llewelyn davies
ARCHITECTS PLANNERS DESIGNERS
Llewelyn-Davies Hong Kong Ltd

25 August 2026

The Secretary
Town Planning Board
c/o Planning Department
15/F North Point Government Offices
333 Java Road
Hong Kong

By Hand and Email

Dear Sir

Section 16 Planning Application for Proposed Mixed-Use Development (Proposed Flat with Permitted Commercial Uses) in Planning Area 32B, Hung Shui Kiu, New Territories (Application No. A/HSK/619)

Reference is made to the captioned application received by the Town Planning Board (the Board) on 16 June 2026 and the comments from relevant departments received via Planning Department in July 2026. Further to our letter dated 30 July 2026 requesting the Board to defer a decision on the captioned application, we write to reactivate the captioned application by submitting herewith a set of Further Information for the Board's consideration.

In response to the departmental comments received, the current Further Information comprises a responses-to-comments table with the following attachments:-

- **Appendix A:** Sewerage Impact Assessment
- **Appendix B:** Revised Traffic Review
- **Appendix C:** Drainage Impact Assessment
- **Appendix D:** Water Supply Impact Assessment
- **Appendix E:** Replacement pages of revised Planning Statement
- **Appendix F:** Revised Environmental Review

Thank you for your kind attention. Should there be any queries, please do not hesitate to contact the undersigned at [redacted] or our Mr. Man Ho at [redacted] / Miss Cody Yu at [redacted].

Yours faithfully
for Llewelyn-Davies Hong Kong Ltd

Winnie Wu
Planning Director

WW/MH/cy

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cc
DPO/TM&YLW - Ms. Carman CHEUNG / Ms. Charlotte LAM (by email)

[redacted]

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	Departmental Comments	Responses to Comments
1.	**Comments from Environmental Protection Department**	
1.1	Please submit dedicated reports for the sewerage review. <u>Environmental Review</u> *Air Quality*	Noted. A Sewerage Impact Assessment (SIA) is attached under **Appendix A** for comments. Relevant paragraphs in the Planning Statement have been updated as well, please refer to **Appendix E**.
1.2	Section 2.1.1: Please revise "arising from the traffic emissions along the road carriageways" to "arising from all relevant emission sources".	Relevant texts of the Environmental Review have been revised as below: This section examines the potential air quality impacts arising from all relevant emission sources in the vicinity of the Application Site. Please see **Appendix F** for consideration.
1.3	Section 2.1.1: The potential air quality impacts arising from the construction activities associated with the proposed development (on the surrounding environment) should also be evaluated. Please provide the following information if available: the size of the site formation or excavation area, the volume of excavated materials to be managed, the maximum number of construction trucks and mechanical equipment to be deployed at the work site at any given time, the identification of nearby ASRs along with their separation distances from the project site boundary, the identification of any concurrent projects within the 500 m of the project site boundary and their cumulative air quality impacts during construction. Appropriate control measures should be proposed to mitigate potential air quality impacts during the construction phase.	The construction phase impact has been added as Section 2.9 of the revised Environmental Review. Please see **Appendix F** for consideration.
1.4	Section 2.3.1: Please revise "the Application Site" to "the boundary of the Application Site".	Relevant texts of Section 2.3.1 of Environmental Review have been amended accordingly. Please see **Appendix F** for consideration.
1.5	Section 2.3.1: Please review whether "and the HSK NDA" should be deleted.	The concerned texts have been deleted in the revised Environmental Review. Please see **Appendix F** for consideration.

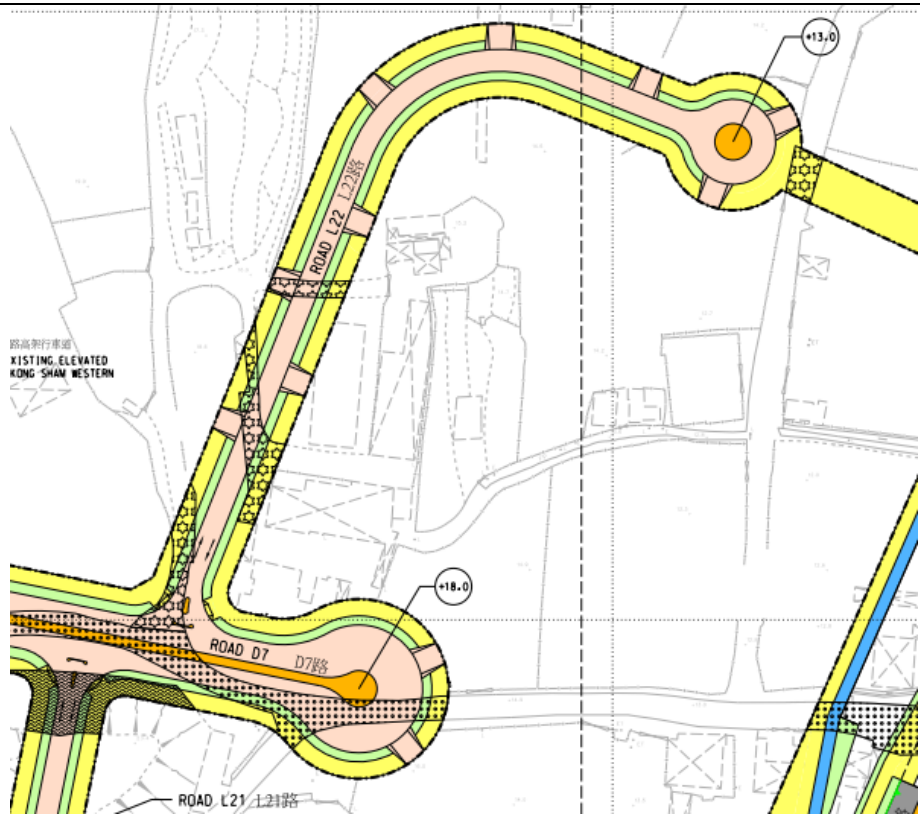
	Departmental Comments	Responses to Comments
1.6	Section 2.3.1: Please confirm whether this statement has been made based on the best available information.	Section 2.3.1 of the Environmental Review has been revised as below: No chimney operation is expected within 200m from the boundary of the Application Site after the completion year of the Proposed Development based on the best available information where the surrounding areas are planned use within the HSK NDA. Please see **Appendix F** for consideration.
1.7	Sections 2.4.2, 2.4.3, 2.5.1, Figure 2.1: Road D7 should be a district distributor. Please review and revise where necessary.	In accordance with the PEP Item No. 7787CL (Part) and 7829CL Hung Shui Kiu / Ha Tsuen New Development Area Advance Works Phase 3 and Stage 2 Works – Site Formation and Engineering Infrastructure issued by CEDD, the planned road next to the Application Site is L22, which is a local road, instead of Road D7. The relevant sections and figure are corrected in the revised Environmental Review. Please see **Appendix F** for consideration.
1.8	Section 2.4.3: Please revise "the hotel development…" to "the planned hotel relies on central ventilation and fresh air intake(s). It is confirmed that no air sensitive uses, including openable windows, fresh air intake of mechanical ventilation and recreational uses in the open area, would be located within the buffer zones".	Section 2.4.3 of the Environmental Review has been revised accordingly. Please see **Appendix F** for consideration.
1.9	Section 2.4: Please include a statement in this section confirming that the best available information has been reviewed to verify the most up-to-date status of road networks within the 500 m assessment areas for the proposed developments.	Section 2.4.4 has been added in the Environmental Review. Please see **Appendix F** for consideration.
1.10	Sections 2.5.1 and 5.2.1: Please consider rewriting the conclusion section to refer to the appraisal of all relevant emission sources within the assessment area, rather than vehicular emissions only.	Sections 2.8 and 6.2 of the Environmental Review have been revised. Please see **Appendix F** for consideration.

	Departmental Comments	Responses to Comments
1.11	Please assess whether the proposed carparks will have any air quality impacts on nearby ASRs by: (i) stating clearly that the design and operation of the proposed carparks will comply with ProPECC PN 2/96 on Control of Air Pollution in Car Parks, and (ii) indicating the exhaust outlets on a map and confirming that the exhaust air from the carpark will be discharged to the atmosphere at such a location as not to cause a nuisance to any air-sensitive uses of the proposed development or other existing and planned ASRs.	Please refer to the Section 2.5 of the revised Environmental Review in **Appendix F** for the discussion.
1.12	Please assess the potential air quality impacts of the planned PTI at Site 4-13a on the proposed development. Please include a map displaying the PTI, indicate the locations of its exhaust outlet(s) (if any) and determine the minimum separation distances between these exhaust outlets and the ASRs of the proposed development. To ensure optimal air quality planning, ASRs within the proposed development - such as openable windows, fresh air intake points and recreational uses in the open area - should be positioned as far as practicable from the PTIs and its openings or exhaust outlets.	Please refer to the Section 2.6 of the revised Environmental Review in **Appendix F** for the discussion.
1.13	Please add a statement in the report confirming that all existing and planned air pollutant and odour emission sources within the 500 m assessment area have been identified, based on the best available information, and their potential air quality impacts on the air-sensitive uses of the proposed development have been evaluated.	Please refer to the Section 2.8 of the revised Environmental Review in **Appendix F** for the discussion.
1.14	Please confirm in the report whether the proposed development, in addition to the carparks, will generate potential air pollutant or odour emissions. The report should demonstrate that any identified emission sources will not cause adverse air or odour nuisances / impacts on air-sensitive uses within the proposed development, and within the 500 m assessment area. If information on specific facilities is not available, please clearly state this in the report and advise whether a relevant assessment will be conducted at a later stage.	Please refer to the Section 2.5 of the revised Environmental Review in **Appendix F** for the discussion.

	Departmental Comments	Responses to Comments
1.15	Appendix 1.1: Please review whether the most updated RODP (No. S/HSK/3) should be referenced.	The ODP obtained from LandsD is included in Appendix 1.1 of the revised Environmental Review in **Appendix F**. *Source:* *https://www.landsd.gov.hk/en/land-acq-clearance/new-development-area/hung-shui-kiu-ha-tsuen-NDA.html* Also, the OZP obtained from Town Planning Board Statutory Planning Portal 3 is also included in the Appendix 1.1 of the revised Environmental Review in **Appendix F**.
	Noise	
1.16	S1.1: Since the population intake of the planned public housing at Area 34A, 34B and 34D is targeted at 2032 which is earlier than the targeted completion year (2033) of the proposed development, please qualitatively address the potential construction noise impact to the surrounding NSRs during the construction phase and propose appropriate mitigation measures as necessary.	Please refer to the Section 5 of the revised Environmental Review in **Appendix F** for the discussion.
1.17	S1.1: The planned Smart and Green Mass Transportation System (SGMTS) will be located at the immediate east of the proposed development. Please address the potential transit noise impact to the proposed development.	Please refer to the Section 4.4 of the revised Environmental Review in **Appendix F** for the discussion.
1.18	S3: The traffic noise impact assessment in this EA report had qualitatively review the result of traffic noise impact assessment on the nearby Site 4-25a,b,c and 4-29 in the EIA report to conclude that no noise exceedance due to the traffic from surrounding roads with the proposed at-source mitigation measures. However, the surrounding road networks for the proposed development is not identical to the reference sites. The dominant road traffic noise source for Site 4-25 & 4-29 is the newly planned Road L22 and Road D6. While the potential dominated road traffic noise source for the proposed development is the planned Road D6, D7 & P1 and the existing Kong Shum Western Highway. Please further elaborate and	Section 3 has been updated by referring to another nearby site 4-10 which is located to the west of Road D6, same as the Application Site, and Site 4-10 is closer to the Road D6. According to the HSK NDA EIA, the predicted noise level at Site 4-10 is 61 to 68 dB(A) which comply with the relevant traffic noise standard. The Application Site is located further to Road D6 and has less angle of view to the Road D6 than Site 4-10, so the Proposed Development is unlikely to be subject to adverse traffic noise from Road D6. The road connects to the application site is local road L22, not Road D7. The Application Site is located at the dead-end of the local road L22 with

	Departmental Comments	Responses to Comments
	provide justification that no adverse traffic noise impact to the proposed development. If noise exceedance is anticipated, noise mitigation measures should be proposed to mitigate the road traffic noise impacts.	the residential portion being away from the roundabout of L22. It is anticipated that there should not be significant noise impact from road L22 to the proposed residential towers. For road P1 and existing Kong Sham Western Highway, it is about 210m away from the boundary of the application site and about 270 to 280m from the proposed residential tower. With this large buffer distance, the noise level from these major roads would be largely reduced. Also, the building structure at the planned public housing at Area 34A and 34B would largely block the noise from these roads to the application site. As such, the major roads should not induce significant noise level upon the proposed residential towers even there may be a delay on the construction of the proposed hotel portion. Nevertheless, the whole HSK NDA is still under planning and there is no detailed layout of the Proposed Development, detailed calculation on the traffic noise level of the Application Site shall be conducted in next stage to further ensure the traffic noise level would not exceed 70dB(A). In case of any exceedance, mitigation measures, such as acoustic window and balcony, shall be applied.
1.19	Appendix 1.2: According to the master layout plan in the appendix, it is noted that the proposed development may be divided into different phases. Please clarify and clearly state in the main text for proper record. If the hotel office at Site B will be constructed after the population intake of the residential portion in Site A, respective interfacing issue should be properly addressed in the report.	Detailed calculation on the traffic noise level of the Application Site shall be conducted in next stage under the lease to further ensure the traffic noise level would not exceed 70dB(A). An interim study will be carried out if there is a delay on the construction of the hotel office at Site B to address the potential interfacing issue.
1.20	S4: Please identify the area sensitivity rating of the proposed development to ensure the same ANL of the reference can be adopted.	Please refer to the Section 4.2.3 of the revised Environmental Review in **Appendix F** for the discussion.

	Departmental Comments	Responses to Comments
1.21	A detailed noise impact assessment (NIA) according to the actual building plan should be carried out at a later stage to confirm the location and extent of at-receiver mitigation measures to achieve full compliance with the road traffic noise, railway noise, fixed noise and transit noise criteria where applicable. In this regard, would the applicant please advise whether there is a mechanism (e.g., land grant or other statutory procedure) for submission of a detailed NIA and state it in the report.	A detailed noise impact assessment under lease will be carried out at later stage. Please refer to Section 6 of the revised Environmental Review in **Appendix F** for the statement.
2.	**Comments from Commissioner of Transport**	
2.1	In Table 2-3, on the basis of the recommendation under Agreement No. CE 86/2017(CE) – fostering a Pedestrian and Bicycle-friendly Environment in Hung Shui Kiu New Development Area and Yuen Long South Development – Feasibility Study, bicycle parking spaces shall be provided at the rate of 1 space per 5 flats.	Table 2-3 has been revised accordingly. Tables 2-4 and 2-5 have been updated subsequently. Please refer to the revised Traffic Review under **Appendix B**. Relevant paragraph in the Planning Statement has been updated as well, please refer to **Appendix E**.
2.2	In Table 3-1, linear extrapolation of trip rates may not reflect the actual trip generation and attraction. Trip rates shall be referenced to the mean trip rates for Private Housing – High Density with flat size of 60m^2.	Table 3-1 has been revised accordingly. Table 3-2 has been updated subsequently. Please refer to the revised Traffic Review under **Appendix B**.
3.	**Comments from Chief Highway Engineer / New Territories West, Highways Department**	
3.1	Responsibility of the mentioned access road R22 is not yet identified.	The subject Proposed Development connects with Road L22. Road L22 has already been gazetted according to Cap. 370 under project title “PWP Item Nos. 7787CL (Part) and 7829CL Hung Shui Kiu / Ha Tsuen New Development Area Advance Works Phase 3 and Stage 2 Works – Site Formation and Engineering Infrastructure” (extracted below). It is understood that it is a public road to be constructed and maintained by Government.

	Departmental Comments	Responses to Comments
3.2	Adequate drainage measures shall be provided to prevent surface water running from the application site to the nearby public roads and drains.	 Noted.

	Departmental Comments	Responses to Comments
4.	**Comments from Project Manager / Major Works, Highways Department**	
	General comments	
4.1	The Deep Bay Link (now known as Kong Sham Western Highway) Project ("the Project") was commissioned in July 2007, with implementation of noise barriers in accordance with Environmental Permit No. EP-163/2003/H ("the EP") to mitigate the traffic noise impact arising from the operation of the Project. Under the condition 3.9 of the EP, noise barriers / enclosures along the Project, namely DBL1, DBL2, DBL14, DBL15, DBL16, DBL5 and DBL6 ("the Noise Barriers") are required to be installed before the population intake at the planned developments in Hung Shui Kiu New Development Area ("HSK NDA"). It is understood that the population intake of the public housing sites near to the Project is anticipated in early 2032.	Noted.
4.2	Major Works Project Management Office, HyD (MWPMO/HyD), as the holder of the EP, is required to comply with all the conditions of the EP which among others, to timely implement the Noise Barriers or otherwise to obtain approval by the Director of Environmental Protection Department subject to the submission of a Noise Mitigation Plan.	Noted.
4.3	In this regard, the following comments on the Environment Review of the proposed development are given from the perspective of implementation of the Noise Barriers of the Project.	Noted.
4.4	The proposed development is located in the vicinity of Kong Sham Western Highway. Please advise whether the road traffic noise impact assessment has duly considered the implementation of the relevant Noise Barriers of the Project.	There are noise barriers at some parts pf the Kong Sham Western Highway. The detailed calculation on the future road traffic noise impact assessment will input the noise barriers in the calculation models.
4.5	Please advise the anticipated population intake date for the proposed development for reference in the assessment.	It is assumed that the population intake year will be same as the completion year, 2033, mentioned in Section 1.2.3 of the Environmental Review.

	Departmental Comments	Responses to Comments
4.6	In Section 3.2.3 of the Environmental Review Report, traffic noise assessment of nearby sites 4-25a, 4-25b, 4-25c and 4-29 of HSK NDA P&E Study are referenced. Please provide a location plan of these sites together with the application site for reference.	The reference site is revised to Site 4-10 due to the comments from EPD. The location plan of Site 4-10 is added in Appendix 3.1 of the revised Environmental Review in **Appendix F**.
4.7	In Appendix 3.1 of the Environmental Review Report, Appendices 4.7.1 to 4.7.5 of the HSK NDA P&E Study are not reproduced. Please clarify whether the assessment basis adopted in Section 4.7.4 of HSK NDA P&E Study has adequately referenced the relevant environmental permit and associated mitigation measures.	The purpose of Appendix 3.1 is to show the traffic noise result of Site 4-10. The Application Site and Site 4-10 are both located west of the Road D6 with a longer buffer distance and smaller angle of view from Road D6 which can be deduced that the maximum noise levels due to traffic on the surrounding roads of the Application Site in terms of $L_{10(1\ hr)}$ would be similar to that in Sites 4-10 (i.e., <70 dB(A)). Also, detailed calculation on the traffic noise level of the Application Site shall be conducted in next stage under the lease to further ensure the traffic noise level would not exceed 70dB(A). In case of any exceedance, mitigation measures, such as acoustic window and balcony shall be applied.
4.8	Please be reminded to include in the detailed Road Traffic Noise Impact Assessment to be submitted all the detailed calculation and supporting information to demonstrate whether any adverse road traffic noise impact from Kong Sham Western Highway, for approval by the relevant authorities. The detailed Road Traffic Noise Impact Assessment should also be circulated to MWPMO/HyD for comment. <u>Advisory Comments</u>	Noted.
4.9	The applicant is encouraged to fully utilise self-mitigation measures against road traffic noise from Kong Sham Western Highway at the residential blocks in Site A to comply with the relevant noise criteria, thereby avoiding the implementation of the relevant Noise Barriers of the Project. While noting that a detailed Road Traffic Noise Impact Assessment would be submitted by the applicant during the design stage of its development, the applicant is encouraged to review and agree <u>at this stage</u> that the implementation of the relevant Noise	Noted.

	Departmental Comments	Responses to Comments
	Barriers of the Project is not required with utilisation of adequate self-mitigation measures at the residential blocks in Site A.	
4.10	Self-mitigation measures against road traffic noise from Kong Sham Western Highway should be incorporated into the detailed Road Traffic Noise Impact Assessment to be submitted by the applicant for Site A. Such measures may include building setback, low-rise development design, fixed glazing, sliding doors with automatic door closers, maintenance windows, A/C platforms with maintenance windows, solid fence walls, solid planters, acoustic windows, acoustic balconies, and sound-absorptive architectural treatments, as appropriate. The assessment should demonstrate compliance with the relevant noise criteria, covering scenarios with and without implementation of the relevant Noise Barriers of the Project.	Noted.
5.	**Comments from Project Manager (West), Civil Engineering and Development Department**	
5.1	His office has no particular comments on the Traffic Review, the Environmental Review and on the planning application. <u>DIA</u>	Noted.
5.2	A drainage lead-in to Site 4-13b was proposed under the design of Contract 4 of HSK/HT SPD, but there is no detailed drainage assessment included in the planning documents. Please be reminded to review whether the proposed development would have any impact on the downstream infrastructure under HSK/HT SPD.	The Proposed Development will rely on drainage lead-in proposed by CEDD in HSK/HT NDA. Yet, the information of drainage lead-in to Site 4-13b is yet to be available under the public domain. The DIA will be updated once the information regarding drainage lead-in is received from CEDD. The DIA is attached under **Appendix C** for comments. Relevant paragraphs in the Planning Statement have been updated as well, please refer to **Appendix E**.

	Departmental Comments	Responses to Comments
	SIA	
5.3	According to the information provided in Para. 4.4.2 of the Planning Statement, it is mentioned that the sewage generated from the proposed development (i.e. 2088.6m^3/day) is less than Base Case (i.e. 2389.4m^3/day). However, this sewage flow of Base Case adopted in the Planning Statement is different from the total ADWF under HSK baseline under our record. Please clarify on the source / calculation of the base case scenario adopted for the comparison and review whether the proposed development would have any impact on the downstream infrastructure under HSK/HT SPD.	A SIA assessing sewerage impact is attached in this submission for comments. The calculation of the Base Case is presented in the SIA under **Appendix A** for comparison. Relevant paragraphs in the Planning Statement have been updated as well, please refer to **Appendix E**.
	WSIA	
5.4	Please provide water supply proposal / assessment for his office review.	Noted. A WSIA is attached in this submission under **Appendix D** for comments. Relevant paragraphs in the Planning Statement have been updated as well, please refer to **Appendix E**.
6.	**Comments from Chief Engineer / Mainland North, Drainage Services Department**	
6.1	Please provide necessary submission to demonstrate the proposed application will not cause adverse drainage impact and sewerage impact.	Noted. DIA and SIA are attached in this submission under **Appendix C** and **Appendix A** respectively for comments. Relevant paragraphs in the Planning Statement have been updated as well, please refer to **Appendix E**.
7.	**Comments from Chief Engineer / Construction, Water Supplies Department**	
7.1	Existing water mains will be affected as shown on the plan (Appendix I). The cost of any necessary diversion shall be borne by the proposed development.	Noted. Please refer to the attached WSIA under **Appendix D** for the diversion proposal of the affected existing water mains for comments. Relevant paragraphs in the Planning Statement have been updated as well, please refer to **Appendix E**.

	Departmental Comments	Responses to Comments
7.2	In case it is not feasible to divert the affected water mains, a waterworks reserve within 1.5 meters from the center line of the water main shall be provided to WSD. No structure shall be built or materials stored within this waterworks reserve. Free access shall be made available at all times for staff of the Director of Water Supplies or their contractor to carry out construction, inspection, operation, maintenance and repair works.	Noted.
7.3	No trees or shrubs with penetrating roots may be planted within the Waterworks Reserve or in the vicinity of the water main shown on the plan.	Noted.
7.4	Government shall not be liable to any damage whatsoever and howsoever caused arising from burst or leakage of the public water mains within and in close vicinity of the application site.	Noted.
7.5	Please provide the Water Supply Impact Assessment for his department's review.	Noted. A WSIA is attached under **Appendix D** for comments. Relevant paragraphs in the Planning Statement have been updated as well, please refer to **Appendix E**.
8.	**Comments from Chief Town Planner, Urban Design & Landscape Section, Planning Department**	
8.1	She has no comment from urban design perspective. <u>Landscape perspective</u> *General comments*	Noted.
8.2	According to the aerial photo taken in 2025, the Site (including Site A – the subject application site and Site B – for indicative purpose only) was situated in an area of Miscellaneous Rural Fringe Landscape characterised by open storages and tree clusters. The Site was located adjoining the future TML HSK Station in the town centre of Hung Shui Kiu / Ha Tsuen New Development Area. It is zoned "Commercial(1)", and the proposed mixed-use development	Noted.

	Departmental Comments	Responses to Comments
	with flat and commercial use is considered not incompatible with the surrounding environment.	
8.3	With reference to the above aerial photo and site photos taken by DPO on 26.6.2026, the Site was formed and some existing trees were observed in the southwestern part of Site A which is the subject of this application.	Noted.
8.4	The Applicant has submitted a Landscape Master Plan (LMP) in support of the application. According to the tree survey, no rare and precious plants nor OVT are found within the Site. As shown on the LMP, 16 existing trees (excluding undesirable species) are proposed to be felled and 25 new trees are proposed to be planted within Site A.	Noted.
8.5	In view of the above, significant adverse landscape impact arising from the proposed use is not anticipated. *Advisory comments*	Noted.
8.6	The applicant should be advised that approval of the application does not imply approval of tree works such as pruning, transplanting and felling. Application for any tree works should be submitted to relevant departments for approval.	Noted.
8.7	For compliance of site coverage of greenery requirements under PNAP APP-152, submission should be made to Building Department for comments and approval.	Noted.

	Departmental Comments	Responses to Comments
9.	**Comments from Chief Estate Surveyor, New Development Area, Lands Department**	
9.1	The proposed mixed-use development site at Area 32B comprises 19 private lots namely, lots 1584 RP, 1630 RP, 3235, 3237, 3238 RP, 3239, 3240, 3241, 3242 RP, 3244, 3247, 3248, 3342, 3343, 3346, 3347, 3348, 3349 and 3350 all in D.D. 124 ("the Lots"), which are all agricultural lots held under Block Government Lease. While lots 1583 RP, 3225 RP, 3245 RP and 3246 RP all in D.D. 124 have been resumed under Lands Resumption Ordinance (Cap.124) pursuant to G.N. 3830 dated 25 June 2026 and will revert to the Government on 26 September 2026.	Noted.
9.2	The Lots are subject to an ongoing land exchange application under the Enhanced Conventional New Town Approach ("ECNTA") for non-industrial use (excluding residential, godown and petrol filling station), pursuant to the Lands Administration Office Practice Notes No. 13/2023 and 1/2024.	Noted.
9.3	The proposed mixed-use development comprising residential cum commercial development at Site A and commercial development at Site B is not permissible under the existing lease conditions of the Lots nor the applied use stated in 9.2 above. Should planning approval be granted by the Town Planning Board, the owners of the private lots must submit a revised land exchange application to LandsD before implementing the proposed mixed-use development.	Noted.
9.4	Paragraphs 3.1.6 and 3.1.7 of the Planning Statement note the applicant's proposal to phase the non-domestic development under the "Pay for What You Build" Pilot Scheme ("Pilot Scheme"), i.e. 60% of the non-domestic GFA of the entire development site will be implemented first and the remaining 40% non-domestic GFA will be implemented at later stage. Please refer to the LAO PN No. 2/2026, which specifies that this Pilot Scheme would only be applicable to non-residential use developments (without any residential elements)	The subject development proposal has been planned in a manner which demonstrates certain residential elements could be introduced with phased implementation of the non-domestic portion in order to expedite materialisation of the HSK core in a sustainable approach. It should be clarified that the subject lot is not located within a mixed use zone. Instead, the subject development proposal is considered to respect the spirit of the phased arrangement under "Pay for What You Build" by falling within zones designated for "non-residential" use (i.e. Commercial)

	Departmental Comments	Responses to Comments
	which can be developed independently as a separate site. Hence, the Pilot Scheme is not applicable to Site A which involves residential development.	under the statutory OZP. Detailed implementation arrangement and lands matter will be subject to separate discussions and approvals with relevant authorities at subsequent stages.
9.5	Land exchange applications including application under the Pilot Scheme will be considered by LandsD, acting in the capacity of landlord, at its sole discretion. If the owners of the private lots apply to develop Site B independently under the Pilot Scheme, Site A and Site B should be processed via two separate land exchange documents. To align with the approved boundary of the ongoing ECNTA land exchange, these documents which together comprise the entire ECNTA site must be executed simultaneously. There is no guarantee that any such application will be approved. Any approved application will be subject to such terms and conditions as the Government sees fit, including, but not limited to, the construction of public facilities, the restriction on alienation except as a whole in respect of the non-residential use development if which is subject to the Pilot Scheme and the payment of premium / premia and administrative fee(s).	Ditto. Please see responses to comments of Item 8.4 above.
9.6	LandsD reserves comment on the proposed schematic design, which will only be examined in detail during the building plan submission stage after the land exchange is completed. There is no guarantee that the schematic design as presently proposed in the subject planning application will be automatically accepted under the lease during future building plan submissions.	Noted.
9.7	The site areas and related figures in this planning application, say paragraph 2 of the Executive Summary, paragraph 2.1.1 and Table 3.1 (including the Footnotes of the Planning Statement), have not been surveyed or verified. These figures will be checked during the processing of the land exchange application.	Noted.

	Departmental Comments	Responses to Comments
10.	**Comments from Chief Building Surveyor / New Territories West, Buildings Department**	
10.1	The applicant's attention is drawn to curtailed checking on fundamental issues under the Buildings Ordinance will be carried out at building plan submission stage.	Noted.
11.	**Comments from District Office (Yuen Long), Home Affairs Department**	
11.1	Her office has not received any local's comment on the application by 17.7.2026.	Noted.
12.	**Comments from Director of Fire Services**	
12.1	Detailed fire safety requirements will be formulated upon receipt of a formal submission of Short Term Tenancy or Short Term Waiver, general building plans or referral of the application via the relevant licensing authority.	Noted.
12.2	The provision of emergency vehicular access in the subject work shall comply with the requirements as stipulated in Section 6, Part D of the Code of Practice for Fire Safety in Buildings 2011.	Noted.
13.	**Comments from Commissioner of Police**	
13.1	In view of public safety, the applicant must maintain the smooth traffic flow of the concerned location and provide sufficient safety precaution to avoid obstruction or danger caused to any person or vehicle on the road.	Noted.

Appendix A

Sewerage Impact Assessment

Section 16 Planning Application for Proposed Mixed-Use Development (Proposed Flat with Permitted Commercial Uses) in Planning Area 32B, Hung Shui Kiu, New Territories
(Application No.: A/HSK/619)

Sewerage Impact Assessment

August 2026

Delivering a better world

Prepared by:

AECOM Asia Company Limited
19/F, Tower A, 83 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong S.A.R.
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1. Introduction

1.1 Background

1.1.1 AECOM Asia Company Limited (AECOM) has been commissioned by the project proponent to act as the engineering consultant to conduct a Sewerage Impact Assessment (SIA) for a private mixed-use development in Hung Shui Kiu, New Territories.

1.1.2 The S16 Planning Application involves Area 32B with total area of 13,601 m^2; referred as the "Application Site". The Site is located next to the Kong Sham Western Highway. Location plan of the Application Site refers to figure no. **AREA 32B/SIA/Figure 1**.

1.1.3 The Application Site falls within “C(1)” zone on the Draft Hung Shui Kiu and Ha Tsuen OZP No. S/HSK/3. and lies within Hung Shui Kiu / Ha Tsuen (HSK/HT) New Development Area (NDA). According to the OZP, commercial uses including ‘Hotel’, ‘Office’, ‘Eating Place’, ‘Shop and Services’, etc. are always permitted in “C(1)” zone; while ‘Flat’ use is under Column 2, planning permission is therefore required for the proposed residential use in Site A of the Application Site.

1.1.4 This SIA report reviews the sewerage impact of the proposed development and serves as a supporting document for the S16 Planning Application.

1.2 Objective of this Submission

1.2.1 This report outlines the assessment results of the potential sewerage impacts caused by the Proposed Development at the Application Site. The main objectives of this assessment include the followings:

(i) Identify any increase in sewage flow due to the Proposed Development.

(ii) Review the existing sewerage condition of the Application Site based on available information.

(iii) Outline the methodology adopted in this assessment.

(iv) Assess any potential impact on the existing or planned sewerage facilities nearby due to the Proposed Development.

(v) Propose mitigation measures and/or improvement works to minimize any potential sewerage impact from the Proposed Development.

(vi) Discuss the responsibility of the construction and maintenance aspects of the proposed sewerage system.

1.3 Nomenclature

1.3.1 The following abbreviations and shortened expressions in **Table 1** are adopted in this report.

ADWF	Average Dry Weather Flow
AECOM	AECOM Asia Company Limited
CIF	Catchment Inflow Factor
CIFSUS	Commercial and Industrial Floor Space Utilization Survey (PlanD)
DSD	Drainage Services Department
EIA	Environmental Impact Assessment
EPD	Environmental Protection Department
F&B	Food and Beverage
GESF	Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning Version 1.0 (EPD)
GFA	Gross Floor Area
mPD	Metres above Principal Datum
PlanD	Planning Department
SWSTW	San Wai Sewage Treatment Works
HSKEPP	Hung Shui Kiu Effluent Polishing Plant
SIA	Sewerage Impact Assessment
UFF	Unit Flow Factor

Table 1 – Nomenclature

2. Development Proposal

2.1 The Indicative Development Proposal

2.1.1 The Application Site area is approximately 13,601m^2. Under the Proposed Development, the total plot ratio is not more than 9.5. (i.e. the total GFA is not more than 129,210m^2) The Applicant proposed 71,066m^2 as non-domestic GFA for the permitted commercial use as of right, whereas the remaining 58,144m^2 GFA would be used for the proposed residential development.

2.1.2 The Proposed Development consists of Site A and Site B. Site A will be developed with 1,240 residential units, recreational facilities, and some permitted commercial use (e.g. retail). Site B will be developed with retail and office development, as well as a hotel which provides 924 rooms. The anticipated completion year of the Application Site (except for the remaining non-domestic GFA to be implemented at a later stage under the arrangement of "Pay for What You Build" Pilot Scheme) is 2033. Details refers to **Remark (3)** of **Table 2**.

2.2 Base Case for Area 32B

2.2.1 With reference to the OZP, the allowed maximum plot ratio is PR 9.5 and the total GFA is not more than 129,210m^2. As specified in the Outline Development Plan (ODP) No. D/HSK/1, the development mix for Area 32B is: 45% GFA for office use, 20% GFA for hotel use and 35% for retail use. Based on this mix, a hypothetical base case scenario is formed for sewage generation estimation.

2.2.2 The comparison table of development parameters between the base case and proposed development is summarized in **Table 2** below.

