

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 708 – CAPITAL SUBVENTIONS AND MAJOR SYSTEMS AND EQUIPMENT

Technical Education and Industrial Training

Vocational Training Council

21EM – Development of the Vocational Training Council Aviation and Maritime Education Centre at Tsing Yi

Members are invited to recommend to the Finance Committee the upgrading of **21EM** to Category A at an estimated cost of \$862.2 million in money-of-the-day prices for the development of the Vocational Training Council Aviation and Maritime Education Centre at Tsing Yi.

PROBLEM

The Vocational Training Council (VTC) needs to develop the new Aviation and Maritime Education Centre (AMEC) to support the manpower development of the aviation and maritime industries, as well as to improve facilities for vocational and professional education and training (VPET) in Hong Kong.

PROPOSAL

2. The Secretary for Education, on the advice of the Director of Architectural Services as the Technical Adviser, proposes to upgrade **21EM** to Category A at an estimated cost of \$862.2 million in money-of-the-day (MOD) prices for the development of the AMEC at Hong Kong Institute of Vocational Education (IVE) (Tsing Yi).

/PROJECT

PROJECT SCOPE AND NATURE

3. The proposed scope of works comprises the construction of a seven-storey (excluding the roof level) building which will provide approximately 9 395 square meters (m²) in net operational floor area (NOFA) with the following facilities -

- (a) workshops, laboratories and training spaces of about 7 092 m² in NOFA;
- (b) common and ancillary facilities of about 2 303 m² in NOFA, including a multi-purpose hall, storage area, server rooms, a covered entrance plaza etc.; and
- (c) a footbridge connecting the AMEC to the existing IVE (Tsing Yi) building and the reprovisioning of a tennis court.

4. The site plan, location plan, artist's impressions, floor plans and sectional drawings of the project are at **Enclosures 1 to 4** respectively. To meet the works programme, the VTC invited tenders for the foundation works in January 2021. The VTC plans to commence the proposed works upon obtaining funding approval from the Finance Committee for target completion in around three and a half years.

JUSTIFICATION

The Aviation and Maritime Education Centre

5. At present, there is a lack of training facilities in Hong Kong for students of aircraft maintenance programmes to fulfil the practical training requirements¹ for the issuance of an Aircraft Maintenance Licence by the Civil Aviation Department (CAD). They have to attend a majority part of their practical training on premises of the outsourced training providers in Guangzhou, Xiamen, and maintenance companies in Hong Kong, in order to meet the training hour requirements of the CAD². Not only does this arrangement incur additional /training

¹ The VTC students are required to accumulate 826 hours of practical training and 354 hours of maintenance practice to be eligible to apply for the Cat B1.1 Aircraft Maintenance Licence issued by the CAD.

² At present, for each student, the VTC can only provide 26 hours of practical training with its existing facilities. 406 hours of practical training are provided by outsourced suppliers. After graduation, the student will also need to undergo 394 hours of practical training conducted at approved aircraft maintenance training organisations, and 354 hours of actual maintenance practice provided by aircraft maintenance organisations.

training costs, but it also creates inconvenience for learning and teaching and may affect the effectiveness of the training programmes in meeting the keen manpower demand in the aviation and maritime industries.

6. The VTC therefore proposes the development of the AMEC to address the shortage of training facilities for the aviation and maritime industries in Hong Kong, which will be the first dedicated practical and skills training centre for the relevant engineering programmes operated by a post-secondary education institution to provide quality VPET for students aspiring to join the relevant industries, with a view to enhancing their employability and competitiveness.

7. Under the proposal, the AMEC would provide the state-of-the-art facilities to provide quality and authentic training experiences for students. It will provide simulated aviation and maritime operation facilities, such as the aircraft structure and sheetmetal maintenance practicing workshop, aero engine and aircraft system repair training workshop, and maritime engineering laboratories that incorporate smart technologies and innovative design with reference to the latest technological advancement and training needs of the industries, enabling the AMEC to provide enhanced in-house practical training, which would significantly improve quality, coordination, and consistency of the teaching and learning by offering such VPET services under the same roof.

8. The proposed AMEC would further support the development of VPET for the relevant maritime and aviation industries by providing multiple progression pathways and career opportunities for young people. The additional and enhanced training facilities would enable the VTC to offer a diversified array of maritime and aviation programmes for both new entrants and in-service practitioners, with a view to providing more comprehensive skills enhancing and progression opportunities and pathways to attract young people to join the relevant industries and reinforcing the knowledge and skills of practitioners. For instance, the maritime-related programmes aim to prepare graduates to join the local vessel sector and ocean-going sector and become holders of the Marine Department's Local Vessel Engine Operator Certificate of Competency (CoC) and Ocean-going CoC respectively.

9. To support the operation of the proposed AMEC, the construction of purpose-built infrastructure is required. The VTC has identified a site within the IVE (Tsing Yi) campus for the development. It would create synergy as IVE (Tsing Yi) has already been providing some relevant programmes and it would also enable the shared use of infrastructure, facilities and resources and economy in land use.

Manpower needs of the aviation and maritime industries

10. While the aviation industry has been affected by the unexpected pandemic situation, and the adverse impact brought about by pandemic is expected to last for a certain period of time, the VTC anticipated that the industry's situation would gradually resume normal after the pandemic is put under control. According to the report published by the International Air Transport Association in July 2020, passenger traffic is expected to return to a level similar to that of 2019 in late 2024. In fact, the air cargo volume in 2020 only dropped by about 10% as compared with that for the same period in 2019 and the relevant sector may recover even earlier. The VTC anticipates that as the development of the AMEC takes about three and a half years, it will tie in with the recovery of the global and local aviation industry upon its commissioning, and address the pressing manpower and associated training needs foreseen by the industry.

11. As regards the maritime industry, both the 2016 Manpower Survey Report and 2020 Manpower Update Report which were published by the VTC after conducting the relevant manpower surveys indicated that the maritime industry had been facing a serious aging problem in its workforce, and the sector had a high demand for licenced marine engineering technicians and engineers working ashore. Following the retirement of serving maritime engineering technicians in the coming five to ten years, about 1 000 vacancies are expected to emerge. In fact, marine engineers and ship superintendents have been included in the Talent List under the Quality Migrant Admission Scheme, demonstrating that there exists a huge demand for the relevant professions in Hong Kong.

Future operation of the Aviation and Maritime Education Centre

12. Upon the commissioning of the proposed AMEC, students of the relevant programmes will be able to undergo the required practical training in the AMEC, which will be located within the IVE(Tsing Yi) campus, utilising the state-of-the-art training facilities. In the long run, the VTC will consider launching suitable new programmes, having regard to the manpower needs of the industries. The long-term planned intake of the relevant programmes will increase from 786 in the 2020-2021 academic year (AY) to about 1 500 in the 2025-2026 AY. Nevertheless, through programme and class reshuffling, the VTC will ensure that the planned student intake figures of the IVE(Tsing Yi) campus will remain at the 2020 level, i.e. 7 500 students.

/FINANCIAL

FINANCIAL IMPLICATIONS

13. The VTC estimates the capital cost of the project to be \$862.2 million in MOD prices, broken down as follows -

	\$ million (in MOD prices)
(a) Site works	13.8
(b) Demolition works	3.6
(c) Site formation and geotechnical works	61.6
(d) Piling	15.0
(e) Building ³	325.9
(f) Building services ⁴	162.3
(g) Drainage	6.9
(h) External works	40.1
(i) Additional energy conservation, green and recycled features	10.6
(j) Furniture and equipment (F&E) ⁵	114.3

/(k)

³ Building works cover construction of substructure and superstructure of the building.

⁴ Building services cover construction and installation of plumbing system, electrical system, mechanical ventilation and air-condition system, fire services system, lift, and compressed air system.

⁵ It includes general F&E, IT system and audio-visual facilities, as well as special F&E such as aircraft maintenance and marine engineering training equipment.

