

Prepared by

Ramboll Hong Kong Limited

**PROPOSED SCHOOL AT VARIOUS LOTS IN D.D. 94, 98 & 100
AND ADJOINING GOVERNMENT LAND, KWU TUNG SOUTH,
NEW TERRITORIES**

SEWERAGE IMPACT ASSESSMENT

Date **October 2025**

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Signed



Project Reference **HENKTSISEI00**

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1. INTRODUCTION

1.1 Background and Objectives

- 1.1.1 The applicants, Global King Investment Limited, Winpost (HK) Investment Limited and Rand Development Limited, seek to rezone the current "Agriculture" zoning with a minor portion of "Green Belt" of the Application Site as outlined in the approved Kwu Tung South Outline Zoning Plan No. S/NE-KTS/22.
- 1.1.2 Ramboll Hong Kong Limited is commissioned to conduct the sewerage impact assessment based on the information regarding the proposed scheme.

1.2 Application Site and its Environs

- 1.2.1 The Application Site is situated along the Sheung Yue River which separate the Application Site into 2 portions (West and East Portions). It is bounded by Sheung Shui Hang Tau Village Sitting Out Area No.2 to the North and Po Shu Garden to the East.
- 1.2.2 **Figure 1.1** shows the location and the environs of the Proposed Development.

1.3 Proposed Development

- 1.3.1 Under the current application, the Application Site is proposed for an International School development. Details of the proposed development schedule are summarised in **Table 1.1** below and the layout plan is shown in **Appendix 1.1**.

Table 1.1 Development Schedule of the Proposed Development

Portions Located	West	East
Site Area (m ²)	~92,000	~35,000
Total GFA (m ²)	~126,850	~44,150
No. of Blocks	18	6
No. of Classrooms	76	65
No. of Students	1,600	1,400
No. of Staff (Including Teaching and Non-Teaching)	338	295
No. of Student/ Staff who can Live in the Accommodation	2243	0
Completion Year	2036	

2. SEWERAGE IMPACT ASSESSMENT

2.1 Scope of Work

- 2.1.1 The aim of this study is to compare the sewage flow generated from the proposed development with the sewage flow generated from the existing usage, and to determine whether adverse sewage impact is anticipated.

2.2 Assessment Criteria and Methodology

- 2.2.1 The Commercial and Industrial Floor Space Utilization Survey (CIFSUS) conducted by the Planning Department has been used to determine the worker density for various economic activities and planned usage types.
- 2.2.2 Environmental Protection Department's (EPD's) Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning, Version 1 (GESF) has been referred to for the purposes of estimating the quantity of the sewage generated from the Proposed Development and the existing catchment area. Sewage flow parameters and global peaking factors in this document have been adopted for this SIA.
- 2.2.3 According to the GESF, the overall unit flow is composed of flows due to employees and the associated activities. The following unit flow factors have been adopted in the SIA calculation in accordance with Tables T-1, T-2 and T-3 of the GESF:
- J10 Restaurants & Hotels: 1.58 m³/day

2.3 Existing and Future Sewerage System

- 2.3.1 With reference to the sewerage system shown in Geoinfo Map, there is currently no existing public sewerage system in the vicinity of the Application Site.

2.4 Wastewater Generated by the Proposed Development

- 2.4.1 The sewage generated by the proposed development is given in **Table 2.1** shown below. Detailed Calculation (including the breakdown for West and East Portions) refers to **Appendix 2.1**.

Table 2.1 Estimated Peak Flow (Overall)

Calculation for Sewage Generation Rate of the Proposed Development at the Application Site			
1. Internation School			
Total number of teachers & staff	=	633	people
Design flow for teachers & staff	=	0.28	m ³ /person/day (refer to Table T-2 of GESF, Community, Social & Personal Services)
Total number of students	=	3000	people
Design flow for students	=	0.04	m ³ /person/day (refer to Table T-2 of GESF, School Student)
Sewage Generation rate	=	297.2	m ³ / day
2. Swimming Pool			
Assumed area	=	2500	m ²
Assumed depth of water	=	1.5	m
Volume of water	=	1500	m ³
Turnover Rate	=	4.0	hr CAP132, Section 42 Swimming Pools Regulation (covered))
Surface loading rate of filter	=	50.0	m ³ /m ² /hr
Filter areas required	=	7.5	m ²
Backwashing flow rate	=	30.0	m ³ /m ² /hr
Design flow for backwashing	=	225	m ³ /hr
Backwash duration	=	3.0	min/day
Backwash generation rate	=	11.25	m ³ /day
Backwash generation rate	=	156.3	litre/sec
3. Dormitory			
No. of residents	=	2243	people
Design flow	=	0.19	m ³ /day (Institutional and Special Class in Table T-1 of GESF)
Sewage generation rate	=	426.2	m ³ /day
4. Canteen			
Assumed floor area	=	4500	m ²
Assumed floor area per employee	=	19.6	m ² /employee
Total number of employees	=	230	employees
Design flow for commercial employees	=	1.58	m ³ /employee/day
Sewage generation rate	=	362.6	m ³ /day
Total Flow from the Proposed Development			
Flow rate	=	1086.0	m ³ /day
Flow rate with P _{ClF}	=	1086.0	m ³ /day (refer to Table T-4 of GESF – North District - 1.0)

2.5 Assessment of Sewerage Impact

- 2.5.1 As mentioned in **Section 2.3.1**, there is no existing sewerage connection in the vicinity of the Proposed Development. It is proposed to construct private STPs in the development site to handle the development sewage.
- 2.5.2 The estimated Average Dry Weather Flow (ADWF) from the proposed development is approximately 705.7 m³/day and 380.3 m³/day in West and East Portion respectively. Detailed Sewage flow calculation refers to **Appendix 2.1**.