	Base Case	Proposed Development (Site A)	Proposed Development (Site B)
Site Area	13,601m^2	8,967m^2	4,634m^2
Total PR (not more than)	9.5	7.1	14.2
		9.5 (Site A + Site B)	
Total GFA (not more than)	129,210m^2	63,365m^2	65,845m^2
		129,210m^2 (Site A + Site B)	
Domestic Portion			
Total Domestic GFA (not more than)	-	58,144m^2	-
No. of Units	-	1,240	-
Population (1)	-	3,348	-
Domestic Portion – Resident's Recreational Facilities (2)	-	2,325m^2	-
Non-Domestic Portion – Retail			
Total Non-Domestic GFA	45,223.5m^2	5,221m^2 (3)	354m^2 (3)
Non-Domestic Portion – Hotel			
Total Non-Domestic GFA	25,842m^2	-	27,871m^2 (3)
No. of Hotel Rooms	-	-	924
Non-Domestic Portion – Office			
Total Non-Domestic GFA	58,144.5m^2	-	37,620m^2
Non-Domestic Portion – Office (Completed in 2033)			
Total Non-Domestic GFA	-	-	9,290m^2 (3)
Non-Domestic Portion – Office (Remaining)			
Total Non-Domestic GFA	-	-	28,330m^2

Table 2 – Key Development Parameters

Remarks:
(1) A person per flat of 2.7 is assumed.
(2) Or such other areas of clubhouse as may be approved by the Buildings Department based on the total permissible domestic GFA for individual land parcel (site under the Buildings Ordinance) at the future General Building Plans.
(3) Drawing upon the spirit of the "Pay for What You Build" Pilot Scheme, about 60% of the non-domestic GFA in Area 32B (i.e. about 42,736m^2) will be implemented first by the target completion year 2033. The GFA to be distributed in both Site A and Site B are 5,221m^2 and 37,515m^2 respectively.

3. Assessment Methodology

3.1 Overview of Methodology

3.1.1 This assessment is carried out to assess the sewerage impact arising from the Proposed Development on the sewerage system.

3.1.2 The sewage generated from the Proposed Development is estimated according to "Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning" (GESF) published by Environmental Protection Department (EPD). The sewage calculation is in accordance with the Sewerage Manual published by Drainage Services Department (DSD).

3.2 Methodology and Assumptions

3.2.1 The adopted sewage unit flow factors for sewage estimation and calculation are summarized in **Table 3**.

Development Type	Flow Type	Unit Flow Factor (UFF) (m^3/head/day)
Residential	R2	0.27
Retail Trade	J4	0.28
Finance, Insurance, Real Estate & Business Services	J6	0.08
Restaurants & Hotels	J10	1.58
Community, Social & Personal Services (Clubhouse)	J11	0.28

Table 3 – Unit Flow Factors

3.2.2 For the non-domestic population, the worker density adopted for business use is referred to Commercial and Industrial Floor Space Utilization Survey (CIFSUS). The adopted worker density is summarised in **Table 4**.

Commercial Activities	Workers per GFA (in 100 m^2)
Restaurants & Hotels	5.1
Retail Trade	3.5
Financial, Insurance, Real Estate & Business Services	5.5
Community, Social & Personal Services (Clubhouse)	3.3

Table 4 – Worker Density

3.2.3 The peaking factor is referred to Table T-5 of GESF. The adopted worker density are summarized in **Table 5**.

Population Range	Peaking Factor (including stormwater allowance) for facility with existing upstream sewerage)	Peaking Factor (excluding stormwater allowance) for facility with new upstream sewerage
5,000 – 10,000	5	4

Table 5 – Peaking Factor

4. Review on Existing and Planned Sewerage System

4.1 Existing and Planned Sewerage System

4.1.1 The Application Site is currently unsewered and it is within the sewerage catchments for Hong Shui Kiu/ Ha Tsuen New Development Area (HSK/HT NDA). It is noted new sewerage network (including pumping stations) is proposed under CEDD consultancy Agreement No. CE 1/2020(CE) HSK/HT NDA Package A Works for Second Phase Development – Design and Construction to cater for sewage flows due to population intensification of HSK/HT NDA. The Proposed Development will rely on the proposed sewerage infrastructure proposed by CEDD.

4.1.2 With reference to Planning Application No.: A/HSK/452, the design capacity of the Sewage Pumping Station No.1 (SPS1) and the Sewage Pumping Station No.2 (SPS2) is 28,874m^3/day and 42,255m^3/day respectively. The sewage would be ultimately conveyed to the planned Hung Shui Kiu Effluent Polishing Plant (HSKEPP). With reference to HSKEPP website, the treatment capacity (i.e. ADWF) of HSKEPP is 90,000m^3/day.

4.1.3 Under DSD project PWP No. 4463DS, the HSKEPP is currently under Phase 1 construction to provide a sewage treatment capacity of 60,000m^3/day and is anticipated to be completed in mid-2031. Under DSD project PWP No. 4428DS, the HSKEPP will increase the sewage treatment capacity from 60 000m^3/day to 90 000 m^3/day. It is currently under planning and design stage.

4.2 Base Case Sewage Estimation

4.2.1 A base case scenario of sewage estimation for Area 32B is calculated based on ODP development mix aforementioned in Para 2.2.1 to predict the sewage estimation under HSK/HT NDA. The total estimated ADWF of Area 32B is approximately 2,389.4m^3/day. Detailed calculation refers to **Annex 4**. **Table 6** below presents the summary of sewage flow estimation of the base case scenario.

Flow Type	Average Dry Weather Flow (ADWF) (m^3/day)
Base Case	
Hotel	730.0
Office	255.8
Retail – Retail Trade	310.2
Retail – Restaurant	1,093.4
Total ADWF	**2,389.4**

Table 6 – Sewage Estimation for the Base Case Scenario

4.3 Impact on Sewerage System

4.3.1 With reference to approved EIA for HSK/HT NDA, the Proposed Development is within the sewerage catchment of proposed SPS1 under HSK/HT NDA.

4.3.2 The estimated ADWF generated from the Proposed Development is about 2088.6m^3/d. The peak flow generated from the Proposed Development including the backwash for swimming pool is 0.135m^3/s. Detailed calculation refers to **Annex 1**. The swimming pool backwash calculation refers to **Annex 2**. **Table 7** below presents the summary of sewage flow estimation of the Proposed Development.

Flow Type	Average Dry Weather Flow (ADWF) (m^3/day)
Site A	
Residential	903.96
Clubhouse	21.56
F&B	211.72
Retail	25.76
Site B	
Hotel	729.96
Office (completed in 2033)	40.88
Office (Remaining)	124.72
F&B	30.02
Total ADWF (excl. Backwash)	**2,088.58**
Outdoor Swimming Pool Backwash	0.023m^3/s
Indoor Swimming Pool Backwash	0.016m^3/s

Table 7 – Sewage Estimation for the Proposed Development

Note:
(1) Swimming pool backwash will last 3 minutes per day

4.4 Sewage Discharge Comparison between Base Case and Proposed Development

4.4.1 Sewage estimation results show that the sewage discharge (i.e. ADWF) from Proposed Development is less than the base case scenario. (i.e. 2088.6m^3/d < 2389.4m^3/d) It is anticipated the planned sewerage infrastructure under HSK/HT NDA is sufficient to cater for the Proposed Development for Area 32B.

5. Proposed Sewerage System

5.1 Proposed Sewerage Connection

5.1.1 The sewage generated from the Application Site would be discharged via internal sewerage network leading to the proposed terminal manhole no. FTMH01 located close to the site boundary and connected to proposed sewer manhole no. FMH01 to be constructed by CEDD under HSK/HT NDA project via proposed 375mm diameter sewer by this Application. The proposed sewerage layout refers to figure no. **Area 32B/SIA/Figure 3**.

5.1.2 The sewage will be conveyed to the proposed SPS1 through planned gravity sewers, and then to the proposed SPS2 through planned rising mains and gravity sewers constructed by CEDD under HSK/HT NDA. The sewage will subsequently be discharged to the CEDD planned HSKEPP. The location of the proposed sewerage facilities and indicative sewerage alignment constructed by CEDD refers to figure no. **Area 32B/SIA/Figure 4.**

5.1.3 Hydraulic calculation as shown in **Annex 3** shows that sewage discharged from the Proposed Development utilises about 76% of the capacity of the proposed 375mm diameter sewer connected from FTMH01 to CEDD proposed sewer manhole FMH01.

5.1.4 Sewage discharged from the Application Site contribute to about 7.2% of the capacity of the SPS1. Hence, the sewerage impact is considered insignificant.

6. Maintenance Responsibility

6.1.1 The development will be responsible for construction of the internal sewer and sewerage manholes within the Application Site. The development will be responsible for the maintenance of the internal sewer and manholes within the Application Site.

6.1.2 The Proposed Development will be responsible for construction of all necessary sewerage connection works to the public sewerage system. The sewerage systems outside the site boundary are proposed to be handed over to relevant government department for future maintenance.

7. Conclusion

7.1.1 This SIA report serves as a supporting document for proposing a mixed-use development with residential and commercial uses. The SIA has been carried out to assess the potential sewerage impact due to the Proposed Development.

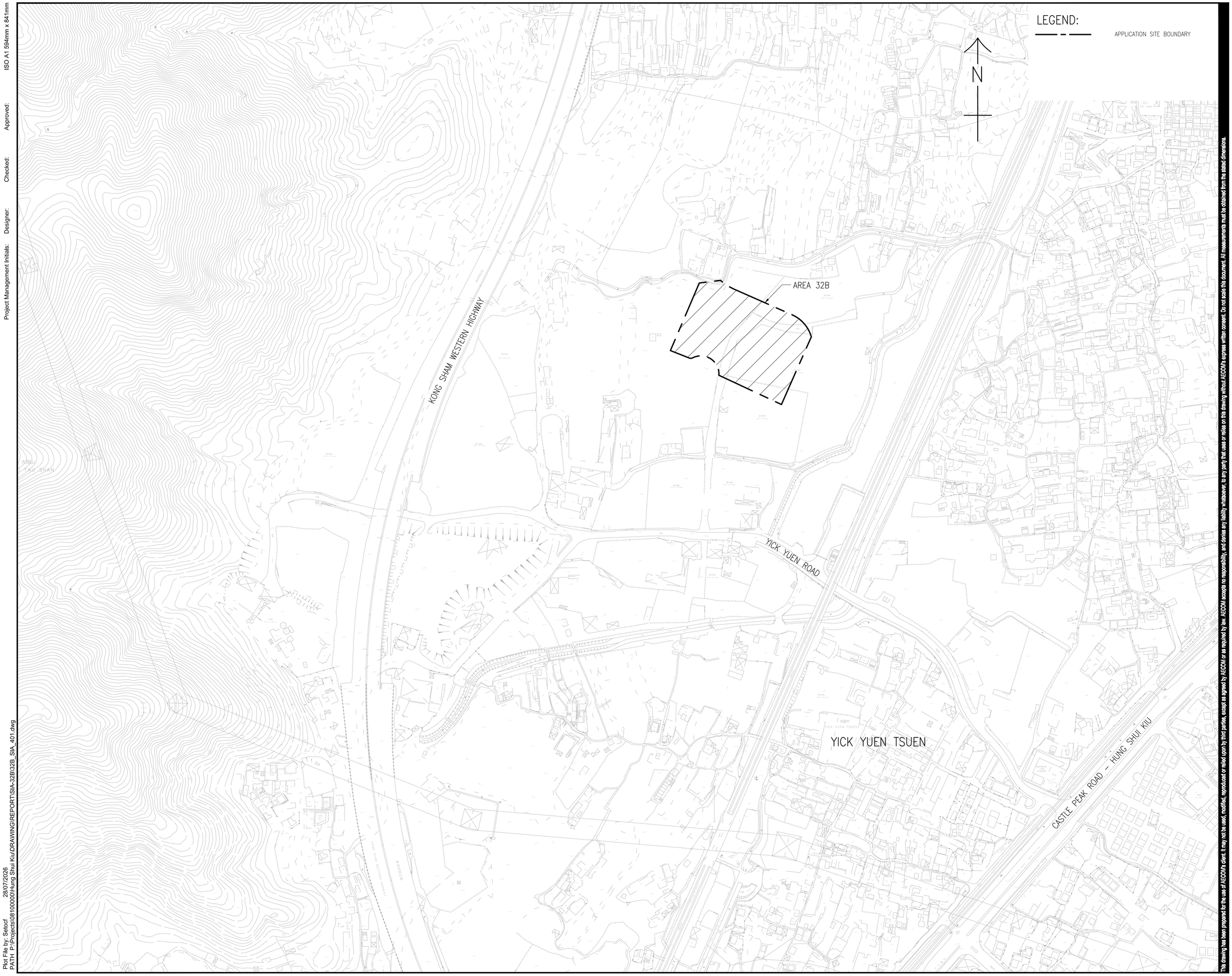
7.1.2 The ADWF generated from the Application Site is about 2088.6m^3/d (excluding the backwash for swimming pool). The peak flow generated from the Proposed Development including the backwash for swimming pool is 0.135 m^3/s.

7.1.3 The sewage will be conveyed to the proposed SPS1 and then to the proposed SPS2. The sewage will subsequently be discharged to the planned HSKEPP. With the implementation of the proposed sewerage arrangement, no adverse impact from sewerage aspect is anticipated.

End of Report

Figure

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SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL DEVELOPMENT WITH PERMITTED COMMERCIAL USES IN PLANNING AREA 32B, HUNG SHUI KIU, NEW TERRITORIES

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工程顧問公司

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SCALE 比例
A1 1 : 1000

DIMENSION UNIT 尺寸單位
METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號

AGREEMENT NO. 協議編號

HUNG SHUI KIU

SHEET TITLE
圖紙名稱

LOCATION PLAN

SHEET NUMBER
圖紙編號

AREA 32B/SIA/FIGURE 1

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ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

816500 E

816750 E

832700 N

832500 N

LEGEND:

APPLICATION SITE BOUNDARY

DEVELOPMENT SITE DEMARCATION LINE

RUN-IN / OUT

RESIDENTIAL

HOTEL / OFFICE

LANDSCAPE AREA / PODIUM DECK

CLUBHOUSE

SWIMMING POOL

N

HOTEL / OFFICE
T1
+152.0

SITE B

SHUTTLE LIFT

RESIDENTIAL
T3
+181.5

HOTEL / OFFICE
T2
+190.0

SITE A

RESIDENTIAL
T2
+185.0

VEHICULAR ACCESS / EVA

RESIDENTIAL
T1
+192.0

Nullah

Track

露天貨倉
Open Storage

貨倉
Storage

Plot File by: Selcof
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比例

A1 1 : 500

DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
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PROJECT NO.
項目編號

HUNG SHUI KIU

AGREEMENT NO.
協議編號

SHEET TITLE
圖紙名稱

MASTER LAYOUT PLAN

SHEET NUMBER
圖紙編號

AREA 32B/SIA/FIGURE 2

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

816500 E

816750 E

832700 N

832500 N

LEGEND:

APPLICATION SITE BOUNDARY

DEVELOPMENT SITE DEMARCATION LINE

RUN-IN / OUT

RESIDENTIAL

HOTEL / OFFICE

LANDSCAPE AREA / PODIUM DECK

CLUBHOUSE

SWIMMING POOL

N

HOTEL / OFFICE
T1
+152.0

SITE B

HOTEL / OFFICE
T2
+190.0

SHUTTLE LIFT

RESIDENTIAL
T3
+181.5

SITE A

RESIDENTIAL
T2
+185.0

RESIDENTIAL
T1
+192.0

VEHICULAR ACCESS / EVA

FTMH01

FMH01

REFER TO FIGURE "AREA 32B/SIA/FIGURE 4" FOR INDICATIVE SEWERAGE ALIGNMENT CONNECTED TO SPS1

Nullah

Track

露天貨倉
Open Storage

貨倉
Storage

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尺寸單位

METRES

KEY PLAN
索引圖

PROJECT NO.
項目編號

AGREEMENT NO.
協議編號

HUNG SHUI KIU

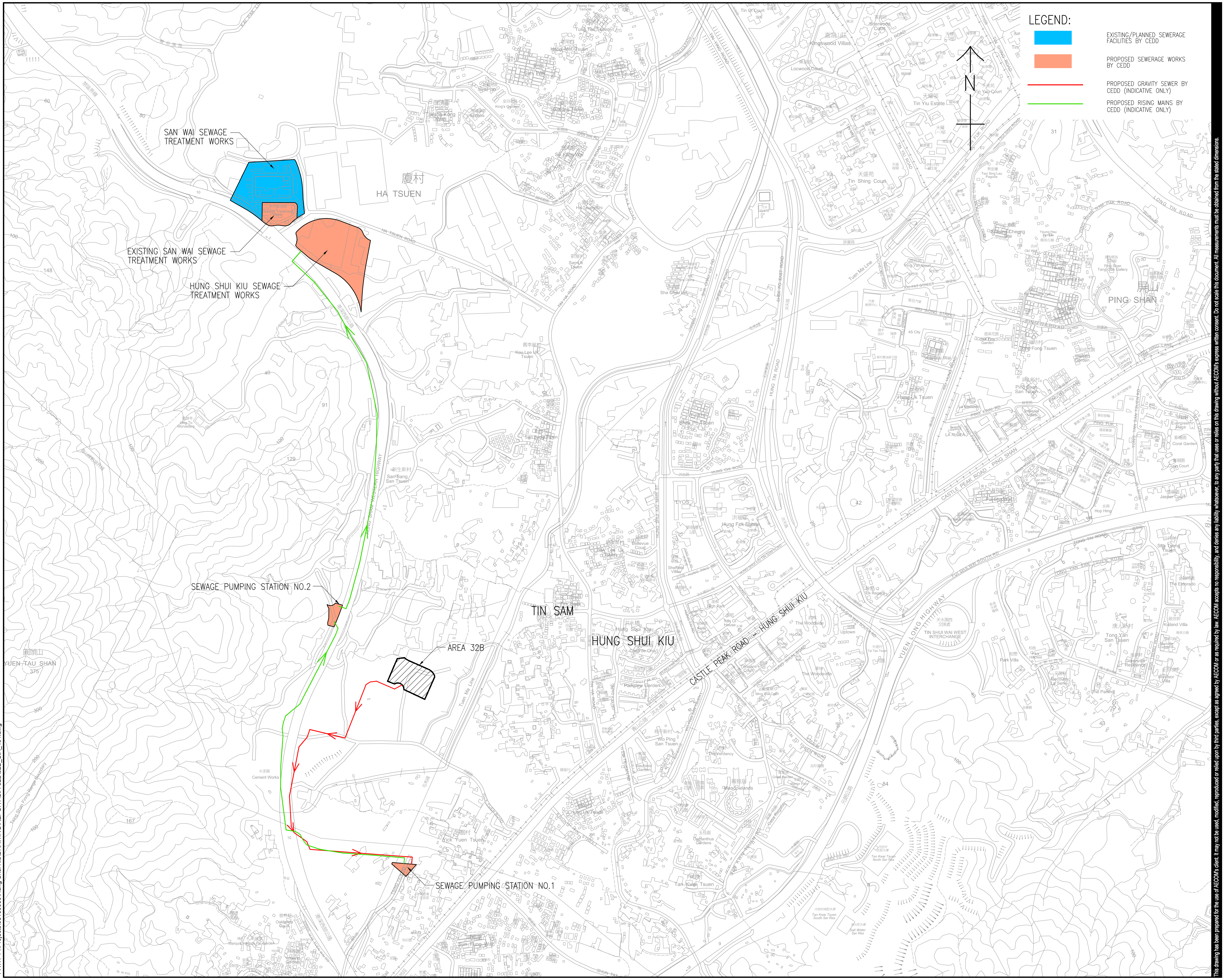
SHEET TITLE
圖紙名稱

PROPOSED SEWERAGE LAYOUT

SHEET NUMBER
圖紙編號

AREA 32B/SIA/FIGURE 3

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DIMENSION UNIT 尺寸單位: METRES

KEY PLAN
索引圖

PROJECT NO. 項目編號: HUNG SHUI KIU

AGREEMENT NO. 協議編號

SHEET TITLE
圖紙名稱

PROPOSED SEWERAGE LAYOUT BY CEDD

SHEET NUMBER
圖紙編號

AREA 32B/SIA/FIGURE 4

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Annex 1

Proposed Development Sewage Estimation

AECOM **Annex 1 - Proposed Development Sewage Estimation**

Proposed Development

Site A						
Residential						
No. of Units	1,240					
PPoF [1]		**Development Type**		**Population**	**Unit Flow Factor**	**ADWF (m^3/d)**
2.7		Private R2		3,348	0.27	903.96
Workers	**GFA (m^2)**	**Worker's Type**	**Workers per GFA (in 100m^2)** [3]	**Employee**	**Unit Flow Factor**	**ADWF (m^3/d)**
GFA for Clubhouse (m^2)	2,325	J11 Community, Social & Personal Services	3.3	77	0.28	21.56
					Sub-total	925.52
Retail						
Workers	**GFA (m^2)**	**Worker's Type**	**Workers per GFA (in 100m^2)** [3]	**Employee**	**Unit Flow Factor**	**ADWF (m^3/d)**
GFA for Restaurant (m^2) [2]	2,611	Restaurants J10 Restaurants & Hotels	5.1	134	1.58	211.72
GFA for Retail Trade (m^2) [3]	2,611	Retail Trade J4 Wholesale & Retail	3.5	92	0.28	25.76
					Sub-total	237.48

.

Site B							
Hotel							
No. of Rooms	**No. of Rooms** 924						
Workers		**Worker's Type**		**Employee**		**Unit Flow Factor**	**ADWF (m^3/d)**
1 employee serves 2 rooms		J10 Restaurants & Hotels		462		1.58	729.96
Office							
GFA for Office (m^2)	**Completed in 2033** 9,290	J6 Finance, Insurance, Real Estate & Business Services	**Workers per GFA (in 100m^2)** [4]	**Completed in 2033**	511	0.08	40.88
	Remaining[10] 28,330		5.5	**Remaining**[10]	1559		124.72
GFA for Restaurant (m^2)(5)	354	Restaurants J10 Restaurants & Hotels	5.1	19		1.58	30.02
						Sub-total	925.58

Total ADWF from the Proposed Development (Site A + Site B) (m^3/day)	2,088.58
Contributing Population [7]	7,735.48
Peaking Factor[9]	4.00
Total Peak Flow from the Proposed Development (m^3/s)	0.097
Total Peak Flow from the Proposed Development including swimming pools(m^3/s)[8]	0.135

Remarks:

[1] A person per flat of 2.7 is assumed.

[2] Assume 50% of the Retail GFA at Site A is for restaurant use

[3] Assume 50% of the Retail GFA at Site A is for retail use

[4] Worker Density is in GFA per worker according to T-8 CIFSUS are assumed.

[5] Assume all Retail GFA at Site B is for restaurant use

[6] Catchment Inflow Factor P_{CIF} = 1 is based on the catchment area in Yuen Long.

[7] Contributing population = Projected Flow (ADWF in m^3/day) / 0.27 (m^3/person/day)

[8] Worst case scenario (all swimming pools will undergo backwash at the same time) is assumed.

[9] Peaking factor excluding stormwater allowance is adopted for hydraulic checking for proposed new constructed sewer.

[10] Remaining indicates the non-domestic GFA to be implemented at a later stage under the arrangement of "Pay for What You Build"Pilot Scheme.

Annex 2

Swimming Pool Backwash Calculation

AECOM

Annex 2 - Swimming Pool Backwash Calculation

Estimation of Outdoor Pool Backwash

Pool area	=	438	m^2
Pool depth	=	1.5	m
Pool volume	=	657	m^3
Turnover rate	=	6	hrs
Flow rate	=	109.50	m^3/hr
Surface loading rate of filter	=	20	$m^3/m^2/hr$
Filter Areas Required	=	5.48	m^2
Assume backwash duration	=	3	min/day
Assume backwash flow rate	=	30	$m^3/m^2/hr$
Volume of backwash	=	8.21	m^3/day
Peak flow	=	0.023	m^3/s

Note
(1)Swimming pool backwash will last for 3 minutes per day.

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Annex 2 - Swimming Pool Backwash Calculation

Estimation of Indoor Pool Backwash

Pool area	=	200	m^2
Pool depth	=	1.5	m
Pool volume	=	300	m^3
Turnover rate	=	4	hrs
Flow rate	=	75.00	m^3/hr
Surface loading rate of filter	=	20	$m^3/m^2/hr$
Filter Areas Required	=	3.75	m^2
Assume backwash duration	=	3	min/day
Assume backwash flow rate	=	30	$m^3/m^2/hr$
Volume of backwash	=	5.63	m^3/day
Peak flow	=	0.016	m^3/s

Note
(1)Swimming pool backwash will last for 3 minutes per day.

Annex 3

Hydraulic Checking

Annex 3 - Hydraulic Check of Proposed Sewer

V of water = 0.000001

Manhle No.		Pipe												
U/S	D/S	Size	Hydraulic Radius	Flow Area	Pipe Gradient	Pipe Velocity	Capacity	Roughness	Accumulated ADWF	Contributing Population	Peaking Factor	Estimated Peak Discharge	Capacity Check	Remark
		mm	m	m^2	(1 in)	m/s	m^3/s	mm	m^3/d			m^3/s	%	
FTMH01	FMH01	375	0.094	0.11	100	1.60	0.18	1.50 (2)	2,088.58	7,736	4.00	0.135	76	

Note
(1) Assume the pipe flows under full-bore capacity.
(2) Assumed proposed slimed sewer is at normal condition, when flowing half full, velocity is about 1.2 m/s.
(3) Peaking factor excluding stormwater allowance is adopted for hydraulic checking for proposed sewer.
(4) FMH01 indicates CEDD proposed sewer manhole

Annex 4

Baseline Sewage Estimation

Appendix 4 Baseline for Area 32B

Estimated Sewage Flow from 32B Baseline Commercial Development			
Site Area	=	13,601.00	
Plot Ratio	=	9.50	
Non-domestic GFA(m2)	=	129,210	
Retail Ratio	=	35%	
Hotel Ratio	=	20%	
Office Ratio	=	45%	
Retail GFA (m^2)	=	45,223.5	(1)
Retail GFA (m^2)	=	31,656	(7)
Occupation Density (person/100m2 or person/room)	=	3.5	(2)
Retail staff (no.)	=	1,108	
Unit Flow Factor (m^3/d/head)	=	0.28	
DWF (m^3/day)	=	**310.2**	
Retail GFA (m^2)	=	13,567	(7)
Occupation Density (person/100m2 or person/room)	=	5.1	(4)
Restaurant staff (no.)	=	692	
Unit Flow Factor (m^3/d/head)	=	1.58	
DWF (m^3/day)	=	**1093.4**	
Hotel GFA (m^2)	=	25,842	(1)
Occupation Density (no. of rooms)	=	924	
Hotel staff (no.)	=	462	(5)
Unit Flow Factor (m^3/d/head)	=	1.58	
DWF (m^3/day)	=	**730.0**	
Office GFA (m^2)	=	58,144.5	(1)
Occupation Density (person/100m2 or person/room)	=	5.5	(3)
Office Staff (no.)	=	3,198	
Unit Flow Factor (m3/d/head)	=	0.08	
DWF (m^3/day)	=	**255.8**	
Total ADWF (m3/day)	=	**2389.4**	

Notes:

1. Adopt retail = 35% of non-domestic GFA, hotel = 20% of non-domestic GFA, office = 45% of non-domestic GFA
2. According to CIFSUS, the worker density for retail trade is assumed as 3.5 workers per GFA (in 100 m^2)
3. According to CIFSUS, the worker density for office is assumed as 5.5 workers per GFA (in 100 m^2)
4. According to CIFSUS, the worker density for restaurants is assumed as 5.1 workers per GFA (in 100 m^2)
5. Assumed 1 hotel staff serves 2 rooms
6. Catchment Inflow Factors (PCIF): Yuen Long = 1.00 is adopted.
7. For retail GFA, it is assumed 30% for F&B and 70% for retail trade usage.

Appendix B

Revised Traffic Review

1. Introduction

1.1 Objective

1.1.1 The Application Site is located in Planning Area 32B near the planned HSK MTR Station within the Hung Shui Kiu New Development Area (HSK NDA). The site is zoned "Commercial (1)" ("C(1)") under the current Hung Shui Kiu & Ha Tsuen (HSK & HT) Outline Zoning Plan (OZP) with various types of commercial use (e.g. office, retail, hotel, etc.) permitted as of right within this zone.

1.1.2 Under the current development proposal, the Applicant proposes to include 'Flat' use in this zone to form a mixed-use development (i.e. **Proposed Scheme**). As 'Flat' use is a Column 2 use under the OZP requiring planning permission from Town Planning Board (TPB), S.16 planning application is submitted for the proposed inclusion of residential element in the zone. This Traffic Review Report is prepared in support of the S.16 planning application by reviewing the vehicular access arrangement and internal transport provisions of the Proposed Scheme, and comparing the Proposed Scheme with the as-of-right permitted commercial scheme to assess the potential traffic impact (if any) of the project.

2. PROPOSED DEVELOPMENT

2.1 Development Schedule

2.1.1 For the purpose of assessment, the as-of-right permitted commercial scheme (or known as **Hypothetical Development Scheme**) is formulated based on the commercial mix suggested in the previous version of the HSK & HT Outline Development Plan (ODP) (i.e. No. D/HSK/1) for the Application Site. The relevant information is provided in **Table 2-1**.

Table 2-1 - Hypothetical Development Schedule

Area 32B	
Retail (~35%)	45,223 m^2 GFA
Office (~45%)	58,145 m^2 GFA
Hotel (~20%)	25,842 m^2 GFA (~857 rooms) (1)
Total	*129,210 m^2 GFA*

Remark:
(1) Based on 30.16 m^2 for each hotel room

2.1.2 Under the **Proposed Scheme**, majority (55%) of the total PR / GFA permissible for the site would be designated for the as-of-right permitted commercial use (i.e. 71,066 m² NGFA), whereas the remaining (45%) permissible PR / GFA would be used for the proposed residential development (i.e. 58,144 m² DGFA). The proposed residential use would be clustered in the eastern portion of the site (Site A) with some as-of-right permitted commercial use (e.g. retail) provided. The western portion of the site (Site B) would only be used for commercial purpose (e.g. office, hotel and retail) without any residential element. The development schedule of the Proposed Scheme is shown in **Table 2-2**.

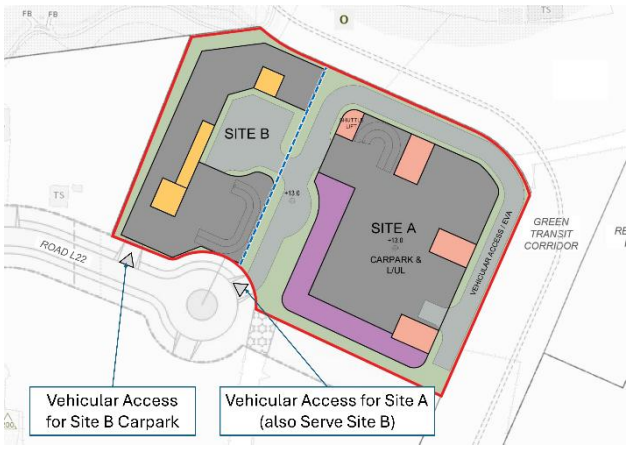
Table 2-2 - Proposed Development Schedule

Development Parameters	Area 32B Site A	Area 32B Site B
Site Area	8,967 m^2	4,634 m^2
Domestic Portion		
Domestic GFA	58,144 m^2	-
No. of Residential Towers	3	-
No. of Units	1,240	-
Average Flat Size	~47 m^2	-
Non-domestic Portion		
Non-Domestic GFA	Retail – 5,221 m^2	Retail – 354 m^2 Hotel – 27,871 m^2 (~ 924 rooms) (1) Office – 9,290 m^2 Office – 28,330 m^2 (2)

Remark:
(1) Based on 30.16 m^2 for each hotel room
(2) Around 40% of the total non-domestic GFA in Area 32B will be implemented at the later stage

2.2 Development Access

2.2.1 As indicated in the Outline Development Plan and Road Gazette Plan, two vehicular access would be provided to serve Area 32B. As shown in **Drawing 2.1**, the development access for Site A would be located at the cul-de-sac of Road L22 (at level +13 mPD) which also serve for Site B via the internal road connected. The Carpark access for Site B would be located at Road L22 close to the cul-de-sac of Road L22.



Drawing 2.1 - Vehicular Accesses

2.3 Internal Transport Facilities

2.3.1 The parking and loading / unloading facilities of the proposed development will be provided in accordance with the requirements as stipulated in the latest Hong Kong Planning Standards and Guidelines (HKPSG). The respective requirements are summarized in **Table 2-3**.

Table 2-3 - HKPSG Parking and Servicing Facilities Provision Requirements

	HKPSG Requirements
Private Car Parking Spaces	
Private Housing – Private Car Parking Spaces	GPS x R1 (1) x R2 (2) x R3 (3) For 40 m^2 < flat size ≤ 70 m^2 = 1 space per 4 – 7 flats x 1.2 x 0.75 x 0.9 = 0.81 spaces per 4 – 7 flats
Private Housing – Visitor Private Car Parking Spaces	5 spaces per block
Retail – Private Car Parking Spaces	1 car space per 150 – 300 m^2 GFA
Hotel – Private Car Parking Spaces	1 car space per 100 rooms
Office – Private Car Parking Spaces	For the first 15,000m^2 GFA, 1 car space per 150 – 200 m^2 GFA. Above 15,000 m^2 GFA, 1 car space per 200 – 300 m^2 GFA
Motorcycle Parking Spaces	
Private Housing – Motorcycle Parking Spaces	1 space per 100 – 150 flats
Retail – Motorcycle Parking Spaces	5% – 10% total provision for private cars
Hotel – Motorcycle Parking Spaces	5% – 10% total provision for private cars
Office – Motorcycle Parking Spaces	5% – 10% total provision for private cars
Loading and Unloading Bays	
Private Housing – Loading and Unloading Bay	1 space for every 800 flats subject to min. 1 bay per block
Retail – Loading and Unloading Bay	1 loading / unloading bay for goods vehicles for every 800 to 1,200 m^2 or part thereof, GFA
Hotel – Loading and Unloading Bay	0.5 – 1 loading / unloading bays for goods vehicles per 100 rooms
Office – Loading and Unloading Bay	1 loading / unloading bay for goods vehicles for every 2,000 to 3,000 m^2 or part thereof, GFA

	HKPSG Requirements
Lay-bys	
Hotel – Taxi / Private Cars Lay-by	4 lay-bys for taxis and private cars for ≥ 600 rooms
Hotel – Single-Deck Tour Buses Lay-by	3 lay-bys for single-deck tour buses for ≥ 900 rooms
Bicycle Parking Spaces	
Private Housing – Bicycle Parking Spaces	1 space per 5 flats for residents

Remark:
(1) For 40 m^2 < flat size ≤ 70 m^2, and R1 of 1.2 is adopted
(2) An accessibility adjustment ratio (R2) of 0.75 has been adopted with the site falling into the 500 m radius of future Hung Shui Kiu MTR Station.
(3) The site area of Site A is 8,967 m^2. With domestic GFA of 58,144 m^2 provided with equivalent domestic plot ratio of 6.48 for the Site A, a development intensity adjustment ratio (R3) of 0.9 is adopted.

