For discussion **PWSC(2019-20)20**
on 19 June 2019

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 708 - CAPITAL SUBVENTIONS AND MAJOR SYSTEMS AND EQUIPMENT

Universities
The Hong Kong Polytechnic University
29EK – Library extension and revitalisation

Members are invited to recommend to the Finance Committee the upgrading of **29EK** to Category A at an estimated cost of $406.6 million in money-of-the-day prices for the extension and revitalisation of the main library of The Hong Kong Polytechnic University.

PROBLEM

The Hong Kong Polytechnic University (PolyU) needs additional and modernised library space to cope with the needs of the modern learning environment.

PROPOSAL

2. The Secretary-General, University Grants Committee (SG, UGC), on the advice of the Director of Architectural Services (D Arch S) as UGC's Technical Adviser, and with the support from the Secretary for Education, proposes to upgrade **29EK** to Category A at an estimated cost of $406.6 million in money-of-the-day (MOD) prices for the extension and revitalisation works of the library at PolyU's main campus in Hung Hom.

/ **PROJECT** …..

PROJECT SCOPE AND NATURE

3. The scope of the works involves mainly the construction of an additional floor providing 2 080 square meters (m^2) in net operational floor area (NOFA)[1] of library space on top of the university library and revitalisation of the existing floors of the library building with an affected area of about 14 600 m^2 in construction floor area (CFA). Upon completion of the project, the library building will provide the following new facilities –

(a) new space on the additional floor for collaborative learning, quiet study, presentation forum and IT workstation areas;

(b) a 24-hour learning centre, group/quiet study areas, recording studios and other student learning facilities on the existing floors from G/F to 5/F of the library building; and

(c) additional washrooms will be provided and existing lifts will be replaced by new models to cope with the increased library users.

4. A site plan, floor plans, sectional drawings, an artist's impression are at Enclosures 1 to 4 respectively. Subject to funding approval of the Finance Committee (FC), PolyU plans to commence the construction and revitalisation works in the third quarter of 2019 for completion in the fourth quarter of 2022. To meet the works programme, PolyU invited tender for the proposed works in March 2019. Tender will only be awarded after obtaining FC's funding approval.

JUSTIFICATION

5. The Government and the UGC are committed to supporting the campus development of the UGC-funded universities. PolyU's existing library building was first built in the 1970s and has not gone through any major

/upgrading …..

[1] NOFA is the floor area actually allocated to the users of a building for carrying out the intended activities. Unlike the construction floor area which takes into account all areas within the building structure envelop, NOFA does not include areas for such facilities (if any) as toilets, bathrooms and shower rooms, lift lobbies, stair halls, public or shared corridors, stairwells, escalators and lift shafts, pipe or services ducts, barriers-free access facilities, gender mainstreaming facilities, refuse chutes and refuse rooms, balconies, verandas, open decks and flat roofs, parking spaces, loading and unloading areas and mechanical plant rooms, etc.

upgrading in the past four decades. The existing facilities have become outdated and could not cope with the needs of the modern learning environment. Moreover, the implementation of the New Academic Structure (i.e. "3+3+4") in the UGC-funded sector since 2012/13 has greatly increased the need for library space, project rooms and collaborative areas for the increased student population. The project will transform the outdated library facilities into a modern learning hub to suit the need of the latest learning environment, and enhance the safety standard and energy efficiency of the lifts.

6. The revitalisation works will provide necessary building services and information technology installations in support of enhanced library services and more multi-media learning facilities in the library. PolyU plans to expand the "I-Space", which is a group work space, where "I" stand for inspiration, ideation and implementation. The inspiration and ideation zones are specifically designed to inspire and stimulate creativity and curiosity through interactive and multi-disciplinary collaboration. Major facilities in the I-Space include -

(a) One Button Studio - a self-service studio with a brand new service model to support students to actualise their creativity and help them create digital content with just a few steps. Unlike traditional studio, the One Button Studio does not require special knowledge or expertise to control audio/video recording equipment during the production;

(b) Digital Studio - a dedicated studio to support audio and video recording, creation of class materials for blended learning, recording interviews of faculty or students, speech rehearsal or thesis preparation, etc. The studio setting is capable of supporting PowerPoint presentation on television in front of a curtain backdrop, small group interview with curtain backdrop, interaction with video/graphics displayed at chroma key background, small-scale product video demonstrations in front of a solid backdrop, audio recording and still photography;

/(c) …..

