Hong Kong Housing Authority

Agreement No. CB20180310
HKHA Term Engineering Consultancy Services 2018-2020
For Kowloon Central & West and Islands Region

Proposed Public Housing Development for Pak Tin Phase 12

Sewerage Impact Assessment (Draft Final)

Document No. Q1021/C010/01
Issue 4

Feb 2024

MANNINGS
(Asia) Consultants Limited

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Issue	Prepared by	Reviewed by	Date
1	TCK	ST	June 2022
2	MWS	ST	March 2023
3	CSY	ST	Oct 2023
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Content

Appendix A Drawings

Drawing No.	Drawing Title
Q1021/C010/001	Sewerage Layout Plan
Q1021/C010/002	Catchment Plan

Executive Summary

The Hong Kong Housing Authority (HKHA) has instructed Mannings (Asia) Consultants Ltd to prepare this proposal for undertaking a Sewerage Impact Assessment. The subject site is bounded by Nam Cheong Street and Pak Wan Street. The Site is inside the Pak Tin Estate. The proposed development will provide accommodation for a population of 6380 (i.e. a population of 5800 in 2000 flats with 10% variation) of which a sewerage impact assessment study is to be carried out. HKHA intends to clear and demolish the existing building in order to make way for development of Pak Tin Phase 12.

According to DSD's Drainage Record Plan, the existing sewerage in the vicinity, including 450mm/600mm diameter sewers along the Pak Wan Street and 600mm/675mm diameter sewers along Nam Cheong Street.

Sewage flow generated from the potential development was estimated in accordance with EPD's Report No. EPD/TP 1/05 "Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning", whereas the capacity of the existing sewerage was assessed as per Sewerage Manual Part I published by DSD.

The flow from the development would be discharged into the proposed terminal manholes through 1 no. of 350 D.I. pipe, 1 no. of DN400 HDPE pipes and 1 no. of existing VC 300 pipe. From the assessment result, the flow in the existing sewerage between manhole MH DF2.02 and MH DF1.07 and between manhole MH DF1.02 and MH DF1.04 will exceed its capacity with the increased flow from the development. After upgrading the diameter of pipes from 225mm to DN400 HDPE pipe between proposed terminal manhole TM3 and MH DF1.07 and upgrading the diameter of pipes from 300mm to 350 D.I. pipe between manhole MH DF1.02 and MH DF1.04, the sewerage system insides Pak Tin Estate have enough capacity to cater for the additional flow generated by the potential development.

It is concluded that the potential development will not result in adverse impact to the existing sewerage system.

1.0 Introduction

1.1 Background

1.1.1 The Hong Kong Housing Authority (HKHA) has instructed Mannings (Asia) Consultants Ltd to prepare this proposal for undertaking a Sewerage Impact Assessment (SIA) (hereinafter refer as "the Subject Study") for the Proposed Public Housing Development at Pak Tin Estate (hereinafter refer as "the Subject Site"). The locatio of the site is shown in the Drawing No. Q1021/C010/001 enclosed in **Appendix A**.

1.1.2 The subject site is bounded by Nam Cheong Street and Pak Wan Street. The Site is inside the Pak Tin Estate.

1.1.3 The proposed development will provide accommodation for a population of 6380 (i.e. a population of 5800 in 2000 flats with 10% variation) of which a sewerage impact assessment study is to be carried out. The proposed development within the subject site includes non-domestic facilities and a car park. The details of non-domestic facilities are summarised in Table 1.1 below.

Table 1.1 – Development parameters of non-domestic facilities

Social Welfare / Community Facilities	GFA (sqm)
Integrated Community Centre for Mental Wellness sub-base	824
Community Rehabilitation Day Centre (CRDC)	612
3 District Support Centre for Persons with Disabilities (DSC)	895
Multi-disciplinary Outreaching Support Team for the Elderly	332
Home Care Services (HCS) for Frail Elderly Person	414
District Elderly Community Centre sub-base	174
HD's Office	2,200

1.1.4 Sewage from existing households is considered. In the vicinity of the proposed development, there are existing buildings and facilities including Driving Test Centre (DTC), City University of Hong Kong Chak On Centre, Chak On Estate, Dynasty Heights, Beacon Heights, Mount Rouge, Shek Kip Mei Service Reservoir Playground, Hong Kong Baptist Mr. & Mrs. Au Shue Hung Rehabilitation & Healthcare Home, The Mental Health Association Of Hong Kong Cornwall School, The Society Of Boys' Centre Chak Yan Centre School, No.3 Lung Kui Road, Public Health Laboratory Centre, Shek Kip Mei Fire Station , (Run Run Shaw Creative Media Centre, City University of Hong Kong), Hk skh Li Ka Shing Care And Attention Home For The Elderly, New Life Psychiatric Rehabilitation Association, T.W.G. Hs Chang Ming Thien College, C.M.A. Secondary School, Shek Kip Mei Park Sports Centre, Tsui Tin House, Yue Tin House, Chak Tin House, Fu Tin House, Yun Tin House, Shing Tin House, Cheung Tin House, Shui Tin House and The H.K. Sze Yap Commercial & Industrial Association Wong Tai Shan.

1.2 Existing Sewerage System in the Vicinity

1.2.1 According to DSD's Drainage Record Plan, the existing sewerage in the vicinity, including 225mm/300mm/375mm/450mm diameter sewers inside Pak Tin Estate, 450mm/600mm diameter sewers along the Pak Wan Street and 600mm/675mm diameter sewers along

Nam Cheong Street. The existing sewerage layout plan is shown in Drawing No. Q1021/C010/001 attached in **Appendix A**.

1.3 Objectives and Scope of the SIA Study

1.3.1 This SIA study is aimed to provide sewerage assessment to support the proposed development under consideration and recommend any improvements as necessary.

1.3.2 The scope of the SIA report are as follows:

1. To assess the impacts of the site's wastewater flow generation and network alignment changes on the connecting public sewerage system as a result of the proposed development;
2. To review the existing sewerage system in the vicinity of the development, to formulate proposals for means of transporting the proposed development/ redevelopment's sewage from the site to the existing public sewerage system servicing the site and to recommend the improvement works for the existing sewerage system and measures to mitigate the sewerage impacts which arise from the site; and
3. To review the boundary conditions and characteristics of the connecting public sewerage system, and assess their impacts on the proposed development's sewerage system.

1.4 Organisation of the Report

1.4.1 This report is organised as follows:

- Section 1 – Introduction
- Section 2 – Sewerage Flows and Loads Generated by the Development and Existing Development
- Section 3 – Sewerage Impact Assessment
- Section 4 – Conclusion

2.0 Sewage Flows and Loads

2.1 Population

2.1.1 The proposed development will provide accommodation for a population of 6380 (i.e. a population of 5800 in 2000 flats with 10% variation) of which a sewerage impact assessment study is to be carried out. The proposed development within the subject site includes a non-domestic Facilities and a car park.

2.1.2 The study area is divided into 18 catchments, i.e. the proposed development (hereinafter refer as "Site Boundary"), Catchments A, B1, B2, B3, B4, B5, C, D, E, F, G, H, I, J, K, L, M and O as shown on the Drawing No. Q1021/C010/002 enclosed in **Appendix A**.

2.1.3 Sewage from existing households is considered. In the vicinity of the proposed development, there are existing buildings and facilities including Driving Test Centre (DTC), City University of Hong Kong Chak On Centre, Chak On Estate, Dynasty Heights, Beacon Heights, Mount Rouge, Shek Kip Mei Service Reservoir Playground, Hong Kong Baptist Mr. & Mrs. Au Shue Hung Rehabilitation & Healthcare Home, The Mental Health Association Of Hong Kong Cornwall School, The Society Of Boys' Centre Chak Yan Centre School, No.3 Lung Kui Road, Public Health Laboratory Centre, Shek Kip Mei Fire Station , (Run Run Shaw Creative Media Centre, City University of Hong Kong), Hk skh Li Ka Shing Care And Attention Home For The Elderly, New Life Psychiatric Rehabilitation Association, T.W.G. Hs Chang Ming Thien College, C.M.A. Secondary School, Shek Kip Mei Park Sports Centre, Tsui Tin House, Yue Tin House, Chak Tin House, Fu Tin House, Yun Tin House, Pak Tin Coummunity Complex, Shing Tin House, Cheung Tin House, Shui Tin House and The H.K. Sze Yap Commercial & Industrial Association Wong Tai Shan in the Catchments as shown in **Appendix B**.

2.1.4 By referring to EPD's Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning, different unit flow factors have been stipulated for the following 3 different types of development:

- Domestic Flows (EPD's Guidelines Section 7, Table T-1);
- Commercial and Institutional Flows (EPD's Guidelines Section 7, Table T-2); and
- Industrial Flows (EPD's Guidelines Section 7, Table T-3).