2.3.2 Taken into consideration the proximity / convenience for access to public transport services (excluding rail) and the availability of public car-parking spaces, a Global Parking Standard (GPS) of 6 is proposed for the residential development. In light of the HKPSG requirements given in **Table 2-3**, the proposed provisions for the Area 32B Site A and Site B (before the implementation of 28,330 m^2 office GFA) are summarized in **Table 2-4**. The proposed provisions for the Area 32B Site A and Site B (after the implementation of 28,330 m^2 office GFA at the later stage) are summarized in **Table 2-5**.

Table 2-4 - Proposed Internal Transport Facilities Provisions (Before the implementation of 28,330 m^2 office GFA in Site B)

Area	Land Use	Parameter	Type	Required Provision	Proposed Provision (GPS = 6)
32B (Site A)	Residential	1,240 units	Residential Parking Space 40<Flat Size≤70	144 - 252	168
		1,240 units	Visitors' Parking Space	15	15
			Motorcycle Parking Space	9 - 13	13 (1)
			Loading / Unloading Bay	3	3
			Bicycle Parking Space	248	248
	Retail	5,221 m^2	Car Parking Space	18 - 35	35 (2)
			Motorcycle Parking Space	1 - 4	4 (3)
			Loading / Unloading Bay	5 - 7	5 (4)

Area	Land Use	Parameter	Type	Required Provision	Proposed Provision (GPS = 6)
32B (Site B)	Retail	354 m^2	Car Parking Space	2 - 3	3 (2)
			Motorcycle Parking Space	1 - 1	1 (3)
			Loading / Unloading Bay	1 - 1	1 (4)
	Hotel	924 rooms	Car Parking Space	10	10
			Motorcycle Parking Space	1 - 1	1 (3)
			Loading / Unloading Bay for Goods Vehicle	5 - 10	5 (5)
			Lay-by for taxi and private car	4	4
			Lay-by for single-deck tour buses	3	3
	Office	9,290 m^2	Car Parking Space	47 - 62	54 (6)
			Motorcycle Parking Space	3 - 7	6 (3)
			Loading / Unloading Bay	4 - 5	4 (7)

Remark:
(1) Based on 1 motorcycle space per 100 flats
(2) Based on 1 car space per 150 m^2 GFA
(3) Based on 10% total provision for private car
(4) Based on 1 loading bay per 1,200 m^2 GFA
(5) Based on 0.5 loading bay per 100 rooms
(6) For the first 15,000 m^2 GFA, based on 1 car space per 175 m^2 GFA. Above 15,000 m^2 GFA, based 1 car space per 250 m^2 GFA
(7) Based on 1 loading bay per 3,000 m^2 GFA

Table 2-5 - Proposed Internal Transport Facilities Provisions (After the implementation of 28,330 m^2 office GFA at the later stage)

Area	Land Use	Parameter	Type	Required Provision	Proposed Provision (GPS = 6)
32B (Site A)	Residential	1,240 units	Residential Parking Space 40<Flat Size≤70	144 - 252	168
		1,240 units	Visitors' Parking Space	15	15
			Motorcycle Parking Space	9 - 13	13 (1)
			Loading / Unloading Bay	3	3
			Bicycle Parking Space	248	248
	Retail	5,221 m^2	Car Parking Space	18 - 35	35 (2)
			Motorcycle Parking Space	1 - 4	4 (3)
			Loading / Unloading Bay	5 - 7	5 (4)
32B (Site B)	Retail	354 m^2	Car Parking Space	2 - 3	3 (2)
			Motorcycle Parking Space	1 - 1	1 (3)
			Loading / Unloading Bay	1 - 1	1 (4)
	Hotel	924 rooms	Car Parking Space	10	10
			Motorcycle Parking Space	1	1 (3)
			Loading / Unloading Bay for Goods Vehicle	5 - 10	5 (5)
			Lay-by for taxi and private car	4	4
			Lay-by for single-deck tour buses	3	3
	Office	37,620 m^2	Car Parking Space	151 - 214	177 (6)
			Motorcycle Parking Space	8 - 22	18 (3)
			Loading / Unloading Bay	13 - 19	13 (7)

Remark:
(1) Based on 1 motorcycle space per 100 flats
(2) Based on 1 car space per 150 m^2 GFA
(3) Based on 10% total provision for private car
(4) Based on 1 loading bay per 1,200 m^2 GFA
(5) Based on 0.5 loading bay per 100 rooms
(6) For the first 15,000 m^2 GFA, based on 1 car space per 175 m^2 GFA. Above 15,000 m^2 GFA, based 1 car space per 250 m^2 GFA
(7) Based on 1 loading bay per 3,000 m^2 GFA

3. Traffic Impact

3.1 Trip Generation

3.1.1 To compare the development traffic generations between the Proposed Scheme and the Hypothetical Scheme, references were made to the trip generation and attraction rates as stipulated in Annex C of Transport Planning and Design Manual (TPDM) Volume 1 Chapter 3 published by Transport Department. The adopted trip rates are presented in **Table 3-1**.

Table 3-1 - Trip Generation and Attraction

Land Use	Unit	Trip Rate			
		AM Peak		PM Peak	
		Gen.	Att.	Gen.	Att.
Private Housing (Flat Size = 60 m^2)	pcu/hr/flat	0.0718	0.0425	0.0286	0.037
Retail	pcu/hr/100 m^2 GFA	0.2296	0.2434	0.31	0.3563
Office	pcu/hr/100 m^2 GFA	0.1703	0.2452	0.1573	0.1175
Hotel	pcu/hr/guest room	0.1329	0.1457	0.129	0.1546

3.1.2 Based on the proposed development schedule as given in **Table 2-2** and the hypothetical development schedule as given in **Table 2-1**, the estimated trips are presented in **Table 3-2**.

Table 3-2 - Trip Generation and Attraction

Land Use	Parameters	Trip Generation / Attraction (pcus/hr)			
		AM Peak		PM Peak	
		Gen.	Att.	Gen.	Att.
Proposed Scheme (A)					
Area 32B (Site A)					
Private Housing	1,240 units	89	53	35	46
Retail	5,221 m^2	12	13	16	19
Area 32B (Site B)					
Retail	354 m^2	1	1	1	1
Office	37,620 m^2	64	92	59	44
Hotel	924 rooms	123	135	119	143
Total (A) (two-way)		*583*		*483*	
Hypothetical Scheme (B)					
Area 32B (Sites A and B)					
Retail	45,223 m^2	104	110	140	161
Office	58,145 m^2	99	143	91	68

Land Use	Parameters	Trip Generation / Attraction (pcus/hr)			
		AM Peak		PM Peak	
		Gen.	Att.	Gen.	Att.
Hotel	857 rooms	114	125	111	132
Total (B) (two-way)		*695*		*703*	
Total (A) – Total (B) (two-way)		**-112**		**-220**	

3.1.3 As shown in **Table 3-2**, the traffic generations under the Proposed Scheme would be much lesser than the Hypothetical Scheme. Hence the traffic impacts imposed on the local road network under the Proposed Scheme would be much lesser and there should not be any insurmountable traffic impact imposed on the surrounding road network.

4. Conclusion

4.1.1 In light of findings of this traffic review, it is concluded that there is no insurmountable traffic impact imposed on the surrounding road network due to the proposed development. With all the transport facilities provided within the development sites in place, the proposed development under the Proposed Scheme is technically feasible in traffic terms.

Appendix C

Drainage Impact Assessment

Section 16 Planning Application for Proposed Mixed-Use Development (Proposed Flat with Permitted Commercial Uses) in Planning Area 32B, Hung Shui Kiu, New Territories
(Application No.: A/HSK/619)

Drainage Impact Assessment

August 2026

Delivering a better world

Prepared by:

AECOM Asia Company Limited
19/F, Tower A, 83 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong S.A.R.
aecom.com

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Table

Table 1 – Key Development Parameters 3

Figure

AREA 32B/DIA/Figure 1 Location Plan

AREA 32B/DIA/Figure 2 Master Layout Plan

AREA 32B/DIA/Figure 3 Drainage Layout Plan

1. Introduction

1.1 Background

1.1.1 AECOM Asia Company Limited (AECOM) has been commissioned by the project proponent to act as the engineering consultant to conduct a Drainage Impact Assessment (DIA) for a private mixed-use development in Hung Shui Kiu, Yuen Long.

1.1.2 The S16 Planning Application involves Area 32B with total area of 13,601m^2; referred as the "Application Site". The Site is located next to the Kong Sham Western Highway. Location plan of the Application Site refers to figure no. **AREA 32B/DIA/Figure 1**.

1.1.3 The Application Site falls within “C(1)” zone on the Draft Hung Shui Kiu and Ha Tsuen OZP No. S/HSK/3 and lies within Hung Shui Kiu / Ha Tsuen (HSK/HT) New Development Area (NDA). According to the OZP, commercial uses including ‘Hotel’, ‘Office’, ‘Eating Place’, ‘Shop and Services’, etc. are always permitted in “C(1)” zone; while ‘Flat’ use is under Column 2, planning permission is therefore required for the proposed residential use in Site A of the Application Site.

1.1.4 This DIA report reviews the drainage impact of the proposed development and serves as a supporting document for the S16 Planning Application.

1.2 Base Case and Proposed Mixed-Use Development for Area 32B

1.2.1 A base case is assumed by following the development mix specified in the Outline Development Plan No. D/HSK/1 with maximum plot ratio of 9.5 and the total non-domestic GFA of not more than 129,210m^2. The development mix for Area 32B consists of retail (i.e. 35% of non-domestic GFA), hotel (i.e. 20% of non-domestic GFA) and office (i.e. 45% of non-domestic GFA).

1.2.2 The proposed mixed-use development for Area 32B (i.e. Proposed Development) consists of residential, retail, hotel and office. Details of development parameter refers to **Table 1**.

2. Development Proposal

2.1 The Proposed Development

2.1.1 The Application Site area is approximately 13,601m^2. The Proposed Development total plot ratio is not more than 9.5. (i.e. the total GFA is not more than 129,210m^2) The Applicant proposed 71,066m² as non-domestic GFA which is for the as-of-right permitted commercial use, whereas the remaining 58,144m² as domestic GFA would be used for the proposed residential development.

2.1.2 The proposed residential use would be clustered in Site A with some as of right permitted commercial use (e.g. retail) provided. Site B would only be used for commercial purpose (e.g. office, hotel and retail) without any residential element. The anticipated completion year of the Application Site (except for the remaining non-domestic GFA to be implemented at a later stage under the arrangement of “Pay for What You Build” Pilot Scheme) is 2033.

2.1.3 The Master Layout Plan (MLP) of the Application Site is shown in figure no. **AREA 32B/DIA/Figure 2**. The comparison table of development parameters between the base case and proposed development is summarized in **Table 1** below.

	Base Case	Proposed Development (Site A)	Proposed Development (Site B)
Site Area	13,601m^2	8,967m^2	4,634m^2
Total PR (not more than)	9.5	7.1	14.2
		9.5 (Site A + Site B)	
Total GFA (not more than)	129,210m^2	63,365m^2	65,845m^2
		129,210m^2 (Site A + Site B)	
Domestic Portion			
Total Domestic GFA (not more than)	-	58,144m^2	-
No. of Units	-	1,240	-
Population (1)	-	3,348	-
Non-Domestic Portion – Resident's Recreational Facilities (2)	-	2,325m^2	-
Non-Domestic Portion – Retail			
Total Non-Domestic GFA	45,223.5m^2	5,221m^2 (3)	354m^2 (3)
Non-Domestic Portion – Hotel			
Total Non-Domestic GFA	25,842m^2	-	27,871m^2 (3)
No. of Hotel Rooms	-	-	924
Non-Domestic Portion – Office			
Total Non-Domestic GFA	58,144.5m^2	-	37,620m^2
Non-Domestic Portion – Office (Completed in 2033)			
Total Non-Domestic GFA	-	-	9,290m^2 (3)
Non-Domestic Portion – Office (Remaining)			
Total Non-Domestic GFA	-	-	28,330m^2

Table 1 – Key Development Parameters

Remarks:
(1) A person per flat of 2.7 is assumed.
(2) Or such other areas of clubhouse as may be approved by the Buildings Department based on the total permissible domestic GFA for individual land parcel (site under the Buildings Ordinance) at the future General Building Plans.
(3) Drawing upon the spirit of the "Pay for What You Build" Pilot Scheme, about 60% of the non-domestic GFA in Area 32B (i.e. about 42,736m^2) will be implemented first by the target completion year 2033. The GFA to be distributed in both Site A and Site B are 5,221m^2 and 37,515m^2 respectively.

3. Discussion

3.1 Existing Drainage System

3.1.1 The Application Site is situated located at the north of Yick Yuen Road in Hung Shui Kiu, Yuen Long and adjoins the riverside promenade to the north. The Application Site is currently used for open storage and car parking.

3.1.2 According to GEOINFO Map, an existing 3m wide rectangular nullah is identified at the north of the Application Site.

3.2 Proposed Public Drainage Arrangement under Hung Shui Kiu/Ha Tsuen New Development Area by CEDD

3.2.1 The Application Site is within the drainage catchments of Hung Shui Kiu/Ha Tsuen New Development Area (HSK/HT NDA). With reference to DIA of Planning Application No. A/HSK/452, it is noted a hydraulic model was established in accordance with Drainage Services Department's guidelines to assess the hydraulic performance of the proposed drainage system within HSK/HT NDA. The result showed that the proposed drainage system is sufficient to cater for the peak flows arising from the planned HSK/HT NDA.

3.2.2 According to CEDD's information provided, drainage lead-in is proposed under the design of Contract 4 of HSK/HT SPD for runoff discharge from the Proposed Development. The Proposed Development will adopt the proposed drainage arrangements implemented by CEDD under HSK/HT NDA project.

3.2.3 The drainage arrangement of the Application Site refers to figure no. **AREA 32B/DIA/Figure 3**.

3.3 Impact on Proposed Public Drainage System

3.3.1 Stormwater of the Proposed Development will be discharged to the planned revitalised river to be constructed by HSK/HT NDA. The Proposed Development will introduce residential component in this zone to form a mixed-use development without changing the site area of Area 32B. The drainage characteristics are considered similar as HSK OZP. (i.e. similar paved/unpaved ratio) No significant change in drainage discharge proposal due the Proposed Development is anticipated.

3.3.2 Therefore, no adverse impact on the proposed drainage system is anticipated.

4. Conclusion

4.1.1 The Application Site is within the drainage catchments of HSK/HT NDA. A hydraulic model was established to show that the proposed drainage system is sufficient to cater for the peak flows arising from the planned HSK/HT NDA.

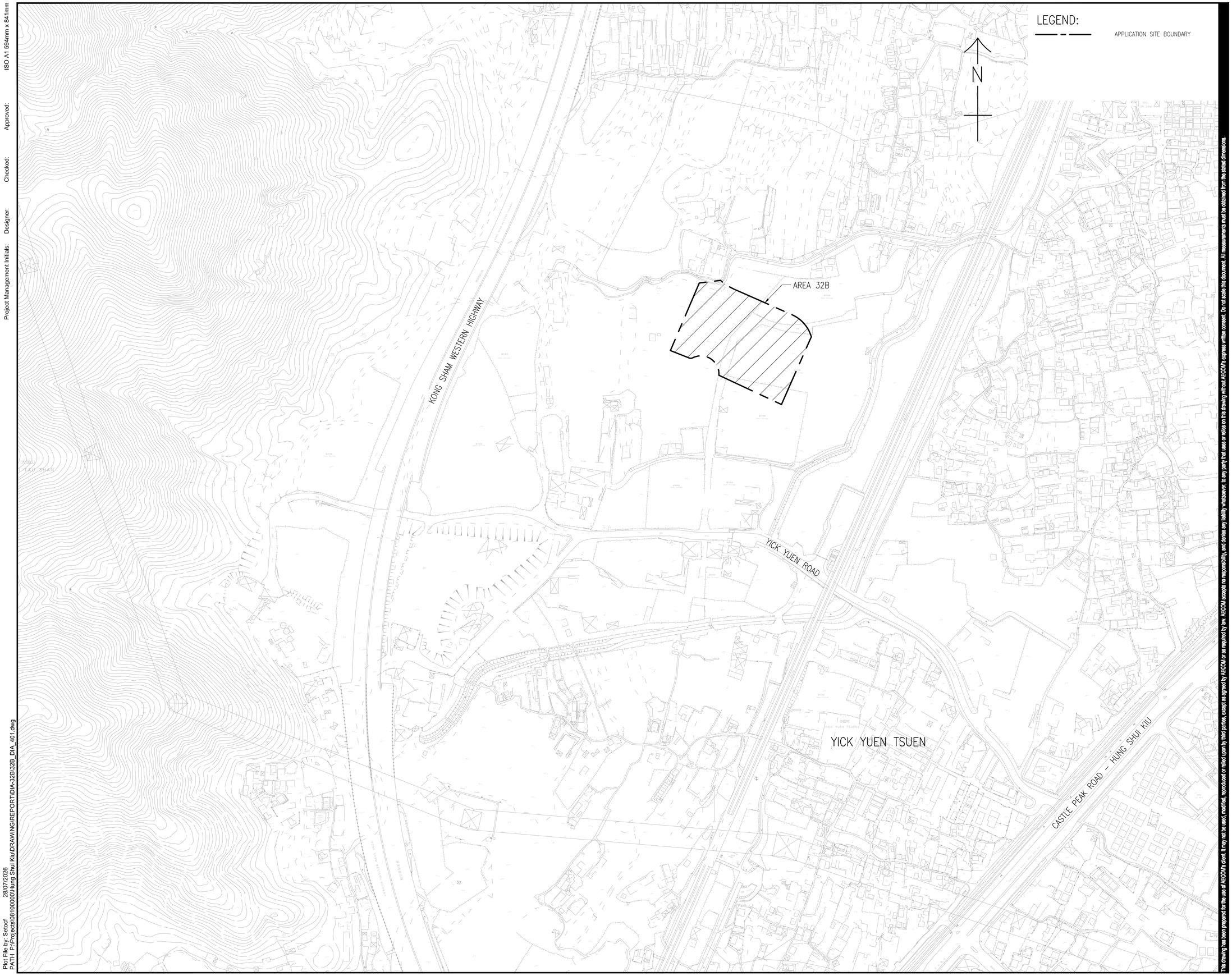
4.1.2 The Proposed Development will introduce residential component in this zone to form a mixed-use development without changing the site area. The drainage characteristics are considered similar as HSK OZP. (i.e. similar paved/unpaved ratio) Therefore, no adverse impact on existing/planned drainage system is anticipated.

4.1.3 The change in land-use over the same site would not influence the drainage characteristics at all. Therefore, it can be concluded that, the proposed development would not pose adverse drainage impact.

End of Report

Figure

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SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL DEVELOPMENT WITH PERMITTED COMMERCIAL USES IN PLANNING AREA 32B, HUNG SHUI KIU, NEW TERRITORIES

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PROJECT NO. 項目編號

AGREEMENT NO. 協議編號

HUNG SHUI KIU

SHEET TITLE
圖紙名稱

LOCATION PLAN

SHEET NUMBER
圖紙編號

AREA 32B/DIA/FIGURE 1

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816500 E

816750 E

832700 N

832500 N

LEGEND:

APPLICATION SITE BOUNDARY

DEVELOPMENT SITE DEMARCATION LINE

RUN-IN / OUT

RESIDENTIAL

HOTEL / OFFICE

LANDSCAPE AREA / PODIUM DECK

CLUBHOUSE

SWIMMING POOL

N

HOTEL / OFFICE
T1
+152.0

SITE B

SHUTTLE LIFT

RESIDENTIAL
T3
+181.5

HOTEL / OFFICE
T2
+190.0

SITE A

RESIDENTIAL
T2
+185.0

VEHICULAR ACCESS / EVA

RESIDENTIAL
T1
+192.0

Nullah

Track

露天貨倉
Open Storage

貨倉
Storage

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HUNG SHUI KIU

SHEET TITLE
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MASTER LAYOUT PLAN

SHEET NUMBER
圖紙編號

AREA 32B/DIA/FIGURE 2

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DEVELOPMENT SITE DEMARCATION LINE

RUN-IN / OUT

RESIDENTIAL

HOTEL / OFFICE

LANDSCAPE AREA / PODIUM DECK

CLUBHOUSE

SWIMMING POOL

N

EXISTING 3m WIDE RECTANGULAR NULLAH

NEW DISCHARGE POINT TO REVITALIZED RIVER TO BE CONSTRUCTED UNDER HSK/HT NDA

PROPOSED DRAINAGE PIPE TO BE CONSTRUCTED UNDER HSK/HT NDA

CONNECTED TO PROPOSED INTERNAL DRAINAGE SYSTEM

HOTEL / OFFICE T1 +152.0

SITE B

HOTEL / OFFICE T2 +190.0

SHUTTLE LIFT

RESIDENTIAL T3 +181.5

SITE A

RESIDENTIAL T2 +185.0

RESIDENTIAL T1 +192.0

VEHICULAR ACCESS / EVA

露天貨倉 Open Storage

Nullah

Track

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AGREEMENT NO. 協議編號

HUNG SHUI KIU

SHEET TITLE 圖紙名稱

DRAINAGE LAYOUT PLAN

SHEET NUMBER 圖紙編號

AREA 32B/DIA/FIGURE 3

Appendix D

Water Supply Impact Assessment

Section 16 Planning Application for Proposed Mixed-Use Development (Proposed Flat with Permitted Commercial Uses) in Planning Area 32B, Hung Shui Kiu, New Territories
(Application No.: A/HSK/619)

Water Supply Impact Assessment

August 2026

Delivering a better world

Prepared by:

AECOM Asia Company Limited
19/F, Tower A, 83 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong S.A.R.
aecom.com

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Annex 1 Proposed Development Population
Annex 2 Water Demand Estimation of the Proposed Development
Annex 3 Hydraulic Review of Planned Water Main
Annex 4 Hydraulic Review of Proposed Lead-in Pipe

1. Introduction

1.1 Background

1.1.1 AECOM Asia Company Limited (AECOM) has been commissioned by the project proponent to act as the engineering consultant to conduct a Water Supply Impact Assessment (WSIA) for a private mixed-use development in Hung Shui Kiu, New Territories.

1.1.2 The S16 Planning Application involves Area 32B with total area of 13,601 m^2; referred as the "Application Site". The Site is located next to the Kong Sham Western Highway. Location plan of the Application Site refers to **AREA 32B/WSIA/Figure 1**.

1.1.3 The Application Site falls within "Commercial (1)" ("C(1)") zone on the Draft Hung Shui Kiu and Ha Tsuen OZP No. S/HSK/3 and lies within Hung Shui Kiu / Ha Tsuen (HSK/HT) New Development Area (NDA). According to the OZP, commercial uses including 'Hotel', 'Office', 'Eating Place', 'Shop and Services', etc. are always permitted in "C(1)" zone; while 'Flat' use is under Column 2, planning permission is therefore required for the proposed residential use in Site A of the Application Site.

1.1.4 This WSIA report serves as a supporting document for the S16 Planning Application.

1.2 Objective of this Submission

1.2.1 This report outlines the assessment results of the potential water supply impacts caused by the Proposed Development at the Application Site. The main objectives of this assessment include the followings:

(i) Review the existing water supply condition of the Application Site;

(ii) Estimate the water demand of the proposed development;

(iii) Identify any potential impact on the current water supply system due to the additional water supply demand from the proposed development;

(iv) Propose water supply mitigation measures where appropriate to mitigate the potential water supply impact.

1.3 Nomenclature

1.3.1 The following abbreviations and shortened expressions in **Table 1** are adopted in this report.

ADWF	Average Dry Weather Flow
AECOM	AECOM Asia Company Limited
CIFSUS	Commercial and Industrial Floor Space Utilization Survey (PlanD)
DSD	Drainage Services Department
EPD	Environmental Protection Department
GFA	Gross Floor Area
PPoF	People Per Unit
mPD	Metres above Principal Datum
PlanD	Planning Department
UFF	Unit Flow Factor
TMF	Temporary Main for Flushing
UDD	Unit Daily Demand
WSD	Water Supplies Department
WSIA	Water Supply Impact Assessment

Table 1 – Nomenclature

2. Development Proposal

2.1 The Proposed Development

2.1.1 The Application Site area is approximately 13,601 m^2. Under the Proposed Development, the total plot ratio is not more than 9.5. (i.e. the total GFA is not more than 129,210 m^2) The Applicant proposed 71,066 m^2 as non-domestic GFA which is designated for the permitted commercial use as of right, whereas the remaining 58,144 m^2 domestic GFA would be used for the proposed residential development.

2.1.2 The Proposed Development consists of Site A and Site B. Site A includes 1,240 residential units and recreational facilities, as well as some permitted commercial use (e.g. retail). Site B contains retail and hotel/office development which provides 924 rooms. The anticipated completion year of the Application Site (except for the remaining non-domestic GFA to be implemented at a later stage under the arrangement of "Pay for What You Build" Pilot Scheme) is 2033. Details refers to **Remark (3)** of **Table 2**.

2.1.3 The Master Layout Plan (MLP) of the Proposed Development is shown in figure no. **AREA 32B/WSIA/Figure 2.** The proposed development schedule is summarised in **Table 2** below.

	Overall	Proposed Development (Site A)	Proposed Development (Site B)
Site Area	13,601m^2	8,967m^2	4,634m^2
Total PR (not more than)	9.5	7.1	14.2
Total GFA (not more than)	129,210m^2	63,365m^2	65,845m^2
Domestic Portion			
Total Domestic GFA (not more than)	58,144m^2	58,144m^2	-
No. of Units	1,240	1,240	-
Population (1)	3,348	3,348	-
Domestic Portion – Resident's Recreational Facilities (2)	2,325m^2	2,325m^2	
Non-Domestic Portion – Retail			
Total Non-Domestic GFA	5,575m^2	5,221m^2 (3)	354m^2 (3)
Non-Domestic Portion – Hotel			
Total Non-Domestic GFA	27,871m^2 (3)	-	27,871m^2 (3)
No. of Hotel Rooms	924	-	924
Non-Domestic Portion – Office (Completed in 2033)			
Total Non-Domestic GFA	9,290m^2 (3)	-	9,290m^2 (3)
Non-Domestic Portion – Office (Remaining)			
Total Non-Domestic GFA	28,330m^2	-	28,330m^2

Table 2 – Key Development Parameters

Remarks:
(1) A person per flat of 2.7 is assumed.
(2) Or such other areas of clubhouse as may be approved by the Buildings Department based on the total permissible domestic GFA for individual land parcel (site under the Buildings Ordinance) at the future General Building Plans.
(3) Drawing upon the spirit of the "Pay for What You Build" Pilot Scheme, about 60% of the non-domestic GFA in Area 32B (i.e. about 42,736m^2) will be implemented first by the target completion year 2033. The GFA to be distributed in both Site A and Site B are 5,221m^2 and 37,515m^2 respectively.

3. Assessment Methodology

3.1 Unit Demand

3.1.1 Assumptions have been made for the unit daily demand (UDD) for each type of land use, for both fresh water and flushing water. The UDD is used for estimating the total demand of the proposed development and the required water supply capacity to support the development.

3.1.2 The water supply demand estimation is presented in **Annex 1**.

3.1.3 The unit flow factors adopted for water demand estimation and calculation are summarised in **Table 3**.

Development Type	Flow Type	Fresh Water UDD (L/head/day)	Flushing Water UDD (L/head/day)
Domestic	Private Residential	300	70
Non-domestic - Retail	Retail	230	50
Non-domestic - Restaurant	Restaurant	1,310	270
Resident's Recreational Facilities	Community, Social & Personal Services	230	50
Hotel	Hotel Room	1 m^3/room/day	0.36 m^3/room/day
Office	Finance, Insurance, Real Estate & Business Services	30	50

Table 3 – Unit Daily Demand adopted in Water Supply Impact Assessment

3.2 Peaking Factors

3.2.1 The peaking demand factors below shall be adopted for design:

- Peak flow rate in fresh water distribution mains = 3 x mean daily demand
- Peak flow in flushing water distribution mains = 2 x mean daily demand
- Peak flow rate in fresh water trunk mains = 1.5 x mean daily demand
- Peak flow rate in flushing water trunk mains = 1.2 x mean daily demand

3.3 Fire-Fighting

3.3.1 In addition to the aforementioned facilities of the Proposed Development, water supply for fire-fighting service has been considered in this WSIA. Fire-fighting requirement for residential zone is 6,000m^3/day with discharge pressure of 17m head. The fire hydrant should be of standard pattern with minimum output pressure of not less than 25 psi. With multiple hydrants operating at the same time, total output of not less than 4,000L/min shall last for 60 minutes. Table 4 summarizes the fire-fighting requirements.

Requirements	Minimum Values
Minimum fresh water supply	6,000 m^3/day
Discharge pressure	17m
Minimum output not less than 25 psi	4,000 L/min to last for an hour

Table 4 – Fire-Fighting Requirement

3.4 Residual Heads

3.4.1 The minimum residual heads at extremity of the fresh water and flushing water supply systems for the Proposed Development are adopted as follow:

- Fresh water: 20m
- Flush water: 15m

3.5 Design Velocity

3.5.1 The desirable flow velocities for hydraulic checking are as follows:

Maximum velocity (under peak flow condition)

Fresh water mains:

>DN700	≤ 3 m/s
DN700 – DN525	≤ 2.5 m/s
DN450 – DN375	≤ 2 m/s
DN300 – DN200	≤1.5 m/s

Flushing water mains:

≥DN1000	≤ 3 m/s
DN900 – DN800	≤ 2.5 m/s
DN700 – DN300	≤ 2 m/s
DN450 – DN300	≤ 1.5 m/s

Minimum velocity (under peak flow condition)

Fresh water mains: ≥ 0.9 m/s

Flushing water mains: ≥ 0.9 m/s

3.5.2 The pipeline shall have a minimum gradient of 1:400. Pipes shall be laid at a minimum separation of 300mm away from existing utilities and underground structures.

4. Review on Existing Water Supply System

4.1 Existing Water Supply System

4.1.1 There is a series of existing DN100 and DN50 PE fresh water distribution main running at the north of the Application Site.

4.1.2 Currently, there is no salt water supply system for flushing water supply at the Application Site and nearby area.

4.2 Impact on Existing Water Supply System

4.2.1 The estimated daily fresh water demand for Application Site is 2,054m^3/day and the estimated daily flushing water demand is 684 m^3/day. Detailed water demand estimation refers to **Annex 1** and **Annex 2**.

4.2.2 The peaking factor adopted for the sizing of fresh water distribution main is 3, such that the required peak flow rate for the Application Site is 0.076m^3/s.

4.2.3 The peaking factor adopted for the sizing of flushing water distribution main is 2, such that the required peak flow rate for the Application Site is 0.019m^3/s.

4.2.4 A section of existing DN50 PE pipe and exposed DN50 GIL pipe crossing Site B is proposed to be diverted to existing public road. The proposed diversion of existing DN50 PE pipe refers to the **AREA 32B/WSIA/Figure 3**.

5. Proposed Water Supply System

5.1 Fresh Water Supply System

5.1.1 According to CEDD information provided, a series of NS315 PE fresh water main is planned and constructed by CEDD in the vicinity of the Application Site to provide fresh water for the future development.

5.1.2 NS250 lead-in pipe is proposed to be tee-off from the planned NS315 fresh water main for fresh water supply to the Proposed Development. The indicative planned fresh water main alignment refers to figure no. **AREA 32B/WSIA/Figure 3** refers. Detailed calculation refers to **Annex 3** and **Annex 4**.

5.1.3 According to hydraulic checking result, the fresh water demand of Proposed Development will utilize 46% of the planned NS315 fresh water main constructed by CEDD.

5.2 Flushing Water Supply System

5.2.1 Currently there is no no salt water supply system for flushing water supply to the Application Site.

5.2.2 According to CEDD information provided, a series of NS250 PE flushing water main is planned and constructed by CEDD in the vicinity of the Application Site to provide flushing water for the future development.

5.2.3 NS125 lead-in pipe is proposed to be tee-off from planned NS250 PE flushing water main to provide flushing water to the Proposed Development. The indicative planned flushing water main alignment refers to figure no **AREA 32B /WSIA/Figure 4**. Detailed calculation refers to **Annex 3** and **Annex 4**.

5.2.4 According to hydraulic checking in **Annex 3**, the fresh water demand of Proposed Development will utilize 21% of the planned NS250 PE flushing water main constructed by CEDD.

6. Maintenance Responsibility

6.1.1 The Applicant is responsible for the construction and maintenance of all water supply facilities within the Application Site boundary, including all internal watermains and water supply lead-in valves.

6.1.2 The proposed fresh water main tee-off from planned fresh water main is proposed to be handed over to the government after construction. The Applicant is responsible for the construction.

6.1.3 The proposed flushing water main tee-off from planned flushing water main is proposed to be handed over to the government after construction. The Applicant is responsible for the construction.

7. Conclusion

7.1.1 The WSIA has been carried out to assess the impact on the existing water supply system due to the proposed development.

7.1.2 The estimated daily fresh water demand for the Application Site is 2,054m^3/day and the estimated daily flushing water demand is 684 m^3/day.

7.1.3 According to CEDD information provided, a series of NS315 PE fresh water main is planned and constructed by CEDD in the vicinity of the Application Site to provide fresh water for the future development. NS250 lead-in pipe is proposed to be tee-off from the planned NS315 fresh water main for fresh water supply to the Proposed Development.