(c) Digital Visualisation Room - a special room equipped with a high performance computer and a high resolution video wall to facilitate visualisation of data with images and videos for research seminar and academic discussion, and to support collaborative learning activities through connecting portable devices to project images, videos, and research data on multiple screens simultaneously; and

(d) Digital Makerspace - a workspace where students can get together to inspire, make and create. The library provides hands-on workshops and technical support to encourage students from all disciplines to learn and operate the easy-to-use digital and fabrication tools. It also offers a Virtual Reality (VR) Experience Zone allowing students to gain immeasurably experience from the enhanced information delivery in three-dimensional and VR digital formats. With the goal of supporting digital participation approach to Digital Literacy, the students can gain hands-on experience in feeling and using the VR technology.

7. With the increased use of electronic copies of books and journals, the opportunity is also taken to convert some of the traditional shelving space into new interactive learning space and digital media stations to suit the modern learning environment.

FINANCIAL IMPLICATIONS

8. We estimate the capital cost of the project to be $406.6 million in MOD prices, broken down as follows –

		$ million (in MOD prices)
(a)	Site development	28.5
(b)	Building	178.6
(c)	Building services	113.7

/**$ million** …..

			$ million (in MOD prices)
(d)	External works		1.4
(e)	Additional energy conservation and measures		6.5
(f)	Furniture and equipment		32.5
(g)	Consultants' fees for		4.4
	(i) contract administration	3.9	
	(ii) management of resident site staff (RSS)	0.5	
(h)	Remuneration of RSS		9.0
(i)	Contingencies		32.0
		Total	406.6

9. PolyU will engage consultants to undertake contract administration and site supervision of the project. A detailed breakdown of the estimates for consultants' fees and RSS costs by man-months is at Enclosure 5.

10. The CFA for an extra floor extension (6/F) on top of the existing library building is approximately 3 270 m^2 and the total affected floor area for revitalisation of the existing floors including G/F to 5/F is approximately 14 600 m^2. The estimated construction unit cost for the extension (i.e. 6/F), which comprises the building and building services costs, is $42,263 per m^2 of CFA in MOD prices. Taking into account the use of steel frame construction to minimise disruption and shorten the construction period, high roof to CFA ratio, the difficulty of constructing the extension to a building which is under full operation in all times and construction within a very congested campus, D Arch S considers that the estimated construction unit cost is reasonable as compared with similar projects for UGC-funded universities. A detailed account of the CFA vis-à-vis the construction unit cost of **29EK** is at Enclosure 6.

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11. Subject to approval, PolyU will phase the expenditure as follows –

Year	$ million (MOD)
2019-2020	28.0
2020-2021	185.8
2021-2022	124.4
2022-2023	51.9
2023-2024	15.9
2024-2025	0.6
	406.6

12. We have derived the MOD estimates on the basis of the Government's latest forecast of trend rate of change in the prices of public sector building and construction output for the period 2019 to 2025. PolyU will award the works on a lump-sum contract because PolyU can clearly define the scope of works in advance. The contract will provide for price adjustment.

13. The project has no impact on tuition fees. The additional recurrent costs associated with this project will be funded by PolyU. The proposal has no additional recurrent financial implications for the Government.

PUBLIC CONSULTATION

14. PolyU conducted several meetings and sharing sessions to consult its staff and students on the project. No adverse comment on the project has been received. The latest design has taken into account feedback of the staff and

/students …..

students as appropriate. As the proposed project is located within the campus of PolyU and there are no residential developments in its immediate vicinity, it is unlikely that the project will affect any residents in the area, and therefore no consultation in this respect is considered necessary.

15. We consulted the Legislative Council Panel on Education on 3 May 2019. Members supported submitting the funding proposal to the Public Works Subcommittee for consideration.

ENVIRONMENTAL IMPLICATIONS

16. This is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). The project will not cause long-term environmental impact. PolyU has included in the project estimates the cost to implement suitable mitigation measures to control short term environmental impacts.

17. During construction, PolyU will control noise, dust and site run-off nuisances to within established standards and guidelines through the implementation of mitigation measures in the relevant contract. These include the use of silencers, mufflers, acoustic lining or shields for noisy construction activities, and frequent cleaning and watering of the site.