		\$ million (in MOD prices)
(k)	Consultants' fees for	14.1
	(i) contract administration	13.7
	(ii) management of resident site staff (RSS)	0.4
(l)	Remuneration of RSS	15.6
(m)	Contingencies	78.4
Total		862.2

14. The VTC proposes to engage consultants to undertake contract administration and site supervision of the project. A detailed breakdown of the estimate for consultants' fees and RSS costs by man-months is at **Enclosure 5**.

15. The construction floor area (CFA) of the project is about 15 425 m². The estimated construction unit cost, represented by the building and building services costs, is \$31,650 per m² of CFA in MOD prices. We consider these comparable to that of similar projects built by the Government.

16. Subject to funding approval, the VTC plans to phase the expenditure as follows –

Year	\$ million (in MOD prices)
2021-2022	34.8
2022-2023	109.1
2023-2024	210.6
2024-2025	304.6
2025-2026	131.7

/Year

Year	\$ million (in MOD prices)
2026-2027	45.7
2027-2028	25.7
	<hr/> 862.2 <hr/>

17. The MOD estimates are derived on the basis of the Government's latest set of assumptions on the trend rate of change in the prices of public sector building and construction output for the period 2021 to 2028. The VTC will deliver the construction works through two lump-sum contracts because the VTC can clearly define the scope of the works in advance. The contract will provide for price adjustment.

18. The project has no impact on the VTC's tuition fees. The VTC estimates that the annual recurrent expenditure arising from this project would be \$26.87 million upon the full commissioning of the new building which will be funded by the recurrent subvention provided by the Government to the VTC.

PUBLIC CONSULTATION

19. The VTC consulted the Planning and District Facilities Management Committee of the Kwai Tsing District Council on 6 May 2020 on this project. In response to Members' questions regarding the potential traffic and environmental impacts of the proposed development, the VTC explained that despite the new programmes to be launched at the proposed AMEC, the VTC would be able to maintain the total number of students attending programmes at the IVE (Tsing Yi) campus at a level similar to the existing level through programme reshuffling, taking into account the projected student numbers in the coming years. The VTC also submitted a Preliminary Environmental Review and a Traffic Impact Assessment to the District Council in September 2020, which indicated that the proposed development would not lead to adverse environmental and traffic impacts. Members have no further comments on the proposed development.

20. We consulted the Panel on Education of the Legislative Council on 8 January 2021. Members of the Panel supported submitting the funding proposal to the Public Works Subcommittee. At the request of the Panel, supplementary information on the planned intakes of the VTC's aviation and maritime-related programmes, prospects of the graduates, as well as the potential traffic impact of the proposed development was provided to the Panel on 9 February 2021.

ENVIRONMENTAL IMPLICATIONS

21. This is not a designated project under the Environmental Impact Assessment Ordinance (Cap 499). The VTC completed a Preliminary Environmental Review (PER) in June 2020. The PER recommended the installation of a centralised air-conditioning system to minimise the associated noise and air quality impact. With such mitigation measures in place, the project will not be exposed to long-term environmental impact. The VTC has included in the project estimate the cost to implement these mitigation measures.

22. During construction, the VTC will control noise, dust and site run-off nuisances to within established standards and guidelines through the implementation of mitigation measures in the relevant contracts. These measures include the use of quieter powered mechanical equipment and acoustic screen, avoidance of concurrent construction activities, frequent cleaning and watering of the site, and the provision of wheel-washing facilities to prevent dust nuisance.

23. At the planning and design stages, the VTC considered measures to reduce the generation of construction waste where possible (e.g. adopting modular design and off-site fabrication). In addition, the VTC will require the contractor to reuse inert construction waste which was generated during new building construction (e.g. use of excavated materials for filling within the site) on site or in other suitable construction sites as far as possible, in order to minimise the disposal of inert construction waste at public fill reception facilities (PFRFs)⁶. The VTC will encourage the contractor to maximise the use of recycled or recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

/24.

⁶ PFRFs are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N). Disposal of inert construction waste at PFRFs requires a licence issued by the Director of Civil Engineering and Development.

24. At the construction stage, the VTC will require the contractor to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. The VTC will ensure that the day-to-day operations on site comply with the approved plan. The VTC will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. The VTC will control the disposal of inert construction waste and non-inert construction waste at PFRFs and landfills respectively through a trip-ticket system.

25. The VTC estimates that the project will generate in total about 46 000 tonnes of construction waste. Of these, the VTC will reuse about 15 000 tonnes (32.6%) of inert construction waste on site and deliver 26 000 tonnes (56.5%) of inert construction waste to PFRFs for subsequent reuse. The VTC will dispose of the remaining 5 000 tonnes (10.9%) of non-inert construction waste at landfills. The total cost for disposal of construction waste at PFRFs and landfill sites is estimated to be \$2.8 million for this project (based on a unit charge rate of \$71 per tonne for disposal at PFRFs and \$200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

HERITAGE IMPLICATIONS

26. This project will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites or buildings, sites of archaeological interest and government historic sites identified by the Antiquities and Monuments Office.

LAND ACQUISITION

27. This project does not require any land acquisition.

ENERGY CONSERVATION, GREEN AND RECYCLED FEATURES

28. This project will adopt various forms of energy efficient features and renewable energy technologies, in particular -

- (a) chillers with variable speed drive;
- (b) demand control of supply air;

/(c)

- (c) heat energy reclaim of exhaust air; and
- (d) photovoltaic system.

29. For greening features, there will be rooftop greening for better building environmental performance.

30. For recycled features, this project will adopt rainwater harvesting system for landscape irrigation.

31. The total estimated additional cost for adoption of the above features is about \$10.6 million (including \$2.0 million for energy efficient features), which has been included in the cost estimate of this project. The energy efficient features will achieve 6% energy savings in the annual energy consumption with a payback period of about eight years.

BACKGROUND INFORMATION

32. We upgraded **21EM** to Category B in October 2017. The VTC engaged consultants in October 2018 to carry out site investigation and to prepare detailed design and tender documents at a total cost of about \$18 million. The services and works provided by the consultants were funded under block allocation **Subhead 8100QX** “Alterations, additions, repairs and improvements to subvented education buildings”. The consultants have completed site investigation, tree topographic survey, detailed design of the project and prepared tender documents for piling contract.

33. Of the 65 trees within the project boundary, 8 trees will be preserved. The proposed works will involve removal of 57 trees, all are to be felled. All trees to be removed are not important trees⁷. In compensation, the

/VTC

⁷ “Important trees” refer to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

- (a) trees of 100 years old or above;
- (b) trees of cultural, historical or memorable significance e.g. Fung Shui tree, tree as landmark of monastery or heritage monument, and trees in memory of an important person or event;
- (c) trees of precious or rare species;
- (d) trees of outstanding form (taking account of overall tree sizes, shape and any special features) e.g. trees with curtain like aerial roots, trees growing in unusual habitat; or
- (e) trees with trunk diameter equal or exceeding 1.0 metre (measured at 1.3 metres above ground level), or with height/canopy spread equal or exceeding 25 metres.

VTC will incorporate planting proposals as part of the project, including the planting of about 57 trees.