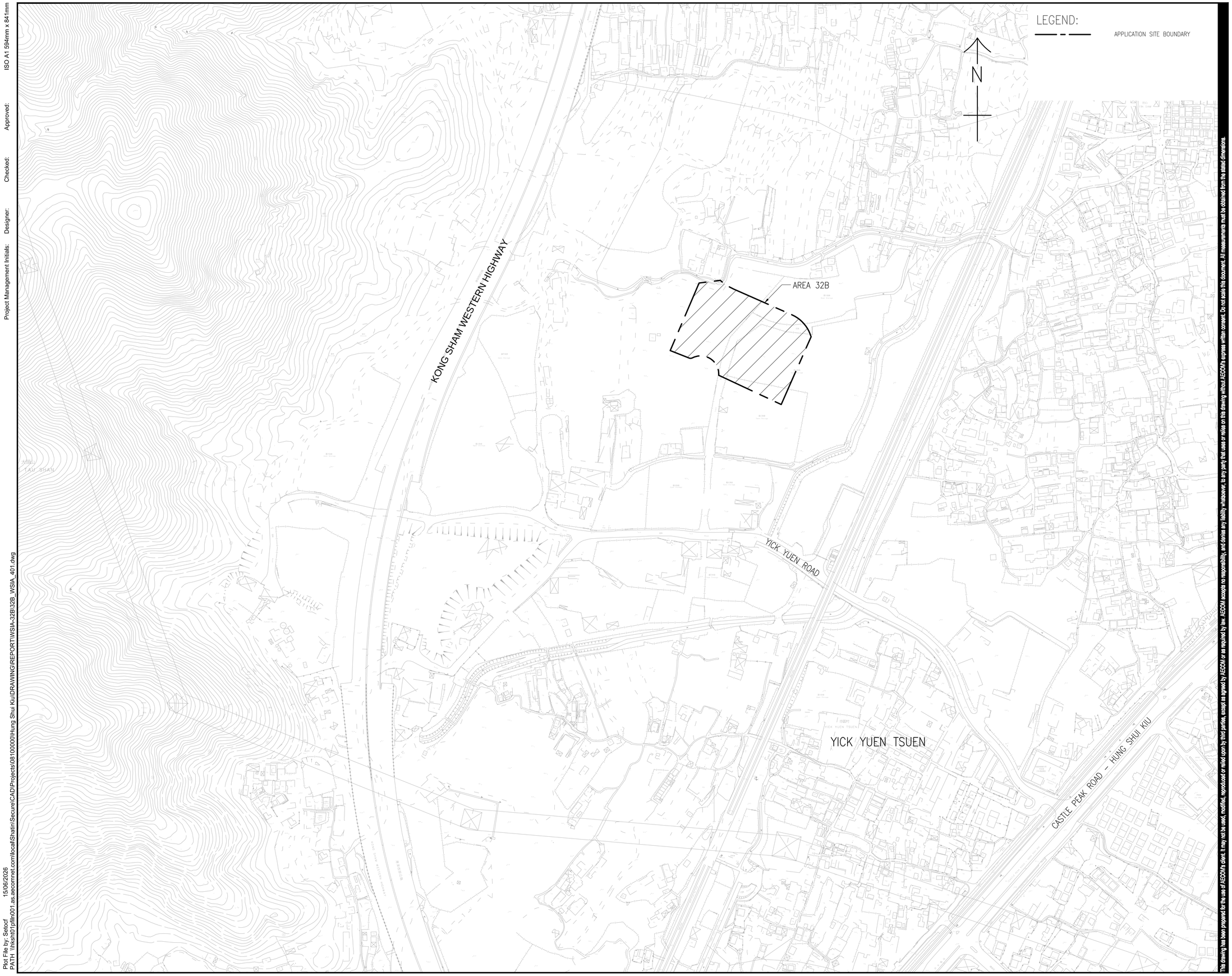
7.1.4 According to CEDD information provided, a series of NS250 PE flushing water main is planned and constructed by CEDD in the vicinity of the Application Site to provide flushing water for the future development. NS125 lead-in pipe is proposed to be tee-off from planned NS250 PE flushing water main to provide flushing water supply to the Proposed Development.

7.1.5 The proposed arrangement is acceptable to the proposed water supply system under CEDD's HSK/HT NDA. Therefore, no adverse impact is anticipated.

End of Report

Figure

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HUNG SHUI KIU

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AREA 32B/WSIA/FIGURE 1

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AREA 32B/WSIA/FIGURE 2

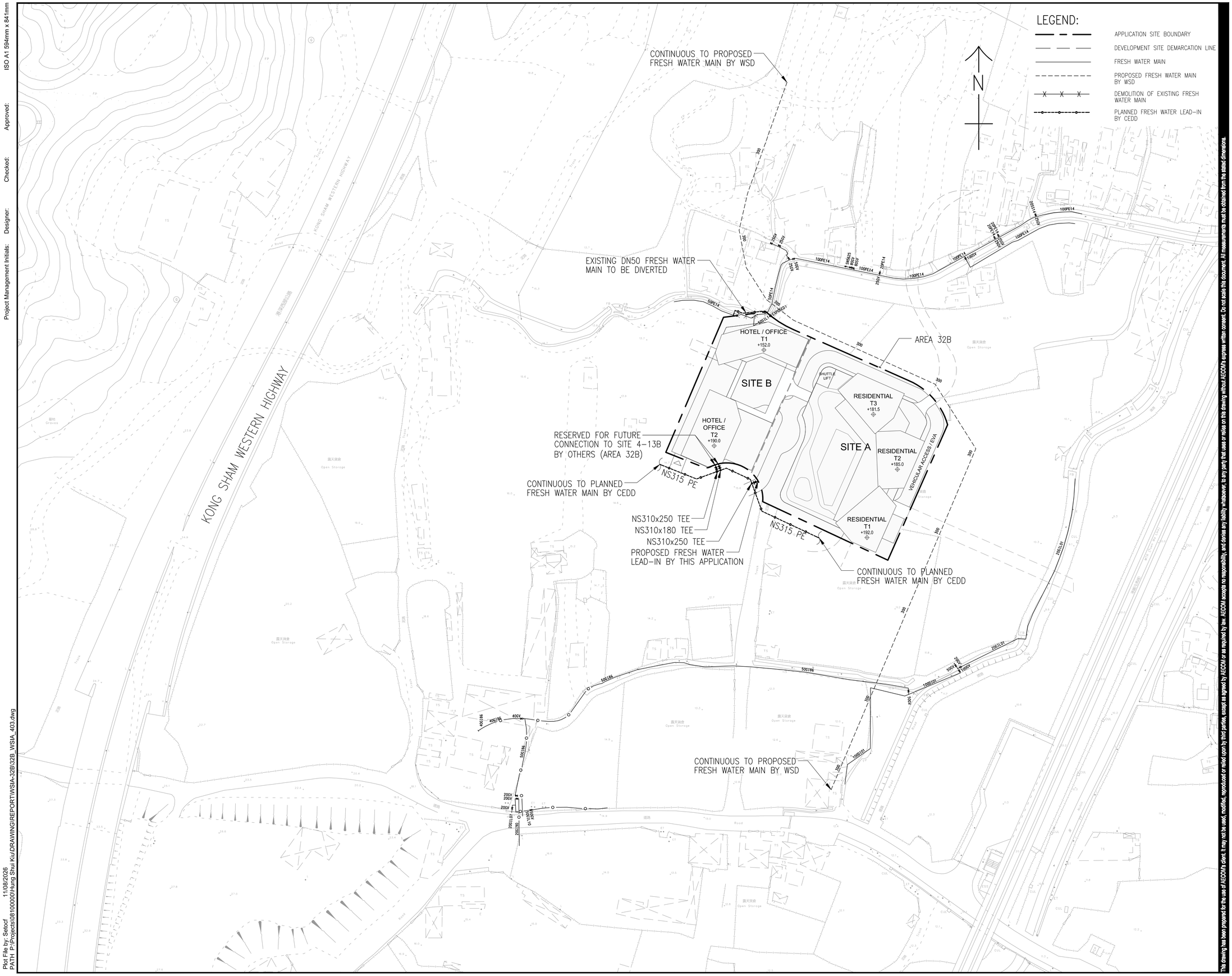
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SECTION 16 PLANNING APPLICATION FOR PROPOSED RESIDENTIAL DEVELOPMENT WITH PERMITTED COMMERCIAL USES IN PLANNING AREA 32B, HUNG SHUI KIU, NEW TERRITORIES

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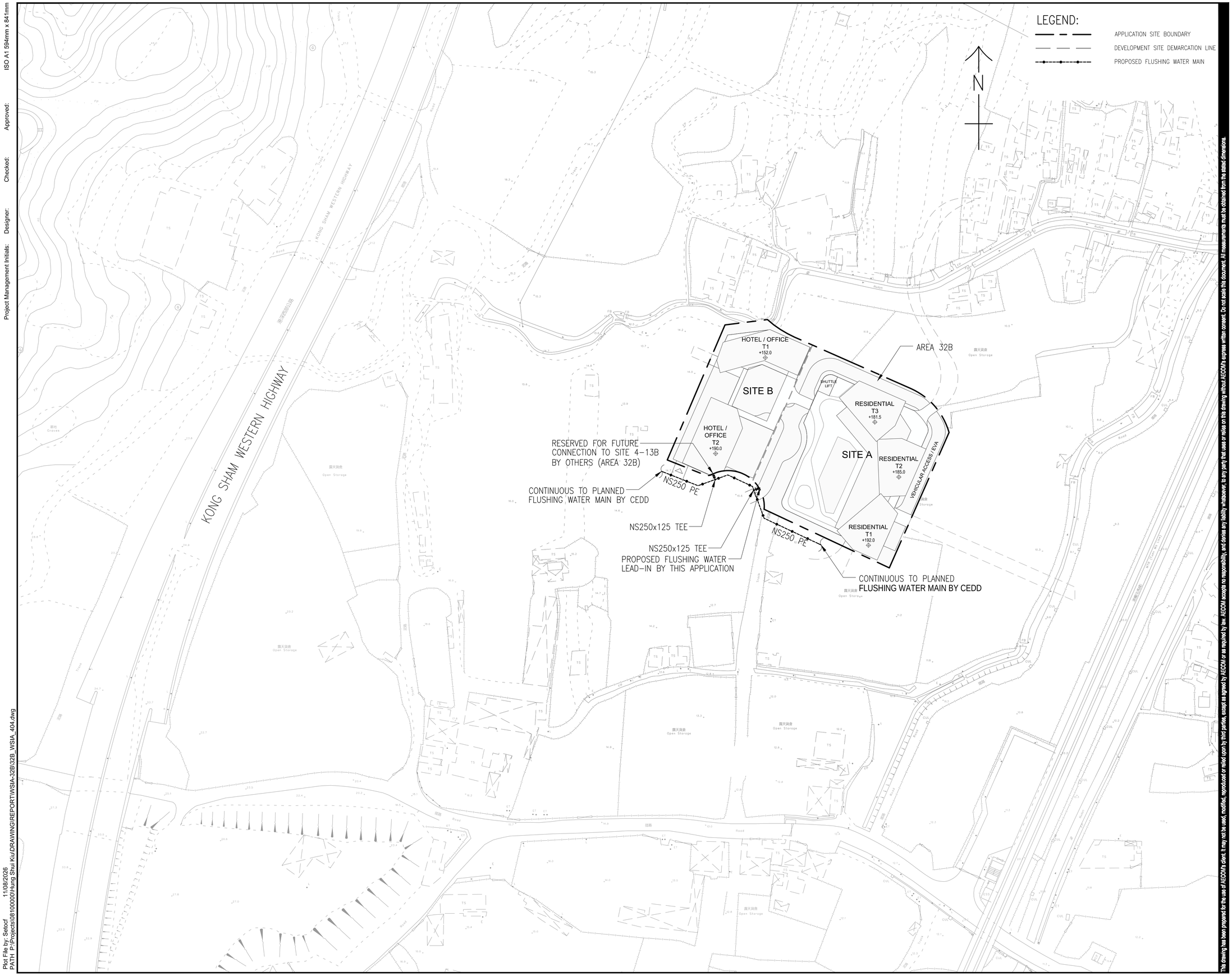
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PROPOSED FRESH WATER SUPPLY LAYOUT PLAN

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圖紙編號

AREA 32B/WSIA/FIGURE 3

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HUNG SHUI KIU

SHEET TITLE
圖紙名稱

PROPOSED FLUSHING WATER SUPPLY LAYOUT PLAN

SHEET NUMBER
圖紙編號

AREA 32B/WSIA/FIGURE 4

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Annex 1

Proposed Development Population

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Annex 1 - Proposed Development Water Demand

Population

Site A					
Residential					
No. of Units	1,240				
PPoF [1]		**Development Type**			**Population**
2.7		Private R2			3,348
Workers	**GFA (m^2)**	**Worker's Type**		**Workers per GFA (in $100m^2$)** [3]	**Employee**
GFA for Clubhouse (m^2)	2,325	Community, Social & Personal Services		3.3	77

Workers	**GFA (m^2)**	**Worker's Type**	**Workers per GFA (in $100m^2$)** [3]	**Employee**
GFA for Restaurant (m^2) [2]	2,611	Restaurants	5.1	134
		J10 Restaurants & Hotels		
GFA for Retail (m^2) [3]	2,611	Retail Trade	3.5	92
		J4 Wholesale & Retail		

.

Site B						
Hotel		**No. of Rooms**				
No. of Rooms	**Phase 1**	924				
	Phase 2	-				
Workers			**Worker's Type**		**Employee**	
Rooms per employee = 2			Hotels and Boarding Houses		**Phase 1**	462
			J10 Restaurants & Hotels		**Phase 2**	-
GFA for Office (m^2)	**Phase 1**	9,290	J6 Finance, Insurance, Real Estate & Business Services	**Workers per GFA (in $100m^2$)** [4]	**Phase 1**	511
	Phase 2	28,330		5.5	**Phase 2**	1559
GFA for Restaurant (m^2)		354	Restaurants	5.1	19	
			J10 Restaurants & Hotels			

Remarks:

[1] A person per flat of 2.7 is assumed.

[2] Assume 50% of the Non-domestic GFA at Site A is for Restaurant use

[3] Assume 50% of the Non-domestic GFA at Site A is for Retail use.

[4] Worker Density is in GFA per worker according to T-8 CIFSUS are assumed.

Annex 2

Water Demand Estimation of the Proposed Development

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Annex 2 - Water Demand Estimation of the Proposed Development

Population	No. of Rooms	Supply	Type	Unit Demand (L/h/d)						Fresh Water Demand (m^3/d)	Flush Water Demand (m^3/d)
				Domestic	School	Hotel (m^3/rom/day)	Restaurants	Office	Retail and Resident's Recreational Facilities		
3,348	-	Fresh Water	Residential	300	-	-	-	-	-	1,004.40	-
(Private Housing Site A)	-	Flushing Water		70	-	-	-	-	-	-	234.36
77	-	Fresh Water	Resident's Recreational Facilities	-	-	-	-	-	230	17.71	-
	-			-	-						
	-	Flushing Water		-	-	-	-	-	50	-	3.85
-	924	Fresh Water	Hotel	-	-	1	-	-	-	924.00	-
-	(Phase 1)	Flushing Water		-	-	0.36	-	-	-	-	332.64
2,070	-	Fresh Water	Office	-	-	-	-	30	-	62.10	-
(Phase 1 +2)	-	Flushing Water		-	-	-	-	50	-	-	103.50
92	-	Fresh Water	Non-domestic (Retail)	-	-	-	-	-	230	21.16	-
	-			-	-						
(Phase 1 +2)	-	Flushing Water		-	-	-	-	-	50	-	4.60
19	-	Fresh Water [3]	Non-domestic (Restaurant)	-	-	-	1,310	-	-	24.89	-
(Phase 1 +2)	-	Flushing Water [4]		-	-	-	270	-	-	-	5.13
							Total			2054.26	684.08

Note:
(1) Fresh and Flushing water demand estimation is referenced to DI1309.
(2) For flushing water unit water demands not provided in DI1309, GESF App III and V are referred.
(3) The fresh water unit water demand adopted is referenced from GESF App V, which the restaurant employee is 1,310 L/h/day (i.e. 1,280 + 30), and the office employee fresh water consumption is 30L/h/d.
(4) The flushing water unit water demand adopted is referenced from GESF App V, which the restaurant employee is 1,580L/h/d - 1,310L/h/d (Fresh Water Unit Water Demand) equals 270L/h/d.

Annex 3

Hydraulic Review of CEDD Planned Water Main for HSK/HT NDA

Annex 3 - Hydraulic Review of Planned Water Main

Fresh Water Demand

Estimated Fresh Water Demand	2054.3	m^3/day
	0.0238	m^3/s

Flushing Water Demand

Estimated Flushing Water Demand	684.1	m^3/day
	0.0079	m^3/s

Hydraulic Review for Proposed NS315 Fresh Water Main by CEDD		
Total water demand	2054.3	m^3/day
Peak factor(1)	3.0	
Peak flow rate from development site	0.071	m^3/s
Size of proposed water main	315	mm
Cross section area	0.078	m^2
Flow velocity limit for NS315 (2)	2	m/s
Flow capacity for NS315	0.156	m^3/s
Capacity checking	46	%

Hydraulic Review for Proposed NS250 Flushing Water Main by CEDD		
Total water demand	684.1	m^3/day
Peak factor(1)	2.0	
Peak flow rate from development site	0.016	m^3/s
Size of proposed water main	250	mm
Cross section area	0.049	m^2
Flow velocity limit for NS250(2)	1.5	m/s
Flow capacity for NS250	0.074	m^3/s
Capacity checking	21	%

Remark:
(1) Peak factor for distribution main refers to Departmental Instruction No. 1309 from Water Supplies Department
(2) Velocity limit of water main refers to Departmental Instruction No. 1309 from Water Supplies Department

Annex 4

Hydraulic Review of Proposed Lead-in Pipe

Annex 4 - Hydraulic Review of Proposed Lead-in Pipe

Fresh Water Demand

Estimated Fresh Water Demand	2054.3	m^3/day
	0.0238	m^3/s

Flushing Water Demand

Estimated Flushing Water Demand	684.1	m^3/day
	0.0079	m^3/s

Hydraulic Review for Proposed DN250 Fresh Water Lead-in by this Application		
Total water demand	2054.3	m^3/day
Peak factor[(1)]	3.0	
Peak flow rate from development site	0.0713	m^3/s
Size of proposed fresh water lead-in	250	mm
Cross section area	0.049	m^2
Flow velocity for DN250	1.46	m/s
Flow velocity limit for DN250 [(2)]	1.5	m/s

Hydraulic Review for Proposed DN125 Flushing Water Lead-in by this Application		
Total water demand	684.1	m^3/day
Peak factor[(1)]	2.0	
Peak flow rate from development site	0.0158	m^3/s
Size of proposed flushing water lead-in	125	mm
Cross section area	0.012	m^2
Flow velocity for DN125	1.32	m/s
Flow velocity limit for DN125 [(2)]	1.5	m/s

Remark:
(1) Peak factor for distribution main refers to Departmental Instruction No. 1309 from Water Supplies Department
(2) Velocity limit of water main refers to Departmental Instruction No. 1309 from Water Supplies Department

Appendix E

Replacement Pages of Revised Planning Statement

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1.2 Report Structure

1.2.1 This Planning Statement consists of the following sections:

Section 2:	describes the Application Site context and planning context;
Section 3:	presents the details of the indicative development scheme;
Section 4:	summarises the key findings of various technical assessments on environmental, air ventilation, traffic, drainage, sewerage and water supply aspects;
Section 5:	presents the planning justifications for the Proposed Development; and
Section 6:	concludes the Planning Statement.

1.2.2 Detailed technical assessments and other supplementary information are attached in **Appendices A to G**.

Appendix A	Extract of the Extant OZP
Appendix B	Landscape Master Plan
Appendix C	Traffic Review
Appendix D	Environmental Review
Appendix E	Drainage Impact Assessment
Appendix F	Sewerage Impact Assessment
Appendix G	Water Supply Impact Assessment

Table 4.1 Proposed Internal Transport Facilities Provision

Site	Use	Parameters	Type	No.
Site A	Residential	1,240 units	Residential parking space	168
			Visitor parking space	15
			Motorcycle parking space	13
			L/UL bay	3
			Bicycle parking space	248
	Retail	5,221m^2	Car parking space	35
			Motorcycle parking space	4
			L/UL bay	5
Site B (future scenario; development mix is indicative only)	Retail	354m^2	Car parking space	3
			Motorcycle parking space	1
			L/UL bay	1
	Hotel	924 rooms	Car parking space	10
			Motorcycle parking space	1
			L/UL bay for goods vehicle	5
			Lay-by for taxi and private car	4
			Lay-by for single-deck tour bus	3
	Office	37,620m^2	Car parking space	177
			Motorcycle parking space	18
			L/UL bay	13

4.3.3 To assess potential traffic impact induced by the Proposed Development, the Traffic Review has compared the traffic generations from a hypothetical scheme with that from the proposed scheme. The hypothetical scheme is formulated based on the commercial mix suggested in the previous version of the Hung Shui Kiu and Ha Tsuen Outline Development Plan No. D/HSK/1 for the Application Site.

4.3.4 According to assessment result, the traffic generations under the proposed scheme would be much less than that under the hypothetical scheme under both AM and PM peak hours. Therefore, there would not be insurmountable traffic impacts imposed on the surrounding road network.

4.4 Drainage, Sewerage and Water Supply Aspects

4.4.1 A Drainage Impact Assessment (see **Appendix E**) has been conducted to review the feasibility of the Proposed Development. The surface runoff of Proposed Development is mainly from rainfall, and it will be directed to existing drainage channel via planned storm drains to be constructed in HSK/HT NDA. With reference to Drainage Impact Assessment of Planning Application No. A/HSK/452, a hydraulic model was established in accordance with Drainage Services Department's guidelines to assess the hydraulic performance of the proposed drainage system within HSK/HT NDA. The result showed that the proposed drainage system was sufficient to cater for the peak flows arising from the planned HSK/HT NDA. It is noted that drainage lead-in is proposed by Civil Engineering and Development Department (CEDD) for runoff discharge from the Application Site. The Proposed Development will adopt the proposed drainage arrangements to be implemented by CEDD under HSK/HT NDA project. As the Proposed Development will not bring significant changes to drainage characteristics, no adverse impact on the drainage system is anticipated.

4.4.2 A Sewerage Impact Assessment (see **Appendix F**) has been conducted to assess the potential sewerage impact arising from the Proposed Development. The sewage impact is assessed by comparing the sewage generated between Base Case (based on Outline Development Plan No. D/HSK/1) and the Proposed Development. The comparison result shows that the sewage generated from the Proposed Development (i.e. 2088.6m^3/day) is less than Base Case (i.e. 2389.4m^3/day), it is anticipated that the Proposed Development will not result in any adverse impact to the future sewerage system in HSK/HT NDA.

4.4.3 The sewage generated from the Proposed Development will be conveyed to Sewage Pumping Station No. 1 via planned gravity sewers, and then to Sewage Pumping Station No. 2 via planned sewer rising mains and gravity sewers constructed by CEDD and then finally to planned HSK Effluent Polishing Plant. The sewage discharged from the Application Site contributes to only about 7.2% of the capacity of Sewage Pumping Station No. 1. To conclude, no adverse impact is

anticipated on planned sewerage system.

4.4.4 A Water Supply Impact Assessment has been prepared and enclosed under **Appendix G** to review the feasibility of the Proposed Development from water supply point of view. The estimated daily fresh water demand for the Proposed Development is 2,054m^3/day and the estimated daily flushing water demand is 684m^3/day. NS250 lead-in pipe is proposed to be tee-off from the planned fresh water main to supply fresh water for the Proposed Development. For flushing water, NS125 lead-in pipe is proposed to be tee-off from the planned flushing water main to provide flushing water for the Proposed Development. To conclude, no adverse water supply impact is anticipated.

Measures	Facilities	Development	
	Automatic Refuse Collection System	• Will be explored in detailed design stage	--
Urban Design Concepts	"Blue-Green Axis Spine" connecting the Northern and Southern Riverine Channels	• Riverside setback provided	--

5.7 The Proposed Development is Technically Feasible

5.7.1 The PR of the Proposed Development will be not more than 9.5, i.e. in compliance with the maximum PR stipulated on the OZP. Therefore, the total GFA of the Proposed Development does not exceed what is allowed under the OZP. The Proposed Development involves a change in development mix by introduction of 'Flat' use only with no change in total PR, thus the technical feasibility confirmed under the Government's previous planning and study for HSK/HT NDA based on a maximum PR of 9.5 for the Application Site is still valid.

5.7.2 Nevertheless, the Applicant has conducted technical review under different technical aspects to further confirm that the proposed change in development mix, based on the ratio of 45% : 55%, is technically acceptable. As detailed in Sections 3 and 4 above, the Proposed Development is technically feasible from landscape, environmental, air ventilation, traffic, drainage, sewerage and water supply aspects. For details, please refer to **Appendices B to G**.

Appendix F

Revised Environmental Review

Prepared for

Prepared by

Ramboll Hong Kong Limited

PLANNING APPLICATION FOR PROPOSED MIXED USE DEVELOPMENT AT HUNG SHUI KIU/HA TSUEN (AREA 32B)

ENVIRONMENTAL REVIEW REPORT

Date	**August 2026**
Prepared by	**Sally Chiu** **Assistant Environmental Consultant**
Signed	
Approved by	**Tony Cheng** **Senior Manager**
Signed	
Project Reference	**SHKHSK32EI00**
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Ramboll Hong Kong Limited

21/F, BEA Harbour View Centre
56 Gloucester Road, Wan Chai, Hong Kong

Tel: (852) 3465 2888
Fax: (852) 3465 2899
Email: hkinfo@ramboll.com

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Appendix 4.1 Railway Noise Result in HSK NDA P&E Study

1. INTRODUCTION

1.1 Background

1.1.1 The Application Site (Area 32B) is in the southern part of the Hung Shui Kiu / Ha Tsuen New Development Area (HSK/HT NDA). It is zoned as "Commercial (1)" ("C(1)") under the current Hung Shui Kiu / Ha Tsuen Outline Zoning Plan ("OZP") No. S/HSK/3 [or known as "Site 4-13b" under the Revised Recommended Outline Development Plan (RODP) of the 2016 HSK NDA Planning & Engineering Study (see **Appendix 1.1**)]. The Application Site is shown in **Figure 1.1**.

1.1.2 Ramboll Hong Kong Limited is commissioned by the Applicant / project proponent to prepare an Environmental Review (ER) for the Proposed Development from an environmental aspect. The Proposed Development scheme adopted in the assessment is provided by the project architect.

1.1.3 The ER includes the following major environmental issues;

i. Qualitative air quality impact on the proposed development

ii. Review of the traffic noise impact from the adjacent road networks on the proposed development; and

iii. Review of the railway noise impact on the Proposed Development.

1.1.4 The Proposed Development will have population intake after completion of infrastructure surrounding the Proposed Development. The existing potential fixed noise sources are expected to be demolished before population intake. The future planned fixed noise sources are expected to comply with Hong Kong Planning Standards and Guidelines (HKPSG) criteria which is 5 dB(A) below Acceptable Noise Levels (ANL) or prevailing background noise. Therefore, adverse fixed noise impact is not expected.

1.2 Proposed Development

1.2.1 The Application Site comprises of 2 sub-sites, namely Application Site 32B – Site A and Application Site 32B – Site B

1.2.2 The master layout plan of the Proposed Scheme is shown in **Appendix 1.2**. Details of Proposed Development are summarized in **Table 1.1** below.

Table 1.1 Development Parameters for Proposed Development in Application Site

Development Parameters		Application Site 32B – Site A	Application Site 32B – Site B
Site Area (m^2)		8,967	4,634
Building Height (mPD)		200	200
GFA (m^2)	Residential	58,144 [1]	0
	Clubhouse	2,325	0
	Office / Hotel / Hostel Development	0	65,845
	Commercial	5,221	0
Remark: [1] 58,144m^2 of residential GFA in Application Site 32B – Site A can provide 1,240 no. of residential units. [2] GFA for non-domestic areas do not require approval and are indicative only.			

1.2.3 It is anticipated the Proposed Development will be completed in 2033.

1.3 Key Environmental Issues and Study Approach

1.3.1 Key Environmental issues and concerns as identified for the Project include:

Air

1.3.2 The potential air quality impacts arising from the vehicular emissions of the nearby roads and chimney emissions (if any). The detail will be discussed at **Section 2**.

Traffic Noise

1.3.3 The identified key noise sources in the vicinity of the Application Site include the road traffic noise from nearby road network. Practical noise mitigation measures should be recommended where required in order to satisfy the requirement of the HKPSG. The detail will be discussed at **Section 3.**

Railway Noise

1.3.4 EIA report of Agreement No. CE 2/2011 (CE) Hung Shui Kiu New Development Area Planning and Engineering Study – Investigation (HSK NDA P&E Study) is reviewed. Practical noise mitigation measures should be recommended where required in order to satisfy the requirement of HKPSG and Technical Memorandum for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Site (IND-TM). The detail will be discussed at **Section 4**.

Fixed Noise

1.3.5 Potential fixed noise sources associated with the proposed Development includes mechanical ventilation and air conditioning (MVAC) system equipment. Other building services equipment, such as water pumps, lift machine etc., will be enclosed within the plant rooms. The planned fixed noise sources shall be designed to meet the HKPSG requirement. With the mitigation measures, it is expected there would be no insurmountable noise impact from fixed noise sources of proposed Development to nearby noise sensitive receivers.

2. QUALITATIVE AIR QUALITY IMPACT ASSESSMENT

2.1 Introduction

2.1.1 This section examines the potential air quality impacts arising from all relevant emission sources in the vicinity of the Application Site.

2.2 Environmental Legislation and Guidelines

2.2.1 The following legislation and regulations provide the standards and guidelines for evaluation of air quality impacts and the type of works that are subject to air pollution control:

- Air Pollution Control Ordinance (APCO) (Cap. 311) and the Air Quality Objectives (AQO)
- Environmental Impact Assessment Ordinance (EIAO) (Cap. 499.S16), EIAO-TM, Annexes 4 and 12
- HKPSG

2.3 Impact of Industrial Emission

2.3.1 No chimney operation is expected within 200m from the boundary of the Application Site after the completion year of the Proposed Development based on the best available information where the surrounding areas are planned use within the HSK NDA.

2.4 Impact of Vehicular Emission

2.4.1 The HKPSG has provided a set of guidelines to assess the potential air quality impacts generated from traffic. According to Table 3.1 in Chapter 9 of HKPSG, a number of horizontal buffer distance between kerb side of roads and sensitive uses is recommended for various types of road.

2.4.2 The Application Site will be bounded by planned road (Road L22) which is classified as local distributor, in accordance with the PEP Item No. 7787CL (Part) and 7829CL Hung Shui Kiu / Ha Tsuen New Development Area Advance Works Phase 3 and Stage 2 Works – Site Formation and Engineering Infrastructure issued by CEDD. According to the Table 3.1 of Chapter 9 of HKPSG, the recommended buffer distance from local distributor is >5m for active and passive recreational uses. The planned roads and its recommended buffer distance are shown in **Figure 2.1**.

2.4.3 In **Figure 2.1**, there is >5m buffer distance from local distributor to the residential development within Application Site 32B – Site A. For Application Site 32B – Site B, although part of the hotel development falls within the 5m buffer distance from the planned road (L22), the planned hotel relies on central ventilation and fresh air intake(s). It is confirmed that no air sensitive uses, including openable windows, fresh air intake of mechanical ventilation and recreational uses in the open area, would be located within the buffer zones.

2.4.4 As the Application Site is located within the HSK NDA, the above review is based on the current best available information, i.e. the roads networks within the 500m assessment areas from the proposed developments shown in the drawings from PWP Item Nos. 7787CL (Part) and 7829CL Hung Shui Kiu / Ha Tsuen New Development Area Advanced Works Phase 3 and Stage 2 Works – Site formation and Engineering Infrastructure.

2.5 Impact of emission source within Site

2.5.1 Within the Application Site, hotel and residential development are proposed. An above ground car park and commercial use in terms of retails will be provided to support the proposed development. As such, the potential air emission source would be the exhaust of the above ground car park and potential kitchen exhaust at the retail, if there are.

Above Ground Car Park

2.5.2 For the above ground car park proposed in the Application Site, its design and operation of the proposed carparks will comply with ProPECC PN 2/96 on Control of Air Pollution in Car Parks. There is no detailed layout of the carparks and its associated design at the moment, nevertheless, the future exhaust outlets will be located at the façade facing towards either the road D7 or the road L22, to avoid nuisance to any air-sensitive uses of the proposed development or other existing and planned ASRs.

Oily Fume & Cooking Odour

2.5.3 If there are any food and beverage (F&B) areas to be provided in the Proposed Development, exhaust hoods and grease trap will be provided and the air change rate for the F&B area will be designed according to the standard of kitchen as stipulated in Building Department's Practice Note for Authorized Persons (PNAP). Potential odour emissions will be minimised as far as practicable. The following considerations recommended in EPD's Control of Oil Fume and Cooling Odour from Restaurant and Food Business shall be taken into account in the detailed design when positioning the exhaust outlets:

- Locate the outlet at such a place where the ventilation is good and the emissions from them can be adequately dispersed without hindrance
- Provide sufficient separation distance from any sensitive receptor in the vicinity so that the emissions will not cause, or contribute to, an odour nuisance or other type of air pollution to the public
- Ensure the emissions from the exhaust system will be directed vertically upwards, unless it can be demonstrated by an environmental professional that other direction is more advantageous in preventing emissions from causing air pollution problems
- Ensure that emissions from the exhaust system will not be restricted nor deflected by, for example, the use of plates or caps

2.6 Impact of off-site planned PTI at Area 32A

2.6.1 According to the Outline Development Plan of HSK NDA, there is a planned PTI at the planned commercial site Area 4-13a, i.e. Planning Area 32A. Based on the best available information, there is no program of the construction and operation of the PTI, nor the design of the PTI. The shortest distance from the boundary of the Application Site to the boundary of the Area 4-13a is around 25m. Nevertheless, for the planned PTI which is constructed by other applicants, their design should take the surrounding air sensitive uses into account for the design of the openings and exhausts outlets, such that the potential nuisance to any air-sensitive uses in the surrounding areas to be minimized. According to the Explanatory Statement of the HSK Outline Zoning Plan (OZP) (S/HSK/3) for the Planning Area 32A, the future development of the site should be governed by Master Layout Plan (MLP) submission under lease. With the careful design of the future PTI by the owner of the Planning Area 32A, it is believed that the

operation of the future PTI should not pose any adverse impact nor nuisance to the surrounding air sensitive use, including the Application Site.

2.7 Impact of Future Industrial Use at Area 35

2.7.1 According to the HSK ODP, there is an industrial zone assigned at Planning Area 35 (two sub-zones are named as 3-50 and 3-51). The Planning Area 35 is about more than 250m west of the Application Site with the major highway Kong Sham Western Highway located in between.

2.7.2 Based on the current public available information, there is no specific use identified at this industrial use aera or the operation information of future industrial use. The whole HSK NDA is still in a planning stage.

2.7.3 According to the notes of the industrial use in the OZP S/HSK/3, this industrial zone is intended primarily for general industrial uses to ensure an adequate supply of industrial floor space to meet demand from production-oriented industries. Information technology and telecommunications industries, office related to industrial uses, and selected uses akin to industrial production and would not compromise building and fire safely are also always permitted in this zone. From the intended use, there is unlikely to have any uncontrolled emission sources within the industrial use zone.

2.7.4 The separation from the planned industrial use and the Application Site is more than 250m with the major highway Kong Sham Western Highway and the planned commercial located in between. With this buffer separation, the potential nuisance from the planned industrial use to the Application Site should be minimized. Furthermore, the proposed use at the western boundary of the Application Site is Hotel, which is equipped with central ventilation system, i.e. not rely on openable windows for ventilation. The residential use is located behind the hotel use. With the further separation of the planned industrial use, the location of central ventilation building in between and the well planned use within the planned industrial zone, the future occupants at the residential portion of the Application Site is unlikely to be subject to any insurmountable air quality impact.

2.8 Conclusion for Operational Phase

2.8.1 As no openable windows, fresh air intakes and recreational uses in the open spaces fall within the 5m buffer distance from local distributor (L22), the Proposed Development will not be subject to unacceptable air quality impacts.

