Appendix E

Sewerage Impact Assessment

Civil Engineering and Development Department

Agreement No. CE 1/2020 (CE) Hung Shui Kiu/Ha Tsuen New Development Area Package A Works for Second Phase Development – Design and Construction

S16 Planning Application for Proposed Flat and Shop and Services and Eating Place at Non-Domestic Podium within "G/IC(1)" Zone of Planning Area 34E of Hung Shui Kiu/ Ha Tsuen New Development Area
Sewerage Impact Assessment

Draft | September 2025

Job number 278463

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ARUP

Contents

Appendices

1. Introduction

1.1 General

1.1.1 Ove Arup and Partners Hong Kong Limited (Arup) was commissioned by the West Development Office (WDO) of the Civil Engineering and Development Department (CEDD) of the Government of Hong Kong Special Administrative Region (HKSAR) on 30 September 2020 to provide Consultancy Services for the Design and Construction Supervision of Hung Shui Kiu / Ha Tsuen New Development Area (HSK/HT NDA) Package A Works for Second Phase Development (the Consultancy). Under the Review Phase of the Consultancy, technical assessments including reports on Traffic and Transport Impact Assessments Review (TTIA), report on Drainage and Sewerage Impact Assessments Review (DSIA), Report on Water Supply and Utilities Impact Assessments Review (WSUIA) had been completed, which was based on the planning parameters adopted in the Approved S16 Planning Application (No. A/HSK/452) for proposed minor relaxation of plot ratio and/or building height restrictions for the proposed/permitted public and private housing developments, proposed social welfare facilities, proposed shop and services, eating place, school, office, educational institution, institutional use, off-course betting centre, place of entertainment, private club, public convenience, recycle collection centre and training centre at non-domestic podium within public housing developments in HSK/HT NDA in April 2023.

1.1.2 This Planning Application is submitted in accordance with Section 16 of the Town Planning Ordinance to seek approval of the Town Planning Board for the proposed flat and shop and services and eating place at non-domestic podium within "Government, Institution or Community (1)" ("G/IC(1)") of Planning Area 34E of Hung Shui Kiu/ Ha Tsuen New Development Area ("the Application Site"). The Proposed Development has a total Plot Ratio of 6.5, comprising residential developments on top of non-domestic podium.

1.1.3 This updated SIA report will be based on the accepted DSIA Report No. REP-031-07 (F3D) for the HSK/HT NDA development under Review Phase of the Consultancy.

1.2 Scope of Updated Technical Assessments

1.2.1 The scope of updated technical assessment for sewerage comprises the following:

- Update the previous SIA conducted using the new development parameters (site area, population, type, mix, etc.) given by CEDD;

- Undertake a review of the proposed sewerage network and identify if there would be any deficiency / inadequate capacity based on the new development parameters;
- Propose the preliminary modification measures for the purpose of the SIA; and
- Submit the SIA to support S16 application.

1.2.2 This section outlines the assessment of the sewerage impact potentially induced by the proposed development parameters at Site No. 4-1 (i.e. the Application Site) in HSK/HT NDA and includes:

- Estimation of sewage flows arising from the Application Site;
- Assessment of potential impact on the existing and planned sewerage system imposed by the Application Site; and
- Proposed preliminary sewerage system modification works, if considered necessary.

2. Planning Data and Sewage Flow Estimation

2.1 Baseline Population and Employment Data

2.1.1 The baseline sewerage catchments and population within the proposed HSK/HT NDA is based on the following planned and committed developments:

- S16 Planning Application No. A/HSK/452 (approved on 23 Jun 2023);
- Updated planned population and employment figures at nine housing sites advised by the Housing Department (i.e. Site No. 4-3, 4-4, 4-5, 4-6, 4-22, 4-24, 4-28, 5-16 and 5-17); and
- Planning Application No. A/HSK/573 – Proposed Minor Relaxation of Domestic Plot Ratio Restriction (From 4.5 to 5) for Mixed Use Development (in Planning Areas 28A and 28B of HSK/HA NDA) (i.e. Site No. 4-25a, 4-25b, 4-25c, and 4-29) (approved on 15 Aug 2025).

2.2 Proposed Development

2.2.1 The proposed development information for the Application Site (i.e. Site No. 4-1) is summarized in in **Table 2.1**. The Indicative Scheme is shown in **Appendix A**.

Table 2.1 Proposed Development Parameters for the Application Site

Development Parameters	Proposed Development
Application Site	About 7,760m^2
Total Plot Ratio (PR)	6.5
- Domestic PR	*6*
- Non-domestic PR	*0.5*
Total Gross Floor Area (GFA)	50,440m^2
- Domestic GFA	*46,560m^2*
- Non-domestic GFA	*3,880m^2*
No. of Blocks	4 nos. of residential towers on top of 5-storey retail, carpark cum clubhouse podium
Population	About 2,420
Clubhouse GFA	About 2,095.2m^2

2.3 Sewerage Parameters and Assumptions

2.3.1 The assumptions for sewage flow estimation have been adopted with reference to those stated in the accepted DSIA (Report No. REP-031-07) (F3D) for the HSK/HT NDA. The relevant sewerage parameters and assumptions are presented in the following paragraphs.

2.3.2 **Error! Reference source not found.**The following unit flow factors for domestic and commercial activities in accordance with EPD's Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning (GESF) are adopted:

Table 2.2 Unit flow Factors for Different Land Uses

Land Use specified in GESF	Unit Flow Factor (m^3/person/day)	Remark
Domestic		
Residential – Private (R1)	0.19 (1)	
Commercial		
General	0.28 (1)	Sum of flows due to employee (0.08m^3/person/day) & General territorial average (0.20m^3/person/day)
J10 – Restaurants & Hotels	1.58 (1)	Sum of flows due to employee (0.08m^3/person/day) & General territorial average (1.50m^3/person/day)

***Notes*:**

(1) Referenced from EPD's Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning Table T-1 and T-2.

2.3.3 As human activities fluctuates throughout the day, sewage flow is likewise not uniform with peaks in certain periods. As such, peaking factor is proposed to accommodate for potential spike in sewage flow. Peaking factor serves to cater for seasonal/diurnal fluctuation and normal amount of infiltration and inflow. Peaking factors (including stormwater allowance) have been adopted in accordance with EPD's GESF as shown in **Table 2.3**.

Table 2.3 Peaking Factors for Various Population Ranges

Population Range	Peaking Factor (including stormwater allowance) for facility with existing upstream sewerage	Peaking Factor (excluding stormwater allowance) for facility with new upstream sewerage
Sewers		
< 1,000	8	6
1,000 – 5,000	6	5
5,000 – 10,000	5	4
10,000 – 50,000	4	3
> 50,000	Max ($7.3/N^{0.15}$, 2.4)	Max ($6/N^{0.175}$, 1.6)
Sewage Treatment Works, Preliminary Treatment Works and Pumping Stations		
< 10,000	4	3
10,000 – 25,000	3.5	2.5
25,000 – 50,000	3	2
> 50,000	Max ($3.9/N^{0.065}$, 2.4)	Max ($2.6/N^{0.065}$, 1.6)

Notes:

(1) Referenced from EPD's GESF Table T-5; N = Contributing population in thousands.

2.3.4 Average dry weather flows (ADWF) were estimated by applying appropriate unit sewage flow factors according to their development type, and peak flows were calculated by multiplying the ADWF by the peaking factor, which account for the peak flows and provide adequate safety margin in planning sewage facilities. A return liquid allowance of 2.5% is also applied to all estimated ADWFs.

3. Assessment of Sewerage Impact

3.1 Existing and Planned Sewerage Infrastructure

3.1.1 The sewerage system in North-west New Territories (NWNT) serves the major urban developments in Tin Shui Wai and Tuen Mun - Yuen Long Corridor and small developments on the periphery of Yuen Long. Two sewerage catchments, Yuen Long Sewerage Catchment and San Wai Sewerage Catchment, correspond to two sewage treatment works, Yuen Long Sewage Treatment Works (YLSTW) and San Wai Sewage Treatment Works (SWSTW) respectively.

3.1.2 SWSTW is planned to serve major developments in Yuen Long Town, Au Tau, Tin Shui Wai, Ping Shan, Lau Fau Shan, Shap Pat Heung and covered part of the area within HSK/HT NDA including Hung Shui Kiu and Ha Tsuen. The remaining areas within HSK/HT NDA are unsewered areas. YLSTW serves the eastern part of the NWNT.

3.1.3 To cater for the forecast sewage flow due to population growth in the NWNT, DSD commenced the works contract no. DC/2013/10 in May 2016 - "Upgrading of San Wai Sewage Treatment Works – Phase 1" to upgrade the SWSTW from preliminary treatment to chemically enhanced primary treatment plus disinfection facilities and increase the ADWF treatment capacity to 200,000 m^3/day. Phase 1 upgrading works of SWSTW at a site adjacent to the existing SWSTW had been completed in the end of 2020.

3.1.4 Under DSD Agreement No. CE30/2006 (DS), Ha Tsuen Sewage Pumping Station (HTSPS) was expanded with an additional 1200mm diameter rising main constructed in parallel with the existing twin 1200mm diameter rising mains. Upon completion of the expansion works in 2014, the design capacity of HTSPS has been increased to 193,100 m^3/day.

3.1.5 Four new sewage pumping stations (SPS) (i.e. SPS1 to SPS4) are proposed to convey sewage flow from the HSK/HT NDA to the upgraded SWSTW – Phase 1 and the planned Hung Shui Kiu Effluent Polishing Plant (HSKEPP) (ADWF treatment capacity of 90,000 m^3/day).

3.1.6 The effluent of the upgraded SWSTW and the HSKEPP will be discharged to the existing NWNT Effluent Tunnel which has a total hydraulic capacity of 440,000 m^3/day and subsequently discharged via the existing Urmston Road Submarine Outfall.

3.2 Sewerage Impact

3.2.1 The ADWF generated from the proposed development at the Application Site is estimated in accordance with EPD's GESF and are summarised in **Table 3.1**.

Table 3.1 Estimation of ADWF from the Proposed Development

Development and Type	GFA (m^2)	Population /Employee	Unit Flow Factor (m^3/day/head)	Design ADWF (m^3/day) (1)
Domestic (Private R1)	46,560	2,420	0.19	471
Non-domestic (Commercial – Non-catering)	2,716 (3)	96 (2)	0.28	28
Non-domestic (Commercial – Catering/Restaurants)	1,164 (3)	60 (2)	1.58	97
Clubhouse (Commercial – General)	2095.2	70 (2)	0.28	20
			Total	616

Notes:

(1) Design ADWF includes a return liquid allowance of 2.5%.

(2) Reference from Table 8 of PlanD's Commercial and Industrial Floor Space Utilization Survey.

(3) Assume total non-domestic GFA (i.e. 3,880 m^2) comprises 70% non-catering and 30% catering GFA.

3.2.2 In the Indicative Scheme formulated for the purpose of technical assessment, a swimming pool is proposed (subject to change at the detailed design stage). Since the discharge of the swimming pool will be only undertaken occasionally, the sewage from the swimming pool is planned to be discharged during non-peak hours to reduce the loading on public sewer. Thus, the swimming pool's backwashing flow will be excluded from the peak sewage flow of the proposed development.

3.2.3 The flow increment compared to the baseline scenario is summarised in **Table 3.2**.

Table 3.2 Sewage Flow Comparison for Site No. 4-1

Scenario	Design ADWF (m^3/day) (1)
Baseline (Refer to **Section 2.1**)	447
Proposed	616
Difference	+169

Notes:

(1) Design ADWF includes a return liquid allowance of 2.5%.

3.2.4 With the proposed residential development in this S16 Planning Application, the additional sewage flow generated from Site No. 4-1 would be conveyed to SPS3, then SPS2, and eventually to the planned HSKEPP.

3.2.5 For the avoidance of doubt, there is no additional sewage flow to SPS1 and SPS4 due to the proposed development. **Table 3.3** summarises the design pumping capacities of the proposed SPS2 and SPS3, and a comparison of design sewage flow under base case and proposed condition.

Table 3.3 Sewage Pumping Capacities and Sewage Flow Comparison

SPS	ADWF (m^3/day) (1)				Capacity Shortfall (m^3/day) *(Proposed ADWF– Pumping Capacity)*	Remarks
	Pumping Capacity	Base Case	Increment under Proposed Condition	Proposed Condition *(Base Case + Increment)*		
SPS2	47,229 (2)	47,229	+169 (0.4%)	47,398	169 (0.4%)	Pumping Capacity < Proposed ADWF
SPS3	12,341 (2)	12,341	+169 (1.4%)	12,511	169 (1.4%)	

Notes:

(1) Design ADWF includes a return liquid allowance of 2.5%.

(2) Refer to latest updated SIA for 9 nos. Housing Sites (i.e. 4-3, 4-4, 4-5, 4-6, 4-22, 4-24, 4-28, 5-16 and 5-17), the pumping capacity of SPS2 and SPS3 under original base case scenario are 46,121 m^3/day and 12,341 m^3/day respectively. Due to the concurrent planned and committed developments in the vicinity, SPS2's pumping capacity under base case is required to be further increased from 46,121 m^3/day to 47,229 m^3/day.

3.2.6 Both SPS2 and SPS3 have a capacity shortfall of 169 m^3/day. Upgrading works are required to handle a respective total ADWF of 47,398 m^3/day and 12,511 m^3/day.

3.2.7 **Table 3.5** summarises the comparison of sewage flow to planned HSKEPP under base case and proposed condition.

Table 3.5 Treatment Works Capacities and Sewage Flow Comparison

Sewage Treatment Works	Treatment Capacity (m^3/day)	ADWF (m^3/day) (1)			Capacity Shortfall (m^3/day)
		Base Case	Increment under Proposed Condition	Proposed Condition	
HSKEPP	90,000	87,421 (2)	+169 (0.2%)	87,591	-

Notes:

(1) Design ADWF includes a return liquid allowance of 2.5%.

(2) Including sewage flow from SPS2 and two-third of SPS4.

3.2.8 It is noted that the 0.2% increment of sewage flow could be absorbed by the planned HSKEPP without any adverse sewerage impact.

3.2.9 Based on the hydraulic checking in **Appendix C**, the proposed gravity sewer within HSK/HT NDA Second Phase Development have sufficient capacity to cater for the additional sewage flow imposed by the proposed development.

4. Proposed Sewerage Modification Works

4.1.1 The design guidelines, standards and criteria used for the preliminary design of the proposed sewerage system and the proposed sewerage improvement schemes are as follows:

- EPD's Technical Paper Guidelines for Estimating Sewage Flows (GESF) for Sewerage Infrastructure Planning Version 1.0; and
- DSD's Sewerage Manual Part 1 (Key Planning Issues and Gravity Collection System) and Part 2 (Pumping Stations and Rising Mains), Third Edition, May 2013.

4.1.2 Refer to **Section 3.2.6**, pump and pump motor upgrading works are required and proposed at SPS2 and SPS3 to achieve a net positive pump outflow during peak flow condition. Due to the relatively small increase in pumping capacity, it is anticipated that the current pump model / physical size can be retained. The increase in pumping capacity should be achievable by enlarging the respective pump impeller diameter and upgrading the corresponding pump motor. As the pump physical size does not increase, the pumping station's physical dimensions would not have to be modified to accommodate the increase in pumping capacity.

4.1.3 The design capacity and utilization ratio after proposed modification is tabulated in **Table 4.1**.

Table 4.1 SPS Arrangement after Proposed Pump Modification Works

SPS	Design Accumulated ADWF under Proposed Condition (m^3/day)	Design Pumping Capacity (in ADWF) after Modification (m^3/day)	Utilization Ratio	Design Total Pump Rate (in peak flow) after Modification (l/s)
SPS2	47,398	47,398 (Upgraded)	100%	1,650 (Upgraded)
SPS3	12,511	12,511 (Upgraded)	100%	435 (Upgraded)

4.1.4 **Table 4.2** summarizes the flow velocity of rising mains upon proposed pump modification in SPS2 and SPS3. The flow velocities under all conditions are well within the design limit of 1 m/s to 3 m/s. As such, no adverse impact on rising mains is envisaged.

Table 4.2 SPS Rising Main Size and Flow Velocity

SPS	Rising Main Diameter (mm)	Flow Velocity under Proposed Condition (m/s)	
		Using 1 Pipe (During Maintenance)	Using 2 Pipes (Normal Condition)
SPS2	2 x DN900 DI pipes	2.34	1.17
SPS3	2 x NS560 HDPE pipes	2.61	1.30

5. Summary

5.1.1 This report estimated the sewage flows generated from the proposed development at Site No. 4-1 in comparison with that from the base case scenario, assessed the potential impact and recommended sewerage modification works to mitigate the potential impact.

5.1.2 According to the assessment, the proposed development would induce an additional ADWF of 169 m^3/day, imposing extra sewage flow to proposed SPS2 and SPS3 (within HSK/HT NDA Second Phase Development), and planned HSKEPP.

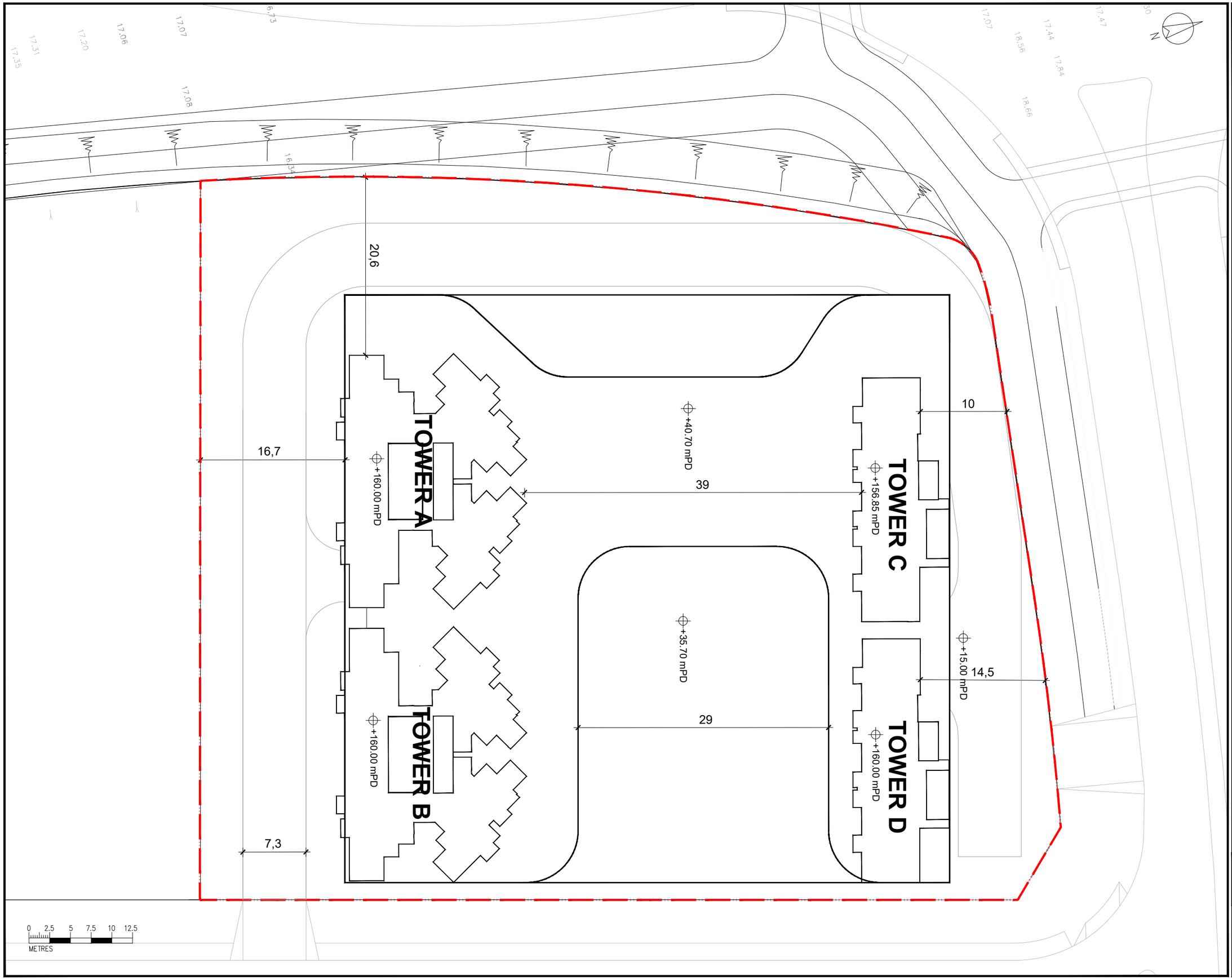
5.1.3 The pumping capacity of proposed SPS2 and SPS3 are found to be marginally insufficient. The pumps and ancillary equipment are required to be upgraded, such that the total pump rates will be increased to cater for the additional sewage flow from the proposed development.

5.1.4 Other than the proposed pump modification works in SPS2 and SPS3, the hydraulic assessment suggested that the proposed development would incur no adverse sewerage impacts to other existing and proposed sewerage infrastructure, including the planned HSKEPP, proposed gravity sewers and rising mains.

5.1.5 Upon implementing the proposed modification / upgrading works at SPS2 and SPS3, no adverse impact to the existing and planned sewerage system is envisaged due to the proposed development.

Appendix A

Indicative Scheme for Site No. 4-1



Rev.	Date	Description	Drawn

GENERAL NOTES:

1. DO NOT SCALE DRAWING. FIGURED DIMENSIONS ARE TO BE FOLLOWED.
2. ALL DIMENSIONS ARE TO BE CHECKED AT SITE BY THE MAIN CONTRACTOR/FABRICATOR.
3. ALL RIGHT RESERVED. REPRODUCTION IN ANY FORM MUST BE APPROVED BY CLIENT/OWNER.
4. READ THIS DRAWING IN CONNECTION WITH GENERAL ARCHITECTURAL PLANS, STRUCTURAL PLANS, AND OTHER RELATED DRAWINGS.

Application Site

CLIENT:

DESIGN CONSULTANT:

ARUP

CONTACT NO.:

PROJECT:

S16 Planning Application for Proposed Flat and Shop and Services and Eating Place at Non-Domestic Podium within "G/IC(1)" Zone of Planning Area 34E of HSK/HT NDA

DRAWING TITTLE:

MASTER LAYOUT PLAN

DRAWING NO.: AR-010

SCALE: 1:400@A3

ISSUED DATE:

DRAWN BY: ES

CHECKED BY: FY

REV.

Appendix B

Proposed Sewerage Upgrading/Modification Works

N

814000 E
816000 E
818000 E
820000 E
836000 N
834000 N
832000 N

DEEP BAY

SEWAGE PUMPING STATION NO. 4 (SPS4)

TIN SHUI WAI

HA TSUEN

HA TSUEN PUMPING STATION

SAN WAI SEWAGE TREATMENT WORKS

PING SHAN

SEWAGE PUMPING STATION NO. 3 (SPS3)

SEWAGE PUMPING STATION NO. 2 (SPS2)

SEWAGE PUMPING STATION NO. 1 (SPS1)

CASTLE PEAK ROAD

YUEN LONG HIGHWAY

0 100 200 300 400 500
METRES
1 : 10000

LEGEND:

- HSK/HT NDA SITE BOUNDARY
- PROPOSED SEWERAGE CATCHMENT AREA OF SPS 1
- PROPOSED SEWERAGE CATCHMENT AREA OF SPS 2
- PROPOSED SEWERAGE CATCHMENT AREA OF SPS 3
- PROPOSED SEWERAGE CATCHMENT AREA OF SPS 4
- PROPOSED SEWERAGE CATCHMENT AREA OF HA TSUEN PS FROM HSK/HT NDA
- EXISTING SPS
- PROPOSED SPS UNDER HSK/HT NDA SECOND PHASE DEVELOPMENT
- THE APPLICATION SITE

Rev	Description	By	Date
A	FIRST ISSUE	BT	09/25

Consultant

ARUP

Project Title

Agreement No. CE 1/2020 (CE)
Hung Shui Kiu / Ha Tsuen
New Development Area Package A
Works for Second Phase Development
– Design and Construction

Drawing title

PROPOSED SEWERAGE CATCHMENT AREA OF EXISTING AND PROPOSED SEWAGE PUMPING STATIONS

Drawing no.			Rev.
278463/SIA/201			A
Drawn	Date	Checked	Approved
MAN	07/25	CF	DL
Scale		Status	
1:10000 @ A1		PRELIMINARY	

土木工程拓展署
Civil Engineering and Development Department

Printed by : wai-man.cheung Date : 9/12/2025
Filename : J:\278000\278463_CE 1-2020_HSK-HT_NDA-DC\05_Int_Proj_Data\05-03_BIM\02-Drawing\Utilities\278463_SIA_201.dgn

N

814000 E
816000 E
818000 E
820000 E
836000 N
834000 N
832000 N

LAU FAU SHAN
TIN SHUI WAI
NGAU HOM SHEK
SAN WAI
PING SHAN
YUEN TAU SHAN
KONG SHAM WESTERN HIGHWAY
CASTLE PEAK ROAD – PING SHAN
YUEN LONG HIGHWAY
SEWAGE PUMPING STATION NO.4 (SPS4)
SEWAGE PUMPING STATION NO.1(SPS1)
C4/SEW/1102
C4/SEW/1103

LEGEND

- HSK/HT NDA SITE BOUNDARY
- THE APPLICATION SITE
- PLANNED HUNG SHUI KIU EFFLUENT POLISHING PLANT (BY OTHERS)
- EXISTING SAN WAI SEWAGE TREATMENT WORKS
- EXISTING HA TSUEN SEWAGE PUMPING STATION
- PROPOSED SEWAGE PUMPING STATION
- PROPOSED HSK/HT NDA SECOND PHASE DEVELOPMENT GRAVITY SEWERAGE NETWORK
- RM — PROPOSED HSK/HT NDA SECOND PHASE DEVELOPMENT SEWAGE RISING MAIN NETWORK
- EXISTING GRAVITY SEWERAGE NETWORK
- RM — EXISTING SEWAGE RISING MAIN NETWORK

0 100 200 300 400 500
METRES
1 : 10000

Rev	Description	By	Date
A	FIRST ISSUE	BT	09/25

Consultant
ARUP

Project Title
Agreement No. CE 1/2020 (CE)
Hung Shui Kiu / Ha Tsuen
New Development Area Package A
Works for Second Phase Development
– Design and Construction

Drawing title
SEWERAGE WORKS
OVERALL LAYOUT PLAN

Drawing no.	Rev.
278463/SIA/202	A

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Civil Engineering and Development Department

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Markup for Proposed Modification Works under S16 Planning Application for Proposed Flat and Shop and Services in G/IC (1) Zone in Planning Area 34E of Hung Shui Kiu/Ha Tsuen New Development Area

MATCH LINE
FOR CONTINUATION
SEE DRG 278463/C4/SEW/1101

SITE 3-39
(ENTERPRISE AND TECHNOLOGY PARK)
(BY OTHER HSK/HT NDA
SECOND PHASE DEVELOPMENT CONTRACT)

RESERVE FOR GTS
(BY OTHER HSK/HT NDA SECOND PHASE DEVELOPMENT CONTRACT)

MATCH LINE
FOR CONTINUATION
SEE DRG 278463/C4/SEW/1103

SITE 4-1
(DIVISIONAL FIRE STATION CUM AMBULANCE DEPOT CUM STAFF QUARTERS)

TOWER A
TOWER B
TOWER C
TOWER D

SITE 4-2
(COMMUNITY HALL, SPORTS CENTRE)

SITE 4-3
(PUBLIC HOUSING)

SITE 4-4
(PUBLIC HOUSING)

ROAD D6
ROAD L25

PROPOSED WASHOUT CHAMBER WOC NO. 1
FOR DETAILS REFER TO DRAWING
NO. 278463/C4/SEW/1422

PROPOSED NS560 TWIN RISING MAIN
FOR DETAILS REFER TO DRAWING NO.
278463/C4/SEW/1401-1402 AND 1411-1413

RESERVE FOR GTS

MATCH LINE
FOR CONTINUATION
SEE DRG 278463/C4/SEW/1105

MATCH LINE
FOR CONTINUATION
SEE DRG 278463/C4/SEW/1106

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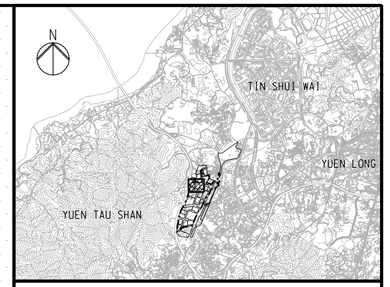
816800 E
833200 N
833100 N
833000 N