18. At the planning and design stages, PolyU has considered the use of steel structure in place of concrete structure on the additional floor to reduce the generation of construction waste where possible. In addition, PolyU will require the contractor to reuse inert construction waste (e.g. bricks and tiles from demolition works) 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[2]. PolyU will encourage the contractor to maximise the use of recycled/recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

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[2] Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap.354N). Disposal of inert construction waste in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

19. At the construction stage, PolyU 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. PolyU will ensure that the day-to-day operations on site comply with the approved plan. PolyU will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. PolyU will control the disposal of inert construction waste and non-inert construction waste at public fill reception facilities and landfills respectively through a trip-ticket system.

20. PolyU estimates that the project will generate in total about 3 100 tonnes of construction waste. Of these, PolyU will deliver 2 800 tonnes (90%) of inert construction waste to public fill reception facilities for subsequent reuse and dispose of the remaining 300 tonnes (10%) of non-inert construction waste at landfills. The total cost for accommodating construction waste at public fill reception facilities and landfill sites is estimated to be $0.26 million for this project (based on a unit charge rate of $71 per tonne for disposal at public fill reception facilities and $200 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap. 354N)).

ENERGY CONSERVATION, GREEN AND RECYCLED FEATURES

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

(a) variable speed drive for chiller;

(b) demand control of supply air;

(c) heat energy reclaim of exhaust air;

(d) building energy management system; and

(e) photovoltaic system.

22. For greening features, this project will provide green roof and greening provisions for better building environmental performance. The external wall on roof floor will also be partially screened by vertical greening. The structural impact of the additional floor with the green features has been verified in the building design and the building plans have been approved by the relevant authorities.

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23. For recycled features, this project will adopt a rainwater harvesting system and grey water recycling system for landscape irrigation and toilet flushing respectively.

24. The total estimated additional cost for adoption of the above features is around $6.5 million (including $3.4 million for energy efficient features), which has been included in the cost estimates of this project. The energy efficiency features will achieve 5.5% energy savings in the annual energy consumption with a payback period of about eight years.

HERITAGE IMPLICATIONS

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

LAND ACQUISITION

26. The project does not require any land acquisition.

BACKGROUND INFORMATION

27. Under existing procedures, UGC-funded universities submit capital works proposals to the UGC annually. The UGC examines all these proposals carefully, with professional advice provided by D Arch S who acts as UGC's Technical Adviser, and refers those supported proposals to the Government for consideration of bidding of funds under the established mechanism.

28. We upgraded **29EK** to Category B in October 2010. PolyU engaged consultants in January 2011 to carry out preliminary design, detailed design and the preparation of tender documents at a total cost of $4.6 million. The services and works by the consultants are funded under block allocation Subhead **8100EX** "Alterations, additions, repairs and improvements to the campuses of the UGC-funded institutions". The consultants have completed preliminary design and detailed design of the project. Parallel tendering has been adopted in this project.

/29. …..

29. The proposed addition and revitalisation works will not involve any tree removal proposal. PolyU will incorporate planting proposals as part of the project, including estimated quantities of 130 numbers of climbers and 1 180 m^2 of lawn.

30. PolyU estimates that the proposed works will create about 129 jobs (100 for labourers and another 29 for professional/technical staff) providing a total employment of 2 784 man-months.

31. We briefed the Panel on Education on 3 May 2019. The project estimates then was $346.1 million. As mentioned in paragraph 4 above, PolyU invited tenders for the proposed works in March 2019 with a deadline of 6 May 2019. Based on the returned tender prices, we have now updated the project estimates. We consider that the latest estimates, which is 17.5% higher than our earlier estimates as stated in Panel paper (LC Paper No. CB(4)810/18-19(07)), has reflected the prevailing market situation and the latest estimates should be adequate to deliver the proposed works with the project scope remains unchanged.