2.8.2 All existing and planned air pollutant and odour emission sources within the 500m assessment area have been identified, based on the best available information, and their potential air quality impacts on the air-sensitive uses of the proposed development have been evaluated.

2.9 Potential Impact Arising from Proposed Development – Construction Phase

2.9.1 During the construction phase of the Proposed Development, there may be potential air quality impacts upon the nearby air sensitive receivers (ASRs). The representative ASRs representing existing and planned ASRs during construction phase among all Development Sites are identified and listed in Table 2.1 and their locations are shown in Figure 2.2 Figure 2.1.

Table 2.1 Distance of the ASRs from the Application Site Boundary

ASR IDs	Descriptions	Distance from the Application Site Boundary (m)
A1	Planned Commercial Use at Area 32A	~15
A2	Planned Commercial Use are Area 32C immediate next to the Proposed Development at the same Area 32C	~ 0
A3	Planned Residential Development at Area 34B	~50

Identification of Potential Emissions

2.9.1 Construction vehicles and machinery are a potential source of air pollutant emissions during the construction phase. Significant emissions are not anticipated from the criteria pollutants – NO_2, SO_2, and CO, etc. as only a limited number of diesel/ petroleum fuelled machinery would be operated at the Subject Site. Besides, the Subject Site is located at an area where supply of electricity is available. Therefore, the number of diesel/ petroleum fuelled machinery operated at the Subject Site shall be minimized as practically as possible with the use of electric construction machinery. Moreover, under the Air Pollutant Control (Non-road Mobile Machinery) (Emission) Regulation, only approved or exempted non-road mobile machineries (including mobile generator, air compressor, crawler crane, bulldozer, etc.) with a proper label are allowed to be used in the construction site, which would meet the prescribed emission standards and requirement. According to the requirements stipulated in the Air Pollution Control (Fuel Restriction) Regulations and its amendment, using liquid fuel with a sulphur content of less than 0.001% by weight (such as Ultra Low Sulphur Diesel) for the equipment should be fulfilled to control the SO_2 and PM emissions. Travelling of the dump trucks is another potential source of air emission of construction. At this planning application stage, there is no detailed information on the construction program or amount of excavated material to be handled. However, it is anticipated that the volume of excavated materials to be handled would be about 13,601 m^3 where no basement carpark is proposed. The excavation is for just removal of top soil for foundation. The period of excavation is anticipated to be around 6 months. There is likely to be around 9 dump trucks per day (assuming each truck can carry 15 tones and there is around 270 working days per year) during the site formation stage of the Development Site. Watering the haul road and the site once per hour would be implemented to minimize the potential dust emission during the travelling of the dump trucks within the site. With reference to other similar scale projects, the number of on-site diesel/petroleum fuelled machinery (20-21 machineries) to be used for construction works is limited owing to the small size of the work site with an area of 13,601 m2. In addition, availability of electricity supply during construction of the project will be explored and such requirement will be specified in future contract. If available, contractor should maximise use of electric non-road mobile machinery (NRMMs) and with least reliance of diesel fuelled equipment (e.g. for electricity powered stationary equipment such as pump instead of using generator). Moreover, air quality impact due to construction shall be reviewed at the later stage.

Mitigation Measures for Fugitive Dust and Air Quality Impact

2.9.2 Since paved roads are already existing within the Subject Site, it is expected that the construction dust to be generated by vehicle movement within the Subject Site are limited. Air pollutant emission mostly arises from construction activities and can be effectively suppressed by incorporating proper mitigation measures into work procedures through contractual clauses with reference to EPD's Recommended Pollution Control Clauses for Construction Contracts, where applicable, good site management, and close monitoring by the resident engineers. The contractor shall be required to follow the requirements of the Air Pollution Control (Construction Dust) Regulations for demolition and construction of the project. With the adoption of good practices, it is expected that emission of construction dust can be kept at an acceptable level. Mitigation measures including but not limited to the followings with respect to demolition, infrastructure construction of a building should be implemented as appropriate.

In the case of demolition works:

- The area at which demolition work takes place shall be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the demolition activities so as to maintain the entire surface wet;
- For any wall of the building to be demolished that abuts or fronts upon a street, service lane or other open area accessible to the public, impervious dust screens or sheeting shall be used to enclose the whole wall to a height of at least 1m higher than the highest level of the structure being demolished;
- Any dusty materials remaining after a stockpile is removed shall be wetted with water and cleared from the surface of roads or streets.

In the case of infrastructure construction works/ site formation/ excavation/ earthworks:

- Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting shall be provided to enclose the scaffolding from the ground floor level of the building;
- Any skip hoist for material transport shall be totally enclosed by impervious sheeting;
- Any relevant requirements set outs in Parts III and IV of Air Pollution Control (Construction Dust) Regulations shall be met;
- Vehicle washing facilities including a high pressure water jet shall be provided at every discernible or designated vehicle exit point;
- Where a site boundary adjoins a road, street, service lane or other area accessible to the public, hoarding of not less than 2.4 m high from ground level shall be provided along the entire length of that portion of the site boundary except for a site entrance or exit;
- Locate all the dusty activities away from any nearby ASRs as far as practicable;
- Erect higher hoarding at the locations with ASRs in immediate proximity to the project site boundary;
- Avoid using exempted non-road mobile machineries;

- Consider connecting construction plant and equipment to mains electricity supply and avoid use of diesel generators and diesel-powered equipment as far as practicable.

The additional dust mitigation measures are described below:

Monitoring and Auditing

2.9.3 Regular site audit will be implemented to ensure that mitigation measures are in place.

General Site Management

2.9.4 Appropriate working methods should be devised and arranged to minimise air pollutant emissions and to ensure any installed control system and/or measures are operated and/or implemented in accordance with their design merits. No free falling of construction debris should be allowed, which should be let down by hoist or enclosed tunnel to the ground.

2.9.5 A high standard of housekeeping shall be maintained. Any piles of materials accumulated on or around the work areas shall be cleaned up regularly. Cleaning, repair and maintenance of all plant facilities within the work areas shall be carried out in a manner to minimize air emissions. Prior to cleaning, the materials should be handled properly to prevent fugitive dust emission. Any exposed earth shall be properly treated by compacting or hydro seeding, within 6 months after the last construction activity.

2.9.6 Frequent mist/ water spraying should be applied on dusty areas. The frequency of spraying will depend upon local conditions such as rainfall, temperature, wind speed and humidity. The amount of water spraying should be just enough to dampen the material without over-watering which could result in surface water runoff.

Material Stockpiling and Handling

2.9.7 The amount of stockpiling should be minimised where possible. Construction material or debris should be covered and stored inside enclosed areas. Other control measures such as enclosed or semi-enclosed windboard should be used, where applicable, to minimise dust emission. Regular watering is needed at areas such as storage piles, where there could be potential dust emission.

Dust Emissions from Site Traffic

2.9.8 Dust emission from construction traffic is generated predominantly from the travelling of dump trucks. Areas within the Subject Site where there are regular vehicle movements should have a hard surface. Speed controls at an upper limit of 10km/hr should be imposed and their movements should be confined to designated roadways within the Subject Site. All dusty vehicle loads should have side and tail boards covered by tarpaulin extending at least 300mm over the edges. Wheel-wash troughs and hoses should be provided at exit points of the Subject Site.

2.9.9 "Recommended Pollution Control Clauses for Construction Contracts" is available on the EPD website which set out the recommended air pollution control measures to be implemented by the contractor(s) during the construction stage of the Project.

2.9.10 With the adoption of good practices, it is expected that construction air quality impact can be minimized.

3. TRAFFIC NOISE IMPACT ASSESSMENT

3.1 Introduction

3.1.1 This section assesses the potential road traffic noise impacts on the noise sensitive uses of the Proposed Development. Practical mitigation measures are proposed to mitigate the potential noise impacts, where necessary.

3.2 Road Traffic Noise Impact Assessment

Assessment Criteria

3.2.1 Noise standards are recommended in Chapter 9, "Environment", of the HKPSG for planning against possible noise impact from road traffic, railway and aircrafts. According to the guidelines, the maximum allowed road traffic noise level, measured in terms of $L_{10(1\ hr.)}$, at noise sensitive facades of the Proposed Development is recommended to be 70 dB(A).

3.2.2 In the present scenario, the maximum noise levels due to traffic on the surrounding roads in terms of $L_{10(1\ hr)}$ should not exceed 70 dB(A) at the noise sensitive facades of the Proposed Development. This criterion applies to uses which rely on opened windows for ventilation.

Review of the Traffic Noise Impact

3.2.3 With reference to the EIA report of Agreement No. CE 2/2011 (CE) Hung Shui Kiu New Development Area Planning and Engineering Study – Investigation (HSK NDA P&E Study), although the traffic noise assessment of the Application Site is not conducted in the HSK NDA P&E Study, the traffic noise assessment of nearby sites, including Site 4-10 at Area 34B are conducted. Same as the Application Site, this 4-10 residential development is located at the same side of the Road D6. The traffic noise results of the nearby site is summarized in **Table 3.1** and attached in **Appendix 3.1**.

Table 3.1 Traffic noise results of the nearby sites

Site	Predicted Unmitigated Overall Noise Level, dB(A)	Compliance of Noise Criteria after Mitigation
4-10	61-68	Yes

3.2.4 The Application Site and Site 4-10 are both located west of the Road D6 with a longer buffer distance and smaller angle of view from Road D6, it can be predicted that the maximum noise levels due to traffic on the surrounding roads of the Application Site in terms of $L_{10(1\ hr)}$ would be similar to that in Site 4-10 (i.e., <70 dB(A)).

3.2.5 For the local road L22 which is a dead-end road, the Application Site is located at its end with the proposed hotel portion located next to the roundabout of the L22. The residential towers shown in the indicative master layout plan are located at the southeastern end of the Application Site. With sufficient buffer distance and limited angle of view to the roundabout of the L22, it is anticipated that there should not have any significant noise impact upon the residential tower.

3.2.6 For the existing Kong Sham Western Highway and the adjacent Road P1, it is about 210m northwest from the boundary of the Application Site, and about 270m to 280m northwest from the residential portion of the proposed development. The large buffer distance from the proposed residential towers to the two major roads would reduce the noise level by equal to or more than 13 dB(A) in accordance with the Calculation of

Road Traffic Noise (i.e. 10*log(270m/13.5m). Moreover, the planned public housing developments at Area 34A and 34B with tentative completion year of 2032 are located northwest of the Application Site. The building structure of future public housing development would provide shielding for the traffic noise from the Kong Sham Western Highway and the Road P1 for the proposed development so that the noise level experienced by the proposed residential towers would be further largely reduced, even if there is a delay on the construction of the hotel portion of the proposed development. With sufficient buffer distance and presence of building structure located in between, it is anticipated that the proposed development is unlikely to be subject to adverse traffic noise impact from the Kong Sham Western Highway and Road P1.

3.2.7 Nevertheless, detailed calculation on the traffic noise level of the Application Site shall be conducted in next stage to further ensure the traffic noise level would not exceed 70dB(A). In case of any exceedance, mitigation measures, such as acoustic window and balcony shall be applied. Under the current public information, such as EPD's Practice Note ProPECC PN 5/23, the noise reduction provided by the acoustic window and balcony can be up to 8 dB(A) which is considered to be adequate to mitigate the relevant exceedance, if any, at the Application Site.

3.3 Conclusion

3.3.1 It is expected that the maximum noise levels due to traffic on the surrounding roads in terms of L10(1 hr) would not exceed 70 dB(A) with sufficient buffer distance and present of building structure in between.

3.3.2 Nevertheless, the whole HSK NDA is still under planning and there is no detail layout of the proposed development, detailed calculation on the traffic noise level of the Application Site shall be conducted in next stage under the lease to further ensure the traffic noise level would not exceed 70dB(A). In case of any exceedance, mitigation measures, such as acoustic window and balcony shall be applied.

4. RAILWAY NOISE IMPACT ASSESSMENT

4.1 Introduction

4.1.1 This section assesses the potential railway noise impacts on the noise sensitive uses of the Proposed Development. Practical mitigation measures are proposed to mitigate the potential noise impacts, where necessary.

4.2 Railway Noise Impact Assessment

Assessment Criteria

4.2.1 Noise standards are recommended in Chapter 9, "Environment", of the HKPSG for planning against possible noise impact from road traffic, railway and aircrafts. According to the guidelines, an averaged noise level, measured in terms of $L_{eq\ (24\ hr)}$ is recommended to be 65dB(A) and the maximum noise levels due to rail traffic during the night time (2300 – 0700) in terms of L_{max} is recommended to be 85dB(A).

4.2.2 The EIAO-TM and IND-TM stipulate the appropriate ANL for rail noise. The ANLs are dependent on ASRs of the NSRs and are shown in Table 4.4.

Table 4.1 Acceptable Noise Levels for Railway Noise

Time Period	ANL on Different Area Sensitivity Rating for Rail Noise, (L_{eq}, 30min, dB(A))		
	ASR "A"	ASR "B"	ASR "C"
Day (0700 to 1900 hours)	60	65	70
Evening (1900 to 2300 hours)	60	65	70
Night (2300 to 0700 hours)	50	55	60

4.2.3 The study area within Hung Shui Kiu and Ha Tsuen OZP is a developed area, in particular the surrounding uses are zoned "C" for commercial development. According to Table 1 in the IND-TM, the type of area should be (iii) Urban Area. Moreover, from the HSK NDA EIA, there is no major road with the daily traffic flow more than 30,000 vehicles and there is no industrial zone located in between, i.e. there is no influence factor surrounding the Application Site. As such, ASR "B" would be adopted.

Assessment Methodology

4.2.4 With reference to the EIA report of Agreement No. CE 2/2011 (CE) Hung Shui Kiu New Development Area Planning and Engineering Study – Investigation (HSK NDA P&E Study), although the railway noise assessment of the Application Site is not conducted in the HSK NDA P&E Study, the railway noise assessment of nearby sites, including Sites 4-25c and 4-29, are conducted. The railway noise results of the nearby sites under unmitigated scenario are summarized in **Table 4.2** and shown in **Appendix 4.1**.

Table 4.2 Railway noise results of the nearby sites - Unmitigated

Site	NSR ID	Area Sensitivity Rating	Predicted Unmitigated Overall Noise Level, dB(A)			
			L_{eq}, 30min, dB(A)		L_{max}	$L_{eq(24\ hr)}$
			Day & Evening (0700 to 2300 hours)	Night (2300 to 0700 hours)		
4-25c	WR-P6a	B	39-52	38-51	40-57	37-52
	WR-P6b	B	39-52	37-51	39-57	37-52
	WR-P6c	B	38-51	37-49	37-55	37-51
4-29	WR-P7a	B	44-56	43-55	49-63	44-56
	WR-P7b	B	47-59	45-**57** *	50-64	47-59
	WR-P7c	B	45-57	44-**56** *	50-64	45-57

Remark:

* **Bold and underline** indicates exceedance of the related criteria.

4.2.5 As shown in **Table 4.2**, there are exceedance at NSR ID WR-P7b and WR-P7c within Site 4-29, hence, mitigation measures are proposed in the HSK NDA P&E Study. The proposed mitigation measures and the railway noise results of the nearby sites under mitigated scenario are summarized in **Table 4.3**.

Table 4.3 Railway noise results of the nearby sites - Mitigated

Site	NSR ID	Proposed Mitigation Measures	Predicted Unmitigated Overall Noise Level, dB(A)			
			$L_{eq(30min)}$, dB(A)		L_{max}	$L_{eq(24\ hr)}$
			Day & Evening (0700 to 2300 hours)	Night (2300 to 0700 hours)		
4-29	WR-P7b	Layout set back to 70m from Tuen Ma Line (TML)	45-57	44-55	48-61	45-57
	WR-P7c	Layout set back to 70m from Tuen Ma Line (TML)	44-56	43-54	48-61	44-56

4.2.6 As the shortest distance between the WRL and the Application Site (~ 131m) is farther than that between the WRL and the Site 4-29 (55m) as well as the recommended setback (70m) under the EIA, no exceedance on $L_{eq(30min)}$ (Day and Evening hours), L_{max} and $L_{eq(24\ hr)}$ is expected.

4.2.7 Detailed calculation on the railway noise level of the Application Site shall be conducted in next stage to further ensure the railway noise level would not exceed the acceptable noise level of $L_{eq(30min)}$ (Day, Evening and Night hours), L_{max} and $L_{eq(24\ hr)}$. In case of any

exceedance, mitigation measures, such as layout set back and acoustic fins or provision of acoustic window/balcony shall be applied.

4.3 Conclusion

4.3.1 It is expected that there is no exceedance on Leq(30min) (Day, Evening and Night hours), Lmax and Leq(24 hr).

4.3.2 Detailed calculation on the railway noise level of the Application Site shall be conducted in next stage to further ensure the railway noise level would not exceed the acceptable noise level of $L_{eq(30min)}$ (Day, Evening and Night hours), L_{max} and $L_{eq(24\ hr)}$. In case of any exceedance, mitigation measures, such as layout set back and acoustic fins or provision of acoustic window/balcony shall be applied.

4.4 Review of the Smart and Green Mass Transportation System (SGMTS)

4.4.1 The Smart and Green Mass Transit System (SGMTS) in Hung Shui Kiu/Ha Tsuen and Yuen Long South New Development Areas is about 16 kilometres in length, most of which are dedicated roads. The SGMTS will adopt a green road-based mode without the need for physical rail tracks, aiming to providing the public with convenient feeder services to travel to various area within the HSK NDA, in accordance with the SGMTS website (https://www.hskhtsgmts.hk/en/home/)

4.4.2 In the SGMTS website, the project is still under design, and detailed information or operation mode of the SGMTS is not available at this stage. Nevertheless, the SGMTS will adopt a green road-based mode, requiring no physical tracks and overhead electrical cable which flexibly adjusting its routing and service frequencies. The design of the SGMTS can also minimize environmental impact while saving construction time and costs. In addition, innovative paving materials will be considered for the road surface in accordance with the SGMTS website.

4.4.3 The SGMTS is still under the planning stage and there is no detailed information about its final design and operation. Nevertheless, it is expected that the operation of SGMTS should not induce insurmountable impact upon the proposed development. Dedicated roads are assigned for the SGMTS only that the number of vehicles travelling is expected not to be many. Also, electricity vehicles may be adopted that the engine noise would not as noisy as traditional vehicles. According to the SGMTS website, the system travelling close the Application Site is about 4.5 km long with seven proposed stations. The travelling speed of the SGMTS is expected not to be as fast as major roads. With a relatively low speed, the noise from the traveling should not be high.

4.4.4 A detailed assessment will be carried out at later stage to review the potential noise impact from the SGMTS to the proposed development when the information is available. Practical mitigation measures will be considered if any unacceptable impact is identified.

5. CONSTRUCTION NOISE IMPACT ASSESSMENT

5.1 Introduction

5.1.1 During the construction phase of the Proposed Development, major noise impacts would arise from piling works, operation of Powered Mechanical Equipment (PME), and construction-related traffic.

5.2 Construction Noise Criteria

5.2.1 Construction noise is controlled under the Noise Control Ordinance (NCO) which prohibits the use of powered mechanical equipment (PME) during the restricted hours (7 p.m. to 7 a.m. on normal weekdays and any time on a public holiday, including Sunday) without a valid Construction Noise Permit (CNP) from the Authority. The criteria and procedures for issuing such a permit are specified in the "Technical Memorandum on Noise from Construction Works Other than Percussive Piling" (TM1). While there is no planned construction works to be carried out during the restricted hours, TM1 should be followed in case there is any need to carry out works in such time period in future.

5.2.2 With effect from 1 November 1996, the use of specified powered mechanical equipment (SPME) for carrying out construction work other than percussive piling and/ or the carrying out of prescribed construction work (PCW) within a designated area are also brought under control. The relevant technical details are provided in the "Technical Memorandum on Noise from Construction Work in Designated Areas" (TM2).

5.2.3 Percussive pilling is controlled similarly by a construction noise permit system and described in the NCO and the "Technical Memorandum on Noise from Percussive Piling" (TM3) which restrict the number of hours during which piling can be conducted. Percussive piling is prohibited between 7 p.m. and 7 a.m. and on holidays (including Sundays). Percussive piling during the daytime (i.e. between 7 a.m. and 7 p.m. on any day not being a holiday) may be carried out in accordance with the permitted hours and other conditions under a valid construction noise permit.

5.2.4 For construction works other than percussive piling, although TM1 does not provide control over daytime construction activities, noise limits as shown in below are set out in the "Practice Note for Professional Persons Environmental Consultative Committee" (ProPECC) PN 1/24.

Table 5.1 Noise Limit for Daytime Construction Activities

NSR	0700 to 1900 Hours on Any Day Not Being a Sunday or General Holiday, Leq (30min), dB(A)
Dwelling	75
School	70 65 (During Examination)

Notes:

(i) The above standards apply to uses which rely on opened windows for ventilation.

(ii) The above standards shall be viewed as the maximum permissible noise levels assessed at 1m from the external façade.

5.3 Recommended Mitigation Measures for Construction Noise

5.3.1 Noise mitigation measures should be introduced in the Proposed Development to alleviate potential noise impacts on nearby NSRs if any. The Contractor(s) will be

required under the contract to ensure regular maintenance of all plant and equipment, and that noise generation at source would be minimized and practicable noise mitigation measures would be in use. The Contractor(s) will be required to adopt quiet type construction plants (e.g. EPD's quality powered mechanical equipment (QPME) inventory), wherever practicable. Similarly, quieter method other than percussive piling will be adopted as far as practicable for any piling works subject to ground investigation result (which usually dictates the piling method). Movable noise barriers will also be erected around noisy plants in order to minimize noise generation at source. With these measures in place noise generation due to construction activities would be minimized.

5.3.2 The following general noise mitigation measures could be considered:

- Application of properly designed silencers, mufflers, acoustically dampened panels and acoustic sheds or shields, etc.;
- Use of electric-powered equipment where applicable instead of diesel-powered or pneumatic-powered equipment;
- Erecting noise enclosures/ movable noise barriers around noisy plants;
- Only well-maintained plants should be operated on-site;
- Plants should be serviced regularly during the construction programme;
- Noisy activities can be scheduled to minimize exposure of nearby NSRs to high levels of construction noise. For example, noisy activities can be scheduled for midday or at times coinciding with periods of high background noise;
- Noisy equipment such as emergency generators shall always be sited as far away as possible from noise sensitive receivers;
- Location of noise emitting plants at maximum possible distances from sensitive receivers;
- Contractual clauses for construction works; and
- Schedule of noisy operations during non-restricted hours where possible.

5.3.3 The above-mentioned noise mitigation measures will be included in the contractual clauses for implementation by the contractor(s) during the construction stage. With these measures in place, construction noise due to the Proposed Development can be minimized, and no significant noise impact is anticipated.

5.3.4 Requirements in relevant pollution control ordinances/regulations and the guideline document "Recommended Pollution Control Clause for Construction Contracts" also are relevant for construction noise control.

5.3.5 This section assesses the potential road traffic noise impacts on the noise sensitive uses of the Proposed Development. Practical mitigation measures are proposed to mitigate the potential noise impacts, where necessary.

6. CONCLUSION

6.1 Introduction

6.1.1 The key environmental issues associated with construction and operation phase of the Proposed Development are qualitatively reviewed in this report.

6.2 Air Quality

6.2.1 As no openable windows, fresh air intakes and recreational uses in the open spaces fall within the HKPSG vehicular emission buffer distance, the Proposed Development will not be subject to unacceptable air quality impacts. Also, based on the best available information, there is no chimney within 200m from the Application Site. Therefore, the proposed development will comply with all relevant HKPSG air quality buffer distance.

6.2.2 With sufficient buffer distance, there would be no insurmountable air quality impact due to the surrounding potential air quality emissions source within 500m to the Application Site.

6.3 Traffic Noise

6.3.1 It is expected that the maximum noise levels due to traffic on the surrounding roads in terms of L10(1 hr) would not exceed 70 dB(A) with the mitigation measures proposed in the HSK NDA P&E Study.

6.3.2 Detailed calculation on the traffic noise level of the Application Site shall be conducted in next stage to further ensure the traffic noise level would not exceed 70dB(A). In case of any exceedance, mitigation measures, such as acoustic window and balcony shall be applied with reference to the Practice Note ProPECC PN 5/23.

6.4 Railway Noise

6.4.1 It is expected that there is no exceedance on Leq(30min) (Day, Evening and Night hours), Lmax and Leq(24 hr).

6.4.2 Detailed calculation on the railway noise level of the Application Site shall be conducted in next stage to further ensure the railway noise level would not exceed the acceptable noise level of Leq(30min) (Day, Evening and Night hours), Lmax and Leq(24 hr). In case of any exceedance, mitigation measures, such as layout set back and acoustic fins shall be applied.

6.4.3 In conclusion, there are no environmental impacts for the Proposed Development.

6.5 Fixed Noise

6.5.1 The planned fixed noise sources shall be designed to meet the HKPSG requirement. With the mitigation measures, it is expected there would be no insurmountable noise impact from fixed noise sources of proposed Development to nearby noise sensitive receivers.

6.6 Construction Phase Impact

6.6.1 During construction, the project proponent would control noise, dust and site run-off nuisances to within established standard and guidelines through the implementation of relevant mitigation measures. In addition, the "Recommended Pollution Control Clauses for Construction Contracts", should also be implemented where necessary.

6.7 Further Study on Noise Impact

A detailed noise impact assessment (NIA) according to the actual building plan will be carried out at a later stage under the lease to confirm the location and extent of at-

Figures

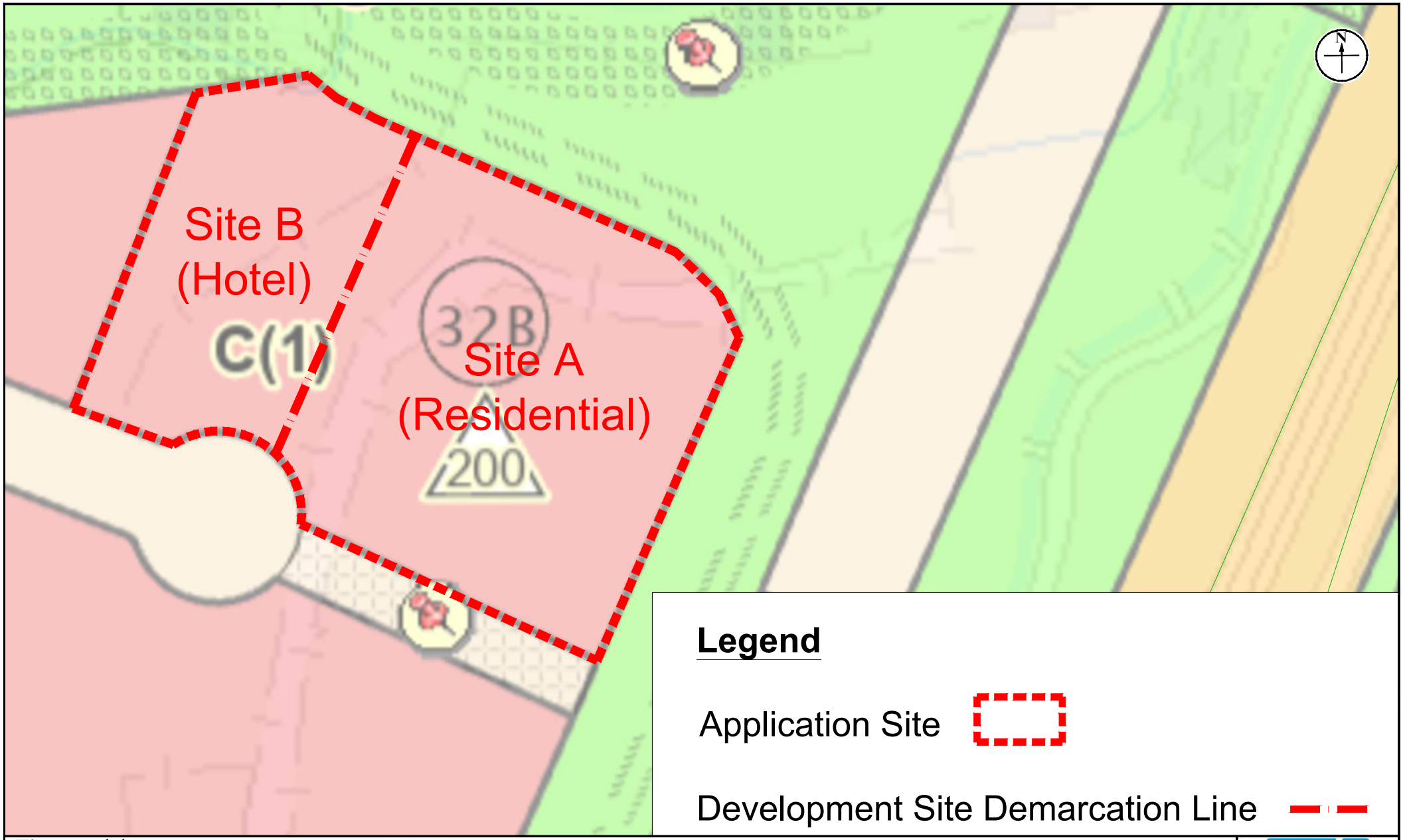


Figure: 1.1	RAMBOLL
Title: Location of Application Site	Drawn by: SC
	Checked by: TC
Project: Planning Application for Proposed Mixed Use Development at Hung Shui Kiu/ Ha Tsuen (Areas 32B)	Rev.: 1.0
	Date: May 2026

Q:\Projects\SHKHSK32EI00\05 Assessments\Fig_EA Report_32B.dwg

Remark

No air-sensitive uses including openable windows, fresh air intakes and recreational uses in the open spaces are allowed within the buffer zone

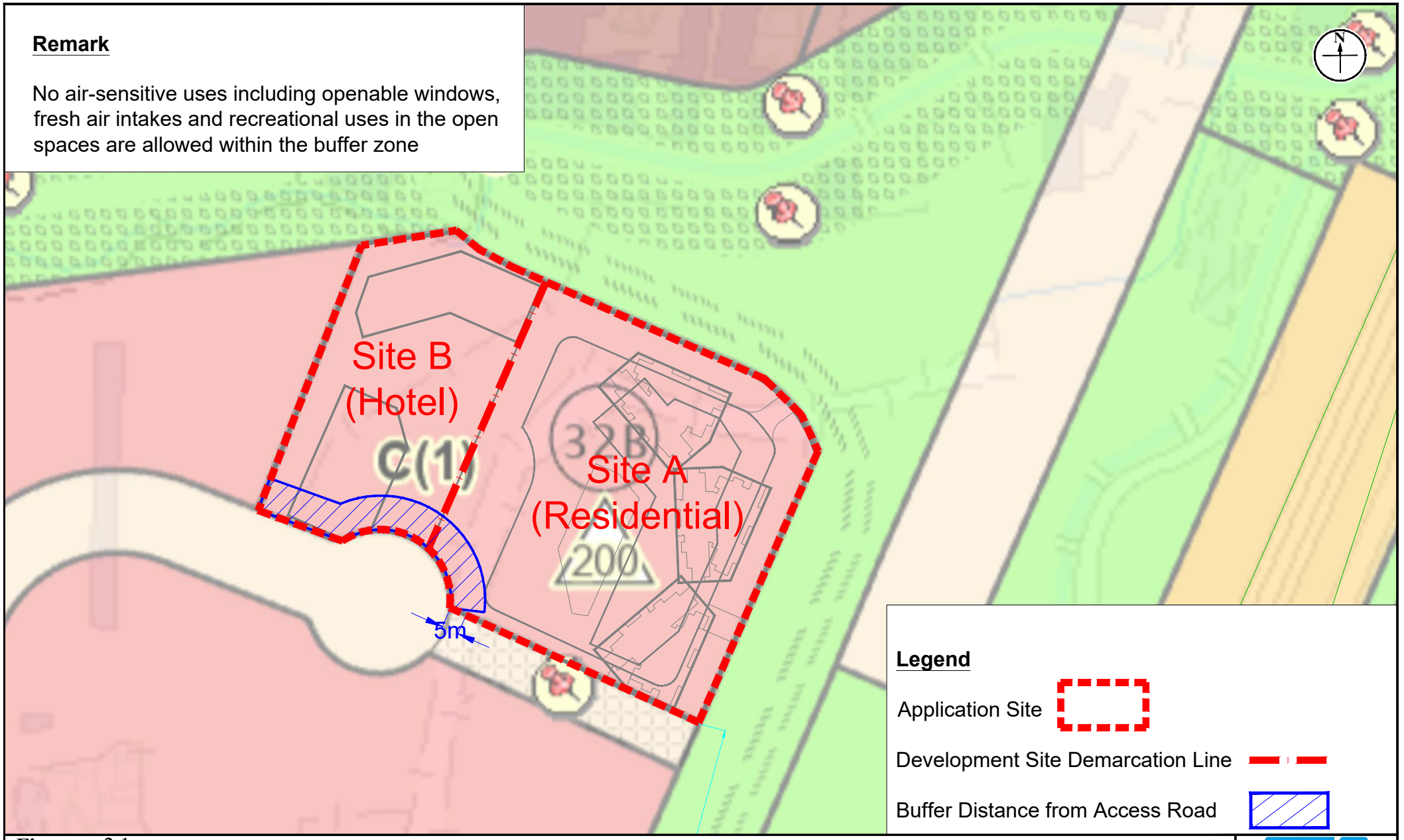
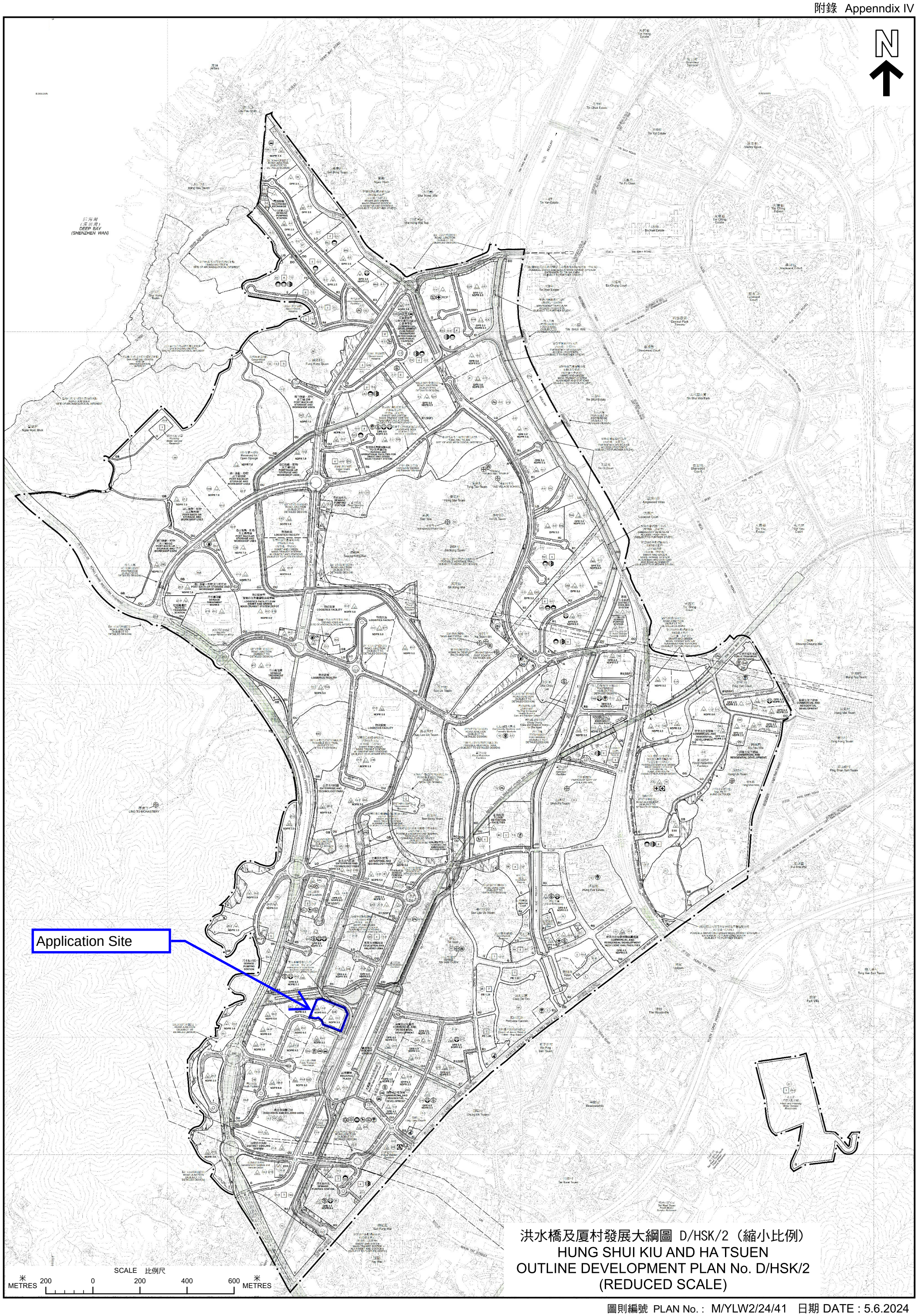


Figure: 2.1	RAMBOLL
Title: Buffer Distance for Planned Road L22	Drawn by: SC Checked by: TC
Project: Planning Application for Proposed Mixed Use Development at Hung Shui Kiu/ Ha Tsuen (32B)	Rev.: 1.0 Date: Dec 2024

Q:\Projects\SHKHSK32EI00\05 Assessments\Fig_EA Report_32B.dwg

Appendix 1.1 Revised Outline Development Plan (RODP) for Hung Shui Kiu and Ha Tsuen and Hung Shui Kiu and Ha Tsuen Outline Zoning Plan (No. S/HSK/3) (Southern Area)



洪水橋及厦村發展大綱圖 D/HSK/2（縮小比例）
HUNG SHUI KIU AND HA TSUEN
OUTLINE DEVELOPMENT PLAN No. D/HSK/2
(REDUCED SCALE)

圖則編號 PLAN No.： M/YLW2/24/41 日期 DATE : 5.6.2024

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

NOTE:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NO. 60222570/TR19A/FIGURE 2.2.