- 2.5.3 The sewage generated from the Proposed Development would be collected and treated on-site and ultimately be discharged to Sheung Yue River through proposed stormwater drain.
- 2.5.4 To avoid the contamination of the Sheung Yue River, no sewage can be passed through and discharged to the Sheung Yue River before treatment. Therefore, two private sewage treatment plants, namely STP – West and STP – East are proposed to treat the sewage discharge generated from West and East Portion of the development respectively. The design capacity of each STP is summarized in **Table 2.2**.

Table 2.2 Design Capacity of STPs

	Design Capacity (m³/day)
STP – West	705.7
STP – East	380.3
Total	1086.0

- 2.5.5 The design capacity of STP – West and STP – East are calculated and the construction of STP – West and STP – East shall be completed before the school admission in 2036. The treated effluent will be discharged to Sheung Yue River through the proposed storm drain.
- 2.5.6 The exact treatment process would be subject to later detailed design and submissions. It will be necessary for the treatment facilities to achieve the necessary discharge standards, as set out in EPD's Technical Memorandum – Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters.
- 2.5.7 Membrane bioreactor with ultra-filtration (MBR) is generally recommended to achieve required effluent discharge standard and sludge dewatering system will be provided and designed in accordance with the requirement in the "Guidelines for the Design of Small Sewage Treatments Plants" issued by EPD.
- 2.5.8 Sludge storage tank with deodorisation facilities will be provided. Exhaust fan will be located and facing away from existing and planned air sensitive uses. The sludge after having been dewatered and thickened will be tanked away to the landfill for disposal subject to confirmation with future licensed collector/contractor. As good practice for sewage treatment facilities, measures will be incorporated into the design to minimize the risk of emergency overflow from the treatment plant. These measures will include standby pumps, secure power supplies and appropriate alarms, as well as comprehensive Operation and Maintenance procedures, to keep the facilities in good working order. Holding tank for emergency storage/retention will be included with adequate capacity (e.g. to store 6-hours of ADWF discharge) to minimise need of emergency discharge. In the event of any emergency overflow, on-call crews will follow the overflow emergency response plan and proceed with the best response to correct the problem immediately. For example, the alarm system will be activated once overflow occurs. The on-call crews will provide instant response by acknowledging the alarm, to investigate the cause of overflow and correct the problem. The alarm system will repeat until it is acknowledged. In addition, the on-call crews will ensure the standby pump is switched on and contain the overflowed sewage using temporary weirs or vacuum trucks, where applicable.