0 5 10 15 20 25
METRES
1 : 500



KEY PLAN

NOTES

1. FOR GENERAL NOTES AND LEGEND, REFER TO DRAWING NO. 278463/C4/SEW/1101.

Remark:

NS355	Other Post-tender Markup
NS355	Markup for Proposed Modification Works under HD's Technical Assessments
NS355	Markup for Proposed Modification Works under S16 Planning Application for Proposed Flat and Shop and Services in G/IC (1) Zone in Planning Area 34E of Hung Shui Kiu/Ha Tsuen New Development Area

Rev	Description	By	Date
01	RtoC SUBMISSION	JT	09/24
00	TENDER ISSUE	EF	02/24

Consultant
ARUP

Project Title
Contract No. YL/2023/04
Hung Shui Kiu/Ha Tsuen
New Development Area
Second Phase Development - Contract 4 -
Site Formation and Engineering
Infrastructure Works

Drawing title
SEWERAGE LAYOUT PLAN
(SHEET 2)

Drawing no. 278463/C4/SEW/1102 Rev. 01

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DT	02/24	EF	DL

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Status TENDER

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Civil Engineering and Development Department

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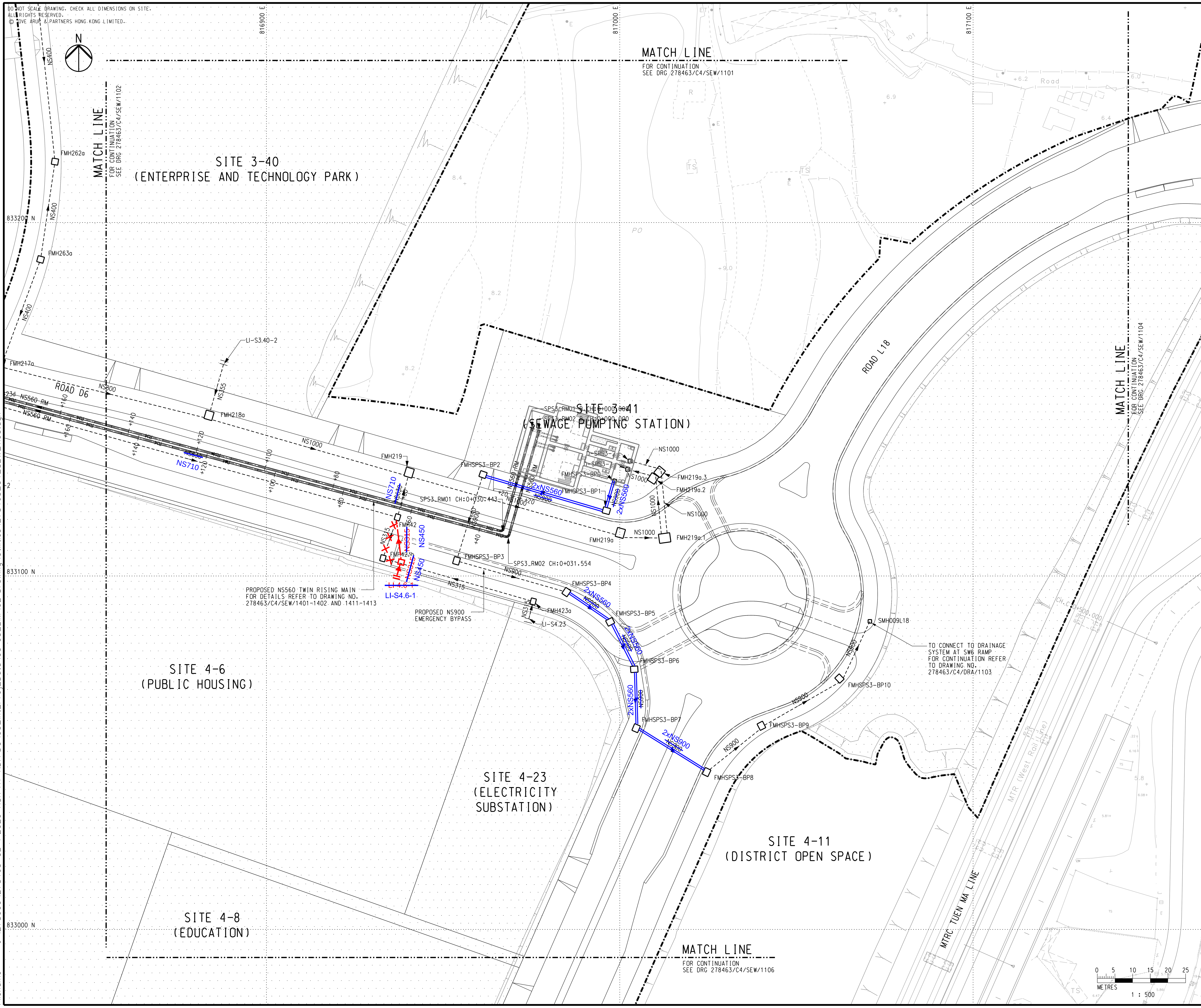
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FOR CONTINUATION SEE DRG 278463/C4/SEW/1101
MATCH LINE
FOR CONTINUATION SEE DRG 278463/C4/SEW/1102
MATCH LINE
FOR CONTINUATION SEE DRG 278463/C4/SEW/1104
MATCH LINE
FOR CONTINUATION SEE DRG 278463/C4/SEW/1106
SITE 3-40
(ENTERPRISE AND TECHNOLOGY PARK)
SITE 3-41
(SEWAGE PUMPING STATION)
SITE 4-6
(PUBLIC HOUSING)
SITE 4-23
(ELECTRICITY SUBSTATION)
SITE 4-11
(DISTRICT OPEN SPACE)
SITE 4-8
(EDUCATION)
ROAD D6
ROAD L18
MTRC TUEN MA LINE
816900 E
817000 E
817100 E
833200 N
833100 N
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FMH219a.2
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FMHSPS3-BP2
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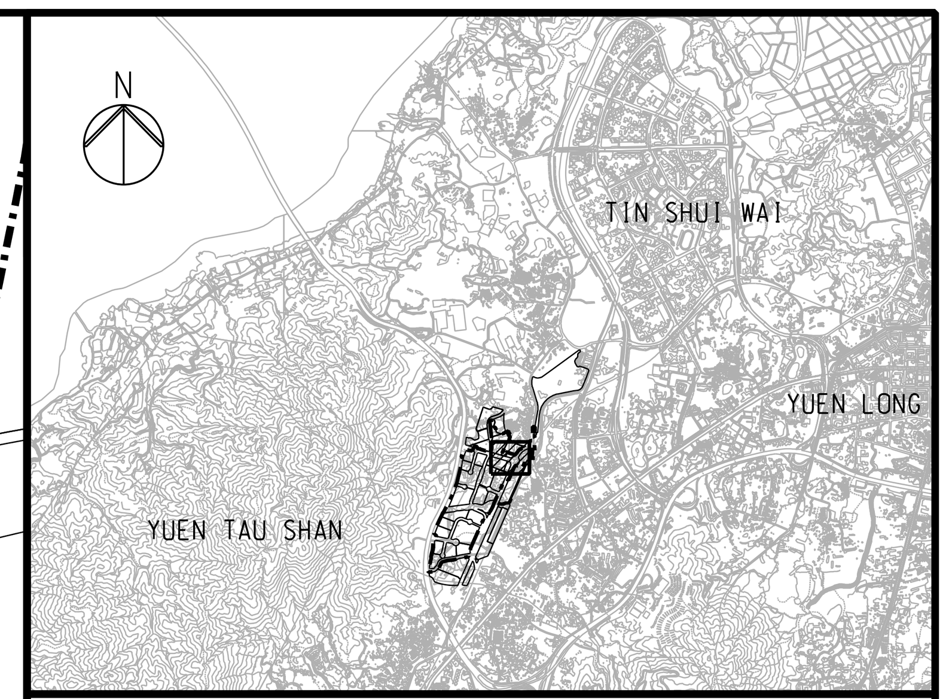
FMHSPS3-BP4
FMHSPS3-BP5
FMHSPS3-BP6
FMHSPS3-BP7
FMHSPS3-BP8
FMHSPS3-BP9
FMHSPS3-BP10
SMH009L18
NS400
NS355
NS1000
NS900
NS315
NS710
NS450
2xNS560
2xNS900
LI-S3.40-2
LI-S4.23
LI-S4.6-1
SPS3_RM01 CH:0+030.443
SPS3_RM02 CH:0+031.554
PROPOSED NS560 TWIN RISING MAIN FOR DETAILS REFER TO DRAWING NO. 278463/C4/SEW/1401-1402 AND 1411-1413
PROPOSED NS900 EMERGENCY BYPASS
TO CONNECT TO DRAINAGE SYSTEM AT SW6 RAMP FOR CONTINUATION REFER TO DRAWING NO. 278463/C4/DRA/1103
0 5 10 15 20 25
METRES
1 : 500



KEY PLAN

NOTES

1. FOR GENERAL NOTES AND LEGEND, REFER TO DRAWING NO. 278463/C4/SEW/1101.

Remark:

NS355	Other Post-tender Markup
NS355	Markup for Proposed Modification Works under HD's Technical Assessments

Rev	Description	By	Date
01	RtoC SUBMISSION	JT	09/24
00	TENDER ISSUE	EF	02/24

Consultant

ARUP

Project Title

Contract No. YL/2023/04
Hung Shui Kiu/Ha Tsuen
New Development Area
Second Phase Development - Contract 4 - Site Formation and Engineering Infrastructure Works

Drawing title

SEWERAGE LAYOUT PLAN
(SHEET 3)

Drawing no.	Rev.
278463/C4/SEW/1103	01

Drawn	Date	Checked	Approved
DT	02/24	EF	DL
Scale 1:500 @ A1		Status TENDER	

CEDD
土木工程拓展署
Civil Engineering and Development Department

Printed by : Michael-KH.Ng Date : 3/6/2024
Filename : J:\278000\278463 CE 1-2020 HSK-HT NDA-DC\05_Int_Proj_Data\05-03_BIM\02-Drawing\Utilities\278463_C4_SEW_1103.dgn

SEWERAGE D6 MANHOLE SCHEDULE

UPSTREAM STRUCTURE	DOWNSTREAM STRUCTURE	PIPE LENGTH (m)	UPSTREAM MH/CP TYPE	DOWNSTREAM MH/CP TYPE	PIPE OUTSIDE DIAMETER (mm)	UPSTREAM FINISHED GROUND LEVEL (mPD)	DOWNSTREAM FINISHED GROUND LEVEL (mPD)	UPSTREAM INVERT LEVEL (mPD)	DOWNSTREAM INVERT LEVEL (mPD)	PIPE GRADIENT (1 in X)	PIPE MATERIAL	STANDARD DIMENSIONAL RATIO
FMHSPS3-BP0	FMHSPS3-BP1	7.85	TP	H	2x560	11.25	8.70	7.70	7.68	175	HDPE	SDR17
FMHSPS3-BP1	FMHSPS3-BP2	34.73	H	H	2x560	8.70	10.98	7.65	7.37	182	HDPE	SDR17
FMHSPS3-BP2	FMHSPS3-BP3	24.71	H	H	900	10.98	9.83	7.45	7.29	511	HDPE	SDR17
FMHSPS3-BP3	FMHSPS3-BP4	31.07	H	G1	900	9.83	8.67	7.40	7.21	539	HDPE	SDR17
FMHSPS3-BP4	FMHSPS3-BP5	13.55	G1	G1	2x560	8.67	8.13	7.34	7.17	150	HDPE	SDR17
FMHSPS3-BP5	FMHSPS3-BP6	13.66	G1	G1	2x560	8.13	7.93	7.24	7.14	89	HDPE	SDR17
FMHSPS3-BP6	FMHSPS3-BP7	15.27	G1	G1	2x560	7.93	9.09	7.65	7.10	185	HDPE	SDR17
FMHSPS3-BP7	FMHSPS3-BP8	22.02	G1	H	2x900	9.09	9.72	6.98	7.05	870	HDPE	SDR17
FMHSPS3-BP8	FMHSPS3-BP9	19.30	H	H	900	9.72	9.03	6.95	6.40	37	HDPE	SDR17
FMHSPS3-BP9	FMHSPS3-BP10	24.71	H	H	900	9.03	8.03	6.40	5.58	31	HDPE	SDR17
FMHSPS3-BP10	SMH009L18	17.72	H	H	900	8.03	5.89	5.58	5.00	31	HDPE	SDR17
FMH210b	FMH211a	60.01	SP-F/D	F1	500	13.88	12.92	9.47	9.24	263	HDPE	SDR17
FMH211a	FMH217a	60.92	F1	F1	560	12.92	11.97	9.24	9.02	268	HDPE	SDR17
FMH217a	FMH218a	59.07	L	L	800	11.97	11.06	6.37	6.16	293	HDPE	SDR17
FMH218a	FMH219	57.10	L	L	1000	11.06	10.51	6.09	5.91	327	HDPE	SDR17
FMH219	FMH219a	60.40	L	L	1000	10.51	12.08	5.91	5.75	391	HDPE	SDR11
FMH219a	FMH219a.1	10.21	L	SP-1	1000	12.08	12.51	5.74	5.72	510	HDPE	SDR11
FMH219a.1	FMH219a.2	16.04	SP-1	L	1000	12.51	11.25	5.71	5.68	535	HDPE	SDR11
FMH219a.2	D-SPS3-1	6.35	L	TP	1000	11.25	6.68	5.68	5.67	500	HDPE	SDR17
FMH219a.1	FMH219a.3	17.50	SP-1	L	1000	12.51	11.25	5.71	5.68	583	HDPE	SDR11
FMH219a.3	D-SPS3-2	7.79	L	TP	1000	11.25	6.68	5.68	5.67	779	HDPE	SDR17
LI-S3.39-1	FMH210b	17.96	TP	L	355	14.19	13.88	11.40	11.28	153	HDPE	SDR17
LI-S3.39-2	FMH211a	14.08	TP	L	355	13.87	12.92	11.14	11.05	158	HDPE	SDR17
LI-S3.40-2	FMH218a	14.73	TP	L	355	13.00	11.06	6.19	6.09	150	HDPE	SDR17
LI-S4.23	FMH423a	4.74	TP	E1	315	11.10	9.30	8.20	8.18	339	HDPE	SDR17
FMH423a	FMH423b	43.21	E1	E1	315 → 450	9.30	10.88	8.18	8.00	240	HDPE	SDR17
LI-S4.6-1	FMH423b	5.00	TP	E1	~~315~~ → 450	11.00	10.88	8.10 → ~~8.05~~ 7.70	~~8.05~~ → ~~7.84~~ 7.25	100 → 47	HDPE	SDR17
FMH423b	FMH423c	21.00	E1	F1	450	10.88	10.53	~~8.05~~ 6.65	~~7.84~~ 6.51	74	HDPE	SDR17
FMH423c	FMH219	10.43	F1	L	630	10.53	10.51	6.65	6.51	74	HDPE	SDR17
FMH224a	FMH223a	29.42	E1	E1	450	10.14	10.45	8.70	8.64	487	HDPE	SDR17
FMH223a	FMH209_a	29.14	E1	F1	500	10.45	10.81	8.64	8.58	501	HDPE	SDR17
FMH209_a	FMH210_a	14.21	F1	F1	560	10.81	10.92	8.58	8.55	495	HDPE	SDR17
FMH210_a	FMH211_a	80.24	F1	L	560	10.92	12.57	8.55	8.39	504	HDPE	SDR17
LI-S4.8-1	FMH224a	16.70	TP	E1	355	11.50	10.14	8.64	8.50	118	HDPE	SDR17
LI-S4.10-2	FMH224a	15.66	TP	E1	355	11.50	10.14	8.64	8.50	114	HDPE	SDR17
LI-S4.8-2	FMH223a	15.24	TP	E1	355	11.70	10.45	8.64	8.50	107	HDPE	SDR17
LI-S4.10-1	FMH223a	16.54	TP	E1	355	11.70	10.45	8.64	8.50	121	HDPE	SDR17
LI-S4.9-2	FMH209_a	18.13	TP	F1	450	11.40	10.81	8.55	8.43	155	HDPE	SDR17
LI-S4.9-1	FMH210_a	5.15	TP	F1	450	11.40	10.92	8.55	8.50	125	HDPE	SDR17
FMH206a	FMH207a	37.56	E1	F1	450	14.85	14.53	11.64	11.31	114	HDPE	SDR17
FMH207a	FMH208b	37.04	F1	L	450	14.53	13.85	10.71	10.50	176	HDPE	SDR17
FMH208b	FMH209b	51.70	L	L	450	13.85	13.18	~~10.77~~ 10.50	~~10.25~~ 10.10	~~100~~ 129	HDPE	SDR17
FMH209b	FMH210b	65.74	L	SP-F/D	500	13.18	13.88	~~10.25~~ 10.05	9.59	~~100~~ 129	HDPE	SDR17
LI-S4.1-1	FMH208b	17.77	TP	L	355	14.50	13.85	12.14	12.05	223	HDPE	SDR17
LI-S4.1-2	FMH209b	16.25	TP	L	355	14.50	13.18	12.14	12.05	206	HDPE	SDR17
LI-S4.2-1	FMH206a	23.74	TP	E1	280	15.00	14.85	12.14	12.07	380	HDPE	SDR17
LI-S4.2-2	FMH207a	14.98	TP	F1	280	15.00	14.53	12.14	12.05	181	HDPE	SDR17
LI-S4.4-2	FMH206a	31.42	TP	E1	400	15.00	14.85	12.00	11.69	101	HDPE	SDR17
LI-S4.3-3	FMH207a	13.53	TP	F1	355	13.48	14.53	10.85	10.71	51	HDPE	SDR17
FMH260a	FMH261B	9.59	L	F1	400	14.11	13.67	10.21	10.17	292	HDPE	SDR17
FMH261B	FMH261a	18.13	F1	F1	400	13.67	12.88	10.17	10.11	305	HDPE	SDR17
FMH261a	FMH262a	58.21	F1	F1	400	12.88	12.40	10.11	8.90	49	HDPE	SDR17
FMH262a	FMH263a	26.62	F1	F1	400	12.40	12.45	8.90	8.86	699	HDPE	SDR17
FMH263a	FMH217a	29.86	F1	L	400	12.45	11.97	8.86	8.49	84	HDPE	SDR17
LI-S3.36-1	FMH260a	6.05	TP	L	400	14.00	14.11	10.25	10.22	217	HDPE	SDR17
LI-S3.40-1	FMH261a	5.62	TP	F1	400	13.00	12.88	10.50	10.48	331	HDPE	SDR17
LI-S4.4-1	FMH195.1	7.44	TP	L	400	13.13	12.52	11.23	11.13	74	HDPE	SDR17
FMH195.1	FMH196.1	14.77	L	E1	560	12.52	12.45	8.70	8.60	100	HDPE	SDR17
FMH196.1	FMH211_a	12.06	E1	L	560	12.45	12.57	8.60	8.54	100	HDPE	SDR17
FMH211_a	FMH213	32.85	L	L	710	12.57	12.87	8.39	8.32	601	HDPE	SDR17
FMH213	FMH212a	29.84	L	L	710	12.87	13.09	8.32	8.25	615	HDPE	SDR17
FMH212a	FMH215	53.60	L	E1	710	13.09	12.87	8.25	8.14	605	HDPE	SDR17
FMH215	FMH213a	24.63	E1	E1	710	12.87	12.60	8.14	8.06	298	HDPE	SDR17
FMH213a	FMH216	24.80	E1	L	710	12.60	12.43	8.06	8.00	453	HDPE	SDR17
FMH216	FMH215a	60.25	L	L	710	12.43	12.28	8.00	7.85	500	HDPE	SDR17
FMH215a	FMH216a	31.12	L	L	710	12.28	12.50	7.85	7.77	706	HDPE	SDR17
FMH216a	FMH423d	19.20	L	L	710	12.50	12.03	7.77	7.69	146	HDPE	SDR17
FMH423d	FMH423c	119.12	L	F1	710	12.03	10.53	7.69	7.24	500	HDPE	SDR17
LI-S4.3-1	FMH208b	22.56	TP	L	315	~~13.50~~ 14.25	12.43	11.00	10.77	100	HDPE	SDR17
LI-S4.3-2	FMH209b	22.04	TP	L	315	~~13.50~~ 13.80	12.50	10.70	10.48	100	HDPE	SDR17
LI-S4.6-2	FMH216a	11.05	TP	L	400	12.20	12.50	8.50	8.43	179	HDPE	SDR17
LI-S4.7-1	FMH212a	9.63	TP	L	400	14.00	13.09	7.44	7.40	299	HDPE	SDR17
LI-S4.7-2	FMH215	9.71	TP	E1	400	14.00	12.87	11.68	11.64	296	HDPE	SDR17
FMH193.1	FMH194.1	106.61	L	L	400	12.94	12.72	10.52	9.68	76	HDPE	SDR17
FMH194.1	FMH195.1	39.23 → 6.17	L	L	400	12.72	12.52	9.68	8.90	100	HDPE	SDR17
LI-S4.5-1	FMH193.1	~~103.00~~	TP	L	400	13.50	12.94	10.60	~~9.57~~ 10.52	~~77~~	HDPE	SDR17
LI-S4.5-2	FMH194.1	4.74	TP	L	400	13.50	12.72	9.73	9.68	95	HDPE	SDR17

SEWERAGE D7 MANHOLE SCHEDULE

UPSTREAM STRUCTURE	DOWNSTREAM STRUCTURE	PIPE LENGTH (m)	UPSTREAM MH TYPE	DOWNSTREAM MH TYPE	PIPE OUTSIDE DIAMETER (mm)	UPSTREAM FINISHED GROUND LEVEL (mPD)	DOWNSTREAM FINISHED GROUND LEVEL (mPD)	UPSTREAM INVERT LEVEL (mPD)	DOWNSTREAM INVERT LEVEL (mPD)	PIPE GRADIENT (1 in X)	PIPE MATERIAL	STANDARD DIMENSIONAL RATIO
LI-S4.13b-2	FMH105a	18.90	TP	E1	500	13.50	12.71	11.05	10.95	196	HDPE	SDR17
FMH115	FMH116a	27.07	SP-L	SP-L	710	18.25	18.86	9.52	9.38	206	HDPE	SDR11
FMH116a	FMH122a	29.11	SP-L	SP-L	710	18.86	19.00	9.38	9.23	197	HDPE	SDR11
FMH122a	TEP-D7	81.94	SP-L	TP	900	19.00	9.59	9.23	8.81	201	HDPE	SDR11
LI-S4.13b-1	FMH106a	14.66	TP	E1	500	14.00	12.78	11.50	11.45	315	HDPE	SDR17
LI-S4.13a-2	FMH106a	23.11	TP	E1	500	14.00	12.78	11.62	11.58	586	HDPE	SDR17
LI-S4.12c-2	FMH107a	12.64	TP	L	500	15.20	14.54	12.14	12.08	211	HDPE	SDR17
LI-S4.12c-1	FMH108a	12.69	TP	L	500	16.00	15.42	14.40	13.72	20	HDPE	SDR17
LI-S4.12b-2	FMH109a	14.07	TP	L	450	16.40	15.68	12.18	12.13	250	HDPE	SDR17
LI-S4.12b-1	FMH109b	12.74	TP	L	450	17.00	16.30	14.55	14.45	132	HDPE	SDR17
LI-S4.12a-2	FMH110a	13.88	TP	L	450	18.10	17.21	12.18	12.13	251	HDPE	SDR17
FMH105a	FMH106a	13.95	E1	E1	500	12.71	12.78	10.95	10.88	203	HDPE	SDR17
LI-S4.12a-1	FMH115	20.37	TP	SP-L	450	19.00	18.25	12.18	12.10	244	HDPE	SDR11
LI-S4.13a-1	FMH114a	22.09	TP	L	500	18.00	17.71	12.18	12.03	145	HDPE	SDR17
FMH114a	FMH115a	26.57	L	L	450	17.71	17.88	11.82	11.63	147	HDPE	SDR17
FMH115a	FMH116a	38.63	L	L	450	17.88	18.86	11.63	11.36	152	HDPE	SDR11
LI-S4.16-2	FMH112a	22.71	TP	L	400	18.00	17.82	12.18	12.03	149	HDPE	SDR11
FMH112a	FMH114a	16.63	L	L	400	17.82	17.71	11.95	11.82	151	HDPE	SDR17
LI-S4.16-1	FMH111a	12.02	TP	L	400	18.00	12.93	12.18	12.10	149	HDPE	SDR17
FMH111a	FMH112a	20.61	L	L	400	12.93	17.82	12.10	11.95	149	HDPE	SDR17
LI-S4.17	FMH117a	14.89	TP	SP-L	355	18.60	17.69	10.18	10.13	274	HDPE	SDR11
FMH117a	FMH118a	10.78	SP-L	SP-L	355	17.69	17.87	10.13	10.08	268	HDPE	SDR11
FMH106a	FMH106b	46.34	E1	E1	560	12.78	13.39	10.88	10.64	199	HDPE	SDR17
FMH118a	FMH120a	11.34	SP-L	SP-L	355	17.87	17.76	10.08	10.03	274	HDPE	SDR11
FMH120a	FMH121a	48.35	SP-L	SP-L	450	17.76	18.15	10.03	9.85	270	HDPE	SDR11
FMH121a	FMH122a	63.04	SP-L	SP-L	500	18.15	19.00	9.85	9.61	272	HDPE	SDR11
LI-S4.2d-1	FMH119a	17.44	TP	F1	450	18.00	17.86	14.53	14.41	149	HDPE	SDR17
FMH119a	FMH120a	17.48	F1	L	450	17.86	17.76	14.41	14.28	146	HDPE	SDR17
LI-S4.15-1	FMH120a	13.56	TP	L	355	18.00	17.76	14.83	14.75	184	HDPE	SDR17
LI-S4.15-2	FMH121a	12.98	TP	L	355	20.00	18.15	13.52	13.43	149	HDPE	SDR17
LI-S4.12d-2	FMH121a	16.74	TP	L	450	19.00	18.15	13.52	13.40	149	HDPE	SDR17
FMH106b	FMH107a	26.99	E1	L	560	13.39	14.54	10.64	10.49	206	HDPE	SDR17
FMH107a	FMH108a	30.35	L	L	560	14.54	15.42	10.49	10.33	200	HDPE	SDR17
FMH108a	FMH109a	23.86	L	L	710	15.42	15.68	10.33	10.20	201	HDPE	SDR17
FMH109a	FMH109b	43.30	L	SP-L	710	15.68	16.30	10.20	9.98	200	HDPE	SDR17
FMH109b	FMH110a	51.73	SP-L	SP-L	710	16.30	17.21	9.98	9.71	200	HDPE	SDR17
FMH110a	FMH115	35.57	SP-L	SP-L	710	17.21	18.25	9.71	9.52	196	HDPE	SDR17

NOTES

1. FOR GENERAL NOTES AND LEGEND REFER TO DRAWING NO. 278463/C4/SEW/1001.
2. FOR DETAILS OF STANDARD MANHOLES TYPES E1, F1, G1, L AND H REFER TO LATEST DSD STANDARD DRAWINGS. 01
3. FOR DETAIL OF SPECIAL MANHOLE TYPE SP-L AND SP-1 REFER TO DRAWING NO. 278463/C4/SEW/1302 -1303.
4. THE COVER LEVELS SHOWN FOR MANHOLES ARE APPROXIMATE ONLY.THE FINAL COVER LEVELS SHALL BE VERIFIED ON SITE TO MATCH WITH THE FINISHED ROAD/GROUND LEVELS.
5. THE ANNOTATION TP INDICATED IN THE MANHOLE SCHEDULE REFERS TO TAPPING PIPE.
6. FOR DETAIL OF SPECIAL MANHOLE TYPE SP-F/D REFER TO DRAWING NO. 278463/C4/DRA/1306. 01

