S16 Planning Application for Proposed Hospital Redevelopment with Minor Relaxation of Building Height Restriction in "Government, Institution or Community (7)" Zone and Areas Shown as 'Road' at Blocks A, B and C of Hong Kong Baptist Hospital, 222 Waterloo Road, Kowloon Tong, Kowloon

Responses to Comments

Comments from Related Departments — Page No.

Responses to Comments

COMMENTS FROM RELATED DEPARTMENTS

No.	Comments	Responses
1.	**Drainage Services Department, Operations & Maintenance Branch, Mainland South Division, Mainland South 5(Kowloon City, Tsim Sha Tsui and Hung Hom), Tsim Sha Tsui, dated 26 June 2024**	
	- Appendix B Table B1 – Please clarify how the ADWFs generated by the No. of visitors under Blocks A, B, C, D and E are calculated. For example, in Block A: No. of visitors 380 x UFF 0.08 = ADWF 5.07?	It is assumed that HKBH peak visiting hours are 12:00pm to 2:00pm and 5:30pm to 7:30pm (4 hours). The estimated sewage flow for visitors is pro-rata from daily flow (8 hours) respect with the visiting duration of 4 hours. This assumption is stated in the remark # of the revised Table B1 of the revised SIA Report (**Appendix A**) for reference.
2.	**Environmental Protection Department, Environmental Assessment Division, Territory South Group, Kowloon, dated 20 June 2024**	
	Air Quality	
	(1) Response to Comment (1): Please confirm the use of electric boiler and incorporate the information provided in RtC into the air quality section.	Noted. The use of a centralized electric hot water boiler system in the redevelopment has been supplemented in S.3.4.2.1 of the revised EAS Report (**Appendix B**).
	Sewerage	
	(1) It is noted that site verification on the manhole settings, including actual invert levels, will be conducted during detailed design stage. Please agree with DSD on the result of manhole survey and revise the hydraulic calculation based on the actual invert level of the concerned manholes when appropriate.	Noted and agreed.
	(2) Please be reminded that the implementation of local sewer connection and upgrading works shall meet the satisfaction of DSD.	Noted and agreed.

No.	Comments	Responses
	Section 3.4	
	(3) Based on the information provided in Plans 2 and 2A, it is noted that sewer segment between manholes FTMH-02 and FMH4026344 will be upgraded from 150mm dia. to 225mm dia.. Please include the description in the corresponding paragraph(s) of the SIA report for the sake of clarity.	Noted and description is included in Section 3.4 of the revised SIA Report (**Appendix A**).
	Section 3.4 and Appendix B (Table B2)	
	(4) It is noted that the sewer segment between manholes FMH4026348 and FMH4026349 will be upgraded from 225mm dia. to 250mm dia. pipe. In view of the size (i.e. 225mm dia.) and utilization rate (i.e. 94.8%) of the subsequent sewer segment between manholes FMH4026349 and FMH4026350, it is recommended to upgrade the sewer segments between FMH4026348 and FMH4026350 as mitigation measure with reference to the DSD's Sewerage Manual.	The sewer segments between FMH4026348 and FMH4026350 will be upgraded to 250mm dia. sewer. Plans 2 and 2A, Section 3.4 and Appendix B (Table B2) are updated in the revised SIA Report (**Appendix A**).
	Appendix B (Table B1)	
	(5) Regarding the ADWF estimation for in-patient, please advise the assumption of UFF adopted, with consideration of the nature of residence instead of the UFF of commercial employee under the business type J11 (Community, Social & Personal Services). Please review and revise the estimated sewage flow as appropriate.	Considering the residence nature of in-patient, we proposed to adopt resident UFF (Institutional and Special Class) of 0.190m3/day for in-patient. Table B1 of Appendix B is updated in the revised SIA Report (**Appendix A**).
	(6) Regarding the ADWF estimation for hospital visitors, it appears that adjustment factor is applied in the calculation of ADWF. Please state the assumption adopted in the calculation	It is assumed that HKBH peak visiting hours are 12:00pm to 2:00pm and 5:30pm to 7:30pm (4 hours). The estimated sewage flow for visitors is pro-rata from daily flow (8 hours) respect with the visiting duration of 4 hours. This assumption is stated in the

No.	Comments	Responses
	to demonstrate the estimated ADWF is reasonable and realistic.	remark # of the revised Table B1 of the revised SIA Report (**Appendix A**) for reference.
	(7) Regarding item #39 (WSD Mechanical and Electrical Workshop), please elaborate how the assumption of "Assumed 50% Usable Floor Area for Staffs" is derived, taking into account the consultant's previous RtC in Feb 2024 of SIA (Issue 1) that 25% of GFA is assumed to be occupied by staff. Please clarify and provide relevant reference source to justify the assumption.	In Feb 2024 of SIA (Issue 1) that 25% of GFA is assumed to be occupied by staff with total estimated employee of 173 which we considered reasonable staff estimate for the existing WSD Mechanical and Electrical Workshop. In SIA (Issue 3), the exact GFA is available from WSD fact sheet which is lower than the assumed GFA in SIA (Issue 1). In order to come up with similar estimated staff number, we proposed to change in SIA (Issue 3) the percentage to 50% which resulted a similar estimated staff number of 187. Please refer to the latest assumption as stated in the remark ## of the revised Table B1 of the revised SIA Report (**Appendix A**) for justification.
3.	**Environmental Protection Department, Environmental Assessment Division, Territory South Group, Kowloon, dated 24 June 2024** **Noise** (1) S.2.3.1.1 Please review if the description of the development is based on the latest scheme (i.e 14 or 15 storeys).	Noted. The key development parameters are clarified as the following: Block A with 14 Storeys and Block B and C with 15 Storeys. S.2.3.1.1, Table 2.1, and Table 2.2 of the revised EAS Report (**Appendix B**) are updated accordingly.
	Waste Management and Land Contamination (1) **Response to Comment (1) and (3) - Table 6.1** (a) Per the response to the previous comment (3), ACM will be anticipated	Noted. The Waste Disposal (Chemical Waste) (General) Regulation has already

No.	Comments	Responses
	during site clearance. The Consultant is advised to specify the ordinances, regulations, guidelines, code of practices, and technical circulars relevant to the handling and disposal of ACM in Table 6.1.	been specified in S.6.1.4.2 of the revised EAS Report (**Appendix B**). An excerpt on the requirements of the Air Pollution Control Ordinance (Cap.311) for handling and disposal of ACMs have been appended in S.3.1.2.4 of **Appendix B**. Table 6.1 of **Appendix B** is to summarize other documents and guidelines, thus the relevant guidelines, code of practices, and technical circulars in relation to handling and disposal of ACM has been appended in Table 6.1 of **Appendix B**.
	(b) Handling of Asbestos Containing Materials in Buildings (ProPECC PN 2/97) has been quoted in Para. 6.2.2.16. Please incorporate such practice note in Table 6.1 for clarity.	Noted. Handling of Asbestos Containing Materials in Buildings (ProPECC PN 2/97) is appended in Table 6.1 of the revised EAS Report (**Appendix B**).
	(2) **Response to Comment (4) – Para. 6.2.1.4**	
	(a) Despite the small scale of the Project, considering the nature of the building, it is anticipated to have certain portions of non-inert materials such as salvageables, equipment, spare part inventories and scrap metals during the site clearance. The Consultant is advised to revisit and provide a preliminary estimate of the quantity of non-inert C&D materials during the construction stage of the Project.	Noted. The preliminary estimate on the quantity of non-inert C&D materials is appended to S.6.2.1.4 of the revised EAS Report (**Appendix B**).
	(b) Please share the calculation and assumption adopted on the estimation of maximum dump truck trips during the construction phase, with information including but not limited to (i) dump truck capacity, (ii) bulk factor assumption, (iii) duration of construction period; (iv) daily quantity of C&D materials at peak.	Noted. According to Project Engineer, Phase 2 Excavation is estimated to generate a maximum of 62,000m^3 of C&D materials at peak. (i) The estimated dump truck capacity will be 7m^3. (ii) The bulk factor is assumed to be 1.3. (iii) The duration of Phase 2 Excavation is estimated to be 200 days. The maximum number of dump truck trips = maximum of 62,000m^3 of C&D materials

No.	Comments	Responses
		at peak × bulk factor 1.3 / 200 days / 7m^3 per truck = 58. (iv) The daily quantity of C&D materials at peak is 406m^3 and is calculated by = 58 dump truck trips per day × 7m^3 dump truck capacity.
	(3) **Response to Comment (3) – Para. 6.2.1.18**	
	(a) Please be advised that ACMs are classified as chemical waste that will be disposed of in accordance with the Waste Disposal Ordinance and its subsidiary Waste Disposal (Chemical Waste) (General) Regulation. ACM shall be disposed of at the EPD's designated disposal site at the landfill in accordance with the Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste issued by the EPD. For clarity, the Consultant shall specify the above details in the main text.	Noted, S.6.1.4.2, S.6.2.1.18, and S6.2.2.16 of the revised EAS Report (**Appendix B**) has specified that ACMs are classified as chemical waste and the handling, collection, transportation, and disposal is controlled by the Waste Disposal (Chemical Waste) (General) Regulation and other relevant ordinances and guidelines. S6.2.1.19 of the revised EAS Report (**Appendix B**) is appended to specify the mentioned details in the main text.
	(b) Please revise "licensed waste collector" to "licensed chemical waste collector".	Noted. Revised accordingly.
	(4) **Section 6.2.2**	
	The Consultant is advised to make reference to the Recommended Pollution Control Clauses to address the control measures for inclement weather (e.g., heavy rain).	Noted. Recommendations on good site practices during foreseeable inclement weather such as typhoon or heavy rain are supplemented to S.6.2.2.2 of the revised EAS Report (**Appendix B**).
	(5) **Response to Comment (9) –Table 6.4**	
	(a) Please clarify whether Footnote [4] shall be revised as Footnote [3] instead.	Noted. Revised as Footnote [3].

No.	Comments	Responses
	(b) The Consultant is advised to estimate the daily quantity of general refuse to be disposed of during the operation phase of the Project.	Noted. The estimation of general refuse to be disposed is appended in Table 6.4.
	(6) **Response to Comment (12) – Para. 7.4.1.4**	
	In addition to the inaccessible rooms mentioned in LG/1, please elaborate on the evaluation arrangement for the area under renovation works as discussed in the response to the previous comment (12d) and revised Appendix 7.2.	Noted. The area under renovation works is recommended to be further evaluated as part of the CAP preparation. S.7.4.1.3, S.7.4.1.4, and Table 7.3 of the revised EAS Report (**Appendix B**) are updated accordingly.
	(7) **Response to Comment (15) – Appendix 7.5 and Appendix 7.6**	
	The Consultant is advised to supplement the enquiry letter with a locational plan for further vetting.	Noted. The enquiry letter along with the included locational plan has been supplemented in Appendix 7.5 and Appendix 7.6 of the revised EAS Report (**Appendix B**).
	(8) **Response to Comment (16) – Para. 7.5.2.2**	
	Per the response to the previous comment (16), the Consultant shall specify that the storage and disposal point of chemical and clinical wastes is located in Block D of the Hospital, which is outside the scope of this Project.	Noted. S.7.5.2.3 of the revised EAS Report (**Appendix B**) has been supplemented to detail that the storage and disposal point of chemical and clinical wastes is located in Block D of the Hospital, which is outside the scope of this Project.
	(9) **Response to Comment (17) –Table 7.3**	
	(a) The disused U/G Storage Tank located underground has been identified as a potential contaminative site. Please review whether the aboveground condition is relevant in this case. If affirmative, the Consultant is advised to supplement the relevant photographic record for further review. Please also review whether	Noted. The aboveground condition of the disused U/G Storage Tanks at LG/2 are supplemented as Photo 69 of the revised EAS Report (**Appendix B**). Potential leakage and spillage concerns for the associated oil pipes are further specified in Table 7.3 of the revised EAS Report (**Appendix B**).

No.	Comments	Responses
	there are potential leakage and spillage concerns for the associated oil pipes.	
	(b) Please clarify the nature of the underground tank at LG/2 as captured in Photo ID 50.	Noted. The nature of the U/G tank at LG/2 is clarified to serve as a U/G Fuel Oil Service Tank. S.7.4.1.5, Table 7.2, and Table 7.3 of the revised EAS Report (**Appendix B**) is updated accordingly.
	(c) The Consultant is advised to graphically indicate the location of areas identified with land contamination potential during the site appraisal and the inaccessible locations that would be further evaluated as part of the CAP preparation.	Noted. The inaccessible locations that would be further evaluated as part of the CAP preparation has been graphically indicated in Appendix 7.2 of the revised EAS Report (**Appendix B**). The graphical indication of areas identified with land contamination potential is now appended in Appendix 7.2 of the revised EAS Report (**Appendix B**).

(Last Updated 8 July 2024)

Appendix A Revised Sewerage Impact Assessment

ARUP

Hong Kong Baptist Hospital

S16 Planning Application for Proposed Minor Relaxation of Building Height Restriction for Permitted Hospital Use in "Government, Institution or Community (7)" Zone at Blocks A, B and C of Hong Kong Baptist Hospital, 222 Waterloo Road, Kowloon Tong, Kowloon

Sewerage Impact Assessment

Reference:

4 | 21 June 2024

Job number 295052

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Contents

Appendices

1. Introduction

1.1 Background

Arup Hong Kong Limited was commissioned by Hong Kong Baptist Hospital to conduct a Local Sewerage Impact Assessment (SIA) for the Proposed Redevelopment of Block A, B and C, Hong Kong Baptist Hospital.

Hong Kong Baptist Hospital is located at 222 Waterloo Road, Kowloon, Hong Kong. Hospital Block A, B and C will be demolished and reconstructed in 2 Phases. The project will be commenced in 2025 with completion of New Block A in 2033 while New Block B and C will be completed after 2033. **Appendix A – Plan 1** shows the location of the Application Site.

1.2 Objective

The objective of this report is to provide an assessment of the impact of wastewater flow generation as a result of the proposed development at the Subject Site on the connecting the existing public sewerage system and to propose mitigation measures (if any).

1.3 Reference Materials

In evaluating the sewerage impact arising from the proposed development, the following sources of information have been specifically referred to:

- Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning (Version 1.0) - Report No.: EPD/TP 1/05 issued by Environmental Protection Department (EPD);
- Sewerage Manual – Key Planning Issues and Gravity Collection System (Third Edition) issued by Drainage Services Department in May 2013;
- Employment density shall refer to Commercial and Industrial Floor Space Utilization Survey published by PlanD; and
- Drainage Record Plans obtained from the GeoInfo Map services of the Lands Department (https://www.map.gov.hk/gm/?lg=en)

2. The Proposed Development

2.1 Proposed Development

A table showing the Proposed Development parameters is shown in table below:

Proposed Development	**Site Particulars**
Project	Proposed Redevelopment of Block A, B and C, Hong Kong Baptist Hospital
Site Location	222 Waterloo Road, Kowloon, Hong Kong
Current Land Use Zoning	Government, Institution or Community (G/IC)
Site Area	Approximately 5,648.5m^2
No. of Beds	About 601 (Current), 700 (Proposed)
GFA for Canteen	Not more than 1,200sq.m

Below is an aerial photograph of the Subject Site in below **Figure 2.1**.

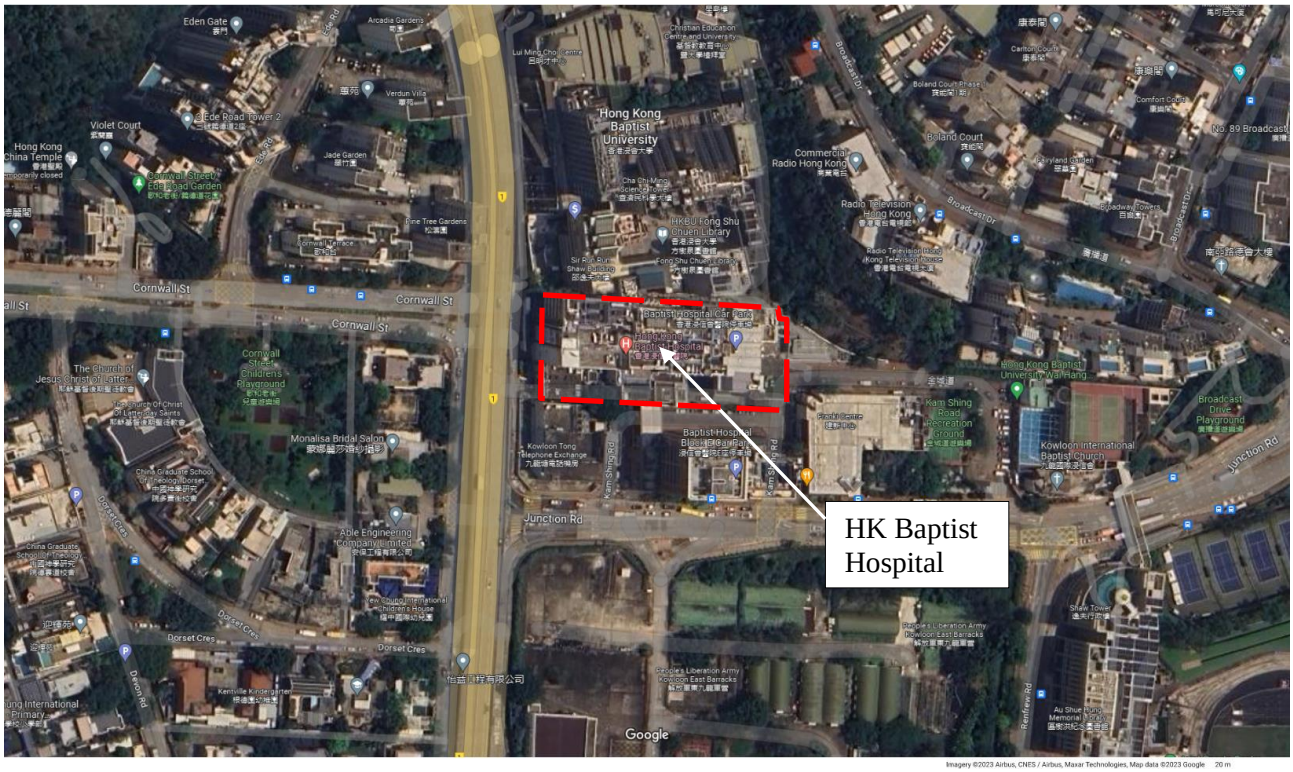


Figure 2.1 – **Aerial Photograph of the Subject Site (Extracted from Google Map dated 2023)**

3. Local Sewerage Network Impact Assessment for the Proposed Development

3.1 Existing Sewerage Network

Appendix A – **Plan 2** shows the existing sewerage network in the vicinity of the Subject Site. The Hong Kong Baptist Hospital is served by an existing 225∅ public sewer running along Kam Shing Road with an existing 225∅ terminal manhole connection to the existing public sewerage manhole FMH4053440 for Block B and an existing 150∅ terminal manhole connection to the existing public sewerage manhole FMH4026344 for Block C. This existing public sewer changes to 300∅-750∅ along Junction Road for connection to the existing public sewer of 300∅ running along Waterloo Road. For Blocks A, there is an existing 150∅ terminal manhole connection to the existing public sewerage manhole FMH4026160 running along Waterloo Road.

3.2 Population of Proposed Development

The assessment for the proposed development sewage generation is based on the information extracted from the development schedule in **Section 2** above.

For easy reference, a table showing the sewage generation of the proposed development is calculated based on the guideline set in EPD Guideline for Estimating Sewage Flows for planning catchment level sewage infrastructure and is shown in **Appendix B** – **Table T1** and summarized in below table.

Proposed Development	Parameters
Block A	
No. of Beds	190
Average Dry Weather Flow for Block A (m^3/day)	283.86
Block B	
No. of Beds	255
Average Dry Weather Flow for Block B (m^3/day)	380.97
Block C	
No. of Beds	255
Average Dry Weather Flow for Block B (m^3/day)	380.97
Canteen	
GFA (m^2)	Not more than 1,200
Average Dry Weather Flow for Canteen (m^3/day)	96.70

3.3 Assumptions and References

The estimation of sewage generation in vicinity of the Application Site is based on the assumptions as below:

a) Population estimation of business and commercial buildings is based on Commercial and Industrial Floor Space Utilization Survey issued by PlanD.

b) Unit flow factors adopted is based on EPD Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning.

c) Global peaking factor with stormwater allowance is adopted as per EPD Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning.

d) Existing public sewer information are based on the latest update of GEOINFO Map (website: http://www.map.gov.hk/gm/map/).

e) Sewerage Catchment Plan as shown in **Appendix A** – **Plan 3**.

The estimation of population for the existing upstream development appended in **Appendix B** – **Table B1**.

3.4 Assessment Result

The assessment result shows that the capacity of the existing 225∅-750∅ public sewers running along Kam Shing Road are sufficient taking into account of sewage from the proposed redevelopment except the existing public sewer 225∅ between manhole FMH4026348 and FMH4026349, the existing public sewer of 300∅ between manhole FMH4026351 and FMH4026352 and the existing sewer connection from terminal manhole FTMH-02 to the existing public manhole FMH4026344 are insufficient in capacity. The project proponent proposed to upgrade the existing public sewer 225∅ between manhole FMH4026348 and FMH4026350 and 300∅ between manhole FMH4026351 and FMH4026353 to 250∅ and 400∅ respectively as shown in **Appendix A** – **Plan 2** and **2A**. Furthermore, the existing sewer connection between terminal manhole FTMH-02 and the existing public manhole FMH4026344 will be upgraded from 150∅ to 225∅ as shown in **Appendix A** – **Plan 2** and **2A**. The existing public sewer 300∅-375∅ running along Waterloo Road is sufficient taking into account of sewage from the proposed redevelopment. The proposed upgrading to the existing public sewer will be handed over to DSD for future maintenance. The capacity performance of the existing public sewers is shown in **Appendix B** – **Table B2**.

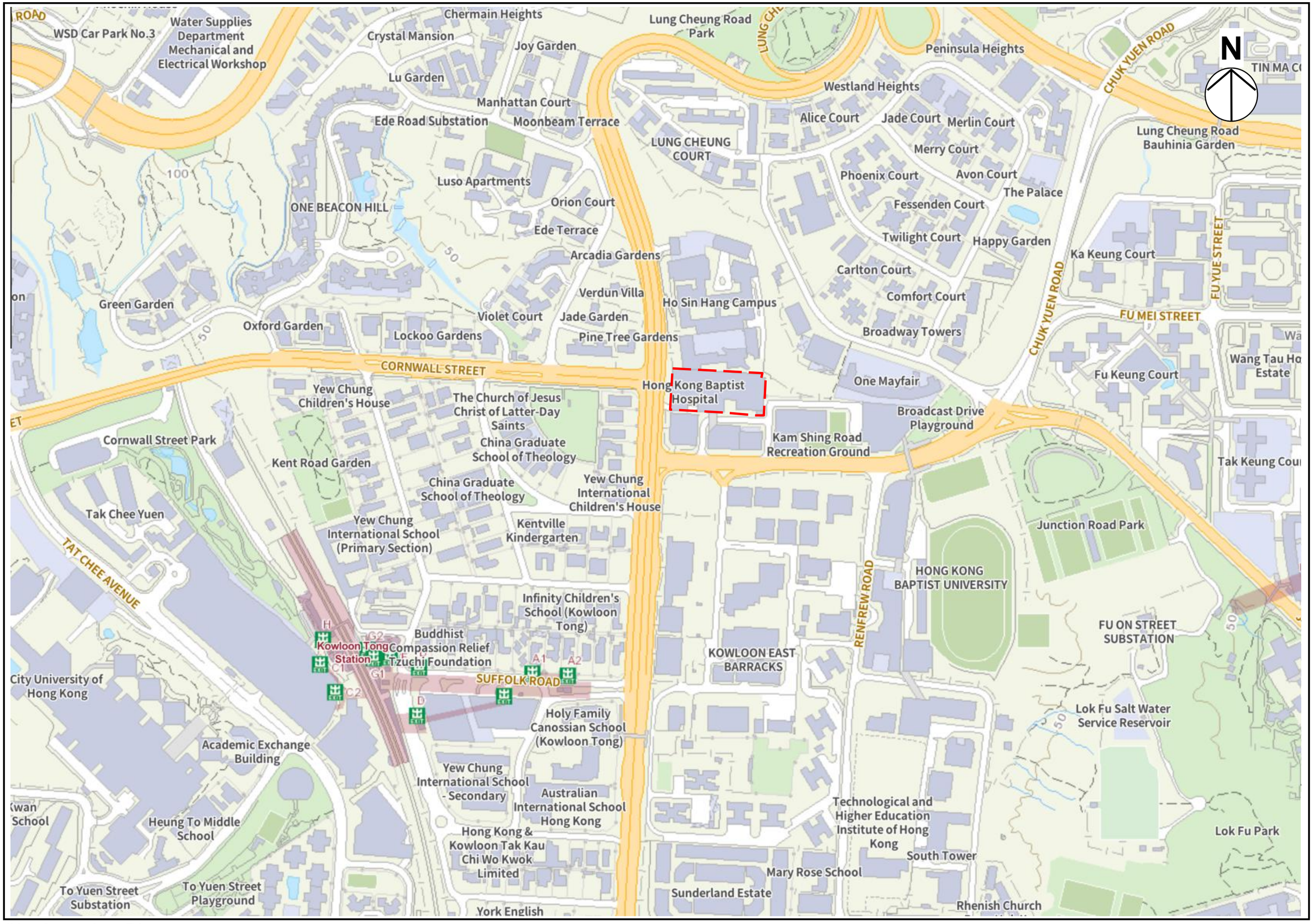
4. Conclusion

The assessment result shows the existing public sewers running along Kam Shing Road and Waterloo Road are sufficient taking into account of sewage from the proposed redevelopment except the existing public sewer 225∅ between manhole FMH4026348 and FMH4026349, the existing public sewer of 300∅ between manhole FMH4026351 and FMH4026352 and the existing sewer connection from terminal manhole FTMH-02 to the existing public manhole FMH4026344 are insufficient in capacity. The project proponent proposed to upgrade the existing public sewer 225∅ between manhole FMH4026348 and FMH4026350 and 300∅ between manhole FMH4026351 and FMH4026353 to 250∅ and 400∅ respectively at our project cost. Furthermore, the existing sewer connection between terminal manhole FTMH-02 and the existing public manhole FMH4026344 will be upgraded from 150∅ to 225∅ at our project cost. The proposed upgrading to the existing public sewer will be handed over to DSD for future maintenance.

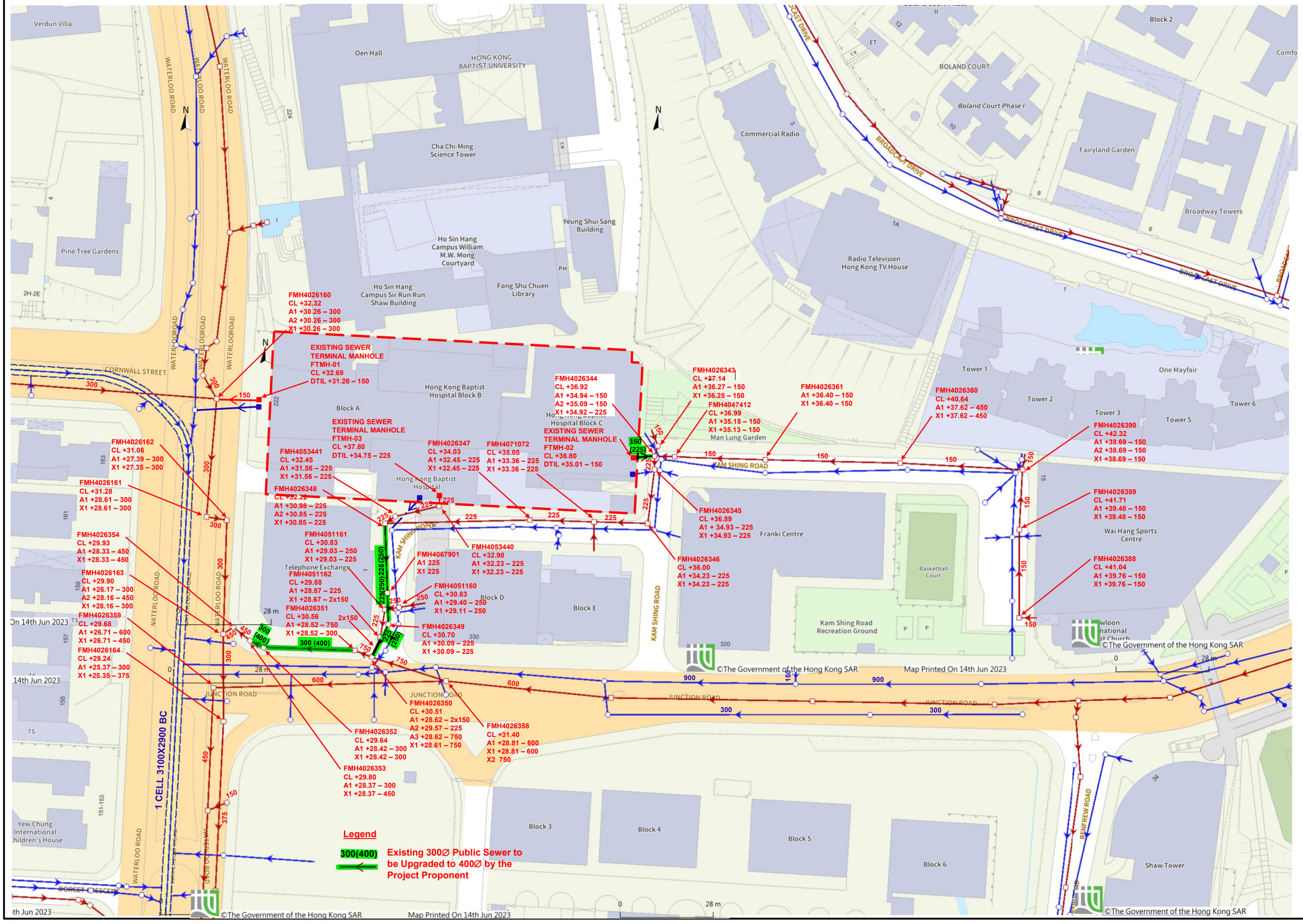
Based on the hydraulic assessment with the implementation of the sewer upgrading work, there will be no adverse impact on the existing sewerage system as a result of the proposed redevelopment.

Appendix A

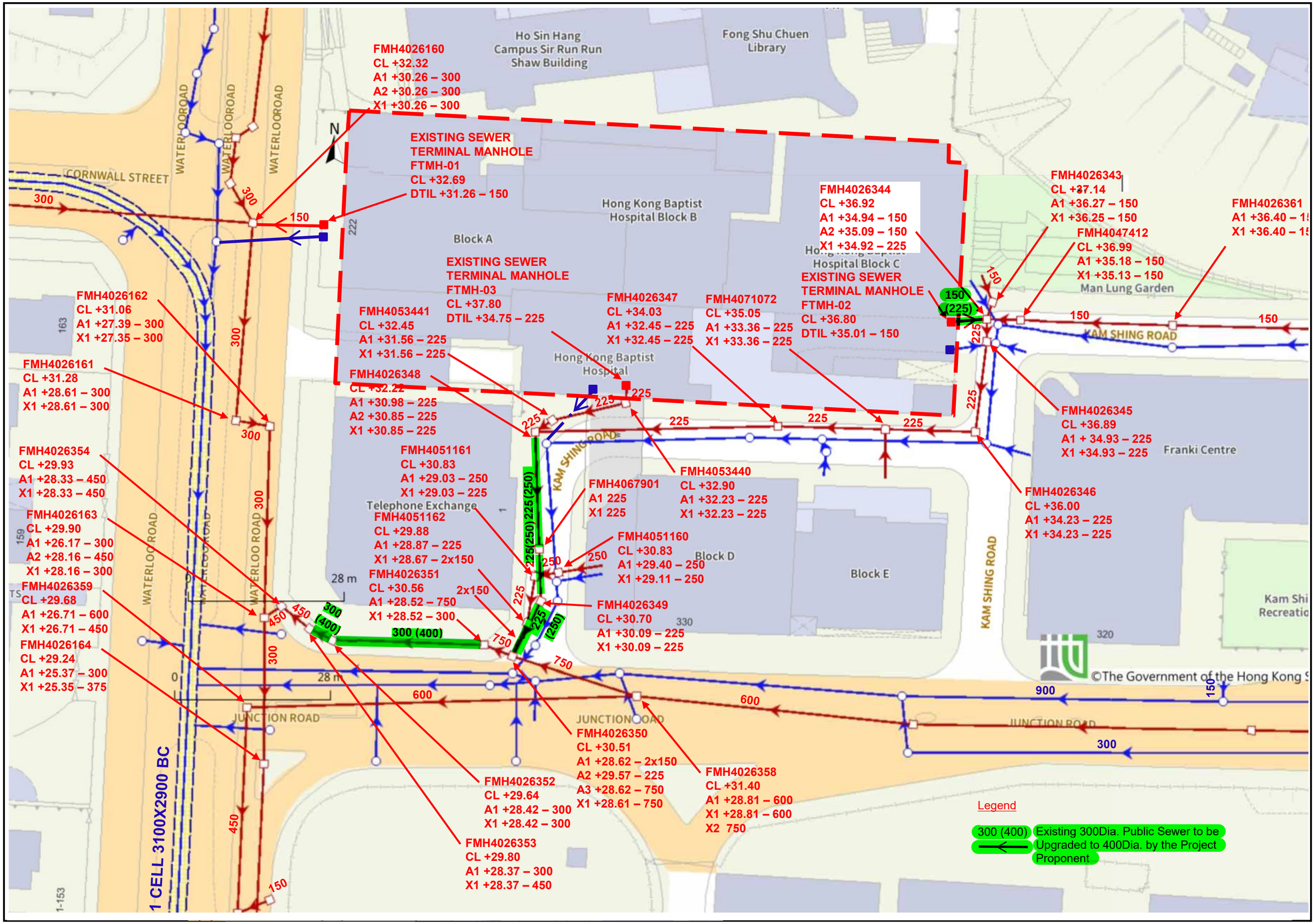
Plan



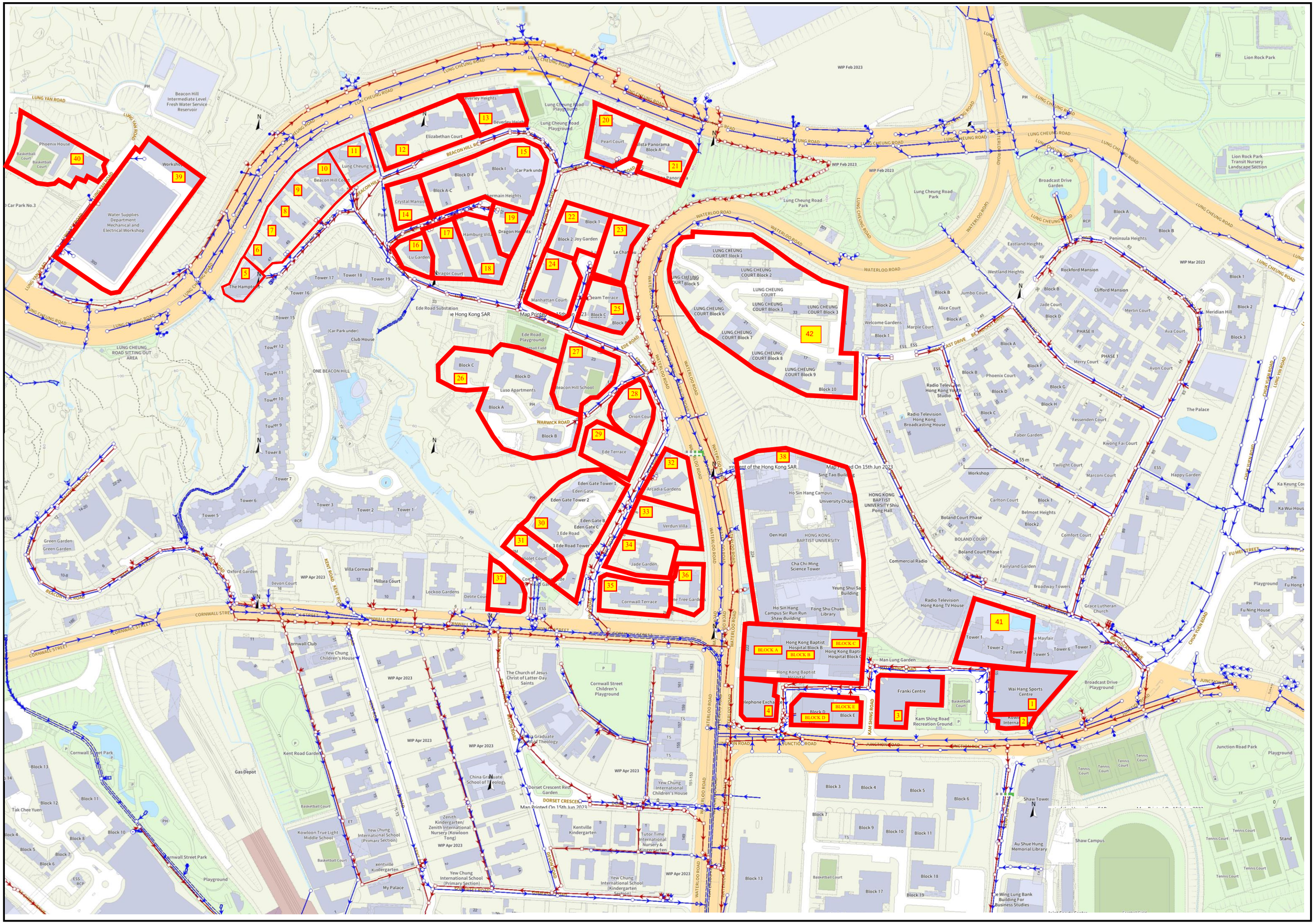
Site Location Plan **Plan 1**



Proposed Sewerage Plan (A3 1:1000) **Plan 2**



Proposed Sewerage Plan Block Up (A3 1:500) **Plan 2A**



Sewerage Catchment Plan (A3 1:3000) **Plan 3**

Appendix B

Calculation

S16 Planning Application for Proposed Minor Relaxation of Building Height Restriction for Permitted Hospital Use in "Government, Institution or Community (7)" Zone at Blocks A, B and C of Hong Kong Baptist Hospital, 222 Waterloo Road, Kowloon Tong, Kowloon

TABLE B1
Estimation of Sewage Flows Estimation for Proposed and Existing Development

Design Code
1. Based on EPD Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning.