2.1.5 The flow into each manhole is then obtained by multiplying the contributing population with the relevant unit flow factors. Population classification is applied to the types of flow (mentioned in Section 2.4) under EPD's Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning in each area. The population assumption is derived from:

- Household Characteristics of Population in Sham Shui Po District Council Constituency Area, By-Census 2016
- Domestic: based on the data from Housing Authority or searches from websites
- Commercial and Institution: based on the General Building Plans from Building Department or searches from websites

- Information of Notional Staffing Establishments from Social Welfare Department (SWD)
- Commercial and Industrial Floor Space Utilization Survey (CIFSUS) published by Planning Department (PlanD)
- Average domestic household size retrieved from Census

2.1.6 The population of the development Catchments A1, A2, A3, A, B1, B2, B3, B4, B5, C, D, E, F, G, H, I, J, K, L, M and O and Catchment Z1, Z2 and Z3, which are proposed to be demolished, are summarized and presented in the following **Tables 2.1 to 2.24**:

Table 2.1 - Population Summary of the Development (A3)

Development	Name	Population	Types	Remarks
Proposed Development for Pak Tin Phase 12	Resident	3190	Domestic Private R2	Half of 2,000 flats of 5,800 populations with 10% variation
Car Park	Car Park	-	-	Assumed 10% of the sewerage from domestic
	Total	3190		

Remarks: The proposed development will consist of 2 residential blocks and 1 welfare block. One of the residential blocks is assumed to fall under Catchment A3.

Table 2.2 - Population Summary of the Development (A2)

Development	Name	Population	Types	Remarks
Proposed Development for Pak Tin Phase 12	Resident	3190	Domestic Private R2	Half of 2,000 flats of 5,800 populations with 10% variation
Car Park	Car Park	-	-	Assumed 10% of the sewerage from domestic
	Total	3190		

Remarks: The proposed development will consist of 2 residential blocks and 1 welfare block. One of the residential blocks is assumed to fall under Catchment A2.

Table 2.3 - Population Summary of the Development (A1)

Development	Name	Population	Types	Remarks
Integrated Community Centre for Mental Wellness sub-base	Staff	35	Commercial: Community, Social & Personal Services (J11)	Based on notional staffing establishment from SWD
Community Rehabilitation Day Centre (CRDC)	Staff	15	Commercial: Community, Social & Personal Services (J11)	Based on notional staffing establishment from SWD
	Visitor	65	Commercial Employee	Assuming a centre serving 60 daily attendance in rehabilitation training programme and 5 places in day care service for severely disabled persons
3 District Support Centre for Persons with Disabilities (DSC)	Staff	30	Commercial: Community, Social & Personal Services (J11)	Assumed 30 staff serving 100 visitors
	Visitor	100	Commercial Employee	
Multi-disciplinary Outreaching Support Team for the Elderly	Staff	14	Commercial: Community, Social & Personal Services (J11)	Based on notional staffing establishment from SWD for Youth Outreaching Team
Home Care Services (HCS) for Frail Elderly Person	Staff	16	Commercial: Community, Social & Personal Services (J11)	Based on notional staffing establishment from SWD
	Visitor	70	Commercial Employee	Assumed 70 visitor
District Elderly Community Centre sub-base	Staff	25	Commercial: Community, Social & Personal Services (J11)	Based on notional staffing establishment from SWD
HD Office	Staff	134	Commercial: Community, Social & Personal Services (J11)	6.1 workers in 100 square meter is assumed based on Commercial and Industrial Floor Space Utilization Survey
	Total	504		

Remarks: The proposed development will consist of 2 residential blocks and 1 welfare blocks. The welfare block is assumed to fall under Catchment A1.

Table 2.4 - Population Summary of the Catchment A

Development	Name	Population	Types	Remarks
Driving Test Centre under Redevelopment CE36/2021 (CE)	Resident, Employee and Visitor	N/A	-	ADWF of 148.02 m^3/day as provided by DSD
City University of Hong Kong Chak On Centre	Student	1000	School Student	Assume 10 classes with 100 people per class
	Employee	112	Commercial: Community, Social & Personal Services (J11)	Assume the number of staff is 1/9 of the total population (1000)
Chak On Estate	Resident	3800	Domestic Private R1	From Hong Kong Housing Authority
	Employee	380	Commercial: Community, Social & Personal Services (J11)	The number of employees is assumed to be 10 % of the residents.
Dynasty Heights	Resident	1658	Domestic Private R3	There are 592 units in Dynasty Height, assuming 2.8 resident per unit.
	Employee	166	Commercial: Community, Social & Personal Services (J11)	The number of employees is assumed to be 10 % of the residents.
Beacon Heights	Resident	1798	Domestic Private R3	There are 642 units in Beacon Height, assuming 2.8 resident per unit.
	Employee	180	Commercial: Community, Social & Personal Services (J11)	The number of employees is assumed to be 10 % of the residents.
Mount Rouge	Resident	126	Domestic Private R3	45 units in Mount Rouge, assuming 2.8 resident per unit.
	Employee	13	Commercial: Community, Social & Personal Services (J11)	The number of employees is assumed to be 10 % of the residents.
Shek Kip Mei Service Reservoir Playground	Visitor	500	Commercial: Community, Social & Personal Services (J11)	Assumed 500 visitors

	Employee	26	Commercial: Community, Social & Personal Services (J11)	Assuming the number of staff is 20 (security guard, gardener, cleaning worker), 6 staff in management office
Hong Kong Baptist Mr. & Mrs. Au Shue Hung Rehabilitation & Healthcare Home	Resident	238	Domestic Private R1	From SWD Elderly Information Website
	Employee	76	Commercial: Community, Social & Personal Services (J11)	
No.3 Lung Kui Road (Mont Verra)	Resident	180	Domestic Private R3	There are 64 units, assuming 2.8 resident per unit
	Employee	18	Commercial: Community, Social & Personal Services (J11)	The number of employees is assumed to be 10 % of the residents.
Public Health Laboratory Centre	Community Service	121	Commercial: Community, Social & Personal Services (J11)	3.3 workers per GFA (in 100 square meter) by Commercial and Industrial Floor Space Utilization Survey
Shek Kip Mei Fire Station	Community Service	20	Commercial: Community, Social & Personal Services (J11)	Assuming the number of staff is 20
Run Run Shaw Creative Media Centre, City University of Hong Kong	Student	2000	School student	From School Website
	Employee	500	Commercial: Community, Social & Personal Services (J11)	
Hk skh Li Ka Shing Care And Attention Home For The Elderly	Resident	257	Domestic Private R1	From SWD Elderly Information Website
	Employee	141	Commercial: Community, Social & Personal Services (J11)	
New Life Psychiatric Rehabilitation Association	Community Service	306	Commercial: Community, Social & Personal Services (J11)	3.3 workers per GFA (in 100 square meter) by Commercial and Industrial Floor Space Utilization

				Survey, assuming staff to visitor ratio as 1:4
T.W.G. Hs Chang Ming Thien College	Student	676	School student	From School Website
	Employee	59	Commercial: Community, Social & Personal Services (J11)	
C.M.A. Secondary School	Student	703	School student	From School Website
	Employee	100	Commercial: Community, Social & Personal Services (J11)	
Shek Kip Mei Park Sports Centre	Visitor	500	Commercial: Community, Social & Personal Services (J11)	Assumed 500 visitors
Redevelopment at Yin Pin Road	Resident, Employee and Visitor	N/A	-	ADWF of 294 m^3/day is assumed as provided by DSD.
Proposed Student Hostel at Tat Hong Avenue, City University of Hong Kong	Residence	1680	Domestic Private R1	From Sham Shui Po DC Committees Documents
	Employee	187	Commercial: Community, Social & Personal Services (J11)	Assume 9:1 for student to staff ratio
The Mental Health Association Of Hong Kong Cornwall School	Student	112	School student	From School Website
	Employee	65	Commercial: Community, Social & Personal Services (J11)	
The Society Of Boys' Centre Chak Yan Centre School	Student	315	School student	From School Website
	Employee	45	Commercial: Community, Social & Personal Services (J11)	
	Total	18,058		

Table 2.5- Population Summary of the Catchment B1

Development	Name	Population	Types	Remarks
Tsui Tin House	Resident	922	Domestic Private R1	There are 329 units in Tsui Tin House, assuming 2.8 resident per unit.
	Total	922		

Table 2.6- Population Summary of the Catchment B2

Development	Name	Population	Types	Remarks
Yun Tin House	Resident	728	Domestic Private R1	There are 260 units in Yun Tin House, assuming 2.8 resident per unit.
	Total	728		

Table 2.7- Population Summary of the Catchment B3

Development	Name	Population	Types	Remarks
Yue Tin House	Resident	572	Domestic Private R1	There are 204 units in Yue Tin House, assuming 2.8 resident per unit.
	Total	572		

Table 2.8- Population Summary of the Catchment B4

Development	Name	Population	Types	Remarks
Chak Tin House	Resident	530	Domestic Private R1	There are 189 units in Chak Tin House, assuming 2.8 resident per unit.
	Total	530		

Table 2.9- Population Summary of the Catchment B5

Development	Name	Population	Types	Remarks
Fu Tin House	Resident	530	Domestic Private R1	There are 189 units in Fu Tin House, assuming 2.8 resident per unit.
	Total	530		

