Hong Kong Housing Authority

Agreement No. CB20120293 Planning and Engineering Study for the Public Housing Site and Yuen Long Industrial Estate Extension at Wang Chau

Final Technical Report No.3K (TR-3K) Preferred Option and Technical Assessment – Financial Assessment

REP-024-01

Final | June 2014

IMPORTANT – CONFIDENTIALITY

This project and study shall be kept confidential and any information contained in and/or related to the project/study shall not be disclosed to any person not involved in the project/study.

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1 INTRODUCTION

1.1 Project Background

1.1.1.1 As stated in the Chief Executive's 2011-12 Policy Address, the Administration is committed to expanding the land resources and increasing housing land supply. To meet this policy objective, the Planning Department (PlanD) has carried out a comprehensive review of the areas zoned "Green Belt" (GB) on the Outline Zoning Plans (OZPs) focusing on sites which are no longer green or spoiled. A number of "GB" and "Open Storage" (OS) sites in Wang Chau, Yuen Long were identified as having potential for public housing (PH) development.

1.1.1.2 Subsequently, the Innovation and Technology Commission (ITC) and the Hong Kong Science and Technology Parks Corporation (HKSTP) advised of the need to expand the Yuen Long Industrial Estate (YLIE), in addition to the existing three Industrial Estates (IEs) at Tai Po, Tseung Kwan O and Yuen Long. It was requested to use a portion of the Wang Chau potential housing site for this purpose.

1.1.1.3 After due consideration, an agreement was reached between the Housing Department (HD) and ITC to share the site, tentatively with the northerly portion to be allocated for the YLIE extension (YLIEE), while the remaining south portion would be developed for public housing use. It was further agreed that no Potential Hazardous Installations (PHIs) would be located at the YLIEE so as to minimize the potential adverse impact on the neighbouring PHD.

1.1.1.4 **Appendix A - Figure 1.1.1** shows the location of the Project site. The PH and YLIEE sites at Wang Chau are zoned GB and OS on the Ping Shan OZP No. S/YL-PS/14. It is currently occupied by OS, vehicle parks, farmland, fallow land, grassland, rural residential dwellings and temporary structures.

1.1.1.5 Ove Arup & Partners Hong Kong Limited (Arup) was commissioned by Hong Kong Housing Authority (HKHA) under entrustments from the Government of the Hong Kong Special Administrative Region (HKSAR) & Hong Kong Science and Technology Parks Corporation (HKSTP) to conduct the Planning and Engineering Study for Public Housing Site and YLIEE at Wang Chau (the Study), which will examine the feasibility on developing public housing and YLIEE at Wang Chau by conducting planning, engineering and environmental assessments to formulate proposal for the PH site and YLIEE, and the implementation strategies and programme for the PHD.

1.2 Purpose of this Report

1.2.1.1 The overall objective of the Study is to examine a broad financial assessment of PH and YLIEE sites at Wang Chau, including the cost

of the development and its potential return; and to give an recommendation on whether each portion of the project, i.e. the housing development and YLIEE, is viable.

1.2.1.2 According to Clause 5.3(c) (xiii) of the Brief, this Financial Assessment report should comprise the following aspects:

- The Consultants shall assess the broad land requirements, and broad cost and revenue for the proposed developments and infrastructures/facilities of the recommended development options. The broad cost assessment shall cover but not limited to land resumption and clearance costs, site formation costs, infrastructure costs and an estimate of contingency sum. The Consultants shall carry out estimate on revenue based on different land uses, or adopting other estimating methods as appropriate so that the financial viability of the development proposals can be determined;
- The Study shall indicate separate assessment for each portion of the development, i.e. the housing development and YLIEE;
- The consultants shall give an recommendation on whether each portion of the project, i.e. the housing development and YLIEE, is viable; and
- The estimates shall reflect money-of-the day situation and tally with the proposals in all other reports of the Assignment.

1.3 Approach

1.3.1.1 A broad Life Cycle Costing Process for valuing the costs and benefits of proposed developments can be applied directly to this Study. There are six steps for evaluating the costs and benefits of each of the developments:

- Step 1: Develop breakdown of cost including operation and capital costs for each development
- Step 2: Prepare cost estimate for each cost breakdown
- Step 3: Estimate the financial benefit based on the proposed development parameters
- Step 4: Phase the cost and benefit into an appropriate interval over the assessment period
- Step 5: Calculate the time profile of the net benefits (revenues minus costs) and assess the funding gap if necessary
- Step 6: Evaluate the variability of each development

1.3.1.2 The financial assessment results will be presented at Money-of-the day (M.O.D.) price to reflect the estimated value on the project commencement date. Based on revenue and construction cost estimates, there are various financial evaluation methods for evaluating the project's financial viability, such as simple payback,

discount payback methods, internal rate of return (IRR) and net present value (NPV).

1.4 Limitations

1.4.1.1 Current accepted professional practices and procedures were used in the development of this report. However, as with any forecast, there may be differences between forecasted and actual results. The report contains reasonable assumptions, estimates, and projections that may be indicative of future values or events. However future developments cannot be predicted with certainty and this will affect the estimates or projections expressed in this report.

1.4.1.2 This document is intended only for the information of the Hong Kong Housing Authority. It is not intended for and should not be relied upon by any third party, and no responsibility is undertaken to any third party. Our findings are based on limited technical, financial, and commercial data.

1.4.1.3 The Consultant Team has relied upon assumptions and estimates and is not aware of any facts that would make such information misleading. We envisage that if the project is to be taken forward, further validation of our findings will be undertaken as part of the procurement process.

1.4.1.4 We must emphasis that the realisation of any prospective financial information set out is dependent on the continuing validity of the assumptions on which it is based. We accept no responsibility for the realisation of the prospective financial information. Actual results are likely to be different from those shown in the prospective financial information because events and circumstances frequently do not occur as expected, and the differences may be material.

1.5 Structure of this Report

1.5.1.1 The structure of this Technical Report is as follows:

Section	Description
Section 1	Introduction
Section 2	Provides the site description and presents the preferred option and the key data of the proposed development on which the impact assessments is based
Section 3	Presents the assumptions and key findings of YLIEE's financial analysis
Section 4	Presents the assumptions and key findings of PH Site's financial analysis
Section 5	Summary and conclusion

1.6 Nomenclature and Abbreviations

1.6.1.1 The following **Table 1** lists out the meaning of abbreviation for expressions adopted in this report:

Table 1 Abbreviations

Abbreviations	Term
AT	Au Tau
CLP	China Light and Power Hong Kong Limited
DSD	Drainage Services Department
EPD	Environmental Protection Department
FSD	Fire Service Department
FWPSR	Fresh Water Primary Service Reservoirs
FWSR	Fresh Water Service Reservoirs
GB	Green Belt
GFA	Gross Floor Area
G/IC	Government/ Institution/ Community
HDLD	Highways Department Lighting Division
HGC	Hutchinson Global Communications Ltd
HKBN	Hong Kong Broadband Network Ltd
HKCG	The Hong Kong and China Gas Company Limited
HKCTV	Hong Kong Cable Television Ltd
HKPSG	Hong Kong Planning Standards and Guidelines
IL	Invert Level
ISWB	Integrated Social Welfare Building
LGV	Light Goods Vehicle
LOS	Local Open Space
MDD	Mean Daily Demand
NTM	Ngau Tam Mei
NWT	New World Telecommunications Ltd
OS	Open Storage
OZP	Outline Zoning Plan
PCCW	Hong Kong Telecommunications Ltd
PE	Polyethylene
PH	Public Housing Site (This Project)
PR	Plot Ratio
PTI	Public Transport Interchange
TR-2	Technical Report No. 2
TR-3	Technical Report No. 3
TTFN	Towngas Telecommunications Fixed Network Ltd
TWL	Top Water Level
VE	Village Environs
WC	Wang Chau
WSD	Water Supplies Department
WT&T	Wharf T&T
WTW	Water Treatment Works
YLIE	Yuen Long Industrial Estate
YLIEE	Yuen Long Industrial Estate Extension (This Project)

2 PROJECT DESCRIPTION

2.1 Site Location

2.1.1.1 The Project site is bounded by the existing YLIE, Fuk Hi Street and Fuk Hing Garden and Sai Tau Wai to the east, Long Ping Road and Long Ping Estate to the south, Kai Shan to the west, as well as Shing Uk Tsuen, Tai Tseng Wai and Ng Uk Tsuen to the north as indicated in **Appendix A - Figure 1.1.1**.

2.2 Existing Conditions

2.2.1.1 According to the approved Ping Shan OZP No. S/YL-PS/14, the PH and YLIEE sites are currently zoned as "Green Belt" (GB) and "Open Storage" (OS) (**Appendix A - Figure 2.1.1)**. It is occupied by OS, vehicle parks, farmland, fallow land, grassland, rural residential dwellings and temporary structures.

2.2.1.2 The surrounding areas of the Project site are characterized by a mixture of various land use zonings as well as different existing major land uses. These include high-rise residential development, villages and low-rise residential developments, natural landscapes, burial grounds and graves, industrial uses, major roads and railway tracks.

2.2.1.3 The Project site is irregular in shape. In terms of topography, it is generally flat on its northern and central portions and has a slightly hilly terrain on the south strip. The major land uses within the Project site include open storage/workshops, residential dwellings, agricultural and vegetated land, nullah with footpaths and watercourses.

2.3 The Preferred Option

2.3.1.1 During the process of option generation, a number of key elements which play determining roles in the formulation of initial development options have been identified. The key elements that have been paid with due respect include the burial ground at Kai Shan, Village Environs (VE) of Wing Ning Tsuen (D.D. 122), VE of Fung Chi Tsuen and Shui Tin Tsuen (D.D 120 & 122) and the Umah International Primary School. A preferred development option for PH site and YLIEE site has been formulated in the TR-2 Option Generation, Evaluation and Preliminary Assessments.