Remark:

NS355 Other Post-tender Markup

NS355 Markup for Proposed Modification Works under HD's Technical Assessments

Rev	Description	By	Date
01	TENDER ADDENDUM NO. 1	EF	03/24
00	TENDER ISSUE	EF	02/24

Consultant

ARUP

Project Title

Contract No. YL/2023/04
Hung Shui Kiu/Ha Tsuen
New Development Area
Second Phase Development - Contract 4 -
Site Formation and Engineering
Infrastructure Works

Drawing title

SEWERAGE
MANHOLE SCHEDULE

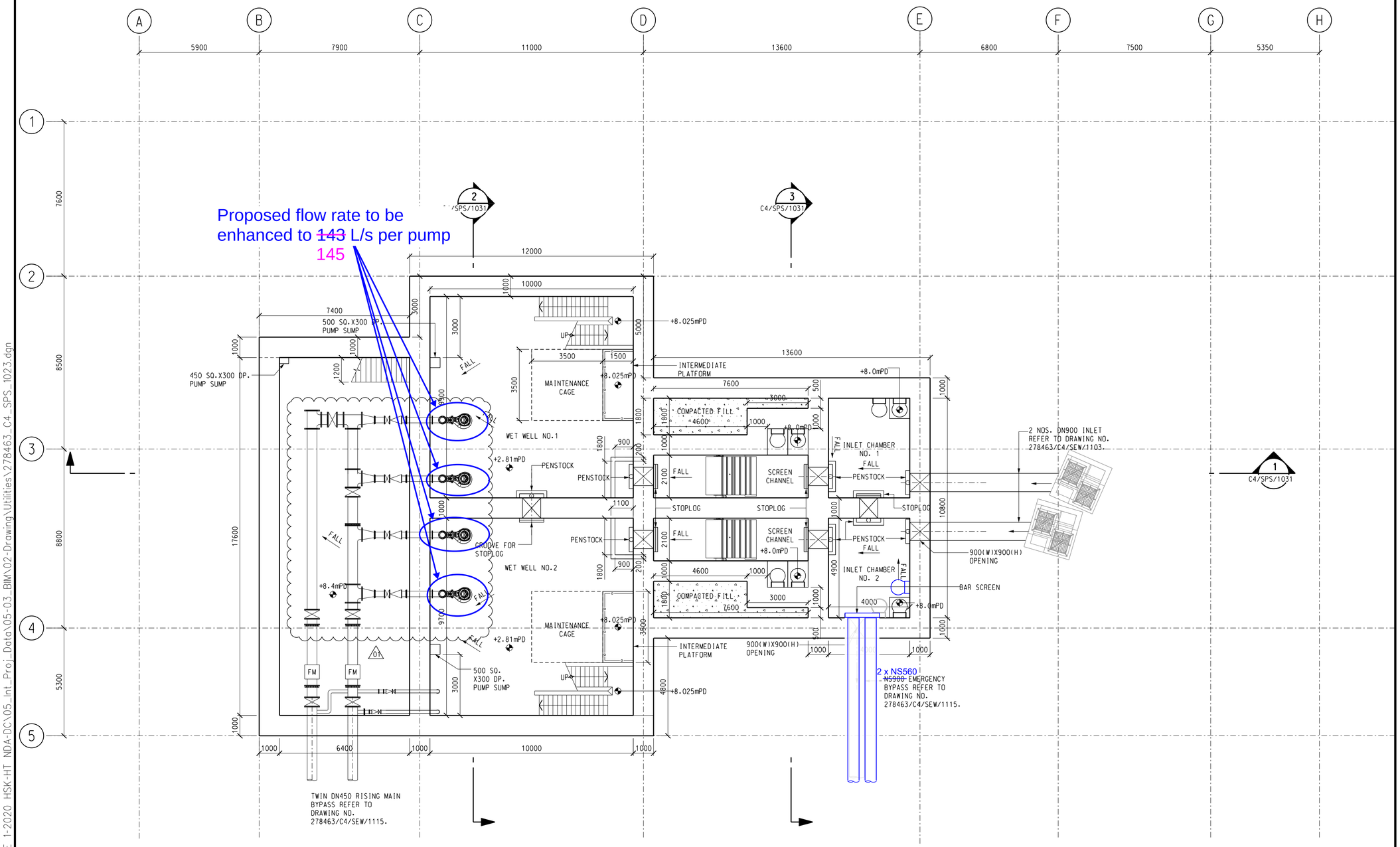
Drawing no.	Rev.
278463/C4/SEW/1151	01

Drawn	Date	Checked	Approved
CN	02/24	EF	DL

Scale	Status
N.T.S.	TENDER

CEDD 土木工程拓展署 Civil Engineering and Development Department

Markup for Proposed Modification Works under S16 Planning Application for Proposed Flat and Shop and Services in G/IC (1) Zone in Planning Area 34E of Hung Shui Kiu/Ha Tsuen New Development Area



UNDERGROUND FLOOR PLAN AT +8.40mPD

SCALE 1:100

NOTES

1. MINIMUM CIVIL & STRUCTURAL DESIGN IS INDICATED IN THE DRAWING AS RESERVATION FOR O&M APPLICATION.

Remark:

NS355 Markup for Proposed Modification Works under HD's Technical Assessments

NS355 Markup for Proposed Modification Works under S16 Planning Application for Proposed Flat and Shop and Services in G/IC (1) Zone in Planning Area 34E of Hung Shui Kiu/Ha Tsuen New Development Area

Rev	Description	By	Date
01	TENDER ADDENDUM NO. 1	EF	03/24
00	TENDER ISSUE	EF	02/24

Consultant

ARUP

Project Title

Contract No. YL/2023/04
Hung Shui Kiu/Ha Tsuen
New Development Area
Second Phase Development - Contract 4 - Site Formation and Engineering Infrastructure Works

Drawing title

SEWAGE PUMPING STATION NO.3 - LAYOUT PLANS (SHEET 3)

Drawing no.			Rev.
278463/C4/SPS/1023			01
Drawn CSK	Date 02/24	Checked EF	Approved DL
Scale 1:100 @ A1		Status TENDER	

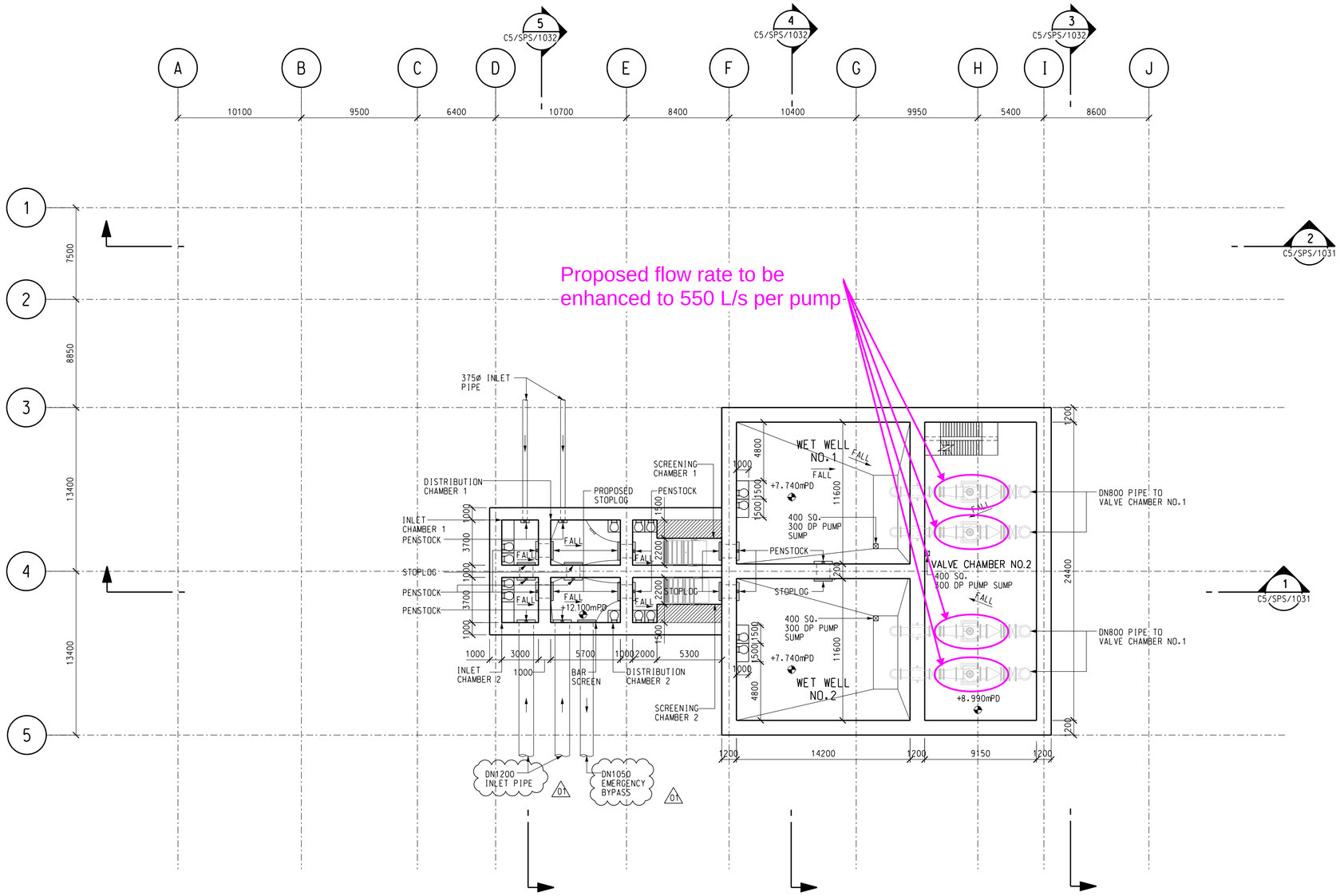
土木工程拓展署
Civil Engineering and Development Department

METRES 0 1 2 3 4 5

1 : 100

Printed by : Michael-KH.Ng Date : 3/21/2024
Filename : J:\278000\278463_CE 1-2020 HSK-HT NDA-DC\05_Int_Proj_Data\05-03_BIM\02-Drawing\Utilities\278463_C4_SPS_1023.dgn

Markup for Proposed Modification Works under S16 Planning Application for Proposed Flat and Shop and Services in G/IC (1) Zone in Planning Area 34E of Hung Shui Kiu/Ha Tsuen New Development Area



UNDERGROUND FLOOR PLAN AT +12.10mPD

SCALE 1:200

NOTES

1. MINIMUM CIVIL & STRUCTURAL DESIGN IS INDICATED IN THE DRAWING AS RESERVATION FOR O&M APPLICATION.

LEGEND:

HADNRAIL

HANDRAIL GATE

Remark:

NS355	Markup for Proposed Modification Works under S16 Planning Application for Proposed Flat and Shop and Services in G/IC (1) Zone in Planning Area 34E of Hung Shui Kiu/Ha Tsuen New Development Area

Rev	Description	By	Date
01	TENDER ADDENDUM NO. 3	EF	10/24
00	TENDER ISSUE	EF	08/24

Consultant

ARUP

Project Title

Contract No. YL/2023/05
Hung Shui Kiu/Ha Tsuen
New Development Area
Second Phase Development - Contract 5 -
Site Formation and Engineering
Infrastructure Works

Drawing title

SEWAGE PUMPING STATION NO.2
UNDERGROUND FLOOR PLAN
(SHEET 2)

Drawing no.	Rev.
278463/C5/SPS/1023	01

Drawn	Date	Checked	Approved
RY	08/24	EF	DL

Scale	Status
1:200 @ A1	TENDER

土木工程拓展署
Civil Engineering and Development Department

0 2 4 6 8 10
METRES
1 : 200

Printed by : Michael-KH.Ng Date : 10/4/2024
Filename : J:\278000\278463 CE 1-2020 HSK-HT NDA-DC\05_Int_Proj_Data\05-03_BIM\02-Drawing\Utilities\278463_C5_SPS_1023.dgn

Appendix C

Sewerage Calculations

Base Case Scenario

1. Sewage flow build-up:

a. S16 Planning Application No. A/HSK/452 (approved on 23 Jun 2023)

b. Updated planned population and employment figures at nine housing sites advised by the Housing Department (i.e. Site No. 4-3, 4-4, 4-5, 4-6, 4-22, 4-24, 4-28, 5-16 and 5-17)

c. No. A/HSK/573 – Proposed Minor Relaxation of Domestic Plot Ratio Restriction (From 4.5 to 5) for Mixed Use Development (in Planning Areas 28A and 28B of HSK/HA NDA) (i.e. Site No. 4-25a, 4-25b, 4-25c, and 4-29) (approved on 15 Aug 2025)

2. Estimation of sewage flow by SPS and phasing

S16 Planning Application No. A/HSK/452 (approved on 23 Jun 2023)

		Development Option 1 (max																																						
Road	Landuse (in ODP)	Zoning	Population	Total Employment	Social Welfare Facility Population	Hotel Population	Hospital Population	Residential UFF	Residential ADWF	Social Welfare Facility UFF	Social Welfare Facility ADWF	Hotel UFF	Hotel ADWF	Hospital UFF	Hospital ADWF	Contributing Population	N	No. of Kindergartens	Kindergarten Student Population	Kindergarten Employee Population	Kindergarten Student UFF	Kindergarten Employee UFF	Kindergarten ADWF	No. of Primary Schools	Primary School Student Population	Primary School Employee Population	Primary School Student UFF	Primary School Employee UFF	Primary School ADWF	No. of Secondary Schools	Secondary School Student Population	Secondary School Employee Population	Secondary School Student UFF	Secondary School Employee UFF	Secondary School ADWF	No. of Higher Education Facilities	Higher Education Student Population	Higher Education Employee Population	Higher Education Student UFF	Higher Education Employee UFF	Higher Education ADWF
DCA1																																									
Site 1-1	GIC Complex (with Community Hall, Clinic and Refuse Collection Point)	G		140												146	0.146																								
Site 1-2	Subsidised Sales Flat (with Commercial)	R1(SSF)	5683	500				0.27	1534.3	0.19						6081	6.081																								
Site 1-3	1 Primary School & 1 Secondary School	E		167												465	0.465							1.00	765.00	67.00	0.04	0.28	49.36	1.00	1200.00	100.00	0.04	0.28	76.00						
Site 1-4	Residential - Zone 2 (with Commercial)	RS	5332	469				0.19	1013.1	0.19						4126	4.126																								
Site 1-5	Residential - Zone 1 (with Commercial)	RS	6155	541				0.19	1169.5	0.19						4764	4.764																								
Site 1-6	Residential - Zone 1 (with Commercial)	RS	8416	739				0.19	1599.1	0.19						6513	6.513																								
Site 1-7	Local Open Space	LO																																							
Site 1-8	Residential - Zone 2 (with Commercial)	R2	3316	403				0.37	1227.0							4964	4.964																								
Site 1-9	Residential - Zone 2 (with Commercial)	R2	2340	285				0.37	865.9							3504	3.504																								
Site 1-10	Local Open Space	LO																																							
Site 1-11	Local Open Space	LO																																							
Site 1-12	Residential - Zone 2	R2	2513	20				0.27	678.6							2542	2.542																								
Site 1-13	Residential - Zone 2 (with Commercial)	R2	2728	332				0.37	1009.5							4085	4.085																								
Site 1-14	Local Open Space	LO																																							
Site 1-15	1 Primary School & 1 Secondary School	E		167												465	0.465							1.00	765.00	67.00	0.04	0.28	49.36	1.00	1200.00	100.00	0.04	0.28	76.00						
Site 1-16	Residential - Zone 2 (with Commercial)	RS	6029	530				0.19	1145.5	0.19						4666	4.666																								
Site 1-17	Residential - Zone 2	RS	5600	492				0.19	1063.9	0.19						4334	4.334																								
Site 1-18	2 Primary Schools	E		134												366	0.366							2.00	1530.00	134.00	0.04	0.28	98.72												
Site 1-19	Residential - Zone 2	R2	2671	28				0.27	721.3							2702	2.702																								
Site 1-20	Local Open Space	LO																																							
Site 1-21	Residential - Zone 2 (with Commercial)	RS	5974	520				0.19	1135.1	0.19						4644	4.644	1.00	180.00	29.00	0.04	0.28	15.32																		
Site 1-22	1 Primary School & 1 Secondary School	E		167												465	0.465							1.00	765.00	67.00	0.04	0.28	49.36	1.00	1200.00	100.00	0.04	0.28	76.00						
Site 1-23	Existing Sewage Pumping Station (Ha Tsuen Pumping Station)	OU		10												11	0.011																								
Site 1-24	District Cooling System (East Plant)	OU		6												2852	2.852																								
Site 1-25	Existing Petrol Filling Station	OU		10												11	0.011																								
Site 1-26	Existing Homes for the Elderly (Yeung Chun Pui and Ching Chung)	IC																																							
Site 1-27	Regional Open Space (Regional Park)	RO																																							
Site 1-28	Regional Open Space (Regional Park)	RO																																							
Site 1-29	Sports Ground	G		25												33	0.033																								
Site 1-30	Sports Centre	G		18												24	0.024																								
Site 1-31	Existing Emergency Access Point	OU																																							
Site 1-32	Flood Retention Facilities	OU																																							
A	Amenity	A																																							
V	Village Type Development	V																																							
DO	DO (Riverside Promenade)	DO																																							
Road	Roads, Junctions, Proposed EFTS Alignment etc.	Road																																							
TOTAL			**56758**	5702																																					
DCA2																																									
Site 2-1	Commercial	C		1,095												1137	1.137																								
Site 2-2	Residential - Zone 3	R3	874	9				0.37	323.4							1209	1.209																								
Site 2-3	Residential - Zone 3	R3	1244	13				0.37	460.4							1720	1.720																								
Site 2-4	Sewage Pumping Station	OU		10												11	0.011																								
Site 2-5	Local Open Space	LO																																							
Site 2-6	Local Open Space	LO																																							
Site 2-7	Residential - Zone 3	R3	928	10				0.37	343.4							1283	1.283																								
Site 2-8	Local Open Space	LO																																							
Site 2-9	1 Primary School	E		67												183	0.183							1.00	765.00	67.00	0.04	0.28	49.36												
Site 2-10	Residential - Zone 3	R3	1096	11				0.37	405.5							1515	1.515																								
Site 2-11	Residential - Zone 3 (with Commercial)	R3	1543	315				0.37	570.8							2470	2.470	1.00	180.00	29.00	0.04	0.28	15.32																		

Road	Industrial J1 Employee Population	Industrial J1 UFF	Industrial J1 ADWF	Commercial J2 Employee Population	Commercial J2 UFF	Commercial J2 ADWF	Commercial J3 Employee Population	Commercial J3 UFF	Commercial J3 ADWF	Commercial J4 Employee Population	Commercial J4 UFF	Commercial J4 ADWF	Commercial J5 Employee Population	Commercial J5 UFF	Commercial J5 ADWF	Commercial J6 Employee Population	Commercial J6 UFF	Commercial J6 ADWF	Commercial J7 Employee Population	Commercial J7 UFF	Commercial J7 ADWF	Commercial J8 Employee Population	Commercial J8 UFF	Commercial J8 ADWF	Commercial J9 Employee Population	Commercial J9 UFF	Commercial J9 ADWF	Commercial J10 Employee Population	Commercial J10 UFF	Commercial J10 ADWF	Commercial J11 Employee Population	Commercial J11 UFF	Commercial J11 ADWF	Commercial J12 Employee Population	Commercial J12 UFF	Commercial J12 ADWF	Commercial + Institution Population	Commercial + Institution ADWF	Total Population	Total ADWF	Downstream Sewerage Infrastructure
DCA1																																									
Site 1-1							10.00	0.28	2.80																						130.00	0.28	36.40				140	39.2	140	39.2	HTSPS
Site 1-2										324.00	0.28	90.72																			176.16	0.28	16.80				500	107.5	6183	1641.8	HTSPS
Site 1-3																																					2132	125.4	2132	125.4	HTSPS
Site 1-4										304.00	0.28	85.12																			164.90	0.28	15.68				469	100.8	5801	1113.9	HTSPS
Site 1-5										351.00	0.28	98.28																			190.40	0.28	18.20				541	116.5	6697	1286.0	HTSPS
Site 1-6										480.00	0.28	134.40																			260.60	0.28	24.92				741	159.3	9157	1758.4	HTSPS
Site 1-7																																									HTSPS
Site 1-8										369.00	0.28	103.32																			35.00	0.28	9.80				404	113.1	3720	1340.1	HTSPS
Site 1-9										261.00	0.28	73.08																			25.00	0.28	7.00				286	80.1	2626	946.0	HTSPS
Site 1-10																																									HTSPS
Site 1-11																																									HTSPS
Site 1-12																															27.00	0.28	7.56				27	7.6	2540	686.1	HTSPS
Site 1-13										304.00	0.28	85.12																			29.00	0.28	8.12				333	93.2	3061	1102.7	HTSPS
Site 1-14																																									HTSPS
Site 1-15																																					2132	125.4	2132	125.4	HTSPS
Site 1-16										344.00	0.28	96.32																			187.42	0.28	17.92				531	114.2	6561	1259.8	HTSPS
Site 1-17										320.00	0.28	89.60																			173.18	0.28	16.52				493	106.1	6093	1170.0	HTSPS
Site 1-18																																					1664	98.7	1664	98.7	HTSPS
Site 1-19																															29.00	0.28	8.12				29	8.1	2700	729.4	HTSPS
Site 1-20																																									HTSPS
Site 1-21										306.00	0.28	85.68																			185.10	0.28	17.64				700	118.6	6674	1253.7	HTSPS
Site 1-22																																					2132	125.4	2132	125.4	HTSPS
Site 1-23				10.00	0.28	2.80																															10	2.8	10	2.8	
Site 1-24				7.00	0.28	1.96																															7	2.0	7	770.0	HTSPS
Site 1-25				10.00	0.28	2.80																															10	2.8	10	2.8	HTSPS
Site 1-26																																									
Site 1-27																																									HTSPS
Site 1-28																																									
Site 1-29																															25.00	0.35	8.75				25	8.8	25	8.8	HTSPS
Site 1-30																															18.00	0.35	6.30				18	6.3	18	6.3	HTSPS
Site 1-31																																									
Site 1-32																																									
A																																									
V																																									
DO																																									
Road																																									
TOTAL																																									
DCA2																																									
Site 2-1										1096.00	0.28	306.88																									1096	306.9	1096	306.9	SPS4
Site 2-2																															10.00	0.28	2.80				10	2.8	884	326.2	SPS4
Site 2-3																															14.00	0.28	3.92				14	3.9	1258	464.3	SPS4
Site 2-4				10.00	0.28	2.80																															10	2.8	10	2.8	SPS4
Site 2-5																																									SPS4
Site 2-6																																									SPS4
Site 2-7																															10.00	0.28	2.80				10	2.8	938	346.2	SPS4
Site 2-8																																									SPS4
Site 2-9																																					832	49.4	832	49.4	SPS4
Site 2-10																															12.00	0.28	3.36				12	3.4	1108	408.8	SPS4
Site 2-11										271.00	0.28	75.88																			17.00	0.28	4.76				497	96.0	2040	666.8	SPS4

Road	Landuse (in ODP)	Zoning	Population	Total Employment	Social Welfare Facility Population	Hotel Population	Hospital Population	Residential UFF	Residential ADWF	Social Welfare Facility UFF	Social Welfare Facility ADWF	Hotel UFF	Hotel ADWF	Hospital UFF	Hospital ADWF	Contributing Population	N
Site 2-12	Local Open Space	LO															
Site 2-13	Local Open Space (with Flood Retention Facilities)	LO															
Site 2-14	Residential - Zone 3	R3	744	8				0.37	275.3							1029	1.029
Site 2-15	1 Primary School	E		67												183	0.183
Site 2-16	2 Primary Schools & 1 Secondary School	E		234												648	0.648
Site 2-17	Reserve	E		67												183	0.183
Site 2-18	Rural Residential - Zone 4	R4	147					0.37	54.3							202	0.202
Site 2-19	Rural Residential - Zone 4	R4	21					0.37	7.9							30	0.030
Site 2-20	Reserve (Near Villages)	G															
Site 2-21	Reserve (District Cooling - North)	OU		11												690	0.690
Site 2-22	Sports Centre	G		18												24	0.024
Site 2-23	Commercial cum Public Transport Interchange and Public Carpark	OU		1,911												1982	1.982
Site 2-24	1 Primary School & 1 Secondary School	E		167												465	0.465
Site 2-25	Residential Care Home for the Elderly	G		165						0.19						172	0.172
Site 2-26	1 Primary School & 1 Secondary School	E		167												465	0.465
Site 2-27	Local Open Space	LO															
Site 2-28	1 Primary School	E		67												183	0.183
Site 2-29	Parking and Operational Facillities for EFTS	OU		30												32	0.032
Site 2-30	Public Housing (with Commercial)	RS	16621	1,123				0.19	3158.0	0.19						12736	12.736
Site 2-31	Subsidised Sales Flat (with Commercial)	R1(SSF)	10236	899				0.27	2763.8	0.19						10954	10.954
Site 2-32	District Open Space (with Flood Retention Facilities)	DO															
Site 2-33a	Reserve in ODP	E		67												366	0.366
Site 2-33b	Reserve in ODP	OU		10												11	0.011
Site 2-34	Sewage Pumping Station (SPS4)	OU		10												11	0.011
Site 2-35	Telephone Exchange	OU															
A	Amenity	A															
V	Village Type Development	V															
DO	DO (Riverside Promenade)	DO															
Road	Roads, Junctions, Proposed EFTS Alignment etc.	Road															
TOTAL			**33455**	6552													
DCA 3																	
Site 3-1	Port Back-up, Storage and Workshop Uses	OU(PBU+SWU)		1,818												1887	1.887
Site 3-2	Green Belt	GB															
Site 3-3	Flushing Water Service Reservoir	OU		10												11	0.011
Site 3-4	Port Back-up, Storage and Workshop Uses	OU(PBU+SWU)		1,403												1456	1.456
Site 3-5	Port Back-up, Storage and Workshop Uses	OU(PBU+SWU)		2,358												2447	2.447
Site 3-6	Port Back-up, Storage and Workshop Uses	OU(PBU+SWU)		1,404												1458	1.458
Site 3-7	Port Back-up, Storage and Workshop Uses	OU(PBU+SWU)		1,413												1467	1.467
Site 3-8	Port Back-up, Storage and Workshop Uses	OU(PBU+SWU)		1,530												1588	1.588
Site 3-9	Petrol Filling Station	OU		10												11	0.011
Site 3-10	Green Belt	GB															
Site 3-11	Port Back-up, Storage and Workshop Uses	OU(PBU+SWU)		973												1010	1.010
Site 3-12	Refuse Transfer Station (With Community Green Station)	OU		30												32	0.032
Site 3-13	Port Back-up, Storage and Workshop Uses	OU(PBU+SWU)		1,672												1736	1.736
Site 3-14	Port Back-up, Storage and Workshop Uses	OU(PBU+SWU)		1,088												1130	1.130
Site 3-15	Logistics Facility	OU(LF)		2,392												2481	2.481
Site 3-16	Logistics Facility	OU(LF)		2,375												2464	2.464
Site 3-17	Sewage Treatment Works (San Wai incl. expansion)	OU		30												32	0.032
Site 3-18	Logistics Facility cum EFTS Depot	OU(LF)		2,361												2449	2.449
Site 3-19	Electricity Substation (ESS 3)	OU		10												11	0.011
Site 3-20	Logistics Facility	OU(LF)		2,307												2394	2.394