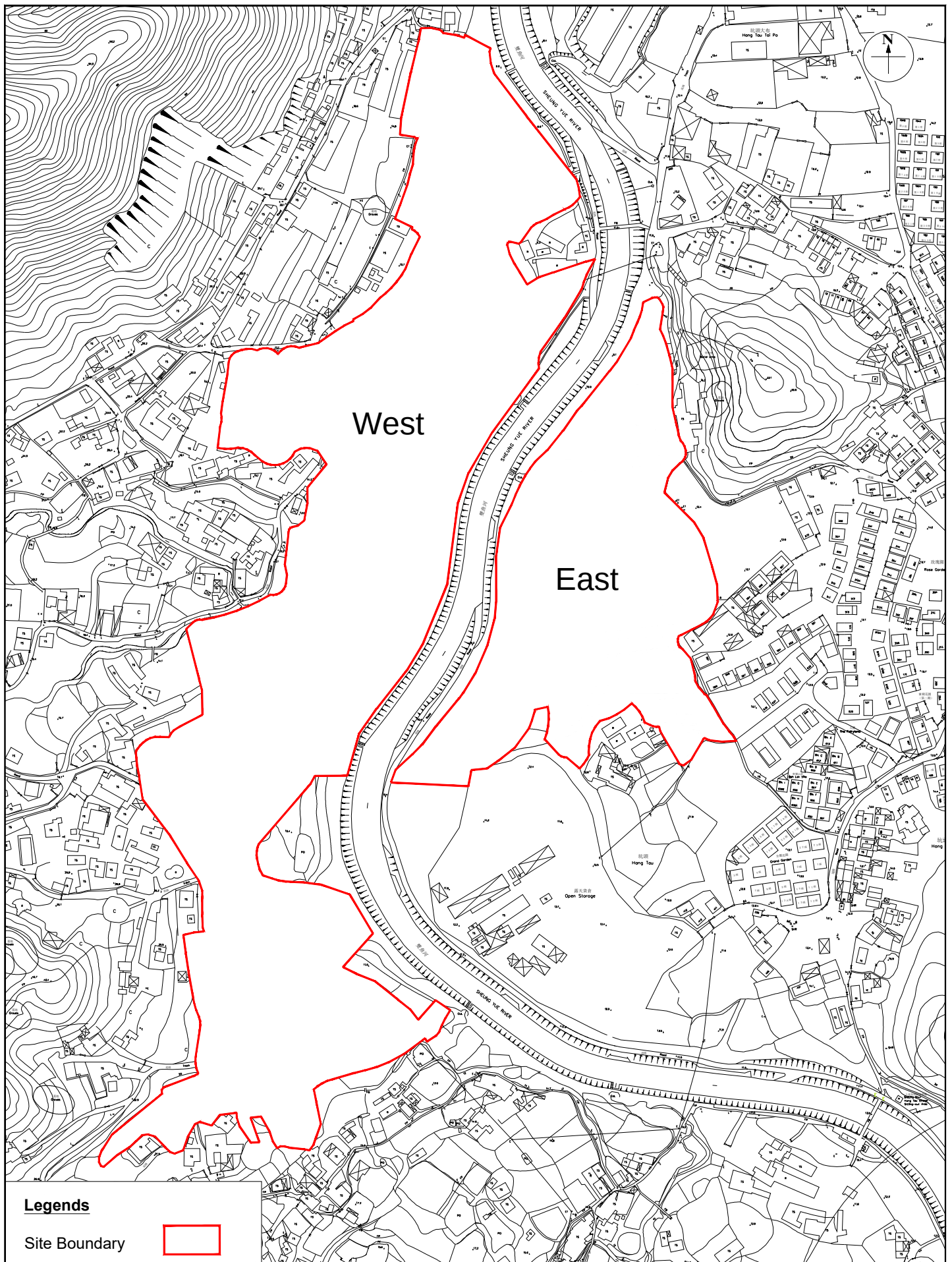
2.6 Maintenance Responsibility

- 2.6.1 The Applicant will be responsible for construction of internal sewerage infrastructure (including the proposed STPs and storm drain) within the development site boundary.
- 2.6.2 The design of the proposed STPs will follow the Guidelines for the Design of Small Sewage Treatment Plants prepared by the EPD.
- 2.6.3 Future property management will be responsible for the maintenance of all the internal sewerage system (including the proposed STPs and storm drain) within the development site boundary.
- 2.6.4 The Applicant will be responsible for the construction, operation and maintenance of the STP. When there is a public sewer available in close proximity to the Application Site in future, the Applicant will make connection to the public sewer and dismantle the proposed underground STP subject to the agreement of DSD and EPD. As the sewage generated from the Application Site will be discharged to the public sewer in accordance with the Water Pollution Control (Sewerage) Regulation, no adverse quality impact is anticipated.
- 2.6.5 The Applicant will be responsible for the future sewer connection upon its availability in future and STP decommissioning with connection details subject to agreement of DSD.

3. OVERALL CONCLUSION

- 3.1.1 The SIA has been carried out to assess the impact on the existing sewerage system due to the Proposed Development.
- 3.1.2 The estimated Average Dry Weather Flow (ADWF) from the Proposed Development is about 1086.0 m³/day with 705.7 m³/day in West Portion and 380.3 m³/day in East Portion.
- 3.1.3 2 on-site sewage treatment plants are proposed to treat the sewage discharge generated from West and East Portion and the treated effluent will be discharged to Sheung Yue River through the proposed storm drains.
- 3.1.4 It is concluded that no adverse sewerage impact is anticipated.

Figures



Legends

Site Boundary



Figure: 1.1

Title: Site Location and its environs

Project: Proposed School at Various Lots in D.D.94, 98 & 100 and Adjoining Government Land, Kwu Tung South, New Territories

