Appendix C – Preliminary Environmental Review

MOTT MACDONALD

Application for Permission under Section 16 of the Town Planning Ordinance (Cap. 131) for Proposed "Flat" with "Commercial (1)" Zone of STTL626 and STTL627 in Shatin

Preliminary Environmental Review (PER)

July 2026

Mott MacDonald

[redacted]

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[redacted]

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1 INTRODUCTION

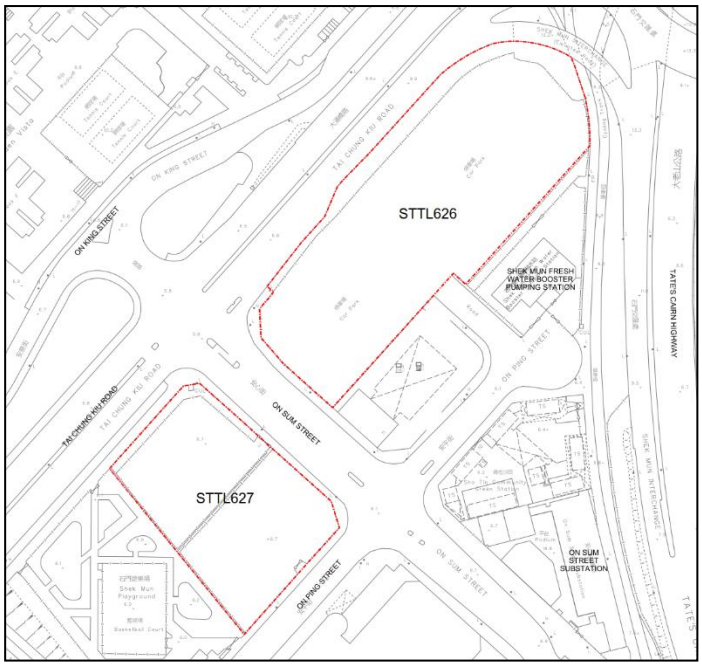
1.1 Study Background

1.1.1 The Government is committed to facilitating steady and continued land supply. The Government will continue to optimise the use of built-up land and its surrounding areas to meet the demand for housing and other development purposes in the short to medium term.

1.1.2 To achieve this objective, the Government has identified potential sites for conversion from commercial to residential use. Upon confirmation of the technical feasibility, a planning application will be submitted under section 16 of Town Planning Ordinance for consideration by the Town Planning Board.

1.1.3 On 15 August 2023, Mott MacDonald Hong Kong Limited (Mott) was commissioned by the CEDD's Housing Projects 3, Civil Engineering Office to undertake the "Term Consultancy for Site Formation and Infrastructure Works for Proposed Housing and Other Developments in Zone 1 (2023 – 2027) – Feasibility Study". Zone 1 mainly covers Shatin, Ma On Shan, Tsuen Wan and Kwai Ching, Lantau and outlying islands. On 31 October 2025, Task Order No. 4 (TO4) was instructed to conduct various technical assessments to support the town planning application for proposed private residential development at two development sites denoted as STTL626 (also known as ST-9353N) and STTL627 (also known as ST-9353S) respectively, located on the north and south sides of the section of On Sum Street between Tai Chung Kiu Road and On Ping Street in Shek Mun, Sha Tin. Location of the Site is shown in **Diagram 1-1**.

Diagram 1-1 Location of the Site

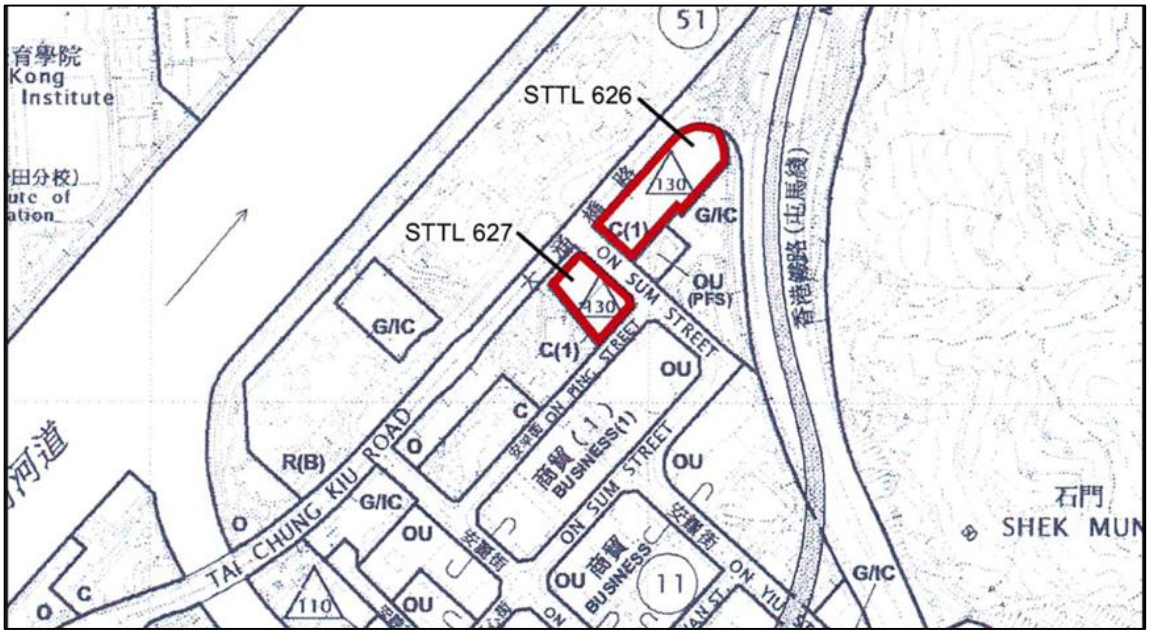


1.2 Site Description and Major Scope of Works

1.2.1 The two subject sites of this assignment STTL626 and STTL627, currently zoned "Commercial (1)" ("C(1)") on the approved Sha Tin Outline Zoning Plan (OZP) no. S/ST/40, cover a site area of approximately 0.80ha and 0.41ha respectively. Located at the northern fringe of the Shek Mun Business Area (Planning Area 11 in the OZP), the sites are generally bounded by Shek Mun Interchange to the north, Tai Chung Kiu Road (TCKR) to the northwest, Shek Mun Playground to the south, and On Ping Street (OPS) to the east, with On Sum Street (OSS) running along a corridor that separates the two sites. A hotel (Courtyard by Marriot Hong Kong Shatin) is located to the further southwest. Currently the STTL626 site is used as a fee-paying carpark (FPC) whereas the STTL627 site is vacant Government land. Both sites are formed flat ground, with an existing ground level at approximately +6mPD.

1.2.2 The proposed sites are covered by the approved Sha Tin Outline Zoning Plan (OZP) No. S/ST/40 and zoned as "C (1)", as shown in Diagram 1-2.

Diagram 1-2 Boundaries of the two sites under Approved Sha Tin Outline Zoning Plan (Plan No. S/ST/40)



Source: Sha Tin Outline Zoning Plan (Plan No. S/ST/40), Town Planning Board Portal

1.2.3 The design parameters of the Indicative Scheme for the Proposed Development are summarised in **Table 1.1** below.

Table 1.1 Target Design Parameters of the Indicative Scheme

	Development Parameters	
	STTL626	**STTL627**
Application Site Area	0.80Ha	0.41Ha
Planned Housing Type	Private Housing	
No. of Flats (Total No. of Flats : 1,456) (1)	962	494

Note:
(1) For technical assessment purpose, the adopted flat nos. for STTL626 and STTL627 are 1,100 and 451 (including 10% buffer) respectively. This is on conservative side since the total flat nos. of 1,551 (and consequently the design population) are larger than that in the Indicative Scheme.

1.2.4 This EFS aims to conduct the necessary technical assessments to support the town planning application for the proposed private residential developments for the two sites STTL626 and STTL627 in Shek Mun. The scope of work includes the followings:

- To conduct the technical assessments related to traffic and transport, drainage, sewerage, water supply and utilities;
- To assess environmental impacts and conduct quantitative risk assessments; and
- To prepare a Planning Report and to provide all necessary inputs to support and complete the planning application procedure.

1.2.5 Based on the information available, the technical assessments are currently scheduled for completion in March 2026 to initiate the Section 16 town planning application procedure in Q2 or Q3 2026. It is targeted that both sites will be included in the 2026/27 Land Sale Programme for private housing development.

1.3 Scope and Structure of this Report

1.3.1 This Preliminary Environmental Review (i.e. hereafter called the PER) has been prepared in accordance with Clause 6.14 of the Consultancy Brief of Agreement No. CE19/2023 (CE), and the purpose of this PER is to:

- Identify the important environmental factors of the Development and infrastructure Works;
- Identify elements of the Development(s) and Infrastructure Works which are Designated Project (DP) under the Environmental Impact Assessment Ordinance (EIAO);
- Identify existing and planned sensitive receivers (including those within the Development) and sensitive parts of the natural environment which may be subject to impact by Development and Infrastructure Works;

- Identify, assess and specify methods, measures and standards, to be included in the detailed design, construction and operation of Development and Infrastructure Works which are necessary to mitigate these impacts and reduce them to established levels;
- Identify alternatives / options / alignments of the Development and Infrastructure Works to minimise potential environmental impacts; and
- Assess the potential environmental impacts arising from and encountered by the Development(s) including the Proposed Development Site(s) for each of the Developments (including but not limited to the assessment of the impacts of existing and new road traffic/railway/industrial noise sources and vehicular/industrial air emission sources on the Development(s))
- Recommend mitigation measures to keep the potential environmental impacts within acceptable levels of the current standards/ regulations;

1.3.2 The report contains the following sections:

- Section 1 – Introduction
- Section 2 – Proposed Development Description
- Section 3 – Air Quality Impact
- Section 4 – Noise Impact
- Section 5 – Water Quality
- Section 6 – Waste Management
- Section 7 – Other Environmental Implications
- Section 8 – Conclusion

2 PROPOSED DEVELOPMENT DESCRIPTION

2.1 Proposed Development Site

2.1.1 The implementation of residential development at STTL626 and STTL627 sites should be explored. In accordance with the latest OZP no. S/ST/40, 'Flat' and 'House' are Column 2 uses within the "C(1)" zone, which requires planning permission from the Town Planning Board (TPB). The technical assessments to be conducted by Mott under this current assignment (Task Order No. 4) will serve to support the forthcoming Section 16 Application to seek TPB's approval for the implementation of residential development in the two subject sites.

2.2 Development Planning Parameters and Layout Scheme

2.2.1 At the time of preparation of this PER, the layout plan is still pending subject to the results from different engineering assessments. Therefore, this PER is aimed to demonstrate the Site would be environmentally feasible for the later proposed development and outline the environmental mitigation measures. This information would provide a baseline for the later detailed design stage.

2.3 Proposed Development Programme

2.3.1 The tentative construction period is Year 2027-2031. The tentative population intake for the proposed development is Year 2032.

2.3.2 The above programme is tentative and subject to review and further discussion among relevant government bureau or departments and relevant stakeholders.

2.4 Environmental Impact Assessment Ordinance Implications

2.4.1 The proposed development does not constitute to any Designated Project as stipulated in Schedule 2, EIAO.

2.4.2 The total area for the proposed developments is less than 50 hectares (i.e. Site Area of STTL626 is 0.80 ha and STTL627 is 0.41ha). Hence, the proposed development does not constitute a Designated Project (DP) under EIAO Schedule 3.

2.5 Concurrent Project

2.5.1 There is no concurrent project identified in the 500m area from the site boundary.

2.6 Environmental Appraisal

General Environmental Impact

2.6.1 General environmental impact, including air quality, noise, water quality (including sewage implications), waste management would be detailed in **Section 3** to **Section 7** of this PER.

3 AIR QUALITY IMPACT ASSESSMENT

3.1 Introduction

3.1.1 This section presents the framework of assessing potential air quality impacts arising from the construction and operation of the proposed development. Representative Air Sensitive Receivers (ASRs) are identified for the air quality assessment. Appropriate mitigation measures are proposed to alleviate potential air quality impact, as necessary.

3.2 Relevant Legislation, Standards and Guidelines

Air Quality Objectives

3.2.1 The Air Pollution Control Ordinance (APCO) provides the statutory authority for controlling air pollutants from a variety of sources. The Hong Kong Air Quality Objectives (AQOs), which stipulate the maximum allowable concentrations over specific periods for typical pollutants, should be met. The prevailing AQOs are listed in **Table 3.1.**

Table 3-1: Air Quality Objective

Pollutant	Averaging time	Concentration (1) (µg/m^3)	Number of exceedances allowed
Sulphur Dioxide (SO_2)	10-minute	500	3
	24-hour	40	3
Respirable Suspended Particulates (RSP or PM_{10}) (2)	24-hour	75	9
	Annual	30	Not applicable
Fine Suspended Particulates (FSP or $PM_{2.5}$) (3)	24-hour	37.5	18
	Annual	15	Not applicable
Nitrogen Dioxide (NO_2)	1-hour	200	18
	24-hour	120	9
	Annual	40	Not applicable
Ozone (O_3)	8-hour	160	9
	Peak Season	100	Not Applicable
Carbon Monoxide (CO)	1-hour	30,000	0
	8-hour	10,000	0
	24-hour	4,000	0
Lead (Pb)	Annual	0.5	Not applicable

Notes:
(1) All measurements of the concentration of gaseous air pollutants, i.e., sulphur dioxide, nitrogen dioxide, ozone and carbon monoxide, are to be adjusted to a reference temperature of 293 Kelvin and a reference pressure of 101.325 kilopascal.
(2) Respirable suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 10µm or less.
(3) Fine suspended particulates means suspended particles in air with a nominal aerodynamic diameter of 2.5 µm or less.

Air Pollution Control (Construction Dust) Regulation

3.2.2 The Air Pollution Control (Construction Dust) Regulation enacted under the APCO defines notifiable and regulatory works activities that are subject to construction dust control. Notifiable works are site formation, reclamation, construction of foundation and superstructure for a building, and road construction work. Regulatory works are renovation of building, road opening or resurfacing work, slope stabilisation works, and any work involving stockpiling, loading and unloading of dusty materials, transfer of dusty materials using belt conveyor system, etc.

3.2.3 Notifiable works require that advance notice of activities shall be given to EPD. The Air Pollution Control (Construction Dust) Regulation also requires works contractor to ensure that both notifiable works and regulatory works are conducted in accordance with the Schedule of Regulation, which provides air quality control measures.

Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation

3.2.4 The Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation came into operation on 1 June 2015. Under the Regulation, Non-road mobile machinery (NRMMs), except those exempted, are required to comply with the prescribed emission standards. From 1 September 2015, all regulated machines sold or leased for use in Hong Kong must be approved or exempted with a proper label in a prescribed format issued by EPD. Starting from 1 December 2015, only approved or exempted NRMMs with a proper label are allowed to be used in specified activities and locations including construction sites. The contractor is required to ensure the adopted machines or non-road vehicle under the proposed development could meet the prescribed emission standards and requirement.

Air Pollution Control (Fuel Restriction) Regulations

3.2.5 Air Pollution Control (Fuel Restriction) Regulations came into operation on 1 July 1990 and were amended in November 2024 to further tighten the control requirements of liquid fuels and remove the restrictions on the use of liquid and solid fuel in Sha Tin Fuel Restriction Area. Under the Regulation, liquid fuel with a sulphur content not exceeding 0.001% by weight and a viscosity not more than 6 centistokes at 40°C is allowed to be used.

Development Bureau Technical Circular (Works)

3.2.6 Development Bureau Technical Circular (Works) No. 13/2020 is one of the environmental guidelines on timely application of temporary electricity and wider use of electric vehicles in public works contract. The project team should timely apply for the temporary electricity and water supply with a target that the necessary cables/water mains laying works could be completed before the commencement of works contract. The project teams should also specify the use of EV(s) and installation of a designated medium-speed charger for each EV in each public contract.

3.2.7 Development Bureau Technical Circular (Works) No. 1/2015 also requires that no exempted generators, air compressors, excavators and crawler cranes shall be allowed in the new capital works contracts of public works (including design and build contracts) with an estimated contract value exceeding $200 million, unless is at the discretion of the Architect/Engineer considering no feasible alternative.

Chapter 9 of the Hong Kong Planning Standards and Guidelines (HKPSG)

3.2.8 The HKPSG buffer distance to "open space" sites have been adopted as there is no specific requirement for buffer distances to non-domestic premises. According to Table 3-1 in Chapter 9 of the HKPSG guidelines on the buffer distance for air sensitive uses from industrial and vehicular emissions in relation to different categories of roads have been recommended. The different categories of roads and the respective minimum buffer distance for open space site are given in **Table 3-2**. Recommended buffer distances from odour sources extracted from

Table 1.3 in Chapter 9 of the HKPSG are also presented in **Table 3-2**.

Table 3-2: Guideline on Usage of Open Space Site

Pollutant Source	Parameter	Buffer Distance (m)	Permitted Uses
Road and Highways	***Type of Road***		
	Trunk Road and Primary Distributor (PD)	>20	Active and passive recreation uses
		3-20	Passive recreational uses
		<3	Amenity areas
	District Distributor (DD)	>10	Active and passive recreation uses
		<10	Passive recreational uses
	Local Distributor (LD)	>5	Active and passive recreation uses
		<5	Passive recreational uses
	Under Flyovers	--	Passive recreational uses
Industrial Areas	***Difference in Height between Industrial Chimney Exist and the Site (m)***		
	<20	>200	Active and passive recreational uses
		5-200	Passive recreational uses
	20-30*	>100	Active and passive recreational uses
		5-100	Passive recreational uses
	30-40	>50	Active and passive recreational uses
		5-50	Passive recreational uses
	>40	>10	Active and passive recreational uses
			Passive recreational uses
Odour Sources	Odour emission rate / source type	>200	Sensitive uses

3.3 Ambient Air Quality

3.3.1 The historical ambient air quality of the assessment area can be referenced from EPD's general Air Quality Monitoring Station (AQMS). The nearest general AQMS is Sha Tin AQMS is presented in **Table 3-3**.

Table 3-3: Historical Air Quality from Sha Tin AQMS

Pollutant	Averaging Period	Concentration (µg/m^3)					Corresponding AQO (µg/m^3)
		2020	2021	2022	2023	2024	
Respirable Suspended Particulates (RSP or PM_{10})	24 hour - 10th highest	54	58	46	51	53	75 (9)
	Annual	25	25	21	22	21	30
Fine Suspended Particulates (FSP or $PM_{2.5}$)	24 hour - 19th highest	28	31	30	26	31	37.5 (18)
	Annual	15	14	13	13	13	15
Nitrogen Dioxide (NO_2)	1 hour - 19th highest	136	159	112	133	122	200 (18)
	24 hour - 10th highest	58	74	55	62	53	120 (9)
	Annual	28	32	26	27	26	40
Sulphur Dioxide (SO_2)	10-Min - 4th highest	31	33	23	57	21	500 (3)
	24 hour - 4th highest	13	11	11	8	6	40 (3)
Ozone (O_3)	8 hour - 10th highest	153	157	**177**	159	**167**	160 (9)
	Peak Season	99	94	**103**	**101**	**109**	100

Notes:
(1) Data extracted from EPD's Smart Air Modelling Platform (SAMP) v2.1.
(2) Monitoring results that exceeded the prevailing AQO criteria are shown in **bold** characters.
(3) Monitoring data for CO and Pb is not available at Sha Tin AQMS.

3.3.2 As shown in **Table 3-3**, the historical background concentrations of all pollutants complied with their respective Air Quality Objectives (AQOs) in the past 5 years with the exception of Ozone.

3.4 Background Air Quality

3.4.1 The future background air pollutant concentrations which are used for predicting the total air quality impact, were estimated by PATH v3.0. The Site is located within the grid (43,42), (44,42), (43,41) and (44,41) of the PATH model. The concentrations of air pollutants in Year 2030 within the concerned grid are summarized below. Year 2030 is referenced as being closest to the tentative population intake year for the proposed Development (i.e. Year 2032).

Table 3-4: Future Air Pollutant Concentration (in Year 2030) from PATH Model (Level 1: 0m-17m)

Pollutant	Averaging Period	Concentration AQO ($\mu g/m^3$)	Concentration ($\mu g/m^3$)			
			PATH Grid (43, 42)	PATH Grid (44, 42)	PATH Grid (43, 41)	PATH Grid (44, 41)
Nitrogen Dioxide (NO_2)	1 hour - 19th highest	200	66.13	59.25	66.63	57.49
	24 hour - 10th highest	120	30.28	28.79	31.91	28.02
	Annual	40	16.27	12.97	16.23	11.23
Respirable Suspended Particulates (PM10)	24 hour - 10th highest	75	50.41	49.43	49.37	48.46
	Annual	30	19.92	19.09	19.41	18.71
Fine Suspended Particulates (PM2.5)	24 hour - 19th highest	37.5	30.77	29.18	29.61	27.81
	Annual	15	12.43	11.66	12.01	11.31
Sulphur Dioxide (SO_2)	10 minute – 1st highest	500	21.67	21.6	21.71	23.24
	24 hour - 4th highest	40	6.72	6.62	6.69	6.54
Ozone (O_3)	8 hour - 10th highest	160	**169.91**	**166.38**	**168.98**	**169.45**
	Peak Season	100	**117.38**	**117.65**	**117.25**	**119.87**
Carbon Monoxide (CO)	1-hour	30,000	538.41	528.93	536.95	525.1
	8-hour	10,000	500.29	484.02	493.95	479.41
	24-hour	4,000	470.04	454.92	466.45	448.23

Notes:
(1) Data extracted from EPD's Smart Air Modelling Platform (SAMP) v2.1.
(2) Air pollutant concentrations that exceed the prevailing AQO criteria are shown in **bold** characters.

3.4.2 According to the PATH model as shown in **Table 3-4**, the predicted future background air pollutant concentrations of RSP, FSP, NO_2, SO_2 and CO are below the criteria of AQOs.

3.4.3 The Environment Bureau released the report "Clean Air Plan for Hong Kong 2035" in June 2021. The report has set out the long-term goals and strategies to further improve the air quality in Hong Kong. According to the information from that report, the average concentration of ozone has remained at a relatively high level. A 3-year joint study on Characterisation of

Photochemical Ozone Formation, Regional and Super-Regional Transportation was launched in 2021 to provide a scientific foundation for formulating policies to improve the regional ozone problem. As ozone is a regional problem and it is not emitted directly from an emission source, it will not be considered in the study.

3.5 Air Sensitive Receiver

3.5.1 The existing representative air sensitive receivers (ASRs) that would be affected by the proposed development under worst case scenario within the assessment area have been identified with reference to the criteria set out in Annex 12 of the EIAO-TM. The identified ASRs are summarised in **Table 3-5** and shown in **Figure 3.1**.

Table 3-5: Summary of Identified Representative ASRs

ID	Description	Type of Use	Distance from Study Site Boundary (m)
ASR1	Ravana Garden, Block 5	Residential	195
ASR 2	Leung Kui Kau Lutheran Primary School	Educational	129
ASR 3	Garden Vista, Block C	Residential	80
ASR 4	Garden Vista, Block F	Residential	82
ASR 5	Garden Vista, Block D	Residential	112
ASR 6	Pictorial Garden Phase I, Abbey Court	Residential	110
ASR 7	Truth Baptist Church Pictorial Kindergarten, Belleve Court	Educational	110
ASR 8	Pictorial Garden, Delite Court	Residential	123
ASR 9	Pictorial Garden Phase II, Tennis Court	Recreational	72
ASR 10	Pictorial Garden Phase I, Tennis Court	Recreational	52
ASR 11	Garden Vista, Tennis Court	Recreational	72
ASR 12	Shek Mun Playground, Basketball Court	Recreational	3
ASR13	Courtyard by Marriott Hong Kong Sha Tin	Hotel	122
ASR14	New Trade Plaza Tower B	Commercial	103
ASR15	Metropole Square	Commercial	150
ASR16	Topsail Plaza	Commercial	118
ASR17	Grandtech Centre	Commercial	32
PA1	Planned Residential Use	Residential	Within the Site
PA2	Planned Residential Use	Residential	Within the Site

3.6 Identification and Evaluation of Air Quality Impact

Construction Phase

Fuel Combustion from Powered Mechanical Equipment (PME)

3.6.1 Fuel combustion from the use of PME during construction works could be a source of PM, NO_2, SO_2 and CO. According to the tentative information provide by our project team, only a small number of PMEs (3 dump trucks and 4 other PMEs which in operation at the same time) will be required on-site under normal operation.

3.6.2 The contractor will be required to properly maintain the construction plants in a good condition to minimize impacts due to exhaust emissions. Wherever possible, connection to the main power supply should be considered to minimize the need for use of diesel fuel generator. To

minimize SO_2 emission from construction plants and equipment, liquid fuel (mostly diesel) with a sulphur content of less than 0.001% by weight should be used in construction plants or vehicles as stipulated in the Air Pollution Control (Fuel Restriction) Regulations. In addition, all plant and vehicles used in conjunction with the construction works shall be subject to a regular maintenance and testing regime to demonstrate that they are compliant with current emissions thresholds. All regulated machines and non-road vehicles shall comply with Air Pollution Control (Non-road Mobile Machines (Emission)) Regulation June 2015. Allowing only approved or exempted NRMMs including regulated machines and non-road vehicles with a label issued by EPD to be used on site. With implementation of the emission control on NRMM as detailed in **Section 3.7.3**, no adverse air quality impacts due to exhaust emissions from the proposed construction activities are expected to occur.

Construction Dust

3.6.3 STTL626 and STTL627 have an area of 0.80ha and 0.41 respectively. Site STTL626 is currently occupied as a fee-paying public carpark and site STTL627 is currently a vacant government land. Therefore, no large-scale demolition works is anticipated. The site formation and excavation works are to be limited as the Site is situated at a flat land with similar elevations levels with the adjacent land. However, these dusty construction activities and wind erosion of exposed sandfill areas would cause potential fugitive emission in particulates.

3.6.4 A review of dust monitoring data during construction phase of similar site formation and infrastructure project of North East New Territories New Development (NENT) has been conducted. NENT is a large-scale development project and the project site area is about 614 ha which is far above than the proposed development (about 1.21 ha). The work sites of NENT were located in close vicinity of ASRs. Good site practices and dust suppression measures as recommended in the EIA Report were adopted. Some existing ASRs were located in close vicinity of construction works and concrete batching plant, and selected as dust monitoring stations for impact monitoring during construction phase of the projects. In view of the above, the data of the monitoring stations of NENT projects were selected for review. The measured 1-hr TSP and 24-hr TSP levels at all monitoring stations at NENT were below the action levels of 300 $\mu g/m^3$ and 150 $\mu g/m^3$ respectively and limit levels of 500 $\mu g/m^3$ and 260 $\mu g/m^3$ respectively during site clearance and site formation with the monitoring locations located from the work site boundary from 1m to 169 m. No exceedance of action level and limit level was recorded, indicating that no significant dust impact (i.e. TSP, RSP, FSP) arising from the construction of NENT. Therefore, it is anticipated that no significant air quality impact would arise from the construction of the proposed development, which has similar nature (site formation and infrastructure project) as NENT, with the implementation of appropriate mitigation measures.

3.6.5 Based on above, similar air quality control measures should be implemented to reduce the fugitive dust emission from the works sites. Dust suppression measures stipulated in Air Pollution Control (Construction Dust) Regulation would be implemented as far as practicable. Regular watering would be provided at works sites with excavation works and exposed areas, and at sites of spoil handling. Haul roads within works sites and works areas would be paved as appropriate and regularly wetted to suppress the fugitive dust emission caused by the travel

of construction vehicles. Wheel washing facility would also be provided at each exit of works sites such that no significant dust impact would be caused by outbound construction vehicles on public roads. With the implementation of above air quality control measures and good site practices (as detailed in Section **3.7**), fugitive dust emission from the construction works would be controlled.

Operation Phase – Vehicular Emission

3.6.6 With reference to the Annual Traffic Census 2024 and correspondence with TD (see **Appendix 3.1**), the road types are shown in **Table 3-6**. With reference to the HKPSG, minimum buffer distances for vehicular emissions between nearby roads and the proposed development, as shown in **Table 3-6**, should be complied to avoid causing adverse air quality impacts to the proposed development. The overall buffer zone is illustrated in **Figure 3.2**.

Table 3-6: Summary of Identified Representative ASRs

Road	Type of Road	Buffer Distance for the air sensitive uses of the Project Development
Tai Chung Kiu Road	PD	>20m for Active and passive recreation uses
Tate's Cairn Highway	EX	>20m for Active and passive recreation uses
Shek Mun Interchange	TR	>20m for Active and passive recreation uses
Access road to STT626	LD	>5m for Active and passive recreation uses or <5m for Passive recreational uses
On Sum Street	LD	>5m for Active and passive recreation uses or <5m for Passive recreational uses
On Ping Street	LD	>5m for Active and passive recreation uses or <5m for Passive recreational uses

Notes:
- The buffer distance for PD roads is applied for Expressway (EX).

3.6.7 Based on current feasibility stage, the assessment has been carried out to foresee if there is any insurmountable air quality impact for the future proposed Development. A preliminary layout is shown in **Figure 3.2**. No air-sensitive uses of the proposed development including openable window, fresh air intake and recreational use in the open space shall be located within the buffer zones. All internal roads within the proposed Development are private roads, classified as emergency vehicular access (EVA) roads and therefore buffer distance requirements do not apply on these roads.

3.6.8 As the buffer distance as shown in **Table 3-6** could be fulfilled, adverse air quality impact due to vehicular emission is not anticipated.

Operation Phase – Industrial Emission

3.6.9 Based on the site visit conducted on 28 January 2026, no industrial chimney was identified within 500m of the site boundary. Desktop review was also conducted through Hong Kong Environmental Database published by EPD. Chimneys are identified at the HSBC Data Centre (SP License) located approximately 245m away from the proposed development Site. Hence the buffer distance requirement of more than 200m from industrial emission sources is fulfilled. Moreover, as observed from the details of the SP License, its chimneys are operated for emergency use only. Therefore, adverse air quality impact due to industrial emission on the proposed development is not anticipated.

Operation Phase – Odour Emission

3.6.10 An odour survey within 500m from the site boundary was carried on 28 January 2026 to identify any malodour from the surrounding. According to the odour survey, malodour was not detected through the odour survey, satisfying the 200m buffer distance requirement of the HKPSG.

3.6.11 The Shing Mun River runs along the northern and western sides of the Site, with its nearest point approximately 180m away. From EPD's records, 13 odour complaints against the Shing Mun River (Section from Sha Tin Road to Sha Tin Hoi) were recorded over the past 5 years (2021-2025). Only 2 odour complaints were recorded near Shing Mun River Main Channel (i.e. 1 in 2022 and 1 in 2023). No odour complaints have been recorded since then. The rest of the odour complaints were recorded near Fo Tan Nullah, Siu Lek Yuen Nullah, and Lion Rock Bridge which are all over 200m away from the proposed development site.

3.6.12 The Shek Mun Fresh Water Booster Pumping Station is located within 100m away from the proposed development boundary, no odour is detected at the boundary of the pumping station during the site visit on 28 January 2026. Therefore, it is not likely to have adverse odour impact.

3.7 Mitigation Measures

Construction Phase

General Practices for Air Quality Control

3.7.1 The contractor should implement the following mitigation measures to maintain dust emissions at acceptable levels during construction phase:

- Any dusty activities should be regularly sprayed with water to maintain damp conditions of the works area;
- Any dusty materials should be covered with tarpaulin or similar material during transportation;
- Any dusty materials stockpiles should be either (i) covered entirely by impervious sheeting; or (ii) sprayed with water.

3.7.2 As ASR 12 (Shek Mun Playground, Basketball) is in close proximity of the proposed development, special attention should be taken. Haul road, dusty works and stockpiles should be located away from ASR 12 during the construction of the proposed development.

Emission control on Non-Road Mobile Machinery (NRMMs)

3.7.3 Fuel combustion from the use of powered mechanical equipment (PME) during construction works would be a source of air emission. To improve air quality, EPD has introduced the Air Pollution Control (NRMMs) (Emission) Regulation, which came into operation in 2015 to regulate emissions from machines and non-road vehicles. Ultra-low sulphur diesel (ULSD) with a sulphur content of not more than 0.001% by weight and a viscosity of not more than 6 centistokes at 40°C will be used as much as practicable to minimise SO_2 emissions. Under the Regulation, NRMMs, except those exempted, are required to comply with the prescribed emission standards. All regulated machines sold or leased for use in Hong Kong must be approved or exempted with a proper label in a prescribed format issued by EPD. Only approved or exempted NRMMs with a proper label are allowed to be used in specified

activities and locations including construction sites. The contractor would also review the contemporary circumstances and site constraints and optimise the quantity of on-site machinery. This would help to reduce the gaseous and PM emission for construction site.

3.7.4 In addition, the following good site practices that can control and reduce the emission from the use of NRMMs from the proposed development are recommended:

- Regulated machines shall be used and exempted NRMMs should be avoided where practicable;
- Optimise the number of on-site machinery to minimize gaseous and PM emissions for each construction site with consideration of actual site constraints or circumstances;
- Use cleaner fuel such as ultra-low sulphur diesel in diesel-operated construction plant to reduce sulphur dioxide emission;
- Zero emission or clean fuels shall be considered as far as practicable for transportation activities;
- Use of electric PMEs where practicable;
- Connect construction plant and equipment to main electricity supply and avoid use of diesel generators and diesel-powered equipment as far as practicable;
- Switch off the engine of PMEs when idling;
- Implement regular and proper maintenance for plant and equipment; and
- Employ plant and equipment of adequate size and power output and avoid overloading of the plant.

Best Practices for Dust Control

3.7.5 Relevant best practices for dust control as stipulated in the Air Pollution Control (Construction Dust) Regulation should also be adopted to further reduce the construction dust impacts of the proposed development. These best practices include:

Good Site Management

3.7.6 Good site management is important to help reduce potential air quality impact down to an acceptable level. As a general guide, the contractor should maintain high standard of housekeeping to prevent emission of fugitive dust. Loading, unloading, handling and storage of raw materials, wastes or by-products should be carried out in a manner so as to minimise the release of visible dust emissions. Any piles of materials accumulated on or around the work areas should be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas should be carried out in a manner minimising generation of fugitive dust emissions. The material should be handled properly to prevent fugitive dust emission before cleaning.

Disturbed Parts of the Roads

3.7.7 Main temporary access points should be paved with concrete, bituminous hardcore materials or metal plates and be kept clear of dusty materials; or

3.7.8 Unpaved parts of the road should be sprayed with water or a dust suppression chemical so as to keep the entire road surface wet.

Loading, Unloading or Transfer of Dusty Materials

3.7.9 All dusty materials should be sprayed with water immediately prior to any loading or transfer operation so as to keep the dusty material wet.

Debris Handling

3.7.10 Any debris should be covered entirely by impervious sheeting or stored in a debris collection area sheltered on the top and the three sides.

3.7.11 Before debris is dumped into a chute, water should be sprayed so that it remains wet when it is dumped.

Transportation of Dusty Materials

3.7.12 Vehicle used for transporting dusty materials/spoils should be covered with tarpaulin or similar material. The cover should extend over the edges of the sides and tailboards.

Wheel washing

3.7.13 Vehicle wheel washing facilities should be provided at each proposed development site exit. Immediately before leaving the proposed development site, every vehicle should be washed to remove any dusty materials from its body and wheels.

Use of vehicles

3.7.14 Immediately before leaving the proposed development site, every vehicle should be washed to remove any dusty materials from its body and wheels.

3.7.15 Where a vehicle leaving the proposed development site is carrying a load of dusty materials, the load should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle.

Site hoarding

3.7.16 Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length of that portion of the site boundary except for a site entrance or exit.

3.7.17 With proper implementation of the recommended mitigation measures as well as the relevant control requirements stipulated in the Air Pollution Control (Construction Dust) Regulation, no adverse air quality impacts are anticipated during the construction phase.

Operation Phase

3.7.18 No industrial chimneys emissions would be located within 200m from the Site. An odour survey was carried out on 28 January 2026, during which no malodour was detected within 200m from the proposed development. In addition, sufficient buffer distances are provided between the corresponding traffic roads and the air sensitive uses. Therefore, no further mitigation measure is required.

4 NOISE IMPACT ASSESSMENT

4.1 Introduction

4.1.1 This section identifies and evaluates the potential noise impact likely to arise during the construction and operation phases of the proposed development.

4.2 Environmental Legislation, Standards and Guidelines

Construction Noise

4.2.1 Legislation, Standards, Guidelines and Criteria relevant to the consideration of construction noise impacts under this assessment include the following:

- Noise Control Ordinance (NCO)
- Chapter 9 of the Hong Kong Planning Standards and Guidelines (HKPSG)
- ProPECC PN 1/24 Minimizing Noise from Construction Activities

Percussive Piling

4.2.2 Noise impacts arising from percussive piling during anytime are governed by the NCO.

4.2.3 For carrying out any percussive piling, a Construction Noise Permit (CNP) issued by the Authority must be obtained under the NCO. The noise criteria and the assessment procedures for issuing a CNP are specified in following Technical Memoranda published under the NCO

- Technical Memorandum on Noise from Percussive Piling under (PP-TM)

4.2.4 In case of any percussive piling is involved, it is the contractor's responsibility to ensure compliance with the NCO and the above TM. The contractor will be required to submit CNP application to the Noise Control Authority and abide by any conditions stated in the CNP.

General Construction Activities during Restricted Hours

4.2.5 Noise impacts arising from general construction activities (excluding percussive piling) conducted during the restricted hours (19:00-07:00 hours on any day and anytime on Sunday or general holiday) are governed by the NCO.

4.2.6 For carrying out of any general construction activities involving the use of any Powered Mechanical Equipment (PME) within the restricted hours, a Construction Noise Permit (CNP) issued by the Authority must be obtained under the NCO. The noise criteria and the assessment procedures for issuing a CNP are specified in following Technical Memoranda published under the NCO –

- Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM).
- Technical Memorandum on Noise from Construction Work in Designated Area (DA-TM)

4.2.7 In case of any construction activities during restricted hours, it is the contractor's responsibility to ensure compliance with the NCO and the relevant TMs. The contractor will be required to submit CNP application to the Noise Control Authority and abide by any conditions stated in the CNP.

General Construction Activities during Non-Restricted Hours

4.2.8 ProPECC PN 1/24 provides assessment criteria as well as requirements relating to construction noise not currently controlled under the NCO. The Practice Note also provides information on noise abatement measures. Noise impacts arising from general construction activities other than percussive piling during the daytime period (07:00-19:00 hours on any day not being a Sunday or general holiday) would be assessed against the noise standards tabulated in **Table 4.1**. Practicable direct mitigation measures will be evaluated and exhausted to maximise the protection of NSRs.

Table 4-1: Noise Standards for Daytime Construction Activities

Noise Sensitive Uses	0700 to 1900 hours on any day not being a Sunday or general holiday, Leq(30 min), dB(A)
• All domestic premises • Temporary housing accommodation • Hostels • Convalescences homes • Homes for the aged	75
• Places of public worship • Courts of law • Hospitals and medical clinics	70
• Educational institutions (including kindergartens and nurseries)	70 (65 during examination)

Notes:
(1) The above noise standards apply to uses, which rely on opened windows for ventilation.
(2) The above standards shall be viewed as the maximum permissible noise levels assessed at 1 m from the external facade.

Road Traffic Noise

4.2.9 Legislation, Standards, Guidelines and Criteria relevant to the consideration of planning against possible road traffic noise impact under this assessment include the following:

- Hong Kong Planning Standard and Guidelines (HKPSG);

4.2.10 The noise criteria for evaluating noise impact of planning development with respect to road traffic noise are based on the HKPSG. The summary of noise criteria is given in **Table 4-2**.

Table 4-2: Relevant Road Traffic Noise Standards for Planning Purposes

Uses	Road Traffic Noise Peak Hour Traffic L10(1 Hour), dB(A)
All domestic premises including temporary housing accommodation, hotels and hostels, offices	70
Educational institutions including kindergarten, child care centres and all other where unaided voice communication is required	65
Places of public worship and courts of law	65
Hospitals, clinics, convalescences and residential care homes for the elderly - diagnostic rooms - wards	55

Notes:
(1) The above standards apply to uses which rely on opened windows for ventilation.
(2) The above standards should be viewed as the maximum permissible noise levels at the external facade.

Fixed Noise Sources / Railway Noise

4.2.11 Legislation, Standards, Guidelines and Criteria relevant to the consideration of planning

against possible fixed noise source and railway noise impact under this assessment include the following:

- Noise Control Ordinance (NCO) (Cap. 400);
- Hong Kong Planning Standard and Guidelines (HKPSG);
- Technical Memorandum for the Assessment of Noise from Places Other Than Domestic Premises, Public Places or Construction Sites (TM-IND).

4.2.12 For fixed noise sources and railway noise impact assessment, the assessment criteria are determined with reference to TM-IND. The Acceptable Noise Levels (ANLs) for the NSRs are based on the Area Sensitivity Rating, which is defined in the TM-IND issued under the NCO. The Area Sensitivity Rating depends on the type of area and the degree of impact that IFs have on the NSRs and as illustrated in **Table 4-3** below. Industrial area, major road or the area within the boundary of Hong Kong International Airport shall be considered to be an Influencing Factor (IF).

Table 4-3: Area Sensitivity Rating

Type of Area Containing NSR	Degree to which NSR is affected by IF		
	Not Affected[(c)]	Indirectly Affected[(d)]	Directly Affected[(e)]
(i) Rural area, including country parks[(a)] or village type developments	A	B	B
(ii) Low density residential area consisting of low-rise or isolated high-rise developments	A	B	C
(iii) Urban area[(b)]	B	C	C
(iv) Area other than those above	B	B	C

Definitions:
a) "Country park" means an area that is designated as a country park pursuant to section 14 of the Country Parks Ordinance.
b) "Urban area" means an area of high density, diverse development including a mixture of such elements as industrial activities, major trade or commercial activities and residential premises.
c) "Not Affected" means that the NSR is at such a location that noise generated by the IF is not noticeable at the NSR.
d) "Indirectly Affected" means that the NSR is at such a location that noise generated by the IF, whilst noticeable at the NSR, is not a dominant feature of the noise climate of the NSR.
e) "Directly Affected" means that the NSR is at such a location that noise generated by the IF is readily noticeable at the NSR and is a dominant feature of the noise climate of the NSR.

4.2.13 However, according to the IND-TM, irrespective any **Table 4.3**, NSR shall be assigned an Area Sensitivity Rating of "C" if it is within 100 m of a zone designated as "Industrial" or "Industrial Estate" on a statutory Outline Zoning Plan, or an Area Sensitivity Rating of "B" if it is between 100 m and 250 m from such a zone, except in cases where **Table 4.3** indicates an Area Sensitivity Rating of "C".

4.2.14 For existing fixed noise source and railway noise impact is controlled under the NCO and shall comply with the ANLs laid down in the Table 2 of the TM-IND. For a given Area Sensitivity Rating, the ANL in dB(A), is given by **Table 4-4** below.

Table 4-4: Acceptable Noise Level for Fixed Noise Sources / Railway Noise

	Area Sensitivity Rating, (ANL L_{eq} (30 min), dB(A))		
Time Period	A	B	C
Day-time (0700 to 1900 hours)	60	65	70
Evening (1900 to 2300 hours)	60	65	70
Night-time (2300 to 0700 hours)	50	55	60

According to 300m noise assessment area as shown in **Figure 4.1**, the Site is surrounded by residential development, commercial buildings and heavy traffic network. Therefore, the surrounding area of the identified representative NSR is classified as "Area other than those above" in Table 1 of the IND-TM. With reference to the Annual Traffic Census 2024, the AADT of Tate's Cairn Highway, Tate's Cairn Highway (section from slip roads to & from Sha Tin Wai Road to Tai Chung Kiu Road Roundabout) is greater than 30,000. Hence, the above roads are considered as Influencing Factor (IF). Façades within the Site that face the IF are considered as "directly affected" and classified as an Area Sensitivity Rating of C while façades not oriented toward the IF are considered "indirectly affected" or "not affected" with a classified Area Sensitivity Rating of B. It is noted that the Area Sensitivity Rating assigned in this PER report is for assessment purpose only. It shall not prejudice the Authority's decision on enforcement based on contemporary conditions.

4.2.15 For planned fixed noise sources, as stipulated in Chapter 9 of the HKPSG, the noise standards for planning purposes fixed noise sources are a) 5 dB(A) below the appropriate ANL as stipulated in the TM-IND, or (b) the prevailing background noise levels (for quiet areas with level 5 dB(A) below the ANL).

4.3 Identification of Representative Noise Sensitive Receivers

4.3.1 The first layer of NSRs located close to the proposed development are identified as representative NSRs for evaluation of different noise impacts (i.e. construction noise, railway noise and fixed noise) within 300m noise assessment area. Details of the representative NSRs are shown in **Table 4-5**. The location of the identified representative NSRs is provided in **Figure 4.1**.

Table 4-5: Summary of Identified Representative NSRs

NSR ID	Description	Type of Use	Distance to Proposed Development Boundary (m)	Noise Impact Assessment				
				Proposed development Construction Noise	Road Traffic Noise	Railway Noise	Fixed Noise	Project Planned Fixed Noise
NSR1	Ravana Garden, Block 5	Residential	195	✓				✓
NSR2	Leung Kui Kau Lutheran Primary School	Educational	129	✓				✓
NSR3	Garden Vista, Block C	Residential	80	✓				✓
NSR4	Garden Vista, Block F	Residential	82	✓				✓
NSR5	Garden Vista, Block D	Residential	112	✓				✓
NSR6	Pictorial Garden Phase I, Abbey Court	Residential	110	✓				✓

NSR7	Truth Baptist Church Pictorial Kindergarten, Belleve Court	Educational	110	✓				✓
NSR8	Pictorial Garden, Delite Court	Residential	123	✓				✓
--	Planned Residential Use (STTL 626)	Residential	Within the Site		✓	✓	✓	
--	Planned Residential Use (STTL 627)	Residential	Within the Site		✓	✓	✓	

4.4 Construction Noise Impact Assessment

Identification of Noise Impact

4.4.1 The potential source of noise impact for construction of the proposed development would be the use of PME for various activities, including minor site clearance works, foundation and superstructure works for the construction of proposed residential blocks cum community hall. PME likely to be used include vibratory poker, mobile crane, generator, etc. for general buildings works.

4.4.2 Under conditions, activities for the proposed development would be carried out during non-restricted hours (0700 – 1900 hours) on normal working dates. For activities that are required to be carried out during restricted hours, it is the contractor's responsibility to ensure compliance with the NCO as well as the relevant Technical Memoranda. The contractor will be required to submit an application for the CNP and abide by the conditions set out by the Noise Control Authority. For carrying out of any general activities involving the use of any PME within restricted hours, a CNP is required from the Authority under the NCO. The noise criteria and the assessment procedures for issuing a CNP are specified in TM-GW under the NCO.

Prediction and Evaluation of Environmental Impact

4.4.3 At this feasibility study stage, the construction programme and construction plant inventory have not yet been available, quantitative construction noise impact will be conducted at later detailed design stage. With consideration of construction works is in small scale (i.e. 1.21ha) and sufficient separation distance (i.e. at least 83m to the nearest representative NSR), and given that the mitigation measures as mentioned below will be implemented, no insurmountable construction noise impact is anticipated.

Mitigation Measures

4.4.4 It is recommended that the following noise mitigation measures should be implemented to minimize the construction noise impact, e.g. "Recommended Pollution Control Clauses for Construction Contracts" available on EPD's website. The following forms of mitigation measures in this PER report are recommended and could be incorporated into the Contract Specifications of the construction contract document in future detailed design stage:

4.4.5 Typical noise mitigation measures include:

- scheduling activities to ensure that only minimal noise activities are in progress at any one time;

- use of equipment with QPME label (i.e. excavator, generator and crane);
- use of movable noise barrier;
- use of noise enclosure / acoustic mat;
- reduction in the number of items of PME operation at any given time;
- avoidance of works in restricted hours; and

Use of QPME

4.4.6 The contractor may be able to obtain particular models of plant that are quieter than the standards given in the GW-TM. This is one of the most effective measures and is increasingly practicable because of the availability of quiet equipment.

4.4.7 Quiet plant is defined as Quality Powered Mechanical Equipment (QPME). The actual sound power level (SWL) of QPME is less than the value specified in TM-GW for the same piece of equipment. The SWLs for specific QPME is taken from EPD's QPME Inventory and "Sound Power Levels of Other Commonly Used PME".

Use of Quiet Construction Method

4.4.8 Instead of traditional construction method, the following quieter construction methods were proposed for the mitigated scenario. It is advised that the contractor should adopt the following quiet construction method as far as practicable.

Hydraulic Crusher for Concrete Breaking

4.4.9 Handheld or excavator mounted concrete breaker is a traditional mechanical equipment for concrete breaking and removal. The operation principle of the traditional handheld or excavator mounted concrete breaker is by percussive striking actions of its chisels which will generate loud noise. Therefore, it is recommended to use of hydraulic concrete crusher to replace the handheld or excavator mounted concrete breaker for demolition works.

Non-Explosive Chemical Expansion Agent (Soundless Chemical Demolition Agent)

4.4.10 Unlike explosive chemicals or expansive compounds, Soundless Chemical Demolition Agents do not produce vibrations, and hence, they are completely quiet and safe to use. When the chemical agent is properly used, it does not cause significant noise, ground vibration, fly rock, gas, dust or any other environmental pollution. This soundless chemical demolition agent is used for concrete demolition or rock breaking and much quieter than traditional breakers. The contractor could also explore the feasibility of adopting Non-Explosive Chemical Expansion Agent (Soundless Chemical Demolition Agent) to replace the use of breakers.

Silent Piling by Press-in Method

4.4.11 Traditional massive augering and piling machines for sheet piling work at hard ground condition would create significant noise and vibration impacts to neighbours. For the Silent Press-in Method, a sheet pile is clipped and pressed underground. Even for harder ground, noise and vibration can also be minimized by pressing-in sheet piles with simultaneous augering, by the Gyropress Method. Construction work can also be completed in shorter duration by using this method so that the noise impact to nearby NSRs can also be further alleviated. Therefore, it is recommended to use of Silent Piling by Press-in Method to replace

the traditional piling machines.

Use of Movable Noise Barrier

4.4.12 Movable noise barriers can be very effective in screening noise from particular items of plant when implementing the proposed development. The noise barriers should be free of gaps and made of materials having a surface mass density in excess of 10 kg/m^2. Noise barriers located along the active works area close to the noise generating component of a PME could produce at least 10 dB(A) screening for stationary plant and 5 dB(A) for mobile plant provided the direct line of sight between the PME and the NSRs is blocked.

4.5 Road Traffic Noise Impact

Identification of Noise Impact

4.5.1 Tate's Carin Highway are classified as Express Road with over 30,000 AADT. This road is located next to the Site and considered as the dominant traffic noise source.

Identification of Noise Sensitive Receivers

4.5.2 The planned noise sensitive uses of the residential blocks which rely on openable window for natural ventilation within the Site are identified as NSRs under the base case scenario. The planned NSRs for road traffic noise assessment are shown in **Figure 4.2**.

Assessment Methodology

4.5.3 The peak hour road traffic noise levels will be predicted using the Road Noise® Model which implements the calculation procedures as provided in the "Calculation of Road Traffic Noise" issued by the UK Department of Transport. The existing roads within 300m from the proposed development site will be included in the assessment.

4.5.4 Noise Assessment Points (NAPs) of the representative NSRs, relevant topographical contours / building structures with noise screening effect or opposite façade effect, and road segments with traffic flow data will be input into the traffic noise model in evaluating the potential traffic noise impacts. Traffic data included traffic flow, percentage of heavy vehicles and speeds. Façade correction will be included in each NAPs.

4.5.5 The tentative population intake year of the residential development is 2032. The assessment years adopted be determined based on the maximum traffic projection within 15 years upon the population intake year of the residential development (i.e. 2047). The year with maximum traffic flow within a 15-year period upon operation of the proposed development is determined to be Year 2047. Therefore, the traffic data for Year 2047 will be adopted for the assessment. The AM peak hour traffic flow data adopted for this study along with TD's endorsement on the traffic forecast is presented in **Appendix 4.1**.

Prediction and Evaluation of Environment Impact

4.5.6 The predicted road traffic noise levels at the NSRs are presented in **Table 4-6**. The predicted road traffic noise levels at the different levels of the representative NSRs are provided in **Appendix 4.3**.

Table 4-6: Summary of Predicted Road Traffic Noise Results under Base Case Scenario

Block	NSR ID	Use	Assessment Level (mPD)	No. of storey	Noise Criterion, dB(A)	Predicted Maximum Noise Level, dB(A)
Block A	1-13	Residential	20.7 – 124.7	34	70	**78**
Block B	14-26	Residential	20.7 – 121.5	33	70	**78**
Block C	27-34	Residential	20.7 – 118.4	32	70	**78**
Block D	35-47	Residential	20.7 – 124.7	34	70	**77**
Block E	48-60	Residential	20.7 – 121.5	33	70	**78**

Note:
^: Based on latest information, 3.15m for each story is assumed.
Bold: With noise exceedance.

According to the predicted road traffic noise levels in **Table 4-6**, noise exceedances are identified at all building blocks with the highest level of 78 dB(A). Therefore, the following noise mitigation measures are proposed during this feasibility study stage to reduce the road traffic noise impact.

Proposed Mitigation Measures

4.5.7 With reference to the ProPECC PN 5/23 "Application of Innovative Noise Mitigation Designs in Planning Private Residential Developments against Road Traffic Noise Impact", the performance of the acoustic window (baffle type) at 8m^2 room and enhanced acoustic balcony (baffle type) at 14m^2 room would achieve up to 7.5 dB(A) and 9.5 dB(A) noise reduction with Sound Absorptive Material (SAM) material when the façade is directly exposed to the dominant road traffic noise source.

4.5.8 In addition, the proper design of building shape could also reduce the angle of road traffic noise, which could also further reduce the noise level by cutting the angle of view and enhance the EAB performance by minimise the horizontal incident angle (e.g. 30° - 60°) to the Tate's Carin Highway and Shek Mun Interchange. This can be further explored in the detailed design stage. The proposed mitigation measures are shown in **Figure 4.5**.

Residual Impact

4.5.9 With the adoption of aforesaid noise mitigation measures, adverse road traffic noise impact is not anticipated. The predicted mitigated road traffic noise levels at the NSRs are presented in **Table 4-7**. The predicted mitigated road traffic noise levels at the different levels of the representative NSRs are provided in **Appendix 4.3**. The consolidated noise mitigation measures are shown in **Figure 4.8**.

4.5.10 This report is only to demonstrate the traffic noise impact is not insurmountable and the Site is feasible for the future residential development at current feasibility stage, if the mitigation measure is proper implemented. The later project proponent (private sector / public sector) should have the responsibility to review and carry out a detailed traffic noise assessment for their later development.

Table 4-7: Summary of Predicted Road Traffic Noise Results under Mitigated Scenario

Block	NSR ID	Use	Assessment Level (mPD)	No. of storey	Noise Criterion, dB(A)	Predicted Maximum Noise Level, dB(A)
Block A	1-13	Residential	20.7 – 124.7	34	70	70
Block B	14-26	Residential	20.7 – 121.5	33	70	70
Block C	27-34	Residential	20.7 – 118.4	32	70	70
Block D	35-47	Residential	20.7 – 124.7	34	70	70
Block E	48-60	Residential	20.7 – 121.5	33	70	70

Note:
^: Based on latest information, 3.15m for each story is assumed.

4.6 Fixed Noise Sources Impact

Review of Major Noise Source

4.6.1 The Site is surrounded by residential development (e.g. Pictorial Garden) and roundabout to the North, expressway to the East, and south (e.g. Ah Kung Kok Fishermen Village), commercial buildings to the South and residential development (e.g. Garden Vista) to the West. The design intention of the Site would be a residential development in the future, no major planned fixed noise sources are anticipated from the residential developments.

4.6.2 The potential major fixed noise sources in the vicinity of the proposed development were identified based on desktop study and the site visit conducted on 14 November 2025. A questionnaire was sent to the premises' owners/ employee to obtain operation details as far as practicable. The operation details obtained, on-site observations and assumptions are summarised in **Appendix 4.4**. The potential fixed noise sources are discussed below:

Shek Mun Fresh Water Booster Pumping Station (SMFWBPS)

4.6.3 Based on the aerial photo, the pumping station is enclosed. The site visit on 14 November 2025 identified no ventilation opening facing the site area. No noticeable noise was observed. With consideration of no significant noise impact from SMFWBPS, this has been excluded from the fixed noise impact assessment calculations.

On Sum Street Substation (OSSS)

4.6.4 Based on the aerial photo, the substation is enclosed. The site visit on 14 November 2025 identified no noticeable noise at the boundary of the substation. With consideration of no significant noise impact from OSSS, this has been excluded from the fixed noise impact assessment calculations.

Shatin North Offtake and Pigging Station (STNOPS)

4.6.5 Based on the site visit on 14 November 2025, no noticeable noise was observed. With consideration of no significant noise impact from STNOPS, this has been excluded from the fixed noise impact assessment calculations.

Grandtech Centre (GC)

4.6.6 Grandtech Centre is a commercial and industrial building. Based on the questionnaire and email confirmation with the property management, there are 5 sets of radiators on rooftop located in 5 different zones. Among the 5 sets of radiators, 1 set is abandoned. According to the operator, only 3 sets of radiators are in operation at peak. There is no night-time operation during 2300 - 0700. Considering the proximity, further details was requested. It is understood that GC will turn on radiators for air-conditioning upon tenant's special request, which typically involve only one set of radiators. According to the property management, such requests are rare and only occur once every 2-3 years. For assessment purpose, assuming that 1 sets of radiators operates during nighttime under normal operation provides a conservative representation of the worst-case scenario.

Topsail Plaza (TP)

4.6.7 Topsail Plaza is a commercial and industrial building. At the time of reporting, no response has been received. Based on the aerial photo, there are 5 chillers on the rooftop. With reference surrounding building with similar business nature (i.e. Grandtech Centre) which do not operate during nighttime, it is conservatively assumed that half of the chillers operate in night-time.

Delta House (DH)

4.6.8 Delta House is an office building. According to the correspondence with the responsible person, only two chillers are in operation at peak. It is confirmed that there is no night-time operation during 2300 - 0700.

W LUXE (WL)

4.6.9 W LUXE is an office building. At the time of reporting, no response has been received. Based on the aerial photo, there are two chillers on the rooftop. With reference to surrounding building of similar business nature (i.e. Delta House) which do not operate during nighttime, it is conservatively assumed that half of the chillers operate in night-time.

HSBC Data Center (HSB)

4.6.10 Based on the questionnaire, there are 10 cooling towers which operate 24 hours.

Metropole Square (MS)

4.6.11 Metropole Square is an office building. Based on the questionnaire, there are two chillers and there is no night-time operation during 2300 - 0700. Measurement data from the approved EAS[1] was referenced.

Corporation Park (CP)

4.6.12 Corporation Park is an office building. Based on the questionnaire, there are 2 chillers and there is no night-time operation during 2300 - 0700.

IDS Li Fung Centre (IDS)

4.6.13 Li Fung Centre is a commercial and industrial building. At the time of reporting, no response has been received. Based on the aerial photo, there are 6 cooling towers on the rooftop. With reference to the surrounding building of similar business nature (i.e. Grandtech Centre) which do not operate during nighttime, it is conservatively assumed that half of the chillers operate in night-time.

Courtyard by Marriott Hong Kong Sha Tin (CMHKST)

4.6.14 Courtyard by Marriott Hong Kong Sha Tin is a hotel. Based on the questionnaire, there are 2 cooling towers operating 24 hours.

Kings Wing Plaza 2 (KWP)

4.6.15 Kings Wing Plaza 2 is an office building. At the time of reporting, no response has been received. Based on the aerial photo, there are 4 cooling towers on the rooftop. Among the 4

[1] SSF Development at On Muk Street Phase 1, Shek Mun, Shatin.

cooling towers, 3 of them are outside 300m assessment area. Measurement data from the approved EAS[1] was referenced.

New Commerce Centre (NCC)

4.6.16 New Commerce Centre is a commercial and industrial building. At the time of reporting, no response has been received. Based on the aerial photo, there are 4 chillers on the rooftop. With reference to the surrounding building of similar business nature (i.e. Grandtech Centre) which do not operate during nighttime, it is conservatively assumed that half of the chillers operate in night-time.

CLP Power Hong Kong Limited Shatin Centre

4.6.17 The responsible person refused to provide any information. Based on the aerial photo, there are there are 3 chillers on podium, 1 chiller and 2 cooling towers on rooftop. Measurement data from the approved EAS[1] was referenced.

Heung Yee Kuk Building (HYKB)

4.6.18 Heung Yee Kuk Building is an office building. At the time of reporting, no response has been received. Based on the aerial photo, there are there are 3 chillers on podium. Measurement data from the approved EAS[1] was referenced.

4.6.19 Based on the above, the major fixed noise sources to be accounted into quantitative assessment are summarised in **Table 4-8** below.

Table 4-8 Existing Major Fixed Noise Sources for Quantitative Assessment

Source ID	Location	Noise Source	Distance to nearest NSR, m	Approx. height, mPD	Operation schedule	SWL, dB(A)	Source of SWL
GC-1 to GC-4 (GC-5 abandoned)	Grandtech Centre	Radiators	49	113	Day and evening – 3 sets Nighttime – 1 set	103	Product catalogue for similar dimensions
TP-1 to TP-5	Topsail Plaza	Chillers	154	81	Day and evening – 5 Nighttime – 3	97	Product catalogue for similar dimensions
DH-1 to DH-2	Delta House	Chillers	233	112	Day and evening – 2 Nighttime – 0	102	Product catalogue based on model and brand given by the property management.
WL-1 to WL-2	W LUXE	Chiller	296	126	Day and evening – 2 Nighttime – 1	98	Product catalogue for similar dimensions
HSB-1 to HSB-10	HSBC Data Center	Cooling Towers	282	87	Day and evening – 10 Nighttime – 10	83-99	Product catalogue based on model and brand given by the property management.
MS-1 to MS-2	Metropole Square	Chillers	203	113	Day and evening – 2 Nighttime – 0	96	Approved EAS for On Muk Street Phase 1
CP-1 to CP-2	Corporation Park	Chillers	240	100	Day and evening – 2 Nighttime – 0	100	Product catalogue based on model and brand given by the property management.
IDS-1 to IDS-6	IDS Li Fung Centre	Cooling Towers	222	95-97	Day and evening – 6 Nighttime – 4	94-95	Product catalogue for similar dimensions
CMHKST-1 to CMHKST-2	Courtyard by Marriott Hong Kong Sha Tin	Cooling Towers	158	114	Day and evening – 2 Nighttime – 2	90-91	Product catalogue based on model and brand given by the property management.
KWP-1	Kings Wing Plaza 2	Cooling Towers	337	121	Day and evening – 1 Nighttime – 1	80	Approved EAS for On Muk Street Phase 1
NCC-1 to NCC-4	New Commerce Centre	Chillers	320	85	Day and evening – 4 Nighttime – 2	89	Product catalogue for similar dimensions
CLP-1 to CLP-3 CLP-4 to 5 CLP-6	CLP Power Hong Kong Limited Shatin Centre	Chillers and Cooling Towers	293	20 124 110	Day and evening – 6 Nighttime – 6	85-98	Approved EAS for On Muk Street Phase 1
HYK-1 to HYK-3	Heung Yee Kuk Building	Chiller	269	21	Day and evening – 3 Nighttime – 0	96	Approved EAS for On Muk Street Phase 1

Identification of Noise Sensitive Receivers

4.6.20 The NSRs that are closest to the fixed noise sources are identified as representative NSRs for the fixed noise impact assessment. The locations of representative NSRs under the base case scenario are shown in **Figure 4.3**. The line-of-sights from representative NSRs to fixed noise sources are shown in **Appendix 4.5**.

Evaluation and Assessment of Fixed Noise Impact

4.6.21 The predicted noise levels at all representative NSRs due to the existing fixed noise sources are shown in **Appendix 4.6**.

4.6.22 Based on the fixed noise impact assessment results, the predicted noise levels at representative NSR30, 35, 37, 39_a, 40_a, 41, 44, 54, 56_a and 57 would exceed the relevant noise criteria due to the existing fixed noise sources.

Mitigation Measures

4.6.23 To mitigate the fixed noise impact, the following mitigation measures were recommended. The proposed mitigation measure is shown in **Figure 4.6**.

- Innovative noise mitigation designs (INMD) - Typical INMD includes acoustic window and enhanced acoustic balcony. Typical INMD can provide relative noise reduction of 2dB(A). The actual performance is subjected to mock-up test/ lab test, and should be verified in future NIA; and
- Fixed glazing or façade with non-noise sensitive use; and
- 1.7m architectual fin.

4.6.24 As the internal layout is not available at this stage, there is no information on the room size or locations of all ventilating windows. For the purpose of this feasibility study, the proposed mitigation measures package would include fixed glazing or non-noise sensitive uses on the worst-affected facades while having INMD on their side ventilation windows.

Residual Impact

4.6.25 With the adoption of aforesaid noise mitigation measures, adverse fixed noise impact is not anticipated. The consolidated noise mitigation measures are shown in **Figure 4.8** and **Appendix 4.6**.

4.6.26 This report is only to demonstrate the fixed noise impact is not insurmountable and the Site is feasible for the future residential development at current feasibility stage, if the mitigation measure is proper implemented. The later project proponent (private sector / public sector) should have the responsibility to review and carry out a detailed fixed noise assessment for their later development.

4.7 Railway Noise Sources Impact

Identification of Noise Source

4.7.1 The key noise impact from the railway would be the train induced airborne noise at both the at-grade and viaduct sections of the Tuen Ma Line. The railway noise terms (at viaduct) were referenced from the Tuen Mun South Extension EIA Report (AEIAR-236/2022) while the railway noise terms (at-grade) were referenced from Approved Shatin to Central Link EIA Report (AEIAR-164/2012). The source terms and assumptions adopted are summarized in **Appendix 4.7**.

Assessment Methodology

4.7.2 According to Section 5.2 of West Rail Operation Noise Assessment Report, a minimum buffer distance of approximate 4m would be required to achieve the statutory requirement of Lmax 85 dB(A) during night-time operation (2300 -0700 hours), based on the corrected maximum noise level (Lmax) of 74dB(A) at 25 m for a 8-car train running at maximum speed of 130 kph. Given that same number of cars would be used in Tuen Ma Line, the maximum speed of would not exceed 130 kph and the separation distance between the NSRs and concerned section of railway line would be larger than 4m, exceedance of Lmax 85 dB(A) is not anticipated along the proposed development's alignment.

4.7.3 Railway noise impact is predicted using the model "RailNoise 98", which incorporated the procedures and methodology documented in "Calculation of Railway Noise (1995)" published by the U.K. Department of Transport. The assumptions are presented in **Appendix 4.7**.

Railway Noise Evaluation

4.7.3.1 The residential premises have been identified as representative NSRs within the study area for prediction of railway noise impact levels (**Figure 4.4** refers). The predicted air-borne railway noise levels at the representative NSRs due to the operation of Tuen Ma Line are summarised in **Table 4-9**. Detailed results of the railway noise impact assessment are shown in **Appendix 4.8**.

Table 4-9: Summary of Predicted Railway Noise Results under Base Case Scenario

NSR ID	Noise Criteria / Max. Noise Level, dB(A)				Exceedance of Noise Criteria?
	Area Sensitivity Rating	Day-time & Evening Leq (30min)	Night-time Leq (30min)	Leq(24hr)	
1	C	70/ 62	60/ 59	65/ 61	No
2	C	70/ 61	60/ 58	65/ 60	No
3	C	70/ 63	60/ **61**	65/ 62	Yes
4	C	70/ 63	60/ 60	65/ 62	No
5	C	70/ 63	60/ 60	65/ 62	No
5_a	C	70/ 49	60/ 47	66/ 48	No
6_a	C	70/ 58	60/ 56	67/ 57	No
6	C	70/ 62	60/ 60	65/ 61	No
7	C	70/ 62	60/ 59	65/ 61	No
8	C	70/ 61	60/ 59	65/ 60	No
9	C	70/ 50	60/ 47	65/ 49	No
10	B	65/ 52	55/ 49	65/ 51	No
11	B	65/ 46	55/ 44	65/ 45	No

NSR ID	Noise Criteria / Max. Noise Level, dB(A)				Exceedance of Noise Criteria?
	Area Sensitivity Rating	Day-time & Evening Leq (30min)	Night-time Leq (30min)	Leq(24hr)	
12	B	65/ 47	55/ 45	65/ 46	No
13	B	65/ 51	55/ 48	65/ 50	No
14	C	70/ 54	60/ 52	65/ 53	No
15	C	70/ 58	60/ 56	65/ 57	No
16	C	70/ 61	60/ 59	65/ 60	No
17	C	70/ 61	60/ 59	65/ 60	No
18_a	C	70/ 45	60/ 43	68/ 44	No
19_a	C	70/ 58	60/ 55	69/ 57	No
18	C	70/ 61	60/ 59	65/ 60	No
19	C	70/ 61	60/ 58	65/ 60	No
20	C	70/ 60	60/ 58	65/ 59	No
21	C	70/ 60	60/ 57	65/ 59	No
22	C	70/ 44	60/ 41	65/ 43	No
23	B	65/ 47	55/ 45	65/ 46	No
24	B	65/ 44	55/ 42	65/ 43	No
25	B	65/ 45	55/ 43	65/ 44	No
26	B	65/ 45	55/ 43	65/ 44	No
27	C	70/ 60	60/ 57	65/ 59	No
28	C	70/ 59	60/ 56	65/ 58	No
30	B	65/ 50	55/ 47	65/ 49	No
31	B	65/ 42	55/ 40	65/ 41	No
32	B	65/ 40	55/ 38	65/ 39	No
33	B	65/ 40	55/ 37	65/ 39	No
34	C	70/ 56	60/ 54	65/ 55	No
35	C	70/ 58	60/ 55	65/ 57	No
36	C	70/ 57	60/ 55	65/ 56	No
36_a	C	70/ 57	60/ 54	65/ 56	No
37	C	70/ 57	60/ 54	65/ 56	No
38	C	70/ 56	60/ 53	65/ 55	No
39	C	70/ 54	60/ 52	65/ 53	No
39_a	B	65/ <40	55/ <40	65/ <40	No
40	B	65/ 48	55/ 45	65/ 47	No
40_a	B	65/ <40	55/ <40	65/ <40	No
41	B	65/ 38	55/ 35	65/ 37	No
42	B	65/ 42	55/ 39	65/ 41	No
43	B	65/ 38	55/ 35	65/ 37	No
44	B	65/ 38	55/ 35	65/ 37	No
45	C	70/ 55	60/ 53	65/ 54	No
46	C	70/ 56	60/ 53	65/ 55	No
47	C	70/ 57	60/ 54	65/ 56	No
48	C	70/ 55	60/ 53	65/ 54	No
49	C	70/ 56	60/ 53	65/ 55	No
50	C	70/ 56	60/ 54	65/ 55	No
51	C	70/ 56	60/ 53	65/ 55	No
51_a	B	65/ 51	55/ 49	65/ 50	No
52	C	70/ 54	60/ 52	65/ 53	No
53	B	65/ 51	55/ 48	65/ 50	No
54	B	65/ 37	55/ 35	65/ 36	No

NSR ID	Noise Criteria / Max. Noise Level, dB(A)				Exceedance of Noise Criteria?
	Area Sensitivity Rating	Day-time & Evening Leq (30min)	Night-time Leq (30min)	Leq(24hr)	
55	B	65/ 42	55/ 39	65/ 41	No
55_a	B	65/ <40	55/ <40	65/ <40	No
56	B	65/ 43	55/ 40	65/ 42	No
56_a	B	65/ <40	55/ <40	65/ <40	No
57	B	65/ 41	55/ 39	65/ 40	No
58	B	65/ 41	55/ 39	65/ 40	No
59	B	65/ 43	55/ 40	65/ 42	No
60	B	65/ 49	55/ 47	65/ 48	No

Note:
Bold: With noise exceedance.

4.7.4 Based on the railway noise impact assessment results, the predicted noise levels at all representative NSRs would comply with the relevant noise criteria, except NSR 3 during night-time period.

Mitigation Measures

4.7.5 To mitigate the railway noise impact, the following mitigation measures were recommended. The proposed mitigation measures is shown in **Figure 4.7**.

- Innovative noise mitigation designs (INMD) - Typical INMD includes acoustic window and enhanced acoustic balcony. Typical INMD can provide relative noise reduction of 2dB(A). The actual performance is subjected to mock-up test/ lab test, and should be verified in future NIA.

Residual Impact

4.7.6 With the adoption of aforesaid noise mitigation measure, adverse railway noise impact is not anticipated. The predicted mitigated railway noise levels at the NSRs are presented in **Table 4-10**. The predicted mitigated railway noise levels at the different levels of the representative NSRs are provided in **Appendix 4.8**. The consolidated noise mitigation measures are shown in **Figure 4.8**.

4.7.7 This report is only to demonstrate the railway impact is not insurmountable and the Site is feasible for the future residential development at current feasibility stage, if the mitigation measure is proper implemented. The later project proponent (private sector / public sector) should have the responsibility to review and carry out a detailed railway assessment for their later development.

Table 4-10: Summary of Predicted Railway Noise Results under Mitigated Scenario

NSR ID	Noise Criteria / Max. Noise Level, dB(A)				Exceedance of Noise Criteria?
	Area Sensitivity Rating	Day-time & Evening Leq (30min)	Night-time Leq (30min)	Leq(24hr)	
1	C	70/ 62	60/ 59	65/ 61	No
2	C	70/ 61	60/ 58	65/ 60	No
3	C	70/ 63	60/ 60	65/ 62	No
4	C	70/ 63	60/ 60	65/ 62	No
5	C	70/ 63	60/ 60	65/ 62	No

NSR ID	Noise Criteria / Max. Noise Level, dB(A)				Exceedance of Noise Criteria?
	Area Sensitivity Rating	Day-time & Evening Leq (30min)	Night-time Leq (30min)	Leq(24hr)	
5_a	C	70/ 49	60/ 47	66/ 48	No
6_a	C	70/ 58	60/ 56	67/ 57	No
6	C	70/ 62	60/ 60	65/ 61	No
7	C	70/ 62	60/ 59	65/ 61	No
8	C	70/ 61	60/ 59	65/ 60	No
9	C	70/ 50	60/ 47	65/ 49	No
10	B	65/ 52	55/ 49	65/ 51	No
11	B	65/ 46	55/ 44	65/ 45	No
12	B	65/ 47	55/ 45	65/ 46	No
13	B	65/ 51	55/ 48	65/ 50	No
14	C	70/ 54	60/ 52	65/ 53	No
15	C	70/ 58	60/ 56	65/ 57	No
16	C	70/ 61	60/ 59	65/ 60	No
17	C	70/ 61	60/ 59	65/ 60	No
18_a	C	70/ 45	60/ 43	68/ 44	No
19_a	C	70/ 58	60/ 55	69/ 57	No
18	C	70/ 61	60/ 59	65/ 60	No
19	C	70/ 61	60/ 58	65/ 60	No
20	C	70/ 60	60/ 58	65/ 59	No
21	C	70/ 60	60/ 57	65/ 59	No
22	C	70/ 44	60/ 41	65/ 43	No
23	B	65/ 47	55/ 45	65/ 46	No
24	B	65/ 44	55/ 42	65/ 43	No
25	B	65/ 45	55/ 43	65/ 44	No
26	B	65/ 45	55/ 43	65/ 44	No
27	C	70/ 60	60/ 57	65/ 59	No
28	C	70/ 59	60/ 56	65/ 58	No
30	B	65/ 50	55/ 47	65/ 49	No
31	B	65/ 42	55/ 40	65/ 41	No
32	B	65/ 40	55/ 38	65/ 39	No
33	B	65/ 40	55/ 37	65/ 39	No
34	C	70/ 56	60/ 54	65/ 55	No
35	C	70/ 58	60/ 55	65/ 57	No
36	C	70/ 57	60/ 55	65/ 56	No
36_a	C	70/ 57	60/ 54	65/ 56	No
37	C	70/ 57	60/ 54	65/ 56	No
38	C	70/ 56	60/ 53	65/ 55	No
39	C	70/ 54	60/ 52	65/ 53	No
39_a	B	65/ <40	55/ <40	65/ <40	No
40	B	65/ 48	55/ 45	65/ 47	No
40_a	B	65/ <40	55/ <40	65/ <40	No
41	B	65/ 38	55/ 35	65/ 37	No
42	B	65/ 42	55/ 39	65/ 41	No
43	B	65/ 38	55/ 35	65/ 37	No
44	B	65/ 38	55/ 35	65/ 37	No
45	C	70/ 55	60/ 53	65/ 54	No
46	C	70/ 56	60/ 53	65/ 55	No
47	C	70/ 57	60/ 54	65/ 56	No

NSR ID	Noise Criteria / Max. Noise Level, dB(A)				Exceedance of Noise Criteria?
	Area Sensitivity Rating	Day-time & Evening Leq (30min)	Night-time Leq (30min)	Leq(24hr)	
48	C	70/ 55	60/ 53	65/ 54	No
49	C	70/ 56	60/ 53	65/ 55	No
50	C	70/ 56	60/ 54	65/ 55	No
51	C	70/ 56	60/ 53	65/ 55	No
51_a	B	65/ 51	55/ 49	65/ 50	No
52	C	70/ 54	60/ 52	65/ 53	No
53	B	65/ 51	55/ 48	65/ 50	No
54	B	65/ 37	55/ 35	65/ 36	No
55	B	65/ 42	55/ 39	65/ 41	No
55_a	B	65/ <40	55/ <40	65/ <40	No
56	B	65/ 43	55/ 40	65/ 42	No
56_a	B	65/ <40	55/ <40	65/ <40	No
57	B	65/ 41	55/ 39	65/ 40	No
58	B	65/ 41	55/ 39	65/ 40	No
59	B	65/ 43	55/ 40	65/ 42	No
60	B	65/ 49	55/ 47	65/ 48	No

Note:
Bold: With noise exceedance.

5 WATER IMPACT ASSESSMENT

5.1 Introduction

5.1.1 This section presents an assessment of the potential water quality impacts associated with the construction and operation phases of the proposed development. Recommendations for mitigation measures have been made where necessary to minimise potential water quality impacts.

5.2 Legislations, Standards and Guidelines

5.2.1 The following legislation and associated guidance are applicable for the evaluation of water quality impacts associated with the proposed development.

- Water Pollution Control Ordnance (WPCO) (Cap. 358)
- Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM-DSS)
- Environmental Impact Assessment Ordinance (Cap. 499., S.16), EIAO-TM, Annexes 6 and 14
- Water Supplies Department (WSD) Water Quality Criteria
- Professional Persons Environmental Consultative Committee Practice Notes (ProPECC PNs)
- Environment, Transport and Works Bureau Technical Circular (ETWB TC)

Water Pollution Control Ordinance (Cap. 358)

5.2.2 According to WPCO and its subsidiary legislation, Hong Kong waters are divided into ten Water Control Zones (WCZs) and four supplementary water control zones. Each WCZ has a designated set of statutory Water Quality Objectives (WQOs) designed to protect the inland and/or marine environment and its users. The assessment area of the proposed development is within the Tolo Harbour and Channel Water Control Zone and the corresponding WQOs are listed in **Table 5-1** below.

Table 5-1: Water Quality Objectives for Tolo Harbour and Channel Water Control Zone

Parameters	Objectives	Sub-Zone
Odour, tints and colour	Not to be present	Whole Zone
Visible foam, oil, grease, scum, litter or other objectionable matter	Not to be present	Whole Zone
Dissolved oxygen (DO)	Not less than 2mg/L within two metres of the bottom, or not less than 4mg/L in the remainder of the water column	Marine Waters in Harbour Subzone
	Not less than 3mg/L within two metres of the bottom, or not less than 4mg/L in the remainder of the water column	Marine Waters in Buffer Subzone
	Not less than 4mg/L at any point in the water column	Marine Waters in Channel Subzone
	Not less than 4 mg/L or 40% saturation (at 150C) at any time	Inland Waters
pH	Not to cause the normal pH range to be extended by more than ±0.5 pH units at any time.	Marine Waters in Harbour Subzone

	Not to cause the normal pH range to be extended by more than ±0.3 pH units at any time.	Marine Waters in Buffer Subzone
	Not to cause the normal pH range to be extended by more than ±0.1 pH units at any time.	Marine Waters in Channel Subzone
	Not exceed the normal pH range of 6.5 – 8.5 at any time	Inland Waters in Shing Mun (A, B, C, F, G, H) subzones
	Not exceed the normal pH range of 6.0 – 9.0 at any time	Inland Waters in Shing Mun (D, E, I) subzones and other watercourses
Light Penetration	Should not reduce light transmission by more than 20% of the normal level at any location or any time.	Marine Waters in Harbour Subzone
	Should not reduce light transmission by more than 15% of the normal level at any location or any time.	Marine Waters in Buffer Subzone
	Should not reduce light transmission by more than 10% of the normal level at any location or any time.	Marine Waters in Channel Subzone
Temperature	Not to cause the natural daily temperature range to be extended by greater than ±1.0 °C at any location or time. The rate of temperature change shall not exceed 0.5 °C per hour at any location, unless due to natural phenomena.	Marine Waters
	Not to cause the natural daily temperature range to be extended by greater than ±2.0 °C at any location or time.	Inland Waters
Chemical oxygen demand (COD)	Not exceed 15 mg/L at any time	Inland Waters in Shing Mun (B, F, G) subzones
	Not exceed 30 mg/L at any time	Inland Waters in Shing Mun (A, C, D, E, H, I) subzones and other watercourses
5-day biochemical oxygen demand (BOD)	Not exceed 3 mg/L at any time	Inland Waters in Shing Mun (B, F, G) subzones
	Not exceed 5 mg/L at any time	Inland Waters in Shing Mun (A, C, D, E, H, I) subzones and other watercourses
Suspended solids (SS)	Not to cause the annual median level to exceed 20 mg/L.	Inland Waters in Shing Mun (A, B, C, F, G, H) subzones
	Not to cause the annual median level to exceed 25 mg/L.	Inland Waters in Shing Mun (D, E, I) subzones and other watercourses
Settleable Material	Bottom deposits or submerged objects should not adversely influence bottom-living communities, alter the basic Harbour geometry or shipping channels, present any hazard to shipping or diving activities, or affect any other beneficial use of the waters.	Whole zone
Ammonia Nitrogen (NH3-N)	Not to exceed 0.5 mg/L at any time	Inland Waters
E. coli Bacteria	Not exceed 610 per 100mL, calculated as the geometric mean of all samples collected in one calendar year	Secondary Contact Recreation Subzone and Fish Culture Zone
	Not exceed 1000 per 100mL, calculated as a running median of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days (or 14 and 42 days)	Inland Waters in Shing Mun (A, C, D, E, H, I) subzones and other watercourses
	Not exceed 0 per 100mL, calculated as a running median of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days (or 14 and 42 days)	Inland Waters in Shing Mun (B, F, G) subzones
Chlorophyll-a	Not to cause the level of chlorophyll-a in waters of the subzone to exceed 20 mg/m3, calculated as a running arithmetic mean of 5 daily measurements for any single location and depth.	Marine Waters in Harbour Subzone
	Not to cause the level of chlorophyll-a in waters of the subzone to exceed 10 mg/m3, calculated as a running arithmetic mean of 5 daily measurements for any single location and depth.	Marine Waters in Buffer Subzone
	Not to cause the level of chlorophyll-a in waters of the subzone to exceed 6 mg/m3, calculated as a running arithmetic mean of 5 daily measurements for any single location and depth.	Marine Waters in Channel Subzone

Toxic substances	Should not attain such a level as to produce significant toxic effects in humans, fish or any other aquatic organisms.	Whole zone

Technical Memorandum for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters

5.2.3 The WPCO also controls effluent discharging into the WCZ through a licensing system. A Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM-DSS) was issued under Section 21 of the WPCO that gives guidance on the permissible effluent discharges based on the type of receiving waters (foul sewers, storm water drains, inland and coastal waters). The limits control the physical, chemical and microbial quality of effluents. Sewage from the proposed construction activities should comply with the standards for effluent discharged into the foul sewers, inshore waters or marine waters of the Tolo Harbour and Channel Water Control WCZ, as given in the TM-DSS.

Water Supplies Department (WSD) Water Quality Criteria

5.2.4 Besides the WQOs set under the WPCO, WSD has specified a set of objectives for water quality at flushing water intakes as shown in **Table 5-2.** These objectives are applied at the points of seawater abstraction along the coastlines of Tolo Harbour for flushing purpose.

Table 5-2: WSD's Water Quality Criteria for Flushing Water Supply[2]

Parameter (in mg/L unless otherwise stated)	WSD's Target Water Quality Limit at Flushing Water Intake
Colour (HU)	< 40
Turbidity (NTU)	< 20
Threshold Odour Number (odour unit)	< 100
Ammonia Nitrogen (NH_3-N)	< 1
Total Suspended Solids (SS)	< 20
Dissolved Oxygen (DO)	> 2
5-day Biochemical Oxygen Demand (BOD5)	< 10
Synthetic Detergents	< 5
E. coli (cfu per 100 mL)	< 5,000

Professional Persons Environmental Consultative Committee Practice Notes (ProPECC PNs)

5.2.5 A ProPECC PN was issued by the EPD to provide guidelines for handling and disposal of construction site discharges. The ProPECC PN 2/24 "Construction Site Drainage" provides good practice guidelines for dealing with 10 types of discharge from construction sites. These include surface run-off, groundwater, boring and drilling

[2] https://www.wsd.gov.hk/en/core-businesses/water-resources/seawater-for-flushing/index.html , accessed on 26 Jun 2025

water, wastewater from concrete batching and/or precast concrete casting, wheel washing water, bentonite slurry, water for testing and/or sterilisation of water retaining structures and water pipes, wastewater from building constructions, acid cleaning, etching and pickling wastewater, and wastewater from site facilities. Practices given in the ProPECC PN 2/24 should be followed as far as possible during construction to minimise the water quality impact due to construction site drainage.

5.2.6 The ProPECC PN 1/23 "Drainage Plans Subject to Comment by the EPD" provides guidelines and practices for handling, treatment and disposal of various effluent discharges to stormwater drains and foul sewers during the operation phase. The design of site drainage and disposal of various site effluents generated within the new development area should follow the relevant guidelines and practices as given in the ProPECC PN 1/23.

Environment, Transport and Works Bureau Technical Circular (ETWB TC)

5.2.7 ETWB TC (Works) No. 5/2005 Protection of natural streams/ rivers from adverse impacts arising from construction works – It provides an administrative framework to better protect all natural streams/rivers from the impacts of construction works. The procedures promulgated under this Circular aim to clarify and strengthen existing measures for protection of natural streams/rivers from government projects and private developments. The guidelines and precautionary mitigation measures given in the ETWB TC (Works) No. 5/2005 should be followed as far as possible to protect the inland watercourse at or near the proposed development area during construction phase.

5.3 Description of the Environment

Description of the Environment - Marine Water

5.3.1 The water quality monitoring results at stations closest to the proposed development Site, namely TM2, in Harbour Subzone, are shown in **Table 5-3** below. Full compliances with the WQO was recorded at the selected stations for DO, chlorophyll-a and E. coli in 2024.

Table 5-3: Trend of Water Quality in Tolo Harbour and Channel WCZ in 2024

Parameter		Harbour Subzone Station TM2	WPCO WQO (in marine waters)
Temperature (°C)		25.5 (20.0 - 31.6)	Change due to waste discharge not to exceed 1°C The rate of temperature change not to exceed 0.5 °C per hour, unless due to natural phenomena
Salinity (part per thousand, ppt)		30.1 (26.7 - 32.7)	Change due to waste discharge not to be greater than ±3ppt
Dissolved Oxygen (mg/L)	Depth Average	6.7 (4.6 - 8.6)	Not less than 4 mg/L in the water column (except for the bottom water layer within 2 m from the seabed)
	Bottom	6.8 (4.8 - 8.8)	Not less than 2 mg/L within 2 m from the seabed

Parameter		Harbour Subzone Station TM2	WPCO WQO (in marine waters)
Dissolved Oxygen (% Saturation)	Depth Average	97 (67 - 115)	Not available
	Bottom	97 (71 - 117)	Not available
pH		8.0 (7.6 - 8.3)	Change due to waste discharge not to be greater than ± 0.5 from natural range
Secchi Disc Depth (m)		2.1 (1.4 – 3.2)	Not available
Turbidity (NTU)		2.5 (0.3 – 10.9)	Not available
Suspended Solids (SS) (mg/L)		3.5 (2.4 - 5.2)	Not available
5-day Biochemical Oxygen Demand (BOD_5) (mg/L)		1.6 (0.8 – 2.6)	Not available
Ammonia Nitrogen (NH3-N) (mg/L)		0.030 (0.010 - 0.068)	Not available
Unionized Ammonia (UIA) (mg/L)		0.002 (<0.001 - 0.009)	Not available
Nitrite Nitrogen (NO2-N) (mg/L)		0.011 (<0.002 - 0.070)	Not available
Nitrate Nitrogen (NO3-N) (mg/L)		0.073 (0.008 - 0.260)	Not available
Total Inorganic Nitrogen (TIN) (mg/L)		0.11 (0.02 - 0.35)	Not available
Total Kjeldahl Nitrogen (TKN) (mg/L)		0.30 (0.21 - 0.40)	Not available
Total Nitrogen (TN) (mg/L)		0.38 (0.22 - 0.67)	Not available
Orthophosphate Phosphorus (PO4) (mg/L)		0.004 (<0.002 - 0.010)	Not available
Total Phosphorus (TP) (mg/L)		0.07 (0.03 - 0.16)	Not available
Silica (as SiO2) (mg/L)		1.02 (0.08 - 2.10)	Not available
Chlorophyll-a (µg/L)		8.8 (3.9 - 17.0)	Not to exceed 20 µg/L for a running arithmetic mean of 5 daily measurements
E. coli (count./100mL)		29 (<1 - 270)	Not to exceed 610 no./100mL for geometric mean

Parameter	Harbour Subzone Station TM2	WPCO WQO (in marine waters)
Faecal Coliforms (count/100mL)	210 (2 – 4100)	Not available

Notes:
1) Data source: EPD Marine Water Quality in Hong Kong in 2024
2) Except as specified, data presented are depth-averaged values calculated by taking the means of three depths: surface, mid-depth and bottom.
3) Data presented are annual arithmetic means of depth-averaged results except for E.coli and faecal coliforms that are annual geometric means.
4) Data in brackets indicate the ranges.

Description of the Environment - Inland Water

5.3.2 The river water quality monitoring results at station in Shing Mun Main Channel, namely TR19I, are shown in **Table 5-4**. According to the EPD's publication "River Water Quality in Hong Kong in 2024", the compliance rate of Shing Mun River was 87% in 2024.

Table 5-4: Trend of Water Quality in Shing Mun River in 2024

Parameter	Shing Mun Main Channel Station TR19I	WPCO WQO (Cap. 358F)
Dissolved oxygen (mg/L)	7.5 (6.5 - 8.2)	Waste discharges shall not cause the level of dissolved oxygen to be less than 4 mg/L
pH	8.0 (7.7 - 8.5)	Inland Waters in Shing Mun (D, E, I) subzones and other watercourses: 6.0 – 9.0 Inland Waters in Shing Mun (A, B, C, F, G, H) subzones, Lam Tsuen (C, D) subzones and Tai Po (A, B,C) subzones: 6.5 – 8.5
Suspended solids (mg/L)	4.1 (1.7 - 7.6)	Inland Waters in Shing Mun (D, E, I) subzones and other watercourses: Annual median not to exceed 25mg/L Inland Waters in Shing Mun (A, B, C, F, G, H) subzones, Lam Tsuen (C, D) subzones and Tai Po (A, B,C) subzones: Annual median not to exceed 20mg/L
5-day Biochemical Oxygen Demand (mg/L)	2.7 (0.8 - 8.2)	Inland Waters in Shing Mun (A, C, D, E, H, I) subzones, Tai Po (B, C) subzones and other watercourses: 5-day biochemical oxygen demand not to exceed 5mg/L Inland Waters in Shing Mun (B, F, G) subzones, Lam Tsuen (C, D) subzones and Tai Po subzone A: 5-day biochemical oxygen demand not to exceed 3mg/L
Chemical Oxygen Demand (mg/L)	37 (27 - 82)	Inland Waters in Shing Mun (B, F, G) subzones, Lam Tsuen (C, D) subzones and Tai Po subzone A: Not to exceed 15mg/L Inland Waters in Shing Mun (A, C, D, E, H, I) subzones, Tai Po (B, C) subzones and other watercourses: Not to exceed 30mg/L
Oil & grease (mg/L)	<0.5 (<0.5 - <0.5)	Not available

Parameter	Shing Mun Main Channel Station TR19I	WPCO WQO (Cap. 358F)
E. coli (counts/100mL)	<346 (<10 - 14,000)	Inland Waters in Shing Mun (A, C, D, E, H, I) subzones, Tai Po (B, C) subzones and other watercourses: Not exceed 1000 per 100 mL Inland Waters in Shing Mun (B, F, G) subzones, Lam Tsuen (C, D) subzones and Tai Po subzone A: Not exceed 0 per 100 mL
Faecal coliforms (counts/100mL)	3,070 (70 - 160,000)	Not available
Ammonia-nitrogen (mg/L)	0.083 (0.042 - 0.260)	Not more than 0.5 mg/L
Nitrate-nitrogen (mg/L)	0.245 (0.026 - 0.570)	Not available
Total Kjeldahl Nitrogen (mg/L)	0.34 (0.12 - 0.61)	Not available
Ortho-phosphate (mg/L)	0.018 (<0.002 - 0.050)	Not available
Total phosphorus (mg/L)	0.10 (0.03 - 0.17)	Not available
Total sulphide (mg/L)	<0.02 (<0.02 - <0.02)	Not available
Aluminium (µg/L)	<50 (<50 - <50)	Not available
Cadmium (µg/L)	<0.1 (<0.1 - <0.1)	Not available
Chromium (µg/L)	2 (<1 - 2)	Not available
Copper (µg/L)	4 (<3 - 5)	Not available
Lead (µg/L)	<1 (<1 - <1)	Not available
Zinc (µg/L)	<10 (<10 - 20)	Not available

Notes:
1) Data source: EPD River Water Quality in Hong Kong in 2024
2) Data presented are in annual medians of monthly samples; except those for faecal coliforms and E. coli which are in annual geometric means
3) Figures in brackets are annual ranges
4) cfu – colony forming unit
5) Values at or below laboratory reporting limits are presented as laboratory reporting limits
6) Equal values for annual medians (or geometric means) and ranges indicate that all data are the same as or below laboratory reporting limits.

5.4 Water Sensitive Receiver

5.4.1 The water sensitive receivers (WSRs) within the 500m assessment area from the boundary of the Site are identified, as summarised in **Table 5.5** and shown in **Figure 5.1**.

Table 5-5: Summary of Key Water Sensitive Receivers

ID	Description	Estimated Distance from the proposed development Site (m)
WSR1	Shing Mun River Channel	187

5.5 Evaluation of Water Quality Impact

Construction Phase

General construction activities

5.5.1 Wastewater generated from construction activities, including general cleaning and polishing, wheel washing, dust suppression and utility installation may contain high SS concentrations. It may also contain a certain amount of grease and oil. Potential water quality impacts due to the wastewater discharge can be minimised with the implementation of construction and site management practices to ensure that litter, fuels, and solvents do not enter public drainage systems. It is therefore expected that if the good site practice suggested in Section 5.6 are followed as far as practicable, the potential water quality impacts associated with construction activities would be minimal.

Construction site runoff

5.5.2 The surface runoff from construction works areas may contain increased loads of suspended solids (SS) and contaminants. Potential sources of pollution from construction site drainage include:

- Runoff and erosion from site surfaces, drainage channels, earth working areas and stockpiles;
- Release of any bentonite slurries, concrete washings and other grouting activities;
- Wash water from dust suppression spray facilities; and
- Fuel, oil, solvents and lubricants from maintenance of mechanical equipment.

5.5.3 Sediment laden runoff particularly from works areas subjected to excavation or earth works, if uncontrolled, may cause increased levels of suspended solids and pollutants entering the stormwater drainage system and into the nearby water bodies.

5.5.4 Mitigation measures and good site practices outlined in ProPECC PN 2/24 be implemented to control construction site runoff and drainage from the works area. The contractor would also be required to apply for a discharge license under the WPCO. With implementation of the recommended mitigation measures along with compliance

of the effluent standards set under TM-DSS, construction site runoff can be effectively controlled, and adverse impacts to storm drains or the nearby water bodies is not anticipated.

Construction Works in Close Proximity to Inland Water

5.5.5 Construction activities in close vicinity to the inland watercourses may impact water quality due to the potential release of construction waste and wastewater. Construction waste and wastewater are generally characterized by high SS concentration and elevated pH. The implementation of adequate construction site drainage and Best Management Practices as described in **Section 5.6** and provision of mitigation measures as specified in ETWB TC (Works) No. 5/2005 "Protection of Natural Streams / Rivers from Adverse Impacts Arising from Construction Works" as detailed in **Section 5.6**, it is anticipated that water quality impacts would be minimal.

Sewage effluent from the construction workforces

5.5.6 Domestic sewage would be generated from the workforce during the construction phase. The portable chemical toilets and sewage holding tanks should be provided for collection of sewage generated by workforce. Also, the Waste Management Plan should document the locations and number of portable chemical toilets. In addition, a licensed contractor should be employed to provide adequate portable toilets to cater 0.23m^3/day generated sewage from each employee and be responsible for appropriate disposal and maintenance. The license collectors should be deployed to collect the sewage regularly during construction phase. With implementation of mitigation measures suggested in **Section 5.6**, adverse water quality impact or impact on the identified sensitive receivers are not anticipated.

Accidental spillage of chemicals

5.5.7 Chemicals stored on-site during construction such as petroleum, oil and grease, lubricants and solvents have the potential to enter the surface water drainage system through accidental spillage on the construction site and subsequent runoff to stormwater drains. To mitigate the impacts of these contaminants, appropriate site storage and bunding of chemicals should be implemented as part of good site practice.

Operation Phase

Sewage implications from the proposed development

5.5.8 The proposed Development intends to discharge the induced sewage flow to existing public sewerage system. The total ADWF of the proposed development from the 2 sites are estimated as 1175.6m3/d, including 831.6m3/d generated from private housing development at STTL626 and 344.0m3/d generated from private housing development and social welfare facilities at STTL627, which are designed to be discharge to public sewerage system.

5.5.9 A potential connection sewers of 300mm diameter (approximately 170m long) is suggested from STTL626 site to the existing sewer no. FWD4041669 near Shek Mun

Playground for discharging the additional sewage from the proposed development at STTL626 site. The details should be subject to the design and planning by the relevant construction parties in future.

5.5.10 The additional sewage from the proposed development at the STTL627 Site will be discharged to the existing 225mm dia. sewers with the proposed terminal manhole no. TM02 replacing the existing tapping point no. FTH4002224.

5.5.11 The additional ADWF of 1175.6m3/d generated from the proposed development at the subject sites will be discharged to STSTW for sewage treatment.

5.5.12 Based on the above, adverse sewage implication was not anticipated. Further details have been discussed in the SIA Reports.

Runoff from road surfaces and paved areas

5.5.13 The paved area will remain unchanged after the proposed development. Therefore, the proposed development would not induce adverse drainage impact to the existing downstream drainage system in the vicinity. The vehicle dust, tyre scraps and oils will be washed away from the road surface to the nearby water courses via surface runoff and road surface cleaning. Also, the stormwater runoff from the paved surfaces within the Site will be directed to drainage system. To minimise debris and silt from entering nearby watercourses via the stormwater drains, silt traps and debris shields / screens should be installed and regularly maintained. For drainage areas covering the car parks, goods loading and unloading areas and the spiral ramp, petrol interceptors should be installed and maintained to prevent fuel / oil from entering the storm drains and nearby water bodies.

5.6 Recommendation of Mitigation Measure

Construction Phase

General construction activities

5.6.1 Best Management Practices (BMPs) should be implemented at the construction site, including proper handling, sorting and storage of construction solid waste, debris and refuse generated on-site prior to disposal. General refuse and recyclable materials should be collected separately and stored in appropriately labelled bins and removed regularly to minimise the risk of windblown waste / debris discharging into the nearby water bodies.

Construction site runoff

5.6.2 At the start of site establishment, perimeter cut-off drains to direct off-site water around the Site should be constructed with internal drainage works and erosion and sedimentation control facilities implemented. Channels (both temporary and permanent drainage pipes and culverts), earth bunds or sand bag barriers should be provided on site to direct stormwater to silt removal facilities.

5.6.3 The good site practices outlined in ProPECC PN 2/24 should be followed as far as practicable in order to minimise surface runoff and erosion, and also to retain and reduce any suspended solids prior to discharge. The following measures are recommended:

- Surface run-off from construction sites should be discharged into storm water drains via adequately designed sand/silt removal facilities such as sand, silt traps, sedimentation tanks and sediment basins. Channels or earth bunds or sand bag barriers should be provided on site to properly direct surface run-off to such silt removal facilities. Perimeter channels at site boundaries should be provided where necessary to intercept surface run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks.
- Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times.
- Construction works should be programmed to minimize soil excavation works in rainy seasons (generally from April to September). If soil excavation works could not be avoided in these months or at any time of year when rainstorms are likely, for the purpose of preventing soil erosion, temporarily exposed slope surfaces should be covered (e.g. by tarpaulin), and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels should be provided (e.g. along the crest/edge of excavation) to prevent surface run-off from washing across exposed soil surfaces. Arrangements should always be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm.
- Earthworks final surfaces should be well compacted and the subsequent permanent works or surface protection works should be carried out immediately after the final surfaces are formed to prevent erosion caused by rainstorms. Appropriate drainage like intercepting channels should be provided where necessary.
- Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in the rainy season is necessary, they should be dug and backfilled in short sections of length. Rainwater pumped out from trenches or foundation excavations should be discharged into storm water drains via silt removal facilities.
- Open stockpiles of Construction and Demolition (C&D) materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar impermeable fabric during rainstorms. Measures should be taken to prevent washing away C&D materials, soil, silt or debris into any drainage system.
- Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, C&D materials or debris from getting into the drainage system, and to prevent surface run-off from getting into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.
- Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecast and actions to be taken during or after rainstorms

5.6.4 Discharge licence issued by the EPD for discharge of effluent from the construction site under the WPCO is needed. The discharge quality and quantity should meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas should be treated so that it satisfies all the standards listed in the TM-DSS. The beneficial uses of the treated effluent for other on-site activities such as dust suppression, wheel washing and general cleaning etc., can minimise water consumption and reduce the effluent discharge volume. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the proposed development, the monitoring should be carried out in accordance with the relevant WPCO licence.

Construction Works in Close Proximity to Inland Water

5.6.5 The practices outlined in ETWB TC (Works) No. 5/2005 "Protection of Natural Streams / Rivers from Adverse Impacts Arising from Construction Works" should be adopted where applicable to minimise the water quality impacts on any natural streams or surface water systems. Relevant mitigation measures from the ETWB TC (Works) No. 5/2005 are listed below:

- Use of less or smaller construction plants may be specified in works area close to the inland water bodies as far as practicable;
- Temporary storage of material (e.g. equipment, filling materials, chemicals and fuel) and temporary stockpile of C&D materials should be located well away from watercourses when carrying out of the construction works;
- Stockpiling of C&D materials and dusty materials should be covered and located away from any watercourses;
- Construction debris and spoil should be covered up and / or disposed of as soon as possible to avoid being washed into the nearby water receivers;
- Construction activities, which generate large amount of wastewater, should be carried out in a distance away from the watercourses, where practicable;
- Construction effluent, site run-off and sewage should be properly collected and / or treated; and
- Proper shoring may need to be erected in order to prevent soil / mud from slipping into the inland water bodies.

Sewage effluent from the construction workforces

5.6.6 The contractor should provide temporary sanitary facilities, such as portable chemical toilets within the construction site to handle sewage from the workforce. The contractor has the responsibility to ensure that chemical toilets are used and properly maintained, and that licensed contractors are employed to collect and dispose of the waste off-site at approved locations.

Accidental spillage of chemicals

5.6.7 Any service shop and maintenance facilities should be located on hard standing within a bunded area, and sumps and oil interceptors should be provided. Maintenance of equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges. Given that the accidental spillage of chemicals is controlled through good management practices, the potential water quality impact would be low.

Operation Phase

5.6.8 The ProPECC PN 1/23, Drainage Plans subject to Comments by Environmental Protection Department, provides guidelines and practices for handling, treatment and disposal of various effluent discharges to stormwater drains and foul sewers. The design of site drainage and disposal of site effluents generated within the proposed Development area should follow the relevant guidelines and practices as given in the ProPECC PN 1/23.

Sewage generated from the proposed Development

5.6.9 The sewage generated from the operation of the proposed Development will be discharged to existing public sewerage system. With proper connections of the public sewer, no adverse sewerage impacts to the existing sewerage network is anticipated.

5.6.10 Further details, including possible sewerage connection arrangements with existing sewerage system (subject to review by devleoper), has been reported in the SIA Report for this Study.

Runoff from road surfaces and paved areas

5.6.11 The proper drainage system should be installed with silt trap and oil interceptor to trap the miscellaneous sources washed away from the road surface. Regular maintenance and cleaning should be provided to the drainage system to ensure it is in a good condition. The design of road gullies and silt trap should be incorporated with later detailed design.

6 WASTE MANAGEMENT

6.1 Introduction

6.1.1 This section identifies the potential waste arising from the construction and operation activities of the proposed development and evaluates the potential environmental impacts that may result from waste generated. Mitigation measures and good site practices, including waste handling, storage and disposal, are recommended with reference to applicable waste legislation and management guidelines to minimise potential waste management impact.

6.2 Legislations, Standards and Guidelines

6.2.1 The following legislation relates to the handling, treatment and disposal of wastes in Hong Kong and should be referenced in assessing potential impacts:

- Waste Disposal Ordinance (WDO) (Cap. 354);
- Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C)
- Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)
- Public Health and Municipal services Ordinance (Cap. 132) – Public Cleansing and Prevention of Nuisances Regulation
- Land (Miscellaneous Provisions) Ordinance (Cap. 28)

Waste Disposal Ordinance (WDO)

6.2.2 WDO prohibits the unauthorised disposal of wastes. Construction waste is defined as any substance, matter or thing that is generated from construction work and abandoned, whether or not it has been processed or stockpiled before being abandoned, but does not include any sludge, screenings or matter removed in or generated from any desludging, desilting or dredging works. Under the WDO, wastes can be disposed of only at designated waste disposal facilities.

Waste Disposal (Chemical Waste) (General) Regulation

6.2.3 Under the WDO, the Chemical Waste (General) Regulation provides regulations for chemical waste control, and administers the possession, storage, collection, transport and disposal of chemical wastes.

6.2.4 According to the Waste Disposal (Chemical Waste) (General) Regulation, all producers of chemical waste must register with the EPD and treat their waste, either utilising on-site plant licensed by EPD, or arranging for a licensed collector to transport the waste to a licensed facility. The Regulation also prescribes the storage facilities to be provided on site, including labelling and warning signs, and requires the preparation of written procedures and training to deal with emergencies such as spillages, leakages or accidents arising from the storage of chemical wastes.

6.2.5 EPD has also issued a 'guideline' document, the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes (1992), which details how to comply with the regulations on chemical wastes.

Waste Disposal (Charges for Disposal of Construction Waste) Regulation

6.2.6 Under the Waste Disposal (Charges for Disposal of Construction Waste) Regulation, enacted in January 2006, construction waste delivered to a landfill for disposal must not contain more than 50% by weight of inert material. Construction waste delivered to a sorting facility for disposal must contain more than 50% by weight of inert material, and construction waste delivered to a public fill reception facility (PFRF) for disposal must consist entirely of inert material.

Public Health and Municipal Services Ordinance (Cap. 132)

6.2.7 The Public Cleansing and Prevention of Nuisances Regulation provides control on illegal tipping of waste on unauthorised (unlicensed) sites.

Land (Miscellaneous Provisions) Ordinance (Cap. 28)

6.2.8 The Land (Miscellaneous Provisions) Ordinance requires that dumpling licenses be obtained by individuals or companies who deliver public fill to public filling areas. The CEDD issues the licences under delegated powers from the Director of Lands. The current policy related to dumping of construction and demolition (C&D) material is documented in the Works Branch Technical Circular no. 2/93 – Public Dumps. C&D materials that are wholly inert, namely public fill, should not be disposed to landfill, but taken to fill banks or public filling areas.

6.2.9 Individual licences and windscreen stickers are issued for each vehicle involved. Under the licence conditions, public fill reception facilities will only accept soil, sand, rubble, brick, tile, rock, boulder, concrete, asphalt, masonry or used bentonite. In addition, in accordance with paragraph 12 of DEVB Technical Circular (Works) TC(W) No.6/2010, the Public Fill Committee (PFC) will advise on the acceptance criteria. The material will, however, be free from marine mud, household refuse, plastic, metal, industrial and chemical wastes, animal and vegetable matter and any other materials considered unsuitable by the public fill reception facility supervisor.

6.3 Identification and Evaluation of Waste Management Implication

Construction Phase

6.3.1 The activities to be carried out for construction of the proposed development would generate a variety of wastes that can be divided into different key categories based on their composition and ultimate method of disposal. The identified waste types include:

- C&D materials;
- Chemical waste; and
- General refuse

6.3.2 The types and quantity of waste generated during construction phase are estimated and listed in **Table 6-1**. Each type of the above waste arising is described below, together with an evaluation of the potential environmental impacts associated with the waste generation, handling, storage, transport and disposal.

Table 6-1: Summary of Waste Generated during Construction Phase

Material Type	Total amount generated (m^3)	Total amount to be reused on site (m^3)	Total amount Disposed (m^3)	Recommended outlets
Inert C&D materials	8,061	Reuse C&D materials on-site as fill materials as far as practicable	8,061	The surplus is proposed to be delivered to public fill reception facilities.
Non-inert C&D materials	896	Reuse and recycle as much as possible	896	Non-Inert C&D materials would be disposal to landfill.
General refuse	< 6.5 kg/day	On-site segregation and off-site recycling for recyclables	< 6.5 kg/day	Non-recyclables will be disposal of at landfill.
Chemical waste	A few dozen litres per month	Chemical waste will be recycled and collected by licensed facility	A few dozen litres per month	The rest will be removal for off-site disposal at the approved Chemical Waste Treatment Centre (CWTC).

Construction and Demolition (C&D) materials

6.3.3 It is anticipated that the majority of C&D materials will be generated from the following key construction activities:

- Site clearance works

6.3.4 The inert materials should be segregated from the C&D materials on-site for reuse as far as practicable. In order to minimise the impact resulting from collection and transportation of C&D material for off-site disposal, the C&D material could be reused on-site as fill materials as far as practicable. The surplus inert C&D materials could be disposed of at the nearest Government's PFRFs, that is Tsuen Kwan O Area 137 Public Fill Reception Facility for beneficial use by any other projects in Hong Kong.

Chemical Waste

6.3.5 Chemical waste will be generated from used paint, engine oils, hydraulic fluids and waste fuel from plant operation as well as spent mineral oils/ cleaning fluids from plant maintenance, etc. It is anticipated that a few dozen litres of chemical waste will be generated monthly during the construction phase.

6.3.6 Materials classified as chemical wastes will require special handling and storage arrangements before removal for off-site disposal at the approved CWTC or recycling by licensed facilities. Mitigation and control requirements for chemical wastes are detailed in **Section 6.4**. Provided that the handling, storage and disposal of chemical wastes are in accordance with these requirements, adverse environmental impacts are not expected.

General Refuse

6.3.7 The construction workforce will generate refuse comprising food scraps, waste paper

and empty containers etc. The daily general refuse arising from the construction workforce can be estimated based on a generation rate of 0.65 kg per worker per day. It is estimated that during the construction peak for site formation works, a maximum of 10 workers will be working simultaneously. Therefore, approximately 6.5 kg/day of general refuse will be generated.

6.3.8 Such refuse will be properly managed so that intentional or accidental release to the surrounding environment will be avoided. Disposal of refuse at sites other than approved waste transfer or disposal facilities will be prohibited. Effective collection of site wastes will be required to prevent waste materials being blown around by wind, flushed or leached into the aquatic environment, or creating an odour nuisance or pest/ vermin problem. Waste storage areas will be well maintained and cleaned regularly.

6.3.9 With the implementation of good waste management practices at the Site, adverse environmental impacts are not expected to arise from the storage, handling and transportation of general refuse generated from the construction workforce.

Operation Phase

6.3.10 The following types of wastes would be generated during operation of the proposed development:

- General refuse; and
- Chemical waste.

6.3.11 Each type of the above waste arising is described below, together with an evaluation of the potential environmental impacts associated with the waste generation, handling, storage, transport and disposal.

General Refuse

6.3.12 General refuse (such as food scraps, waste paper, empty containers and packaging, etc.) from operation of the proposed development will mainly be generated from residents within the proposed development. Such refuse will be properly managed by suitable waste collectors so that intentional or accidental release to the surrounding environment will not occur. The total population of the proposed development is approximately 4,343. According to "Monitoring of Solid Waste in Hong Kong – Waste Statistic for 2024" as published by EPD, the per capita disposal rate for domestic waste is 0.86 kg/person/day. The recovery rate of domestic waste in 2024 is 22%. Therefore, the total general refuse generated from the proposed development is approximately 4,788 kg/day.

6.3.13 Effective collection of general wastes will be implemented to prevent waste materials from creating odour nuisance or pest/ vermin problem. Waste storage areas will be well maintained and cleaned regularly. To reduce waste and improve recycling, it is expected that waste such as waste paper, plastics and aluminium can be segregated for off-site recycling.

6.3.14 To support waste reduction and recycling, the future developer is encouraged to explore appropriate recycling means of food waste to be generated during operational phase, e.g.

delivering food waste generated to Organic Resources Recovery Centre (ORRC) or installation of food waste recycling machines for composting treatment, etc.

6.3.15 A refuse collection room should be incorporated on the ground floor for localized waste collection, from which it will be transported to the Shatin Transfer Station (STTS). Subsequently, the waste will be compacted at the STTS and placed into containers for transportation to the NENT landfill for final disposal.

Chemical Waste

6.3.16 Chemical waste is not anticipated during operation phase for residential development. However, chemical waste with amount of a few dozen litres per month may be generated from maintenance activities in housing estate such as hazardous waste from cooling towers, emergency generator, paint, etc. occasionally.

6.3.17 Chemical wastes may pose environmental, health and safety hazards if not stored and disposed of in an appropriate manner as stipulated in the Waste Disposal (Chemical Waste) (General) Regulation. Chemical wastes will require special handling and storage arrangements in accordance with the relevant regulations before removal for off-site disposal at CWTC or recycling by licensed facilities. Provided that the handling, storage and disposal of chemical wastes will be in accordance with these requirements, adverse environmental impacts will not be expected.

6.4 Recommendation of Mitigation Measures

Construction Phase

Good Site Practices

6.4.1 Adverse impacts related to waste management such as dust, odour, noise and wastewater discharge will not be expected to arise, provided that good site practices will be strictly followed. Recommendations for good site practices during the construction activities include:

- Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the Site;
- Training of site personnel in proper waste management and chemical handling procedures;
- Provision of sufficient waste disposal points and regular collection of waste;
- Appropriate measures to minimise windblown litter and dust/odour during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;
- Stockpiles of C&D materials should be kept covered by impervious sheets to avoid wind-blown dust;
- All dusty materials including C&D materials should be sprayed with water immediately prior to any loading transfer operation so as to keep the dusty material wet during material handling at the stockpile areas;

- Provision of wheel washing facilities before the trucks leaving the works area so as to minimise dust introduction to public roads;
- Well planned delivery programme for offsite disposal such that adverse environmental impact from transporting the inert or non-inert C&D materials is not anticipated.
- Drip tray should be provided to chemical waste containers. The drip tray should be clean up regularly. Clean up should be done before foreseeable inclement weather such as typhoon or heavy rain;
- All dump trucks engaged on-site for delivery of inert and non-inert C&D material from the Site to the designated disposal location, including PFRFs, landfill etc., should be equipped with GPS or equivalent system for tracking and monitoring of their travel routings and parking locations by the contractor to prohibit illegal dumping and landfilling of materials; and
- The data collected by GPS or equivalent system should be recorded properly for checking and analysis the travel routing and parking locations of dump truck engaged on site.

Waste Reduction Measures

6.4.2 Good management and control can prevent the generation of a significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:

- Sort non-inert C&D materials to recover any recyclable portions;
- Segregation and storage of different types of waste in different containers or skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;
- Encourage collection of recyclable waste such as waste paper and aluminium cans by providing separate labelled bins to enable such waste to be segregated from other general refuse generated by the work force;
- Proper site practices to minimise the potential for damage or contamination of inert C&D materials;
- Plan the use of C&D materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.

6.4.3 In addition to the above measures, specific mitigation measures are recommended below for the identified waste arising to minimise environmental impacts during handling, transportation and disposal of these wastes.

Inert and Non-inert C&D Materials

6.4.4 In order to minimise impacts resulting from collection and transportation of inert C&D materials for off-site disposal, the inert C&D materials should be reused on-site as fill material as far as practicable. In addition, inert C&D materials generated from excavation works could be reused as fill materials in local projects that require public fill for reclamation.

6.4.5 The surplus inert C&D materials will be disposed of at the nearest Government's PFRFs, Tseung Kwan O Area 137 Public Fill Reception Facility.

6.4.6 The C&D materials generated from general site clearance should be sorted on site to segregate any inert materials for reuse or disposal of at PFRFs whereas the non-inert materials will be disposed of at the designated landfill site.

6.4.7 In order to monitor the disposal of inert and non-inert C&D materials at respectively PFRFs and the designated landfill site, and to control fly-tipping, it is recommended that the contractor should follow the Technical Circular (Works) No. 6/2010 for Trip Ticket System for Disposal of Construction & Demolition Materials issued by Development Bureau. In addition, it is also recommended that the contractor should prepare and implement a Waste Management Plan (WMP) detailing their various waste arising and waste management practices in accordance with the relevant requirements of the Technical Circular (Works) No. 19/2005 Environmental Management on Construction Site. The WMP shall be submitted to Project Engineer or Architect for approval.

Chemical Wastes

6.4.8 If chemical wastes are produced at the construction site, the contractor will be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the "Code of Practice on the Packaging Labelling and Storage of Chemical Wastes". Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The contractor should use a licensed collector to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.

6.4.9 Potential environmental impacts arising from the handling activities (including storage, collection, transportation and disposal of chemical waste) are expected to be minimal with the implementation of appropriate mitigation measures as recommended.

General Refuse

6.4.10 General refuse should be stored in enclosed bins or compaction units separated from inert C&D materials. A reputable waste collector should be employed by the contractor to remove general refuse from the Site, separately from inert C&D materials. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.

Operation Phase

General Refuse

6.4.11 General refuse should be collected on daily basis and delivered to the refuse collection point accordingly. A reputable waste collector should be employed to remove general refuse regularly to avoid odour nuisance or pest/vermin problem. Sufficient recycling

containers are recommended to be provided at suitable locations of the proposed development to encourage recycling of such waste as aluminium cans, plastics and waste paper.

Chemical Waste

6.4.12 If chemical wastes are expected to be produced during the operation phase, the operator should register with the EPD as a chemical waste producer and follow the guidelines stated in the "Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes". Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidising, irritant, toxic, harmful, corrosive, etc. Licensed collector should be deployed to transport and dispose of the chemical wastes at the approved Chemical Waste Treatment Centre or other licensed recycling facilities, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.

7 OTHER ENVIRONMENTAL IMPACTS

Hazard to Life

7.1.1 A Quantitative Risk Assessment was conducted for the underground Towngas high pressure pipeline in Shek Mun, New Territories to assess the risks associated with the proposed residential development which will be located in the vicinity of the pipelines. The assessment has considered the surrounding building population, traffic population, and future occupants of the residential development at appropriate stages of the proposed development.

7.1.2 Based on the results, the maximum individual risk within the offtake station is below 1 x 10^{-3} per year. At the boundary of the offtake station, the maximum individual risk remains below 1 x 10^{-5} per year. Furthermore, the maximum individual risk associated with both high pressure pipeline and the proposed development is below 1 x 10^{-7} per year. Therefore, in terms of individual risk, the proposed development has met the requirements defined in Hong Kong risk guidelines and no mitigation measures are deemed necessary.

7.1.3 The societal risk assessment for the 2 assessment cases considered, i.e. Base Case (2025) and Developed Case (2032), falls within the acceptable region of the criteria. Moreover, the maximum fatality for both cases is less than 1,000 people at 1 x 10^{-9} per year (i.e. 500 and 650 people at 1 x 10^{-9} per year for Base Case and Developed Case, respectively). Overall, the proposed development meets the Hong Kong societal risk guideline, and no mitigation measures are deemed necessary.

7.1.4 Details please refer to the Quantitative Risk Assessment (QRA).

Cultural Heritage Review

7.1.5 No graded historic building, declared monument, site of archaeological interest or site of marine archaeological potential is located within the 50m study area from the Project Site. Thus, no potential direct or indirect impact to cultural heritage resources is anticipated.

Ecology

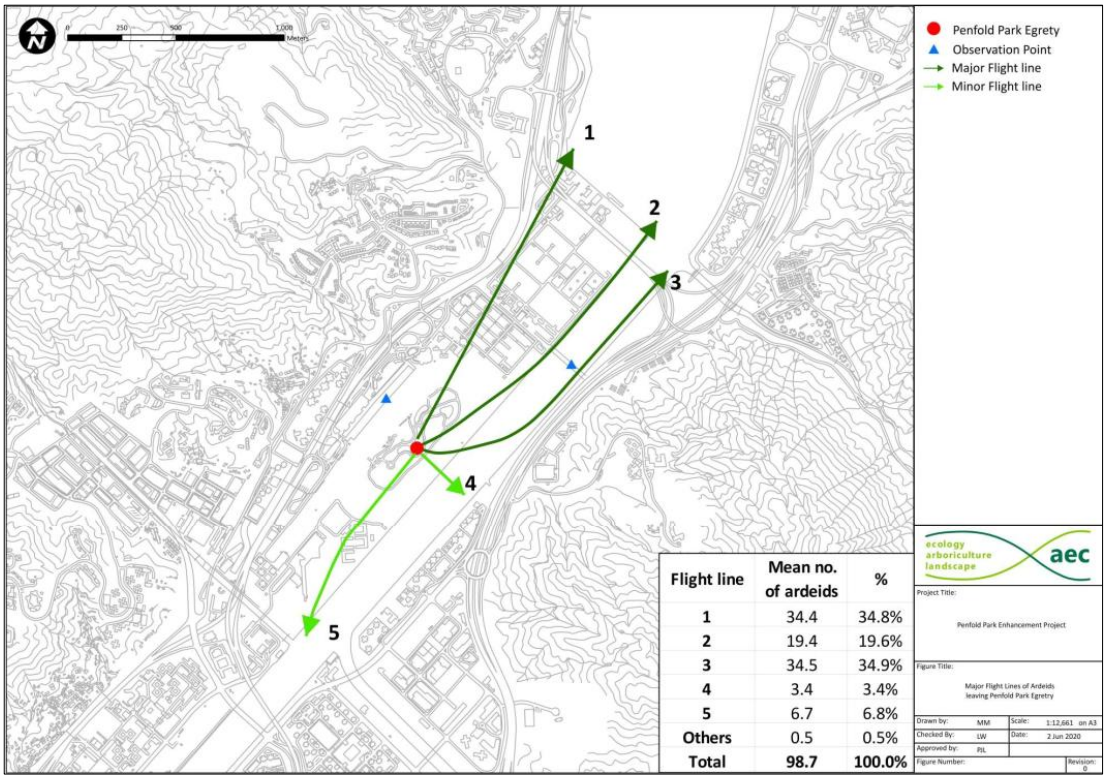
7.1.6 The proposed development is located within urban developed area and surrounded by residential and commercial developments. It does not fall within the boundary of Coastal Protection Area (CPA), Site of Special Scientific Interest (SSSI), Green Belt (GB), Conservation Area (CA), Country Park, Marine Park and Marine Reserve.

7.1.7 Although the Penfold Park Egretry is located approximately 600m metres from the proposed development, flight line surveys within both the Project Profile (PP) of Penfold Park Enhancement Project (PP-605/2020) and the EIA Report of Sha Tin Cavern Sewage Treatment Works (AEIAR-202/2016) indicate a flight line usage of less than 5% transversing close to or towards the proposed development. This level of usage is

considered minor and does not represent a major commuting corridor for ardeids. Therefore, potential impact to the Penfold Park Egretry and its associated flight paths is not anticipated. Survey data from the referenced flight line surveys for Penfold Park and Sha Tin Cavern Sewage Treatment Works are presented in Diagram 7.1a and 7.1b and Diagram 7.2a and 7.2b, respectively.

7.1.8 It is also noted and indicated in the PP for Penfold Park, that its egretry is located in the middle of a racecourse and a busy public park, where levels of human disturbance are already very high and the ardeids are clearly tolerant of the existing environment. Therefore, with the implementation of good site practice for construction activities (i.e. control of noise and glare), potential disturbance to the flight paths is not anticipated.

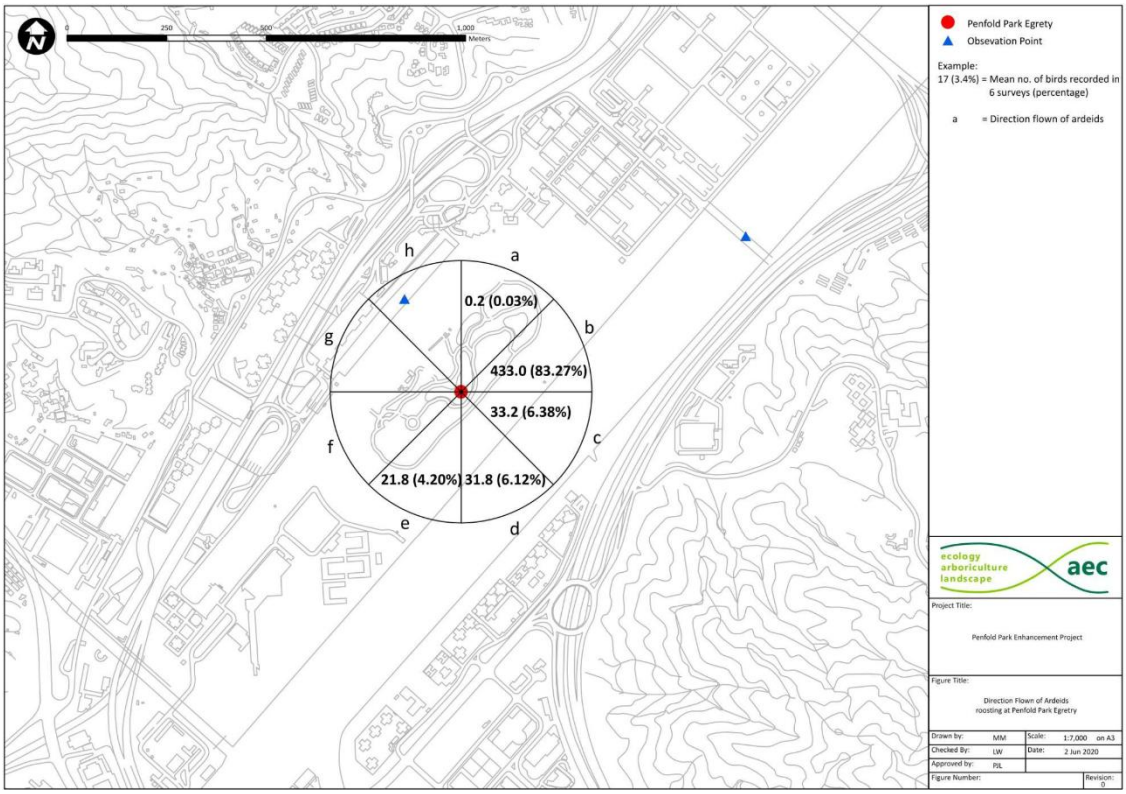
Diagram 7.1a Flight Lines of Ardeids Leaving the Egretry identified from Breeding Season Ardeid Flight Line Survey (PP-605/2020)



Flight line	Mean no. of ardeids	%
1	34.4	34.8%
2	19.4	19.6%
3	34.5	34.9%
4	3.4	3.4%
5	6.7	6.8%
Others	0.5	0.5%
Total	98.7	100.0%

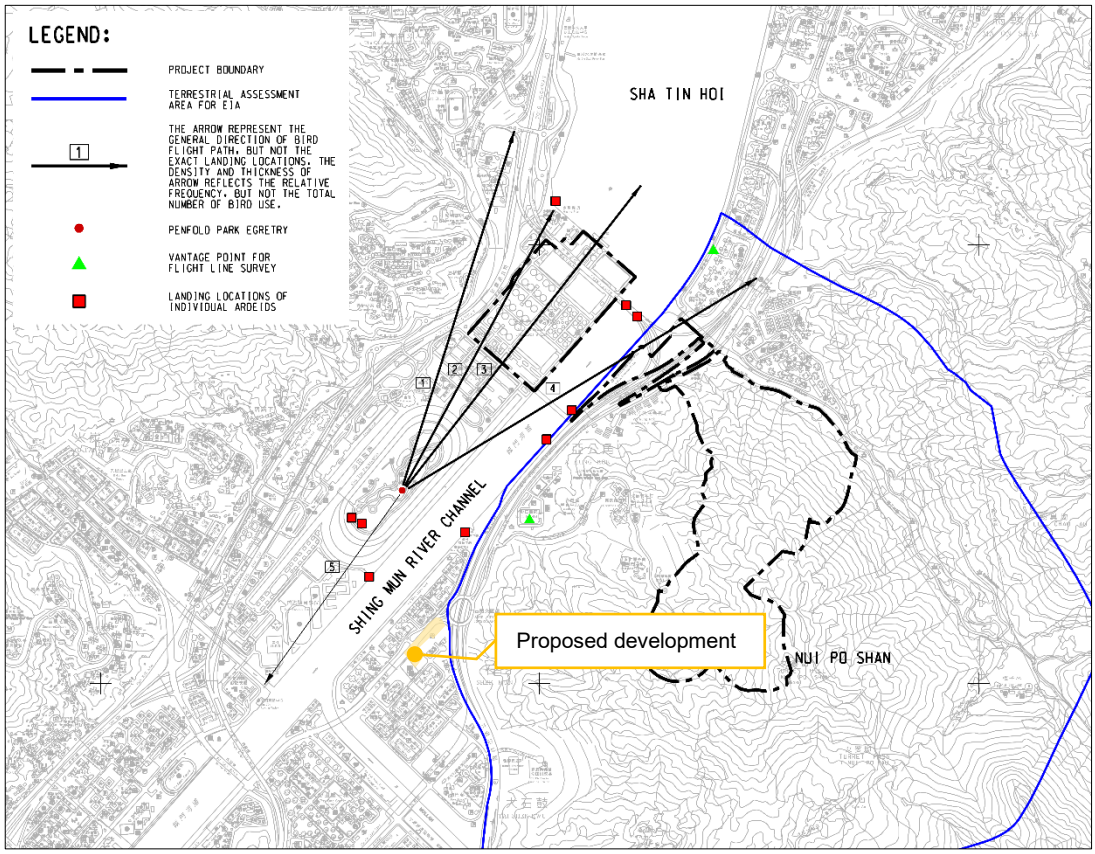
Notes:
(1) Ardeid flight line survey conducted between May and August 2019.
(2) Majority of ardeids headed northeast to the coastal areas in Tolo Habour and other wetland habitats (e.g. Lake Ad Excellentiam in the Chinese University of Hong Kong) which are suitable foraging habitats for ardeids.
(3) Minor flight line 4 transverses closest to the proposed development and has a flight line usage of only 3.4%.

Diagram 7.1b Direction of Flow of Ardeids Returning to the Roost identified from Non-Breeding Season Flight Line Survey (PP-605/2020)



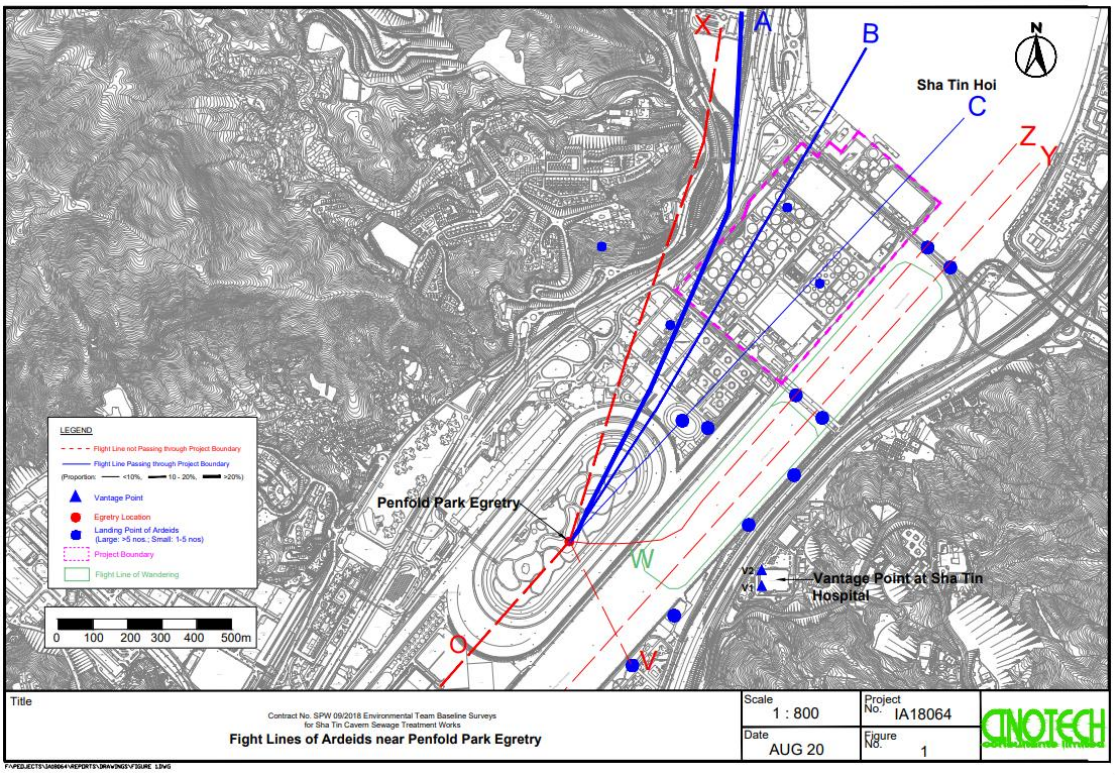
Notes:
(1) Evening flight line surveys conducted between October 2019 and March 2020.
(2) Almost all roosting ardeids were arriving from the direction of the Shing Mun River, northeast of the egretry.

Diagram 7.2a Flight Lines of Ardeids near Penfold Park Egretry (AEIAR-202/2016)



Notes:
(1) Survey conducted at Penfold Park Egretry between March and July 2015.
(2) No flight line was observed in the direction of the proposed development.

Diagram 7.2b Flight Lines of Ardeids near Penfold Park Egretry (EP-533/2017)



Notes:
(1) Survey conducted at monthly interval from April to July 2020 for Baseline Survey Report on Egretry for the Environmental Permit (EP-533/2017) under Sha Tin Cavern Sewage Treatment Works.
(2) The overall flight line usage for Route V, i.e. towards the proposed development, was 3.6% (as extracted from Table 4-4 of the EP).

Land Contamination

7.1.9 The available aerial photos showing the information for the historical development of the Sites are given in **Appendix 3.2a**. Discussions on the current land-use and land-status are given below.

7.1.10 An understanding on the development and land-use history of the Site will be beneficial to some technical studies for the Site, particularly on land contamination. The historical developments/land-use patterns of the Site were mainly deduced from interpretation on aerial photos and some literature research. The findings by chronology are given below.

1973-74

7.1.11 From 1973 to 1974, the land for the Site had not been formed yet. The area of interest was a part of Shing Mun River.

1982

7.1.12 Large scale of reclamation works was in progress of the Site and its vicinity which could be observed from the aerial photos taken at that time.

1993

7.1.13 From the aerial photos taken at that time, STTL626 was vacant with vegetation. STTL627 was a construction site.

2003

7.1.14 From the aerial photos taken at that time, STTL 626 and STTL 627 were occupied by carparks.

2008-2014

7.1.15 From the aerial photos taken at that time, STTL 626 was occupied by carparks. STTL 627 was occupied by temporary structures.

2023

7.1.16 From the aerial photos taken at that time, STTL 626 was occupied by carparks. Carparking was observed. STTL 627 was a construction site.

7.1.17 To identify any past land uses which may have the potential for causing land contamination, the development history of the Site has been reviewed with the aid of selected historical aerial photos between 1973 and 2023 (see the historical aerial photos **Appendix 3.2a**) and the findings are summarised as below.

Table 7-1: Summary of Historical Land Use

Year	Historical Land Use
1973-74	Sea.
1982	Reclaimed land is formed.
1993	STTL626 was vacant with vegetation. STTL627 was a construction site.
2003	STTL626 and STTL627 were occupied by carparks.
2008	STTL626 had no significant changes of land use as compared with 2003. STTL627 was occupied by temporary structures.
2014	STTL626 had no significant changes of land use as compared with 2003. STTL627 had no significant changes of land use as compared with 2008.
2023	STTL626 had no significant changes of land use as compared with 2003. STTL627 was a construction site. Carparking was observed.

7.1.18 Based on the past and existing conditions, STTL 626 serves as temporary carparks. Provided that the operators of both sites follow the prevailing standard and guidelines and essential environmental protection requirements under the respective STTs, land contamination issues are not anticipated to arise from the past and current land-use of STTL626.

7.1.19 Based on the past conditions, STTL627 was a construction site and occupied by temporary structures as site offices for public works projects.

7.1.20 According to information provided by the Lands Department (LandsD), the past land use of STTL 627 was designated as a Works Area in connection with the construction of the Subway supporting the Provision of Columbarium at Shek Mun (TGLA No. TST-483) during the period from September 2022 to December 2023.

7.1.21 Under the engineering conditions of this TGLA (See **Appendix 3.2b**), the allocatee was required to ensure that the site remained free from contamination. In the event that contamination was identified, the allocatee was obligated to remove all contaminating substances from the site and its adjoining areas, and to reinstate the site to the satisfaction of the District Lands Office (DLO) upon expiry of the allocation. The site was duly handed over to the Government, to the satisfaction of the DLO, on 29 December 2023.

7.1.22 In addition, according to the information provided by FSD and EPD (See **Appendix 3.3c**), it is noted that no record of chemical and dangerous spillage complaint/incident was found at the subject sites.

7.1.23 Based on the above, it is reasonably concluded that both STTL626 and STTL 627 are free from land contamination.

8 CONCLUSION

8.1 Air Quality

8.1.1 During construction phase, with implementation of appropriate mitigation measures on site, no adverse impact on air quality would be anticipated. During operation phase, since the required vehicular buffer distance (i.e. 20m from PD/ EX/ TR and 5m from LD) as stipulated in HKPSG is complied, no adverse impact on air quality is anticipated.

8.2 Noise

Construction Noise

8.2.1 During construction stage, with implementation of appropriate mitigation measures on site such as using QPME and movable noise barrier, it is expected that the construction noise impact would be minimal.

Road Traffic Noise

8.2.2 For road traffic noise impact, the predicted maximum noise level is 78 dB(A). Mitigation measures such as acoustic window and enhanced acoustic balcony are proposed. With these mitigation measures, no adverse noise impact on the development due to road traffic is anticipated.

Fixed Noise Source

8.2.3 Based on the fixed noise impact assessment results, the predicted noise levels at representative NSR30, 35, 37, 39_a, 40_a, 41, 44, 54, 56_a and 57 would exceed the relevant noise criteria. With the proposed mitigation measures, no insurmountable noise impact arising from the fixed noise sources to the proposed development is anticipated

Railway Noise

8.2.4 Based on the railway noise impact assessment results, the predicted noise levels at all representative NSRs would meet with the relevant noise criteria, except NSR3. With the proposed mitigation measures, no insurmountable noise impact arising from the railway lines to the proposed development is anticipated

8.3 Water Quality

8.3.1 During construction phase, the water quality pollutants from the proposed development are mainly generated by construction activities, site run-off, accidental spillage, on-site sewage effluent. With implementation of mitigation measures such as drainage system with silt traps, proper sewage collection and disposal of sewage, no adverse water quality impact during construction phase is anticipated.

8.3.2 During operation phase, the water quality pollutants from the proposed development are mainly the sewage generated from the proposed Development and surface runoff. With implementation of proposed drainage and sewerage network, no adverse water quality impact during operation phase is anticipated.

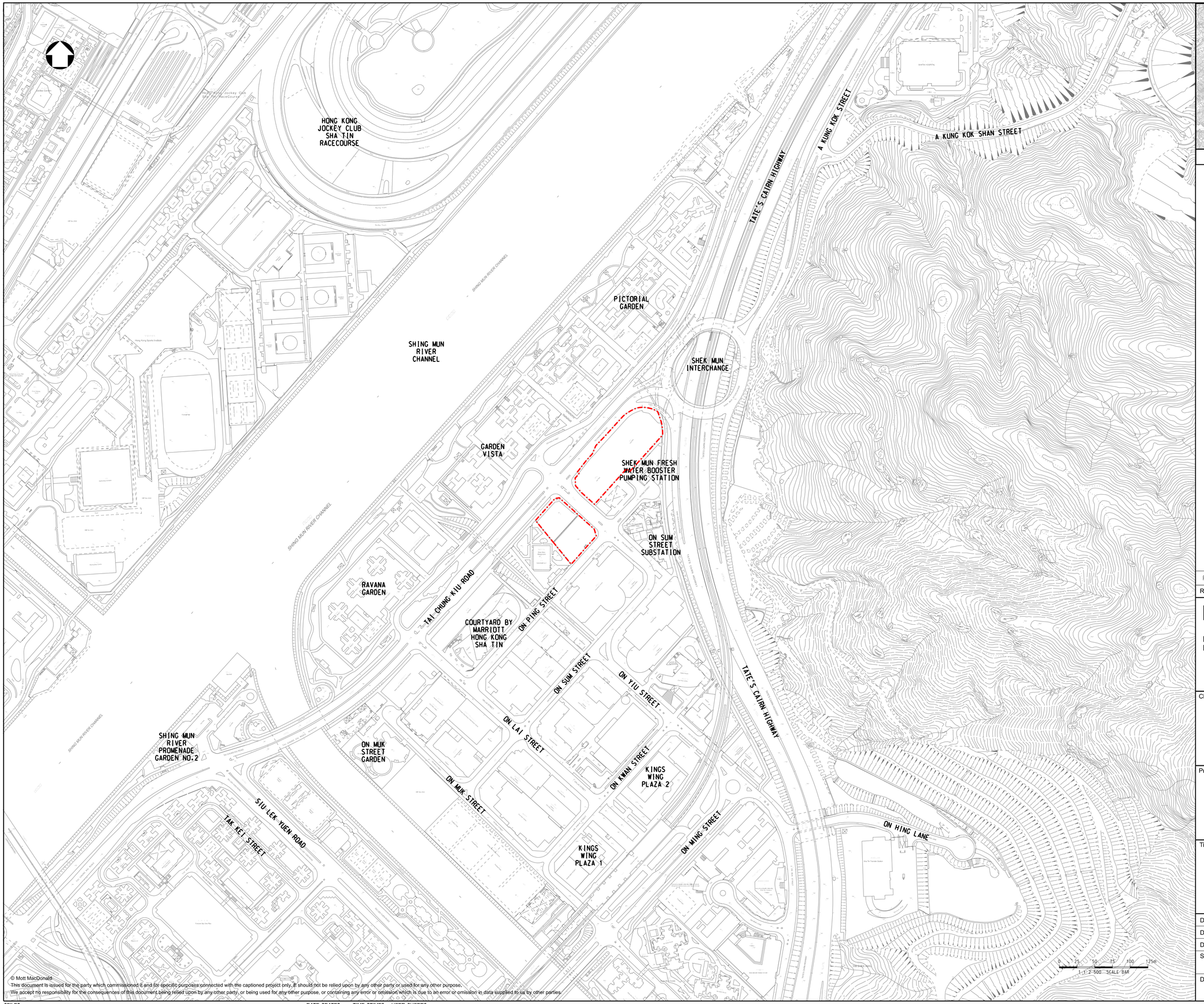
8.4 Waste Management

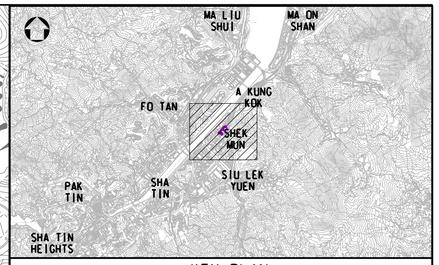
8.4.1 With reference to other projects of similar scale and nature, the estimated inert and non-inert C&D materials that will be generated due to construction activities are approximately 8,061m^3 and 896 m^3 respectively. No adverse environmental impact arising from handling, storage, transportation and disposal of waste from the proposed development is anticipated.

8.5 Other Environmental Impacts

8.5.1 The potential impacts of hazard to life, cultural heritage, ecology and land contamination are reviewed. Adverse impact is not anticipated.

Figure





KEY PLAN

LEGEND:

APPLICATION SITE BOUNDARY

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	JAN 2024	HL	FIRST ISSUE	VF	EC

MOTT MACDONALD

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Client

CEDD

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

AGREEMENT NO. CE 19/2023 (CE)
TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027)

Title

SITE LOCATION PLAN

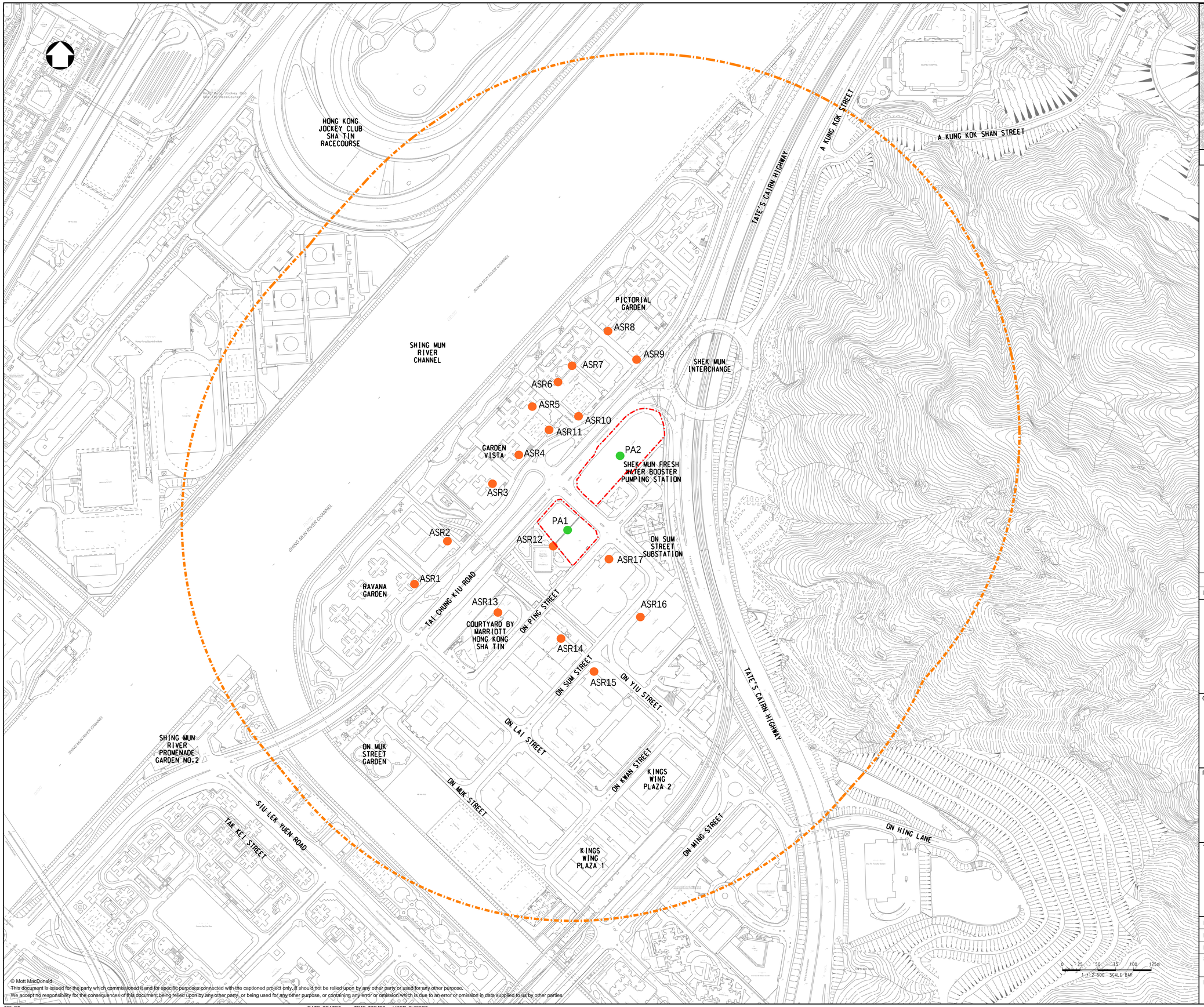
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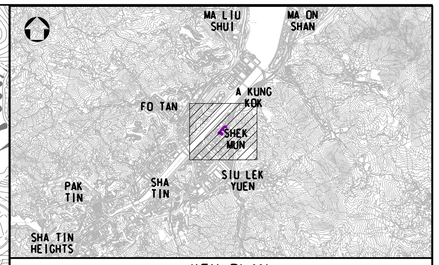
Scale at A1	Status	Rev
1:2500	PRE	P1

Drawing Number

FIGURE 1.1

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KEY PLAN

LEGEND:

- APPLICATION SITE BOUNDARY
- 500M ASSESSMENT AREA
- REPRESENTATIVE AIR SENSITIVE RECEIVERS (EXISTING)
- REPRESENTATIVE AIR SENSITIVE RECEIVERS (PLANNED)

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	JAN 2024	HL	FIRST ISSUE	VF	EC

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AGREEMENT NO. CE 19/2023 (CE)
TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027)

Title

LOCATION OF AIR SENSITIVE RECEIVERS

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FIGURE 3.1

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$FILE$ DATE: $DATE$ TIME: $TIME$ USER: $USER$

PICTORIAL GARDEN

GARDEN VISTA

ON KING STREET

TAI CHUNG KIU ROAD

ON SUM STREET

ON PING STREET

STTL 626

STTL 627

SHEK MUN FRESH WATER BOOSTER PUMPING STATION

ON SUM STREET SUBSTATION

TATE'S CAIRN HIGHWAY

SHEK MUN INTERCHANGE

SHEK MUN INTERCHANGE (Elevated Road)

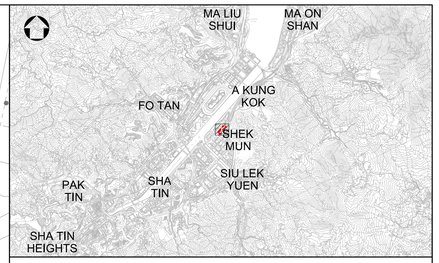
Cycling Track

石門遊樂場 Shek Mun Playground

籃球場 Basketball Court

Sha Tin Community Green Station 綠在沙田

Subway



KEY PLAN

LEGEND:

- APPLICATION SITE BOUNDARY
- 20m BUFFER DISTANCE
- 5m BUFFER DISTANCE

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	JAN 2026	TL	FIRST ISSUE	VF	DN

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AGREEMENT NO. CE 19/2023 (CE) - TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027) TASK ORDER NO.4

Title

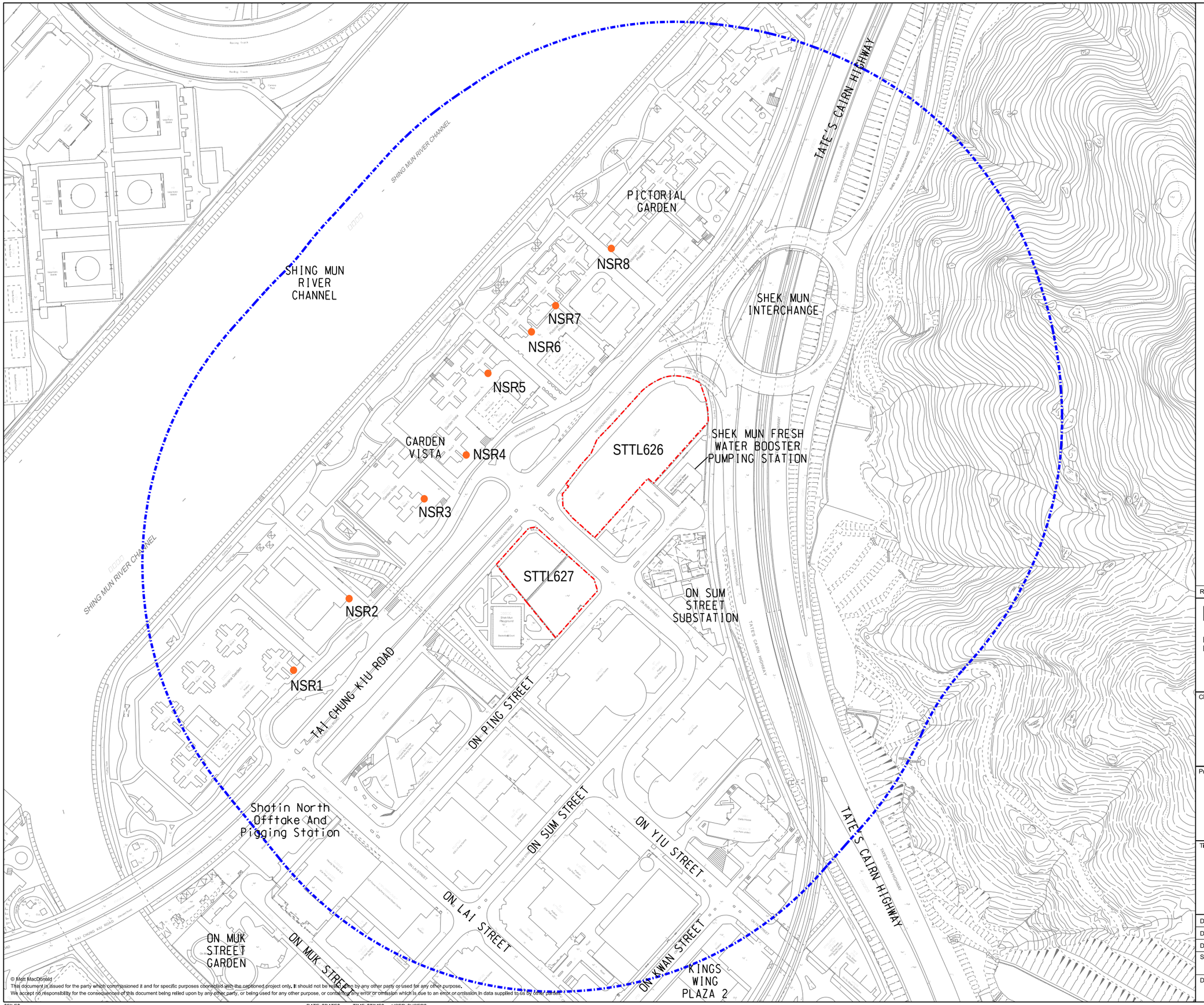
VEHICULAR BUFFER DISTANCE

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Figure 3.2

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LEGEND:

- APPLICATION SITE BOUNDARY
- 300M ASSESSMENT AREA
- REPRESENTATIVE NOISE SENSITIVE RECEIVERS (EXISTING)

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Project

AGREEMENT NO. CE 19/2023 (CE)
TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027)

Title

LOCATION OF REPRESENTATIVE NOISE SENSITIVE RECEIVERS

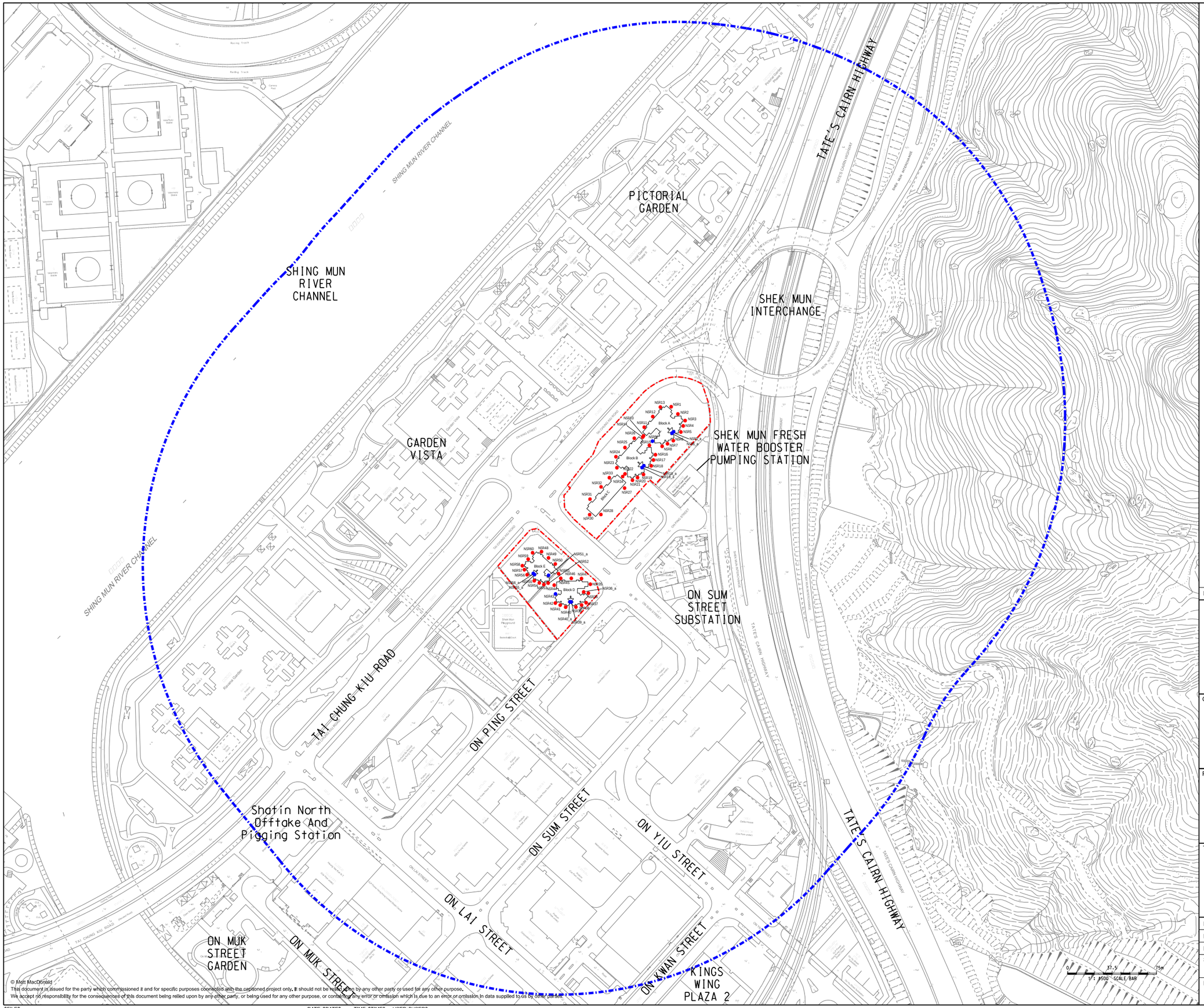
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FIGURE 4.1

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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS (WITH NO NOISE EXCEEDANCE) UNDER BASE CASE
- NOISE SENSITIVE RECEIVERS (WITH NOISE EXCEEDANCE) UNDER BASE CASE

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AGREEMENT NO. CE 19/2023 (CE)
TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027)

Title

LOCAITON OF NOISE SENSITIVE RECEIVERS FOR ROAD TRAFFIC NOISE IMPACT ASSESSMENT

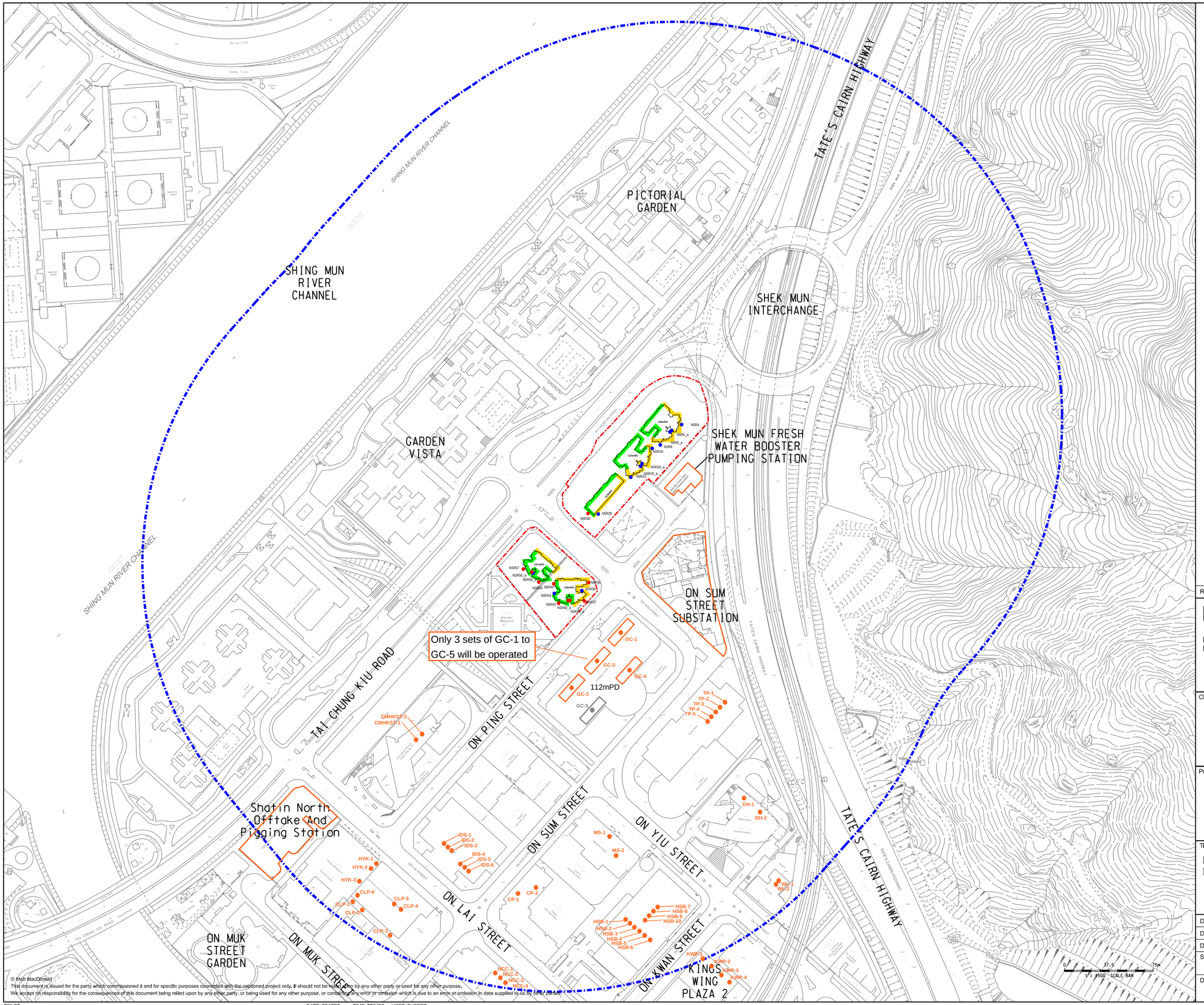
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Scale at A1		Status		Rev	

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FIGURE 4.2

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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"

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Title

LOCAITON OF NOISE SENSITIVE RECEIVERS AND FIXED NOISE SOURCES FOR FIXED NOISE IMPACT ASSESSMENT

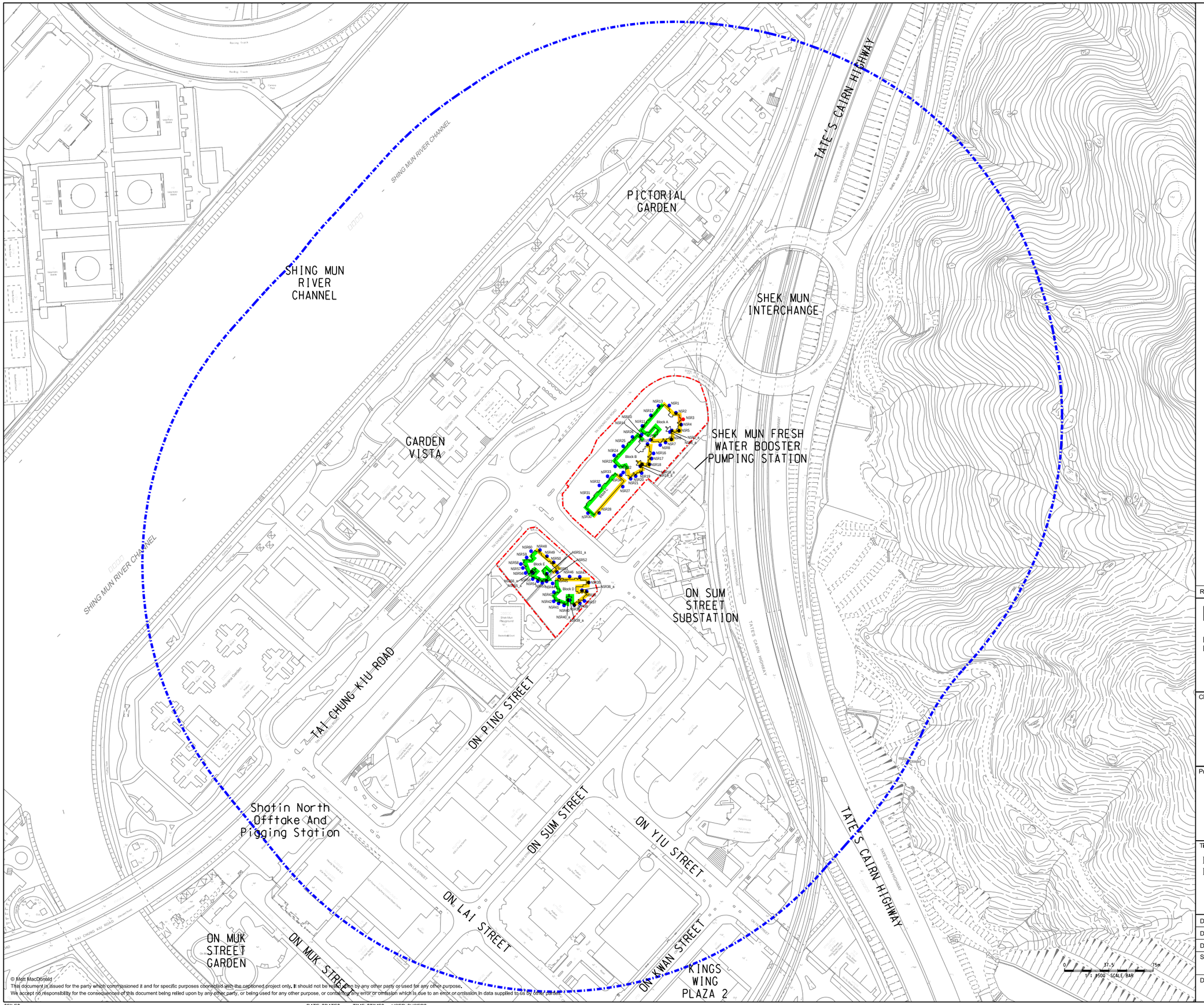
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Scale at A1		Status		Rev	

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FIGURE 4.3

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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS (WITH NO NOISE EXCEEDANCE) UNDER BASE CASE
- NOISE SENSITIVE RECEIVERS (WITH NOISE EXCEEDANCE) UNDER BASE CASE
- FACADE WITH AREA SENSITIVITY RATING OF "B"
- FACADE WITH AREA SENSITIVITY RATING OF "C"

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TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027)

Title

LOCAITON OF NOISE SENSITIVE RECEIVERS FOR RAILWAY NOISE IMPACT ASSESSMENT

Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

Drawing Number

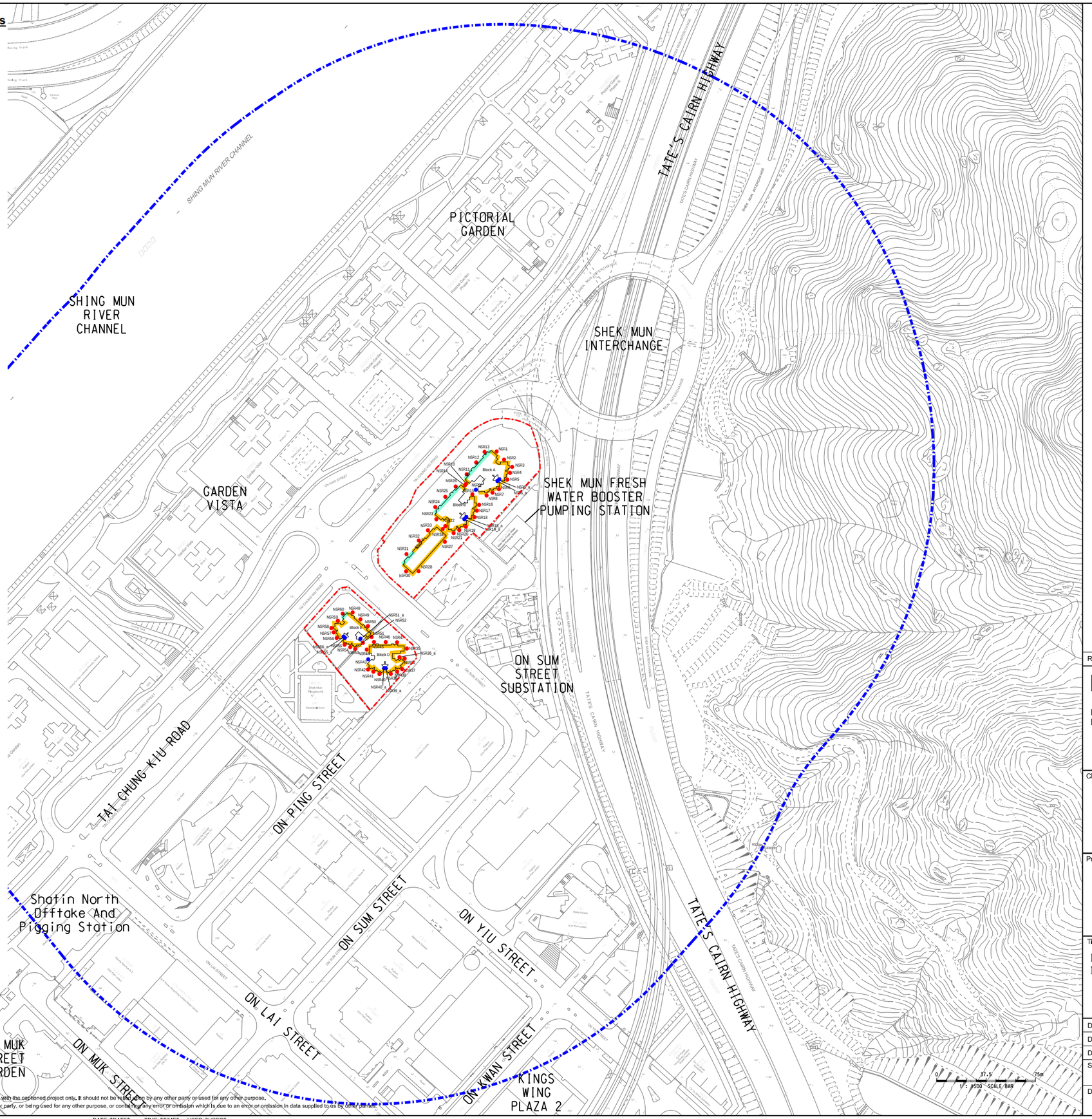
FIGURE 4.4

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Schedule of Proposed Mitigation Measures

NAP	Acoustic Window (BT) with SAM	Enhanced Acoustic Balcony (BT) with SAM
Block A		
1	1-34/F	
2	1-34/F	
3	1-34/F	
4	1-34/F	
5	1-34/F	
6	1-34/F	
7	1-34/F	
8	1-34/F	
10	1-30/F	
11	2-34/F	1/F
12	2-34/F	1/F
13	4-34/F	1-3/F
Block B		
14	1-29/F	
15	8-10/F	
16	1-33/F	
17	1-33/F	
18	1-33/F	
19	1-33/F	
20	1-33/F	
21	1-33/F	
22	1-14/F	
23	1-33/F	
24	3-33/F	1-2/F
25	2-33/F	1/F
26	2-33/F	1/F
Block C		
27	1-32/F	
28	1-32/F	
30	1-32/F	
31	2-32/F	1/F
32	1-32/F	
33	1-32/F	
34	1-23/F	
Block D		
35	1-34/F	
36	1-34/F	
36_a	1-22/F	
37	1-34/F	
38	1-27/F	
39	1-18/F	
40	1-10/F	
41	1-10/F	
42	1-15/F	
44	1-5/F	
45	1-34/F	
46	1-34/F	
47	1-34/F	
Block E		
48	1-33/F	
49	1-33/F	
50	1-33/F	
51	1-33/F	
52	1-8/F	
53	1-18/F	
54	1-10/F	
55	1-18/F	
56	1-27/F	
57	1-32/F	
58	1-33/F	
59	1-33/F	
60	2-33/F	1/F



LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS (WITH NO NOISE EXCEEDANCE) UNDER BASE CASE
- NOISE SENSITIVE RECEIVERS (WITH NOISE EXCEEDANCE) UNDER BASE CASE
- ACOUSTIC WINDOW (BAFFLE TYPE) WITH SAM
- ACOUSTIC WINDOW (BAFFLE TYPE) AND ENHANCED ACOUSTIC BALCONY (BAFFLE TYPE) WITH SAM

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TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027)

Title

PROPOSED MITIGATION MEASYRES FOR ROAD TRAFFIC NOISE IMPACT ASSESSMENT

Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

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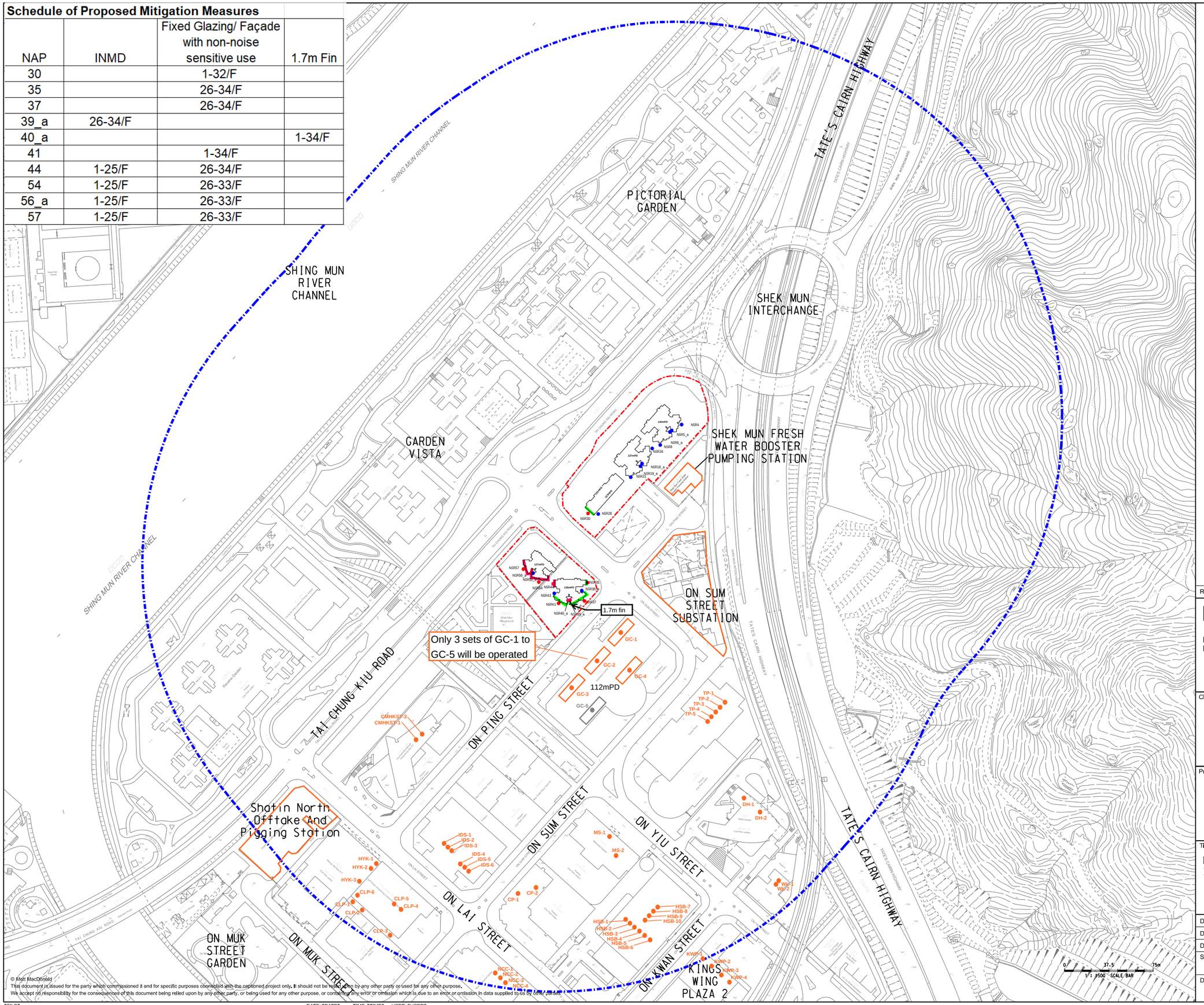
FIGURE 4.5

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Schedule of Proposed Mitigation Measures

NAP	INMD	Fixed Glazing/ Façade with non-noise sensitive use	1.7m Fin
30		1-32/F	
35		26-34/F	
37		26-34/F	
39_a	26-34/F		
40_a			1-34/F
41		1-34/F	
44	1-25/F	26-34/F	
54	1-25/F	26-33/F	
56_a	1-25/F	26-33/F	
57	1-25/F	26-33/F	



LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS (WITH NO NOISE EXCEEDANCE) UNDER BASE CASE
- NOISE SENSITIVE RECEIVERS (WITH NOISE EXCEEDANCE) UNDER BASE CASE
- PROPOSED INMD
- PRPOSED INMD OR FIXED GLAZING/ FACADE WITH NON-NOISE SENSITIVE USE
- FIXED GLAZING/ FACADE WITH NON-NOISE SENSITIVE USE

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TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027)

Title

PROPOSED MITIGATION MEASURES FOR FIXED NOISE IMPACT ASSESSMENT

Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

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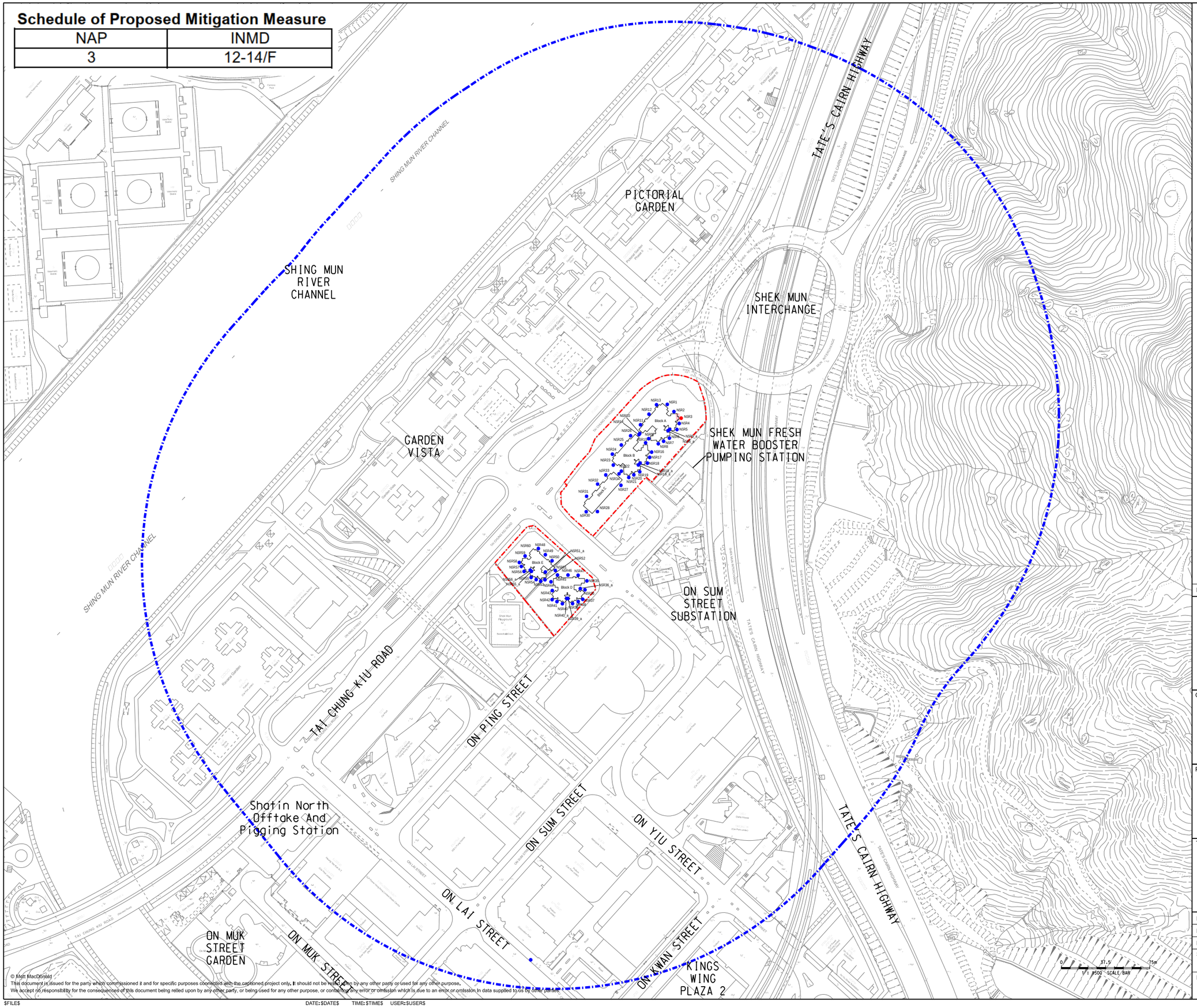
FIGURE 4.6

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$FILE$ DATE:$DATE$ TIME:$TIME$ USER:$USER$

Schedule of Proposed Mitigation Measure

NAP	INMD
3	12-14/F



LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS (WITH NO NOISE EXCEEDANCE) UNDER BASE CASE
- NOISE SENSITIVE RECEIVERS (WITH NOISE EXCEEDANCE) UNDER BASE CASE
- PROPOSE INMD

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Title

PROPOSED MITIGATION MEASYRES FOR RAIL NOISE IMPACT ASSESSMENT

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FIGURE 4.7

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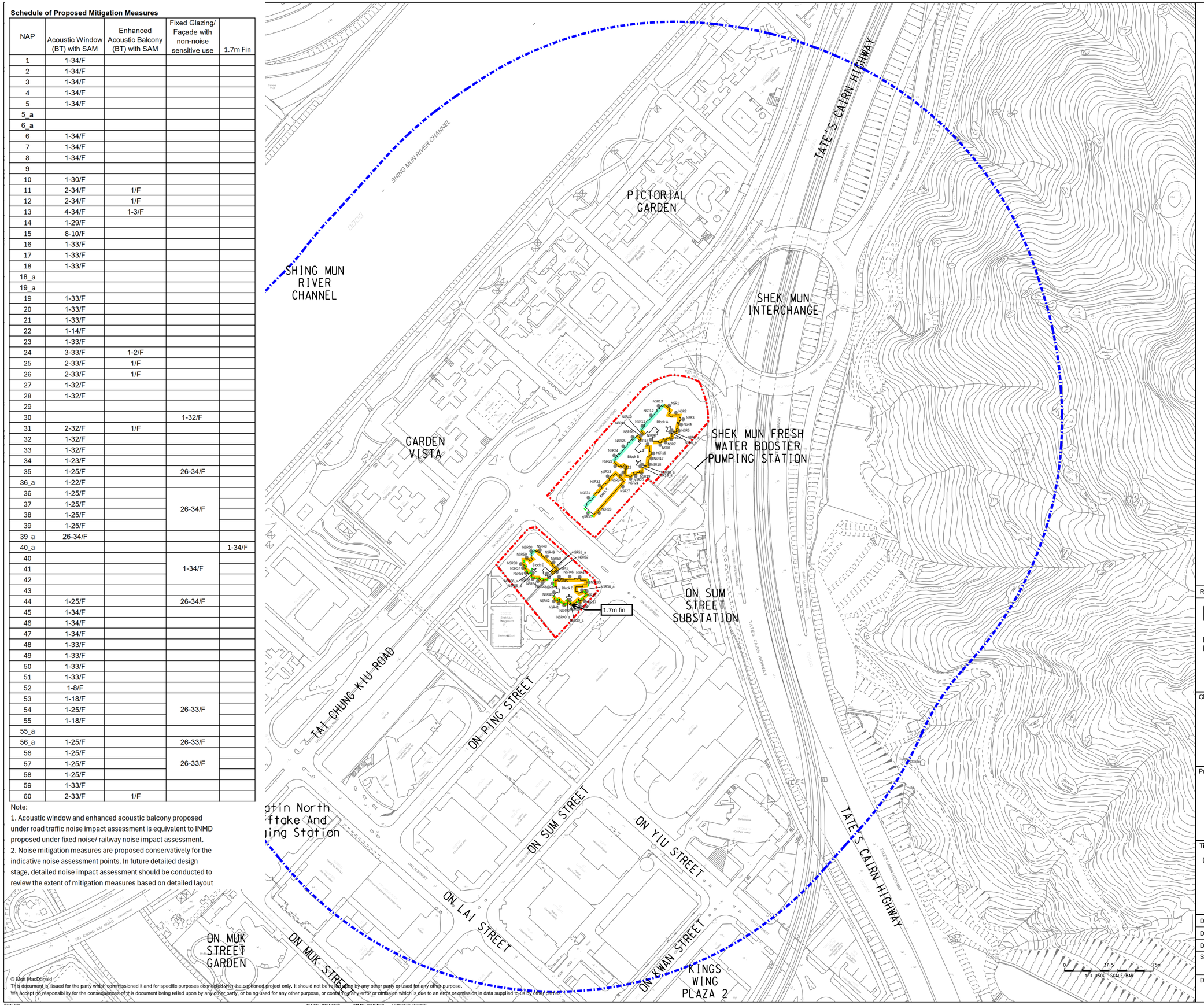
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Schedule of Proposed Mitigation Measures

NAP	Acoustic Window (BT) with SAM	Enhanced Acoustic Balcony (BT) with SAM	Fixed Glazing/ Façade with non-noise sensitive use	1.7m Fin
1	1-34/F			
2	1-34/F			
3	1-34/F			
4	1-34/F			
5	1-34/F			
5_a				
6_a				
6	1-34/F			
7	1-34/F			
8	1-34/F			
9				
10	1-30/F			
11	2-34/F	1/F		
12	2-34/F	1/F		
13	4-34/F	1-3/F		
14	1-29/F			
15	8-10/F			
16	1-33/F			
17	1-33/F			
18	1-33/F			
18_a				
19_a				
19	1-33/F			
20	1-33/F			
21	1-33/F			
22	1-14/F			
23	1-33/F			
24	3-33/F	1-2/F		
25	2-33/F	1/F		
26	2-33/F	1/F		
27	1-32/F			
28	1-32/F			
29				
30			1-32/F	
31	2-32/F	1/F		
32	1-32/F			
33	1-32/F			
34	1-23/F			
35	1-25/F		26-34/F	
36_a	1-22/F			
36	1-25/F			
37	1-25/F		26-34/F	
38	1-25/F			
39	1-25/F			
39_a	26-34/F			
40_a				1-34/F
40				
41			1-34/F	
42				
43				
44	1-25/F		26-34/F	
45	1-34/F			
46	1-34/F			
47	1-34/F			
48	1-33/F			
49	1-33/F			
50	1-33/F			
51	1-33/F			
52	1-8/F			
53	1-18/F			
54	1-25/F		26-33/F	
55	1-18/F			
55_a				
56_a	1-25/F		26-33/F	
56	1-25/F			
57	1-25/F		26-33/F	
58	1-25/F			
59	1-33/F			
60	2-33/F	1/F		

Note:

1. Acoustic window and enhanced acoustic balcony proposed under road traffic noise impact assessment is equivalent to INMD proposed under fixed noise/ railway noise impact assessment.
2. Noise mitigation measures are proposed conservatively for the indicative noise assessment points. In future detailed design stage, detailed noise impact assessment should be conducted to review the extent of mitigation measures based on detailed layout



LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- REPRESENTATIVE NSR
- FIXED GLAZING/ FACADE WITH NON-NOISE SENSITIVE USE
- ACOUSTIC WINDOW (BAFFLE TYPE)with SAM
- ACOUSTIC WINDOW (BAFFLE TYPE) OR ENHANCED ACOUSTIC BALCONY (BAFFLE TYPE)with SAM
- 1.7M FIN

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Title

Consolidated Proposed Mitigation Measures

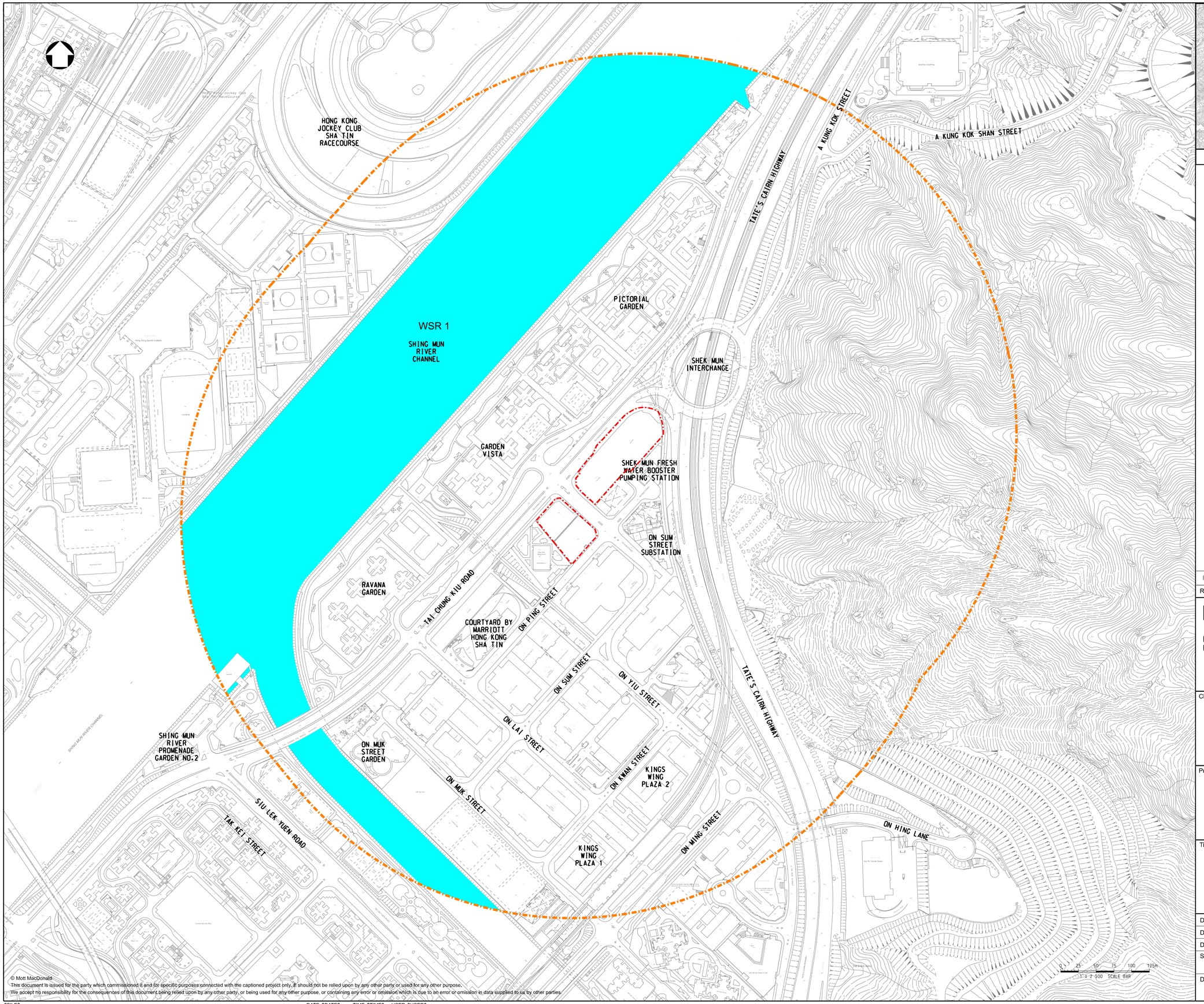
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Scale at A1		Status		Rev	

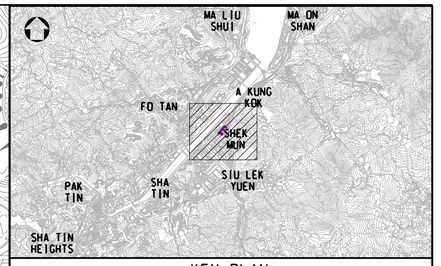
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FIGURE 4.8

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KEY PLAN

LEGEND:

- APPLICATION SITE BOUNDARY
- 500M ASSESSMENT AREA
- WATER SENSITIVE RECEIVER

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	JAN 2024	HL	FIRST ISSUE	VF	EC

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Title

Location of Water Sensitive Receiver

Designed			Eng check		
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Figure 5.1

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3.1 Correspondence with TD

Outlook

Re: Agreement No. CE19/2023(CE) - Task Order No.4 - Road Classification for Preliminary Environmental Review Study

From Yee Lin PANG <yeelinpang@td.gov.hk>
Date Mon 2025-12-08 17:20
To Andrew Tsang <[redacted]>
Cc Terry Chui <[redacted]>; Vincent Fong <[redacted]>

Dear Andrew,

Please note my comments as noted in your table.

Regards,
Rebecca PANG
E/ST3, TENTE
Transport Department
Tel: 2399 6966

From: "Andrew Tsang" <[redacted]>
To: "Yee Lin PANG/TD" <yeelinpang@td.gov.hk>
Cc: "Vincent Fong" <[redacted]>, "Terry Chui" <[redacted]>
Date: 25/11/2025 03:37 pm
Subject: Agreement No. CE19/2023(CE) - Task Order No.4 - Road Classification for Preliminary Environmental Review Study

Dear Rebecca,

Agreement No. CE 19/2023 (CE)
Term Consultancy for Site Formation and Infrastructure Works for Proposed Housing and Other Developments in Zone 1 (2023-2027) – Feasibility Study – Task Order No.4
Road Classification for PER Study
To facilitate our study of Preliminary Environmental Review for 2 sites at Shek Mun, Sha Tin, we would like to seek your advice / confirmation on the road type classification of particular road sections as shown in the table below. ***20251125_Location Plan.pdf*** is also attached for your easy reference.

Road Index	Road Name	Road Type	Justification / Consideration
1	Slip Road from Tate's Cairn Highway NB	Expressway **TD: The concerned slip road is classified as trunk road**	- Based on the upstream road section (Tate's Cairn Highway as Expressway according to TD's ATC website **https://atc.td.gov.hk/map**)
2	Unnamed Road	Local Distributor (LD) **TD: Please specify the street names**	- According to TPDM Vol.2 Section 3.2.2.4, "Local Distributors - Roads within Districts linking developments to the District Distributor Roads." - Road 2 with various frontage accesses to/from Petrol-cum-LPG Filling Station and Public Parking Space.
3	On Sum Street	District Distributor (DD) **TD: The concerned street is classified as local distributor**	- According to TPDM Vol.2 Section 3.2.2.3, "District Distributors - Roads Linking Districts to the Primary Distributor Roads. High capacity at-grade junctions, with peak hour stopping restrictions and parking restrictions throughout the day." - Road 3 connecting On Ping Street (LD) and Tai Chung Kiu Road (PD).
4	On Ping Street	Local Distributor (LD) **TD: I have no further comment.**	- According to TPDM Vol.2 Section 3.2.2.4, "Local Distributors - Roads within Districts linking developments to the District Distributor Roads." - Road 4 with various frontage accesses to/from commercial and industrial buildings.

Due to the tight programme of the Study, it would be grateful if you could advise the above road type classification on or before 28 November 2025. Thank you for your attention and assistance.

Regards,

Andrew Tsang
[redacted]

MOTT MACDONALD
[redacted]

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HONG KONG JOCKEY CLUB SHA TIN RACECOURSE

SHING MUN RIVER CHANNEL

PICTORIAL GARDEN

SHING MUN RIVER CHANNEL

SHEK MUN INTERCHANGE

TATE'S CAIRN HIGHWAY

A KUNG KOK STREET

A KUNG KOK SHAN STREET

GARDEN VISTA

SHEK MUN FRESH WATER BOOSTER PUMPING STATION

1

2

3

4

4

ON SUM STREET SUBSTATION

SHING MUN RIVER CHANNEL

RAVANA GARDEN

TAI CHUNG KIU ROAD

COURTYARD BY MARRIOTT HONG KONG SHA TIN

ON PING STREET

ON SUM STREET

ON YIU STREET

ON LAI STREET

ON KWAN STREET

ON MUK STREET

SHING MUN RIVER PROMENADE GARDEN NO.2

ON MUK STREET GARDEN

SIU LEK YUEN ROAD

TAK KEI STREET

KINGS WING PLAZA 2

KINGS WING PLAZA 1

ON MING STREET

ON HING LANE

TATE'S CAIRN HIGHWAY

0 50 100m

1 : 2 000 SCALE BAR

MA LIU SHUI

MA ON SHAN

A KUNG KOK

FO TAN

SHEK MUN

PAK TIN

SHA TIN

SIU LEK YUEN

SHA TIN HEIGHTS

KEY PLAN

LEGEND:

APPLICATION SITE BOUNDARY

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	JAN 2024	HL	FIRST ISSUE	VF	EC

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Title

SITE LOCATION PLAN

Designed	GL		Eng check	VF	
Drawn	HL		Coordination	VF	
Dwg check	GL		Approved	EC	

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1:2000	PRE	P1

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3.2a Historical Aerial Photos

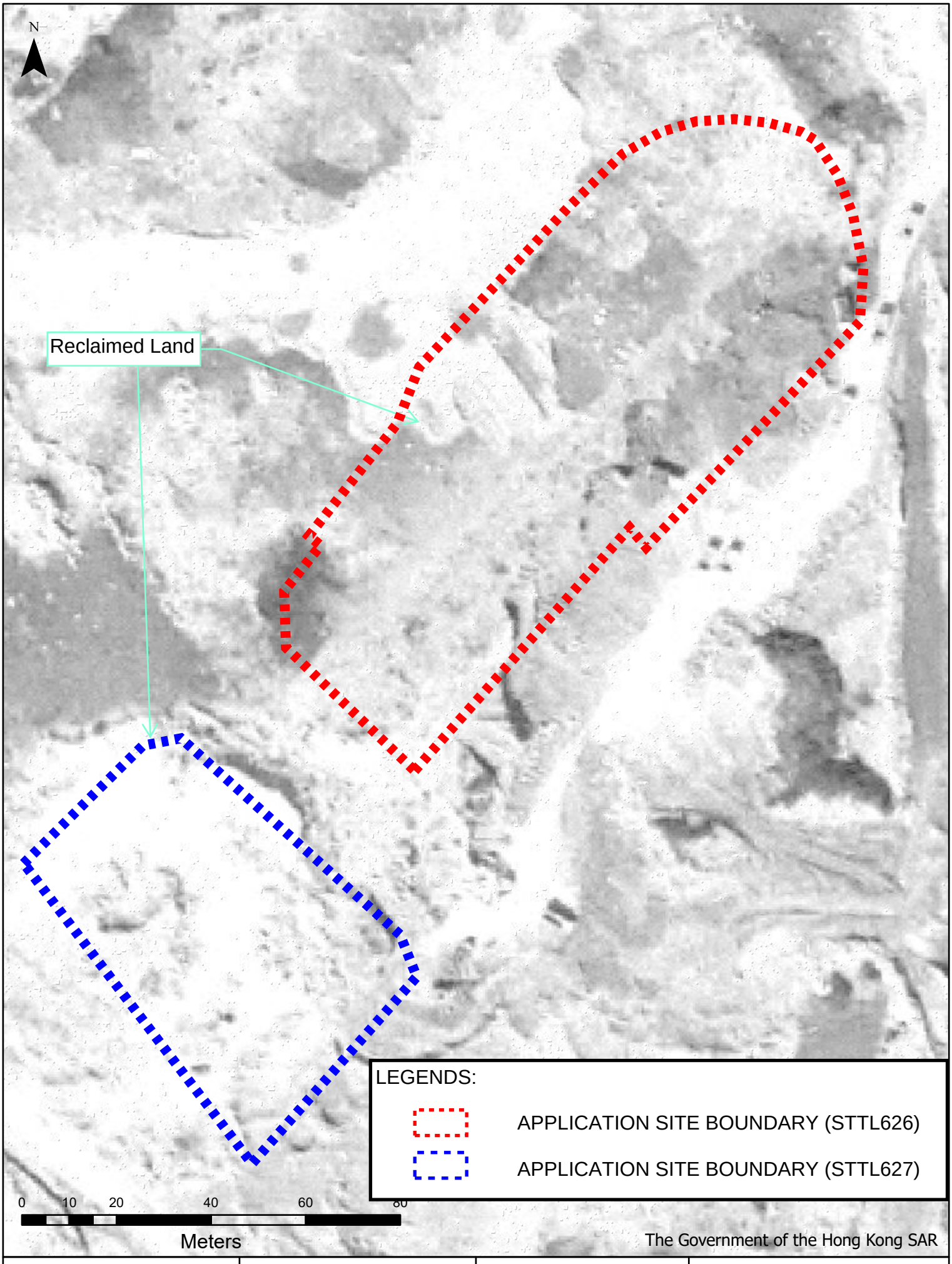
Yr 1973-74



Figure No.	Scale	Date	
MMH/CE19/TO4/BR/FIG/3.50a	1:1000	25/11/2025	GEOTECHNICAL ENGINEERING OFFICE CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

(Print by Mott)

Yr 1982



The Government of the Hong Kong SAR

Figure No.	Scale	Date	
MMH/CE19/TO4/BR/FIG/3.50b	1:1000	25/11/2025	GEOTECHNICAL ENGINEERING OFFICE CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

(Print by Mott)

Yr 1993



Figure No.	Scale	Date	
MMH/CE19/TO4/BR/FIG/3.50c	1:1000	25/11/2025	GEOTECHNICAL ENGINEERING OFFICE CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

(Print by Mott)

Yr 2003



Figure No.	Scale	Date	
MMH/CE19/TO4/BR/FIG/3.50d	1:1000	25/11/2025	GEOTECHNICAL ENGINEERING OFFICE CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

(Print by Mott)

Yr 2008

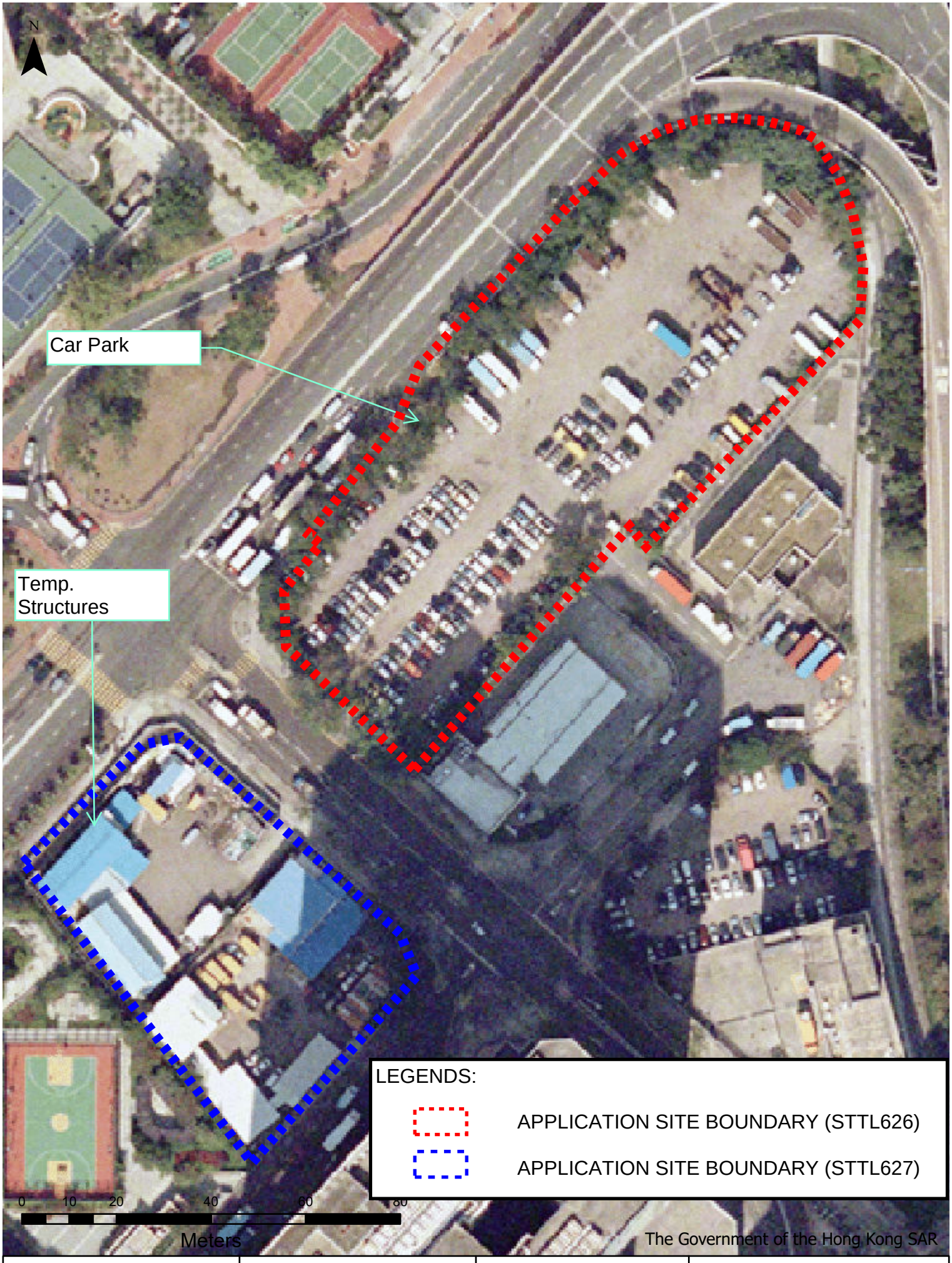


The Government of the Hong Kong SAR

Figure No.	Scale	Date	
MMH/CE19/TO4/BR/FIG/3.50e	1:1000	25/11/2025	GEOTECHNICAL ENGINEERING OFFICE CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

(Print by Mott)

Yr 2014



The Government of the Hong Kong SAR

Figure No.	Scale	Date	
MMH/CE19/TO4/BR/FIG/3.50f	1:1000	25/11/2025	GEOTECHNICAL ENGINEERING OFFICE CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

(Print by Mott)

Yr 2023

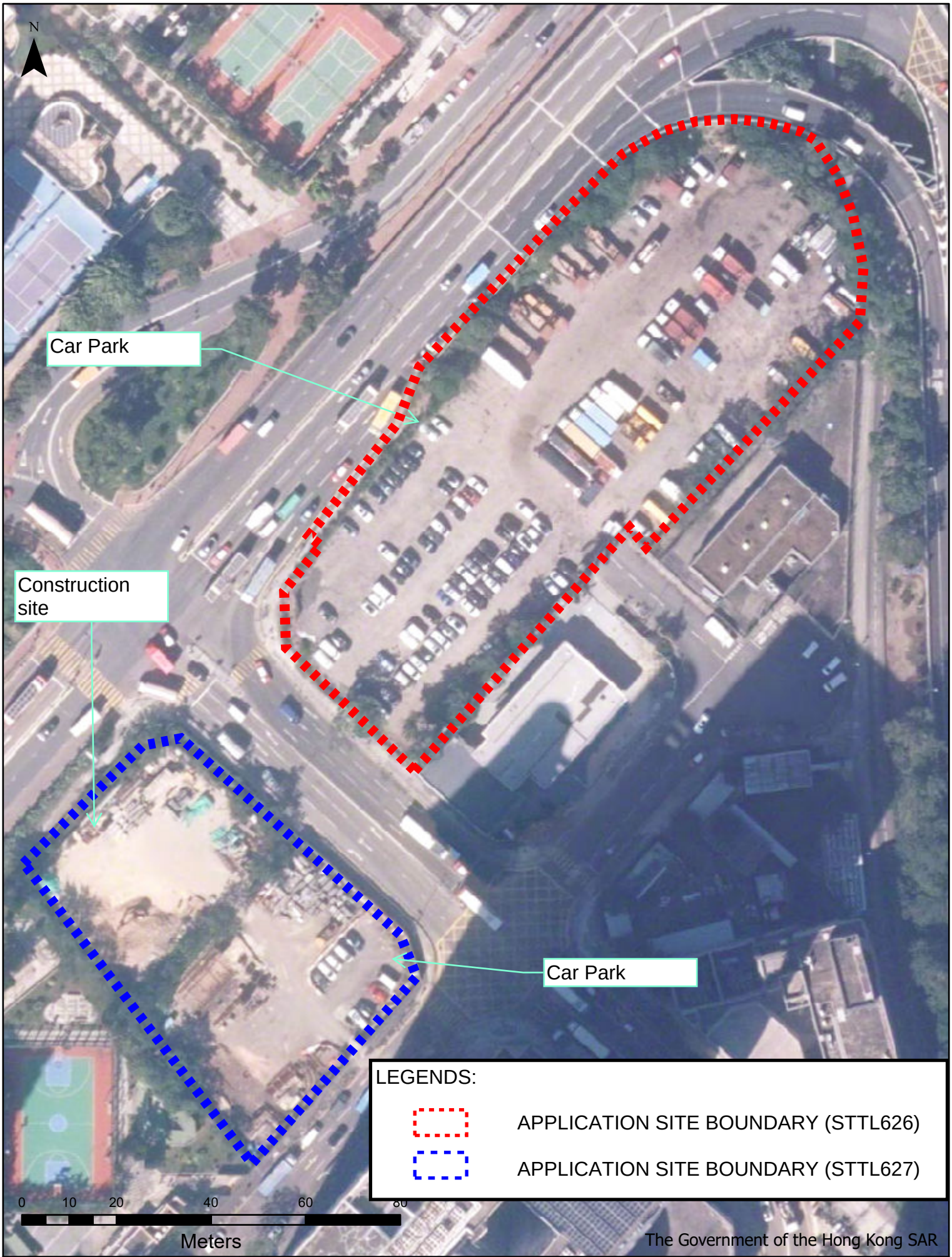


Figure No.	Scale	Date	
MMH/CE19/TO4/BR/FIG/3.50g	1:1000	25/11/2025	GEOTECHNICAL ENGINEERING OFFICE CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

(Print by Mott)

3.2b Information of Past Land Use of STTL627

Andrew Tsang

From: Andrew Tsang
Sent: Monday, 20 April 2026 3:03 pm
Subject: Re: *Restricted: Restricted: Agreement No. CE19/2023(CE) - Task Order No. 4 - Previous Land Use of STTL627

From: Sean Wan Shing WU/LAO/LANDSD
Sent: Wednesday, April 15, 2026 6:45 PM
To: Andrew Tsang <[redacted]>
Cc: CHUN YAT LEE/CEDD <cylee@cedd.gov.hk>; Dicky Ngai <[redacted]>; Ivan Cheng <[redacted]>; Vincent Fong <[redacted]>
Subject: Re: *Restricted: Restricted: Agreement No. CE19/2023(CE) - Task Order No. 4 - Previous Land Use of STTL627

Dear Andrew

Previous land use of STTL 627 was TGLA TST-483 for the purpose of works Area in connection with the construction of Subway in support of the Provision of Columbarium at Shek Mun. The allocatee was CEDD. You may approach them for previous information.

Thanks.

Regards
Sean WU
ES/S, DLO/ST
Tel: 2158 4847

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From: Andrew Tsang <[redacted]>
Sent: Wednesday, April 15, 2026 3:24 PM
To: Sean Wan Shing WU/LAO/LANDSD <essts@landsd.gov.hk>
Cc: CHUN YAT LEE/CEDD <cylee@cedd.gov.hk>; Dicky Ngai <[redacted]>; Ivan Cheng <[redacted]>; Vincent Fong <[redacted]>
Subject: Restricted: Agreement No. CE19/2023(CE) - Task Order No. 4 - Previous Land Use of STTL627

Dear Sean (LandsD),

We have been appointed by CEDD to undertake various technical assessments for the 2 sites denoted as STTL626(also known as ST-9353N) and STTL627 (also known as ST-9353S) in Shek Mun, Sha Tin. The appointment letter and site location plan has been attached above.

Our assessments, encompassing traffic/environmental/drainage/other technical aspects, will serve to support the intended Section 16 Application to implement residential development within these C(1) sites.

In this regard, we would be grateful if you could advise us the previous land-use of STTL627 (currently a Vacant Government Land). To facilitate our study on the subject sites, your responses on or before 16 April 2026 would be highly appreciated.

Should you find any enquiries, please feel free to contact the undersigned. Thank you for your attention.

Regards,

Andrew Tsang

[redacted]

MOTT MACDONALD

[redacted]

Website | **LinkedIn** | **Instagram** | **Facebook** | **YouTube**

[redacted]

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Mott MacDonald Restricted

RECEIVED BY
26 SEP 2022
LAND WORKS DIV. C.E.D.D.

Please quote our reference in you reply

MEMO **By Fax & By Despatch**

From:	District Lands Officer/ Sha Tin		CEDD
Ref.:	(84) *in* LD DLO/ST 460/163	*(Attn.:*	Ms. Rachel YEUNG)
Tel. No.:	2158 4847	*Your Ref.:*	(03JRB5) in LW-30-3005-3265-09 Pt.
Fax. No.:	2602 4093	*Dated:*	22.4.2022
E-mail::	essts@landsd.gov.hk	*Fax No.:*	2714 0079
Date:	23.9.2022	*Total Pages:*	2 + Encl.

Temporary Government Land Allocation (TGLA No. TST-483)
Works Area in connection with the construction of Subway
in support of the Provision of Columbarium at Shek Mun ("the Project")
at the Junction of On Ping Street and On Sum Street, Sha Tin, New Territories
(Allocatee: Director of Civil Engineering and Development)

Approval is hereby given to you a Temporary Government Land Allocation of Government land at the junction of On Ping Street and On Sum Street, Sha Tin, as shown coloured pink on the attached draft site plan at **Appendix I** for works area for a term from 26.9.2022 to 25.9.2023, subject to the attached Engineering Conditions at **Appendix II**.

2. For "Existing water mains" under EC(22), a plan namely "Part Copy of Fresh Water Mains Record Plan(s)" is attached at **Appendix III**.

3. For all land held by you (the Allocatee) under the allocation, you are fully responsible for the management and maintenance of the land and building erected thereon. If you allow third parties to occupy the land/building, it is your responsibility to supervise and monitor the use and occupation of the land/building by third parties to ensure the agreed aims and objectives are achieved, and to recover the land in case you consider there is under utilization or abuse. You should examine all your allocations occupied by third parties and build in the monitoring system and the recovering mechanism if they are not ready in place.

4. In the interest of time, a formal allocation plan will be issued in due course. For any enquiries, please contact our Mr. Kenneth LUI at tel. 2158 4781.

pp (Ms. Phoebe NG)
for District Lands Officer/Sha Tin

Encls.

CE	SE/1	SE/4	SE/5	SE/6	SE/7	SLA	E/	E/	
		✓							
PTL/HEP	SE/2	SE/3	DPTL	CES(LD)	PTO	SSO(Q)	LA/	PC/	
PSII	bu		On		ec		ACCT	GR	

site or the nature of the project to be carried out on the site together with the telephone number and the facsimile number of the officer to whom members of the public may contact should they wish to lodge any complaints or make any enquiries relating to the site.

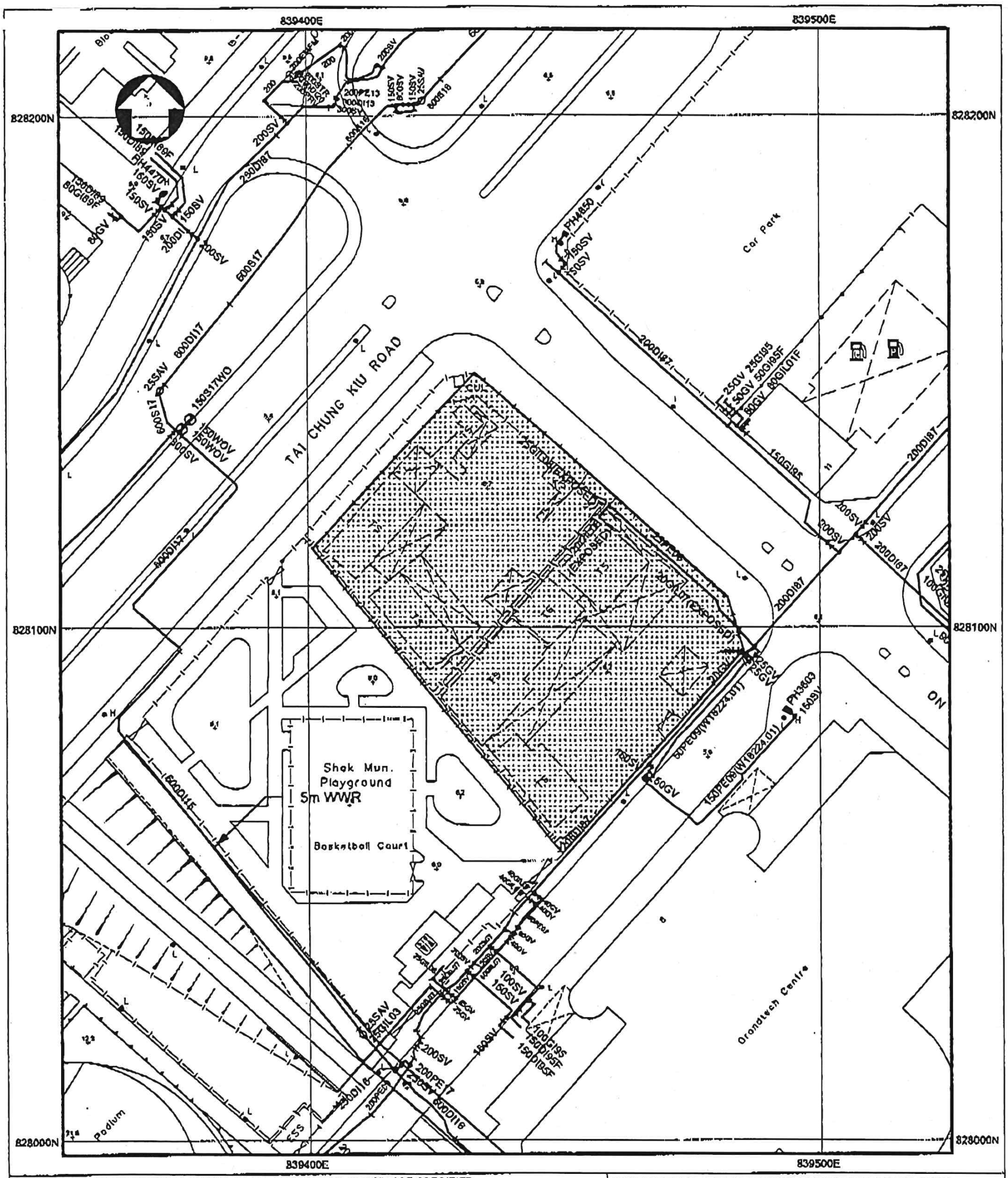
Decontamination

(37) The allocatee shall, in connection with the occupation and use of the site, ensure that the site are free from contamination. In the event that the site are found to be contaminated by any substance, such as soil or groundwater contaminant, the allocatee shall remove all contaminate substance from the site and their adjoining area, if necessary, and reinstate the site to the satisfaction of and prior to the handing back of the site to the District Lands Officer at the expiry of the allocation. The cost of such decontamination work shall be paid for as part of the project.

No reprovisioning

(38) Without prejudice to any of the forgoing, on the termination of this allocation in whatsoever manner and under whatsoever circumstances, the allocatee and any person shall have no right whatsoever to claim any compensation, losses, damages, expenses, charges or costs in any form or site reprovisioning from the District Lands Officer.

Appendix III



NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
2. ALL LEVELS ARE IN METRES ABOVE PRINCIPAL DATUM.
3. INFORMATION ON ALIGNMENT OF MAINS IS OF INDICATIVE VALUE ONLY. WHERE POSITIONAL ACCURACY MAY BE OF IMPORTANCE, DETAILS SHOULD BE SITE CHECKED.
4. FOR MAINS RECORDS SIGN CONVENTIONS AND DESIGNATIONS SEE SKETCH NO. 3988.
5. NO PROPOSED WATER MAINS IN THE VICINITY OF THE SITE.
6. NO EXISTING WSD CABLE IN THE VICINITY OF THE SITE.
7. NO PROPOSED WSD CABLE IN THE VICINITY OF THE SITE.
8. THE SITE IS NOT WITHIN WSD GATHERING GROUNDS.
9. THE SUBJECT SITE IS WITHIN THE DAM-BREAK FLOOD PLAIN OF LOWER SHING MUN DAM OF LOWER SHING MUN RESERVOIR.
10. NO WSD SLOPES ARE AFFECTED IN THE VICINITY OF THE SITE.

SUBJECT SITE

PART COPY OF FRESH WATER MAINS RECORD PLAN(S)

W67880/7-SE-7A & 7C

FILE REF: (1) IN WSD/NTEG/1836/2022 PT.1

REF. CODE: 26W22M	SHEET 1 OF 1	SCALE 1:1000

水 務 署
Water Supplies Department

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File Ref : ( ) in LD DLO/ST/ST 460/163
To : District Lands Officer, Sha Tin

Handover Certificate
TGLA No. TST 483
Works Area in connection with the construction of Subway
in support of the Provision of Columbarium at Shek Mun ("the Project")
at the Junction of On Ping Street and On Sum Street, Sha Tin, New Territories
Allocatee: Director of Civil Engineering and Development

I confirm that I handed back the land as shown coloured pink on the Plan No. STM10568 to District Lands Officer, Sha Tin on 29 December 2023.

Signature : _____

Name : JESSICA LAM

Post Title : Engineer 181

For and on behalf of : Director of Civil Engineering and Development

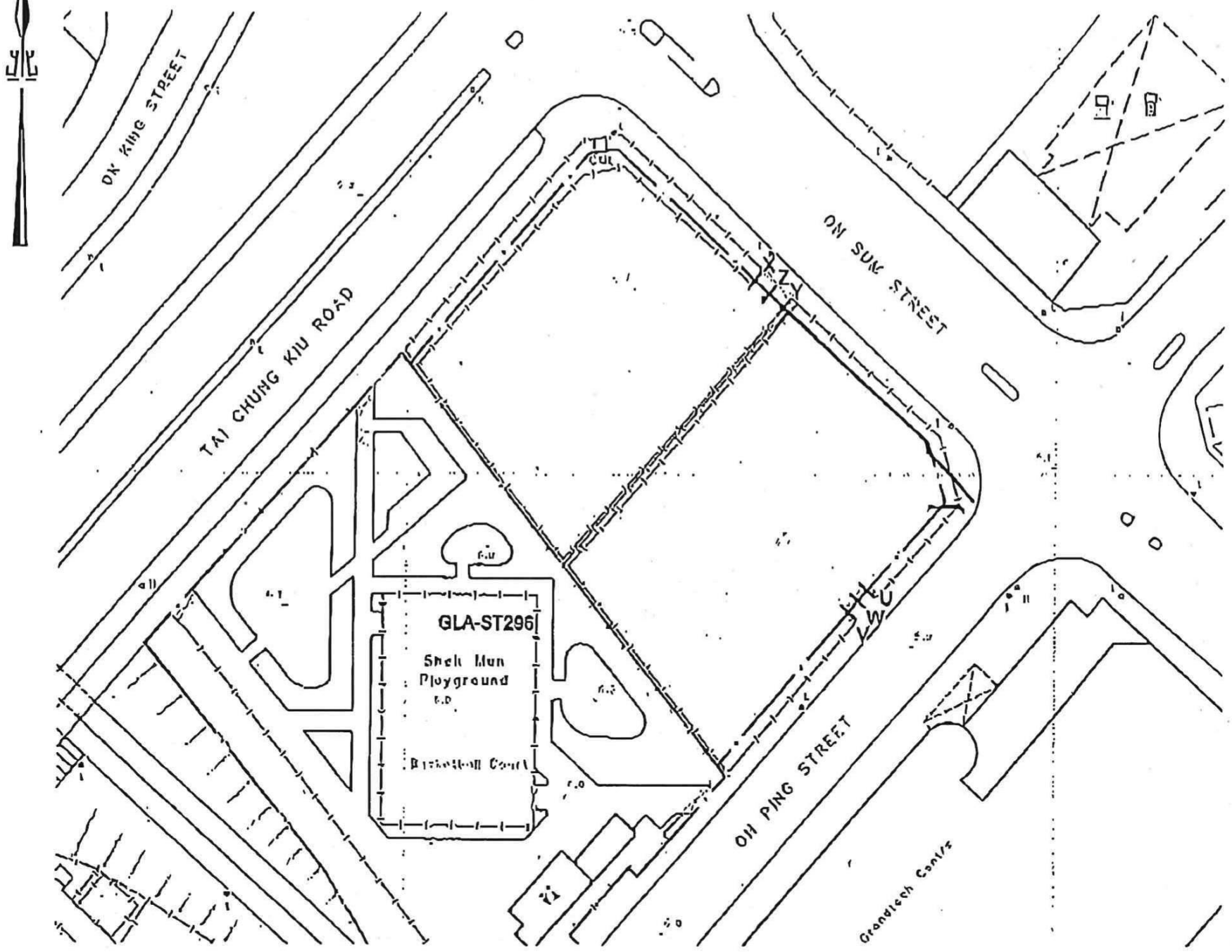
Date : 29 December 2023

Witnessed by : _____

(Josephine TSE)
For District Lands Officer/ Sha Tin

Date : 29 December 2023

TEMPORARY GOVERNMENT LAND ALLOCATION No. TST483
WORKS AREA NEAR ON PING STREET AND ON SUM STREET, SHEK MUN
CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

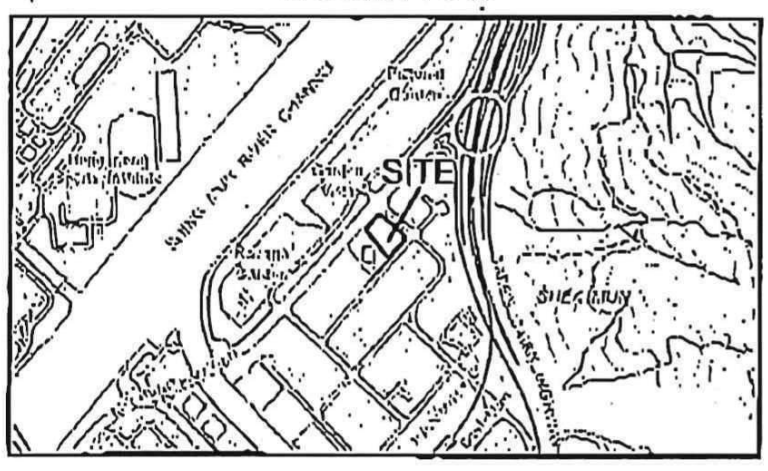


COLOURED PINK AREA 3 770 SQUARE METRES (ABOUT)

SCALE 1:1 000

metres 20 0 20 40 60 80 100 metres

LOCATION



SCALE 1:20 000

POINTS U, V, W, X, Y, Z } ENGINEERING CONDITIONS REFER

LEGEND

——— EXISTING FRESH WATER MAINS

FOR IDENTIFICATION PURPOSES ONLY

District Lands Office, Sha Tin
Lands Department

Plan Prepared by District Survey Office, Sha Tin

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File No. L/M(1) in LD DLO/ST460/163

Survey Sheet No. 7-SE-7C

O.Z.P. No. -----

Reference Plan No. HNTDM22-592 (HyD) & W67880/7-SE-7A&7C (WSD)

PLAN No. STM10568

Date : 20/09/2023

3.2c Information of Spillage/Leakage Incident Record

本署檔案
OUR REF : ( ) in EP549/E2/1
來函檔案
YOUR REF :AK/OW/DN/VF/601100186/TO4/L0009
電　話
TEL NO : 2158 5744
圖文傳真
FAX NO : 2650 6033
網　址
HOMEPAGE : http://www.epd.gov.hk/

Environmental Protection Department
Environmental Compliance Division
Regional Office (North)
10/F., Sha Tin Government Offices,
No. 1, Sheung Wo Che Road,
Sha Tin, N.T. Hong Kong.

環境保護署
環保法規管理科
區域辦事處(北)
香港新界沙田
上禾輋路 1 號
沙田政府合署 10 樓

18 November 2025

Mott MacDonald Hong Kong Limited
[redacted]
(Attn: Mr. Dicky NGAI, Deputy Project Manager)

Dear Mr. NGAI,

Agreement No. CE 19/2023 (CE)
Term Consultancy for Site Formation and Infrastructure Works for Proposed Housing and Other Developments in Zone 1 (2023-2027) – Feasibility Study
Request for Information of Chemical Waste Producer and Spillage/ Leakage Incidents

I refer to your letter dated 6 November 2025 on the subject matter.

Please be informed that we have nil record of chemical spillage/leakage complaint within the Concerned Area as shown in the enclosed location plan of your letter. You may wish to check with other relevant parties or departments for the record as appropriate.

As registered chemical waste producers at the location are concerned, a register of chemical waste producers is available for inspection in the Territorial Control Office of this department. If you would like to inspect, please contact Mr. MAN at 2835 1017 for making appointment to view the records.

While we have made a reasonable effort to ensure the completeness and accuracy of the information provided, you should comprehend that the information is provided as is and the EPD is not responsible or liable for any claim, loss or damage resulting from the use of this information.

Should you have any queries, please feel free to contact the undersigned or our Senior Environmental Protection Inspector, Ms. MAK at 2158 5764.

	To	Action	Inform	Copy	Sign	Date
1						
2						
Rec'd	20 NOV 2025					
3						
4						
File No.			MOTT MACDONALD M		M	

Yours sincerely,

(Antony C.H. FAN)
for Director of Environmental Protection

再造紙
RECYCLED PAPER

Outlook

FW: *Restricted: Re: Fw: Re: Fw: Fw: Agreement No. CE19/2023(CE) - Task Order No. 4 Shek Mun

From [redacted]
Date Thu 2025-12-25 10:31
To [redacted]

FYI regarding no incident record near TO4 sites. Thanks.

[redacted]
Civil Engineer
[redacted]

Mott MacDonald Restricted

From: ado_lea_cs@hkfsd.gov.hk <ado_lea_cs@hkfsd.gov.hk>
Sent: Wednesday, 24 December 2025 2:07 pm
To: [redacted]
Cc: [redacted]
Subject: *Restricted: Re: Fw: Re: Fw: Fw: Agreement No. CE19/2023(CE) - Task Order No. 4 Shek Mun

Some people who received this message don't often get email from [redacted] Learn why this is important

Our reference: (26) in FSD GR 6-5/4 R Pt. 61
Your reference: AK/OW/DN/VF/601100186/TO4/L0010

Dear Mr. LEE,

Agreement No. CE19/2023(CE)
Term Consultancy for Site Formation and Infrastructure Works for Proposed Housing and Other Developments in Zone 1 (2023-2027)
Request for Information – Dangerous Goods Record and Records of accidents of spillage/leakage

I refer to your email of 17.11.2025 regarding the captioned request and reply below in response to your questions:-

Please be advised that neither records of dangerous goods license, fire incidents nor incidents of spillage / leakage of dangerous goods were found in connection with the given conditions of your request at the subject location.

If you have further questions, please feel free to contact the undersigned.

Best regards,

LEE Yeung, Darwin
Assistant Divisional Officer (Legal Affairs)(Acting)
Corporate Services Division

Fire Services Department

Tel.: 2733 7896

Remark:
Lift incidents are excluded unless otherwise required.

Disclaimer:
*Fire Services Department uses its best endeavor to ensure the accuracy and reliability of the information provided, but cannot guarantee its accuracy and reliability and accepts no liability of any nature for any loss or damage arising from any inaccuracies or omissions that may from the information provided.

From: ADO LEA CS <ado_lea_cs@hkfsd.gov.hk>
Sent: Monday, December 22, 2025 4:45 PM
To: [redacted]
Cc: [redacted]
Subject: *Restricted: Re: Fw: Fw: Agreement No. CE19/2023(CE) - Task Order No. 4 Shek Mun

Our reference: (26) in FSD GR 6-5/4 R Pt. 61
Your reference: AK/OW/DN/VF/601100186/TO4/L0010

Dear Mr. LEE,

Agreement No. CE19/2023(CE)
Term Consultancy for Site Formation and Infrastructure Works for Proposed Housing and Other Developments in Zone 1 (2023-2027)
Request for Information – Dangerous Goods Record and Records of accidents of spillage/leakage

I refer to your email dated 17.11.2025 regarding the captioned subject.

Your case is being handled, and a reply will be furnished to you as soon as possible. Please be advised that due to time lapse, this Department can only provide the following information for your requested information:

(i) Dangerous Goods Licence Record: from the year of 1990 to present moment.

(ii) Incident Record: Past three years of fire and special services incidents. Lift incidents will be excluded unless otherwise required.

Should you have further questions, please feel free to contact the undersigned.

Best regards,

LEE Yeung, Darwin
Assistant Divisional Officer (Legal Affairs)(Acting)
Corporate Services Division
Fire Services Department

Tel.: 2733 7896

From: ADO PD/FSD
Sent: Monday, December 1, 2025 4:27 PM
To: [redacted]
Cc: CHUN YAT LEE/CEDD; SSO3 CP PD/FSD
Subject: Re: *Restricted: Agreement No. CE19/2023(CE) - Task Order No. 4 Shek Mun
Dear Andrew,

Please be informed that there is no dangerous goods licence/approval granted within the subject area according to our records.

Should you have any enquiries, please contact Mr. QIU Yi at 2733 5845.

Best regards,

WONG Cheuk-kei
Assistant Divisional Officer (Planning and Development)
Fire Services Department
Tel.: 2733 7735
Fax: 2739 8775



From: CHUN YAT LEE/CEDD <cylee@cedd.gov.hk>
Sent: Monday, November 17, 2025 5:42 PM
To: ADO PD/FSD <ado_pd@hkfsd.gov.hk>
Cc: [redacted]
Subject: *Restricted: Agreement No. CE19/2023(CE) - Task Order No. 4 Shek Mun

Dear Mr WONG,

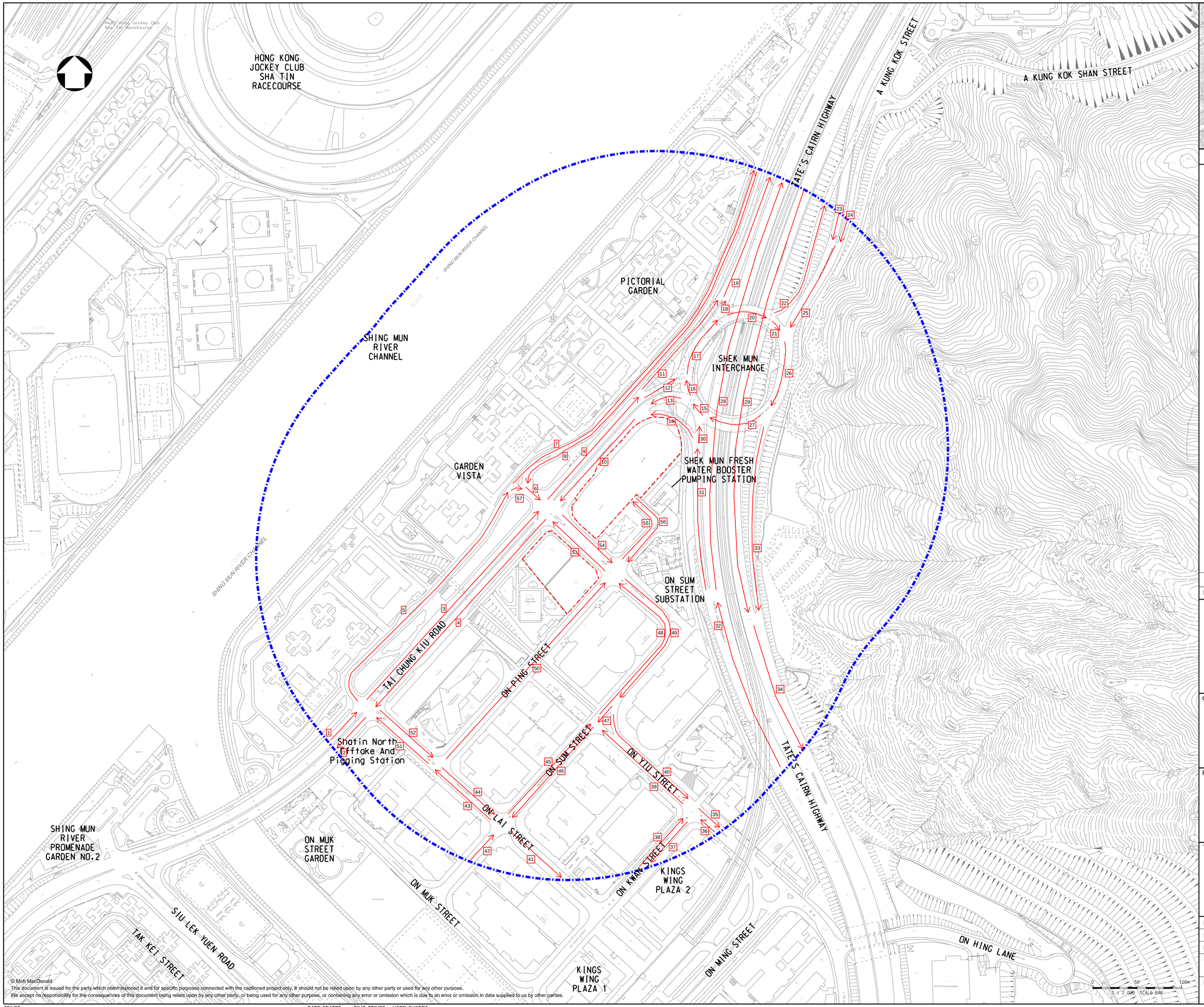
I refer to the attached letter from our Consultants regarding request for dangerous good information under Task Order 4 – Shek Mun Residential Sites EFS under Agreement no. CE 19/2023 (CE).

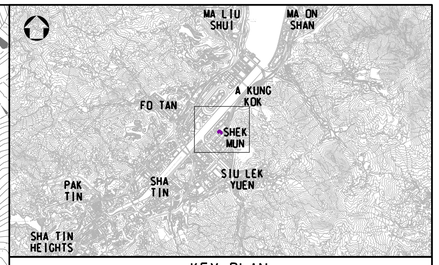
Given the tight schedule of this project (EFS to be completed by Mar 2026 to align with the 26/27 Land Sale Programme), I would appreciate it if you could provide our Consultants with the requested information **by the specified deadline on 18 Nov 2025**.

Thanks.

Regards,
Martin CY Lee
PC1/P, PU, CEO, CEDD
Tel: 3758 3484

4.1 Traffic Forecast





KEY PLAN

LEGEND:

- APPLICATION SITE BOUNDARY
- 300M ASSESSMENT AREA
- ROAD LINKS

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	JAN 2024	HL	FIRST ISSUE	VF	EC

MOTT MACDONALD

[redacted]

Client

CEDD

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

AGREEMENT NO. CE 19/2023 (CE)
TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027)

Title

ROAD INDEX PLAN OF TRAFFIC FORECAST WITHIN 300-M CATCHMENT AREA

Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		

Scale at A1: 1:2000

Status:

Rev:

Drawing Number: MMH/CE19/TO4/BR/FIG/3.41

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Traffic forecast for Year 2047 **Received on 20260205**

Road ID	Road Name	Road Type	Speed Limit (km/hr)	AM (Veh/hr)	HV% (AM)
1	Tai Chung Kiu Road	PD	50	850	36%
2	Tai Chung Kiu Road	PD	50	1545	29%
3	Tai Chung Kiu Road	PD	50	560	39%
4	Tai Chung Kiu Road	PD	50	1670	27%
5	On King Street	LD	50	225	26%
6	On Sum Street	LD	50	310	32%
7	On King Street	LD	50	40	30%
8	On King Street	LD	50	50	31%
9	Tai Chung Kiu Road	LD	50	965	41%
10	Tai Chung Kiu Road	LD	50	1650	26%
11	Shek Mun Interchange	PD	50	465	41%
12	Shek Mun Interchange	PD	50	500	42%
13	Shek Mun Interchange	PD	50	1325	26%
14	Shek Mun Interchange	PD	50	325	25%
15	Shek Mun Interchange	PD	50	1545	28%
16	Shek Mun Interchange	PD	50	220	40%
17	Shek Mun Interchange	PD	50	720	41%
18	Shek Mun Interchange	PD	50	60	44%
19	Shek Mun Interchange	PD	50	525	41%
20	Shek Mun Interchange	PD	50	660	42%
21	Shek Mun Interchange	PD	50	250	42%
22	Shek Mun Interchange	PD	50	410	42%
23	Shek Mun Interchange	PD	50	1525	30%
24	Shek Mun Interchange	PD	50	380	30%
25	Shek Mun Interchange	PD	50	1910	30%
26	Shek Mun Interchange	PD	50	2160	32%
27	Shek Mun Interchange	PD	50	1390	26%
28	Tate's Cairn Highway	EX	80	2160	16%
29	Tate's Cairn Highway	EX	80	2625	18%
30	Shek Mun Interchange	PD	50	160	41%
31	Shek Mun Interchange	PD	50	480	30%
32	Tate's Cairn Highway	EX	80	2640	19%
33	Shek Mun Interchange	PD	50	770	42%
34	Tate's Cairn Highway	EX	80	3395	23%
35	On Yiu Street	LD	50	90	30%
36	On Yiu Street	LD	50	135	31%
37	On Kwan Street	LD	50	140	33%
38	On Kwan Street	LD	50	60	31%
39	On Yiu Street	LD	50	125	33%
40	On Yiu Street	LD	50	175	33%
41	On Lai Street	LD	50	290	32%
42	On Sum Street	LD	50	225	36%
43	On Lai Street	LD	50	340	35%
44	On Lai Street	LD	50	190	28%
45	On Sum Street	LD	50	40	30%
46	On Sum Street	LD	50	255	35%

47	On Sum Street	LD	50	345	24%
48	On Sum Street	LD	50	285	42%
49	On Sum Street	LD	50	520	27%
50	On Ping Street	LD	50	365	28%
51	On Lai Street	LD	50	290	35%
52	On Lai Street	LD	50	480	28%
53	On Sum Street	LD	50	600	42%
54	On Sum Street	LD	50	485	29%
55	On Ping Street	LD	50	160	17%
56	On Ping Street	LD	50	140	41%
57	On Sum Street	LD	50	185	26%
58	7+8	LD	50	90	30%

Andrew Tsang

From: Yee Lin PANG <yeelinpang@td.gov.hk>
Sent: Thursday, 16 July 2026 6:39 pm
To: Andrew Tsang
Cc: CHUN YAT LEE/CEDD; Dicky Ngai; Ivan Cheng; SC CHAN
Subject: RE: Agreement No. CE 19/2023 (CE) - Task Order No.4 - Submission of Technical Note of Traffic Forecast for Environmental Assessment Study
Attachments: TO4_Technical Note of Traffic Forecast Methodology for Environmental Assessment_Issue 2.pdf

Dear Andrew,

I have no further comment for the captioned submission.

Regards,
Rebecca PANG
E/ST3, TENTE
Transport Department
Tel: 2399 6966

From: "Andrew Tsang" [redacted]
To: "Yee Lin PANG" <yeelinpang@td.gov.hk>
Cc: "CHUN YAT LEE/CEDD" <cylee@cedd.gov.hk>, "Dicky Ngai" [redacted] "Ivan Cheng" [redacted]
Date: 07/07/2026 07:03 pm
Subject: RE: Agreement No. CE 19/2023 (CE) - Task Order No.4 - Submission of Technical Note of Traffic Forecast for Environmental Assessment Study

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Dear Rebecca,

As per our discussion on the captioned TN, BDTM data at year 2036 to 2046 are referenced for EAS traffic forecast at design year 2047.

Please find the attached revision for your review and comment.

Due to the tight schedule, we shall be most grateful if you could provide your written comment, if any, by 8 July 2026.

Thank you for your attention.

Regards,

Andrew Tsang

[redacted]

[redacted]

Mott MacDonald Restricted

From: Yee Lin PANG <yeelinpang@td.gov.hk>
Sent: Thursday, 25 June 2026 2:48 pm
To: Andrew Tsang [redacted]
Cc: CHUN YAT LEE/CEDD <cylee@cedd.gov.hk>; Dicky Ngai [redacted] Ivan Cheng [redacted] LEO TL CHAN/CEDD <leochan@cedd.gov.hk>; Vincent Fong [redacted] SC CHAN <scchan@td.gov.hk>
Subject: RE: Agreement No. CE 19/2023 (CE) - Task Order No.4 - Submission of Technical Note of Traffic Forecast for Environmental Assessment Study

Dear Andrew,

Please note my comment for the captioned submission.

1. Para. 2.1.2 - Please adopt Year 2046 as design year to prepare the traffic forecast based on BDTM data at Year 2046 forecast year.

Regards,
Rebecca PANG
E/ST3, TENTE
Transport Department
Tel: 2399 6966

From: "Andrew Tsang" [redacted]
To: "Yee Lin PANG" <yeelinpang@td.gov.hk>
Cc: "LEO TL CHAN/CEDD" <leochan@cedd.gov.hk>, "CHUN YAT LEE/CEDD" <cylee@cedd.gov.hk>, "Dicky Ngai" [redacted] "Ivan Cheng" [redacted] "Vincent Fong" [redacted]
Date: 05/06/2026 04:47 pm
Subject: RE: Agreement No. CE 19/2023 (CE) - Task Order No.4 - Submission of Technical Note of Traffic Forecast for Environmental Assessment Study

Dear Rebecca,

This serves a gentle reminder on your written comments, if any, on the Technical Note of Traffic Forecast for Environmental Assessment Study submitted on 2 April 2026.