CUT LINE A-A

SEE DRAWING NO. 60222570/TR19A/FIGURE 2.2.1

N

816000 E

817000 E

833000 N

832000 N

Application Site

Yuen Tau Shan

Kau Lee Uk Tsuen

San Sang Tsuen

San Uk Tsuen

Sha Chau Lei

Shek Po Tsuen

Kiu Tau Wai

Hung Uk Tsuen

San Lee Uk Tsuen

Tin Sum Tsuen

Chung Uk Tsuen

Sun Fung Wai

Nai Wai

Tsing Chuen Wai

KONG SHAM WESTERN HIGHWAY

CASTLE PEAK ROAD

YUEN LONG HIGHWAY

COMMUNITY FARMING AND FARMERS' MARKETS

HUNG FUK ESTATE

HOSPITAL, SPECIALIST CLINIC/ POLYCLINIC

RETENTION FACILITIES

(COMMERCIAL & RESIDENTIAL DEVELOPMENT WITH LIGHT RAIL FACILITIES)

COMMERCIAL & RESIDENTIAL

OU (REGIONAL PLAZA WITH LEISURE, FOOD & BEVERAGES USES)

OU (RAILWAY STATION)

OU (VEHICLE DEPOT)

FWSR & FLWSR

Ser Res

Plot File by: ZENGFX
PATH: P:\PROJECTS\60222570\Drawing\REPORT\TR19A\TR19A_714.dgn

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PROJECT
項目

HUNG SHUI KIU NEW DEVELOPMENT AREA PLANNING AND ENGINEERING STUDY - INVESTIGATION

CLIENT
業主

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

規劃署
Planning Department

CONSULTANT
工程顧問公司

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ISSUE/REVISION
修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核對

STATUS
狀況

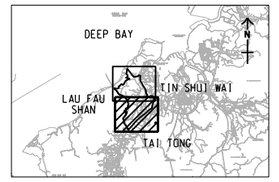
SCALE
比例

A3 1 : 10000

DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
索引圖 A3 1 : 500000



PROJECT NO.
項目編號

60222570

AGREEMENT NO.
協議編號

CE2/2011 (CE)

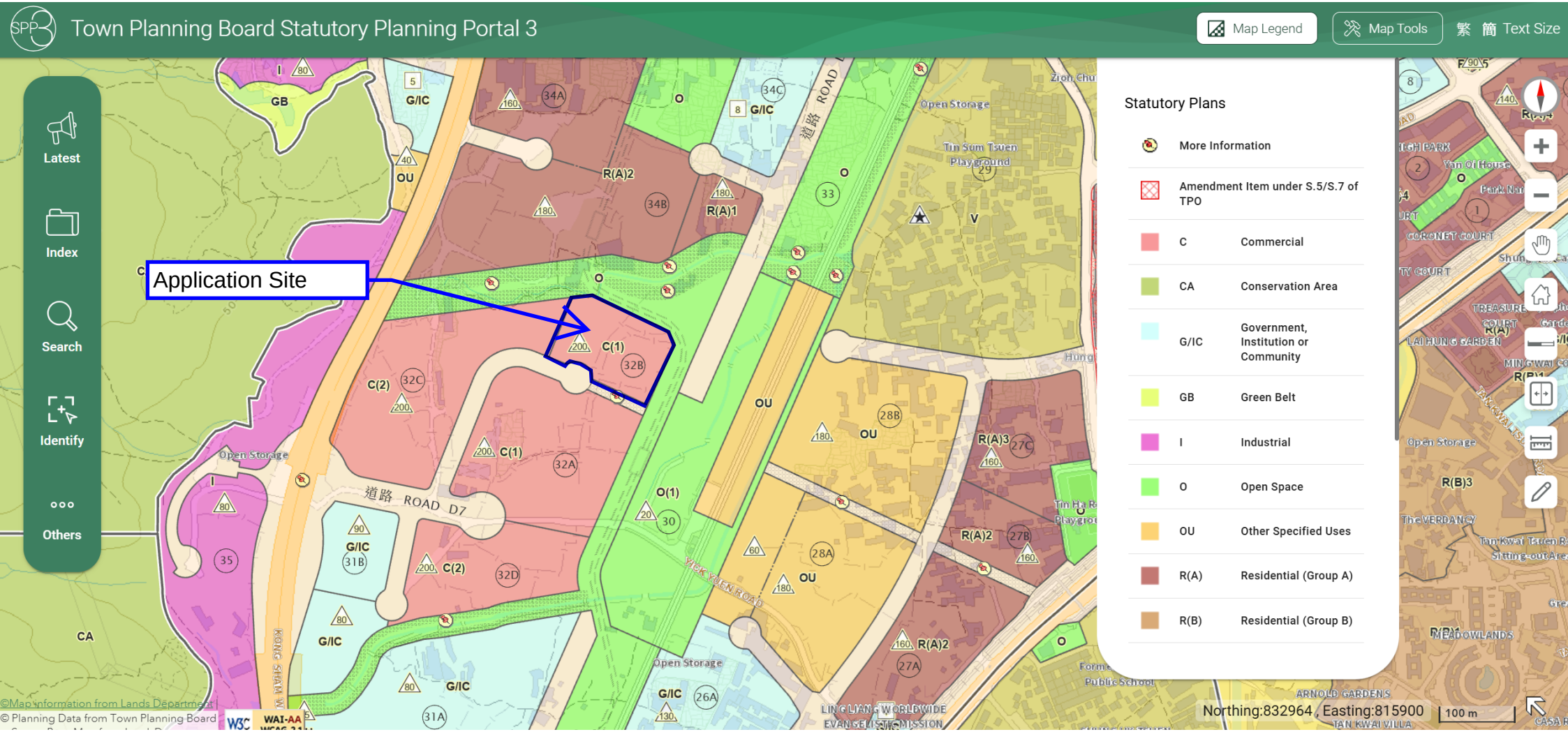
SHEET TITLE
圖紙名稱

REVISED RECOMMENDED OUTLINE DEVELOPMENT PLAN (RODP) (SOUTHERN AREA)

SHEET 2 OF 2

SHEET NUMBER
圖紙編號

60222570/TR19A/FIGURE 2.2.2


Town Planning Board Statutory Planning Portal 3
Map Legend
Map Tools
繁 簡 Text Size
Latest
Index
Search
Identify
Others
Application Site
Statutory Plans
More Information
Amendment Item under S.5/S.7 of TPO
C Commercial
CA Conservation Area
G/IC Government, Institution or Community
GB Green Belt
I Industrial
O Open Space
OU Other Specified Uses
R(A) Residential (Group A)
R(B) Residential (Group B)
道路 ROAD D7
YICK YUEN ROAD
Northing:832964 , Easting:815900
100 m
©Map information from Lands Department
© Planning Data from Town Planning Board
WAI-AA

Appendix 1.2 Master Layout Plan of the Proposed Development



Remarks

For Site B, the layout, uses and development parameters are for indicative purpose only. The proposed non-domestic development conforms to the Notes of the OZP, which commercial development with uses such as 'Office', 'Hotel', 'Shop and Services', 'Eating Place', 'Place of Entertainment', and etc. are always permitted under the OZP.

	Title	Checked		Drawn	
	G/F Plan	Rev		Date	
		Scale		Figure	



Remarks

For Site B, the layout, uses and development parameters are for indicative purpose only. The proposed non-domestic development conforms to the Notes of the OZP, which commercial development with uses such as 'Office', 'Hotel', 'Shop and Services', 'Eating Place', 'Place of Entertainment', and etc. are always permitted under the OZP.

	Title: 1/F Plan	Checked		Drawn	
		Rev		Date	
		Scale		Figure	



Remarks

For Site B, the layout, uses and development parameters are for indicative purpose only. The proposed non-domestic development conforms to the Notes of the OZP, which commercial development with uses such as 'Office', 'Hotel', 'Shop and Services', 'Eating Place', 'Place of Entertainment', and etc. are always permitted under the OZP.

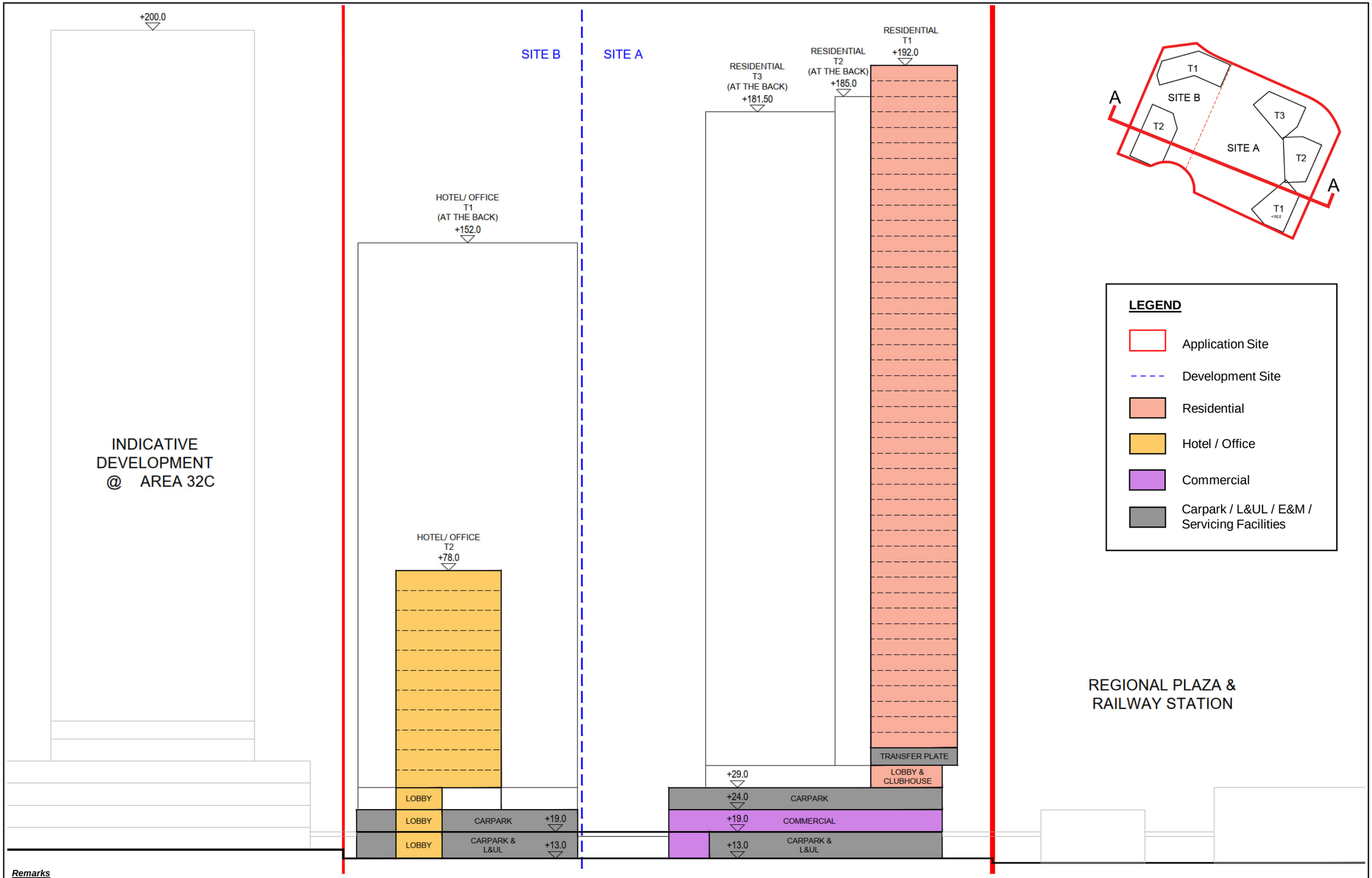
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		Rev		Date	
		Scale		Figure	



Remarks

For Site B, the layout, uses and development parameters are for indicative purpose only. The proposed non-domestic development conforms to the Notes of the OZP, which commercial development with uses such as 'Office', 'Hotel', 'Shop and Services', 'Eating Place', 'Place of Entertainment', and etc. are always permitted under the OZP.

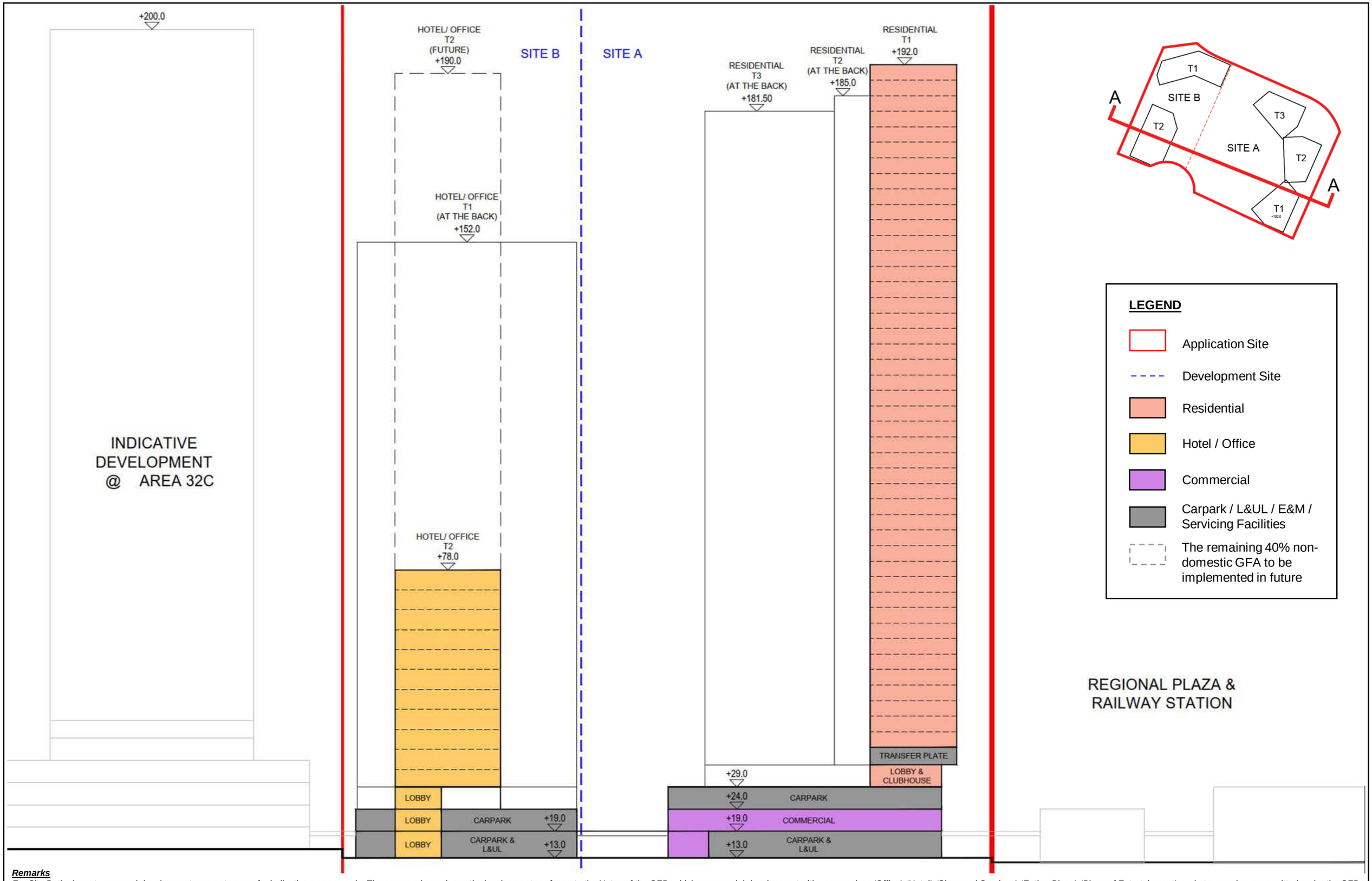
	Title	Checked		Drawn	
	3/F Plan	Rev		Date	
		Scale		Figure	



Remarks

For Site B, the layout, uses and development parameters are for indicative purpose only. The proposed non-domestic development conforms to the Notes of the OZP, which commercial development with uses such as 'Office', 'Hotel', 'Shop and Services', 'Eating Place', 'Place of Entertainment', and etc. are always permitted under the OZP.

Title	Section Plan (Phase 1)	Checked	DH	Drawn PW
		Rev	0	Date Jun 2026
		Scale		Figure 3.6



Remarks

For Site B, the layout, uses and development parameters are for indicative purpose only. The proposed non-domestic development conforms to the Notes of the OZP, which commercial development with uses such as 'Office', 'Hotel', 'Shop and Services', 'Eating Place', 'Place of Entertainment', and etc. are always permitted under the OZP.

	Title: Section Plan (Future Scenario)	Checked	DH	Drawn PW
		Rev	0	Date Jun 2026
		Scale		Figure 3.7

Appendix 3.1 Traffic Noise Result in HSK NDA P&E Study

NOTE:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NO. 60222570/TR19A/FIGURE 2.2.

CUT LINE A-A

SEE DRAWING NO. 60222570/TR19A/FIGURE 2.2.1

Reference Site

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

Plot File by: ZENGFX
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PROJECT 項目

HUNG SHUI KIU NEW DEVELOPMENT AREA PLANNING AND ENGINEERING STUDY - INVESTIGATION

CLIENT 業主

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

規劃署 Planning Department

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ISSUE/REVISION 修訂

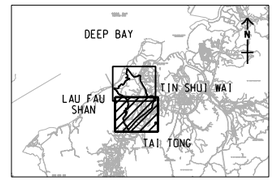
I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核實

STATUS 階段

SCALE 比例: A3 1 : 10000

DIMENSION UNIT 尺寸單位: METRES

KEY PLAN 索引圖 A3 1 : 500000



PROJECT NO. 項目編號: 60222570

AGREEMENT NO. 協議編號: CE2/2011 (CE)

SHEET TITLE 圖紙名稱

REVISED RECOMMENDED OUTLINE DEVELOPMENT PLAN (RODP) (SOUTHERN AREA)

SHEET 2 OF 2

SHEET NUMBER 圖紙編號

60222570/TR19A/FIGURE 2.2.2

4.7 Traffic Noise Impact Assessment

Assessment Approach and Methodology

4.7.1 Road traffic noise impact is predicted using the methodology provided in the UK Department of Transport Calculation of Road Traffic Noise (CRTN) 1988. The computer model RoadNoise 2000 which complies with the CRTN is used for the prediction. The noise levels are presented in terms of noise levels exceeded for 10% of the one-hour period during the peak traffic flow, i.e. $L_{10(1hour)}$ dB(A).

4.7.2 Traffic noise is predicted based on the worst-case year traffic forecast within 15 years upon commencement of operation of the proposed roadwork according to Clause 3.4.5.2(vi)(a) of the EIA Study Brief. Based on the latest project programme, the proposed road network is expected to be in operation in operation in Year 2033. The assessment year for road traffic noise is taken as Year 2048 which is the maximum traffic projection within 15 years after full operation of the proposed roadwork. The peak traffic flow with the Project in Year 2048 is shown in **Appendix 4.7.1**. Transport Department (TD) has no comment on the traffic forecast adopted in this EIA study.

4.7.3 The following scenarios are studied in the assessment:

- Unmitigated scenario in Year 2048;
- Mitigated scenario in Year 2048; and
- Prevailing scenario in Year 2018 for indirect technical remedies eligibility assessment.

4.7.4 For the purpose of the traffic noise assessment in the EIA study, the roads within 300 m from the proposed Project boundary are included in the assessment. Road-plots of the traffic noise model with the extent of Project roads are depicted in **Appendix 4.7.2**. The friction course on Hung Tin Road (excluding slip roads) and Yuen Long Highway, existing noise barriers at Tin Ha Road, Hung Tin Road (in the vicinity of Hung Fuk Estate), Hung Chi Road, Hung Shui Kiu Tin Sum Road and all traffic noise mitigation measures and friction course as stated in the approved EIA Report of “Deep Bay Link” (EIA-078/2002) have been taken into account in the assessment. In this study, the planned Tuen Mun Western Bypass (TMWB) which is located next to planned Site 4-4 is also considered in the assessment with the assumption of the semi-enclosures on its slip-roads under unmitigated and mitigated scenarios.

4.7.5 The traffic speeds adopted for the roads in the noise models are summarised as follows and the traffic speed adopted for each road is presented in **Appendix 4.7.2**:

(a) KSWH and Yuen Long Highway: 80 km per hour;

(b) Tin Ying Road (for prevailing scenario only), Hung Tin Road and certain sections of Castle Peak Road: 70 km per hour; and

(c) Concerned roads other than those listed in (a) and (b) above: 50 km per hour.

4.7.6 Direct mitigation measures would be proposed in all situations where the predicted traffic noise level exceeds the criteria set in Table 1A of Annex 5 to the EIAO-TM by 1 dB(A) or more.

4.7.7 If any façades of NSRs are still exposed to predicted noise levels exceeding the relevant noise criteria after the implementation of all direct mitigation measures, provision of indirect technical remedies in the form of acoustic insulation and air conditioning should be considered under the EIAO-TM and EIAO Guidance Note No. 12/2010. The eligibility for indirect technical remedies would be tested against the following three criteria:

- The predicted overall noise level from the Project roads, together with other traffic noise in the vicinity must be above a specified noise level (for example, 70 dB(A) for domestic premises and 65 dB(A) for educational institutions. All are in $L_{10\ (1hour)}$);
- The predicted overall noise level is at least 1.0 dB(A) more than the prevailing traffic noise level, i.e. the total traffic noise level existing before the works to construct Project roads were commenced; and
- The contribution to the increase in the predicted overall noise level from the Project roads must be at least 1.0 dB(A).

Prediction and Evaluation of Environmental Impacts

4.7.8 The Revised RODP has incorporated environmentally friendly designs to avoid and/or reduce traffic noise impact to sensitive receivers. These designs include deletion of Tin Ying Road, provision of depressed roads with or without decking-over, allocation of non-sensitive uses at the noisy roads, traffic controls for heavy goods vehicles which centralising the cargo truck travelling along KSWH, Planned Road P1 and D1 would also be implemented to reduce the road traffic noise impact at those NSRs within the Project area. In addition, provision of EFTS would potentially reduce the road-based traffic volume, thereby reducing the potential traffic noise impact arising from the Project. In the Stage 2 Community Engagement which consulted the public on the PODP and facilitated formulation of the RODP, there were comments expressing concerns over the noise impact brought by Castle Peak Road. Taking into account the public concern, low noise road surfacing (LNRS) would be implemented, subject to design review, on the road section of Castle Peak Road in the vicinity of Project area. Different materials for LNRS are being reviewed and tested by the Government for application in Hong Kong. Environmental review will be conducted in due course to study how the use of new road surfacing material could help reduce traffic noise impacts.

4.7.9 Road traffic noise assessment has been conducted for the representative NSRs in the worst-case year 2048. The predicted traffic noise levels at the representative NSRs under the unmitigated scenario are presented in **Table 4.24** to **Table 4.26**. Whereas **Appendix 4.7.3** shows the details of the noise assessment results of the each assessment points of the NSRs at different assessment levels under unmitigated scenario.

Table 4.24 Summary of Unmitigated Road Traffic Noise Assessment Results (Existing NSRs outside the Project Area)

NSR ID	Description	Existing / Planned Use	NAP ID	Criteria, dB(A)	Predicted Unmitigated Overall Noise Level, dB(A)	Compliance of Noise Criteria
E1-OA	Tin Wah Estate	Existing Residential	E1-OA_R01	70	66-67	Yes
E1-OB_R	Tin Shing Court	Existing Residential	E1-OB_R01	70	67-68	Yes
E1-OB_E0	Q.E.S. Old Students' Association Branch Primary School	Existing Educational	E1-OB_E01 to E1-OB_E02	65	56-74	No
E1-OB_E1	YLPMSAA Tang Siu Tong Secondary School	Existing Educational	E1-OB_E11 to E1-OB_E12	65	61-74	No
E1-OB_E2	Lions Clubs International Ho Tak Sum Primary School	Existing Educational	E1-OB_E21	65	57-69	No
E2-OA	Village House at Lau Fau Shan	Existing Village	E2-OA_R01	70	66-67	Yes
E2-OB	San Hing Tsuen	Existing Village	E2-OB_R01 to E2-OB_R03	70	71-72	No
E2-OC	Sha Kong Wai	Existing Village	E2-OC_R01 to E2-OC_R04	70	71-76	No
E2-OD	Tin Yan Estate	Existing Residential	E2-OD_R01	70	66-67	Yes
E4-OA	Tsing Cheun Wai	Existing Village	E4-OA_R01 to E4-OA_R04	70	71-73	No
E4-OB	Nai Wai	Existing Village	E4-OB_R01	70	77	No
E4-OC	Sun Fung Wai	Existing Village	E4-OC_R01 to E4-OC_R03	70	72-80	No
E4-OD	Chung Uk Tsuen	Existing Village	E4-OD_R01 to E4-OD_R04	70	74-78	No
E5-OA	Tong Fong Tsuen	Existing Village	E5-OA-R01 & E5-OA-R02	70	67-79	No
E5-OB	Hang Mei Tsuen	Existing Village	E5-OB-R01	70	75	No
E5-OC	Tai Tao Tsuen	Existing Village	E5-OC-R01	70	71	No
E5-OD	Uptown	Existing Residential	E5-OD_R01	70	71-76	No
E5-OE	Shung Tak Catholic English College	Existing Educational	E5-OE_E01	65	73-74	No
E5-OF	Treasure Court	Existing Residential	E5-OF_R01	70	73	No
E5-OG	Lai Hung Garden	Existing Residential	E5-OG_R01	70	74	No
E5-OH	Bauhinia Garden	Existing Residential	E5-OH_R01	70	74-75	No

Note: Full names of the abbreviations of uses should be referred to the List of Abbreviations.

Table 4.25 Summary of Unmitigated Road Traffic Noise Assessment Results (Existing NSRs within the Project Area)

NSR ID	Description	Use	NAP ID	Criteria, dB(A)	Predicted Unmitigated Overall Noise Level, dB(A)	Compliance of Noise Criteria
E1-IA	Tseung Kong Wai	Existing Village	E1-IA_R01	70	76	No
E1-IB	Hong Mei Tsuen	Existing Village	E1-IB_R01	70	54-55	Yes
E1-IC	Tung Tau Tsuen	Existing Village	E1-IC_R01 to E1-IC_R03	70	64-69	Yes
E1-ID	Lo Uk Tsuen	Existing Village	E1-ID_R01	70	59	Yes
E1-IE	Sik Kong Wai	Existing Village	E1-IE_R01	70	69-70	Yes
E1-IF	Ha Tsuen Shi	Existing Village	E1-IF_R01 to E1-IF_R02	70	64-76	No
E1-IG	San Uk Tsuen	Existing Village	E1-IG_R01 to E1-IG_R03	70	65-69	Yes
E1-IH	Sha Chau Lei	Existing Village	E1-IH_R01 to E1-IH_R02	70	66-70	Yes
E1-IJ	San Sang Tsuen	Existing Village	E1-IJ_R01 to E1-IJ_R05	70	68-73	No
E1-IK	Shek Po Tsuen	Existing Village	E1-IK_R01 to E1-IK_R03	70	64-73	No
E2-IA	Fung Kong Tsuen	Existing Village	E2-IA_R01 to E2-IA_R02	70	72-76	No
E4-IA	Tin Sum Tsuen	Existing Village	E4-IA_R01 to E4-IA_R03	70	72-73	No
E4-IB	Tsing Chuen Wai	Existing Village	E4-IB_R01	70	69-72	No
E5-IA	Kiu Tau Wai	Existing Village	E5-IA_R01	70	64-69	Yes
E5-IB_R	Hung Uk Tsuen	Existing Village	E5-IB_R01 to E5-IB_R02	70	63-74	No
E5-IB_C	Chinese Mission Seminary	Existing Church	E5-IB_C01	65	73-74	No
E5-IC	San Lee Uk Tsuen	Existing Village	E5-IC_R01	70	73	No
E1-26	Existing Homes for the Elderly (Yeung Chun Pui and Ching Chung)	IC	E1-26_H01 to E1-26_H02	70	59-63	Yes
E4-30	Ling Liang Worldwide Evangelistic Mission Hung Shui Kiu Ling Liang Church	IC	E4-30_C01	65	72	No
E5-23	Sheffield Villas	R3	E5-23_R01 to E5-23_R12	70	64-66	Yes
E5-25	Hung Fuk Estate	RSc	E5-25_R01 to E5-25_R41	70	59-73	No
E5-31	Existing Residential Development	R2	E5-31_R01 to E5-31_R22	70	61-73	No
E5-35	Bellevue Court	R4	E5-35_R01	70	64-73	No
E5-39	Existing Residential Development	R3	E5-39_R01 to E5-39_R05	70	68-77	No
E5-44	The Church of Jesus Christ of Latter-Day Saints (Hung Shui Kiu)	R3	E5-44_C01 to E5-44_C02	65	68-71	No

NSR ID	Description	Use	NAP ID	Criteria, dB(A)	Predicted Unmitigated Overall Noise Level, dB(A)	Compliance of Noise Criteria
O5-06	Committed Subsidised Sales Flat	R2(SSF)c	O5-06_R01 to O5-06_R24	70	59-75	No
O5-33	Committed Residential Development	R2	O5-33_R01 to O5-33_R31	70	72-73	No

Note: Full names of the abbreviations of uses should be referred to the List of Abbreviations.

4.7.10 Referring to **Table 4.24** and **Table 4.25**, the predicted noise levels at the representative existing NSRs outside and within the Project area would be in the range of 56 to 79 dB(A) and 54 to 77 dB(A), respectively. Most of representative existing NSRs would expose to the noise levels exceeding the relevant noise criteria. Mitigation measures are required to alleviate the potential adverse traffic noise impact.