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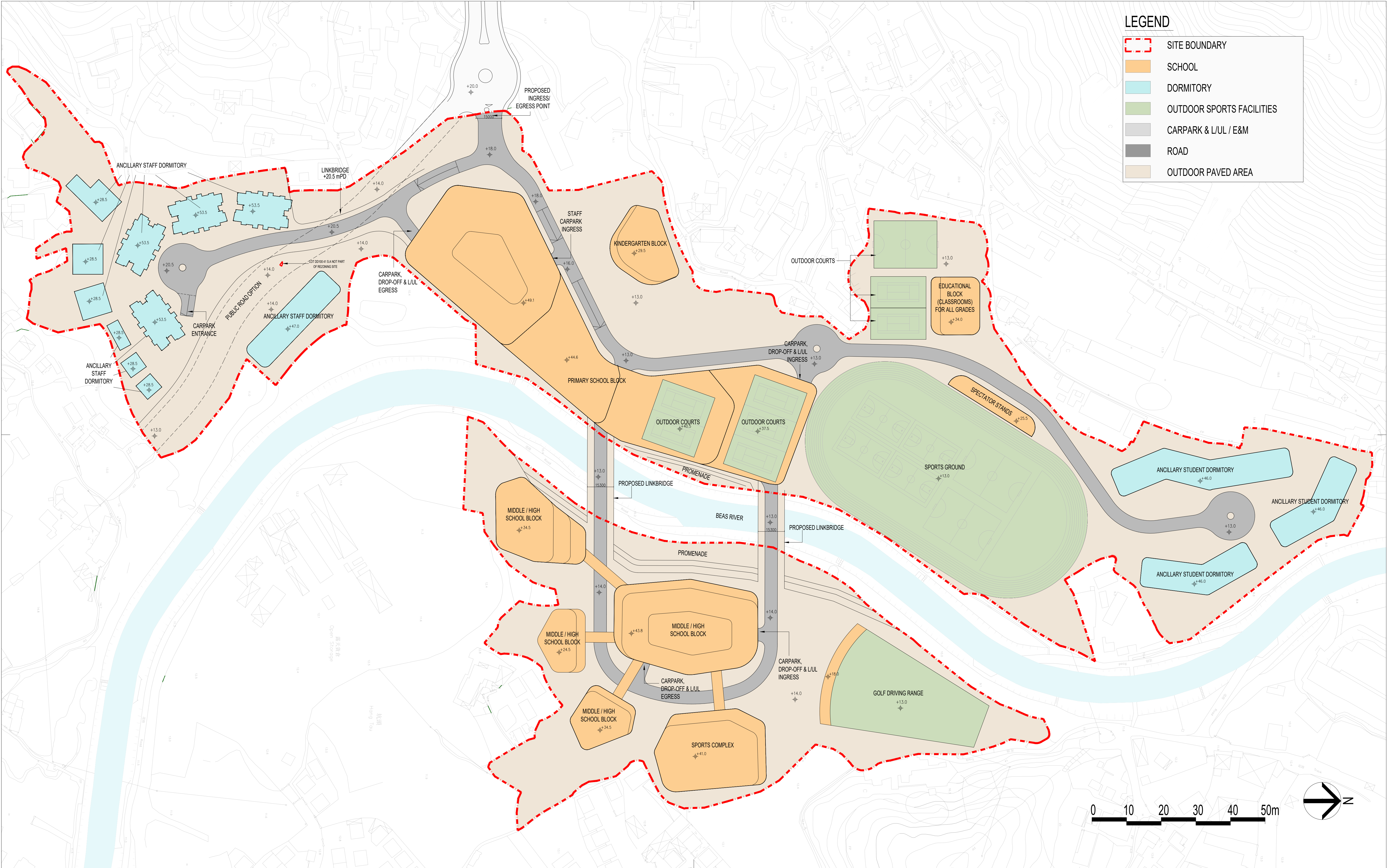
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Rev.: 1.0

Date: Aug 2025

Appendix 1.1 Master Layout Plan of the Application Site



Rev.	Description	Drawn	Checked	Approved	Date
—	I PLANNING SUBMISSION	I HKO	I JHK	I JHY	9-2025
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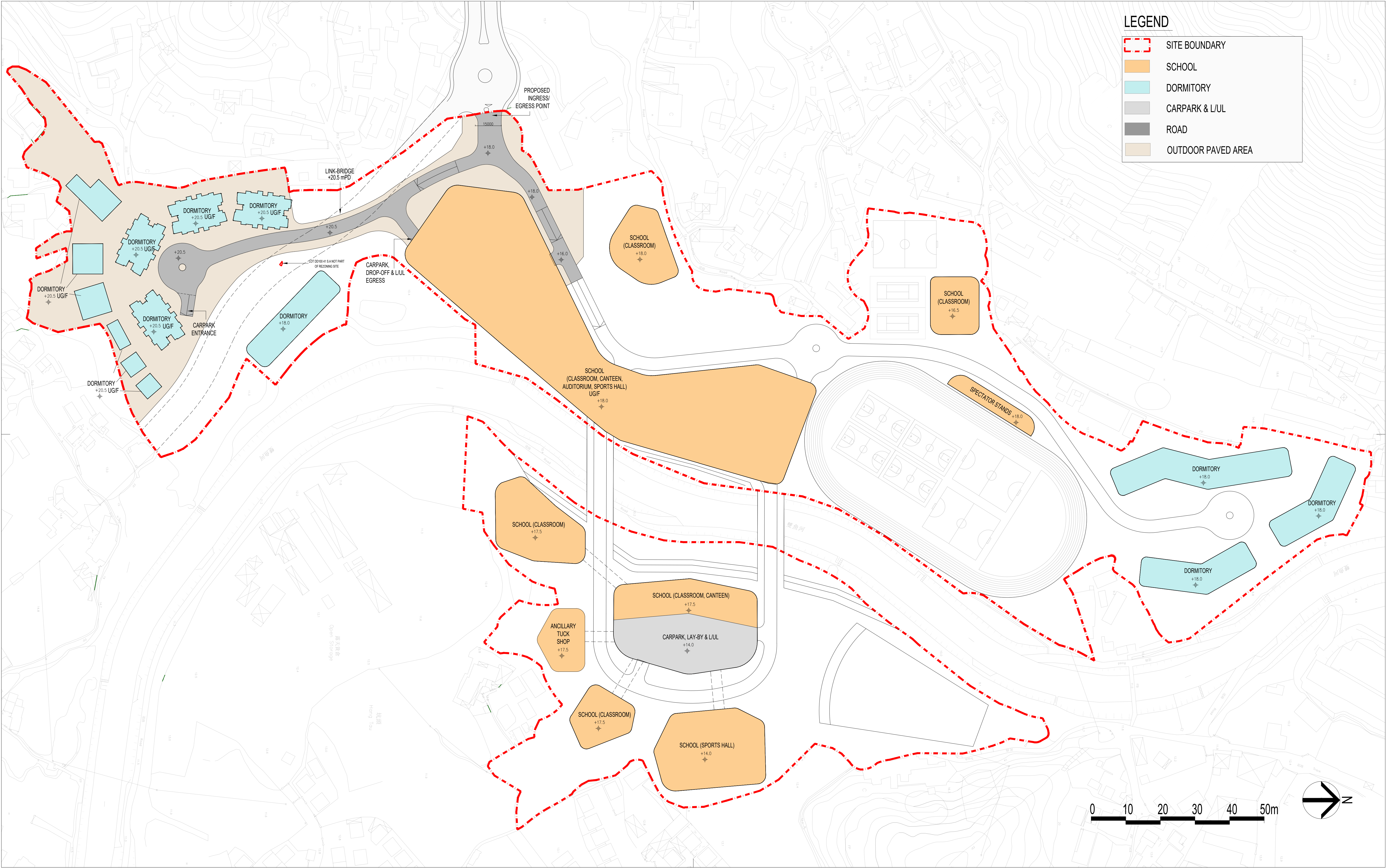