Design Assumption:
Global Peaking Factor, P (Including Stormwater Allowance) as per Table T-5
Global Unit Flow Factors as per Tables T-2 and T-3
Catchment Inflow Factor for North West Kowloon (PCIF = 1.30) as per Table T-4

Development Schedule

Sewage Flow Estimates	Estimation	Remark
Proposed Baptist Hospital Redevelopment		
Block A		
No. of Beds (Inpatient)	190	
Unit flow factor (m^3/bed/day)	0.19	Domestic (Institutional and special class)
ADWF, (m^3/day)	36.10	No PCIF for New Block A
No. of outpatient	190	Assumed same number as hospital beds
Unit flow factor (m^3/person/day)	0.08	Unit flow factor for Commercial Employee
ADWF, (m^3/day)	15.20	No PCIF for New Block A
No. of staff	776	Assumed by Applicant
Unit flow factor (m^3/person/day)	0.28	Community, Social & Personal Services J11
ADWF, (m^3/day)	217.36	No PCIF for New Block A
No. of vistor	380	Assumed 2 visitors per 1 hospital bed
Unit flow factor (m^3/person/day)	0.08	Unit flow factor for Commercial Employee
ADWF, (m^3/day)	15.20	See Remark # , No PCIF for New Block A
Sub-total ADWF, (m^3/day)	283.86	
Block B		
No. of Beds (Inpatient)	255	
Unit flow factor (m^3/bed/day)	0.19	Domestic (Institutional and special class)
ADWF, (m^3/day)	48.45	No PCIF for New Block B
No. of outpatient	255	Assumed same number as hospital beds
Unit flow factor (m^3/person/day)	0.08	Unit flow factor for Commercial Employee
ADWF, (m^3/day)	20.40	No PCIF for New Block B
No. of staff	1042	Assumed by Applicant
Unit flow factor (m^3/person/day)	0.28	Community, Social & Personal Services J11
ADWF, (m^3/day)	291.72	No PCIF for New Block B
No. of vistor	510	Assumed 2 visitors per 1 hospital bed
Unit flow factor (m^3/person/day)	0.08	Unit flow factor for Commercial Employee
ADWF, (m^3/day)	20.40	See Remark # , No PCIF for New Block B
Sub-total ADWF, (m^3/day)	380.97	
Block C		
No. of Beds (Inpatient)	255	
Unit flow factor (m^3/bed/day)	0.19	Domestic (Institutional and special class)
ADWF, (m^3/day)	48.45	No PCIF for New Block C
No. of outpatient	255	Assumed same number as hospital beds
Unit flow factor (m^3/person/day)	0.08	Unit flow factor for Commercial Employee
ADWF, (m^3/day)	20.40	No PCIF for New Block C
No. of staff	1042	Assumed by Applicant
Unit flow factor (m^3/person/day)	0.28	Community, Social & Personal Services J11
ADWF, (m^3/day)	291.72	No PCIF for New Block C
No. of vistor	510	Assumed 2 visitors per 1 hospital bed
Unit flow factor (m^3/person/day)	0.08	Unit flow factor for Commercial Employee
ADWF, (m^3/day)	20.40	See Remark # , No PCIF for New Block C
Sub-total ADWF, (m^3/day)	380.97	
Canteen		
GFA (m^2)	1200	
Population	61	Restaurant = 5.1 employee per 100m^2 of GFA
Unit flow factor (m^3/person/day)	1.58	Restaurant J10
ADWF, (m^3/day)	96.70	No PCIF for New Canteen
Existing Baptist Hospital		
Block D		
No. of Beds (Inpatient)	109	
Unit flow factor (m^3/bed/day)	0.19	Domestic (Institutional and special class)
ADWF, (m^3/day)	26.92	PCIF = 1.30 included for North West Kowloon
No. of outpatient	109	Assumed same number as hospital beds
Unit flow factor (m^3/person/day)	0.08	Unit flow factor for Commercial Employee
ADWF, (m^3/day)	11.34	PCIF = 1.30 included for North West Kowloon
No. of staff	218	Assumed same number as patient
Unit flow factor (m^3/person/day)	0.28	Community, Social & Personal Services J11
ADWF, (m^3/day)	79.35	PCIF = 1.30 included for North West Kowloon
No. of vistor	218	Assumed 2 visitors per 1 hospital bed
Unit flow factor (m^3/person/day)	0.08	Unit flow factor for Commercial Employee
ADWF, (m^3/day)	11.34	See Remark # , PCIF = 1.30 included for North West Kowloon
Sub-total ADWF, (m^3/day)	128.95	
Block E		
No. of Beds (Inpatient)	120	
Unit flow factor (m^3/bed/day)	0.19	Domestic (Institutional and special class)
ADWF, (m^3/day)	29.64	PCIF = 1.30 included for North West Kowloon
No. of outpatient	120	Assumed same number as hospital beds
Unit flow factor (m^3/person/day)	0.08	Unit flow factor for Commercial Employee
ADWF, (m^3/day)	12.48	PCIF = 1.30 included for North West Kowloon
No. of staff	240	Assumed same number as patient
Unit flow factor (m^3/person/day)	0.28	Community, Social & Personal Services J11
ADWF, (m^3/day)	87.36	PCIF = 1.30 included for North West Kowloon
No. of vistor	240	Assumed 2 visitors per 1 hospital bed
Unit flow factor (m^3/person/day)	0.08	Unit flow factor for Commercial Employee
ADWF, (m^3/day)	12.48	See Remark # , PCIF = 1.30 included for North West Kowloon
Canteen		
GFA (m^2)	328	
Population	17	Restaurant = 5.1 employee per 100m^2 of GFA
Unit flow factor (m^3/person/day)	1.58	Restaurant J10
ADWF, (m^3/day)	34.37	PCIF = 1.30 included for North West Kowloon
Sub-total ADWF, (m^3/day)	176.33	

S16 Planning Application for Proposed Minor Relaxation of Building Height Restriction for Permitted Hospital Use in "Government, Institution or Community (7)" Zone at Blocks A, B and C of Hong Kong Baptist Hospital, 222 Waterloo Road, Kowloon Tong, Kowloon

TABLE B1
Estimation of Sewage Flows Estimation for Proposed and Existing Development

Design Code
1. Based on EPD Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning.

Design Assumption:
Global Peaking Factor, P (Including Stormwater Allowance) as per Table T-5
Global Unit Flow Factors as per Tables T-2 and T-3
Catchment Inflow Factor for North West Kowloon (PCIF = 1.30) as per Table T-4

Development Schedule

Sewage Flow Estimates	Estimation	Remark
Proposed Baptist Hospital Redevelopment		
Existing Development		
1 **Hong Kong Baptist University Wai Hang Sports Centre**		
Total GFA (m^2)	3184	https://sustainability.hkbu.edu.hk/Public/pdf/2013-14%20Greenhouse%20Gas%20Emissions%20and%20Removals%20Report.pdf
Assumed 25% GFA Used by Staffs (m^2)	796	Comprises G/F to 3/F with G/F booking and office area. Therefore assume whole G/F for working area of employee.
Population	26	Community, Social & Personal Services = 3.3 employee per $100m^2$ of GFA
Unit flow factor (m^3/person/day)	0.28	Community, Social & Personal Services J11
ADWF, (m^3/day)	9.56	PCIF = 1.30 included for North West Kowloon
Swimming Pool Volume (m^3)	375	Based on LCSD standard indoor swimming pool (Length 25m x Width 12.5m, Depth: 1.2m)
Turnover Rate (hr)	6	Based on General Specification for Swimming Pool Water Treatment Installation in Government Buildings of HKSAR recommend 6 hours
Filter Loading Rate of Filter (m^3/m^2/hr)	50	Based on Swimming Pools: Design and Construction, Fourth Edition recommends $50m^3/m^2$/hr
Filter Areas Required (m^2) = $375m^3$/6hr/$50m^3/m^2$/hr	1.25	
Backwash Duration (min/d)	7.0	Based on General Specification for Swimming Pool Water Treatment Installation in Government Buildings of HKSAR recommend duration of 7 minutes
Backwash Flow Rate (m^3/m^2/hr)	30.0	Based on Technical Paper - Domestic Swimminig Pool Filtration by European Union of Swimming Pool and Spa Associations
Daily Flow for Swimming Pool Backwashing (m^3/day) = $1.25m^2$*7min/d*$30m^3/m^2$/hr/60	4.38	
Instantaneous Peak Flow (L/s), by direct discharge = $4.38m^3$/day*1000/7min/60	10.42	Intantaneous flow rate completed in 7 minutes duration
2 **Kowloon International Baptist Church**		
GFA (m^2)	402	Assumed based on site area and number of floors
Employee Population	13	Community, Social & Personal Services = 3.3 employee per $100m^2$ of GFA
Unit flow factor (m^3/person/day)	0.28	Community, Social & Personal Services J11
ADWF, (m^3/day)	4.83	PCIF = 1.30 included for North West Kowloon
3 **Frankie Centre**		
GFA (m^2) Total	6600	Assumed based on site area and number of floors
GFA (m^2) 50% Restaurant	3300	
Population	168	Restaurant = 5.1 employee per $100m^2$ of GFA
Unit flow factor (m^3/person/day)	1.58	Restaurant J10
ADWF, (m^3/day)	345.69	PCIF = 1.30 included for North West Kowloon
GFA (m^2) 50% Retail	3300	
Population	116	Retail = 3.5 employee per $100m^2$ of GFA
Unit flow factor (m^3/person/day)	0.28	Retail J4
ADWF, (m^3/day)	42.04	PCIF = 1.30 included for North West Kowloon
4 **HKT Telephone Exchange Building**		
GFA (m^2)	3660	Assumed based on site area and number of floors
Population	201	Office = 5.5 employee per $100m^2$ of GFA
Unit flow factor (m^3/person/day)	0.18	UFF J3
ADWF, (m^3/day)	47.10	PCIF = 1.30 included for North West Kowloon
5 **The Hamptons**		
No. of Flats	18	https://hk.centanet.com/estate/en/The-Hamptons/2-EDAPWWPOWS
Population	49	
Unit flow factor (m^3/person/day)	0.34	Domestic Private R3
ADWF, (m^3/day)	21.48	PCIF = 1.30 included for North West Kowloon
6 **47 Beacon Hill Road**		
No. of Flats	4	https://hk.centanet.com/estate/en/47-Beacon-Hill-Road/2-UJJRURRARO
Population	11	
Unit flow factor (m^3/person/day)	0.34	Domestic Private R3
ADWF, (m^3/day)	4.77	PCIF = 1.30 included for North West Kowloon
7 **49 Beacon Hill Road**		
No. of Flats	3	https://hk.centanet.com/estate/en/49-Beacon-Hill-Road/2-UJCRURRERO
Population	8	
Unit flow factor (m^3/person/day)	0.34	Domestic Private R3
ADWF, (m^3/day)	3.58	PCIF = 1.30 included for North West Kowloon
8 **51 Beacon Hill Road**		
No. of Flats	1	https://hk.centanet.com/estate/en/51-Beacon-Hill-Road/2-UJROURRSRO
Population	3	
Unit flow factor (m^3/person/day)	0.34	Domestic Private R3
ADWF, (m^3/day)	1.19	PCIF = 1.30 included for North West Kowloon
9 **53 Beacon Hill Road**		
No. of Flats	8	https://hk.centanet.com/estate/en/53-Beacon-Hill-Road/2-UJJOURRRRO
Population	22	
Unit flow factor (m^3/person/day)	0.34	Domestic Private R3
ADWF, (m^3/day)	9.55	PCIF = 1.30 included for North West Kowloon
10 **Beacon Hill Court**		
No. of Flats	48	https://hk.centanet.com/estate/en/Beacon-Hill-Court/2-UJOQURRJRO
Population	130	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	45.49	PCIF = 1.30 included for North West Kowloon
11 **Lung Cheung Villa**		
No. of Flats	36	https://hk.centanet.com/estate/en/Lung-Cheung-Villa/2-UJSSURRSRO
Population	97	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	34.12	PCIF = 1.30 included for North West Kowloon
12 **Elizabethan Court**		
No. of Flats	96	
Population	259	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	90.98	PCIF = 1.30 included for North West Kowloon

TABLE B1
Estimation of Sewage Flows Estimation for Proposed and Existing Development

Design Code
1. Based on EPD Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning.

Design Assumption:
Global Peaking Factor, P (Including Stormwater Allowance) as per Table T-5
Global Unit Flow Factors as per Tables T-2 and T-3
Catchment Inflow Factor for North West Kowloon (PCIF = 1.30) as per Table T-4

Development Schedule

Sewage Flow Estimates	Estimation	Remark
Proposed Baptist Hospital Redevelopment		
13 **Beverley Height**		
No. of Flats	70	https://hk.centanet.com/estate/en/Beverley-Heights/2-UJSVURRSRO
Population	189	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	66.34	PCIF = 1.30 included for North West Kowloon
14 **Crystal Mansion**		
No. of Flats	36	https://hk.centanet.com/estate/en/Crystal-Mansion/2-MILHTHDOHT
Population	97	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	34.12	PCIF = 1.30 included for North West Kowloon
15 **Chermain Heights**		
No. of Flats	144	https://hk.centanet.com/estate/en/Chermain-Heights/2-MITZTHDRHT
Population	389	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	136.47	PCIF = 1.30 included for North West Kowloon
Eastbourne Court		
No. of Flats	72	https://hk.centanet.com/estate/en/Eastbourne-Court/2-MISMTHDXHT
Population	194	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	68.23	PCIF = 1.30 included for North West Kowloon
16 **Lu Garden**		
No. of Flats	8	https://hk.centanet.com/estate/en/Lu-Garden/2-MIZNTHDJHT
Population	22	
Unit flow factor (m^3/person/day)	0.34	Domestic Private R3
ADWF, (m^3/day)	9.55	PCIF = 1.30 included for North West Kowloon
17 **Dragon Court**		
No. of Flats	44	https://hk.centanet.com/estate/en/Dragon-Court/2-MINNTHDJHT
Population	119	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	41.70	PCIF = 1.30 included for North West Kowloon
18 **Hamburg Villa**		
No. of Flats	33	https://hk.centanet.com/estate/en/Hamburg-Villa/2-MIMXTHDXHT
Population	89	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	31.27	PCIF = 1.30 included for North West Kowloon
19 **Dragon Heights**		
No. of Flats	24	https://hk.centanet.com/estate/en/Dragon-Heights/2-MISXTHDSHT
Population	65	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	22.74	PCIF = 1.30 included for North West Kowloon
20 **Pearl Court**		
No. of Flats	47	https://hk.centanet.com/estate/en/Pearl-Court/2-MIDLZHIRHT
Population	127	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	44.54	PCIF = 1.30 included for North West Kowloon
21 **Vista Panorama**		
No. of Flats	48	https://www.midland.com.hk/en/estate/Kowloon-%E7%AD%86%E6%9E%B6%E5%B1%B1-Vista-Panorama-E09076
Population	130	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	45.49	PCIF = 1.30 included for North West Kowloon
22 **Joy Garden**		
No. of Flats	56	https://hk.centanet.com/estate/en/Joy-Garden/2-EDDSPPPOPS
Population	151	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	53.07	PCIF = 1.30 included for North West Kowloon
23 **Le Chateau**		
No. of Flats	31	https://hk.centanet.com/estate/en/Le-Chateau/2-EDBPWWPJWS
Population	84	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	29.38	PCIF = 1.30 included for North West Kowloon
24 **Manhattan Court**		
No. of Flats	43	https://hk.centanet.com/estate/en/Manhattan-Court/2-EDDSPPPXPS
Population	116	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	40.75	PCIF = 1.30 included for North West Kowloon
25 **Moon Beam Terrace**		
No. of Flats	42	https://hk.centanet.com/estate/en/Moon-Beam-Terrace/2-EDDEPPPJPS
Population	113	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	39.80	PCIF = 1.30 included for North West Kowloon
26 **Luso Apartments**		
No. of Flats	117	https://hk.centanet.com/estate/en/Luso-Apartments/2-UJFJFRFXRO
Population	316	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	110.88	PCIF = 1.30 included for North West Kowloon
27 **Beacon Hill School**		G/IC
No. of Student	540	https://www.schooland.hk/is/beaconhill
No. of Staff	32	https://www.teacherhorizons.com/schools/asia-hong-kong-hong-kong-beacon-hill-school
Unit flow factor for Student (m^3/person/day)	0.04	
Unit flow factor for Staff (m^3/person/day)	0.28	Community, Social & Personal Services
ADWF, (m^3/day)	39.73	PCIF = 1.30 included for North West Kowloon

TABLE B1
Estimation of Sewage Flows Estimation for Proposed and Existing Development

Design Code
1. Based on EPD Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning.

Design Assumption:
Global Peaking Factor, P (Including Stormwater Allowance) as per Table T-5
Global Unit Flow Factors as per Tables T-2 and T-3
Catchment Inflow Factor for North West Kowloon (PCIF = 1.30) as per Table T-4

Development Schedule

Sewage Flow Estimates	Estimation	Remark
Proposed Baptist Hospital Redevelopment		
28 **Orion Court**		
No. of Flats	16	https://hk.centanet.com/estate/en/Orion-Court/2-UJCRURQRRO
Population	43	
Unit flow factor (m^3/person/day)	0.34	Domestic Private R3
ADWF, (m^3/day)	19.09	PCIF = 1.30 included for North West Kowloon
29 **Ede Terrace**		
No. of Flats	16	https://hk.centanet.com/estate/en/Ede-Terrace/2-MIXLTHDXHT
Population	43	
Unit flow factor (m^3/person/day)	0.34	Domestic Private R3
ADWF, (m^3/day)	19.09	PCIF = 1.30 included for North West Kowloon
30 **Eden Gate**		
No. of Flats	47	https://hk.centanet.com/estate/en/Eden%20Gate/2-EDDPWWPSWS
Population	127	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	44.54	PCIF = 1.30 included for North West Kowloon
No.1 & 3 Ede Road		
No. of Flats	41	https://hk.centanet.com/estate/en/No.-1-3-Ede-Road/2-EDDPWPPRPS
Population	111	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	38.86	PCIF = 1.30 included for North West Kowloon
31 **Violet Court**		
No. of Flats	28	https://hk.centanet.com/estate/en/Violet-Court/2-EDKGBPSXPS
Population	76	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	26.54	PCIF = 1.30 included for North West Kowloon
32 **Arcadia Gardens**		
No. of Flats	24	https://hk.centanet.com/estate/en/Arcadia-Gardens/2-UJRVURQARO
Population	65	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	22.74	PCIF = 1.30 included for North West Kowloon
33 **Verdun Villa**		
No. of Flats	24	https://hk.centanet.com/estate/en/Verdun-Villa/2-UJDQURQSROO
Population	65	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	22.74	PCIF = 1.30 included for North West Kowloon
34 **Jade Garden**		
No. of Flats	36	https://hk.centanet.com/estate/en/Jade-Garden/2-UJVQURQSRO
Population	97	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	34.12	PCIF = 1.30 included for North West Kowloon
35 **Cornwall Terrace**		
No. of Flats	20	https://hk.centanet.com/estate/en/Cornwall-Terrace/2-EDGABPSSPS
Population	54	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	18.95	PCIF = 1.30 included for North West Kowloon
36 **Pine Tree Gardens**		
No. of Flats	24	https://hk.centanet.com/estate/en/Pine-Tree-Gardens/2-UJSQURQSRO
Population	65	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	22.74	PCIF = 1.30 included for North West Kowloon
37 **Hong Kong China Temple**		
GFA (m^2)	460	
Employee Population	15	Community, Social & Personal Services = 3.3 employee per 100m^2 of GFA
Unit flow factor (m^3/person/day)	0.28	Community, Social & Personal Services J11
ADWF, (m^3/day)	5.53	PCIF = 1.30 included for North West Kowloon
38 **Baptist University**		G/IC
No. of Student	12150	https://intl.hkbu.edu.hk/student-exchange/incoming-students/why-hkbu/fast-facts
No. of Staff	850	https://intl.hkbu.edu.hk/student-exchange/incoming-students/why-hkbu/fast-facts
Unit flow factor for Student (m^3/person/day)	0.04	
Unit flow factor for Staff (m^3/person/day)	0.28	Community, Social & Personal Services
ADWF, (m^3/day)	941.20	PCIF = 1.30 included for North West Kowloon
Catering Services (Seat)	1528	https://fohome.hkbu.edu.hk/for-others/information/facilities/catering.html
Employee	183	6 staff per 50 customer assumed
Unit flow factor (m^3/person/day)	1.58	Restaurant & Hotels J10
ADWF, (m^3/day)	376.62	PCIF = 1.30 included for North West Kowloon
39 **WSD Mechanical and Electrical Workshop**		
Total GFA (m^2)	16300	https://www.wsd.gov.hk/en/publications-and-statistics/statistics/key-facts/waterworks-data/index.html
Worker Density (No. of Worker per 100m^2)	1.1	See Remark ## , Employee density = 1.1 employee per 100sqm GFA
No. of Employee	179	
Unit flow factor (m^3/person/day)	0.23	J9 Construction
ADWF, (m^3/day)	53.61	PCIF = 1.30 included for North West Kowloon
40 **CSD Phoenix House**		
No. of Residential Capacity	30	https://www.csd.gov.hk/english/facility/facility_ind/ins_kln_ph.html
Unit flow factor (m^3/person/day)	0.19	Institutional and special class
ADWF, (m^3/day)	7.41	PCIF = 1.30 included for North West Kowloon
No. of Employee	11	Social Welfare Department Notional Staffing Establishment
Unit flow factor (m^3/person/day)	0.28	J11 Community, Social & Personal Services
ADWF, (m^3/day)	4.00	PCIF = 1.30 included for North West Kowloon

S16 Planning Application for Proposed Minor Relaxation of Building Height Restriction for Permitted Hospital Use in "Government, Institution or Community (7)" Zone at Blocks A, B and C of Hong Kong Baptist Hospital, 222 Waterloo Road, Kowloon Tong, Kowloon

TABLE B1
Estimation of Sewage Flows Estimation for Proposed and Existing Development

Design Code
1. Based on EPD Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning.

Design Assumption:
Global Peaking Factor, P (Including Stormwater Allowance) as per Table T-5
Global Unit Flow Factors as per Tables T-2 and T-3
Catchment Inflow Factor for North West Kowloon (PCIF = 1.30) as per Table T-4

Development Schedule

Sewage Flow Estimates	Estimation	Remark
Proposed Baptist Hospital Redevelopment		
41 **One Mayfair**		
No. of Flats	120	https://www.midland.com.hk/en/estate/Kowloon-Kowloon-Tong-One-Mayfair-E000008992
Population	324	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	113.72	PCIF = 1.30 included for North West Kowloon
Clubhouse GFA (m^2) from BD exempted GFA of amenity facilities	1357	https://www.bd.gov.hk/doc/en/resources/codes-and-references/notices-and-reports/GFA/GFA_c/KN2011041GFACe.pdf
Clubhouse Employee	45	Community, Social & Personal Services = 3.3 employee per 100m^2 of GFA
Unit flow factor (m^3/person/day)	0.28	J11 Community, Social & Personal Services
ADWF, (m^3/day)	16.30	PCIF = 1.30 included for North West Kowloon
Swimming Pool Volume (m^3)	369	Swimming pool volume based on plan area of the swimming pool x 1.3m depth
Turnover Rate (hr)	6	Based on General Specification for Swimming Pool Water Treatment Installation in Government Buildings of HKSAR recommend 6 hours
Filter Loading Rate of Filter (m^3/m^2/hr)	50	Based on Swimming Pools: Design and Construction, Fourth Edition recommends 50m^3/m^2/hr
Filter Areas Required (m^2) = 369m^3/6hr/50m^3/m^2/hr	1.23	
Backwash Duration (min/d)	7.0	Based on General Specification for Swimming Pool Water Treatment Installation in Government Buildings of HKSAR recommend duration of 7 minutes
Backwash Flow Rate (m^3/m^2/hr)	30.0	Based on Technical Paper - Domestic Swimminig Pool Filtration by European Union of Swimming Pool and Spa Associations
Daily Flow for Swimming Pool Backwashing (m^3/day) = 1.23m^2*7min/d*30m^3/m^2/hr/60	4.31	
Instantaneous Peak Flow (L/s), by direct discharge = 4.31m^3/day*1000/7min/60	10.26	Intantaneous flow rate completed in 7 minutes duration
42 **Lung Cheung Court**		
No. of Flats	296	https://hk.centanet.com/estate/en/Lung-Cheung-Court/2-MITMIHTYHM
Population	799	
Unit flow factor (m^3/person/day)	0.27	Domestic Private R2
ADWF, (m^3/day)	280.52	PCIF = 1.30 included for North West Kowloon
Proposed Scenario		
Total ADWF, (m^3/day)	4,925.56	
Contributing Population	18,243	
Global Peaking Factor	4.00	
Total Peak Flow (L/s) + Swimming Pool Instantaneous Peak Flow (L/s)	248.71	

Notes:
Employment density shall refer to Commercial and Industrial Floor Space Utilization Survey (CIFSUS) published by PlanD.
Financial, Insurance, Real Estate & Business Services = 5.5 per 100m^2 of GFA
Community, Social & Personal Services = 3.3 employee per 100m^2 of GFA
Restaurants = 5.1 employee per 100m^2 of GFA
Average Household size is 2.7 persons per household for Kowloon City District based on Hong Kong Population Projection for 2022-2046 published by Census and Statistics Department.

Remarks:
- It is assumed that HKBH peak visiting hours are 12:00pm to 2:00pm and 5:30pm to 7:30pm (4 hours). The estimated sewage flow for visitors is pro-rata from daily flow (8 hours) respect with the visiting duration of 4 hours.
- Refer to Commercial and Industrial Floor Space Utilization Survey (CIFSUS) published by PlanD, the category of "Specialized Factories" with definition factory premises, primarily purpose-built for specialized manufacturing processes, usually for occupation by a single operator is considered applicable for "WSD Mechanical and Electrical Workshop". According to Figure 10 of CIFSUS, the workers per GFA for Specialized Factories equal to 1.1 employee per 100sqm GFA.

Table B2 - Capacity Performance of Existing and Proposed Sewer

Notes:
(1) Calculate by Colebrook-White Equation

$$\overline{V} = -\sqrt{32gRS_f}\,\log\left[\frac{k_s}{14.8R} + \frac{1.255\nu}{R\sqrt{32gRS_f}}\right]$$

where ks is roughness value is 0.6mm for vitrified clay sewer; 3mm for concrete sewer, 0.15mm for PE sewer.
ν is kinematic viscosity of fluid = 1.14 x 10-6 m2/s and g is the gravity = 9.81m/s2
V is the velocity, D is the diameter of the sewer and S is the gradient of the sewer.

Abbreviation:

UP_MAN	Upstream Manhole	CON_POP	Contributing Population	DN_GL	Downstream Ground Level	CAP	Peak Pipe Capacity	PE	Polyethylene PE100 Pipe
DN_MAN	Downstream Manhole	DIA	Diameter	UP_INV	Upstream Invert Level	F/C	Peak Flow/Capacity		
ADWF	Average Dry Weather Flow	LEN	Length	DN_INV	Downstream Invert Level	VC	Vitrified Clay Pipe		
ACC_ADWF	Accumulated Average Dry Weather Flow	UP_GL	Upstream Ground Level	VEL	Peak Pipe Velocity	PC	Precast Concrete Pipe		

Proposed Development

Manhole							Existing Pipe Parameter											Proposed Sewer Upgrading						
UP_MAN No.	DN_MAN No.	From Existing and Proposed Development	CON_POP	PEAKING FACTOR	ACC_ADWF (m^3/d)	Peak Flow (L/s)	DIA (D) (mm)	LEN (m)	UP_GL (mPD)	DN_GL (mPD)	UP_INV (mPD)	DN_INV (mPD)	Gradient (S)	Pipe Materal ks (mm)	VEL (m/s)	CAP (L/s)	F/C (%)	Adequate Capacity?	Upgraded Pipe Dia. (mm)	Gradient (S)	Pipe Materal ks (mm)	VEL (m/s)	CAP (L/s)	F/C (%)	Adequate Capacity?
FMH4026344	FMH4026345	HKBH Block C, Hong Kong Baptist University Wai Hang Sports Centre, Kowloon International Baptist Church, 50%One Mayfair	1,705	6	460.37	52.64	225	3.0	36.92	36.89	34.92	34.93	-300	VC, ks = 0.6mm	-	-	-	-							
FMH4026345	FMH4026346	HKBH Block C, Hong Kong Baptist University Wai Hang Sports Centre, Kowloon International Baptist Church, 50%One Mayfair	1,705	6	460.37	52.64	225	15.3	36.89	36.00	34.93	34.23	22	VC, ks = 0.6mm	2.81	111.64	47.2%	YES							
FMH4026346	FMH4071072	HKBH Block C, Hong Kong Baptist University Wai Hang Sports Centre, Kowloon International Baptist Church, Franki Centre, 50%One Mayfair	3,141	6	848.10	79.57	225	15.2	36.00	35.05	34.23	33.36	17	VC, ks = 0.6mm	3.14	124.94	63.7%	YES							
FMH4071072	FMH4026347	HKBH Block C, Block E, Hong Kong Baptist University Wai Hang Sports Centre, Kowloon International Baptist Church, Franki Centre, 50%One Mayfair	3,794	6	1,024.43	91.81	225	18.3	35.05	34.03	33.36	32.45	20	VC, ks = 0.6mm	2.93	116.42	78.9%	YES							
FMH4026347	FMH4026348	HKBH Block C, Block E, Hong Kong Baptist University Wai Hang Sports Centre, Kowloon International Baptist Church, Franki Centre, 50%One Mayfair	3,794	6	1,024.43	91.81	225	42.6	34.03	32.22	32.45	30.85	27	VC, ks = 0.6mm	2.54	101.10	90.8%	YES							
FMH4026348	FMH4067901	HKBH Block B, Block C, Block E, Hong Kong Baptist University Wai Hang Sports Centre, Kowloon International Baptist Church, Franki Centre, HKT Telephone Exchange, 50%One Mayfair	5,738	5	1,549.20	110.32	225	20.0	32.22	30.83	30.85	30.31	37	VC, ks = 0.6mm	2.15	85.25	129.4%	NO	250	37	PE, ks = 0.15mm	2.69	131.99	83.6%	YES
FMH4067901	FMH4026349	HKBH Block B, Block C, Block E, Hong Kong Baptist University Wai Hang Sports Centre, Kowloon International Baptist Church, Franki Centre, HKT Telephone Exchange, 50%One Mayfair	5,738	5	1,549.20	110.32	225	8.4	30.83	30.70	30.31	30.09	37	VC, ks = 0.6mm	2.15	85.25	129.4%	NO	250	37	PE, ks = 0.15mm	2.69	131.99	83.6%	YES
FMH4026349	FMH4026350	HKBH Block B, Block C, Block E, Hong Kong Baptist University Wai Hang Sports Centre, Kowloon International Baptist Church, Franki Centre, HKT Telephone Exchange, 50%One Mayfair	5,738	5	1,549.20	110.32	225	10.2	30.70	30.51	30.09	29.57	20	VC, ks = 0.6mm	2.97	117.88	93.6%	YES	250	20	PE, ks = 0.15mm	3.73	183.16	60.2%	YES
FMH4026350	FMH4026351	HKBH Block B, Block C, Block D, Block E, Hong Kong Baptist University Wai Hang Sports Centre, Kowloon International Baptist Church, Franki Centre, HKT Telephone Exchange, 50%One Mayfair	6,215	5	1,678.15	117.79	750	4.3	30.51	30.56	28.61	28.52	48	PC, ks = 3.0mm	3.29	1452.37	8.1%	YES							
FMH4026351	FMH4026352	HKBH Block B, Block C, Block D, Block E, Hong Kong Baptist University Wai Hang Sports Centre, Kowloon International Baptist Church, Franki Centre, HKT Telephone Exchange, 50%One Mayfair	6,215	5	1,678.15	117.79	300	26.3	30.56	29.64	28.52	28.42	263	VC, ks = 0.6mm	0.96	68.04	173.1%	NO	400	263	PE, ks = 0.15mm	1.33	166.86	70.6%	YES
FMH4026352	FMH4026353	HKBH Block B, Block C, Block D, Block E, Hong Kong Baptist University Wai Hang Sports Centre, Kowloon International Baptist Church, Franki Centre, HKT Telephone Exchange, 50%One Mayfair	6,215	5	1,678.15	117.79	300	3.5	29.64	29.80	28.42	28.37	70	VC, ks = 0.6mm	1.88	132.82	88.7%	YES	400	70	PE, ks = 0.15mm	2.62	328.96	35.8%	YES
FMH4026353	FMH4026354	HKBH Block B, Block C, Block D, Block E, Hong Kong Baptist University Wai Hang Sports Centre, Kowloon International Baptist Church, Franki Centre, HKT Telephone Exchange, 50%One Mayfair	6,215	5	1,678.15	117.79	450	5.5	29.80	29.93	28.37	28.33	137	VC, ks = 0.6mm	1.73	275.04	42.8%	YES							
FMH4026354	FMH4026163	HKBH Block B, Block C, Block D, Block E, Hong Kong Baptist University Wai Hang Sports Centre, Kowloon International Baptist Church, Franki Centre, HKT Telephone Exchange, 50%One Mayfair	6,215	5	1,678.15	117.79	450	2.5	29.93	29.90	28.33	28.16	15	VC, ks = 0.6mm	5.32	845.80	13.9%	YES							
FMH4026160	FMH4026161	Existing Development No. 5 to 40, 42 and HKBN Block A	12,027	4	3,247.41	171.02	300	34.4	32.32	31.28	30.26	28.61	20.84	VC, ks = 0.6mm	3.46	244.30	70.0%	YES							
FMH4026161	FMH4026162	Existing Development No. 5 to 40, 42 and HKBN Block A	12,027	4	3,247.41	171.02	300	5.3	31.28	31.06	28.61	27.39	4	VC, ks = 0.6mm	7.57	534.62	32.0%	YES							
FMH4026162	FMH4026163	Existing Development No. 5 to 40, 42 and HKBN Block A	12,027	4	3,247.41	171.02	300	33.3	31.06	29.90	27.35	26.17	28	VC, ks = 0.6mm	2.97	209.88	81.5%	YES							
FMH4026163	FMH4026164	Existing Development No. 1 to 42 and HKBN Block A, Block B, Block C, Block D, Block E	18,243	4	4,925.56	248.71	300	25.4	29.90	29.24	28.16	25.37	9	VC, ks = 0.6mm	5.24	370.36	67.2%	YES							
FMH4026164	FMH4026551	Existing Development No. 1 to 42 and HKBN Block A, Block B, Block C, Block D, Block E	18,243	4	4,925.56	248.71	375	48.9	29.24	27.85	25.35	24.53	59.62	VC, ks = 0.6mm	2.35	259.26	95.9%	YES							
FMH4026551	FMH4026552	Existing Development No. 1 to 42 and HKBN Block A, Block B, Block C, Block D, Block E	18,243	4	4,925.56	248.71	375	59.7	27.85	25.82	24.50	23.46	57	VC, ks = 0.6mm	2.39	264.19	94.1%	YES							
FTMH-01	FMH4026160	HKBN Block A	1,051	6	283.86	19.71	150	11.8	32.69	32.32	31.26	30.26	12	VC, ks = 0.6mm	2.95	52.06	37.9%	YES							
FTMH-02	FMH4026344	HKBN Block C	1,411	6	380.97	26.46	150	5.0	36.80	36.92	35.01	34.94	70	VC, ks = 0.6mm	1.20	21.22	124.6%	NO	225	70	PE, ks = 0.15mm	1.83	72.59	36.4%	YES
FTMH-03	FMH4053440	HKBN Block B + Canteen	1,769	6	477.67	33.17	225	2.0	37.80	32.90	34.75	32.23	1	VC, ks = 0.6mm	14.81	588.41	5.6%	YES							
FMH4053440	FMH4053441	HKBN Block B + Canteen	1,769	6	477.67	33.17	225	12.5	32.90	32.45	32.23	31.56	19	VC, ks = 0.6mm	3.04	120.89	27.4%	YES							
FMH4053441	FMH4026348	HKBN Block B + Canteen	1,769	6	477.67	33.17	225	2.5	32.45	32.22	31.56	30.98	4	VC, ks = 0.6mm	6.34	252.14	13.2%	YES							

Appendix C

Responses to Comments

COMMENTS FROM RELATED DEPARTMENTS

No.	Comments	Responses
1.	**Environmental Protection Department, Environmental Assessment Division, Territory South Group, Kowloon, dated 28 December 2023**	
	Please ask the consultant to provide calculation spreadsheets (in excel) for our review. Please also clarify with the consultant whether any environmental assessment (other than SIA) has been conducted.	Noted. The calculation spreadsheets (in excel) have been submitted to Environmental Protection Department on 29 December 2023. The Application is seeking approval from height restriction to support the redevelopment of the existing hospital and the permitted land use of hospital development in the "G/IC" zone of the prevailing OZP remains unchanged while there is no restriction on the plot ratio or GFA on the development in the same G/IC zone. During the construction phase, it is considered that adverse environmental impact is not anticipated with the implementation of dust and noise control measure and good site practices. In the operation phase, the proposed redevelopment is planned to be provided with central air condition / mechanical ventilation and sufficient setback distances from the surrounding roads will be allowed for the fresh air intakes with reference to the Hong Kong Planning Standards and Guidelines (HKPSG) requirements. No chimney operation is anticipated for the redevelopment. Planned fixed plant noise sources will be well designed (e.g. at a greater distance from receivers, avoid any direct line of sight between the receivers and noisy equipment) and implemented noise mitigation measures (e.g. silencers, acoustic louvers) where necessary. The Contractor will carry out a noise commissioning test for the fixed noise

No.	Comments	Responses
		sources before operation of the Project to ensure the compliance of relevant noise criteria.
2.	**Environmental Protection Department, Environmental Assessment Division, Territory South Group, Kowloon, dated 15 January 2024** Please find comments below from sewerage infrastructure planning perspective for follow-up. Besides, the technical assessment on environmental (EA) as stated in planning statement S 5.7.1.1 have not been included in the Appendices. As stated previously, please clarify whether any environmental assessment (other than Sewerage Impact Assessment) has been conducted. **Section 1.1** • Please confirm if the abbreviation of Sewerage Impact Assessment should be read as SIA instead of DIA. **Section 2.1** • For "GFA for Canteen", please advise whether the estimated GFA has included the area of kitchens and associated area for catering services. **Section 3.1** • For Blocks A and C, please provide the reference source to demonstrate that sewage generated from the respective Block is connected to FMH4026344 (Block C) and FMH4026160 (Block A) by 150mm dia. pipe. **Section 3.2** • In addition to the in-patient services (in terms of number of beds) and	Please refer to our Submission of Responses to Comments to Government Departments on 24 January 2024. The abbreviation is revised to SIA in Section 1.1 of the revised Sewerage Impact Assessment (SIA) (**Annex A**). The GFA for Canteen has included the area of kitchens and associated area for catering services in Section 2.1 of the revised SIA (**Annex A**). The existing sewerage connection for Block A and C are based on the as-built sewerage record plans retrieved from Buildings Department as attached for easy reference (**Annex B**). The sewage estimation had been considered all activities including in-

No.	Comments	Responses
	canteen, please advise if the sewage flow generated from ALL activities in the proposed development (e.g. out-patient services, transient users, employees, catering services, retail shops, etc.) have been considered and incorporated into the estimation of sewage flow. Please provide the relevant reference sources and calculation methodology to demonstrate the estimation of sewage flow is practical and reasonable. Please update the calculations in Appendix B, Table B1 as appropriate.	patient services, out-patient services, employees, catering services in the estimation of sewage flow. The sources of information was provided by HKBH. The calculation methodology and the calculation in Appendix B, Table B1 in the Pre-Submission had considered the above and demonstrated the sewage flow practically and reasonably, and remain valid.
	Section 3.4 • Please confirm if the proposed sewer upgrading will be conducted from manholes FMH4026351, FMH4026352 to FMH4026353 (i.e. sewer pipes FWD4027490 and FWD4027491).	Confirmed.
	Appendix B, Table B1 • The proposed development is located in the North West Kowloon catchment. The catchment inflow factor should be 1.3 instead of 1.0. Please review and revise the calculations and remarks.	Catchment inflow factor of 1.3 is adopted and included in Table B1 of the revised SIA (**Annex A**).
	• Please provide the reference sources for the estimated number of employees/population for each concerned development.	The reference sources based on the information available in the public domain is included in Table B1 of the revised SIA (**Annex A**).
	• Based on the best available information, some premises in the concerned sewerage catchments are omitted in the assessment, such as One Mayfair, Eastbourne Count, 1 Ede Road, 3 Ede Road, Lung Cheung Court, and upstream developments with sewage flow discharged to	The sewage flow estimation from One Mayfair, Eastbourne Count, 1 Ede Road, 3 Ede Road and Lung Cheung Court is included in Table B1 of the revised SIA (**Annex A**). For upstream developments with sewage flow discharged to manhole FMH4026253,

No.	Comments	Responses
	manhole FMH4026253. Please check and revise the assessment.	since the existing 225mm diameter sewer between manhole FMH4026252 to FMH4026253 is draining in opposite direction (i.e. from IL 31.19 (FMH4026253) to IL 31.03 (FMH4026252)) and the existing 300mm diameter sewer between manhole FMH4026252 to FMH4026328 has full bore capacity of 89.7L/s which has adequate capacity to intercept upstream catchment to FMH4026252, the sewage flow discharged to FMH4026252 will be discharged to the existing 300mm diameter sewer between manhole FMH4026252 to FMH4026328 and therefore it will not be considered in sewer capacity checking。
	• For the residential developments within the concerned catchment, please indicate the parameter adopted for the averaged number of residents per unit with reference sources, and confirm whether there are clubhouses and/or swimming pools in the development. Please revise the hydraulic calculation when appropriate.	According to Hong Kong Population Projects for 2022-2046 released on 15 August 2023 by Census and Statistics Department, the average household size is projected to decrease continuously, from 2.7 persons per household in 2021 to 2.6 persons in 2046. Therefore we adopted 2.7 persons per household. (C&SD : Hong Kong population projections for 2022-2046 released (censtatd.gov.hk). Clubhouses and/or swimming pool flow are considered based on the information available in the public domain.
	• For the private residential developments with low density, a higher UFF (e.g. R3/R4) should be adopted for a more conservative estimation.	UFF of 0.37m^3/day R3 for private residential developments with low density is adopted in Table B1 of the revised SIA (**Annex A**).
	• The instantaneous backwash flow generated from the filtration system of swimming pool shall be included in the calculation of peak flow instead of ADWF. Please check and revise.	Instantaneous backwash flow is revised in Table B1 of the revised SIA (**Annex A**).