Education Bureau
June 2019

SITE PLAN 工地平面圖

GROUND FLOOR PLAN 地面平面圖

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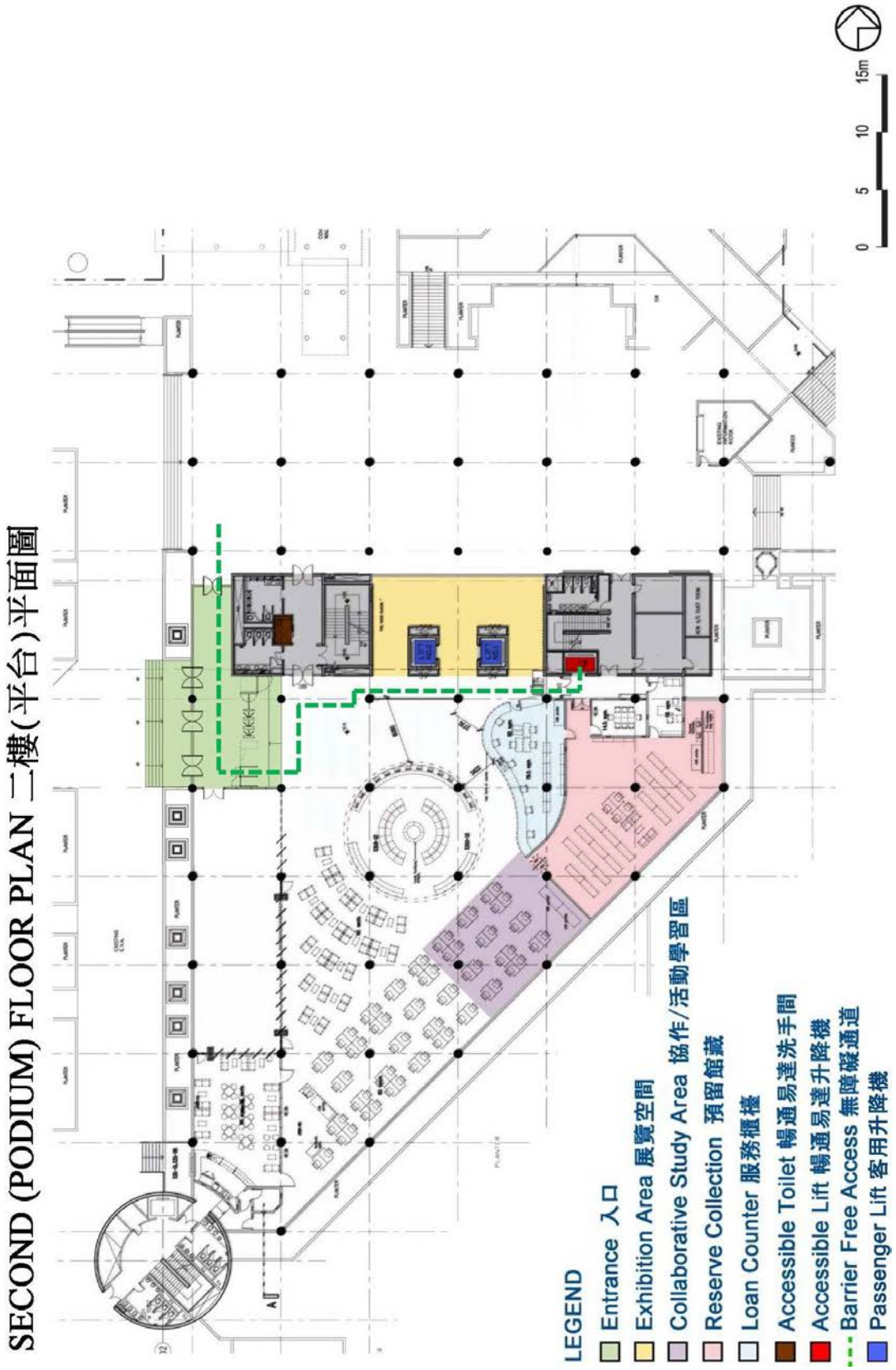
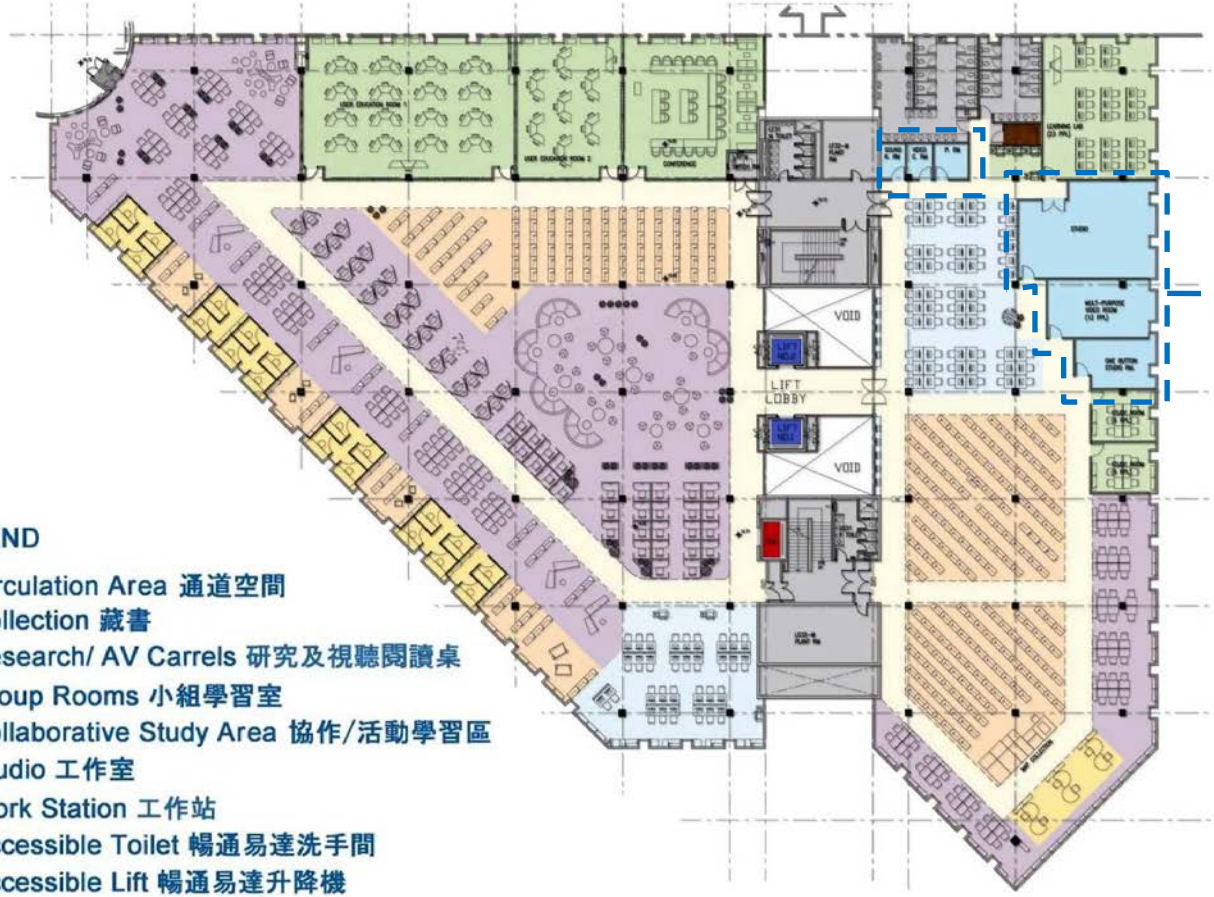
FIRST FLOOR PLAN 一樓平面圖