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Project Title
PROPOSED INTERNATIONAL
SCHOOL DEVELOPMENT AT KWU
TUNG SOUTH

Drawing Title	FULL PHASE – MASTER LAYOUT PLAN
Project No.	25018NT
Scale	1:1000
Issue Date	NOV 2025
Drawing No.	A/GBP_01_

Drawing Purpose



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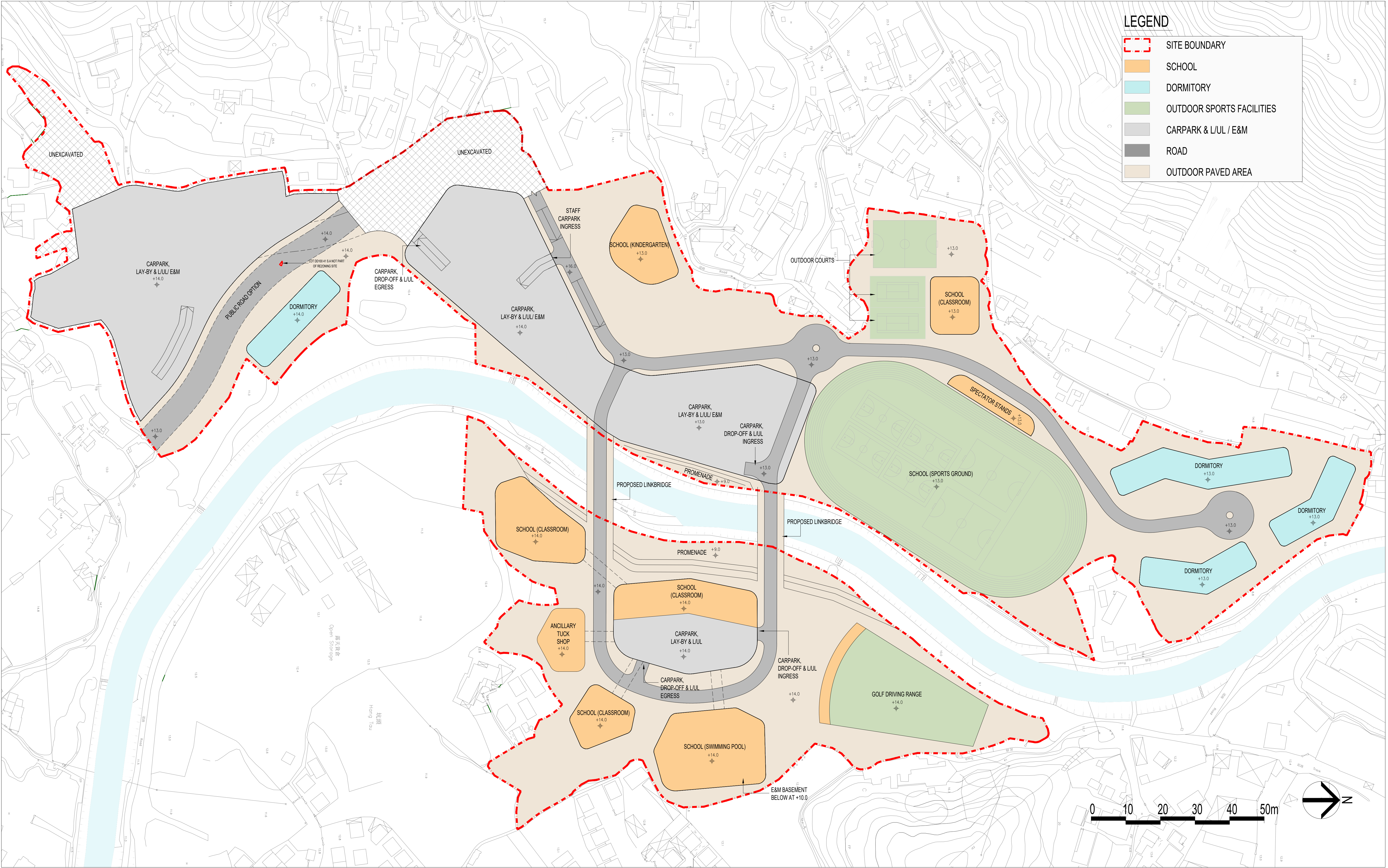
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Project Title