No.	Comments	Responses
	Appendix B, Table B1, "Proposed Baptist Hospital Redevelopment" and "Existing Baptist Hospital"	
	• The consultant is suggested to adopt a more conservative UFF for hospital staff instead of considering them as general commercial employees (0.08 m3/day).	Refer to GESF Appendix V, page 4 of 4, first para., it said for social and community services such as hospitals, the calculated per-employee consumption rate (without inclusion of consumption of the customers of job type J11), based on the WSD water consumption data is 0.100m^3/employee/day. We adopted 0.100m^3/employee/day for hospital staff in Table B1 of the revised SIA (**Annex A**).
	Appendix B, Table B1, "Hong Kong Baptist University Wai Hang Sports Centre"	
	• The estimated population of Wai Hang Sports Centre seems to be on high side. Please check and provide reference source for the estimated population and revise the estimated sewage flow as appropriate.	As there is no staff number available for Wai Hang Sports Centre, we assumed the 25% of GFA will be occupied by staffs and revised the calculation accordingly. Table B1 of the revised SIA (**Annex A**).
	• The instantaneous backwash flow of filtration system during the backwash period should be included in the calculation of peak flow (in L/s) instead of m3/day. Please review and revise the calculation.	Instantaneous backwash flow is revised in Table B1 of the revised SIA (**Annex A**).
	Appendix B, Table B1, "Frankie Centre"	
	• Please provide the reference source for the assumption of GFA as 50% F&B and 50% Retail.	The assumption is based on site visit, the current tenants include supermarket, banks, School of Continuing Education of Hong Kong Baptist University, estate agents, offices, retail shops and other restaurants, we considered that assumption of GFA as 50% F&B and 50% Retail is appropriate.
	Appendix B, Table B1, "HKT Telephone Exchange Building"	

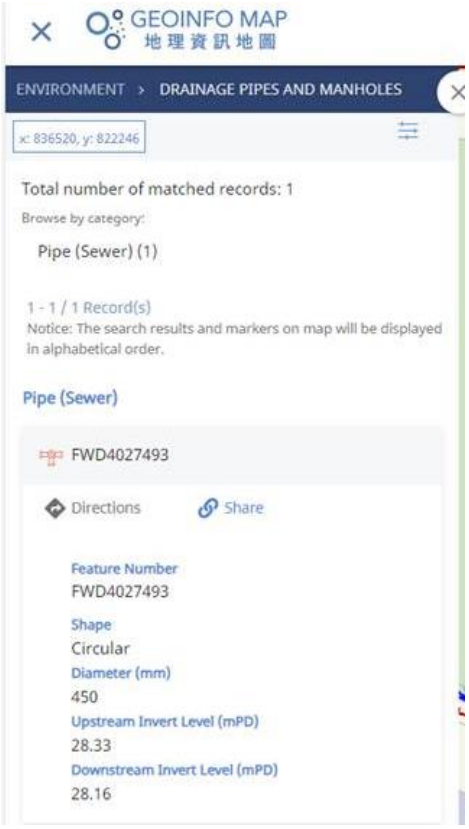
No.	Comments	Responses
	• Please review the calculation of the estimated population in accordance with the assumptions.	Calculation revised accordingly in Table B1 of the revised SIA (**Annex A**).
	Appendix B, Table B1, "Baptist University"	
	• Please confirm whether there are other activities (e.g. dormitory), apart from students/staff and catering services in the development. Please revise the hydraulic calculation when appropriate.	HKBU student residence hall is at Baptist University Road and HKBU staff quarters is at Fo Tan. Both of them are outside the sewerage catchment of HKBH.
	• Please check and confirm the estimated number of student stated in the report (i.e. 11900). It appears from the provided reference source that the estimated number of student is 12150 (7300 undergraduate + 4300 postgraduate + 550 international exchange students).	HKBU student of 12,150 is adopted in the revised calculation in Table B1 of the revised SIA (**Annex A**).
	• For catering services, it appears that the assumption of 1 seat for 1 customer per day is adopted. Such assumption may under-estimate the sewage flow generated from catering services in the vicinity. Please review.	The catering services seat numbers define the size of the restaurants. We are using these information to estimate the number of employees employed for these restaurants and then used the UFF for restaurant 1.58m^3/employee/day to estimate the daily sewage flow. It is not means that only 1,528 customers visit the restaurants in one day.
	Appendix B, Table B1, "WSD Mechanical and Electrical Workshop"	
	• The estimated population of 690 seems to be on high side, please check and confirm.	As there is no staff number available for WSD Mechanical and Electrical Workshop, we assumed the 25% of GFA will be occupied by staffs and revised the calculation accordingly in Table B1 of the revised SIA (**Annex A**).
	Appendix B, Table B2	

No.	Comments	Responses
	• The consultant is reminded that, the instantaneous backwash flow generated from the filtration system of swimming pool shall be included in the calculation of peak flow instead of ADWF. Please check and revise the Table.	Instantaneous backwash flow is revised in Table B2 of the revised SIA (**Annex A**).
	Please provide the reference sources for the invert levels adopted for manhole FMH4067901 and the pipe length between manholes FMH4026354 and FMH4026163.	The invert level at FMH4067901 is a proportional value between manhole FMH4026348 and FMH4026349 which invert levels at these two existing manholes are known. The pipe length between manholes FMH4026354 and FMH4026163 is measured from record plan from pipe outlet to pipe inlet at manholes.
3.	**Environmental Protection Department, Environmental Assessment Division, Territory South Group, Kowloon, dated 1 March 2024** **Comments on the SIA**	
	• Please be reminded that the implementation of local sewer connection/upgrading works shall meet the satisfaction of DSD. The consultant should seek DSD's view and agreement on the SIA.	Noted. The SIA had also been circulated to DSD for review.
	• The consultant is suggested to provide softcopy of the report (in pdf) and calculation spreadsheet (in Excel) as well as all Response to Comments from EPD and DSD as appendix. Please also highlight the revised / updated content of the SIA report in next submission to facilitate review.	Appendix C had been added to include all RtC from EPD and DSD. The revised report had been highlighted for further review. Report in pdf and calculation spreadsheet in excel format will be submitted for further review.
	Specific Comments **Section 4**	

No.	Comments	Responses
	• Please state the party responsible for the maintenance of the proposed upgraded sewer sections(s).	The proposed upgrading to the existing public sewer sections will be handed over to DSD for future maintenance. Sections 3.4 and 4 are revised to incorporate this comment.
	Appendix B, Table B1, Tables "Proposed Baptist Hospital Development" and "Existing Baptist Development"	
	• In accordance with Appendix V of GESF, item (g) J11, taking into consideration the nature of J11 (e.g. hospital), the population of J11 employees and the uncertainties in the water consumption and licensed flow data, it is recommended that the activities UFF is 0.200m^3 /employee/day. The consultant is also reminded that the total unit flow generated from an employee in a particular trade is the sum of the unit flow factor of employee (i.e. 0.080 m^3/day) and the unit flow factor of commercial activities of a particular trade under consideration. In this regard, please adopt the UFF 0.28m^3 /employee/day for hospital staff and revise the calculations accordingly.	UFF 0.28m^3/employee/day had been adopted for hospital staff in Table B1 of the revised SIA.
	Appendix B, Table B1, item 1 Hong Kong Baptist University Wai Hang Sports Centre	
	• Please elaborate how the assumption of 25% GFA to be occupied by staff is derived by providing relevant reference source to justify the assumption.	The Wai Hang Sports Centre comprises G/F to 3/F. The G/F is the booking and office area. Therefore 25% GFA corresponds to whole of G/F for working area of the employees for the sports centre.
	• Please provide reference source for the assumption of the duration of pumping (i.e. 30 minutes), instead of direct discharge during backwash.	Instantaneous peak flow by direct discharge is calculated in Table B1 of the revised SIA.
	Appendix B, Table B1	

No.	Comments	Responses
	• For all residential developments, the assumption of number of household per domestic unit, please adopt a district specific factor based on the District Council Constituency Areas or Tertiary Planning Units instead of the territory-wide average factor, for a more accurate assumption.	According to 2023 District Council Geographical Constituency Boundary Map, the study area belongs to Kowloon City District. According to Table 130-06806: Average household size by District Council district, the average household size in 2022 in Kowloon City is 2.7 C&SD : Table 130-06806 : Average household size and median monthly household income of households by District Council district (censtatd.gov.hk). Therefore, we adopted 2.7 in Table B1 for number of household per domestic unit.
	Appendix B, Table B1, item 41 One Mayfair	
	• Please provide the reference sources or the basis of assumption for the estimated number of employees.	The employee number is revised based on clubhouse GFA from BD exempted GFA of amenity facilities for One Mayfair.
	• Please provide reference source of the relevant design parameters (e.g. Volume of swimming pool, turnover rate, surface loading rate of filter, backwash duration, backwash flow rate, etc.) to justify the assumption of instantaneous peak flow.	The swimming pool is based on the plan area of the swimming pool from GeoInfo Map times 1.3m depth. The full calculation of the backwash amount is added in Table B1 of the revised SIA for easy reference.
	Appendix B, Table B2	
	• For the manhole with unknown invert level (i.e. FMH4067901), manhole survey may be required to determine the actual invert levels and pipe capacity. Please agree with DSD on the result of manhole survey. The consultant should revise the hydraulic calculation based on the actual invert level of the concerned manholes when appropriate.	Noted. Site verification on the actual invert level of manhole FMH4067901 will be carried out during detailed design stage for verification of the hydraulic calculation.
	• Please provide the reference sources of pipe diameter between manholes FMH4026354 and FMH4026163.	The pipe information is obtained from GeoInfo Map with pipe name FWD4027493 with screen capture below for your easy reference.

Responses to Comments

No.	Comments	Responses
	 **Appendix B, Table B1** • The sewage flow generated from upstream catchment, which will be discharged to manhole FMH4026253 via pipe FWD4027449, was omitted. Please review and include the associated sewage flow in the assessment as appropriate.	The sewage flow generated from the upstream catchment [including , Violet Court (Item 31) and Hong Kong China Temple (Item 37) which will be discharged to manhole FMH4026253 via pipe FWD4027449 (150mm diameter) are included in Table B1 of the revised SIA.
4.	**Director of Drainage Services, dated 2 February 2024** **SIA** (a) Section 1.1 – Please clarify id SIA is referred.	The abbreviation is revised to SIA in Section 1.1 of the revised SIA.

No.	Comments	Responses
	(b) Appendix B, Table B1 - Subject to the views and agreement of EPD, please review the uff for staff at the proposed hospital redevelopment Blocks A-C.	UFF 0.28m^3/employee/day had been adopted for hospital staff in Table B1 of the revised SIA.
	(c) Appendix B, Table B1 – Please note that the proposed development is within North West Kowloon Catchment.	Catchment inflow factor of 1.3 for North West Kowloon Catchment is adopted and included in Table B1 of the revised SIA.
	(d) Appendix B, Table B1 – Please review if the UFF J3 is more appropriate for commercial flow of HKT Telephone Exchange Building.	UFF J3 for HKT Telephone Exchange Building is revised in Table B1 of the revised SIA.
5.	**Environmental Protection Department, Environmental Assessment Division, Territory South Group, Kowloon, dated 26 April 2024** **SIA** Appendix A (Plan 2)	
	(1) For the sake of clarity, please review the legend of the proposed sewer upgrading works for reference.	For easy reference, Plan 2A with larger scale is added to clearly show the proposed sewer upgrading works.
	Appendix B, Table B1, Tables "Proposed Baptist Hospital Development" and "Existing Baptist Hospital"	
	(2) It appears that only the sewage flows of "outpatient", "staff", "visitor" and "canteen" are estimated. Please advise whether there will be "in-patient" in the proposed and existing Baptist Hospital development. If affirmative, please include the corresponding sewage flow estimation with reference to the GESF.	In-patient sewage flows included in the revised Table B1.
	(3) For the assumption "2 visitors per 1 hospital bed", please advise the estimated duration of visitors staying in the hospital. It may overestimate the sewage flow of visitor by adopting the UFF of commercial employee, if the	HKBH official visiting hours are 12:00pm to 2:00pm and 5:30pm to 7:30pm. Total 4 hours of visiting duration in a day. The estimated sewage flow for visitors is pro-

No.	Comments	Responses
	time spent by visitor in hospital is generally less than the normal working hour of commercial employee. Please review and revise the estimated sewage flow as appropriate.	rata respect with the visiting duration of 4 hours and included in the revised Table B1.
	(4) In accordance with Section 10 of the GESF, the catchment inflow factor (Pcif) is not applicable to new catchments which are deemed to be free from misconnections and pipe defects. Therefore, the consultant is suggested to apply Pcif only in the existing developments in the hydraulic assessment.	Noted Pcif for redeveloped HKBH Block A, B and C is removed in the revised Table B1.
	Appendix B, Table B1, Table "Existing Development"	
	(5) For the estimation of swimming pool backwash flow, please provide relevant assumptions and detailed calculations to substantiate the calculation. If the backwash flow is discharged instantaneously during the backwash duration without retention, the discharge should be completed in 3 minutes as stated in the assumption. Please review and revise the estimated peak flow (L/s) arising from the backwash of swimming pool filtration system.	Relevant assumptions and detailed calculations are provided in revised Table B1 to substantiate the revised estimated peak flow arising from the backwash of swimming pool filtration system.
	(6) In accordance with Table T-1 of the GESF, the UFF for existing Private R3 domestic development should be 0.34 m3/day. Please review and revise the corresponding paragraphs and calculations in the report.	Noted and included in the revised Table B1.
	(7) For item #39 (WSD Mechanical and Electrical Workshop), please check and revise the GFA adopted in the calculation in accordance with the best available information.	The GFA for WSD Mechanical and Electrical Workshop is 16,300sqm as provided in WSD's Key Facts 2019 (Link included in Table B1).

No.	Comments	Responses
	(8) For item #40 (CSD Phoenix House), in view of the special housing type, it is suggested to consider it as "institutional and special class" instead of private R3. Please review and revise the calculation accordingly.	Noted and included in the revised Table B1.
6.	**Director of Drainage Services, dated 14 May 2024** Please find below our comment to the SIA of the submitted Planning Statements:	
	- The SIA for the subject planning application needs to meet the full satisfaction of Environmental Protection Department (EPD), the planning authority of sewerage infrastructure. DSD's comments on the captioned SIA submitted by the developer are subject to views and agreement of EPD.	Noted.
	- Appendix B, Table B1 – The selected uff for staff at the proposed development does not tally with the uff type stated with reference to EPD's GESF.	As commented by EPD on 1 March 2024 the UFF 0.28m^3/employee/day for hospital staff J11 Community, Social & Personal Services should be used.
	- Appendix B, Table B2 – The pipe segments between FMH4026348 and FMH4026349 are almost fully utilized, please consider to propose mitigation works.	The existing 225 dia. sewer between FMH4026348 and FMH4026349 will be upgraded to 250 internal dia. PE sewer.
	- Appendix B, Table B2 - Sewage flow upstream to FMH4026350 from FMH4026358 appears to be missing, please review and clarify.	The sewage flow upstream to FMH4026350 from FMH4026358 should be intercepted by the existing 600mm diameter sewer between FMH4026358 and FMH4026359 instead discharge to the existing 300mm dia. sewer between FMH4026351 and FMH4026353. Furthermore the existing sewer between FMH4026350 and FMH4026358 should be located at higher invert level at FMH4026358 as this existing sewer is located above the existing 900mm diameter stormwater drain between

No.	Comments	Responses
		SMH4031431 (IL28.52) and SMH4031415 (IL27.64) at the crossover point.
	- Appendix B, Table B2 – 150mm dia. pipe (between FTMH-01 and FMH4026160) should normally not be used unless agreed by the operation and maintenance agents.	As the section of Waterloo Road near Lion Rock Tunnel is day-time ban and difficult to obtain excavation permit, this existing 150mm dia. sewer (between FTMH-01 and FMH4026160) currently been used for HKBH should continue be used.
7.	**Environmental Protection Department, Environmental Assessment Division, Territory South Group, Kowloon, dated 26 April 2024** **Sewerage**	
	(1) It is noted that site verification on the manhole settings, including actual invert levels, will be conducted during detailed design stage. Please agree with DSD on the result of manhole survey and revise the hydraulic calculation based on the actual invert level of the concerned manholes when appropriate.	Noted and agreed.
	(2) Please be reminded that the implementation of local sewer connection and upgrading works shall meet the satisfaction of DSD.	Noted and agreed.
	Section 3.4	
	(3) Based on the information provided in Plans 2 and 2A, it is noted that sewer segment between manholes FTMH-02 and FMH4026344 will be upgraded from 150mm dia. to 225mm dia. Please include the description in the corresponding paragraph(s) of the SIA report for the sake of clarity.	Noted and description is included in Section 3.4 of the revised SIA report revision 4.
	Section 3.4 and Appendix B (Table B2)	

No.	Comments	Responses
	(4) It is noted that the sewer segment between manholes FMH4026348 and FMH4026349 will be upgraded from 225mm dia. to 250mm dia. pipe. In view of the size (i.e. 225mm dia.) and utilization rate (i.e. 94.8%) of the subsequent sewer segment between manholes FMH4026349 and FMH4026350, it is recommended to upgrade the sewer segments between FMH4026348 and FMH4026350 as mitigation measure with reference to the DSD's Sewerage Manual. ***Appendix B (Table B1)***	The sewer segments between FMH4026348 and FMH4026350 will be upgraded to 250mm dia. sewer. Plans 2 and 2A, Section 3.4 and Appendix B (Table B2) are updated in the revised SIA report revision 4.
	(5) Regarding the ADWF estimation for in-patient, please advise the assumption of UFF adopted, with consideration of the nature of residence instead of the UFF of commercial employee under the business type J11 (Community, Social & Personal Services). Please review and revise the estimated sewage flow as appropriate.	Considering the residence nature of in-patient, we proposed to adopt resident UFF (Institutional and Special Class) of 0.190m^3/day for in-patient. Table B1 of Appendix B is updated in the revised SIA report revision 4.
	(6) Regarding the ADWF estimation for hospital visitors, it appears that adjustment factor is applied in the calculation of ADWF. Please state the assumption adopted in the calculation to demonstrate the estimated ADWF is reasonable and realistic.	It is assumed that HKBH peak visiting hours are 12:00pm to 2:00pm and 5:30pm to 7:30pm (4 hours). The estimated sewage flow for visitors is pro-rata from daily flow (8 hours) respect with the visiting duration of 4 hours. This assumption is stated in the remark # of the revised Table B1 for reference.
	(7) Regarding item #39 (WSD Mechanical and Electrical Workshop), please elaborate how the assumption of "Assumed 50% Usable Floor Area for Staffs" is derived, taking into account the consultant's previous RtC in Feb 2024 of SIA (Issue 1) that 25% of GFA is assumed to be occupied by staff. Please clarify and provide	In Feb 2024 of SIA (Issue 1) that 25% of GFA is assumed to be occupied by staff with total estimated employee of 173 which we considered reasonable staff estimate for the existing WSD Mechanical and Electrical Workshop. In SIA (Issue 3), the exact GFA is available from WSD fact sheet which is lower than the assumed GFA in SIA (Issue 1). In order to come up with similar estimated staff number, we

Responses to Comments

No.	Comments	Responses
	relevant reference source to justify the assumption.	proposed to change in SIA (Issue 3) the percentage to 50% which resulted a similar estimated staff number of 187. Please refer to the latest assumption as stated in the remark ## of the revised Table B1 for justification.
8	**Drainage Services Department, Operations & Maintenance Branch, Mainland South Division, Mainland South 5(Kowloon City, Tsim Sha Tsui and Hung Hom), Tsim Sha Tsui, dated 26 June 2024** Appendix B Table B1 – Please clarify how the ADWFs generated by the No. of visitors under Blocks A, B, C, D and E are calculated. For example, in Block A: No. of visitors 380 x UFF 0.08 = ADWF 5.07?	It is assumed that HKBH peak visiting hours are 12:00pm to 2:00pm and 5:30pm to 7:30pm (4 hours). The estimated sewage flow for visitors is pro-rata from daily flow (8 hours) respect with the visiting duration of 4 hours. This assumption is stated in the remark # of the revised Table B1 for reference.

(Last Updated 21 June 2024)

Appendix B Revised Environmental Assessment Study

Hong Kong Baptist Hospital

Proposed Hospital Redevelopment with Minor Relaxation of Building Height Restriction in "Government, Institution or Community (7)" Zone and Areas Shown as 'Road' at Blocks A, B and C of Hong Kong Baptist Hospital, 222 Waterloo Road, Kowloon Tong, Kowloon

Environmental Assessment Study

REP-01-001

Draft Final

Job number 282303

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1 Introduction

1.1.1.1 This Environmental Assessment Study (EAS) was prepared in support of the Section 16 Planning Application for proposed minor relaxation of building height restriction for permitted hospital use at Blocks A, B and C of Hong Kong Baptist Hospital at No. 222 Waterloo Road, Kowloon Tong, Kowloon.

1.1.1.2 The Application Site is located at No. 222 Waterloo Road, situated in the community of Kowloon Tong near the foothill of the Beacon Hill, with an approximated site area of 5,648.5m2. The Application Site falls within an area zoned as the "Government, Institution and Community (7)" ("G/IC(7)") and Areas Shown as 'Road' on the Approved Kowloon Tong Outline Zoning Plan No. S/K18/21 (Kowloon Tong OZP).

1.1.1.3 This EAS is conducted to evaluate the potential environmental impacts on the proposed development with respect to the guidance for environmental considerations provided in Chapter 9 – Environment of the Hong Kong Planning Standards & Guidelines (HKPSG). The structure of this EAS report is as follows:

Chapter	Title	Aims
1	Introduction	Provides project background, objective and scope of this EAS
2	Project Description	Describes the site and the surrounding environment
3	Air Quality Impact	Presents the legislation, methodology; assesses qualitatively the impacts on construction and operational phases; and provides recommendations to mitigate air quality impacts
4	Noise Impact	Presents the legislation, methodology; assesses qualitatively and quantitatively the impacts on construction and operational phases respectively; and provides recommendations to mitigate noise impacts
5	Water Quality Impact	Presents the legislation, methodology; assesses qualitatively the impacts on construction and operational phases; and provides recommendations to mitigate water quality impact
6	Waste Management Implication	Presents the legislation, methodology; assesses qualitatively the impacts on construction and operational phases; and provides recommendations for waste management implications

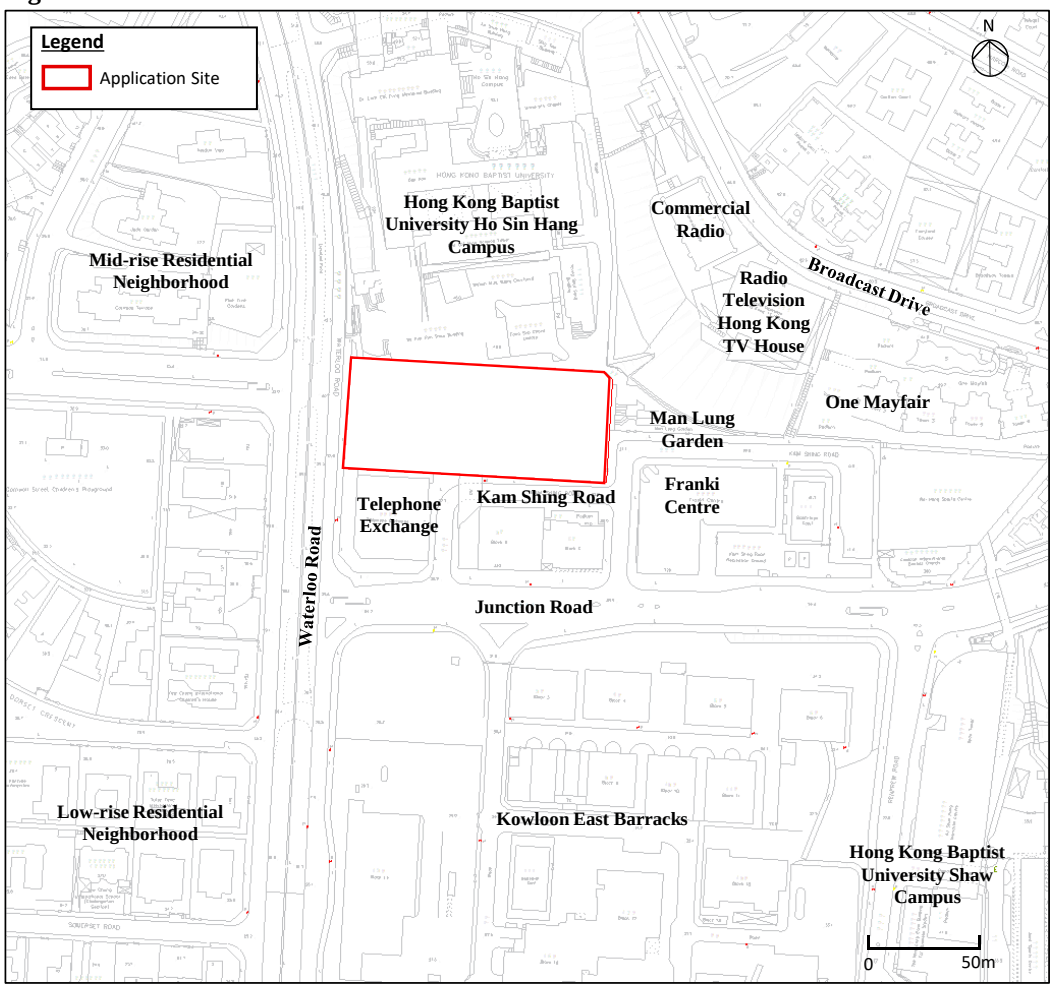
Chapter	Title	Aims
7	Land Contamination Impact	Presents the legislation, methodology; assesses qualitatively the impacts on construction and operational phases; and provides recommendations for land contamination implication
8	Conclusion	Summarises and concludes the findings

2 Site Location and Building Design

2.1 Site Location and Description

2.1.1.1 The Application Site is bounded by Waterloo Road to the west, the Telephone Exchange to the southwest, Kam Shing Road to the south, Franki Centre and Man Lung Garden to the east, the Radio Television Hong Kong TV House and Commercial Radio to the northeast and the Hong Kong Baptist University (HKBU) Ho Sin Hang Campus to the north. The Application Site has been used as a private hospital since 1963. There are 5 blocks of hospital buildings (i.e., Block A to E) in total, 3 of them (Blocks A to C) are included in the Application Site. To the immediate northeast of the Application Site is an area on top of elevated ground, dominated by mid-rise residential developments (e.g. One Mayfair) and broadcasting-related facilities such as Radio Television Hong Kong and Commercial Radio, building around the Broadcast Drive. To the immediate northwest of the Application Site is a mid-rise residential neighbourhood (e.g. Jade Garden, Cornwall Terrace, etc.) situated on a gentle slope between Waterloo Road and Lung Cheung Road. To the immediate southeast of the Application Site is the Kowloon East Barracks, and the mid-rise Shaw Campus of the HKBU. To the immediate southwest of the Application Site is a low-rise residential neighbourhood mixed with various educational and religious institution uses. The location of the Application Site is illustrated in **Figure 2.1**.

Figure 2.1: Site location



2.1.1.2 In accordance with the Approved Kowloon Tong Outline Zoning Plan No. S/K18/21 (Kowloon Tong OZP), the Application Site is currently zoned as Government, Institution and Community (7)" ("G/IC(7)") and Areas Shown as 'Road'. The areas in the vicinity are mainly zoned as "Residential (Group C)1" ("R(C)1"), "Residential (Group C)6" ("R(C)6"), "Residential (Group C)10" ("R(C)10"), "Government, Institution or Community" ("G/IC"), "Commercial (2)" ("C(2)") and "Other Specified Uses (MILITARY CAMP)" ("OU").

2.2 Site Inspection

2.2.1.1 Site visit was carried out in March 2024. Photographs taken at the site and the neighbouring areas are given in **Photo 3.1** to **Photo 3.7** below.

2.2.1.2 The Application Site (**Photo 3.1**) is situated at the existing Hong Kong Baptist Hospital Blocks A, B and C. The Hong Kong Baptist University Ho Sin Hang Campus (**Photo 3.2**) is located at the immediate north. Further northeast, upon a hill, locates the Commercial Radio Hong Kong (**Photo 3.3**) and Radio Television Hong Kong Television House (**Photo 3.4**). Towards the east, Man Lung Garden (**Photo 3.5**) and Franki Centre (**Photo 3.6**) sits adjacent. In the south, exists the Hong Kong Baptist Hospital Blocks D and E, Telephone Exchange (**Photo 3.7**),

and Kowloon East Barracks (**Photo 3.8**). Further to the west, the Application Site is bounded by Waterloo Road (**Photo 3.9**) and a low-rise residential neighbourhood (**Photo 3.10**). Lastly, towards the northwest exists some mid-rise residential buildings (i.e. Jade Garden, Pine Tree Gardens, etc.) (**Photo 3.11**).

2.2.1.3 Based on site observation, the noise climate in the vicinity of the Application Site was dominated by traffic noise from Waterloo Road. No other significant noise was perceived at the Site.

Photo 3.1: Application Site	**Photo 3.2: Hong Kong Baptist University Ho Sin Hang Campus**
	
Photo 3.3: Commercial Radio Hong Kong	**Photo 3.4:** Radio Television Hong Kong Television House
	

Photo 3.5: Man Lung Garden	**Photo 3.6**: Franki Centre
	
Photo 3.7: Hong Kong Baptist Hospital Blocks D and E, Kowloon Tong Telephone Exchange	**Photo 3.8**: Kowloon East Barracks

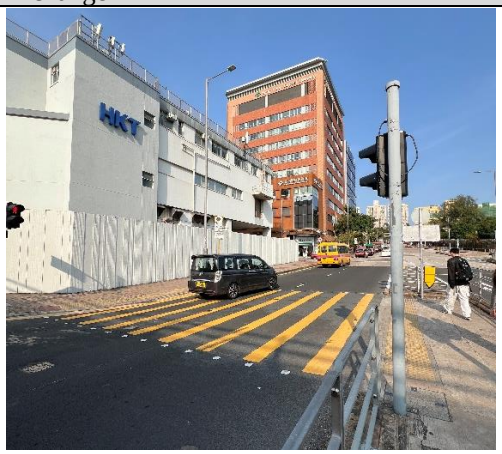



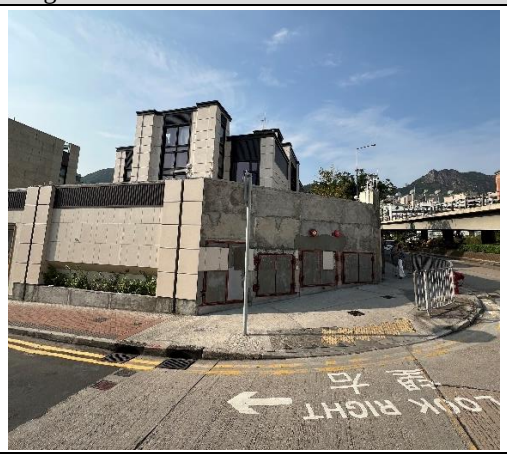
Photo 3.9: Waterloo Road	**Photo 3.10:** Low-rise residential neighbourhood
	

Photo 3.11: Mid-rise residential buildings

2.3 Building Design

2.3.1.1 The proposed development is a redevelopment of existing Blocks A, B and C of Hong Kong Baptist Hospital. The proposed development consists of 14-storeys building at Block A and 15 storeys building at Block B and C, with 3 levels of basement. Floor uses of the proposed development are set out in **Table 2.1** below.

Table 2.1: Floor Uses of the Proposed Development

Blocks A, B & C	
R/F	E&M / Green Roof
4-14/F	Clinical Services / Support Services / E&M / Back of House (B.O.H.)
3/F	Clinical Services / Support Services / E&M / Back of House (B.O.H.) / Staff
2/F	Clinical Services / Support Services / E&M / Link Bridge /Back of House (B.O.H.)
1/F	Clinical Services / Ancillary Services / Link Bridge / E&M / Back of House
G/F	Clinical Services / Ancillary Services / Support Services / Loading /Unloading/ Drop-off Area/ Entrance Atrium/ Back of House (B.O.H)
B1/F	Car Park / E&M / Support Services
B2/F	Car Park / E&M / Support Services
B3/F	Clinical Services / Support Services / E&M

2.3.1.2 To ensure continuation of clinical operation during the entire redevelopment process, the redevelopment will be carried out in 2 phases. Phase 1 serves to demolish existing Block A, 'New Block (Phase 1)' will be constructed at the same location upon completion of demolition of 'existing Block A'. Upon completion of New Block (Phase 1), phase 2 redevelopment will be commenced which involves demolishing existing Blocks B and C and construction of 'New Block (Phase 2)'. The tentative completion year of the whole development is Year 2034.

2.3.1.3 The key development parameters for the Application Site are given in **Table 2.2**. The layout plans and schematic section drawings are provided in the Planning Statement.

Table 2.2: Key development parameters for the Proposed House Development

	Development Parameters
Application Site Area	About 5,648.5 m^2
Plot Ratio	10.89
Total Gross Floor Area	About 61,513 m^2
No of Blocks	1
No. of Storeys	Block A: 14 [1] Block B and C: 15 [1]
Floor-to-floor Height	About 4.2 – 6m
Building Height	Block A: about +98.5mPD Block B and C: about +102.5mPD
Tentative Completion Year	2034

Note:
[1] Excluding 3 levels of basement.

2.4 EIAO Implication

2.4.1.1 This section is to identify if the proposed works/facilities of the development would constitute any Designated Project(s) (DPs) under the Environmental Impact Assessment Ordinance (EIAO). Details are discussed below.

Engineering Feasibility Study for Urban Development Projects

2.4.1.2 The proposed development site is less than 50ha, and hence it does not constitute a DP under Schedule 3 of EIAO.

Road Works

2.4.1.3 The site is currently served by existing Waterloo Road and Kam Shing Road. Ingress and egress points of the site will be provided at Waterloo Road and Kam Shing Road which is considered as minor work only. Therefore, it does not fall into the category of Item A.1 of Schedule 2 of EIAO and does not constitute a DP under Schedule 2 of EIAO.

Sewerage Works

2.4.1.4 Sewage generated from the Application Site will be served by the existing public sewer running along Kam Shing Road and Junction Road. Therefore, it does not constitute a DP under Schedule 2 of EIAO.

Drainage Works

2.4.1.5 As confirmed by the Engineers, the stormwater from the proposed development is proposed to be discharged into the existing public stormwater drain along Kam Shing Road and Junction Road. The proposed drainage works do not fall into the category of Item I.1 of Schedule 2 of EIAO and do not constitute a DP under Schedule 2 of EIAO.

Works within Nearby Sensitive Areas Listed in Item Q.1

2.4.1.6 All works of the proposed development will not encroach in an existing or gazetted proposed country park or special area, a conservation area, an existing or gazetted

proposed marine park or marine reserve, a site of cultural heritage, and a site of special scientific interest. Therefore, the proposed works for the site do not fall into the category of Item Q.1 of Schedule 2 of EIAO and do not constitute a DP under Schedule 2 of EIAO.

3 Air Quality

3.1 Legislation, Standards and Guidelines

3.1.1 General

3.1.1.1 The relevant legislations, standards and guidelines applicable to the present study for the assessment of air quality impacts include:

- Air Pollution Control Ordinance (APCO) (Cap. 311);
- Air Pollution Control (Construction Dust) Regulation;
- Air Pollution Control (Non-road Machinery) (Emission) Regulation; and
- Hong Kong Planning Standards and Guidelines (HKPSG).

3.1.2 Air Pollution Control Ordinance

3.1.2.1 The principal legislation for controlling air pollutants is the APCO (Cap. 311) and its subsidiary regulations, which defines statutory Air Quality Objectives (AQOs).

3.1.2.2 The APCO (Cap. 311) provides the power for controlling air pollutants from a variety of stationary and mobile sources and encompasses a number of AQOs. In addition to the APCO, the following overall policy objectives are laid down in Chapter 9 of the HKPSG as follows:

- Limit the contamination of the air in Hong Kong, through land use planning and through the enforcement of the APCO to safeguard the health and well-being of the community; and
- Ensure that the AQOs for 7 common air pollutants are met as soon as possible.

3.1.2.3 The prevailing AQOs, which took effect on 1 January 2022, are listed in **Table 3.1** below.

Table 3.1: Hong Kong air quality objectives

Pollutant	**Limits on Concentration, µg/m^3 [1] (Number of Exceedance per year allowed in brackets)**				
	10-min	**1-hr**	**8-hr**	**24-hr [2]**	**Annual [2]**
Sulphur Dioxide (SO_2)	500 (3)	-	-	50 (3)	-
Respirable Suspended Particulates (RSP, or PM_{10}) [3]	-	-	-	100 (9)	50
Fine Suspended Particulates (FSP, or $PM_{2.5}$) [4]	-	-	-	50 (35/18) [5]	25
Carbon Monoxide (CO)	-	30,000 (0)	10,000 (0)	-	-
Nitrogen Dioxide (NO_2)	-	200 (18)	-	-	40
Ozone (O_3)	-	-	160 (9)	-	-

Pollutant	Limits on Concentration, μg/m³ [1] (Number of Exceedance per year allowed in brackets)				
	10-min	1-hr	8-hr	24-hr [2]	Annual [2]
Lead (Pb)	-	-	-	-	0.5

Note:
[1] Measured at 293K and 101.325 kPa (for gaseous pollutants only).
[2] Arithmetic mean.
[3] RSP means suspended particulates in air with a nominal aerodynamic diameter of 10 micrometres or smaller.
[4] FSP means suspended particulates in air with a nominal aerodynamic diameter of 2.5 micrometres or smaller.
[5] A more stringent standard of 24-hour AQO for FSP (i.e. tightening the number of allowable exceedances to 18 days per calendar year) would be adopted for government projects.

3.1.2.4 The APCO (Cap. 311) also specifies that for premises that contain asbestos containing materials (ACM), the owner/occupier of the premises shall hire a registered a registered asbestos contractor to carry out the removal of the ACM. They shall give a written notice to the Environmental Protection Department (EPD) not less than 28 days prior to the commencement of the work.

3.1.3 Air Pollution Control (Construction Dust) Regulation

3.1.3.1 The Air Pollution Control (Construction Dust) Regulation specifies processes that require special dust control. The Contractors are required to inform the Environmental Protection Department (EPD) and adopt proper dust suppression measures while carrying out "Notifiable Works" (which requires prior notification by the regulation) and "Regulatory Works" to meet the requirements as defined under the regulation.

3.1.4 Air Pollution Control (Non-road mobile Machinery) (Emission) Regulation

3.1.4.1 Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation specifies that all Non-road Mobile Machinery (NRMMs), except those exempted, used in specified activities and locations including construction sites, container terminals and back up facilities, restricted areas of the airport, designated waste disposal facilities and specified processes are required to comply with the prescribed emission standards.

3.1.5 Hong Kong Planning Standards and Guidelines

3.1.5.1 Chapter 9 of HKPSG outlines the environmental requirements that need to be considered in land use planning. The recommended guidelines, standards and guidance cover the selection of suitable locations for the developments and sensitive uses, provision of environmental facilities, and design, layout, phasing and operational controls to minimise adverse environmental impacts. It also lists out environmental factors influencing land use planning and recommends buffer distances for land uses. The HKPSG also recommends minimum setback distance from different categories of air pollution sources. **Table 3.2** shows these minimum setback distances.