Due to matter of urgency of this study, we shall be grateful if you could provide your written comments, if any, on or before 9 June 2026.

Should you have any enquiries, please feel free to contact Mr. Ivan CHENG [redacted] or the undersigned. Thank you.

Thank you for your attention and understanding.

Regards,

Andrew Tsang

[redacted]

Mott MacDonald Restricted

From: Terry Chui
Sent: 02 April 2026 16:13
To: Yee Lin PANG <yeelinpang@td.gov.hk>
Cc: CHUN YAT LEE/CEDD <cylee@cedd.gov.hk>; LEO TL CHAN/CEDD <leochan@cedd.gov.hk>; Dicky Ngai [redacted] Ivan Cheng [redacted]; Andrew Tsang [redacted] Wallace Wong [redacted]
Subject: Agreement No. CE 19/2023 (CE) - Task Order No.4 - Submission of Technical Note of Traffic Forecast for Environmental Assessment Study

Dear Rebecca,

Agreement No. CE 19/2023 (CE)
Term Consultancy for Site Formation and Infrastructure Works for Proposed Housing and Other Developments in Zone 1 (2023-2027) – Feasibility Study
Task Order No. 4 – Review on Conversion of 2 Commercial Sites to Residential Sites for Private Housing Development in Shek Mun (STTL 626 and 627) - EFS

Submission of Technical Note of Traffic Forecast for Environmental Assessment Study

To support the development and evaluation of our environmental models for the captioned project, we would like to seek your office's written comments, if any, on the assumptions and methodology used for the traffic forecast in the environmental reports.

The details and results of the traffic forecast are summarized in the attached technical note for your reference and review.

Due to the tight programme of this Study, your prompt reply **on or before 16 April 2026** is highly appreciated. A "Nil Response" is also required.

Should you have any queries, please feel free to contact our Mr. Ivan Cheng [redacted] Thank you.

Regards,

Terry Chui

[redacted]

MOTT MACDONALD

[redacted]

Website | **LinkedIn** | **Instagram** | **Facebook** | **YouTube**

[redacted]

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4.2 (Not Used)

4.3 Result of Road Traffic Noise Impact Assessment

Project: Housing Development at Shek Mun
Block: Block A
Scenario: Base Case

Floor	Assessment point level (mPD)	1	2	3	4	5	5_a	6	7	8	9	10	11	12	13
34/F	124.7	74	73	74	74	73	63	65	72	72	71	67	71	73	73
33/F	121.5	74	73	74	74	74	63	65	72	72	71	67	71	73	73
32/F	118.4	74	73	74	74	74	64	65	73	72	71	67	71	73	73
31/F	115.2	74	74	75	74	74	64	66	73	72	71	67	71	73	73
30/F	112.1	75	74	75	74	74	64	66	73	72	72	67	71	74	74
29/F	108.9	75	74	75	74	74	64	66	73	72	72	67	71	74	74
28/F	105.8	75	74	75	74	74	64	66	73	72	72	68	71	74	74
27/F	102.6	75	74	75	74	74	64	66	73	72	72	68	71	74	74
26/F	99.5	75	74	75	74	74	64	66	73	72	72	68	72	74	74
25/F	96.3	75	74	75	74	74	64	66	73	72	72	68	72	74	74
24/F	93.2	75	74	75	74	74	64	66	73	72	72	68	72	74	74
23/F	90.0	75	74	75	75	74	64	66	73	73	72	68	72	74	74
22/F	86.9	75	74	75	75	75	65	66	73	73	72	68	72	74	75
21/F	83.7	75	75	76	75	75	65	66	74	73	72	68	72	75	75
20/F	80.6	76	75	76	75	75	65	67	74	73	72	68	72	75	75
19/F	77.4	76	75	76	75	75	65	67	74	73	73	68	73	75	75
18/F	74.3	76	75	76	75	75	65	67	74	73	73	69	73	75	75
17/F	71.1	76	75	76	75	75	65	67	74	73	73	69	73	75	75
16/F	68.0	76	75	76	75	75	65	67	74	73	73	69	73	75	75
15/F	64.8	76	75	76	75	75	65	67	74	73	73	69	73	76	76
14/F	61.7	76	75	76	76	75	65	67	74	73	73	69	73	76	76
13/F	58.5	77	76	77	76	75	66	67	74	73	73	69	73	76	76
12/F	55.4	77	76	77	76	76	66	67	74	74	73	69	74	76	76
11/F	52.2	77	76	77	76	76	66	67	75	74	73	69	74	76	76
10/F	49.1	77	76	77	76	76	66	68	75	74	73	70	74	76	76
9/F	45.9	77	76	77	76	76	66	68	75	74	73	70	74	77	77
8/F	42.8	77	76	77	76	76	66	68	75	74	73	70	74	77	77
7/F	39.6	77	76	77	76	76	66	68	75	74	73	70	74	77	77
6/F	36.5	77	76	77	76	76	67	67	75	74	73	70	75	77	78
5/F	33.3	77	76	77	76	76	67	67	75	74	73	70	75	77	78
4/F	30.2	78	77	77	76	76	67	67	75	73	73	70	75	78	78
3/F	27.0	78	77	77	76	76	67	66	74	73	73	70	75	78	78
2/F	23.9	78	76	77	76	76	67	66	74	73	72	70	75	78	78
1/F	20.7	78	76	77	76	75	66	64	73	72	72	70	75	78	78
Max.		78	77	77	76	76	67	68	75	74	73	70	75	78	78

Notes:
The NSRs with noise exceedance has been highlighted in yellow.

Project: Housing Development at Shek Mun
Block: Block B
Scenario: Base Case

Floor	Assessment point level (mPD)	14	15	16	17	18	18_a	19_a	19	20	21	22	23	24	25	26
34/F	124.7															
33/F	121.5	70	68	72	72	72	63	66	72	72	72	68	71	73	73	73
32/F	118.4	70	69	72	72	72	63	66	72	72	72	68	71	73	73	73
31/F	115.2	70	69	72	72	72	63	66	72	72	72	68	72	73	73	73
30/F	112.1	70	69	72	72	73	64	66	72	72	72	69	72	73	73	73
29/F	108.9	71	69	72	72	73	64	66	72	72	72	69	72	74	74	74
28/F	105.8	71	69	72	72	73	64	66	73	72	72	69	72	74	74	74
27/F	102.6	71	69	72	72	73	64	66	73	72	72	69	72	74	74	74
26/F	99.5	71	69	72	72	73	64	66	73	72	72	69	72	74	74	74
25/F	96.3	71	69	72	73	73	64	66	73	72	72	69	72	74	74	74
24/F	93.2	71	69	72	73	73	64	67	73	72	72	69	72	74	74	74
23/F	90.0	71	69	72	73	73	64	67	73	72	72	69	73	74	74	74
22/F	86.9	71	69	73	73	73	64	67	73	72	72	70	73	74	74	74
21/F	83.7	72	70	73	73	73	64	67	73	72	72	70	73	75	75	75
20/F	80.6	72	70	73	73	73	64	67	73	73	73	70	73	75	75	75
19/F	77.4	72	70	73	73	73	65	67	73	73	73	70	73	75	75	75
18/F	74.3	72	70	73	73	74	65	67	73	73	73	70	73	75	75	75
17/F	71.1	72	70	73	73	74	65	67	73	73	73	70	73	75	75	75
16/F	68.0	72	70	73	73	74	65	67	74	73	73	70	73	75	75	75
15/F	64.8	72	70	73	73	74	65	67	74	73	73	70	74	76	75	75
14/F	61.7	72	70	73	73	74	65	67	74	73	73	71	74	76	76	76
13/F	58.5	73	70	73	74	74	65	67	74	73	73	71	74	76	76	76
12/F	55.4	73	70	73	74	74	65	67	74	73	73	71	74	76	76	76
11/F	52.2	73	70	73	74	74	65	67	74	73	73	71	74	76	76	76
10/F	49.1	73	71	74	74	74	66	67	74	73	73	71	74	76	76	76
9/F	45.9	73	71	74	74	74	66	67	74	73	73	71	75	77	77	77
8/F	42.8	73	71	74	74	74	66	67	74	73	73	71	75	77	77	77
7/F	39.6	74	70	74	74	74	66	67	74	73	73	71	75	77	77	77
6/F	36.5	74	70	73	74	74	66	67	74	73	73	71	75	77	77	77
5/F	33.3	74	70	73	74	74	66	67	74	73	73	72	75	77	77	77
4/F	30.2	74	70	73	73	74	66	66	74	73	73	72	75	78	78	78
3/F	27.0	74	70	73	73	74	66	66	73	73	73	72	76	78	78	78
2/F	23.9	74	70	73	73	73	66	65	73	72	72	72	76	78	78	78
1/F	20.7	74	69	72	72	73	67	63	73	72	72	72	76	78	78	78
Max.		74	71	74	74	74	67	67	74	73	73	72	76	78	78	78

Notes:
The NSRs with noise exceedance has been highlighted in yellow.

Project: Housing Development at Shek Mun
Block: Block C
Scenario: Base Case

Floor	Assessment point level (mPD)	27	28	30	31	32	33	34
34/F	124.7							
33/F	121.5							
32/F	118.4	71	72	72	73	73	72	70
31/F	115.2	71	72	72	73	73	72	70
30/F	112.1	72	72	73	73	73	72	70
29/F	108.9	72	72	73	73	73	73	70
28/F	105.8	72	72	73	73	73	73	70
27/F	102.6	72	72	73	73	73	73	70
26/F	99.5	72	72	73	74	73	73	70
25/F	96.3	72	72	73	74	73	73	70
24/F	93.2	72	72	73	74	73	73	70
23/F	90.0	72	73	73	74	74	73	71
22/F	86.9	72	73	73	74	74	73	71
21/F	83.7	72	73	74	74	74	74	71
20/F	80.6	72	73	74	74	74	74	71
19/F	77.4	72	73	74	75	74	74	71
18/F	74.3	72	73	74	75	74	74	71
17/F	71.1	72	73	74	75	74	74	71
16/F	68.0	73	73	74	75	75	74	71
15/F	64.8	73	73	74	75	75	75	71
14/F	61.7	73	73	74	75	75	75	71
13/F	58.5	73	73	75	76	75	75	72
12/F	55.4	73	73	75	76	75	75	72
11/F	52.2	73	73	75	76	75	75	72
10/F	49.1	73	73	75	76	76	75	72
9/F	45.9	73	73	75	76	76	76	72
8/F	42.8	73	73	75	76	76	76	72
7/F	39.6	73	73	75	77	76	76	72
6/F	36.5	73	73	76	77	76	76	72
5/F	33.3	72	74	76	77	77	76	72
4/F	30.2	72	74	76	77	77	77	72
3/F	27.0	72	74	76	77	77	77	72
2/F	23.9	72	74	76	78	77	77	72
1/F	20.7	72	74	77	78	77	77	72
Max.		73	74	77	78	77	77	72

Notes:
The NSRs with noise exceedance has been highlighted in yellow.

Project: Housing Development at Shek Mun
Block: Block D
Scenario: Base Case

Floor	Assessment point level (mPD)	35	36	36_a	37	38	39	39_a	40	40_a	41	42	43	44	45	46	47
34/F	124.7	73	72	70	71	70	70	58	69	59	68	69	67	68	72	72	73
33/F	121.5	73	72	70	72	70	70	58	69	59	68	69	67	68	72	72	73
32/F	118.4	73	72	70	72	70	70	58	69	59	68	69	67	68	72	72	73
31/F	115.2	73	72	70	72	70	70	58	69	59	68	69	67	68	72	72	73
30/F	112.1	73	72	70	72	70	70	59	69	59	69	69	67	68	72	72	73
29/F	108.9	74	72	70	72	70	70	59	69	59	69	69	68	68	72	72	73
28/F	105.8	74	72	70	72	70	70	59	69	59	69	69	68	68	73	73	73
27/F	102.6	74	72	70	72	71	70	59	69	58	69	69	68	68	73	73	73
26/F	99.5	74	72	70	72	71	70	59	69	59	69	69	68	68	73	73	74
25/F	96.3	74	72	70	72	71	70	59	69	59	69	70	68	68	73	73	74
24/F	93.2	74	72	70	72	71	70	59	69	59	69	70	68	68	73	73	74
23/F	90.0	74	72	70	72	71	70	59	69	59	69	70	68	69	73	73	74
22/F	86.9	74	72	71	72	71	70	60	69	59	69	70	68	69	73	73	74
21/F	83.7	74	73	71	72	71	70	60	70	59	69	70	68	69	73	73	74
20/F	80.6	74	73	71	72	71	70	60	70	59	69	70	68	69	73	73	74
19/F	77.4	74	73	71	72	71	70	60	70	60	70	70	68	69	73	73	74
18/F	74.3	75	73	71	73	71	71	60	70	60	70	70	69	69	73	73	74
17/F	71.1	75	73	71	73	71	71	60	70	60	70	70	69	69	74	74	74
16/F	68.0	75	73	71	73	71	71	60	70	60	70	70	69	69	74	74	74
15/F	64.8	75	73	71	73	71	71	61	70	60	70	71	69	69	74	74	74
14/F	61.7	75	73	71	73	71	71	61	70	61	70	71	69	70	74	74	75
13/F	58.5	75	73	71	73	72	71	61	70	61	70	71	69	70	74	74	75
12/F	55.4	75	73	71	73	72	71	61	70	61	70	71	69	70	74	74	75
11/F	52.2	75	73	71	73	72	71	61	70	61	70	71	69	70	74	74	75
10/F	49.1	75	74	71	73	72	71	62	71	62	71	71	69	70	74	74	75
9/F	45.9	76	74	71	73	72	71	62	71	62	71	71	69	70	74	74	75
8/F	42.8	76	74	71	73	72	72	62	71	62	71	71	70	70	75	75	75
7/F	39.6	76	74	72	74	72	72	62	71	62	71	71	70	70	75	75	75
6/F	36.5	76	74	72	74	72	72	63	71	63	71	72	70	70	75	75	76
5/F	33.3	76	74	72	74	73	72	63	71	63	71	72	70	71	75	75	76
4/F	30.2	77	75	72	74	73	72	63	71	63	71	72	70	71	75	75	76
3/F	27.0	77	75	72	74	73	73	64	72	64	71	72	70	71	75	75	76
2/F	23.9	77	75	72	75	73	73	64	72	64	72	72	70	71	75	76	76
1/F	20.7	77	75	72	75	74	73	64	72	64	72	72	70	71	75	76	77
Max.		77	75	72	75	74	66	64	72	64	72	72	70	71	75	76	77

Notes:
The NSRs with noise exceedance has been highlighted in yellow.

Project: Housing Development at Shek Mun
Block: Block E
Scenario: Base Case

Floor	Assessment point level (mPD)	48	49	50	51	51_a	52	53	54	55	55_a	56	56_a	57	58	59	60
34/F	124.7																
33/F	121.5	74	73	73	71	64	69	69	68	69	62	70	55	70	72	72	73
32/F	118.4	74	73	73	71	64	69	69	68	69	62	70	55	71	72	72	73
31/F	115.2	74	73	73	71	64	69	69	68	69	62	70	55	71	72	73	73
30/F	112.1	74	73	73	71	64	69	69	68	69	62	70	55	71	72	73	73
29/F	108.9	74	73	73	71	64	69	70	68	69	63	70	55	71	72	73	73
28/F	105.8	74	73	73	72	64	69	70	69	69	63	70	55	71	72	73	73
27/F	102.6	74	74	73	72	64	69	70	69	70	63	71	55	71	73	73	74
26/F	99.5	74	74	74	72	64	69	70	69	70	63	71	55	71	73	73	74
25/F	96.3	74	74	74	72	64	69	70	69	70	63	71	55	71	73	73	74
24/F	93.2	74	74	74	72	64	69	70	69	70	63	71	55	71	73	73	74
23/F	90.0	74	74	74	72	65	70	70	69	70	63	71	55	72	73	73	74
22/F	86.9	74	74	74	72	65	70	70	69	70	63	71	56	72	73	74	74
21/F	83.7	75	74	74	72	65	70	70	69	70	63	71	56	72	73	74	74
20/F	80.6	75	74	74	72	65	70	70	69	70	64	71	56	72	74	74	74
19/F	77.4	75	74	74	72	65	70	70	70	70	64	72	56	72	74	74	75
18/F	74.3	75	74	74	72	65	70	71	70	71	64	72	56	72	74	74	75
17/F	71.1	75	75	74	72	65	70	71	70	71	64	72	56	72	74	74	75
16/F	68.0	75	75	75	73	65	70	71	70	71	64	72	56	73	74	75	75
15/F	64.8	75	75	75	73	65	70	71	70	71	64	72	56	73	74	75	76
14/F	61.7	75	75	75	73	65	70	71	70	71	64	72	56	73	74	75	75
13/F	58.5	76	75	75	73	65	70	71	70	71	65	72	56	73	75	75	76
12/F	55.4	76	75	75	73	65	70	71	70	71	65	73	56	73	75	75	76
11/F	52.2	76	75	75	73	65	70	71	70	71	65	73	56	73	75	75	76
10/F	49.1	76	76	75	73	65	70	71	71	72	65	73	56	74	75	76	76
9/F	45.9	76	76	75	73	66	70	71	71	72	65	73	56	74	75	76	76
8/F	42.8	76	76	75	73	66	71	72	71	72	65	73	56	74	76	76	77
7/F	39.6	77	76	76	73	66	71	72	71	72	65	73	56	74	76	76	77
6/F	36.5	77	76	76	74	66	71	72	71	72	66	74	56	74	76	76	77
5/F	33.3	77	76	76	74	66	71	72	71	72	66	74	56	75	76	77	77
4/F	30.2	77	76	76	74	66	71	72	71	72	66	74	56	75	76	77	77
3/F	27.0	77	77	76	74	66	71	72	71	72	66	74	56	75	77	77	78
2/F	23.9	77	77	76	74	66	71	72	71	73	66	74	56	75	77	77	78
1/F	20.7	78	77	77	74	66	71	72	71	73	66	74	56	75	77	77	78
Max.		78	77	77	74	66	71	72	71	73	66	74	56	75	77	77	78

Notes:
The NSRs with noise exceedance has been highlighted in yellow.

Project: Housing Development at Shek Mun
Block: Block A
Scenario: Mitigated case

Floor	Assessment point level (mPD)	1	2	3	4	5	5_a	6	7	8	9	10	11	12	13
34/F	124.7	67	66	67	66	66	63	65	65	64	64	67	63	66	66	66
33/F	121.5	67	66	67	66	66	63	65	65	64	64	67	63	66	66	66
32/F	118.4	67	66	67	66	66	64	66	65	64	64	67	63	66	66	66
31/F	115.2	67	66	67	66	66	64	66	65	64	64	67	64	66	66	66
30/F	112.1	67	66	67	66	66	64	66	65	64	64	67	64	66	66	66
29/F	108.9	67	66	67	66	66	64	66	65	64	64	67	64	66	66	67
28/F	105.8	67	66	67	67	66	64	66	65	65	64	68	64	66	66	67
27/F	102.6	67	66	67	67	67	64	66	66	65	64	68	64	66	67	67
26/F	99.5	67	67	68	67	67	64	66	66	65	64	68	64	66	67	67
25/F	96.3	68	67	68	67	67	64	66	66	65	64	68	64	67	67	67
24/F	93.2	68	67	68	67	67	64	66	66	65	65	68	64	67	67	67
23/F	90.0	68	67	68	67	67	64	66	66	65	65	68	64	67	67	67
22/F	86.9	68	67	68	67	67	65	66	66	65	65	68	65	67	67	67
21/F	83.7	68	67	68	67	67	65	66	66	65	65	68	65	67	67	68
20/F	80.6	68	67	68	67	67	65	67	66	65	65	68	65	67	67	68
19/F	77.4	68	67	68	67	67	65	67	66	65	65	68	65	67	67	68
18/F	74.3	68	67	68	68	67	65	67	66	65	65	69	65	68	68	68
17/F	71.1	68	68	69	68	68	65	67	66	66	65	69	65	68	68	68
16/F	68.0	69	68	69	68	68	65	67	67	66	65	69	65	68	68	68
15/F	64.8	69	68	69	68	68	65	67	67	66	65	69	66	68	68	68
14/F	61.7	69	69	69	68	68	65	67	67	66	65	69	66	68	68	69
13/F	58.5	69	68	69	68	68	66	67	67	66	66	69	66	68	68	69
12/F	55.4	69	68	69	68	68	66	67	67	66	66	69	66	69	69	69
11/F	52.2	69	68	69	68	68	66	67	67	66	66	69	66	69	69	69
10/F	49.1	69	68	69	69	68	66	68	67	66	66	70	66	69	69	69
9/F	45.9	70	69	70	69	68	66	68	67	66	66	70	67	69	69	69
8/F	42.8	70	69	70	69	69	66	68	67	66	66	70	67	69	69	70
7/F	39.6	70	69	70	69	69	66	68	67	66	66	70	67	70	70	70
6/F	36.5	70	69	70	69	69	67	67	67	66	66	70	67	70	70	70
5/F	33.3	70	69	70	69	69	67	67	67	66	66	70	67	70	70	70
4/F	30.2	70	69	70	69	69	67	67	67	66	66	70	67	70	70	70
3/F	27.0	70	69	70	69	68	67	66	67	66	65	70	68	70	70	69
2/F	23.9	70	69	70	69	68	67	66	67	65	65	70	68	70	70	69
1/F	20.7	70	69	70	68	68	66	64	66	65	64	70	68	69	69	69
Max.		70	69	70	69	69	67	68	67	66	66	70	68	70	70	70

Notes:
Propose to adopt Acoustic Window (Baffle Type) with Sound Absorptive Material
Propose to adopt Enhanced Acoustic Balcony (Baffle Type) with Sound Absorptive Material

Project: Housing Development at Shek Mun
Block: Block B
Scenario: Mitigated case

Floor	Assessment point level (mPD)	14	15	16	17	18	18_a	19_a	19	20	21	22	23	24	25	26
34/F	124.7	70	68	64	64	65	63	66	65	64	64	68	64	66	66	66
33/F	121.5	70	69	64	64	65	63	66	65	64	64	68	64	66	66	66
32/F	118.4	70	69	64	64	65	63	66	65	64	64	68	64	66	66	66
31/F	115.2	70	69	64	65	65	63	66	65	64	64	68	64	66	66	66
30/F	112.1	70	69	64	65	65	64	66	65	64	64	69	64	66	66	66
29/F	108.9	63	69	65	65	65	64	66	65	64	64	69	64	66	66	66
28/F	105.8	63	69	65	65	65	64	66	65	64	64	69	64	66	66	66
27/F	102.6	63	69	65	65	65	64	66	65	65	65	69	65	66	66	66
26/F	99.5	63	69	65	65	65	64	66	65	65	65	69	65	66	66	66
25/F	96.3	64	69	65	65	65	64	66	65	65	65	69	65	67	67	67
24/F	93.2	64	69	65	65	66	64	67	65	65	65	69	65	67	67	67
23/F	90.0	64	69	65	65	66	64	67	65	65	65	69	65	67	67	67
22/F	86.9	64	69	65	65	66	64	67	66	65	65	70	65	67	67	67
21/F	83.7	64	70	65	65	66	64	67	66	65	65	70	65	67	67	67
20/F	80.6	64	70	65	65	66	64	67	66	65	65	70	65	67	67	67
19/F	77.4	64	70	65	66	66	65	67	66	65	65	70	66	67	67	67
18/F	74.3	64	70	65	66	66	65	67	66	65	65	70	66	68	68	68
17/F	71.1	65	70	66	66	66	65	67	66	65	65	70	66	68	68	68
16/F	68.0	65	70	66	66	66	65	67	66	65	65	70	66	68	68	68
15/F	64.8	65	70	66	66	66	65	67	66	65	65	70	66	68	68	68
14/F	61.7	65	70	66	66	66	65	67	66	66	66	63	66	68	68	68
13/F	58.5	65	70	66	66	66	65	67	66	66	66	63	66	68	68	68
12/F	55.4	65	70	66	66	66	65	67	66	66	66	63	67	69	69	69
11/F	52.2	65	70	66	66	67	65	67	66	66	66	63	67	69	69	69
10/F	49.1	66	63	66	66	67	66	67	66	66	66	64	67	69	69	69
9/F	45.9	66	63	66	66	67	66	67	66	66	66	64	67	69	69	69
8/F	42.8	66	63	66	66	67	66	67	66	66	66	64	67	69	69	69
7/F	39.6	66	70	66	66	67	66	67	66	66	66	64	67	69	69	69
6/F	36.5	66	70	66	66	67	66	67	66	65	66	64	68	70	70	70
5/F	33.3	66	70	66	66	66	66	67	66	65	65	64	68	70	70	70
4/F	30.2	66	70	66	66	66	66	66	66	65	65	64	68	70	70	70
3/F	27.0	67	70	65	66	66	66	66	66	65	65	64	68	70	70	70
2/F	23.9	67	70	65	65	66	66	65	66	65	65	64	68	69	70	70
1/F	20.7	67	69	65	65	67	63	65	65	65	64	68	69	69	69	69
Max.		70	70	66	66	67	67	67	66	66	66	70	68	70	70	70

Notes:
Propose to adopt Acoustic Window (Baffle Type) with Sound Absorptive Material
Propose to adopt Enhanced Acoustic Balcony (Baffle Type) with Sound Absorptive Material

Project: Housing Development at Shek Mun
Block: Block C
Scenario: Mitigated case

Floor	Assessment point level (mPD)	27	28	30	31	32	33	34
34/F	124.7							
33/F	121.5							
32/F	118.4	64	64	65	65	65	65	70
31/F	115.2	64	64	65	66	65	65	70
30/F	112.1	64	65	65	66	65	65	70
29/F	108.9	64	65	65	66	65	65	70
28/F	105.8	64	65	65	66	65	65	70
27/F	102.6	64	65	65	66	66	65	70
26/F	99.5	64	65	65	66	66	65	70
25/F	96.3	64	65	66	66	66	66	70
24/F	93.2	64	65	66	66	66	66	70
23/F	90.0	65	65	66	66	66	66	63
22/F	86.9	65	65	66	67	66	66	63
21/F	83.7	65	65	66	67	66	66	63
20/F	80.6	65	65	66	67	67	66	63
19/F	77.4	65	65	66	67	67	66	63
18/F	74.3	65	65	66	67	67	67	64
17/F	71.1	65	65	67	67	67	67	64
16/F	68.0	65	66	67	68	67	67	64
15/F	64.8	65	66	67	68	67	67	64
14/F	61.7	65	66	67	68	67	67	64
13/F	58.5	65	66	67	68	68	67	64
12/F	55.4	65	66	67	68	68	68	64
11/F	52.2	65	66	67	68	68	68	64
10/F	49.1	65	66	68	69	68	68	64
9/F	45.9	65	66	68	69	68	68	64
8/F	42.8	65	66	68	69	69	68	64
7/F	39.6	65	66	68	69	69	68	64
6/F	36.5	65	66	68	69	69	69	65
5/F	33.3	65	66	68	70	69	69	65
4/F	30.2	65	66	69	70	69	69	65
3/F	27.0	65	66	69	70	69	69	65
2/F	23.9	65	66	69	70	70	69	65
1/F	20.7	64	66	69	68	70	70	64
Max.		65	66	69	70	70	70	70

Notes:
Propose to adopt Acoustic Window (Baffle Type) with Sound Absorptive Material
Propose to adopt Enhanced Acoustic Balcony (Baffle Type) with Sound Absorptive Material

Project: Housing Development at Shek Mun
Block: Block D
Scenario: Mitigated case

Floor	Assessment point level (mPD)	35	36	36_a	37	38	39	39_a	40	40_a	41	42	43	44	45	46	47
34/F	124.7	66	64	70	64	70	70	58	69	59	68	69	67	68	65	65	65
33/F	121.5	66	64	70	64	70	70	58	69	59	68	69	67	68	65	65	65
32/F	118.4	66	64	70	64	70	70	58	69	59	68	69	67	68	65	65	65
31/F	115.2	66	64	70	64	70	70	58	69	59	68	69	67	68	65	65	66
30/F	112.1	66	65	70	64	70	70	59	69	59	69	69	68	68	65	65	66
29/F	108.9	66	64	70	64	70	70	59	69	59	69	69	68	68	65	65	66
28/F	105.8	66	65	70	64	70	70	59	69	59	69	69	68	68	65	65	66
27/F	102.6	66	65	70	64	63	70	59	69	58	69	69	68	68	65	65	66
26/F	99.5	66	65	70	65	63	70	59	69	59	69	69	68	68	65	65	66
25/F	96.3	66	65	70	65	63	70	59	69	59	69	70	68	68	65	65	66
24/F	93.2	66	65	70	65	63	70	59	69	59	69	70	68	68	65	65	66
23/F	90.0	67	65	70	65	63	70	59	69	59	69	70	68	69	65	65	66
22/F	86.9	67	65	63	65	63	70	60	69	59	69	70	68	69	66	66	66
21/F	83.7	67	65	63	65	63	70	60	70	59	69	70	68	69	66	66	66
20/F	80.6	67	65	63	65	63	70	60	70	59	69	70	68	69	66	66	66
19/F	77.4	67	65	63	65	64	70	60	70	60	70	70	68	69	66	66	67
18/F	74.3	67	65	63	65	63	64	63	60	70	60	70	69	69	66	66	67
17/F	71.1	67	65	63	65	64	63	60	70	60	70	70	69	69	66	66	67
16/F	68.0	67	66	64	65	64	63	60	70	60	70	70	69	69	66	66	67
15/F	64.8	67	66	63	65	64	63	61	70	60	70	63	69	69	66	66	67
14/F	61.7	67	66	63	65	64	63	61	70	61	70	63	69	70	66	66	67
13/F	58.5	68	66	64	65	64	63	61	70	61	70	63	69	70	66	66	67
12/F	55.4	68	66	64	66	64	64	61	70	61	70	63	69	70	67	67	67
11/F	52.2	68	66	64	66	64	64	61	70	61	70	64	69	70	67	67	67
10/F	49.1	68	66	64	66	64	64	62	63	62	63	64	69	70	67	67	67
9/F	45.9	68	66	64	66	64	64	62	63	62	63	64	69	70	67	67	68
8/F	42.8	68	66	64	66	65	64	62	63	62	63	64	70	70	67	67	68
7/F	39.6	68	66	64	66	65	64	62	63	62	63	64	70	70	67	67	68
6/F	36.5	69	67	64	66	65	64	63	64	63	64	64	70	70	67	67	68
5/F	33.3	69	67	64	66	65	65	63	64	63	64	64	70	63	67	68	68
4/F	30.2	69	67	64	67	65	65	63	64	64	64	64	70	63	68	68	69
3/F	27.0	69	67	65	67	66	65	64	64	64	64	64	70	63	68	68	69
2/F	23.9	70	67	65	67	66	65	64	64	64	65	65	70	63	68	68	69
1/F	20.7	70	68	65	67	66	66	64	64	64	64	65	70	63	68	68	69
Max.		70	68	70	67	70	70	64	70	64	70	70	70	70	68	68	69

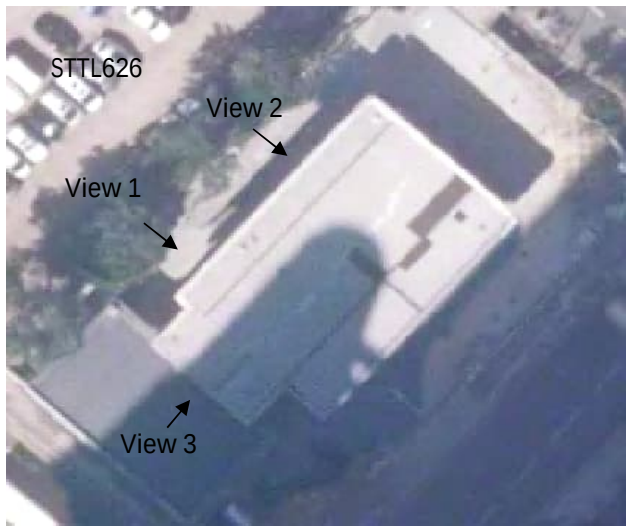
Notes:
Propose to adopt Acoustic Window (Baffle Type) with Sound Absorptive Material
Propose to adopt Enhanced Acoustic Balcony (Baffle Type) with Sound Absorptive Material

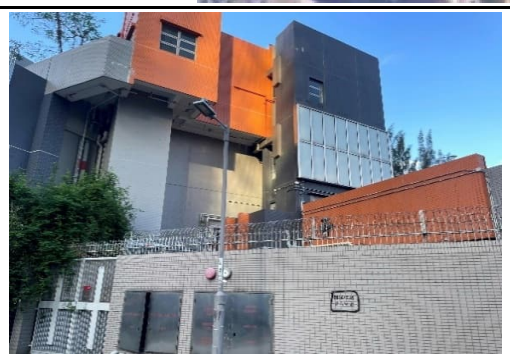
Project: Housing Development at Shek Mun
Block: Block E
Scenario: Mitigated case

Floor	Assessment point level (mPD)	48	49	50	51	51_a	52	53	54	55	55_a	56	56_a	57	58	59	60
34/F	124.7	66	66	65	64	64	69	69	68	69	62	70	55	70	64	65	65
33/F	121.5	66	66	66	64	64	69	69	68	69	62	70	55	63	65	65	66
32/F	118.4	66	66	66	64	64	69	69	68	69	62	70	55	63	65	65	66
31/F	115.2	66	66	66	64	64	69	69	68	69	62	70	55	63	65	65	66
30/F	112.1	66	66	66	64	64	69	69	68	69	62	70	55	63	65	65	66
29/F	108.9	66	66	66	64	64	69	70	68	69	63	70	55	63	65	65	66
28/F	105.8	66	66	66	64	64	69	70	69	69	63	70	55	63	65	65	66
27/F	102.6	66	66	66	64	64	69	70	69	70	63	63	55	64	65	65	66
26/F	99.5	67	66	66	64	64	69	70	69	70	63	63	55	64	65	66	66
25/F	96.3	67	66	66	64	64	69	70	69	70	63	63	55	64	65	66	66
24/F	93.2	67	66	66	64	64	69	70	69	70	63	63	55	64	65	66	66
23/F	90.0	67	66	66	64	65	70	70	69	70	63	63	55	64	66	66	67
22/F	86.9	67	67	66	65	65	70	70	69	70	63	64	56	64	66	66	67
21/F	83.7	67	67	66	65	65	70	70	69	70	63	64	56	64	66	66	67
20/F	80.6	67	67	67	65	65	70	70	69	70	64	64	56	64	66	66	67
19/F	77.4	67	67	67	65	65	70	70	70	70	64	64	56	65	66	67	67
18/F	74.3	67	67	67	65	65	70	63	70	63	64	64	56	66	66	67	67
17/F	71.1	68	67	67	65	65	70	63	70	63	64	64	56	65	66	67	67
16/F	68.0	68	67	67	65	65	70	63	70	63	64	64	56	65	67	67	68
15/F	64.8	68	67	67	65	65	70	63	70	63	64	65	56	65	67	67	68
14/F	61.7	68	67	67	65	65	70	63	70	64	64	65	56	66	67	67	68
13/F	58.5	68	67	67	65	65	70	64	70	64	64	65	56	66	67	68	68
12/F	55.4	68	68	67	65	65	70	64	70	64	65	65	56	66	67	68	68
11/F	52.2	68	68	68	65	65	70	64	70	64	65	65	56	66	68	68	68
10/F	49.1	69	68	68	66	65	70	64	63	64	65	65	56	66	68	68	69
9/F	45.9	69	68	68	66	66	70	64	63	64	65	66	56	66	68	68	69
8/F	42.8	69	68	68	66	66	63	64	63	64	65	66	56	66	68	68	69
7/F	39.6	69	68	68	66	66	63	64	63	64	65	66	56	66	67	68	69
6/F	36.5	69	69	68	66	66	63	64	64	64	65	66	56	67	69	69	69
5/F	33.3	69	69	68	66	66	63	64	64	65	66	66	56	67	69	69	70
4/F	30.2	70	69	69	66	66	63	64	64	65	66	66	56	67	69	69	70
3/F	27.0	70	69	69	66	66	63	64	64	65	66	66	56	67	69	70	70
2/F	23.9	70	69	69	67	66	63	64	64	65	66	67	56	68	69	70	70
1/F	20.7	70	69	69	67	66	63	64	64	65	66	67	56	68	70	70	69
Max.		70	69	69	67	66	70	70	70	70	66	70	56	70	70	70	70

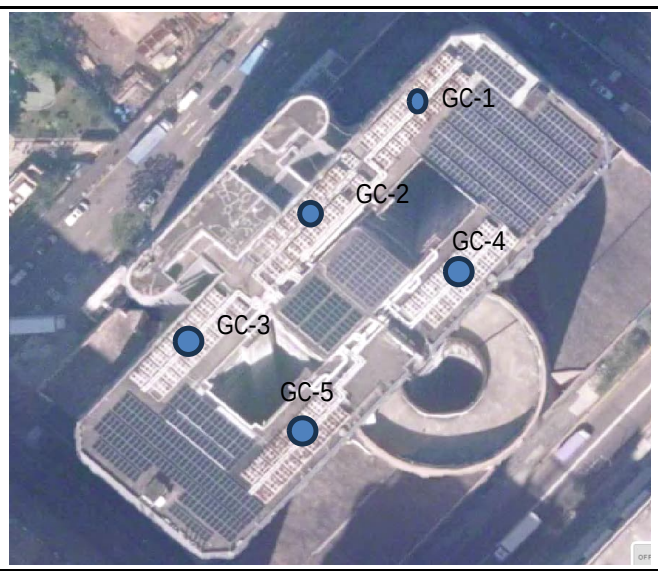
Notes:
Propose to adopt Acoustic Window (Baffle Type) with Sound Absorptive Material
Propose to adopt Enhanced Acoustic Balcony (Baffle Type) with Sound Absorptive Material

4.4 Fixed Noise Impact Assessment Details

Location:	Shek Mun Fresh Water Booster Pumping Station
Source ID:	SMFWBPS
Description and Observation:	Based on the aerial photo, the pumping station is enclosed. The site visit on 14 Nov 2025 identified no ventilation opening facing the site area. Also, no noticeable noise was observed.
Aerial photo	
Site Photo	 View 1  View 2  View 3

Location:	On Sum Street Substation
Source ID:	OSSS
Description and Observation:	Based on the aerial photo, the substation is fully enclosed. The site visit on 14 Nov 2025 identified no noticeable noise was observed.
Aerial photo	
Site Photo	 View 1  View 2

Location:	Shatin North Offtake and Pigging Station
Source ID:	STNOPS
Description and Observation:	Based on the site visit on 14 Nov 2025, no noticeable noise was observed.
Aerial photo	
Site Photo	 View 1  View 2

Location (Nature):	Grandtech Centre (Commercial and Industrial use)
Source ID:	GC
Description and Observation:	A questionnaire was sent via email in Nov 2025. Based on the reply slip and further verbal clarification, there are 5 sets of radiators (Brand: Cold Magic; Model: DHM-042) located in 5 zones. 1 set is abandoned (GC-5) and only 3 sets are in operation at peak. There is no operation in nighttime (2300-0700). On-site measurement was not permitted. Considering the proximity, further details was requested. It is understood that GC will turn on radiators for air-conditioning upon tenant's special request, which typically involve only one set of radiators. According to the property management, such requests are rare and only occur once every 2-3 years.
Aerial photo	

Operational Details

NS ID	Description	Reference Model	Operation Hour 0700-2300	Operation Hour 2300-0700	SWL for single set, dB(A)
GC-1	Air-cooled Condenser	Krack LAVB-23	Yes	No	103
GC-2	Air-cooled Condenser	Krack LAVB-23	Yes	No	103
GC-3	Air-cooled Condenser	Krack LAVB-23	Yes	No	103
GC-4	Air-cooled Condenser	Krack LAVB-23	Yes	No	103
GC-5	Abandoned				

Assumptions	1. There are 18 units of radiators (or air-cooled condenser) per set. Noise level of each set is assumed by the total noise level of 18 no. radiator. There are only 3 sets in operation during day and evening during the peak season. It is assumed the nearest sets of radiators to the NSRs will be operated.

Reference

Catalogue of Air-Cooled Condenser (LAVB-22) from Krack

TWO FANS WIDE

MODEL	TOTAL HEAT OF REJECTION (MBH) R-404A, R-507A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	R-407A, R-448A / R-449A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	AIR FLOW (CFM)	CEC TITLE 24 COMPLIANT	CONDENSER CHARGE R-404A (LBS) SUMMER	WINTER	EST SOUND 10' (dBA)	SHIP WEIGHT (LBS)
LAVB-22208	109.9	164.8	219.8	274.7	105.8	158.7	211.6	264.5	27600	No	12	38	71	642
LAVB-22210	128.2	192.3	256.4	320.5	124.7	187.0	249.3	311.6	27000	No	12	38	71	654
LAVB-22212	143.0	214.6	286.1	357.6	140.0	210.1	280.1	350.1	26424	No	12	38	71	666
LAVB-22308	153.6	230.4	307.2	384.0	149.9	224.8	299.8	374.7	26376	No	16	58	71	845
LAVB-22310	174.9	262.3	349.8	437.2	173.0	259.5	346.0	432.5	25600	Compliant	16	58	71	865
LAVB-22312	192.0	288.0	384.0	480.0	190.9	286.4	381.8	477.3	24868	No	16	58	71	885
LAVB-22408	183.8	275.7	367.6	459.5	183.1	274.6	366.1	457.7	24896	Compliant	20	76	71	895
LAVB-22410	205.2	307.8	410.3	512.9	206.8	310.2	413.6	517.0	24000	Compliant	20	76	71	925
LAVB-22412	220.3	330.5	440.7	550.9	225.1	337.6	450.1	562.7	23196	No	20	76	71	953
LAVB-23308	230.4	345.6	460.7	575.9	224.8	337.2	449.7	562.1	39564	No	22	84	73	1088
LAVB-23310	262.3	393.5	524.7	655.8	259.5	389.3	519.0	648.8	38400	Compliant	22	84	73	1118
LAVB-23312	288.0	432.0	576.0	720.0	286.4	429.5	572.7	715.9	37302	No	22	84	73	1148
LAVB-23408	275.7	413.5	551.4	689.2	274.6	411.9	549.2	686.5	37344	Compliant	28	114	73	1185
LAVB-23410	307.8	461.6	615.5	769.4	310.2	465.3	620.4	775.4	36000	Compliant	28	114	73	1225
LAVB-23412	330.5	495.8	661.0	826.3	337.6	506.4	675.2	844.0	34794	No	28	114	73	1265
LAVB-24308	307.2	460.7	614.3	767.9	299.8	449.7	599.6	749.4	52752	No	28	112	74	1665

TWO FANS WIDE

	L	W	H	P	A	B	C	CONNECTIONS OD IN(1) INLET	OUTLET
LAV*-22***	112	90-1/2	54	49	108	-	86-1/2	(2)1-5/8	(2)1-5/8
LAV*-23***	166	90-1/2	54	49	108	54	86-1/2	(2)2-1/8	(2)2-1/8
LAV*-24***	220	90-1/2	54	49	108	-	86-1/2	(2)2-1/8	(2)2-1/8
LAV*-25***	274	90-1/2	58-1/2	65	108	54	86-1/2	(2)2-1/8	(2)2-1/8
LEV*-26***	328	90-1/2	58-1/2	65	108	-	86-1/2	(2)2-5/8	(2)2-5/8
LEV*-27***	382	90-1/2	58-1/2	65	108	162	86-1/2	(2) 2-5/8	(2) 2-5/8

Correspondence and Information provided by the responsible person	Details please refer to precedding pages

Outlook

RE: Enquiry- Rooftop AC system of Grandtech Centre 偉達中心

From [redacted]
Date Fri 2026-03-20 10:39
To [redacted]
Cc Grandtech Centre [redacted]

[redacted]

Kindly refer to the reply highlighted in red below.

Best regards,

[redacted]

HARRIMAN Property Management Limited 夏利文物業管理有限公司 "PROPERTY MANAGEMENT TEAM OF THE YEAR" RICS Awards 2020 Excellence

Save a Tree-Please Don't Print Me

From: [redacted]
Sent: Thursday, March 19, 2026 11:31 AM
To [redacted]
Subject: Fw: Enquiry- Rooftop AC system of Grandtech Centre 偉達中心

Dear Mr. [redacted]

Grateful if you could advise the following for Grandtech Centre. Your reply by today is highly appreciated. Thank you.

Regards,
[redacted]

From: [redacted]
Sent: Wednesday, March 18, 2026 11:15
To: Grandtech Centre [redacted]
Cc: [redacted]
Subject: Re: Enquiry- Rooftop AC system of Grandtech Centre 偉達中心

Dear sir/ madam (property management of Grandtech Centre),

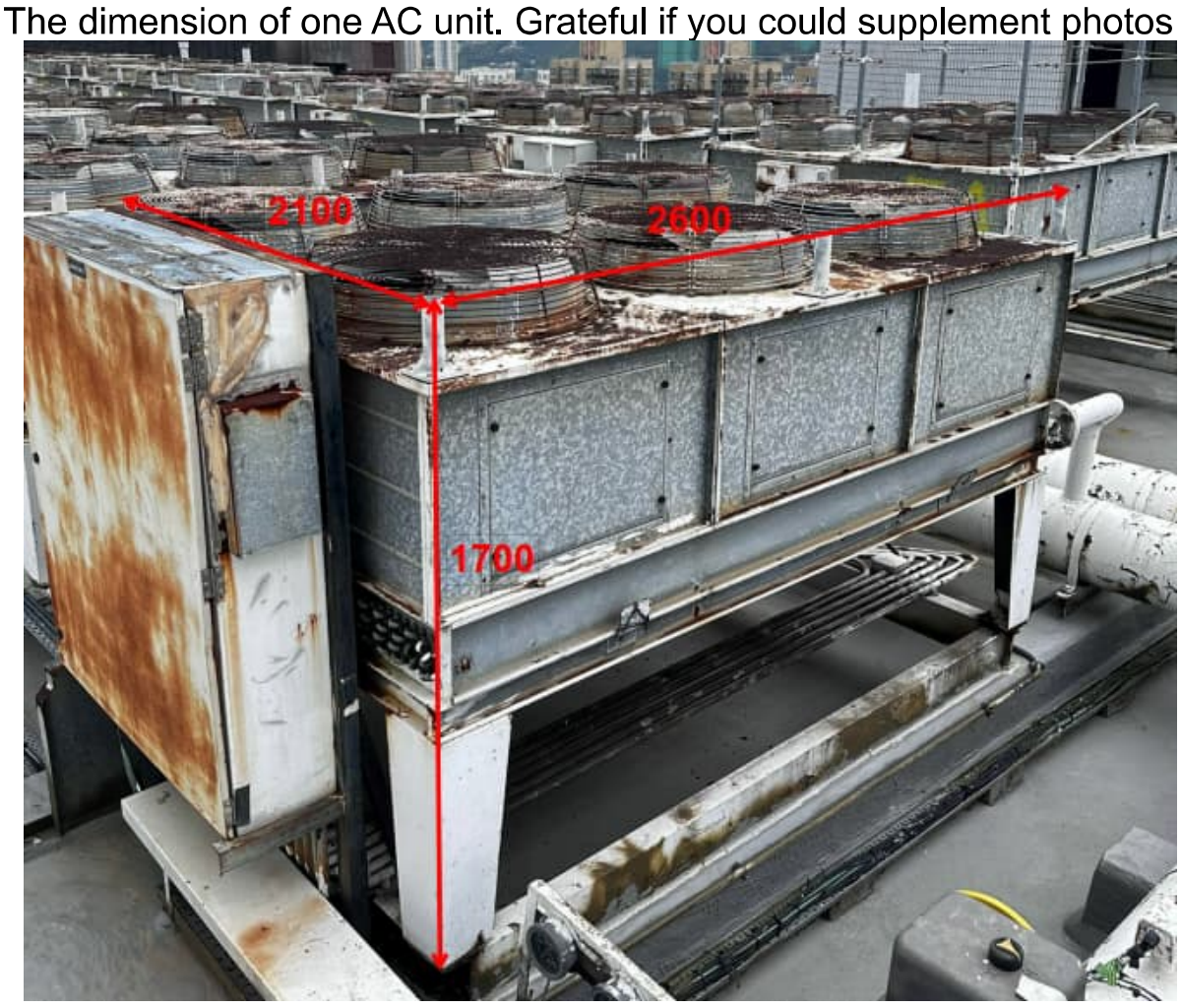
Thank you for replying to our previous questionnaire. As requested by the Authority, grateful if you could further advise the following:

1. The type rooftop AC systems (radiator/ water-cooled tower/ dry cooler) Radiator
2. What business operation the rooftop AC systems serve? (general office-based business/ business that requires specific cooling need) General office-based business, warehouse, etc.

3. Based on previous tele-conversation, it is understood that 5 sets of AC systems, 1 set is abandoned and only max. 3 sets are in operation during peak season. There is 18 AC units per set. Please confirm. Confirmed

4. Based on previous reply slip, there is no night-time operation. Please confirm. Confirmed

5. The dimension of one AC unit. Grateful if you could supplement photos of one AC unit.



Due to urgency of the Project, your response to the above items by **tomorrow** is highly appreciated. Sorry for the rush. Please feel free to contact me if you have any queries.

Regards,

[redacted]

From: Grandtech Centre [redacted]
Sent: Monday, December 29, 2025 11:57
To: [redacted]
Subject: RE: Enquiry- Rooftop AC system of Grandtech Centre 偉達中心

Dear Miss Cheung

Please find the attachment for your notice, thanks.

[redacted]

HARRIMAN Property Management Limited 夏利文物業管理有限公司 | "PROPERTY MANAGEMENT TEAM OF THE YEAR" RICS Awards 2020 Excellence

Save a Tree-Please Don't Print Me

From: Grandtech Centre
Sent: Wednesday, November 19, 2025 11:17 AM
To: [redacted]
Subject: RE: Enquiry- Rooftop AC system of Grandtech Centre 偉達中心

Dear Sir/ Madam,

Please find the attachment for your reference, thanks.

Best regards,

[redacted]

HARRIMAN Property Management Limited 夏利文物業管理有限公司 | "PROPERTY MANAGEMENT TEAM OF THE YEAR" RICS Awards 2020 Excellence

Save a Tree-Please Don't Print Me

From: [redacted]
Sent: Tuesday, November 18, 2025 4:17 PM
To: Grandtech Centre [redacted]
Cc: [redacted]
Subject: Enquiry- Rooftop AC system of Grandtech Centre 偉達中心

Dear sir/ madam,

We have been appointed by Civil Engineering Development Department of HKSAR Government to undertake various technical assessments for possible development sites near Shek Mun/Sha Tin (please see attached

appointment letter). To facilitate our preparation of noise assessment of the surrounding environment, we would be grateful if you could furnish us with the information as requested in the reply slip attached.

We would be much grateful if you can reply us **25 Nov** . Please feel free to contact me if you have any enquiry.

Regards,

[redacted]

MOTT MACDONALD

[redacted]

Website | **LinkedIn** | **Instagram** | **Facebook** | **YouTube**

[redacted]

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Outlook

RE: Enquiry- Rooftop AC system of Grandtech Centre 偉達中心

From [redacted]
Date Fri 2026-03-20 10:09
To [redacted]
Cc Grandtech Centre <grandtechcentre@hpml.com.hk>

Dear Sylvia,

According to your photo, AC system zone D is abandoned.



Best regards,

[redacted]

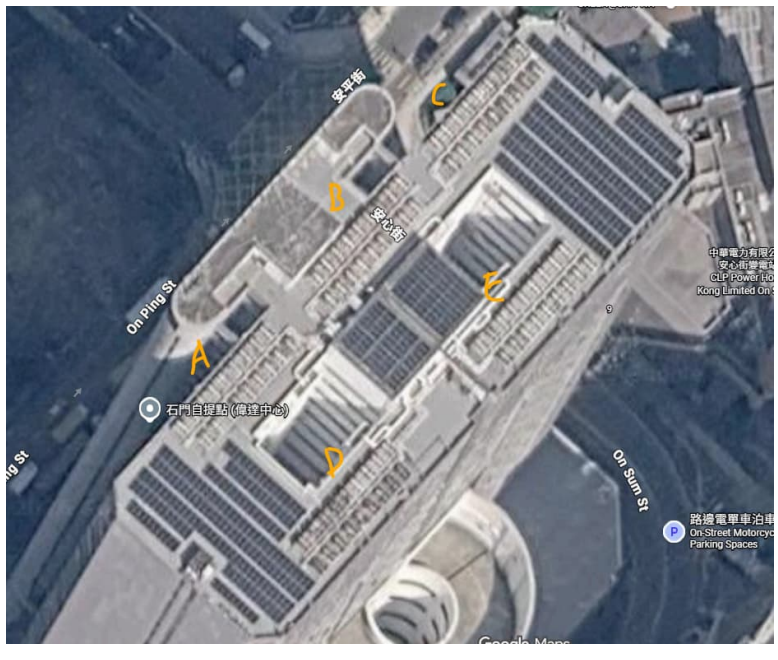
HARRIMAN Property Management Limited 夏利文物業管理有限公司 "PROPERTY MANAGEMENT TEAM OF THE YEAR" RICS Awards 2020 Excellence

Save a Tree-Please Don't Print Me

From: [redacted]
Sent: Friday, March 20, 2026 9:38 AM
To: [redacted]
Subject: Re: Enquiry- Rooftop AC system of Grandtech Centre 偉達中心

Dear [redacted],

Grateful if you could also advise the position of the abandoned AC system. Thank you.



Regards,

Sylvia Cheung

[redacted]

Mott MacDonald Restricted

From: [redacted]
Sent: Thursday, March 19, 2026 11:30
To [redacted]
Subject: Fw: Enquiry- Rooftop AC system of Grandtech Centre 偉達中心

Dear [redacted] (Engineering Department),

Grateful if you could advise the following for Grandtech Centre. Your reply by today is highly appreciated. Thank you.

Regards,
Sylvia

From: [redacted]
Sent: Wednesday, March 18, 2026 11:15
To: [redacted]
Cc: [redacted]
Subject: Re: Enquiry- Rooftop AC system of Grandtech Centre 偉達中心

Dear sir/ madam (property management of Grandtech Centre),

Thank you for replying to our previous questionnaire. As requested by the Authority, grateful if you could further advise the following:

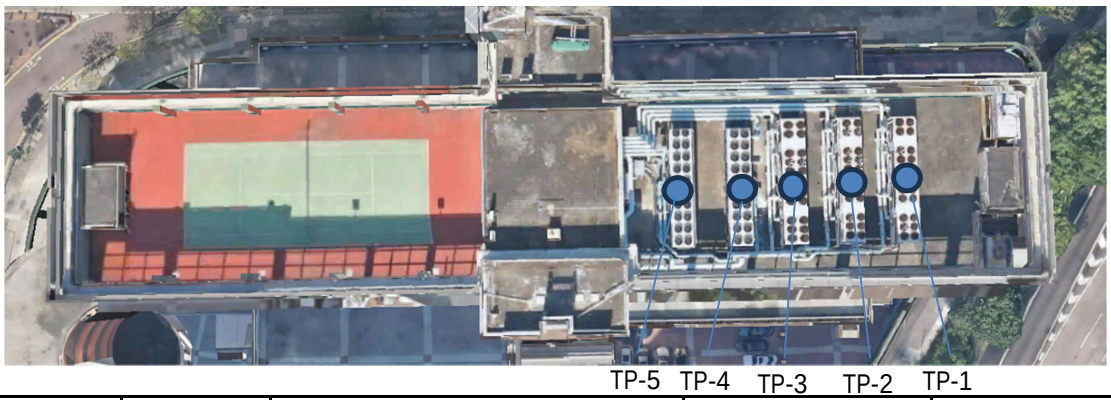
1. The type rooftop AC systems (radiator/ water-cooled tower/ dry cooler)

2. What business operation the rooftop AC systems serve? (general office-based business/ business that requires specific cooling need)

3. Based on previous tele-conversation, it is understood that 5 sets of AC systems, 1 set is abandoned and only max. 3 sets are in operation during peak season. There is 18 AC units per set. Please confirm.

4. Based on previous reply slip, there is no night-time operation. Please confirm

5. The dimension of one AC unit. Grateful if you could supplement photos of one AC unit.

Location (Nature):	Topsail Plaza **(Commercial and Industrial use)**
Source ID:	TP
Description and Observation:	The operator refused to provide any contact information. A questionnaire was sent by post in Nov 2025. No response has been received as of the date of this report. Based on aerial photo, there are five chillers on the rooftop. Based on the estimated size and appearance of the chillers, Carrier 30XA1352 is selected as the reference.
Aerial photo	

Operational Details

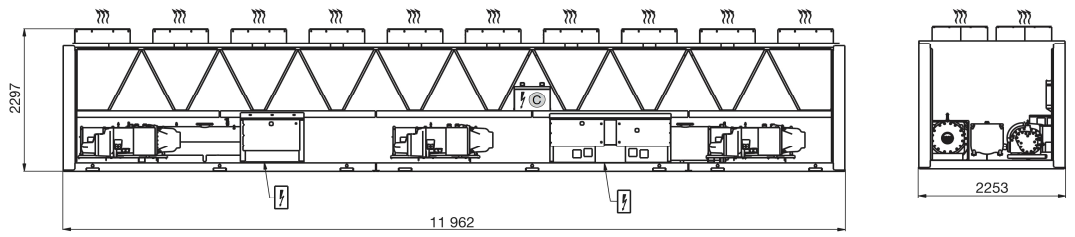
NS ID	Description	Reference Model		Operation Hour 0700-2300	Operation Hour 2300-0700	SWL for single unit, dB(A)
TP-1	Chiller	Carrier	30XA1352	Yes	No	97
TP-2	Chiller	Carrier	30XA1352	Yes	No	97
TP-3	Chiller	Carrier	30XA1352	Yes	No	97
TP-4	Chiller	Carrier	30XA1352	Yes	No	97
TP-5	Chiller	Carrier	30XA1352	Yes	No	97

Assumptions	1. Assume ½ chillers operate in nighttime.

Reference

Catalogue of 30XA Air-Cooled Chillers from Carrier

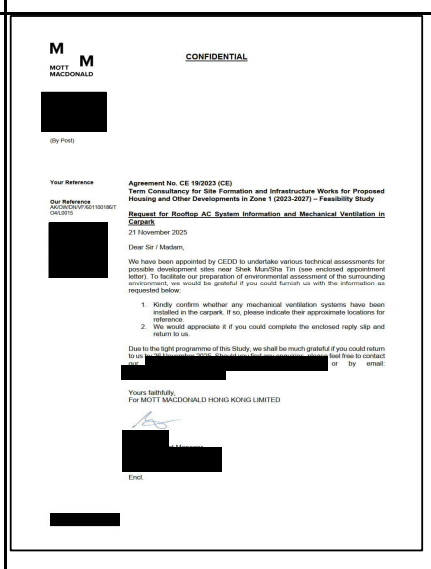
3.7 - 30XA 1102-1352 (standard and option 254/255)



4.3 - Sound levels

30XA		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Standard unit																					
Sound power level*	dB(A)	89	89	89	92	93	93	94	93	95	95	94	96	95	96	96	96	97	97	97	97
Sound pressure level at 10 m**	dB(A)	57	57	57	60	61	61	62	61	63	63	62	63	63	63	63	63	64	64	64	64

Correspondence with the responsible person



M MOTT MACDONALD M

CONFIDENTIAL

[redacted]

(By Post)

Your Reference

Our Reference
AK/CR/ENVF/501100186/T
O41/2015

Agreement No. CE 19/2023 (CE)
Term Consultancy for Site Formation and Infrastructure Works for Proposed Housing and Other Developments in Zone 1 (2023-2027) – Feasibility Study

Request for Rooftop AC System Information and Mechanical Ventilation in Carpark

21 November 2025

Dear Sir / Madam,

We have been appointed by CEDD to undertake various technical assessments for possible development sites near Shek Mun/Sha Tin (see enclosed appointment letter). To facilitate our preparation of environmental assessment of the surrounding environment, we would be grateful if you could furnish us with the information as requested below:

1. Kindly confirm whether any mechanical ventilation systems have been installed in the carpark. If so, please indicate their approximate locations for reference.
2. We would appreciate it if you could complete the enclosed reply slip and return to us.

Due to the tight programme of this Study, we shall be much grateful if you could return to us [redacted] or by email: [redacted]

Yours faithfully,
For MOTT MACDONALD HONG KONG LIMITED

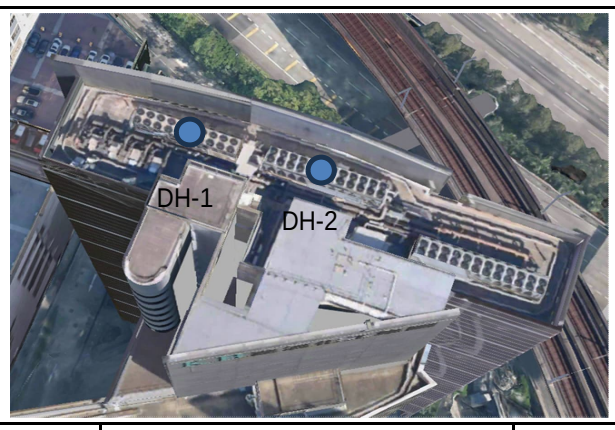
[redacted]

Encl.

[redacted]

Measured Dimension from aerial photo



Location (Nature):	Delta House **(Office Building)**
Source ID:	DH
Description and Observation:	A questionnaire was sent via email in Nov 2025. Only 2 chillers are used at peak. The chillers operate at 0800-1900 and the model is RLC-SVX19F-GB from Trane.
Aerial photo	

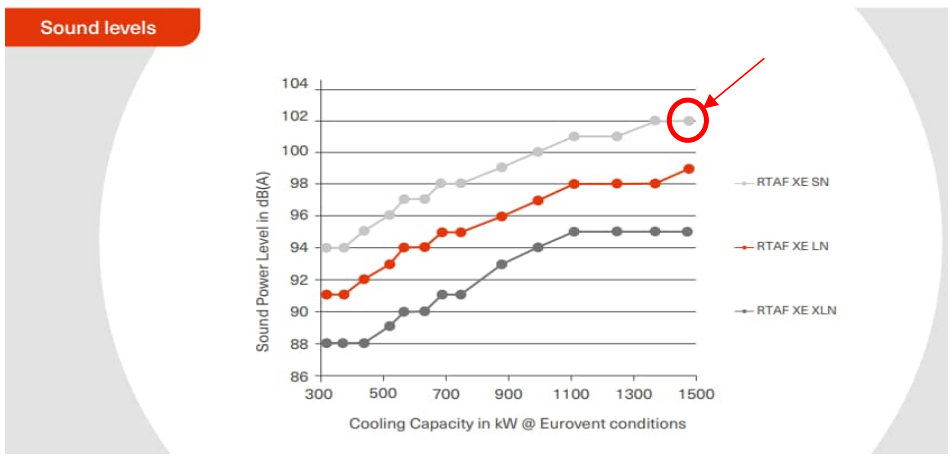
Operational Details

NS ID	Description	Reference Model		Operation Hour 0700-2300	Operation Hour 2300-0700	SWL for single unit, dB(A)
DH-1	Chiller	Trane	Sintesis series	Yes	No	102
DH-2	Chiller	Trane	Sintesis series	Yes	No	102

Assumptions	1. The model RLC-SVX19F-GB belongs to Sintesis series of Trane. Its noise level is determined by the mode of operation and cooling capacity. Considering the large size of the chiller, highest cooling capacity is assumed.

Reference

Sound Level of Sintesis series Chiller from Trane



SN: Standard Noise XLN: Extra Low Noise
LN: Low Noise

Correspondence with the responsible person

Outlook

Re: Re: Enquiry- Rooftop AC system of Delta House匯達大廈

From [redacted]
Date Thu 2026-03-19 11:36
To [redacted]
Cc [redacted]

Dear Syliva:

- Only 2 chillers are used at peak -confirmed.
- The chillers operate at 0800-1900 confirmed.
- The models are RLC-SVX19F-GB from Trane - confirmed.

Best Regards,
[redacted]

From: [redacted]
Date: 2026-03-18 15:35
To: [redacted]
CC: [redacted]
Subject: Re: Enquiry- Rooftop AC system of Delta House匯達大廈

Dear [redacted]

As per our tele-conversation, grateful if you could confirm the following regarding Rooftop AC system:

- Only 2 chillers are used at peak .
- The chillers operate at 0800-1900 .
- The models are RLC-SVX19F-GB from Trane .

Your reply by tomorrow is highly appreciated. Thank you.

Regards,

[redacted]

From: [redacted]
Sent: Friday, December 05, 2025 13:48
To: [redacted]
Cc: [redacted]
Subject: Re: Enquiry- Rooftop AC system of Delta House匯達大廈

Dear Cherry,

We would like to kindly remind your response by the end of today.
If you are experiencing any difficulties or need clarification, please let me know. I am happy to discuss with you.
Thank you.

Regards,
Sylvia

From: [redacted]
Sent: Monday, December 01, 2025 09:54
To: [redacted]
Cc: [redacted]
Subject: Re: Enquiry- Rooftop AC system of Delta House匯達大廈

Dear [redacted]

Due to the urgency of the project, your reply by 5 Dec is highly appreciated. The reply slip is re-attached for your use.
Please feel free to let me know if you have any difficulties.

Regards,
[redacted]

From: [redacted]
Sent: Tuesday, November 25, 2025 10:42
To: [redacted]

Cc: [redacted]
Subject: Re: Enquiry- Rooftop AC system of Delta House匯達大廈

Dear sir/ madam,

I am writing to kindly follow up on the information I requested earlier to assist with the noise assessment. I understand there may be internal processes involved, but if you could share the details at your earliest convenience, it would be greatly appreciated.

Please let me know if you need any clarification or additional details from my side to facilitate the process.

Thank you very much for your time and support.

Regards,
Sylvia

From: [redacted]
Sent: Monday, November 17, 2025 12:19
To: [redacted]
Cc: [redacted]
Subject: Enquiry- Rooftop AC system of Delta House匯達大廈

Dear sir/ madam,

We have been appointed by Civil Engineering Development Department of HKSAR Government to undertake various technical assessments for possible development sites near Shek Mun/Sha Tin (please see attached appointment letter). To facilitate our preparation of noise assessment of the surrounding environment, we would be grateful if you could furnish us with the information as requested in the reply slip attached.

We would be much grateful if you can reply us **25 Nov** . Please feel free to contact me if you have any enquiry.

Regards,
[redacted]
MOTT MACDONALD
[redacted]

Location (Nature):	W LUXE **(Office Building)**
Source ID:	WL
Description and Observation:	A questionnaire was sent via email in Nov 2025. No response has been received as of the date of this report. Based on aerial photo, there are two chillers on the rooftop. Based on the estimated size and appearance of the chillers, Trane RTAG 170H is selected as the reference.
Aerial photo	

Operational Details

NS ID	Description	Reference Model	Operation Hour 0700-2300	Operation Hour 2300-0700	SWL for single unit, dB(A)
WL-1	Chiller	Trane RTAG 170H	Yes	No	98
WL-2	Chiller	Trane RTAG 170H	Yes	No	98

Assumptions	1. The model of chiller is assumed based on no. of fans and dimesion of the chillers measured on aerial photo. 2. Assume ½ chillers operate in nighttime.

Reference

Catalogue and Sound Data of Series R Chiller from Trane

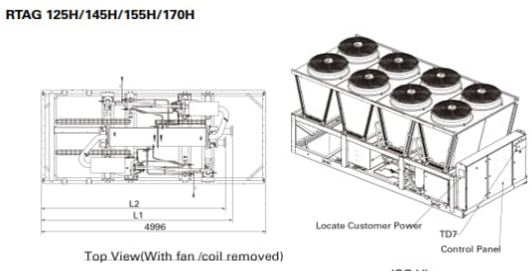


Table 1 — Sound Pressure Levels Series R™ Air-Cooled Chiller

Unit Size RTAG	A-Weighted Sound Pressure Level, dBA, ref 20 micro Pa, Standard Noise Option					
	High Efficiency Unit		Extra High Efficiency Unit		Premium Seasonal Efficiency Unit	
	AC fan @ 10m	EC fan @ 10m	AC fan @ 10m	EC fan @ 10m	AC fan @ 10m	EC fan @ 10m
85	NA	NA	66.5	66.0	NA	66.0
100	66.5	66.0	66.5	66.0	NA	66.0
125	68.0	67.5	68.5	68.0	NA	68.0
145	68.0	67.5	68.5	68.0	NA	68.0
155	68.5	68.5	69.0	68.5	NA	68.5
170	69.0	69.0	69.5	69.0	NA	69.0
190	69.5	69.0	69.5	69.0	NA	69.0
205	69.5	69.0	69.5	69.0	NA	69.0
250	71.0	70.5	71.5	71.0	NA	71.0
280	71.0	70.5	71.5	71.0	NA	71.0
310	71.5	71.5	72.0	71.5	NA	71.5
350	72.0	72.0	72.5	72.0	NA	72.0
380	72.5	72.0	72.5	72.0	NA	72.0
410	72.5	72.0	72.5	72.0	NA	72.0

Note: 10 m is measured from the side of the chiller. Sound radiation at this distance will approximate a line noise source.

Correspondence with the responsible person

Outlook

Re: Enquiry- Rooftop AC system of W LUXE

From [redacted]
Date: Fri 2025-12-05 13:49
To [redacted]
Cc

1 attachment (49 KB)
(6) Reply slipW LUXE.docx;

Dear sir/madam,

We would like to kindly remind your response by the end of today.
If you are experiencing any difficulties or need clarification, please let me know. I am happy to discuss with you.
Thank you.

Regards,
Sylvia

From [redacted]
Sent: Monday, December 01, 2025 09:58
To [redacted]
Cc
Subject: Re: Enquiry- Rooftop AC system of W LUXE

Dear sir/ madam,

Due to the urgency of the project, your reply by 5 Dec is highly appreciated. The reply slip is re-attached for your use.
Please feel free to let me know if you have any difficulties.

Regards,

[redacted]

Mott MacDonald Restricted

From [redacted]
Sent: Tuesday, November 25, 2025 10:41
To [redacted]
Cc
Subject: Re: Enquiry- Rooftop AC system of W LUXE

Dear sir/ madam,

I am writing to kindly follow up on the information I requested earlier to assist with the noise assessment. I understand there may be internal processes involved, but if you could share the details at your earliest convenience, it would be greatly appreciated.

Please let me know if you need any clarification or additional details from my side to facilitate the process.

Thank you very much for your time and support.

Regards,
Sylvia

From [redacted]
Sent: Monday, November 17, 2025 12:24
To [redacted]
Cc
Subject: Enquiry- Rooftop AC system of W LUXE

Dear sir/ madam,

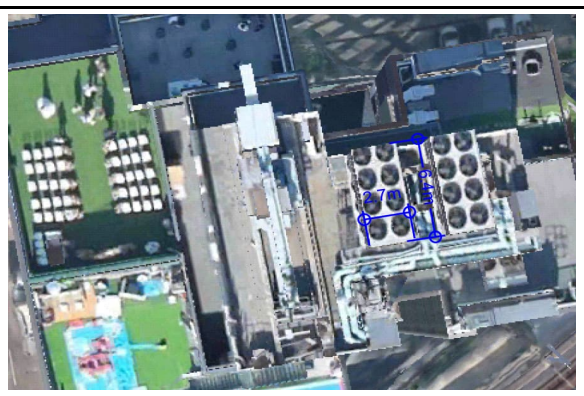
We have been appointed by Civil Engineering Development Department of HKSAR Government to undertake various technical assessments for possible development sites near Shek Mun/Sha Tin (please see attached appointment letter). To facilitate our preparation of noise assessment of the surrounding environment, we would be grateful if you could furnish us with the information as requested in the reply slip attached.

We would be much grateful if you can reply us **25 Nov** . Please feel free to contact me if you have any enquiry.

Regards,

[redacted]

Measured Dimension from aerial photo



Location (Nature):	HSBC Data Center
Source ID:	HSB
Description and Observation:	A questionnaire was sent via email in Nov 2025. Based on the reply slip, there are 10 cooling towers and operate 24 hours. The details of the cooling towers are as follow:

品牌及型號 Brand and Model	製冷量及聲音數據 (如有) Cooling Capacity and Sound Data (if any)
6pc. Marley – NC8405TAN1 3pc. Marley – NC8403RAN1 1pc. Marley – NC8405KAN1	Marley – NC8405TAN1 - 2417kW Marley – NC8403RAN1- 1644kW Marley – NC8405KAN1- 440kW

Aerial photo



Operational Details

NS ID	Description	Reference Model		Operation Hour 0700-2300	Operation Hour 2300-0700	SWL for single unit, dB(A)
HSB-1	Cooling Tower - 2417kW	Marley	NC8405TAN1	Yes	Yes	99
HSB-2	Cooling Tower - 2417kW	Marley	NC8405TAN1	Yes	Yes	99
HSB-3	Cooling Tower - 2417kW	Marley	NC8405TAN1	Yes	Yes	99
HSB-4	Cooling Tower - 2417kW	Marley	NC8405TAN1	Yes	Yes	99
HSB-5	Cooling Tower - 2417kW	Marley	NC8405TAN1	Yes	Yes	99
HSB-6	Cooling Tower - 2417kW	Marley	NC8405TAN1	Yes	Yes	99
HSB-7	Cooling Tower - 1644kW	Marley	NC8403RAN1	Yes	Yes	93
HSB-8	Cooling Tower - 1644kW	Marley	NC8403RAN1	Yes	Yes	93
HSB-9	Cooling Tower - 1644kW	Marley	NC8403RAN1	Yes	Yes	93
HSB-10	Cooling Tower - 440kW	Marley	NC8405KAN1	Yes	Yes	83

Assumptions: N/A

Reference

Engineering Data of NC Steel Cooling Tower from Marley

NC8401 NC8402 NC8403 NC8405

Model note 2	Nominal Tons note 3	Motor hp	dBA 5'-0" from air inlet face	Design Operating Weight lb	Shipping Weight lb	Dimensions L	W	H	A
NC8401G-1	101	2	63						
NC8401H-1	117	3	65						
NC8401K-1	139	5	71	8488	4062	8'-6¼"	12'-10"	10'-2½"	6'-9¾"
NC8401M-1	159	7.5	73						
NC8401N-1	175	10	76						
NC8401P-1	198	15	78						
NC8402G-1	131	2	64						
NC8402H-1	148	3	65						
NC8402K-1	175	5	68						
NC8402M-1	205	7.5	74	11184	4890	8'-4¾"	14'-2"	10'-3"	8'-8¼"
NC8402N-1	228	10	76						
NC8402P-1	256	15	79						
NC8402Q-1	277	20	81						
NC8403K-1	213	5	68						
NC8403M-1	243	7.5	72						
NC8403N-1	275	10	76						
NC8403P-1	312	15	79	16772	7442	8'-4¾"	18'-2"	11'-11¼"	8'-8¼"
NC8403Q-1	342	20	80						
NC8403R-1	366	25	81						
NC8403S-1	386	30	84						
NC8403T-1	423	40	85						
NC8405N-1	331	10	74						
NC8405P-1	377	15	76						
NC8405Q-1	412	20	78	20690	8685	9'-10¾"	19'-11"	11'-11¼"	10'-2¼"
NC8405R-1	445	25	81						
NC8405S-1	472	30	84						
NC8405T-1	515	40	87						

Correspondence with the responsible person

其他露天固定噪音源 (如水冷卻塔)運作細節 Operational Details of Other Outdoor Fixed Noise Source (e.g. Cooling Tower)

其他固定噪音源種類 Type of other fixed noise source: Cooling Tower

時間 Time	有否運作? In operation?	運作數量 Unit in operation	位置 Location (如: 行政大樓 9 樓平台/ 天台) (e.g. 9/F Platform of Admin. Building or rooftop)	品牌及型號 Brand and Model	製冷量及聲音數據 (如有) Cooling Capacity and Sound Data (if any)	備註 Remark
上午 7:00 至 晚上 11:00 7am to 11pm	有/ ~~否~~ Y/~~N~~	10	Rooftop	6pc. Marley – NC8405TAN1 3pc. Marley – NC8403RAN1 1pc. Marley – NC8405KAN1	Marley – NC8405TAN1 - 2417kW Marley – NC8403RAN1- 1644kW Marley – NC8405KAN1- 440kW	
晚上 11:00 至 明日上午 7:00 11pm to 7am	有/ ~~否~~ Y/~~N~~	10	Rooftop	6pc. Marley – NC8405TAN1 3pc. Marley – NC8403RAN1 1pc. Marley – NC8405KAN1	Marley – NC8405TAN1 - 2417kW Marley – NC8403RAN1- 1644kW Marley – NC8405KAN1- 440kW	

* 請刪去不適用者 Please delete as appropriate.

Location (Nature):	Metropole Square **(Office Building)**
Source ID:	MS
Description and Observation:	A questionnaire was sent via email in Nov 2025. Based on the reply slip, there are 2 chillers (Brand: Carrier) which operates from 0800-1900. The relevant noise data from the approved EAS for On Muk Street Phase 1 has been extracted and adopted.
Aerial photo	

Operational Details

NS ID	Description	Reference Model	Operation Hour 0700-2300	Operation Hour 2300-0700	SPL for single unit, dB(A)	SWL for single unit, dB(A)
MS-1	Chiller	Carrier	Yes	No	82 at 2m	96
MS-2	Chiller	Carrier	Yes	No	76 at 4m	96

Assumptions	
Reference	With reference to approved EAS report, a maximum measured SPL of 82 dB(A) at 2m from MS01 and SPL of 76 dB(A) at 4m from MS02 has been adopted.

Correspondence with the responsible person

第三部分: 固定噪音源的運作細節 Part III: Operational Details of Fixed Noise Source(s)

露天冷凍水機運作細節 (氣冷式/ 水冷式)* Operational Details of Outdoor Chiller (Air-cooled/ Water-cooled)*

時間 Time	有否運作? In operation?	運作數量 Unit in operation	位置 Location (如: 行政大樓 9 樓平台/ 天台) (e.g. 9/F Platform of Admin. Building or rooftop)	品牌及型號 Brand and Model	製冷量及聲音數據 (如有) Cooling Capacity and Sound Data (if any)	備註 Remark
上午 8:00 至 晚上 7:00 8am to 7pm	有/ ~~否~~* Y/N	2	天台	開利		
晚上 7:00 至明日上午 8:00 7pm to 8am	~~有~~/ 否* Y/N	0	N/A	N/A		

* 請刪去不適用者 Please delete as appropriate.

註: 如果有任何應用的噪音緩解措施 (如消聲器/ 隔音百葉簾)，請添加備註 Note: Please add remark if there is any applied noise mitigation measure (e.g. silencer/ acoustic louvre).

Location (Nature):	Corporation Park **(Office Building)**
Source ID:	CP
Description and Observation:	A questionnaire was sent via email in Nov 2025. Based on the reply slip, there are 2 chillers (Brand: Carrier; Model: 30GH245; Cooling Capacity: 490 TR) which operates from 0800-2300.
Aerial photo	

Operational Details

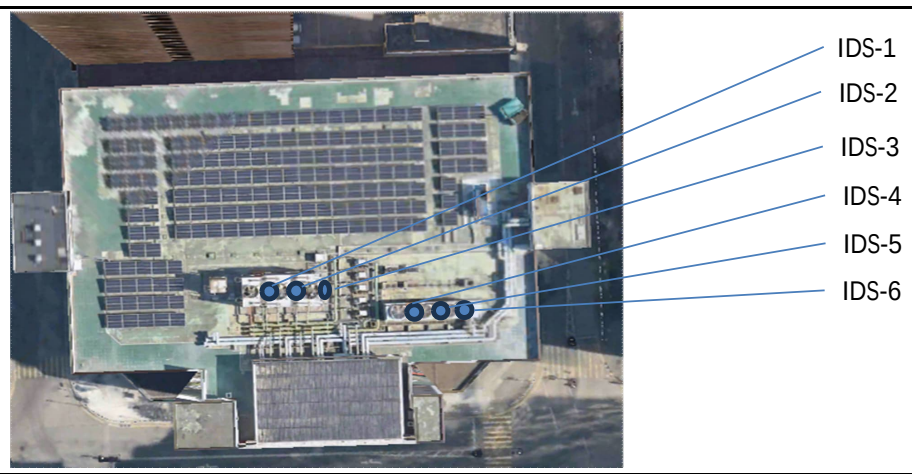
NS ID	Description	Reference Model		Operation Hour 0700-2300	Operation Hour 2300-0700	SWL for single unit, dB(A)	
CP-1	Chiller	Carrier	30GZ245	Yes	No	100	
CP-2	Chiller	Carrier	30GZ245	Yes	No	100	

Assumptions	As sound data of Carrier 30GH245 is not available, sound data from the similar model Carrier 30GZ245 is selected.
Reference	**Catalogue of 30GZ Chiller from Carrier** Sound levels 30GZ: 040 045 060 085 095 100 120 130 145 150 160 170 190 220 245 Sound power, dB(A): 91 97 97 97 95 96 96 97 97 98 98 98 99 99 100 100 **Note:** According to ISO standard 3744 and Eurovent 8/1.
Correspondence with the responsible person	第三部分: 固定噪音源的運作細節 **Part III: Operational Details of Fixed Noise Source(s)** 露天冷凍水機運作細節 (氣冷式/ 水冷式)* Operational Details of Outdoor Chiller (Air-cooled/ Water-cooled)*

時間 Time	有否運作? In operation?	運作數量 Unit in operation	位置 Location (如: 行政大樓 9 樓平台/ 天台) (e.g. 9/F Platform of Admin. Building or rooftop)	品牌及型號 Brand and Model	製冷量及聲音數據 (如有) Cooling Capacity and Sound Data (if any)	備註 Remark
上午 7:00 至 晚上 11:00 7am to 11pm	(有)/ 否* (Y)/N	2部	天台	Carrier 30GH245	490 TR	
晚上 11:00 至 明日上午 7:00 11pm to 7am	(有)/ 否* (Y)/N	✓	✓	✓	✓	

* 請刪去不適用者 Please delete as appropriate.

註: 如果有任何應用的噪音緩解措施 (如消聲器/ 隔音百葉簾)，請添加備註 Note: Please add remark if there is any applied noise mitigation measure (e.g. silencer/ acoustic louvre).

Location (Nature):	Li Fung Centre **(Commercial and Industrial use)**
Source ID:	IDS
Description and Observation:	A questionnaire was sent via email in Nov 2025. No response has been received as of the date of this report. Therefore, based on the estimated size and appearance of the cooling towers, Ryowo FWS-127-11, FWS-169-15 and FWS-200-15 are selected as the reference.
Aerial photo	

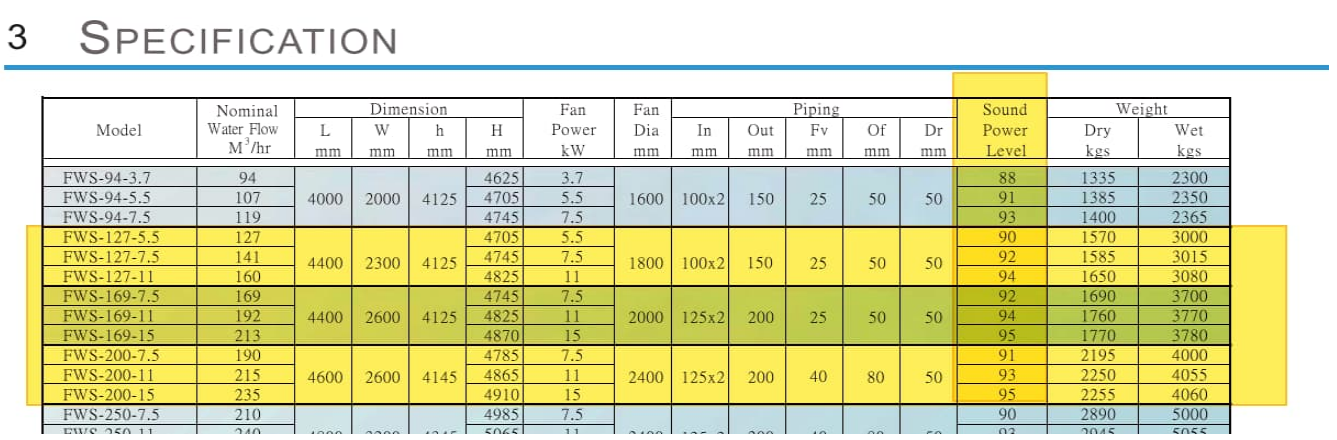
Operational Details

NS ID	Description	Reference Model	Operation Hour 0700-2300	Operation Hour 2300-0700	SWL for single unit, dB(A)
IDS-1	Cooling Tower - 1.8m dia.	Ryowo FWS-127-11	Yes	No	94
IDS-2	Cooling Tower - 2.5m dia.	Ryowo FWS-200-15	Yes	No	95
IDS-3	Cooling Tower - 2.5m dia.	Ryowo FWS-200-15	Yes	No	95
IDS-4	Cooling Tower - 2.2m dia.	Ryowo FWS-169-15	Yes	No	95
IDS-5	Cooling Tower - 2.2m dia.	Ryowo FWS-169-15	Yes	No	95
IDS-6	Cooling Tower - 2.2m dia.	Ryowo FWS-169-15	Yes	No	95

Assumptions	1. The model of cooling tower is assumed based on diameter of fan measured on aerial photo. 2. Assume all chillers in operation in daytime and evening and ½ operation in nighttime.

Reference

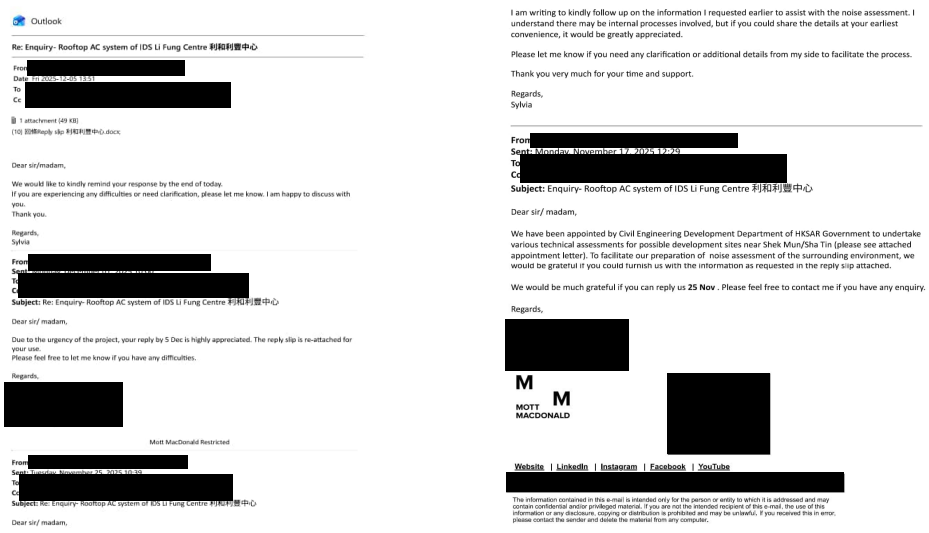
Catalogue of FWS Cooling Tower from Ryowo



3 SPECIFICATION

Model	Nominal Water Flow M^3/hr	Dimension L mm	W mm	h mm	H mm	Fan Power kW	Fan Dia mm	Piping In mm	Out mm	Fv mm	Of mm	Dr mm	Sound Power Level	Weight Dry kgs	Wet kgs
FWS-94-3.7	94	4000	2000	4125	4625	3.7	1600	100x2	150	25	50	50	88	1335	2300
FWS-94-5.5	107				4705	5.5							91	1385	2350
FWS-94-7.5	119				4745	7.5							93	1400	2365
FWS-127-5.5	127	4400	2300	4125	4705	5.5	1800	100x2	150	25	50	50	90	1570	3000
FWS-127-7.5	141				4745	7.5							92	1585	3015
FWS-127-11	160				4825	11							94	1650	3080
FWS-169-7.5	169	4400	2600	4125	4745	7.5	2000	125x2	200	25	50	50	92	1690	3700
FWS-169-11	192				4825	11							94	1760	3770
FWS-169-15	213				4870	15							95	1770	3780
FWS-200-7.5	190	4600	2600	4145	4785	7.5	2400	125x2	200	40	80	50	91	2195	4000
FWS-200-11	215				4865	11							93	2250	4055
FWS-200-15	235				4910	15							95	2255	4060
FWS-250-7.5	210				4985	7.5							90	2890	5000
FWS-250-11	240				5065	11							93	2945	5055

Correspondence with the responsible person



Outlook

Re: Enquiry- Rooftop AC system of IDS Li Fung Centre 利和利豐中心

From: [redacted]
Date: Fri 2025-12-05 13:51
To: [redacted]
Cc:

1 attachment (49 KB)
(10) 回條Reply slip 利和利豐中心.docx;

Dear sir/madam,

We would like to kindly remind your response by the end of today.
If you are experiencing any difficulties or need clarification, please let me know. I am happy to discuss with you.
Thank you.

Regards,
Sylvia

From: [redacted]
Sent: Monday, November 17, 2025 12:29
To: [redacted]
Cc:
Subject: Re: Enquiry- Rooftop AC system of IDS Li Fung Centre 利和利豐中心

Dear sir/ madam,

Due to the urgency of the project, your reply by 5 Dec is highly appreciated. The reply slip is re-attached for your use.
Please feel free to let me know if you have any difficulties.

Regards,
[redacted]

Mott MacDonald Restricted

From: [redacted]
Sent: Tuesday, November 25, 2025 10:30
To: [redacted]
Cc: [redacted]
Subject: Re: Enquiry- Rooftop AC system of IDS Li Fung Centre 利和利豐中心

Dear sir/ madam,

I am writing to kindly follow up on the information I requested earlier to assist with the noise assessment. I understand there may be internal processes involved, but if you could share the details at your earliest convenience, it would be greatly appreciated.

Please let me know if you need any clarification or additional details from my side to facilitate the process.

Thank you very much for your time and support.

Regards,
Sylvia

From: [redacted]
Sent: Monday, November 17, 2025 12:29
To: [redacted]
Cc:
Subject: Enquiry- Rooftop AC system of IDS Li Fung Centre 利和利豐中心

Dear sir/ madam,

We have been appointed by Civil Engineering Development Department of HKSAR Government to undertake various technical assessments for possible development sites near Shek Mun/Sha Tin (please see attached appointment letter). To facilitate our preparation of noise assessment of the surrounding environment, we would be grateful if you could furnish us with the information as requested in the reply slip attached.

We would be much grateful if you can reply us **25 Nov** . Please feel free to contact me if you have any enquiry.

Regards,

[redacted]

M MOTT MACDONALD

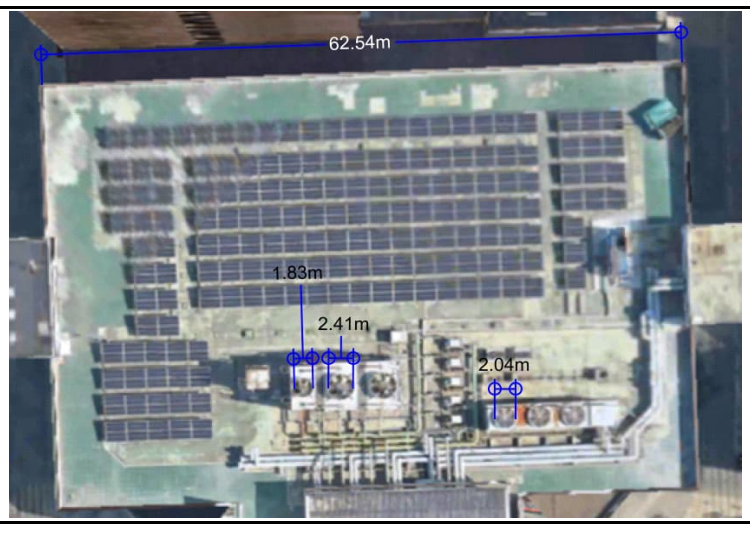
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Website | LinkedIn | Instagram | Facebook | YouTube

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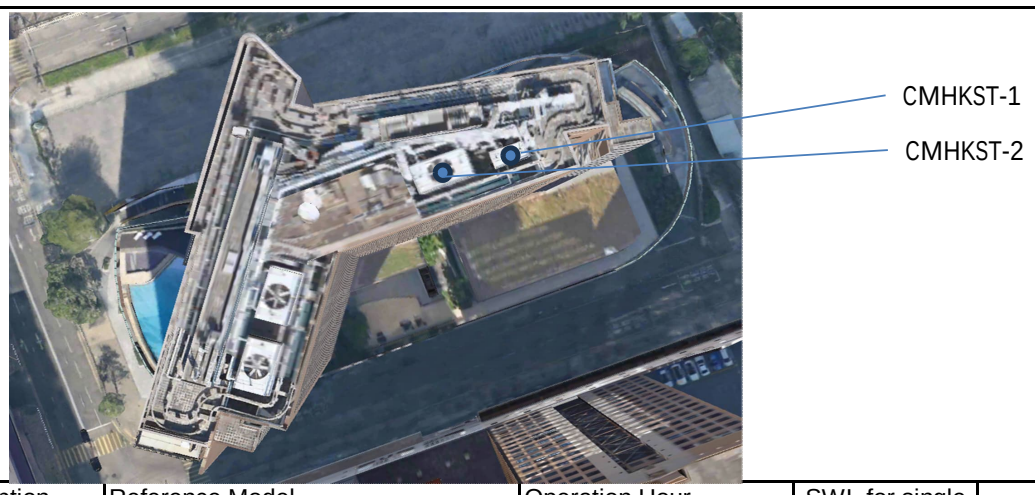
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Measured Dimension from aerial photo



Location (Nature):	Courtyard by Marriott Hong Kong Sha Tin **(Hotel)**
Source ID:	CMHKST
Description and Observation:	A questionnaire was sent via email in Nov 2025. Based on the reply slip, there are 2 cooling towers (Brand: Marley Cooling Tower; Model: NC8407SAN 1 & NC8401PAN 1) operating 24 hours.

Aerial photo



Operational Details

NS ID	Description	Reference Model	Operation Hour 0700-2300	Operation Hour 2300-0700	SWL for single unit, dB(A)
CMHKST-1	Cooling Tower	Marley NC8401PAN 1	Yes	Yes	90
CMHKST-2	Cooling Tower	Marley NC8407SAN 1	Yes	Yes	91

Assumptions

Reference

Engineering Data of NC Steel Cooling Tower from Marley

Model note 2	Nominal Tons note 3	Motor hp	dBA 5'-0" from air inlet face	Design Operating Weight lb	Shipping Weight lb	Dimensions L	W	H	A
NC8401G-1	101	2	63	8488	4062	6'-6¼"	12'-10"	10'-2½"	6'-9¾"
NC8401H-1	117	3	65						
NC8401K-1	139	5	71						
NC8401M-1	159	7.5	73						
NC8401N-1	175	10	76						
NC8401P-1	198	15	78						

Model note 2	Nominal Tons note 3	Nominal Tons with VR Cylinder note 3	Motor hp	dBA 5'-0" from air inlet face	Design Operating Weight lb	Shipping Weight lb	Dimensions L	W	A
NC8407M-1	338	352	7.5	66	27044	11829	11'-10¾"	21'-0"	12'-2¼"
NC8407N-1	372	385	10	69					
NC8407P-1	428	448	15	70					
NC8407Q-1	468	490	20	72					
NC8407R-1	510	531	25	77					
NC8407S-1	540	561	30	79					
NC8407T-1	590	612	40	82					
NC8407U-1	629	653	50	83					
NC8407V-1	664	690	60	84					

Correspondence with the responsible person

其他露天固定噪音源 (如水冷卻塔)運作細節 Operational Details of Other Outdoor Fixed Noise Source (e.g. Cooling Tower)

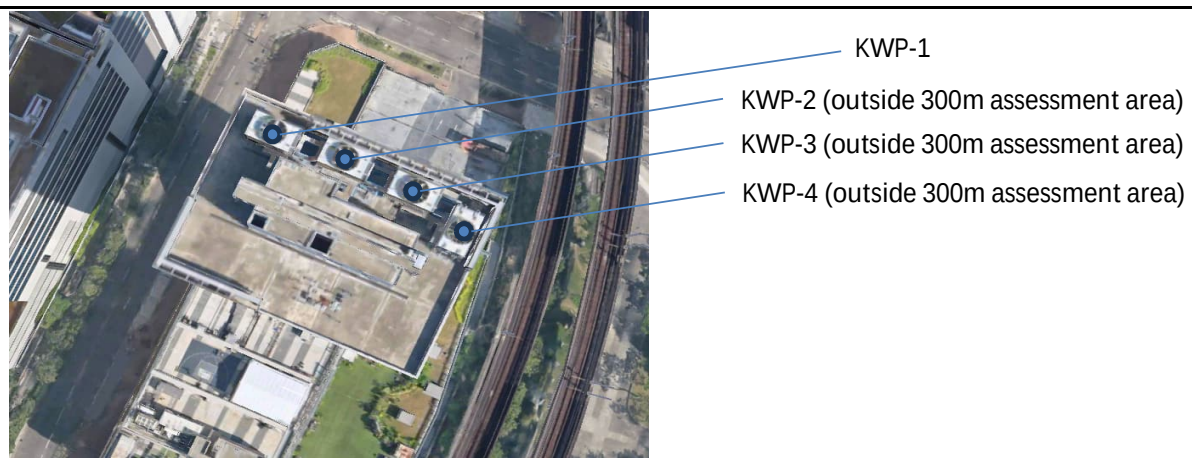
其他固定噪音源種類 Type of other fixed noise source: Cooling Tower

時間 Time	有否運作? In operation?	運作數量 Unit in operation	位置 Location (如: 行政大樓 9 樓平台/ 天台) (e.g. 9/F Platform of Admin. Building or rooftop)	品牌及型號 Brand and Model	製冷量及聲音數據 (如有) Cooling Capacity and Sound Data (if any)	備註 Remark
上午 7:00 至 晚上 11:00 7am to 11pm	有/~~否~~ Y/N	1 部份	天台	Brand: Marley Cooling Tower Model: NC8407SAN 1	Water Flow RATE: 117 L/S	
晚上 11:00 至 明日上午 7:00 11pm to 7am	有/~~否~~ Y/N	1 部份	天台	Brand: Marley Cooling Tower Model: NC8401PAN 1	Water Flow RATE: 42 L/S	

* 請刪去不適用者 Please delete as appropriate.

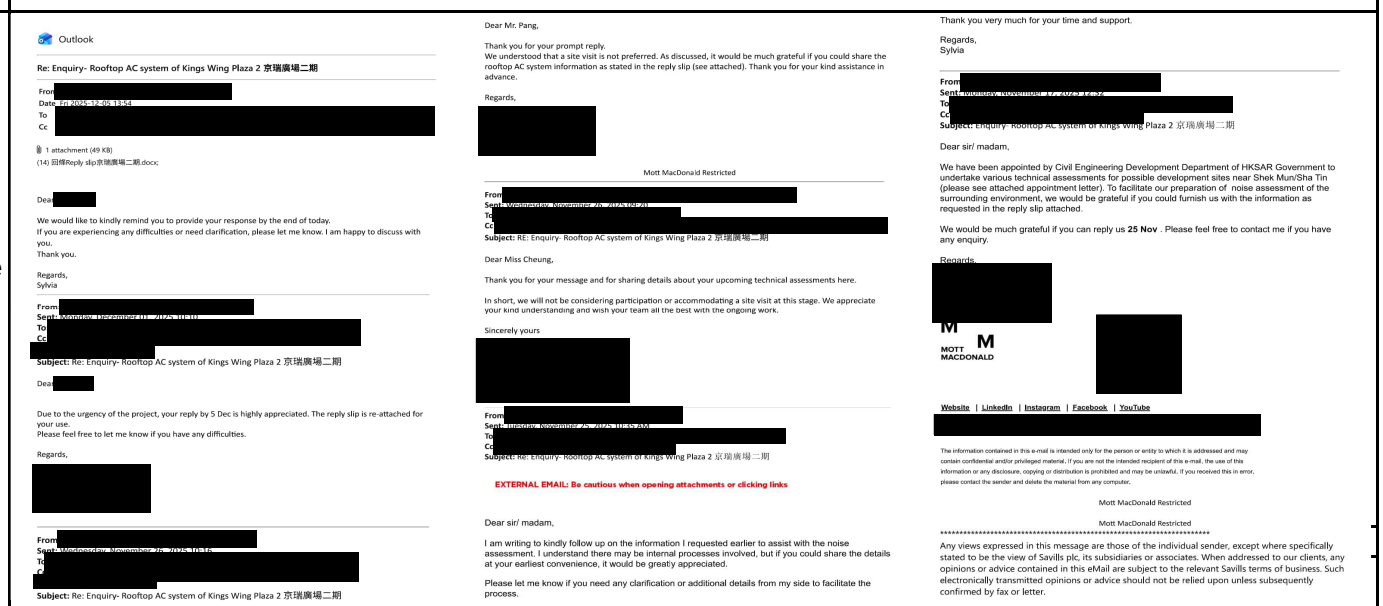
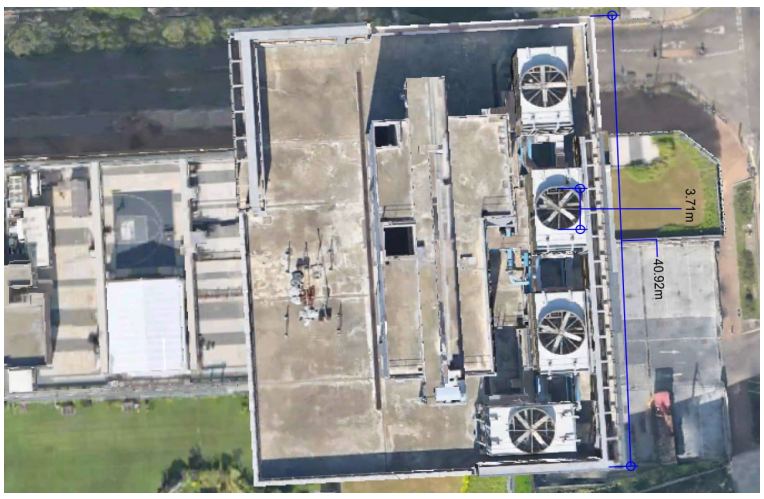
註: 如果有任何應用的噪音緩解措施 (如消聲器/ 隔音百葉簾)，請添加備註 Note: Please add remark if there is any applied noise mitigation measure (e.g. silencer/ acoustic louvre).

回覆日期: 25年11月19日

Location (Nature):	Kings Wing Plaza 2 **(Office Building)**
Source ID:	KWP
Description and Observation:	A questionnaire was sent via email in Nov 2025. No response has been received as of the date of this report. Based on aerial photo, there are four cooling towers on the rooftop. The relevant noise data from the approved EAS for On Muk Street Phase 1 has been extracted and adopted.
Aerial photo	

Operational Details

NS ID	Description	Reference Model	Operation Hour 0700-2300	Operation Hour 2300-0700	SPL for single unit, dB(A)	SWL for single unit, dB(A)
KWP-1	Cooling Tower	-	Yes	No	60 at 4m	80
KWP-2	Cooling Tower	-	Yes	No	60 at 4m	80
KWP-3	Cooling Tower	-	Yes	No	60 at 4m	80
KWP-4	Cooling Tower	-	Yes	No	60 at 4m	80

Assumptions	1. According to the approved EAS report for On Muk Street Phase 1, there is no nighttime operation. Considering there is no change in businees nature of the building, the fact that there is no nighttimer operation is considered to be valid.
Reference	With reference to approved EAS report, a maximum measured SPL of 60 dB(A) at 4m from the identified cooling tower has been adopted.
Correspondence with the responsible person	
Measured Dimension from aerial photo	

Outlook

Re: Enquiry- Rooftop AC system of Kings Wing Plaza 2 京瑞廣場二期

From [redacted]
Date Fri 2025-12-05 13:54
To [redacted]
Cc [redacted]

1 attachment (49 KB)
(14) 回傳Reply slip京瑞廣場二期.docx;

Dear [redacted]

We would like to kindly remind you to provide your response by the end of today.
If you are experiencing any difficulties or need clarification, please let me know. I am happy to discuss with you.
Thank you.

Regards,
Sylvia

From [redacted]
Sent: Monday, December 01, 2025 11:11
To [redacted]
Cc [redacted]
Subject: Re: Enquiry- Rooftop AC system of Kings Wing Plaza 2 京瑞廣場二期

Dear [redacted]

Due to the urgency of the project, your reply by 5 Dec is highly appreciated. The reply slip is re-attached for your use.
Please feel free to let me know if you have any difficulties.

Regards,
[redacted]

From [redacted]
Sent: Wednesday, November 26, 2025 10:15
To [redacted]
Cc [redacted]
Subject: Re: Enquiry- Rooftop AC system of Kings Wing Plaza 2 京瑞廣場二期

Dear Mr. Pang,

Thank you for your prompt reply.
We understood that a site visit is not preferred. As discussed, it would be much grateful if you could share the rooftop AC system information as stated in the reply slip (see attached). Thank you for your kind assistance in advance.

Regards,
[redacted]

Mott MacDonald Restricted

From [redacted]
Sent: Wednesday, November 26, 2025 10:01
To [redacted]
Cc [redacted]
Subject: RE: Enquiry- Rooftop AC system of Kings Wing Plaza 2 京瑞廣場二期

Dear Miss Cheung,

Thank you for your message and for sharing details about your upcoming technical assessments here.

In short, we will not be considering participation or accommodating a site visit at this stage. We appreciate your kind understanding and wish your team all the best with the ongoing work.

Sincerely yours
[redacted]

From [redacted]
Sent: Monday, November 24, 2025 11:54 AM
To [redacted]
Cc [redacted]
Subject: Re: Enquiry- Rooftop AC system of Kings Wing Plaza 2 京瑞廣場二期

EXTERNAL EMAIL: Be cautious when opening attachments or clicking links

Dear sir/ madam,

I am writing to kindly follow up on the information I requested earlier to assist with the noise assessment. I understand there may be internal processes involved, but if you could share the details at your earliest convenience, it would be greatly appreciated.

Please let me know if you need any clarification or additional details from my side to facilitate the process.

Thank you very much for your time and support.

Regards,
Sylvia

From [redacted]
Sent: Monday, November 17, 2025 [illegible]
To [redacted]
Cc [redacted]
Subject: Enquiry- Rooftop AC system of Kings Wing Plaza 2 京瑞廣場二期

Dear sir/ madam,

We have been appointed by Civil Engineering Development Department of HKSAR Government to undertake various technical assessments for possible development sites near Shek Mun/Sha Tin (please see attached appointment letter). To facilitate our preparation of noise assessment of the surrounding environment, we would be grateful if you could furnish us with the information as requested in the reply slip attached.

We would be much grateful if you can reply us **25 Nov** . Please feel free to contact me if you have any enquiry.

Regards,
[redacted]

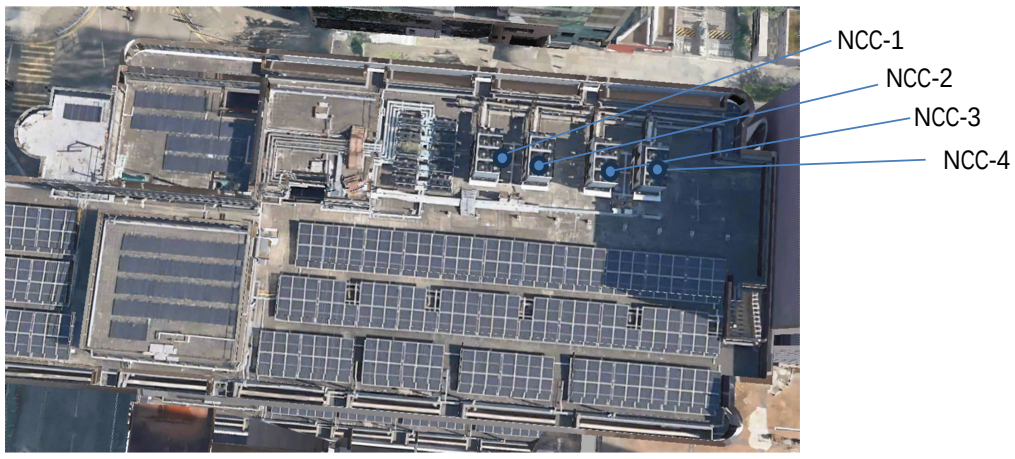
MOTT MACDONALD

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[redacted]

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Location (Nature):	New Commerce Centre (Commercial and Industrial use)
Source ID:	NCC
Description and Observation:	A questionnaire was sent via email in Nov 2025. No response has been received as of the date of this report. There are four chillers on the rooftop. Based on the estimated size and appearance of the chillers, Carrier 30XA302 is selected as the reference.
Aerial photo	

Operational Details

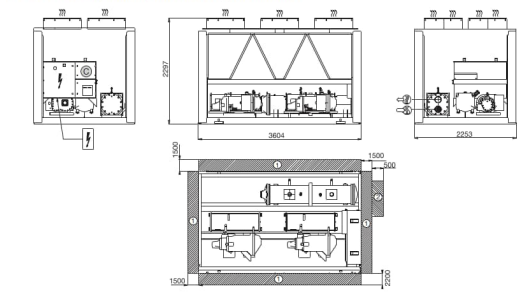
NS ID	Description	Reference Model		Operation Hour 0700-2300	Operation Hour 2300-0700	SWL for single unit, dB(A)	
NCC-1	Chiller	Carrier	XA 302	Y	N	89	
NCC-2	Chiller	Carrier	XA 302	Y	N	89	
NCC-3	Chiller	Carrier	XA 302	Y	N	89	
NCC-4	Chiller	Carrier	XA 302	Y	N	89	

Assumptions	1. Assume all chillers in operation in daytime and evening and ½ operation in nighttime.

Reference

Catalogue of 30XA Air-Cooled Chillers from Carrier

3.1 - 30XA 252-352 (standard) and 252-302 (option 254/255)



4.3 - Sound levels

30XA		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Standard unit																					
Sound power level*	dB(A)	89	89	89	92	93	93	94	93	95	95	94	96	95	96	96	96	97	97	97	97
Sound pressure level at 10 m**	dB(A)	57	57	57	60	61	61	62	61	63	63	62	63	63	63	63	63	64	64	64	64
Standard unit + option 257																					
Sound power level*	dB(A)	86	86	86	89	90	90	91	90	92	92	91	93	92	93	93	93	94	94	94	94
Sound pressure level at 10 m**	dB(A)	54	54	54	57	58	58	59	57	60	59	58	60	59	60	60	60	61	61	61	61
High energy efficiency version (option 119)																					
Sound power level*	dB(A)	94	94	94	95	95	95	96	96	98	98	98	99	98	99	100	99	100	101	100	101
Sound pressure level at 10 m**	dB(A)	62	62	62	62	62	62	63	64	65	66	65	66	65	66	67	66	67	68	67	67
Unit with options 119 + 257																					
Sound power level*	dB(A)	92	92	92	94	94	94	95	95	96	96	96	97	97	98	98	98	98	99	99	99
Sound pressure level at 10 m**	dB(A)	60	60	60	62	62	62	62	62	63	63	63	64	64	65	65	65	62	66	66	65

* 10^{-12} W - In accordance with ISO 9614-1 and certified by Eurovent
** Average sound pressure level, unit in a free field on a reflective surface

Correspondence with the responsible person

Outlook

Re: Enquiry- Rooftop AC system of New Commerce Centre 滙貿中心

From [redacted]
Date 於 2025-12-03 13:33
To [redacted]
Cc [redacted]

1 attachment (49 KB)
(11) 回條Reply slip 滙貿中心.docx;

Dear sir/madam,

We would like to kindly remind you to provide your response by the end of today.
If you are experiencing any difficulties or need clarification, please let me know. I am happy to discuss with you.
Thank you.

Regards,
Sylvia

From: Sylvia Cheung [redacted]
Sent: Monday, December 01, 2025 10:03
To: [redacted]
Cc: Andrew Tsang [redacted]
Subject: Re: Enquiry- Rooftop AC system of New Commerce Centre 滙貿中心

Dear sir/ madam,

Due to the urgency of the project, your reply by 5 Dec is highly appreciated. The reply slip is re-attached for your use.
Please feel free to let me know if you have any difficulties.

Regards,

Sylvia Cheung
[redacted]

From [redacted]
Sent: Tuesday, November 25, 2025 10:19
To [redacted]
Cc [redacted]
Subject: Re: Enquiry- Rooftop AC system of New Commerce Centre 滙貿中心

Dear sir/ madam,

I am writing to kindly follow up on the information I requested earlier to assist with the noise assessment. I understand there may be internal processes involved, but if you could share the details at your earliest convenience, it would be greatly appreciated.

Please let me know if you need any clarification or additional details from my side to facilitate the process.

Thank you very much for your time and support.

Regards,
Sylvia

From [redacted]
Sent: Monday, November 17, 2025 12:30
To [redacted]
Cc [redacted]
Subject: Enquiry- Rooftop AC system of New Commerce Centre 滙貿中心

Dear sir/ madam,

We have been appointed by Civil Engineering Development Department of HKSAR Government to undertake various technical assessments for possible development sites near Shek Mun/Sha Tin (please see attached appointment letter). To facilitate our preparation of noise assessment of the surrounding environment, we would be grateful if you could furnish us with the information as requested in the reply slip attached.

We would be much grateful if you can reply us **25 Nov** . Please feel free to contact me if you have any enquiry.

Regards,

[redacted]

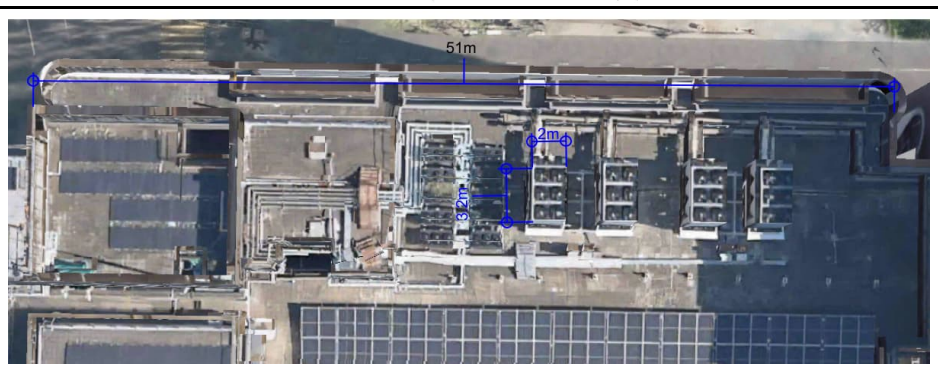
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[redacted]

Website | LinkedIn | Instagram | Facebook | YouTube
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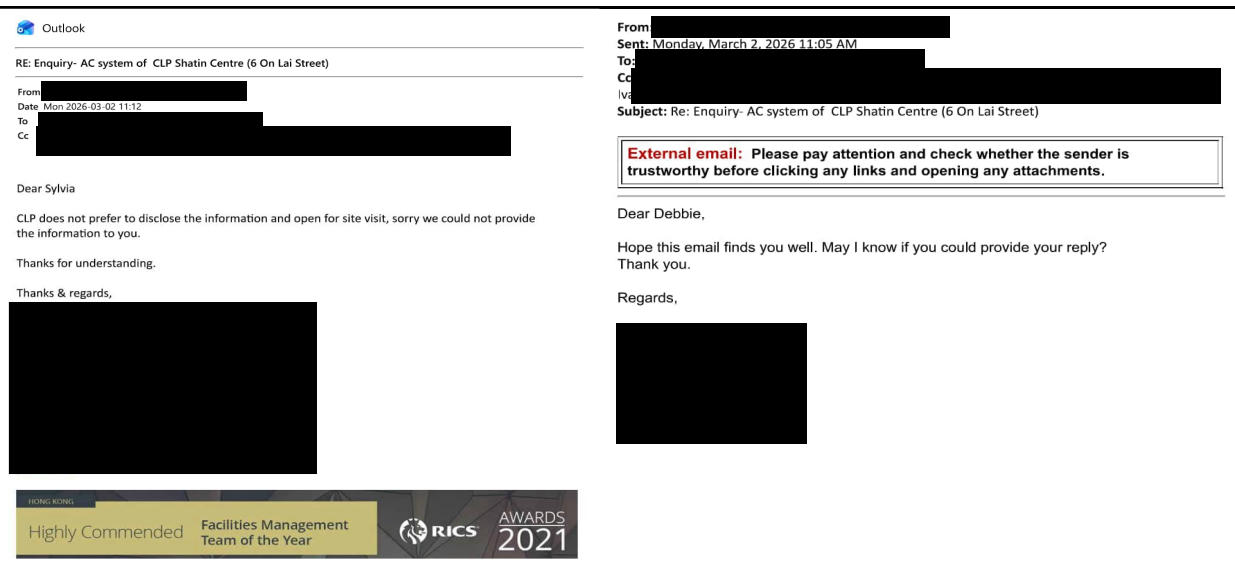
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Measured Dimension from aerial photo



Location (Nature):	CLP Power Hong Kong Limited Shatin Centre
Source ID:	CLP
Description and Observation:	A questionnaire was sent via email in Feb 2026. No response has been received as of the date of this report. Based on aerial photo, there are three chillers on podium, one chiller and two cooling towers on rooftop. The relevant noise data from the approved EAS for On Muk Street Phase 1 has been extracted and adopted.
Aerial photo	

	NS ID	Description	Reference Model	Operation Hour		SPL for single unit, dB(A)	SWL for single unit, dB(A)
				0700-2300	2300-0700		
Operational Details	CLP-1	Chiller	-	Y	Y	78 at 4m	98
	CLP-2	Chiller	-	Y	Y	78 at 4m	98
	CLP-3	Chiller	-	Y	Y	78 at 4m	98
	CLP-4	Cooling tower	-	Y	Y	71 at 2m	85
	CLP-5	Cooling tower	-	Y	Y	72 at 2m	86
	CLP-6	Chiller	-	Y	Y	81 at 2.5m	97

Assumptions	It is assumed to operate for 24 hours.
Reference	With reference to approved EAS report, a maximum measured SPL of 78 dB(A) at 4m from CLP-1 to 3, SPL of 71 dB(A) at 2m from CLP-4, SPL of 72dB(A) at 2m from CLP-5 and SPL of 81 dB(A) at 2.5m from CLP-6 have been adopted.
Correspondence with the responsible person	

Outlook

RE: Enquiry- AC system of CLP Shatin Centre (6 On Lai Street)

From [redacted]
Date Mon 2026-03-02 11:12
To [redacted]
Cc [redacted]

Dear Sylvia

CLP does not prefer to disclose the information and open for site visit, sorry we could not provide the information to you.

Thanks for understanding.

Thanks & regards,

[redacted]

HONG KONG Highly Commended Facilities Management Team of the Year RICS AWARDS 2021

From [redacted]
Sent: Monday, March 2, 2026 11:05 AM
To: [redacted]
Cc [redacted]
Subject: Re: Enquiry- AC system of CLP Shatin Centre (6 On Lai Street)

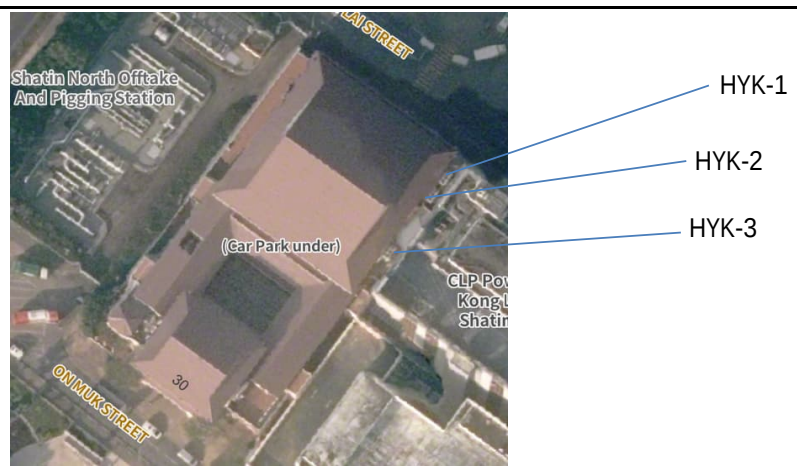
External email: Please pay attention and check whether the sender is trustworthy before clicking any links and opening any attachments.

Dear Debbie,

Hope this email finds you well. May I know if you could provide your reply?
Thank you.

Regards,

[redacted]

Location (Nature):	Heung Yee Kuk Building
Source ID:	HYK
Description and Observation:	A questionnaire was sent via email in Nov 2025. No response has been received as of the date of this report. Based on aerial photo, there are three chillers on the podium. The relevant noise data from the approved EAS for On Muk Street Phase 1 has been extracted and adopted. Facade effect was included in the measurements.
Aerial photo	

Operational Details	NS ID	Description	Reference Model	Operation Hour 0700-2300	Operation Hour 2300-0700	SPL for single unit, dB(A)	SWL for single unit, dB(A)
	HYK-1	Chiller	-	Y	N	82 at 2m	96
	HYK-2	Chiller	-	Y	N	82 at 2m	96
	HYK-3	Chiller	-	Y	N	82 at 2m	96

Assumptions	1. With reference to surrounding building of similar business nature (i.e.. Grandtech Centre), it is assumed there will be no nighttime operation. This assumption is also supported by approved EAS report for On Muk Street Phase 1.
Reference	With reference to approved EAS report, a maximum measured SPL of 82 dB(A) at 2m from the identified chiller has been adopted.

Correspondence with the responsible person

Outlook

Re: Enquiry- Rooftop AC system of Heung Yee Kok

From [redacted]
Date Mon 2026-02-23 11:15
To [redacted]
Cc [redacted]

2 attachments (76 KB)
IC0001 CEDD HP3 (fax copy).pdf; (15) 回條Reply slip鄉議局.docx;

Dear sir/ madam,

Grateful if you could provide your response. Thank you.

Regards,
Sylvia

Mott MacDonald Restricted

From [redacted]
Sent: Tuesday, February 3, 2026 09:55
To [redacted]
Cc [redacted]
Subject: Enquiry- Rooftop AC system of Heung Yee Kok

Dear sir/ madam,

We have been appointed by Civil Engineering Development Department of HKSAR Government to undertake various technical assessments for possible development sites near Shek Mun/Sha Tin (please see attached appointment letter). To facilitate our preparation of noise assessment of the surrounding environment, we would be grateful if you could furnish us with the information as requested in the reply slip attached.

We would be much grateful if you can reply us **10 Feb** . Please feel free to contact me if you have any enquiry.

Regards,

[redacted]

MOTT MACDONALD

[redacted]

Appendices 4.4.1 and 4.4.2

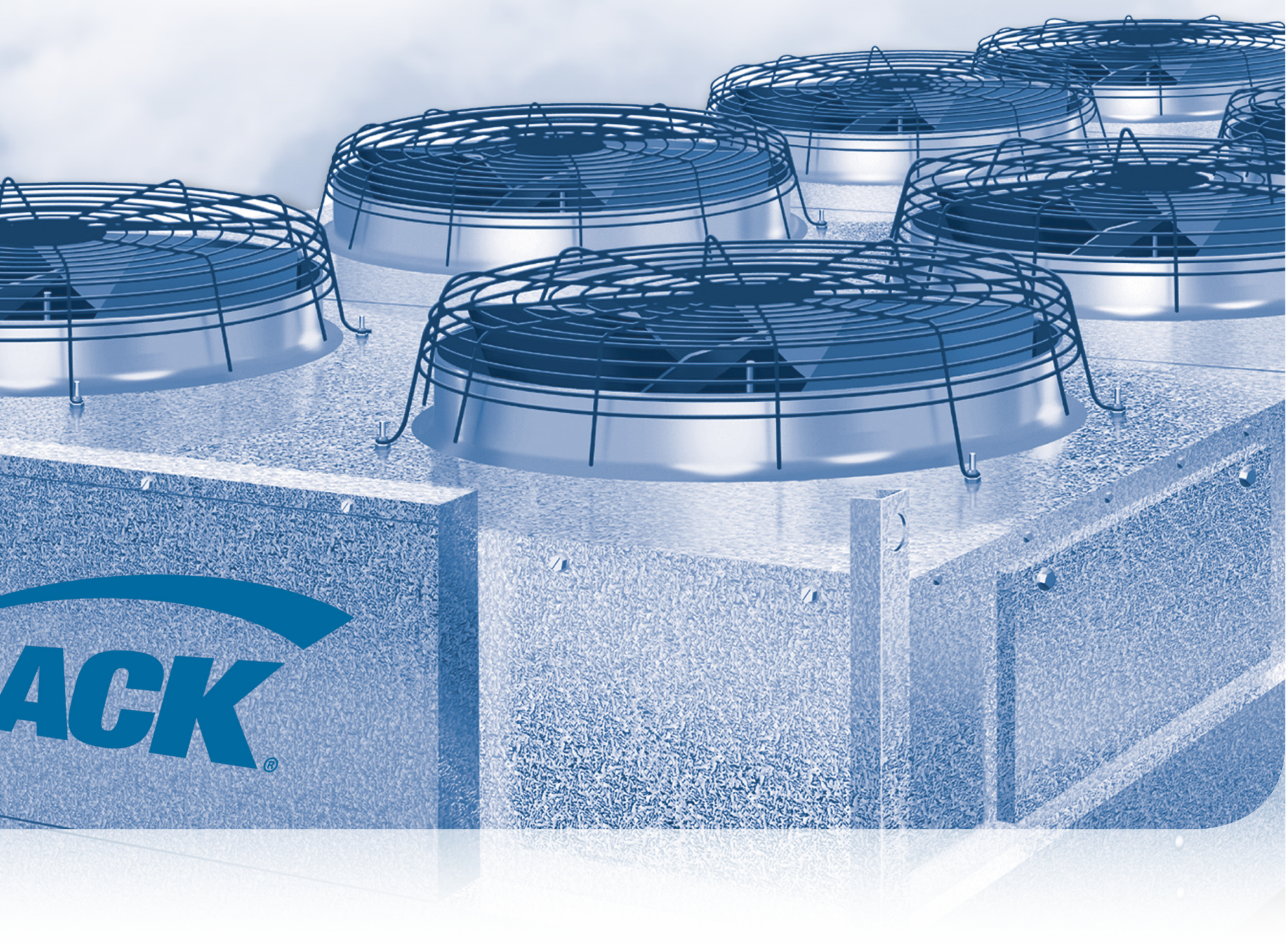
- Appendix 4.4.1a Catalogue for GC
- Appendix 4.4.1b Catalogue for TP
- Appendix 4.4.1c Catalogue for DH
- Appendix 4.4.1d Catalogue for WL
- Appendix 4.4.1e Catalogue for HSB
- Appendix 4.4.1f Catalogue for CP
- Appendix 4.4.1g Catalogue for IDS
- Appendix 4.4.1h Catalogue for CMHKST
- Appendix 4.4.1i Catalogue for NCC
- Appendix 4.4.2 Extract of Approved EAS for On Muk Street Phase 1

Appendix 4.4.1a Catalogue for GC

Levitor II

AIR-COOLED CONDENSER

Datasheet



Products that provide lasting solutions.

Levitor II Air-Cooled Condenser

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Note

For all **Performance Data Tables**, capacity ratings are based on midpoint condensing temperature at 95° F entering air temperature and with 0° F sub-cooling. TEMPERATURE DIFFERENCE is midpoint condensing temperature to entering ambient air temperature.

De-rate capacity data 10% for 50 Hz applications with all motors except K (variable speed BPM motors and panel mounted drive) which have no reduction in capacity for the change in frequency.

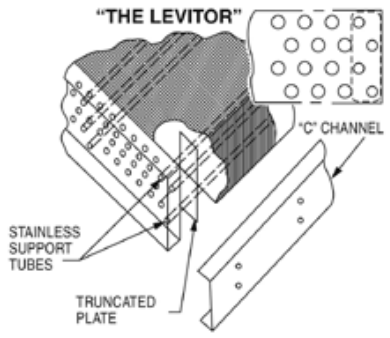
See **Electrical Motor Data Tables** on pages 13 - 15.

Specifications subject to change without notice.

Levitor II Air-Cooled Condenser

(Available for Fluid Cooler Applications)

Benefits and Features



Rooftop condensers have to operate in some of the toughest conditions imaginable. Temperature extremes result in constant expansion and contraction of refrigerant tubes as fans cycle and loads vary.

The consequences are costly: rapid tube wear results inleaks, system breakdown and loss of costly refrigerant.

The LEVITOR system addresses refrigerant coil wear and leaks due to vibration and thermal stress.

LEVITOR Coil Design Eliminates Refrigerant Tube Wear

Environmental concerns and spiraling cost of refrigerants have led to the development of direct drive remote air-cooled condensers with the LEVITOR coil support system. This innovative design uses dedicated stainless steel tubes and a unique coil support system to isolate refrigerant tubes from the unit. Coil support is transferred from the fins to the stainless tubes and truncated tube plates which ride freely in "C" channels. Tubes expand and contract without interference. The result, contact and friction wear are eliminated.

Quiet by Design

LEVITOR coil design does more than just eliminate tube wear. Sound reduction is an added benefit. Unlike traditional air-cooled condensers, fan and coil vibration are isolated from the cabinet, so it is not transmitted to the unit frame and building supports.

Vspeed Variable Speed Condenser Fan Solutions

- Krack's latest fan motor technology is now offered with a variable speed fan motor solution called Vspeed under the LAVK configuration that utilizes a Brushless Permanent Motor (BPM) and panel mounted electronic drive (per motor). The electronic drive will vary the fan speeds (1140 RPM at 0 volts / 0 RPM at 10 volts) to match the loads saving more energy versus single speed fans. Fan blade configurations, mounting, and capacities are equivalent to the standard 1140 RPM motor options.

Low Sound Quietor Fan

- The "swept-wing" blade design offers lower noise levels at the same fan speed. For example, the QUIETOR fan blade on a 575 RPM motor will be much quieter (8 dBA) than the old 575 RPM fan.
- Lower noise condensers can translate into savings for your customer by minimizing the need of costly noise barriers.
- Quietor fan not available on 24" models.

Computerized Circuiting

- Our computerized coil circuiting program is designed to minimize the condenser refrigerant charge and maximize sub-cooling. Every condenser will be custom circuited to precisely meet your application needs.

Modular Design

- Arranged for vertical or horizontal air discharge. Multi-fan sections compartmented to allow individual fan cycling while preventing off-fan "windmilling". Large clean-out access doors standard.

Corrosion Resistant

- All models employ mill galvanized steel fan sections and coil side baffles. Legs are heavy gauge mill galvanized steel.

Direct Driven Propeller Fans

- Quiet multi-bladed propeller fans provide uniform air distribution through the coil. Venturi fan orifices optimize efficiency.

High Efficiency Coil

- Copper tubes are mechanically expanded into corrugated full collared aluminum fins spaced 8, 10, or 12 per inch. Coils are helium leak and pressure tested with 400 psig dry air, shipped pressurized with dry nitrogen.
- Optional fin materials are copper or polyester coated aluminum.
- Optional Electrofin or Heresite coil coatings.
- Multi-circuiting available.

Fan Motors and Electrical Rating

- Outdoor condenser motors designed with ball bearings inherent overheat protection in each phase; shaft slingers; enclosure, hardware, and lubrication for all weather conditions. Each motor lead is wired to terminals in an electrical enclosure.
- Inverter duty motors are standard for 230/3 ,460/3 and some 575/3 (F = 1140 RPM and A = 850 RPM 1 HP) condensers.
- Variable speed motors are available for 230/3 and 460/3 (K = 1140 RPM 1.5 HP) condensers.
- Default AIC rating is 10,000 amps (10kA) with rating up to 100kA available with selection of fused disconnect and standard fuses for fan motors.
- Standard phase monitor protects the fan motors from potential phase loss/imbalance in the power supply, ensuring increased reliability and a long life.

Versatile Fan Cycling Control Methods

- Temperature fan cycling
- Pressure fan cycling
- Temperature and pressure fan cycling
- Electronic relay boards
- Variable speed header end fans
- Energy-saving variable speed options for all fans

c UL us LISTED

Specifications subject to change without notice.

Levitor II Air-Cooled Condenser

System Selection

THR Total Heat of Rejection

- Condenser total heat of rejection (BTU/H) is the sum of the evaporator refrigeration effect and the heat of compression which varies with compressor type and operating conditions.

THR Calculation Method

- THR = Open Reciprocating Compressor Capacity (BTU/H) + (2545 x BHP)
- THR = Suction Gas Cooled Hermetic Reciprocating Compressor Capacity (BTU/H) + (3413 x kW)

THR Estimated Method

- THR may be estimated by multiplying the rated compressor BTU/H capacity by the compressor operating condition factor shown in Table 1 or 2. Multiply result by altitude factor when applicable.

TABLE 1

EVAPORATOR TEMP (°F)	HERMETIC COMPRESSOR CONDENSING TEMPERATURE (°F) 90	100	110	120	130	140
-40	1.66	1.73	1.80	2.00	*	*
-30	1.57	1.62	1.68	1.80	*	*
-20	1.49	1.53	1.58	1.65	*	*
-10	1.42	1.46	1.50	1.57	1.64	*
0	1.36	1.40	1.44	1.50	1.56	1.62
5	1.33	1.37	1.41	1.46	1.52	1.59
10	1.31	1.34	1.38	1.43	1.49	1.55
15	1.28	1.32	1.35	1.40	1.46	1.52
20	1.26	1.29	1.33	1.37	1.43	1.49
25	1.24	1.27	1.31	1.35	1.40	1.45
30	1.22	1.25	1.28	1.32	1.37	1.42
40	1.18	1.21	1.24	1.27	1.31	1.35
50	1.14	1.17	1.20	1.23	1.26	1.29

* Beyond the normal limits for single-stage compressor application.

TABLE 2

EVAPORATOR TEMP (°F)	OPEN COMPRESSOR CONDENSING TEMPERATURE (°F) 90	100	110	120	130	140
-30	1.37	1.42	1.47	*	*	*
-20	1.33	1.37	1.42	1.47	*	*
-10	1.28	1.32	1.37	1.42	1.47	*
0	1.24	1.28	1.32	1.37	1.41	1.47
10	1.21	1.24	1.28	1.32	1.36	1.42
20	1.17	1.20	1.24	1.28	1.32	1.37
30	1.14	1.17	1.20	1.24	1.27	1.32
40	1.12	1.15	1.17	1.20	1.23	1.28
50	1.09	1.12	1.14	1.17	1.20	1.24

* Beyond the normal limits for single-stage compressor application.

TABLE 3

ALTITUDE FEET	FACTOR	FEET	FACTOR
1,000	1.02	5,000	1.12
2,000	1.05	6,000	1.15
3,000	1.07	7,000	1.17
4,000	1.10	8,000	1.24

Multi-Circuit Selection

- Condenser coils may be divided into several individual refrigeration circuits or systems; each sized for a specific refrigerant, THR capacity and TD. Systems are tagged for identification from left to right; facing the connection end. Avoid 3 row condensers. 34 circuits are available on 30" fan models and 30 circuits on 24" fan models. Un-used circuits should be added to low TD sections next to high TD sections or the outboard sections of the condenser.

SAMPLE CALCULATION: 95°F AMBIENT-SUCTION COOLED SEMI-HERMETIC RECIPROCATING COMPRESSORS

COMP NOM HP	REF	DESIGN TD °F	SAT SUCT °F	SAT COND °F	COMPRESSOR RATING NET BTU/H	MOTOR kW	BTU	TOTAL BTU/H	BASED ON R-404A AT 15° FTD REF FACTOR		TD FACTOR		SELECT THR	CAP PER CIRCUIT	CIRCUIT REQ'D	# CIR	SYSTEM NUMBER L TO R	ACTUAL TD °F
6	134a	15	+20	110	40090	4.3	14676	54,766	÷ 0.97	x	1.0	=	56460	13450	4.2	4	1	15.7
9	404A	10	-20	105	45900	8.1	27645	73,545	÷ 1.00	x	1.5	=	110318	13450	8.2	10	2	8.2
10	404A	10	-20	105	50640	9.6	32765	83,405	÷ 1.00	x	1.5	=	125108	13450	9.3	10	3	9.3
12	22	15	+20	110	104000	9.7	33106	137,106	÷ 1.02	x	1.0	=	134418	13450	10.0	10	4	15.0
									UNIT THR REQ'D				426304			34		

Selection

- LAVA-14410 Rated at THR of 457.3 MBH with R-404A at 15° F TD. LAVA-14410 Unit lists 34 Circuits.
- Sample Calculation: THR Req'd. / Circuit = 426304 ÷ 34 = 12538. LAVA-14410 = 457300 ÷ 34 = 13450 (Available THR / Circuit).
- Circuits Req'd. = Select THR ÷ THR / Circuit. Example: 56460 ÷ 13450 = 4.2 Circuits.
- Assign Number of Circuits System and System Number Left to Right. Actual TD = (Circuits Req'd ÷ Assign Circuits) x Design TD. Example: 4.2 ÷ 4 x 15 = 15.7.

REF FACTOR R-404A Baseline
R-404A - 1.00
R-22 - 1.02
R-134a - 0.97
R-410A - 1.02

REF FACTOR R-407A Baseline
R-407A - 1.00
R-407C - 0.98
R-448A / R-449A - 1.00

TD FACTOR
10°F - 1.50
15°F - 1.00
20°F - 0.75
25°F - 0.60

Levitor II Air-Cooled Condenser

Levitor Application

Locate Condensers no closer than their width from wall or other condensers. Avoid locations near exhaust fans, plumbing vents, flues or chimneys. Reference the IOM for other considerations for locating condensers.

Parallel Condensers should be the same models resulting in the same refrigerant side pressure drops. Compressor discharge lines should have equal pressure drops to each condenser.

Summer Charge based on 25% of condenser volume with 90˚ F liquid. Multiply by 1.1 for R-407A.

Winter Charge based on 90% of condenser volume with -20˚ F liquid. Multiply by 1.08 for R-407A.

Receiver Capacity should be sized to store condenser summer charge, plus the condenser low ambient allowance, plus the evaporator charge, plus an allowance for piping and heat reclaim coil charges.

Compressor Discharge lines should be sized to minimize pressure drops and maintain oil return gas velocities. Each connection should be looped to the top of the condenser.

Gravity Liquid Drain Lines should drop from each outlet as low as possible before headering or running horizontally. Pitch downhill to receiver.

Off-Line Coil Sections will have refrigerant pressures corresponding to the ambient. Check valves or isolating valves should be installed in the liquid line drains to prevent refrigerant migration and receiver pressure loss.

See Installation and Operating instructions for piping, holdback and fan cycling details.

Note

For all **Performance Data Tables**, capacity ratings are based on midpoint condensing temperature at 95° F entering air temperature and with 0° F sub-cooling. TEMPERATURE DIFFERENCE is midpoint condensing temperature to entering ambient air temperature.

De-rate capacity data 10% for 50 Hz applications with all motors except K (variable speed BPM motors and panel mounted drive) which have no reduction in capacity for the change in frequency.

See **Electrical Motor Data Table** on page 13.

Levitor II Air-Cooled Condenser

Model Key

L	A	V	A	1	2	4	10	M

UNIT TYPE:
L = Levitor Condenser

TUBE DIAMETER:
A = 3/8
E = 1/2

FAN DISCHARGE DIRECTIONS:
H = Horizontal
V = Vertical
X = Hinged Vertical
E = Hinged Horizontal

FAN / MOTOR COMBINATION:
A = 850 RPM, 1 HP, 30"
B = 1140 RPM, 0.5 HP, 24"
C = 850 RPM, 1.5 HP, 30"
E = 575 RPM, 0.5 HP, 30"
F = 1140 RPM, 1.5 HP, 30"
K = 1140 RPM, 1.5 HP, 30"*

FANS WIDE: 1, 2

VOLTAGE:
A = 230/1/60**
K = 208-230/3/60
M = 460/3/60
P = 575/3/60
U = 380/3/50

FIN SPACING:
08 = 8 FPI
10 = 10 FPI
12 = 12 FPI

ROWS DEEP:
2
3
4

FANS IN LINE:
1
2
3
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Note:
* K Vspeed Variable Speed BPM (brushless permanent magnet motors) and panel mounted electronic drive are 208-240/3/60, 380/3/50, 380/3/60, and 460/3/60. Gravity dampers should not be used with K motor applications.
** LAVB only

Correction Factors Table

REFRIGERANTS	MULTIPLY R-404A BY CAPACITY FACTOR	CHARGE CORRECTION FACTOR	
		SUMMER	WINTER
R-404A	1.00	1.00	1.00
R-134a	0.97	1.17	1.11
R-410A	1.02	1.02	1.03
R-22	1.02	1.14	1.09
R-407A	See R-407A Chart	1.10	1.08
R-407C	0.98 x R-407A	1.09	1.07
R-448A / R-449A	See R-448A / R-449A Chart	1.06	1.04
R513A	See R-404A / R-507A Chart	1.10	1.05

Levitor II Air-Cooled Condenser

LAVF/LAVK Performance Data

(1.5 HP - 1140 RPM)

ONE FAN WIDE

MODEL	TOTAL HEAT OF REJECTION (MBH) R-404A, R-507A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	R-407A, R-448A / R-449A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	AIR FLOW (CFM)	CEC TITLE 24 COMPLIANT	CONDENSER CHARGE R-404A (LBS) SUMMER	WINTER	EST SOUND 10' (dBA)	SHIP WEIGHT (LBS)
LAV( )-11208	46.3	69.4	92.5	115.6	44.2	66.3	88.4	110.5	11649	No	4	17	72	437
LAV( )-11210	53.2	79.8	106.4	133.0	51.8	77.7	103.6	129.5	11541	No	4	17	72	439
LAV( )-11212	59.8	89.7	119.6	149.5	58.5	87.8	117.1	146.3	11430	No	4	17	72	444
LAV( )-11308	64.7	97.1	129.5	161.9	62.9	94.4	125.9	157.3	11323	No	6	25	72	466
LAV( )-11310	74.0	111.0	148.0	185.1	73.2	109.8	146.4	183.0	11147	No	6	25	72	469
LAV( )-11312	81.8	122.8	163.7	204.6	81.8	122.6	163.5	204.4	10969	No	6	25	72	478
LAV( )-11408	78.2	117.2	156.3	195.4	77.8	116.6	155.5	194.4	10974	No	8	33	72	495
LAV( )-11410	87.6	131.3	175.1	218.9	88.4	132.7	176.9	221.1	10730	Compliant	8	33	72	499
LAV( )-11412	95.1	142.6	190.2	237.7	97.2	145.7	194.3	242.9	10486	No	8	33	72	508
LAV( )-12208	92.5	138.8	185.0	231.3	88.4	132.5	176.7	220.9	23298	No	9	32	75	718
LAV( )-12210	106.4	159.6	212.8	266.0	103.6	155.4	207.1	258.9	23082	No	9	32	75	721
LAV( )-12212	119.6	179.4	239.2	299.0	117.1	175.6	234.1	292.7	22860	No	9	32	75	729
LAV( )-12308	129.5	194.2	259.0	323.7	125.9	188.8	251.7	314.6	22646	No	13	48	75	773
LAV( )-12310	148.0	222.1	296.1	370.1	146.4	219.6	292.8	366.0	22294	No	13	48	75	779
LAV( )-12312	163.7	245.5	327.3	409.2	163.5	245.3	327.0	408.8	21938	No	13	48	75	792
LAV( )-12408	156.3	234.5	312.6	390.8	155.5	233.3	311.0	388.8	21948	No	17	64	75	830
LAV( )-12410	175.1	262.7	350.3	437.8	176.9	265.3	353.8	442.2	21460	Compliant	17	64	75	838
LAV( )-12412	190.2	285.3	380.4	475.5	194.3	291.5	388.6	485.8	20972	No	17	64	75	855
LAV( )-13210	159.6	239.4	319.2	398.9	155.4	233.0	310.7	388.4	34623	No	13	48	77	1041
LAV( )-13212	179.4	269.1	358.8	448.5	175.6	263.4	351.2	439.0	34290	No	13	48	77	1060
LAV( )-13308	194.2	291.4	388.5	485.6	188.8	283.2	377.6	472.0	33969	No	18	72	77	1126
LAV( )-13310	222.1	333.1	444.1	555.2	219.6	329.4	439.2	549.0	33441	No	18	72	77	1135
LAV( )-13312	245.5	368.3	491.0	613.8	245.3	367.9	490.6	613.2	32907	No	18	72	77	1153
LAV( )-13408	234.5	351.7	468.9	586.2	233.3	349.9	466.6	583.2	32922	No	24	96	77	1210
LAV( )-13410	262.7	394.0	525.4	656.7	265.3	398.0	530.7	663.3	32190	Compliant	24	96	77	1223
LAV( )-13412	285.3	427.9	570.6	713.2	291.5	437.2	582.9	728.6	31458	No	24	96	77	1247
LAV( )-14308	259.0	388.5	518.0	647.5	251.7	377.6	503.4	629.3	45292	No	24	96	78	1437
LAV( )-14310	296.1	444.1	592.2	740.2	292.8	439.2	585.6	732.0	44588	No	24	96	78	1449
LAV( )-14312	327.3	491.0	654.7	818.4	327.0	490.6	654.1	817.6	43876	No	24	96	78	1474
LAV( )-14408	312.6	468.9	625.2	781.6	311.0	466.6	622.1	777.6	43896	No	32	127	78	1550
LAV( )-14410	350.3	525.4	700.5	875.6	353.8	530.7	707.6	884.4	42920	Compliant	32	127	78	1566
LAV( )-14412	380.4	570.6	760.7	950.9	388.6	582.9	777.2	971.5	41944	No	32	127	78	1599
LAV( )-15308	323.7	485.6	647.5	809.4	314.6	472.0	629.3	786.6	56615	No	32	119	79	2020
LAV( )-15310	370.1	555.2	740.2	925.3	366.0	549.0	732.0	915.0	55735	No	32	119	79	2035
LAV( )-15312	409.2	613.8	818.4	1023.0	408.8	613.2	817.6	1022.0	54845	No	32	119	79	2066
LAV( )-15408	390.8	586.2	781.6	977.0	388.8	583.2	777.6	972.0	54870	No	41	159	79	2160
LAV( )-15410	437.8	656.7	875.6	1094.6	442.2	663.3	884.4	1105.6	53650	Compliant	41	159	79	2181
LAV( )-15412	475.5	713.2	950.9	1188.7	485.8	728.6	971.5	1214.4	52430	No	41	159	79	2222
LEV( )-16308	388.5	582.7	777.0	971.2	377.6	566.4	755.1	943.9	67938	No	65	266	80	2554
LEV( )-16310	444.1	666.2	888.3	1110.3	439.2	658.8	878.4	1098.0	66882	No	65	266	80	2573
LEV( )-16312	491.0	736.5	982.0	1227.5	490.6	735.8	981.1	1226.4	65814	No	65	266	80	2610
LEV( )-16408	468.9	703.4	937.9	1172.3	466.6	699.8	933.1	1166.4	65844	No	84	354	80	2784
LEV( )-16410	525.4	788.1	1050.8	1313.5	530.7	796.0	1061.3	1326.7	64380	Compliant	84	354	80	2808
LEV( )-16412	570.6	855.8	1141.1	1426.4	582.9	874.4	1165.8	1457.3	62916	No	84	354	80	2858
LEV( )-17308	453.2	679.9	906.5	1133.1	440.5	660.7	881.0	1101.2	79261	Compliant	76	310	81	3020
LEV( )-17310	518.1	777.2	1036.3	1295.4	512.4	768.6	1024.8	1281.0	78029	Compliant	76	310	81	3042
LEV( )-17312	572.9	859.3	1145.7	1432.1	572.3	858.5	1144.6	1430.8	76783	No	76	310	81	3088
LEV( )-17408	547.1	820.6	1094.2	1367.7	544.3	816.5	1088.6	1360.8	76818	Compliant	98	413	81	3279
LEV( )-17410	612.9	919.4	1225.9	1532.4	619.1	928.7	1238.2	1547.8	75110	Compliant	98	413	81	3307
LEV( )-17412	665.6	998.5	1331.3	1664.1	680.1	1020.1	1360.1	1700.2	73402	No	98	413	81	3366

See NOTES on 50 Hz operation and TEMPERATURE DIFFERENCE on page 3. See Correction Factor Table for refrigerant charge on page 4. CEC TITLE 24 COMPLIANT indicates condenser meets the 65 BTU/H / watt efficiency requirement. To complete the TITLE 24 compliance, fan speed must vary requiring an additional VFD and controller on fixed speed motors (F, A, C, E & B). Krack recommends the K motor option which has variable speed capability and need only a controller to provide the 0-10 V control signal to meet the regulation. Gravity dampers should not be used with K motor applications.

Levitor II Air-Cooled Condenser

LAVF/LAVK Performance Data

(1.5 HP - 1140 RPM)

TWO FANS WIDE

MODEL	TOTAL HEAT OF REJECTION (MBH) R-404A, R-507A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	R-407A, R-448A / R-449A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	AIR FLOW (CFM)	CEC TITLE 24 COMPLIANT	CONDENSER CHARGE R-404A (LBS) SUMMER	WINTER	EST SOUND 10' (dBA)	SHIP WEIGHT (LBS)
LAV( )-22208	185.0	277.5	370.0	462.5	176.7	265.1	353.4	441.8	46,596	No	18	64	78	1311
LAV( )-22210	212.8	319.2	425.5	531.9	207.1	310.7	414.3	517.9	46,164	No	18	64	78	1320
LAV( )-22212	239.2	358.8	478.4	598.0	234.1	351.2	468.3	585.4	45,720	No	18	64	78	1336
LAV( )-22308	259.0	388.5	518.0	647.5	251.7	377.6	503.4	629.3	45,292	No	26	96	78	1425
LAV( )-22310	296.1	444.1	592.2	740.2	292.8	439.2	585.6	732.0	44,588	No	26	96	78	1437
LAV( )-22312	327.3	491.0	654.7	818.4	327.0	490.6	654.1	817.6	43,876	No	26	96	78	1462
LAV( )-22408	312.6	468.9	625.2	781.6	311.0	466.6	622.1	777.6	43,896	No	34	128	78	1539
LAV( )-22410	350.3	525.4	700.5	875.6	353.8	530.7	707.6	884.4	42,920	Compliant	34	128	78	1555
LAV( )-22412	380.4	570.6	760.7	950.9	388.6	582.9	777.2	971.5	41,944	No	34	128	78	1588
LAV( )-23210	319.2	478.7	638.3	797.9	310.7	466.1	621.4	776.8	69,246	No	26	96	80	1875
LAV( )-23212	358.8	538.2	717.6	897.0	351.2	526.8	702.4	878.0	68,580	No	26	96	80	1912
LAV( )-23308	388.5	582.7	777.0	971.2	377.6	566.4	755.1	943.9	67,938	No	36	144	80	2044
LAV( )-23310	444.1	666.2	888.3	1110.3	439.2	658.8	878.4	1098.0	66,882	No	36	144	80	2063
LAV( )-23312	491.0	736.5	982.0	1227.5	490.6	735.8	981.1	1226.4	65,814	No	36	144	80	2100
LAV( )-23408	468.9	703.4	937.9	1172.3	466.6	699.8	933.1	1166.4	65,844	No	48	192	80	2214
LAV( )-23410	525.4	788.1	1050.8	1313.5	530.7	796.0	1061.3	1326.7	64,380	Compliant	48	192	80	2238
LAV( )-23412	570.6	855.8	1141.1	1426.4	582.9	874.4	1165.8	1457.3	62,916	No	48	192	80	2287
LAV( )-24308	518.0	777.0	1036.0	1295.0	503.4	755.1	1006.8	1258.6	90,584	No	48	192	81	2526
LAV( )-24310	592.2	888.3	1184.3	1480.4	585.6	878.4	1171.2	1464.0	89,176	No	48	192	81	2651
LAV( )-24312	654.7	982.0	1309.4	1636.7	654.1	981.1	1308.1	1635.2	87,752	No	48	192	81	2700
LAV( )-24408	625.2	937.9	1250.5	1563.1	622.1	933.1	1244.2	1555.2	87,792	No	64	254	81	2851
LAV( )-24410	700.5	1050.8	1401.0	1751.3	707.6	1061.3	1415.1	1768.9	85,840	Compliant	64	254	81	2884
LAV( )-24412	760.7	1141.1	1521.5	1901.8	777.2	1165.8	1554.4	1943.0	83,888	No	64	254	81	2950
LAV( )-25308	647.5	971.2	1295.0	1618.7	629.3	943.9	1258.6	1573.2	113,230	No	64	238	82	3725
LAV( )-25310	740.2	1110.3	1480.4	1850.5	732.0	1098.0	1464.0	1830.1	111,470	No	64	238	82	3755
LAV( )-25312	818.4	1227.5	1636.7	2045.9	817.6	1226.4	1635.2	2044.0	109,690	No	64	238	82	3817
LAV( )-25408	781.6	1172.3	1563.1	1953.9	777.6	1166.4	1555.2	1944.0	109,740	No	82	318	82	4005
LAV( )-25410	875.6	1313.5	1751.3	2189.1	884.4	1326.7	1768.9	2211.1	107,300	Compliant	82	318	82	4046
LAV( )-25412	950.9	1426.4	1901.8	2377.3	971.5	1457.3	1943.0	2428.8	104,860	No	82	318	82	4129
LEV( )-26308	777.0	1165.5	1554.0	1942.5	755.1	1132.7	1510.3	1887.8	135,876	No	130	532	83	4759
LEV( )-26310	888.3	1332.4	1776.5	2220.6	878.4	1317.6	1756.8	2196.1	133,764	No	130	532	83	4796
LEV( )-26312	982.0	1473.0	1964.1	2455.1	981.1	1471.7	1962.2	2452.8	131,628	No	130	532	83	4870
LEV( )-26408	937.9	1406.8	1875.7	2344.7	933.1	1399.7	1866.2	2332.8	131,688	No	168	708	83	5218
LEV( )-26410	1050.8	1576.2	2101.5	2626.9	1061.3	1592.0	2122.7	2653.3	128,760	Compliant	168	708	83	5268
LEV( )-26412	1141.1	1711.7	2282.2	2852.8	1165.8	1748.7	2331.6	2914.6	125,832	No	168	708	83	5366
LEV( )-27308	906.5	1359.7	1813.0	2266.2	881.0	1321.5	1762.0	2202.5	158522	Compliant	152	620	84	5691
LEV( )-27310	1036.3	1554.4	2072.6	2590.7	1024.8	1537.2	2049.7	2562.1	156058	Compliant	152	620	84	5734
LEV( )-27312	1145.7	1718.6	2291.4	2864.3	1144.6	1716.9	2289.3	2861.6	153566	No	152	620	84	5826
LEV( )-27408	1094.2	1641.3	2188.4	2735.5	1088.6	1633.0	2177.3	2721.6	153636	Compliant	196	826	84	6208
LEV( )-27410	1225.9	1838.8	2451.8	3064.7	1238.2	1857.3	2476.4	3095.5	150220	Compliant	196	826	84	6266
LEV( )-27412	1331.3	1996.9	2662.6	3328.2	1360.1	2040.2	2720.3	3400.3	146804	No	196	826	84	6382

See NOTES on 50 Hz operation and TEMPERATURE DIFFERENCE on page 3. See Correction Factor Table for refrigerant charge on page 4. CEC TITLE 24 COMPLIANT indicates condenser meets the 65 BTU/H / watt efficiency requirement. To complete the TITLE 24 compliance, fan speed must vary requiring an additional VFD and controller on fixed speed motors (F, A, C, E & B). Krack recommends the K motor option which has variable speed capability and need only a controller to provide the 0-10 V control signal to meet the regulation. Gravity dampers should not be used with K motor applications.

Levitor II Air-Cooled Condenser

LAVE Performance Data

(0.5 HP - 575 RPM)

ONE FAN WIDE

MODEL	TOTAL HEAT OF REJECTION (MBH) R-404A, R-507A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	R-407A, R-448A / R-449A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	AIR FLOW (CFM)	CEC TITLE 24 COMPLIANT	CONDENSER CHARGE R-404A (LBS) SUMMER	WINTER	EST SOUND 10' (dBA)	SHIP WEIGHT (LBS)
LAVE-11208	35.2	52.8	70.3	87.9	34.4	51.6	68.8	86.0	6480	Compliant	4	17	52	437
LAVE-11210	41.3	61.9	82.5	103.1	40.5	60.7	81.0	101.2	6420	Compliant	4	17	52	439
LAVE-11212	45.9	68.9	91.9	114.8	45.7	68.6	91.4	114.3	6360	No	4	17	52	444
LAVE-11308	47.1	70.6	94.1	117.7	46.4	69.6	92.8	116.0	6300	Compliant	6	25	52	466
LAVE-11310	53.0	79.4	105.9	132.4	53.0	79.5	106.0	132.5	6200	Compliant	6	25	52	469
LAVE-11312	57.1	85.6	114.2	142.7	58.3	87.5	116.6	145.8	6100	No	6	25	52	478
LAVE-11408	55.9	83.9	111.9	139.8	56.6	84.8	113.1	141.4	6105	Compliant	8	33	52	495
LAVE-11410	61.1	91.7	122.2	152.8	63.5	95.3	127.1	158.8	5975	Compliant	8	33	52	499
LAVE-11412	64.7	97.1	129.5	161.8	68.3	102.5	136.6	170.8	5835	No	8	33	52	508
LAVE-12208	70.3	105.5	140.7	175.9	68.8	103.2	137.6	172.0	12960	Compliant	9	32	55	718
LAVE-12210	82.5	123.8	165.0	206.3	81.0	121.5	162.0	202.5	12840	Compliant	9	32	55	721
LAVE-12212	91.9	137.8	183.7	229.6	91.4	137.1	182.9	228.6	12720	No	9	32	55	729
LAVE-12308	94.1	141.2	188.3	235.4	92.8	139.2	185.6	232.1	12600	Compliant	13	48	55	773
LAVE-12310	105.9	158.9	211.8	264.8	106.0	159.0	212.1	265.1	12400	Compliant	13	48	55	779
LAVE-12312	114.2	171.2	228.3	285.4	116.6	175.0	233.3	291.6	12200	No	13	48	55	792
LAVE-12408	111.9	167.8	223.8	279.7	113.1	169.7	226.3	282.8	12210	Compliant	17	64	55	830
LAVE-12410	122.2	183.3	244.5	305.6	127.1	190.6	254.1	317.6	11950	Compliant	17	64	55	838
LAVE-12412	129.5	194.2	258.9	323.7	136.6	205.0	273.3	341.6	11670	No	17	64	55	855
LAVE-13210	123.8	185.6	247.5	309.4	121.5	182.2	242.9	303.7	19260	Compliant	13	48	57	1041
LAVE-13212	137.8	206.7	275.6	344.5	137.1	205.7	274.3	342.9	19080	No	13	48	57	1060
LAVE-13308	141.2	211.8	282.4	353.0	139.2	208.8	278.5	348.1	18900	Compliant	18	72	57	1126
LAVE-13310	158.9	238.3	317.8	397.2	159.0	238.6	318.1	397.6	18600	Compliant	18	72	57	1135
LAVE-13312	171.2	256.9	342.5	428.1	175.0	262.4	349.9	437.4	18300	No	18	72	57	1153
LAVE-13408	167.8	251.7	335.6	419.5	169.7	254.5	339.4	424.2	18315	Compliant	24	96	57	1210
LAVE-13410	183.3	275.0	366.7	458.4	190.6	285.9	381.2	476.4	17925	Compliant	24	96	57	1223
LAVE-13412	194.2	291.3	388.4	485.5	205.0	307.4	409.9	512.4	17505	No	24	96	57	1247
LAVE-14308	188.3	282.4	376.6	470.7	185.6	278.5	371.3	464.1	25200	Compliant	24	96	58	1437
LAVE-14310	211.8	317.8	423.7	529.6	212.1	318.1	424.1	530.1	24800	Compliant	24	96	58	1449
LAVE-14312	228.3	342.5	456.6	570.8	233.3	349.9	466.6	583.2	24400	No	24	96	58	1474
LAVE-14408	223.8	335.6	447.5	559.4	226.3	339.4	452.5	565.7	24420	Compliant	32	127	58	1550
LAVE-14410	244.5	366.7	488.9	611.1	254.1	381.2	508.2	635.3	23900	Compliant	32	127	58	1566
LAVE-14412	258.9	388.4	517.9	647.3	273.3	409.9	546.6	683.2	23340	No	32	127	58	1599
LAVE-15308	235.4	353.0	470.7	588.4	232.1	348.1	464.1	580.1	31500	Compliant	32	119	59	2020
LAVE-15310	264.8	397.2	529.6	662.0	265.1	397.6	530.1	662.7	31000	Compliant	32	119	59	2035
LAVE-15312	285.4	428.1	570.8	713.5	291.6	437.4	583.2	729.0	30500	No	32	119	59	2066
LAVE-15408	279.7	419.5	559.4	699.2	282.8	424.2	565.7	707.1	30525	Compliant	41	159	59	2160
LAVE-15410	305.6	458.4	611.1	763.9	317.6	476.4	635.3	794.1	29875	Compliant	41	159	59	2181
LAVE-15412	323.7	485.5	647.3	809.2	341.6	512.4	683.2	854.0	29175	No	41	159	59	2222
LEVE-16308	282.4	423.6	564.9	706.1	278.5	417.7	556.9	696.2	37800	Compliant	65	266	60	2554
LEVE-16310	317.8	476.7	635.5	794.4	318.1	477.1	636.2	795.2	37200	Compliant	65	266	60	2573
LEVE-16312	342.5	513.7	684.9	856.2	349.9	524.9	699.9	874.8	36600	No	65	266	60	2610
LEVE-16408	335.6	503.5	671.3	839.1	339.4	509.1	678.8	848.5	36630	Compliant	84	354	60	2784
LEVE-16410	366.7	550.0	733.4	916.7	381.2	571.7	762.3	952.9	35850	Compliant	84	354	60	2808
LEVE-16412	388.4	582.6	776.8	971.0	409.9	614.9	819.8	1024.8	35010	No	84	354	60	2858
LEVE-17308	329.5	494.2	659.0	823.7	324.9	487.3	649.8	812.2	44100	Compliant	76	310	61	3020
LEVE-17310	370.7	556.1	741.5	926.8	371.1	556.6	742.2	927.7	43400	Compliant	76	310	61	3042
LEVE-17312	399.6	599.3	799.1	998.9	408.2	612.4	816.5	1020.6	42700	No	76	310	61	3088
LEVE-17408	391.6	587.4	783.1	978.9	396.0	593.9	791.9	989.9	42735	Compliant	98	413	61	3279
LEVE-17410	427.8	641.7	855.6	1069.5	444.7	667.0	889.4	1111.7	41825	Compliant	98	413	61	3307
LEVE-17412	453.1	679.7	906.2	1132.8	478.2	717.4	956.5	1195.6	40845	No	98	413	61	3366

See NOTES on 50 Hz operation and TEMPERATURE DIFFERENCE on page 3. See Correction Factor Table for refrigerant charge on page 4. CEC TITLE 24 COMPLIANT indicates condenser meets the 65 BTU/H / watt efficiency requirement. To complete the TITLE 24 compliance, fan speed must vary requiring an additional VFD and controller on fixed speed motors (F, A, C, E & B). Krack recommends the K motor option which has variable speed capability and need only a controller to provide the 0-10 V control signal to meet the regulation.

Levitor II Air-Cooled Condenser

LAVE Performance Data

(0.5 HP - 575 RPM)

TWO FANS WIDE

MODEL	TOTAL HEAT OF REJECTION (MBH) R-404A, R-507A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	R-407A, R-448A / R-449A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	AIR FLOW (CFM)	CEC TITLE 24 COMPLIANT	CONDENSER CHARGE R-404A (LBS) SUMMER	WINTER	EST SOUND 10' (dBA)	SHIP WEIGHT (LBS)
LAVE-22208	140.7	211.0	281.4	351.7	137.6	206.4	275.2	344.0	25920	Compliant	18	64	58	1311
LAVE-22210	165.0	247.5	330.0	412.5	162.0	242.9	323.9	404.9	25680	Compliant	18	64	58	1320
LAVE-22212	183.7	275.6	367.4	459.3	182.9	274.3	365.7	457.2	25440	No	18	64	58	1336
LAVE-22308	188.3	282.4	376.6	470.7	185.6	278.5	371.3	464.1	25200	Compliant	26	96	58	1425
LAVE-22310	211.8	317.8	423.7	529.6	212.1	318.1	424.1	530.1	24800	Compliant	26	96	58	1437
LAVE-22312	228.3	342.5	456.6	570.8	233.3	349.9	466.6	583.2	24400	No	26	96	58	1462
LAVE-22408	223.8	335.6	447.5	559.4	226.3	339.4	452.5	565.7	24420	Compliant	34	128	58	1539
LAVE-22410	244.5	366.7	488.9	611.1	254.1	381.2	508.2	635.3	23900	Compliant	34	128	58	1555
LAVE-22412	258.9	388.4	517.9	647.3	273.3	409.9	546.6	683.2	23340	No	34	128	58	1588
LAVE-23210	247.5	371.3	495.0	618.8	242.9	364.4	485.9	607.4	38520	Compliant	26	96	60	1875
LAVE-23212	275.6	413.4	551.1	688.9	274.3	411.4	548.6	685.7	38160	No	26	96	60	1912
LAVE-23308	282.4	423.6	564.9	706.1	278.5	417.7	556.9	696.2	37800	Compliant	36	144	60	2044
LAVE-23310	317.8	476.7	635.5	794.4	318.1	477.1	636.2	795.2	37200	Compliant	36	144	60	2063
LAVE-23312	342.5	513.7	684.9	856.2	349.9	524.9	699.9	874.8	36600	No	36	144	60	2100
LAVE-23408	335.6	503.5	671.3	839.1	339.4	509.1	678.8	848.5	36630	Compliant	48	192	60	2214
LAVE-23410	366.7	550.0	733.4	916.7	381.2	571.7	762.3	952.9	35850	Compliant	48	192	60	2238
LAVE-23412	388.4	582.6	776.8	971.0	409.9	614.9	819.8	1024.8	35010	No	48	192	60	2287
LAVE-24308	376.6	564.9	753.1	941.4	371.3	556.9	742.6	928.2	50400	Compliant	48	192	61	2526
LAVE-24310	423.7	635.5	847.4	1059.2	424.1	636.2	848.2	1060.3	49600	Compliant	48	192	61	2651
LAVE-24312	456.6	684.9	913.3	1141.6	466.6	699.9	933.1	1166.4	48800	No	48	192	61	2700
LAVE-24408	447.5	671.3	895.0	1118.8	452.5	678.8	905.1	1131.3	48840	Compliant	64	254	61	2851
LAVE-24410	488.9	733.4	977.8	1222.3	508.2	762.3	1016.4	1270.5	47800	Compliant	64	254	61	2884
LAVE-24412	517.9	776.8	1035.7	1294.6	546.6	819.8	1093.1	1366.4	46680	No	64	254	61	2950
LAVE-25308	470.7	706.1	941.4	1176.8	464.1	696.2	928.2	1160.3	63000	Compliant	64	238	62	3725
LAVE-25310	529.6	794.4	1059.2	1324.1	530.1	795.2	1060.3	1325.4	62000	Compliant	64	238	62	3755
LAVE-25312	570.8	856.2	1141.6	1427.0	583.2	874.8	1166.4	1458.0	61000	No	64	238	62	3817
LAVE-25408	559.4	839.1	1118.8	1398.5	565.7	848.5	1131.3	1414.2	61050	Compliant	82	318	62	4005
LAVE-25410	611.1	916.7	1222.3	1527.9	635.3	952.9	1270.5	1588.2	59750	Compliant	82	318	62	4046
LAVE-25412	647.3	971.0	1294.6	1618.3	683.2	1024.8	1366.4	1708.0	58350	No	82	318	62	4129
LEVE-26308	564.9	847.3	1129.7	1412.1	556.9	835.4	1113.9	1392.3	75600	Compliant	130	532	63	4759
LEVE-26310	635.5	953.3	1271.1	1588.9	636.2	954.3	1272.3	1590.4	74400	Compliant	130	532	63	4796
LEVE-26312	684.9	1027.4	1369.9	1712.4	699.9	1049.8	1399.7	1749.6	73200	No	130	532	63	4870
LEVE-26408	671.3	1006.9	1342.5	1678.2	678.8	1018.2	1357.6	1697.0	73260	Compliant	168	708	63	5218
LEVE-26410	733.4	1100.1	1466.7	1833.4	762.3	1143.5	1524.6	1905.8	71700	Compliant	168	708	63	5268
LEVE-26412	776.8	1165.2	1553.6	1942.0	819.8	1229.8	1639.7	2049.6	70020	No	168	708	63	5366
LEVE-27308	659.0	988.5	1318.0	1647.5	649.8	974.6	1299.5	1624.4	88200	Compliant	152	620	64	5691
LEVE-27310	741.5	1112.2	1482.9	1853.7	742.2	1113.3	1484.4	1855.5	86800	Compliant	152	620	64	5734
LEVE-27312	799.1	1198.7	1598.2	1997.8	816.5	1224.7	1633.0	2041.2	85400	No	152	620	64	5826
LEVE-27408	783.1	1174.7	1566.3	1957.9	791.9	1187.9	1583.8	1979.8	85470	Compliant	196	826	64	6208
LEVE-27410	855.6	1283.4	1711.2	2139.0	889.4	1334.0	1778.7	2223.4	83650	Compliant	196	826	64	6266
LEVE-27412	906.2	1359.4	1812.5	2265.6	956.5	1434.7	1913.0	2391.2	81690	No	196	826	64	6382

See NOTES on 50 Hz operation and TEMPERATURE DIFFERENCE on page 3. See Correction Factor Table for refrigerant charge on page 4. CEC TITLE 24 COMPLIANT indicates condenser meets the 65 BTU/H / watt efficiency requirement. To complete the TITLE 24 compliance, fan speed must vary requiring an additional VFD and controller on fixed speed motors (F, A, C, E & B). Krack recommends the K motor option which has variable speed capability and need only a controller to provide the 0-10 V control signal to meet the regulation.

Specifications subject to change without notice.

Levitor II Air-Cooled Condenser

LAVA Performance Data

(1 HP - 850 RPM)

ONE FAN WIDE

MODEL	TOTAL HEAT OF REJECTION (MBH) R-404A, R-507A TEMPERATURE DIFFERENCE 10°F	15°F	20°F	25°F	R-407A, R-448A / R-449A TEMPERATURE DIFFERENCE 10°F	15°F	20°F	25°F	AIR FLOW (CFM)	CEC TITLE 24 COMPLIANT	CONDENSER CHARGE R-404A (LBS) SUMMER	WINTER	EST SOUND 10' (dBA)	SHIP WEIGHT (LBS)
LAVA-11208	41.9	62.8	83.8	104.7	40.3	60.5	80.7	100.8	9260	No	4	17	63	437
LAVA-11210	48.8	73.2	97.6	122.0	47.3	71.0	94.6	118.3	9151	No	4	17	63	439
LAVA-11212	54.3	81.5	108.7	135.8	53.4	80.1	106.8	133.5	9040	No	4	17	63	444
LAVA-11308	58.4	87.6	116.9	146.1	56.4	84.5	112.7	140.9	8933	No	6	25	63	466
LAVA-11310	65.4	98.1	130.8	163.5	65.0	97.5	130.0	162.4	8760	Compliant	6	25	63	469
LAVA-11312	71.9	107.9	143.9	179.8	72.3	108.5	144.6	180.8	8574	No	6	25	63	478
LAVA-11408	69.6	104.5	139.3	174.1	68.8	103.1	137.5	171.9	8582	Compliant	8	33	63	495
LAVA-11410	76.2	114.3	152.4	190.5	77.4	116.2	154.9	193.6	8314	Compliant	8	33	63	499
LAVA-11412	81.2	121.7	162.3	202.9	83.8	125.8	167.7	209.6	8025	No	8	33	63	508
LAVA-12208	83.8	125.6	167.5	209.4	80.7	121.0	161.3	201.7	18520	No	9	32	66	718
LAVA-12210	97.6	146.4	195.1	243.9	94.6	141.9	189.2	236.5	18302	No	9	32	66	721
LAVA-12212	108.7	163.0	217.3	271.7	106.8	160.2	213.7	267.1	18080	No	9	32	66	729
LAVA-12308	116.9	175.3	233.7	292.2	112.7	169.1	225.5	281.8	17866	No	13	48	66	773
LAVA-12310	130.8	196.2	261.6	327.0	130.0	194.9	259.9	324.9	17520	Compliant	13	48	66	779
LAVA-12312	143.9	215.8	287.7	359.6	144.6	217.0	289.3	361.6	17148	No	13	48	66	792
LAVA-12408	139.3	208.9	278.5	348.2	137.5	206.3	275.0	343.8	17164	Compliant	17	64	66	830
LAVA-12410	152.4	228.7	304.9	381.1	154.9	232.3	309.8	387.2	16628	Compliant	17	64	66	838
LAVA-12412	162.3	243.5	324.6	405.8	167.7	251.5	335.3	419.2	16050	No	17	64	66	855
LAVA-13210	146.4	219.5	292.7	365.9	141.9	212.9	283.8	354.8	27453	No	13	48	68	1041
LAVA-13212	163.0	244.5	326.0	407.5	160.2	240.4	320.5	400.6	27120	No	13	48	68	1060
LAVA-13308	175.3	262.9	350.6	438.2	169.1	253.6	338.2	422.7	26799	No	18	72	68	1126
LAVA-13310	196.2	294.3	392.4	490.5	194.9	292.4	389.9	487.3	26280	Compliant	18	72	68	1135
LAVA-13312	215.8	323.7	431.6	539.4	217.0	325.5	433.9	542.4	25722	No	18	72	68	1153
LAVA-13408	208.9	313.4	417.8	522.3	206.3	309.4	412.5	515.6	25746	Compliant	24	96	68	1210
LAVA-13410	228.7	343.0	457.3	571.6	232.3	348.5	464.6	580.8	24942	Compliant	24	96	68	1223
LAVA-13412	243.5	365.2	486.9	608.7	251.5	377.3	503.0	628.8	24075	No	24	96	68	1247
LAVA-14308	233.7	350.6	467.4	584.3	225.5	338.2	450.9	563.7	35732	No	24	96	69	1437
LAVA-14310	261.6	392.4	523.2	654.0	259.9	389.9	519.8	649.8	35040	Compliant	24	96	69	1449
LAVA-14312	287.7	431.6	575.4	719.3	289.3	433.9	578.6	723.2	34296	No	24	96	69	1474
LAVA-14408	278.5	417.8	557.1	696.3	275.0	412.5	550.0	687.5	34328	Compliant	32	127	69	1550
LAVA-14410	304.9	457.3	609.7	762.2	309.8	464.6	619.5	774.4	33256	Compliant	32	127	69	1566
LAVA-14412	324.6	486.9	649.2	811.6	335.3	503.0	670.7	838.4	32100	No	32	127	69	1599
LAVA-15308	292.2	438.2	584.3	730.4	281.8	422.7	563.7	704.6	44665	No	32	119	70	2020
LAVA-15310	327.0	490.5	654.0	817.5	324.9	487.3	649.8	812.2	43800	Compliant	32	119	70	2035
LAVA-15312	359.6	539.4	719.3	899.1	361.6	542.4	723.2	904.1	42870	No	32	119	70	2066
LAVA-15408	348.2	522.3	696.3	870.4	343.8	515.6	687.5	859.4	42910	Compliant	41	159	70	2160
LAVA-15410	381.1	571.6	762.2	952.7	387.2	580.8	774.4	968.0	41570	Compliant	41	159	70	2181
LAVA-15412	405.8	608.7	811.6	1014.5	419.2	628.8	838.4	1047.9	40125	No	41	159	70	2222
LEVA-16308	350.6	525.9	701.2	876.5	338.2	507.3	676.4	845.5	53598	No	65	266	71	2554
LEVA-16310	392.4	588.6	784.8	981.0	389.9	584.8	779.7	974.7	52560	Compliant	65	266	71	2573
LEVA-16312	431.6	647.3	863.1	1078.9	433.9	650.9	867.9	1084.9	51444	No	65	266	71	2610
LEVA-16408	417.8	626.7	835.6	1044.5	412.5	618.8	825.0	1031.3	51492	Compliant	84	354	71	2784
LEVA-16410	457.3	686.0	914.6	1143.3	464.6	697.0	929.3	1161.6	49884	Compliant	84	354	71	2808
LEVA-16412	486.9	730.4	973.9	1217.3	503.0	754.5	1006.0	1257.5	48150	No	84	354	71	2858
LEVA-17308	409.0	613.5	818.0	1022.5	394.6	591.8	789.1	986.4	62531	Compliant	76	310	72	3020
LEVA-17310	457.8	686.7	915.6	1144.5	454.8	682.3	909.7	1137.1	61320	Compliant	76	310	72	3042
LEVA-17312	503.5	755.2	1007.0	1258.7	506.3	759.4	1012.5	1265.7	60018	No	76	310	72	3088
LEVA-17408	487.4	731.2	974.9	1218.6	481.3	721.9	962.5	1203.2	60074	Compliant	98	413	72	3279
LEVA-17410	533.5	800.3	1067.1	1333.8	542.1	813.1	1084.1	1355.2	58198	Compliant	98	413	72	3307
LEVA-17412	568.1	852.1	1136.2	1420.2	586.8	880.3	1173.7	1467.1	56175	No	98	413	72	3366

See NOTES on 50 Hz operation and TEMPERATURE DIFFERENCE on page 3. See Correction Factor Table for refrigerant charge on page 4. CEC TITLE 24 COMPLIANT indicates condenser meets the 65 BTU/H / watt efficiency requirement. To complete the TITLE 24 compliance, fan speed must vary requiring an additional VFD and controller on fixed speed motors (F, A, C, E & B). Krack recommends the K motor option which has variable speed capability and need only a controller to provide the 0-10 V control signal to meet the regulation.

Levitor II Air-Cooled Condenser

LAVA Performance Data

(1 HP - 850 RPM)

TWO FANS WIDE														
MODEL	TOTAL HEAT OF REJECTION (MBH)								AIR FLOW (CFM)	CEC TITLE 24 COMPLIANT	CONDENSER CHARGE R-404A (LBS)		EST SOUND 10' (dBA)	SHIP WEIGHT (LBS)
	R-404A, R-507A				R-407A, R-448A / R-449A									
	TEMPERATURE DIFFERENCE				TEMPERATURE DIFFERENCE									
	10° F	15° F	20° F	25° F	10° F	15° F	20° F	25° F			SUMMER	WINTER		
LAVA-22208	167.5	251.3	335.0	418.8	161.3	242.0	322.7	403.4	37040	No	18	64	69	1311
LAVA-22210	195.1	292.7	390.3	487.9	189.2	283.8	378.4	473.0	36604	No	18	64	69	1320
LAVA-22212	217.3	326.0	434.6	543.3	213.7	320.5	427.3	534.1	36160	No	18	64	69	1336
LAVA-22308	233.7	350.6	467.4	584.3	225.5	338.2	450.9	563.7	35732	No	26	96	69	1425
LAVA-22310	261.6	392.4	523.2	654.0	259.9	389.9	519.8	649.8	35040	Compliant	26	96	69	1437
LAVA-22312	287.7	431.6	575.4	719.3	289.3	433.9	578.6	723.2	34296	No	26	96	69	1462
LAVA-22408	278.5	417.8	557.1	696.3	275.0	412.5	550.0	687.5	34328	Compliant	34	128	69	1539
LAVA-22410	304.9	457.3	609.7	762.2	309.8	464.6	619.5	774.4	33256	Compliant	34	128	69	1555
LAVA-22412	324.6	486.9	649.2	811.6	335.3	503.0	670.7	838.4	32100	No	34	128	69	1588
LAVA-23210	292.7	439.1	585.4	731.8	283.8	425.7	567.6	709.5	54906	No	26	96	71	1875
LAVA-23212	326.0	489.0	652.0	815.0	320.5	480.7	641.0	801.2	54240	No	26	96	71	1912
LAVA-23308	350.6	525.9	701.2	876.5	338.2	507.3	676.4	845.5	53598	No	36	144	71	2044
LAVA-23310	392.4	588.6	784.8	981.0	389.9	584.8	779.7	974.7	52560	Compliant	36	144	71	2063
LAVA-23312	431.6	647.3	863.1	1078.9	433.9	650.9	867.9	1084.9	51444	No	36	144	71	2100
LAVA-23408	417.8	626.7	835.6	1044.5	412.5	618.8	825.0	1031.3	51492	Compliant	48	192	71	2214
LAVA-23410	457.3	686.0	914.6	1143.3	464.6	697.0	929.3	1161.6	49884	Compliant	48	192	71	2238
LAVA-23412	486.9	730.4	973.9	1217.3	503.0	754.5	1006.0	1257.5	48150	No	48	192	71	2287
LAVA-24308	467.4	701.2	934.9	1168.6	450.9	676.4	901.8	1127.3	71464	No	48	192	72	2526
LAVA-24310	523.2	784.8	1046.4	1308.0	519.8	779.7	1039.6	1299.6	70080	Compliant	48	192	72	2651
LAVA-24312	575.4	863.1	1150.8	1438.5	578.6	867.9	1157.2	1446.5	68592	No	48	192	72	2700
LAVA-24408	557.1	835.6	1114.1	1392.7	550.0	825.0	1100.0	1375.0	68656	Compliant	64	254	72	2851
LAVA-24410	609.7	914.6	1219.5	1524.4	619.5	929.3	1239.0	1548.8	66512	Compliant	64	254	72	2884
LAVA-24412	649.2	973.9	1298.5	1623.1	670.7	1006.0	1341.4	1676.7	64200	No	64	254	72	2950
LAVA-25308	584.3	876.5	1168.6	1460.8	563.7	845.5	1127.3	1409.1	89330	No	64	238	73	3725
LAVA-25310	654.0	981.0	1308.0	1635.0	649.8	974.7	1299.6	1624.5	87600	Compliant	64	238	73	3755
LAVA-25312	719.3	1078.9	1438.5	1798.2	723.2	1084.9	1446.5	1808.1	85740	No	64	238	73	3817
LAVA-25408	696.3	1044.5	1392.7	1740.9	687.5	1031.3	1375.0	1718.8	85820	Compliant	82	318	73	4005
LAVA-25410	762.2	1143.3	1524.4	1905.5	774.4	1161.6	1548.8	1936.0	83140	Compliant	82	318	73	4046
LAVA-25412	811.6	1217.3	1623.1	2028.9	838.4	1257.5	1676.7	2095.9	80250	No	82	318	73	4129
LEVA-26308	701.2	1051.7	1402.3	1752.9	676.4	1014.6	1352.8	1691.0	107196	No	130	532	74	4759
LEVA-26310	784.8	1177.2	1569.6	1962.0	779.7	1169.6	1559.5	1949.3	105120	Compliant	130	532	74	4796
LEVA-26312	863.1	1294.7	1726.2	2157.8	867.9	1301.8	1735.8	2169.7	102888	No	130	532	74	4870
LEVA-26408	835.6	1253.4	1671.2	2089.0	825.0	1237.5	1650.0	2062.6	102984	Compliant	168	708	74	5218
LEVA-26410	914.6	1371.9	1829.2	2286.5	929.3	1393.9	1858.5	2323.2	99768	Compliant	168	708	74	5268
LEVA-26412	973.9	1460.8	1947.7	2434.7	1006.0	1509.0	2012.0	2515.1	96300	No	168	708	74	5366
LEVA-27308	818.0	1227.0	1636.0	2045.1	789.1	1183.7	1578.2	1972.8	125062	Compliant	152	620	75	5691
LEVA-27310	915.6	1373.4	1831.2	2289.0	909.7	1364.5	1819.4	2274.2	122640	Compliant	152	620	75	5734
LEVA-27312	1007.0	1510.4	2013.9	2517.4	1012.5	1518.8	2025.1	2531.3	120036	No	152	620	75	5826
LEVA-27408	974.9	1462.3	1949.8	2437.2	962.5	1443.8	1925.1	2406.3	120148	Compliant	196	826	75	6208
LEVA-27410	1067.1	1600.6	2134.1	2667.6	1084.1	1626.2	2168.3	2710.4	116396	Compliant	196	826	75	6266
LEVA-27412	1136.2	1704.3	2272.4	2840.5	1173.7	1760.5	2347.4	2934.2	112350	No	196	826	75	6382

See NOTES on 50 Hz operation and TEMPERATURE DIFFERENCE on page 3. See Correction Factor Table for refrigerant charge on page 4. CEC TITLE 24 COMPLIANT indicates condenser meets the 65 BTU/H / watt efficiency requirement. To complete the TITLE 24 compliance, fan speed must vary requiring an additional VFD and controller on fixed speed motors (F, A, C, E & B). Krack recommends the K motor option which has variable speed capability and need only a controller to provide the 0-10 V control signal to meet the regulation.

Specifications subject to change without notice.

Levitor II Air-Cooled Condenser

LAVC Performance Data

(1.5 HP - 850 RPM)

ONE FAN WIDE

MODEL	TOTAL HEAT OF REJECTION (MBH) R-404A, R-507A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	R-407A, R-448A / R-449A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	AIR FLOW (CFM)	CEC TITLE 24 COMPLIANT	CONDENSER CHARGE R-404A (LBS) SUMMER	WINTER	EST SOUND 10' (dBA)	SHIP WEIGHT (LBS)
LAVC-11208	44.6	66.9	89.2	111.5	43.2	64.9	86.5	108.1	10967	No	4	17	65	437
LAVC-11210	51.8	77.7	103.6	129.5	50.4	75.6	100.8	126.0	10682	No	4	17	65	439
LAVC-11212	57.6	86.5	115.3	144.1	56.7	85.0	113.3	141.7	10409	No	4	17	65	444
LAVC-11308	61.5	92.3	123.1	153.8	59.9	89.9	119.9	149.9	10159	No	6	25	65	466
LAVC-11310	69.1	103.6	138.2	172.7	68.8	103.2	137.6	172.0	9785	No	6	25	65	469
LAVC-11312	75.8	113.7	151.6	189.6	75.9	113.9	151.8	189.8	9441	No	6	25	65	478
LAVC-11408	72.1	108.1	144.1	180.1	72.3	108.5	144.6	180.8	9449	No	8	33	65	495
LAVC-11410	80.0	120.0	160.1	200.1	80.8	121.3	161.7	202.1	9031	Compliant	8	33	65	499
LAVC-11412	85.0	127.5	170.0	212.5	87.7	131.6	175.4	219.3	8660	No	8	33	65	508
LAVC-12208	89.2	133.8	178.4	222.9	86.5	129.7	173.0	216.2	21934	No	9	32	68	718
LAVC-12210	103.6	155.4	207.2	259.0	100.8	151.2	201.6	251.9	21364	No	9	32	68	721
LAVC-12212	115.3	172.9	230.6	288.2	113.3	170.0	226.6	283.3	20818	No	9	32	68	729
LAVC-12308	123.1	184.6	246.1	307.7	119.9	179.8	239.8	299.7	20318	No	13	48	68	773
LAVC-12310	138.2	207.2	276.3	345.4	137.6	206.4	275.2	344.0	19570	No	13	48	68	779
LAVC-12312	151.6	227.5	303.3	379.1	151.8	227.7	303.6	379.5	18882	No	13	48	68	792
LAVC-12408	144.1	216.2	288.2	360.3	144.6	216.9	289.2	361.5	18898	No	17	64	68	830
LAVC-12410	160.1	240.1	320.1	400.1	161.7	242.5	323.4	404.2	18062	Compliant	17	64	68	838
LAVC-12412	170.0	255.0	340.0	425.0	175.4	263.1	350.9	438.6	17320	No	17	64	68	855
LAVC-13210	155.4	233.1	310.8	388.5	151.2	226.8	302.3	377.9	32046	No	13	48	70	1041
LAVC-13212	172.9	259.4	345.9	432.4	170.0	255.0	340.0	425.0	31227	No	13	48	70	1060
LAVC-13308	184.6	276.9	369.2	461.5	179.8	269.7	359.7	449.6	30477	No	18	72	70	1126
LAVC-13310	207.2	310.9	414.5	518.1	206.4	309.6	412.8	516.0	29355	No	18	72	70	1135
LAVC-13312	227.5	341.2	454.9	568.7	227.7	341.6	455.4	569.3	28323	No	18	72	70	1153
LAVC-13408	216.2	324.2	432.3	540.4	216.9	325.4	433.8	542.3	28347	No	24	96	70	1210
LAVC-13410	240.1	360.1	480.2	600.2	242.5	363.8	485.0	606.3	27093	Compliant	24	96	70	1223
LAVC-13412	255.0	382.5	510.0	637.5	263.1	394.7	526.3	657.9	25980	No	24	96	70	1247
LAVC-14308	246.1	369.2	492.2	615.3	239.8	359.7	479.5	599.4	40636	No	24	96	71	1437
LAVC-14310	276.3	414.5	552.6	690.8	275.2	412.8	550.4	688.0	39140	No	24	96	71	1449
LAVC-14312	303.3	454.9	606.6	758.2	303.6	455.4	607.2	759.0	37764	No	24	96	71	1474
LAVC-14408	288.2	432.3	576.4	720.5	289.2	433.8	578.5	723.1	37796	No	32	127	71	1550
LAVC-14410	320.1	480.2	640.2	800.3	323.4	485.0	646.7	808.4	36124	Compliant	32	127	71	1566
LAVC-14412	340.0	510.0	680.0	850.0	350.9	526.3	701.7	877.2	34640	No	32	127	71	1599
LAVC-15308	307.7	461.5	615.3	769.1	299.7	449.6	599.4	749.3	50795	No	32	119	72	2020
LAVC-15310	345.4	518.1	690.8	863.5	344.0	516.0	688.0	860.0	48925	No	32	119	72	2035
LAVC-15312	379.1	568.7	758.2	947.8	379.5	569.3	759.0	948.8	47205	No	32	119	72	2066
LAVC-15408	360.3	540.4	720.5	900.7	361.5	542.3	723.1	903.9	47245	No	41	159	72	2160
LAVC-15410	400.1	600.2	800.3	1000.4	404.2	606.3	808.4	1010.5	45155	Compliant	41	159	72	2181
LAVC-15412	425.0	637.5	850.0	1062.4	438.6	657.9	877.2	1096.5	43300	No	41	159	72	2222
LEVC-16308	369.2	553.8	738.4	923.0	359.7	539.5	719.3	899.1	60954	No	65	266	73	2554
LEVC-16310	414.5	621.7	828.9	1036.2	412.8	619.2	825.6	1032.0	58710	No	65	266	73	2573
LEVC-16312	454.9	682.4	909.8	1137.3	455.4	683.1	910.8	1138.5	56646	No	65	266	73	2610
LEVC-16408	432.3	648.5	864.6	1080.8	433.8	650.8	867.7	1084.6	56694	No	84	354	73	2784
LEVC-16410	480.2	720.3	960.3	1200.4	485.0	727.6	970.1	1212.6	54186	Compliant	84	354	73	2808
LEVC-16412	510.0	765.0	1019.9	1274.9	526.3	789.4	1052.6	1315.7	51960	No	84	354	73	2858
LEVC-17308	430.7	646.1	861.4	1076.8	419.6	629.4	839.2	1049.0	71113	Compliant	76	310	74	3020
LEVC-17310	483.5	725.3	967.1	1208.9	481.6	722.4	963.2	1203.9	68495	Compliant	76	310	74	3042
LEVC-17312	530.7	796.1	1061.5	1326.9	531.3	797.0	1062.6	1328.3	66087	No	76	310	74	3088
LEVC-17408	504.4	756.6	1008.8	1260.9	506.2	759.2	1012.3	1265.4	66143	Compliant	98	413	74	3279
LEVC-17410	560.2	840.3	1120.4	1400.5	565.9	848.8	1131.8	1414.7	63217	Compliant	98	413	74	3307
LEVC-17412	595.0	892.4	1189.9	1487.4	614.0	921.0	1228.0	1535.0	60620	No	98	413	74	3366

See NOTES on 50 Hz operation and TEMPERATURE DIFFERENCE on page 3. See Correction Factor Table for refrigerant charge on page 4. CEC TITLE 24 COMPLIANT indicates condenser meets the 65 BTU/H / watt efficiency requirement. To complete the TITLE 24 compliance, fan speed must vary requiring an additional VFD and controller on fixed speed motors (F, A, C, E & B). Krack recommends the K motor option which has variable speed capability and need only a controller to provide the 0-10 V control signal to meet the regulation.

Levitor II Air-Cooled Condenser

LAVC Performance Data

(1.5 HP - 850 RPM)

TWO FANS WIDE														
MODEL	TOTAL HEAT OF REJECTION (MBH) R-404A, R-507A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	R-407A, R-448A / R-449A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	AIR FLOW (CFM)	CEC TITLE 24 COMPLIANT	CONDENSER CHARGE R-404A (LBS) SUMMER	WINTER	EST SOUND 10' (dBA)	SHIP WEIGHT (LBS)
LAVC-22208	178.4	267.5	356.7	445.9	173.0	259.5	346.0	432.5	43868	No	18	64	71	1311
LAVC-22210	207.2	310.8	414.4	518.1	201.6	302.3	403.1	503.9	42728	No	18	64	71	1320
LAVC-22212	230.6	345.9	461.2	576.5	226.6	340.0	453.3	566.6	41636	No	18	64	71	1336
LAVC-22308	246.1	369.2	492.2	615.3	239.8	359.7	479.5	599.4	40636	No	26	96	71	1425
LAVC-22310	276.3	414.5	552.6	690.8	275.2	412.8	550.4	688.0	39140	No	26	96	71	1437
LAVC-22312	303.3	454.9	606.6	758.2	303.6	455.4	607.2	759.0	37764	No	26	96	71	1462
LAVC-22408	288.2	432.3	576.4	720.5	289.2	433.8	578.5	723.1	37796	No	34	128	71	1539
LAVC-22410	320.1	480.2	640.2	800.3	323.4	485.0	646.7	808.4	36124	Compliant	34	128	71	1555
LAVC-22412	340.0	510.0	680.0	850.0	350.9	526.3	701.7	877.2	34640	No	34	128	71	1588
LAVC-23210	310.8	466.3	621.7	777.1	302.3	453.5	604.7	755.8	64092	No	26	96	73	1875
LAVC-23212	345.9	518.8	691.8	864.7	340.0	510.0	679.9	849.9	62454	No	26	96	73	1912
LAVC-23308	369.2	553.8	738.4	923.0	359.7	539.5	719.3	899.1	60954	No	36	144	73	2044
LAVC-23310	414.5	621.7	828.9	1036.2	412.8	619.2	825.6	1032.0	58710	No	36	144	73	2063
LAVC-23312	454.9	682.4	909.8	1137.3	455.4	683.1	910.8	1138.5	56646	No	36	144	73	2100
LAVC-23408	432.3	648.5	864.6	1080.8	433.8	650.8	867.7	1084.6	56694	No	48	192	73	2214
LAVC-23410	480.2	720.3	960.3	1200.4	485.0	727.6	970.1	1212.6	54186	Compliant	48	192	73	2238
LAVC-23412	510.0	765.0	1019.9	1274.9	526.3	789.4	1052.6	1315.7	51960	No	48	192	73	2287
LAVC-24308	492.2	738.4	984.5	1230.6	479.5	719.3	959.1	1198.9	81272	No	48	192	74	2526
LAVC-24310	552.6	828.9	1105.2	1381.6	550.4	825.6	1100.8	1375.9	78280	No	48	192	74	2651
LAVC-24312	606.6	909.8	1213.1	1516.4	607.2	910.8	1214.4	1518.0	75528	No	48	192	74	2700
LAVC-24408	576.4	864.6	1152.9	1441.1	578.5	867.7	1156.9	1446.2	75592	No	64	254	74	2851
LAVC-24410	640.2	960.3	1280.4	1600.6	646.7	970.1	1293.4	1616.8	72248	Compliant	64	254	74	2884
LAVC-24412	680.0	1019.9	1359.9	1699.9	701.7	1052.6	1403.5	1754.3	69280	No	64	254	74	2950
LAVC-25308	615.3	923.0	1230.6	1538.3	599.4	899.1	1198.9	1498.6	101590	No	64	238	75	3725
LAVC-25310	690.8	1036.2	1381.6	1727.0	688.0	1032.0	1375.9	1719.9	97850	No	64	238	75	3755
LAVC-25312	758.2	1137.3	1516.4	1895.5	759.0	1138.5	1518.0	1897.5	94410	No	64	238	75	3817
LAVC-25408	720.5	1080.8	1441.1	1801.4	723.1	1084.6	1446.2	1807.7	94490	No	82	318	75	4005
LAVC-25410	800.3	1200.4	1600.6	2000.7	808.4	1212.6	1616.8	2021.0	90310	Compliant	82	318	75	4046
LAVC-25412	850.0	1274.9	1699.9	2124.9	877.2	1315.7	1754.3	2192.9	86600	No	82	318	75	4129
LEVC-26308	738.4	1107.5	1476.7	1845.9	719.3	1079.0	1438.6	1798.3	121908	No	130	532	76	4759
LEVC-26310	828.9	1243.4	1657.9	2072.3	825.6	1238.3	1651.1	2063.9	117420	No	130	532	76	4796
LEVC-26312	909.8	1364.8	1819.7	2274.6	910.8	1366.2	1821.6	2277.0	113292	No	130	532	76	4870
LEVC-26408	864.6	1297.0	1729.3	2161.6	867.7	1301.5	1735.4	2169.2	113388	No	168	708	76	5218
LEVC-26410	960.3	1440.5	1920.7	2400.8	970.1	1455.1	1940.2	2425.2	108372	Compliant	168	708	76	5268
LEVC-26412	1019.9	1529.9	2039.9	2549.9	1052.6	1578.9	2105.2	2631.5	103920	No	168	708	76	5366
LEVC-27308	861.4	1292.1	1722.8	2153.6	839.2	1258.8	1678.4	2098.0	142226	Compliant	152	620	77	5691
LEVC-27310	967.1	1450.6	1934.2	2417.7	963.2	1444.7	1926.3	2407.9	136990	Compliant	152	620	77	5734
LEVC-27312	1061.5	1592.2	2123.0	2653.7	1062.6	1593.9	2125.2	2656.5	132174	No	152	620	77	5826
LEVC-27408	1008.8	1513.1	2017.5	2521.9	1012.3	1518.5	2024.6	2530.8	132286	Compliant	196	826	77	6208
LEVC-27410	1120.4	1680.6	2240.8	2801.0	1131.8	1697.6	2263.5	2829.4	126434	Compliant	196	826	77	6266
LEVC-27412	1189.9	1784.9	2379.9	2974.8	1228.0	1842.0	2456.0	3070.1	121240	No	196	826	77	6382

See NOTES on 50 Hz operation and TEMPERATURE DIFFERENCE on page 3. See Correction Factor Table for refrigerant charge on page 4. CEC TITLE 24 COMPLIANT indicates condenser meets the 65 BTU/H / watt efficiency requirement. To complete the TITLE 24 compliance, fan speed must vary requiring an additional VFD and controller on fixed speed motors (F, A, C, E & B). Krack recommends the K motor option which has variable speed capability and need only a controller to provide the 0-10 V control signal to meet the regulation.

Specifications subject to change without notice.

Levitor II Air-Cooled Condenser

Electrical Motor Data

MOTOR TYPE A - 1 HP 850 RPM *(FLA, MCA MOP)*

	K - 230/3/60				U - 380/3/50				M - 460/3/60				P - 575/3/60			
MODEL	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP
1X1	4.8	7.8	9.0	15.0	2.3	4.3	4.9	15.0	2.4	3.9	4.5	15.0	1.8	3.0	3.5	15.0
1X2	9.6	12.6	13.8	20.0	4.6	6.6	7.2	15.0	4.8	6.3	6.9	15.0	3.6	4.8	5.3	15.0
1X3	14.4	17.4	18.6	25.0	6.9	8.9	9.5	15.0	7.2	8.7	9.3	15.0	5.4	6.6	7.1	15.0
1X4	19.2	22.2	23.4	30.0	9.2	11.2	11.8	15.0	9.6	11.1	11.7	15.0	7.2	8.4	8.9	15.0
1X5	24.0	27.0	28.2	35.0	11.5	13.5	14.1	20.0	12.0	13.5	14.1	20.0	9.0	10.2	10.7	15.0
1X6	28.8	31.8	33.0	40.0	13.8	15.8	16.4	20.0	14.4	15.9	16.5	20.0	10.8	12.0	12.5	15.0
1X7	33.6	36.6	37.8	50.0	16.1	18.1	18.7	25.0	16.8	18.3	18.9	25.0	12.6	13.8	14.3	20.0
2X2	19.2	22.2	23.4	30.0	9.2	11.2	11.8	15.0	9.6	11.1	11.7	15.0	7.2	8.4	8.9	15.0
2X3	28.8	31.8	33.0	40.0	13.8	15.8	16.4	20.0	14.4	15.9	16.5	20.0	10.8	12.0	12.5	15.0
2X4	38.4	41.4	42.6	60.0	18.4	20.4	21.0	30.0	19.2	20.7	21.3	30.0	14.4	15.6	16.1	20.0
2X5	48.0	51.0	52.2	70.0	23.0	25.0	25.6	35.0	24.0	25.5	26.1	35.0	18.0	19.2	19.7	25.0
2X6	57.6	60.6	61.8	80.0	27.6	29.6	30.2	40.0	28.8	30.3	30.9	40.0	21.6	22.8	23.3	30.0
2X7	67.2	70.2	71.4	90.0	32.2	34.2	34.8	45.0	33.6	35.1	35.7	45.0	25.2	26.4	26.9	35.0

MOTOR TYPE B - 0.5 HP 1140 RPM *(FLA, MCA MOP)*

	K - 230/3/60				M - 460/3/60				P - 575/3/60				A - 230/1/60			
MODEL	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP
1X1	2.5	5.5	6.1	15.0	1.3	2.8	3.1	15.0	1.0	2.2	2.5	15.0	4.2	7.2	8.3	15.0
1X2	5.0	8.0	8.6	15.0	2.6	4.1	4.4	15.0	2.0	3.2	3.5	15.0	8.4	11.4	12.5	15.0
1X3	7.5	10.5	11.1	15.0	3.9	5.4	5.7	15.0	3.0	4.2	4.5	15.0	12.6	15.6	16.7	20.0
1X4	10.0	13.0	13.6	20.0	5.2	6.7	7.0	15.0	4.0	5.2	5.5	15.0	16.8	19.8	20.9	25.0
1X5	12.5	15.5	16.1	20.0	6.5	8.0	8.3	15.0	5.0	6.2	6.5	15.0	21.0	24.0	25.1	30.0
1X6	15.0	18.0	18.6	25.0	7.8	9.3	9.6	15.0	6.0	7.2	7.5	15.0	25.2	28.2	29.3	40.0
1X7	17.5	20.5	21.1	30.0	9.1	10.6	10.9	15.0	7.0	8.2	8.5	15.0	29.4	32.4	33.5	45.0
2X2	10.0	13.0	13.6	20.0	5.2	6.7	7.0	15.0	4.0	5.2	5.5	15.0	16.8	19.8	20.9	25.0
2X3	15.0	18.0	18.6	25.0	7.8	9.3	9.6	15.0	6.0	7.2	7.5	15.0	25.2	28.2	29.3	40.0
2X4	20.0	23.0	23.6	30.0	10.4	11.9	12.2	15.0	8.0	9.2	9.5	15.0	33.6	36.6	37.7	50.0
2X5	25.0	28.0	28.6	35.0	13.0	14.5	14.8	20.0	10.0	11.2	11.5	15.0	42.0	45.0	46.1	60.0
2X6	30.0	33.0	33.6	45.0	15.6	17.1	17.4	25.0	12.0	13.2	13.5	20.0	50.4	53.4	54.5	70.0
2X7	35.0	38.0	38.6	50.0	18.2	19.7	20.0	25.0	14.0	15.2	15.5	20.0	58.8	61.8	62.9	80.0

Notes:
- Condenser Fan FLA for VFD Sizing
- Unit FLA - Number of Fans X FLA of Fan Motors + Control Circuit Amps*
- Minimum Unit Circuit Amps - 1.25 x FLA of One Motor + FLA of All Remaining Motors + (voltage-specific) Control Circuit Amps*
- Maximum Unit Overload Protection - 2.25 x FLA of One Motor + FLA of All Remaining Motors + (voltage-specific) Control Circuit Amps* (Round Down to Next Standard Breaker)

* Control Circuit amps are:
- 208-230/3/60 – 3.0 Amps
- 460/3/60 – 1.5 Amps
- 575/3/60 – 1.2 Amps
- 380/3/50 and 60 – 2.0 Amps

Specifications subject to change without notice.

Levitor II Air-Cooled Condenser

Electrical Motor Data

MOTOR TYPE C - 1.5 HP 850 RPM *(FLA, MCA MOP)*

	K - 230/3/60				U - 380/3/50				M - 460/3/60				P - 575/3/60			
MODEL	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP
1X1	6.9	9.9	11.6	15.0	2.9	4.9	5.6	15.0	3.3	4.8	5.6	15.0	2.5	3.7	4.3	15.0
1X2	13.8	16.8	18.5	25.0	5.8	7.8	8.5	15.0	6.6	8.1	8.9	15.0	5.0	6.2	6.8	15.0
1X3	20.7	23.7	25.4	30.0	8.7	10.7	11.4	15.0	9.9	11.4	12.2	15.0	7.5	8.7	9.3	15.0
1X4	27.6	30.6	32.3	40.0	11.6	13.6	14.3	20.0	13.2	14.7	15.5	20.0	10.0	11.2	11.8	15.0
1X5	34.5	37.5	39.2	50.0	14.5	16.5	17.2	25.0	16.5	18.0	18.8	25.0	12.5	13.7	14.3	20.0
1X6	41.4	44.4	46.1	60.0	17.4	19.4	20.1	25.0	19.8	21.3	22.1	30.0	15.0	16.2	16.8	25.0
1X7	48.3	51.3	53.0	70.0	20.3	22.3	23.0	30.0	23.1	24.6	25.4	35.0	17.5	18.7	19.3	25.0
2X2	27.6	30.6	32.3	40.0	11.6	13.6	14.3	20.0	13.2	14.7	15.5	20.0	10.0	11.2	11.8	15.0
2X3	41.4	44.4	46.1	60.0	17.4	19.4	20.1	25.0	19.8	21.3	22.1	30.0	15.0	16.2	16.8	25.0
2X4	55.2	58.2	59.9	80.0	23.2	25.2	25.9	35.0	26.4	27.9	28.7	35.0	20.0	21.2	21.8	30.0
2X5	69.0	72.0	73.7	90.0	29.0	31.0	31.7	40.0	33.0	34.5	35.3	45.0	25.0	26.2	26.8	35.0
2X6	82.8	85.8	87.5	110.0	34.8	36.8	37.5	50.0	39.6	41.1	41.9	60.0	30.0	31.2	31.8	40.0
2X7	96.6	99.6	101.3	125.0	40.6	42.6	43.3	60.0	46.2	47.7	48.5	60.0	35.0	36.2	36.8	50.0

MOTOR TYPE E - 0.5 HP 575 RPM *(FLA, MCA MOP)*

	K - 230/3/60				U - 380/3/50				M - 460/3/60				P - 575/3/60			
MODEL	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP
1X1	3.4	6.4	7.3	15.0	1.4	3.4	3.8	15.0	1.6	3.1	3.5	15.0	1.5	2.7	3.1	15.0
1X2	6.8	9.8	10.7	15.0	2.8	4.8	5.2	15.0	3.2	4.7	5.1	15.0	3.0	4.2	4.6	15.0
1X3	10.2	13.2	14.1	20.0	4.2	6.2	6.6	15.0	4.8	6.3	6.7	15.0	4.5	5.7	6.1	15.0
1X4	13.6	16.6	17.5	25.0	5.6	7.6	8.0	15.0	6.4	7.9	8.3	15.0	6.0	7.2	7.6	15.0
1X5	17.0	20.0	20.9	25.0	7.0	9.0	9.4	15.0	8.0	9.5	9.9	15.0	7.5	8.7	9.1	15.0
1X6	20.4	23.4	24.3	30.0	8.4	10.4	10.8	15.0	9.6	11.1	11.5	15.0	9.0	10.2	10.6	15.0
1X7	23.8	26.8	27.7	35.0	9.8	11.8	12.2	15.0	11.2	12.7	13.1	20.0	10.5	11.7	12.1	15.0
2X2	13.6	16.6	17.5	25.0	5.6	7.6	8.0	15.0	6.4	7.9	8.3	15.0	6.0	7.2	7.6	15.0
2X3	20.4	23.4	24.3	30.0	8.4	10.4	10.8	15.0	9.6	11.1	11.5	15.0	9.0	10.2	10.6	15.0
2X4	27.2	30.2	31.1	40.0	11.2	13.2	13.6	20.0	12.8	14.3	14.7	20.0	12.0	13.2	13.6	20.0
2X5	34.0	37.0	37.9	50.0	14.0	16.0	16.4	20.0	16.0	17.5	17.9	25.0	15.0	16.2	16.6	20.0
2X6	40.8	43.8	44.7	60.0	16.8	18.8	19.2	25.0	19.2	20.7	21.1	30.0	18.0	19.2	19.6	25.0
2X7	47.6	50.6	51.5	70.0	19.6	21.6	22.0	30.0	22.4	23.9	24.3	30.0	21.0	22.2	22.6	30.0

Notes:
- Condenser Fan FLA for VFD Sizing
- Unit FLA - Number of Fans X FLA of Fan Motors + Control Circuit Amps*
- Minimum Unit Circuit Amps - 1.25 x FLA of One Motor + FLA of All Remaining Motors + (voltage-specific) Control Circuit Amps*
- Maximum Unit Overload Protection - 2.25 x FLA of One Motor + FLA of All Remaining Motors + (voltage-specific) Control Circuit Amps* (Round Down to Next Standard Breaker)

* Control Circuit amps are:
  - 208-230/3/60 – 3.0 Amps
  - 460/3/60 – 1.5 Amps
  - 575/3/60 – 1.2 Amps
  - 380/3/50 and 60 – 2.0 Amps

Levitor II Air-Cooled Condenser

Electrical Motor Data

MOTOR TYPE F - 1.5 HP 1140 RPM *(FLA, MCA MOP)*

	K - 230/3/60				U - 380/3/50				M - 460/3/60				P - 575/3/60				L - 380/3/60			
MODEL	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP
1X1	5.4	8.4	9.8	15.0	2.1	4.1	4.6	15.0	2.5	4.0	4.6	15.0	2.5	3.7	4.3	15.0	3.0	5.0	5.8	15.0
1X2	10.8	13.8	15.2	20.0	4.2	6.2	6.7	15.0	5.0	6.5	7.1	15.0	5.0	6.2	6.8	15.0	6.0	8.0	8.8	15.0
1X3	16.2	19.2	20.6	25.0	6.3	8.3	8.8	15.0	7.5	9.0	9.6	15.0	7.5	8.7	9.3	15.0	9.0	11.0	11.8	15.0
1X4	21.6	24.6	26.0	35.0	8.4	10.4	10.9	15.0	10.0	11.5	12.1	15.0	10.0	11.2	11.8	15.0	12.0	14.0	14.8	20.0
1X5	27.0	30.0	31.4	40.0	10.5	12.5	13.0	20.0	12.5	14.0	14.6	20.0	12.5	13.7	14.3	20.0	15.0	17.0	17.8	25.0
1X6	32.4	35.4	36.8	45.0	12.6	14.6	15.1	20.0	15.0	16.5	17.1	25.0	15.0	16.2	16.8	25.0	18.0	20.0	20.8	30.0
1X7	37.8	40.8	42.2	60.0	14.7	16.7	17.2	25.0	17.5	19.0	19.6	25.0	17.5	18.7	19.3	25.0	21.0	23.0	23.8	30.0
2X2	21.6	24.6	26.0	35.0	8.4	10.4	10.9	15.0	10.0	11.5	12.1	15.0	10.0	11.2	11.8	15.0	12.0	14.0	14.8	20.0
2X3	32.4	35.4	36.8	45.0	12.6	14.6	15.1	20.0	15.0	16.5	17.1	25.0	15.0	16.2	16.8	25.0	18.0	20.0	20.8	30.0
2X4	43.2	46.2	47.6	60.0	16.8	18.8	19.3	25.0	20.0	21.5	22.1	30.0	20.0	21.2	21.8	30.0	24.0	26.0	26.8	35.0
2X5	54.0	57.0	58.4	80.0	21.0	23.0	23.5	30.0	25.0	26.5	27.1	35.0	25.0	26.2	26.8	35.0	30.0	32.0	32.8	45.0
2X6	64.8	67.8	69.2	90.0	25.2	27.2	27.7	35.0	30.0	31.5	32.1	40.0	30.0	31.2	31.8	40.0	36.0	38.0	38.8	50.0
2X7	75.6	78.6	80.0	100.0	29.4	31.4	31.9	40.0	35.0	36.5	37.1	50.0	35.0	36.2	36.8	50.0	42.0	44.0	44.8	60.0

MOTOR TYPE K - 1.5 HP 1140 RPM *(FLA, MCA MOP)*

	K - 230/3/60				M - 460/3/60			
MODEL	FAN FLA	UNIT FLA	MCA	MOP	FAN FLA	UNIT FLA	MCA	MOP
1X1	5.4	8.4	9.8	15.0	3.0	4.5	5.3	15.0
1X2	10.8	13.8	15.2	20.0	6.0	7.5	8.3	15.0
1X3	16.2	19.2	20.6	25.0	9.0	10.5	11.3	15.0
1X4	21.6	24.6	26.0	35.0	12.0	13.5	14.3	20.0
1X5	27.0	30.0	31.4	40.0	15.0	16.5	17.3	25.0
1X6	32.4	35.4	36.8	45.0	18.0	19.5	20.3	25.0
1X7	37.8	40.8	42.2	60.0	21.0	22.5	23.3	30.0
2X2	21.6	24.6	26.0	35.0	12.0	13.5	14.3	20.0
2X3	32.4	35.4	36.8	45.0	18.0	19.5	20.3	25.0
2X4	43.2	46.2	47.6	60.0	24.0	25.5	26.3	35.0
2X5	54.0	57.0	58.4	80.0	30.0	31.5	32.3	40.0
2X6	64.8	67.8	69.2	90.0	36.0	37.5	38.3	50.0
2X7	75.6	78.6	80.0	100.0	42.0	43.5	44.3	60.0

Notes:
- Condenser Fan FLA for VFD Sizing
- Unit FLA - Number of Fans X FLA of Fan Motors + Control Circuit Amps*
- Minimum Unit Circuit Amps - 1.25 x FLA of One Motor + FLA of All Remaining Motors + (voltage-specific) Control Circuit Amps*
- Maximum Unit Overload Protection - 2.25 x FLA of One Motor + FLA of All Remaining Motors + (voltage-specific) Control Circuit Amps* (Round Down to Next Standard Breaker)

* Control Circuit amps are:
- 208-230/3/60 – 3.0 Amps
- 460/3/60 – 1.5 Amps
- 575/3/60 – 1.2 Amps
- 380/3/50 and 60 – 2.0 Amps

Specifications subject to change without notice.

Levitor II Air-Cooled Condenser

Electrical Motor Watts Data

FAN MOTOR COMBINATION (kW)						
MODEL	**A**	**B**	**C**	**E**	**F**	**K**
11208	0.90	0.61	1.07	0.27	1.17	1.15
11210	0.91	0.61	1.08	0.28	1.17	1.15
11212	0.92	0.61	1.09	0.28	1.18	1.16
11308	0.92	0.61	1.10	0.28	1.19	1.17
11310	0.93	0.62	1.13	0.28	1.21	1.19
11312	0.94	0.62	1.15	0.29	1.22	1.20
11408	0.94	0.63	1.15	0.29	1.22	1.20
11410	0.96	0.63	1.17	0.29	1.24	1.22
11412	0.98	0.64	1.20	0.30	1.27	1.25

Watts shown are for a single fan and are multiplied by the number of the fans for units with more fans.

Note

For all **Performance Data Tables**, capacity ratings are based on midpoint condensing temperature at 95° F entering air temperature and with 0° F sub-cooling. TEMPERATURE DIFFERENCE is midpoint condensing temperature to entering ambient air temperature.

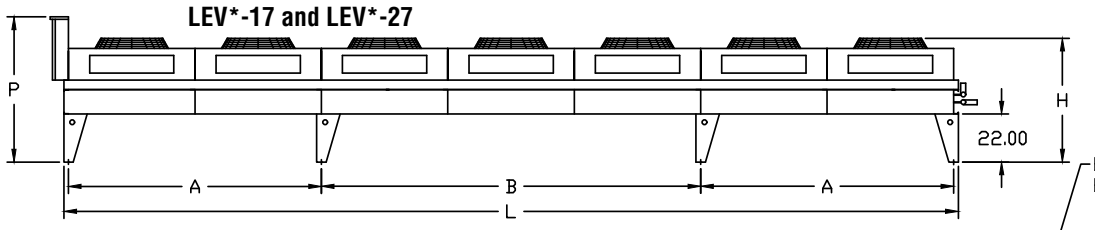
De-rate capacity data 10% for 50 Hz applications with all motors except K (variable speed BPM motors and panel mounted drive) which have no reduction in capacity for the change in frequency.

See **Electrical Motor Data Tables** on pages 13 - 15.

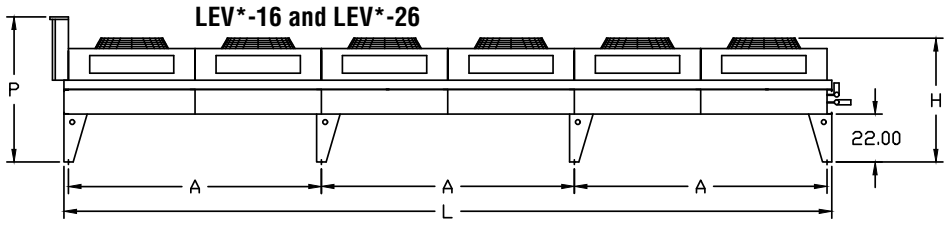
Levitor II Air-Cooled Condenser

Dimensional Drawings

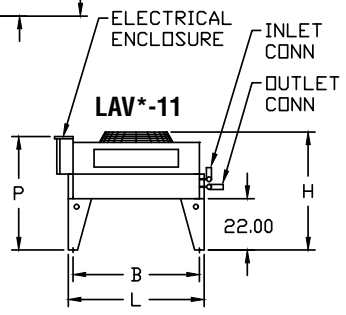
LEV*-17 and LEV*-27



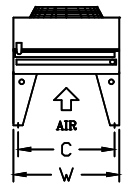
LEV*-16 and LEV*-26



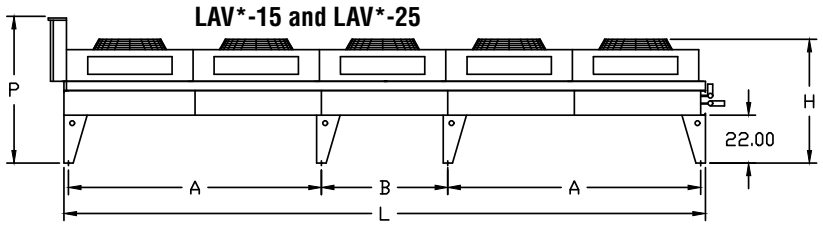
LAV*-11



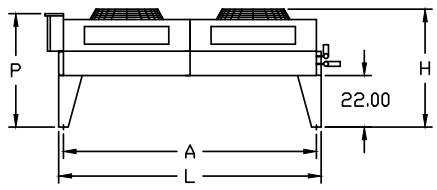
END VIEW - ONE FAN WIDE -



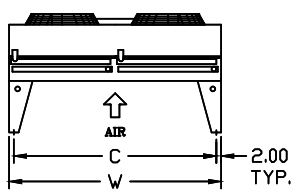
LAV*-15 and LAV*-25



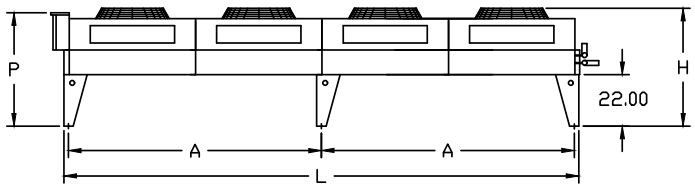
LAV*-12 and LAV*-22



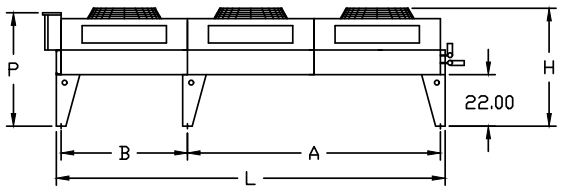
END VIEW - TWO FAN WIDE -



LAV*-14 and LAV*-24



LAV*-13 and LAV*-23



ONE FAN WIDE

								CONNECTIONS OD IN(1)	
	L	W	H	P	A	B	C	INLET	OUTLET
LAV*-11***	58	45-1/4	54	49	-	54	41-1/4	1-3/8	1-3/8
LAV*-12***	112	45-1/4	54	49	108	-	41-1/4	1-5/8	1-5/8
LAV*-13***	166	45-1/4	54	49	108	54	41-1/4	2-1/8	2-1/8
LAV*-14***	220	45-1/4	54	49	108	-	41-1/4	2-1/8	2-1/8
LAV*-15***	274	45-1/4	58-1/2	65	108	54	41-1/4	2-1/8	2-1/8
LEV*-16***	328	45-1/4	58-1/2	65	108	-	41-1/4	2-5/8	2-5/8
LEV*-17***	382	45-1/4	58-1/2	65	108	162	41-1/4	2-5/8	2-5/8

TWO FANS WIDE

								CONNECTIONS OD IN(1)	
	L	W	H	P	A	B	C	INLET	OUTLET
LAV*-22***	112	90-1/2	54	49	108	-	86-1/2	(2)1-5/8	(2)1-5/8
LAV*-23***	166	90-1/2	54	49	108	54	86-1/2	(2)2-1/8	(2)2-1/8
LAV*-24***	220	90-1/2	54	49	108	-	86-1/2	(2)2-1/8	(2)2-1/8
LAV*-25***	274	90-1/2	58-1/2	65	108	54	86-1/2	(2)2-1/8	(2)2-1/8
LEV*-26***	328	90-1/2	58-1/2	65	108	-	86-1/2	(2)2-5/8	(2)2-5/8
LEV*-27***	382	90-1/2	58-1/2	65	108	162	86-1/2	(2) 2-5/8	(2) 2-5/8

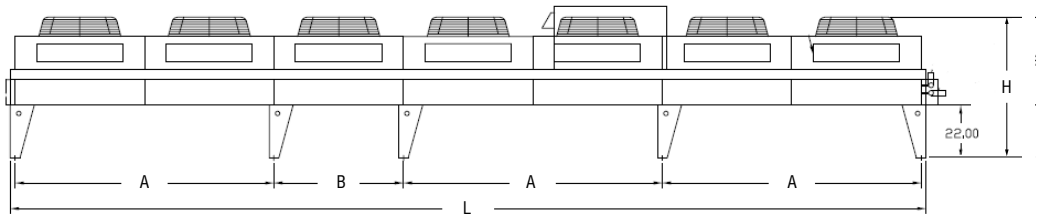
NOTE:
* Indicates fan / motor combination.
*** Indicates Rows & FPI. 'H' value includes standard 22" legs.
(1) Connections are approximate. Exact size is determined by computerized circuiting program.
(2) 1 x 3 has six legs; 2 x 3 has eight legs.

Specifications subject to change without notice.

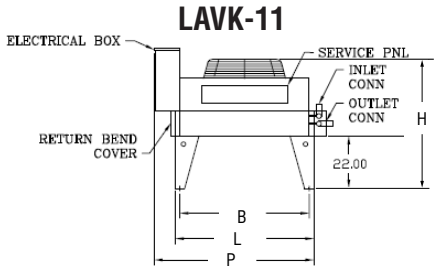
Levitor II Air-Cooled Condenser

Dimensional Drawings *(for K Fan Models)*

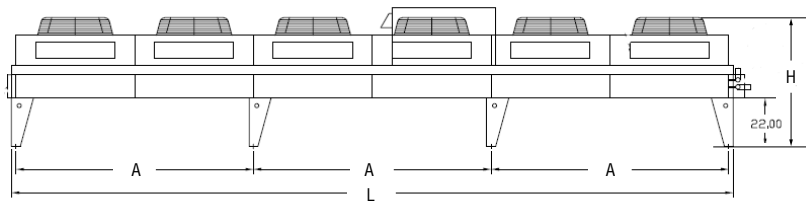
LEVK-17 and LEVK-27



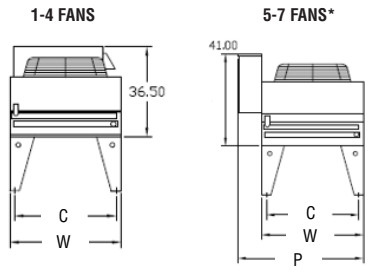
LAVK-11



LEVK-16 and LEVK-26

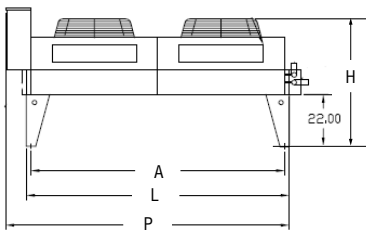


END VIEW
- ONE FAN WIDE -

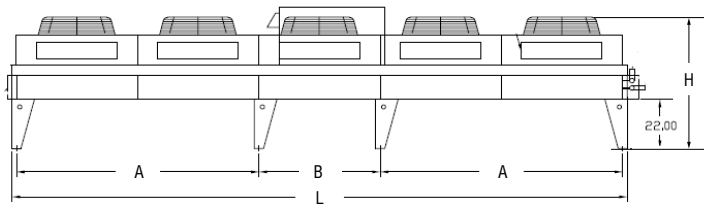


* 5-7 Fan Models have electrical panel on the side of the condenser increasing the width and requiring electrical clearance on the side. Panel is located on the LEFT side when facing the headers.

LAVK-12 and LAVK-22

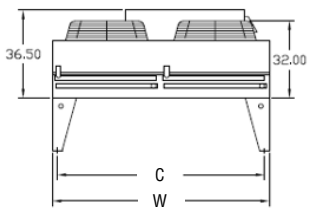


LAVK-15 and LAK-25

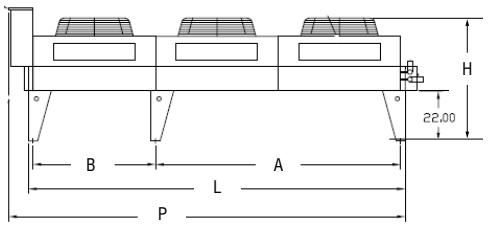


END VIEW
- TWO FAN WIDE -

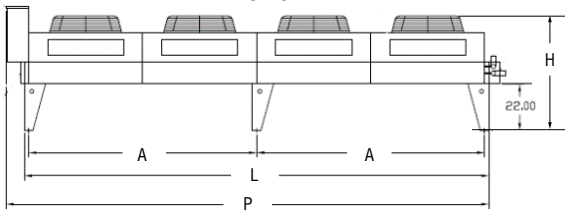
ALL UNITS



LAVK-13 and LAVK-23



LAVK-14 and LAVK-24



ONE FAN WIDE

								CONNECTIONS OD IN(1)	
	L	W	H	P	A	B	C	INLET	OUTLET
LAVK-11***	58	45-1/4	54	66.75	-	54	41-1/4	1-3/8	1-3/8
LAVK-12***	112	45-1/4	54	120.75	108	-	41-1/4	1-5/8	1-5/8
LAVK-13***	166	45-1/4	54	174.75	108	54	41-1/4	2-1/8	2-1/8
LAVK-14***	220	45-1/4	54	228.75	108	-	41-1/4	2-1/8	2-1/8
LAVK-15***	274	45-1/4	58-1/2	56	108	54	41-1/4	2-1/8	2-1/8
LEVK-16***	328	45-1/4	58-1/2	56	108	-	41-1/4	2-5/8	2-5/8
LEVK-17***	382	45-1/4	58-1/2	56	108	162	41-1/4	2-5/8	2-5/8

TWO FANS WIDE

								CONNECTIONS OD IN(1)	
	L	W	H	P	A	B	C	INLET	OUTLET
--									
LAVK-22***	112	90-1/2	54	120.75	108	-	86-1/2	(2)1-5/8	(2)1-5/8
LAVK-23***	166	90-1/2	54	174.75	108	54	86-1/2	(2)2-1/8	(2)2-1/8
LAVK-24***	220	90-1/2	54	228.75	108	-	86-1/2	(2)2-1/8	(2)2-1/8
LAVK-25***	274	90-1/2	58-1/2	56	108	54	86-1/2	(2)2-1/8	(2)2-1/8
LEVK-26***	328	90-1/2	58-1/2	56	108	-	86-1/2	(2)2-5/8	(2)2-5/8
LEVK-27***	382	90-1/2	58-1/2	56	108	162	86-1/2	(2) 2-5/8	(2) 2-5/8

Levitor II Air-Cooled Condenser

LAVB Performance Data

(0.5 HP - 1140 RPM)

ONE FAN WIDE

MODEL	TOTAL HEAT OF REJECTION (MBH) R-404A, R-507A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	R-407A, R-448A / R-449A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	AIR FLOW (CFM)	CEC TITLE 24 COMPLIANT	CONDENSER CHARGE R-404A (LBS) SUMMER	WINTER	EST SOUND 10' (dBA)	SHIP WEIGHT (LBS)
LAVB-11208	27.5	41.2	54.9	68.7	26.5	39.7	52.9	66.1	6900	No	3	10	65	178
LAVB-11210	32.0	48.1	64.1	80.1	31.2	46.7	62.3	77.9	6750	No	3	10	65	181
LAVB-11212	35.8	53.6	71.5	89.4	35.0	52.5	70.0	87.5	6606	No	3	10	65	184
LAVB-11308	38.4	57.6	76.8	96.0	37.5	56.2	74.9	93.7	6594	No	4	15	65	180
LAVB-11310	43.7	65.6	87.4	109.3	43.3	64.9	86.5	108.1	6400	Compliant	4	15	65	185
LAVB-11312	48.0	72.0	96.0	120.0	47.7	71.6	95.5	119.3	6217	No	4	15	65	190
LAVB-11408	45.9	68.9	91.9	114.9	45.8	68.6	91.5	114.4	6224	Compliant	5	20	65	193
LAVB-11410	51.3	76.9	102.6	128.2	51.7	77.5	103.4	129.2	6000	Compliant	5	20	65	200
LAVB-11412	55.1	82.6	110.2	137.7	56.3	84.4	112.5	140.7	5799	No	5	20	65	207
LAVB-12208	54.9	82.4	109.9	137.4	52.9	79.4	105.8	132.3	13800	No	6	19	68	346
LAVB-12210	64.1	96.1	128.2	160.2	62.3	93.5	124.7	155.8	13500	No	6	19	68	352
LAVB-12212	71.5	107.3	143.0	178.8	70.0	105.0	140.0	175.1	13212	No	6	19	68	358
LAVB-12308	76.8	115.2	153.6	192.0	74.9	112.4	149.9	187.4	13188	No	8	29	68	362
LAVB-12310	87.4	131.2	174.9	218.6	86.5	129.8	173.0	216.3	12800	Compliant	8	29	68	372
LAVB-12312	96.0	144.0	192.0	240.0	95.5	143.2	190.9	238.6	12434	No	8	29	68	382
LAVB-12408	91.9	137.8	183.8	229.7	91.5	137.3	183.1	228.8	12448	Compliant	10	38	68	386
LAVB-12410	102.6	153.9	205.2	256.5	103.4	155.1	206.8	258.5	12000	Compliant	10	38	68	400
LAVB-12412	110.2	165.3	220.3	275.4	112.5	168.8	225.1	281.3	11598	No	10	38	68	413
LAVB-13308	115.2	172.8	230.4	288.0	112.4	168.6	224.8	281.0	19782	No	11	42	70	544
LAVB-13310	131.2	196.8	262.3	327.9	129.8	194.6	259.5	324.4	19200	Compliant	11	42	70	559
LAVB-13312	144.0	216.0	288.0	360.0	143.2	214.8	286.4	357.9	18651	No	11	42	70	574
LAVB-13408	137.8	206.8	275.7	344.6	137.3	205.9	274.6	343.2	18672	Compliant	14	57	70	580
LAVB-13410	153.9	230.8	307.8	384.7	155.1	232.6	310.2	387.7	18000	Compliant	14	57	70	600
LAVB-13412	165.3	247.9	330.5	413.1	168.8	253.2	337.6	422.0	17397	No	14	57	70	620
LAVB-14308	153.6	230.4	307.2	384.0	149.9	224.8	299.8	374.7	26376	No	14	56	71	820
LAVB-14310	174.9	262.3	349.8	437.2	173.0	259.5	346.0	432.5	25600	Compliant	14	56	71	840
LAVB-14312	192.0	288.0	384.0	480.0	190.9	286.4	381.8	477.3	24868	No	14	56	71	860
LAVB-14408	183.8	275.7	367.6	459.5	183.1	274.6	366.1	457.7	24896	Compliant	19	75	71	873
LAVB-14410	205.2	307.8	410.3	512.9	206.8	310.2	413.6	517.0	24000	Compliant	19	75	71	900
LAVB-14412	220.3	330.5	440.7	550.9	225.1	337.6	450.1	562.7	23196	No	19	75	71	927
LAVB-15308	192.0	288.0	384.0	479.9	187.4	281.0	374.7	468.4	32970	No	18	70	72	836
LAVB-15310	218.6	327.9	437.2	546.5	216.3	324.4	432.5	540.7	32000	Compliant	18	70	72	861
LAVB-15312	240.0	360.0	480.0	600.0	238.6	357.9	477.3	596.6	31085	No	18	70	72	886
LAVB-15408	229.7	344.6	459.5	574.4	228.8	343.2	457.7	572.1	31120	Compliant	23	94	72	917
LAVB-15410	256.5	384.7	512.9	641.2	258.5	387.7	517.0	646.2	30000	Compliant	23	94	72	950
LAVB-15412	275.4	413.1	550.9	688.6	281.3	422.0	562.7	703.3	28995	No	23	94	72	983
LAVB-16308	230.4	345.6	460.7	575.9	224.8	337.2	449.7	562.1	39564	No	22	85	73	1040
LAVB-16310	262.3	393.5	524.7	655.8	259.5	389.3	519.0	648.8	38400	Compliant	22	85	73	1070
LAVB-16312	288.0	432.0	576.0	720.0	286.4	429.5	572.7	715.9	37302	No	22	85	73	1100
LAVB-16408	275.7	413.5	551.4	689.2	274.6	411.9	549.2	686.5	37344	Compliant	28	113	73	1110
LAVB-16410	307.8	461.6	615.5	769.4	310.2	465.3	620.4	775.4	36000	Compliant	28	113	73	1150
LAVB-16412	330.5	495.8	661.0	826.3	337.6	506.4	675.2	844.0	34794	No	28	113	73	1190
LAVB-17308	268.8	403.1	537.5	671.9	262.3	393.5	524.6	655.8	46158	No	25	98	74	1314
LAVB-17310	306.1	459.1	612.1	765.2	302.8	454.1	605.5	756.9	44800	Compliant	25	98	74	1349
LAVB-17312	336.0	504.0	672.0	840.1	334.1	501.1	668.2	835.2	43519	No	25	98	74	1384
LAVB-17408	321.6	482.5	643.3	804.1	320.4	480.5	640.7	800.9	43568	Compliant	32	131	74	1404
LAVB-17410	359.0	538.6	718.1	897.6	361.9	542.8	723.7	904.7	42000	Compliant	32	131	74	1450
LAVB-17412	385.6	578.4	771.2	964.0	393.9	590.8	787.7	984.6	40593	No	32	131	74	1497

See NOTES on 50 Hz operation and TEMPERATURE DIFFERENCE on page 3. See Correction Factor Table for refrigerant charge on page 4. CEC TITLE 24 COMPLIANT indicates condenser meets the 65 BTU/H / watt efficiency requirement. To complete the TITLE 24 compliance, fan speed must vary requiring an additional VFD and controller on fixed speed motors (F, A, C, E & B). Krack recommends the K motor option which has variable speed capability and need only a controller to provide the 0-10 V control signal to meet the regulation.

Specifications subject to change without notice.

Levitor II Air-Cooled Condenser

LAVB Performance Data

(0.5 HP - 1140 RPM)

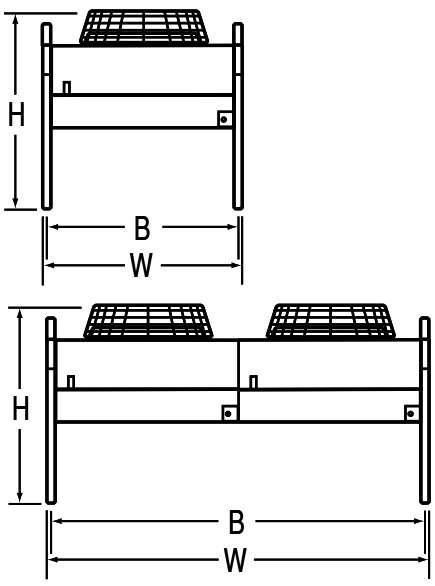
TWO FANS WIDE														
MODEL	TOTAL HEAT OF REJECTION (MBH) R-404A, R-507A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	R-407A, R-448A / R-449A TEMPERATURE DIFFERENCE 10° F	15° F	20° F	25° F	AIR FLOW (CFM)	CEC TITLE 24 COMPLIANT	CONDENSER CHARGE R-404A (LBS) SUMMER	WINTER	EST SOUND 10' (dBA)	SHIP WEIGHT (LBS)
LAVB-22208	109.9	164.8	219.8	274.7	105.8	158.7	211.6	264.5	27600	No	12	38	71	642
LAVB-22210	128.2	192.3	256.4	320.5	124.7	187.0	249.3	311.6	27000	No	12	38	71	654
LAVB-22212	143.0	214.6	286.1	357.6	140.0	210.1	280.1	350.1	26424	No	12	38	71	666
LAVB-22308	153.6	230.4	307.2	384.0	149.9	224.8	299.8	374.7	26376	No	16	58	71	845
LAVB-22310	174.9	262.3	349.8	437.2	173.0	259.5	346.0	432.5	25600	Compliant	16	58	71	865
LAVB-22312	192.0	288.0	384.0	480.0	190.9	286.4	381.8	477.3	24868	No	16	58	71	885
LAVB-22408	183.8	275.7	367.6	459.5	183.1	274.6	366.1	457.7	24896	Compliant	20	76	71	895
LAVB-22410	205.2	307.8	410.3	512.9	206.8	310.2	413.6	517.0	24000	Compliant	20	76	71	925
LAVB-22412	220.3	330.5	440.7	550.9	225.1	337.6	450.1	562.7	23196	No	20	76	71	953
LAVB-23308	230.4	345.6	460.7	575.9	224.8	337.2	449.7	562.1	39564	No	22	84	73	1088
LAVB-23310	262.3	393.5	524.7	655.8	259.5	389.3	519.0	648.8	38400	Compliant	22	84	73	1118
LAVB-23312	288.0	432.0	576.0	720.0	286.4	429.5	572.7	715.9	37302	No	22	84	73	1148
LAVB-23408	275.7	413.5	551.4	689.2	274.6	411.9	549.2	686.5	37344	Compliant	28	114	73	1185
LAVB-23410	307.8	461.6	615.5	769.4	310.2	465.3	620.4	775.4	36000	Compliant	28	114	73	1225
LAVB-23412	330.5	495.8	661.0	826.3	337.6	506.4	675.2	844.0	34794	No	28	114	73	1265
LAVB-24308	307.2	460.7	614.3	767.9	299.8	449.7	599.6	749.4	52752	No	28	112	74	1665
LAVB-24310	349.8	524.7	699.6	874.5	346.0	519.0	692.0	865.0	51200	Compliant	28	112	74	1705
LAVB-24312	384.0	576.0	768.0	960.1	381.8	572.7	763.6	954.5	49736	No	28	112	74	1745
LAVB-24408	367.6	551.4	735.2	919.0	366.1	549.2	732.2	915.3	49792	Compliant	38	150	74	1771
LAVB-24410	410.3	615.5	820.7	1025.8	413.6	620.4	827.1	1033.9	48000	Compliant	38	150	74	1825
LAVB-24412	440.7	661.0	881.4	1101.7	450.1	675.2	900.2	1125.3	46392	No	38	150	74	1880
LAVB-25308	384.0	575.9	767.9	959.9	374.7	562.1	749.4	936.8	65940	No	36	140	75	1672
LAVB-25310	437.2	655.8	874.5	1093.1	432.5	648.8	865.0	1081.3	64000	Compliant	36	140	75	1722
LAVB-25312	480.0	720.0	960.1	1200.1	477.3	715.9	954.5	1193.2	62170	No	36	140	75	1772
LAVB-25408	459.5	689.2	919.0	1148.7	457.7	686.5	915.3	1144.1	62240	Compliant	46	188	75	1859
LAVB-25410	512.9	769.4	1025.8	1282.3	517.0	775.4	1033.9	1292.4	60000	Compliant	46	188	75	1925
LAVB-25412	550.9	826.3	1101.7	1377.1	562.7	844.0	1125.3	1406.6	57990	No	46	188	75	1991
LAVB-26308	460.7	691.1	921.5	1151.9	449.7	674.5	899.3	1124.2	79128	No	44	170	76	2035
LAVB-26310	524.7	787.0	1049.4	1311.7	519.0	778.5	1038.0	1297.6	76800	Compliant	44	170	76	2095
LAVB-26312	576.0	864.1	1152.1	1440.1	572.7	859.1	1145.4	1431.8	74604	No	44	170	76	2155
LAVB-26408	551.4	827.1	1102.8	1378.5	549.2	823.8	1098.4	1373.0	74688	Compliant	56	226	76	2145
LAVB-26410	615.5	923.3	1231.0	1538.8	620.4	930.5	1240.7	1550.9	72000	Compliant	56	226	76	2225
LAVB-26412	661.0	991.5	1322.0	1652.6	675.2	1012.8	1350.4	1688.0	69588	No	56	226	76	2305
LAVB-27308	537.5	806.3	1075.1	1343.8	524.6	786.9	1049.2	1311.5	92316	Compliant	50	196	77	2655
LAVB-27310	612.1	918.2	1224.2	1530.3	605.5	908.3	1211.1	1513.8	89600	No	50	196	77	2725
LAVB-27312	672.0	1008.1	1344.1	1680.1	668.2	1002.2	1336.3	1670.4	87038	No	50	196	77	2795
LAVB-27408	643.3	964.9	1286.6	1608.2	640.7	961.1	1281.4	1601.8	87136	Compliant	64	262	77	2835
LAVB-27410	718.1	1077.1	1436.2	1795.2	723.7	1085.6	1447.5	1809.4	84000	Compliant	64	262	77	2925
LAVB-27412	771.2	1156.8	1542.4	1928.0	787.7	1181.6	1575.4	1969.3	81186	No	64	262	77	3015

See NOTES on 50 Hz operation and TEMPERATURE DIFFERENCE on page 3. See Correction Factor Table for refrigerant charge on page 4. CEC TITLE 24 COMPLIANT indicates condenser meets the 65 BTU/H / watt efficiency requirement. To complete the TITLE 24 compliance, fan speed must vary requiring an additional VFD and controller on fixed speed motors (F, A, C, E & B). Krack recommends the K motor option which has variable speed capability and need only a controller to provide the 0-10 V control signal to meet the regulation.