SECOND (PODIUM) FLOOR PLAN 二樓(平台)平面圖
0
5
10
15m
LEGEND
Entrance 入口
Exhibition Area 展覽空間
Collaborative Study Area 協作/活動學習區
Reserve Collection 預留館藏
Loan Counter 服務櫃檯
Accessible Toilet 暢通易達洗手間
Accessible Lift 暢通易達升降機
Barrier Free Access 無障礙通道
Passenger Lift 客用升降機

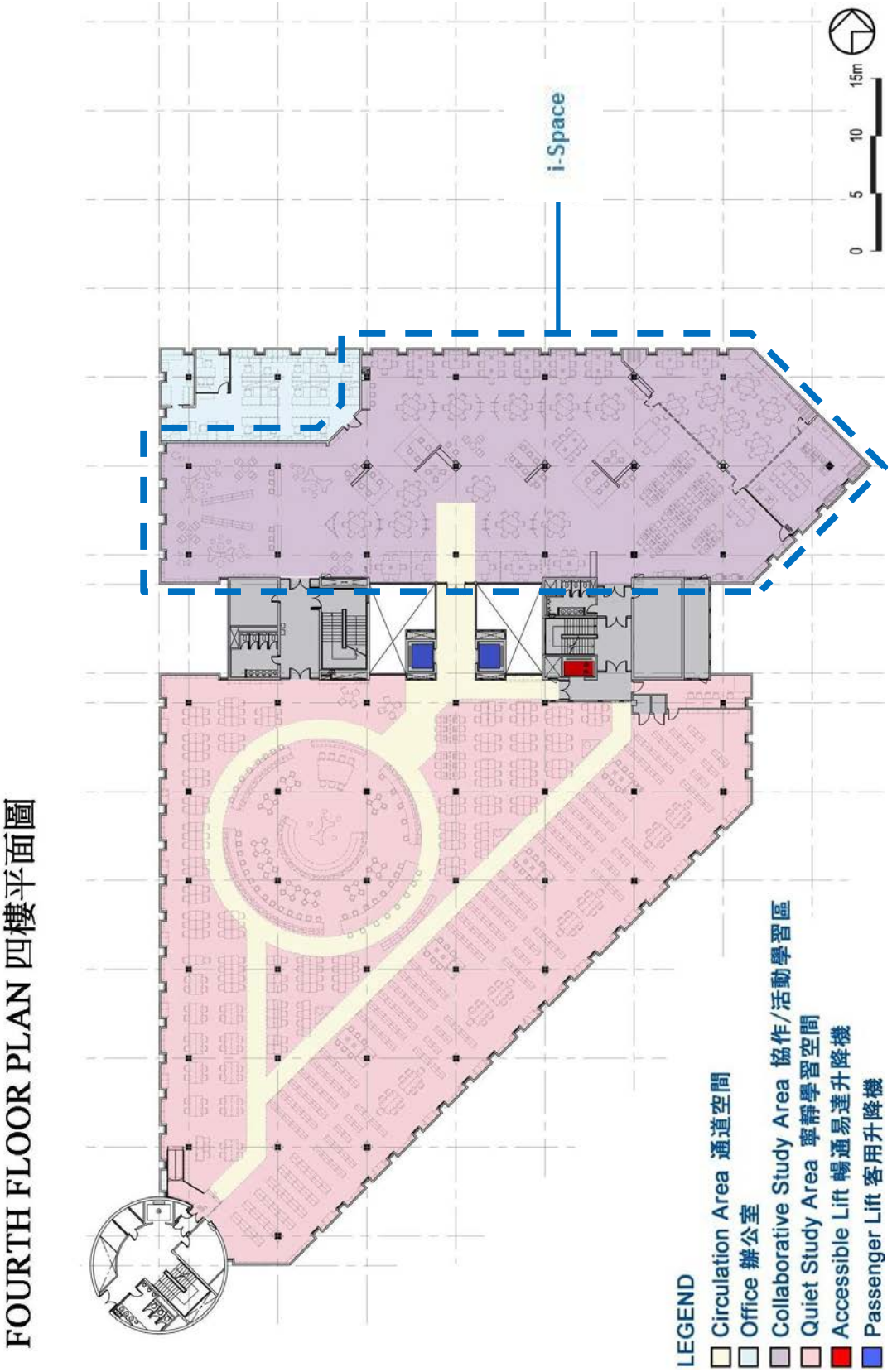
THIRD FLOOR PLAN 三樓平面圖



LEGEND

- Circulation Area 通道空間
- Collection 藏書
- Research/ AV Carrels 研究及視聽閱讀桌
- Group Rooms 小組學習室
- Collaborative Study Area 協作/活動學習區
- Studio 工作室
- Work Station 工作站
- Accessible Toilet 暢通易達洗手間
- Accessible Lift 暢通易達升降機
- Passenger Lift 客用升降機