Table 4.26 Summary of Unmitigated Road Traffic Noise Assessment Results (Planned NSRs within the Project Area)

NSR ID	Use	Description	NAP ID	Criteria, dB(A)	Predicted Unmitigated Overall Noise Level, dB(A)	Compliance of Noise Criteria
P1-02	R2(SSF)c	Site 1-02	P1-02_R01 to P1-02_R31	70	57-75	No
P1-03	E	Site 1-03	P1-03_E01 to P1-03_E11	65	53-64	Yes
P1-04	R2c	Site 1-04	P1-04_R01	70	47-60	Yes
P1-05	R2c	Site 1-05	P1-05_R01 to P1-05_R11	70	57-67	Yes
P1-06	R2c	Site 1-06	P1-06_R01 to P1-06_R11	70	64-70	Yes
P1-08	R2c	Site 1-08	P1-08_R01 to P1-08_R22	70	66-74	No
P1-09	R2c	Site 1-09	P1-09_R01 to P1-09_R12	70	68-75	No
P1-12	R2	Site 1-12	P1-12_R01	70	68-73	No
P1-15	E	Site 1-15	P1-15_E01 to P1-15_E05	65	65-73	No
P1-17	R2	Site 1-17	P1-17_R01	70	57-63	Yes
P1-18	E	Site 1-18	P1-18_E01 to P1-18_E03	65	57-68	No
P1-19	R2	Site 1-19	P1-19_R01 to P1-19_R21	70	69-76	No
P1-21	R2c	Site 1-21	P1-21_R01 to P1-21_R21	70	54-69	Yes
P1-22	E	Site 1-22	P1-22_E01 to P1-22_E11	65	63-79	No
P2-02	R3	Site 2-02	P2-02_R01 to P2-02_R32	70	61-67	Yes
P2-03	R3	Site 2-03	P2-03_R01 to P2-03_R21	70	52-65	Yes
P2-07	R3	Site 2-07	P2-07_R01 to P2-07_R21	70	62-66	Yes
P2-09	E	Site 2-09	P2-09_E01 to P2-09_E02	65	57-66	No

NSR ID	Use	Description	NAP ID	Criteria, dB(A)	Predicted Unmitigated Overall Noise Level, dB(A)	Compliance of Noise Criteria
P2-10	R3	Site 2-10	P2-10_R01 to P2-10_R31	70	62-70	Yes
P2-11	R3c	Site 2-11	P2-11_R01 to P2-11_R31	70	66-74	No
P2-14	R3	Site 2-14	P2-14_R01 to P2-14_R12	70	62-68	Yes
P2-15	E	Site 2-15	P2-15_R01	70	62-64	Yes
P2-16	E	Site 2-16	P2-16_E01 to P2-16_R15	65	63-69	No
P2-18	RR4	Site 2-18	P2-18_R01 to P2-18_R05	70	69-71	No
P2-19	RR4	Site 2-19	P2-19_R01	70	66-67	Yes
P2-24	E	Site 2-24	P2-24_E01 to P2-24_E11	65	59-70	Yes
P2-25	G	Site 2-25	P2-25_H01	70	69-71	No
P2-26	E	Site 2-26	P2-26_E01 to P2-26_E11	65	63-70	No
P2-28	E	Site 2-28	P2-28_E01 to P2-28_E02	65	60-68	No
P2-30	RSc	Site 2-30	P2-30_R01 to P2-30_R21	70	48-70	Yes
P2-31	R2(SSF)c	Site 2-31	P2-31_R01 to P2-31_R21	70	61-68	Yes
P4-01	G	Site 4-01	P4-01_R01 to P4-01_R13	70	64-75	No
P4-03	R2(SSF)c	Site 4-03	P4-03_R01 to P4-03_R11	70	61-76	No
P4-04	RSc	Site 4-04	P4-04_R01 to P4-04_R24	70	56-71	No
P4-05	RSc	Site 4-05	P4-05_R01 to P4-05_R14	70	65-72	No
P4-06	R2(SSF)c	Site 4-06	P4-06_R01 to P4-06_R12	70	66-74	No
P4-08	E	Site 4-08	P4-08_E01 to P4-08_E11	65	61-65	Yes
P4-09	R1c	Site 4-09	P4-09_E06	70	62-68	Yes
P4-17	OU	Site 4-17	P4-17_E01 to P4-17_E06	65	57-73	No
P4-20	RR4	Site 4-20	P4-20_R01 to P4-20_R04	70	64-72	No
P4-22	RSc	Site 4-22	P4-22_R01 to P4-22_R42	70	52-71	No
P4-24	R2(SSF)c	Site 4-24	P4-24_R01 to P4-24_R46	70	66-75	No
P4-25a	OU(C&R)	Site 4-25a	P4-25a_R01	70	65-69	Yes
P4-25b	OU(C&R)	Site 4-25b	P4-25b_R01 to P4-25b_R11	70	61-71	No
P4-25c	OU(C&R)	Site 4-25c	P4-25c_R01 to P4-25c_R11	70	52-60	Yes
P4-26	R1c	Site 4-26	P4-26_R01 to P4-26_R21	70	64-71	No

NSR ID	Use	Description	NAP ID	Criteria, dB(A)	Predicted Unmitigated Overall Noise Level, dB(A)	Compliance of Noise Criteria
P4-28	RSc	Site 4-28	P4-28_R01 to P4-28_R44	70	54-73	No
P4-29	OU(C&R)	Site 4-29	P4-29_R01 to P4-29_R31	70	50-71	No
P4-32	G	Site 4-32	P4-32_R01 to P4-32_R14	70	63-73	No
P4-33	E	Site 4-33	P4-33_E01 to P4-33_E03	65	67-75	No
P4-36	E	Site 4-36	P4-36_E02 to P4-36_R01	65	66-70	No
P5-07a	OU(C&R)	Site 5-07a	P5-07a_R01 – P5-07a_R21	70	55-71	No
P5-07b	OU(C&R)	Site 5-07b	P5-07b_R01 to P5-07b_R21	70	60-73	No
P5-08	OU(C&R)	Site 5-08	P5-08_R01 to P5-08_R11	70	69-73	No
P5-09	OU(C&R)	Site 5-09	P5-09_R01 to P5-09_R31	70	60-71	No
P5-14	E	Site 5-14	P5-14_E01 to P5-14_E11	65	67-74	No
P5-16	R2(SSF)c	Site 5-16	P5-16_R01 to P5-16_R11	70	58-79	No
P5-17	RSc	Site 5-17	P5-17_E04 to P5-17_R12	65	54-75	No
P5-21	E	Site 5-21	P5-21_E01 to P5-21_E02	65	61-66	No
P5-22	Site 5-22	R3	P5-22_R01 to P5-22_R03	70	65-77	No
P5-24	R2(SSF)c	Site 5-24	P5-24_R01 to P5-24_R23	70	43-68	Yes
P5-26	R2(SSF)	Site 5-26	P5-26_R01 to P5-26_R04	70	63-74	No
P5-28	G	Site 5-28	P5-28_H01 to P5-32_R01 to P5-32_R82	70	64-72	No
P5-32	OU(C&R)	Site 5-32	P5-32_R01 to P5-32_R82	70	62-80	No
P5-34	E	Site 5-34	P5-34_E01 to P5-34_E11	65	60-73	No
P5-37	E	Site 5-37	P5-37_E01 to P5-37_E02	65	70-74	No

Note: Full names of the abbreviations of uses should be referred to the List of Abbreviations.

4.7.11 For the planned NSRs within the Project area (see **Table 4.26**), the predicted road traffic noise levels would be in the range of 43 to 80 dB(A). Despite the environmentally friendly designs are considered in the Revised RODP, results indicate that most planned residential and educational NSRs would still exceed the noise criteria by up to 10 dB(A) and 14 dB(A) respectively. Hence, direct mitigation measures for these affected NSRs are required. For those non-compliance planned educational institutes, mitigation measures as discussed in **Section 4.7.15** are considered under the Class Assessment Document following ETWB Technical Circular (Works) No. 13/2003.

4.7.12 The total number of dwellings, classrooms and other NSRs that will be exposed to noise impact exceeding the criteria set in Annex 5 in the EIAO-TM have been calculated. It is estimated that a total of 786 of existing dwellings, 4352 planned dwellings, 120 existing classrooms, 445 planned classroom, 2 existing churches, 1 existing and 3 planned buildings of home for the elderly would be exposed to traffic noise impact under unmitigated scenario.

Direct Mitigation Measures

4.7.13 High volume of traffic flows of some major roads within or surrounding the Project, namely KSWH, Yuen Long Highway, Ping Ha Road, Tin Wah Road, Hung Tin Road, Castle Peak Road, Planned Road P1 and Planned Road D1, is expected in Year 2048. With the implementation of environmentally friendly designs in the Revised RODP, the noise barriers on KSWH according to its approved EIA Report and the LNRS on Castle Peak Road, exceedance of the noise criteria at some existing and planned NSRs are still predicted in the unmitigated scenario. Noise mitigation measures would therefore be required to alleviate the potential road traffic noise impact.

4.7.14 Noise mitigation measures in terms of: (i) vertical barriers and cantilever noise barriers on the Project roads; (ii)LNRS on Project roads; and (iii) alternative residential development layout (for Sites 5-8, 5-26 and 5-32) are proposed to alleviate adverse traffic noise impact on the affected NSRs. The details of proposed LNRS and noise barriers are summarised in below **Table 4.27** and **Table 4.28** with total length of mitigation measures rounded off to the nearest 10 m. The locations of the vertical barriers, cantilever noise barriers and extent of LNRS are shown in **Figures 4.7.1 – Figure 4.7.16**. The alternative residential development layouts are presented in **Figure 4.7.17 – Figure 4.7.27**. Different materials for LNRS are being reviewed and tested by the Government for application in Hong Kong. Environmental reviews will be conducted at the later design stage to review the proposed noise mitigation measures taking into account the latest design standard at that time for the application of the LNRS materials.

Table 4.27 Locations of Proposed Low Noise Road Surfacing

ID	Road	Length, m
LNS1	Not used	-
LNS2	Tin Wah Road	350
LNS3	Proposed Roundabout at Junction J2	210
LNS4	Proposed Road D1	500
LNS5	Proposed Road near Site2-26	280
LNS6	Proposed Road D1	400
LNS7	Proposed Road D1	640
LNS8	Proposed Road D1 (Depressed Section)	120
LNS9	Proposed Road L1	670
LNS10	Proposed Road P1	560
LNS11	Proposed Road L5	440
LNS12	Proposed Road D2	280
LNS13	Proposed Road D2 (Depressed Section)	180
LNS14	Proposed Road D2	1260
LNS15	Proposed Road L3	390
LNS16	Proposed Road D2	370
LNS17	Proposed Roundabout at Junction J8	190
LNS18	Ping Ha Road	110
LNS19	Not used	-

ID	Road	Length, m
LNS20	Kiu Fat Street	280
LNS22	Proposed Road near Site 5-13	730
LNS23	Hung Chi Road / Proposed Road L5	340
LNS24	Not used	-
LNS25	Note used	-
LNS26	Not used	-
LNS27	Proposed Road near Site 4-24	140
LNS28	Not used	-
LNS29	Proposed Road L2	670
LNS30	Proposed Road near Site 4-29	270
LNS31	Not used	-
LNS32	Proposed Road P1	790
LNS33	Proposed Road P1	380
LNS34	Proposed Road P1	610
LNS35	Proposed Road D8	480
LNS36	Proposed Road near Site 4-33	210

Table 4.28 List of Proposed Traffic Noise Mitigation Measures

Noise Barrier ID	Location	Barrier Type	Height, mAG	Length, m
CB1	Proposed Road D2	Cantilever	6+4.2 m at 45 degree	50
CB2	Not Used	-	-	-
CB3a	Proposed Road P1	Cantilever	5.5+2.5 m at 45 degree	80
CB3b	Proposed Road P1	Cantilever	5.5+2.5 m at 45 degree	130
CB4	Not Used	-	-	-
CB5	Proposed Road D2, near Site 1-22	Cantilever	6+4.2 m at 45 degree	130
VB2	Tin Wah Road / Lau Fau Shan Road	Vertical	5	140
VB3	Proposed Road D1	Vertical	3	120
VB4	Proposed Road D2	Vertical	5	140
VB5	Proposed Road D1	Vertical	5	90
VB6	Proposed Road D1	Vertical	5	150
VB7	Proposed Road D3	Vertical	4	60
VB8	Proposed Road D3	Vertical	4	50
VB9	Proposed Road D3	Vertical	4	50
VB10	Proposed Road D2	Vertical	4	180
VB11	Not used	-	-	-
VB12	Proposed Road D2	Vertical	6	110
VB13	Not used	-	-	-
VB14	Not used	-	-	-
VB15	Proposed Road D2	Vertical	5	30
VB16	Proposed Road D2	Vertical	5	60
VB17	Proposed Road D2	Vertical	5	20

Noise Barrier ID	Location	Barrier Type	Height, mAG	Length, m
VB17	Proposed Road D2	Vertical	5	20
VB18	Proposed Road D2	Vertical	4	60
VB19	Not used	-	-	-
VB20	Proposed Road L3	Vertical	7	110
VB21	Proposed Road D2/ Ping Ha Road	Vertical	7	50
VB22	Not used	-	-	-
VB23	Proposed Road D2/ Ping Ha Road	Vertical	7	130
VB24	Ping Ha Road	Vertical	7	160
VB25	Not used	-	-	-
VB26	Proposed Road L1	Vertical	5	70
VB27	Not used	-	-	-
VB28	Hung Tin Road	Vertical	5	90
VB29	Hung Tin Road	Vertical	7	80
VB30	Not used	-	-	-
VB31	Hung Tin Road	Vertical	7	60
VB32	Not used	-	-	-
VB33	Not used	-	-	-
VB34	Not used	Vertical	7	30
VB35	Proposed Road D5	Vertical	5	80
VB36	Proposed Road D5	Vertical	5	70
VB37	Proposed Road D5	Vertical	3	70
VB38	Proposed Road D5	Vertical	3	80
VB39	Proposed Road P1	Vertical	3	100
VB40	Proposed Road P1	Vertical	3	130
VB41	Proposed Road D2	Vertical	5	130
VB42	Not used	-	-	-

4.7.15 Regarding the noise exceedance on the planned education institutes at Sites 1-18, 1-22, 2-16, 4-33, 4-36 and 5-34, alternative layouts and 3 m high boundary wall (for Site 2-9, 4-33, 4-36 and 5-34 only) are also considered under the Class Assessment Document following ETWB Technical Circular (Works) No. 13/2003. The details of the proposed boundary wall are presented in **Table 4.29** and the alternative layouts are presented in **Figure 4.7.17 – Figure 4.7.27**.

Table 4.29 Details of Proposed Boundary Wall for Planned Education Institutes

Boundary Wall ID	Location	Barrier Type	Height, mAG	Length, m
VB1	Boundary Wall at Site 2-9	Vertical	3	65
VB43	Boundary wall at Site 4-36	Vertical	3	60
VB44	Boundary wall at Site 4-36	Vertical	3	120
VB45	Boundary wall at Site 4-33	Vertical	3	200
VB46	Boundary wall at Site 5-34	Vertical	3	150
VB47	Boundary wall at Site 5-34	Vertical	3	160

4.7.16 With the implementation of the above recommended noise mitigation measures, the noise levels at some of the representative NSRs would comply with the traffic noise criteria. However, exceedance of the traffic noise criteria would still be predicted at some of the representative existing NSRs due to existing roads and some planned NSRs due to existing roads including KSWH and planned local roads.

4.7.17 The predicted mitigated traffic noise levels at the representative existing NSRs outside and within the Project area, and the major noise source causing exceedance on the affected existing NSRs are presented in below **Table 4.30** and **Table 4.31**. **Table 4.32** summarises the predicted mitigated traffic noise levels at the planned representative NSRs.

Table 4.30 Summary of Mitigated Road Traffic Noise Assessment Results (Existing NSRs outside the Project area)

NSR ID	Description	Existing / Planned Use	NAP ID	Criteria, dB(A)	Predicted Mitigated Overall Noise Level, dB(A)	Major Noise Source causing Exceedance
E1-OA	Tin Wah Estate	Existing Residential	E1-OA_R01	70	65-67	-
E1-OB	Tin Shing Court	Existing Residential	E1-IB_R01	70	62-66	-
E1-OB_E0	Q.E.S. Old Students' Association Branch Primary School	Existing Educational	E1-OB_E01 to E1-OB_E02	65	56-74	Ping Ha Road (East of Hung Tin Road)
E1-OB_E1	YLPMSAA Tang Siu Tong Secondary School	Existing Educational	E1-OB_E11 to E1-OB_E12	65	61-74	Ping Ha Road (East of Hung Tin Road). Hung Tin Road
E1-OB_E2	Lions Clubs International Ho Tak Sum Primary School	Existing Educational	E1-OB_E21	65	54-65	-
E2-OA	Village House at Lau Fau Shan	Existing Village	E2-OA_R01	70	66-67	-
E2-OB	San Hing Tsuen	Existing Village	E2-OB_R01 to E2-OB_R03	70	71-72	Lau Fau Shan Road
E2-OC	Sha Kong Wai	Existing Village	E2-OC_R01 to E2-OC_R04	70	64-70	-
E2-OD	Tin Yan Estate	Existing Residential	E2-OD_R01	70	66-67	-
E4-OA	Tsing Cheun Wai	Existing Village	E4-OA_R01 to E4-OA_R04	70	68-70	-
E4-OB	Nai Wai	Existing Village	E4-OB_R01	70	76-77	Castle Peak Road
E4-OC	Sun Fung Wai	Existing Village	E4-OC_R01 to E4-OC_R03	70	72-78	Castle Peak Road
E4-OD	Chung Uk Tsuen	Existing Village	E4-OD_R01 to E4-OD_R04	70	74-78	Castle Peak Road

NSR ID	Description	Existing / Planned Use	NAP ID	Criteria, dB(A)	Predicted Mitigated Overall Noise Level, dB(A)	Major Noise Source causing Exceedance
E5-OA	Tong Fong Tsuen	Existing Village	E5-OA-R01 & E5-OA-R02	70	66-79	Ping Ha Road (East of Hung Tin Road)
E5-OB	Hang Mei Tsuen	Existing Village	E5-OB-R01	70	75	Ping Ha Road (East of Hung Tin Road)
E5-OC	Tai Tao Tsuen	Existing Village	E5-OC-R01	70	71	Castle Peak Road, Hung Tin Road
E5-OD	Uptown	Existing Residential	E5-OD_R01	70	72-76	Castle Peak Road, Hung Tin Road
E5-OE	Shung Tak Catholic English College	Existing Educational	E5-OE_E01	65	73-74	Castle Peak Road, Hung Tin Road
E5-OF	Treasure Court	Existing Residential	E5-OF_R01	70	73	Castle Peak Road
E5-OG	Lai Hung Garden	Existing Residential	E5-OG_R01	70	74	Castle Peak Road
E5-OH	Bauhinia Garden	Existing Residential	E5-OH_R01	70	74-75	Castle Peak Road

Table 4.31 Summary of Mitigated Road Traffic Noise Assessment Results (Existing NSRs within the Project area)

NSR ID	Description	Use	NAP ID	Criteria	Predicted Overall Noise Level, dB(A)	Major Noise Source causing Exceedance
E1-IA	Tseung Kong Wai	Existing Village	E1-IA_R01	70	69-70	-
E1-IB	Hong Mei Tsuen	Existing Village	E1-IB_R01	70	54-55	-
E1-IC	Tung Tau Tsuen	Existing Village	E1-IC_R01 to E1-IC_R03	70	61-67	-
E1-ID	Lo Uk Tsuen	Existing Village	E1-ID_R01	70	56	-
E1-IE	Sik Kong Wai	Existing Village	E1-IE_R01	70	66-68	-
E1-IF	Ha Tsuen Shi	Existing Village	E1-IF_R01 to E1-IF_R02	70	62-67	-
E1-IG	San Uk Tsuen	Existing Village	E1-IG_R01 to E1-IG_R03	70	61-66	-
E1-IH	Sha Chau Lei	Existing Village	E1-IH_R01 to E1-IH_R02	70	66-70	-
E1-IJ	San Sang Tsuen	Existing Village	E1-IJ_R01 to E1-IJ_R05	70	68-73	Tin Ha Road
E1-IK	Shek Po Tsuen	Existing Village	E1-IK_R01 to E1-IK_R03	70	64-72	Hung Tin Road, Hung Chi Road
E2-IA	Fung Kong Tsuen	Existing Village	E2-IA_R01 to E2-IA_R02	70	67-68	-
E4-IA	Tin Sum Tsuen	Existing Village	E4-IA_R01 to E4-IA_R03	70	72-73	Tin Ha Road

NSR ID	Description	Use	NAP ID	Criteria	Predicted Overall Noise Level, dB(A)	Major Noise Source causing Exceedance
E4-IB	Tsing Chuen Wai	Existing Village	E4-IB_R01	70	67-70	-
E5-IA	Kiu Tau Wai	Existing Village	E5-IA_R01	70	61-66	-
E5-IB_R	Hung Uk Tsuen	Existing Village	E5-IB_R01 to E5-IB_R02	70	61-69	-
E5-IB_C	Chinese Mission Seminary	Existing Church	E5-IB_C01	65	73-74	Castle Peak Road
E5-IC	San Lee Uk Tsuen	Existing Village	E5-IC_R01	70	73	Tin Ha Road
E1-26	Existing Homes for the Elderly (Yeung Chun Pui and Ching Chung)	Homes for the Elderly	E1-26_H01 to E1-26_H02	70	58-60	-
E4-30	Ling Liang Worldwide Evangelistic Mission Hung Shui Kiu Ling Liang Church	Place of Worship	E4-30_C01	65	72	Castle Peak Road
E5-23	Sheffield Villas	Residential	E5-23_R01 to E5-23_R12	70	64-66	-
E5-25	Hung Fuk Estate	Residential	E5-25_R01 to E5-25_R41	70	61-74	Hung Tin Road, Hung Chi Road
E5-31	Existing Residential Development	Residential	E5-31_R01 to E5-31_R22	70	64-73	Castle Peak Road
E5-35	Bellevue Court	Residential	E5-35_R01	70	67-71	Castle Peak Road
E5-39	Existing Residential Development	Residential	E5-39_R01 to E5-39_R05	70	59-75	Castle Peak Road
E5-44	The Church of Jesus Christ of Latter-Day Saints (Hung Shui Kiu)	Residential	E5-44_C01 to E5-44_C02	65	72-73	Castle Peak Road, Tin Ha Road
O5-06	Committed Subsidised Sales Flat	Residential	O5-06_R01 to O5-06_R24	70	58-72	Ping Ha Road (East of Hung Tin Road)
O5-33	Committed Residential Development	Residential	O5-33_R01 to O5-33_R31	70	68-77	Hung Shui Kiu Tin Sum Road

Table 4.32 Summary of Mitigated Road Traffic Noise Assessment Results (Planned NSRs within the Project area)

NSR ID	Use	Description	NAP ID	Criteria	Mitigated Overall Noise Level, dB(A)	Require Additional Mitigation Measures
P1-02	Residential	Site 1-02	P1-02_R01 to P1-02_R31	70	54-72	Yes
P1-03	Educational	Site 1-03	P1-03_E01 to P1-03_E11	65	51-62	No
P1-04	Residential	Site 1-04	P1-04_R01	70	44-58	No
P1-05	Residential	Site 1-05	P1-05_R01 to P1-05_R11	70	56-66	No
P1-06	Residential	Site 1-06	P1-06_R01 to P1-06_R11	70	64-70	No
P1-08	Residential	Site 1-08	P1-08_R01 to P1-08_R22	70	63-70	No

NSR ID	Use	Description	NAP ID	Criteria	Mitigated Overall Noise Level, dB(A)	Require Additional Mitigation Measures
P1-09	Residential	Site 1-09	P1-09_R01 to P1-09_R12	70	58-69	No
P1-12	Residential	Site 1-12	P1-12_R01	70	66-70	No
P1-15	Educational	Site 1-15	P1-15_E01 to P1-15_E05	65	60-66	Yes
P1-17	Residential	Site 1-17	P1-17_R01	70	54-60	No
P1-18	Educational	Site 1-18	P1-18_E01 to P1-18_E03	65	53-65	No
P1-19	Residential	Site 1-19	P1-19_R01 to P1-19_R21	70	60-70	No
P1-21	Residential	Site 1-21	P1-21_R01 to P1-21_R21	70	52-67	No
P1-22	Educational	Site 1-22	P1-22_E01 to P1-22_E11	65	49-69	Yes
P2-02	Residential	Site 2-02	P2-02_R01 to P2-02_R32	70	61-67	No
P2-03	Residential	Site 2-03	P2-03_R01 to P2-03_R21	70	52-65	No
P2-07	Residential	Site 2-07	P2-07_R01 to P2-07_R21	70	62-66	No
P2-09	Educational	Site 2-09	P2-09_E01 to P2-09_E02	65	58-65	No
P2-10	Residential	Site 2-10	P2-10_R01 to P2-10_R31	70	61-69	No
P2-11	Residential	Site 2-11	P2-11_R01 to P2-11_R31	70	65-70	No
P2-14	Residential	Site 2-14	P2-14_R01 to P2-14_R12	70	62-67	No
P2-15	Educational	Site 2-15	P2-15_R01	70	62-64	No
P2-16	Educational	Site 2-16	P2-16_E01 to P2-16_R15	65	60-63	No
P2-18	Residential	Site 2-18	P2-18_R01 to P2-18_R05	70	68-70	No
P2-19	Residential	Site 2-19	P2-19_R01	70	65-67	No
P2-24	Educational	Site 2-24	P2-24_E01 to P2-24_E11	65	54-65	No
P2-25	Residential Home for the Elderly	Site 2-25	P2-25_H01	70	67-69	No
P2-26	Educational	Site 2-26	P2-26_E01 to P2-26_E11	65	59-66	Yes
P2-28	Educational	Site 2-28	P2-28_E01 to P2-28_E02	65	55-63	No
P2-30	Residential	Site 2-30	P2-30_R01 to P2-30_R21	70	47-70	No
P2-31	Residential	Site 2-31	P2-31_R01 to P2-31_R21	70	60-67	No
P4-01	Staff Quarters	Site 4-01	P4-01_R01 to P4-01_R13	70	62-72	Yes
P4-03	Residential	Site 4-03	P4-03_R01 to P4-03_R11	70	58-70	No
P4-04	Residential	Site 4-04	P4-04_R01 to P4-04_R24	70	54-70	No

NSR ID	Use	Description	NAP ID	Criteria	Mitigated Overall Noise Level, dB(A)	Require Additional Mitigation Measures
P4-05	Residential	Site 4-05	P4-05_R01 to P4-05_R14	70	56-72	Yes
P4-06	Residential	Site 4-06	P4-06_R01 to P4-06_R12	70	61-70	No
P4-08	Educational	Site 4-08	P4-08_E01 to P4-08_E11	65	61-64	No
P4-10	Residential	Site 4-10	P4-10_R01	70	61-68	No
P4-20	Residential	Site 4-20	P4-20_R01 to P4-20_R04	70	62-70	No
P4-22	Residential	Site 4-22	P4-22_R01 to P4-22_R42	70	52-70	No
P4-24	Residential	Site 4-24	P4-24_R01 to P4-24_R46	70	63-75	Yes
P4-25a	Other Use (Commercial and Residential)	Site 4-25a	P4-25a_R01	70	63-67	No
P4-25b	Other Use (Commercial and Residential)	Site 4-25b	P4-25b_R01 to P4-25b_R11	70	60-69	No
P4-25c	Other Use (Commercial and Residential)	Site 4-25c	P4-25c_R01 to P4-25c_R11	70	52-60	No
P4-26	Residential	Site 4-26	P4-26_R01 to P4-26_R21	70	61-71	Yes
P4-28	Residential	Site 4-28	P4-28_R01 to P4-28_R44	70	54-71	Yes
P4-29	Other Use (Commercial and Residential)	Site 4-29	P4-29_R01 to P4-29_R31	70	50-69	No
P4-32	Staff Quarters	Site 4-32	P4-32_R01 to P4-32_R14	70	61-70	No
P4-33	Educational	Site 4-33	P4-33_E01 to P4-33_E03	65	59-73	Yes
P4-36	Educational	Site 4-36	P4-36_E02 to P4-36_R01	65	58-65	No
P5-07a	Other Use (Commercial and Residential)	Site 5-07a	P5-07a_R01 - P5-07a_R21	70	53-68	No
P5-07b	Other Use (Commercial and Residential)	Site 5-07b	P5-07b_R01 to P5-07b_R21	70	57-73	Yes
P5-08	Other Use (Commercial and Residential)	Site 5-08	P5-08_R01 to P5-08_R11	70	66-70	No
P5-09	Other Use (Commercial and Residential)	Site 5-09	P5-09_R01 to P5-09_R31	70	57-69	No
P5-14	Educational	Site 5-14	P5-14_E01 to P5-14_E11	65	66-72	Yes
P5-16	Residential	Site 5-16	P5-16_R01 to P5-16_R11	70	55-74	Yes
P5-17	Residential	Site 5-17	P5-17_E04 to P5-17_R12	65	53-73	Yes

NSR ID	Use	Description	NAP ID	Criteria	Mitigated Overall Noise Level, dB(A)	Require Additional Mitigation Measures
P5-21	Educational	Site 5-21	P5-21_E01 to P5-21_E02	65	61-66	Yes
O5-22	Committed Residential Development (Site 5-22)	Residential	O5-22_R01 to O5-22_R03	70	65-77	Yes
P5-24	Residential	Site 5-24	P5-24_R01 to P5-24_R23	70	43-68	No
P5-26	Residential	Site 5-26	P5-26_R01 to P5-26_R04	70	56-70	No
P5-28	Residential Home for the Elderly	Site 5-28	P5-28_H01	70	64-72	Yes
P5-32	Other Use (Commercial and Residential)	Site 5-32	P5-32_R01 to P5-32_R82	70	63-77	Yes
P5-34	Educational	Site 5-34	P5-34_E01 to P5-34_E11	65	48-71	Yes
P5-37	Educational	Site 5-37	P5-37_E01 to P5-37_E02	65	70-74	Yes

4.7.18 As shown in **Table 4.30** and **Table 4.31,** the exceedance at the representative existing NSRs would be due to Ping Ha Road (East of Hung Tin Road), Lau Fau Shan Road, Castle Peak Road, Tin Ha Road, Hung Tin Road, Hung Chi Road and Hung Shui Kiu Tin Sam Road. A review is conducted to determine whether the traffic noise impact on these existing roads due to the Project would be considered significant. Findings as presented in **Appendix 4.7.6** indicate that significant traffic noise impact from the Project would only be predicted on Hung Chi Road and Hung Shui Kiu Tin Sam Road. Implementation of mitigation measures on these existing roads under this Project are proposed to alleviate the traffic noise impact as described in **Sections 4.7.19** to **4.7.21**.

Hung Chi Road

4.7.19 The facades of Hung Fuk Estate (E1-IK_R02 and EI-IK_R03) and Shek Po Tsuen (E5-25_R01) facing Hung Chi Road would be exposed to the traffic noise level exceeding the noise criterion of 70 dB(A) though existing 2 m high noise barrier at the Shek Po Tsuen side and 5 m high noise barrier in the vicinity of Hung Fuk Estate have been in place. To alleviate the adverse traffic noise impact on these facades, LNRS on the concerned road sections is proposed and the results indicate that the above affected facades would comply with the noise criterion of 70 dB(A). Different materials for LNRS are being reviewed and tested by the Government for application in Hong Kong. Environmental reviews will be conducted at the later design stage to review the proposed noise mitigation measures taking into account the latest design standard at that time for the application of the LNRS materials.

Hung Shui Kiu Tin Sam Road (East Section)

4.7.20 The planned NSRs at Sites 5-28, 5-32 and 5-33 facing Hung Shui Kiu Tin Sam Road (East Section) would be exposed to traffic noise levels exceeding 70 dB(A) though existing 3 m high noise barrier in the vicinity of Site 5-28 has been in place. Provision of noise barrier along the concerned road section are studied. It is noted that a number of existing run-ins will be required for Site 5-32, which will break off the alignment of the noise barrier. In addition, the existing space of planting strips allowing installation of noise barriers are limited. Provision of noise barrier for Sites 5-32 and 5-33 is not feasible. LNRS on the concerned road sections is proposed to alleviate the traffic noise

impact and the results indicate that the affected facades at Site 5-28 would comply with the noise criterion of 70 dB(A). Different materials for LNRS are being reviewed and tested by the Government for application in Hong Kong. Environmental reviews will be conducted at the later design stage to review the proposed noise mitigation measures taking into account the latest design standard at that time for the application of the LNRS materials.

Hung Shui Kiu Tin Sam Road (South of San Lee Uk Tsuen)

4.7.21 The planned residential NSRs at Site 5-33 and educational institute at Site 5-37 facing Hung Shui Kiu Tin Sam Road (South of San Lee Uk Tsuen) would be exposed to traffic noise levels exceeding 70dB(A) and 65 dB(A) respectively. Mitigation measure on this road section is studied. Due to the existing bus stops, the existing space of planting strips allowing installation of noise barriers are limited. Provision of noise barrier is not feasible. LNRS on the concerned road sections is proposed to alleviate the traffic noise impact. Different materials for LNRS are being reviewed and tested by the Government for application in Hong Kong. Environmental reviews will be conducted at the later design stage to review the proposed noise mitigation measures taking into account the latest design standard at that time for the application of the LNRS materials.

Castle Peak Road

4.7.22 With the enhancement of the existing noise environment with LNRS described in **Section 4.7.8,** the Project would reduce the noise emissions at Castle Peak Road.

4.7.23 It is noted that a retrofitting programme for Castle Peak Road (Hung Shui Kiu) has also been studied by EPD and an approximately 106 m long 5 m high vertical barrier along westbound of Castle Peak Road (Hung Shui Kiu Section) near Parkview Garden (with absorptive panels) would be implemented. However, for other sections of Castle Peak road (Hung Shui Kiu), there are following site constraints that provision of noise barriers/enclosures are not feasible or ineffectiveness.

4.7.24 Space Availability: The central reserve at Castle Peak Road (Hung Shui Kiu) is less than 2 m in width. Therefore, space is not adequate for horizontal clearance at both sides of the carriageways. In addition, there is not enough space to widen the width of the central reserve as there are bus stop and existing subway on the westbound of the carriageway of Castle Peak Road (Hung Shui Kiu Section) and Light Railway Transit (LRT) on the opposite side of the carriageway. This has imposed constraints for erection of noise enclosure and barrier.

4.7.25 Existing Structure: For the section fronting Treasure Court, there is an existing subway across Castle Peak Road and a ramp structure on both sides of the carriageway. The amenity area between the carriageway and the existing ramp structure is less than 2 m width. If the noise barriers are proposed, its foundations and columns would conflict with the existing subway structure.

4.7.26 Road Safety: A few existing bus bay located along Castle Peak Road. It could be another constraint since sightline of passengers and the bus drivers at bus bay would be much degraded after erection of a barrier structure so that the barrier should be set back from the carriageway. However, it would reduce the effectiveness of noise barrier.

4.7.27 Pedestrian/Vehicle Access: There are also many pedestrian access/vehicle access along Castle Peak Road. This imposed a constraint on the extent of the noise barrier and the short length of barriers (e.g. less than 30 m) is considered not acoustically effective in noise reduction due to the diffracted noise at the two ends of the noise barrier.

4.7.28 For the remaining roads including Ping Ha Road, Lau Fau Shan Road, Tin Ha Road and Hung Tin Road, as reviewed, the Project would not change the nature and the alignment of these roads, and would not induce significant change in the traffic capacity, traffic composition and traffic pattern of these roads. Therefore, the noise impact on these existing roads due to the Project is considered insignificant and should therefore be addressed under the policy endorsed by the Executive Council in November 2000 to address the noise impacts from existing roads if necessary and feasible. The engineering solutions under the policy include retrofitting of barriers and enclosures; and providing LNRS. The feasibility of the installation of noise barriers/enclosures on the concerned existing roads is studied and the outcome is summarised in the following paragraphs.

Ping Ha Road

4.7.29 With the existing 5 m high vertical barrier at Ping Ha Road in the vicinity of YLPMSAA Tang Siu Tong Secondary School and Q.E.S. Old Students' Association Branch Primary School, the predicted noise levels at these two schools would still exceed the noise criterion of 65 dB(A). Upgrading the existing noise barrier to cantilever noise barriers is not feasible as the existing foundation cannot allow extra loading.

Lau Fau Shan Road

4.7.30 Construction of noise barriers along Lau Fau Shan Road is considered not feasible as there is no sufficient space on footpath outside private land and there are a number of entrance accesses.

Tin Ha Road

4.7.31 Vertical noise barriers have been proposed at private land under “Hung Shui Kiu Development, Stage 2 – Widening of Tin Ha Road and Tan Kwai Tsuen Road”. However, no barrier is proposed in the final layout due to address public objections on land resumption for noise barrier. Therefore, it is not feasible to install noise barrier. Resurfacing with LNRS materials may be considered to be implemented where practicable by the Government.