Table 3.2: Guidelines on buffer distance between air pollution sources and different land uses

Pollution Source	Parameter	Buffer Distance	Permitted Uses
Road and Highways	*Type of Road*		
	Trunk Road and Primary Distributor	> 20m	Active and passive recreation uses
		3 – 20m	Passive recreational uses
		< 3m	Amenity areas
	District Distributor	> 10m	Active and passive recreational uses
		< 10m	Passive recreational uses
	Local Distributor	> 5m	Active and passive recreational uses
		< 5m	Passive recreational uses
Industrial Areas	*Difference in Height between Industrial Chimney Exit and the Site*		
	< 20m	> 200m	Active and passive recreational uses
		5 – 200m	Passive recreational uses
	20 – 30m (*)	> 100m	Active and passive recreational uses
		5 – 100m	Passive recreational uses
	30m – 40m	> 50m	Active and passive recreational uses
		5 – 50m	Passive recreational uses
	> 40m	> 10m	Active and passive recreation uses
Construction and Earth Moving Activities	-	< 50m	Passive recreational uses
		> 50m	Active and passive recreational uses

Note:
[1] In situations where the height of chimneys is not known, use the set of guidelines marked with an asterisk for preliminary planning purpose and refine as and when more information is available.
[2] The buffer distance is the horizontal, shortest distance from the boundary of the industrial lot, the position of existing chimneys or the edge of road kerb, to the boundary of open space sites.
[3] The guidelines are generally applicable to major industrial areas but NOT individual large industrial establishments which are likely to be significant air pollution sources. EPD shall be consulted when planning open space sites close to such establishments.
[4] Amenity areas are permitted in any situation.

3.2 Identification of Representative Air Sensitive Receivers

3.2.1.1 In accordance with Annex 12 of the EIAO-TM, Air Sensitive Receivers (ASRs) include any domestic premises, hotel, hostel, hospital, clinic, nursery, temporary housing accommodation, school, educational institution, office, factory, shop, shopping centre, place of public worship, library, court of law, sports stadium or performing arts centre. Any other premises or places with which, in terms of duration or number of people affected, have a similar sensitivity to the air pollutant as the aforelisted premises and places would also be considered as a sensitive receiver.

3.2.1.2 Existing ASRs are identified by means of reviewing topographic maps, aerial photos, land status plans and supplemented by site inspections, whilst planned/ committed ASRs are reviewed by making reference to relevant Outline Zoning Plans (OZP), Outline Development Plans, Layout Plans and other published plans in the vicinity of the site.

3.2.1.3 Representative ASRs within 500m study area have been reviewed. Details of the identified ASR are summarised in **Table 3.5**. and its corresponding location is illustrated in **Figure 3.2**.

Figure 3.2: Location of representative ASR within 500m study area

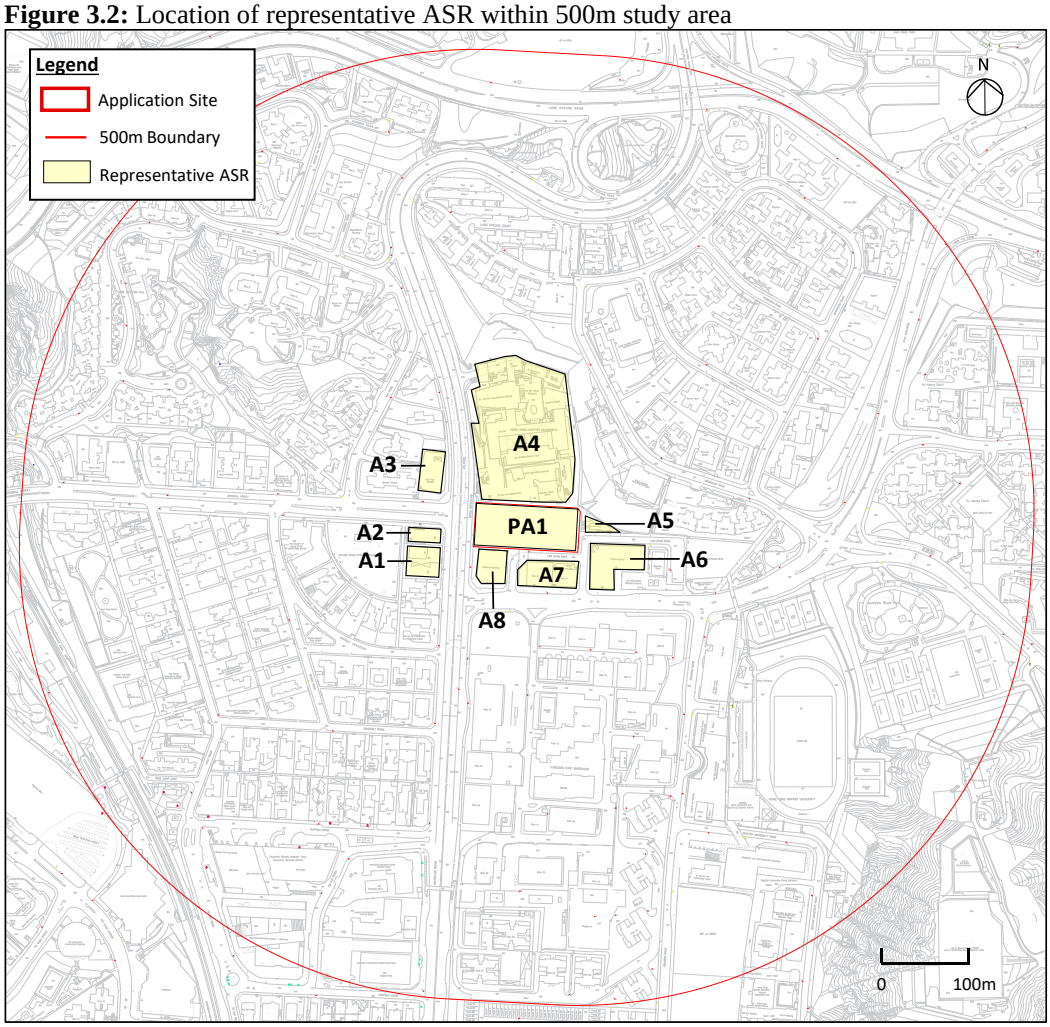


Table 3.5: Representative ASR within 500m study area

ASR ID	Location	Land Use	Approx. Distance from Site (m)	ASR for Construction Phase	ASR for Operational Phase
Existing ASR					
A1	161 Waterloo Road	Residential	50	✓	×
A2	163 Waterloo Road	Residential	40	✓	×
A3	Pine Tree Gardens	Residential	40	✓	×
A4	Hong Kong Baptist University Ho Sin Hang Campus	Educational	5	✓	×
A5	Man Lung Garden	Recreational	10	✓	×
A6	Franki Centre	Commercial	15	✓	×
A7	Hong Kong Baptist Hospital Block D and E	Hospital	15	✓	×
A8	Telephone Exchange	Office	< 5	✓	×
Planned ASR					
PA1	Proposed Hospital Redevelopment	Hospital	Within the Site	×	✓

3.3 Evaluation of Construction Phase Impact

3.3.1 Identification and Evaluation of Impact

3.3.1.1 The key sources of potential air quality impact during construction phase would be the dust emission generated from the construction activities associated with the Project, including site clearance, demolition, piling works, soil excavation for basement and superstructure, loading and unloading dusty material, and wind erosion of open sites. Based on the latest available information at the time of preparing this Report, the size of site formation and amount of excavated materials would be about 5073m^2 and 112,000 m^3 respectively. The horizontal separation distance from the nearest ASR identified (i.e. Telephone Exchange (A8)) is less than 5m. Nevertheless, given the proper implementation of recommended good site practices as stipulated in Air Pollution Control (Construction Dust) Regulation in place, any potential construction dust impact is expected to be minimized.

3.3.1.2 Fuel combustion from the use of Powered Mechanical Equipment (PME) during construction works could be a source of NO2, SO_2 and CO. Information regarding the number of machinery anticipated on site during construction stage is unavailable at the time of preparing this Report. Nevertheless, in order to improve air quality and protect public health, EPD has introduced the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation, which came in effect on 1 June 2015, to regulate emissions from machines and non-road vehicles. Starting from 1 December 2015, only approved or exempted non-road mobile machinery are allowed to be used in construction sites. Hence, the emissions from PMEs are considered relatively small and will not cause insurmountable adverse air quality impact to nearby ASRs with the effect of the Regulation.

3.3.1.3 Based on review on EIA and other planning applications available in public domain, no concurrent project is identified in the vicinity of the site. Therefore, no cumulative constructional air quality impact is anticipated.

3.3.2 Recommended Practices

3.3.2.1 The Contractor is recommended to follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation. It stipulates the construction dust control requirements for both Notifiable and Regulatory Works to be carried out by the Contractor. The following dust suppression measures should be incorporated by the Contractor to monitor and control the dust nuisance throughout the construction phase:

- Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading;
- Any dusty material remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;
- A stockpile of dusty material should not extend beyond the pedestrian barriers, fencing or traffic cones;

- The load of dusty materials on vehicles leaving a construction site should be covered entirely by impervious sheeting to ensure that the dusty materials do not leak from the vehicle;
- Where practicable, vehicles washing facilities including a high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores;
- When there are open excavation and reinstatement works, hoarding of not less than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period;
- The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials;
- Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation take place should be sprayed with water or a dust suppression chemical continuously;
- Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the 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 1 m higher than the highest level of the structure being demolished;
- Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding;
- Any skip hoist for material transport should be totally enclosed by impervious sheeting;
- Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the three sides;
- Immediately before leaving a construction site, all vehicles shall be washed to remove any dusty materials from its body and wheels;
- Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; and
- Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen,

shortcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.

- Connecting construction plant and equipment to mains electricity supply should be considered and use of diesel generators and diesel-powered equipment should be avoided as far as possible.

3.3.2.2 Fuel combustion from the use of PME during construction works would be a source of air emission. Ultra-low sulphur diesel (ULSD) with a sulphur content of not more than 0.005% by weight and a viscosity of not more than 6 centistokes at 40^{o}C will be used to minimise SO_2 emissions in accordance with Air Pollution Control (Fuel Restriction) Regulation. Under the Air Pollution Control (Non-road Mobile Machinery) (Emission) Regulation, NRMMs, except those exempted, are required to comply with the prescribed emission standards. All regulated machines sold or leased for use in Hong Kong must be approved or exempted with a proper label in a prescribed format issued by EPD. Only approved or exempted NRMMs with a proper label are allowed to be used in specified activities and locations including construction sites.

3.3.2.3 To further control and reduce the emission from the use of NRMM from the Project, the following good site practices are recommended:

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

3.3.2.4 Given that some ASRs (i.e. Hong Kong Baptist University Ho Sin Hang Campus and Telephone Exchange) are located close to the Application Site, the following measures shall be considered near those ASRs during construction phase to further minimize the dust impact:

- Adopt site hoarding at sufficient height close to those concerned ASRs;
- Locate the haul road away from those concerned ASRs;

- Avoid dusty works or placing stockpiles near to those concerned ASRs; and
- Minimization of unpaved, exposed earth by immediate covering/ permanent paving as soon as the works have been completed.

3.3.2.5 Furthermore, guidelines stipulated in EPD's Recommended Pollution Control Clauses for Construction Contracts should also be incorporated in the contract documents to abate dust impacts. The clauses include:

- The Contractor shall observe and comply with the Air Pollution Control Ordinance and its subsidiary regulations, particularly the Air Pollution Control (Open Burning) Regulation, Air Pollution Control (Construction Dust) Regulation, Air Pollution Control (Non-road Mobile Machinery)(Emission) Regulation , Air Pollution Control (Fuel Restriction) Regulation and Air Pollution Control (Smoke) Regulation;
- In addition to the statutory requirements of the Regulations, the Contractor of the public works contracts shall also observe the requirements as set out in the government circulars, including DEVB's TC No, 13/2020 (Timely Application of Temporary Electricity and Water Supply for Public Works Contracts and Wider Use of Electric Vehicles in Public Works Contracts) and DEVB's TC No. 1/2015 (Emissions Control of NRMM in Capital Works Contracts of Public Works);
- The Contractor shall undertake at all times to prevent dust nuisance and smoke as a result of his activities, and minimise the emission of air pollutants from construction plant and equipment;
- The Contractor shall ensure that there will be adequate water supply/storage for dust suppression;
- The Contractor shall devise, arrange methods of working and carrying out the works in such a manner so as to minimise dust impacts on the surrounding environment, and shall provide experienced personnel with suitable training to ensure that these methods are implemented;
- For better smoke control, the Contractor shall not use diesel hammer for percussive piling; and
- Before the commencement of any work, the Engineer may require the methods of working, plant, equipment and air pollution control system to be used on the site to be made available for inspection and approval to ensure that they are suitable for the project.

3.3.2.6 With the implementation of these good practice and measures, adverse construction dust impacts on the ASRs are not anticipated. Construction dust impacts are therefore not insurmountable.

3.4 Evaluation of Operational Phase Impact

3.4.1 Vehicular Emission

3.4.1.1 The site is bounded by Waterloo Road and Kam Shing Road. Vehicular emissions arising from these roads would be potential air pollution sources to any proposed active and recreational uses within the site. HKPSG provides environmental guidance on air quality for planning developments. The guidelines recommend the minimum buffer distance required for active and passive recreational uses.

3.4.1.2 According to the Annual Traffic Census 2022, Waterloo Road is classified as Primary Distributor. Thus, the minimum buffer distance of 20m for active and passive recreational uses has been recommended according to HKPSG.

3.4.1.3 The road types of Kam Shing Road are not indicated in the Annual Traffic Census. The Traffic Department (TD) has confirmed that it is Local Distributor and the correspondence is enclosed in **Appendix 3.1**. Hence, the minimum buffer distance of 5m for active and passive recreational uses has been recommended according to HKPSG.

3.4.1.4 The minimum buffer distances required between the aforementioned roads and any proposed active and passive recreational uses with reference to HKPSG are summarized in below **Table 3.6**.

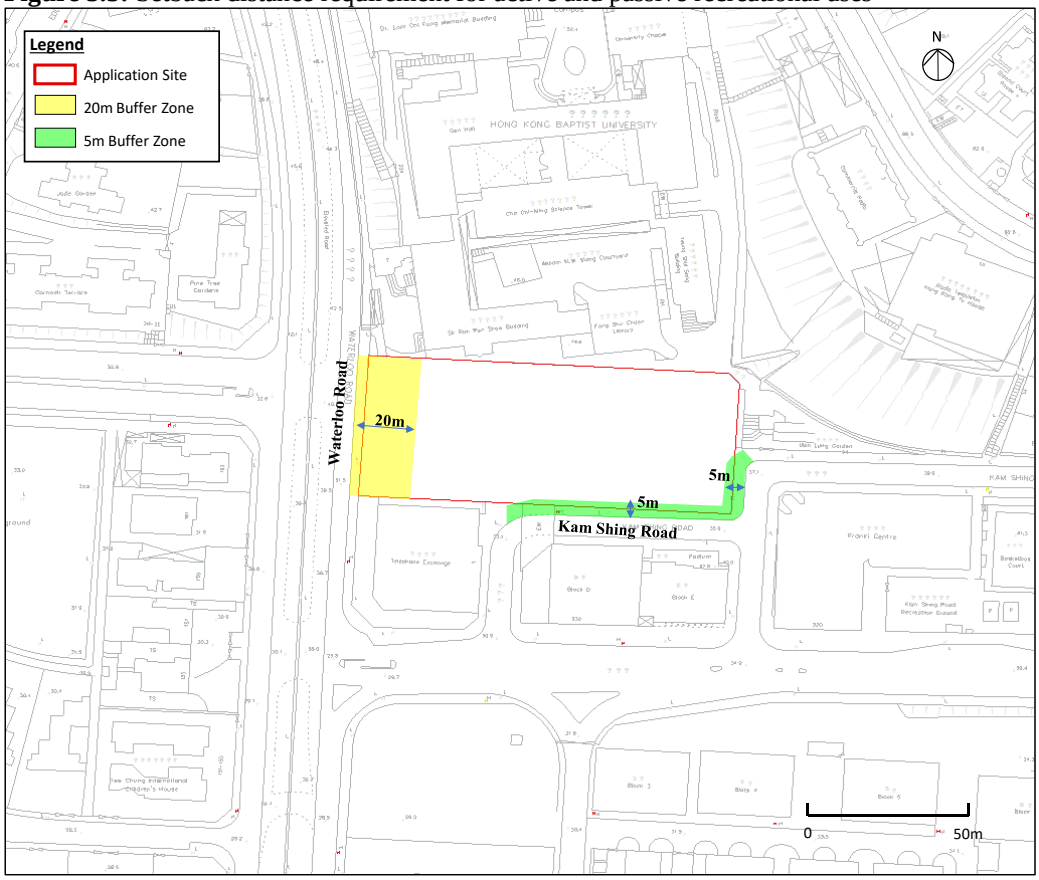
Table 3.6: Separation distances between the proposed building block and nearby major roads

Name of Road	Type of Road	HKPSG Recommended Setback Distance for Local Distributor
Waterloo Road	Primary Distributor / Urban Trunk [1]	>20m
Kam Sing Street	Local Road [2]	>5m

Notes:
[1] In accordance with Annual Traffic Census 2022.
[2] Confirmed by Traffic Department.

3.4.1.5 Detailed design of the proposed development is unavailable at the time of preparing this Report. Nevertheless, setback distance requirements as stipulated in HKPSG would be followed for any proposed active and passive recreational uses, as illustrated in **Figure 3.3**. The proposed development is a medical facility which would rely on centrally air-conditioning. Fresh air intakes as well as any other proposed open recreational uses would be planned in accordance with the HKPSG requirements to avoid vehicular emission from adjacent roads. Adverse vehicular emission impact on the proposed development is therefore not anticipated.

Figure 3.3: Setback distance requirement for active and passive recreational uses



3.4.2 Chimney Emission

3.4.2.1 A chimney survey was conducted on a walk-over basis within 500m from the site boundary where site access was allowed and practicable in March 2024. One chimney was identified at the existing Block A of Hong Kong Baptist Hospital. This chimney will be removed during the demolition of Block A. Centralized electric hot water boiler system is proposed for the redevelopment, as such no reprovision or new chimney will be implemented. Besides, no other chimney was found within 500m of the site. Hence, no adverse air quality due to chimney emission is anticipated.

4 Noise Impact

4.1 Legislation, Standards and Guidelines

4.1.1 General

4.1.1.1 The relevant legislations, standards and guidelines applicable to the present assessment of noise impacts include:

- Noise Control Ordinance (NCO) (Cap. 400);
- Technical Memorandum I on Noise from Construction Work other than Percussive Piling (GW-TM);
- TM on Noise from Construction Work in Designated Areas (DA-TM);
- TM on Noise from Percussive Piling (PP-TM);
- TM for the Assessment of Noise from Places other than Domestic Premises, Public Places or Construction Sites (IND-TM); and
- Good Practices on Ventilation System Noise Control;
- ProPECC PN 1/24 "Minimizing Noise from Construction Activities"; and
- Hong Kong Planning Standards and Guidelines (HKPSG).

4.1.2 Construction Noise Standards

4.1.2.1 There is no statutory noise limit for general construction works during daytime (i.e. 0700 to 1900 hours on any day not being a Sunday or general holiday) under the Noise Control Ordinance (NCO) and related Technical Memoranda (TMs) while the NCO provides statutory control of general construction works during restricted hours (i.e. 1900 to 0700 hours (of the next day) from Monday to Saturday and at any time on Sundays or general holidays). Nevertheless, ProPECC PN1/24 "Minimizing Noise from Construction Activities" stipulates criteria of 65 to 75dB(A) for daytime construction activities. **Table 4.1** below shows the criteria as stipulated in ProPECC PN1/24 "Minimizing Noise from Construction Activities".

Table 4.1: Noise standards for construction activities

Uses	**Noise Standards[1], $L_{eq\ (30mins)}$**
	0700-1900 hours on any day not being a Sunday or general Holiday
All domestic premises Temporary housing accommodation Hostels Convalescences homes Homes for the aged	75
Places of public worship Courts of law Hospitals and medical clinics	70

Uses	Noise Standards[1], $L_{eq\ (30mins)}$
	0700-1900 hours on any day not being a Sunday or general Holiday
Educational institutions including kindergartens, nurseries and all others where unaided voice communication is required	70 65 (During Examination)

Notes:

[1] The above standards apply to uses that rely on opened windows for ventilation.

[2] The standards shall be viewed as the maximum permissible noise levels assessed at 1m from the external façade.

4.1.3 Noise Standards for Fixed Noise Sources

4.1.3.1 The HKPSG states that in order to plan for a better environment, all planned fixed noise sources should be located and designed that when assessed in accordance with the TM-Place, the level of intruding noise at the façade of the nearest sensitive use should be at least 5dB(A) below the appropriate Acceptable Noise Levels (ANLs) shown in Table 2 of the TM-Place or, in the case of the background being 5dB(A) lower than the ANL, should not be higher than the background.

4.1.3.2 The ANL for a particular Noise Sensitive Receiver (NSR) is dependent upon the Area Sensitive Rating of the area within which the NSR is located, and the time period under consideration.

4.1.3.3 Area Sensitivity Rating is defined in the TM–Places issued under the NCO. The Area Sensitivity Rating depends on the type of area and the degree of impact that Influencing Factors (IFs) have on the NSRs. Industrial area, major road (with an annual average daily traffic (AADT) flow in excess of 30,000) or the area within the boundary of Hong Kong International Airport shall be considered to be an IF.

4.1.3.4 The appropriate Area Sensitivity Rating for the NSR shall be assigned on the basis of **Table 4.2**. Having regard to the appropriate Area Sensitivity Rating and the time period under consideration, the appropriate ANL for a given NSR could be determined from **Table 4.3**. All these criteria only apply to NSRs relying on opened windows for ventilation.

Table 4.2: Area Sensitivity Ratings

Type of area containing Area Sensitivity Rating	Degree to which NSR is affected by IF		
	Not Affected	**Indirectly Affected**	**Directly Affected**
i) Rural area, including country parks or village type developments	A	B	B
ii) Low density residential area consisting of low-rise or isolated high-rise developments	A	B	C
iii) Urban area	B	C	C
iv) Area other than those above	B	B	C

Table 4.3: Acceptable noise level for different Area Sensitivity Ratings and time periods

Time Period	Area Sensitivity Rating		
	A [1]	B [1]	C [1]
Day (0700 to 1900 hours)	60 (55)	65 (60)	70 (65)
Evening (1900 to 2300 hours)			
Night (2300 to 0700 hours)	50 (45)	55 (50)	60 (55)

Notes:

[1] The brackets show the permissible noise levels at NSRs for any planned fixed plant noise sources, i.e. 5 dB(A) below the corresponding ANLs.

4.2 Identification of Representative Noise Sensitive Receivers

4.2.1.1 With reference to Appendix 4.1 of Chapter 9 of the HKPSG, Noise Sensitive Uses include residential uses (all domestic premises including temporary housing), offices, institutional uses (educational institutions including kindergarten and nurseries), hospitals, medical clinics, residential care homes for the elderly, convalescent homes, places of public worship, libraries, courts of law, performing arts centres, auditoria, amphitheatres and Country Parks.

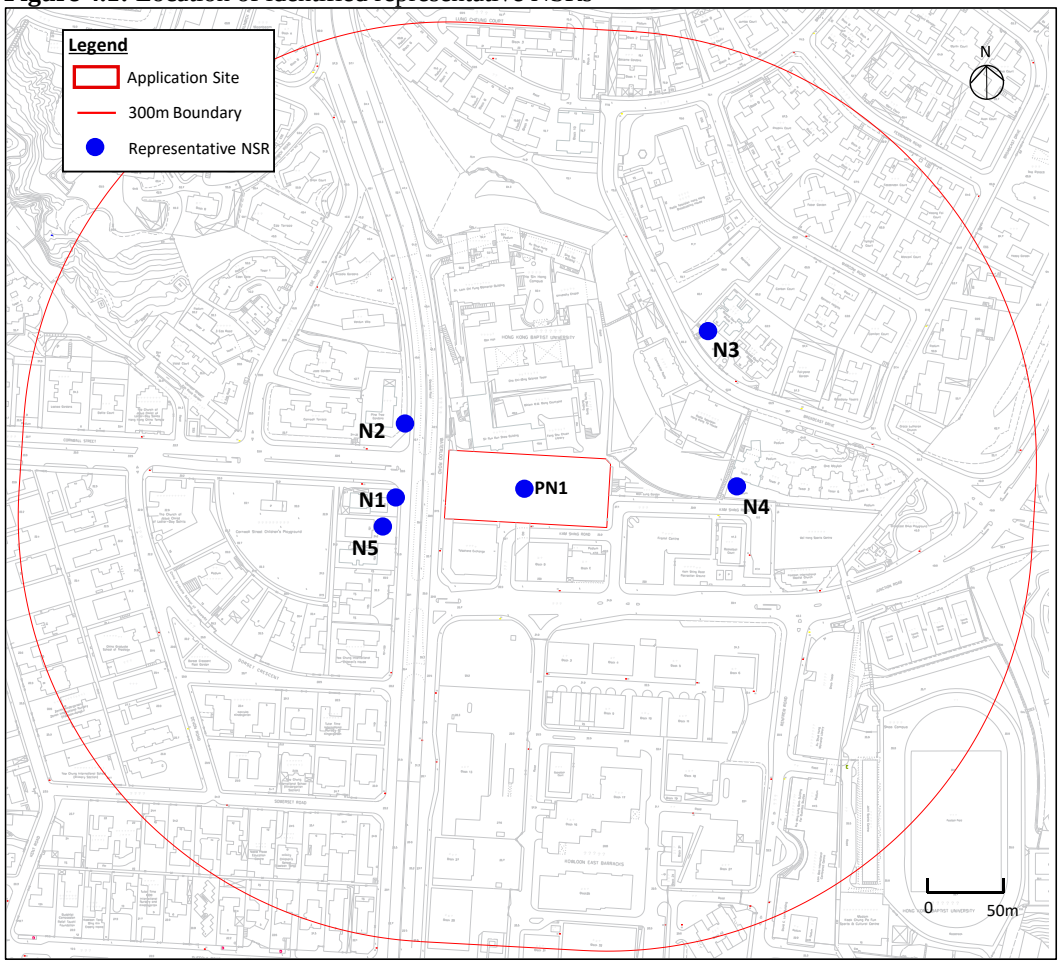
4.2.1.2 The proposed development is a medical facility which would be operating with central air-conditioning system and not be relying on opened window for ventilation. As such, the HKPSG standards do not apply to the proposed medical facility.

4.2.1.3 The assessment area for noise impact assessment is generally defined by a distance of 300m from the boundary of the site. Within the assessment area, the first layer of NSRs is identified as key representative NSRs for noise assessment. No planned NSR is identified within the assessment area. Details of the identified representative NSR are summarised in **Table 4.4**. and its corresponding location is illustrated in **Figure 4.1**.

Table 4.4: Representative NSRs within 300m study area

NSR ID	Location	Land Use	Approx. Distance from Site (m)	NSR for Construction Phase	NSR for Operational Phase
Existing NSR					
N1	3/F, 163 Waterloo Road	Residential	40	✓	✓
N2	12/F, Pine Tree Gardens	Residential	40	✓	✓
N3	10/F, Boland Court Phase II	Residential	120	✓	✓
N4	1/F, One Mayfair Tower 1	Residential	90	✓	✓
N5	2/F 161 Waterloo Road	Residential	50	✓	✓
Planned NSR					
PN1	Proposed Hospital Redevelopment	Hospital	Within the Site	×	✓

Figure 4.1: Location of identified representative NSRs



4.3 Evaluation of Construction Phase Impact

4.3.1 Construction Noise Impact

4.3.1.1 Potential source of noise impact during construction phase would be construction noise generated from the use of Powered Mechanical Equipment (PME) for various construction activities. The key construction activities include site clearance, demolition, soil excavation for basement, piling works and superstructure works, which would involve the use of excavator, breaker, dump truck, etc.

4.3.1.2 The horizontal separation distance from the nearest NSR identified (i.e. 3/F, 163 Waterloo Road (N1)) is approximately 40m. The Contractor would be required to implement the mitigation measures mentioned in ProPECC PN 1/24 "Minimizing Noise from Construction Activities" as good practices. By adopting appropriate mitigation measures and good site practices, the construction noise impact can be minimised.

4.3.2 Recommended Mitigation Measures

4.3.2.1 In accordance with ProPECC PN 1/24 "Minimizing Noise from Construction Activities", the following mitigation measures should be given wherever practicable:

- Implementation of good site practices to limit noise emissions at source;
- Use of Quality Powered Mechanical Equipment (QPME);
- Installation of temporary noise barriers, panels or enclosures around the site boundary;
- Siting noisy equipment, such as emergency generators, water pumps, as far as possible from the NSR;
- Scheduling of work to avoid simultaneous operations of noisy equipment.

4.3.2.2 Quieter Construction Methods and Equipment (QCME) shall also be adopted to further alleviate the construction noise impact. With reference to EPD's recommendations on QCME, the feasibility of the QCME shall be determined during the preparation of the Construction Noise Management Plan (CNMP). The QCME shall be exhaustively explored and included in the particular specifications of construction contracts and CNMP to ensure measures are duly implemented.

4.3.2.3 The above recommended practices would need to be implemented in worksite as good practices whenever possible. Reference shall also be made to EPD's recommended pollution control clauses for construction contracts. With the implementation of the recommended mitigation measures, no insurmountable construction noise impact is therefore anticipated.

4.4 Evaluation of Operational Phase Impact

4.4.1 Noise Criteria for Fixed Noise Impact Assessment

4.4.1.1 For fixed noise impact assessment, the representative NSRs associated with the relevant noise criteria (ANL-5) are summarised in **Table 4.5**.

Table 4.5: Representative noise sensitive receiver during operation phase and its noise criteria

NSR ID	Description	Land use	Area Sensitivity Rating [1]	ANL-5 (Day or Evening-time/ Night-time), dB(A)
Existing NSR				
N1	3/F, 163 Waterloo Road	Residential	C	65 / 55
N2	12/F, Pine Tree Gardens	Residential	C	65 / 55
N3	10/F, Boland Court Phase II	Residential	C	65 / 55
N4	1/F, One Mayfair Tower 1	Residential	C	65 / 55
N5	2/F 161 Waterloo Road	Residential	C	65 / 55

Notes:

[1] The corresponding ASRs of the NSRs are determined based on the best available information. The ASRs determined in this report should not bind the Authority when enforcing the NCO based on the contemporary conditions.

4.4.1.2 The 300m assessment area including the site and surrounding NSR is considered as an urban area. According to the Annual Traffic Census 2022 published by TD, Waterloo Road Flyover (the section between Suffolk Road and Ede Road) at the immediate west of the site and Junction Road (the section between Broadcast Drive and Renfrew Road) at the east of the site have an Annual Average Daily Traffic (AADT) of 46,280 and 32,940 respectively in Year 2022, which are both considered as influencing factors (IFs). As identified NSRs are located within 300m from the above IFs, it is considered to be affected by the IF and hence an ASR of "C" should be adopted. The ANL-5 for ASR of "C" should be 65dB(A) and 55dB(A) for daytime & evening and night-time respectively.

4.4.2 Methodology for Fixed Noise Impact Assessment

4.4.2.1 Fixed plants (e.g. ventilation shaft, exhaust, etc.) will be installed to facilitate the operation of the proposed development, which may have potential fixed noise impact on the nearby NSR. Since detailed information and specifications of the proposed fixed plants are not available at the time of noise assessment, the maximum allowable total sound power levels (SWLs) are determined for future detailed design of the fixed plants.

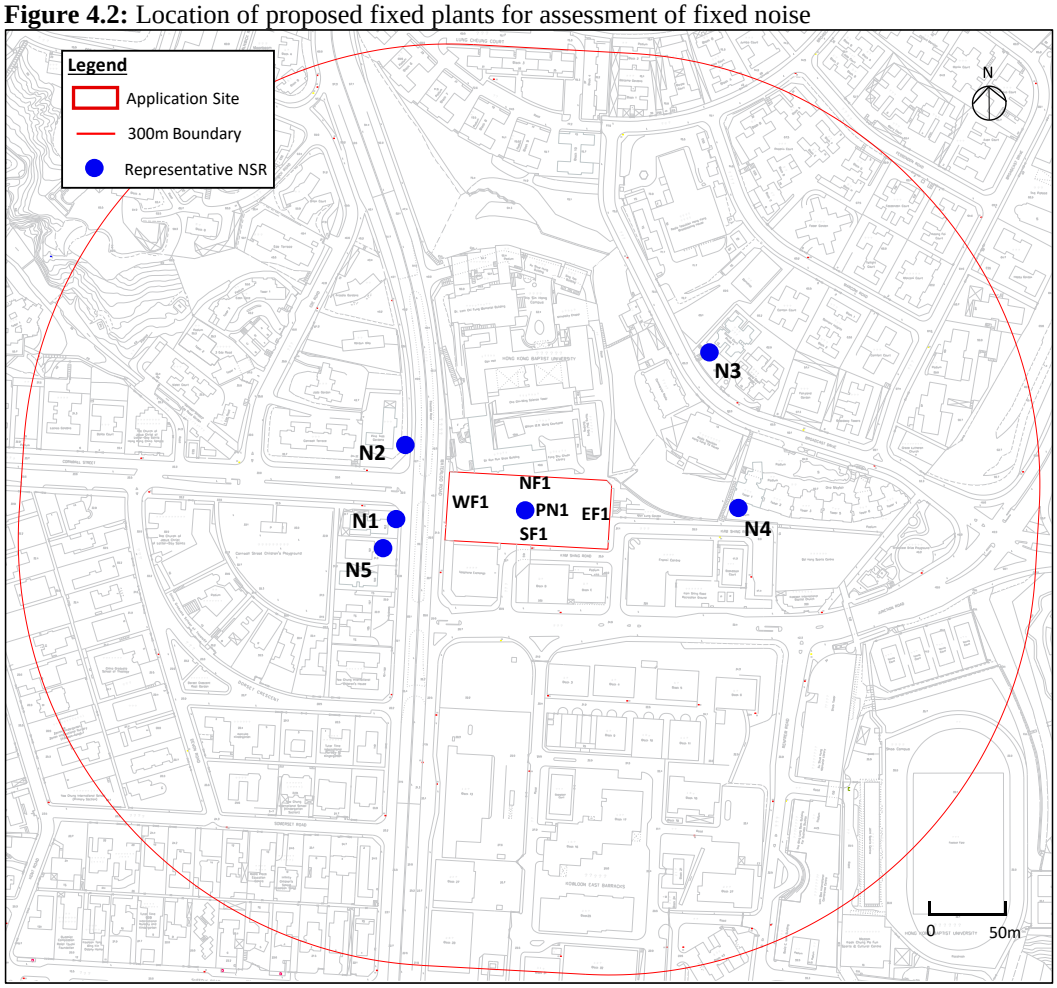
4.4.2.2 The following assessment methodology is adopted for fixed noise impact assessment:

- Identify and locate representative NSRs that may be affected by the noise sources;
- Determine noise criteria for daytime & evening and night-time for each NSR;
- Determine the distance attenuation, façade effect and tonal effect according to standard acoustic principles; and
- Determine the maximum permissible SWLs of fixed noise sources in accordance with standard acoustic principles.

4.4.3 Assessment Results for Fixed Noise

4.4.3.1 The exact location of the proposed fixed plants was not available during the planning stage. As advised by the Project Engineer, all mechanical plants for the proposed development will be located on the rooftop or enclosed in the plant rooms with the exhausts located on the building facades. A conservative approach was taken by assuming the exhausts having the shortest horizontal distance from the building façades of the proposed development block to each NSR as shown in **Figure 4.2**.

Figure 4.2: Location of proposed fixed plants for assessment of fixed noise



4.4.3.2 Corrections, including distance attenuation and façade reflection have been included in this fixed plant noise impact assessment. Since the locations of the exhaust are yet to be determined in this stage, distance attenuation has been applied by determining the shortest horizontal distances between the building facades of the proposed development block and the representative NSRs. Furthermore, 3dB(A) correction for façade reflection has also been applied. In this assessment, tonality correction is not incorporated in the calculation of maximum permissible SWLs. If the tonality effect is identified in the future, tonality correction should be applied according to the TM-Places. In addition, for NSRs with direct line of sight to more than one facade of the proposed development, the cumulative noise impacts from planned fixed noise sources at different facades have been considered.

4.4.3.3 The noise criteria (i.e. ANL-5) for the planned fixed noise sources at NSR are 65dB(A) and 55dB(A) for daytime & evening and night-time respectively. The maximum permissible SWLs for the identified NSR at daytime & evening and night-time periods are summarised in **Table 4.6**.

Table 4.6: Calculation of maximum permissible SWL at representative NSRs

Facade ID	Max. permissible SWL (Day or evening-time/ night-time)[1], dB(A)
NF1	100/90
EF1	109/99
SF1	102/92
WF1	100/90

Notes:

[1] Tonality correction is not applied in the calculation of maximum permissible SWL. In case tonality effect is identified during design stage, tonality correction should be considered, according to the TM-Places.

4.4.4 Predicted Fixed Noise Impact at NSRs

4.4.4.1 Based on the determined maximum permissible SWLs, the fixed noise impact on the representative NSRs have been predicted. The predicted facade noise levels of the representative NSRs are summarised in **Table 4.7**. Detailed calculations are presented in **Appendix 4.1**.

Table 4.7: Assessment results for noise from industrial noise sources

NSR ID	Description	ASR	ANL-5 (Day or Evening-time/ Night-time), dB(A)	Predicted Noise Level (Day or Evening-time/ Night-time), dB(A) [1]	Comply with ANL-5 (Y/N)
Existing NSR					
N1	3/F, 163 Waterloo Road	C	65/55	63/53	Y
N2	12/F, Pine Tree Gardens	C	65/55	65/55	Y
N3	10/F, Boland Court Phase II	C	65/55	63/53	Y
N4	1/F, One Mayfair Tower 1	C	65/55	65/55	Y
N5	2/F, 161 Waterloo Road	C	65/55	65/55	Y

Notes:

[1] For conservative assessment, the shortest horizontal distances between the assessment points and industrial noise sources are adopted in the calculation. No screening correction has been taken into account.

4.4.4.2 Results indicate that all representative NSRs are predicted to comply with the NCO criteria. Hence, adverse noise impact from the proposed development is not anticipated. Notwithstanding the conservative approach adopted in this assessment, the maximum permissible SWLs for the planned fixed plant noise source is subject to future design changes of the proposed development. Nonetheless, mitigation measures should be considered as recommended in the next section.

4.4.5 Recommended Mitigation Measures for Fixed Plant Noise

4.4.5.1 According to "Good Practices on Ventilation System Noise Control" issued by EPD, noisy equipment should be placed, wherever practicable, at a greater distance from receivers and behind some large enough obstruction (e.g. a building or a barrier) to avoid any direct line of sight between the receivers and noisy equipment.

This should be a factor of consideration when deciding on the location of the planned louvres.

4.4.5.2 In case the total SWL of exhausts is higher than the maximum allowable SWL, installation of silencers/ acoustic louvers at the exhaust shall be considered to minimise the noise impact.

4.4.5.3 The proposed maximum allowable SWL for fixed noise sources and recommended mitigation measures specified in this report shall be implemented by the Contractor. The Contractor shall select fixed plants that can achieve the proposed maximum allowable SWL, as well as adopting the proposed mitigation strategies and measures when necessary. The Contractor should also carry out a noise commissioning test for all fixed noise sources before operation of the Project, in order to ensure compliance of the operational airborne noise levels with the planning fixed source noise criteria under HKPSG.

4.4.5.4 With the above measures, adverse noise impact from the planned fixed plant noise sources due to the operation of the proposed medical facility is not anticipated. The Contractor should also carry out a noise commissioning test for all fixed noise sources before operation of the Project, in order to ensure compliance of the operational airborne noise levels with the planning fixed source noise criteria under NCO.