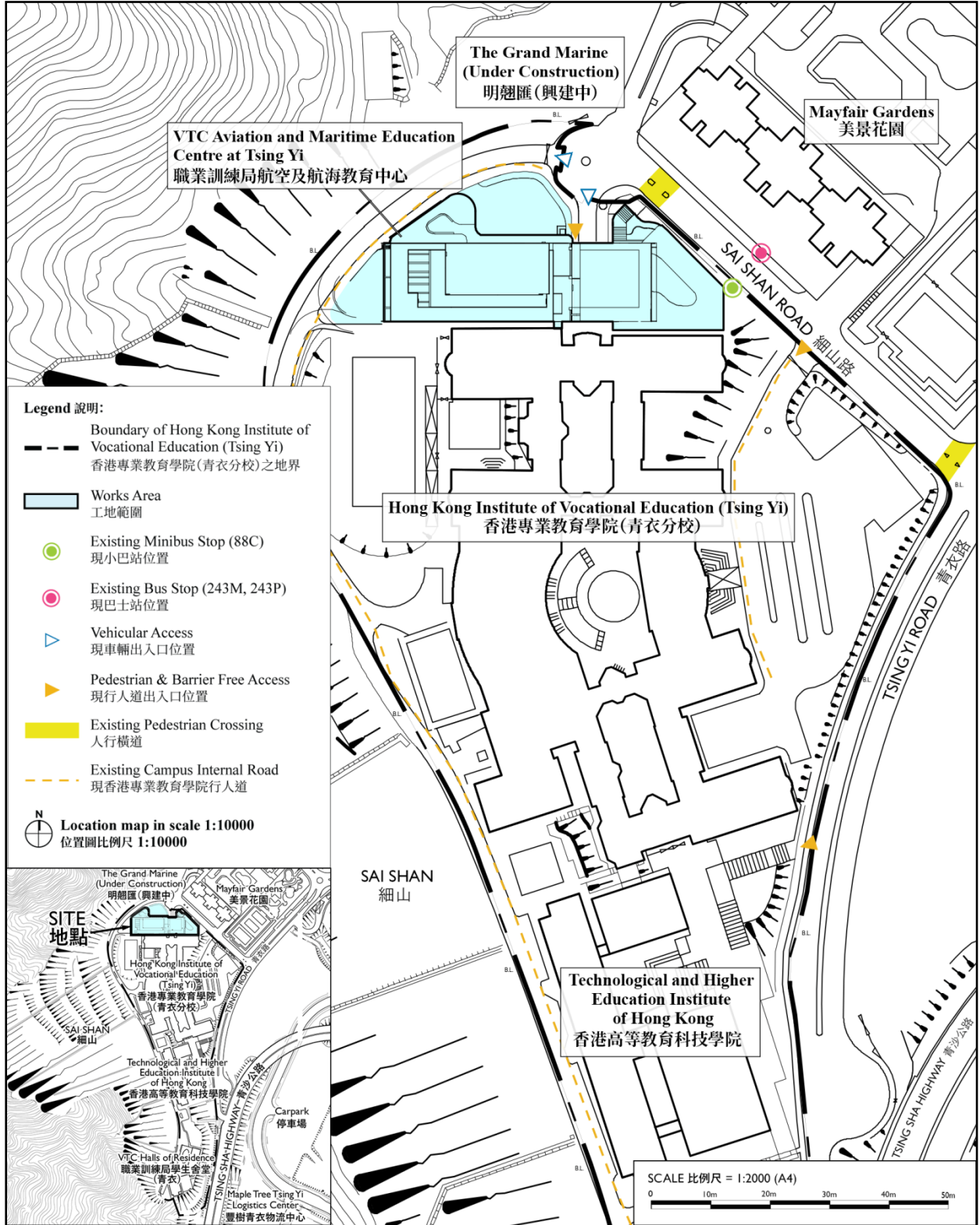
34. We briefed the Panel on Education on 8 January 2021. The then project estimate was \$879.0 million. As mentioned in paragraph 4 above, the VTC has invited tenders for the foundation works. Based on the returned tender prices, the VTC has now updated the project estimate. We consider that the latest estimate, which is 1.91% lower than our earlier estimate as stated in the Panel paper (LC Paper No. CB(4)334/20-21(01)) reflects the prevailing market situation and is sufficient for the delivery of the proposed project.

35. The VTC estimates that the proposed works will create about 190 jobs (165 for labourers and another 25 for professional or technical staff) providing a total employment of 4 910 man-months.

Education Bureau
March 2021

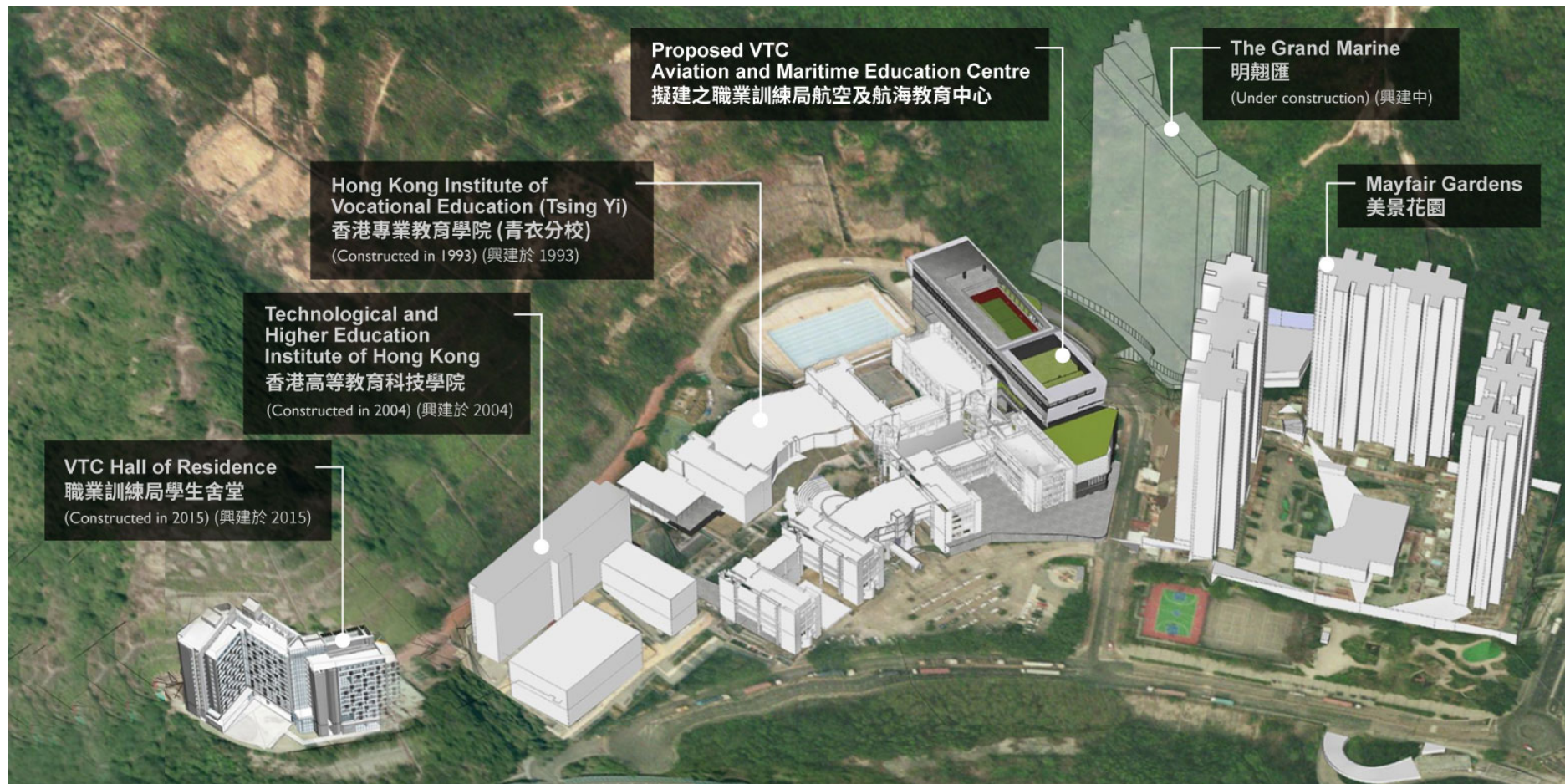
21EM - Development of the Vocational Training Council Aviation and Maritime Education Centre at Tsing Yi