2.3.1.2 Since the approval of TR-2, discussions with various government departments have been carried out; and subsequently the Project site boundary, site layout and development parameters of the preferred option have been slightly refined and optimised to address different concerns of particular departments. This TR-3 is carried out based on

the refined preferred option which is illustrated in **Appendix A - Figure 2.1.2**.

2.3.1.3 The revised Project site boundary, land use budget, site layout, urban design element and development scheme with parameters are briefly described in the following sections.

2.4 The Project Site Boundary

2.4.1.1 As recommended in TR-2, the Project site of the original preferred option is about 33.31 ha in size, with about 18.69 ha for the PH site and about 14.62 ha for the YLIEE site.

2.4.1.2 Taking into account the existing burial urns at Kai Shan, impacts to private land lots, woodland cutting, woodland compensation provision, existing boundaries of adjacent VE, interfacing with existing land use zonings and further optimisation of land use between PH and YLIEE sites, some minor refinements have been proposed.

2.4.1.3 The refined development site boundary is shown in **Appendix A - Figure 2.1.2**. With the refinement, the total area of the Project site is about 33.46 ha, with about 18.81 ha for PH site and about 14.65 ha for YLIEE site.

2.5 Land Use Budget

2.5.1.1 Subsequent to the refinement of the Project site boundary, with an aim to keep up with the development intensity and land use mix in the preferred option as generated under the guiding principles and relevant regulations, minor adjustments have also been made onto the land use budget.

2.5.1.2 **Table 2** below summarizes the land use budget for the refined site boundary.

Table 2 Proposed land use budget for the refined site boundary

Land Use	Land use budget
PH Site	
Residential	About 14.49 ha
School	About 1.94 ha (3 school sites)
G/IC (Integrated Social Welfare Building)	About 0.47 ha
Public Transport Interchange	About 0.41 ha
Roads, amenity greening and slope	About 1.49 ha
Total site area	**About 18.81 ha**
YLIEE Site	
Industrial	About 11.66 ha
Local Open Space (On-site preserved woodland area)	About 0.27 ha
Roads	About 1.81 ha
Slope	About 0.31 ha

Land Use	Land use budget
Woodland compensation area & on-site ecological compensation area	About 0.41 ha
Parking Spaces	About 0.19 ha
Total site area	**About 14.65 ha**

2.6 Proposed Development of the PH Site

2.6.1 Guiding Planning Design Principles for the Public Housing Site

2.6.1.1 There are three major planning & urban design guiding principles followed in the design of the preferred option. These include:

i. Establishing view corridors to Kai Shan - This is achieved by aligning the northern road toward the foothills of the mountain, by strategically placing the schools to provide moments of lower density around the taller residential structures, and by utilizing the 50-metre buffer area as a non-developable zone separating the public housing site from the proposed industrial estate extension site.

ii. Placing public functions closer to the existing road networks - Commercial activities and the public transport interchange (PTI) have been placed along Fuk Hi Street and Long Ping Road in order to serve the greater community.

iii. Creating a tapering building height profile. The buildings taper down from 41 to 31 storeys. The tapering occurs at 5-storey intervals, in order to minimize the effect of the flat-head development.

2.6.2 Land Use Proposals

2.6.2.1 With the proposed refinement of the PH site boundary, types of land use remain unchanged. These include residential with local open space and parking spaces, retail, schools, integrated social welfare building (ISWB), PTI, roads, amenity greening and slope.

2.6.2.2 The PH site can be roughly divided into three portions. The southwestern portion of the PH site consists of the area around residential blocks 1 to 10 (Phase 1), the middle portion consists of the area around residential blocks 11 to 17 (Phase 2), and the northern portion consists of the area around buildings 18 to 24 (Phase 3). The middle and northern portions are bisected by the proposed northern access road.

2.6.2.3 **The Southwestern Portion**: The southwestern portion occupies an area of about 5.5ha. It consists of 10 residential buildings, two underground parking structures, a 2-storey commercial area, a social

welfare building, i.e. ISWB, one school, and complementary recreational functions. All residential buildings in this portion will be of either 31 or 36 storeys. Single-aspect buildings have been utilized in all of the buildings, except Block 3, in order to minimize any potential conflicts from traffic noise issues. A two-storey retail facility has been placed strategically along Long Ping Road to allow street-front retail as well as serve the residents within the proposed new residential housing estate. An indicative pedestrian walkway from Long Ping Estate would land at the same level as the podium level. The ISWB at the southwestern tip of this portion will provide a minimum net operating floor area of approximately 6000 m^2 for various social welfare facilities. A site of a primary school is reserved and proposed with a maximum building height of 8 storeys. Areas for two children playgrounds, two badminton courts, and one basketball court have also been reserved to serve the future residents. An existing shrine exists adjacent to the ISWB. Minimal disturbance has been taken into consideration with site formation in order to preserve this shrine.

2.6.2.4 **The Middle Portion**: It has an area of about 5.8ha. It consists of 7 residential buildings, a commercial area, one underground parking area, and other complementary recreational functions as well as a new road. The residential buildings in this portion taper from tallest (41 storeys) to the west to lowest (31 storeys) to the east. A pedestrian corridor with retail facilities on both sides is proposed. This design will minimize the adverse interface conflict between pedestrians and vehicles. In terms of complementary recreational functions, areas for four children playgrounds, three badminton courts, and two basketball courts have been served. An existing well currently situated between the proposed Blocks 12 and 13 is proposed to be preserved and beautified to give the area more character.

2.6.2.5 **The Northern Portion**: This portion occupies an area of about 7.5ha. It consists of 7 residential buildings, a commercial area, a semi-covered PTI, a non-buildable area, one underground parking area, two schools and complementary recreational functions. The residential buildings taper from tallest to the west (41 storeys) to lowest to the east (31 storeys). This tapering is of similar nature as to the buildings tapering in the middle portion. The commercial area in this portion is placed in the vicinity of the PTI, and creates a gateway to the pedestrian street found in the middle portion with the intention that it would serve both the PH site as well as the YLIEE site. In order to minimize the adverse interface conflicts generated between the YLIEE and the PH sites, a 50-metre buffer has been created between these two distinct zones. The buffer area would comprise of open space, a football pitch, badminton courts, and two playgrounds. Due to the shape of the 50-metre buffer area, this area is also most suitable for an underground parking area. Two schools have been placed strategically at the end of the proposed road, in order to further expand the frame of vision toward Kai Shan, as well as to provide a visual buffer from the

high-density developments of the middle and northern portions. Apart from the recreational functions found along the 50-metre buffer, areas for two additional children playgrounds and two basketball courts have been reserved.

2.6.3 Development Schemes with Parameters

2.6.3.1 In the refined development scheme, the PH site has a site area of 18.81 ha. While the total site area is 18.81 ha, the total residential site area is of a total of 14. 49ha which excludes 30-degree cut slope areas, local roads, and non residential structures, like the PTI, the ISWB, and the three school sites, based on the abovementioned land use proposals. Taking the opportunities to further optimize housing supply in response to the territorial need for housing by visiting various factors with a remained plot ratio (PR) of 6.0 (i.e. 5.86 domestic and 0.14 non-domestic) and maximum building height of 41 storeys, a total of a domestic GFA of 848,750 m^2 and retail GFA of 19,760 m^2. will be accommodated (**Table 3**). The proposed development option could then provide a total of 16,975 flats to cater for around 52,113 populations (**Table 4**). The breakdown of the GFA of each portion is as follows:

Table 3 Domestic and Retail GFA of the Three Portions

	Domestic GFA (m^2)	Retail GFA (m^2)
Southwestern Portion	213,750	6,784
Middle Portion	324,000	8,589
Northern Portion	311,000	4,383
Total	**848,750**	**19,756**

Remarks: It is assumed that the social welfare facilities, PTI, underground parking areas, schools and recreational functions are not accountable for GFA.

Table 4 The Estimation and Number of Flats of the Three Portions

	Area of Residential Site (ha)	Number of Flats^	Population*
Southwestern Portion	3.83	4,275	13,124
Middle Portion	5.00	6,480	19,894
Northern Portion	5.68	6,220	19,095
Total	**14.49#**	**16,975**	**52,113**

An adjustment of 0.02ha has been applied and subtracted from the total site area to avoid overprovision of domestic GFA.
^ It is also assumed that 50% of the flats will be for PRH and 50% will be for HOS.
* It is assumed that the person per flat is 3.07.

2.6.3.2 A summary of the key planning parameters for the PH development is given in **Table 5** below.

Table 5 Summary of Key Planning Parameters for PH development

Development Parameters	Units
Residential Site Area	14.49 ha
Domestic Plot Ratio	5.86
Domestic GFA	848,750 m^2
Estimates No. of Flats	16,975
Estimated Population	52,113
Non-domestic Plot Ratio	0.14
Non-domestic GFA	19,760 m^2
Maximum Building Height (in storeys) (Ground floor included)	31 / 36 / 41
Maximum Building Height (in metres)	87.1m / 100.85m / 114.6m
Maximum Number of Residential Storeys	30 / 35 / 40
Assumed No. of Units Per Storey	11 - 29 units
No. of Towers	24

2.7 Proposed Development of the YLIEE Site

2.7.1 Guiding Planning & Design Principles for the Public Housing Site

2.7.1.1 There are four planning & design principles that should be considered:

i. Optimising the development potential by partitioning the individual site with an optimal plot size between 0.65 and 0.75 ha.
ii. Minimising disturbance to existing woodland and providing an on-site woodland compensation area to minimise the need for off-site woodland compensation.
iii. Providing sufficient local open space for the enjoyment of local employees.
iv. Providing a pedestrian connection from the existing YLIE to the proposed YLIEE site.