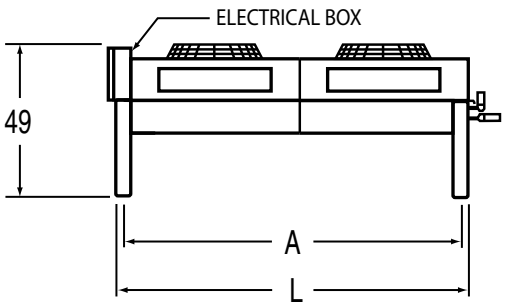
Levitor II Air-Cooled Condenser

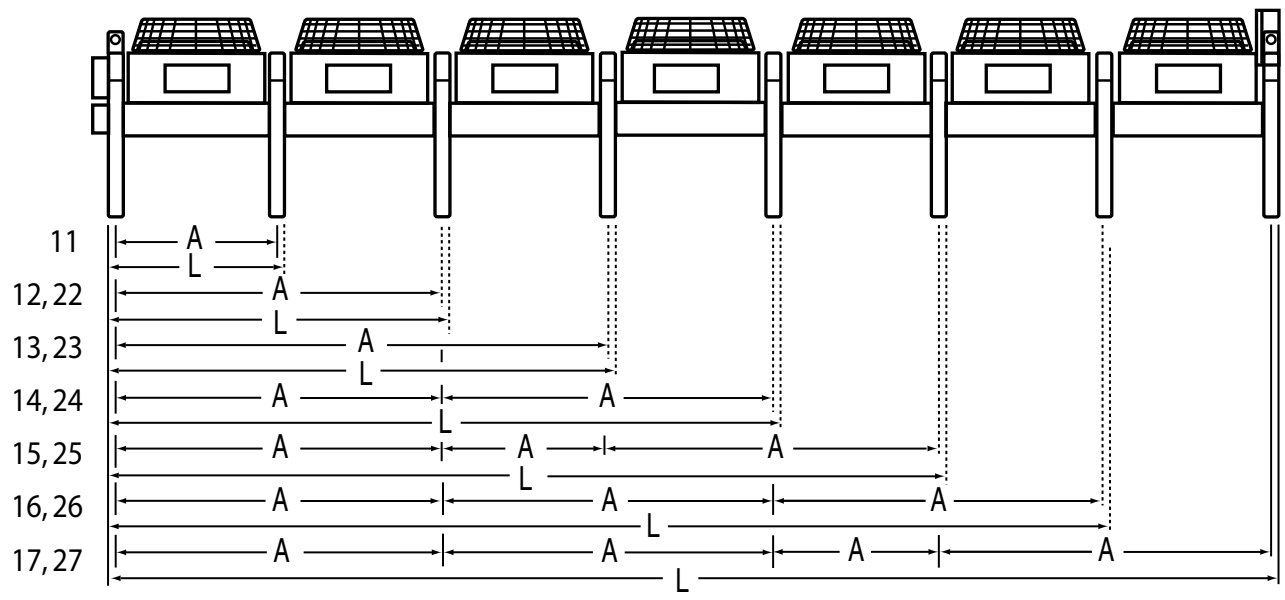
Dimensional Drawings (for B Fan Models)

HEADER END VIEW



SIDE VIEWS





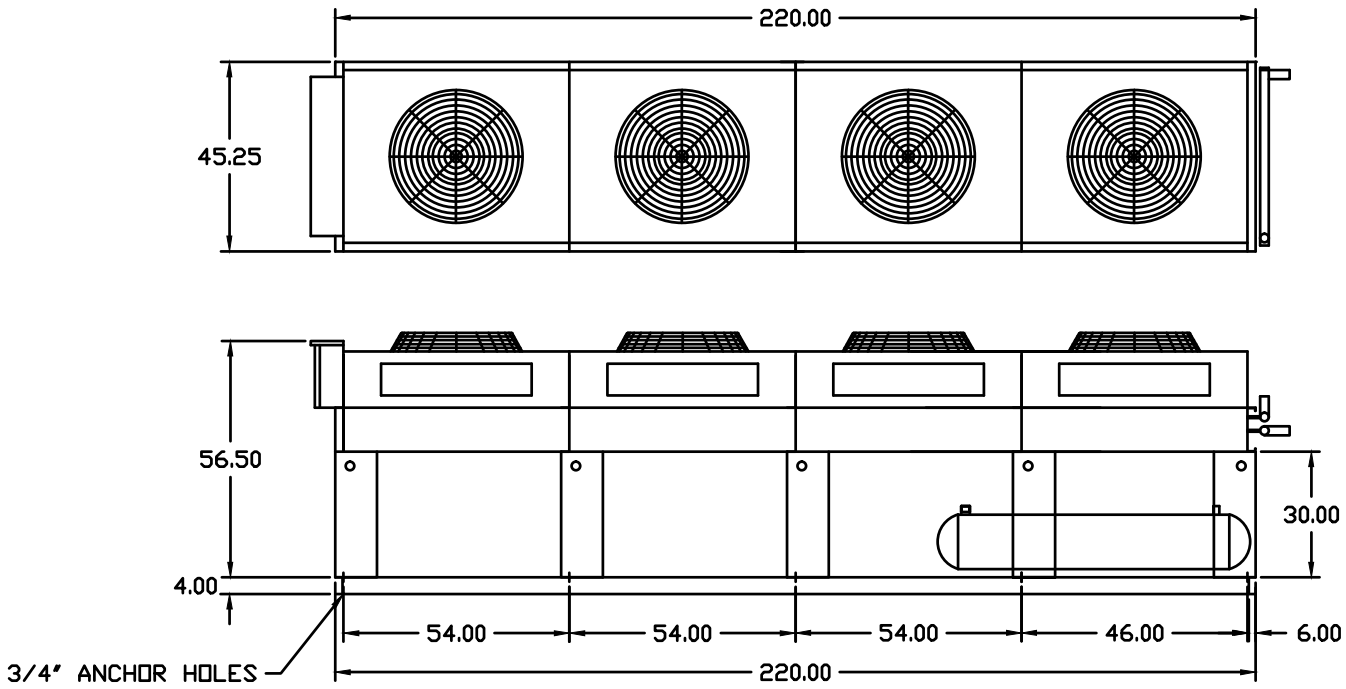
DIMENSIONAL DATA

						CONNECTIONS OD IN.(1)	
	L	W	H	A	B	INLET	OUTLET
LAVB-11***	39	45-1/4	41-1/4	36	43-1/4	1-1/8	1-1/8
LAVB-12***	75	45-1/4	41-1/4	72	43-1/4	1-3/8	1-3/8
LAVB-13***	111	45-1/4	41-1/4	108	43-1/4	1-3/8	1-3/8
LAVB-14***	147	45-1/4	41-1/4	72/72	43-1/4	1-5/8	1-5/8
LAVB-15***	183	45-1/4	41-1/4	72/36/72	43-1/4	2-1/8	2-1/8
LAVB-16***	219	45-1/4	41-1/4	72/72/72	43-1/4	2-1/8	2-1/8
LAVB-17***	262	45-1/4	41-1/4	72/72/36/72	43-1/4	2-5/8	2-5/8
LAVB-22***	75	87-5/8	41-1/4	72	85-5/8	1-3/8	1-3/8
LAVB-23***	111	87-5/8	41-1/4	108	85-5/8	1-3/8	1-3/8
LAVB-24***	147	87-5/8	41-1/4	72/72	85-5/8	1-5/8	1-5/8
LAVB-25***	183	87-5/8	41-1/4	72/36/72	85-5/8	2-1/8	2-1/8
LAVB-26***	219	87-5/8	41-1/4	72/72/72	85-5/8	2-1/8	2-1/8
LAVB-27***	262	87-5/8	41-1/4	72/72/36/72	85-5/8	2-5/8	2-5/8

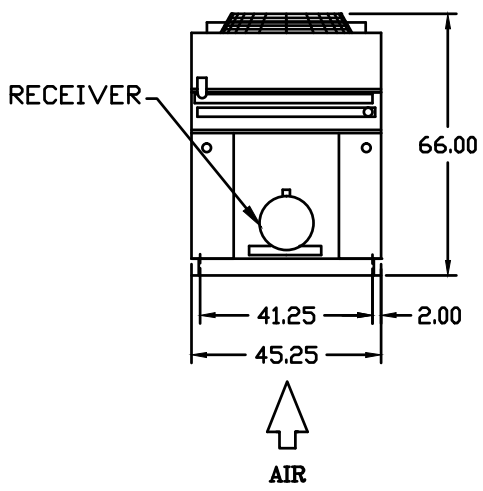
NOTE: Refer to pages 13 for B Motor Electrical Data.
*** Indicates Rows & FPI. 'H' value includes standard 18" legs.
(1) Connections are approximate. Exact size is determined by computerized circuiting program.

Levitor II Air-Cooled Condenser

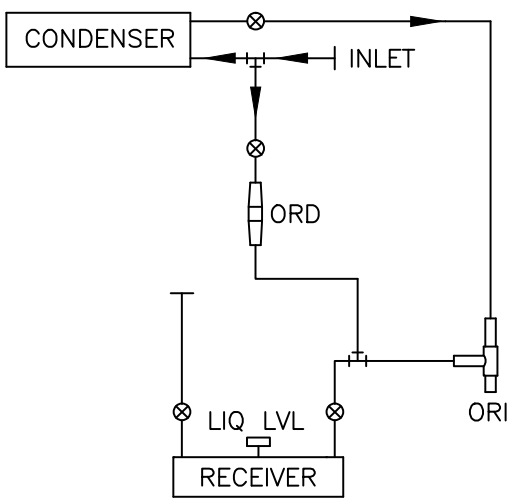
Mounted Receiver Diagram (One Receiver) - If Applicable



END VIEW

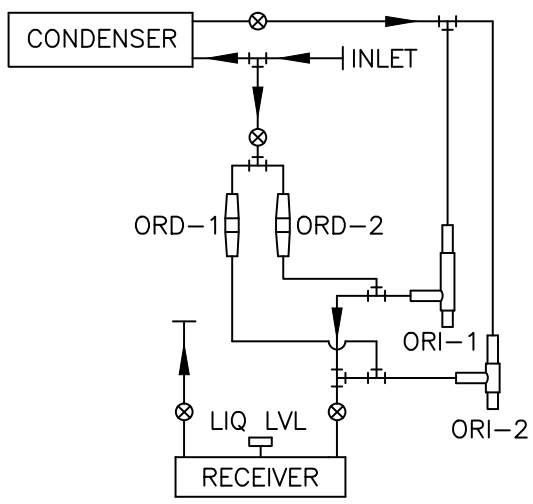


RECEIVER PIPING



RECEIVER PIPING

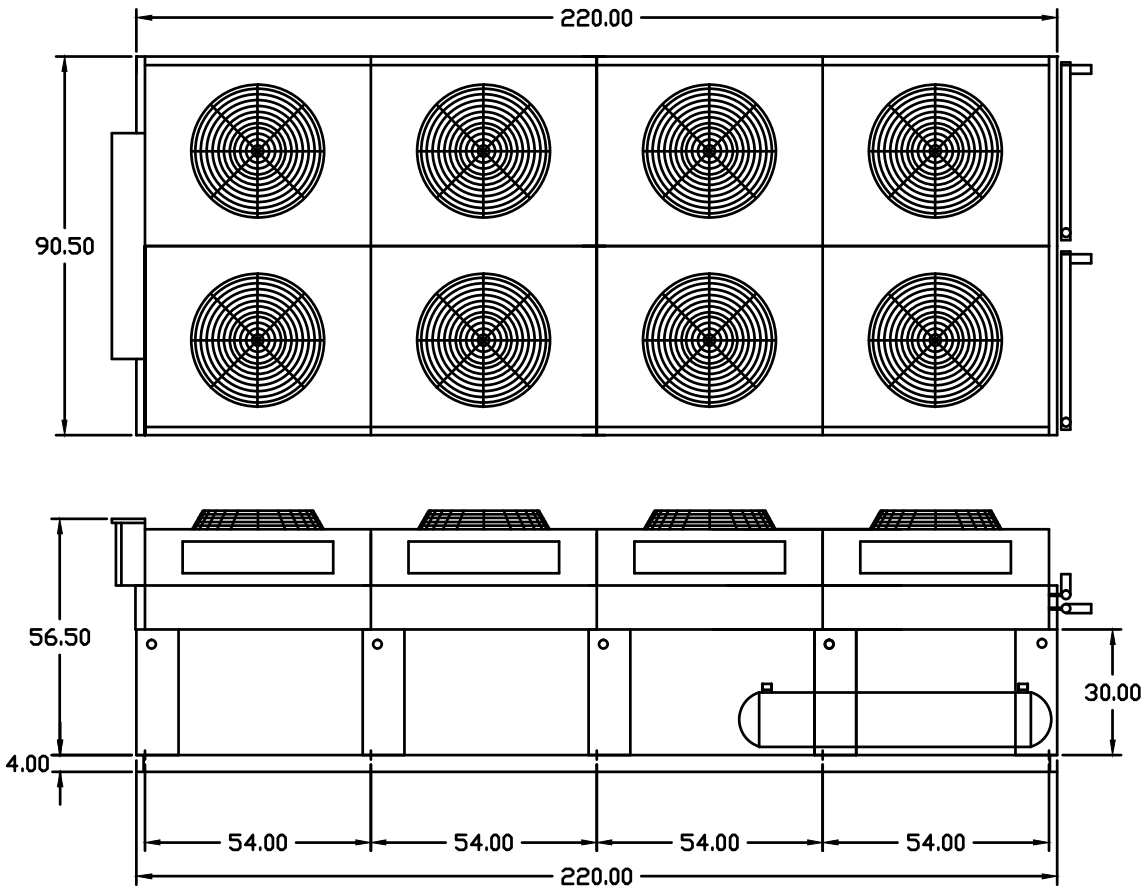
DUAL ORI/ORD VALVES
REQUIRED FOR HIGHER CAPACITY MODELS



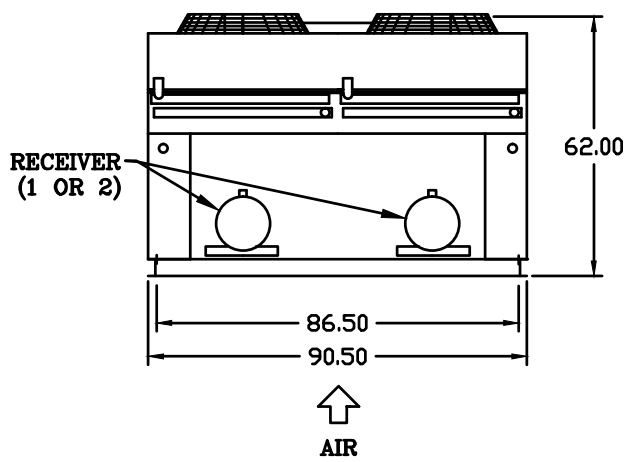
Specifications subject to change without notice.

Levitor II Air-Cooled Condenser

Mounted Receiver Diagram (Two Receivers) - If Applicable

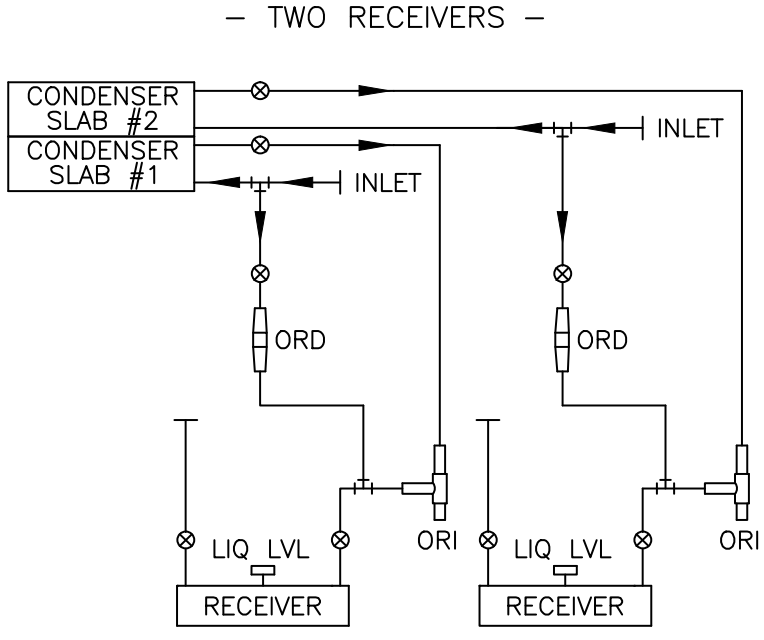


END VIEW



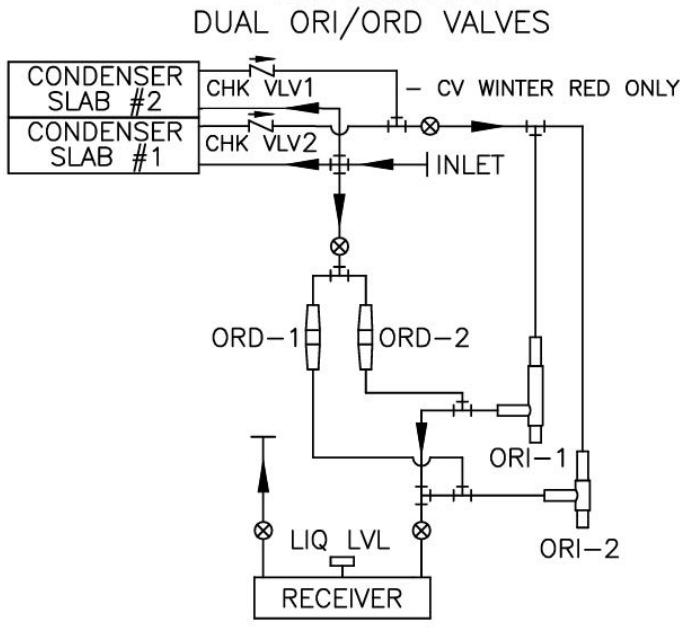
RECEIVER PIPING

– TWO RECEIVERS –



RECEIVER PIPING

– ONE RECEIVER –
DUAL ORI/ORD VALVES



Specifications subject to change without notice.

Levitor II Air-Cooled Condenser

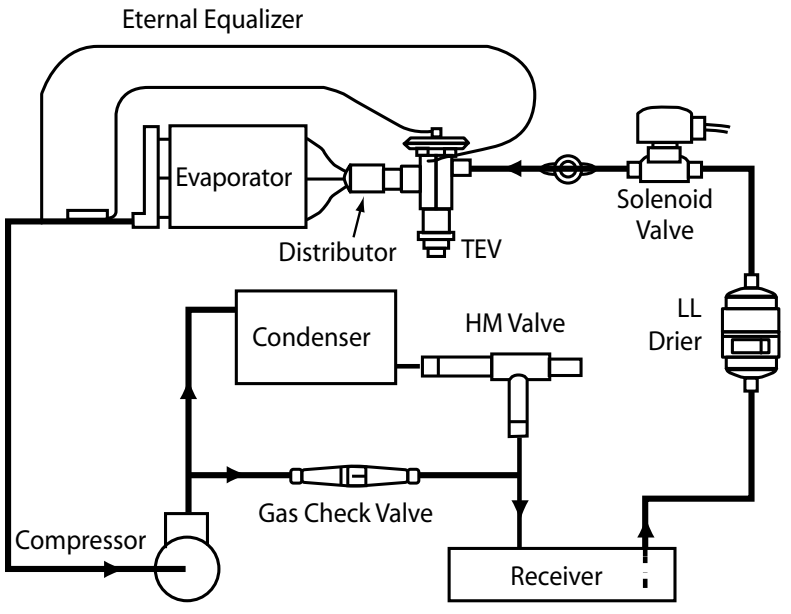
Low Ambient Controls (Head Pressure Control System)

Piping Schematic for Winter Control

Head Pressure Control for systems with air-cooled condenser is accomplished with two pressure regulating valves designed specifically for this type of application. When low ambient conditions are encountered during winter operation on air-cooled systems with a resultant drop in condensing pressure, the Head Pressure control's purpose is to hold back enough of the condenser liquid refrigerant so that some of the condenser surface is rendered inactive. This reduction of active condensing surface results in a rise in the condensing pressure and sufficient liquid line pressure for normal system operation.

Fan Cycling Controls

Factory installed and tested fan cycling control panels (optional, see pages 26 - 32).



Mounted Receivers

Levitor is available with a mounted receiver for applications where a remote receiver is desired. Included in the option are a heavy-duty base, extended legs, receiver, a 3-way valve, relief valve(s), rotalocks, ball valves, and ORI / ORD valves. Optional heated, insulated and oversized receivers available.

ADDITIONAL UNIT WEIGHTS

# OF FANS	# OF RECEIVERS 1	2
1 x 1	350	550
1 x 2	440	640
1 x 3	530	730
1 x 4	620	820
1 x 5	820	1120
1 x 6	910	1210
1 x 7	1000	1300
2 x 2	520	700
2 x 3	620	800
2 x 4	720	910
2 x 5	910	1210
2 x 6	1020	1320
2 x 7	1120	1420

Receiver models are 12" taller than standard models.
Add the above to weights.

RECEIVER CAPACITIES @ 80% FULL

SIZE	R-404A/R-507A (LBS)	R-407A (LBS)	R-448A / R-449A (LBS)
10-3/4" x 48"	114	126	121
10-3/4" x 60"	144	159	153
12-3/4" x 72"	245	270	260
14-3/4" x 96"	395	435	419

Levitor II Air-Cooled Condenser

Mounted Receivers

Includes ORI / ORD flooding valve, isolation ball valves, gauge-type liquid level indicator and dual relief valve. Optional heat tape and insulation.

FACTORY MOUNTED RECEIVERS

LEVITOR II MODEL	SIZE	RECEIVER SIZE
LAVB 24" FAN MODEL 1 Receiver	LAVB-11	10.75" x 48"
	LAVB-12	10.75" x 60"
	LAVB-13	10.75" x 60"
	LAVB-14	10.75" x 60"
	LAVB-15	10.75" x 60"
	LAVB-16	10.75" x 60"
	LAVB-17	12.75" x 72"
LAVB 24" FAN MODEL 1 Receiver	LAVB-22	(1) 10.75" x 60"
	LAVB-23	(1) 10.75" x 60"
	LAVB-24	(1) 12.75" x 72"
	LAVB-25	(1) 12.75" x 72"
	LAVB-26	(1) 12.75" x 72"
	LAVB-27	(1) 12.75" x 72"
LAVB 24" FAN MODEL 2 Receivers for Independent Slab Operation	LAVB-22	(2) 10.75" x 60"
	LAVB-23	(2) 10.75" x 60"
	LAVB-24	(2) 10.75" x 60"
	LAVB-25	(2) 10.75" x 60"
	LAVB-26	(2) 10.75" x 60"
	LAVB-27	(2) 12.75" x 72"
LAV-LEV 30" FAN MODEL 1 Receiver	LAV*-11	10.75" x 60"
	LAV*-12	10.75" x 60"
	LAV*-13	10.75" x 60"
	LAV*-14	10.75" x 60"
	LAV*-15	12.75" x 72"
	LAV*-16	12.75" x 72"
	LAV*-17	12.75" x 72"
LAV-LEV 30" FAN MODEL 1 Receiver	LAV*-22	(1) 10.75" x 60"
	LAV*-23	(1) 12.75" x 72"
	LAV*-24	(1) 12.75" x 72"
	LAV*-25	(1) 12.75" x 72"
	LAV*-26	(1) 12.75" x 72"
	LAV*-27	(1) 12.75" x 72"
LAV-LEV 30" FAN MODEL 2 Receivers for Independent Slab Operation	LAV*-22	(2) 10.75" x 60"
	LAV*-23	(2) 10.75" x 60"
	LAV*-24	(2) 10.75" x 60"
	LAV*-25	(2) 12.75" x 72"
	LAV*-26	(2) 12.75" x 72"
	LEV*-27	(2) 12.75" x 72"

Specifications subject to change without notice.

Levitor II Air-Cooled Condenser

Control Panel Nomenclature

CPC	PT	B	3	3	1	N	R

RELAY BOARD (optional)
A, B, C, E, F Motor
N - None
CPC - 8RO board
CPC1 - Multiflex 88
CPC2 - Multiflex 88AO
AKC - Danfoss 88 w/AKC-SC355/255
AKS - Danfoss 88 w/AKS-SM800
MTH - Microthermo 508
MTH1 - Microthermo 722F and 784A
NOV - Novar
K Motor***
N - None
CPC2 - Multiflex 88AO
HSM - HSM Controller
MTH1 - Microthermo 722F and 784A
DAN - Danfoss

BACKUP CONTROLLER
A, B, C, E, F Motor
NC - No Controls
PT - PressureControls
TF - Temperature Controls
TP - Temp. and Pressure Controls
PV - Pressure Controls w/ Variable Speed*
TV - Temp. Controls w/ Variable Speed*
VN - No Controls w/ Variable Speed*
K Motor***
KB - KB Drive
CD - Copeland Drive

CONTROL VOLTAGE
A, B, C, E, F Motor
A - 208/230 V
B - 115 V
C - No Control Voltage
D - 24 V
E** - 208/230 V w/o Transformer
F** - 115 V w/o Transformer
H** - 24 V w/o Transformer
K Motor***
A - 208/230 V
B - 115 V

RECEIVER OPTION
R - Factory Mounted Receiver (R-Heated or Non-Heated)
S - Standard No Receiver

AMBIENT AIR SENSOR FOR SPLIT
A, B, C, E, F Motor
T - Sensor Provided
N - Sensor Not Required
K Motor***
T - Sensor Provided
N - Sensor Not Required

TYPE OF APPLICATION
A, B, C, E, F Motor
1 - Standard
2 - 50% Winter Reduction (Split Condenser)
3 - 50/50 Split Dual Panel (for Two Independent Slabs)
4 - No Control Operation (Terminal Blocks Only)
K Motor***
1 - Standard
2 - 50% Winter Reduction (Split Condenser)
3 - 50/50 Split Dual Panel (for Two Independent Slabs)

FUSES AND BREAKERS
A, B, C, E, F Motor
1 - Individual Fuses and Contactors
2 - Individual Circuit Breakers and Contactors per Fan 3 - Fuses and Contactors per Pair of Fans
4 - Terminal Blocks Only
5 - Circuit Breaker and Contactor per Pair of Fans
6 - Fuses Only per Motor
8 - High SCCR, Individual Fuses and Contactors
9 - High SCCR, Fuses and Contactors Per Pair of Fans
K Motor***
6 - Fuses Only per Motor

BACKUP CONTROL TYPE
A, B, C, E, F Motor
3 - Johnson Electric
4 - No Controls
K Motor***
4 - No Controls

* Variable Speed - Header End Fans only
** Without Transformer - Control Voltage from source outside of Condenser Control Panel
*** LEVITOR II MODELS LAVK / LEVK (1.5 HP, 1,140 RPM, BPM MOTOR, AND PANEL MOUNTED DRIVE)

Levitor II Air-Cooled Condenser

Standard Fan Cycling / Control Arrangements

- Electronic temperature control cycles fans in response to entering air temperature. Set points and differential for each step are adjustable.
- Electronic pressure control with single point pressure transducer cycles fans in response to condenser pressure. Set points and differential for each step are adjustable.
- Thermal Pressure Electronic temperature control cycle fans in response to entering air temperature, except for header end fan(s). Header end fan(s) are controlled by pressure control.
- Variable Speed Control-Header end fan(s) are controlled with a speed controller in response to head pressure.
- Fan Cycling Sequence-Fans are cycled off individually or side-by-side in pairs in sequence from the end opposite the header to the header end. Header end fans run continuously if compressors are operating.

Control Panel

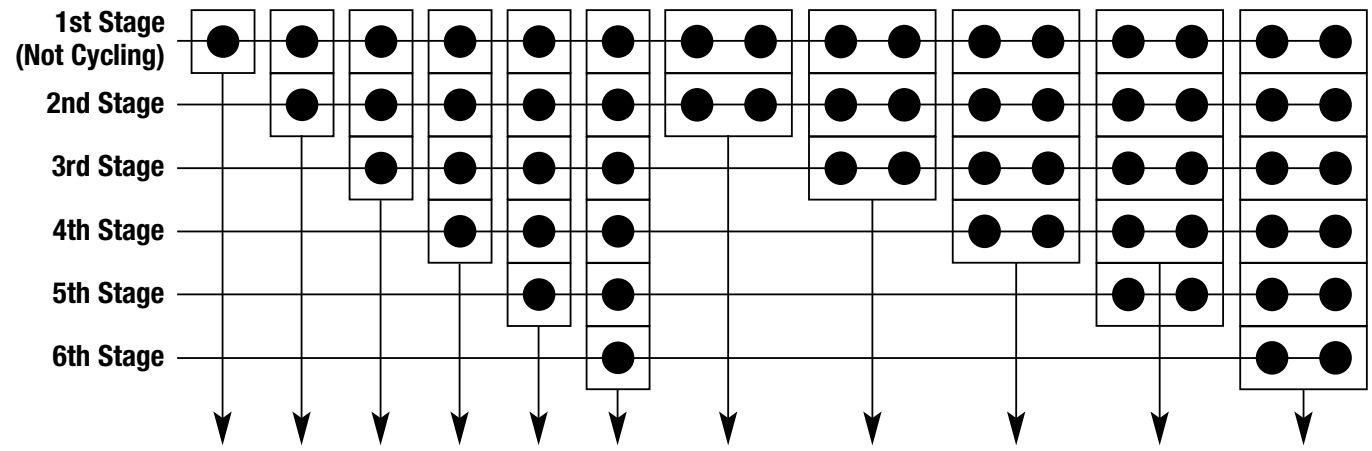
- Standard weather resistant enclosure is mounted on the opposite end of the unit when looking at the headers.
- Control power is 24, 115 or 230 volts. A transformer is factory installed when required.
- Fan contactor with branch circuit fuse protection. Each motor or bank of motors protected by fuses.
- Disconnect not included, but may be required to meet local codes.

Optional Arrangements

- Fan motor contactor and fuses only.
- Fan motor contactor and fuses only which operate via a customer specified solid state board. Circuit board is factory mounted and wired.
- 50/50 split with two fan wide models. Each side is controlled separately with individual control panels on each side.
- 50% winter reduction with two fan wide models. The right side fans are isolated in winter. Fans are locked out via a relay or switch during shutdown.
- Consult Price List for additional options.

Fan Cycling Sequence

TABLE A



CAPACITY MULTIPLIER WITH HEADER FANS RUNNING	1.00	0.55	0.40	0.33	0.28	0.24	0.55	0.40	0.33	0.28	0.24

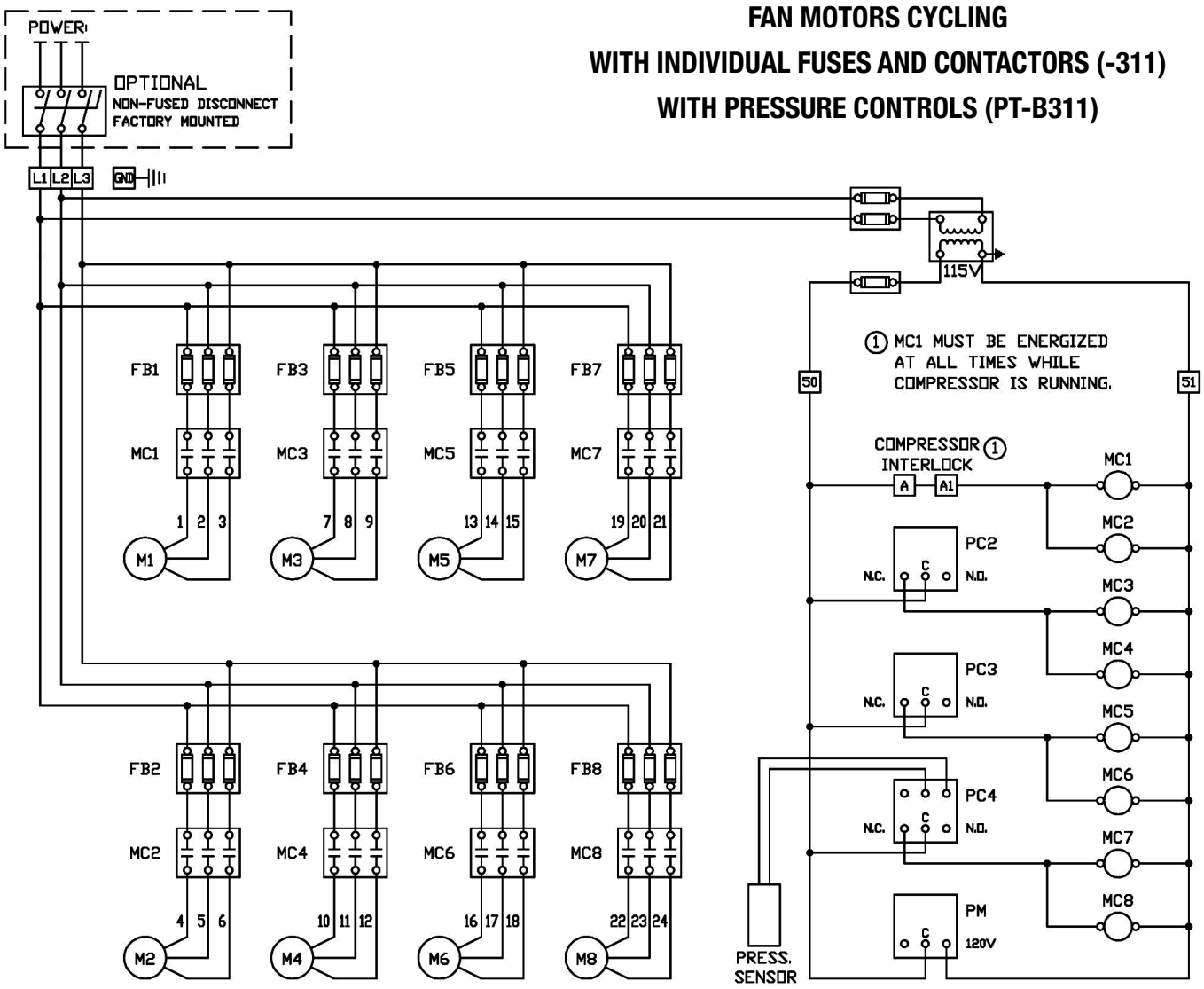
NOTE: Data given in Table "A" is based on zero wind velocity. If condensers are subjected to wind effect, these multipliers will increase.

Specifications subject to change without notice.

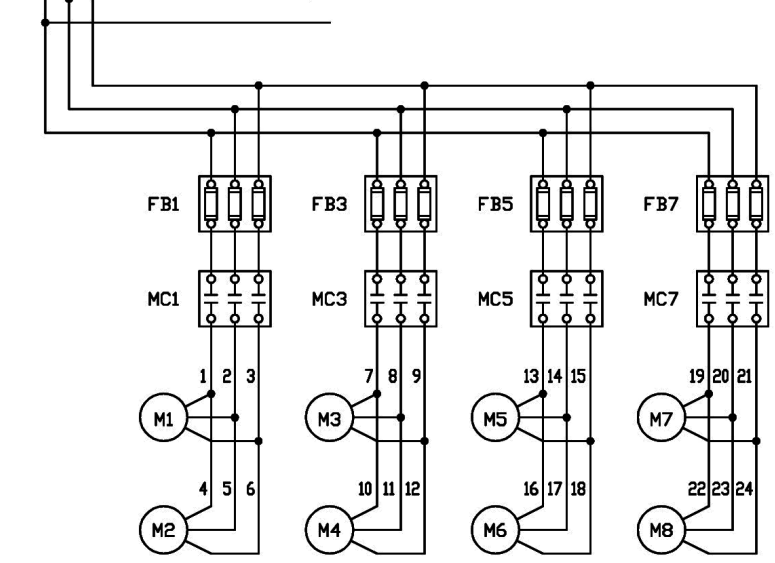
Levitor II Air-Cooled Condenser

Example Wiring Diagrams

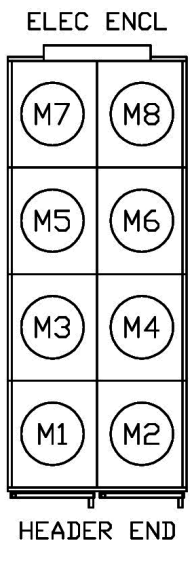
FAN MOTORS CYCLING
WITH INDIVIDUAL FUSES AND CONTACTORS (-311)
WITH PRESSURE CONTROLS (PT-B311)



FAN MOTORS CYCLING
WITH FUSES AND CONTACTORS IN PAIRS (-311)



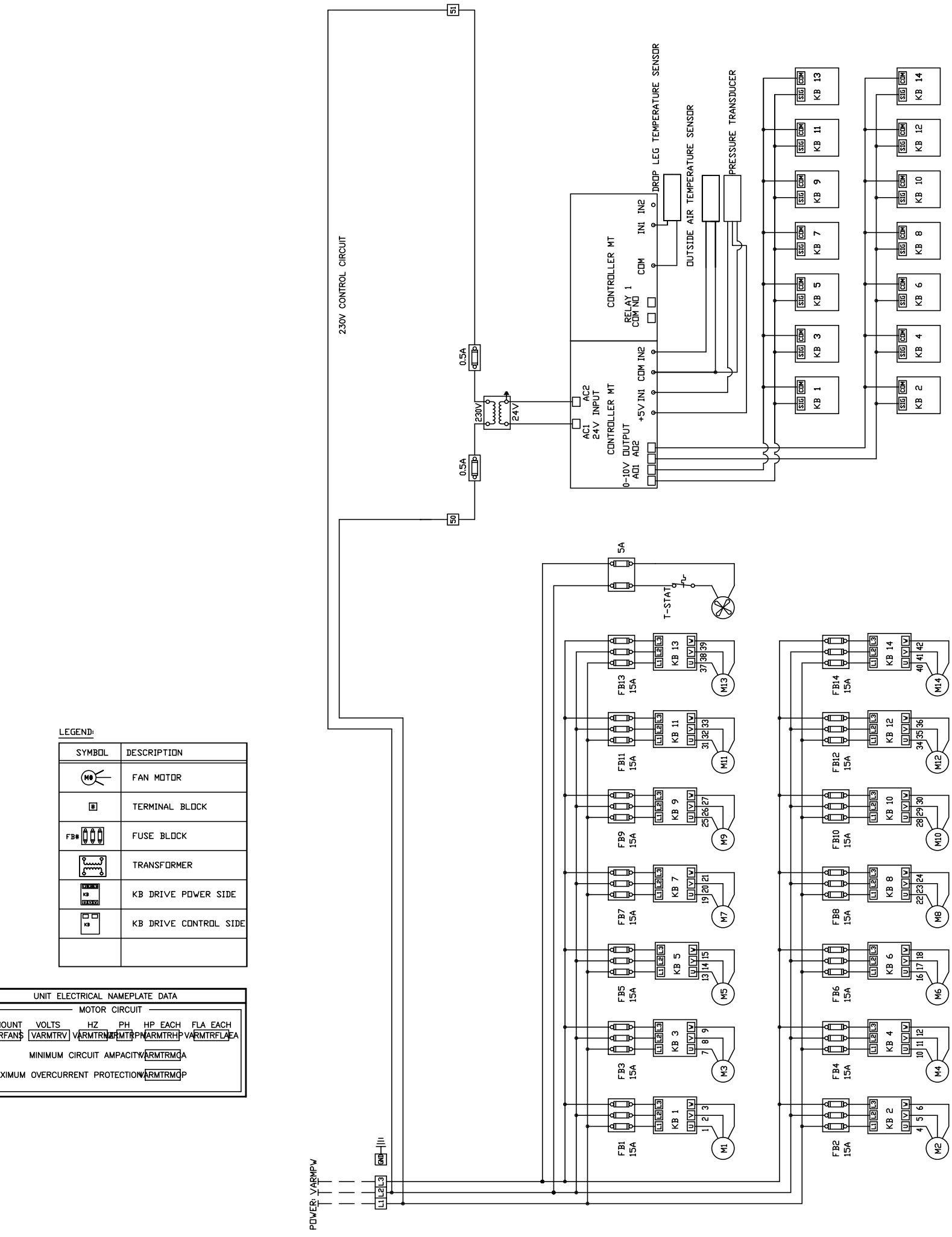
SYMBOL	DESCRIPTION
	FUSE BLOCK
	TRANSFORMER
#	TERMINAL BLOCK
MC#	MOTOR CONTACTOR COIL
N.C. C PC# N.O.	PRESSURE CONTROL MODULE
N.C. C PC# N.O.	PRESSURE CONTROL STAGE MODULE
240V C PM 120V	POWER MODULE



Levitor II Air-Cooled Condenser

Example Wiring Diagrams

K MOTOR VSPEED VARIABLE SPEED FAN CONTROL WITH INDIVIDUAL FAN FUSING (-461)
AND MICROTHERMO CONTROL BOARD (MTH OR MTH1) FOR COMPLETE NOMENCLATURE (MTH NCA461)



LEGEND:

SYMBOL	DESCRIPTION
M#	FAN MOTOR
#	TERMINAL BLOCK
FB#	FUSE BLOCK
	TRANSFORMER
KB	KB DRIVE POWER SIDE
KB	KB DRIVE CONTROL SIDE

UNIT ELECTRICAL NAMEPLATE DATA

MOTOR CIRCUIT

AMOUNT VARFANS	VOLTS VARMTRV	HZ VARMTRHZ	PH VARMTRPH	HP EACH VARMTRHP	FLA EACH VARMTRFLA

MINIMUM CIRCUIT AMPACITY VARMTRMCA

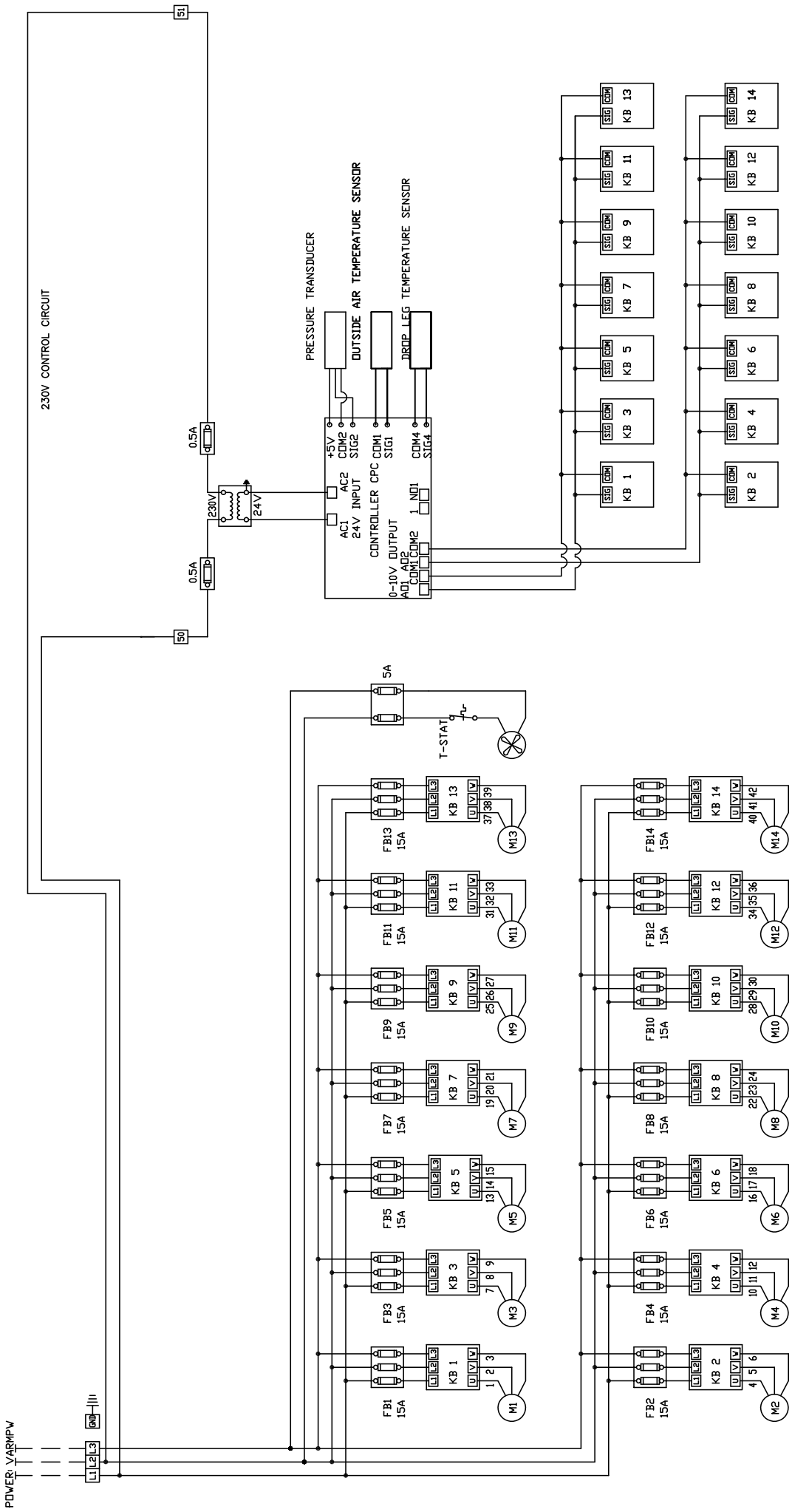
MAXIMUM OVERCURRENT PROTECTION VARMTRMOP

Specifications subject to change without notice.

Levitor II Air-Cooled Condenser

Example Wiring Diagrams

K MOTOR VSPEED VARIABLE SPEED FAN CONTROL WITH INDIVIDUAL FAN FUSING (-461)
AND CPC CONTROL BOARD (CPC2) FOR COMPLETE NOMENCLATURE (CPC2 NCA461)



LEGEND:

SYMBOL	DESCRIPTION
M#	FAN MOTOR
#	TERMINAL BLOCK
FB#	FUSE BLOCK
	TRANSFORMER
KB	KB DRIVE POWER SIDE
KB	KB DRIVE CONTROL SIDE

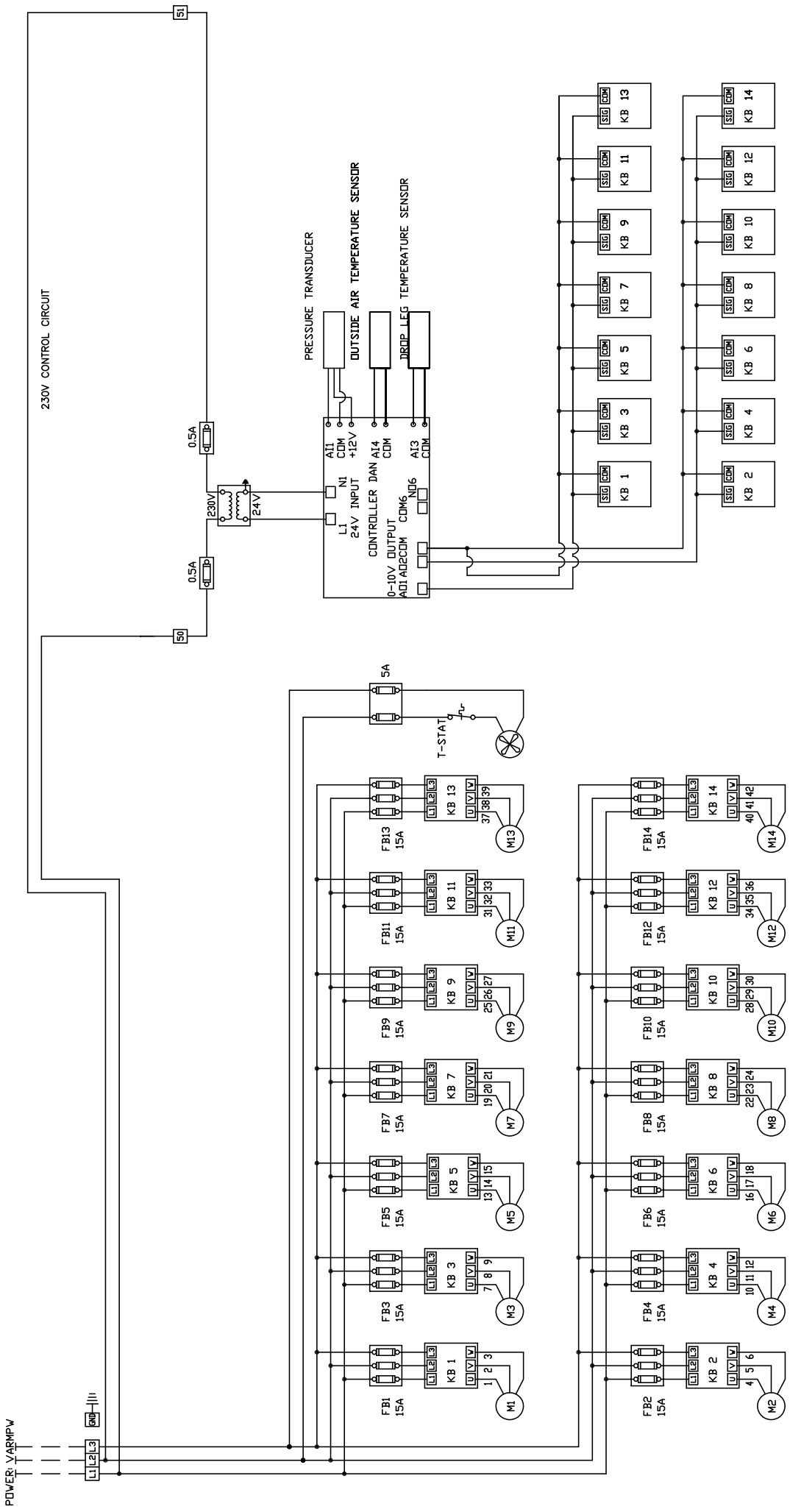
UNIT ELECTRICAL NAMEPLATE DATA					
MOTOR CIRCUIT					
AMOUNT	VOLTS	HZ	PH	HP EACH	FLA EACH
VARFANS	VARMTRV	VARMTRHZ	VARMTRPH	VARMTRHP	VARMTRFLA EA
MINIMUM CIRCUIT AMPACITY VARMTRMCA					
MAXIMUM OVERCURRENT PROTECTION VARMTRMOP					

Specifications subject to change without notice.

Levitor II Air-Cooled Condenser

Example Wiring Diagrams

K MOTOR VSPEED VARIABLE SPEED FAN CONTROL WITH INDIVIDUAL FAN FUSING (-461)
AND DANFOSS CONTROL BOARD (DAN) FOR COMPLETE NOMENCLATURE (DAN NCA461)



LEGEND:

SYMBOL	DESCRIPTION
M#	FAN MOTOR
#	TERMINAL BLOCK
FB#	FUSE BLOCK
	TRANSFORMER
KB	KB DRIVE POWER SIDE
KB	KB DRIVE CONTROL SIDE

UNIT ELECTRICAL NAMEPLATE DATA

MOTOR CIRCUIT

AMOUNT	VOLTS	HZ	PH	HP EACH	FLA EACH
VARFANS	VARMTRV	VARMTRHZ	VARMTRPH	VARMTRHP	VARMTRFLA EA

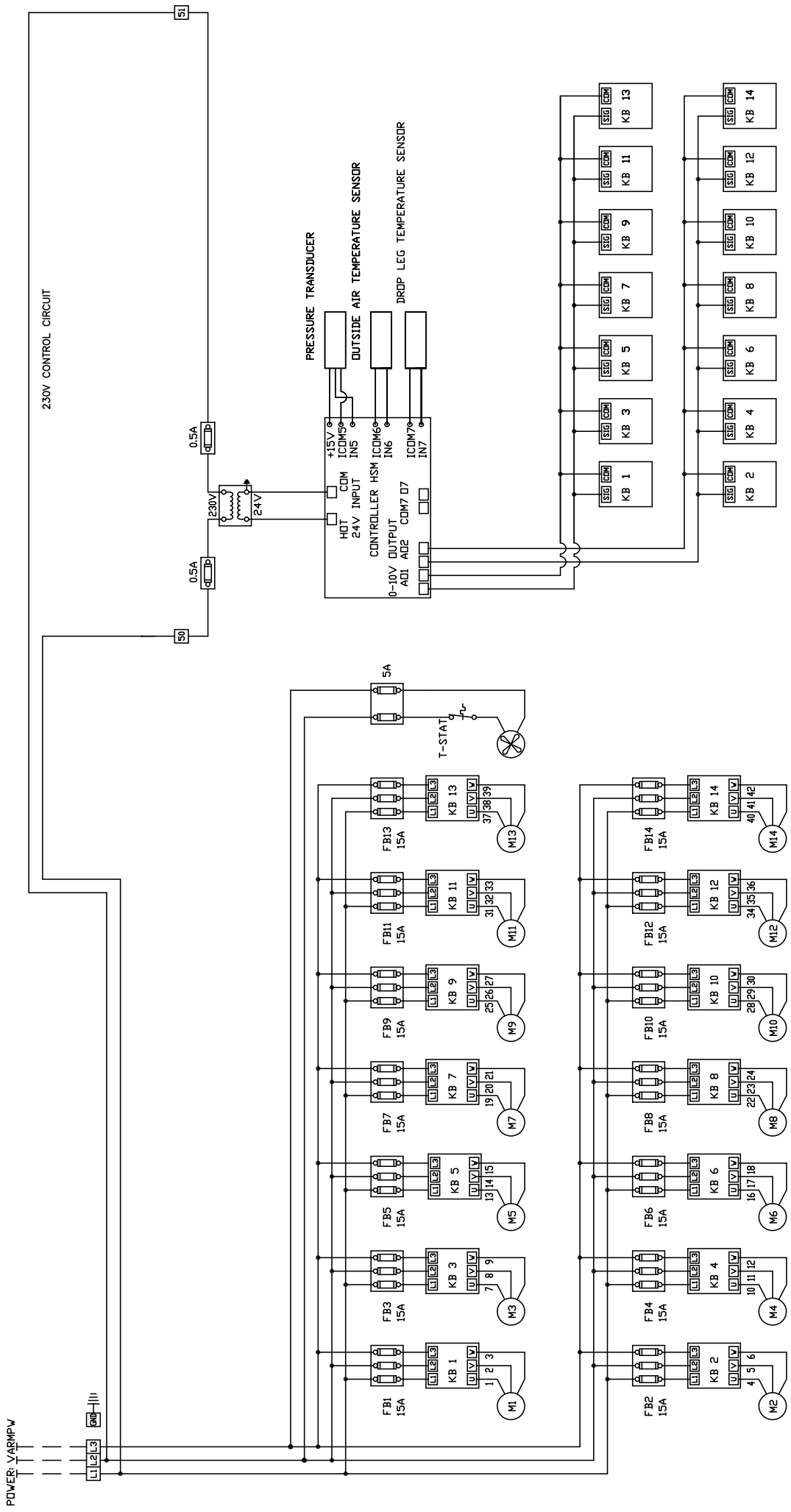
MINIMUM CIRCUIT AMPACITY VARMTRMCA

MAXIMUM OVERCURRENT PROTECTION VARMTRMOP

Levitor II Air-Cooled Condenser

Example Wiring Diagrams

K MOTOR VSPEED VARIABLE SPEED FAN CONTROL WITH INDIVIDUAL FAN FUSING (-461) AND HUSSMANN CONTROL BOARD (HSM) FOR COMPLETE NOMENCLATURE (HSM NCA461)



LEGEND:

SYMBOL	DESCRIPTION
M#	FAN MOTOR
#	TERMINAL BLOCK
FB#	FUSE BLOCK
	TRANSFORMER
KB	KB DRIVE POWER SIDE
KB	KB DRIVE CONTROL SIDE

Specifications subject to change without notice.

[redacted]

Krack, a Hussmann Corporation brand

[redacted]

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Appendix 4.4.1b Catalogue for TP

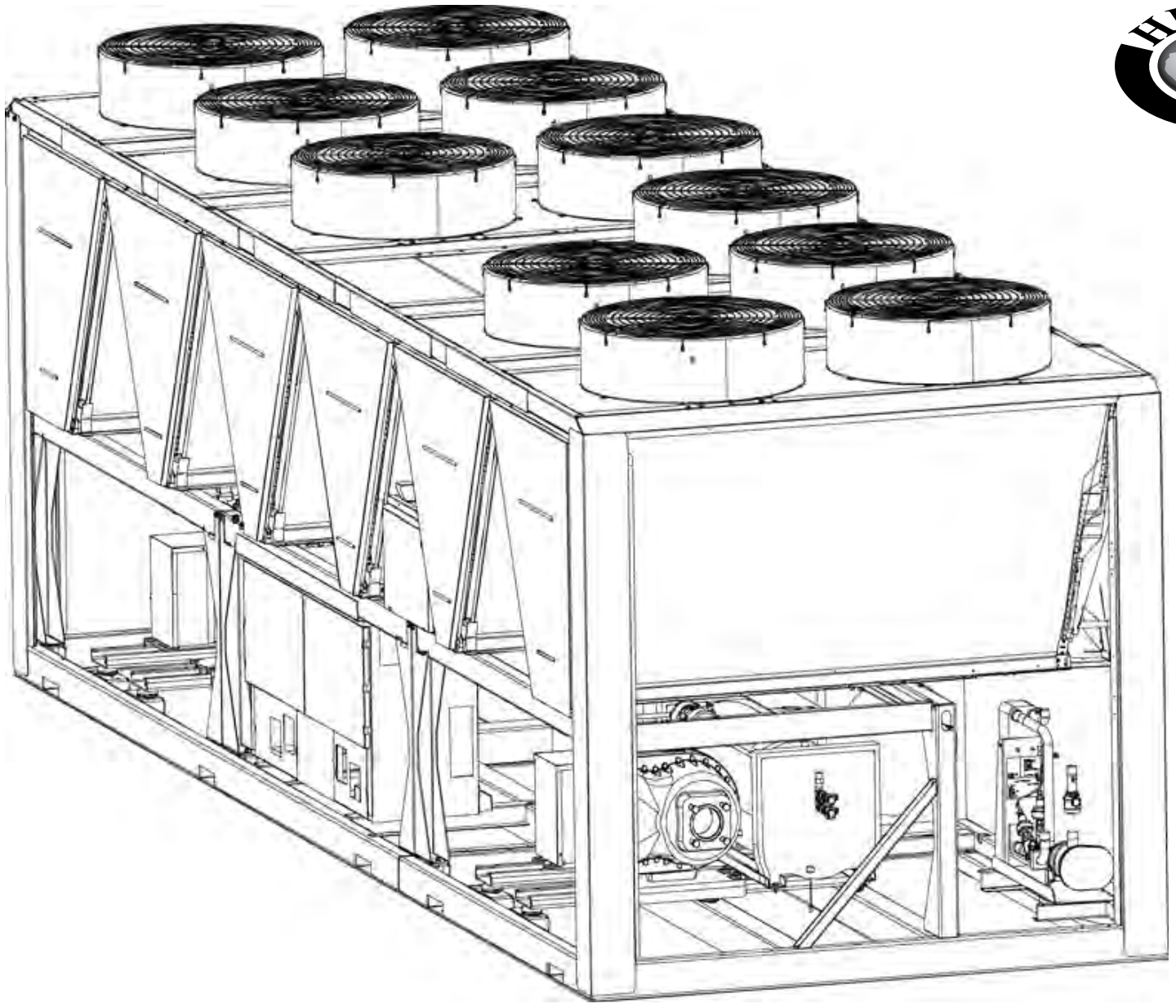
30XA
Air-Cooled Liquid Chillers

Nominal cooling capacity: 270-1670 kW

50 Hz

AQUAFORCE™

HFC-134a



Installation, operation and maintenance instructions

LLOYD'S REGISTER QUALITY ASSURANCE · ISO9001

UKAS QUALITY MANAGEMENT 001

Quality Management System Approval

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The cover photograph is for illustrative purposes only and is not part of any offer for sale or contract.

1 - INTRODUCTION

The 30XA Aquaforce units are designed to cool water for the air conditioning of buildings and industrial procsses.

Prior to the initial start-up of the 30XA units, the people involved in the on-site installation, start-up, operation, and maintenance of this unit should be thoroughly familiar with these instructions and the specific project data for the installation site.

The 30XA liquid chillers are designed to provide a very high level of safety during installation, start-up, operation and maintenance. They will provide safe and reliable service when operated within their application range.

This manual provides the necessary information to familiarize yourself with the control system before performing start-up procedures. The procedures in this manual are arranged in the sequence required for machine installation, start-up, operation and maintenance.

Always ensure that all required safety measures are followed, including those in this document, such as: wearing protective clothing (gloves, shoes) and safety glasses, using appropriate tools, employing qualified and skilled technicians (electricians, refrigeration engineers) and following local regulations. These units comply with the requirements of the European machine safety, electromagnetic compatibility, pressurised equipment and low voltage directives.

1.1 - Installation safety considerations

Access to the unit must be reserved to authorised personnel, qualified and trained in monitoring and maintenance. The access limitation device must be installed by the customer (e.g. cut-off, enclosure).

After the unit has been received, when it is ready to be installed or reinstalled, and before it is started up, it must be inspected for damage. Check that the refrigerant circuit(s) is (are) intact, especially that no components or pipes have shifted (e.g. follow-ing a shock). If in doubt, carry out a leak tightness check and verify with the manufacturer that the circuit integrity has not been impaired. If damage is detected upon receipt, immediately file a claim with the shipping company.

Carrier strongly recommends employing a specialised company to unload the machine.

Do not remove the skid or the packaging until the unit is in its final position. These units can be moved with a fork lift truck, as long as the forks are positioned in the right place and direction on the unit.

The units can also be lifted with slings, using only the designated lifting points marked on the unit.

These units are not designed to be lifted from above. Use slings with the correct capacity, and always follow the lifting instructions on the certified drawings supplied with the unit.

Safety is only guaranteed, if these instructions are carefully followed. If this is not the case, there is a risk of material deterioration and injuries to personnel.

Never cover any safety devices.

This applies to the relief valve in the water circuit and the relief valve(s) in the refrigerant circuit(s).

Ensure that the valves are correctly installed, before operating the unit.

In certain cases the relief valves are installed on isolating valves. These valves are factory-supplied lead-sealed in the open position. This system permits isolation and removal of the relief valves for checking and replacing. The relief valves are designed and installed to ensure protection against overpressure caused by fire.

The relief valve must only be removed when the fire risk is fully controlled and this is the responsibility of the operator.

All factory-installed relief valves are lead-sealed to prevent any calibration change. If the relief valves are installed on a change-over manifold, this is equipped with a relief valve on each of the two outlets. Only one of the two relief valves is in operation, the other one is isolated. Never leave the change-over valve in the intermediate position, i.e. with both ways open (locate the control element in the stop position). If a relief valve is removed for checking or replacement please ensure that there is always an active relief valve on each of the change-over valves installed in the unit.

If the unit is installed in a room, the safety valves must be connected to discharge pipes. These pipes must be installed in a way that ensures that people and property are not exposed to refrigerant leaks. These fluids may be diffused in the air, but far away from any building air intake, or they must be discharged in a quantity that is appropriate for a suitably absorbing environment.

Periodic check of the relief valves: See paragraph "Maintenance safety considerations".

Provide a drain in the discharge circuit, close to each relief valve, to avoid an accumulation of condensate or rain water.

Ensure good ventilation, as accumulation of refrigerant in an enclosed space can displace oxygen and cause asphyxiation or explosions.

Inhalation of high concentrations of vapour is harmful and may cause heart irregularities, unconsciousness, or death. Vapour is heavier than air and reduces the amount of oxygen available for breathing. These products cause eye and skin irritation. Decomposition products are hazardous.

1.2 - Equipment and components under pressure

See section "10.2 - Pressure vessels".

1.3 - Maintenance safety considerations

Engineers working on the electric or refrigeration components must be authorized, trained and fully qualified to do so.

All refrigerant circuit repairs must be carried out by a trained person, fully qualified to work on these units. He must have been trained and be familiar with the equipment and the installation. All welding operations must be carried out by qualified specialists.

Any manipulation (opening or closing) of a shut-off valve must be carried out by a qualified and authorised engineer. These procedures must be carried out with the unit shut-down.

NOTE: The unit must never be left shut down with the liquid line valve closed, as liquid refrigerant can be trapped between this valve and the expansion device. (This valve is situated on the liquid line before the filter drier box.)

During any handling, maintenance and service operations the engineers working on the unit must be equipped with safety gloves, glasses, shoes and protective clothing.

Never work on a unit that is still energized.

Never work on any of the electrical components, until the general power supply to the unit has been cut using the disconnect switch(es) in the control box(es).

If any maintenance operations are carried out on the unit, lock the power supply circuit in the open position ahead of the machine.

If the work is interrupted, always ensure that all circuits are still deenergized before resuming the work.

ATTENTION: Even if the unit has been switched off, the power circuit remains energized, unless the unit or circuit disconnect switch is open. Refer to the wiring diagram for further details. Attach appropriate safety labels.

Operating checks: During the life-time of the system, inspection and tests must be carried out in accordance with national regulations.

The information on operating inspections given in annex C of standard EN278-2 can be used if no similar criteria exist in the national regulations.

While working in the fan area, especially when grilles or casings are removed, disconnect the fan power supply to prevent their automatic restart.

Safety device checks (annex C6 – EN378-2): The safety devices must be checked on site once a year for safety devices (high-pressure switches), and every five years for external overpressure devices (pressure relief valves).

Check manual "30XA Pro-Dialog Control" for a detailed explanation of the high-pressure switch test method.

At least once a year thoroughly inspect the protection devices (valves). If the machine operates in a corrosive environment, inspect the protection devices more frequently.

Regularly carry out leak tests and immediately repair any leaks.

Ensure regularly that the vibration levels remain acceptable and close to those at the initial unit start-up.

Before opening a refrigerant circuit, purge and consult the pressure gauges.

Change the refrigerant when there are equipment failures, following a procedure such as the one described in NFE 29-795 or carry out a refrigerant analysis in a specialist laboratory.

Plug all openings whenever the refrigerant circuit is opened for up to one day. For longer openings place a nitrogen charge in the circuit.

1.4 - Repair safety considerations

All installation parts must be maintained by the personnel in charge, in order to avoid material deterioration and injuries to people. Faults and leaks must be repaired immediately. The authorized technician must have the responsibility to repair the fault immediately. Each time repairs have been carried out to the unit, the operation of the safety devices must be re-checked.

Comply with the regulations and recommendations in unit and HVAC installation safety standards, such as: EN 378, ISO 5149, etc.

If a leak occurs or if the refrigerant becomes contaminated (e.g. by a short circuit in a motor) remove the complete charge using a recovery unit and store the refrigerant in mobile containers.

Repair the leak detected and recharge the circuit with the total R134a charge, as indicated on the unit name plate. Certain parts of the circuit can be isolated. Only charge liquid refrigerant R134a at the liquid line.

Ensure that you are using the correct refrigerant type before recharging the unit.

Charging any refrigerant other than the original charge type (R134a) will impair machine operation and can even lead to a destruction of the compressors. The compressors operating with this refrigerant type are lubricated with a synthetic polyolester oil.

Do not use oxygen to purge lines or to pressurize a machine for any purpose. Oxygen gas reacts violently with oil, grease, and other common substances.

Never exceed the specified maximum operating pressures. Verify the allowable maximum high- and low-side test pressures by checking the instructions in this manual and the pressures given on the unit name plate.

Do not use air for leak testing. Use only refrigerant or dry nitrogen.

Do not unweld or flamecut the refrigerant lines or any refrigerant circuit component until all refrigerant (liquid and vapour) has been removed from chiller. Traces of vapour should be displaced with dry air nitrogen. Refrigerant in contact with an open flame produces toxic gases.

The necessary protection equipment must be available, and appropriate fire extinguishers for the system and the refrigerant type used must be within easy reach.

Do not siphon refrigerant.

Avoid spilling liquid refrigerant on skin or splashing it into the eyes. Use safety goggles. Wash any spills from the skin with soap and water. If liquid refrigerant enters the eyes, immediately and abundantly flush the eyes with water and consult a doctor.

Never apply an open flame or live steam to a refrigerant container. Dangerous overpressure can result. If it is necessary to heat refrigerant, use only warm water.

During refrigerant removal and storage operations follow applicable regulations. These regulations, permitting conditioning and recovery of halogenated hydrocarbons under optimum quality conditions for the products and optimum safety conditions for people, property and the environment are described in standard NFE 29795.

Any refrigerant transfer and recovery operations must be carried out using a transfer unit. A 3/8" SAE connector on the manual liquid line valve is supplied with all units for connection to the transfer station. The units must never be modified to add refrigerant and oil charging, removal and purging devices. All these devices are provided with the units. Please refer to the certified dimensional drawings for the units.

Do not re-use disposable (non-returnable) cylinders or attempt to refill them. It is dangerous and illegal. When cylinders are empty, evacuate the remaining gas pressure, and move the cylinders to a place designated for their recovery. Do not incinerate.

Do not attempt to remove refrigerant circuit components or fittings, while the machine is under pressure or while it is running. Be sure pressure is at 0 kPa before removing components or opening a circuit.

Do not attempt to repair or recondition any safety devices when corrosion or build-up of foreign material (rust, dirt, scale, etc.) is found within the valve body or mechanism. If necessary, replace the device. Do not install safety valves in series or backwards.

ATTENTION: No part of the unit must use feet, racks or supports during operation. Periodically monitor and repair or if necessary replace any component or piping that shows signs of damage.

The refrigerant lines can break under the weight and release refrigerant, causing personal injury.

Do not climb on a machine. Use a platform, or staging to work at higher levels.

Use mechanical lifting equipment (crane, hoist, winch, etc.) to lift or move heavy components. For lighter components, use lifting equipment when there is a risk of slipping or losing your balance.

Use only original replacement parts for any repair or component replacement. Consult the list of replacement parts that corresponds to the specification of the original equipment.

Do not drain water circuits containing industrial brines, without informing the technical service department at the installation site or a competent body first.

Close the entering and leaving water shutoff valves and purge the unit water circuit, before working on the components installed on the circuit (screen filter, pump, water flow switch, etc.).

Do not loosen the water box bolts until the water boxes have been completely drained.

Periodically inspect all valves, fittings and pipes of the refrigerant and hydronic circuits to ensure that they do not show any corrosion or any signs of leaks.

It is recommended to wear ear defenders, when working near the unit and the unit is in operation.

2 - PRELIMINARY CHECKS

2.1 - Check equipment received

- Inspect the unit for damage or missing parts. If damage is detected, or if shipment is incomplete, immediately file a claim with the shipping company.
- Confirm that the unit received is the one ordered. Compare the name plate data with the order.
- The unit name plate must include the following information:
  - Version number
  - Model number
  - CE marking
  - Serial number
  - Year of manufacture and test date
  - Refrigerant used and refrigerant class
  - Refrigerant charge per circuit
  - Containment fluid to be used
  - PS: Min./max. allowable pressure (high and low pressure side)
  - TS: Min./max. allowable temperature (high and low pressure side)
  - Relief valve set pressure
  - Pressure switch cut-out pressure
  - Unit leak test pressure
  - Voltage, frequency, number of phases
  - Maximum current drawn
  - Maximum power input
  - Unit net weight

- Confirm that all accessories ordered for on-site installation have been delivered, and are complete and undamaged.

The unit must be checked periodically during its whole operating life to ensure that no shocks (handling accessories, tools etc.) have damaged it. If necessary, the damaged parts must be repaired or replaced. See also chapter "Maintenance".

2.2 - Moving and siting the unit

2.2.1 - Moving

See chapter 1.1 "Installation safety considerations".

2.2.2 - Siting the unit

Always refer to the chapter "Dimensions and clearances" to confirm that there is adequate space for all connections and service operations. For the centre of gravity coordinates, the position of the unit mounting holes, and the weight distribution points, refer to the certified dimensional drawing supplied with the unit.

The support points under the chassis must have at least the size of the chassis opening at the lifting point (minimum 220 x 180 mm) in order to prevent a deformation of the chassis.

Typical applications of these units are in refrigeration systems, and they do not require earthquake resistance. Earthquake resistance has not been verified.

CAUTION: Only use slings at the designated lifting points which are marked on the unit.

Before siting the unit check that:
- the permitted loading at the site is adequate or that appropriate strenghtening measures have been taken.
- the unit is installed level on an even surface (maximum tolerance is 5 mm in both axes).
- there is adequate space above the unit for air flow and to ensure access to the components.
- the number of support points is adequate and that they are in the right places.
- the location is not subject to flooding.
- for outdoor installations, where heavy snowfall is likely and long periods of sub-zero temperatures are normal, provision has to be made to prevent snow accumulating by raising the unit above the height of drifts normally experienced. Baffles may be necessary to deflect strong winds. They must not restrict air flow into the unit.

CAUTION: Before lifting the unit, check that all casing panels are securely fixed in place. Lift and set down the unit with great care. Tilting and jarring can damage the unit and impair unit operation.

If 30XA units are hoisted with rigging, it is advisable to protect coils against crushing while a unit is being moved. Use struts or spreader bar to spread the slings above the unit. Do not tilt a unit more than 15°.

WARNING: Never push or lever on any of the enclosure panels of the unit. Only the base of the unit frame is designed to withstand such stresses.

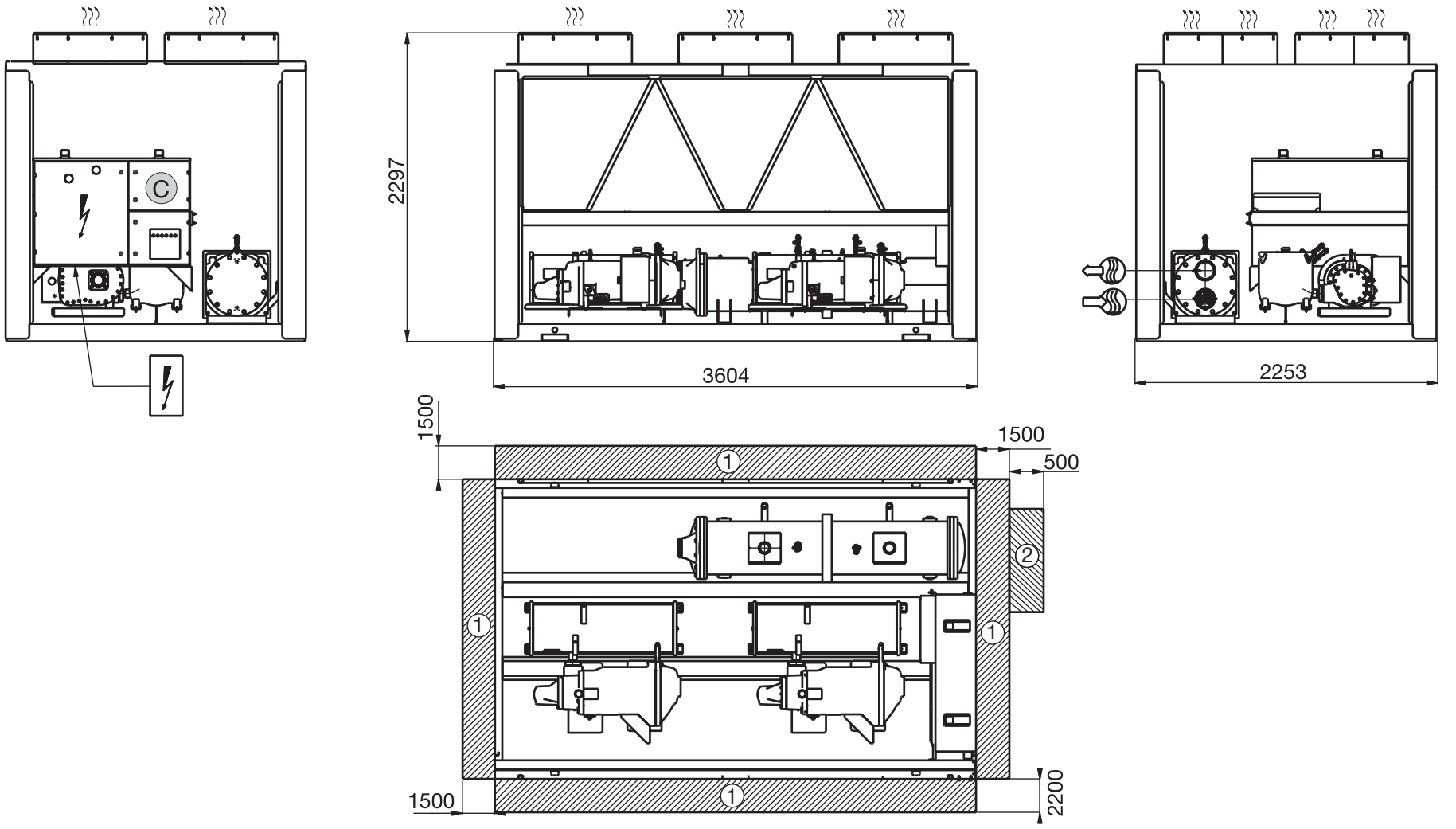
Checks before system start-up
Before the start-up of the refrigeration system, the complete installation, including the refrigeration system must be verified against the installation drawings, dimensional drawings, system piping and instrumentation diagrams and the wiring diagrams.

During the installation test national regulations must be followed. If no national regulation exists, paragraph 9-5 of standard EN 378-2 can be used as a guide.

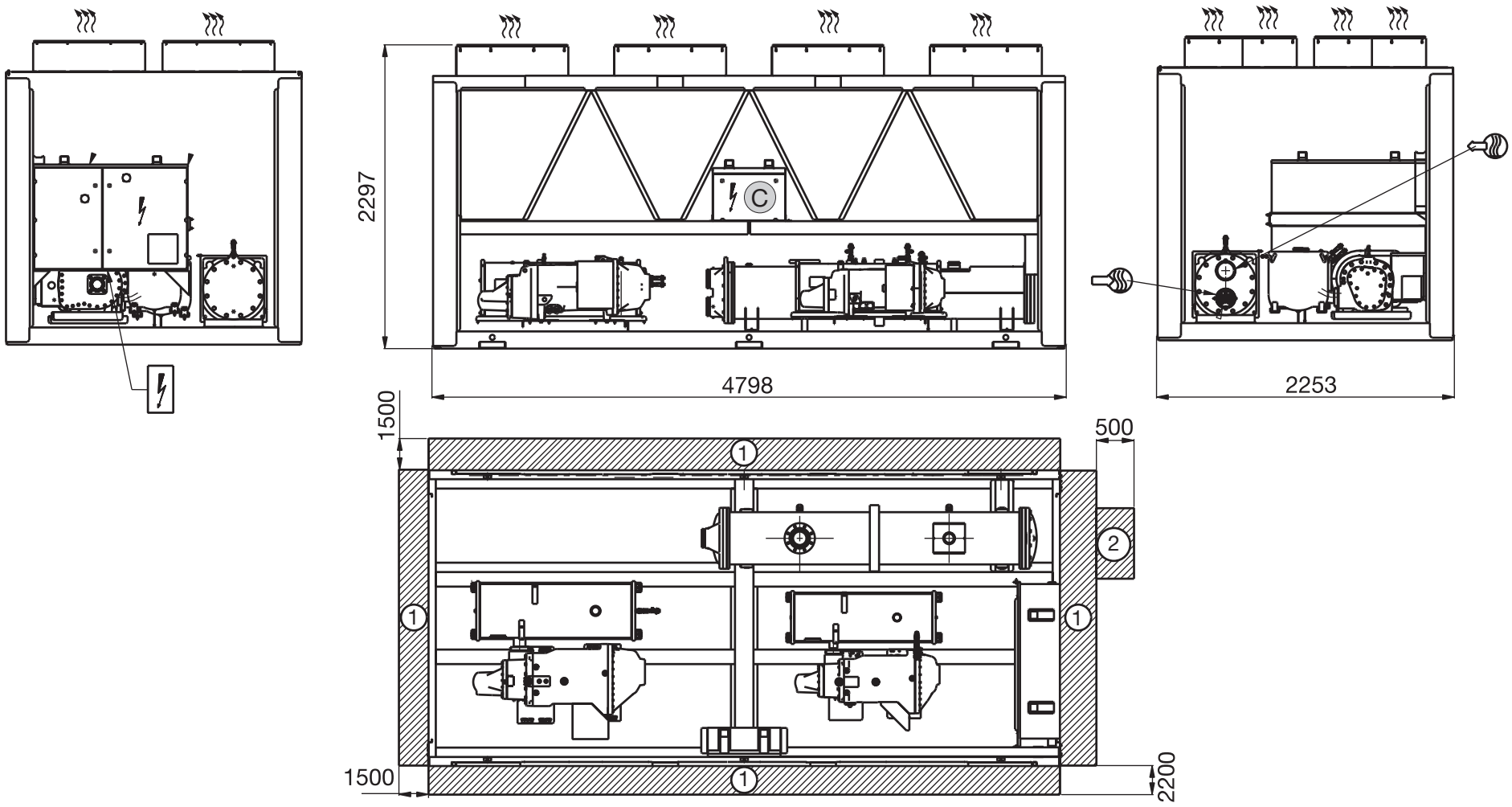
External visual installation checks:
- Compare the complete installation with the refrigeration system and power circuit diagrams.
- Check that all components comply with the design specifications.
- Check that all safety documents and equipments that are required by current European standards are present.
- Verify that all safety and environmental protection devices and arrangements are in place and comply with the current European standard.
- Verify that all relevant documents for pressure vessels (certificates, name plates, files, instruction manuals etc.) required by the current European standards are present.
- Verify the free passage of access and safety routes.
- Check that ventilation in the plant room is adequate.
- Check that refrigerant detectors are present.
- Verify the instructions and directives to prevent the deliberate removal of refrigerant gases that are harmful to the environment.
- Verify the installation of connections.
- Verify the supports and fixing elements (materials, routing and connection).
- Verify the quality of welds and other joints.
- Check the protection against mechanical damage.
- Check the protection against heat.
- Check the protection of moving parts.
- Verify the accessibility for maintenance or repair and to check the piping.
- Verify the status of the valves.
- Verify the quality of the thermal insulation and of the vapour barriers.

3 - DIMENSIONS, CLEARANCES

3.1 - 30XA 252-352 (standard) and 252-302 (option 254/255)



3.2 - 30XA 402-452 (standard) and 352-452 (option 254/255)



Legend:
All dimensions are given in mm.

(1) Required clearances for maintenance and air flow

(2) Recommended space for evaporator tube removal

Water inlet

Water outlet

Air outlet - do not obstruct

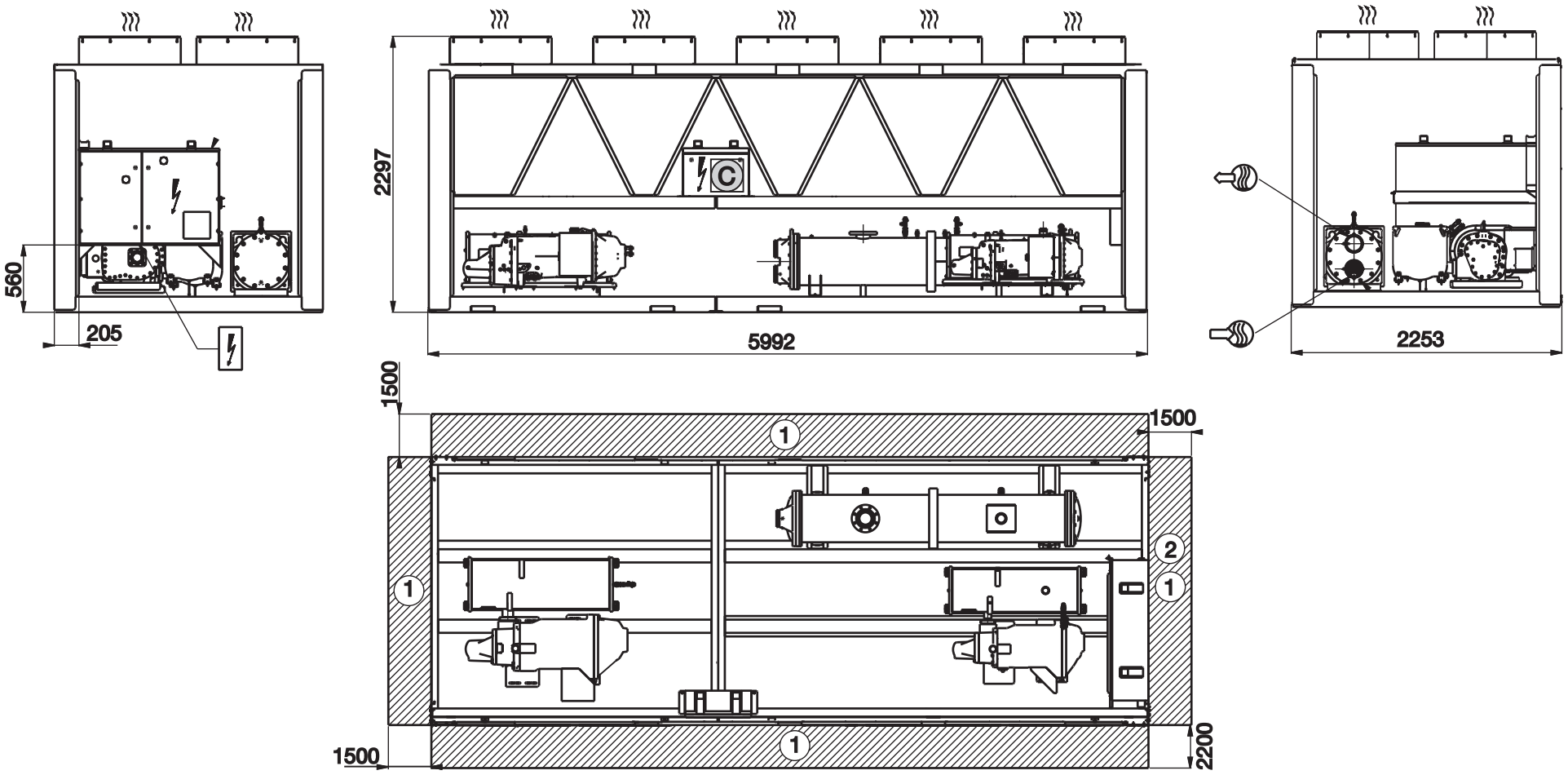
Power supply connection

(C) Control circuit connection

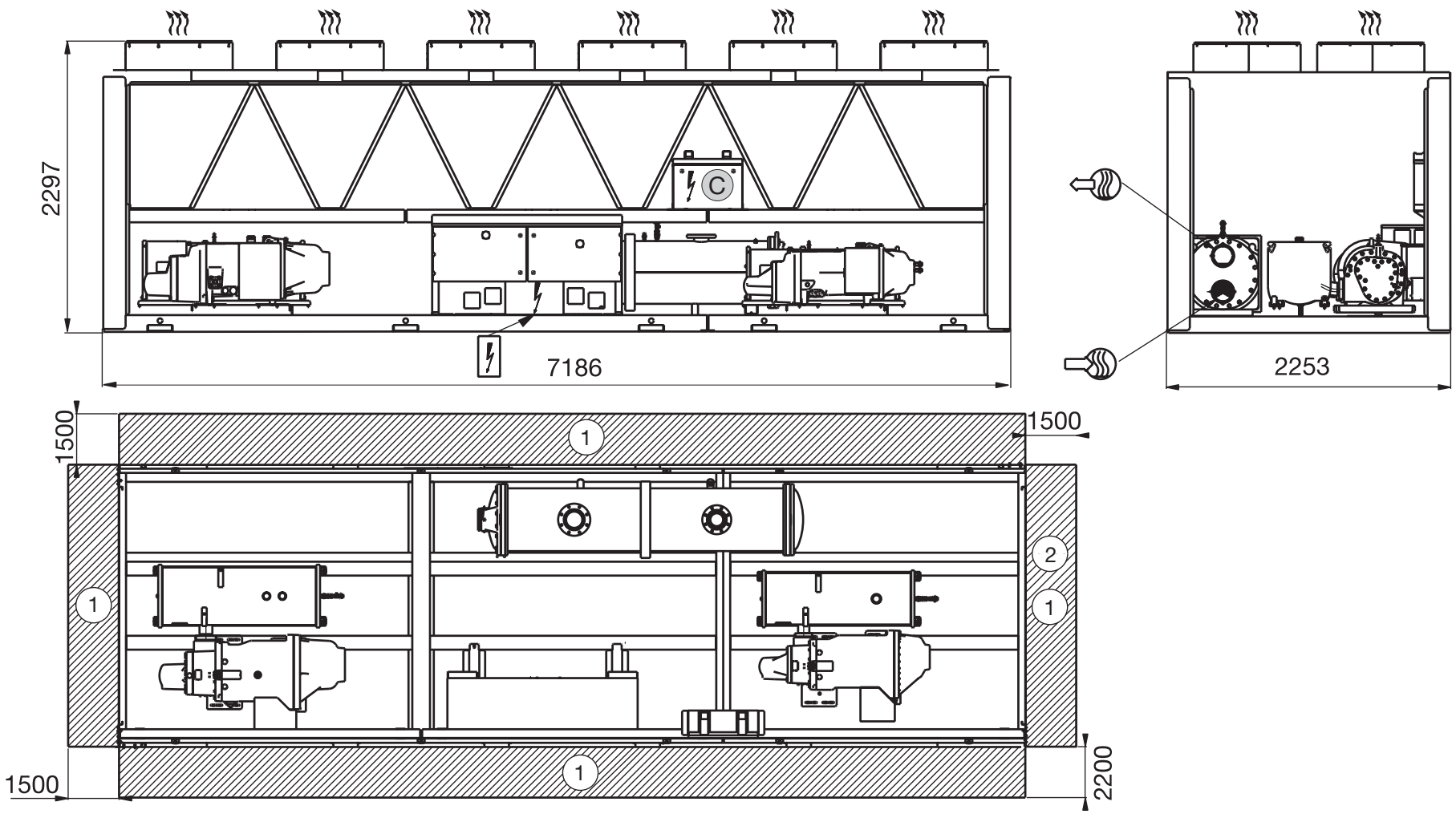
NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

3.3 - 30XA 502 (standard and option 254/255)



3.4 - 30XA 602-802 (standard) and 602-702 (option 254/255)



Legend:
All dimensions are given in mm.

(1) Required clearances for maintenance and air flow

(2) Recommended space for evaporator tube removal

Water inlet

Water outlet

Air outlet - do not obstruct

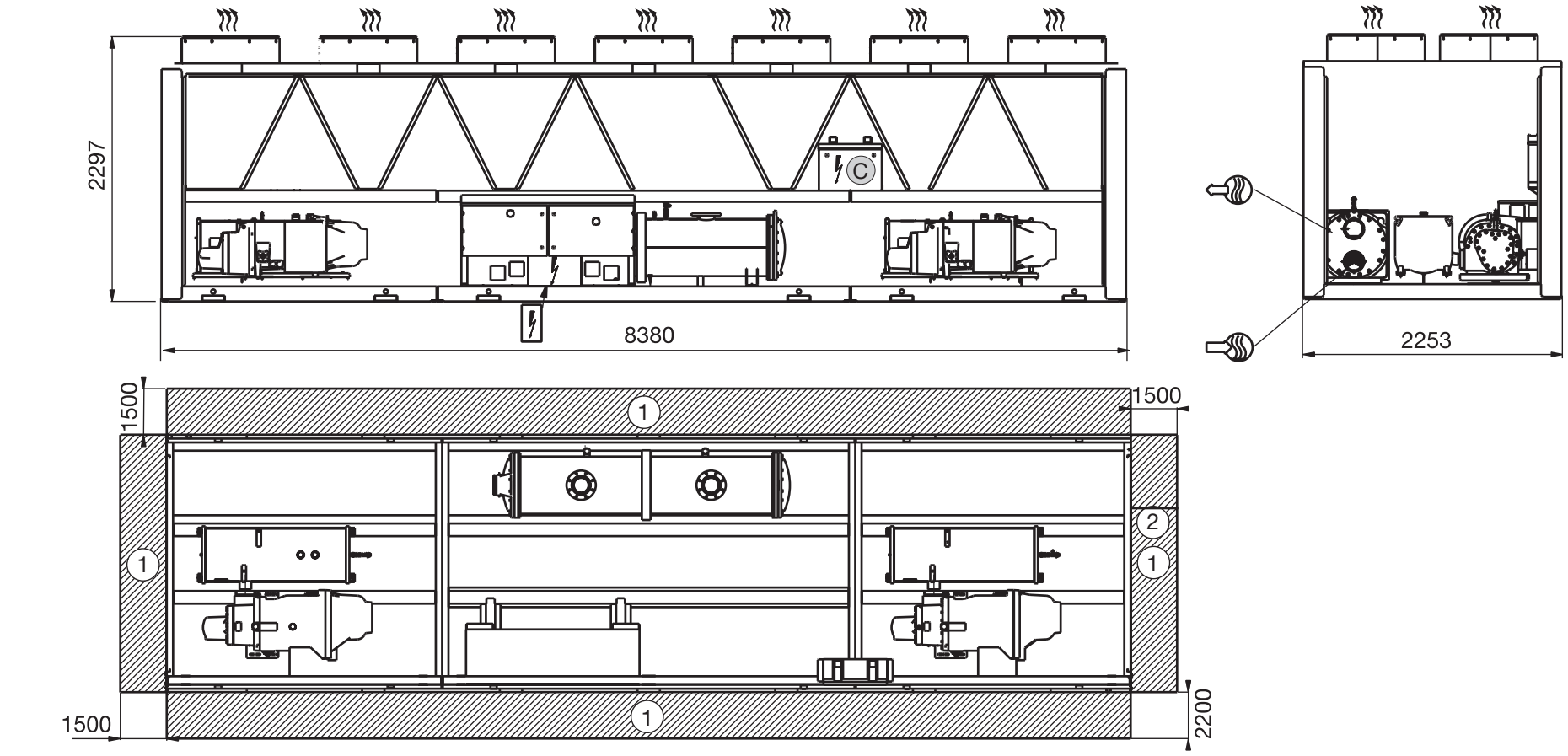
Power supply connection

(C) Control circuit connection

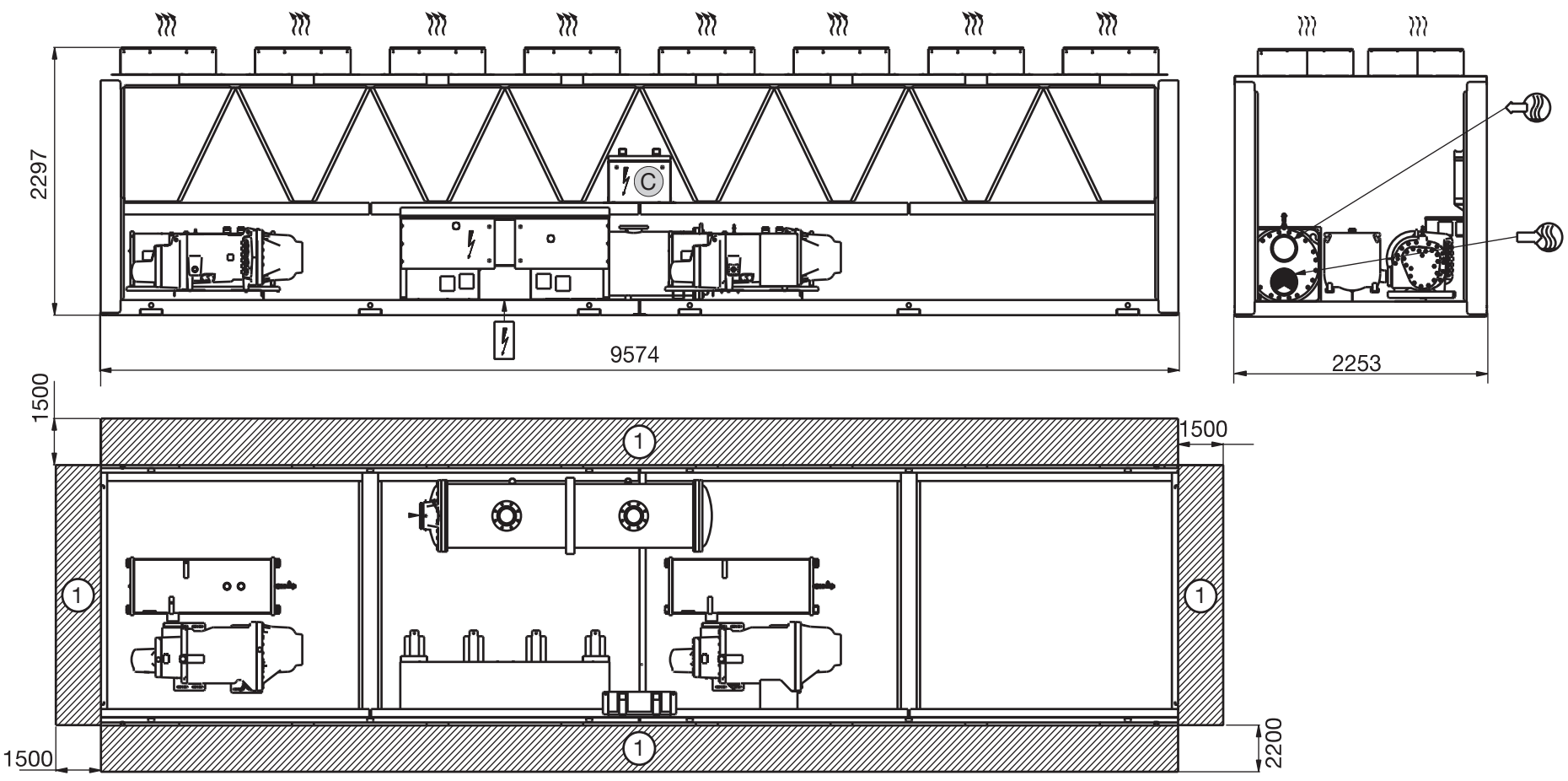
NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

3.5 - 30XA 852-902 (standard) and 752-852 (option 254/255)



3.6 - 30XA 1002 (standard) and 902-1002 (option 254/255)



Legend:
All dimensions are given in mm.

(1) Required clearances for maintenance and air flow

(2) Recommended space for evaporator tube removal

Water inlet

Water outlet

Air outlet - do not obstruct

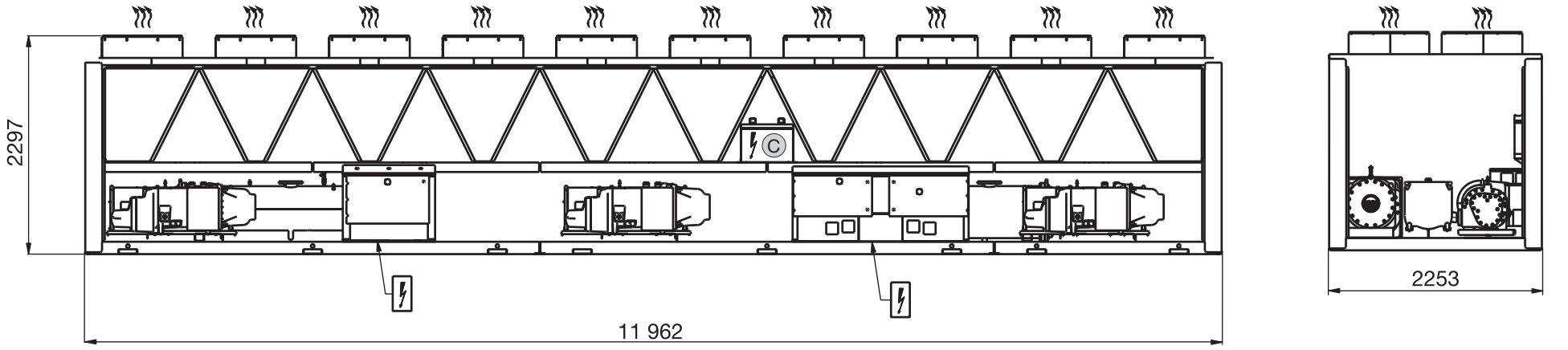
Power supply connection

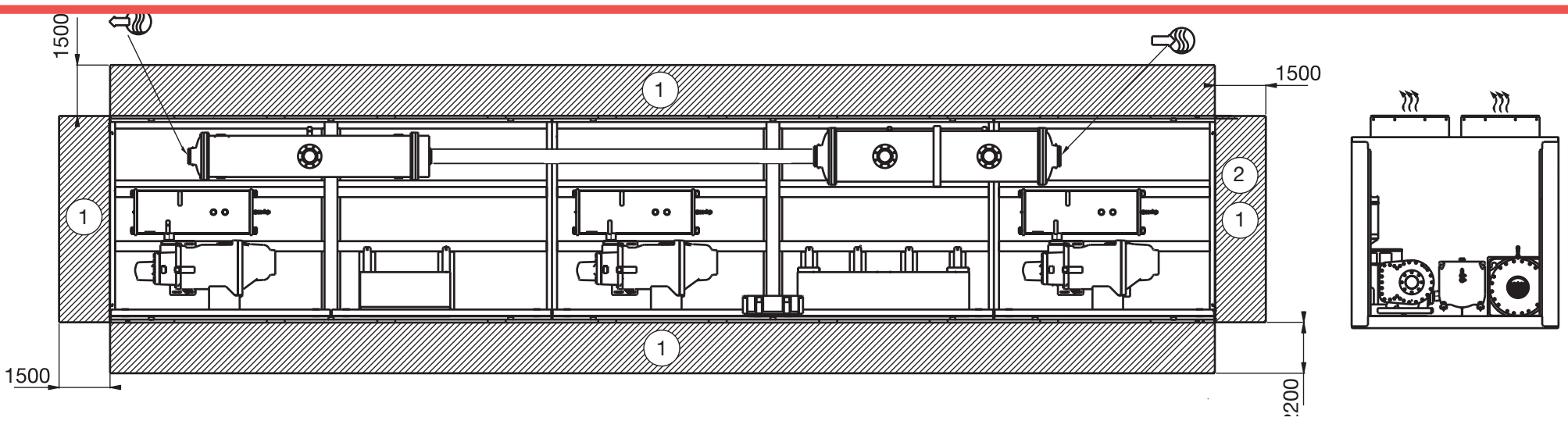
(C) Control circuit connection

NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request.

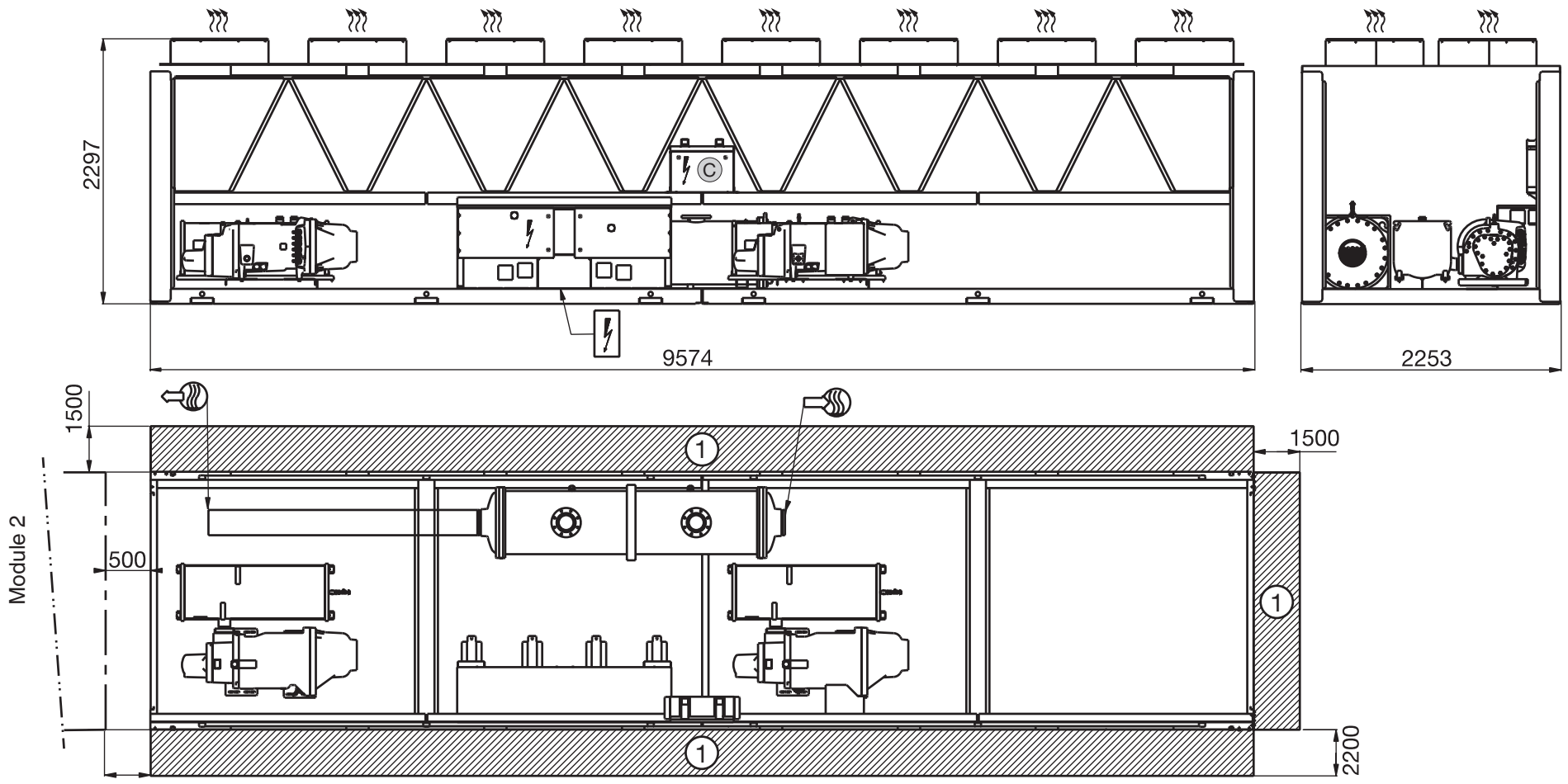
For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

3.7 - 30XA 1102-1352 (standard and option 254/255)





3.8 - 30XA 1402-1502 module 1 (standard and option 254/255)



Legend:
All dimensions are given in mm.

(1) Required clearances for maintenance and air flow

(2) Recommended space for evaporator tube removal

Water inlet

Water outlet (sizes 1402-1502: to be connected to water inlet of module 2)

Air outlet - do not obstruct

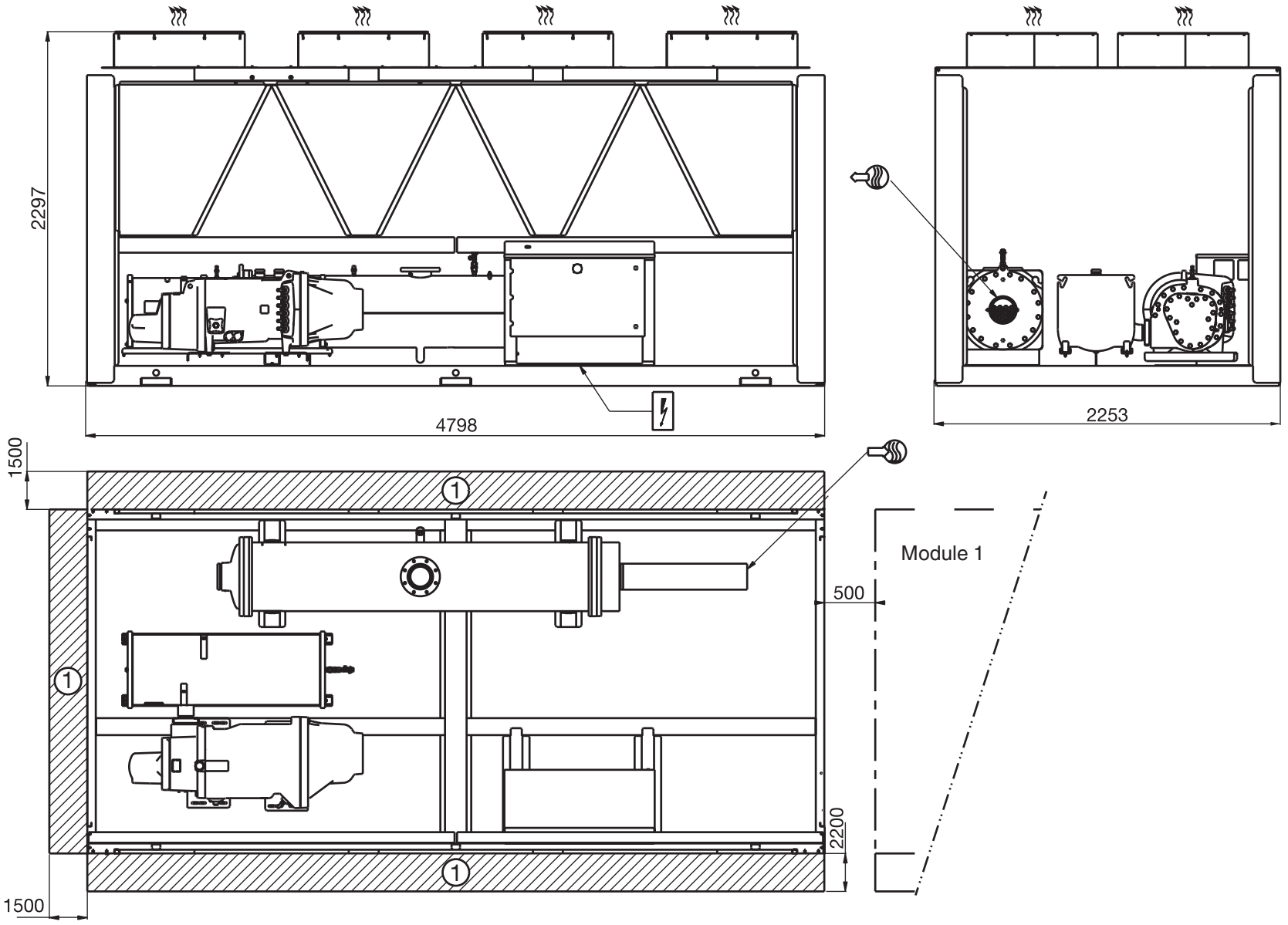
Power supply connection

(C) Control circuit connection

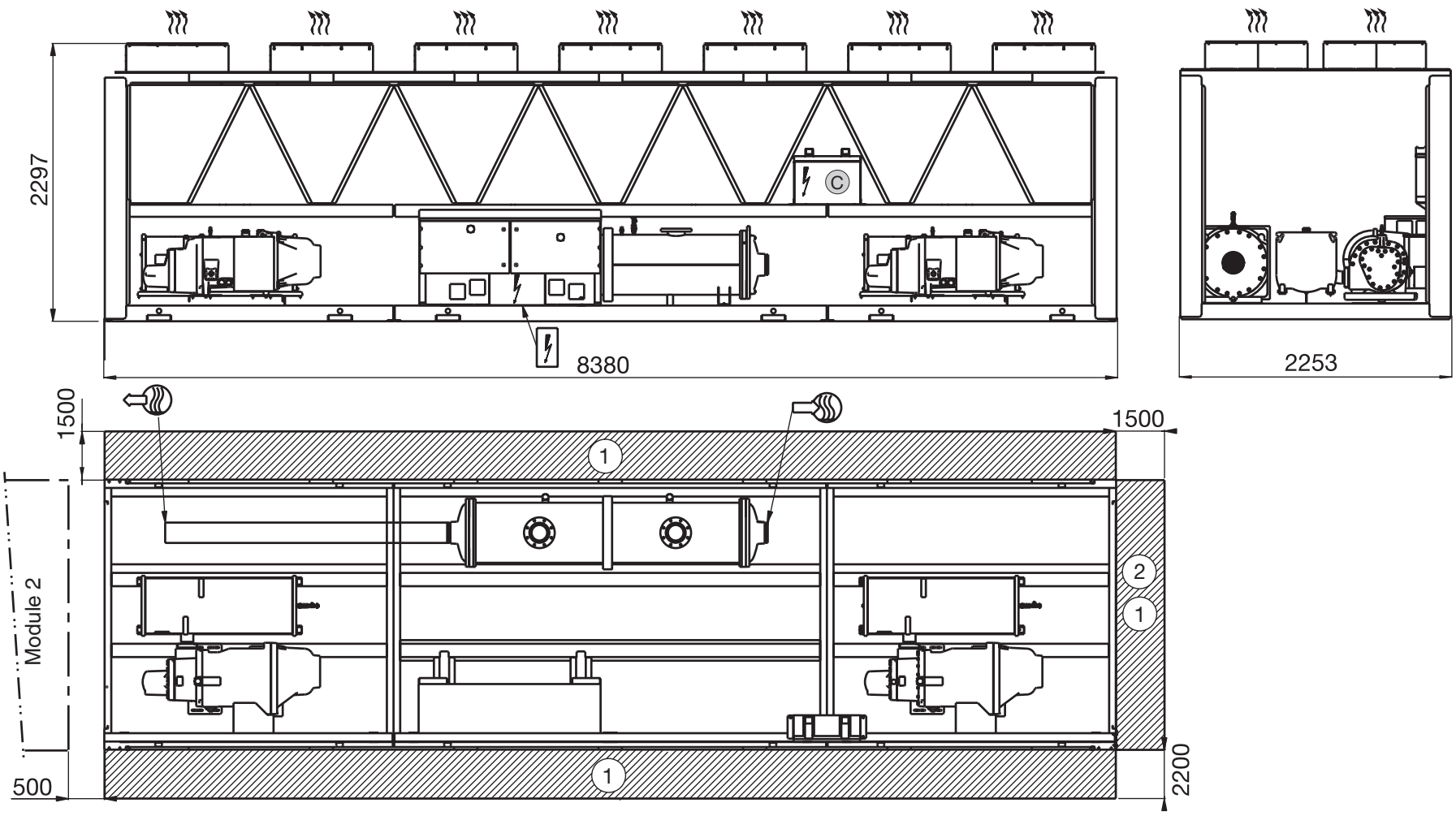
NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

3.9 - 30XA 1402-1502 module 2 (standard and option 254/255)



3.10 - 30XA 1702 module 1 (standard and option 254/255)



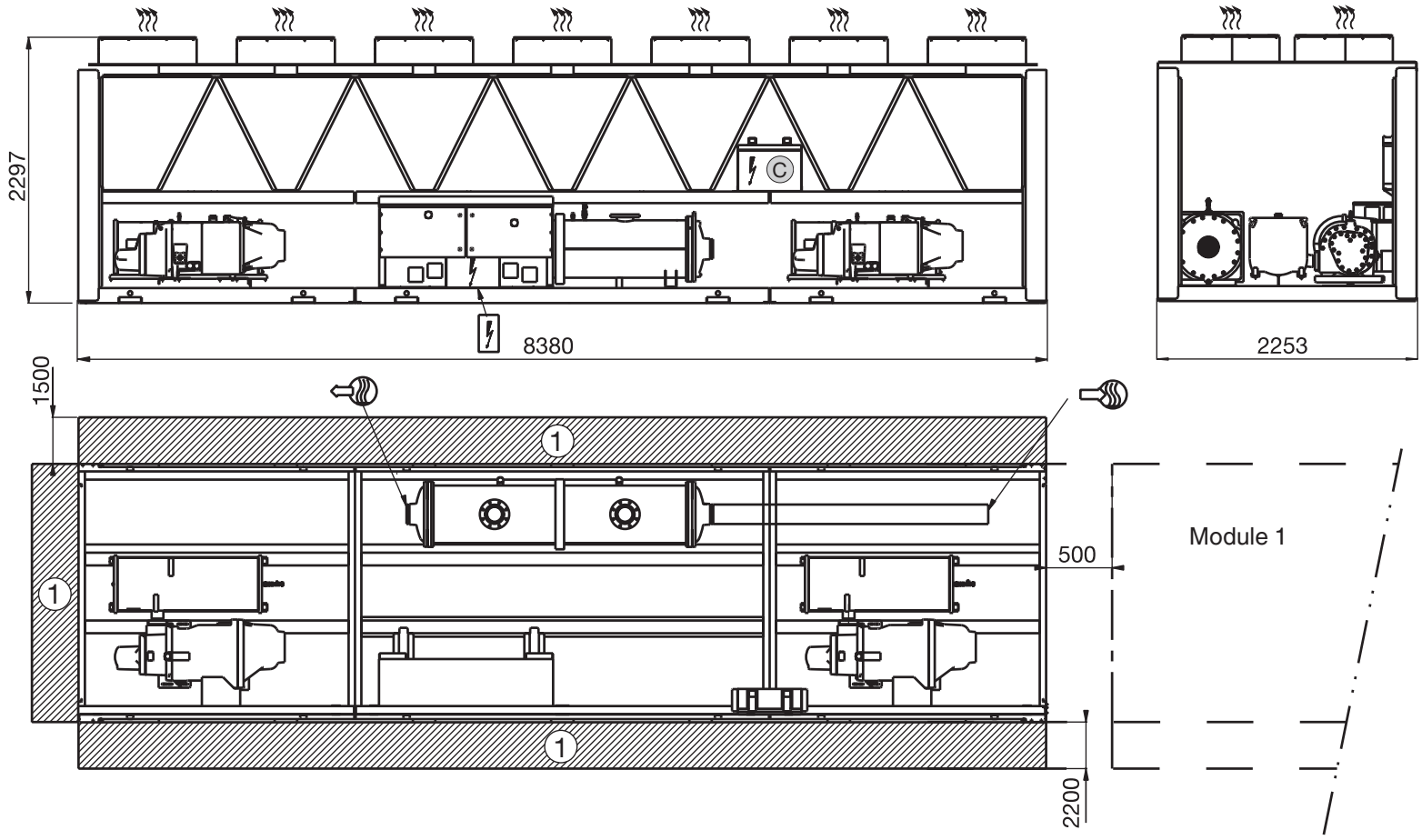
Legend:
All dimensions are given in mm.

- (1) Required clearances for maintenance and air flow
- (2) Recommended space for evaporator tube removal
- Water inlet (sizes 1402-1502: to be connected to water outlet of module 1)
- Water outlet (size 1702: to be connected to water inlet of module 2)
- Air outlet – do not obstruct
- Power supply connection
- (C) Control circuit connection

NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

3.11 - 30XA 1702 module 2 (standard and option 254/255)



Legend:
All dimensions are given in mm.

1 Required clearances for maintenance and air flow

2 Recommended space for evaporator tube removal

Water inlet (to be connected to water outlet of module 1)

Water outlet

Air outlet – do not obstruct

Power supply connection

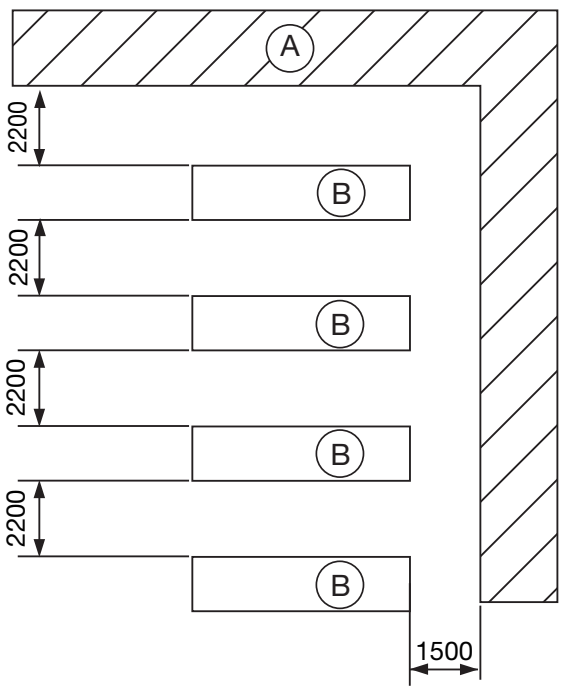
C Control circuit connection

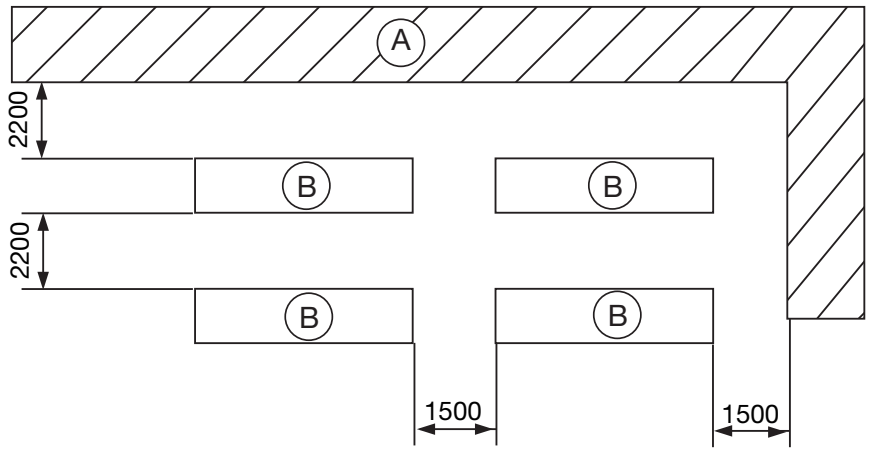
NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

3.12 - Multiple chiller installation

NOTE: If the walls are higher than 2 m, contact the factory.





Legend
A Wall
B Units

4 - PHYSICAL AND ELECTRICAL DATA FOR 30XA UNITS

4.1 - Physical data 30XA - Standard units and option 119***

30XA		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Nominal cooling capacity*																					
Standard unit	kW	268	293	320	382	437	492	605	653	706	764	802	869	952	1116	1216	1297	1382	1426	1478	1605
Option 119	kW	274	300	326	393	451	508	616	677	726	792	838	899	1000	1147	1247	1354	1442	1468	1523	1675
Nominal power input*																					
Standard unit‡	kW	87	98	106	122	142	168	198	208	235	259	265	297	321	363	405	445	504	473	488	528
Option 119‡	kW	88	96	105	120	141	154	192	203	234	249	256	286	310	348	388	425	463	450	465	513
Operating weight**	kg	3840	3880	3920	4780	4850	5330	6260	6410	6710	7010	7560	7860	8440	10440	10880	11260	11620	8380/ 4250	8530/ 4250	7560/ 7560
Refrigerant		R-134a																			
Circuit A	kg	36	37	37	53	55	62	62	62	70	74	77	74	80	69	85	78	87	100	92	77
Circuit B	kg	38	38	39	37	39	39	62	66	62	65	68	77	84	66	66	68	80	85	95	68
Circuit C	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	100	100	100	96	100	100	77
Circuit D	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	66
Compressors		06T semi-hermetic screw compressors, 50 r/s																			
Circuit A		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Circuit B		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Circuit C		-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1
Circuit D		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Minimum capacity	%	15	15	15	15	15	15	15	15	15	15	15	15	15	10	10	10	10	10	10	8
Control		PRO-DIALOG, electronic expansion valve (EXV)																			
Condensers		All aluminium micro-channel heat exchanger																			
Condenser fans		Axial Flying Bird 4 fans with rotating shroud																			
Standard unit																					
Quantity		6	6	6	8	8	9	11	12	12	12	14	14	16	19	20	20	20	24	24	28
Total air flow	l/s	20500	20500	20500	27333	27333	30750	37583	41000	41000	41000	47833	47833	54667	64917	68333	68333	68333	82000	82000	95667
Fan speed	r/s	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
Option 119																					
Quantity		6	6	6	8	8	9	11	12	12	12	14	14	16	19	20	20	20	24	24	28
Total air flow at high speed	l/s	27083	27083	27083	36111	36111	40625	49653	54167	54167	54167	63194	63194	72222	85764	90278	90278	90278	108333	108333	126389
Fan speed	r/s	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7
Evaporator		Flooded multi-pipe type																			
Water content	l	58	61	61	66	70	77	79	94	98	119	119	130	140	168	182	203	224	230	240	240
Maximum pressure****	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

* Nominal conditions: evaporator entering/leaving water temperature = 12°C/7°C. Outdoor air temperature = 35°C, evaporator fouling factor = 0.000018 m^2 K/W.

** Weights are guidelines only. Weight and diameters of connection modules 1 and 2 for sizes 1402 to 1702. The refrigerant charge is also given on the unit nameplate.

*** Options: 119 = high energy efficiency; 254 = traditional coils.

**** Max. water-side operating pressure without hydronic module

‡ Data is not contractually binding and for information only. The values are rounded.

Note:
Unit sizes 30XA 1402 to 1702 are supplied in two field-assembled modules.

4.2 - Physical data 30XA - Units with option 254 and 255***

30XA		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Nominal cooling capacity*																					
Option 254	kW	271	295	322	387	438	493	600	659	708	766	809	870	967	1119	1218	1299	1399	1433	1484	1619
Option 255	kW	268	293	319	383	434	488	594	652	701	758	801	861	957	1108	1205	1286	1385	1419	1469	1603
Nominal power input*																					
Option 254‡	kW	88	99	104	124	145	160	198	212	236	258	270	303	327	370	413	453	513	479	497	539
Option 255‡	kW	90	101	106	127	148	163	202	217	241	263	277	310	335	378	422	464	527	489	509	552
Operating weight**	kg	4160	4190	4710	5190	5260	5830	6870	7030	7820	8140	8260	9010	9260	11470	11890	12250	12640	9180/ 4650	9340/ 4650	8270/ 8270
Refrigerant		R-134a																			
Circuit A	kg	60	64	70	85	85	102	102	100	129	112	130	129	140	102	112	112	112	140	140	130
Circuit B	kg	64	64	56	56	56	56	88	95	88	95	95	103	129	92	92	92	98	103	129	95
Circuit C	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	135	135	135	122	135	135	130
Circuit D	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95
Compressors		06T semi-hermetic screw compressors, 50 r/s																			
Circuit A		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Circuit B		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Circuit C		-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1
Circuit D		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Minimum capacity	%	15	15	15	15	15	15	15	15	15	15	15	15	15	10	10	10	10	10	10	8
Control		PRO-DIALOG, electronic expansion valve (EXV)																			
Condensers		All aluminium micro-channel heat exchanger																			
Condenser fans		Axial Flying Bird 4 fans with rotating shroud																			
Quantity		6	6	7	8	8	9	11	12	13	13	14	15	16	19	20	20	20	24	24	28
Total air flow	l/s	20500	20500	20500	27333	27333	30750	37583	41000	41000	41000	47833	47833	54667	64917	68333	68333	68333	82000	82000	95667
Fan speed	r/s	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
Evaporator		Flooded multi-pipe type																			
Water content	l	58	61	61	66	70	77	79	94	98	119	119	130	140	168	182	203	224	230	240	240
Maximum pressure****	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

* Nominal conditions: evaporator entering/leaving water temperature = 12°C/7°C. Outdoor air temperature = 35°C, evaporator fouling factor = 0.000018 m^2 K/W
** Weights are guidelines only. Weight and diameters of connection modules 1 and 2 for sizes 1402 to 1702. The refrigerant charge is also given on the unit nameplate.
*** Option 254 = Units with copper/aluminium coils
Option 255 = Units with copper/aluminium coils without slots
**** Max. water-side operating pressure without hydronic module
‡ Data is not contractually binding and for information only. The values are rounded.

Notes:
Unit sizes 30XA 1402 to 1702 are supplied in two field-assembled modules.

Option 119 (high energy efficiency) can be used together with options 254 and 255. Contact your Carrier representative to obtain the performances.

4.3 - Sound levels

30XA		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Standard unit																					
Sound power level*	dB(A)	89	89	89	92	93	93	94	93	95	95	94	96	95	96	96	96	97	97	97	97
Sound pressure level at 10 m**	dB(A)	57	57	57	60	61	61	62	61	63	63	62	63	63	63	63	63	64	64	64	64
Standard unit + option 257																					
Sound power level*	dB(A)	86	86	86	89	90	90	91	90	92	92	91	93	92	93	93	93	94	94	94	94
Sound pressure level at 10 m**	dB(A)	54	54	54	57	58	58	59	57	60	59	58	60	59	60	60	60	61	61	61	61
High energy efficiency version (option 119)																					
Sound power level*	dB(A)	94	94	94	95	95	95	96	96	98	98	98	99	98	99	100	99	100	101	100	101
Sound pressure level at 10 m**	dB(A)	62	62	62	62	62	62	63	64	65	66	65	66	65	66	67	66	67	68	67	67
Unit with options 119 + 257																					
Sound power level*	dB(A)	92	92	92	94	94	94	95	95	96	96	96	97	97	98	98	98	98	99	99	99
Sound pressure level at 10 m**	dB(A)	60	60	60	62	62	62	62	62	63	63	63	64	64	65	65	65	62	66	66	65

* 10^{-12} W - In accordance with ISO 9614-1 and certified by Eurovent
** Average sound pressure level, unit in a free field on a reflective surface

4.4 - Short-circuit stability current for all units

30XA		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Short-circuit stability current (TN system)*																					
Circuits A + B**	kA	38	38	38	38	38	38	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Circuits C + D**	kA	-	-	-	-	-	-	-	-	-	-	-	-	-	50	50	50	50	50	50	50
Units with option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	50	50	50	50	50	50	-

* Type of system earthing
** rms value

4.5 - Electrical data 30XA - Standard unit (including option 81)

30XA		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Power circuit																					
Nominal power supply	V-ph-Hz	400-3-50																			
Voltage range	V	360-440																			
Control circuit		24 V via internal transformer																			
Maximum start-up current*																					
Circuit A+B	A	269	269	287	402	505	505	574	606	773	803	805	893	941	574	773	803	891	893	941	805
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	587	805
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	991	1079	1155	1242	1248	1294	-
Nominal start-up current**																					
Circuit A+B	A	245	245	263	378	481	481	539	562	738	759	761	845	869	539	738	759	843	845	869	761
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	587	761
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	909	993	1036	1156	1125	1143	-
Cosine Phi maximum***		0.88	0.88	0.87	0.88	0.88	0.88	0.88	0.88	0.86	0.86	0.87	0.85	0.86	0.88	0.86	0.87	0.85	0.85	0.86	0.87
Cosine Phi nominal****		0.85	0.85	0.84	0.84	0.86	0.86	0.87	0.87	0.84	0.85	0.85	0.83	0.84	0.85	0.84	0.85	0.83	0.83	0.84	0.85
Maximum power input†																					
Circuit A+B	kW	121	131	141	165	185	204	247	267	293	312	343	359	420	247	293	342	388	390	420	343
Circuit C+D††	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	210	210	210	209	210	210	343
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	457	503	552	597	600	630	-
Nominal unit current draw******																					
Circuit A+B	A	151	167	184	210	240	266	322	349	406	431	452	516	556	322	406	449	569	538	556	452
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	278	278	278	292	278	278	452
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	600	684	727	861	816	834	-
Maximum unit current draw (Un)†																					
Circuit A+B	A	198	215	233	270	303	335	404	436	492	522	572	611	707	404	492	568	655	661	707	572
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	354	354	354	352	354	354	572
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	758	845	922	1007	1015	1061	-
Maximum unit current draw (Un -10%)***																					
Circuit A+B	A	208	232	251	290	326	360	435	469	529	561	615	657	760	435	529	611	705	711	760	615
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	380	380	380	378	380	380	615
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	815	909	991	1083	1091	1141	-

* Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at operation with maximum unit power input.
** Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C
*** Values obtained at operation with maximum unit power input.
**** Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C
† Values obtained at operation with maximum unit power input. Values given on the unit name plate
†† Circuit D - only for size 1702

Note:
Motor and fan electrical data if the unit operates at Eurovent conditions (motor ambient temperature 50°C): 1.9 A
Start-up current: 8.4 A
Power input: 760 W

4.6 - Electrical data 30XA - Option 119 (including option 81)

30XA - option 119		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Power circuit																					
Nominal power supply	V-ph-Hz	400-3-50																			
Voltage range	V	360-440																			
Control circuit		24 V via internal transformer																			
Maximum start-up current*																					
Circuit A+B	A	274	274	292	407	510	510	583	616	782	812	815	905	954	583	782	812	901	905	954	815
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	587	815
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	1010	1099	1175	1265	1275	1321	-
Nominal start-up current**																					
Circuit A+B	A	246	246	261	379	479	479	535	561	734	757	760	845	860	535	734	757	846	845	860	760
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	587	760
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	907	991	1026	1124	1122	1133	-
Cosine Phi maximum***		0.88	0.87	0.87	0.88	0.88	0.88	0.88	0.88	0.86	0.86	0.86	0.85	0.86	0.88	0.86	0.87	0.85	0.85	0.86	0.86
Cosine Phi nominal****		0.84	0.84	0.83	0.83	0.85	0.85	0.86	0.86	0.84	0.84	0.84	0.82	0.82	0.84	0.83	0.83	0.83	0.82	0.82	0.84
Maximum power input†																					
Circuit A+B	kW	126	136	147	172	192	212	257	278	304	323	356	372	435	257	304	353	400	405	435	356
Circuit C+D††	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	217	217	217	216	217	217	356
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	475	522	570	615	622	652	712
Nominal unit current draw******																					
Circuit A+B	A	151	167	182	210	237	264	320	346	404	427	446	516	546	320	404	439	537	535	546	446
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	273	273	273	275	273	273	446
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	593	678	712	812	808	820	893
Maximum unit current draw (Un)†																					
Circuit A+B	A	208	226	243	284	316	350	423	457	512	542	596	635	734	423	512	588	678	688	734	596
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	367	367	367	364	367	367	596
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	790	879	956	1041	1056	1102	1191
Maximum unit current draw (Un -10%)***																					
Circuit A+B	A	219	243	262	305	340	376	455	491	551	583	640	683	790	455	551	633	729	740	790	640
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	395	395	395	391	395	395	640
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	850	946	1028	1120	1135	1185	1281

* Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at operation with maximum unit power input.

** Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C

*** Values obtained at operation with maximum unit power input.

**** Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C

† Values obtained at operation with maximum unit power input. Values given on the unit name plate

†† Circuit D - only for size 1702

Note:
Motor and fan electrical data if the unit operates at Eurovent conditions (motor ambient temperature 50°C): 3.6 A
Start-up current: 20 A
Power input: 1.65 kW

4.7 - Electrical data 30XA - Option 254/255 (including option 81)

Option 254: Units with copper/aluminium coils
Option 255: Units with copper/aluminium coils without slots

30XA - option 254/255		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Power circuit																					
Nominal power supply	V-ph-Hz	400-3-50																			
Voltage range	V	360-440																			
Control circuit		24 V via internal transformer																			
Maximum start-up current*																					
Circuit A+B	A	269	269	287	402	505	505	574	606	773	805	805	893	941	574	773	803	891	893	941	805
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	587	761
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	991	1079	1155	1242	1248	1294	1333
Nominal start-up current**																					
Circuit A+B	A	245	245	262	378	480	480	536	562	735	761	761	845	865	536	735	759	859	845	865	761
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	587	761
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	909	993	1036	1156	1125	1143	1214
Cosine Phi maximum***		0.88	0.88	0.87	0.88	0.88	0.88	0.88	0.88	0.86	0.86	0.87	0.85	0.86	0.88	0.86	0.87	0.85	0.85	0.86	0.87
Cosine Phi nominal****		0.85	0.85	0.84	0.84	0.86	0.86	0.87	0.87	0.84	0.84	0.85	0.83	0.84	0.85	0.84	0.85	0.84	0.83	0.84	0.85
Maximum power input†																					
Circuit A+B	kW	121	131	142	165	185	204	247	267	294	313	343	360	420	247	293	342	388	390	420	343
Circuit C+D††	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	210	210	210	209	210	210	343
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	457	503	552	597	600	630	687
Nominal unit current draw******																					
Circuit A+B	A	151	167	186	210	240	266	322	349	408	433	452	518	556	322	406	449	569	538	556	452
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	278	278	278	292	278	278	452
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	600	684	727	861	816	834	905
Maximum unit current draw (Un)†																					
Circuit A+B	A	198	215	235	270	303	335	404	436	494	524	572	613	707	404	492	568	655	661	707	572
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	354	354	354	352	354	354	572
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	758	845	922	1007	1015	1061	1144
Maximum unit current draw (Un -10%)***																					
Circuit A+B	A	208	232	253	290	326	360	435	469	531	563	615	659	760	435	529	611	705	711	760	615
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	380	380	380	378	380	380	615
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	815	909	991	1083	1091	1141	1230

* Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at operation with maximum unit power input.

** Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C

*** Values obtained at operation with maximum unit power input.

**** Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C

† Values obtained at operation with maximum unit power input. Values given on the unit name plate

†† Circuit D - only for size 1702

Note:
Motor and fan electrical data if the unit operates at Eurovent conditions (motor ambient temperature 50°C): 1.9 A
Start-up current: 8.4 A
Power input: 760 W

4.8 - Electrical data 30XA - Option 254/255 with option 119 (including option 81)

Option 119: High energy efficiency option
Option 254: Units with copper/aluminium coils
Option 255: Units with copper/aluminium coils without slots

30XA - option 254/255 with 119		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Power circuit																					
Nominal power supply	V-ph-Hz	400-3-50																			
Voltage range	V	360-440																			
Control circuit		24 V via internal transformer																			
Maximum start-up current*																					
Circuit A+B	A	274	274	292	407	510	510	583	616	782	815	815	905	954	583	782	812	901	905	954	815
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	587	815
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	1010	1099	1175	1265	1275	1321	1411
Nominal start-up current**																					
Circuit A+B	A	246	246	261	379	479	479	535	561	734	760	760	845	860	535	734	757	846	845	860	760
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	587	760
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	907	991	1026	1124	1122	1133	1206
Cosine Phi maximum***		0.88	0.87	0.87	0.88	0.88	0.88	0.88	0.88	0.86	0.86	0.86	0.84	0.86	0.88	0.86	0.87	0.85	0.85	0.86	0.86
Cosine Phi nominal****		0.84	0.84	0.83	0.83	0.85	0.85	0.86	0.86	0.83	0.84	0.84	0.82	0.82	0.84	0.83	0.83	0.83	0.82	0.82	0.84
Maximum power input†																					
Circuit A+B	kW	126	136	148	172	192	212	257	278	306	325	356	373	435	257	304	353	400	405	435	356
Circuit C+D††	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	217	217	217	216	217	217	356
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	475	522	570	615	622	652	712
Nominal unit current draw******																					
Circuit A+B	A	151	167	185	210	237	264	320	346	408	431	446	519	546	320	404	439	537	535	546	446
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	273	273	273	275	273	273	446
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	593	678	712	812	808	820	893
Maximum unit current draw (Un)†																					
Circuit A+B	A	208	226	247	284	316	350	423	457	516	546	596	639	734	423	512	588	678	688	734	596
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	367	367	367	364	367	367	596
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	790	879	956	1041	1056	1102	1191
Maximum unit current draw (Un -10%)***																					
Circuit A+B	A	219	243	266	305	340	376	455	491	555	587	640	687	790	455	551	633	729	740	790	640
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	395	395	395	391	395	395	640
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	850	946	1028	1120	1135	1185	1281

* Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at operation with maximum unit power input.

** Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C

*** Values obtained at operation with maximum unit power input.

**** Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C

† Values obtained at operation with maximum unit power input. Values given on the unit name plate

†† Circuit D - only for size 1702

Note:
Motor and fan electrical data if the unit operates at Eurovent conditions (motor ambient temperature 50°C): 3.6 A
Start-up current: 20 A
Power input: 1.65 kW

4.9 - Compressor electrical data

Compressor	I Nom* Std/Option 119	I Max** (Un)	MHA	LRYA (Un)	LRDA (Un)	Cosine Phi (max.)**	Cosine Phi (nom.)*
06TSA155	69/64	86	96	170	530	0.90	0.87
06TSA186	87/80	108	120	170	530	0.89	0.86
06TTA266	128/117	158	176	303	945	0.90	0.86
06TTA301	142/130	173	193	388	1210	0.90	0.89
06TTA356	163/150	198	220	388	1210	0.90	0.89
06TUA483	245/230	280	311	587	1828	0.86	0.84
06TUA554	267/246	329	366	587	1828	0.87	0.85

* Average value for the range (unit at Eurovent conditions)
** Value at maximum capacity and nominal voltage (400 V)

Legend
MHA - Maximum compressor operating current, limited by the unit (current given for maximum capacity at 360 V)
LRYA - Locked rotor current for star connection (connection during compressor start-up)
LRDA - Locked rotor current for delta connection

4.10 - Compressor usage per circuit (A, B, C, D)

Compressor	30XA 252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
06TSA155	AB	B	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06TSA186	-	A	AB	-	B	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06TTA266	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06TTA301	-	-	-	-	A	-	B	-	B	-	-	-	-	B	B	-	-	-	-	-
06TTA356	-	-	-	-	-	A	A	AB	-	B	B	-	-	A	-	B	-	-	-	BD
06TUA483	-	-	-	-	-	-	-	-	A	A	-	AB	-	-	A	-	B	B	-	-
06TUA554	-	-	-	-	-	-	-	-	-	-	A	-	AB	C	C	AC	AC	AC	ABC	AC

4.11 - Electrical data, optional hydronic module

30XA		252	302	352	402	452	502
Single and dual low-pressure pump							
Motor power	kW	2.2	2.2	3	4	4	5.5
Power input	kW	2.8	2.8	3.9	5.1	5.1	7.2
Maximum current draw	A	4.7	4.7	6.4	8.2	8.2	11.7
Single and dual high-pressure pump							
Motor power	kW	4	5.5	5.5	7.5	11	11
Power input	kW	5.1	7.2	7.2	9.2	13.2	13.2
Maximum current draw	A	8.2	11.7	11.7	15	21.2	21.2

Notes:
1. To obtain the maximum power input for a unit with hydronic module add the maximum unit power input to the pump power input.
2. To obtain the maximum unit operating current draw for a unit with hydronic module add the maximum unit current draw to the pump current draw.

5 - ELECTRICAL CONNECTION

Please refer to the certified dimensional drawings, supplied with the unit.

5.1 - Power supply

The power supply must conform to the specification on the chiller nameplate. The supply voltage must be within the range specified in the electrical data table. For connections refer to the wiring diagrams and the certified dimensional drawings.

WARNING: Operation of the chiller with an improper supply voltage or excessive phase imbalance constitutes abuse which will invalidate the Carrier warranty. If the phase imbalance exceeds 2% for voltage, or 10% for current, contact your local electricity supply at once and ensure that the chiller is not switched on until corrective measures have been taken.

5.2 - Voltage phase imbalance (%)

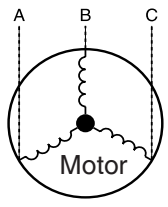
$$\frac{\text{100 x max. deviation from average voltage}}{\text{Average voltage}}$$

Example:
On a 400 V - 3 ph - 50 Hz supply, the individual phase voltages were measured to be:

AB = 406 V; BC = 399; AC = 394 V

Average voltage = (406 + 399 + 394)/3 = 1199/3
= 399.7 say 400 V

Calculate the maximum deviation from the 400 V average:
(AB) = 406 - 400 = 6
(BC) = 400 - 399 = 1
(CA) = 400 - 394 = 6



The maximum deviation from the average is 6 V. The greatest percentage deviation is:

100 x 6/400 = 1.5 %

This is less than the permissible 2% and is therefore acceptable.

5.3 - Power connection/disconnect switch

Units	Connection points
30XA 0252-1002	1 per unit
30XA 1102-1702	1 for circuits A and B
	1 for circuit(s) C (and D)

Electrical data notes for 30XA units:

- 30XA 252-1002 units have a single power connection point; 30XA 1102-1702 units have two connection points.
- The control box includes the following standard features:
  - One general disconnect switch per circuit
  - Starter and motor protection devices for each compressor, the fan(s) and the pump
  - Control devices

Field connections:

- All connections to the system and the electrical installations must be in full accordance with all applicable local codes.
- The Carrier 30XA units are designed and built to ensure conformance with these codes. The recommendations of European standard EN 60 204-1 (corresponds to IEC 60204-1) (machine safety - electrical machine components - part 1: general regulations) are specifically taken into account, when designing the electrical equipment.

IMPORTANT:

- Generally the recommendations of IEC 60364 are accepted as compliance with the requirements of the installation directives.
  Conformance with EN 60 204 is the best means of ensuring compliance with the Machines Directive § 1.5.1.
- Annex B of EN 60204-1 describes the electrical characteristics used for the operation of the machines.
- The operating environment for the 30XA units is specified below:

1. Environment* - Environment as classified in EN 60 721 (corresponds to IEC 60721) :
   - outdoor installation*
   - ambient temperature range: -20°C to +55°C, class 4K4H*
   - altitude: ≤ 2000 m
   - presence of hard solids, class 4S2* (no significant dust present)
   - presence of corrosive and polluting substances, class 4C2 (negligible)
2. Power supply frequency variation: ± 2 Hz.
3. The neutral (N) line must not be connected directly to the unit (if necessary use a transformer).
4. Overcurrent protection of the power supply conductors is not provided with the unit.
5. The factory-installed disconnect switch(es)/circuit breaker(s) is (are) of a type suitable for power interruption in accordance with EN 60947-3 (corresponds to IEC 60947-3).
6. The units are designed for connection to TN networks (IEC 60364). For IT networks the earth connection must not be at the network earth. Provide a local earth, consult competent local organisations to complete the electrical installation.

NOTE: If particular aspects of an actual installation do not conform to the conditions described above, or if there are other conditions which should be considered, always contact your local Carrier representative.

* The required protection level for this class is IP43BW (according to reference document IEC 60529). All 30XA units are protected to IP44CW and fulfil this protection condition.

5.4 - Recommended wire sections

Wire sizing is the responsibility of the installer, and depends on the characteristics and regulations applicable to each installation site. The following is only to be used as a guide-line, and does not make in any way liable. After wire sizing has been completed, using the certified dimensional drawing, the installer must ensure easy connection and define any modifications necessary on site.

The connections provided as standard for the field-supplied power entry cables to the general disconnect/isolator switch are designed for the number and type of wires, listed in the table below.

The calculations are based on the maximum machine current (see electrical data tables).

For the design the following standardised installation methods are used, in accordance with IEC 60364, table 52C:

- For 30XA units installed outside the building:
  No.17: suspended aerial lines
  No. 61: buried conduit with a derating coefficient of 20.

The calculation is based on PVC or XLPE insulated cables with copper core. The maximum temperature is 46°C for 30XA units.

The given wire length limits the voltage drop to < 5%.

IMPORTANT: Before connection of the main power cables (L1 - L2 - L3) on the terminal block, it is imperative to check the correct order of the 3 phases before proceeding to the connection on then terminal block or the main disconnect/isolator switch.

5.5 - Power cable entry

The power cables can enter the 30XA control box from below or from the unit side.

For 30XA unit sizes 602 to 1702 the control box that includes the power supply cable connection terminal is located in the lower part of the unit. In this case the control box is raised by 120 mm compared to the lowest point of the chassis. The cable entry point depends on the unit configuration:

1. Unit raised from the ground (e.g. installation on support rails): It is recommended to enter the power cables from below the control box. A removable aluminium plate below the control box allows introduction of the cables.
2. Unit placed on the ground: For power cable entry from below the control box ensure that the cable bend radius is compatible with the connection space available in the control box. If not, an aluminium plate on the control box face allows introduction of the cables.

For units with three circuits with option 81 (single power connection point) the connection must be made from below the unit.

IMPORTANT: Check the cable bend radius for cable entry into a control box, located in the lower part of the unit.

Refer to the certified dimensional drawing for the unit.

5.6 - Field control wiring

Refer to the 30XA Pro-Dialog Controls IOM and the certified wiring diagram supplied with the unit for the field control wiring of the following features:

- Evaporator pump interlock (mandatory)
- Remote on/off switch
- Demand limit external switch
- Remote dual set point
- Alarm, alert and operation report
- Evaporator pump control
- Heat reclaim condenser pump control (option)
- Hot water valve control (option)
- Set point reset via outside air temperature sensor reset
- Various interlocks on the Energy Management Module (EMM) board (accessory or option)

Selection table of minimum and maximum wire sections for connection to 30XA units

	Maximum wire section	Minimum calculated section			Maximum calculated section		
30XA	**Section (mm²)**	**Section (mm²)***	**Max. length (m)**	**Wire type**	**Section (mm²)***	**Max. length (m)**	**Wire type**
252	2 x 240	1 x 95	190	XLPE Cu	2 x 95	410	PVC Cu
302	2 x 240	1 x 95	190	XLPE Cu	2 x 120	435	PVC Cu
352	2 x 240	1 x 120	197	XLPE Cu	2 x 150	455	PVC Cu
402	2 x 240	1 x 150	200	XLPE Cu	2 x 185	470	PVC Cu
452	2 x 240	1 x 185	205	XLPE Cu	2 x 120	435	XLPE Cu
502	2 x 240	1 x 240	205	XLPE Cu	2 x 150	455	XLPE Cu
602	4 x 240	2 x 95	190	XLPE Cu	2 x 240	480	XLPE Cu
702	4 x 240	2 x 120	198	XLPE Cu	2 x 240	480	XLPE Cu
752	4 x 240	2 x 120	198	XLPE Cu	3 x 240	600	XLPE Cu
802	4 x 240	2 x 150	200	XLPE Cu	3 x 240	600	XLPE Cu
852	4 x 240	2 x 150	200	XLPE Cu	4 x 240	685	XLPE Cu
902	6 x 240	2 x 185	205	XLPE Cu	4 x 240	685	XLPE Cu
1002	6 x 240	2 x 240	205	XLPE Cu	5 x 240	750	XLPE Cu
Circuits A and B/C							
1102	4 x 240/2 x 240	2 x 95/1 x 240	190/280	XLPE Cu	4 x 240/2 x 240	685/480	PVC Cu/XLPE Cu
1202	4 x 240/2 x 240	2 x 150/1 x 240	280/280	XLPE Cu	4 x 240/2 x 240	685/480	XLPE Cu/XLPE Cu
1302	4 x 240/2 x 240	2 x 150/1 x 240	280/280	XLPE Cu	4 x 240/2 x 240	685/480	XLPE Cu/XLPE Cu
1352	6 x 240/2 x 240	2 x 185/1 x 240	280/280	XLPE Cu	5 x 240/2 x 240	750/480	XLPE Cu/XLPE Cu
1402	6 x 240/2 x 240	3 x 150/1 x 240	280/280	XLPE Cu	5 x 240/2 x 240	750/480	XLPE Cu/XLPE Cu
1502	6 x 240/2 x 240	3 x 150/1 x 240	280/280	XLPE Cu	6 x 240/2 x 240	750/480	XLPE Cu/XLPE Cu
1702	4 x 240/4 x 240	2 x 150/2 x 150	200/200	XLPE Cu	4 x 240/4 x 240	685/685	XLPE Cu
Option 81							
1102-1502	8 x 240						

* Power supply wire section (see diagram in chapter 5 'Electrical connection').

Note: The current values used are given for a unit equipped with a hydronic kit operating at maximum current.

6 - APPLICATION DATA

6.1 - Operating limits

Evaporator fluid temperature			
	°C	Minimum	Maximum
Water entering temperature at start-up		-	45
Water entering temperature during operation		6.8	21
Water leaving temperature during operation		3.3	15

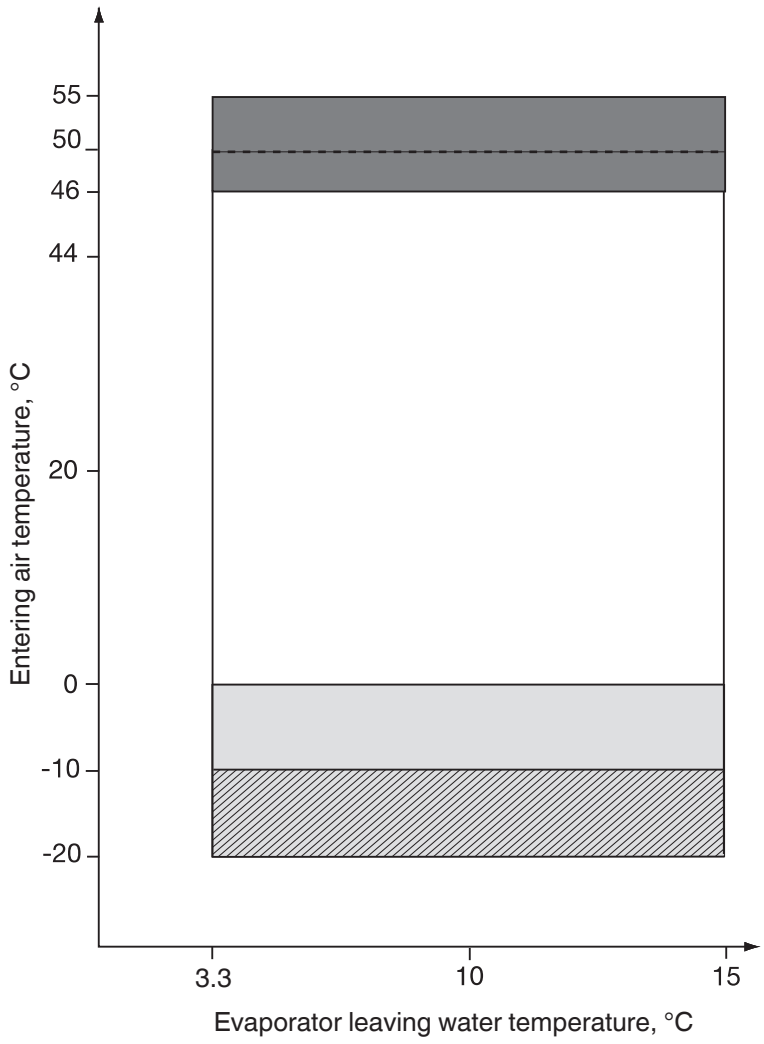
Note: If the leaving water temperature is below 4°C, a glycol/water solution or the frost protection option must be used.

Condenser air temperature			
	°C	Minimum	Maximum
Storage		-20	68
Operation, standard unit		-10	55*
With winter operation option (option 28)		-20	55*
With high energy efficiency option (option 119)		-10	55*

Note: If the air temperature is below 0°C, a glycol/water solution or the frost protection option must be used.

* Full or part-load operation, depending on the model
** Recommended for operation above 46°C

Operating range 30XA



Legend:

Part load average: from 46°C for standard unit
from 50°C with option 119.

Operating range, standard unit.

Below 0°C air temperature the unit must either be equipped with the evaporator frost protection option (41A or 41B), or the water loop must be protected against frost by using a frost protection solution (by the installer).

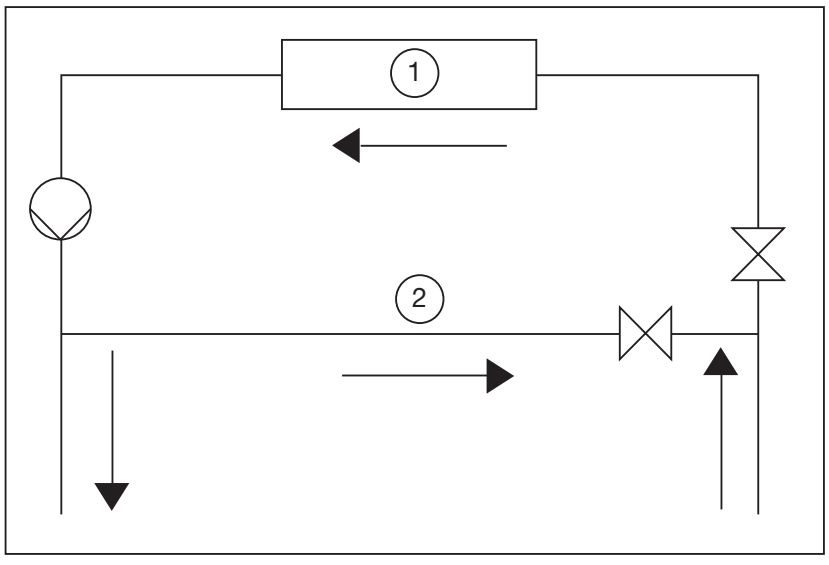
Operating range, unit equipped with option 28 (winter operation).

ATTENTION: Option 28 (Winter operation)
If the outside temperature is below -10°C and the unit has been switched off for more than 4 hours, it is necessary to wait 2 hours after the unit has been switched on again to allow the frequency converter to warm up.

6.2 - Minimum chilled water flow (units without hydronic module)

The minimum chilled water flow is shown in the table on the next page. If the system flow is less than this, the evaporator flow can be recirculated, as shown in the diagram.

For minimum chilled water flow rate

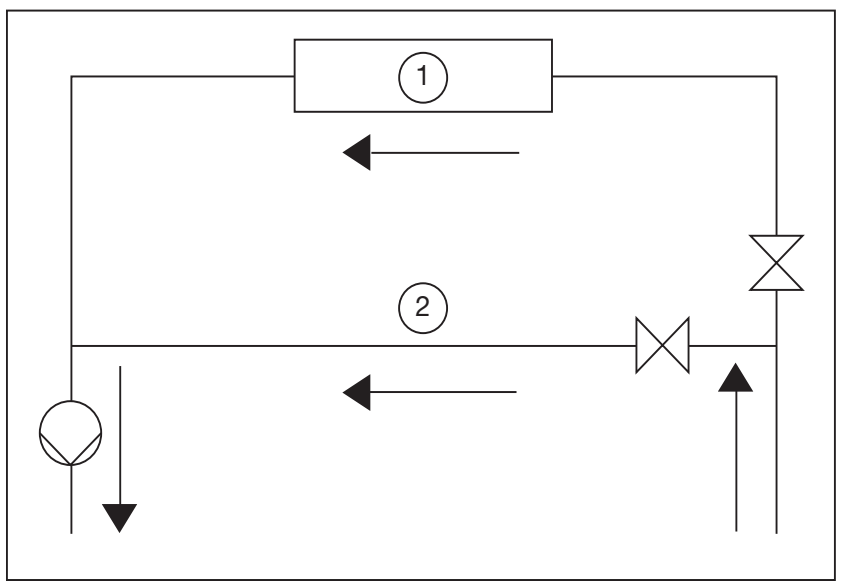


Legend
1 Evaporator
2 Recirculation

6.3 - Maximum chilled water flow (units without hydronic module)

The maximum chilled water flow is shown in the table on the next page. If the system flow exceeds the maximum value, it can be bypassed as shown in the diagram.

For maximum chilled water flow rate



Legend
1 Evaporator
2 Bypass

6.4 - Variable flow evaporator

Variable evaporator flow can be used in standard 30XA chillers. The chillers maintain a constant leaving water temperature under all flow conditions. For this to happen, the minimum flow rate must be higher than the minimum flow given in the table of permissible flow rates and must not vary by more than 10% per minute.

If the flow rate changes more rapidly, the system should contain a minimum of 6.5 litres of water per kW instead of 3.25 l/kW.

6.5 - System minimum water volume

Whichever the system, the water loop minimum capacity is given by the formula:

Capacity = Cap (kW) x N litres

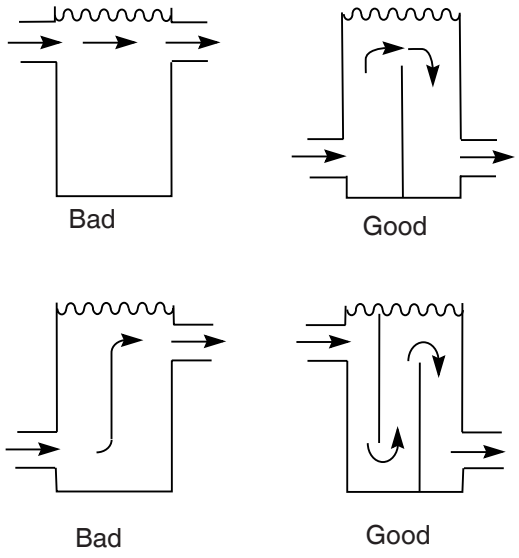
Application	N
Normal air conditioning	3.25
Process type cooling	6.5

Where Cap is the nominal system cooling capacity (kW) at the nominal operating conditions of the installation.

This volume is necessary for stable operation and accurate temperature control.

It is often necessary to add a buffer water tank to the circuit in order to achieve the required volume. The tank must itself be internally baffled in order to ensure proper mixing of the liquid (water or brine). Refer to the examples below.

Connection to a buffer tank



6.6 - Maximum system water volume

Units with hydronic module incorporate an expansion tank that limits the water volume. The table below gives the maximum loop volume for pure water or ethylene glycol with various system concentrations, as well as the static pressures. If the maximum volume is insufficient, compared to the minimum system water loop volume, an additional expansion tank must be added to the system.

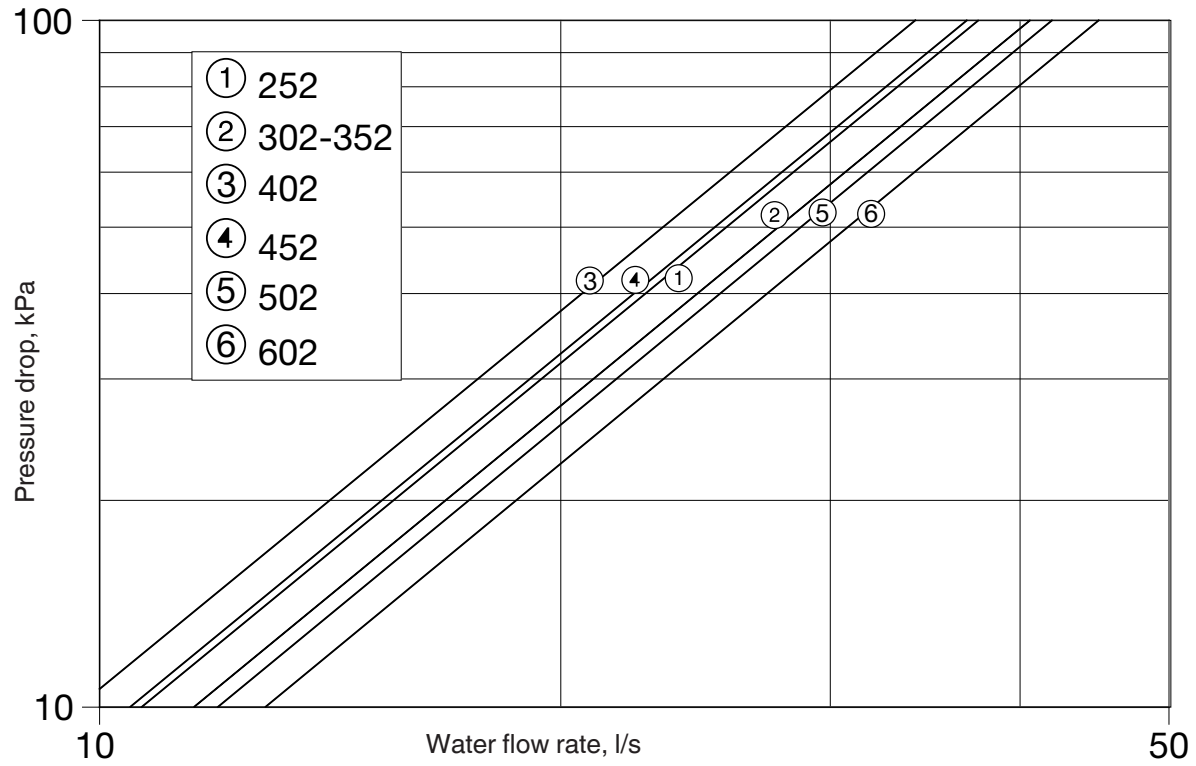
30XA		252-452			502		
Static pressure	**bar**	**1**	**2**	**2.5**	**1**	**2**	**2.5**
Maximum water loop volume	**l**						
Pure water		2400	1600	1200	3960	2640	1980
Ethylene glycol 10%		1800	1200	900	2940	1960	1470
Ethylene glycol 20%		1320	880	660	2100	1400	1050
Ethylene glycol 30%		1080	720	540	1740	1160	870
Ethylene glycol 40%		900	600	450	1500	1000	750

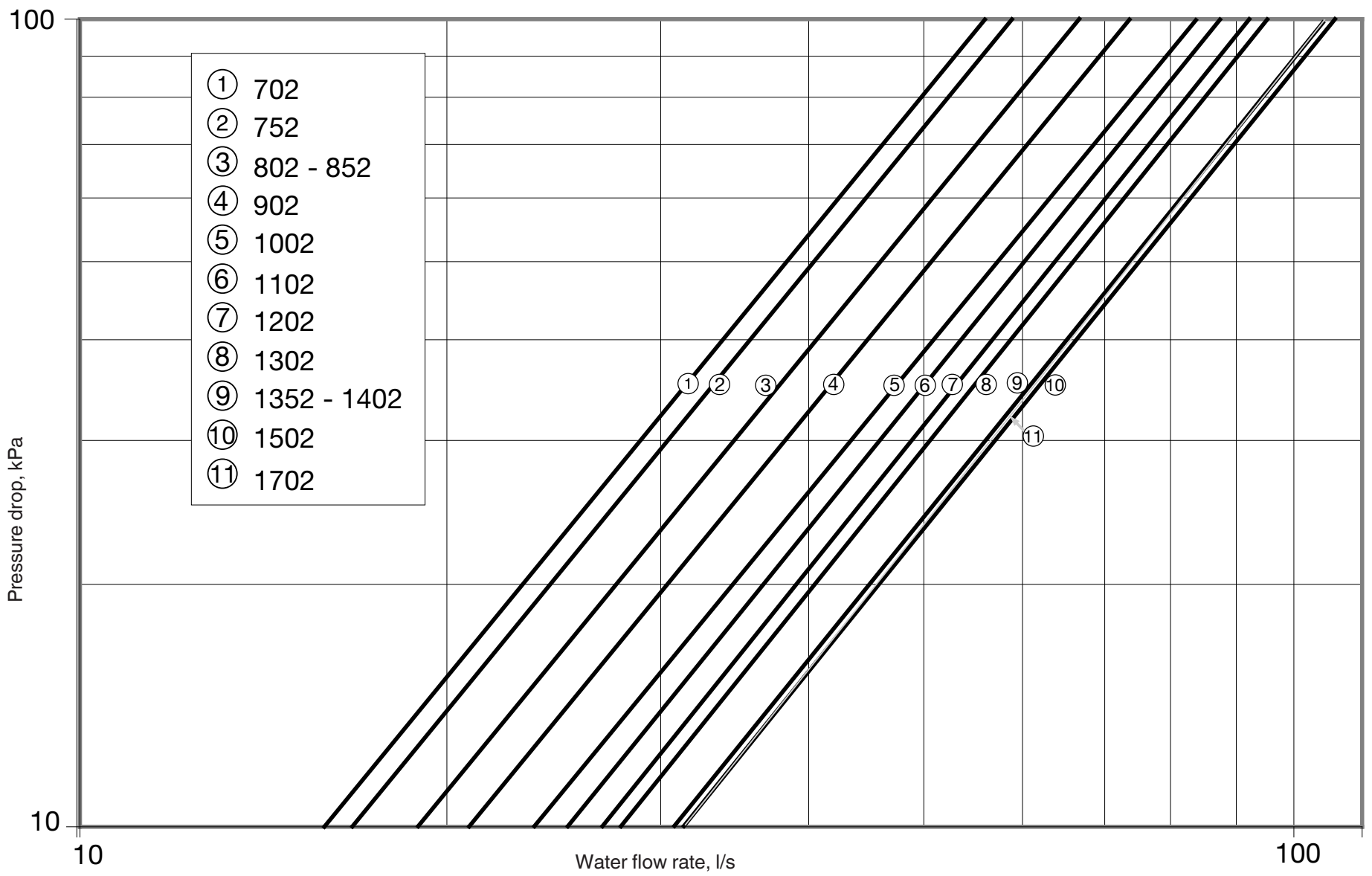
6.7 - Evaporator water flow rate

30XA	Evaporator water flow rate, l/s	
	Min. flow rate	Max. flow rate*
252	3.6	37.5
302	4.0	40.5
352	4.3	40.5
402	5.3	34.1
452	6.0	36.9
502	6.7	42.0
602	8.1	45.0
702	8.9	56.1
752	9.6	59.1
802	10.4	67.1
852	11.0	67.1
902	11.8	73.9
1002	13.1	83.9
1102	15.1	87.8
1202	16.4	92.9
1302	17.5	96.1
1352	18.8	107.4
1402	19.3	107.4
1502	19.9	109.4
1702	22.0	107.4

* The maximum water flow rate corresponds to a pressure drop of 100 kPa.

6.8 - Evaporator pressure drop curve





7 - WATER CONNECTIONS

ATTENTION: Before carrying out any water connections install the water box purge plugs (one plug per water box in the lower section - supplied in the control box).

For size and position of the heat exchanger water inlet and outlet connections refer to the certified dimensional drawings supplied with the unit.

The water pipes must not transmit any radial or axial force to the heat exchangers nor any vibration.

The water supply must be analysed and appropriate filtering, treatment, control devices, isolation and bleed valves and circuits built in, to prevent corrosion, fouling and deterioration of the pump fittings. Consult either a water treatment specialist or appropriate literature on the subject.

7.1 - Operating precautions

The water circuit should be designed to have the least number of elbows and horizontal pipe runs at different levels. Below the main points to be checked for the connection:

- Comply with the water inlet and outlet connections shown on the unit.
- Install manual or automatic air purge valves at all high points in the circuit(s).
- Use an expansion device to maintain pressure in the circuit(s) and install a safety valve as well as an expansion tank.
- Install thermometers in both the entering and leaving water connections.
- Install drain connections at all low points to allow the whole circuit to be drained.
- Install stop valves, close to the entering and leaving water connections.
- Use flexible connections to reduce the transmission of vibrations.
- Insulate all pipework, after testing for leaks, both to reduce heat gains and to prevent condensation.
- Cover the insulation with a vapour barrier.
- Where there are particles in the fluid that could foul the heat exchanger, a screen filter should be installed ahead of the pump. The mesh size of the filter must be 1.2 mm (see 'Typical water circuit' diagram on the right).
- Before the system start-up verify that the water circuits are connected to the appropriate heat exchangers (e.g. no reversal between evaporator and condenser).
- Do not introduce any significant static or dynamic pressure into the heat exchange circuit (with regard to the design operating pressures).
- Before any start-up verify that the heat exchange fluid is compatible with the materials and the water circuit coating.

  In case additives or other fluids than those recommended by Carrier are used, ensure that the fluids are not considered as a gas, and that they belong to class 2, as defined in directive 97/23/EC.

Carrier recommendations on heat exchange fluids:

1. No NH^{4+} ammonium ions in the water, they are very detrimental for copper. This is one of the most important factors for the operating life of copper piping. A content of several tenths of mg/l will badly corrode the copper over time.
2. Cl^- Chloride ions are detrimental for copper with a risk of perforations by corrosion by puncture. If possible keep below 10 mg/l.
3. SO_4^{2-} sulphate ions can cause perforating corrosion, if their content is above 30 mg/l.
4. No fluoride ions (<0.1 mg/l).
5. No Fe^{2+} and Fe^{3+} ions with non negligible levels of dissolved oxygen must be present. Dissolved iron < 5 mg/l with dissolved oxygen < 5 mg/l.
6. Dissolved silicon: silicon is an acid element of water and can also lead to corrosion risks. Content < 1 mg/l.
7. Water hardness: TH >5°F. Values between 10 and 25 can be recommended. This will facilitate scale deposit that can limit corrosion of copper. TH values that are too high can cause piping blockage over time. A total alkalimetric titre (TAC) below 100 is desirable.
8. Dissolved oxygen: Any sudden change in water oxygenation conditions must be avoided. It is as detrimental to deoxygenate the water by mixing it with inert gas as it is to over-oxygenate it by mixing it with pure oxygen. The disturbance of the oxygenation conditions encourages destabilisation of copper hydroxides and enlargement of particles.
9. Specific resistance – electric conductivity: the higher the specific resistance, the slower the corrosion tendency. Values above 3000 Ohm/cm are desirable. A neutral environment favours maximum specific resistance values. For electric conductivity values in the order of 200-6000 S/cm can be recommended.
10. pH: Ideal case pH neutral at 20-25°C
    $7 < pH < 8$

If the water circuit must be emptied for longer than one month, the complete circuit must be placed under nitrogen charge to avoid any risk of corrosion by differential aeration.

Charging and removing heat exchange fluids should be done with devices that must be included on the water circuit by the installer. Never use the unit heat exchangers to add heat exchange fluid.

7.2 - Victaulic water connections

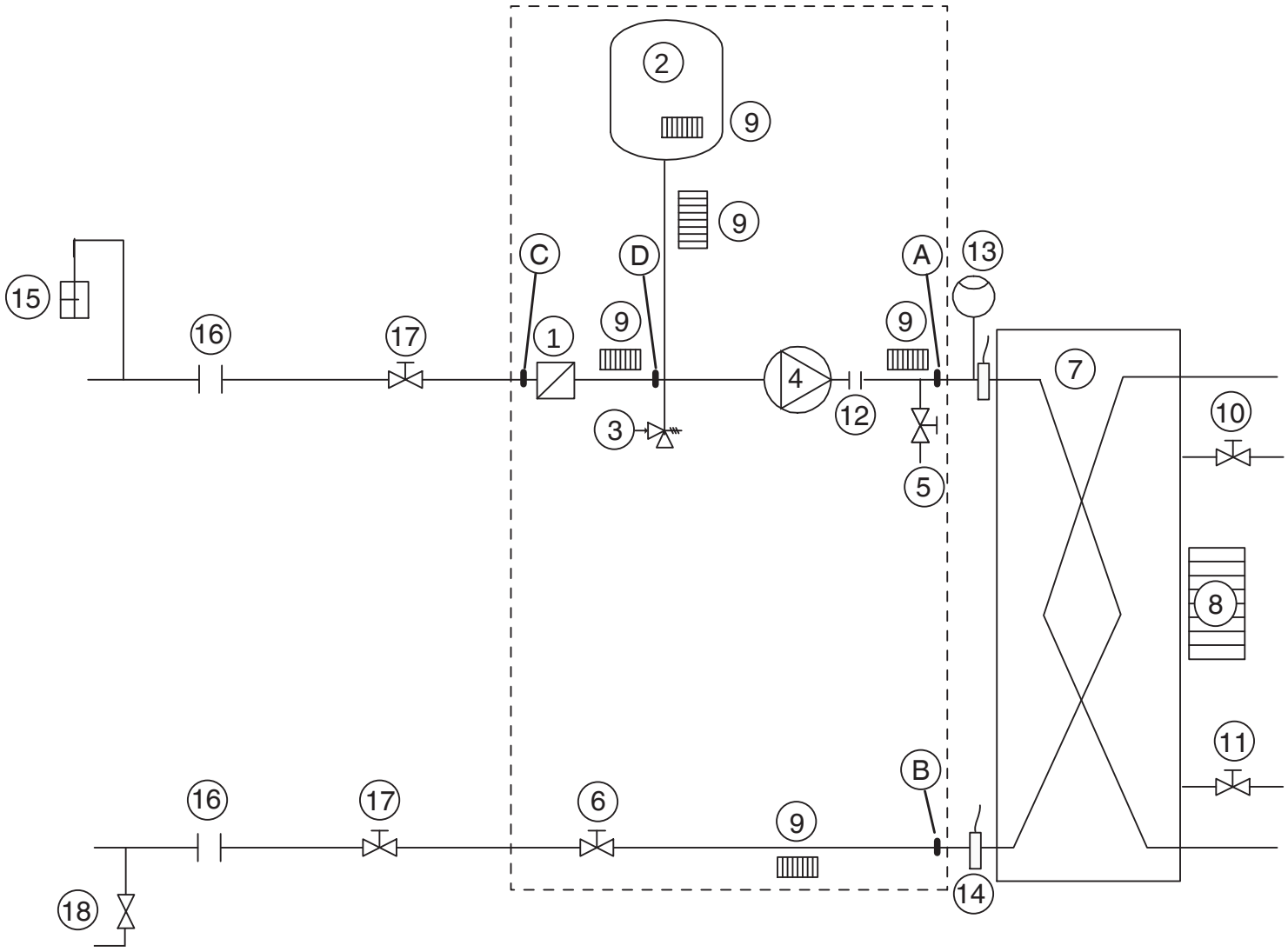
Inlet/outlet diameters without hydronic module

30XA		252-502	602	702-902	1002	1102	1202-1302	1352-1502	1702
Standard									
Diameter	in	5	5	6	8	6/6	6/6	8/6	6/6
Outside diameter	mm	141.3	141.3	168.3	219.1	168.3/168.3	168.3/168.3	219.3/168.3	168.3/168.3
Options 5, 6 and 100A									
Diameter	in	4	5	5	6	5/5	6/5	8/5	6/6
Outside diameter	mm	114.3	141.3	141.3	168.3	141.3/141.3	168.3/141.3	219.1/141.3	168.3/168.3
Option 100C									
Diameter	in	5	6	6	8	-	-	-	-
Outside diameter	mm	141.3	168.3	168.3	219.1	-	-	-	-

Inlet/outlet diameters with hydronic module (option)

30XA (option 116)		252	302	352	402	452	502
Diameter	in	4	4	4	5	5	5
Outside diameter	mm	114.3	114.3	114.3	139.7	139.7	139.7
Expansion tank volume	l	50	50	50	50	50	80
Max. operating pressure	kPa	400	400	400	400	400	400

Typical water circuit diagram



Legend

Components of the unit and hydronic module

A Pressure sensor (A-B = ΔP evaporator)
B Pressure sensor
C Pressure sensor (C-D = ΔP water filter)
D Pressure sensor
1 Victaulic screen filter
2 Expansion tank
3 Safety valve
4 Available pressure pump
5 Drain valve
6 Flow control valve
7 Evaporator
8 Evaporator defrost heater (option)
9 Hydronic module defrost heater (option)
10 Air vent (evaporator)
11 Water drain (evaporator)
12 Expansion compensator (flexible connections)
13 Flow switch
14 Water temperature sensor
15 Air vent

Installation components

16 Flexible connection
17 Check valve
18 Charge valve

--- Hydronic module (supplied as an option)

7.3 - Flow control

Evaporator flow switch and chilled water pump interlock

IMPORTANT: On 30XA units, the unit water flow switch must be energised, and the chilled water pump interlock must be connected. Failure to follow this instruction will void the Carrier guarantee.

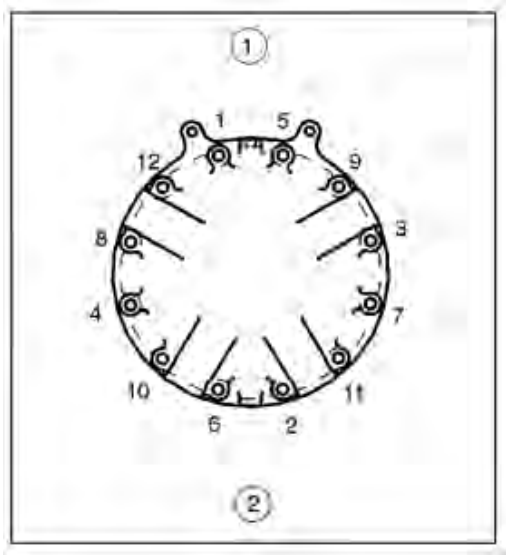
The water flow switch is installed on the evaporator water inlet and adjusted by the control, based on unit size and application. If adjustment is necessary, it must be carried out by qualified personnel trained by Carrier Service.

Terminals 34 and 35 are provided for field installation of the chilled water pump interlock (auxiliary contact for pump operation to be wired on site).

7.4 - Evaporator water box bolt tightening

The evaporator (and condenser) are of the shell and tube type with removable water boxes to facilitate cleaning. Re-tightening or tightening must be done in accordance with the illustration below.

Water box tightening sequence



Legend

1 Sequence 1: 1 2 3 4
Sequence 2: 5 6 7 8
Sequence 3: 9 10 11 12

2 Tightening torque
Bolt size M16 - 171 - 210 Nm

NOTE: Before this operation we recommend draining the circuit and disconnecting the pipes to be sure that the bolts are correctly and uniformly tightened.

7.5 - Frost protection

7.5.1 - Standard machine

If the chiller or the water piping is in an area where the ambient temperature can fall below 0°C it is recommended to add an antifreeze solution to protect the unit and the water piping to a temperature of 10 K below the lowest temperature likely to be reached at the installation site. Use only antifreeze solutions, approved for heat exchanger duty. If the system is not protected by an antifreeze solution and will not be used during the freezing weather conditions, draining of the cooler and outdoor piping is mandatory. Damage due to freezing is not covered by the warranty.

IMPORTANT: Depending on the climatic conditions in your area you must:

- ***Add ethylene glycol with an adequate concentration to protect the installation up to a temperature of 10 K below the lowest temperature likely to occur at the installation site.***
- ***If the unit is not used for an extended period, it is recommended to drain it, and as a safety precaution add ethylene glycol to the heat exchanger, using the water entering purge valve connection (a purge connection is available somewhere on the heat exchanger water box in case the machine is not perfectly level).***
- ***At the start of the next season, refill the unit with water and add an inhibitor.***
- ***For the installation of auxiliary equipment, the installer must comply with basic regulations, especially for minimum and maximum flow rates, which must be between the values listed in the operating limit table (application data).***

7.5.2 - Optional evaporator frost protection (30XA)

In cases where it is not possible to apply the recommendations in paragraph 7.5.1, the units can be equipped with heaters to protect the evaporator against frost (option 41A or 41B).

7.6 - Operation of two units in master/slave mode

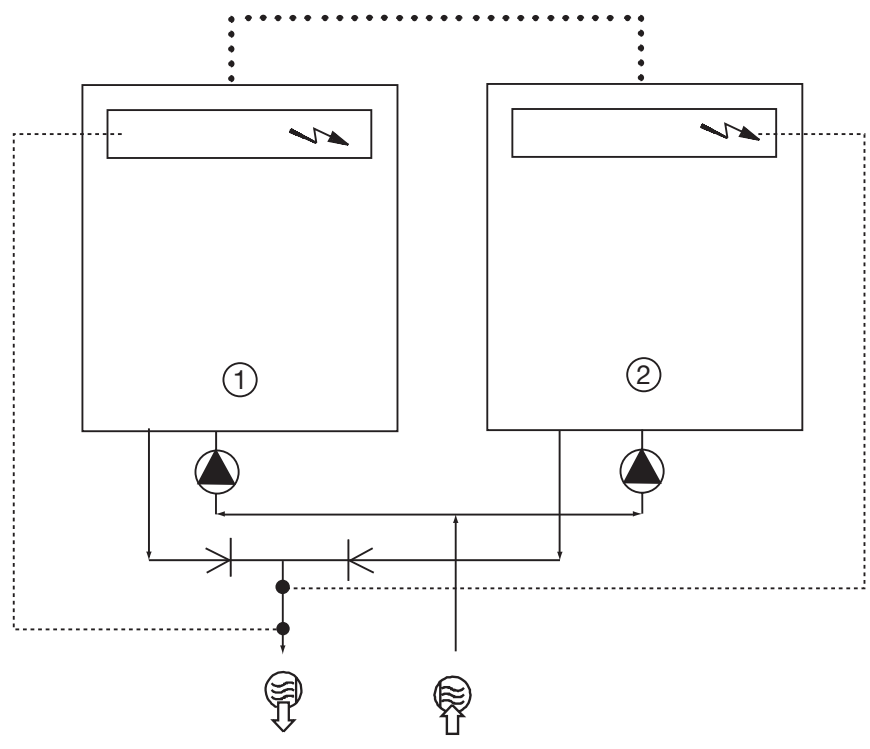
NOTE: This operating mode is not available for 30XA 1702 units.

The control of a master/slave assembly is in the entering water and does not require any additional sensors (standard configuration). It can also be located in the leaving water. In this case two additional sensors must be added on the common piping.

All parameters, required for the master/slave function must be configured using the Service Configuration menu. All remote controls of the master/slave assembly (start/stop, set point, load shedding etc.) are controlled by the unit configured as master and must only be applied to the master unit.

Each unit controls its own water pump. If there is only one common pump, in cases with variable flow, isolation valves must be installed on each unit. They will be activated at the opening and closing by the control of each heat pump (in this case the valves are controlled using the dedicated water pump outputs). See the 30XA Pro-Dialog Control IOM for a more detailed explanation.

30XA with configuration: leaving water control

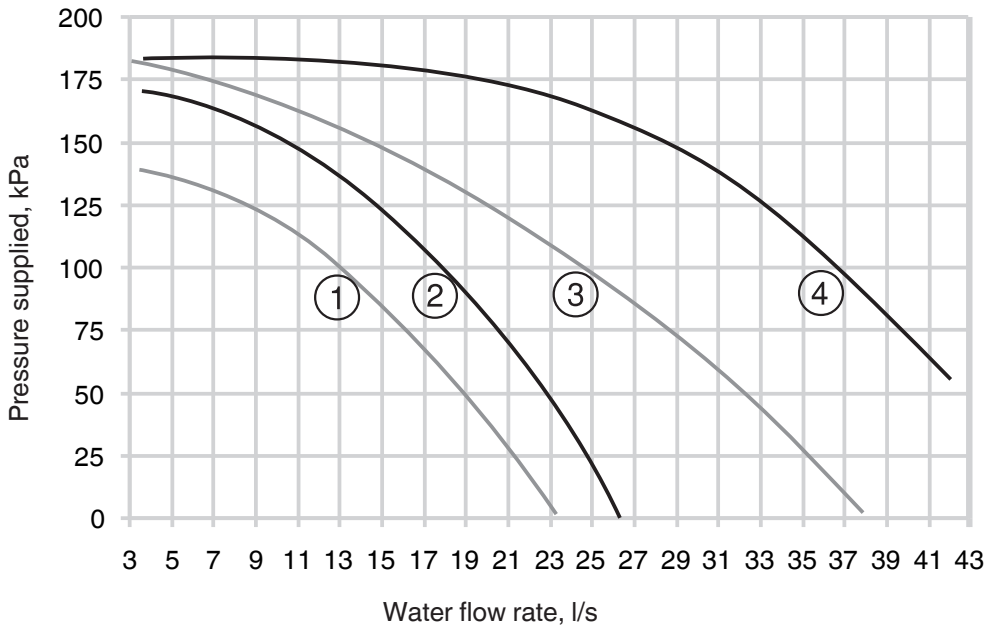


Legend

1 Master unit
2 Slave unit
Control boxes of the master and slave units
Water inlet
Water outlet
Water pumps for each unit (included as standard for units with hydronic module)
● Additional sensors for leaving water control, to be connected to channel 1 of the slave boards of each master and slave unit
♦ ♦ ♦ CCN communication bus
------ Connection of two additional sensors

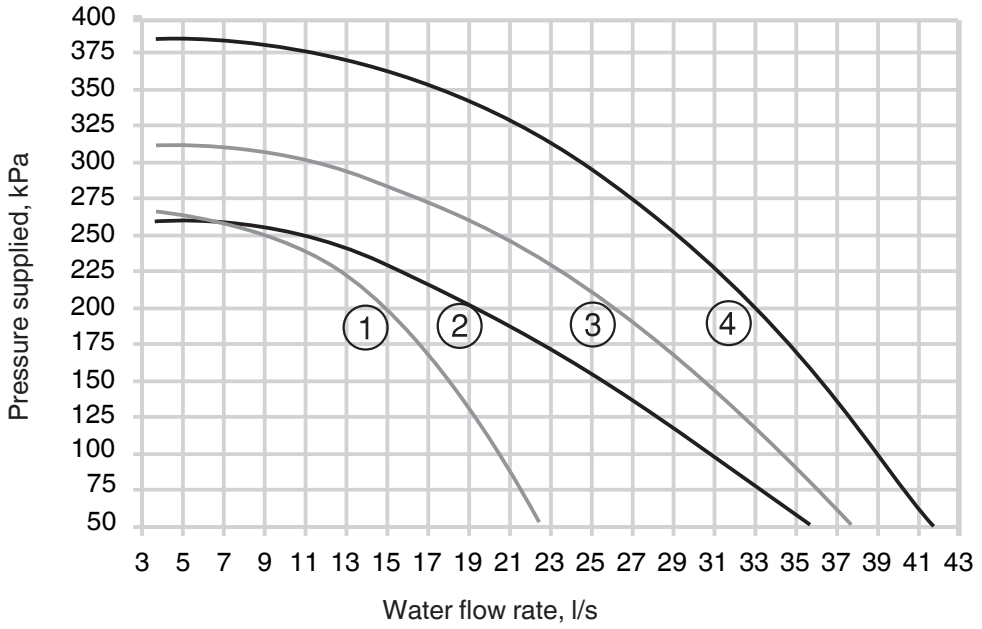
7.7 - Pump pressure/flow rate curves

Low-pressure pumps



Legend
1 30XA 252-302
2 30XA 352
3 30XA 402
4 30XA 452-502

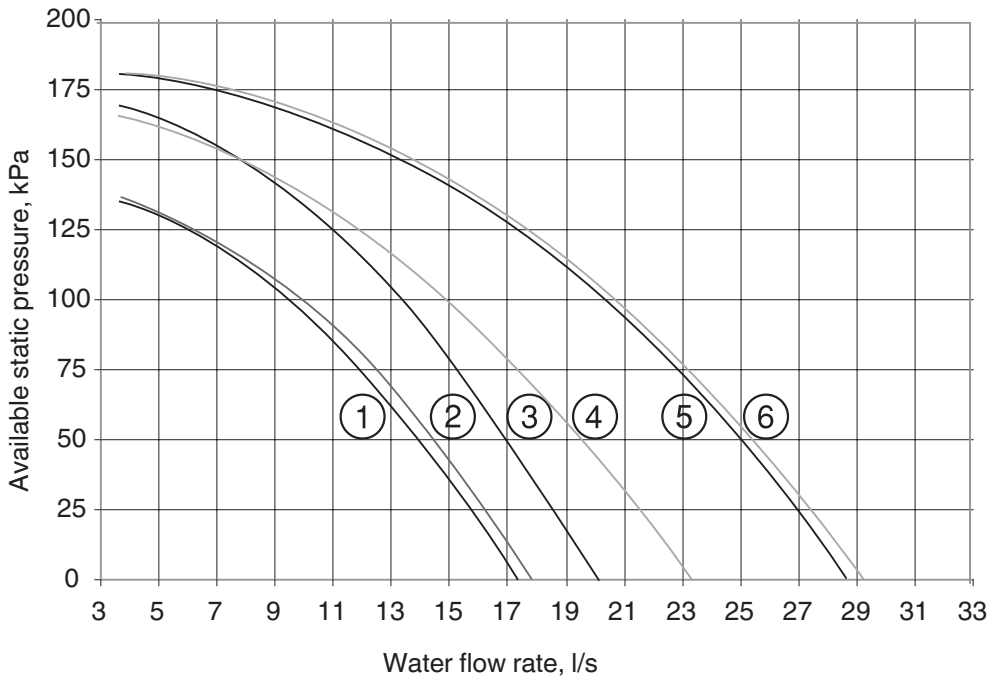
High-pressure pumps



Legend
1 30XA 252
2 30XA 302-352
3 30XA 402-452
4 30XA 502

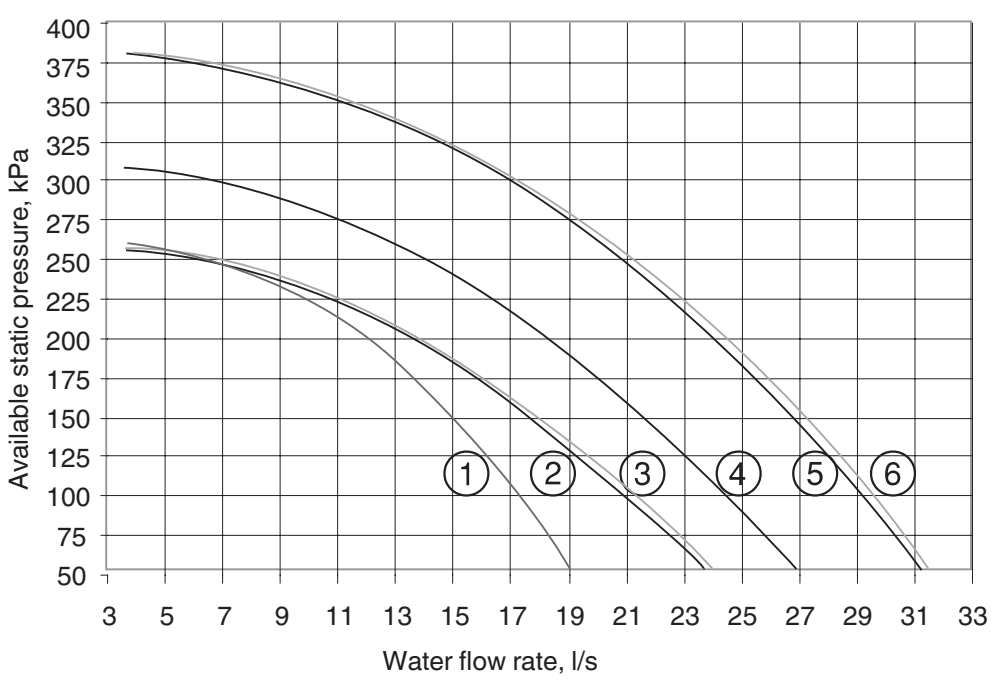
7.8 - Available static system pressure (optional hydronic module)

Low-pressure pumps



Legend
1 30XA 252
2 30XA 302
3 30XA 352
4 30XA 402
5 30XA 452
6 30XA 502

High-pressure pumps



Legend
1 30XA 252
2 30XA 352
3 30XA 302
4 30XA 402
5 30XA 452
6 30XA 502

8 - FREE-COOLING OPTION

8.1 - Characteristics

30XA with Option 118A		252	302	352	402	452	502	602	702	752	802	852	902	1002
Operating weight*	**kg**	3840	3880	3920	4780	4850	5330	6260	6410	6710	7010	7560	7860	8440
Refrigerant charge	**kg**													
Circuit A		36	37	37	54	56	64	64	64	72	76	79	76	83
Circuit B		38	38	39	37	39	39	64	68	64	67	70	79	87
Refrigerant charge, option 254	**kg**													
Circuit A		60	64	**	87	87	104	104	102	**	**	133	**	143
Circuit B		64	64	**	56	56	56	90	97	**	**	97	**	132

* Standard unit and option 119

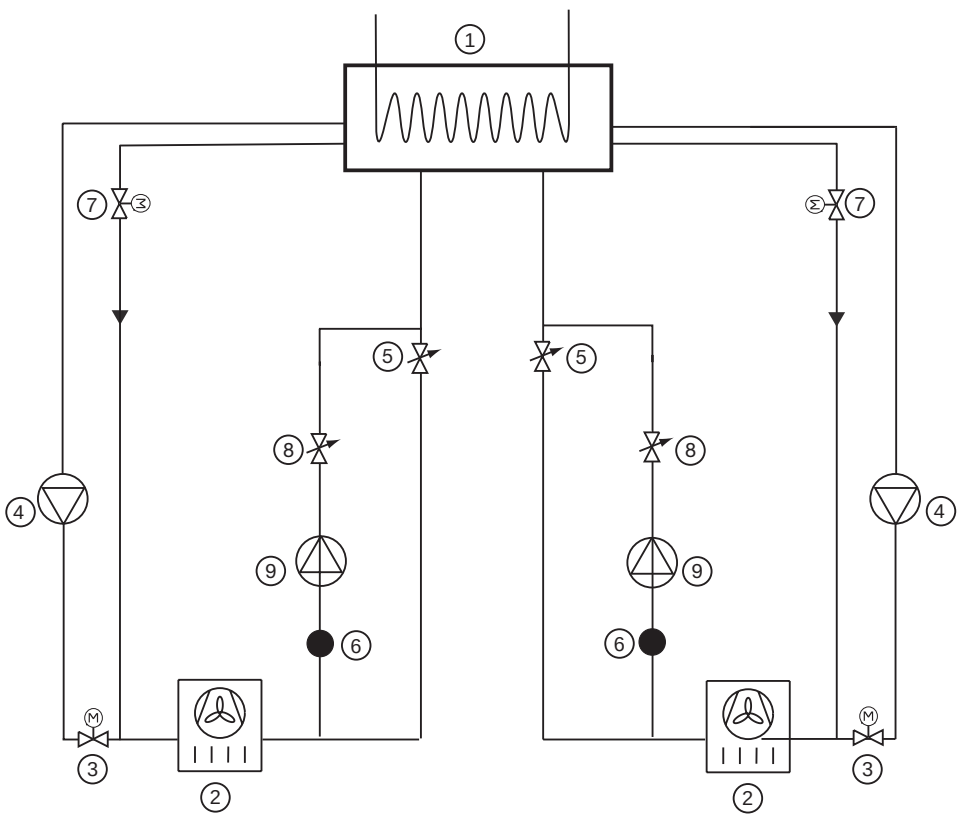
** Option 118A (free cooling) is not compatible with these units.

8.2 - Operating limits

Cooling mode			
Evaporator		**Minimum**	**Maximum**
Entering water temperature at start-up	°C	-	45
Entering water temperature during operation	°C	6.8	21
Leaving water temperature during operation	°C	3.3	26
Condenser (air)		**Minimum**	**Maximum**
Outdoor ambient operating temperature	°C	-10	55*
With winter operation option (option 28)	°C	-20	55*
Free-cooling mode			
Evaporator		**Minimum**	**Maximum**
Entering water temperature at start-up	°C	-	45
Leaving water temperature during operation	°C	3,3	26*
Condenser (air)		**Minimum**	**Maximum**
Outdoor ambient operating temperature	°C	-10	20
With winter operation option (option 28)	°C	-20	20

* Maximum configurable set-point

8.3 - Operation



Legend

1 Evaporator
2 Air condenser (coils)
3 Motorised two-way valve, discharge side
4 Compressor and oil separator
5 Principal electronic expansion valve (EXV)
6 Pressure and temperature measurement to calculate the sub-cooling upstream of the pump
7 Motorised two-way bypass valve
8 Free-cooling expansion device (EXV)
9 Refrigerant pump

The change-over between the cooling and free-cooling modes is automatically controlled (it is possible to block the change-over to free-cooling by reconfiguring the machine - see Controls IOM). The configurable parameters permitting change-over are the outside air temperature and the leaving water temperature set-point. As soon as the temperature difference LWTstp - OAT is above 8 K the current capacity in cooling mode is calculated and compared with the theoretical free-cooling capacity. This comparison authorizes/stops the change-over to free-cooling.

After change-over to free-cooling all compressors are stopped, the two (or four) two-way valves change to the free-cooling position (the compressor functions are bypassed). As soon as the valves open, the free-cooling pump is started. This change-over logic takes around 4 minutes. Taking this timing into consideration two cooling - free-cooling change-overs are authorized per hour.

If the capacity supplied in the free-cooling mode is insufficient (set-point not reached), the unit automatically changes over to cooling mode.

To optimize operation in free-cooling mode we strongly recommend to use the set-point offset function. This favours the change-over to free-cooling and increases the capacity in free-cooling mode.

9 - HEAT RECLAIM CONDENSER OPTION

9.1 - Technical data, 30XA units with heat reclaim condenser option

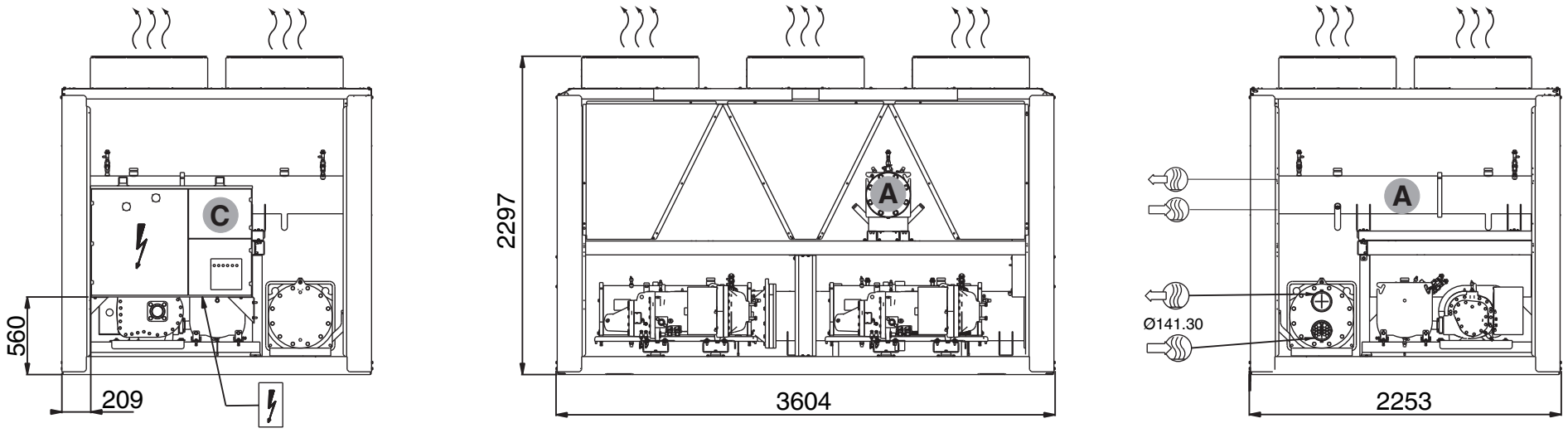
30XA heat reclaim mode		252	302	352	402	452	502	602	702	752	802	852	902	1002
Cooling capacity*	kW	261	291	311	379	438	493	603	665	707	775	814	875	971
Heating capacity in heat reclaim mode*	kW	336	373	401	481	554	620	760	832	894	974	1027	1105	1229
Total power input (unit)*	kW	82	90	99	113	128	140	172	183	206	219	234	253	283
Total energy efficiency ratio (EER/COP)	kW/kW	3.16/ 4.07	3.22/ 4.13	3.15/ 4.06	3.36/ 4.27	3.40/ 4.31	3.53/ 4.46	3.52/ 4.44	3.63/ 4.55	3.43/ 4.35	3.53/ 4.45	3.48/ 4.40	3.45/ 4.38	3.42/ 4.35
Operating weight**	kg	4230	4270	4280	5260	5380	5880	7000	7100	7470	7680	8320	8670	9280
Refrigerant charge														
Circuit A	kg	36	37	37	53	54,5	62	62	62	70	74	77	74	96
Circuit B	kg	38	38	39	37	39	39	62	66	62	69	68	77	94
Heat reclaim condenser		Flooded multi-pipe condenser												
Water volume	l	38	38	38	55	68	68	55 + 55	55 + 55	55 + 68	55 + 68	55 + 68	68 + 68	68 + 68
Water connections		Victaulic												
Diameter	in	3-1/2	3-1/2	3-1/2	4	4	4	4	4	4	4	4	4	4
Outside diameter	mm	93	93	93	106	106	106	106	106	106	106	106	106	106

* Entering and leaving water temperature: evaporator 12°C/7°C; heat reclaim condenser: 40°C/45°C

** Weights are for guidance only

9.2 - Dimensions, clearances

9.2.1 - 30XA 252-352 - heat reclaim option



Legend:
All dimensions are given in mm.

(1) Required clearances for maintenance and air flow

(2) Recommended space for evaporator tube removal

Water inlet

Water outlet

Air outlet – do not obstruct

Power supply connection

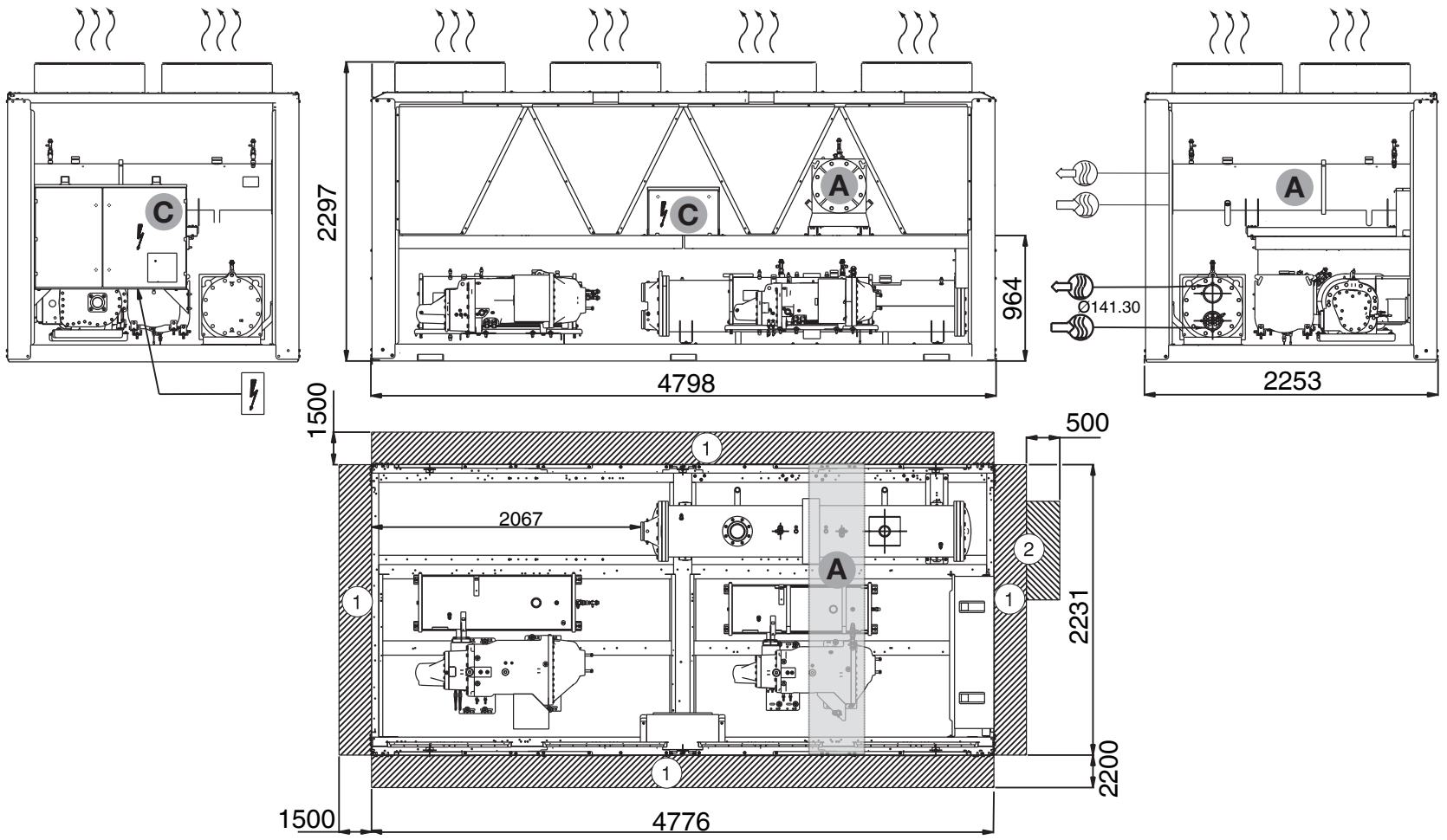
(C) Control circuit connection

(A) Heat reclaim condenser

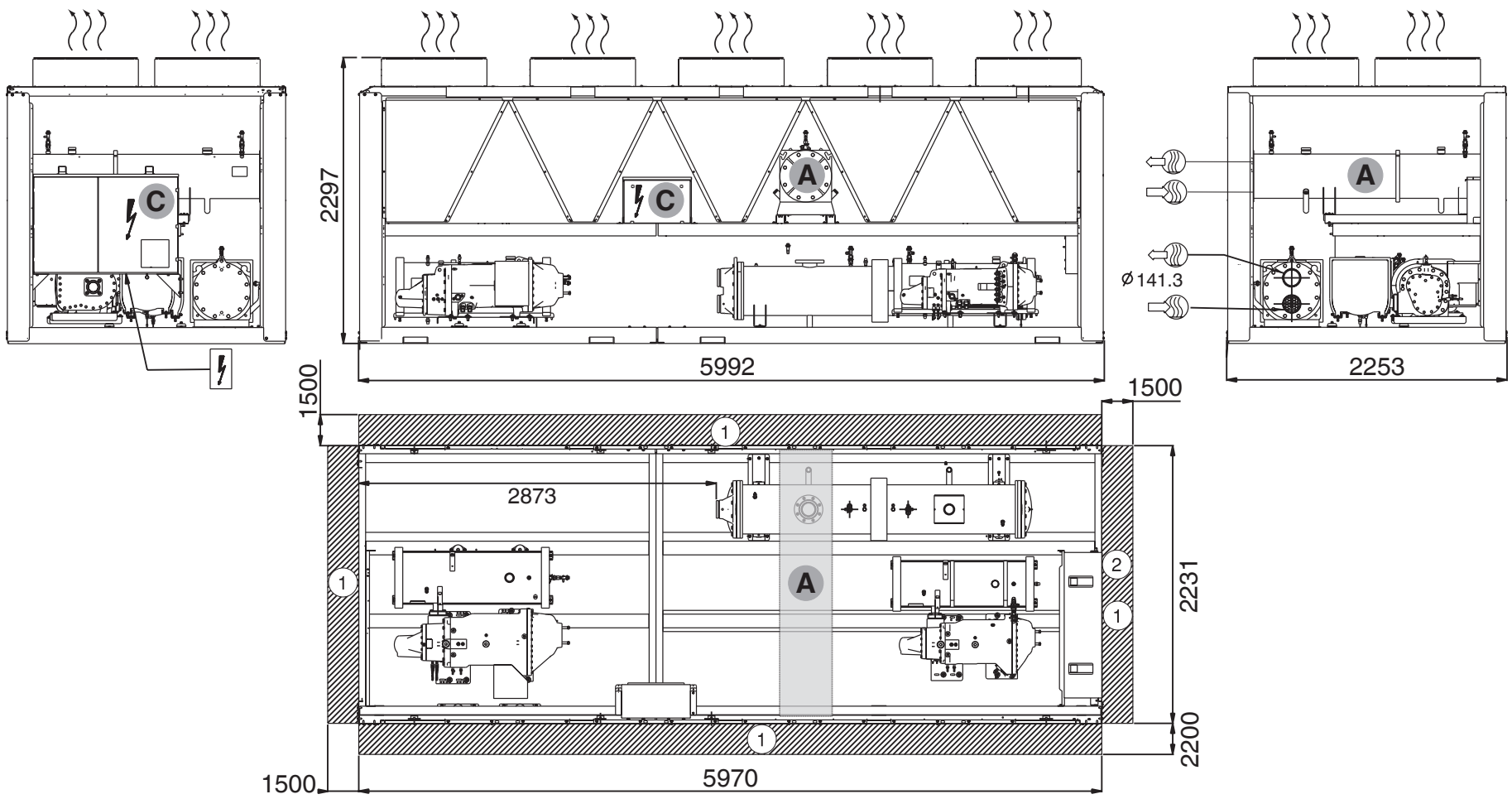
ATTENTION: The Victaulic flange sleeves of the condenser are not installed, but supplied with the unit. The sealing joints are in the control box. The temperature sensors and the condenser flow switch are wired and fixed in the machine. They must be installed as described in the chapter "Condenser water connections".

NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request. For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

9.2.2 - 30XA 402-452 - heat reclaim option



9.2.3 - 30XA 502 - heat reclaim option



Legend:
All dimensions are given in mm.

(1) Required clearances for maintenance and air flow

(2) Recommended space for evaporator tube removal

Water inlet

Water outlet

Air outlet – do not obstruct

Power supply connection

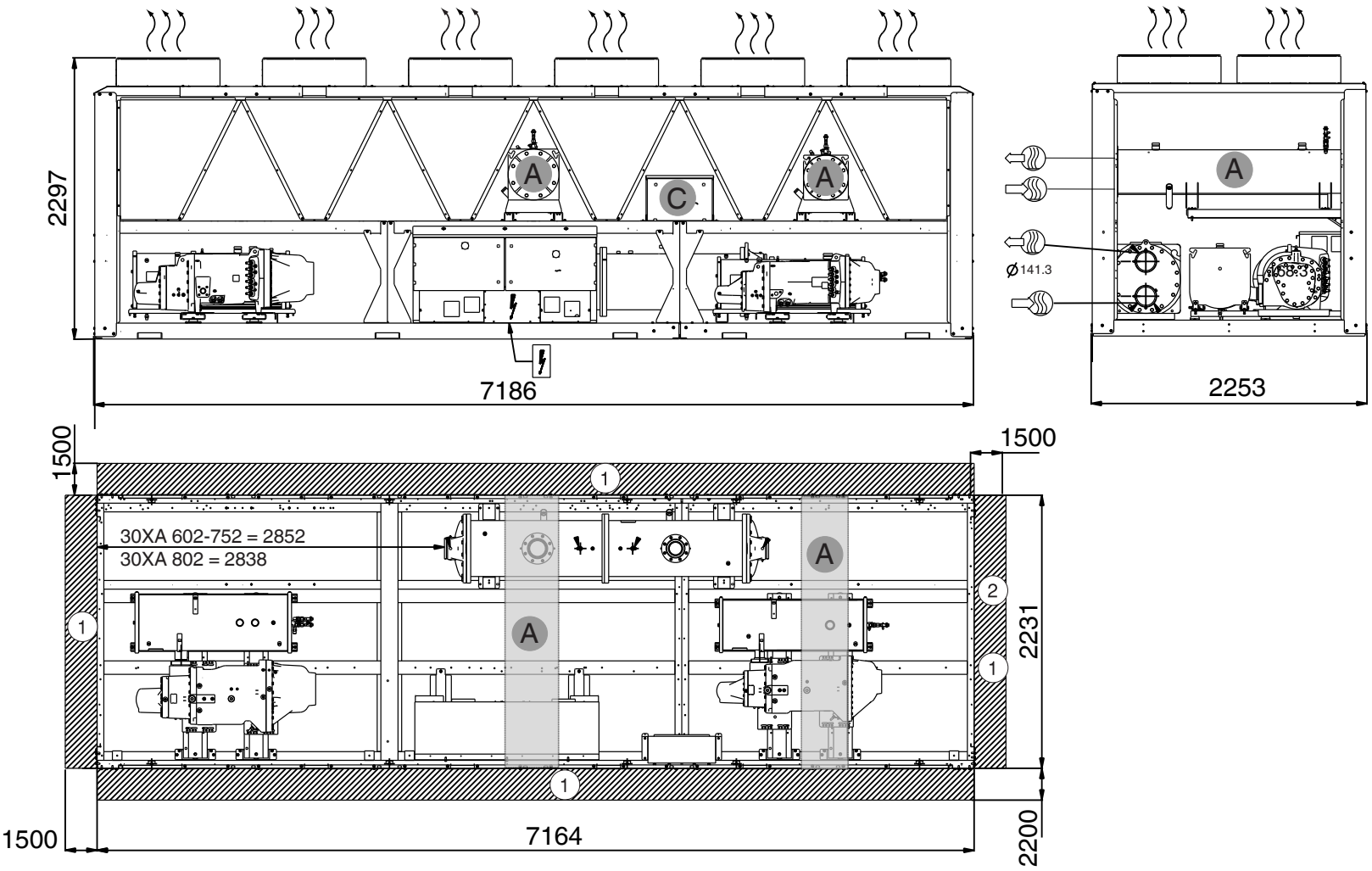
(C) Control circuit connection

(A) Heat reclaim condenser

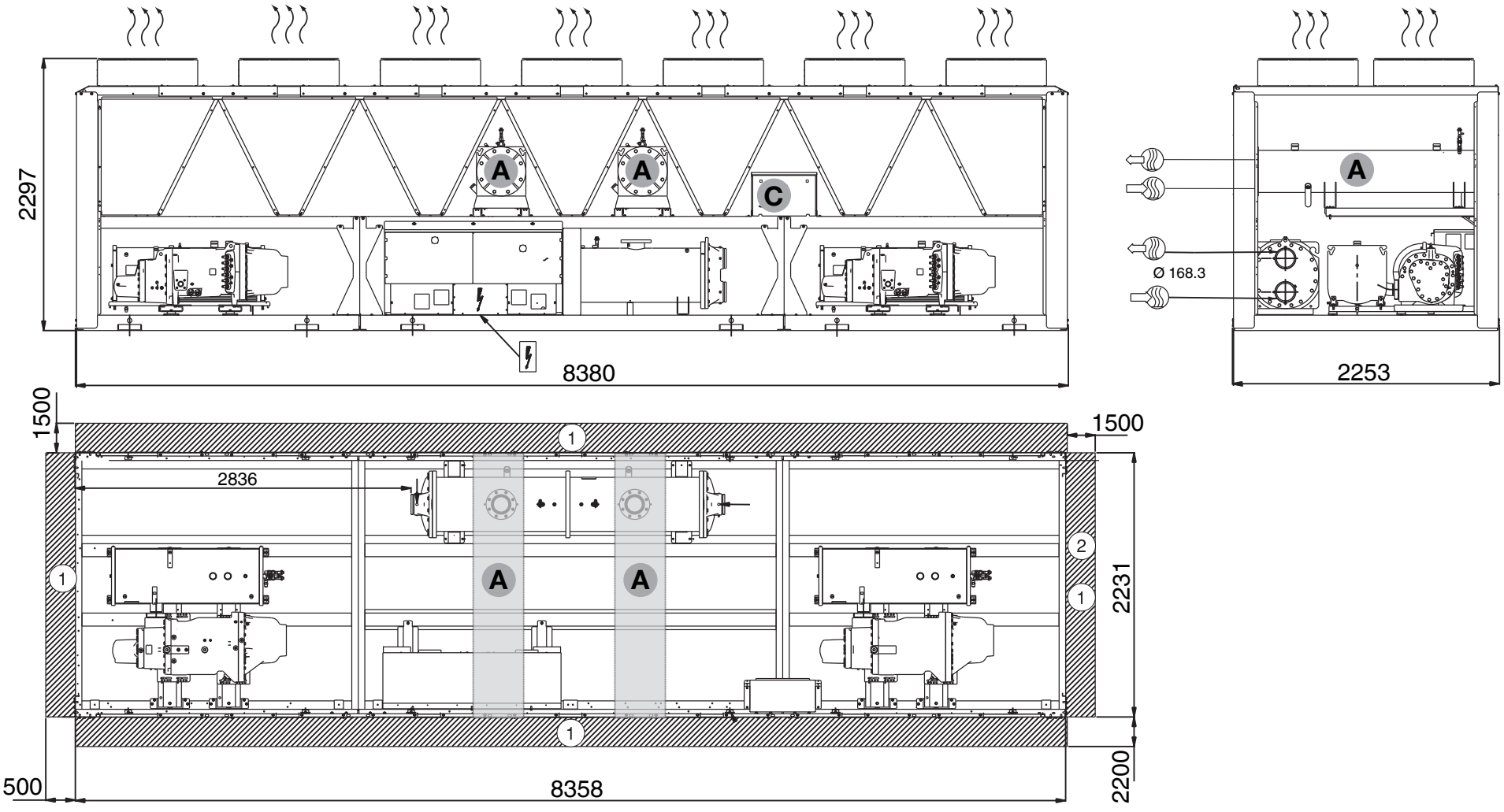
ATTENTION: The Victaulic flange sleeves of the condenser are not installed, but supplied with the unit. The sealing joints are in the control box. The temperature sensors and the condenser flow switch are wired and fixed in the machine. They must be installed as described in the chapter "Condenser water connections".

NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request. For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

9.2.4 - 30XA 602-802 - heat reclaim option



9.2.5 - 30XA 852-902 - heat reclaim option



Legend:
All dimensions are given in mm.

(1) Required clearances for maintenance and air flow

(2) Recommended space for evaporator tube removal

Water inlet

Water outlet

Air outlet – do not obstruct

Power supply connection

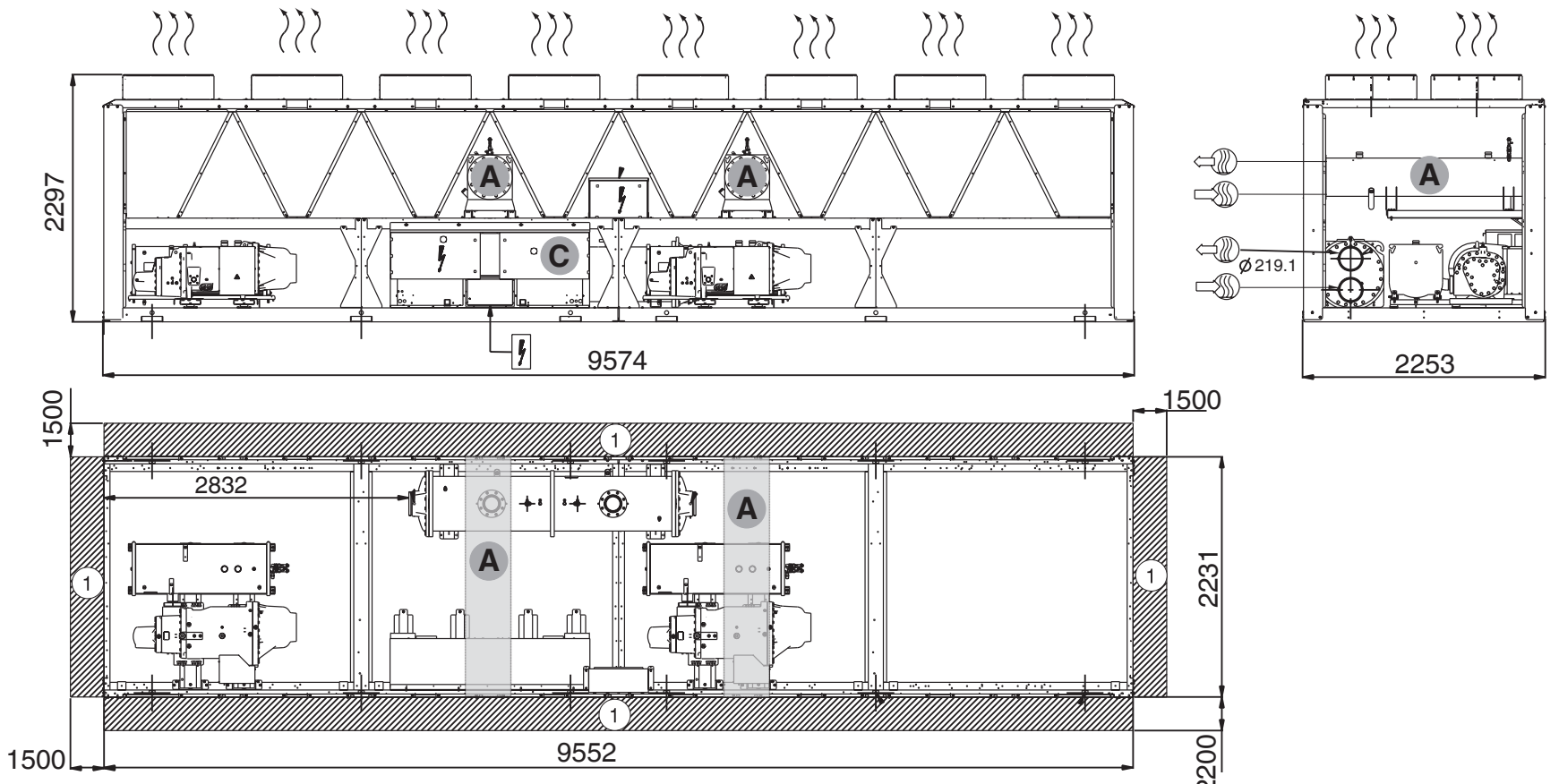
(C) Control circuit connection

(A) Heat reclaim condenser

ATTENTION: The Victaulic flange sleeves of the condenser are not installed, but supplied with the unit. The sealing joints are in the control box. The temperature sensors and the condenser flow switch are wired and fixed in the machine. They must be installed as described in the chapter "Condenser water connections".

NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request. For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

9.2.6 - 30XA 1002 - heat reclaim option



Legend:
All dimensions are given in mm.

(1) Required clearances for maintenance and air flow

(2) Recommended space for evaporator tube removal

Water inlet

Water outlet

Air outlet – do not obstruct

Power supply connection

(C) Control circuit connection

(A) Heat reclaim condenser

ATTENTION: The Victaulic flange sleeves of the condenser are not installed, but supplied with the unit. The sealing joints are in the control box. The temperature sensors and the condenser flow switch are wired and fixed in the machine. They must be installed as described in the chapter "Condenser water connections".

NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request. For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

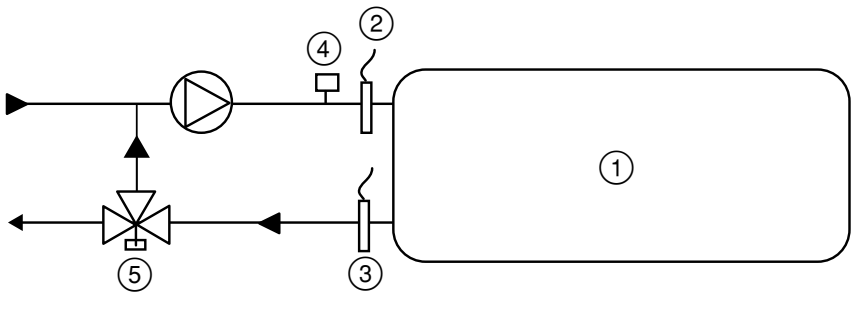
9.3 - Condenser location

All heat reclaim condensers are located between the air-cooled condensers on the upper part of the chassis, supported by two cross rails. The water inlet and outlet are on the same side.

9.4 - Condenser water connections

9.4.1 - Unit with one heat reclaim condenser (30XA 252-502)

The water flow switch must be installed at the water inlet of the installation that arrives at the heat reclaim condenser.

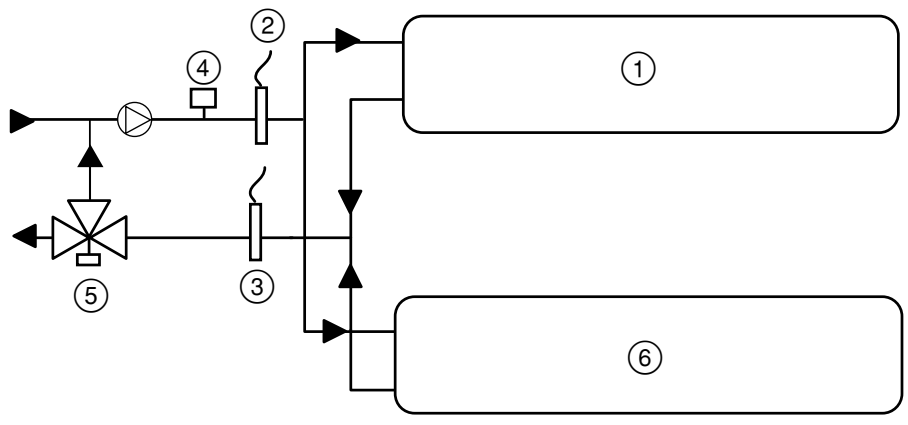


Legend
1 Heat reclaim condenser
2 Entering water temperature sensor (supplied)
3 Leaving water temperature sensor (supplied)
4 Condenser water flow switch (supplied)
5 Three-way valve (not supplied)

9.4.2 - Unit with two heat reclaim condensers (30XA 602-1002)

The two condensers must be installed in parallel in the water system of the installation. The water flow switch and the entering/leaving water temperature sensors must be installed in the line that is common to both heat reclaim circuits and as close as possible to the condensers. A T-piece must be provided by the installer at the water inlet and outlet of the condensers.

For units with two condensers the maximum cable length of the temperature sensors and the flow switch (7.5 m) is designed to allow connection to the common inlet or outlet in a radius of 4.5 m after routing along the width of the unit.



Legend
Please refer to the legend in chapter 9.4.1 opposite, noting that items 2, 3 and 4 - flow switch and sensors - are placed on the common sections.

9.4.3 - Three-way valves

It is strongly recommended to install a three-way valve in the system (not supplied with the unit). A 0-10 V output is available on the unit electronic board to control this valve. The valve allows bypassing of the heat reclaim condenser entering/leaving circuit to ensure unit operation with heat reclaim at low entering water temperature (< 12.5°C). It also ensures an optimal and controlled leaving water temperature.

9.5 - Operating limits for stable operation (no mode changeover)

9.5.1 - Cooling only mode

Please refer to the earlier chapters in this manual:
6.1 - Unit operating range
6.7 - Evaporator water flow rate

9.5.2 - Heat reclaim mode

Condenser water temperature			
	°C	**Minimum**	**Maximum**
Water entering temperature at start-up		12.5*	55
Water entering temperature during operation		20	55
Water leaving temperature during operation		25	60
Evaporator water temperature			
	°C	**Minimum**	**Maximum**
Water entering temperature at start-up		-	45
Water entering temperature during operation		6.8	21
Water leaving temperature during operation		3.3	15

* The water entering temperature at start-up must not be lower than 12.5°C. For installations with a lower temperature a three-way valve must be used.

NOTE: If the temperature at the evaporator is below 4°C, a glycol/water solution or the frost protection option must be used.

9.6 - Operating limits for changeover between modes

From cooling only to heat reclaim and vice versa.

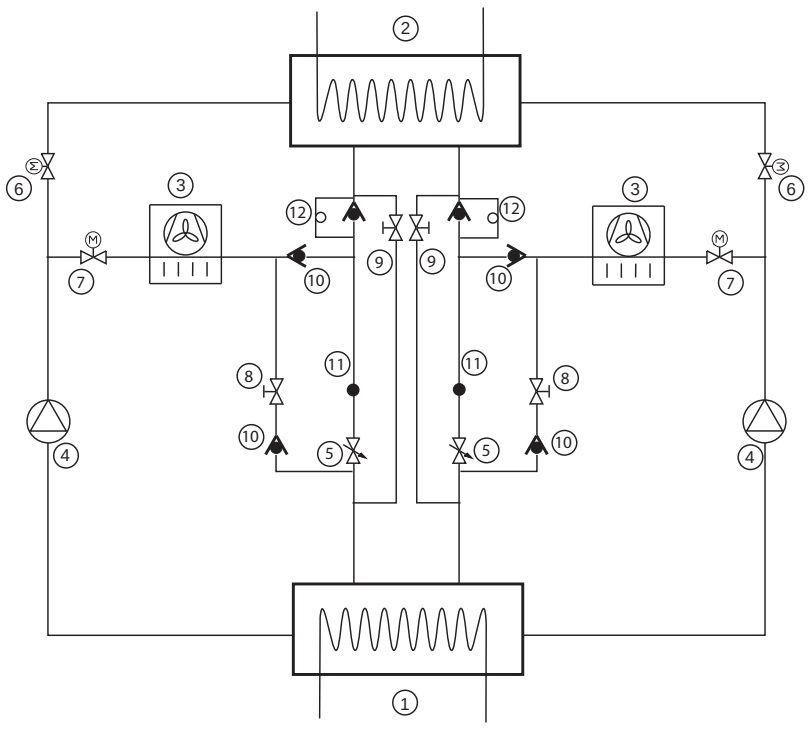
Heat reclaim condenser water temperature			
	°C	**Minimum**	**Maximum**
Water entering temperature		12.5	57.5
Ambient operating temperature		-10*	45

* -20°C with winter operation option (option 28)

9.7 - Flow control

The water flow switch supplied needs to be installed at the heat reclaim condenser water inlet and protects the condenser loop against low water flow conditions. When the heat reclaim mode is required, a signal from the additional board output activates the system pump. Once the pump is started, flow detection takes place for one minute. If no flow is detected by the end of this time:

1. changeover to the heat reclaim mode is not permitted
2. mode is changed to cooling only mode when the water flow rate is low, accompanied by a water flow detection alarm.



Legend

1 Evaporator
2 Heat reclaim condenser
3 Air condenser (coils)
4 Compressor
5 Expansion device (EXV)
6 Motorised valve - heat reclaim mode
7 Motorised valve - cooling only mode
8 Solenoid valve - charge recovery in heat reclaim mode
9 Solenoid valve - charge recovery in cooling only mode
10 Check valve
11 Pressure and temperature measurement to calculate the liquid sub-cooling to optimise the charge recovery
12 Check valve with capillary

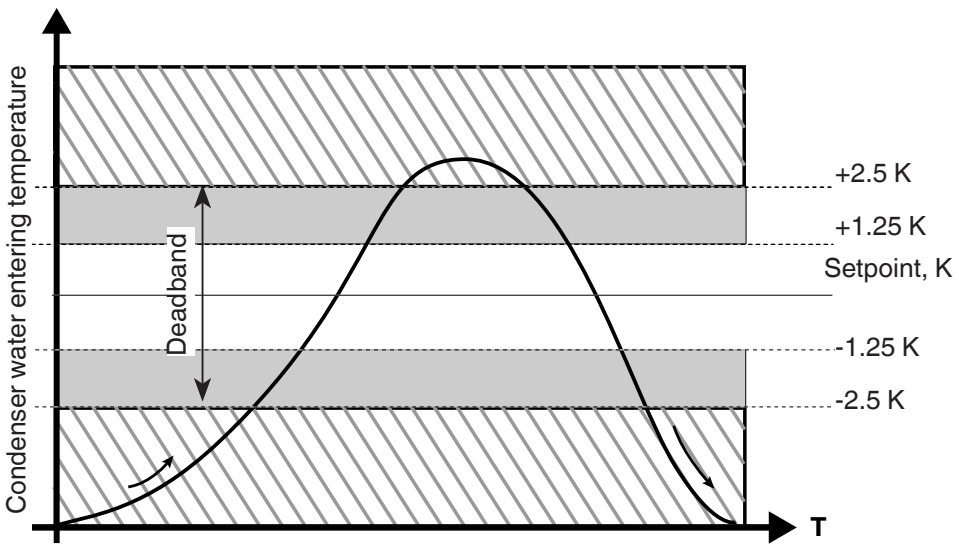
9.8 - Heat reclaim operation

The heat reclaim condenser option is only available on units with two circuits. It has been designed with one or two single or two-circuit shell-and-tube heat exchangers, depending on the unit size.

The two circuits are independently controlled. One circuit can be in cooling only and the other in heat reclaim mode.

Changeover from one mode to the other (changeover from heat exchange at the air condenser to heat exchange at the water condenser and vice versa) is ensured by motorised two-way valves located upstream of the air and water condensers.

Depending on the mode selected (heat reclaim or cooling), the logic compares the water entering temperature required with the setpoint of the condenser entering water temperature, chosen by the user. Depending on this difference the unit circuits are either activated or deactivated in heat reclaim mode (one or two together), as shown in the following diagram and table.



The deadband of 5 K is controlled by default.

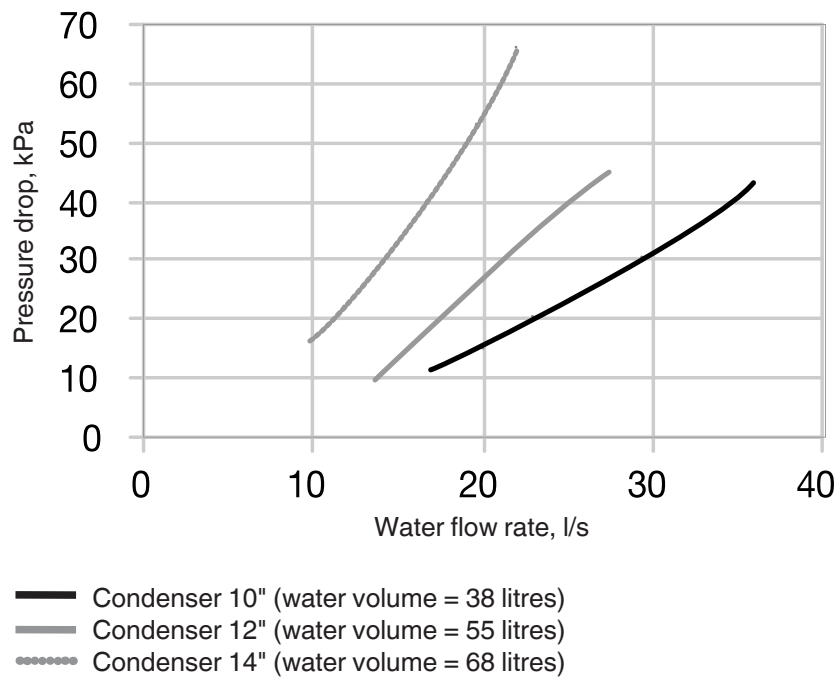
Case	Selection of the heat reclaim mode	Number of circuits in heat reclaim mode	Action
-	NO	0	+ 2 circuits in cooling mode
A	YES	Whatever the number	+ 2 circuits in heat reclaim mode
B	YES	0	+ 1 circuit in heat reclaim mode
		1	No change
		2	No change
C	YES	Whatever the number	No change
D	YES	1	No change
		2	- 1 circuit in heat reclaim mode
E	YES	Whatever the number	- 2 circuits in heat reclaim mode

For more details on the heat reclaim operation logic please refer to the 30XA control manual in chapter “Heat reclaim module option”.

9.9 - Condenser pump selection

Heat reclaim condenser water flow rate/pressure drop

Heat reclaim condenser pressure drop in water flow rate function



For units with a water condenser please refer to chapter 9.1.

9.10 - Frost protection

The heat reclaim condenser is equippped with electric heaters to protect the condenser against frost. These are activated if the condenser entering and leaving water temperatures are below 3°C and deactivated, if they are higher than 4.4°C.

10 - MAJOR SYSTEM COMPONENTS AND OPERATION DATA

10.1 - Direct-drive twin-screw compressor with variable capacity slide valve

- 30XA units use 06T geared twin-screw compressors equipped with a variable capacity slide valve for continuous control between 30% and 100% of full load.
- Nominal capacities range from 120 to 530 kW. The seven models used in the 30XA range are economised.

10.1.1 - Oil filter
The 06T screw compressor has an independent oil filter attached to the oil separator. This filter is field replaceable.

10.1.2 - Refrigerant
The 30XA a water chiller operating only with refrigerant R134a.

10.1.3 - Lubricant
The 06T screw compressor is approved for use with the following lubricant: CARRIER MATERIAL SPEC PP 47-32.

10.1.4 - Oil supply solenoid valve
An oil supply solenoid valve is installed on the oil return line as standard to isolate the compressor from oil flow when the compressor is not operating. The oil solenoid valve is field replaceable.

10.1.5 - Suction and economizer screens
To increase the reliability of the compressor, a screen has been incorporated as a standard feature into suction and economizer inlets of the compressor.

10.1.6 - Capacity control system
The 06T screw compressor has an unloading system that is standard on all compressors. This unloading system consists of slide valve that permits changing the length of the screw used for the refrigerant compression. This valve is controlled by the action of a piston controlled by two solenoid valves on the oil return line.

10.2 - Pressure vessels

General
Monitoring during operation, re-qualification, re-testing and re-testing dispensation:
- Follow the regulations on monitoring pressurised equipment.
- It is normally required that the user or operator sets up and maintains a monitoring and maintenance file.
- Follow the control programmes of EN 378-2, annexes A, B, C and D.
- If they exist follow local professional recommendations.
- Regularly inspect the condition of the coating (paint) to detect blistering resulting from corrosion. To do this, check a non-insulated section of the container or the rust formation at the insulation joints.
- Regularly check for possible presence of impurities (e.g. silicon grains) in the heat exchange fluids. These impurities maybe the cause of the wear or corrosion by puncture.
- Filter the heat exchange fluid check and carry out internal inspections as described in EN 378-2, annex C.
- In case of re-testing please refer to the maximum operating pressure given on the unit nameplate.
- The reports of periodical checks by the user or operator must be included in the supervision and maintenance file.

Repair
Any repair or modification, including the replacement of moving parts:
- must follow local regulations and be made by qualified operators and in accordance with qualified procedures, including changing the heat exchanger tubes.
- must be made in accordance with the instructions of the original manufacturer. Repair and modification that necessitate permanent assembly (soldering, welding, expanding etc.) must be made using the correct procedures and by qualified operators.
- An indication of any modification or repair must be shown in the monitoring and maintenance file.

Recycling
The unit is wholly or partly recyclable. After use it contains refrigerant vapours and oil residue. It is coated by paint.

Operating life
This unit is designed for:
- prolonged storage of 15 years under nitrogen charge with a temperature difference of 20 K per day.
- 452000 cycles (start-ups) with a maximum difference of 6 K between two neighbouring points in the vessel, based on 6 start-ups per hour over 15 years at a usage rate of 57%.

Corrosion allowances:
Gas side: 0 mm
Heat exchange fluid side: 1 mm for tubular plates in lightly alloyed steels, 0 mm for stainless steel plates or plates with copper-nickel or stainless steel protection.

10.2.1 - Evaporator
30XA chillers use a flooded multi-tube evaporator. The water circulates in the tubes and the refrigerant is on the outside in the shell. One vessel is used to serve both refrigerant circuits. There is a centre tube sheet which separates the two refrigerant circuits. The tubes are 3/4” diameter copper with an enhanced surface inside and out. There is just one water circuit, and depending on the size of the chiller, there may be one, two or three water passes.

The units have three refrigerant circuits with two evaporators connected in series on the heat transfer fluid.

The evaporator shell has a thermal insulation of 19 mm thick polyurethane foam, an aluminium sheet and a water drain and purge.

It has been tested and stamped in accordance with applicable pressure codes for a maximum operating pressure of 2100 kPa refrigerant-side and 1000 kPa water-side.

The water connection of the heat exchanger is a Victaulic connection. As an option the evaporator is available with frost protection (evaporator frost protection option).

The products that may be added for thermal insulation of the containers during the water piping connection procedure must be chemically neutral in relation to the materials and coatings to which they are applied. This is also the case for the products originally supplied by Carrier.

10.2.2 - Oil separator

In these units, the oil separator is a pressure vessel that is mounted under the outside vertical condenser coils. Discharge gas at the compressor outlet is directed towards the bottom of the oil separator ring and most of the oil separates from the gas by strong deceleration and by gravity. The gas then flows through a wire mesh screen where the remaining oil is separated by coalescence and flows to the bottom of the ring. The gas is now free from oil and leaves the ring at the top towards the condenser.

The oil separator is equipped with a trace heater regulated by the control. This heater is equipped with an internal thermostat that disconnects the power supply when the temperature reaches 85°C and automatically resets when the temperature again falls to a normal value.

The products that may be added for thermal insulation of the vessels during the water piping connection procedure must be chemically neutral in relation to the materials and coatings to which they are applied. This is also the case for the products originally supplied by Carrier.

10.2.3 - Economiser function

The economiser function includes a liquid line valve, a filter drier, two EXVs, a plate heat exchanger as well as protection devices (fuse or valve).

At the condenser outlet a part of the liquid is expanded via the secondary EXV in one of the heat exchanger circuits and then returns as gas at the compressor economiser. This expansion permits increase of the liquid sub-cooling of the rest of the flow that penetrates the evaporator via the principal EXV. This permits increasing the cooling capacity of the system as well as its efficiency.

10.3 - High-pressure safety switch

30XA units are equipped with high-pressure safety switches, calibrated to 2200 kPa.

These pressure switches are located at the discharge of each compressor.

10.4 - Condensers

The 30XA coils are micro-channel condensers made entirely of aluminium. Optional coils with internally groved copper tubes with aluminium fins are also available (options 254 and 255).

10.5 - Fans

The fans are axial Flying Bird fans equipped with rotating shroud and made of composite recyclable material. Each motor is fixed with transverse supports. The motors are three-phase, with permanently lubricated bearings and insulation class F.

10.6 - Electronic expansion valve (EXV)

The EXV is equipped with a stepper motor (2785 to 3690 steps, depending on the model) that is controlled via the EXV board.

The EXV is also equipped with a sightglass that permits verification of the mechanism movement and the presence of the liquid gasket.

10.7 - Moisture indicator

Located on the EXV, permits control of the unit charge and indicates moisture in the circuit. The presence of bubbles in the sight-glass indicates an insufficient charge or non-condensables in the system. The presence of moisture changes the colour of the indicator paper in the sight-glass.

10.8 - Filter drier

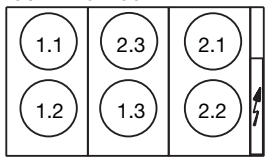
The role of the filter drier is to keep the circuit clean and moisture-free. The moisture indicator shows, when it is necessary to change the element. A difference in temperature between the filter inlet and outlet shows that the element is dirty.

10.9 - Sensors

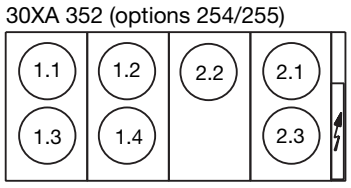
The units use thermistors to measure the temperature, and pressure transducers to control and regulate system operation (see 30XA - Pro-Dialog Control IOM for a more detailed explanation).

30XA fan arrangement

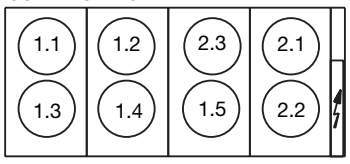
30XA 252-352



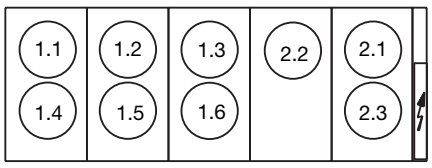
30XA 352 (options 254/255)



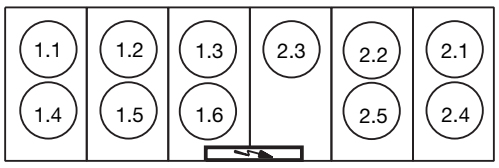
30XA 402-452



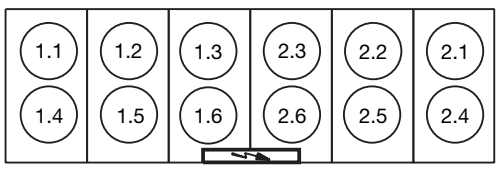
30XA 502



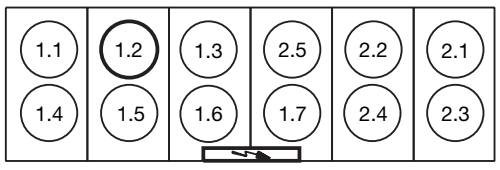
30XA 602



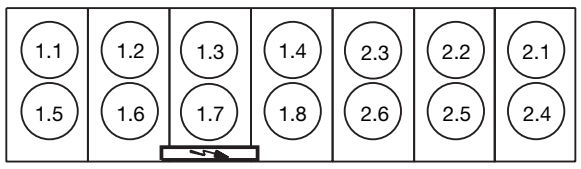
30XA 702



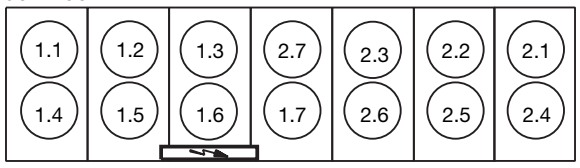
30XA 752 - 802



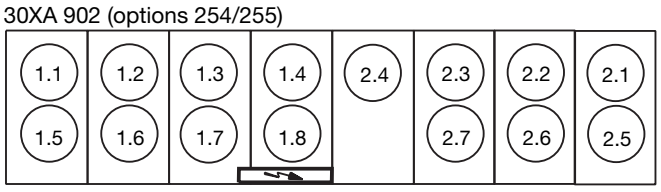
30XA 752-802 (options 254/255)



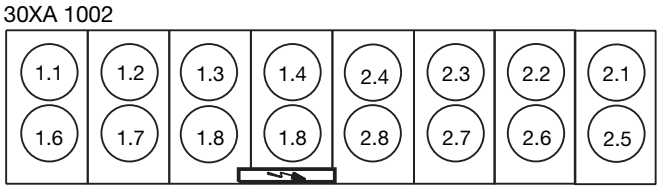
30XA 902



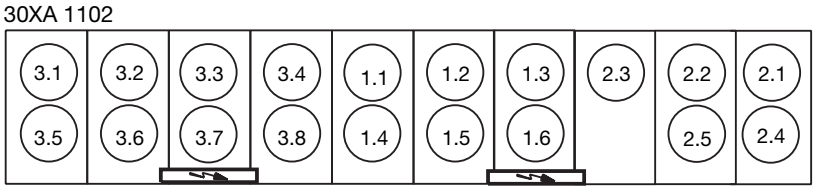
30XA 902 (options 254/255)



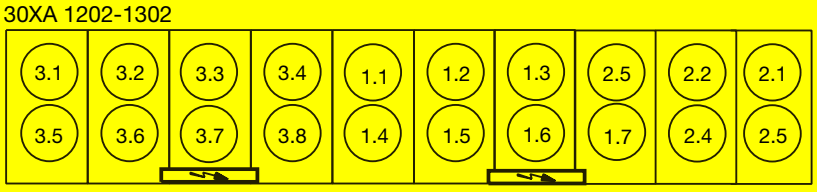
30XA 1002



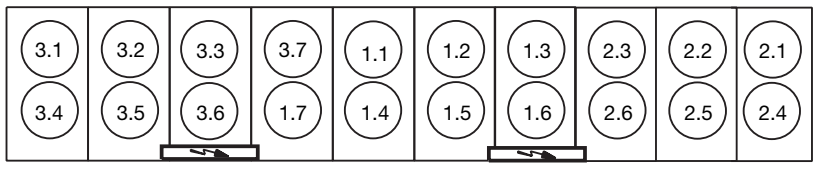
30XA 1102



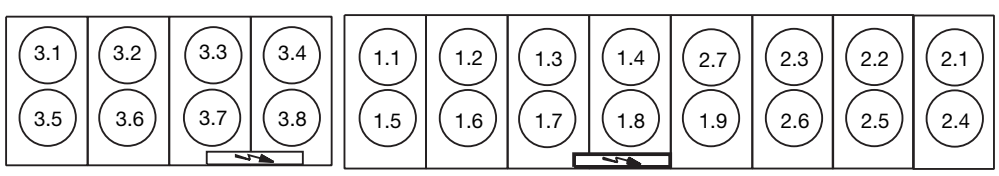
30XA 1202-1302



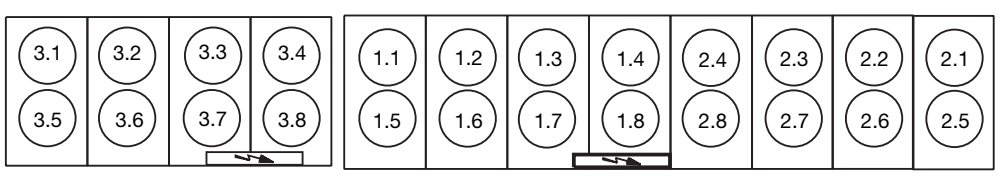
30XA 1352



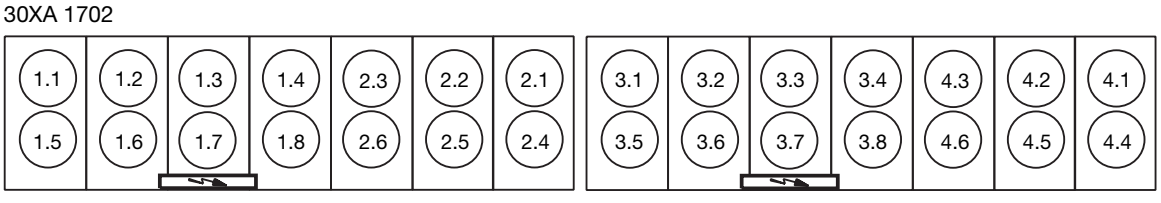
30XA 1402



30XA 1502



30XA 1702



x.y x.y = Circuit number
y = Start-up order

NOTE: The values above do not correspond to the fan designation. The fan designation and position are given on the unit drawings and wiring diagrams supplied with the unit.