Table 2.10- Population Summary of the Catchment C

Development	Name	Population	Types	Remarks
Shing Tin House	Resident	2238	Domestic Private R1	There are 799 units in Shing Tin House, assuming 2.8 resident per unit.
Cheung Tin House	Resident	2238	Domestic Private R1	There are 799 units in Cheung Tin House, assuming 2.8 resident per unit.
Shui Tin House	Resident	824	Domestic Private R1	There are 294 units in Shui Tin House, assuming 2.8 resident per unit.
	Total	5300		

Table 2.11- Population Summary of the Catchment D

Development	Name	Population	Types	Remarks
The H.K. Sze Yap Commercial & Industrial Association Wong Tai Shan	Employee	61	Commercial: Community, Social & Personal Services (J11)	From School Website
	Student	749	School Student	
	Total	810		

Table 2.12- Population Summary of the Catchment E

Development	Name	Population	Types	Remarks
Proposed Redevelopment at Pak Tin Estate Phase 11 Block 6	Proposed Redevelopment	1612	Domestic Private R1	Based on information from approved SIA for Pak Tin Phase 7,8 10 11 & 13 (Doc. No. L1070/C006/03)
	Commercial Retail	97	Commercial: Wholesale & Retail (J4)	
	Food & Beverage	20	Commercial: Restaurants & Hotels (J10)	
	Kindergarten Student	90	School Student	
	Kindergarten Teacher and Staff	18	Commercial: Community, Social & Personal Services (J11)	
Proposed Redevelopment at Pak Tin Estate Phase 11 Block 7	Proposed Redevelopment	1956	Domestic Private R1	
	Commercial Retail	96	Commercial: Wholesale & Retail (J4)	
	Food & Beverage	20	Commercial: Restaurants & Hotels (J10)	
	Kindergarten Student	90	School Student	
	Kindergarten Teacher and Staff	18	Commercial: Community, Social & Personal Services (J11)	
	Total	4017		

Table 2.13- Population Summary of the Catchment F

Development	Name	Population	Types	Remarks
Proposed Redevelopment at Pak Tin Estate Phase 13 Block 8	Proposed Redevelopment	2502	Domestic Private R1	Based on information from approved SIA for Pak Tin Phase 7,8 10 11 & 13 (Doc. No. L1070/C006/03)
	Commercial Retail	7	Commercial: Wholesale & Retail (J4)	
	Food & Beverage	8	Commercial: Restaurants & Hotels (J10)	
	Hostel for Moderately Mentally Handicapped Person	40	Commercial: Community, Social & Personal Services (J11)	
		20	Commercial: Community, Social & Personal Services (J11)	
	Hostel for Severely Physically Handicapped Persons (50 places)	50	Commercial: Community, Social & Personal Services (J11)	
		38	Commercial: Community, Social & Personal Services (J11)	

Proposed Redevelopment at Pak Tin Estate Phase 13 Block 9	Proposed Redevelopment	2105	Domestic Private R1	
	Neighborhood Elderly Centre	30	Commercial: Community, Social & Personal Services (J11)	
		11	Commercial: Community, Social & Personal Services (J11)	
	Day Care Centre for the Elderly	40	Commercial: Community, Social & Personal Services (J11)	
		23	Commercial: Community, Social & Personal Services (J11)	
	Integrated Vocational Rehabilitation Services Centre	120	Commercial: Community, Social & Personal Services (J11)	
		17	Commercial: Community, Social & Personal Services (J11)	
	Kindergarten Student	180	School Student	
	Kindergarten Teacher and Staff	36	Commercial: Community, Social & Personal Services (J11)	
Proposed Redevelopment at Pak Tin Estate Phase 13 Block 10	Proposed Redevelopment	3065	Domestic Private R1	
	Carpark	-		
	Total	8292		

Table 2.14- Population Summary of the Catchment G

Development	Name	Population	Types	Remarks
Proposed Redevelopment at Pak Tin Estate Phase 7 Block 1	Proposed Redevelopment	1592	Domestic Private R1	Based on information from approved SIA for Pak Tin Phase 7,8 10 11 & 13 (Doc. No. L1070/C006/03)
	Commercial Retail	157	Commercial: Wholesale & Retail (J4)	
	Welfare Facilities	24	Commercial: Community, Social & Personal Services (J11)	
	Welfare Facilities	72	Domestic Private R1	
	Office	29	Commercial Employee	
	Food & Beverage	26	Commercial: Restaurants & Hotels (J10)	
Proposed Redevelopment at Pak Tin Estate Phase 7 Block 2	Proposed Redevelopment	1658	Domestic Private R1	
	Commercial Retail	158	Commercial: Wholesale & Retail (J4)	
	Welfare Facilities	23	Commercial: Community, Social & Personal Services (J11)	
	Welfare Facilities	72	Domestic Private R1	
	Office	30	Commercial Employee	
	Food & Beverage	26	Commercial: Restaurants & Hotels (J10)	
Temporary Driving Test Centre	Resident, Employee and Visitor	N/A	-	ADWF of 25.2m^3/day is assumed as provided by DSD.
	Total	3867		

Table 2.15- Population Summary of the Catchment H

Development	Name	Population	Types	Remarks
Proposed Redevelopment at Pak Tin Estate Phase 8 Block 3	Proposed Redevelopment	1575	Domestic Private R1	Based on information from approved SIA for Pak Tin Phase 7,8 10 11 & 13 (Doc. No. L1070/C006/03)
	Commercial Retail	157	Commercial: Wholesale & Retail (J4)	
	Welfare Facilities	23	Commercial: Community, Social & Personal Services (J11)	
	Welfare Facilities	72	Domestic Private R1	
	Office	29	Commercial Employee	
	Food & Beverage	26	Commercial: Restaurants & Hotels (J10)	
Proposed Redevelopment at Pak Tin Estate Phase 8 Block 4	Proposed Redevelopment	1411	Domestic Private R1	
	Commercial Retail	158	Commercial: Wholesale & Retail (J4)	
	Welfare Facilities	23	Commercial: Community, Social & Personal Services (J11)	
	Welfare Facilities	72	Domestic Private R1	
	Office	29	Commercial Employee	
	Food & Beverage	25	Commercial: Restaurants & Hotels (J10)	
	Total	3600		

Table 2.16- Population Summary of the Catchment I

Development	Name	Population	Types	Remarks
Proposed Redevelopment at Pak Tin Estate Phase 10 Block 5	Proposed Redevelopment	2799	Domestic Private R1	Based on information from approved SIA for Pak Tin Phase 7,8 10 11 & 13 (Doc. No. L1070/C006/03)
	Commercial Retail	340	Commercial: Wholesale & Retail (J4)	
	Food & Beverage	27	Commercial: Restaurants & Hotels (J10)	
	Total	3166		

Table 2.17- Population Summary of the Catchment J

Development	Name	Population	Types	Remarks
Tai Tin House	Resident	2238	Domestic Private R1	There are 799 units in Tai Tin House, assuming 2.8 resident per unit.
Lai Tin House	Resident	2196	Domestic Private R1	There are 784 units in Lai Tin House, assuming 2.8 resident per unit.
Wan Tin House	Resident	681	Domestic Private R1	There are 243 units in Wan Tin House , assuming 2.8 resident per unit.
	Total	5,115		

Table 2.18- Population Summary of the Catchment K

Development	Name	Population	Types	Remarks
Telephone Exchange Centre	Employee	5	Commercial: Transport, Storage &	Assumed 5 employee
Po Tin Building	Resident	177	Domestic Private R2	There are 63 units in Po Tin Building, assuming 2.8 resident per unit.
Fook Tin Building	Resident	269	Domestic Private R2	There are 96 units in Fook Tin Building, assuming 2.8 resident per unit.
	Total	451		

Table 2.19- Population Summary of the Catchment L

Development	Name	Population	Types	Remarks
Pak Yuk Lau	Resident	238	Domestic Private R2	There are 85 units in Pak Yuk Lau , assuming 2.8 resident per unit.
Tin Fung Lau	Resident	238	Domestic Private R2	There are 85 units in Tin Fung Lau , assuming 2.8 resident per unit.
	Total	476		

Table 2.20- Population Summary of the Catchment M

Development	Name	Population	Types	Remarks
Kam Yuck Building	Resident	499	Domestic Private R2	There are 178 units in Kam Yuck Building, assuming 2.8 resident per unit.
	Commercial Retail	320	Commercial: Wholesale & Retail (J4)	3.5 workers per GFA (in 100 square meter) by Commercial and Industrial Floor Space Utilization Survey, assuming staff to visitor ratio as 1:4
	Total	819		

Table 2.21- Population Summary of the Catchment O

Development	Name	Population	Types	Remarks
Nam Cheong Commercial Building	Resident	353	Domestic Private R2	There are 126 units in Nam Cheong Commercial Building, assuming 2.8 resident per unit.
Maintown Plaza	Commercial Retail (Ground floor)	177	Commercial: Wholesale & Retail (J4)	3.5 workers per GFA (in 100 square meter) by Commercial and Industrial Floor Space Utilization Survey, assuming staff to visitor ratio as 1:4

	Welfare Facilities (1st to 3rd floor)	500	Commercial: Community, Social & Personal Services (J11)	3.3 workers per GFA (in 100 square meter) by Commercial and Industrial Floor Space Utilization Survey, assuming staff to visitor ratio as 1:4
	Total	1030		