2.7.2 Land Use Proposal

2.7.2.1 With the proposed refinement of the YLIEE site boundary, the major types of land use remain unchanged and a large portion of the area still contributes to industrial uses. While chances have been taken to further bring forward capitalization on existing natural resources within the YLIEE site, it is proposed to allow more on-site woodland compensation and ecological conservation area. In summary, other land uses include local open space, car parking space, road and slope area.

2.7.2.2 The YLIEE site has an area of 14.65ha. It consists of 16 individual plots, connected by a local road that terminates at a roundabout.

Adequate Local Open Space (LOS) and parking areas have also been provided within the site. The LOS is currently occupied by woodland which will be preserved on-site. One on-site ecological compensation area has been proposed to the west of development plot VIII, and a woodland compensation area to the west of development plot VII has also been proposed.

2.7.3 Development Schemes with Parameters

2.7.3.1 In the refined development scheme, the total area for YLIEE site is 14.65 ha with 11.66 ha reserved for industrial use. A PR ratio of 2.5 and a maximum building height of 8 storeys for the industrial lots are proposed to remain unchanged. Chances were also taken to optimize industrial GFA provision and as a result, a maximum GFA of 291,545 m^2 will be provided to accommodate about 3,887 workers. A summary of the key planning parameters for the YLIEE development is given in **Table 6** below.

Table 6 Summary of key planning parameters for YLIEE development

Development Parameters	Units
Industrial Site Area	11.66 ha
Plot Ratio	2.5
Maximum GFA	291,545 m^2
Estimated No. of Worker*	About 3,887
Maximum Building Height (in storeys)	8 storeys
Maximum Building Height (in metres)	32m

* It is assumed that a worker density is 75 workers/ m^2.

2.7.3.2 In terms of the distribution of industrial lots, a summary is given in **Table 7** below.

Table 7 Summary of industrial lot sizes

Industrial lot size	Number of lots
1.10 ha -1.19 ha	1
1.00 ha - 1.09 ha	0
0.90 ha - 0.99 ha	0
0.80 ha - 0.89 ha	2
0.70 ha - 0.79 ha	4
0.60 ha - 0.69 ha	8
0.50 ha - 0.59 ha	1
Total number of lots	16

2.8 Tentative Implementation Programme

2.8.1.1 The PH site would be implemented in three phases and the YLIEE site would be developed in a single phase. The following summarises the tentative commissioning dates for both the PH and the YLIEE sites:

a) Year 2022: Granting of YLIEE's land starting from 2022 which will take about 4 years to complete

b) Year 2024: Population intake of PH Site Phase 1

c) Year 2026: Population intake of PH Site Phases 2 & 3

3 Financial Viability Analysis for YLIEE

3.1 Introduction

3.1.1.1 The financial analysis attempts to ascertain the extent to which YLIEE in Wang Chau can be recovered through the competitive land leasing revenue of the industrial estate extension. It is worthwhile to highlight the goal of the extension is to provide more space for industries to create momentum in developing new or improved technology, in so broadening Hong Kong's industrial base. The ultimate goal of YLIEE is to encourage innovation and high-growth entrepreneurship, hence strengthening R&D and the productivity of Hong Kong.

3.1.1.2 The objective is to evaluate achievable breakeven leasing rates, determined on the basis of Project Net Present Value (NPV) and Financial Internal Rate of Return (FIRR) computations.

3.2 Overview of Approach

3.2.1.1 Financial Viability is evaluated over several assessment periods ranging from 2 to 6 years after construction to determine a breakeven lease rate for a potential payback period. Under this approach, costs and revenues are estimated and these include:

1. Capital costs spread across a 4 year construction period from 2019 to 2022
2. Land resumption costs from 2016 – 2017
3. Annual lease premia revenues based on anticipated occupancy from year 2023 onwards

3.2.1.2 The annual cash flows are entered at the appropriate period within a Discounted Cash Flow Model and converted to present day values to estimate the NPV for the project.

3.3 Key Assumptions

The details of the main assumptions adopted for the financial analysis are shown in the following sections.

3.3.1 Assessment Period

3.3.1.1 Development of infrastructure for the proposed Yuen Long Industrial Estate Extension at Wang Chau site area is expected to begin in 2019. The total assessment period comprises:

1. About 4 year construction and development period from 2019 to 2022
2. A Payback period of 4 years (post-construction) from 2023 will be assessed as the base scenario. Additional sensitivity analysis of 2 years before and after base year (i.e. 2, 3, 5 and 6 years) will also be assessed for breakeven lease rates

3.3.2 Discount Rate

3.3.2.1 Given the long term horizon of this project, a [redacted] discount rate has been adopted by taking the average of the Best Hong Kong dollar lending rates for the past 30 years (8.77%), with an additional [redacted]% premium as a conservative measure.

3.3.3 Inflation

3.3.3.1 During the construction period, the escalation indexes for capital and construction costs (i.e. infrastructure costs) are assumed to be 6% in 2017 and 5% per annum consistent over 2018 – 2022[1]. Revenues are assumed to increase by 2.3%[2] per annum based on Hong Kong Consumer Price Index 2003 – 2012.

3.3.4 Borrowing Costs

3.3.4.1 Key assumptions are:

1. External financing may be required for Hong Kong Science & Technology Parks Corporation (HKSTP) and [redacted]% borrowing cost[3] is assumed for all costs incurred
2. HKSTP will provide necessary financing and will hold 100% ownership interest for the industrial estate extension project

3.4 Broad Cost Estimates

3.4.1 Capital Costs

3.4.1.1 The preliminary estimates of infrastructure costs of the Industrial Estate Extension is shown in **Table 8** and the capital cost expenditure profile inclusive of inflation is presented in **Table 9**.

Table 8 Infrastructure Costs (HK$ Million, 2013 Prices)

Items	Amount (HK$'Mil)
Site clearance including tree felling and transplanting	[redacted]
Site formation including site decontamination	[redacted]
Geotechnical works	[redacted]
Drainage works	[redacted]
Sewerage works	[redacted]
Waterworks	[redacted]
Roadwork and Pavement	[redacted]
Ecological and environmental mitigation works	[redacted]
Utilities (provided by Utilities companies)	[redacted]

[1] Capital Works Programme - Price Adjustment Factors for Conversion of Constant Prices into MOD Prices, Secretary for Financial Services and the Treasury, 2012

[2] Source: Consumer Price Indices over 2003 – 2012, Census and Statistical Department, 2013

[3] [redacted]% Finance costs is set by HKSTP based on management discussion

Items	Amount (HK$'Mil)
Base estimate (A)	[redacted]
Add [redacted]% for preliminaries (A x [redacted]%)	[redacted]
Add [redacted]% for safety and environmental measures (A x [redacted]%)	[redacted]
Sub-total (B)	[redacted]
Add [redacted]% for contract contingency (B x [redacted]%)	[redacted]
Sub-total (C)	[redacted]
Provisional Sum for Reimbursement of MPF ([redacted]% of sub-total (C)	[redacted]
Sub-total (D)	[redacted]
Add [redacted]% for project contingency (D x [redacted]%)	[redacted]
Sub-total (E)	[redacted]
Add [redacted]% for detailed design consultancy (E x [redacted]%)	[redacted]
Add [redacted]% for resident site staff (E x [redacted]%)	[redacted]
Add [redacted]% ground investigation (E x [redacted]%)	[redacted]
Sub-total (F)	[redacted]
Add: [redacted]% Overhead and [redacted]% Finance Costs (F x [redacted]%)	[redacted]
Total	[redacted]

Note: The infrastructure costs are estimated by Arup's Quantity Surveyors based on assigned GFA of the development

Table 9 Capital Costs Expenditure Profile (HK$ Million)

Item	2019	2020	2021	2022	Total
Infrastructure Costs (2013 Prices)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Infrastructure Costs (M.O.D.)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

3.4.2 Land Resumption Costs

3.4.2.1 The land resumption cost for YLIEE is based on the proposed land resumption boundary presented in TR3 Land Requirement Plan. It should be noted that the land resumption boundary is still being reviewed by LandsD, CEDD, HD and HKSTPC and hence the cost will be subject to change upon finalization of the land resumption boundary.

3.4.2.2 According to the Zonal Plan for Calculation of Compensation Rates – Yuen Long District (valid from 1st April 2013 and the latest version available from LandsD in November 2013), all private lots affected by YLIEE development sites fall within "Zone C". However, [redacted]

[redacted]

3.4.2.3 No projection for the ex-gratia compensation rate has been made in this assessment and the current ex-gratia compensation rate has been adopted. The basic rate for [redacted] (valid from 1st April 2013 and the latest version available from LandsD in November 2013) is $[redacted] per sq ft. The compensation for agricultural land in [redacted] is [redacted]% of the basic rate. Therefore, the ex-gratia zonal land compensation rate adopted for the agricultural land is $[redacted] per sq ft and for building land is valuation price plus $[redacted] per sq ft.

3.4.2.4 The resulting land resumption cost is then estimated at HK$ [redacted] million (at 2013 Prices) or at HK$ [redacted] million (M.O.D.) and is expected to be paid in the year 2016 – 2017.

3.4.3 Taxation

3.4.3.1 No provision for Hong Kong profits tax is assumed as the HKSTP Corporation is exempted from Hong Kong taxation in accordance with section 25 of the Hong Kong Science and Technology Parks Corporation Ordinance.

3.4.4 Cost Summary

3.4.4.1 A summary of capital and land resumption costs are shown below (**Table 10**). The total cost of YLIEE is estimated to be approximately HK$[redacted] million (M.O.D.).