11 - OPTIONS AND ACCESSORIES

Options	No.	Description	Advantages	Use
Corrosion protection, traditional coils	2B	Factory application of Blygold Polual treatment on the copper/aluminium coils	Improved corrosion resistance, recommended for industrial, rural and marine environments	30XA 252-1702
Corrosion protection, traditional coils	3A	Fins made of pre-treated aluminium (polyurethane and epoxy)	Improved corrosion resistance, recommended for moderate marine and urban environments	30XA 252-1702
Low temperature glycol solution	5	Low temperature chilled water production down to -6°C with ethylene glycol and -3°C with propylene glycol	Covers specific applications such as ice storage and industrial processes	30XA 252-1702
Very low temperature glycol solution	6	Low temperature chilled water production down to -12°C with ethylene glycol (limited to -10°C for certain sizes) and -8°C with propylene glycol (limited to -6°C for certain sizes)	Covers specific applications such as ice storage and industrial processes	30XA 252-1702
IP 54 control box	20A	Increased leak tightness of control boxes	Increased control box protection	30XA 252-1702
Tropical applications	22	Unit control box suitable for tropical applications	Reduced relative humidity in the control box for operation in tropical environments (hot and humid)	30XA 252-1702
Grilles	23	Metallic grilles on the unit front, rear and sides	Enhanced aesthetics, protection against intrusion to the unit interior	30XA 252-1702
Winter operation	28	Fan speed control via frequency converter	Stable unit operation when the air temperature is between -10°C and -20°C	30XA 252-1702
Evaporator frost protection	41A	Resistance heater on the evaporator	Evaporator frost protection down to -20°C outside temperature	30XA 252-1702
Evaporator and hydronic module frost protection	41B	Resistance heater on the evaporator and the hydronic module	Evaporator and hydronic module frost protection down to -20°C outside temperature	30XA 252-1502
Heat reclaim	50	Complete recovery of the heat rejected by the condenser	Free hot-water production as well as cold-water production	30XA 252-1002
Single power connection point	81	Power connection of the machine via one main supply connection	Quick and easy installation	30XA 252-1502
Suction valve	92	Shut-off valves on the compressor suction piping, the economiser line and the compressor discharge piping	Simplified maintenance	30XA 252-1702
Three-pass evaporator	100A	Evaporator with three passes water-side	Increased water inlet and outlet pressure losses on opposite sides	30XA 252-602
One-pass evaporator	100C	Evaporator with one pass water-side	Reduced water inlet and outlet pressure losses on opposite sides	30XA 252-1002
21 bar evaporator	104	Reinforced evaporator for extension of the maximum water-side service pressure range to 21 bar	Covers applications with a high water column (high buildings)	30XA 252-1702
Reversed water connections	107	Evaporator with reversed water inlet/outlet	Simplification of the water piping	30XA 252-1702
High-pressure single-pump hydronic module	116B	See hydronic module chapter	Easy and fast installation	30XA 252-502
High-pressure dual-pump hydronic module	116C	See hydronic module chapter	Easy and fast installation, operating safety	30XA 252-502
Low-pressure single-pump hydronic module	116F	See hydronic module chapter	Easy and fast installation	30XA 252-502
Low-pressure dual-pump hydronic module	116G	See hydronic module chapter	Easy and fast installation, operating safety	30XA 252-502
Direct-expansion free-cooling system	118A	Chilled water production without the use of the compressors, using direct-expansion heat exchange on the condensers	Very economical chilled water production at low outdoor temperatures	30XA 252-1002
High energy efficiency	119	Improved condenser performance	Energy cost reduction, full load operation at higher air temperatures	30XA 252-1702
JBus gateway	148B	Two-directional communications board, complies with JBus protocol	Easy connection by communication bus to a building management system	30XA 252-1702
BacNet gateway	148C	Two-directional communications board, complies with BacNet protocol	Easy connection by communication bus to a building management system	30XA 252-1702
LON gateway	148D	Two-directional communications board, complies with LON protocol	Easy connection by communication bus to a building management system	30XA 252-1702
Energy Management Module EMM	156	See chapter “Energy Management Module”	Easy connection by wired connection to a building management system	30XA 252-1702
Unit without enclosure	253	Compressors not equipped with acoustic enclosure	More economical	30XA 252-1702
Traditional coils (Cu/Al)	254	Coils made of copper tubes with aluminium fins	Possibility to add specialised condenser treatment	30XA 252-1702
Traditional coils (Cu/Al) without slots	255	Coils made of copper tubes with aluminium fins without slots	Recommended for the Middle East, sand storms. Possibility to add specialised condenser treatment.	30XA 252-1702
Suction piping insulation	256	Thermal insulation of the suction piping with flexible, anti-UV insulant	Prevents condensation on the suction piping	30XA 252-1702
Low sound level	257	Acoustical insulation of certain unit refrigerant circuit components (suction, evaporator and economiser piping)	Unit sound power level reduction of -3 dB(A)	30XA 252-1702
Accessories		**Description**	**Advantages**	**Use**
CCN JBus gateway		See option 148B	See option 148B	See option 148B
CCN BacNet gateway		See option 148C	See option 148C	See option 148C
CCN LON Talk gateway		See option 148D	See option 148D	See option 148D
Connection sleeve		Piping to be welded with Victaulic connection	Ease-of-installation	30XA 252-1702
Energy Management Module EMM		See controls manual	Easy connection by wired connection to a building management system	30XA 252-1702
Lead-lag kit		Supplementary water outlet temperature sensor kit, field-installed, allows master/slave operation of two chillers connected in parallel.	Optimised operation of two chillers connected in parallel with operating time balancing.	30XA 252-1502
Anti-vibration mountings		Elastomeric anti-vibration mountings for each unit weight distribution point	Absorption of vibrations, linked to the unit operation (essentially compressor)	30XA 252-1702

12 - STANDARD MAINTENANCE

Air conditioning equipment must be maintained by professional technicians, whilst routine checks can be carried out locally by specialised technicians.

Simple preventive maintenance will allow you to get the best performance from your HVAC unit:

- improved cooling performance
- reduced power consumption
- prevention of accidental component failure
- prevention of major time-consuming and costly interventions
- protection of the environment

There are five maintenance levels for HVAC units, as defined by the AFNOR X60-010 standard.

12.1 - Level 1 maintenance (see note)

Simple procedure can be carried out by the user:

- Visual inspection for oil traces (sign of a refrigerant leak)
- Air heat exchanger (condenser) cleaning - see chapter "Condenser coil - level 1"
- Check for removed protection devices, and badly closed doors/covers
- Check the unit alarm report when the unit does not work (see report in the 30XA Pro-Dialog Plus control manual).

General visual inspection for any signs of deterioration.

12.2 - Level 2 maintenance (see note)

This level requires specific know-how in the electrical, hydronic and mechanical fields. It is possible that these skills are avail-able locally: existence of a maintenance service, industrial site, specialised subcontractor.

In these cases, the following maintenance operations are recommended.

Carry out all level 1 operations, then:

- At least once a year tighten the power circuit electrical connections (see tightening torques table).
- Check and re-tighten all control/command connections, if required (see tightening torques table).
- Check the differential switches for correct operation every 6 months (free-cooling option 118A).
- Remove the dust and clean the interior of the control boxes, if required.
- Check the presence and the condition of the electrical protection devices.
- Check the correct operation of all heaters.
- Replace the fuses every 3 years or every 15000 hours (age-hardening).
- Replace the control box cooling fans used with option 22 (with designation EF22_) every five years.
- Check the height of the anti-vibration mountings (located between the compressor rails and the unit chassis) after 5 years of operation, and then each year. When the total minimum height of the mountings is less than 28 mm replace the mountings.
- Check the water connections
- Purge the water circuit (see chapter "Water flow control procedure")
- Clean the water filter (see chapter "Water flow control procedure")
- Fully clean the condensers with a low-pressure jet and a bio-degradable cleaner (counter-current cleaning - see chapter "Condenser coil - level 2)
- Replace the stuffing box packing of the pump after 10000 hours of operation
- Check the unit operating parameters and compare them with previous values
- Keep and maintain a maintenance sheet, attached to each HVAC unit

All these operations require strict observation of adequate safety measures: individual protection garments, compliance with all industry regulations, compliance with applicable local regulations and using common sense.

12.3 - Level 3 (or higher) maintenance (see note)

The maintenance at this level requires specific skills/approval/tools and know-how and only the manufacturer, his representative or authorised agent are permitted to carry out these operations. These maintenance operations concern for example:

- A major component replacement (compressor, evaporator)
- Any intervention on the refrigerant circuit (handling refrigerant)
- Changing of parameters set at the factory (application change)
- Removal or dismantling of the HVAC unit
- Any intervention due to a missed established maintenance operation
- Any intervention covered by the warranty

NOTE: Any deviation or non-observation of these maintenance criteria will render the guarantee conditions for the HVAC unit nul and void, and the manufacturer, France, will no longer be held responsible.

12.4 - Tightening torques for the main electrical connections

Component	Designation in the unit	Value (Nm)
Screw on bus bar, customer connection		
M8		18
M10	L1/L2/L3	30
Soldered screw PE, customer connection (M12)	PE	70
Tunnel terminal screw, compressor contactor		
Contactor 3RT103*		
Contactor 3RT104*		5
Contactor 3RT105*		11
Contactor 3RT106*	KM*	21
Tunnel terminal screw, current transformer		
Size 2 (3RB2956*)		11
Size 3 (3RB2966*)	TI*	21
Compressor earth terminal in the power wiring control box, terminal M8	Gnd	30
Compresor phase connection terminals M12	1/2/3/4/5/6 on EC	25
Compressor earth connection	Gnd on EC*	25
Tunnel terminal screw, disconnects 3RV1011*	QF*/QM*	1
Tunnel terminal screw, hydronic pump contactor		
Contactor 3RT101*	KM90*	1
Contactor 3RT102*		2.2
Screw on bus bar for power connection between the control boxes for option 81	L1/L2/L3	30

12.5 - Tightening torques for the main bolts and screws

Screw type	Used for	Value (Nm)
Metal screw D=4.8	Condensing module, housing supports	4.2
Screw H M8	Condensing module, compressor fixing	18
Taptite screw M10	Condensing module, chassis - structure fixing, control box fixings, compressor fixings, oil separator fixing	30
Taptite screw M6	Piping support, cowling	7
Screw H M8	Piping clip	12
Screw H M6	Piping clip	10
Nut H M10	Compressor chassis	30
Nut H M10	Hydronic pump chassis	30
Screw H M8	Filter drier cover	40
Screw H M12	Economiser port flange	40
Screw H M16	Oil separator flanges, suction flanges	110
Screw H M16	Heat exchanger water boxes	190
Screw H M20	Suction flanges	190
Nut 5/8 ORFS	Oil line	65
Nut 3/8 ORFS	Oil line	26

12.6 - Condenser coil

We recommend, that finned coils are inspected regularly to check the degree of fouling. This depends on the environment where the unit is installed, and will be worse in urban and industrial installations and near trees that shed their leaves.

For coil cleaning, two maintenance levels are used, based on the AFNOR X60-010 standard:

Level 1

- If the condensers are fouled, clean them gently in a vertical direction, using a brush.
- Only work on condensers with the fans switched off.
- For this type of operation switch off the HVAC unit if service considerations allow this.
- Clean condensers guarantee optimal operation of your HVAC unit. This cleaning is necessary when the condensers begin to become fouled. The frequency of cleaning depends on the season and location of the HVAC unit (ventilated, wooded, dusty area, etc.).
- With MCHX condensers it is preferable to clean them with a vacuum cleaner or a high-pressure cleaner (maximum 68 bar and with 300 mm distance between the diffuser and the coil).

Level 2

The two cleaning products can be used for any of the following coil finishes: Cu/Cu, Cu/Al, Cu/Al with Polual, Blygold and/or Heresite protection.

Clean the coil, using appropriate products.

We recommend TOTALINE products for coil cleaning:
Part No. P902 DT 05EE: traditional cleaning method
Part No. P902 CL 05EE: cleaning and degreasing.

These products have a neutral pH value, do not contain phosphates, are not harmful to the human body, and can be disposed of through the public drainage system.

Depending on the degree of fouling both products can be used diluted or undiluted.

For normal maintenance routines we recommend using 1 kg of the concentrated product, diluted to 10%, to treat a coil surface of 2 m^2. This process can either be carried out using a high-pressure spray gun in the low-pressure position. With pressurised cleaning methods care should be taken not to damage the coil fins. The spraying of the coil must be done:

- in the direction of the fins
- in the opposite direction of the air flow direction
- with a large diffuser (25-30°)
- at a minimum distance of 300 mm from the coil.

It is not necessary to rinse the coil, as the products used are pH neutral. To ensure that the coil is perfectly clean, we recommend rinsing with a low water flow rate. The pH value of the water used should be between 7 and 8.

WARNING: Never use pressurised water without a large diffuser. Do not use high-pressure cleaners for Cu/Cu and Cu/Al coils! High pressure cleaners are only permitted for MCHX coils (maximum permitted pressure 68 bar)

Concentrated and/or rotating water jets are strictly forbidden.

Never use a fluid with a temperature above 45°C to clean the air heat exchangers.

Correct and frequent cleaning (approximately every three months) will prevent 2/3 of the corrosion problems. Protect the control box during cleaning operations.

12.7 - Evaporator maintenance

Check that:

- the insulating foam is intact and securely in place.
- the cooler heaters are operating, secure and correctly positioned.
- the water-side connections are clean and show no sign of leakage.

12.8 - Compressor maintenance

12.8.1 - Oil separator

Check the correct operation of the heaters and check that they are well attached to the oil separator ring.

12.8.2 - Integral oil filter change

As system cleanliness is critical to reliable system operation, there is a filter in the oil line at the oil separator outlet. The oil filter is specified to provide a high level of filtration (5 µm) required for long bearing life.

The filter should be checked after the first 500 hours of operation, and every subsequent 2000 hours. The filter should be replaced at any time when the pressure differential across the filter exceeds 2 bar.

The pressure drop across the filter can be determined by measuring the pressure at the filter service port and the oil pressure port. The difference in these two pressures will be the pressure drop across the filter, check valve, and solenoid valve. The pressure drop across the check valve and solenoid valve is approximately 0.4 bar, which should be subtracted from the two oil pressure measurements to give the oil filter pressure drop.

12.8.3 - Compressor rotation control

Correct compressor rotation is one of the most critical application considerations. Reverse rotation, even for a very short duration, damages the compressor.

The reverse rotation protection scheme must be capable of determining the direction of rotation and stopping the compressor within 300 milliseconds. Reverse rotation is most likely to occur whenever the wiring to the compressor terminals is disturbed.

To minimize the opportunity for reverse rotation, the following procedure must be applied. Rewire the power cables to the compressor terminal pin as originally wired.

For replacement of the compressor, a low pressure switch is included with the compressor. This low pressure switch should be temporarily installed as a hard safety on the high pressure part of the compressor. The purpose of this switch is to protect the compressor against any wiring errors at the compressor terminal pin. The electrical contact of the switch would be wired in series with the high pressure switch. The switch will remain in place until the compressor has been started and direction of rotation has been verified; at this point, the switch will be removed.

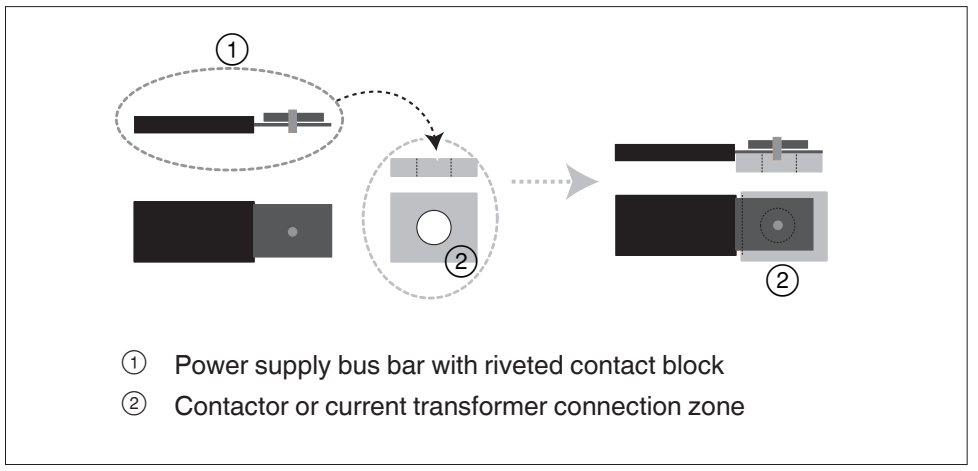
The switch that has been selected for detecting reverse rotation is Carrier part number HK01CB001. This switch opens the contacts when the pressure falls below 7 kPa. The switch is a manual reset type that can be reset after the pressure has once again risen above 70 kPa. It is critical that the switch be a manual reset type to preclude the compressor from short cycling in the reverse direction.

12.9 - Precaution for compresssor power supply bus bar connection

This note applies to units using power supply bus bars with riveted contact block at the level of the connection cages in the control box. During re-connection it is imperative to:

- engage each bus bar in the cage up to the stop
- ensure visually that the bus bars have good contact at the connection areas: there must not be any free movement between the bus bar and the connection area created by the fixing rivet of the contact block.

Connection of the contactor or current transformer



① Power supply bus bar with riveted contact block
② Contactor or current transformer connection zone

13 - START-UP CHECKLIST FOR 30XA LIQUID CHILLERS (USE FOR JOB FILE)

Preliminary information

Job name: .....
Location: .....
Installing contractor: .....
Distributor: .....

Unit
Model: .....

Compresseurs

Circuit A
Model number .....
Serial number .....
Motor number .....

Circuit B
Model number .....
Serial number .....
Motor number .....

Circuit C
Model number .....
Serial number .....
Motor number .....

Circuit D
Model number .....
Serial number .....
Motor number .....

Evaporator
Model number .....
Serial number .....

Condenser
Model number .....

Additional optional units and accessories .....
.....

Preliminary equipment check

Is there any shipping damage? ..... If so, where? .....
.....
Will this damage prevent unit start-up? .....

☐ Unit is level in its installation
☐ Power supply agrees with the unit nameplate
☐ Electrical circuit wiring has been sized and installed properly
☐ Unit ground wire has been connected
☐ Electrical circuit protection has been sized and installed properly
☐ All terminals are tight
☐ All chilled water valves are open
☐ All chilled water piping is connected properly
☐ All air has been vented from the chilled water circuit
☐ Chilled water pump (CWP) is operating with the correct rotation. Check the phase sequence of the electrical connection. If the unit is equipped with a hydronic module, use the pump test function (refer to the 30XA Pro-Dialog control manual). After the pump test has been completed, switch the unit off again
☐ Circuit chilled water in the water circuit for at last two hours, then remove, clean and replace the screen filter. After the pump test has been completed, switch the unit off again.
☐ Inlet piping to cooler includes a 20 mesh strainer with a mesh size of 1.2 mm.
☐ The compressor flange has been removed.

Unit start-up

☐ a. Oil heaters have been energized for at least 24 hours (30XA)
☐ b. Oil level is correct
☐ c. All discharge and liquid valves are open
☐ d. All suction valves are open, if equipped
☐ e. All oil line valves and economizer discharge bubbler valves (if equipped) are open
☐ f. The contactor
☐ g. Checks have been carried out for any possible leaks. Unit has been leak checked (including fittings)
  ☐ g1 - on the whole unit
  ☐ g2 - at all connections
  Locate, repair, and report any refrigerant leaks.....
  .....
  .....
☐ h. Check voltage imbalance: AB..... AC..... BC.....
  Average voltage = ... V
  Maximum deviation = ... V
  Voltage imbalance = ... %
☐ i. Voltage imbalance is less than 2%

WARNING: Operation of the chiller with an improper supply voltage or excessive phase imbalance constitutes abuse which will invalidate the Carrier warranty. If the phase imbalance exceeds 2% for voltage, or 10% for current, contact your local electricity supply at once and ensure that the chiller is not switched on until corrective measures have been taken.

Check cooler water loop
☐ Water loop volume = ... litres
☐ Calculated volume = ... litres
☐ 3.25 litres/nominal kW capacity for air conditioning
☐ 6.5 litres/nominal kW capacity for process cooling
☐ Proper loop volume established
☐ Proper loop corrosion inhibitor included.....litres of.....
☐ Proper loop freeze protection included (if required) .....litres of.....
☐ Piping includes electric heater tape, if exposed to the outside
☐ Inlet piping to cooler includes a 20 mesh strainer with a mesh size of 1.2 mm

Check pressure drop across the cooler
☐ Entering cooler = ... kPa
☐ Leaving cooler = ... kPa
☐ Leaving - entering = ... kPa

WARNING: Plot cooler pressure drop on performance data chart (in product data literature) to determine total litres per second (l/s) and find unit's minimum flow rate.

☐ Total = ... l/s
☐ Nominal kW = ... l/s
☐ Total l/s is greater than unit's minimum flow rate
☐ Total l/s meets job specified requirement of..... l/s

WARNING: Once power is supplied to the unit, check for any alarms (refer to the 30XA controls IOM for the alarm menu).

Note all alarms:.....
.....
Notes:.....
.....



Environmental Management System Approval

Order No: 13452-76, 03.2008 - Supersedes order No: 13452-76, 07.2007
Manufacturer reserves the right to change any product specifications without notice.

Manufacturer: Carrier SCS, Montluel, France.
Printed in the Netherlands.

Appendix 4.4.1c Catalogue for DH

TRANE®

SINTESIS™

PR1ME

Air-Cooled Screw Chillers
The best bundled in one. Our best.



RTAF 300-2090 kW
R134a - R513A

TRANE TECHNOLOGIES

The total package

Quality, performance and reliability

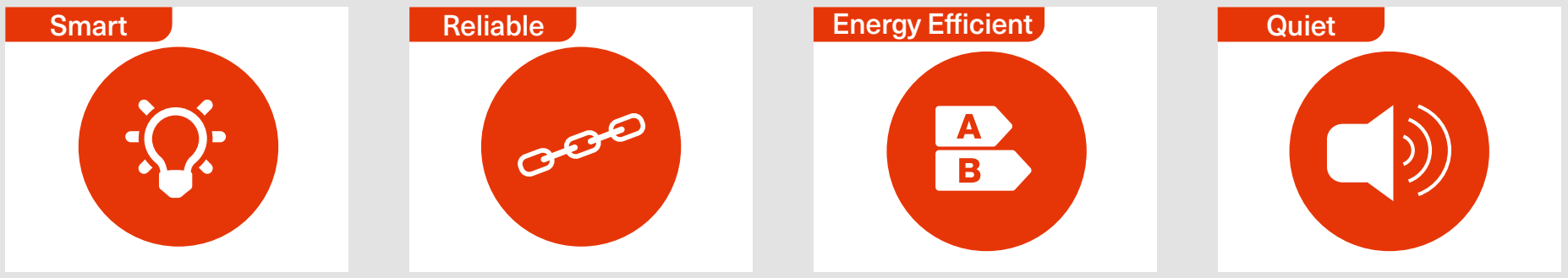
The Trane advantage

Trane is recognized as a world leader with over 100 years of experience in creating and sustaining safe, comfortable and energy efficient environments while improving the performance of buildings and processes around the world.

Trane solutions optimize indoor environments with a broad portfolio of energy efficient heating, ventilating and air conditioning systems, building services, parts support and advanced controls.

To ensure your equipment continues to work at its optimum, throughout the life of the building, Trane provides a full range of service solutions, combined with in-house expertise and an extensive support network.

The Trane offering is...





Smart Com interface

The Smart Com interface provides complete connectivity with LonTalk®, BACnet®, Modbus and Trane BMS for remote monitoring.
Total control over your system to optimize performance and reliability.

- 7” touch screen
- Intuitive menus
- Easy to use
- Full monitoring of data, settings and alarms
- Full connectivity for remote monitoring
- Trane will design the ideal control solution for your building

Smart flow control

- Trane Adaptive Frequency™ Drive on water pumps
- Variable primary flow to best adapt to jobsite conditions and energy savings

The best in quality, the best in reliability

At Trane we manufacture what we supply, so we enjoy full control from concept to delivery.

Our test procedures are the most rigorous in the industry, so your system will be totally dependable under the most demanding conditions.

Specialist industrial designers ensure every unit is as good looking as the building it is going into.

Because of the confidence we have in our products, we can offer the Trane Select 10 year warranty.

Total compliance

Trane ensures that all our products meet or exceed all requirements for efficiency, noise, refrigerants and safety. This means you can have total peace of mind.

Trane Proprietary Technology*

Provides the innovative solution your building needs

* Compact - High performance - Integrated design - Low charge (CHIL) flooded evaporator

- Reduced refrigerant volume
- Increased efficiency
- Reduced carbon footprint



Electronically Commutated (EC) fans

- Improved capacity modulation
- Reduced power consumption
- Reduced energy costs

*Redesigned fan diffusers

- Remodelled to optimize airflow
- Fans consume less power
- Operating noise reduced



* Trane smart control and interface combined



- Leading TD7 touch screen with 7” color display
- Clear display of critical information
- Monitor settings, data trending, reports and alarms
- Simple, intuitive navigation
- Effective operation, monitoring and management
- Durable construction for both indoor and outdoor use

SINTESIS™ PR1ME

* Micro-channel condenser coils

- Leading edge coil design for increased corrosion resistance
- Longer life expectancy
- Increased efficiency with less refrigerant
- Reduced carbon footprint
- 10% overall unit weight reduction

* Tracer™ UC800 controller

- New generation of Trane control platform for chillers
- Advanced algorithms for the most challenging conditions
- Perfect balance of performance and economy

* Connectivity

- Full interoperability via SmartCom interface Lontalk®, BACnet® and Modbus
- Full remote control capability via our Trane BMS





Adaptive Frequency™ Drive on HSE and HSS versions

- Improved efficiency under part load conditions
- Improved capacity modulation
- Current surge reduced by a factor of 5

* Trane Compressor

- Direct drive, two screws helical rotary design
- Infinite capacity modulation via the slide valve
- Trane legendary reliability

Three different refrigerant alternatives

- R134a
- R513A
- R1234ze

Sintesis Prime RTAF

Range description

Outstanding energy efficiency

Exceptional efficiency means less energy consumed and lower electricity bills.

Choose from five efficiency versions:

Standard Efficiency: SE

- SEER up to 5.00
- EER up to 3.24

High Efficiency: HE

- SEER up to 4.97
- EER up to 3.3

Extra Efficiency: XE

- SEER up to 5.13
- EER up to 3.37

High Seasonal Short: HSS

- **A**daptive **F**requency™ **D**rive, inverter technology
- SEER up to 4.9
- EER up to 3.17

High Seasonal Efficiency: HSE

- **A**daptive **F**requency™ **D**rive, inverter technology
- SEER up to 5.06
- EER up to 3.3



Quietest system on the market

- Choose from five levels of sound attenuation depending on the sensitivity of the application.
- Achieved without any loss of operating efficiency and even improving performances with the Extra Low Noise-EC version

Standard Noise: SN - average sound power Lw 99 dB(A)

Low Noise: LN - average sound power Lw 96 dB(A)

- Compressor enclosure
- Additional insulation on the refrigerant circuit

Low Noise Night Noise Set Back: LN-NNSB - average sound power Lw 96 dB(A)

- Compressor enclosure
- Additional insulation on the refrigerant circuit
- Night noise set back option

Extra Low Noise-AC: XLN-AC - average sound power Lw 93 dB(A)

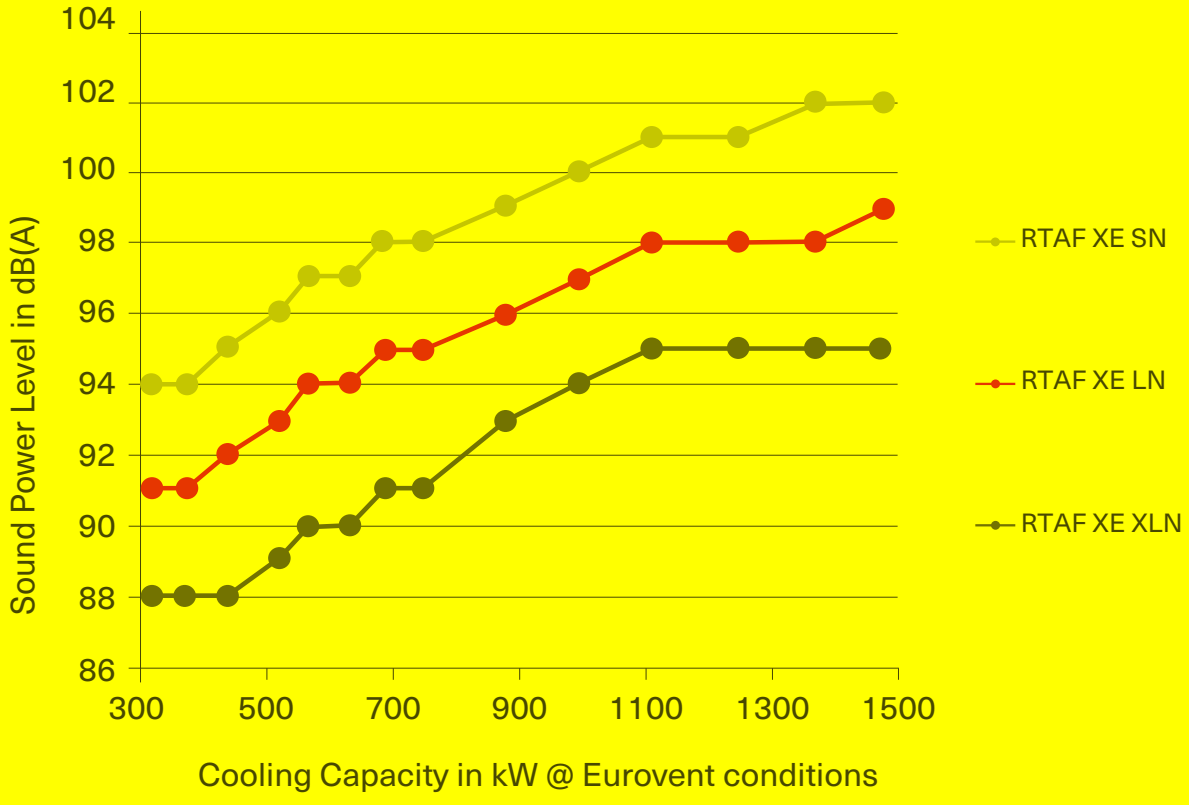
- Compressor enclosure
- Refrigerant line insulation

Extra Low Noise-EC: XLN-EC - average sound power Lw 93 dB(A)*

- Compressor enclosure
- Refrigerant line insulation
- EC fans with top diffusers

* The lowest noise rating on the market.

Sound levels



XLN-EC

The quietest in the industry!

The lowest sound levels...

Extra **L**ow **N**oise EC (**XLN-EC**): Lw from 88 to 105dB(A) across the range thanks to:

- Compressor enclosure
- Refrigerant line insulation
- EC fans with top diffusers



...at the efficiency that you need

The **XLN-EC** (Extra Low Noise EC)* version improves unit efficiency even further and is available in four efficiency levels for an optimized **T**otal **C**ost of **O**wnership (**TCO**)

- **S**tandard **E**fficiency (**SE**): Class B/A on the majority of sizes
- **E**xtra **E**fficiency (**XE**): Class A with SEER up to 5.13
- **H**igh **S**easonal **S**hort (**HSS**) with Trane Adaptive Frequency™ Drive and a reduced footprint
- **H**igh **S**easonal **E**fficiency (**HSE**): Large majority in Class A, using Trane Adaptive Frequency™ Drive Drive technology on the compressors allowing SEER up to 5.06



Heat Recovery

Heat recovery is reusing the energy which is produced as a natural by-product of the cooling cycle. Trane Sintesis chillers with Partial or Total Heat Recovery option combine the energy savings from heat recovery operation with the cost savings from installation and maintenance. Units with the Heat Recovery option operate as a standard chiller as long as heat is not required or can simultaneously produce chilled and hot water for use in applications like:

- Heating or preheating of boiler systems or domestic cater
- Air conditioning
- Ventilation air pre-heating
- Industrial processes.

Trane Sintesis model RTAF offers a heating capacity

- up to 25% of the cooling capacity with Partial Heat Recovery (PHR) option.
- up to 130% of the cooling capacity with Total Heat Recovery (THR) option.

Free-Cooling

Take the advantage of low ambient conditions to help cool water in your HVAC system.

- A small footprint compared to a system where a dry cooler and a chiller are used
- One single equipment control
- A wide range of capacities

Choose from four free-cooling alternatives.

- Total Direct Free-cooling
- Partial Direct Free-cooling
- Total Glycol-Free Free-cooling
- Partial Glycol-Free Free-cooling





HSE/HSS

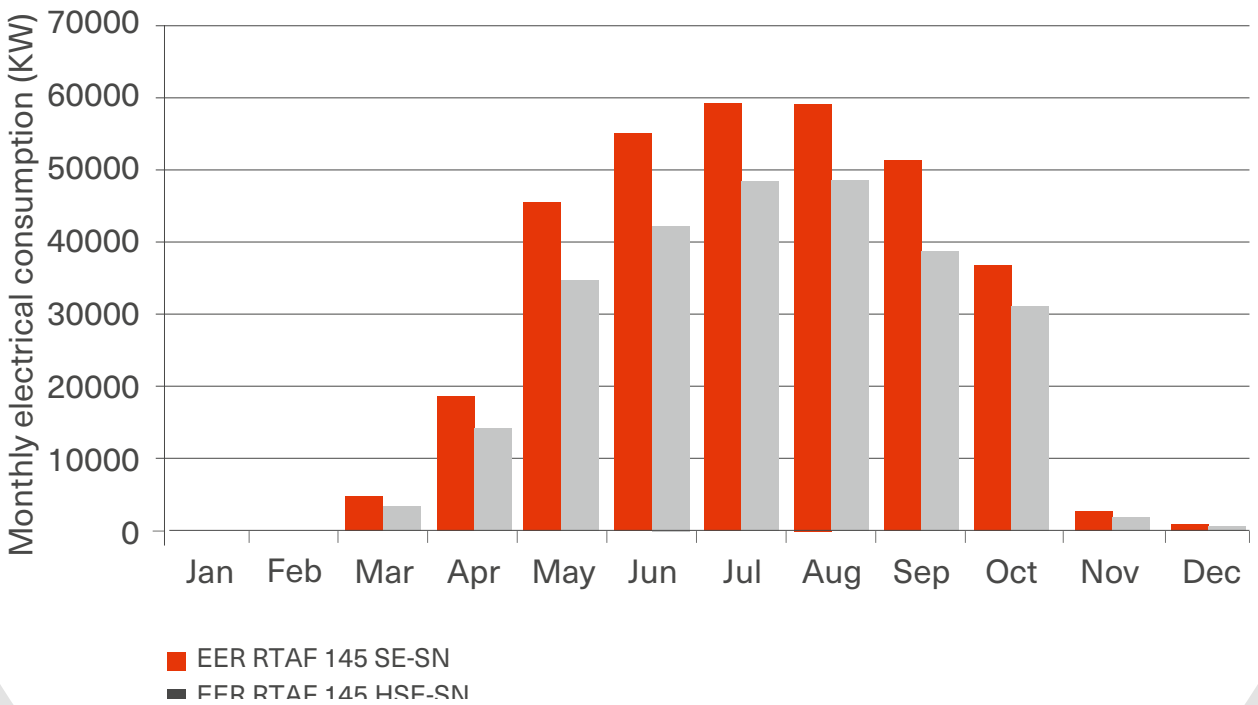
With Trane Adaptive Frequency™ Drive

The highest efficiencies - and up to 2090 kW

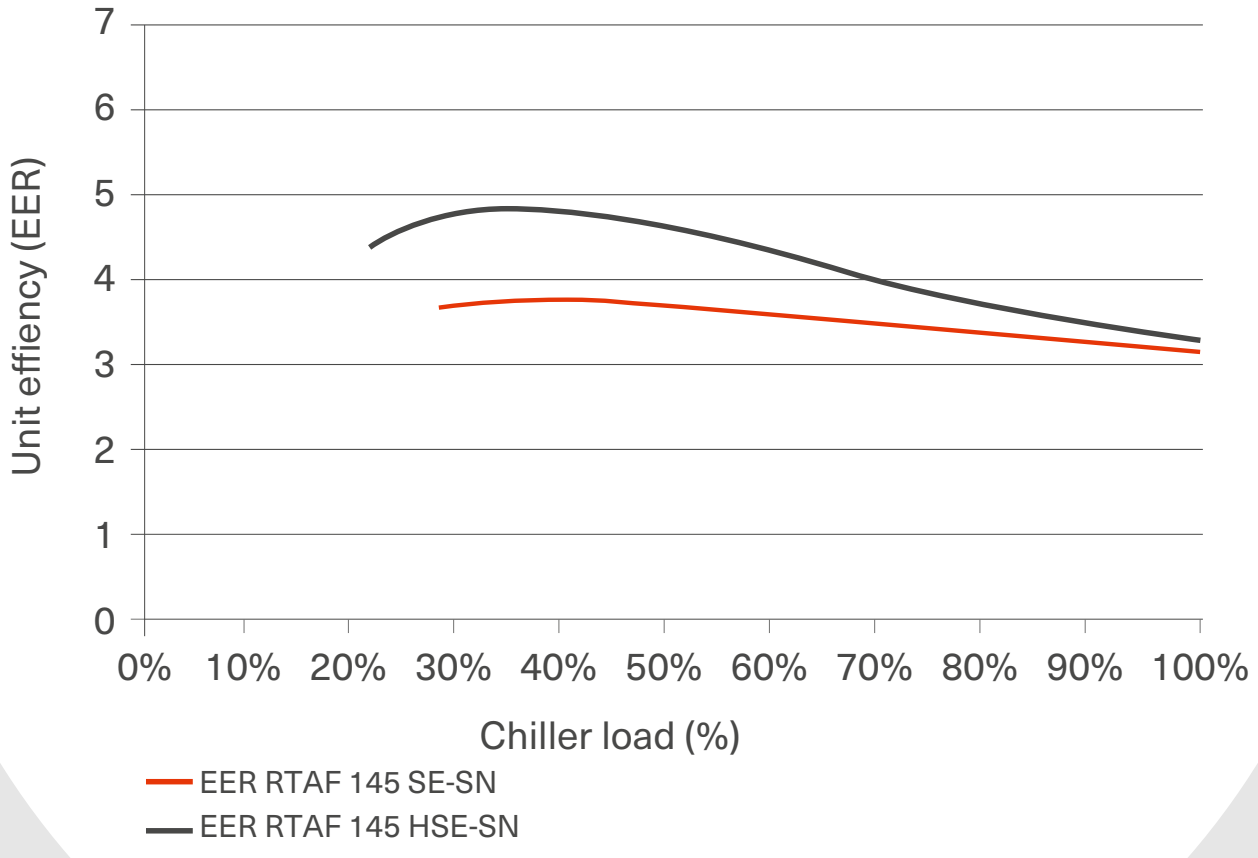
High **S**easonal **E**fficiency (**HSE**)*: with Trane **A**daptive **F**requency™ **D**rive technology on the compressors and fans:

- **EER up to 3.3**
- **SEER up to 5.06**
- Reduced inrush current
- Improved **capacity modulation**
- The High Seasonal Efficiency Short (HSS) version equipped with one condensing coil less, shortening its length.

Monthly chiller consumption



Unit efficiency improvement



General specifications

HSE

RTAF HSE - High Seasonal Efficiency - Extra Low Noise - EC

Eurovent performances (1)		090	105	125	145	155	175	190	205	245	250	280
Net cooling capacity (1) (2)	(kW)	332	386	453	535	580	642	702	760	877	890	1010
Net EER (1) (2)		3.30	3.22	3.15	3.23	3.19	3.17	3.25	3.20	2.87	3.17	3.21
Eurovent Energy class - Cooling		A	A	A	A	A	A	A	A	C	A	A
Net ESEER (2)		4.56	4.46	4.48	4.50	4.57	4.60	4.63	4.61	4.36	4.64	4.71
SEER (3)		4.63	4.60	4.63	4.86	4.89	4.84	5.05	5.04	4.83	4.67	4.60
Space cooling efficiency ηs.c (3)	(%)	182	181	182	191	193	191	199	199	190	184	181
Sound power level	(dB(A))	88	88	88	89	91	91	92	92	101	94	95
Compressor												
Circuit 1		1	1	1	1	1	1	1	1	1	2	2
Circuit 2		1	1	1	1	1	1	1	1	1	1	1
Refrigerant												
Type		R134a										
Charge Circuit 1	(kg)	43	42	45	48	50	60	62	66	66	108	104
Charge Circuit 2	(kg)	41	40	41	46	44	46	56	62	62	43	53
Dimensions & Weight												
Length	(mm)	5645	5645	5645	6770	6770	6770	7895	7895	7895	9390	10135
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight	(kg)	3810	3845	4025	4455	4605	4930	5310	5510	5620	7067	7548

Eurovent performances (1)		310	350	370	380	400	410	450	510	550	600
Net cooling capacity (1) (2)	(kW)	1128	1259	1416	1371	1513	1480	1612	1836	1927	2093
Net EER (1) (2)		3.20	3.21	3.20	3.22	2.95	3.15	2.92	3.08	2.95	2.60
Eurovent Energy class - Cooling		A	A	A	A	B	A	C	B	B	D
Net ESEER (2)		4.75	4.73	4.46	4.72	4.40	4.75	4.52	4.51	4.46	4.55
SEER (3)		4.71	5.03	4.87	4.82	4.73	5.01	4.77	5.05	5.06	4.70
Space cooling efficiency ηs.c (3)	(%)	185	198	192	190	186	197	188	199	200	184
Sound power level	(dB(A))	96	96	104	96	105	96	102	104	105	107
Compressor											
Circuit 1		2	2	2	2	2	2	2	2	2	2
Circuit 2		1	2	1	2	1	2	2	2	2	2
Refrigerant											
Type		R134a									
Charge Circuit 1	(kg)	112	102	112	103	112	107	107	140	140	140
Charge Circuit 2	(kg)	54	96	54	108	54	110	110	140	140	140
Dimensions & Weight											
Length	(mm)	11260	12385	11260	13510	11260	13510	13510	13510	13510	13510
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight	(kg)	7998	9369	8278	9574	8318	9519	9955	9799	9799	10244

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016

RTAF HSE - High Seasonal Efficiency - Standard and Low Noise

EUROVENT CERTIFIED PERFORMANCE 96.01.109 Range RTAF www.eurovent-certification.com

R134a

Eurovent performances (1)		090	105	125	145	155	175	190	205	245	250	280
Net cooling capacity (1) (2)	(kW)	333	386	454	535	581	643	702	754	877	891	1010
Net EER (1) (2)		3.27	3.19	3.12	3.20	3.17	3.13	3.21	3.17	2.85	3.14	3.18
Eurovent Energy class - Cooling		A	A	A	A	A	A	A	A	C	A	A
Net ESEER (2)		4.50	4.39	4.41	4.43	4.51	4.53	4.56	4.56	4.30	4.59	4.65
SEER (3)		4.58	4.55	4.58	4.80	4.83	4.77	4.99	4.98	4.77	4.62	4.56
Space cooling efficiency ηs.c (3)	(%)	180	179	180	189	190	188	197	196	188	182	179
Sound power level (standard noise)	(dB(A))	94	94	95	96	98	98	99	99	107	100	101
Sound power level (low noise)	(dB(A))	91	91	92	93	95	95	96	96	103	97	98
Compressor												
Circuit 1		1	1	1	1	1	1	1	1	1	2	2
Circuit 2		1	1	1	1	1	1	1	1	1	1	1
Refrigerant												
Type						R134a						
Charge Circuit 1	(kg)	43	42	45	48	50	60	62	66	66	108	104
Charge Circuit 2	(kg)	41	40	41	46	44	46	56	62	62	43	53
Dimensions & Weight												
Length	(mm)	5645	5645	5645	6770	6770	6770	7895	7895	7895	9390	10135
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight	(kg)	3710	3745	3925	4335	4485	4810	5170	5370	5480	6907	7368

Eurovent performances (1)		310	350	370	380	400	410	450	510	550	600
Net cooling capacity (1) (2)	(kW)	1129	1259	1409	1371	1504	1491	1613	1826	1914	2075
Net EER (1) (2)		3.16	3.18	3.15	3.19	2.90	3.12	2.87	3.04	2.90	2.55
Eurovent Energy class - Cooling		A	A	A	A	B	A	C	B	B	D
Net ESEER (2)		4.69	4.68	4.42	4.67	4.36	4.68	4.46	4.47	4.42	4.51
SEER (3)		4.66	4.97	4.83	4.76	4.69	4.93	4.71	5.01	5.02	4.64
Space cooling efficiency ηs.c (3)	(%)	183	196	190	187	185	194	185	198	198	183
Sound power level (standard noise)	(dB(A))	102	102	106	102	107	103	108	106	107	109
Sound power level (low noise)	(dB(A))	99	99	105	99	106	100	104	105	106	109
Compressor											
Circuit 1		2	2	2	2	2	2	2	2	2	2
Circuit 2		1	2	1	2	1	2	2	2	2	2
Refrigerant											
Type						R134a					
Charge Circuit 1	(kg)	112	102	112	103	112	107	107	140	140	140
Charge Circuit 2	(kg)	54	96	54	108	54	110	110	140	140	140
Dimensions & Weight											
Length	(mm)	11260	12385	11260	13510	11260	13510	13510	13510	13510	13510
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight	(kg)	7798	9149	8078	9334	8078	9279	9715	9559	9559	10004

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016

General specifications

HSS

RTAF HSS - High Seasonal Short - Extra Low Noise - EC

Eurovent performances (1)		090	105	125	140	145	150	155	170	175	185
Net cooling capacity (1) (2)	(kW)	333	381	447	513	531	549	572	586	622	662
Net EER (1) (2)		3.17	3.09	2.99	2.91	3.12	2.76	3.01	2.62	2.93	2.82
Eurovent Energy class - Cooling		A	B	B	B	A	C	B	D	B	C
Net ESEER (2)		4.43	4.33	4.34	4.23	4.36	4.29	4.45	4.26	4.46	4.37
SEER (3)		4.52	4.48	4.49	4.56	4.74	4.55	4.75	4.50	4.68	4.71
Space cooling efficiency ηs.c (3)	(%)	178	176	177	179	187	179	187	177	184	185
Sound power level	(dB(A))	88	89	89	89	89	90	90	90	90	91
Compressor											
Circuit 1		1	1	1	1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1	1	1	1
Refrigerant											
Type		R134a									
Charge Circuit 1	(kg)	41	40	42	42	45	44	47	54	57	56
Charge Circuit 2	(kg)	39	38	38	40	43	38	41	40	43	50
Dimensions & Weight											
Length	(mm)	4520	4520	4520	4520	5645	4520	5645	4520	5645	5645
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2672	2672	2672	2672	2672	2672	2672	2672	2672	2672
Operating weight	(kg)	3515	3545	3725	3885	4205	4155	4470	4590	4735	4960

Eurovent performances (1)		190	200	205	245	250	280	310	350	380	410
Net cooling capacity (1) (2)	(kW)	682	716	737	847	872	979	1078	1209	1327	1448
Net EER (1) (2)		3.01	2.76	2.95	2.68	2.95	2.95	2.84	2.84	2.9	2.91
Eurovent Energy class - Cooling		B	C	B	D	B	B	C	C	B	B
Net ESEER (2)		4.53	4.32	4.48	4.33	4.44	4.54	4.29	4.55	4.59	4.62
SEER (3)		4.90	4.61	4.80	4.71	4.66	4.70	4.68	4.55	4.56	4.62
Space cooling efficiency ηs.c (3)	(%)	193	181	189	185	183	185	184	179	179	182
Sound power level	(dB(A))	91	91	91	97	93	94	94	94	95	95
Compressor											
Circuit 1		1	1	1	1	2	2	2	2	2	2
Circuit 2		1	1	1	1	1	1	1	2	2	2
Refrigerant											
Type		R134a									
Charge Circuit 1	(kg)	59	60	63	63	93	96	97	94	98	107
Charge Circuit 2	(kg)	53	56	59	59	45	49	52	91	100	104
Dimensions & Weight											
Length	(mm)	6770	5645	6770	6770	8265	9390	9390	10135	11260	12385
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2672	2672	2672	2672	2672	2672	2672	2672	2672	2672
Operating weight	(kg)	5220	4990	5255	5365	6747	7248	7378	8724	8994	9229

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016

RTAF HSS - High Seasonal Short - Standard and Low Noise

EUROVENT CERTIFIED PERFORMANCE 96.01.109 Range RTAF www.eurovent-certification.com

R134a

Eurovent performances (1)		090	105	125	140	145	150	155	170	175	185
Net cooling capacity (1) (2)	(kW)	333	381	447	513	531	549	572	586	622	662
Net EER (1) (2)		3.12	3.05	2.96	2.89	3.09	2.74	2.98	2.60	2.90	2.79
Eurovent Energy class - Cooling		A	B	B	C	B	C	B	D	B	C
Net ESEER (2)		4.37	4.27	4.28	4.16	4.30	4.21	4.38	4.19	4.40	4.30
SEER (3)		4.47	4.43	4.44	4.50	4.68	4.48	4.69	4.42	4.61	4.64
Space cooling efficiency ηs.c (3)	(%)	176	174	175	177	184	176	185	174	181	183
Sound power level (standard noise)	(dB(A))	95	95	95	96	96	96	96	97	97	97
Sound power level (low noise)	(dB(A))	92	92	92	93	93	93	93	94	94	94
Compressor											
Circuit 1		1	1	1	1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1	1	1	1
Refrigerant											
Type		R134a									
Charge Circuit 1	(kg)	41	40	42	42	45	44	47	54	57	56
Charge Circuit 2	(kg)	39	38	38	40	43	38	41	40	43	50
Dimensions & Weight											
Length	(mm)	4520	4520	4520	4520	5645	4520	5645	4520	5645	5645
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight (standard noise)	(kg)	3415	3445	3625	3785	4085	4055	4350	4490	4615	4840

Eurovent performances (1)		190	200	205	245	250	280	310	350	380	410
Net cooling capacity (1) (2)	(kW)	683	712	737	848	872	980	1078	1210	1327	1449
Net EER (1) (2)		2.98	2.72	2.92	2.69	2.92	2.93	2.83	2.82	2.88	2.89
Eurovent Energy class - Cooling		B	C	B	D	B	B	C	C	C	C
Net ESEER (2)		4.47	4.26	4.42	4.27	4.33	4.49	4.26	4.50	4.54	4.57
SEER (3)		4.84	4.54	4.74	4.65	4.61	4.64	4.63	4.50	4.50	4.57
Space cooling efficiency ηs.c (3)	(%)	191	179	187	183	181	183	182	177	177	180
Sound power level (standard noise)	(dB(A))	97	97	97	104	99	100	101	101	101	102
Sound power level (low noise)	(dB(A))	94	94	94	101	96	97	98	98	98	99
Compressor											
Circuit 1		1	1	1	1	2	2	2	2	2	2
Circuit 2		1	1	1	1	1	1	1	2	2	2
Refrigerant											
Type		R134a									
Charge Circuit 1	(kg)	59	60	63	63	93	96	97	94	98	107
Charge Circuit 2	(kg)	53	56	59	59	45	49	52	91	100	104
Dimensions & Weight											
Length	(mm)	6770	5645	6770	6770	8265	9390	9390	10135	11260	12385
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight (standard noise)	(kg)	5080	4870	5115	5225	6587	7068	7178	8504	8754	8989

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016

General specifications

XE

RTAF XE - Extra Efficiency- Extra Low Noise -EC

Eurovent performances (1)		090	105	125	145	155	175	190	205	245
Net cooling capacity (1) (2)	(kW)	328	383	450	531	573	638	695	758	830
Net EER (1) (2)		3.37	3.31	3.25	3.34	3.23	3.21	3.24	3.22	3.37
Eurovent Energy class - Cooling		A	A	A	A	A	A	A	A	A
Net ESEER (2)		4.23	4.16	4.21	4.25	4.18	4.15	4.11	4.09	4.19
SEER (3)		4.38	4.33	4.36	4.47	4.42	4.34	4.33	4.29	4.65
Space cooling efficiency ηs.c (3)	(%)	172	170	171	176	174	171	170	169	183
Sound power level	(dB(A))	88	88	88	89	90	90	91	91	97
Compressor										
Circuit 1		1	1	1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1	1	1
Refrigerant										
Type					R134a					
Charge Circuit 1	(kg)	43	42	45	48	50	60	62	66	66
Charge Circuit 2	(kg)	41	40	41	46	44	46	56	62	62
Dimensions & Weight										
Length	(mm)	5645	5645	5645	6770	6770	6770	7895	6770	7895
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2672	2672	2672	2672	2672	2672	2672	2672	2672
Operating weight	(kg)	3710	3740	3920	4350	4615	4775	5225	5365	5445

Eurovent performances (1)		250	280	310	350	355	380	410	450
Net cooling capacity (1) (2)	(kW)	887	1002	1120	1253	1200	1375	1481	1624
Net EER (1) (2)		3.27	3.32	3.26	3.31	3.30	3.30	3.21	3.21
Eurovent Energy class - Cooling		A	A	A	A	A	A	A	A
Net ESEER (2)		4.62	4.71	4.62	4.65	4.52	4.66	4.59	4.33
SEER (3)		4.67	4.92	4.74	5.12	5.06	5.12	5.07	5.13
Space cooling efficiency ηs.c (3)	(%)	184	194	187	202	200	202	200	202
Sound power level	(dB(A))	93	94	95	95	103	95	95	103
Compressor									
Circuit 1		2	2	2	2	2	2	2	2
Circuit 2		1	1	1	2	1	2	2	2
Refrigerant									
Type					R134a				
Charge Circuit 1	(kg)	108	104	112	102	112	103	107	107
Charge Circuit 2	(kg)	43	53	54	96	54	108	110	110
Dimensions & Weight									
Length	(mm)	9390	10135	11260	12385	11260	13510	13510	13510
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2672	2672	2672	2672	2672	2672	2672	2672
Operating weight	(kg)	6847	7298	7748	9129	7833	9334	9279	9399

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016

RTAF XE - Extra Efficiency - Standard and Low Noise

EUROVENT CERTIFIED PERFORMANCE 96.01.109 Range RTAF www.eurovent-certification.com

R134a

Eurovent performances (1)		090	105	125	145	155	175	190	205	245
Net cooling capacity (1) (2)	(kW)	329	383	451	532	574	639	695	758	830
Net EER (1) (2)		3.36	3.30	3.24	3.33	3.23	3.20	3.22	3.20	3.33
Eurovent Energy class - Cooling		A	A	A	A	A	A	A	A	A
Net ESEER (2)		4.19	4.12	4.17	4.22	4.15	4.12	4.09	4.06	4.10
SEER (3)		4.34	4.29	4.33	4.44	4.39	4.31	4.30	4.26	4.55
Space cooling efficiency ηs.c (3)	(%)	171	169	170	175	173	169	169	167	179
Sound power level (standard noise)	(dB(A))	94	94	95	96	97	97	98	98	99
Sound power level (low noise)	(dB(A))	91	91	92	93	94	94	95	95	98
Compressor										
Circuit 1		1	1	1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1	1	1
Refrigerant										
Type						R134a				
Charge Circuit 1	(kg)	43	42	45	48	50	60	62	66	66
Charge Circuit 2	(kg)	41	40	41	46	44	46	56	62	62
Dimensions & Weight										
Length	(mm)	5645	5645	5645	6770	6770	6770	7895	6770	7895
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight (standard noise)	(kg)	3610	3640	3820	4230	4495	4655	5085	5225	5305

Eurovent performances (1)		250	280	310	350	355	380	410	415	450
Net cooling capacity (1) (2)	(kW)	887	1002	1120	1253	1200	1376	1481	1498	1625
Net EER (1) (2)		3.23	3.28	3.22	3.26	3.26	3.26	3.18	3.16	3.17
Eurovent Energy class - Cooling		A	A	A	A	A	A	A	A	A
Net ESEER (2)		4.56	4.64	4.56	4.59	4.40	4.60	4.53	4.51	4.21
SEER (3)		4.61	4.86	4.54	5.05	4.94	5.05	5.00	5.00	4.99
Space cooling efficiency ηs.c (3)	(%)	181	191	179	199	195	199	197	197	197
Sound power level (standard noise)	(dB(A))	99	100	101	101	105	102	102	103	105
Sound power level (low noise)	(dB(A))	96	97	98	98	104	98	99	100	104
Compressor										
Circuit 1		2	2	2	2	2	2	2	2	2
Circuit 2		1	1	1	2	1	2	2	2	2
Refrigerant										
Type						R134a				
Charge Circuit 1	(kg)	108	104	112	102	112	103	107	107	107
Charge Circuit 2	(kg)	43	53	54	96	54	108	110	110	110
Dimensions & Weight										
Length	(mm)	9390	10135	11260	12385	11260	13510	13510	13510	13510
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight (standard noise)	(kg)	6687	7118	7548	8909	7633	9094	9039	9039	9159

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016

General specifications

HE

RTAF HE - High Efficiency- Extra Low noise - AC

Eurovent performances (1)		090	105	125	145	155	175	190	205	245
Net cooling capacity (1) (2)	(kW)	333	385	453	534	578	632	690	751	824
Net EER (1) (2)		3.25	3.25	3.21	3.30	3.20	3.16	3.19	3.16	3.30
Eurovent Energy class - Cooling		A	A	A	A	A	A	A	A	A
Net ESEER (2)		3.89	3.84	3.95	4.06	4.01	4.02	3.96	3.98	4.12
SEER (3)		4.14	4.17	4.26	4.31	4.28	4.21	4.19	4.19	4.58
Space cooling efficiency ηs.c (3)	(%)	163	164	167	169	168	165	165	165	180
Sound power level	(dB(A))	90	90	90	90	90	90	91	91	97
Compressor										
Circuit 1		1	1	1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1	1	1
Refrigerant										
Type					R134a					
Charge Circuit 1	(kg)	43	42	45	48	50	60	62	66	66
Charge Circuit 2	(kg)	41	40	41	46	44	46	56	62	62
Dimensions & Weight										
Length	(mm)	5645	5645	5645	6770	6770	6770	7895	6770	7895
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight	(kg)	3710	3740	3920	4350	4615	4775	5225	5365	5445

Eurovent performances (1)		250	280	310	350	355	380	410	450
Net cooling capacity (1) (2)	(kW)	875	990	1106	1237	1189	1357	1459	1607
Net EER (1) (2)		3.20	3.25	3.23	3.24	3.22	3.23	3.13	3.12
Eurovent Energy class - Cooling		A	A	A	A	A	A	A	A
Net ESEER (2)		4.29	4.38	4.33	4.34	4.37	4.37	4.35	4.32
SEER (3)		4.41	4.68	4.56	4.88	4.86	4.89	4.87	4.97
Space cooling efficiency ηs.c (3)	(%)	173	184	179	192	191	193	192	196
Sound power level	(dB(A))	92	93	94	94	104	94	95	104
Compressor									
Circuit 1		2	2	2	2	2	2	2	2
Circuit 2		1	1	1	2	1	2	2	2
Refrigerant									
Type					R134a				
Charge Circuit 1	(kg)	108	104	112	102	112	103	107	107
Charge Circuit 2	(kg)	43	53	54	96	54	108	110	110
Dimensions & Weight									
Length	(mm)	9390	10135	11260	12385	11260	13510	13510	13510
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight	(kg)	6827	7278	7728	9109	7813	9314	9279	9399

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016

RTAF HE - High Efficiency- Standard and Low Noise

EUROVENT CERTIFIED PERFORMANCE 96.01.109 Range RTAF www.eurovent-certification.com

R134a

Eurovent performances (1)		090	105	125*	145	155	175	190*	205	245
Net cooling capacity (1) (2)	(kW)	333	386	456	538	582	638	695	757	829
Net EER (1) (2)		3.17	3.19	3.18	3.26	3.18	3.15	3.17	3.16	3.30
Eurovent Energy class - Cooling		A	A	A	A	A	A	A	A	A
Net ESEER (2)		3.75	3.69	3.83	3.94	3.91	3.92	3.87	3.90	4.05
SEER (3)		3.83	3.98	4.09	4.19	4.18	4.11	4.09	4.12	4.50
Space cooling efficiency ηs.c (3)	(%)	150	156	161	165	164	161	161	162	177
Sound power level (standard noise)	(dB(A))	95	95	96	96	97	97	98	98	99
Sound power level (low noise)	(dB(A))	93	93	93	93	94	94	95	95	98
Compressor										
Circuit 1		1	1	1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1	1	1
Refrigerant										
Type					R134a					
Charge Circuit 1	(kg)	43	42	45	48	50	60	62	66	66
Charge Circuit 2	(kg)	41	40	41	46	44	46	56	62	62
Dimensions & Weight										
Length	(mm)	5645	5645	5645	6770	6770	6770	7895	6770	7895
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight (standard noise)	(kg)	3610	3640	3820	4230	4495	4655	5085	5225	5305

Eurovent performances (1)		250	280	310	350	355	380	410	450
Net cooling capacity (1) (2)	(kW)	883	998	1115	1248	1196	1369	1473	1619
Net EER (1) (2)		3.20	3.25	3.23	3.24	3.23	3.23	3.15	3.14
Eurovent Energy class - Cooling		A	A	A	A	A	A	A	A
Net ESEER (2)		4.18	4.25	4.21	4.17	4.25	4.21	4.21	4,20
SEER (3)		4.33	4.54	4.44	4.58	4.76	4.62	4.63	4,86
Space cooling efficiency ηs.c (3)	(%)	170	179	175	180	187	182	182	191
Sound power level (standard noise)	(dB(A))	99	100	101	101	105	102	102	105
Sound power level (low noise)	(dB(A))	96	97	98	98	104	98	99	104
Compressor									
Circuit 1		2	2	2	2	2	2	2	2
Circuit 2		1	1	1	2	1	2	2	2
Refrigerant									
Type					R134a				
Charge Circuit 1	(kg)	108	104	112	102	112	103	107	107
Charge Circuit 2	(kg)	43	53	54	96	54	108	110	110
Dimensions & Weight									
Length	(mm)	9390	10135	11260	12385	11260	13510	13510	13510
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight (standard noise)	(kg)	6687	7118	7548	8909	7633	9094	9039	9159

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016
* Not available for comfort applications for countries adopting the Ecodesign directive.

General specifications

SE

RTAF SE - Standard Efficiency - Extra Low noise - EC

Eurovent performances (1)		090	105	125	140	145	150*	155	170*	175	185*	190
Net cooling capacity (1) (2)	(kW)	329	379	444	510	527	547	569	586	621	661	681
Net EER (1) (2)		3.24	3.18	3.09	3.02	3.23	2.87	3.12	2.74	3.04	2.92	3.11
Eurovent Energy class - Cooling		A	A	B	B	A	C	A	C	B	B	A
Net ESEER (2)		4.12	4.04	4.06	3.93	4.08	3.84	4.00	3.68	4.04	3.79	4.02
SEER (3)		4.27	4.20	4.21	4.11	4.28	4.04	4.23	3.81	4.20	4.00	4.22
Space cooling efficiency ηs.c (3)	(%)	168	165	165	161	168	159	166	149	165	157	166
Sound power level	(dB(A))	88	89	89	89	89	90	90	90	90	91	91
Compressor												
Circuit 1		1	1	1	1	1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1	1	1	1	1
Refrigerant												
Type		R134a										
Charge Circuit 1	(kg)	41	40	42	42	45	44	47	54	57	56	59
Charge Circuit 2	(kg)	39	38	38	40	43	38	41	40	43	50	53
Dimensions & Weight												
Length	(mm)	4520	4520	4520	4520	5645	4520	5645	4520	5645	5645	6770
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2672	2672	2672	2672	2672	2672	2672	2672	2672	2672	2672
Operating weight	(kg)	3510	3545	3720	3880	4220	4145	4485	4470	4645	4820	5110

Eurovent performances (1)		200*	205	245	250	280	310	350	355	380	410	450
Net cooling capacity (1) (2)	(kW)	714	739	816	869	984	1087	1207	1167	1338	1464	1607
Net EER (1) (2)		2.85	3.06	3.21	3.02	3.01	2.91	2.91	3.04	2.94	2.97	3.01
Eurovent Energy class - Cooling		C	B	A	B	B	B	B	B	B	B	B
Net ESEER (2)		3.74	3.96	4.12	4.31	4.39	4.29	4.37	4.36	4.40	4.44	4.37
SEER (3)		3.92	4.17	4.56	4.35	4.53	4.34	4.65	4.79	4.68	4.76	5.00
Space cooling efficiency ηs.c (3)	(%)	154	164	179	171	178	171	183	188	184	187	197
Sound power level	(dB(A))	91	91	97	93	94	94	94	103	95	95	103
Compressor												
Circuit 1		1	1	1	2	2	2	2	2	2	2	2
Circuit 2		1	1	1	1	1	1	2	1	2	2	2
Refrigerant												
Type		R134a										
Charge Circuit 1	(kg)	60	63	63	93	96	97	94	97	98	107	107
Charge Circuit 2	(kg)	56	59	59	45	49	52	91	52	100	104	104
Dimensions & Weight												
Length	(mm)	5645	6770	6770	8265	9390	9390	10135	9390	11260	12385	12385
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2672	2672	2672	2672	2672	2672	2672	2672	2672	2672	2672
Operating weight	(kg)	4850	5140	5220	6647	7138	7283	8664	7368	8954	9229	9509

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016
* Not available for comfort applications for countries adopting the Ecodesign directive.

RTAF SE - Standard Efficiency- Extra Low noise - AC

EUROVENT CERTIFIED PERFORMANCE 96.01.109 Range RTAF www.eurovent-certification.com

R134a

Eurovent performances (1)		090	105	125	140*	145	150*	155	170*	175	185*	190
Net cooling capacity (1) (2)	(kW)	327	376	439	503	522	539	563	576	613	652	674
Net EER (1) (2)		3.20	3.13	3.03	2.95	3.18	2.80	3.05	2.66	2.97	2.85	3.05
Eurovent Energy class - Cooling		A	A	B	B	A	C	B	D	B	C	B
Net ESEER (2)		3.91	3.89	3.92	3.87	3.96	3.77	3.88	3.60	3.96	3.72	3.92
SEER (3)		4.17	4.11	4.13	4.03	4.16	3.96	4.12	3.72	4.12	3.92	4.13
Space cooling efficiency ηs.c (3)	(%)	164	161	162	158	163	155	162	146	162	154	162
Sound power level	(dB(A))	88	88	89	89	89	90	90	90	90	91	91
Compressor												
Circuit 1		1	1	1	1	1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1	1	1	1	1
Refrigerant												
Type		R134a										
Charge Circuit 1	(kg)	41	40	42	42	45	44	47	54	57	56	59
Charge Circuit 2	(kg)	39	38	38	40	43	38	41	40	43	50	53
Dimensions & Weight												
Length	(mm)	4520	4520	4520	4520	5645	4520	5645	4520	5645	5645	6770
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight	(kg)	3410	3445	3620	3780	4100	4045	4365	4370	4525	4700	4970

Eurovent performances (1)		200*	205*	245	250	280	310	350	355	380	410	450
Net cooling capacity (1) (2)	(kW)	703	730	810	858	972	1072	1191	1155	1320	1445	1592
Net EER (1) (2)		2.77	3.00	3.13	2.95	2.94	2.84	2.82	2.95	2.87	2.89	2.92
Eurovent Energy class - Cooling		C	B	A	B	B	C	C	B	C	C	B
Net ESEER (2)		3.67	3.88	4.05	4.05	4.16	4.07	4.14	4.29	4.20	4.23	4.33
SEER (3)		3.84	4.09	4.47	4.22	4.32	4.24	4.46	4.61	4.52	4.58	4.83
Space cooling efficiency ηs.c (3)	(%)	151	161	176	166	170	167	175	181	178	180	190
Sound power level	(dB(A))	91	91	97	93	94	94	95	104	95	96	104
Compressor												
Circuit 1		1	1	1	2	2	2	2	2	2	2	2
Circuit 2		1	1	1	1	1	1	2	1	2	2	2
Refrigerant												
Type		R134a										
Charge Circuit 1	(kg)	60	63	63	93	96	97	94	97	98	107	107
Charge Circuit 2	(kg)	56	59	59	45	49	52	91	52	100	104	104
Dimensions & Weight												
Length	(mm)	5645	6770	6770	8265	9390	9390	10135	9390	11260	12385	12385
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight	(kg)	4730	5000	5080	6507	6978	7103	8464	7188	8734	8989	9269

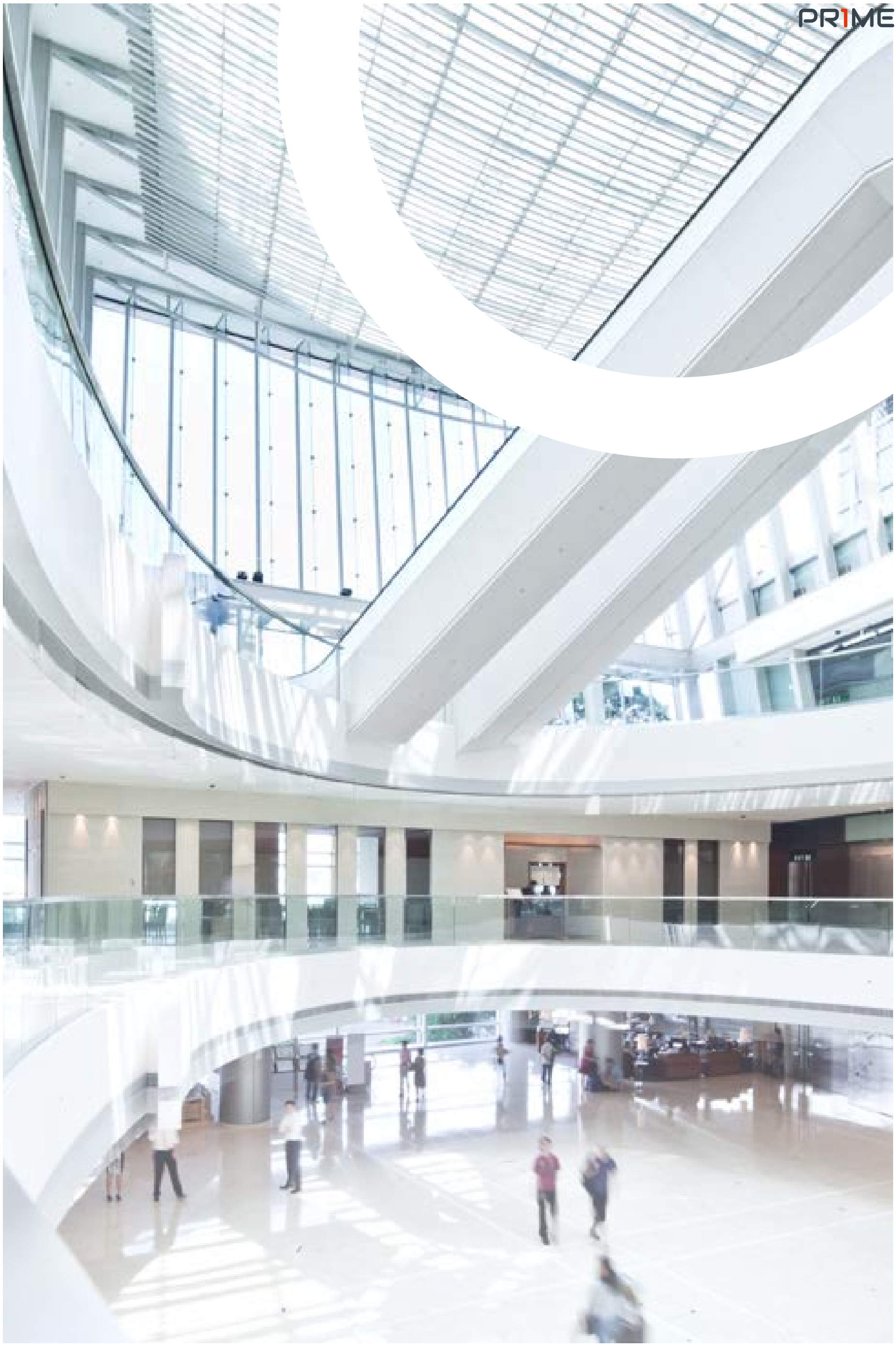
(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016
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RTAF SE - Standard Efficiency - Standard and Low Noise

Eurovent performances (1)		090	105	125*	140*	145*	150*	155*	170*	175*	185*	190*
Net cooling capacity (1) (2)	(kW)	329	378	443	509	527	546	568	585	620	660	681
Net EER (1) (2)		3.16	3.11	3.03	2.97	3.17	2.83	3.06	2.71	2.99	2.88	3.06
Eurovent Energy class - Cooling		A	A	B	B	A	C	B	C	B	C	B
Net ESEER (2)		3.79	3.80	3.85	3.83	3.87	3.74	3.80	3.60	3.91	3.69	3.86
SEER (3)		3.93	4.00	4.04	4.01	4.08	3.95	4.05	3.73	4.08	3.89	4.08
Space cooling efficiency ηs.c (3)	(%)	154	157	159	157	160	155	159	146	160	153	160
Sound power level (standard noise)	(dB(A))	95	95	95	96	96	96	96	97	97	97	97
Sound power level (low noise)	(dB(A))	92	92	92	93	93	93	93	94	94	94	94
Compressor												
Circuit 1		1	1	1	1	1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1	1	1	1	1
Refrigerant												
Type		R134a										
Charge Circuit 1	(kg)	41	40	42	42	45	44	47	54	57	56	59
Charge Circuit 2	(kg)	39	38	38	40	43	38	41	40	43	50	53
Dimensions & Weight												
Length	(mm)	4520	4520	4520	4520	5645	4520	5645	4520	5645	5645	6770
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight (standard noise)	(kg)	3310	3345	3520	3680	3980	3945	4245	4270	4405	4580	4830

Eurovent performances (1)		200*	205*	245	250	280	310	350	355	380	410	450
Net cooling capacity (1) (2)	(kW)	713	738	816	868	983	1086	1206	1166	1337	1462	1606
Net EER (1) (2)		2.81	3.01	3.15	2.97	2.96	2.87	2.85	2.85	2.85	2.85	2.85
Eurovent Energy class - Cooling		C	B	A	B	B	C	C	C	C	C	C
Net ESEER (2)		3.65	3.84	4.01	3.97	4.05	4.01	4.03	4.19	4.09	4.10	4.21
SEER (3)		3.83	4.06	4.44	4.15	4.24	4.25	4.27	4.58	4.34	4.42	4.72
Space cooling efficiency ηs.c (3)	(%)	150	159	174	163	167	167	168	180	171	174	186
Sound power level (standard noise)	(dB(A))	97	97	99	99	100	101	101	105	101	102	105
Sound power level (low noise)	(dB(A))	94	94	98	96	97	98	98	104	98	99	104
Compressor												
Circuit 1		1	1	1	2	2	2	2	2	2	2	2
Circuit 2		1	1	1	1	1	1	2	1	2	2	2
Refrigerant												
Type		R134a										
Charge Circuit 1	(kg)	60	63	63	93	96	97	94	97	98	107	107
Charge Circuit 2	(kg)	56	59	59	45	49	52	91	52	100	104	104
Dimensions & Weight												
Length	(mm)	5645	6770	6770	8265	9390	9390	10135	9390	11260	12385	12385
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight (standard noise)	(kg)	4610	4860	4940	6367	6818	6923	8264	7008	8514	8749	9029

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016
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The Future of F-Gases

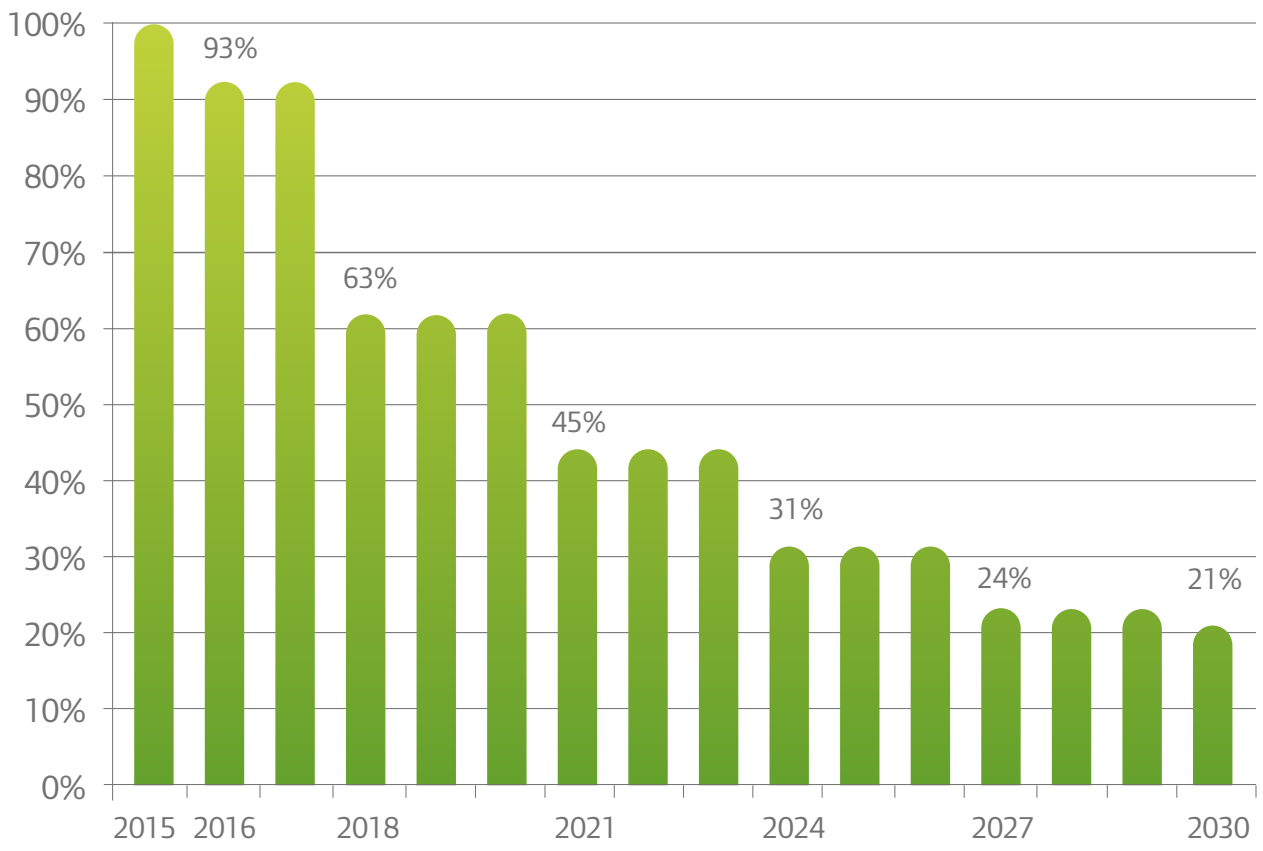
The fluorinated refrigerants phase-down, as defined in the new EU F-Gas Regulation, is a step-by-step approach where the quantities of HFCs expressed in CO_2 equivalent that are placed on the market are gradually reduced. As a result of the phase-down, HFC consumption will be reduced by 79% by 2030.

This is an unprecedented reduction and means that industry and users need to make, over time, the transition to refrigerants with a lower global warming potential.

Trane, recognized as a leading innovator in the HVAC industry, introduces this new, next generation, lower GWP refrigerant in Sintesis and other products to be front running in the marketplace and to support your strong sustainability objectives.

Trane - provider of sustainable solutions.

HFC consumption



Baseline value (100%) is the annual average of total quantity of CO_2 equivalents placed on the EU market from 2009 to 2012.

An environmentally sustainable solution

EcoWise™

Sintesis™ chillers with low GWP refrigerants are part of the EcoWise™ portfolio of products that are designed to lower their environmental impact with next-generation, low global warming potential (GWP) refrigerants and high-efficiency operation.

R1234ze R513A

Refrigerant	Global Warming Potential (GWP)
R410A	1924
R407C	1774
R134a	1300
R513A	572
R1233zd	1
R1234ze	<1



What is GWP?

GWP is the global warming impact relative to the impact of the same quantity of carbon dioxide over a 100 year period.

What is ODP?

Ozone depletion potential of a chemical is the amount of degradation to the ozone layer it can cause.

General specifications

HSE

RTAF HSE - High Seasonal Efficiency- Extra Low Noise -EC

Eurovent performances (1)		090	105	125	145	155	175	190	205
Net cooling capacity (1) (2)	(kW)	324	378	446	528	569	632	689	747
Net EER (1) (2)		3.17	3.06	2.97	3.05	2.94	2.92	2.96	2.92
Eurovent Energy class - Cooling		A	B	B	B	B	B	B	B
Net ESEER (2)		4.45	4.35	4.39	4.44	4.39	4.40	4.39	4.38
SEER (3)		4.58	4.54	4.55	4.72	4.67	4.65	4.72	4.71
Space cooling efficiency ηs.c (3)	(%)	180	179	179	186	184	183	186	185
Sound power level	(dB(A))	89	89	89	90	92	92	93	93
Compressor									
Circuit 1		1	1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1	1
Refrigerant									
Type					R513A				
Charge Circuit 1	(kg)	43	42	45	48	50	60	62	66
Charge Circuit 2	(kg)	41	40	41	46	44	46	56	62
Dimensions & Weight									
Length	(mm)	5645	5645	5645	6770	6770	6770	7895	7895
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2672	2672	2672	2672	2672	2672	2672	2672
Operating weight	(kg)	3810	3845	4025	4455	4605	4930	5310	5510

Eurovent performances (1)		245	250	280	310	350	380	410	450
Net cooling capacity (1) (2)	(kW)	865	878	995	1112	1239	1365	1466	1603
Net EER (1) (2)		2.79	2.89	2.90	2.90	2.89	2.90	2.82	2.78
Eurovent Energy class - Cooling		C	C	B	B	C	B	C	C
Net ESEER (2)		4.17	4.34	4.39	4.41	4.49	4.51	4.53	4.39
SEER (3)		4.62	4.52	4.47	4.62	4.57	4.70	4.51	4.74
Space cooling efficiency ηs.c (3)	(%)	182	178	176	182	180	185	177	187
Sound power level	(dB(A))	102	95	96	97	97	97	97	103
Compressor									
Circuit 1		1	2	2	2	2	2	2	2
Circuit 2		1	1	1	1	2	2	2	2
Refrigerant									
Type					R513A				
Charge Circuit 1	(kg)	66	108	104	112	102	103	107	107
Charge Circuit 2	(kg)	62	43	53	54	96	108	110	110
Dimensions & Weight									
Length	(mm)	7895	9390	10135	11260	12385	13510	13510	13510
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2672	2672	2672	2672	2672	2672	2672	2672
Operating weight	(kg)	5620	7067	7548	7998	9369	9574	9519	9955

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016

RTAF HSE - High Seasonal Efficiency- Standard and Low Noise

EUROVENT CERTIFIED PERFORMANCE 96.01.109 Range RTAF www.eurovent-certification.com

R513A

Eurovent performances (1)		090	105	125	145	155	175	190	205
Net cooling capacity (1) (2)	(kW)	325	378	446	529	570	632	689	747
Net EER (1) (2)		3.18	3.07	2.98	3.07	2.97	2.92	2.97	2.93
Eurovent Energy class - Cooling		A	B	B	B	B	B	B	B
Net ESEER (2)		4.39	4.29	4.33	4.37	4.32	4.33	4.33	4.32
SEER (3)		4.53	4.49	4.50	4.67	4.62	4.58	4.66	4.65
Space cooling efficiency ηs.c (3)	(%)	178	177	177	184	182	180	183	183
Sound power level (standard noise)	(dB(A))	95	95	96	97	99	99	100	100
Sound power level (low noise)	(dB(A))	92	92	93	94	96	96	97	97
Compressor									
Circuit 1		1	1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1	1
Refrigerant									
Type					R513A				
Charge Circuit 1	(kg)	43	42	45	48	50	60	62	66
Charge Circuit 2	(kg)	41	40	41	46	44	46	56	62
Dimensions & Weight									
Length	(mm)	5645	5645	5645	6770	6770	6770	7895	7895
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight	(kg)	3710	3745	3925	4335	4485	4810	5170	5370

Eurovent performances (1)		245	250	280	310	350	380	410	450
Net cooling capacity (1) (2)	(kW)	866	878	996	1113	1240	1365	1467	1604
Net EER (1) (2)		2.81	2.9	2.92	2.91	2.9	2.91	2.83	2.74
Eurovent Energy class - Cooling		C	B	B	B	B	B	C	
Net ESEER (2)		4.11	4.29	4.34	4.35	4.44	4.46	4.48	4.33
SEER (3)		4.56	4.47	4.42	4.56	4.52	4.65	4.46	4.68
Space cooling efficiency ηs.c (3)	(%)	179	176	174	179	178	183	175	184
Sound power level (standard noise)	(dB(A))	108	101	102	103	103	104	104	107
Sound power level (low noise)	(dB(A))	104	98	99	100	100	100	101	104
Compressor									
Circuit 1		1	2	2	2	2	2	2	2
Circuit 2		1	1	1	1	2	2	2	2
Refrigerant									
Type					R513A				
Charge Circuit 1	(kg)	66	108	104	112	102	103	107	107
Charge Circuit 2	(kg)	62	43	53	54	96	108	110	110
Dimensions & Weight									
Length	(mm)	7895	9390	10135	11260	12385	13510	13510	13510
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight	(kg)	5480	6907	7368	7798	9149	9334	9279	9715

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016

General specifications

HSS

RTAF HSS - High Seasonal Short - Extra Low Noise -EC

Eurovent performances (1)		090	105	125	145	155	175	190	205
Net cooling capacity (1) (2)	(kW)	325	374	438	524	564	612	673	726
Net EER (1) (2)		3.03	2.93	2.80	2.93	2.83	2.74	2.83	2.76
Eurovent Energy class - Cooling		B	B	C	B	C	C	C	C
Net ESEER (2)		4.32	4.23	4.25	4.32	4.25	4.29	4.31	4.28
SEER (3)		4.47	4.41	4.40	4.61	4.54	4.50	4.60	4.57
Space cooling efficiency ηs.c (3)	(%)	176	173	173	181	179	177	181	180
Sound power level	(dB(A))	89	90	90	90	91	91	92	92
Compressor									
Circuit 1		1	1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1	1
Refrigerant									
Type					R513A				
Charge Circuit 1	(kg)	41	40	42	45	47	57	59	63
Charge Circuit 2	(kg)	39	38	38	43	41	43	53	59
Dimensions & Weight									
Length	(mm)	4520	4520	4520	5645	5645	5645	6770	6770
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2672	2672	2672	2672	2672	2672	2672	2672
Operating weight	(kg)	3515	3545	3725	4205	4470	4735	5220	5255

Eurovent performances (1)		245	250	280	310	350	380	410
Net cooling capacity (1) (2)	(kW)	817	861	974	1069	1194	1322	1441
Net EER (1) (2)		2.65	2.77	2.76	2.65	2.66	2.71	2.72
Eurovent Energy class - Cooling		D	C	C	D	D	C	C
Net ESEER (2)		4.10	4.26	4.32	4.27	4.39	4.42	4.48
SEER (3)		4.53	4.46	4.42	4.50	4.35	4.55	4.46
Space cooling efficiency ηs.c (3)	(%)	178	175	174	177	171	179	175
Sound power level	(dB(A))	98	94	95	95	95	96	96
Compressor								
Circuit 1		1	2	2	2	2	2	2
Circuit 2		1	1	1	1	2	2	2
Refrigerant								
Type				R513A				
Charge Circuit 1	(kg)	63	93	96	97	94	98	107
Charge Circuit 2	(kg)	59	45	49	52	91	100	104
Dimensions & Weight								
Length	(mm)	6770	8265	9390	9390	10135	11260	12385
Width	(mm)	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2672	2672	2672	2672	2672	2672	2672
Operating weight	(kg)	5365	6727	7228	7358	8704	8974	9229

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016

RTAF HSS - High Seasonal Short - Standard and Low Noise

EUROVENT CERTIFIED PERFORMANCE 96.01.109 Range RTAF www.eurovent-certification.com

R513A

Eurovent performances (1)		090	105	125	145	155	175	190	205
Net cooling capacity (1) (2)	(kW)	325	374	439	524	564	613	673	726
Net EER (1) (2)		2.99	2.89	2.77	2.90	2.80	2.71	2.80	2.74
Eurovent Energy class - Cooling		B	C	C	B	C	C	C	C
Net ESEER (2)		4.26	4.17	4.19	4.26	4.19	4.23	4.25	4.22
SEER (3)		4.42	4.36	4.35	4.55	4.49	4.44	4.54	4.51
Space cooling efficiency ηs.c (3)	(%)	174	171	171	179	177	175	179	177
Sound power level (standard noise)	(dB(A))	96	96	96	97	97	98	98	98
Sound power level (low noise)	(dB(A))	93	93	93	94	94	95	95	95
Compressor									
Circuit 1		1	1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1	1
Refrigerant									
Type					R513A				
Charge Circuit 1	(kg)	41	40	42	45	47	57	59	63
Charge Circuit 2	(kg)	39	38	38	43	41	43	53	59
Dimensions & Weight									
Length	(mm)	4520	4520	4520	5645	5645	5645	6770	6770
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight (standard noise)	(kg)	3415	3445	3625	4085	4350	4615	5080	5115

Eurovent performances (1)		245	250	280	310	350	380	410
Net cooling capacity (1) (2)	(kW)	817	861	974	1069	1194	1323	1442
Net EER (1) (2)		2.63	2.74	2.74	2.63	2.64	2.69	2.70
Eurovent Energy class - Cooling		D	C	C	D	D	D	D
Net ESEER (2)		4.05	4.21	4.27	4.22	4.34	4.37	4.43
SEER (3)		4.47	4.41	4.37	4.44	4.30	4.50	4.41
Space cooling efficiency ηs.c (3)	(%)	176	173	172	175	169	177	173
Sound power level (standard noise)	(dB(A))	105	100	101	102	102	102	103
Sound power level (low noise)	(dB(A))	102	97	98	99	99	99	100
Compressor								
Circuit 1		1	2	2	2	2	2	2
Circuit 2		1	1	1	1	2	2	2
Refrigerant								
Type				R513A				
Charge Circuit 1	(kg)	63	93	96	97	94	98	107
Charge Circuit 2	(kg)	59	45	49	52	91	100	104
Dimensions & Weight								
Length	(mm)	6770	8265	9390	9390	10135	11260	12385
Width	(mm)	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526
Operating weight (standard noise)	(kg)	5225	6587	7068	7178	8504	8754	8989

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016

General specifications

XE

RTAF XE - Extra Efficiency- Extra Low Noise -EC

Eurovent performances (1)		090	105	125	145	155	175	190
Net cooling capacity (1) (2)	(kW)	321	379	445	525	568	632	689
Net EER (1) (2)		3.15	3.16	3.10	3.19	3.08	3.05	3.09
Eurovent Energy class - Cooling		A	A	A	A	B	B	B
Net ESEER (2)		4.32	4.04	4.07	4.12	4.04	4.02	3.99
SEER (3)		4.30	4.21	4.22	4.32	4.27	4.18	4.19
Space cooling efficiency ηs.c (3)	(%)	169	165	166	170	168	164	165
Sound power level	(dB(A))	89	89	89	90	91	91	92
Compressor								
Circuit 1		1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1
Refrigerant								
Type				R513A				
Charge Circuit 1	(kg)	43	42	45	48	50	60	62
Charge Circuit 2	(kg)	41	40	41	46	44	46	56
Dimensions & Weight								
Length	(mm)	5645	5645	5645	6770	6770	6770	7895
Width	(mm)	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2672	2672	2672	2672	2672	2672	2672
Operating weight	(kg)	3710	3740	3920	4350	4615	4775	5225

Eurovent performances (1)		205*	250	280	310	350	380	410
Net cooling capacity (1) (2)	(kW)	750	878	995	1116	1240	1366	1472
Net EER (1) (2)		3.05	2.99	3.00	2.99	2.97	2.98	2.90
Eurovent Energy class - Cooling		B	B	B	B	B	B	B
Net ESEER (2)		3.96	4.25	4.33	4.32	4.36	4.40	4.36
SEER (3)		4.14	4.29	4.44	4.37	4.66	4.69	4.70
Space cooling efficiency ηs.c (3)	(%)	163	169	175	172	183	185	185
Sound power level	(dB(A))	92	94	95	96	96	96	96
Compressor								
Circuit 1		1	2	2	2	2	2	2
Circuit 2		1	1	1	1	2	2	2
Refrigerant								
Type				R513A				
Charge Circuit 1	(kg)	66	108	104	112	102	103	107
Charge Circuit 2	(kg)	62	43	53	54	96	108	110
Dimensions & Weight								
Length	(mm)	7895	9390	10135	11260	12385	13510	13510
Width	(mm)	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2672	2672	2672	2672	2672	2672	2672
Operating weight	(kg)	5365	6827	7278	7728	9109	9314	9279

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016
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RTAF XE - Extra Efficiency- Standard and Low Noise

EUROVENT CERTIFIED PERFORMANCE 96.01.109 Range RTAF www.eurovent-certification.com

R513A

Eurovent performances (1)		090	105	125	145	155	175	190	205*
Net cooling capacity (1) (2)	(kW)	321	380	446	526	569	632	689	750
Net EER (1) (2)		3.12	3.13	3.07	3.16	3.06	3.02	3.05	3.02
Eurovent Energy class - Cooling		A	A	B	A	B	B	B	B
Net ESEER (2)		4.25	3.99	4.02	4.07	4.00	3.97	3.94	3.91
SEER (3)		4.25	4.15	4.17	4.27	4.22	4.13	4.14	4.09
Space cooling efficiency ηs.c (3)	(%)	167	163	164	168	166	162	163	161
Sound power level (standard noise)	(dB(A))	95	95	96	97	98	98	99	99
Sound power level (low noise)	(dB(A))	92	92	93	94	95	95	96	96
Compressor									
Circuit 1		1	1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1	1
Refrigerant									
Type					R513A				
Charge Circuit 1	(kg)	43	42	45	48	50	60	62	66
Charge Circuit 2	(kg)	41	40	41	46	44	46	56	62
Dimensions & Weight									
Length	(mm)	5645	5645	5645	6770	6770	6770	7895	7895
Width	(mm)	2200	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526	2526
Operating weight (standard noise)	(kg)	3610	3640	3820	4230	4495	4655	5085	5225

Eurovent performances (1)		250	280	310	350	380	410	415
Net cooling capacity (1) (2)	(kW)	878	996	1116	1241	1366	1472	1495
Net EER (1) (2)		2.96	2.97	2.96	2.94	2.95	2.87	3.02
Eurovent Energy class - Cooling		B	B	B	B	B	C	B
Net ESEER (2)		4.20	4.24	4.25	4.31	4.34	4.30	4.41
SEER (3)		4.25	4.38	4.32	4.61	4.63	4.64	4.91
Space cooling efficiency ηs.c (3)	(%)	167	172	170	181	182	183	193
Sound power level (standard noise)	(dB(A))	100	101	102	102	103	103	104
Sound power level (low noise)	(dB(A))	97	98	99	99	99	100	101
Compressor								
Circuit 1		2	2	2	2	2	2	2
Circuit 2		1	1	1	2	2	2	2
Refrigerant								
Type				R513A				
Charge Circuit 1	(kg)	108	104	112	102	103	107	107
Charge Circuit 2	(kg)	43	53	54	96	108	110	110
Dimensions & Weight								
Length	(mm)	9390	10135	11260	12385	13510	13510	13510
Width	(mm)	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526
Operating weight (standard noise)	(kg)	6687	7118	7548	8909	9094	9039	9039

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016
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General specifications

HE

RTAF HE - High Efficiency- Standard and Low Noise

Eurovent performances (1)		090*	105	125*	145*	155*	175*	190*
Net cooling capacity (1) (2)	(kW)	326	383	452	532	576	631	689
Net EER (1) (2)		2.96	3.04	3.03	3.11	3.04	2.99	3.02
Eurovent Energy class - Cooling		B	B	B	A	B	B	B
Net ESEER (2)		3.66	3.60	3.72	3.83	3.79	3.80	3.75
SEER (3)		3.75	3.87	3.96	4.06	4.05	3.97	3.96
Space cooling efficiency ηs.c (3)	(%)	147	152	155	159	159	156	155
Sound power level (standard noise)	(dB(A))	96	96	97	97	98	98	99
Sound power level (low noise)	(dB(A))	94	94	94	94	95	95	96
Compressor								
Circuit 1		1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1
Refrigerant								
Type				R513A				
Charge Circuit 1	(kg)	43	42	45	48	50	60	62
Charge Circuit 2	(kg)	41	40	41	46	44	46	56
Dimensions & Weight								
Length	(mm)	5645	5645	5645	6770	6770	6770	7895
Width	(mm)	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526
Operating weight	(kg)	3610	3640	3820	4230	4495	4655	5085

Eurovent performances (1)		205*	250*	280	310*	350	380	410
Net cooling capacity (1) (2)	(kW)	749	877	994	1115	1240	1365	1470
Net EER (1) (2)		2.99	2.93	2.94	2.94	2.92	2.92	2.85
Eurovent Energy class - Cooling		B	B	B	B	B	B	C
Net ESEER (2)		3.78	3.85	3.93	3.89	3.93	3.98	4.00
SEER (3)		3.98	4.02	4.13	4.10	4.23	4.25	4.32
Space cooling efficiency ηs.c (3)	(%)	156	158	162	161	166	167	170
Sound power level (standard noise)	(dB(A))	99	100	101	102	102	103	103
Sound power level (low noise)	(dB(A))	96	97	98	99	99	99	100
Compressor								
Circuit 1		1	2	2	2	2	2	2
Circuit 2		1	1	1	1	2	2	2
Refrigerant								
Type				R513A				
Charge Circuit 1	(kg)	66	108	104	112	102	103	107
Charge Circuit 2	(kg)	62	43	53	54	96	108	110
Dimensions & Weight								
Length	(mm)	7895	9390	10135	11260	12385	13510	13510
Width	(mm)	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526
Operating weight	(kg)	5225	6687	7118	7548	8909	9094	9039

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016
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General specifications

SE

RTAF SE - Standard Efficiency- Extra Low Noise -EC

EUROVENT CERTIFIED PERFORMANCE 96.01.109 Range RTAF www.eurovent-certification.com

R513A

Eurovent performances (1)		090	105	125*	145	155*	175*	190*
Net cooling capacity (1) (2)	(kW)	321	375	439	522	564	615	675
Net EER (1) (2)		3.01	3.02	2.93	3.07	2.96	2.87	2.96
Eurovent Energy class - Cooling		B	B	B	B	B	C	B
Net ESEER (2)		4.20	3.93	3.92	3.96	3.87	3.90	3.89
SEER (3)		4.20	4.08	4.06	4.13	4.08	4.04	4.08
Space cooling efficiency ηs.c (3)	(%)	165	160	159	162	160	159	160
Sound power level	(dB(A))	89	90	90	90	91	91	92
Compressor								
Circuit 1		1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1
Refrigerant								
Type				R513A				
Charge Circuit 1	(kg)	41	40	42	45	47	57	59
Charge Circuit 2	(kg)	39	38	38	43	41	43	53
Dimensions & Weight								
Length	(mm)	4520	4520	4520	5645	5645	5645	6770
Width	(mm)	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2672	2672	2672	2672	2672	2672	2672
Operating weight (standard noise)	(kg)	3410	3445	3620	4100	4365	4525	4970

Eurovent performances (1)		205*	250	280	310	350	380	410
Net cooling capacity (1) (2)	(kW)	731	861	975	1075	1197	1325	1448
Net EER (1) (2)		2.89	2.87	2.85	2.74	2.74	2.78	2.79
Eurovent Energy class - Cooling		C	C	C	C	C	C	C
Net ESEER (2)		3.83	4.17	4.27	4.19	4.25	4.27	4.32
SEER (3)		4.01	4.19	4.27	4.18	4.48	4.53	4.60
Space cooling efficiency ηs.c (3)	(%)	157	165	168	164	176	178	181
Sound power level	(dB(A))	92	94	95	95	95	96	96
Compressor								
Circuit 1		1	2	2	2	2	2	2
Circuit 2		1	1	1	1	2	2	2
Refrigerant								
Type				R513A				
Charge Circuit 1	(kg)	63	93	96	97	94	98	107
Charge Circuit 2	(kg)	59	45	49	52	91	100	104
Dimensions & Weight								
Length	(mm)	6770	8265	9390	9390	10135	11260	12385
Width	(mm)	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2672	2672	2672	2672	2672	2672	2672
Operating weight (standard noise)	(kg)	5000	6527	6998	7123	8484	8754	8989

(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016
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RTAF SE - Standard Efficiency- Standard and Low Noise

Eurovent performances (1)		090	105	125*	145*	155*	175*	190*
Net cooling capacity (1) (2)	(kW)	321	374	439	522	563	614	675
Net EER (1) (2)		2.94	2.96	2.88	3.01	2.91	2.83	2.91
Eurovent Energy class - Cooling		B	B	C	B	B	C	B
Net ESEER (2)		3.84	3.70	3.73	3.75	3.68	3.78	3.74
SEER (3)		3.85	3.88	3.89	3.94	3.91	3.92	3.95
Space cooling efficiency ηs.c (3)	(%)	151	152	153	155	153	154	155
Sound power level (standard noise)	(dB(A))	96	96	96	97	97	98	98
Sound power level (low noise)	(dB(A))	93	93	93	94	94	95	95
Compressor								
Circuit 1		1	1	1	1	1	1	1
Circuit 2		1	1	1	1	1	1	1
Refrigerant								
Type					R513A			
Charge Circuit 1	(kg)	41	40	42	45	47	57	59
Charge Circuit 2	(kg)	39	38	38	43	41	43	53
Dimensions & Weight								
Length	(mm)	4520	4520	4520	5645	5645	5645	6770
Width	(mm)	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526
Operating weight (standard noise)	(kg)	3310	3345	3520	3980	4245	4405	4830

Eurovent performances (1)		205*	250*	280	310	350	380	410
Net cooling capacity (1) (2)	(kW)	730	860	974	1074	1195	1323	1446
Net EER (1) (2)		2.85	2.82	2.81	2.70	2.70	2.74	2.75
Eurovent Energy class - Cooling		C	C	C	C	C	C	C
Net ESEER (2)		3.72	3.85	3.95	3.85	3.95	3.98	4.00
SEER (3)		3.91	4.03	4.11	4.11	4.19	4.21	4.29
Space cooling efficiency ηs.c (3)	(%)	153	158	161	161	165	165	169
Sound power level (standard noise)	(dB(A))	98	100	101	102	102	102	103
Sound power level (low noise)	(dB(A))	95	97	98	99	99	99	100
Compressor								
Circuit 1		1	2	2	2	2	2	2
Circuit 2		1	1	1	1	2	2	2
Refrigerant								
Type					R513A			
Charge Circuit 1	(kg)	63	93	96	97	94	98	107
Charge Circuit 2	(kg)	59	45	49	52	91	100	104
Dimensions & Weight								
Length	(mm)	6770	8265	9390	9390	10135	11260	12385
Width	(mm)	2200	2200	2200	2200	2200	2200	2200
Height	(mm)	2526	2526	2526	2526	2526	2526	2526
Operating weight (standard noise)	(kg)	4860	6367	6818	6923	8264	8514	8749

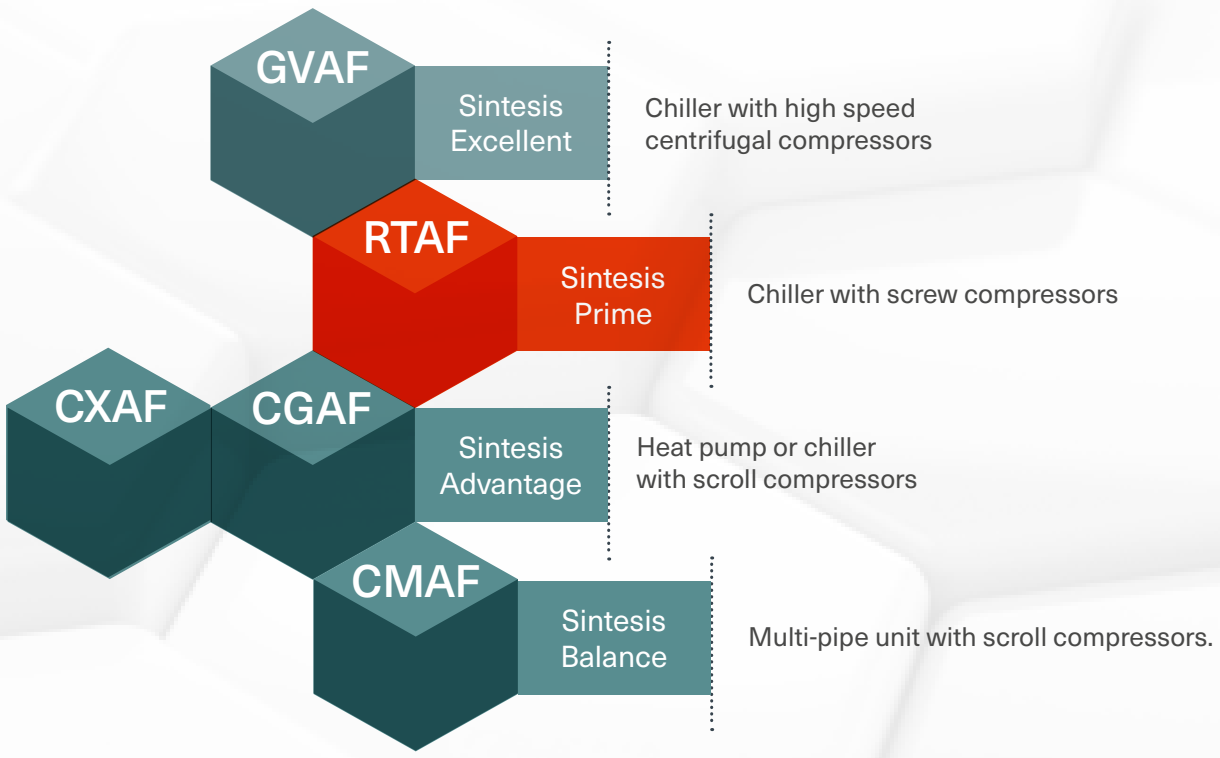
(1) Evaporator 12/7°C and 0.0 m^2K/kW, and condenser at 35°C
(2) Net performances calculated as per EN 14511-2013.
(3) hs,c / SEER as defined in Directive 2009/125/EC of the European Parliament and of the Council with regard to Ecodesign requirements for Comfort Chillers with 2000 kW maximum capacity - COMMISSION REGULATION (EU) N° 2016/2281 of 20 December 2016
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The Trane Sintesis Prime range:

- Unit sizes providing cooling capacities from 300 - 2090 kW
- Five efficiency versions
- Three levels of sound attenuation
- 3 refrigerant alternatives
    - Standard leaving water temperature range from +5°C up to +20°C
    - Low leaving water temperature range from +5°C down to -12°C with Glycol
    - Standard ambient option: from -10°C to 46°C
    - High ambient option: right up to 55°C
    - Low ambient option: right down to -18°C.

Factory-mounted options:

- Hydraulic kit with dual pumps
- Smart flow control
- Partial heat recovery
- Total heat recovery
- Free-cooling

TRANE®

Trane – by Trane Technologies (NYSE: TT), a global climate innovator – creates comfortable, energy efficient indoor environments through a broad portfolio of heating, ventilating and air conditioning systems and controls, services, parts and supply. For more information, please visit *trane.eu* or *tranetechnologies.com.*

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RTAF-SLB001-GB June 2020

Appendix 4.4.1d Catalogue for WL

Product Catalog

Air Cooled Chillers

Model RTAG

085 to 440 Nominal Tons (50 Hz)



January 2019

RTAG-PRC001B-EN

Introduction

The new Trane model RTAG chiller is the result of a search for higher reliability, higher energy efficiency, and lower sound levels for today's environment.

In an effort to reduce energy consumed by HVAC equipment and to continually produce chilled water, Trane has developed the Model RTAG chiller with higher efficiencies and a more reliable design than any other air-cooled chiller available on the market today.

The RTAG chiller uses the proven design of the Trane helical-rotary compressor, which embraces all of the design features that have made the Trane helical-rotary compressor liquid chillers such a success since 1987.

Trane RTAG chillers offers high reliability coupled with greatly improved energy efficiency, and improved acoustical performance, due to its advanced design, low-speed, direct-drive compressor, and high efficiency evaporator.

The major advantages of the RTAG chiller are:
• Lower sound levels
• Higher energy efficiency at full load & part load.
The model RTAG chiller is an industrial-grade design, built for both the industrial and commercial markets. It is ideal for schools, hotels, hospitals, retailers, office buildings, and industrial applications RTAG chillers are available in 3 or 4 sound levels and 3 efficiencies levels to answer accurately to every customer's needs.

Sound levels
- Standard Noise
- Medium Low Noise (compressor or tube sound attenuation)
- Low Noise (compressor + tube sound wrap)
- Low Noise + night noise set back

Efficiency levels
- High Efficiency (H)
- Extra High Efficiency (X)
- Premium seasonal efficiency (P)

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Features and Benefits

The Helical-Rotary Compressor

- Unequaled-reliability. The Trane helical-rotary compressor is designed, built, and tested to the same demanding and rugged standards as the Trane scroll compressors, the centrifugal compressors, and the previous generation helical-rotary compressors used in both air- and water-cooled chillers for more than 29 years.
- Years of research and testing. The Trane helical-rotary compressor has amassed thousands of hours of testing, much of it at severe operating conditions beyond normal commercial air-conditioning applications.
- Proven track record. The Trane Company is the world's largest manufacturer of large helical- rotary compressors used for refrigeration. Over 300,000 compressors worldwide have proven that the Trane helical- rotary compressor has a reliability rate of greater than 99.5% in the first year of operation — unequaled in the industry.
- Resistance to liquid slugging. The robust design of the Series R compressor can ingest amounts of liquid refrigerant that normally would severely damage compressor.
- Fewer moving parts. The helical-rotary compressor has only two rotating parts: the male rotor and the female rotor.
- Direct-drive, low-speed, semi-hermetic compressor for high efficiency and high reliability.
- Field-serviceable compressor for easy maintenance.
- Suction-gas-cooled motor. The motor operates at lower temperatures for longer motor life.
- Five minute start-to-start and two minute stop to start anti-recycle timer allows for closer water-loop temperature control.

Capacity Control and Load Matching

The combination patented unloading system on Trane helical-rotary compressors uses the variable unloading valve for the majority of the unloading function. This allows the compressor to modulate infinitely, to exactly match building load and to maintain chilled-water supply temperatures within ± 0.3℃ [±0.5°F] of the set point. Helical- rotary chillers that rely on stepped capacity control must run at a capacity equal to or greater than the load, and typically can only maintain water temperature to around ± 1℃ [±2°F]. Much of this excess capacity is lost because overcooling goes toward removing building latent heat, causing the building to be dried beyond normal comfort requirements.

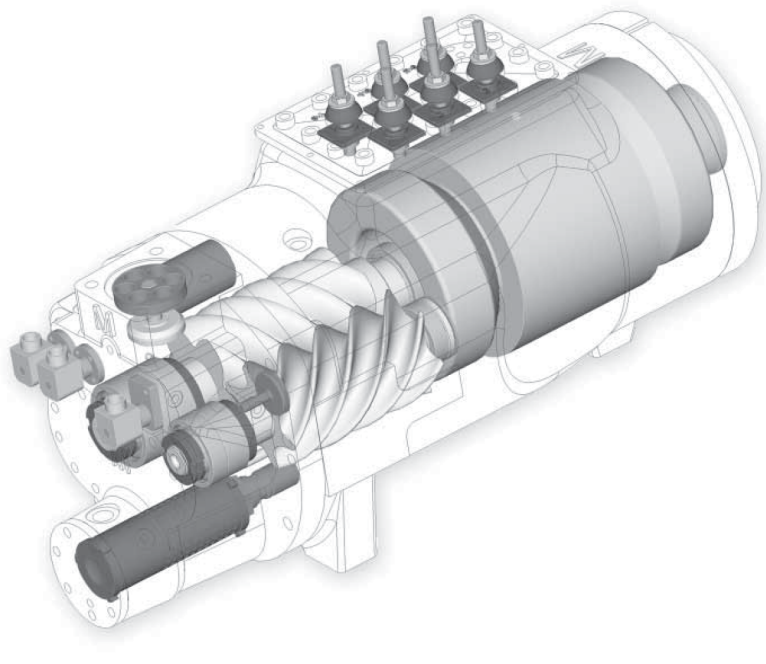


Figure 1 – Cutaway of a compressor

On RTAG P version, the combination of the variable unloading valve plus the adaptive frequency drive allow to exactly match building load and get excellent efficiencies at full load and part load.

Close Spacing Installation

The RTAG chiller has the tightest recommended side clearance in the industry, 1.2 meter, but that is not all. In situations where equipment must be installed with less clearance than recommended, which frequently occurs in retrofit applications, restricted airflow is common. Conventional chillers may not work at all. However, the RTAG chiller with the Adaptive Control™ microprocessor will make as much chilled water as possible given the actual installed conditions, stay online during any unforeseen abnormal conditions, and optimize its performance. Consult your sales engineer for more details.

Factory Testing Means Trouble-Free Start-up

All RTAG chillers are given a complete functional test at the factory. This computer-based test program completely checks the sensors, wiring, electrical components, microprocessor function, communication capability, expansion valve performance, and fans. In addition, each compressor is run-tested to verify capacity and efficiency. Where applicable, each unit is factory preset to the customer's design conditions. An example would be the leaving-liquid temperature set point. The result of this test program is that the chiller arrives at the job site fully tested and ready for operation

Factory-Installed and Tested Controls and Options Speed Installation

All RTAG chiller options, including low ambient control, ambient temperature sensor, low ambient lockout, communication interface controls are factory installed and tested. Some manufacturers send accessories in pieces to be field installed. With Trane, the customer saves on installation expense and has assurance that ALL chiller controls and options have been tested and will function as expected.

CHIL evaporator

Trane developed an evaporator specially designed for air-cooled chillers. CHIL evaporator optimizes the flow of the refrigerant to get an excellent heat exchange with water in every operating condition and minimize the quantity of refrigerant used.

Fans

RTAG chillers use EC fans (P series) or have EC fans option (H and X series) in order to reduce power consumption at full load and at part load. EC fans allow a significant reduction of sound level and a better operation of the chiller at low ambient conditions.

Superior Control with UC 800™ Chiller Controls

The Adaptive Control™ microprocessor system enhances the RTAG chiller by providing the very latest chiller control technology. With the Adaptive Control microprocessor, unnecessary service calls and unhappy tenants are avoided. The unit does not nuisance-trip or unnecessarily shut down. Only when the Tracer chiller controls have exhausted all possible corrective actions and the unit is still violating an operating limit, will the chiller shut down. Controls on other equipment typically shut down the chiller, usually just when it is needed the most.

For Example:
A typical five-year-old chiller with dirty coils might trip out on high- pressure cutout on a 38°C [100°F] day in August. A hot day is just when comfort cooling is needed the most. In contrast, the RTAG chiller with an Adaptive Control microprocessor will stage fans on, modulate the electronic expansion valve, and modulate the slide valve as it approaches a high-pressure cutout, thereby keeping the chiller on line when you need it the most, on high ambient temperatures.

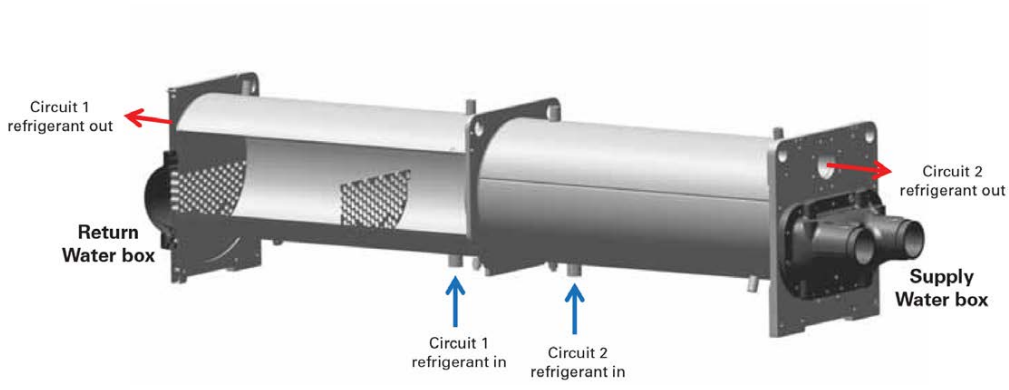


Figure 2 – CHIL Evaporator



Figure 3 – EC fan

Options

Application options

Low ambient
The low ambient option adds unit controls, EC fan to allow start and operation when the unit works with ambient temperatures down to -18℃ (-0.4°F). High side of ambient range remains at 46℃ (115°F).

High ambient
The high ambient option adds unit controls, EC fan, oil coolers and oversized electrical components to allow start and operation up to ambient temperatures of 52℃ (125°F) operation. Low side of ambient range remains at 0℃(32°F).

Wide ambient
The wide ambient option adds unit controls, EC fan, oil coolers and electrical components to allow start and operation up to ambient temperatures of 52℃ (125°F) operation. down to ambient temperatures of -18℃(-0.4°F).

Sound level options

Low noise
Low noise option of Sound Treatment use sound wrap to reduce the compressor, suction and discharge line, oil separator noise; low noise with night noise setback is implement with both sound wrap and variable speed fan, adjust fan speed.

Medium low noise
Medium low noise option of Sound Treatment use sound wrap depends compressor configuration: N5, N6 use tube sound wrap, N6E2 use compressor sound box. this option is only for unit nominal tonnage >225.

Control options

BACnet™ communications interface
Allows the user to easily interface with BACnet via a single twisted pair wiring to a factory installed and tested communication board.

LonTalk™ (LCI-C) Communications Interface
Provides the LonMark chiller profile inputs/outputs for use with a generic building automation system via a single twisted pair wiring to a factory installed and tested communication board.

ModBus™ Communications Interface
Allows the user to easily interface with ModBus via a single twisted pair wiring to a factory installed and tested communication board.

External chilled water setpoint
UC800 accepts either a 2-10 VDC or a 4-20mA input signal, to adjust the chilled water setpoint from a remote location.

External current limit setpoint
UC800 accepts either a 2-10VDC or a 4-20mA input signal to adjust the current limit setpoint from a remote location.

Run test report

Run test report gives the results of the performance test of the unit in the design conditions specified in the order write up with water without glycol.

The data recorded are: cooling capacity, power input, air temperature, water entering temperature, water leaving temperature and water flow.
* Components may differ depending on unit model and size. Contact your local sales office for details.

Other Options

Relief valves
Dual relief valve plus 3 way valve on low pressure side.

High performance insulation
Evaporator is insulated with 2 layers of Armaflex II or equivalent of 19 mm (3/4 inches) thickness and K factor of 0,26 W/m²°K.

Neoprene isolators
Isolators provide isolation between chiller and structure to help eliminate vibration transmission and have an efficiency of 95% minimum.

Export shipping package
Metallic clog are fixed on the base frame of the unit.
It prevents direct contact between the chiller and the container while loading and unloading from the container.

Disconnect with circuit breaker
The unit is equipped with a circuit breaker for each circuit.

Operating Map
To choose the unit configuration, refer to operating map figure below: Standard ambient, High ambient, Low ambient, or Wide ambient.
* Standard ambient units:
  -0℃ ≤ Air temperature ≤ 46℃.
* Low ambient units:
  -18℃ ≤ Air temperature ≤ 46℃
* High ambient units:
  -0℃ ≤ Air temperature ≤ 52℃
* Wide ambient units:
  -18℃ ≤ Air temperature ≤ 52℃

Application Considerations

Important

Certain application constraints should be considered when sizing, selecting, and installing Trane RTAG chillers. Unit and system reliability is often dependent on properly and completely complying with these considerations. When the application varies from the guidelines presented, it should be reviewed with your local sales engineer.

Unit Sizing

Unit capacities are listed in the performance data section. Intentionally oversizing a unit to ensure adequate capacity is not recommended. Erratic system operation and excessive compressor cycling are often a direct result of an oversized chiller. In addition, an oversized unit is usually more expensive to purchase, install, and operate. If oversizing is desired, consider using two units.

Water Treatment

Dirt, scale, products of corrosion, and other foreign material will adversely affect heat transfer between the water and system components. Foreign matter in the chilled-water system can also increase pressure drop and, consequently, reduce water flow. Proper water treatment must be determined locally, depending on the type of system and local water characteristics. Neither salt nor brackish water is recommended for use in Trane RTAG chillers. Use of either will lead to a shortened chiller life. Trane encourages the employment of a reputable water-treatment specialist, familiar with local water conditions, to assist in this determination and in the establishment of a proper water- treatment program.

Effect of Altitude on Capacity

RTAG chiller capacities given in the performance data tables are for use at sea level. At elevations substantially above sea level, the decreased air density will reduce condenser capacity and, therefore, unit capacity and efficiency.

Ambient Limitations

Trane RTAG chillers are designed for year-round operation over a range of ambient temperatures. The RTAG chiller will operate in ambient temperatures of 0 to 46°C [32 to 115°F]. Selecting the high-ambient option will allow the chiller to operate in ambient temperatures of 52°C [125°F], and selecting the low-ambient option will increase the operational capability of the water chiller to ambient temperatures as low as -18°C [-0.4°F] and selecting the wide ambient option will increase the operational capability of the water chiller to ambient temperatures as –18 to 52°C [-0.4 to 125°F].For operation outside of these ranges, contact the local sales office.

Water Flow Limits

The minimum water flow rates are given in Tables 1 to 6. Evaporator flow rates below the tabulated values will result in laminar flow and cause freeze-up problems, scaling, stratification, and poor control.
The maximum evaporator water flow rate is also given in the general data section. Flow rates exceeding those listed may result in excessive tube erosion.

Flow Rates Out of Range

Many process cooling jobs require flow rates that cannot be met with the minimum and maximum published values within the Model RTAG evaporator. A simple piping change can alleviate this problem. For example: a plastic injection molding process requires 5.0 l/s [80 gpm] of 10°C [50°F] water and returns that water at 15.6°C [60°F]. The selected chiller can operate at these temperatures, but has a minimum flow rate of 7.6 l/s [120 gpm]. The following system can satisfy the process.

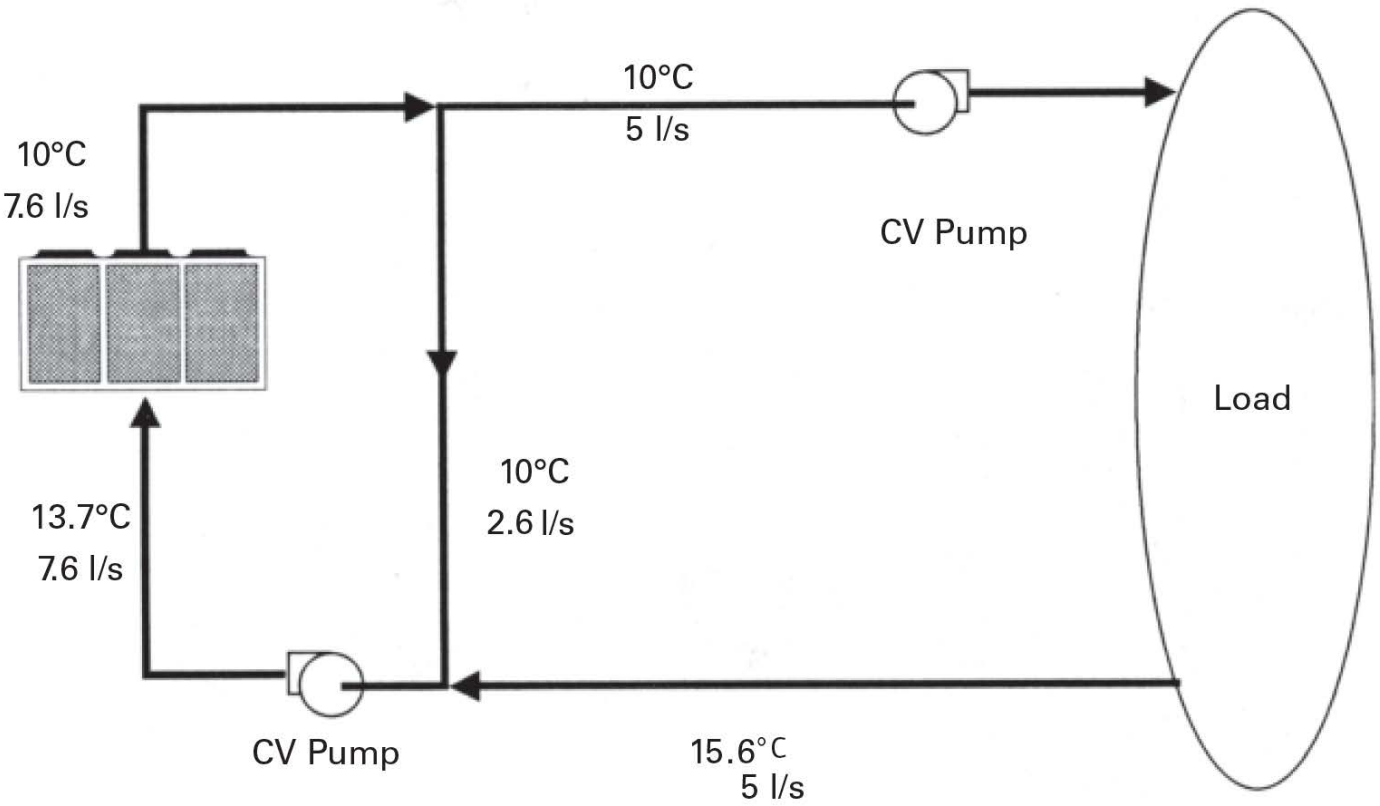


Figure 4 – Flow rate Out of Range

Flow Control

Trane requires the chilled water flow control in conjunction with the RTAG Chiller to be done by the chiller.
This will allow the chiller to protect itself in potentially harmful conditions.

Leaving-Water Temperature Limits

The standard leaving solution temperature range is 4 to 20°C [39 to 68°F]. Since liquid supply temperature set points less than 4°C [39°F] result in suction temperatures at or below the freezing point of water.

Leaving-Water Temperature

Out of Range

Many process cooling jobs require temperature ranges that cannot be met with the minimum and maximum published values. A simple piping change can alleviate this problem. For example: a laboratory load requires 7.6 l/s [120 gpm] of water entering the process at 29.4°C [85°F] and returning at 35°C [95°F]. The accuracy required is higher than the cooling tower can give. The selected chiller has adequate capacity, but has a maximum leaving-chilled-water temperature of 20°C [68°F]. In the example shown, both the chiller and process flow rates are equal. This is not necessary. For example, if the chiller had a higher flow rate, there would be more water bypassing and mixing with warm water.

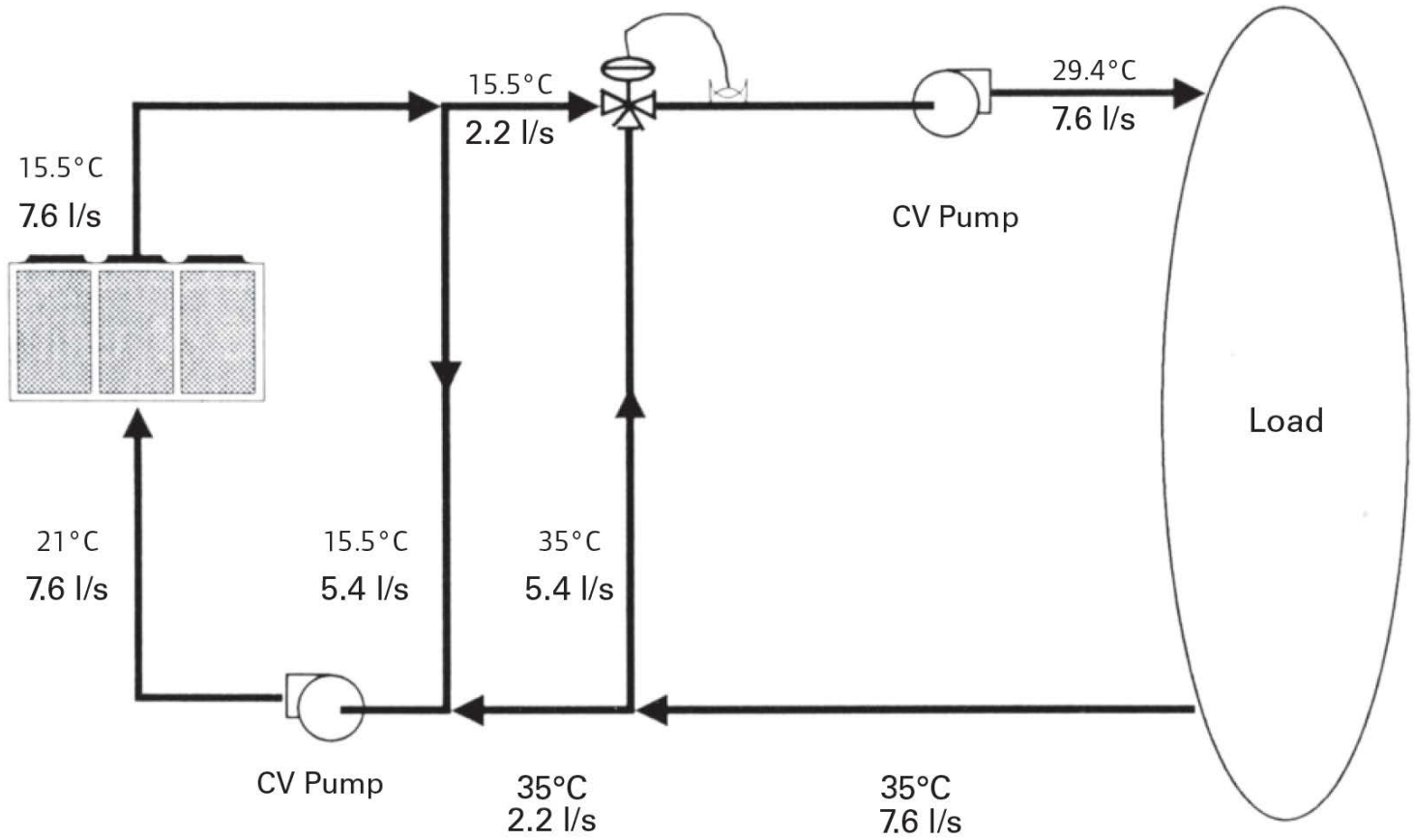


Figure 5 – Temperature Out of Range

Supply-Water Temperature Drop

The performance data for the Trane RTAG chiller is based on a chilled-water temperature drop of 5.6°C [10°F]. Chilled-water temperature drops from 3.3 to 10°C [38 to 50°F] may be used as long as minimum and maximum water temperature, and minimum and maximum flow rates, is not violated. Temperature drops outside this range are beyond the optimum range for control, and may adversely affect the microcomputer's ability to maintain an acceptable supply-water temperature range. When temperature drops are less than 3.3°C [38°F], an evaporator runaround loop may be required.

Short Water Loops

The proper location of the temperature control sensor is in the supply (outlet) water connection or pipe. This location allows the building to act as a buffer and assures a slowly-changing return-water temperature. If there is not a sufficient volume of water in the system to provide an adequate buffer, temperature control can be lost, resulting in erratic system operation and excessive compressor cycling. A short water loop has the same effect as attempting to control using the building return water. Typically, a two-minute water loop is sufficient to prevent a short water loop. Therefore, as a guideline, ensure that the volume of water in the evaporator loop equals or exceeds two times the evaporator flow rate per minute. For a rapidly changing load profile, the amount of volume should be increased. To prevent the effect of a short water loop, the following item should be given careful consideration: a storage tank or larger header pipe to increase the volume of water in the system and, therefore, reduce the rate of change of the return water temperature.

Application Types

- Comfort cooling
- Industrial process cooling
- Low-temperature process cooling

Model Number Descriptions

R	T	A	G	1	9	0	C	C	A	0	P	0	C	S	N	D	X	F	N	L	2	S	T	X	X	X	C	X	0	X	F	R	V	0	D	1	N	N	1
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

Digit 1-4 - Unit Model
RTAG = Air Cooled Series chiller

Digit 5-7 - Unit Nominal Tons
085 = 85 Nominal Tons
100 = 100 Nominal Tons
125 = 125 Nominal Tons
145 = 145 Nominal Tons
155 = 155 Nominal Tons
170 = 170 Nominal Tons
190 = 190 Nominal Tons
205 = 205 Nominal Tons
225 = 225 Nominal Tons
255 = 255 Nominal Tons
285 = 285 Nominal Tons
310 = 310 Nominal Tons
340 = 340 Nominal Tons
375 = 375 Nominal Tons
400 = 400 Nominal Tons
410 = 410 Nominal Tons
440 = 440 Nominal Tons

Digit 08 - Unit Voltage
C = 380V/50Hz/3Ph
D = 400V/50Hz/3Ph
6 = 415V/50Hz/3Ph

Digit 09 - Manufacturing Location
C = Taicang, China

Digit 10, 11 - Design Sequence
XX-Factory/ABU Assigned

Digit 12 - Unit Type
H = High Efficiency
X = Extra High Efficiency
P =Premium seasonal efficiency

Digit 13 - Safety Agency Listing
N = No Safety Agency Listing

Digit 14 - Pressure Vessel Code
A = ASME Pressure Vessel Code
C = Chinese Pressure Vessel Code

Digit 15 - Sound Treatment
S = Standard
X = Medium low noise (compressor or tube sound attenuation)
L = Low noise(compressor +tube sound wrap)
M = Low noise + night noise set back

Digit 16 - Unit Application
N= Standard Ambient 32-114.8°F (0-46°C)
H= High Ambient 32-125°F (0-52°C)
L= Low Ambient 0-114.8°F (-18-46°C)
W= Wide Ambient 0-125°F (-18-52°C)

Digit 17 - Relief Valve Option
S = Single Relief Valve
D = Dual Relief Valve With 3 Way Valve

Digit 18 - Flow Switch
X = No Flow Switch
F = Field Installed Flow Switch

Digit 19 - Water Connection
F = Flange

Digit 20 - Evaporator Application
N = Standard Cooling (4 to 20°C)

Digit 21 - Evaporator Water Pressure
L= 150psi
H= 300psi

Digit 22 - Evaporator Configurations
1 = 1 Pass Evaporator (255-440)
2 = 2 Pass Evaporator (85 - 225)

Digit 23 - Thermal Insulation
S = Standard Thermal Insulation

Digit 24 - Condenser Options
T = Normal Tube Fin Coil

Digit 25 - Heat Recovery
X = No Heat Recovery

Digit 26 - Pump Package
X = Pump Signal On/Off

Digit 27 - Free Cooling
X= None

Digit 28 - Unit Operator Interface Language
C = Chinese
E = English

Digit 29 - Remote Communications Options
X = None
L = Lontalk Interface
M = Modbus Interface
B = BACnet Interface

Digit 30 - Easy Remote Controller
0 = Without

Digit 31 - External Set Points & Capacity Outputs
X = None
A = External Set Points & Capacity Outputs

Digit 32 - Refrigerant Charge
F = Full Charge
N = Nitrogen
P = 12kg Charge

Digit 33 - Factory Tests
R = Standard Functional Test
P = Non-witnessed Performance Test, With Report
W = Customer-witnessed Performance Test, With Report

Digit 34 - Compressor Motor Starter Type
V = VFD
Y = Wye-delta closed transition

Digit 35 - Harmonic Filter
0 = None

Digit 36 - Power Line Connection Type
T= Terminal Block Connection
C = Circuit Breaker
D = Mech Disconnect Switch

Digit 37 - Incoming Power Line
1 = Single Point Power Connection (85-225)
2 = Dual Point Power Connection (255-440)

Digit 38 - Control Output Accessories Options
N = No Output Options
A = Alarm Relay Outputs

Digit 39 - Appearance Options
N = No Appearance Options

Digit 40 - Unit Isolation Installation Accessory
N = None
R = Neoprene Isolators

General Data

General Data - 50Hz - High efficiency

Model			100H	125H	145H	155H	170H	190H	205H
compressor	type		screw compressor						
	starter type		Wye-Delta Closed Transition Starter						
	circuit no.		1	2	2	2	2	2	2
	min load %		30%	15%	15%	15%	15%	15%	15%
Evaporator	type		Flooded (CHIL)						
	flow rate	gpm	229.5	288.0	333.6	359.1	388.8	427.1	460.6
	Pressure drop (WPD)	psid	4.9	4.5	6.0	5.9	4.5	5.4	4.9
	Connection	inch	4	5	5	5	6	6	6
Condenser	fan type		Direct drive propeller						
	fan no.		6	8	8	8	8	10	10
	fan input power	kW/fan	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	Fan speed	RPM	950	950	950	950	950	950	950
	Air flow / fan	CFM	10584	10584	10584	10584	10584	10584	10584
RLA	comp1A	A	203	140	140	170	170	203	203
	comp1B	A	NA	NA	NA	NA	NA	NA	NA
	comp2A	A	NA	98	140	140	170	170	203
	comp2B	A	NA	NA	NA	NA	NA	NA	NA
LRA	comp1A	A	406	273	273	373	373	406	406
	comp1B	A	NA	NA	NA	NA	NA	NA	NA
	comp2A	A	NA	190	273	273	373	373	406
	comp2B	A	NA	NA	NA	NA	NA	NA	NA
Inrush		A	406	371	413	513	543	576	609
Max. RLA			244	286	336	372	408	448	487
Power type			380V/50Hz/3Ph						
Refrigerant			R134a						
Refrigerant Charge	ckt1	lb	207	176	167	167	167	179	181
	ckt2	lb	NA	137	167	167	167	179	181
Oil Charge	ckt1	gal	2.1	1.6	1.6	1.8	2.1	2.1	2.1
	ckt2	gal	NA	1.6	1.6	1.6	2.1	2.1	2.1
Dimension	Length	inch	151	198	198	198	198	244	244
	Width	inch	88	88	88	88	88	88	88
	Height	inch	98	98	98	98	98	98	98
Unit shipping weight		lb	6184	8426	9105	9202	9570	10360	10578
Operating weight		lb	6527	8920	9621	9746	10147	10958	11211

Note:

1. Cooling condition: evaporating water temperature 54 °F/44°F, ambient temperature 95°F, fouling factor 0.0001 ft²·°F·h/Btu.
2. EC fans will be applicated when Super Low Noise (85 to 205 model) or Suppler Low noise with night setback (225 to 440 model) chosen.
3. EC fans will be applicated when Wide ambient temperature or Low ambient temperature chosen.
4. Single power connection: model 85 to 225; dual power connection: model 255 to 440.

General Data - 50Hz - High efficiency

Model			225H	255H	285H	310H	340H	375H	400H	440H
compressor	type		screw compressor							
	starter type		Wye-Delta Closed Transition Starter							
	circuit no.		2	2	2	2	2	2	2	2
	min load %		15%	10%	10%	10%	10%	7.5%	7.5%	7.5%
Evaporator	type		Flooded (CHIL)							
	flow rate	gpm	521.3	592.2	669.8	741.0	779.4	869.4	933.5	1039.6
	Pressure drop (WPD)	psid	5.2	5.7	5.8	5.7	6.3	6.1	5.8	4.7
	Connection	inch	6	6	6	6	6	8	8	8
Condenser	fan type		Direct drive propeller							
	fan no.		12	14	14	16	16	18	18	20
	fan input power	kW/fan	1.5	1.5	1.8	1.8	1.8	1.8	1.8	1.8
	Fan speed	RPM	950	950	970	970	970	970	970	970
	Air flow / fan	CFM	10584	10584	11772	11772	11772	11772	11772	11772
RLA	comp1A	A	203	170	170	203	203	170	203	203
	comp1B	A	NA	170	203	203	203	203	203	203
	comp2A	A	203	170	203	203	203	170	203	203
	comp2B	A	NA	NA	NA	NA	NA	203	203	203
LRA	comp1A	A	385	354	354	385	385	354	385	385
	comp1B	A	NA	354	385	385	385	385	385	385
	comp2A	A	385	354	385	385	385	354	385	385
	comp2B	A	NA	NA	NA	NA	NA	385	385	385
Inrush		A	753	631/441	714/524	753/524	753/524	714/708	747/741	747/747
Max. RLA			542	455/226	495/266	542/266	542/266	495/489	536/530	536/536
Power type			380V/50Hz/3Ph							
Refrigerant			R134a							
Refrigerant Charge	ckt1	lb	216	309	309	348	384	326	326	403
	ckt2	lb	216	152	152	165	165	326	326	403
Oil Charge	ckt1	gal	2.1	4.2	4.2	4.2	4.2	4.2	4.2	4.2
	ckt2	gal	2.1	2.1	2.1	2.1	2.1	4.2	4.2	4.2
Dimension	Length	inch	291	354	354	399	399	445	445	465
	Width	inch	88	88	88	88	88	88	88	88
	Height	inch	98	98	98	98	98	98	98	98
Unit shipping weight		lb	11804	15700	16184	17699	17734	20308	20639	22481
Operating weight		lb	12067	15933	16449	18001	18036	20641	21007	22935

Note:

1. Cooling condition: evaporating water temperature 54 °F/44°F, ambient temperature 95°F, fouling factor 0.0001 ft²·°F·h/Btu.
2. EC fans will be applicated when Super Low Noise (85 to 205 model) or Suppler Low noise with night setback (225 to 440 model) chosen.
3. EC fans will be applicated when Wide ambient temperature or Low ambient temperature chosen.
4. Single power connection: model 85 to 225; dual power connection: model 255 to 440.

General Data - 50Hz - Extra high efficiency model

Model			85X	100X	125X	145X	155X	170X	190X	205X
compressor	type		screw compressor							
	starter type		Wye-Delta Closed Transition Starter							
	circuit no.		1	1	2	2	2	2	2	2
	min load %		30%	30%	15%	15%	15%	15%	15%	15%
Evaporator	type		Flooded (CHIL)							
	flow rate	gpm	197.7	237.9	298.1	345.4	372.1	403.1	438.4	476.4
	Pressure drop (WPD)	psid	4.4	5.3	3.6	5.4	5.6	4.9	5.7	4.4
	Connection	inch	4	4	5	5	5	6	6	6
Condenser	fan type		Direct drive propeller							
	fan no.		6	6	10	10	10	10	12	12
	fan input power	kW/fan	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	Fan speed	RPM	950	950	950	950	950	950	950	950
	Air flow / fan	CFM	10584	10584	10584	10584	10584	10584	10584	10584
RLA	comp1A	A	170	203	140	140	170	170	203	203
	comp1B	A	NA	NA	NA	NA	NA	NA	NA	NA
	comp2A	A	NA	NA	98	140	140	170	170	203
	comp2B	A	NA	NA	NA	NA	NA	NA	NA	NA
LRA	comp1A	A	373	406	273	273	373	373	406	406
	comp1B	A	NA	NA	NA	NA	NA	NA	NA	NA
	comp2A	A	NA	NA	190	273	273	373	373	406
	comp2B	A	NA	NA	NA	NA	NA	NA	NA	NA
Inrush		A	373	406	371	413	513	543	576	609
Max. RLA			204	243.6	285.6	336	372	408	447.6	487.2
Power type			380V/50Hz/3Ph							
Refrigerant			R134a							
Refrigerant Charge	ckt1	lb	207	220	196	187	187	187	198	201
	ckt2	lb	NA	NA	157	187	187	187	198	201
Oil Charge	ckt1	gal	1.6	1.6	1.6	1.6	1.8	2.1	2.1	2.1
	ckt2	gal	NA	NA	1.6	1.6	1.6	2.1	2.1	2.1
Dimension	Length	inch	151	151	244	244	244	244	291	291
	Width	inch	88	88	88	88	88	88	88	88
	Height	inch	98	98	98	98	98	98	98	98
Unit shipping weight		lb	6041	6415	9405	10161	10245	10613	11114	11354
Operating weight		lb	6367	6767	9953	10731	10829	11229	11752	12051

Note:

1. Cooling condition: evaporating water temperature 54°F/44°F ambient temperature 95°F, fouling factor 0.0001 ft²·°F·h/Btu.
2. EC fans will be applicated when Super Low Noise (85 to 205model) or Suppler Low noise with night setback (225 to 440 model) chosen.
3. EC fans will be applicated when Wide ambient temperature or Low ambient temperature chosen.
4. Single power connection: model 85 to 225; dual power connection: model 255 to 440.

General Data - 50Hz - Extra high efficiency model

Model			225X	255X	285X	310X	340X	375X	400X	410X	440X
compressor	type		screw compressor								
	starter type		Wye-Delta Closed Transition Starter								
	circuit no.		2	2	2	2	2	2	2	2	2
	min load %		15%	10%	10%	10%	10%	7.5%	7.5%	7.5%	7.5%
Evaporator	type		Flooded (CHIL)								
	flow rate	gpm	532.2	604.8	693.6	752.1	797.3	886.0	951.8	980.8	1063.7
	Pressure drop (WPD)	psid	4.5	6.0	6.2	5.8	6.5	5.2	5.1	5.4	4.9
	Connection	inch	6	6	6	6	6	8	8	8	8
Condenser	fan type		Direct drive propeller								
	fan no.		14	16	18	18	20	20	20	24	24
	fan input power	kW/fan	1.5	1.5	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	Fan speed	RPM	950	950	970	970	970	970	970	970	970
	Air flow / fan	CFM	10584	10584	11772	11772	11772	11772	11772	11772	11772
RLA	comp1A	A	203	170	170	203	203	170	203	203	203
	comp1B	A	NA	170	203	203	203	203	203	203	203
	comp2A	A	203	170	203	203	203	170	203	203	203
	comp2B	A	NA	NA	NA	NA	NA	203	203	203	203
LRA	comp1A	A	385	354	354	385	385	354	385	385	385
	comp1B	A	NA	354	385	385	385	385	385	385	385
	comp2A	A	385	354	385	385	385	354	385	385	385
	comp2B	A	NA	NA	NA	NA	NA	385	385	385	385
Inrush		A	759	637/441	720/530	753/530	759/530	717/717	747/747	753/753	753/753
Max. RLA			548	461/226	501/272	542/272	548/272	495/495	536/536	542/542	542/542
Power type			380V/50Hz/3Ph								
Refrigerant			R134a								
Refrigerant Charge	ckt1	lb	229	344	364	366	437	368	368	384	445
	ckt2	lb	229	152	170	183	181	368	368	384	445
Oil Charge	ckt1	gal	2.1	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
	ckt2	gal	2.1	2.1	2.1	2.1	2.1	4.2	4.2	4.2	4.2
Dimension	Length	inch	339	399	445	445	465	465	465	585	585
	Width	inch	88	88	88	88	88	88	88	88	88
	Height	inch	98	98	98	98	98	98	98	98	98
Unit shipping weight		lb	13075	16964	18249	18439	19120	22006	22291	23808	24943
Operating weight		lb	13364	17198	18514	18741	19422	22374	22695	24211	25397

Note:

1. Cooling condition: evaporating water temperature 54°F/44°F ambient temperature 95°F, fouling factor 0.0001 ft²·°F·h/Btu.
2. EC fans will be applicated when Super Low Noise (85 to 205model) or Suppler Low noise with night setback (225 to 440 model) chosen.
3. EC fans will be applicated when Wide ambient temperature or Low ambient temperature chosen.
4. Single power connection: model 85 to 225; dual power connection: model 255 to 440.

General Data - 50Hz - Premium seasonal efficiency

Model			85P	100P	125P	145P	155P	170P	190P	205P
compressor	type		screw compressor							
	starter type		Adaptive Frequency Driver							
	circuit no.		1	1	2	2	2	2	2	2
	min load %		36%	36%	18%	18%	18%	18%	18%	18%
Evaporator	type		Flooded (CHIL)							
	flow rate	gpm	194.2	232.1	298.2	345.7	368.5	395.0	430.4	466.8
	Pressure drop (WPD)	psid	4.2	5.0	4.1	5.4	5.5	4.7	5.5	4.2
	Connection	inch	4	4	5	5	5	6	6	6
Condenser	fan type		Direct drive propeller (EC Fan)							
	fan no.		6	6	10	10	10	10	12	12
	fan input power	kW/fan	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	Fan speed	RPM	"Max:910 Min:200"	"Max:910 Min:200"	"Max:910 Min:200"	"Max:910 Min:200"	"Max:910 Min:200"	"Max:910 Min:200"	"Max:910 Min:200"	"Max:910 Min:200"
	Air flow / fan	CFM	10036	10036	10036	10036	10036	10036	10036	10036
RLA	comp1A	A	170	203	140	140	170	170	203	203
	comp1B	A	NA	NA	NA	NA	NA	NA	NA	NA
	comp2A	A	NA	NA	98	140	140	170	170	203
	comp2B	A	NA	NA	NA	NA	NA	NA	NA	NA
LRA	comp1A	A	170	203	140	140	170	170	203	203
	comp1B	A	NA	NA	NA	NA	NA	NA	NA	NA
	comp2A	A	NA	NA	98	140	140	170	170	203
	comp2B	A	NA	NA	NA	NA	NA	NA	NA	NA
Inrush		A	195	228	285	327	357	387	420	453
Max. RLA			204	244	286	336	372	408	448	487
Power type			380V/50Hz/3Ph							
Refrigerant			R134a							
Refrigerant Charge	ckt1	lb	207	220	196	187	187	187	198	201
	ckt2	lb	NA	NA	157	187	187	187	198	201
Oil Charge	ckt1	gal	2.1	2.1	1.6	1.6	1.8	2.1	2.1	2.1
	ckt2	gal	NA	NA	1.6	1.6	1.6	2.1	2.1	2.1
Dimension	Length	inch	156	156	249	249	249	249	296	296
	Width	inch	88	88	88	88	88	88	88	88
	Height	inch	98	98	98	98	98	98	98	98
Unit shipping weight		lb	6658	7033	10243	10999	11083	11451	11951	12192
Operating weight		lb	6989	7388	10791	11569	11666	12067	12590	12889

Note:

1. Cooling condition: evaporating water temperature 54F/44°F, ambient temperature 95°F, fouling factor 0.0001 ft²·°F·h/Btu.
2. Single power connection: model 85 to 225; dual power connection: model 255 to 440.

General Data - 50Hz - Premium seasonal efficiency

Model			225P	255P	285P	310P	340P	375P	400P	440P
compressor	type		screw compressor							
	starter type		Wye-Delta Closed Transition Starter			Adaptive Frequency Driver				
	circuit no.		2	2	2	2	2	2	2	2
	min load %		18%	12%	12%	12%	12%	9.0%	9.0%	9.0%
Evaporator	type		Flooded (CHIL)							
	flow rate	gpm	511.4	582.1	663.6	734.7	773.2	863.7	926.3	1032.3
	Pressure drop (WPD)	psid	5.0	5.5	5.7	5.6	6.2	6.0	5.7	4.6
	Connection	inch	6	6	6	6	6	8	8	8
Condenser	fan type		Direct drive propeller							
	fan no.		12	14	14	16	16	18	18	20
	fan input power	kW/fan	1.5	1.5	1.8	1.8	1.8	1.8	1.8	1.8
	Fan speed	RPM	"Max:910 Min:200"	"Max:910 Min:200"	"Max:970 Min:200"	"Max:970 Min:200"	"Max:970 Min:200"	"Max:970 Min:200"	"Max:970 Min:200"	"Max:970 Min:200"
	Air flow / fan	CFM	10036	10036	11772	11772	11772	11772	11772	11772
RLA	comp1A	A	203	170	170	203	203	170	203	203
	comp1B	A	NA	170	203	203	203	203	203	203
	comp2A	A	203	170	203	203	203	170	203	203
	comp2B	A	NA	NA	NA	NA	NA	203	203	203
LRA	comp1A	A	203	170	170	203	203	170	203	203
	comp1B	A	NA	354	385	385	385	385	385	385
	comp2A	A	203	170	203	203	203	170	203	203
	comp2B	A	NA	NA	NA	NA	NA	385	385	385
Inrush		A	546	631/226	670/266	753/266	753/266	631/631	747/741	747/747
Max. RLA			546	631/226	670/266	753/266	753/266	631/631	747/741	747/747
Power type			380V/50Hz/3Ph							
Refrigerant			R134a							
Refrigerant Charge	ckt1	lb	216	309	309	348	384	326	326	403
	ckt2	lb	216	152	152	165	165	326	326	403
Oil Charge	ckt1	gal	2.1	4.2	4.2	4.2	4.2	4.2	4.2	4.2
	ckt2	gal	2.1	2.1	2.1	2.1	2.1	4.2	4.2	4.2
Dimension	Length	inch	296	362	362	409	409	455	455	465
	Width	inch	88	88	88	88	88	88	88	88
	Height	inch	98	98	98	98	98	98	98	98
Unit shipping weight		lb	12642	16471	16956	18470	18506	21080	21410	22922
Operating weight		lb	12904	16705	17221	18772	18808	21413	21779	23376

Note:

1. Cooling condition: evaporating water temperature 54F/44°F, ambient temperature 95°F, fouling factor 0.0001 ft²·°F·h/Btu.
2. Single power connection: model 85 to 225; dual power connection: model 255 to 440.

Controls System

Tracer UC800 Controller

Today's RTAG chillers offer predictive controls that anticipate and compensate for load changes. Other control strategies made possible with the Tracer UC800 controls are:

Feedforward Adaptive Control

Feedforward is an open-loop, predictive control strategy designed to anticipate and compensate for load changes. It uses evaporator entering-water temperature as an indication of load change. This allows the controller to respond faster and maintain stable leaving-water temperatures.

Soft Loading

The chiller controller uses soft loading except during manual operation. Large adjustments due to load or setpoint changes are made gradually, preventing the compressor from cycling unnecessarily. It does this by internally filtering the setpoints to avoid reaching the differential-to-stop or the demand limit. Soft loading applies to the leaving chilled-water temperature and demand limit setpoints.

Adaptive Controls

There are many objectives that the controller must meet, but it cannot satisfy more than one objective at a time. Typically, the controllers primary objective is to maintain the evaporator leaving water temperature. Whenever the controller senses that it can no longer meet its primary objective without triggering a protective shutdown, it focuses on the most critical secondary objective. When the secondary objective is no longer critical, the controller reverts to its primary objective

AdaptiSpeed Control

The speed control is now optimized mathematically and controlled simultaneously. The increased performance of the UC800 Controller allows the chiller to operate longer at higher efficiency, and with greater stability.

Variable-Primary Flow (VPF)

Chilled-water systems that vary the water flow through chiller evaporators have caught the attention of engineers, contractors, building owners, and operators. Varying the water flow reduces the energy consumed by pumps, while having limited effect on the chiller energy consumption. This strategy can be a significant source of energy savings, depending on the application.

TD7 Operator Interface

The standard TD7 display provided with the Trane UC800 controller features a 7" LCD touch-screen, allowing access to all operational inputs and outputs. This is an advanced interface that allows the user to access any important information concerning setpoints, active temperatures, modes, electrical data, pressure, and diagnostics.

Display Features Include:

- Factory-mounted above the control panel door
- UV Resistant touchscreen
- -40°C to 70°C Operating temperature

Display Features Include:

- Factory-mounted above the control panel door
- UV Resistant touchscreen
- -40°C to 70°C Operating temperature
- IP56 rated
- CE marking
- Emissions: EN55011(Class B)
- Immunity: EN61000(Industrial)
- 7″ diagonal
- 800x480 pixels
- TFT LCD @ 600 nits brightness
- 16 bit color graphic display
- Display features:
  - Alarms
  - Reports
  - Chiller settings
  - Display settings
  - Graphing



Figure 6 – TD7 operator interface

TracerTU Interface

TracerTU (non-Trane personnel, contact your local Trane office for software) adds a level of sophistication that improves service technician effectiveness and minimizes chiller downtime. The portable PC-based service-tool software, TracerTU, supports service and maintenance tasks. TracerTU serves as a common interface to all Trane® chillers, and will customize itself based on the properties of the chiller with which it is communicating. Thus, the service technician learns only one service interface. The panel bus is easy to troubleshoot using LED sensor verification. Only the defective device is replaced. TracerTU can communicate with individual devices or groups of devices. All chiller status, machine configuration settings, customizable limits, and up to 100 active or historic diagnostics are displayed through the service-tool software interface. LEDs and their respective TracerTU indicators visually confirm the availability of each connected sensor, relay, and actuator.

TracerTU is designed to run on a customer's laptop, connected to the Tracer TD7 control panel with a USB cable. Your laptop must meet the following hardware and software requirements:

- 1 GB RAM (minimum)
- 1024 x 768 screen resolution
- CD-ROM drive
- Ethernet 10/100 LAN card
- An available USB 2.0 port
- Microsoft® Windows® XP Professional operation system with Service Pack 3 (SP3) or Windows 7 Enterprise or Professional operating system (32-bit or 64-bit)
- Microsoft .NET Framework 4.0 or later

Note: TracerTU is designed and validated for this minimum laptop configuration. Any variation from this configuration may have different results. Therefore, support for TracerTU is limited to only those laptops with the configuration previously specified.

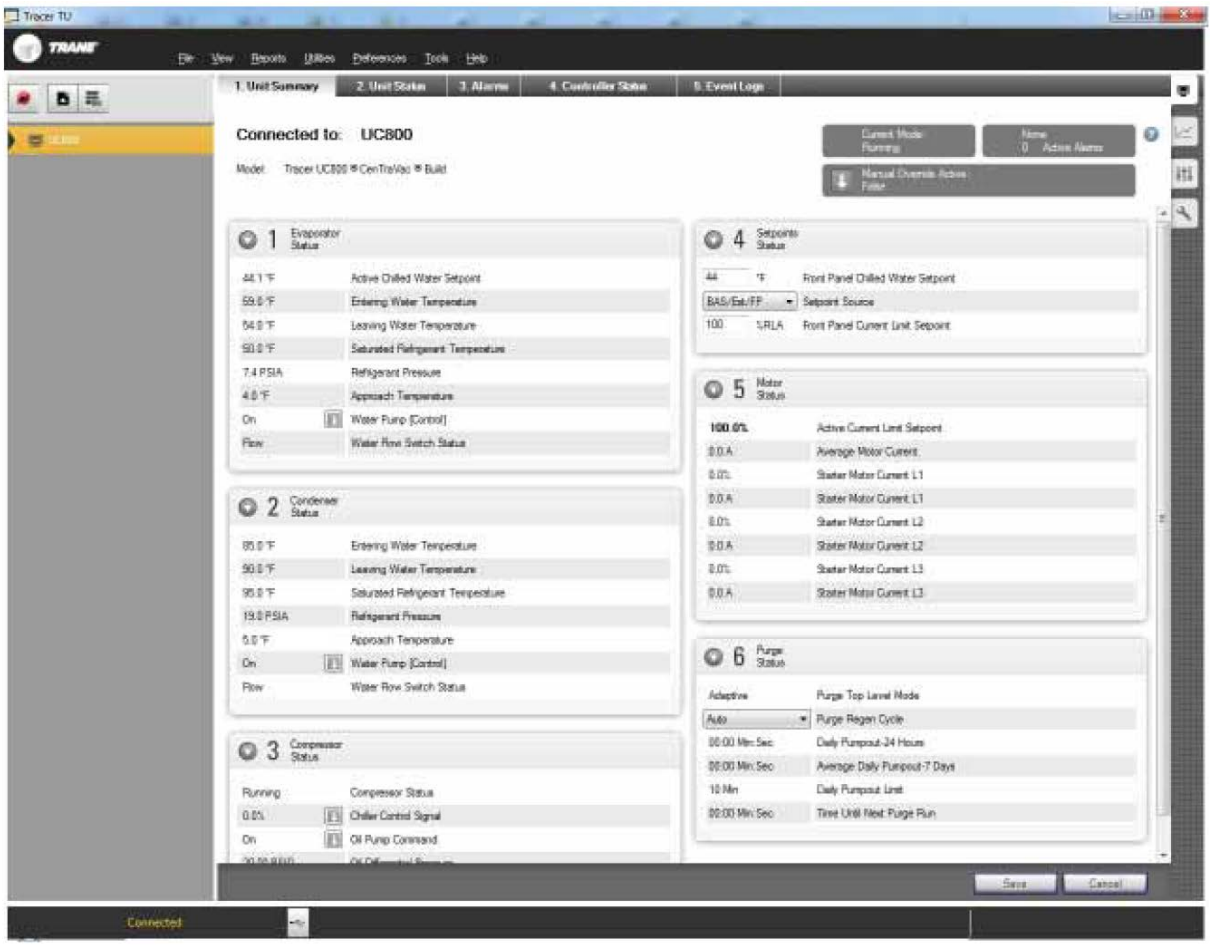


Figure 7 – TracerTU interface

System Integration

Stand-Alone Controls

Single chillers installed in applications without a building management system are simple to install and control: only a remote auto/stop for scheduling is required for unit operation. Signals from the chilled - water pump contactor auxiliary, or a flow switch, are wired to the chilled-water flow interlock. Signals from a time clock or some other remote device are wired to the external auto/stop input.

- Auto/Stop - A job-site provided contact closure turns the unit on and off.
- External Interlock - A job-site provided contact opening wired to this input turns the unit off and requires a manual reset of the unit microcomputer. This closure is typically triggered by a job-site provided system such as a fire alarm.

Hardwire Points

Microcomputer controls allow simple interface with other control systems, such as time clocks, building automation systems via hardwire points. This means you have the flexibility to meet job requirements while not having to learn a complicated control system. Remote devices are wired from the control panel to provide auxiliary control to a building automation system. Inputs and outputs can be communicated via a typical 4–20 mA electrical signal, an equivalent 2–10 V dc signal, or by utilizing contact closures. This setup has the same features as a stand-alone water chiller, with the possibility of having additional optional features:

- Ice making control.
- External chilled water setpoint, external demand limit setpoint
- Chilled water temperature reset.
- Programmable relays - available outputs are: alarm latching, alarm-auto reset, general alarm-warning, chiller limit mode, compressor running, and Tracer control.
- BACnet Interface
- Tracer TD7 control can be configured for BACnet communications at the factory or in the field. This enables the chiller controller to communicate on a BACnet MS/TP network. Chiller setpoints, operating modes, alarms, and status can be monitored and controlled through BACnet. Tracer TD7 controls conforms to the BACnet B-ASC profile as defined by ASHRAE 135-2004.

• Lon Talk Communications Interface (LCI-C)
• The optional Lon Talk® Communications Interface for Chillers (LCI-C) is available factory or field installed. It is an integrated communication board that enables the chiller controller to communicate over a LonTalk network. The LCI-C is capable of controlling and monitoring chiller setpoints, operating modes, alarms, and status. The Trane LCI-C provides additional points beyond the standard LONMARK® defined chiller profile to extend interoperability and support a broader range of system applications. These added points are referred to as open extensions. The LCI-C is certified to the LONMARK Chiller Controller Functional Profile 8040 version 1.0, and follows LonTalk FTT-10A free topology communications.
Modbus Interface Tracer TD7 control can be configured for Modbus communications at the factory or in the field. This enables the chiller controller to communicate as a slave device on a Modbus network. Chiller setpoints, operating modes, alarms, and status can be monitored and controlled by a Modbus master device.

Tracer Summit

The chiller plant control capabilities of the Trane Tracer Summit™ building automation system are unequaled in the industry. Trane's depth of experience in chillers and controls makes us a well-qualified choice for automation of chiller plants using air-cooled RTAG chillers. Our chiller plant automation software is fully pre-engineered and tested.
Required features:
• LonTalk/Tracer Summit Interface (selectable option with chiller)
• Building Control Unit (external device required)
• Sequences starting of chillers to optimize the overall chiller plant energy efficiency
– Individual chillers operate as base, peak, or swing based on capacity and efficiency
– Automatically rotates individual chiller operation to equalize runtime and wear between chillers
– Evaluates and selects the lowest energy consumption alternative from an overall system perspective.
• Regulatory Compliance Documentation
• Gathers information and generates the reports mandated in ASHRAE Guideline 3.
• Easy Operation and Maintenance
• Remote monitoring and control
• Displays both current operation conditions and scheduled automated control actions
• Concise reports assist in planning for preventative maintenance and verifying performance
Alarm notification and diagnostic messages aid in quick and accurate troubleshooting.

Tracer SC

The Tracer SC™ system controller acts as the central coordinator for all individual equipment devices on a Tracer building automation system. The Tracer SC scans all unit controllers to update information and coordinate building control, including building subsystems such as VAV and chiller water systems. With this system option, the full breadth of Trane's HVAC and controls experience are applied to offer solutions to many facility issues. The LAN allows building operators to manage these varied components as one system from any personal computer with web access.
The benefits of this system are:
• Improved usability with automatic data collection, enhanced data logging, easier to create graphics, simpler navigation, pre-programmed scheduling, reporting, and alarm logs.
• Flexible technology allows for system sizes from 30-120 unit controllers with any combination of LonTalk or BACnet unit controllers.
• LEED certification through site commissioning report, energy data collection measurement, optimizing energy performance, and maintaining indoor air quality.
Energy savings programs include: fan pressure optimization, ventilation reset, and chiller plant control (adds and subtracts chillers to meet cooling loads).

Building Automation and Chiller Plant Control

The UC800 controller can communicate with Trane Tracer Summit, Tracer SC and Tracer ES building automation systems, which include pre-engineered and flexible control for chiller plants. These building automation systems can control the operation of the complete installation: chillers, pumps, isolating valves, air handlers, and terminal units.

Trane can undertake full responsibility for optimized automation and energy management for the entire chiller plant.
The main functions are:
• **Chiller sequencing:** equalizes the number of running hours of the chillers. Different control strategies are available depending on the configuration of the installation.
• **Control of the auxiliaries:** includes input/output modules to control the operation of the various auxiliary equipment (water pumps, valves, etc.).
• **Time-of-day scheduling:** allows the end user to define the occupancy period, for example: time of the day, holiday periods and exception schedules.
• **Optimization of the installation start/stop time:** based on the programmed schedule of occupancy and the historical temperature records. Tracer Summit and Tracer SC calculate the optimal start/stop time of the installation to get the best compromise between energy savings and comfort of the occupants.
• **Soft loading:** the soft loading function minimizes the number of chillers that are operated to satisfy a large chilled-water-loop pull down, thus preventing an overshoot of the actual capacity required. Unnecessary starts are avoided and the peak current demand is lowered.
• **Communication capabilities:** local, through a PC workstation keyboard. Tracer Summit and Tracer SC can be programmed to send messages to other local or remote workstations and or a pager in the following cases:
– Analog parameter exceeding a programmed value
– Maintenance warning
– Component failure alarm
– Critical alarm messages. In this latter case, the message is displayed until the operator acknowledges the receipt of the information. From the remote station it is also possible to access and modify the chiller plants control parameters.

Remote communication through a modem: as an option, a modem can be connected to communicate the plant operation parameters through voice grade phone lines. A remote terminal is a PC workstation equipped with a modem and software to display the remote plant parameters.

Integrated Comfort System (ICS)

The onboard Tracer chiller controller is designed to be able to communicate with a wide range of building automation systems. In order to take full advantage of chiller's capabilities, incorporate your chiller into a Tracer Summit or Tracer SC building automation system. But the benefits do not stop at the chiller plant. At Trane, we realize that all the energy used in your cooling system is important. That is why we worked closely with other equipment manufacturers to predict the energy required by the entire system. We used this information to create patented control logic for optimizing HVAC system efficiency. The building owners challenge is to tie components and applications expertise into a single reliable system that provides maximum comfort, control, and efficiency. Trane Integrated Comfort systems (ICS) are a concept that combines system components, controls, and engineering applications expertise into a single, logical, and efficient system. These advanced controls are fully commissioned and available on every piece of Trane® equipment, from the largest chiller to the smallest VAV box. As a manufacturer, only Trane offers this universe of equipment, controls, and factory installation and verification.

Electrical Data

Electrical data - High efficiency

Unit Size	Rated Voltage	Unit Power In				Motor Data						
						Compressor (Each)				Fan(Each)		
		Power Conns	MCA	Max. Fuse, HACR breaker or MOP	Rec. time delay or RDE	Qty	RLA Comp1A, Comp1B/ Comp2A, Comp2B	XLRA Comp1A, Comp1B/ Comp2A, Comp2B	YLRA Comp1A, Comp1B/ Comp2A, Comp2B	Qty. Comp1A, Comp1B/ Comp2A, Comp2B	kW	FLA
85	380/50/3	1	285	450	400	1	170	1089	354	6	1.5	3
100	380/50/3	1	336	500	450	1	203	1161	385	6	1.5	3
125	380/50/3	1	372	500	450	2	140/98	796/589	259/180	5/3	1.5	3
145	380/50/3	1	423	550	500	2	140/140	796/796	259/259	4/4	1.5	3
155	380/50/3	1	469	650	550	2	170/140	1089/796	354/259	4/4	1.5	3
170	380/50/3	1	506	700	600	2	170/170	1089/1089	354/354	4/4	1.5	3
190	380/50/3	1	563	800	650	2	203/170	1161/1089	385/354	5/5	1.5	3
205	380/50/3	1	604	850	700	2	203/203	1161/1161	385/385	5/5	1.5	3
225	380/50/3	1	604	850	700	2	203/203	1161/1161	385/385	6/6	1.5	3
255	380/50/3	2	502/275	700/450	600/350	3	170,170/170	1089,1089/1089	354,354/354	9/5	1.5	3
285	380/50/3	2	553/326	800/550	650/500	3	170,203/203	1089,1161/1161	354,385/385	9/5	1.65	3.3
310	380/50/3	2	604/326	850/550	700/500	3	203,203/203	1161,1161/1161	385,385/385	11/5	1.65	3.3
340	380/50/3	2	604/326	850/550	700/500	3	203,203/203	1161,1161/1161	385,385/385	11/5	1.65	3.3
375	380/50/3	2	553/547	800/800	650/650	4	170,203/170,203	1089,1161/1089,1161	354,385/354,385	9/9	1.65	3.3
400	380/50/3	2	594/588	850/850	700/700	4	203,203/203,203	1161,1161/1161,1161	385,385/385,385	9/9	1.65	3.3
440	380/50/3	2	594/594	850/850	700/700	4	203,203/203,203	1161,1161/1161,1161	385,385/385,385	10/10	1.65	3.3

Electrical data –Extra high efficiency

Unit Size	Rated Voltage	Unit Power In				Motor Data						
						Compressor (Each)				Fan(Each)		
		Power Conns	MCA	Max. Fuse, HACR breaker or MOP	Rec. time delay or RDE	Qty	RLA Comp1A, Comp1B/ Comp2A, Comp2B	XLRA Comp1A, Comp1B/ Comp2A, Comp2B	YLRA Comp1A, Comp1B/ Comp2A, Comp2B	Qty. Comp1A, Comp1B/ Comp2A, Comp2B	kW	FLA
85	380/50/3	1	285	450	400	1	170	1089	354	6	1.5	3
100	380/50/3	1	336	500	450	1	203	1161	385	6	1.5	3
125	380/50/3	1	372	500	450	2	140/98	796/589	259/180	6/4	1.5	3
145	380/50/3	1	423	550	500	2	140/140	796/796	259/259	5/5	1.5	3
155	380/50/3	1	469	650	550	2	170/140	1089/796	354/259	5/5	1.5	3
170	380/50/3	1	506	700	600	2	170/170	1089/1089	354/354	5/5	1.5	3
190	380/50/3	1	563	800	650	2	203/170	1161/1089	385/354	6/6	1.5	3
205	380/50/3	1	604	850	700	2	203/203	1161/1161	385/385	6/6	1.5	3
225	380/50/3	1	604	850	700	2	203/203	1161/1161	385/385	7/7	1.5	3
255	380/50/3	2	508/275	700/450	600/350	3	170,170/170	1089,1089/1089	354,354/354	11/5	1.5	3
285	380/50/3	2	559/332	800/550	650/500	3	170,203/203	1089,1161/1161	354,385/385	12/6	1.65	3.3
310	380/50/3	2	604/332	850/550	700/500	3	203,203/203	1161,1161/1161	385,385/385	12/6	1.65	3.3
340	380/50/3	2	606/332	850/550	700/500	3	203,203/203	1161,1161/1161	385,385/385	14/6	1.65	3.3
375	380/50/3	2	553/553	800/800	650/650	4	170,203/170,203	1089,1161/1089,1161	354,385/354,385	10/10	1.65	3.3
400	380/50/3	2	594/594	850/850	700/700	4	203,203/203,203	1161,1161/1161,1161	385,385/385,385	10/10	1.65	3.3
410	380/50/3	2	604/604	850/850	700/700	4	203,203/203,203	1161,1161/1161,1161	385,385/385,385	12/12	1.65	3.3
440	380/50/3	2	604/604	850/850	700/700	4	203,203/203,203	1161,1161/1161,1161	385,385/385,385	12/12	1.65	3.3

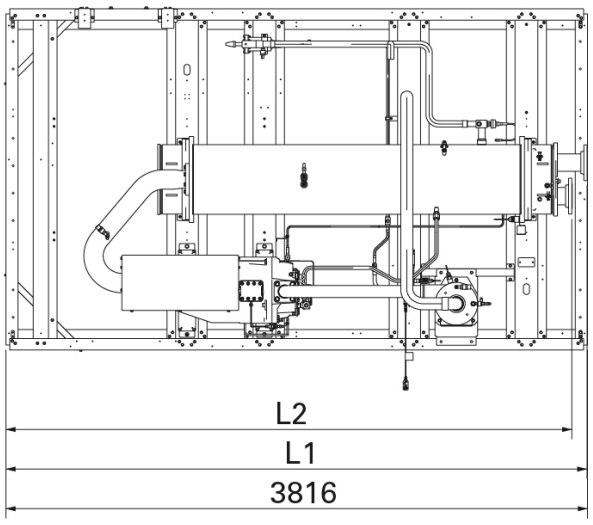
Electrical data –Premium seasonal efficiency

Unit Size	Rated Voltage	Unit Power In				Motor Data						
						Compressor (Each)				Fan(Each)		
		Power Conns	MCA	Max. Fuse, HACR breaker or MOP	Rec. time delay or RDE	Qty	RLA Comp1A, Comp1B/ Comp2A, Comp2B	XLRA Comp1A, Comp1B/ Comp2A, Comp2B	YLRA Comp1A, Comp1B/ Comp2A, Comp2B	Qty. Comp1A, Comp1B/ Comp2A, Comp2B	kW	FLA
85	380/50/3	1	285	450	400	1	170	1089	354	6	1.5	3
100	380/50/3	1	336	500	450	1	203	1161	385	6	1.5	3
125	380/50/3	1	372	500	450	2	140/98	796/589	259/180	6/4	1.5	3
145	380/50/3	1	423	550	500	2	140/140	796/796	259/259	5/5	1.5	3
155	380/50/3	1	469	650	550	2	170/140	1089/796	354/259	5/5	1.5	3
170	380/50/3	1	506	700	600	2	170/170	1089/1089	354/354	5/5	1.5	3
190	380/50/3	1	563	800	650	2	203/170	1161/1089	385/354	6/6	1.5	3
205	380/50/3	1	604	850	700	2	203/203	1161/1161	385/385	6/6	1.5	3
225	380/50/3	1	604	850	700	2	203/203	1161/1161	385/385	6/6	1.5	3
255	380/50/3	2	506/279	700/450	600/350	3	170,170/170	1089,1089/1089	354,354/354	9/5	1.5	3
285	380/50/3	2	557/330	800/550	650/500	3	170,203/203	1089,1161/1161	354,385/385	9/5	1.65	3.3
310	380/50/3	2	604/330	850/550	700/500	3	203,203/203	1161,1161/1161	385,385/385	11/5	1.65	3.3
340	380/50/3	2	604/330	850/550	700/500	3	203,203/203	1161,1161/1161	385,385/385	11/5	1.65	3.3
375	380/50/3	2	557/551	800/800	650/650	4	170,203/170,203	1089,1161/1089,1161	354,385/354,385	9/9	1.65	3.3
400	380/50/3	2	598/592	850/850	700/700	4	203,203/203,203	1161,1161/1161,1161	385,385/385,385	9/9	1.65	3.3
440	380/50/3	2	598/598	850/850	700/700	4	203,203/203,203	1161,1161/1161,1161	385,385/385,385	10/10	1.65	3.3

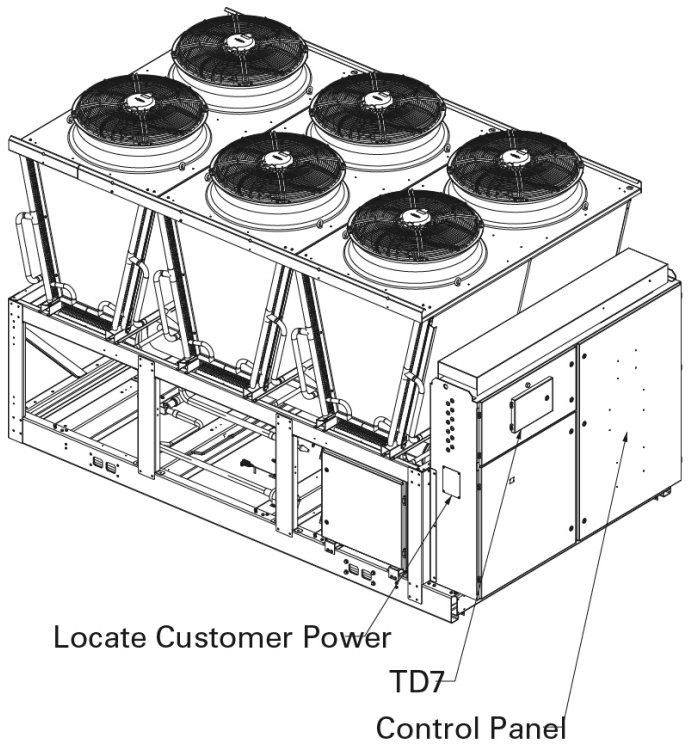
Notes:
1. MCA-Minimum circuit ampacity
2. MOP-Maximum over current protection
3. RDE-Recommend time delay fuse size
4. RLA-Rated load amps
5. XLRA-Locked rotor amps are based on full winding starts
6. YLRA-Locked rotor amps in Wye configuration

Dimensional Data

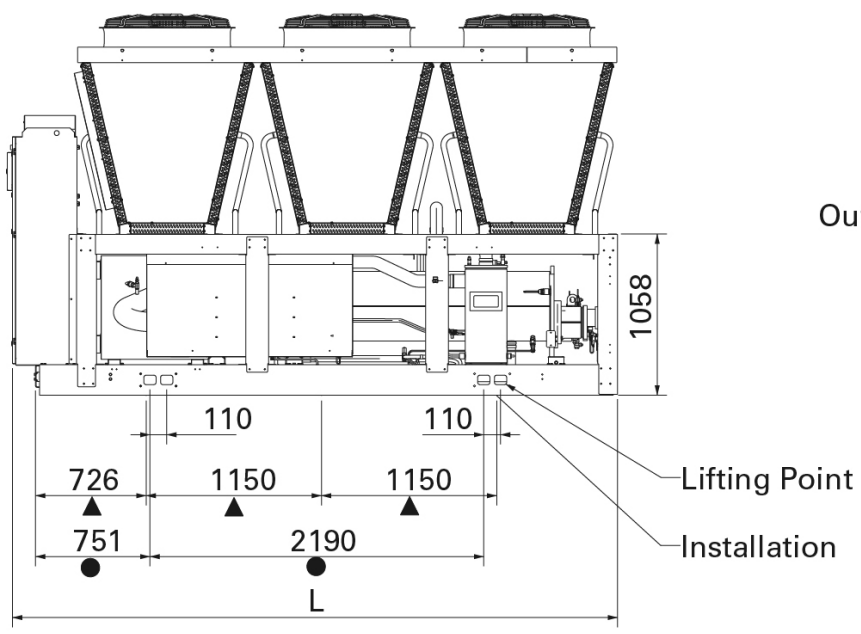
RTAG 100H, 085X/100X, 085P/100P



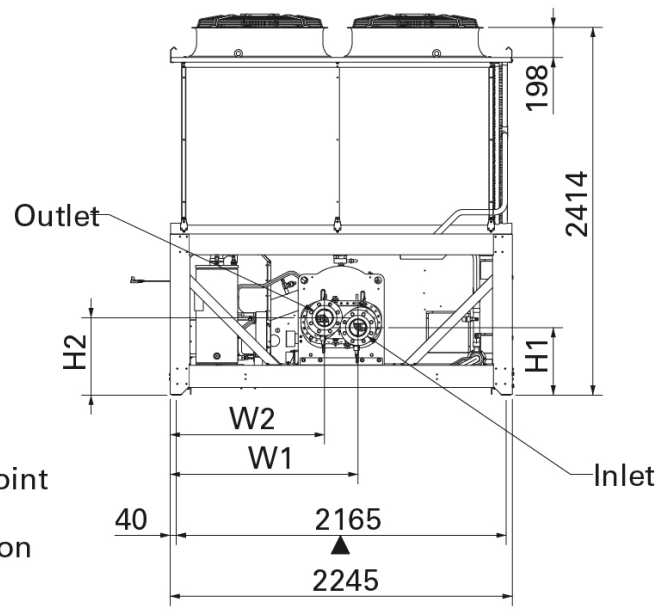
Top View(With fan /coil removed)



ISO View



Side View

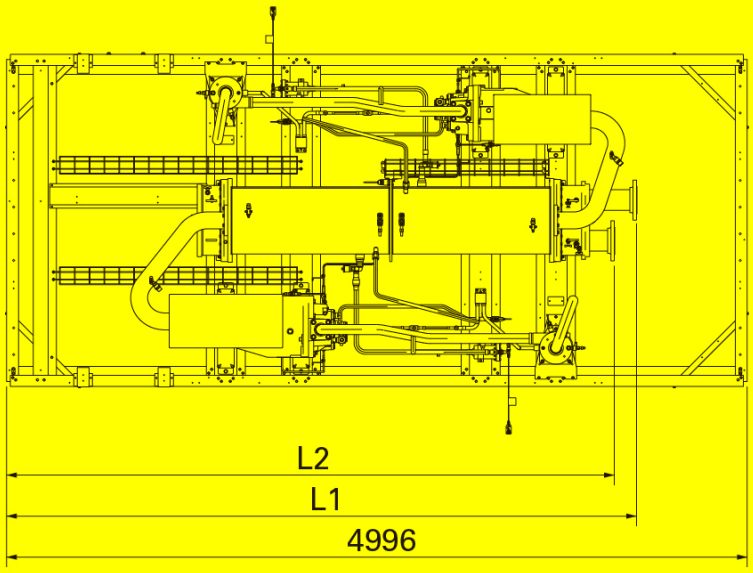


Back View

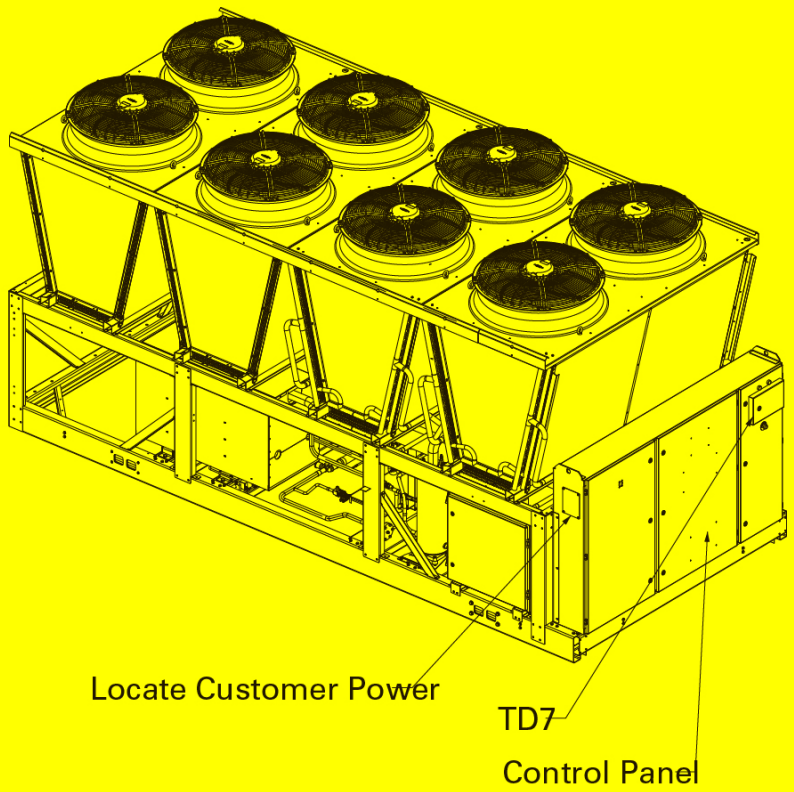
▲ Installation Point
● Lifting Point

		H1	H2	W1	W2	L1	L2	Water pipe	L (High and Extra eff)	L (Premium seasonal eff)
RTAG085 X RTAG085 P	150PSI	468	478	1252	992	3619	3619	4"	3840	3970
	300PSI	443	508	1233	1013	3813	3713	4"	3840	3970
RTAG100 H	150PSI	468	478	1252	992	3619	3619	4"	3840	-
	300PSI	443	508	1233	1013	3813	3713	4"	3840	-
RTAG100 X RTAG100 P	150PSI	468	478	1252	992	3619	3619	4"	3840	3970
	300PSI	443	508	1233	1013	3813	3713	4"	3840	3970

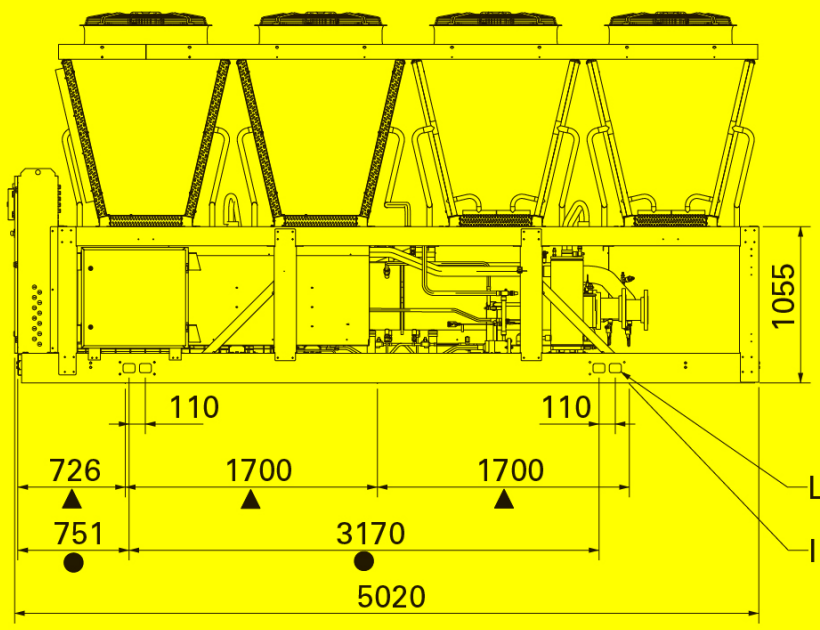
RTAG 125H/145H/155H/170H

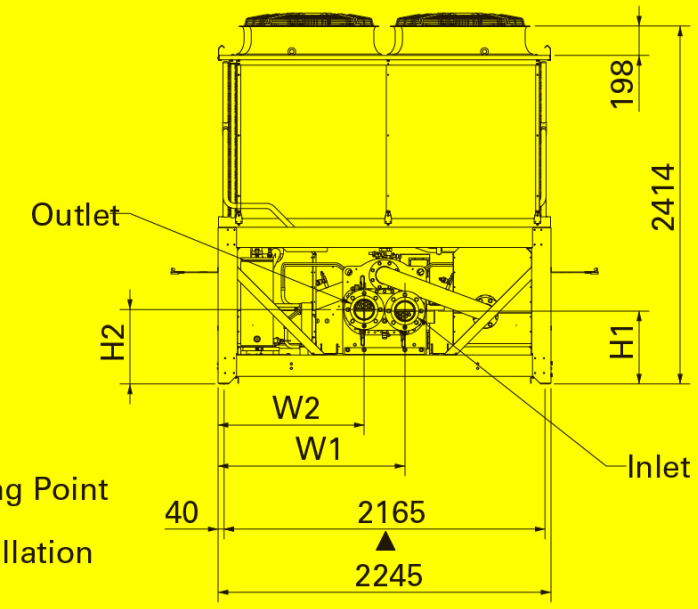


Top View(With fan /coil removed)



ISO View





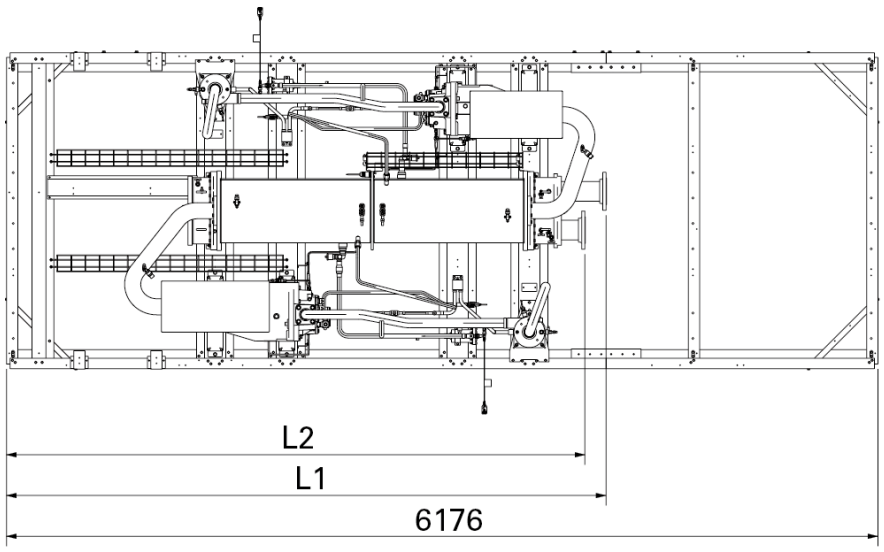
Side View

▲ Installation Point
● Lifting Point

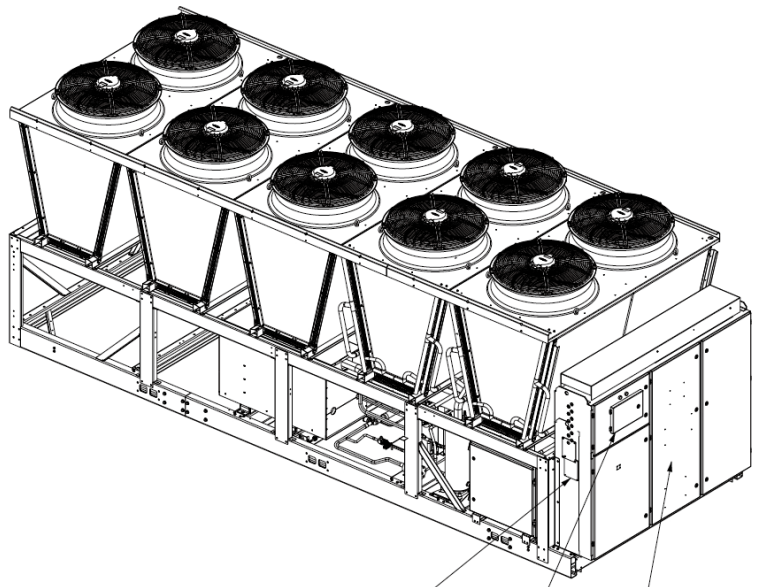
Back View

		H1	H2	W1	W2	L1	L2	Water pipe
RTAG125 H	150PSI	491	501	1260	985	3905	3905	5"
	300PSI	492	502	1260	985	4249	4099	5"
RTAG145 H	150PSI	491	501	1260	985	3905	3905	5"
	300PSI	492	502	1260	985	4249	4099	5"
RTAG155 H	150PSI	491	501	1260	985	3905	3905	5"
	300PSI	492	502	1260	985	4249	4099	5"
RTAG170 H	150PSI	491	501	1275	969	3938	3938	6"
	300PSI	492	502	1275	969	4250	4100	6"

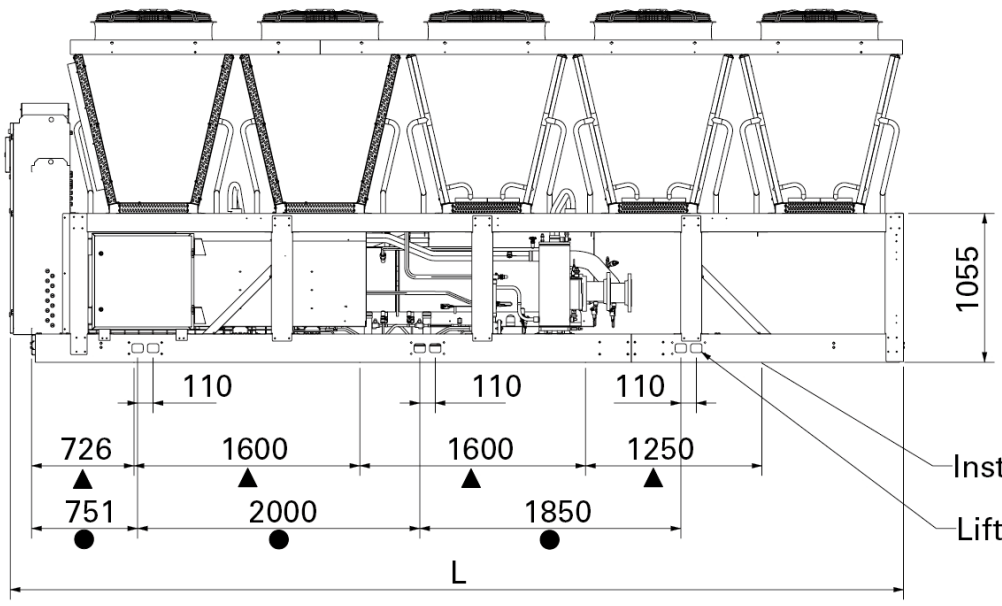
RTAG 190H/205H, 125X/145X/155X/170X, 125P/145P/155P/170P



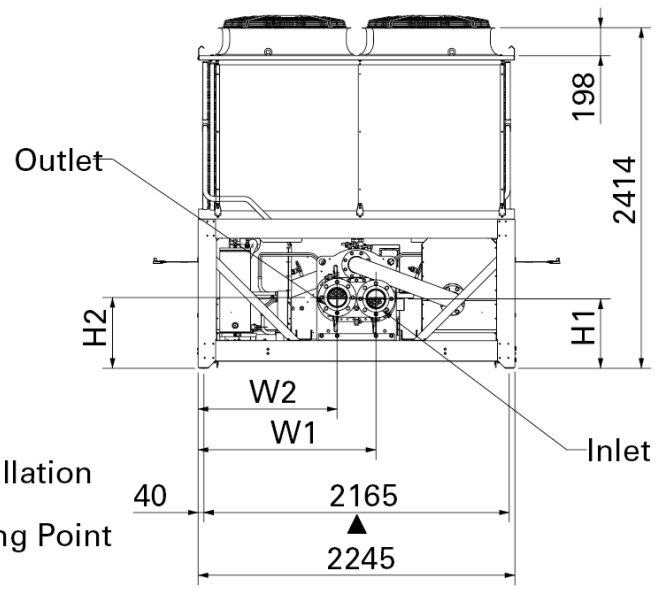
Top View(With fan /coil removed)



ISO View



Side View

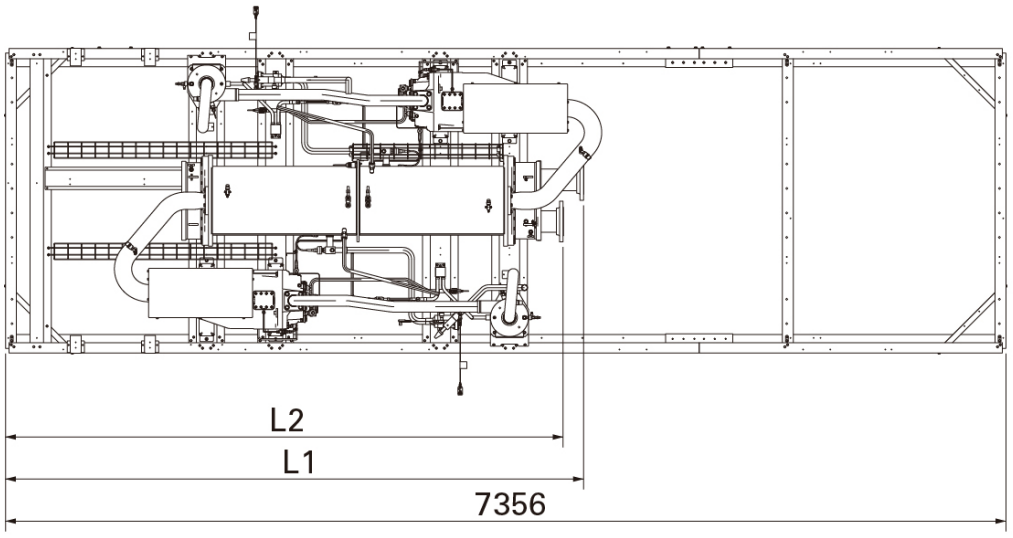


▲ Installation Point
● Lifting Point

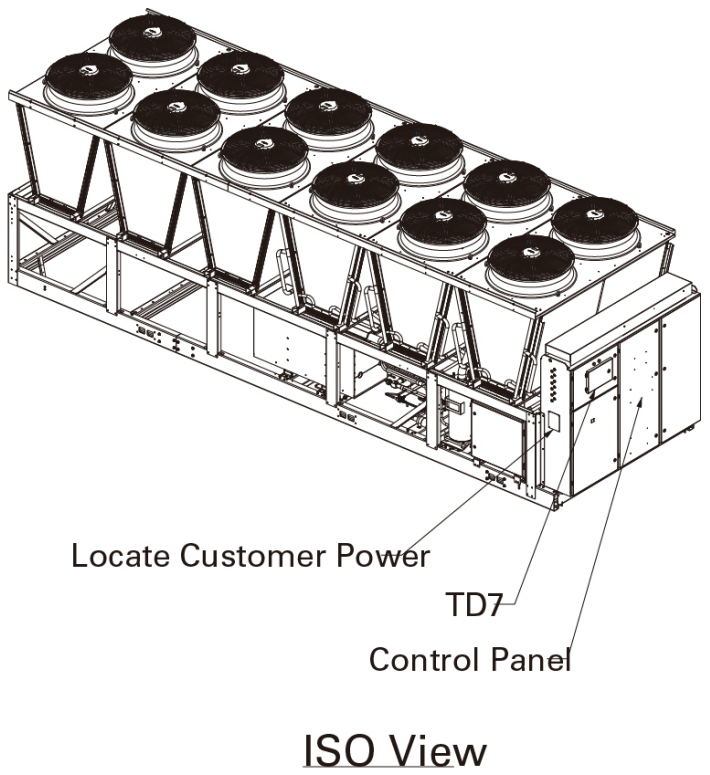
Back View

		H1	H2	W1	W2	L1	L2	Water pipe	L (High and Extra eff)	L (Premium seasonal eff)
RTAG125 X RTAG125 P	150PSI	491	501	1260	3905	3905	3905	5"	6200	6330
	300PSI	492	502	1260	4249	4099	4099	5"	6200	6330
RTAG145 X RTAG145 P	150PSI	491	501	1260	3905	3905	3905	5"	6200	6330
	300PSI	492	502	1260	4249	4099	4099	5"	6200	6330
RTAG155 X RTAG155 P	150PSI	491	501	1260	3905	3905	3905	5"	6200	6330
	300PSI	492	502	1260	4249	4099	4099	5"	6200	6330
RTAG170 X RTAG170 P	150PSI	449	464	1275	3938	3938	3938	6"	6200	6330
	300PSI	450	465	1275	4250	4100	4100	6"	6200	6330
RTAG190 H	150PSI	449	464	1275	3938	3938	3938	6"	6200	-
	300PSI	450	465	1275	4250	4100	4100	6"	6200	-
RTAG205 H	150PSI	449	464	1275	3938	3938	3938	6"	6200	-
	300PSI	450	465	1275	4250	4100	4100	6"	6200	-

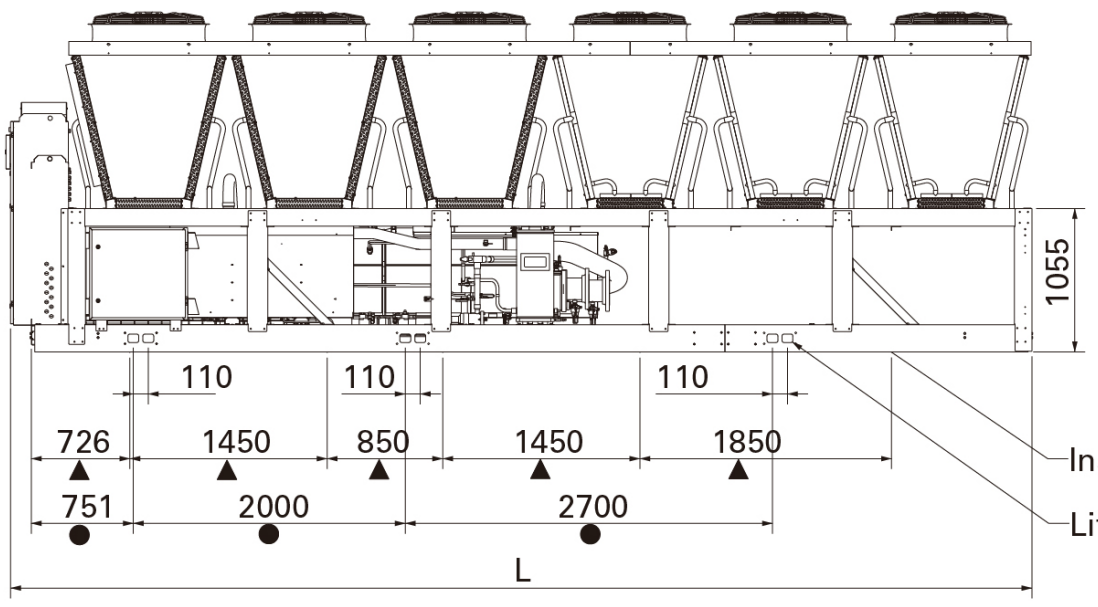
RTAG 190X/205X, 190P/205P



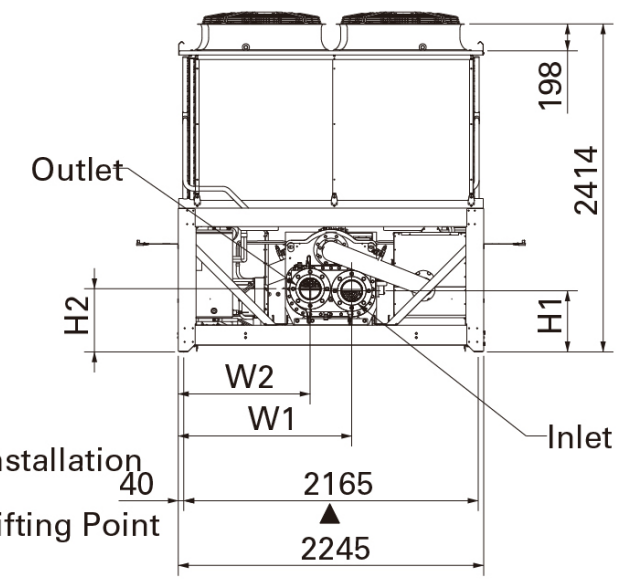
Top View(With fan /coil removed)



ISO View



Side View

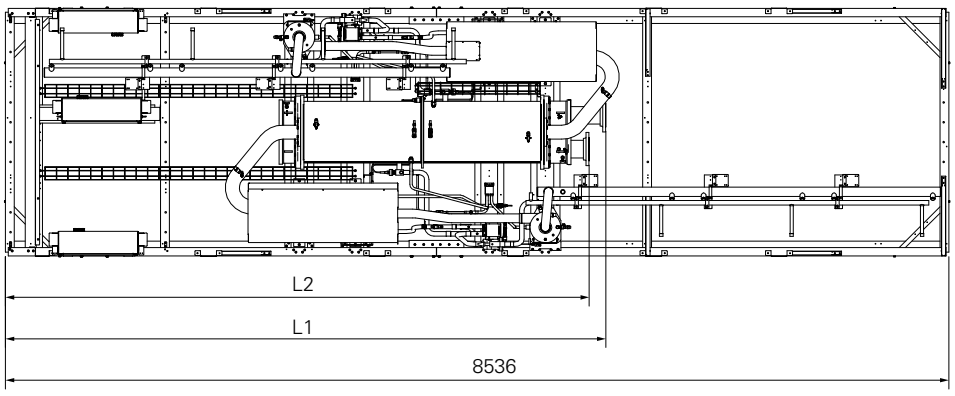


Back View

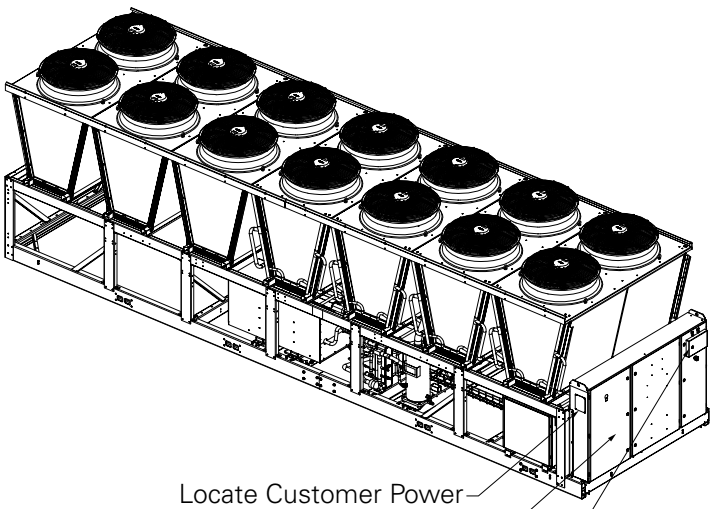
▲ Installation Point
● Lifting Point

		H1	H2	W1	W2	L1	L2	Water pipe	L (High and Extra eff)	L (Premium seasonal eff)
RTAG 190 X RTAG 190 P RTAG 205 X RTAG 205 P	150PSI	448	463	1275	969	3938	3938	6"	7380	7510
RTAG 225 H RTAG 225 P	300PSI	449	464	1275	969	4250	4100	6"	7380	7510

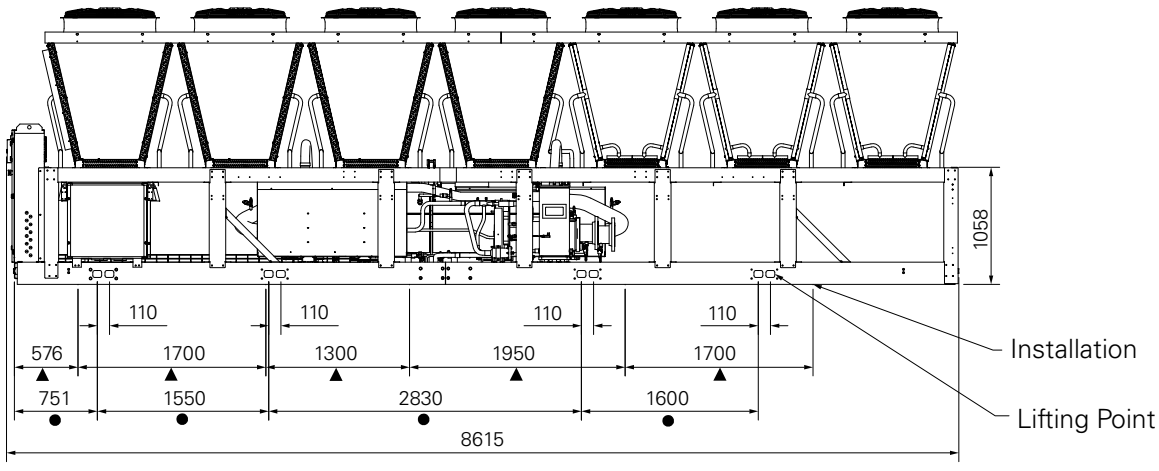
RTAG 225X



Top View
(With fan/coil removed)

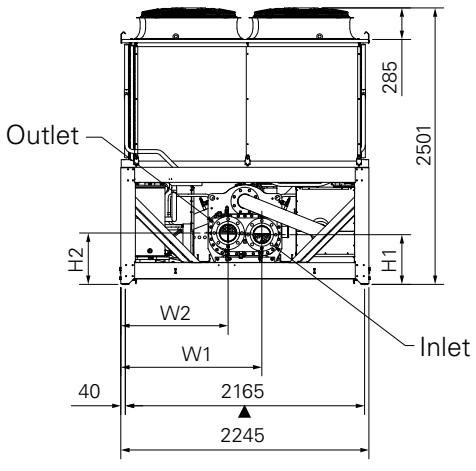


ISO View



Side View

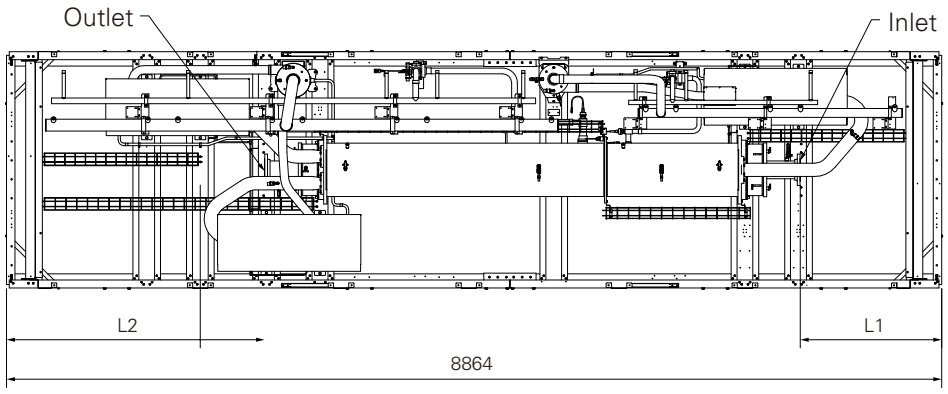
▲ Installation Point
● Lifting Point



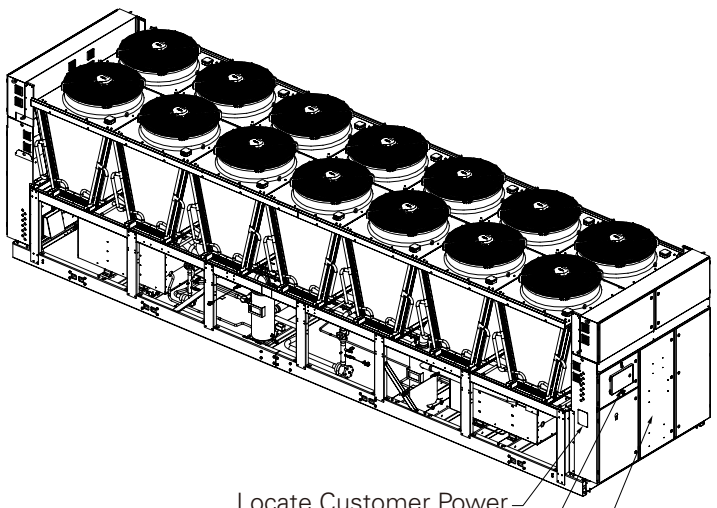
Back View
(With near side control panel removed)

		H1	H2	W1	W2	L1	L2	Water pipe	L (Extra eff) (mm)
RTAG 225X	150PSI	448	463	1275	969	5118	5118	6"	8615
	300PSI	449	464	1275	969	5430	5280	6"	8615

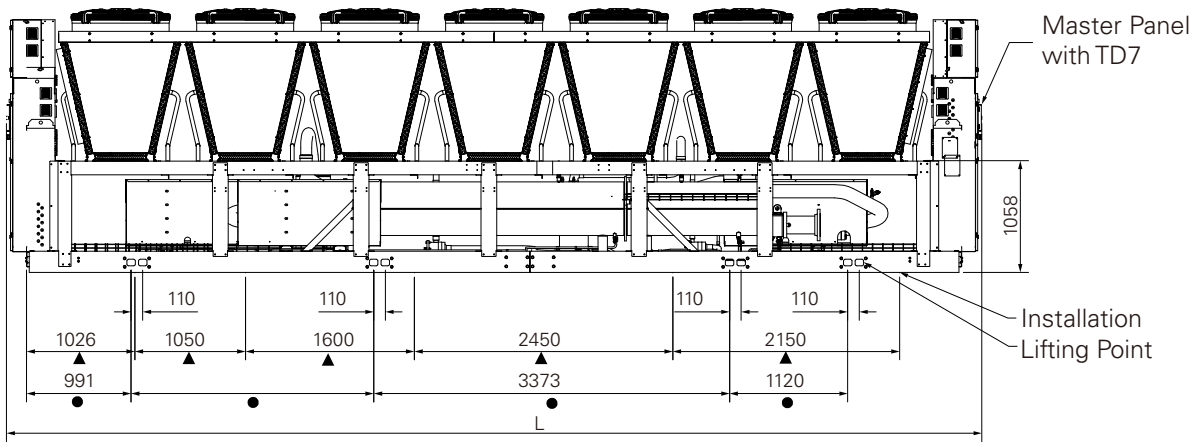
RTAG 255H/285H, 255P/285P



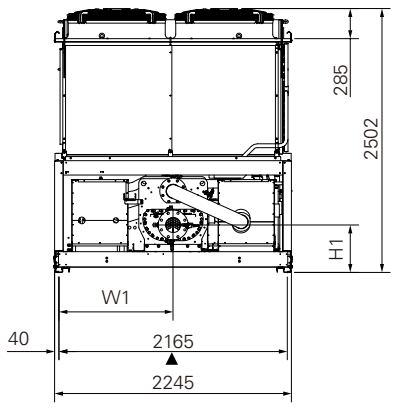
Top View
(With fan/coil removed)



ISO View



Side View

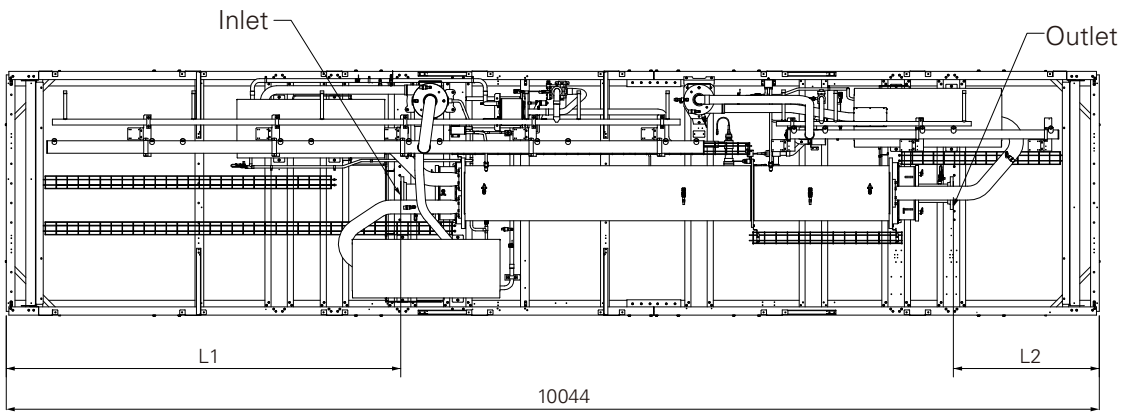


Back View
(With near side control panel removed)

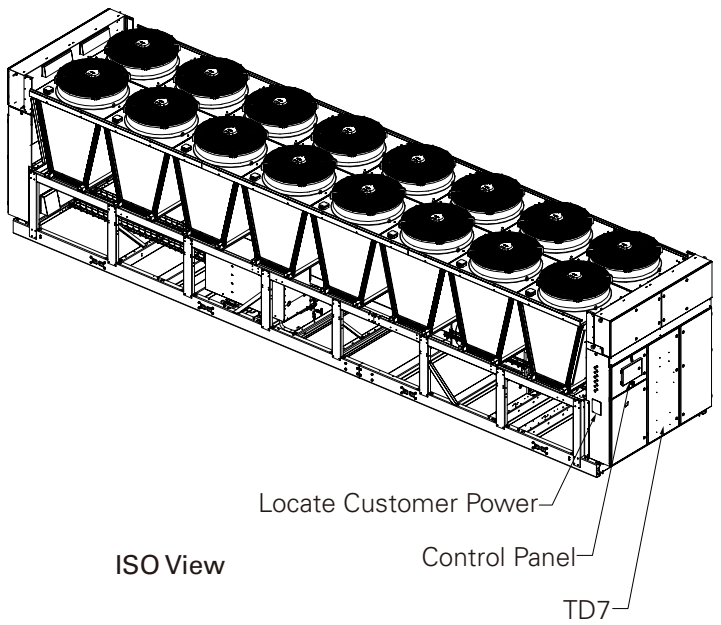
▲ Installation Point
● Lifting Point

		H1	W1	L1	L2	Water pipe	L (High eff) (mm)	L (Premium seasonal eff) (mm)
RTAG 255H	150PSI	450	1120	2698	1593	6"	9006	-
	300PSI	450	1120	2447	1343	6"	9006	-
RTAG 285H	150PSI	450	1120	2698	1593	6"	9006	-
	300PSI	450	1120	2447	1343	6"	9006	-
RTAG 255P	150PSI	450	1120	2698	1593	6"	-	9246
	300PSI	450	1120	2447	1343	6"	-	9246
RTAG 285P	150PSI	450	1120	2698	1593	6"	-	9246
	300PSI	450	1120	2447	1343	6"	-	9246

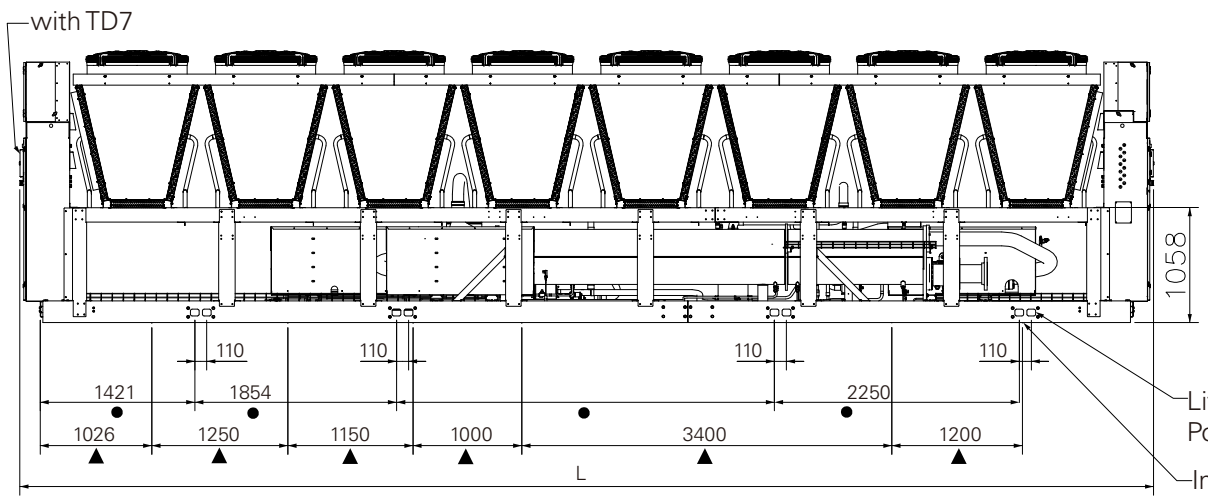
RTAG 255X, 310H/340H, 310P/340P



Top View
(With fan/coil removed)

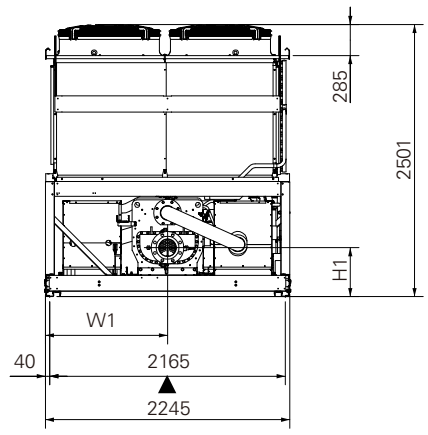


ISO View



Side View

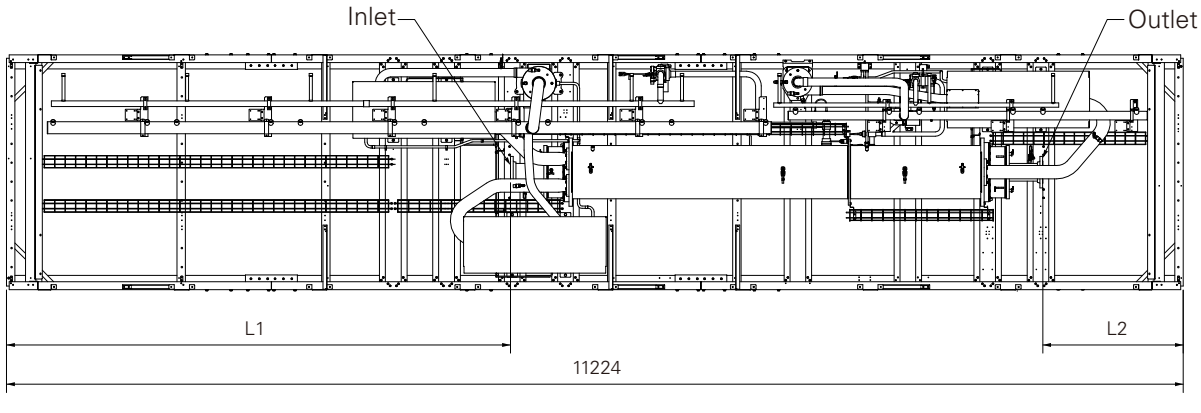
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● Lifting Point



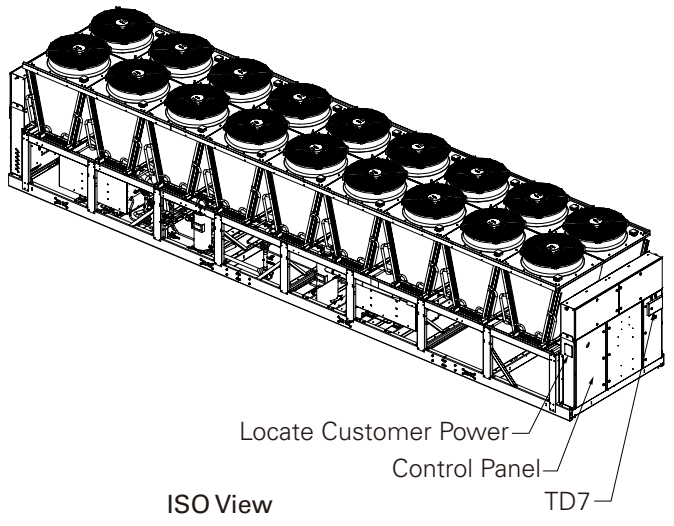
Back View
(With near side control panel removed)

		H1	W1	L1	L2	Water pipe	L (High eff) (mm)	L (Premium seasonal eff) (mm)
RTAG 255X	150PSI	450	1120	3877	1593	6"	10186	-
	300PSI	450	1120	3627	1343	6"	10186	-
RTAG 310H	150PSI	450	1120	3877	1593	6"	10186	-
	300PSI	450	1120	3627	1343	6"	10186	-
RTAG 310P	150PSI	450	1120	3877	1593	6"	-	10418
	300PSI	450	1120	3627	1343	6"	-	10418
RTAG 340H	150PSI	450	1120	3877	1593	6"	10186	-
	300PSI	450	1120	3627	1343	6"	10186	-
RTAG 340P	150PSI	450	1120	3877	1593	6"	-	10418
	300PSI	450	1120	3627	1343	6"	-	10418

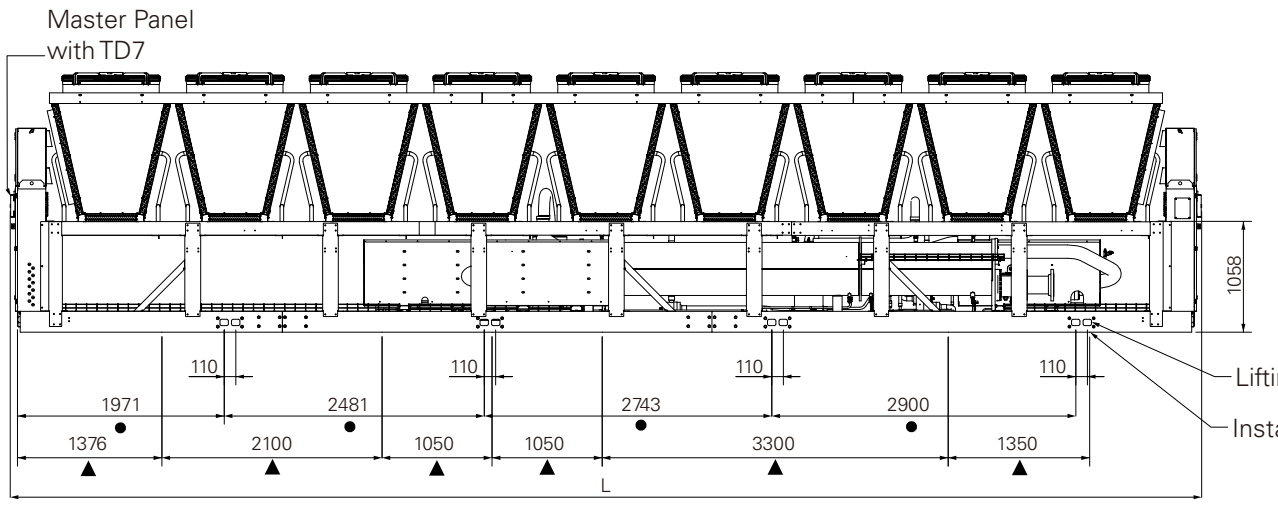
RTAG 285X/310X



Top View
(With fan/coil removed)

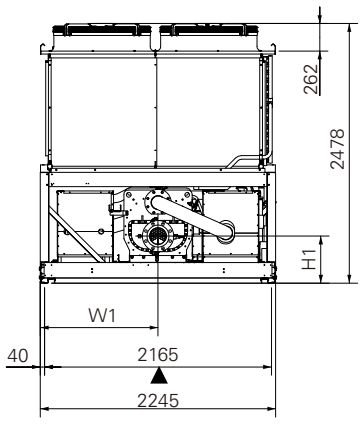


ISO View



Side View

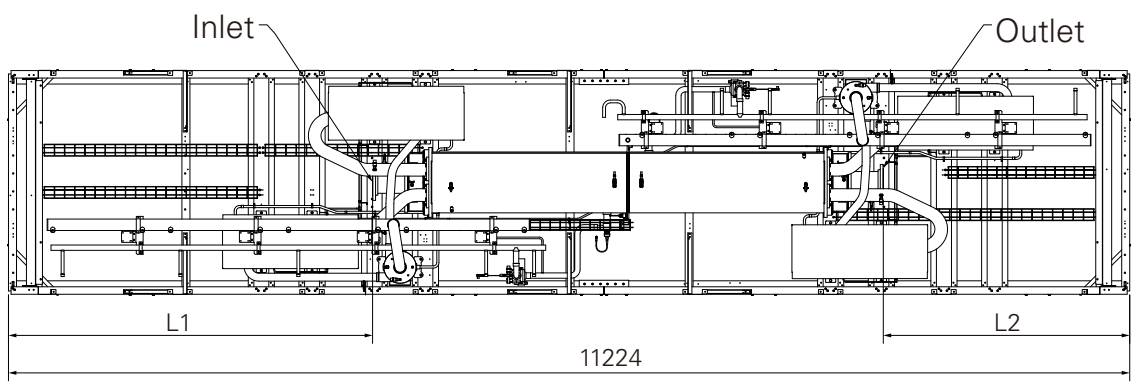
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● Lifting Point



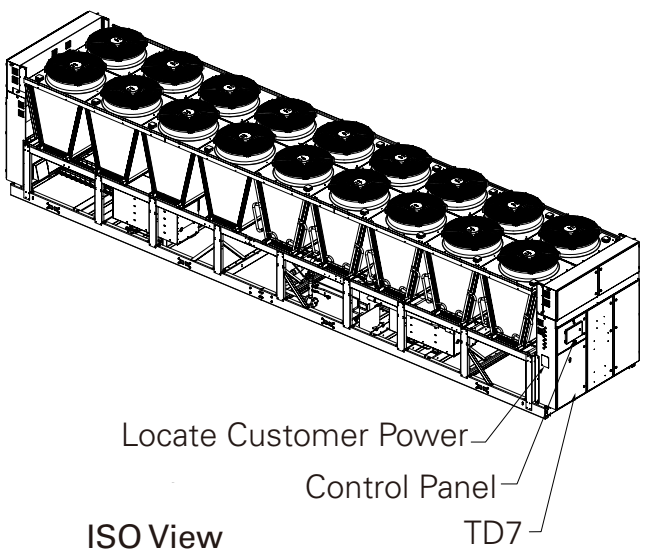
Back View
(With near side control panel removed)

		H1	W1	L1	L2	Water pipe	L (High eff) (mm)
RTAG 285X	150PSI	450	1120	5058	1593	6"	11366
	300PSI	450	1120	4807	1343	6"	9006
RTAG 310X	150PSI	450	1120	5058	1593	6"	9006
	300PSI	450	1120	4807	1343	6"	9006

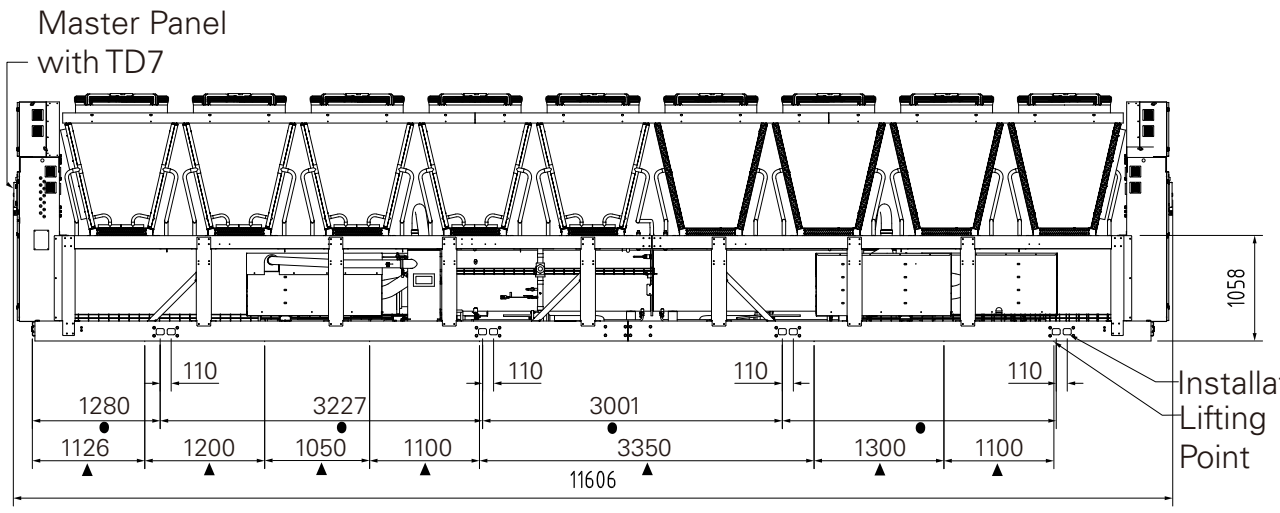
RTAG 340X



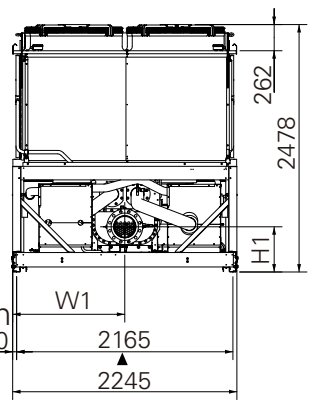
Top View
(With fan/coil removed)



ISO View



Side View

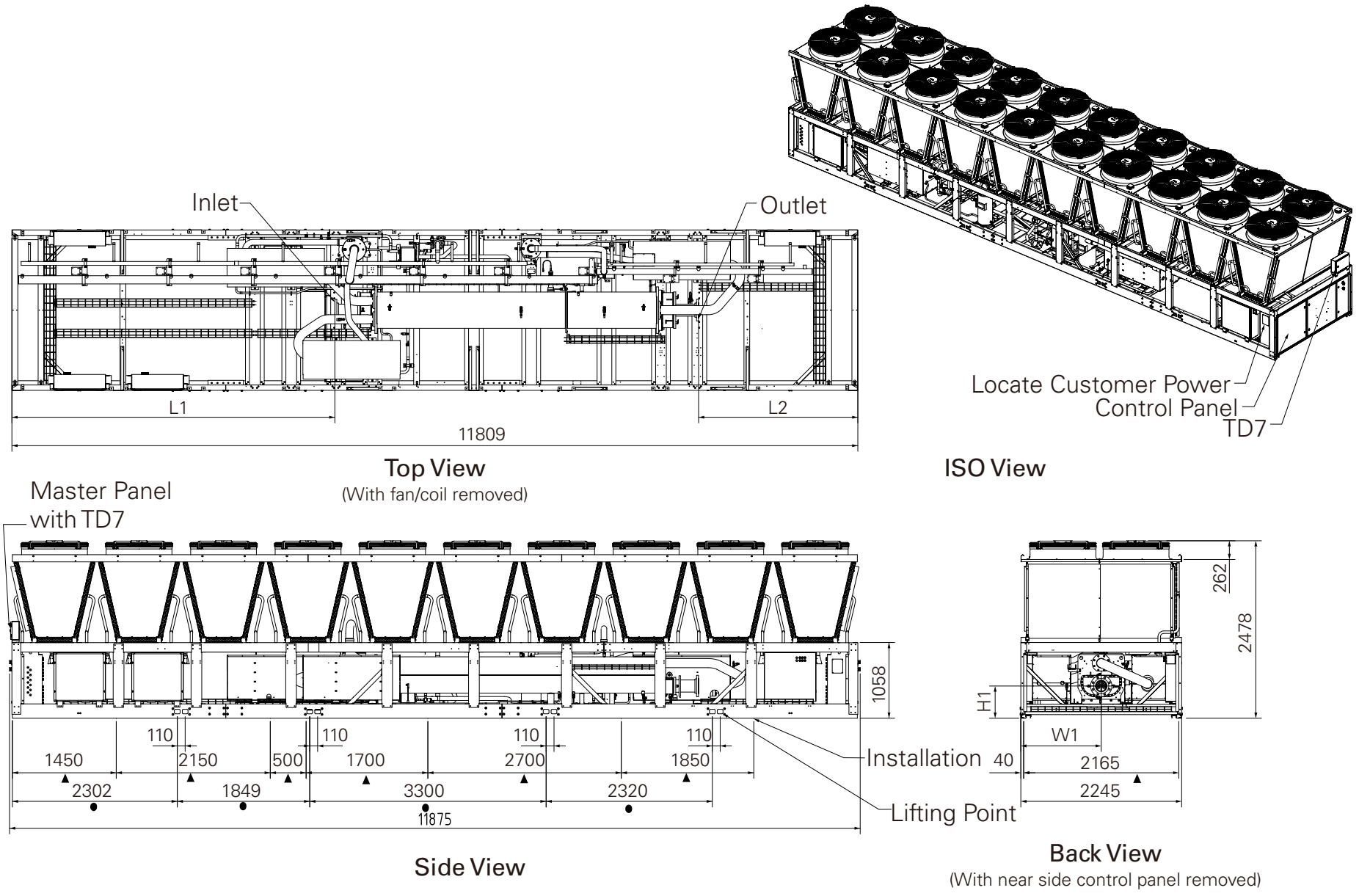


Back View
(With near side control panel removed)

▲ Installation Point
● Lifting Point

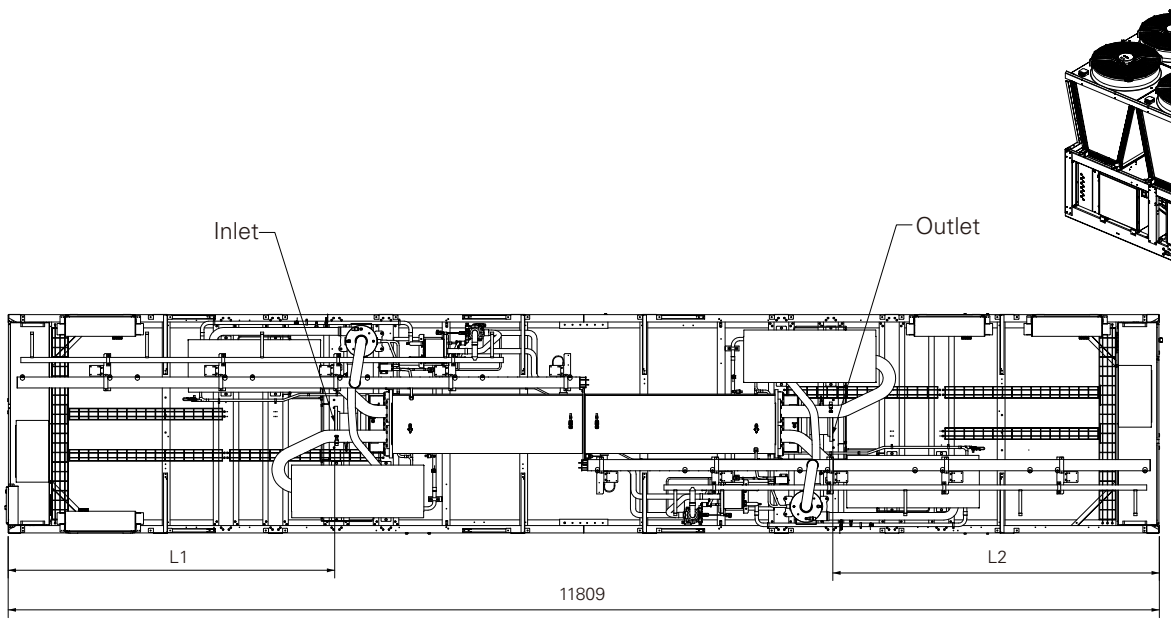
		H1	W1	L1	L2	Water pipe	L (High eff) (mm)
RTAG 340X	150PSI	450	1120	4758	2473	6"	11875
	300PSI	450	1120	4508	2222	6"	11875

RTAG 375H/400H, 375P/400P

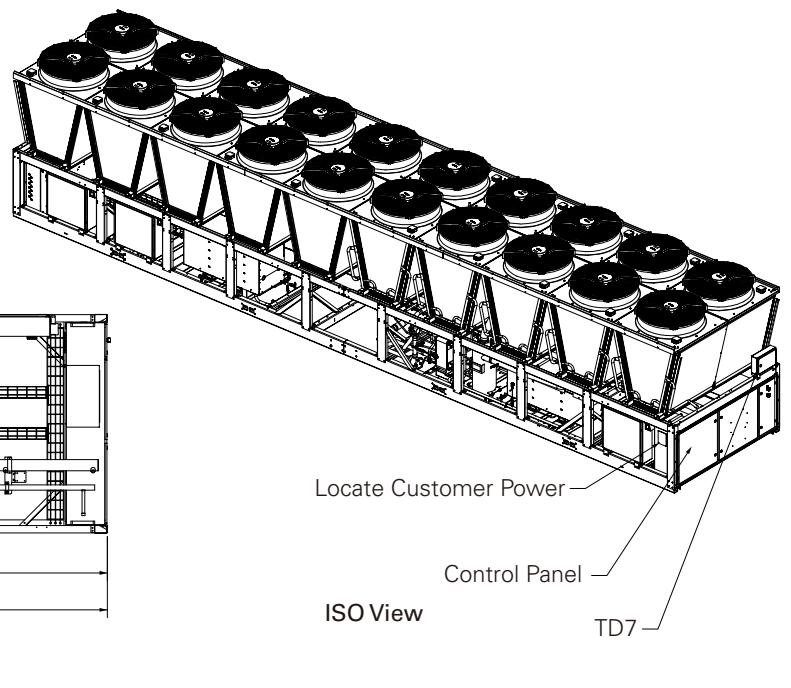


		H1	W1	L1	L2	Water pipe	L (High eff) (mm)	L (Premium seasonal eff) (mm)
RTAG 375H	150PSI	453	1120	3882	2703	8"	11323	-
	300PSI	453	1120	3647	2469	8"	11323	-
RTAG 375P	150PSI	453	1120	3882	2703	8"	11323	11580
	300PSI	453	1120	3647	2469	8"	-	11580
RTAG 400H	150PSI	453	1120	3882	2703	8"	11323	-
	300PSI	453	1120	3647	2469	8"	11323	-
RTAG 400P	150PSI	453	1120	3882	2703	8"	-	11580
	300PSI	453	1120	3647	2469	8"	-	11580

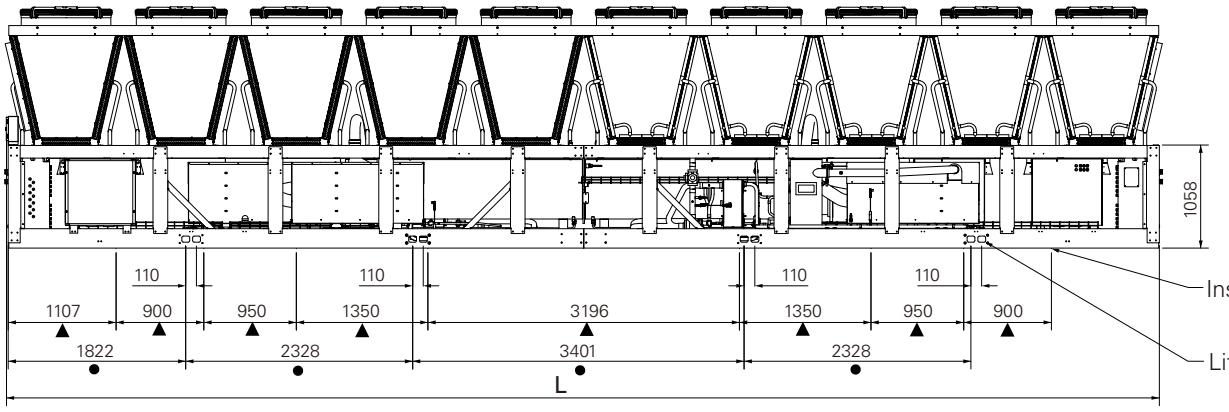
RTAG 375X/400X, 440H, 440P



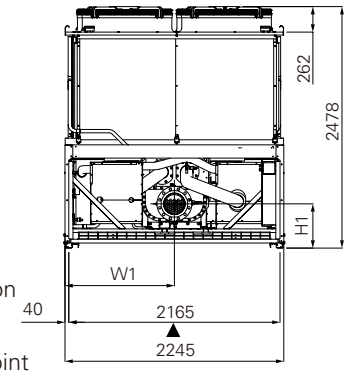
Top View
(With fan/coil removed)



ISO View



Side View

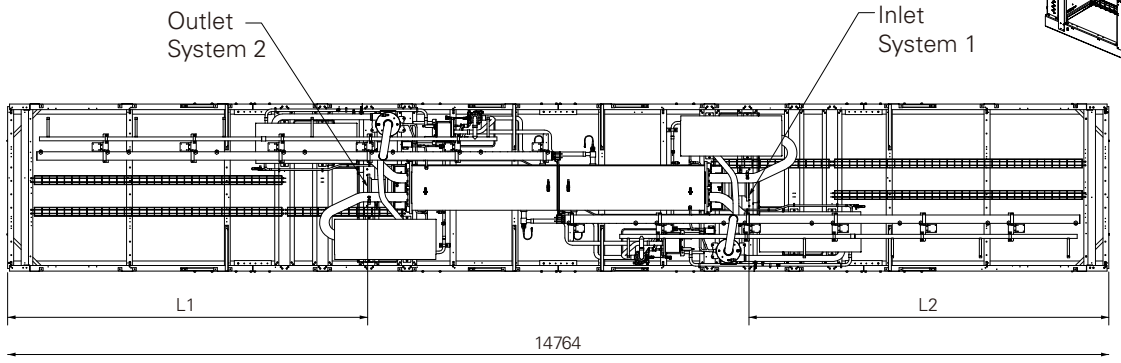


Back View
(With near side control panel removed)

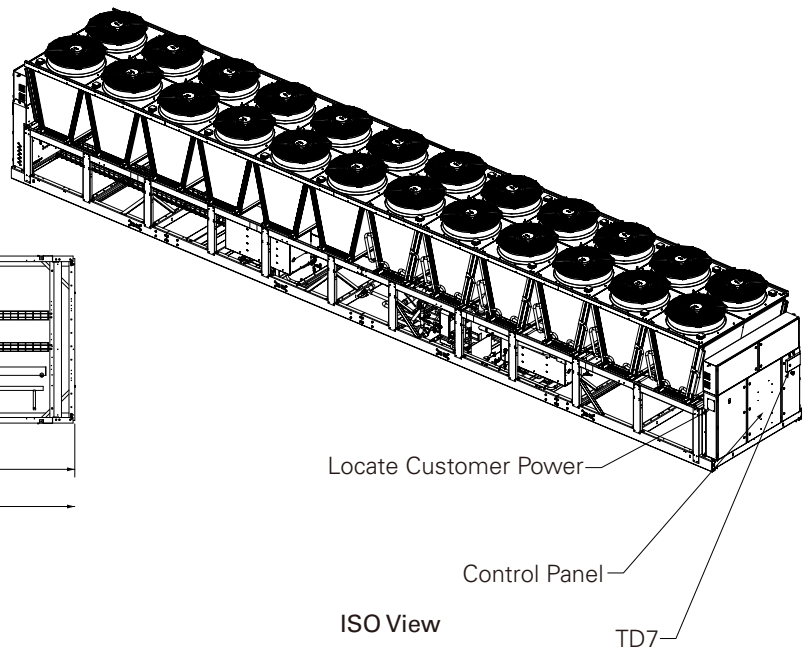
▲ Installation Point
● Lifting Point

		H1	W1	L1	L2	Water pipe	L (High eff) (mm)	L (Premium seasonal eff) (mm)
RTAG 375X	150PSI	453	1120	3582	3582	8"	11875	-
	300PSI	453	1120	3348	3348	8"	11875	-
RTAG 400X	150PSI	453	1120	3582	3582	8"	11875	-
	300PSI	453	1120	3348	3348	8"	11875	-
RTAG 440H	150PSI	453	1120	3582	3582	8"	11875	-
	300PSI	453	1120	3348	3348	8"	11875	-
RTAG 440P	150PSI	453	1120	3582	3582	8"	-	11875
	300PSI	453	1120	3348	3348	8"	-	11875

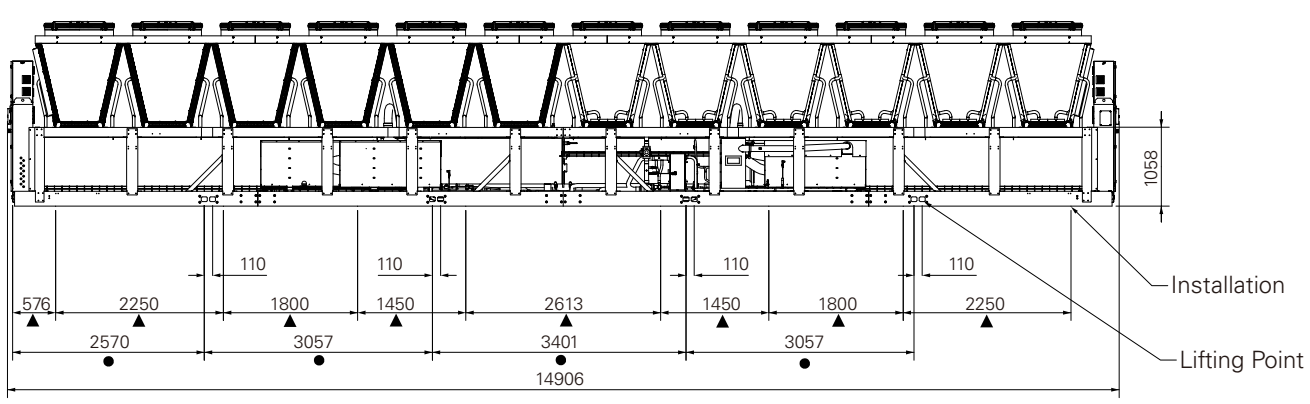
RTAG 410X/440X



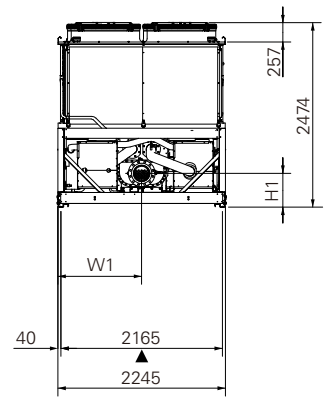
Top View
(With fan/coil removed)



ISO View



Side View



Back View
(With near side control panel removed)

▲ Installation Point
● Lifting Point

		H1	W1	L1	L2	Water pipe	L (High eff) (mm)	L (Premium seasonal eff) (mm)
RTAG 410X	150PSI	453	1120	5062	5062	8"	11323	14906
	300PSI	453	1120	4828	4828	8"	11323	14906
RTAG 440X	150PSI	453	1120	5062	5062	8"	-	14906
	300PSI	453	1120	4828	4828	8"	-	14906

Mechanical Specifications

General

Chilled water production will be made by a factory assembled and tested, air-cooled liquid chiller, Trane type RTAG H/X/P. Chiller will have one or two refrigerant circuits with one or two compressors per circuit.