Road	No. of Kindergartens	Kindergarten Student Population	Kindergarten Employee Population	Kindergarten Student UFF	Kindergarten Employee UFF	Kindergarten ADWF	No. of Primary Schools	Primary School Student Population	Primary School Employee Population	Primary School Student UFF	Primary School Employee UFF	Primary School ADWF	No. of Secondary Schools	Secondary School Student Population	Secondary School Employee Population	Secondary School Student UFF	Secondary School Employee UFF	Secondary School ADWF	No. of Higher Education Facilities	Higher Education Student Population	Higher Education Employee Population	Higher Education Student UFF	Higher Education Employee UFF	Higher Education ADWF	Industrial J1 Employee Population	Industrial J1 UFF	Industrial J1 ADWF	Commercial J2 Employee Population	Commercial J2 UFF	Commercial J2 ADWF
Site 2-12																														
Site 2-13																														
Site 2-14																														
Site 2-15							1.00	765.00	67.00	0.04	0.28	49.36																		
Site 2-16							2.00	1530.00	134.00	0.04	0.28	98.72	1.00	1200.00	100.00	0.04	0.28	76.00												
Site 2-17							1.00	765.00	67.00	0.04	0.28	49.36																		
Site 2-18																														
Site 2-19																														
Site 2-20																														
Site 2-21																												10.98	0.28	3.07
Site 2-22																														
Site 2-23																														
Site 2-24							1.00	765.00	67.00	0.04	0.28	49.36	1.00	1200.00	100.00	0.04	0.28	76.00												
Site 2-25																														
Site 2-26							1.00	765.00	67.00	0.04	0.28	49.36	1.00	1200.00	100.00	0.04	0.28	76.00												
Site 2-27																														
Site 2-28							1.00	765.00	67.00	0.04	0.28	49.36																		
Site 2-29																														
Site 2-30	2.00	360.00	58.00	0.04	0.28	30.64																								
Site 2-31																														
Site 2-32																														
Site 2-33a							2.00	1530.00	134.00	0.04	0.28	98.72																		
Site 2-33b																												10.00	0.28	2.80
Site 2-34																												10.00	0.28	2.80
Site 2-35																														
A																														
V																														
DO																														
Road																														
TOTAL																														
DCA 3																														
Site 3-1																														
Site 3-2																														
Site 3-3																												10.00	0.28	2.80
Site 3-4																														
Site 3-5																														
Site 3-6																														
Site 3-7																														
Site 3-8																														
Site 3-9																												10.00	0.28	2.80
Site 3-10																														
Site 3-11																														
Site 3-12																														
Site 3-13																														
Site 3-14																														
Site 3-15																														
Site 3-16																														
Site 3-17																												30.00	0.28	8.40
Site 3-18																														
Site 3-19																												10.00	0.28	2.80
Site 3-20																														

Road	Commercial J3 Employee Population	Commercial J3 UFF	Commercial J3 ADWF	Commercial J4 Employee Population	Commercial J4 UFF	Commercial J4 ADWF	Commercial J5 Employee Population	Commercial J5 UFF	Commercial J5 ADWF	Commercial J6 Employee Population	Commercial J6 UFF	Commercial J6 ADWF	Commercial J7 Employee Population	Commercial J7 UFF	Commercial J7 ADWF	Commercial J8 Employee Population	Commercial J8 UFF	Commercial J8 ADWF	Commercial J9 Employee Population	Commercial J9 UFF	Commercial J9 ADWF	Commercial J10 Employee Population	Commercial J10 UFF	Commercial J10 ADWF	Commercial J11 Employee Population	Commercial J11 UFF	Commercial J11 ADWF	Commercial J12 Employee Population	Commercial J12 UFF	Commercial J12 ADWF	Commercial + Institution Population	Commercial + Institution ADWF	Total Population	Total ADWF	Downstream Sewerage Infrastructure
Site 2-12																																			SPS4
Site 2-13																																			SPS4
Site 2-14																									8.00	0.28	2.24				8	2.2	752	277.6	SPS4
Site 2-15																															832	49.4	832	49.4	SPS4
Site 2-16																															2964	174.7	2964	174.7	SPS4
Site 2-17																															832	49.4	832	49.4	SPS4
Site 2-18																																	147	54.3	SPS4
Site 2-19																																	21	7.9	SPS4
Site 2-20																																			SPS4
Site 2-21																															11	3.1	11	186.1	SPS4
Site 2-22																									18.00	0.35	6.30				18	6.3	18	6.3	SPS4
Site 2-23	10.00	0.28	2.80	1901.00	0.28	532.28																									1911	535.1	1911	535.1	SPS4
Site 2-24																															2132	125.4	2132	125.4	SPS4
Site 2-25																									165.00	0.28	46.20				165	46.2	165	46.2	SPS4
Site 2-26																															2132	125.4	2132	125.4	SPS4
Site 2-27																																			SPS4
Site 2-28																															832	49.4	832	49.4	SPS4
Site 2-29	30.00	0.28	8.40																												30	8.4	30	8.4	SPS4
Site 2-30				576.00	0.28	161.28																			490.58	0.28	88.76				1485	280.7	18105	3438.7	SPS4
Site 2-31				584.00	0.28	163.52																			316.56	0.28	30.24				901	193.8	11137	2957.5	SPS4
Site 2-32																																			SPS4
Site 2-33a																															1664	98.7	1664	98.7	SPS4
Site 2-33b																															10	2.8	10	2.8	SPS4
Site 2-34																															10	2.8	10	2.8	
Site 2-35																																			SPS4
A																																			
V																																			
DO																																			
Road																																			
TOTAL																																			
DCA 3																																			
Site 3-1	1733.00	0.28	485.24	86.00	0.28	24.08																									1819	509.3	1819	509.3	SPS4
Site 3-2																																			
Site 3-3																															10	2.8	10	2.8	SPS4
Site 3-4	1337.00	0.28	374.36	67.00	0.28	18.76																									1404	393.1	1404	393.1	SPS4
Site 3-5	2247.00	0.28	629.16	112.00	0.28	31.36																									2359	660.5	2359	660.5	SPS4
Site 3-6	1338.00	0.28	374.64	67.00	0.28	18.76																									1405	393.4	1405	393.4	SPS4
Site 3-7	1347.00	0.28	377.16	67.00	0.28	18.76																									1414	395.9	1414	395.9	SPS4
Site 3-8	1458.00	0.28	408.24	73.00	0.28	20.44																									1531	428.7	1531	428.7	SPS4
Site 3-9																															10	2.8	10	2.8	SPS4
Site 3-10																																			
Site 3-11	927.00	0.28	259.56	46.00	0.28	12.88																									973	272.4	973	272.4	SPS4
Site 3-12	30.00	0.28	8.40																												30	8.4	30	8.4	SPS4
Site 3-13	1594.00	0.28	446.32	80.00	0.28	22.40																									1674	468.7	1674	468.7	SPS4
Site 3-14	1037.00	0.28	290.36	52.00	0.28	14.56																									1089	304.9	1089	304.9	SPS4
Site 3-15	2317.00	0.28	648.76	75.00	0.28	21.00																									2392	669.8	2392	669.8	SPS4
Site 3-16	2301.00	0.28	644.28	75.00	0.28	21.00																									2376	665.3	2376	665.3	HTSPS
Site 3-17																															30	8.4	30	8.4	
Site 3-18	2288.00	0.28	640.64	73.00	0.28	20.44																									2361	661.1	2361	661.1	HTSPS
Site 3-19																															10	2.8	10	2.8	HTSPS
Site 3-20	2235.00	0.28	625.80	73.00	0.28	20.44																									2308	646.2	2308	646.2	HTSPS

Road	Landuse (in ODP)	Zoning	Population	Total Employment	Social Welfare Facility Population	Hotel Population	Hospital Population	Residential UFF	Residential ADWF	Social Welfare Facility UFF	Social Welfare Facility ADWF	Hotel UFF	Hotel ADWF	Hospital UFF	Hospital ADWF	Contributing Population	N	No. of Kindergartens	Kindergarten Student Population	Kindergarten Employee Population	Kindergarten Student UFF	Kindergarten Employee UFF	Kindergarten ADWF	No. of Primary Schools	Primary School Student Population	Primary School Employee Population	Primary School Student UFF	Primary School Employee UFF	Primary School ADWF	No. of Secondary Schools	Secondary School Student Population	Secondary School Employee Population	Secondary School Student UFF	Secondary School Employee UFF	Secondary School ADWF	No. of Higher Education Facilities	Higher Education Student Population	Higher Education Employee Population	Higher Education Student UFF	Higher Education Employee UFF	Higher Education ADWF	Industrial J1 Employee Population	Industrial J1 UFF	Industrial J1 ADWF	Commercial J2 Employee Population	Commercial J2 UFF	Commercial J2 ADWF	Commercial J3 Employee Population	Commercial J3 UFF	Commercial J3 ADWF	Commercial J4 Employee Population	Commercial J4 UFF	Commercial J4 ADWF	Commercial J5 Employee Population	Commercial J5 UFF	Commercial J5 ADWF	Commercial J6 Employee Population	Commercial J6 UFF	Commercial J6 ADWF	Commercial J7 Employee Population	Commercial J7 UFF	Commercial J7 ADWF	Commercial J8 Employee Population	Commercial J8 UFF	Commercial J8 ADWF	Commercial J9 Employee Population	Commercial J9 UFF	Commercial J9 ADWF	Commercial J10 Employee Population	Commercial J10 UFF	Commercial J10 ADWF	Commercial J11 Employee Population	Commercial J11 UFF	Commercial J11 ADWF	Commercial J12 Employee Population	Commercial J12 UFF	Commercial J12 ADWF	Commercial + Institution Population	Commercial + Institution ADWF	Total Population	Total ADWF	Downstream Sewerage Infrastructure
Site 3-21	Petrol Filling Station	OU		10											11	0.011																											10.00	0.28	2.80																														10	2.8	10	2.8	HTSPS
Site 3-22	Local Open Space	LO																																																																																	HTSPS
Site 3-23	Green Belt	GB																																																																																	
Site 3-24	Logistics Facility	OU(LF)		1,968											2042	2.042																														1907.00	0.28	533.96	62.00	0.28	17.36																								1969	551.3	1969	551.3	HTSPS
Site 3-25	Logistics Facility	OU(LF)		2,209											2293	2.293																														2141.00	0.28	599.48	70.00	0.28	19.60																								2211	619.1	2211	619.1	HTSPS
Site 3-26	Sewage Treatment Works (HSKEPP)	OU		30											32	0.032																											30.00	0.28	8.40																														30	8.4	30	8.4	
Site 3-27	Logistics Facility	OU(LF)		2,824											2930	2.930																														2736.00	0.28	766.08	89.00	0.28	24.92																								2825	791.0	2825	791.0	HTSPS
Site 3-28	Logistics Facility	OU(LF)		3,187											3307	3.307																														3088.00	0.28	864.64	100.00	0.28	28.00																								3188	892.6	3188	892.6	HTSPS
Site 3-29	Logistics Facility	OU(LF)		2,793											2898	2.898																														2706.00	0.28	757.68	88.00	0.28	24.64																								2794	782.3	2794	782.3	HTSPS
Site 3-30	Green Belt	GB																																																																																	
Site 3-31	Local Open Space (with Flood Retention Facilities)	LO																																																																																	HTSPS
Site 3-32	Enterprise and Technology Park	OU(E+TP)		4,659											4833	4.833																														2315.00	0.28	648.20	47.00	0.28	13.16				2298.00	0.28	643.44																		4660	1304.8	4660	1304.8	HTSPS
Site 3-33	Enterprise and Technology Park	OU(E+TP)		4,302											4464	4.464																														2138.00	0.28	598.64	44.00	0.28	12.32				2122.00	0.28	594.16																		4304	1205.1	4304	1205.1	HTSPS
Site 3-34	Reserve (Near Villages)	G																																																																																	SPS3
Site 3-35	Green Belt	GB																																																																																	SPS3
Site 3-36	Local Open Space	LO																																																																																	SPS3
Site 3-37	Local Open Space	LO																																																																																	SPS3
Site 3-38	Green Belt	GB																																																																																	SPS3
Site 3-39	Enterprise and Technology Park	OU(E+TP)		2,026											2103	2.103																														1007.00	0.28	281.96	21.00	0.28	5.88				999.00	0.28	279.72																		2027	567.6	2027	567.6	SPS3
Site 3-40	Enterprise and Technology Park	OU(E+TP)		4,091											4245	4.245																														2033.00	0.28	569.24	42.00	0.28	11.76				2018.00	0.28	565.04																		4093	1146.0	4093	1146.0	SPS3
Site 3-41	Sewage Pumping Station (SPS3)	OU		10											11	0.011																											10.00	0.28	2.80																														10	2.8	10	2.8	
Site 3-42	Enterprise and Technology Park	OU(E+TP)		2,892											3001	3.001																														1437.00	0.28	402.36	30.00	0.28	8.40				1426.00	0.28	399.28																		2893	810.0	2893	810.0	SPS3
Site 3-43	Industry	I		552											574	0.574																								536.00	0.28	150.08							17.00	0.28	4.76																								553	154.8	553	154.8	SPS2
Site 3-44	Industry	I		825											857	0.857																								801.00	0.28	224.28							25.00	0.28	7.00																								826	231.3	826	231.3	SPS2
Site 3-45	Industry	I		331											345	0.345																								322.00	0.28	90.16							10.00	0.28	2.80																								332	93.0	332	93.0	SPS2
Site 3-46	Refuse Collection Point	OU		10											11	0.011																											10.00	0.28	2.80					0.28																										10	2.8	10	2.8	SPS2
Site 3-47	Industry	I		479											498	0.498																								465.00	0.28	130.20							15.00	0.28	4.20																								480	134.4	480	134.4	SPS2
Site 3-48	Sewage Pumping Station (SPS2)	OU		10											11	0.011																											10.00	0.28	2.80																														10	2.8	10	2.8	SPS2
Site 3-49	Green Belt	GB																																																																																	SPS2
Site 3-50	Industry	I		1,037											1077	1.077																								1007.00	0.28	281.96							31.00	0.28	8.68																								1038	290.6	1038	290.6	SPS2
Site 3-51	400kV Station	OU														724	0.724																								698.00	0.28	195.44								0.28																										698	195.4	698	195.4	SPS2
Site 3-52	Industry	I		928											964	0.964																								901.00	0.28	252.28							28.00	0.28	7.84																								929	260.1	929	260.1	SPS2
Site 3-53	ESS	OU														11	0.011																											10.00	0.28	2.80																														10	2.8	10	2.8	SPS2
A	Amenity	A																																																																																	
Road	Roads, Junctions, Proposed EFTS Alignment etc.	Road																																																																																	
Total				58355																																																																													
DCA4																																																																																				
Site 4-1	Divisional Fire Station cum Ambulance Depot cum Staff Quarters	G		140											1615	1.615																														140.00	0.28	39.20																											140	39.2	140	435.8	SPS3
Site 4-2	Community Hall, Sports Centre	G		148											192	0.192																																																						148.00	0.35	51.80				148	51.8	148	51.8	SPS3
Site 4-3	Subsidised Sales Flat (with Commercial)	R1(SSF)	3097	202				0.27	836.1	0.19						3241	3.241																																	106.00	0.28	29.68																		96.36	0.28	9.24				202	38.9	3299	875.0	SPS3
Site 4-4	Public Housing (with Commercial)	RS	8771	483				0.19	1666.5	0.19						6587	6.587	2.00	360.00	58.00	0.04	0.28	30.64																											152.00	0.28	42.56																		273.96	0.28	38.64				844	111.8	9615	1778.3	SPS3
Site 4-5	Public Housing (with Commercial)	RS	8908	508				0.19	1692.5	0.19						6667	6.667	1.00	180.00	29.00	0.04	0.28	15.32																											215.00	0.28	60.20																		265.14	0.28	31.92				689	107.4	9597	1799.9	SPS3
Site 4-6	Subsidised Sales Flat (with Commercial)	R1(SSF)	5088	332				0.27	1373.9	0.19						5325	5.325																																	174.00	0.28	48.72																		158.28	0.28	15.12				332	63.8	5421	1437.7	SPS3
Site 4-7	Local Open Space	LO																																																																																	SPS3
Site 4-8	1 Primary School & 1 Secondary School	E		167											465	0.465							1.00	765.00	67.00	0.04	0.28	49.36	1.00	1200.00	100.00	0.04	0.28	76.00																																										2132	125.4	2132	125.4	SPS3
Site 4-9	Residential - Zone 1 (with Commercial)	R1	3723	332				0.37	1377.3							5469	5.469	1.00	180.00	29.00	0.04	0.28	15.32																											299.00	0.28	83.72																								508	99.0	4231	1476.4	SPS3
Site 4-10	Residential - Zone 1 (with Commercial)	R1	1676	152				0.37	619.9							2455	2.455																																	135.00	0.28	37.80																		18.00	0.28	5.04				153	42.8	1829	662.8	SPS3
Site 4-11	District Open Space (with Flood Retention Facilities)	DO																																																																																	SPS3
Site 4-12a	Commercial	C		2,602											3793	3.793																																	679.00	0.28	190.12				1697.00	0.28	475.16										227.00	1.58	358.66							2603	1023.9	2603	1023.9	SPS1
Site 4-12b	Commercial	C		3,304											3427	3.427																																	661.00	0.28	185.08				2643.00	0.28	740.04																		3304	925.1	3304	925.1	SPS1
Site 4-12c	Commercial	C		3,738								0.27				4828	4.828																																	1550.00	0.28	434.00				1993.00	0.28	558.04										197.00	1.58	311.26							3740	1303.3	3740	1303.3	SPS1
Site 4-12d	Commercial	C		3,077								0.27				3972	3.972																																	1276.00	0.28	357.28				1640.00	0.28	459.20										162.00	1.58	255.96							3078	1072.4	3078	1072.4	SPS1
Site 4-13a	Commercial (Anchor Development)	C		10,979								0.27				14171	14.171																														10.00	0.28	2.80	4547.00	0.28	1273.16				5846.00	0.28	1636.88										578.00	1.58	913.24							10981	3826.1	10981	3826.1	SPS1

Road	Landuse (in ODP)	Zoning	Population	Total Employment	Social Welfare Facility Population	Hotel Population	Hospital Population	Residential UFF	Residential ADWF	Social Welfare Facility UFF	Social Welfare Facility ADWF	Hotel UFF	Hotel ADWF	Hospital UFF	Hospital ADWF	Contributing Population	N
Site 4-13b	Commercial	C		4,352								0.27				5622	5.622
Site 4-14	Regional Plaza with Leisure, Food and Beverages Uses	OU		54												58	0.058
Site 4-15	Youth Facility	G		30												32	0.032
Site 4-16	Commercial	C		3,092								0.27				3993	3.993
Site 4-17	Education & Related Uses	OU		212												906	0.906
Site 4-18	District Cooling System (South Plant)	OU		21												4544	4.544
Site 4-19	Local Open Space (with Flood Retention Facilities)	LO															
Site 4-20	Rural Residential - Zone 4	R4	153					0.37	56.6							210	0.210
Site 4-21	Vehicle Depot	G		130												135	0.135
Site 4-22	Public Housing (with Commercial)	RS	9813	482				0.19	1864.4	0.19						7342	7.342
Site 4-23	Electricity Substation (ESS 2)	OU		10												11	0.011
Site 4-24	Subsidised Sales Flat (with Commercial)	R1(SSF)	7522	490				0.27	2031.0	0.19						7872	7.872
Site 4-25a	Commercial & Residential Development	OU(C&R)	2408	1,313				0.27	650.1							3772	3.772
Site 4-25b	Commercial & Residential Development	OU(C&R)	2408	1,313				0.27	650.1							3772	3.772
Site 4-25c	Commercial & Residential Development	OU(C&R)	2479	1,352				0.27	669.3							3884	3.884
Site 4-26	Residential - Zone 1 (with Commercial)	R1	3284	298				0.37	1215.2							4811	4.811
Site 4-27	Existing Local Open Space (Tin Ha Road Playground)	LO															
Site 4-28	Public Housing (with Commercial)	RS	9307	512				0.19	1768.4	0.19						6993	6.993
Site 4-29	Commercial & Residential Development	OU(C&R)	8097	3,947				0.27	2186.2							12191	12.191
Site 4-30	Existing Church (Ling Liang Church)	IC															
Site 4-31	Government Offices, Community Hall, Magistrates' Court, Post Office and Delivery Office, Performance Venue and Public Market	G		4,438												4584	4.584
Site 4-32	District Police Station and Married Quarters	G		539												2089	2.089
Site 4-33	1 Secondary School	E		100												282	0.282
Site 4-34	Station (Proposed HSK Station)	OU															
Site 4-35	Sewage Pumping Station (SPS1)	OU		10												11	0.011
Site 4-36	1 Primary School	E		67												183	0.183
Site 4-37	Electricity Substation (ESS 4)	OU		10												11	0.011
Site 4-38	District Open Space	DO															
V	Village Type Development	V															
DO	DO (Riverside Promenade)	DO															
A	Amenity	A															
Road	Roads, Junctions, Proposed EFTS Alignment etc.	Road															
Total			**76733**	48936													
DCA 5																	
Site 5-1	Commercial	C		4,977												5163	5.163
Site 5-2	Committed Commercial	C*														3301	3.301
Site 5-3a	Commercial	C		3,339												3464	3.464
Site 5-3b	Commercial	C		2,657												2757	2.757
Site 5-4	Commercial	C		4,542												4712	4.712
Site 5-5	Planned PTI	OU															
Site 5-6	Planned Subsidised Sales Flat (with Commercial)	R1(SSF)*	7420					0.27	2003.4							7420	7.420
Site 5-7a	Commercial & Residential Development	OU(C&R)	1214	657				0.27	327.9							1924	1.924
Site 5-7b	Commercial & Residential Development	OU(C&R)	1340	731				0.27	361.8							2100	2.100
Site 5-7c	Commercial & Residential Development	OU(C&R)	1366	745				0.27	368.9							2140	2.140
Site 5-8	Commercial & Residential Development	OU(C&R)	2837	1,547				0.27	766.0							4443	4.443
Site 5-9	Commercial & Residential Development	OU(C&R)	2877	1,570				0.27	776.9								
Site 5-10	Green Belt	GB															
Site 5-11	Local Open Space (with Flood Retention Facilities)	LO															
Site 5-12	Green Belt	GB															

Road	No. of Kindergartens	Kindergarten Student Population	Kindergarten Employee Population	Kindergarten Student UFF	Kindergarten Employee UFF	Kindergarten ADWF	No. of Primary Schools	Primary School Student Population	Primary School Employee Population	Primary School Student UFF	Primary School Employee UFF	Primary School ADWF	No. of Secondary Schools	Secondary School Student Population	Secondary School Employee Population	Secondary School Student UFF	Secondary School Employee UFF	Secondary School ADWF	No. of Higher Education Facilities	Higher Education Student Population	Higher Education Employee Population	Higher Education Student UFF	Higher Education Employee UFF	Higher Education ADWF
Site 4-13b																								
Site 4-14																								
Site 4-15																								
Site 4-16																								
Site 4-17																			1.00	4622.00	213.00	0.04	0.28	244.52
Site 4-18																								
Site 4-19																								
Site 4-20																								
Site 4-21																								
Site 4-22	2.00	360.00	58.00	0.04	0.28	30.64																		
Site 4-23																								
Site 4-24																								
Site 4-25a																								
Site 4-25b																								
Site 4-25c																								
Site 4-26																								
Site 4-27																								
Site 4-28	2.00	360.00	58.00	0.04	0.28	30.64																		
Site 4-29																								
Site 4-30																								
Site 4-31																								
Site 4-32																								
Site 4-33													1.00	1200.00	100.00	0.04	0.28	76.00						
Site 4-34																								
Site 4-35																								
Site 4-36							1.00	765.00	67.00	0.04	0.28	49.36	1.00											
Site 4-37																								
Site 4-38																								
V																								
DO																								
A																								
Road																								
Total																								
DCA 5																								
Site 5-1																								
Site 5-2																								
Site 5-3a																								
Site 5-3b																								
Site 5-4																								
Site 5-5																								
Site 5-6																								
Site 5-7a	1.00	180.00	29.00	0.04	0.28	15.32																		
Site 5-7b																								
Site 5-7c																								
Site 5-8																								
Site 5-9																								
Site 5-10																								
Site 5-11																								
Site 5-12																								

Road	Industrial J1 Employee Population	Industrial J1 UFF	Industrial J1 ADWF	Commercial J2 Employee Population	Commercial J2 UFF	Commercial J2 ADWF	Commercial J3 Employee Population	Commercial J3 UFF	Commercial J3 ADWF	Commercial J4 Employee Population	Commercial J4 UFF	Commercial J4 ADWF	Commercial J5 Employee Population	Commercial J5 UFF	Commercial J5 ADWF	Commercial J6 Employee Population	Commercial J6 UFF	Commercial J6 ADWF
Site 4-13b										1804.00	0.28	505.12				2319.00	0.28	649.32
Site 4-14										55.00	0.28	15.40						
Site 4-15																		
Site 4-16										1282.00	0.28	358.96				1648.00	0.28	461.44
Site 4-17																		
Site 4-18				20.50	0.28	5.74												
Site 4-19																		
Site 4-20																		
Site 4-21							130.00	0.28	36.40									
Site 4-22										109.00	0.28	30.52						
Site 4-23				10.00	0.28	2.80												
Site 4-24										258.00	0.28	72.24						
Site 4-25a										1289.00	0.28	360.92						
Site 4-25b										1289.00	0.28	360.92						
Site 4-25c										1327.00	0.28	371.56						
Site 4-26										264.00	0.28	73.92						
Site 4-27																		
Site 4-28										153.00	0.28	42.84						
Site 4-29							10.00	0.28	2.80	3852.00	0.28	1078.56						
Site 4-30																		
Site 4-31																4170.00	0.28	1167.60
Site 4-32																		
Site 4-33																		
Site 4-34																		
Site 4-35				10.00	0.28	2.80												
Site 4-36																		
Site 4-37				10.00	0.28	2.80												
Site 4-38																		
V																		
DO																		
A																		
Road																		
Total																		
DCA 5																		
Site 5-1										996.00	0.28	278.88				3982.00	0.28	1114.96
Site 5-2										1860.00	0.28	520.80				1323.00	0.28	370.44
Site 5-3a										668.00	0.28	187.04				2672.00	0.28	748.16
Site 5-3b										532.00	0.28	148.96				2126.00	0.28	595.28
Site 5-4										909.00	0.28	254.52				3634.00	0.28	1017.52
Site 5-5																		
Site 5-6																		
Site 5-7a										616.00	0.28	172.48						
Site 5-7b										717.00	0.28	200.76						
Site 5-7c										731.00	0.28	204.68						
Site 5-8										1518.00	0.28	425.04						
Site 5-9										1540.00	0.28	431.20						
Site 5-10																		
Site 5-11																		
Site 5-12																		