Table 10 Summary of Costs (HK$ Million, 2013 Prices)

Item	HK$ Million, 2013 Prices	HK$ Million, M.O.D.
Capital Costs	[redacted]	[redacted]
Land Resumption Cost	[redacted]	[redacted]
Total Costs (approx.)	[redacted]	[redacted]

3.5 Revenue Determinants

3.5.1 Land Premium

3.5.1.1 Revenue is recognised when it is probable that the economic benefits will flow through the project and that the revenue can be measured reliably. The benefits are measured on the basis that land premium will be received upon transfer of possession of land, on the date of completion of transfer as stated in the relevant agreements for transfer of possession signed between the authority of YLIEE and the grantees.

3.5.1.2 It is expected that management will closely monitor the credit quality of land premium receivables and will consider, based on, including but not limited to, historical information and background of the counterparties, that the land premium receivables are neither past due

nor impaired to be of a good credit quality. On default of payment, the management will reclaim the premises granted to the grantees and so that management will not come across with significant credit risks.

3.5.1.3 Revenues are assumed to be generated through land premium. Currently, the land premium rate per tenant (per squared meter) for the existing Yuen Long Industrial Estate was adopted on 17 September 2013 (**Table 11**), for the usage of land through to year 2047.

Table 11 Existing Land Premium Rates (2013 prices)

Existing Industrial Estate	Land Premium per sq. m. (HK$)
Yuen Long Industrial Estate	[redacted]

Source: Hong Kong Science & Technology Parks Corporation - Land Premium Website, 2013

3.5.1.4 Given the existing land premium rate was adopted on a different basis to the current development, it may not reflect the development costs in 2013 Prices. As a result, breakeven land premium rates with a payback year of 2 to 6 years are estimated and presented in **section 3.6**.

3.5.2 Planned Industrial Lot Area Usage

3.5.2.1 The planned industrial plots area for development is and a summary is provided in **Table 12**.

Table 12 Planned Area for YLIEE (Million)

Item	Industrial Lots Area (ha)	Maximum Gross Floor Area (sq. m.)
Yuen Long Industrial Estate Extension	11.66	291,545

Source: Arup Consultants

Occupancy of Yuen Long Industrial Estate

3.5.2.2 The occupancy of Yuen Long Industrial Estate is published yearly by the Hong Kong Science & Technology Parks. It is assumed that with the increased high office rent and limited supply of low rent research facilities in Hong Kong, the industrial estate extension will be almost fully occupied 4 years [4] after it is opened (Base case scenario). Projected long term occupancy is provided in **Table 13**.

Table 13 Occupancy of Yuen Long Industrial Estate

	Occupancy
Yuen Long Industrial Estate (Existing)	
2011-2012	95%
2010-2011	99%

[4] Base year scenario: Assume 3ha of land will be supplied per year (provided by HKSTP). 11.47ha divided by 3ha is ~ approximately equal to 4 years

	Occupancy
Average Occupancy – 2010-2012 (existing)	**97%**
Source: HKSTP 2012 Annual Report	
Base Case Projection for Yuen Long Industrial Estate Extension (YLIEE)	
Projected occupancy – first year 2023	25%
Projected occupancy – second year 2024	50%
Projected occupancy – third year 2025	75%
Projected occupancy - 2026 onwards	97%

Note: Projected occupancy is assumed according to supply of 3ha land per year, estimated by HKSTP. Maximum occupancy is assumed to be capped at 97% base on the existing average occupancy

3.5.3 Financing Structures

3.5.3.1 The financing structure for the project is assumed 100% of the financing being provided internally or funded by the Government. It is equivalent to the public sector comparator and the case is summarised in **Table 14**.

Table 14 Assumed Financing Structures

Financing Structure	Description/Assumption
100% Financed internally or provided by Government (equivalent to the Public Sector Comparator)	The Corporation subsidizes all costs through cash payment and may not seek alternative funding mechanisms such as loan (debt) and/or equity from parties other than the Government

3.6 Broad Financial Analysis Results for YLIEE

3.6.1 Estimated Breakeven Price

3.6.1.1 In determining a potential payback period, lease rates are adjusted to estimate payback period ranging from 2 to 6 years[5]. These adjusted lease rates are set at breakeven condition where NPVs are at zero (non-negative).

3.6.2 Base Case: Breakeven In Four Years After Construction

3.6.2.1 In achieving a project payback period in 4 years (post-construction) with a land supply rate of approximately 2.9ha per year, a breakeven lease rate of at least HK$[redacted] is required. The cash flows findings in **Table 15** indicates that a NPV of approximately HK$[redacted] million will be resulted from this lease rate, suggesting it is just sufficient to finance the project on a commercial basis if a 4 year payback period is

[5] With associated hectare of land supply per year

required. The costs and revenues have been discounted at a nominal rate of [redacted]

Table 15 Financial Summary – Breakeven Price At Four Years (HK$ Mil)

Summary	YLIEE	
	Land Leasing Rate of HK$[redacted] per sqm	
	Undiscounted	PV@[redacted] Nominal Discount Rate
Revenues	[redacted]	[redacted]
Capital Costs	[redacted]	[redacted]
Land Resumption Costs	[redacted]	[redacted]
NPV	[redacted]	[redacted]
FIRR		[redacted]%

Notes: Undiscounted refers to the sum of the annual undiscounted value inclusive of inflation

3.6.3 Breakeven In Two Years After Construction

3.6.3.1 In order to achieve project payback period in 2 years (post-construction) with a land supply rate of approximately 5.83ha per year, a breakeven lease rate of at least HK$ [redacted] is required. The cash flows findings in **Table 16** indicates that a NPV of approximately HK$[redacted] million will be resulted from this lease rate, suggesting it is just sufficient to finance the project on a commercial basis if a 2 year payback period is required. The costs and revenues have been discounted at a nominal rate of [redacted]

Table 16 Financial Summary – Breakeven Price At Two Years (HK$ Mil)

Summary	YLIEE	
	Land Leasing Rate of HK$[redacted] per sqm	
	Undiscounted	PV@[redacted] Nominal Discount Rate
Revenues	[redacted]	[redacted]
Capital Costs	[redacted]	[redacted]
Land Resumption Costs	[redacted]	[redacted]
NPV	[redacted]	[redacted]
FIRR		[redacted]%

Notes: Undiscounted refers to the sum of the annual undiscounted value inclusive of inflation

3.6.4 Breakeven In Three Years After Construction

3.6.4.1 In order to achieve project payback period in 3 years (post-construction) with a land supply rate of approximately 3.9ha per year, a breakeven lease rate of at least HK$ [redacted] is required. The cash flows findings in **Table 17** indicates that a NPV of approximately HK$[redacted] million will be resulted from this lease rate, suggesting it is just sufficient to finance the project on a commercial basis if a 3 year payback period is required. The costs and revenues have been discounted at a nominal rate of [redacted]

Table 17 Financial Summary – Breakeven Price At Three Years (HK$ Mil)

Summary	YLIEE	
	Land Leasing Rate of HK$[redacted] per sqm	
	Undiscounted	PV@[redacted] Nominal Discount Rate
Revenues	[redacted]	[redacted]
Capital Costs	[redacted]	[redacted]
Land Resumption Costs	[redacted]	[redacted]
NPV	[redacted]	[redacted]
FIRR		[redacted]%

Notes: Undiscounted refers to the sum of the annual undiscounted value inclusive of inflation

3.6.5 Breakeven In Five Years After Construction

3.6.5.1 In order to achieve project payback period in 5 years (post-construction) with a land supply rate of approximately 2.33ha per year, a breakeven lease rate of at least HK$ [redacted] is required. The cash flows findings in **Table 18** indicates that a NPV of approximately HK$[redacted] million will be resulted from this lease rate, suggesting it is just sufficient to finance the project on a commercial basis if a 5 year payback period is required. The costs and revenues have been discounted at a nominal rate of[redacted]

Table 18 Financial Summary – Breakeven Price At Five Years (HK$ Mil)

Summary	YLIEE	
	Land Leasing Rate of HK$[redacted] per sqm	
	Undiscounted	PV@[redacted] Nominal Discount Rate
Revenues	[redacted]	[redacted]
Capital Costs	[redacted]	[redacted]
Land Resumption Costs	[redacted]	[redacted]
NPV	[redacted]	[redacted]
FIRR		[redacted]%

Notes: Undiscounted refers to the sum of the annual undiscounted value inclusive of inflation

3.6.6 Breakeven In Six Years After Construction

3.6.6.1 In order to achieve project payback period in 6 years (post-construction) with a land supply rate of approximately 1.94ha per year, a breakeven lease rate of at least HK$ [redacted] is required. The cash flows findings in **Table 19** indicates that a NPV of approximately HK$[redacted] million will be resulted from this lease rate, suggesting it is just sufficient to finance the project on a commercial basis if a 6 year payback period is required. The costs and revenues have been discounted at a nominal rate of[redacted]

Table 19 Financial Summary – Breakeven Price At Six Years (HK$ Mil)

Summary	YLIEE	
	Land Leasing Rate of HK$[redacted] per sqm	
	Undiscounted	PV@[redacted] Nominal Discount Rate
Revenues	[redacted]	[redacted]
Capital Costs	[redacted]	[redacted]
Land Resumption Costs	[redacted]	[redacted]
NPV	[redacted]	[redacted]
FIRR		[redacted]%

Notes: Undiscounted refers to the sum of the annual undiscounted value inclusive of inflation

3.7 Summary

3.7.1.1 The findings of the financial analysis indicate that under the assumptions adopted, the land premium rate must be higher than HK$[redacted] per sqm in order to be financially viable in 4 years after construction.

3.7.1.2 The most significant parameters that may affect results are capital costs, tenant demand and land premium rate. Alternatively, since a constant supply of 2.9ha of land per year is assumed only for the base case, breakeven lease rates required for payback period of 2 to 6 years are also estimated. The broad analysis has shown that the breakeven land premium rates for YLIEE are HK$[redacted] per sqm (to achieve a payback period of 2 years), HK$[redacted] per sqm (to achieve a payback period of 3 years), HK$[redacted] per sqm (to achieve a payback period of 5 years) and HK$[redacted] per sqm (to achieve a payback period of 6 years). The results are in line with expectation and the relationship is depicted in **Figure 1**.