0 5 10 15m



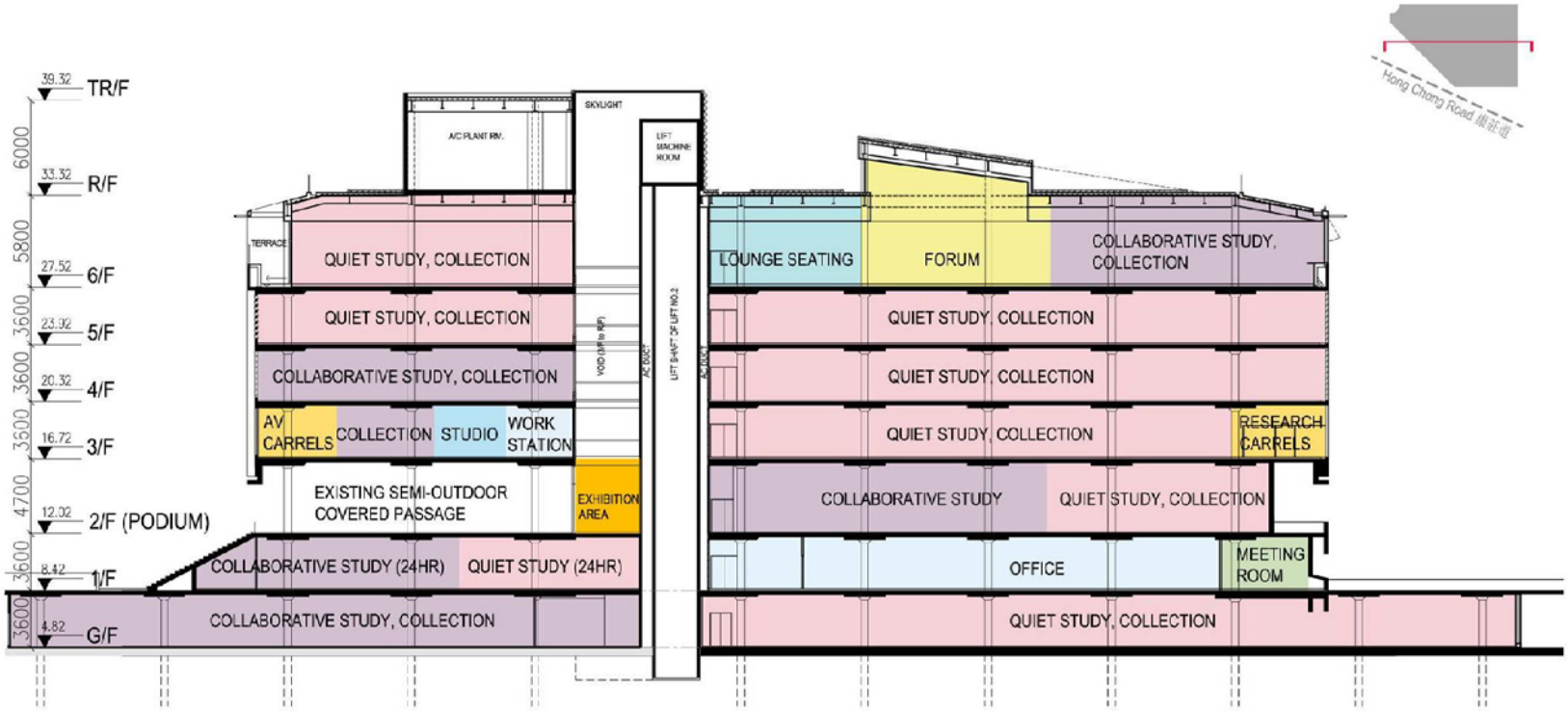
FOURTH FLOOR PLAN 四樓平面圖

FIFTH FLOOR PLAN 五樓平面圖

SIXTH FLOOR PLAN 六樓平面圖

ROOF FLOOR PLAN 屋頂平面圖

SECTIONAL DRAWING 截面圖 A



QUIET STUDY, COLLECTION
寧靜學習空間, 藏書

COLLABORATIVE STUDY, COLLECTION 協作/活動學習區, 藏書

RESEARCH/ AV CARRELS
研究及視聽閱讀桌

LOUNGE SEATING 休息座位

FORUM 開放論壇

STUDIO 工作室

WORK STATION 工作站

OFFICE 辦公室

MEETING ROOM 會議室

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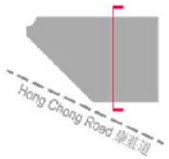
SECTIONAL DRAWING 截面圖 B