Road	Commercial J7 Employee Population	Commercial J7 UFF	Commercial J7 ADWF	Commercial J8 Employee Population	Commercial J8 UFF	Commercial J8 ADWF	Commercial J9 Employee Population	Commercial J9 UFF	Commercial J9 ADWF	Commercial J10 Employee Population	Commercial J10 UFF	Commercial J10 ADWF	Commercial J11 Employee Population	Commercial J11 UFF	Commercial J11 ADWF	Commercial J12 Employee Population	Commercial J12 UFF	Commercial J12 ADWF	Commercial + Institution Population	Commercial + Institution ADWF	Total Population	Total ADWF	Downstream Sewerage Infrastructure
Site 4-13b										230.00	1.58	363.40							4353	1517.8	4353	1517.8	SPS1
Site 4-14																			55	15.4	55	15.4	SPS1
Site 4-15													30.00	0.28	8.40				30	8.4	30	8.4	SPS1
Site 4-16										163.00	1.58	257.54							3093	1077.9	3093	1077.9	SPS1
Site 4-17																			4835	244.5	4835	244.5	SPS1
Site 4-18																			21	5.7	21	1226.7	SPS1
Site 4-19																							SPS1
Site 4-20																					153	56.6	SPS1
Site 4-21																			130	36.4	130	36.4	SPS1
Site 4-22													315.52	0.28	56.56				843	117.7	10655	1982.2	SPS1
Site 4-23																			10	2.8	10	2.8	SPS3
Site 4-24													232.78	0.28	22.12				491	94.4	8013	2125.3	SPS1
Site 4-25a													26.00	0.28	7.28				1315	368.2	3723	1018.3	SPS1
Site 4-25b													26.00	0.28	7.28				1315	368.2	3723	1018.3	SPS1
Site 4-25c													27.00	0.28	7.56				1354	379.1	3833	1048.4	SPS1
Site 4-26													35.00	0.28	9.80				299	83.7	3583	1298.9	SPS1
Site 4-27																							SPS1
Site 4-28													301.62	0.28	46.20				873	119.7	10180	1888.1	SPS1
Site 4-29													85.00	0.28	23.80				3947	1105.2	12044	3291.3	SPS1
Site 4-30																							
Site 4-31													250.00	0.28	70.00				4420	1237.6	4420	1237.6	SPS1
Site 4-32													539.00	0.28	150.92				539	150.9	539	564.0	SPS1
Site 4-33																			1300	76.0	1300	76.0	SPS1
Site 4-34																							
Site 4-35																			10	2.8	10	2.8	
Site 4-36																			832	49.4	832	49.4	SPS1
Site 4-37																			10	2.8	10	2.8	SPS1
Site 4-38																							SPS1
V																							
DO																							
A																							
Road																							
Total																							
DCA 5																							
Site 5-1																			4978	1393.8	4978	1393.8	HTSPS
Site 5-2																			3183	891.2	3183	891.2	
Site 5-3a																			3340	935.2	3340	935.2	HTSPS
Site 5-3b																			2658	744.2	2658	744.2	HTSPS
Site 5-4																			4543	1272.0	4543	1272.0	HTSPS
Site 5-5																							
Site 5-6																					7420	2003.4	
Site 5-7a													13.00	0.28	3.64				838	191.4	2052	519.3	HTSPS
Site 5-7b													15.00	0.28	4.20				732	205.0	2072	566.8	HTSPS
Site 5-7c													15.00	0.28	4.20				746	208.9	2112	577.8	HTSPS
Site 5-8													30.00	0.28	8.40				1548	433.4	4385	1199.4	HTSPS
Site 5-9													31.00	0.28	8.68				1571	439.9	4448	1216.8	HTSPS
Site 5-10																							
Site 5-11																							HTSPS
Site 5-12																							

Road	Landuse (in ODP)	Zoning	Population	Total Employment	Social Welfare Facility Population	Hotel Population	Hospital Population	Residential UFF	Residential ADWF	Social Welfare Facility UFF	Social Welfare Facility ADWF	Hotel UFF	Hotel ADWF	Hospital UFF	Hospital ADWF	Contributing Population	N
Site 5-13	Hospital and Specialist Clinic/ Polyclinic	G		3,100										0.37		1371	1.371
Site 5-14	~~1 Primary School & 1 Secondary School~~ ESS 1 (7,976m2)	OU		10												11	0.011
Site 5-15	Green Belt	GB															
Site 5-16	Subsidised Sales Flat (with Commercial)	R1(SSF)	5908	385				0.27	1595.1	0.19						6182	6.182
Site 5-17	Public Housing (with Commercial)	RS	7110	450				0.19	1350.8	0.19						5373	5.373
Site 5-18a	Commercial	C		678												2245	2.245
Site 5-18b	Commercial	C		659												2182	2.182
Site 5-19	~~Electricity Substation (ESS 1)~~ Reserve (5,368m2)	G															
Site 5-20	Existing Emergency Access Point	OU															
Site 5-21	1 Secondary School	E		100												282	0.282
Site 5-22	Planned Residential Development	R3*	486					0.37	179.9							667	0.667
Site 5-23	Existing Residential Development	R3*															
Site 5-24	Planned Residential - Zone 1 (Local Rehousing)	R1(LR)	6630	502				0.37	2453.1	0.19						9514	9.514
Site 5-25	Existing Public Rental Housing (with Commercial)	RS*	13000					0.19	2470.0							9149	9.149
Site 5-26	Planned Residential - Zone 1 (Local Rehousing)	R1(LR)	900	26				0.37	333.0	0.19						1243	1.243
Site 5-27	Clinic	G		100												104	0.104
Site 5-28	Residential Care Home for the Elderly	G		185						0.19						192	0.192
Site 5-29	Refuse Collection Point	OU		10												11	0.011
Site 5-30	Local Open Space	LO															
Site 5-31	Existing Residential Development	R2*															
Site 5-32	Commercial & Residential Development with Light Rail Facilities	OU(C&R)	5971	547				0.27	1612.1							6539	6.539
Site 5-33	Planned Residential Development	R2*	2712					0.27	732.2							2712	2.712
Site 5-34	1 Primary School & 1 Secondary school	E		167												465	0.465
Site 5-35	Existing Residential Development	R4*															
Site 5-36	Local Open Space	LO															
Site 5-37	Reserve	G															
Site 5-38	Reserve (Near Villages)	G															
Site 5-39a	Existing Residential Development	R3*															
Site 5-39b	Residential - Zone 3	R3	722	8				0.37	267.2								
Site 5-39c	Residential - Zone 3	R3	417	4				0.37	154.2								
Site 5-39d	Residential - Zone 3	R3	394	4				0.37	145.8								
Site 5-40	Fresh Water Service Reservoir and Flushing Water Service Reservoir	G		10													
Site 5-41	Local Open Space	LO															

Road	No. of Kindergartens	Kindergarten Student Population	Kindergarten Employee Population	Kindergarten Student UFF	Kindergarten Employee UFF	Kindergarten ADWF	No. of Primary Schools	Primary School Student Population	Primary School Employee Population	Primary School Student UFF	Primary School Employee UFF	Primary School ADWF	No. of Secondary Schools	Secondary School Student Population	Secondary School Employee Population	Secondary School Student UFF	Secondary School Employee UFF	Secondary School ADWF	No. of Higher Education Facilities	Higher Education Student Population	Higher Education Employee Population	Higher Education Student UFF	Higher Education Employee UFF	Higher Education ADWF	Industrial J1 Employee Population	Industrial J1 UFF	Industrial J1 ADWF
Site 5-13																											
Site 5-14																											
Site 5-15																											
Site 5-16																											
Site 5-17	2.00	360.00	58.00	0.04	0.28	30.64																					
Site 5-18a																											
Site 5-18b																											
Site 5-19																											
Site 5-20																											
Site 5-21													1.00	1200.00	100.00	0.04	0.28	76.00									
Site 5-22																											
Site 5-23																											
Site 5-24	1.00	180.00	29.00	0.04	0.28	15.32																					
Site 5-25																											
Site 5-26																											
Site 5-27																											
Site 5-28																											
Site 5-29																											
Site 5-30																											
Site 5-31																											
Site 5-32																											
Site 5-33																											
Site 5-34							1.00	765.00	67.00	0.04	0.28	49.36	1.00	1200.00	100.00	0.04	0.28	76.00									
Site 5-35																											
Site 5-36																											
Site 5-37										0.04	0.28																
Site 5-38																											
Site 5-39a																											
Site 5-39b																											
Site 5-39c																											
Site 5-39d																											
Site 5-40																											
Site 5-41																											

Road	Commercial J2 Employee Population	Commercial J2 UFF	Commercial J2 ADWF	Commercial J3 Employee Population	Commercial J3 UFF	Commercial J3 ADWF	Commercial J4 Employee Population	Commercial J4 UFF	Commercial J4 ADWF	Commercial J5 Employee Population	Commercial J5 UFF	Commercial J5 ADWF	Commercial J6 Employee Population	Commercial J6 UFF	Commercial J6 ADWF	Commercial J7 Employee Population	Commercial J7 UFF	Commercial J7 ADWF	Commercial J8 Employee Population	Commercial J8 UFF	Commercial J8 ADWF	Commercial J9 Employee Population	Commercial J9 UFF	Commercial J9 ADWF	Commercial J10 Employee Population	Commercial J10 UFF	Commercial J10 ADWF	Commercial J11 Employee Population	Commercial J11 UFF	Commercial J11 ADWF	Commercial J12 Employee Population	Commercial J12 UFF	Commercial J12 ADWF	Commercial + Institution Population	Commercial + Institution ADWF	Total Population	Total ADWF	Downstream Sewerage Infrastructure
Site 5-13																												3100.00	0.37	370.00				3100	370.0	3100	370.0	HTSPS
Site 5-14	10.00	0.28	2.80																															10	2.8	10	2.8	HTSPS
Site 5-15																																						
Site 5-16							202.00	0.28	56.56																			182.78	0.28	17.36				385	73.9	6293	1669.1	HTSPS
Site 5-17							172.00	0.28	48.16																			220.20	0.28	21.00				810	99.8	7920	1450.6	HTSPS
Site 5-18a							359.00	0.28	100.52																320.00	1.58	505.60							679	606.1	679	606.1	HTSPS
Site 5-18b							349.00	0.28	97.72																311.00	1.58	491.38							660	589.1	660	589.1	HTSPS
Site 5-19																																						HTSPS
Site 5-20																																						
Site 5-21																																		1300	76.0	1300	76.0	HTSPS
Site 5-22																																				486	179.9	
Site 5-23																																						
Site 5-24							292.00	0.28	81.76																			182.82	0.28	18.48				684	115.6	7314	2568.7	HTSPS
Site 5-25																																				13000	2470.0	
Site 5-26																												26.16	0.28	2.52				26	2.5	926	335.5	HTSPS
Site 5-27																												100.00	0.28	28.00				100	28.0	100	28.0	HTSPS
Site 5-28																												185.00	0.28	51.80				185	51.8	185	51.8	HTSPS
Site 5-29				10.00	0.28	2.80																												10	2.8	10	2.8	HTSPS
Site 5-30																																						HTSPS
Site 5-31																																						
Site 5-32							484.00	0.28	135.52																			63.00	0.28	17.64				547	153.2	6518	1765.3	HTSPS
Site 5-33																																				2712	732.2	
Site 5-34																																		2132	125.4	2132	125.4	HTSPS
Site 5-35																																						
Site 5-36																																						
Site 5-37																																						HTSPS
Site 5-38																																						HTSPS
Site 5-39a																																						
Site 5-39b																												8.00	0.28	2.24				8	2.2	730	269.4	HTSPS
Site 5-39c																												5.00	0.28	1.40				5	1.4	422	155.6	HTSPS
Site 5-39d																												5.00	0.28	1.40				5	1.4	399	147.2	HTSPS
Site 5-40	10.00	0.28	2.80																															10	2.8	10	2.8	
Site 5-41																																						

Road	Landuse (in ODP)	Zoning	Population	Total Employment	Social Welfare Facility Population	Hotel Population	Hospital Population	Residential UFF	Residential ADWF	Social Welfare Facility UFF	Social Welfare Facility ADWF	Hotel UFF	Hotel ADWF	Hospital UFF	Hospital ADWF	Contributing Population	N	No. of Kindergartens	Kindergarten Student Population	Kindergarten Employee Population	Kindergarten Student UFF	Kindergarten Employee UFF	Kindergarten ADWF	No. of Primary Schools	Primary School Student Population	Primary School Employee Population	Primary School Student UFF	Primary School Employee UFF	Primary School ADWF	No. of Secondary Schools	Secondary School Student Population	Secondary School Employee Population	Secondary School Student UFF	Secondary School Employee UFF	Secondary School ADWF
Site 5-42	~~Reserve~~ Reconfigure as School Site (13,978m2) 1 Primary School & 1 Secondary school	E		167																				1.00	765.00	67.00	0.04	0.28	49.36	1.00	1200.00	100.00	0.04	0.28	76.00
Site 5-43	Local Open Space (with Flood Retention Facilities)	LO																																	
Site 5-44	Existing Church (Church of Jesus Christ of Latter – Day Saints)	IC																#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
V	Village Type Development	V																																	
DO	DO (Riverside Promenade)	DO																																	
A	Amenity	A																																	
Road	Roads, Junctions, Proposed EFTS Alignment etc.	Road																																	

Road	No. of Higher Education Facilities	Higher Education Student Population	Higher Education Employee Population	Higher Education Student UFF	Higher Education Employee UFF	Higher Education ADWF	Industrial J1 Employee Population	Industrial J1 UFF	Industrial J1 ADWF	Commercial J2 Employee Population	Commercial J2 UFF	Commercial J2 ADWF	Commercial J3 Employee Population	Commercial J3 UFF	Commercial J3 ADWF	Commercial J4 Employee Population	Commercial J4 UFF	Commercial J4 ADWF	Commercial J5 Employee Population	Commercial J5 UFF	Commercial J5 ADWF	Commercial J6 Employee Population	Commercial J6 UFF	Commercial J6 ADWF	Commercial J7 Employee Population	Commercial J7 UFF	Commercial J7 ADWF	Commercial J8 Employee Population	Commercial J8 UFF	Commercial J8 ADWF	Commercial J9 Employee Population	Commercial J9 UFF	Commercial J9 ADWF	Commercial J10 Employee Population	Commercial J10 UFF	Commercial J10 ADWF	Commercial J11 Employee Population	Commercial J11 UFF	Commercial J11 ADWF	Commercial J12 Employee Population	Commercial J12 UFF	Commercial J12 ADWF	Commercial + Institution Population	Commercial + Institution ADWF	Total Population	Total ADWF	Downstream Sewerage Infrastructure
Site 5-42																																											2132	125.4	2132	125.4	HTSPS
Site 5-43																																															HTSPS
Site 5-44	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A					
V																																															
DO																																															
A																																															
Road																																															

Updated planned population and employment figures at nine housing sites advised by the Housing Department (i.e. Site No. 4-3, 4-4, 4-5, 4-6, 4-22, 4-24, 4-28, 5-16 and 5-17)

Sewage Flow Estimation for 9 Nos. Public Housing Sites under Revised Scheme (Apr 2025)

Site	Domestic Zoning	Population	Residential UFF (m^3/day)	Non-caterng Retail (J4) GFA (m^2)	Employee	Non-caterng Retail (J4) UFF (m^3/day)	Catering (J10) GFA (m^2)	Employee	Catering (J10) UFF (m^3/day)	Social Services (J11) GFA (m^2)	Employee	Social Services (J11) UFF (m^3/day)	DTMO/DMO/ EMO (J12) GFA (m^2)	Employee	DTMO/DMO/ EMO (J12) UFF (m^3/day)	Kindergarten Teacher	Kindergarten Teacher (General) UFF (m^3/day)	Kindergarten Student	Kindergarten Student UFF (m^3/day)	Total ADWF (m^3/day)	Deisgn ADWF [1] (m^3/day)
4-3	SSF	4420	0.27	434	15	0.28	651	33	1.58	788	26	0.28	200	48	0.08	0	0.28	0	0.04	1261	1292
4-4	PRH	7800	0.19	1479	52	0.28	986	50	1.58	7124	235	0.28	1657	144	0.08	29	0.28	180	0.04	1668	1710
4-5	SSF	8450	0.27	490	17	0.28	1550	79	1.58	4275	141	0.28	300	92	0.08	44	0.28	270	0.04	2481	2543
4-6	SSF	4680	0.27	632	22	0.28	538	27	1.58	3766	124	0.28	200	51	0.08	0	0.28	0	0.04	1351	1385
4-22	PRH	11310	0.19	1103	38	0.28	832	42	1.58	8000	264	0.28	1850	182	0.08	29	0.28	180	0.04	2330	2388
4-24	SSF	7150	0.27	654	23	0.28	418	21	1.58	6042	199	0.28	250	78	0.08	44	0.28	270	0.04	2055	2107
4-28	SSF	9048	0.27	1761	61	0.28	1224	62	1.58	7471	247	0.28	572	99	0.08	0	0.28	0	0.04	2635	2701
5-16	SSF	5460	0.27	0	0	0.28	0	0	1.58	3023	100	0.28	250	60	0.08	34	0.28	210	0.04	1525	1563
5-17	SSF	6838	0.27	1650	58	0.28	2480	127	1.58	5850	193	0.28	300	75	0.08	0	0.28	0	0.04	2123	2176

(1) Design ADWF includes a return liquid allowance of 2.5%

No. A/HSK/573 – Proposed Minor Relaxation of Domestic Plot Ratio Restriction (From 4.5 to 5) for Mixed Use Development (in Planning Areas 28A and 28B of HSK/HA NDA) (i.e. Site No. 4-25a, 4-25b, 4-25c, and 4-29) (approved on 15 Aug 2025)

ADWF before MTRC Sites S16

Site	Zoning	Domestic Population	Domestic UFF (m^3/head/day)	Employee Population			Commercial UFF (m^3/day)			Total ADWF (m^3/day)	Design ADWF [1] (m^3/day)
				J3	J4	J11	J3	J4	J11		
4-25a	OU(C&R)	2,408	0.27	0	1,288	25	0.18	0.28	0.28	1,018	1,043
4-25b	OU(C&R)	2,408	0.27	0	1,288	25	0.18	0.28	0.28	1,018	1,043
4-25c	OU(C&R)	2,479	0.27	0	1,326	26	0.18	0.28	0.28	1,048	1,074
4-29	OU(C&R)	8,097	0.27	10	3,852	85	0.18	0.28	0.28	3,290	3,372
										Total	**6,533**

(1) Design ADWF includes a return liquid allowance of 2.5%

ADWF after MTRC Sites S16

Site	Zoning	Domestic Population	Domestic UFF (m^3/head/day)	Contributing population	Total ADWF (m^3/day)	Design ADWF [1] (m^3/day)	Remarks
4-25a	OU(C&R)	1,400	0.27	1,925	520	533	- ADWF assumed for club house, swimmmig pool, commercial and office uses
4-25b	OU(C&R)	5,364	0.27	5,446	1,471	1,507	- ADWF assumed for club house and swimmmig pool uses
4-25c	OU(C&R)	4,161	0.27	9,739	2,630	2,695	- ADWF assumed for club house, swimmmig pool and commercial uses
4-29	OU(C&R)	12,040	0.27	20,253	5,468	5,605	- ADWF assumed for club house, swimmmig pool, commercial and PTI uses
					Total	**10,340**	

(1) Design ADWF includes a return liquid allowance of 2.5%

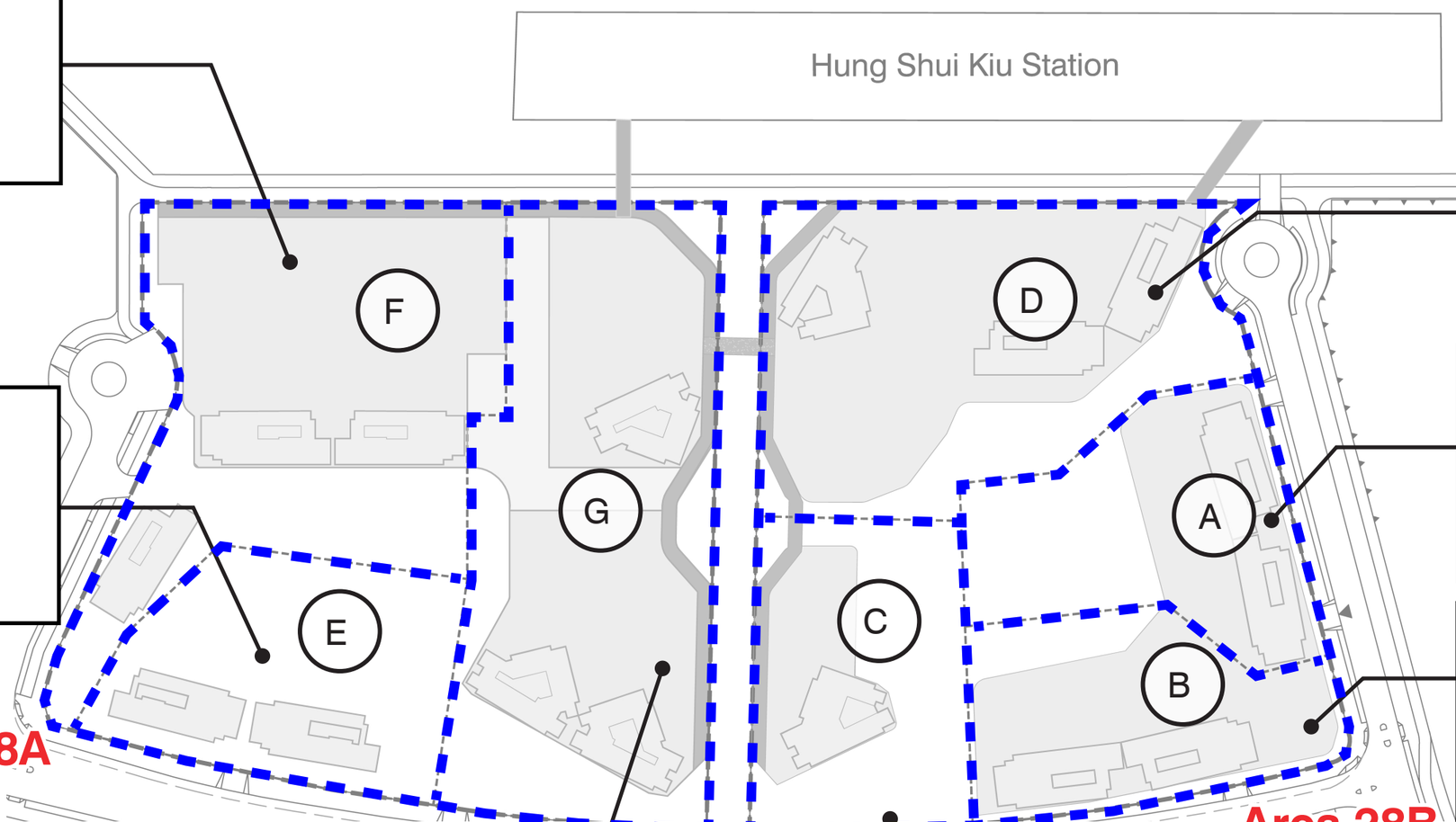
Difference **3,807**

Extracted from Sewerage Appraisal under No. A/HSK/573

DLN

Master Scheme Design
for Hung Shui Kiu Property Dvelopment
N3306-H

Phasing Strategy (Proposed Scheme)



28A-2
ADWF = 1371.2 m^3/day

28A-1
ADWF = 881.2 m^3/day

28A-3
ADWF = 3216 m^3/day

28B-4
ADWF = 2629.5 m^3/day

28B-1
ADWF = 735.3 m^3/day

28B-2
ADWF = 735.3 m^3/day

28B-3
ADWF = 519.7 m^3/day

Updated ADWF
Extracted from Appendix 5 - Sewerage Appraisal under No. A/HSK/573

Updated ADWF under No. A/HSK/573

MATCH LINE
FOR CONTINUATION
SEE DRG 278463/C3/SEW/1113

MATCH LINE
FOR CONTINUATION
SEE DRG 278463/C3/SEW/1114

TIN SAM TSUEN

817000 E

817100 E

832600 N

832500 N

832400 N

FMH157b
NS450
FMH399a
NS450
ROAD L16
FMH158a
NS450
FMH159a
NS450
FMH160b
NS450
FMH162a
NS600

LI-S4.25c-1
LI-S4.25c-2
LI-S4.25b-1

Half of Site 28B-4
ADWF = 1,314.75 m³/day

Half of Site 28B-4
ADWF = 1,314.75 m³/day

Site 28B-1
ADWF = 735.3 m³/day

SITE 4-25c
(COMMERCIAL & RESIDENTIAL DEVELOPMENT)

Site 4-25c
Total ADWF = ~2,630 m³/day

SITE 4-25b
(COMMERCIAL & RESIDENTIAL DEVELOPMENT)

Site 4-25b
Total ADWF = ~1,471 m³/day

LI-S4.25b-2
FMH163a
NS560

Site 28B-2
ADWF = 735.3 m³/day

LI-S4.25b-3
FMH164a
NS400
LI-S4.24-2

NS630

SITE 4-25a
(COMMERCIAL & RESIDENTIAL DEVELOPMENT)

Site 4-25a
Total ADWF = ~ 520 m3/day

LI-S4.25b-2
FMH164
ROAD L12

SITE 4-24
(PUBLIC HOUSING)

SITE 4-26
(RESIDENTIAL)

Site 28B-3
ADWF = 519.7 m³/day

LI-S4.25a-1
FMH165a
NS450
LI-S4.24-1

SITE 4-29
(COMMERCIAL & RESIDENTIAL DEVELOPMENT)

MATCH LINE
FOR CONTINUATION
SEE DRG 278463/C3/SEW/1115

MATCH LINE
FOR CONTINUATION
SEE DRG 278463/C3/SEW/1117

MATCH LINE
FOR CONTINUATION
SEE DRG 278463/C3/SEW/1119

MATCH LINE
FOR CONTINUATION
SEE DRG 278463/C3/SEW/1120

PROPOSED TUEN MA LINE
HUNG SHUI KIU STATION
(BY OTHERS)

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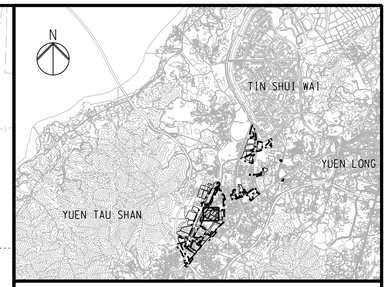


KEY PLAN

NOTES

1. FOR GENERAL NOTES AND LEGEND, REFER TO DRAWING NO. 278463/C3/SEW/1001.

Rev	Description	By	Date
01	TENDER ADDENDUM NO. 1	EF	04/24
00	TENDER ISSUE	EF	03/24

Consultant

ARUP

Project Title

Contract No. YL/2023/03
Hung Shui Kiu/Ha Tsuen
New Development Area
Second Phase Development - Contract 3 -
Site Formation and Engineering
Infrastructure Works

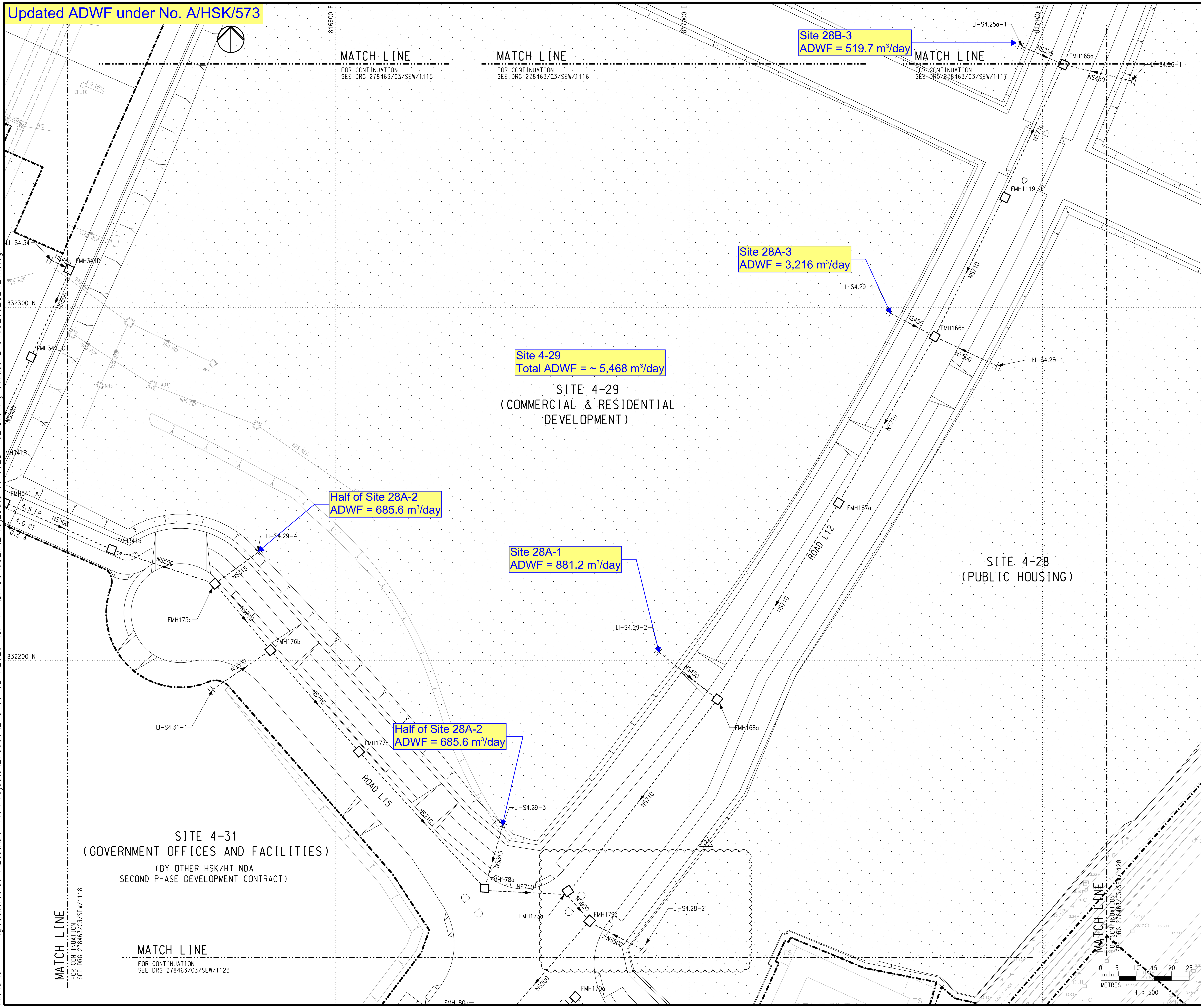
Drawing title

SEWERAGE LAYOUT PLAN
(SHEET 16)