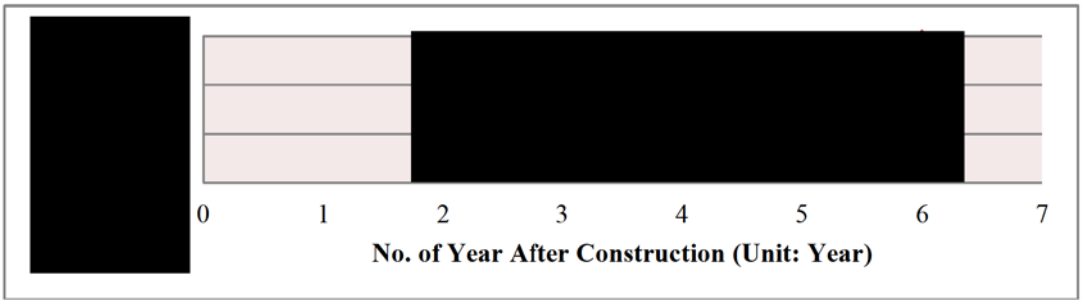

Figure 1 Land Premium Rates Required To Breakeven After Construction Years

4 Financial Viability Analysis For PH Site

4.1 Introduction

4.1.1.1 The financial analysis attempts to ascertain the extent to which the Public Housing (PH) site at Wang Chau can be recovered through relevant revenue of Public Rental Housing (PRH) units, retails, car parks, Public Transport Interchange (PTI) and the sale of Home Ownership Scheme (HOS) units. It is worthwhile to highlight the development plan is to contribute housing supply in addressing Chief Executive's 2011 Policy Address, and to provide affordable housing for families in need.

4.1.1.2 The viability of the project is evaluated on the basis of Project Net Present Value (NPV) and Financial Internal Rate of Return (FIRR) computations.

4.2 Overview of Approach

4.2.1.1 Costs and revenues have been evaluated over a 47 year assessment period from 2017 to 2063. The approach includes:

1. Capital costs spread across a 7 year construction period from 2017 to 2024; Construction of amenities are presumed to be taken place simultaneously
2. Annual operational and maintenance costs over a 40 year operational period from 2024 to 2063
3. Annual revenues based on projected occupancy over a 40 year operational period

4.2.1.2 Cash flows driven by various facilities in the PH site areas are shown in **Figure 2**. The annual cash flows are entered at the appropriate period within a Discounted Cash Flow Model and converted to present day values to estimate the NPV for the project.

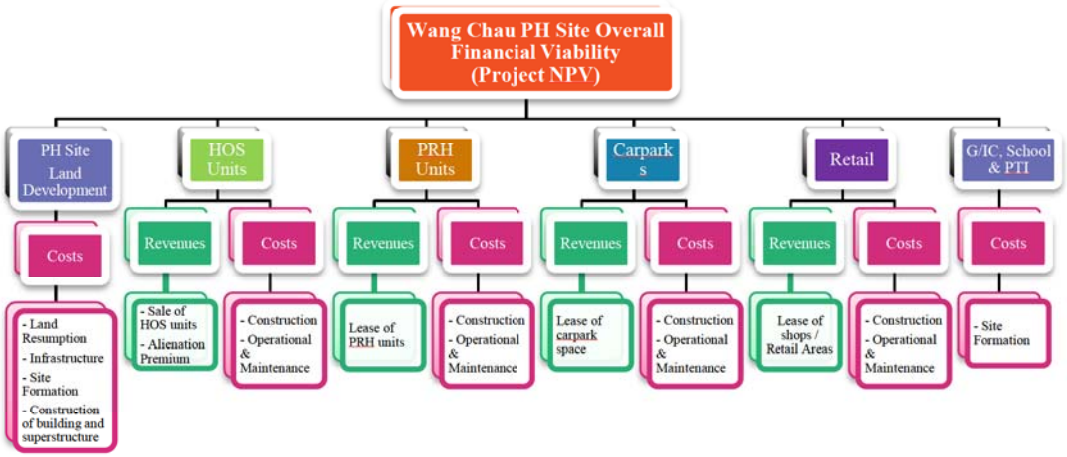

Figure 2 PH Site: Overview of Costs and Revenues Items

4.2.2 Key Assumptions

The details of the main key assumptions adopted for the financial analysis are shown in the following sections.

4.2.3 Assessment Period

4.2.3.1 Development of infrastructure for the proposed Public Housing site in Wang Chau is expected to begin in 2017. The total assessment period has been assumed as 47 years which comprises:

Phase 1

1. Construction and development period from 2017 to 2024
2. 40 year operational period from 2024 to 2063
3. Phase 1's population intake will commence in 2024;

Phase 2 and 3

4. Construction and development period from 2020 to 2026
5. 38 year operational period from 2026 to 2063
6. Phase 2 and 3's population intake will commence in 2026

4.2.4 Development Parameters

4.2.4.1 Under the present development plan, a total of 18.81ha of land area will be used for the PH site. The initial planned areas and development parameters are summarized in **Table 20** and **Table 21** below.

Table 20 Planned Development Areas by Types

Items	Land Area (sqm)	Gross Floor Area (sqm)
Public Rental Housing	144,900 (approx.)	424,375 (approx.)
Home Ownership Scheme		424,375 (approx.)
Retail		19,760 (approx.)
Car parks	Underground (Do not occupy land area)	23,745 (approx.)
G/IC	4,700 (approx.)	8,862 (approx.)
School	19,400 (approx.)	N/A
Roads, amenity greening and slope	14,900 (approx.)	
Public Transport Interchange	4,100 (approx.)	N/A - No GFA (covered structure)
Total Areas	**188,100 (approx.)**	**901,117 (approx.)**

Table 21 Development Parameters

Development Parameters		
Flat Mix	**Total Number of Flats**	**%**
PRH (IFA : 50m^2 /flat*)	8,488 (approx.)	50%
HOS (IFA : 50m^2 /flat*)	8,488 (approx.)	50%
	16,975 (approx.)	100%
Domestic Plot ratio	**5.86**	
Retail GFA	**19,760 sqm** (approx.)	
Parking Facilities		
Type	**Number of Spaces**	
Private Car - Residential	717 (approx.)	
Private Car - Retail	70 (approx.)	
Light Goods Vehicle (LGV)	42 (approx.)	
Motorcycle	187 (approx.)	

* Arup's Planning Consultant Assumptions

4.2.5 Discount Rate

4.2.5.1 Given the long term horizon of this project, a 10% discount rate has been adopted by taking the average of the Best Hong Kong dollar lending rates for the past 30 years (8.77%), with an additional 1% premium as a conservative measure.

4.2.6 Inflation

4.2.6.1 During the construction period, the escalation indexes for infrastructure and construction costs are assumed to be 6% in 2017 and 5% per annum consistent over 2018 – 2022[6]. All operational costs and revenues are assumed to increase by 2.3%[7] per annum based on Hong Kong Consumer Price Index 2003 – 2012.

4.2.7 Fund Arrangement for Construction

4.2.7.1 The Government will fund the site formation and associated infrastructures cost and the Hong Kong Housing Authority will fund the building cost.

4.2.8 Borrowing Costs

4.2.8.1 Key assumptions are:

1. No external financing would be required for Hong Kong Housing Authority and no borrowing cost would be incurred

[6] Capital Works Programme - Price Adjustment Factors for Conversion of Constant Prices into MOD Prices, Secretary for Financial Services and the Treasury, 2012

[7] Source: Consumer Price Indices over 2003 – 2012, Census and Statistical Department, 2013

2. Hong Kong Housing Authority will provide all necessary financing and will hold 100% ownership interest for the public housing project

4.3 Broad Cost Estimates

4.3.1 Capital Costs

4.3.1.1 The preliminary estimates of capital costs include the cost for site formation, cost for foundation and the cost for superstructure works as shown in **Table 22**, **Table 23** and **Table 24** respectively. The "Exterior" cost in the column of **Table 22** refers to the cost for other supporting infrastructure works outside the PH zone area. A summary for the total capital cost expenditure profile inclusive of inflation is presented in **Table 25**.