Table 2.22- Population Summary of the Catchment Z1

Development	Name	Population	Types	Remarks
Pak Tin Block 13	Resident	1260	Domestic Private R1	Half of 900 flats of 2,520 populations
	Total	1260		

Table 2.23- Population Summary of the Catchment Z2

Development	Name	Population	Types	Remarks
Pak Tin Block 13	Resident	1260	Domestic Private R1	Half of 900 flats of 2,520 populations
	Total	1260		

Table 2.24- Population Summary of the Catchment Z3

Development	Name	Population	Types	Remarks
Pak Tin Catholic Primary School	Employee	54	Commercial: Community, Social & Personal Services (J11)	450 students and 54 staff
	School Student	450	School Student	
	Total	504.00		

Note: Numbers of flat numbers of existing public housing are obtained from the information of Housing Authority's Public Rental Housing Stock. https://data.gov.hk/en-data/dataset/hk-housing-emms-emms-housing-stock

2.2 Average Dry Weather Flow (ADWF)

2.2.1 The unit flow factors are extracted from Table T-1 "Unit Flow Factors for Domestic Flows" and Table T-2 "Unit Flow Factors – Commercial and Institutional Flows" of the Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning as shown in **Appendix D**. For domestic flows, since the residential developments in this project area are classified as type private R1 and R2, the relevant R1 and R2 unit flow factor is adopted. In accordance with the EPD Guideline, for the commercial flows, the total unit flow generated from an "employee" in a particular trade is the sum of the unit flow factor of the employee and the unit flow factor of commercial activities of a particular trade. To derive the unit flow factor for visitors, it is assumed that visitors will be staying maximum 8 hrs per day within the development site. The sewage flow will be from two sources, one from flushing and the other from use of wash basin. The unit flow factors from flushing use, has assumed flushing water consumption of 0.1m3/person/day for 16 hours of typical domestic residents, employees and students usage. The unit flow factor from the wash basin use has assumed a consumption of 0.03m3/person/day on 8 hours daily basis. This results in UFF of 0.08m3/person/day. The parameters adopted are:

- Domestic Private R1 = 0.19 m^3/d/person
- Domestic Private R2 = 0.27 m^3/d/person
- Domestic Private R3 = 0.37 m^3/d/person
- Commercial: Transport, Storage & Communication (J3) = 0.18 m^3/d/person
- Wholesale and Retail (J4) = 0.28 m^3/d/person
- Commercial: Finance, Insurance, Real Estate & Business Services (J6) = 0.08 m^3/d/person
- Commercial: Restaurants and Hotels (J10) = 1.58 m^3/d/person
- Commercial: Community, Social and Personal Services (J11) = 0.28 m^3/d/person
- Commercial Employee = 0.08 m^3/d/person
- School Student = 0.04 m^3/d/person
- Visitors = 0.08 m^3/d/person

2.2.2 Table 2.25 below presents the estimated average dry weather flow generated from the catchment areas. The summary of the above area is demonstrated in **Appendices B** and **C**.

Table 2.25 - ADWF Summary of Catchments

Catchment	Population	ADWF (m^3/day)
A1	504	94.12
A2	3190	947.43
A3	3190	947.43
A	18058	4032.79
B1	922	175.18
B2	728	138.32
B3	572	108.68
B4	530	100.70

Catchment	Population	ADWF (m^3/day)
B5	530	100.70
C	5300	1007.00
D	810	47.04
E	4017	812.44
F	8292	1744.25
G	3867	858.3
H	3600	781.00
I	3166	669.67
J	5115	971.85
K	451	121.32
L	476	128.52
M	819	224.33
O	1030	284.87
Z1	1260	239.40
Z2	1260	239.40
Z3	504	33.12

2.3 Catchment Inflow Factors

2.3.1 Catchment Inflow Factors (P_{CIF}) refer to Table T-4 "Catchment Inflow Factors, P_{CIF}" of the Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning are S. They are catchment-dependent and applicable to major sewerage facilities of a catchment. They indicate the net overall ingress of water or waste water to the sewerage system which P_{CIF} for North West Kowloon area is 1.3.

2.3.2 Table 2.26 below illustrates the estimated average dry weather flow generated from the catchment areas.

Table 2.26 - $Q_{AVERAGE}$ Summary of Catchments

Catchment	ADWF (m^3/day)	$Q_{AVERAGE}$ (m^3/day)
A1	94.12	122.356
A2	947.43	1231.66
A3	947.43	1231.66
A	4032.79	5242.627
B1	175.18	227.73
B2	138.32	179.82
B3	108.68	141.28
B4	100.70	130.91
B5	100.70	130.91
C	1007.00	1309.10
D	47.04	61.15
E	812.44	1056.17
F	1744.25	2267.53
G	858.3	1115.79
H	781	1015.3
I	669.67	870.57
J	971.85	1263.41
K	121.32	157.72
L	128.52	167.08
M	224.33	291.629
O	284.87	370.331
Z1	239.40	311.22
Z2	239.40	311.22
Z3	33.12	43.06

2.4 Peak Flow

2.4.1 The peak flows for the catchment areas are then estimated for the assessment and design of the sewers. According to Table T-5 of Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning, the peak factor (including stormwater allowance) for facility with existing upstream sewerage are adopted.

2.4.2 Instantaneous backwash flow from swimming pools in the catchment areas are added to the peak flow and the calculation for backwash flow from swimming pools are presented in **Appendix F**.

2.4.3 The peak flows of the sewerage system, without and with the development, are shown in **Tables 1** and **Table 2** in **Appendix C** respectively.

2.5 Velocity and Capacity of Pipe

2.5.1 The Colebrook-White Equation is used in the hydraulic design and analysis:

$$V = -\sqrt{(8gDs)}\log\left(\frac{k_s}{3.7D} + \frac{2.51v}{D\sqrt{(2gDs)}}\right)$$

where

V	=	mean velocity (m/s)
g	=	gravitational acceleration (m/s^2)
R	=	hydraulic radius (m)
D	=	pipe diameter (m)
k_s	=	roughness (m)
v	=	kinematic viscosity of fluid (m^2/s)
s	=	frictional slope (energy gradient due to frictional loss)

2.5.2 The capacity of a pipe is based on the cross-sectional area and mean flow velocity. The mean flow velocity is calculated by Colebrook – White equation and the capacity is calculated using the following formula:

Capacity = Velocity × π × (Diameter of pipe)^2/4

2.5.3 The detailed calculation is shown in **Table 1** and **Table 2** of **Appendix C**. It is observed that the pipe sections between MH DF2.02 and MH DF1.07 and MH DF 1.02 to MH DF 1.04 under the maintenance of Housing Department will be in over-capacity condition with the proposed development. The capacity of pipe with over capacity are summarised in **Table 2.27** to **2.28** below.

Table 2.27 - Summary of Capacity of Pipe with over-capacity– (without Development)

Upstream Manhole	Downstream Manhole	Capacity (m^3/s)	PDWF (m^3/s)	Peak Flow/ Capacity Ratio
MH DF2.02	MH DF2.03	0.041	0.004	0.097
MH DF2.03	MH DF2.04	0.037	0.022	0.592
MH DF2.04	MH DF2.05	0.040	0.022	0.547
MH DF2.05	MH DF1.07	0.074	0.022	0.296
MH DF1.02	MH DF1.03	0.082	0.022	0.264
MH DF1.03	MH DF1.04	0.078	0.037	0.480

Note:
1. PDWF = Peak Dry Weather Flow

Table 2.28 - Summary of Capacity of Pipe with over-capacity– (with Development)

Upstream Manhole	Downstream Manhole	Capacity (m^3/s)	PDWF (m^3/s)	Peak Flow/ Capacity Ratio
Proposed Terminal Manhole TM3 (To replace existing MH DF 2.02)	MH DF2.03	0.041	0.086	2.086
MH DF2.03	MH DF2.04	0.037	0.087	2.352
MH DF2.04	MH DF2.05	0.040	0.087	2.176
MH DF2.05	MH DF1.07	0.074	0.087	1.176
MH DF1.02	MH DF1.03	0.082	0.086	1.043
MH DF1.03	MH DF1.04	0.078	0.084	1.083

Note:
1. PDWF = Peak Dry Weather Flow

2.5.4 Since the peak flow to capacity ratio between the proposed terminal manhole TM3 to MH DF1.07 and MH DF1.02 to MH DF 1.04 shown in the last column of the above table is larger than 0.93, the flow capacity of the pipe is considered insufficient and is required to be upgraded for providing sufficient flow capacity. The pipe section between the proposed terminal manhole TM3 and MH DF1.07 are proposed to be upgraded from 225 mm diameter vitrified clay pipe to DN400 HDPE pipes and the pipe section between manhole MH DF1.02 and MH DF 1.04 are proposed to be upgraded from 300 mm diameter vitrified clay pipe to 350 D.I. pipes. Inner diameter of 355mm is adopted for DN400 HDPE pipe in hydraulic analysis. Housing Department will undertake the proposed upgrading works.