Documentation including installation-operation maintenance manual, user guide, wiring diagram and submittal is placed in the control panel.

Compressors and Motors

The helical-rotary compressor is semi-hermetic, direct drive, 3000 rpm, differential refrigerant pressure oil circulation system without oil pump, and with oil heater.

On Trane RTAG P Capacity control is done through the VFD to optimize performances at partial load allowing reduction of capacity down to 36% or 18% or 12% or 9% (one or two refrigerant circuits, each circuit has one or two compressors) of the maximum value.

On Trane RTAG H and X capacity control will be made through a slide valve allowing reduction of capacity down to 30 or 15% or 10% or 7.5% (one or two refrigerant circuits, each circuit has one or two compressors) of the maximum value. Compressor will start always unloaded.

Motor is suction gas cooled, hermetically sealed, two poles, squirrel cage induction type, with four pressure lubricated rolling elements, bearing groups shall support the rotating assembly. Motor bearings will be designed for the whole life of the chiller.

Oil Management

The chiller is equipped with an oil management system without oil pump that ensures proper oil circulation throughout the unit. The key components of the system include an oil separator, oil filter with particles retention capacity of at least 5µm.
An oil heater is installed to avoid startup with low oil temperature.

An optional oil cooler is installed when the unit is used for high condensing temperature or unit with compressor VFD or economizer.

Unit-Mounted Wye-Delta Starter (RTAG H and X)

The compressor starters shall be Star-Delta configuration closed transition, factory-mounted and fully pre-wired to the compressor motor and control panel. Starter will reduce by 33% the inrush current.

Adaptive Frequency Drive (AFD) mounted on RTAG P

Compressors of RTAG P shall be equipped with an adaptive frequency drive, factory mounted, tested and wired. Frequency converter will drive the chiller start and ramp up, and the partial load operation.

AFD enclosure is IP54 as standard, with integrated air cooling system, consisting of a fan below the VFD frame.

Evaporator

The evaporator is a tube-in-shell heat exchanger design with internally and externally finned copper tubes roller expanded into the tube sheet. If select the option of "ASME Pressure Vessel Code" , the evaporator is designed, tested and stamped in accordance with ASME for a refrigerant side working pressure of 200 psig. The evaporator is designed for a water side working pressure of 150 /300 psig. Water connections are flange. Each shell includes a vent, a drain and fittings for temperature control sensors and is insulated with 3/4 inch equal insulation (K=0.26). Evaporator heaters with thermostat are provided to help protect the evaporator from freezing at ambient temperatures down to -20°F (-29°C). Factory installed flow switch is installed on a pipe stub in the evaporator inlet.

Condenser and Fans

Air-cooled condenser coils have aluminum fins mechanically bonded to internally finned seamless copper tubing. The condenser coil has an integral subcooling circuit. Condensers are factory proof and leak tested at 506 psig.

Direct-drive vertical-discharge airfoil condenser fans are dynamically balanced.
Standard units will start and operate from 0°C to 46°C (32°F to115°F) ambient.
Standard ambient or high ambient, standard noise or low noise are equipped with three-phase AC condenser fan motors. Low ambient or wide ambient, ultra low noise and premium seasonal efficiency units are equipped with EC condenser fan motors.

Refrigerant Circuit

Each unit has one or two refrigerant circuits, with one or two rotary screw compressors per circuit. Each refrigerant circuit includes liquid line shut off valve, removable core filter, charging port, high pressure and low pressure safety valves and electronic expansion valve.

Electrical Panel

Single point power connection (85-225 models) or dual point power connection (255-440 models) with disconnect switch and fuses.
The disconnect switch is mechanically interlocked to disconnect line power from the starter before the starter doors are open.
All components and control cables are numbered in accordance with CEI 60750.
A factory-installed, factory-wired control power transformer provides all unit control power and UC800 module power. All the starter elements are enclosed in an IP54 panel, with hinged door.

Unit Controls (Tracer UC800)

The microprocessor-based control panel is factory installed and factory-tested. The control system is powered by a control power transformer. It loads and unloads the chiller through adjustment of the compressor slide valve on models RTAG H/X and through a Adaptive Frequency Drive on the model RTAG P.
Microprocessor-based chilled water reset based on return water is standard. The UC800 utilizing the “Adaptive Control™” microprocessor automatically takes action to prevent unit shutdown due to abnormal operating conditions associated with low evaporator refrigerant temperature, high condensing temperature, and motor current overload. If abnormal operating condition continues and protective limit is reached, the refrigerant circuit will be shut down. Controller includes machine protection shutdown requiring manual reset for:

- Low evaporator refrigerant temperature and pressure
- High condenser refrigerant pressure
- Low oil flow
- Critical sensor or detection circuit fault
- Motor current overload
- High compressor discharge temperature
- Communications lost between modules
- Electrical distribution faults: phase loss, phase imbalance, phase reversal
- External and local emergency stop
- Starter transition failure.

The panel includes machine protection shutdown with automatic reset when the condition is corrected for:
- Momentary power loss
- Over / under voltage
- Loss of evaporator water flow.

Over 100 diagnostic checks is made and are displayed when a fault is detected. The display indicates the fault, the type of reset required, the time and date the diagnostic occurred, the mode in which the machine was operating at the time of the diagnostic, and a help message. A diagnostic history displays the last 20 diagnostics with the time and date of their occurrence. Alarms and diagnostics are displayed in chronological order, with a color/symbol code: red octagon for immediate shutdown, yellow triangle for normal shutdown and blue circle for warning.

Human interface with Touchable Display Trane TD7
- Factory-mounted above the control panel door
- UV Resistant touchscreen
- -40°C to 70°C operating temperature
- IP56 rated
- CE certification
- Emissions: EN55011(Class B)
- Immunity: EN61000 (Industrial)
- 7” diagonal
- 800x480 pixels
- TFT LCD @ 600 nits brightness
- 16 bit color graphic display

Display features:
- Alarms
- Reports
- Chiller settings
- Display settings
- Graphing

Dry contacts
UC800 provides a flexible alarm or chiller status indication to a remote location through a hard wired interface to a dry contact closure. Four relays are available for this function.

Ingersoll Rand

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RTAG-PRC001B-EN January 2019
Supersedes RTAG-PRC001A-EN (October 2017)

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Engineering Bulletin

Sound Data and Application Guide For Air-Cooled Series R™ Chiller

Model RTAG

85-205 Tons (50 Hz)



⚠ SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

November 2017 **RTAG-PRB001A-EN**

Introduction

The New, Quieter Air Cooled Series R™ Chiller – Model RTAG

The sound levels of the air-cooled Series R™ Model RTAA chillers have been steadily improved since their introduction in 1990. With the advent of the Model RTAG, sound levels are reduced significantly by addressing three major sources: the compressor, the refrigerant piping, and the condenser fans.

The compressor has been designed to minimize sound at its point of creation. This was accomplished by conducting finite element analysis on the compressor housing to find areas that would amplify the frequencies generated from compression. These areas were then redesigned to reduce sound transmission.

The refrigerant components and piping have been optimized to reduce vibration and sound propagation throughout the system.

Another source of sound originates from the condenser fans. Fan sound power can be as much as half of the overall unit sound power levels. Careful consideration was taken when designing and selecting the next generation condenser fans to be engineered into the Model RTAG. The sound levels achieved on the Model RTAG represent the lowest sound levels ever on Trane air-cooled screw compressor water chillers.

When installing any chiller, forethought should be given to the chiller and its relationship with the structure. Issues such as sound and vibration should be considered and factored into the building design and chiller location within a given structure. These issues are not unique to chillers but should be considered when any mechanical device is located in or on a structure.

This bulletin is not intended to be a replacement for a sound consultant, but rather a tool for you to advise owners, engineers and contractors of useful tips when designing and installing chiller installations. This engineering bulletin provides guidelines for addressing both unit location and airborne sound when installing air-cooled Series R™ chillers.

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Unit Location

Outdoor HVAC equipment must be located to minimize noise and vibration transmission to the occupied spaces of the building structure it serves. Also, the equipment must be located to prevent objectionable noise levels at adjacent property lines or building structures. When choosing a location for the equipment, consider the following application material for both ground level and roof mounted equipment.

An additional concern for the designer is the resulting noise level at adjacent property lines. When commercial size equipment is installed near a residential lot line, there is potential for a sound problem. In this situation, the problem is not the commercial equipment but rather locating the equipment too close to a quiet zone! For equipment operating adjacent to residential areas, zone ordinances require maximum lot line dBA levels of 50-55/45 (day/night). In commercial areas 60-65/55-60 (day/ night). In industrial areas typical levels mandated by local code authorities are 65-70/65-70 (day/night). The reader is cautioned that the foregoing values listed are those typically seen across major cities of the U.S. The requirements vary by locality so **the designer is cautioned to always check the criteria and local requirements before selecting equipment locations**

A. Ground Level Equipment

1. If the equipment must be located in close proximity to a building, it should be placed next to an unoccupied space such as a storage room, mechanical room, switch gear/electrical room or other typically unoccupied space. It is not recommended to locate the equipment near occupied, sound sensitive areas of the building or near windows. Also, do not locate the equipment adjacent to other building walls or large objects which may reflect the sound back to the sound sensitive receiver.
2. Seal all piping and electrical conduit penetrations in the building envelope with an approved fire safe sealant. Utilize insulated, dielectrically compatible sleeves at wall penetrations to properly support the piping and provide vibration damping. Provide flexible couplings and vibration isolators for the water circulating pump and connections to prevent the transmission of sound throughout the building.
3. Install the unit on a pad isolated from the building or install the unit with proper vibration isolation underneath the unit to prevent machine vibrations from being transmitted to the structure of the building.

B. Roof Mounted Equipment

1. Roof Location

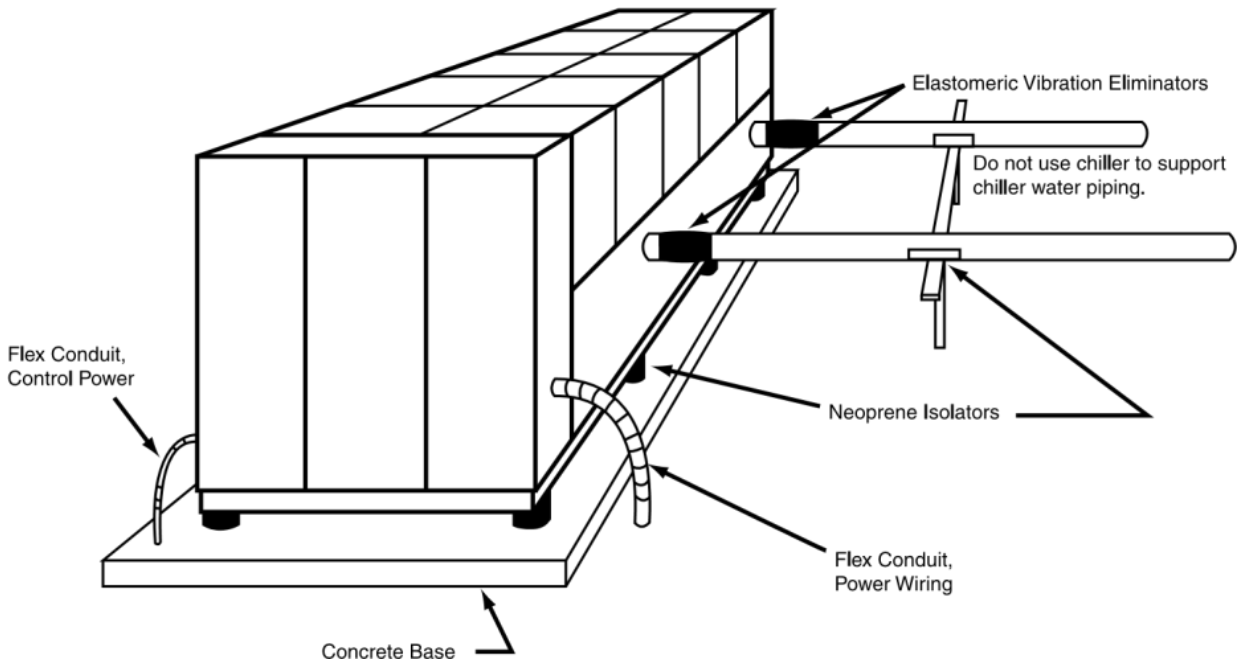
- The single most effective recommendation to prevent sound problems within a building is to locate the unit over non-critical areas such as copy rooms, restrooms, storage rooms, and other similar non-occupied areas of the building. It is not recommended to locate a unit directly over or in close proximity to sound sensitive areas such as conference rooms, executive office spaces, libraries, etc.
- It is not recommended to locate the equipment near occupied, sound sensitive areas of the building or near window glass. Also, do not locate the equipment adjacent to other building walls or large objects which may reflect the sound back to the sound sensitive receiver.

2. Building Structure

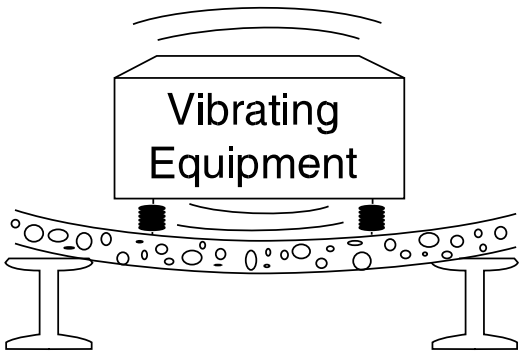
- When mounting the chiller on the roofline, it is not recommended to locate the unit on a beam or structure at mid-span of the column grid. Rather, directly support the unit over columns. Nor is it recommended to locate the unit in the middle of a horizontal beam. Try to avoid large column spans. This will minimize the roof deflection vibration transmission.
- When directly mounting chillers on I-beams that are above the roofline and mounted to the building support columns, there exists the potential for a resonant frequency at which higher than normal vibration may be transmitted to the rest of the building. Be cognizant of this application. A consultant may be required for evaluation.

Unit Location

When directly mounting chillers on I-beams (at the roofline) that are mounted to the building, support columns potentially can transmit higher than normal vibration at a resonant frequency to the rest of the building. The following drawing depicts what type of prevention methods can be taken.

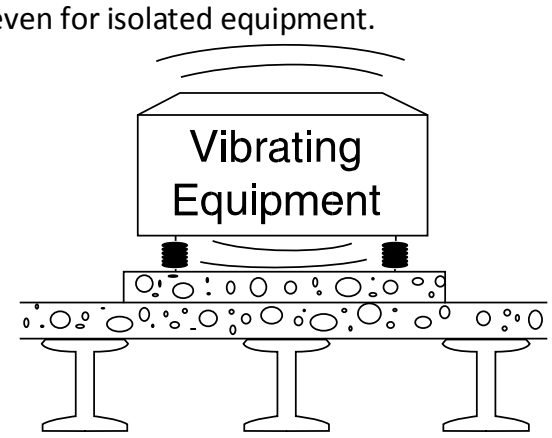


Building Support



Poor

Concentration of equipment weight between beams causes excessive roof deflection and vibration transmission, even for isolated equipment.



Good

Further addition of housekeeping pad and additional beams add mass and stiffness to roof.

Very Good

A column directly under the equipment gives the roof a very high local stiffness, but some equipment vibration still enters the roof slab.

3. Base

- It is not recommended to bolt down vibrating equipment directly to foundation without using isolators.
- Install the unit upon an inertia base or concrete pad structure with vibration isolation to match the characteristics of the roof structure. Beware of lightweight roof structures which are difficult to isolate from vibration.
- Use an inertia base or solid concrete pad as a base for the chiller. This mass, properly supported, will maximize vibration dampening and help prevent noise from penetrating through the roof directly below the unit. Floors and ceiling should be concrete slabs.

4. Isolators

- Isolate chiller on ELASTOMERIC isolators. Originally intended for reciprocating compressors, spring isolators are not as effective at absorbing movement and vibration on air-cooled Series R chiller installations. This is because air-cooled Series R chillers have higher frequency vibration (900 Hz) than reciprocating chillers (less than 125 Hz).
- Isolate the unit on elastomeric isolators selected to match the characteristics of the roof structure. It is not recommended that equipment be applied to buildings with a lightweight roof structure unless column supports are provided which are independent of the roof structure.

5. Chilled Water Piping

- Provide flexible couplings and vibration isolators for the water circulating pump connections to prevent the transmission of sound throughout the building.
- Isolate chilled water piping from the chiller with ELASTOMERIC vibration eliminators. Metal braided eliminators have proven to be much less effective than elastomeric isolators in reducing vibration transmission to the building through the piping.
- Isolate pipe hangers with ELASTOMERIC isolators. This reduces vibration transmission to the building. Do not let the chiller support the weight of the chilled water piping. Isolating pipe hangers this way reduces vibration transmission to the building.

6. Electrical

- Electrical connections to the chiller should be in flex conduit. Hard electrical conduit is another vibration path that should be eliminated in chiller installations.

Unit Location

Table 1 — Sound Pressure Levels Series R™ Air-Cooled Chiller

Unit Size RTAG	A-Weighted Sound Pressure Level, dBA, ref 20 micro Pa, Standard Noise Option					
	High Efficiency Unit		Extra High Efficiency Unit		Premium Seasonal Efficiency Unit	
	AC fan @ 10m	EC fan @ 10m	AC fan @ 10m	EC fan @ 10m	AC fan @ 10m	EC fan @ 10m
85	NA	NA	66.5	66.0	NA	66.0
100	66.5	66.0	66.5	66.0	NA	66.0
125	68.0	67.5	68.5	68.0	NA	68.0
145	68.0	67.5	68.5	68.0	NA	68.0
155	68.5	68.5	69.0	68.5	NA	68.5
170	69.0	69.0	69.5	69.0	NA	69.0
190	69.5	69.0	69.5	69.0	NA	69.0
205	69.5	69.0	69.5	69.0	NA	69.0
250	71.0	70.5	71.5	71.0	NA	71.0
280	71.0	70.5	71.5	71.0	NA	71.0
310	71.5	71.5	72.0	71.5	NA	71.5
350	72.0	72.0	72.5	72.0	NA	72.0
380	72.5	72.0	72.5	72.0	NA	72.0
410	72.5	72.0	72.5	72.0	NA	72.0

Note: 10 m is measured from the side of the chiller. Sound radiation at this distance will approximate a line noise source.

Unit Size RTAG	A-Weight Sound Pressure Level, dBA, ref 20 micro Pa, Low Noise Option					
	High Efficiency Unit		Extra High Efficiency Unit		Premium Seasonal Efficiency Unit	
	AC fan @ 10m	EC fan @ 10m	AC fan @ 10m	EC fan @ 10m	AC fan @ 10m	EC fan @ 10m
85	NA	NA	63.0	62.5	NA	62.5
100	63.0	62.5	63.0	62.5	NA	62.5
125	64.5	63.5	65.0	64.5	NA	64.5
145	64.5	63.5	65.0	64.5	NA	64.5
155	65.0	64.0	65.5	64.5	NA	64.5
170	65.0	64.5	65.5	65.0	NA	65.0
190	65.5	65.0	66.0	65.5	NA	65.5
205	65.5	65.0	66.0	65.5	NA	65.5
250	67.5	66.5	68.0	67.5	NA	67.5
280	67.5	66.5	68.0	67.5	NA	67.5
310	68.0	67.0	68.5	67.5	NA	67.5
350	68.0	67.5	68.5	68.0	NA	68.0
380	68.5	68.0	69.0	68.5	NA	68.5
410	68.5	68.0	69.0	68.5	NA	68.5

Note: 10 m is measured from the side of the chiller. Sound radiation at this distance will approximate a line noise source.

Unit Size RTAG	A-Weighted Sound Pressure Level, dBA, ref 20 micro Pa, Low Noise With Night Noise Set Back Option					
	High Efficiency Unit		Extra High Efficiency Unit		Premium Seasonal Efficiency Unit	
	AC fan @ 10m	EC fan @ 10m	AC fan @ 10m	EC fan @ 10m	AC fan @ 10m	EC fan @ 10m
85	NA	NA	NA	59.5	NA	59.5
100	NA	59.5	NA	59.5	NA	59.5
125	NA	61.0	NA	61.5	NA	61.5
145	NA	61.0	NA	61.5	NA	61.5
155	NA	61.5	NA	62.0	NA	62.0
170	NA	62.0	NA	62.5	NA	62.5
190	NA	62.5	NA	62.5	NA	62.5
205	NA	62.5	NA	62.5	NA	62.5
250	NA	64.0	NA	64.5	NA	64.5
280	NA	64.0	NA	64.5	NA	64.5
310	NA	64.5	NA	65.0	NA	65.0
350	NA	65.0	NA	65.5	NA	65.5
380	NA	65.5	NA	65.5	NA	65.5
410	NA	65.5	NA	65.5	NA	65.5

Note: 10 m is measured from the side of the chiller. Sound radiation at this distance will approximate a line noise source.

7. Sealing Penetrations

- Seal all piping and electrical conduit penetrations in the building envelope with an approved fire safe sealant. Utilize insulated, dielectrically compatible sleeves at wall penetrations to properly support the piping and provide vibration damping.
- Acoustically treat all wall penetrations (piping, conduit, duct, outdoor vents, etc.)

Sound Pressure

Table 1 gives the overall A-weighted sound pressure levels for the air-cooled Series R™ chiller. Information given in this bulletin along with the data in Table 1 may be used to estimate the sound pressure levels of common installations. Estimations made using this bulletin are considered typical of what may be measured in a free field with a hand-held sound meter, in the absence of a nearby reflective surface.

Sound power octave band data are given in Appendix A. Acoustical consultants may require the data in Appendix A to perform a detailed acoustical analysis. Acoustical analysis may also be done using the Trane Acoustics Program (C.D.S.).

Note: The sound power data in Appendix 1 cannot be compared directly to SOUND PRESSURE data given in Table 1 above.

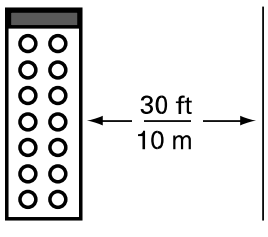


Figure 1

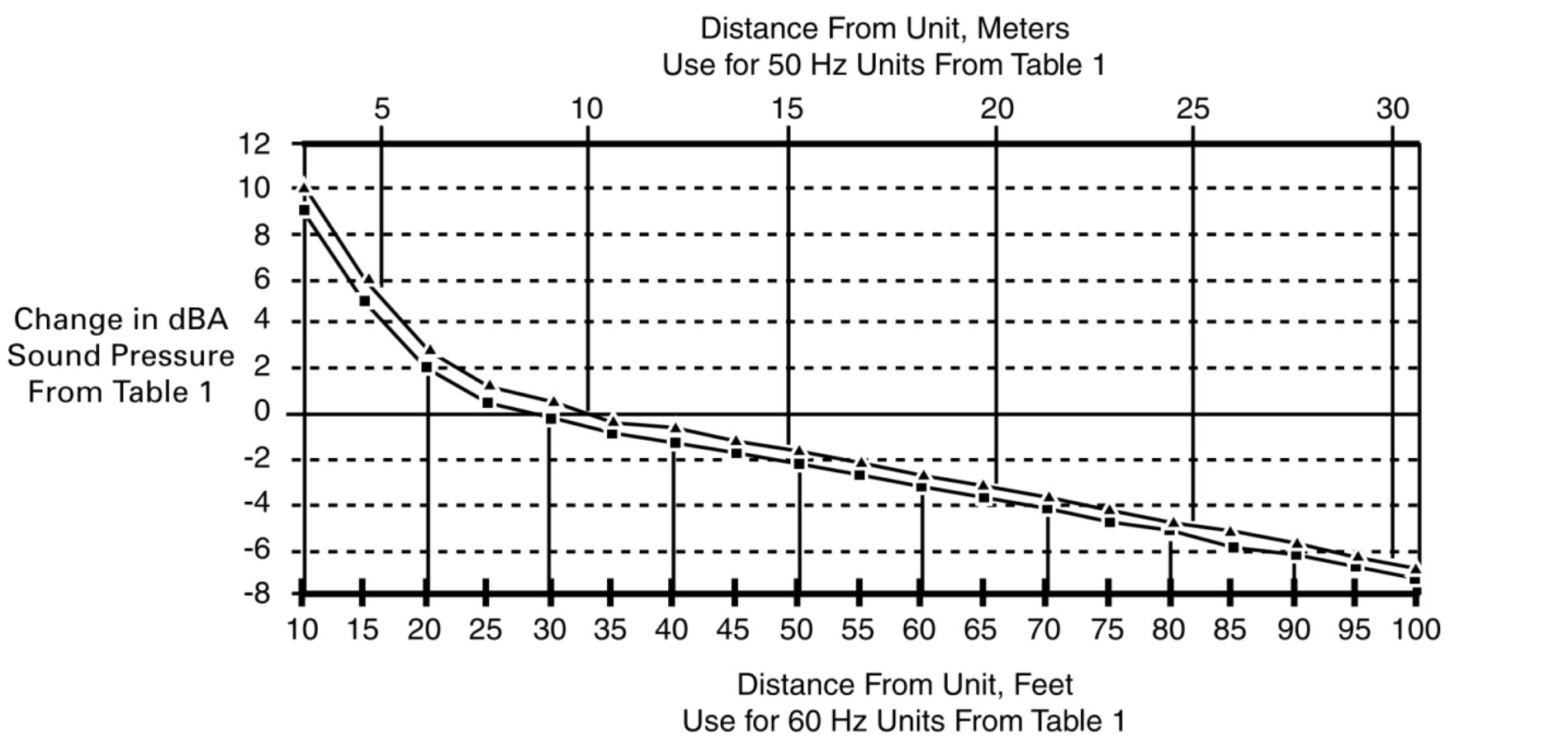
Sound measurements taken closer than 30 ft/10 m may be greatly distorted due to the large chiller lengths and multiple noise sources within the chiller.

Unit Location

Distance Factor

The distance between a source of sound and the receiver or place of sound measurement plays an important part in minimizing potential noise problems. Figure 2 gives the reductions in sound pressure level, dBA based on increasing distance from the chiller. Sound levels at a specific location can be minimized by correctly orienting the chiller (see Figure 1) and placing the chiller as far away from the location as possible (see Figure 2).

Figure 2 – Sound Attenuation Due to Distance



Note: Sound measurements taken closer than 30 ft/10 m may be greatly distorted when compared to an estimation made using Table 1 and Figure 2 due to large chiller lengths and multiple noise sources within the chiller.

Note: Beyond 100 ft or 30 meters, the sound pressure will continue to decrease 5 dBA for each doubling of the distance from the unit to the place of measurement. For example, the sound pressure at 200 ft will be 5 dBA lower than the sound pressure at 100 ft.

Unit Location

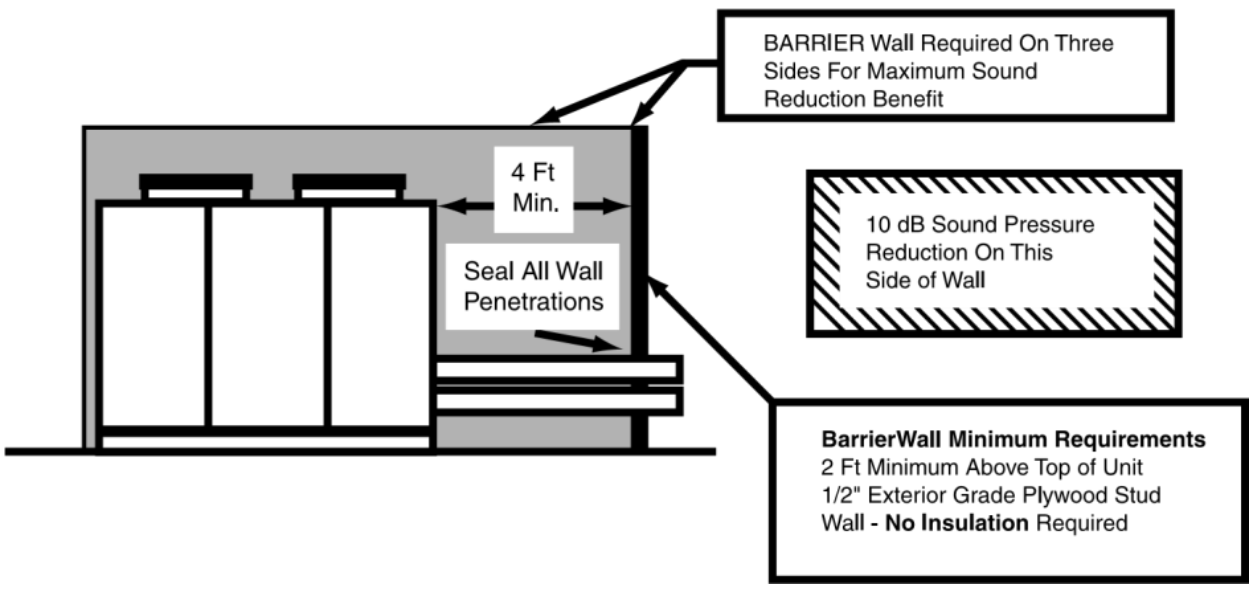
Sound Attenuation Using Barrier Walls Reciprocating chillers are characterized by a low frequency pounding sound that is typically difficult to attenuate. The direct drive Series R™ compressor and condenser fans have a medium and high frequency characteristic that may be attenuated with simple, inexpensive barrier walls.

A barrier wall constructed to only ½ inch exterior grade plywood gives a dramatic 10 dBA reduction in sound. Refer to Figure 3 for minimum wall requirements. Solid walls of brick or other more robust outdoor materials are equally acceptable and can be expected to give better attenuation. Masonry block walls with special sound absorbing cavities should be considered for critical applications.

A minimum distance of 4 ft is recommended, but the chiller may be placed closer than 4 ft to a barrier wall. Some loss of performance will occur.
Refer to Trane engineering bulletin RLC-PRB004-EN.

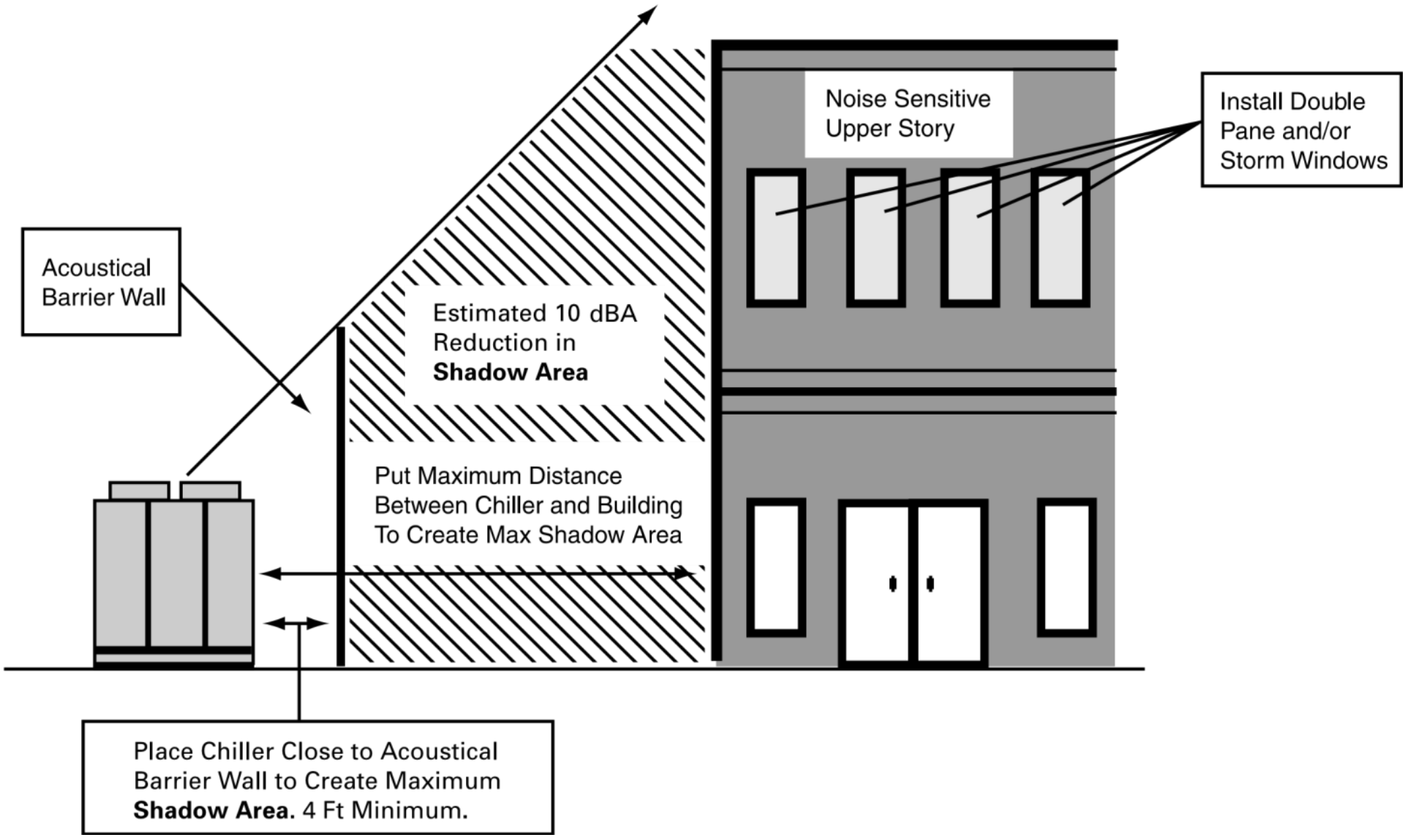
Louvered panels or decorative walls with any amount of open area should not be used to attenuate sound. They have little or no sound reflecting or attenuating benefit. Also, an insulated sheet metal box covering the compressors alone will provide minimal sound attenuation and is not recommended.

Figure 3 – Suggested Barrier Wall for Sound Attenuation



Unit Location

Figure 4 – Use of Attenuation for Upper Story Building Sound Problems



Acoustical Fan Discharge Stacks Use of acoustical fan discharge stacks by themselves will produce only marginal sound attenuating benefits. It is important to remember that both the compressors and the fans contribute to the sound of the air-cooled Series R™ chiller. Compressor noise is not attenuated by a fan discharge stack and a locally built and installed acoustical "box" around the compressors is not an effective means of compressor sound attenuation.

However, acoustical fan discharge stacks can be used with an acoustical barrier wall. Selection and installation of acoustical fan discharge stacks must be done by a competent acoustical engineer in order to be effective.

Please note that chiller performance is adversely affected by the use of acoustical fan discharge stacks. Refer to Figures 6 through 8. The length and open area of acoustical fan discharge stacks must be designed to produce no more than 0.5 inch of additional static pressure on the condenser fans. Also note that care must be taken to properly support discharge fan stacks against severe cross winds.

Appendix A

Appendix A

Sound Power Octave Band Data

Sound power octave band data can be used for purposes of describing the basic acoustical properties of the air-cooled Series R™ chiller. However, there are two cautionary notes. First, if the engineer is using the data as a criteria in a bid evaluation, make sure that the data from all competitors is on an equal basis. Insist that all competitors present data terms of **SOUND POWER (not sound pressure),** in a consistent format, according to **ARI Standard 370**.

>>>Sound **power** data CANNOT be compared directly to sound **pressure** data. <<<

Second, the sound power data does not provide sufficient information to correctly position the chiller or attenuate its sound to take full advantage of the characteristics of the air-cooled Series R chiller. Unlike most reciprocating chillers that exhibit a low frequency, pounding sound, the air-cooled Series R chiller sound is directional in nature and has a higher frequency characteristic that is more easily attenuated. The specific application information given in the preceding parts of this bulletin can be used to create a significant competitive advantage over competitive air-cooled reciprocating chillers.

NOTE: Sound Power Rating data given in Tables A-1 through A-2 and Tables B-7 through B-10 may vary ± 2 dB in any specific octave band due to normal variations in chiller construction.

Table A-1 (50 Hz) – Octave Band Sound Power Levels, dB ref, 1 pw, High Efficiency Unit with AC Fan, Standard Noise Option

Unit Size RTAG	Standard Noise Option, High Efficiency Unit with AC Fan								
	Sound Power Levels, dB ref, 1 pw								Overall A'Wtd
	Octave Band Center Frequency, Hz								
	63	125	250	500	1000	2000	4000	8000	
85	NA	NA	NA	NA	NA	NA	NA	NA	NA
100	96.0	89.0	91.5	97.0	94.0	89.0	80.5	74.0	98.0
125	97.0	90.5	92.5	98.5	95.5	90.5	82.0	75.5	99.5
145	97.0	90.5	92.5	98.5	95.5	90.5	82.0	75.5	99.5
155	97.0	90.5	93.0	98.5	96.5	91.0	82.5	76.0	100.0
170	97.5	90.5	93.5	99.0	97.0	91.5	83.0	76.5	100.5
190	98.5	91.5	94.0	99.5	97.0	92.0	83.5	77.0	101.0
205	98.5	91.5	94.0	99.5	97.0	92.0	83.5	77.0	101.0
250	100.0	93.5	95.5	101.5	98.5	93.5	85.0	78.5	102.5
280	100.0	93.5	95.5	101.5	98.5	93.5	85.0	78.5	102.5
310	100.5	93.5	96.0	101.5	99.5	94.0	85.5	79.0	103.0
350	100.5	93.5	96.5	102.0	100.0	94.5	86.0	79.5	103.5
380	101.0	94.5	97.0	102.5	100.0	95.0	86.0	79.5	104.0
410	101.0	94.5	97.0	102.5	100.0	95.0	86.0	79.5	104.0

Sound Power is a calculated quantity and cannot be measured directly like SOUND PRESSURE. Sound power is the amount of acoustical power produced at the source, and thus is an absolute quantity and not dependent on the surrounding environment or distance, as is sound pressure. 32 measurements are taken over a prescribed area around the unit. Data is then mathematically reduced to give the sound power level, dB.

Appendix A

Table A-2 (50 Hz) – Octave Band Sound Power Levels, dB ref, 1 pw, High Efficiency Unit with EC Fan, Standard Noise Option

Unit Size RTAG	Standard Noise Option, High Efficiency Unit with EC Fan								
	Octave Band Sound Power Levels, dB ref, 1 pw								Overall A'Wtd
	Octave Band Center Frequency, Hz								
	63	125	250	500	1000	2000	4000	8000	
85	NA	NA	NA	NA	NA	NA	NA	NA	NA
100	99.0	90.5	92.5	95.0	94.5	89.0	81.5	74.5	97.5
125	100.5	91.5	94.0	96.5	96.0	90.5	83.0	76.0	99.0
145	100.5	91.5	94.0	96.5	96.0	90.5	83.0	76.0	99.0
155	100.5	91.5	94.5	97.0	96.5	91.5	83.5	76.5	100.0
170	100.5	91.5	94.5	97.5	97.0	92.0	83.5	77.0	100.5
190	101.5	92.5	95.5	97.5	97.5	92.0	84.0	77.0	100.5
205	101.5	92.5	95.5	97.5	97.5	92.0	84.0	77.0	100.5
250	103.5	94.5	97.0	99.5	99.0	93.5	86.0	79.0	102.0
280	103.5	94.5	97.0	99.5	99.0	93.5	86.0	79.0	102.0
310	103.5	94.5	97.5	100.0	99.5	94.5	86.5	79.5	103.0
350	103.5	94.5	98.0	100.5	100.0	95.0	86.5	80.0	103.5
380	104.5	95.5	98.5	100.5	100.5	95.0	87.0	80.0	103.5
410	104.5	95.5	98.5	100.5	100.5	95.0	87.0	80.0	103.5

Table A-3 (50 Hz) – Octave Band Sound Power Levels, dB ref, 1 pw, Extra High Efficiency Unit with AC Fan, Standard Noise Option

Unit Size RTAG	Standard Noise Option, Extra High Efficiency Unit with AC Fan								
	Octave Band Sound Power Levels, dB ref, 1 pw								Overall A'Wtd
	Octave Band Center Frequency, Hz								
	63	125	250	500	1000	2000	4000	8000	
85	96.0	89.0	91.5	97.0	94.0	89.0	80.5	74.0	98.0
100	96.0	89.0	91.5	97.0	94.0	89.0	80.5	74.0	98.0
125	98.0	91.0	93.0	99.0	95.5	90.5	82.5	75.5	100.0
145	98.0	91.0	93.0	99.0	95.5	90.5	82.5	75.5	100.0
155	98.0	91.0	93.5	99.0	96.5	91.0	83.0	76.0	100.5
170	98.5	91.5	94.0	99.5	97.0	92.0	83.5	77.0	101.0
190	99.0	92.0	94.5	100.0	97.0	92.0	83.5	77.0	101.0
205	99.0	92.0	94.5	100.0	97.0	92.0	83.5	77.0	101.0
250	101.0	94.0	96.0	102.0	98.5	93.5	85.5	78.5	103.0
280	101.0	94.0	96.0	102.0	98.5	93.5	85.5	78.5	103.0
310	101.0	94.5	96.5	102.0	99.5	94.0	86.0	79.0	103.5
350	101.0	94.5	97.0	102.5	100.0	95.0	86.0	79.5	104.0
380	102.0	95.0	97.5	103.0	100.0	95.0	86.5	80.0	104.0
410	102.0	95.0	97.5	103.0	100.0	95.0	86.5	80.0	104.0

Appendix A

Table A-4 (50 Hz) – Octave Band Sound Power Levels, dB ref, 1 pw, Extra High Efficiency Unit with EC Fan, Standard Noise Option

Unit Size RTAG	Standard Noise Option, Extra High Efficiency Unit with EC Fan								
	Octave Band Sound Power Levels, dB ref, 1 pw								Overall A'Wtd
	Octave Band Center Frequency, Hz								
	63	125	250	500	1000	2000	4000	8000	
85	99.0	90.5	92.5	95.0	94.5	89.0	81.5	74.5	97.5
100	99.0	90.5	92.5	95.0	94.5	89.0	81.5	74.5	97.5
125	101.5	92.5	94.5	96.5	96.0	90.5	83.5	76.0	99.5
145	101.5	92.5	94.5	96.5	96.0	90.5	83.5	76.0	99.5
155	101.5	92.5	95.0	97.0	97.0	91.5	84.0	76.5	100.0
170	101.5	92.5	95.5	97.5	97.5	92.0	84.0	77.0	100.5
190	102.0	93.5	95.5	98.0	97.5	92.0	84.5	77.5	100.5
205	102.0	93.5	95.5	98.0	97.5	92.0	84.5	77.5	100.5
250	104.5	95.5	97.5	99.5	99.0	93.5	86.5	79.0	102.5
280	104.5	95.5	97.5	99.5	99.0	93.5	86.5	79.0	102.5
310	104.5	95.5	98.0	100.0	100.0	94.5	87.0	79.5	103.0
350	104.5	95.5	98.5	100.5	100.5	95.0	87.0	80.0	103.5
380	105.0	96.5	98.5	101.0	100.5	95.0	87.5	80.5	103.5
410	105.0	96.5	98.5	101.0	100.5	95.0	87.5	80.5	103.5

Table A-5 (50 Hz) – Octave Band Sound Power Levels, dB ref, 1 pw, Premium Seasonal Efficiency Unit with EC Fan, Standard Noise Option

Unit Size RTAG	Standard Noise Option, Premium Seasonal Efficiency Unit with EC Fan								
	Octave Band Sound Power Levels, dB ref, 1 pw								Overall A'Wtd
	Octave Band Center Frequency, Hz								
	63	125	250	500	1000	2000	4000	8000	
85	99.0	90.5	92.5	95.0	94.5	89.0	81.5	74.5	97.5
100	99.0	90.5	92.5	95.0	94.5	89.0	81.5	74.5	97.5
125	101.5	92.5	94.5	96.5	96.0	90.5	83.5	76.0	99.5
145	101.5	92.5	94.5	96.5	96.0	90.5	83.5	76.0	99.5
155	101.5	92.5	95.0	97.0	97.0	91.5	84.0	76.5	100.0
170	101.5	92.5	95.5	97.5	97.5	92.0	84.0	77.0	100.5
190	102.0	93.5	95.5	98.0	97.5	92.0	84.5	77.5	100.5
205	102.0	93.5	95.5	98.0	97.5	92.0	84.5	77.5	100.5
250	104.5	95.5	97.5	99.5	99.0	93.5	86.5	79.0	102.5
280	104.5	95.5	97.5	99.5	99.0	93.5	86.5	79.0	102.5
310	104.5	95.5	98.0	100.0	100.0	94.5	87.0	79.5	103.0
350	104.5	95.5	98.5	100.5	100.5	95.0	87.0	80.0	103.5
380	105.0	96.5	98.5	101.0	100.5	95.0	87.5	80.5	103.5
410	105.0	96.5	98.5	101.0	100.5	95.0	87.5	80.5	103.5

Appendix A

Table A-6 (50 Hz) – Octave Band Sound Power Levels, dB ref, 1 pw, High Efficiency Unit with AC Fan, Low Noise Option

Unit Size RTAG	Low Noise Option, High Efficiency Unit with AC Fan								
	Octave Band Sound Power Levels, dB ref, 1 pw								Overall A'Wtd
	Octave Band Center Frequency, Hz								
	63	125	250	500	1000	2000	4000	8000	
85	NA	NA	NA	NA	NA	NA	NA	NA	NA
100	96.0	89.0	88.5	95.0	89.0	83.5	78.0	69.0	94.5
125	97.0	90.0	89.5	96.5	90.5	84.5	79.5	70.5	96.0
145	97.0	90.0	89.5	96.5	90.5	84.5	79.5	70.5	96.0
155	97.0	90.0	90.0	96.5	91.0	85.5	79.5	71.0	96.5
170	97.0	90.0	90.0	96.5	91.5	86.0	80.0	71.5	96.5
190	98.0	91.0	91.0	97.5	92.0	86.0	80.5	72.0	97.0
205	98.0	91.0	91.0	97.5	92.0	86.0	80.5	72.0	97.0
250	100.0	93.0	92.5	99.5	93.5	87.5	82.5	73.5	99.0
280	100.0	93.0	92.5	99.5	93.5	87.5	82.5	73.5	99.0
310	100.0	93.0	93.0	99.5	94.0	88.5	82.5	74.0	99.5
350	100.0	93.0	93.0	99.5	94.5	88.5	82.5	74.0	99.5
380	101.0	94.0	94.0	100.5	95.0	89.0	83.5	75.0	100.0
410	101.0	94.0	94.0	100.5	95.0	89.0	83.5	75.0	100.0

Table A-7 (50 Hz) – Octave Band Sound Power Levels, dB ref, 1 pw, High Efficiency Unit with EC Fan, Low Noise Option

Unit Size RTAG	Low Noise (Compressor+Tube Sound Wrap) Option, High Efficiency Unit with EC Fan								
	Octave Band Sound Power Levels, dB ref, 1 pw								Overall A'Wtd
	Octave Band Center Frequency, Hz								
	63	125	250	500	1000	2000	4000	8000	
85	NA	NA	NA	NA	NA	NA	NA	NA	NA
100	99.0	90.0	91.0	91.0	90.5	84.0	80.0	70.5	94.0
125	100.0	91.0	92.0	92.5	91.5	85.5	81.0	72.0	95.0
145	100.0	91.0	92.0	92.5	91.5	85.5	81.0	72.0	95.0
155	100.0	91.0	92.0	93.0	92.0	86.0	81.0	72.0	95.5
170	100.5	91.5	92.5	93.0	92.5	86.5	81.5	72.5	96.0
190	101.0	92.0	93.0	93.5	93.0	86.5	82.0	73.0	96.5
205	101.0	92.0	93.0	93.5	93.0	86.5	82.0	73.0	96.5
250	103.5	94.0	95.0	95.5	94.5	88.5	84.0	75.0	98.0
280	103.5	94.0	95.0	95.5	94.5	88.5	84.0	75.0	98.0
310	103.5	94.0	95.0	96.0	95.0	89.0	84.0	75.0	98.5
350	103.5	94.5	95.0	96.0	95.5	89.5	84.5	75.5	99.0
380	104.0	95.0	96.0	96.5	96.0	89.5	85.0	76.0	99.5
410	104.0	95.0	96.0	96.5	96.0	89.5	85.0	76.0	99.5

Appendix A

Table A-8 (50 Hz) – Octave Band Sound Power Levels, dB ref, 1 pw, Extra High Efficiency Unit with AC Fan, Low Noise Option

Unit Size RTAG	Low Noise (Compressor+Tube Sound Wrap) Option, Extra High Efficiency Unit with AC Fan								
	Octave Band Sound Power Levels, dB ref, 1 pw								Overall A'Wtd
	Octave Band Center Frequency, Hz								
	63	125	250	500	1000	2000	4000	8000	
85	96.0	89.0	88.5	95.0	89.0	83.5	78.0	69.0	94.5
100	96.0	89.0	88.5	95.0	89.0	83.5	78.0	69.0	94.5
125	98.0	91.0	90.5	97.5	91.0	85.0	80.5	71.0	96.5
145	98.0	91.0	90.5	97.5	91.0	85.0	80.5	71.0	96.5
155	98.0	91.0	90.5	97.5	91.5	85.5	80.5	71.5	97.0
170	98.0	91.0	91.0	97.5	92.0	86.0	80.5	72.0	97.0
190	99.0	92.0	91.5	98.0	92.0	86.5	81.0	72.0	97.5
205	99.0	92.0	91.5	98.0	92.0	86.5	81.0	72.0	97.5
250	101.0	94.0	93.5	100.5	94.0	88.0	83.5	74.0	99.5
280	101.0	94.0	93.5	100.5	94.0	88.0	83.5	74.0	99.5
310	101.0	94.0	93.5	100.5	94.5	88.5	83.5	74.5	100.0
350	101.0	94.0	94.0	100.5	95.0	89.0	83.5	75.0	100.0
380	102.0	95.0	94.5	101.0	95.0	89.5	84.0	75.0	100.5
410	102.0	95.0	94.5	101.0	95.0	89.5	84.0	75.0	100.5

Table A-9 (50 Hz) – Octave Band Sound Power Levels, dB ref, 1 pw, Extra High Efficiency Unit with EC Fan, Low Noise Option

Unit Size RTAG	Low Noise (Compressor+Tube Sound Wrap) Option, Extra High Efficiency Unit with EC Fan								
	Octave Band Sound Power Levels, dB ref, 1 pw								Overall A'Wtd
	Octave Band Center Frequency, Hz								
	63	125	250	500	1000	2000	4000	8000	
85	99.0	90.0	91.0	91.0	90.5	84.0	80.0	70.5	94.0
100	99.0	90.0	91.0	91.0	90.5	84.0	80.0	70.5	94.0
125	101.5	92.5	93.0	93.0	92.5	86.0	82.0	72.5	96.0
145	101.5	92.5	93.0	93.0	92.5	86.0	82.0	72.5	96.0
155	101.5	92.5	93.0	93.5	92.5	86.5	82.0	73.0	96.0
170	101.0	92.0	93.0	93.5	93.0	86.5	82.0	73.0	96.5
190	102.0	93.0	94.0	94.0	93.5	87.0	83.0	73.5	97.0
205	102.0	93.0	94.0	94.0	93.5	87.0	83.0	73.5	97.0
250	104.5	95.5	96.0	96.0	95.5	89.0	85.0	75.5	99.0
280	104.5	95.5	96.0	96.0	95.5	89.0	85.0	75.5	99.0
310	104.5	95.5	96.0	96.5	95.5	89.5	85.0	76.0	99.0
350	104.0	95.0	96.0	96.5	96.0	89.5	85.0	76.0	99.5
380	105.0	96.0	96.5	97.0	96.5	90.0	86.0	76.5	100.0
410	105.0	96.0	96.5	97.0	96.5	90.0	86.0	76.5	100.0

Appendix A

Table A-10 (50 Hz) – Octave Band Sound Power Levels, dB ref, 1 pw, Premium Seasonal Efficiency Unit with EC Fan, Low Noise Option

Unit Size RTAG	Low Noise (Compressor+Tube Sound Wrap) Option, Premium Seasonal Efficiency Unit with EC Fan								
	Octave Band Sound Power Levels, dB ref, 1 pw								Overall A'Wtd
	Octave Band Center Frequency, Hz								
	63	125	250	500	1000	2000	4000	8000	
85	99.0	90.0	91.0	91.0	90.5	84.0	80.0	70.5	94.0
100	99.0	90.0	91.0	91.0	90.5	84.0	80.0	70.5	94.0
125	101.5	92.5	93.0	93.0	92.5	86.0	82.0	72.5	96.0
145	101.5	92.5	93.0	93.0	92.5	86.0	82.0	72.5	96.0
155	101.5	92.5	93.0	93.5	92.5	86.5	82.0	73.0	96.0
170	101.0	92.0	93.0	93.5	93.0	86.5	82.0	73.0	96.5
190	102.0	93.0	94.0	94.0	93.5	87.0	83.0	73.5	97.0
205	102.0	93.0	94.0	94.0	93.5	87.0	83.0	73.5	97.0
250	104.5	95.5	96.0	96.0	95.5	89.0	85.0	75.5	99.0
280	104.5	95.5	96.0	96.0	95.5	89.0	85.0	75.5	99.0
310	104.5	95.5	96.0	96.5	95.5	89.5	85.0	76.0	99.0
350	104.0	95.0	96.0	96.5	96.0	89.5	85.0	76.0	99.5
380	105.0	96.0	96.5	97.0	96.5	90.0	86.0	76.5	100.0
410	105.0	96.0	96.5	97.0	96.5	90.0	86.0	76.5	100.0

Table A-11 (50 Hz) – Octave Band Sound Power Levels, dB ref, 1 pw, High Efficiency Unit with EC Fan, Low Noise with Night Setback Option

Unit Size RTAG	Low Noise + Night Noise Set Back Option, High Efficiency Unit with EC Fan								
	Octave Band Sound Power Levels, dB ref, 1 pw								Overall A'Wtd
	Octave Band Center Frequency, Hz								
	63	125	250	500	1000	2000	4000	8000	
85	NA	NA	NA	NA	NA	NA	NA	NA	NA
100	90.0	84.5	91.5	87.5	87.5	82.0	75.5	67.0	91.0
125	91.0	85.5	93.0	89.0	89.0	83.5	76.5	68.5	92.5
145	91.0	85.5	93.0	89.0	89.0	83.5	76.5	68.5	92.5
155	91.0	85.5	93.0	89.5	89.5	84.0	77.0	69.0	93.0
170	91.0	85.5	93.0	90.0	90.0	85.0	77.0	69.5	93.5
190	92.5	87.0	94.0	90.5	90.5	85.0	78.0	70.0	94.0
205	92.5	87.0	94.0	90.5	90.5	85.0	78.0	70.0	94.0
250	94.0	88.5	96.0	92.0	92.0	86.5	79.5	71.5	95.5
280	94.0	88.5	96.0	92.0	92.0	86.5	79.5	71.5	95.5
310	94.0	88.5	96.0	92.5	92.5	87.0	80.0	72.0	96.0
350	94.5	89.0	96.0	93.0	93.0	88.0	80.0	72.5	96.5
380	95.5	90.0	97.0	93.5	93.5	88.0	81.0	73.0	97.0
410	95.5	90.0	97.0	93.5	93.5	88.0	81.0	73.0	97.0

Appendix A

Table A-12 (50 Hz) – Octave Band Sound Power Levels, dB ref, 1 pw, Extra High Efficiency Unit with EC Fan, Low Noise with Night Setback Option

Unit Size RTAG	Low Noise + Night Noise Set Back Option, Extra High Efficiency Unit with EC Fan								
	Octave Band Sound Power Levels, dB ref, 1 pw								Overall A'Wtd
	Octave Band Center Frequency, Hz								
	63	125	250	500	1000	2000	4000	8000	
85	90.0	84.5	91.5	87.5	87.5	82.0	75.5	67.0	91.0
100	90.0	84.5	91.5	87.5	87.5	82.0	75.5	67.0	91.0
125	92.0	86.5	94.0	89.0	89.0	83.5	77.0	68.5	93.0
145	92.0	86.5	94.0	89.0	89.0	83.5	77.0	68.5	93.0
155	92.5	86.5	94.0	90.0	89.5	84.5	77.5	69.5	93.5
170	92.5	87.0	94.0	90.5	90.5	85.0	78.0	70.0	94.0
190	93.0	87.5	94.5	90.5	90.5	85.0	78.5	70.0	94.0
205	93.0	87.5	94.5	90.5	90.5	85.0	78.5	70.0	94.0
250	95.5	89.5	97.0	92.0	92.0	86.5	80.0	71.5	96.0
280	95.5	89.5	97.0	92.0	92.0	86.5	80.0	71.5	96.0
310	95.5	89.5	97.0	93.0	92.5	87.5	80.5	72.5	96.5
350	95.5	90.0	97.0	93.5	93.5	88.0	81.0	73.0	97.0
380	96.0	90.5	97.5	93.5	93.5	88.0	81.5	73.0	97.0
410	96.0	90.5	97.5	93.5	93.5	88.0	81.5	73.0	97.0

Table A-13 (50 Hz) – Octave Band Sound Power Levels, dB ref, 1 pw, Premium Seasonal Efficiency Unit with EC Fan, Low Noise with Night Setback Option

Unit Size RTAG	Low Noise + Night Noise Set Back Option, Premium Seasonal Efficiency Unit with EC Fan								
	Octave Band Sound Power Levels, dB ref, 1 pw								Overall A'Wtd
	Octave Band Center Frequency, Hz								
	63	125	250	500	1000	2000	4000	8000	
85	90.0	84.5	91.5	87.5	87.5	82.0	75.5	67.0	91.0
100	90.0	84.5	91.5	87.5	87.5	82.0	75.5	67.0	91.0
125	92.0	86.5	94.0	89.0	89.0	83.5	77.0	68.5	93.0
145	92.0	86.5	94.0	89.0	89.0	83.5	77.0	68.5	93.0
155	92.5	86.5	94.0	90.0	89.5	84.5	77.5	69.5	93.5
170	92.5	87.0	94.0	90.5	90.5	85.0	78.0	70.0	94.0
190	93.0	87.5	94.5	90.5	90.5	85.0	78.5	70.0	94.0
205	93.0	87.5	94.5	90.5	90.5	85.0	78.5	70.0	94.0
250	95.5	89.5	97.0	92.0	92.0	86.5	80.0	71.5	96.0
280	95.5	89.5	97.0	92.0	92.0	86.5	80.0	71.5	96.0
310	95.5	89.5	97.0	93.0	92.5	87.5	80.5	72.5	96.5
350	95.5	90.0	97.0	93.5	93.5	88.0	81.0	73.0	97.0
380	96.0	90.5	97.5	93.5	93.5	88.0	81.5	73.0	97.0
410	96.0	90.5	97.5	93.5	93.5	88.0	81.5	73.0	97.0

Ingersoll Rand (NYSE: IR) advances the quality of life by creating comfortable, sustainable and efficient environments. Our people and our family of brands—including Club Car®, Ingersoll Rand®, Thermo King® and Trane®—work together to enhance the quality and comfort of air in homes and buildings; transport and protect food and perishables; and increase industrial productivity and efficiency. We are a global business committed to a world of sustainable progress and enduring results.

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We are committed to using environmentally conscious print practices.

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Appendix 4.4.1e Catalogue for HSB

LENNTECH
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NC® Steel Cooling Tower

Engineering Data



Marley

Marley

NC® INSIGHT

Overview

Marley's flagship factory-assembled cooling tower, providing higher performance, fast installation and easy maintenance.

Primary Benefits

- Higher tonnage and efficiency per cell can lower energy costs up to 20%
- Up to 64% less installation time per cell, providing over $1400 savings per cell, over previous designs
- Less than half the maintenance costs for gear drives compared to belt drive systems

Benefit Detail

Higher Tonnage and Efficiency:

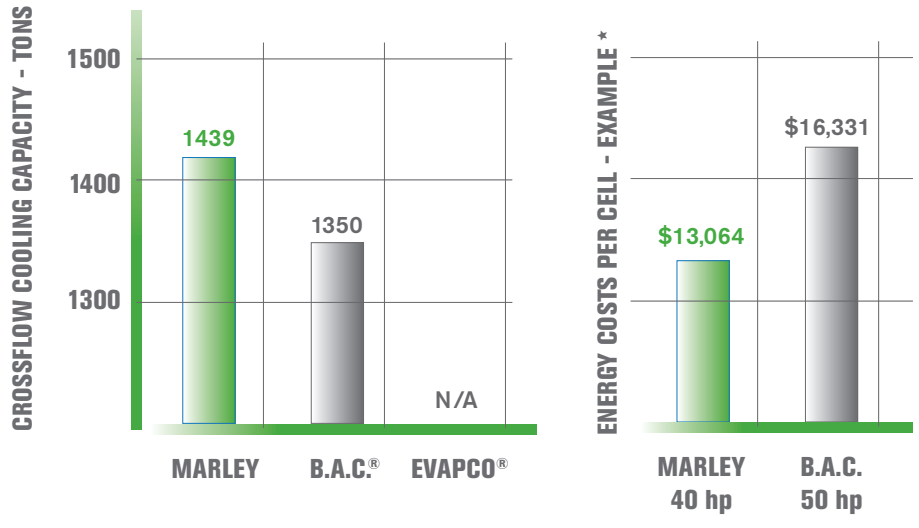
- Highest capacity package cooling tower in the market* helps to reduce the number of cells required, saving purchasing costs
- Higher efficiency design can provide up to 20% lower energy costs

Fast Installation:

- Up to 64% faster installation than previous designs provides over $1000 in savings per cell
- Quick Installation features include:
  - Factory-mounted terminal box option – provides a single location for all controls wiring
  - Quick-Install guardrails and aluminum ladders and welded aluminum safety cages options
  - Four-point support allows parallel I-beams in any direction or separate piers

*as of May, 2010





* assumes nameplate motor horsepower for a 610 ton cooling tower with a footprint of 250 sq ft – $0.10/kWh and 50% annual usage

field installation hours	*latest design*	*previous design*
Ladder and Guardrail	2	3
Ladder Safety Cage	.25	4
Fan Cylinder	0	1
Access Platform	5	7
Factory Installed Terminal Box	4	16
total	**11.25**	**31**
based on $75/hour, savings per tower cell would be over $1,480		

more

NC INSIGHT

Benefit Detail

Easy Maintenance:

- Gear drive standard — 5 year no-hassle operation
- Integral louvers and eliminators provide water containment and freezing prevention compared to blade louvers used by other manufacturers
- Bolted and/or welded basins stop leaks better than tap screwed connections used by other manufacturers
- Large access doors and a flat fan deck designed as a walking surface makes tower service checks easier

Special Design Considerations

- ASHRAE® Std. 90.1 compliant
- Full set of design options:
  - CTI Certified sound options including attenuation and/or Ultra Quiet fan
  - Splash fill for dirty water applications - NC Alpha
  - Plume abatement - NCWD
  - Marley controls and VFD options for superior energy management
- 3D configuration specific drawings provided with quotes and orders
- FM Approval option on every model including FRP fan cylinder and PVC inlet piping

Capacity Range

101 to 1439 tons per cell at 95°/85°/78°F

303 to 4307 GPM per cell hydraulic limit

No-Hassle System 5 Geareducer®		belt drive
Annual Maintenance	$624	$2,380
5 Year Maintenance	$4,270	$11,900
example savings	$7,630	

Technical Features

- Induced draft, crossflow design with vertical air discharge
- Non-corrosive stainless steel or galvanized structure with bolted galvanized or welded stainless steel cold water basin
- TEFC motor, low sound fan standard
- Drift rates as low as 0.001%
- Belt drive available on all models up to 60hp
- Assembled with as much as 71% recycled content

Common Applications

HVAC

- Mission critical data centers, hospitals and health treatment facilities, commercial buildings, schools and colleges

Industrial

- Chemical, fertilizer, grain processing, ethanol production, metals, mining, oil refining, textiles and steel production

Power Generation

- Turbine inlet cooling, jacket cooling and trim cooling during peak heat load

The NC–Quiet by Design

The NC is the result of extensive design studies focused on cooling tower sound control. These studies were complicated by the fact that the cooling tower market is typically driven by one of two powerful, yet often conflicting requirements. The most common is for a cooling tower that provides the required heat rejection capacity with a high level of reliability at low cost. Sound control, while important, is not the primary consideration for this application.

The other requirement, which is becoming ever more important in our crowded, fast-paced society, is driven by conditions that demand the lowest practical sound level. Energy efficiency, reliability, ease of maintenance and reasonable cost, while still extremely important, are not the highest priorities

In the first case, sound is important, while in the second case it is extremely important. To best satisfy these two competing market requirements we created a multi-tiered approach, through key mechanical equipment selections, to sound control. The result is more options than any other cooling tower on the market today.

The result is a line of towers capable of meeting all but the most restrictive noise limitations—and that will react favorably to natural attenuation. Where the tower has been sized to operate within an enclosure, the enclosure itself will have a damping effect on sound. Sound also declines with distance—by about 6 dBA each time the distance doubles.

All standard NC cooling towers are equipped with low sound fans. This in combination with zero-splash crossflow film-fill results in a line of towers capable of meeting most noise limitations. Where noise at a critical point is likely to exceed an acceptable limit, several other options are available—listed below in ascending order of cost impact:

- The Marley "Quiet Package" includes the affordable Quiet Fan mechanical option, optimized to achieve the lowest possible sound levels while maintaining efficiency.
- A Marley Variable Speed Drive automatically minimizes the tower's noise level during periods of reduced load and/or reduced ambient temperature without sacrificing the system's ability to maintain a constant cold water temperature. This is a relatively inexpensive solution, and can pay for itself quickly in reduced energy costs. The natural nighttime reduction in wet-bulb temperature makes this a very feasible solution in most areas of the world. It also eliminates fan cycling. In combination with a Marley Quiet Package, the Marley Variable Speed Drive is capable of meeting all but the most restrictive noise limitations.
- The most extreme cases may require inlet and discharge sound attenuator sections—however, the static pressure loss imposed by discharge attenuators may necessitate an increase in tower size. Two stages of inlet or discharge attenuators supported by the tower and designed and tested for the most stringent requirements are available as an option. See page 24.
- For more severe cases requiring the lowest possible fan sound levels the Marley "Ultra Quiet" fan option is now available on most NC models. Tower height will increase—obtain current sales drawings from your Marley sales representative for accurate dimensions.

The advantage is yours. You now have the choices you need to balance your project's performance, space and cost requirements with your sound level needs for a win-win solution to your cooling system design.

Enclosures

Occasionally, cooling towers are located inside architectural enclosures for aesthetic reasons. Although NC Class towers adapt well to enclosures, the designer must realize the potential impact of a poorly arranged enclosure on the tower's performance and operation. The designer must take care to provide generous air inlet paths, and the tower's fan cylinder discharge height should not be lower than the elevation of the top of the enclosure. *Marley Technical Report #H-004* "External Influences on Cooling Tower Performance" is available at spxcooling.com or from your Marley sales representative.

As suggested in the aforementioned Technical Report, it may also be advisable to specify a design wet-bulb temperature 1°F higher than normal to compensate for potential recirculation initiated by the enclosure. You'll benefit from discussing your project with your Marley sales representative.



Marley "Ultra Quiet" fan

System Cleanliness

Cooling towers are very effective air washers. Atmospheric dust able to pass through the relatively small louver openings will enter the circulating water system. Increased concentrations can intensify system maintenance by clogging screens and strainers—and smaller particulates can coat system heat transfer surfaces. In areas of low flow velocity—such as the cold water basin—sedimentary deposits can provide a breeding ground for bacteria.

In areas prone to dust and sedimentation, you should consider installing some means for keeping the cold water basin clean. Typical devices include side stream filters and a variety of filtration media.

Water Treatment

To control the buildup of dissolved solids resulting from water evaporation, as well as airborne impurities and biological contaminants including Legionella, an effective consistent water treatment program is required. Simple blowdown may be adequate to control corrosion and scale, but biological contamination can only be controlled with biocides.

An acceptable water treatment program must be compatible with the variety of materials incorporated in a cooling tower—ideally the pH of the circulating water should fall between 6.5 and 8.0. Batch feeding of chemicals directly into the cooling tower is not a good practice since localized damage to the tower is possible. Specific startup instructions and additional water quality recommendations can be found in the NC User Manual which accompanies the tower and also is available from your local Marley sales representative. For complete water treatment recommendations, consult a competent, qualified water treatment supplier.

⚠ CAUTION

The cooling tower must be located at such distance and direction to avoid the possibility of contaminated discharge air being drawn into building fresh air intake ducts. The purchaser should obtain the services of a Licensed Professional Engineer or Registered Architect to certify that the location of the cooling tower is in compliance with applicable air pollution, fire and clean air codes.

Typical Applications

The NC tower is an excellent choice for normal applications requiring cold water for the dissipation of heat. This includes condenser water cooling for air conditioning, refrigeration, and thermal storage systems, as well as their utilization for free-cooling in all of those systems. The NC can also be used in the cooling of jacket water for engines and air compressors, and are widely applied to dissipate waste heat in a variety of industrial, power and manufacturing processes.

Choosing the all stainless steel construction option, the NC can be confidently applied in unusually corrosive processes and operating environments. However, no single product line can answer all problems, and selective judgement should be exercised in the following situations

Applications Requiring Alternative Cooling Tower Selections

Certain types of applications are incompatible with any cooling tower with film fill—whether NC or a competitive tower of similar manufacture. Film fill is subject to distortion in high water temperatures, and the narrow passages are easily clogged by turbid or debris-laden water. Some of the applications, which call for alternative tower designs are:

- Water temperatures exceeding 125°F—adversely affects the service life and performance of normal PVC fill. Higher temperature fill materials are available.
- Ethylene glycol content—can plug fill passages as slime and algae accumulate to feed on the available organic materials.
- Fatty acid content—found in processes such as soap and detergent manufacturing and some food processing—fatty acids pose a serious threat for plugging fill passages.
- Particulate carry over—often found in steel mills and cement plants—can both cause fill plugging, and can build up to potentially damaging levels on tower structure.
- Pulp carry over—typical of the paper industry and food processing where vacuum pumps or barometric condensers are used. Causes fill plugging which may be intensified by algae.

Alternative Selections

In addition to the NC, SPX Cooling Technologies offers a full scope of products in various designs and capacities to meet the special demands of specific applications.

spxcooling.com—visit us on the web for a complete list of products, services, publications and to find your nearest sales representative.

NC8401 NC8402 NC8403 NC8405

Use this data for preliminary layouts only. Obtain current drawing from your Marley sales representative.

UPDATE *web-based selection software available at spxcooling.com/update provides NC model recommendations based on customer's specific design requirements.*

A Sound dBA Approach

Various low sound options are available from 2 to 19 dB reduction from the standard dBA options in the schematic data table. Consult ***UPDATE*** *selection software for performance, sound levels and dimensions.*

NC8401 NC8402 NC8403 NC8405

Model note 2	**Nominal Tons** note 3	**Motor** hp	**dBA** 5'-0" from air inlet face	**Design Operating Weight** lb	**Shipping Weight** lb	**Dimensions**			
						L	**W**	**H**	**A**
NC8401G-1	101	2	63						
NC8401H-1	117	3	65						
NC8401K-1	139	5	71	8488	4062	6'-6¼"	12'-10"	10'-2½"	6'-9¾"
NC8401M-1	159	7.5	73						
NC8401N-1	175	10	76						
NC8401P-1	198	15	78						
NC8402G-1	131	2	64						
NC8402H-1	148	3	65						
NC8402K-1	175	5	68						
NC8402M-1	205	7.5	74	11184	4890	8'-4¾"	14'-2"	10'-3"	8'-8¼"
NC8402N-1	228	10	76						
NC8402P-1	256	15	79						
NC8402Q-1	277	20	81						
NC8403K-1	213	5	68						
NC8403M-1	243	7.5	72						
NC8403N-1	275	10	76						
NC8403P-1	312	15	79						
NC8403Q-1	342	20	80	16772	7442	8'-4¾"	18'-2"	11'-11¼"	8'-8¼"
NC8403R-1	366	25	81						
NC8403S-1	386	30	84						
NC8403T-1	423	40	85						
NC8405N-1	331	10	74						
NC8405P-1	377	15	76						
NC8405Q-1	412	20	78						
NC8405R-1	445	25	81	20690	8685	9'-10¾"	19'-11"	11'-11¼"	10'-2¼"
NC8405S-1	472	30	84						
NC8405T-1	515	40	87						

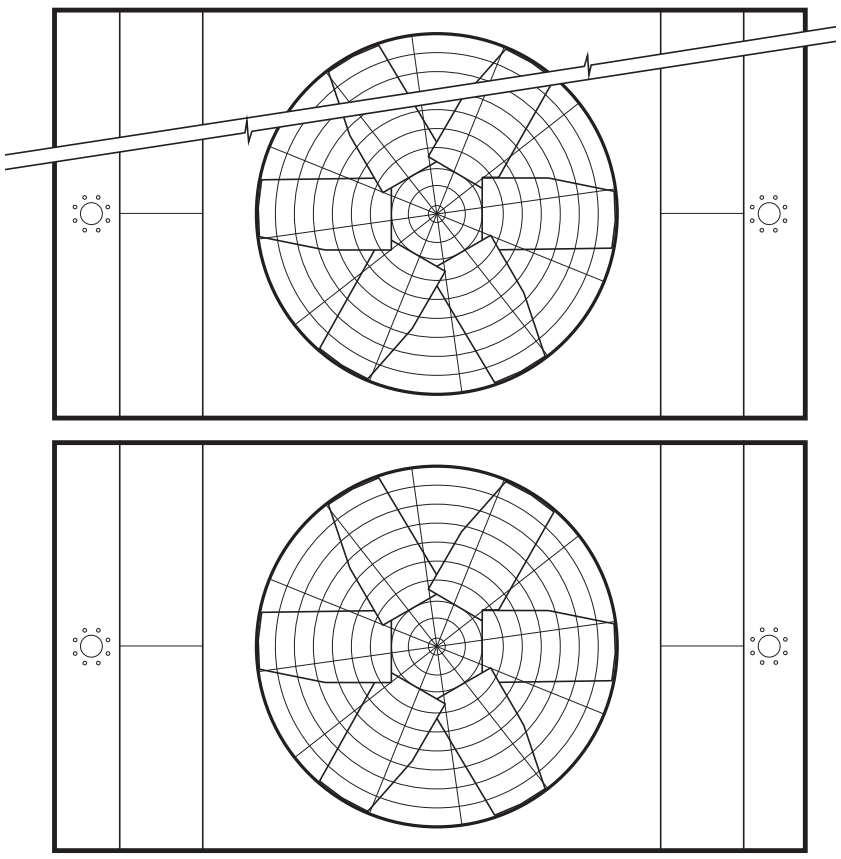
NOTE

1 **Use this bulletin for preliminary layouts only.** Obtain current drawings from your Marley sales representative. All table data is per cell.
2 Last numeral of model number indicates number of cells. Change as appropriate for your selection.
3 Nominal tons are based upon 95°F HW, 85°F CW, 78°F WB and 3 GPM/ton. The ***UPDATE*** web-based selection software provides NC model recommendations based on specific design requirements.
4 Standard overflow is a 4" dia. standpipe in the collection basin floor. The standpipe removes for flush-out and draining. See page 18 for side overflow option.
5 Outlet sizes vary according to GPM and arrangement. See pages 18 and 19 for outlet sizes and details.
6 Makeup water connection may be 1" or 2" dia., depending upon tower heat load, water pressure, and desired connections. See page 13 for additional information.

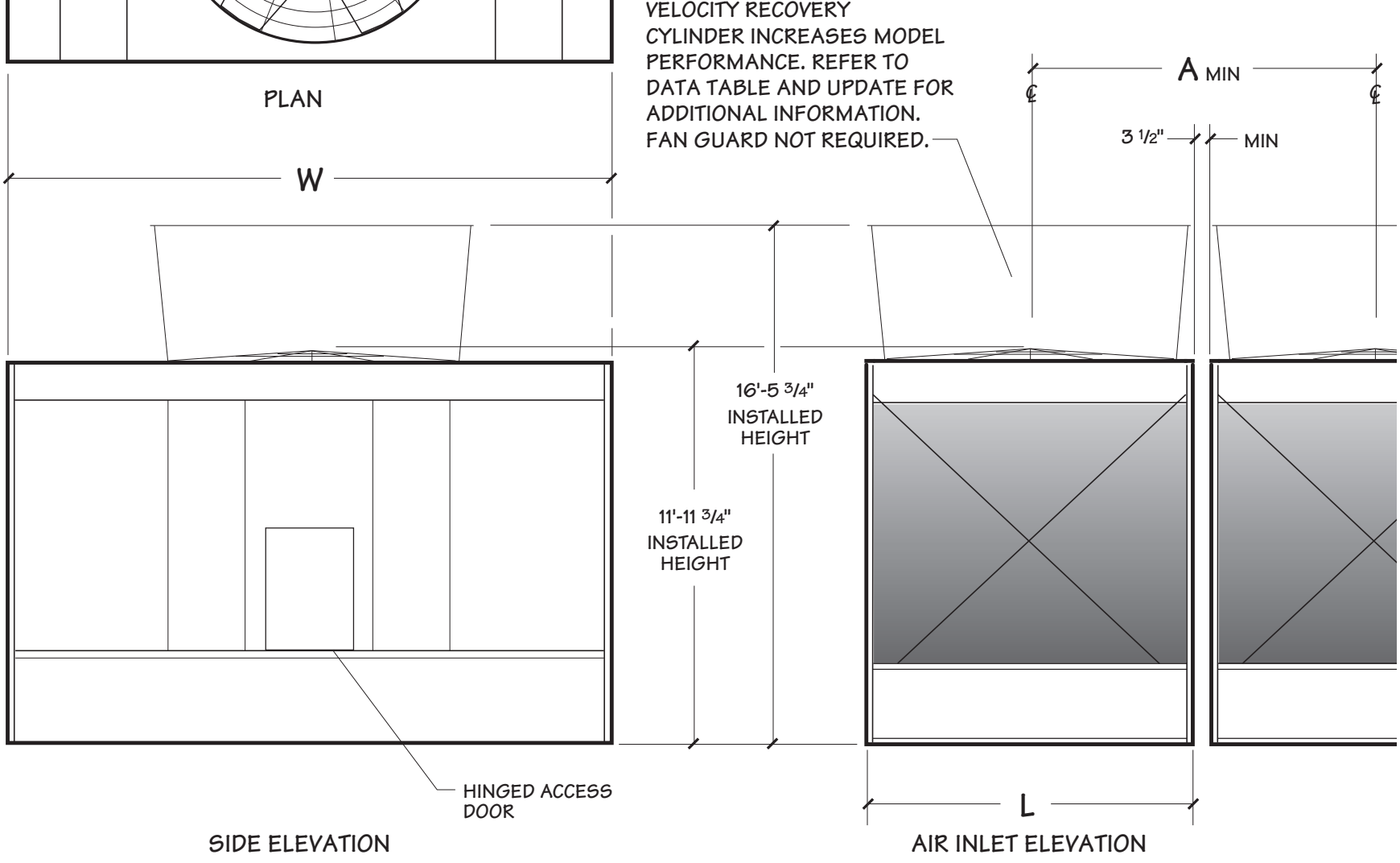
NC8407 NC8409

Use this data for preliminary layouts only. Obtain current drawing from your Marley sales representative.

UPDATE *web-based selection software available at spxcooling.com/update provides NC model recommendations based on customer's specific design requirements.*



PLAN



SIDE ELEVATION

AIR INLET ELEVATION

NC8407 NC8409

Model note 2	**Nominal Tons** note 3	**Nominal Tons with VR Cylinder** note 3	**Motor** hp	**dBA** 5'-0" from air inlet face	**Design Operating Weight** lb	**Shipping Weight** lb	**Dimensions**		
							L	**W**	**A**
NC8407M-1	338	352	7.5	66	27044	11829	11'-10¾"	21'-0"	12'-2¼"
NC8407N-1	372	385	10	69					
NC8407P-1	428	448	15	70					
NC8407Q-1	468	490	20	72					
NC8407R-1	510	531	25	77					
NC8407S-1	540	561	30	79					
NC8407T-1	590	612	40	82					
NC8407U-1	629	653	50	83					
NC8407V-1	664	690	60	84					
NC8409P-1	488	502	15	65	32888	13996	13'-10¾"	22'-5"	14'-2¼"
NC8409Q-1	530	546	20	67					
NC8409R-1	586	602	25	75					
NC8409S-1	616	636	30	79					
NC8409T-1	678	696	40	79					
NC8409U-1	721	741	50	81					
NC8409V-1	761	782	60	83					

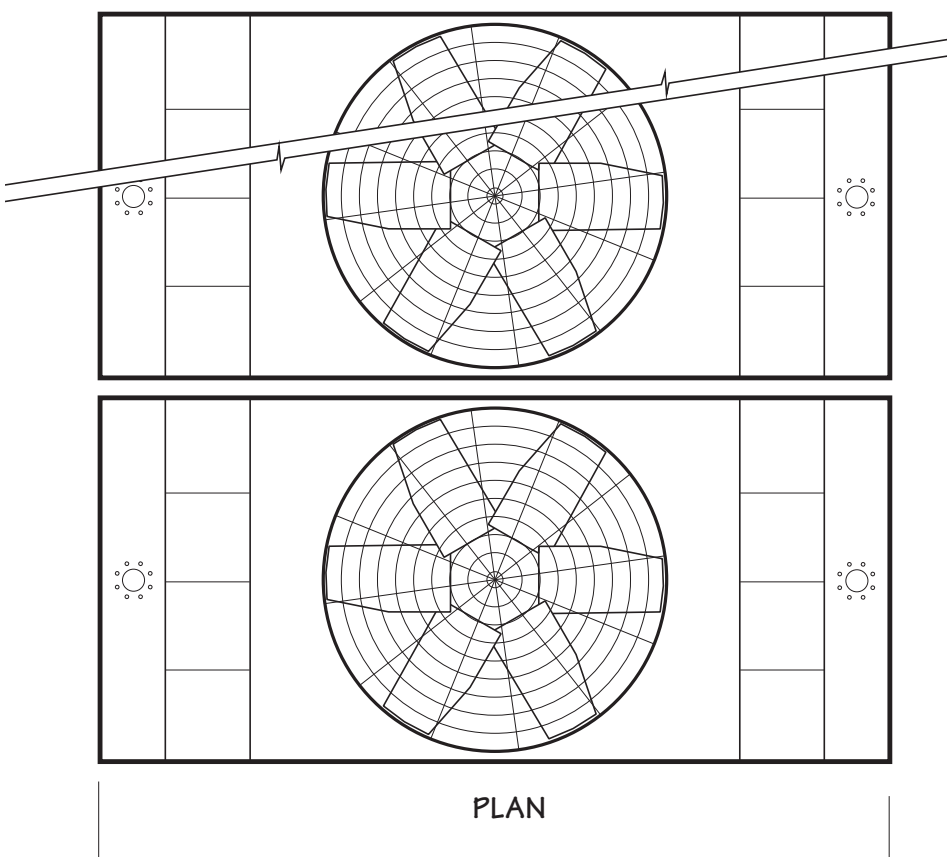
A Sound dBA Approach

Various low sound options are available from 2 to 19 dB reduction from the standard dBA options in the schematic data table. Consult ***UPDATE*** *selection software for performance, sound levels and dimensions.*

NOTE

1 **Use this bulletin for preliminary layouts only.** Obtain current drawings from your Marley sales representative. All table data is per cell.
2 Last numeral of model number indicates number of cells. Change as appropriate for your selection.
3 Nominal tons are based upon 95°F HW, 85°F CW, 78°F WB and 3 GPM/ton. The ***UPDATE*** web-based selection software provides NC model recommendations based on specific design requirements.
4 Standard overflow is a 4" dia. standpipe in the collection basin floor. The standpipe removes for flush-out and draining. See page 18 for side overflow option.
5 Outlet sizes vary according to GPM and arrangement. See pages 18 and 19 for outlet sizes and details.
6 Makeup water connection may be 1" or 2" dia., depending upon tower heat load, water pressure, and desired connections. See page 13 for additional information.

NC8411 NC8412



Use this data for preliminary layouts only. Obtain current drawing from your Marley sales representative.

UPDATE *web-based selection software available at spxcooling.com/update provides NC model recommendations based on customer's specific design requirements.*

NC8411 NC8412

Model note 2	**Nominal Tons** note 3	**Nominal Tons with VR Cylinder** note 3	**Motor** hp	**dBA** 5'-0" from air inlet face	**Design Operating Weight** lb	**Shipping Weight** lb	**Dimensions**		
							L	**A**	**C**
NC8411Q-1	636	671	20	67	39515	18137	11'-10¾"	12'-2¼"	11'-9⅛"
NC8411R-1	680	717	25	69					
NC8411S-1	720	759	30	71					
NC8411T-1	809	854	40	77					
NC8411U-1	865	913	50	78					
NC8411V-1	910	961	60	82					
NC8411W-1	974	1019	75	84					
NC8412Q-1	711	747	20	67	45749	20653	13'-10¾"	14'-2¼"	13'-9³⁄₁₆"
NC8412R-1	762	799	25	69					
NC8412S-1	805	845	30	70					
NC8412T-1	906	951	40	74					
NC8412U-1	968	1012	50	78					
NC8412V-1	1020	1068	60	80					
NC8412W-1	1087	1136	75	84					
NC8412X-1	1183	1239	100	83					

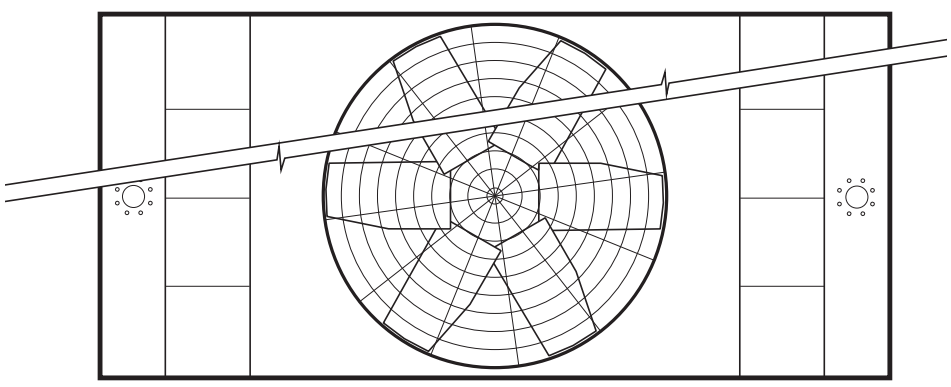
A Sound dBA Approach

Various low sound options are available from 2 to 19 dB reduction from the standard dBA options in the schematic data table. Consult ***UPDATE*** *selection software for performance, sound levels and dimensions.*

NOTE

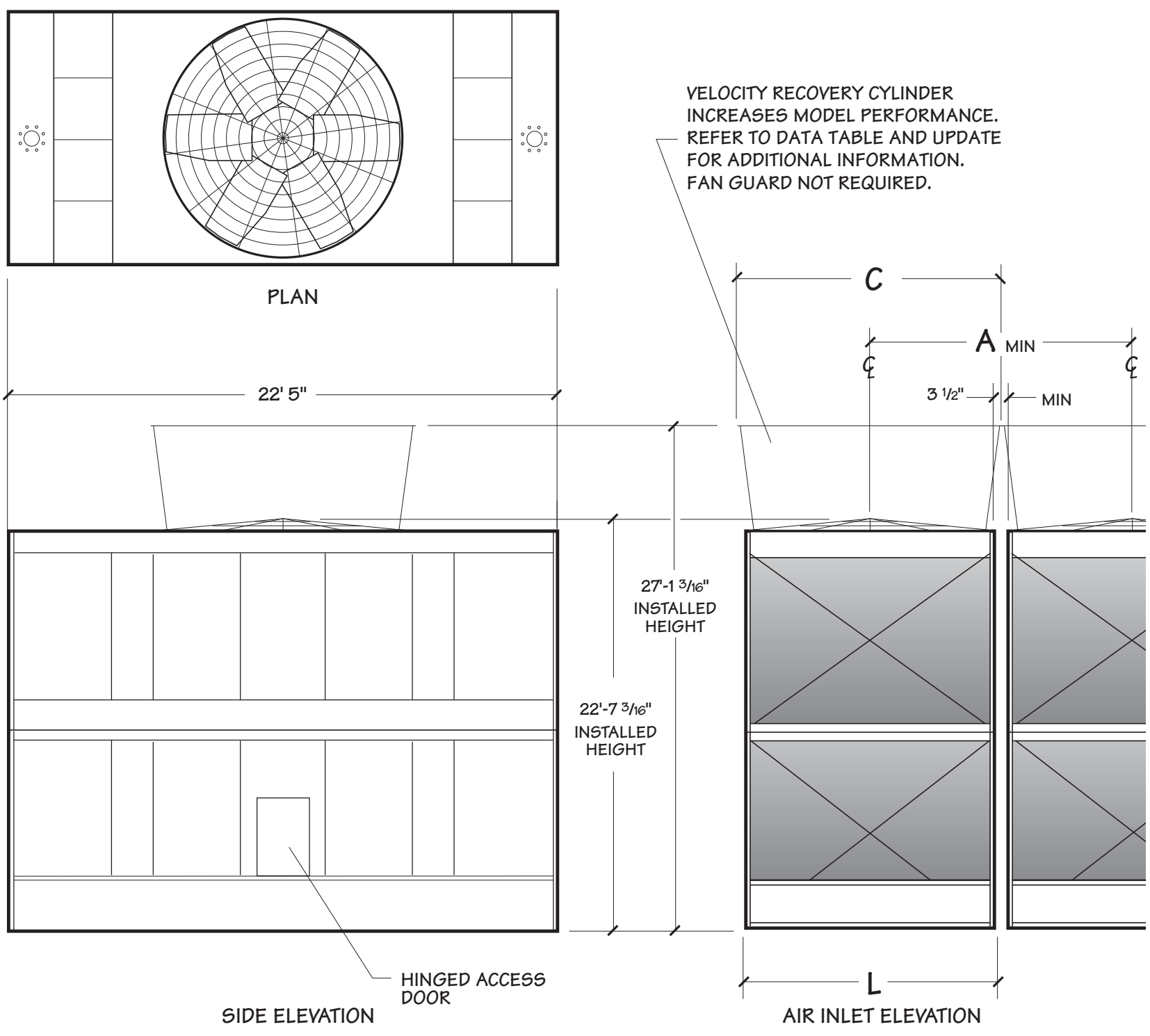
1 **Use this bulletin for preliminary layouts only.** Obtain current drawings from your Marley sales representative. All table data is per cell.
2 Last numeral of model number indicates number of cells. Change as appropriate for your selection.
3 Nominal tons are based upon 95°F HW, 85°F CW, 78°F WB and 3 GPM/ton. The ***UPDATE*** web-based selection software provides NC model recommendations based on specific design requirements.
4 Standard overflow is a 4" dia. standpipe in the collection basin floor. The standpipe removes for flush-out and draining. See page 18 for side overflow option.
5 Outlet sizes vary according to GPM and arrangement. See pages 18 and 19 for outlet sizes and details.
6 Makeup water connection may be 1" or 2" dia., depending upon tower heat load, water pressure, and desired connections. See page 13 for additional information.

NC8413 NC8414



Use this data for preliminary layouts only. Obtain current drawing from your Marley sales representative.

UPDATE *web-based selection software available at spxcooling.com/update provides NC model recommendations based on customer's specific design requirements.*



NC8413 NC8414

Model note 2	**Nominal Tons** note 3	**Nominal Tons with VR Cylinder** note 3	**Motor** hp	**dBA** 5'-0" from air inlet face	**Design Operating Weight** lb	**Shipping Weight** lb	**Dimensions**		
							L	**A**	**C**
NC8413Q-1	692	735	20	67	44764	20744	11'-10¾"	12'-2¼"	11'-9⅛"
NC8413R-1	741	785	25	69					
NC8413S-1	780	833	30	72					
NC8413T-1	855	906	40	73					
NC8413U-1	941	1003	50	78					
NC8413V-1	993	1058	60	82					
NC8413W-1	1062	1129	75	84					
NC8413X-1	1147	1214	100	86					
NC8414Q-1	771	814	20	87	51895	23698	13'-10¾"	14'-2¼"	13'-9³⁄₁₆"
NC8414R-1	825	872	25	89					
NC8414S-1	873	921	30	70					
NC8414T-1	949	999	40	71					
NC8414U-1	1048	1108	50	78					
NC8414V-1	1107	1170	60	80					
NC8414W-1	1178	1242	75	84					
NC8414X-1	1288	1358	100	83					
NC8414Y-1	1366	1439	125	85					

A Sound dBA Approach

Various low sound options are available from 2 to 19 dB reduction from the standard dBA options in the schematic data table. Consult ***UPDATE*** *selection software for performance, sound levels and dimensions.*

NOTE

1 **Use this bulletin for preliminary layouts only.** Obtain current drawings from your Marley sales representative. All table data is per cell.
2 Last numeral of model number indicates number of cells. Change as appropriate for your selection.
3 Nominal tons are based upon 95°F HW, 85°F CW, 78°F WB and 3 GPM/ton. The ***UPDATE*** web-based selection software provides NC model recommendations based on specific design requirements.
4 Standard overflow is a 4" dia. standpipe in the collection basin floor. The standpipe removes for flush-out and draining. See page 18 for side overflow option.
5 Outlet sizes vary according to GPM and arrangement. See pages 18 and 19 for outlet sizes and details.
6 Makeup water connection may be 1" or 2" dia., depending upon tower heat load, water pressure, and desired connections. See page 13 for additional information.

Tired of having to design your piping and tower layout to accommodate the standards of cooling tower manufacturers? Marley's multiple variety of piping systems accommodates your design intentions to make your layout of the NC both expedient and economical.

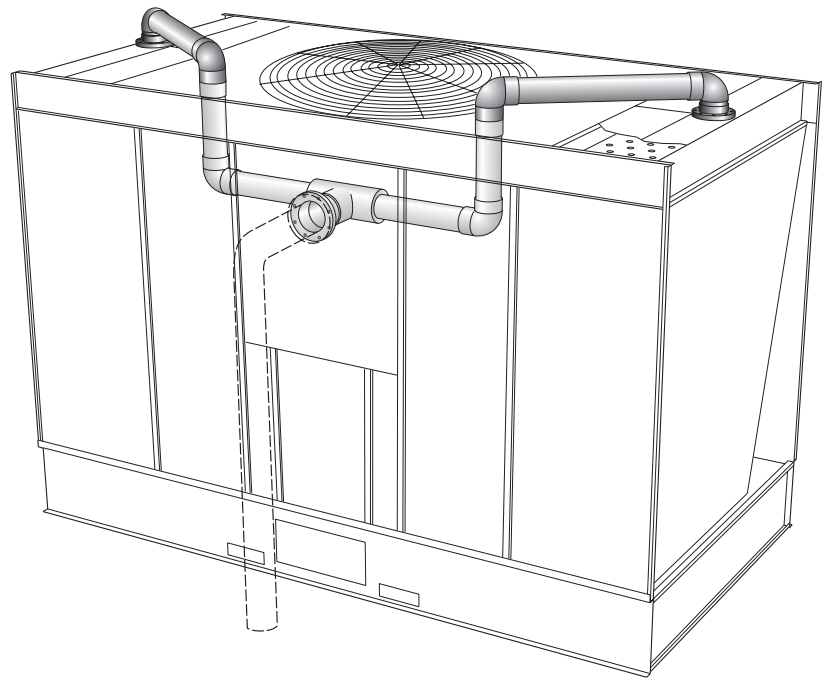
- Single or dual hot water inlet connections.
- Side inlet, bottom inlet or top inlet connections.
- Side or bottom cold water outlet connections.
- A variety of makeup, overflow and drain options.

For the single inlet connection all piping to the distribution basins is part of the tower package. Installation and design costs are reduced and the need for extra piping and supports are eliminated. The single bottom inlet connection is perfect for multicell applications—keeping all the inlet piping below the tower.

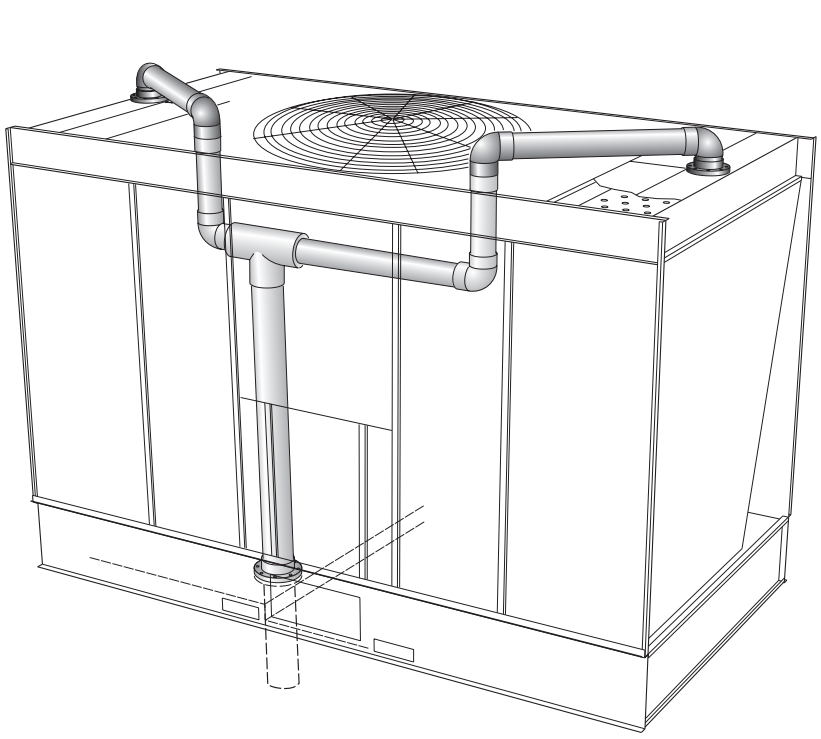
Unless otherwise specified, single-cell towers normally have a cased-face outlet appropriate for the design water flow rate—see pages 18 and 19. This usually assures the lowest possible installed tower elevation. Cased-face outlet connection pipes extend approximately 3" outside the basin, and are beveled for weld connection and also grooved for a mechanical coupling.

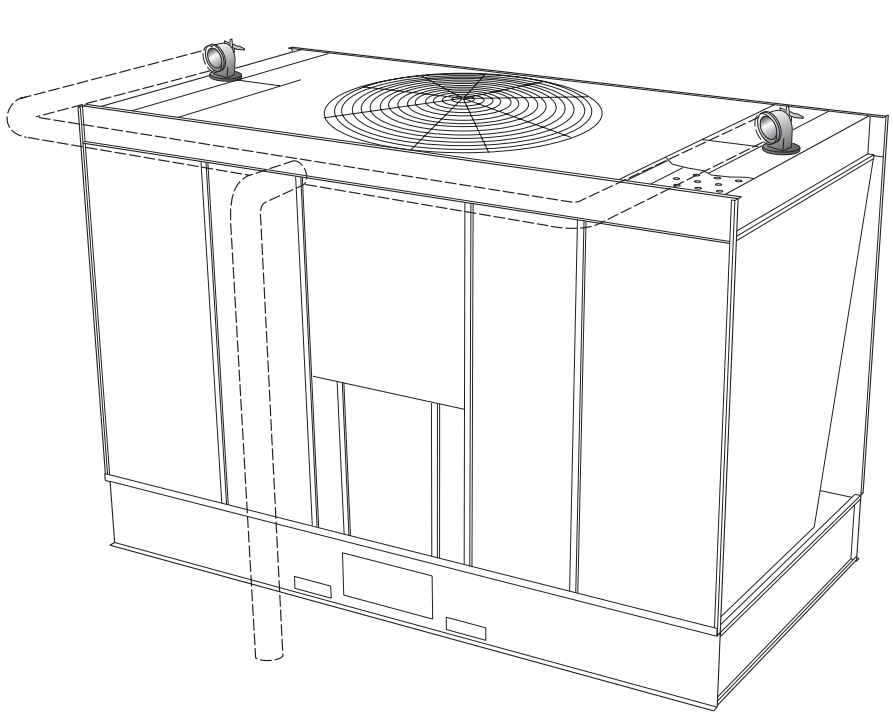
Outlet piping can be kept below the cold water basin level by choosing either a depressed sump or a bottom outlet connection in lieu of the cased-face outlets. Both outlet designs conform to standard class 125 ANSI pipe flange specifications. Easily removable debris screens are optional on bottom outlets and are standard on all other outlet arrangements.

Depressed sumps are made of inert fire-retardant FRP or heavy-gauge welded stainless steel. Unless otherwise specified towers with galvanized steel collection basins are supplied with FRP sumps and towers with stainless steel basins are supplied with stainless sumps.



Multicell towers, intended to operate together as a common unit, are joined by steel flumes between the collection basins. These flumes equalize the operating water level between basins and also provide a flow passage from cells not equipped with outlets or makeup valves, often eliminating the need to specify an outlet and makeup valve for each cell on a multicell installation. Select the number of outlets required to maintain a maximum flow of 1371 GPM through each flume for NC8401 through NC8405 models and 2203 GPM for NC8407 through NC8414 models. Flow values are for cased-face outlet or bottom-outlets without trash screen. Refer to NC sales drawings to obtain flow values for sumps and bottom outlets with trash screens.





If each cell is to be equipped with an outlet, cased-face outlet can be used on end cells of multicell towers, but not on interior cells. For direct outlet from each cell on installations of three or more cells, use either the depressed sump or bottom outlet on interior cells.

The best choice for a tower used with a remote or indoor storage tank—see page 22—or on a concrete cold water basin is usually a bottom outlet.

A cased-face outlet equipped tower can be installed on a flat concrete slab if a side drain and overflow are also specified—see page 18. Consult your Marley sales representative for complete information.

Makeup

The amount of water constantly evaporated from a cooling tower varies directly with the heat load applied. In addition to evaporation, water is normally lost to the blowdown (bleed-off) necessary to maintain dissolved solids concentration at an acceptable level in the circulating water system.

The NC is equipped with one or more float-operated, mechanical makeup valves to automatically replenish this lost water. The tables on this page, calculated for a concentration of 3 times normal, indicate the rate of water loss—and the size of valve(s) required. If your installation's cold water basin will drain by gravity to a remote storage tank—or if you plan a separate means of controlling makeup water—a price reduction is available for deleting the Marley valve(s). We also offer an optional electronic liquid-level control.

In most instances cooling towers will see the highest water usage at design heat load. Off design conditions (99% of the time) water usage will be less. For a better understanding of how much water your application will use throughout the year, consult our water usage calculator at:

spxcooling.com/watercalc

If too much water is still being consumed consult your Marley sales representative for water saving alternatives.

Makeup Water Flow Required–GPM to Maintain Three (3) Concentrations

Tower GPM	Cooling "Range" (hot water minus cold water)					
	5°F	10°F	15°F	20°F	30°F	40°F
200	2	3	4	5	8	10
400	3	5	8	10	15	20
600	4	8	12	15	23	30
800	5	10	15	20	30	40
1000	7	13	19	25	38	50
1500	10	19	29	38	57	75
2000	13	25	38	50	75	100
3000	19	38	57	75	113	150
4000	25	50	75	100	150	200
5000	32	63	94	125	188	250
6000	38	75	113	150	225	300
8000	50	100	150	200	300	400

NOTE

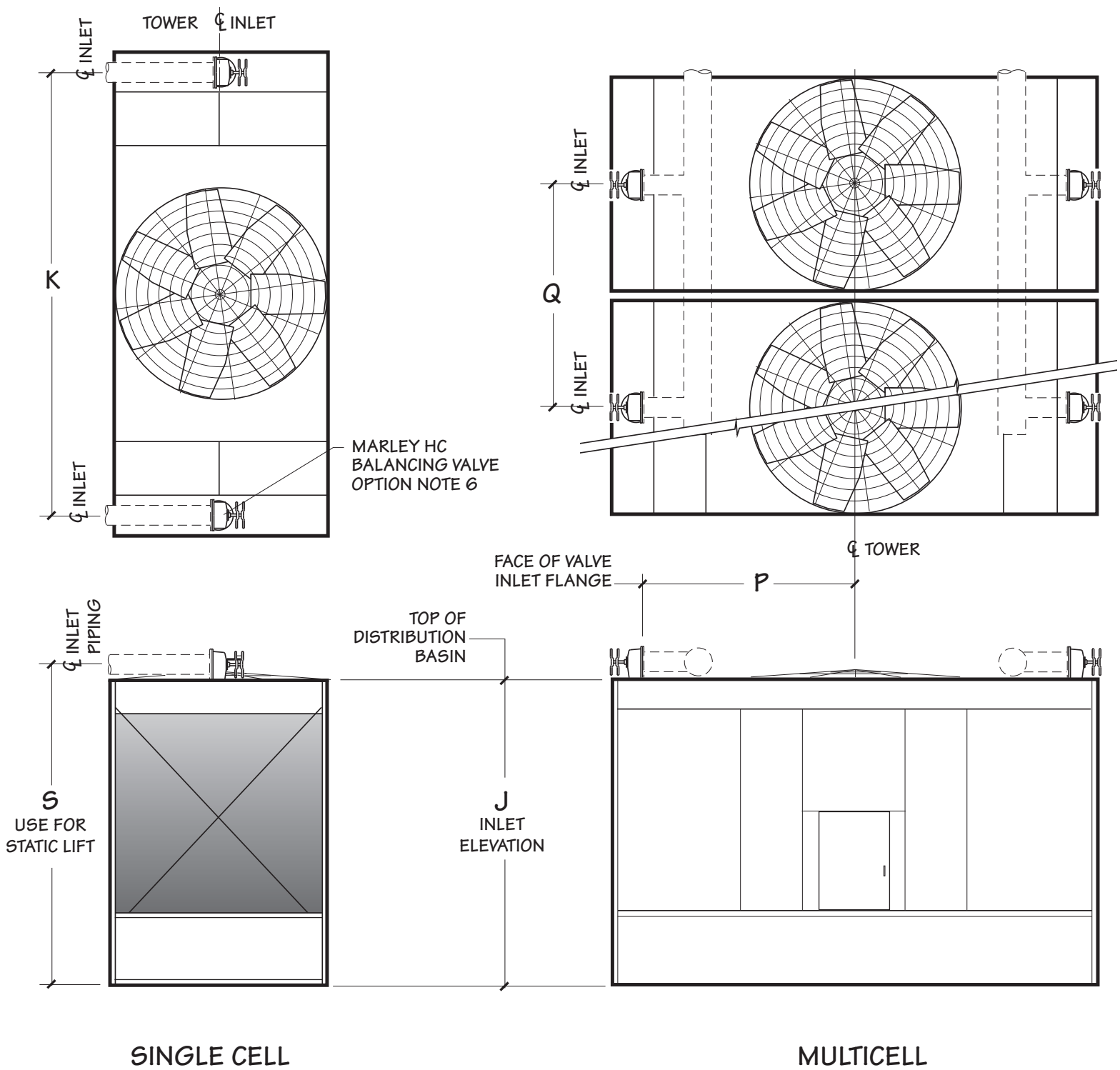
If circulating water is to be maintained at 2 concentrations instead of 3, multiply table GPM values by 1.36 before sizing makeup valve.

Makeup Valve Flow Capacities–GPM

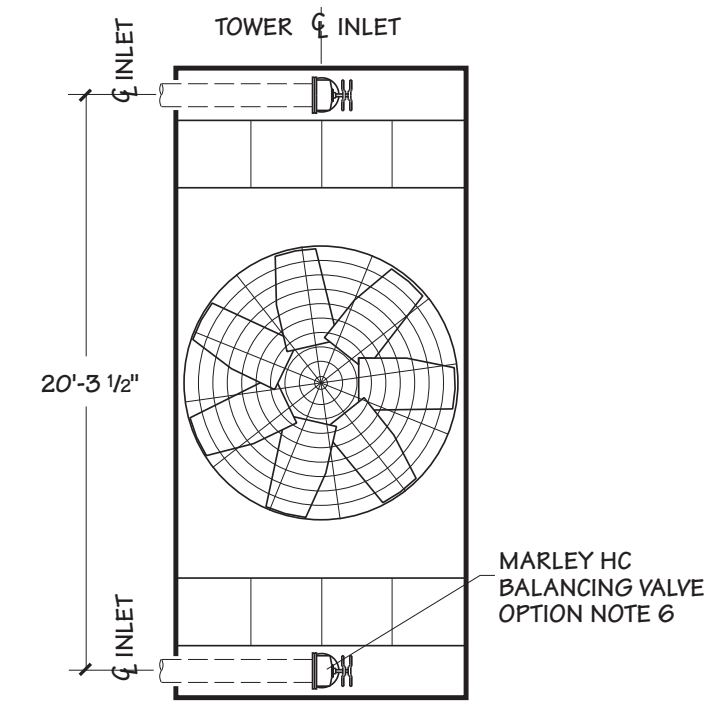
Pressure at Valve Inlet while flowing–psig	1" Diameter Valve	2" Diameter Valve
10	56	90
20	78	120
30	92	143
40	106	160
50	117	167

NOTE

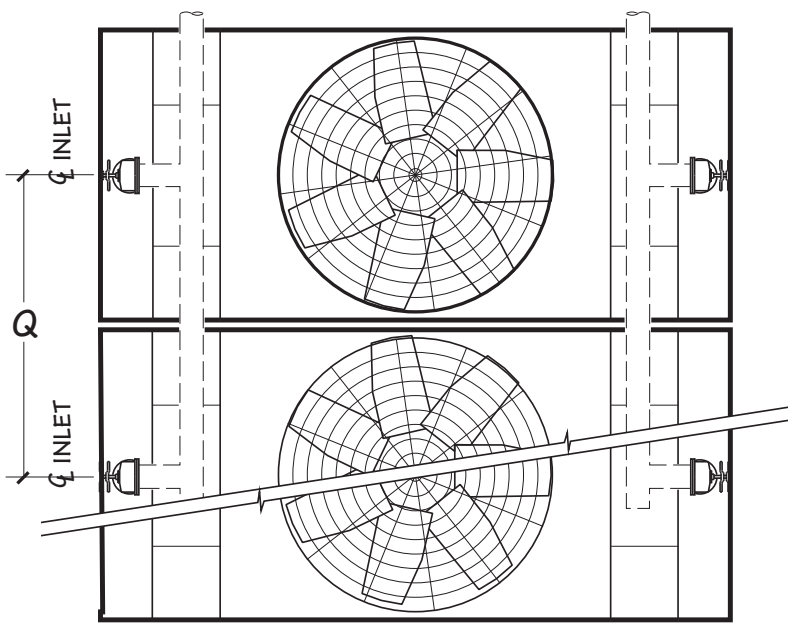
- If makeup water pressure exceeds 50 psig, use pressure reducer ahead of valve.
- For flow requirements exceeding the above limitations, use multiples of the same size valve.

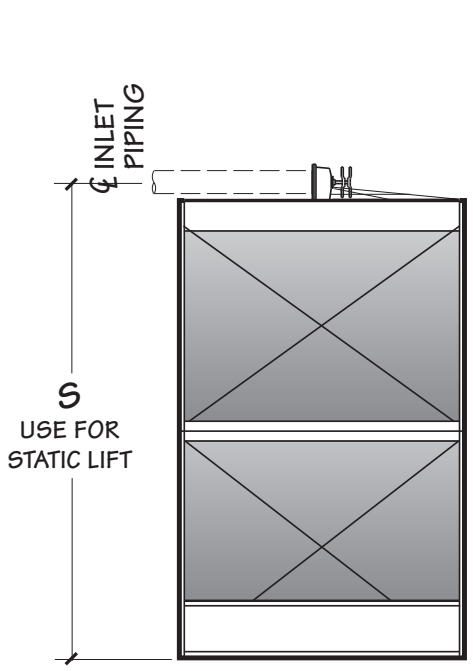


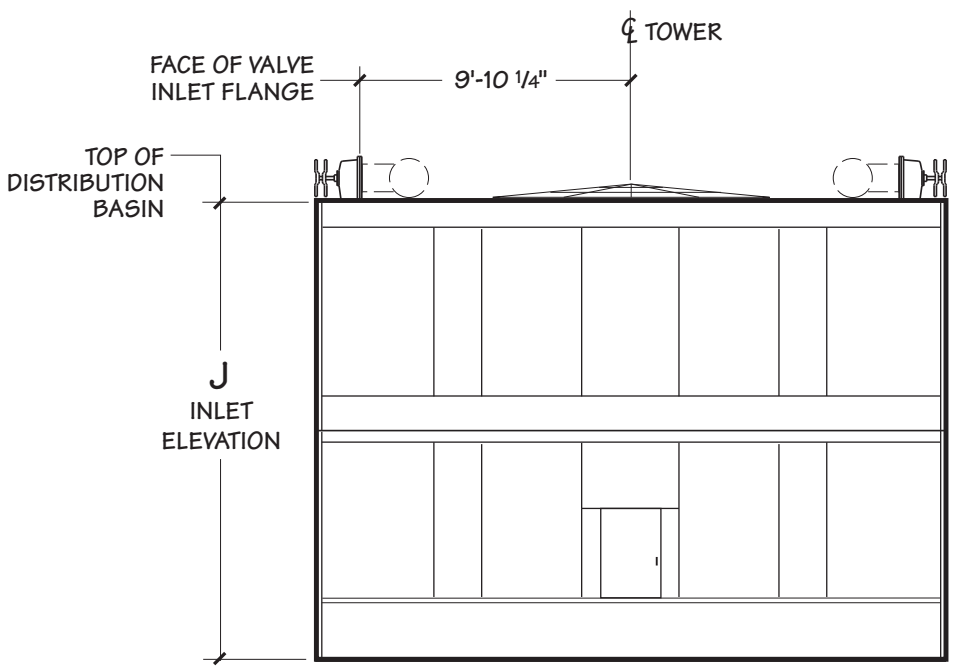
Model	Dimensions					Fan Diameter	Inlet Diameter
	J	K	S	P	Q		
NC8401	9'-9"	11'-1"	10'-5 3/16"	5'-3"	6'-9 3/4"	72"	2 at 6"
NC8402	9'-9"	12'-5"	10'-5 3/16"	5'-11"	8'-8 1/4"	84"	2 at 6"
NC8403	11'-5 5/16"	16'-0 1/2"	12'-2 7/16"	7'-8 3/4"	8'-8 1/4"	84"	2 at 8"
NC8405	11'-5 5/16"	17'-9 1/2"	12'-2 7/16"	8'-7 1/4"	10'-2 1/4"	108"	2 at 8"
NC8407	11'-5 5/16"	19'-0 7/8"	12'-2 7/16"	9'-2 15/16"	12'-2 1/4"	120"	2 at 8"
NC8409	11'-5 5/16"	20'-3 1/2"	12'-4 7/16"	9'-9 1/2"	14'-2 1/4"	144"	2 at 10"



SINGLE CELL





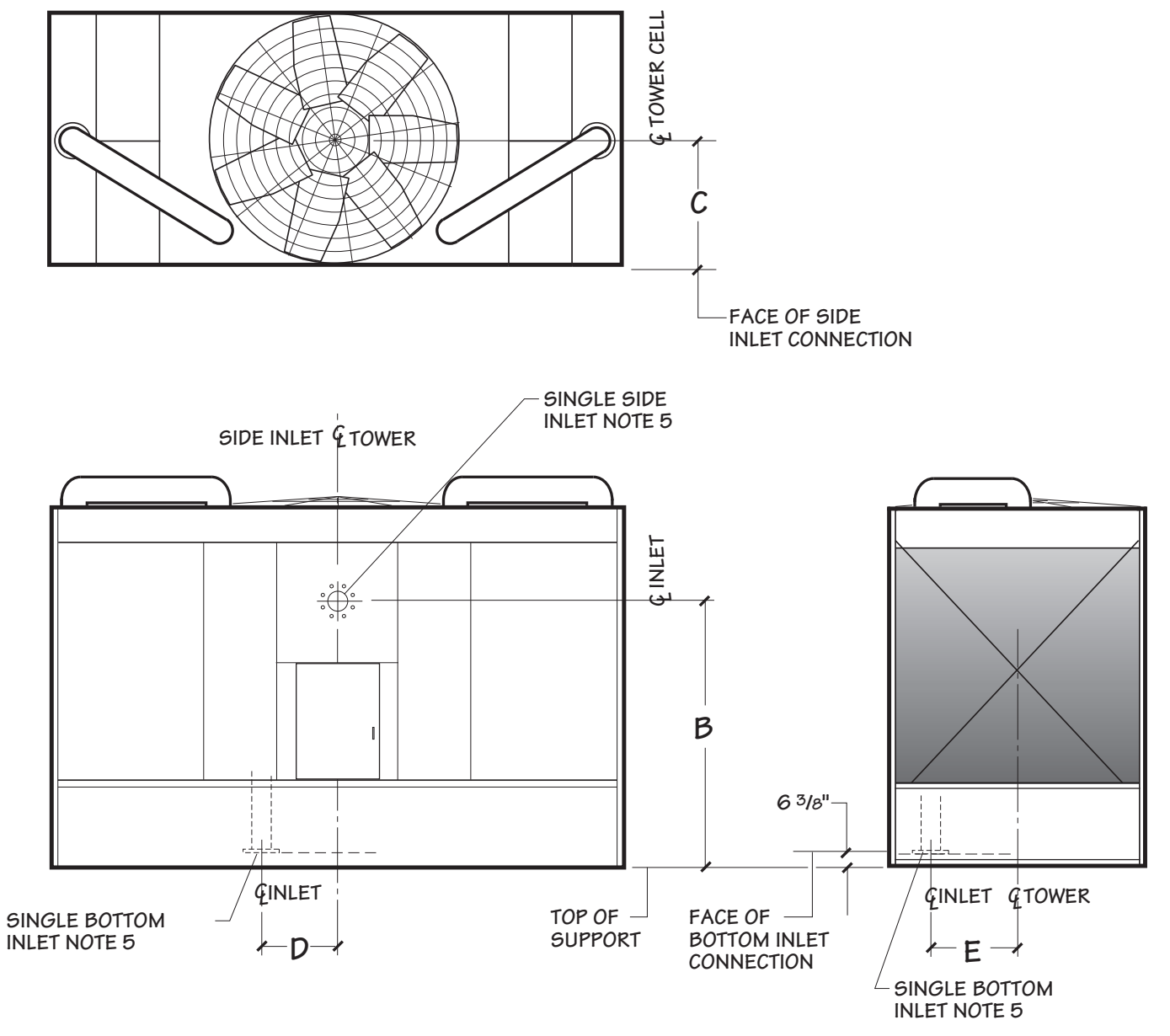


MULTICELL

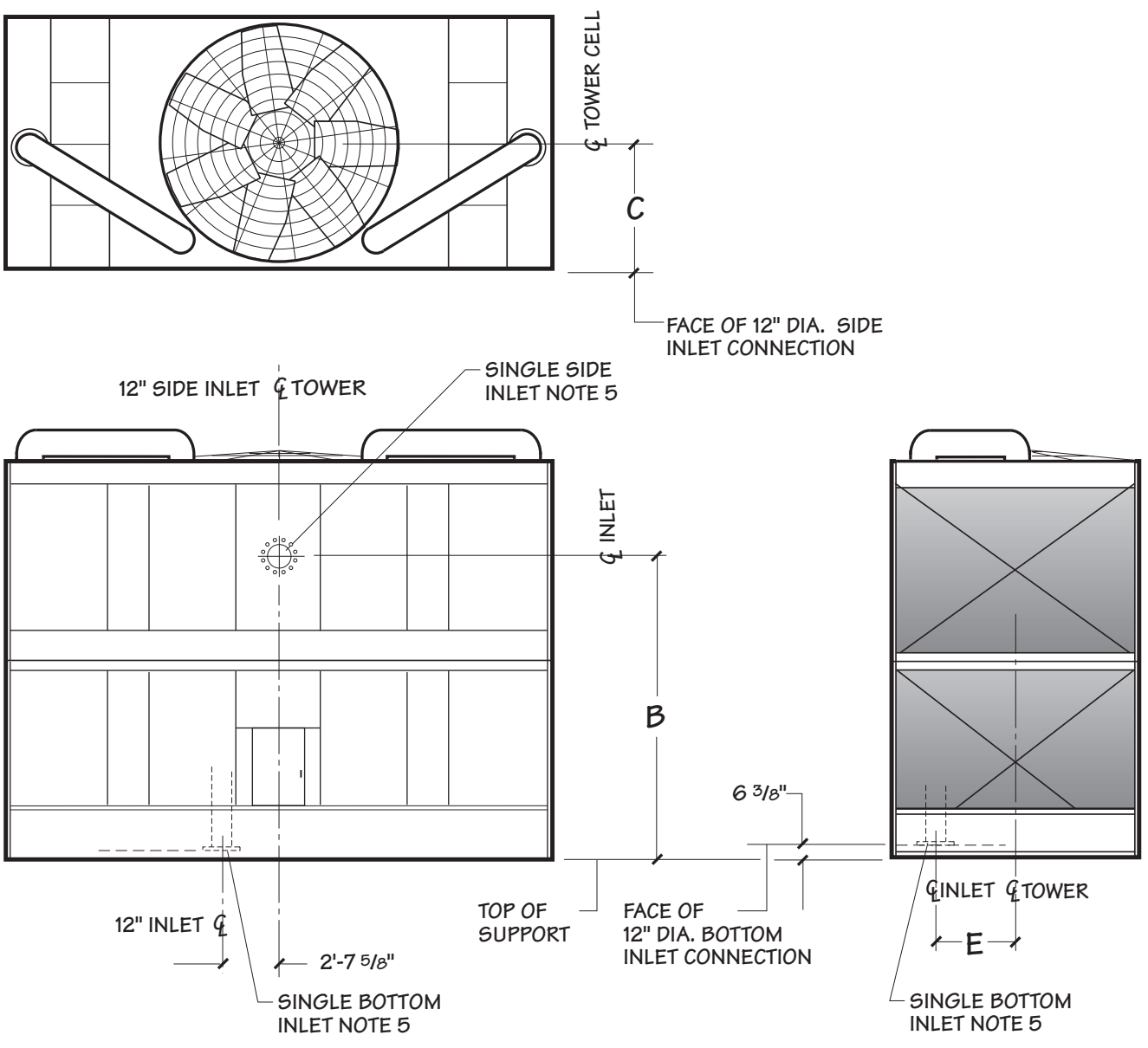
Model	Dimensions			Fan Diameter	Inlet Diameter
	J	S	Q		
NC8411	18'-3⅝"	19'-2¾"	12'-2¼"	132"	2 at 10"
NC8412	18'-3⅝"	19'-2¾"	14'-2¼"	144"	2 at 10"
NC8413	22'-0¾"	22'-11⅜"	12'-2¼"	132"	2 at 10"
NC8414	22'-0¾"	22'-11⅜"	14'-2¼"	144"	2 at 10"

NOTE

1 **Use this bulletin for preliminary layouts only.** Obtain current drawings from your Marley sales representative.
2 Pumping head contributed by the tower is static lift **"S"**. Add your system dynamic pipe losses for total.
3 The tower will support the vertical weight of piping shown within the plan area of the tower only. All piping loads, including thrust and lateral loads of riser and horizontal piping must be supported independent of the tower. See inlet piping drawings for details.
4 All piping and supports–and their design–are by others.
5 Allow adequate clearance for entry to tower access doors and safe use of optional ladder. Refer to appropriate Marley drawings.
6 You may choose to use 90° short radius flanged elbows in place of HC balancing valves on single-cell towers where inlet piping is balanced for equal flow. Pipe elevation remains as shown.



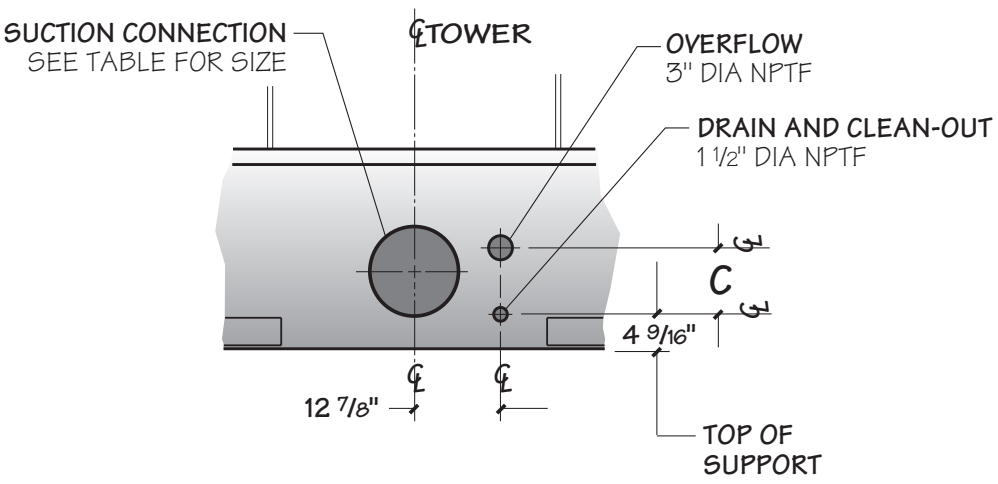
Model	Dimensions				Inlet Diameter
	B	C	D	E	
NC8401	7'-6 7/16"	3'-11 1/4"			6"
NC8402	7'-6 5/8"	5'-0 13/16"	2'-4 1/8"	2'-0"	8"
NC8403	9'-3 9/16"	5'-0 11/16"	2'-4 3/16"	2'-5"	8"
NC8405	9'-2 9/16"	5'-11 7/8"	2'-7 11/16"	3'-0 1/4"	10"
NC8407	9'-1 11/16"	7'-0 1/16"	2'-10 5/8"	4'-2"	10"
NC8409	9'-2 1/8"	8'-0"	2'-10 7/8"	4'-8"	10"



Model	Dimensions		
	B	C	E
NC8411	16'-1½"	7'-3 7/16"	4'-6"
NC8412	16'-1½"	8'-2½"	5'-5 15/16"
NC8413	19'-10 5/8"	7'-3 7/16"	4'-6"
NC8414	19'-10 5/8"	8'-2½"	5'-5 15/16"

NOTE

1 **Use this bulletin for preliminary layouts only.** Obtain current drawings from your Marley sales representative.
2 All external piping loads, including weight, thrust and lateral loads of riser and horizontal piping plus the weight of water in the internal riser must be supported independent of the tower. Internal riser adds additional vertical operating loads to external piping at the bottom inlet flange.
3 All piping and supports beyond the inlet connection–and their design–are by others.
4 Allow adequate clearance for entry to tower access doors and safe use of optional ladder. Refer to appropriate Marley drawings.
5 You may choose either a bottom inlet connection or a side inlet connection. The bottom inlet connects at the tower collection basin floor. Refer to appropriate Marley drawings.
6 Contact your Marley sales representative for the required pump head for single-inlet applications.
7. Weight of internal piping must be added to tower weights. Contact your Marley sales representative for combined tower weight information.

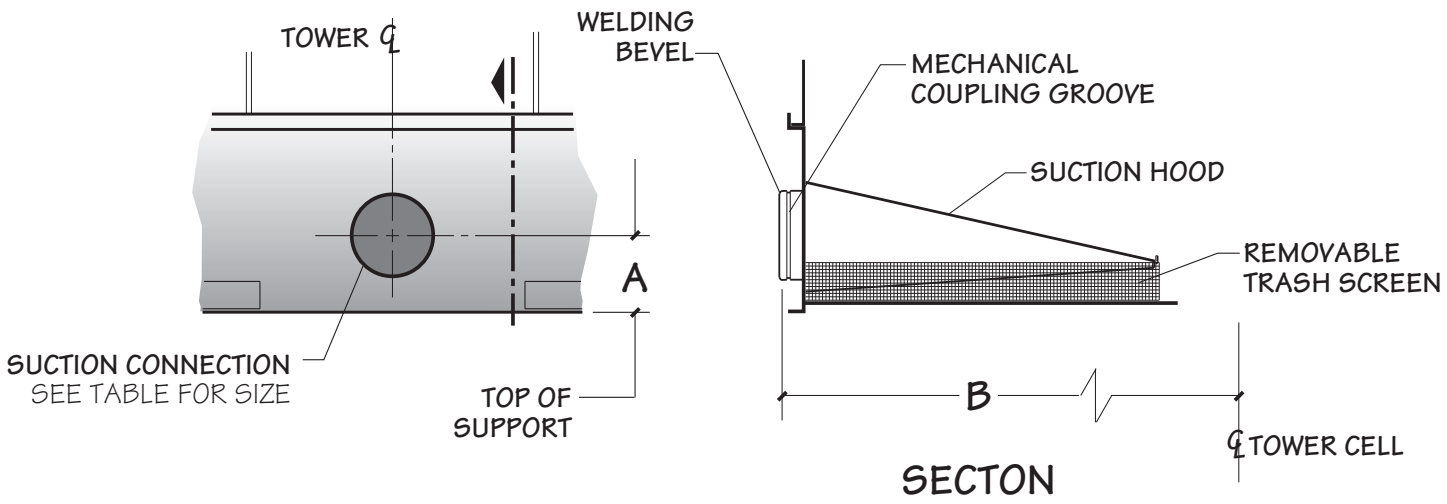


DRAIN AND OVERFLOW CONNECTION
OPTION

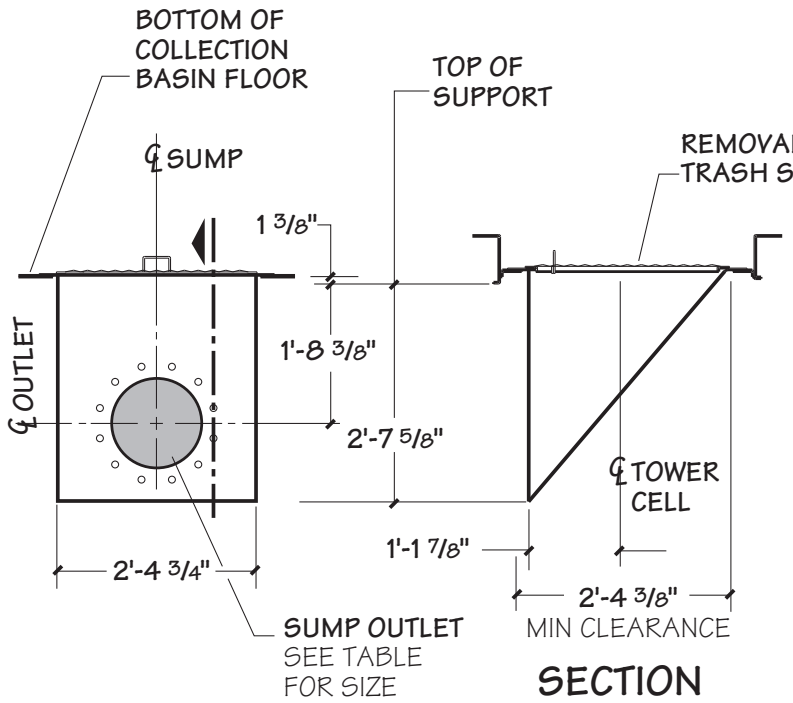
Model	Dimensions		
	A	B	C
NC8401	10"	3'-4 1/8"	8 1/8"
NC8402	10"	4'-3 3/8"	8 1/8"
NC8403	11 1/4"	4'-3 3/8"	10 3/16"
NC8405	11 1/4"	5'-0 3/8"	10 3/16"
NC8407	11 1/4"	6'-0 3/8"	10 3/16"
NC8409	11 1/4"	7'-0 3/8"	10 3/16"
NC8411	11 1/4"	6'-0 3/8"	11 15/16"
NC8412	11 1/4"	7'-0 3/8"	11 15/16"
NC8413	11 1/4"	6'-0 3/8"	11 15/16"
NC8414	11 1/4"	7'-0 3/8"	11 15/16"

NOTE

Standard overflow is a 4" dia. standpipe in the collection basin floor. The standpipe removes for flush-out and draining.

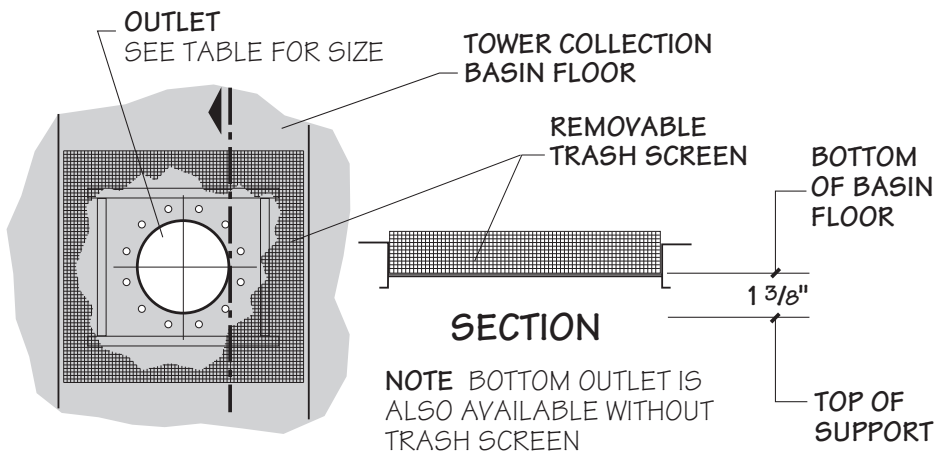


CASED-FACE OUTLET CONNECTION



DEPRESSED SIDE-OUTLET SUMP CONNECTION

STAINLESS STEEL OR FRP

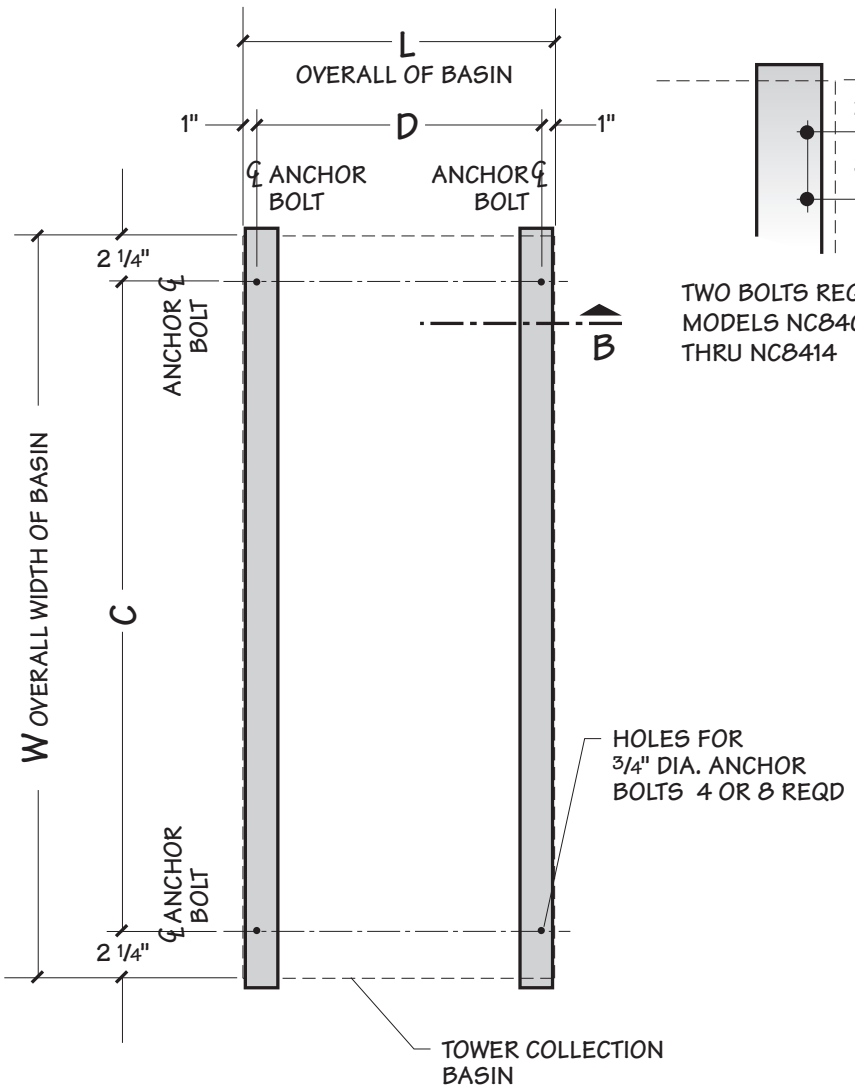


BOTTOM OUTLET CONNECTION

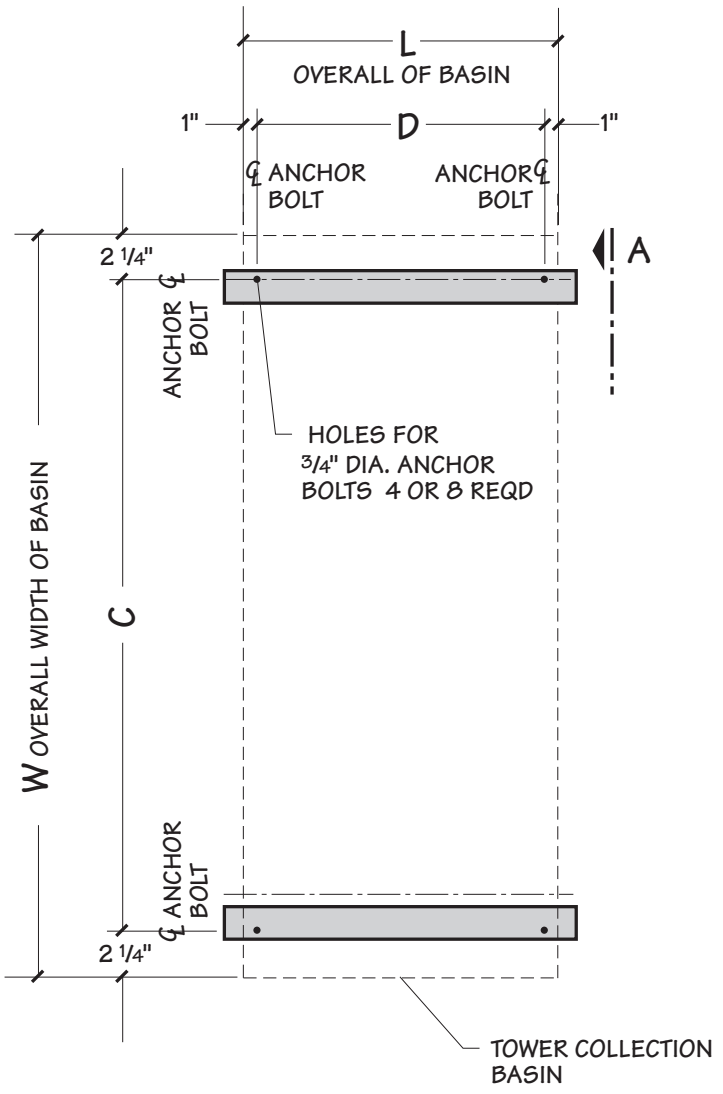
Maximum GPM Per Outlet Diameter											
Outlet Type	**Flow Type**	**Model**	**Outlet Diameter**								
			4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
Bottom	pump flow w/ anti-vortex plate or gravity flow w/ or w/o anti-vortex plate	NC8401 thru NC8405	157	355	630	993	1413	1729	2285	2509	3322	4019
		NC8407 thru NC8414	167	380	673	1061	1510	1848	2442	3164	3829	4896
	pump flow w/o anti-vortex plate	NC8401 thru NC8414	71	162	287	453	644	788	1042	1349	1676	2433
Sump	pump flow w/ anti-vortex plate or gravity flow w/ or w/o anti-vortex plate	NC8401 thru NC8405		900	1595	2515	3578	4284				
		NC8407 thru NC8414		900	1595	2515	3578	4379				
	pump flow w/o anti-vortex plate	NC8401 thru NC8414		630	1116	1761	2505	3065				
cased-face outlet	pump flow only	NC8401 thru NC8405		900	1595	2515	3578					
		NC8407 thru NC8414		900	1595	2515	3578	4379				

NOTE

- Flow rate may be limited by the maximum GPM for unit size.
- For gravity-flow situations (as to an indoor tank), use bottom outlet or depressed side outlet sump. Cased-face outlet is not recommended for gravity flow.
- GPM limits are the outlet capacities per outlet based on the design operating water level–8½" above the top of support on models NC8401 through NC8405–9½" on NC8407 thru NC8414.

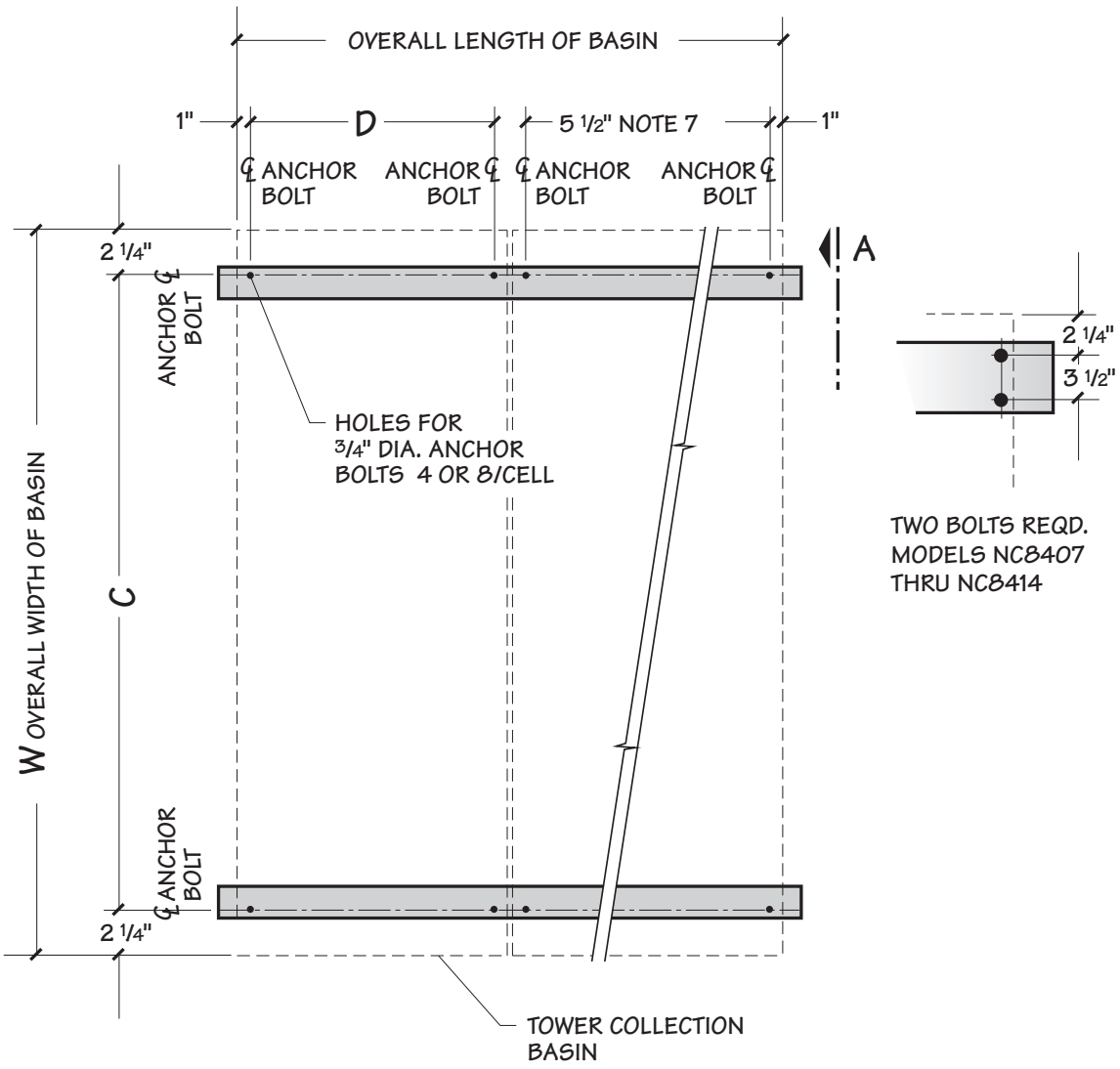


SUPPORTING STEEL
SINGLE CELL



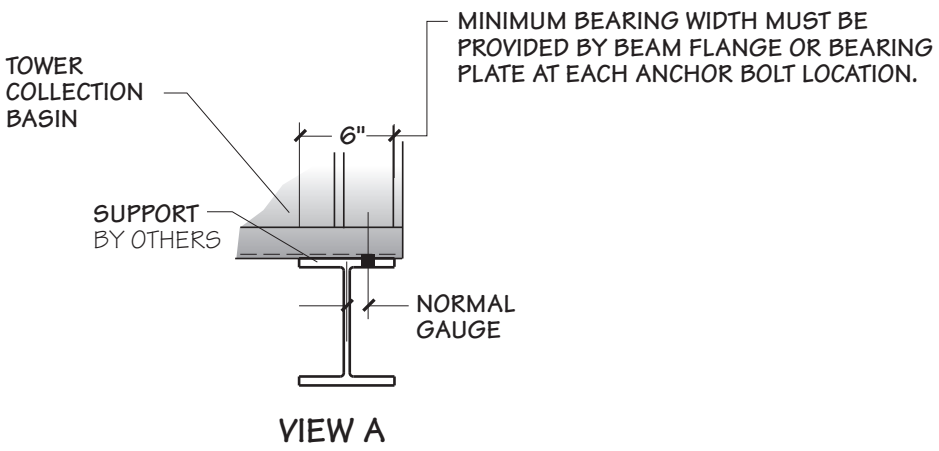
SUPPORTING STEEL ALTERNATE
SINGLE CELL

Model	Dimensions				Design Operating Weight/Cell lb	Design Operating Load at Anchor lb	Wind **p** and Seismic **g** Loads lb note 4			
							Max Vertical Reaction at Anchor		Max Horizontal Reaction at Anchor	
	W	**L**	**C**	**D**						
NC8401	12'-10"	6'-6¼"	12'-5½"	6'-4¼"	8488	2122	48.41 x **p**	3023 x **g**	31.41 x **p**	2121 x **g**
NC8402	14'-2"	8'-4¾"	13'-9½"	8'-2¾"	11184	2796	41.26 x **p**	2960 x **g**	34.68 x **p**	2817 x **g**
NC8403	18'-2"	8'-4¾"	17'-9½"	8'-2¾"	16772	4193	72.72 x **p**	5145 x **g**	52.13 x **p**	3986 x **g**
NC8405	19'-11"	9'-10¾"	19'-6½"	9'-8¾"	20690	5172	67.43 x **p**	5184 x **g**	57.16 x **p**	4973 x **g**
NC8407	21'-0"	11'-10¾"	20'-7½"	11'-8¾"	26879	6720	58.98 x **p**	5247 x **g**	60.26 x **p**	6222 x **g**
NC8409	22'-5"	13'-10¾"	22'-0½"	13'-8¾"	32592	8148	53.79 x **p**	5057 x **g**	64.33 x **p**	6686 x **g**
NC8411	22'-5"	11'-10¾"	22'-0½"	11'-8¾"	39331	9833	160.70 x **p**	16812 x **g**	102.78 x **p**	10151 x **g**
NC8412	22'-5"	13'-10¾"	22'-0½"	13'-8¾"	45453	11363	137.29 x **p**	14372 x **g**	102.78 x **p**	10533 x **g**
NC8413	22'-5"	11'-10¾"	22'-0½"	11'-8¾"	44581	11145	233.33 x **p**	23262 x **g**	123.85 x **p**	11602 x **g**
NC8414	22'-5"	13'-10¾"	22'-0½"	13'-8¾"	51501	12875	199.34 x **p**	20176 x **g**	123.85 x **p**	12143 x **g**
NC Models with Velocity Recovery Cylinder										
NC8407	21'-0"	11'-10¾"	20'-7½"	11'-8¾"	27044	6761	73.88 x **p**	5439 x **g**	66.51 x **p**	6260 x **g**
NC8409	22'-5"	13'-10¾"	22'-0½"	13'-8¾"	32888	8222	69.06 x **p**	5277 x **g**	71.83 x **p**	6760 x **g**
NC8411	22'-5"	11'-10¾"	22'-0½"	11'-8¾"	39515	9879	185.13 x **p**	17002 x **g**	109.65 x **p**	10197 x **g**
NC8412	22'-5"	13'-10¾"	22'-0½"	13'-8¾"	45749	11437	160.06 x **p**	14558 x **g**	110.28 x **p**	10606 x **g**
NC8413	22'-5"	11'-10¾"	22'-0½"	11'-8¾"	44764	11191	262.17 x **p**	23482 x **g**	130.72 x **p**	11648 x **g**
NC8414	22'-5"	13'-10¾"	22'-0½"	13'-8¾"	51895	12974	226.22 x **p**	20392 x **g**	131.35 x **p**	12251 x **g**

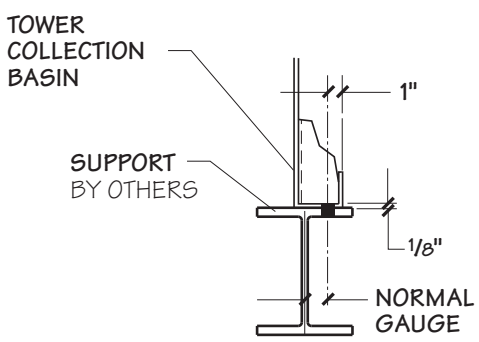


SUPPORTING STEEL

MULTICELL



VIEW A



SECTION B

NOTE

1 **Use this bulletin for preliminary layouts only.** Obtain current drawings from your Marley sales representative for final design.
2 Purchaser to provide tower support complete with holes and anchor bolts. Do not use studs! Anchor points must be framed flush and level at top.
3 Design operating weight occurs with collection basin full to overflow level. Actual operating weight varies with GPM and piping scheme.
4 Wind reactions can be calculated by multiplying by **p**, which is the wind pressure in psf. Seismic reactions can be calculated by design **g**. Wind loads are additive to operating loads.
5 Tower may be placed on a flat concrete slab. Side outlet and optional side drain and overflow must be specified. See pages 13 and 18 and consult your Marley sales representative.
6 Tower may be supported from piers at each anchor bolt location, as a support alternative.
7. Dimensions between anchor bolts may vary depending on the number of cells and options. Dimensions shown are for a standard two cell arrangement. Obtain current drawings from your Marley sales representative for final dimension.

When the ambient air temperature falls below 32°F, the water in a cooling tower can freeze. *Marley Technical Report #H-003* "Operating Cooling Towers in Freezing Weather" describes how to prevent freezing during operation. Available at spxcooling.com or ask your Marley sales representative for a copy.

During shutdown, water collects in the cold water basin and may freeze solid. You can prevent freezing by adding heat to the water left in the tower—or, you can drain the tower and all exposed pipework at shutdown.

Electric Basin Heaters

An automatic basin water heater system is available consisting of the following components:

- Stainless steel electric immersion heater(s).

  —Threaded couplings are provided in the side of the collection basin.

- NEMA 4 enclosure containing:

  —Magnetic contactor to energize heater.

  —Transformer to convert power supply to 24 volts for control circuit.

  —Solid state circuit board for temperature and low-water cutoff.

  Enclosure may be mounted on the side of the tower.

- Control probe in the collection basin to monitor water temperature and level.

Heater components are normally shipped separately for installation by others.

Note: any exposed piping that is still filled with water at shutdown—including the makeup water line—should be electrically traced and insulated (by others).

Steam Jet Basin Heaters

Penberthy Houdaille bronze steam jet heaters (¼" to ¾") are available for freeze protection (installation by others). Injectors install in a coupling provided in the side of the collection basin. Live steam, as required, is injected directly into the water. Condensed steam adds water to the basin, and the excess will exit the overflow of the tower.

Indoor Storage Tank

With this type of system, water flows from an indoor tank, through the load system, and back to the tower, where it is cooled. The cooled water flows by gravity from the tower to the tank located in a heated space. At shutdown, all exposed water drains into the tank, where it is safe from freezing.

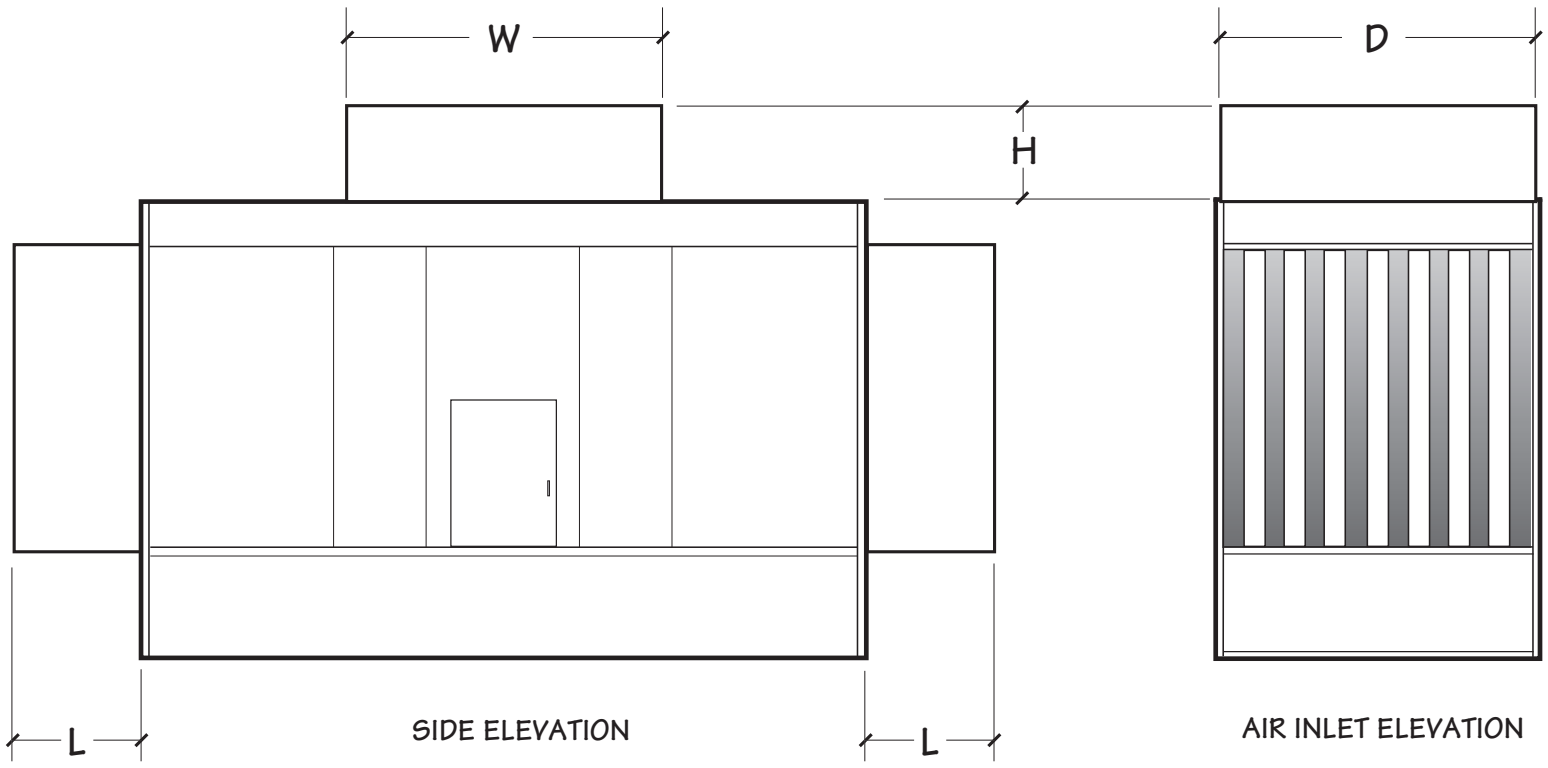
The table on page 23 lists typical drain-down capacities for all NC Class tower models. Although we do not produce tanks, many of our representatives offer tanks supplied by reputable manufacturers.

The amount of water needed to successfully operate the system depends on the tower size and GPM and on the volume of water contained in the piping system to and from the tower. You must select a tank large enough to contain those combined volumes—plus a level sufficient to maintain a flooded suction on your pump. Control makeup water according to the level where the tank stabilizes during operation.

NC Drain-Down Capacity					
Model	Range of Tower Design GPM	Drain Down Maximum Gallons	Model	Range of Tower Design GPM	Drain Down Maximum Gallons
NC8401	132-280	371	**NC8409**	481-1200	1673
	290-450	402		1210-1800	1769
	460-620	421		1810-2400	1877
	630-780	442		2410-3000	1910
	790-919	457		3010-3565	1993
NC8402	183-380	508	**NC8411**	410-1300	1763
	390-590	537		1310-2000	1974
	600-800	568		2010-2700	2128
	810-1010	590		2710-3300	2216
	920-1200	606		3310-4049	2360
NC8403	285-700	811	**NC8412**	481-1400	2050
	710-1030	877		1410-2200	2231
	1040-1390	925		2210-3000	2422
	1400-1700	960		3010-3800	2571
	1710-2113	1009		3810-4753	2770
NC8405	337-810	969	**NC8413**	410-1200	1919
	820-1230	1041		1210-1900	2124
	1240-1610	1120		1910-2600	2331
	1620-2030	1173		2610-3300	2494
	2040-2509	1211		3310-4049	2672
NC8407	410-1000	1320	**NC8414**	481-1400	2244
	1010-1500	1424		1410-2200	2471
	1510-2000	1493		2210-3000	2711
	2010-2500	1542		3010-3900	2940
	2510-3037	1614		3910-4753	3137

NOTE

Volumes shown are maximums for the GPM ranges indicated. Actual volumes will usually be less. Contact your Marley sales representative for more specific information.



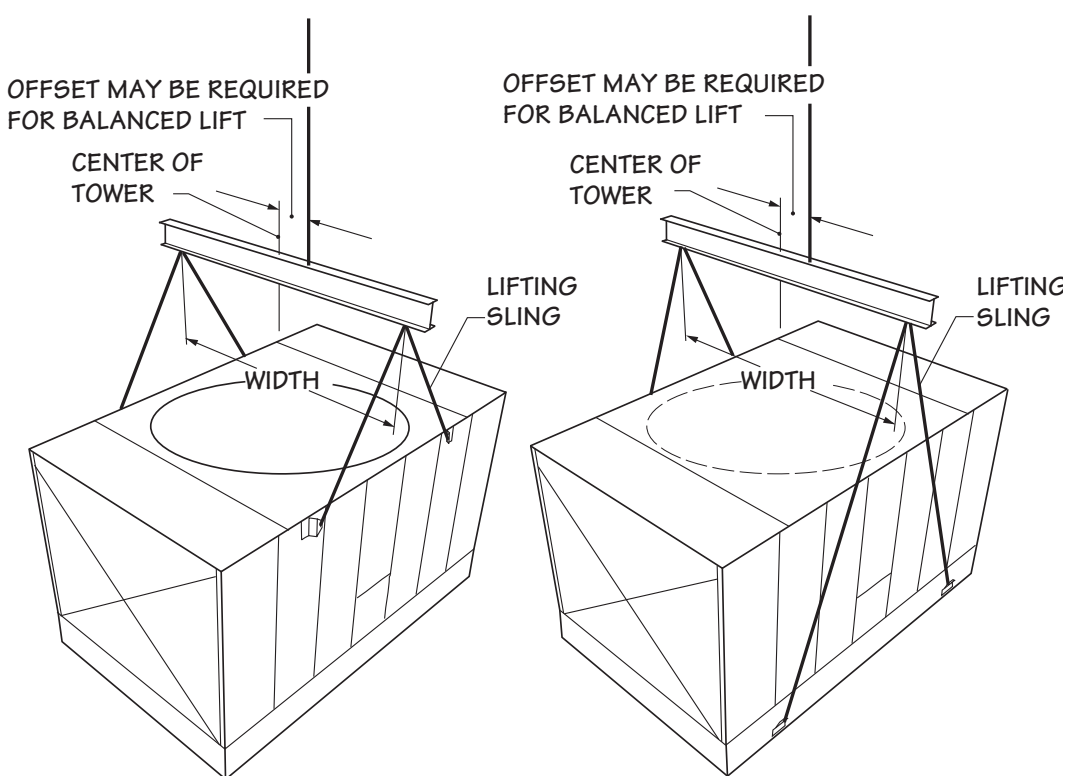
SIDE ELEVATION

AIR INLET ELEVATION

Model	Dimensions				Add To Design Operating Weight lb	
	L	W	D	H	Discharge Attenuator	Inlet Attenuators
NC8401	2'-3¼"	6'-10"	6'-1½"	2'-3"	620	1523
	4'-6½"	6'-10"	6'-1½"	4'-6"	1241	3045
NC8402	2'-3¼"	7'-10¼"	8'-0"	2'-3"	774	1869
	4'-6½"	7'-10¼"	8'-0"	4'-6"	1547	3738
NC8403	2'-3¼"	7'-10¼"	8'-0"	2'-3"	774	2101
	4'-6½"	7'-10¼"	8'-0"	4'-6"	1547	4201
NC8405	2'-3¼"	9'-9"	9'-6"	2'-3"	1051	2460
	4'-6½"	9'-9"	9'-6"	4'-6"	2102	4920
NC8407	2'-3¼"	10'-8⅜"	11'-6"	2'-3"	1395	3115
	4'-6½"	10'-8⅜"	11'-6"	4'-6"	2791	6231
NC8409	2'-3¼"	12'-9⅜"	13'-6"	2'-3"	1616	3508
	4'-6½"	12'-9⅜"	13'-6"	4'-6"	3233	7016
NC8411	2'-3¼"	11'-8⅞"	11'-6"	2'-3"	1564	5562
	4'-6½"	11'-8⅞"	11'-6"	4'-6"	3128	11125
NC8412	2'-3¼"	12'-9⅜"	13'-6"	2'-3"	1616	6272
	4'-6½"	12'-9⅜"	13'-6"	4'-6"	3233	12545
NC8413	2'-3¼"	11'-8⅞"	11'-6"	2'-3"	1564	6417
	4'-6½"	11'-8⅞"	11'-6"	4'-6"	3128	12834
NC8414	2'-3¼"	12'-9⅜"	13'-6"	2'-3"	1616	7051
	4'-6½"	12'-9⅜"	13'-6"	4'-6"	3233	14103

NOTE

1 **Use this bulletin for preliminary layouts only.** Obtain current drawings from your Marley sales representative. All table data is per cell.
2 Attenuators are field installed by others with hardware provided by Marley
3 Attenuators are supported by the tower. Additional support not required.
4 Discharge attenuators are not available for NC models with velocity recovery cylinders.



Model	Width	Minimum Sling Length
NC8401	6'-7"	6'-0"
NC8402	8'-6"	6'-0"
NC8403	8'-6"	8-0"
NC8405	10'-0"	8'-0"
NC8407	12'-0"	9'-0"
NC8409	14-0"	18'-0"
NC8411 Top	12'-0"	9'-0"
NC8411 Bottom	12'-0"	18'-0"
NC8412 Top	14'-0"	9'-0"
NC8412 Bottom	14'-0"	18'-0"
NC8413 Top	12'-0"	9'-0"
NC8413 Bottom	12'-0"	18'-0"
NC8414 Top	14'-0"	9'-0"
NC8414 Bottom	14'-0"	18'-0"

NOTE

- All hoisting clip holes are 1¼".
- On multicell tower installations, overall length of shackle pins should not exceed 5¼".
- For overhead lifts or where additional safety is required, add slings beneath the tower unit.

LENNTECH

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SPX®

[redacted]

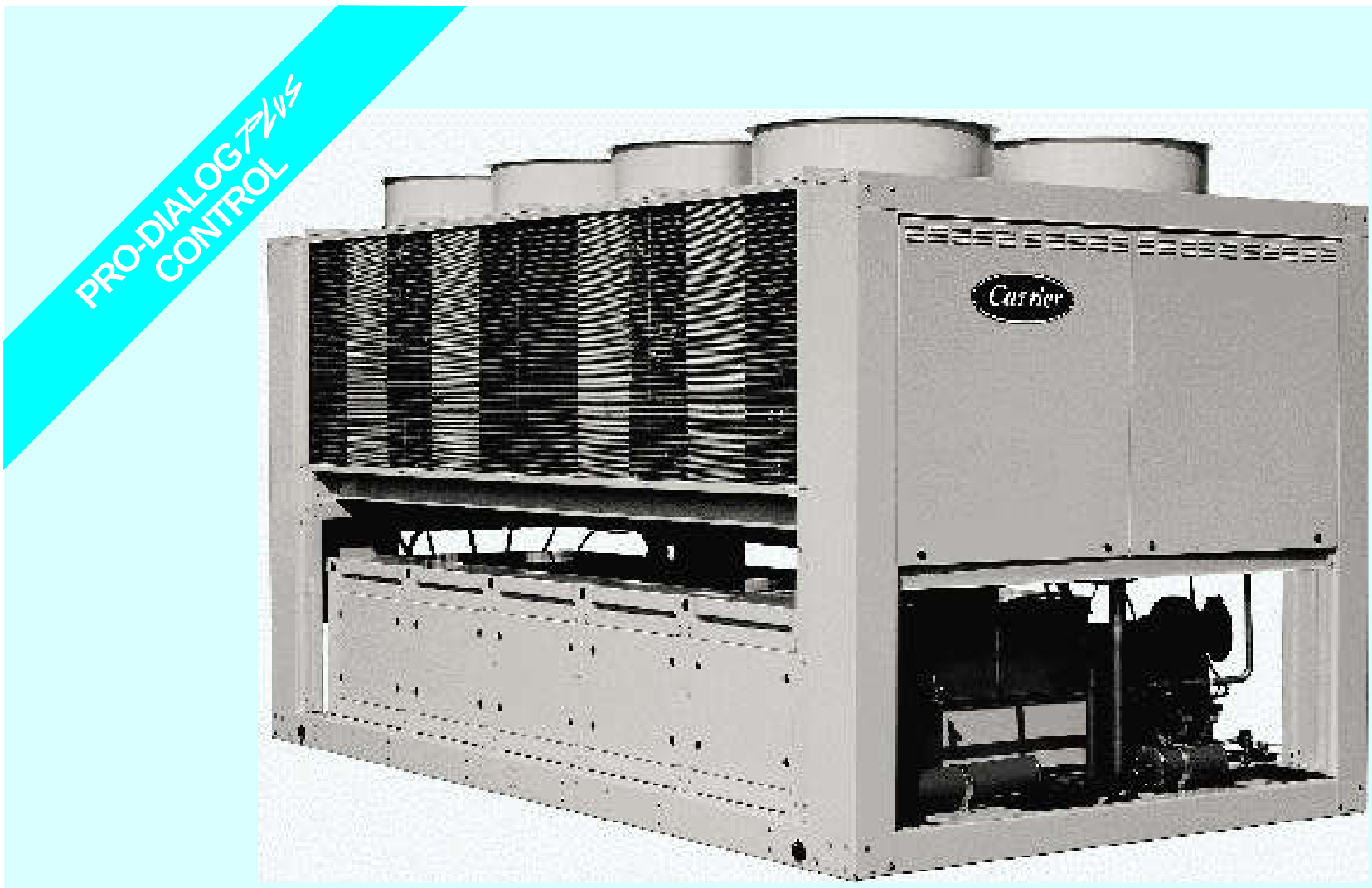
In the interest of technological progress,
all products are subject to design and/or
material change without notice.
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TECH-NC-10

Appendix 4.4.1f Catalogue for CP

30GZ 040-245

Air-Cooled Liquid Chillers

Nominal cooling capacity 102-750 kW



Carrier is participating in the Eurovent Certification Programme. Products are as listed in the Eurovent Directory of Certified Products.

The 30GZ series of air-cooled liquid chillers is designed for operation with refrigerant HFC-407C to meet new environmental protection requirements. These chillers feature extra-quiet operation and a new ecological refrigerant, and offer an ideal solution for chilled water production.

Features

- The new, ecological refrigerant HFC-407C has an ozone depletion potential of zero and is not affected by international regulations on the usage of CFCs and their derivatives. This new refrigerant ensures similar performances to HCFC-22 and offers an economical solution to environmental protection problems.
  HFC-407C is a blend of HFC-32, 125 and 134a. As it is produced and distributed world-wide, there are no availability problems. These new HFC-407C chillers have been designed using specific refrigeration components and new production methods and are backed by thousands of hours of laboratory and field tests. This allows Carrier to offer tomorrow?s chiller technology today.
- Low-noise operation. The revolutionary, low-noise, shrouded axial Flying Bird fan is made of a composite plastic material which is fully recyclable. Together with the substantial reduction of compressor noise transmission (discharge muffler, anti-vibration mountings), this results in a uniform chiller sound spectrum and eliminates intrusive low frequency noises.
- Excellent part-load energy efficiency through use of multiple compressors and electronic expansion valves (optional on some models). As the chiller rarely operates at full load, significant savings are ensured.
  This reduced power consumption also contributes to limiting the greenhouse effect, resulting from power generation from fossil energy.
- Two independent refrigerant circuits, the second one takes over automatically when the first one malfunctions, maintaining partial cooling under all circumstances.
- Refrigerant containment - rigorous factory tightness tests and use of temperature or pressure sensors without capillary tubes eliminate the risk of leaks. Shut-off valves permit isolation of the refrigerant charge in the heat exchangers. Maintenance operations become less frequent and more effective.

PRO-DIALOG Plus control

PRO-DIALOG Plus is an advanced numeric control system that combines complex intelligence with great operating simplicity.

PRO-DIALOG Plus ensures intelligent leaving water temperature control and optimises energy requirements.

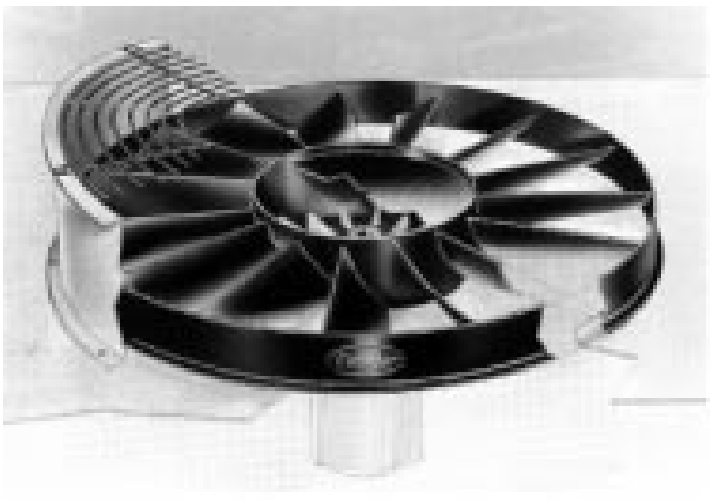
- The PID control algorithm with return water temperature compensation anticipates load variations, guarantees leaving water temperature stability and prevents unnecessary compressor cycling.
- The long-stroke electronic expansion valves (EXV) and PID superheat control (standard on 30GZ 085-245), together with a patented head pressure control algorithm allow a significant energy efficiency improvement at part load conditions, and faultless chiller operation in a wider temperature range.
- Several capacity loading possibilities ensure improved start-up at low outdoor air temperature, and permit use of one of the refrigerant circuits as a back-up circuit.
- Adjustable ramp loading, according to the inertia of the application, avoids load increases that are too fast and too frequent, increasing unit life and limiting power consumption peaks.

PRO-DIALOG Plus ensures preventive protection and enhances chiller reliability.

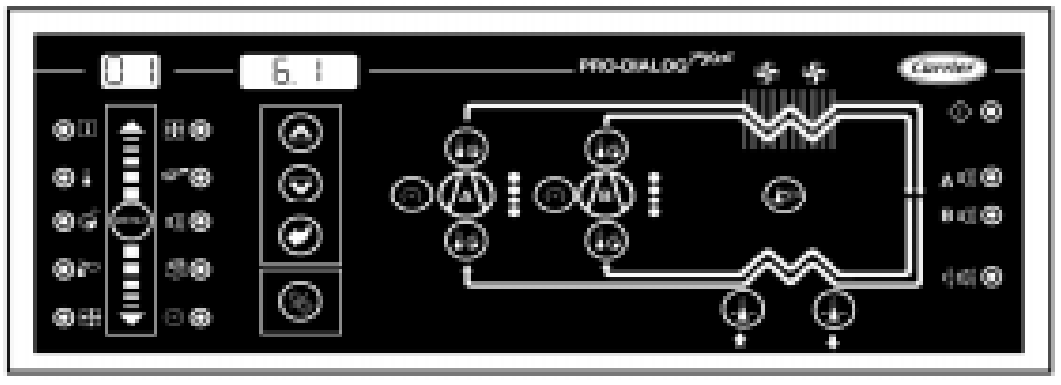
- Equalisation of compressor operating hours
- No capillary tubes or pressostats (except as safety device)
- PRO-DIALOG Plus monitors all chiller safety parameters. The fault history function and the 80 fault codes facilitate immediate fault location (see Technical Description)

PRO-DIALOG Plus offers extended communications capabilities

- Clear and easy-to-understand operator interface. The LEDs, numeric displays and touch keys are well-positioned on the schematic chiller diagram. The user immediately knows all operating parameters: pressures, temperatures, operating hours, etc.
- The extensive chiller remote control capabilities (wired connection) allow integration into building monitoring systems (see Technical Description)
- RS485 series port for connection to the Carrier Comfort Network (CCN) or any other monitoring system (optional communications interface with open protocol allows transfer of almost 50 parameters).
- Parallel piloting of two units as standard, or of several units with Flotronic System Manager (FSM) and Chiller System Manager (CSM III) options.



Low-noise Flying Bird fan



PRO-DIALOG Plus operator interface

Options and accessories

	Option	Accessory
Condenser anti-corrosion treatment for marine applications	X	
Condenser anti-corrosion treatment for rural, urban and industrial applications	X	
Low leaving brine temperatures from 5°C to -6°C	X	
Very low leaving brine temperatures from -6°C to -10°C (except ISPESL code)	X	
Electrical box protection to IP55	X	
Protection grilles	X	X
High and low pressure manometers	X	
Electronic compressor oil pressure protection and display	X	
Head pressure control for low outside temperature applications (fan speed variation)	X	X
220-3-50 power supply (30GZ 040-100)	X	
Main power disconnect switch with auxiliary circuit power supply transformer	X	
Compressor suction valve (30GZ 085-245)	X	
Evaporator with fewer or more baffles	X	
Electronic expansion valves (30GZ 045-060)	X	
Compressor sound enclosure	X	
Compressor part-winding start (30GZ 085-100)	X	
RS485 communications interface with open protocol	X	X

Sound levels

30GZ	040	045	060	085	095	100	120	130	145	150	160	170	190	220	245
Sound power, dB(A)	91	97	97	97	95	96	96	97	97	98	98	98	99	99	100	100

Note: According to ISO standard 3744 and Eurovent 8/1.

Physical data

30GZ		040	045	050	060	085	095	100	120	130	145	150	160	170	190	220	245
Net nominal cooling capacity*	kW	102	119	150	181	240	284	321	375	425	429	463	481	525	608	671	750
Operating weight	kg	1380	1445	1710	1780	3012	3067	3439	3884	4330	4452	5010	5172	5592	6442	6742	7992
Refrigerant charge	kg	R-407C															
Circuit A		16.5	16.5	19	21.5	33	34	28	36	47	46	53	59	59	59	59	66
Circuit B		16.5	16.5	19	21.5	19	24	28	36	32	35	38.5	46	48	56	59	66
Compressors		Semi-hermetic, 4 or 6 cylinders, 24.2 r/s															
Quantity - Circuit A		1	1	1	1	2	2	2	2	3	3	3	3	3	4	4	4
Quantity - Circuit B		1	1	1	1	1	1	2	2	2	2	2	2	3	3	4	4
Capacity control		PRO-DIALOG Plus control															
No. of control steps		4	4	4	4	6	6	4	4	5	5	5	5	6	7	8	8
Minimum step capacity	%	25	33	33	33	20	22	22	25	16.7	17	20	20	14	12	10	12.5
Evaporator		Direct-expansion, multi-tube shell type															
Net water volume	l	55	55	63	63	92	92	154	154	199	242	199	242	242	242	242	242
Water connections		Flat flange PN 16, corresponding to NFE 29 203															
Inlet/outlet		DN 80	DN 80	DN 80	DN 80	DN 100	DN 100	DN125	DN125	DN 150	DN 150	DN 150	DN 150	DN 150	DN 150	DN 150	DN 150
Drain	in	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT	1/2 NPT
Max. water side operating pressure	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Condenser		Copper tubes, aluminium fins															
Condenser fans		Shrouded axial, Flyinç g Bird fan															
Quantity		2	2	4	4	6	6	6	8	8	8	10	10	10	12	12	16
Total air flow	l/s	9444	9444	19890	19890	29830	29830	29830	39780	39780	39780	49720	49720	49720	59670	59670	79560
Fan speed	r/s	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5

* Standard Eurovent conditions: Evaporator entering/leaving water temperature 12°C and 7°C. Condenser entering air temperature 35°C.
Net cooling capacity = gross cooling capacity minus the water pump heat against the internal evaporator pressure drop.

Electrical data

30GZ		040	045	050	060	085	095	100	120	130	145	150	160	170	190	220	245
Power wiring																	
Nominal power supply	V-ph-Hz	400-3-50															
Voltage range	V	360-440															
Auxiliary circuit (heaters)	V-ph-Hz	230-1-50															
Power input	W	570	570	570	570	980	980	1160	1160	1460	1460	1460	1460	1640	1820	2000	2000
Max. unit power input*	kW	41	55	64	87	110	134	152	174	192	202	228	225	241	282	328	358
Circuit A**	kW	-	-	-	-	-	-	-	-	-	-	-	-	141	165	164	179
Circuit B**	kW	-	-	-	-	-	-	-	-	-	-	-	-	100	117	164	179
Fan power supply	V-ph-Hz	400-3-50															
Fan power input	kW	2.3	2.3	4.6	4.6	7	7	7	9	9	9	12	12	12	14	14	19
Max. starting current (compr. + fans)	A																
Total (30GZ standard unit)		144	186	219	296	476	518	553	601	636	636	684	684	719	802	879	934
Circuit A**		-	-	-	-	-	-	-	-	-	-	-	-	517	574	574	601
Circuit B**		-	-	-	-	-	-	-	-	-	-	-	-	469	497	574	601
Total (30GZ with part-winding start)		std	std	std	std	338	380	415	463	498	498	546	546	581	664	741	796
Max. unit current drawn (compr. + fans)*	A																
Total		72	97	113	154	194	238	264	308	338	354	394	393	405	496	565	641
Circuit A**		-	-	-	-	-	-	-	-	-	-	-	-	238	290	282	320
Circuit B**		-	-	-	-	-	-	-	-	-	-	-	-	167	206	282	320

* Compressor and fan, at maximum unit operating values.
** Unit sizes 30GZ 170-245 have a separate power supply per circuit. All current values are at nominal voltage.

Electrical data notes:

- 30GZ units have a single power connection point (except 30GZ 170-245 which have two connection points).
- A separate power source (230 V, 1 ph, 50 Hz) that does not exceed the main switch capacity is required to power the compressor crankcase heater circuit. This source must be supplied from a transformer. It must not be supplied from a phase + neutral supply (for ground + neutral systems).
- The control box includes the following standard features:
  - Starter and motor protection devices for each compressor and the fan(s)
  - Control devices
- **Field connections:**
  All connections to the system and the electrical installations must be in full accordance with all applicable local codes.
- The Carrier 30GZ chillers are designed and built to ensure conformance with these codes. The recommendations of European standard EN 60 204-1 (machine safety - electrical machine components - part 1: general regulations) are specifically taken into account, when designing the electrical equipment.

NOTES:

- Generally the recommendations of IEC 364 are accepted as compliance with the requirements of the installation directives. Conformance with EN 60 204 is the best means of ensuring compliance with the Machines Directive § 1.5.1.
- Annex B of EN 60204-1 describes the electrical characteristics used for the operation of the machines.

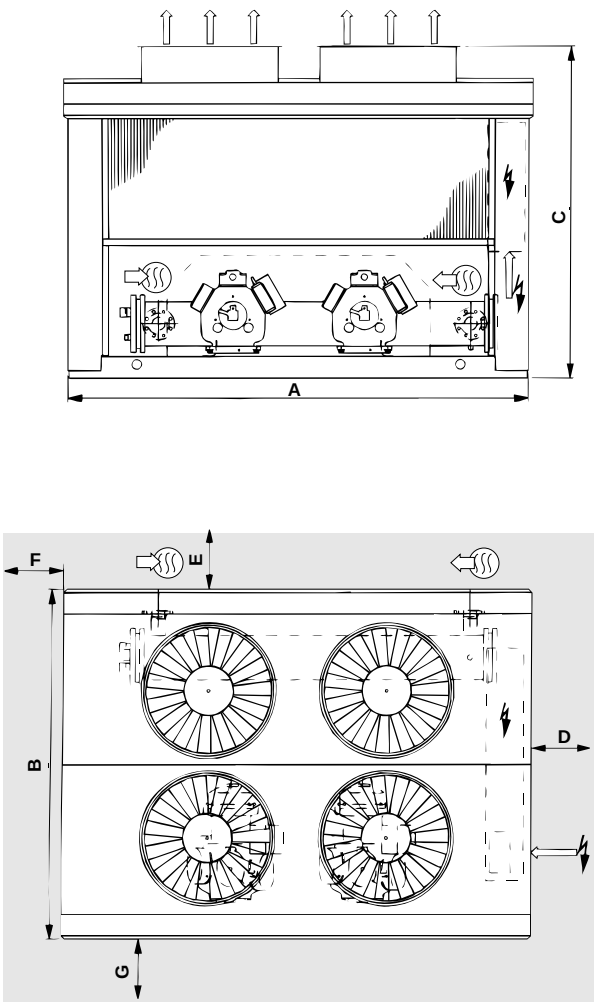
1. The operating environment for the 30GZ chillers is specified below:
   - Environment* - Environment as classified in EN 60 721:
     - outdoor installation*
     - ambient temperature range: -18°C to +46°C, class 4K4H*
     - altitude: ≤ 2000 m
     - presence of hard solids, class 4S2 (no significant dust present)
     - presence of corrosive and polluting substances, class 4C2 (negligible)
     - vibration and shock, class 4M2
   - Competence of personnel, class BA4* (trained personnel - IEC 364)
2. Power supply frequency variation: ± 2 Hz.
3. The neutral (N) line must not be connected directly to the unit (if necessary use a transformer).
4. Overcurrent protection of the power supply conductors is not provided with the unit.
5. The optional factory-installed circuit breaker is of type "a" (EN 60 204-1 § 5.3.2).

NOTE:
If particular aspects of an actual installation do not conform to the conditions described above, or if there are other conditions which should be considered, always contact your local Carrier representative.

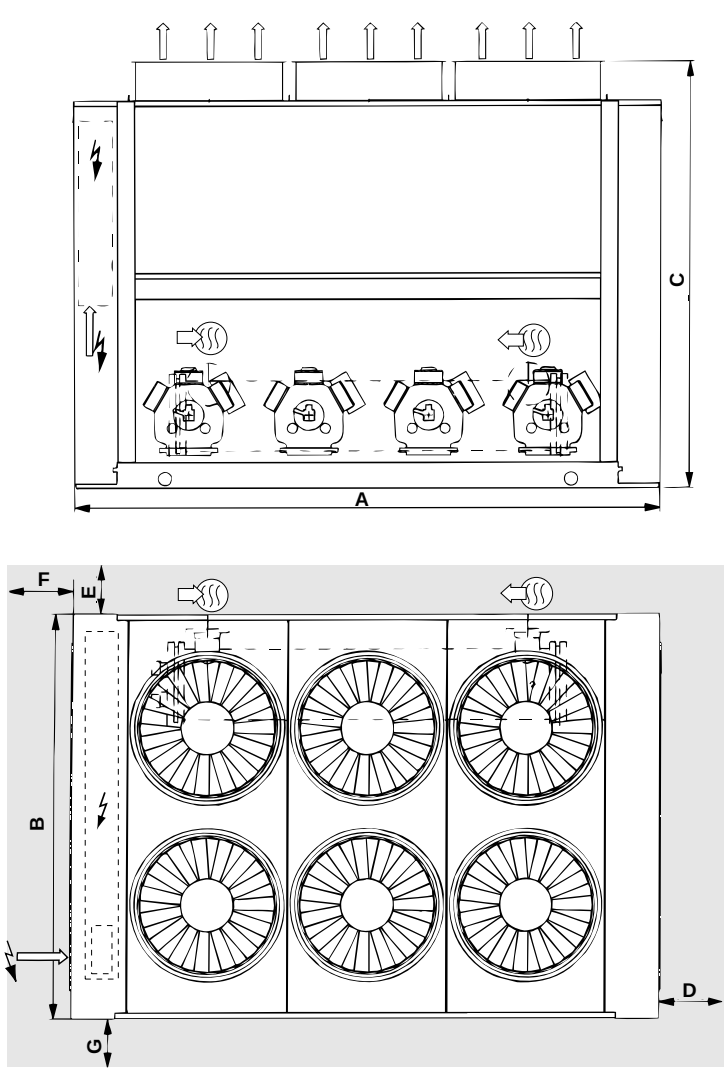
* The required protection level for this class is IP43BW (according to reference document IEC 529). All 30GZ units are protected to IP44CW and fulfill this protection condition.

Dimensions/clearances

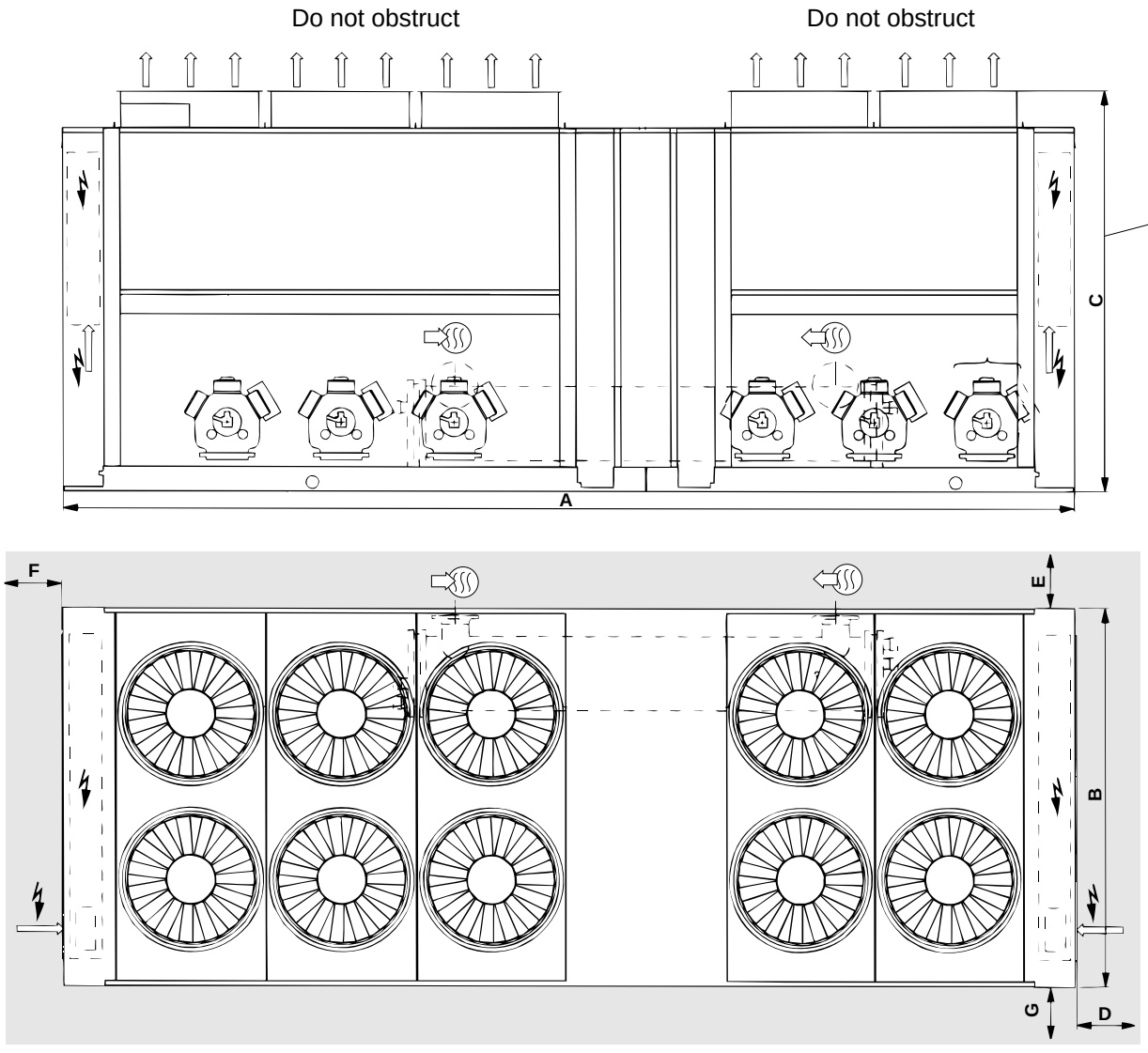
30GZ 040-060



30GZ 085-145



30GZ 150-245



ATTENTION: 30GZ 170-245 units have two power connection points.

30GZ	A	B	C	D	E	F	G
040-045	2450	1870	1912	2500	1200	500	1200
050-060	2900	2156	2060	2500	1200	500	1200
085-100	3404	2328	2471	1600	1800	1600	1800
120-145	4322	2328	2471	1600	1800	1600	1800
150-170	6229	2328	2471	1600	1800	1600	1800
190-220	7147	2328	2471	1600	1800	1600	1800
245	8983	2328	2471	1600	1800	1600	1800

Legend:

All dimensions are given in mm.

Required clearances for operation and maintenance

Power supply

Water inlet

Water outlet

NOTE:
Certified dimensional drawings are available on request.

Cooling capacities

30GZ	LCWT °C	Condenser entering air temperature °C																						
		25				30				35				40				45				Max. entering air temperature, °C*				
		CAP kW	COMP kW	UNIT kW	COOL kPa	CAP kW	COMP kW	UNIT kW	COOL kPa	CAP kW	COMP kW	UNIT kW	COOL kPa	CAP kW	COMP kW	UNIT kW	COOL kPa	CAP kW	COMP kW	UNIT kW	COOL kPa	CAP kW	COMP kW	UNIT kW	COOL kPa	Max. temp.
040	5	109	29.2	32.5	17	102	30.8	34.1	15	95	32.5	35.7	13	87	34.1	37.3	11	80	35.8	38.9	9	73	37.5	40.5	8	50
045		129	42.5	46.1	20	120	44.1	47.5	18	111	45.6	49	15	102	47.2	50	13	92	48.7	52	11	91	49	52	11	46
050		164	45.4	51	21	152	47.8	54	18	140	50	56	16	128	53	58	13	116	55	61	11	107	57	62	9	49
060		193	61	67	30	181	64	70	26	169	67	73	23	157	70	76	20	145	73	79	17	138	75	81	15	48
085		255	75	84	21	239	79	88	19	223	83	92	16	208	87	96	14	192	92	100	12	173	96	105	10	51
095		299	92	101	30	282	97	106	26	264	102	111	23	247	108	117	21	229	113	122	18	219	116	125	16	48
100		346	111	120	21	323	116	125	19	299	121	130	16	275	125	134	14	252	130	139	11	233	134	143	10	49
120		399	125	137	29	374	131	143	26	350	138	149	23	325	144	155	20	301	151	162	17	286	154	165	15	48
130		456	143	156	32	427	149	162	28	398	156	168	24	369	163	175	21	****	****	****	****	345	168	180	18	44
145		467	149	161	23	435	155	167	20	402	160	172	17	370	166	178	15	337	172	183	12	312	177	188	11	49
150		499	158	175	39	466	166	182	34	433	174	190	29	400	182	197	25	366	190	205	21	353	193	208	19	47
160		518	159	175	29	485	166	182	26	452	173	189	22	419	180	195	19	385	187	202	16	365	191	206	15	48
170		568	173	190	34	530	181	197	30	493	189	205	26	455	197	212	22	417	205	220	19	409	206	221	18	46
190		653	204	225	45	611	214	234	40	568	224	243	35	526	233	252	30	483	243	261	25	449	251	268	22	49
220		723	245	267	55	676	253	275	48	629	261	282	42	582	269	289	36	535	278	296	31	506	283	301	27	48
245		800	253	283	68	751	266	295	60	702	279	306	52	653	292	318	45	604	305	330	39	555	318	342	33	50
040	6	113	29.6	33	18	106	31.3	34.6	16	98	33.1	36.3	14	91	34.8	38	12	83	36.5	39.7	10	77	37.9	41	9	49
045		134	43.4	47	22	124	45	48.5	19	115	46.6	50	16	105	48.3	52	14	96	49.9	53	12	96	49.9	53	12	45
050		170	46.3	52	23	157	48.7	55	20	145	51	57	17	133	54	59	14	121	56	62	12	111	58	64	10	49
060		200	62	68	32	187	65	71	28	175	68	74	25	163	72	78	21	151	75	81	18	146	76	82	17	47
085		264	77	86	22	248	81	90	20	232	85	94	17	215	89	98	15	199	94	102	13	183	98	106	11	50
095		310	93	103	32	292	99	108	28	274	104	114	25	256	110	119	22	238	115	124	19	231	118	126	18	47
100		359	113	123	23	334	118	128	20	310	123	132	17	285	128	137	15	261	133	142	12	246	136	145	11	48
120		413	128	140	32	388	134	146	28	362	141	152	24	337	147	158	21	312	154	165	18	296	158	169	17	48
130		472	145	159	35	442	152	165	30	411	159	172	26	381	166	178	22	****	****	****	****	357	172	184	20	44
145		482	152	164	25	449	158	170	21	416	164	175	18	382	170	181	16	349	176	187	13	329	179	190	12	48
150		516	161	178	42	482	170	186	36	448	178	194	31	413	186	201	27	379	194	209	22	365	198	212	21	47
160		535	163	179	31	501	170	186	27	466	177	192	24	432	184	199	20	397	191	206	17	384	194	208	16	47
170		586	176	193	37	548	184	201	32	509	192	208	28	470	200	216	24	431	208	223	20	423	210	225	19	46
190		676	208	229	48	632	218	238	42	588	228	248	37	545	238	257	32	501	248	266	27	474	254	272	24	48
220		747	251	274	59	699	259	281	52	650	267	288	45	601	276	296	38	553	284	303	33	523	289	308	29	48
245		827	827	827	72	776	272	301	64	726	285	313	56	676	299	325	48	625	312	337	42	574	325	350	35	50
040	7	118	30.1	33.4	19	110	31.9	35.2	17	102	33.7	36.9	15	94	35.4	38.6	13	86	37.2	40.4	11	80	38.7	41.8	9	49
045		139	44.2	47.9	23	129	45.9	49.5	20	119	47.6	51	18	109	49.4	53	15	99	51	54	12	99	51	54	12	45
050		176	47.1	53	24	163	49.7	56	21	150	52	58	18	138	55	60	15	125	57	63	13	118	59	64	11	48
060		206	63	69	34	194	66	73	30	181	70	76	26	169	73	79	23	156	77	83	20	151	78	84	18	47
085		273	78	87	24	256	82	91	21	240	87	96	19	223	91	100	16	207	95	104	14	190	100	108	12	50
095		320	95	105	34	302	101	110	30	284	107	116	27	265	112	121	24	246	118	127	20	239	120	129	19	47
100		371	116	125	24	346	121	130	21	321	126	135	18	295	131	140	16	270	136	145	13	255	140	148	12	48
120		427	130	142	34	401	137	149	30	375	143	155	26	349	150	162	23	323	157	168	20	312	159	171	18	47
130		487	148	162	37	456	156	169	32	425	163	175	28	394	170	182	24	****	****	****	****	368	176	187	21	44
145		497	155	167	26	463	161	173	23	429	167	179	20	395	173	185	17	360	179	190	14	340	183	194	12	48
150		534	164	182	45	498	173	190	39	463	181	198	33	427	190	206	28	392	199	214	24	377	202	217	22	47
160		553	166	182	33	517	173	189	29	481	180	196	25	445	187	203	22	410	195	209	18	395	197	212	17	47
170		605	179	197	39	565	187	204	34	525	195	211	30	485	203	219	25	445	211	227	21	437	213	228	21	46
190		698	212	233	52	653	222	243	45	608	233	252	39	563	243	262	34	518	254	272	29	491	260	278	26	48
220		770	257	281	62	721	265	288	55	671	274	295	48	621	282	302	41	571	290	310	35	551	294	313	32	47
245		853	264	295	77	801	277	307	68	750	291	320	59	698	305	332	52	645	319	344	44	604	330	355	39	49
040	8	122	30.5	33.9	21	114	32.4	35.7	18	105	34.2	37.5	16	97	36.1	39.3	14	89	38	41.1	12	84	39.1	42.2	10	48
045		143	45.1	48.8	25	133	46.9	50	22	123	48.7	52	19	113	50	54	16	****	****	****	****	105	52	55	14	44
050		181	48	54	26	169	51	57	22	156	53	59	19	143	56	62	16	130	58	64	13	122	60	66	12	48
060		213	64	71	36	200	68	74	32	188	71	77	28	175	75	81	24	162	78	84	21	159	79	85	20	46
085		282	80	89	26	265	84	93	23	248	88	97	20	231	93	102	17	214	97	106	15	200	101	109	13	49
095		331	97	107	36	312	103	112	32	293	109	118	29	274	114	124	25	255	120	129	22	251	121	130	21	46
100		384	118	128	26	358	123	133	23	332	129	138	20	305	134	143	17	279	139	148	14	269	142	150	13	47
120		441	132	145	36	414	139	152	32	387	146	158	28	360	153	165	24	333	160	171	21	328	161	172	20	46
130		503	151	165	40	470	159	172	34	438	166	179	30	406	173	186	25	****	****	****	****	380	179	191	22	44
145		512	158	170	28	477	164	176	24	442	170	182	21	407	176	188	18	372	183	194	15	357	185	196	14	47
150		551	168	185	48	515	176	193	42	478	185	201	36	441	194	210	30	404	203	218	25	397	204	220	24	46
160		570	169	186	35	533	176	193	31	496	184	199	27	459	191	206	23	422	198	213	20	407	201	216	18	47
170		624	182	200	41	582	190	207	36	541	198	215	31	500	207	222	27	458	215	230	23	450	216	232	22	46
190		720	215	238	55	674	226	247	48	628	237	257	42	582	248	267	36	535	259	278	31	517	264	282	29	47
220		794	263	287	66	743	271	294	58	691	280	301	51	640	288	309	43	588	297	316	37	568	300	319	34	47
245		880	269	301	82	826	283	314	72	773	297	326	63	720	311	339	55	666	325	352	47	634	334	359	43	48
040	10	130	31.4	34.9	23	121	33.4	36.8	20	113	35.4	38.7	18	104	37.4	40.7	15	96	39.4	42.6	13	92	40.2	43.4	12	47
045		153	46.8	51	28	142	48.7	52	24	131	51	54	21	120	53	56	18	****	****	****	****	114	54	57	16	43
050		193	49.7	56	29	180	52	59	25	166	55	61	22	153	58	64	18	139	61	66	15	134	62	67	14	47
060		227	66	73	41	213	70	77	36	200	74	80	32	186	78	84	28	173	82	88	24	173	82	88	24	45
085		300	82	92	29	283	87	96	26	265	92	101	23	247	97	105	20	229	101	110	17	218	104	113	16	48
095		353	100	111	41	332	107	116	37	312	113	122	32	292	119	128	28	272	125	134	25	272	125	134	25	45
100		409	122	133	29	381	128	138	26	353	134	143	22	326	140	149	19	298	146	154	16	292	147	156	15	46
120		469	137	150	40	441	144	157	36	412	152	164	31	384	159	171	27	355	166	178	24	355	166	178	24	45
130		533	157	172	45	499	165	179	39	465	173	186	34	431	181	193	29	****	****	****	****	403	187	199	25	44
145		543	163	177	31	506	170	183	27	469	176	189	23	431	183	195	20	394	189	201	17	394	189	201	17	45
150		586	174	193	54	547	183	201	47	508	192	209	41	469	202	218	34	430	211	227	29	422	213	228	28	46
160		604	176	193	39	565	183	200	35	525	191	207	30	486	198	214	26	446	206	221	22	438	207	222	21	46
170		661	187	206	46	617	196	214	41	574	204	222	35	530	213	229	30	486	222	237	25	486	222	237	25	45
190		765	223	246	62	716	234	257	54	668	246	267	47	619	258	278	41	570	270	289	35	560	272	291	34	46
220		841	274	301	74	787	283	308	65	733	292	315	57	679	301	322	49	624	310	330	41	624	310	330	41	45
245		932	279	314	92	876	294	327	81	820	309	339	71	764	324	353	62	707	339	366	53	684	345	371	50	47

Legend:

LCWT	Leaving chilled water temperature °C
CAP kW	Net cooling capacity (gross cooling capacity minus the water pump heat against the internal evaporator pressure drop)
COMP kW	Compressor power input
UNIT kW	Effective unit power input (power input of the compressors, control circuit and fans plus the power input of the pump against the internal evaporator pressure drop)
COOL kPa	Evaporator water pressure drop
	Capacity at Eurovent conditions

* Max. operating temperature: for temperatures above 46°C contact Carrier.

Application data:
Refrigerant: R-407C
Evaporator temperature rise: 5 K
Evaporator fluid: Fresh water
Fouling factor: 0.44 x 10^{-4} (m^2K)/W

Full load correction factors for Eurovent laboratory test:

Net cooling capacity	1.000
Energy efficiency ratio	1.000
Evaporator pressure drop	1.000

Note: Evaporator water flow rate$_{(l/s)}$= CAP$_{(kW)}$x 860 / [5$_{(°C)}$x 3600]

The published performances are Eurovent certified in accordance with document 6C/003.

Operating limits

Minimum cooler flow rates

30GZ	Minimum flow, l/s
040-045	3.6
050-060	4.0
085-095	6.0
100-120	8.5
130	9.8
145	12.1
150	9.8
160-245	12.1

Minimum chilled water loop flow rate

Whatever the size of the system, the water loop minimum volume is given by the following formula:
Volume = $CAP_{[kW]}$ x N = litres
where CAP is the nominal system capacity (kW) at the nominal operating conditions of the installation.

Application	N
Air conditioning	3.25
Industrial process cooling	6.50
Low ambient temperature	6.50

This volume is necessary for stable operation and accurate control. It is often necessary to add a buffer water reservoir to the circuit in order to achieve the required volume.

Technical description

Air-cooled packaged liquid chillers for outdoor installation, equipped with numerical control and electronic expansion valves (30GZ 085-245) and operating with chlorine-free refrigerant HFC-407C.

Quality assurance

Designed and manufactured in a factory, accredited to Quality Assurance Standard ISO 9001. Performances in accordance with EUROVENT recommendations.

Chassis and casing

Galvanized steel, with polyester-powder paint finish, baked-in electrostatically before assembly, colour light grey (RAL 7035).

Compressors

- 30GZ 040-245: Semi-hermetic reciprocating Carrier compressors with anti-friction treatment specially designed for operation with HFC-407C, lubricated by POE oil, using a reversible oil pump.
- Crankcase heater includes a protection device that stops the compressor in case of a fault. 4-pole electric motor with two windings (part-winding for 30GZ 040-060), cooled by suction gas and protected by the following safety devices against abnormal operating conditions: thermo-magnetic circuit breaker (breaking capacity 22 kA), ground current detector to avoid acid formation (multi-compressor circuit).
- The compressors are mounted on rubber anti-vibration dampers and equipped with a discharge muffler and suction (optional on 30GZ 085-245) and discharge service valves.

Condensers

Aluminium fins mechanically bonded to seamless copper tubes, with built-in subcoolers. Ultra low-noise axial Carrier Flying Bird fan(s) with 15 blades and rotating shroud, made of recyclable composite material. 8-pole, 3-phase motor(s) to IP55, protected by built-in circuit breaker.

Evaporator

Multi-tube evaporator with two refrigerant circuits, internally finned copper tubes, expanded into tube sheets with internal polypropylene baffles. Water connections threaded (MPT) or with standard flat flange. Freeze-up protection down to an outside temperature of -20°C using 19 mm closed-cell polyurethane foam and trace heater.

Refrigerant circuits

Each circuit includes: one or more compressors, filter drier, combined moisture indicator and sightglass, liquid line shut-off/drain valve, thermostatic expansion valve or Carrier electronic expansion valve (EXV) (30GZ 085-245), controlled by a stepper motor (1500 steps) for improved refrigerant flow control and pump-down, dual-safety high pressure switch.

Control box, power and control wiring

Galvanized sheet steel, polyester paint finish, with hinged access doors and removable sun protection shield. Control box contains: circuit breakers and compressor and fan contactors, control circuit transformer, 3-phase power supply terminals (30GZ 170-245 units have a power supply terminal at each end), and separate 230 V power supply for heater circuits. Control circuit cables and electrical components are numbered.

Numeric PRO-DIALOG Plus control accessible without opening the control box, offers:

- PID control of leaving water temperature with return temperature compensation for control of compressors, fans and electronic expansion valves (30GZ 085-245).
- Protection against abnormal operating conditions, compressor faults, high or low refrigerant pressure, low suction temperature, evaporator freeze-up, pump-down when the circuit shuts down, etc.
- Communications
  Digital display of parameters: suction and discharge pressures and temperatures, evaporator entering/leaving water temperatures, number of compressors running, compressor operating hours, history of recorded faults, etc.
  Remote location of controls: start/stop, dual setpoint, setpoint reset, demand limit control, general fault reporting by circuit.
- Series RS485 port for connection to a building monitoring system.

Delivery

All chillers are factory-tested before shipping. Standard packing: wooden skid.

The cover photo is solely for illustration purposes, and is not contractually binding.
The photo shows a unit with optional compressor sound enclosure.

Order No. 13190-20, August 1997. Supersedes order No. June 1997.
Manufacturer reserves the right to change any product specifications without notice.

Manufactured by Carrier SA, Montluel, France.
Printed on Totally Chlorine Free Paper.
Printed in the Netherlands.

Appendix 4.4.1g Catalogue for IDS

菱和
ryowo™





RYOWO COOLING TOWER

FWS SERIES

Low Noise Cross Flow Type



CTI CERTIFIED

bsi. ANAB ACCREDITED

ISO 9001 : 2008 FM 601004






The ryowo™ Group is the pioneer and manufacturer of fiberglass-reinforced polyester (FRP) cooling towers in Hong Kong.

We offer a full range of product lines in FRP, stainless steel and galvanized steel water-cooling towers. With our vital production station, Dongguan RYOWO Cooling Tower Company Limited, we manufacture, market and service a full range of water-cooling towers. Over 90% of the cooling tower parts are from our own factory and, as a result, control of cost and quality are ensured.

RYOWO has been a member of the Cooling Technology Institute since 1982. With our own R&D department and testing facilities, we have six lines of product which are CTI-201 certified.

In 2004, our R & D department successfully developed a CTI STD-20l rated product line, the FWS series, the highest standard of water-cooling towers with guaranteed cooling capacity. In order to expand the application of our cooling towers, we developed the integrated drift eliminator, and used the super low noise fan as an option in this series.

FWS

Low Noise Cross Flow Type



CTI CERTIFIED

MANUFACTURER'S PUBLISHED THERMAL PERFORMANCE IS CERTIFIED BY THE COOLING TOWER INSTITUTE UNDER THE PROVISIONS OF STD-201(11)

CERTIFICATION VALIDATION NUMBER

C27A-04R05

THE COOLING TOWER YOU CAN RELY ON

MODEL DESIGNATION

STD 201 Certified Line

FWS-300-15-AS /L

Model Nos

/E is for integrated drift eliminator
/AE is for additional drift eliminator
/L is for additional louver installed in front of air inlet face
/SLF is for super low noise fan

GI for FRP Casing & Basin, HDG Structure
SS for FRP Casing & Basin, SS Structure
AG for HDG Casing, Basin & Structure
AS for SS Casing, Basin, SS Structure

There are a total of 71 models for the FWS series with 15 different configurations to meet various requirements and provide a high degree of flexibility.



Factory assembled





Most FWS cooling towers can be factory assembled and delivered to site.



High flexible



All FWS models can be fitted with RYOWO special integrated drift eliminators to achieve drift loss less than 0.001% and equipped with OSHA handrail and caged ladder to comply with requirement.



Complied with OSHA requirement





Accessible



Super low noise fan to reduce the sound power level, maintaining the same thermal performance.





FRP / HDG / SS MATERIAL ARE AVAILABLE

All Hot dip galvanized





All Stainless steel

FRP Casing + SS Basin

The standard FWS cooling towers are made of FRP casing & basin with hot dip galvanized structure. Optional stainless steel casing & basin and structure can also be provided upon request.



ryowo™

3 SPECIFICATION

Model	Nominal Water Flow M^3/hr	Dimension L mm	W mm	h mm	H mm	Fan Power kW	Fan Dia mm	Piping In mm	Out mm	Fv mm	Of mm	Dr mm	Sound Power Level	Weight Dry kgs	Wet kgs
FWS-94-3.7	94	4000	2000	4125	4625	3.7	1600	100x2	150	25	50	50	88	1335	2300
FWS-94-5.5	107				4705	5.5							91	1385	2350
FWS-94-7.5	119				4745	7.5							93	1400	2365
FWS-127-5.5	127	4400	2300	4125	4705	5.5	1800	100x2	150	25	50	50	90	1570	3000
FWS-127-7.5	141				4745	7.5							92	1585	3015
FWS-127-11	160				4825	11							94	1650	3080
FWS-169-7.5	169	4400	2600	4125	4745	7.5	2000	125x2	200	25	50	50	92	1690	3700
FWS-169-11	192				4825	11							94	1760	3770
FWS-169-15	213				4870	15							95	1770	3780
FWS-200-7.5	190	4600	2600	4145	4785	7.5	2400	125x2	200	40	80	50	91	2195	4000
FWS-200-11	215				4865	11							93	2250	4055
FWS-200-15	235				4910	15							95	2255	4060
FWS-250-7.5	210	4800	3200	4345	4985	7.5	2400	125x2	200	40	80	50	90	2890	5000
FWS-250-11	240				5065	11							93	2945	5055
FWS-250-15	265				5110	15							94	2950	5060
FWS-275-7.5	225	5200	3200	4145	4785	7.5	2900	150x2	200	40	80	50	89	3050	5160
FWS-275-11	255				4865	11							92	3105	5215
FWS-275-15	285				5910	15							94	3110	5220
FWS-300-7.5	235	6000	3200	4345	4895	7.5	2400	150x2	200	40	80	50	89	3310	6500
FWS-300-11	270				5065	11							91	3365	6555
FWS-300-15	300				5110	15							93	3370	6560
FWS-300-18.5	320				5175	18.5							94	3410	6600
FWS-300-22	340				5215	22							95	3470	6660
FWS-330-7.5	260	6300	3200	4145	4785	7.5	2900	150x2	250	50	80	50	88	3405	6595
FWS-330-11	300				4865	11							91	3460	6650
FWS-330-15	330				4910	15							93	3465	6655
FWS-330-18.5	350				5175	18.5							94	3505	6695
FWS-330-22	375				5215	22							95	3565	6755
FWS-350-7.5	275	5400	3600	5425	6065	7.5	3000	150x2	250	50	80	50	89	3580	6770
FWS-350-11	315				6145	11							91	3635	6825
FWS-350-15	350				6190	15							93	3640	6830
FWS-350-18.5	375				6255	18.5							94	3680	6870
FWS-350-22	400				6295	22							95	3740	6930
FWS-400-7.5	285	6600	3600	4345	4985	7.5	3000	125x4	250	50	80	50	87	3630	7000
FWS-400-11	325				5065	11							89	3685	7055
FWS-400-15	360				5110	15							91	3690	7060
FWS-400-18.5	385				5135	18.5							92	3730	7100
FWS-400-22	410				5195	22							93	3790	7160
FWS-400-30	450				5255	30							94	3820	7185
FWS-500-7.5	305	6000	4200	5355	5990	7.5	3400	125x4	250	50	80	50	87	4230	8000
FWS-500-11	345				6070	11							90	4285	8055
FWS-500-15	385				6115	15							91	4290	8060
FWS-500-18.5	410				6180	18.5							93	4325	8100
FWS-500-22	435				6220	22							94	4390	8120
FWS-500-30	485				6280	30							95	4415	8145
FWS-550-7.5	315	6600	3600	5355	5990	7.5	3000	125x4	250	50	80	50	87	4350	8080
FWS-550-11	360				6070	11							89	4405	8135
FWS-550-15	400				6115	15							91	4410	8140
FWS-550-18.5	430				6180	18.5							92	4450	8180
FWS-550-22	455				6220	22							94	4510	8240
FWS-550-30	500				6280	30							95	4535	8275
FWS-600-11	435	7000	4200	5500	6255	11	3700	150x4	300	50	80	50	89	5015	9000
FWS-600-15	485				6300	15							91	5020	9005
FWS-600-18.5	520				6365	18.5							92	5060	9045
FWS-600-22	550				6405	22							94	5120	9085
FWS-600-30	610				6465	30							95	5140	9110
FWS-600-37	650				6485	37							96	5330	9300
FWS-700-11	515	7000	5000	5500	6255	11	3700	150x4	300	50	80	50	89	5650	12000
FWS-700-15	570				6300	15							91	5655	12005
FWS-700-18.5	610				6365	18.5							92	5690	12055
FWS-700-22	645				6405	22							93	5755	12120
FWS-700-30	720				6465	30							95	5780	12145
FWS-700-37	765				6485	37							96	5970	12335
FWS-800-11	555	7500	5000	6400	7155	11	4200	150x4	300	50	80	50	88	6905	14880
FWS-800-15	615				7200	15							90	6910	14885
FWS-800-18.5	655				7265	18.5							91	6945	14920
FWS-800-22	695				7305	22							93	7010	14985
FWS-800-30	760				7365	30							95	7035	15010
FWS-800-37	820				7385	37	4200	150x4	350	50	80	50	98	7225	15200
FWS-800-45	880				7405	45							99	7255	15230
FWS-800-55	940				7495	55							100	7365	15340

Notes:

1/CTI Certification applies to the operation with the Wet Bulb Temp. between 12.8℃ and 32.2℃, Max. Entering Water Temp. 51.7℃, Min. Range of 2.2℃ and Min. Approach of 2.8℃.

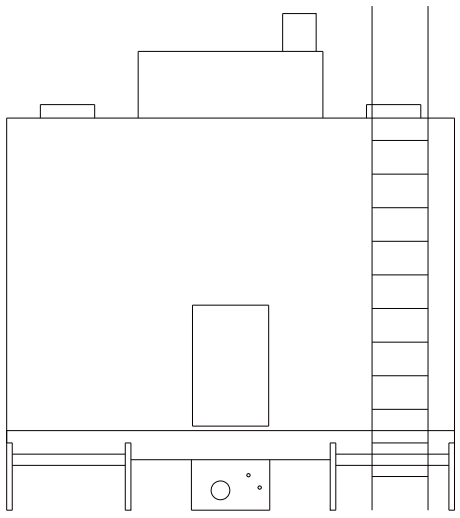
2/The nominal water flows are based upon 37℃ HWT, 32℃ CWT, 28℃ WBT, 32℃ DBT and 101.3 kPa Barometric pressure.

3/Sound Power Level is in dBA re 10^{-12} Watt.

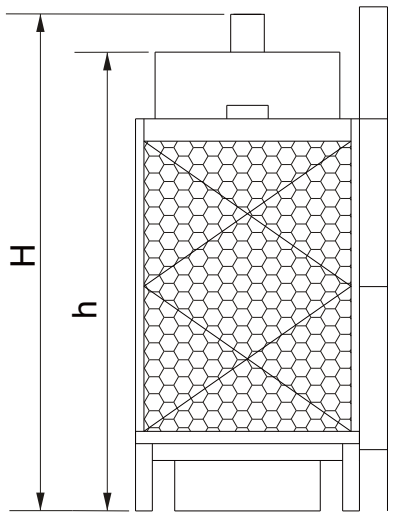
4/Data and specifications are subjected to change without prior notice.

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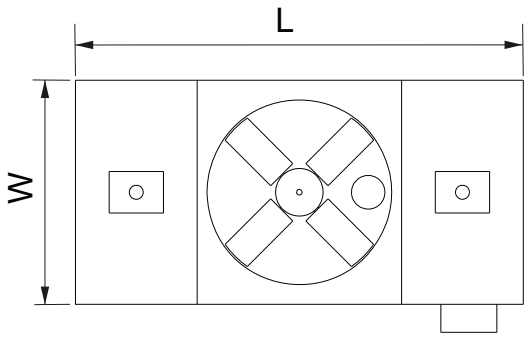
TOWER SCHEMATIC



Casing Panel

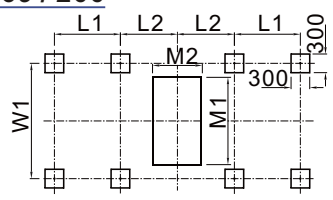


Air Intake

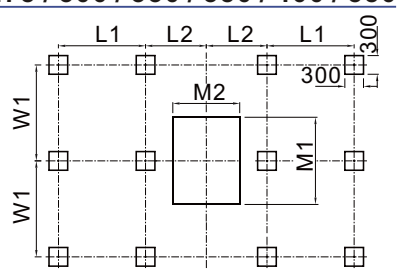


Top view

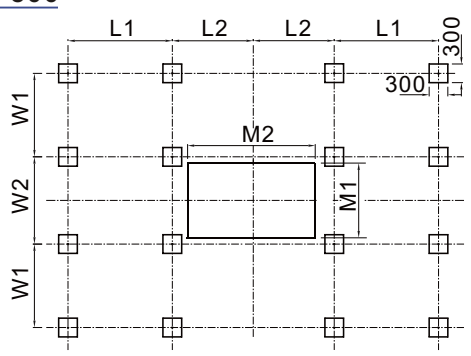
FWS 94 / 127 / 169 / 200



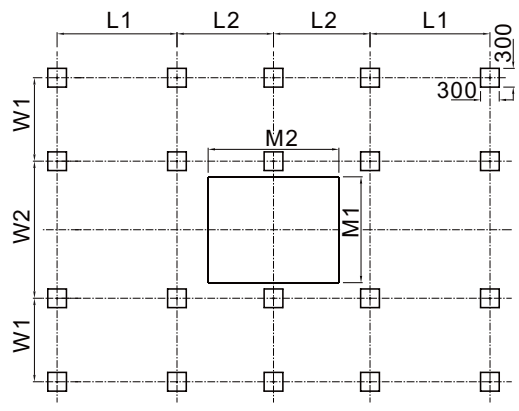
FWS 250 / 275 / 300 / 330 / 350 / 400 / 550



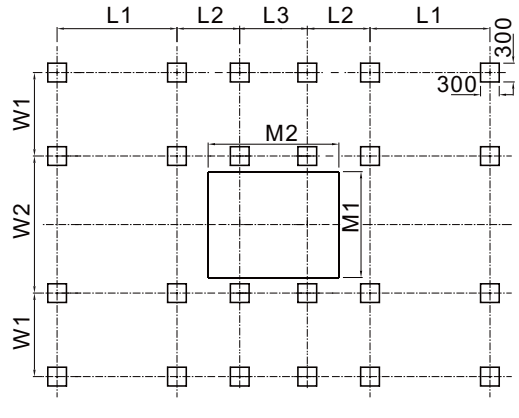
FWS 500



FWS 600 / 700



FWS 800



Model	L1	L2	L3	W1	W2	M1	M2
FWS 94 3 7	1060	915		1850		1400	800
FWS 94 5 5	1060	915		1850		1400	800
FWS 94 7 5	1060	915		1850		1400	800
FWS 127 5 5	1060	1115		2150		1400	800
FWS 127 7 5	1060	1115		2150		1400	800
FWS 127 11	1060	1115		2150		1400	800
FWS 169 7 5	1060	1115		2450		1400	800
FWS 169 11	1060	1115		2450		1400	800
FWS 169 15	1060	1115		2450		1400	800
FWS 200 7 5	1400	875		2450		1400	1100
FWS 200 11	1400	875		2450		1400	1100
FWS 200 15	1400	875		2450		1400	1100
FWS 250 7 5	1400	975		1540		1400	1100
FWS 250 11	1400	975		1540		1400	1100
FWS 250 15	1400	975		1540		1400	1100
FWS 275 7 5	1400	1175		1540		1400	1100
FWS 275 11	1400	1175		1540		1400	1100
FWS 275 15	1400	1175		1540		1400	1100
FWS 300 7 5	1848	1127		1540		1400	1100
FWS 300 11	1848	1127		1540		1400	1100
FWS 300 15	1848	1127		1540		1400	1100
FWS 300 18 5	1848	1127		1540		1400	1100
FWS 300 22	1848	1127		1540		1400	1100
FWS 330 7 5	1848	1277		1540		1400	1100
FWS 330 11	1848	1277		1540		1400	1100
FWS 330 15	1848	1277		1540		1400	1100
FWS 330 18 5	1848	1277		1540		1400	1100
FWS 330 22	1848	1277		1540		1400	1100
FWS 350 7 5	1675	1000		1740		2100	1200
FWS 350 11	1675	1000		1740		2100	1200
FWS 350 15	1675	1000		1740		2100	1200
FWS 350 18 5	1675	1000		1740		2100	1200
FWS 350 22	1675	1000		1740		2100	1200
FWS 400 7 5	1925	1350		1740		1400	1100
FWS 400 11	1925	1350		1740		1400	1100
FWS 400 15	1925	1350		1740		1400	1100
FWS 400 18 5	1925	1350		1740		1400	1100
FWS 400 22	1925	1350		1740		1400	1100
FWS 400 30	1925	1350		1740		1400	1100
FWS 500 7 5	1675	1300		1340	1400	1300	2100
FWS 500 11	1675	1300		1340	1400	1300	2100
FWS 500 15	1675	1300		1340	1400	1300	2100
FWS 500 18 5	1675	1300		1340	1400	1300	2100
FWS 500 22	1675	1300		1340	1400	1300	2100
FWS 500 30	1675	1300		1340	1400	1300	2100
FWS 550 7 5	1925	1350		1740		2100	1300
FWS 550 11	1925	1350		1740		2100	1300
FWS 550 15	1925	1350		1740		2100	1300
FWS 550 18 5	1925	1350		1740		2100	1300
FWS 550 22	1925	1350		1740		2100	1300
FWS 550 30	1925	1350		1740		2100	1300
FWS 600 11	1925	1550		1340	1400	1300	2100
FWS 600 15	1925	1550		1340	1400	1300	2100
FWS 600 18 5	1925	1550		1340	1400	1300	2100
FWS 600 22	1925	1550		1340	1400	1300	2100
FWS 600 30	1925	1550		1340	1400	1300	2100
FWS 600 37	1925	1550		1340	1400	1300	2100
FWS 700 11	1925	1550		1340	2200	1300	2100
FWS 700 15	1925	1550		1340	2200	1300	2100
FWS 700 18 5	1925	1550		1340	2200	1300	2100
FWS 700 22	1925	1550		1340	2200	1300	2100
FWS 700 30	1925	1550		1340	2200	1300	2100
FWS 700 37	1925	1550		1340	2200	1300	2100
FWS 800 11	2050	1090	1170	1340	2200	1300	2100
FWS 800 15	2050	1090	1170	1340	2200	1300	2100
FWS 800 18 5	2050	1090	1170	1340	2200	1300	2100
FWS 800 22	2050	1090	1170	1340	2200	1300	2100
FWS 800 30	2050	1090	1170	1340	2200	1300	2100
FWS 800 37	2050	1090	1170	1340	2200	1300	2100
FWS 800 45	2050	1090	1170	1340	2200	1300	2100
FWS 800 55	2050	1090	1170	1340	2200	1300	2100

Notes:

1/The footing dimensions are for preliminary layout only. For detail footing drawing, please consult RYOWO engineers.

2/Dimensions are in mm.

5 MODEL SELECTION

Model	Temp.	Water flow rate at indicated HWT, CWT & WBT (M^3/HR)											
	HWT °C	33	33	37	33	32	37	35	34	33	37	36	35
	CWT °C	28	27	32	28	27	32	30	29	28	32	31	30
	WBT °C	23	23	24	24	24	25	25	25	25	26	26	26
FWS-94-3.7		88	66	142	77	62	131	97	81	65	119	101	85
FWS-94-5.5		100	75	161	88	71	149	110	92	74	135	115	96
FWS-94-7.5		111	84	179	97	79	165	122	102	82	150	128	107
FWS-127-5.5		119	89	192	104	84	177	131	109	88	161	137	114
FWS-127-7.5		132	99	213	115	93	196	145	121	98	178	152	127
FWS-127-11		150	112	242	131	106	223	164	137	111	202	173	144
FWS-169-7.5		158	119	254	138	112	234	174	145	117	213	182	152
FWS-169-11		179	135	288	157	127	266	197	165	133	242	207	173
FWS-169-15		199	150	320	174	141	295	219	183	148	268	229	192
FWS-200-7.5		176	129	295	152	121	270	195	160	127	244	206	169
FWS-200-11		199	146	334	172	136	306	221	182	144	276	233	191
FWS-200-15		218	160	365	188	149	334	242	198	157	302	255	209
FWS-250-7.5		194	143	325	169	134	298	216	178	141	269	227	187
FWS-250-11		222	163	371	193	153	340	246	203	161	308	260	214
FWS-250-15		245	180	410	213	169	376	272	224	178	340	287	236
FWS-275-7.5		208	153	348	181	143	319	231	190	151	288	243	200
FWS-275-11		236	174	394	205	162	361	262	216	171	327	276	227
FWS-275-15		264	194	441	229	181	404	293	241	191	365	308	254
FWS-300-7.5		217	162	357	189	151	328	240	199	159	298	253	210
FWS-300-11		250	186	410	217	174	377	276	229	183	343	291	241
FWS-300-15		277	206	456	242	193	419	307	254	204	381	323	268
FWS-300-18.5		291	217	478	254	203	440	322	267	214	400	339	281
FWS-300-22		305	227	501	266	213	461	338	280	224	419	355	295
FWS-330-7.5		240	179	395	209	168	363	266	220	176	330	280	232
FWS-330-11		277	206	456	242	193	419	307	254	204	381	323	268
FWS-330-15		305	227	501	266	213	461	338	280	224	419	355	295
FWS-330-18.5		323	241	532	282	226	489	358	297	237	444	377	312
FWS-330-22		342	254	562	298	238	517	379	314	251	470	399	330
FWS-350-7.5		254	189	419	221	177	386	282	233	186	350	297	245
FWS-350-11		291	216	480	254	202	442	323	267	213	401	340	281
FWS-350-15		324	240	534	282	225	491	358	297	237	445	377	312
FWS-350-18.5		347	257	572	302	241	526	384	318	254	477	404	335
FWS-350-22		370	274	610	322	257	561	410	339	271	509	431	357
FWS-400-7.5		263	196	433	230	184	398	292	242	193	362	307	254
FWS-400-11		300	223	494	262	209	454	333	276	221	413	350	290
FWS-400-15		333	247	547	290	232	503	368	305	244	457	388	321
FWS-400-18.5		356	265	585	310	248	538	394	326	261	489	415	344
FWS-400-22		379	282	623	330	264	573	419	348	278	520	442	366
FWS-400-30		416	309	684	362	290	629	460	382	305	571	485	402
FWS-500-7.5		282	209	465	245	196	428	312	258	206	388	329	272
FWS-500-11		319	237	526	278	222	484	353	292	233	439	372	308
FWS-500-15		356	264	587	310	247	540	394	326	261	490	415	344
FWS-500-18.5		379	281	625	330	263	575	420	347	277	522	442	366
FWS-500-22		402	298	663	350	279	610	445	369	294	553	469	388
FWS-500-30		448	333	740	390	312	680	497	411	328	617	523	433
FWS-550-7.5		291	218	473	254	205	436	322	268	215	397	338	282
FWS-550-11		332	249	541	291	234	498	367	306	246	454	387	322
FWS-550-15		369	277	601	323	260	554	408	340	273	504	430	358
FWS-550-18.5		397	298	646	347	279	595	439	365	294	542	462	384
FWS-550-22		420	315	683	367	295	630	464	387	311	574	489	407
FWS-550-30		461	346	751	404	325	692	510	425	342	631	537	447
FWS-600-11		401	301	653	351	282	602	444	370	297	549	467	389
FWS-600-15		448	336	728	392	315	672	495	412	332	612	521	434
FWS-600-18.5		480	360	781	420	338	720	531	442	355	656	558	465
FWS-600-22		508	381	826	444	357	762	561	467	376	694	591	492
FWS-600-30		563	422	916	493	396	845	623	518	417	769	655	545
FWS-600-37		600	450	976	525	422	900	663	552	444	820	698	581
FWS-700-11		475	356	774	416	334	713	526	437	352	649	553	460
FWS-700-15		526	394	856	460	370	789	582	484	390	719	612	510
FWS-700-18.5		563	422	916	493	396	845	623	518	417	769	655	545
FWS-700-22		595	446	969	521	419	893	658	548	441	813	693	577
FWS-700-30		664	498	1081	581	468	997	735	612	492	908	773	644
FWS-700-37		706	529	1149	618	497	1059	781	650	523	965	822	684
FWS-800-11		512	386	828	449	362	764	566	472	381	697	595	497
FWS-800-15		567	427	917	497	401	847	627	523	422	772	659	550
FWS-800-18.5		604	455	977	530	427	902	667	557	450	823	702	586
FWS-800-22		641	483	1037	562	454	957	708	591	477	873	745	622
FWS-800-30		701	528	1134	615	496	1046	774	646	522	954	815	680
FWS-800-37		756	570	1223	663	535	1129	836	697	563	1030	879	734
FWS-800-45		811	611	1312	712	574	1212	897	748	604	1105	943	787
FWS-800-55		867	653	1402	760	613	1294	958	799	646	1180	1008	841

Notes:

1/CTI Certification applies to the operation with the Wet Bulb Temp. between 12.8℃ and 32.2℃, Max. Entering Water Temp. 51.7℃, Min. Range of 2.2℃ and Min. Approach of 2.8℃.

2/This table is for quick selection only. For more precise selection, please consult RYOWO engineers.

Model	Temp.	Water flow rate at indicated HWT, CWT & WBT (M^3/HR)											
	HWT °C	34	38	37	36	35	39	38	37	36	39	38	37
	CWT °C	29	33	32	31	30	34	33	32	31	34	33	32
	WBT °C	26	27	27	27	27	28	28	28	28	29	29	29
FWS-94-3.7		68	125	106	89	72	131	112	94	75	117	98	79
FWS-94-5.5		78	142	121	101	82	149	127	107	86	133	111	90
FWS-94-7.5		87	158	135	112	91	166	141	119	95	148	124	100
FWS-127-5.5		92	169	144	120	97	177	151	127	102	158	132	107
FWS-127-7.5		102	187	160	133	107	196	168	141	113	176	147	118
FWS-127-11		116	212	181	151	122	223	190	160	128	200	166	134
FWS-169-7.5		123	223	191	160	129	234	200	169	136	210	176	142
FWS-169-11		140	254	217	181	147	266	228	192	154	239	200	162
FWS-169-15		155	282	241	201	163	295	252	213	171	265	222	179
FWS-200-7.5		134	257	217	178	141	271	229	190	149	241	198	157
FWS-200-11		152	291	245	202	160	307	259	215	169	273	225	178
FWS-200-15		166	318	268	221	175	336	283	235	184	298	246	195
FWS-250-7.5		149	284	239	197	157	299	252	210	165	266	219	174
FWS-250-11		170	324	274	225	179	342	289	240	189	304	251	199
FWS-250-15		187	358	302	249	198	377	319	265	208	336	277	220
FWS-275-7.5		159	304	257	211	168	321	271	225	177	285	235	187
FWS-275-11		180	345	291	239	190	363	307	255	201	323	266	212
FWS-275-15		202	385	325	268	213	406	343	285	224	361	298	237
FWS-300-7.5		168	314	267	221	177	331	281	235	187	296	245	197
FWS-300-11		193	361	306	254	203	380	323	270	214	340	282	226
FWS-300-15		214	401	340	282	226	422	358	300	238	378	313	251
FWS-300-18.5		225	421	357	296	237	443	376	315	250	397	329	264
FWS-300-22		236	441	374	310	249	465	394	330	262	416	345	276
FWS-330-7.5		186	347	295	245	196	366	311	260	206	327	272	218
FWS-330-11		214	401	340	282	226	422	358	300	238	378	313	251
FWS-330-15		236	441	374	310	249	465	394	330	262	416	345	276
FWS-330-18.5		250	468	397	329	264	493	418	350	278	441	366	293
FWS-330-22		264	494	420	348	279	521	442	370	294	466	386	310
FWS-350-7.5		196	368	312	259	207	388	329	275	218	347	287	230
FWS-350-11		225	422	358	296	237	445	377	315	250	397	329	263
FWS-350-15		250	469	397	329	263	494	419	350	277	441	366	292
FWS-350-18.5		267	502	426	353	282	529	449	375	297	473	392	313
FWS-350-22		285	536	454	376	301	565	479	400	317	504	418	334
FWS-400-7.5		204	381	323	268	215	401	341	285	226	359	298	239
FWS-400-11		232	434	369	306	245	458	388	325	258	409	339	272
FWS-400-15		257	481	408	339	271	507	430	360	286	453	376	301
FWS-400-18.5		275	515	437	362	290	542	460	385	306	485	402	322
FWS-400-22		293	548	465	386	309	577	490	410	325	516	428	343
FWS-400-30		322	601	510	423	339	633	538	450	357	567	470	377
FWS-500-7.5		217	409	346	287	229	431	365	305	242	385	319	255
FWS-500-11		246	462	392	324	259	487	413	345	273	435	360	288
FWS-500-15		274	516	437	362	289	543	461	385	305	486	402	322
FWS-500-18.5		292	549	466	385	308	579	491	410	325	517	428	343
FWS-500-22		310	583	494	409	327	614	521	435	345	549	454	363
FWS-500-30		346	650	551	456	364	685	580	485	384	612	507	405
FWS-550-7.5		227	418	356	296	239	440	375	315	252	395	329	265
FWS-550-11		259	478	407	339	273	503	428	360	287	451	376	303
FWS-550-15		288	531	452	376	303	559	476	400	319	501	418	337
FWS-550-18.5		309	571	486	405	326	601	512	430	343	539	449	362
FWS-550-22		327	604	514	428	345	636	541	455	363	570	475	383
FWS-550-30		360	664	565	471	379	699	595	500	399	627	522	421
FWS-600-11		313	577	492	409	330	608	518	435	347	545	454	366
FWS-600-15		349	644	548	456	368	678	577	485	387	608	506	408
FWS-600-18.5		374	690	588	489	394	726	619	520	415	652	543	438
FWS-600-22		396	730	622	518	417	768	655	550	439	689	574	463
FWS-600-30		439	810	689	574	462	852	726	610	487	765	637	513
FWS-600-37		468	863	735	612	493	908	774	650	519	815	679	547
FWS-700-11		371	683	582	485	390	719	613	515	411	646	538	433
FWS-700-15		410	756	644	537	432	796	678	570	455	714	595	480
FWS-700-18.5		439	810	689	574	462	852	726	610	487	765	637	513
FWS-700-22		464	856	729	607	489	901	768	645	515	808	674	543
FWS-700-30		518	955	814	678	546	1006	857	720	575	902	752	606
FWS-700-37		551	1015	865	720	580	1069	910	765	611	959	799	644
FWS-800-11		401	733	626	523	422	772	659	555	445	694	580	469
FWS-800-15		445	813	694	579	468	855	730	615	493	769	642	519
FWS-800-18.5		473	865	739	617	498	911	778	655	525	819	684	553
FWS-800-22		502	918	784	655	529	966	825	695	557	869	726	587
FWS-800-30		549	1004	857	716	578	1057	902	760	609	950	794	642
FWS-800-37		593	1083	925	772	624	1140	973	820	657	1025	856	692
FWS-800-45		636	1163	993	829	670	1224	1045	880	705	1100	919	743
FWS-800-55		679	1242	1060	885	715	1307	1116	940	753	1175	982	794

Notes:

1/CTI Certification applies to the operation with the Wet Bulb Temp. between 12.8℃ and 32.2℃, Max. Entering Water Temp. 51.7℃, Min. Range of 2.2℃ and Min. Approach of 2.8℃.

2/This table is for quick selection only. For more precise selection, please consult RYOWO engineers.



City University of
Hong Kong



The Hong Kong
Polytechnic University



The University of
Hong Kong



The Ritz-Carlton Hotel

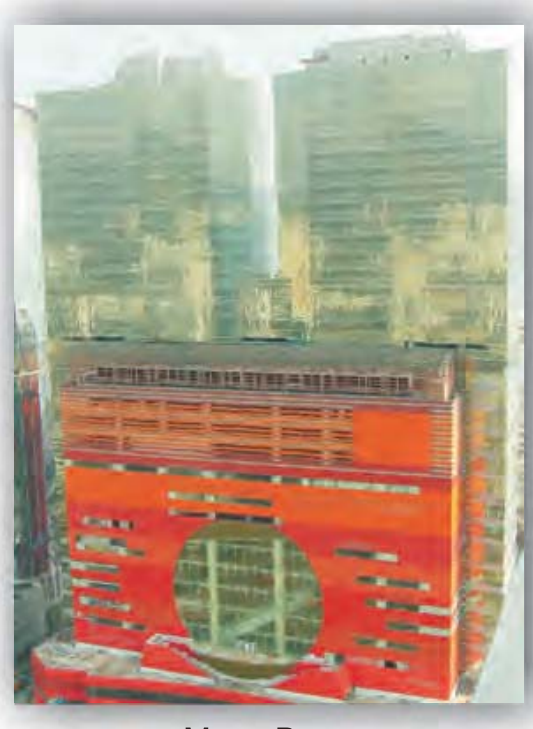
FWS series



Kai Tak Cruise Terminal



Studio City, Macau



Mega Box



Galaxy Casino & Resort, Macau

RYOWO (HOLDING) CO., LTD.

Head Office:

[redacted]

Factory:

[redacted]

DONGGUAN RYOWO COOLING TOWER CO., LTD.

[redacted]

COOLING TOWER MANUFACTURER SINCE 1978

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CAT-FWS-EN-(15)-2014

Appendix 4.4.1h Catalogue for CMHKST

LENNTECH

NC® Steel Cooling Tower

Engineering Data



Marley

Marley

NC® INSIGHT

Overview

Marley's flagship factory-assembled cooling tower, providing higher performance, fast installation and easy maintenance.

Primary Benefits

- Higher tonnage and efficiency per cell can lower energy costs up to 20%
- Up to 64% less installation time per cell, providing over $1400 savings per cell, over previous designs
- Less than half the maintenance costs for gear drives compared to belt drive systems

Benefit Detail

Higher Tonnage and Efficiency:

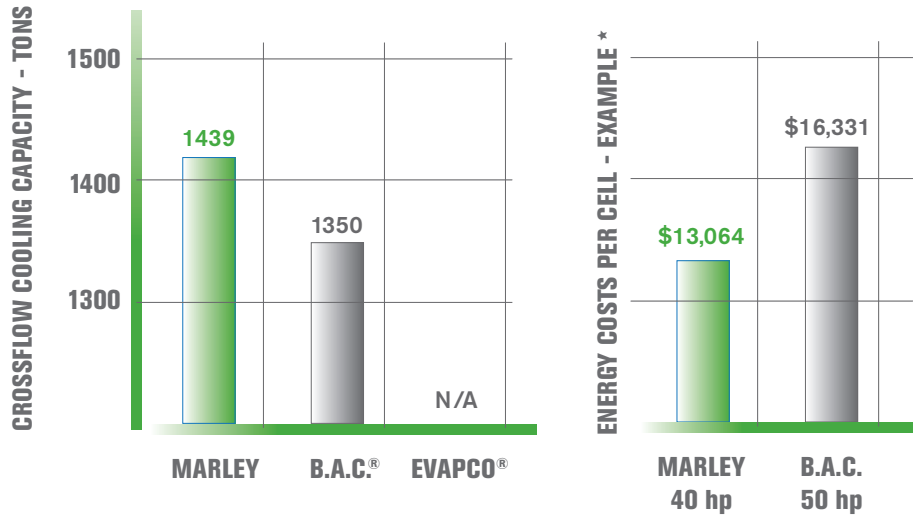
- Highest capacity package cooling tower in the market* helps to reduce the number of cells required, saving purchasing costs
- Higher efficiency design can provide up to 20% lower energy costs

Fast Installation:

- Up to 64% faster installation than previous designs provides over $1000 in savings per cell
- Quick Installation features include:
  - Factory-mounted terminal box option – provides a single location for all controls wiring
  - Quick-Install guardrails and aluminum ladders and welded aluminum safety cages options
  - Four-point support allows parallel I-beams in any direction or separate piers

*as of May, 2010





* assumes nameplate motor horsepower for a 610 ton cooling tower with a footprint of 250 sq ft – $0.10/kWh and 50% annual usage

field installation hours	*latest design*	*previous design*
Ladder and Guardrail	2	3
Ladder Safety Cage	.25	4
Fan Cylinder	0	1
Access Platform	5	7
Factory Installed Terminal Box	4	16
total	**11.25**	**31**
based on $75/hour, savings per tower cell would be over $1,480		

more

NC INSIGHT

Benefit Detail

Easy Maintenance:

- Gear drive standard — 5 year no-hassle operation
- Integral louvers and eliminators provide water containment and freezing prevention compared to blade louvers used by other manufacturers
- Bolted and/or welded basins stop leaks better than tap screwed connections used by other manufacturers
- Large access doors and a flat fan deck designed as a walking surface makes tower service checks easier

Special Design Considerations

- ASHRAE® Std. 90.1 compliant
- Full set of design options:
  - CTI Certified sound options including attenuation and/or Ultra Quiet fan
  - Splash fill for dirty water applications - NC Alpha
  - Plume abatement - NCWD
  - Marley controls and VFD options for superior energy management
- 3D configuration specific drawings provided with quotes and orders
- FM Approval option on every model including FRP fan cylinder and PVC inlet piping

Capacity Range

101 to 1439 tons per cell at 95°/85°/78°F

303 to 4307 GPM per cell hydraulic limit

No-Hassle System 5 Geareducer®		belt drive
Annual Maintenance	$624	$2,380
5 Year Maintenance	$4,270	$11,900
example savings	$7,630	

Technical Features

- Induced draft, crossflow design with vertical air discharge
- Non-corrosive stainless steel or galvanized structure with bolted galvanized or welded stainless steel cold water basin
- TEFC motor, low sound fan standard
- Drift rates as low as 0.001%
- Belt drive available on all models up to 60hp
- Assembled with as much as 71% recycled content

Common Applications

HVAC

- Mission critical data centers, hospitals and health treatment facilities, commercial buildings, schools and colleges

Industrial

- Chemical, fertilizer, grain processing, ethanol production, metals, mining, oil refining, textiles and steel production

Power Generation

- Turbine inlet cooling, jacket cooling and trim cooling during peak heat load

The NC–Quiet by Design

The NC is the result of extensive design studies focused on cooling tower sound control. These studies were complicated by the fact that the cooling tower market is typically driven by one of two powerful, yet often conflicting requirements. The most common is for a cooling tower that provides the required heat rejection capacity with a high level of reliability at low cost. Sound control, while important, is not the primary consideration for this application.