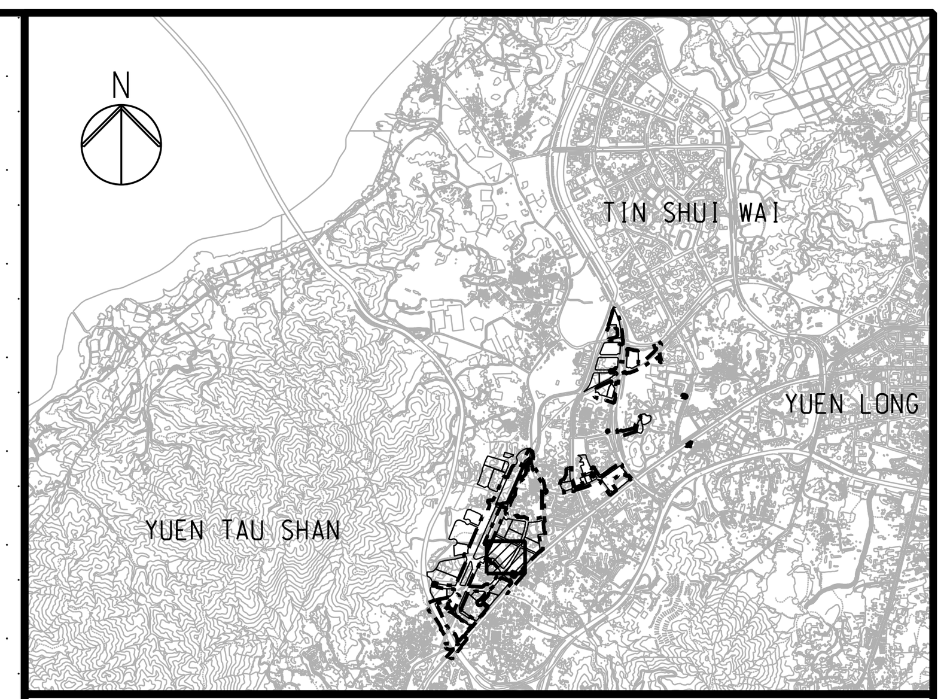
Drawing no.		Rev.
278463/C3/SEW/1116		01
Drawn: DT	Date: 03/24	Checked: EF	Approved: DL
Scale: 1:500 @ A1		Status: TENDER	

CEDD
土木工程拓展署
Civil Engineering and Development Department

Printed by : Michael-KH.Ng Date : 4/24/2024
Filename : J:\278000\278463_CE 1-2020 HSK-HT NDA-DC\05_Int_Proj_Data\05-03_BIM\02-Drawing\Utilities\278463_C3_SEW_1116.dgn



Updated ADWF under No. A/HSK/573
MATCH LINE
FOR CONTINUATION SEE DRG 278463/C3/SEW/1115
MATCH LINE
FOR CONTINUATION SEE DRG 278463/C3/SEW/1116
Site 28B-3
ADWF = 519.7 m³/day
MATCH LINE
FOR CONTINUATION SEE DRG 278463/C3/SEW/1117
Site 28A-3
ADWF = 3,216 m³/day
Site 4-29
Total ADWF = ~ 5,468 m³/day
SITE 4-29
(COMMERCIAL & RESIDENTIAL DEVELOPMENT)
Half of Site 28A-2
ADWF = 685.6 m³/day
Site 28A-1
ADWF = 881.2 m³/day
SITE 4-28
(PUBLIC HOUSING)
Half of Site 28A-2
ADWF = 685.6 m³/day
ROAD L12
ROAD L15
SITE 4-31
(GOVERNMENT OFFICES AND FACILITIES)
(BY OTHER HSK/HT NDA SECOND PHASE DEVELOPMENT CONTRACT)
MATCH LINE
FOR CONTINUATION SEE DRG 278463/C3/SEW/1118
MATCH LINE
FOR CONTINUATION SEE DRG 278463/C3/SEW/1123
MATCH LINE
FOR CONTINUATION SEE DRG 278463/C3/SEW/1120
METRES
1 : 500



KEY PLAN

NOTES

1. FOR GENERAL NOTES AND LEGEND, REFER TO DRAWING NO. 278463/C3/SEW/1001.

Rev	Description	By	Date
01	TENDER ADDENDUM NO. 3	EF	05/24
00	TENDER ISSUE	EF	03/24

Consultant

ARUP

Project Title

Contract No. YL/2023/03
Hung Shui Kiu/Ha Tsuen
New Development Area
Second Phase Development - Contract 3 -
Site Formation and Engineering
Infrastructure Works

Drawing title

SEWERAGE LAYOUT PLAN
(SHEET 19)

Drawing no. 278463/C3/SEW/1119 Rev. 01

Drawn	Date	Checked	Approved
DT	01/8	EF	DL

Scale 1:500 @ A1 Status TENDER

CEDD 土木工程拓展署 Civil Engineering and Development Department

Extracted from Appendix 5 - Sewerage Appraisal under No. A/HSK/573

Table 3 Calculation for Sewage Generation Rate of the Proposed Development (By Site)

Subject Site 28A

Site 28A-1

1. Residential

Total number of residential units	=	1148	units
Total number of residents	=	3214	residents (refer to Census and Statistics Department 2021 data - average household size of 2.8 in Hung Shui Kiu)
Design flow	=	270	litre/person/day -- (Private R2 in Table T-1 of GESF)
Sewage generation rate	=	**867.9**	m^3/day

2. Club House

Assumed area	=	1435.3	m^2 (Assume 2.5% of residential GFA)
Assumed floor area per employee	=	30.3	m^2 per employee -- (refer to Table 8 of CIFSUS - Community, Social & Personal Services)
Total number of employees	=	47	employees
Design flow	=	280	litre/employee/day -- (refer to Table T-2 of GESF - J11 Community, Social, Personal Services)
Sewage generation rate	=	**13.3**	m^3/day

3. Proposed Swimming Pool (Indoor)

Area of Swimming Pool	=	50	m^2 (Assume)
Depth of Swimming Pool	=	1.5	m
Volume of Swimming Pool (Ordinary Assumptio	=	75	m^3
Turnover Rate	=	4	hr
Required Surface Loading Rate of Filter	=	18.75	$m^3/m^2/hr$
Filter Areas required	=	1	m^2
Adopted Surface Loading Rate of Filter	=	50	$m^3/m^2/hr$
Adopted Filter Area	=	0.38	m^2
Backwash Duration	=	3	min/d
Backwash flow rate	=	30	$m^3/m^2/hr$
Design flow for Swimming Pool Backwashing	=	0.5625	m^3/day
Design flow for Swimming Pool Backwashing	=	**3.1**	litre/sec

Part of ADWF of Site 4-29

Total Flow from the Proposed Development (Site 28A-1)

Flow rate	=	881.2	m^3/day
Flow rate with P_{CIF} (Yuen Long - 1.0)	=	881.2	m^3/day (refer to Table T-4 of GESF - Yuen Long - 1.0)
Contributing population	=	3264	people (refer to Section 12 of GESF)
Peaking factor	=	6	(refer to Table T-5 of GESF for a population between 1000-5000 incl. stormwater allowance)
Peak flow (without swimming pool)	=	**61.2**	litre/sec
Peak flow (with swimming pool)	=	**64.3**	litre/sec

Extracted from Appendix 5 - Sewerage Appraisal under No. A/HSK/573

Site 28A-2

1. Residential

Total number of residential units	=	1535	units
Total number of residents	=	4298	residents (refer to Census and Statistics Department 2021 data - average household size of 2.8 in Hung Shui Kiu)
Design flow	=	270	litre/person/day -- (Private R2 in Table T-1 of GESF)
Sewage generation rate	=	**1160.5**	m^3/day

2. Club House

Assumed area	=	1918	m^2 (Assume 2.5% of residential GFA)
Assumed floor area per employee	=	30.3	m^2 per employee -- (refer to Table 8 of CIFSUS - Community, Social & Personal Services)
Total number of employees	=	63	employees
Design flow	=	280	litre/employee/day -- (refer to Table T-2 of GESF - J11 Community, Social, Personal Services)
Sewage generation rate	=	**17.7**	m^3/day

3. Proposed Swimming Pool (Indoor)

Area of Swimming Pool	=	50	m^2 (Assume)
Depth of Swimming Pool	=	1.5	m
Volume of Swimming Pool (Ordinary Assumptio	=	75	m^3
Turnover Rate	=	4	hr
Required Surface Loading Rate of Filter	=	18.75	$m^3/m^2/hr$
Filter Areas required	=	1	m^2
Adopted Surface Loading Rate of Filter	=	50	$m^3/m^2/hr$
Adopted Filter Area	=	0.38	m^2
Backwash Duration	=	3	min/d
Backwash flow rate	=	30	$m^3/m^2/hr$
Design flow for Swimming Pool Backwashing	=	0.5625	m^3/day
Design flow for Swimming Pool Backwashing	=	**3.1**	litre/sec

4. Commercial (Retail)

GFA	=	1000	m^2
Assumed floor area per employee	=	28.6	m^2 per employee -- (refer to Table 8 of CIFSUS - Retail Trade)
Total number of employees	=	35	employees
Design flow	=	280	litre/employee/day -- (refer to Table T-2 of GESF - J4 Wholesale & Retail)
Sewage generation rate	=	**9.8**	m^3/day

5. Commercial (F&B)

GFA	=	1000	m^2
Assumed floor area per employee	=	19.6	m^2 per employee -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	51	employees
Design flow	=	1580	litre/employee/day -- (refer to Table T-2 of GESF - J10 Restaurant & Hotels)
Sewage generation rate	=	**80.6**	m^3/day

6. PTI

Assumed area	=	15000	m^2
Assumed floor area per employee	=	26.3	m^2 per employee -- (refer to Table 8 of CIFSUS - Transport)
Total number of employees	=	570	employees
Design flow	=	180	litre/employee/day -- (refer to Table T-2 of GESF - J3 Transport, Storage & Communiccation)
Sewage generation rate	=	**102.6**	m^3/day

Total Flow from the Proposed Development (Site 28A-2 - PTI)

Flow rate	=	102.6	m^3/day
Flow rate with P_{CIF} (Yuen Long - 1.0)	=	102.6	m^3/day (refer to Table T-4 of GESF - Yuen Long - 1.0)
Contributing population	=	380	people (refer to Section 12 of GESF)
Peaking factor	=	8	(refer to Table T-5 of GESF for a population between <1,000 incl. stormwater allowance)
Peak flow	=	**9.5**	litre/sec

Total Flow from the Proposed Development (Site 28A-2 - exclude PTI)

Flow rate	=	1268.6	m^3/day
Flow rate with P_{CIF} (Yuen Long - 1.0)	=	1268.6	m^3/day (refer to Table T-4 of GESF - Yuen Long - 1.0)
Contributing population	=	4698	people (refer to Section 12 of GESF)
Peaking factor	=	6	(refer to Table T-5 of GESF for a population between <1,000 incl. stormwater allowance)
Peak flow (without swimming pool)	=	**88.1**	litre/sec
Peak flow (with swimming pool)	=	**91.2**	litre/sec

Part of ADWF of Site 4-29

Total Flow from the Proposed Development (Site 28A-2)

Flow rate	=	1371.2	m^3/day
Flow rate with P_{CIF} (Yuen Long - 1.0)	=	1371.2	m^3/day (refer to Table T-4 of GESF - Yuen Long - 1.0)
Contributing population	=	5078	people
Peaking factor	=	5	(refer to Table T-5 of GESF for a population 5000-10000 incl. stormwater allowance)
Peak flow (without swimming pool)	=	**79.3**	litre/sec
Peak flow (with swimming pool)	=	**82.5**	litre/sec

Extracted from Appendix 5 - Sewerage Appraisal under No. A/HSK/573

Site 28A-3

1. Residential

Total number of residential units	=	1617	units
Total number of residents	=	4528	residents (refer to Census and Statistics Department 2021 data - average household size of 2.8 in Hung Shui Kiu)
Design flow	=	270	litre/person/day -- (Private R2 in Table T-1 of GESF)
Sewage generation rate	=	**1222.5**	m^3/day

2. Club House

Assumed area	=	2021	m^2 (Assume 2.5% of residential GFA)
Assumed floor area per employee	=	30.3	m^2 per employee -- (refer to Table 8 of CIFSUS - Community, Social & Personal Services)
Total number of employees	=	67	employees
Design flow	=	280	litre/employee/day -- (refer to Table T-2 of GESF - J11 Community, Social, Personal Services)
Sewage generation rate	=	**18.7**	m^3/day

3. Proposed Swimming Pool (Indoor)

Area of Swimming Pool	=	50	m^2 (Assume)
Depth of Swimming Pool	=	1.5	m
Volume of Swimming Pool (Ordinary Assumptio	=	75	m^3
Turnover Rate	=	4	hr
Required Surface Loading Rate of Filter	=	18.75	$m^3/m^2/hr$
Filter Areas required	=	1	m^2
Adopted Surface Loading Rate of Filter	=	50	$m^3/m^2/hr$
Adopted Filter Area	=	0.38	m^2
Backwash Duration	=	3	min/d
Backwash flow rate	=	30	$m^3/m^2/hr$
Design flow for Swimming Pool Backwashing	=	0.5625	m^3/day
Design flow for Swimming Pool Backwashing	=	**3.1**	litre/sec

4. Commercial (Retail)

GFA	=	21851	m^2
Assumed floor area per employee	=	28.6	m^2 per employee -- (refer to Table 8 of CIFSUS - Retail Trade)
Total number of employees	=	765	employees
Design flow	=	280	litre/employee/day -- (refer to Table T-2 of GESF - J4 Wholesale & Retail)
Sewage generation rate	=	**214.1**	m^3/day

5. Commercial (F&B)

GFA	=	21851	m^2
Assumed floor area per employee	=	19.6	m^2 per employee -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	1114	employees
Design flow	=	1580	litre/employee/day -- (refer to Table T-2 of GESF - J10 Restaurant & Hotels)
Sewage generation rate	=	**1760.8**	m^3/day

Total Flow from the Proposed Development (Site 28A-3)

Flow rate	=	3216.0	m^3/day
Flow rate with P_{CIF} (Yuen Long - 1.0)	=	3216.0	m^3/day (refer to Table T-4 of GESF - Yuen Long - 1.0)
Contributing population	=	11911	people (refer to Section 12 of GESF)
Peaking factor	=	4	(refer to Table T-5 of GESF for a population between 10000-50000 incl. stormwater allowance)
Peak flow (without swimming pool)	=	**148.9**	litre/sec
Peak flow (with swimming pool)	=	**152.0**	litre/sec

Part of ADWF of Site 4-29

Remark: The Proposed Development will have phasing based on indicative preliminary deisgn. This calculation is prepared base on 7 phasing (3 on Site 28A and 4 on Site 28B), serving only as an assumption for the Sewerage Appraisal.

Extracted from Appendix 5 - Sewerage Appraisal under No. A/HSK/573

Subject Site 28B

Site 28B-1

1. Residential

Total number of residential units	=	958	units
Total number of residents	=	2682	residents (refer to Census and Statistics Department 2021 data - average household size of 2.8 in Hung Shui Kiu)
Design flow	=	270	litre/person/day -- (Private R2 in Table T-1 of GESF)
Sewage generation rate	=	**724.2**	m^3/day

2. Club House

Assumed area	=	1198	m^2 (Assume 2.5% of residential GFA)
Assumed floor area per employee	=	30.3	m^2 per employee -- (refer to Table 8 of CIFSUS - Community, Social & Personal Services)
Total number of employees	=	40	employees
Design flow	=	280	litre/employee/day -- (refer to Table T-2 of GESF - J11 Community, Social, Personal Services)
Sewage generation rate	=	**11.1**	m^3/day

3. Proposed Swimming Pool (Indoor)

Area of Swimming Pool	=	37.5	m^2 (Assume)
Depth of Swimming Pool	=	1.5	m
Volume of Swimming Pool (Ordinary Assumption)	=	56.25	m^3
Turnover Rate	=	4	hr
Required Surface Loading Rate of Filter	=	14.0625	$m^3/m^2/hr$
Filter Areas required	=	1	m^2
Adopted Surface Loading Rate of Filter	=	50	$m^3/m^2/hr$
Adopted Filter Area	=	0.28	m^2
Backwash Duration	=	3	min/d
Backwash flow rate	=	30	$m^3/m^2/hr$
Design flow for Swimming Pool Backwashing	=	0.421875	m^3/day
Design flow for Swimming Pool Backwashing	=	**2.3**	litre/sec

Total Flow from the Proposed Development (Site 28B-1)

Flow rate	=	735.3	m^3/day
Flow rate with P_{CIF} (Yuen Long - 1.0)	=	735.3	m^3/day (refer to Table T-4 of GESF - Yuen Long - 1.0)
Contributing population	=	2723	people (refer to Section 12 of GESF)
Peaking factor	=	6	(refer to Table T-5 of GESF for a population between 1000-5000 incl. stormwater allowance)
Peak flow (without swimming pool)	=	**51.1**	litre/sec
Peak flow (with swimming pool)	=	**53.4**	litre/sec

Part of ADWF of Site 4-25b

Extracted from Appendix 5 - Sewerage Appraisal under No. A/HSK/573

Site 28B-2

1. Residential

Total number of residential units	=	958	units
Total number of residents	=	2682	residents (refer to Census and Statistics Department 2021 data - average household size of 2.8 in Hung Shui Kiu)
Design flow	=	270	litre/person/day -- (Private R2 in Table T-1 of GESF)
Sewage generation rate	=	**724.2**	m^3/day

2. Club House

Assumed area	=	1198	m^2 (Assume 2.5% of residential GFA)
Assumed floor area per employee	=	30.3	m^2 per employee -- (refer to Table 8 of CIFSUS - Community, Social & Personal Services)
Total number of employees	=	40	employees
Design flow	=	280	litre/employee/day -- (refer to Table T-2 of GESF - J11 Community, Social, Personal Services)
Sewage generation rate	=	**11.1**	m^3/day

3. Proposed Swimming Pool (Indoor)

Area of Swimming Pool	=	37.5	m^2 (Assume)
Depth of Swimming Pool	=	1.5	m
Volume of Swimming Pool (Ordinary Assumption)	=	56.25	m^3
Turnover Rate	=	4	hr
Required Surface Loading Rate of Filter	=	14.0625	$m^3/m^2/hr$
Filter Areas required	=	1	m^2
Adopted Surface Loading Rate of Filter	=	50	$m^3/m^2/hr$
Adopted Filter Area	=	0.28	m^2
Backwash Duration	=	3	min/d
Backwash flow rate	=	30	$m^3/m^2/hr$
Design flow for Swimming Pool Backwashing	=	0.421875	m^3/day
Design flow for Swimming Pool Backwashing	=	**2.3**	litre/sec

Total Flow from the Proposed Development (Site 28B-2)

Flow rate	=	735.3	m^3/day
Flow rate with P_{CIF} (Yuen Long - 1.0)	=	735.3	m^3/day (refer to Table T-4 of GESF - Yuen Long - 1.0)
Contributing population	=	2723	people (refer to Section 12 of GESF)
Peak flow (without swimming pool)	=	6	(refer to Table T-5 of GESF for a population between 1000-5000 incl. stormwater allowance)
Peak flow (with swimming pool)	=	**51.1**	litre/sec
	=	**53.4**	litre/sec

Part of ADWF of Site 4-25b

Extracted from Appendix 5 - Sewerage Appraisal under No. A/HSK/573

Site 28B-3

1. Residential

Total number of residential units	=	500	units
Total number of residents	=	1400	residents (refer to Census and Statistics Department 2021 data - average household size of 2.8 in Hung Shui Kiu)
Design flow	=	270	litre/person/day -- (Private R2 in Table T-1 of GESF)
Sewage generation rate	=	**378.0**	m^3/day

2. Club House

Assumed area	=	625	m^2 (Assume 2.5% of residential GFA)
Assumed floor area per employee	=	30.3	m^2 per employee -- (refer to Table 8 of CIFSUS - Community, Social & Personal Services)
Total number of employees	=	21	employees
Design flow	=	280	litre/employee/day -- (refer to Table T-2 of GESF - J11 Community, Social, Personal Services)
Sewage generation rate	=	**5.8**	m^3/day

3. Proposed Swimming Pool (Indoor)

Area of Swimming Pool	=	37.5	m^2 (Assume)
Depth of Swimming Pool	=	1.5	m
Volume of Swimming Pool (Ordinary Assumption)	=	56.25	m^3
Turnover Rate	=	4	hr
Required Surface Loading Rate of Filter	=	14.0625	$m^3/m^2/hr$
Filter Areas required	=	1	m^2
Adopted Surface Loading Rate of Filter	=	50	$m^3/m^2/hr$
Adopted Filter Area	=	0.28	m^2
Backwash Duration	=	3	min/d
Backwash flow rate	=	30	$m^3/m^2/hr$
Design flow for Swimming Pool Backwashing	=	0.421875	m^3/day
Design flow for Swimming Pool Backwashing	=	**2.3**	litre/sec

4. Commercial (Retail)

GFA	=	700	m^2
Assumed floor area per employee	=	28.6	m^2 per employee -- (refer to Table 8 of CIFSUS - Retail Trade)
Total number of employees	=	25	employees
Design flow	=	280	litre/employee/day -- (refer to Table T-2 of GESF - J4 Wholesale & Retail)
Sewage generation rate	=	**6.9**	m^3/day

5. Commercial (F&B)

GFA	=	700	m^2
Assumed floor area per employee	=	19.6	m^2 per employee -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	36	employees
Design flow	=	1580	litre/employee/day -- (refer to Table T-2 of GESF - J10 Restaurant & Hotels)
Sewage generation rate	=	**56.4**	m^3/day

6. Office

GFA	=	16504	m^2
Assumed floor area per employee	=	18.2	m^2 per employee -- (refer to Table 8 of CIFSUS - Financial, Insurance, Real Estate & Business Services)
Total number of employees	=	908	employees
Design flow	=	0.08	m^3/employee/day -- (refer to Table T-2 of GESF - J6 Finance, Insurance, Real Estate & Business Services)
Sewage generation rate	=	**72.6**	m^3/day

Total Flow from the Proposed Development (Site 28B-3)

Flow rate	=	519.7	m^3/day
Flow rate with P_{CIF} (Yuen Long - 1.0)	=	519.7	m^3/day (refer to Table T-4 of GESF - Yuen Long - 1.0)
Contributing population	=	1925	people (refer to Section 12 of GESF)
Peaking factor	=	6	(refer to Table T-5 of GESF for a population between 1000-5000 incl. stormwater allowance)
Peak flow	=	**36.1**	litre/sec
Peak flow (with swimming pool)	=	**38.4**	litre/sec

Total ADWF of Site 4-25a

Extracted from Appendix 5 - Sewerage Appraisal under No. A/HSK/573

Site 28B-4

1. Residential

Total number of residential units	=	1486	units
Total number of residents	=	4161	residents (refer to Census and Statistics Department 2021 data - average household size of 2.8 in Hung Shui Kiu)
Design flow	=	270	litre/person/day -- (Private R2 in Table T-1 of GESF)
Sewage generation rate	=	**1123.4**	m^3/day

2. Club House

Assumed area	=	1857	m^2 (Assume 2.5% of residential GFA)
Assumed floor area per employee	=	30.3	m^2 per employee -- (refer to Table 8 of CIFSUS - Community, Social & Personal Services)
Total number of employees	=	61	employees
Design flow	=	280	litre/employee/day -- (refer to Table T-2 of GESF - J11 Community, Social, Personal Services)
Sewage generation rate	=	**17.2**	m^3/day

3. Proposed Swimming Pool (Indoor)

Area of Swimming Pool	=	37.5	m^2 (Assume)
Depth of Swimming Pool	=	1.5	m
Volume of Swimming Pool (Ordinary Assumption)	=	56.25	m^3
Turnover Rate	=	4	hr
Required Surface Loading Rate of Filter	=	14.0625	$m^3/m^2/hr$
Filter Areas required	=	1	m^2
Adopted Surface Loading Rate of Filter	=	50	$m^3/m^2/hr$
Adopted Filter Area	=	0.28	m^2
Backwash Duration	=	3	min/d
Backwash flow rate	=	30	$m^3/m^2/hr$
Design flow for Swimming Pool Backwashing	=	0.421875	m^3/day
Design flow for Swimming Pool Backwashing	=	**2.3**	litre/sec

4. Commercial (Retail)

GFA	=	16474	m^2
Assumed floor area per employee	=	28.6	m^2 per employee -- (refer to Table 8 of CIFSUS - Retail Trade)
Total number of employees	=	577	employees
Design flow	=	280	litre/employee/day -- (refer to Table T-2 of GESF - J4 Wholesale & Retail)
Sewage generation rate	=	**161.4**	m^3/day

5. Commercial (F&B)

GFA	=	16474	m^2
Assumed floor area per employee	=	19.6	m^2 per employee -- (refer to Table 8 of CIFSUS - Restaurants)
Total number of employees	=	840	employees
Design flow	=	1580	litre/employee/day -- (refer to Table T-2 of GESF - J10 Restaurant & Hotels)
Sewage generation rate	=	**1327.5**	m^3/day

Total Flow from the Proposed Development (Site 28B-4)

Flow rate	=	2629.5	m^3/day
Flow rate with P_{CIF} (Yuen Long - 1.0)	=	2629.5	m^3/day (refer to Table T-4 of GESF - Yuen Long - 1.0)
Contributing population	=	9739	people (refer to Section 12 of GESF)
Peaking factor	=	5	(refer to Table T-5 of GESF for a population between 5000-10000 incl. stormwater allowance)
Peak flow (without swimming pool)	=	**152.2**	litre/sec
Peak flow (with swimming pool)	=	**154.5**	litre/sec

Total ADWF of Site 4-25c

Remark: The Proposed Development will have phasing based on indicative preliminary deisgn. This calculation is prepared base on 7 phasing (3 on Site 28A and 4 on Site 28B), serving only as an assumption for the Sewerage Appraisal.