21EM - 職業訓練局於青衣的航空及航海教育中心發展計劃



Site Plan and Location Plan 平面圖和位置

21EM - Development of the Vocational Training Council Aviation and Maritime Education Centre at Tsing Yi
21EM - 職業訓練局於青衣的航空及航海教育中心發展計劃



Aerial View of VTC Aviation and Maritime Education Centre and Surrounding Buildings
職業訓練局航空及航海教育中心和鄰近建築物鳥瞰圖

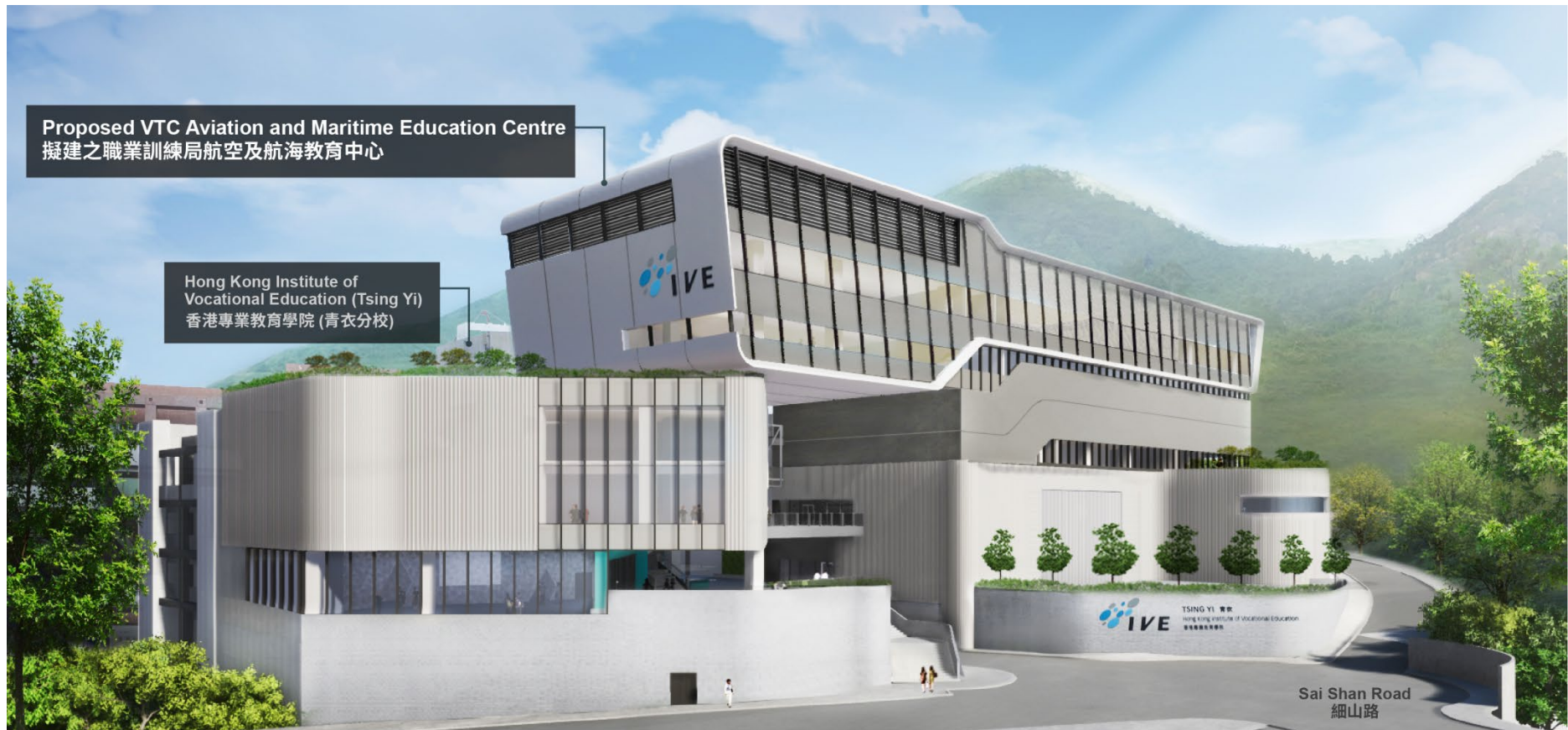
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Artist's Impression of VTC Aviation and Maritime Education Centre from nearby residential development under construction

從興建中住宅望向職業訓練局航空及航海教育中心的構思圖

21EM - Development of the Vocational Training Council Aviation and Maritime Education Centre at Tsing Yi
21EM - 職業訓練局於青衣的航空及航海教育中心發展計劃



Artist's Impression of VTC Aviation and Maritime Education Centre from Sai Shan Road
從細山路望向職業訓練局航空及航海教育中心的構思圖

21EM - Development of the Vocational Training Council Aviation and Maritime Education Centre at Tsing Yi