Hung Tin Road

4.7.32 The existing Hung Tin Road outside the Shek Po Tsuen is constructed with retaining structures between the local roads and Hung Tin Road, therefore, there will be no space for installing noise barrier next to Hung Tin Road. In addition, construction of noise barriers along local road of Shek Po Tsuen is also considered not feasible as there is no sufficient space on footpath outside private land.

4.7.33 Except the above existing roads, exceedance at some planned NSRs would be due to KSWH (the section in the vicinity of Site 4-1 and Site 4-5) and some planned local roads. However, this section of the existing KSWH may not have sufficient structural capacity for installing more extensive noise barriers. Construction of a large extent of noise barrier along local roads is not feasible due to insufficient space. Therefore, additional mitigation measures including blank façade/acoustic windows would be considered for these planned residential NSRs. Provision of air conditioning and noise insulated windows for planned educational institutes under Class Assessment Document is proposed to alleviate the adverse traffic noise impact. With these mitigation measures in place, the noise levels at these affected planned NSRs would be within the respective noise criteria. Details of the additional mitigation measures proposed at the affected NSRs are summarised in **Table 4.33** below and its locations are shown in **Figures 4.7.17 – Figure 4.7.27**.

Table 4.33 Proposed Additional Mitigation Measures at Planned Sites

Site Ref. No.	Use	Proposed Additional Mitigation Measures	Applied to	Figure Reference
1-2	Residential	Acoustic Windows	1 - 17/F	Figure 4.7.19
1-15	Educational	Blank Façade	1 edge of 1 building	Figure 4.7.21
1-22	Educational	Noise Insulated Windows and Air Conditioning	1 school	Figure 4.7.21
2-26	Educational	Blank Façade	1 edge of 1 building	Figure 4.7.20
4-1	Staff Quarters	Acoustic Windows	1 - 25/F	Figure 4.7.25
		Blank Façade	1 edge of 2 buildings	
4-5	Residential	Acoustic Windows	20 - 42/F	Figure 4.7.25
4-24	Residential	Acoustic Windows	1 - 20/F	Figure 4.7.26
4-26	Residential	Acoustic Windows	3 - 11/F	Figure 4.7.26
4-28	Residential	Acoustic Windows	1 - 2/F	Figure 4.7.26
4-33	Educational	Noise Insulated Windows and Air Conditioning	1 school	Figure 4.7.27
5-7b	Residential/ Commercial	Acoustic Windows	1 – 9/F	Figure 4.7.22
5-14	Educational	Noise Insulated Windows and Air Conditioning	2 schools	Figure 4.7.23
5-16	Residential	Acoustic Windows	3 – 22/F	Figure 4.7.21
5-17	Residential	Acoustic Windows	4 – 29/F	Figure 4.7.22
5-21	Educational	Noise Insulated Windows and Air Conditioning	1 school	Figure 4.7.23
5-22	Residential	Acoustic Balcony	1 - 21/F	Figure 4.7.24
5-28	Residential Home for the Elderly	Noise Insulated Windows and Air Conditioning[(a)]	1 Residential Home for the Elderly	Figure 4.7.24
5-32	Residential/ Commercial	Acoustic Windows	1 - 28/F	Figure 4.7.24
		Acoustic Balcony	1 – 9/F	
5-34	Educational	Blank Façade	1 edge of 1 building	Figure 4.7.24
		Noise Insulated Windows and Air Conditioning	1 school	
5-37	Educational	Noise Insulated Windows and Air Conditioning	1 school	Figure 4.7.24

Note:
(a) For Site 5-28, the need of additional mitigation measures would subject to whether the LNRS can apply on Hung Shui Kiu Tin Sam Road (East Section).

4.7.34 **Appendix 4.7.4** summarises the predicted traffic noise levels at various NSRs under mitigated scenario. It has been demonstrated that the noise impact can be mitigated to an acceptable level by employing a package of mitigation measures including: (i) noise barriers at some road sections of Project roads; (ii) application of LNRS on some Project road sections; (iii) alternative building layout and special building layout design such as blank façade design and provision of acoustic windows/acoustic balcony for planned residential NSRs; and (iv) boundary wall and provision of noise insulated windows and air conditioning for some educational institutes under Class Assessment Document. However, there is scope for adoption of alternative noise mitigation measures, for example, by means of alternative layout and design of individual developments at detailed design stage. Noise impact assessment at the planned residential sites is proposed to be conducted by future developers at the detailed design stage to study whether the future development layout would avoid exposing excessive traffic noise

levels so as to minimise the scale/extent of the proposed noise mitigation measures such as noise barriers and special building layout design. The requirement of noise impact assessment would be included in the lease condition or planning briefs of the residential sites.

4.7.35 With the implementation of mitigation measures, the total number of dwellings, classrooms and other noise sensitive element that will be benefited and protected has been calculated. It is estimated that a total of about 786 existing dwellings, 4352 planned dwellings, 120 existing classrooms, 455 planned classrooms and 1 existing and 3 planned buildings of home for the elderly would be benefited. A total of about 189 existing dwellings, 4352 planned dwellings, 30 existing classrooms, 455 planned classrooms and 1 existing and 3 planned buildings of home for the elderly would be protected.

Indirect Mitigation Measures for Existing NSRs

4.7.36 Review of the further mitigation measures have been conducted in consideration of the constraints and project nature. It is considered that all practicable direct mitigation measures, including: i) noise barriers at some road sections of Project roads; ii) application of LNRS on some Project Road sections; and iii) alternative building layout and special building design including blank façade design and provision of acoustic windows/acoustic balcony for planned residential NSRs and provision of noise insulated windows and air conditioning for planned educational institutes have been exhausted and no adverse residual impact is anticipated.

4.7.37 **Appendix 4.7.5** presents the eligibility test against the above three testing criteria stated in **Section 4.7.7** for indirect technical noise mitigation measures. All representative NSRs do not fall within the above three testing criteria, indirect mitigation measure is therefore not required under this Project.

Evaluation of Residual Environmental Impacts

4.7.38 The traffic noise impact from the Project can be properly mitigated by implementing the proposed noise control measures such as noise barriers on Project roads, LNRS and special building design on the planned developments. Residual road traffic noise impact is not anticipated.

Appendix 4.1 Railway Noise Result in HSK NDA P&E Study

ISO A1 594mm x 841mm

Approved:

Checked:

Designer:

Project Management Initials:

NOTE:

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NO. 60222570/TR19A/FIGURE 2.2.

CUT LINE A-A

SEE DRAWING NO. 60222570/TR19A/FIGURE 2.2.1

N

816000 E

817000 E

833000 N

832000 N

Reference Site

Yuen Tau Shan

San Uk Tsuen

Sha Chau Lei

Kau Lee Uk Tsuen

San Sang Tsuen

Shek Po Tsuen

San Lee Uk Tsuen

Tin Sum Tsuen

Hung Uk Tsuen

Kiu Tau Wai

Chung Uk Tsuen

Sun Fung Wai

Nai Wai

Tsing Chuen Wai

KONG SHAM WESTERN HIGHWAY

CASTLE PEAK ROAD

YUEN LONG HIGHWAY

COMMUNITY FARMING AND FARMERS' MARKETS

RETENTION FACILITIES

HUNG FUK ESTATE

HOSPITAL, SPECIALIST CLINIC/ POLYCLINIC

(COMMERCIAL & RESIDENTIAL DEVELOPMENT WITH LIGHT RAIL FACILITIES)

COMMERCIAL & RESIDENTIAL

COMMERCIAL & RESIDENTIAL (PODIUM)

OU (REGIONAL PLAZA WITH LEISURE, FOOD AND BEVERAGES USES)

OU (RAILWAY STATION)

OU (RCP)

OU (SPS)

OU (ESS)

OU (E+TP)

OU (LF)

PTI

G (VEHICLE DEPOT)

FWSR & FLWSR

Ser Res

DEEP BAY

TIN SHUI WAI

LAU FAU SHAN

TAI TONG

AECOM

PROJECT
項目

HUNG SHUI KIU NEW DEVELOPMENT AREA PLANNING AND ENGINEERING STUDY - INVESTIGATION

CLIENT
業主

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

規劃署
Planning Department

CONSULTANT
工程顧問公司

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ISSUE/REVISION
修訂

I/R 修訂	DATE 日期	DESCRIPTION 內容摘要	CHK. 核實

STATUS
狀況

SCALE
比例

A3 1 : 10000

DIMENSION UNIT
尺寸單位

METRES

KEY PLAN
索引圖

A3 1 : 500000

PROJECT NO.
項目編號

60222570

AGREEMENT NO.
協議編號

CE2/2011 (CE)

SHEET TITLE
圖紙名稱

REVISED RECOMMENDED OUTLINE DEVELOPMENT PLAN (RODP) (SOUTHERN AREA)

SHEET 2 OF 2

SHEET NUMBER
圖紙編號

60222570/TR19A/FIGURE 2.2.2

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PATH: P:\PROJECTS\60222570\Drawing\REPORT\TR19A\TR19A_714.dgn

4.8 Rail Noise Assessment

Assessment Approach and Methodology

Train Noise Source Term for Rail Noise Assessment

4.8.1 The key noise impact from the railway would be the train induced airborne noise at viaduct and at grade section of WRL and LRT respectively across the Project area. Three noise sources have been identified from train operation are listed below:

- Rolling noise from train wheel and rail interaction;
- Noise from air conditioning unit on top of the each train cars; and
- Structure re-radiated noise from the viaduct structure during train passing.

4.8.2 The WRL viaduct structure including the multi plenum system and the above noise source propagation path are further illustrated with diagram in **Appendix 4.8.1**.

WRL Source Terms Reference Review

4.8.3 The rail noise source terms of WRL were referred from the "West Rail Operation Noise Assessment Report" prepared by MTR Corporation Limited in July 2015. The report aims to assess the noise impact of WRL due to the change from 7 cars to 8 cars in accordance with the Environmental Permit (FEP-24/004/1998/J). Noise measurement has been conducted to obtain the in-situ noise source terms for trains running on typical viaduct sections with the installation of multi plenum system. The air conditioning units on top of the WRL train and the structure re-radiated noise from the viaduct were also measured during the study. All three train noise source terms are considered as the latest information and adopted in the WRL noise assessment for this Project.

LRT Source Terms Reference Review

4.8.4 The source term of LRT was adopted from the previous EIA Report No. EIA-027/1999 entitled "Light Rail Transit (LRT) works for Tin Shui Wai Reserve Zone and Grade Separation of the LRT with Pui To Road and Tsing Lun Road in Tuen Mun" under a EIA Study Brief No: ESB-027/1999. The Sound Exposure Level (SEL) of the LRT was evaluated from the Lmax referenced from the previous EIA report. Air conditioning noise and re-radiated noise are considered insignificant contribution compared with the rolling noise of a LRT in this Project.

Rail Noise Assessment Procedures

4.8.5 The rail noise assessment was carried out to assess the worst case scenario under normal, abnormal, transient and emergency operation. The rail noise from the noise source to the NSRs will be corrected by distance, angle of view, barrier, speed, frequency, façade etc. The railway track was divided into segments and the respective noise level of each segment was calculated. The assessment procedure is listed in **Table 4.34** summarised the steps and assumption of the rail noise calculation. Major assessment parameters are including train frequency and speed are provided by MTRC and summarised in **Table 4.35**.

Table 4.34 Rail Noise Assessment Procedures

Description	Assumptions / Remarks	Ref.
Locate the NAPs which would most likely be affected by air-borne noise from the rail operation	The first layer of existing/planned NSRs located in the vicinity of WRL and LRT, have been selected as representative NAPs for rail noise prediction and evaluation	Section 4.4
Identify the train noise sources origination	The rolling noise source is located from the gap between the train and the walkway on the viaduct. Part of the train wheel rail interaction noise had been absorbed by a multi-plenum system and the effect of the system has been included in the source measurement in previous study A/C noise located on the roof of each car and source level was measured in previous study Structural re-radiated noise generated from the vibration of the viaduct during event was measured in previous study	**Appendix 4.8.1**
Identify the train frequency and make appropriate frequency correction	+10 log10 (N) where N = Train frequency per 30 min per Direction	A
Identify the train speed for correction	+20 log10 (V/Vref) where V = Train speed, Vref = Reference train speed	A
Identify the distance from the NSR to the train and make distance correction	-10 log10 (d'/dref) where d' = Slant distance from track to NSR and dref = Reference distance	A

Description	Assumptions / Remarks	Ref.
Identify the train type and the source term of the train	Relevant noise level referred to previous study	B & C
Identify the angle of view and make appropriate angle of view correction	+10 log10 ($\pi\theta/180 - \cos 2\alpha \sin\theta$) -5 where θ= Angle of View and α= Acute angle between a line drawn through the NSR, parallel to the track, and the line bisecting the angle of view, θ	A
Incorporate Façade Correction	+2.5 dB(A)	A
Incorporate Track Wear Correction	+3 dB(A)	A
Incorporate Joint/Turnout Correction	With conservative assumption, +7.0dB(A) for a representative 20 m segment	A
Incorporate Barrier Correction	Shadow Zone: -21dB(A) for δ > 2.5 m where δ is the Path Difference in metre -7.75 log10 (5.2 + 203 δ) dB(A) for 0≤ δ <2.5 m Illuminated Zone: 0dB(A) for δ > 0.4 m 0.88 + 2.14 log10 (10-3 + δ) dB(A) for 0≤ δ <0.4 m	Chart 6(a) of A
Calculate the overall noise level from all rail segments including rolling noise, A/C noise and structural re-radiated noise	Standard acoustic principal	-
Calculate the Lmax	SEL = Lmax + 10log(L/V) +10.5 – 10log[(4D/(4D2+1)) + 2tan-1(1/(2D))]	Equation 15.21 of D
Calculate the Leq, 24hr	Standard acoustic principal	-
Model validation	On site measurement was carried out to record the in-situ noise level and compared against the modelled results.	**Appendix 4.8.2**

Reference:
A - Calculation of Railway Noise (1995).
B - "West Rail Operation Noise Assessment Report" prepared by MTR Corporation Limited in July 2015.
C - "Light Rail Transit (LRT) works for Tin Shui Wai Reserve Zone and Grade Separation of the LRT with Pui To Road and Tsing Lun Road in Tuen Mun" under a EIA Study Brief No: ESB-027/1999.
D - Transportation Noise Reference Book.

Table 4.35 Rail Noise Assessment Input Summary

Parameters	WRL	LRT
Train Type and No. of Car	SP1900, 9 cars total 225 m in accordance with the VEP-45/2001	LRV, 2 cars of total 40 m as conservative scenario
Rolling Noise	SEL Northbound = 81.4 dB(A) [a] SEL Southbound = 80.7 dB(A) [a] (8 cars running 130kph at 25 m)	Lmax = 65 dB(A) [b] (2 cars running 50kph at 25 m)
Air Conditioning Noise	Lmax at Viaduct = 48.8 dB(A) [a] Lmax at Station = 54.8 dB(A) [a] (8 cars at 25 m)	Not applicable as insignificant contribution
Structure Re-radiated Noise	$L_{eq\ 30mins}$ = 40.6 dB(A) Viaduct [a]	Not applicable as LRT in HSK is at grade
Train Frequency per 30 min per Direction	14 number during peak daytime; 10 number during peak night-time	Between Nai Wai LRT Station to HSK LRT Station: Southbound: 20 number during peak daytime; 13 number during peak night-time Northbound: 20 number during peak daytime; 24 number during peak night-time From Tin Shui Wai LRT Station to Hang Mei Tsuen LRT Station: Southbound: 14 number during peak daytime; 13 number during peak night-time Northbound: 14 number during peak daytime; 18 number during peak night-time
Train Frequency per 24hrs both directions	680 trains	Between Nai Wai LRT Station to HSK LRT Station: 917 trains From Tin Shui Wai LRT Station to Hang Mei Tsuen LRT Station: 717 trains
Train Speed	Refer to speed profile in Appendix 2.1 in [a] • Station speed, 50 kph • Approach and leaving Station, 80 kph • Other viaduct section, 100 kph	LRT speed was measured on site. • Section near planned NSR, 60 kph • Section approaching and leaving junctions and stations, 40 kph • Section near NAP LR-E1, 50 kph • Section near NAP LR-E2, 36 kph

Notes:
[a] "West Rail Operation Noise Assessment Report" prepared by MTR Corporation Limited in July 2015.
[b] "Light Rail Transit (LRT) works for Tin Shui Wai Reserve Zone and Grade Separation of the LRT with Pui To Road and Tsing Lun Road in Tuen Mun , 1999".

Proposed HSK Station

4.8.6 A new HSK railway station (HSK Station) is proposed within the Project area. No detail layout is available at this EIA stage. The new station should match the existing West Rail alignment such that station platforms would be constructed on both sides of the tracks (i.e. sided platform design) and enclosed by 4 m screen doors, side wall and top cover. The track section of the station is remain uncovered in the centre. The assumed layout of proposed HSK Station is shown in **Figure 4.8.1**.

4.8.7 As mentioned in **Section 2.4.44**, the proposed HSK Station is a separate DP under Item A.2 of Schedule 2 of EIAO-TM, a separate EIA study would be conducted by the rail operator to fulfil all the statutory requirements and procedures under the Ordinance.

Phasing of HSK Development

4.8.8 The site layouts for rail noise assessment have been confirmed with Planning Department. Commercial developments Site 5-18 of 125 mPD are strategically planned to protect planned residential Site 5-17 of 115 mPD. Therefore Site 5-18 should be developed prior to Site 5-17 in purpose. This phasing approach also applied to the HSK WRL Station which should be developed before or concurrent with the residential development Sites 4-25 and 4-29 nearby. A review would be conducted for the environmental noise performance of the sites if the above development phasing programme cannot meet the specific arrangement.

Prediction and Evaluation of Noise Impacts

WRL Noise

4.8.9 The predicted air-borne noise levels from WRL with respect to the representative site layouts confirmed with relevant departments are presented in **Table 4.36**. The predicted noise level with full mPD level of all NSRs are shown in **Appendix 4.8.3.** Exceedances were predicted at representative NSRs WR-P5d, P5e, P5f, P7b & P7c at night-time period. While exceedance of day time criteria was predicted at WR-P10. It is predicted that a total of about 155 planned dwellings will be exposed to WR noise impact under unmitigated scenario. Mitigation measures are therefore required to reduce the rail noise impact for above NSRs during WRL operation.

Table 4.36 WRL Noise Calculation Summary – Unmitigated

NAP	Description	Area Sensitivity Rating	Noise Criteria, dB(A)		mPD	Leq, 30min, dB(A)		L_{max}, dB(A)	Leq, 24 hrs, dB(A)
			0700-2300 hrs	2300-0700 hrs		0700-2300 hrs	2300-0700 hrs		
Existing WRL NSRs									
WR-E1	Premises to the southwest of Yick Yuen Tsuen	A	60	50	8.7	50	48	57	49
WR-E2	Premises to the east of Oakland Court	A	60	50	8.5	48	47	54	48
WR-E3	Premises to the southwest of Tin Sum Tsuen	A	60	50	7.7	43	41	48	43
WR-E4	Premises to the West of San Lee Uk Tsuen	A	60	50	6.5	47	46	51	47

NAP	Description	Area Sensitivity Rating	Noise Criteria, dB(A)		mPD	Leq, 30min, dB(A)		L_{max}, dB(A)	Leq, 24 hrs, dB(A)
			0700-2300 hrs	2300-0700 hrs		0700-2300 hrs	2300-0700 hrs		
WR-E5	Premises to the West of San Lee Uk Tsuen Block 3,Galore Garden	A	60	50	6.9-9.9	47-48	46-47	52-54	47-48
WR-E6	Shek Po Tsuen Village House Premises to the southwest of Yick Yuen Tsuen Premises to the east of Oakland Court	A	60	50	6.4-15.4	47-49	45-47	51-54	47-49
WR-E7	Premises to the southwest of Tin Sum Tsuen	A	60	50	5.2-8.2	45	44	46-47	45
Project Planned WRL NSRs									
WR-P1	Residential Development in Site 4-6	B	65	55	10.0-141.0	42-52	41-51	42-53	42-52
WR-P2	School in Site 4-8	B	65	[a]	11.0-47.0	42-47	[a]	41-48	42-48
WR-P3	Residential Development in Site 4-10	B	65	55	11.0-166.0	43-54	41-52	43-55	43-54
WR-P4	Residential Development in Site 4-20	B	65	55	11.0-19.0	50-54	48-53	56-62	49-54
WR-P5a	Residential Development in Site 4-22	B	65	55	11.0-127.0	42-53	41-52	48-62	40-53
WR-P5b	Residential Development in Site 4-22	B	65	55	11.0-127.0	41-53	40-51	49-64	40-53
WR-P5c	Residential Development in Site 4-2	B	65	55	11.0-127.0	39-49	39-48	45-60	36-49
WR-P5d	Residential Development in Site 4-22	B	65	55	11.0-127.0	45-58	44-**56**	51-67	44-58
WR-P5e	Residential Development in Site 4-22	B	65	55	11.0-127.0	46-58	45-**57**	51-65	45-58
WR-P5f	Residential Development in Site 4-22	B	65	55	11.0-127.0	47-59	46-**58**	52-66	47-59
WR-P6a	Residential Development in Site 4-25	B	65	55	12.0-178.0	39-52	38-51	40-57	37-52
WR-P6b	Residential Development in Site 4-25	B	65	55	12.0-178.0	39-52	37-51	39-57	37-52
WR-P6c	Residential Development in Site 4-25	B	65	55	12.0-178.0	38-51	37-49	37-55	37-51

NAP	Description	Area Sensitivity Rating	Noise Criteria, dB(A)		mPD	Leq, 30min, dB(A)		L_{max}, dB(A)	Leq, 24 hrs, dB(A)
			0700-2300 hrs	2300-0700 hrs		0700-2300 hrs	2300-0700 hrs		
WR-P7a	Residential Development in Site 4-29	B	65	55	13.0-171.0	44-56	43-55	49-63	44-56
WR-P7b	Residential Development in Site 4-29	B	65	55	13.0-171.0	47-59	45-**57**	50-64	47-59
WR-P7c	Residential Development in Site 4-29	B	65	55	13.0-171.0	45-57	44-**56**	50-64	45-57
WR-P8	School in Site 4-36	B	65	[a]	12.0-48.0	43-52	[a]	46-56	43-52
WR-P9a	Residential Development in Site 5-17	B	65	55	7.0-111.0	42-54	41-53	48-61	42-54
WR-P9b	Residential Development in Site 5-17	B	65	55	7.0-111.0	44-55	42-54	49-62	44-55
WR-P10	School in Site 5-21	B	65	[a]	6.0-43.0	49-**67**	[a]	56-74	48-**67**
WR-P11	School in Site 5-34	B	65	[a]	7.0-43.0	42-46	[a]	42-47	42-46

Notes:
[a] Educational use is not considered as a night-time NSR.
Numbers in bold denote exceedances of the noise criteria.

LRT Noise

4.8.10 The predicted air-borne noise levels from LRT with respect to the representative site layouts confirmed with relevant departments are presented in **Table 4.37**. The full list of predicted levels with respect to mPD is shown in **Appendix 4.8.4.** It is noticed that low level of the NSRs LR-P5a & P6 would exceed the night-time criteria. It is predicted that a total of about 30 planned dwellings will be exposed to LRT noise impact under unmitigated scenario. Mitigation measures are required to reduce the rail noise impact during LRT operation.

Table 4.37 LRT Noise Calculation Summary – Unmitigated

NAP	Site No.	Area Sensitivity Rating	Noise Criteria, dB(A)		mPD	Leq, 30min, dB(A)		Lmax, dB(A)	Leq, 24 hrs, dB(A)
			0700-2300 Hrs	2300-0700 hrs		0700-2300 hrs	2300-0700 hrs		
Existing LRT NSRs									
LR-E1	Parkview Garden Block 24 - 27	C	70	60	12.5-21.5	60-61	60	71-72	59
LR-E2	Tak Cheung Building	C	70	60	11.6-29.6	57-60	57-60	66-70	56-59
LR-E3	Beauty Court Block 1	C	70	60	10.4-46.4	54-57	54-57	61-66	53-56
LR-E4	Coronet Court	C	70	60	10.1-46.1	55-58	55-58	62-67	54-57
LR-E5	Park Nara Tower 1	C	70	60	10.6-46.6	55-58	54-58	62-68	53-57
LR-E6	Village House in Hung Uk Tsuen facing Kiu Hung Road	C	70	60	5.5-14.5	58	58	64	57
LR-E7	Ling Liang Church	C	70	[a]	13.5-16.5	58	[a]	66	56-57
Project Planned LRT NSRs									
LR-P1	Residential Development in Site 4-22	C	70	60	11.0-127.0	48-51	48-51	49-55	46-50
LR-P2	Residential Development in Site 4-26	C	70	60	12.0-152.0	49-54	48-54	48-58	47-52
LR-P3a	Residential Development in Site 4-28	C	70	60	13.0-144.0	51-57	51-57	55-66	50-55
LR-P3b	Residential Development in Site 4-28	C	70	60	13.0-144.0	50-58	50-57	55-68	49-56
LR-P4	School in Site 4-33	C	70	[a]	12.0-48.0	59-64	[a]	69-78	58-63
LR-P5a	Residential Development in Site 5-7b	B	65	55	5.0-142.0	50-55	50-**56**	49-61	50-55
LR-P5b	Residential Development in Site 5-7b	B	65	55	5.0-142.0	49-55	49-55	49-60	49-55
LR-P5c	Residential Development in Site 5-7b	B	65	55	5.0-142.0	48-54	49-55	50-62	49-54
LR-P6	Residential Development in Site 5-9	B	65	55	5.0-152.0	50-56	51-**56**	52-63	50-56

Notes:
[a] Educational use and church is not considered as a night-time NSR.
Numbers in bold denote exceedances of the noise criteria.

Rail Noise Mitigation Measures Options

4.8.11 Based on the assessment results, those rail noise level of exceeding the criteria are less than 3 dB(A), the acoustic fins, non-sensitive use or fixed glazing and layout set back at the NSR are considered effective to reduce the noise impact. Moreover, planning strategy including commercial buildings screening and residential buildings orientation are considered against rail noise during the development of the revised RODP. Predicted noise levels of mitigated NSRs are enclosed in **Appendix 4.8.5**. None of the dwellings will exceed the noise criteria due to rail noise under mitigated scenario.

Architectural Fins

4.8.12 Architectural fins are typical noise mitigation measure for buildings units impacted by traffic or rail noise. For NSR WR-P5d and LR-P5a, 2 m fins has been proposed for the dwellings to narrow the angle of view to the railway track. The noise level of the NSR screened by architectural fins were assessed and the mitigated noise level satisfy the noise criteria as shown in **Table 4.38** and **Figure 4.8.2 – 4.8.4**.

Non-Sensitive Use or Fixed Glazing

4.8.13 For those façade NAP with exceedance, the NAP would be relocated to another positions with smaller angle of view facing the railway and the façade NAP with exceeded the criteria are designed as non-sensitive use or fixed glazing. The noise level of relocated NAPs at WR-P5e, P5f and LR-P6a are satisfied the noise criteria and shown in **Table 4.38** and **Figure 4.8.2 & 4.8.4**.

Layout Setback

4.8.14 Some of the proposed development sites has a potential of shifting the layout as well as set-back away from the existing railway line. The setback provides a sufficient buffer distance and attenuation in terms of noise propagation. It was proposed to setback the layout of Site 4-29 and Site 5-21 from the WRL to a distance of 70 m and 25 m as shown in **Figure 4.8.5 and Figure 4.8.6 respectively**, the assessed noise level at NAP WR-7b, WR-P7c and WR-P10 would satisfy the noise criteria as shown in **Table 4.38**.

Table 4.38 Rail Noise Calculation Summary – Mitigated

NAP	Proposed Mitigation Measures	Noise Criteria, dB(A)		mPD	Leq, 30min, dB(A)		Lmax, dB(A)	Leq, 24 hrs, dB(A)
		Daytime /evening	Night-time		0700-2300 hrs	2300-0700 hrs		
WR-P5d	2 m Architectural fin	65	55	11.0-127.0	42-51	41-50	45-60	37-51
WR-P5e.1	1.5 m Architectural fin + Relocation to non-sensitive use or fixed glazing	65	55	11.0-127.0	43-55	42-54	49-63	43-55
WR-P5f.1	Relocation to non-sensitive use or fixed glazing	65	55	11.0-127.0	45-57	43-55	51-65	44-57
WR-P7b	Layout Set Back to 70 m from WRL	65	55	13.0-171.0	45-57	44-55	48-61	45-57
WR-P7c	Layout Set Back to 70 m from WRL	65	55	13.0-171.0	44-56	43-54	48-61	44-56
WR-P10	Layout Set Back to 25 m from WRL	65	[a]	6.0-43.0	48-63	[a]	54-70	47-63
LR-P5a	2 m Architectural fin	65	55	5.0-142.0	49-54	49-55	49-61	49-54
LR-P6.1	Relocation to non-sensitive use or fixed glazing	65	55	5.0-152.0	48-53	49-54	53-63	48-53

NAP	Proposed Mitigation Measures	Noise Criteria, dB(A)		mPD	Leq, 30min, dB(A)		Lmax, dB(A)	Leq, 24 hrs, dB(A)
		Daytime /evening	Night-time		0700-2300 hrs	2300-0700 hrs		
LR-P6.2	1.3 m Architectural fin + Relocation to non-sensitive use or fixed glazing	65	55	5.0-152.0	47-53	48-54	51-62	47-53
LR-P6.3	Relocation to non-sensitive use or fixed glazing	65	55	5.0-152.0	49-55	49-55	52-63	49-55

Notes:
[a] Educational use is not considered as a night-time NSR.

Rail Noise Impact Assessment for Development Sites

4.8.15 For the new developments in the OZP, the future development proponents should conduct a stand-alone Railway Noise Impact Assessment (RNIA) to assess the potential noise impacts from rail operations on future occupants, and implement the aforesaid or other specific designed noise mitigation measures at their respective development sites to the satisfaction of EPD, to ensure full compliance with the statutory noise limits. The above development requirements would be imposed through relevant Planning Briefs or Land Lease conditions to be fulfilled by the future development proponents. Sites require RNIA include: 4-6, 4-8, 4-10, 4-22, 4-25c, 4-26, 4-28, 4-29, 4-31, 4-32, 4-33, 4-36, 5-7b, 5-9, 5-17, 5-21, 5-32 and 5-34.

Environmentally Friendly Transport Services

4.8.16 An EFTS is proposed to be introduced to operate within the Project. The alignment of EFTS is shown in **Figure 4.8.7.**

4.8.17 Several modes of EFTS, including LRT, trolley bus, automatic people mover (APM), monorails, modern tramway and electric / LPG bus, will be investigated in later stage. No updated information was available at the time of preparing this report. For conservative noise assessment, the rail based EFTS was assumed for rail noise impact assessment. As shown in **Figure 4.8.7**, all of the NSRs are planned with at least 10 m buffer distance from the proposed alignment for EFTS. A reference scheme was developed with the assumptions and assessed level shown in **Table 4.39**.

Table 4.39 Rail based EFTS Reference Scheme

Items	Description
Type of source	Automated guideway transit, steel wheel, welded rail
Noise source level	SEL 80 dB(A) at 50 feet and 50 mph Ref: Table 5-1 Transit Noise and Vibration Impact Assessment FTA-VA-90-1003-06 May 2006 by Office of Planning and Environment Federal Transit Administration
NSR Distance from track	10 m
Operating speed	Assumed 40 kph
Frequency	Assumed 5 trains per headway
Calculated Noise level at NSR boundary	57.2 dB(A) > night-time noise criteria of 55 dB(A)
Track enhancement	• Embedded rail of 3 dB(A) reduction • Green track with vegetation 2 dB(A) reduction Reference material as shown in **Appendix 4.8.6**
Noise level at NSR after track enhancement	< 55 dB(A) complied with night-time noise criteria of HSKNDA

4.8.18 In case a rail cross or joint is designed for the EFTS, such cross joint location should be located at the section with largest distance between the track and the NSR. Alternatively, erect a noise barrier or enclosure at the cross joint section to control the noise impact to the nearby NSRs.

4.8.19 There is no design and operation detail of the EFTS during this Schedule 3 EIA. In any case there are changes to the assumption in **Table 4.39** and causing an exceed of the noise level compared with the criteria, the EFTS project proponent should implement further noise mitigation measures such as noise barrier and enclosure to control the noise impact by the EFTS to satisfy the noise criteria. Noise barrier and enclosure are effective and traditional mitigation measures to reduce rail noise by 10 dB(A) and 15 dB(A) respectively.

4.8.20 As discussed in **Chapter 2** of this report, the proposed EFTS is a Schedule 2 DP under the EIAO. The proposed EFTS will be designed, constructed and operated by the others. The associated environmental impacts will be adequately addressed in a further detailed EIA study to be prepared and submitted under the EIAO by the respective project proponent. Adverse noise impacts from EFTS are therefore not expected.

Cumulative Impact

4.8.21 The existing WRL is running at the centre of the Project area and the LRT is running along Castle Peak Road close to the southern Project area. The cumulative impact is not anticipated by both existing rail to the planned and existing NSRs. However, the proposed EFTS would run from the southern Project area near Nai Wai LRT station to the northern of the Project area and end at TSW Station. As shown in the EFTS alignment, there is potential cumulative rail noise impact to those NSRs by both EFTS, LRT and WRL for Site 4-22 at the southern Project area. If the cumulative noise level to Site 4-22 evaluated by the EFTS project proponent exceeds the noise criteria, the noise level of the EFTS should be further mitigated by means of measure mentioned in **Section 4.8.17** to a level of ANL-10 dB(A) at the Site 4-22 NSR.

Evaluation of Residual Environmental Impacts

4.8.22 WRL would be the major mass transit railway for the Project area. A new HSK Station would be built to serve the community to and from urban area. The operation of WRL will generate noise impact to some of the planned development. Noise control measure should be considered during the planning of the land use and the design of building. Different noise mitigation measures such as layout set back, relocation of noise sensitive uses or implementation of fixed glazing and architectural fins are considered effective mitigation measures. With the mitigation measures in place, the predicted noise level of all dwellings would satisfy the noise criteria in the TM.

4.8.23 LRT will continue running in Castle Peak Road along the southern Project area. Planned developments may expose to the LRT noise without any screening obstacles and result in noise impact. Mitigation measures such as architectural fin and relocation of habitable windows are suggested to abate the rail noise impact.

4.8.24 In conclusion, the future development proponents should conduct a stand-alone Noise Impact Assessment (NIA) to assess the potential noise impacts from rail operations on future occupants, and implement the aforesaid or other specific designed noise mitigation measures at their respective development sites to the satisfaction of EPD, to ensure full compliance with the statutory noise limits. The above development requirements would be imposed through relevant Planning Briefs or Land Lease conditions to be fulfilled by the future development proponents.