Table 22 Capital Costs for PH Site Formation (HK$ Million, 2013 Prices)

Description	Phase 1 HK$'Mil	Phase 2 HK$'Mil	Phase 3 HK$'Mil	Exterior HK$'Mil
Site clearance including tree felling and transplanting	[redacted]	[redacted]	[redacted]	[redacted]
Site formation including site decontamination	[redacted]	[redacted]	[redacted]	[redacted]
Geotechnical works	[redacted]	[redacted]	[redacted]	[redacted]
Drainage works	[redacted]	[redacted]	[redacted]	[redacted]
Sewerage works	[redacted]	[redacted]	[redacted]	[redacted]
Waterworks	[redacted]	[redacted]	[redacted]	[redacted]
Roadwork and Pavement	[redacted]	[redacted]	[redacted]	[redacted]
Ecological and environmental mitigation works	[redacted]	[redacted]	[redacted]	[redacted]
Base estimate (A)	[redacted]	[redacted]	[redacted]	[redacted]
Add [redacted]% for preliminaries (A x [redacted]%)	[redacted]	[redacted]	[redacted]	[redacted]
Add [redacted]% for safety and environmental measures (A x [redacted]%)	[redacted]	[redacted]	[redacted]	[redacted]
Sub-total (B)	[redacted]	[redacted]	[redacted]	[redacted]
Add [redacted]% for contract contingency (B x [redacted]%)	[redacted]	[redacted]	[redacted]	[redacted]
Sub-total (C)	[redacted]	[redacted]	[redacted]	[redacted]
Provisional Sum for Reimbursement of MPF ([redacted]% of C)	[redacted]	[redacted]	[redacted]	[redacted]
Sub-total (D)	[redacted]	[redacted]	[redacted]	[redacted]
Add [redacted]% for project contingency (D x [redacted]%)	[redacted]	[redacted]	[redacted]	[redacted]
Sub-total (E)	[redacted]	[redacted]	[redacted]	[redacted]
Add [redacted]% for detailed design consultancy (E x [redacted]%)	[redacted]	[redacted]	[redacted]	[redacted]
Add [redacted]% for resident site staff (E x [redacted]%)	[redacted]	[redacted]	[redacted]	[redacted]
Add [redacted]% ground investigation (E x [redacted]%)	[redacted]	[redacted]	[redacted]	[redacted]
Total (Price level at Sep 2013)	[redacted]	[redacted]	[redacted]	[redacted]

Note: Costs are estimated by Arup's Quantity Surveyors based on development area and land use

Table 23 Cost for Foundation Works (HK$ Million, 2013 Prices)

Description	Phase 1	Phase 2	Phase 3
	HK$'Mil	HK$'Mil	HK$'Mil
Building foundation for residential towers	[redacted]	[redacted]	[redacted]
Building foundation for retails	[redacted]	[redacted]	[redacted]
Building foundation for car parks	[redacted]	[redacted]	[redacted]
Base estimate (A)	[redacted]	[redacted]	[redacted]
Add [redacted]% for preliminaries (A x [redacted]%)	[redacted]	[redacted]	[redacted]
Add [redacted]% for safety and environmental measures (A x [redacted]%)	[redacted]	[redacted]	[redacted]
Sub-total (B)	[redacted]	[redacted]	[redacted]
Add [redacted]% for contract contingency (B x [redacted]%)	[redacted]	[redacted]	[redacted]
Sub-total (C)	[redacted]	[redacted]	[redacted]
Provisional Sum for Reimbursement of MPF ([redacted]% of C)	[redacted]	[redacted]	[redacted]
Sub-total (D)	[redacted]	[redacted]	[redacted]
Add [redacted]% for project contingency (D x [redacted]%)	[redacted]	[redacted]	[redacted]
Sub-total (E)	[redacted]	[redacted]	[redacted]
Add [redacted]% for detailed design consultancy (E x [redacted]%)	[redacted]	[redacted]	[redacted]
Add [redacted]% for resident site staff (E x [redacted]%)	[redacted]	[redacted]	[redacted]
Add [redacted]% ground investigation (E x [redacted]%)	[redacted]	[redacted]	[redacted]
Total (Price level at Sep 2013)	[redacted]	[redacted]	[redacted]

Note: Costs are estimated by Arup's Quantity Surveyors based on development area and land use

Table 24 Cost for Superstructure Works (HK$ Million, 2013 Prices)

Description	Phase 1	Phase 2	Phase 3
	HK$'Mil	HK$'Mil	HK$'Mil
Building works	[redacted]	[redacted]	[redacted]
Landscape works	[redacted]	[redacted]	[redacted]
Environmental mitigation measures	[redacted]	[redacted]	[redacted]
PTI	[redacted]	[redacted]	[redacted]
Base estimate (A)	[redacted]	[redacted]	[redacted]
Add [redacted]% for preliminaries (A x [redacted]%)	[redacted]	[redacted]	[redacted]
Add [redacted]% for safety and environmental measures (A x [redacted]%)	[redacted]	[redacted]	[redacted]
Sub-total (B)	[redacted]	[redacted]	[redacted]
Add [redacted]% for contract contingency (B x [redacted]%)	[redacted]	[redacted]	[redacted]
Sub-total (C)	[redacted]	[redacted]	[redacted]
Provisional Sum for Reimbursement of MPF ([redacted]% of C)	[redacted]	[redacted]	[redacted]
Sub-total (D)	[redacted]	[redacted]	[redacted]
Add [redacted]% for project contingency (D x [redacted]%)	[redacted]	[redacted]	[redacted]
Sub-total (E)	[redacted]	[redacted]	[redacted]
Add [redacted]% for detailed design consultancy (E x [redacted]%)	[redacted]	[redacted]	[redacted]
Add [redacted]% for resident site staff (E x [redacted]%)	[redacted]	[redacted]	[redacted]
Total (Price level at Sep 2013)	[redacted]	[redacted]	[redacted]

Note: Costs are estimated by Arup's Quantity Surveyors based on development area and land use

Table 25 Capital Costs Expenditure Profile (HK$ Million, MOD)

Item	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Total
Capital Costs for Site Formation	[redacted]										
Cost for Foundation Works	[redacted]										
Cost for Superstructure Works	[redacted]										
Total (Approx.)	[redacted]										

Note:
(1) Includes inflation
(2) Numbers may not add up due to rounding[redacted]

4.3.2 Operational and Maintenance Costs

4.3.2.1 The proposed PH site is assumed to commence operation in 2024 and the operational costs estimated (included maintenance of physical parts due to wear and tear) are presented in **Table 26**.

Table 26 PH Site Operational Costs (HK$ Million, 2013 Prices)

Type of Structure	Operational Cost Items	(HK$ Million, 2013 Prices)	(HK$ Million, M.O.D.)
Land / Infrastructure [1]	Utilities, Maintenance & Administrative Expenses	N/A	N/A
G/IC [1]	Operating & Administrative Expenses	N/A	N/A
PTI [1]	Operating & Administrative Expenses	N/A	N/A
PRH Domestic [2]	Operating & Maintenance	2,996.8	6,294.5
HOS Domestic [3]	Operating & Maintenance	2,319.4	4,871.8
Retail Mall [4]	Operating & Maintenance	1,321.0	2,769.6
Car parks [5]	Operating & Maintenance	131.4	276.1
Total Operating Costs		**6,768.6**	**14,212**

Note:

[1] Operational and maintenance costs are assumed to be financially backed by relevant B/Ds upon completion of PH site development.

[2] According to Memorandum for the Subsidised Housing Committee of Hong Kong Housing Authority, Paper No. SHC 36/2013, the targeted annual average cost

per PRH unit is HK$ 9,170[8]. This maintenance cost per unit is multiplied by the total number of PRH flats (8,488) to attain the total operational and maintenance costs of the estate per year. Figure shown has included 40 years of operational costs and is adjusted for inflation.

[3] According to Annual Review of Management Fees for Home Ownership Scheme Courts in February 2013, HA is the manager under the Deeds of Mutual Covenants (DMCs) to manage HOS courts where the owners have not yet taken over the management. HA appoints Property Services Agents (PSAs) to perform daily property management on its behalf. Management fees for HOS courts are reviewed annually. At the time of writing, the proposed average monthly management fee of the eleven existing HOS courts range from $501 to $884 per flat per month[9], giving an average of $591.4 per flat[10]. This management cost per flat is multiplied by the total number of HOS flats (8,488) to attain the total operational and maintenance costs of the estate per year. Figure shown has included 40 years of operational costs and is adjusted for inflation.

[4] In relation to the Housing Authority Commercial Properties Committee paper CPC 17/2013, the operating expenditure per square metre retail space per month is as at 31/03/2013 is HK$144. This figure is adopted for the study and the 40 years retail operational costs is estimated by incorporating retail GFA (19,760 sqm) and inflation.

[5] Management and maintenance costs of car parking facilities is taken from the Housing Authority Commercial Properties Committee paper CPC 27/2012, where the target operating expenditure per unit car park space per month is HK$280[11]. This figure is adopted for the study and the 40 years car park facilities operational costs is estimated by incorporating the number of car parking space (1,016 parking space) and inflation.

4.3.2.2 The broad operational costs expenditure profile inclusive of inflation for PH Site under the management of HA is shown in **Table 27**.

[8] Comprising of Direct management cost of $5,450 and Actual maintenance cost of $3,720, where (i) Direct management cost comprises direct personal emoluments for property management only and other recurrent expenditure incurred at estate level such as EMAC fund, electricity, cleansing, security services and demolition and clearance costs (ii) Actual maintenance cost comprises maintenance works incurred at estate level and the costs attributed to PRH maintenance allocated from indirect cost centres. Paper No. SHC 36/2013

[9] Annual Review of Management Fees for Home Ownership Scheme Courts, Memorandum for the Subsidised Housing Committee of the Hong Kong Housing Authority, Paper No. SHC 12/2013, 08/02/2013

[10] Computed base on the Annex of Annual Review of Management Fees for Home Ownership Scheme Courts, Memorandum for the Subsidised Housing Committee of the Hong Kong Housing Authority, Paper No. SHC 12/2013, 08/02/2013

[11] Year-end Performance Review Programme of Activities for Commercial Properties 2011/12, Memorandum for the Commercial Properties Committee of the Hong Kong Housing Authority, Paper No. CPC 27/2012, 2012

Table 27 Operational Costs Expenditure Profile (HK$ Million, MOD)

Operational Costs	2029	2039	2049	2059	2063
PRH Flats	112	140.6	176.5	221.5	242.6
HOS Flats	86.7	108.8	136.6	171.5	187.8
Retail	49.1	61.7	77.4	97.2	106.4
Car parks	4.9	6.2	7.7	9.9	10.6

Note: Includes inflation

4.3.3 Land Resumption Costs

4.3.3.1 The land resumption cost for PH Site is based on the proposed land resumption boundary presented in TR3 Land Requirement Plan. It should be noted that the land resumption boundary is still being reviewed by LandsD, CEDD, HD and HKSTPC and hence the cost will be subject to change upon finalization of the land resumption boundary.