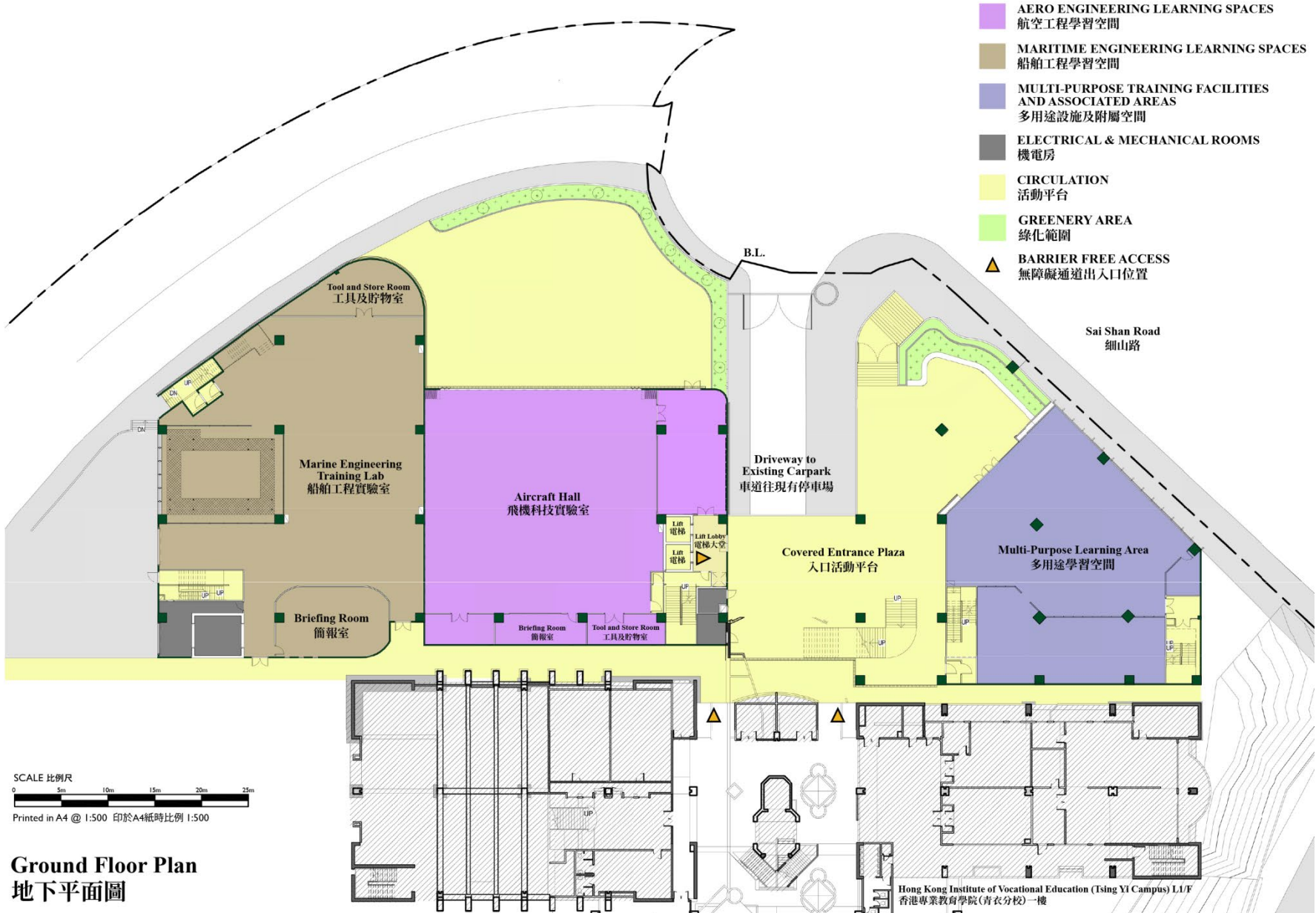
21EM - 職業訓練局於青衣的航空及航海教育中心發展計劃



Lower Ground Floor Plan
地下低層平面圖

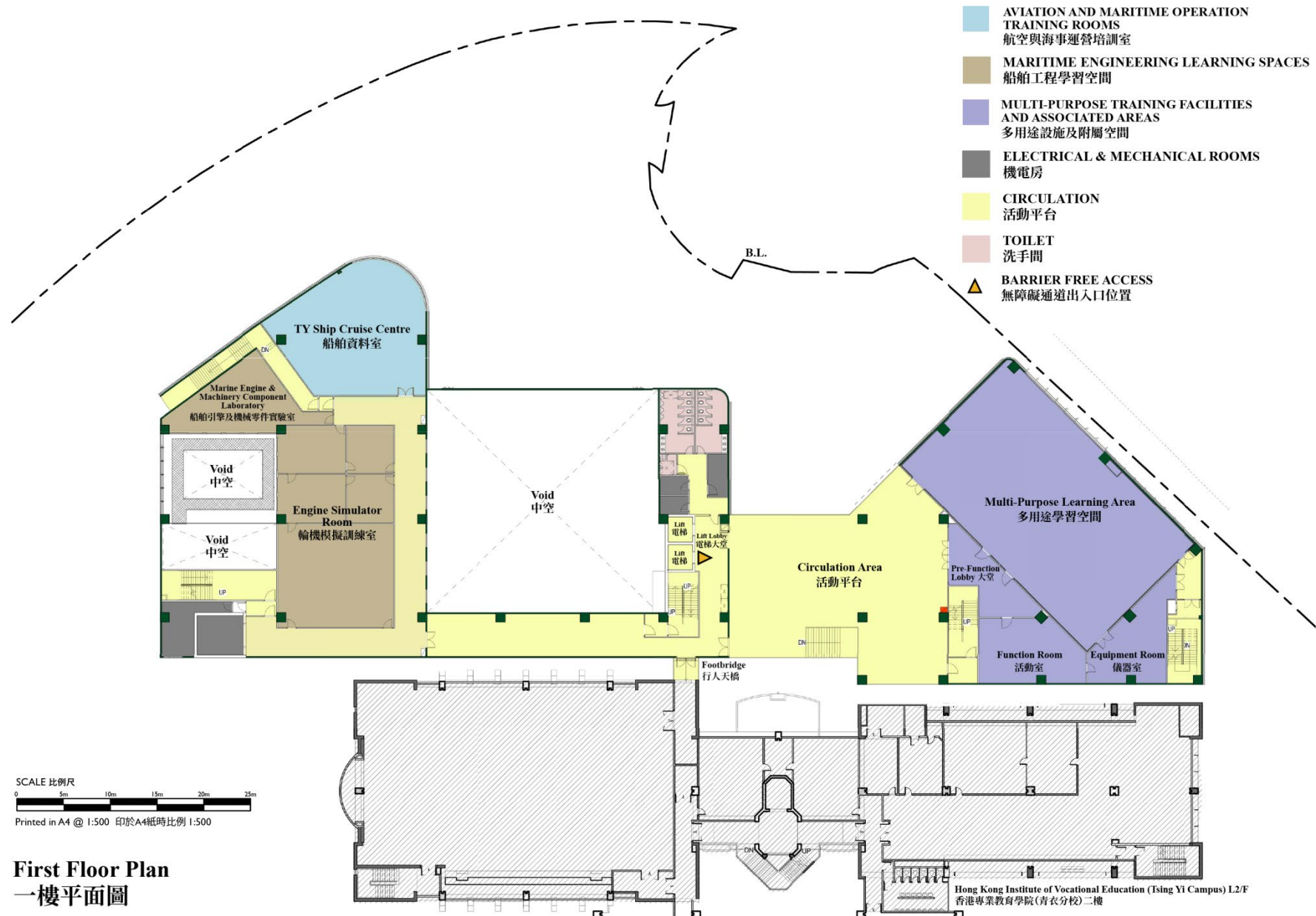
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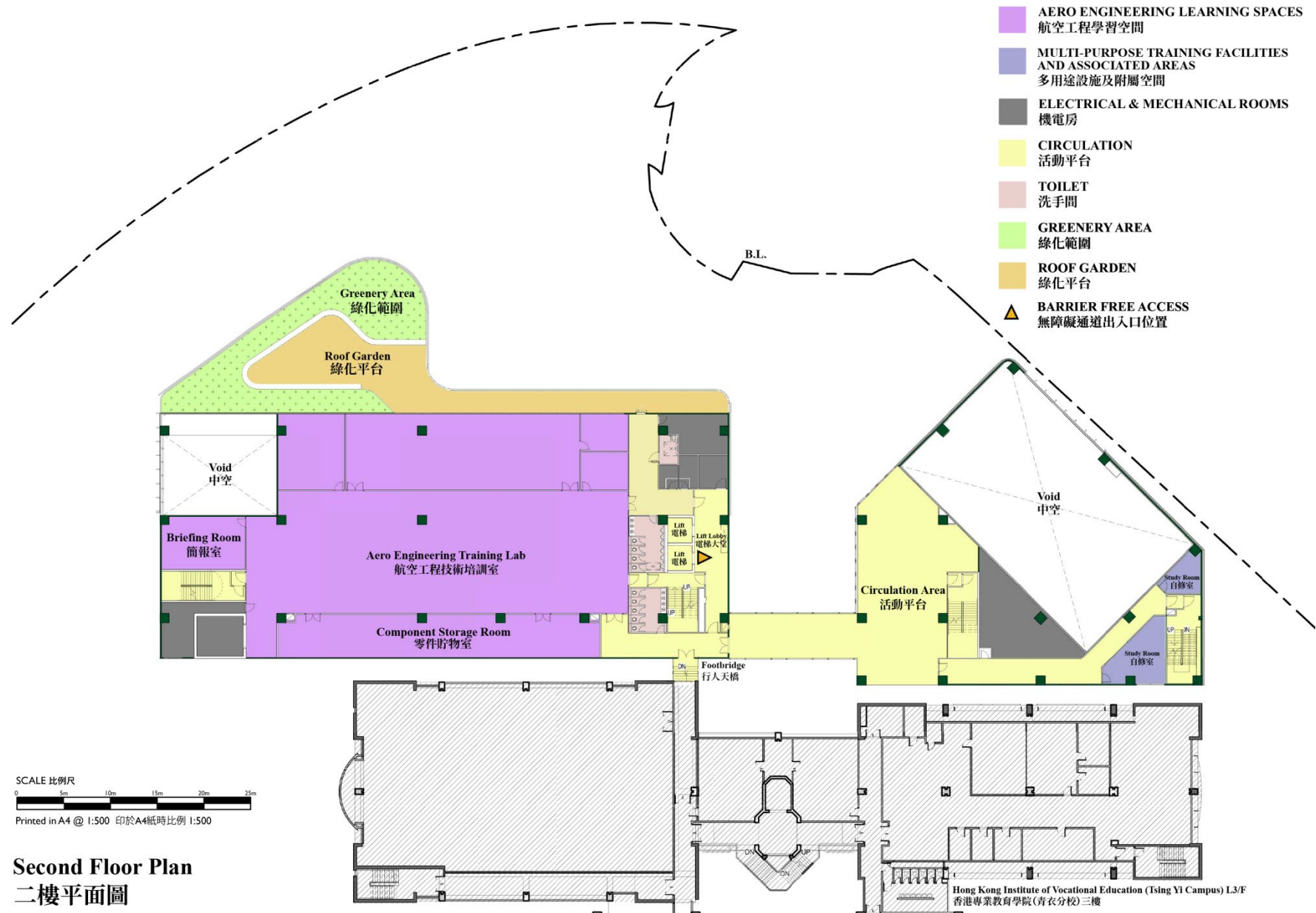