2.5.5 Apart from the proposed upgraded pipe sections, 3 no. of terminal manhole, namely TM1, TM2 and TM3 are proposed to be connected to the existing sewerage system by 1 no. of 350 D.I. pipe, 1 no. of DN400 HDPE pipe and 1 no. of existing VC 300 pipe. Inner diameter of 355mm is adopted for DN400 HDPE pipe in hydraulic analysis. Housing Department will undertake the proposed connection works.

2.5.6 The detailed calculation of proposed pipes and upgraded pipe are shown in **Table 3** of **Appendix C**. The summary is listed in the following **Tables 2.29**.

Table 2.29- Summary of Capacity of Pipe– (with Development with Upgrading works)

Upstream Manhole	Downstream Manhole	Capacity (m^3/s)	PDWF (m^3/s)	Peak Flow/ Capacity Ratio
Proposed Terminal Manhole TM3 (To replace existing MH DF 2.02)	MH DF2.03	0.125	0.086	0.684
MH DF2.03	MH DF2.04	0.125	0.087	0.696
MH DF2.04	MH DF2.05	0.125	0.087	0.696
MH DF2.05	MH DF1.07	0.168	0.087	0.518
MH DF1.02	MH DF1.03	0.136	0.086	0.629
MH DF1.03	MH DF1.04	0.136	0.084	0.621
Proposed Terminal Manhole TM1 (Utilized TM1 to replace existing FMH4016440)	FMH4016441	0.083	0.010	0.123
Proposed Terminal Manhole TM2	MH DF1.02	0.146	0.086	0.586
Proposed Terminal Manhole TM3 (Utilized TM3 to replace existing MH DF 2.02)	MH DF2.03	0.122	0.086	0.701

Note:
1. PDWF = Peak Dry Weather Flow

2.5.7 The peak flow to capacity ratio shown in the last column of the above table is less than 0.93, the flow capacity of the pipe is considered sufficient.

3.0 Sewerage Impact Assessment

3.1.1 Drainage record plan has been retrieved from DSD for the SIA study. The proposed development will provide accommodation for a population of 6380 (i.e. a population of 5800 in 2000 flats with 10% variation). The Catchments A, A1, A2, A3, B1, B2, B3, B4, B5, C, D, E, F, G, H, I, J, K, L, M and O are shown in the **Appendix A**. The detailed of the population and flow factor are shown in **Appendix B**.

3.1.2 The estimated Sewage from existing household is considered. In the vicinity of the proposed development, there are existing buildings and facilities including Driving Test Centre (DTC), City University of Hong Kong Chak On Centre, Chak On Estate, Dynasty Heights, Beacon Heights, Mount Rouge, Shek Kip Mei Service Reservoir Playground, Hong Kong Baptist Mr. & Mrs. Au Shue Hung Rehabilitation & Healthcare Home, The Mental Health Association Of Hong Kong Cornwall School, The Society Of Boys' Centre Chak Yan Centre School, No.3 Lung Kui Road, Public Health Laboratory Centre, Shek Kip Mei Fire Station , (Run Run Shaw Creative Media Centre, City University of Hong Kong), Hk skh Li Ka Shing Care And Attention Home For The Elderly, New Life Psychiatric Rehabilitation Association, T.W.G. Hs Chang Ming Thien College, C.M.A. Secondary School, Shek Kip Mei Park Sports Centre, Tsui Tin House, Yue Tin House, Chak Tin House, Fu Tin House, Yun Tin House, Shing Tin House, Cheung Tin House, Shui Tin House and The H.K. Sze Yap Commercial & Industrial Association Wong Tai Shan. As shown in the Section 2.

3.1.3 The flow from the development would be discharged into the proposed terminal manholes through 1 no. of 350 D.I. pipe, 1 no. of DN400 HDPE pipes and 1 no. of existing VC 300 pipe. From the assessment result, the flow in the existing sewerage between manhole MH DF2.02 to MH DF1.07 and MH DF1.02 to MH DF 1.04 will exceed its capacity with the increased flow from the development. After upgrading the diameter of pipes from 225mm to DN400 HDPE pipe for section between proposed terminal manhole TM3 to MH DF1.07 and upgrading the diameter of pipes from 300mm to 350 D.I. pipe for section between manhole MH DF1.02 to MH DF 1.04, the sewerage system insides Pak Tin Estate have enough capacity to cater for the additional flow generated by the potential development. Relevant hydraulic assessments are detailed in **Table 2 & 3** in the **Appendix C**.

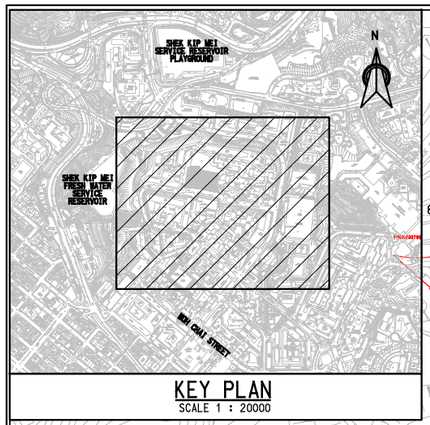
4.0 Conclusion

4.1.1 The subject site is bounded by Nam Cheong Street and Pak Wan Street. The Site is inside the Pak Tin Estate.

4.1.2 According to DSD's Drainage Record Plan, the existing sewerage in the vicinity, including 450mm/600mm diameter sewers along the Pak Wan Street and 600mm/675mm diameter sewers along Nam Cheong Street.

4.1.3 The flow from the development would be discharged into the proposed terminal manholes through 1 no. of 350 D.I. pipe, 1 no. of DN400 HDPE pipes and 1 no. of existing VC 300 pipe. From the assessment result, the flow in the existing sewerage between proposed terminal manhole TM3 to MH DF1.07 and MH DF1.02 to MH DF 1.04 will exceed its capacity with the increased flow from the development. After upgrading the diameter of pipes from 225mm to DN400 HDPE pipe for section between proposed terminal manhole TM3 to MH DF1.07 and upgrading the diameter of pipes from 300mm to 350 D.I. pipe for section between manhole MH DF1.02 to MH DF 1.04, the sewerage system insides Pak Tin Estate have enough capacity to cater for the additional flow generated by the potential development.

Appendix A
Drawing



KEY PLAN
SCALE 1 : 20000

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. ALL LEVEL ARE IN mPD METRE ABOVE HONG KONG PRINCIPAL DATUM.

LEGEND :

- SITE BOUNDARY
- 450 — EXISTING SEWERAGE SYSTEM
- 450 — AFFECTED EXISTING SEWERAGE
- (225) — PROPOSED UPGRADED PIPE
- TM1 225 — PROPOSED MANHOLE AND PIPE

Rev.	Description of Revision	Date	Ckd.

Client
HONG KONG HOUSING AUTHORITY

Consultants
MANNINGS (Asia) Consultants Limited

Scale in A3	Date
AS SHOWN	AUG 2020

Designed	Drawn	Checked
MWS	WK	ST
Design Team Leader		Date
WS		SEP 2020
Approved		Date
KTC		SEP 2020

Project
HKHA TEAM ENGINEERING CONSULTANCY SERVICES 2018-2020 FOR KOWLOON CENTRAL & WEST AND ISLANDS REGION

Title
SEWERAGE LAYOUT PLAN

Drawing No.	Stage	Rev.
Q1021/C010/001	P	B

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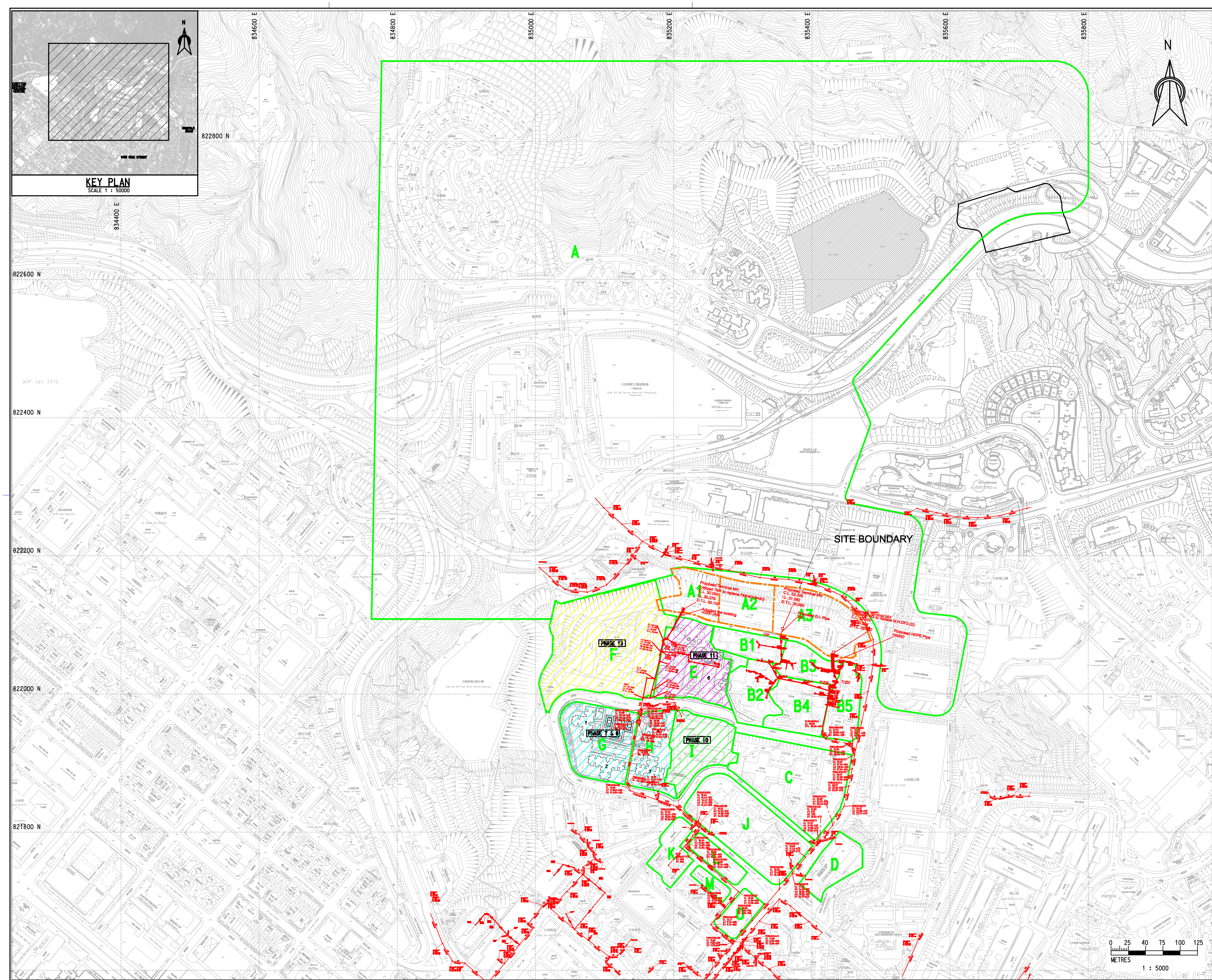