The other requirement, which is becoming ever more important in our crowded, fast-paced society, is driven by conditions that demand the lowest practical sound level. Energy efficiency, reliability, ease of maintenance and reasonable cost, while still extremely important, are not the highest priorities

In the first case, sound is important, while in the second case it is extremely important. To best satisfy these two competing market requirements we created a multi-tiered approach, through key mechanical equipment selections, to sound control. The result is more options than any other cooling tower on the market today.

The result is a line of towers capable of meeting all but the most restrictive noise limitations—and that will react favorably to natural attenuation. Where the tower has been sized to operate within an enclosure, the enclosure itself will have a damping effect on sound. Sound also declines with distance—by about 6 dBA each time the distance doubles.

All standard NC cooling towers are equipped with low sound fans. This in combination with zero-splash crossflow film-fill results in a line of towers capable of meeting most noise limitations. Where noise at a critical point is likely to exceed an acceptable limit, several other options are available—listed below in ascending order of cost impact:

- The Marley "Quiet Package" includes the affordable Quiet Fan mechanical option, optimized to achieve the lowest possible sound levels while maintaining efficiency.
- A Marley Variable Speed Drive automatically minimizes the tower's noise level during periods of reduced load and/or reduced ambient temperature without sacrificing the system's ability to maintain a constant cold water temperature. This is a relatively inexpensive solution, and can pay for itself quickly in reduced energy costs. The natural nighttime reduction in wet-bulb temperature makes this a very feasible solution in most areas of the world. It also eliminates fan cycling. In combination with a Marley Quiet Package, the Marley Variable Speed Drive is capable of meeting all but the most restrictive noise limitations.
- The most extreme cases may require inlet and discharge sound attenuator sections—however, the static pressure loss imposed by discharge attenuators may necessitate an increase in tower size. Two stages of inlet or discharge attenuators supported by the tower and designed and tested for the most stringent requirements are available as an option. See page 24.
- For more severe cases requiring the lowest possible fan sound levels the Marley "Ultra Quiet" fan option is now available on most NC models. Tower height will increase—obtain current sales drawings from your Marley sales representative for accurate dimensions.

The advantage is yours. You now have the choices you need to balance your project's performance, space and cost requirements with your sound level needs for a win-win solution to your cooling system design.

Enclosures

Occasionally, cooling towers are located inside architectural enclosures for aesthetic reasons. Although NC Class towers adapt well to enclosures, the designer must realize the potential impact of a poorly arranged enclosure on the tower's performance and operation. The designer must take care to provide generous air inlet paths, and the tower's fan cylinder discharge height should not be lower than the elevation of the top of the enclosure. *Marley Technical Report #H-004* "External Influences on Cooling Tower Performance" is available at spxcooling.com or from your Marley sales representative.

As suggested in the aforementioned Technical Report, it may also be advisable to specify a design wet-bulb temperature 1°F higher than normal to compensate for potential recirculation initiated by the enclosure. You'll benefit from discussing your project with your Marley sales representative.



Marley "Ultra Quiet" fan

System Cleanliness

Cooling towers are very effective air washers. Atmospheric dust able to pass through the relatively small louver openings will enter the circulating water system. Increased concentrations can intensify system maintenance by clogging screens and strainers—and smaller particulates can coat system heat transfer surfaces. In areas of low flow velocity—such as the cold water basin—sedimentary deposits can provide a breeding ground for bacteria.

In areas prone to dust and sedimentation, you should consider installing some means for keeping the cold water basin clean. Typical devices include side stream filters and a variety of filtration media.

Water Treatment

To control the buildup of dissolved solids resulting from water evaporation, as well as airborne impurities and biological contaminants including Legionella, an effective consistent water treatment program is required. Simple blowdown may be adequate to control corrosion and scale, but biological contamination can only be controlled with biocides.

An acceptable water treatment program must be compatible with the variety of materials incorporated in a cooling tower—ideally the pH of the circulating water should fall between 6.5 and 8.0. Batch feeding of chemicals directly into the cooling tower is not a good practice since localized damage to the tower is possible. Specific startup instructions and additional water quality recommendations can be found in the NC User Manual which accompanies the tower and also is available from your local Marley sales representative. For complete water treatment recommendations, consult a competent, qualified water treatment supplier.

⚠ CAUTION

The cooling tower must be located at such distance and direction to avoid the possibility of contaminated discharge air being drawn into building fresh air intake ducts. The purchaser should obtain the services of a Licensed Professional Engineer or Registered Architect to certify that the location of the cooling tower is in compliance with applicable air pollution, fire and clean air codes.

Typical Applications

The NC tower is an excellent choice for normal applications requiring cold water for the dissipation of heat. This includes condenser water cooling for air conditioning, refrigeration, and thermal storage systems, as well as their utilization for free-cooling in all of those systems. The NC can also be used in the cooling of jacket water for engines and air compressors, and are widely applied to dissipate waste heat in a variety of industrial, power and manufacturing processes.

Choosing the all stainless steel construction option, the NC can be confidently applied in unusually corrosive processes and operating environments. However, no single product line can answer all problems, and selective judgement should be exercised in the following situations

Applications Requiring Alternative Cooling Tower Selections

Certain types of applications are incompatible with any cooling tower with film fill—whether NC or a competitive tower of similar manufacture. Film fill is subject to distortion in high water temperatures, and the narrow passages are easily clogged by turbid or debris-laden water. Some of the applications, which call for alternative tower designs are:

- Water temperatures exceeding 125°F—adversely affects the service life and performance of normal PVC fill. Higher temperature fill materials are available.
- Ethylene glycol content—can plug fill passages as slime and algae accumulate to feed on the available organic materials.
- Fatty acid content—found in processes such as soap and detergent manufacturing and some food processing—fatty acids pose a serious threat for plugging fill passages.
- Particulate carry over—often found in steel mills and cement plants—can both cause fill plugging, and can build up to potentially damaging levels on tower structure.
- Pulp carry over—typical of the paper industry and food processing where vacuum pumps or barometric condensers are used. Causes fill plugging which may be intensified by algae.

Alternative Selections

In addition to the NC, SPX Cooling Technologies offers a full scope of products in various designs and capacities to meet the special demands of specific applications.

spxcooling.com—visit us on the web for a complete list of products, services, publications and to find your nearest sales representative.

NC8401 NC8402 NC8403 NC8405

Use this data for preliminary layouts only. Obtain current drawing from your Marley sales representative.

UPDATE *web-based selection software available at spxcooling.com/update provides NC model recommendations based on customer's specific design requirements.*

A Sound dBA Approach

Various low sound options are available from 2 to 19 dB reduction from the standard dBA options in the schematic data table. Consult ***UPDATE*** *selection software for performance, sound levels and dimensions.*

NC8401 NC8402 NC8403 NC8405

Model note 2	**Nominal Tons** note 3	**Motor** hp	**dBA** 5'-0" from air inlet face	**Design Operating Weight** lb	**Shipping Weight** lb	**Dimensions**			
						L	**W**	**H**	**A**
NC8401G-1	101	2	63	8488	4062	6'-6¼"	12'-10"	10'-2½"	6'-9¾"
NC8401H-1	117	3	65						
NC8401K-1	139	5	71						
NC8401M-1	159	7.5	73						
NC8401N-1	175	10	76						
NC8401P-1	198	15	78						
NC8402G-1	131	2	64	11184	4890	8'-4¾"	14'-2"	10'-3"	8'-8¼"
NC8402H-1	148	3	65						
NC8402K-1	175	5	68						
NC8402M-1	205	7.5	74						
NC8402N-1	228	10	76						
NC8402P-1	256	15	79						
NC8402Q-1	277	20	81						
NC8403K-1	213	5	68	16772	7442	8'-4¾"	18'-2"	11'-11¼"	8'-8¼"
NC8403M-1	243	7.5	72						
NC8403N-1	275	10	76						
NC8403P-1	312	15	79						
NC8403Q-1	342	20	80						
NC8403R-1	366	25	81						
NC8403S-1	386	30	84						
NC8403T-1	423	40	85						
NC8405N-1	331	10	74	20690	8685	9'-10¾"	19'-11"	11'-11¼"	10'-2¼"
NC8405P-1	377	15	76						
NC8405Q-1	412	20	78						
NC8405R-1	445	25	81						
NC8405S-1	472	30	84						
NC8405T-1	515	40	87						

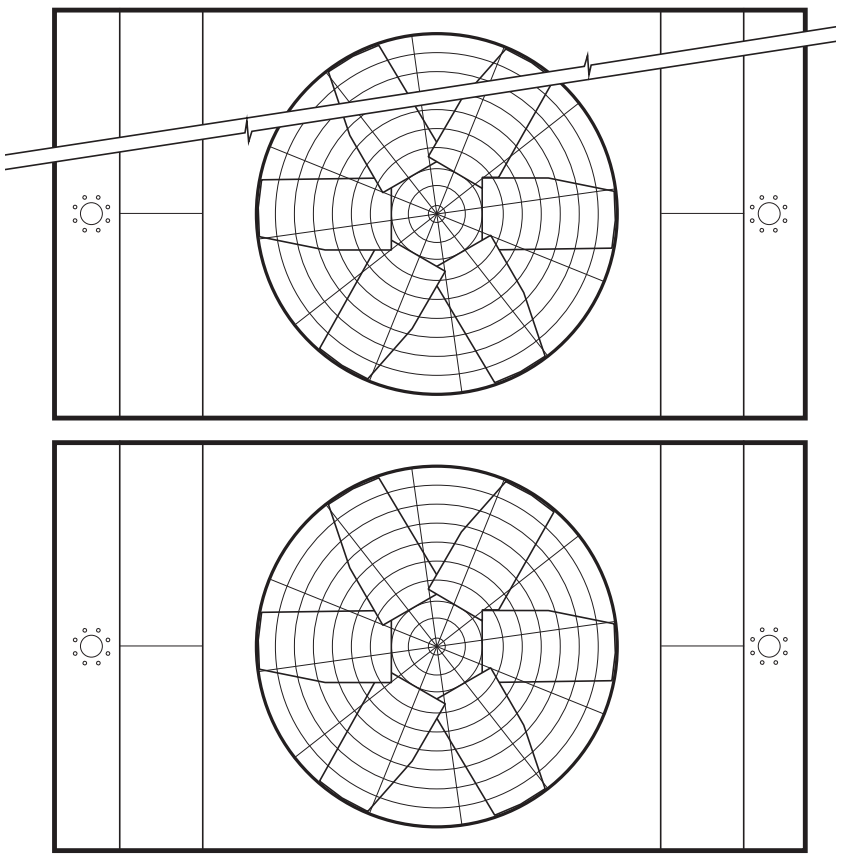
NOTE

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2 Last numeral of model number indicates number of cells. Change as appropriate for your selection.
3 Nominal tons are based upon 95°F HW, 85°F CW, 78°F WB and 3 GPM/ton. The ***UPDATE*** web-based selection software provides NC model recommendations based on specific design requirements.
4 Standard overflow is a 4" dia. standpipe in the collection basin floor. The standpipe removes for flush-out and draining. See page 18 for side overflow option.
5 Outlet sizes vary according to GPM and arrangement. See pages 18 and 19 for outlet sizes and details.
6 Makeup water connection may be 1" or 2" dia., depending upon tower heat load, water pressure, and desired connections. See page 13 for additional information.

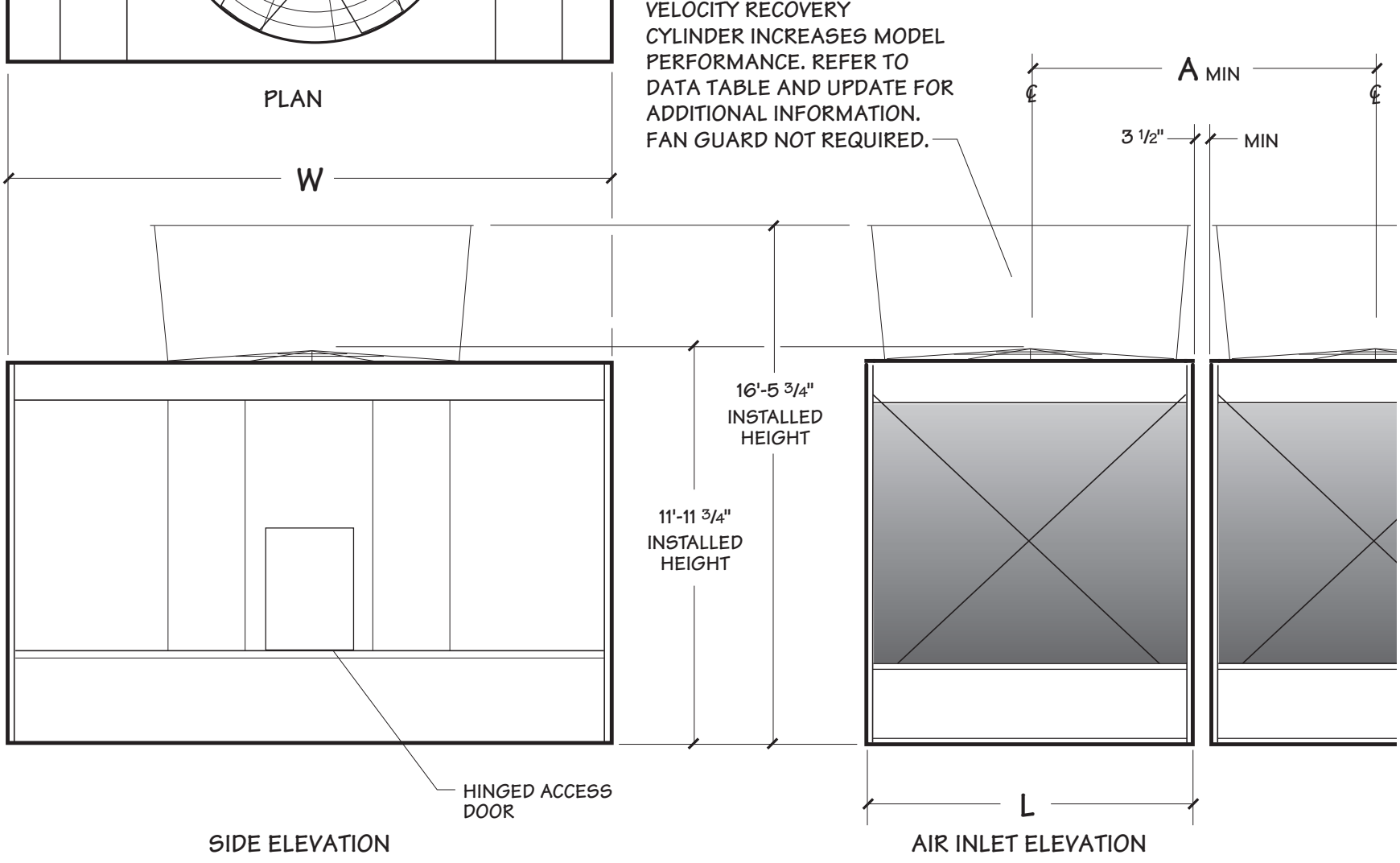
NC8407 NC8409

Use this data for preliminary layouts only. Obtain current drawing from your Marley sales representative.

UPDATE *web-based selection software available at spxcooling.com/update provides NC model recommendations based on customer's specific design requirements.*



PLAN



SIDE ELEVATION

AIR INLET ELEVATION

NC8407 NC8409

Model note 2	**Nominal Tons** note 3	**Nominal Tons with VR Cylinder** note 3	**Motor** hp	**dBA** 5'-0" from air inlet face	**Design Operating Weight** lb	**Shipping Weight** lb	**Dimensions**		
							L	**W**	**A**
NC8407M-1	338	352	7.5	66	27044	11829	11'-10¾"	21'-0"	12'-2¼"
NC8407N-1	372	385	10	69					
NC8407P-1	428	448	15	70					
NC8407Q-1	468	490	20	72					
NC8407R-1	510	531	25	77					
NC8407S-1	540	561	30	79					
NC8407T-1	590	612	40	82					
NC8407U-1	629	653	50	83					
NC8407V-1	664	690	60	84					
NC8409P-1	488	502	15	65	32888	13996	13'-10¾"	22'-5"	14'-2¼"
NC8409Q-1	530	546	20	67					
NC8409R-1	586	602	25	75					
NC8409S-1	616	636	30	79					
NC8409T-1	678	696	40	79					
NC8409U-1	721	741	50	81					
NC8409V-1	761	782	60	83					

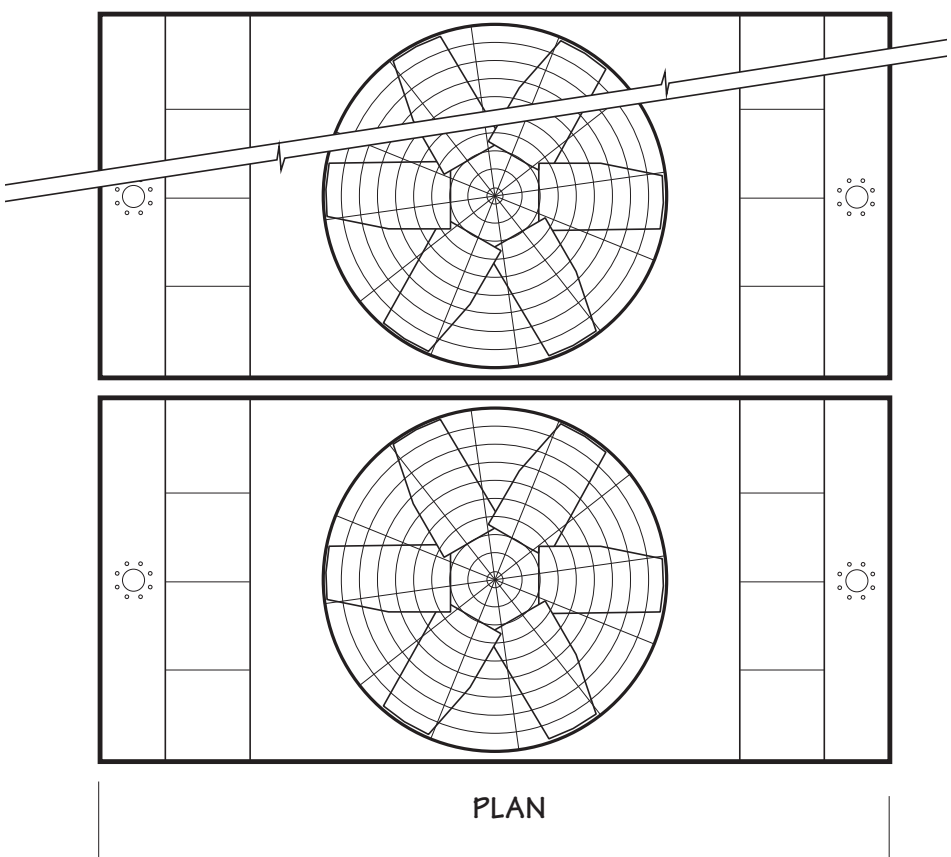
A Sound dBA Approach

Various low sound options are available from 2 to 19 dB reduction from the standard dBA options in the schematic data table. Consult ***UPDATE*** *selection software for performance, sound levels and dimensions.*

NOTE

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3 Nominal tons are based upon 95°F HW, 85°F CW, 78°F WB and 3 GPM/ton. The ***UPDATE*** web-based selection software provides NC model recommendations based on specific design requirements.
4 Standard overflow is a 4" dia. standpipe in the collection basin floor. The standpipe removes for flush-out and draining. See page 18 for side overflow option.
5 Outlet sizes vary according to GPM and arrangement. See pages 18 and 19 for outlet sizes and details.
6 Makeup water connection may be 1" or 2" dia., depending upon tower heat load, water pressure, and desired connections. See page 13 for additional information.

NC8411 NC8412



Use this data for preliminary layouts only. Obtain current drawing from your Marley sales representative.

UPDATE *web-based selection software available at spxcooling.com/update provides NC model recommendations based on customer's specific design requirements.*

NC8411 NC8412

Model note 2	**Nominal Tons** note 3	**Nominal Tons with VR Cylinder** note 3	**Motor** hp	**dBA** 5'-0" from air inlet face	**Design Operating Weight** lb	**Shipping Weight** lb	**Dimensions**		
							L	**A**	**C**
NC8411Q-1	636	671	20	67	39515	18137	11'-10¾"	12'-2¼"	11'-9⅛"
NC8411R-1	680	717	25	69					
NC8411S-1	720	759	30	71					
NC8411T-1	809	854	40	77					
NC8411U-1	865	913	50	78					
NC8411V-1	910	961	60	82					
NC8411W-1	974	1019	75	84					
NC8412Q-1	711	747	20	67	45749	20653	13'-10¾"	14'-2¼"	13'-9³⁄₁₆"
NC8412R-1	762	799	25	69					
NC8412S-1	805	845	30	70					
NC8412T-1	906	951	40	74					
NC8412U-1	968	1012	50	78					
NC8412V-1	1020	1068	60	80					
NC8412W-1	1087	1136	75	84					
NC8412X-1	1183	1239	100	83					

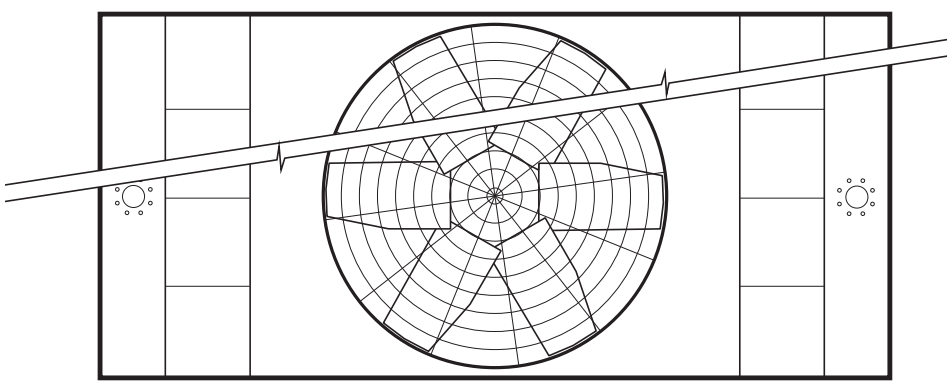
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NOTE

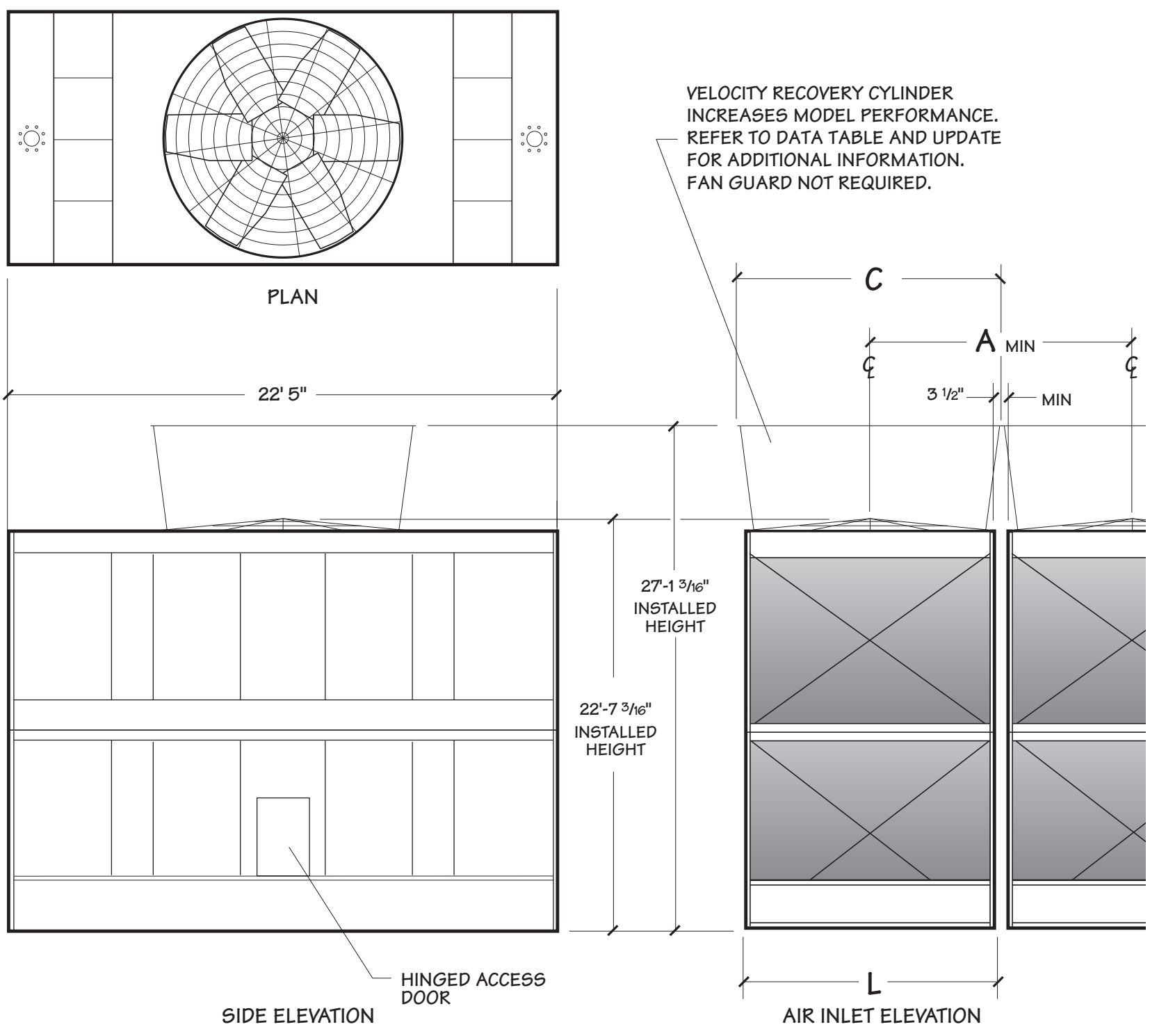
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3 Nominal tons are based upon 95°F HW, 85°F CW, 78°F WB and 3 GPM/ton. The ***UPDATE*** web-based selection software provides NC model recommendations based on specific design requirements.
4 Standard overflow is a 4" dia. standpipe in the collection basin floor. The standpipe removes for flush-out and draining. See page 18 for side overflow option.
5 Outlet sizes vary according to GPM and arrangement. See pages 18 and 19 for outlet sizes and details.
6 Makeup water connection may be 1" or 2" dia., depending upon tower heat load, water pressure, and desired connections. See page 13 for additional information.

NC8413 NC8414



Use this data for preliminary layouts only. Obtain current drawing from your Marley sales representative.

UPDATE *web-based selection software available at spxcooling.com/update provides NC model recommendations based on customer's specific design requirements.*



NC8413 NC8414

Model note 2	**Nominal Tons** note 3	**Nominal Tons with VR Cylinder** note 3	**Motor** hp	**dBA** 5'-0" from air inlet face	**Design Operating Weight** lb	**Shipping Weight** lb	**Dimensions**		
							L	**A**	**C**
NC8413Q-1	692	735	20	67	44764	20744	11'-10¾"	12'-2¼"	11'-9⅛"
NC8413R-1	741	785	25	69					
NC8413S-1	780	833	30	72					
NC8413T-1	855	906	40	73					
NC8413U-1	941	1003	50	78					
NC8413V-1	993	1058	60	82					
NC8413W-1	1062	1129	75	84					
NC8413X-1	1147	1214	100	86					
NC8414Q-1	771	814	20	87	51895	23698	13'-10¾"	14'-2¼"	13'-9³⁄₁₆"
NC8414R-1	825	872	25	89					
NC8414S-1	873	921	30	70					
NC8414T-1	949	999	40	71					
NC8414U-1	1048	1108	50	78					
NC8414V-1	1107	1170	60	80					
NC8414W-1	1178	1242	75	84					
NC8414X-1	1288	1358	100	83					
NC8414Y-1	1366	1439	125	85					

A Sound dBA Approach

Various low sound options are available from 2 to 19 dB reduction from the standard dBA options in the schematic data table. Consult ***UPDATE*** *selection software for performance, sound levels and dimensions.*

NOTE

1 **Use this bulletin for preliminary layouts only.** Obtain current drawings from your Marley sales representative. All table data is per cell.
2 Last numeral of model number indicates number of cells. Change as appropriate for your selection.
3 Nominal tons are based upon 95°F HW, 85°F CW, 78°F WB and 3 GPM/ton. The ***UPDATE*** web-based selection software provides NC model recommendations based on specific design requirements.
4 Standard overflow is a 4" dia. standpipe in the collection basin floor. The standpipe removes for flush-out and draining. See page 18 for side overflow option.
5 Outlet sizes vary according to GPM and arrangement. See pages 18 and 19 for outlet sizes and details.
6 Makeup water connection may be 1" or 2" dia., depending upon tower heat load, water pressure, and desired connections. See page 13 for additional information.

Tired of having to design your piping and tower layout to accommodate the standards of cooling tower manufacturers? Marley's multiple variety of piping systems accommodates your design intentions to make your layout of the NC both expedient and economical.

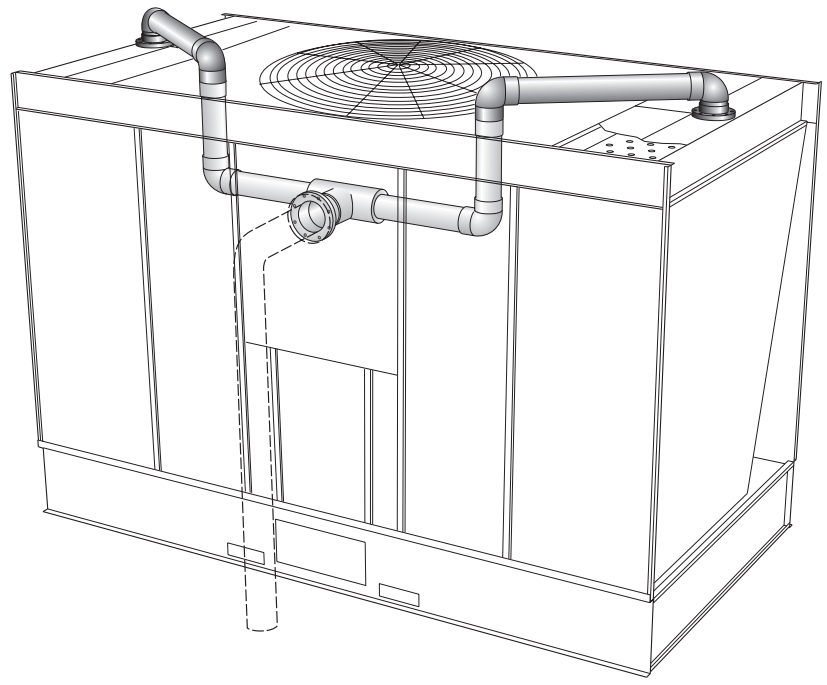
- Single or dual hot water inlet connections.
- Side inlet, bottom inlet or top inlet connections.
- Side or bottom cold water outlet connections.
- A variety of makeup, overflow and drain options.

For the single inlet connection all piping to the distribution basins is part of the tower package. Installation and design costs are reduced and the need for extra piping and supports are eliminated. The single bottom inlet connection is perfect for multicell applications—keeping all the inlet piping below the tower.

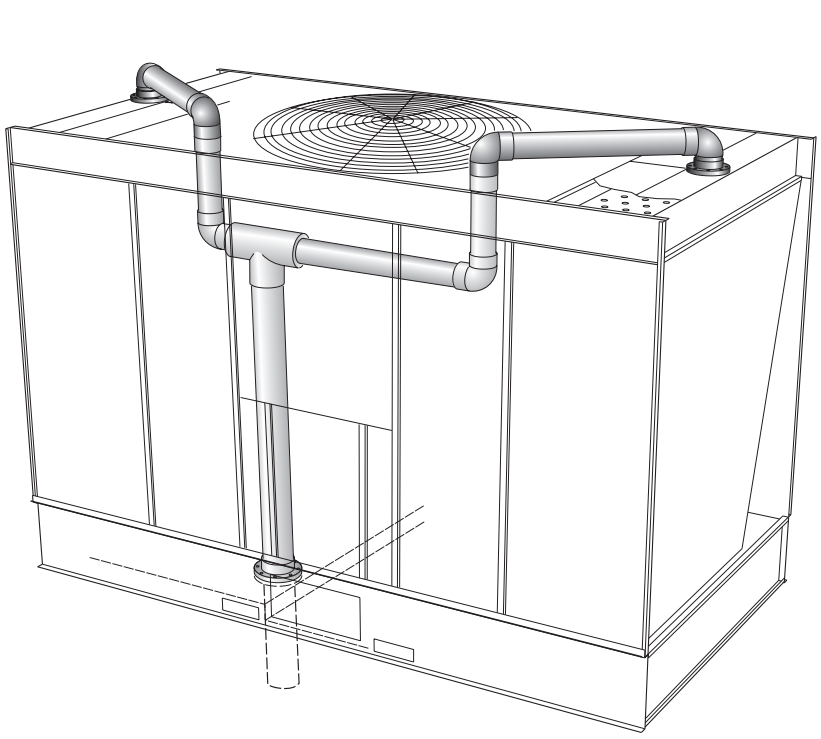
Unless otherwise specified, single-cell towers normally have a cased-face outlet appropriate for the design water flow rate—see pages 18 and 19. This usually assures the lowest possible installed tower elevation. Cased-face outlet connection pipes extend approximately 3" outside the basin, and are beveled for weld connection and also grooved for a mechanical coupling.

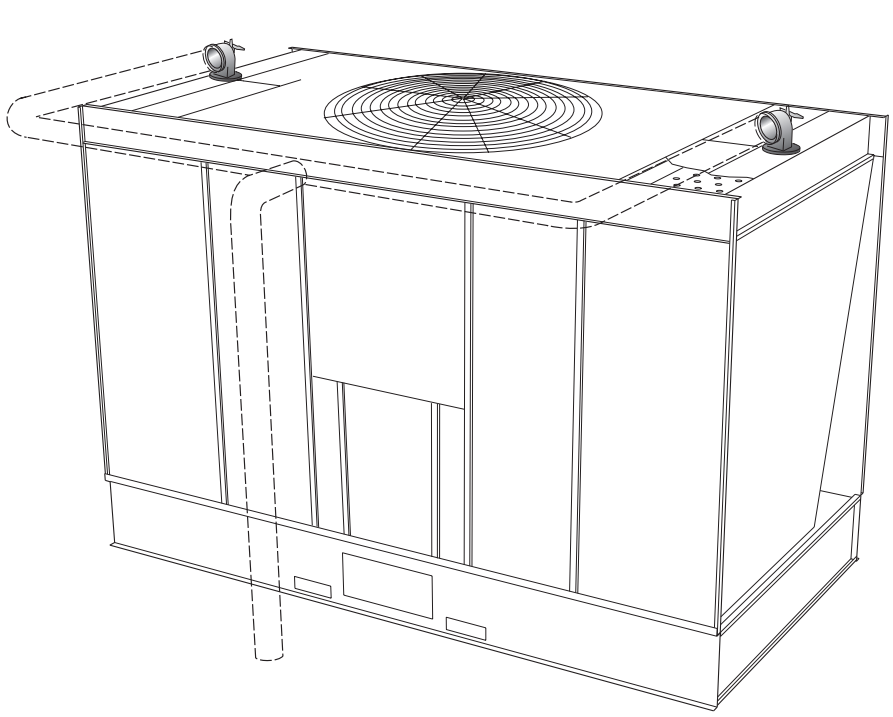
Outlet piping can be kept below the cold water basin level by choosing either a depressed sump or a bottom outlet connection in lieu of the cased-face outlets. Both outlet designs conform to standard class 125 ANSI pipe flange specifications. Easily removable debris screens are optional on bottom outlets and are standard on all other outlet arrangements.

Depressed sumps are made of inert fire-retardant FRP or heavy-gauge welded stainless steel. Unless otherwise specified towers with galvanized steel collection basins are supplied with FRP sumps and towers with stainless steel basins are supplied with stainless sumps.



Multicell towers, intended to operate together as a common unit, are joined by steel flumes between the collection basins. These flumes equalize the operating water level between basins and also provide a flow passage from cells not equipped with outlets or makeup valves, often eliminating the need to specify an outlet and makeup valve for each cell on a multicell installation. Select the number of outlets required to maintain a maximum flow of 1371 GPM through each flume for NC8401 through NC8405 models and 2203 GPM for NC8407 through NC8414 models. Flow values are for cased-face outlet or bottom-outlets without trash screen. Refer to NC sales drawings to obtain flow values for sumps and bottom outlets with trash screens.





If each cell is to be equipped with an outlet, cased-face outlet can be used on end cells of multicell towers, but not on interior cells. For direct outlet from each cell on installations of three or more cells, use either the depressed sump or bottom outlet on interior cells.

The best choice for a tower used with a remote or indoor storage tank—see page 22—or on a concrete cold water basin is usually a bottom outlet.

A cased-face outlet equipped tower can be installed on a flat concrete slab if a side drain and overflow are also specified—see page 18. Consult your Marley sales representative for complete information.

Makeup

The amount of water constantly evaporated from a cooling tower varies directly with the heat load applied. In addition to evaporation, water is normally lost to the blowdown (bleed-off) necessary to maintain dissolved solids concentration at an acceptable level in the circulating water system.

The NC is equipped with one or more float-operated, mechanical makeup valves to automatically replenish this lost water. The tables on this page, calculated for a concentration of 3 times normal, indicate the rate of water loss—and the size of valve(s) required. If your installation's cold water basin will drain by gravity to a remote storage tank—or if you plan a separate means of controlling makeup water—a price reduction is available for deleting the Marley valve(s). We also offer an optional electronic liquid-level control.

In most instances cooling towers will see the highest water usage at design heat load. Off design conditions (99% of the time) water usage will be less. For a better understanding of how much water your application will use throughout the year, consult our water usage calculator at:

spxcooling.com/watercalc

If too much water is still being consumed consult your Marley sales representative for water saving alternatives.

Makeup Water Flow Required–GPM to Maintain Three (3) Concentrations

Tower GPM	Cooling "Range" (hot water minus cold water)					
	5°F	10°F	15°F	20°F	30°F	40°F
200	2	3	4	5	8	10
400	3	5	8	10	15	20
600	4	8	12	15	23	30
800	5	10	15	20	30	40
1000	7	13	19	25	38	50
1500	10	19	29	38	57	75
2000	13	25	38	50	75	100
3000	19	38	57	75	113	150
4000	25	50	75	100	150	200
5000	32	63	94	125	188	250
6000	38	75	113	150	225	300
8000	50	100	150	200	300	400

NOTE

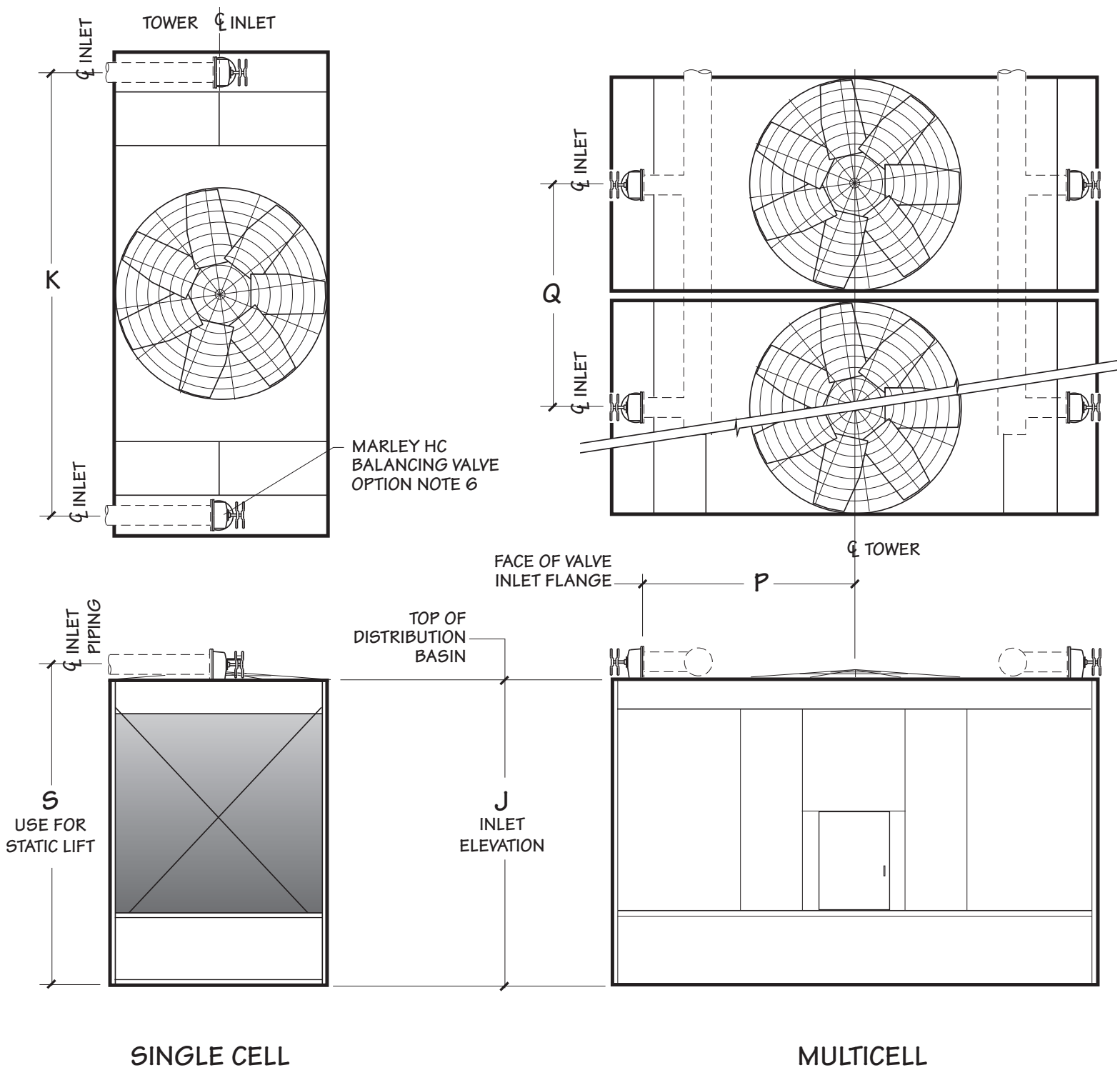
If circulating water is to be maintained at 2 concentrations instead of 3, multiply table GPM values by 1.36 before sizing makeup valve.

Makeup Valve Flow Capacities–GPM

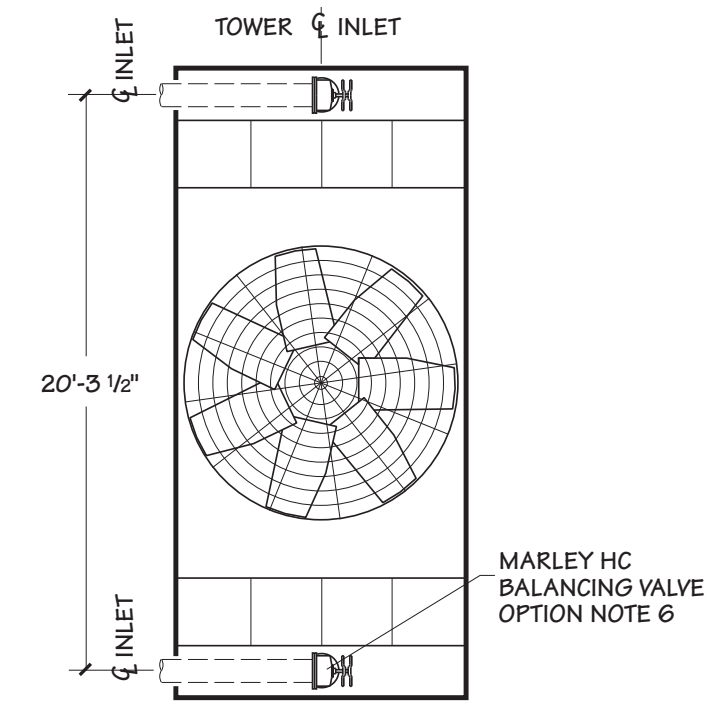
Pressure at Valve Inlet while flowing–psig	1" Diameter Valve	2" Diameter Valve
10	56	90
20	78	120
30	92	143
40	106	160
50	117	167

NOTE

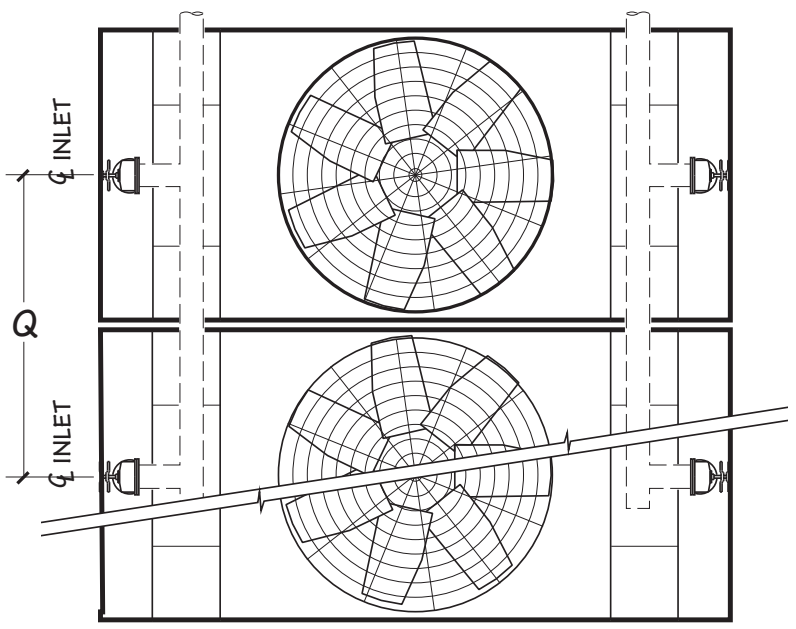
- If makeup water pressure exceeds 50 psig, use pressure reducer ahead of valve.
- For flow requirements exceeding the above limitations, use multiples of the same size valve.

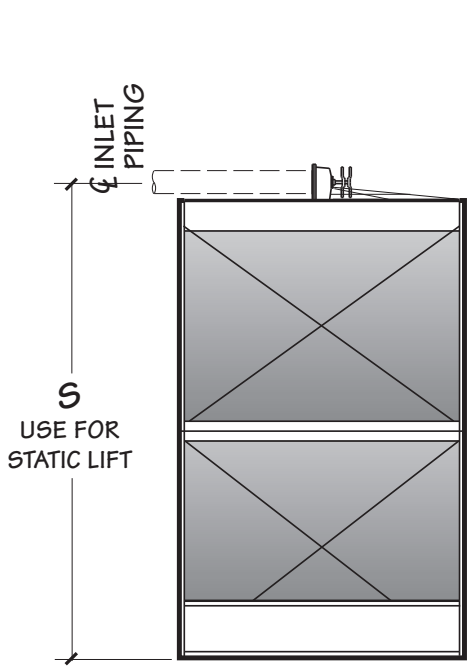


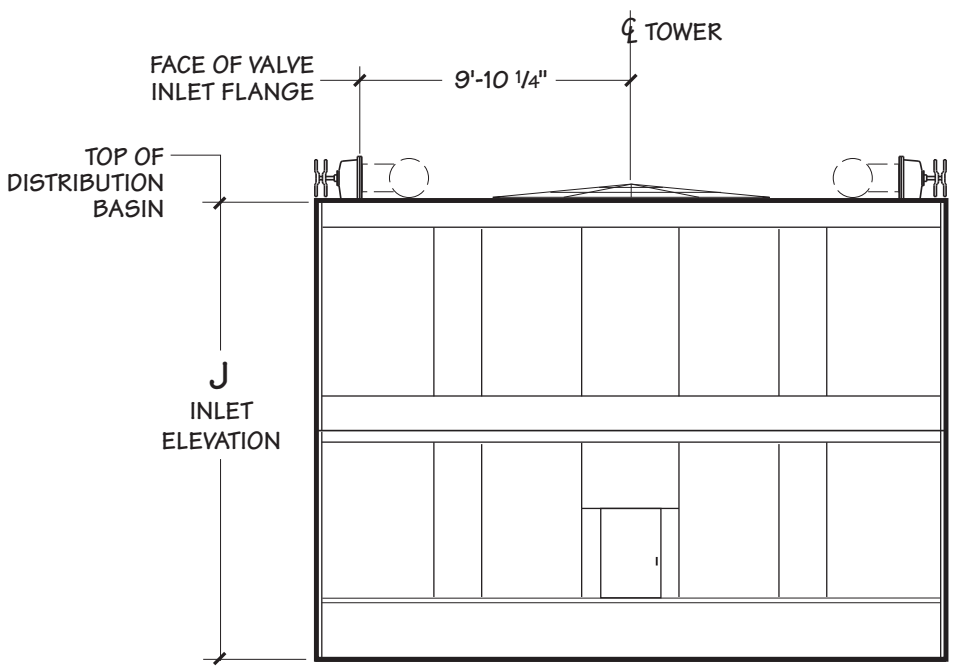
Model	Dimensions					Fan Diameter	Inlet Diameter
	J	K	S	P	Q		
NC8401	9'-9"	11'-1"	10'-5 3/16"	5'-3"	6'-9 3/4"	72"	2 at 6"
NC8402	9'-9"	12'-5"	10'-5 3/16"	5'-11"	8'-8 1/4"	84"	2 at 6"
NC8403	11'-5 5/16"	16'-0 1/2"	12'-2 7/16"	7'-8 3/4"	8'-8 1/4"	84"	2 at 8"
NC8405	11'-5 5/16"	17'-9 1/2"	12'-2 7/16"	8'-7 1/4"	10'-2 1/4"	108"	2 at 8"
NC8407	11'-5 5/16"	19'-0 7/8"	12'-2 7/16"	9'-2 15/16"	12'-2 1/4"	120"	2 at 8"
NC8409	11'-5 5/16"	20'-3 1/2"	12'-4 7/16"	9'-9 1/2"	14'-2 1/4"	144"	2 at 10"



SINGLE CELL





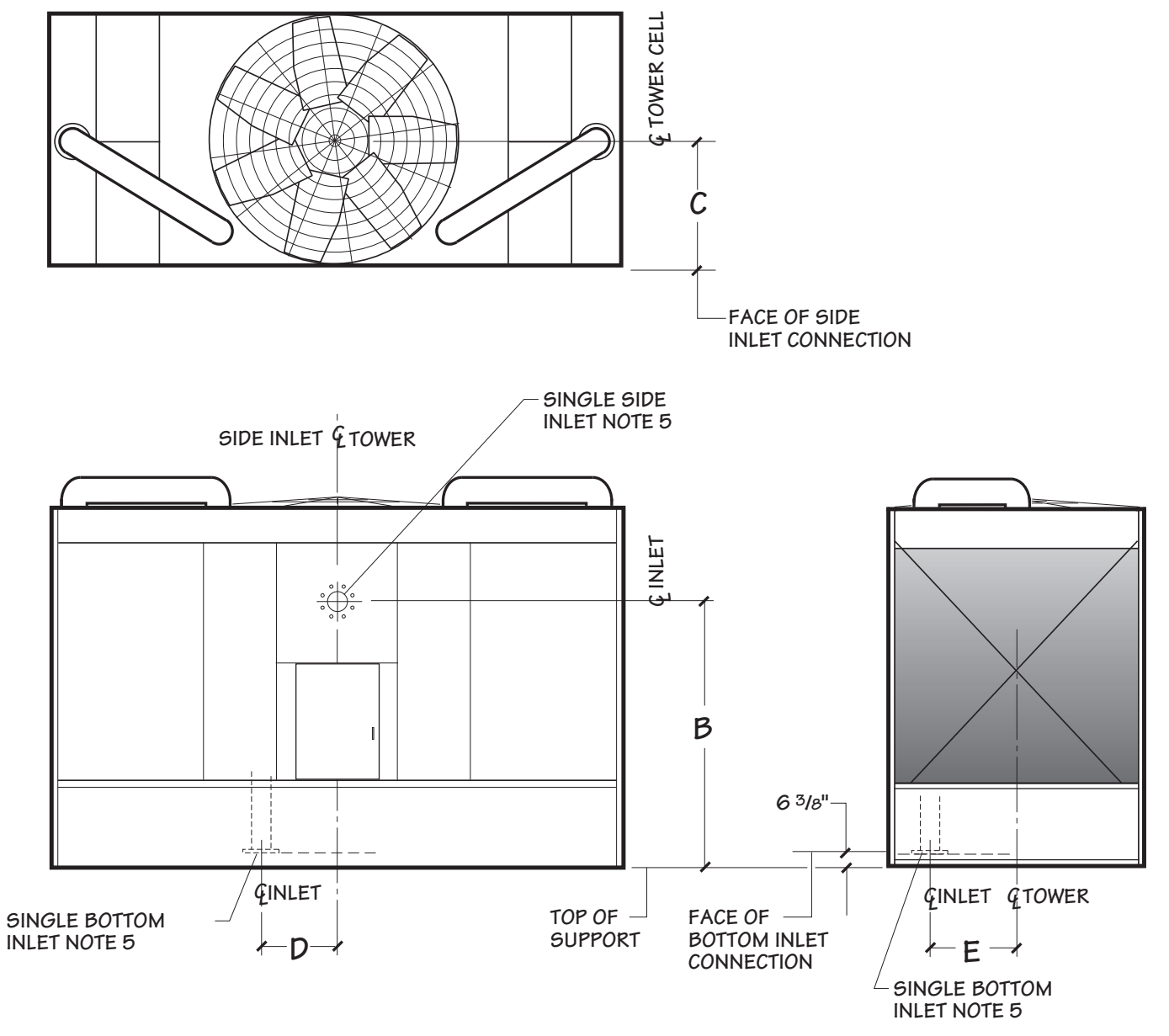


MULTICELL

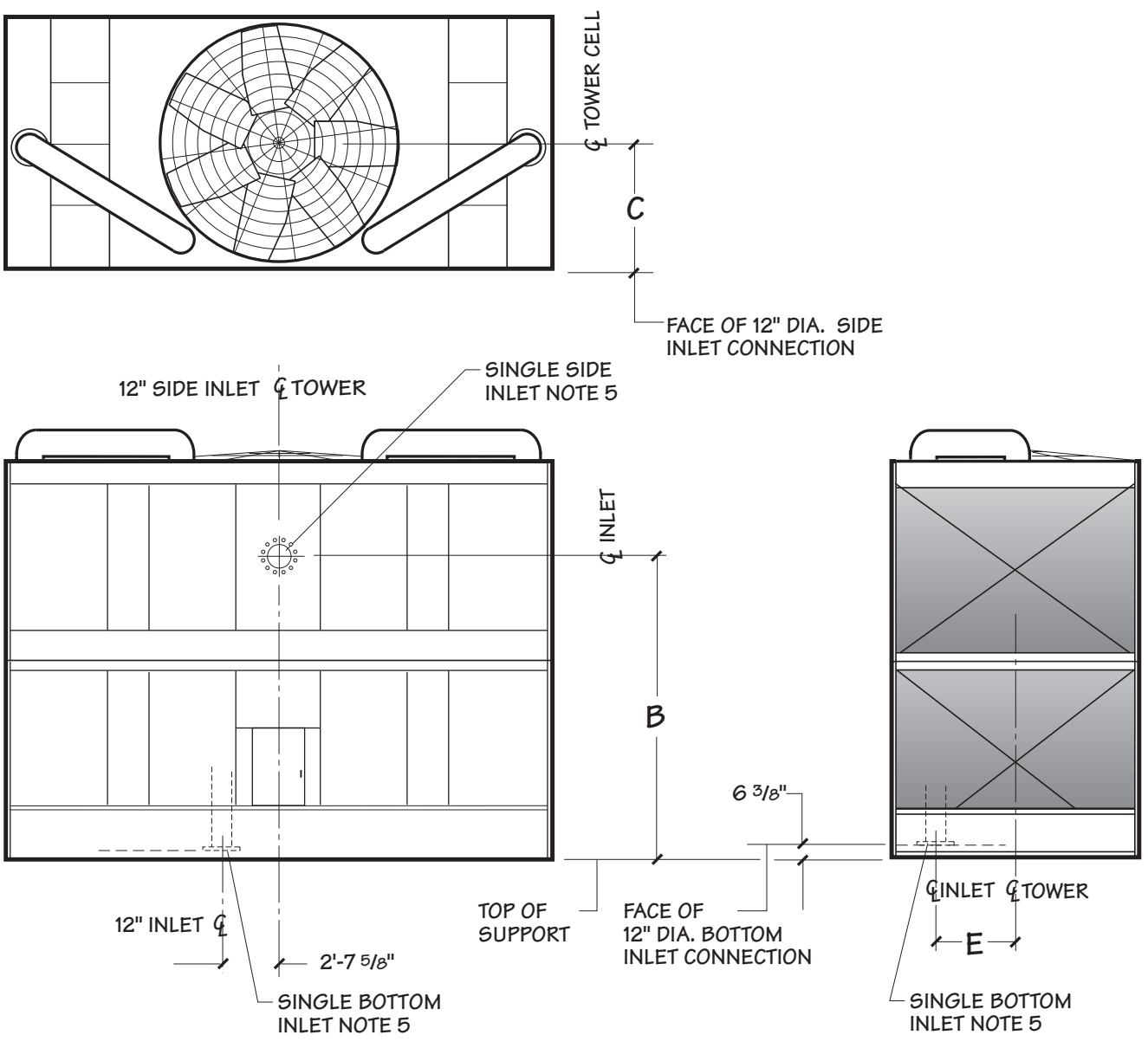
Model	Dimensions			Fan Diameter	Inlet Diameter
	J	S	Q		
NC8411	18'-3⅝"	19'-2¾"	12'-2¼"	132"	2 at 10"
NC8412	18'-3⅝"	19'-2¾"	14'-2¼"	144"	2 at 10"
NC8413	22'-0¾"	22'-11⅜"	12'-2¼"	132"	2 at 10"
NC8414	22'-0¾"	22'-11⅜"	14'-2¼"	144"	2 at 10"

NOTE

1 **Use this bulletin for preliminary layouts only.** Obtain current drawings from your Marley sales representative.
2 Pumping head contributed by the tower is static lift **"S"**. Add your system dynamic pipe losses for total.
3 The tower will support the vertical weight of piping shown within the plan area of the tower only. All piping loads, including thrust and lateral loads of riser and horizontal piping must be supported independent of the tower. See inlet piping drawings for details.
4 All piping and supports–and their design–are by others.
5 Allow adequate clearance for entry to tower access doors and safe use of optional ladder. Refer to appropriate Marley drawings.
6 You may choose to use 90° short radius flanged elbows in place of HC balancing valves on single-cell towers where inlet piping is balanced for equal flow. Pipe elevation remains as shown.



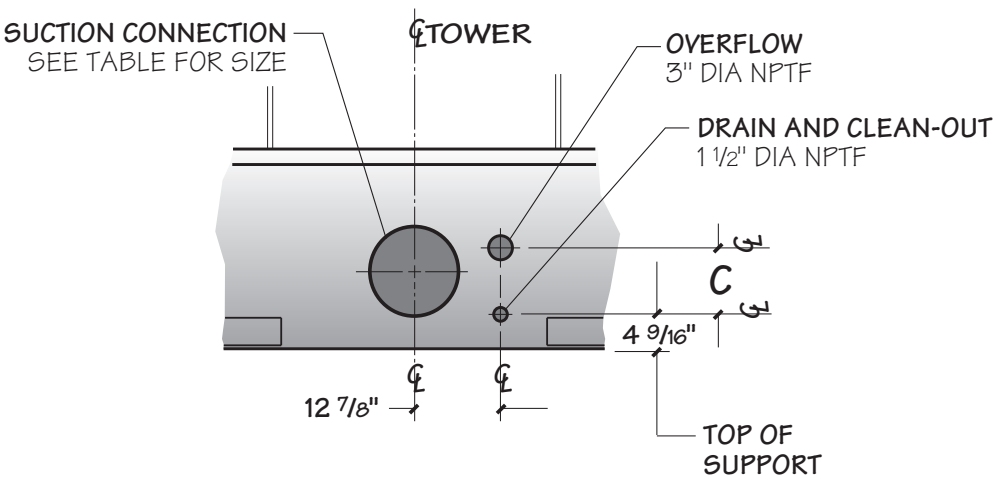
Model	Dimensions				Inlet Diameter
	B	C	D	E	
NC8401	7'-6 7/16"	3'-11 1/4"			6"
NC8402	7'-6 5/8"	5'-0 13/16"	2'-4 1/8"	2'-0"	8"
NC8403	9'-3 9/16"	5'-0 11/16"	2'-4 3/16"	2'-5"	8"
NC8405	9'-2 9/16"	5'-11 7/8"	2'-7 11/16"	3'-0 1/4"	10"
NC8407	9'-1 11/16"	7'-0 1/16"	2'-10 5/8"	4'-2"	10"
NC8409	9'-2 1/8"	8'-0"	2'-10 7/8"	4'-8"	10"



Model	Dimensions		
	B	C	E
NC8411	16'-1½"	7'-3 7/16"	4'-6"
NC8412	16'-1½"	8'-2½"	5'-5 15/16"
NC8413	19'-10 5/8"	7'-3 7/16"	4'-6"
NC8414	19'-10 5/8"	8'-2½"	5'-5 15/16"

NOTE

1 **Use this bulletin for preliminary layouts only.** Obtain current drawings from your Marley sales representative.
2 All external piping loads, including weight, thrust and lateral loads of riser and horizontal piping plus the weight of water in the internal riser must be supported independent of the tower. Internal riser adds additional vertical operating loads to external piping at the bottom inlet flange.
3 All piping and supports beyond the inlet connection–and their design–are by others.
4 Allow adequate clearance for entry to tower access doors and safe use of optional ladder. Refer to appropriate Marley drawings.
5 You may choose either a bottom inlet connection or a side inlet connection. The bottom inlet connects at the tower collection basin floor. Refer to appropriate Marley drawings.
6 Contact your Marley sales representative for the required pump head for single-inlet applications.
7. Weight of internal piping must be added to tower weights. Contact your Marley sales representative for combined tower weight information.

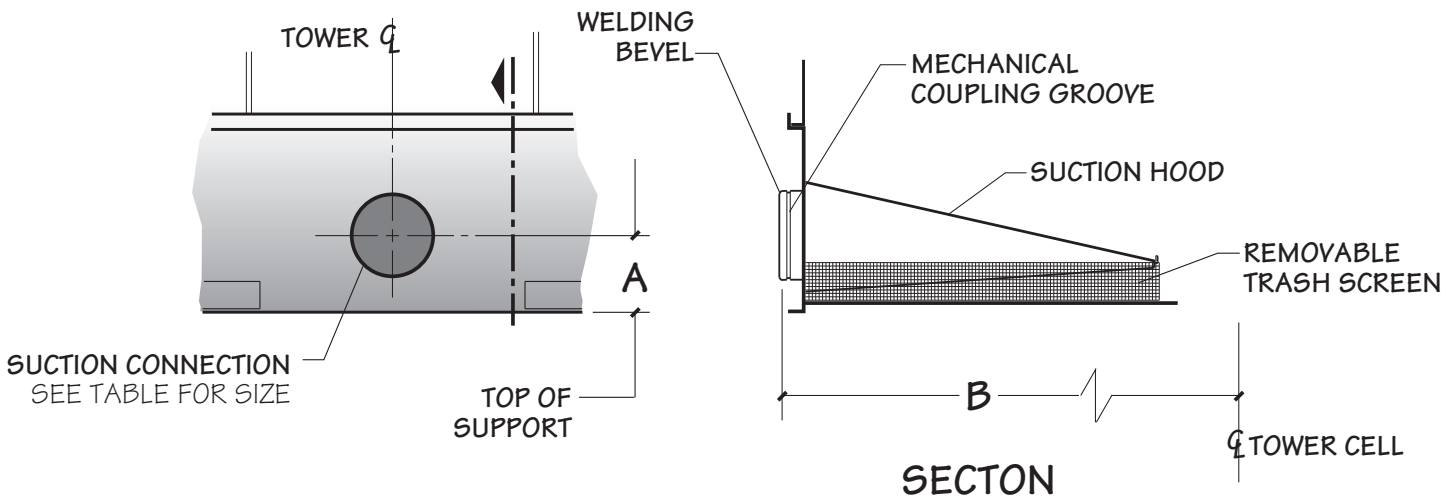


DRAIN AND OVERFLOW CONNECTION
OPTION

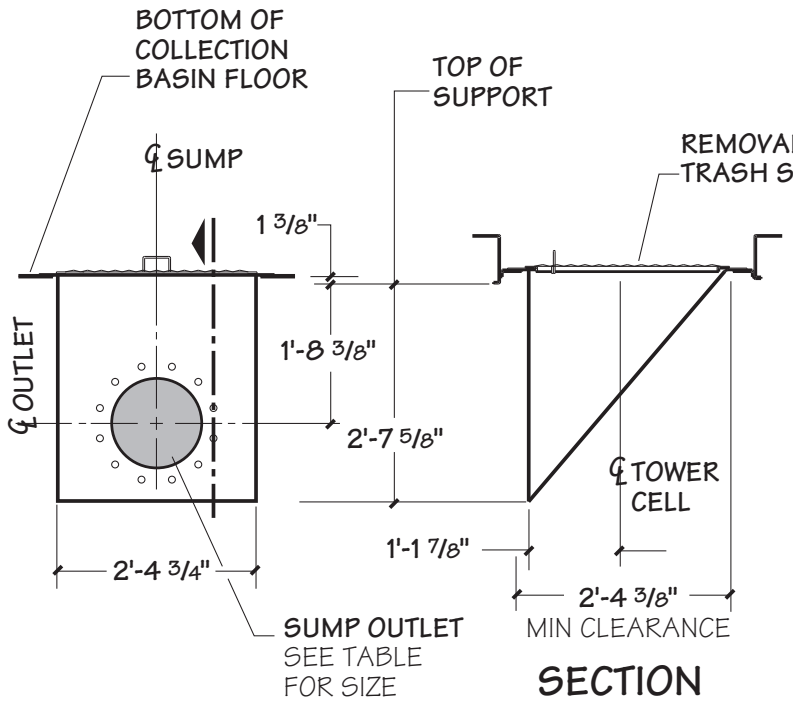
Model	Dimensions		
	A	B	C
NC8401	10"	3'-4 1/8"	8 1/8"
NC8402	10"	4'-3 3/8"	8 1/8"
NC8403	11 1/4"	4'-3 3/8"	10 3/16"
NC8405	11 1/4"	5'-0 3/8"	10 3/16"
NC8407	11 1/4"	6'-0 3/8"	10 3/16"
NC8409	11 1/4"	7'-0 3/8"	10 3/16"
NC8411	11 1/4"	6'-0 3/8"	11 15/16"
NC8412	11 1/4"	7'-0 3/8"	11 15/16"
NC8413	11 1/4"	6'-0 3/8"	11 15/16"
NC8414	11 1/4"	7'-0 3/8"	11 15/16"

NOTE

Standard overflow is a 4" dia. standpipe in the collection basin floor. The standpipe removes for flush-out and draining.

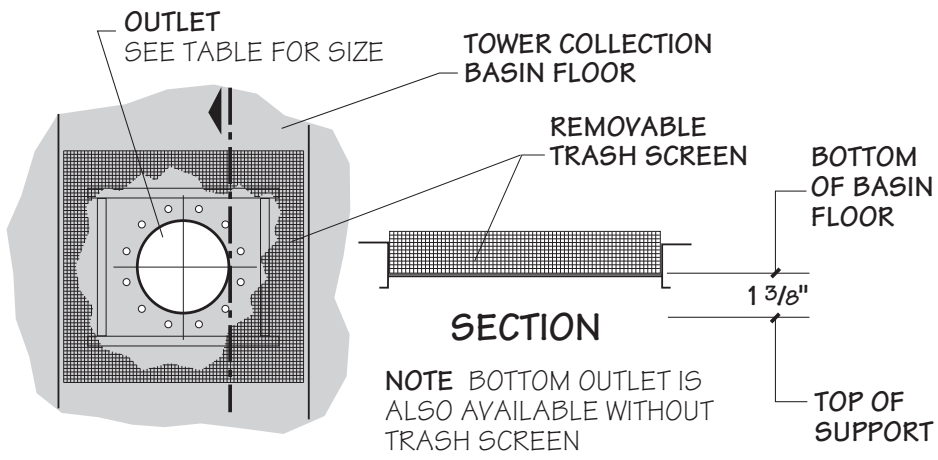


CASED-FACE OUTLET CONNECTION



DEPRESSED SIDE-OUTLET SUMP CONNECTION

STAINLESS STEEL OR FRP

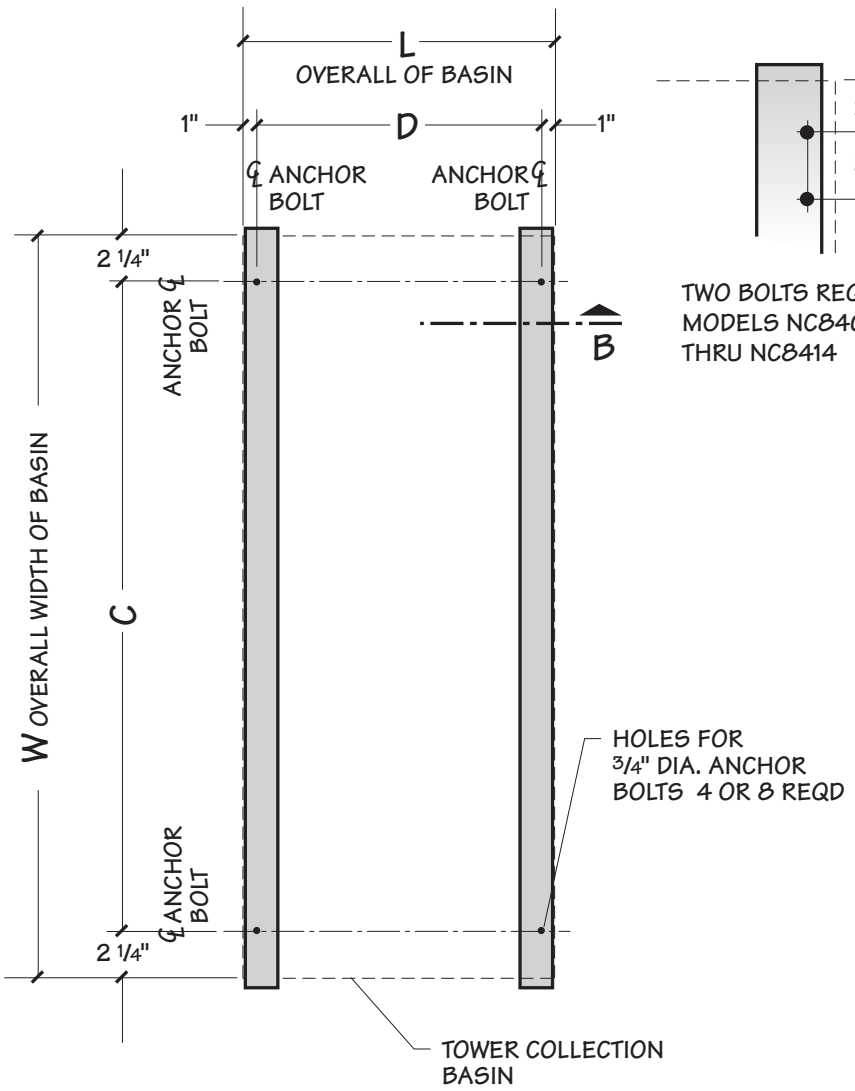


BOTTOM OUTLET CONNECTION

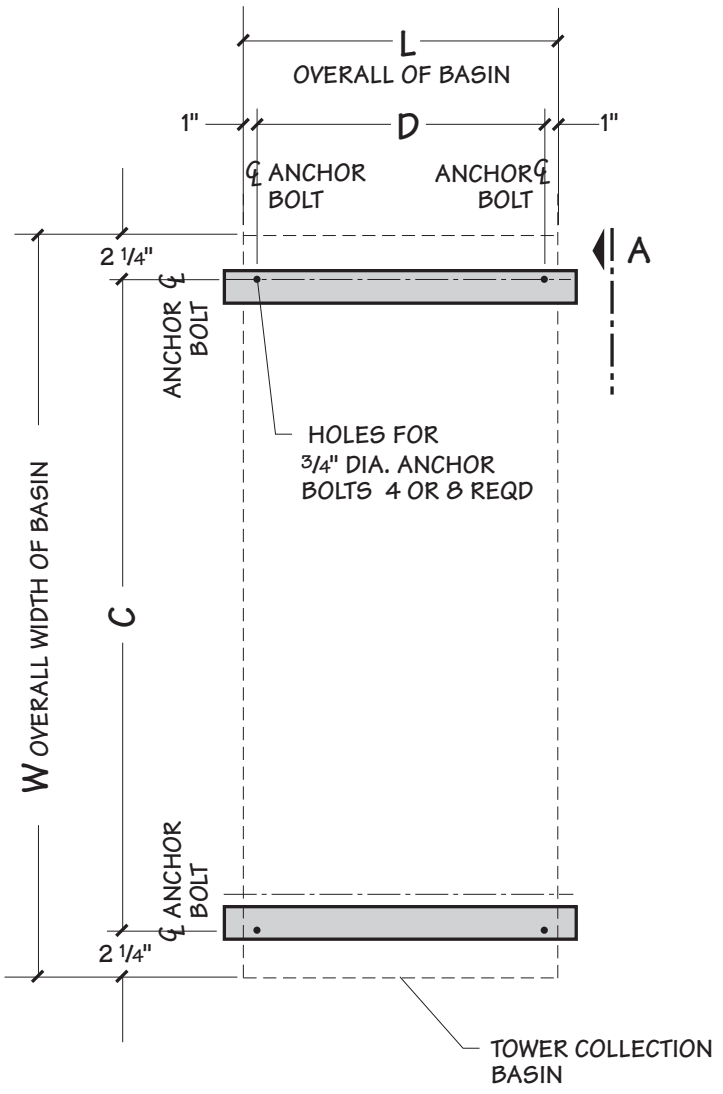
Maximum GPM Per Outlet Diameter											
Outlet Type	**Flow Type**	**Model**	**Outlet Diameter**								
			4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
Bottom	pump flow w/ anti-vortex plate or gravity flow w/ or w/o anti-vortex plate	NC8401 thru NC8405	157	355	630	993	1413	1729	2285	2509	3322	4019
		NC8407 thru NC8414	167	380	673	1061	1510	1848	2442	3164	3829	4896
	pump flow w/o anti-vortex plate	NC8401 thru NC8414	71	162	287	453	644	788	1042	1349	1676	2433
Sump	pump flow w/ anti-vortex plate or gravity flow w/ or w/o anti-vortex plate	NC8401 thru NC8405		900	1595	2515	3578	4284				
		NC8407 thru NC8414		900	1595	2515	3578	4379				
	pump flow w/o anti-vortex plate	NC8401 thru NC8414		630	1116	1761	2505	3065				
cased-face outlet	pump flow only	NC8401 thru NC8405		900	1595	2515	3578					
		NC8407 thru NC8414		900	1595	2515	3578	4379				

NOTE

- Flow rate may be limited by the maximum GPM for unit size.
- For gravity-flow situations (as to an indoor tank), use bottom outlet or depressed side outlet sump. Cased-face outlet is not recommended for gravity flow.
- GPM limits are the outlet capacities per outlet based on the design operating water level–8½" above the top of support on models NC8401 through NC8405–9½" on NC8407 thru NC8414.

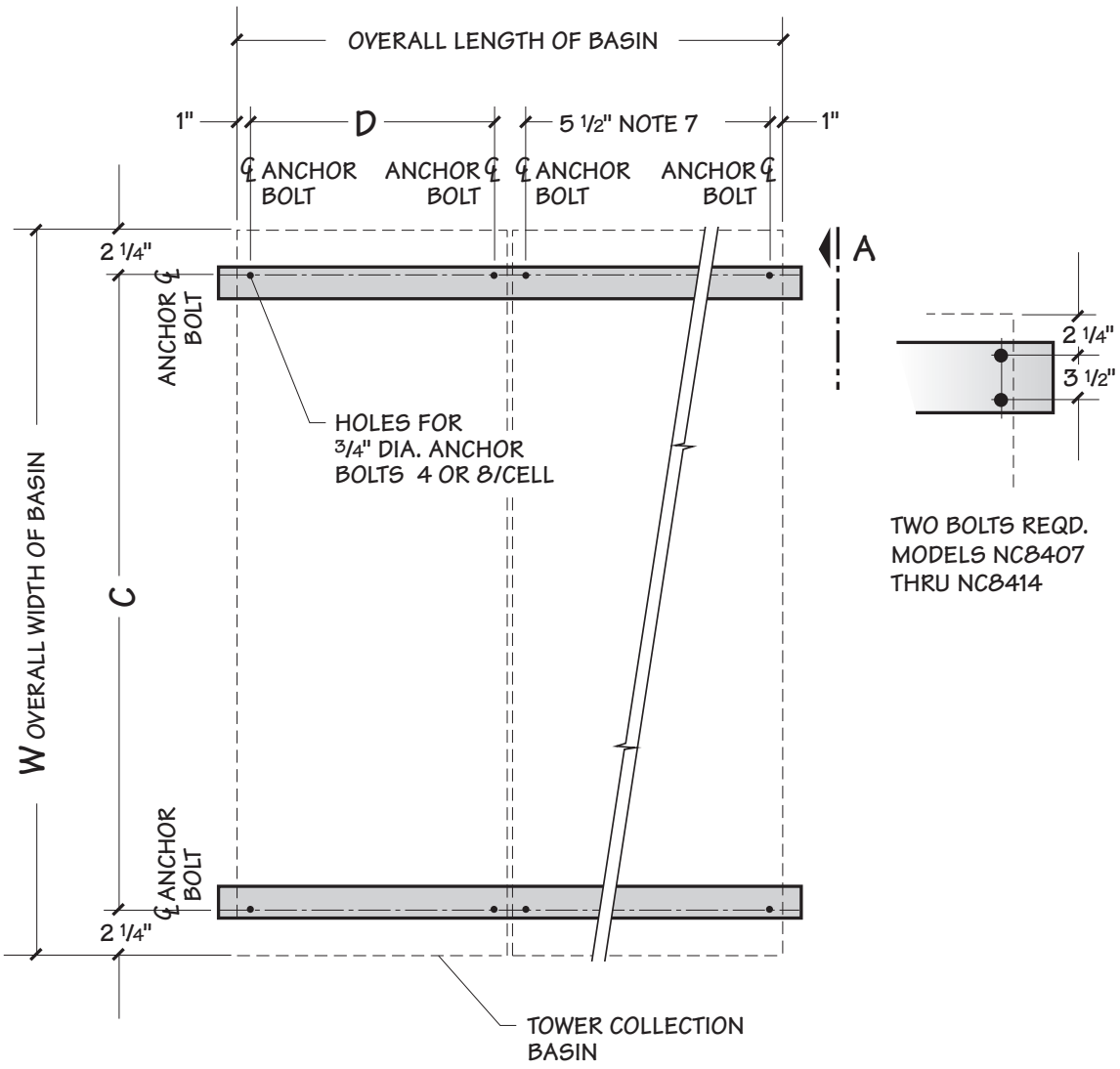


SUPPORTING STEEL
SINGLE CELL



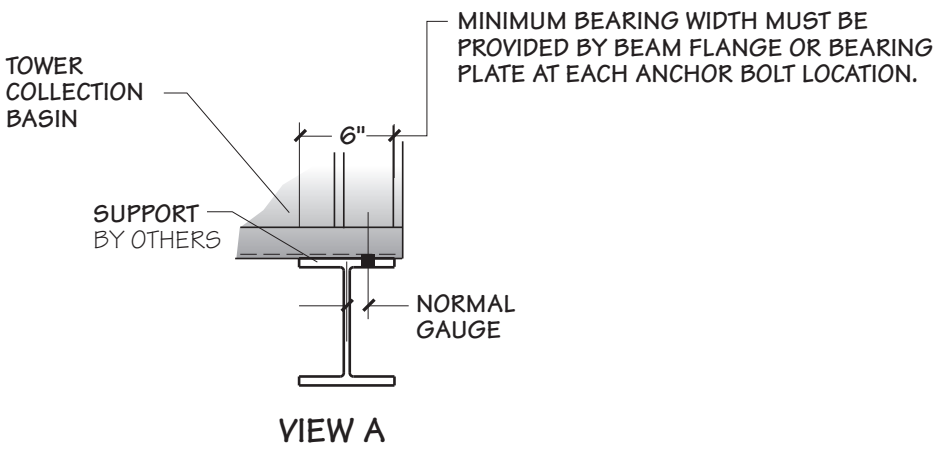
SUPPORTING STEEL ALTERNATE
SINGLE CELL

Model	Dimensions				Design Operating Weight/Cell lb	Design Operating Load at Anchor lb	Wind **p** and Seismic **g** Loads lb note 4			
							Max Vertical Reaction at Anchor		Max Horizontal Reaction at Anchor	
	W	**L**	**C**	**D**						
NC8401	12'-10"	6'-6¼"	12'-5½"	6'-4¼"	8488	2122	48.41 x **p**	3023 x **g**	31.41 x **p**	2121 x **g**
NC8402	14'-2"	8'-4¾"	13'-9½"	8'-2¾"	11184	2796	41.26 x **p**	2960 x **g**	34.68 x **p**	2817 x **g**
NC8403	18'-2"	8'-4¾"	17'-9½"	8'-2¾"	16772	4193	72.72 x **p**	5145 x **g**	52.13 x **p**	3986 x **g**
NC8405	19'-11"	9'-10¾"	19'-6½"	9'-8¾"	20690	5172	67.43 x **p**	5184 x **g**	57.16 x **p**	4973 x **g**
NC8407	21'-0"	11'-10¾"	20'-7½"	11'-8¾"	26879	6720	58.98 x **p**	5247 x **g**	60.26 x **p**	6222 x **g**
NC8409	22'-5"	13'-10¾"	22'-0½"	13'-8¾"	32592	8148	53.79 x **p**	5057 x **g**	64.33 x **p**	6686 x **g**
NC8411	22'-5"	11'-10¾"	22'-0½"	11'-8¾"	39331	9833	160.70 x **p**	16812 x **g**	102.78 x **p**	10151 x **g**
NC8412	22'-5"	13'-10¾"	22'-0½"	13'-8¾"	45453	11363	137.29 x **p**	14372 x **g**	102.78 x **p**	10533 x **g**
NC8413	22'-5"	11'-10¾"	22'-0½"	11'-8¾"	44581	11145	233.33 x **p**	23262 x **g**	123.85 x **p**	11602 x **g**
NC8414	22'-5"	13'-10¾"	22'-0½"	13'-8¾"	51501	12875	199.34 x **p**	20176 x **g**	123.85 x **p**	12143 x **g**
NC Models with Velocity Recovery Cylinder										
NC8407	21'-0"	11'-10¾"	20'-7½"	11'-8¾"	27044	6761	73.88 x **p**	5439 x **g**	66.51 x **p**	6260 x **g**
NC8409	22'-5"	13'-10¾"	22'-0½"	13'-8¾"	32888	8222	69.06 x **p**	5277 x **g**	71.83 x **p**	6760 x **g**
NC8411	22'-5"	11'-10¾"	22'-0½"	11'-8¾"	39515	9879	185.13 x **p**	17002 x **g**	109.65 x **p**	10197 x **g**
NC8412	22'-5"	13'-10¾"	22'-0½"	13'-8¾"	45749	11437	160.06 x **p**	14558 x **g**	110.28 x **p**	10606 x **g**
NC8413	22'-5"	11'-10¾"	22'-0½"	11'-8¾"	44764	11191	262.17 x **p**	23482 x **g**	130.72 x **p**	11648 x **g**
NC8414	22'-5"	13'-10¾"	22'-0½"	13'-8¾"	51895	12974	226.22 x **p**	20392 x **g**	131.35 x **p**	12251 x **g**

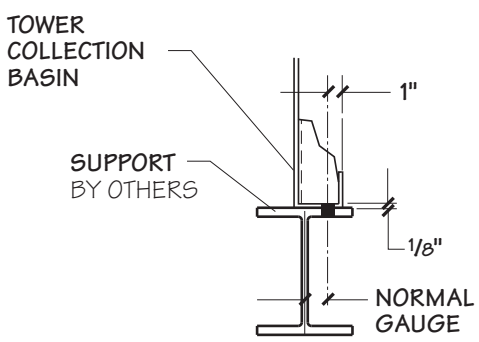


SUPPORTING STEEL

MULTICELL



VIEW A



SECTION B

NOTE

1 **Use this bulletin for preliminary layouts only.** Obtain current drawings from your Marley sales representative for final design.
2 Purchaser to provide tower support complete with holes and anchor bolts. Do not use studs! Anchor points must be framed flush and level at top.
3 Design operating weight occurs with collection basin full to overflow level. Actual operating weight varies with GPM and piping scheme.
4 Wind reactions can be calculated by multiplying by **p**, which is the wind pressure in psf. Seismic reactions can be calculated by design **g**. Wind loads are additive to operating loads.
5 Tower may be placed on a flat concrete slab. Side outlet and optional side drain and overflow must be specified. See pages 13 and 18 and consult your Marley sales representative.
6 Tower may be supported from piers at each anchor bolt location, as a support alternative.
7. Dimensions between anchor bolts may vary depending on the number of cells and options. Dimensions shown are for a standard two cell arrangement. Obtain current drawings from your Marley sales representative for final dimension.

When the ambient air temperature falls below 32°F, the water in a cooling tower can freeze. *Marley Technical Report #H-003* "Operating Cooling Towers in Freezing Weather" describes how to prevent freezing during operation. Available at spxcooling.com or ask your Marley sales representative for a copy.

During shutdown, water collects in the cold water basin and may freeze solid. You can prevent freezing by adding heat to the water left in the tower—or, you can drain the tower and all exposed pipework at shutdown.

Electric Basin Heaters

An automatic basin water heater system is available consisting of the following components:

- Stainless steel electric immersion heater(s).

  —Threaded couplings are provided in the side of the collection basin.

- NEMA 4 enclosure containing:

  —Magnetic contactor to energize heater.

  —Transformer to convert power supply to 24 volts for control circuit.

  —Solid state circuit board for temperature and low-water cutoff.

  Enclosure may be mounted on the side of the tower.

- Control probe in the collection basin to monitor water temperature and level.

Heater components are normally shipped separately for installation by others.

Note: any exposed piping that is still filled with water at shutdown—including the makeup water line—should be electrically traced and insulated (by others).

Steam Jet Basin Heaters

Penberthy Houdaille bronze steam jet heaters (¼" to ¾") are available for freeze protection (installation by others). Injectors install in a coupling provided in the side of the collection basin. Live steam, as required, is injected directly into the water. Condensed steam adds water to the basin, and the excess will exit the overflow of the tower.

Indoor Storage Tank

With this type of system, water flows from an indoor tank, through the load system, and back to the tower, where it is cooled. The cooled water flows by gravity from the tower to the tank located in a heated space. At shutdown, all exposed water drains into the tank, where it is safe from freezing.

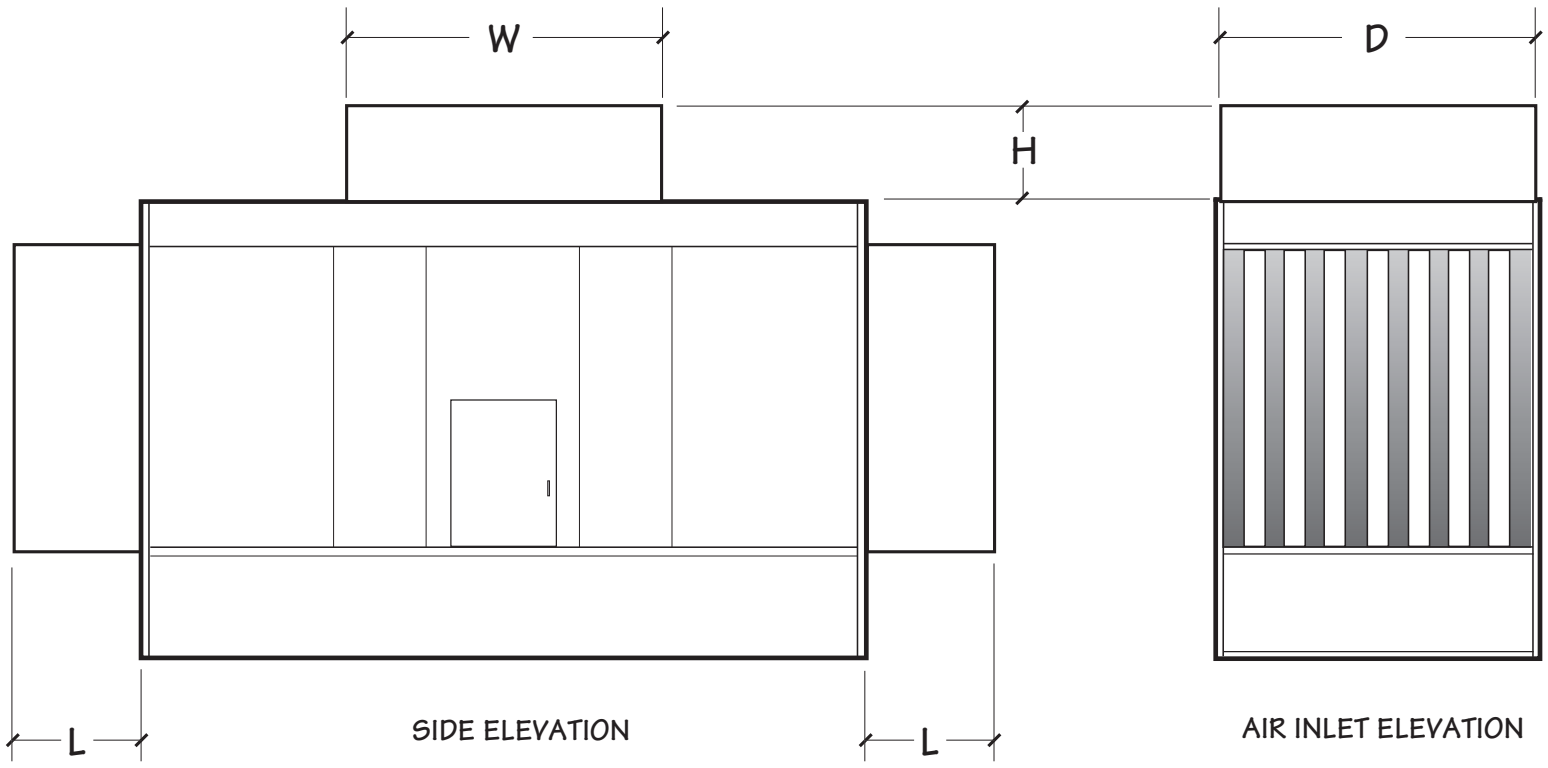
The table on page 23 lists typical drain-down capacities for all NC Class tower models. Although we do not produce tanks, many of our representatives offer tanks supplied by reputable manufacturers.

The amount of water needed to successfully operate the system depends on the tower size and GPM and on the volume of water contained in the piping system to and from the tower. You must select a tank large enough to contain those combined volumes—plus a level sufficient to maintain a flooded suction on your pump. Control makeup water according to the level where the tank stabilizes during operation.

NC Drain-Down Capacity					
Model	Range of Tower Design GPM	Drain Down Maximum Gallons	Model	Range of Tower Design GPM	Drain Down Maximum Gallons
NC8401	132-280	371	**NC8409**	481-1200	1673
	290-450	402		1210-1800	1769
	460-620	421		1810-2400	1877
	630-780	442		2410-3000	1910
	790-919	457		3010-3565	1993
NC8402	183-380	508	**NC8411**	410-1300	1763
	390-590	537		1310-2000	1974
	600-800	568		2010-2700	2128
	810-1010	590		2710-3300	2216
	920-1200	606		3310-4049	2360
NC8403	285-700	811	**NC8412**	481-1400	2050
	710-1030	877		1410-2200	2231
	1040-1390	925		2210-3000	2422
	1400-1700	960		3010-3800	2571
	1710-2113	1009		3810-4753	2770
NC8405	337-810	969	**NC8413**	410-1200	1919
	820-1230	1041		1210-1900	2124
	1240-1610	1120		1910-2600	2331
	1620-2030	1173		2610-3300	2494
	2040-2509	1211		3310-4049	2672
NC8407	410-1000	1320	**NC8414**	481-1400	2244
	1010-1500	1424		1410-2200	2471
	1510-2000	1493		2210-3000	2711
	2010-2500	1542		3010-3900	2940
	2510-3037	1614		3910-4753	3137

NOTE

Volumes shown are maximums for the GPM ranges indicated. Actual volumes will usually be less. Contact your Marley sales representative for more specific information.



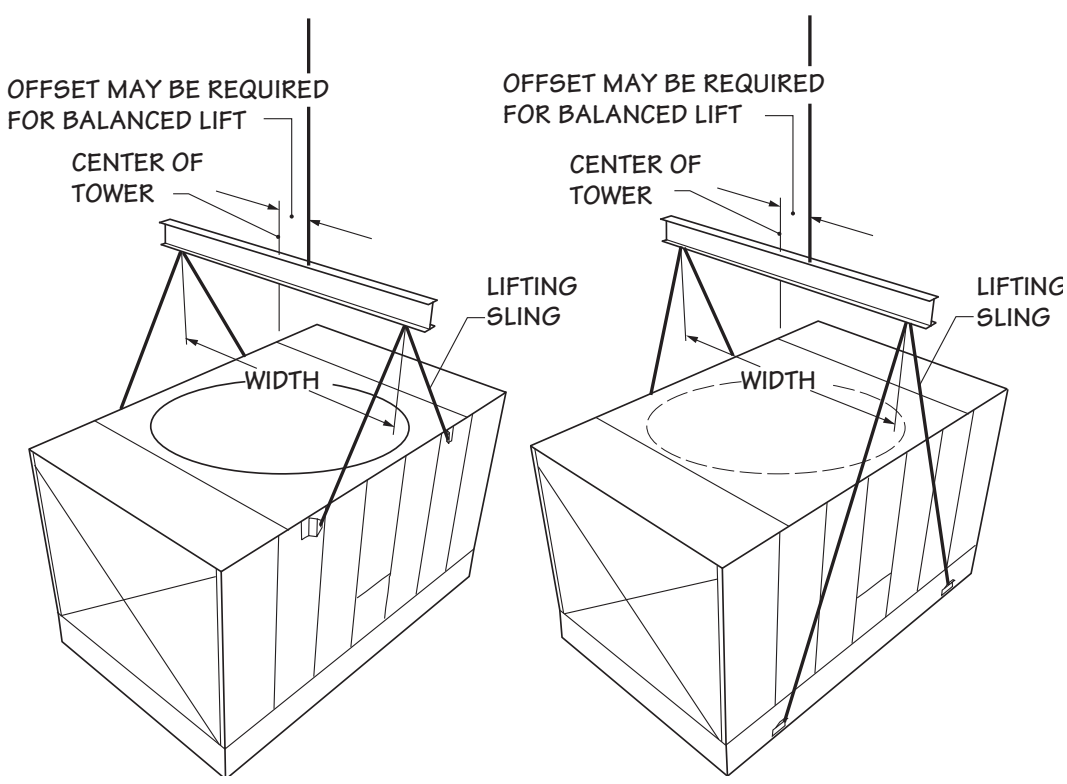
SIDE ELEVATION

AIR INLET ELEVATION

Model	Dimensions				Add To Design Operating Weight lb	
	L	W	D	H	Discharge Attenuator	Inlet Attenuators
NC8401	2'-3¼"	6'-10"	6'-1½"	2'-3"	620	1523
	4'-6½"	6'-10"	6'-1½"	4'-6"	1241	3045
NC8402	2'-3¼"	7'-10¼"	8'-0"	2'-3"	774	1869
	4'-6½"	7'-10¼"	8'-0"	4'-6"	1547	3738
NC8403	2'-3¼"	7'-10¼"	8'-0"	2'-3"	774	2101
	4'-6½"	7'-10¼"	8'-0"	4'-6"	1547	4201
NC8405	2'-3¼"	9'-9"	9'-6"	2'-3"	1051	2460
	4'-6½"	9'-9"	9'-6"	4'-6"	2102	4920
NC8407	2'-3¼"	10'-8⅜"	11'-6"	2'-3"	1395	3115
	4'-6½"	10'-8⅜"	11'-6"	4'-6"	2791	6231
NC8409	2'-3¼"	12'-9⅜"	13'-6"	2'-3"	1616	3508
	4'-6½"	12'-9⅜"	13'-6"	4'-6"	3233	7016
NC8411	2'-3¼"	11'-8⅞"	11'-6"	2'-3"	1564	5562
	4'-6½"	11'-8⅞"	11'-6"	4'-6"	3128	11125
NC8412	2'-3¼"	12'-9⅜"	13'-6"	2'-3"	1616	6272
	4'-6½"	12'-9⅜"	13'-6"	4'-6"	3233	12545
NC8413	2'-3¼"	11'-8⅞"	11'-6"	2'-3"	1564	6417
	4'-6½"	11'-8⅞"	11'-6"	4'-6"	3128	12834
NC8414	2'-3¼"	12'-9⅜"	13'-6"	2'-3"	1616	7051
	4'-6½"	12'-9⅜"	13'-6"	4'-6"	3233	14103

NOTE

1 **Use this bulletin for preliminary layouts only.** Obtain current drawings from your Marley sales representative. All table data is per cell.
2 Attenuators are field installed by others with hardware provided by Marley
3 Attenuators are supported by the tower. Additional support not required.
4 Discharge attenuators are not available for NC models with velocity recovery cylinders.



Model	Width	Minimum Sling Length
NC8401	6'-7"	6'-0"
NC8402	8'-6"	6'-0"
NC8403	8'-6"	8-0"
NC8405	10'-0"	8'-0"
NC8407	12'-0"	9'-0"
NC8409	14-0"	18'-0"
NC8411 Top	12'-0"	9'-0"
NC8411 Bottom	12'-0"	18'-0"
NC8412 Top	14'-0"	9'-0"
NC8412 Bottom	14'-0"	18'-0"
NC8413 Top	12'-0"	9'-0"
NC8413 Bottom	12'-0"	18'-0"
NC8414 Top	14'-0"	9'-0"
NC8414 Bottom	14'-0"	18'-0"

NOTE

- All hoisting clip holes are 1¼".
- On multicell tower installations, overall length of shackle pins should not exceed 5¼".
- For overhead lifts or where additional safety is required, add slings beneath the tower unit.

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SPX®

[redacted]

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Appendix 4.4.1i Catalogue for NCC

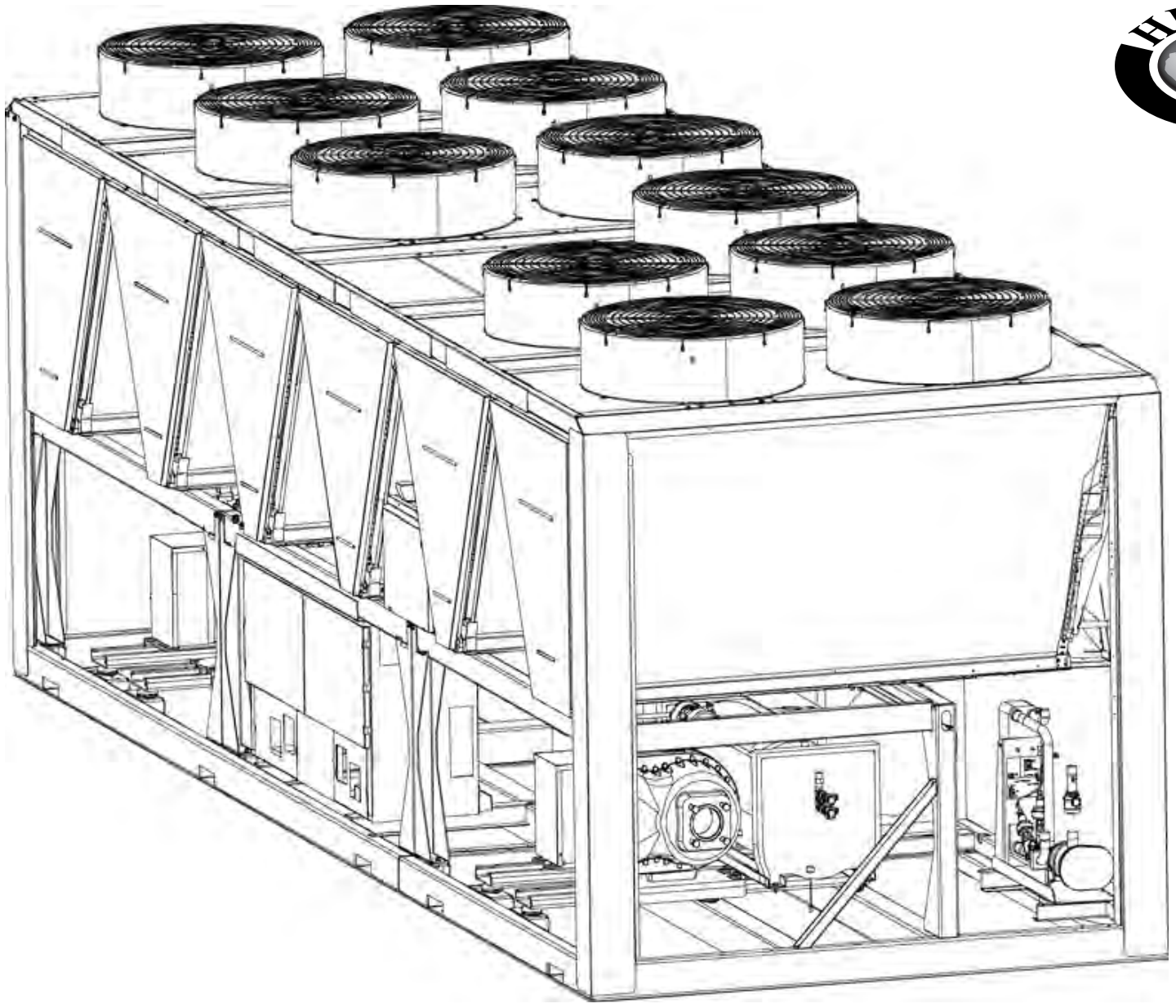
30XA
Air-Cooled Liquid Chillers

Nominal cooling capacity: 270-1670 kW

50 Hz

AQUAFORCE™

HFC-134a



Installation, operation and maintenance instructions

LLOYD'S REGISTER QUALITY ASSURANCE · ISO9001

UKAS QUALITY MANAGEMENT 001

Quality Management System Approval

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The cover photograph is for illustrative purposes only and is not part of any offer for sale or contract.

1 - INTRODUCTION

The 30XA Aquaforce units are designed to cool water for the air conditioning of buildings and industrial procsses.

Prior to the initial start-up of the 30XA units, the people involved in the on-site installation, start-up, operation, and maintenance of this unit should be thoroughly familiar with these instructions and the specific project data for the installation site.

The 30XA liquid chillers are designed to provide a very high level of safety during installation, start-up, operation and maintenance. They will provide safe and reliable service when operated within their application range.

This manual provides the necessary information to familiarize yourself with the control system before performing start-up procedures. The procedures in this manual are arranged in the sequence required for machine installation, start-up, operation and maintenance.

Always ensure that all required safety measures are followed, including those in this document, such as: wearing protective clothing (gloves, shoes) and safety glasses, using appropriate tools, employing qualified and skilled technicians (electricians, refrigeration engineers) and following local regulations. These units comply with the requirements of the European machine safety, electromagnetic compatibility, pressurised equipment and low voltage directives.

1.1 - Installation safety considerations

Access to the unit must be reserved to authorised personnel, qualified and trained in monitoring and maintenance. The access limitation device must be installed by the customer (e.g. cut-off, enclosure).

After the unit has been received, when it is ready to be installed or reinstalled, and before it is started up, it must be inspected for damage. Check that the refrigerant circuit(s) is (are) intact, especially that no components or pipes have shifted (e.g. follow-ing a shock). If in doubt, carry out a leak tightness check and verify with the manufacturer that the circuit integrity has not been impaired. If damage is detected upon receipt, immediately file a claim with the shipping company.

Carrier strongly recommends employing a specialised company to unload the machine.

Do not remove the skid or the packaging until the unit is in its final position. These units can be moved with a fork lift truck, as long as the forks are positioned in the right place and direction on the unit.

The units can also be lifted with slings, using only the designated lifting points marked on the unit.

These units are not designed to be lifted from above. Use slings with the correct capacity, and always follow the lifting instructions on the certified drawings supplied with the unit.

Safety is only guaranteed, if these instructions are carefully followed. If this is not the case, there is a risk of material deterioration and injuries to personnel.

Never cover any safety devices.

This applies to the relief valve in the water circuit and the relief valve(s) in the refrigerant circuit(s).

Ensure that the valves are correctly installed, before operating the unit.

In certain cases the relief valves are installed on isolating valves. These valves are factory-supplied lead-sealed in the open position. This system permits isolation and removal of the relief valves for checking and replacing. The relief valves are designed and installed to ensure protection against overpressure caused by fire.

The relief valve must only be removed when the fire risk is fully controlled and this is the responsibility of the operator.

All factory-installed relief valves are lead-sealed to prevent any calibration change. If the relief valves are installed on a change-over manifold, this is equipped with a relief valve on each of the two outlets. Only one of the two relief valves is in operation, the other one is isolated. Never leave the change-over valve in the intermediate position, i.e. with both ways open (locate the control element in the stop position). If a relief valve is removed for checking or replacement please ensure that there is always an active relief valve on each of the change-over valves installed in the unit.

If the unit is installed in a room, the safety valves must be connected to discharge pipes. These pipes must be installed in a way that ensures that people and property are not exposed to refrigerant leaks. These fluids may be diffused in the air, but far away from any building air intake, or they must be discharged in a quantity that is appropriate for a suitably absorbing environment.

Periodic check of the relief valves: See paragraph "Maintenance safety considerations".

Provide a drain in the discharge circuit, close to each relief valve, to avoid an accumulation of condensate or rain water.

Ensure good ventilation, as accumulation of refrigerant in an enclosed space can displace oxygen and cause asphyxiation or explosions.

Inhalation of high concentrations of vapour is harmful and may cause heart irregularities, unconsciousness, or death. Vapour is heavier than air and reduces the amount of oxygen available for breathing. These products cause eye and skin irritation. Decomposition products are hazardous.

1.2 - Equipment and components under pressure

See section "10.2 - Pressure vessels".

1.3 - Maintenance safety considerations

Engineers working on the electric or refrigeration components must be authorized, trained and fully qualified to do so.

All refrigerant circuit repairs must be carried out by a trained person, fully qualified to work on these units. He must have been trained and be familiar with the equipment and the installation. All welding operations must be carried out by qualified specialists.

Any manipulation (opening or closing) of a shut-off valve must be carried out by a qualified and authorised engineer. These procedures must be carried out with the unit shut-down.

NOTE: The unit must never be left shut down with the liquid line valve closed, as liquid refrigerant can be trapped between this valve and the expansion device. (This valve is situated on the liquid line before the filter drier box.)

During any handling, maintenance and service operations the engineers working on the unit must be equipped with safety gloves, glasses, shoes and protective clothing.

Never work on a unit that is still energized.

Never work on any of the electrical components, until the general power supply to the unit has been cut using the disconnect switch(es) in the control box(es).

If any maintenance operations are carried out on the unit, lock the power supply circuit in the open position ahead of the machine.

If the work is interrupted, always ensure that all circuits are still deenergized before resuming the work.

ATTENTION: Even if the unit has been switched off, the power circuit remains energized, unless the unit or circuit disconnect switch is open. Refer to the wiring diagram for further details. Attach appropriate safety labels.

Operating checks: During the life-time of the system, inspection and tests must be carried out in accordance with national regulations.

The information on operating inspections given in annex C of standard EN278-2 can be used if no similar criteria exist in the national regulations.

While working in the fan area, especially when grilles or casings are removed, disconnect the fan power supply to prevent their automatic restart.

Safety device checks (annex C6 – EN378-2): The safety devices must be checked on site once a year for safety devices (high-pressure switches), and every five years for external overpressure devices (pressure relief valves).

Check manual "30XA Pro-Dialog Control" for a detailed explanation of the high-pressure switch test method.

At least once a year thoroughly inspect the protection devices (valves). If the machine operates in a corrosive environment, inspect the protection devices more frequently.

Regularly carry out leak tests and immediately repair any leaks.

Ensure regularly that the vibration levels remain acceptable and close to those at the initial unit start-up.

Before opening a refrigerant circuit, purge and consult the pressure gauges.

Change the refrigerant when there are equipment failures, following a procedure such as the one described in NFE 29-795 or carry out a refrigerant analysis in a specialist laboratory.

Plug all openings whenever the refrigerant circuit is opened for up to one day. For longer openings place a nitrogen charge in the circuit.

1.4 - Repair safety considerations

All installation parts must be maintained by the personnel in charge, in order to avoid material deterioration and injuries to people. Faults and leaks must be repaired immediately. The authorized technician must have the responsibility to repair the fault immediately. Each time repairs have been carried out to the unit, the operation of the safety devices must be re-checked.

Comply with the regulations and recommendations in unit and HVAC installation safety standards, such as: EN 378, ISO 5149, etc.

If a leak occurs or if the refrigerant becomes contaminated (e.g. by a short circuit in a motor) remove the complete charge using a recovery unit and store the refrigerant in mobile containers.

Repair the leak detected and recharge the circuit with the total R134a charge, as indicated on the unit name plate. Certain parts of the circuit can be isolated. Only charge liquid refrigerant R134a at the liquid line.

Ensure that you are using the correct refrigerant type before recharging the unit.

Charging any refrigerant other than the original charge type (R134a) will impair machine operation and can even lead to a destruction of the compressors. The compressors operating with this refrigerant type are lubricated with a synthetic polyolester oil.

Do not use oxygen to purge lines or to pressurize a machine for any purpose. Oxygen gas reacts violently with oil, grease, and other common substances.

Never exceed the specified maximum operating pressures. Verify the allowable maximum high- and low-side test pressures by checking the instructions in this manual and the pressures given on the unit name plate.

Do not use air for leak testing. Use only refrigerant or dry nitrogen.

Do not unweld or flamecut the refrigerant lines or any refrigerant circuit component until all refrigerant (liquid and vapour) has been removed from chiller. Traces of vapour should be displaced with dry air nitrogen. Refrigerant in contact with an open flame produces toxic gases.

The necessary protection equipment must be available, and appropriate fire extinguishers for the system and the refrigerant type used must be within easy reach.

Do not siphon refrigerant.

Avoid spilling liquid refrigerant on skin or splashing it into the eyes. Use safety goggles. Wash any spills from the skin with soap and water. If liquid refrigerant enters the eyes, immediately and abundantly flush the eyes with water and consult a doctor.

Never apply an open flame or live steam to a refrigerant container. Dangerous overpressure can result. If it is necessary to heat refrigerant, use only warm water.

During refrigerant removal and storage operations follow applicable regulations. These regulations, permitting conditioning and recovery of halogenated hydrocarbons under optimum quality conditions for the products and optimum safety conditions for people, property and the environment are described in standard NFE 29795.

Any refrigerant transfer and recovery operations must be carried out using a transfer unit. A 3/8" SAE connector on the manual liquid line valve is supplied with all units for connection to the transfer station. The units must never be modified to add refrigerant and oil charging, removal and purging devices. All these devices are provided with the units. Please refer to the certified dimensional drawings for the units.

Do not re-use disposable (non-returnable) cylinders or attempt to refill them. It is dangerous and illegal. When cylinders are empty, evacuate the remaining gas pressure, and move the cylinders to a place designated for their recovery. Do not incinerate.

Do not attempt to remove refrigerant circuit components or fittings, while the machine is under pressure or while it is running. Be sure pressure is at 0 kPa before removing components or opening a circuit.

Do not attempt to repair or recondition any safety devices when corrosion or build-up of foreign material (rust, dirt, scale, etc.) is found within the valve body or mechanism. If necessary, replace the device. Do not install safety valves in series or backwards.

ATTENTION: No part of the unit must use feet, racks or supports during operation. Periodically monitor and repair or if necessary replace any component or piping that shows signs of damage.

The refrigerant lines can break under the weight and release refrigerant, causing personal injury.

Do not climb on a machine. Use a platform, or staging to work at higher levels.

Use mechanical lifting equipment (crane, hoist, winch, etc.) to lift or move heavy components. For lighter components, use lifting equipment when there is a risk of slipping or losing your balance.

Use only original replacement parts for any repair or component replacement. Consult the list of replacement parts that corresponds to the specification of the original equipment.

Do not drain water circuits containing industrial brines, without informing the technical service department at the installation site or a competent body first.

Close the entering and leaving water shutoff valves and purge the unit water circuit, before working on the components installed on the circuit (screen filter, pump, water flow switch, etc.).

Do not loosen the water box bolts until the water boxes have been completely drained.

Periodically inspect all valves, fittings and pipes of the refrigerant and hydronic circuits to ensure that they do not show any corrosion or any signs of leaks.

It is recommended to wear ear defenders, when working near the unit and the unit is in operation.

2 - PRELIMINARY CHECKS

2.1 - Check equipment received

- Inspect the unit for damage or missing parts. If damage is detected, or if shipment is incomplete, immediately file a claim with the shipping company.
- Confirm that the unit received is the one ordered. Compare the name plate data with the order.
- The unit name plate must include the following information:
  - Version number
  - Model number
  - CE marking
  - Serial number
  - Year of manufacture and test date
  - Refrigerant used and refrigerant class
  - Refrigerant charge per circuit
  - Containment fluid to be used
  - PS: Min./max. allowable pressure (high and low pressure side)
  - TS: Min./max. allowable temperature (high and low pressure side)
  - Relief valve set pressure
  - Pressure switch cut-out pressure
  - Unit leak test pressure
  - Voltage, frequency, number of phases
  - Maximum current drawn
  - Maximum power input
  - Unit net weight

- Confirm that all accessories ordered for on-site installation have been delivered, and are complete and undamaged.

The unit must be checked periodically during its whole operating life to ensure that no shocks (handling accessories, tools etc.) have damaged it. If necessary, the damaged parts must be repaired or replaced. See also chapter "Maintenance".

2.2 - Moving and siting the unit

2.2.1 - Moving

See chapter 1.1 "Installation safety considerations".

2.2.2 - Siting the unit

Always refer to the chapter "Dimensions and clearances" to confirm that there is adequate space for all connections and service operations. For the centre of gravity coordinates, the position of the unit mounting holes, and the weight distribution points, refer to the certified dimensional drawing supplied with the unit.

The support points under the chassis must have at least the size of the chassis opening at the lifting point (minimum 220 x 180 mm) in order to prevent a deformation of the chassis.

Typical applications of these units are in refrigeration systems, and they do not require earthquake resistance. Earthquake resistance has not been verified.

CAUTION: Only use slings at the designated lifting points which are marked on the unit.

Before siting the unit check that:
- the permitted loading at the site is adequate or that appropriate strenghtening measures have been taken.
- the unit is installed level on an even surface (maximum tolerance is 5 mm in both axes).
- there is adequate space above the unit for air flow and to ensure access to the components.
- the number of support points is adequate and that they are in the right places.
- the location is not subject to flooding.
- for outdoor installations, where heavy snowfall is likely and long periods of sub-zero temperatures are normal, provision has to be made to prevent snow accumulating by raising the unit above the height of drifts normally experienced. Baffles may be necessary to deflect strong winds. They must not restrict air flow into the unit.

CAUTION: Before lifting the unit, check that all casing panels are securely fixed in place. Lift and set down the unit with great care. Tilting and jarring can damage the unit and impair unit operation.

If 30XA units are hoisted with rigging, it is advisable to protect coils against crushing while a unit is being moved. Use struts or spreader bar to spread the slings above the unit. Do not tilt a unit more than 15°.

WARNING: Never push or lever on any of the enclosure panels of the unit. Only the base of the unit frame is designed to withstand such stresses.

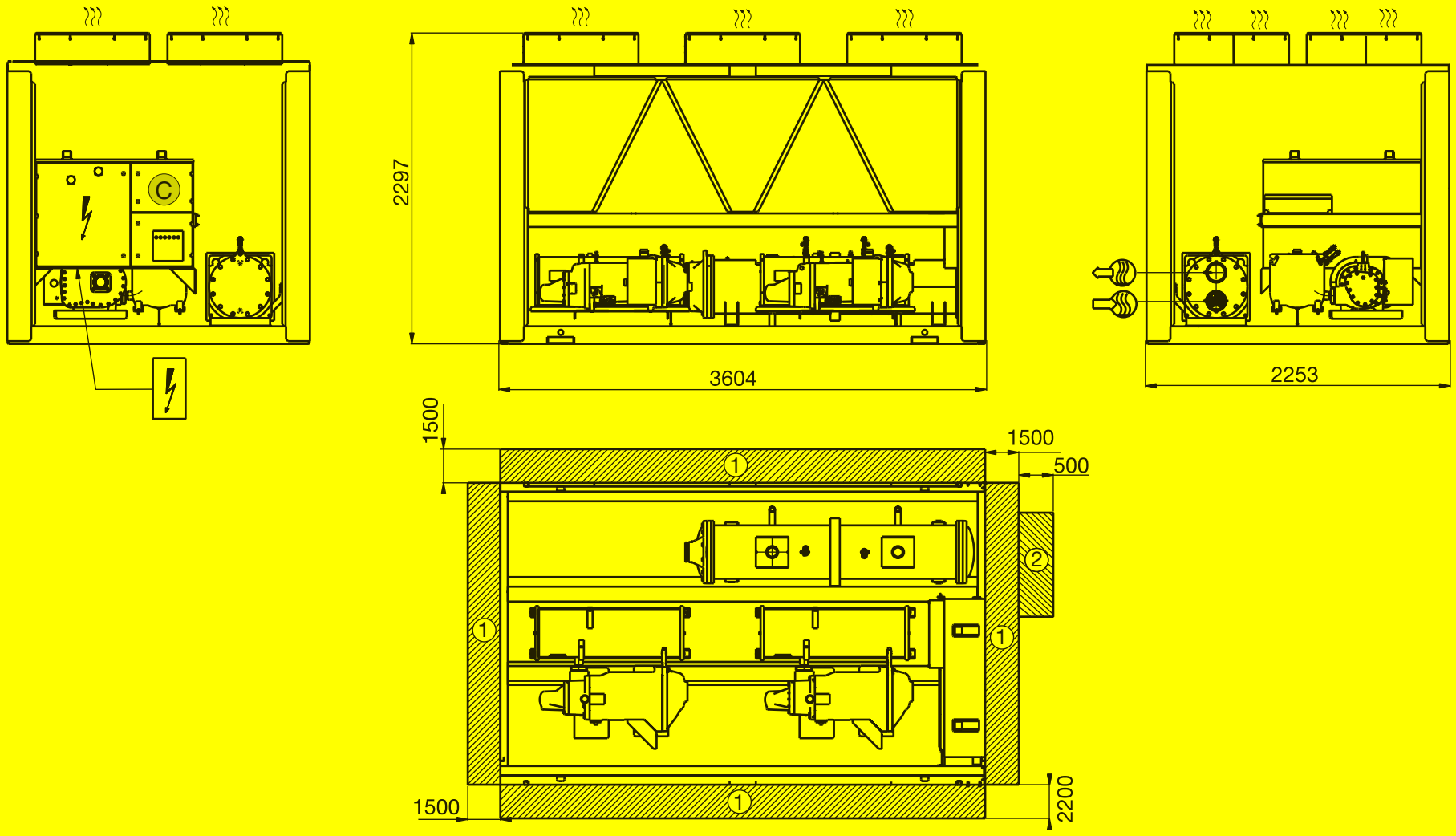
Checks before system start-up
Before the start-up of the refrigeration system, the complete installation, including the refrigeration system must be verified against the installation drawings, dimensional drawings, system piping and instrumentation diagrams and the wiring diagrams.

During the installation test national regulations must be followed. If no national regulation exists, paragraph 9-5 of standard EN 378-2 can be used as a guide.

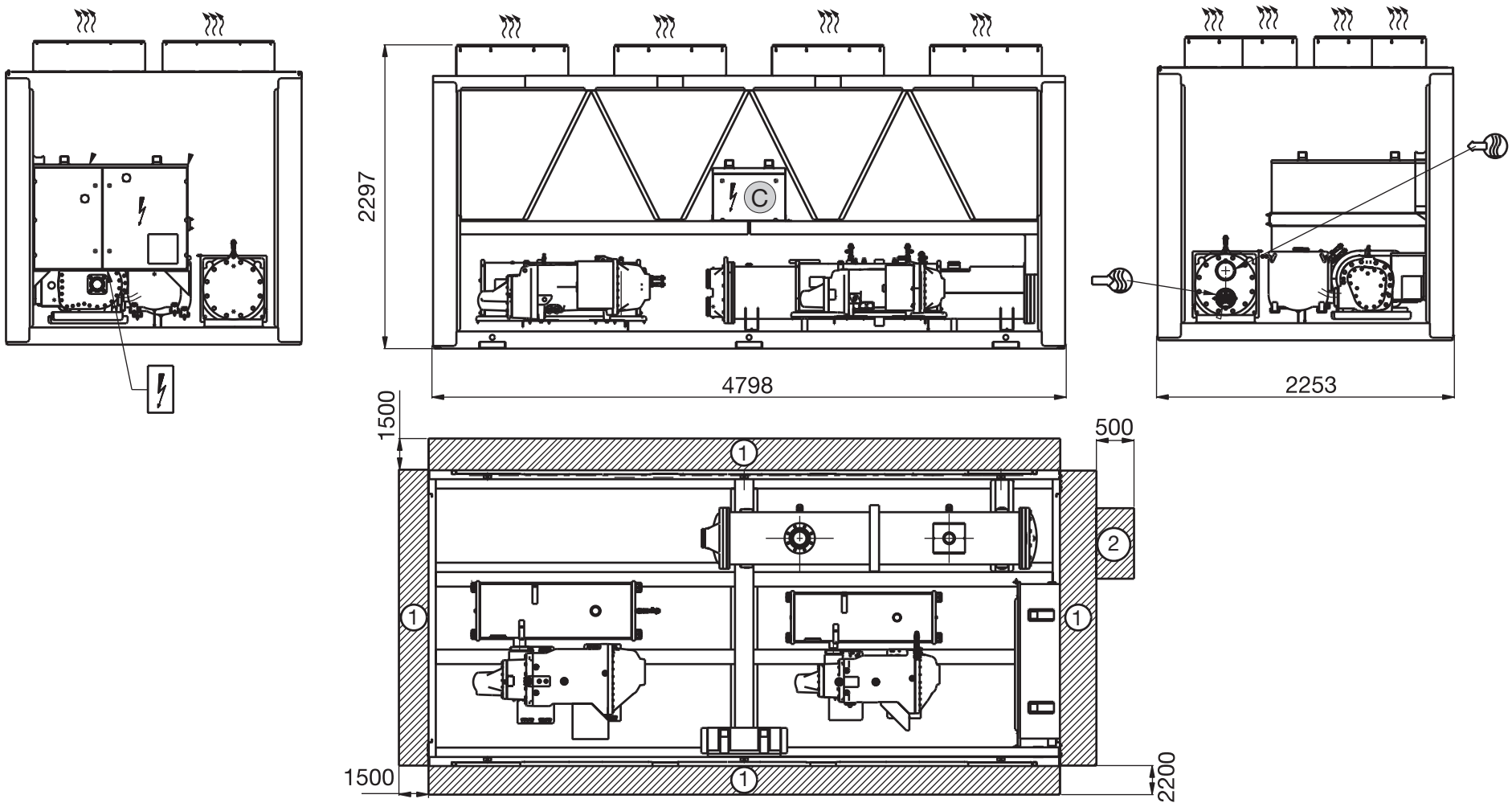
External visual installation checks:
- Compare the complete installation with the refrigeration system and power circuit diagrams.
- Check that all components comply with the design specifications.
- Check that all safety documents and equipments that are required by current European standards are present.
- Verify that all safety and environmental protection devices and arrangements are in place and comply with the current European standard.
- Verify that all relevant documents for pressure vessels (certificates, name plates, files, instruction manuals etc.) required by the current European standards are present.
- Verify the free passage of access and safety routes.
- Check that ventilation in the plant room is adequate.
- Check that refrigerant detectors are present.
- Verify the instructions and directives to prevent the deliberate removal of refrigerant gases that are harmful to the environment.
- Verify the installation of connections.
- Verify the supports and fixing elements (materials, routing and connection).
- Verify the quality of welds and other joints.
- Check the protection against mechanical damage.
- Check the protection against heat.
- Check the protection of moving parts.
- Verify the accessibility for maintenance or repair and to check the piping.
- Verify the status of the valves.
- Verify the quality of the thermal insulation and of the vapour barriers.

3 - DIMENSIONS, CLEARANCES

3.1 - 30XA 252-352 (standard) and 252-302 (option 254/255)



3.2 - 30XA 402-452 (standard) and 352-452 (option 254/255)



Legend:
All dimensions are given in mm.

(1) Required clearances for maintenance and air flow

(2) Recommended space for evaporator tube removal

Water inlet

Water outlet

Air outlet - do not obstruct

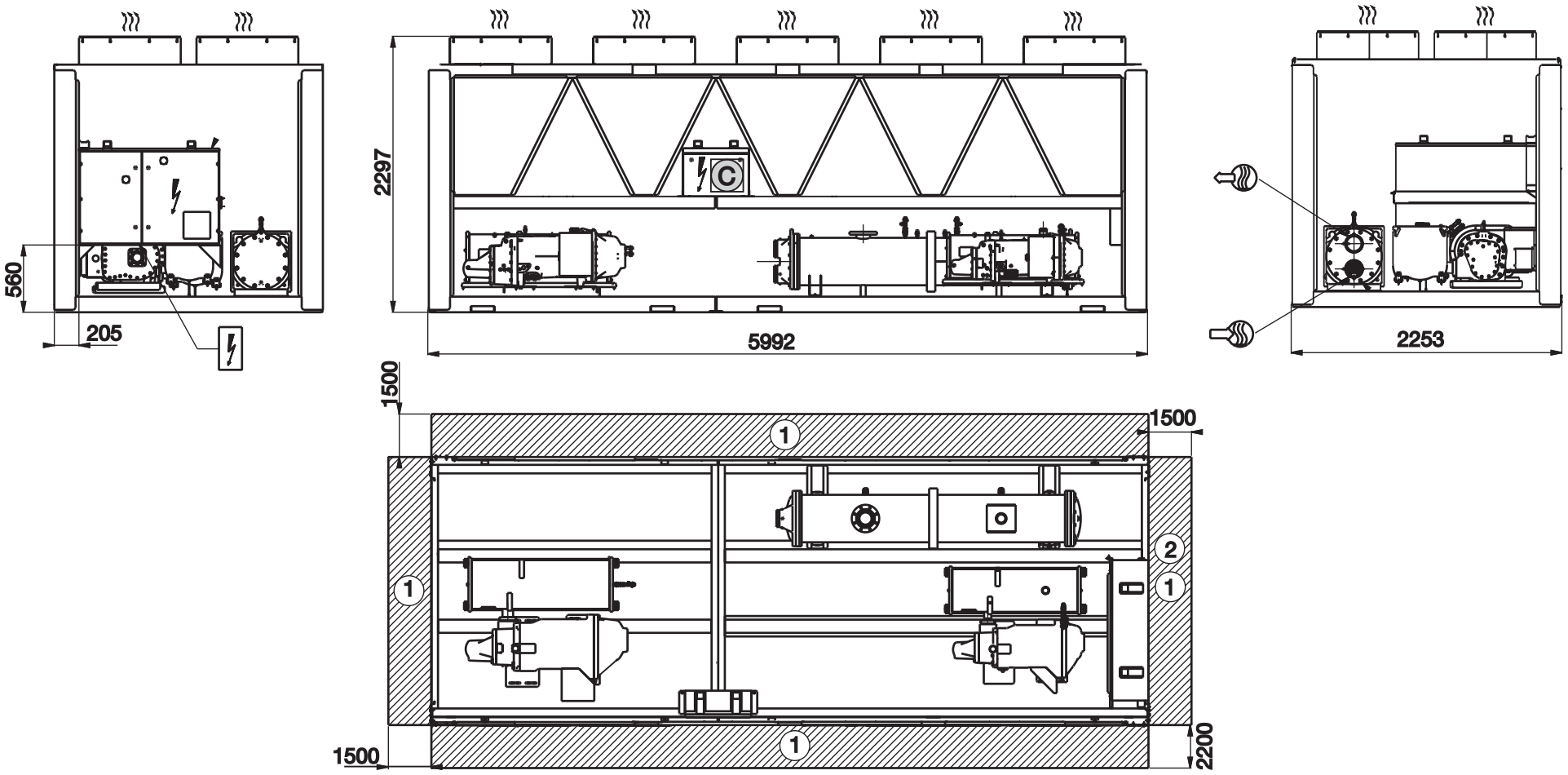
Power supply connection

(C) Control circuit connection

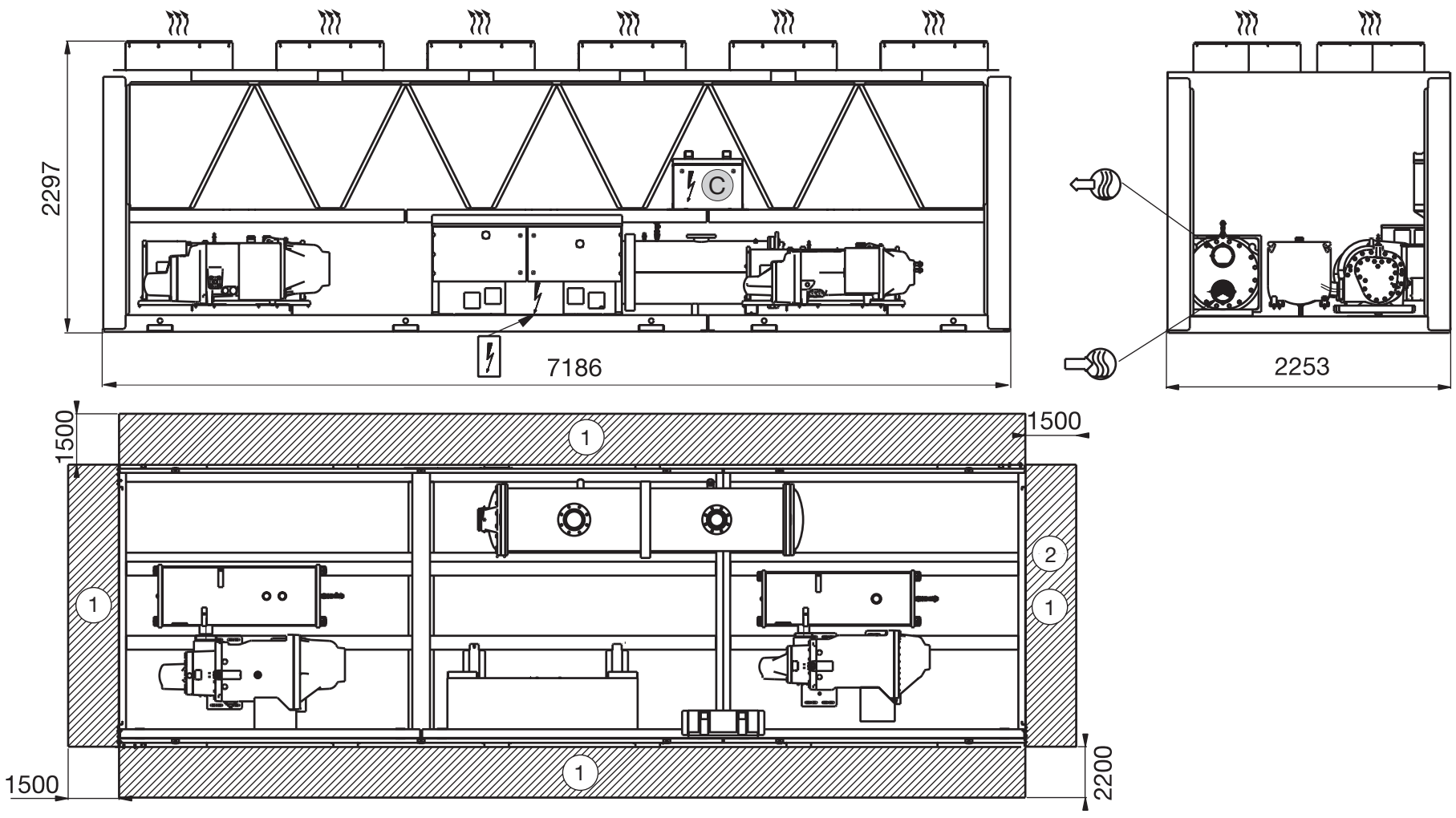
NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

3.3 - 30XA 502 (standard and option 254/255)



3.4 - 30XA 602-802 (standard) and 602-702 (option 254/255)



Legend:
All dimensions are given in mm.

(1) Required clearances for maintenance and air flow

(2) Recommended space for evaporator tube removal

Water inlet

Water outlet

Air outlet - do not obstruct

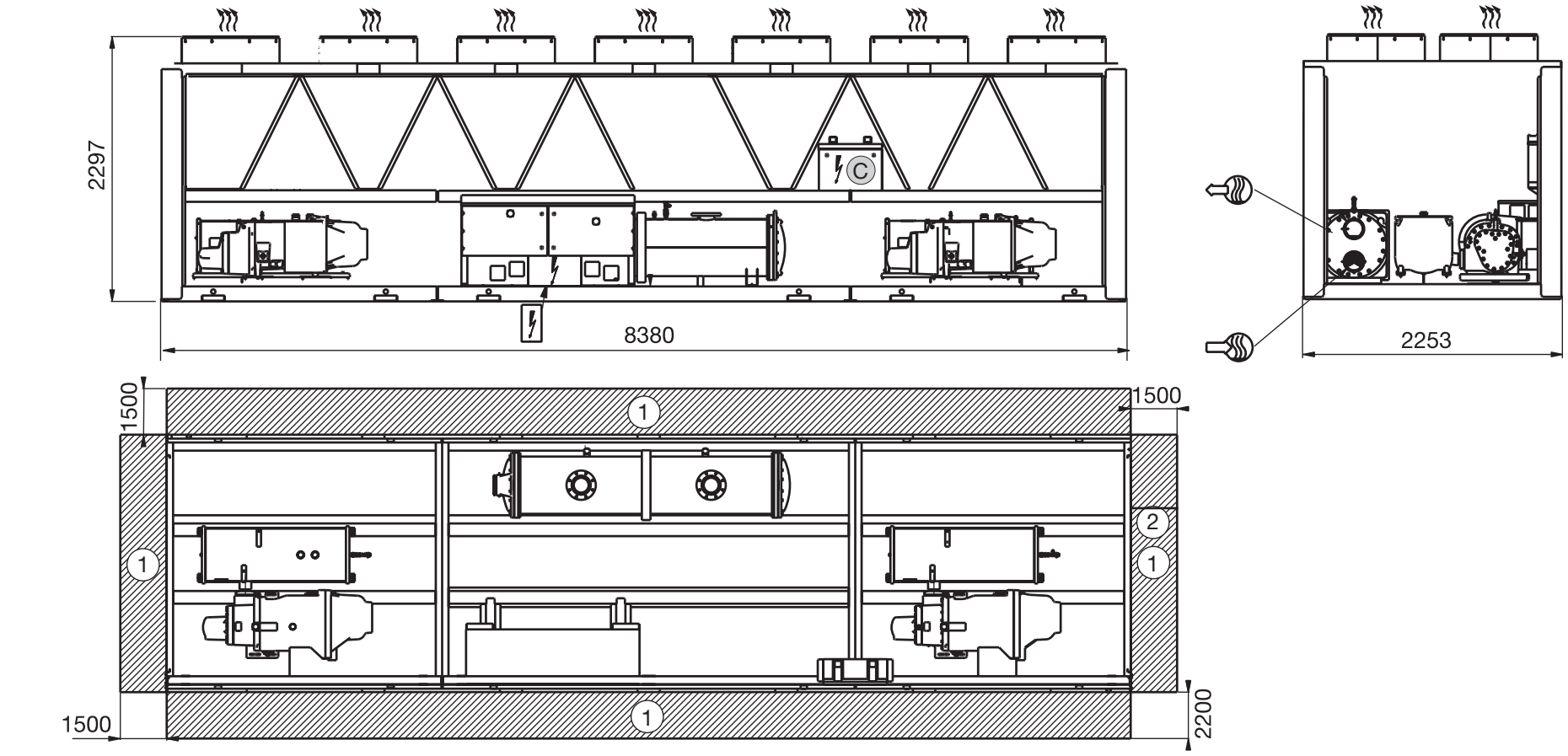
Power supply connection

(C) Control circuit connection

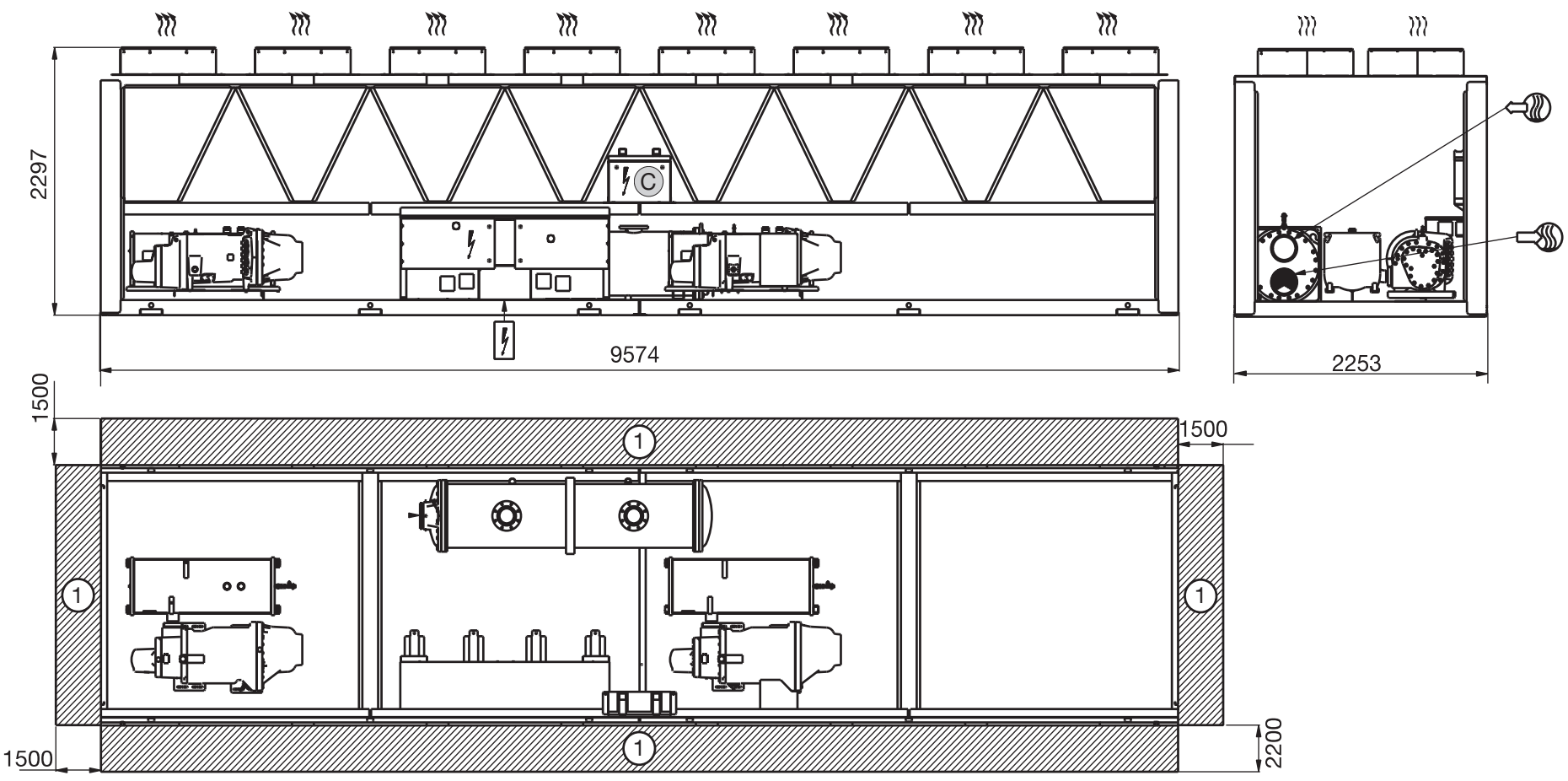
NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

3.5 - 30XA 852-902 (standard) and 752-852 (option 254/255)



3.6 - 30XA 1002 (standard) and 902-1002 (option 254/255)



Legend:
All dimensions are given in mm.

(1) Required clearances for maintenance and air flow

(2) Recommended space for evaporator tube removal

Water inlet

Water outlet

Air outlet - do not obstruct

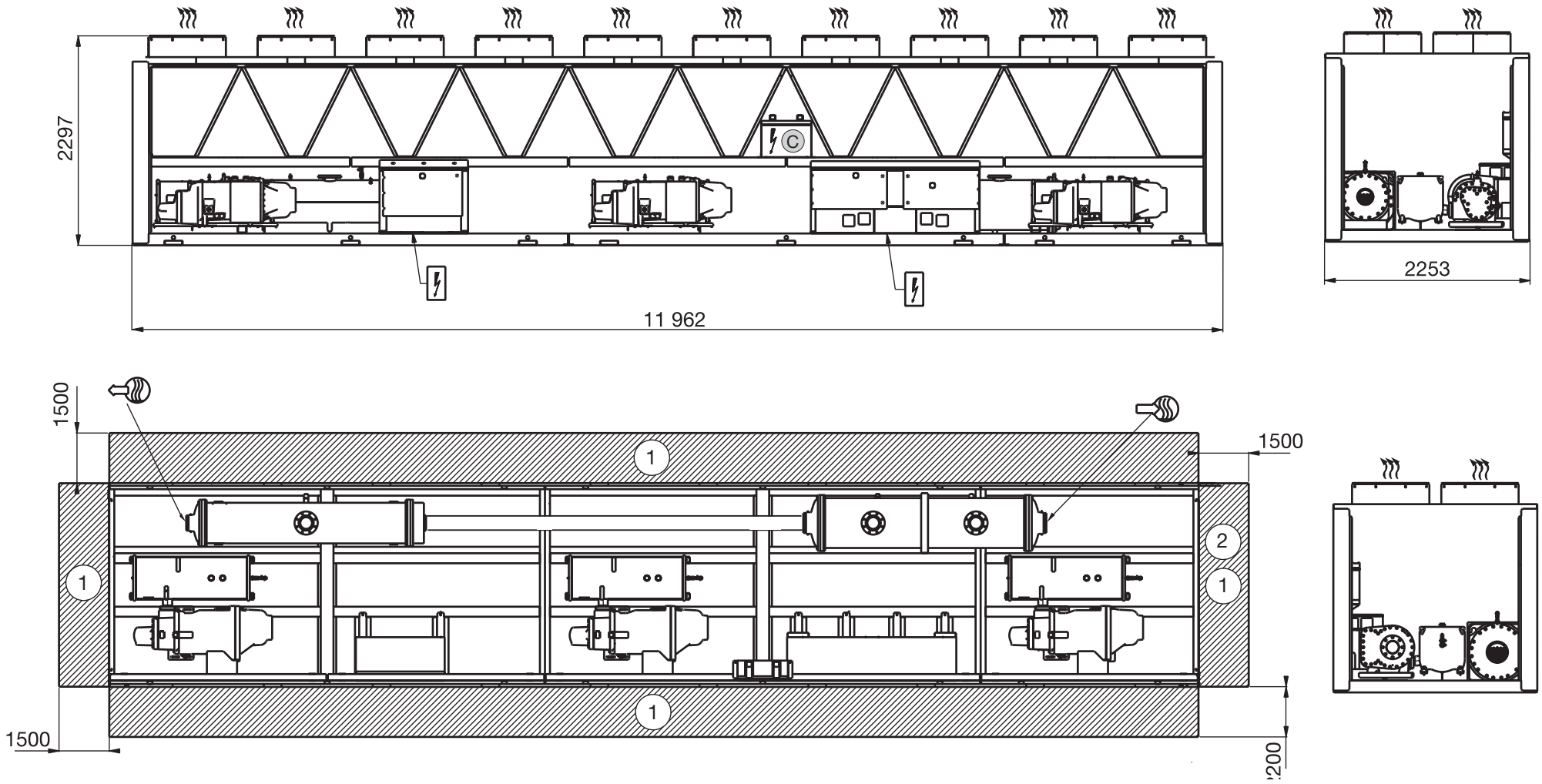
Power supply connection

(C) Control circuit connection

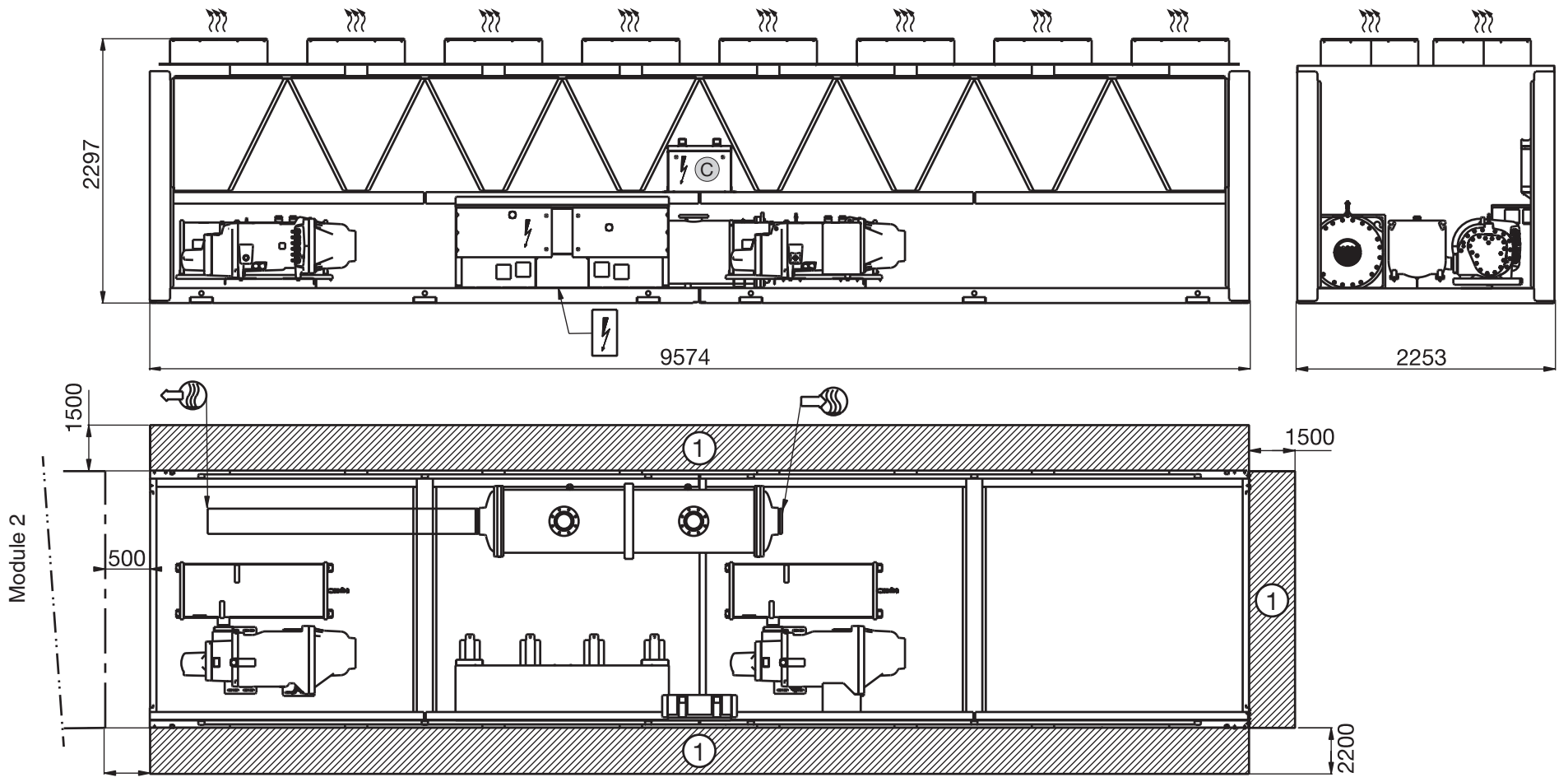
NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

3.7 - 30XA 1102-1352 (standard and option 254/255)



3.8 - 30XA 1402-1502 module 1 (standard and option 254/255)



Legend:
All dimensions are given in mm.

1 Required clearances for maintenance and air flow

2 Recommended space for evaporator tube removal

Water inlet

Water outlet (sizes 1402-1502: to be connected to water inlet of module 2)

Air outlet - do not obstruct

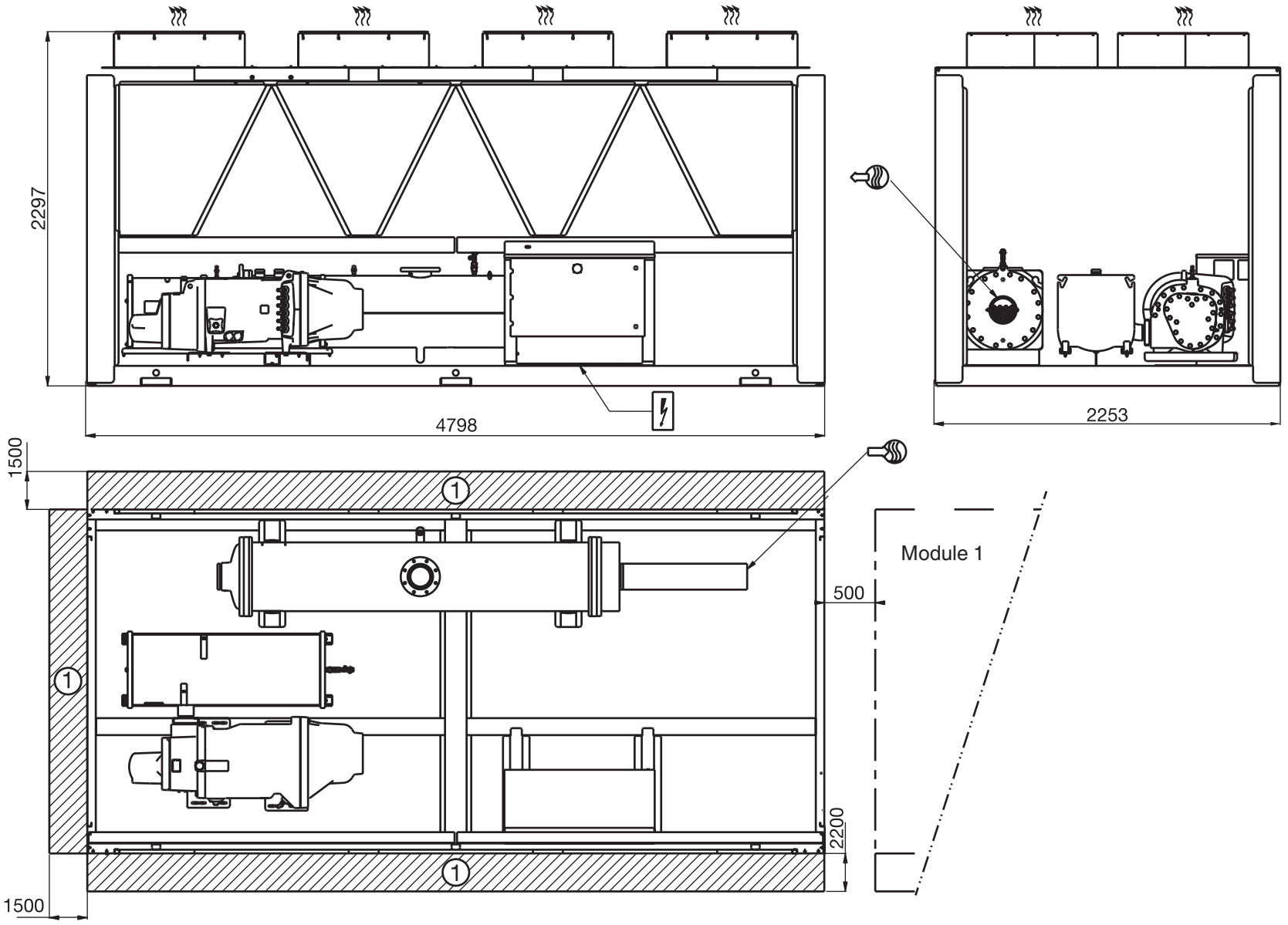
Power supply connection

C Control circuit connection

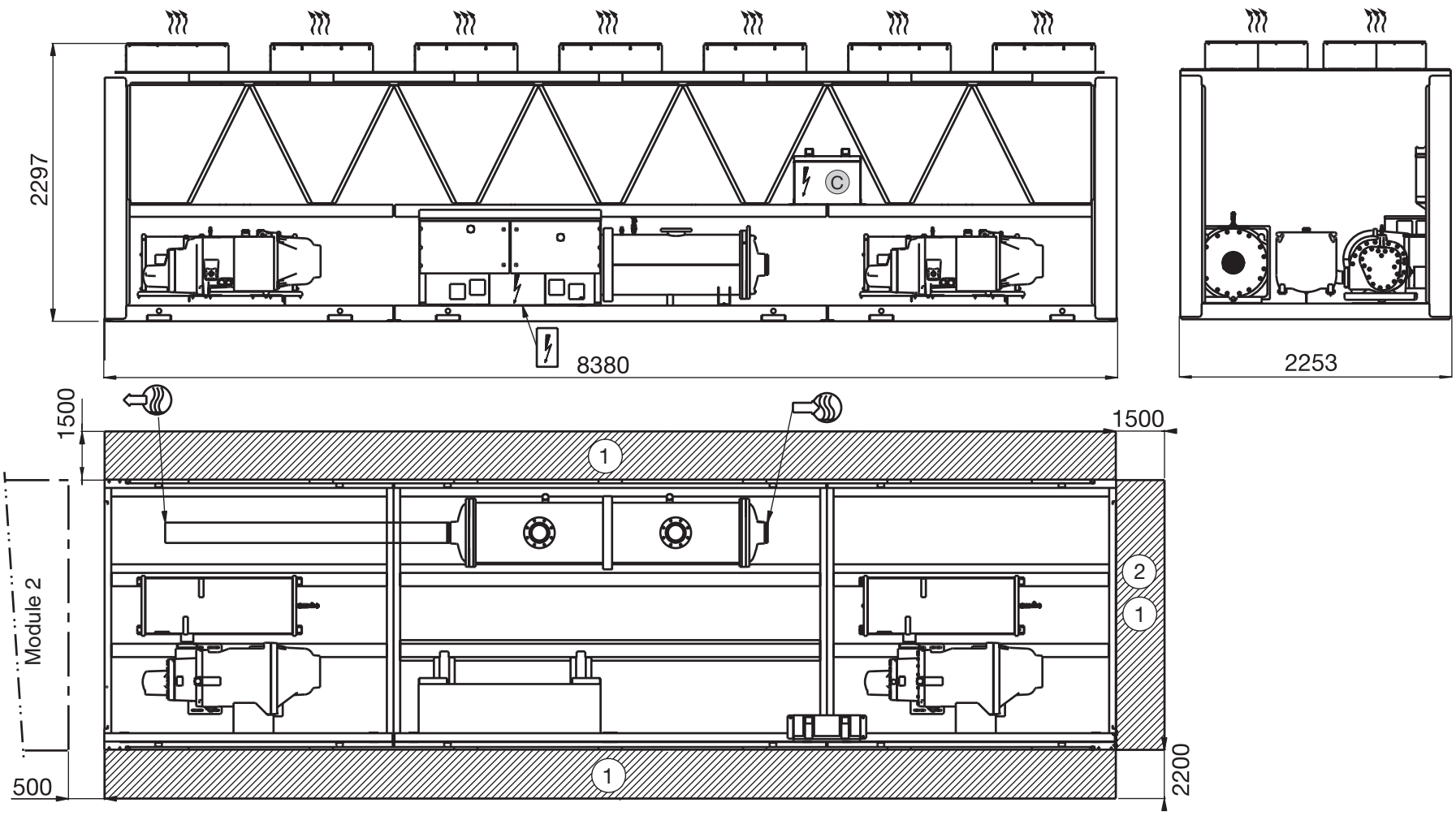
NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

3.9 - 30XA 1402-1502 module 2 (standard and option 254/255)



3.10 - 30XA 1702 module 1 (standard and option 254/255)



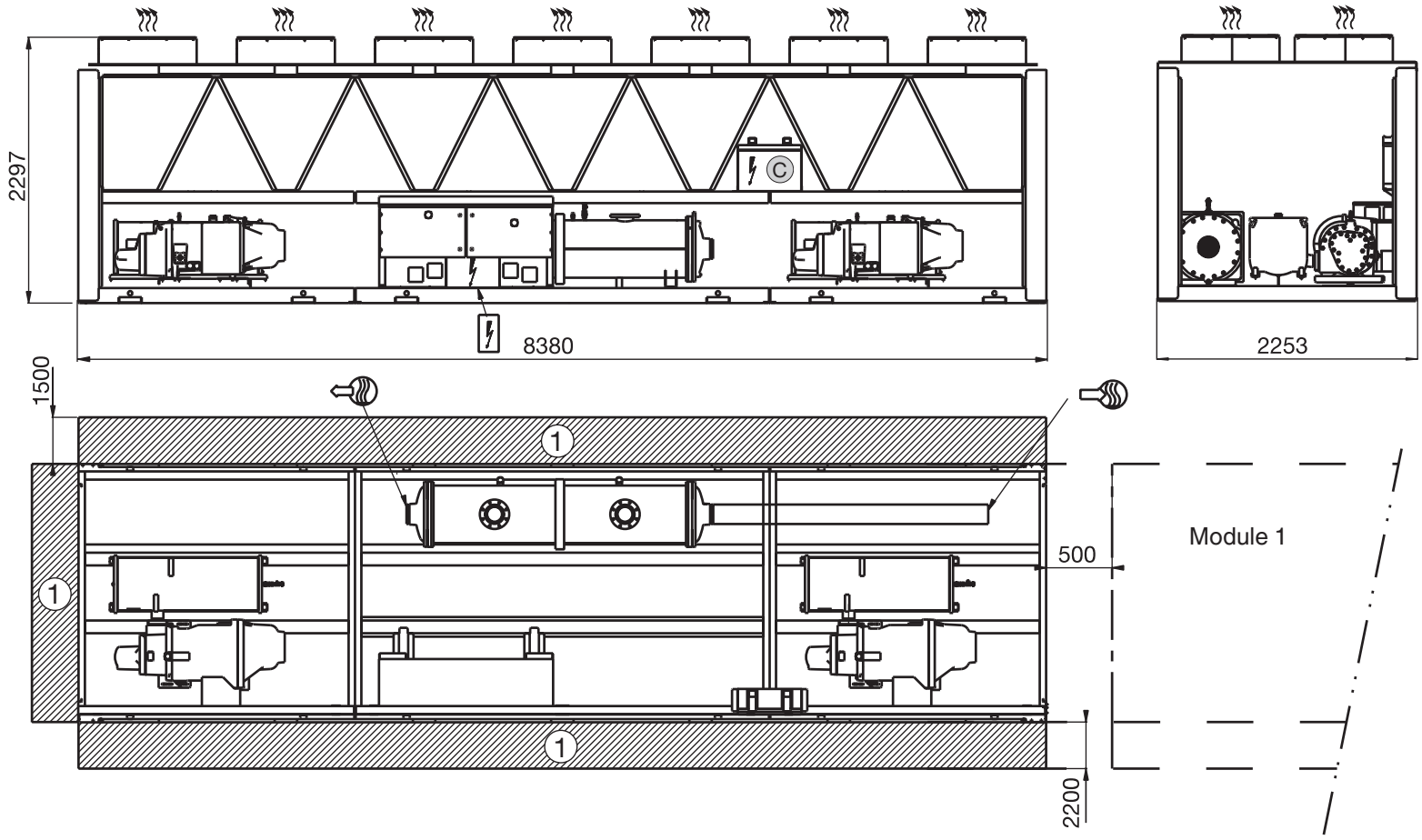
Legend:
All dimensions are given in mm.

- (1) Required clearances for maintenance and air flow
- (2) Recommended space for evaporator tube removal
- Water inlet (sizes 1402-1502: to be connected to water outlet of module 1)
- Water outlet (size 1702: to be connected to water inlet of module 2)
- Air outlet – do not obstruct
- Power supply connection
- (C) Control circuit connection

NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

3.11 - 30XA 1702 module 2 (standard and option 254/255)



Legend:
All dimensions are given in mm.

1 Required clearances for maintenance and air flow

2 Recommended space for evaporator tube removal

Water inlet (to be connected to water outlet of module 1)

Water outlet

Air outlet – do not obstruct

Power supply connection

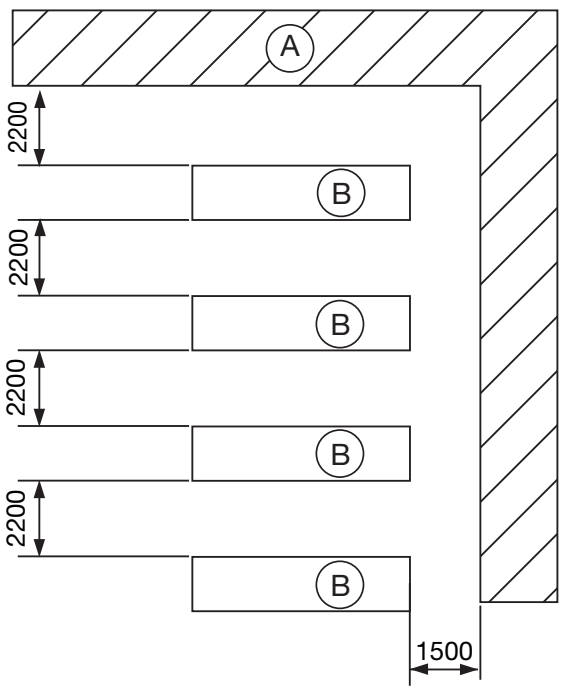
C Control circuit connection

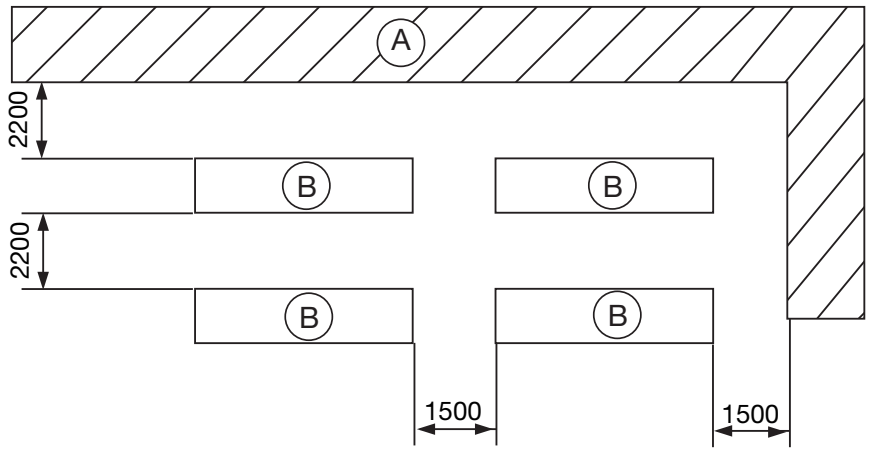
NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request.

For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

3.12 - Multiple chiller installation

NOTE: If the walls are higher than 2 m, contact the factory.





Legend
A Wall
B Units

4 - PHYSICAL AND ELECTRICAL DATA FOR 30XA UNITS

4.1 - Physical data 30XA - Standard units and option 119***

30XA		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Nominal cooling capacity*																					
Standard unit	kW	268	293	320	382	437	492	605	653	706	764	802	869	952	1116	1216	1297	1382	1426	1478	1605
Option 119	kW	274	300	326	393	451	508	616	677	726	792	838	899	1000	1147	1247	1354	1442	1468	1523	1675
Nominal power input*																					
Standard unit‡	kW	87	98	106	122	142	168	198	208	235	259	265	297	321	363	405	445	504	473	488	528
Option 119‡	kW	88	96	105	120	141	154	192	203	234	249	256	286	310	348	388	425	463	450	465	513
Operating weight**	kg	3840	3880	3920	4780	4850	5330	6260	6410	6710	7010	7560	7860	8440	10440	10880	11260	11620	8380/ 4250	8530/ 4250	7560/ 7560
Refrigerant		R-134a																			
Circuit A	kg	36	37	37	53	55	62	62	62	70	74	77	74	80	69	85	78	87	100	92	77
Circuit B	kg	38	38	39	37	39	39	62	66	62	65	68	77	84	66	66	68	80	85	95	68
Circuit C	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	100	100	100	96	100	100	77
Circuit D	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	66
Compressors		06T semi-hermetic screw compressors, 50 r/s																			
Circuit A		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Circuit B		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Circuit C		-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1
Circuit D		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Minimum capacity	%	15	15	15	15	15	15	15	15	15	15	15	15	15	10	10	10	10	10	10	8
Control		PRO-DIALOG, electronic expansion valve (EXV)																			
Condensers		All aluminium micro-channel heat exchanger																			
Condenser fans		Axial Flying Bird 4 fans with rotating shroud																			
Standard unit																					
Quantity		6	6	6	8	8	9	11	12	12	12	14	14	16	19	20	20	20	24	24	28
Total air flow	l/s	20500	20500	20500	27333	27333	30750	37583	41000	41000	41000	47833	47833	54667	64917	68333	68333	68333	82000	82000	95667
Fan speed	r/s	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
Option 119																					
Quantity		6	6	6	8	8	9	11	12	12	12	14	14	16	19	20	20	20	24	24	28
Total air flow at high speed	l/s	27083	27083	27083	36111	36111	40625	49653	54167	54167	54167	63194	63194	72222	85764	90278	90278	90278	108333	108333	126389
Fan speed	r/s	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7
Evaporator		Flooded multi-pipe type																			
Water content	l	58	61	61	66	70	77	79	94	98	119	119	130	140	168	182	203	224	230	240	240
Maximum pressure****	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

* Nominal conditions: evaporator entering/leaving water temperature = 12°C/7°C. Outdoor air temperature = 35°C, evaporator fouling factor = 0.000018 m^2 K/W.

** Weights are guidelines only. Weight and diameters of connection modules 1 and 2 for sizes 1402 to 1702. The refrigerant charge is also given on the unit nameplate.

*** Options: 119 = high energy efficiency; 254 = traditional coils.

**** Max. water-side operating pressure without hydronic module

‡ Data is not contractually binding and for information only. The values are rounded.

Note:
Unit sizes 30XA 1402 to 1702 are supplied in two field-assembled modules.

4.2 - Physical data 30XA - Units with option 254 and 255***

30XA		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Nominal cooling capacity*																					
Option 254	kW	271	295	322	387	438	493	600	659	708	766	809	870	967	1119	1218	1299	1399	1433	1484	1619
Option 255	kW	268	293	319	383	434	488	594	652	701	758	801	861	957	1108	1205	1286	1385	1419	1469	1603
Nominal power input*																					
Option 254‡	kW	88	99	104	124	145	160	198	212	236	258	270	303	327	370	413	453	513	479	497	539
Option 255‡	kW	90	101	106	127	148	163	202	217	241	263	277	310	335	378	422	464	527	489	509	552
Operating weight**	kg	4160	4190	4710	5190	5260	5830	6870	7030	7820	8140	8260	9010	9260	11470	11890	12250	12640	9180/ 4650	9340/ 4650	8270/ 8270
Refrigerant		R-134a																			
Circuit A	kg	60	64	70	85	85	102	102	100	129	112	130	129	140	102	112	112	112	140	140	130
Circuit B	kg	64	64	56	56	56	56	88	95	88	95	95	103	129	92	92	92	98	103	129	95
Circuit C	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	135	135	135	122	135	135	130
Circuit D	kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95
Compressors		06T semi-hermetic screw compressors, 50 r/s																			
Circuit A		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Circuit B		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Circuit C		-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1
Circuit D		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Minimum capacity	%	15	15	15	15	15	15	15	15	15	15	15	15	15	10	10	10	10	10	10	8
Control		PRO-DIALOG, electronic expansion valve (EXV)																			
Condensers		All aluminium micro-channel heat exchanger																			
Condenser fans		Axial Flying Bird 4 fans with rotating shroud																			
Quantity		6	6	7	8	8	9	11	12	13	13	14	15	16	19	20	20	20	24	24	28
Total air flow	l/s	20500	20500	20500	27333	27333	30750	37583	41000	41000	41000	47833	47833	54667	64917	68333	68333	68333	82000	82000	95667
Fan speed	r/s	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7
Evaporator		Flooded multi-pipe type																			
Water content	l	58	61	61	66	70	77	79	94	98	119	119	130	140	168	182	203	224	230	240	240
Maximum pressure****	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

* Nominal conditions: evaporator entering/leaving water temperature = 12°C/7°C. Outdoor air temperature = 35°C, evaporator fouling factor = 0.000018 m^2 K/W
** Weights are guidelines only. Weight and diameters of connection modules 1 and 2 for sizes 1402 to 1702. The refrigerant charge is also given on the unit nameplate.
*** Option 254 = Units with copper/aluminium coils
Option 255 = Units with copper/aluminium coils without slots
**** Max. water-side operating pressure without hydronic module
‡ Data is not contractually binding and for information only. The values are rounded.

Notes:
Unit sizes 30XA 1402 to 1702 are supplied in two field-assembled modules.

Option 119 (high energy efficiency) can be used together with options 254 and 255. Contact your Carrier representative to obtain the performances.

4.3 - Sound levels

30XA		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Standard unit																					
Sound power level*	dB(A)	89	89	89	92	93	93	94	93	95	95	94	96	95	96	96	96	97	97	97	97
Sound pressure level at 10 m**	dB(A)	57	57	57	60	61	61	62	61	63	63	62	63	63	63	63	63	64	64	64	64
Standard unit + option 257																					
Sound power level*	dB(A)	86	86	86	89	90	90	91	90	92	92	91	93	92	93	93	93	94	94	94	94
Sound pressure level at 10 m**	dB(A)	54	54	54	57	58	58	59	57	60	59	58	60	59	60	60	60	61	61	61	61
High energy efficiency version (option 119)																					
Sound power level*	dB(A)	94	94	94	95	95	95	96	96	98	98	98	99	98	99	100	99	100	101	100	101
Sound pressure level at 10 m**	dB(A)	62	62	62	62	62	62	63	64	65	66	65	66	65	66	67	66	67	68	67	67
Unit with options 119 + 257																					
Sound power level*	dB(A)	92	92	92	94	94	94	95	95	96	96	96	97	97	98	98	98	98	99	99	99
Sound pressure level at 10 m**	dB(A)	60	60	60	62	62	62	62	62	63	63	63	64	64	65	65	65	62	66	66	65

* 10^{-12} W - In accordance with ISO 9614-1 and certified by Eurovent
** Average sound pressure level, unit in a free field on a reflective surface

4.4 - Short-circuit stability current for all units

30XA		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Short-circuit stability current (TN system)*																					
Circuits A + B**	kA	38	38	38	38	38	38	50	50	50	50	50	50	50	50	50	50	50	50	50	50
Circuits C + D**	kA	-	-	-	-	-	-	-	-	-	-	-	-	-	50	50	50	50	50	50	50
Units with option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	50	50	50	50	50	50	-

* Type of system earthing
** rms value

4.5 - Electrical data 30XA - Standard unit (including option 81)

30XA		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Power circuit																					
Nominal power supply	V-ph-Hz	400-3-50																			
Voltage range	V	360-440																			
Control circuit		24 V via internal transformer																			
Maximum start-up current*																					
Circuit A+B	A	269	269	287	402	505	505	574	606	773	803	805	893	941	574	773	803	891	893	941	805
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	587	805
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	991	1079	1155	1242	1248	1294	-
Nominal start-up current**																					
Circuit A+B	A	245	245	263	378	481	481	539	562	738	759	761	845	869	539	738	759	843	845	869	761
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	587	761
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	909	993	1036	1156	1125	1143	-
Cosine Phi maximum***		0.88	0.88	0.87	0.88	0.88	0.88	0.88	0.88	0.86	0.86	0.87	0.85	0.86	0.88	0.86	0.87	0.85	0.85	0.86	0.87
Cosine Phi nominal****		0.85	0.85	0.84	0.84	0.86	0.86	0.87	0.87	0.84	0.85	0.85	0.83	0.84	0.85	0.84	0.85	0.83	0.83	0.84	0.85
Maximum power input†																					
Circuit A+B	kW	121	131	141	165	185	204	247	267	293	312	343	359	420	247	293	342	388	390	420	343
Circuit C+D††	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	210	210	210	209	210	210	343
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	457	503	552	597	600	630	-
Nominal unit current draw******																					
Circuit A+B	A	151	167	184	210	240	266	322	349	406	431	452	516	556	322	406	449	569	538	556	452
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	278	278	278	292	278	278	452
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	600	684	727	861	816	834	-
Maximum unit current draw (Un)†																					
Circuit A+B	A	198	215	233	270	303	335	404	436	492	522	572	611	707	404	492	568	655	661	707	572
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	354	354	354	352	354	354	572
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	758	845	922	1007	1015	1061	-
Maximum unit current draw (Un -10%)***																					
Circuit A+B	A	208	232	251	290	326	360	435	469	529	561	615	657	760	435	529	611	705	711	760	615
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	380	380	380	378	380	380	615
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	815	909	991	1083	1091	1141	-

* Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at operation with maximum unit power input.
** Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C
*** Values obtained at operation with maximum unit power input.
**** Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C
† Values obtained at operation with maximum unit power input. Values given on the unit name plate
†† Circuit D - only for size 1702

Note:
Motor and fan electrical data if the unit operates at Eurovent conditions (motor ambient temperature 50°C): 1.9 A
Start-up current: 8.4 A
Power input: 760 W

4.6 - Electrical data 30XA - Option 119 (including option 81)

30XA - option 119		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Power circuit																					
Nominal power supply	V-ph-Hz	400-3-50																			
Voltage range	V	360-440																			
Control circuit		24 V via internal transformer																			
Maximum start-up current*																					
Circuit A+B	A	274	274	292	407	510	510	583	616	782	812	815	905	954	583	782	812	901	905	954	815
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	587	815
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	1010	1099	1175	1265	1275	1321	-
Nominal start-up current**																					
Circuit A+B	A	246	246	261	379	479	479	535	561	734	757	760	845	860	535	734	757	846	845	860	760
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	587	760
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	907	991	1026	1124	1122	1133	-
Cosine Phi maximum***		0.88	0.87	0.87	0.88	0.88	0.88	0.88	0.88	0.86	0.86	0.86	0.85	0.86	0.88	0.86	0.87	0.85	0.85	0.86	0.86
Cosine Phi nominal****		0.84	0.84	0.83	0.83	0.85	0.85	0.86	0.86	0.84	0.84	0.84	0.82	0.82	0.84	0.83	0.83	0.83	0.82	0.82	0.84
Maximum power input†																					
Circuit A+B	kW	126	136	147	172	192	212	257	278	304	323	356	372	435	257	304	353	400	405	435	356
Circuit C+D††	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	217	217	217	216	217	217	356
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	475	522	570	615	622	652	712
Nominal unit current draw******																					
Circuit A+B	A	151	167	182	210	237	264	320	346	404	427	446	516	546	320	404	439	537	535	546	446
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	273	273	273	275	273	273	446
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	593	678	712	812	808	820	893
Maximum unit current draw (Un)†																					
Circuit A+B	A	208	226	243	284	316	350	423	457	512	542	596	635	734	423	512	588	678	688	734	596
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	367	367	367	364	367	367	596
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	790	879	956	1041	1056	1102	1191
Maximum unit current draw (Un -10%)***																					
Circuit A+B	A	219	243	262	305	340	376	455	491	551	583	640	683	790	455	551	633	729	740	790	640
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	395	395	395	391	395	395	640
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	850	946	1028	1120	1135	1185	1281

* Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at operation with maximum unit power input.

** Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C

*** Values obtained at operation with maximum unit power input.

**** Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C

† Values obtained at operation with maximum unit power input. Values given on the unit name plate

†† Circuit D - only for size 1702

Note:
Motor and fan electrical data if the unit operates at Eurovent conditions (motor ambient temperature 50°C): 3.6 A
Start-up current: 20 A
Power input: 1.65 kW

4.7 - Electrical data 30XA - Option 254/255 (including option 81)

Option 254: Units with copper/aluminium coils
Option 255: Units with copper/aluminium coils without slots

30XA - option 254/255		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Power circuit																					
Nominal power supply	V-ph-Hz	400-3-50																			
Voltage range	V	360-440																			
Control circuit		24 V via internal transformer																			
Maximum start-up current*																					
Circuit A+B	A	269	269	287	402	505	505	574	606	773	805	805	893	941	574	773	803	891	893	941	805
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	587	761
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	991	1079	1155	1242	1248	1294	1333
Nominal start-up current**																					
Circuit A+B	A	245	245	262	378	480	480	536	562	735	761	761	845	865	536	735	759	859	845	865	761
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	587	761
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	909	993	1036	1156	1125	1143	1214
Cosine Phi maximum***		0.88	0.88	0.87	0.88	0.88	0.88	0.88	0.88	0.86	0.86	0.87	0.85	0.86	0.88	0.86	0.87	0.85	0.85	0.86	0.87
Cosine Phi nominal****		0.85	0.85	0.84	0.84	0.86	0.86	0.87	0.87	0.84	0.84	0.85	0.83	0.84	0.85	0.84	0.85	0.84	0.83	0.84	0.85
Maximum power input†																					
Circuit A+B	kW	121	131	142	165	185	204	247	267	294	313	343	360	420	247	293	342	388	390	420	343
Circuit C+D††	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	210	210	210	209	210	210	343
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	457	503	552	597	600	630	687
Nominal unit current draw******																					
Circuit A+B	A	151	167	186	210	240	266	322	349	408	433	452	518	556	322	406	449	569	538	556	452
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	278	278	278	292	278	278	452
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	600	684	727	861	816	834	905
Maximum unit current draw (Un)†																					
Circuit A+B	A	198	215	235	270	303	335	404	436	494	524	572	613	707	404	492	568	655	661	707	572
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	354	354	354	352	354	354	572
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	758	845	922	1007	1015	1061	1144
Maximum unit current draw (Un -10%)***																					
Circuit A+B	A	208	232	253	290	326	360	435	469	531	563	615	659	760	435	529	611	705	711	760	615
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	380	380	380	378	380	380	615
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	815	909	991	1083	1091	1141	1230

* Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at operation with maximum unit power input.

** Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C

*** Values obtained at operation with maximum unit power input.

**** Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C

† Values obtained at operation with maximum unit power input. Values given on the unit name plate

†† Circuit D - only for size 1702

Note:
Motor and fan electrical data if the unit operates at Eurovent conditions (motor ambient temperature 50°C): 1.9 A
Start-up current: 8.4 A
Power input: 760 W

4.8 - Electrical data 30XA - Option 254/255 with option 119 (including option 81)

Option 119: High energy efficiency option
Option 254: Units with copper/aluminium coils
Option 255: Units with copper/aluminium coils without slots

30XA - option 254/255 with 119		252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
Power circuit																					
Nominal power supply	V-ph-Hz	400-3-50																			
Voltage range	V	360-440																			
Control circuit		24 V via internal transformer																			
Maximum start-up current*																					
Circuit A+B	A	274	274	292	407	510	510	583	616	782	815	815	905	954	583	782	812	901	905	954	815
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	587	815
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	1010	1099	1175	1265	1275	1321	1411
Nominal start-up current**																					
Circuit A+B	A	246	246	261	379	479	479	535	561	734	760	760	845	860	535	734	757	846	845	860	760
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	587	587	587	587	587	587	760
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	907	991	1026	1124	1122	1133	1206
Cosine Phi maximum***		0.88	0.87	0.87	0.88	0.88	0.88	0.88	0.88	0.86	0.86	0.86	0.84	0.86	0.88	0.86	0.87	0.85	0.85	0.86	0.86
Cosine Phi nominal****		0.84	0.84	0.83	0.83	0.85	0.85	0.86	0.86	0.83	0.84	0.84	0.82	0.82	0.84	0.83	0.83	0.83	0.82	0.82	0.84
Maximum power input†																					
Circuit A+B	kW	126	136	148	172	192	212	257	278	306	325	356	373	435	257	304	353	400	405	435	356
Circuit C+D††	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	217	217	217	216	217	217	356
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	475	522	570	615	622	652	712
Nominal unit current draw******																					
Circuit A+B	A	151	167	185	210	237	264	320	346	408	431	446	519	546	320	404	439	537	535	546	446
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	273	273	273	275	273	273	446
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	593	678	712	812	808	820	893
Maximum unit current draw (Un)†																					
Circuit A+B	A	208	226	247	284	316	350	423	457	516	546	596	639	734	423	512	588	678	688	734	596
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	367	367	367	364	367	367	596
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	790	879	956	1041	1056	1102	1191
Maximum unit current draw (Un -10%)***																					
Circuit A+B	A	219	243	266	305	340	376	455	491	555	587	640	687	790	455	551	633	729	740	790	640
Circuit C+D††	A	-	-	-	-	-	-	-	-	-	-	-	-	-	395	395	395	391	395	395	640
Option 81	A	-	-	-	-	-	-	-	-	-	-	-	-	-	850	946	1028	1120	1135	1185	1281

* Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at operation with maximum unit power input.

** Instantaneous start-up current (operating current of the smallest compressor + fan current + locked rotor current in star connection of the largest compressor). Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C

*** Values obtained at operation with maximum unit power input.

**** Values obtained at standard Eurovent unit operating conditions: air 35°C, water 12/7°C

† Values obtained at operation with maximum unit power input. Values given on the unit name plate

†† Circuit D - only for size 1702

Note:
Motor and fan electrical data if the unit operates at Eurovent conditions (motor ambient temperature 50°C): 3.6 A
Start-up current: 20 A
Power input: 1.65 kW

4.9 - Compressor electrical data

Compressor	I Nom* Std/Option 119	I Max** (Un)	MHA	LRYA (Un)	LRDA (Un)	Cosine Phi (max.)**	Cosine Phi (nom.)*
06TSA155	69/64	86	96	170	530	0.90	0.87
06TSA186	87/80	108	120	170	530	0.89	0.86
06TTA266	128/117	158	176	303	945	0.90	0.86
06TTA301	142/130	173	193	388	1210	0.90	0.89
06TTA356	163/150	198	220	388	1210	0.90	0.89
06TUA483	245/230	280	311	587	1828	0.86	0.84
06TUA554	267/246	329	366	587	1828	0.87	0.85

* Average value for the range (unit at Eurovent conditions)
** Value at maximum capacity and nominal voltage (400 V)

Legend
MHA - Maximum compressor operating current, limited by the unit (current given for maximum capacity at 360 V)
LRYA - Locked rotor current for star connection (connection during compressor start-up)
LRDA - Locked rotor current for delta connection

4.10 - Compressor usage per circuit (A, B, C, D)

Compressor	30XA 252	302	352	402	452	502	602	702	752	802	852	902	1002	1102	1202	1302	1352	1402	1502	1702
06TSA155	AB	B	-	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06TSA186	-	A	AB	-	B	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06TTA266	-	-	-	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
06TTA301	-	-	-	-	A	-	B	-	B	-	-	-	-	B	B	-	-	-	-	-
06TTA356	-	-	-	-	-	A	A	AB	-	B	B	-	-	A	-	B	-	-	-	BD
06TUA483	-	-	-	-	-	-	-	-	A	A	-	AB	-	-	A	-	B	B	-	-
06TUA554	-	-	-	-	-	-	-	-	-	-	A	-	AB	C	C	AC	AC	AC	ABC	AC

4.11 - Electrical data, optional hydronic module

30XA		252	302	352	402	452	502
Single and dual low-pressure pump							
Motor power	kW	2.2	2.2	3	4	4	5.5
Power input	kW	2.8	2.8	3.9	5.1	5.1	7.2
Maximum current draw	A	4.7	4.7	6.4	8.2	8.2	11.7
Single and dual high-pressure pump							
Motor power	kW	4	5.5	5.5	7.5	11	11
Power input	kW	5.1	7.2	7.2	9.2	13.2	13.2
Maximum current draw	A	8.2	11.7	11.7	15	21.2	21.2

Notes:
1. To obtain the maximum power input for a unit with hydronic module add the maximum unit power input to the pump power input.
2. To obtain the maximum unit operating current draw for a unit with hydronic module add the maximum unit current draw to the pump current draw.

5 - ELECTRICAL CONNECTION

Please refer to the certified dimensional drawings, supplied with the unit.

5.1 - Power supply

The power supply must conform to the specification on the chiller nameplate. The supply voltage must be within the range specified in the electrical data table. For connections refer to the wiring diagrams and the certified dimensional drawings.

WARNING: Operation of the chiller with an improper supply voltage or excessive phase imbalance constitutes abuse which will invalidate the Carrier warranty. If the phase imbalance exceeds 2% for voltage, or 10% for current, contact your local electricity supply at once and ensure that the chiller is not switched on until corrective measures have been taken.

5.2 - Voltage phase imbalance (%)

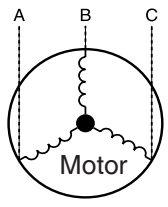
$$\frac{\text{100 x max. deviation from average voltage}}{\text{Average voltage}}$$

Example:
On a 400 V - 3 ph - 50 Hz supply, the individual phase voltages were measured to be:

AB = 406 V; BC = 399; AC = 394 V

Average voltage = (406 + 399 + 394)/3 = 1199/3
= 399.7 say 400 V

Calculate the maximum deviation from the 400 V average:
(AB) = 406 - 400 = 6
(BC) = 400 - 399 = 1
(CA) = 400 - 394 = 6



The maximum deviation from the average is 6 V. The greatest percentage deviation is:

100 x 6/400 = 1.5 %

This is less than the permissible 2% and is therefore acceptable.

5.3 - Power connection/disconnect switch

Units	Connection points
30XA 0252-1002	1 per unit
30XA 1102-1702	1 for circuits A and B
	1 for circuit(s) C (and D)

Electrical data notes for 30XA units:

- 30XA 252-1002 units have a single power connection point; 30XA 1102-1702 units have two connection points.
- The control box includes the following standard features:
  - One general disconnect switch per circuit
  - Starter and motor protection devices for each compressor, the fan(s) and the pump
  - Control devices

Field connections:

- All connections to the system and the electrical installations must be in full accordance with all applicable local codes.
- The Carrier 30XA units are designed and built to ensure conformance with these codes. The recommendations of European standard EN 60 204-1 (corresponds to IEC 60204-1) (machine safety - electrical machine components - part 1: general regulations) are specifically taken into account, when designing the electrical equipment.

IMPORTANT:

- Generally the recommendations of IEC 60364 are accepted as compliance with the requirements of the installation directives.
  Conformance with EN 60 204 is the best means of ensuring compliance with the Machines Directive § 1.5.1.
- Annex B of EN 60204-1 describes the electrical characteristics used for the operation of the machines.
- The operating environment for the 30XA units is specified below:

1. Environment* - Environment as classified in EN 60 721 (corresponds to IEC 60721) :
   - outdoor installation*
   - ambient temperature range: -20°C to +55°C, class 4K4H*
   - altitude: ≤ 2000 m
   - presence of hard solids, class 4S2* (no significant dust present)
   - presence of corrosive and polluting substances, class 4C2 (negligible)
2. Power supply frequency variation: ± 2 Hz.
3. The neutral (N) line must not be connected directly to the unit (if necessary use a transformer).
4. Overcurrent protection of the power supply conductors is not provided with the unit.
5. The factory-installed disconnect switch(es)/circuit breaker(s) is (are) of a type suitable for power interruption in accordance with EN 60947-3 (corresponds to IEC 60947-3).
6. The units are designed for connection to TN networks (IEC 60364). For IT networks the earth connection must not be at the network earth. Provide a local earth, consult competent local organisations to complete the electrical installation.

NOTE: If particular aspects of an actual installation do not conform to the conditions described above, or if there are other conditions which should be considered, always contact your local Carrier representative.

* The required protection level for this class is IP43BW (according to reference document IEC 60529). All 30XA units are protected to IP44CW and fulfil this protection condition.

5.4 - Recommended wire sections

Wire sizing is the responsibility of the installer, and depends on the characteristics and regulations applicable to each installation site. The following is only to be used as a guide-line, and does not make in any way liable. After wire sizing has been completed, using the certified dimensional drawing, the installer must ensure easy connection and define any modifications necessary on site.

The connections provided as standard for the field-supplied power entry cables to the general disconnect/isolator switch are designed for the number and type of wires, listed in the table below.

The calculations are based on the maximum machine current (see electrical data tables).

For the design the following standardised installation methods are used, in accordance with IEC 60364, table 52C:

- For 30XA units installed outside the building:
  No.17: suspended aerial lines
  No. 61: buried conduit with a derating coefficient of 20.

The calculation is based on PVC or XLPE insulated cables with copper core. The maximum temperature is 46°C for 30XA units.

The given wire length limits the voltage drop to < 5%.

IMPORTANT: Before connection of the main power cables (L1 - L2 - L3) on the terminal block, it is imperative to check the correct order of the 3 phases before proceeding to the connection on then terminal block or the main disconnect/isolator switch.

5.5 - Power cable entry

The power cables can enter the 30XA control box from below or from the unit side.

For 30XA unit sizes 602 to 1702 the control box that includes the power supply cable connection terminal is located in the lower part of the unit. In this case the control box is raised by 120 mm compared to the lowest point of the chassis. The cable entry point depends on the unit configuration:

1. Unit raised from the ground (e.g. installation on support rails): It is recommended to enter the power cables from below the control box. A removable aluminium plate below the control box allows introduction of the cables.
2. Unit placed on the ground: For power cable entry from below the control box ensure that the cable bend radius is compatible with the connection space available in the control box. If not, an aluminium plate on the control box face allows introduction of the cables.

For units with three circuits with option 81 (single power connection point) the connection must be made from below the unit.

IMPORTANT: Check the cable bend radius for cable entry into a control box, located in the lower part of the unit.

Refer to the certified dimensional drawing for the unit.

5.6 - Field control wiring

Refer to the 30XA Pro-Dialog Controls IOM and the certified wiring diagram supplied with the unit for the field control wiring of the following features:

- Evaporator pump interlock (mandatory)
- Remote on/off switch
- Demand limit external switch
- Remote dual set point
- Alarm, alert and operation report
- Evaporator pump control
- Heat reclaim condenser pump control (option)
- Hot water valve control (option)
- Set point reset via outside air temperature sensor reset
- Various interlocks on the Energy Management Module (EMM) board (accessory or option)

Selection table of minimum and maximum wire sections for connection to 30XA units

	Maximum wire section	Minimum calculated section			Maximum calculated section		
30XA	**Section (mm²)**	**Section (mm²)***	**Max. length (m)**	**Wire type**	**Section (mm²)***	**Max. length (m)**	**Wire type**
252	2 x 240	1 x 95	190	XLPE Cu	2 x 95	410	PVC Cu
302	2 x 240	1 x 95	190	XLPE Cu	2 x 120	435	PVC Cu
352	2 x 240	1 x 120	197	XLPE Cu	2 x 150	455	PVC Cu
402	2 x 240	1 x 150	200	XLPE Cu	2 x 185	470	PVC Cu
452	2 x 240	1 x 185	205	XLPE Cu	2 x 120	435	XLPE Cu
502	2 x 240	1 x 240	205	XLPE Cu	2 x 150	455	XLPE Cu
602	4 x 240	2 x 95	190	XLPE Cu	2 x 240	480	XLPE Cu
702	4 x 240	2 x 120	198	XLPE Cu	2 x 240	480	XLPE Cu
752	4 x 240	2 x 120	198	XLPE Cu	3 x 240	600	XLPE Cu
802	4 x 240	2 x 150	200	XLPE Cu	3 x 240	600	XLPE Cu
852	4 x 240	2 x 150	200	XLPE Cu	4 x 240	685	XLPE Cu
902	6 x 240	2 x 185	205	XLPE Cu	4 x 240	685	XLPE Cu
1002	6 x 240	2 x 240	205	XLPE Cu	5 x 240	750	XLPE Cu
Circuits A and B/C							
1102	4 x 240/2 x 240	2 x 95/1 x 240	190/280	XLPE Cu	4 x 240/2 x 240	685/480	PVC Cu/XLPE Cu
1202	4 x 240/2 x 240	2 x 150/1 x 240	280/280	XLPE Cu	4 x 240/2 x 240	685/480	XLPE Cu/XLPE Cu
1302	4 x 240/2 x 240	2 x 150/1 x 240	280/280	XLPE Cu	4 x 240/2 x 240	685/480	XLPE Cu/XLPE Cu
1352	6 x 240/2 x 240	2 x 185/1 x 240	280/280	XLPE Cu	5 x 240/2 x 240	750/480	XLPE Cu/XLPE Cu
1402	6 x 240/2 x 240	3 x 150/1 x 240	280/280	XLPE Cu	5 x 240/2 x 240	750/480	XLPE Cu/XLPE Cu
1502	6 x 240/2 x 240	3 x 150/1 x 240	280/280	XLPE Cu	6 x 240/2 x 240	750/480	XLPE Cu/XLPE Cu
1702	4 x 240/4 x 240	2 x 150/2 x 150	200/200	XLPE Cu	4 x 240/4 x 240	685/685	XLPE Cu
Option 81							
1102-1502	8 x 240						

* Power supply wire section (see diagram in chapter 5 'Electrical connection').

Note: The current values used are given for a unit equipped with a hydronic kit operating at maximum current.

6 - APPLICATION DATA

6.1 - Operating limits

Evaporator fluid temperature			
	°C	Minimum	Maximum
Water entering temperature at start-up		-	45
Water entering temperature during operation		6.8	21
Water leaving temperature during operation		3.3	15

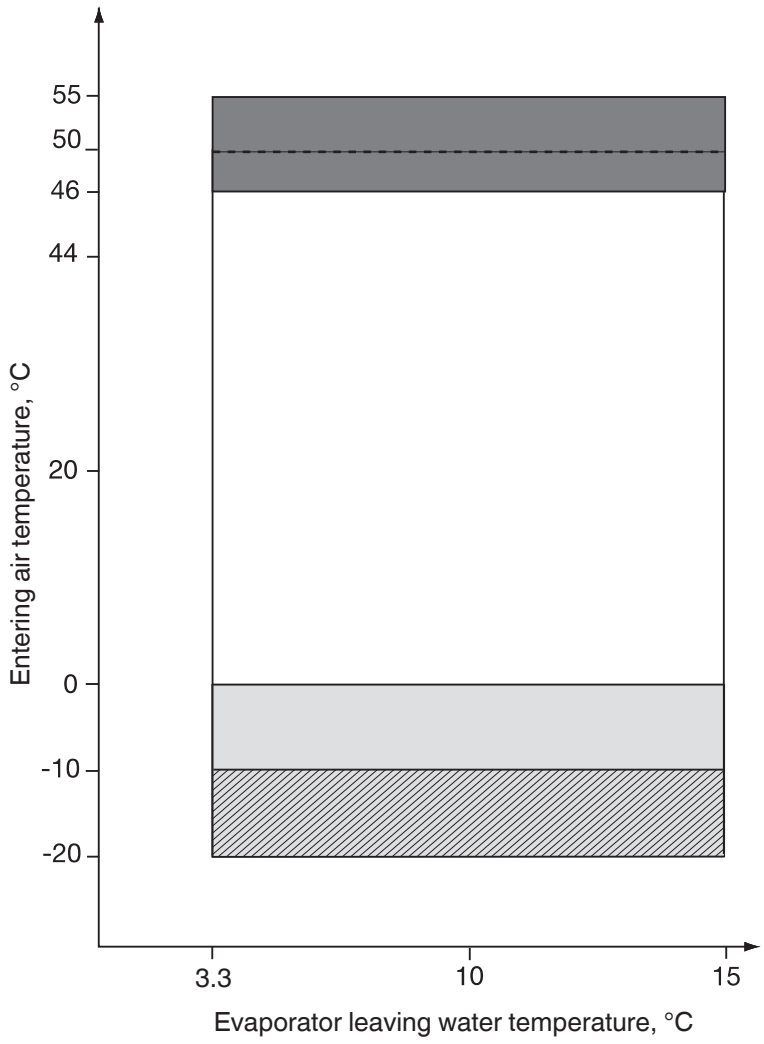
Note: If the leaving water temperature is below 4°C, a glycol/water solution or the frost protection option must be used.

Condenser air temperature			
	°C	Minimum	Maximum
Storage		-20	68
Operation, standard unit		-10	55*
With winter operation option (option 28)		-20	55*
With high energy efficiency option (option 119)		-10	55*

Note: If the air temperature is below 0°C, a glycol/water solution or the frost protection option must be used.

* Full or part-load operation, depending on the model
** Recommended for operation above 46°C

Operating range 30XA



Legend:

Part load average: from 46°C for standard unit
from 50°C with option 119.

Operating range, standard unit.

Below 0°C air temperature the unit must either be equipped with the evaporator frost protection option (41A or 41B), or the water loop must be protected against frost by using a frost protection solution (by the installer).

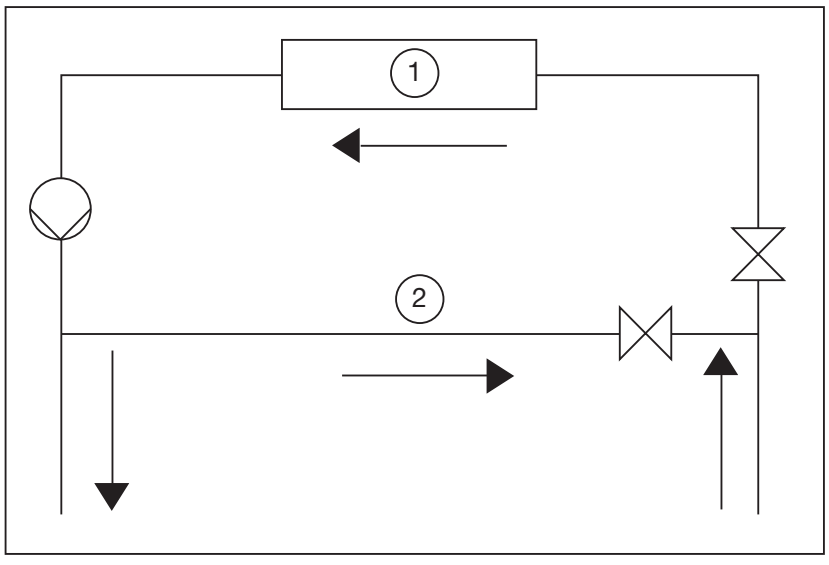
Operating range, unit equipped with option 28 (winter operation).

ATTENTION: Option 28 (Winter operation)
If the outside temperature is below -10°C and the unit has been switched off for more than 4 hours, it is necessary to wait 2 hours after the unit has been switched on again to allow the frequency converter to warm up.

6.2 - Minimum chilled water flow (units without hydronic module)

The minimum chilled water flow is shown in the table on the next page. If the system flow is less than this, the evaporator flow can be recirculated, as shown in the diagram.

For minimum chilled water flow rate

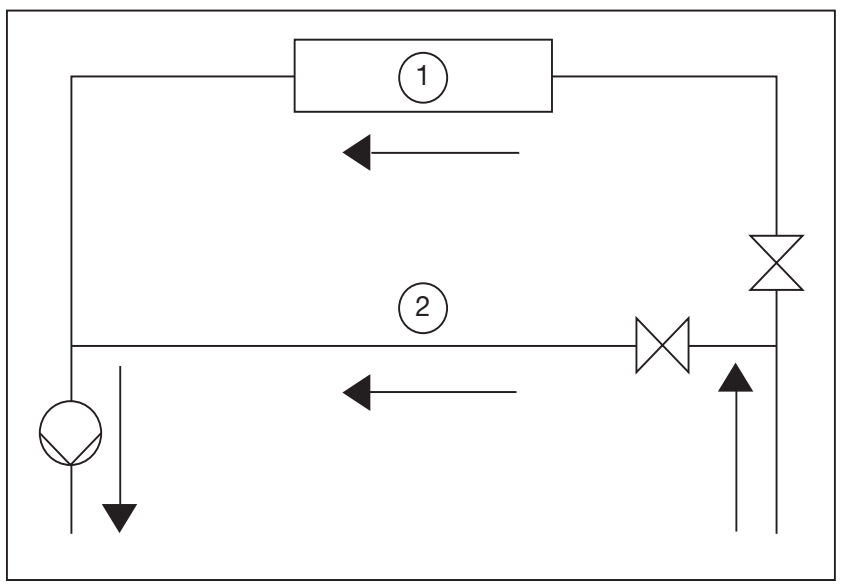


Legend
1 Evaporator
2 Recirculation

6.3 - Maximum chilled water flow (units without hydronic module)

The maximum chilled water flow is shown in the table on the next page. If the system flow exceeds the maximum value, it can be bypassed as shown in the diagram.

For maximum chilled water flow rate



Legend
1 Evaporator
2 Bypass

6.4 - Variable flow evaporator

Variable evaporator flow can be used in standard 30XA chillers. The chillers maintain a constant leaving water temperature under all flow conditions. For this to happen, the minimum flow rate must be higher than the minimum flow given in the table of permissible flow rates and must not vary by more than 10% per minute.

If the flow rate changes more rapidly, the system should contain a minimum of 6.5 litres of water per kW instead of 3.25 l/kW.

6.5 - System minimum water volume

Whichever the system, the water loop minimum capacity is given by the formula:

Capacity = Cap (kW) x N litres

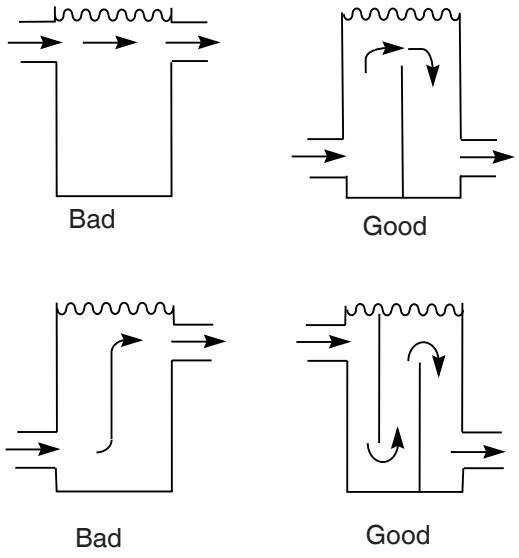
Application	N
Normal air conditioning	3.25
Process type cooling	6.5

Where Cap is the nominal system cooling capacity (kW) at the nominal operating conditions of the installation.

This volume is necessary for stable operation and accurate temperature control.

It is often necessary to add a buffer water tank to the circuit in order to achieve the required volume. The tank must itself be internally baffled in order to ensure proper mixing of the liquid (water or brine). Refer to the examples below.

Connection to a buffer tank



6.6 - Maximum system water volume

Units with hydronic module incorporate an expansion tank that limits the water volume. The table below gives the maximum loop volume for pure water or ethylene glycol with various system concentrations, as well as the static pressures. If the maximum volume is insufficient, compared to the minimum system water loop volume, an additional expansion tank must be added to the system.

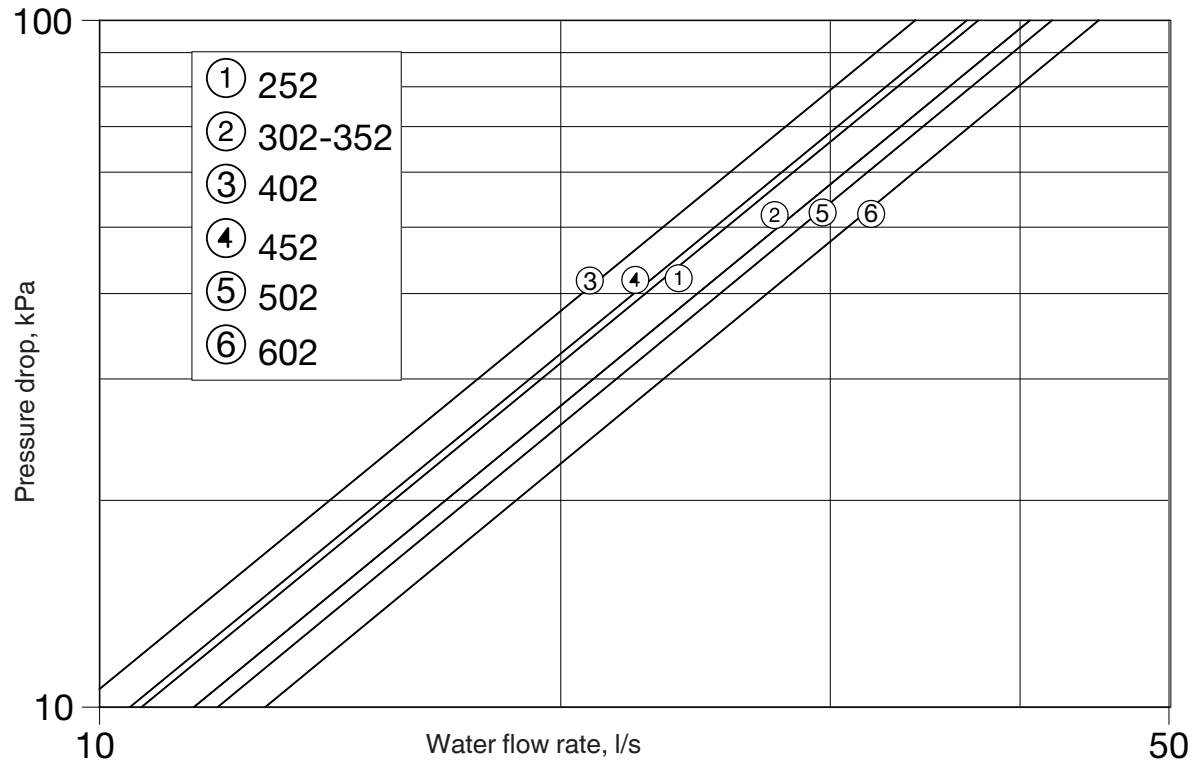
30XA		252-452			502		
Static pressure	**bar**	**1**	**2**	**2.5**	**1**	**2**	**2.5**
Maximum water loop volume	**l**						
Pure water		2400	1600	1200	3960	2640	1980
Ethylene glycol 10%		1800	1200	900	2940	1960	1470
Ethylene glycol 20%		1320	880	660	2100	1400	1050
Ethylene glycol 30%		1080	720	540	1740	1160	870
Ethylene glycol 40%		900	600	450	1500	1000	750

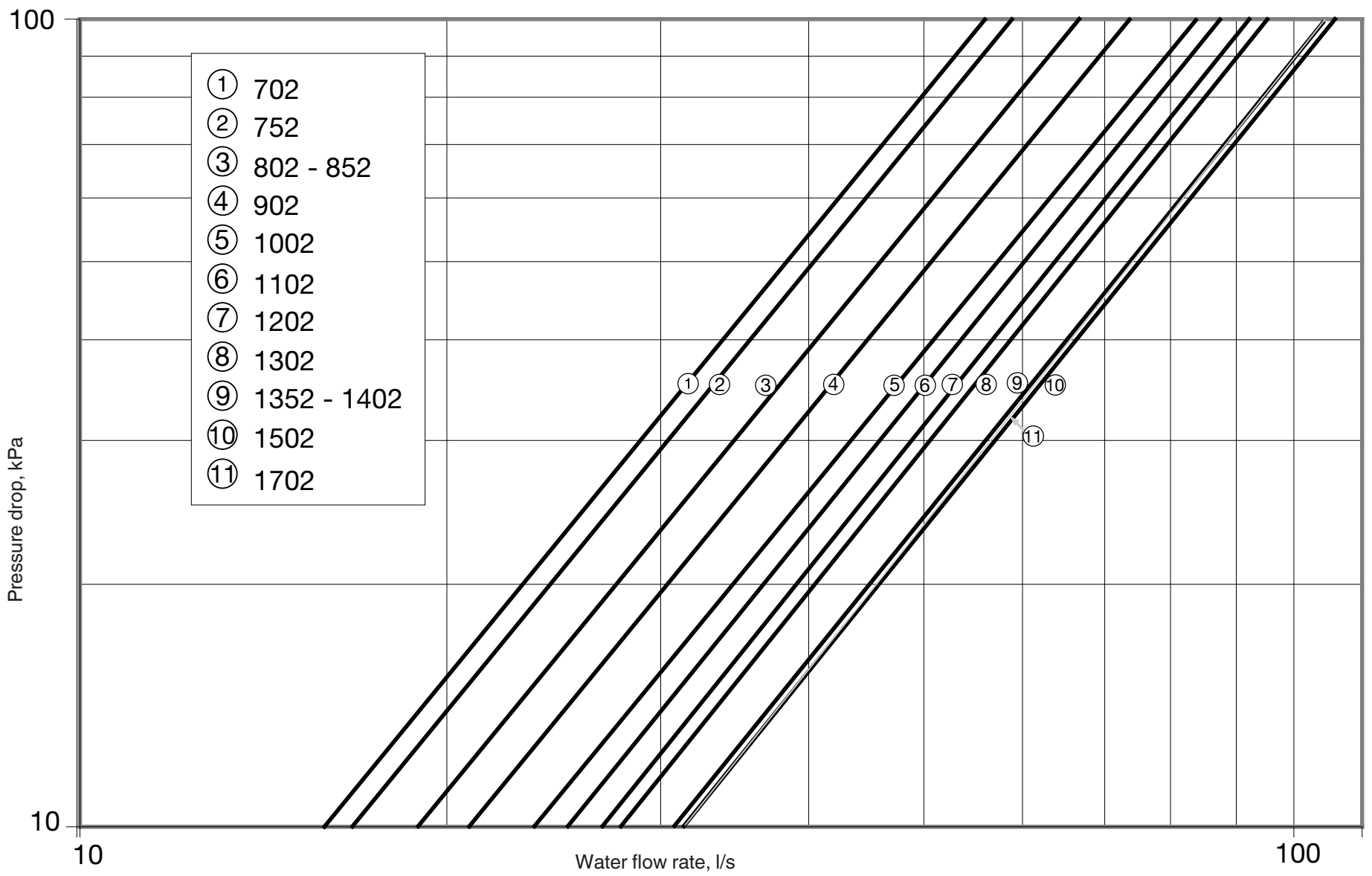
6.7 - Evaporator water flow rate

30XA	Evaporator water flow rate, l/s	
	Min. flow rate	Max. flow rate*
252	3.6	37.5
302	4.0	40.5
352	4.3	40.5
402	5.3	34.1
452	6.0	36.9
502	6.7	42.0
602	8.1	45.0
702	8.9	56.1
752	9.6	59.1
802	10.4	67.1
852	11.0	67.1
902	11.8	73.9
1002	13.1	83.9
1102	15.1	87.8
1202	16.4	92.9
1302	17.5	96.1
1352	18.8	107.4
1402	19.3	107.4
1502	19.9	109.4
1702	22.0	107.4

* The maximum water flow rate corresponds to a pressure drop of 100 kPa.

6.8 - Evaporator pressure drop curve





7 - WATER CONNECTIONS

ATTENTION: Before carrying out any water connections install the water box purge plugs (one plug per water box in the lower section - supplied in the control box).

For size and position of the heat exchanger water inlet and outlet connections refer to the certified dimensional drawings supplied with the unit.

The water pipes must not transmit any radial or axial force to the heat exchangers nor any vibration.

The water supply must be analysed and appropriate filtering, treatment, control devices, isolation and bleed valves and circuits built in, to prevent corrosion, fouling and deterioration of the pump fittings. Consult either a water treatment specialist or appropriate literature on the subject.

7.1 - Operating precautions

The water circuit should be designed to have the least number of elbows and horizontal pipe runs at different levels. Below the main points to be checked for the connection:

- Comply with the water inlet and outlet connections shown on the unit.
- Install manual or automatic air purge valves at all high points in the circuit(s).
- Use an expansion device to maintain pressure in the circuit(s) and install a safety valve as well as an expansion tank.
- Install thermometers in both the entering and leaving water connections.
- Install drain connections at all low points to allow the whole circuit to be drained.
- Install stop valves, close to the entering and leaving water connections.
- Use flexible connections to reduce the transmission of vibrations.
- Insulate all pipework, after testing for leaks, both to reduce heat gains and to prevent condensation.
- Cover the insulation with a vapour barrier.
- Where there are particles in the fluid that could foul the heat exchanger, a screen filter should be installed ahead of the pump. The mesh size of the filter must be 1.2 mm (see 'Typical water circuit' diagram on the right).
- Before the system start-up verify that the water circuits are connected to the appropriate heat exchangers (e.g. no reversal between evaporator and condenser).
- Do not introduce any significant static or dynamic pressure into the heat exchange circuit (with regard to the design operating pressures).
- Before any start-up verify that the heat exchange fluid is compatible with the materials and the water circuit coating.

  In case additives or other fluids than those recommended by Carrier are used, ensure that the fluids are not considered as a gas, and that they belong to class 2, as defined in directive 97/23/EC.

Carrier recommendations on heat exchange fluids:

1. No NH^{4+} ammonium ions in the water, they are very detrimental for copper. This is one of the most important factors for the operating life of copper piping. A content of several tenths of mg/l will badly corrode the copper over time.
2. Cl^- Chloride ions are detrimental for copper with a risk of perforations by corrosion by puncture. If possible keep below 10 mg/l.
3. SO_4^{2-} sulphate ions can cause perforating corrosion, if their content is above 30 mg/l.
4. No fluoride ions (<0.1 mg/l).
5. No Fe^{2+} and Fe^{3+} ions with non negligible levels of dissolved oxygen must be present. Dissolved iron < 5 mg/l with dissolved oxygen < 5 mg/l.
6. Dissolved silicon: silicon is an acid element of water and can also lead to corrosion risks. Content < 1 mg/l.
7. Water hardness: TH >5°F. Values between 10 and 25 can be recommended. This will facilitate scale deposit that can limit corrosion of copper. TH values that are too high can cause piping blockage over time. A total alkalimetric titre (TAC) below 100 is desirable.
8. Dissolved oxygen: Any sudden change in water oxygenation conditions must be avoided. It is as detrimental to deoxygenate the water by mixing it with inert gas as it is to over-oxygenate it by mixing it with pure oxygen. The disturbance of the oxygenation conditions encourages destabilisation of copper hydroxides and enlargement of particles.
9. Specific resistance – electric conductivity: the higher the specific resistance, the slower the corrosion tendency. Values above 3000 Ohm/cm are desirable. A neutral environment favours maximum specific resistance values. For electric conductivity values in the order of 200-6000 S/cm can be recommended.
10. pH: Ideal case pH neutral at 20-25°C
    $7 < pH < 8$

If the water circuit must be emptied for longer than one month, the complete circuit must be placed under nitrogen charge to avoid any risk of corrosion by differential aeration.

Charging and removing heat exchange fluids should be done with devices that must be included on the water circuit by the installer. Never use the unit heat exchangers to add heat exchange fluid.

7.2 - Victaulic water connections

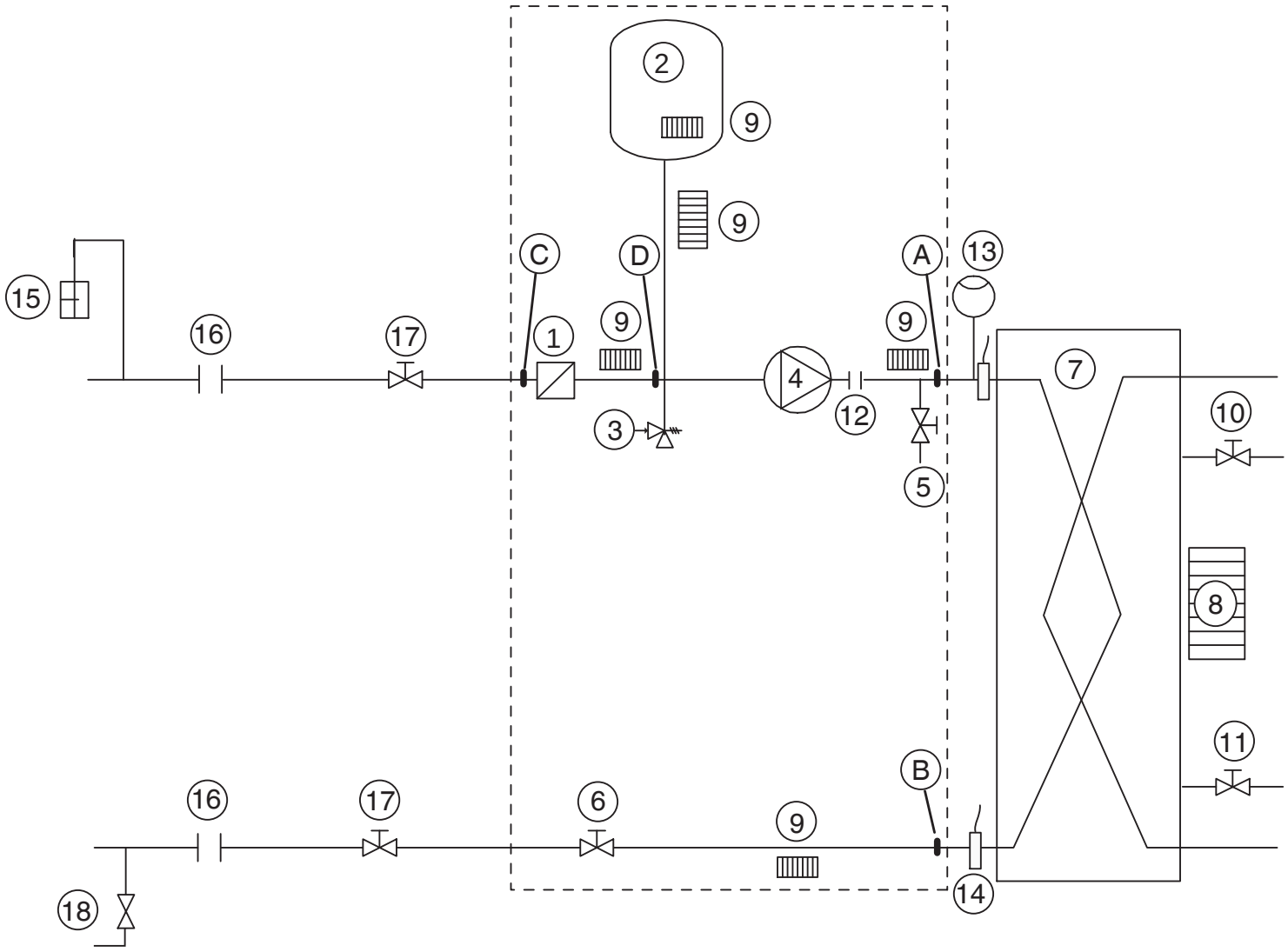
Inlet/outlet diameters without hydronic module

30XA		252-502	602	702-902	1002	1102	1202-1302	1352-1502	1702
Standard									
Diameter	in	5	5	6	8	6/6	6/6	8/6	6/6
Outside diameter	mm	141.3	141.3	168.3	219.1	168.3/168.3	168.3/168.3	219.3/168.3	168.3/168.3
Options 5, 6 and 100A									
Diameter	in	4	5	5	6	5/5	6/5	8/5	6/6
Outside diameter	mm	114.3	141.3	141.3	168.3	141.3/141.3	168.3/141.3	219.1/141.3	168.3/168.3
Option 100C									
Diameter	in	5	6	6	8	-	-	-	-
Outside diameter	mm	141.3	168.3	168.3	219.1	-	-	-	-

Inlet/outlet diameters with hydronic module (option)

30XA (option 116)		252	302	352	402	452	502
Diameter	in	4	4	4	5	5	5
Outside diameter	mm	114.3	114.3	114.3	139.7	139.7	139.7
Expansion tank volume	l	50	50	50	50	50	80
Max. operating pressure	kPa	400	400	400	400	400	400

Typical water circuit diagram



Legend

Components of the unit and hydronic module

A Pressure sensor (A-B = ΔP evaporator)
B Pressure sensor
C Pressure sensor (C-D = ΔP water filter)
D Pressure sensor
1 Victaulic screen filter
2 Expansion tank
3 Safety valve
4 Available pressure pump
5 Drain valve
6 Flow control valve
7 Evaporator
8 Evaporator defrost heater (option)
9 Hydronic module defrost heater (option)
10 Air vent (evaporator)
11 Water drain (evaporator)
12 Expansion compensator (flexible connections)
13 Flow switch
14 Water temperature sensor
15 Air vent

Installation components

16 Flexible connection
17 Check valve
18 Charge valve

--- Hydronic module (supplied as an option)

7.3 - Flow control

Evaporator flow switch and chilled water pump interlock

IMPORTANT: On 30XA units, the unit water flow switch must be energised, and the chilled water pump interlock must be connected. Failure to follow this instruction will void the Carrier guarantee.

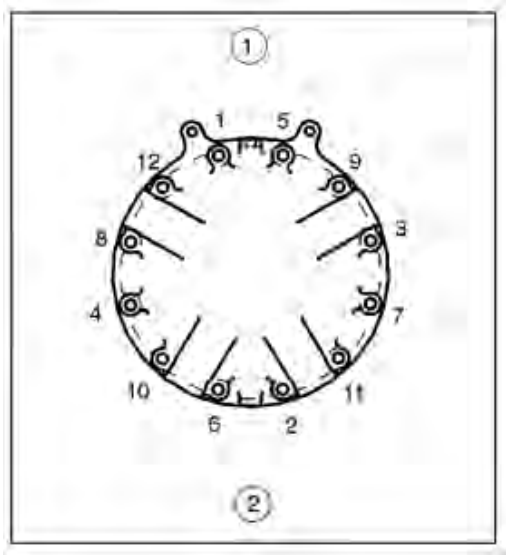
The water flow switch is installed on the evaporator water inlet and adjusted by the control, based on unit size and application. If adjustment is necessary, it must be carried out by qualified personnel trained by Carrier Service.

Terminals 34 and 35 are provided for field installation of the chilled water pump interlock (auxiliary contact for pump operation to be wired on site).

7.4 - Evaporator water box bolt tightening

The evaporator (and condenser) are of the shell and tube type with removable water boxes to facilitate cleaning. Re-tightening or tightening must be done in accordance with the illustration below.

Water box tightening sequence



Legend

1 Sequence 1: 1 2 3 4
Sequence 2: 5 6 7 8
Sequence 3: 9 10 11 12

2 Tightening torque
Bolt size M16 - 171 - 210 Nm

NOTE: Before this operation we recommend draining the circuit and disconnecting the pipes to be sure that the bolts are correctly and uniformly tightened.

7.5 - Frost protection

7.5.1 - Standard machine

If the chiller or the water piping is in an area where the ambient temperature can fall below 0°C it is recommended to add an antifreeze solution to protect the unit and the water piping to a temperature of 10 K below the lowest temperature likely to be reached at the installation site. Use only antifreeze solutions, approved for heat exchanger duty. If the system is not protected by an antifreeze solution and will not be used during the freezing weather conditions, draining of the cooler and outdoor piping is mandatory. Damage due to freezing is not covered by the warranty.

IMPORTANT: Depending on the climatic conditions in your area you must:

- ***Add ethylene glycol with an adequate concentration to protect the installation up to a temperature of 10 K below the lowest temperature likely to occur at the installation site.***
- ***If the unit is not used for an extended period, it is recommended to drain it, and as a safety precaution add ethylene glycol to the heat exchanger, using the water entering purge valve connection (a purge connection is available somewhere on the heat exchanger water box in case the machine is not perfectly level).***
- ***At the start of the next season, refill the unit with water and add an inhibitor.***
- ***For the installation of auxiliary equipment, the installer must comply with basic regulations, especially for minimum and maximum flow rates, which must be between the values listed in the operating limit table (application data).***

7.5.2 - Optional evaporator frost protection (30XA)

In cases where it is not possible to apply the recommendations in paragraph 7.5.1, the units can be equipped with heaters to protect the evaporator against frost (option 41A or 41B).

7.6 - Operation of two units in master/slave mode

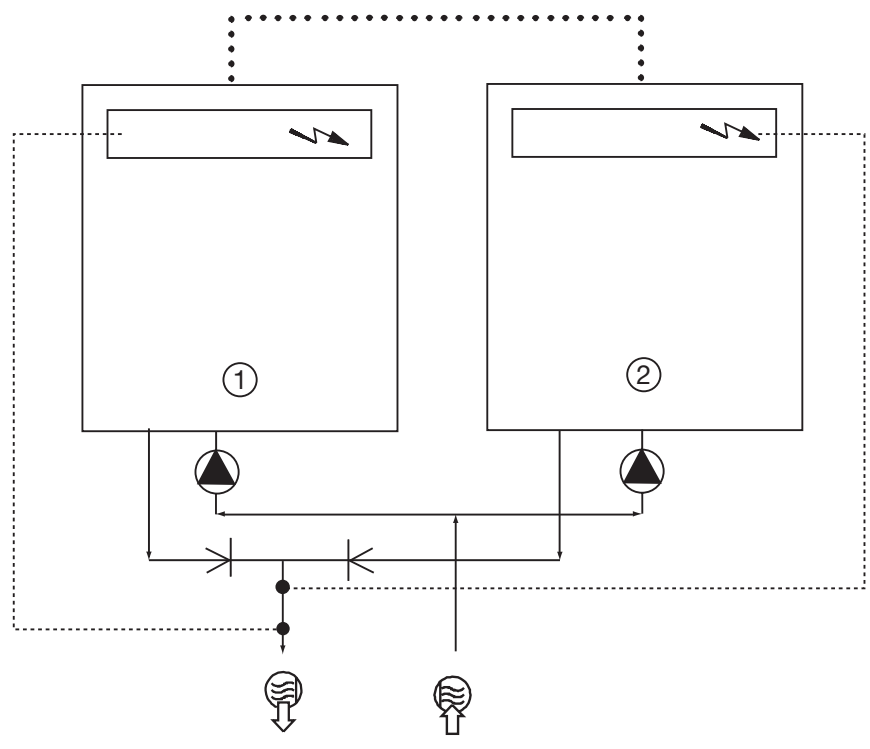
NOTE: This operating mode is not available for 30XA 1702 units.

The control of a master/slave assembly is in the entering water and does not require any additional sensors (standard configuration). It can also be located in the leaving water. In this case two additional sensors must be added on the common piping.

All parameters, required for the master/slave function must be configured using the Service Configuration menu. All remote controls of the master/slave assembly (start/stop, set point, load shedding etc.) are controlled by the unit configured as master and must only be applied to the master unit.

Each unit controls its own water pump. If there is only one common pump, in cases with variable flow, isolation valves must be installed on each unit. They will be activated at the opening and closing by the control of each heat pump (in this case the valves are controlled using the dedicated water pump outputs). See the 30XA Pro-Dialog Control IOM for a more detailed explanation.

30XA with configuration: leaving water control

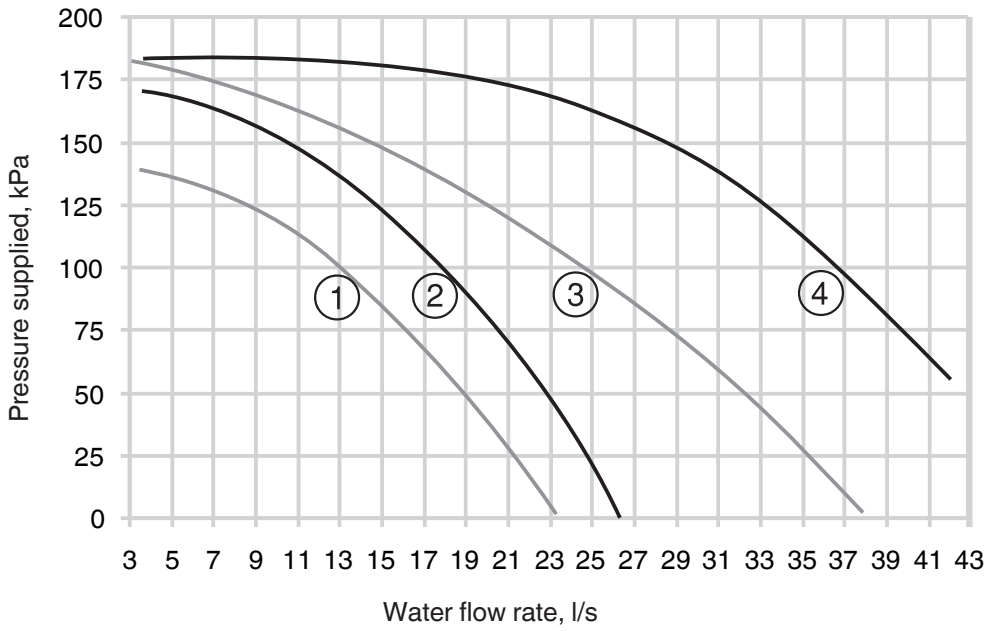


Legend

1 Master unit
2 Slave unit
Control boxes of the master and slave units
Water inlet
Water outlet
Water pumps for each unit (included as standard for units with hydronic module)
● Additional sensors for leaving water control, to be connected to channel 1 of the slave boards of each master and slave unit
♦ ♦ ♦ CCN communication bus
------ Connection of two additional sensors

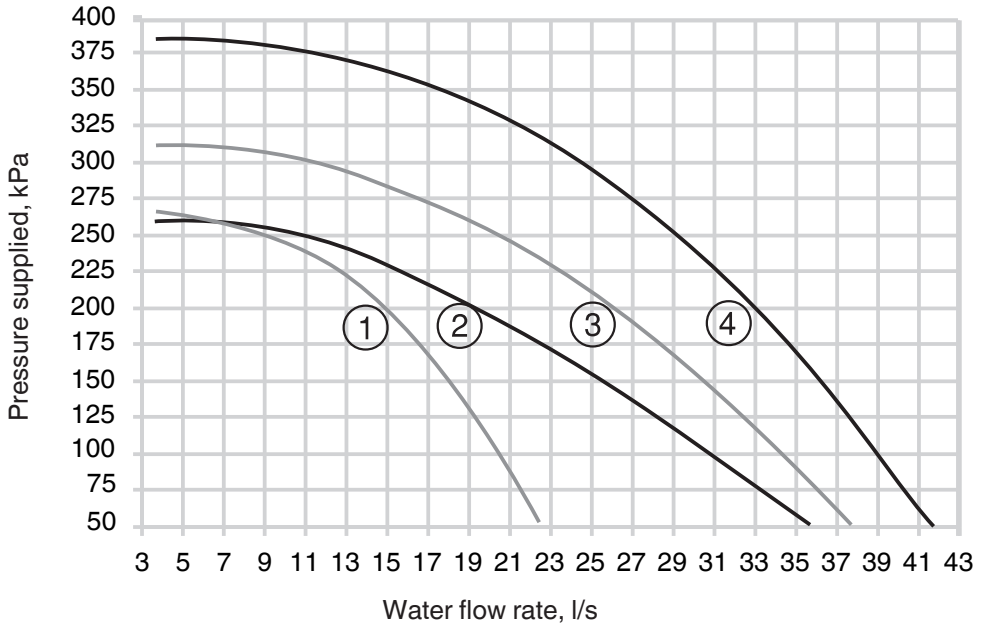
7.7 - Pump pressure/flow rate curves

Low-pressure pumps



Legend
1 30XA 252-302
2 30XA 352
3 30XA 402
4 30XA 452-502

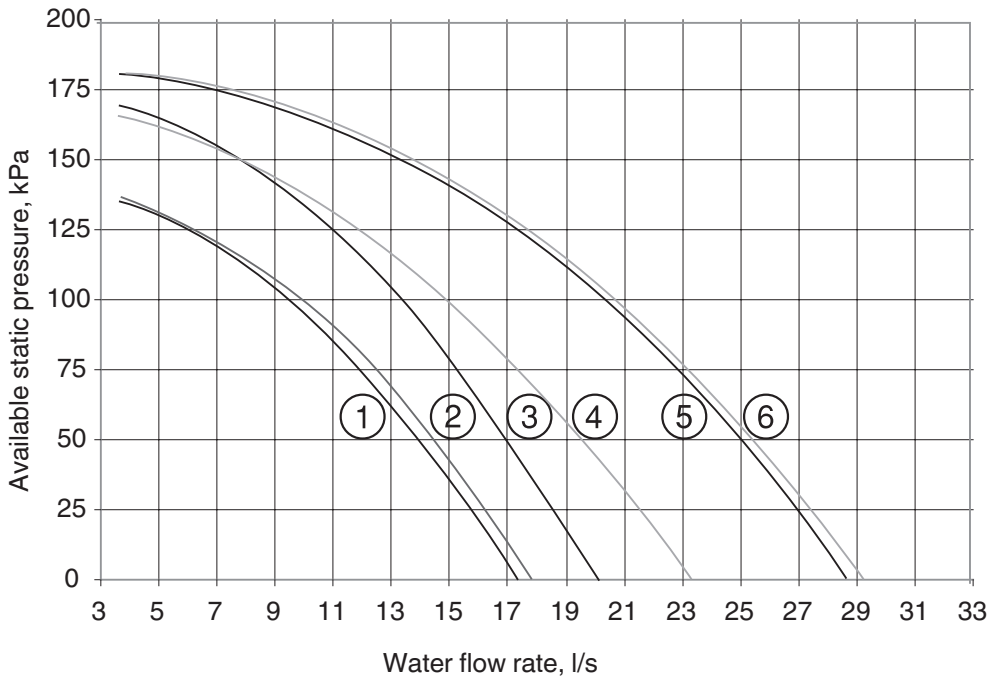
High-pressure pumps



Legend
1 30XA 252
2 30XA 302-352
3 30XA 402-452
4 30XA 502

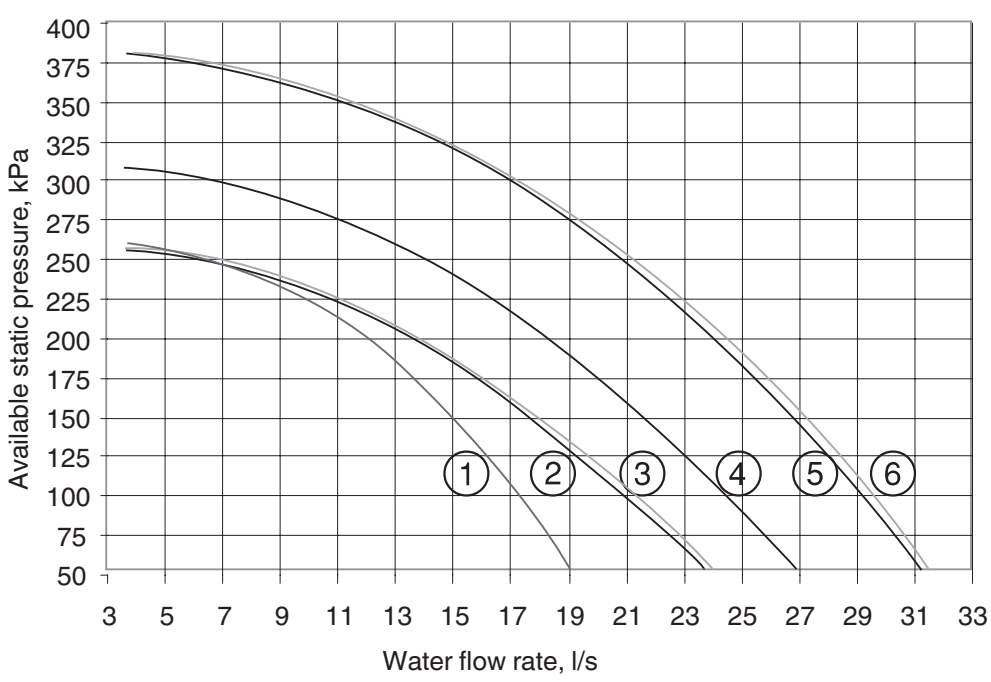
7.8 - Available static system pressure (optional hydronic module)

Low-pressure pumps



Legend
1 30XA 252
2 30XA 302
3 30XA 352
4 30XA 402
5 30XA 452
6 30XA 502

High-pressure pumps



Legend
1 30XA 252
2 30XA 352
3 30XA 302
4 30XA 402
5 30XA 452
6 30XA 502

8 - FREE-COOLING OPTION

8.1 - Characteristics

30XA with Option 118A		252	302	352	402	452	502	602	702	752	802	852	902	1002
Operating weight*	**kg**	3840	3880	3920	4780	4850	5330	6260	6410	6710	7010	7560	7860	8440
Refrigerant charge	**kg**													
Circuit A		36	37	37	54	56	64	64	64	72	76	79	76	83
Circuit B		38	38	39	37	39	39	64	68	64	67	70	79	87
Refrigerant charge, option 254	**kg**													
Circuit A		60	64	**	87	87	104	104	102	**	**	133	**	143
Circuit B		64	64	**	56	56	56	90	97	**	**	97	**	132

* Standard unit and option 119

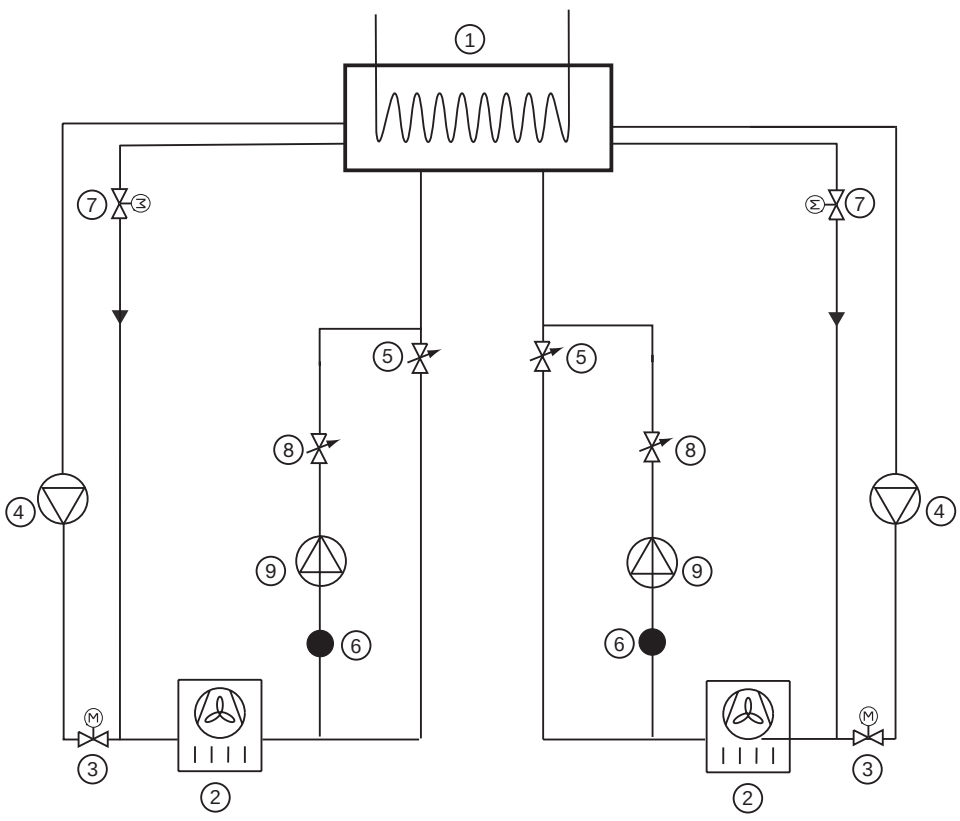
** Option 118A (free cooling) is not compatible with these units.

8.2 - Operating limits

Cooling mode			
Evaporator		**Minimum**	**Maximum**
Entering water temperature at start-up	°C	-	45
Entering water temperature during operation	°C	6.8	21
Leaving water temperature during operation	°C	3.3	26
Condenser (air)		**Minimum**	**Maximum**
Outdoor ambient operating temperature	°C	-10	55*
With winter operation option (option 28)	°C	-20	55*
Free-cooling mode			
Evaporator		**Minimum**	**Maximum**
Entering water temperature at start-up	°C	-	45
Leaving water temperature during operation	°C	3,3	26*
Condenser (air)		**Minimum**	**Maximum**
Outdoor ambient operating temperature	°C	-10	20
With winter operation option (option 28)	°C	-20	20

* Maximum configurable set-point

8.3 - Operation



Legend

1 Evaporator
2 Air condenser (coils)
3 Motorised two-way valve, discharge side
4 Compressor and oil separator
5 Principal electronic expansion valve (EXV)
6 Pressure and temperature measurement to calculate the sub-cooling upstream of the pump
7 Motorised two-way bypass valve
8 Free-cooling expansion device (EXV)
9 Refrigerant pump

The change-over between the cooling and free-cooling modes is automatically controlled (it is possible to block the change-over to free-cooling by reconfiguring the machine - see Controls IOM). The configurable parameters permitting change-over are the outside air temperature and the leaving water temperature set-point. As soon as the temperature difference LWTstp - OAT is above 8 K the current capacity in cooling mode is calculated and compared with the theoretical free-cooling capacity. This comparison authorizes/stops the change-over to free-cooling.

After change-over to free-cooling all compressors are stopped, the two (or four) two-way valves change to the free-cooling position (the compressor functions are bypassed). As soon as the valves open, the free-cooling pump is started. This change-over logic takes around 4 minutes. Taking this timing into consideration two cooling - free-cooling change-overs are authorized per hour.

If the capacity supplied in the free-cooling mode is insufficient (set-point not reached), the unit automatically changes over to cooling mode.

To optimize operation in free-cooling mode we strongly recommend to use the set-point offset function. This favours the change-over to free-cooling and increases the capacity in free-cooling mode.

9 - HEAT RECLAIM CONDENSER OPTION

9.1 - Technical data, 30XA units with heat reclaim condenser option

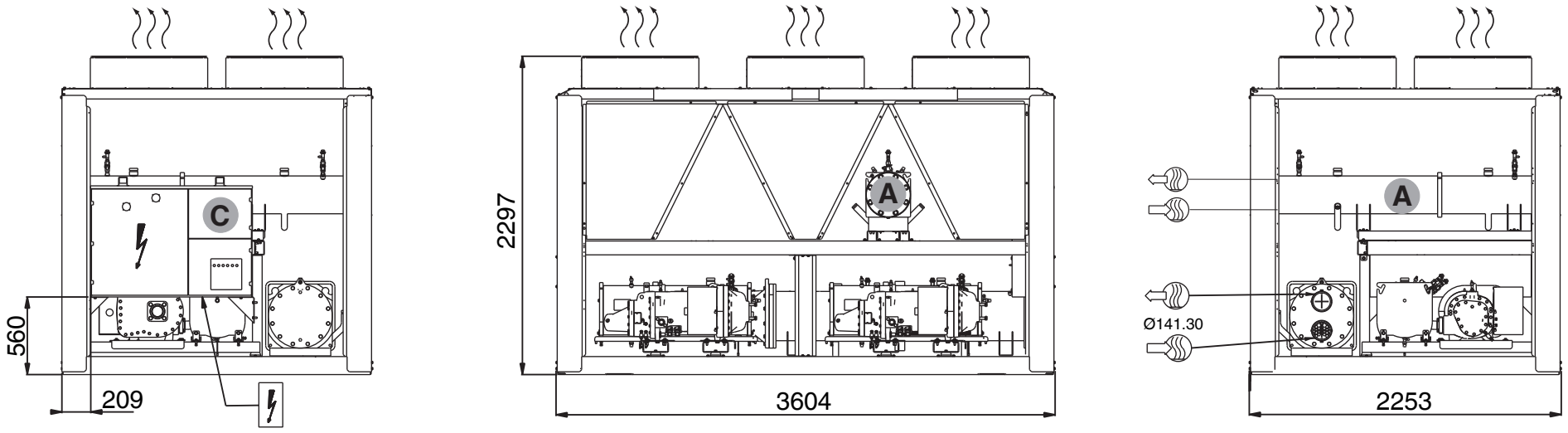
30XA heat reclaim mode		252	302	352	402	452	502	602	702	752	802	852	902	1002
Cooling capacity*	kW	261	291	311	379	438	493	603	665	707	775	814	875	971
Heating capacity in heat reclaim mode*	kW	336	373	401	481	554	620	760	832	894	974	1027	1105	1229
Total power input (unit)*	kW	82	90	99	113	128	140	172	183	206	219	234	253	283
Total energy efficiency ratio (EER/COP)	kW/kW	3.16/ 4.07	3.22/ 4.13	3.15/ 4.06	3.36/ 4.27	3.40/ 4.31	3.53/ 4.46	3.52/ 4.44	3.63/ 4.55	3.43/ 4.35	3.53/ 4.45	3.48/ 4.40	3.45/ 4.38	3.42/ 4.35
Operating weight**	kg	4230	4270	4280	5260	5380	5880	7000	7100	7470	7680	8320	8670	9280
Refrigerant charge														
Circuit A	kg	36	37	37	53	54,5	62	62	62	70	74	77	74	96
Circuit B	kg	38	38	39	37	39	39	62	66	62	69	68	77	94
Heat reclaim condenser		Flooded multi-pipe condenser												
Water volume	l	38	38	38	55	68	68	55 + 55	55 + 55	55 + 68	55 + 68	55 + 68	68 + 68	68 + 68
Water connections		Victaulic												
Diameter	in	3-1/2	3-1/2	3-1/2	4	4	4	4	4	4	4	4	4	4
Outside diameter	mm	93	93	93	106	106	106	106	106	106	106	106	106	106

* Entering and leaving water temperature: evaporator 12°C/7°C; heat reclaim condenser: 40°C/45°C

** Weights are for guidance only

9.2 - Dimensions, clearances

9.2.1 - 30XA 252-352 - heat reclaim option



Legend:
All dimensions are given in mm.