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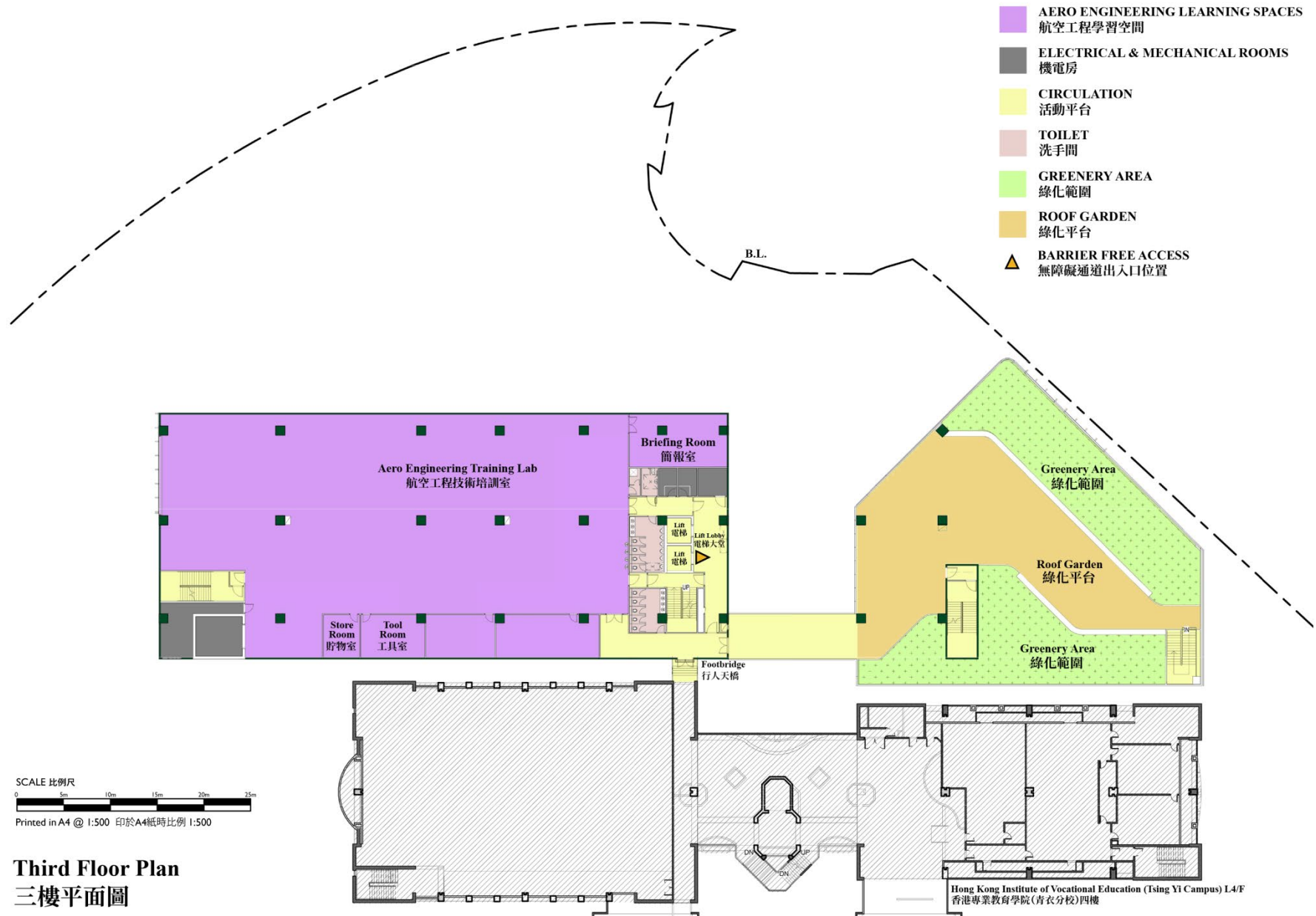
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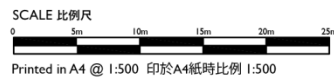
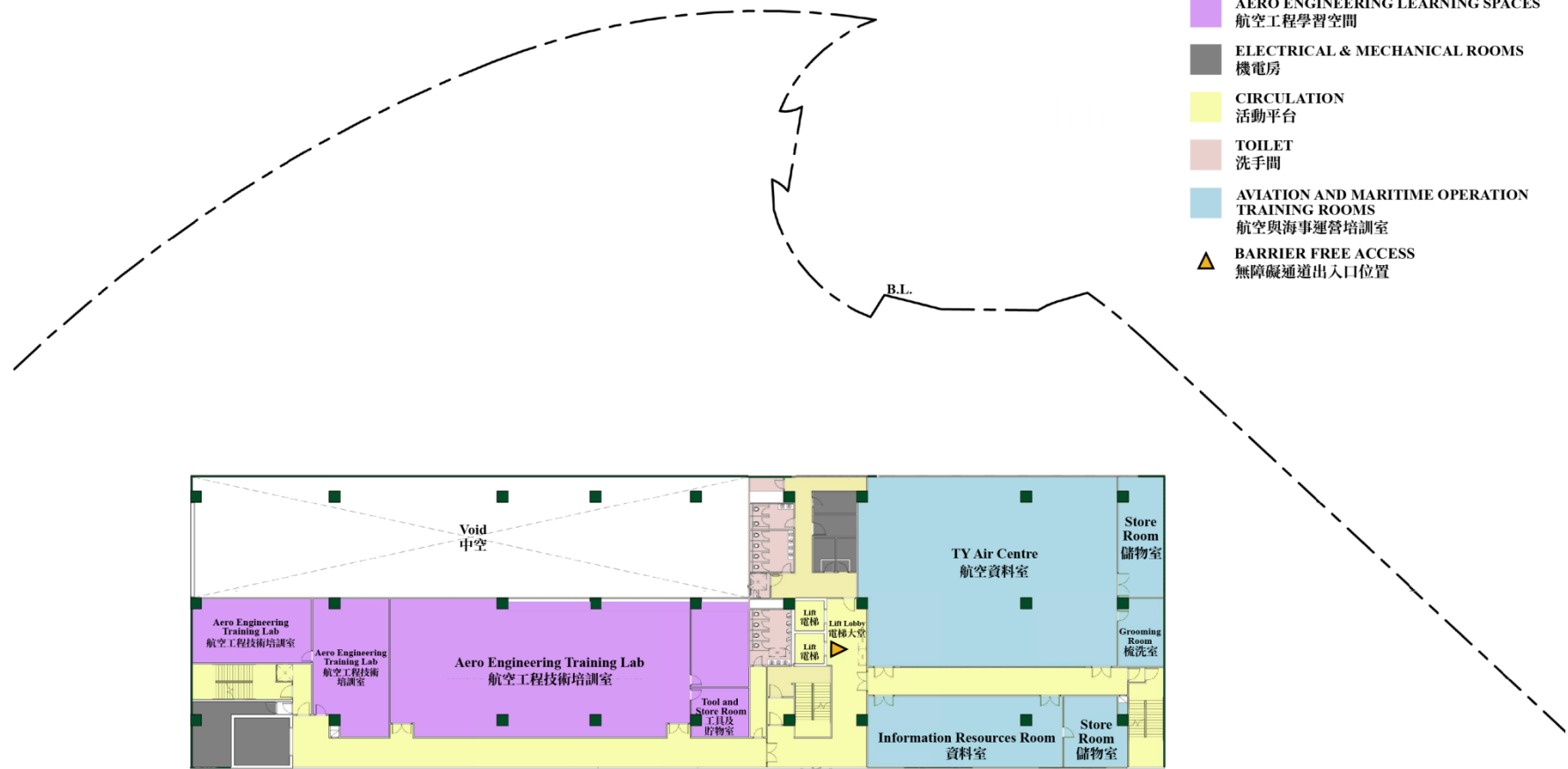
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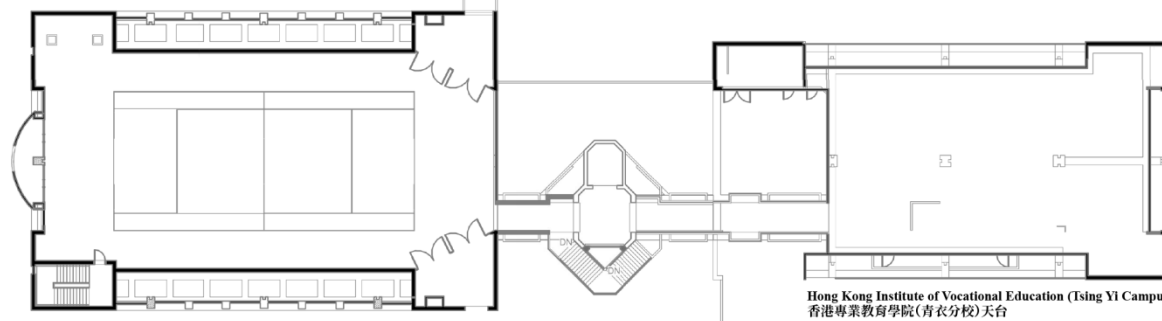