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. ALL LEVEL ARE IN mPD METRE ABOVE HONG KONG PRINCIPAL DATUM.

LEGEND :

- SITE BOUNDARY
- 450 EXISTING SEWERAGE SYSTEM
- A CATCHMENT AREA

Rev.	Description of Revision	Date	Ckd.

Client

HONG KONG HOUSING AUTHORITY

Consultants

MANNINGS (Asia) Consultants Limited

Scale in A3: AS SHOWN		Date: AUG 2020
Designed: MWS	Drawn: WK	Checked: ST
Design Team Leader: WS		Date: SEP 2020
Approved: KTC		Date: SEP 2020

Project

HKHA TEAM ENGINEERING CONSULTANCY SERVICES 2018-2020 FOR KOWLOON CENTRAL & WEST AND ISLANDS REGION

Title

CATCHMENT PLAN

Drawing No.	Stage	Rev.
Q1021/C010/002	P	B

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Appendix B
Flow Data

Proposed Development A3

Development	Name	Population	Unit Flow Factor (m^3/d/person)	ADWF (m^3/day)	Types	Sewerage Manhole No.	Remarks
Proposed Development for Pak Tin 12 phase	Resident	3190	0.27	861.30	Domestic Private R2	M.H. DF 2.03	Half of 2,000 flats of 5,800 populations with 10% variation
Car Park	Car Park	-	-	86.13	-		Assumed 10% of the sewerage from domestic
	Total	3,190		947.43			

Proposed Development A2

Development	Name	Population	Unit Flow Factor (m^3/d/person)	ADWF (m^3/day)	Types	Sewerage Manhole No.	Remarks
Proposed Development for Pak Tin 12 phase	Resident	3190	0.27	861.30	Domestic Private R2	MH DF1.02	Half of 2,000 flats of 5,800 populations with 10% variation
Car Park	Car Park	-	-	86.13	-		Assumed 10% of the sewerage from domestic
	Total	3,190		947.43			

Proposed Development A1

Development	Name	Population	Unit Flow Factor (m^3/d/person)	ADWF (m^3/day)	Types	Sewerage Manhole No.	Remarks
Integrated Community Centre for Mental Wellness sub-base	Staff	35	0.28	9.80	Commercial: Community, Social & Personal Services (J11)	FMH4016441	Based on notional staffing establishment from SWD
Community Rehabilitation Day Centre (CRDC)	Staff	15	0.28	4.20	Commercial: Community, Social & Personal Services (J11)		Based on notional staffing establishment from SWD
	Visitor	65	0.08	5.20	Commercial Employee		Assuming a centre serving 60 daily attendance in rehabilitation training programme and 5 places in day care service for severely disabled persons
3 District Support Centre for Persons with Disabilities (DSC)	Staff	30	0.28	8.40	Commercial: Community, Social & Personal Services (J11)		Assumed 30 staff serving 100 visitors
	Visitor	100	0.08	8.00	Commercial Employee		
Multi-disciplinary Outreaching Support Team for the Elderly	Staff	14	0.28	3.92	Commercial: Community, Social & Personal Services (J11)		Based on notional staffing establishment from SWD for Youth Outreaching Team
Home Care Services (HCS) for Frail Elderly Person	Staff	16	0.28	4.48	Commercial: Community, Social & Personal Services (J11)		Based on notional staffing establishment from SWD
	Visitor	70	0.08	5.60	Commercial Employee		Assumed 70 visitor
District Elderly Community Centre sub-base	Staff	25	0.28	7.00	Commercial: Community, Social & Personal Services (J11)		Based on notional staffing establishment from SWD
HD Office	Staff	134	0.28	37.52	Commercial: Community, Social & Personal Services (J11)		6.1 workers in 100 square meter is assumed based on Commercial and Industrial Floor Space Utilization Survey
	Total	504		94.12			

Catchment A

Development	Name	Population	Unit Flow Factor (m^3/d/person)	ADWF (m^3/day)	Types	Sewerage Manhole No.	Remarks
Driving Test Centre under Redevelopment CE36/2021 (CE)	Resident, Employee and Visitor	N/A	-	148.02	-	FMH4016272	Based on informnation from DSD
City University of Hong Kong Chak On Centre	Student	1000	0.04	40.00	School Student		Assume 10 classes with 100 people per class
	Employee	112	0.28	31.36	Commercial: Community, Social & Personal Services (J11)		Assume the number of staff is 1/9 of the total population(1000)
Chak On Estate	Resident	3800	0.19	722.00	Domestic Private R1		From Hong Kong Housing Authority
	Employee	380	0.28	106.40	Commercial: Community, Social & Personal Services (J11)		The number of employees is assumed to be 10 % of the residents.
Dynasty Heights	Resident	1658	0.34	563.72	Domestic Private R3		There are 592 units in Dynasty Height, assuming 2.8 resident per unit.
	Employee	166	0.28	46.48	Commercial: Community, Social & Personal Services (J11)		The number of employees is assumed to be 10 % of the residents.
Beacon Heights	Resident	1798	0.34	611.32	Domestic Private R3		There are 642 units in Beacon Height, assuming 2.8 resident per unit.
	Employee	180	0.28	50.40	Commercial: Community, Social & Personal Services (J11)		The number of employees is assumed to be 10 % of the residents.
Mount Rouge	Resident	126	0.34	42.84	Domestic Private R3		45 units in Mount Rouge, assuming 2.8 resident per unit.
	Employee	13	0.28	3.64	Commercial: Community, Social & Personal Services (J11)		The number of employees is assumed to be 10 % of the residents.
Shek Kip Mei Service Reservoir Playground	Visitor	500	0.28	140.00	Commercial: Community, Social & Personal Services (J11)		Assumed 500 visitors
	Employee	26	0.28	7.28	Commercial: Community, Social & Personal Services (J11)		Assuming the number of staff is 20 (security guard, gardener,cleaning worker), 6 staff in management office
Hong Kong Baptist Mr. & Mrs. Au Shue Hung Rehabilitation & Healthcare Home	Resident	238	0.19	45.22	Domestic Private R1		From SWD Elderly Information Website
	Employee	76	0.28	21.28	Commercial: Community, Social & Personal Services (J11)		
No.3 Lung Kui Road (Mont Verra)	Resident	180	0.34	61.20	Domestic Private R3		There are 64 units, assuming 2.8 resident per unit
	Employee	18	0.28	5.04	Commercial: Community, Social & Personal Services (J11)		The number of employees is assumed to be 10 % of the residents.
Public Health Laboratory Centre	Community Service	121	0.28	33.88	Commercial: Community, Social & Personal Services (J11)		3.3 workers per GFA (in 100 square meter) by Commercial and Industrial Floor Space Utilization Survey
Shek Kip Mei Fire Station	Community Service	20	0.28	5.60	Commercial: Community, Social & Personal Services (J11)		Assuming the number of staff is 20
Run Run Shaw Creative Media Centre, City University of Hong Kong	Student	2000	0.04	80.00	School student		From School Website
	Employee	500	0.28	140.00	Commercial: Community, Social & Personal Services (J11)		
Hk skh Li Ka Shing Care And Attention Home For The Elderly	Resident	257	0.19	48.83	Domestic Private R1		From SWD Elderly Information Website
	Employee	141	0.28	39.48	Commercial: Community, Social & Personal Services (J11)		
New Life Psychiatric Rehabilitation Association	Community Service	306	0.28	85.68	Commercial: Community, Social & Personal Services (J11)		3.3 workers per GFA (in 100 square meter) by Commercial and Industrial Floor Space Utilization Survey, assuming staff to visitor raito as 1:4
T.W.G. Hs Chang Ming Thien College	Student	676	0.04	27.04	School student		From School Website
	Employee	59	0.28	16.52	Commercial: Community, Social & Personal Services (J11)		
C.M.A. Secondary School	Student	703	0.04	28.12	School student		From School Website
	Employee	100	0.28	28.00	Commercial: Community, Social & Personal Services (J11)		
Shek Kip Mei Park Sports Centre	Visitor	500	0.28	140.00	Commercial: Community, Social & Personal Services (J11)		Assumed 500 visitors
Redevelopment at Yin Pin Road	Resident, Employee and Visitor	N/A	-	294.00	-		Based on informnation from DSD
The Mental Health Association Of Hong Kong Cornwall School	Student	112	0.04	4.48	School student		From School Website
	Employee	65	0.28	18.20	Commercial: Community, Social & Personal Services (J11)		
The Society Of Boys' Centre Chak Yan Centre School	Student	315	0.04	12.60	School student		From School Website
	Employee	45	0.28	12.60	Commercial: Community, Social & Personal Services (J11)		
Proposed Student Hostel at Tat Hong Avenue, City University	Resident	1680	0.19	319.20	Domestic Private R1		From Sham Shui Po DC Committees Documents
	Employee	187	0.28	52.36	Commercial: Community, Social & Personal Services (J11)		Assume 9:1 for student to staff ratio
	Total	18,058		4,032.79			