Table 6a Comparison of the Hydraulic Capacity of the Lead-in for Each Site

Sewerage catchment to lead-ins

Hydraulic Capacity of Future Sewers

Manhole Reference	Manhole Reference	Proposed Pipe Dia. (mm)	Proposed Pipe Length (m)	Gradient	Estimated Capacity (L/s)	Peak Flow from the Proposed Development (L/s)	Contribution from the Proposed Development (%)	Status	Included Catchment
LI-S4.25b-1	FMH158a	355	11.4	0.0035	110	53.4	48.5%	OK	Site 28B-1
LI-S4.25b-3	FMH164a	355	12.8	0.0055	138	53.4	38.6%	OK	Site 28B-2
LI-S4.25a-1	FMH165a	355	11.6	0.0035	109	38.4	35.2%	OK	Site 28B-3
LI-S4.25c-1	FMH157b	355	11.6	0.0060	145	77.3	53.2%	OK	Half of Site 28B-4
LI-S4.25c-2	FMH399a	355	12.4	0.0056	140	77.3	55.1%	OK	Half of Site 28B-4
LI-S4.29-2	FMH168a	450	20.0	0.0040	220	64.3	29.2%	OK	Site 28A-1
LI-S4.29-3	FMH178A	315	17.6	0.0034	79	41.2	52.0%	OK	Half of Site 28A-2
LI-S4.29-4	FMH175a	315	14.6	0.0041	87	41.2	47.2%	OK	Half of Site 28A-2
LI-S4.29-1	FMH166b	450	13.0	0.0041	223	152.0	68.2%	OK	Site 28A-3

Table 6b Comparison of the Public Sewers for Sewerage generated from the Proposed Development and Surrounding Catchment Areas

Manhole Reference	Manhole Reference	Pipe Dia. (mm)	Pipe Length (m)	Gradient	Estimated Capacity (L/s)	Peak Flow from the Proposed Development and Surrounding Catchment (L/s)	Contribution from the S16 Proposed Development and Surrounding Catchment (%)	Status	Catchment included/ to be included
LI-S4.25c-1	FMH157b	355	11.6	0.006	145.11	77.3	53.2%	OK	Half of Site 28B-4
FMH157b	FMH399a	450	17.1	0.008	315.98	77.3	24.5%	OK	Half of Site 28B-4
LI-S4.25c-2	FMH399a	355	12.4	0.006	140.29	77.3	55.1%	OK	Half of Site 28B-4
FMH399a	FMH158a	450	37.1	0.006	274.74	154.5	56.2%	OK	Site 28B-4 (whole)
FMH158a	FMH159a	450	46.8	0.005	244.13	160.5	65.7%	OK	Site 28B-4 + Site 28B-1
FMH159a	FMH160b	450	42.0	0.006	269.18	160.5	59.6%	OK	Site 28B-4 + Site 28B-1
FMH160b	FMH162a	450	15.0	0.013	404.27	160.5	39.7%	OK	Site 28B-4 + Site 28B-1
FMH162a	FMH163a	560	57.5	0.004	407.34	263.6	64.7%	OK	Site 28B-4 + Site 28B-1 + Catchment A
FMH163a	FMH164a	560	39.7	0.006	481.41	263.6	54.7%	OK	Site 28B-4 + Site 28B-1 + Catchment A
FMH164a	FMH164_1	630	48.0	0.007	720.34	300.0	41.6%	OK	Site 28B-4 + Site 28B-1 + Catchment A + Site 28B-2
FMH164_1	FMH165a	630	49.8	0.003	475.71	300.0	63.1%	OK	Site 28B-4 + Site 28B-1 + Catchment A + Site 28B-2
FMH165a	FMH1119-1	710	39.2	0.003	634.39	382.1	60.2%	OK	Site 28B-4 + Site 28B-1+ Catchment A + Site 28B-2 + Site 28B-3 + Catchment B
FMH1119-1	FMH166b	710	42.3	0.003	635.83	382.1	60.1%	OK	Site 28B-4 + Site 28B-1+ Catchment A + Site 28B-2 + Site 28B-3 + Catchment B
FMH166b	FMH167a	710	52.6	0.005	777.05	581.5	74.8%	OK	Site 28B-4 + Site 28B-1 + Catchment A + Site 28B-2 + Site 28B-3 + Catchment B + Site 28A-3 + Half of Catchment C
FMH167a	FMH168a	710	63.5	0.005	790.53	581.5	73.6%	OK	Site 28B-4 + Site 28B-1 + Catchment A + Site 28B-2 + Site 28B-3 + Catchment B + Site 28A-3 + Half of Catchment C
FMH168a	FMH173a	710	67.0	0.003	672.74	625.5	93.0%	OK	Site 28B-4 + Site 28B-1 + Catchment A + Site 28B-2 + Site 28B-3 + Catchment B + Site 28A-3 + Half of Catchment C + Site 28A-1
FMH341A	FMH175a	500	28.9	0.007	383	23.1	6.0%	OK	Catchment D
FMH175a	FMH176b	710	22.7	0.007	998.34	73.2	7.3%	OK	Half of Site 28A-2 + Catchment D
FMH176b	FMH177a	710	36.3	0.008	1013.39	136.9	13.5%	OK	Half of Site 28A-2 + Catchment D + Catchment E
FMH177a	FMH178a	710	50.5	0.007	987.23	136.9	13.9%	OK	Half of Site 28A-2 + Catchment D + Catchment E
FMH178a	FMH173a	710	21.0	0.009	1069.26	176.6	16.5%	OK	Site 28A-2 + Catchment D + Catchment E
FMH173a	FMH179a	900	7.7	0.025	3387.43	765.0	22.6%	OK	Site 28B-1 + Site 28B-2 + Site 28B-3 + Site 28B-4 + Site 28A-1 + Site 28A-2 + Site 28A-3 + Catchment A + Catchment B + Half of Catchment C + Catchment D + Catchment E

Remark: The Proposed Development will have phasing based on indicative preliminary deisgn. This calculation is prepared base on 7 phasing (3 on Site 28A and 4 on Site 28B), serving only as an assumption for the Sewerage Appraisal.

S16 Planning Application for Proposed Flat and Shop and Services and Eating Place at Non-Domestic Podium within "G/IC(1)" Zone of Planning Area 34E of Hung Shui Kiu/ Ha Tsuen New Development Area
Sewerage Impact Assessment

Base Case Scenario

ARUP

Job No.	Sheet No.	Rev.	
278463			
Member/Location			
Job Title	HSK/HT NDA Package A Works for Second Phase Development - Design and Construction	Drg. Ref.	
Calculation	Estimation of Sewage Flow (by SPS and Phase)	Made by GC	Date 09/2025 Chd. BT

Sewage Pumping Station (1)	Implementation Phase (2)	Total Population (3)	ADWF (4) (m^3/day)	Cumulative ADWF (5) (m^3/day)	Design Cumulative ADWF (6) (m^3/day)	N (7)	P (8)	Q_{peak} (9) (m^3/day)	Q_{peak} (m^3/s)	Design Capacity (m^3/day)	Utilization Ratio (%)
Post-Development (Based on latest parameters under the Revised RODP)											
SPS2	AWP1	0	0	0	0	0	0.00	0	0.000	47,229	0%
	AWP2	0	0	57	59	219	4.00	226	0.003		0%
	AWP3	3,239	907	4,834	4,955	18,352	3.50	16,918	0.196		10%
	S1	0	0	4,834	4,955	18,352	3.50	16,918	0.196		10%
	S2	1,627	456	45,266	46,399	171,849	2.79	126,344	1.462		98%
	S3	0	0	46,076	47,229	174,923	2.79	128,457	1.487		100%
	S4	0	0	46,076	47,229	174,923	2.79	128,457	1.487		100%
SPS3	AWP1	0	0	0	0	0	0.00	0	0.000	12,341	0%
	AWP2	0	0	0	0	0	0.00	0	0.000		0%
	AWP3	0	0	0	0	0	0.00	0	0.000		0%
	S1	0	0	0	0	0	0.00	0	0.000		0%
	S2	42,747	11,230	11,230	11,511	42,634	3.00	33,690	0.390		93%
	S3	2,893	810	12,040	12,341	45,708	3.00	36,120	0.418		100%
	S4	0	0	12,040	12,341	45,708	3.00	36,120	0.418		100%
HSKEPP	AWP1	0	0		0	0	0.00	0	0.000	0	-
	AWP2	0	0		0	0	0.00	0	0.000		-
	AWP3	0	0		0	0	0.00	0	0.000		-
	S1	0	0		0	0	0.00	0	0.000		-
	S2	133,886	41,998	47,872	49,070	181,741	2.78	133,133	1.541	60000	82%
	S3	29,899	6,304	83,207	85,288	315,882	2.68	223,232	2.584	90000	95%
	S4	9,031	2,082	85,289	87,421	323,782	2.68	228,449	2.644		97%

Notes:

(1) Denotes the name of SPS to which the sewage flow is discharged

(2) Implementation phases in accordance with the latest development schedule enclosed in Appendix F

(3) Total projected population contributing to the respective SPS

(4) Estimated ADWF from the catchment area of its own respective SPS

(5) Cumulative ADWF of the SPS (i.e. SPS2 will receive sewage flow from SPS1 and SPS3)

- SPS2 will receive sewage flow from SPS1 and SPS3.
- SPS4 will receive sewage flow from existing Tin Wah Road Sewage Pumping Station (TWRSPS):

ADWF (m^3/day)	43,546

- HTSPS will receive sewage flow from Agreement No. CE 92/2017 (CE) Tan Kwai Tsuen Public Housing Development (TKT PHD) project for subsequent treatment at SWSTW:

ADWF (m^3/day)	4,960

(6) Cumulative ADWF of the SPS taking into account the Return Liquid Allowance (RLA) of 2.5%

RLA (%)	2.5

(7) Contributing population N calculated in accordance with EPD's GESF

(8) Peaking factor P calculated in accordance with EPD's GESF

(9) Estimated peak flow Q to the respective SPS

Proposed Scenario

1. Sewage flow build-up for the Application Site
2. Estimation of sewage flow by SPS and phasing

Proposed Scenario

Baseline (Extracted from S16 Planning Application No. A/HSK/452 (approved on 23 Jun 2023))							
Site No.	Zoning	Domestic GFA (m^2)	Average Flat Size (m^2)	Total Number of Flat	Total ADWF (m^3/day)	Design ADWF (1) (m^3/day)	Remarks
4-1	G	33600	70	480	436	447	- Divisional Fire Station cum Ambulance Depot - 140 workers - Divisional Fire Station cum Ambulance Depot - minimum site allocation of 3,830 sqm + Drill Yard of 1,635 sqm - 4 storeys podium for fire station/ambulance depot (Part of 1st-2nd floor will accommodate double-storey fire engine parking) - Two 31-storey residential towers (1 storey lobby + 30 storeys flats) (Reference: Existing footprint of developed FSD quarters)

(1) Design ADWF includes a return liquid allowance of 2.5%

Proposed Development							
Site No.	Zoning	GFA (m^2) (2)	Population	UFF (m^3/head/day)	Total ADWF (m^3/day)	Design ADWF (1) (m^3/day)	Remarks
4-1	Domestic (R1)	46560	2420	0.19	460	471	- Assume person per flat ratio of 2.6, with reference to the latest C&SD projection of average household size starting from 2031
	Non-domestic (Commercial – General)	2716	96	0.28	27	28	- Assume worker density of 3.5 based on "Retail Trade" activity under Table 8 of CIFSUS by PlanD
	Non-domestic (Restaurants)	1164	60	1.58	95	97	- Assume worker density of 5.1 based on "Restaurants" activity under Table 8 of CIFSUS by PlanD
	Clubhouse (Commercial – General)	2095.2	70	0.28	20	20	- Assume worker density of 3.3 based on "Community, Social & Personal Services" activity under Table 8 of CIFSUS by PlanD
				Total	601	616	

(1) Design ADWF includes a return liquid allowance of 2.5%
(2) Assume total non-domestic GFA (i.e. 3,880 m^2) comprises 70% non-catering and 30% catering GFA.

Estimation of backwash flow from proposed swimming pools

Indoor swimming pool

Pool length =	20	m	
Pool width =	9	m	
Pool depth =	1.5	m	
Pool volume =	270	m^3	
Turnover rate =	6	hours	
Filter loading rate =	48	m^3/m^2/hr	
Filter area required =	270 / 6 / 48 =	0.94	m^2
Backwash flow rate =	0.5	m^3/m^2/mins.	
Backwash duration =	3	mins./day	
Daily backwash flow =	0.94 x 3 x 0.5 =	1.41	m^3/day

Outdoor swimming pool

Pool length =	30	m	
Pool width =	9	m	
Pool depth =	1.5	m	
Pool volume =	405	m^3	
Turnover rate =	6	hours	
Filter loading rate =	48	m^3/m^2/hr	
Filter area required =	405 / 6 / 48 =	1.41	m^2
Backwash flow rate =	0.5	m^3/m^2/mins.	
Backwash duration =	3	mins./day	
Daily backwash flow =	1.41 x 3 x 0.5 =	2.12	m^3/day
Total daily backwash flow =	1.41 + 2.12 =	3.53	m^3/day

S16 Planning Application for Proposed Flat and Shop and Services and Eating Place at Non-Domestic Podium within "G/IC(1)" Zone of Planning Area 34E of Hung Shui Kiu/ Ha Tsuen New Development Area
Sewerage Impact Assessment

Proposed Scenario

ARUP

Job No.	Sheet No.	Rev.	
278463			
Member/Location			
Job Title	HSK/HT NDA Package A Works for Second Phase Development - Design and Construction	Drg. Ref.	
Calculation	Estimation of Sewage Flow (by SPS and Phase)	Made by GC	Date 09/2025 Chd. BT

Sewage Pumping Station (1)	Implementation Phase (2)	Total Population (3)	ADWF (4) (m^3/day)	Cumulative ADWF (5) (m^3/day)	Design Cumulative ADWF (6) (m^3/day)	N (7)	P (8)	Q_{peak} (9) (m^3/day)	Q_{peak} (m^3/s)	Design Capacity (m^3/day)	Utilization Ratio (%)
Post-Development (Based on latest parameters under the Revised RODP)											
SPS2	AWP1	0	0	0	0	0	0.00	0	0.000	47,398	0%
	AWP2	0	0	57	59	219	4.00	226	0.003		0%
	AWP3	3,239	907	4,834	4,955	18,352	3.50	16,918	0.196		10%
	S1	0	0	4,834	4,955	18,352	3.50	16,918	0.196		10%
	S2	1,627	456	45,432	46,568	172,475	2.79	126,776	1.467		98%
	S3	0	0	46,242	47,398	175,549	2.79	128,888	1.492		100%
	S4	0	0	46,242	47,398	175,549	2.79	128,888	1.492		100%
SPS3	AWP1	0	0	0	0	0	0.00	0	0.000	12,511	0%
	AWP2	0	0	0	0	0	0.00	0	0.000		0%
	AWP3	0	0	0	0	0	0.00	0	0.000		0%
	S1	0	0	0	0	0	0.00	0	0.000		0%
	S2	42,747	11,395	11,395	11,681	43,263	3.00	34,185	0.396		93%
	S3	2,893	810	12,205	12,511	46,338	3.00	36,616	0.424		100%
	S4	0	0	12,205	12,511	46,338	3.00	36,616	0.424		100%
HSKEPP	AWP1	0	0		0	0	0.00	0	0.000	0	-
	AWP2	0	0		0	0	0.00	0	0.000		-
	AWP3	0	0		0	0	0.00	0	0.000		-
	S1	0	0		0	0	0.00	0	0.000		-
	S2	133,886	42,163	48,038	49,239	182,367	2.78	133,563	1.546	60000	82%
	S3	29,899	6,304	83,372	85,457	316,508	2.68	223,647	2.589	90000	95%
	S4	9,031	2,082	85,454	87,591	324,412	2.68	228,863	2.649		97%

Notes:

(1) Denotes the name of SPS to which the sewage flow is discharged

(2) Implementation phases in accordance with the latest development schedule enclosed in Appendix F

(3) Total projected population contributing to the respective SPS

(4) Estimated ADWF from the catchment area of its own respective SPS

(5) Cumulative ADWF of the SPS (i.e. SPS2 will receive sewage flow from SPS1 and SPS3)

- SPS2 will receive sewage flow from SPS1 and SPS3.
- SPS4 will receive sewage flow from existing Tin Wah Road Sewage Pumping Station (TWRSPS):

ADWF (m^3/day)	43,546

- HTSPS will receive sewage flow from Agreement No. CE 92/2017 (CE) Tan Kwai Tsuen Public Housing Development (TKT PHD) project for subsequent treatment at SWSTW:

ADWF (m^3/day)	4,960

(6) Cumulative ADWF of the SPS taking into account the Return Liquid Allowance (RLA) of 2.5%

RLA (%)	2.5

(7) Contributing population N calculated in accordance with EPD's GESF

(8) Peaking factor P calculated in accordance with EPD's GESF

(9) Estimated peak flow Q to the respective SPS

Hydraulic Checking on Proposed Gravity Sewer

ARUP

Job No.	Sheet No.	Rev.
278463		
Member/Location		
Drg. Ref.		
Made by GC	Date Sept 2025	Chd. BT

Job Title: HSK/HT NDA Package A Works for Second Phase Development - Design and Construction

Calculation: **Hydraulic Checking on Proposed Sewerage Works in C4**

Table 1c Capacity Check - Proposed Development

Location and Level/Depth Information											Pipe/Channel/BC/UC Information											Peak Flow Estimation						Pipeworks Capacity and Design			
																												Velocity		Capacity	
US MH No.	DS MH No.	USGL (mPD)	DSGL (mPD)	USIL (mPD)	DSIL (mPD)	US DTIL (m)	DS DTIL (m)	DS MH BackDrop (DS_i - US_{i+1})	US Cover Depth (m)	DS Cover Depth (m)	Length (m)	Shape (UC/Circular/ BC/RC)	Nominal Diameter	Pipe Material	Diameter of Pipe/Width of Channel (mm)	Diameter of Pipe/Width of Channel (m)	No of Cells or Pipes	Gradient (1 in)	Flow Area (m^2)	Wetted Perimeter (m)	Hydraulic Radius (m)	Colebrook-White Roughness Coefficient (mm)	Additional ADWF (m^3/day)	Cumulative ADWF (m^3/day)	Cumulative ADWF (m^3/s)	Cumulative Contributing Population (Head)	Peak Factor	Total Peak Flow per Pipe or Cell (m^3/s)	(32gRS)^0.5	Full-bore Velocity (m/s)	Full-bore Capacity per Pipe or Cell (m^3/s)	Utilization Ratio
FMHSPS3-BP0	FMHSPS3-BP1	11.25	8.70	7.700	7.650	3.550	1.050	0.000	3.06	0.56	8.75	Circular	NS560	HDPE (SDR17)	491.8	0.4918	2	175	0.190	1.545	0.123	0.3	12511	12511.00	0.145	46337	4.00	0.290	0.47	1.75	0.33	87%
FMHSPS3-BP1	FMHSPS3-BP2	8.70	10.98	7.650	7.450	1.050	3.530	0.000	0.56	3.04	36.37	Circular	NS560	HDPE (SDR17)	491.8	0.4918	2	182	0.190	1.545	0.123	0.3	0.00	12511.00	0.145	46337	4.00	0.290	0.46	1.71	0.33	89%
FMHSPS3-BP2	FMHSPS3-BP3	10.98	9.83	7.450	7.400	3.530	2.430	0.000	2.74	1.64	25.53	Circular	NS900	HDPE (SDR17)	791.6	0.7916	1	511	0.492	2.487	0.198	0.3	0.00	12511.00	0.145	46337	4.00	0.579	0.35	1.36	0.67	86%
FMHSPS3-BP3	FMHSPS3-BP4	9.83	8.67	7.400	7.340	2.430	1.330	0.000	1.64	0.54	32.33	Circular	NS900	HDPE (SDR17)	791.6	0.7916	1	539	0.492	2.487	0.198	0.3	0.00	12511.00	0.145	46337	4.00	0.579	0.34	1.33	0.65	89%
FMHSPS3-BP4	FMHSPS3-BP5	8.67	8.13	7.340	7.240	1.330	0.890	0.000	0.84	0.40	14.98	Circular	NS560	HDPE (SDR17)	491.8	0.4918	2	150	0.190	1.545	0.123	0.3	0.00	12511.00	0.145	46337	4.00	0.290	0.51	1.89	0.36	81%
FMHSPS3-BP5	FMHSPS3-BP6	8.13	7.93	7.240	7.070	0.890	0.860	0.000	0.40	0.37	15.05	Circular	NS560	HDPE (SDR17)	491.8	0.4918	2	89	0.190	1.545	0.123	0.3	0.00	12511.00	0.145	46337	4.00	0.290	0.66	2.47	0.47	62%
FMHSPS3-BP6	FMHSPS3-BP7	7.93	9.09	7.070	6.980	0.860	2.110	0.000	0.37	1.62	16.68	Circular	NS560	HDPE (SDR17)	491.8	0.4918	2	185	0.190	1.545	0.123	0.3	0.00	12511.00	0.145	46337	4.00	0.290	0.46	1.70	0.32	90%
FMHSPS3-BP7	FMHSPS3-BP8	9.09	9.72	6.980	6.953	2.110	2.767	0.000	1.32	1.98	23.50	Circular	NS900	HDPE (SDR17)	791.6	0.7916	2	870	0.492	2.487	0.198	0.3	0.00	12511.00	0.145	46337	4.00	0.290	0.27	1.04	0.51	57%
FMHSPS3-BP8	FMHSPS3-BP9	9.72	9.03	6.953	6.400	2.767	2.630	0.000	1.98	1.84	20.40	Circular	NS900	HDPE (SDR17)	791.6	0.7916	1	37	0.492	2.487	0.198	0.3	0.00	12511.00	0.145	46337	4.00	0.579	1.30	5.15	2.53	23%
FMHSPS3-BP9	FMHSPS3-BP10	9.03	8.03	6.400	5.580	2.630	2.450	0.000	1.84	1.66	25.63	Circular	NS900	HDPE (SDR17)	791.6	0.7916	1	31	0.492	2.487	0.198	0.3	0.00	12511.00	0.145	46337	4.00	0.579	1.41	5.60	2.75	21%
FMHSPS3-BP10	SMH009L18	8.03	5.89	5.580	5.000	2.450	0.890	-	1.66	0.10	18.08	Circular	NS900	HDPE (SDR17)	791.6	0.7916	1	31	0.492	2.487	0.198	0.3	0.00	12511.00	0.145	46337	4.00	0.579	1.41	5.60	2.76	21%
LI-S4.4-2	FMH206a	15.00	14.85	12.000	11.690	3.000	3.160	0.050	2.65	2.81	31.42	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	101	0.097	1.104	0.088	0.3	854.85	854.85	0.010	3166	6.00	0.059	0.52	1.87	0.18	33%
FMH206a	FMH207a	14.85	14.53	11.640	11.310	3.210	3.220	0.600	2.81	2.82	37.56	Circular	NS450	HDPE (SDR17)	395.2	0.3952	1	114	0.123	1.242	0.099	0.3	26.55	881.40	0.010	3264	6.00	0.061	0.52	1.90	0.23	26%
FMH207a	FMH208b	14.53	13.85	10.710	10.500	3.820	3.350	0.000	3.42	2.95	37.04	Circular	NS450	HDPE (SDR17)	395.2	0.3952	1	176	0.123	1.242	0.099	0.3	457.39	1338.79	0.015	4958	6.00	0.093	0.42	1.52	0.19	50%
FMH208b	FMH209b	13.85	13.18	10.500	10.100	3.350	3.080	0.050	2.95	2.68	51.70	Circular	NS450	HDPE (SDR17)	395.2	0.3952	1	129	0.123	1.242	0.099	0.3	738.91	2077.69	0.024	7695	5.00	0.120	0.49	1.78	0.22	55%
FMH209b	FMH210b	13.18	13.88	10.050	9.590	3.130	4.290	0.120	2.69	3.85	65.74	Circular	NS500	HDPE (SDR17)	439.2	0.4392	1	143	0.152	1.380	0.110	0.3	738.91	2816.60	0.033	10432	4.00	0.130	0.49	1.81	0.27	48%
FMH210b	FMH211a	13.88	12.92	9.470	9.240	4.410	3.680	0.000	3.97	3.24	60.01	Circular	NS500	HDPE (SDR17)	439.2	0.4392	1	261	0.152	1.380	0.110	0.3	290.87	3107.47	0.036	11509	4.00	0.144	0.36	1.33	0.20	71%
FMH211a	FMH217a	12.92	11.97	9.240	9.020	3.680	2.950	2.650	3.19	2.46	60.92	Circular	NS560	HDPE (SDR17)	491.8	0.4918	1	277	0.190	1.545	0.123	0.3	290.87	3398.35	0.039	12586	4.00	0.157	0.37	1.38	0.26	60%
FMH217a	FMH218a	11.97	11.06	6.370	6.160	5.600	4.900	0.070	4.90	4.20	59.07	Circular	NS800	HDPE (SDR17)	703.9	0.7039	1	281	0.389	2.211	0.176	0.3	0.00	3398.35	0.039	12586	4.00	0.157	0.44	1.72	0.67	24%
FMH218a	FMH219	11.06	10.51	6.090	5.910	4.970	4.600	0.000	4.09	3.72	57.10	Circular	NS1000	HDPE (SDR17)	879.8	0.8798	1	317	0.608	2.764	0.220	0.3	587.35	3985.69	0.046	14762	4.00	0.185	0.47	1.85	1.13	16%
FMH219	FMH219a	10.51	12.08	5.910	5.750	4.600	6.330	0.010	3.79	5.52	60.40	Circular	NS1000	HDPE (SDR11)	814.9	0.8149	1	378	0.522	2.560	0.204	0.3	7106.65	11092.34	0.128	41083	4.00	0.514	0.41	1.62	0.84	61%
FMH219a	FMH219a.1	12.08	12.51	5.740	5.720	6.340	6.790	0.010	5.53	5.98	10.21	Circular	NS1000	HDPE (SDR11)	814.9	0.8149	1	510	0.522	2.560	0.204	0.3	0.00	11092.34	0.128	41083	4.00	0.514	0.35	1.39	0.72	71%
FMH219a.1	FMH219a.2	12.51	11.25	5.710	5.680	6.800	5.570	0.000	5.99	4.76	16.04	Circular	NS1000	HDPE (SDR11)	814.9	0.8149	1	535	0.522	2.560	0.204	0.3	0.00	5546.17	0.064	20541	4.00	0.257	0.35	1.36	0.71	36%
FMH219a.2	D-SPS3-1	11.25	6.68	5.680	5.670	5.570	1.010	-	4.69	0.13	6.35	Circular	NS1000	HDPE (SDR17)	879.8	0.8798	1	635	0.608	2.764	0.220	0.3	0.00	5546.17	0.064	20541	4.00	0.257	0.33	1.30	0.79	32%
FMH219a.1	FMH219a.3	12.51	11.25	5.710	5.680	6.800	5.570	0.000	5.99	4.76	17.50	Circular	NS1000	HDPE (SDR11)	814.9	0.8149	1	583	0.522	2.560	0.204	0.3	0.00	5546.17	0.064	20541	4.00	0.257	0.33	1.30	0.68	38%
FMH219a.3	D-SPS3-2	11.25	6.68	5.680	5.670	5.570	1.010	-	4.69	0.13	7.79	Circular	NS1000	HDPE (SDR17)	879.8	0.8798	1	779	0.608	2.764	0.220	0.3	0.00	5546.17	0.064	20541	4.00	0.257	0.30	1.17	0.71	36%
LI-S4.2-1	FMH206a	15.00	14.85	12.140	12.070	2.860	2.780	0.430	2.61	2.53	23.74	Circular	NS280	HDPE (SDR17)	245.9	0.2459	1	339	0.047	0.773	0.061	0.3	26.55	26.55	0.000	98	8.00	0.002	0.24	0.80	0.04	6%
LI-S4.2-2	FMH207a	15.00	14.53	12.140	12.050	2.860	2.480	1.340	2.61	2.23	14.98	Circular	NS280	HDPE (SDR17)	245.9	0.2459	1	166	0.047	0.773	0.061	0.3	26.55	26.55	0.000	98	8.00	0.002	0.34	1.16	0.05	4%
LI-S4.3-3	FMH207a	13.48	14.53	10.850	10.710	2.630	3.820	0.000	2.32	3.51	14.98	Circular	NS355	HDPE (SDR17)	311.6	0.3116	1	107	0.076	0.979	0.078	0.3	430.84	430.84	0.005	1596	6.00	0.030	0.48	1.69	0.13	23%
LI-S4.1-1	FMH208b	14.50	13.85	12.140	12.050	2.360	1.800	1.550	2.05	1.49	17.77	Circular	NS355	HDPE (SDR17)	311.6	0.3116	1	197	0.076	0.979	0.078	0.3	308.06	308.06	0.004	1141	6.00	0.021	0.35	1.23	0.09	23%
LI-S4.3-1	FMH208b	14.25	13.85	11.000	10.770	3.250	3.080	0.270	2.90	2.73	23.90	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	104	0.097	1.104	0.088	0.3	430.84	430.84	0.005	1596	6.00	0.030	0.52	1.84	0.18	17%
LI-S4.1-2	FMH209b	14.50	13.18	12.140	12.050	2.360	1.130	2.000	2.05	0.82	16.25	Circular	NS355	HDPE (SDR17)	311.6	0.3116	1	181	0.076	0.979	0.078	0.3	308.06	308.06	0.004	1141	6.00	0.021	0.37	1.29	0.10	22%
LI-S4.3-2	FMH209b	13.80	13.18	10.700	10.480	3.100	2.700	0.430	2.75	2.35	22.44	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	102	0.097	1.104	0.088	0.3	430.84	430.84	0.005	1596	6.00	0.030	0.52	1.86	0.18	17%
LI-S3.39-1	FMH210b	14.19	13.88	11.400	11.280	2.790	2.600	1.810	2.48	2.29	17.96	Circular	NS355	HDPE (SDR17)	311.6	0.3116	1	150	0.076	0.979	0.078	0.3	290.87	290.87	0.003	1077	6.00	0.020	0.40	1.42	0.11	19%
LI-S3.39-2	FMH211a	13.87	12.92	11.140	11.050	2.730	1.870	1.810	2.42	1.56	14.08	Circular	NS355	HDPE (SDR17)	311.6	0.3116	1	156	0.076	0.979	0.078	0.3	290.87	290.87	0.003	1077	6.00	0.020	0.40	1.39	0.11	19%
LI-S3.36-1	FMH260a	14.00	14.11	10.250	10.220	3.750	3.890	0.010	3.40	3.54	6.05	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	202	0.097	1.104	0.088	0.3	0.00	0.00	0.000	0	8.00	0.000	0.37	1.32	0.13	0%
FMH260a	FMH261B	14.11	13.67	10.210	10.170	3.900	3.500	0.000	3.55	3.15	9.59	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	240	0.097	1.104	0.088	0.3	0.00	0.00	0.000	0	8.00	0.000	0.34	1.21	0.12	0%
FMH261B	FMH261a	13.67	12.88	10.170	10.110	3.500	2.770	0.000	3.15	2.42	18.13	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	302	0.097	1.104	0.088	0.3	0.00	0.00	0.000	0	8.00	0.000	0.30	1.07	0.10	0%
FMH261a	FMH262a	12.88	12.40	10.110	8.900	2.770	3.500	0.000	2.42	3.15	58.21	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	48	0.097	1.104	0.088	0.3	0.00	0.00	0.000	0	8.00	0.000	0.76	2.72	0.26	0%
FMH262a	FMH263a	12.40	12.45	8.900	8.822	3.500	3.628	0.000	3.15	3.28	26.62	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	341	0.097	1.104	0.088	0.3	0.00	0.00	0.000	0	8.00	0.000	0.28	1.01	0.10	0%
FMH263a	FMH217a	12.45	11.97	8.822	8.490	3.628	3.480	2.120	3.28	3.13	29.86	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	90	0.097	1.104	0.088	0.3	0.00	0.00	0.000	0	8.00	0.000	0.55	1.98	0.19	0%
LI-S3.40-2	FMH218a	13.00	11.06	6.190	6.090	6.810	4.970	0.000	6.50	4.66	14.73	Circular	NS355	HDPE (SDR17)	311.6	0.3116	1	147	0.076	0.979	0.078	0.3	587.35	587.35	0.007	2175	6.00	0.041	0.41	1.43	0.11	37%
LI-S4.23	FMH423a	11.10	9.30	8.200	8.180	2.900	1.120	0.000	2.62	0.84	4.74	Circular	NS315	HDPE (SDR17)	276.6	0.2766	1	237	0.060	0.869	0.069	0.3	2.87	2.87	0.000	11	8.00	0.000	0.30	1.04	0.06	0%
FMH423a	FMH423b	9.30	11.00	8.180	8.000	1.120	3.000	0.300	0.84	2.72	43.21	Circular	NS315	HDPE (SDR17)	276.6	0.2766	1	240	0.060	0.869	0.069	0.3	0.00	2.87	0.000	11	8.00	0.000	0.30	1.03	0.06	0%
FMH423b	FMH423c	11.00	10.53	7.700	7.250	3.300	3.280	0.600	2.90	2.88	21.00	Circular	NS450	HDPE (SDR17)	395.2	0.3952	1	47	0.123	1.242	0.099	0.3	692.39	695.26	0.008	2575	6.00	0.048	0.82	2.98	0.37	13%
FMH423c	FMH219	10.53	10.51	6.650	6.510	3.880	4.000	0.600	3.26	3.38	10.43	Circular	NS710	HDPE (SDR17)	624.6	0.6246	1	74	0.306	1.962	0.156	0.3	6411.39	7106.65	0.082	26321	4.00	0.329	0.81	3.12	0.96	34%
LI-S4.5-1	FMH193.1	13.50	12.94	10.600	10.520	2.900	2.420	0.000	2.55	2.07	6.17	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	77	0.097	1.104	0.088	0.3	1271.51	1271.51	0.015	4709	6.00	0.088	0.60	2.15	0.21	42%
FMH193.1	FMH194.1	12.94	12.72	10.520	9.680	2.420	3.040	0.000	2.07	2.69	106.61	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	127	0.097	1.104	0.088	0.3	0.00	1271.51	0.015	4709	6.00	0.088	0.47	1.67	0.16	55%
FMH194.1	FMH195.1	12.72	12.52	9.680	8.900	3.040	3.620	0.200	2.69	3.27	39.23	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	50	0.097	1.104	0.088	0.3	1271.51	2543.03	0.029	9419	5.00	0.147	0.74	2.66	0.26	57%
FMH195.1	FMH196.1	12.52	12.45	8.700	8.600	3.820	3.850	0.000	3.33	3.36	14.77	Circular	NS560	HDPE (SDR17)	491.8	0.4918	1	148	0.190	1.545	0.123	0.3	854.85	3397.88	0.039	12585	4.00	0.157	0.51	1.91	0.36	43%
FMH196.1	FMH211_a	12.45	12.57	8.600	8.540	3.850	4.030	0.150	3.36	3.54	12.06	Circular	NS560	HDPE (SDR17)	491.8	0.4918	1	201	0.190	1.545	0.123	0.3	0.00	3397.88	0.039	12585	4.00	0.157	0.44	1.63	0.31	51%
FMH211_a	FMH213	12.57	12.87	8.390	8.320	4.180	4.550	0.000	3.56	3.93	32.85	Circular	NS710	HDPE (SDR17)	624.6	0.6246	1	469	0.306	1.962	0.156	0.3	2321.13	5719.01	0.066	21182	4.00	0.265	0.32	1.23	0.38	70%
FMH213	FMH212a	12.87	13.09	8.320	8.250	4.550	4.840	0.000	3.93	4.22	29.84	Circular	NS710	HDPE (SDR17)	624.6	0.6246	1	426	0.306	1.962	0.156	0.3	0.00	5719.01	0.066	21182	4.00	0.265	0.34	1.29	0.40	67%
FMH212a	FMH215	13.09	12.87	8.250	8.140	4.840	4.730	0.000	4.22	4.11	53.60	Circular	NS710	HDPE (SDR17)	624.6	0.6246	1	487	0.306	1.962	0.156	0.3	0.00	5719.01	0.066	21182	4.00	0.265	0.32	1.21	0.37	72%
FMH215	FMH213a	12.87	12.60	8.140	8.060	4.730	4.540	0.000	4.11	3.92	24.63	Circular	NS710	HDPE (SDR17)	624.6	0.6246	1	308	0.306	1.962	0.156	0.3	0.00	5719.01	0.066	21182	4.00	0.265	0.40	1.52	0.47	57%
FMH213a	FMH216	12.60	12.43	8.060	8.000	4.540	4.430	0.000	3.92	3.81	24.80	Circular	NS710	HDPE (SDR17)	624.6	0.6246	1	413	0.306	1.962	0.156	0.3	0.00	5719.01	0.066	21182	4.00	0.265	0.34	1.31	0.40	66%
FMH216	FMH215a	12.43	12.28	8.000	7.850	4.430	4.430	0.000	3.81	3.81	60.25	Circular	NS710	HDPE (SDR17)	624.6	0.6246	1	402	0.306	1.962	0.156	0.3	0.00	5719.01	0.066	21182	4.00	0.265	0.35	1.33	0.41	65%
FMH215a	FMH216a	12.28	12.50	7.850	7.770	4.430	4.730	0.000	3.81	4.11	31.12	Circular	NS710	HDPE (SDR17)	624.6	0.6246	1	389	0.306	1.962	0.156	0.3	0.00	5719.01	0.066	21182	4.00	0.265	0.35	1.35	0.41	64%
FMH216a	FMH423d	12.50	12.03	7.770	7.690	4.730	4.340	0.000	4.11	3.72	19.20	Circular	NS710	HDPE (SDR17)	624.6	0.6246	1	240	0.306	1.962	0.156	0.3	692.39	6411.39	0.074	23746	4.00	0.297	0.45	1.73	0.53	56%
FMH423d	FMH423c	12.03	10.53	7.690	7.240	4.340	3.290	0.590	3.72	2.67	119.12	Circular	NS710	HDPE (SDR17)	624.6	0.6246	1	265	0.306	1.962	0.156	0.3	0.00	6411.39	0.074	23746	4.00	0.297	0.43	1.64	0.50	59%
LI-S4.8-1	FMH224a	11.50	10.14	8.768	8.711	2.732	1.429	0.000	2.42	1.12	16.70	Circular	NS355	HDPE (SDR17)	311.6	0.3116	1	293	0.076	0.979	0.078	0.3	64.25	64.25	0.001	238	8.00	0.006	0.29	1.01	0.08	8%
FMH224a	FMH223a	10.14	10.45	8.711	8.637	1.429	1.813	0.000	1.03	1.42	29.42	Circular	NS450	HDPE (SDR17)	395.2	0.3952	1	398	0.123	1.242	0.099	0.3	339.68	403.93	0.005	1496	6.00	0.028	0.28	1.00	0.12	23%
FMH223a	FMH209_a	10.45	10.81	8.637	8.573	1.813	2.237	0.000	1.37	1.80	29.14	Circular	NS500	HDPE (SDR17)	439.2	0.4392	1	455	0.152	1.380	0.110	0.3	403.93	807.85	0.009	2992	6.00	0.056	0.28	1.00	0.15	37%
FMH209_a	FMH210_a	10.81	10.92	8.573	8.545	2.237	2.375	0.000	1.75	1.88	14.21	Circular	NS560	HDPE (SDR17)	491.8	0.4918	1	507	0.190	1.545	0.123	0.3	756.64	1564.49	0.018	5794	5.00	0.091	0.28	1.02	0.19	47%
FMH210_a	FMH211_a	10.92	12.57	8.545	8.390	2.375	4.180	0.000	1.88	3.69	80.24	Circular	NS560	HDPE (SDR17)	491.8	0.4918	1	518	0.190	1.545	0.123	0.3	756.64	2321.13	0.027	8597	5.00	0.134	0.27	1.01	0.19	70%
LI-S4.10-2	FMH224a	11.50	10.14	8.764	8.711	2.736	1.429	0.000	2.42	1.12	15.66	Circular	NS355	HDPE (SDR17)	311.6	0.3116	1	295	0.076	0.979	0.078	0.3	339.68	339.68	0.004	1258	6.00	0.024	0.29	1.00	0.08	31%
LI-S4.10-1	FMH223a	11.70	10.45	8.693	8.637	3.007	1.813	0.000	2.70	1.50	16.54	Circular	NS355	HDPE (SDR17)	311.6	0.3116	1	295	0.076	0.979	0.078	0.3	339.68	339.68	0.004	1258	6.00	0.024	0.29	1.00	0.08	31%
LI-S4.8-2	FMH223a	11.70	10.45	8.689	8.637	3.011	1.813	0.000	2.70	1.50	15.24	Circular	NS355	HDPE (SDR17)	311.6	0.3116	1	293	0.076	0.979	0.078	0.3	64.25	64.25	0.001	238	8.00	0.006	0.29	1.01	0.08	8%