4.3.3.2 According to the Zonal Plan for Calculation of Compensation Rates – Yuen Long District (valid from 1st April 2013 and the latest version available from LandsD in November 2013), all private lots affected by the PH development sites fall within "Zone C". However, [redacted]

4.3.3.3 No projection for the ex-gratia compensation rate has been made in this assessment and the current ex-gratia compensation rate has been adopted. The basic rate for [redacted] (valid from 1st April 2013 and the latest version available from LandsD in November 2013) is $[redacted] per sq ft. The compensation for agricultural land in [redacted] is [redacted]% of the basic rate. Therefore, the ex-gratia zonal land compensation rate adopted for the agricultural land is $[redacted] per sq ft and for building land is valuation price plus $[redacted] per sq ft.

4.3.3.4 The resulting land resumption cost is then estimated at HK$ [redacted] million (at 2013 Prices). It is expected to be paid in the year 2014 – 2018 and the M.O.D. value is approximately HK$[redacted] million.

4.3.4 Cost Summary

4.3.4.1 A summary of capital and operational costs (cash outflows) are shown below (**Table 28**). Capital and operational costs are inflated at the assumed 5% and 2.3% per annum inflation rate respectively.

Table 28 Summary of Costs (HK$ Million)

Item	HK$ Million, 2013 Prices	HK$ Million, M.O.D.
Capital Costs (2017-2026)	[redacted]	[redacted]
Land Resumption Cost (2014-2018)	[redacted]	[redacted]
Operational Costs (2024-2063)	6,768.6	14,212

4.4 Broad Revenues

4.4.1 Revenue from Public Rental Housing (PRH) Units

4.4.1.1 The rental income for public housing is one of the major inputs in the financial assessment of PH site. The public rental housing aims to cater low income families and the rental rate is highly dependent on government policy rather than market mechanisms. Rental adjustment mechanisms are also subject to rental policy rather than other market factors such as property inflation.

PRH Revenue Parameters and Assumptions

Monthly Rental Rate (PRH)

4.4.1.2 With reference to Annex A of the Memorandum for the Subsidised Housing Committee of Hong Kong Housing Authority SHC 33/2013 dated 20/06/2013, the rents of domestic flats in newly completed PRH estates are stable according to the District Best Rent Levels (DBRLs) of respective districts. At the time of the writing this paper Yuen Long was priced at HK$42.9 per sq m (IFA) per month. Though PRH rental rate is subject to be changed once in a while[12], the supply of PRH is to accommodate low income families and is thus related to household income level and individual's circumstances. In this study, the rental rate HK$42.9 per sq m for PRH units is used and is inflated at 2.3% CPI.

PRH Occupancy

4.4.1.3 Given the current average waiting time (AWT) for general PRH applicants was 2.7 years as at end of March 2013, HA intended to maintain the PRH AWT for general applicants at around three years[13]. Given the large number of applicants on the waiting list for PRH, HA should allocate as many available flats as possible in light of PRH

[12] HA approved Paper No. HA 56/2006 that the arrangement of conducting two rent fixing exercises each year to determine the rents of newly completed estates

[13] Annex 1 of the Memorandum for the Subsidised Housing Committee of Hong Kong Housing Authority, SHC 36/2013, Year-end Performance Review of 2012/13 Programme of Activities for Subsidised Housing, 15/07/2013

supply and other competing demand. For that reason, 98.5% occupancy rate[14] is adopted for three phases and the long term.

Projected PRH Revenue

4.4.1.4 Using the planned PRH GFA, occupancy and rental rate, the projected PRH revenue profile is shown in **Table 29**.

Table 29 Projected Revenue Profile of PRH

	2024 (Phase 1)	2026 (Phase 2,3)	2029	2039	2049	2059	2063
HK$ Million 2013 Prices	54.2	215.2	215.2	215.2	215.2	215.2	215.2
HK$ Million M.O.D.	69.8	290.1	310.8	391.0	492.0	619.0	678.6

4.4.2 Revenue from Home Ownership Scheme (HOS) Units

4.4.2.1 The Government announced in 2011 a new policy for the resumption of the HOS for low and middle-income families to buy their own homes, with a planning objective to provide some 17,000 flats under the New HOS over the four years from 2016/17 onwards[15]. The planned new HOS of Wang Chau is expected to bring in a significant part of revenue in addition to PRH of the PH site.

HOS Revenue Parameters and Assumptions

Sale Price of HOS Units

4.4.2.2 In the paper SHC 53/2012, HOS flats have been sold at 30% discount with respect to the market value in past practice. This 30% discount guideline was reaffirmed in 2006 for the sale of Surplus HOS flats and it has been proposed to adopt this established formula for the sale in future of HOS flats.

4.4.2.3 For this study, the HOS unit price is estimated using the existing private domestic housing price per square metre of Yuen Long District at 30% discount.

[14] This rate is in line with HA's target to keep the percentage of vacant flats at below 1.5% of PRH stock (100% - 1.5% = 98.5%), as outlined in the paper SHC 30/2013 "Public Rental Housing Allocation Plan for 2013/14"

[15] Paper No. SHC 53/2012, Sale of Remaining Surplus Home Ownership Scheme Flats and New Home Ownership Scheme Flats, Memorandum for the Subsidised Housing Committee of the Hong Kong Housing Authority

4.4.2.4 At the time of writing, the prevailing market price of Yuen Long District is HK$5,748 per sq ft[16], which is equivalent to HK$61,871 per sq m. Therefore, at 30% discount the sale price is equivalent to HK$43,310 per sq m. This rate HK$43,310 per sq m will be used for the sale of HOS units. This price is indexed at 4.9%[17] using the growth rate of Average Private Domestic Price of New Territories (of unit size 40m^2 to 69.9 m^2).

Occupancy

4.4.2.5 It is assumed all HOS flats will be sold out given the attractiveness of discounted residential price.

Alienation Premium

4.4.2.6 The traditional HOS flats were sold at a discounted price by HA and are subject to alienation restrictions, or restriction for resale. Pursuant to the Housing Ordinance, change of ownership of HOS flat is restricted except for disposal in the Secondary Market after two years has elapsed since the first assignment[18], or in the open market upon payment of premium. Owners must pay this premium for removal of the restrictions before they can sell, let or assign the flats on the open market[19]. However, according to the surveys on Subsidised Housing, Paper No. SHC 60/2012, approximately 38% of the HOS owners knew the procedures for selling HOS flats. Less than 1% had attempted to sell their HOS flats in 2011-2012 and less than 1% considered selling their HOS flats. Given this low number, it is assumed for this study 0% of HOS owners of the PH site will sell their flats and therefore zero premium revenue is assumed for this study.

Projected HOS Revenue

4.4.2.7 The HOS revenue profile is shown in **Table 30**.

Table 30 Sales Revenue of HOS Flats

HOS Sale	2024 (Phase 1)	2026 (Phase 2,3)	Total
HK$ Million 2013 Prices	4,629	13,751	18,380
HK$ Million M.O.D.	7,840	25,632	33,472

[16] Centadata, Transaction Price of New Territories West – Yuen Long, 03/09/2013, Data base on The Land Registry & Centadata Company Limited, http://centadata.com/epaddresssearch1.aspx?type=district16&code=NW

[17] Rating and Valuation Department, Table. Private Domestic - Average Price By Class, 2013, Growth rate of1999 – 2012 Prices

[18] Refers to the date when the HA first assigns a flat to a purchaser

[19] Housing Authority (http://www.housingauthority.gov.hk/en/home-ownership/information-for-home-owners/resale-restriction/index.html)

4.4.3 Revenue from Local Retail Mall

Retail Revenue Parameters and Assumptions

4.4.3.1 According to Financial committee paper FC 1/2013, the proposed budget 2013/14 for income from commercial premises is HK$728 million. Given the existing 197,875 m^2 of retail area as at 30/9/2012, the average rent would be HK$3,679/ m^2 per year, or HK$307/ m^2 per month. The unit rate of HK$307/ m^2 IFA per month is adopted for retail rent assessment.

Occupancy

4.4.3.2 With reference to the Memorandum for the Commercial Properties Committee of HA, the latest target occupancy set for retail premises (shops) is 95.2%[20] for 2012/13. This retail occupancy rate is also assumed for the PH site study with retail IFA of 13,173 m^2 (GFA 19,760 m^2 divided by plot ratio 1.5)

Projected Retail Revenue

4.4.3.3 Using Retail IFA of 13,173 m^2 (GFA 19,760 m^2 divided by plot ratio 1.5), the assumed occupancy rate and rent of HK$307/ m^2 per month with an indexation of 4.3%[21] per year using the growth rate of Private Retail Average Rent of New Territories, the projected Retail revenue result is attained and the revenue profile is shown in **Table 31**.

Table 31 Projected Retail Rent Revenue

	2024 (Phase 1)	**2026** (Phase 2,3)	**2029**	**2039**	**2049**	**2059**	**2063**
HK$ Million 2013 Prices	15.9	46.2	46.2	46.2	46.2	46.2	46.2
HK$ Million M.O.D.	25.3	80.3	91.2	139.6	213.5	326.6	387.2

[20] Year-end Performance Review of 2012/13 Programme of Activities for Commercial Properties, Memorandum for the Commercial Properties Committee of Hong Kong Housing Authority, Paper No. CPC 17/2013

[21] Rating and Valuation Department, Table: Private Retail - Average Rent And Prices, 2013, Growth rate of1999 – 2012 Retail rent

4.4.4 Revenue from Car parks

Carparks Revenue Parameters and Assumptions

Occupancy

4.4.4.1 With reference to the Memorandum for the Commercial Properties Committee of HA, the latest target occupancy set for carpark is 77%[22]. This occupancy rate is also adopted for this study.