(1) Required clearances for maintenance and air flow

(2) Recommended space for evaporator tube removal

Water inlet

Water outlet

Air outlet – do not obstruct

Power supply connection

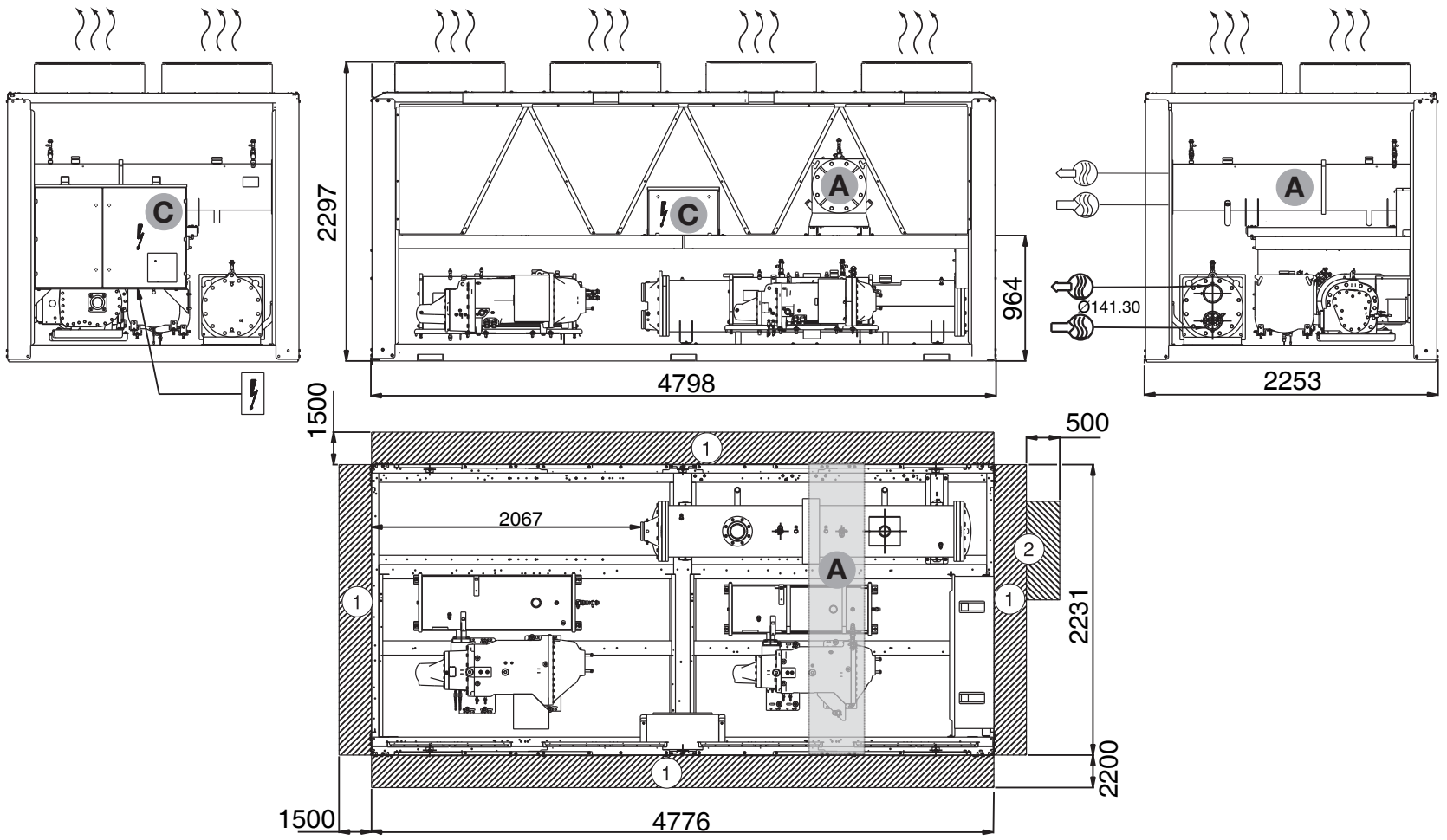
(C) Control circuit connection

(A) Heat reclaim condenser

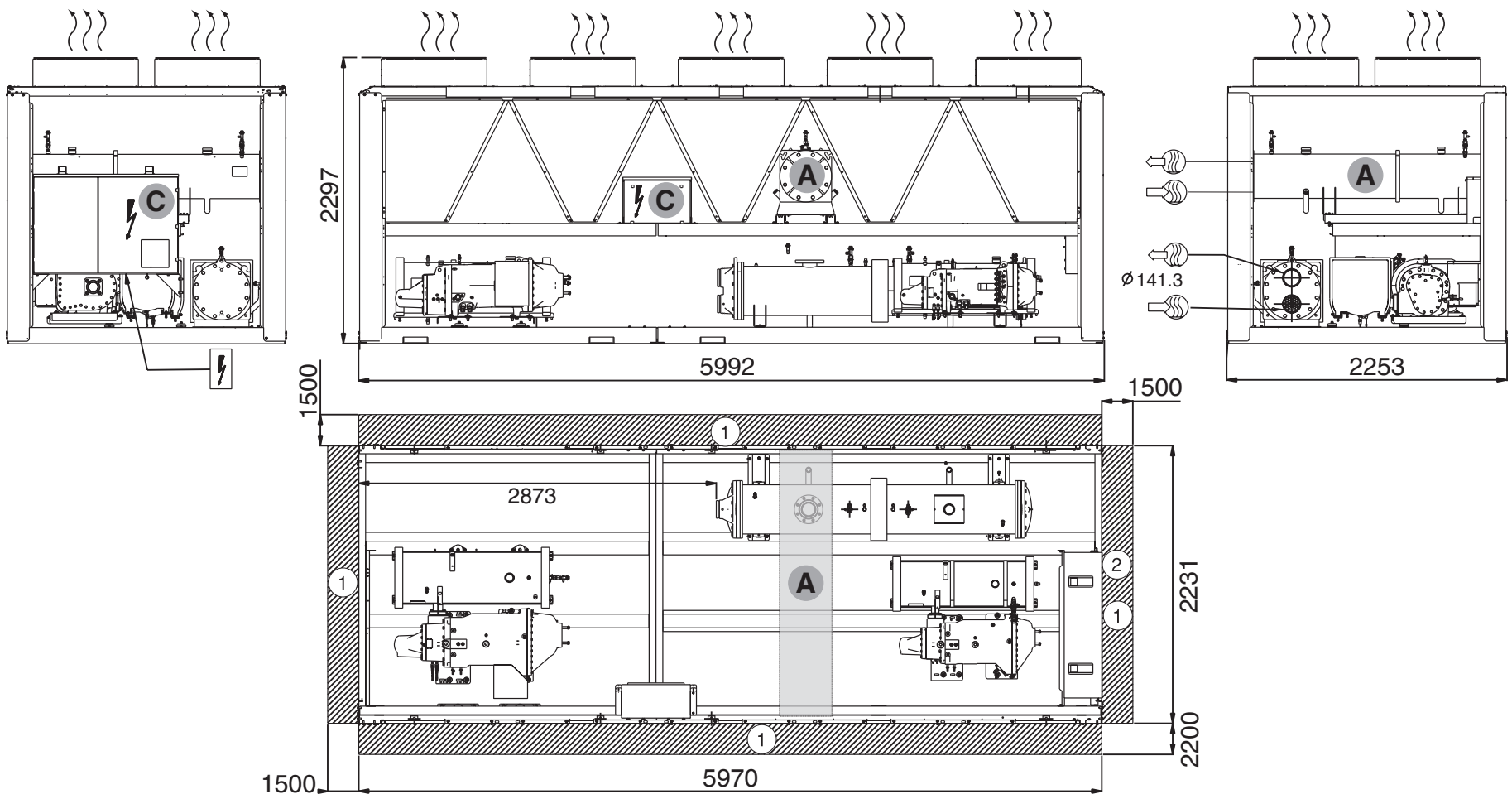
ATTENTION: The Victaulic flange sleeves of the condenser are not installed, but supplied with the unit. The sealing joints are in the control box. The temperature sensors and the condenser flow switch are wired and fixed in the machine. They must be installed as described in the chapter "Condenser water connections".

NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request. For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

9.2.2 - 30XA 402-452 - heat reclaim option



9.2.3 - 30XA 502 - heat reclaim option



Legend:
All dimensions are given in mm.

(1) Required clearances for maintenance and air flow

(2) Recommended space for evaporator tube removal

Water inlet

Water outlet

Air outlet – do not obstruct

Power supply connection

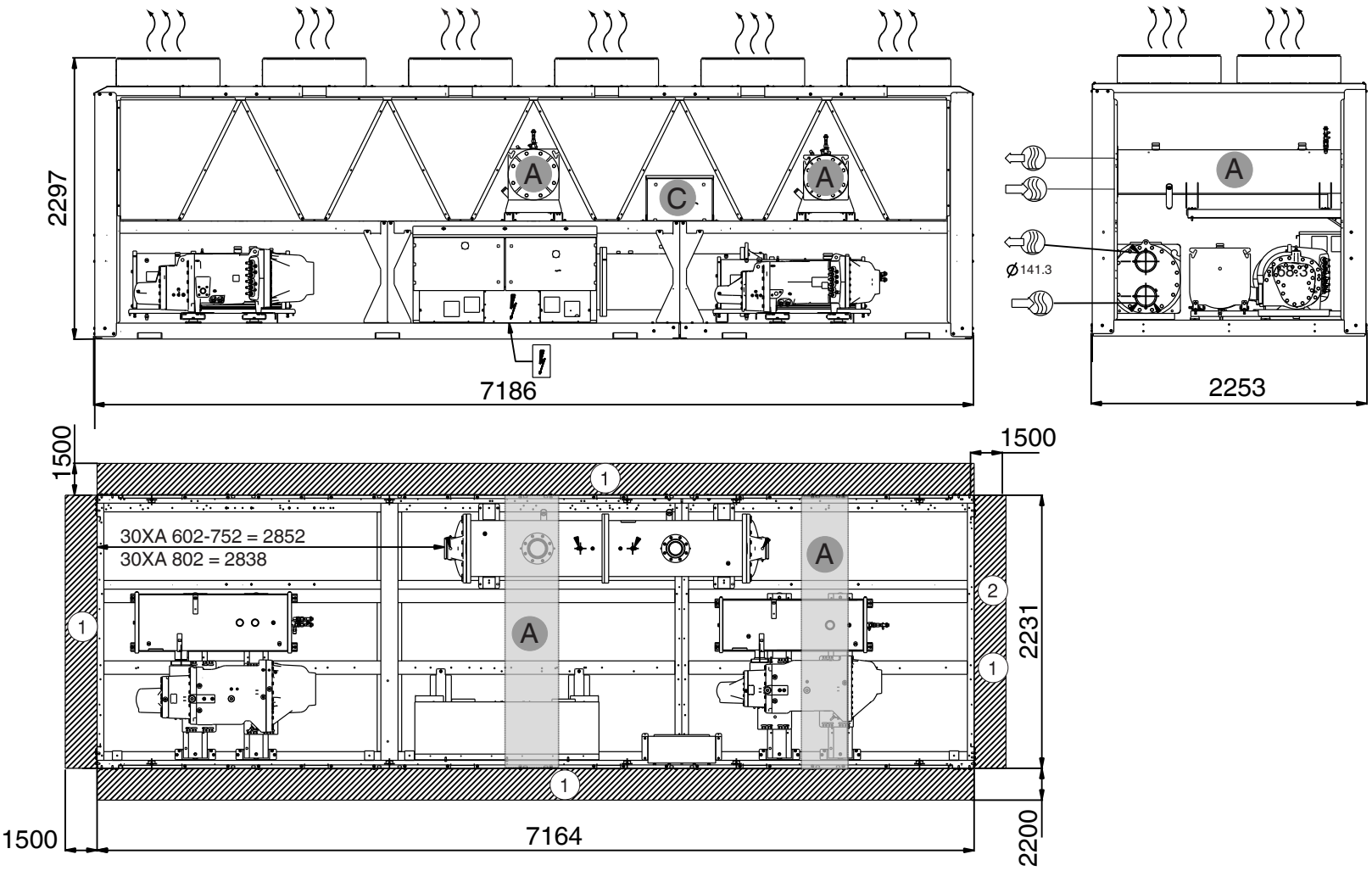
(C) Control circuit connection

(A) Heat reclaim condenser

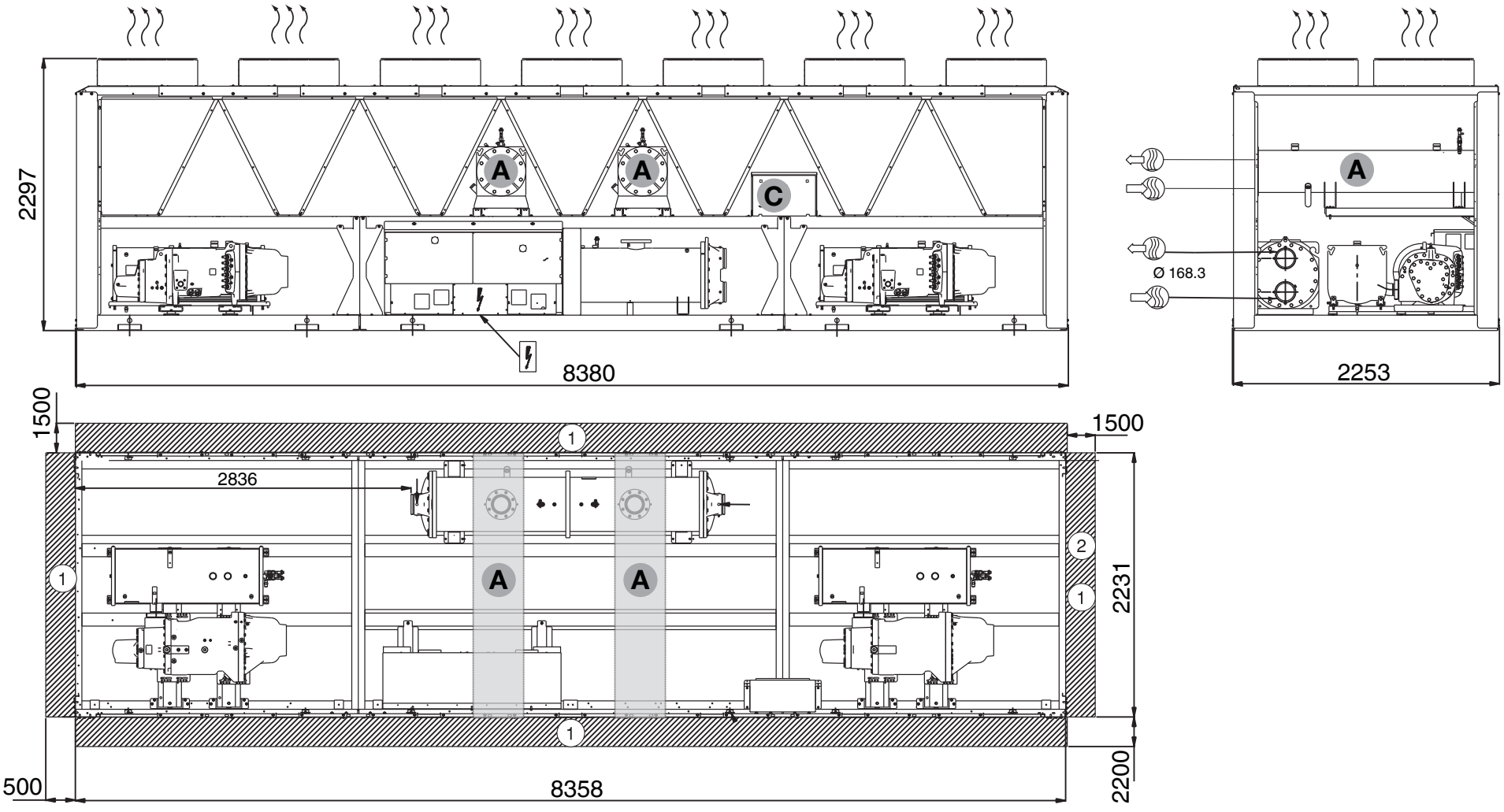
ATTENTION: The Victaulic flange sleeves of the condenser are not installed, but supplied with the unit. The sealing joints are in the control box. The temperature sensors and the condenser flow switch are wired and fixed in the machine. They must be installed as described in the chapter "Condenser water connections".

NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request. For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

9.2.4 - 30XA 602-802 - heat reclaim option



9.2.5 - 30XA 852-902 - heat reclaim option



Legend:
All dimensions are given in mm.

(1) Required clearances for maintenance and air flow

(2) Recommended space for evaporator tube removal

Water inlet

Water outlet

Air outlet – do not obstruct

Power supply connection

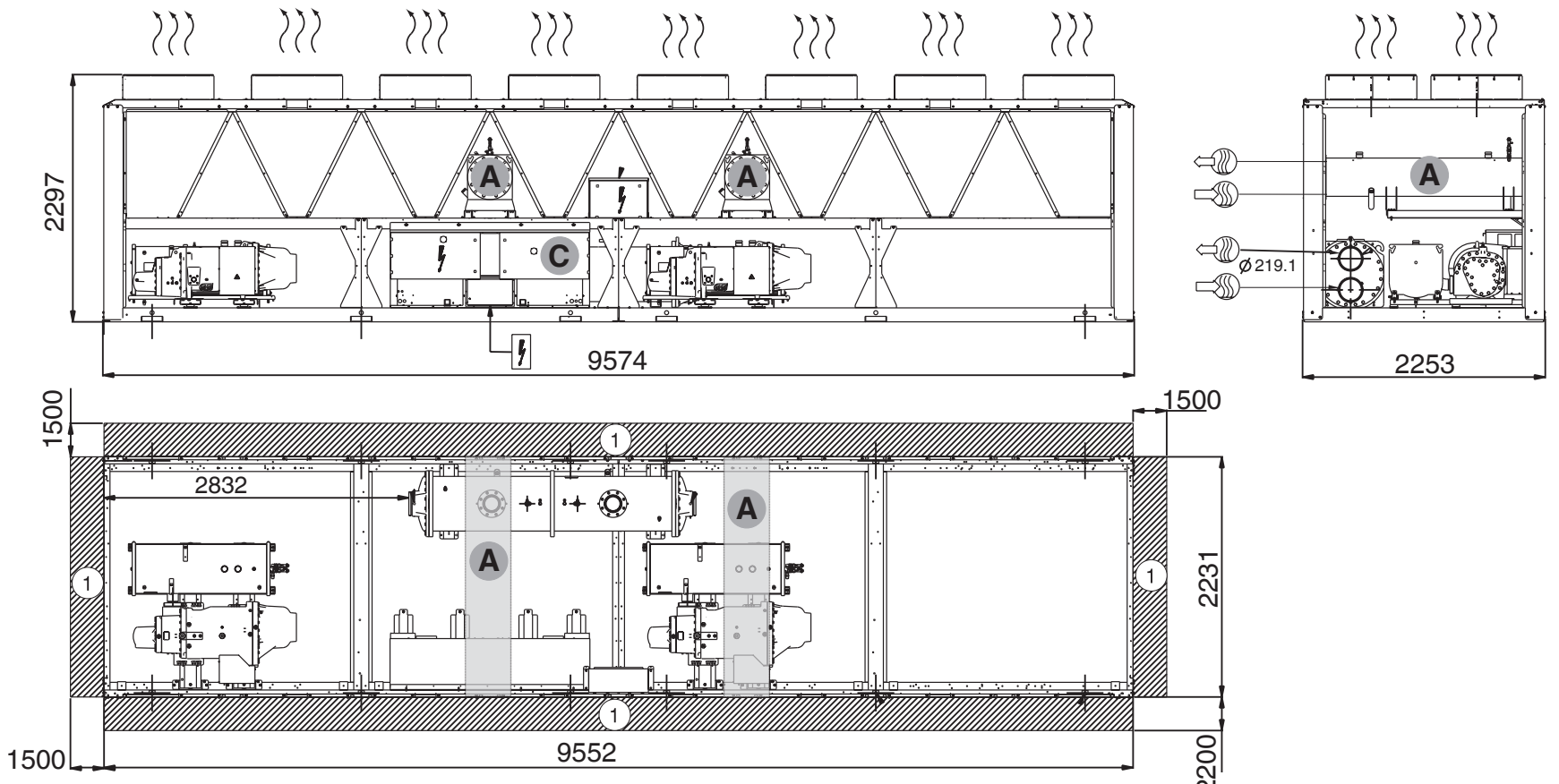
(C) Control circuit connection

(A) Heat reclaim condenser

ATTENTION: The Victaulic flange sleeves of the condenser are not installed, but supplied with the unit. The sealing joints are in the control box. The temperature sensors and the condenser flow switch are wired and fixed in the machine. They must be installed as described in the chapter "Condenser water connections".

NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request. For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

9.2.6 - 30XA 1002 - heat reclaim option



Legend:
All dimensions are given in mm.

(1) Required clearances for maintenance and air flow

(2) Recommended space for evaporator tube removal

Water inlet

Water outlet

Air outlet – do not obstruct

Power supply connection

(C) Control circuit connection

(A) Heat reclaim condenser

ATTENTION: The Victaulic flange sleeves of the condenser are not installed, but supplied with the unit. The sealing joints are in the control box. The temperature sensors and the condenser flow switch are wired and fixed in the machine. They must be installed as described in the chapter "Condenser water connections".

NOTE: Drawings are not contractually binding. Before designing an installation, consult the certified dimensional drawings supplied with the unit or available on request. For the positioning of the fixing points, weight distribution and centre of gravity coordinates please refer to the dimensional drawings.

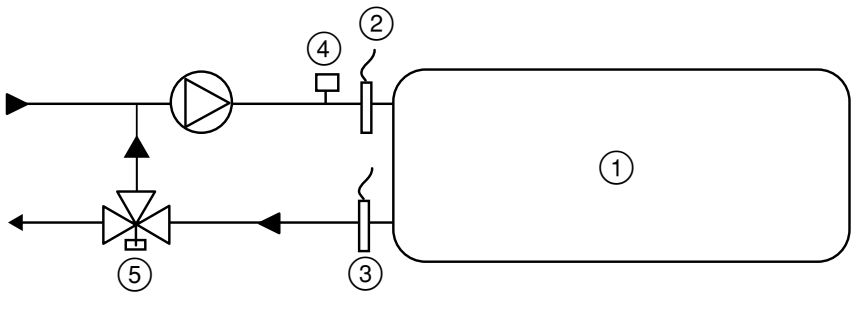
9.3 - Condenser location

All heat reclaim condensers are located between the air-cooled condensers on the upper part of the chassis, supported by two cross rails. The water inlet and outlet are on the same side.

9.4 - Condenser water connections

9.4.1 - Unit with one heat reclaim condenser (30XA 252-502)

The water flow switch must be installed at the water inlet of the installation that arrives at the heat reclaim condenser.

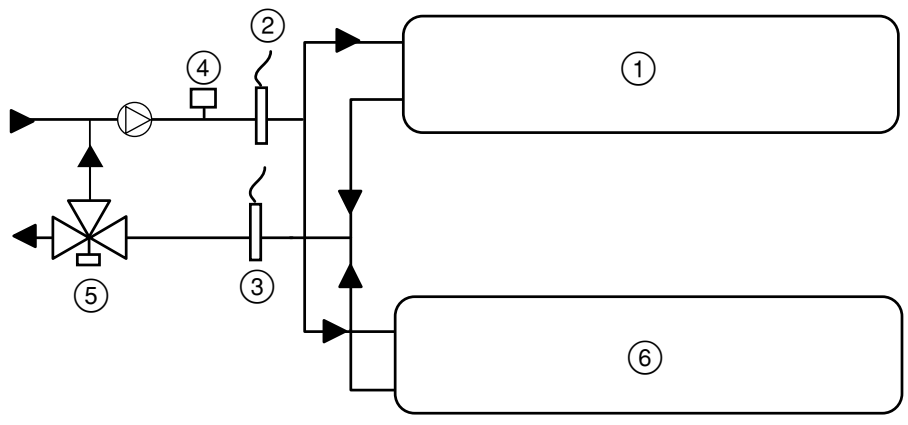


Legend
1 Heat reclaim condenser
2 Entering water temperature sensor (supplied)
3 Leaving water temperature sensor (supplied)
4 Condenser water flow switch (supplied)
5 Three-way valve (not supplied)

9.4.2 - Unit with two heat reclaim condensers (30XA 602-1002)

The two condensers must be installed in parallel in the water system of the installation. The water flow switch and the entering/leaving water temperature sensors must be installed in the line that is common to both heat reclaim circuits and as close as possible to the condensers. A T-piece must be provided by the installer at the water inlet and outlet of the condensers.

For units with two condensers the maximum cable length of the temperature sensors and the flow switch (7.5 m) is designed to allow connection to the common inlet or outlet in a radius of 4.5 m after routing along the width of the unit.



Legend
Please refer to the legend in chapter 9.4.1 opposite, noting that items 2, 3 and 4 - flow switch and sensors - are placed on the common sections.

9.4.3 - Three-way valves

It is strongly recommended to install a three-way valve in the system (not supplied with the unit). A 0-10 V output is available on the unit electronic board to control this valve. The valve allows bypassing of the heat reclaim condenser entering/leaving circuit to ensure unit operation with heat reclaim at low entering water temperature (< 12.5°C). It also ensures an optimal and controlled leaving water temperature.

9.5 - Operating limits for stable operation (no mode changeover)

9.5.1 - Cooling only mode

Please refer to the earlier chapters in this manual:
6.1 - Unit operating range
6.7 - Evaporator water flow rate

9.5.2 - Heat reclaim mode

Condenser water temperature			
	°C	**Minimum**	**Maximum**
Water entering temperature at start-up		12.5*	55
Water entering temperature during operation		20	55
Water leaving temperature during operation		25	60
Evaporator water temperature			
	°C	**Minimum**	**Maximum**
Water entering temperature at start-up		-	45
Water entering temperature during operation		6.8	21
Water leaving temperature during operation		3.3	15

* The water entering temperature at start-up must not be lower than 12.5°C. For installations with a lower temperature a three-way valve must be used.

NOTE: If the temperature at the evaporator is below 4°C, a glycol/water solution or the frost protection option must be used.

9.6 - Operating limits for changeover between modes

From cooling only to heat reclaim and vice versa.

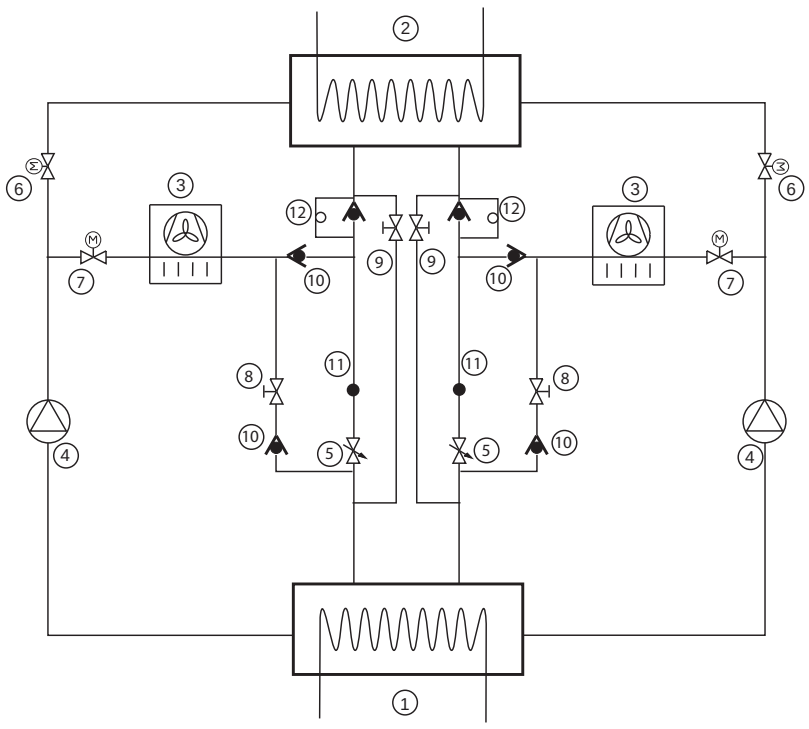
Heat reclaim condenser water temperature			
	°C	**Minimum**	**Maximum**
Water entering temperature		12.5	57.5
Ambient operating temperature		-10*	45

* -20°C with winter operation option (option 28)

9.7 - Flow control

The water flow switch supplied needs to be installed at the heat reclaim condenser water inlet and protects the condenser loop against low water flow conditions. When the heat reclaim mode is required, a signal from the additional board output activates the system pump. Once the pump is started, flow detection takes place for one minute. If no flow is detected by the end of this time:

1. changeover to the heat reclaim mode is not permitted
2. mode is changed to cooling only mode when the water flow rate is low, accompanied by a water flow detection alarm.



Legend

1 Evaporator
2 Heat reclaim condenser
3 Air condenser (coils)
4 Compressor
5 Expansion device (EXV)
6 Motorised valve - heat reclaim mode
7 Motorised valve - cooling only mode
8 Solenoid valve - charge recovery in heat reclaim mode
9 Solenoid valve - charge recovery in cooling only mode
10 Check valve
11 Pressure and temperature measurement to calculate the liquid sub-cooling to optimise the charge recovery
12 Check valve with capillary

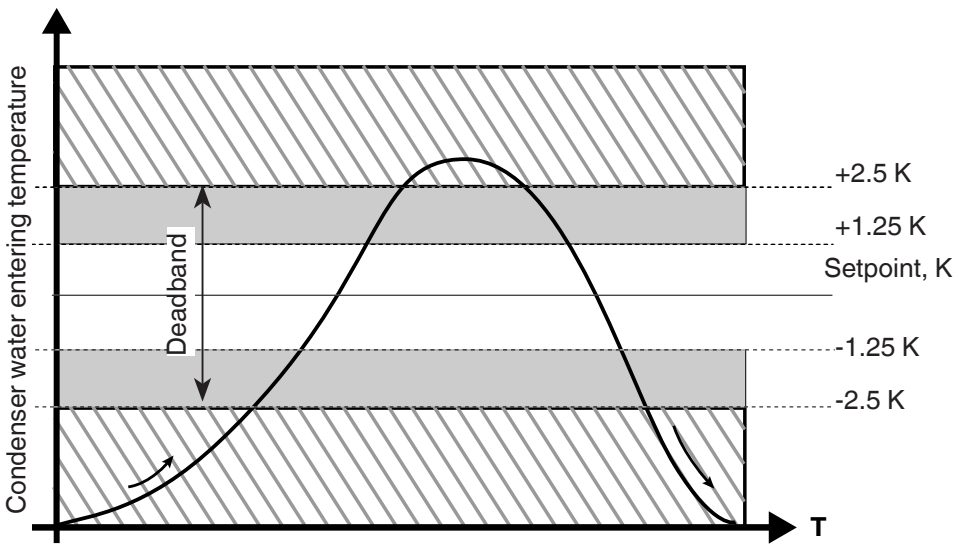
9.8 - Heat reclaim operation

The heat reclaim condenser option is only available on units with two circuits. It has been designed with one or two single or two-circuit shell-and-tube heat exchangers, depending on the unit size.

The two circuits are independently controlled. One circuit can be in cooling only and the other in heat reclaim mode.

Changeover from one mode to the other (changeover from heat exchange at the air condenser to heat exchange at the water condenser and vice versa) is ensured by motorised two-way valves located upstream of the air and water condensers.

Depending on the mode selected (heat reclaim or cooling), the logic compares the water entering temperature required with the setpoint of the condenser entering water temperature, chosen by the user. Depending on this difference the unit circuits are either activated or deactivated in heat reclaim mode (one or two together), as shown in the following diagram and table.



The deadband of 5 K is controlled by default.

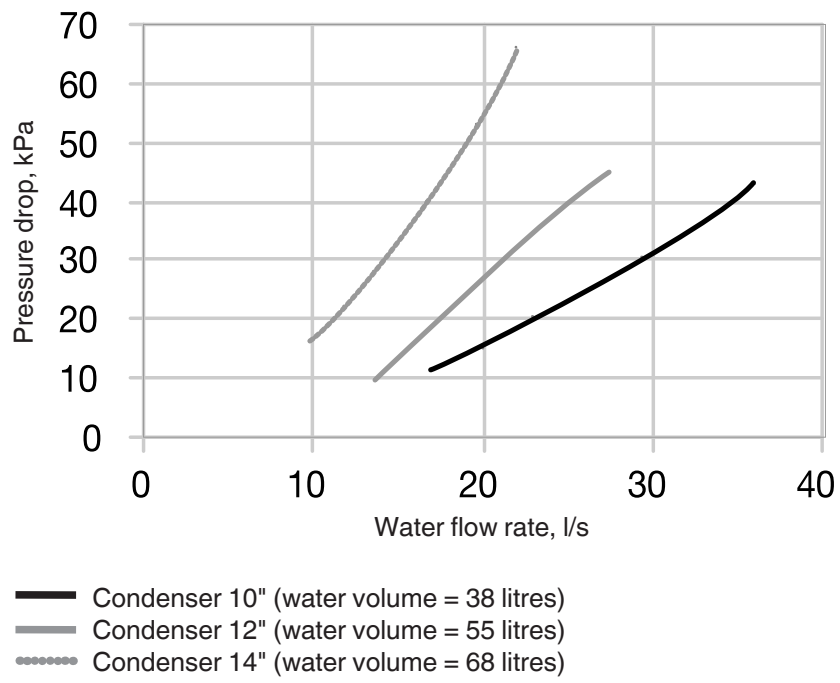
Case	Selection of the heat reclaim mode	Number of circuits in heat reclaim mode	Action
-	NO	0	+ 2 circuits in cooling mode
A	YES	Whatever the number	+ 2 circuits in heat reclaim mode
B	YES	0	+ 1 circuit in heat reclaim mode
		1	No change
		2	No change
C	YES	Whatever the number	No change
D	YES	1	No change
		2	- 1 circuit in heat reclaim mode
E	YES	Whatever the number	- 2 circuits in heat reclaim mode

For more details on the heat reclaim operation logic please refer to the 30XA control manual in chapter “Heat reclaim module option”.

9.9 - Condenser pump selection

Heat reclaim condenser water flow rate/pressure drop

Heat reclaim condenser pressure drop in water flow rate function



For units with a water condenser please refer to chapter 9.1.

9.10 - Frost protection

The heat reclaim condenser is equippped with electric heaters to protect the condenser against frost. These are activated if the condenser entering and leaving water temperatures are below 3°C and deactivated, if they are higher than 4.4°C.

10 - MAJOR SYSTEM COMPONENTS AND OPERATION DATA

10.1 - Direct-drive twin-screw compressor with variable capacity slide valve

- 30XA units use 06T geared twin-screw compressors equipped with a variable capacity slide valve for continuous control between 30% and 100% of full load.
- Nominal capacities range from 120 to 530 kW. The seven models used in the 30XA range are economised.

10.1.1 - Oil filter
The 06T screw compressor has an independent oil filter attached to the oil separator. This filter is field replaceable.

10.1.2 - Refrigerant
The 30XA a water chiller operating only with refrigerant R134a.

10.1.3 - Lubricant
The 06T screw compressor is approved for use with the following lubricant: CARRIER MATERIAL SPEC PP 47-32.

10.1.4 - Oil supply solenoid valve
An oil supply solenoid valve is installed on the oil return line as standard to isolate the compressor from oil flow when the compressor is not operating. The oil solenoid valve is field replaceable.

10.1.5 - Suction and economizer screens
To increase the reliability of the compressor, a screen has been incorporated as a standard feature into suction and economizer inlets of the compressor.

10.1.6 - Capacity control system
The 06T screw compressor has an unloading system that is standard on all compressors. This unloading system consists of slide valve that permits changing the length of the screw used for the refrigerant compression. This valve is controlled by the action of a piston controlled by two solenoid valves on the oil return line.

10.2 - Pressure vessels

General
Monitoring during operation, re-qualification, re-testing and re-testing dispensation:
- Follow the regulations on monitoring pressurised equipment.
- It is normally required that the user or operator sets up and maintains a monitoring and maintenance file.
- Follow the control programmes of EN 378-2, annexes A, B, C and D.
- If they exist follow local professional recommendations.
- Regularly inspect the condition of the coating (paint) to detect blistering resulting from corrosion. To do this, check a non-insulated section of the container or the rust formation at the insulation joints.
- Regularly check for possible presence of impurities (e.g. silicon grains) in the heat exchange fluids. These impurities maybe the cause of the wear or corrosion by puncture.
- Filter the heat exchange fluid check and carry out internal inspections as described in EN 378-2, annex C.
- In case of re-testing please refer to the maximum operating pressure given on the unit nameplate.
- The reports of periodical checks by the user or operator must be included in the supervision and maintenance file.

Repair
Any repair or modification, including the replacement of moving parts:
- must follow local regulations and be made by qualified operators and in accordance with qualified procedures, including changing the heat exchanger tubes.
- must be made in accordance with the instructions of the original manufacturer. Repair and modification that necessitate permanent assembly (soldering, welding, expanding etc.) must be made using the correct procedures and by qualified operators.
- An indication of any modification or repair must be shown in the monitoring and maintenance file.

Recycling
The unit is wholly or partly recyclable. After use it contains refrigerant vapours and oil residue. It is coated by paint.

Operating life
This unit is designed for:
- prolonged storage of 15 years under nitrogen charge with a temperature difference of 20 K per day.
- 452000 cycles (start-ups) with a maximum difference of 6 K between two neighbouring points in the vessel, based on 6 start-ups per hour over 15 years at a usage rate of 57%.

Corrosion allowances:
Gas side: 0 mm
Heat exchange fluid side: 1 mm for tubular plates in lightly alloyed steels, 0 mm for stainless steel plates or plates with copper-nickel or stainless steel protection.

10.2.1 - Evaporator
30XA chillers use a flooded multi-tube evaporator. The water circulates in the tubes and the refrigerant is on the outside in the shell. One vessel is used to serve both refrigerant circuits. There is a centre tube sheet which separates the two refrigerant circuits. The tubes are 3/4” diameter copper with an enhanced surface inside and out. There is just one water circuit, and depending on the size of the chiller, there may be one, two or three water passes.

The units have three refrigerant circuits with two evaporators connected in series on the heat transfer fluid.

The evaporator shell has a thermal insulation of 19 mm thick polyurethane foam, an aluminium sheet and a water drain and purge.

It has been tested and stamped in accordance with applicable pressure codes for a maximum operating pressure of 2100 kPa refrigerant-side and 1000 kPa water-side.

The water connection of the heat exchanger is a Victaulic connection. As an option the evaporator is available with frost protection (evaporator frost protection option).

The products that may be added for thermal insulation of the containers during the water piping connection procedure must be chemically neutral in relation to the materials and coatings to which they are applied. This is also the case for the products originally supplied by Carrier.

10.2.2 - Oil separator

In these units, the oil separator is a pressure vessel that is mounted under the outside vertical condenser coils. Discharge gas at the compressor outlet is directed towards the bottom of the oil separator ring and most of the oil separates from the gas by strong deceleration and by gravity. The gas then flows through a wire mesh screen where the remaining oil is separated by coalescence and flows to the bottom of the ring. The gas is now free from oil and leaves the ring at the top towards the condenser.

The oil separator is equipped with a trace heater regulated by the control. This heater is equipped with an internal thermostat that disconnects the power supply when the temperature reaches 85°C and automatically resets when the temperature again falls to a normal value.

The products that may be added for thermal insulation of the vessels during the water piping connection procedure must be chemically neutral in relation to the materials and coatings to which they are applied. This is also the case for the products originally supplied by Carrier.

10.2.3 - Economiser function

The economiser function includes a liquid line valve, a filter drier, two EXVs, a plate heat exchanger as well as protection devices (fuse or valve).

At the condenser outlet a part of the liquid is expanded via the secondary EXV in one of the heat exchanger circuits and then returns as gas at the compressor economiser. This expansion permits increase of the liquid sub-cooling of the rest of the flow that penetrates the evaporator via the principal EXV. This permits increasing the cooling capacity of the system as well as its efficiency.

10.3 - High-pressure safety switch

30XA units are equipped with high-pressure safety switches, calibrated to 2200 kPa.

These pressure switches are located at the discharge of each compressor.

10.4 - Condensers

The 30XA coils are micro-channel condensers made entirely of aluminium. Optional coils with internally groved copper tubes with aluminium fins are also available (options 254 and 255).

10.5 - Fans

The fans are axial Flying Bird fans equipped with rotating shroud and made of composite recyclable material. Each motor is fixed with transverse supports. The motors are three-phase, with permanently lubricated bearings and insulation class F.

10.6 - Electronic expansion valve (EXV)

The EXV is equipped with a stepper motor (2785 to 3690 steps, depending on the model) that is controlled via the EXV board.

The EXV is also equipped with a sightglass that permits verification of the mechanism movement and the presence of the liquid gasket.

10.7 - Moisture indicator

Located on the EXV, permits control of the unit charge and indicates moisture in the circuit. The presence of bubbles in the sight-glass indicates an insufficient charge or non-condensables in the system. The presence of moisture changes the colour of the indicator paper in the sight-glass.

10.8 - Filter drier

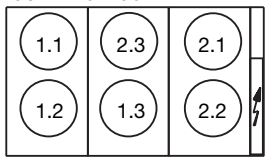
The role of the filter drier is to keep the circuit clean and moisture-free. The moisture indicator shows, when it is necessary to change the element. A difference in temperature between the filter inlet and outlet shows that the element is dirty.

10.9 - Sensors

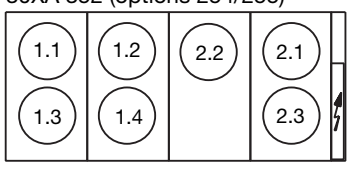
The units use thermistors to measure the temperature, and pressure transducers to control and regulate system operation (see 30XA - Pro-Dialog Control IOM for a more detailed explanation).

30XA fan arrangement

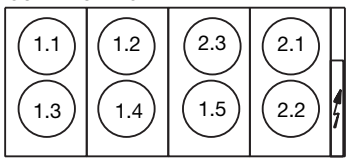
30XA 252-352



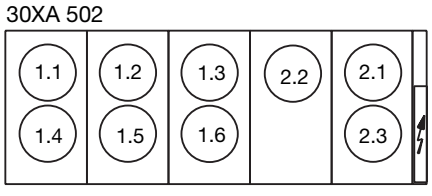
30XA 352 (options 254/255)



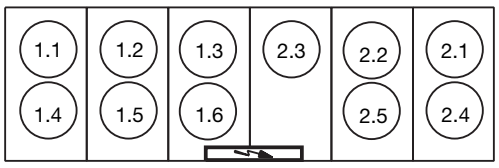
30XA 402-452



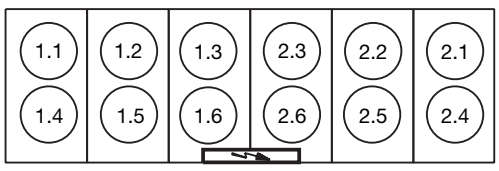
30XA 502



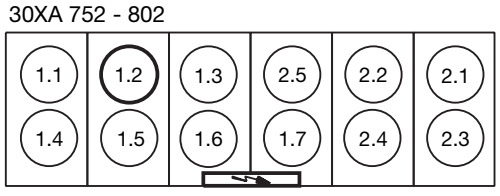
30XA 602



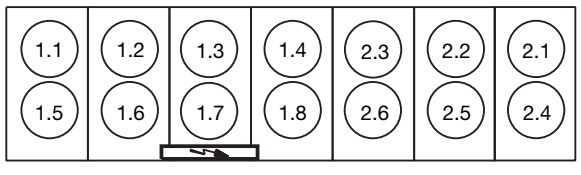
30XA 702



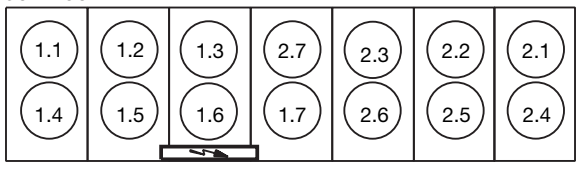
30XA 752 - 802



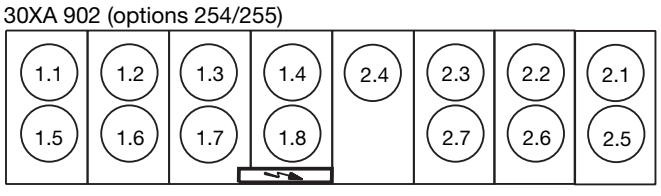
30XA 752-802 (options 254/255)



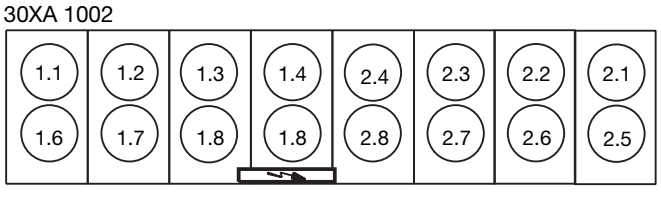
30XA 902



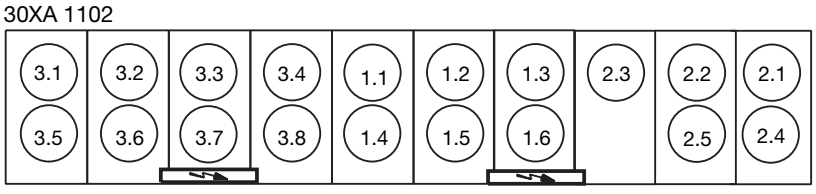
30XA 902 (options 254/255)



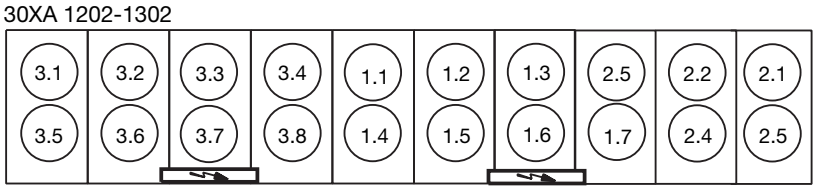
30XA 1002



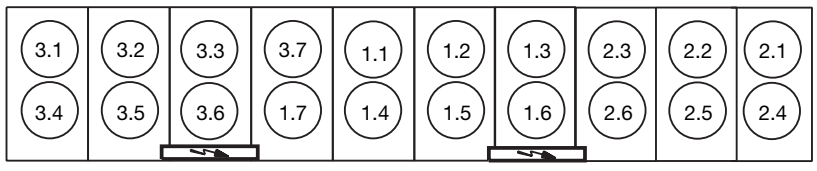
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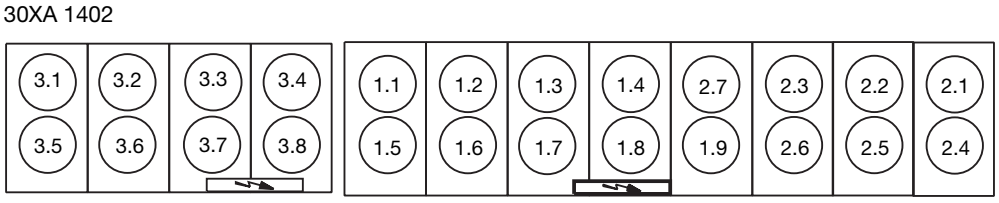
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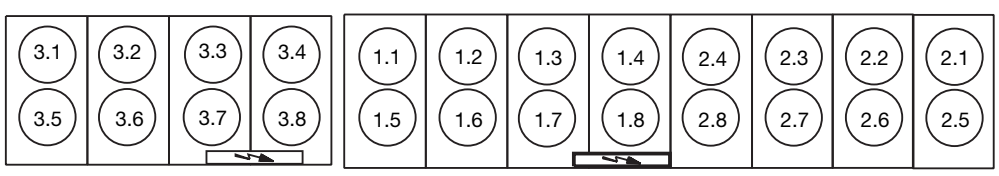
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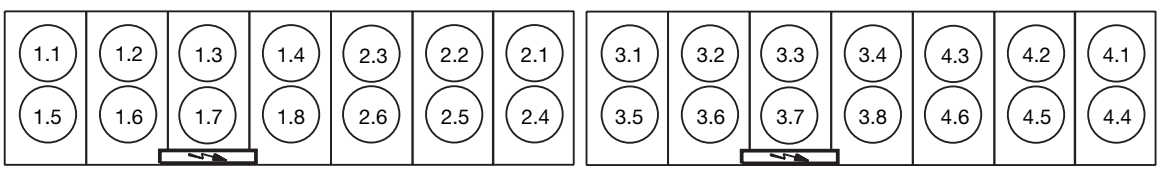
30XA 1402



30XA 1502



30XA 1702



x.y x.y x = Circuit number
y = Start-up order

NOTE: The values above do not correspond to the fan designation. The fan designation and position are given on the unit drawings and wiring diagrams supplied with the unit.

11 - OPTIONS AND ACCESSORIES

Options	No.	Description	Advantages	Use
Corrosion protection, traditional coils	2B	Factory application of Blygold Polual treatment on the copper/aluminium coils	Improved corrosion resistance, recommended for industrial, rural and marine environments	30XA 252-1702
Corrosion protection, traditional coils	3A	Fins made of pre-treated aluminium (polyurethane and epoxy)	Improved corrosion resistance, recommended for moderate marine and urban environments	30XA 252-1702
Low temperature glycol solution	5	Low temperature chilled water production down to -6°C with ethylene glycol and -3°C with propylene glycol	Covers specific applications such as ice storage and industrial processes	30XA 252-1702
Very low temperature glycol solution	6	Low temperature chilled water production down to -12°C with ethylene glycol (limited to -10°C for certain sizes) and -8°C with propylene glycol (limited to -6°C for certain sizes)	Covers specific applications such as ice storage and industrial processes	30XA 252-1702
IP 54 control box	20A	Increased leak tightness of control boxes	Increased control box protection	30XA 252-1702
Tropical applications	22	Unit control box suitable for tropical applications	Reduced relative humidity in the control box for operation in tropical environments (hot and humid)	30XA 252-1702
Grilles	23	Metallic grilles on the unit front, rear and sides	Enhanced aesthetics, protection against intrusion to the unit interior	30XA 252-1702
Winter operation	28	Fan speed control via frequency converter	Stable unit operation when the air temperature is between -10°C and -20°C	30XA 252-1702
Evaporator frost protection	41A	Resistance heater on the evaporator	Evaporator frost protection down to -20°C outside temperature	30XA 252-1702
Evaporator and hydronic module frost protection	41B	Resistance heater on the evaporator and the hydronic module	Evaporator and hydronic module frost protection down to -20°C outside temperature	30XA 252-1502
Heat reclaim	50	Complete recovery of the heat rejected by the condenser	Free hot-water production as well as cold-water production	30XA 252-1002
Single power connection point	81	Power connection of the machine via one main supply connection	Quick and easy installation	30XA 252-1502
Suction valve	92	Shut-off valves on the compressor suction piping, the economiser line and the compressor discharge piping	Simplified maintenance	30XA 252-1702
Three-pass evaporator	100A	Evaporator with three passes water-side	Increased water inlet and outlet pressure losses on opposite sides	30XA 252-602
One-pass evaporator	100C	Evaporator with one pass water-side	Reduced water inlet and outlet pressure losses on opposite sides	30XA 252-1002
21 bar evaporator	104	Reinforced evaporator for extension of the maximum water-side service pressure range to 21 bar	Covers applications with a high water column (high buildings)	30XA 252-1702
Reversed water connections	107	Evaporator with reversed water inlet/outlet	Simplification of the water piping	30XA 252-1702
High-pressure single-pump hydronic module	116B	See hydronic module chapter	Easy and fast installation	30XA 252-502
High-pressure dual-pump hydronic module	116C	See hydronic module chapter	Easy and fast installation, operating safety	30XA 252-502
Low-pressure single-pump hydronic module	116F	See hydronic module chapter	Easy and fast installation	30XA 252-502
Low-pressure dual-pump hydronic module	116G	See hydronic module chapter	Easy and fast installation, operating safety	30XA 252-502
Direct-expansion free-cooling system	118A	Chilled water production without the use of the compressors, using direct-expansion heat exchange on the condensers	Very economical chilled water production at low outdoor temperatures	30XA 252-1002
High energy efficiency	119	Improved condenser performance	Energy cost reduction, full load operation at higher air temperatures	30XA 252-1702
JBus gateway	148B	Two-directional communications board, complies with JBus protocol	Easy connection by communication bus to a building management system	30XA 252-1702
BacNet gateway	148C	Two-directional communications board, complies with BacNet protocol	Easy connection by communication bus to a building management system	30XA 252-1702
LON gateway	148D	Two-directional communications board, complies with LON protocol	Easy connection by communication bus to a building management system	30XA 252-1702
Energy Management Module EMM	156	See chapter “Energy Management Module”	Easy connection by wired connection to a building management system	30XA 252-1702
Unit without enclosure	253	Compressors not equipped with acoustic enclosure	More economical	30XA 252-1702
Traditional coils (Cu/Al)	254	Coils made of copper tubes with aluminium fins	Possibility to add specialised condenser treatment	30XA 252-1702
Traditional coils (Cu/Al) without slots	255	Coils made of copper tubes with aluminium fins without slots	Recommended for the Middle East, sand storms. Possibility to add specialised condenser treatment.	30XA 252-1702
Suction piping insulation	256	Thermal insulation of the suction piping with flexible, anti-UV insulant	Prevents condensation on the suction piping	30XA 252-1702
Low sound level	257	Acoustical insulation of certain unit refrigerant circuit components (suction, evaporator and economiser piping)	Unit sound power level reduction of -3 dB(A)	30XA 252-1702
Accessories		**Description**	**Advantages**	**Use**
CCN JBus gateway		See option 148B	See option 148B	See option 148B
CCN BacNet gateway		See option 148C	See option 148C	See option 148C
CCN LON Talk gateway		See option 148D	See option 148D	See option 148D
Connection sleeve		Piping to be welded with Victaulic connection	Ease-of-installation	30XA 252-1702
Energy Management Module EMM		See controls manual	Easy connection by wired connection to a building management system	30XA 252-1702
Lead-lag kit		Supplementary water outlet temperature sensor kit, field-installed, allows master/slave operation of two chillers connected in parallel.	Optimised operation of two chillers connected in parallel with operating time balancing.	30XA 252-1502
Anti-vibration mountings		Elastomeric anti-vibration mountings for each unit weight distribution point	Absorption of vibrations, linked to the unit operation (essentially compressor)	30XA 252-1702

12 - STANDARD MAINTENANCE

Air conditioning equipment must be maintained by professional technicians, whilst routine checks can be carried out locally by specialised technicians.

Simple preventive maintenance will allow you to get the best performance from your HVAC unit:

- improved cooling performance
- reduced power consumption
- prevention of accidental component failure
- prevention of major time-consuming and costly interventions
- protection of the environment

There are five maintenance levels for HVAC units, as defined by the AFNOR X60-010 standard.

12.1 - Level 1 maintenance (see note)

Simple procedure can be carried out by the user:

- Visual inspection for oil traces (sign of a refrigerant leak)
- Air heat exchanger (condenser) cleaning - see chapter "Condenser coil - level 1"
- Check for removed protection devices, and badly closed doors/covers
- Check the unit alarm report when the unit does not work (see report in the 30XA Pro-Dialog Plus control manual).

General visual inspection for any signs of deterioration.

12.2 - Level 2 maintenance (see note)

This level requires specific know-how in the electrical, hydronic and mechanical fields. It is possible that these skills are avail-able locally: existence of a maintenance service, industrial site, specialised subcontractor.

In these cases, the following maintenance operations are recommended.

Carry out all level 1 operations, then:

- At least once a year tighten the power circuit electrical connections (see tightening torques table).
- Check and re-tighten all control/command connections, if required (see tightening torques table).
- Check the differential switches for correct operation every 6 months (free-cooling option 118A).
- Remove the dust and clean the interior of the control boxes, if required.
- Check the presence and the condition of the electrical protection devices.
- Check the correct operation of all heaters.
- Replace the fuses every 3 years or every 15000 hours (age-hardening).
- Replace the control box cooling fans used with option 22 (with designation EF22_) every five years.
- Check the height of the anti-vibration mountings (located between the compressor rails and the unit chassis) after 5 years of operation, and then each year. When the total minimum height of the mountings is less than 28 mm replace the mountings.
- Check the water connections
- Purge the water circuit (see chapter "Water flow control procedure")
- Clean the water filter (see chapter "Water flow control procedure")
- Fully clean the condensers with a low-pressure jet and a bio-degradable cleaner (counter-current cleaning - see chapter "Condenser coil - level 2)
- Replace the stuffing box packing of the pump after 10000 hours of operation
- Check the unit operating parameters and compare them with previous values
- Keep and maintain a maintenance sheet, attached to each HVAC unit

All these operations require strict observation of adequate safety measures: individual protection garments, compliance with all industry regulations, compliance with applicable local regulations and using common sense.

12.3 - Level 3 (or higher) maintenance (see note)

The maintenance at this level requires specific skills/approval/tools and know-how and only the manufacturer, his representative or authorised agent are permitted to carry out these operations. These maintenance operations concern for example:

- A major component replacement (compressor, evaporator)
- Any intervention on the refrigerant circuit (handling refrigerant)
- Changing of parameters set at the factory (application change)
- Removal or dismantling of the HVAC unit
- Any intervention due to a missed established maintenance operation
- Any intervention covered by the warranty

NOTE: Any deviation or non-observation of these maintenance criteria will render the guarantee conditions for the HVAC unit nul and void, and the manufacturer, France, will no longer be held responsible.

12.4 - Tightening torques for the main electrical connections

Component	Designation in the unit	Value (Nm)
Screw on bus bar, customer connection		
M8		18
M10	L1/L2/L3	30
Soldered screw PE, customer connection (M12)	PE	70
Tunnel terminal screw, compressor contactor		
Contactor 3RT103*		
Contactor 3RT104*		5
Contactor 3RT105*		11
Contactor 3RT106*	KM*	21
Tunnel terminal screw, current transformer		
Size 2 (3RB2956*)		11
Size 3 (3RB2966*)	TI*	21
Compressor earth terminal in the power wiring control box, terminal M8	Gnd	30
Compresor phase connection terminals M12	1/2/3/4/5/6 on EC	25
Compressor earth connection	Gnd on EC*	25
Tunnel terminal screw, disconnects 3RV1011*	QF*/QM*	1
Tunnel terminal screw, hydronic pump contactor		
Contactor 3RT101*	KM90*	1
Contactor 3RT102*		2.2
Screw on bus bar for power connection between the control boxes for option 81	L1/L2/L3	30

12.5 - Tightening torques for the main bolts and screws

Screw type	Used for	Value (Nm)
Metal screw D=4.8	Condensing module, housing supports	4.2
Screw H M8	Condensing module, compressor fixing	18
Taptite screw M10	Condensing module, chassis - structure fixing, control box fixings, compressor fixings, oil separator fixing	30
Taptite screw M6	Piping support, cowling	7
Screw H M8	Piping clip	12
Screw H M6	Piping clip	10
Nut H M10	Compressor chassis	30
Nut H M10	Hydronic pump chassis	30
Screw H M8	Filter drier cover	40
Screw H M12	Economiser port flange	40
Screw H M16	Oil separator flanges, suction flanges	110
Screw H M16	Heat exchanger water boxes	190
Screw H M20	Suction flanges	190
Nut 5/8 ORFS	Oil line	65
Nut 3/8 ORFS	Oil line	26

12.6 - Condenser coil

We recommend, that finned coils are inspected regularly to check the degree of fouling. This depends on the environment where the unit is installed, and will be worse in urban and industrial installations and near trees that shed their leaves.

For coil cleaning, two maintenance levels are used, based on the AFNOR X60-010 standard:

Level 1

- If the condensers are fouled, clean them gently in a vertical direction, using a brush.
- Only work on condensers with the fans switched off.
- For this type of operation switch off the HVAC unit if service considerations allow this.
- Clean condensers guarantee optimal operation of your HVAC unit. This cleaning is necessary when the condensers begin to become fouled. The frequency of cleaning depends on the season and location of the HVAC unit (ventilated, wooded, dusty area, etc.).
- With MCHX condensers it is preferable to clean them with a vacuum cleaner or a high-pressure cleaner (maximum 68 bar and with 300 mm distance between the diffuser and the coil).

Level 2

The two cleaning products can be used for any of the following coil finishes: Cu/Cu, Cu/Al, Cu/Al with Polual, Blygold and/or Heresite protection.

Clean the coil, using appropriate products.

We recommend TOTALINE products for coil cleaning:
Part No. P902 DT 05EE: traditional cleaning method
Part No. P902 CL 05EE: cleaning and degreasing.

These products have a neutral pH value, do not contain phosphates, are not harmful to the human body, and can be disposed of through the public drainage system.

Depending on the degree of fouling both products can be used diluted or undiluted.

For normal maintenance routines we recommend using 1 kg of the concentrated product, diluted to 10%, to treat a coil surface of 2 m^2. This process can either be carried out using a high-pressure spray gun in the low-pressure position. With pressurised cleaning methods care should be taken not to damage the coil fins. The spraying of the coil must be done:

- in the direction of the fins
- in the opposite direction of the air flow direction
- with a large diffuser (25-30°)
- at a minimum distance of 300 mm from the coil.

It is not necessary to rinse the coil, as the products used are pH neutral. To ensure that the coil is perfectly clean, we recommend rinsing with a low water flow rate. The pH value of the water used should be between 7 and 8.

WARNING: Never use pressurised water without a large diffuser. Do not use high-pressure cleaners for Cu/Cu and Cu/Al coils! High pressure cleaners are only permitted for MCHX coils (maximum permitted pressure 68 bar)

Concentrated and/or rotating water jets are strictly forbidden.

Never use a fluid with a temperature above 45°C to clean the air heat exchangers.

Correct and frequent cleaning (approximately every three months) will prevent 2/3 of the corrosion problems. Protect the control box during cleaning operations.

12.7 - Evaporator maintenance

Check that:

- the insulating foam is intact and securely in place.
- the cooler heaters are operating, secure and correctly positioned.
- the water-side connections are clean and show no sign of leakage.

12.8 - Compressor maintenance

12.8.1 - Oil separator

Check the correct operation of the heaters and check that they are well attached to the oil separator ring.

12.8.2 - Integral oil filter change

As system cleanliness is critical to reliable system operation, there is a filter in the oil line at the oil separator outlet. The oil filter is specified to provide a high level of filtration (5 µm) required for long bearing life.

The filter should be checked after the first 500 hours of operation, and every subsequent 2000 hours. The filter should be replaced at any time when the pressure differential across the filter exceeds 2 bar.

The pressure drop across the filter can be determined by measuring the pressure at the filter service port and the oil pressure port. The difference in these two pressures will be the pressure drop across the filter, check valve, and solenoid valve. The pressure drop across the check valve and solenoid valve is approximately 0.4 bar, which should be subtracted from the two oil pressure measurements to give the oil filter pressure drop.

12.8.3 - Compressor rotation control

Correct compressor rotation is one of the most critical application considerations. Reverse rotation, even for a very short duration, damages the compressor.

The reverse rotation protection scheme must be capable of determining the direction of rotation and stopping the compressor within 300 milliseconds. Reverse rotation is most likely to occur whenever the wiring to the compressor terminals is disturbed.

To minimize the opportunity for reverse rotation, the following procedure must be applied. Rewire the power cables to the compressor terminal pin as originally wired.

For replacement of the compressor, a low pressure switch is included with the compressor. This low pressure switch should be temporarily installed as a hard safety on the high pressure part of the compressor. The purpose of this switch is to protect the compressor against any wiring errors at the compressor terminal pin. The electrical contact of the switch would be wired in series with the high pressure switch. The switch will remain in place until the compressor has been started and direction of rotation has been verified; at this point, the switch will be removed.

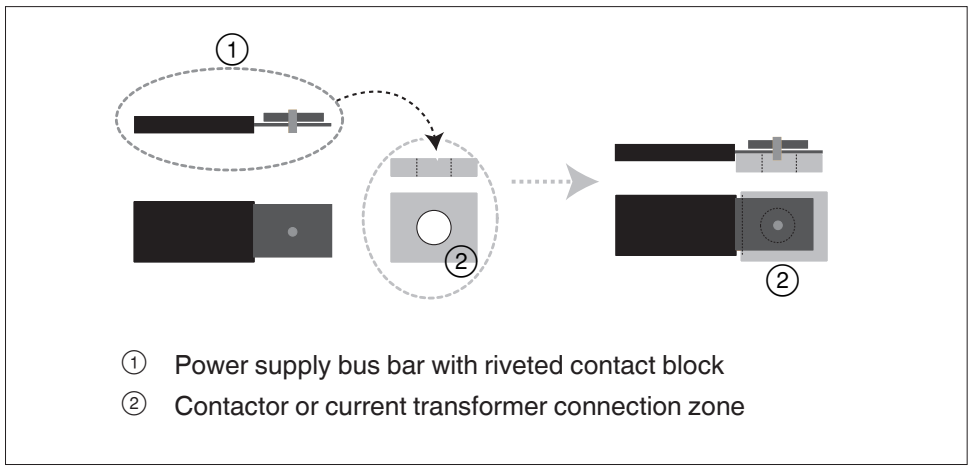
The switch that has been selected for detecting reverse rotation is Carrier part number HK01CB001. This switch opens the contacts when the pressure falls below 7 kPa. The switch is a manual reset type that can be reset after the pressure has once again risen above 70 kPa. It is critical that the switch be a manual reset type to preclude the compressor from short cycling in the reverse direction.

12.9 - Precaution for compresssor power supply bus bar connection

This note applies to units using power supply bus bars with riveted contact block at the level of the connection cages in the control box. During re-connection it is imperative to:

- engage each bus bar in the cage up to the stop
- ensure visually that the bus bars have good contact at the connection areas: there must not be any free movement between the bus bar and the connection area created by the fixing rivet of the contact block.

Connection of the contactor or current transformer



① Power supply bus bar with riveted contact block
② Contactor or current transformer connection zone

13 - START-UP CHECKLIST FOR 30XA LIQUID CHILLERS (USE FOR JOB FILE)

Preliminary information

Job name: .....
Location: .....
Installing contractor: .....
Distributor: .....

Unit
Model: .....

Compresseurs

Circuit A
Model number .....
Serial number .....
Motor number .....

Circuit B
Model number .....
Serial number .....
Motor number .....

Circuit C
Model number .....
Serial number .....
Motor number .....

Circuit D
Model number .....
Serial number .....
Motor number .....

Evaporator
Model number .....
Serial number .....

Condenser
Model number .....

Additional optional units and accessories .....
.....

Preliminary equipment check

Is there any shipping damage? ..... If so, where? .....
.....
Will this damage prevent unit start-up? .....

☐ Unit is level in its installation
☐ Power supply agrees with the unit nameplate
☐ Electrical circuit wiring has been sized and installed properly
☐ Unit ground wire has been connected
☐ Electrical circuit protection has been sized and installed properly
☐ All terminals are tight
☐ All chilled water valves are open
☐ All chilled water piping is connected properly
☐ All air has been vented from the chilled water circuit
☐ Chilled water pump (CWP) is operating with the correct rotation. Check the phase sequence of the electrical connection. If the unit is equipped with a hydronic module, use the pump test function (refer to the 30XA Pro-Dialog control manual). After the pump test has been completed, switch the unit off again
☐ Circuit chilled water in the water circuit for at last two hours, then remove, clean and replace the screen filter. After the pump test has been completed, switch the unit off again.
☐ Inlet piping to cooler includes a 20 mesh strainer with a mesh size of 1.2 mm.
☐ The compressor flange has been removed.

Unit start-up

☐ a. Oil heaters have been energized for at least 24 hours (30XA)
☐ b. Oil level is correct
☐ c. All discharge and liquid valves are open
☐ d. All suction valves are open, if equipped
☐ e. All oil line valves and economizer discharge bubbler valves (if equipped) are open
☐ f. The contactor
☐ g. Checks have been carried out for any possible leaks. Unit has been leak checked (including fittings)
  ☐ g1 - on the whole unit
  ☐ g2 - at all connections
  Locate, repair, and report any refrigerant leaks.....
  .....
  .....
☐ h. Check voltage imbalance: AB..... AC..... BC.....
  Average voltage = ... V
  Maximum deviation = ... V
  Voltage imbalance = ... %
☐ i. Voltage imbalance is less than 2%

WARNING: Operation of the chiller with an improper supply voltage or excessive phase imbalance constitutes abuse which will invalidate the Carrier warranty. If the phase imbalance exceeds 2% for voltage, or 10% for current, contact your local electricity supply at once and ensure that the chiller is not switched on until corrective measures have been taken.

Check cooler water loop
☐ Water loop volume = ... litres
☐ Calculated volume = ... litres
☐ 3.25 litres/nominal kW capacity for air conditioning
☐ 6.5 litres/nominal kW capacity for process cooling
☐ Proper loop volume established
☐ Proper loop corrosion inhibitor included.....litres of.....
☐ Proper loop freeze protection included (if required) .....litres of.....
☐ Piping includes electric heater tape, if exposed to the outside
☐ Inlet piping to cooler includes a 20 mesh strainer with a mesh size of 1.2 mm

Check pressure drop across the cooler
☐ Entering cooler = ... kPa
☐ Leaving cooler = ... kPa
☐ Leaving - entering = ... kPa

WARNING: Plot cooler pressure drop on performance data chart (in product data literature) to determine total litres per second (l/s) and find unit's minimum flow rate.

☐ Total = ... l/s
☐ Nominal kW = ... l/s
☐ Total l/s is greater than unit's minimum flow rate
☐ Total l/s meets job specified requirement of..... l/s

WARNING: Once power is supplied to the unit, check for any alarms (refer to the 30XA controls IOM for the alarm menu).

Note all alarms:.....
.....
Notes:.....
.....



Environmental Management System Approval

Order No: 13452-76, 03.2008 - Supersedes order No: 13452-76, 07.2007
Manufacturer reserves the right to change any product specifications without notice.

Manufacturer: Carrier SCS, Montluel, France.
Printed in the Netherlands.

Appendix 4.4.2 Extract of Approved EAS for On Muk Street Phase 1

and night-time respectively, while the ANL for ASR of "B" should be 65dB(A) and 55dB(A) for daytime and night-time respectively. There is no planned fixed noise source and hence the criteria of ANL-5dB(A) are not applicable to this site.

6.3 Assessment Methodology

6.3.1.1 In the Final EAS Report for the HKHA housing development at Shek Mun Estate Phase 2, noise measurements have been conducted for some fixed noise sources at Ever Gain Centre which is located adjacent to the subject site. These fixed noise sources have been revisited. It is found that the conditions of most of these fixed noise sources remain unchanged. The respective noise measurement data for these fixed noise sources have been verified in the current study and are found still valid. Besides, new fixed noise sources were also identified on the rooftop of Ever Gain Centre and other locations. Additional noise measurements were conducted between November 2015 and January 2016, February and March 2017, and in March 2018. Noise measurements were conducted at certain distances from the identified industrial noise sources. Measurements were taken at locations where access was allowed and influences from other noisy activities were as minimal as possible. The measurement details including measurement date, time and equipment are given in **Appendix 6.2**. During the measurement, some premises were not in operation or site access was not allowed. Reference has therefore made to other plant of similar mode, nature and scale for this assessment. It is confirmed that the noise data reference to other plants are applicable to the noise assessment considering that they are of similar type, nature and scale. **Appendix 6.2** presents the measured sound pressure levels for the fixed noise sources.

6.3.1.2 Where possible, enquires were directly made to premises' owners/employee to obtain the information on the daily operation hours and the worst operating time for each identified fixed plant as far as practicable. Operational details for the noise sources are given in **Appendix 6.1**.

6.3.1.3 The tonal, impulsive and intermittent characteristics of the identified noise sources were investigated and considered in accordance with TM-Places. On-site noise measurements were conducted on the rooftop of nearby buildings (i.e. Even Gain Centre) where is about 20m from the site (the only accessible location closest to the receiver end). No tonal, impulsive and intermittent character was identified at the measurement location and therefore no correction has been applied **(Appendix 6.3)**.

6.3.1.4 The assessment has taken into account the distance attenuation, facade effect and screening effect etc. where appropriate. A summary of the corrections and assumptions adopted in the calculation are presented in **Appendix 6.4**. It should be noted that some plants not in operation during the site visits have also been assumed to be operated for the worst assessment scenario.

6.3.1.5 There are noise sources at podium level but majority of the noise sources are located on the rooftop of the buildings. The dominant noise sources are located on the rooftop of Ever Gain Building (at 92.3mPD) at similar level to the top domestic floor of the residential block. Nonetheless, the representative worst affected NSRs at 1/F, 10/F, 20/F, 25/F and top domestic floor of the residential block are selected for the assessment. The locations of the selected representative worst affected NSRs are shown in **Figure 6.2**.

Appendix 6.2

Project: SSF Development at On Muk Street Phase 1, Shek Mun, Shatin
Project number: 254045-01
Title: Measured SPL of Fixed Noise Sources
Measurement Period: November 2015 - January 2016, February 2017 - March 2017, March 2018
Measurement Equipment Used RION-NA28 Sound Level Meter

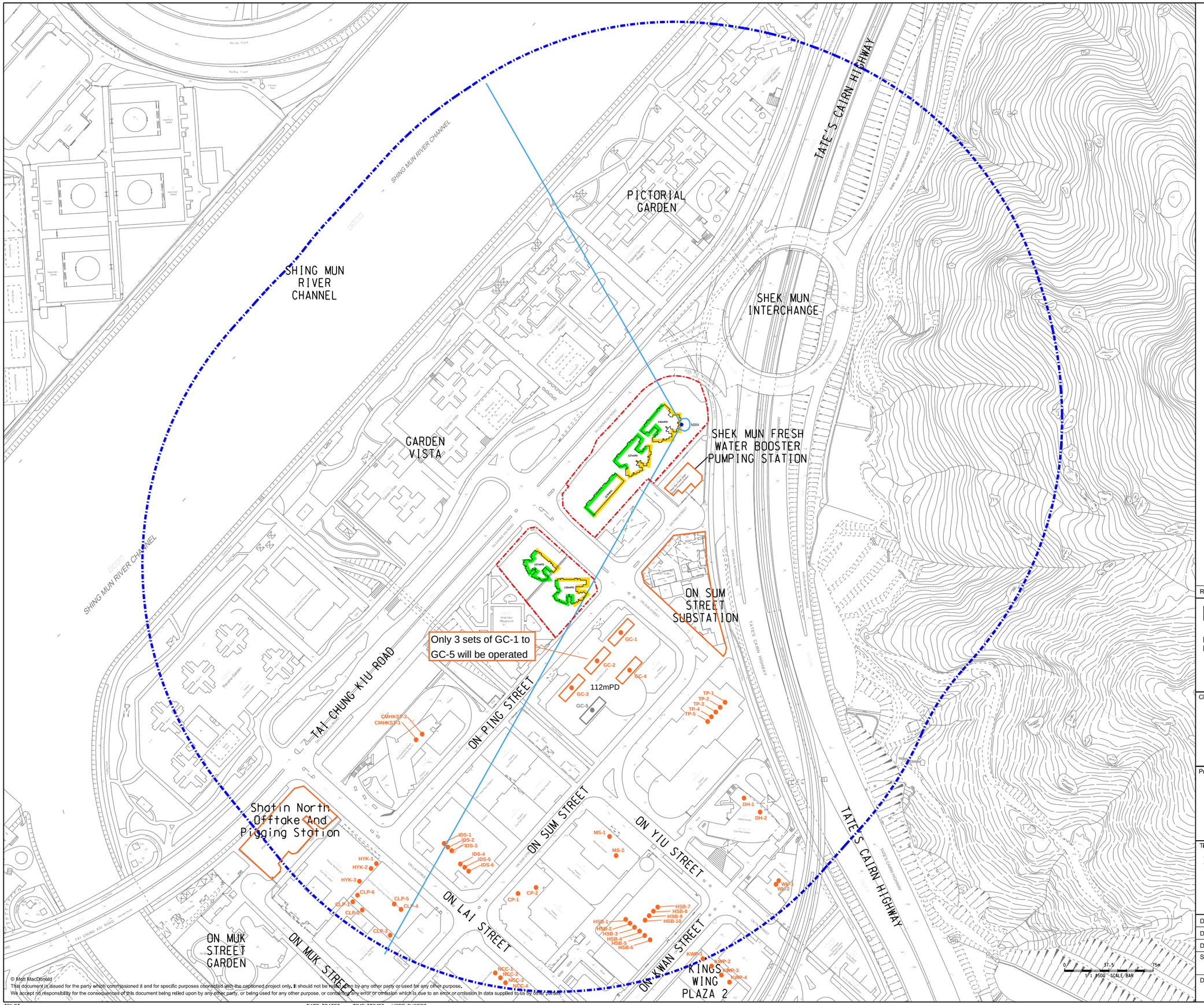
Source Location	Source Description	Source ID	Max. Measured SPL, dB(A)	Measurement distance, m	Operation		Assumption	Remarks
					Daytime	Nighttime		
Ever Gain Centre	Chiller on rooftop (6 motors)	EGC01	82	1.0	Y	N	Measurement has been conducted for the same fixed noise sources in HKHA Shek Mun "O" Site EAS. Measured SPL of the fixed plant sources have been verified and considered still valid. Thus, SPL are directly extracted from the Report (Source ID:EGC003-EGC004).	As advised by the property management office, fixed plant will not be operating during nighttime period.
	Chiller on rooftop (6 motors)	EGC02	84	1.0	Y	N		
	Chiller on rooftop (6 motors)	EGC03	78	3.0	Y	N	-	
	Chiller on rooftop (6 motors)	EGC04	78	4.0	Y	N	-	
	Emergency Gen Set on rooftop	EGC05	-	-	N	N	Emergency uses only and hence not included.	
	Emergency Gen Set on rooftop	EGC06	-	-	N	N		
	Emergency Gen Set on rooftop	EGC07	-	-	N	N		
	Emergency Gen Set on rooftop	EGC08	-	-	N	N		
	Cooling Tower on rooftop	EGC09	86	1.0	Y	N	Measurement has been conducted for the same fixed noise sources in HKHA Shek Mun "O" Site EAS. Measured SPL of the fixed plant sources have been verified and considered still valid. Thus, SPL are directly extracted from the Report (Source ID:EGC025).	
	Cooling Tower on rooftop	EGC10	77	3.0	Y	N	-	
	Cooling Tower on rooftop	EGC11	77	3.0	Y	N	-	
	Chiller on rooftop (6 motors)	EGC12	82	2.0	Y	N	Measurement has been conducted for the same fixed noise sources in HKHA Shek Mun "O" Site EAS. Measured SPL of the fixed plant sources have been verified and considered still valid. Thus, SPL are directly extracted from the Report (Source ID:EGC011-EGC013, EGC016-EGC017).	
	Chiller on rooftop (6 motors)	EGC13	81	2.5	Y	N		
	Chiller on rooftop (6 motors)	EGC14	81	2.5	Y	N		
	Chiller on rooftop (8 motors)	EGC15	84	1.5	Y	N		
	Chiller on rooftop (8 motors)	EGC16	83	1.5	Y	N		
Corporation Park	Chiller on rooftop (6 motors)	COP01	71	3.0	Y	N	-	As advised by the property management office, fixed plant will not be operating during nighttime period.
	Chiller on rooftop (6 motors)	COP02	71	3.0	Y	N	-	
	Chiller on rooftop (6 motors)	COP03	71	3.0	Y	N	-	
	Chiller on rooftop (2 motors)	COP04	71	3.0	Y	N	-	
	Chiller on rooftop (16 motors)	COP05	75	3.0	Y	N	-	
	Chiller on rooftop (16 motors)	COP06	75	3.0	Y	N	-	
	Chiller on rooftop (16 motors)	COP07	75	3.0	Y	N	-	
	Chiller on rooftop (16 motors)	COP08	75	3.0	Y	N	-	
	Chiller on rooftop (16 motors)	COP09	75	3.0	Y	N	-	
	Chiller on rooftop (16 motors)	COP10	75	3.0	Y	N	-	
	2 Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	COP11	64	1.5	Y	N	No operation was observed during site visits. Assume the same measured SPL as COP15 due to same type, size (LxWxH=~2mx1mx1m), number of fans (2 fans), nature (condenser) and scale. [1]	
	2 Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	COP12	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	COP13	64	1.5	Y	N		
	2 Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	COP14	64	1.5	Y	N		
	2 Condenser on rooftop (2 fans)	COP15	64	1.5	Y	N	-	
	2 Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	COP16	64	1.5	Y	N	No operation was observed during site visits. Assume the same measured SPL as COP15 due to same type, size (LxWxH=~2mx1mx1m), number of fans (2 fans), nature (condenser) and scale. [1]	
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	COP17	64	1.5	Y	N		
	2 Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	COP18	64	1.5	Y	N		
	2 Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	COP19	64	1.5	Y	N		
	2 Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	COP20	64	1.5	Y	N		
	2 Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	COP21	64	1.5	Y	N		
Metropole Square	Chiller on rooftop (16 motors)	MS01	82	2.0	Y	N	-	As advised by the property management office, fixed plant will not be operating during nighttime period.
	3 Chillers on rooftop (16 motors)	MS02	76	4.0	Y	N	-	
Heung Yee Kuk Building	Chiller on rooftop (6 motors)	HYK01	82	2.0	Y	N	-	As advised by the property management office, fixed plant will not be operating during nighttime period. Facade effect was included in the measurements for HYK01.
	Chiller on rooftop (6 motors, LxWxH=~4mx2mx2m)	HYK02	82	2.0	Y	N	No operation was observed during site visits. Assume the same measured SPL as HYK01 due to same type, size (LxWxH=~4mx2mx2m), number of motors (6 motors), nature (chiller) and scale. [1]	
	Chiller on rooftop (6 motors, LxWxH=~4mx2mx2m)	HYK03	82	2.0	Y	N		
CLP Power Hong Kong Limited - Shatin Centre	Chiller on podium (22 motors)	CLP01	78	4.0	Y	Y	Assume operate in both daytime and nighttime	As advised by the property management office, fixed plant might be operated during both daytime and nighttime for the 24 hrs call-centre.
	Chiller on podium (22 motors)	CLP02	78	4.0	Y	Y		
	Chiller on podium (22 motors)	CLP03	78	4.0	Y	Y		
	Cooling Tower on rooftop	CLP04	71	2.0	Y	Y		
	Cooling Tower on rooftop	CLP05	72	2.0	Y	Y		
	Chiller on lower rooftop(6 motors)	CLP06	81	2.5	Y	Y		
Ever Gain Building (No.3)	Emergency Gen Set on rooftop	EGB01	-	-	N	N	Emergency uses only and hence not included.	As advised by the property management office, fixed plant will not be operating during nighttime period.
	Emergency Gen Set on rooftop	EGB02	-	-	N	N		
	Emergency Gen Set on rooftop	EGB03	-	-	N	N		
	Emergency Gen Set on rooftop	EGB04	-	-	N	N		
	6 Chillers and 2 Cooling Towers on rooftop	EGB05	75	14.0	Y	N	These fixed plant were located close together and measurements on individual sources were not practicable. Thus, measurements were carried out in group at certain distances.	
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	EGB06	64	1.5	Y	N	No operation was observed during site visits. Assume the same measured SPL as COP15 due to same type, size (LxWxH=~2mx1mx1m), number of fans (2 fans), nature (condenser) and scale. [1]	
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	EGB07	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	EGB08	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	EGB09	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	EGB10	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	EGB11	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	EGB12	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	EGB13	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	EGB14	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	EGB15	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	EGB16	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	EGB17	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	EGB18	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	EGB19	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	EGB20	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	EGB21	64	1.5	Y	N		
Courtyard Hong Kong Shatin	Cooling tower on rooftop (1 motor)	CHK01	72	2.0	Y	Y	-	According to the property management office, fixed plant at the rooftop operate during daytime and nighttime. Two of them will be in operation for most of the time and the rest of them are for backups. Only one was in operation during the noise measurement.
	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	CHK02	72	2.0	Y	Y	No operation was observed during site visits. For conservative assessments, all 4 cooling towers are assumed to operate during daytime and nighttime. Assume the same measured SPL as CHK01 due to similar type, size (LxWxH=~4mx2mx6m), number of motor (1 motor), nature (cooling tower) and scale. [1]	
	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	CHK03	72	2.0	Y	Y		
	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	CHK04	72	2.0	Y	Y		

Project: SSF Development at On Muk Street Phase 1, Shek Mun, Shatin
Project number: 254045-01
Title: Measured SPL of Fixed Noise Sources
Measurement Period: November 2015 - January 2016, February 2017 - March 2017, March 2018
Measurement Equipment Used RION-NA28 Sound Level Meter

Source Location	Source Description	Source ID	Max. Measured SPL, dB(A)	Measurement distance, m	Operation		Assumption	Remarks
					Daytime	Nighttime		
Li Fung Centre	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	LFC01	72	2.0	Y	N	Site access was not allowed, reference was made to the measued SPL as CHK01 due to similar type, size (LxWxH=~4mx2mx6m), number of motor (1 motor), nature (cooling tower) and scale. Assume operate in both daytime and nighttime.	According to the property management office, nighttime activities could only be found at the warehouses which are for storage purposes. Therefore, fixed plant will not be operated during nighttime.
	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	LFC02	72	2.0	Y	N		
	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	LFC03	72	2.0	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	LFC04	64	1.5	Y	N	Site access was not allowed, reference was made to the measued SPL as COP15 due to similar type, size (LxWxH=~2mx1mx1m), number of fans (2 fans), nature (condenser) and scale. Assume operate in both daytime and nighttime.	
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	LFC05	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	LFC06	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	LFC07	64	1.5	Y	N		
	Condenser on rooftop (2 fans, LxWxH=~2mx1mx1m)	LFC08	64	1.5	Y	N		
	Chiller on rooftop (3 motors, LxWxH=~4mx2mx2m)	LFC09	81	2.5	Y	N	Site access was not allowed, reference was made to the measued SPL as EGC13 due to similar type, size (LxWxH=~4mx2mx2m), number of motors (6 motors - for conservative assessment), nature (chiller) and scale. Assume operate in both daytime and nighttime.	
New Commerce Centre	Group of condensers on rooftop (3 fans)	NCC01	67	10.0	Y	N	-	As advised by the property management office, fixed plant will not be operating during nighttime period.
	Emergency Gen Set on rooftop	NCC02	-	-	N	N	Emergency uses only and hence not included.	
	Cooling Tower on podium (1 motor, Diameter=~2m, H=~2m)	NCC03	71	2.0	Y	N	Site access was not allowed, reference was made to the measued SPL as CLP04 due to similar type, size (Diameter=~2m, H=~2m), number of motor (1 motor), nature (cooling tower) and scale.	
	Cooling Tower on podium (1 motor, Diameter=~2m, H=~2m)	NCC04	71	2.0	Y	N		
	Cooling Tower on podium (1 motor, Diameter=~2m, H=~2m)	NCC05	71	2.0	Y	N		
	Cooling Tower on podium (1 motor, Diameter=~3m, H=~3m)	NCC06	77	3.0	Y	N	Site access was not allowed, reference was made to the measued SPL as EGC10 due to similar type, size (Diameter=~3m, H=~3m), number of motor (1 motor), nature (cooling tower) and scale.	
	Emergency Gen Set on podium	NCC07	-	-	N	N	Emergency uses only and hence not included.	
	Emergency Gen Set on podium	NCC08	-	-	N	N	Emergency uses only and hence not included.	
HSBC Shek Mun Building	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	HSB01	72	2.0	Y	Y	Site access was not allowed, reference was made to the measued SPL as CHK01 due to similar type, size (LxWxH=~4mx2mx6m), number of motor (1 motor), nature (cooling tower) and scale. Assume operate in both daytime and nighttime.	-
	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	HSB02	72	2.0	Y	Y		
	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	HSB03	72	2.0	Y	Y		
	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	HSB04	72	2.0	Y	Y		
	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	HSB05	72	2.0	Y	Y		
	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	HSB06	72	2.0	Y	Y		
	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	HSB07	72	2.0	Y	Y		
	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	HSB08	72	2.0	Y	Y		
	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	HSB09	72	2.0	Y	Y		
	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	HSB10	72	2.0	Y	Y		
Kings Wing Plaza 1	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	KWA01	60	4.0	Y	N	Site access was not allowed, reference was made to the measued SPL as KWB01 due to similar type, size (LxWxH=~4mx2mx6m), number of motor (1 motor), nature (cooling tower) and scale.	According to the property management office, there will be no nighttime operation.
	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	KWA02	60	4.0	Y	N		
	Cooling tower on rooftop (1 motor, LxWxH=~4mx2mx6m)	KWA03	60	4.0	Y	N		
	Chiller on podium (6 motors, LxWxH=~4mx2mx2m)	KWA04	78	4.0	Y	N	New sources identified in recent visit in Mar 2018. However, site access was not allowed. Reference was made to the measued SPL as EGC04 due to similar type, size (LxWxH=~4mx2mx2m), number of motors (6 motors), nature (chiller) and scale.	
	Chiller on podium (6 motors, LxWxH=~4mx2mx2m)	KWA05	78	4.0	Y	N		
Kings Wing Plaza 2	Cooling tower on rooftop	KWB01	60	4.0	Y	N	-	According to the property management office, there will be no nighttime operation.
	Cooling tower on rooftop	KWB02	60	4.0	Y	N		
	Cooling tower on rooftop	KWB03	60	4.0	Y	N		
	Cooling tower on rooftop	KWB04	60	4.0	Y	N		
	Chiller on podium (8 motors, LxWxH=~4mx2mx2m)	KWB05	81	7.0	Y	N	New sourecs idenified in recent visit in Mar 2018. However, site access was not allowed. Similar types of plants (size (LxWxH=~4mx2mx2m), number of motors (8 motors), nature (chiller)) were found in HKHA Sheung Shui Area 30 EAS and hence the measured SPL of the fixed plant sources are directly extracted from the EAS Report (Source ID:JP001)	

[1] Noise measurement were taken under normal opereation of the plant. Some plants observed not in operation during the site visits are assumed to be operated in the assessment for worst assessment scenario

4.5 Illustration of Line of Sight



LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

AGREEMENT NO. CE 19/2023 (CE)
TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027)

Title

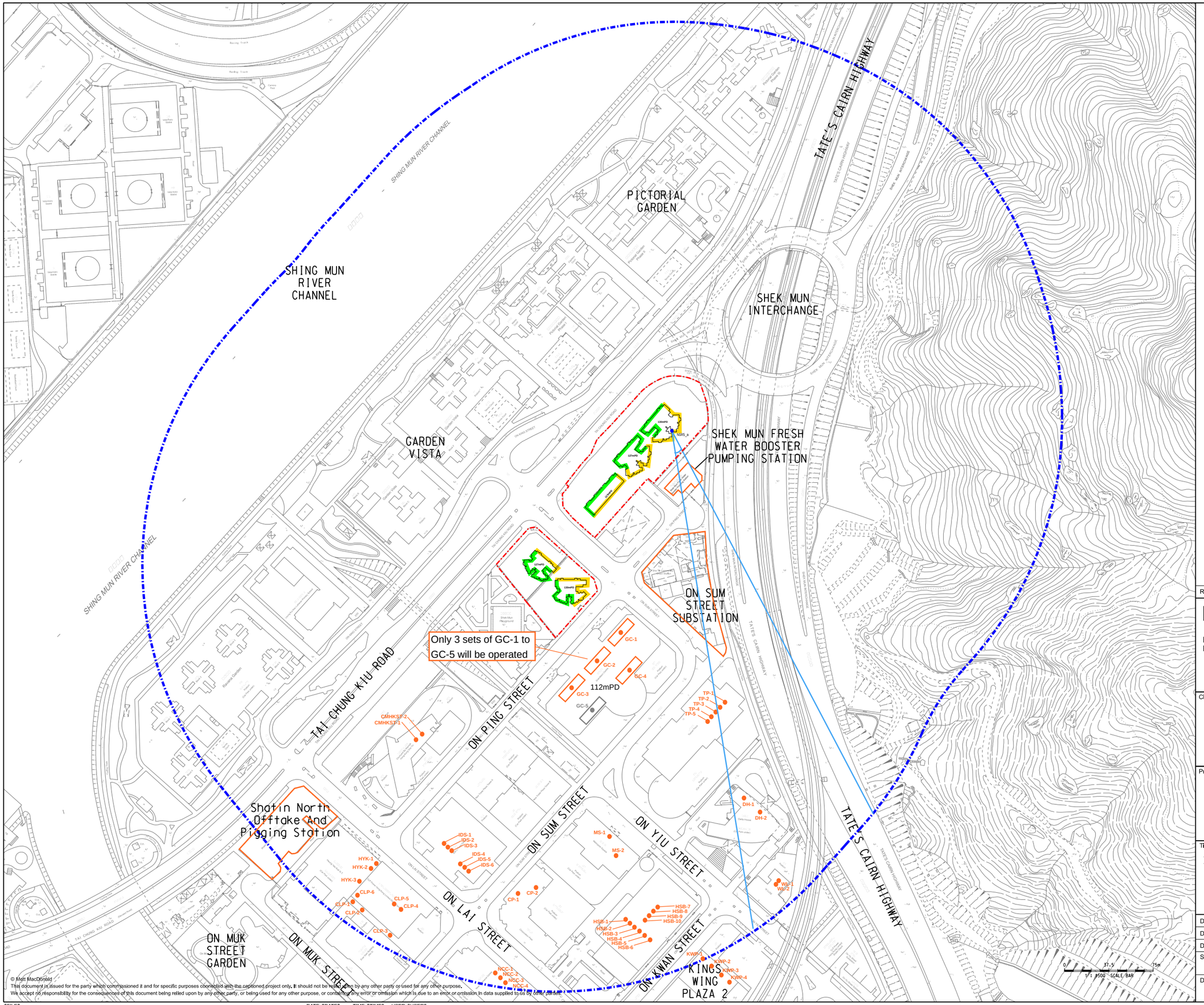
ILLUSTRATION OF LINE OF SIGHT FOR NSR 4

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Drawn			Coordination		
Dwg check			Approved		
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Drawing Number

APPENDIX 4.1

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LEGEND:

- APPLICATION SITE BOUNDARY
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- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 5_a

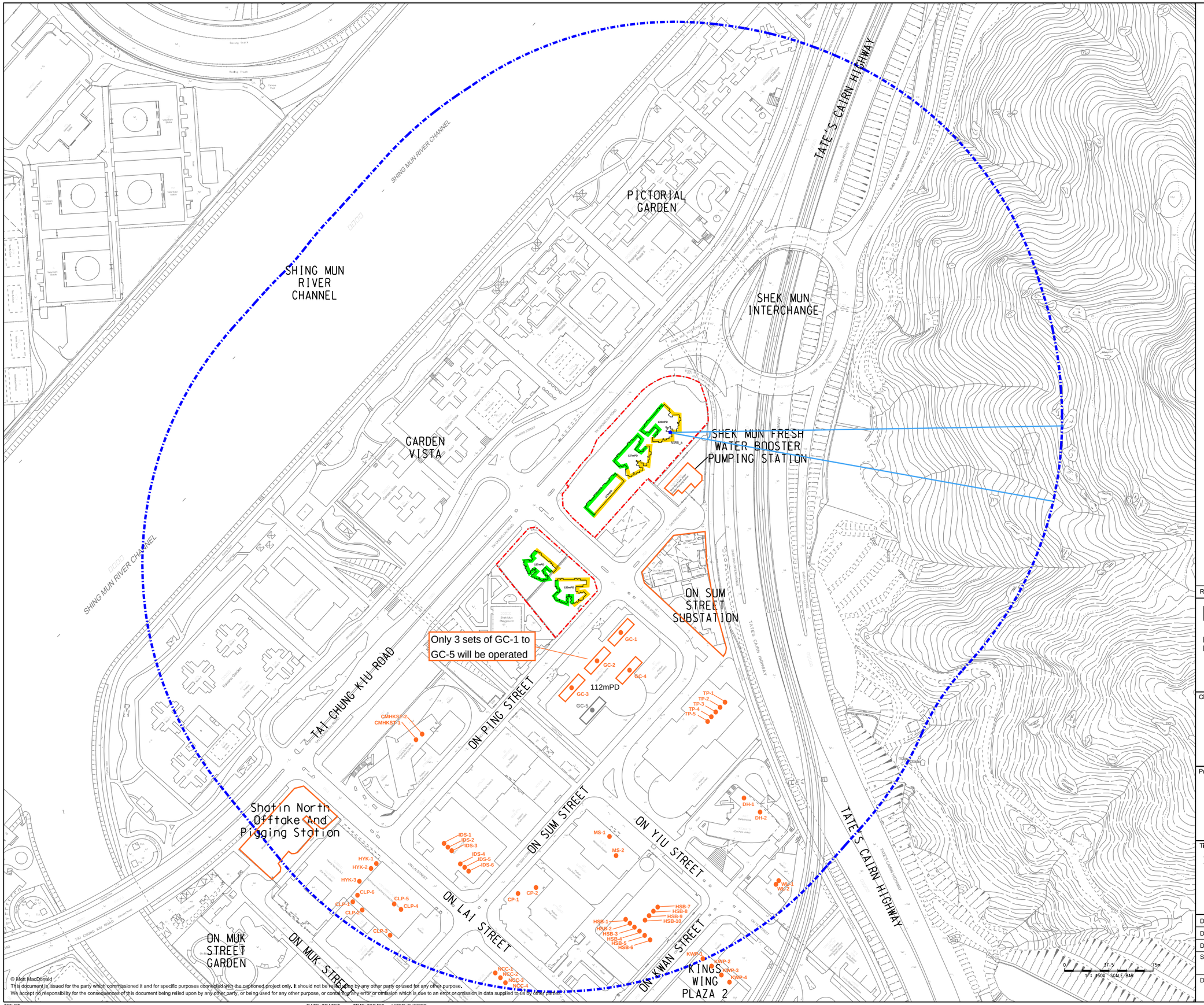
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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
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- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 6_a

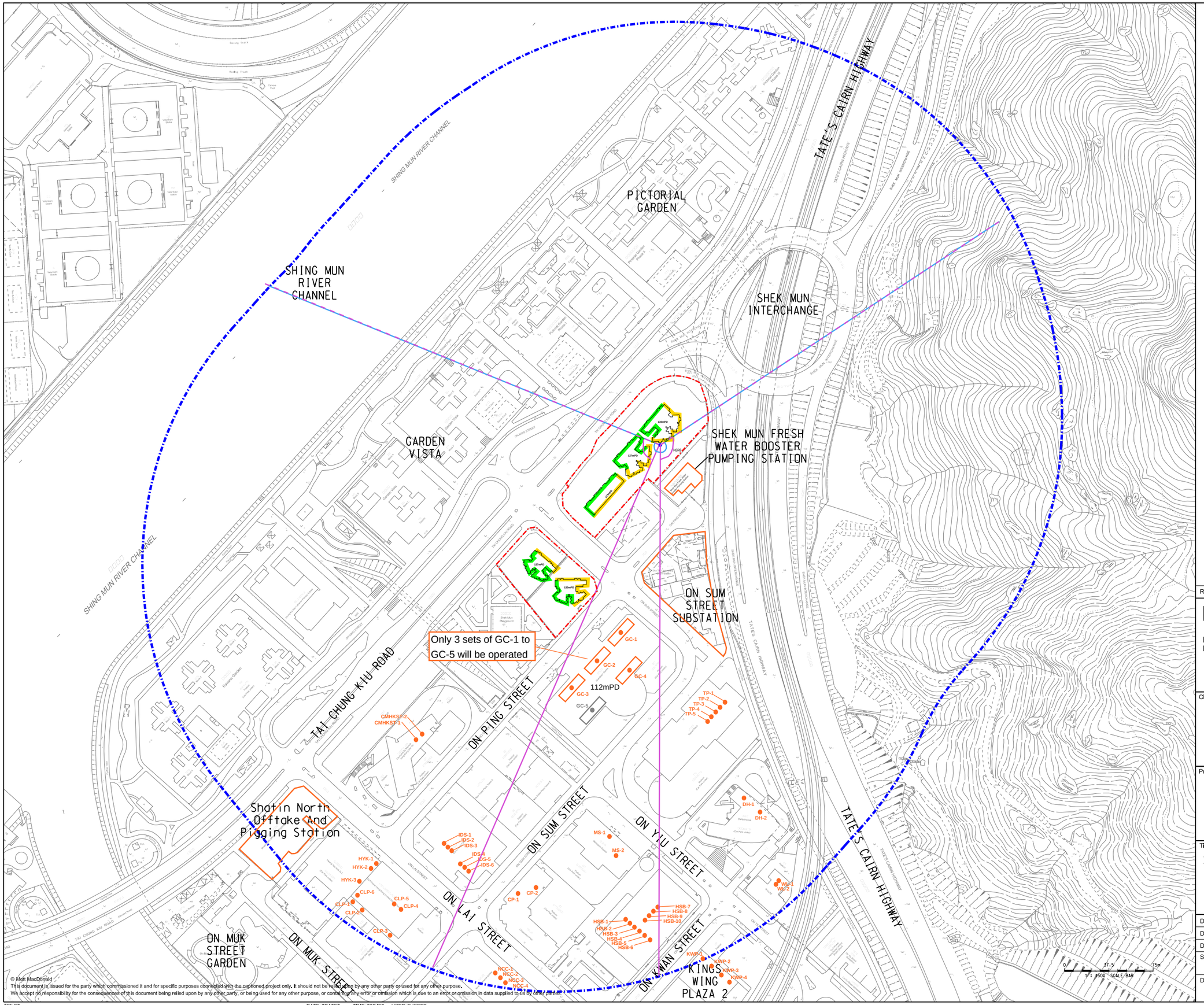
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Drawn			Coordination		
Dwg check			Approved		
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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027)

Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 8

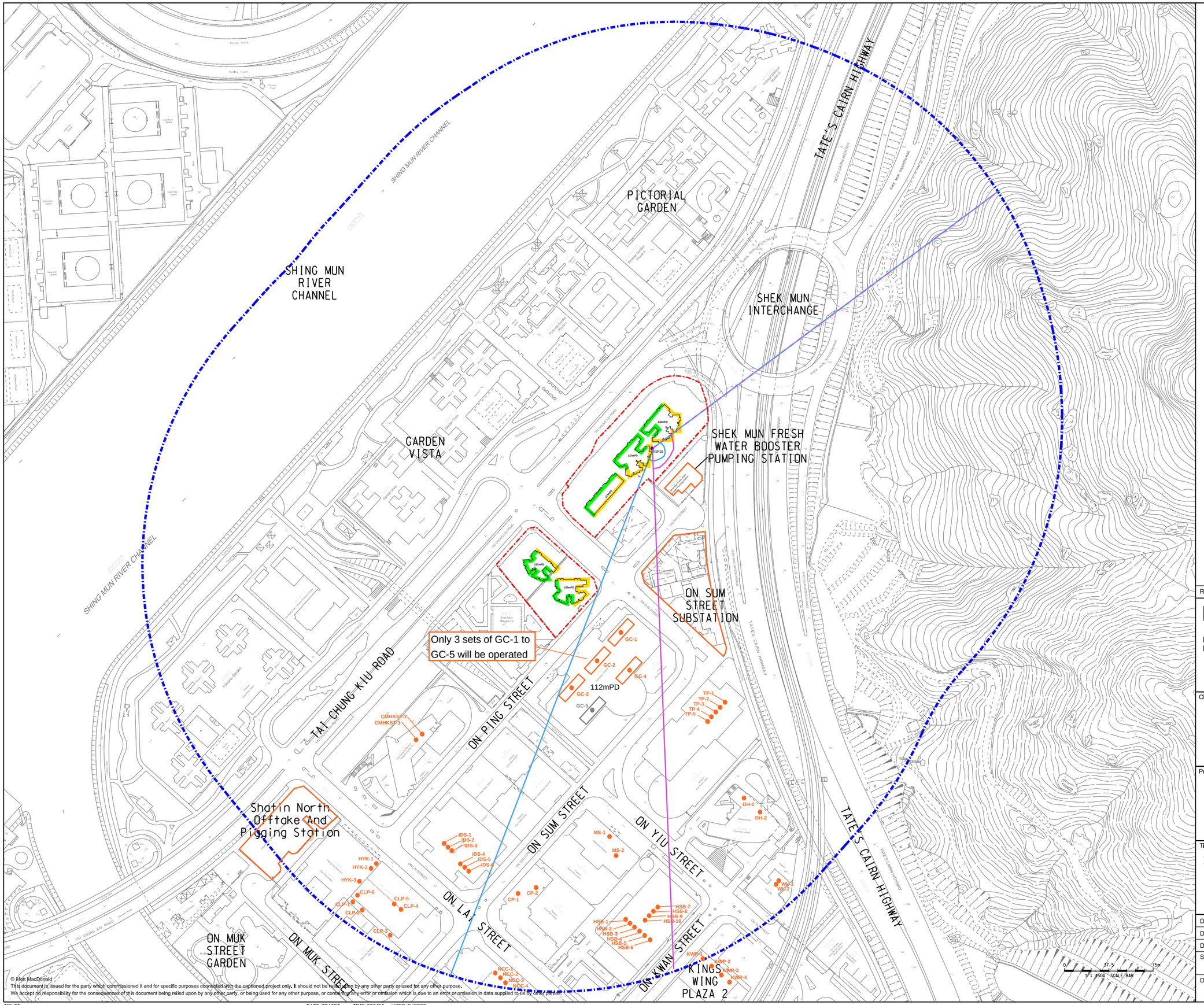
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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
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- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

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TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027)

Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 16

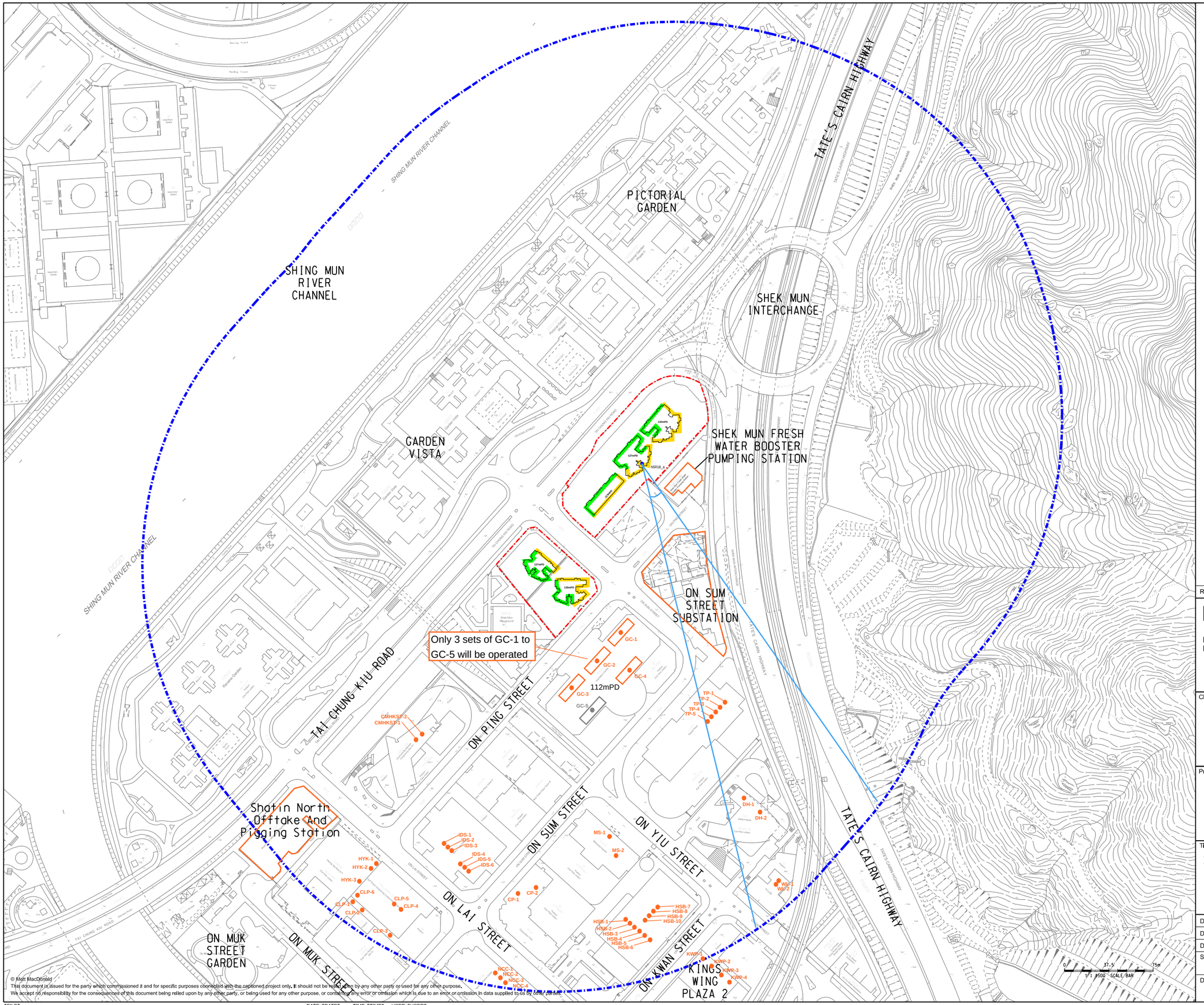
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Dwg check			Approved		
Scale at A1		Status		Rev	

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LEGEND:

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- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

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TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027)

Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 18_a

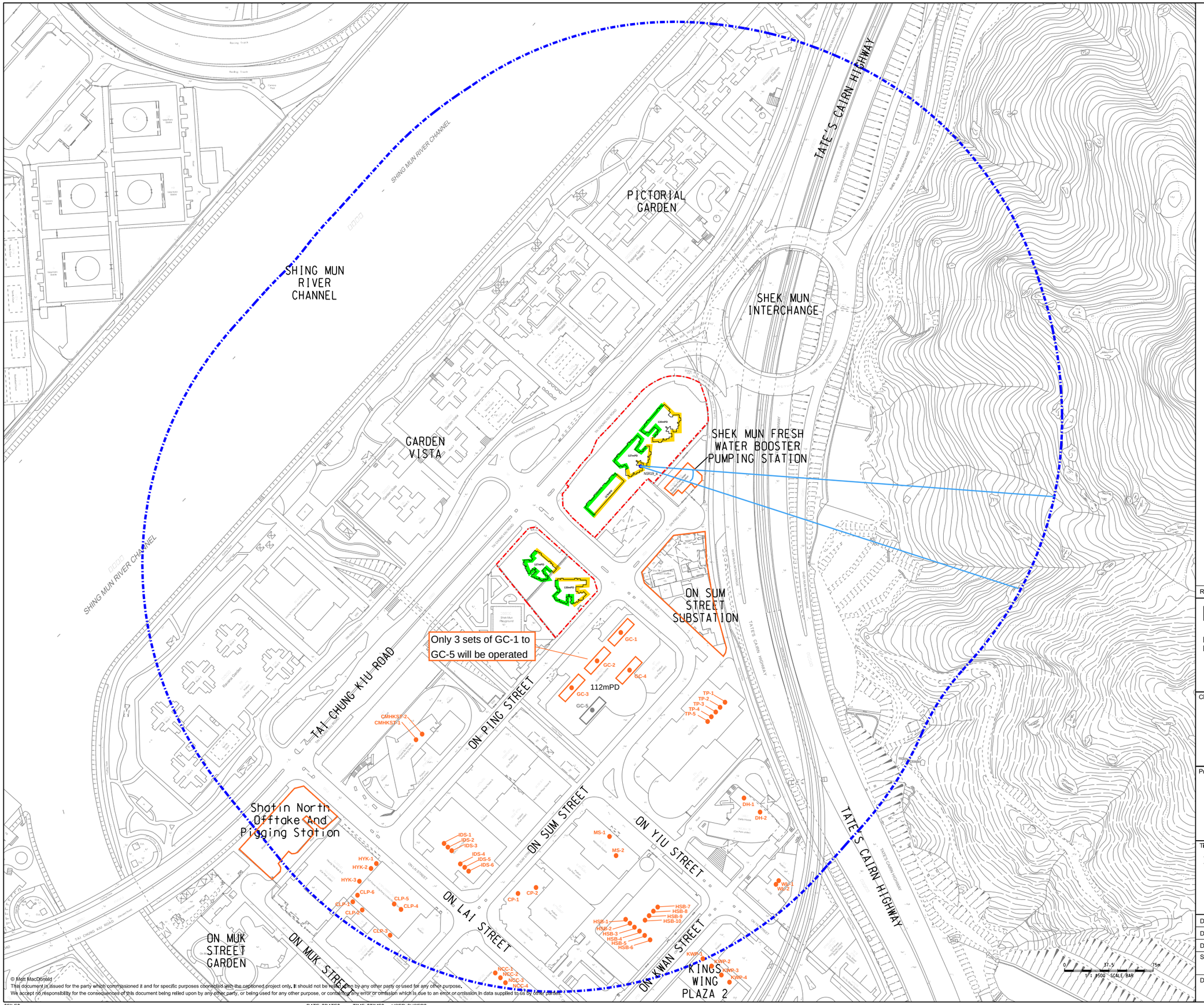
Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

Drawing Number

APPENDIX 4.6

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$FILE$ DATE:$DATE$ TIME:$TIME$ USER:$USER$



LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

AGREEMENT NO. CE 19/2023 (CE)
TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027)

Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 19_a

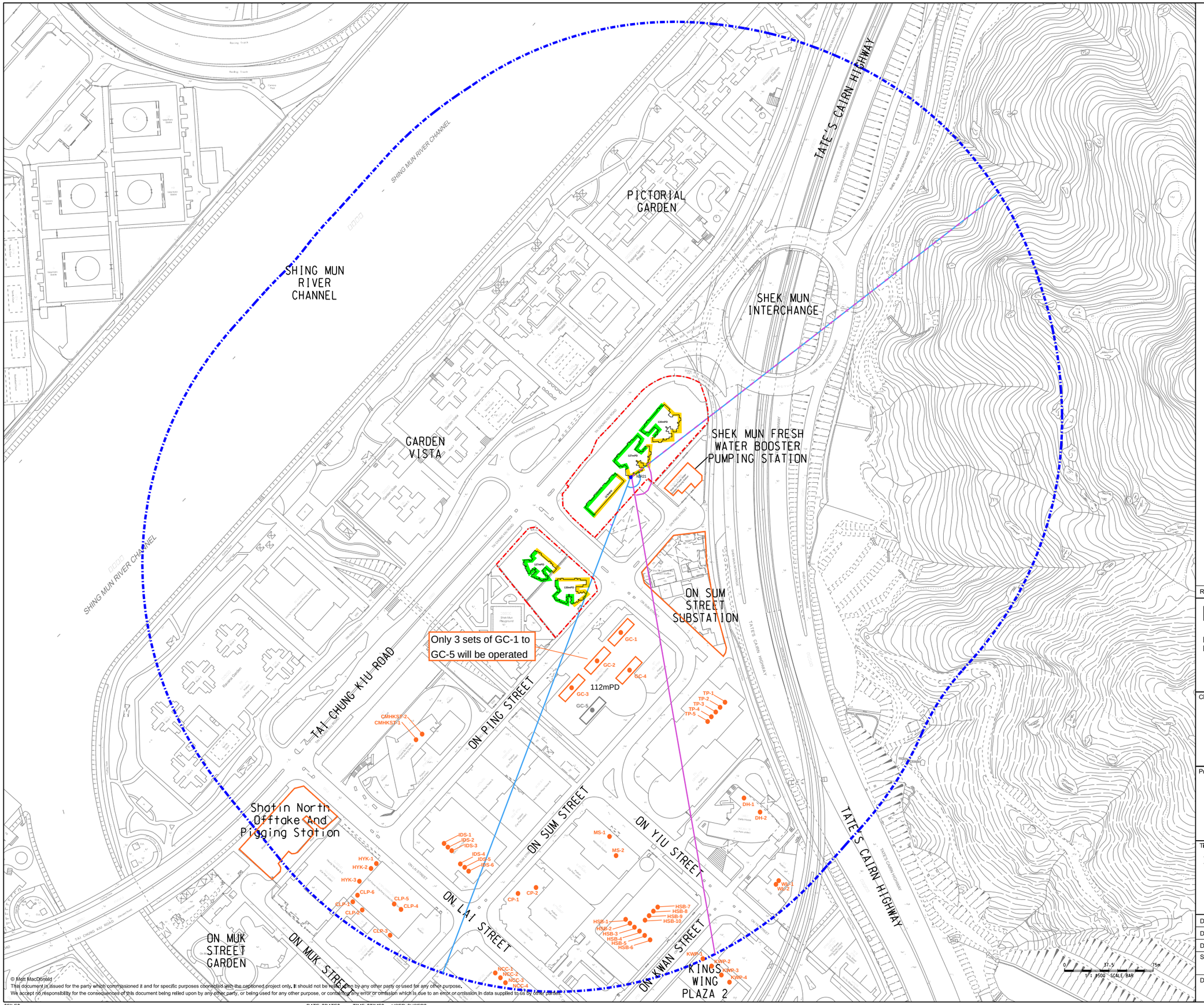
Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

Drawing Number

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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 21

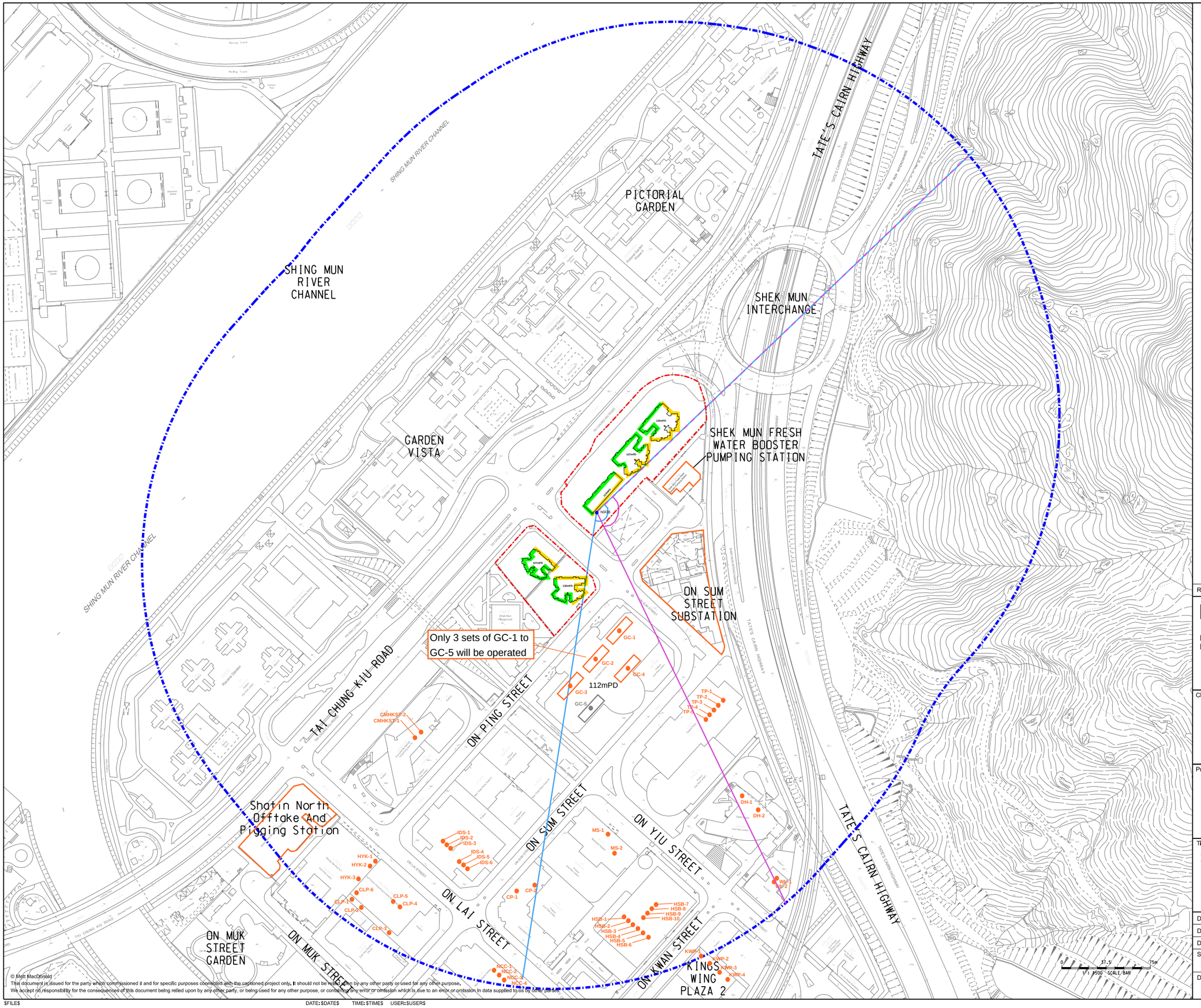
Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

Drawing Number

APPENDIX 4.8

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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 28

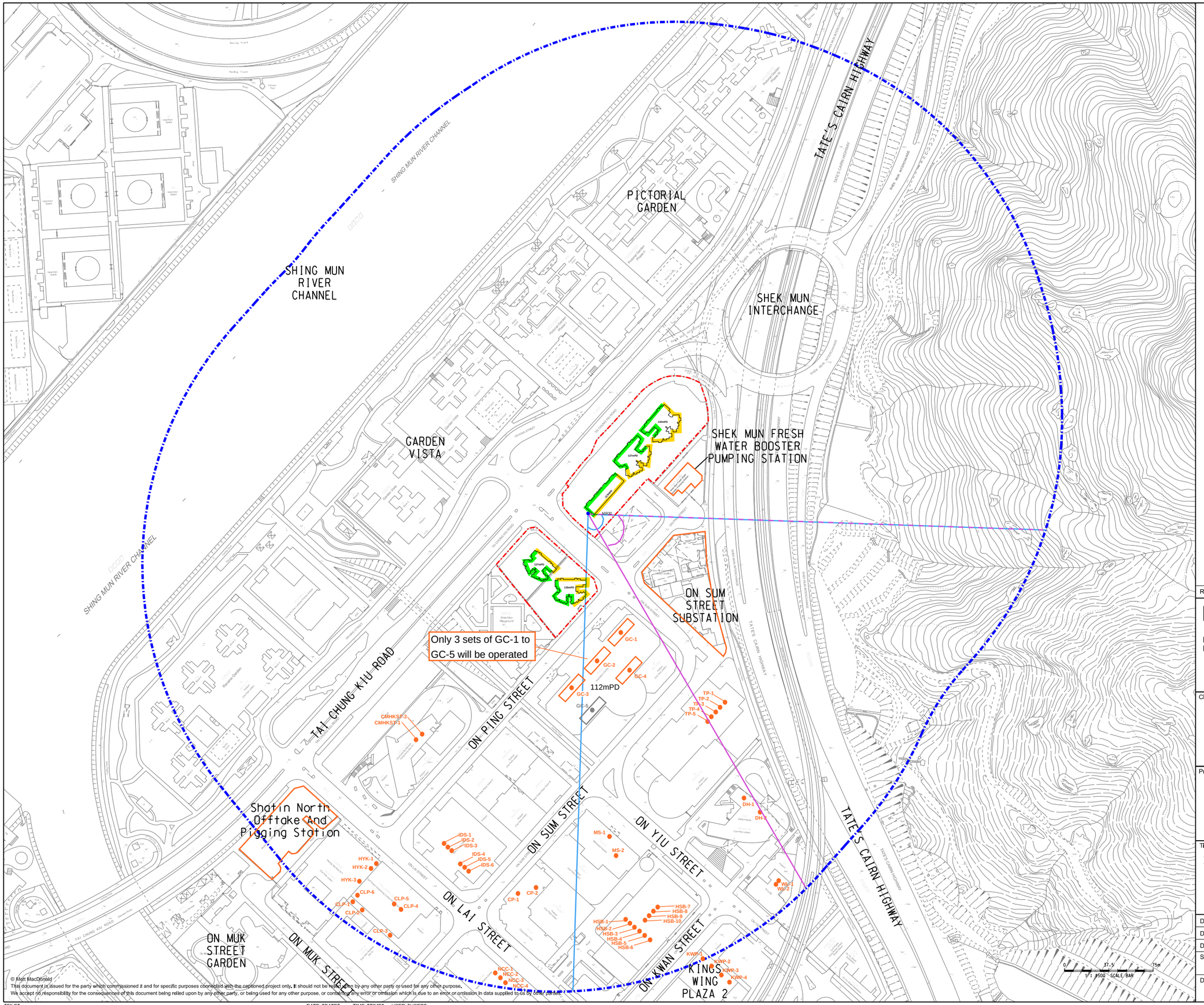
Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 30

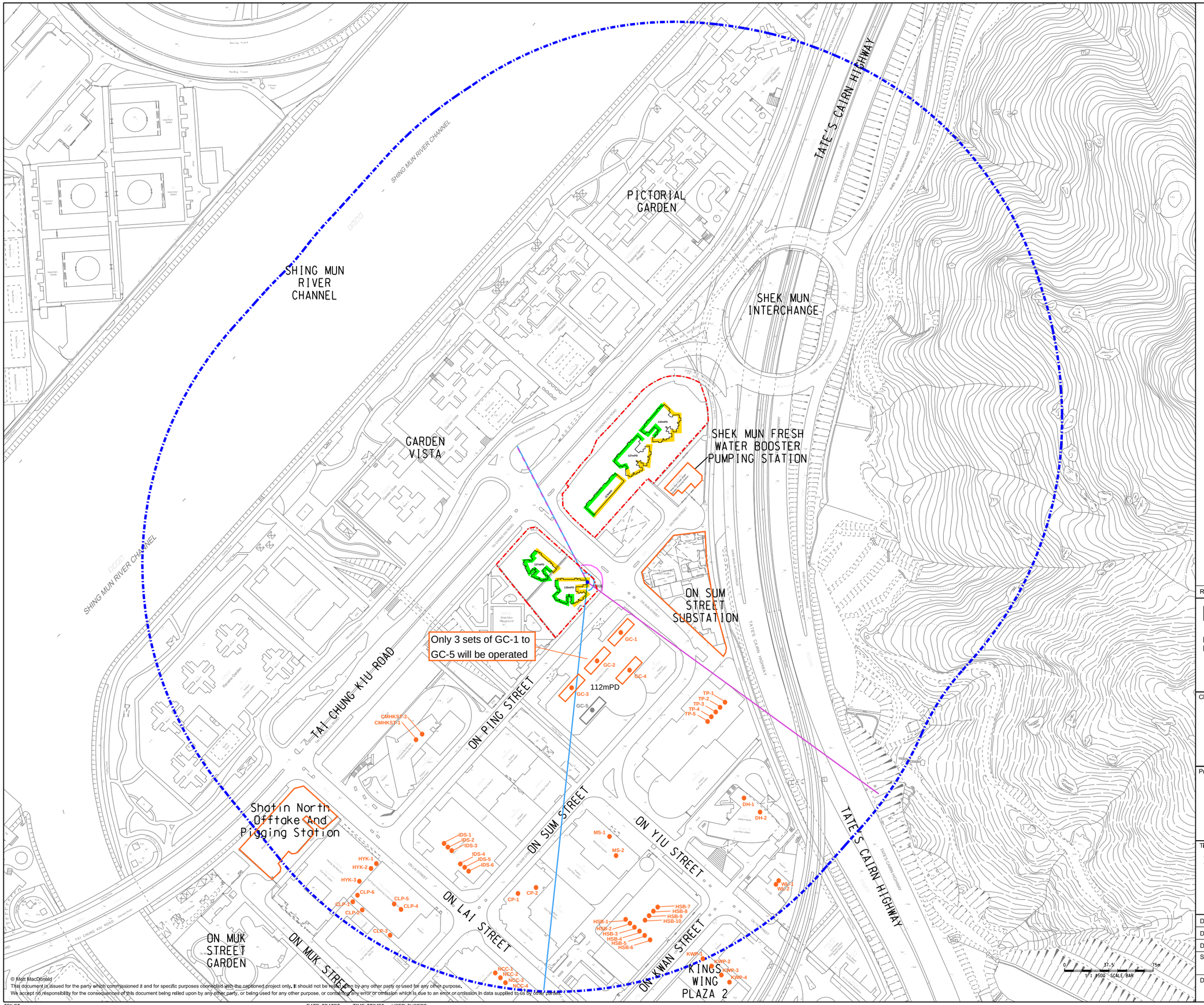
Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

Drawing Number

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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027)

Title

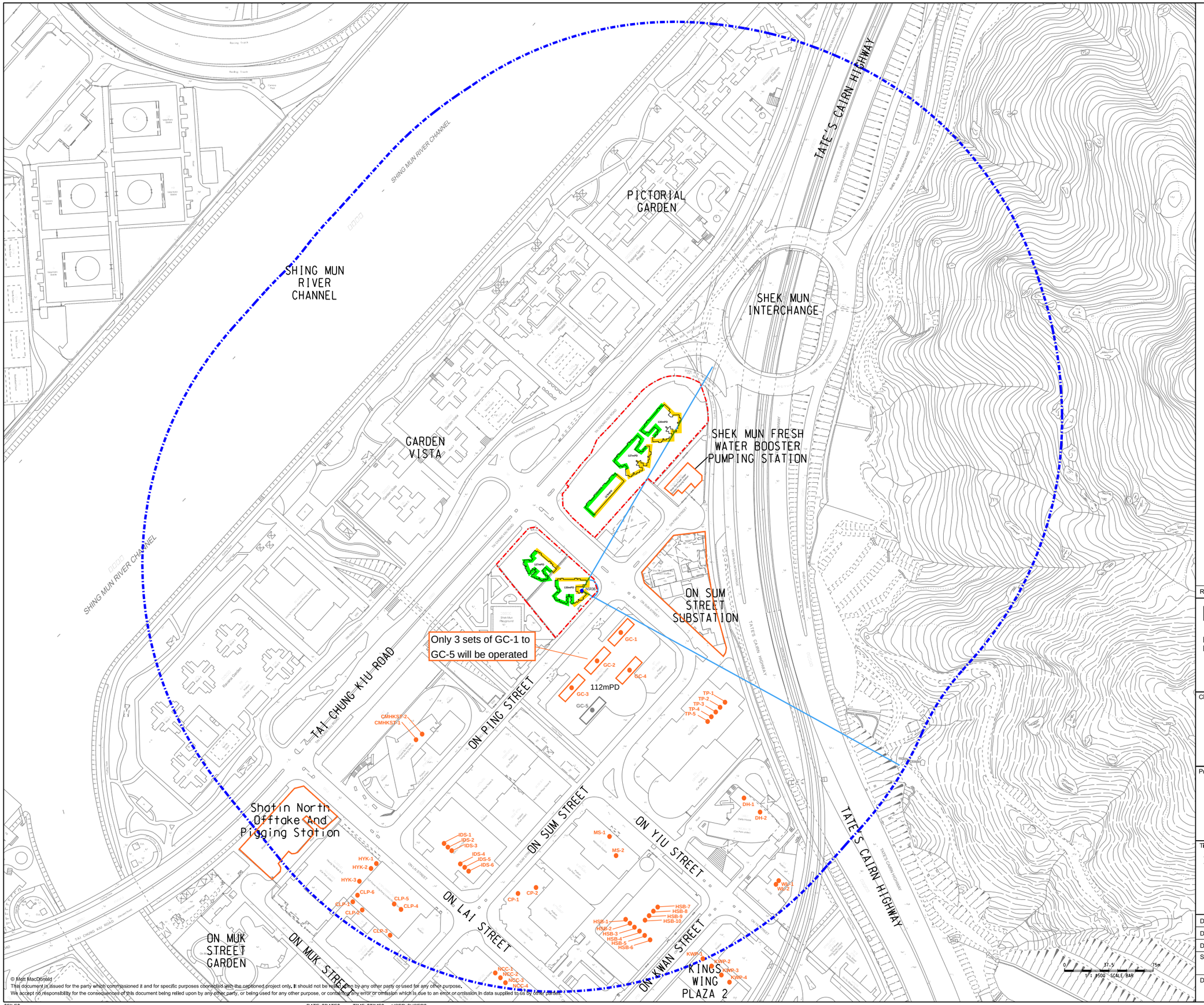
ILLUSTRATION OF LINE OF SIGHT FOR NSR 35

Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 36

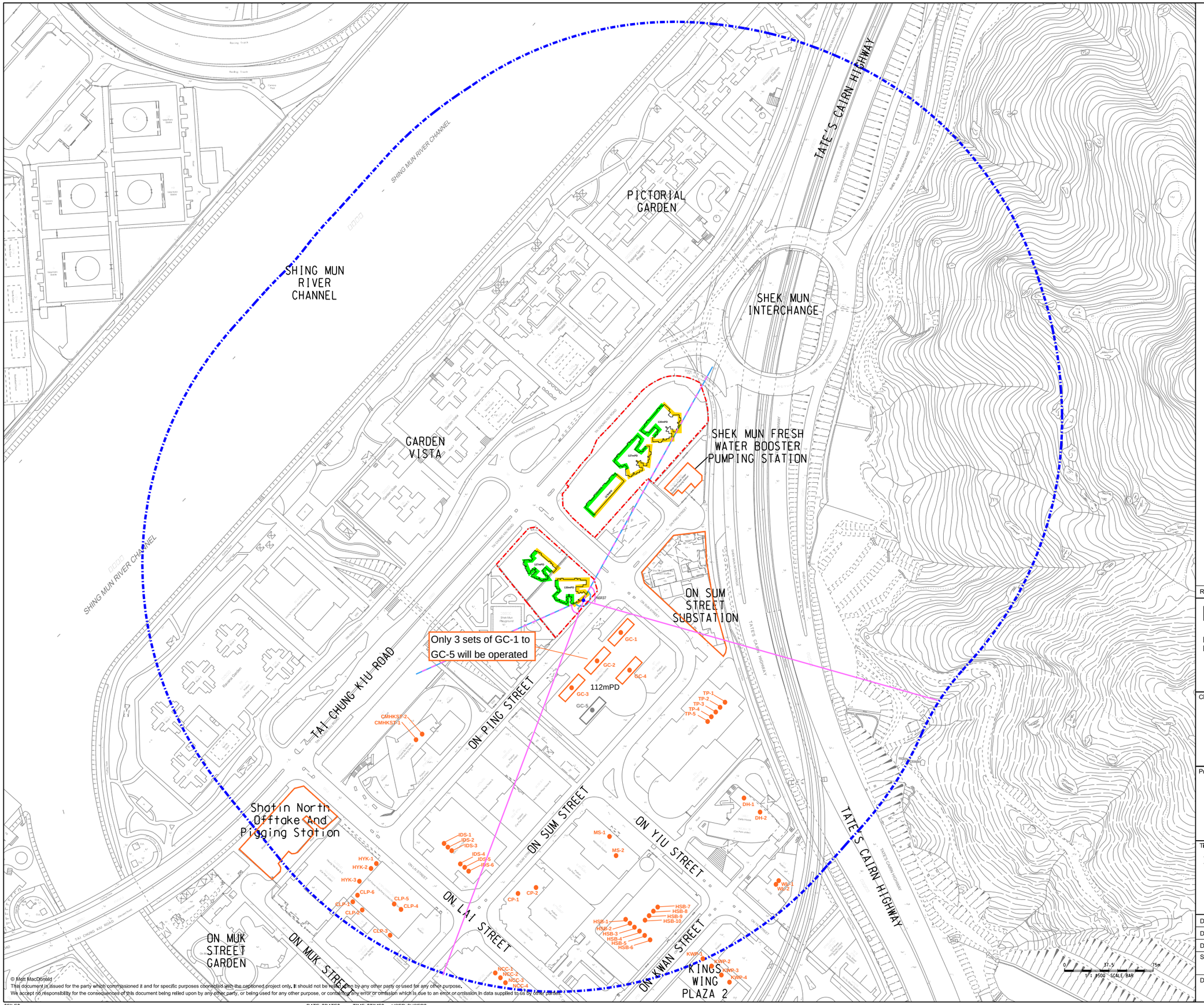
Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

Drawing Number

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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 37

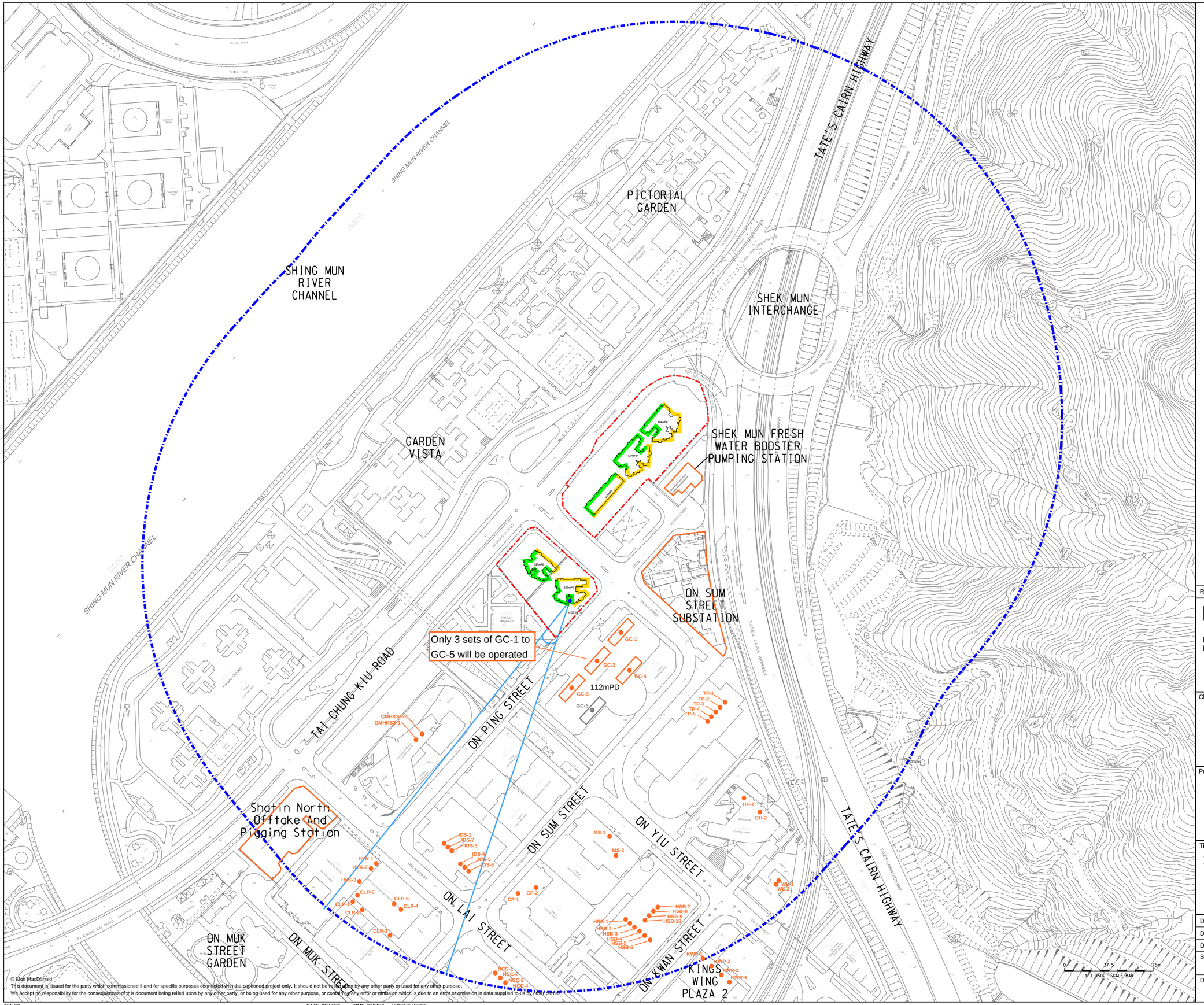
Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 39_a

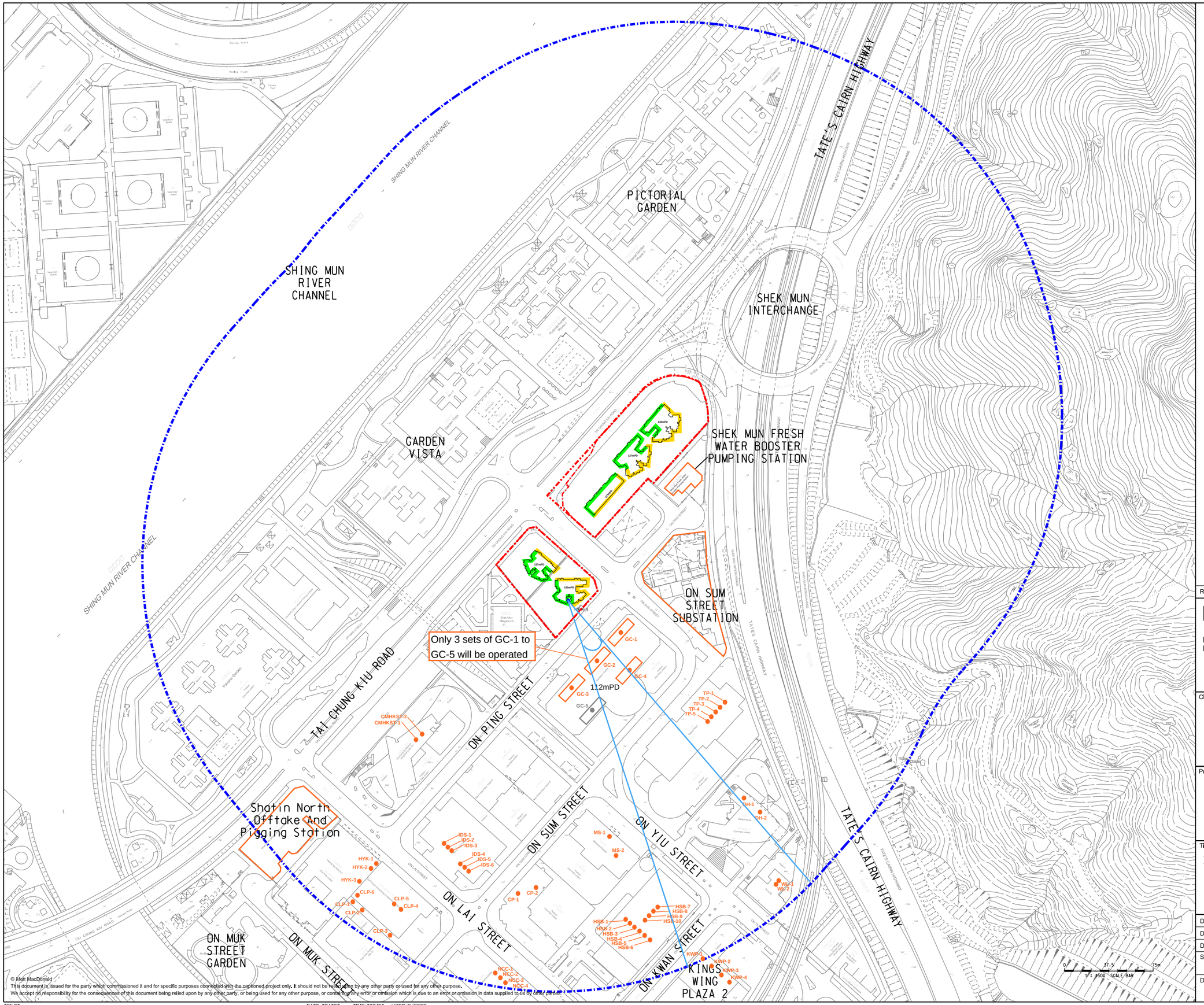
Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

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LEGEND:

- SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 40_a

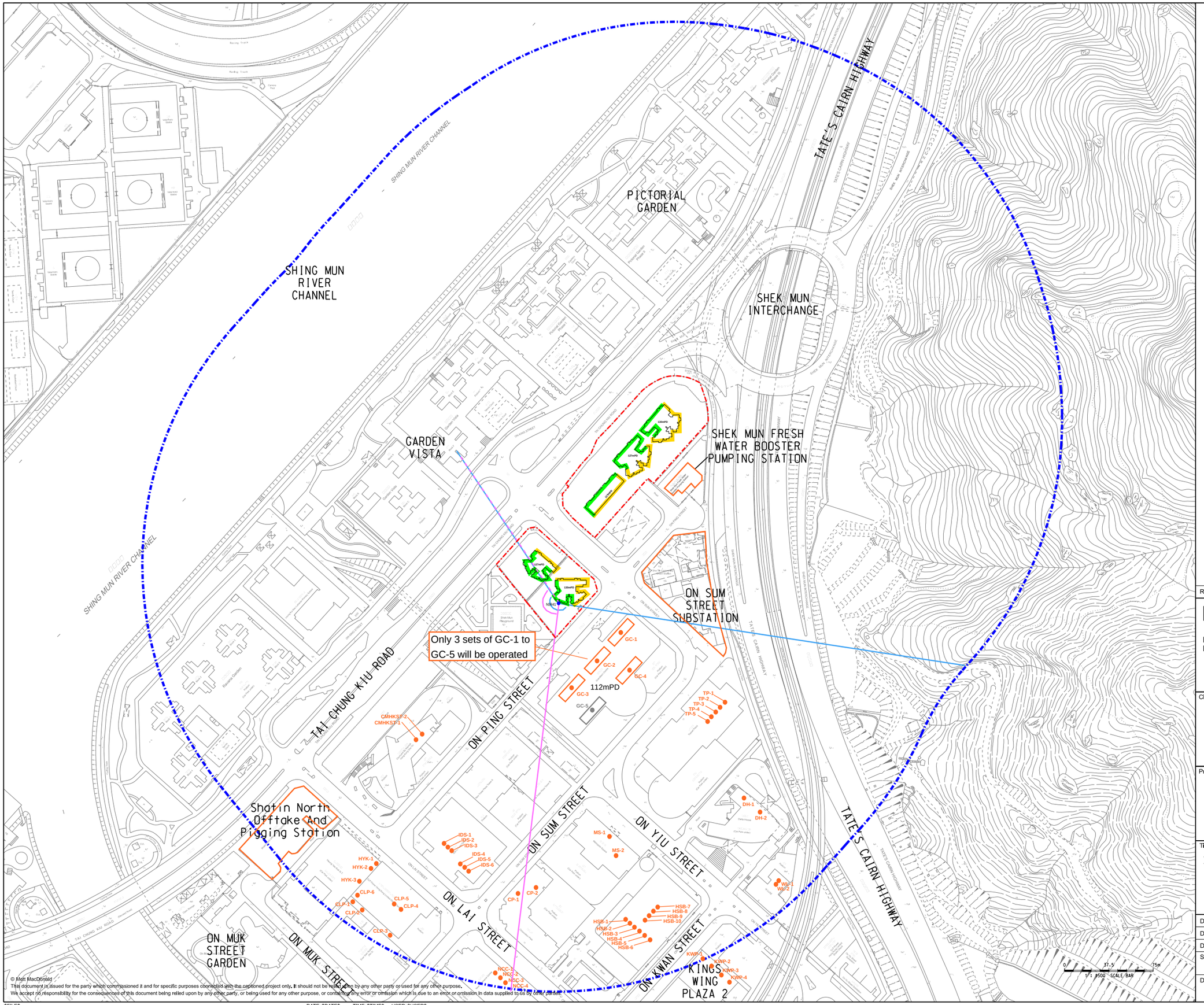
Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

Drawing Number

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Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 41

Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

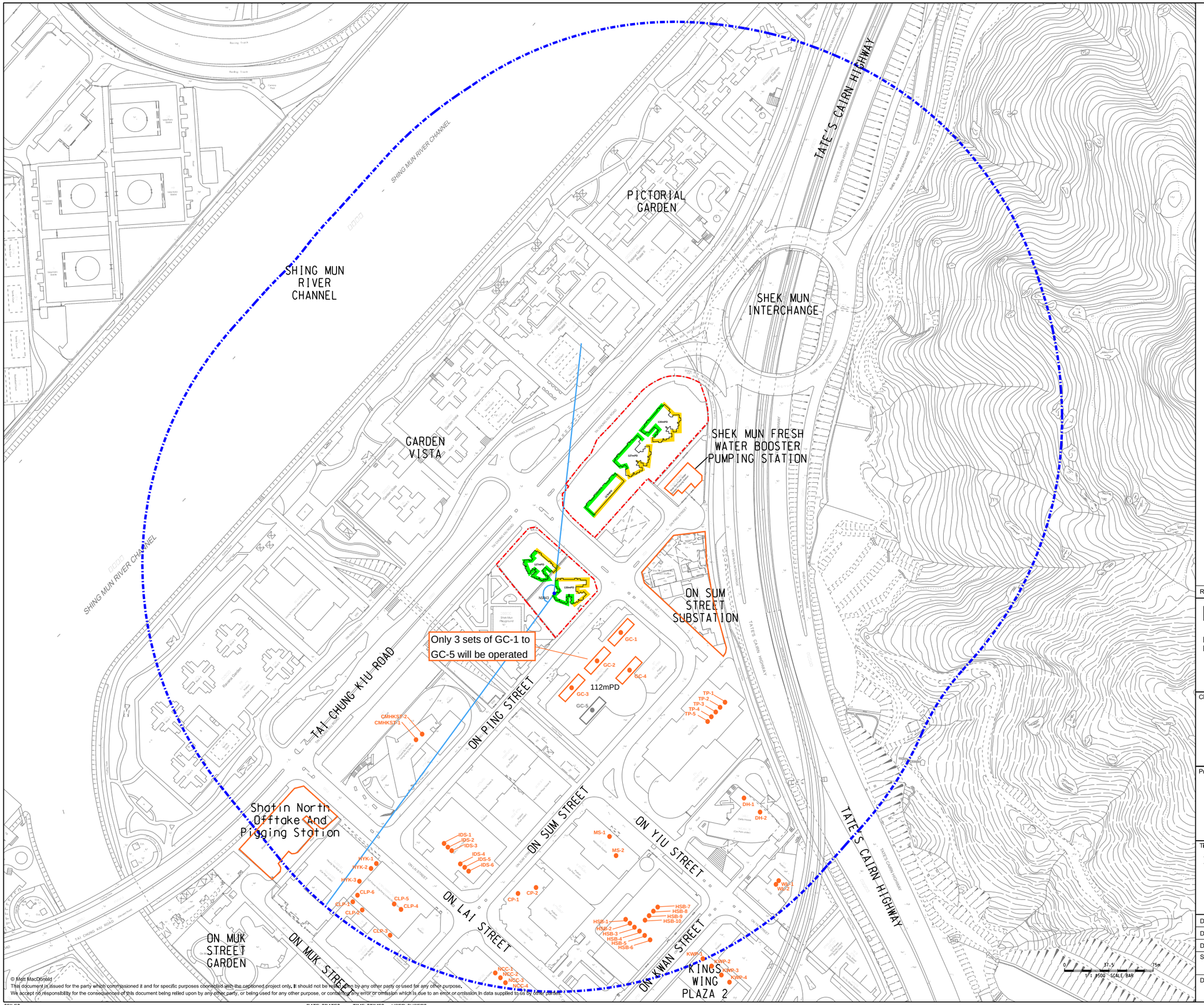
0 37.5 75m
1 : 1500 SCALE BAR

Drawing Number

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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 43

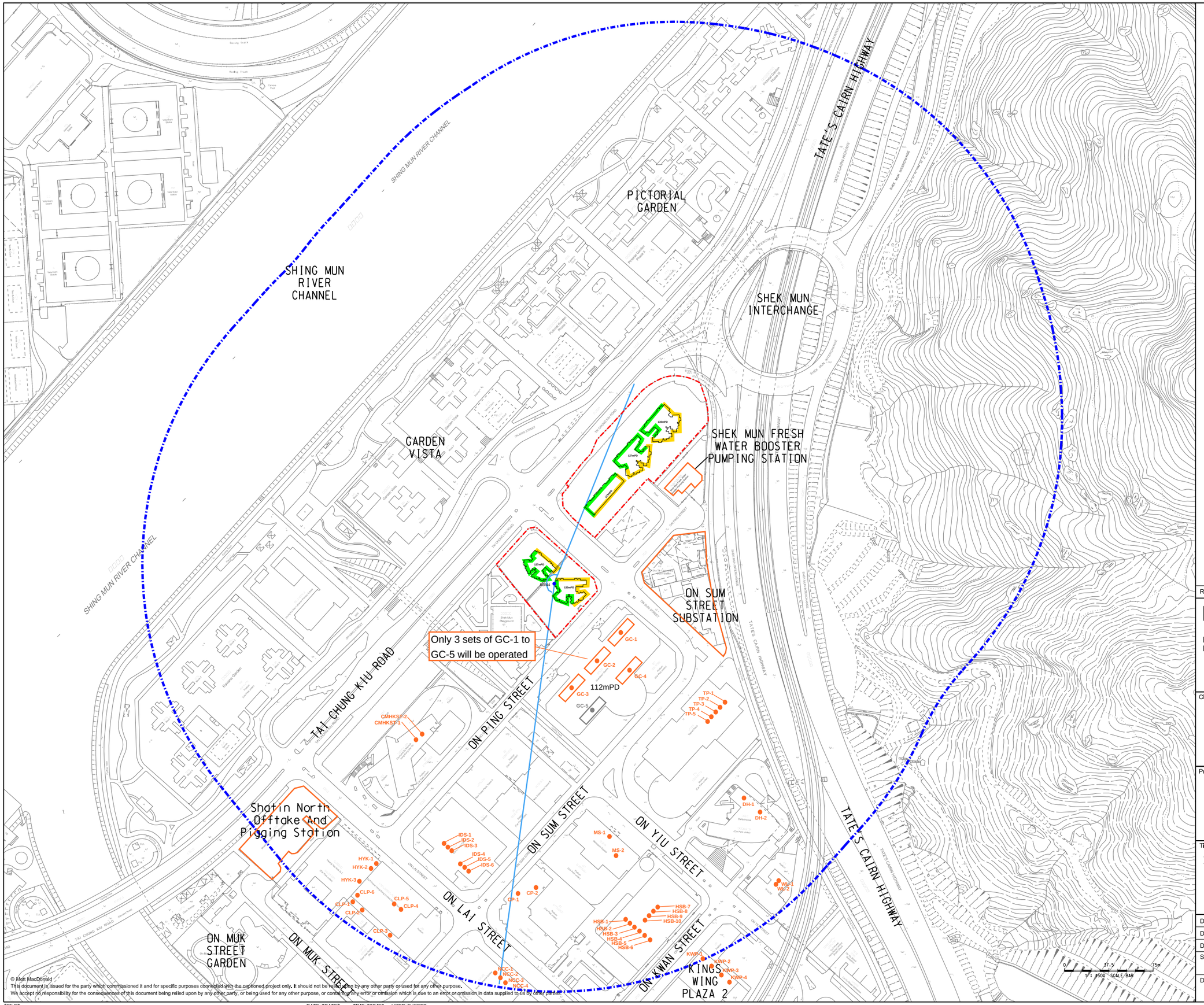
Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 44

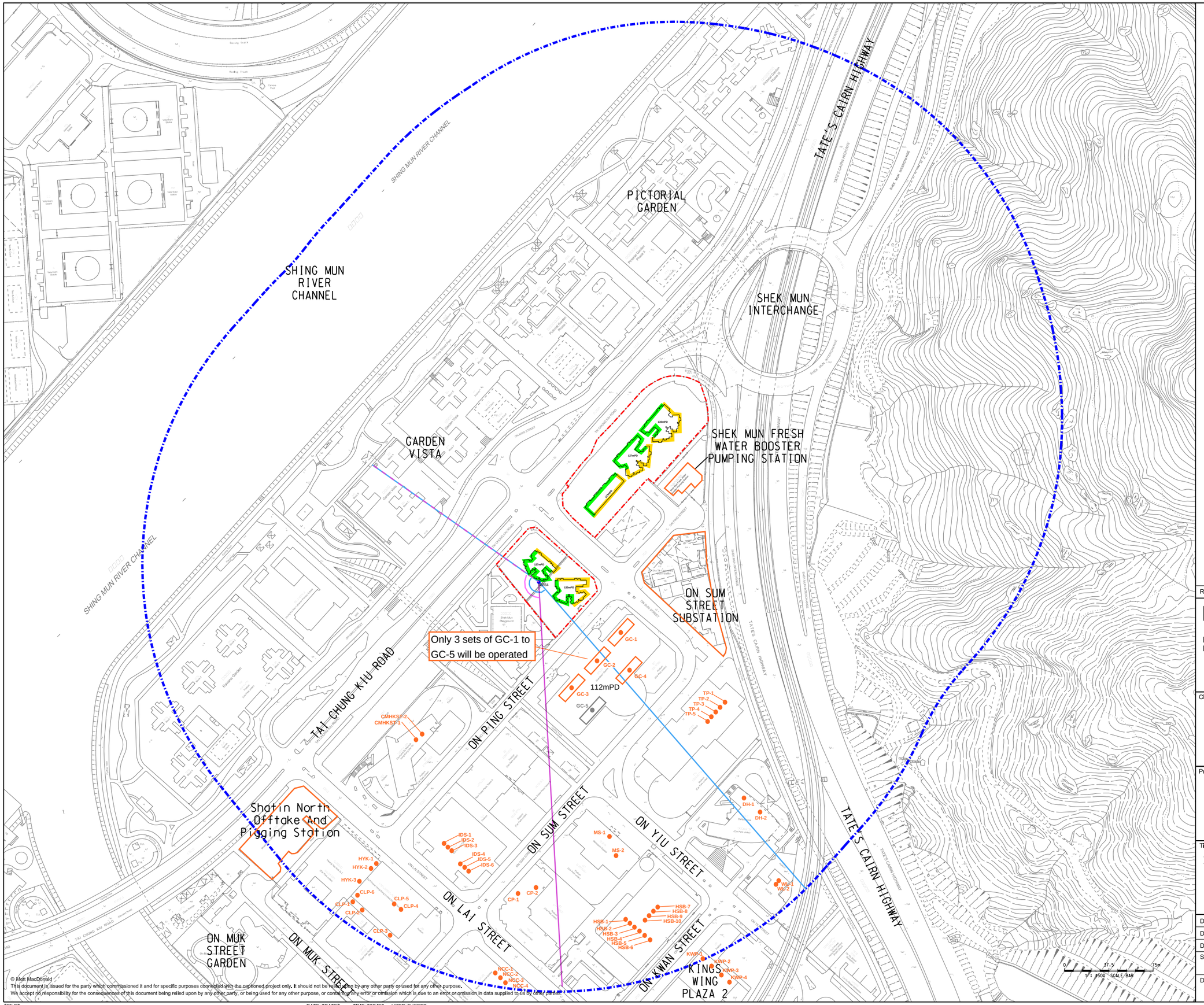
Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 54

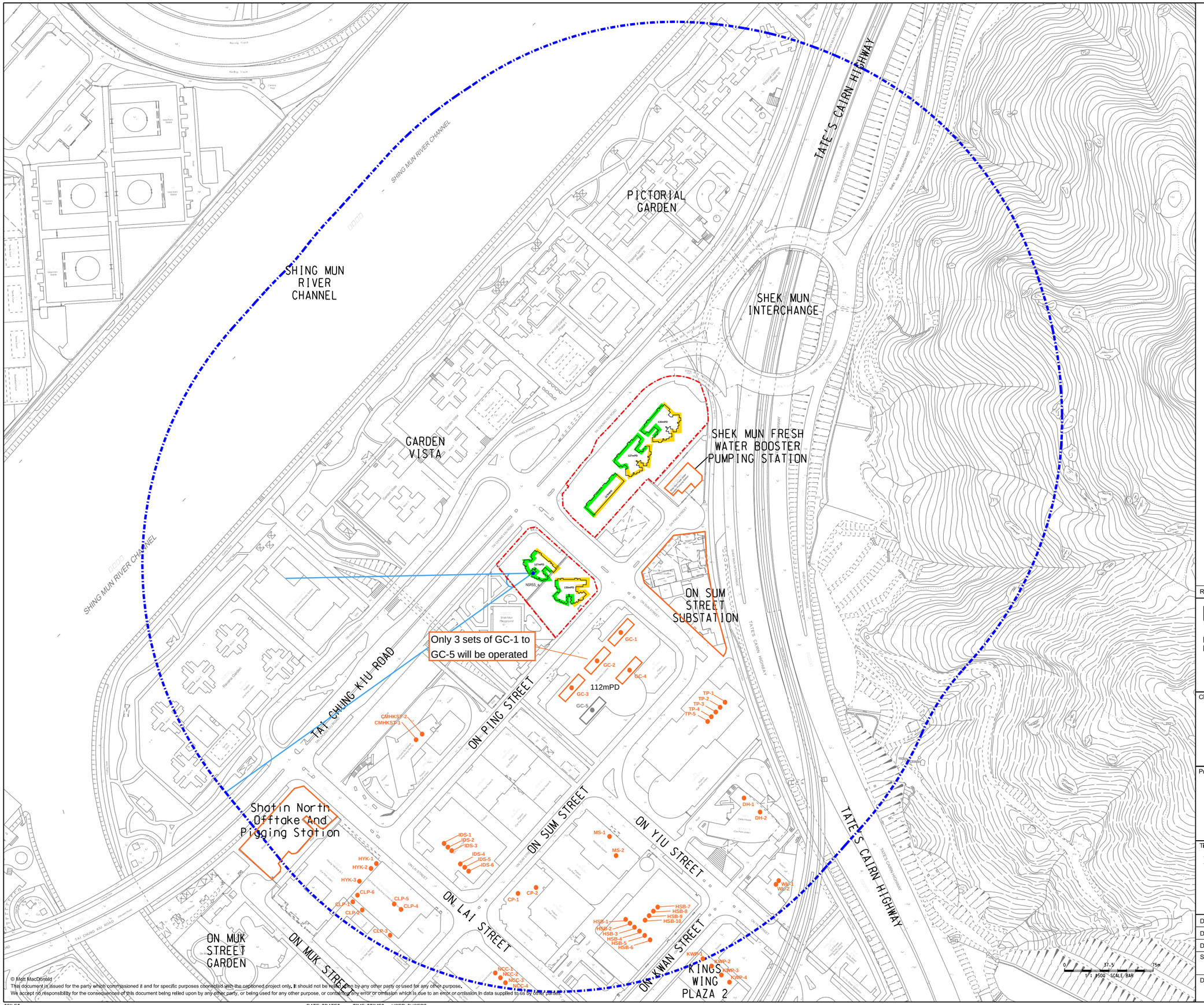
Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 55_a

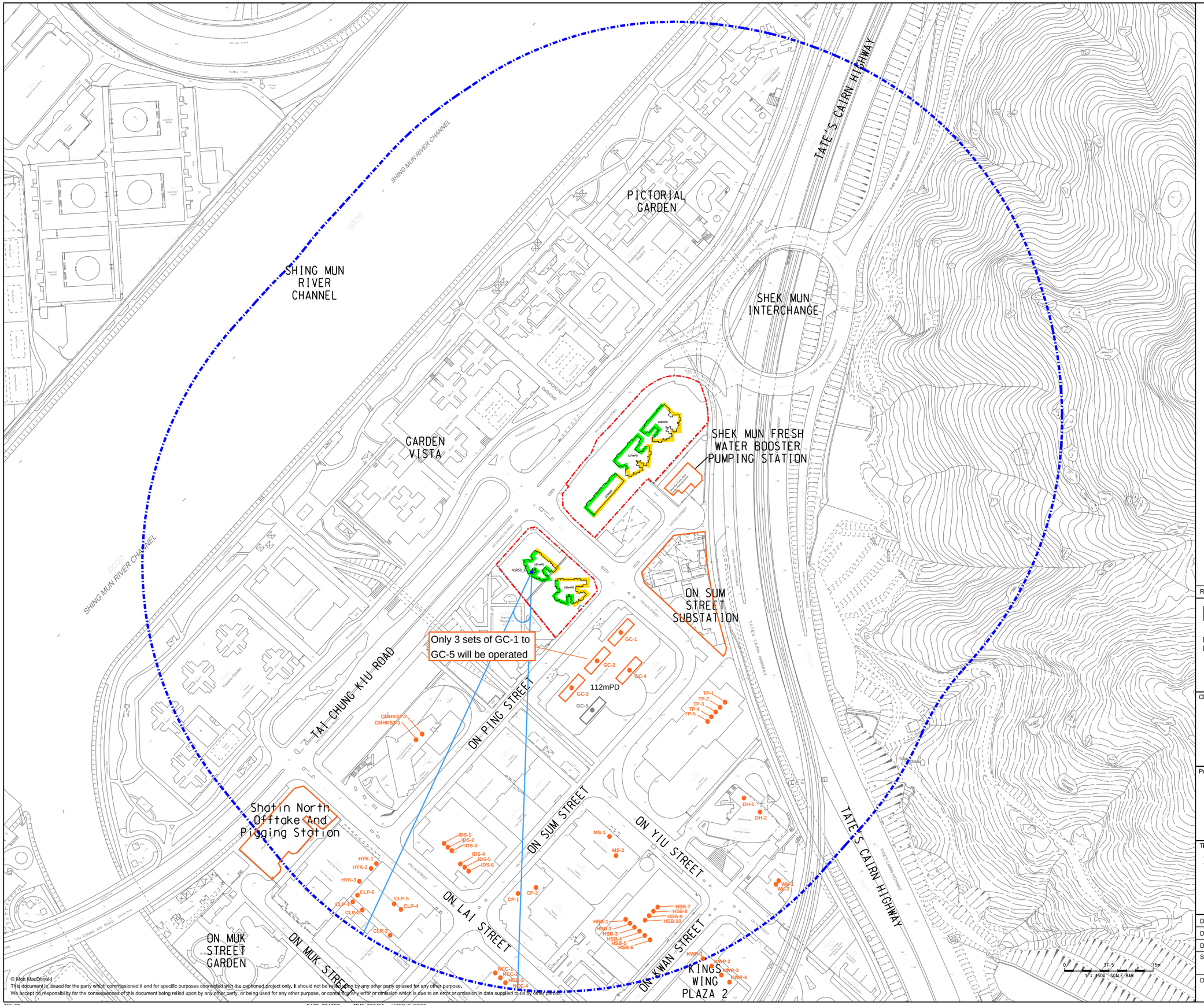
Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

Drawing Number

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LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 56_a

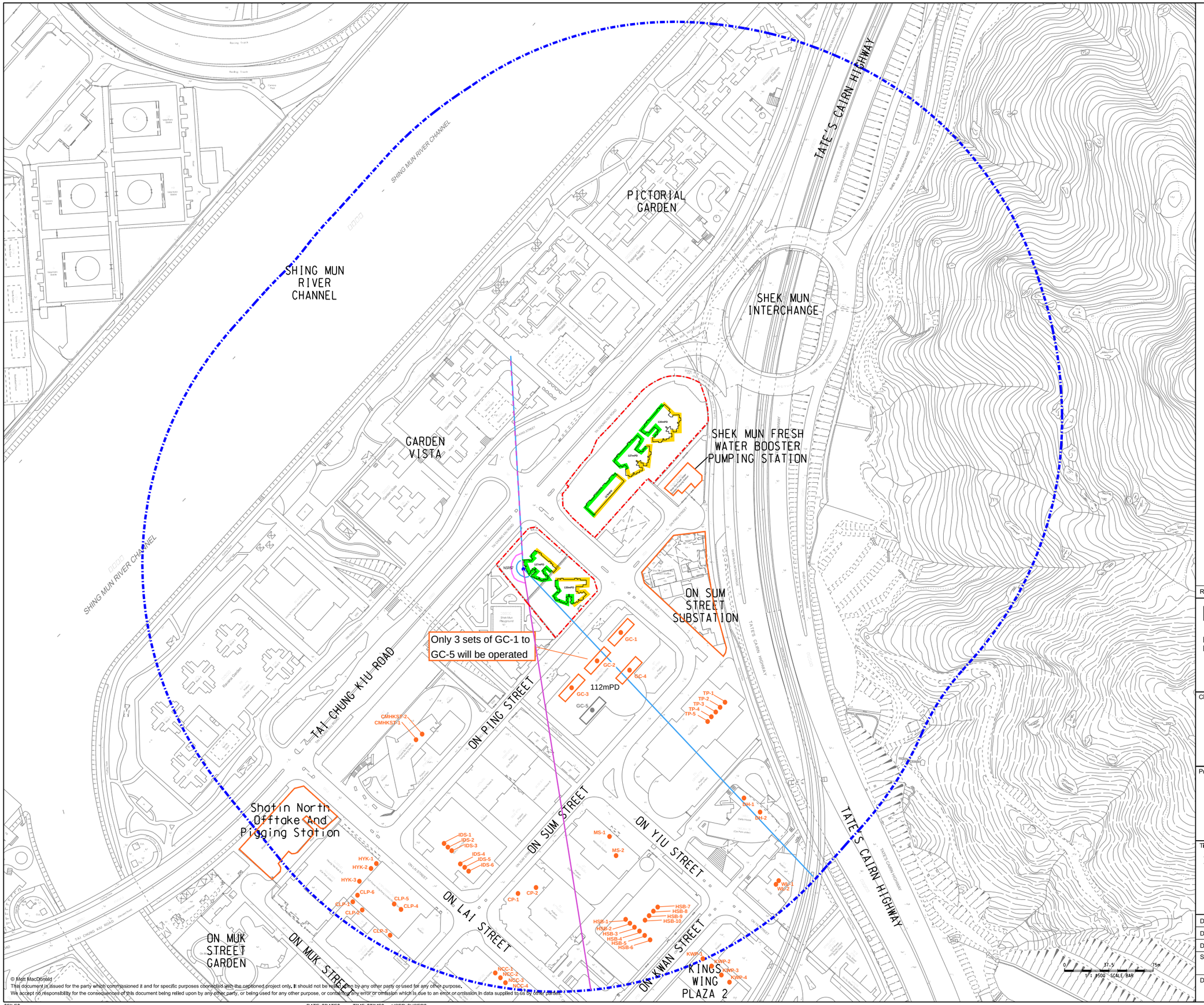
Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

Drawing Number

APPENDIX 4.21

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$FILE$ DATE:$DATE$ TIME:$TIME$ USER:$USER$



LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Client

CEDD

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

AGREEMENT NO. CE 19/2023 (CE)
TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027)

Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 57

Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

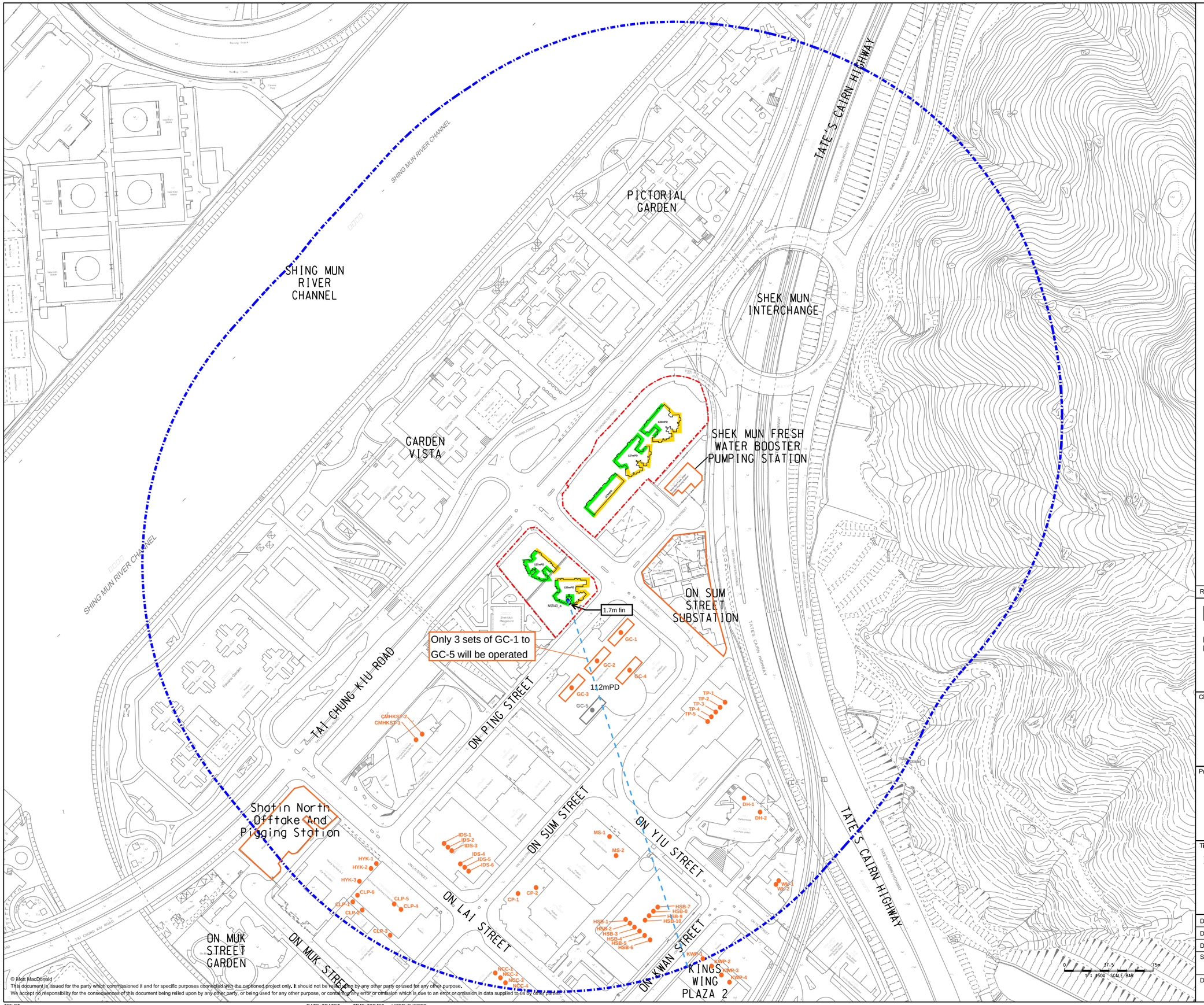
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Mitigated Scenario



LEGEND:

- APPLICATION SITE BOUNDARY
- NOISE ASSESSMENT AREA
- NOISE SENSITIVE RECEIVERS
- FIXED NOISE SOURCE
- FACADE WITH Area Sensitivity Rating OF "B"
- FACADE WITH Area Sensitivity Rating OF "C"
- Line-of-sight from 30/F
- No direct line-of-sight from 30F
- Line-of-sight from 25/F or below

Rev	Date	Drawn	Description	Ch'k'd	App'd

MOTT MACDONALD

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Client

CEDD

CIVIL ENGINEERING AND DEVELOPMENT DEPARTMENT

Project

AGREEMENT NO. CE 19/2023 (CE)
TERM CONSULTANCY FOR SITE FORMATION AND INFRASTRUCTURE WORKS FOR PROPOSED HOUSING AND OTHER DEVELOPMENTS IN ZONE 1 (2023-2027)

Title

ILLUSTRATION OF LINE OF SIGHT FOR NSR 40_a (Mitigated)

Designed			Eng check		
Drawn			Coordination		
Dwg check			Approved		
Scale at A1		Status		Rev	

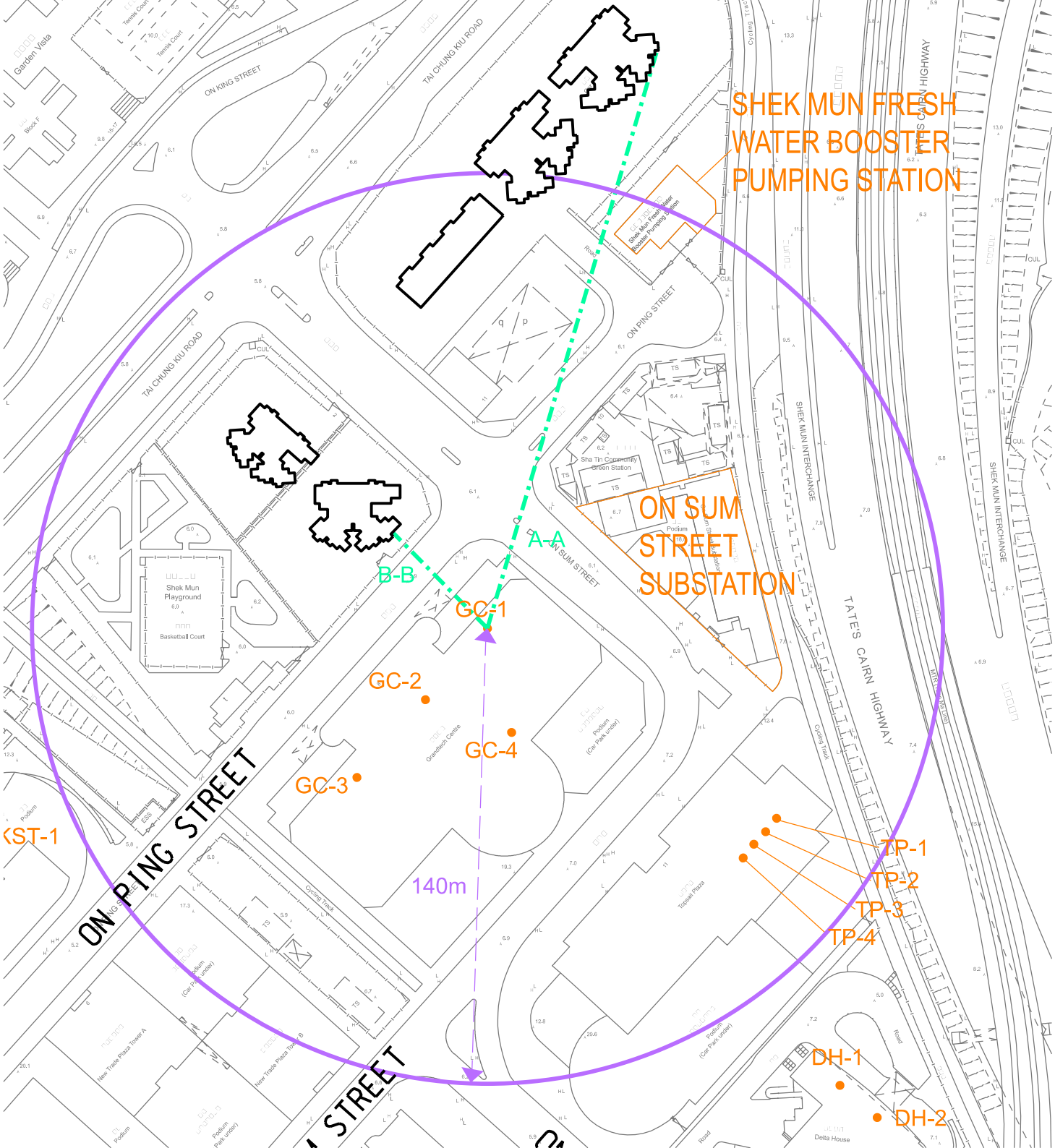
Drawing Number

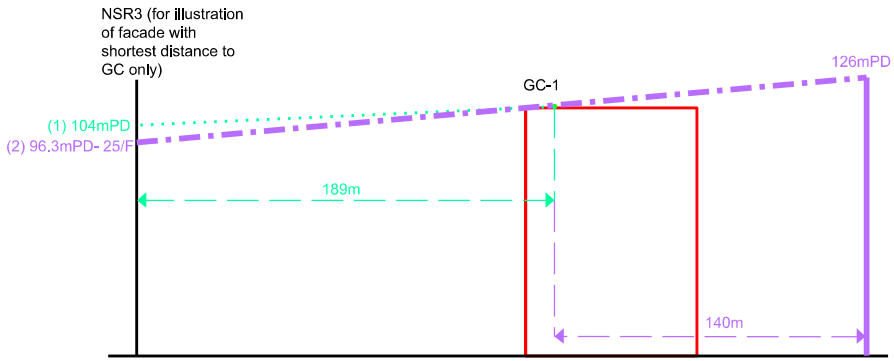
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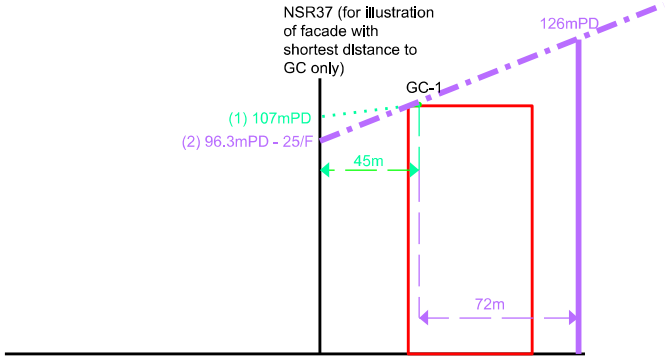
$FILE$ DATE:$DATE$ TIME:$TIME$ USER:$USER$

Illustration of line of sight from NSR to GC (Vertical)


SHEK MUN FRESH WATER BOOSTER PUMPING STATION
ON SUM STREET SUBSTATION
A-A
B-B
GC-1
GC-2
GC-3
GC-4
140m
TP-1
TP-2
TP-3
TP-4
DH-1
DH-2
ON PING STREET
TAI CHUNG KIU ROAD
ON KING STREET
ON PING STREET
ON SUM STREET
SHEK MUN INTERCHANGE
TATE'S CAIRN HIGHWAY
Shek Mun Playground
Basketball Court
Sha Tin Community Green Station
Grandtech Centre
Topsail Plaza
Delta House



Section A-A



Section B-B

(1) By drawing the sections between NSR and GC, the height at NSR with line-of-sight to GC being screened is identified. Based on Section A-A and B-B, which show sections of the nearest and furthest NSRs, NSRs lower than 104mPD should have no line-of-sight to GC.

(2) The tallest fixed noise source is 126mPD. Based on the sections, if the tallest fixed noise source is at least 140m away from GC1, NSR with height lower than 96.3mPD should have no line-of-sight to the concern noise source. There is no fixed noise source within 140m of GC1, except TP. As TP is shorter than GC, the line-of-sight should be completely blocked by GC.

4.6 Result of Fixed Noise Impact Assessment

Summary

NSR	ASR	Floor of NSR	Height of NSR, mPD	Assessment Period	Acceptable Noise Level, dB(A)	Predicted Noise Level, dB(A)	Exceedance?	Mitigation Measure	Mitigated Noise Level, dB(A)	Exceedance?
4	C		112.1	Day-time & Evening	70	66	No		66	No
	C	30/F		Night-time	60	59	No		59	No
	C		96.3	Day-time & Evening	70	64	No		64	No
	C	25/F		Night-time	60	59	No		59	No
	C		80.6	Day-time & Evening	70	64	No		64	No
	C	20/F		Night-time	60	59	No		59	No
	C		64.8	Day-time & Evening	70	64	No		64	No
	C	15/F		Night-time	60	59	No		59	No
	C		49.1	Day-time & Evening	70	63	No		63	No
	C	10/F		Night-time	60	59	No		59	No
	C		33.3	Day-time & Evening	70	63	No		63	No
	C	5/F		Night-time	60	59	No		59	No
5_a	C		112.1	Day-time & Evening	70	61	No		61	No
	C	30/F		Night-time	60	57	No		57	No
	C		96.3	Day-time & Evening	70	61	No		61	No
	C	25/F		Night-time	60	57	No		57	No
	C		80.6	Day-time & Evening	70	61	No		61	No
	C	20/F		Night-time	60	57	No		57	No
	C		64.8	Day-time & Evening	70	61	No		61	No
	C	15/F		Night-time	60	57	No		57	No
	C		49.1	Day-time & Evening	70	61	No		61	No
	C	10/F		Night-time	60	57	No		57	No
	C		33.3	Day-time & Evening	70	61	No		61	No
	C	5/F		Night-time	60	56	No		56	No
6_a	C		112.1	Day-time & Evening	70	56	No		56	No
	C	30/F		Night-time	60	50	No		50	No
	C		96.3	Day-time & Evening	70	56	No		56	No
	C	25/F		Night-time	60	50	No		50	No
	C		80.6	Day-time & Evening	70	56	No		56	No
	C	20/F		Night-time	60	50	No		50	No
	C		64.8	Day-time & Evening	70	56	No		56	No
	C	15/F		Night-time	60	50	No		50	No
	C		49.1	Day-time & Evening	70	56	No		56	No
	C	10/F		Night-time	60	50	No		50	No
	C		33.3	Day-time & Evening	70	56	No		56	No
	C	5/F		Night-time	60	50	No		50	No
8	C		112.1	Day-time & Evening	70	66	No		66	No
	C	30/F		Night-time	60	60	No		60	No
	C		96.3	Day-time & Evening	70	64	No		64	No
	C	25/F		Night-time	60	59	No		59	No
	C		80.6	Day-time & Evening	70	63	No		63	No
	C	20/F		Night-time	60	59	No		59	No
	C		64.8	Day-time & Evening	70	63	No		63	No
	C	15/F		Night-time	60	59	No		59	No
	C		49.1	Day-time & Evening	70	63	No		63	No
	C	10/F		Night-time	60	59	No		59	No
	C		33.3	Day-time & Evening	70	63	No		63	No
	C	5/F		Night-time	60	59	No		59	No
16	C		112.1	Day-time & Evening	70	66	No		66	No
	C	30/F		Night-time	60	59	No		59	No
	C		96.3	Day-time & Evening	70	63	No		63	No
	C	25/F		Night-time	60	57	No		57	No
	C		80.6	Day-time & Evening	70	63	No		63	No
	C	20/F		Night-time	60	57	No		57	No
	C		64.8	Day-time & Evening	70	63	No		63	No
	C	15/F		Night-time	60	57	No		57	No
	C		49.1	Day-time & Evening	70	63	No		63	No
	C	10/F		Night-time	60	57	No		57	No
	C		33.3	Day-time & Evening	70	63	No		63	No
	C	5/F		Night-time	60	57	No		57	No
18_a	C		112.1	Day-time & Evening	70	62	No		62	No
	C	30/F		Night-time	60	57	No		57	No
	C		96.3	Day-time & Evening	70	62	No		62	No
	C	25/F		Night-time	60	57	No		57	No
	C		80.6	Day-time & Evening	70	62	No		62	No
	C	20/F		Night-time	60	57	No		57	No
	C		64.8	Day-time & Evening	70	62	No		62	No
	C	15/F		Night-time	60	57	No		57	No
	C		49.1	Day-time & Evening	70	62	No		62	No
	C	10/F		Night-time	60	57	No		57	No
	C		33.3	Day-time & Evening	70	62	No		62	No
	C	5/F		Night-time	60	57	No		57	No
19_a	C		112.1	Day-time & Evening	70	57	No		57	No
	C	30/F		Night-time	60	51	No		51	No
	C		96.3	Day-time & Evening	70	57	No		57	No
	C	25/F		Night-time	60	51	No		51	No
	C		80.6	Day-time & Evening	70	57	No		57	No
	C	20/F		Night-time	60	51	No		51	No
	C		64.8	Day-time & Evening	70	57	No		57	No
	C	15/F		Night-time	60	51	No		51	No
	C		49.1	Day-time & Evening	70	57	No		57	No
	C	10/F		Night-time	60	51	No		51	No
	C		33.3	Day-time & Evening	70	57	No		57	No
	C	5/F		Night-time	60	51	No		51	No
21	C		112.1	Day-time & Evening	70	67	No		67	No
	C	30/F		Night-time	60	60	No		60	No
	C		96.3	Day-time & Evening	70	64	No		64	No
	C	25/F		Night-time	60	58	No		58	No
	C		80.6	Day-time & Evening	70	64	No		64	No
	C	20/F		Night-time	60	58	No		58	No
	C		64.8	Day-time & Evening	70	64	No		64	No
	C	15/F		Night-time	60	58	No		58	No
	C		49.1	Day-time & Evening	70	64	No		64	No
	C	10/F		Night-time	60	58	No		58	No
	C		33.3	Day-time & Evening	70	63	No		63	No
	C	5/F		Night-time	60	57	No		57	No
28	C		112.1	Day-time & Evening	70	69	No		69	No
	C	30/F		Night-time	60	60	No		60	No
	C		96.3	Day-time & Evening	70	65	No		65	No
	C	25/F		Night-time	60	58	No		58	No
	C		80.6	Day-time & Evening	70	65	No		65	No
	C	20/F		Night-time	60	58	No		58	No
	C		64.8	Day-time & Evening	70	65	No		65	No
	C	15/F		Night-time	60	58	No		58	No
	C		49.1	Day-time & Evening	70	65	No		65	No
	C	10/F		Night-time	60	58	No		58	No
	C		33.3	Day-time & Evening	70	64	No		64	No
	C	5/F		Night-time	60	58	No		58	No
30	B		112.1	Day-time & Evening	65	69	Yes	F	-	-
	B	30/F		Night-time	55	60	Yes		-	-
	B		96.3	Day-time & Evening	65	65	No	F	-	-
	B	25/F		Night-time	55	58	Yes		-	-
	B		80.6	Day-time & Evening	65	65	No	F	-	-
	B	20/F		Night-time	55	58	Yes		-	-
	B		64.8	Day-time & Evening	65	65	No	F	-	-
	B	15/F		Night-time	55	58	Yes		-	-
	B		49.1	Day-time & Evening	65	64	No	F	-	-
	B	10/F		Night-time	55	58	Yes		-	-
	B		33.3	Day-time & Evening	65	64	No	F	-	-
	B	5/F		Night-time	55	58	Yes		-	-
35	C		112.1	Day-time & Evening	70	74	Yes	F	-	-
	C	30/F		Night-time	60	62	Yes		-	-
	C		96.3	Day-time & Evening	70	69	No		69	No
	C	25/F		Night-time	60	60	No		60	No
	C		80.6	Day-time & Evening	70	68	No		68	No
	C	20/F		Night-time	60	60	No		60	No
	C		64.8	Day-time & Evening	70	67	No		67	No
	C	15/F		Night-time	60	60	No		60	No
	C		49.1	Day-time & Evening	70	67	No		67	No
	C	10/F		Night-time	60	60	No		60	No
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	C	5/F		Night-time	60	60	No		60	No
36_a	C		112.1	Day-time & Evening	70	65	No		65	No
	C	30/F		Night-time	60	54	No		54	No
	C		96.3	Day-time & Evening	70	64	No		64	No
	C	25/F		Night-time	60	54	No		54	No
	C		80.6	Day-time & Evening	70	64	No		64	No
	C	20/F		Night-time	60	54	No		54	No
	C		64.8	Day-time & Evening	70	63	No		63	No
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	C		49.1	Day-time & Evening	70	62	No		62	No
	C	10/F		Night-time	60	53	No		53	No
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	C	5/F		Night-time	60	53	No		53	No
37	C		112.1	Day-time & Evening	70	75	Yes	F	-	-
	C	30/F		Night-time	60	64	Yes		-	-
	C		96.3	Day-time & Evening	70	70	No		70	No
	C	25/F		Night-time	60	59	No		59	No
	C		80.6	Day-time & Evening	70	69	No		69	No
	C	20/F		Night-time	60	59	No		59	No
	C		64.8	Day-time & Evening	70	68	No		68	No
	C	15/F		Night-time	60	59	No		59	No
	C		49.1	Day-time & Evening	70	67	No		67	No
	C	10/F		Night-time	60	59	No		59	No
	C		33.3	Day-time & Evening	70	66	No		66	No
	C	5/F		Night-time	60	59	No		59	No
39_a	B		112.1	Day-time & Evening	65	65	No	INMD	63	No
	B	30/F		Night-time	55	57	Yes		55	No
	B		96.3	Day-time & Evening	65	64	No		64	No
	B	25/F		Night-time	55	55	No		55	No
	B		80.6	Day-time & Evening	65	64	No		64	No
	B	20/F		Night-time	55	55	No		55	No
	B		64.8	Day-time & Evening	65	63	No		63	No
	B	15/F		Night-time	55	55	No		55	No
	B		49.1	Day-time & Evening	65	62	No		62	No
	B	10/F		Night-time	55	55	No		55	No
	B		33.3	Day-time & Evening	65	61	No		61	No
	B	5/F		Night-time	55	55	No		55	No
40_a	B		112.1	Day-time & Evening	65	70	Yes	FIN	64	No
	B	30/F		Night-time	55	55	No		54	No
	B		96.3	Day-time & Evening	65	66	Yes	FIN	64	No
	B	25/F		Night-time	55	54	No		54	No
	B		80.6	Day-time & Evening	65	65	No	FIN	63	No
	B	20/F		Night-time	55	54	No		54	No
	B		64.8	Day-time & Evening	65	64	No	FIN	62	No
	B	15/F		Night-time	55	54	No		54	No
	B		49.1	Day-time & Evening	65	63	No	FIN	62	No
	B	10/F		Night-time	55	53	No		53	No
	B		33.3	Day-time & Evening	65	62	No	FIN	61	No
	B	5/F		Night-time	55	53	No		53	No
41	B		112.1	Day-time & Evening	65	74	Yes	F	-	-
	B	30/F		Night-time	55	64	Yes		-	-
	B		96.3	Day-time & Evening	65	69	Yes	F	-	-
	B	25/F		Night-time	55	59	Yes		-	-
	B		80.6	Day-time & Evening	65	68	Yes	F	-	-
	B	20/F		Night-time	55	59	Yes		-	-
	B		64.8	Day-time & Evening	65	68	Yes	F	-	-
	B	15/F		Night-time	55	59	Yes		-	-
	B		49.1	Day-time & Evening	65	67	Yes	F	-	-
	B	10/F		Night-time	55	59	Yes		-	-
	B		33.3	Day-time & Evening	65	66	Yes	F	-	-
	B	5/F		Night-time	55	59	Yes		-	-
43	B		112.1	Day-time & Evening	65	63	No		63	No
	B	30/F		Night-time	55	55	No		55	No
	B		96.3	Day-time & Evening	65	63	No		63	No
	B	25/F		Night-time	55	53	No		53	No
	B		80.6	Day-time & Evening	65	62	No		62	No
	B	20/F		Night-time	55	53	No		53	No
	B		64.8	Day-time & Evening	65	62	No		62	No
	B	15/F		Night-time	55	53	No		53	No
	B		49.1	Day-time & Evening	65	61	No		61	No
	B	10/F		Night-time	55	53	No		53	No
	B		33.3	Day-time & Evening	65	60	No		60	No
	B	5/F		Night-time	55	53	No		53	No
44	B		112.1	Day-time & Evening	65	64	No	F	-	-
	B	30/F		Night-time	55	59	Yes		-	-
	B		96.3	Day-time & Evening	65	63	No	INMD	61	No
	B	25/F		Night-time	55	57	Yes		55	No
	B		80.6	Day-time & Evening	65	63	No	INMD	61	No
	B	20/F		Night-time	55	57	Yes		55	No
	B		64.8	Day-time & Evening	65	62	No	INMD	60	No
	B	15/F		Night-time	55	57	Yes		55	No
	B		49.1	Day-time & Evening	65	62	No	INMD	60	No
	B	10/F		Night-time	55	57	Yes		55	No
	B		33.3	Day-time & Evening	65	61	No	INMD	59	No
	B	5/F		Night-time	55	57	Yes		55	No
54	B		112.1	Day-time & Evening	65	70	Yes	F	-	-
	B	30/F		Night-time	55	61	Yes		-	-
	B		96.3	Day-time & Evening	65	65	No	INMD	63	No
	B	25/F		Night-time	55	57	Yes		55	No
	B		80.6	Day-time & Evening	65	65	No	INMD	63	No
	B	20/F		Night-time	55	57	Yes		55	No
	B		64.8	Day-time & Evening	65	65	No	INMD	63	No
	B	15/F		Night-time	55	57	Yes		55	No
	B		49.1	Day-time & Evening	65	64	No	INMD	62	No
	B	10/F		Night-time	55	57	Yes		55	No
	B		33.3	Day-time & Evening	65	64	No	INMD	62	No
	B	5/F		Night-time	55	57	Yes		55	No
55_a	B		112.1	Day-time & Evening	65	61	No		61	No
	B	30/F		Night-time	55	53	No		53	No
	B		96.3	Day-time & Evening	65	61	No		61	No
	B	25/F		Night-time	55	53	No		53	No
	B		80.6	Day-time & Evening	65	61	No		61	No
	B	20/F		Night-time	55	53	No		53	No
	B		64.8	Day-time & Evening	65	60	No		60	No
	B	15/F		Night-time	55	53	No		53	No
	B		49.1	Day-time & Evening	65	60	No		60	No
	B	10/F		Night-time	55	53	No		53	No
	B		33.3	Day-time & Evening	65	59	No		59	No
	B	5/F		Night-time	55	52	No		52	No
56_a	B		112.1	Day-time & Evening	65	63	No	F	-	-
	B	30/F		Night-time	55	58	Yes		-	-
	B		96.3	Day-time & Evening	65	62	No	INMD	60	No
	B	25/F		Night-time	55	56	Yes		54	No
	B		80.6	Day-time & Evening	65	62	No	INMD	60	No
	B	20/F		Night-time	55	56	Yes		54	No
	B		64.8	Day-time & Evening	65	62	No	INMD	60	No
	B	15/F		Night-time	55	56	Yes		54	No
	B		49.1	Day-time & Evening	65	62	No	INMD	60	No
	B	10/F		Night-time	55	56	Yes		54	No
	B		33.3	Day-time & Evening	65	61	No	INMD	59	No
	B	5/F		Night-time	55	56	Yes		54	No
57	B		112.1	Day-time & Evening	65	69	Yes	F	-	-
	B	30/F		Night-time	55	61	Yes		-	-
	B		96.3	Day-time & Evening	65	64	No	INMD	62	No
	B	25/F		Night-time	55	57	Yes		55	No
	B		80.6	Day-time & Evening	65	64	No	INMD	62	No
	B	20/F		Night-time	55	57	Yes		55	No
	B		64.8	Day-time & Evening	65	64	No	INMD	62	No
	B	15/F		Night-time	55	57	Yes		55	No
	B		49.1	Day-time & Evening	65	64	No	INMD	62	No
	B	10/F		Night-time	55	57	Yes		55	No
	B		33.3	Day-time & Evening	65	63	No	INMD	61	No
	B	5/F		Night-time	55	57	Yes		55	No

Note:
INMD Typical Innovative Noise Mitigation Design (such as Acoustic Window/ Enhanced Acoustic Balcony) can provide relative noise reduction of 2dB(A). The actual performance is subjected to mock-up test/ lab test, and should be verified in future NIA.
F Fixed glazing or Façade with no noise sensitive use