21EM - Development of the Vocational Training Council Aviation and Maritime Education Centre at Tsing Yi

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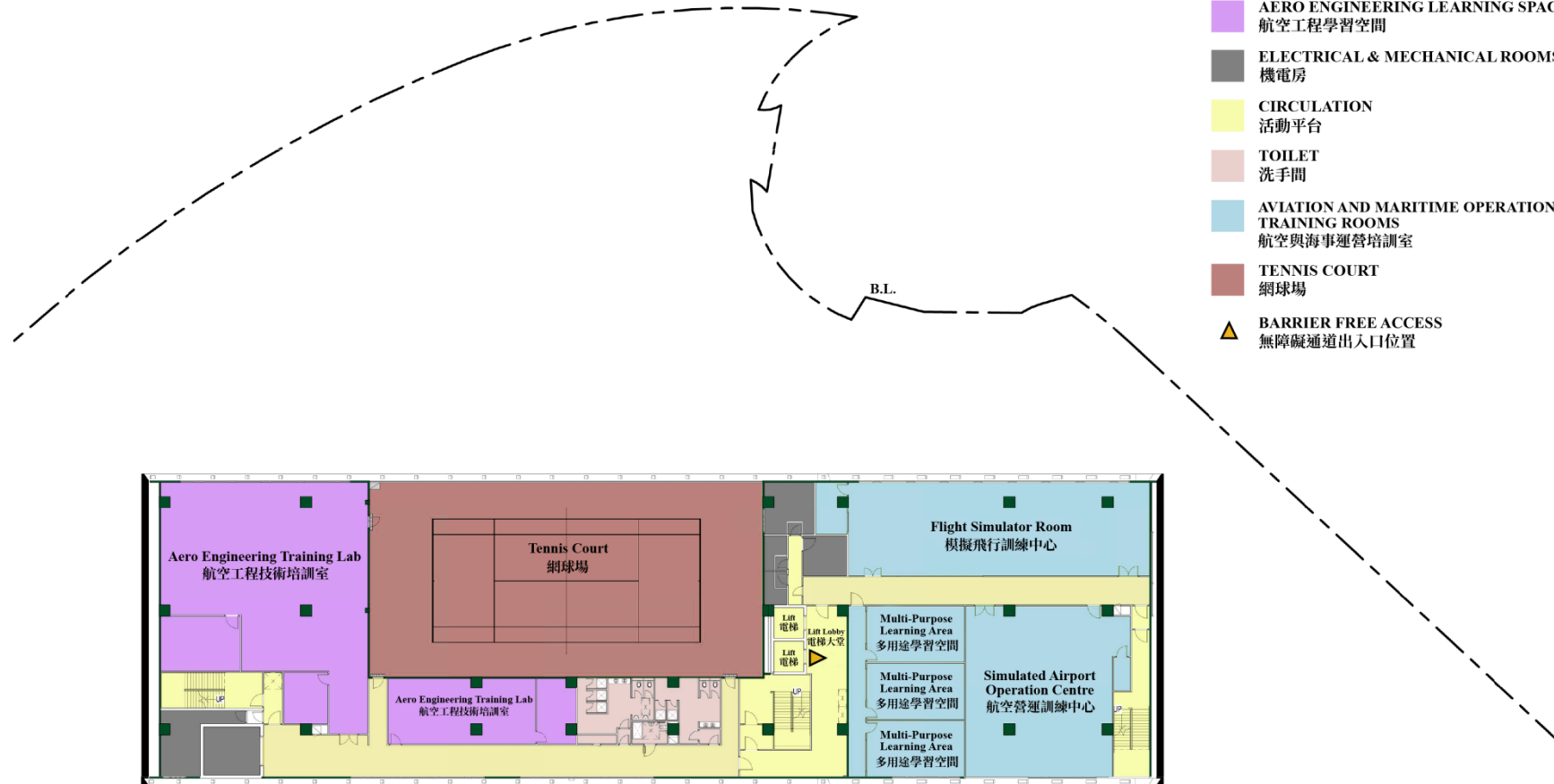