Catchment B1

Development	Name	Population (a)	Unit Flow Factor (m^3/d/person) (b)	ADWF (m^3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
Tsui Tin House	Resident	922	0.19	175.18	Domestic Private R1	MH DF1.03	There are 329 units in Tsui Tin House , assuming 2.8 resident per unit.
	Total	922		175.18			

Catchment B2

Development	Name	Population (a)	Unit Flow Factor (m^3/d/person) (b)	ADWF (m^3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
Yun Tin House	Resident	728	0.19	138.32	Domestic Private R1	MH DF 1.06	There are 260 units in Yun Tin House , assuming 2.8 resident per unit.
	Total	728		138.32			

Catchment B3

Development	Name	Population (a)	Unit Flow Factor (m^3/d/person) (b)	ADWF (m^3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
Yue Tin House	Resident	572	0.19	108.68	Domestic Private R1	MH DF 2.03	There are 204 units in Yue Tin House , assuming 2.8 resident per unit.
	Total	572		108.68			

Catchment B4

Development	Name	Population (a)	Unit Flow Factor (m^3/d/person) (b)	ADWF (m^3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
Chak Tin House	Resident	530	0.19	100.70	Domestic Private R1	MH DF1.07	There are 189 units in Chak Tin House , assuming 2.8 resident per unit.
	Total	530		100.70			

Catchment B5

Development	Name	Population (a)	Unit Flow Factor (m^3/d/person) (b)	ADWF (m^3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
Fu Tin House	Resident	530	0.19	100.70	Domestic Private R1	MH DF2.03	There are 189 units in Fu Tin House , assuming 2.8 resident per unit.
	Total	530		100.70			

Catchment C

Development	Name	Population (a)	Unit Flow Factor (m^3/d/person) (b)	ADWF (m^3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
Shing Tin House	Resident	2238	0.19	425.22	Domestic Private R1	FMH4016277	There are 799 units in Shing Tin House , assuming 2.8 resident per unit.
Cheung Tin House	Resident	2238	0.19	425.22	Domestic Private R1		There are 799 units in Cheung Tin House , assuming 2.8 resident per unit.
Shui Tin House	Resident	824	0.19	156.56	Domestic Private R1		There are 294 units in Shui Tin House , assuming 2.8 resident per unit.
	Total	5300		1007.00			

Catchment D

Development	Name	Population (a)	Unit Flow Factor (m^3/d/person) (b)	ADWF (m^3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
The H.K. Sze Yap Commercial & Industrial Association Wong Tai Shan	Employee	61	0.28	17.08	Commercial: Community, Social & Personal Services (J11)	FMH4016465	From School Website
	Student	749	0.04	29.96	School Student		
	Total	810		47.04			

Catchment E

Development	Name	Population (a)	Unit Flow Factor (m^3/d/person) (b)	ADWF (m^3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
Proposed Redevelopment at Pak Tin Estate Phase 11 Block 6	Proposed Redevelopment	1612	0.19	306.28	Domestic Private R1	F1. 7a(Ph11)	Based on information from approved SIA for Pak Tin Phase 7,8 10 11 & 13 (Doc. No. L1070/C006/03)
	Commercial Retail	97	0.28	27.16	Commercial: Wholesale & Retail (J4)		
	Food & Beverage	20	1.58	31.60	Commercial: Restaurants & Hotels (J10)		
	Kindergarten Student	90	0.04	3.60	School Student		
	Kindergarten Teacher and Staff	18	0.28	5.04	Commercial : Community, Social & Personal Services (J11)		
Proposed Redevelopment at Pak Tin Estate Phase 11 Block 7	Proposed Redevelopment	1956	0.19	371.64	Domestic Private R1		
	Commercial Retail	96	0.28	26.88	Commercial: Wholesale & Retail (J4)		
	Food & Beverage	20	1.58	31.60	Commercial: Restaurants & Hotels (J10)		
	Kindergarten Student	90	0.04	3.60	School Student		
	Kindergarten Teacher and Staff	18	0.28	5.04	Commercial : Community, Social & Personal Services (J11)		
	Total	4017		812.44			

Catchment F

Development	Name	Population (a)	Unit Flow Factor (m^3/d/person) (b)	ADWF (m^3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
Proposed Redevelopment at Pak Tin Estate Phase 13 Block 8	Proposed Redevelopment	2502	0.19	475.38	Domestic Private R1	TMF1	Based on information from approved SIA for Pak Tin Phase 7,8 10 11 & 13 (Doc. No. L1070/C006/03)
	Commercial Retail	7	0.28	1.96	Commercial: Wholesale & Retail (J4)		
	Food & Beverage	8	1.58	12.64	Commercial: Restaurants & Hotels (J10)		
	Hostel for Moderately	40	0.28	11.20	Commercial: Community, Social & Personal Services (J11)		
	Mentally Handicapped Person	20	0.28	5.60	Commercial: Community, Social & Personal Services (J11)		
	Hostel for Severely Physically	50	0.28	14.00	Commercial: Community, Social & Personal Services (J11)		
	Handicapped Persons (50	38	0.28	10.64	Commercial: Community, Social & Personal Services (J11)		
Proposed Redevelopment at Pak Tin Estate Phase 13 Block 9	Proposed Redevelopment	2105	0.19	399.95	Domestic Private R1	TMF1	
	Neigbourhood Elderly Centre	30	0.28	8.40	Commercial: Community, Social & Personal Services (J11)		
		11	0.28	3.08	Commercial: Community, Social & Personal Services (J11)		
	Day Care Centre for the Elderly	40	0.28	11.20	Commercial: Community, Social & Personal Services (J11)		
		23	0.28	6.44	Commercial: Community, Social & Personal Services (J11)		
	Integrated Vocational Rehabilitation	120	0.28	33.60	Commercial: Community, Social & Personal Services (J11)		
		17	0.28	4.76	Commercial: Community, Social & Personal Services (J11)		
	Kindergarten Student	180	0.04	7.20	School Student		
	Kindergarten Teacher and Staff	36	0.28	10.08	Commercial: Community, Social & Personal Services (J11)		
Proposed Redevelopment at Pak Tin Estate Phase 13 Block 10	Proposed Redevelopment	3065	0.19	582.35	Domestic Private R1	TMF1	
	Carpark	-	-	145.77			
	Total	8292		1744.25			

Catchment G

Development	Name	Population (a)	Unit Flow Factor (m3/d/person) (b)	ADWF (m3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
Proposed Redevelopment at Pak Tin Estate Phase 7 Block 1	Proposed Redevelopment	1592	0.19	302.48	Domestic Private R1	FMH4084581	Based on information from approved SIA for Pak Tin Phase 7,8 10 11 & 13 (Doc. No. L1070/C006/03)
	Commercial Retail	157	0.28	43.96	Commercial: Wholesale & Retail (J4)		
	Welfare Facilities	24	0.28	6.72	Commercial: Community, Social & Personal Services (J11)		
	Wakfare Facilities	72	0.19	13.68	Domestic Private R1		
	Office	29	0.08	2.32	Commercial Employee		
	Food & Beverage	26	1.58	41.08	Commercial: Restaurants & Hotels (J10)		
Proposed Redevelopment at Pak Tin Estate Phase 7 Block 2	Proposed Redevelopment	1658	0.19	315.02	Domestic Private R1	FMH4084582	
	Commercial Retail	158	0.28	44.24	Commercial: Wholesale & Retail (J4)		
	Walfare Facilities	23	0.28	6.44	Commercial: Community, Social & Personal Services (J11)		
	Walfare Facilities	72	0.19	13.68	Domestic Private R1		
	Office	30	0.08	2.4	Commercial Employee		
	Food & Beverage	26	1.58	41.08	Commercial: Restaurants & Hotels (J10)		
Temporary Driving Test Centre	Resident, Employee and Visitor	N/A	-	25.20	-	FMH4016450	Based on informnation from DSD
	Total	3867		858.30			