Parking Fee

4.4.4.2 In accordance to HA announcement dated 16/11/2012, carpark fees with effect from 1/1/2013 for Yuen Long District is $1,100 per private car parking space per month (under the category "50% to below 90%" occupancy"), $350 per motorcycle parking space per month and $2,420 per LGV parking space per month[23], these monthly rates are undertaken for the estimation for car park revenue on the basis of 787 private car park space, 187 motorcycle space and 42 LGV space provided by the PH site. The longer term car parking fee is indexed at 2.9%[24] using the growth rate of Private Domestic Average Rent of New Territories (of unit size less than 40 m^2). This rate is almost in line with the average income growth rate set by Housing Authority's Revised Budget 2012/13[25].

Projected Carparks Revenue

4.4.4.3 Using the number of carpark space (for the vehicle "Private Car", "Motorcycle" and "LGV") and the target parking occupancy with adjustment for inflation. The expected revenue generated from parking facilities is shown in **Table 32**.

Table 32 Projected Carpark Rent Revenue

	2024 (Phase 1)	**2026** (Phase 2,3)	**2029**	**2039**	**2049**	**2059**	**2063**
HK$ Million 2013 Prices	2.3	9.5	9.5	9.5	9.5	9.5	9.5
HK$ Million M.O.D.	3.2	13.8	15.1	20.1	26.8	35.6	40.0

Note: Numbers may not add up due to rounding.

[22] Year-end Performance Review of 2012/13 Programme of Activities for Commercial Properties, Memorandum for the Commercial Properties Committee of Hong Kong Housing Authority, Paper No. CPC 17/2013

[23] Review of Carpark Charges for 2013, Summary of Decisions Made by the Commercial Properties Committee, Paper No. CPC 39/2012

[24] Rating and Valuation Department, Table. Private Domestic - Average Rent By Class, 2013, Growth rate of1999 – 2012 Rent

[25] Section 3.1, Housing Authority's Revised Budget 2012/13, Proposed Budget 2013/14 and Financial Forecasts 2014/15 to 2016/17, Memorandum for the Hong Kong Housing Authority, Paper No. HA 4/2013

4.4.5 PH Site Revenue Summary

4.4.5.1 A summary of all revenues (cash inflows) are shown below (**Table 33**). Individual revenues are inflated using the following inflation rates throughout the assessment period:

a) PRH Domestic Units: 2.3% CPI

b) HOS Domestic Units : 4.9%[26] growth rate of Private Domestic Average Price of New Territories

c) Retail Rent : 4.3%[27] growth rate of Private Retail Average Rent of New Territories

d) Carpark Fee : 2.9%[28] growth rate of Private Domestic Average Rent of New Territories

Table 33 Summary of Revenues (HK$ Million)

Item	HK$ Million 2013 Prices	HK$ Million M.O.D.
PRH Domestic	8,286	17,541
HOS Domestic	18,380	33,472
Retail Mall	1,787	7,505
Car parks	367	945
Total (Approx.)	**28,820**	**59,462**

Note: Numbers may not add up due to rounding

4.4.5.2 The total revenues have been estimated by the assumed revenue parameters and assumed occupancy. The annual revenues inclusive of inflation for PH Site are shown below in **Table 34**.

Table 34 PH Site Revenues Profile by Year (HK$ Million, M.O.D.)

	2024 (Phase 1)	2026 (Phase 2,3)	2029	2039	2049	2059	2063
PRH	70	290	312	391	492	619	679
HOS	7,840	25,632	-	-	-	-	-
Retail	25	80	91	140	214	327	387
Carpark	3	14	15	20	27	36	40
PH Site Total Revenue	7938	26016	417	551	732	981	1106

Note:
(1) Includes inflation
(2) Numbers may not add up due to rounding

[26] Rating and Valuation Department, Table: Private Domestic - Average Price By Class, 2013, Growth rate of1999 – 2012 Prices (of unit size 40m^2 to 69.9 m^2)
[27] Rating and Valuation Department, Table: Private Retail - Average Rent And Prices, 2013, Growth rate of1999 – 2012 Retail rent
[28] Rating and Valuation Department, Table: Private Domestic - Average Rent By Class, 2013, Growth rate of1999 – 2012 Rent (of unit size less than 40 m^2)

4.4.6 Financing Structures

4.4.6.1 The financing structures for the project is assumed 100% of the financing being provided by the Housing Authority and is equivalent to the public sector comparator. The case is summarised in **Table 35**.

Table 35 Assumed Financing Structures

Financing Structure	Description/Assumption
100% Financed by Housing Authority (equivalent to the Public Sector Comparator)	Housing Authority subsidizes all costs through a cash payment and will not seek alternative funding mechanisms such as loan (debt) and/or equity.

Note: Government financed means a cash injection by the Government exclusive of borrowing costs.

4.5 Broad Financial Analysis Results for PH Site

4.5.1 Key Findings of Cash Flow Analysis

4.5.1.1 The cash flows findings indicates that a negative financial return will be resulted with the assumed financing structure.

4.5.1.2 The analysis indicates that PH Site development would result in HK$7,009 million of negative NPV (**Table 36**). **Figure 3** shows that the net cash flow balance under the assumption is not met by the long term revenue generated from PRH, HOS, Retail and Car parks.

4.5.1.3 The figure clearly shows that the projected revenue is not sufficient to finance the project on a commercial basis. The costs and revenues have been discounted at a nominal rate of 10%.

Table 36 Financial Summary For PH Site (HK$ Million)

Summary	PH Site	
	Undiscounted	PV@10% Nominal Discount Rate
Total Revenues	59,462	11,815
Total Operational Costs	(14,212)	(956)
Total Capital Costs	[redacted]	[redacted]
Land Resumption Costs	[redacted]	[redacted]
Project NPV	(4,312)	(7,081)
FIRR	**N/A**	**N/A**

Notes: Undiscounted refers to the sum of the annual undiscounted value inclusive of inflation over the 47 years assessment period

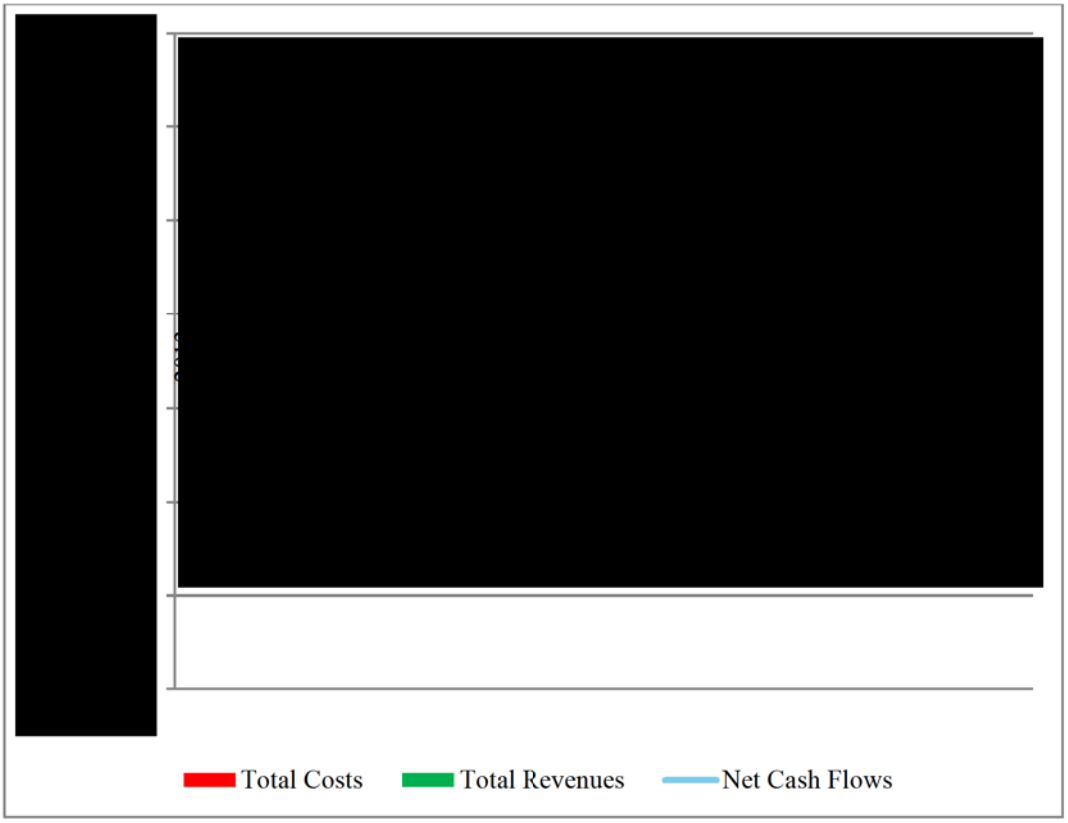

Figure 3 Cash Flow Analysis of PH Site development

4.6 Summary

4.6.1.1 The findings of the financial analysis indicate that under the assumptions adopted, the PH Site project, inclusive of various revenue parameters is not financially viable with the existing source of funding, i.e. revenues from various facilities. In this case, the most significant parameters are the initial and on-going capital and maintenance costs, tenant demand and rental rates. Revenue parameters maybe evaluated carefully if there is any change in assumptions. In summary, the most profitable facility within the PH site is the HOS, and the least profitable facility is the carpark facility. Key findings before assuming related costs (such as land resumption and capital costs) are shown in **Table 33**.

5 Conclusion

5.1.1.1 Base on the results generated in Section 3 and Section 4, it appears that the development of both the PH site and YLIEE may not provide optimistic financial results under the current assumptions adopted for the study. This is represented by the negative NPV of PH Site and the relatively high land leasing fee required for the YLIEE.

5.1.1.2 However, the financial results may not solely be the 'decision rule' for the project as other social considerations have to be taken into account along with the financial results, such as improving productivity of Hong Kong and fulfilling the housing supply objective set by the Long Term Housing Strategy Steering Committee.