ARUP	Job No. 278463	Sheet No.	Rev.
	Member/Location		
Job Title HSK/HT NDA Package A Works for Second Phase Development - Design and Construction	Drg. Ref.		
Calculation **Hydraulic Checking on Proposed Sewerage Works in C4**	Made by GC	Date Sept 2025	Chd. BT

Table 1c Capacity Check - Proposed Development

Location and Level/Depth Information										Pipe/Channel/BC/UC Information										Peak Flow Estimation						Pipeworks Capacity and Design			
																										Velocity		Capacity	
US MH No.	DS MH No.	USGL (mPD)	DSGL (mPD)	USIL (mPD)	DSIL (mPD)	US DTIL (m)	DS DTIL (m)	DS MH BackDrop (DS_i - US_{i+1})	US Cover Depth (m)	DS Cover Depth (m)	Length (m)	Shape (UC/Circular/ BC/RC)	Nominal Diameter	Pipe Material	Diameter of Pipe/Width of Channel (mm)	Diameter of Pipe/Width of Channel (m)	No of Cells or Pipes	Gradient (1 in)	Flow Area (m^2)	Wetted Perimeter (m)	Hydraulic Radius (m)	Colebrook-White Roughness Coefficient (mm)	Additional ADWF (m^3/day)	Cumulative ADWF (m^3/day)	Cumulative ADWF (m^3/s)	Cumulative Contributing Population (Head)	Peak Factor	Total Peak Flow per Pipe or Cell (m^3/s)	(32gRS)^0.5	Full-bore Velocity (m/s)	Full-bore Capacity per Pipe or Cell (m^3/s)	Utilization Ratio
LI-S4.9-2	FMH209_a	11.40	10.81	8.619	8.573	2.781	2.237	0.000	2.39	1.84	18.13	Circular	NS450	HDPE (SDR17)	395.2	0.3952	1	394	0.123	1.242	0.099	0.3	756.64	756.64	0.009	2802	6.00	0.053	0.28	1.01	0.12	43%
LI-S4.9-1	FMH210_a	11.40	10.92	8.558	8.545	2.842	2.375	0.000	2.45	1.98	5.15	Circular	NS450	HDPE (SDR17)	395.2	0.3952	1	396	0.123	1.242	0.099	0.3	756.64	756.64	0.009	2802	6.00	0.053	0.28	1.00	0.12	43%
LI-S4.5-2	FMH194.1	13.50	12.72	9.730	9.680	3.770	3.040	0.000	3.42	2.69	4.74	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	95	0.097	1.104	0.088	0.3	1271.51	1271.51	0.015	4709	6.00	0.088	0.54	1.93	0.19	47%
LI-S4.4-1	FMH195.1	13.13	12.52	11.230	11.130	1.900	1.390	2.530	1.55	1.04	7.44	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	74	0.097	1.104	0.088	0.3	854.85	854.85	0.010	3166	6.00	0.059	0.61	2.18	0.21	28%
LI-S4.7-1	FMH212a	14.00	13.09	7.440	7.400	6.560	5.690	-0.850	6.21	5.34	9.63	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	241	0.097	1.104	0.088	0.3	0.00	0.00	0.000	0	8.00	0.000	0.34	1.20	0.12	0%
LI-S4.7-2	FMH215	14.00	12.87	11.680	11.640	2.320	1.230	3.500	1.97	0.88	9.71	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	243	0.097	1.104	0.088	0.3	0.00	0.00	0.000	0	8.00	0.000	0.34	1.20	0.12	0%
LI-S4.6-1	FMH423b	11.00	11.00	8.100	8.050	2.900	2.950	0.350	2.50	2.55	5.00	Circular	NS450	HDPE (SDR17)	395.2	0.3952	1	100	0.123	1.242	0.099	0.3	692.39	692.39	0.008	2564	6.00	0.048	0.56	2.02	0.25	19%
LI-S4.6-2	FMH216a	12.20	12.50	8.500	8.430	3.700	4.070	0.660	3.35	3.72	11.05	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	158	0.097	1.104	0.088	0.3	692.39	692.39	0.008	2564	6.00	0.048	0.42	1.49	0.14	33%
LI-S4.13b-2	FMH105a	13.50	12.71	11.050	10.950	2.450	1.760	0.000	2.01	1.32	18.90	Circular	NS500	HDPE (SDR17)	439.2	0.4392	1	189	0.152	1.380	0.110	0.3	777.89	777.89	0.009	2881	6.00	0.054	0.43	1.57	0.24	23%
FMH105a	FMH106a	12.71	12.78	10.950	10.880	1.760	1.900	0.000	1.32	1.46	13.95	Circular	NS500	HDPE (SDR17)	439.2	0.4392	1	199	0.152	1.380	0.110	0.3	0.00	777.89	0.009	2881	6.00	0.054	0.42	1.52	0.23	23%
FMH106a	FMH106b	12.78	13.39	10.880	10.640	1.900	2.750	0.000	1.41	2.26	46.34	Circular	NS560	HDPE (SDR17)	491.8	0.4918	1	193	0.190	1.545	0.123	0.3	2738.76	3516.65	0.041	13025	4.00	0.163	0.45	1.66	0.32	52%
FMH106b	FMH107a	13.39	14.54	10.640	10.490	2.750	4.050	0.000	2.26	3.56	26.99	Circular	NS560	HDPE (SDR17)	491.8	0.4918	1	180	0.190	1.545	0.123	0.3	0.00	3516.65	0.041	13025	4.00	0.163	0.46	1.72	0.33	50%
FMH107a	FMH108a	14.54	15.42	10.490	10.330	4.050	5.090	0.000	3.56	4.60	30.35	Circular	NS560	HDPE (SDR17)	491.8	0.4918	1	190	0.190	1.545	0.123	0.3	667.94	4184.59	0.048	15498	4.00	0.194	0.45	1.68	0.32	61%
FMH108a	FMH109a	15.42	15.68	10.330	10.200	5.090	5.480	0.000	4.47	4.86	23.86	Circular	NS710	HDPE (SDR17)	624.6	0.6246	1	184	0.306	1.962	0.156	0.3	667.94	4852.53	0.056	17972	4.00	0.225	0.52	1.98	0.61	37%
FMH109a	FMH109b	15.68	16.30	10.200	9.980	5.480	6.320	0.000	4.86	5.70	43.30	Circular	NS710	HDPE (SDR17)	624.6	0.6246	1	197	0.306	1.962	0.156	0.3	474.12	5326.66	0.062	19728	4.00	0.247	0.50	1.91	0.59	42%
FMH109b	FMH110a	16.30	17.21	9.980	9.710	6.320	7.500	0.000	5.70	6.88	51.73	Circular	NS710	HDPE (SDR17)	624.6	0.6246	1	192	0.306	1.962	0.156	0.3	474.12	5800.78	0.067	21484	4.00	0.269	0.51	1.94	0.59	45%
FMH110a	FMH115	17.21	18.25	9.710	9.520	7.500	8.730	0.000	6.88	8.11	35.57	Circular	NS710	HDPE (SDR17)	624.6	0.6246	1	187	0.306	1.962	0.156	0.3	524.77	6325.55	0.073	23428	4.00	0.293	0.51	1.96	0.60	49%
FMH115	FMH116a	18.25	18.86	9.520	9.380	8.730	9.480	0.000	8.15	8.90	27.07	Circular	NS710	HDPE (SDR11)	577.6	0.5776	1	193	0.262	1.815	0.144	0.3	524.77	6850.32	0.079	25372	4.00	0.317	0.48	1.84	0.48	66%
FMH116a	FMH122a	18.86	19.00	9.380	9.167	9.480	9.833	0.000	8.90	9.26	29.11	Circular	NS710	HDPE (SDR11)	577.6	0.5776	1	137	0.262	1.815	0.144	0.3	3065.75	9916.08	0.115	36726	4.00	0.459	0.58	2.19	0.57	80%
FMH122a	TEP-D7	19.00	9.59	9.167	8.700	9.833	0.890	-	9.10	0.16	81.94	Circular	NS900	HDPE (SDR11)	732.4	0.7324	1	175	0.421	2.301	0.183	0.3	1358.49	11274.57	0.130	41758	4.00	0.522	0.57	2.24	0.94	55%
LI-S4.12d-1	FMH119a	18.00	17.86	14.530	14.410	3.470	3.450	0.000	3.07	3.05	17.44	Circular	NS450	HDPE (SDR17)	395.2	0.3952	1	145	0.123	1.242	0.099	0.3	549.63	549.63	0.006	2036	6.00	0.038	0.46	1.68	0.21	19%
FMH119a	FMH120a	17.86	17.76	14.410	14.280	3.450	3.480	4.250	3.05	3.08	17.48	Circular	NS450	HDPE (SDR17)	395.2	0.3952	1	134	0.123	1.242	0.099	0.3	0.00	549.63	0.006	2036	6.00	0.038	0.48	1.74	0.21	18%
FMH120a	FMH121a	17.76	18.15	10.030	9.850	7.730	8.300	0.000	7.36	7.93	48.35	Circular	NS450	HDPE (SDR11)	365.4	0.3654	1	269	0.105	1.148	0.091	0.3	254.94	804.56	0.009	2980	6.00	0.056	0.33	1.17	0.12	46%
FMH121a	FMH122a	18.15	19.00	9.850	9.610	8.300	9.390	0.443	7.89	8.98	63.04	Circular	NS500	HDPE (SDR11)	406	0.406	1	263	0.129	1.275	0.102	0.3	553.93	1358.49	0.016	5031	5.00	0.079	0.35	1.26	0.16	48%
LI-S4.17	FMH117a	18.60	17.69	10.180	10.124	8.420	7.566	0.000	8.13	7.28	14.89	Circular	NS355	HDPE (SDR11)	288.3	0.2883	1	266	0.065	0.906	0.072	0.3	250.63	250.63	0.003	928	8.00	0.023	0.29	1.01	0.07	35%
FMH117a	FMH118a	17.69	17.87	10.124	10.083	7.566	7.787	0.000	7.28	7.50	10.78	Circular	NS355	HDPE (SDR11)	288.3	0.2883	1	263	0.065	0.906	0.072	0.3	0.00	250.63	0.003	928	8.00	0.023	0.29	1.01	0.07	35%
FMH118a	FMH120a	17.87	17.76	10.083	10.040	7.787	7.720	0.010	7.50	7.43	11.34	Circular	NS355	HDPE (SDR11)	288.3	0.2883	1	264	0.065	0.906	0.072	0.3	0.00	250.63	0.003	928	8.00	0.023	0.29	1.01	0.07	35%
LI-S4.15-1	FMH120a	18.00	17.76	14.830	14.750	3.170	3.010	4.720	2.86	2.70	13.56	Circular	NS355	HDPE (SDR17)	311.6	0.3116	1	170	0.076	0.979	0.078	0.3	4.31	4.31	0.000	16	8.00	0.000	0.38	1.33	0.10	0%
LI-S4.15-2	FMH121a	20.00	18.15	13.520	13.430	6.480	4.720	3.580	6.17	4.41	12.98	Circular	NS355	HDPE (SDR17)	311.6	0.3116	1	144	0.076	0.979	0.078	0.3	4.31	4.31	0.000	16	8.00	0.000	0.41	1.45	0.11	0%
LI-S4.12d-2	FMH121a	19.00	18.15	13.520	13.400	5.480	4.750	3.550	5.08	4.35	16.74	Circular	NS450	HDPE (SDR17)	395.2	0.3952	1	140	0.123	1.242	0.099	0.3	549.63	549.63	0.006	2036	6.00	0.038	0.47	1.71	0.21	18%
LI-S4.16-1	FMH111a	18.00	12.93	12.180	12.100	5.820	0.830	0.000	5.47	0.48	12.02	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	150	0.097	1.104	0.088	0.3	552.44	552.44	0.006	2046	6.00	0.038	0.43	1.53	0.15	26%
FMH111a	FMH112a	12.93	17.82	12.100	11.950	0.830	5.870	0.000	0.48	5.52	20.61	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	137	0.097	1.104	0.088	0.3	0.00	552.44	0.006	2046	6.00	0.038	0.45	1.60	0.16	25%
FMH112a	FMH114a	17.82	17.71	11.950	11.820	5.870	5.890	0.000	5.52	5.54	16.63	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	128	0.097	1.104	0.088	0.3	552.44	1104.89	0.013	4092	6.00	0.077	0.46	1.66	0.16	48%
FMH114a	FMH115a	17.71	17.88	11.820	11.630	5.890	6.250	0.000	5.49	5.85	26.57	Circular	NS450	HDPE (SDR17)	395.2	0.3952	1	140	0.123	1.242	0.099	0.3	1960.87	3065.75	0.035	11355	4.00	0.142	0.47	1.71	0.21	68%
FMH115a	FMH116a	17.88	18.86	11.630	11.360	6.250	7.500	1.980	5.88	7.13	38.63	Circular	NS450	HDPE (SDR11)	365.4	0.3654	1	143	0.105	1.148	0.091	0.3	0.00	3065.75	0.035	11355	4.00	0.142	0.45	1.61	0.17	84%
LI-S4.16-2	FMH112a	18.00	17.82	12.180	12.030	5.820	5.790	0.080	5.47	5.44	22.71	Circular	NS400	HDPE (SDR17)	351.3	0.3513	1	151	0.097	1.104	0.088	0.3	552.44	552.44	0.006	2046	6.00	0.038	0.43	1.52	0.15	26%
LI-S4.13a-1	FMH114a	18.00	17.71	12.180	12.030	5.820	5.680	0.210	5.38	5.24	22.09	Circular	NS500	HDPE (SDR17)	439.2	0.4392	1	147	0.152	1.380	0.110	0.3	1960.87	1960.87	0.023	7262	5.00	0.113	0.48	1.78	0.27	42%
LI-S4.12a-1	FMH115	19.00	18.25	12.180	12.100	6.820	6.150	2.580	6.45	5.78	20.37	Circular	NS450	HDPE (SDR11)	365.4	0.3654	1	255	0.105	1.148	0.091	0.3	524.77	524.77	0.006	1944	6.00	0.036	0.34	1.20	0.13	29%
LI-S4.12a-2	FMH110a	18.10	17.21	12.180	12.130	5.920	5.080	2.420	5.52	4.68	13.88	Circular	NS450	HDPE (SDR17)	395.2	0.3952	1	278	0.123	1.242	0.099	0.3	524.77	524.77	0.006	1944	6.00	0.036	0.33	1.20	0.15	25%
LI-S4.12b-1	FMH109b	17.00	16.30	14.550	14.450	2.450	1.850	4.470	2.05	1.45	12.74	Circular	NS450	HDPE (SDR17)	395.2	0.3952	1	127	0.123	1.242	0.099	0.3	474.12	474.12	0.005	1756	6.00	0.033	0.49	1.79	0.22	15%
LI-S4.12b-2	FMH109a	16.40	15.68	12.180	12.130	4.220	3.550	1.930	3.82	3.15	14.07	Circular	NS450	HDPE (SDR17)	395.2	0.3952	1	281	0.123	1.242	0.099	0.3	474.12	474.12	0.005	1756	6.00	0.033	0.33	1.20	0.15	22%
LI-S4.12c-1	FMH108a	16.00	15.42	14.400	13.720	1.600	1.700	3.390	1.16	1.26	12.69	Circular	NS500	HDPE (SDR17)	439.2	0.4392	1	19	0.152	1.380	0.110	0.3	667.94	667.94	0.008	2474	6.00	0.046	1.36	5.04	0.76	6%
LI-S4.12c-2	FMH107a	15.20	14.54	12.140	12.080	3.060	2.460	1.590	2.62	2.02	12.64	Circular	NS500	HDPE (SDR17)	439.2	0.4392	1	211	0.152	1.380	0.110	0.3	667.94	667.94	0.008	2474	6.00	0.046	0.40	1.48	0.22	21%
LI-S4.13a-2	FMH106a	14.00	12.78	11.620	11.569	2.380	1.211	0.689	1.94	0.77	23.11	Circular	NS500	HDPE (SDR17)	439.2	0.4392	1	453	0.152	1.380	0.110	0.3	1960.87	1960.87	0.023	7262	5.00	0.113	0.28	1.00	0.15	75%
LI-S4.13b-1	FMH106a	14.00	12.78	11.500	11.450	2.500	1.330	0.570	2.06	0.89	14.66	Circular	NS500	HDPE (SDR17)	439.2	0.4392	1	293	0.152	1.380	0.110	0.3	777.89	777.89	0.009	2881	6.00	0.054	0.34	1.25	0.19	28%