Drawing Title
FULL PHASE –
FIRST FLOOR PLAN

Project No.	25018NT
Scale	1:1000
Issue Date	NOV 2025
Drawing No.	A/GBP_03

Drawing Purpose



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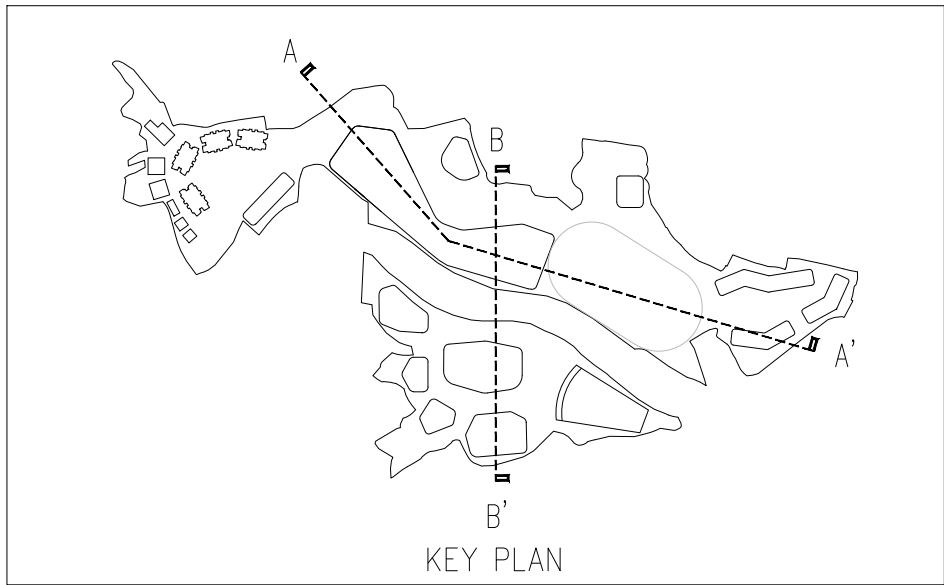
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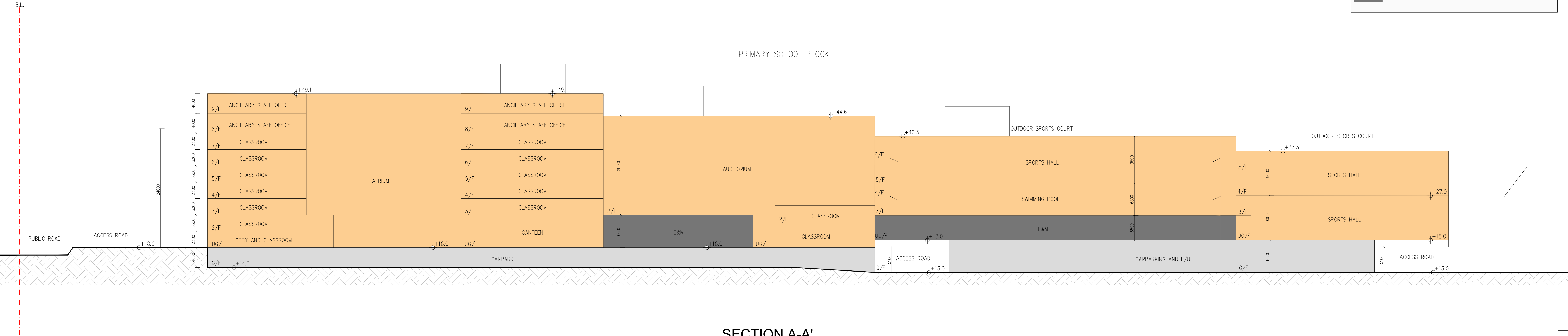
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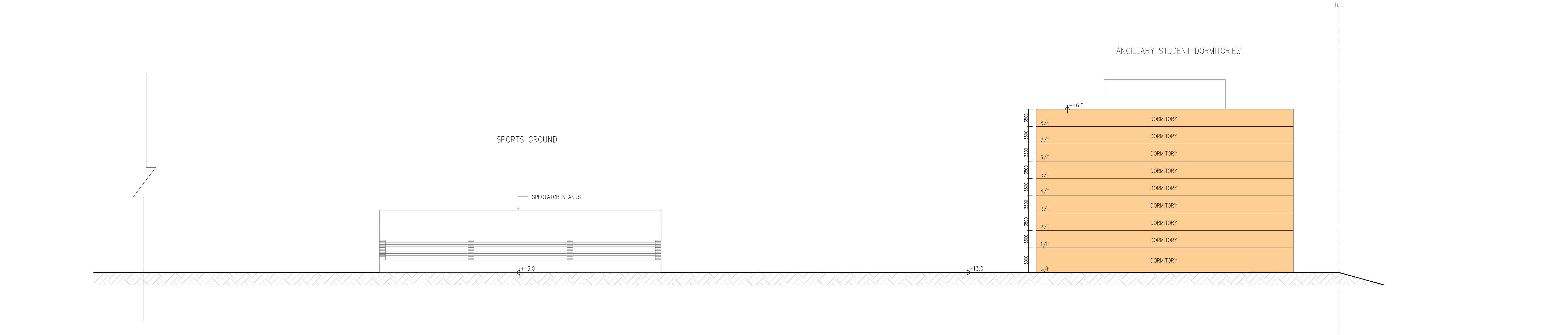


LEGEND

SITE BOUNDARY

SCHOOL

SECTION A-A'



SECTION A-A' (cont.)