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR4 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	Y	103	1	103	184	-53	0	3	6	58.7	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	Y	103	1	103	211	-54	0	3	6	57.5			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	Y	103	1	103	213	-55	0	3	6	57.4			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	246	-56	0	3	6	57.2			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	329	-58	0	3	6	55.7			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	398	-60	0	3	6	50.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	429	-61	0	3	6	54.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	429	-61	0	3	6	45.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	429	-61	0	3	6	31.4			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	360	-59	0	3	6	45.9			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	371	-59	0	3	6	45.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	414	-60	0	3	6	51.7			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	406	-60	0	3	6	42.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	406	-60	0	3	6	46.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	418	-60	0	3	6	48.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	345	-59	-10	3	6	30.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	345	-59	-10	3	6	31.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	465	-61	0	3	6	27.6			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	496	-62	0	3	6	42.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	500	-62	-10	3	6	40.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	478	-62	-10	3	6	22.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	478	-62	-10	3	6	23.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	485	-62	-10	3	6	34.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	465	-61	-10	0	6	35.6			
													Cumulative Noise Level, dB(A)	66			
	GC-1	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	246	-56	0	3	6	55.2			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	398	-60	0	3	6	47.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	429	-61	0	3	6	54.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	429	-61	0	3	6	45.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	429	-61	0	3	6	31.4			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	406	-60	0	3	6	42.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	406	-60	0	3	6	43.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	418	-60	0	3	6	46.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	345	-59	-10	3	6	30.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	345	-59	-10	3	6	31.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	496	-62	0	3	6	39.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	500	-62	-10	3	6	40.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	478	-62	-10	3	6	22.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	478	-62	-10	3	6	23.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	485	-62	-10	3	6	34.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR4 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	185	-53	-5	3	6	53.7	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	212	-55	-5	3	6	52.5			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	214	-55	-5	3	6	52.4			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	245	-56	0	3	6	57.2			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	329	-58	0	3	6	55.6			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	399	-60	0	3	6	50.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	428	-61	0	3	6	54.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	428	-61	0	3	6	45.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	428	-61	0	3	6	31.4			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	360	-59	0	3	6	45.9			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	371	-59	0	3	6	45.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	414	-60	0	3	6	51.7			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	406	-60	0	3	6	42.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	406	-60	0	3	6	46.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	418	-60	0	3	6	48.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	345	-59	-10	3	6	30.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	345	-59	-10	3	6	31.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	466	-61	0	3	6	27.6			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	495	-62	0	3	6	42.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	498	-62	-10	3	6	40.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	479	-62	-10	3	6	22.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	479	-62	-10	3	6	23.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	485	-62	-10	3	6	34.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	462	-61	-10	0	6	35.7			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	245	-56	0	3	6	55.2			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	399	-60	0	3	6	47.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	428	-61	0	3	6	54.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	428	-61	0	3	6	45.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	428	-61	0	3	6	31.4			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	406	-60	0	3	6	42.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	406	-60	0	3	6	43.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	418	-60	0	3	6	46.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	345	-59	-10	3	6	30.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	345	-59	-10	3	6	31.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	495	-62	0	3	6	39.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	498	-62	-10	3	6	40.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	479	-62	-10	3	6	22.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	479	-62	-10	3	6	23.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	485	-62	-10	3	6	34.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR4 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	187	-53	-5	3	6	53.6	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	213	-55	-5	3	6	52.4			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	215	-55	-5	3	6	52.3			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	244	-56	0	3	6	57.3			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	330	-58	0	3	6	55.6			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	401	-60	0	3	6	49.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	428	-61	0	3	6	54.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	428	-61	0	3	6	45.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	428	-61	0	3	6	31.4			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	361	-59	0	3	6	45.8			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	372	-59	0	3	6	45.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	414	-60	0	3	6	51.7			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	406	-60	0	3	6	42.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	406	-60	0	3	6	46.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	418	-60	0	3	6	48.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	347	-59	-10	3	6	30.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	347	-59	-10	3	6	31.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	467	-61	0	3	6	27.6			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	495	-62	0	3	6	42.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	496	-62	-10	3	6	40.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	480	-62	-10	3	6	22.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	480	-62	-10	3	6	23.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	486	-62	-10	3	6	34.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	460	-61	-10	0	6	35.7			
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	244	-56	0	3	6	55.3			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	401	-60	0	3	6	46.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	428	-61	0	3	6	54.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	428	-61	0	3	6	45.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	428	-61	0	3	6	31.4			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	406	-60	0	3	6	42.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	406	-60	0	3	6	43.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	418	-60	0	3	6	46.6			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	347	-59	-10	3	6	30.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	347	-59	-10	3	6	31.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	495	-62	0	3	6	39.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	496	-62	-10	3	6	40.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	480	-62	-10	3	6	22.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	480	-62	-10	3	6	23.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	486	-62	-10	3	6	34.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR4	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	190	-54	-5	3	6	53.4			
15/F	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	216	-55	-5	3	6	52.3			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
64.8	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	218	-55	-5	3	6	52.2			
mPD	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	245	-56	0	3	6	57.2			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	332	-58	0	3	6	55.6			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	403	-60	0	3	6	49.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	429	-61	0	3	6	54.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	429	-61	0	3	6	45.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	429	-61	0	3	6	31.4			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	363	-59	0	3	6	45.8			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	374	-59	0	3	6	45.5	Day-time & Evening (7am - 11pm)	70	Yes
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	416	-60	0	3	6	51.6			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	407	-60	0	3	6	42.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	407	-60	0	3	6	46.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	419	-60	0	3	6	48.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	348	-59	-10	3	6	30.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	348	-59	-10	3	6	31.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	468	-61	0	3	6	27.6			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	495	-62	0	3	6	42.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	494	-62	-10	3	6	40.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	482	-62	-10	3	6	22.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	482	-62	-10	3	6	23.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	487	-62	-10	3	6	34.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	458	-61	-10	0	6	35.8			
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	245	-56	0	3	6	55.2			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	403	-60	0	3	6	46.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	429	-61	0	3	6	54.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	429	-61	0	3	6	45.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	429	-61	0	3	6	31.4			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	407	-60	0	3	6	42.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	407	-60	0	3	6	43.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	419	-60	0	3	6	46.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	348	-59	-10	3	6	30.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	348	-59	-10	3	6	31.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	495	-62	0	3	6	39.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	494	-62	-10	3	6	40.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	482	-62	-10	3	6	22.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	482	-62	-10	3	6	23.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	487	-62	-10	3	6	34.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR4	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	195	-54	-5	3	6	53.2			
10/F	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	220	-55	-5	3	6	52.1			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
49.1	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	222	-55	-5	3	6	52.1			
mPD	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	246	-56	0	3	6	57.2			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	335	-58	0	3	6	55.5			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	405	-60	0	3	6	49.8			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	430	-61	0	3	6	54.3	Day-time & Evening (7am - 11pm)	70	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	430	-61	0	3	6	45.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	430	-61	0	3	6	31.3			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	366	-59	0	3	6	45.7			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	376	-60	0	3	6	45.5			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	417	-60	0	3	6	51.6			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	409	-60	0	3	6	42.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	409	-60	0	3	6	46.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	421	-60	0	3	6	48.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	351	-59	-10	3	6	30.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	351	-59	-10	3	6	31.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	470	-61	0	3	6	27.5			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	496	-62	0	3	6	42.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	493	-62	-10	3	6	40.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	484	-62	-10	3	6	22.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	484	-62	-10	3	6	23.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	489	-62	-10	3	6	34.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	457	-61	-10	0	6	35.8			
												Cumulative Noise Level, dB(A)		63			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	246	-56	0	3	6	55.2			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	405	-60	0	3	6	46.8			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	430	-61	0	3	6	54.3			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	430	-61	0	3	6	45.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	430	-61	0	3	6	31.3			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	409	-60	0	3	6	42.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	409	-60	0	3	6	43.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	421	-60	0	3	6	46.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	351	-59	-10	3	6	30.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	351	-59	-10	3	6	31.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	496	-62	0	3	6	39.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	493	-62	-10	3	6	40.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	484	-62	-10	3	6	22.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	484	-62	-10	3	6	23.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	489	-62	-10	3	6	34.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
												Cumulative Noise Level, dB(A)		59			
NSR4 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	200	-54	-5	3	6	53.0	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	226	-55	-5	3	6	51.9			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	227	-55	-5	3	6	51.9			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	249	-56	0	3	6	57.1			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	338	-59	0	3	6	55.4			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	409	-60	0	3	6	49.8			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	431	-61	0	3	6	54.3			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	431	-61	0	3	6	45.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	431	-61	0	3	6	31.3			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	369	-59	0	3	6	45.7			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	379	-60	0	3	6	45.4			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	419	-60	0	3	6	51.5			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	411	-60	0	3	6	42.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	411	-60	0	3	6	46.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	423	-61	0	3	6	48.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	354	-59	-10	3	6	30.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	354	-59	-10	3	6	31.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	473	-62	0	3	6	27.5			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	498	-62	0	3	6	42.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	492	-62	-10	3	6	40.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	486	-62	-10	3	6	22.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	486	-62	-10	3	6	23.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	491	-62	-10	3	6	34.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	456	-61	-10	0	6	35.8			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	249	-56	0	3	6	55.1			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	409	-60	0	3	6	46.8			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	431	-61	0	3	6	54.3			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	431	-61	0	3	6	45.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	431	-61	0	3	6	31.3			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	411	-60	0	3	6	42.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	411	-60	0	3	6	43.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	423	-61	0	3	6	46.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	354	-59	-10	3	6	30.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	354	-59	-10	3	6	31.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	498	-62	0	3	6	39.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	492	-62	-10	3	6	40.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	486	-62	-10	3	6	22.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	486	-62	-10	3	6	23.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	491	-62	-10	3	6	34.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR5 a 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	177	-53	-10	3	6	49.0	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	204	-54	-10	3	6	47.8			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	207	-54	-10	3	6	47.7			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	242	-56	0	3	6	57.3			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	325	-58	0	3	6	55.8			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	394	-60	0	3	6	50.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	424	-61	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	424	-61	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	424	-61	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	354	-59	-10	3	6	36.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	365	-59	-10	3	6	35.8			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	407	-60	-10	3	6	41.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	398	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	398	-60	-10	3	6	37.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	410	-60	-10	3	6	38.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	337	-59	-10	3	6	30.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	337	-59	-10	3	6	31.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	460	-61	-10	3	6	17.7			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	489	-62	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	493	-62	-10	3	6	40.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	471	-61	-10	3	6	22.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	471	-61	-10	3	6	23.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	477	-62	-10	3	6	34.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	457	-61	-10	0	6	35.8			
												Cumulative Noise Level, dB(A)		61			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	242	-56	0	3	6	55.3			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	394	-60	0	3	6	47.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	424	-61	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	424	-61	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	424	-61	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	398	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	398	-60	-10	3	6	34.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	410	-60	-10	3	6	36.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	337	-59	-10	3	6	30.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	337	-59	-10	3	6	31.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	489	-62	-10	3	6	29.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	493	-62	-10	3	6	40.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	471	-61	-10	3	6	22.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	471	-61	-10	3	6	23.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	477	-62	-10	3	6	34.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
												Cumulative Noise Level, dB(A)		57			
NSR5_a 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	178	-53	-10	3	6	49.0	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	205	-54	-10	3	6	47.8			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	208	-54	-10	3	6	47.7			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	241	-56	0	3	6	57.4			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	325	-58	0	3	6	55.8			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	395	-60	0	3	6	50.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	423	-61	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	423	-61	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	423	-61	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	354	-59	-10	3	6	36.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	365	-59	-10	3	6	35.7			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	407	-60	-10	3	6	41.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	398	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	398	-60	-10	3	6	37.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	410	-60	-10	3	6	38.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	337	-59	-10	3	6	30.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	337	-59	-10	3	6	31.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	461	-61	-10	3	6	17.7			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	488	-62	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	490	-62	-10	3	6	40.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	472	-61	-10	3	6	22.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	472	-61	-10	3	6	23.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	477	-62	-10	3	6	34.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	454	-61	-10	0	6	35.9			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	61			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	241	-56	0	3	6	55.4			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	395	-60	0	3	6	47.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	423	-61	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	423	-61	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	423	-61	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	398	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	398	-60	-10	3	6	34.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	410	-60	-10	3	6	36.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	337	-59	-10	3	6	30.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	337	-59	-10	3	6	31.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	488	-62	-10	3	6	29.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	490	-62	-10	3	6	40.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	472	-61	-10	3	6	22.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	472	-61	-10	3	6	23.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	477	-62	-10	3	6	34.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR5_a 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	180	-53	-10	3	6	48.9	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	207	-54	-10	3	6	47.7			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	210	-54	-10	3	6	47.6			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	240	-56	0	3	6	57.4			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	326	-58	0	3	6	55.7			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	397	-60	0	3	6	50.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	423	-61	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	423	-61	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	423	-61	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	355	-59	-10	3	6	36.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	366	-59	-10	3	6	35.7			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	407	-60	-10	3	6	41.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	398	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	398	-60	-10	3	6	37.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	410	-60	-10	3	6	38.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	339	-59	-10	3	6	30.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	339	-59	-10	3	6	31.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	462	-61	-10	3	6	17.7			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	488	-62	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	488	-62	-10	3	6	40.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	473	-61	-10	3	6	22.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	473	-61	-10	3	6	23.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	478	-62	-10	3	6	34.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	452	-61	-10	0	6	35.9			
													Cumulative Noise Level, dB(A)	61			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	240	-56	0	3	6	55.4			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	397	-60	0	3	6	47.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	423	-61	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	423	-61	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	423	-61	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	398	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	398	-60	-10	3	6	34.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	410	-60	-10	3	6	36.7			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	339	-59	-10	3	6	30.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	339	-59	-10	3	6	31.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	488	-62	-10	3	6	29.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	488	-62	-10	3	6	40.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	473	-61	-10	3	6	22.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	473	-61	-10	3	6	23.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	478	-62	-10	3	6	34.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR5_a 15/F 64.8 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	183	-53	-10	3	6	48.7	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	210	-54	-10	3	6	47.6			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	213	-55	-10	3	6	47.5			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	241	-56	0	3	6	57.4			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	328	-58	0	3	6	55.7			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	399	-60	0	3	6	50.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	424	-61	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	424	-61	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	424	-61	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	357	-59	-10	3	6	35.9			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	368	-59	-10	3	6	35.7			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	409	-60	-10	3	6	41.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	399	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	399	-60	-10	3	6	37.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	411	-60	-10	3	6	38.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	341	-59	-10	3	6	30.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	340	-59	-10	3	6	31.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	463	-61	-10	3	6	17.7			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	488	-62	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	486	-62	-10	3	6	40.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	475	-62	-10	3	6	22.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	475	-62	-10	3	6	23.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	479	-62	-10	3	6	34.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	450	-61	-10	0	6	35.9			
													Cumulative Noise Level, dB(A)	61			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	241	-56	0	3	6	55.4			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	399	-60	0	3	6	47.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	424	-61	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	424	-61	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	424	-61	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	399	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	399	-60	-10	3	6	34.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	411	-60	-10	3	6	36.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	341	-59	-10	3	6	30.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	340	-59	-10	3	6	31.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	488	-62	-10	3	6	29.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	486	-62	-10	3	6	40.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	475	-62	-10	3	6	22.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	475	-62	-10	3	6	23.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	479	-62	-10	3	6	34.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR5_a 10/F 49.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	188	-53	-10	3	6	48.5			
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	214	-55	-10	3	6	47.4			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	217	-55	-10	3	6	47.3			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	242	-56	0	3	6	57.3			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	331	-58	0	3	6	55.6			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	401	-60	0	3	6	49.9			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	425	-61	-10	3	6	44.4	Day-time & Evening (7am - 11pm)	70	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	425	-61	-10	3	6	35.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	425	-61	-10	3	6	21.4			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	360	-59	-10	3	6	35.9			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	371	-59	-10	3	6	35.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	410	-60	-10	3	6	41.7			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	401	-60	-10	3	6	32.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	401	-60	-10	3	6	36.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	413	-60	-10	3	6	38.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	343	-59	-10	3	6	30.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	343	-59	-10	3	6	31.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	466	-61	-10	3	6	17.6			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	489	-62	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	485	-62	-10	3	6	40.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	477	-62	-10	3	6	22.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	477	-62	-10	3	6	23.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	481	-62	-10	3	6	34.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	449	-61	-10	0	6	36.0			
													Cumulative Noise Level, dB(A)	61			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	242	-56	0	3	6	55.3			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	401	-60	0	3	6	46.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	425	-61	-10	3	6	44.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	425	-61	-10	3	6	35.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	425	-61	-10	3	6	21.4			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	401	-60	-10	3	6	32.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	401	-60	-10	3	6	33.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	413	-60	-10	3	6	36.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	343	-59	-10	3	6	30.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	343	-59	-10	3	6	31.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	489	-62	-10	3	6	29.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	485	-62	-10	3	6	40.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	477	-62	-10	3	6	22.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	477	-62	-10	3	6	23.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	481	-62	-10	3	6	34.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR5_a 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	194	-54	-10	3	6	48.2	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	219	-55	-10	3	6	47.2			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	222	-55	-10	3	6	47.1			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	245	-56	0	3	6	57.2			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	334	-58	0	3	6	55.5			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	405	-60	0	3	6	49.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	426	-61	-10	3	6	44.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	426	-61	-10	3	6	35.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	426	-61	-10	3	6	21.4			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	363	-59	-10	3	6	35.8			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	374	-59	-10	3	6	35.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	412	-60	-10	3	6	41.7			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	403	-60	-10	3	6	32.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	403	-60	-10	3	6	36.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	415	-60	-10	3	6	38.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	346	-59	-10	3	6	30.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	346	-59	-10	3	6	31.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	468	-61	-10	3	6	17.6			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	491	-62	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	484	-62	-10	3	6	40.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	480	-62	-10	3	6	22.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	480	-62	-10	3	6	23.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	483	-62	-10	3	6	34.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	448	-61	-10	0	6	36.0			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	61			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	245	-56	0	3	6	55.2			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	405	-60	0	3	6	46.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	426	-61	-10	3	6	44.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	426	-61	-10	3	6	35.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	426	-61	-10	3	6	21.4			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	403	-60	-10	3	6	32.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	403	-60	-10	3	6	33.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	415	-60	-10	3	6	36.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	346	-59	-10	3	6	30.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	346	-59	-10	3	6	31.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	491	-62	-10	3	6	29.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	484	-62	-10	3	6	40.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	480	-62	-10	3	6	22.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	480	-62	-10	3	6	23.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	483	-62	-10	3	6	34.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	56			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR6 a 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	175	-53	-10	3	6	49.1	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	202	-54	-10	3	6	47.9			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	205	-54	-10	3	6	47.8			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	241	-56	-10	3	6	47.4			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	324	-58	-10	3	6	45.8			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	393	-60	-10	3	6	40.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	422	-61	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	422	-61	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	422	-61	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	352	-59	-10	3	6	36.1			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	363	-59	-10	3	6	35.8			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	405	-60	-10	3	6	41.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	396	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	396	-60	-10	3	6	37.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	408	-60	-10	3	6	38.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	335	-59	-10	3	6	30.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	335	-59	-10	3	6	31.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	459	-61	-10	3	6	17.8			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	487	-62	-10	3	6	32.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	491	-62	-10	3	6	40.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	469	-61	-10	3	6	22.6			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	469	-61	-10	3	6	23.6			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	474	-62	-10	3	6	34.5			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	454	-61	-10	0	6	35.9			
													Cumulative Noise Level, dB(A)	56			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	241	-56	-10	3	6	45.4			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	393	-60	-10	3	6	37.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	422	-61	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	422	-61	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	422	-61	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	396	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	396	-60	-10	3	6	34.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	408	-60	-10	3	6	36.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	335	-59	-10	3	6	30.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	335	-59	-10	3	6	31.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	487	-62	-10	3	6	29.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	491	-62	-10	3	6	40.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	468	-61	-10	3	6	22.6			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	468	-61	-10	3	6	23.6			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	474	-62	-10	3	6	34.5			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	50			
NSR6_a 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	176	-53	-10	3	6	49.1	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	203	-54	-10	3	6	47.9			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	206	-54	-10	3	6	47.7			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	240	-56	-10	3	6	47.4			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	324	-58	-10	3	6	45.8			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	394	-60	-10	3	6	40.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	421	-60	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	421	-60	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	421	-60	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	352	-59	-10	3	6	36.1			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	363	-59	-10	3	6	35.8			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	405	-60	-10	3	6	41.9			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	396	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	396	-60	-10	3	6	37.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	408	-60	-10	3	6	38.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	335	-59	-10	3	6	30.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	335	-59	-10	3	6	31.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	460	-61	-10	3	6	17.8			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	486	-62	-10	3	6	32.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	488	-62	-10	3	6	40.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	469	-61	-10	3	6	22.6			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	469	-61	-10	3	6	23.6			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	474	-62	-10	3	6	34.5			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	451	-61	-10	0	6	35.9			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	56			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	240	-56	-10	3	6	45.4			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	394	-60	-10	3	6	37.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	421	-60	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	421	-60	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	421	-60	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	396	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	396	-60	-10	3	6	34.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	408	-60	-10	3	6	36.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	335	-59	-10	3	6	30.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	335	-59	-10	3	6	31.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	486	-62	-10	3	6	29.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	488	-62	-10	3	6	40.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	469	-61	-10	3	6	22.6			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	469	-61	-10	3	6	23.6			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	474	-62	-10	3	6	34.5			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	50			
NSR6_a 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	178	-53	-10	3	6	49.0	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	205	-54	-10	3	6	47.8			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	208	-54	-10	3	6	47.7			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	239	-56	-10	3	6	47.4			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	325	-58	-10	3	6	45.7			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	396	-60	-10	3	6	40.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	421	-60	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	421	-60	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	421	-60	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	353	-59	-10	3	6	36.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	364	-59	-10	3	6	35.8			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	405	-60	-10	3	6	41.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	396	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	396	-60	-10	3	6	37.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	408	-60	-10	3	6	38.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	337	-59	-10	3	6	30.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	337	-59	-10	3	6	31.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	461	-61	-10	3	6	17.7			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	486	-62	-10	3	6	32.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	486	-62	-10	3	6	40.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	470	-61	-10	3	6	22.6			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	470	-61	-10	3	6	23.6			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	475	-62	-10	3	6	34.5			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	449	-61	-10	0	6	36.0			
													Cumulative Noise Level, dB(A)	56			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	239	-56	-10	3	6	45.4			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	396	-60	-10	3	6	37.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	421	-60	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	421	-60	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	421	-60	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	396	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	396	-60	-10	3	6	34.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	408	-60	-10	3	6	36.8			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	337	-59	-10	3	6	30.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	337	-59	-10	3	6	31.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	486	-62	-10	3	6	29.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	486	-62	-10	3	6	40.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	470	-61	-10	3	6	22.6			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	470	-61	-10	3	6	23.6			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	475	-62	-10	3	6	34.5			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	50			
NSR6_a 15/F 64.8 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	181	-53	-10	3	6	48.8	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	208	-54	-10	3	6	47.7			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	211	-54	-10	3	6	47.5			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	240	-56	-10	3	6	47.4			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	327	-58	-10	3	6	45.7			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	398	-60	-10	3	6	40.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	422	-60	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	422	-60	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	422	-60	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	355	-59	-10	3	6	36.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	366	-59	-10	3	6	35.7			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	407	-60	-10	3	6	41.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	397	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	397	-60	-10	3	6	37.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	409	-60	-10	3	6	38.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	339	-59	-10	3	6	30.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	338	-59	-10	3	6	31.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	462	-61	-10	3	6	17.7			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	486	-62	-10	3	6	32.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	484	-62	-10	3	6	40.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	472	-61	-10	3	6	22.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	472	-61	-10	3	6	23.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	476	-62	-10	3	6	34.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	447	-61	-10	0	6	36.0			
													Cumulative Noise Level, dB(A)	56			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	240	-56	-10	3	6	45.4			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	398	-60	-10	3	6	37.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	422	-60	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	422	-60	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	422	-60	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	397	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	397	-60	-10	3	6	34.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	409	-60	-10	3	6	36.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	339	-59	-10	3	6	30.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	338	-59	-10	3	6	31.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	486	-62	-10	3	6	29.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	484	-62	-10	3	6	40.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	472	-61	-10	3	6	22.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	472	-61	-10	3	6	23.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	476	-62	-10	3	6	34.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	50			
NSR6_a 10/F 49.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	186	-53	-10	3	6	48.6			
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	212	-55	-10	3	6	47.5			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	215	-55	-10	3	6	47.4			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	241	-56	-10	3	6	47.4			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	330	-58	-10	3	6	45.6			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	400	-60	-10	3	6	40.0			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	423	-61	-10	3	6	44.5	Day-time & Evening (7am - 11pm)	70	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	423	-61	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	423	-61	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	358	-59	-10	3	6	35.9			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	369	-59	-10	3	6	35.7			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	408	-60	-10	3	6	41.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	399	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	399	-60	-10	3	6	37.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	411	-60	-10	3	6	38.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	341	-59	-10	3	6	30.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	341	-59	-10	3	6	31.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	465	-61	-10	3	6	17.7			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	487	-62	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	483	-62	-10	3	6	40.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	474	-62	-10	3	6	22.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	474	-62	-10	3	6	23.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	478	-62	-10	3	6	34.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	446	-61	-10	0	6	36.0			
													Cumulative Noise Level, dB(A)	56			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	241	-56	-10	3	6	45.4			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	400	-60	-10	3	6	37.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	423	-61	-10	3	6	44.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	423	-61	-10	3	6	35.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	423	-61	-10	3	6	21.5			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	399	-60	-10	3	6	33.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	399	-60	-10	3	6	34.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	411	-60	-10	3	6	36.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	341	-59	-10	3	6	30.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	341	-59	-10	3	6	31.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	487	-62	-10	3	6	29.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	483	-62	-10	3	6	40.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	474	-62	-10	3	6	22.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	474	-62	-10	3	6	23.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	478	-62	-10	3	6	34.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	50			
NSR6_a 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	192	-54	-10	3	6	48.3	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	217	-55	-10	3	6	47.3			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	220	-55	-10	3	6	47.2			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	244	-56	-10	3	6	47.3			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	333	-58	-10	3	6	45.5			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	404	-60	-10	3	6	39.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	424	-61	-10	3	6	44.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	424	-61	-10	3	6	35.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	424	-61	-10	3	6	21.4			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	361	-59	-10	3	6	35.9			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	372	-59	-10	3	6	35.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	411	-60	-10	3	6	41.7			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	401	-60	-10	3	6	32.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	401	-60	-10	3	6	36.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	413	-60	-10	3	6	38.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	345	-59	-10	3	6	30.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	344	-59	-10	3	6	31.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	467	-61	-10	3	6	17.6			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	489	-62	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	482	-62	-10	3	6	40.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	477	-62	-10	3	6	22.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	477	-62	-10	3	6	23.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	480	-62	-10	3	6	34.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	445	-61	-10	0	6	36.0			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	56			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	244	-56	-10	3	6	45.3			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	404	-60	-10	3	6	36.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	424	-61	-10	3	6	44.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	424	-61	-10	3	6	35.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	424	-61	-10	3	6	21.4			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	401	-60	-10	3	6	32.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	401	-60	-10	3	6	33.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	413	-60	-10	3	6	36.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	345	-59	-10	3	6	30.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	344	-59	-10	3	6	31.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	489	-62	-10	3	6	29.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	482	-62	-10	3	6	40.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	477	-62	-10	3	6	22.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	477	-62	-10	3	6	23.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	480	-62	-10	3	6	34.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	50			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR8 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	Y	103	1	103	164	-52	0	3	6	59.7	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	Y	103	1	103	190	-54	0	3	6	58.4			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	Y	103	1	103	194	-54	0	3	6	58.2			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	233	-55	0	3	6	57.6			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	316	-58	0	3	6	56.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	385	-60	0	3	6	50.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	412	-60	0	3	6	54.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	412	-60	0	3	6	45.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	412	-60	0	3	6	31.7			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	341	-59	0	3	6	46.3			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	352	-59	0	3	6	46.1			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	393	-60	0	3	6	52.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	384	-60	0	3	6	43.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	384	-60	0	3	6	47.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	395	-60	0	3	6	49.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	322	-58	0	3	6	40.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	322	-58	0	3	6	41.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	450	-61	0	3	6	27.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	475	-62	0	3	6	42.5			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	478	-62	0	3	6	50.4			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	456	-61	0	3	6	32.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	456	-61	0	3	6	33.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	462	-61	0	3	6	44.7			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	443	-61	0	0	6	46.1			
												Cumulative Noise Level, dB(A)		66			
	GC-1	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	233	-55	0	3	6	55.6			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	385	-60	0	3	6	47.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	412	-60	0	3	6	54.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	412	-60	0	3	6	45.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	412	-60	0	3	6	31.7			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	384	-60	0	3	6	43.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	384	-60	0	3	6	44.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	395	-60	0	3	6	47.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	322	-58	0	3	6	40.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	322	-58	0	3	6	41.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	475	-62	0	3	6	39.5			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	478	-62	0	3	6	50.4			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	456	-61	0	3	6	32.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	456	-61	0	3	6	33.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	462	-61	0	3	6	44.7			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
												Cumulative Noise Level, dB(A)		60			
NSR8 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	165	-52	-5	3	6	54.7	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	191	-54	-5	3	6	53.4			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	195	-54	-5	3	6	53.2			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	232	-55	0	3	6	57.7			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	316	-58	0	3	6	56.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	386	-60	0	3	6	50.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	411	-60	-10	3	6	44.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	411	-60	-10	3	6	35.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	411	-60	-10	3	6	21.7			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	341	-59	-10	3	6	36.3			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	352	-59	-10	3	6	36.1			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	393	-60	-10	3	6	42.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	384	-60	0	3	6	43.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	384	-60	0	3	6	47.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	395	-60	0	3	6	49.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	322	-58	0	3	6	40.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	322	-58	0	3	6	41.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	451	-61	0	3	6	27.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	474	-62	-10	3	6	32.5			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	475	-62	0	3	6	50.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	457	-61	0	3	6	32.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	457	-61	0	3	6	33.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	462	-61	0	3	6	44.7			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	440	-61	0	0	6	46.1			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	232	-55	0	3	6	55.7			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	386	-60	0	3	6	47.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	411	-60	-10	3	6	44.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	411	-60	-10	3	6	35.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	411	-60	-10	3	6	21.7			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	384	-60	0	3	6	43.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	384	-60	0	3	6	44.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	395	-60	0	3	6	47.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	322	-58	0	3	6	40.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	322	-58	0	3	6	41.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	474	-62	-10	3	6	29.5			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	475	-62	0	3	6	50.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	457	-61	0	3	6	32.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	457	-61	0	3	6	33.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	462	-61	0	3	6	44.7			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR8 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	167	-52	-5	3	6	54.5	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	193	-54	-5	3	6	53.3			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	197	-54	-5	3	6	53.1			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	231	-55	0	3	6	57.7			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	318	-58	0	3	6	56.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	388	-60	0	3	6	50.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	411	-60	-10	3	6	44.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	411	-60	-10	3	6	35.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	411	-60	-10	3	6	21.7			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	343	-59	-10	3	6	36.3			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	353	-59	-10	3	6	36.0			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	393	-60	-10	3	6	42.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	384	-60	0	3	6	43.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	384	-60	0	3	6	47.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	395	-60	0	3	6	49.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	324	-58	0	3	6	40.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	324	-58	0	3	6	41.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	452	-61	0	3	6	27.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	474	-62	-10	3	6	32.5			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	473	-61	0	3	6	50.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	458	-61	0	3	6	32.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	458	-61	0	3	6	33.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	463	-61	0	3	6	44.7			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	437	-61	0	0	6	46.2			
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	231	-55	0	3	6	55.7			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	388	-60	0	3	6	47.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	411	-60	-10	3	6	44.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	411	-60	-10	3	6	35.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	411	-60	-10	3	6	21.7			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	384	-60	0	3	6	43.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	384	-60	0	3	6	44.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	395	-60	0	3	6	47.1			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	324	-58	0	3	6	40.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	324	-58	0	3	6	41.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	474	-62	-10	3	6	29.5			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	473	-61	0	3	6	50.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	458	-61	0	3	6	32.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	458	-61	0	3	6	33.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	463	-61	0	3	6	44.7			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR8 15/F 64.8 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	171	-53	-5	3	6	54.3	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	196	-54	-5	3	6	53.2			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	200	-54	-5	3	6	53.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	232	-55	0	3	6	57.7			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	319	-58	0	3	6	55.9			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	390	-60	0	3	6	50.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	412	-60	-10	3	6	44.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	412	-60	-10	3	6	35.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	412	-60	-10	3	6	21.7			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	344	-59	-10	3	6	36.3			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	355	-59	-10	3	6	36.0			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	395	-60	-10	3	6	42.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	385	-60	0	3	6	43.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	385	-60	0	3	6	47.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	396	-60	0	3	6	49.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	326	-58	0	3	6	40.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	326	-58	0	3	6	41.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	453	-61	0	3	6	27.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	474	-62	-10	3	6	32.5			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	471	-61	0	3	6	50.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	460	-61	0	3	6	32.7			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	460	-61	0	3	6	33.7			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	464	-61	0	3	6	44.7			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	435	-61	0	0	6	46.2			
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	232	-55	0	3	6	55.7			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	390	-60	0	3	6	47.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	412	-60	-10	3	6	44.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	412	-60	-10	3	6	35.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	412	-60	-10	3	6	21.7			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	385	-60	0	3	6	43.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	385	-60	0	3	6	44.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	396	-60	0	3	6	47.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	326	-58	0	3	6	40.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	326	-58	0	3	6	41.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	474	-62	-10	3	6	29.5			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	471	-61	0	3	6	50.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	460	-61	0	3	6	32.7			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	460	-61	0	3	6	33.7			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	464	-61	0	3	6	44.7			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR8 10/F 49.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	176	-53	-5	3	6	54.1			
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	200	-54	-5	3	6	53.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	204	-54	-5	3	6	52.8			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	233	-55	0	3	6	57.6			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	322	-58	0	3	6	55.8			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	393	-60	0	3	6	50.1			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	413	-60	-10	3	6	44.7	Day-time & Evening (7am - 11pm)	70	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	413	-60	-10	3	6	35.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	413	-60	-10	3	6	21.7			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	347	-59	-10	3	6	36.2			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	358	-59	-10	3	6	35.9			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	396	-60	-10	3	6	42.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	387	-60	0	3	6	43.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	387	-60	0	3	6	47.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	398	-60	0	3	6	49.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	328	-58	0	3	6	40.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	328	-58	0	3	6	41.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	456	-61	0	3	6	27.8			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	475	-62	-10	3	6	32.5			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	470	-61	0	3	6	50.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	462	-61	0	3	6	32.7			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	462	-61	0	3	6	33.7			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	466	-61	0	3	6	44.6			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	434	-61	0	0	6	46.3			
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	233	-55	0	3	6	55.6			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	393	-60	0	3	6	47.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	413	-60	-10	3	6	44.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	413	-60	-10	3	6	35.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	413	-60	-10	3	6	21.7			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	387	-60	0	3	6	43.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	387	-60	0	3	6	44.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	398	-60	0	3	6	47.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	328	-58	0	3	6	40.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	328	-58	0	3	6	41.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	475	-62	-10	3	6	29.5			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	470	-61	0	3	6	50.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	462	-61	0	3	6	32.7			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	462	-61	0	3	6	33.7			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	466	-61	0	3	6	44.6			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR8 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	182	-53	-5	3	6	53.8	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	206	-54	-5	3	6	52.7			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	210	-54	-5	3	6	52.6			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	236	-55	0	3	6	57.5			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	326	-58	0	3	6	55.7			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	396	-60	0	3	6	50.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	415	-60	-10	3	6	44.6			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	415	-60	-10	3	6	35.6			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	415	-60	-10	3	6	21.6			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	350	-59	-10	3	6	36.1			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	361	-59	-10	3	6	35.9			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	399	-60	-10	3	6	42.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	389	-60	0	3	6	43.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	389	-60	0	3	6	47.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	400	-60	0	3	6	49.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	332	-58	0	3	6	40.6			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	332	-58	0	3	6	41.6			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	458	-61	0	3	6	27.8			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	477	-62	-10	3	6	32.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	469	-61	0	3	6	50.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	465	-61	0	3	6	32.7			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	465	-61	0	3	6	33.7			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	468	-61	0	3	6	44.6			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	433	-61	0	0	6	46.3			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	236	-55	0	3	6	55.5			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	396	-60	0	3	6	47.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	415	-60	-10	3	6	44.6			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	415	-60	-10	3	6	35.6			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	415	-60	-10	3	6	21.6			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	389	-60	0	3	6	43.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	389	-60	0	3	6	44.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	400	-60	0	3	6	47.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	332	-58	0	3	6	40.6			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	332	-58	0	3	6	41.6			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	477	-62	-10	3	6	29.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	469	-61	0	3	6	50.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	465	-61	0	3	6	32.7			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	465	-61	0	3	6	33.7			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	468	-61	0	3	6	44.6			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR1630/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	Y	103	1	103	155	-52	0	3	6	60.2	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	Y	103	1	103	181	-53	0	3	6	58.8			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	Y	103	1	103	186	-53	0	3	6	58.6			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	227	-55	0	3	6	57.9			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	311	-58	0	3	6	56.1			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	380	-60	0	3	6	50.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	404	-60	0	3	6	54.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	404	-60	0	3	6	45.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	404	-60	0	3	6	31.9			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	333	-58	0	3	6	46.6			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	344	-59	0	3	6	46.3			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	384	-60	0	3	6	52.3			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	374	-59	0	3	6	43.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	374	-59	-10	3	6	37.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	386	-60	-10	3	6	39.3			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	312	-58	-10	3	6	31.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	312	-58	-10	3	6	32.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	95	1	95	312	-58	-10	3	6	32.6			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	466	-61	0	3	6	42.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	469	-61	-10	3	6	40.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	446	-61	-10	3	6	23.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	446	-61	-10	3	6	24.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	446	-61	-10	3	6	34.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	433	-61	-10	0	6	36.3			
													Cumulative Noise Level, dB(A)	66			
	GC-1	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	227	-55	0	3	6	55.9			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	380	-60	0	3	6	47.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	404	-60	0	3	6	54.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	404	-60	0	3	6	45.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	404	-60	0	3	6	31.9			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	374	-59	0	3	6	43.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	374	-59	-10	3	6	34.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	386	-60	-10	3	6	37.3			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	312	-58	-10	3	6	31.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	312	-58	-10	3	6	32.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	466	-61	0	3	6	39.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	469	-61	-10	3	6	40.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	446	-61	-10	3	6	23.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	446	-61	-10	3	6	24.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	452	-61	-10	3	6	34.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR1625/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	156	-52	-5	3	6	55.1	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	182	-53	-5	3	6	53.8			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	187	-53	-5	3	6	53.6			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	226	-55	0	3	6	57.9			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	311	-58	0	3	6	56.1			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	381	-60	0	3	6	50.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	403	-60	-10	3	6	44.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	403	-60	-10	3	6	35.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	403	-60	-10	3	6	21.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	333	-58	-10	3	6	36.5			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	344	-59	0	3	6	46.3			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	384	-60	-10	3	6	42.3			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	374	-59	0	3	6	43.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	374	-59	-10	3	6	37.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	386	-60	-10	3	6	39.3			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	312	-58	-10	3	6	31.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	312	-58	-10	3	6	32.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	444	-61	0	3	6	28.1			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	465	-61	-10	3	6	32.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	466	-61	-10	3	6	40.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	447	-61	-10	3	6	23.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	447	-61	-10	3	6	24.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	452	-61	-10	3	6	34.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	430	-61	-10	0	6	36.3			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	226	-55	0	3	6	55.9			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	381	-60	0	3	6	47.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	403	-60	-10	3	6	44.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	403	-60	-10	3	6	35.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	403	-60	-10	3	6	21.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	374	-59	0	3	6	43.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	374	-59	-10	3	6	34.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	386	-60	-10	3	6	37.3			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	312	-58	-10	3	6	31.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	312	-58	-10	3	6	32.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	465	-61	-10	3	6	29.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	466	-61	-10	3	6	40.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	447	-61	-10	3	6	23.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	447	-61	-10	3	6	24.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	452	-61	-10	3	6	34.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR16 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	158	-52	-5	3	6	55.0	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	184	-53	-5	3	6	53.7			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	189	-54	-5	3	6	53.5			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	225	-55	0	3	6	58.0			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	313	-58	0	3	6	56.1			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	383	-60	0	3	6	50.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	403	-60	-10	3	6	44.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	403	-60	-10	3	6	35.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	403	-60	-10	3	6	21.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	335	-58	-10	3	6	36.5			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	346	-59	0	3	6	46.2			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	385	-60	-10	3	6	42.3			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	374	-59	0	3	6	43.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	374	-59	-10	3	6	37.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	386	-60	-10	3	6	39.3			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	314	-58	-10	3	6	31.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	314	-58	-10	3	6	32.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	445	-61	0	3	6	28.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	465	-61	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	464	-61	-10	3	6	40.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	448	-61	-10	3	6	23.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	448	-61	-10	3	6	24.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	453	-61	-10	3	6	34.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	427	-61	-10	0	6	36.4			
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	225	-55	0	3	6	56.0			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	383	-60	0	3	6	47.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	403	-60	-10	3	6	44.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	403	-60	-10	3	6	35.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	403	-60	-10	3	6	21.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	374	-59	0	3	6	43.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	374	-59	-10	3	6	34.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	386	-60	-10	3	6	37.3			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	314	-58	-10	3	6	31.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	314	-58	-10	3	6	32.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	465	-61	-10	3	6	29.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	464	-61	-10	3	6	40.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	448	-61	-10	3	6	23.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	448	-61	-10	3	6	24.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	453	-61	-10	3	6	34.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR16 15/F 64.8 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	162	-52	-5	3	6	54.8	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	187	-53	-5	3	6	53.6			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	192	-54	-5	3	6	53.3			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	226	-55	0	3	6	57.9			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	315	-58	0	3	6	56.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	385	-60	0	3	6	50.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	404	-60	-10	3	6	44.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	404	-60	-10	3	6	35.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	404	-60	-10	3	6	21.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	336	-59	-10	3	6	36.5			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	347	-59	0	3	6	46.2			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	386	-60	-10	3	6	42.3			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	375	-59	0	3	6	43.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	375	-59	-10	3	6	37.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	387	-60	-10	3	6	39.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	316	-58	-10	3	6	31.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	316	-58	-10	3	6	32.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	447	-61	0	3	6	28.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	465	-61	-10	3	6	32.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	462	-61	-10	3	6	40.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	450	-61	-10	3	6	22.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	450	-61	-10	3	6	23.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	454	-61	-10	3	6	34.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	425	-61	-10	0	6	36.4			
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	226	-55	0	3	6	55.9			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	385	-60	0	3	6	47.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	404	-60	-10	3	6	44.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	404	-60	-10	3	6	35.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	404	-60	-10	3	6	21.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	375	-59	0	3	6	43.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	375	-59	-10	3	6	34.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	387	-60	-10	3	6	37.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	316	-58	-10	3	6	31.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	316	-58	-10	3	6	32.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	465	-61	-10	3	6	29.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	462	-61	-10	3	6	40.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	450	-61	-10	3	6	22.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	450	-61	-10	3	6	23.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	454	-61	-10	3	6	34.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR16 10/F 49.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	168	-52	-5	3	6	54.5			
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	192	-54	-5	3	6	53.3			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	197	-54	-5	3	6	53.1			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	227	-55	0	3	6	57.9			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	317	-58	0	3	6	56.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	388	-60	0	3	6	50.2			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	405	-60	-10	3	6	44.9	Day-time & Evening (7am - 11pm)	70	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	405	-60	-10	3	6	35.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	405	-60	-10	3	6	21.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	339	-59	-10	3	6	36.4			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	350	-59	0	3	6	46.1			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	387	-60	-10	3	6	42.2			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	377	-60	0	3	6	43.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	377	-60	-10	3	6	37.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	389	-60	-10	3	6	39.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	319	-58	-10	3	6	30.9			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	319	-58	-10	3	6	31.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	449	-61	0	3	6	28.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	466	-61	-10	3	6	32.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	461	-61	-10	3	6	40.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	452	-61	-10	3	6	22.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	452	-61	-10	3	6	23.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	456	-61	-10	3	6	34.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	424	-61	-10	0	6	36.5			
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	227	-55	0	3	6	55.9			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	388	-60	0	3	6	47.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	405	-60	-10	3	6	44.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	405	-60	-10	3	6	35.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	405	-60	-10	3	6	21.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	377	-60	0	3	6	43.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	377	-60	-10	3	6	34.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	389	-60	-10	3	6	37.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	319	-58	-10	3	6	30.9			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	319	-58	-10	3	6	31.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	466	-61	-10	3	6	29.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	461	-61	-10	3	6	40.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	452	-61	-10	3	6	22.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	452	-61	-10	3	6	23.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	456	-61	-10	3	6	34.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR16 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	174	-53	-5	3	6	54.2	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	198	-54	-5	3	6	53.1			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	202	-54	-5	3	6	52.9			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	230	-55	0	3	6	57.8			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	321	-58	0	3	6	55.9			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	391	-60	0	3	6	50.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	407	-60	-10	3	6	44.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	407	-60	-10	3	6	35.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	407	-60	-10	3	6	21.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	342	-59	-10	3	6	36.3			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	353	-59	0	3	6	46.0			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	390	-60	-10	3	6	42.2			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	379	-60	0	3	6	43.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	379	-60	-10	3	6	37.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	391	-60	-10	3	6	39.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	322	-58	-10	3	6	30.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	322	-58	-10	3	6	31.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	452	-61	0	3	6	27.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	468	-61	-10	3	6	32.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	460	-61	-10	3	6	40.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	455	-61	-10	3	6	22.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	455	-61	-10	3	6	23.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	458	-61	-10	3	6	34.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	423	-61	-10	0	6	36.5			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	230	-55	0	3	6	55.8			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	391	-60	0	3	6	47.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	407	-60	-10	3	6	44.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	407	-60	-10	3	6	35.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	407	-60	-10	3	6	21.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	379	-60	0	3	6	43.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	379	-60	-10	3	6	34.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	391	-60	-10	3	6	37.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	322	-58	-10	3	6	30.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	322	-58	-10	3	6	31.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	468	-61	-10	3	6	29.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	460	-61	-10	3	6	40.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	455	-61	-10	3	6	22.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	455	-61	-10	3	6	23.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	458	-61	-10	3	6	34.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR18_a 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	144	-51	-10	3	6	50.8	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	169	-53	-10	3	6	49.4			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	175	-53	-10	3	6	49.1			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	220	-55	0	3	6	58.1			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	304	-58	0	3	6	56.3			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	373	-59	0	3	6	50.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	395	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	395	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	395	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	322	-58	-10	3	6	36.8			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	333	-58	-10	3	6	36.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	372	-59	-10	3	6	42.6			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	361	-59	-10	3	6	33.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	361	-59	-10	3	6	37.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	373	-59	-10	3	6	39.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	299	-58	-10	3	6	31.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	299	-58	-10	3	6	32.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	434	-61	-10	3	6	18.2			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	454	-61	-10	3	6	32.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	455	-61	-10	3	6	40.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	433	-61	-10	3	6	23.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	433	-61	-10	3	6	24.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	433	-61	-10	3	6	35.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	420	-60	-10	0	6	36.5			
												Cumulative Noise Level, dB(A)		62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	220	-55	0	3	6	56.1			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	373	-59	0	3	6	47.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	395	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	395	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	395	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	361	-59	-10	3	6	33.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	361	-59	-10	3	6	34.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	373	-59	-10	3	6	37.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	299	-58	-10	3	6	31.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	299	-58	-10	3	6	32.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	454	-61	-10	3	6	29.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	455	-61	-10	3	6	40.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	433	-61	-10	3	6	23.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	433	-61	-10	3	6	24.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	439	-61	-10	3	6	35.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
												Cumulative Noise Level, dB(A)		57			
NSR18_a 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	145	-51	-10	3	6	50.8	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	170	-53	-10	3	6	49.4			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	176	-53	-10	3	6	49.1			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	219	-55	0	3	6	58.2			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	304	-58	0	3	6	56.3			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	374	-59	0	3	6	50.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	394	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	394	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	394	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	322	-58	-10	3	6	36.8			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	333	-58	-10	3	6	36.5			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	372	-59	-10	3	6	42.6			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	361	-59	-10	3	6	33.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	361	-59	-10	3	6	37.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	373	-59	-10	3	6	39.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	300	-58	-10	3	6	31.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	299	-58	-10	3	6	32.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	435	-61	-10	3	6	18.2			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	453	-61	-10	3	6	32.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	452	-61	-10	3	6	40.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	434	-61	-10	3	6	23.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	434	-61	-10	3	6	24.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	439	-61	-10	3	6	35.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	417	-60	-10	0	6	36.6			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	219	-55	0	3	6	56.2			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	374	-59	0	3	6	47.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	394	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	394	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	394	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	361	-59	-10	3	6	33.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	361	-59	-10	3	6	34.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	373	-59	-10	3	6	37.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	300	-58	-10	3	6	31.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	299	-58	-10	3	6	32.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	453	-61	-10	3	6	29.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	452	-61	-10	3	6	40.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	434	-61	-10	3	6	23.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	434	-61	-10	3	6	24.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	439	-61	-10	3	6	35.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR18_a 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	148	-51	-10	3	6	50.6	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	172	-53	-10	3	6	49.3			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	178	-53	-10	3	6	49.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	218	-55	0	3	6	58.2			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	306	-58	0	3	6	56.3			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	376	-59	0	3	6	50.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	394	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	394	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	394	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	324	-58	-10	3	6	36.8			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	335	-58	-10	3	6	36.5			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	373	-59	-10	3	6	42.6			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	361	-59	-10	3	6	33.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	361	-59	-10	3	6	37.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	373	-59	-10	3	6	39.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	301	-58	-10	3	6	31.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	301	-58	-10	3	6	32.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	436	-61	-10	3	6	18.2			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	453	-61	-10	3	6	32.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	450	-61	-10	3	6	40.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	435	-61	-10	3	6	23.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	435	-61	-10	3	6	24.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	440	-61	-10	3	6	35.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	414	-60	-10	0	6	36.7			
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	218	-55	0	3	6	56.2			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	376	-59	0	3	6	47.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	394	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	394	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	394	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	361	-59	-10	3	6	33.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	361	-59	-10	3	6	34.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	373	-59	-10	3	6	37.6			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	301	-58	-10	3	6	31.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	301	-58	-10	3	6	32.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	453	-61	-10	3	6	29.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	450	-61	-10	3	6	40.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	435	-61	-10	3	6	23.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	435	-61	-10	3	6	24.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	440	-61	-10	3	6	35.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR18_a 15/F 64.8 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	152	-52	-10	3	6	50.4	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	176	-53	-10	3	6	49.1			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	181	-53	-10	3	6	48.8			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	219	-55	0	3	6	58.2			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	308	-58	0	3	6	56.2			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	378	-60	0	3	6	50.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	395	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	395	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	395	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	326	-58	-10	3	6	36.7			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	336	-59	-10	3	6	36.5			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	374	-59	-10	3	6	42.5			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	362	-59	-10	3	6	33.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	362	-59	-10	3	6	37.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	374	-59	-10	3	6	39.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	303	-58	-10	3	6	31.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	303	-58	-10	3	6	32.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	438	-61	-10	3	6	18.2			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	453	-61	-10	3	6	32.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	448	-61	-10	3	6	41.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	437	-61	-10	3	6	23.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	437	-61	-10	3	6	24.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	441	-61	-10	3	6	35.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	412	-60	-10	0	6	36.7			
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	219	-55	0	3	6	56.2			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	378	-60	0	3	6	47.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	395	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	395	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	395	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	362	-59	-10	3	6	33.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	362	-59	-10	3	6	34.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	374	-59	-10	3	6	37.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	303	-58	-10	3	6	31.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	303	-58	-10	3	6	32.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	453	-61	-10	3	6	29.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	448	-61	-10	3	6	41.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	437	-61	-10	3	6	23.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	437	-61	-10	3	6	24.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	441	-61	-10	3	6	35.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR18_a 10/F 49.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	158	-52	-10	3	6	50.1			
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	181	-53	-10	3	6	48.9			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	186	-53	-10	3	6	48.6			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	220	-55	0	3	6	58.1			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	310	-58	0	3	6	56.2			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	381	-60	0	3	6	50.4			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	396	-60	-10	3	6	45.0	Day-time & Evening (7am - 11pm)	70	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	396	-60	-10	3	6	36.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	396	-60	-10	3	6	22.0			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	328	-58	-10	3	6	36.7			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	339	-59	-10	3	6	36.4			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	376	-59	-10	3	6	42.5			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	364	-59	-10	3	6	33.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	364	-59	-10	3	6	37.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	376	-60	-10	3	6	39.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	306	-58	-10	3	6	31.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	306	-58	-10	3	6	32.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	440	-61	-10	3	6	18.1			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	454	-61	-10	3	6	32.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	447	-61	-10	3	6	41.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	439	-61	-10	3	6	23.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	439	-61	-10	3	6	24.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	443	-61	-10	3	6	35.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	411	-60	-10	0	6	36.7			
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	220	-55	0	3	6	56.1			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	381	-60	0	3	6	47.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	396	-60	-10	3	6	45.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	396	-60	-10	3	6	36.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	396	-60	-10	3	6	22.0			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	364	-59	-10	3	6	33.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	364	-59	-10	3	6	34.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	376	-60	-10	3	6	37.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	306	-58	-10	3	6	31.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	306	-58	-10	3	6	32.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	454	-61	-10	3	6	29.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	447	-61	-10	3	6	41.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	439	-61	-10	3	6	23.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	439	-61	-10	3	6	24.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	443	-61	-10	3	6	35.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR18_a 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	165	-52	-10	3	6	49.7	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	187	-53	-10	3	6	48.6			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	192	-54	-10	3	6	48.3			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	223	-55	0	3	6	58.0			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	314	-58	0	3	6	56.1			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	384	-60	0	3	6	50.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	398	-60	-10	3	6	45.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	398	-60	-10	3	6	36.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	398	-60	-10	3	6	22.0			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	332	-58	-10	3	6	36.6			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	342	-59	-10	3	6	36.3			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	378	-60	-10	3	6	42.5			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	367	-59	-10	3	6	33.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	367	-59	-10	3	6	37.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	378	-60	-10	3	6	39.4			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	310	-58	-10	3	6	31.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	309	-58	-10	3	6	32.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	443	-61	-10	3	6	18.1			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	456	-61	-10	3	6	32.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	446	-61	-10	3	6	41.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	442	-61	-10	3	6	23.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	442	-61	-10	3	6	24.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	446	-61	-10	3	6	35.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	410	-60	-10	0	6	36.7			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	223	-55	0	3	6	56.0			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	384	-60	0	3	6	47.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	398	-60	-10	3	6	45.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	398	-60	-10	3	6	36.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	398	-60	-10	3	6	22.0			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	367	-59	-10	3	6	33.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	367	-59	-10	3	6	34.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	378	-60	-10	3	6	37.4			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	310	-58	-10	3	6	31.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	309	-58	-10	3	6	32.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	456	-61	-10	3	6	29.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	446	-61	-10	3	6	41.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	442	-61	-10	3	6	23.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	442	-61	-10	3	6	24.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	446	-61	-10	3	6	35.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR19_a 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	142	-51	-10	3	6	51.0	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	168	-53	-10	3	6	49.5			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	173	-53	-10	3	6	49.2			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	219	-55	-10	3	6	48.2			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	303	-58	-10	3	6	46.4			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	372	-59	-10	3	6	40.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	393	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	393	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	393	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	320	-58	-10	3	6	36.9			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	332	-58	-10	3	6	36.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	370	-59	-10	3	6	42.6			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	359	-59	-10	3	6	33.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	359	-59	-10	3	6	37.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	372	-59	-10	3	6	39.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	297	-57	-10	3	6	31.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	297	-57	-10	3	6	32.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	433	-61	-10	3	6	18.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	452	-61	-10	3	6	32.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	453	-61	-10	3	6	40.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	431	-61	-10	3	6	23.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	431	-61	-10	3	6	24.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	431	-61	-10	3	6	35.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	418	-60	-10	0	6	36.6			
												Cumulative Noise Level, dB(A)		57			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	219	-55	-10	3	6	46.2			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	372	-59	-10	3	6	37.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	393	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	393	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	393	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	359	-59	-10	3	6	33.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	359	-59	-10	3	6	34.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	372	-59	-10	3	6	37.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	297	-57	-10	3	6	31.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	297	-57	-10	3	6	32.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	452	-61	-10	3	6	29.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	453	-61	-10	3	6	40.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	431	-61	-10	3	6	23.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	431	-61	-10	3	6	24.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	437	-61	-10	3	6	35.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
												Cumulative Noise Level, dB(A)		51			
NSR19_a 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	143	-51	-10	3	6	50.9	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	169	-53	-10	3	6	49.5			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	174	-53	-10	3	6	49.2			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	218	-55	-10	3	6	48.2			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	303	-58	-10	3	6	46.4			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	373	-59	-10	3	6	40.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	392	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	392	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	392	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	320	-58	-10	3	6	36.9			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	332	-58	-10	3	6	36.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	370	-59	-10	3	6	42.6			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	359	-59	-10	3	6	33.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	359	-59	-10	3	6	37.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	372	-59	-10	3	6	39.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	298	-57	-10	3	6	31.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	297	-57	-10	3	6	32.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	434	-61	-10	3	6	18.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	451	-61	-10	3	6	32.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	450	-61	-10	3	6	40.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	432	-61	-10	3	6	23.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	432	-61	-10	3	6	24.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	437	-61	-10	3	6	35.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	415	-60	-10	0	6	36.6			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	57			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	218	-55	-10	3	6	46.2			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	373	-59	-10	3	6	37.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	392	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	392	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	392	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	359	-59	-10	3	6	33.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	359	-59	-10	3	6	34.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	372	-59	-10	3	6	37.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	298	-57	-10	3	6	31.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	297	-57	-10	3	6	32.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	451	-61	-10	3	6	29.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	450	-61	-10	3	6	40.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	432	-61	-10	3	6	23.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	432	-61	-10	3	6	24.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	437	-61	-10	3	6	35.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	51			
NSR19_a 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	146	-51	-10	3	6	50.7	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	171	-53	-10	3	6	49.3			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	176	-53	-10	3	6	49.1			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	217	-55	-10	3	6	48.3			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	305	-58	-10	3	6	46.3			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	375	-59	-10	3	6	40.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	392	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	392	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	392	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	322	-58	-10	3	6	36.9			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	334	-58	-10	3	6	36.5			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	371	-59	-10	3	6	42.6			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	359	-59	-10	3	6	33.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	359	-59	-10	3	6	37.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	372	-59	-10	3	6	39.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	299	-58	-10	3	6	31.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	299	-58	-10	3	6	32.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	435	-61	-10	3	6	18.2			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	451	-61	-10	3	6	32.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	448	-61	-10	3	6	41.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	433	-61	-10	3	6	23.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	433	-61	-10	3	6	24.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	438	-61	-10	3	6	35.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	412	-60	-10	0	6	36.7			
													Cumulative Noise Level, dB(A)	57			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	217	-55	-10	3	6	46.3			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	375	-59	-10	3	6	37.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	392	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	392	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	392	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	359	-59	-10	3	6	33.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	359	-59	-10	3	6	34.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	372	-59	-10	3	6	37.6			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	299	-58	-10	3	6	31.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	299	-58	-10	3	6	32.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	451	-61	-10	3	6	29.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	448	-61	-10	3	6	41.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	433	-61	-10	3	6	23.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	433	-61	-10	3	6	24.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	438	-61	-10	3	6	35.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	51			
NSR19_a 15/F 64.8 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	150	-52	-10	3	6	50.5	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	175	-53	-10	3	6	49.2			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	180	-53	-10	3	6	48.9			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	218	-55	-10	3	6	48.2			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	307	-58	-10	3	6	46.3			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	377	-60	-10	3	6	40.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	393	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	393	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	393	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	324	-58	-10	3	6	36.8			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	335	-59	-10	3	6	36.5			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	372	-59	-10	3	6	42.6			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	360	-59	-10	3	6	33.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	360	-59	-10	3	6	37.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	373	-59	-10	3	6	39.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	301	-58	-10	3	6	31.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	301	-58	-10	3	6	32.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	437	-61	-10	3	6	18.2			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	451	-61	-10	3	6	32.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	446	-61	-10	3	6	41.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	435	-61	-10	3	6	23.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	435	-61	-10	3	6	24.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	439	-61	-10	3	6	35.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	410	-60	-10	0	6	36.7			
													Cumulative Noise Level, dB(A)	57			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	218	-55	-10	3	6	46.2			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	377	-60	-10	3	6	37.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	393	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	393	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	393	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	360	-59	-10	3	6	33.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	360	-59	-10	3	6	34.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	373	-59	-10	3	6	37.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	301	-58	-10	3	6	31.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	301	-58	-10	3	6	32.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	451	-61	-10	3	6	29.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	446	-61	-10	3	6	41.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	435	-61	-10	3	6	23.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	435	-61	-10	3	6	24.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	439	-61	-10	3	6	35.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	51			
NSR19_a 10/F 49.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	156	-52	-10	3	6	50.2			
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	180	-53	-10	3	6	48.9			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	184	-53	-10	3	6	48.7			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	219	-55	-10	3	6	48.2			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	309	-58	-10	3	6	46.2			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	380	-60	-10	3	6	40.4			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	394	-60	-10	3	6	45.1	Day-time & Evening (7am - 11pm)	70	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	394	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	394	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	326	-58	-10	3	6	36.7			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	338	-59	-10	3	6	36.4			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	374	-59	-10	3	6	42.6			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	362	-59	-10	3	6	33.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	362	-59	-10	3	6	37.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	375	-59	-10	3	6	39.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	304	-58	-10	3	6	31.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	304	-58	-10	3	6	32.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	439	-61	-10	3	6	18.2			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	452	-61	-10	3	6	32.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	445	-61	-10	3	6	41.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	437	-61	-10	3	6	23.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	437	-61	-10	3	6	24.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	441	-61	-10	3	6	35.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	409	-60	-10	0	6	36.8			
													Cumulative Noise Level, dB(A)	57			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	219	-55	-10	3	6	46.2			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	380	-60	-10	3	6	37.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	394	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	394	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	394	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	362	-59	-10	3	6	33.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	362	-59	-10	3	6	34.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	375	-59	-10	3	6	37.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	304	-58	-10	3	6	31.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	304	-58	-10	3	6	32.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	452	-61	-10	3	6	29.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	445	-61	-10	3	6	41.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	437	-61	-10	3	6	23.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	437	-61	-10	3	6	24.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	441	-61	-10	3	6	35.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	51			
NSR19_a 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	163	-52	-10	3	6	49.8	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	186	-53	-10	3	6	48.6			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	190	-54	-10	3	6	48.4			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	222	-55	-10	3	6	48.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	313	-58	-10	3	6	46.1			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	383	-60	-10	3	6	40.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	396	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	396	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	396	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	330	-58	-10	3	6	36.6			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	341	-59	-10	3	6	36.3			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	376	-60	-10	3	6	42.5			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	365	-59	-10	3	6	33.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	365	-59	-10	3	6	37.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	377	-60	-10	3	6	39.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	308	-58	-10	3	6	31.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	308	-58	-10	3	6	32.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	442	-61	-10	3	6	18.1			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	454	-61	-10	3	6	32.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	444	-61	-10	3	6	41.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	440	-61	-10	3	6	23.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	440	-61	-10	3	6	24.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	444	-61	-10	3	6	35.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	408	-60	-10	0	6	36.8			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	57			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	222	-55	-10	3	6	46.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	383	-60	-10	3	6	37.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	396	-60	-10	3	6	45.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	396	-60	-10	3	6	36.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	396	-60	-10	3	6	22.1			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	365	-59	-10	3	6	33.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	365	-59	-10	3	6	34.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	377	-60	-10	3	6	37.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	308	-58	-10	3	6	31.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	308	-58	-10	3	6	32.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	454	-61	-10	3	6	29.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	444	-61	-10	3	6	41.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	440	-61	-10	3	6	23.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	440	-61	-10	3	6	24.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	444	-61	-10	3	6	35.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	51			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR21 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	Y	103	1	103	131	-50	0	3	6	61.7	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	Y	103	1	103	156	-52	0	3	6	60.1			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	Y	103	1	103	163	-52	0	3	6	59.8			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	212	-55	0	3	6	58.5			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	296	-57	0	3	6	56.6			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	365	-59	0	3	6	50.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	383	-60	0	3	6	55.3			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	383	-60	0	3	6	46.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	383	-60	0	3	6	32.3			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	310	-58	0	3	6	47.2			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	321	-58	0	3	6	46.9			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	358	-59	0	3	6	52.9			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	347	-59	-10	3	6	34.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	347	-59	-10	3	6	38.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	359	-59	-10	3	6	39.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	284	-57	-10	3	6	31.9			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	284	-57	-10	3	6	32.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	95	1	95	424	-61	-10	3	6	32.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	440	-61	0	3	6	43.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	441	-61	-10	3	6	41.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	418	-60	-10	3	6	23.6			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	418	-60	-10	3	6	24.6			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	424	-61	-10	3	6	35.5			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	405	-60	-10	0	6	36.8			
													Cumulative Noise Level, dB(A)	67			
	GC-1	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	212	-55	0	3	6	56.5			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	365	-59	0	3	6	47.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	383	-60	0	3	6	55.3			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	383	-60	0	3	6	46.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	383	-60	0	3	6	32.3			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	347	-59	-10	3	6	34.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	347	-59	-10	3	6	35.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	359	-59	-10	3	6	37.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	284	-57	-10	3	6	31.9			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	284	-57	-10	3	6	32.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	440	-61	0	3	6	40.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	441	-61	-10	3	6	41.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	418	-60	-10	3	6	23.6			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	418	-60	-10	3	6	24.6			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	424	-61	-10	3	6	35.5			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	60			
NSR21 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	132	-50	-5	3	6	56.6	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	157	-52	-5	3	6	55.1			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	164	-52	-5	3	6	54.7			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	211	-54	0	3	6	58.5			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	296	-57	0	3	6	56.6			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	366	-59	0	3	6	50.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	382	-60	-10	3	6	45.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	382	-60	-10	3	6	36.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	382	-60	-10	3	6	22.4			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	310	-58	-10	3	6	37.2			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	321	-58	-10	3	6	36.9			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	358	-59	-10	3	6	42.9			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	347	-59	-10	3	6	34.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	347	-59	-10	3	6	38.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	359	-59	-10	3	6	39.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	285	-57	-10	3	6	31.9			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	285	-57	-10	3	6	32.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	425	-61	-10	3	6	18.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	439	-61	-10	3	6	33.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	438	-61	-10	3	6	41.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	419	-60	-10	3	6	23.6			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	419	-60	-10	3	6	24.6			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	424	-61	-10	3	6	35.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	402	-60	-10	0	6	36.9			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	211	-54	0	3	6	56.5			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	366	-59	0	3	6	47.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	382	-60	-10	3	6	45.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	382	-60	-10	3	6	36.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	382	-60	-10	3	6	22.4			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	347	-59	-10	3	6	34.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	347	-59	-10	3	6	35.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	359	-59	-10	3	6	37.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	285	-57	-10	3	6	31.9			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	285	-57	-10	3	6	32.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	439	-61	-10	3	6	30.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	438	-61	-10	3	6	41.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	419	-60	-10	3	6	23.6			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	419	-60	-10	3	6	24.6			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	424	-61	-10	3	6	35.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	58			
NSR21	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	135	-51	-5	3	6	56.4	Day-time & Evening (7am - 11pm)	70	Yes
20/F	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	159	-52	-5	3	6	55.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
80.6	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	166	-52	-5	3	6	54.6			
mPD	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	210	-54	0	3	6	58.6			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	298	-57	0	3	6	56.5			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	368	-59	0	3	6	50.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	382	-60	-10	3	6	45.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	382	-60	-10	3	6	36.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	382	-60	-10	3	6	22.4			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	312	-58	-10	3	6	37.1			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	323	-58	-10	3	6	36.8			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	359	-59	-10	3	6	42.9			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	347	-59	-10	3	6	34.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	347	-59	-10	3	6	38.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	359	-59	-10	3	6	39.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	286	-57	-10	3	6	31.9			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	286	-57	-10	3	6	32.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	426	-61	-10	3	6	18.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	439	-61	-10	3	6	33.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	435	-61	-10	3	6	41.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	420	-60	-10	3	6	23.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	420	-60	-10	3	6	24.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	425	-61	-10	3	6	35.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	400	-60	-10	0	6	37.0			
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	210	-54	0	3	6	56.6			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	368	-59	0	3	6	47.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	382	-60	-10	3	6	45.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	382	-60	-10	3	6	36.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	382	-60	-10	3	6	22.4			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	347	-59	-10	3	6	34.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	347	-59	-10	3	6	35.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	359	-59	-10	3	6	37.9			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	286	-57	-10	3	6	31.9			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	286	-57	-10	3	6	32.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	439	-61	-10	3	6	30.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	435	-61	-10	3	6	41.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	420	-60	-10	3	6	23.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	420	-60	-10	3	6	24.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	425	-61	-10	3	6	35.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	58			
NSR21 15/F 64.8 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	140	-51	-5	3	6	56.1	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	163	-52	-5	3	6	54.7			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	170	-53	-5	3	6	54.4			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	211	-54	0	3	6	58.5			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	300	-58	0	3	6	56.5			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	370	-59	0	3	6	50.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	383	-60	-10	3	6	45.3			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	383	-60	-10	3	6	36.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	383	-60	-10	3	6	22.3			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	314	-58	-10	3	6	37.1			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	325	-58	-10	3	6	36.8			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	360	-59	-10	3	6	42.9			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	349	-59	-10	3	6	34.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	349	-59	-10	3	6	38.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	360	-59	-10	3	6	39.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	288	-57	-10	3	6	31.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	288	-57	-10	3	6	32.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	428	-61	-10	3	6	18.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	439	-61	-10	3	6	33.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	433	-61	-10	3	6	41.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	422	-61	-10	3	6	23.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	422	-61	-10	3	6	24.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	426	-61	-10	3	6	35.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	397	-60	-10	0	6	37.0			
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	211	-54	0	3	6	56.5			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	370	-59	0	3	6	47.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	383	-60	-10	3	6	45.3			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	383	-60	-10	3	6	36.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	383	-60	-10	3	6	22.3			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	349	-59	-10	3	6	34.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	349	-59	-10	3	6	35.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	360	-59	-10	3	6	37.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	288	-57	-10	3	6	31.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	288	-57	-10	3	6	32.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	439	-61	-10	3	6	30.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	433	-61	-10	3	6	41.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	422	-61	-10	3	6	23.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	422	-61	-10	3	6	24.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	426	-61	-10	3	6	35.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	58			
NSR21 10/F 49.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	146	-51	-5	3	6	55.7			
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	169	-53	-5	3	6	54.5			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	175	-53	-5	3	6	54.1			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	212	-55	0	3	6	58.5			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	303	-58	0	3	6	56.4			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	373	-59	0	3	6	50.6			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	384	-60	-10	3	6	45.3	Day-time & Evening (7am - 11pm)	70	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	384	-60	-10	3	6	36.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	384	-60	-10	3	6	22.3			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	316	-58	-10	3	6	37.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	327	-58	-10	3	6	36.7			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	362	-59	-10	3	6	42.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	350	-59	-10	3	6	34.1			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	350	-59	-10	3	6	38.1			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	362	-59	-10	3	6	39.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	291	-57	-10	3	6	31.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	291	-57	-10	3	6	32.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	430	-61	-10	3	6	18.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	440	-61	-10	3	6	33.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	432	-61	-10	3	6	41.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	425	-61	-10	3	6	23.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	425	-61	-10	3	6	24.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	428	-61	-10	3	6	35.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	396	-60	-10	0	6	37.0			
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	212	-55	0	3	6	56.5			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	373	-59	0	3	6	47.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	384	-60	-10	3	6	45.3			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	384	-60	-10	3	6	36.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	384	-60	-10	3	6	22.3			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	350	-59	-10	3	6	34.1			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	350	-59	-10	3	6	35.1			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	362	-59	-10	3	6	37.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	291	-57	-10	3	6	31.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	291	-57	-10	3	6	32.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	440	-61	-10	3	6	30.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	432	-61	-10	3	6	41.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	425	-61	-10	3	6	23.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	425	-61	-10	3	6	24.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	428	-61	-10	3	6	35.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	58			
NSR21 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	153	-52	-5	3	6	55.3	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	175	-53	-5	3	6	54.1			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	181	-53	-5	3	6	53.8			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	215	-55	0	3	6	58.3			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	306	-58	0	3	6	56.3			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	376	-60	0	3	6	50.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	386	-60	-10	3	6	45.3			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	386	-60	-10	3	6	36.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	386	-60	-10	3	6	22.3			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	320	-58	-10	3	6	36.9			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	331	-58	-10	3	6	36.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	364	-59	-10	3	6	42.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	353	-59	-10	3	6	34.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	353	-59	-10	3	6	38.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	364	-59	-10	3	6	39.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	295	-57	-10	3	6	31.6			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	295	-57	-10	3	6	32.6			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	433	-61	-10	3	6	18.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	442	-61	-10	3	6	33.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	431	-61	-10	3	6	41.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	428	-61	-10	3	6	23.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	428	-61	-10	3	6	24.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	431	-61	-10	3	6	35.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	395	-60	-10	0	6	37.1			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	215	-55	0	3	6	56.3			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	376	-60	0	3	6	47.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	386	-60	-10	3	6	45.3			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	386	-60	-10	3	6	36.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	386	-60	-10	3	6	22.3			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	353	-59	-10	3	6	34.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	353	-59	-10	3	6	35.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	364	-59	-10	3	6	37.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	295	-57	-10	3	6	31.6			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	295	-57	-10	3	6	32.6			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	442	-61	-10	3	6	30.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	431	-61	-10	3	6	41.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	428	-61	-10	3	6	23.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	428	-61	-10	3	6	24.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	431	-61	-10	3	6	35.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR28 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	Y	103	1	103	103	-48	0	3	6	63.7	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	Y	103	1	103	124	-50	0	3	6	62.1			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	Y	103	1	103	136	-51	0	3	6	61.3			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	198	-54	0	3	6	59.1			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	281	-57	0	3	6	57.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	348	-59	0	3	6	51.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	356	-59	0	3	6	56.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	356	-59	0	3	6	47.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	356	-59	0	3	6	33.0			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	280	-57	0	3	6	48.1			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	292	-57	0	3	6	47.7			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	324	-58	-10	3	6	43.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	308	-58	-10	3	6	35.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	308	-58	-10	3	6	39.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	322	-58	-10	3	6	40.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	244	-56	-10	3	6	33.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	244	-56	-10	3	6	34.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	402	-60	0	3	6	28.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	406	-60	-10	3	6	33.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	403	-60	-10	3	6	41.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	381	-60	-10	3	6	24.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	381	-60	-10	3	6	25.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	384	-60	-10	3	6	36.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	367	-59	-10	0	6	37.7			
												Cumulative Noise Level, dB(A)		69			
	GC-1	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	198	-54	0	3	6	57.1			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	348	-59	0	3	6	48.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	356	-59	0	3	6	56.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	356	-59	0	3	6	47.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	356	-59	0	3	6	33.0			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	308	-58	-10	3	6	35.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	308	-58	-10	3	6	36.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	322	-58	-10	3	6	38.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	244	-56	-10	3	6	33.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	244	-56	-10	3	6	34.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	406	-60	-10	3	6	30.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	403	-60	-10	3	6	41.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	380	-60	-10	3	6	24.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	380	-60	-10	3	6	25.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	384	-60	-10	3	6	36.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
												Cumulative Noise Level, dB(A)		60			
NSR29 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	104	-48	-5	3	6	58.6	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	125	-50	-5	3	6	57.1			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	137	-51	-5	3	6	56.3			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	196	-54	0	3	6	59.2			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	281	-57	0	3	6	57.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	349	-59	0	3	6	51.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	355	-59	-10	3	6	46.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	355	-59	-10	3	6	37.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	355	-59	-10	3	6	23.0			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	280	-57	-10	3	6	38.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	292	-57	-10	3	6	37.7			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	324	-58	-10	3	6	43.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	308	-58	-10	3	6	35.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	308	-58	-10	3	6	39.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	322	-58	-10	3	6	40.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	245	-56	-10	3	6	33.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	245	-56	-10	3	6	34.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	403	-60	-10	3	6	18.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	405	-60	-10	3	6	33.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	399	-60	-10	3	6	42.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	381	-60	-10	3	6	24.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	381	-60	-10	3	6	25.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	384	-60	-10	3	6	36.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	363	-59	-10	0	6	37.8			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	65			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	196	-54	0	3	6	57.2			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	349	-59	0	3	6	48.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	355	-59	-10	3	6	46.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	355	-59	-10	3	6	37.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	355	-59	-10	3	6	23.0			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	308	-58	-10	3	6	35.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	308	-58	-10	3	6	36.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	322	-58	-10	3	6	38.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	245	-56	-10	3	6	33.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	245	-56	-10	3	6	34.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	405	-60	-10	3	6	30.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	399	-60	-10	3	6	42.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	381	-60	-10	3	6	24.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	381	-60	-10	3	6	25.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	384	-60	-10	3	6	36.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	58			
NSR29 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	108	-49	-5	3	6	58.3	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	128	-50	-5	3	6	56.8			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	140	-51	-5	3	6	56.1			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	195	-54	0	3	6	59.2			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	283	-57	0	3	6	57.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	351	-59	0	3	6	51.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	355	-59	-10	3	6	46.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	355	-59	-10	3	6	37.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	355	-59	-10	3	6	23.0			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	282	-57	-10	3	6	38.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	294	-57	-10	3	6	37.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	325	-58	-10	3	6	43.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	308	-58	-10	3	6	35.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	308	-58	-10	3	6	39.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	322	-58	-10	3	6	40.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	246	-56	-10	3	6	33.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	246	-56	-10	3	6	34.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	404	-60	-10	3	6	18.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	405	-60	-10	3	6	33.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	397	-60	-10	3	6	42.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	382	-60	-10	3	6	24.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	382	-60	-10	3	6	25.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	385	-60	-10	3	6	36.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	360	-59	-10	0	6	37.9			
													Cumulative Noise Level, dB(A)	65			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	195	-54	0	3	6	57.2			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	351	-59	0	3	6	48.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	355	-59	-10	3	6	46.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	355	-59	-10	3	6	37.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	355	-59	-10	3	6	23.0			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	308	-58	-10	3	6	35.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	308	-58	-10	3	6	36.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	322	-58	-10	3	6	38.8			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	246	-56	-10	3	6	33.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	246	-56	-10	3	6	34.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	405	-60	-10	3	6	30.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	397	-60	-10	3	6	42.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	382	-60	-10	3	6	24.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	382	-60	-10	3	6	25.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	385	-60	-10	3	6	36.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	58			
NSR29 15/F 64.8 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	114	-49	-5	3	6	57.9	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	133	-50	-5	3	6	56.5			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	144	-51	-5	3	6	55.8			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	196	-54	0	3	6	59.2			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	285	-57	0	3	6	56.9			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	353	-59	0	3	6	51.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	356	-59	-10	3	6	46.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	356	-59	-10	3	6	37.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	356	-59	-10	3	6	23.0			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	284	-57	-10	3	6	37.9			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	296	-57	-10	3	6	37.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	326	-58	-10	3	6	43.7			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	310	-58	-10	3	6	35.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	310	-58	-10	3	6	39.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	323	-58	-10	3	6	40.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	249	-56	-10	3	6	33.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	249	-56	-10	3	6	34.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	406	-60	-10	3	6	18.8			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	405	-60	-10	3	6	33.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	395	-60	-10	3	6	42.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	385	-60	-10	3	6	24.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	385	-60	-10	3	6	25.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	387	-60	-10	3	6	36.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	358	-59	-10	0	6	37.9			
													Cumulative Noise Level, dB(A)	65			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	196	-54	0	3	6	57.2			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	353	-59	0	3	6	48.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	356	-59	-10	3	6	46.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	356	-59	-10	3	6	37.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	356	-59	-10	3	6	23.0			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	310	-58	-10	3	6	35.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	310	-58	-10	3	6	36.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	323	-58	-10	3	6	38.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	249	-56	-10	3	6	33.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	249	-56	-10	3	6	34.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	405	-60	-10	3	6	30.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	395	-60	-10	3	6	42.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	385	-60	-10	3	6	24.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	385	-60	-10	3	6	25.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	387	-60	-10	3	6	36.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	58			
NSR29 10/F 49.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	121	-50	-5	3	6	57.3			
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	139	-51	-5	3	6	56.1			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	150	-52	-5	3	6	55.5			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	198	-54	0	3	6	59.1			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	288	-57	0	3	6	56.8			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	356	-59	0	3	6	51.0			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	357	-59	-10	3	6	45.9	Day-time & Evening (7am - 11pm)	70	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	357	-59	-10	3	6	36.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	357	-59	-10	3	6	22.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	287	-57	-10	3	6	37.8			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	299	-58	-10	3	6	37.5			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	328	-58	-10	3	6	43.7			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	312	-58	-10	3	6	35.1			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	312	-58	-10	3	6	39.1			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	325	-58	-10	3	6	40.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	252	-56	-10	3	6	33.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	252	-56	-10	3	6	34.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	408	-60	-10	3	6	18.8			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	407	-60	-10	3	6	33.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	393	-60	-10	3	6	42.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	387	-60	-10	3	6	24.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	387	-60	-10	3	6	25.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	389	-60	-10	3	6	36.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	356	-59	-10	0	6	38.0			
													Cumulative Noise Level, dB(A)	65			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	198	-54	0	3	6	57.1			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	356	-59	0	3	6	48.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	357	-59	-10	3	6	45.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	357	-59	-10	3	6	36.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	357	-59	-10	3	6	22.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	312	-58	-10	3	6	35.1			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	312	-58	-10	3	6	36.1			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	325	-58	-10	3	6	38.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	252	-56	-10	3	6	33.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	252	-56	-10	3	6	34.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	407	-60	-10	3	6	30.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	393	-60	-10	3	6	42.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	387	-60	-10	3	6	24.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	387	-60	-10	3	6	25.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	389	-60	-10	3	6	36.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	58			
NSR29 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	130	-50	-5	3	6	56.7	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	147	-51	-5	3	6	55.6			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	158	-52	-5	3	6	55.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	201	-54	0	3	6	59.0			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	292	-57	0	3	6	56.7			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	360	-59	0	3	6	50.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	359	-59	-10	3	6	45.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	359	-59	-10	3	6	36.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	359	-59	-10	3	6	22.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	291	-57	-10	3	6	37.7			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	303	-58	-10	3	6	37.4			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	331	-58	-10	3	6	43.6			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	315	-58	-10	3	6	35.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	315	-58	-10	3	6	39.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	328	-58	-10	3	6	40.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	257	-56	-10	3	6	32.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	257	-56	-10	3	6	33.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	411	-60	-10	3	6	18.7			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	408	-60	-10	3	6	33.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	392	-60	-10	3	6	42.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	391	-60	-10	3	6	24.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	391	-60	-10	3	6	25.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	392	-60	-10	3	6	36.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	355	-59	-10	0	6	38.0			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	201	-54	0	3	6	57.0			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	360	-59	0	3	6	47.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	359	-59	-10	3	6	45.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	359	-59	-10	3	6	36.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	359	-59	-10	3	6	22.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	315	-58	-10	3	6	35.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	315	-58	-10	3	6	36.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	328	-58	-10	3	6	38.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	257	-56	-10	3	6	32.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	257	-56	-10	3	6	33.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	408	-60	-10	3	6	30.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	392	-60	-10	3	6	42.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	391	-60	-10	3	6	24.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	391	-60	-10	3	6	25.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	392	-60	-10	3	6	36.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	58			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR3030/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	Y	103	1	103	105	-48	0	3	6	63.6	Day-time & Evening (7am - 11pm)	65	No
	GC-2	Dry cooler	Grandtech Centre	Y	Y	103	1	103	124	-50	0	3	6	62.1			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	Y	103	1	103	138	-51	0	3	6	61.2			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	201	-54	0	3	6	58.9			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	285	-57	0	3	6	56.9			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	352	-59	0	3	6	51.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	357	-59	0	3	6	55.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	357	-59	0	3	6	46.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	357	-59	0	3	6	32.9			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	280	-57	0	3	6	48.1			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	293	-57	0	3	6	47.7			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	323	-58	-10	3	6	43.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	306	-58	-10	3	6	35.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	306	-58	-10	3	6	39.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	319	-58	-10	3	6	40.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	239	-56	-10	3	6	33.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	239	-56	-10	3	6	34.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	404	-60	0	3	6	28.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	404	-60	-10	3	6	33.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	399	-60	-10	3	6	42.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	376	-60	-10	3	6	24.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	376	-60	-10	3	6	25.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	376	-60	-10	3	6	36.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	363	-59	-10	0	6	37.8			
													Cumulative Noise Level, dB(A)	69			
	GC-1	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	201	-54	0	3	6	56.9			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	352	-59	0	3	6	48.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	357	-59	0	3	6	55.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	357	-59	0	3	6	46.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	357	-59	0	3	6	32.9			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	306	-58	-10	3	6	35.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	306	-58	-10	3	6	36.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	319	-58	-10	3	6	38.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	239	-56	-10	3	6	33.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	239	-56	-10	3	6	34.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	404	-60	-10	3	6	30.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	399	-60	-10	3	6	42.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	376	-60	-10	3	6	24.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	376	-60	-10	3	6	25.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	380	-60	-10	3	6	36.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	60			
NSR3025/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	106	-49	-5	3	6	58.5	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	125	-50	-5	3	6	57.1			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	139	-51	-5	3	6	56.1			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	200	-54	0	3	6	59.0			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	285	-57	0	3	6	56.9			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	353	-59	-10	3	6	41.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	356	-59	-10	3	6	46.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	356	-59	-10	3	6	37.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	356	-59	-10	3	6	23.0			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	280	-57	-10	3	6	38.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	293	-57	-10	3	6	37.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	323	-58	-10	3	6	43.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	306	-58	-10	3	6	35.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	306	-58	-10	3	6	39.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	319	-58	-10	3	6	40.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	240	-56	-10	3	6	33.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	240	-56	-10	3	6	34.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	405	-60	0	3	6	28.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	403	-60	-10	3	6	33.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	395	-60	-10	3	6	42.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	377	-60	-10	3	6	24.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	377	-60	-10	3	6	25.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	380	-60	-10	3	6	36.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	359	-59	-10	0	6	37.9			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	65			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	200	-54	0	3	6	57.0			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	353	-59	-10	3	6	38.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	356	-59	-10	3	6	46.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	356	-59	-10	3	6	37.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	356	-59	-10	3	6	23.0			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	306	-58	-10	3	6	35.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	306	-58	-10	3	6	36.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	319	-58	-10	3	6	38.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	240	-56	-10	3	6	33.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	240	-56	-10	3	6	34.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	403	-60	-10	3	6	30.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	395	-60	-10	3	6	42.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	377	-60	-10	3	6	24.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	377	-60	-10	3	6	25.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	380	-60	-10	3	6	36.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	58			
NSR30 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	110	-49	-5	3	6	58.2	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	128	-50	-5	3	6	56.8			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	142	-51	-5	3	6	56.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	199	-54	0	3	6	59.0			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	287	-57	0	3	6	56.9			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	355	-59	-10	3	6	41.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	356	-59	-10	3	6	46.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	356	-59	-10	3	6	37.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	356	-59	-10	3	6	23.0			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	282	-57	-10	3	6	38.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	295	-57	-10	3	6	37.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	324	-58	-10	3	6	43.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	306	-58	-10	3	6	35.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	306	-58	-10	3	6	39.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	319	-58	-10	3	6	40.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	241	-56	-10	3	6	33.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	241	-56	-10	3	6	34.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	406	-60	0	3	6	28.8			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	403	-60	-10	3	6	33.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	393	-60	-10	3	6	42.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	378	-60	-10	3	6	24.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	378	-60	-10	3	6	25.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	381	-60	-10	3	6	36.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	356	-59	-10	0	6	38.0			
													Cumulative Noise Level, dB(A)	65			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	199	-54	0	3	6	57.0			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	355	-59	-10	3	6	38.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	356	-59	-10	3	6	46.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	356	-59	-10	3	6	37.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	356	-59	-10	3	6	23.0			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	306	-58	-10	3	6	35.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	306	-58	-10	3	6	36.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	319	-58	-10	3	6	38.9			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	241	-56	-10	3	6	33.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	241	-56	-10	3	6	34.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	403	-60	-10	3	6	30.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	393	-60	-10	3	6	42.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	378	-60	-10	3	6	24.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	378	-60	-10	3	6	25.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	381	-60	-10	3	6	36.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	58			
NSR30	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	115	-49	-5	3	6	57.7			
15/F	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	133	-50	-5	3	6	56.5			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
64.8	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	146	-51	-5	3	6	55.7			
mPD	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	200	-54	0	3	6	59.0			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	289	-57	0	3	6	56.8			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	357	-59	-10	3	6	40.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	357	-59	-10	3	6	46.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	357	-59	-10	3	6	37.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	357	-59	-10	3	6	23.0			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	284	-57	-10	3	6	37.9			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	297	-57	-10	3	6	37.5	Day-time & Evening (7am - 11pm)	65	Yes
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	325	-58	-10	3	6	43.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	308	-58	-10	3	6	35.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	308	-58	-10	3	6	39.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	320	-58	-10	3	6	40.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	244	-56	-10	3	6	33.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	244	-56	-10	3	6	34.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	408	-60	0	3	6	28.8			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	403	-60	-10	3	6	33.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	391	-60	-10	3	6	42.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	381	-60	-10	3	6	24.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	381	-60	-10	3	6	25.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	383	-60	-10	3	6	36.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	354	-59	-10	0	6	38.0			
													Cumulative Noise Level, dB(A)	65			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	200	-54	0	3	6	57.0			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	357	-59	-10	3	6	37.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	357	-59	-10	3	6	46.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	357	-59	-10	3	6	37.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	357	-59	-10	3	6	23.0			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	308	-58	-10	3	6	35.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	308	-58	-10	3	6	36.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	320	-58	-10	3	6	38.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	244	-56	-10	3	6	33.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	244	-56	-10	3	6	34.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	403	-60	-10	3	6	30.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	391	-60	-10	3	6	42.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	381	-60	-10	3	6	24.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	381	-60	-10	3	6	25.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	383	-60	-10	3	6	36.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	58			
NSR30	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	123	-50	-5	3	6	57.2			
10/F	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	139	-51	-5	3	6	56.1			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
49.1	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	152	-52	-5	3	6	55.4			
mPD	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	201	-54	0	3	6	58.9			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	292	-57	0	3	6	56.7			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	360	-59	-10	3	6	40.9			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	358	-59	-10	3	6	45.9	Day-time & Evening (7am - 11pm)	65	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	358	-59	-10	3	6	36.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	358	-59	-10	3	6	22.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	287	-57	-10	3	6	37.8			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	300	-58	-10	3	6	37.5			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	327	-58	-10	3	6	43.7			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	310	-58	-10	3	6	35.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	310	-58	-10	3	6	39.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	322	-58	-10	3	6	40.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	248	-56	-10	3	6	33.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	247	-56	-10	3	6	34.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	410	-60	0	3	6	28.7			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	405	-60	-10	3	6	33.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	389	-60	-10	3	6	42.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	383	-60	-10	3	6	24.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	383	-60	-10	3	6	25.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	385	-60	-10	3	6	36.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	352	-59	-10	0	6	38.1			
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	201	-54	0	3	6	56.9			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	360	-59	-10	3	6	37.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	358	-59	-10	3	6	45.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	358	-59	-10	3	6	36.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	358	-59	-10	3	6	22.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	310	-58	-10	3	6	35.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	310	-58	-10	3	6	36.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	322	-58	-10	3	6	38.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	248	-56	-10	3	6	33.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	247	-56	-10	3	6	34.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	405	-60	-10	3	6	30.9			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	389	-60	-10	3	6	42.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	383	-60	-10	3	6	24.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	383	-60	-10	3	6	25.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	385	-60	-10	3	6	36.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	58			
NSR30 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	132	-50	-5	3	6	56.6	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	147	-51	-5	3	6	55.6			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	159	-52	-5	3	6	55.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	205	-54	0	3	6	58.8			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	296	-57	0	3	6	56.6			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	364	-59	-10	3	6	40.8			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	360	-59	-10	3	6	45.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	360	-59	-10	3	6	36.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	360	-59	-10	3	6	22.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	291	-57	-10	3	6	37.7			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	304	-58	-10	3	6	37.4			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	330	-58	-10	3	6	43.6			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	313	-58	-10	3	6	35.1			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	313	-58	-10	3	6	39.1			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	325	-58	-10	3	6	40.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	252	-56	-10	3	6	33.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	252	-56	-10	3	6	34.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	413	-60	0	3	6	28.7			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	406	-60	-10	3	6	33.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	388	-60	-10	3	6	42.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	387	-60	-10	3	6	24.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	387	-60	-10	3	6	25.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	388	-60	-10	3	6	36.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	351	-59	-10	0	6	38.1			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	205	-54	0	3	6	56.8			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	364	-59	-10	3	6	37.8			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	360	-59	-10	3	6	45.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	360	-59	-10	3	6	36.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	360	-59	-10	3	6	22.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	313	-58	-10	3	6	35.1			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	313	-58	-10	3	6	36.1			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	325	-58	-10	3	6	38.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	252	-56	-10	3	6	33.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	252	-56	-10	3	6	34.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	406	-60	-10	3	6	30.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	388	-60	-10	3	6	42.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	387	-60	-10	3	6	24.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	387	-60	-10	3	6	25.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	388	-60	-10	3	6	36.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	58			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR35 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	Y	103	1	103	50	-42	0	3	6	70.0	Day-time & Evening (7am - 11pm)	70	No
	GC-2	Dry cooler	Grandtech Centre	Y	Y	103	1	103	65	-44	0	3	6	67.7			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	Y	103	1	103	82	-46	0	3	6	65.7			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	156	-52	0	3	6	61.1			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	236	-55	0	3	6	58.5			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	301	-58	0	3	6	52.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	299	-58	0	3	6	57.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	299	-58	0	3	6	48.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	299	-58	0	3	6	34.5			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	221	-55	0	3	6	50.1			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	234	-55	0	3	6	49.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	265	-56	-10	3	6	45.5			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	252	-56	-10	3	6	37.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	252	-56	-10	3	6	41.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	265	-56	-10	3	6	42.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	194	-54	-10	3	6	35.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	194	-54	-10	3	6	36.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	348	-59	0	3	6	30.2			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	346	-59	-10	3	6	35.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	350	-59	-10	3	6	43.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	324	-58	-10	3	6	25.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	324	-58	-10	3	6	26.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	324	-58	-10	3	6	37.6			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	316	-58	-10	0	6	39.0			
													Cumulative Noise Level, dB(A)	74			
	GC-1	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	No
	GC-2	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	156	-52	0	3	6	59.1			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	301	-58	0	3	6	49.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	299	-58	0	3	6	57.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	299	-58	0	3	6	48.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	299	-58	0	3	6	34.5			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	252	-56	-10	3	6	37.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	252	-56	-10	3	6	38.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	265	-56	-10	3	6	40.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	194	-54	-10	3	6	35.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	194	-54	-10	3	6	36.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	346	-59	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	350	-59	-10	3	6	43.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	324	-58	-10	3	6	25.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	324	-58	-10	3	6	26.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	331	-58	-10	3	6	37.6			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	62			
NSR35 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	53	-42	-5	3	6	64.6	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	67	-45	-5	3	6	62.5			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	84	-46	-5	3	6	60.5			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	154	-52	0	3	6	61.3			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	236	-55	-10	3	6	48.5			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	302	-58	-10	3	6	42.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	298	-57	-10	3	6	47.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	298	-57	-10	3	6	38.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	298	-57	-10	3	6	24.5			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	222	-55	-10	3	6	40.1			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	235	-55	-10	3	6	39.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	265	-56	-10	3	6	45.5			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	252	-56	-10	3	6	37.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	252	-56	-10	3	6	41.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	264	-56	-10	3	6	42.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	195	-54	-10	3	6	35.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	195	-54	-10	3	6	36.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	349	-59	-10	3	6	20.1			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	345	-59	-10	3	6	35.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	346	-59	-10	3	6	43.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	325	-58	-10	3	6	25.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	325	-58	-10	3	6	26.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	331	-58	-10	3	6	37.6			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	311	-58	-10	0	6	39.1			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	69			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	154	-52	0	3	6	59.3			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	302	-58	-10	3	6	39.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	298	-57	-10	3	6	47.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	298	-57	-10	3	6	38.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	298	-57	-10	3	6	24.5			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	252	-56	-10	3	6	37.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	252	-56	-10	3	6	38.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	264	-56	-10	3	6	40.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	195	-54	-10	3	6	35.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	195	-54	-10	3	6	36.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	345	-59	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	346	-59	-10	3	6	43.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	325	-58	-10	3	6	25.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	325	-58	-10	3	6	26.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	331	-58	-10	3	6	37.6			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	60			
NSR35 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	60	-43	-5	3	6	63.5	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	73	-45	-5	3	6	61.8			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	88	-47	-5	3	6	60.1			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	153	-52	0	3	6	61.3			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	238	-56	-10	3	6	48.5			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	304	-58	-10	3	6	42.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	298	-57	-10	3	6	47.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	298	-57	-10	3	6	38.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	298	-57	-10	3	6	24.5			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	223	-55	-10	3	6	40.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	236	-55	-10	3	6	39.5			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	266	-56	-10	3	6	45.5			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	253	-56	-10	3	6	37.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	253	-56	-10	3	6	41.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	264	-56	-10	3	6	42.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	197	-54	-10	3	6	35.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	197	-54	-10	3	6	36.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	350	-59	-10	3	6	20.1			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	345	-59	-10	3	6	35.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	343	-59	-10	3	6	43.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	327	-58	-10	3	6	25.7			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	327	-58	-10	3	6	26.7			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	332	-58	-10	3	6	37.6			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	308	-58	-10	0	6	39.2			
													Cumulative Noise Level, dB(A)	68			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	153	-52	0	3	6	59.3			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	304	-58	-10	3	6	39.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	298	-57	-10	3	6	47.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	298	-57	-10	3	6	38.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	298	-57	-10	3	6	24.5			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	253	-56	-10	3	6	37.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	253	-56	-10	3	6	38.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	264	-56	-10	3	6	40.6			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	197	-54	-10	3	6	35.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	197	-54	-10	3	6	36.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	345	-59	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	343	-59	-10	3	6	43.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	327	-58	-10	3	6	25.7			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	327	-58	-10	3	6	26.7			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	332	-58	-10	3	6	37.6			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	60			
NSR35 15/F 64.8 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	69	-45	-5	3	6	62.2	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	81	-46	-5	3	6	60.8			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	95	-48	-5	3	6	59.4			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	154	-52	0	3	6	61.3			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	241	-56	-10	3	6	48.4			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	307	-58	-10	3	6	42.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	299	-58	-10	3	6	47.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	299	-58	-10	3	6	38.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	299	-58	-10	3	6	24.5			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	226	-55	-10	3	6	39.9			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	239	-56	-10	3	6	39.4			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	267	-57	-10	3	6	45.5			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	254	-56	-10	3	6	36.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	254	-56	-10	3	6	40.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	266	-56	-10	3	6	42.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	200	-54	-10	3	6	35.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	200	-54	-10	3	6	36.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	352	-59	-10	3	6	20.1			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	346	-59	-10	3	6	35.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	341	-59	-10	3	6	43.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	329	-58	-10	3	6	25.6			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	329	-58	-10	3	6	26.6			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	334	-58	-10	3	6	37.5			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	305	-58	-10	0	6	39.3			
													Cumulative Noise Level, dB(A)	67			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	154	-52	0	3	6	59.3			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	307	-58	-10	3	6	39.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	299	-58	-10	3	6	47.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	299	-58	-10	3	6	38.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	299	-58	-10	3	6	24.5			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	254	-56	-10	3	6	36.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	254	-56	-10	3	6	37.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	266	-56	-10	3	6	40.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	200	-54	-10	3	6	35.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	200	-54	-10	3	6	36.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	346	-59	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	341	-59	-10	3	6	43.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	329	-58	-10	3	6	25.6			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	329	-58	-10	3	6	26.6			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	334	-58	-10	3	6	37.5			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	60			
NSR35 10/F 49.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	81	-46	-5	3	6	60.8			
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	91	-47	-5	3	6	59.8			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	104	-48	-5	3	6	58.7			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	156	-52	0	3	6	61.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	244	-56	-10	3	6	48.2			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	311	-58	-10	3	6	42.2			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	300	-58	-10	3	6	47.4	Day-time & Evening (7am - 11pm)	70	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	300	-58	-10	3	6	38.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	300	-58	-10	3	6	24.4			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	230	-55	-10	3	6	39.8			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	243	-56	-10	3	6	39.3			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	270	-57	-10	3	6	45.4			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	257	-56	-10	3	6	36.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	257	-56	-10	3	6	40.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	268	-57	-10	3	6	42.4			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	204	-54	-10	3	6	34.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	204	-54	-10	3	6	35.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	355	-59	-10	3	6	20.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	347	-59	-10	3	6	35.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	339	-59	-10	3	6	43.4			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	332	-58	-10	3	6	25.6			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	332	-58	-10	3	6	26.6			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	336	-59	-10	3	6	37.5			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	303	-58	-10	0	6	39.4			
													Cumulative Noise Level, dB(A)	67			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	156	-52	0	3	6	59.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	311	-58	-10	3	6	39.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	300	-58	-10	3	6	47.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	300	-58	-10	3	6	38.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	300	-58	-10	3	6	24.4			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	257	-56	-10	3	6	36.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	257	-56	-10	3	6	37.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	268	-57	-10	3	6	40.4			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	204	-54	-10	3	6	34.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	204	-54	-10	3	6	35.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	347	-59	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	339	-59	-10	3	6	43.4			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	332	-58	-10	3	6	25.6			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	332	-58	-10	3	6	26.6			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	336	-59	-10	3	6	37.5			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	60			
NSR35 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	94	-47	-5	3	6	59.5	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	103	-48	-5	3	6	58.8			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	P	103	1	103	114	-49	-5	3	6	57.8			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	160	-52	0	3	6	60.9			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	249	-56	-10	3	6	48.1			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	315	-58	-10	3	6	42.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	303	-58	-10	3	6	47.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	303	-58	-10	3	6	38.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	303	-58	-10	3	6	24.4			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	235	-55	-10	3	6	39.6			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	247	-56	-10	3	6	39.1			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	273	-57	-10	3	6	45.3			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	260	-56	-10	3	6	36.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	260	-56	-10	3	6	40.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	271	-57	-10	3	6	42.3			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	210	-54	-10	3	6	34.6			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	210	-54	-10	3	6	35.6			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	359	-59	-10	3	6	19.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	349	-59	-10	3	6	35.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	338	-59	-10	3	6	43.4			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	336	-59	-10	3	6	25.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	336	-59	-10	3	6	26.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	340	-59	-10	3	6	37.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	302	-58	-10	0	6	39.4			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	66			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	160	-52	0	3	6	58.9			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	315	-58	-10	3	6	39.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	303	-58	-10	3	6	47.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	303	-58	-10	3	6	38.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	303	-58	-10	3	6	24.4			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	260	-56	-10	3	6	36.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	260	-56	-10	3	6	37.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	271	-57	-10	3	6	40.3			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	210	-54	-10	3	6	34.6			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	210	-54	-10	3	6	35.6			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	349	-59	-10	3	6	32.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	338	-59	-10	3	6	43.4			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	336	-59	-10	3	6	25.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	336	-59	-10	3	6	26.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	340	-59	-10	3	6	37.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	60			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR36_a 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	44	-41	-10	3	6	61.1	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	57	-43	-10	3	6	58.9			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	75	-46	-10	3	6	56.5			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	152	-52	-10	3	6	51.3			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	230	-55	-10	3	6	48.8			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	295	-57	-10	3	6	42.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	291	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	291	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	291	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	214	-55	-10	3	6	40.4			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	226	-55	-10	3	6	39.9			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	257	-56	-10	3	6	45.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	244	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	244	-56	-10	3	6	41.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	257	-56	-10	3	6	42.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	188	-53	-10	3	6	35.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	188	-53	-10	3	6	36.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	341	-59	-10	3	6	20.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	338	-59	-10	3	6	35.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	343	-59	-10	3	6	43.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	316	-58	-10	3	6	26.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	316	-58	-10	3	6	27.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	324	-58	-10	3	6	37.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	309	-58	-10	0	6	39.2			
												Cumulative Noise Level, dB(A)		65			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	152	-52	-10	3	6	49.3			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	295	-57	-10	3	6	39.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	291	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	291	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	291	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	244	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	244	-56	-10	3	6	38.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	257	-56	-10	3	6	40.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	188	-53	-10	3	6	35.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	188	-53	-10	3	6	36.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	338	-59	-10	3	6	32.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	343	-59	-10	3	6	43.3			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	316	-58	-10	3	6	26.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	316	-58	-10	3	6	27.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	324	-58	-10	3	6	37.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
												Cumulative Noise Level, dB(A)		54			
NSR36_a 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	47	-41	-10	3	6	60.6	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	59	-43	-10	3	6	58.5			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	77	-46	-10	3	6	56.3			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	150	-52	-10	3	6	51.5			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	231	-55	-10	3	6	48.7			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	296	-57	-10	3	6	42.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	290	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	290	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	290	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	215	-55	-10	3	6	40.4			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	227	-55	-10	3	6	39.9			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	257	-56	-10	3	6	45.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	244	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	244	-56	-10	3	6	41.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	256	-56	-10	3	6	42.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	189	-54	-10	3	6	35.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	189	-54	-10	3	6	36.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	342	-59	-10	3	6	20.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	337	-59	-10	3	6	35.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	340	-59	-10	3	6	43.4			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	317	-58	-10	3	6	26.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	317	-58	-10	3	6	27.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	324	-58	-10	3	6	37.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	305	-58	-10	0	6	39.3			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	150	-52	-10	3	6	49.5			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	296	-57	-10	3	6	39.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	290	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	290	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	290	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	244	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	244	-56	-10	3	6	38.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	256	-56	-10	3	6	40.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	189	-54	-10	3	6	35.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	189	-54	-10	3	6	36.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	337	-59	-10	3	6	32.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	340	-59	-10	3	6	43.4			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	317	-58	-10	3	6	26.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	317	-58	-10	3	6	27.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	324	-58	-10	3	6	37.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	54			
NSR36_a 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	55	-43	-10	3	6	59.3	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	66	-44	-10	3	6	57.7			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	82	-46	-10	3	6	55.8			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	149	-51	-10	3	6	51.5			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	232	-55	-10	3	6	48.7			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	298	-57	-10	3	6	42.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	290	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	290	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	290	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	216	-55	-10	3	6	40.3			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	228	-55	-10	3	6	39.8			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	258	-56	-10	3	6	45.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	245	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	245	-56	-10	3	6	41.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	256	-56	-10	3	6	42.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	191	-54	-10	3	6	35.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	191	-54	-10	3	6	36.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	343	-59	-10	3	6	20.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	337	-59	-10	3	6	35.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	336	-59	-10	3	6	43.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	319	-58	-10	3	6	25.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	319	-58	-10	3	6	26.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	325	-58	-10	3	6	37.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	301	-58	-10	0	6	39.4			
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	149	-51	-10	3	6	49.5			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	298	-57	-10	3	6	39.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	290	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	290	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	290	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	245	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	245	-56	-10	3	6	38.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	256	-56	-10	3	6	40.8			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	191	-54	-10	3	6	35.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	191	-54	-10	3	6	36.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	337	-59	-10	3	6	32.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	336	-59	-10	3	6	43.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	319	-58	-10	3	6	25.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	319	-58	-10	3	6	26.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	325	-58	-10	3	6	37.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	54			
NSR36_a 15/F 64.8 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	65	-44	-10	3	6	57.7	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	75	-45	-10	3	6	56.5			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	89	-47	-10	3	6	55.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	150	-52	-10	3	6	51.5			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	235	-55	-10	3	6	48.6			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	301	-58	-10	3	6	42.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	291	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	291	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	291	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	219	-55	-10	3	6	40.2			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	231	-55	-10	3	6	39.7			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	259	-56	-10	3	6	45.7			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	246	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	246	-56	-10	3	6	41.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	258	-56	-10	3	6	42.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	194	-54	-10	3	6	35.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	194	-54	-10	3	6	36.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	346	-59	-10	3	6	20.2			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	338	-59	-10	3	6	35.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	334	-58	-10	3	6	43.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	321	-58	-10	3	6	25.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	321	-58	-10	3	6	26.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	327	-58	-10	3	6	37.7			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	298	-57	-10	0	6	39.5			
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	150	-52	-10	3	6	49.5			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	301	-58	-10	3	6	39.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	291	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	291	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	291	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	246	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	246	-56	-10	3	6	38.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	258	-56	-10	3	6	40.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	194	-54	-10	3	6	35.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	194	-54	-10	3	6	36.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	338	-59	-10	3	6	32.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	334	-58	-10	3	6	43.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	321	-58	-10	3	6	25.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	321	-58	-10	3	6	26.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	327	-58	-10	3	6	37.7			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	54			
NSR36_a 10/F 49.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	78	-46	-10	3	6	56.2			
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	86	-47	-10	3	6	55.4			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	98	-48	-10	3	6	54.1			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	152	-52	-10	3	6	51.3			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	238	-56	-10	3	6	48.5			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	305	-58	-10	3	6	42.3			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	292	-57	-10	3	6	47.7	Day-time & Evening (7am - 11pm)	70	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	292	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	292	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	223	-55	-10	3	6	40.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	235	-55	-10	3	6	39.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	262	-56	-10	3	6	45.6			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	249	-56	-10	3	6	37.1			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	249	-56	-10	3	6	41.1			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	260	-56	-10	3	6	42.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	199	-54	-10	3	6	35.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	199	-54	-10	3	6	36.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	348	-59	-10	3	6	20.2			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	339	-59	-10	3	6	35.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	332	-58	-10	3	6	43.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	325	-58	-10	3	6	25.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	325	-58	-10	3	6	26.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	330	-58	-10	3	6	37.6			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	296	-57	-10	0	6	39.6			
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	152	-52	-10	3	6	49.3			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	305	-58	-10	3	6	39.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	292	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	292	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	292	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	249	-56	-10	3	6	37.1			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	249	-56	-10	3	6	38.1			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	260	-56	-10	3	6	40.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	199	-54	-10	3	6	35.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	199	-54	-10	3	6	36.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	339	-59	-10	3	6	32.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	332	-58	-10	3	6	43.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	325	-58	-10	3	6	25.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	325	-58	-10	3	6	26.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	330	-58	-10	3	6	37.6			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	53			
NSR36_a 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	91	-47	-10	3	6	54.8	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	98	-48	-10	3	6	54.2			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	Y	N	103	1	103	109	-49	-10	3	6	53.2			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	156	-52	-10	3	6	51.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	243	-56	-10	3	6	48.3			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	309	-58	-10	3	6	42.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	295	-57	-10	3	6	47.6			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	295	-57	-10	3	6	38.6			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	295	-57	-10	3	6	24.6			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	228	-55	-10	3	6	39.8			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	240	-56	-10	3	6	39.4			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	266	-56	-10	3	6	45.5			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	252	-56	-10	3	6	37.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	252	-56	-10	3	6	41.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	263	-56	-10	3	6	42.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	204	-54	-10	3	6	34.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	204	-54	-10	3	6	35.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	352	-59	-10	3	6	20.1			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	341	-59	-10	3	6	35.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	331	-58	-10	3	6	43.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	329	-58	-10	3	6	25.7			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	329	-58	-10	3	6	26.7			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	333	-58	-10	3	6	37.6			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	295	-57	-10	0	6	39.6			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	61			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	156	-52	-10	3	6	49.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	309	-58	-10	3	6	39.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	295	-57	-10	3	6	47.6			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	295	-57	-10	3	6	38.6			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	295	-57	-10	3	6	24.6			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	252	-56	-10	3	6	37.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	252	-56	-10	3	6	38.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	263	-56	-10	3	6	40.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	204	-54	-10	3	6	34.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	204	-54	-10	3	6	35.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	341	-59	-10	3	6	32.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	331	-58	-10	3	6	43.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	329	-58	-10	3	6	25.7			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	329	-58	-10	3	6	26.7			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	333	-58	-10	3	6	37.6			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	53			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR37 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	Y	103	1	103	40	-40	0	3	6	72.0	Day-time & Evening (7am - 11pm)	70	No
	GC-2	Dry cooler	Grandtech Centre	Y	Y	103	1	103	50	-42	0	3	6	70.0			
	GC-3	Dry cooler	Grandtech Centre	Y	Y	103	1	103	74	-45	0	3	6	66.6			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	148	-51	0	3	6	61.6			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	225	-55	0	3	6	59.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	289	-57	0	3	6	52.8			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	284	-57	0	3	6	57.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	284	-57	0	3	6	48.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	284	-57	0	3	6	34.9			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	206	-54	0	3	6	50.7			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	218	-55	0	3	6	50.2			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	248	-56	0	3	6	56.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	236	-55	0	3	6	47.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	236	-55	0	3	6	51.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	249	-56	0	3	6	53.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	181	-53	0	3	6	45.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	181	-53	0	3	6	46.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	334	-58	0	3	6	30.5			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	330	-58	0	3	6	45.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	336	-59	0	3	6	53.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	308	-58	0	3	6	36.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	308	-58	0	3	6	37.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	316	-58	0	3	6	48.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	301	-58	0	0	6	49.4			
													Cumulative Noise Level, dB(A)	75			
	GC-1	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	No
	GC-2	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	148	-51	0	3	6	59.6			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	289	-57	0	3	6	49.8			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	284	-57	0	3	6	57.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	284	-57	0	3	6	48.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	284	-57	0	3	6	34.9			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	236	-55	0	3	6	47.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	236	-55	0	3	6	48.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	249	-56	0	3	6	51.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	181	-53	0	3	6	45.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	181	-53	0	3	6	46.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	330	-58	0	3	6	42.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	336	-59	0	3	6	53.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	308	-58	0	3	6	36.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	308	-58	0	3	6	37.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	316	-58	0	3	6	48.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	64			
NSR37 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	43	-41	-5	3	6	66.3	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	53	-42	-5	3	6	64.6			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	76	-46	-5	3	6	61.4			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	146	-51	-10	3	6	51.7			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	226	-55	-10	3	6	48.9			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	290	-57	-10	3	6	42.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	283	-57	-10	3	6	48.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	283	-57	-10	3	6	39.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	283	-57	-10	3	6	25.0			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	207	-54	-10	3	6	40.7			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	219	-55	-10	3	6	40.2			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	248	-56	-10	3	6	46.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	236	-55	0	3	6	47.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	236	-55	0	3	6	51.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	248	-56	0	3	6	53.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	182	-53	0	3	6	45.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	182	-53	0	3	6	46.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	335	-58	0	3	6	30.5			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	329	-58	-10	3	6	35.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	332	-58	0	3	6	53.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	309	-58	0	3	6	36.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	309	-58	0	3	6	37.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	316	-58	0	3	6	48.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	297	-57	0	0	6	49.6			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	70			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	146	-51	-10	3	6	49.7			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	290	-57	-10	3	6	39.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	283	-57	-10	3	6	48.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	283	-57	-10	3	6	39.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	283	-57	-10	3	6	25.0			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	236	-55	0	3	6	47.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	236	-55	0	3	6	48.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	248	-56	0	3	6	51.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	182	-53	0	3	6	45.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	182	-53	0	3	6	46.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	329	-58	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	332	-58	0	3	6	53.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	309	-58	0	3	6	36.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	309	-58	0	3	6	37.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	316	-58	0	3	6	48.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR37	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	51	-42	-5	3	6	64.8	Day-time & Evening (7am - 11pm)	70	Yes
20/F	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	60	-43	-5	3	6	63.5			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	81	-46	-5	3	6	60.9			
80.6	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
mPD	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	145	-51	-10	3	6	51.8			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	227	-55	-10	3	6	48.9			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	292	-57	-10	3	6	42.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	283	-57	-10	3	6	48.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	283	-57	-10	3	6	39.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	283	-57	-10	3	6	25.0			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	209	-54	-10	3	6	40.6			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	220	-55	-10	3	6	40.1			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	249	-56	-10	3	6	46.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	237	-55	0	3	6	47.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	237	-55	0	3	6	51.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	248	-56	0	3	6	53.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	184	-53	0	3	6	45.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	184	-53	0	3	6	46.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	336	-59	0	3	6	30.5			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	329	-58	-10	3	6	35.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	329	-58	0	3	6	53.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	311	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	311	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	317	-58	0	3	6	48.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	293	-57	0	0	6	49.7			
													Cumulative Noise Level, dB(A)	69			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	145	-51	-10	3	6	49.8			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	292	-57	-10	3	6	39.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	283	-57	-10	3	6	48.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	283	-57	-10	3	6	39.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	283	-57	-10	3	6	25.0			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	237	-55	0	3	6	47.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	237	-55	0	3	6	48.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	248	-56	0	3	6	51.1			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	184	-53	0	3	6	45.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	184	-53	0	3	6	46.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	329	-58	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	329	-58	0	3	6	53.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	311	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	311	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	317	-58	0	3	6	48.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR37 15/F 64.8 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	63	-44	-5	3	6	63.1	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	69	-45	-5	3	6	62.2			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	88	-47	-5	3	6	60.1			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	146	-51	-10	3	6	51.7			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	230	-55	-10	3	6	48.8			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	295	-57	-10	3	6	42.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	284	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	284	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	284	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	212	-55	-10	3	6	40.5			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	223	-55	-10	3	6	40.0			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	251	-56	-10	3	6	46.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	238	-56	0	3	6	47.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	238	-56	0	3	6	51.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	250	-56	0	3	6	53.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	187	-53	0	3	6	45.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	187	-53	0	3	6	46.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	339	-59	0	3	6	30.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	330	-58	-10	3	6	35.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	326	-58	0	3	6	53.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	314	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	314	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	319	-58	0	3	6	47.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	290	-57	0	0	6	49.7			
													Cumulative Noise Level, dB(A)	68			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	146	-51	-10	3	6	49.7			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	295	-57	-10	3	6	39.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	284	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	284	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	284	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	238	-56	0	3	6	47.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	238	-56	0	3	6	48.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	250	-56	0	3	6	51.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	187	-53	0	3	6	45.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	187	-53	0	3	6	46.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	330	-58	-10	3	6	32.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	326	-58	0	3	6	53.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	314	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	314	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	319	-58	0	3	6	47.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR37 10/F 49.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	75	-46	-5	3	6	61.5			
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	81	-46	-5	3	6	60.8			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	98	-48	-5	3	6	59.2			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	148	-51	-10	3	6	51.6			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	234	-55	-10	3	6	48.6			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	299	-58	-10	3	6	42.5			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9	Day-time & Evening (7am - 11pm)	70	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	216	-55	-10	3	6	40.3			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	227	-55	-10	3	6	39.9			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	253	-56	-10	3	6	45.9			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	241	-56	0	3	6	47.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	241	-56	0	3	6	51.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	252	-56	0	3	6	53.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	192	-54	0	3	6	45.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	192	-54	0	3	6	46.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	342	-59	0	3	6	30.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	331	-58	-10	3	6	35.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	324	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	317	-58	0	3	6	36.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	317	-58	0	3	6	37.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	322	-58	0	3	6	47.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	288	-57	0	0	6	49.8			
													Cumulative Noise Level, dB(A)	67			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	148	-51	-10	3	6	49.6			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	299	-58	-10	3	6	39.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	241	-56	0	3	6	47.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	241	-56	0	3	6	48.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	252	-56	0	3	6	51.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	192	-54	0	3	6	45.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	192	-54	0	3	6	46.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	331	-58	-10	3	6	32.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	324	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	317	-58	0	3	6	36.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	317	-58	0	3	6	37.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	322	-58	0	3	6	47.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR37 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	89	-47	-5	3	6	60.0	Day-time & Evening (7am - 11pm)	70	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	94	-47	-5	3	6	59.5			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	109	-49	-5	3	6	58.3			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	153	-52	-10	3	6	51.3			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	238	-56	-10	3	6	48.5			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	303	-58	-10	3	6	42.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	288	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	288	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	288	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	221	-55	-10	3	6	40.1			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	232	-55	-10	3	6	39.7			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	257	-56	-10	3	6	45.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	244	-56	0	3	6	47.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	244	-56	0	3	6	51.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	256	-56	0	3	6	52.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	198	-54	0	3	6	45.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	198	-54	0	3	6	46.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	345	-59	0	3	6	30.2			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	333	-58	-10	3	6	35.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	323	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	321	-58	0	3	6	35.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	321	-58	0	3	6	36.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	325	-58	0	3	6	47.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	287	-57	0	0	6	49.8			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	66			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	60	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	153	-52	-10	3	6	49.3			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	303	-58	-10	3	6	39.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	288	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	288	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	288	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	244	-56	0	3	6	47.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	244	-56	0	3	6	48.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	256	-56	0	3	6	50.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	198	-54	0	3	6	45.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	198	-54	0	3	6	46.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	333	-58	-10	3	6	32.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	323	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	321	-58	0	3	6	35.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	321	-58	0	3	6	36.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	325	-58	0	3	6	47.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR39 a 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	50	-42	-10	3	6	60.0	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	54	-43	-10	3	6	59.4			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	74	-45	-10	3	6	56.6			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	158	-52	-10	3	6	51.0			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	234	-55	-10	3	6	48.6			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	297	-57	-10	3	6	42.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	287	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	287	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	287	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	208	-54	-10	3	6	40.6			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	221	-55	-10	3	6	40.1			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	247	-56	-10	3	6	46.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	231	-55	0	3	6	47.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	231	-55	0	3	6	51.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	245	-56	0	3	6	53.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	173	-53	-10	3	6	36.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	173	-53	-10	3	6	37.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	339	-59	-10	3	6	20.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	329	-58	-10	3	6	35.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	330	-58	-10	3	6	43.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	303	-58	0	3	6	36.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	303	-58	0	3	6	37.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	309	-58	0	3	6	48.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	296	-57	0	0	6	49.6			
													Cumulative Noise Level, dB(A)	65			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	158	-52	-10	3	6	49.0			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	297	-57	-10	3	6	39.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	287	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	287	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	287	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	231	-55	0	3	6	47.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	231	-55	0	3	6	48.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	245	-56	0	3	6	51.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	173	-53	-10	3	6	36.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	173	-53	-10	3	6	37.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	329	-58	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	330	-58	-10	3	6	43.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	303	-58	0	3	6	36.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	303	-58	0	3	6	37.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	309	-58	0	3	6	48.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR39_a 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	53	-42	-10	3	6	59.6	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	56	-43	-10	3	6	59.0			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	76	-46	-10	3	6	56.4			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	156	-52	-10	3	6	51.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	234	-55	-10	3	6	48.6			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	298	-57	-10	3	6	42.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	209	-54	-10	3	6	40.6			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	222	-55	-10	3	6	40.1			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	247	-56	-10	3	6	46.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	231	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	231	-55	-10	3	6	41.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	244	-56	-10	3	6	43.3			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	174	-53	-10	3	6	36.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	174	-53	-10	3	6	37.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	340	-59	-10	3	6	20.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	328	-58	-10	3	6	35.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	326	-58	-10	3	6	43.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	304	-58	0	3	6	36.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	304	-58	0	3	6	37.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	309	-58	0	3	6	48.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	291	-57	0	0	6	49.7			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	156	-52	-10	3	6	49.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	298	-57	-10	3	6	39.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	231	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	231	-55	-10	3	6	38.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	244	-56	-10	3	6	41.3			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	174	-53	-10	3	6	36.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	174	-53	-10	3	6	37.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	328	-58	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	326	-58	-10	3	6	43.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	304	-58	0	3	6	36.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	304	-58	0	3	6	37.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	309	-58	0	3	6	48.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	55			
NSR39_a 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	60	-43	-10	3	6	58.5	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	63	-44	-10	3	6	58.0			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	81	-46	-10	3	6	55.9			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	155	-52	-10	3	6	51.2			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	236	-55	-10	3	6	48.5			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	300	-58	-10	3	6	42.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	210	-54	-10	3	6	40.5			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	223	-55	-10	3	6	40.0			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	248	-56	-10	3	6	46.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	232	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	232	-55	-10	3	6	41.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	244	-56	-10	3	6	43.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	176	-53	-10	3	6	36.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	176	-53	-10	3	6	37.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	341	-59	-10	3	6	20.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	328	-58	-10	3	6	35.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	323	-58	-10	3	6	43.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	306	-58	0	3	6	36.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	306	-58	0	3	6	37.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	310	-58	0	3	6	48.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	287	-57	0	0	6	49.8			
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	155	-52	-10	3	6	49.2			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	300	-58	-10	3	6	39.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	232	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	232	-55	-10	3	6	38.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	244	-56	-10	3	6	41.2			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	176	-53	-10	3	6	36.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	176	-53	-10	3	6	37.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	328	-58	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	323	-58	-10	3	6	43.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	306	-58	0	3	6	36.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	306	-58	0	3	6	37.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	310	-58	0	3	6	48.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	55			
NSR39_a 15/F 64.8 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	69	-45	-10	3	6	57.2	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	72	-45	-10	3	6	56.8			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	88	-47	-10	3	6	55.1			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	156	-52	-10	3	6	51.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	239	-56	-10	3	6	48.4			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	303	-58	-10	3	6	42.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	287	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	287	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	287	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	213	-55	-10	3	6	40.4			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	226	-55	-10	3	6	39.9			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	250	-56	-10	3	6	46.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	233	-55	-10	3	6	37.6			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	233	-55	-10	3	6	41.6			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	246	-56	-10	3	6	43.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	180	-53	-10	3	6	35.9			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	180	-53	-10	3	6	36.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	344	-59	-10	3	6	20.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	329	-58	-10	3	6	35.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	320	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	309	-58	0	3	6	36.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	309	-58	0	3	6	37.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	312	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	284	-57	0	0	6	49.9			
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	156	-52	-10	3	6	49.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	303	-58	-10	3	6	39.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	287	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	287	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	287	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	233	-55	-10	3	6	37.6			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	233	-55	-10	3	6	38.6			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	246	-56	-10	3	6	41.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	180	-53	-10	3	6	35.9			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	180	-53	-10	3	6	36.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	329	-58	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	320	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	309	-58	0	3	6	36.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	309	-58	0	3	6	37.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	312	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	55			
NSR39_a 10/F 49.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	81	-46	-10	3	6	55.8			
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	84	-46	-10	3	6	55.6			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	98	-48	-10	3	6	54.2			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	158	-52	-10	3	6	51.0			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	242	-56	-10	3	6	48.3			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	307	-58	-10	3	6	42.3			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	289	-57	-10	3	6	47.8	Day-time & Evening (7am - 11pm)	65	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	289	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	289	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	218	-55	-10	3	6	40.2			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	230	-55	-10	3	6	39.8			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	252	-56	-10	3	6	46.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	236	-55	-10	3	6	37.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	236	-55	-10	3	6	41.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	248	-56	-10	3	6	43.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	185	-53	-10	3	6	35.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	184	-53	-10	3	6	36.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	346	-59	-10	3	6	20.2			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	330	-58	-10	3	6	35.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	318	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	312	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	312	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	315	-58	0	3	6	48.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	282	-57	0	0	6	50.0			
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	158	-52	-10	3	6	49.0			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	307	-58	-10	3	6	39.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	289	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	289	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	289	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	236	-55	-10	3	6	37.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	236	-55	-10	3	6	38.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	248	-56	-10	3	6	41.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	185	-53	-10	3	6	35.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	184	-53	-10	3	6	36.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	330	-58	-10	3	6	32.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	318	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	312	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	312	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	315	-58	0	3	6	48.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	55			
NSR39_a 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	94	-47	-10	3	6	54.5	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	96	-48	-10	3	6	54.3			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	109	-49	-10	3	6	53.3			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	162	-52	-10	3	6	50.8			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	247	-56	-10	3	6	48.2			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	311	-58	-10	3	6	42.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	291	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	291	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	291	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	223	-55	-10	3	6	40.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	235	-55	-10	3	6	39.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	256	-56	-10	3	6	45.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	240	-56	-10	3	6	37.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	240	-56	-10	3	6	41.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	252	-56	-10	3	6	43.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	191	-54	-10	3	6	35.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	191	-54	-10	3	6	36.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	350	-59	-10	3	6	20.1			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	332	-58	-10	3	6	35.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	317	-58	-10	3	6	44.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	316	-58	0	3	6	36.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	316	-58	0	3	6	37.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	318	-58	0	3	6	47.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	281	-57	0	0	6	50.0			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	61			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	162	-52	-10	3	6	48.8			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	311	-58	-10	3	6	39.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	291	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	291	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	291	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	240	-56	-10	3	6	37.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	240	-56	-10	3	6	38.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	252	-56	-10	3	6	41.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	191	-54	-10	3	6	35.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	191	-54	-10	3	6	36.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	332	-58	-10	3	6	32.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	317	-58	-10	3	6	44.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	316	-58	0	3	6	36.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	316	-58	0	3	6	37.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	318	-58	0	3	6	47.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	55			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR40_a 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	51	-42	-10	3	6	59.8	Day-time & Evening (7am - 11pm)	65	No
	GC-2	Dry cooler	Grandtech Centre	Y	Y	103	1	103	55	-43	0	3	6	69.2			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	74	-45	-10	3	6	56.6			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	159	-52	-10	3	6	51.0			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	235	-55	-10	3	6	48.6			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	298	-57	0	3	6	52.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	287	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	287	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	287	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	208	-54	0	3	6	50.6			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	221	-55	0	3	6	50.1			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	247	-56	-10	3	6	46.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	231	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	231	-55	-10	3	6	41.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	245	-56	-10	3	6	43.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	172	-53	-10	3	6	36.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	172	-53	-10	3	6	37.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	339	-59	0	3	6	30.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	328	-58	-10	3	6	35.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	329	-58	-10	3	6	43.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	302	-58	-10	3	6	26.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	302	-58	-10	3	6	27.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	309	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	295	-57	-10	0	6	39.6			
													Cumulative Noise Level, dB(A)	70			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	159	-52	-10	3	6	49.0			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	298	-57	0	3	6	49.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	287	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	287	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	287	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	231	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	231	-55	-10	3	6	38.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	245	-56	-10	3	6	41.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	172	-53	-10	3	6	36.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	172	-53	-10	3	6	37.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	328	-58	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	329	-58	-10	3	6	43.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	302	-58	-10	3	6	26.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	302	-58	-10	3	6	27.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	309	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	55			
NSR40_a 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	54	-43	-10	3	6	59.4	Day-time & Evening (7am - 11pm)	65	No
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	57	-43	-5	3	6	63.8			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	76	-46	-10	3	6	56.4			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	157	-52	-10	3	6	51.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	235	-55	-10	3	6	48.6			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	299	-58	-10	3	6	42.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	209	-54	-10	3	6	40.6			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	222	-55	-10	3	6	40.1			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	247	-56	-10	3	6	46.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	231	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	231	-55	-10	3	6	41.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	244	-56	-10	3	6	43.3			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	173	-53	-10	3	6	36.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	173	-53	-10	3	6	37.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	340	-59	-10	3	6	20.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	327	-58	-10	3	6	35.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	325	-58	-10	3	6	43.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	303	-58	-10	3	6	26.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	303	-58	-10	3	6	27.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	309	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	290	-57	-10	0	6	39.8			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	66			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	157	-52	-10	3	6	49.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	299	-58	-10	3	6	39.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	231	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	231	-55	-10	3	6	38.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	244	-56	-10	3	6	41.3			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	173	-53	-10	3	6	36.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	173	-53	-10	3	6	37.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	327	-58	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	325	-58	-10	3	6	43.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	303	-58	-10	3	6	26.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	303	-58	-10	3	6	27.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	309	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	54			
NSR40_a 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	60	-44	-10	3	6	58.4	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	64	-44	-5	3	6	62.9			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	81	-46	-10	3	6	55.9			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	156	-52	-10	3	6	51.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	237	-55	-10	3	6	48.5			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	301	-58	-10	3	6	42.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	210	-54	-10	3	6	40.5			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	223	-55	-10	3	6	40.0			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	248	-56	-10	3	6	46.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	232	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	232	-55	-10	3	6	41.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	244	-56	-10	3	6	43.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	175	-53	-10	3	6	36.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	175	-53	-10	3	6	37.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	341	-59	-10	3	6	20.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	327	-58	-10	3	6	35.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	322	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	305	-58	-10	3	6	26.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	305	-58	-10	3	6	27.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	310	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	286	-57	-10	0	6	39.9			
													Cumulative Noise Level, dB(A)	65			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	156	-52	-10	3	6	49.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	301	-58	-10	3	6	39.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	232	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	232	-55	-10	3	6	38.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	244	-56	-10	3	6	41.2			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	175	-53	-10	3	6	36.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	175	-53	-10	3	6	37.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	327	-58	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	322	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	305	-58	-10	3	6	26.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	305	-58	-10	3	6	27.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	310	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	54			
NSR40_a 15/F 64.8 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	70	-45	-10	3	6	57.1	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	73	-45	-5	3	6	61.7			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	88	-47	-10	3	6	55.1			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	157	-52	-10	3	6	51.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	240	-56	-10	3	6	48.4			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	304	-58	-10	3	6	42.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	287	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	287	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	287	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	213	-55	-10	3	6	40.4			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	226	-55	-10	3	6	39.9			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	250	-56	-10	3	6	46.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	233	-55	-10	3	6	37.6			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	233	-55	-10	3	6	41.6			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	246	-56	-10	3	6	43.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	179	-53	-10	3	6	36.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	179	-53	-10	3	6	37.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	344	-59	-10	3	6	20.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	328	-58	-10	3	6	35.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	319	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	308	-58	-10	3	6	26.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	308	-58	-10	3	6	27.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	312	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	283	-57	-10	0	6	39.9			
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	157	-52	-10	3	6	49.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	304	-58	-10	3	6	39.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	287	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	287	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	287	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	233	-55	-10	3	6	37.6			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	233	-55	-10	3	6	38.6			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	246	-56	-10	3	6	41.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	179	-53	-10	3	6	36.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	179	-53	-10	3	6	37.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	328	-58	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	319	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	308	-58	-10	3	6	26.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	308	-58	-10	3	6	27.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	312	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	54			
NSR40_a 10/F 49.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	82	-46	-10	3	6	55.8			
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	84	-47	-5	3	6	60.5			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	98	-48	-10	3	6	54.2			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	159	-52	-10	3	6	51.0			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	243	-56	-10	3	6	48.3			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	308	-58	-10	3	6	42.2			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	289	-57	-10	3	6	47.8	Day-time & Evening (7am - 11pm)	65	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	289	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	289	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	218	-55	-10	3	6	40.2			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	230	-55	-10	3	6	39.8			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	252	-56	-10	3	6	46.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	236	-55	-10	3	6	37.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	236	-55	-10	3	6	41.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	248	-56	-10	3	6	43.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	184	-53	-10	3	6	35.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	184	-53	-10	3	6	36.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	346	-59	-10	3	6	20.2			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	329	-58	-10	3	6	35.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	317	-58	-10	3	6	44.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	311	-58	-10	3	6	26.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	311	-58	-10	3	6	27.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	315	-58	-10	3	6	38.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	281	-57	-10	0	6	40.0			
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	159	-52	-10	3	6	49.0			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	308	-58	-10	3	6	39.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	289	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	289	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	289	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	236	-55	-10	3	6	37.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	236	-55	-10	3	6	38.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	248	-56	-10	3	6	41.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	184	-53	-10	3	6	35.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	184	-53	-10	3	6	36.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	329	-58	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	317	-58	-10	3	6	44.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	311	-58	-10	3	6	26.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	311	-58	-10	3	6	27.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	315	-58	-10	3	6	38.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	53			
NSR40_a 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	95	-48	-10	3	6	54.5	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	97	-48	-5	3	6	59.3			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	109	-49	-10	3	6	53.3			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	163	-52	-10	3	6	50.8			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	248	-56	-10	3	6	48.1			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	312	-58	-10	3	6	42.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	291	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	291	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	291	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	223	-55	-10	3	6	40.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	235	-55	-10	3	6	39.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	256	-56	-10	3	6	45.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	240	-56	-10	3	6	37.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	240	-56	-10	3	6	41.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	252	-56	-10	3	6	43.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	190	-54	-10	3	6	35.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	190	-54	-10	3	6	36.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	350	-59	-10	3	6	20.1			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	331	-58	-10	3	6	35.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	316	-58	-10	3	6	44.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	315	-58	-10	3	6	26.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	315	-58	-10	3	6	27.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	318	-58	-10	3	6	37.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	280	-57	-10	0	6	40.0			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	163	-52	-10	3	6	48.8			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	312	-58	-10	3	6	39.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	291	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	291	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	291	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	240	-56	-10	3	6	37.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	240	-56	-10	3	6	38.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	252	-56	-10	3	6	41.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	190	-54	-10	3	6	35.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	190	-54	-10	3	6	36.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	331	-58	-10	3	6	32.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	316	-58	-10	3	6	44.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	315	-58	-10	3	6	26.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	315	-58	-10	3	6	27.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	318	-58	-10	3	6	37.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	53			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR41 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	Y	103	1	103	57	-43	0	3	6	68.9	Day-time & Evening (7am - 11pm)	65	No
	GC-2	Dry cooler	Grandtech Centre	Y	Y	103	1	103	57	-43	0	3	6	68.9			
	GC-3	Dry cooler	Grandtech Centre	Y	Y	103	1	103	72	-45	0	3	6	66.9			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	5	104	164	-52	0	3	6	60.7			
	DH-1 to DH-2	Chiller	Delta House	Y	Y	102	2	105	238	-56	0	3	6	58.5			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	300	-58	0	3	6	52.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	287	-57	0	3	6	57.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	287	-57	0	3	6	48.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	287	-57	0	3	6	34.8			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	207	-54	0	3	6	50.7			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	221	-55	0	3	6	50.1			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	244	-56	0	3	6	56.2			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	225	-55	0	3	6	47.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	225	-55	0	3	6	51.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	240	-56	0	3	6	53.4			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	165	-52	0	3	6	46.6			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	165	-52	0	3	6	47.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	340	-59	0	3	6	30.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	325	-58	0	3	6	45.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	323	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	297	-57	0	3	6	36.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	297	-57	0	3	6	37.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	297	-57	0	3	6	48.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	289	-57	0	0	6	49.8			
													Cumulative Noise Level, dB(A)	74			
	GC-1	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	Y	97	3	102	164	-52	0	3	6	58.7			
	DH-1 to DH-2	Chiller	Delta House	N	Y	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	300	-58	0	3	6	49.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	287	-57	0	3	6	57.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	287	-57	0	3	6	48.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	287	-57	0	3	6	34.8			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	225	-55	0	3	6	47.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	225	-55	0	3	6	48.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	240	-56	0	3	6	51.4			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	165	-52	0	3	6	46.6			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	165	-52	0	3	6	47.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	325	-58	0	3	6	42.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	323	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	297	-57	0	3	6	36.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	297	-57	0	3	6	37.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	302	-58	0	3	6	48.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	64			
NSR42 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	59	-43	-5	3	6	63.5	Day-time & Evening (7am - 11pm)	65	No
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	59	-43	-5	3	6	63.5			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	74	-45	-5	3	6	61.6			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	162	-52	-10	3	6	50.8			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	238	-56	-10	3	6	48.5			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	301	-58	-10	3	6	42.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	208	-54	-10	3	6	40.7			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	222	-55	-10	3	6	40.1			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	244	-56	0	3	6	56.3			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	225	-55	0	3	6	48.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	225	-55	0	3	6	52.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	239	-56	0	3	6	53.4			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	166	-52	0	3	6	46.6			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	166	-52	0	3	6	47.6			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	341	-59	-10	3	6	20.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	324	-58	0	3	6	45.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	319	-58	0	3	6	53.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	298	-57	0	3	6	36.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	298	-57	0	3	6	37.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	302	-58	0	3	6	48.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	284	-57	0	0	6	49.9			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	69			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	162	-52	-10	3	6	48.8			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	301	-58	-10	3	6	39.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	225	-55	0	3	6	48.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	225	-55	0	3	6	49.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	239	-56	0	3	6	51.4			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	166	-52	0	3	6	46.6			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	166	-52	0	3	6	47.6			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	324	-58	0	3	6	42.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	319	-58	0	3	6	53.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	298	-57	0	3	6	36.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	298	-57	0	3	6	37.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	302	-58	0	3	6	48.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR42	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	66	-44	-5	3	6	62.7	Day-time & Evening (7am - 11pm)	65	No
20/F	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	66	-44	-5	3	6	62.7			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	79	-46	-5	3	6	61.1			
80.6	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
mPD	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	161	-52	-10	3	6	50.9			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	240	-56	-10	3	6	48.4			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	303	-58	-10	3	6	42.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	209	-54	-10	3	6	40.6			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	223	-55	-10	3	6	40.0			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	245	-56	0	3	6	56.2			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	226	-55	0	3	6	47.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	226	-55	0	3	6	51.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	239	-56	0	3	6	53.4			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	168	-53	0	3	6	46.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	168	-53	0	3	6	47.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	342	-59	-10	3	6	20.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	324	-58	0	3	6	45.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	316	-58	0	3	6	54.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	300	-58	0	3	6	36.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	300	-58	0	3	6	37.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	303	-58	0	3	6	48.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	280	-57	0	0	6	50.0			
													Cumulative Noise Level, dB(A)	68			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	161	-52	-10	3	6	48.9			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	303	-58	-10	3	6	39.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	226	-55	0	3	6	47.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	226	-55	0	3	6	48.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	239	-56	0	3	6	51.4			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	168	-53	0	3	6	46.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	168	-53	0	3	6	47.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	324	-58	0	3	6	42.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	316	-58	0	3	6	54.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	300	-58	0	3	6	36.5			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	300	-58	0	3	6	37.5			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	303	-58	0	3	6	48.4			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR42	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	75	-45	-5	3	6	61.5			
15/F	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	75	-45	-5	3	6	61.5			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	87	-47	-5	3	6	60.3			
64.8	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
mPD	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	162	-52	-10	3	6	50.8			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	243	-56	-10	3	6	48.3			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	306	-58	-10	3	6	42.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	287	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	287	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	287	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	212	-55	-10	3	6	40.5			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	226	-55	-10	3	6	39.9	Day-time & Evening (7am - 11pm)	65	No
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	247	-56	0	3	6	56.2			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	227	-55	0	3	6	47.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	227	-55	0	3	6	51.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	241	-56	0	3	6	53.4			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	172	-53	0	3	6	46.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	172	-53	0	3	6	47.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	345	-59	-10	3	6	20.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	325	-58	0	3	6	45.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	313	-58	0	3	6	54.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	303	-58	0	3	6	36.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	303	-58	0	3	6	37.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	305	-58	0	3	6	48.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	278	-57	0	0	6	50.1			
													Cumulative Noise Level, dB(A)	68			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	162	-52	-10	3	6	48.8			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	306	-58	-10	3	6	39.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	287	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	287	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	287	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	227	-55	0	3	6	47.9			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	227	-55	0	3	6	48.9			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	241	-56	0	3	6	51.4			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	172	-53	0	3	6	46.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	172	-53	0	3	6	47.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	325	-58	0	3	6	42.8			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	313	-58	0	3	6	54.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	303	-58	0	3	6	36.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	303	-58	0	3	6	37.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	305	-58	0	3	6	48.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR42	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	86	-47	-5	3	6	60.4			
10/F	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	86	-47	-5	3	6	60.4			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	96	-48	-5	3	6	59.3			
49.1	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
mPD	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	164	-52	-10	3	6	50.7			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	246	-56	-10	3	6	48.2			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	310	-58	-10	3	6	42.2			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	289	-57	-10	3	6	47.8	Day-time & Evening (7am - 11pm)	65	No
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	289	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	289	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	217	-55	-10	3	6	40.3			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	230	-55	-10	3	6	39.8			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	249	-56	0	3	6	56.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	230	-55	0	3	6	47.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	230	-55	0	3	6	51.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	243	-56	0	3	6	53.3			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	177	-53	0	3	6	46.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	177	-53	0	3	6	47.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	347	-59	-10	3	6	20.2			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	326	-58	0	3	6	45.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	311	-58	0	3	6	54.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	306	-58	0	3	6	36.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	306	-58	0	3	6	37.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	308	-58	0	3	6	48.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	275	-57	0	0	6	50.2			
													Cumulative Noise Level, dB(A)	67			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	164	-52	-10	3	6	48.7			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	310	-58	-10	3	6	39.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	289	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	289	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	289	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	230	-55	0	3	6	47.8			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	230	-55	0	3	6	48.8			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	243	-56	0	3	6	51.3			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	177	-53	0	3	6	46.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	177	-53	0	3	6	47.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	326	-58	0	3	6	42.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	311	-58	0	3	6	54.1			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	306	-58	0	3	6	36.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	306	-58	0	3	6	37.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	308	-58	0	3	6	48.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR42 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	P	103	1	103	98	-48	-5	3	6	59.2	Day-time & Evening (7am - 11pm)	65	No
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	98	-48	-5	3	6	59.2			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	107	-49	-5	3	6	58.4			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	168	-52	-10	3	6	50.5			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	251	-56	-10	3	6	48.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	314	-58	-10	3	6	42.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	291	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	291	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	291	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	222	-55	-10	3	6	40.1			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	235	-55	-10	3	6	39.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	253	-56	0	3	6	55.9			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	234	-55	0	3	6	47.6			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	234	-55	0	3	6	51.6			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	247	-56	0	3	6	53.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	184	-53	0	3	6	45.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	183	-53	0	3	6	46.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	351	-59	-10	3	6	20.1			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	328	-58	0	3	6	45.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	310	-58	0	3	6	54.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	310	-58	0	3	6	36.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	310	-58	0	3	6	37.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	311	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	274	-57	0	0	6	50.2			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	66			
	GC-1	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	168	-52	-10	3	6	48.5			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	314	-58	-10	3	6	39.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	291	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	291	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	291	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	234	-55	0	3	6	47.6			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	234	-55	0	3	6	48.6			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	247	-56	0	3	6	51.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	184	-53	0	3	6	45.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	183	-53	0	3	6	46.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	328	-58	0	3	6	42.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	310	-58	0	3	6	54.2			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	310	-58	0	3	6	36.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	310	-58	0	3	6	37.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	311	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR4330/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	65	-44	-10	3	6	57.7	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	66	-44	-10	3	6	57.6			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	81	-46	-10	3	6	55.8			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	173	-53	-10	3	6	50.2			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	248	-56	-10	3	6	48.1			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	310	-58	-10	3	6	42.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	297	-57	-10	3	6	47.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	297	-57	-10	3	6	38.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	297	-57	-10	3	6	24.5			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	217	-55	-10	3	6	40.3			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	230	-55	-10	3	6	39.8			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	252	-56	-10	3	6	46.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	232	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	232	-55	-10	3	6	41.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	247	-56	-10	3	6	43.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	168	-53	0	3	6	46.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	168	-53	0	3	6	47.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	350	-59	-10	3	6	20.1			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	333	-58	-10	3	6	35.5			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	328	-58	-10	3	6	43.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	302	-58	-10	3	6	26.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	302	-58	-10	3	6	27.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	307	-58	-10	3	6	38.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	293	-57	-10	0	6	39.7			
												Cumulative Noise Level, dB(A)		63			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	173	-53	-10	3	6	48.2			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	310	-58	-10	3	6	39.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	297	-57	-10	3	6	47.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	297	-57	-10	3	6	38.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	297	-57	-10	3	6	24.5			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	232	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	232	-55	-10	3	6	38.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	247	-56	-10	3	6	41.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	168	-53	0	3	6	46.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	168	-53	0	3	6	47.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	333	-58	-10	3	6	32.5			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	328	-58	-10	3	6	43.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	302	-58	-10	3	6	26.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	302	-58	-10	3	6	27.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	307	-58	-10	3	6	38.3			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
												Cumulative Noise Level, dB(A)		55			
NSR4325/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	67	-45	-10	3	6	57.5	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	68	-45	-10	3	6	57.3			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	83	-46	-10	3	6	55.7			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	171	-53	-10	3	6	50.4			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	248	-56	-10	3	6	48.1			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	311	-58	-10	3	6	42.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	296	-57	-10	3	6	47.6			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	296	-57	-10	3	6	38.6			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	296	-57	-10	3	6	24.6			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	218	-55	-10	3	6	40.2			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	231	-55	-10	3	6	39.7			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	252	-56	-10	3	6	46.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	232	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	232	-55	-10	3	6	41.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	246	-56	-10	3	6	43.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	169	-53	-10	3	6	36.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	169	-53	-10	3	6	37.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	351	-59	-10	3	6	20.1			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	332	-58	-10	3	6	35.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	324	-58	-10	3	6	43.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	303	-58	-10	3	6	26.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	303	-58	-10	3	6	27.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	307	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	288	-57	-10	0	6	39.8			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	171	-53	-10	3	6	48.4			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	311	-58	-10	3	6	39.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	296	-57	-10	3	6	47.6			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	296	-57	-10	3	6	38.6			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	296	-57	-10	3	6	24.6			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	232	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	232	-55	-10	3	6	38.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	246	-56	-10	3	6	41.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	169	-53	-10	3	6	36.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	169	-53	-10	3	6	37.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	332	-58	-10	3	6	32.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	324	-58	-10	3	6	43.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	303	-58	-10	3	6	26.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	303	-58	-10	3	6	27.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	307	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	53			
NSR43	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	73	-45	-10	3	6	56.8	Day-time & Evening (7am - 11pm)	65	Yes
20/F	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	73	-45	-10	3	6	56.7			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	87	-47	-10	3	6	55.2			
80.6	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
mPD	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	170	-53	-10	3	6	50.4			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	250	-56	-10	3	6	48.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	313	-58	-10	3	6	42.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	296	-57	-10	3	6	47.6			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	296	-57	-10	3	6	38.6			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	296	-57	-10	3	6	24.6			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	219	-55	-10	3	6	40.2			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	232	-55	-10	3	6	39.7			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	253	-56	-10	3	6	45.9			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	233	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	233	-55	-10	3	6	41.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	246	-56	-10	3	6	43.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	171	-53	-10	3	6	36.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	171	-53	-10	3	6	37.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	352	-59	-10	3	6	20.1			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	332	-58	-10	3	6	35.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	321	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	305	-58	-10	3	6	26.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	305	-58	-10	3	6	27.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	308	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	284	-57	-10	0	6	39.9			
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	170	-53	-10	3	6	48.4			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	313	-58	-10	3	6	39.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	296	-57	-10	3	6	47.6			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	296	-57	-10	3	6	38.6			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	296	-57	-10	3	6	24.6			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	233	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	233	-55	-10	3	6	38.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	246	-56	-10	3	6	41.2			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	171	-53	-10	3	6	36.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	171	-53	-10	3	6	37.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	332	-58	-10	3	6	32.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	321	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	305	-58	-10	3	6	26.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	305	-58	-10	3	6	27.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	308	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	53			
NSR43	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	81	-46	-10	3	6	55.8			
15/F	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	82	-46	-10	3	6	55.8			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	94	-47	-10	3	6	54.5			
64.8	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
mPD	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	171	-53	-10	3	6	50.4			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	252	-56	-10	3	6	48.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	316	-58	-10	3	6	42.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	297	-57	-10	3	6	47.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	297	-57	-10	3	6	38.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	297	-57	-10	3	6	24.5			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	222	-55	-10	3	6	40.1			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	235	-55	-10	3	6	39.6	Day-time & Evening (7am - 11pm)	65	Yes
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	255	-56	-10	3	6	45.9			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	234	-55	-10	3	6	37.6			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	234	-55	-10	3	6	41.6			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	248	-56	-10	3	6	43.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	175	-53	-10	3	6	36.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	175	-53	-10	3	6	37.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	354	-59	-10	3	6	20.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	333	-58	-10	3	6	35.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	318	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	308	-58	-10	3	6	26.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	308	-58	-10	3	6	27.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	310	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	281	-57	-10	0	6	40.0			
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	171	-53	-10	3	6	48.4			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	316	-58	-10	3	6	39.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	297	-57	-10	3	6	47.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	297	-57	-10	3	6	38.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	297	-57	-10	3	6	24.5			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	234	-55	-10	3	6	37.6			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	234	-55	-10	3	6	38.6			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	248	-56	-10	3	6	41.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	175	-53	-10	3	6	36.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	175	-53	-10	3	6	37.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	333	-58	-10	3	6	32.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	318	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	308	-58	-10	3	6	26.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	308	-58	-10	3	6	27.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	310	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	53			
NSR43	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	91	-47	-10	3	6	54.8			
10/F	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	92	-47	-10	3	6	54.7			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	103	-48	-10	3	6	53.7			
49.1	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
mPD	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	173	-53	-10	3	6	50.2			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	256	-56	-10	3	6	47.8			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	319	-58	-10	3	6	41.9			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	298	-57	-10	3	6	47.5	Day-time & Evening (7am - 11pm)	65	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	298	-57	-10	3	6	38.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	298	-57	-10	3	6	24.5			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	226	-55	-10	3	6	39.9			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	239	-56	-10	3	6	39.4			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	257	-56	-10	3	6	45.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	237	-55	-10	3	6	37.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	237	-55	-10	3	6	41.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	250	-56	-10	3	6	43.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	180	-53	-10	3	6	35.9			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	180	-53	-10	3	6	36.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	357	-59	-10	3	6	19.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	334	-58	-10	3	6	35.5			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	316	-58	-10	3	6	44.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	311	-58	-10	3	6	26.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	311	-58	-10	3	6	27.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	313	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	279	-57	-10	0	6	40.1			
													Cumulative Noise Level, dB(A)	61			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	173	-53	-10	3	6	48.2			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	319	-58	-10	3	6	38.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	298	-57	-10	3	6	47.5			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	298	-57	-10	3	6	38.5			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	298	-57	-10	3	6	24.5			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	237	-55	-10	3	6	37.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	237	-55	-10	3	6	38.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	250	-56	-10	3	6	41.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	180	-53	-10	3	6	35.9			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	180	-53	-10	3	6	36.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	334	-58	-10	3	6	32.5			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	316	-58	-10	3	6	44.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	311	-58	-10	3	6	26.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	311	-58	-10	3	6	27.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	313	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	53			
NSR43 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	103	-48	-10	3	6	53.8	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	103	-48	-10	3	6	53.7			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	114	-49	-10	3	6	52.9			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	176	-53	-10	3	6	50.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	260	-56	-10	3	6	47.7			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	323	-58	-10	3	6	41.8			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	301	-58	-10	3	6	47.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	301	-58	-10	3	6	38.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	301	-58	-10	3	6	24.4			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	231	-55	-10	3	6	39.7			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	243	-56	-10	3	6	39.3			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	261	-56	-10	3	6	45.7			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	241	-56	-10	3	6	37.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	241	-56	-10	3	6	41.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	254	-56	-10	3	6	42.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	186	-53	-10	3	6	35.6			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	186	-53	-10	3	6	36.6			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	361	-59	-10	3	6	19.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	336	-59	-10	3	6	35.5			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	315	-58	-10	3	6	44.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	315	-58	-10	3	6	26.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	315	-58	-10	3	6	27.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	316	-58	-10	3	6	38.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	278	-57	-10	0	6	40.1			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	60			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	176	-53	-10	3	6	48.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	323	-58	-10	3	6	38.8			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	301	-58	-10	3	6	47.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	301	-58	-10	3	6	38.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	301	-58	-10	3	6	24.4			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	241	-56	-10	3	6	37.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	241	-56	-10	3	6	38.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	254	-56	-10	3	6	40.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	186	-53	-10	3	6	35.6			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	186	-53	-10	3	6	36.6			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	336	-59	-10	3	6	32.5			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	315	-58	-10	3	6	44.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	315	-58	-10	3	6	26.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	315	-58	-10	3	6	27.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	316	-58	-10	3	6	38.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	53			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR44 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	70	-45	-10	3	6	57.1	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	73	-45	-10	3	6	56.7			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	89	-47	-10	3	6	55.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	178	-53	-10	3	6	50.0			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	254	-56	-10	3	6	47.9			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	316	-58	-10	3	6	42.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	304	-58	-10	3	6	47.3			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	304	-58	-10	3	6	38.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	304	-58	-10	3	6	24.3			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	224	-55	-10	3	6	40.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	237	-55	-10	3	6	39.5			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	260	-56	-10	3	6	45.7			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	239	-56	0	3	6	47.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	239	-56	0	3	6	51.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	254	-56	0	3	6	52.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	173	-53	0	3	6	46.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	173	-53	0	3	6	47.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	357	-59	-10	3	6	19.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	340	-59	0	3	6	45.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	334	-58	0	3	6	53.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	309	-58	0	3	6	36.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	309	-58	0	3	6	37.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	313	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	298	-57	0	0	6	49.5			
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	178	-53	-10	3	6	48.0			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	316	-58	-10	3	6	39.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	304	-58	-10	3	6	47.3			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	304	-58	-10	3	6	38.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	304	-58	-10	3	6	24.3			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	239	-56	0	3	6	47.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	239	-56	0	3	6	48.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	254	-56	0	3	6	50.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	173	-53	0	3	6	46.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	173	-53	0	3	6	47.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	340	-59	0	3	6	42.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	334	-58	0	3	6	53.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	309	-58	0	3	6	36.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	309	-58	0	3	6	37.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	313	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	59			
NSR44 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	72	-45	-10	3	6	56.9	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	75	-45	-10	3	6	56.5			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	91	-47	-10	3	6	54.9			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	176	-53	-10	3	6	50.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	254	-56	-10	3	6	47.9			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	317	-58	-10	3	6	42.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	303	-58	-10	3	6	47.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	303	-58	-10	3	6	38.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	303	-58	-10	3	6	24.4			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	225	-55	-10	3	6	40.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	238	-56	-10	3	6	39.5			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	260	-56	-10	3	6	45.7			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	239	-56	-10	3	6	37.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	239	-56	-10	3	6	41.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	253	-56	-10	3	6	42.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	174	-53	-10	3	6	36.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	174	-53	-10	3	6	37.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	358	-59	-10	3	6	19.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	339	-59	0	3	6	45.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	330	-58	0	3	6	53.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	310	-58	0	3	6	36.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	310	-58	0	3	6	37.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	313	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	294	-57	0	0	6	49.6			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	176	-53	-10	3	6	48.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	317	-58	-10	3	6	39.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	303	-58	-10	3	6	47.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	303	-58	-10	3	6	38.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	303	-58	-10	3	6	24.4			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	239	-56	-10	3	6	37.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	239	-56	-10	3	6	38.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	253	-56	-10	3	6	40.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	174	-53	-10	3	6	36.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	174	-53	-10	3	6	37.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	339	-59	0	3	6	42.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	330	-58	0	3	6	53.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	310	-58	0	3	6	36.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	310	-58	0	3	6	37.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	313	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR44	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	77	-46	-10	3	6	56.3	Day-time & Evening (7am - 11pm)	65	Yes
20/F	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	80	-46	-10	3	6	56.0			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	95	-48	-10	3	6	54.5			
80.6	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
mPD	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	175	-53	-10	3	6	50.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	256	-56	-10	3	6	47.8			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	319	-58	-10	3	6	41.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	303	-58	-10	3	6	47.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	303	-58	-10	3	6	38.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	303	-58	-10	3	6	24.4			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	226	-55	-10	3	6	39.9			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	239	-56	-10	3	6	39.4			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	261	-56	-10	3	6	45.7			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	240	-56	-10	3	6	37.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	240	-56	-10	3	6	41.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	253	-56	-10	3	6	42.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	176	-53	-10	3	6	36.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	176	-53	-10	3	6	37.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	359	-59	-10	3	6	19.9			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	339	-59	0	3	6	45.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	327	-58	0	3	6	53.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	312	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	312	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	314	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	290	-57	0	0	6	49.7			
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	175	-53	-10	3	6	48.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	319	-58	-10	3	6	38.9			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	303	-58	-10	3	6	47.4			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	303	-58	-10	3	6	38.4			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	303	-58	-10	3	6	24.4			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	240	-56	-10	3	6	37.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	240	-56	-10	3	6	38.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	253	-56	-10	3	6	40.9			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	176	-53	-10	3	6	36.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	176	-53	-10	3	6	37.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	339	-59	0	3	6	42.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	327	-58	0	3	6	53.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	312	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	312	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	314	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR44	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	85	-47	-10	3	6	55.4			
15/F	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	87	-47	-10	3	6	55.2			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	101	-48	-10	3	6	53.9			
64.8	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
mPD	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	176	-53	-10	3	6	50.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	258	-56	-10	3	6	47.8			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	322	-58	-10	3	6	41.8			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	304	-58	-10	3	6	47.3			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	304	-58	-10	3	6	38.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	304	-58	-10	3	6	24.3			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	229	-55	-10	3	6	39.8			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	242	-56	-10	3	6	39.3	Day-time & Evening (7am - 11pm)	65	Yes
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	262	-56	-10	3	6	45.6			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	241	-56	-10	3	6	37.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	241	-56	-10	3	6	41.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	255	-56	-10	3	6	42.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	180	-53	-10	3	6	35.9			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	180	-53	-10	3	6	36.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	361	-59	-10	3	6	19.8			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	340	-59	0	3	6	45.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	324	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	315	-58	0	3	6	36.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	315	-58	0	3	6	37.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	316	-58	0	3	6	48.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	287	-57	0	0	6	49.8			
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	176	-53	-10	3	6	48.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	322	-58	-10	3	6	38.8			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	304	-58	-10	3	6	47.3			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	304	-58	-10	3	6	38.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	304	-58	-10	3	6	24.3			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	241	-56	-10	3	6	37.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	241	-56	-10	3	6	38.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	255	-56	-10	3	6	40.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	180	-53	-10	3	6	35.9			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	180	-53	-10	3	6	36.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	340	-59	0	3	6	42.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	324	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	315	-58	0	3	6	36.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	315	-58	0	3	6	37.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	316	-58	0	3	6	48.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR44	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	95	-48	-10	3	6	54.5			
10/F	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	97	-48	-10	3	6	54.3			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	110	-49	-10	3	6	53.2			
49.1	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
mPD	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	178	-53	-10	3	6	50.0			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	262	-56	-10	3	6	47.6			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	325	-58	-10	3	6	41.8			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	305	-58	-10	3	6	47.3	Day-time & Evening (7am - 11pm)	65	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	305	-58	-10	3	6	38.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	305	-58	-10	3	6	24.3			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	233	-55	-10	3	6	39.7			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	245	-56	-10	3	6	39.2			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	265	-56	-10	3	6	45.5			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	244	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	244	-56	-10	3	6	41.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	257	-56	-10	3	6	42.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	185	-53	-10	3	6	35.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	184	-53	-10	3	6	36.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	364	-59	-10	3	6	19.8			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	341	-59	0	3	6	45.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	322	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	318	-58	0	3	6	36.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	318	-58	0	3	6	37.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	319	-58	0	3	6	47.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	285	-57	0	0	6	49.9			
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	178	-53	-10	3	6	48.0			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	325	-58	-10	3	6	38.8			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	305	-58	-10	3	6	47.3			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	305	-58	-10	3	6	38.3			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	305	-58	-10	3	6	24.3			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	244	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	244	-56	-10	3	6	38.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	257	-56	-10	3	6	40.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	185	-53	-10	3	6	35.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	184	-53	-10	3	6	36.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	341	-59	0	3	6	42.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	322	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	318	-58	0	3	6	36.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	318	-58	0	3	6	37.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	319	-58	0	3	6	47.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR44 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	106	-49	-10	3	6	53.5	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	108	-49	-10	3	6	53.3			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	119	-50	-10	3	6	52.5			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	181	-53	-10	3	6	49.8			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	266	-56	-10	3	6	47.5			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	329	-58	-10	3	6	41.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	308	-58	-10	3	6	47.2			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	308	-58	-10	3	6	38.2			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	308	-58	-10	3	6	24.2			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	238	-56	-10	3	6	39.5			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	250	-56	-10	3	6	39.0			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	269	-57	-10	3	6	45.4			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	247	-56	-10	3	6	37.1			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	247	-56	-10	3	6	41.1			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	261	-56	-10	3	6	42.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	191	-54	-10	3	6	35.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	191	-54	-10	3	6	36.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	368	-59	-10	3	6	19.7			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	343	-59	0	3	6	45.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	321	-58	0	3	6	53.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	322	-58	0	3	6	35.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	322	-58	0	3	6	36.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	322	-58	0	3	6	47.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	284	-57	0	0	6	49.9			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	61			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	181	-53	-10	3	6	47.8			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	329	-58	-10	3	6	38.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	308	-58	-10	3	6	47.2			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	308	-58	-10	3	6	38.2			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	308	-58	-10	3	6	24.2			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	247	-56	-10	3	6	37.1			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	247	-56	-10	3	6	38.1			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	261	-56	-10	3	6	40.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	191	-54	-10	3	6	35.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	191	-54	-10	3	6	36.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	343	-59	0	3	6	42.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	321	-58	0	3	6	53.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	322	-58	0	3	6	35.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	322	-58	0	3	6	36.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	322	-58	0	3	6	47.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR54 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	81	-46	-10	3	6	55.8	Day-time & Evening (7am - 11pm)	65	No
	GC-2	Dry cooler	Grandtech Centre	Y	Y	103	1	103	82	-46	0	3	6	65.7			
	GC-3	Dry cooler	Grandtech Centre	Y	Y	103	1	103	94	-47	0	3	6	64.5			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	189	-54	-10	3	6	49.5			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	264	-56	-10	3	6	47.6			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	326	-58	0	3	6	51.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	310	-58	0	3	6	57.2			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	310	-58	0	3	6	48.2			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	310	-58	0	3	6	34.2			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	229	-55	0	3	6	49.8			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	243	-56	0	3	6	49.3			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	261	-56	0	3	6	55.7			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	236	-55	0	3	6	47.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	236	-55	0	3	6	51.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	252	-56	0	3	6	53.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	167	-52	0	3	6	46.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	167	-52	0	3	6	47.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	364	-59	0	3	6	29.8			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	341	-59	0	3	6	45.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	330	-58	0	3	6	53.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	306	-58	0	3	6	36.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	306	-58	0	3	6	37.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	309	-58	0	3	6	48.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	295	-57	0	0	6	49.6			
												Cumulative Noise Level, dB(A)		70			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	189	-54	-10	3	6	47.5			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	326	-58	0	3	6	48.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	310	-58	0	3	6	57.2			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	310	-58	0	3	6	48.2			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	310	-58	0	3	6	34.2			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	236	-55	0	3	6	47.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	236	-55	0	3	6	48.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	252	-56	0	3	6	51.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	167	-52	0	3	6	46.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	167	-52	0	3	6	47.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	341	-59	0	3	6	42.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	330	-58	0	3	6	53.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	306	-58	0	3	6	36.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	306	-58	0	3	6	37.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	309	-58	0	3	6	48.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
												Cumulative Noise Level, dB(A)		61			
NSR54 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	83	-46	-10	3	6	55.7	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	84	-46	-5	3	6	60.5			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	95	-48	-5	3	6	59.4			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	187	-53	-10	3	6	49.6			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	264	-56	-10	3	6	47.6			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	327	-58	-10	3	6	41.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	309	-58	-10	3	6	47.2			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	309	-58	-10	3	6	38.2			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	309	-58	-10	3	6	24.2			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	230	-55	-10	3	6	39.8			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	244	-56	-10	3	6	39.3			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	261	-56	0	3	6	55.7			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	236	-55	-10	3	6	37.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	236	-55	-10	3	6	41.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	251	-56	-10	3	6	43.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	168	-53	-10	3	6	36.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	168	-52	-10	3	6	37.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	365	-59	-10	3	6	19.8			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	340	-59	0	3	6	45.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	326	-58	0	3	6	53.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	307	-58	0	3	6	36.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	307	-58	0	3	6	37.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	309	-58	0	3	6	48.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	290	-57	0	0	6	49.8			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	65			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	187	-53	-10	3	6	47.6			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	327	-58	-10	3	6	38.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	309	-58	-10	3	6	47.2			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	309	-58	-10	3	6	38.2			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	309	-58	-10	3	6	24.2			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	236	-55	-10	3	6	37.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	236	-55	-10	3	6	38.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	251	-56	-10	3	6	41.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	168	-53	-10	3	6	36.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	168	-52	-10	3	6	37.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	340	-59	0	3	6	42.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	326	-58	0	3	6	53.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	307	-58	0	3	6	36.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	307	-58	0	3	6	37.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	309	-58	0	3	6	48.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR54 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	87	-47	-10	3	6	55.2	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	88	-47	-5	3	6	60.1			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	99	-48	-5	3	6	59.1			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	186	-53	-10	3	6	49.6			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	266	-56	-10	3	6	47.5			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	329	-58	-10	3	6	41.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	309	-58	-10	3	6	47.2			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	309	-58	-10	3	6	38.2			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	309	-58	-10	3	6	24.2			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	231	-55	-10	3	6	39.7			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	245	-56	-10	3	6	39.2			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	262	-56	0	3	6	55.6			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	237	-55	-10	3	6	37.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	237	-55	-10	3	6	41.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	251	-56	-10	3	6	43.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	170	-53	-10	3	6	36.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	170	-53	-10	3	6	37.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	366	-59	-10	3	6	19.7			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	340	-59	0	3	6	45.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	323	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	309	-58	0	3	6	36.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	309	-58	0	3	6	37.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	310	-58	0	3	6	48.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	286	-57	0	0	6	49.9			
													Cumulative Noise Level, dB(A)	65			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	186	-53	-10	3	6	47.6			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	329	-58	-10	3	6	38.7			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	309	-58	-10	3	6	47.2			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	309	-58	-10	3	6	38.2			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	309	-58	-10	3	6	24.2			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	237	-55	-10	3	6	37.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	237	-55	-10	3	6	38.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	251	-56	-10	3	6	41.0			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	170	-53	-10	3	6	36.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	170	-53	-10	3	6	37.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	340	-59	0	3	6	42.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	323	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	309	-58	0	3	6	36.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	309	-58	0	3	6	37.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	310	-58	0	3	6	48.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR54	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	94	-47	-10	3	6	54.5			
15/F	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	95	-48	-5	3	6	59.4			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	106	-48	-5	3	6	58.5			
64.8	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
mPD	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	187	-53	-10	3	6	49.6			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	268	-57	-10	3	6	47.4			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	332	-58	-10	3	6	41.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	310	-58	-10	3	6	47.2			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	310	-58	-10	3	6	38.2			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	310	-58	-10	3	6	24.2			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	234	-55	-10	3	6	39.6			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	248	-56	-10	3	6	39.1	Day-time & Evening (7am - 11pm)	65	Yes
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	263	-56	0	3	6	55.6			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	238	-56	-10	3	6	37.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	238	-56	-10	3	6	41.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	253	-56	-10	3	6	42.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	174	-53	-10	3	6	36.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	174	-53	-10	3	6	37.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	368	-59	-10	3	6	19.7			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	341	-59	0	3	6	45.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	320	-58	0	3	6	53.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	312	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	312	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	312	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	283	-57	0	0	6	49.9			
													Cumulative Noise Level, dB(A)	65			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	187	-53	-10	3	6	47.6			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	332	-58	-10	3	6	38.6			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	310	-58	-10	3	6	47.2			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	310	-58	-10	3	6	38.2			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	310	-58	-10	3	6	24.2			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	238	-56	-10	3	6	37.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	238	-56	-10	3	6	38.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	253	-56	-10	3	6	40.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	174	-53	-10	3	6	36.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	174	-53	-10	3	6	37.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	341	-59	0	3	6	42.4			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	320	-58	0	3	6	53.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	312	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	312	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	312	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR54	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	103	-48	-10	3	6	53.7			
10/F	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	104	-48	-5	3	6	58.7			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	114	-49	-5	3	6	57.9			
49.1	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
mPD	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	189	-54	-10	3	6	49.5			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	271	-57	-10	3	6	47.3			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	335	-58	-10	3	6	41.5			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	311	-58	-10	3	6	47.1	Day-time & Evening (7am - 11pm)	65	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	311	-58	-10	3	6	38.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	311	-58	-10	3	6	24.1			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	238	-56	-10	3	6	39.5			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	251	-56	-10	3	6	39.0			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	266	-56	0	3	6	55.5			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	241	-56	-10	3	6	37.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	241	-56	-10	3	6	41.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	255	-56	-10	3	6	42.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	179	-53	-10	3	6	35.9			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	179	-53	-10	3	6	36.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	371	-59	-10	3	6	19.6			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	342	-59	0	3	6	45.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	318	-58	0	3	6	53.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	315	-58	0	3	6	36.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	315	-58	0	3	6	37.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	315	-58	0	3	6	48.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	281	-57	0	0	6	50.0			
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	189	-54	-10	3	6	47.5			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	335	-58	-10	3	6	38.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	311	-58	-10	3	6	47.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	311	-58	-10	3	6	38.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	311	-58	-10	3	6	24.1			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	241	-56	-10	3	6	37.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	241	-56	-10	3	6	38.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	255	-56	-10	3	6	40.9			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	179	-53	-10	3	6	35.9			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	179	-53	-10	3	6	36.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	342	-59	0	3	6	42.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	318	-58	0	3	6	53.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	315	-58	0	3	6	36.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	315	-58	0	3	6	37.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	315	-58	0	3	6	48.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR54 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	114	-49	-10	3	6	52.9	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	114	-49	-5	3	6	57.8			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	123	-50	-5	3	6	57.2			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	192	-54	-10	3	6	49.3			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	275	-57	-10	3	6	47.2			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	339	-59	-10	3	6	41.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	314	-58	-10	3	6	47.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	314	-58	-10	3	6	38.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	314	-58	-10	3	6	24.1			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	242	-56	-10	3	6	39.3			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	256	-56	-10	3	6	38.8			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	269	-57	0	3	6	55.4			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	244	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	244	-56	-10	3	6	41.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	259	-56	-10	3	6	42.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	185	-53	-10	3	6	35.6			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	185	-53	-10	3	6	36.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	374	-59	-10	3	6	19.5			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	344	-59	0	3	6	45.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	317	-58	0	3	6	54.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	319	-58	0	3	6	35.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	319	-58	0	3	6	36.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	318	-58	0	3	6	47.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	280	-57	0	0	6	50.0			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	192	-54	-10	3	6	47.3			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	339	-59	-10	3	6	38.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	314	-58	-10	3	6	47.1			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	314	-58	-10	3	6	38.1			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	314	-58	-10	3	6	24.1			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	244	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	244	-56	-10	3	6	38.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	259	-56	-10	3	6	40.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	185	-53	-10	3	6	35.6			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	185	-53	-10	3	6	36.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	344	-59	0	3	6	42.3			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	317	-58	0	3	6	54.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	319	-58	0	3	6	35.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	319	-58	0	3	6	36.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	318	-58	0	3	6	47.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR55_a 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	89	-47	-10	3	6	55.0	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	90	-47	-10	3	6	54.9			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	102	-48	-10	3	6	53.8			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	197	-54	-10	3	6	49.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	272	-57	-10	3	6	47.3			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	334	-58	-10	3	6	41.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	318	-58	-10	3	6	47.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	318	-58	-10	3	6	38.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	318	-58	-10	3	6	24.0			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	237	-55	-10	3	6	39.5			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	251	-56	-10	3	6	39.0			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	268	-57	-10	3	6	45.4			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	242	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	242	-56	-10	3	6	41.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	258	-56	-10	3	6	42.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	170	-53	-10	3	6	36.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	170	-53	-10	3	6	37.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	373	-59	-10	3	6	19.6			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	348	-59	-10	3	6	35.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	334	-58	-10	3	6	43.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	310	-58	-10	3	6	26.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	310	-58	-10	3	6	27.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	312	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	298	-57	-10	0	6	39.5			
												Cumulative Noise Level, dB(A)		61			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	197	-54	-10	3	6	47.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	334	-58	-10	3	6	38.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	318	-58	-10	3	6	47.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	318	-58	-10	3	6	38.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	318	-58	-10	3	6	24.0			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	242	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	242	-56	-10	3	6	38.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	258	-56	-10	3	6	40.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	170	-53	-10	3	6	36.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	170	-53	-10	3	6	37.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	348	-59	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	334	-58	-10	3	6	43.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	310	-58	-10	3	6	26.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	310	-58	-10	3	6	27.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	312	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
												Cumulative Noise Level, dB(A)		53			
NSR55_a 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	91	-47	-10	3	6	54.9	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	92	-47	-10	3	6	54.8			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	103	-48	-10	3	6	53.7			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	195	-54	-10	3	6	49.2			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	272	-57	-10	3	6	47.3			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	335	-59	-10	3	6	41.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	317	-58	-10	3	6	47.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	317	-58	-10	3	6	38.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	317	-58	-10	3	6	24.0			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	238	-56	-10	3	6	39.5			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	252	-56	-10	3	6	39.0			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	268	-57	-10	3	6	45.4			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	242	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	242	-56	-10	3	6	41.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	257	-56	-10	3	6	42.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	171	-53	-10	3	6	36.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	171	-53	-10	3	6	37.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	374	-59	-10	3	6	19.5			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	347	-59	-10	3	6	35.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	330	-58	-10	3	6	43.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	311	-58	-10	3	6	26.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	311	-58	-10	3	6	27.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	312	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	294	-57	-10	0	6	39.6			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	61			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	195	-54	-10	3	6	47.2			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	335	-59	-10	3	6	38.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	317	-58	-10	3	6	47.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	317	-58	-10	3	6	38.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	317	-58	-10	3	6	24.0			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	242	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	242	-56	-10	3	6	38.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	257	-56	-10	3	6	40.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	171	-53	-10	3	6	36.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	171	-53	-10	3	6	37.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	347	-59	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	330	-58	-10	3	6	43.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	311	-58	-10	3	6	26.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	311	-58	-10	3	6	27.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	312	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	53			
NSR55_a 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	95	-48	-10	3	6	54.5	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	96	-48	-10	3	6	54.4			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	107	-49	-10	3	6	53.4			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	194	-54	-10	3	6	49.2			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	274	-57	-10	3	6	47.3			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	337	-59	-10	3	6	41.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	317	-58	-10	3	6	47.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	317	-58	-10	3	6	38.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	317	-58	-10	3	6	24.0			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	239	-56	-10	3	6	39.4			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	253	-56	-10	3	6	38.9			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	269	-57	-10	3	6	45.4			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	243	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	243	-56	-10	3	6	41.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	257	-56	-10	3	6	42.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	173	-53	-10	3	6	36.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	173	-53	-10	3	6	37.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	375	-59	-10	3	6	19.5			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	347	-59	-10	3	6	35.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	327	-58	-10	3	6	43.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	313	-58	-10	3	6	26.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	313	-58	-10	3	6	27.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	313	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	290	-57	-10	0	6	39.7			
													Cumulative Noise Level, dB(A)	61			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	194	-54	-10	3	6	47.2			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	337	-59	-10	3	6	38.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	317	-58	-10	3	6	47.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	317	-58	-10	3	6	38.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	317	-58	-10	3	6	24.0			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	243	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	243	-56	-10	3	6	38.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	257	-56	-10	3	6	40.8			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	173	-53	-10	3	6	36.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	173	-53	-10	3	6	37.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	347	-59	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	327	-58	-10	3	6	43.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	313	-58	-10	3	6	26.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	313	-58	-10	3	6	27.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	313	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	53			
NSR55_a 15/F 64.8 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	101	-48	-10	3	6	53.9	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	102	-48	-10	3	6	53.8			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	113	-49	-10	3	6	53.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	195	-54	-10	3	6	49.2			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	276	-57	-10	3	6	47.2			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	339	-59	-10	3	6	41.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	318	-58	-10	3	6	47.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	318	-58	-10	3	6	38.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	318	-58	-10	3	6	24.0			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	242	-56	-10	3	6	39.3			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	256	-56	-10	3	6	38.9			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	270	-57	-10	3	6	45.4			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	244	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	244	-56	-10	3	6	41.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	259	-56	-10	3	6	42.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	177	-53	-10	3	6	36.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	177	-53	-10	3	6	37.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	377	-60	-10	3	6	19.5			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	348	-59	-10	3	6	35.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	324	-58	-10	3	6	43.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	316	-58	-10	3	6	26.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	316	-58	-10	3	6	27.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	315	-58	-10	3	6	38.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	287	-57	-10	0	6	39.8			
													Cumulative Noise Level, dB(A)	60			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	195	-54	-10	3	6	47.2			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	339	-59	-10	3	6	38.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	318	-58	-10	3	6	47.0			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	318	-58	-10	3	6	38.0			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	318	-58	-10	3	6	24.0			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	244	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	244	-56	-10	3	6	38.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	259	-56	-10	3	6	40.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	177	-53	-10	3	6	36.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	177	-53	-10	3	6	37.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	348	-59	-10	3	6	32.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	324	-58	-10	3	6	43.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	316	-58	-10	3	6	26.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	316	-58	-10	3	6	27.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	315	-58	-10	3	6	38.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	53			
NSR55_a 10/F 49.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	110	-49	-10	3	6	53.2			
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	110	-49	-10	3	6	53.1			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	120	-50	-10	3	6	52.4			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	197	-54	-10	3	6	49.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	279	-57	-10	3	6	47.1			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	343	-59	-10	3	6	41.3			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	319	-58	-10	3	6	46.9	Day-time & Evening (7am - 11pm)	65	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	319	-58	-10	3	6	37.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	319	-58	-10	3	6	23.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	245	-56	-10	3	6	39.2			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	259	-56	-10	3	6	38.7			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	273	-57	-10	3	6	45.3			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	247	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	247	-56	-10	3	6	41.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	261	-56	-10	3	6	42.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	182	-53	-10	3	6	35.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	182	-53	-10	3	6	36.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	380	-60	-10	3	6	19.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	349	-59	-10	3	6	35.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	322	-58	-10	3	6	43.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	319	-58	-10	3	6	25.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	319	-58	-10	3	6	26.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	318	-58	-10	3	6	38.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	285	-57	-10	0	6	39.9			
													Cumulative Noise Level, dB(A)	60			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	197	-54	-10	3	6	47.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	343	-59	-10	3	6	38.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	319	-58	-10	3	6	46.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	319	-58	-10	3	6	37.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	319	-58	-10	3	6	23.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	247	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	247	-56	-10	3	6	38.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	261	-56	-10	3	6	40.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	182	-53	-10	3	6	35.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	182	-53	-10	3	6	36.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	349	-59	-10	3	6	32.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	322	-58	-10	3	6	43.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	319	-58	-10	3	6	25.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	319	-58	-10	3	6	26.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	318	-58	-10	3	6	38.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	53			
NSR55_a 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	119	-50	-10	3	6	52.5	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	120	-50	-10	3	6	52.4			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	129	-50	-10	3	6	51.8			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	200	-54	-10	3	6	49.0			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	283	-57	-10	3	6	47.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	346	-59	-10	3	6	41.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	322	-58	-10	3	6	46.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	322	-58	-10	3	6	37.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	322	-58	-10	3	6	23.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	250	-56	-10	3	6	39.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	263	-56	-10	3	6	38.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	276	-57	-10	3	6	45.2			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	250	-56	-10	3	6	37.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	250	-56	-10	3	6	41.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	264	-56	-10	3	6	42.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	188	-53	-10	3	6	35.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	188	-53	-10	3	6	36.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	383	-60	-10	3	6	19.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	351	-59	-10	3	6	35.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	321	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	323	-58	-10	3	6	25.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	323	-58	-10	3	6	26.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	321	-58	-10	3	6	37.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	284	-57	-10	0	6	39.9			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	59			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	200	-54	-10	3	6	47.0			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	346	-59	-10	3	6	38.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	322	-58	-10	3	6	46.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	322	-58	-10	3	6	37.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	322	-58	-10	3	6	23.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	250	-56	-10	3	6	37.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	250	-56	-10	3	6	38.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	264	-56	-10	3	6	40.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	188	-53	-10	3	6	35.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	188	-53	-10	3	6	36.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	351	-59	-10	3	6	32.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	321	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	323	-58	-10	3	6	25.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	323	-58	-10	3	6	26.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	321	-58	-10	3	6	37.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	52			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR56_a 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	90	-47	-10	3	6	54.9	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	91	-47	-10	3	6	54.8			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	103	-48	-10	3	6	53.7			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	198	-54	-10	3	6	49.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	273	-57	-10	3	6	47.3			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	335	-59	-10	3	6	41.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	319	-58	-10	3	6	46.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	319	-58	-10	3	6	37.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	319	-58	-10	3	6	23.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	238	-56	-10	3	6	39.5			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	251	-56	-10	3	6	39.0			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	269	-57	0	3	6	55.4			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	242	-56	0	3	6	47.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	242	-56	0	3	6	51.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	259	-56	0	3	6	52.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	170	-53	-10	3	6	36.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	170	-53	-10	3	6	37.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	374	-59	-10	3	6	19.5			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	348	-59	0	3	6	45.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	334	-58	0	3	6	53.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	311	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	311	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	313	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	298	-57	-10	0	6	39.5			
												Cumulative Noise Level, dB(A)		63			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	198	-54	-10	3	6	47.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	335	-59	-10	3	6	38.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	319	-58	-10	3	6	46.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	319	-58	-10	3	6	37.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	319	-58	-10	3	6	23.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	242	-56	0	3	6	47.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	242	-56	0	3	6	48.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	259	-56	0	3	6	50.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	170	-53	-10	3	6	36.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	170	-53	-10	3	6	37.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	348	-59	0	3	6	42.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	334	-58	0	3	6	53.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	311	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	311	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	313	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
												Cumulative Noise Level, dB(A)		58			
NSR56_a 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	92	-47	-10	3	6	54.8	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	93	-47	-10	3	6	54.7			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	104	-48	-10	3	6	53.6			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	196	-54	-10	3	6	49.2			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	273	-57	-10	3	6	47.3			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	336	-59	-10	3	6	41.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	318	-58	-10	3	6	46.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	318	-58	-10	3	6	37.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	318	-58	-10	3	6	23.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	239	-56	-10	3	6	39.4			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	252	-56	-10	3	6	39.0			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	269	-57	0	3	6	55.4			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	242	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	242	-56	-10	3	6	41.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	258	-56	-10	3	6	42.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	171	-53	-10	3	6	36.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	171	-53	-10	3	6	37.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	375	-59	-10	3	6	19.5			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	347	-59	0	3	6	45.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	330	-58	0	3	6	53.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	312	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	312	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	313	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	294	-57	-10	0	6	39.6			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	196	-54	-10	3	6	47.2			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	336	-59	-10	3	6	38.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	318	-58	-10	3	6	46.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	318	-58	-10	3	6	37.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	318	-58	-10	3	6	23.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	242	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	242	-56	-10	3	6	38.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	258	-56	-10	3	6	40.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	171	-53	-10	3	6	36.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	171	-53	-10	3	6	37.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	347	-59	0	3	6	42.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	330	-58	0	3	6	53.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	312	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	312	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	313	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	56			
NSR56_a 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	96	-48	-10	3	6	54.4	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	97	-48	-10	3	6	54.3			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	108	-49	-10	3	6	53.3			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	195	-54	-10	3	6	49.2			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	275	-57	-10	3	6	47.2			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	338	-59	-10	3	6	41.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	318	-58	-10	3	6	46.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	318	-58	-10	3	6	37.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	318	-58	-10	3	6	23.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	240	-56	-10	3	6	39.4			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	253	-56	-10	3	6	38.9			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	270	-57	0	3	6	55.4			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	243	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	243	-56	-10	3	6	41.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	258	-56	-10	3	6	42.8			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	173	-53	-10	3	6	36.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	173	-53	-10	3	6	37.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	376	-60	-10	3	6	19.5			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	347	-59	0	3	6	45.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	327	-58	0	3	6	53.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	314	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	314	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	314	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	290	-57	-10	0	6	39.7			
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	195	-54	-10	3	6	47.2			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	338	-59	-10	3	6	38.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	318	-58	-10	3	6	46.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	318	-58	-10	3	6	37.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	318	-58	-10	3	6	23.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	243	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	243	-56	-10	3	6	38.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	258	-56	-10	3	6	40.8			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	173	-53	-10	3	6	36.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	173	-53	-10	3	6	37.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	347	-59	0	3	6	42.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	327	-58	0	3	6	53.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	314	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	314	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	314	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	56			
NSR56_a 15/F 64.8 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	102	-48	-10	3	6	53.8	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	103	-48	-10	3	6	53.7			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	114	-49	-10	3	6	52.9			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	196	-54	-10	3	6	49.2			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	277	-57	-10	3	6	47.2			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	340	-59	-10	3	6	41.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	319	-58	-10	3	6	46.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	319	-58	-10	3	6	37.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	319	-58	-10	3	6	23.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	243	-56	-10	3	6	39.3			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	256	-56	-10	3	6	38.9			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	271	-57	0	3	6	55.3			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	244	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	244	-56	-10	3	6	41.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	260	-56	-10	3	6	42.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	177	-53	-10	3	6	36.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	177	-53	-10	3	6	37.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	378	-60	-10	3	6	19.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	348	-59	0	3	6	45.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	324	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	317	-58	0	3	6	36.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	317	-58	0	3	6	37.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	316	-58	-10	3	6	38.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	287	-57	-10	0	6	39.8			
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	196	-54	-10	3	6	47.2			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	340	-59	-10	3	6	38.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	319	-58	-10	3	6	46.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	319	-58	-10	3	6	37.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	319	-58	-10	3	6	23.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	244	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	244	-56	-10	3	6	38.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	260	-56	-10	3	6	40.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	177	-53	-10	3	6	36.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	177	-53	-10	3	6	37.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	348	-59	0	3	6	42.2			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	324	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	317	-58	0	3	6	36.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	317	-58	0	3	6	37.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	316	-58	-10	3	6	38.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	56			
NSR56_a 10/F 49.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	110	-49	-10	3	6	53.1			
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	111	-49	-10	3	6	53.1			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	121	-50	-10	3	6	52.3			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	198	-54	-10	3	6	49.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	280	-57	-10	3	6	47.1			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	344	-59	-10	3	6	41.3			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	320	-58	-10	3	6	46.9	Day-time & Evening (7am - 11pm)	65	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	320	-58	-10	3	6	37.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	320	-58	-10	3	6	23.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	246	-56	-10	3	6	39.2			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	259	-56	-10	3	6	38.7			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	274	-57	0	3	6	55.2			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	247	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	247	-56	-10	3	6	41.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	262	-56	-10	3	6	42.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	182	-53	-10	3	6	35.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	182	-53	-10	3	6	36.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	381	-60	-10	3	6	19.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	349	-59	0	3	6	45.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	322	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	320	-58	0	3	6	35.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	320	-58	0	3	6	36.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	319	-58	-10	3	6	37.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	285	-57	-10	0	6	39.9			
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	198	-54	-10	3	6	47.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	344	-59	-10	3	6	38.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	320	-58	-10	3	6	46.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	320	-58	-10	3	6	37.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	320	-58	-10	3	6	23.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	247	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	247	-56	-10	3	6	38.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	262	-56	-10	3	6	40.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	182	-53	-10	3	6	35.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	182	-53	-10	3	6	36.8			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	349	-59	0	3	6	42.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	322	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	320	-58	0	3	6	35.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	320	-58	0	3	6	36.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	319	-58	-10	3	6	37.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	56			
NSR56_a 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	120	-50	-10	3	6	52.4	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	121	-50	-10	3	6	52.4			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	130	-50	-10	3	6	51.7			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	201	-54	-10	3	6	49.0			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	284	-57	-10	3	6	46.9			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	347	-59	-10	3	6	41.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	323	-58	-10	3	6	46.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	323	-58	-10	3	6	37.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	323	-58	-10	3	6	23.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	251	-56	-10	3	6	39.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	263	-56	-10	3	6	38.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	277	-57	0	3	6	55.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	250	-56	-10	3	6	37.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	250	-56	-10	3	6	41.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	265	-56	-10	3	6	42.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	188	-53	-10	3	6	35.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	188	-53	-10	3	6	36.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	384	-60	-10	3	6	19.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	351	-59	0	3	6	45.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	321	-58	0	3	6	53.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	324	-58	0	3	6	35.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	324	-58	0	3	6	36.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	322	-58	-10	3	6	37.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	284	-57	-10	0	6	39.9			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	61			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	201	-54	-10	3	6	47.0			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	347	-59	-10	3	6	38.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	323	-58	-10	3	6	46.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	323	-58	-10	3	6	37.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	323	-58	-10	3	6	23.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	250	-56	-10	3	6	37.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	250	-56	-10	3	6	38.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	265	-56	-10	3	6	40.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	188	-53	-10	3	6	35.5			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	188	-53	-10	3	6	36.5			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	351	-59	0	3	6	42.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	321	-58	0	3	6	53.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	324	-58	0	3	6	35.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	324	-58	0	3	6	36.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	322	-58	-10	3	6	37.8			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	56			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR5730/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	98	-48	-10	3	6	54.2	Day-time & Evening (7am - 11pm)	65	No
	GC-2	Dry cooler	Grandtech Centre	Y	Y	103	1	103	98	-48	0	3	6	64.2			
	GC-3	Dry cooler	Grandtech Centre	Y	Y	103	1	103	108	-49	0	3	6	63.3			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	205	-54	-10	3	6	48.7			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	280	-57	-10	3	6	47.1			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	2	101	342	-59	0	3	6	51.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	324	-58	0	3	6	56.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	324	-58	0	3	6	47.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	324	-58	0	3	6	33.8			
	MS-1	Chiller	Metropole Square	Y	Y	96	1	96	243	-56	0	3	6	49.3			
	MS-2	Chiller	Metropole Square	Y	Y	96	1	96	256	-56	0	3	6	48.8			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	272	-57	0	3	6	55.3			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	243	-56	0	3	6	47.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	243	-56	0	3	6	51.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	3	100	260	-56	0	3	6	52.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	169	-53	0	3	6	46.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	169	-53	0	3	6	47.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	Y	80	1	80	379	-60	0	3	6	29.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	351	-59	0	3	6	45.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	334	-58	0	3	6	53.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	311	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	311	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	312	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	297	-57	0	0	6	49.5			
												Cumulative Noise Level, dB(A)		69			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	Y	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	205	-54	-10	3	6	46.7			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	Y	98	1	98	342	-59	0	3	6	48.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	Y	99	6	106	324	-58	0	3	6	56.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	Y	93	3	97	324	-58	0	3	6	47.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	Y	83	1	83	324	-58	0	3	6	33.8			
	MS-1	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	Y	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	Y	94	1	94	243	-56	0	3	6	47.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	Y	95	1	95	243	-56	0	3	6	48.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	Y	95	2	98	260	-56	0	3	6	50.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	90	1	90	169	-53	0	3	6	46.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	Y	91	1	91	169	-53	0	3	6	47.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	Y	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	351	-59	0	3	6	42.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	334	-58	0	3	6	53.5			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	311	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	311	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	312	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
												Cumulative Noise Level, dB(A)		61			
NSR5725/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	99	-48	-10	3	6	54.1	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	99	-48	-5	3	6	59.1			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	109	-49	-5	3	6	58.2			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	204	-54	-10	3	6	48.8			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	280	-57	-10	3	6	47.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	343	-59	-10	3	6	41.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	323	-58	-10	3	6	46.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	323	-58	-10	3	6	37.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	323	-58	-10	3	6	23.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	244	-56	-10	3	6	39.3			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	257	-56	-10	3	6	38.8			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	272	-57	0	3	6	55.3			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	243	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	243	-56	-10	3	6	41.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	259	-56	-10	3	6	42.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	170	-53	-10	3	6	36.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	170	-53	-10	3	6	37.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	380	-60	-10	3	6	19.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	350	-59	0	3	6	45.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	330	-58	0	3	6	53.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	312	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	312	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	312	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	293	-57	0	0	6	49.7			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	204	-54	-10	3	6	46.8			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	343	-59	-10	3	6	38.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	323	-58	-10	3	6	46.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	323	-58	-10	3	6	37.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	323	-58	-10	3	6	23.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	243	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	243	-56	-10	3	6	38.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	259	-56	-10	3	6	40.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	170	-53	-10	3	6	36.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	170	-53	-10	3	6	37.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	350	-59	0	3	6	42.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	330	-58	0	3	6	53.6			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	312	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	312	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	312	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR57	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	103	-48	-10	3	6	53.7	Day-time & Evening (7am - 11pm)	65	Yes
20/F	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	103	-48	-5	3	6	58.7			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	113	-49	-5	3	6	58.0			
80.6	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
mPD	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	203	-54	-10	3	6	48.9			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	282	-57	-10	3	6	47.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	345	-59	-10	3	6	41.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	323	-58	-10	3	6	46.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	323	-58	-10	3	6	37.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	323	-58	-10	3	6	23.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	245	-56	-10	3	6	39.2			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	258	-56	-10	3	6	38.8			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	273	-57	0	3	6	55.3			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	244	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	244	-56	-10	3	6	41.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	259	-56	-10	3	6	42.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	172	-53	-10	3	6	36.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	172	-53	-10	3	6	37.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	381	-60	-10	3	6	19.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	350	-59	0	3	6	45.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	327	-58	0	3	6	53.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	314	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	314	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	313	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	289	-57	0	0	6	49.8			
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	203	-54	-10	3	6	46.9			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	345	-59	-10	3	6	38.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	323	-58	-10	3	6	46.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	323	-58	-10	3	6	37.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	323	-58	-10	3	6	23.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	244	-56	-10	3	6	37.3			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	244	-56	-10	3	6	38.3			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	259	-56	-10	3	6	40.7			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	172	-53	-10	3	6	36.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	172	-53	-10	3	6	37.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	350	-59	0	3	6	42.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	327	-58	0	3	6	53.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	314	-58	0	3	6	36.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	314	-58	0	3	6	37.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	313	-58	0	3	6	48.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR57	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	109	-49	-10	3	6	53.2			
15/F	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	109	-49	-5	3	6	58.2			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	118	-49	-5	3	6	57.5			
64.8	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
mPD	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	204	-54	-10	3	6	48.8			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	284	-57	-10	3	6	46.9			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	347	-59	-10	3	6	41.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	324	-58	-10	3	6	46.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	324	-58	-10	3	6	37.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	324	-58	-10	3	6	23.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	248	-56	-10	3	6	39.1			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	260	-56	-10	3	6	38.7	Day-time & Evening (7am - 11pm)	65	Yes
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	274	-57	0	3	6	55.2			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	245	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	245	-56	-10	3	6	41.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	261	-56	-10	3	6	42.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	176	-53	-10	3	6	36.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	176	-53	-10	3	6	37.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	383	-60	-10	3	6	19.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	351	-59	0	3	6	45.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	324	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	317	-58	0	3	6	36.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	317	-58	0	3	6	37.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	315	-58	0	3	6	48.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	286	-57	0	0	6	49.9			
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	204	-54	-10	3	6	46.8			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	347	-59	-10	3	6	38.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	324	-58	-10	3	6	46.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	324	-58	-10	3	6	37.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	324	-58	-10	3	6	23.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	245	-56	-10	3	6	37.2			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	245	-56	-10	3	6	38.2			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	261	-56	-10	3	6	40.7			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	176	-53	-10	3	6	36.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	176	-53	-10	3	6	37.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	351	-59	0	3	6	42.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	324	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	317	-58	0	3	6	36.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	317	-58	0	3	6	37.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	315	-58	0	3	6	48.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR57	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	117	-49	-10	3	6	52.6			
10/F	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	117	-49	-5	3	6	57.6			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	125	-50	-5	3	6	57.0			
49.1	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
mPD	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	205	-54	-10	3	6	48.7			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	287	-57	-10	3	6	46.8			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	350	-59	-10	3	6	41.1			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	325	-58	-10	3	6	46.8	Day-time & Evening (7am - 11pm)	65	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	325	-58	-10	3	6	37.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	325	-58	-10	3	6	23.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	251	-56	-10	3	6	39.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	264	-56	-10	3	6	38.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	277	-57	0	3	6	55.2			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	248	-56	-10	3	6	37.1			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	248	-56	-10	3	6	41.1			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	263	-56	-10	3	6	42.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	181	-53	-10	3	6	35.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	181	-53	-10	3	6	36.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	386	-60	-10	3	6	19.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	352	-59	0	3	6	45.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	322	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	320	-58	0	3	6	35.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	320	-58	0	3	6	36.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	318	-58	0	3	6	48.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	284	-57	0	0	6	49.9			
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	205	-54	-10	3	6	46.7			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	350	-59	-10	3	6	38.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	325	-58	-10	3	6	46.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	325	-58	-10	3	6	37.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	325	-58	-10	3	6	23.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	248	-56	-10	3	6	37.1			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	248	-56	-10	3	6	38.1			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	263	-56	-10	3	6	40.6			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	181	-53	-10	3	6	35.8			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	181	-53	-10	3	6	36.9			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	352	-59	0	3	6	42.1			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	322	-58	0	3	6	53.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	320	-58	0	3	6	35.9			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	320	-58	0	3	6	36.9			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	318	-58	0	3	6	48.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			
NSR57 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	126	-50	-10	3	6	52.0	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	P	103	1	103	126	-50	-5	3	6	57.0			
	GC-3	Dry cooler	Grandtech Centre	Y	P	103	1	103	134	-51	-5	3	6	56.4			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	208	-54	-10	3	6	48.6			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	291	-57	-10	3	6	46.7			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	354	-59	-10	3	6	41.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	327	-58	-10	3	6	46.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	327	-58	-10	3	6	37.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	327	-58	-10	3	6	23.7			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	256	-56	-10	3	6	38.8			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	268	-57	-10	3	6	38.4			
	CP-1 to CP-2	Chiller	Corporation Park	Y	Y	100	2	103	280	-57	0	3	6	55.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	251	-56	-10	3	6	37.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	251	-56	-10	3	6	41.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	266	-57	-10	3	6	42.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	187	-53	-10	3	6	35.6			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	187	-53	-10	3	6	36.6			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	389	-60	-10	3	6	19.2			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	4	95	354	-59	0	3	6	45.0			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	321	-58	0	3	6	53.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	324	-58	0	3	6	35.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	324	-58	0	3	6	36.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	321	-58	0	3	6	47.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	Y	96	3	101	283	-57	0	0	6	50.0			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	No
	GC-2	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	P	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	208	-54	-10	3	6	46.6			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	354	-59	-10	3	6	38.0			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	327	-58	-10	3	6	46.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	327	-58	-10	3	6	37.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	327	-58	-10	3	6	23.7			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	Y	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	251	-56	-10	3	6	37.0			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	251	-56	-10	3	6	38.0			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	266	-57	-10	3	6	40.5			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	187	-53	-10	3	6	35.6			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	187	-53	-10	3	6	36.6			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	Y	89	2	92	354	-59	0	3	6	42.0			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	98	3	103	321	-58	0	3	6	53.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	85	1	85	324	-58	0	3	6	35.8			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	Y	86	1	86	324	-58	0	3	6	36.8			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	Y	97	1	97	321	-58	0	3	6	47.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	Y	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	57			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

Mitigated Scenario

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
NSR40_a 30/F 112.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	51	-42	-10	3	6	59.8	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	55	-43	-10	3	6	59.2			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	74	-45	-10	3	6	56.6			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	159	-52	-10	3	6	51.0			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	235	-55	-10	3	6	48.6			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	298	-57	-10	3	6	42.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	287	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	287	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	287	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	208	-54	-10	3	6	40.6			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	221	-55	-10	3	6	40.1			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	247	-56	-10	3	6	46.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	231	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	231	-55	-10	3	6	41.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	245	-56	-10	3	6	43.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	172	-53	-10	3	6	36.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	172	-53	-10	3	6	37.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	339	-59	-10	3	6	20.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	328	-58	-10	3	6	35.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	329	-58	-10	3	6	43.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	302	-58	-10	3	6	26.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	302	-58	-10	3	6	27.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	309	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	295	-57	-10	0	6	39.6			
												Cumulative Noise Level, dB(A)		64			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	159	-52	-10	3	6	49.0			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	298	-57	-10	3	6	39.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	287	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	287	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	287	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	231	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	231	-55	-10	3	6	38.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	245	-56	-10	3	6	41.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	172	-53	-10	3	6	36.3			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	172	-53	-10	3	6	37.3			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	328	-58	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	329	-58	-10	3	6	43.7			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	302	-58	-10	3	6	26.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	302	-58	-10	3	6	27.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	309	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
												Cumulative Noise Level, dB(A)		54			
NSR40_a 25/F 96.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	54	-43	-10	3	6	59.4	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	57	-43	-10	3	6	58.8			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	76	-46	-10	3	6	56.4			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	157	-52	-10	3	6	51.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	235	-55	-10	3	6	48.6			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	299	-58	-10	3	6	42.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	209	-54	-10	3	6	40.6			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	222	-55	-10	3	6	40.1			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	247	-56	-10	3	6	46.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	231	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	231	-55	-10	3	6	41.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	244	-56	-10	3	6	43.3			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	173	-53	-10	3	6	36.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	173	-53	-10	3	6	37.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	340	-59	-10	3	6	20.4			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	327	-58	-10	3	6	35.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	325	-58	-10	3	6	43.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	303	-58	-10	3	6	26.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	303	-58	-10	3	6	27.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	309	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	290	-57	-10	0	6	39.8			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	64			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	157	-52	-10	3	6	49.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	299	-58	-10	3	6	39.5			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	231	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	231	-55	-10	3	6	38.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	244	-56	-10	3	6	41.3			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	173	-53	-10	3	6	36.2			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	173	-53	-10	3	6	37.2			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	327	-58	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	325	-58	-10	3	6	43.8			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	303	-58	-10	3	6	26.4			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	303	-58	-10	3	6	27.4			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	309	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	54			
NSR40_a 20/F 80.6 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	60	-44	-10	3	6	58.4	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	64	-44	-10	3	6	57.9			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	81	-46	-10	3	6	55.9			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	156	-52	-10	3	6	51.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	237	-55	-10	3	6	48.5			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	301	-58	-10	3	6	42.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	210	-54	-10	3	6	40.5			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	223	-55	-10	3	6	40.0			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	248	-56	-10	3	6	46.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	232	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	232	-55	-10	3	6	41.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	244	-56	-10	3	6	43.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	175	-53	-10	3	6	36.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	175	-53	-10	3	6	37.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	341	-59	-10	3	6	20.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	327	-58	-10	3	6	35.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	322	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	305	-58	-10	3	6	26.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	305	-58	-10	3	6	27.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	310	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	286	-57	-10	0	6	39.9			
													Cumulative Noise Level, dB(A)	63			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	156	-52	-10	3	6	49.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	301	-58	-10	3	6	39.4			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	286	-57	-10	3	6	47.9			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	286	-57	-10	3	6	38.9			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	286	-57	-10	3	6	24.9			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	232	-55	-10	3	6	37.7			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	232	-55	-10	3	6	38.7			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	244	-56	-10	3	6	41.2			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	175	-53	-10	3	6	36.1			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	175	-53	-10	3	6	37.1			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	327	-58	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	322	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	305	-58	-10	3	6	26.3			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	305	-58	-10	3	6	27.3			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	310	-58	-10	3	6	38.2			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	54			
NSR40_a 15/F 64.8 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	70	-45	-10	3	6	57.1	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	73	-45	-10	3	6	56.7			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	88	-47	-10	3	6	55.1			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	157	-52	-10	3	6	51.1			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	240	-56	-10	3	6	48.4			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	304	-58	-10	3	6	42.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	287	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	287	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	287	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	213	-55	-10	3	6	40.4			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	226	-55	-10	3	6	39.9			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	250	-56	-10	3	6	46.1			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	233	-55	-10	3	6	37.6			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	233	-55	-10	3	6	41.6			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	246	-56	-10	3	6	43.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	179	-53	-10	3	6	36.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	179	-53	-10	3	6	37.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	344	-59	-10	3	6	20.3			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	328	-58	-10	3	6	35.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	319	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	308	-58	-10	3	6	26.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	308	-58	-10	3	6	27.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	312	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	283	-57	-10	0	6	39.9			
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	157	-52	-10	3	6	49.1			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	304	-58	-10	3	6	39.3			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	287	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	287	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	287	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	233	-55	-10	3	6	37.6			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	233	-55	-10	3	6	38.6			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	246	-56	-10	3	6	41.2			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	179	-53	-10	3	6	36.0			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	179	-53	-10	3	6	37.0			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	328	-58	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	319	-58	-10	3	6	43.9			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	308	-58	-10	3	6	26.2			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	308	-58	-10	3	6	27.2			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	312	-58	-10	3	6	38.1			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	54			
NSR40_a 10/F 49.1 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	82	-46	-10	3	6	55.8			
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	84	-47	-10	3	6	55.5			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	98	-48	-10	3	6	54.2			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	159	-52	-10	3	6	51.0			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	243	-56	-10	3	6	48.3			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	308	-58	-10	3	6	42.2			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	289	-57	-10	3	6	47.8	Day-time & Evening (7am - 11pm)	65	Yes
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	289	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	289	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	218	-55	-10	3	6	40.2			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	230	-55	-10	3	6	39.8			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	252	-56	-10	3	6	46.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	236	-55	-10	3	6	37.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	236	-55	-10	3	6	41.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	248	-56	-10	3	6	43.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	184	-53	-10	3	6	35.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	184	-53	-10	3	6	36.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	346	-59	-10	3	6	20.2			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	329	-58	-10	3	6	35.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	317	-58	-10	3	6	44.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	311	-58	-10	3	6	26.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	311	-58	-10	3	6	27.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	315	-58	-10	3	6	38.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	281	-57	-10	0	6	40.0			
													Cumulative Noise Level, dB(A)	62			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	159	-52	-10	3	6	49.0			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	308	-58	-10	3	6	39.2			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	289	-57	-10	3	6	47.8			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	289	-57	-10	3	6	38.8			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	289	-57	-10	3	6	24.8			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	236	-55	-10	3	6	37.5			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	236	-55	-10	3	6	38.5			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	248	-56	-10	3	6	41.1			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	184	-53	-10	3	6	35.7			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	184	-53	-10	3	6	36.7			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	329	-58	-10	3	6	32.7			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	317	-58	-10	3	6	44.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	311	-58	-10	3	6	26.1			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	311	-58	-10	3	6	27.1			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	315	-58	-10	3	6	38.0			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	53			
NSR40_a 5/F 33.3 mPD	GC-1	Dry cooler	Grandtech Centre	Y	N	103	1	103	95	-48	-10	3	6	54.5	Day-time & Evening (7am - 11pm)	65	Yes
	GC-2	Dry cooler	Grandtech Centre	Y	N	103	1	103	97	-48	-10	3	6	54.3			
	GC-3	Dry cooler	Grandtech Centre	Y	N	103	1	103	109	-49	-10	3	6	53.3			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	5	104	163	-52	-10	3	6	50.8			
	DH-1 to DH-2	Chiller	Delta House	Y	N	102	2	105	248	-56	-10	3	6	48.1			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	2	101	312	-58	-10	3	6	42.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	291	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	291	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	291	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	Y	N	96	1	96	223	-55	-10	3	6	40.0			
	MS-2	Chiller	Metropole Square	Y	N	96	1	96	235	-55	-10	3	6	39.6			
	CP-1 to CP-2	Chiller	Corporation Park	Y	N	100	2	103	256	-56	-10	3	6	45.8			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	240	-56	-10	3	6	37.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	240	-56	-10	3	6	41.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	3	100	252	-56	-10	3	6	43.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	190	-54	-10	3	6	35.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	190	-54	-10	3	6	36.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	Y	N	80	1	80	350	-59	-10	3	6	20.1			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	4	95	331	-58	-10	3	6	35.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	316	-58	-10	3	6	44.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	315	-58	-10	3	6	26.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	315	-58	-10	3	6	27.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	318	-58	-10	3	6	37.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	Y	N	96	3	101	280	-57	-10	0	6	40.0			

Noise Assessment for the Identified Fixed Noise Sources (Base Case Scenario)

NSR	Fixed Noise Source	Equipment	Location	Noise Source in Operation (Y/N)[4]	Direct Line-of-sight to Noise Source (Y:YES; N:NO; P: GC sources screened due to height difference)[5] [6]	SWL for Single Unit, dB(A)[1]	No. of Equipment [4]	Total SWL, dB(A)	Slant Distance from NSR to Noise Source (m)	Distance Attenuation dB(A)	Screening Correction dB(A)	Facade Correction dB(A)[2]	Tonality Correction dB(A)[3]	Predicted Noise Level, dB(A)	Assessment Period	Cumulative Noise Standard, dB(A)	Comply (Yes/ No)
													Cumulative Noise Level, dB(A)	61			
	GC-1	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0	Night-time (11pm - 7am)	55	Yes
	GC-2	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-3	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-4	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	GC-5	Dry cooler	Grandtech Centre	N	N	-	-	-	-	-	-	-	-	0.0			
	TP-1 to TP-5	Chiller	Topsail Plaza	Y	N	97	3	102	163	-52	-10	3	6	48.8			
	DH-1 to DH-2	Chiller	Delta House	N	N	-	-	-	-	-	-	-	-	0.0			
	WL-to WL-2	Chiller	W LUXE	Y	N	98	1	98	312	-58	-10	3	6	39.1			
	HSB-1 to HSB-6	Cooling Tower - 2417kW	HSBC Data Center	Y	N	99	6	106	291	-57	-10	3	6	47.7			
	HSB-7 to HSB-9	Cooling Tower - 1644kW	HSBC Data Center	Y	N	93	3	97	291	-57	-10	3	6	38.7			
	HSB-10	Cooling Tower - 440kW	HSBC Data Center	Y	N	83	1	83	291	-57	-10	3	6	24.7			
	MS-1	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	MS-2	Chiller	Metropole Square	N	N	-	-	-	-	-	-	-	-	0.0			
	CP-1 to CP-2	Chiller	Corporation Park	N	N	-	-	-	-	-	-	-	-	0.0			
	IDS-1	Cooling tower	IDS Li Fung Centre	Y	N	94	1	94	240	-56	-10	3	6	37.4			
	IDS-2 to IDS-3	Cooling tower	IDS Li Fung Centre	Y	N	95	1	95	240	-56	-10	3	6	38.4			
	IDS-4 to IDS-6	Cooling tower	IDS Li Fung Centre	Y	N	95	2	98	252	-56	-10	3	6	41.0			
	CMHKST-1	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	90	1	90	190	-54	-10	3	6	35.4			
	CMHKST-2	Cooling tower	Courtyard by Marriott Hong Kong Sha Tin	Y	N	91	1	91	190	-54	-10	3	6	36.4			
	KWP-1	Cooling tower	Kings Wing Plaza 2	N	N	-	-	-	-	-	-	-	-	0.0			
	NCC-1 to NCC-4	Chiller	New Commerce Centre	Y	N	89	2	92	331	-58	-10	3	6	32.6			
	CLP-1 to CLP-3	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	98	3	103	316	-58	-10	3	6	44.0			
	CLP-4	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	85	1	85	315	-58	-10	3	6	26.0			
	CLP-5	Cooling tower	CLP Power Hong Kong Limited Shatin Centre	Y	N	86	1	86	315	-58	-10	3	6	27.0			
	CLP-6	Chiller	CLP Power Hong Kong Limited Shatin Centre	Y	N	97	1	97	318	-58	-10	3	6	37.9			
	HYK-1 to HYK-3	Chiller	Heung Yee Kuk Building	N	N	-	-	-	-	-	-	-	-	0.0			
													Cumulative Noise Level, dB(A)	53			

Note:
(1) The Sound Power Level (SWL) of fixed noise sources are based on reference catalogue and the measurement data from the approved EAS for On Muk Street Phase 1.
(2) Facade effect was included in the measurements for chillers in Heung Yee Kuk Buidiling. Therefore, no façade correction is adopted.
(3) The tonality correction of 6 is assumed based on worst-case scenario.
(4) Details of the operation hour and no. of equipment should refer to Appendix 4.4.
(5) 10 dB(A) screening correction is applied to NSRs where NSRs do not have a line-of-sight due to screening from building structure, except that a 5 dB(A) screening correction is conservatively assumed for Grandtech Centre due to its close proximity to the NSRs

4.7 Source Term and Assumptions

Assumptions and Parameters for Railway Airborne Noise Assessment

Parameter	Tuen Ma Line		Remarks	Ref
No. of Car and Train Length	8-car, m	200	Electric Multiple Unit train	D
Train Noise (Rolling Noise)	SEL to Hung Hom , dB(A) at viaduct	81.4	8 cars at 25m at 130kph	D
	SEL to Tuen Mun, dB(A) at viaduct	80.7	8 cars at 25m at 130kph	D
	SEL, dB(A) at grade	82.7	8 cars at 25m at 130kph	E
Air-conditioning Noise	Lmax at viaduct for running train, dB(A)	48.8	Considering the high running speed, rolling noise is dominant. Air-conditioning noise is negligible.	D
	Lmax at station for runnung train, dB(A)	54.8		D
Structure Re-radiated Noise	$L_{eq\ 30mins}$ Viaduct, dB(A)	40.6	Typical viaduct - plain track	D
	$L_{eq\ 30mins}$ Viaduct with full enclosure, dB(A)	47.1	Turn out inside enclosure	D
Train Frequency per 30 min per Direction	during peak daytime, nos	14	0700-2300	F
	duing peak night-time, nos	8	2300-0700	F
Train Frequency per 24 hrs per Direction	Trains, nos	540		F
Train Speed	kph	110	Max. operating speed, at grade	F
	kph	110	Max. operating speed, on viaduct	F

Railway Noise Impact Assessment Correction Factors

Description	Assumption / Remarks	Ref.	Note
Speed Correction	+20 log10 (V/Vref) where V = Train speed, Vref = Reference train speed	A	
Train Frequency Correction	+10 log (N) where N = Train frequency per 30 min per Direction	A	
Distance Correction	-10 log10 (d'/dref) where d' = Slant distance from track to NSR and dref = Reference distance (i.e.25m)	A	
Angle of View Correction	+10 log10 ($\pi\theta/180$ – cos2α sinθ) -5 where θ= Angle of View and α= Acute angle between a line drawn through the NSR, parallel to the track, and the line bisecting the angle of view, θ	A	
Air Absorption Correction	Cair = 0.2 - 0.008 x d' where d' is slant distance from track to NSR	A	
Reflection Correction	Crefl = 1.5 (θ'/θ) dB(A) (θ' is the sum of the angles subtended by all reflecting facades on the opposite side of the railway facign the receiver point and θ is the total angle subtended by the source line at the receiver point, +1.5dB maximum correction for each reflection	A	
Façade Correction	+2.5 dB(A)	A	
Rail and Rolling Stock Condition Deterioration	+3 dB(A)	A	(i)
Joint / Turnout Correction	+7 dB(A)	B	(i)
Incorporate Barrier Correction	Shadow Zone: -21dB(A) for δ > 2.5 m where δ is the Path Difference in metre -7.75 log10 (5.2 + 203 δ) dB(A) for 0≤ δ <2.5 m Illuminated Zone: 0dB(A) for δ > 0.4 m 0.88 + 2.14 log10 (10-3 + δ) dB(A) for 0≤ δ <0.4 m	Chart 6(a) of A	
Calculate the overall noise level from all rail segments including rolling noise	Standard acoustic principal	-	
Calculate the Lmax	SEL = Lmax + 10log(L/V) +10.5 – 10log[(4D/(4D^2+1)) + 2tan-1(1/(2D))] where D = d/L with L being train length (m)	Equation 15.21 of C	
Calculate the Leq, 30 mins	Leq(30mins) = SEL - 10log(T) + 10log(N) + Cdist + Cav +Cpoor +Cbar + Cfac WhereT = 1800s, N = Number of Trains per 30 minutes		
Calculate the Leq, 24hr	Leq(24-hr) = SEL - 10log(T) + 10log(N) + Cdist + Cav +Cpoor +Cbar + Cfac WhereT = 86400s, N = Number of Trains per day	-	

Reference:

A - Calculation of Railway Noise (1995).
B - "West Rail Operation Noise Assessment Report" prepared by MTR Corporation Limited in July 2015.
C - Transportation Noise Reference Book.
D - Approved Tuen Mun South Extension EIA Report (Register No.: AEIAR-236/2022)
E - Shatin to Central Link - Stabling Sidings at Hung Hom Freight Yard (Register No: AEIAR-164/2012)
F- Information provided by MTR (future scenario)
(i) - Model input

4.8 Result of Railway Noise Impact Assessment

Project: **Housing Development at Shek Mun**

Block: **Block A**
Scenario: **Base Case (Day and Evening)**

Floor	Assessment point level (mPD)	1	2	3	4	5	6	7	8	9	10	11	12	13	5_a	6_a
34/F	124.7	60	59	61	61	61	61	60	60	49	51	46	46	50	47	57
33/F	121.5	60	59	61	61	61	61	60	60	49	51	46	46	50	47	57
32/F	118.4	61	59	61	61	61	61	60	60	49	51	46	47	50	48	57
31/F	115.2	61	59	61	61	61	61	60	60	49	51	46	47	50	48	57
30/F	112.1	61	59	61	61	61	61	60	60	49	51	46	47	50	48	57
29/F	108.9	61	59	62	61	61	61	61	60	49	51	46	47	50	48	57
28/F	105.8	61	60	62	62	62	61	61	60	49	51	46	47	50	48	57
27/F	102.6	61	60	62	62	62	62	61	61	60	49	51	46	47	50	48	57
26/F	99.5	61	60	62	62	62	62	61	61	61	49	52	46	47	50	48	57
25/F	96.3	61	60	62	62	62	62	61	61	61	49	52	46	47	50	48	57
24/F	93.2	61	60	62	62	62	62	61	61	61	49	52	46	47	50	48	58
23/F	90.0	61	60	62	62	62	62	61	61	61	49	52	46	47	51	48	58
22/F	86.9	61	60	62	62	62	62	61	61	61	50	52	46	47	51	48	58
21/F	83.7	62	60	62	62	62	62	61	61	61	50	52	46	47	51	48	58
20/F	80.6	62	60	62	62	62	62	61	61	61	50	52	46	47	50	49	58
19/F	77.4	62	60	63	62	62	62	61	61	61	50	52	46	47	50	49	58
18/F	74.3	62	60	63	63	63	62	61	61	61	49	52	46	47	50	49	58
17/F	71.1	62	61	63	63	63	62	62	61	61	49	51	46	47	50	49	58
16/F	68.0	62	61	63	63	63	62	62	61	61	49	51	46	47	50	49	58
15/F	64.8	62	61	63	63	63	62	61	61	61	49	51	46	47	50	49	58
14/F	61.7	62	61	63	63	63	62	61	61	61	49	51	46	47	50	49	58
13/F	58.5	61	61	63	63	63	62	61	61	61	49	51	46	47	50	49	58
12/F	55.4	61	60	63	63	63	62	61	61	61	49	51	46	47	50	49	58
11/F	52.2	61	60	63	63	63	62	61	61	60	49	51	46	47	50	49	58
10/F	49.1	61	60	63	63	62	62	61	60	49	51	46	47	50	48	57
9/F	45.9	61	60	63	62	62	62	61	60	48	50	45	46	50	48	57
8/F	42.8	61	60	63	62	62	61	60	60	48	50	45	46	50	48	57
7/F	39.6	61	60	62	62	62	61	60	60	48	50	45	46	50	48	57
6/F	36.5	61	60	62	62	62	61	60	60	47	49	45	46	49	48	57
5/F	33.3	60	60	62	62	62	61	60	59	47	48	44	46	49	47	57
4/F	30.2	60	59	62	62	62	61	60	59	46	48	44	44	45	48	46	56
3/F	27.0	58	58	61	61	60	59	58	57	46	47	44	45	47	45	55
2/F	23.9	58	57	60	60	59	58	57	56	45	46	43	44	46	44	54
1/F	20.7	57	56	59	59	58	57	56	55	44	45	43	44	46	43	53
Max.		62	61	63	63	63	62	62	61	50	52	46	47	51	49	58

Notes:

NSR with an Area Sensitivity Rating of C
NSR with an Area Sensitivity Rating of B

Project: **Housing Development at Shek Mun**

Block: **Block B**
Scenario: **Base Case (Day and Evening)**

Floor	Assessment point level (mPD)	14	15	16	17	18	19	20	21	22	23	24	25	26	18_a	19_a
34/F	124.7															
33/F	121.5	54	57	60	60	60	60	60	59	44	47	44	45	45	45	57
32/F	118.4	54	57	60	60	60	60	60	59	44	47	44	45	45	45	57
31/F	115.2	54	57	60	60	60	60	60	60	44	47	44	45	45	45	57
30/F	112.1	54	58	60	60	61	60	60	60	44	47	44	45	45	45	57
29/F	108.9	54	58	60	61	61	60	60	60	44	47	44	45	45	45	57
28/F	105.8	54	58	61	61	61	60	60	60	44	47	44	45	45	45	57
27/F	102.6	54	58	61	61	61	61	60	60	44	47	44	45	45	45	57
26/F	99.5	54	58	61	61	61	61	60	60	44	47	44	45	45	45	57
25/F	96.3	54	58	61	61	61	61	60	60	44	47	44	45	45	45	57
24/F	93.2	54	58	61	61	61	61	60	60	44	47	44	45	45	45	57
23/F	90.0	54	58	61	61	61	61	60	60	44	47	44	45	45	45	57
22/F	86.9	54	58	61	61	61	61	60	60	44	47	44	45	45	45	58
21/F	83.7	54	58	61	61	61	61	60	60	44	47	44	45	45	45	57
20/F	80.6	54	58	61	61	61	61	60	60	44	47	44	45	45	45	57
19/F	77.4	54	58	61	61	61	61	60	59	44	47	44	45	45	45	57
18/F	74.3	54	58	61	61	61	60	60	59	44	46	44	45	45	45	57
17/F	71.1	54	58	61	61	61	60	60	59	44	46	44	45	45	45	57
16/F	68.0	54	58	61	61	61	60	60	59	44	46	44	45	45	45	57
15/F	64.8	54	58	61	61	61	60	60	59	44	46	44	45	45	45	57
14/F	61.7	54	58	61	61	61	60	59	59	43	46	44	44	45	45	57
13/F	58.5	53	57	61	61	60	60	59	59	43	46	44	44	45	44	57
12/F	55.4	53	57	60	60	60	60	59	59	43	45	44	44	45	44	56
11/F	52.2	53	57	60	60	60	60	59	59	43	45	43	44	45	44	56
10/F	49.1	53	57	60	60	60	60	59	59	43	45	43	44	45	44	56
9/F	45.9	53	57	60	60	60	60	59	59	58	43	45	43	44	44	56
8/F	42.8	53	57	60	60	60	59	59	58	43	45	43	44	44	43	56
7/F	39.6	53	57	60	60	60	59	58	57	42	44	43	44	44	42	55
6/F	36.5	51	56	59	59	59	58	57	56	42	44	42	43	44	42	54
5/F	33.3	51	55	59	58	58	57	56	56	42	43	42	43	43	42	54
4/F	30.2	50	54	58	58	57	56	56	55	41	42	42	43	43	41	53
3/F	27.0	49	54	57	57	56	56	55	54	41	42	42	42	43	40	52
2/F	23.9	48	53	56	56	55	55	54	53	41	42	41	42	42	38	51
1/F	20.7	48	52	55	54	54	53	53	52	41	41	41	42	42	37	50
Max.		54	58	61	61	61	61	60	60	44	47	44	45	45	45	58

Notes:

NSR with an Area Sensitivity Rating of C
NSR with an Area Sensitivity Rating of B

Project: **Housing Development at Shek Mun**

Block: **Block C**
Scenario: **Base Case (Day and Evening)**

Floor	Assessment point level (mPD)	27	28	30	31	32	33	34
34/F	124.7							
33/F	121.5							
32/F	118.4	59	59	50	42	39	38	56
31/F	115.2	59	59	50	42	39	38	56
30/F	112.1	60	59	50	42	39	39	56
29/F	108.9	60	59	50	42	39	39	56
28/F	105.8	60	58	50	42	39	39	56
27/F	102.6	60	58	50	42	39	39	56
26/F	99.5	60	58	50	42	39	39	56
25/F	96.3	60	58	49	42	39	39	56
24/F	93.2	60	58	49	42	39	39	56
23/F	90.0	59	58	49	42	39	39	56
22/F	86.9	59	58	49	42	40	39	56
21/F	83.7	59	58	49	42	40	39	56
20/F	80.6	59	58	49	42	40	39	56
19/F	77.4	59	58	49	42	40	39	56
18/F	74.3	59	58	49	42	40	39	55
17/F	71.1	59	58	48	42	40	39	55
16/F	68.0	59	57	48	42	40	39	55
15/F	64.8	59	57	48	42	40	39	55
14/F	61.7	59	57	48	42	40	39	55
13/F	58.5	58	57	48	42	40	39	55
12/F	55.4	58	57	47	42	40	39	55
11/F	52.2	58	56	47	42	40	39	55
10/F	49.1	58	56	47	42	40	39	54
9/F	45.9	58	55	46	42	40	40	54
8/F	42.8	57	55	46	42	40	40	53
7/F	39.6	57	54	45	42	40	40	53
6/F	36.5	56	54	44	42	40	40	52
5/F	33.3	55	53	43	42	40	40	51
4/F	30.2	54	52	42	42	40	40	50
3/F	27.0	53	51	41	41	40	40	49
2/F	23.9	53	50	41	41	40	40	49
1/F	20.7	52	50	40	41	39	40	48
Max.		60	59	50	42	40	40	56

Notes:

NSR with an Area Sensitivity Rating of C
NSR with an Area Sensitivity Rating of B

Project: **Housing Development at Shek Mun**

Block: **Block D**
Scenario: **Base Case (Day and Evening)**

Floor	Assessment point level (mPD)	35	36	37	38	39	40	41	42	43	44	45	46	47	96_a	39_a	40_a
34/F	124.7	58	57	57	56	54	48	37	40	37	37	55	56	57	57	<40	<40
33/F	121.5	58	57	57	56	54	48	37	40	37	37	55	56	57	57	<40	<40
32/F	118.4	58	57	57	56	54	47	37	40	37	37	55	56	57	57	<40	<40
31/F	115.2	58	57	57	56	54	47	37	40	37	37	55	55	57	57	<40	<40
30/F	112.1	58	57	56	56	54	47	37	40	37	37	55	55	57	56	<40	<40
29/F	108.9	58	57	56	55	54	47	37	41	37	37	55	55	57	56	<40	<40
28/F	105.8	57	57	56	55	54	47	37	41	37	37	55	55	56	56	<40	<40
27/F	102.6	57	57	56	55	54	47	37	41	37	37	55	55	56	56	<40	<40
26/F	99.5	57	57	56	55	54	47	37	41	37	37	55	55	56	56	<40	<40
25/F	96.3	57	57	56	55	54	47	37	41	37	37	55	55	56	56	<40	<40
24/F	93.2	57	57	56	55	54	47	37	41	37	37	55	55	56	56	<40	<40
23/F	90.0	57	57	56	55	54	47	37	41	37	37	55	55	56	56	<40	<40
22/F	86.9	57	57	56	55	53	47	37	41	37	37	55	55	56	56	<40	<40
21/F	83.7	57	56	56	55	53	46	37	42	37	37	54	55	56	56	<40	<40
20/F	80.6	57	56	56	55	53	46	37	41	37	37	54	55	56	56	<40	<40
19/F	77.4	57	56	56	55	53	45	37	41	37	37	54	55	56	56	<40	<40
18/F	74.3	57	56	55	55	53	45	37	40	37	37	54	55	56	55	<40	<40
17/F	71.1	57	56	55	54	53	45	37	40	37	37	54	54	56	55	<40	<40
16/F	68.0	56	56	55	54	52	45	37	40	37	37	54	54	55	55	<40	<40
15/F	64.8	56	56	55	54	52	44	37	40	37	37	54	54	55	55	<40	<40
14/F	61.7	56	55	54	53	51	44	37	40	37	37	53	54	55	54	<40	<40
13/F	58.5	55	55	54	53	51	44	37	39	37	37	53	53	54	54	<40	<40
12/F	55.4	55	54	54	52	51	43	37	39	37	37	52	53	54	54	<40	<40
11/F	52.2	55	54	53	52	50	43	37	39	37	37	52	52	54	53	<40	<40
10/F	49.1	54	54	53	51	49	43	38	39	37	37	51	52	53	53	<40	<40
9/F	45.9	53	53	52	51	49	42	38	39	37	37	51	51	52	52	<40	<40
8/F	42.8	53	52	51	50	48	41	38	38	37	37	50	51	52	51	<40	<40
7/F	39.6	52	51	50	49	47	40	38	38	37	37	50	50	51	50	<40	<40
6/F	36.5	51	50	50	48	46	40	38	38	37	38	49	49	50	50	<40	<40
5/F	33.3	50	50	49	48	45	39	38	38	37	38	48	49	50	49	<40	<40
4/F	30.2	50	49	48	47	45	39	38	38	37	38	48	48	49	48	<40	<40
3/F	27.0	49	48	48	46	44	39	38	38	38	37	47	48	48	48	<40	<40
2/F	23.9	48	48	47	46	44	38	38	38	38	37	47	47	48	47	<40	<40
1/F	20.7	48	47	46	45	44	38	38	38	38	38	46	47	47	46	<40	<40
Max.		58	57	57	56	54	48	38	42	38	38	55	56	57	57	<40	<40

Notes:

NSR with an Area Sensitivity Rating of C
NSR with an Area Sensitivity Rating of B
<40 Noise level of less than 40 dB(A1) will be denoted "<40"

Project: **Housing Development at Shek Mun**

Block: **Block E**
Scenario: **Base Case (Day and Evening)**

Floor	Assessment point level (mPD)	48	49	50	51	52	53	54	55	56	57	58	59	60	51_a	55_a	56_a
34/F	124.7																
33/F	121.5	55	56	56	56	54	51	36	41	42	40	40	43	49	51	<40	<40
32/F	118.4	55	56	56	55	54	51	36	41	42	41	41	43	49	51	<40	<40
31/F	115.2	55	56	56	55	54	51	36	41	43	41	41	43	49	51	<40	<40
30/F	112.1	55	56	56	55	54	50	37	41	42	41	41	43	49	51	<40	<40
29/F	108.9	55	55	56	55	54	50	37	41	42	41	41	43	49	51	<40	<40
28/F	105.8	55	55	56	55	54	50	37	41	42	41	41	43	49	51	<40	<40
27/F	102.6	55	55	56	55	54	50	37	41	42	41	41	43	49	51	<40	<40
26/F	99.5	55	55	55	55	54	50	37	41	42	41	41	43	49	51	<40	<40
25/F	96.3	55	55	55	55	54	50	37	41	42	41	41	43	49	51	<40	<40
24/F	93.2	55	55	55	55	54	50	37	41	41	41	41	43	49	51	<40	<40
23/F	90.0	55	55	55	55	54	50	37	41	41	41	41	43	49	51	<40	<40
22/F	86.9	55	55	55	55	54	50	37	41	41	41	41	43	49	51	<40	<40
21/F	83.7	55	55	55	55	54	50	37	41	41	41	41	43	49	51	<40	<40
20/F	80.6	55	55	55	55	54	50	37	41	41	41	41	42	49	51	<40	<40
19/F	77.4	54	55	55	55	54	50	37	41	41	41	41	42	49	50	<40	<40
18/F	74.3	54	55	55	54	53	50	37	41	41	41	41	42	49	50	<40	<40
17/F	71.1	54	54	55	54	53	50	37	41	41	41	41	42	48	49	<40	<40
16/F	68.0	54	54	54	54	53	49	37	41	41	41	41	42	48	49	<40	<40
15/F	64.8	53	54	54	54	52	49	37	41	41	41	41	42	48	49	<40	<40
14/F	61.7	53	53	54	53	52	48	37	41	41	41	41	42	48	48	<40	<40
13/F	58.5	52	53	53	53	52	48	37	41	41	41	41	42	47	48	<40	<40
12/F	55.4	52	52	53	52	51	48	37	41	41	41	41	42	47	47	<40	<40
11/F	52.2	52	52	52	52	51	47	37	40	41	41	41	42	47	46	<40	<40
10/F	49.1	51	51	52	51	50	47	37	40	41	41	41	42	47	46	<40	<40
9/F	45.9	51	51	51	51	50	47	37	41	41	41	41	42	46	45	<40	<40
8/F	42.8	50	50	51	50	49	46	37	42	42	41	41	41	46	44	<40	<40
7/F	39.6	49	50	50	50	49	46	37	40	40	40	40	41	46	44	<40	<40
6/F	36.5	49	49	49	49	48	45	37	40	40	40	40	41	45	43	<40	<40
5/F	33.3	48	49	49	48	48	45	37	40	40	40	40	41	45	43	<40	<40
4/F	30.2	48	48	48	48	47	44	37	40	40	40	40	41	44	42	<40	<40
3/F	27.0	47	47	48	47	47	44	37	40	40	40	40	41	44	42	<40	<40
2/F	23.9	47	47	47	47	46	44	37	40	40	40	40	40	44	42	<40	<40
1/F	20.7	46	46	46	46	46	43	37	40	40	40	40	40	43	42	<40	<40
Max.		55	56	56	56	54	51	37	42	43	41	41	43	49	51	<40	<40

Notes:

NSR with an Area Sensitivity Rating of C
NSR with an Area Sensitivity Rating of B
<40 Noise level of less than 40 dB(A1) will be denoted "<40"

Project: **Housing Development at Shek Mun**

Block: **Block A**

Scenario: **Base Case (Nighttime)**

Floor	Assessment point level (mPD)	1	2	3	4	5	6	7	8	9	10	11	12	13	5_a	9_a
34/F	124.7	58	57	59	59	59	58	58	57	46	48	43	44	47	45	54
33/F	121.5	58	57	59	59	59	58	58	57	46	49	43	44	47	45	54
32/F	118.4	58	57	59	59	59	58	58	58	46	49	43	44	47	45	54
31/F	115.2	58	57	59	59	59	59	58	58	46	49	43	44	48	45	54
30/F	112.1	58	57	59	59	59	59	58	58	46	49	43	44	48	45	55
29/F	108.9	58	57	59	59	59	59	58	58	47	49	43	44	48	45	55
28/F	105.8	58	57	59	59	59	59	58	58	47	49	43	44	48	45	55
27/F	102.6	58	57	59	59	59	59	58	58	47	49	44	44	48	45	55
26/F	99.5	59	57	59	59	59	59	58	58	47	49	44	44	48	46	55
25/F	96.3	59	57	59	59	59	59	58	58	47	49	44	45	48	46	55
24/F	93.2	59	57	60	59	59	59	59	58	47	49	44	45	48	46	55
23/F	90.0	59	58	60	60	60	59	59	58	47	49	44	45	48	46	55
22/F	86.9	59	58	60	60	60	59	59	58	47	49	44	45	48	46	55
21/F	83.7	59	58	60	60	60	59	59	58	47	49	44	45	48	46	55
20/F	80.6	59	58	60	60	60	60	59	59	47	49	44	45	48	46	55
19/F	77.4	59	58	60	60	60	60	59	59	47	49	44	45	48	46	56
18/F	74.3	59	58	60	60	60	60	59	59	47	49	44	45	48	46	56
17/F	71.1	59	58	60	60	60	60	59	59	47	49	44	45	48	46	56
16/F	68.0	59	58	60	60	60	60	59	58	47	49	44	45	48	46	56
15/F	64.8	59	58	60	60	60	60	59	58	47	49	44	45	48	47	55
14/F	61.7	59	58	**61**	60	60	60	59	58	47	49	44	45	48	47	55
13/F	58.5	59	58	**61**	60	60	60	59	58	47	48	43	44	48	46	55
12/F	55.4	59	58	**61**	60	60	60	59	58	46	48	43	44	48	46	55
11/F	52.2	59	58	60	60	60	59	58	58	46	48	43	44	47	46	55
10/F	49.1	59	58	60	60	60	59	58	58	46	48	43	44	47	46	55
9/F	45.9	58	58	60	60	60	59	58	58	46	48	43	44	47	46	55
8/F	42.8	58	57	60	60	60	59	58	57	46	48	43	44	47	45	55
7/F	39.6	58	57	60	60	59	59	58	57	46	47	43	44	47	45	55
6/F	36.5	58	57	60	59	59	59	58	57	45	46	43	44	47	45	55
5/F	33.3	58	57	60	59	59	59	57	57	44	46	42	43	46	45	54
4/F	30.2	57	57	59	59	59	58	56	56	44	45	42	42	45	44	54
3/F	27.0	56	56	59	58	58	57	56	55	43	44	41	42	45	43	52
2/F	23.9	55	55	57	57	57	56	55	54	42	44	41	42	44	42	52
1/F	20.7	54	54	56	56	56	56	53	52	42	43	40	41	43	40	50
Max.		59	58	**61**	60	60	60	59	59	47	49	44	45	48	47	56

Notes:

NSR with an Area Sensitivity Ratino of C
NSR with an Area Sensitivity Ratino of B

Project: **Housing Development at Shek Mun**

Block: **Block B**

Scenario: **Base Case (Nighttime)**

Floor	Assessment point level (mPD)	14	15	16	17	18	19	20	21	22	23	24	25	26	18_a	19_a
34/F	124.7															
33/F	121.5	51	55	58	58	58	58	57	57	41	44	42	42	42	42	54
32/F	118.4	51	55	58	58	58	58	57	57	41	44	42	42	42	42	54
31/F	115.2	51	55	58	58	58	58	57	57	41	44	42	42	42	42	55
30/F	112.1	51	55	58	58	58	58	57	57	41	44	42	42	43	42	55
29/F	108.9	51	55	58	58	58	58	57	57	41	44	42	42	43	42	55
28/F	105.8	52	55	58	58	58	58	58	57	41	44	42	42	43	42	55
27/F	102.6	52	55	58	58	58	58	58	57	41	45	42	42	43	42	55
26/F	99.5	52	55	58	58	58	58	58	57	41	45	42	42	43	42	55
25/F	96.3	52	55	58	58	58	58	58	57	41	45	42	42	43	42	55
24/F	93.2	52	55	58	58	58	58	58	57	41	44	42	42	43	43	55
23/F	90.0	52	56	58	59	59	59	58	58	57	41	44	42	43	43	55
22/F	86.9	52	56	59	59	59	59	58	58	57	41	44	42	43	43	55
21/F	83.7	52	56	59	59	59	59	58	58	57	41	44	42	43	43	55
20/F	80.6	52	56	59	59	59	59	58	58	57	41	44	42	43	43	55
19/F	77.4	52	56	59	59	59	58	58	57	41	44	42	42	43	43	55
18/F	74.3	52	55	59	59	58	58	57	57	41	44	42	42	43	43	55
17/F	71.1	52	55	58	58	58	58	57	57	41	44	42	42	43	43	55
16/F	68.0	51	55	58	58	58	58	57	57	41	44	42	42	43	42	54
15/F	64.8	51	55	58	58	58	58	57	57	41	43	41	42	43	42	54
14/F	61.7	51	55	58	58	58	58	57	56	41	43	41	42	43	42	54
13/F	58.5	51	55	58	58	58	57	57	56	41	43	41	42	42	42	54
12/F	55.4	51	55	58	58	58	57	57	56	41	43	41	42	42	42	54
11/F	52.2	51	55	58	58	58	57	57	56	41	43	41	42	42	41	54
10/F	49.1	51	54	58	58	57	57	56	56	41	43	41	41	42	41	54
9/F	45.9	51	54	57	57	57	57	56	56	40	42	41	41	42	41	54
8/F	42.8	51	54	57	57	57	56	55	55	40	42	41	41	42	40	54
7/F	39.6	50	54	57	57	57	56	55	55	40	42	40	41	42	40	53
6/F	36.5	49	54	57	57	56	56	55	54	40	41	40	41	41	40	52
5/F	33.3	48	53	56	56	56	55	54	53	39	41	40	40	41	<40	51
4/F	30.2	48	52	55	55	55	54	53	52	39	40	39	40	41	<40	50
3/F	27.0	47	51	54	54	54	53	52	52	38	39	39	40	40	<40	50
2/F	23.9	46	50	53	53	53	52	51	51	38	39	39	<40	40	<40	49
1/F	20.7	45	49	52	52	52	51	50	50	38	39	39	<40	40	<40	48
Max.		52	56	59	59	59	58	58	57	41	45	42	43	43	43	55

Notes:

NSR with an Area Sensitivity Ratino of C
NSR with an Area Sensitivity Ratino of B

Project: **Housing Development at Shek Mun**

Block: **Block C**

Scenario: **Base Case (Nighttime)**

Floor	Assessment point level (mPD)	27	28	30	31	32	33	34
34/F	124.7							
33/F	121.5							
32/F	118.4	57	56	47	39	37	36	53
31/F	115.2	57	56	47	39	37	36	53
30/F	112.1	57	56	47	39	37	36	54
29/F	108.9	57	56	47	39	37	36	54
28/F	105.8	57	56	47	40	37	36	54
27/F	102.6	57	56	47	40	37	36	54
26/F	99.5	57	56	47	40	37	36	54
25/F	96.3	57	56	47	40	37	36	53
24/F	93.2	57	56	47	40	37	36	53
23/F	90.0	57	56	47	40	37	36	53
22/F	86.9	57	55	47	40	37	36	53
21/F	83.7	57	55	46	40	37	37	53
20/F	80.6	57	55	46	40	37	37	53
19/F	77.4	57	55	46	40	37	37	53
18/F	74.3	57	55	46	40	37	37	53
17/F	71.1	56	55	46	40	37	37	53
16/F	68.0	56	55	46	40	37	37	53
15/F	64.8	56	55	46	40	37	37	52
14/F	61.7	56	55	45	40	37	37	52
13/F	58.5	56	55	45	40	37	37	52
12/F	55.4	56	54	45	40	37	37	52
11/F	52.2	56	54	45	40	38	37	52
10/F	49.1	56	53	44	40	38	37	52
9/F	45.9	55	53	44	40	38	37	51
8/F	42.8	55	52	43	40	38	37	51
7/F	39.6	54	52	42	40	38	37	50
6/F	36.5	53	51	41	40	38	37	49
5/F	33.3	53	50	40	39	37	37	49
4/F	30.2	52	50	39	39	37	37	48
3/F	27.0	51	49	39	39	37	37	47
2/F	23.9	50	48	38	39	37	37	46
1/F	20.7	49	47	38	39	37	37	46
Max.		57	56	47	40	38	37	54

Notes:

NSR with an Area Sensitivity Ratino of C
NSR with an Area Sensitivity Ratino of B

Project: **Housing Development at Shek Mun**

Block: **Block D**

Scenario: **Base Case (Nighttime)**

Floor	Assessment point level (mPD)	35	36	37	38	39	40	41	42	43	44	45	46	47	36_a	39_a	40_a
34/F	124.7	55	55	54	53	52	45	34	38	34	34	53	53	54	54	<40	<40
33/F	121.5	55	55	54	53	52	45	34	38	34	34	53	53	54	54	<40	<40
32/F	118.4	55	55	54	53	52	45	34	38	34	34	53	53	54	54	<40	<40
31/F	115.2	55	55	54	53	52	45	34	38	34	34	53	53	54	54	<40	<40
30/F	112.1	55	55	54	53	52	45	34	38	34	34	52	53	54	54	<40	<40
29/F	108.9	55	55	54	53	51	45	35	38	34	34	52	53	54	54	<40	<40
28/F	105.8	55	55	54	53	51	45	35	38	34	34	52	53	54	54	<40	<40
27/F	102.6	55	54	54	53	51	44	35	38	34	35	52	53	54	54	<40	<40
26/F	99.5	55	54	54	53	51	44	35	38	35	35	52	53	54	54	<40	<40
25/F	96.3	55	54	54	53	51	44	35	38	35	35	52	53	54	54	<40	<40
24/F	93.2	55	54	53	53	51	44	35	38	35	35	52	52	54	53	<40	<40
23/F	90.0	55	54	53	52	51	44	35	38	35	35	52	52	54	53	<40	<40
22/F	86.9	54	54	53	52	51	44	35	38	35	35	52	52	54	53	<40	<40
21/F	83.7	54	54	53	52	51	44	35	39	35	35	52	52	53	53	<40	<40
20/F	80.6	54	54	53	52	51	44	35	39	35	35	52	52	53	53	<40	<40
19/F	77.4	54	54	53	52	51	43	35	38	35	35	52	52	53	53	<40	<40
18/F	74.3	54	54	53	52	51	43	35	38	35	35	52	52	53	53	<40	<40
17/F	71.1	54	54	53	52	50	42	35	38	35	35	51	52	53	53	<40	<40
16/F	68.0	54	53	53	52	50	42	35	38	35	35	51	52	53	53	<40	<40
15/F	64.8	54	53	52	51	49	42	35	37	35	35	51	51	53	52	<40	<40
14/F	61.7	53	53	52	51	49	42	35	37	35	35	51	51	52	52	<40	<40
13/F	58.5	53	52	52	50	49	41	35	37	35	35	50	51	52	52	<40	<40
12/F	55.4	53	52	51	50	48	41	35	37	35	35	50	50	51	51	<40	<40
11/F	52.2	52	52	51	51	49	41	35	36	35	35	49	50	51	51	<40	<40
10/F	49.1	52	51	50	49	47	40	35	36	35	35	49	49	51	50	<40	<40
9/F	45.9	51	50	49	48	46	40	35	36	35	35	48	49	50	49	<40	<40
8/F	42.8	50	50	49	47	45	39	35	36	35	35	48	48	49	49	<40	<40
7/F	39.6	49	49	48	47	44	38	35	36	35	35	47	47	48	48	<40	<40
6/F	36.5	49	48	47	46	44	37	35	36	35	35	47	47	48	47	<40	<40
5/F	33.3	48	47	46	45	43	37	35	36	35	35	46	47	46	<40	<40	<40
4/F	30.2	47	46	46	44	42	36	35	36	35	35	45	46	46	<40	<40	<40
3/F	27.0	46	46	45	44	42	36	35	36	35	35	45	45	46	45	<40	<40
2/F	23.9	46	45	44	43	41	36	35	36	35	35	44	45	45	44	<40	<40
1/F	20.7	45	45	44	43	41	36	35	36	35	35	44	44	45	44	<40	<40
Max.		55	55	54	53	52	45	35	39	35	35	53	53	54	54	<40	<40

Notes:

NSR with an Area Sensitivity Ratino of C
NSR with an Area Sensitivity Ratino of B
<40 Noise level of less than 40 dB(A) will be denoted "<40"

Project: **Housing Development at Shek Mun**

Block: **Block E**

Scenario: **Base Case (Nighttime)**

Floor	Assessment point level (mPD)	48	49	50	51	52	53	54	55	56	57	58	59	60	51_a	55_a	56_a
34/F	124.7																
33/F	121.5	53	53	54	53	52	48	34	39	39	38	38	40	47	49	<40	<40
32/F	118.4	53	53	53	53	52	48	34	39	39	38	38	40	47	49	<40	<40
31/F	115.2	53	53	53	53	52	48	34	39	40	38	38	40	47	49	<40	<40
30/F	112.1	53	53	53	53	52	48	34	39	39	38	38	40	47	49	<40	<40
29/F	108.9	53	53	53	53	52	48	34	39	39	38	38	40	47	48	<40	<40
28/F	105.8	53	53	53	53	52	48	34	39	39	38	38	40	47	48	<40	<40
27/F	102.6	53	53	53	53	52	48	34	39	39	38	38	40	47	48	<40	<40
26/F	99.5	52	53	53	53	51	48	34	39	39	38	38	40	47	48	<40	<40
25/F	96.3	52	53	53	52	51	48	34	39	39	38	38	40	46	48	<40	<40
24/F	93.2	52	53	53	52	51	48	34	38	39	38	38	40	46	48	<40	<40
23/F	90.0	52	53	53	52	51	48	34	38	39	38	38	40	46	48	<40	<40
22/F	86.9	52	53	53	52	51	48	34	38	39	38	38	40	46	48	<40	<40
21/F	83.7	52	52	53	52	51	48	34	38	39	38	38	40	46	48	<40	<40
20/F	80.6	52	52	53	52	51	47	34	38	39	38	38	40	46	48	<40	<40
19/F	77.4	52	52	53	52	51	47	34	38	39	38	38	40	46	48	<40	<40
18/F	74.3	52	52	52	52	51	47	34	38	39	38	38	40	46	47	<40	<40
17/F	71.1	51	52	52	52	51	47	34	38	39	39	38	40	46	46	<40	<40
16/F	68.0	51	51	52	51	50	47	34	38	39	39	38	40	46	46	<40	<40
15/F	64.8	51	51	51	51	50	46	34	38	39	39	39	40	45	46	<40	<40
14/F	61.7	50	51	51	51	50	46	34	38	39	39	39	40	45	46	<40	<40
13/F	58.5	50	50	51	50	49	46	34	38	39	39	38	40	45	45	<40	<40
12/F	55.4	50	50	50	50	49	45	34	38	39	38	38	40	45	45	<40	<40
11/F	52.2	49	50	50	49	48	45	34	38	39	38	38	39	44	44	<40	<40
10/F	49.1	49	49	49	49	48	44	35	38	38	38	38	39	44	43	<40	<40
9/F	45.9	48	48	49	48	47	44	35	38	39	38	38	39	44	43	<40	<40
8/F	42.8	47	48	48	48	47	44	35	39	39	38	38	39	43	42	<40	<40
7/F	39.6	47	47	47	47	46	43	35	38	38	38	38	39	43	41	<40	<40
6/F	36.5	46	47	47	46	46	43	35	38	38	38	38	39	43	41	<40	<40
5/F	33.3	46	46	46	46	45	42	35	37	37	38	38	38	42	40	<40	<40
4/F	30.2	45	46	46	45	45	42	35	37	37	37	38	38	42	40	<40	<40
3/F	27.0	45	45	45	45	44	42	35	37	37	37	38	38	42	40	<40	<40
2/F	23.9	44	44	44	44	44	41	35	37	37	37	38	38	41	39	<40	<40
1/F	20.7	44	44	44	44	43	41	35	37	37	37	38	38	41	39	<40	<40
Max.		53	53	54	53	52	48	35	39	40	39	39	40	47	49	<40	<40

Notes:

NSR with an Area Sensitivity Ratino of C
NSR with an Area Sensitivity Ratino of B
<40 Noise level of less than 40 dB(A) will be denoted "<40"

Project: Housing Development at Shek Mun

Block: Block A
Scenario: Base Case (24 hr)

Floor	Assessment point level (mPD)	1	2	3	4	5	6	7	8	9	10	11	12	13	5_a	8_a
34/F	124.7	59	58	60	60	60	60	59	59	48	50	45	49	46	56	
33/F	121.5	59	58	60	60	60	60	59	59	48	50	45	49	46	56	
32/F	118.4	60	58	60	60	60	60	59	59	48	50	45	46	49	47	56
31/F	115.2	60	58	60	60	60	60	59	59	48	50	45	46	49	47	56
30/F	112.1	60	58	60	60	60	60	59	59	48	50	45	46	49	47	56
29/F	108.9	60	58	61	60	60	60	60	59	48	50	45	46	49	47	56
28/F	105.8	60	59	61	61	61	60	60	59	48	50	45	46	49	47	56
27/F	102.6	60	59	61	61	61	60	60	59	48	50	45	46	49	47	56
26/F	99.5	60	59	61	61	61	61	60	60	48	51	45	46	49	47	56
25/F	96.3	60	59	61	61	61	61	60	60	48	51	45	46	49	47	56
24/F	93.2	60	59	61	61	61	61	60	60	48	51	45	46	49	47	57
23/F	90.0	60	59	61	61	61	61	60	60	48	51	45	46	50	47	57
22/F	86.9	60	59	61	61	61	61	60	60	49	51	45	46	50	47	57
21/F	83.7	61	59	61	61	61	61	60	60	49	51	45	46	50	47	57
20/F	80.6	61	59	61	61	61	61	60	60	49	51	45	46	49	48	57
19/F	77.4	61	59	62	61	61	61	60	60	49	51	45	46	49	48	57
18/F	74.3	61	59	62	62	62	61	60	60	48	51	45	46	49	48	57
17/F	71.1	61	60	62	62	62	61	61	60	48	50	45	46	49	48	57
16/F	68.0	61	60	62	62	62	61	61	60	48	50	45	46	49	48	57
15/F	64.8	61	60	62	62	62	61	60	60	48	50	45	46	49	48	57
14/F	61.7	61	60	62	62	62	61	60	60	48	50	45	46	49	48	57
13/F	58.5	60	60	62	62	62	61	60	60	48	50	45	46	49	48	57
12/F	55.4	60	59	62	62	62	61	60	60	48	50	45	46	49	48	57
11/F	52.2	60	59	62	62	62	61	60	59	48	50	45	46	49	48	57
10/F	49.1	60	59	62	62	61	61	60	59	48	50	45	46	49	47	56
9/F	45.9	60	59	62	61	61	61	60	59	47	49	44	45	49	47	56
8/F	42.8	60	59	62	61	61	61	60	59	47	49	44	45	49	47	56
7/F	39.6	60	59	61	61	61	60	59	59	47	49	44	45	49	47	56
6/F	36.5	60	59	61	61	61	60	59	59	46	48	44	45	48	47	56
5/F	33.3	59	59	61	61	61	60	59	58	46	47	43	45	48	46	56
4/F	30.2	59	58	61	61	60	59	58	57	45	47	43	44	47	45	55
3/F	27.0	57	57	60	60	59	58	57	56	45	46	43	44	46	44	54
2/F	23.9	57	56	59	59	58	57	56	55	44	45	42	43	45	43	53
1/F	20.7	56	55	58	58	57	56	55	54	43	44	42	43	45	42	52
Max.		61	60	62	62	62	61	61	60	49	51	45	46	50	48	57

Notes:

NSR with an ASR of C
NSR with an ASR of B

Project: Housing Development at Shek Mun

Block: Block B
Scenario: Base Case (24 hr)

Floor	Assessment point level (mPD)	14	15	16	17	18	19	20	21	22	23	24	25	26	28_a	29_a
34/F	124.7															
33/F	121.5	53	56	59	59	59	59	59	58	43	46	43	44	44	44	56
32/F	118.4	53	56	59	59	59	59	59	58	43	46	43	44	44	44	56
31/F	115.2	53	56	59	59	59	59	59	59	43	46	43	44	44	44	56
30/F	112.1	53	57	59	59	60	59	59	59	43	46	43	44	44	44	56
29/F	108.9	53	57	59	60	60	59	59	59	43	46	43	44	44	44	56
28/F	105.8	53	57	60	60	60	59	59	59	43	46	43	44	44	44	56
27/F	102.6	53	57	60	60	60	60	59	59	43	46	43	44	44	44	56
26/F	99.5	53	57	60	60	60	60	59	59	43	46	43	44	44	44	56
25/F	96.3	53	57	60	60	60	60	59	59	43	46	43	44	44	44	56
24/F	93.2	53	57	60	60	60	60	59	59	43	46	43	44	44	44	56
23/F	90.0	53	57	60	60	60	60	59	59	43	46	43	44	44	44	56
22/F	86.9	53	57	60	60	60	60	59	59	43	46	43	44	44	44	57
21/F	83.7	53	57	60	60	60	60	59	59	43	46	43	44	44	44	57
20/F	80.6	53	57	60	60	60	60	59	59	43	46	43	44	44	44	56
19/F	77.4	53	57	60	60	60	60	59	58	43	46	43	44	44	44	56
18/F	74.3	53	57	60	60	60	60	59	58	43	45	43	44	44	44	56
17/F	71.1	53	57	60	60	60	60	59	59	58	43	45	43	44	44	56
16/F	68.0	53	57	60	60	60	60	59	59	58	43	45	43	44	44	56
15/F	64.8	53	57	60	60	60	60	59	59	58	43	45	43	44	44	56
14/F	61.7	53	57	60	60	60	60	59	58	58	42	45	43	43	44	56
13/F	58.5	52	56	60	60	59	59	58	58	42	45	43	43	44	43	56
12/F	55.4	52	56	59	59	59	59	59	58	42	44	43	43	44	43	55
11/F	52.2	52	56	59	59	59	59	58	58	42	44	42	43	44	43	55
10/F	49.1	52	56	59	59	59	59	58	58	42	44	42	43	43	43	55
9/F	45.9	52	56	59	59	59	58	58	57	42	44	42	43	43	42	55
8/F	42.8	52	56	59	59	59	58	58	57	42	44	42	43	43	42	55
7/F	39.6	52	56	59	59	59	58	57	56	41	43	42	43	43	41	54
6/F	36.5	50	55	58	58	58	58	57	56	41	43	41	42	43	41	53
5/F	33.3	50	54	58	57	57	56	55	55	41	42	41	42	42	41	53
4/F	30.2	49	53	57	57	56	55	55	54	40	41	41	42	42	40	52
3/F	27.0	48	53	56	56	55	55	54	53	40	41	41	41	42	<40	51
2/F	23.9	47	52	55	55	54	54	53	52	40	41	40	41	41	<40	50
1/F	20.7	47	51	54	53	53	52	52	51	40	40	40	41	41	<40	49
Max.		53	57	60	60	60	60	59	59	43	46	43	44	44	44	57

Notes:

NSR with an ASR of C
NSR with an ASR of B

Project: Housing Development at Shek Mun

Block: Block C
Scenario: Base Case (24 hr)

Floor	Assessment point level (mPD)	27	28	30	31	32	33	34
34/F	124.7							
33/F	121.5							
32/F	118.4	58	58	49	41	38	37	55
31/F	115.2	58	58	49	41	38	37	55
30/F	112.1	59	58	49	41	38	38	55
29/F	108.9	59	58	49	41	38	38	55
28/F	105.8	59	57	49	41	38	38	55
27/F	102.6	59	57	49	41	38	38	55
26/F	99.5	59	57	49	41	38	38	55
25/F	96.3	59	57	48	41	38	38	55
24/F	93.2	59	57	48	41	38	38	55
23/F	90.0	58	57	48	41	38	38	55
22/F	86.9	58	57	48	41	39	38	55
21/F	83.7	58	57	48	41	39	38	55
20/F	80.6	58	57	48	41	39	38	55
19/F	77.4	58	57	48	41	39	38	55
18/F	74.3	58	57	48	41	39	38	54
17/F	71.1	58	57	47	41	39	38	54
16/F	68.0	58	56	47	41	39	38	54
15/F	64.8	58	56	47	41	39	38	54
14/F	61.7	58	56	47	41	39	38	54
13/F	58.5	57	56	47	41	39	38	54
12/F	55.4	57	56	46	41	39	38	54
11/F	52.2	57	55	46	41	39	38	54
10/F	49.1	57	55	46	41	39	38	53
9/F	45.9	57	54	45	41	39	39	53
8/F	42.8	56	54	45	41	39	39	52
7/F	39.6	56	53	44	41	39	39	52
6/F	36.5	55	53	43	41	39	39	51
5/F	33.3	54	52	42	41	39	39	50
4/F	30.2	53	51	41	41	39	39	49
3/F	27.0	52	50	40	40	39	39	48
2/F	23.9	52	49	40	40	39	39	48
1/F	20.7	51	49	39	40	38	39	47
Max.		59	58	49	41	39	39	55

Notes:

NSR with an ASR of C
NSR with an ASR of B

Project: Housing Development at Shek Mun

Block: Block D
Scenario: Base Case (24 hr)

Floor	Assessment point level (mPD)	35	36	37	38	39	40	41	42	43	44	45	46	47	36_a	39_a	40_a
34/F	124.7	57	56	56	55	53	47	36	39	36	36	54	55	56	56	<40	<40
33/F	121.5	57	56	56	55	53	47	36	39	36	36	54	55	56	56	<40	<40
32/F	118.4	57	56	56	55	53	46	36	39	36	36	54	55	56	56	<40	<40
31/F	115.2	57	56	56	55	53	46	36	39	36	36	54	54	56	56	<40	<40
30/F	112.1	57	56	55	55	53	46	36	39	36	36	54	54	56	55	<40	<40
29/F	108.9	57	56	55	54	53	46	36	40	36	36	54	54	56	55	<40	<40
28/F	105.8	56	56	55	54	53	46	36	40	36	36	54	54	55	55	<40	<40
27/F	102.6	56	56	55	54	53	46	36	40	36	36	54	54	55	55	<40	<40
26/F	99.5	56	56	55	54	53	46	36	40	36	36	54	54	55	55	<40	<40
25/F	96.3	56	56	55	54	53	46	36	40	36	36	54	54	55	55	<40	<40
24/F	93.2	56	56	55	54	53	46	36	40	36	36	54	54	55	55	<40	<40
23/F	90.0	56	56	55	54	53	46	36	40	36	36	54	54	55	55	<40	<40
22/F	86.9	56	56	55	54	52	46	36	40	36	36	54	54	55	55	<40	<40
21/F	83.7	56	55	55	54	52	45	36	41	36	36	53	54	55	55	<40	<40
20/F	80.6	56	55	55	54	52	45	36	40	36	36	53	54	55	55	<40	<40
19/F	77.4	56	55	55	54	52	44	36	40	36	36	53	54	55	55	<40	<40
18/F	74.3	56	55	54	54	52	44	36	39	36	36	53	54	55	54	<40	<40
17/F	71.1	56	55	54	53	52	44	36	39	36	36	53	53	55	54	<40	<40
16/F	68.0	55	55	54	53	51	44	36	39	36	36	53	53	54	54	<40	<40
15/F	64.8	55	55	54	53	51	43	36	39	36	36	52	53	54	54	<40	<40
14/F	61.7	55	54	53	52	50	43	36	39	36	36	52	53	53	53	<40	<40
13/F	58.5	54	54	53	52	50	43	36	38	36	36	52	52	53	53	<40	<40
12/F	55.4	54	53	53	51	50	42	36	38	36	36	51	52	53	53	<40	<40
11/F	52.2	54	53	52	51	49	42	36	38	36	36	51	51	53	52	<40	<40
10/F	49.1	53	53	52	50	48	42	37	38	36	36	50	51	52	52	<40	<40
9/F	45.9	52	52	51	50	48	41	37	38	36	36	50	50	51	51	<40	<40
8/F	42.8	52	51	50	49	47	40	37	37	36	36	49	50	51	50	<40	<40
7/F	39.6	51	50	49	48	46	39	37	37	36	36	49	49	50	49	<40	<40
6/F	36.5	50	49	49	47	45	39	37	37	36	37	48	49	49	49	<40	<40
5/F	33.3	49	49	48	47	44	38	37	37	36	37	47	48	49	48	<40	<40
4/F	30.2	49	48	47	46	44	38	37	37	36	37	47	47	48	47	<40	<40
3/F	27.0	48	47	47	45	43	38	37	37	37	37	46	47	47	47	<40	<40
2/F	23.9	47	47	46	45	43	37	37	37	37	37	46	46	47	46	<40	<40
1/F	20.7	47	46	45	44	43	37	37	37	37	37	45	46	46	45	<40	<40
Max.		57	56	56	55	53	47	37	41	37	37	54	55	56	56	<40	<40

Notes:

NSR with an ASR of C
NSR with an ASR of B
<40 Noise level of less than 40 dB(A) will be denoted "<40"

Project: Housing Development at Shek Mun

Block: Block E
Scenario: Base Case (24 hr)

Floor	Assessment point level (mPD)	48	49	50	51	52	53	54	55	56	57	58	59	60	61_a	62_a
34/F	124.7															
33/F	121.5	54	55	55	55	53	50	35	40	41	39	39	42	48	50	<40
32/F	118.4	54	55	55	54	53	50	35	40	41	40	40	42	48	50	<40
31/F	115.2	54	55	55	54	53	50	35	40	42	40	40	42	48	50	<40
30/F	112.1	54	55	55	54	53	49	36	40	41	40	40	42	48	50	<40
29/F	108.9	54	54	55	54	53	49	36	40	41	40	40	42	48	50	<40
28/F	105.8	54	54	55	54	53	49	36	40	41	40	40	42	48	50	<40
27/F	102.6	54	54	55	54	53	49	36	40	41	40	40	42	48	50	<40
26/F	99.5	54	54	54	54	53	49	36	40	41	40	40	42	48	50	<40
25/F	96.3	54	54	54	54	53	49	36	40	41	40	40	42	48	50	<40
24/F	93.2	54	54	54	54	53	49	36	40	40	40	40	42	48	50	<40
23/F	90.0	54	54	54	54	53	49	36	40	40	40	40	42	48	50	<40
22/F	86.9	54	54	54	54	53	49	36	40	40	40	40	42	48	50	<40
21/F	83.7	54	54	54	54	53	49	36	40	40	40	40	42	48	50	<40
20/F	80.6	54	54	54	54	53	49	36	40	40	40	41	48	49	50	<40
19/F	77.4	53	54	54	54	53	49	36	40	40	40	41	48	49	49	<40
18/F	74.3	53	54	54	54	53	52	49	36	40	40	40	41	48	49	<40
17/F	71.1	53	53	54	53	52	49	36	40	40	40	40	41	47	48	<40
16/F	68.0	53	53	53	53	52	48	36	40	40	40	40	41	47	48	<40
15/F	64.8	52	53	53	53	51	48	36	40	40	40	40	41	47	48	<40
14/F	61.7	52	52	53	52	51	47	36	40	40	40	40	41	47	47	<40
13/F	58.5	51	52	52	52	51	47	36	40	40	40	40	41	46	47	<40
12/F	55.4	51	51	52	51	50	47	36	40	40	40	40	41	46	46	<40
11/F	52.2	51	51	51	51	50	46	36	39	40	40	40	41	46	45	<40
10/F	49.1	50	50	51	50	49	46	36	39	40	40	40	41	46	45	<40
9/F	45.9	50	50	50	50	49	46	36	40	40	40	40	41	45	44	<40
8/F	42.8	49	49	50	49	48	45	36	41	41	40	40	40	45	43	<40
7/F	39.6	48	49	49	49	48	45	36	39	39	39	39	40	45	43	<40
6/F	36.5	48	48	48	48	47	44	36	39	39	39	40	40	44	42	<40
5/F	33.3	47	48	48	47	47	44	36	39	39	39	40	40	44	42	<40
4/F	30.2	47	47	47	47	46	43	36	39	39	39	40	40	43	41	<40
3/F	27.0	46	46	47	46	46	43	36	39	39	39	39	40	43	41	<40
2/F	23.9	46	46	46	46	45	43	36	39	39	39	39	40	43	41	<40
1/F	20.7	45	45	45	45	45	42	36	39	39	39	39	39	42	41	<40
Max.		54	55	55	55	53	50	36	41	42	40	40	42	48	50	<40

Notes:

NSR with an ASR of C
NSR with an ASR of B
<40 Noise level of less than 40 dB(A) will be denoted "<40"

Project: **Housing Development at Shek Mun**

Block: **Block A**

Scenario: **Mitigated Case (Nighttime)**

Floor	Assessment point level (mPD)	1	2	3	4	5	6	7	8	9	10	11	12	13	5_a	9_a
34/F	124.7	58	57	57	59	59	58	58	57	46	48	43	44	47	45	54
33/F	121.5	58	57	59	59	59	58	58	57	46	49	43	44	47	45	54
32/F	118.4	58	57	59	59	59	58	58	58	46	49	43	44	47	45	54
31/F	115.2	58	57	59	59	59	59	58	58	46	49	43	44	48	45	54
30/F	112.1	58	57	59	59	59	59	58	58	46	49	43	44	48	45	55
29/F	108.9	58	57	59	59	59	59	58	58	47	49	43	44	48	45	55
28/F	105.8	58	57	59	59	59	59	58	58	47	49	43	44	48	45	55
27/F	102.6	58	57	59	59	59	59	58	58	47	49	44	44	48	45	55
26/F	99.5	59	57	59	59	59	59	58	58	47	49	44	44	48	46	55
25/F	96.3	59	57	59	59	59	59	58	58	47	49	44	45	48	46	55
24/F	93.2	59	57	60	59	59	59	59	58	47	49	44	45	48	46	55
23/F	90.0	59	58	60	60	60	59	59	58	47	49	44	45	48	46	55
22/F	86.9	59	58	60	60	60	59	59	58	47	49	44	45	48	46	55
21/F	83.7	59	58	60	60	60	59	59	58	47	49	44	45	48	46	55
20/F	80.6	59	58	60	60	60	60	59	59	47	49	44	45	48	46	55
19/F	77.4	59	58	60	60	60	60	59	59	47	49	44	45	48	46	56
18/F	74.3	59	58	60	60	60	60	59	59	47	49	44	45	48	46	56
17/F	71.1	59	58	60	60	60	60	59	59	47	49	44	45	48	46	56
16/F	68.0	59	58	60	60	60	60	59	58	47	49	44	45	48	46	56
15/F	64.8	59	58	60	60	60	60	59	58	47	49	44	45	48	47	55
14/F	61.7	59	58	[59]	60	60	60	59	58	47	49	44	45	48	47	55
13/F	58.5	59	58	[59]	60	60	60	59	58	47	48	43	44	48	46	55
12/F	55.4	59	58	[59]	60	60	60	59	58	46	48	43	44	48	46	55
11/F	52.2	59	58	60	60	60	59	58	58	46	48	43	44	47	46	55
10/F	49.1	59	58	60	60	60	59	58	58	46	48	43	44	47	46	55
9/F	45.9	58	58	60	60	60	59	58	58	46	48	43	44	47	46	55
8/F	42.8	58	57	60	60	60	59	58	57	46	48	43	44	47	45	55
7/F	39.6	58	57	60	60	59	59	58	57	46	47	43	44	47	45	55
6/F	36.5	58	57	60	59	59	59	58	57	45	46	43	44	47	45	55
5/F	33.3	58	57	60	59	59	59	57	57	44	46	42	43	46	45	54
4/F	30.2	57	57	59	59	59	58	56	56	44	45	42	42	45	44	54
3/F	27.0	56	56	59	58	58	57	56	55	43	44	41	42	45	43	52
2/F	23.9	55	55	57	57	57	56	55	54	42	44	41	42	44	42	52
1/F	20.7	54	54	56	56	56	56	53	52	42	43	40	41	43	40	50
Max.		59	58	60	60	60	60	59	59	47	49	44	45	48	47	56

Notes:
[Noise Level]: Adoption of Innovative Noise Mitigation Design

NSR with an Area Sensitivity Ratio of C
NSR with an Area Sensitivity Ratio of B

Project: **Housing Development at Shek Mun**

Block: **Block B**

Scenario: **Mitigated Case (Nighttime)**

Floor	Assessment point level (mPD)	14	15	16	17	18	19	20	21	22	23	24	25	26	18_a	19_a
34/F	124.7															
33/F	121.5	51	55	58	58	58	58	57	57	41	44	42	42	42	42	54
32/F	118.4	51	55	58	58	58	58	57	57	41	44	42	42	42	42	54
31/F	115.2	51	55	58	58	58	58	57	57	41	44	42	42	42	42	55
30/F	112.1	51	55	58	58	58	58	57	57	41	44	42	42	43	42	55
29/F	108.9	51	55	58	58	58	58	57	57	41	44	42	42	43	42	55
28/F	105.8	52	55	58	58	58	58	57	57	41	44	42	42	43	42	55
27/F	102.6	52	55	58	58	58	58	57	57	41	45	42	42	43	42	55
26/F	99.5	52	55	58	58	58	58	57	57	41	45	42	42	43	42	55
25/F	96.3	52	55	58	58	58	58	57	57	41	45	42	42	43	42	55
24/F	93.2	52	55	58	58	58	58	57	57	41	44	42	42	43	43	55
23/F	90.0	52	56	58	59	59	58	57	57	41	44	42	42	43	43	55
22/F	86.9	52	56	59	59	59	58	58	57	41	44	42	43	43	43	55
21/F	83.7	52	56	59	59	59	58	58	57	41	44	42	42	43	43	55
20/F	80.6	52	56	59	59	59	58	58	57	41	44	42	42	43	43	55
19/F	77.4	52	56	59	59	59	58	58	57	41	44	42	42	43	43	55
18/F	74.3	52	55	59	59	58	58	57	57	41	44	42	42	43	43	55
17/F	71.1	52	55	58	58	58	58	57	57	41	44	42	42	43	43	55
16/F	68.0	51	55	58	58	58	58	57	57	41	44	42	42	43	42	54
15/F	64.8	51	55	58	58	58	58	57	57	41	43	41	42	43	42	54
14/F	61.7	51	55	58	58	58	58	57	56	41	43	41	42	43	42	54
13/F	58.5	51	55	58	58	58	57	57	56	41	43	41	42	42	42	54
12/F	55.4	51	55	58	58	58	57	57	56	41	43	41	42	42	42	54
11/F	52.2	51	55	58	58	58	57	57	56	41	43	41	42	42	41	54
10/F	49.1	51	54	58	58	57	57	56	56	41	43	41	41	42	41	54
9/F	45.9	51	54	57	57	57	57	56	56	40	42	41	41	42	41	54
8/F	42.8	51	54	57	57	57	56	55	55	40	42	41	41	42	40	54
7/F	39.6	50	54	57	57	57	56	55	55	40	42	40	41	42	40	53
6/F	36.5	49	54	57	57	56	56	55	54	40	41	40	41	41	40	52
5/F	33.3	48	53	56	56	56	55	54	53	39	41	40	40	41	<40	51
4/F	30.2	48	52	55	55	55	54	53	52	39	40	39	40	41	<40	50
3/F	27.0	47	51	54	54	54	53	52	52	38	39	39	40	40	<40	50
2/F	23.9	46	50	53	53	53	52	51	51	38	39	39	<40	40	<40	49
1/F	20.7	45	49	52	52	52	51	50	50	38	39	39	<40	40	<40	48
Max.		52	56	59	59	59	58	58	57	41	45	42	43	43	43	55

Notes:

NSR with an Area Sensitivity Ratio of C
NSR with an Area Sensitivity Ratio of B

Project: **Housing Development at Shek Mun**

Block: **Block C**

Scenario: **Mitigated Case (Nighttime)**

Floor	Assessment point level (mPD)	27	28	30	31	32	33	34
34/F	124.7							
33/F	121.5							
32/F	118.4	57	56	47	39	37	36	53
31/F	115.2	57	56	47	39	37	36	53
30/F	112.1	57	56	47	39	37	36	54
29/F	108.9	57	56	47	39	37	36	54
28/F	105.8	57	56	47	40	37	36	54
27/F	102.6	57	56	47	40	37	36	54
26/F	99.5	57	56	47	40	37	36	54
25/F	96.3	57	56	47	40	37	36	54
24/F	93.2	57	56	47	40	37	36	53
23/F	90.0	57	56	47	40	37	36	53
22/F	86.9	57	55	47	40	37	36	53
21/F	83.7	57	55	46	40	37	37	53
20/F	80.6	57	55	46	40	37	37	53
19/F	77.4	57	55	46	40	37	37	53
18/F	74.3	57	55	46	40	37	37	53
17/F	71.1	56	55	46	40	37	37	53
16/F	68.0	56	55	46	40	37	37	53
15/F	64.8	56	55	46	40	37	37	53
14/F	61.7	56	55	45	40	37	37	52
13/F	58.5	56	55	45	40	37	37	52
12/F	55.4	56	54	45	40	37	37	52
11/F	52.2	56	54	45	40	38	37	52
10/F	49.1	56	53	44	40	38	37	52
9/F	45.9	55	53	44	40	38	37	51
8/F	42.8	55	52	43	40	38	37	51
7/F	39.6	54	52	42	40	38	37	50
6/F	36.5	53	51	41	40	38	37	49
5/F	33.3	53	50	40	39	37	37	49
4/F	30.2	52	50	39	39	37	37	48
3/F	27.0	51	49	39	39	37	37	47
2/F	23.9	50	48	38	39	37	37	46
1/F	20.7	49	47	38	39	37	37	46
Max.		57	56	47	40	38	37	54

Notes:

NSR with an Area Sensitivity Ratio of C
NSR with an Area Sensitivity Ratio of B

Project: **Housing Development at Shek Mun**

Block: **Block D**

Scenario: **Mitigated Case (Nighttime)**

Floor	Assessment point level (mPD)	35	36	37	38	39	40	41	42	43	44	45	46	47	36_a	39_a	40_a
34/F	124.7	55	55	54	53	52	45	34	38	34	34	53	53	54	54	<40	<40
33/F	121.5	55	55	54	53	52	45	34	38	34	34	53	53	54	54	<40	<40
32/F	118.4	55	55	54	53	52	45	34	38	34	34	53	53	54	54	<40	<40
31/F	115.2	55	55	54	53	52	45	34	38	34	34	53	53	54	54	<40	<40
30/F	112.1	55	55	54	53	52	45	34	38	34	34	52	53	54	54	<40	<40
29/F	108.9	55	55	54	53	51	45	35	38	34	34	52	53	54	54	<40	<40
28/F	105.8	55	55	54	53	51	45	35	38	34	34	52	53	54	54	<40	<40
27/F	102.6	55	54	54	53	51	44	35	38	34	35	52	53	54	54	<40	<40
26/F	99.5	55	54	54	53	51	44	35	38	35	35	52	53	54	54	<40	<40
25/F	96.3	55	54	54	53	51	44	35	38	35	35	52	53	54	54	<40	<40
24/F	93.2	55	54	53	53	51	44	35	38	35	35	52	52	54	53	<40	<40
23/F	90.0	55	54	53	52	51	44	35	38	35	35	52	52	54	53	<40	<40
22/F	86.9	54	54	53	52	51	44	35	38	35	35	52	52	54	53	<40	<40
21/F	83.7	54	54	53	52	51	44	35	39	35	35	52	52	53	53	<40	<40
20/F	80.6	54	54	53	52	51	44	35	39	35	35	52	52	53	53	<40	<40
19/F	77.4	54	54	53	52	51	43	35	38	35	35	52	52	53	53	<40	<40
18/F	74.3	54	54	53	52	51	43	35	38	35	35	52	52	53	53	<40	<40
17/F	71.1	54	54	53	52	50	42	35	38	35	35	51	52	53	53	<40	<40
16/F	68.0	54	53	53	52	50	42	35	38	35	35	51	52	53	53	<40	<40
15/F	64.8	54	53	52	51	49	42	35	37	35	35	51	51	53	52	<40	<40
14/F	61.7	53	53	52	51	49	42	35	37	35	35	51	51	52	52	<40	<40
13/F	58.5	53	52	52	50	49	41	35	37	35	35	50	51	52	52	<40	<40
12/F	55.4	53	52	51	50	48	41	35	37	35	35	50	50	51	51	<40	<40
11/F	52.2	52	52	51	51	49	41	35	36	35	35	49	50	51	51	<40	<40
10/F	49.1	52	51	50	49	47	40	35	36	35	35	49	49	51	50	<40	<40
9/F	45.9	51	50	49	48	46	40	35	36	35	35	48	49	50	49	<40	<40
8/F	42.8	50	50	49	47	45	39	35	36	35	35	48	48	49	49	<40	<40
7/F	39.6	49	49	48	47	44	38	35	36	35	35	47	47	48	48	<40	<40
6/F	36.5	49	48	47	46	44	37	35	36	35	35	47	47	48	47	<40	<40
5/F	33.3	48	47	46	45	43	37	35	36	35	35	46	47	46	<40	<40	<40
4/F	30.2	47	46	46	44	42	36	35	36	35	35	45	46	46	<40	<40	<40
3/F	27.0	46	46	45	44	42	36	35	36	35	35	45	45	46	<40	<40	<40
2/F	23.9	46	45	44	43	41	36	35	36	35	35	44	45	45	<40	<40	<40
1/F	20.7	45	45	44	43	41	36	35	36	35	35	44	44	45	<40	<40	<40
Max.		55	55	54	53	52	45	35	39	35	35	53	53	54	54	<40	<40

Notes:

NSR with an Area Sensitivity Ratio of C
NSR with an Area Sensitivity Ratio of B
<40 Noise level of less than 40 dB(A) will be denoted "<40"

Project: **Housing Development at Shek Mun**

Block: **Block E**

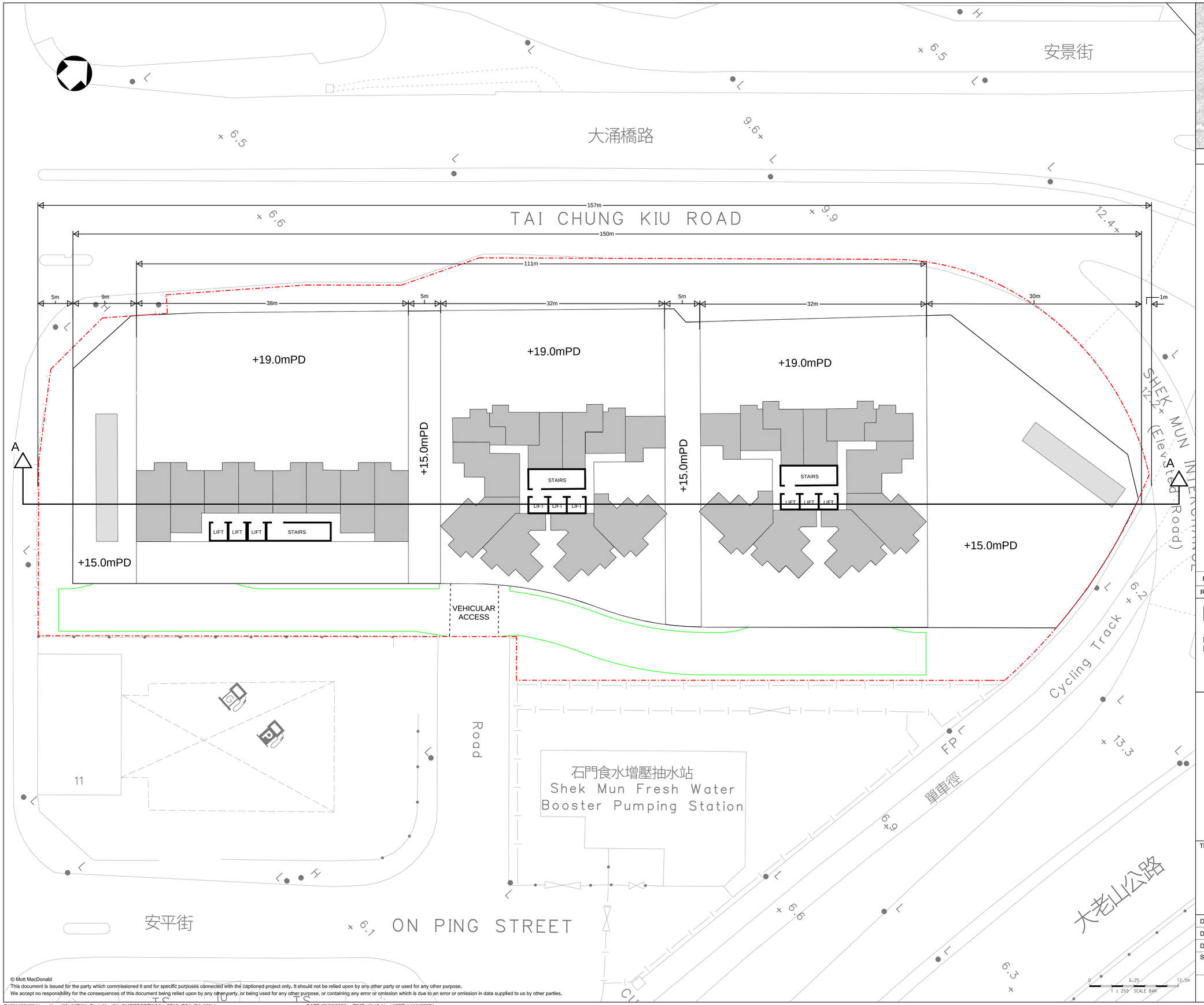
Scenario: **Mitigated Case (Nighttime)**

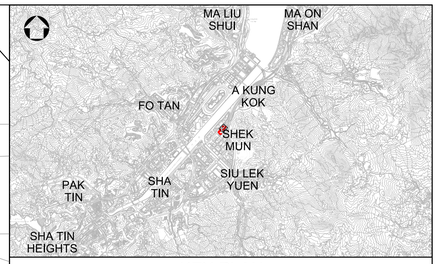
Floor	Assessment point level (mPD)	48	49	50	51	52	53	54	55	56	57	58	59	60	51_a	55_a	56_a
34/F	124.7																
33/F	121.5	53	53	54	53	52	48	34	39	39	38	38	40	47	49	<40	<40
32/F	118.4	53	53	53	53	52	48	34	39	39	38	38	40	47	49	<40	<40
31/F	115.2	53	53	53	53	52	48	34	39	40	38	38	40	47	49	<40	<40
30/F	112.1	53	53	53	53	52	48	34	39	39	38	38	40	47	49	<40	<40
29/F	108.9	53	53	53	53	52	48	34	39	39	38	38	40	47	48	<40	<40
28/F	105.8	53	53	53	53	52	48	34	39	39	38	38	40	47	48	<40	<40
27/F	102.6	53	53	53	53	52	48	34	39	39	38	38	40	47	48	<40	<40
26/F	99.5	52	53	53	53	51	48	34	39	39	38	38	40	47	48	<40	<40
25/F	96.3	52	53	53	52	51	48	34	39	39	38	38	40	46	48	<40	<40
24/F	93.2	52	53	53	52	51	48	34	38	39	38	38	40	46	48	<40	<40
23/F	90.0	52	53	53	52	51	48	34	38	39	38	38	40	46	48	<40	<40
22/F	86.9	52	53	53	52	51	48	34	38	39	38	38	40	46	48	<40	<40
21/F	83.7	52	52	53	52	51	48	34	38	39	38	38	40	46	48	<40	<40
20/F	80.6	52	52	53	52	51	47	34	38	39	38	38	40	46	48	<40	<40
19/F	77.4	52	52	53	52	51	47	34	38	39	38	38	40	46	48	<40	<40
18/F	74.3	52	52	52	52	51	47	34	38	39	38	38	40	46	47	<40	<40
17/F	71.1	51	52	52	52	51	47	34	38	39	39	38	40	46	46	<40	<40
16/F	68.0	51	51	52	51	50	47	34	38	39	39	38	40	46	46	<40	<40
15/F	64.8	51	51	51	51	50	46	34	38	39	39	39	40	46	46	<40	<40
14/F	61.7	50	51	51	51	50	46	34	38	39	39	39	40	45	46	<40	<40
13/F	58.5	50	50	51	50	49	46	34	38	39	39	38	40	45	45	<40	<40
12/F	55.4	50	50	50	50	49	45	34	38	39	38	38	40	45	45	<40	<40
11/F	52.2	49	50	50	49	48	45	34	38	39	38	38	39	44	44	<40	<40
10/F	49.1	49	49	49	49	48	44	35	38	38	38	38	39	44	43	<40	<40
9/F	45.9	48	48	49	48	47	44	35	38	39	38	38	39	44	43	<40	<40
8/F	42.8	47	48	48	48	47	44	35	39	39	38	38	39	43	42	<40	<40
7/F	39.6	47	47	47	47	46	43	35	38	38	38	38	39	43	41	<40	<40
6/F	36.5	46	47	47	46	46	43	35	38	38	38	38	39	43	41	<40	<40
5/F	33.3	46	46	46	46	45	42	35	37	37	38	38	38	42	40	<40	<40
4/F	30.2	45	46	46	45	45	42	35	37	37	37	38	38	42	40	<40	<40
3/F	27.0	45	45	45	45	44	42	35	37	37	37	38	38	42	40	<40	<40
2/F	23.9	44	44	44	44	44	41	35	37	37	37	38	38	41	39	<40	<40
1/F	20.7	44	44	44	44	43	41	35	37	37	37	38	38	41	39	<40	<40
Max.		53	53	54	53	52	48	35	39	40	39	39	40	47	49	<40	<40

Notes:

NSR with an Area Sensitivity Ratio of C
NSR with an Area Sensitivity Ratio of B
<40 Noise level of less than 40 dB(A) will be denoted "<40"

4.9 Reference Flat Arrangement





KEY PLAN

LEGEND:

- APPLICATION SITE BOUNDARY
- PODIUM
- PROPOSED EVA

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	JUL 2026	TL	FIRST ISSUE	VF	DN

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[redacted]

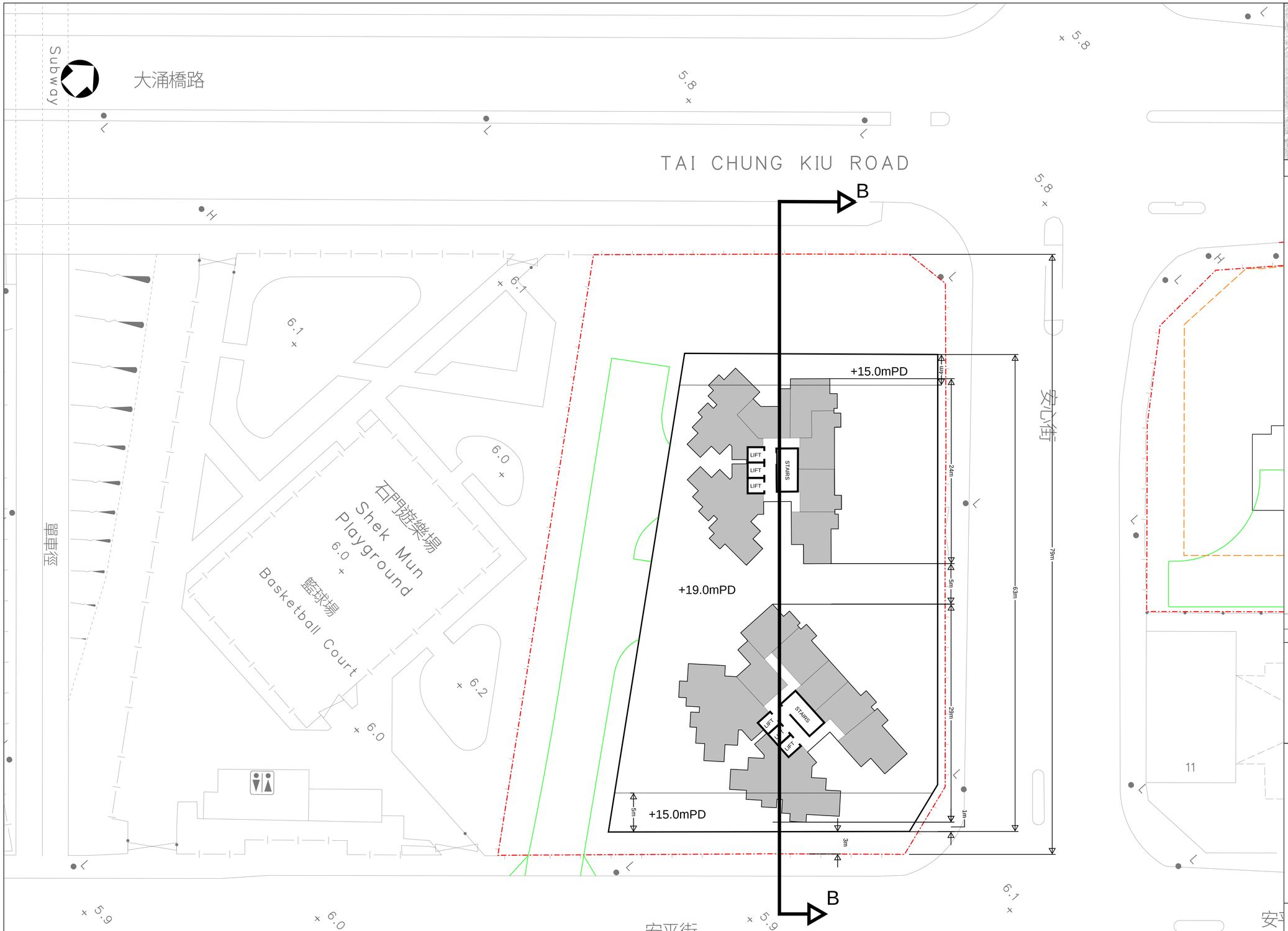
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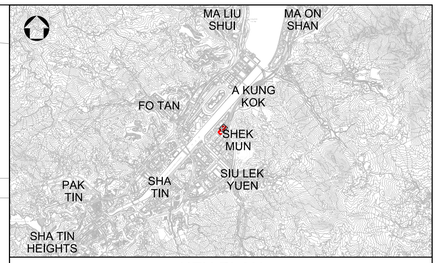
TYPICAL RESIDENTIAL FLOOR PLAN (STTL 626)

Designed	TC		Eng check	VF	
Drawn	TL		Coordination	VF	
Dwg check	AT		Approved	DN	
Scale at A1	1:250	Status	PRE	Rev	P1

DRAWING A-5

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KEY PLAN

LEGEND:

- APPLICATION SITE BOUNDARY
- PODIUM
- PROPOSED EVA

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	JUL 2026	TL	FIRST ISSUE	VF	DN

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[redacted]

Title

TYPICAL RESIDENTIAL FLOOR PLAN (STTL 627)

Designed	TC		Eng check	VF	
Drawn	TL		Coordination	VF	
Dwg check	AT		Approved	DN	

Scale at A1	Status	Rev
1:250	PRE	P1

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