Fourth Floor Plan
四樓平面圖



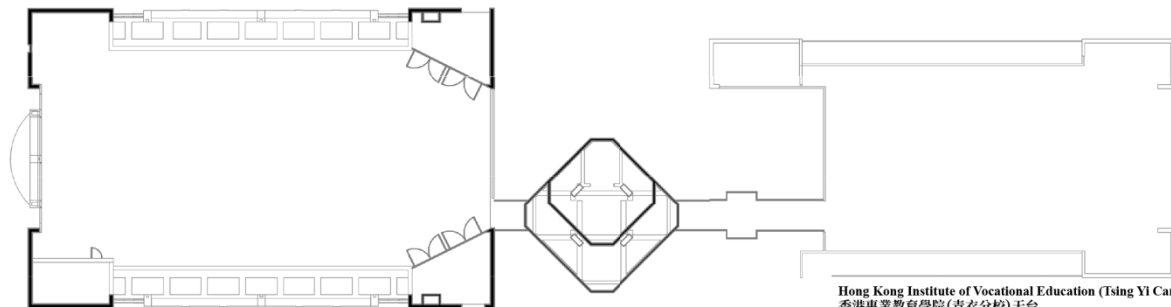
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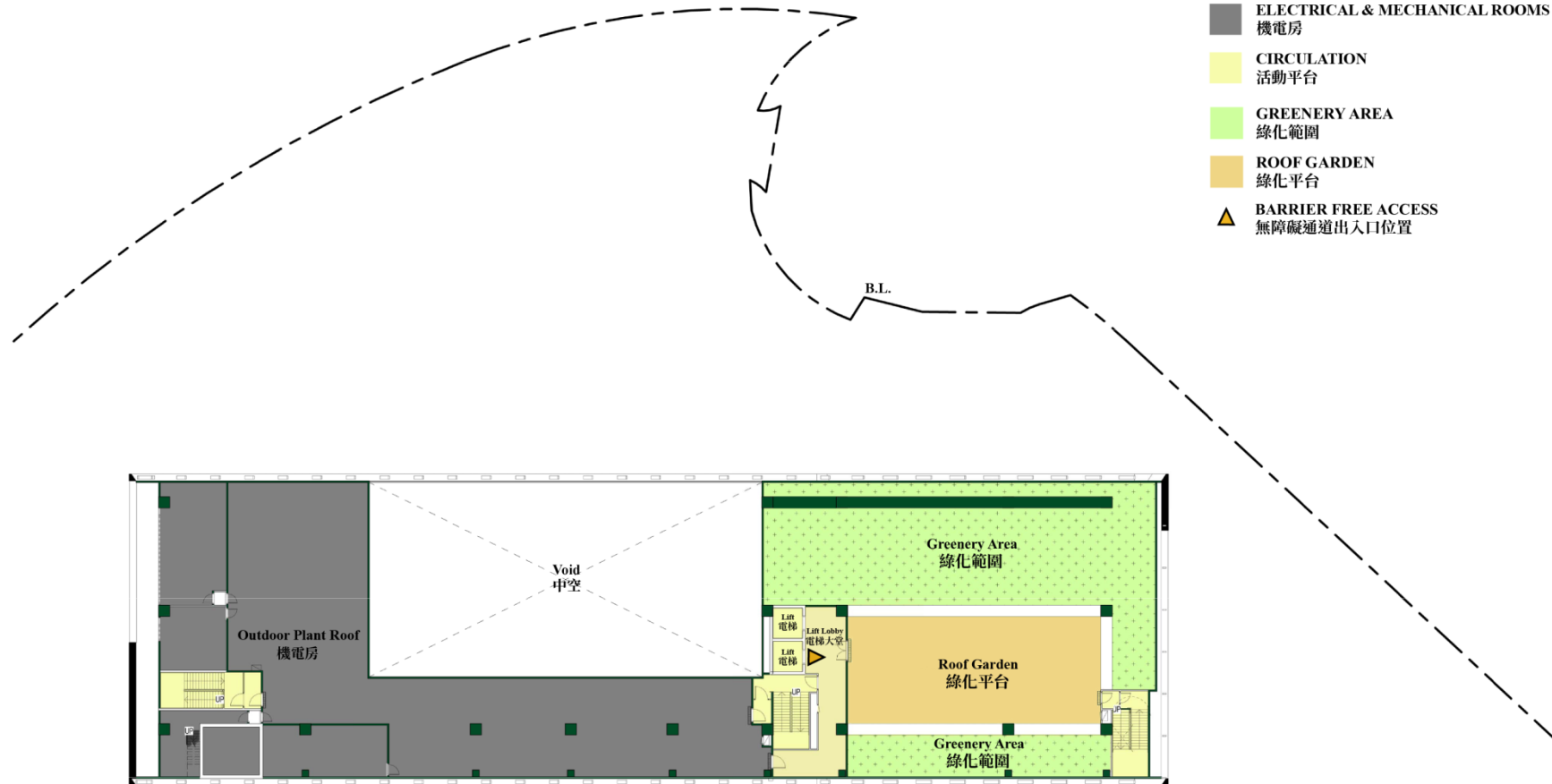
SCALE 比例尺

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Fifth Floor Plan
 五樓平面圖



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SCALE 比例尺

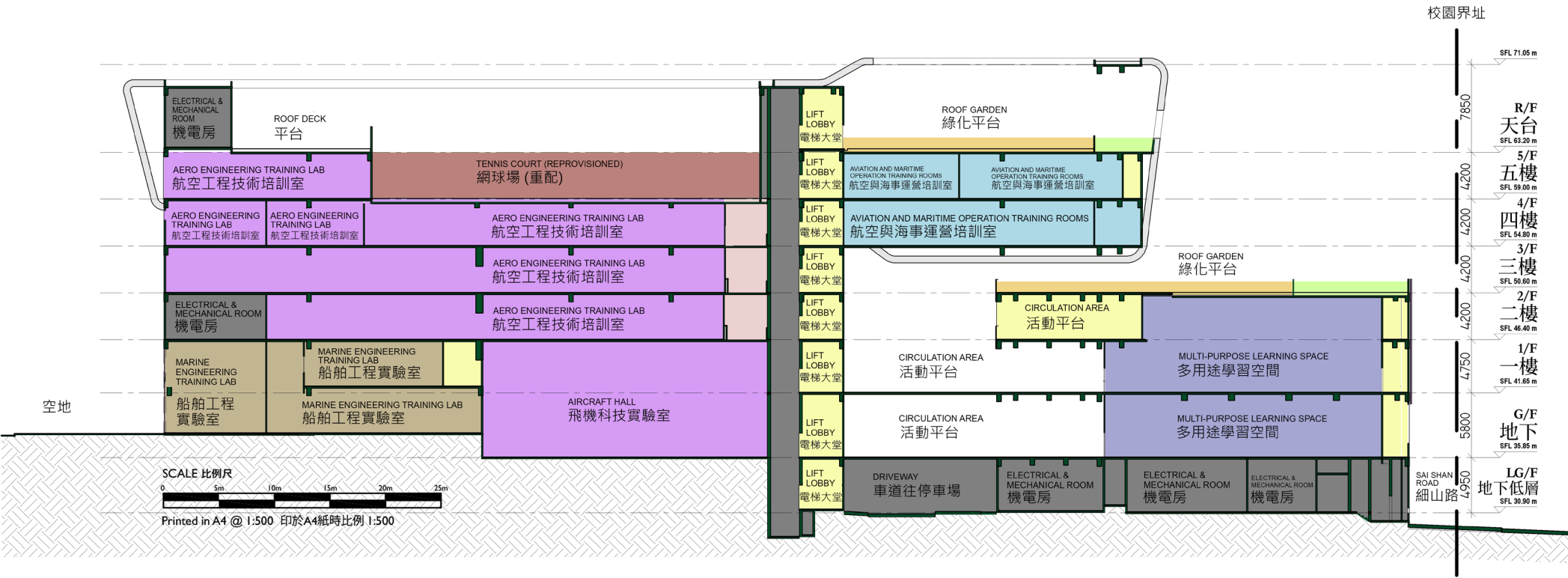


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Roof Floor Plan

天台平面圖

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Sectional Plan 截面圖

**21EM –Development of the Vocational Training Council Aviation and
Maritime Education Centre at Tsing Yi**

**Breakdown of the estimates for consultants' fees and resident site staff costs
(in September 2020 prices)**

		Estimated man- months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$ million)
(a)	Consultants' fees for contract administration (Note 2)				
	Professional	–	–	–	6.9
	Technical	–	–	–	4.6
				Sub-total	<u>11.5#</u>
(b)	Resident site staff (RSS) costs (Note 3)				
	Professional	–	–	–	–
	Technical	277	14	1.6	13.4
				Sub-total	<u>13.4</u>
Comprising -					
(i)	Consultants' fees for management of RSS			0.3#	
(ii)	Remuneration of RSS			13.1#	
				Total	<u>24.9</u>

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 is applied to the average MPS salary point to estimate the cost of RSS supplied by the consultants (as at now, MPS salary point 14 = \$30,235 per month).
2. The consultants' fees for contract administration are calculated in accordance with the existing consultancy agreement for the design and construction of **21EM**. The construction phase of the assignment will only be executed subject to Finance Committee's funding approval to upgrade the project to Category A.
3. The actual man-months and actual costs will only be known after completion of the construction works.

Remarks

The figures in this Enclosure are shown in constant prices correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day prices in paragraph 13 of the main paper.