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Enclosure 4 to PWSC(2019-20)20
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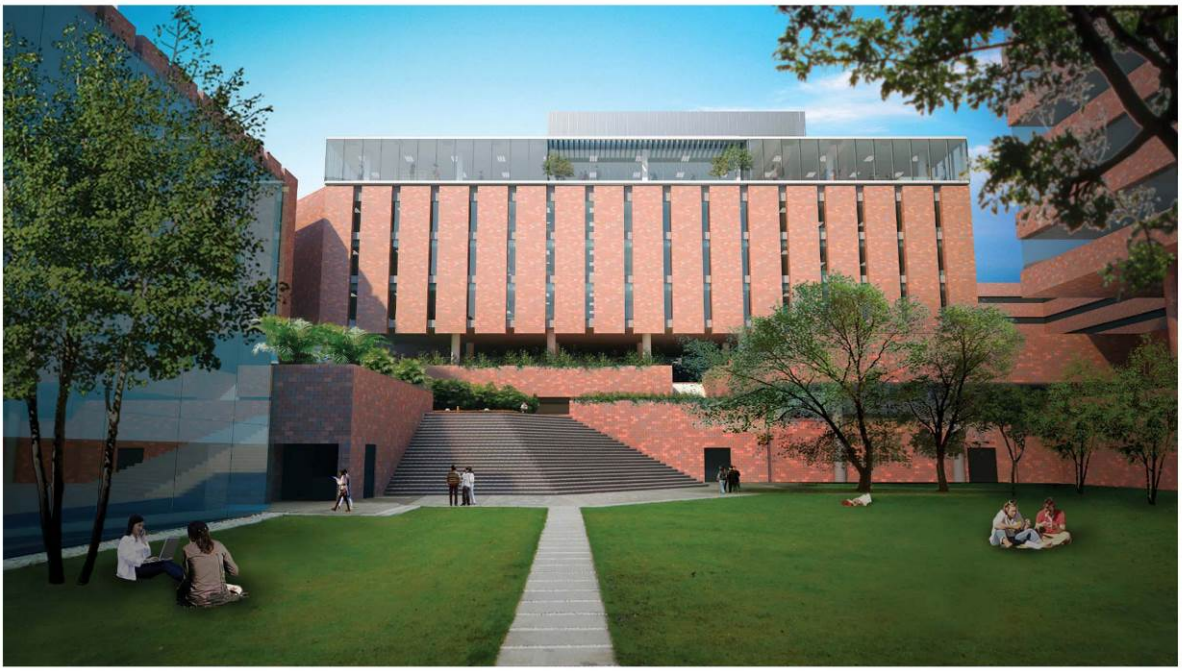
ARTIST'S IMPRESSION 構思圖 1
View of the library extension from Hung Hom Cross Harbour Tunnel
從紅磡海底隧道望向圖書館擴建的構思圖

ARTIST'S IMPRESSION 構思圖 2
View of library extension from the north of university campus
從大學校園北面望向圖書館擴建的構思圖



Enclosure 5 to PWSC(2019-20)20
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The Hong Kong Polytechnic University
29EK – Library extension and revitalisation

Breakdown of the estimates for consultants' fees and resident site staff costs (in September 2018 prices)

			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee ($ million)
(a)	Consultants' fees for contract administration(Note 2)	Professional	–	–	–	3.9
		Technical	–	–	–	-
					Sub-total	3.9 #
(b)	Resident site staff (RSS) costs(Note 3)	Professional	-	-	-	-
		Technical	190	14	1.6	8.7
					Sub-total	8.7 #
	Comprising –					
	(i) Consultants' fees for management of RSS				0.5 #	
	(ii) Remuneration of RSS				8.2 #	
					Total	**12.6**

* MPS = Master Pay Scale

Notes

1. A multiplier of 1.6 applied to the average MPS salary point to estimate the cost of RSS employed direct by consultants. (as at now, MPS salary point 14 = $28,725 per month).
2. The consultants' fees for contract administration is calculated in accordance with the existing consultancy agreements for provision of contract administration and site supervision of **29EK.** The assignment will only be executed subject to Finance Committee's approval to upgrade **29EK** to Category A.
3. The consultants' staff cost for site supervision is based on the estimates prepared by PolyU. We will only know the actual man-months and actual costs for site supervision after completion of the construction works.

Remarks

The figures in this Enclosure are shown in constant prices to correlate with the MPS salary point of the same year. The figures marked with # are shown in money-of-the-day prices in paragraph 8 of the main paper.

Enclosure 6 to PWSC(2019-20)20
PWSC(2019-20)20 附件 6

The Hong Kong Polytechnic University
29EK – Library extension and revitalisation

Breakdown of the construction floor area (CFA) vis-à-vis the construction unit cost

(a)	Breakdown of CFA of the Library extension and revitalisation	
		Estimated floor area (m^2)
	Net operational floor area (NOFA) for 6/F only	2 080
	Circulation areas and toilets for 6/F only	790
	Mechanical and electrical plant rooms for 6/F only	400
	CFA	3 270
(b)	NOFA / CFA ratio	63.6%
(c)	Affected Area (AFA) for G/F to 5/F	14 600
(d)	Extra floor extension (6/F) Estimated construction unit cost (represented by the building and building services costs)	$42,263 per m^2 of CFA (in MOD prices)
	Revitalisation of other floors (G/F to 5/F) Estimated construction unit cost (represented by the building and building services costs)	$10,555 per m^2 of CFA (in MOD prices)