5 Water Quality Impact

5.1 Legislation and Standards

5.1.1 General

5.1.1.1 The relevant legislation, standards, and guidelines applicable to the present study for the assessment of water quality impacts include:

- Water Pollution Control Ordinance (WPCO) (Cap. 358);
- Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (TM-DSS);
- Practice Note for Professional Persons on Construction Site Drainage (ProPECC) PN 2/23;
- Practice Note for Professional Persons on Drainage Plan Subject to Comment by the Environmental Protection Department (ProPECC) PN 1/23; and
- Hong Kong Planning Standards and Guidelines (HKPSG).

5.1.2 Water Pollution Control Ordinance (Cap. 358)

5.1.2.1 WPCO (Cap. 358) provides the major statutory framework for the protection and control of water quality in Hong Kong. According to the Ordinance and its subsidiary legislation, the entire Hong Kong waters are divided into ten Water Control Zones (WCZs) and four supplementary WCZs. Each WCZ has a designated set of statutory Water Quality Objectives (WQOs) designed to protect the inland and/ or marine environment and its users. The Project is located within the Victoria Harbour (Phase 2) WCZ with corresponding WQOs as summarised in **Table 5.1**.

Table 5.1: Water Quality Objectives for Victoria Harbour (Phase 2) Water Control Zone

Parameters	Objectives	Sub-Zone
Aesthetic appearance	There should be no objectionable odours or discolouration of the water.	Whole zone
	Tarry residues, floating wood, articles made of glass, plastic, rubber or of any other substances should be absent.	Whole zone
	Mineral oil should not be visible on the surface. Surfactants should not give rise to a lasting foam.	Whole zone
	There should be no recognisable sewage-derived debris.	Whole zone
	Floating, submerged and semi-submerged objects of a size likely to interfere with the free movement of vessels, or cause damage to vessels, should be absent.	Whole zone
	The water should not contain substances which settle to form objectionable deposits.	Whole zone
Bacteria	The level of Escherichia coli (*E. coli*) should not exceed 1000/100 mL, calculated as the geometric mean of the most recent 5 consecutive samples taken at intervals of between 7 and 21 days	Inland waters

Parameters	Objectives	Sub-Zone
Colour	Human activity should not cause the colour of water to exceed 50 Hazen units.	Inland waters
Dissolved oxygen (DO)	The level of DO should not fall below 4 mg/L for 90% of the sampling occasions during the whole year; values should be calculated as the annual water column average [1]. In addition, the concentration of DO should not be less than 2 mg/L within 2 m of the seabed for 90% of the sampling occasions during the whole year.	Marine waters
	The level of dissolved oxygen should not be less than 4 mg/L.	Inland waters
pH	The pH of the water should be within the range of 6.5–8.5 units. In addition, human activity should not cause the natural pH range to be extended by more than 0.2 unit.	Marine waters
	Human activity should not cause the pH of the water to exceed the range of 6.0–9.0 units.	Inland waters
Temperature	Human activity should not cause the daily temperature range to change by more than 2.0°C	Whole zone
Salinity	Human activity should not cause the salinity level to change by more than 10%.	Whole zone
Suspended solids (SS)	Human activity should neither cause the SS concentration to be raised more than 30% nor give rise to accumulation of suspended solids which may adversely affect aquatic communities.	Marine waters
	Human activity should not cause the annual median of suspended solids to exceed 25 mg/L.	Inland waters
Ammonia	The unionized ammoniacal nitrogen level should not be more than 0.021 mg/L, calculated as the annual average (arithmetic mean).	Whole zone
Nutrients	Nutrients should not be present in quantities sufficient to cause excessive or nuisance growth of algae or other aquatic plants.	Marine waters
	Without limiting the generality of above objective, the level of inorganic nitrogen should not exceed 0.4 mg/L, expressed as annual water column average [1].	Marine waters
5-Day biochemical oxygen demand (BOD5)	Not to exceed 5 mg/L.	Inland waters
Chemical oxygen demand (COD)	Not to exceed 30 mg/L.	Inland waters
Toxic substances	Should not attain such level as to produce significant toxic, carcinogenic, mutagenic or teratogenic effects in humans, fish or any other aquatic organisms, with due regard to biologically cumulative effects in food chains and to interactions of toxic substances with each other.	Whole Zone
	Human activity should not cause a risk to any beneficial use of the aquatic environment.	Whole Zone

Notes:

[1] Expressed normally as the arithmetic mean of at least 3 measurements at 1 m below surface, mid depth and 1 m above the seabed. However in water of a depth of 5 m or less the mean shall be that of 2 measurements (1 m below surface and 1 m above seabed), and in water of less than 3 m the 1 m below surface sample only shall apply.

5.1.3 Technical Memorandum on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland & Coastal Waters (TM-DSS)

5.1.3.1 TM-DSS specifies the limits to control the physical, chemical and microbial parameters for effluent discharges into foul sewers leading into Government's sewage treatment plants. **Table 5.2** summarises the standards for effluent discharged into foul sewers leading into Governmental sewage treatments plants.

Table 5.2: Standards for effluents discharged into foul sewers leading into Government sewage treatments plants

Parameter	Flow rate (m^3/day)												
	≤ 10	**> 10 & ≤100**	**> 100 & ≤ 200**	**> 200 & ≤ 400**	**> 400 & ≤ 600**	**> 600 & ≤ 800**	**> 800 & ≤ 1000**	**> 1000 & ≤ 1500**	**> 1500 & ≤ 2000**	**> 2000 & ≤ 3000**	**> 3000 & ≤ 4000**	**> 4000 & ≤ 5000**	**> 5000 & ≤ 6000**
pH (pH units)	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10	6-10
Temperature (℃)	43	43	43	43	43	43	43	43	43	43	43	43	43
Suspended solids	1200	1000	900	800	800	800	800	800	800	800	800	800	800
Settleable solids	100	100	100	100	100	100	100	100	100	100	100	100	100
BOD	1200	1000	900	800	800	800	800	800	800	800	800	800	800
COD	3000	2500	2200	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Oil & Grease	100	100	50	50	50	40	30	20	20	20	20	20	20
Iron	30	25	25	25	15	12.5	10	7.5	5	3.5	2.5	2	1.5
Boron	8	7	6	5	4	3	2.4	1.6	1.2	0.8	0.6	0.5	0.4
Barium	8	7	6	5	4	3	2.4	1.6	1.2	0.8	0.6	0.5	0.4
Mercury	0.2	0.15	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cadmium	0.2	0.15	0.1	0.1	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Copper	4	4	4	3	1.5	1.5	1	1	1	1	1	1	1
Nickel	4	3	3	2	1.5	1.5	1	0.8	0.7	0.7	0.6	0.6	0.6
Chromium	2	2	2	2	1	0.7	0.6	0.4	0.3	0.2	0.1	0.1	0.1
Zinc	5	5	4	3	1.5	1.5	1	0.8	0.7	0.7	0.6	0.6	0.6
Silver	4	3	3	2	1.5	1.5	1	0.8	0.7	0.7	0.6	0.6	0.6
Other toxic metals individually	2.5	2.2	2	1.5	1	0.7	0.6	0.4	0.3	0.2	0.15	0.12	0.1
Total toxic metals	10	10	8	7	3	2	2	1.6	1.4	1.2	1.2	1.2	1
Cyanide	2	2	2	1	0.7	0.5	0.4	0.27	0.2	0.13	0.1	0.08	0.06
Phenols	1	1	1	1	0.7	0.5	0.4	0.27	0.2	0.13	0.1	0.1	0.1
Sulphide	10	10	10	10	5	5	4	2	2	2	1	1	1
Sulphate	1000	1000	1000	1000	1000	1000	1000	900	800	600	600	600	600
Total nitrogen	200	200	200	200	200	200	200	100	100	100	100	100	100
Total phosphorus	50	50	50	50	50	50	50	25	25	25	25	25	25
Surfactants (total)	200	150	50	40	30	25	25	25	25	25	25	25	25

Note:
[1] All units in mg/L unless otherwise stated; all figures are upper limits unless otherwise indicated.

5.1.4 Practice Note for Professional Persons on Construction Site Drainage (ProPECC) PN 2/23

5.1.4.1 The Practice Note for Professional Persons (ProPECC Note PN2/23) on Construction Site Drainage provides guidelines for the handling and disposal of construction discharges. It is applicable to this study for the control of site runoff and wastewater generated during the construction phase of the Project. The types of discharges from construction sites outlined in the ProPECC Note PN 2/23 include:

- surface runoff;
- groundwater;
- boring and drilling water;
- wastewater from concrete batching and precast concrete casting;
- wheel washing water;
- bentonite slurries;
- water for testing and sterilization of water retaining structures and water pipes;
- wastewater from building construction and site facilities; and
- acid cleaning, etching and pickling wastewater.

5.1.5 Practice Note for Professional Persons on Drainage Plan Subject to Comment by the Environmental Protection Department (ProPECC) PN 1/23

5.1.5.1 The Practice Note for Professional Persons (ProPECC Note PN1/23) on Drainage Plans subject to Comment by the Environmental Protection Department provides non-statutory guidelines in preparing drainage plans for the operational phase of the Project. It suggests that drainage plans submitted to the Building Authority should be referred to the Environmental Protection Department (EPD) for comment whenever there is a concern for pollution control.

5.1.6 Hong Kong Planning Standards and Guidelines (HKPSG)

5.1.6.1 Chapter 9 of the HKPSG outlines environmental requirements that need to be considered in land use planning. The recommended guidelines, standards and guidance cover the selection of suitable locations for the developments and sensitive uses, provision of environmental facilities, and design, layout, phasing and operational controls to minimize the adverse environmental impacts. It also

lists out environmental factors influencing land use planning and recommended buffer distances for land uses.

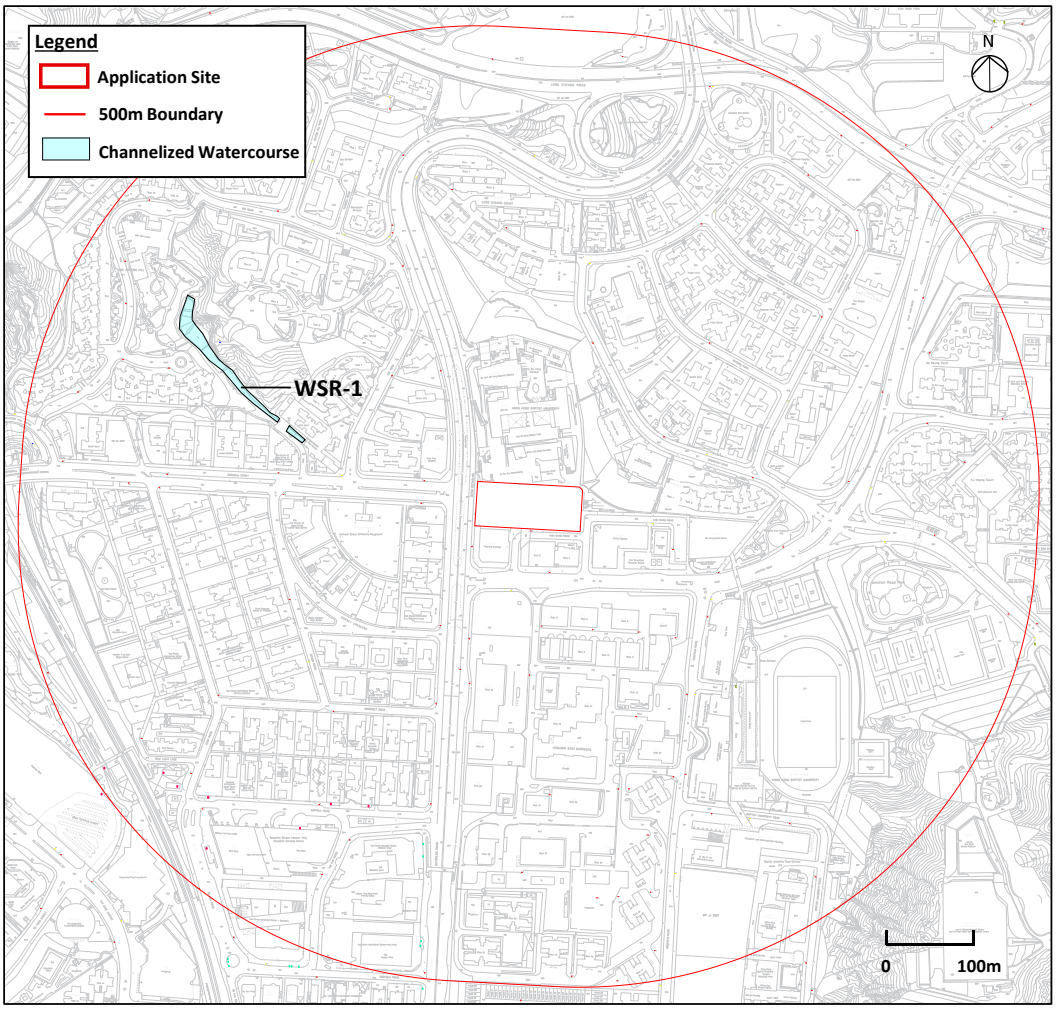
5.2 Identification of Representative Water Sensitive Receivers

5.2.1.1 One Water Sensitive Receiver (WSR) was identified within 500m from the Application Site. The WSR is listed in **Table 5.3** and presented in **Figure 5.1**.

Table 5.3: Water sensitive receivers

ID	WSRs	Status	Approx. Nearest Distance of WSR to the Application Site
WSR 1	Drainage near Cornwall Street/ Ede Road Garden	Channelized Watercourse	~200m

Figure 5.1: Locations of water sensitive receivers



5.3 Evaluation of Construction Phase Impact

5.3.1 Identification and Evaluation of Impact

5.3.1.1 The major sources of water quality impact during construction phase includes:

- Construction site runoff; and
- Sewage from site workforce.

Construction Site Runoff

5.3.1.2 During rainstorm events, construction site runoff would come from all over the works site. The surface runoff might be polluted by:

- Runoff and erosion from site surfaces, earth working areas and stockpiles;
- Wash water from dust suppression sprays and wheel washing facilities; and
- Accidental chemicals spillage such as fuel, oil, solvents and lubricants from maintenance of construction machinery and equipment.

5.3.1.3 Construction site runoff may have physical, biological and chemical effects. The physical effects include potential blockage of drainage channels and increase of SS levels in the water bodies nearby. Runoff containing significant amounts of concrete and cement-derived material may cause primary chemical effects such as increasing turbidity and discoloration, elevation in pH, and accretion of solids. A number of secondary effects may also result in toxic effects to water biota due to elevated pH values, and reduced decay rates of faecal micro-organisms and photosynthetic rate due to the decreased light penetration.

5.3.1.4 These water should not be directly discharged to nearby drainage systems of other water bodies otherwise they would be contaminated causing significant impacts on water quality. The site runoff with higher content of SS should be treated before discharge with appropriate mitigation measures, such as temporary drainage together with sand traps/ sedimentation basin. With the implementation of these mitigation measures, water quality impact is considered unlikely.

Sewage from Workforce

5.3.1.5 Sewage arising from the on-site construction workforce is likely to cause water pollution if it is discharged improperly. The sewage is characterized by high levels of biochemical oxygen demand (BOD_5), ammonia, *E. coli* and oil/ grease. The watercourses polluted by sewage would have aesthetic and odour problem, and may become hypoxic due to decay of large amount of oxygen demanding matter.

5.3.1.6 According to Table T-2 of Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning, the unit flow is 0.23 m^3/day/employee. The total number of workforce (clerical and workers) to be employed for the site is anticipated not to be over 500 staff. It is estimated that the volume of sewage from workforce would be around 115 m^3/day. Since temporary sanitary facilities, e.g. portable

chemical toilets, and sewage holding tank will be provided, no adverse water quality impact is expected.

5.3.1.7 It is anticipated that construction site runoff and sewage generation during the construction phase of the Project would not cause adverse water quality impact in all WSRs after undertaking all the recommended practices as discussed in **Section 5.3.2**.

5.3.2 Recommended Practices

Construction Site Runoff

5.3.2.1 In accordance with the Practice Note for Professional Persons on Construction Site Drainage, Environmental Protection Department, 2023 (ProPECC PN 2/23), best management practices should be implemented as far as practicable to ensure compliance with the WPCO (Cap. 358) and subsidiary regulations, which shall include but not limited to the following:

- Surface run-off from construction sites should be discharged into storm water drains via adequately designed sand/silt removal facilities such as sand traps, silt traps, sedimentation tanks and sediment basins. Channels or earth bunds or sand bag barriers should be provided on site to properly direct surface run-off to such silt removal facilities. Perimeter channels at site boundaries should be provided where necessary to intercept surface run-off from outside the site so that it will not wash across the site. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks.
- Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, at the onset of and after each rainstorm to ensure that these facilities are functioning properly at all times. Dikes or embankments for flood protection should be implemented around the boundaries of earthwork areas. Temporary ditches should be provided to facilitate the runoff discharge into storm drains, through a silt/sediment trap. The silt/ sediment traps should be incorporated in the permanent drainage channels to enhance deposition rates.
- Construction works should be programmed to minimize soil excavation works in rainy seasons (generally from April to September). If soil excavation works could not be avoided in these months or at any time of year when rainstorms are likely, for the purpose of preventing soil erosion, temporarily exposed slope surfaces should be covered (e.g. by tarpaulin), and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Intercepting channels should be provided (e.g. along the crest/edge of excavation) to prevent surface run-off from washing across exposed soil surfaces. Arrangements should always be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of a rainstorm.
- Earthworks final surfaces should be well compacted and the subsequent permanent works or surface protection works should be carried out immediately after the final surfaces are formed to prevent erosion caused by

rainstorms. Appropriate drainage like intercepting channels should be provided where necessary.

- Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in the rainy season is necessary, they should be dug and backfilled in short sections of length. Rainwater pumped out from trenches or foundation excavations should be discharged into storm water drains via silt removal facilities.
- Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar impermeable fabric during rainstorms. Measures should be taken to prevent washing away construction materials, soil, silt or debris into any drainage system.
- Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent surface run-off from getting into foul sewers. Discharge of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system.
- Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecast and actions to be taken during or after rainstorms.
- Groundwater pumped out of wells, etc. for lowering ground water level in basement or foundation construction, and groundwater seepage pumped out of tunnels or caverns under construction should be diverted to silt removal facilities for treatment before discharging into storm water drains.
- Water used in ground boring and drilling for site investigation or rock/soil anchoring should as far as practicable be recirculated after sedimentation. When there is a need for final disposal, the wastewater should be discharged into storm water drains via silt removal facilities
- Wastewater generated from the washing down of mixer trucks and drum mixers and similar equipment should wherever practicable be recycled. The discharge of wastewater should be kept to a minimum.
- To prevent pollution from wastewater overflow, the pump sump of any water recycling system should be provided with a standby pump of adequate capacity and with automatic alternating devices.
- Under normal circumstances, surplus wastewater may be discharged into foul sewers after proper treatment (e.g. silt removal, pH adjustment to within the pH range of 6 to 10, etc.). Disposal of wastewater into storm water drains will require more elaborate treatment. Surface run-off should be segregated from the concrete batching plant and casting yard area as much as possible, and diverted to the storm water drainage system. Surface run-off contaminated by materials in a concrete batching plant or casting yard should be adequately treated before disposal into storm water drains.
- All vehicles and plants should be cleaned before they leave a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. A wheel washing bay should be provided at every site exit if practicable and wash-water should have sand and silt settled out or removed before discharging

into storm water drains. The section of construction road between the wheel washing bay and the public road should be paved to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.

- Bentonite slurries used in diaphragm wall and bored-pile construction should be reconditioned and reused wherever practicable. If the disposal of a certain residual quantity cannot be avoided, used bentonite slurry (if mixed with only inert fill materials) should be dewatered, and disposed of at a (i) public fill reception facility / area; or (ii) marine dumping ground (as the last resort) subject to obtaining a marine dumping licence from the Environmental Protection Department (EPD) on a case-by-case basis.
- The water generated from the dewatering process should be treated to the respective effluent standards applicable to foul sewers, storm water drains or the receiving waters as set out in the "Technical Memorandum on Effluent Standards" (TM) (Cap. 358 AK) issued under the Water Pollution Control Ordinance (WPCO) (Cap. 358) which is made available at the EPD's website (http://www.epd.gov.hk).
- Water used in water testing to check leakage of structures and pipes should be reused for other purposes as far as practicable. Surplus unpolluted water could be discharged into storm water drains.
- Sterilization is commonly accomplished by chlorination. Specific advice from the EPD should be sought during the design stage of the works with regard to the disposal of the sterilizing water. The sterilizing water should be reused wherever practicable.
- Before commencing any demolition works, all sewer and drainage connections should be sealed to prevent building debris, soil, sand etc. from entering public sewers/drains. Wastewater generated from building construction activities including concreting, plastering, internal decoration, cleaning of works and similar activities should not be discharged into the storm water drainage system. If the wastewater is to be discharged into foul sewers, it should undergo the removal of settleable solids in a silt removal facility, and pH adjustment as necessary.
- Acidic wastewater generated from acid cleaning, etching, pickling and similar activities should be neutralized to within the pH range of 6 to 10 before discharging into foul sewers. If there is no public foul sewer in the vicinity, the neutralized wastewater should be tankered off site for disposal into foul sewers or treated to a standard acceptable for discharge into to storm water drains and the receiving waters.
- Sewage from toilets, kitchens and similar facilities should be discharged into a foul sewer. If there is no foul sewer in the vicinity, chemical toilets, a septic tank and soakaway system (see Appendix B for general reference) or for larger flows, a sewage treatment plant will have to be provided as appropriate.
- Wastewater collected from canteen kitchens, including that from basins, sinks and floor drains, should be discharged into foul sewers via grease traps capable of providing at least 20 minutes retention during peak flow. Details of a typical grease trap should be referred to Appendix C for general reference. The EPD has also published "Grease Traps for Restaurants and Food Processors" which

provides guidance on the design, operation and maintenance of grease traps and it is made available at the EPD's website (http://www.epd.gov.hk).

- Drainage serving an open oil filling point should be connected to storm water drains via a petrol interceptor with peak storm bypass. Typical details of such a petrol interceptor prepared by the Highways Department, available at its website (http://www.hyd.gov.hk) for general reference.
- Vehicle and plant servicing areas, vehicle wash bays and lubrication bays should as far as possible be located within roofed areas. The drainage in these covered areas should be connected to the foul sewer via petrol interceptor(s). Oil leakage or spillage should be contained and cleaned up immediately. Waste oil should be collected and stored for recycling or disposal in accordance with the Waste Disposal Ordinance (Cap. 354).

5.3.2.2 By adopting the best management practices, it is anticipated that the impacts of general site operation will be reduced to satisfactory levels before discharges. The details of best management practices will be highly dependent on actual site condition and the Contractor shall apply for a discharge license under WPCO.

Sewage from Workforce

5.3.2.3 Portable chemical toilets should be provided for handling the construction sewage generated by the workforce. With reference to Section 5.6.10 of Reference Material on Construction Site Welfare Health and Safety Measures, the recommended ratio for the number of chemical toilets to the number of workers is 1:25. The total number of work force (clerical and workers) to be employed for the site is anticipated not to be over 500 staff. As such, about 20 chemical toilets is estimated to cater the employed population of 500. Nevertheless, a licensed contractor should be employed to provide appropriate and adequate portable toilets to cater $0.23m^3$/day/employed population and be responsible for appropriate disposal and maintenance.

5.3.2.4 Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the Project. The Wastewater Management Plan should document the locations and number of portable chemical toilets depending on the number of workers, land availability, site condition and activities. Regular collection by licensed collectors should be arranged to minimise potential environmental impacts. It is anticipated that sewage generation during the construction phase of the Project would not cause adverse water quality impacts after undertaking all the required measures.

5.4 Evaluation of Operational Phase Impact

5.4.1 Identification and Evaluation of Impact

5.4.1.1 The major sources of water quality impact during operational phase includes:

- Runoff from the development; and
- Sewage from the development.

Runoff from the Development

5.4.1.2 In terms of water quality impact, there would be pollution loading in association with surface runoff, which is known as non-point source pollutions during operational phase. Substances such as vehicle dust, tyre scraps and oils deposited and accumulated on the road surfaces will be washed into nearby drainage system or watercourses during rainfall events. Under normal condition, runoff will not be generated in low rainfall intensity. The worst scenario to water quality will take place during the first flush under heavy rainstorm events.

5.4.1.3 Since the site is planned to be a medical facility with well-paved roads or surfaces, additional surface runoff due to the proposed new development is very limited. Proper drainage systems with gullies, silt traps and manholes installed will be provided for the proposed development. With such implementation, no adverse water quality impact during operational phase would be anticipated.

Sewage from the Development

5.4.1.4 Sewage will be generated from the future population who use the facilities of the proposed development. According to the current design, all sewage will be conveyed to the public sewerage system, which will be connected to the Sham Shui Po No.1 & No.2 Sewage Screening Plant for pre-treatment before being further treated at Stonecutters Island Sewage Treatment Works. The proposed development will be properly sewered and adverse water quality impact is not anticipated.

5.4.2 Recommended Mitigation Measures

5.4.2.1 The site is located at a highly urbanised, well-planned area. As evaluated in above **Section 5.4.1**, adverse water quality impact during operational phase is not anticipated. However, any potential impact can be further minimized with the implementation of mitigation measures recommended below.

Runoff from the Development

5.4.2.2 The proposed development will lead to an increase in area of impermeable surfaces and hence the peak surface runoff rates. Besides, vehicle dust, tyre scraps and oils might be washed away from the road surface to the nearby water environment by

surface runoff or road surface cleaning. Proper drainage systems with silt traps and oil interceptors should be installed.

5.4.2.3 Runoff will be controlled by best management practice. Runoff will be intercepted by properly designed and managed silt traps at appropriate spacing so that common debris, refuse and fallen leaves etc. can be captured before allowing the runoff to drain into nearby water environment. The collected pollutants would be tankered away for off-site disposal at landfill sites. After the removal of the pollutants, the pollution levels from stormwater would be much reduced. Furthermore, the design of drainage plans would follow the recommendations in ProPECC PN 1/23 which provides useful non-statutory guidelines for pollution control on different types of discharge from the proposed development to minimize water quality impact.

Sewage from the Development

5.4.2.4 As mentioned in **Section 5.4.1.4** above, the proposed development will be properly sewered and adverse water quality impact is not anticipated. A separate Sewerage Impact Assessment Report has been conducted to assess the impact of sewage generation as a result of the proposed development. Details of mitigation measures, if necessary, shall be referred to the Sewerage Impact Assessment Report.

6 Waste Management Implication

6.1 Legislation and Standards

6.1.1 General

6.1.1.1 The relevant legislation and associated guidance notes related to the study for the assessment of waste management implications include:

- Waste Disposal Ordinance (Cap. 354) and subsidiary regulations;
- Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N);
- Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C);
- Waste Disposal (Clinical Waste) (General) Regulation (Cap. 354O);
- Land (Miscellaneous Provisions) Ordinance (Cap. 28);
- Public Health and Municipal Service Ordinance – Public Cleansing and Prevention of Nuisances Regulation (Cap. 132BK); and
- Works Bureau Technical Circular (WBTC) No. 12/2000 Fill Management.

6.1.2 Waste Disposal Ordinance and Waste Disposal (Charges for Disposal of Construction Waste) Regulation

6.1.2.1 The Waste Disposal Ordinance (WDO) prohibits unauthorised disposal of wastes. Schedule 5 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Charging Regulation) defines that inert construction waste includes rock, rubble, boulder, earth, soil, sand, concrete, brick, tile, masonry or used bentonite.

6.1.2.2 Under the WDO and the Charging Regulation, wastes can only be disposed of at designated waste disposal facilities licensed by EPD. Breach of this Ordinance can lead to a fine and/or imprisonment. The WDO also stipulates the requirements for issuing licenses for the collection and transportation of wastes.

6.1.2.3 The Construction Waste Disposal Charging Scheme entered into operation on 1 December 2005. Starting from 1 December 2005, the main contractor undertaking construction work under a contract with value of HK$1 million or above is required to establish a billing account with EPD before transporting the construction waste to the designated waste disposal facilities (e.g. landfill, public fill reception facilities, etc.). Vehicles delivering construction waste to public fill reception facilities require prior approval from CEDD and EPD. Breach of these regulations can lead to a fine and/or imprisonment.

6.1.3 Waste Disposal (Chemical Waste) (General) Regulation

6.1.3.1 Chemical waste includes any scrap materials, or unwanted substances specified under Schedule 1 of this Regulation if such a substance or chemical occurs in such

a form, quantity or concentration that causes pollution or constitutes a danger to health or risk of pollution to the environment.

6.1.3.2 A person shall not produce, or cause to be produced, chemical wastes unless he is registered with EPD. Any person who contravenes this requirement commits an offence and is liable to a fine and/or imprisonment. Chemical wastes must be treated utilising on-site plant licensed by EPD, or be collected by a licensed collector to transport the wastes to a licensed treatment facility. For each consignment of wastes, the waste producer, collector and disposer of the wastes must sign all relevant parts of a computerised trip ticket. The system is designed to trace wastes from production through to disposal.

6.1.3.3 This regulation also prescribes the storage facilities to be provided on site including labelling and warning signs. To minimise the risk of pollution and danger to human health or life, the waste producer is required to prepare and make available written emergency procedures for spillage, leakage or accidents arising from the storage of chemical wastes. The waste producer must also provide employees with training for such procedures. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes (1992) details how the Contractor should comply with the regulations on chemical wastes.

6.1.4 Waste Disposal (Chemical Waste) (General) Regulation

6.1.4.1 Chemical waste includes any scrap materials, or unwanted substances specified under Schedule 1 of this Regulation if such a substance or chemical occurs in such a form, quantity or concentration that causes pollution or constitutes a danger to health or risk of pollution to the environment.

6.1.4.2 Asbestos is a hazardous material and appropriate care must be taken in handling any material which contains asbestos. Asbestos waste is classifiable as chemical waste under the Waste Disposal (Chemical Waste) (General) Regulation and its handling, collection, transportation and disposal is controlled by the legislation.

6.1.5 Land (Miscellaneous Provisions) Ordinance

6.1.5.1 The inert portion of C&D materials may be taken to public filling facilities including public filling area, public filling barging points and stockpiling areas. This ordinance requires Dumping Licenses (to be issued by Civil and Engineering Development Department (CEDD)) to be obtained by individuals or companies, who deliver inert C&D materials to the public filling facilities.

6.1.5.2 Individual licenses and windscreen stickers are issued for each vehicle involved. Public filling areas will accept only inert building debris, soil, rock and broken concrete. The material should, however, be free from marine mud, household refuse, plastic, metal, individual and chemical wastes, animal and vegetable matters and any other materials considered unsuitable by the Filling Supervisor.

6.1.6 Public Cleansing and Prevention of Nuisances Regulation (Cap. 132BK)

6.1.6.1 This regulation provides further control on illegal dumping of litter or waste on unauthorised (unlicensed) sites. An offence of this regulation would result in a fine and/or imprisonment.

6.1.7 Works Bureau Technical Circular (WBTC) No. 12/2000 Fill Management

6.1.7.1 WBTC No. 12/2000 explains how fill resources, construction and demolition material (C&DM), and dredged/excavated sediment disposal are managed.

6.1.8 Other Relevant Guidelines

6.1.8.1 **Table 6.1** summaries other documents and guidelines that are related to waste management and disposal:

Table 6.1: Other relevant documents and guidelines

Bureau / Department	Documents / Guidelines / Technical Circulars
EPD	• Waste Disposal Plan for Hong Kong (December 1989) • A Policy Framework for Management of Municipal Solid Waste (2005-2014), (December 2005) • Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes (1992) • A Guide to the Chemical Waste Control Scheme • A Guide to the Registration of Chemical Waste Producers • The Clinical Waste Control Scheme • Monitoring of Solid Waste in Hong Kong 2022 • Code of Practice for the Management of Clinical Waste – Major Clinical Waste Producers and Waste Collectors (2010) • Practice Note for Professional Persons – Handling of Asbestos Containing Materials in Buildings (ProPECC PN 2/97) • Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste • Preparation of Asbestos Investigation Report Asbestos Management Plan and Asbestos Abatement Plan • Safe Handling of Low Risk Asbestos Containing Material • Asbestos Work Using Full Containment or Mini Containment Method • Asbestos Work Using Glove Bag Method • Registers of Asbestos Professionals
CEDD	• Project Administration Handbook for Civil Engineering Works, 2022 Edition • CEDD TC No. 11/2019, Management of Construction and Demolition Materials
EPD / CEDD	• New Disposal Arrangements for Construction Waste (1992)
Development Bureau	• Works Branch Technical Circular (WBTC) No. 2/93, Public Dumps • WBTC No 2/93B, Public Filling Facilities • WBTC No. 16/96, Wet Soil in Public Dumps • WBTC Nos. 4/98 and 4/98A, Use of Public Fill in Reclamation and Earth Filling Project • WBTC No. 19/2001, Metallic Site Hoardings and Signboards • WBTC No. 12/2002, Specification Facilitating the Use of Recycled Aggregates • ETWBTC No. 22/2003 & 22/2003A, Additional Measures to Improve Site Cleanliness and Control Mosquito Breeding on Construction Sites • ETWBTCW No. 19/2005, Environmental Management on Construction Sites • Development Bureau Technical Circular (Works) (DEVBTCW) No. 06/2010, Trip-ticket System for Disposal of Construction and Demolition Material

Bureau / Department	Documents / Guidelines / Technical Circulars
	• DEVBTCW No. 08/2010, Enhanced Specification for Site Cleanliness and Tidiness • DEVBTCW No. 09/2011, Enhanced Control Measures for Management of Public Fill
PlanD	• Environmental Guidelines for Planning in Hong Kong (2024), Hong Kong Planning Standards and Guidelines
BD	• Practice Note for Authorized Persons and Registered Structural Engineers (PN for AP & RSE) No. 243
Environment and Ecology Bureau	• Waste Reduction Framework Plan, 1998 to 2008

6.1.9 C&D Material Management

6.1.9.1 According to the Project Administrative Handbook for Civil Engineering Works and CEDD TC No. 11/2019, the project office is required to draw up a Construction and Demolition Material Management Plan (C&DMMP) at the feasibility study or preliminary design stage of each project, which generates more than 50,000 m3 of C&D materials. For projects with more than 300,000 m3 of surplus inert C&D materials, a C&DMMP should be prepared and submitted to the Public Fill Committee (PFC) for in-principle approval prior to the commencement of the detailed design.

6.1.9.2 ETWB TC(W) No. 19/2005 sets out the policy and procedures requiring contractors to prepare and implement an Environmental Management Plan (EMP) to encourage on-site sorting of C&D materials and to reduce C&D waste generation during construction.

6.2 Evaluation of Construction Phase Impact

6.2.1 Identification and Evaluation of Impact

6.2.1.1 The key construction activities which would potentially result in the generation of waste include minor site clearance including any temporary structure, piling works, soil excavation for basement and superstructure, etc. within the site area.

6.2.1.2 Refer to the construction activities of the Project mentioned above, those activities would result in the generation of wastes. Different types of wastes would be generated during construction phase and these wastes can be divided into the following categories based on their compositions:

- C&D materials;
    - Inert portion – soil, rock and concrete, etc. that can be recycled as fill material and delivered to public fill reception facilities; and
    - Non-inert portion – timber, glass, steel, plastics, etc. that are not suitable for reuse as fill material and should be recycled before disposal at landfills
- Chemical wastes; and
- General refuse from on-site workforce.

6.2.1.3 In general, the handling, delivery and disposal of these materials and wastes will require proper management in order not to cause environmental impacts and nuisance. It is anticipated that there would not be any insurmountable impacts provided good site practices and other appropriate mitigation measures are implemented.

C&D Materials

6.2.1.4 The C&D materials consist of inert portion and non-inert portion. Based on the preliminary design, the total area of excavation and depth is approximately 5073m^2 and 22m, respectively. The total estimated volume of concrete due to demolition of Blocks A, B and C is approximately 17,000m^3. As such, it is estimated that about 130,000m^3 of inert C&D materials (e.g. demolition, site clearance, excavated soil, etc.) will be generated during the construction phase of the site formation and infrastructure works, which would require a maximum of about 58 dump trucks per day. Due to the small scale of the Project, the quantity of non-inert C&D materials generated is approximately 13,000m^3. All C&D materials arising from the construction will be sorted on–site to recover the inert C&D materials as well as the reusable and recyclable materials. Non-inert portion of C&D materials should also be reused whenever possible and be disposed of at landfills as a last resort.

6.2.1.5 Any surplus C&D materials will become the property of the Contractor once they are removed from the site. The Contractor will be responsible for devising a system to work for on-site sorting of C&D materials and to promptly remove all sorted and processed material arising from the construction activities to optimise temporary stockpiling on-site. It is recommended that the system should include the identification of the source of generation, estimated quantity, arrangement for on-site sorting and/or collection, temporary storage areas, and frequency of collection by recycling contractors or frequency of removal off-site.

6.2.1.6 Disposal of C&D materials can be minimized through careful planning during the detailed design stage and with good site practice during construction. This includes the use of non–timber formwork and temporary works and on–site sorting of the C&D materials for reuse and recycling as far as practicable. For the inert C&D materials, it would be reused on–site as far as possible or else it would be delivered to public fill reception facilities. The opportunity of reusing excavated C&D materials would be investigated in the C&DMMP, which will be derived in later detailed design stage.

6.2.1.7 With the proper implementation of good construction site practice and recommended mitigation measures, the on-site handling, reuse, transportation and disposal of C&D materials would not cause adverse environmental impacts.

Chemical Waste

6.2.1.8 Chemical wastes likely to be generated from the construction activities and associated facilities may include:

- Scrap batteries;

- Spent hydraulic oil and waste fuel;
- Spent lubrication oil and cleaning fluids from mechanical machinery; and
- Spent solvents from equipment cleansing activities.

6.2.1.9 Chemical wastes may pose environmental, health and safety hazards if not stored and disposed of in an appropriate manner as outlined in the Waste Disposal (Chemical Waste) (General) Regulation and the Code of Practice on the Packaging, Labelling and Storage of Chemical Waste. These hazards may include:

- Toxic effects to workers;
- Adverse effects on air, water and land from spills; and
- Fire hazards.

6.2.1.10 It is difficult to quantify the amount of chemical waste as it will be highly dependent on the contractor's on–site maintenance practice the number of plant and vehicles utilized. Nevertheless, it is anticipated that the quantity of chemical wastes would be small and in the order of few hundred kilograms/ few hundred litres per month. The estimated amount of chemical waste to be generated during construction phase is summarized in **Table 6.2**. The amount of chemical waste to be generated shall be quantified in the Waste Management Plan (WMP) as part of the EMP to be prepared by the Contractor in the subsequent construction stage.

Table 6.2: Summary of chemical waste during construction phase

Waste type	Total amount generated
Scrap batteries	A few hundred kilograms per month
Spend hydraulic oil and waste fuel	A few hundred litres per month
Spent lubrication oil and cleaning fluids	
Spend solvent	

6.2.1.11 Suitable arrangements for the storage, handling, transport and disposal of chemical wastes shall be made in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Waste and Waste Disposal (Chemical Waste) (General) Regulation (Cap. 354C). Wherever possible opportunities should be taken to reuse and recycle materials. Given that the quantity of chemical wastes would be small and that the regulations as stipulated in the Code of Practice on the Packaging, Labelling and Storage of Chemical Waste and Cap. 354C would be strictly followed, adverse impacts brought by the generation of chemical waste is not anticipated.

General Refuse

6.2.1.12 The general refuse generated by the construction workforces mainly consists of food waste, aluminium cans and wastepaper. These general refuses will require off–site disposal. The number of workforce (clerical and workers) to be employed for the proposed development is not available at this stage but it is anticipated not to be over 500 staff. Based on the generation rate of 0.65kg/person/day, the total refuse generated per day would not be less than 325kg/day. Therefore, it is estimated that around 1070 tonnes of general refuse would be generated during

construction phase. The breakdown of estimated amount of general refuse to be generated during construction phase is summarised in **Table 6.3** below.

Table 6.3: Summary of general refuse during construction phase

Activities	Period	Daily Waste Generation (kg/day)	Total Amount Generated (tonne)
Construction phase	Approx. 9 years	> 325	> 1070

6.2.1.13 Food waste is a main source of unpleasant odour and environmental hygiene concerns. Separation of food waste from other waste shall be carried out in order to facilitate the recycling of food waste on-site or off-site.