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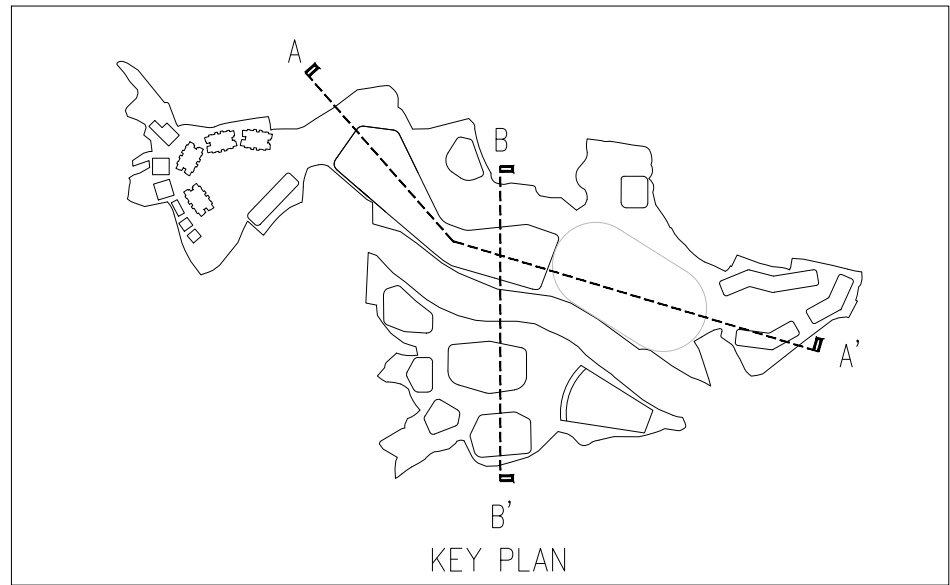
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Project Title

Drawing Title
SECTION A-A

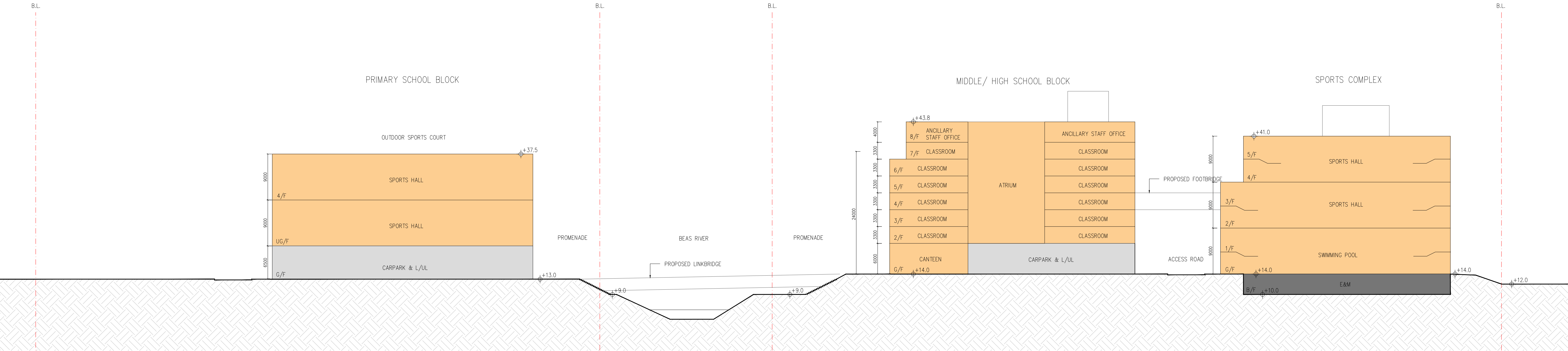
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LEGEND

SITE BOUNDARY

SCHOOL

SECTION B-B'

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SECTION B-B

Project No.	25018NT
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Drawing Purpose

Appendix 2.1 Detailed Sewerage Impact Assessment Calculations

Table 1 Calculation for Sewage Generation Rate of the Proposed Development (Overall)