6.2.1.14 Effective collection of site waste will be required to prevent waste materials being blown around by wind or creating an odour nuisance or pest and vermin problem. Waste storage areas shall be well maintained and cleaned regularly. In addition, disposal of waste at sites other than approved waste transfer or disposal facilities shall be prohibited.

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

Asbestos Containing Materials (ACM)

6.2.1.16 Asbestos was widely used in the construction industry prior to the early 1980's for fireproofing, thermal and electrical insulation as well as in sound absorption materials. However, asbestos is currently recognized as hazardous materials, due to its etiological effects on human respiratory system.

6.2.1.17 As the Project involves the demolition of buildings/structures that were built before 1980's, ACM may be present in the buildings within the Project Site. Thus, ACM which may be disturbed during the demolition activities, should be removed and disposed of in a proper manner prior to the demolition work, so as to avoid the release of harmful asbestos fibres to the environment and minimise potential hazard.

6.2.1.18 ACM would be treated as chemical waste and handled and disposed of in compliance with the relevant legislation and guidelines. All ACM if confirmed to be present within the existing premises must be removed and disposed of in accordance with the Air Pollution Control Ordinance and the Waste Disposal Ordinance prior to the refurbishment work. A Registered Asbestos Consultant and Registered Asbestos Laboratory shall be engaged to conduct investigation for the presence of ACM. An Asbestos Investigation Report, an Asbestos Abatement Plan (AAP) (if required) and a notification of commencement of asbestos abatement works shall be submitted to EPD at least 28 days before the asbestos abatement works commences. Also, the removal of ACMs should be carried out by a Registered Asbestos Contractor according to the approved AAP under the supervision of a Registered Asbestos Consultant. The asbestos waste generated

shall be disposed of by a licensed chemical waste collector in compliance with the Waste Disposal Ordinance.

6.2.1.19 ACMs are classified as chemical waste that will be disposed of in accordance with the Waste Disposal Ordinance and its subsidiary Waste Disposal (Chemical Waste) (General) Regulation. ACM shall be disposed of at the EPD's designated disposal site at the landfill in accordance with the Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste issued by the EPD

6.2.2 Recommended Practices for Construction Phase

6.2.2.1 The mitigation measures for construction phase are recommended based on the waste management hierarchy principles. Recommendations of good site practices, waste reduction measures as well as the waste transportation, storage and collection are described in the following sub-sections.

Good Site Practices

6.2.2.2 Adverse waste management implications are not anticipated, provided that good site practices are strictly implemented. The following good site practices are recommended throughout the construction activities:

- nomination of an approved personnel, such as a site manager, to be responsible for the implementation of good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site;
- training of site personnel in site cleanliness, appropriate waste management procedures and concepts of waste reduction, reuse and recycling;
- provision of sufficient waste disposal points and regular collection for disposal;
- appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers;
- regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors;
- WMP should be prepared and implemented by the Contractor and submitted to Engineer/ Architect for approval in accordance with the Building Department's "Practice Note for Authorized Persons and Registered Structural Engineers (PN for AP & RSE) No. 243";
- drip tray should be provided to chemical waste containers, cleaned up regularly and clean up should be done before foreseeable inclement weather such as typhoon or heavy rain;
- disposal of general refuse is recommended on a regular basis and before foreseeable inclement weather such as typhoon or heavy rain; and
- any sewage, waste water or effluent containing sand, cement, silt or any other suspended or dissolved material should be prohibited to flow from the Site onto any adjoining land or allow any waste matter or refuse, which is not part of the final product from waste processing plants, to be deposited anywhere within the Site or onto any adjoining land. Clean up should be done regularly and before foreseeable inclement weather such as typhoon or heavy rain.

Waste Reduction Measures

6.2.2.3 Amount of waste generation can be significantly reduced through good management and control. Waste reduction is best achieved at the planning and design phase, as well as by ensuring the implementation of good site practices. The following recommendations are proposed to achieve reduction:

- segregate and store different types of waste in different containers, skip or stockpiles to enhance reuse or recycling of materials and their proper disposal;
- proper storage and site practices to minimise the potential for damage and contamination of construction materials;
- plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste;
- sort out demolition debris and excavated materials from demolition works to recover reusable/recyclable portions (i.e. soil, broken concrete, metal etc.); and
- provide training to workers on the importance of appropriate waste management procedures, including waste reduction, reuse and recycling.

6.2.2.4 In addition to the above measures, specific mitigation measures are recommended for the specific waste types so as to minimise waste management implication during handling, transportation and disposal of waste.

Storage, Collection and Transportation of Waste

6.2.2.5 Storage of waste on site may induce adverse waste management implication if not properly managed. The following recommendation should be implemented to minimise the impacts:

- waste such as soil should be handled and stored well to ensure secure containment;
- stockpiling area should be provided with covers and water spraying system to prevent materials from wind-blown or being washed away; and
- different locations should be designated to stockpile each material to enhance reuse.

6.2.2.6 The collection and transportation of waste from works area to respective disposal sites may also induce adverse environmental impacts if not properly managed. The following recommendation should be implemented to minimise the impacts:

- remove waste in timely manner;
- employ trucks with cover or enclosed containers for waste transportation;
- obtain relevant waste disposal permits from the appropriate authorities; and
- disposal of waste should be done at licensed waste disposal facilities.

6.2.2.7 In addition to the above measures, other specific mitigation measures on handling the excavated C&D materials, chemical waste and materials generated from construction phase are recommended in the following subsections.

C&D Materials

6.2.2.8 Wherever practicable, C&D materials should be segregated from other wastes to avoid contamination and ensure acceptability at Public Fill Reception Facilities areas or reclamation sites. The following mitigation measures should be implemented in handling the waste from construction works:

- maintain temporary stockpiles and reuse excavated fill material for backfilling;
- carry out on-site sorting;
- make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; and
- implement a trip-ticket system for each works contract to ensure that the transportation of C&D materials are properly documented and verified.

6.2.2.9 Fly tipping or disposal of C&D materials at locations other than designation destinations shall be prohibited. The following recommendations should be followed:

- All dump trucks engaged on-site for delivery of inert and non-inert C&D material from the site to the designated disposal location, including public fill reception facilities, landfill etc., should be equipped with GPS or equivalent system for tracking and monitoring of their travel routings and parking locations by the Contractor to prohibit illegal dumping and landfilling of materials; and
- The data collected by GPS or equivalent system should be recorded properly for checking and analysis the travel routing and parking locations of dump truck engaged on site.

6.2.2.10 Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Metal hoarding should be used to enhance the possibility of recycling. The purchasing of construction materials should be carefully planned in order to avoid over ordering and wastage.

6.2.2.11 The contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance recycling of materials and their proper transportation. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the construction site should be considered for such segregation and storage.

Chemical Waste

6.2.2.12 For those processes which generated chemical waste, it may be possible to find alternatives to eliminate the use of chemicals, to reduce the generation quantities or to select a chemical type of less impacts on environment, health and safety as far as possible.

6.2.2.13 If chemical wastes are produced at the construction site, the Contractors should register with EPD as chemical waste producers. Chemical wastes should be stored in appropriate containers and collected by a licensed chemical waste contractor.

The licensed waste contractor should consider to recycle the chemical wastes (e.g. spent lubricant oil) at an appropriate off-site facility as far as possible, while the chemical waste that cannot be recycled should be disposed of at either the CWTC, or other licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.

General Refuse

6.2.2.14 General refuse should be stored in enclosed bins separately from construction and chemical wastes. Recycling bins should also be placed to encourage recycling. Preferably enclosed and covered areas should be provided for general refuse collection and routine cleaning for these areas should also be implemented to keep areas clean. A reputable waste collector should be employed to remove general refuse on a daily basis. It is expected that such arrangements would minimise potential waste management implication impact.

Asbestos Containing Materials

6.2.2.15 Due to the potential ACM during the site clearance stage, asbestos investigation is required. It is considered that an asbestos specialist shall be employed by the responsible parties during the construction stage to investigate this issue.

6.2.2.16 ACM would be treated as chemical waste and handled and disposed of in compliance with the relevant legislation and guidelines. Sufficient and reasonable lead time shall be allowed for preparation, vetting and implementation of asbestos investigation report and asbestos abatement plan in accordance with Air Pollution Control Ordinance, Cap. 311, before commencement of any demolition or site clearance work. With the reference to the precautionary measures related to the handling and disposal of asbestos based on Handling of Asbestos Containing Materials in Buildings (ProPECC PN 2/97), insurmountable impact from asbestos containing materials is not anticipated, subject to detailed assessment in the later stage.

6.3 Evaluation of Operational Phase Impact

6.3.1 Identification and Evaluation of Impact

6.3.1.1 Operation of the proposed medical facility would generate a variety of wastes including but not limited to general refuse, chemical wastes and clinical wastes generated from daily operation.

6.3.1.2 The amount of different types of wastes to be generated has been estimated by Project Engineer and is summarised in **Table 6.4** below.

Table 6.4: Estimation of quantity of wastes

Waste Type	Total Generated	Total Reuse			Total Disposed	
		On-site Reuse	Off-site Reuse			
	(kg per day)	(m^3)	(m^3)	Location	(kg per day)	Location
General Refuse	3,460 [1]	-	-	-	2,353[2]	Note [2]
Chemical Waste	0.5 L per day [1]	-	-	-	0.5 L per day	Note [3]
Clinical Waste	151 [1]	-	-	-	151	Note [3]

Note:

[1] Based on the information provided by Hospital Authority, the existing Blocks A, B, and C of Baptist Hospital has 601 beds and the amount of general refuse, chemical wastes and clinical wastes generated in year 2023 are 569,400kg, 142L and 47,349kg respectively. Therefore, generation rates of 2.6 kg per bed per day, 0.0006 L per bed per day and 0.2 kg per bed per day are assumed for generation of general refuse, chemical wastes, and clinical wastes respectively. Estimations are made based on a designed bed number of 700 for the medical facility under the Current Scheme. In addition, the existing canteen generated an approximate of 600,000kg of general refuse in Year 2023 which is added to the estimation.

[2] To facilitate recycling efforts, the collection of food waste alongside other recyclable materials (e.g. paper, tin-can, etc.) will be encouraged with the provision of recycling bins. The remaining non-recyclable waste materials will be disposed of at designated landfill sites by a reputable waste collector. Estimations on the possible total general refuse recovered for recycling can be referenced from the Monitoring of Solid Waste in Hong Kong 2022 with a stated Municipal Solid Waste (MSW) recovery rate of 32%, of which 3.8% were food waste.

[3] The storage and disposal point of chemical/clinical waste is at Block D of the hospital, which is outside the scope of the Application Site. Nonetheless the chemical/clinical waste will be stored within suitably designed containers prior to collection by licensed chemical/ clinical waste collector for subsequent disposal at Chemical Waste Treatment Centre or other licensed facilities.

6.3.1.3 The handling and disposal of these materials and wastes will require proper management in order not to cause environmental impacts and nuisance. It is anticipated that there would not be any insurmountable impacts provided good site practices and other appropriate mitigation measures are implemented.

6.3.1.4 The hospital generates radioactive waste as part of its daily operations. To ensure that there are no potential impact arising from radioactive wastes, the hospital strictly adheres to Radiation Ordinance Cap. 303 and Cap. 303A, as well as relevant license conditions and requirements. All radioactive waste produced within the hospital are stored in hot labs approved by the Hong Kong Radiation Board, located at LG/1 and LG/2. To manage radioactive waste effectively, the hospital strictly follows Condition 6 of the license, in which radioactive wastes are stored in leaded shield containers for the designated delay and decay period. Condition 10 of the license also requires the radioactive waste to be separately stored prior to disposal. This meticulous approach is inspected annually by a medical physicist from the Hong Kong Radiation Board to ensure renewal of the hospital's radioactive license. As a result, the hospital releases radioactive wastes at undetectable levels, and it is anticipated that there would not be any insurmountable impacts associated from radioactive wastes.

6.3.2 Recommended Practices for Operational Phase

Waste Collection and Disposal

6.3.2.1 An effective and efficient waste handling system is essential in order to minimize potential adverse environmental impacts during waste storage, collection and transport, such impacts may include odour if waste is not collected frequently; water quality if waste enters storm water drains; aesthetics and vermin problems if the waste storage area is not well maintained and cleaned regularly. The waste handling system may also facilitate materials recovery and recycling.

6.3.2.2 A refuse collection room would be installed at the ground floor for localized refuse collection and the waste would be transported to a refuse transfer station (RFS). To avoid potential odour nuisance during transport of waste, enclosed waste collection trucks should be used and the collection route and time should be properly planned. At least daily collection should be arranged by the waste collector.

6.3.2.3 MSW from the proposed medical facility should be collected with lidded bins and delivered to a central collection point and stored in enclosed containers to prevent windblown, vermin, water pollution and visual impact. At least daily collection should be arranged by the waste collector.

Waste Recycling

6.3.2.4 In order to facilitate recycling, a 4-bin recycling system for paper, metals, plastics and glass should be adopted together with a general refuse bin. They should be placed in prominent places to promote waste separation at source. All recyclable materials should be collected by recyclers.

Chemical Wastes

6.3.2.5 Chemical wastes should be handled in accordance with the "*Code of Practice on Packaging, Labelling and Storage of Chemical Wastes*" published by EPD. Chemical containers should have the following properties:

- They are suitable for the substance that they hold and are resistant to corrosion;
- They should be maintained in a good condition and are securely closed; and
- Labels in English and Chinese are displayed in accordance with instructions prescribed in Schedule 2 of the Waste Disposal (Chemical Waste) (General) Regulation.

6.3.2.6 Apart from the containers, there are other recommended properties for the storage area of chemical wastes:

- The area is clearly labelled, and the sole use is storage of chemical wastes;
- The area is enclosed on at least three sides;
- The area has an impermeable floor and bunding. The bunding should have the capacity of 110% of the volume of the largest container stored within, or 20% by volume of the chemical wastes stored in the area;
- The area has adequate ventilation;
- The area is covered to prevent entering of rainfall;

- Water collected within the bund must be tested and, if necessary, disposed as chemical waste; and
- They are arranged in a way that incompatible materials are adequately separated.

6.3.2.7 Baptist Hospital is currently under EPD Chemical Waste Producer registry. The chemical wastes shall be collected by a licensed chemical waste collector for subsequent disposal at the Chemical Waste Treatment Centre at Tsing Yi or other licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.

Clinical Wastes

6.3.2.8 Clinical wastes should be handled in accordance with the "*Code of Practice for the Management of Clinical Waste – Major Clinical Waste Producers and Waste Collectors*" published by EPD. Key elements include:

- Clinical wastes must be properly managed and segregated from other municipal solid waste;
- Clinical wastes must be placed in containers that are leak-proof, impervious to moisture and strong enough to prevent tearing or bursting. These containers should be of one-trip type and should not be reused;
- Packaging of clinical wastes should follow the designated colour-coding to enable easy and unique identification of different type of clinical wastes;
- Containers of clinical wastes should not be filled above the warning line indicating between 70% and 80% of their maximum volume before sealing;
- Storage area of the clinical wastes should be enclosed on at least three sides. Impermeable floor and bund should be provided;
- The storage area shall be used for clinical wastes only; and
- Collection of clinical wastes must be conducted by licensed clinical waste collectors and the clinical wastes must be delivered to a licensed disposal facility (i.e. Chemical Waste Treatment Centre in Tsing Yi) within 24 hours after collection.

7 Land Contamination Appraisal

7.1 Relevant Legislation, Standard and Guidelines

7.1.1 General

7.1.1.1 The relevant legislations, standards and guidelines applicable to the present study for the assessment of land contamination include:

- Guidance Note for Contaminated Land Assessment and Remediation, EPD, (Revised in April 2023);
- Practice Guide for Investigation and Remediation of Contaminated Land, EPD, 2011 (Revised in April 2023); and
- Guidance Manual for Use of Risked-based Remediation Goals for Contaminated Land Management, 2007 (Revised in April 2023).

7.2 Site Description

7.2.1.1 The Application Site is situated in No. 222 Waterloo Road, Kowloon Tong, Kowloon. The site is currently used as a private hospital, with 3 out of 5 Blocks within the Application Site (Blocks A to C). Surrounding the Application Site are Hong Kong Baptist University (HKBU) Ho Sin Hang Campus to the north, Kam Shing Road to the south, Franki Centre and Man Lung Garden to the east, and bounded by Waterloo Road to the west. The location of Application Site is indicated in **Figure 2.1**.

7.3 Review of Aerial Photographs and Historical Land Uses

7.3.1.1 Selected historical aerial photographs between 1963 to 2021 (i.e. 1963, 1973, 1983, 1999, 2015, and 2021) have been reviewed to identify any past land uses which may have the potential for causing land contamination. The historical aerial photographs are given in **Appendix 7.1**. The key findings are summarised in **Table 7.1** below.

Table 7.1: Description of historical land uses

Year	Description
1963	• The Application Site was under construction for private hospital use at western portion, with mountainous area at eastern portion. • A construction site for Hong Kong Baptist University Ho Sin Hang Campus was observed to the north of the Application Site. • Mountainous Area was observed to the east and south of the Application Site. Kowloon East Barracks were observed to the farther south of the Application Site. • Low-rise residential developments were observed to the southwest of the Application Site.

Year	Description
	• A single mid-rise residential development was observed to the northwest of the Application Site.
1973	• The private hospital on the Application Site was constructed at western portion and in operation while the mountainous area at eastern portion was cleared and occupied as basketball court. • The Hong Kong Baptist University Ho Sin Hang Campus to the north of the Application Site was in operation. • The mountainous area to the east and south of the Application Site was cleared for a construction site. • Telephone Exchange south of the Application Site was built. • More mid-rise residential developments have been constructed to the northwest of the Application Site.
1983	• The private hospital remained at western portion of the Application Site while the eastern portion was cleared for open area of the hospital. • An extension of the private hospital to the south of the Application Site was observed. • No other significant change in historical land use was observed as compared with that in Year 1973.
1999	• The private hospital was extended with more building blocks within the Application Site. • Additional buildings at the Hong Kong Baptist University Ho Sin Hang Campus were observed to be built to the north of the Application Site. • No other significant change in historical land use was observed as compared with that in Year 1983.
2015	• Block D and E of Hong Kong Baptist Hospital have been built south of the Application Site. • No other significant change in historical land use was observed within the Application Site and in the vicinity as compared with that in Year 1999.
2021	• No significant change in historical land use was observed as compared with that in Year 2015.

7.3.1.2 Based on the review of historical aerial photos, no potential contamination land use is observed within the site during the period of 1963 to 2021.

7.4 Site Survey Findings

7.4.1.1 Site survey was conducted in March 2024 to identify any existing land uses within the Application Site which may have potential for causing land contamination. There is no direct contact of the upper floors above G/F and only the areas where there are direct contact to ground (i.e. without a lower ground beneath) have been inspected. Photo record of the site survey is given in **Appendix 7.2** and the site walkover checklist is given in **Appendix 7.3**. Some areas were inaccessible during the site survey, as indicated in **Appendix 7.2.** These inaccessible areas should be further evaluated as part of the Contamination Assessment Plan (CAP) preparation.

G/F

7.4.1.2 The areas with direct contact to ground at the G/F is generally occupied by the reception area, waiting areas, pharmacy, chemotherapy day centre, storeroom, etc. In general, the floors were entirely paved with tiles or concrete, and are in good condition with no observable cracks. Some rusting surface was observed in an A/C plant room on the southwest of Block A (**Photo 24**). However, the ground is well paved with no oil stains or chemical stains observed, and no odours were noticed during site survey.

LG/1

7.4.1.3 The areas with direct contact to ground at the LG/1 is generally occupied by the canteen, linen storage, cyclotron centre, and an area under renovation works (including radiotherapy, tomotherapy system room, equipment room, PET-MR room, and store room). In general, the floors were entirely paved with tiles or concrete, and are in good condition with no observable cracks. Some potentially contaminating uses on the LG/1 includes an oil tank room with drip trays (**Photo 32**), emergency generator room with secondary containment (**Photo 33**) on the southwest of Block C, no stains and odour were observed at these areas. Besides, there was a boiler room located in Block B (**Photo 41 and 42**), only electric boilers were used, and no other potential land contaminating activities were observed within the boiler room. No oil stains or chemical stains were observed, and no odours were noticed during site survey.

7.4.1.4 C.L.P. transformer room, existing transformer room, dangerous goods stores, radioactive store, and area under renovation works were inaccessible during the site survey. It is recommended that these inaccessible areas should be further evaluated as part of the CAP preparation. The hazardous materials and chemicals associated with the operation and maintenance of the aforementioned inaccessible rooms and the paving conditions of the rooms shall be assessed in the subsequent assessment stage.

LG/2

7.4.1.5 The areas with direct contact to ground at the LG/2 is generally occupied by the Nuclear Medicine & PET CT Centre, a loading and unloading bay, refuse area, medical gas plant and boiler room. In general, the floors were entirely paved with tiles or concrete, and are in good condition with no observable cracks. Some potentially contaminating uses on the LG/2 includes a storeroom (**Photo 45**), a boiler room (**Photo 46** and **47**), fuel tank room (**Photo 49**), U/G fuel oil service tank (**Photo 50**), oil pump storage (**Photo 51**) and medical gas plant room (**Photo 54** and **55**) on the north. Two disused underground storage tanks and associated pipes are located at LG/2, the location and general layout of pipe route is given in **Appendix 7.4**. Stains were observed at the store room, boiler room fire escape corridor (**Photo 48**) and fuel tank room (**Photo 49**), odour of fuel was also noticed at the daily fuel tank room. Meanwhile, there were no oil stains or chemical stains observed and odour noticed at remaining areas.

7.4.1.6 3 dangerous goods stores, a grease trap room, an electric workshop, refuse area, and sluice room at LG/2 were inaccessible during site survey. It is recommended that these inaccessible areas should be further evaluated as part of the CAP preparation. The hazardous materials and chemicals associated with the operation and maintenance of the inaccessible rooms and the paving conditions of the rooms shall be assessed in the subsequent assessment stage.

7.5 Relevant Information Request

7.5.1 Fire Services Department

7.5.1.1 Information request on any Dangerous Goods (DGs) license registered, and any record of DGs spillage/leakage incidents within the Application Site have been sent to FSD. The correspondence with FSD is attached in **Appendix 7.5**.

7.5.1.2 Based on FSD reply, there are 24 Dangerous Goods license registered. The items with potential for land contamination are summarized in **Table 7.2**.

Table 7.2: Summary of Dangerous Goods License Information

Item	Type of Dangerous Goods	Quantity	Location of Storage
8	Diesel	18,185 litres	U/G Fuel Oil Service Tank at LG/2
18	Diesel	2,000 litres	Oil Tank Room at LG/1
19	Diesel	1,550 litres	Fuel Tank Room at LG/2
20	Acetone	10 litres	Dangerous Goods Store

7.5.1.3 A total of 26 incident reports were found and all incidents were lift cases, which do not have any potential land contamination.

7.5.2 Environmental Protection Department

7.5.2.1 Information request on any Chemical Waste Producer (CWP) registered, and any record of chemical spillage/leakage incidents within the Application Site were made to EPD. The correspondence with EPD is attached in **Appendix 7.6**.

7.5.2.2 Based on information provided by EPD, there are no records of report accidents of spillage/ leakage of chemicals and the Baptist Hospital is under the EPD Chemical Waste Producer registry.

7.5.2.3 The storage and disposal point of the chemical and clinical wastes are located at Block D of the Hospital, which is outside the scope of the Application Site.

7.6 Identification of Potentially Contaminated Site

7.6.1.1 Review of desktop data and information request from relevant departments have been conducted. In addition, as confirmed through site surveys, some potentially contaminative uses were identified and are summarized in **Table 7.3**. Some areas were inaccessible during the site survey, and it is recommended that should be further evaluated as part of the CAP preparation.

Table 7.3: Summary of Potentially Contaminative Site

Photo ID (Appendix 7.2)	Location	Potentially Contaminative Use	Observation
32	Oil Tank Room at LG/1	Storage of fuels	The floor is entirely concrete paved with no observable cracks. No oil or chemical stains, or odour was noticed. The oil tanks were placed with secondary containment in case of any potential spillage.
33	Emergency Generator Room at LG/1	Handling of fuels for generator use	The floor is entirely concrete paved with no observable cracks. No oil or chemical stains, or odour was noticed.
45	Storeroom at LG/2	Possible historical operation of processing plants or storage of fuel	The floor is entirely concrete paved with no observable cracks. Dark stained surface were observed on the floor. No odour was noticed.
46 & 47	Boiler Room at LG/2	Use of fuels for steam boilers	The floor is entirely concrete paved with metal flooring installed above. No oil or chemical stains were observed. No odour was noticed.
48	Boiler Room Fire Escape Corridor at LG/2	Transportation of fuels	The floor is entirely concrete paved with no observable cracks. Dark oil stains were observed on the floor. No odour of fuel was noticed.
49	Fuel Tank Room at LG/2	Storage of fuels	The floor is entirely concrete paved with no observable cracks. Dark oil stains were observed on the floor. Odour of fuel was noticed.
50	U/G Fuel Oil Service Tank at LG/2	Storage of fuels	The condition of the U/G Fuel Oil Service Tank cannot be observed as it is located underground and encased in concrete. However, the aboveground condition of the floor is entirely concrete paved with no observable cracks. No oil or chemical stains, or odour was noticed.
51	Oil Pump Storage at LG/2	Storage of equipment with possible oil leakage	The floor is entirely concrete paved with no observable cracks. No oil or chemical stains, or odour was noticed. The equipment is stored in a locked metal cabinet.
54 & 55	Medical Gas Plant Room at LG/2	Use and storage of chemicals	The floor is entirely concrete paved with no observable cracks. No oil or chemical stains, or odour was noticed. Chemical cylinders are in good condition.

Photo ID (Appendix 7.2)	Location	Potentially Contaminative Use	Observation
69	Two Disused U/G Storage Tanks and Associated Oil Pipes at LG/2	Previous use and storage of chemicals, potential leakage and spillage concerns of associated oil pipes	The condition of the disused U/G storage tanks cannot be observed as they are located underground and encased in concrete. However, the aboveground condition of the floor above is entirely concrete paved with no observable cracks. No oil or chemical stains, or odour was noticed.
N/A	Radioactive Store Room at LG/1	Storage of radioactive materials	In general, the radioactive store room is used to store low-level radioactive materials with relatively short-lived radionuclides. The storage containers are suitably shielded and handling of low-level radioactive materials within the store room will follow all procedures and guidelines under the Radiation Ordinance and relevant Code of Practices. It is unlikely that any potential contamination will arise from this room, though for completeness, it is recommended to further evaluate this area as part of the CAP preparation.
35	C.L.P. Transformer Room at LG/1	Handling of chemicals and fuel during maintenance and operation of transformer	The area was inaccessible. It is recommended that the inaccessible area should be further evaluated as part of the CAP preparation to confirm for any potential contamination issues.
36	Existing Transformer Room at LG/1	Handling of chemicals and fuel during maintenance and operation of transformer	The area was inaccessible. It is recommended that the inaccessible area should be further evaluated as part of the CAP preparation to confirm for any potential contamination issues.
37	Dangerous Goods Stores A & B at LG/1	Storage of dangerous goods	The area was inaccessible. It is recommended that the inaccessible area should be further evaluated as part of the CAP preparation to confirm for any potential contamination issues.
56 & 57	Dangerous Goods Store No.3, No.4 and No.5 at LG/2	Storage of dangerous goods	The area was inaccessible. It is recommended that the inaccessible area should be further evaluated as part of the CAP preparation to confirm for any potential contamination issues.
N/A	Grease Trap Room at LG/2	Storage of grease	The area was inaccessible. It is recommended that the inaccessible area should be further evaluated as part of the CAP preparation to confirm for any potential contamination issues.
N/A	Electric Workshop at LG/2	Use of chemicals for workshop activities	The area was inaccessible. It is recommended that the inaccessible area should be further evaluated as part of the CAP preparation to confirm for any potential contamination issues.
N/A	Refuse Area at LG/2	Storage of chemicals and other hazardous materials	The area was inaccessible. It is recommended that the inaccessible area should be further evaluated as part of the

Photo ID (Appendix 7.2)	Location	Potentially Contaminative Use	Observation
			CAP preparation to confirm for any potential contamination issues.
N/A	Sluice Room at LG/2	Use of chemicals for the disinfection of equipment and disposal of wastes	The area was inaccessible. It is recommended that the inaccessible area should be further evaluated as part of the CAP preparation to confirm for any potential contamination issues.
30	Area under renovation works at LG/1	Storage of chemicals and other hazardous materials	The area was inaccessible. It is recommended that the inaccessible area should be further evaluated as part of the CAP preparation to confirm for any potential contamination issues.

7.6.1.2 Given that areas with potentially contaminative uses were identified during the land contamination appraisal, further site investigation and sampling should be proposed in a CAP with a similar assessment scope. A Contamination Assessment Report (CAR) should then be prepared based on the results of the site investigation prior to any construction works. Should any land contamination be identified in the CAR, a Remediation Action Plan (RAP) shall be prepared to propose the appropriate remediation methods suitable. All documents shall be submitted to EPD for endorsement prior to any construction works at the Application Site.

8 Conclusion

8.1.1.1 An Environmental Assessment Study has been conducted to support the Section 16 Planning Application for proposed minor relaxation of building height restriction for permitted hospital use at Blocks A, B and C of Hong Kong Baptist Hospital at No. 222 Waterloo Road, Kowloon Tong, Kowloon.

8.1.1.2 Potential dust impact would be generated from the construction activities during the construction phase. Adverse dust impact is not anticipated with the implementation of the recommended dust control measure and good site practices.

8.1.1.3 For operational phase, despite the fact that detailed design of the proposed development is unavailable at the time of preparing this Report, sufficient setback distances from the surrounding roads will be allowed for any air sensitive uses including proposed open space for active and passive recreational uses as well as fresh air intakes and openable windows (if any), with reference to the HKPSG requirements. No chimney is identified within 500m of the site. Hence, no adverse air quality impact on the proposed development is anticipated

8.1.1.4 Potential source of noise impact during the construction phase would be construction noise generated from the use of PME for various construction activities With the implementation of the recommended mitigation measures, no insurmountable construction noise impact is therefore anticipated.

8.1.1.5 For the planned fixed plant noise sources on the proposed development, as no detailed design information is available at the time of assessment, the maximum permissible SWL is determined. By selecting fixed plant sources that can achieve the proposed maximum permissible SWL, as well as adopting the proposed mitigation strategies and measures, when necessary, adverse noise impact from planned fixed plant noise sources due to the operation of the proposed development is not anticipated. The Contractor should also carry out a noise commissioning test for all fixed noise sources before operation of the Project, in order to ensure compliance of the operational airborne noise levels with the planning fixed source noise criteria.

8.1.1.6 For water quality, construction site runoff and sewage from site workforce have been identified as potential water pollution and impact sources during construction phase. With the implementation of the recommended site management practices listed in ProPECC Note PN 2/23, no adverse water quality impact during construction phase is anticipated.

8.1.1.7 Operational impacts associated with runoff and sewage from the development would be insignificant with proper management practices in place. The proposed development would be properly drained and sewered. Adverse water quality impact is thereby not anticipated. A separate Sewerage Impact Assessment Report has been conducted as well to assess the impact of sewage generation as a result of

the proposed development. Details of mitigation measures, if necessary, shall be referred to the Sewerage Impact Assessment Report.

8.1.1.8 Potential waste management implications impact from the generation of waste during the construction phase have been evaluated. Measures, including the opportunity for on-site sorting, reusing C&D materials etc., are recommended to minimise materials to be disposed. Recommendations have been made for implementation by the Contractor during the construction period to minimise waste generation and off-site delivery. With the implementation of the recommended measures, no adverse waste management implications are anticipated.

8.1.1.9 Municipal solid waste, chemical waste and clinical wastes would be generated during operational phase. Recommendations have been made to ensure proper treatment and disposal of these wastes. With the implementation of the recommended measures, no adverse waste management implications is anticipated.

8.1.1.10 Given that areas with potentially contaminative uses were identified during the land contamination appraisal, further site investigation with a similar scope and sampling should be proposed in a CAP. A Contamination Assessment Report (CAR) should then be prepared based on the results of the site investigation prior to any construction works. Should any land contamination be identified in the CAR, a Remediation Action Plan (RAP) shall be prepared to propose the appropriate remediation methods suitable. All documents shall be submitted to EPD for endorsement prior to any construction works at the Application Site.

Appendix 3.1

TD Confirmation on Kam Shing Road

From: Hon Yeung LI <honyeungli@td.gov.hk>
Sent: Friday, March 22, 2024 11:24 AM
To: Damon Wong <Damon.Wong@arup.com>
Cc: Johnny So <johnny.so@arup.com>; Charling Leung <charling.leung@arup.com>; Jason Leung WY <jason-wy.leung@arup.com>
Subject: Fw: s.16 Planning Application - Proposed Minor Relaxation of Building Height Restriction for Permitted Hospital Use at Blocks A, B and C of Hong Kong Baptist Hospital

Dear Damon,

Kam Shing Road is a local distributor.

Regards,
Simon LI
EK/KC, TEK,TD
Tel 2399 2512
----- Forwarded by Hon Yeung LI/TD/HKSARG on 22/03/2024 11:21 AM -----

From: Damon Wong <Damon.Wong@arup.com>
To: Hon Yeung LI <honyeungli@td.gov.hk>
Cc: Johnny So <johnny.so@arup.com>, Charling Leung <charling.leung@arup.com>, Jason Leung WY <jason-wy.leung@arup.com>
Date: 13/03/2024 03:12 PM
Subject: s.16 Planning Application - Proposed Minor Relaxation of Building Height Restriction for Permitted Hospital Use at Blocks A, B and C of Hong Kong Baptist Hospital

---

Dear Simon,

For the purpose of the Environmental Assessment Study preparation for the captioned project, we would like to seek your confirmation on the road type classification for Kam Shing Road, as it is not indicated in the ATC. The proposed road type for Kam Shing Road is shown below and the location plan is attached for your reference.

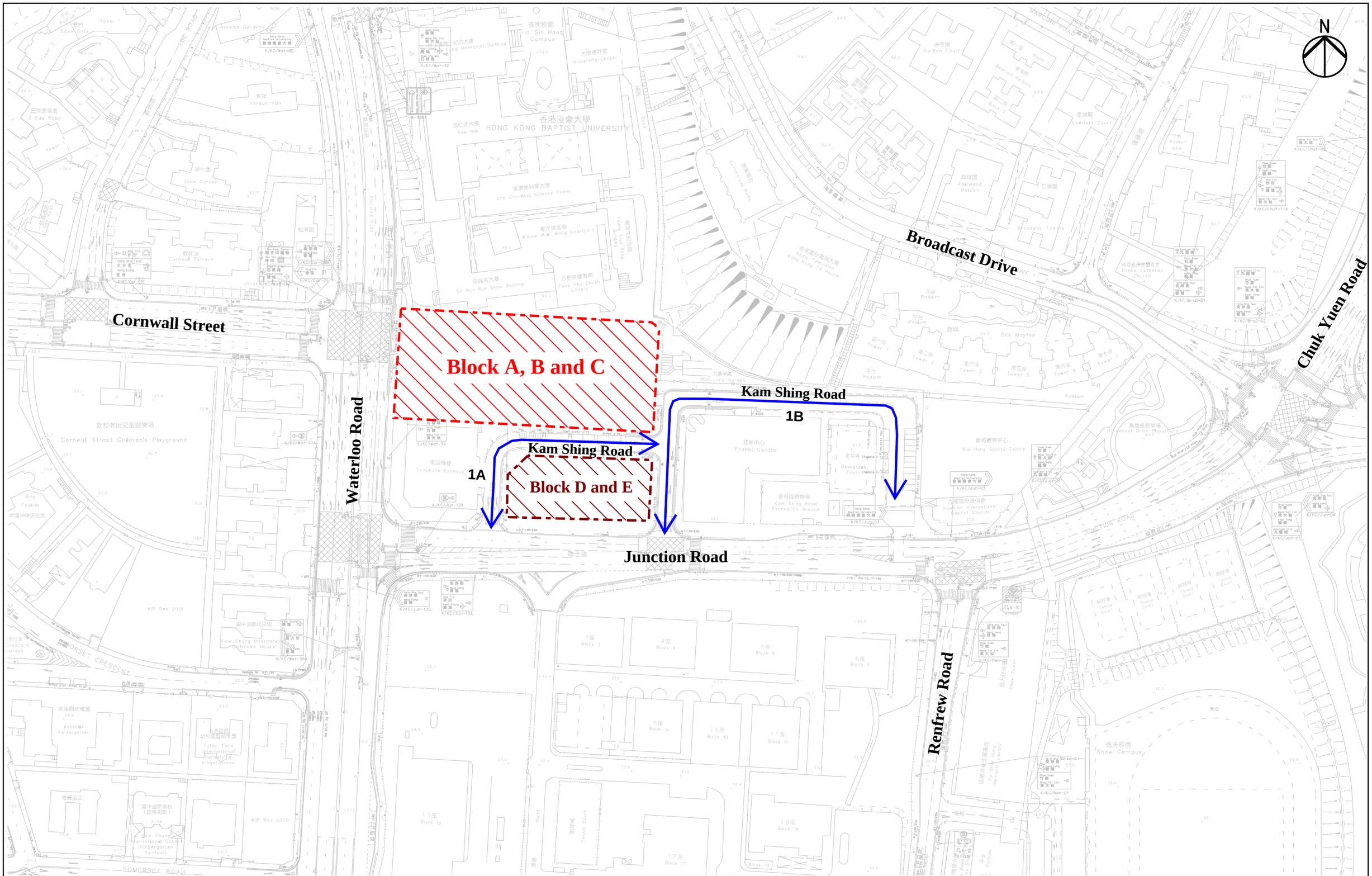
Index.	Road Links	Road Type
1A	Kam Shing Road	Local Distributor
1B		

Your reply by 20 March 2024 would be much appreciated.

Should you have any queries, please feel free to contact the undersigned.