1. International School			
Total number of teachers & staff	=	633	people
Design flow for teachers & staff	=	0.28	m ³ /person/day (refer to Table T-2 of GESF , Community, Social & Personal Services)
Total number of students	=	3000	people
Design flow for students	=	0.04	m ³ /person/day (refer to Table T-2 of GESF, School Student)
Sewage Generation rate	=	297.2	m ³ /day
2. Indoor Swimming Pool			
Assumed area	=	2500	m ²
Assumed depth of water	=	1.5	m
Volume of water	=	3750.0	m ³
Turnover Rate	=	4.0	hr (CAP132, Section 42 Swimming Pools Regulation (covered))
Surface loading rate of filter	=	50.0	m ³ /m ² /hr
Filter areas required	=	18.8	m ²
Backwashing flow rate	=	30.0	m ³ /m ² /hr
Design flow for backwashing	=	562.5	m ³ /hr
Backwash duration	=	3.0	min/day
Backwash generation rate	=	28.13	m ³ /day
Backwash generation rate	=	156.3	litre/sec
3. Dormitory for Student and Staff			
Number of residents	=	2243	residents
Design flow	=	0.19	m ³ /day (Institutional and Special Class in Table T-1 of GESF)
Sewage generation rate	=	426.2	m ³ /day
4. Canteen			
Assumed Floor Area	=	4500	m ²
Assumed floor area per employee	=	19.6	m ² per employee -- (refer to Table 8 of CIFSUS - Restaurant)
Total number of employees	=	230	employees
Design flow for commercial employees	=	1.58	m ³ /employee/day -- (refer to Table T-2 of GESF - J10 Restaurant & Hotels)
Sewage generation rate	=	362.6	m ³ /day
Total Flow from the Proposed Development			
Flow rate	=	1086.0	m ³ /day
Flow rate with P _{CIF}	=	1086.0	m ³ /day (refer to Table T-4 of GESF - North District - 1.00)

Table 2
Calculation for Sewage Generation Rate of the Proposed Development (West)

1. International School

Total number of teachers & staff	=	338	people
Design flow for teachers & staff	=	0.28	m ³ /person/day (refer to Table T-2 of GESF , Community, Social & Personal Services)
Total number of students	=	1,600	people
Design flow for students	=	0.04	m ³ /person/day (refer to Table T-2 of GESF, School Student)
Sewage Generation rate	=	158.6	m ³ /day

2. Indoor Swimming Pool

Assumed area	=	1250	m ²
Assumed depth of water	=	1.5	m
Volume of water	=	1875.0	m ³
Turnover Rate	=	4.0	hr (CAP132, Section 42 Swimming Pools Regulation (covered))
Surface loading rate of filter	=	50.0	m ³ /m ² /hr
Filter areas required	=	9.4	m ²
Backwashing flow rate	=	30.0	m ³ /m ² /hr
Design flow for backwashing	=	281.3	m ³ /hr
Backwash duration	=	3.0	min/day
Backwash generation rate	=	14.06	m ³ /day
Backwash generation rate	=	78.1	litre/sec

3. Dormitory for Student and Staff

Number of residents	=	2243	people
Design flow	=	0.19	m ³ /day (Institutional and Special Class in Table T-1 of GESF)
Sewage generation rate	=	426.2	m ³ /day

4. Canteen

Assumed floor area	=	1500	m ²
Assumed floor area per employee	=	19.6	m ² per employee -- (refer to Table 8 of CIFSUS - Restaurant)
Total number of employees	=	77	employees
Design flow for commercial employees	=	1.58	m ³ /employee/day -- (refer to Table T-2 of GESF - J10 Restaurant & Hotels)
Sewage generation rate	=	120.9	m ³ /day

Total Flow from the Proposed Development (West)

Flow rate	=	705.7	m ³ /day
Flow rate with P _{CIF}	=	705.7	m ³ /day (refer to Table T-4 of GESF - North District - 1.0)

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

1. International School

Total number of teachers & staff	=	295	people
Design flow for teachers & staff	=	0.28	m ³ /person/day (refer to Table T-2 of GESF , Community, Social & Personal Services)
Total number of students	=	1400	people
Design flow for students	=	0.04	m ³ /person/day (refer to Table T-2 of GESF, School Student)
Sewage Generation rate	=	138.6	m ³ /day

2. Indoor Swimming Pool

Assumed area	=	1250	m ²
Assumed depth of water	=	1.5	m
Volume of water	=	1875.0	m ³
Turnover Rate	=	4.0	hr (CAP132, Section 42 Swimming Pools Regulation (covered))
Surface loading rate of filter	=	50.0	m ³ /m ² /hr
Filter areas required	=	9.4	m ²
Backwashing flow rate	=	30.0	m ³ /m ² /hr
Design flow for backwashing	=	281.3	m ³ /hr
Backwash duration	=	3.0	min/day
Backwash generation rate	=	14.06	m ³ /day
Backwash generation rate	=	78.1	litre/sec

3. Dormitory for Student and Staff

Number of residents	=	0	people (All dormitory are at the West Portion of the Site)
Design flow	=	0.19	m ³ /day (Institutional and Special Class in Table T-1 of GESF)
Sewage generation rate	=	0.0	m ³ /day

4. Canteen

Assumed floor area	=	3000	m ²
Assumed floor area per employee	=	19.6	m ² per employee -- (refer to Table 8 of CIFSUS - Restaurant)
Total number of employees	=	153	employees
Design flow for commercial employees	=	1.58	m ³ /employee/day -- (refer to Table T-2 of GESF - J10 Restaurant & Hotels)
Sewage generation rate	=	241.7	m ³ /day

Total Flow from the Proposed Development (East)

Flow rate	=	380.3	m ³ /day
Flow rate with P _{CF}	=	380.3	m ³ /day (refer to Table T-4 of GESF - North District - 1.0)