Regards,
Damon Wong
Senior Engineer | Transport Consulting

Arup
Level 5 Festival Walk 80 Tat Chee Avenue Kowloon Tong Kowloon Hong Kong
d: +852 2908 4703
www.arup.com



Job Title: **PROPOSED MINOR RELAXATION OF BUILDING HEIGHT RESTRICTION FOR PERMITTED HOSPITAL USE AT BLOCKS A, B AND C OF HONG KONG BAPTIST HOSPITAL AT NO. 222 WATERLOO ROAD**			**FIGURE A1.1**
Date: **03/2024**	Scale: **1:1,500 (A3)**	Drawing Title: **LOCATION OF THE APPLICATION SITE AND ITS ENVIRONS**	**ARUP**
Drawn: **WYJL**	Job No.: **292058-24**		

Appendix 4.1

Detailed Fixed Noise Assessment

	Appendix 4.1 - Detailed Fixed Noise Assessment
NSR ID:	**N1**
NSR x coord:	**836485.4**
NSR y coord:	**822302.2**
NSR z coord:	**40.5**
ASR	**C**

Noise Source ID	Description	Maximum Permissible SWL, dB(A)	Source Location			Shortest Horizontal Distance from Application Site Boundary, m[1]	Correction, dB(A)		Predicted Daytime & Evening SPL, dB(A)	Predicted Nighttime SPL, dB(A)
			X (m)	Y (m)	Z (mpd)		Distance[2]	Facade		
Planned Sources (Day-time/ Evening)										
WF-1	West Façade of the Proposed Hospital at the Application Site	100	836525.2	822299.55	40.5	40	-40	3	63	-
Planned Sources (Night-time)										
WF-1	West Façade of the Proposed Hospital at the Application Site	90	836525.2	822299.55	40.5	40	-40	3	-	53

Tonality	0	0
Total SPL	63.0	53.0
Criteria ANL-5	65	55
Exceedance	-	-

Notes:
[1] For the case where the NSR has line of sight to a façade of the proposed hospital, it is assumed the planned louvres will be at the point with the shortest horizontal distance on the site boundary to the NSR.
[2] Distance attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metres

	Appendix 4.1 - Detailed Fixed Noise Assessment
NSR ID:	**N2**
NSR x coord:	**836488.7**
NSR y coord:	**822355.5**
NSR z coord:	**78.7**
ASR	**C**

Noise Source ID	Description	Maximum Permissible SWL, dB(A)	Source Location			Shortest Horizontal Distance from Application Site Boundary, m[1]	Correction, dB(A)		Predicted Daytime & Evening SPL, dB(A)	Predicted Nighttime SPL, dB(A)
			X (m)	Y (m)	Z (mpd)		Distance[2]	Facade		
Planned Sources (Day-time & Evening)										
NF-1	North Façade of the Proposed Hospital at Application Site	100	836527.7	822336.87	78.7	43	-41	3	62	-
WF-1	West Façade of the Proposed Hospital at Application Site	100	836527.7	822336.87	78.7	43	-41	3	62	-
Planned Sources (Night-time)										
NF-1	North Façade of the Proposed Hospital at Application Site	90	836527.7	822336.87	78.7	43	-41	3	-	52
WF-1	West Façade of the Proposed Hospital at Application Site	90	836527.7	822336.87	78.7	43	-41	3	-	52

Tonality	0	0
Total SPL	65.3	55.3
Criteria ANL-5	65	55
Exceedance	-	-

Notes:
[1] For the case where the NSR has line of sight to a façade of the proposed hospital, it is assumed the planned louvres will be at the point with the shortest horizontal distance on the site boundary to the NSR.
[2] Distance attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metres

	Appendix 4.1 - Detailed Fixed Noise Assessment
NSR ID:	**N3**
NSR x coord:	**836724.4**
NSR y coord:	**822419.2**
NSR z coord:	**93.4**
ASR	**C**

Noise Source ID	Description	Maximum Permissible SWL, dB(A)	Source Location			Shortest Horizontal Distance from Application Site Boundary, m[1]	Correction, dB(A)		Predicted Daytime & Evening SPL, dB(A)	Predicted Nighttime SPL, dB(A)
			X (m)	Y (m)	Z (mpd)		Distance[2]	Facade		
Planned Sources (Day-time & Evening)										
NF-1	North Façade of the Proposed Hospital at Application Site	100	836641.2	822328.87	93.4	123	-50	3	53	-
EF-1	East Façade of the Proposed Hospital at Application Site	109	836641.2	822328.87	93.4	123	-50	3	62	-
Planned Sources (Night-time)										
NF-1	North Façade of the Proposed Hospital at Application Site	90	836641.2	822328.87	93.4	123	-50	3	-	43
EF-1	East Façade of the Proposed Hospital at Application Site	99	836641.2	822328.87	93.4	123	-50	3	-	52

Tonality	0	0
Total SPL	62.7	52.7
Criteria ANL-5	65	55
Exceedance	-	-

Notes:
[1] For the case where the NSR has line of sight to a façade of the proposed hospital, it is assumed the planned louvres will be at the point with the shortest horizontal distance on the site boundary to the NSR.
[2] Distance attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metres

	Appendix 4.1 - Detailed Fixed Noise Assessment
NSR ID:	**N4**
NSR x coord:	**836730.2**
NSR y coord:	**822315.5**
NSR z coord:	**73.3**
ASR	**C**

Noise Source ID	Description	Maximum Permissible SWL, dB(A)	Source Location			Shortest Horizontal Distance from Application Site Boundary, m[1]	Correction, dB(A)		Predicted Daytime & Evening SPL, dB(A)	Predicted Nighttime SPL, dB(A)
			X (m)	Y (m)	Z (mpd)		Distance[2]	Facade		
Planned Sources (Day-time & Evening)										
EF-1	East Façade of the Proposed Hospital at Application Site	109	836642.1	822320.67	73.3	88	-47	3	65	-
Planned Sources (Night-time)										
EF-1	East Façade of the Proposed Hospital at Application Site	99	836642.1	822320.67	73.3	88	-47	3	-	55

Tonality	0	0
Total SPL	65.1	55.1
Criteria ANL-5	65	55
Exceedance	-	-

Notes:
[1] For the case where the NSR has line of sight to a façade of the proposed hospital, it is assumed the planned louvres will be at the point with the shortest horizontal distance on the site boundary to the NSR.
[2] Distance attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metres

	Appendix 4.1 - Detailed Fixed Noise Assessment
NSR ID:	**N5**
NSR x coord:	**836473.8**
NSR y coord:	**822275.5**
NSR z coord:	**36.75**
ASR	**C**

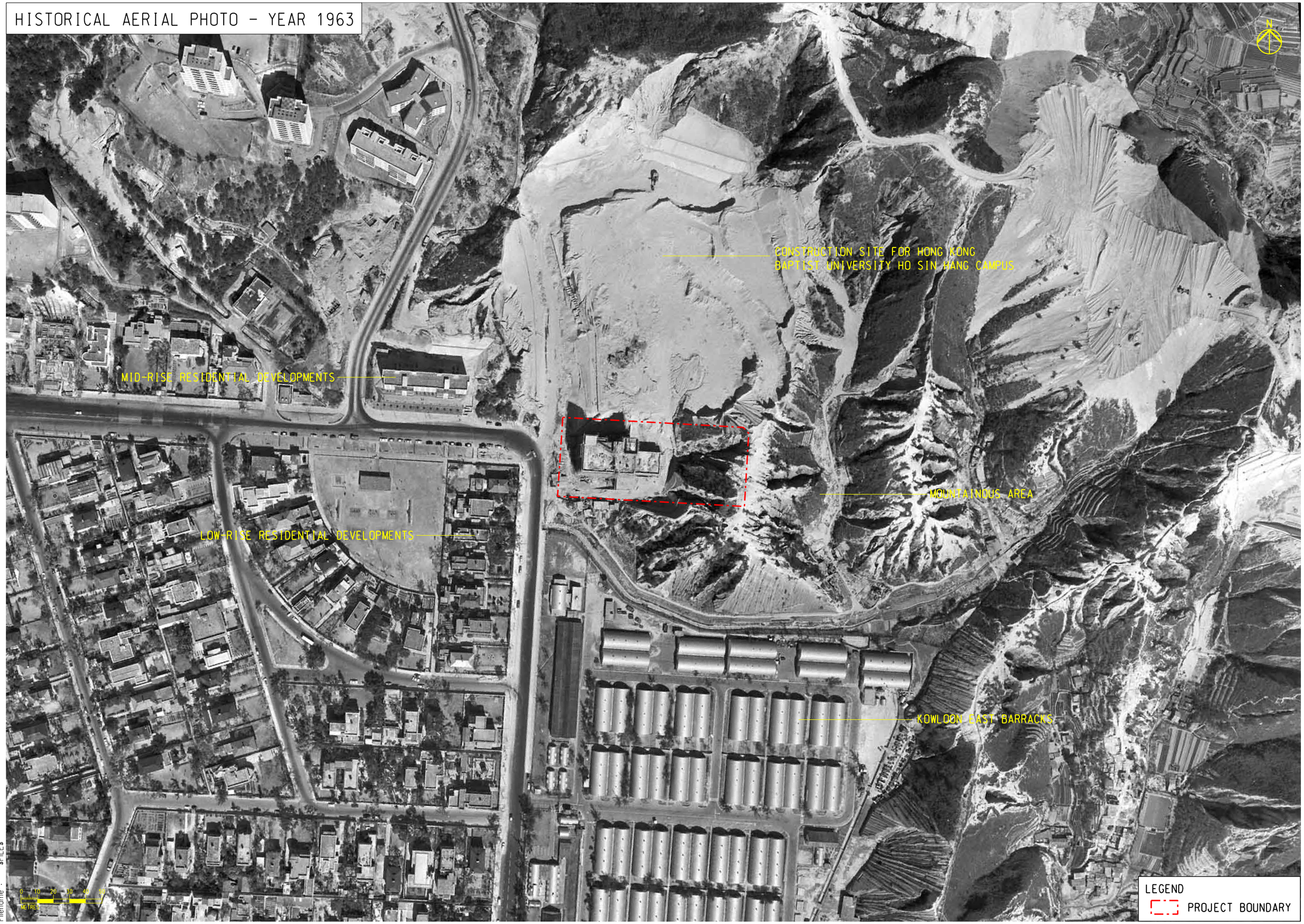
Noise Source ID	Description	Maximum Permissible SWL, dB(A)	Source Location			Shortest Horizontal Distance from Application Site Boundary, m[1]	Correction, dB(A)		Predicted Daytime & Evening SPL, dB(A)	Predicted Nighttime SPL, dB(A)
			X (m)	Y (m)	Z (mpd)		Distance[2]	Facade		
Planned Sources (Day-time & Evening)										
SF-1	South Façade of the Proposed Hospital at Application Site	102	836524.4	822288.17	36.75	52	-42	3	63	-
WF-1	West Façade of the Proposed Hospital at Application Site	100	836524.4	822288.17	36.75	52	-42	3	61	-
Planned Sources (Night-time)										
SF-1	South Façade of the Proposed Hospital at Application Site	92	836524.4	822288.17	36.75	52	-42	3	-	53
WF-1	West Façade of the Proposed Hospital at Application Site	90	836524.4	822288.17	36.75	52	-42	3	-	51

Tonality	0	0
Total SPL	64.8	54.8
Criteria ANL-5	65	55
Exceedance	-	-

Notes:
[1] For the case where the NSR has line of sight to a façade of the proposed hospital, it is assumed the planned louvres will be at the point with the shortest horizontal distance on the site boundary to the NSR.
[2] Distance attenuation = 20 log D + 8, where D is the distance between the NSR and the source in metres

Appendix 7.1
Historical Aerial Photos

HISTORICAL AERIAL PHOTO - YEAR 1963



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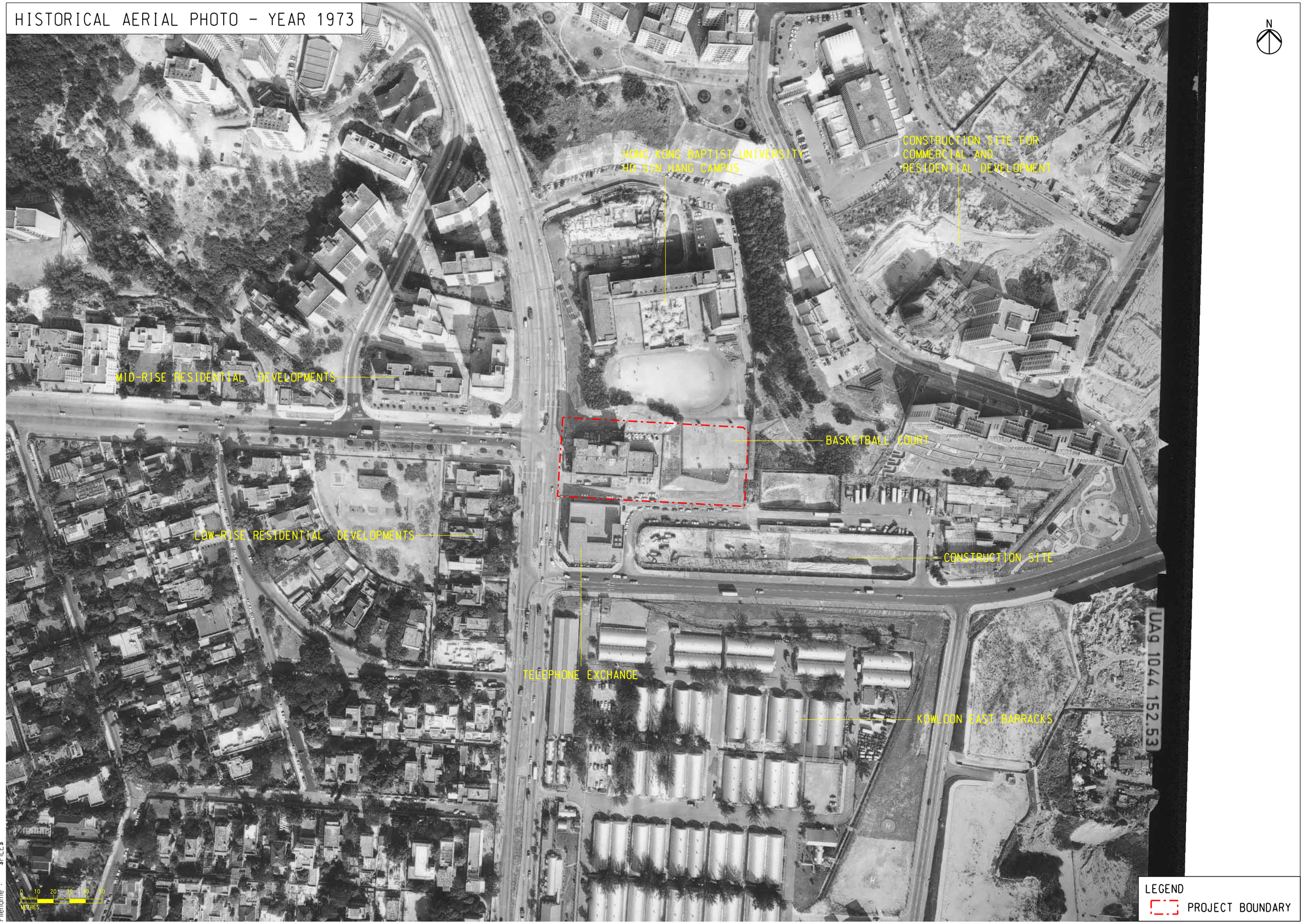
Filename : $FILE$

HISTORICAL AERIAL PHOTO - YEAR 1973



N

LEGEND

PROJECT BOUNDARY

Printed by : $DATE$
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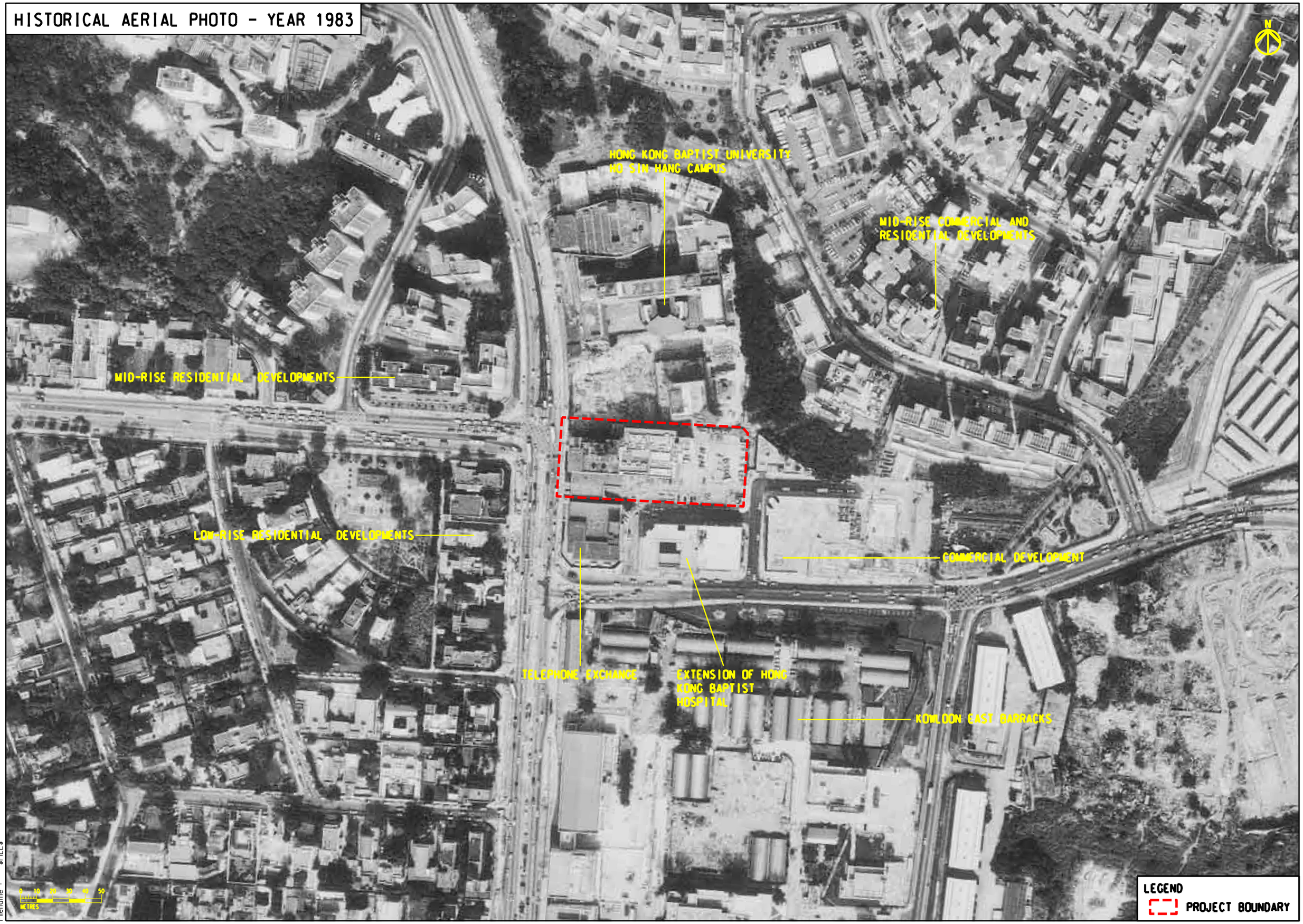
HISTORICAL AERIAL PHOTO - YEAR 1983



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HISTORICAL AERIAL PHOTO - YEAR 1999

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Filename : $FILE$

HISTORICAL AERIAL PHOTO - YEAR 2015

Printed by : $DATE$
Filename : $FILE$

HISTORICAL AERIAL PHOTO - YEAR 2021

Printed by : $DATE$
Filename : $FILE$

0mm

Appendix 7.2

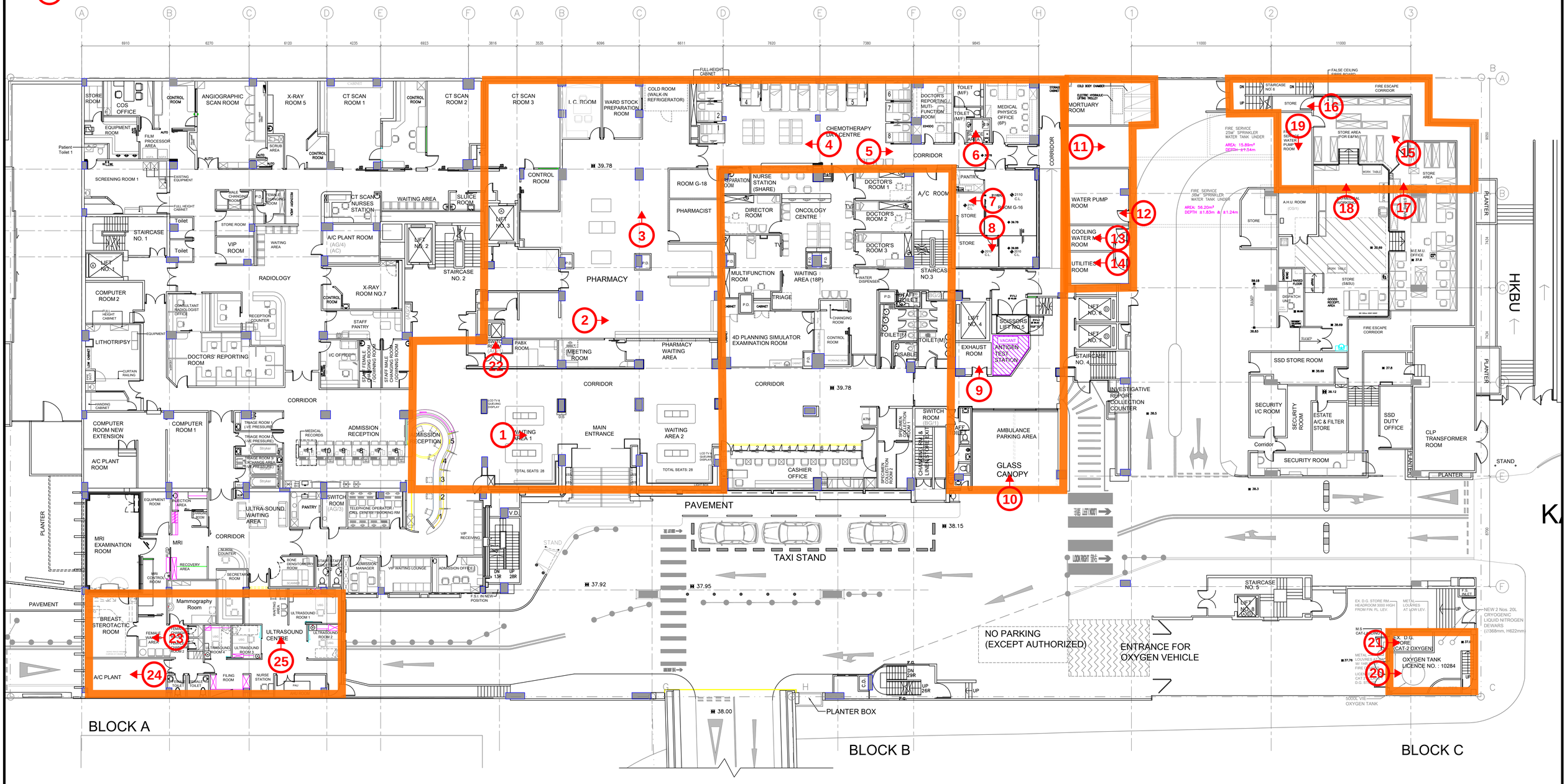
Photo Record of Site Survey

Area with direct contact to Ground

Areas identified with land contamination potential

ID Photo Location and Orientation

Inaccessible Areas that would be further evaluated as part of the CAP preparation



Notes: DRAWING FOR INFORMATION ONLY ALL DIMENSION SHOULD BE MEASURED IN mm UNLESS OTHERWISE STATED AND EXACT LOCATION TO BE DETERMINED ON SITE.	香港浸信會醫院 Hong Kong Baptist Hospital	Job Title: EXISTING LAYOUT PLAN	Drawing Title: BLOCK ABC G/F

Drawn By: K.C.	Checked By: K.K.	Approved By: B.T.
Scale: 1:300(A3)	Date: 08/11/2022	
DWG. NO. LP-BlkABC-GF		Rev.
ACAD Ref. LP-BlkABC-GF		

Area with direct contact to Ground

Areas identified with land contamination potential

ID Photo Location and Orientation

Inaccessible Areas that would be further evaluated as part of the CAP preparation

BOILER ROOM

LIFT NO. 1

LIFT NO. 2

STAIRCASE NO. 5

STAIRCASE NO. 4

STAIRCASE NO. 3

STAIRCASE NO. 1

PAU ROOM

SEATING AREA

KITCHEN

OPEN KITCHEN

FAN ROOM

STORE ROOM

SEATING AREA

ROAD

BLOCK A

DIRTY LINEN OF STORAGE AREA

A/C PIPE DUCT ROOM

CLEAN LINEN STORAGE

FEMALE CHANGING ROOM (6 Sets 4Lockers = 24P)

FEMALE CHANGING ROOM (42 Sets 4Lockers = 168P)

TOILET & SHOWER

STAFF LOUNGE

REST AREA

STORE

CYCLOTRON CENTRE

EXISTING TRANSFORMER ROOM

EXISTING SWITCH ROOM (MBE LG/M1)

C.L.P. TRANSFORMER ROOM

SWITCH ROOM (BLG1/2)

EMERGENCY GENERATOR ROOM

OIL TANK ROOM

KAM SHING ROAD

BLOCK B

EARTH

TREATMENT ROOM A

TREATMENT ROOM B

LIFT NO. 6

LIFT NO. 7

TREATMENT CONTROL ROOM A

DOCTOR ROOM

WAITING AREA

TREATMENT CONTROL ROOM B

RADIOTHERAPY

PATIENT TOILET

DISA TOILET

TOMOTHERAPY SYSTEM ROOM

EQUIP. RM

F.S. PRE-ACTION RM

DARK RM

WAITING AREA

RECEPTION & NURSE STATION

PET-MR ROOM

UPTAKE 2

UPTAKE 1

NURSE COUNTER

CONTROL ROOM

COMPUTER PLANNING ROOM C

CORRIDOR

WAITING

CHANGING

SRT RM

PATIENT TOILET

PLASTER ROOM

SERVER ROOM

TOILET

COMPUTER PLANNING ROOM D

STORE ROOM

STAFF TOILET

WORKSHOP

INTERVIEW ROOM

RADIOACTIVE STORE (SHARE)

OFFICE

LIFT SHAFT (LIFT NO.8)

STORE RM 2

STORE RM 1

MALE CHANGING ROOM

FEMALE CHANGING ROOM

COMPUTER PLANNING ROOM B

COMPUTER PLANNING ROOM A

SWITCH ROOM FOR LSSB BLDG & HOSPITAL (CLG1/M)

PANTRY

MOULD ROOM

BLOCK C

The Radiotherapy, Tomotherapy System Room, Equip. Room, PET-MR Room, Store Rm 2 areas were under renovation works and were inaccessible

Notes:

DRAWING FOR INFORMATION ONLY ALL DIMENSION SHOULD BE MEASURED IN mm UNLESS OTHERWISE STATED AND EXACT LOCATION TO BE DETERMINED ON SITE.

香港浸信會醫院
Hong Kong Baptist Hospital

Job Title: EXISTING LAYOUT PLAN

Drawing Title: BLOCK ABC LG1/F

Drawn By	Checked By	Approved By
K.C.	K.K.	B.T.

Scale: 1:300(A3) Date: 08/02/2023

DWG. NO. LP-BlkABC-LG1 Rev.

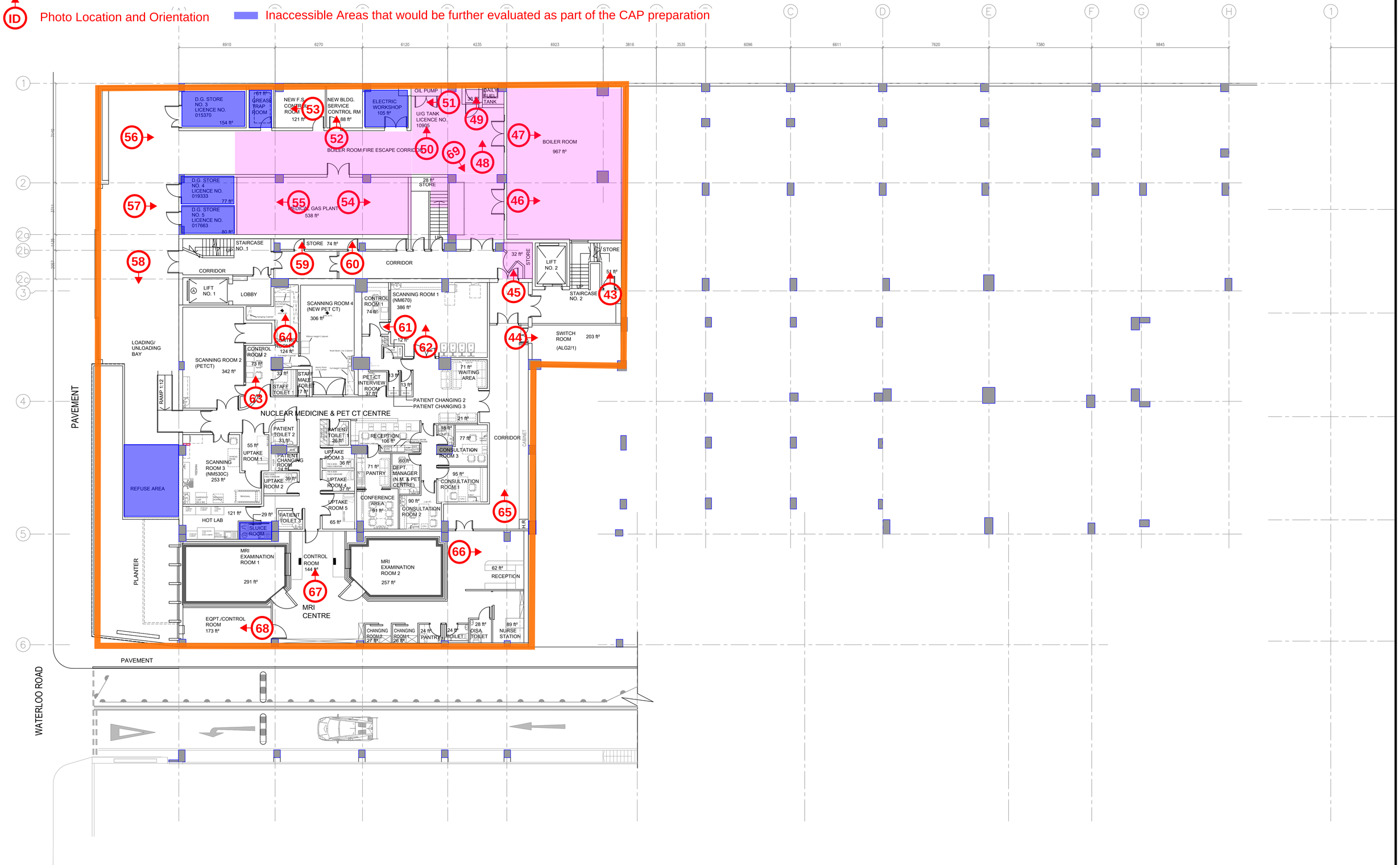
ACAD Ref. LP-BlkABC-LG1

Area with direct contact to Ground

Areas identified with land contamination potential

ID Photo Location and Orientation

Inaccessible Areas that would be further evaluated as part of the CAP preparation



Notes:		Job Title:	Drawing Title:	Drawn By	Checked By	Approved By
DRAWING FOR INFORMATION ONLY ALL DIMENSION SHOULD BE MEASURED IN mm UNLESS OTHERWISE STATED AND EXACT LOCATION TO BE DETERMINED ON SITE.	香港浸信會醫院 Hong Kong Baptist Hospital	EXISTING LAYOUT PLAN	BLOCK ABC LG2/F	K.C.	K.K.	B.T.
				Scale: 1:250(A3)	Date: 12/03/2021	
				DWG. NO. LP-BlkABC-LG2		Rev.
				ACAD Ref. LP-BlkABC-LG2		

Photo Records

	
Photo 1 Waiting Area 1 and Main Entrance at G/F	**Photo 2** Pharmacy at G/F
	
Photo 3 Pharmacy at G/F	**Photo 4** Chemotherapy Day Centre at G/F
	
Photo 5 Chemotherapy Day Centre at G/F	**Photo 6** Sluice Area at G/F

Photo 7
Storeroom at G/F

Photo 8
Storeroom at G/F

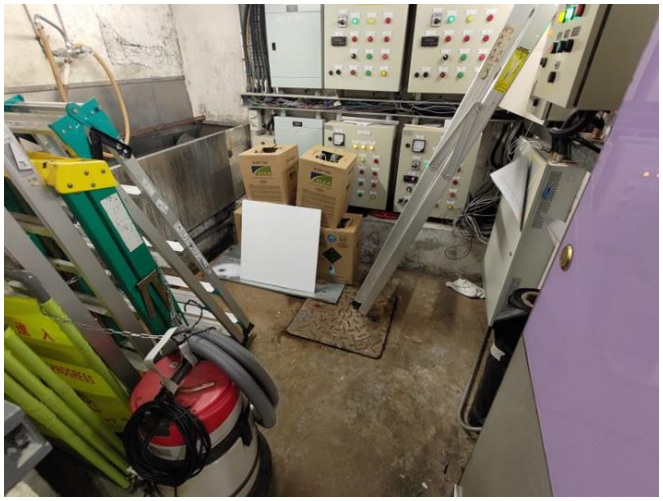


Photo 9
Exhaust Room at G/F

Photo 10
Ambulance Parking Area at G/F

Photo 11
Corridor to Carpark at G/F

Photo 12
Water Pump Room at G/F

Photo 13
Cooling Water M/C Room at G/F

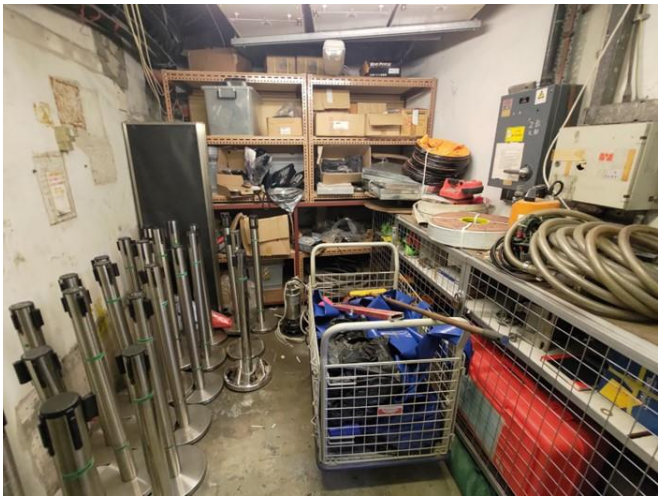


Photo 14
Utilities Room at G/F

Photo 15
Store Area for E&FM at G/F

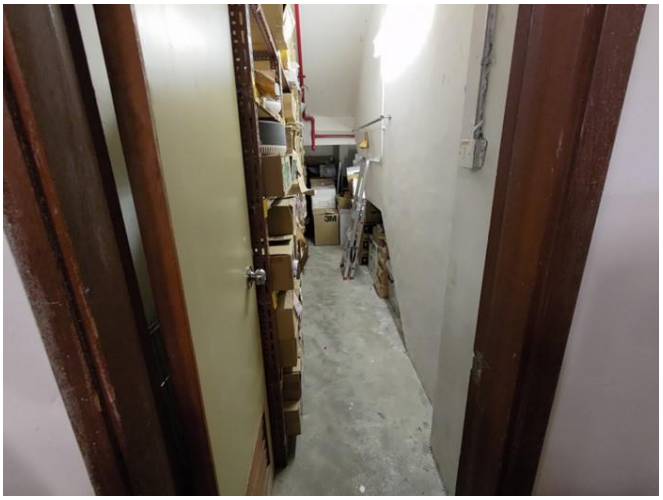


Photo 16
Storeroom at G/F

Photo 17
Store Area at G/F

Photo 18
Biomedical Workshop at G/F

Photo 19
Fire Service Water Pump Room at G/F

Photo 20
Oxygen Tank Room at G/F

Photo 21
D.G. Store at G/F

Photo 22
Switch Room at G/F

Photo 23
Female Waiting Area at G/F

Photo 24
A/C Plant Room at G/F

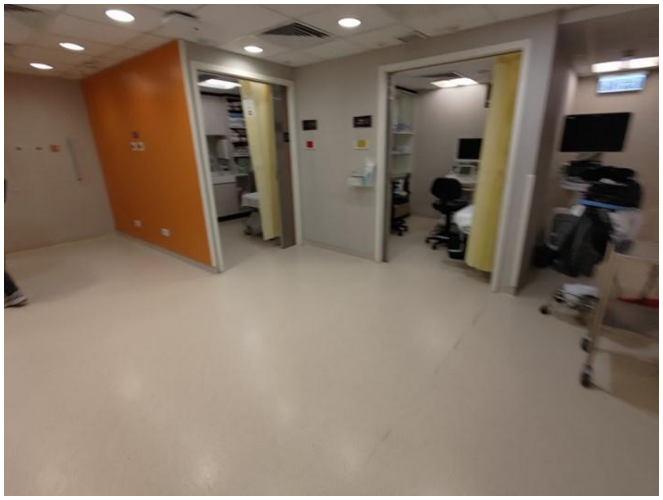


Photo 25
Ultrasound Centre at G/F

Photo 26
Canteen Entrance at LG/1

Photo 27
Tray Collecting No.2 Room at LG/1

Photo 28
MRI Room (previously a multi-function room) at LG/1

Photo 29
Workshop at LG/1

Photo 30
Renovation Works Area at LG/1

Photo 31
Switch-Room for LLSB Building & Hospital at LG/1

Photo 32
Oil Tank Room at LG/1

Photo 33
Emergency Generator Room at LG/1

Photo 34
Switch Room at LG/1

Photo 35
CLP Transformer Room at LG/1

Photo 36
Existing Transformer Room at LG/1

Photo 37
D.G. Storeroom A and B at LG/1

Photo 38
Switch Room at LG/1

Photo 39
Compress Air Room at LG/1

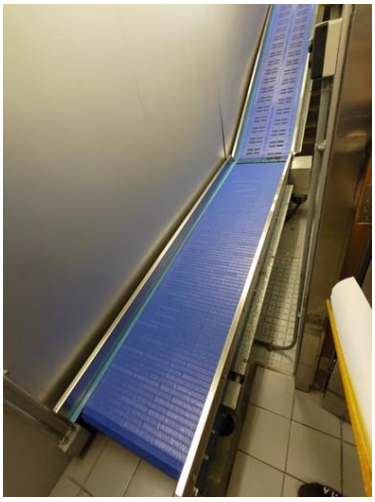


Photo 40
Equipment Room at LG/1

Photo 41
Boiler Room at LG/1

Photo 42
Boiler Room at LG/1

Photo 43
Storeroom at LG/2

Photo 44
Switch Room at LG/2

Photo 45
Storeroom at LG/2

Photo 46
Boiler Room at LG/2

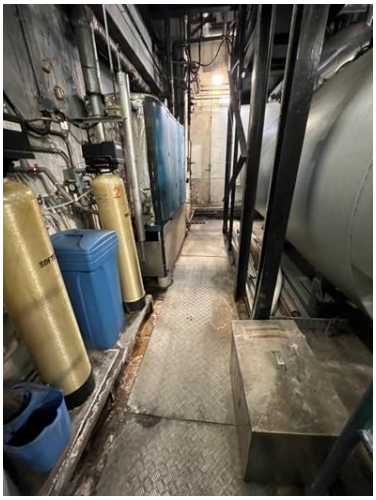


Photo 47
Boiler Room at LG/2

Photo 48
Boiler Room Fire Escape Corridor at LG/2

Photo 49
Fuel Tank Room at LG/2

Photo 50
U/G Tank at LG/2

Photo 51
Oil Pump Storage at LG/2

Photo 52
New Building Service Control Room at LG/2

Photo 53
New F.S. Control Room

Photo 54
Medical Gas Plant Room at LG/2

Photo 55
Medical Gas Plant Room at LG/2

Photo 56
D.G. Store at LG/2

Photo 57
D.G. Store at LG/2

Photo 58
Loading and Unloading Bay at LG/2

Photo 59
Storeroom at LG/2

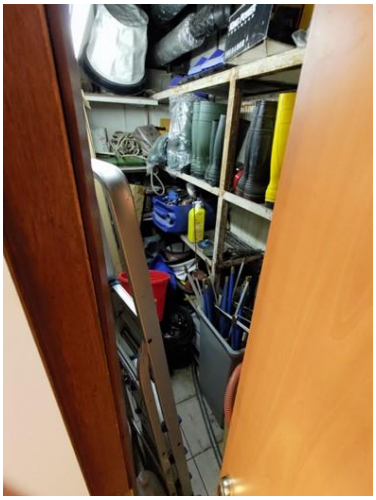


Photo 60
Storeroom at LG/2

Photo 61
Control Room 1 at LG/2

Photo 62
Scanning Room 1 at LG/2

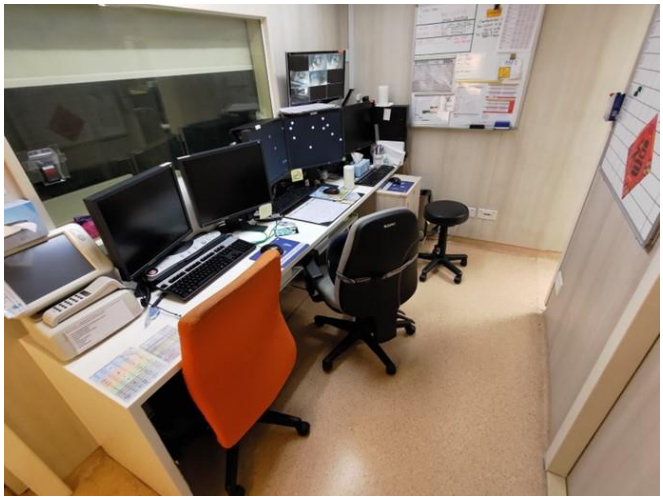


Photo 63
Control Room 2 at LG/2

Photo 64
Control Room 4 at LG/2

Photo 65
Corridor to M.R.I Centre at LG/2

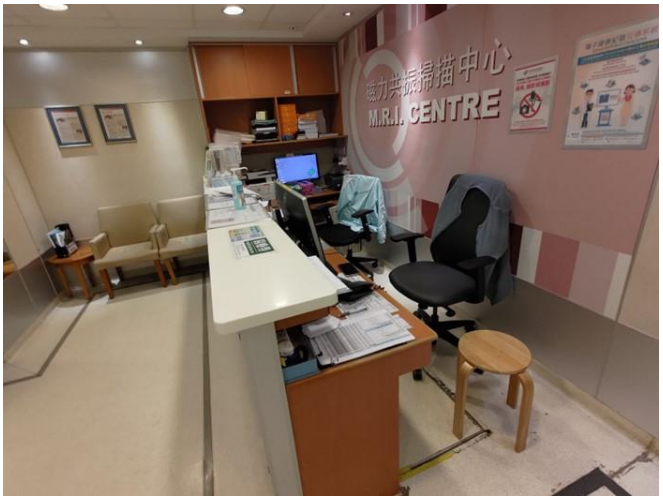


Photo 66
M.R.I Centre Reception at LG/2

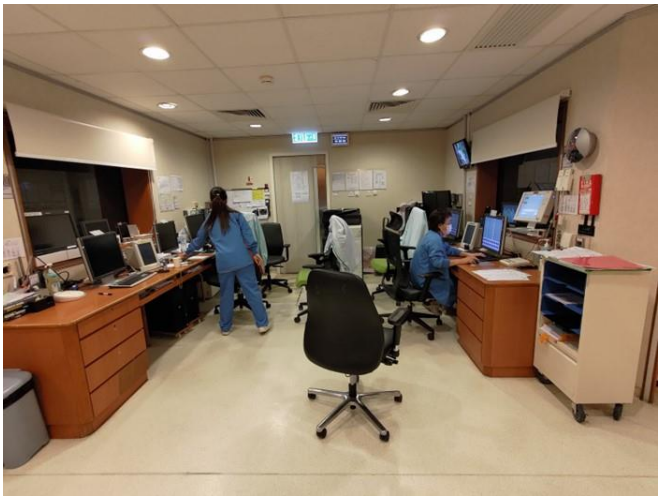


Photo 67
M.R.I Centre Control Room at LG/2

Photo 68
Equipment / Control Room at LG/2

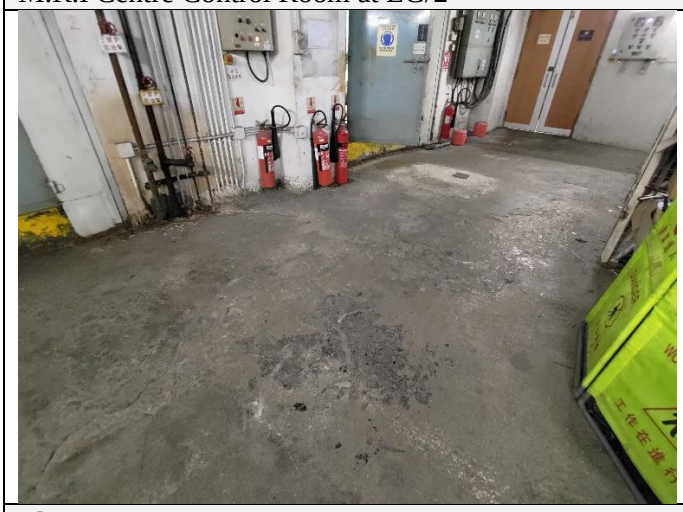


Photo 69
Aboveground of disused U/G Storage Tanks at LG/2

Appendix 7.3

Site Walkover Checklist

Site Walkover Checklist

1) GENERAL SITE DETAILS	
Site Owner/ Client	Hong Kong Baptist Hospital
Property Address	222 Waterloo Road
Person Conducting the Questionnaire (name & position)	Edric Lau, Assistant Consultant
Authorised Owner/ Client Representative (if applicable) (name, position & telephone)	Joshua L., HKBH Representative

2) ACTIVITIES	
Briefly describe activities carried out on site, including types of products/chemicals/materials handled. **Obtain a flow schematic if possible.**	Private Hospital Use
Number of employees:	N/A
- Full-time:	N/A
- Part-time:	N/A
- Temporary/Seasonal:	N/A
Maximum no. of people on site at any time:	N/A
Typical hours of operation:	24 hours
Number of shifts:	N/A
Days per week:	7
Weeks per year:	52
Scheduled plant shut-down:	N/A
Detail the main sources of energy at the site:	
Gas (Yes/No)	No
Electricity (Yes/No)	Yes
Coal (Yes/No)	No
Oil (Yes/No)	No
Other (Yes/No)	No

Site Walkover Checklist

3) SITE DESCRIPTION	
This section is intended to gather information on site setting and environmental receptors on, adjacent or close to the site.	
What is the total site area (m^2):	5649
What area of the site is covered by buildings (%):	98%
Please list all current and previous owners/occupiers if possible.	Hong Kong Baptist Hospital
Is a site plan available? (Yes/No) If yes, please attach.	Yes
Are there any other parties on site as tenants or sub-tenants? (Yes/No) If yes, identify those parties.	No
Describe surrounding land use (residential, industrial, rural, etc.) and identify neighbouring facilities and types of industry.	
North:	Educational
South:	Commercial/Hospital
East:	Commerical
West:	Residential
Describe the topography of the area (flat terrain, rolling hills, mountains, by a large body of water, vegetation, etc.).	Slope
State the size and location of the nearest residential communities.	Low-rise residential neighborhood (163 Waterloo Road, 157 Waterloo Road)
Are there any sensitive habitats nearby, such as nature reserves, parks, wetlands, or sites of special scientific interest?	No

Site Walkover Checklist

4) QUESTIONNAIRE WITH EXISTING/ PREVIOUS SITE OWNER OR OCCUPIER		
	Yes/No	**Notes**
1. What are the main activities/operations at the above address?	N/A	Private Hospital use
2. How long have you been occupying the site?	N/A	1963 to current
3. Were you the first occupant on site? (If yes, what was the usage of the site prior to occupancy.)	N/A	-
4. Prior to your occupancy, who occupied the site?	N/A	-
5. What were the main activities/operations during their occupancy?	N/A	Private Hospital use
6. Have there been any major changes in operations carried out at the site in the last 10 years?	N/A	Private Hospital use
7. Have any polluting activities been carried out in the vicinity of the site in the past?	No	-
8. To the best of your knowledge, has the site ever been used as a petrol filling station/car service garage?	No	-
9. Are there any boreholes/wells or natural springs either on the site or in the surrounding area?	No	-
10. Do you have any registered hazardous installations as defined under relevant ordinances? (If yes, please provide details.)	No	-
11. Are any chemicals used in your daily operations? (If yes, please provide details.)	Yes	Diesel, lubricating oils, hydraulic fluids, cleaning solvents, and chemical solutions are used in the hospital's routine operation.(i.e. maintenance and operation of transformers, cleaning, disinfecting etc.)
- Where do you store these chemicals?	Yes	Dedicated storage cabinets and areas without direct contact to the ground.
12. Material inventory lists, including quantities and locations available? (If yes, how often are these inventories updated?)	N/A	-
13. Has the facility produced a separate hazardous substance inventory?	N/A	-
14. Have there ever been any incidents or accidents (e.g. spills, fires, injuries, etc.) involving any of these materials? (If yes, please provide details.)	No	-
15. How are materials received (e.g. rail, truck, etc.) and stored on site (e.g. drums, tanks, carboys, bays, silos, cisterns, vaults and cylinders)?	N/A	Truck

Site Walkover Checklist

4) QUESTIONNAIRE WITH EXISTING/ PREVIOUS SITE OWNER OR OCCUPIER (CONTINUED)		
	Yes/No	**Notes**
16. Do you have any underground storage tanks? (If yes, please provide details.)	Yes	One U/G Oil Tank at LG/2
- How many underground storage tanks do you have on site?	N/A	1
- What are the tanks constructed of?	N/A	-
- What are the contents of these tanks?	N/A	Diesel
- Are the pipelines above or below ground?	N/A	Below ground
- If the pipelines are below ground, has any leak and integrity testing been performed?	Yes	-
- Have there been any spills associated with these tanks?	N/A	Regular maintenance checks
17. Are there any disused underground storage tanks?	Yes	Two U/G Oil Tanks concealed by concrete
18. Do you have regular check for any spillage and monitoring of chemicals handled? (If yes, please provide details.)	N/A	-
19. How are the wastes disposed of?	N/A	-
20. Have you ever received any notices of violation of environmental regulations or received public complains? (If yes, please provide details.)	No	-
21. Have any spills occurred on site? (If yes, please provide details)	N/A	-
- When did the spill occur?		
- What were the substances spilled?		
- What was the quantity of material spilled?		
- Did you notify the relevant departments of the spill?		
- What were the actions taken to clean up the spill?		
- What were the areas affected?		
22. Do you have any records of major renovation of your site or re-arrangement of underground utilities, pipe work/underground tanks? (If yes, please provide details.)	No	-
23. Have disused underground tanks been removed or otherwise secured (e.g. concrete, sand, etc.)?	Yes	Two U/G Oil Tanks concealed by concrete
24. Are there any known contaminations on site? (If yes, please provide details.)	N/A	-
25. Has the site ever been remediated? (If yes, please provide details.)	N/A	-

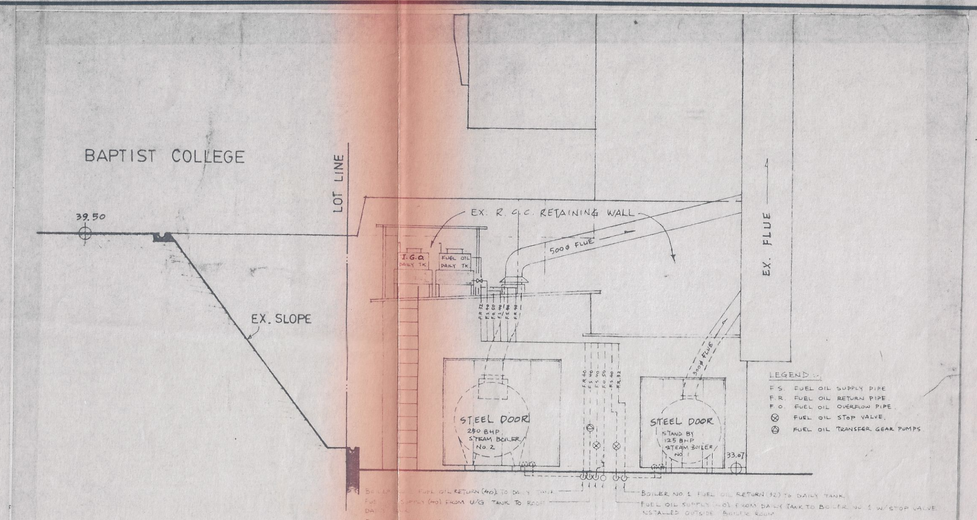
Site Walkover Checklist

5) SITE SURVEY INFORMATION	
1. Date of Survey:	03/21/2024

6) OBSERVATIONS		
	Yes/No	**Notes**
1. Are chemical storage areas provided with secondary containment (i.e. bund walls and floors)?	-	N/A
2. What are the conditions of the bund walls and floors?	-	N/A
3. Are any surface water drains located near to drum storage and unloading areas?	-	N/A
4. Are any solid or liquid waste (other than wastewater) generated at the site? (If yes, please provide details.)	Yes	General refuse, chemical waste, and clinical waste are generated at the site.
5. Is there a storage site for the wastes?	Yes	Waste storage area at G/F and Refuse Area at LG/2. Storage and disposal point of the chemical and clinical waste are located at Block D of the Hospital, which is outside of the Application Site.
6. Is there an on-site landfill?	No	N/A
7. Were any stressed vegetation noted on site during the site reconnaissance? (If yes, please indicate location and approximate size.)	No	N/A
8. Were any stained surfaces noted on-site during the site reconnaissance? (If yes, please provide details.)	Yes	Storeroom at LG/2 (Photo 44), Boiler Room Fire Escape Corridor (Photo 48), and Fuel Tank Room at LG/2 (Photo 49)
9. Are there any potential off-site sources of contamination?	No	N/A
10. Does the site have any equipment which might contain polychlorinated biphenyls (PCBs)?	Yes	Transformers
11. Are there any sumps, effluent pits, interceptors or lagoons on site?	No	N/A
12. Any noticeable odours during site walkover?	No	Odour was noticed at the Fuel Tank Room at LG/2
13. Are any of the following chemicals used on site: fuels, lubricating oils, hydraulic fluids, cleaning solvents, used chemical solutions, acids, anti-corrosive paints, thinners, coal, ash, oily tanks and bilge sludge, metal wastes, wood preservatives, and polyurethane foam?	Yes	Diesel, lubricating oils, hydraulic fluids, cleaning solvents, and chemical solutions are used in the hospital's routine operation.

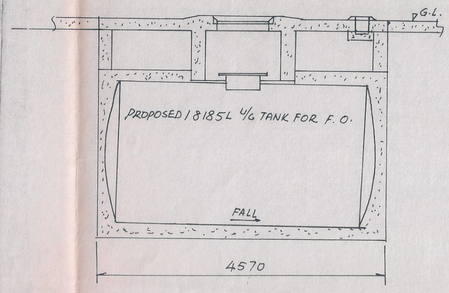
Appendix 7.4

General Pipe Layout in 1983

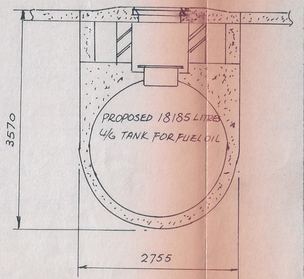


ELEVATION OF TEMPORARY BOILER RM.

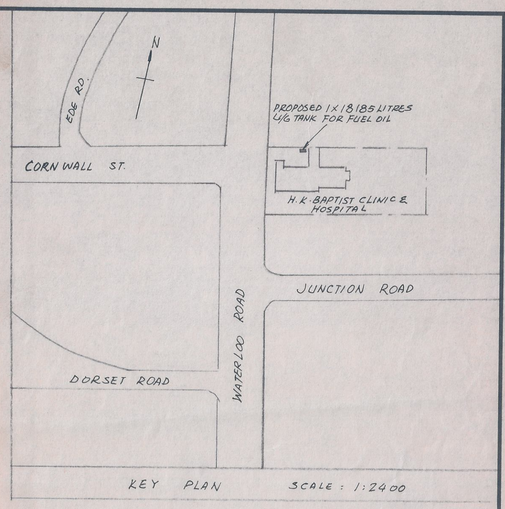
SCALE : 1:100

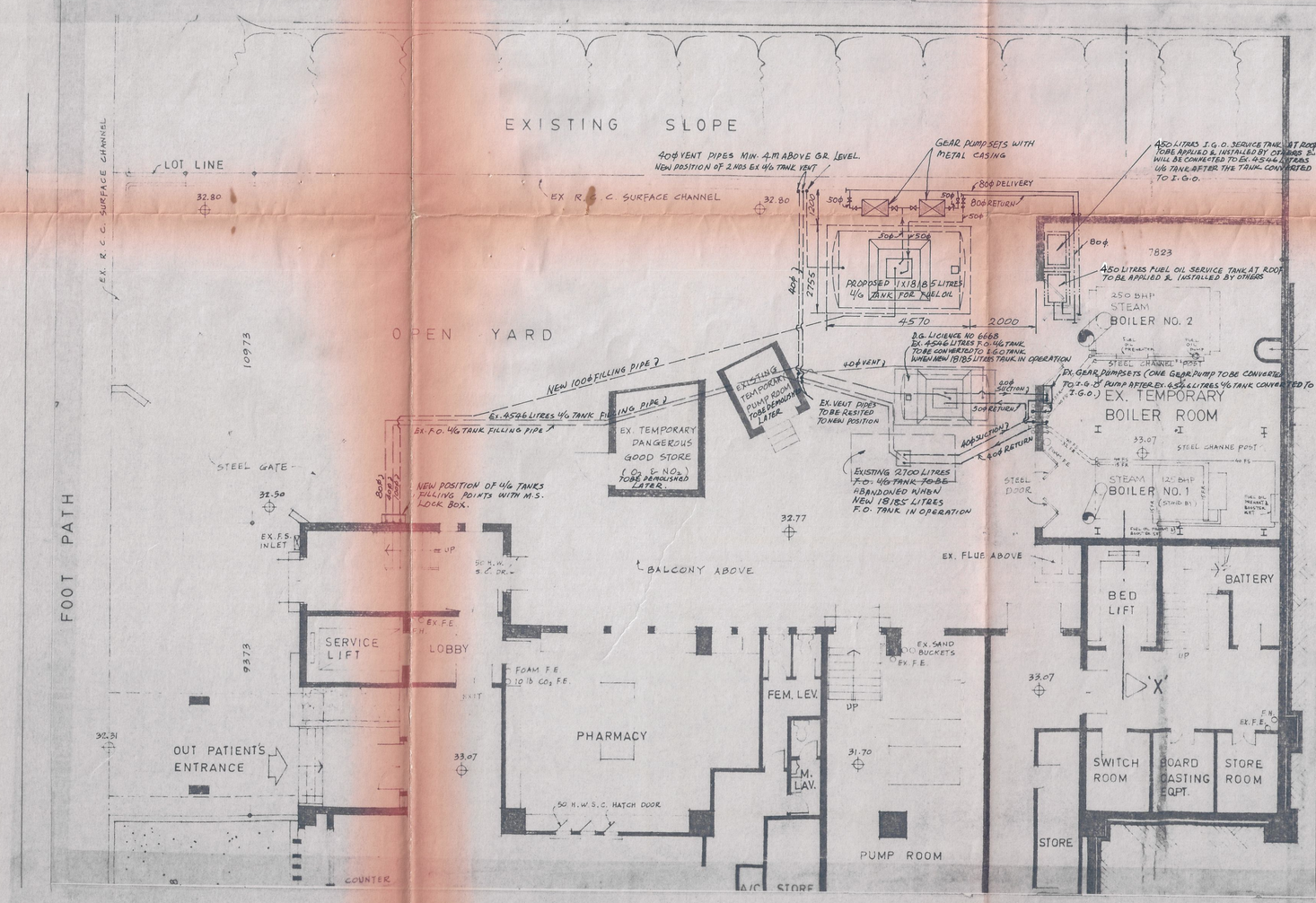


LONGITUDINAL SECTION OF PRO. 18185 L 4/6 TANK

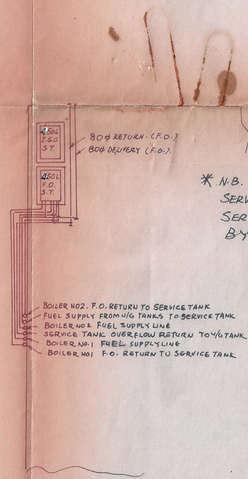


CROSS SECTION OF PRO. 18185 L. 4/6 TANK





PLAN SCALE : 1:100



PIPE ROUTE AT BOILER ROOM ROOF

* N.B. 2 X 450 LITRES SERVICE TANK & PIPELINES FROM SERVICE TANKS TO BOILERS & FROM BOILERS TO SERVICE TANKS TO BE APPLIED & INSTALLED BY OTHERS

NOTE:
1. ALL R.C. WORKS TO BE 1:2:4 MIX. & VIBRATED.
2. ALL PLAIN CONC. TO BE 1:3:6 MIX. & VIBRATED.
3. ALL BRICK WORK TO BE LAID IN 1:3 CEMENT MORTAR.
4. ALL UNDERGROUND PIPES TO BE SURROUNDED BY 75 mm CONC.
5. DETAIL OF 4/6 TANK AS PER DRG NO. 878/71 APPROVED BY F.S.D. DATED 4-3-71 REF NO. 112/0068.
6. ALL F.S.D. REQUIREMENTS TO BE COMPLIED WITH.

TO	REASON	DATE
S-1820%83	CAPACITY OF FUEL TANK & SERVICE TANK ADDED. CHEMI-KEY ADDED. ECQUITION OF BOILER ROOM ADDED	S.S. 2/9/83

REVISIONS

THE SHELL COMPANY OF HONG KONG LTD.

H.K. BAPTIST CLINIC AND HOSPITAL WATERLOO ROAD. KOWLOON

SUBJECT PROPOSED 18185 LITRES 4/6 TANK FOR FUEL OIL

GENERAL LAYOUT

SCALES	DRAWN/TRACED	CHECKED	APP'D.
AS SHOWN	S.S.		

DATE	DRAWING NUMBER
2/9/83	S-1820%83

NUMBERS CROSSED OUT ARE SUPERSEDED DRAWINGS.

DRAWER NO.

Appendix 7.5

Relevant Correspondence with FSD

Our ref 282303/L001/JS/el

ARUP

By Post, Fax (2988 1196)
and Email (aio_fsd@hkfsd.gov.hk)

Access to Information Officer
Management Group
9/F, Fire Services Headquarters Building
1 Hong Chong Road
Tsim Sha Tsui East, Kowloon

Level 5 Festival Walk
80 Tat Chee Avenue
Kowloon Tong
Kowloon
Hong Kong

t +852 2528 3031
d +852 2908 4381
f +852 2268 3380

johnny.so@arup.com
www.arup.com

17 April 2024

Dear Sir/Madam,

Proposed Hospital Redevelopment with Minor Relaxation of Building Height Restriction in "Government, Institution or Community (7)" Zone and Areas Shown as 'Road' at Blocks A, B and C of Hong Kong Baptist Hospital, 222 Waterloo Road, Kowloon Tong, Kowloon

Request for Information of Dangerous Goods and Incident Records

Ove Arup & Partners Hong Kong Ltd. has been appointed by Hong Kong Baptist Hospital to conduct an Environmental Assessment Study (EAS) for the captioned project.

As part of the EAS, we are required to review the historical and present land use around the area and evaluate any potential land contamination issues within the Site Boundary as shown in **Figure 1.1**. We would like to request the following information for our land contamination assessment:

- The records of Dangerous Goods License issued within the Site Boundary;
- Any past and present information related to the use, storage, spillage/leakage of dangerous goods within the Site Boundary; and
- Past and present incident records within the Site Boundary.

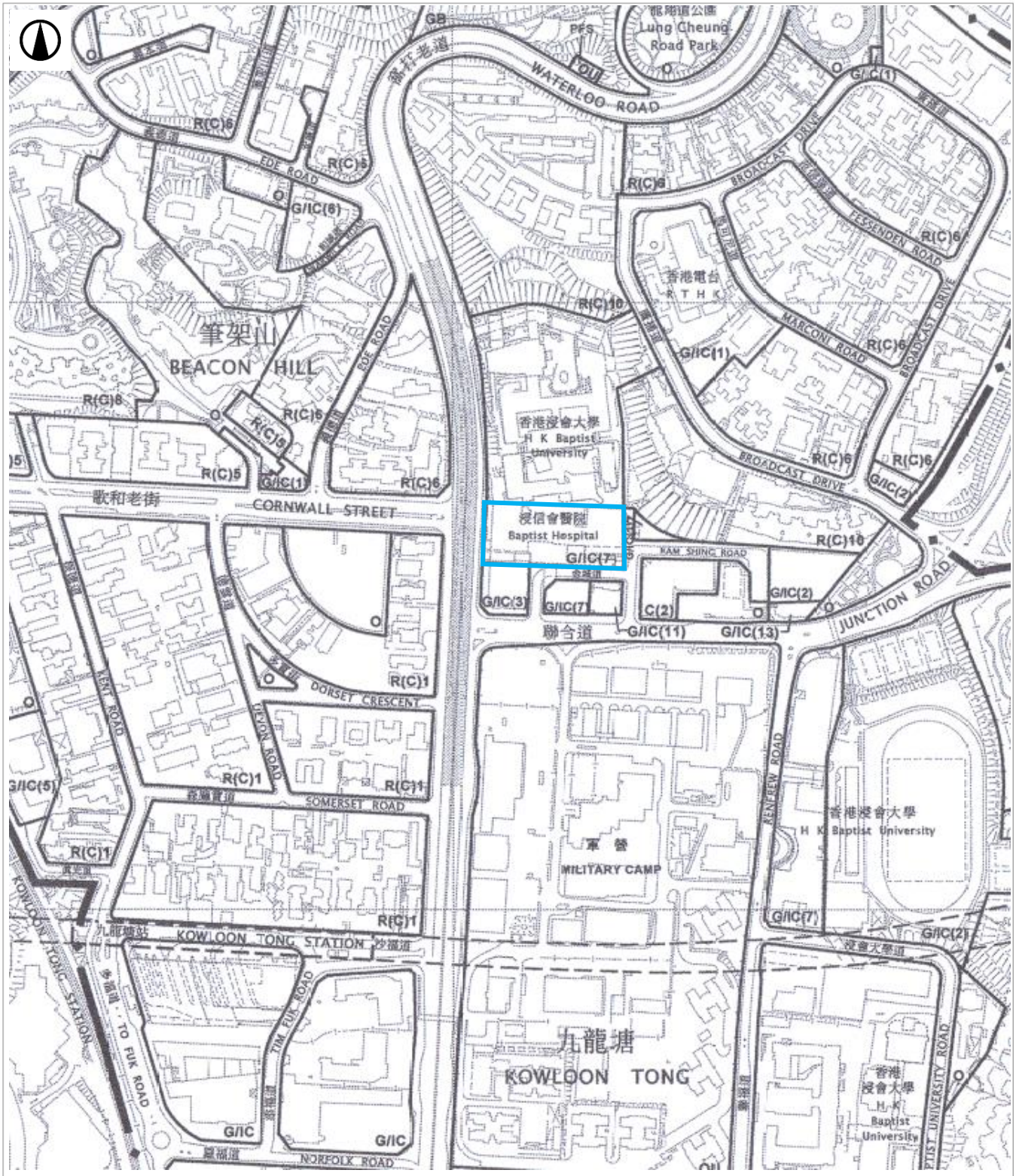
We would be grateful if you could provide the requested information at your earliest convenience and before 26 April 2024.

If you require any further information, please do not hesitate to contact the undersigned or our Mr. Edric Lau at 2908 4938.

Yours sincerely,

Johnny So
Senior Consultant

Encl. **Figure 1.1**



LEGEND Application Site

ZONING

C(2)	Commercial (2)
GB	Green Belt
G/IC	Government, Institution or Community
G/IC(2)	Government, Institution or Community(2)
G/IC(3)	Government, Institution or Community(3)
G/IC(5)	Government, Institution or Community(5)
G/IC(6)	Government, Institution or Community(6)
G/IC(7)	Government, Institution or Community(7)
G/IC(11)	Government, Institution or Community(11)
G/IC(13)	Government, Institution or Community(13)
O	Open Space
OU	Other Specified Uses
R(C)1	Residential (Group C)1
R(C)5	Residential (Group C)5
R(C)6	Residential (Group C)6
R(C)8	Residential (Group C)8
R(C)10	Residential (Group C)10

Figure No.	*Scale*	*Figure Title*
1.1	As shown	**Location Plan**
ARUP	*Date* December 2023	*Source* Extracted from the Approved Kowloon Tong Outline Zoning Plan (No. S/K18/21)

消 防 處
香港九龍尖沙咀東部康莊道 1 號
消防處總部大廈

FIRE SERVICES DEPARTMENT
FIRE SERVICES HEADQUARTERS BUILDING,
No.1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 **OUR REF.** : (16) in FSD GR 6-5/4 R Pt. 53
來函檔號 **YOUR REF.** : 282303/L001/JS/el
電子郵件 **E-mail** : hkfsdenq@hkfsd.gov.hk
圖文傳真 **FAX NO.** : 2988 1196
電　　話 **TEL NO.** : 2733 7570

7 May 2024

ARUP
Level 5, Festival Walk,
80 Tat Chee Avenue,
Kowloon Tong, Kowloon
(Attn: Mr. Johnny SO, Senior Consultant)

Dear Mr. SO,

Proposed Hospital Redevelopment
with Minor Relaxation of Building Height Restriction
in "Government, Institution or Community (7)" Zone and Areas
Shown as 'Road' at Blocks A, B and C of Hong Kong Baptist Hospital,
222 Waterloo Road, Kowloon Tong, Kowloon
Request for Information of Dangerous Goods & Incident Records

I refer to your letter of 17.4.2024 regarding the captioned request and reply below in response to your questions:-

1. According to our record, from the year of 1990 to present moment, dangerous goods licenses have been issued by this department to the subject address, with details as shown in **Appendix A**.

2. A total of **26** incident records were found at the subject location. Please refer to **Appendix B** for details.

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

Yours sincerely,

(LAI Kin-man)
for Director of Fire Services

Appendix A

Proposed Hospital Redevelopment
with Minor Relaxation of Building Height Restriction
in "Government, Institution or Community (7)" Zone and Areas
Shown as 'Road' at Blocks A, B and C of Hong Kong Baptist Hospital,
222 Waterloo Road, Kowloon Tong, Kowloon
Request for Information of Dangerous Goods & Incident Records

Item	Type of dangerous goods	Quantity	Location of storage
1.	Oxygen, Compressed	2,274 litres	Hong Kong Baptist Hospital, 222 Waterloo Road, Kowloon Tong, Kowloon
2.	Nitrous Oxide	1,137 litres	
3.	Carbon Dioxide	310 litres	
4.	Compressed Gas, Oxidizing, N.O.S.	270 litres	
5.	Air, Compressed	150 litres	
6.	Oxygen, Compressed	800 litres	
7.	Air, Compressed	750 litres	
8.	Diesel	18,185 litres	
9.	Isopropanol	510 litres	
10.	Flammable Liquid, N.O.S.	150 litres	
11.	Ethanol	50 litres	
12.	Oxygen, Refrigerated Liquid	5,000 litres	
13.	Nitrogen, Compressed	150 litres	
14.	Hydrogen, Compressed	100 litres	
15.	Helium, Compressed	100 litres	

Item	Type of dangerous goods	Quantity	Location of storage
16.	Compressed Gas, Flammable, N.O.S.	100 litres	Au Shue Hung Health Centre, Hong Kong Baptist Hospital, 222 Waterloo Road, Kowloon Tong, Kowloon
17.	Compressed Gas, N.O.S.	100 litres	
18.	Diesel	2,000 litres	
19.	Diesel	1,550 litres	
20.	Acetone	10 litres	
21.	Ethanol	700 litres	
22.	Isopropanol	1,000 litres	
23.	Methanol	35 litres	
24.	Flammable Liquid, N.O.S.	400 litres	

Proposed Hospital Redevelopment with Minor Relaxation of Building Height Restriction in "Government, Institution or Community (7)" Zone and Areas Shown as 'Road' at Blocks A, B and C of Hong Kong Baptist Hospital, 222 Waterloo Road, Kowloon Tong, Kowloon

Request for Information of Dangerous Goods & Incident Records

No.	Date	Type of Incident	Location in Hong Kong Baptist Hospital
1.	9/5/2021	Lift Case	Block A & B
2.	11/6/2021	Lift Case	Block C
3.	17/6/2021	Lift Case	Block C
4.	18/6/2021	Lift Case	Block C
5.	5/6/2022	Lift Case	Block A & B
6.	18/10/2022	Lift Case	Block C
7.	7/12/2022	Lift Case	Block C
8.	14/12/2022	Lift Case	Block C
9.	3/3/2023	Lift Case	Block A & B
10.	6/3/2023	Lift Case	Block C
11.	15/4/2023	Lift Case	Block C
12.	10/6/2023	Lift Case	Block A
13.	11/6/2023	Lift Case	Block C
14.	27/7/2023	Lift Case	Block C
15.	25/8/2023	Lift Case	Block C
16.	27/8/2023	Lift Case	Block C
17.	6/9/2023	Lift Case	Block C
18.	7/10/2023	Lift Case	Block A
19.	8/10/2023	Lift Case	Block C
20.	11/10/2023	Lift Case	Block A
21.	18/10/2023	Lift Case	Block C
22.	19/10/2023	Lift Case	-
23.	3/11/2023	Lift Case	Block C
24.	8/12/2023	Lift Case	Block A
25.	17/1/2024	Lift Case	Block C
26.	3/2/2024	Lift Case	Block C

Appendix 7.6

Relevant Correspondence with EPD

Our ref 282303/L001/JS/el

ARUP

BY FAX (2756 8588) AND BY POST

Level 5 Festival Walk
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Environmental Protection Department
Environmental Compliance Division
Regional Office (East)
5/F., Nan Fung Commercial Centre,
19 Lam Lok Street, Kowloon Bay,
Kowloon.

12 March 2024

Dear Sir/Madam,

Proposed Hospital Redevelopment with Minor Relaxation of Building Height Restriction in "Government, Institution or Community (7)" Zone and Areas Shown as 'Road' at Blocks A, B and C of Hong Kong Baptist Hospital, 222 Waterloo Road, Kowloon Tong, Kowloon

Request for Information of Chemical Waste Producers Registration and Chemical Spillage Accident Records

Ove Arup & Partners Hong Kong Ltd. has been commissioned by Hong Kong Baptist Hospital to carry out an Environmental Assessment Study (EAS) for the captioned project.

As part of the EAS, we are required to review the historical and present land use around the area and evaluate any potential land contamination issues within the Site Boundary as shown in **Figure 1.1**. We would like to request the following information for our land contamination assessment:

- The records of Chemical Waste Producers Registration of the area within the Site Boundary; and
- Past and present chemical spillage / leakage records of the area within the Site Boundary.

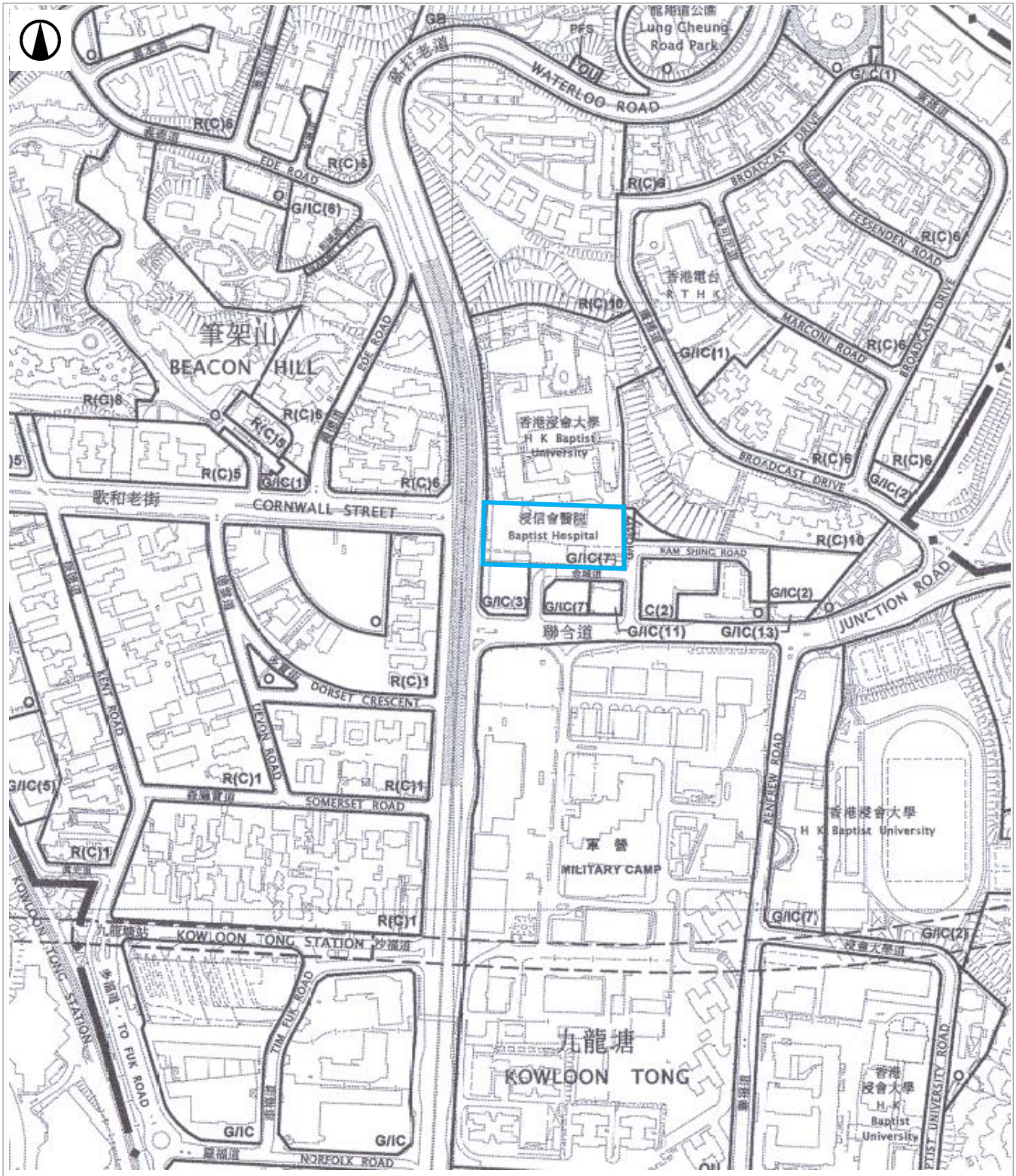
We would be grateful if you could provide the requested information at your earliest convenience and before 22 March 2024.

If you require any further information, please do not hesitate to contact the undersigned or our Mr. Edric Lau at 2908 4938.

Yours faithfully,

Johnny So
Senior Consultant

Encl. **Figure 1.1**



LEGEND Application Site

ZONING

C(2)	Commercial (2)
GB	Green Belt
G/IC	Government, Institution or Community
G/IC(2)	Government, Institution or Community(2)
G/IC(3)	Government, Institution or Community(3)
G/IC(5)	Government, Institution or Community(5)
G/IC(6)	Government, Institution or Community(6)
G/IC(7)	Government, Institution or Community(7)
G/IC(11)	Government, Institution or Community(11)
G/IC(13)	Government, Institution or Community(13)
O	Open Space
OU	Other Specified Uses
R(C)1	Residential (Group C)1
R(C)5	Residential (Group C)5
R(C)6	Residential (Group C)6
R(C)8	Residential (Group C)8
R(C)10	Residential (Group C)10

Figure No.	*Scale*	*Figure Title*
1.1	As shown	**Location Plan**
ARUP	*Date* December 2023	*Source* Extracted from the Approved Kowloon Tong Outline Zoning Plan (No. S/K18/21)

Edric Lau

From: kristyhnwong@epd.gov.hk
Sent: Friday, May 17, 2024 2:51 PM
To: Edric Lau
Subject: Re: Request for Information of Chemical Waste Producers Registration and Chemical Spillage Accident Records
Attachments: L001-EPD.pdf

Dear Edric,

I am writing in response to your captioned request.

Please note that a licensee namely "HONG KONG BAPTIST HOSPITAL" is found registered as a Chemical Waste Producer within the site boundary and there is no related report about chemical spillage accident occurred.

Should you have any further enquiries, please feel free to contact my colleague Mr. CHIU at 2117 7580 or me. Thank you.

Best Regards,
Kristy WONG/ AE(RE)53
Regional Office (East)
Environmental Protection Department

From: Edric Lau <Edric.Lau@arup.com>
To: "mingchunng@epd.gov.hk" <mingchunng@epd.gov.hk>
Cc: Johnny So <johnny.so@arup.com>
Date: 14/05/2024 14:17
Subject: Request for Information of Chemical Waste Producers Registration and Chemical Spillage Accident Records

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Dear Mr. Ng,

Proposed Hospital Redevelopment with Minor Relaxation of Building Height Restriction in "Government, Institution or Community (7)" Zone and Areas Shown as 'Road' at Blocks A, B and C of Hong Kong Baptist Hospital, 222 Waterloo Road, Kowloon Tong, Kowloon

As discussed on the phone just now, we have been commissioned by Hong Kong Baptist Hospital to carry out an Environmental Assessment Study (EAS) for the captioned project.

We have previously sent a letter of request for Information of Chemical Waste Producers Registration and Chemical Spillage Accident Records by fax and post to EPD Regional Office (East), as attached "L001-EPD.pdf".

As we have not received a reply yet, we would be grateful if you could provide the requested information at your earliest convenience by directly responding to this email.

If you require any further information, please do not hesitate to contact us.

Thanks a lot.

Best Regards,

Edric Lau
Assistant Consultant | Environmental

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