Catchment H

Development	Name	Population (a)	Unit Flow Factor (m3/d/person) (b)	ADWF (m3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
Proposed Redevelopment at Pak Tin Estate Phase 8 Block 3	Proposed Redevelopment	1575	0.19	299.25	Domestic Private R1	FMH4084581 & FMH4016451	Based on information from approved SIA for Pak Tin Phase 7,8 10 11 & 13 (Doc. No. L1070/C006/03)
	Commercial Retail	157	0.28	43.96	Commercial: Wholesale & Retail (J4)		
	Welfare Facilities	23	0.28	6.44	Commercial: Community, Social & Personal Services (J11)		
	Welfare Facilities	72	0.19	13.68	Domestic Private R1		
	Office	29	0.08	2.32	Commercial Employee		
	Food & Beverage	26	1.58	41.08	Commercial: Restaurants & Hotels (J10)		
Proposed Redevelopment at Pak Tin Estate Phase 8 Block 4	Proposed Redevelopment	1411	0.19	268.09	Domestic Private R1	FMH4084580	
	Commercial Retail	158	0.28	44.24	Commercial: Wholesale & Retail (J4)		
	Welfare Facilities	23	0.28	6.44	Commercial: Community, Social & Personal Services (J11)		
	Welfare Facilities	72	0.19	13.68	Domestic Private R1		
	Office	29	0.08	2.32	Commercial Employee		
	Food & Beverage	25	1.58	39.50	Commercial: Restaurants & Hotels (J10)		
	Total	3600		781.00			

Catchment I

Development	Name	Population (a)	Unit Flow Factor (m^3/d/person) (b)	ADWF (m^3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
Proposed Redevelopment at Pak Tin Estate Phase 10 Block 5	Proposed Redevelopment	2799	0.19	531.81	Domestic Private R1	FMH4045054	Based on information from approved SIA for Pak Tin Phase 7,8 10 11 & 13 (Doc. No. L1070/C006/03)
	Commercial Retail	340	0.28	95.20	Commercial: Wholesale & Retail (J4)		
	Food & Beverage	27	1.58	42.66	Commercial: Restaurants & Hotels (J10)		
	Total	3166		669.67			

Catchment J

Development	Name	Population (a)	Unit Flow Factor (m^3/d/person) (b)	ADWF (m^3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
Tai Tin House	Resident	2238	0.19	425.22	Domestic Private R1	FMH4016656	There are 799 units in Tai Tin House , assuming 2.8 resident per unit.
Lai Tin House	Resident	2196	0.19	417.24	Domestic Private R1	FMH4016453	There are 784 units in Lai Tin House , assuming 2.8 resident per unit.
Wan Tin House	Resident	681	0.19	129.39	Domestic Private R1		There are 243 units in Wan Tin House , assuming 2.8 resident per unit.
	Total	5,115		971.85			

Catchment K

Development	Name	Population (a)	Unit Flow Factor (m^3/d/person) (b)	ADWF (m^3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
Telephone Exchange Center	Employee	5	0.18	0.90	Commercial: Transport, Storage & Communication (J3)	FMH4016656	Assumed 5 employee
Po Tin Building	Resident	177	0.27	47.79	Domestic Private R2	FMH4016454	There are 63 units in Po Tin Building , assuming 2.8 resident per unit.
Fook Tin Building	Resident	269	0.27	72.63	Domestic Private R2		There are 96 units in Fook Tin Building , assuming 2.8 resident per unit.
	Total	451		121.32			

Catchment L

Development	Name	Population (a)	Unit Flow Factor (m^3/d/person) (b)	ADWF (m^3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
Pak Yuk Lau	Resident	238	0.27	64.26	Domestic Private R2	FMH4016457	There are 85 units in Pak Yuk Lau , assuming 2.8 resident per unit.
Tin Fung Lau	Resident	238	0.27	64.26	Domestic Private R2		There are 85 units in Tin Fung Lau , assuming 2.8 resident per unit.
	Total	476		128.52			

Catchment M

Development	Name	Population (a)	Unit Flow Factor (m^3/d/person) (b)	ADWF (m^3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
Kam Yuck Building	Commercial Retail	320	0.28	89.60	Commercial: Wholesale & Retail (J4)	FMH4016458	3.5 workers per GFA (in 100 square meter) by Commercial and Industrial Floor Space Utilization Survey, assuming staff to visitor ratio as 1:4
	Resident	499	0.27	134.73	Domestic Private R2		There are 178 units in Kam Yuck Building , assuming 2.8 resident per unit.
	Total	819		224.33			

Catchment O

Development	Name	Population (a)	Unit Flow Factor (m^3/d/person) (b)	ADWF (m^3/sec) (a) x (b)	Types	Sewerage Manhole No.	Remarks
Nam Cheong Commercial Building	Resident	353	0.27	95.31	Domestic Private R2	FMH4016460	There are 126 units in Nam Cheong Commercial Building , assuming 2.8 resident per unit.
Maintown Plaza	Commercial Retail (G/F)	177	0.28	49.56	Commercial: Wholesale & Retail (J4)		3.5 workers per GFA (in 100 square meter) by Commercial and Industrial Floor Space Utilization Survey, assuming staff to visitor ratio as 1:4
	Elderly home (1st to 3rd floor)	500	0.28	140.00	Commercial: Community, Social & Personal Services (J11)		3.3 workers per GFA (in 100 square meter) by Commercial and Industrial Floor Space Utilization Survey, assuming staff to visitor ratio as 1:4
	Total	1030		284.87			

Catchment Z1 Existing Development to be Demolished

Development	Name	Population	Unit Flow Factor (m^3/d/person)	ADWF (m^3/day)	Types	Sewerage Manhole No.	Remarks
Half of Pak Tin Block 13	Resident	1260	0.19	239.40	Domestic Private R1	FMH4016440	Half of 900 flats of 2,520 populations
	Total	1260		239.40			

Catchment Z2 Existing Development to be Demolished

Development	Name	Population	Unit Flow Factor (m^3/d/person)	ADWF (m^3/day)	Types	Sewerage Manhole No.	Remarks
Half of Pak Tin Block 13	Resident	1260	0.19	239.40	Domestic Private R1	MH DF1.01	Half of 900 flats of 2,520 populations
	Total	1260		239.40			

Catchment Z3 Existing Development to be Demolished

Development	Name	Population	Unit Flow Factor (m^3/d/person)	ADWF (m^3/day)	Types	Sewerage Manhole No.	Remarks
Pak Tin Catholic Primary School	Employee	54	0.28	15.12	Commercial: Community, Social & Personal Services (J11)	MH DF2.02	450 students and 54 staff
	School Student	450	0.04	18.00	School Student		
	Total	504.00		33.12			

Appendix C
Sewerage Impact Assessment

Table 1 Sewerage Impact Assessment before Proposed Development

Existing Sewerage System

Roughness Coefficient for Exisiting Sewer, KS = 3.00 mm (Slimmed Clayware in Poor Condition)
Kinematic Viscosity, n = 0.000001 m^2/sec @ 20^oC

US Manhole	DS Manhole	Pipe Size (mm)	No. of Pipe	Approx. Length (m)	US I.L. (mPD)	DS I.L. (mPD)	Gradient		Catchment	Population		ADWF (m^3/day)		Catchment Factor Pclf	$Q_{AVERAGE}$ (m3/day)	Backwash Flow Rate from Swimming Pools (m3/min)	Contributing Population	Peak Flow Factor	PDWF (m^3/s)	Area of Flow (m^2)	Slope	Velocity (m/s)	Capacity (m^3/s)	Peak Flow/ Capacity	Capacity> ADWF ?
							%	1 in	Increment	Increment	Accu.	Increment	Accu.													
		(a)	(b)										(c)	(d)	(e) =(c) x (d)	(m)	(f) = (e) /0.27	(h)	(i) = (e) x (h)/3600/24) + (m)	(j) =((a)^2 /4) x(b) x π /100000		(k)	(l) = (j) x (k)	(i) / (l)	
FMH4016440	FMH4016441	300	1	44.0	30.10	29.71	0.9	112.8	Z1	1,260	1,260	239.40	239.40	1.3	311.22	-	1153	6	0.022	0.071	0.009	1.171	0.083	0.260	Ok
FMH4016441	F1. 1(Ph12)	300	1	6.4	29.71	29.62	1.4	73.6			1,260		239.40	1.3	311.22	-	1153	6	0.022	0.071	0.014	1.450	0.103	0.210	Ok
F1. 1(Ph12)	F1. 7a(Ph11)	300	1	15.2	29.36	29.06	2.0	50.8			1,260		239.40	1.3	311.22	-	1153	6	0.022	0.071	0.020	1.745	0.123	0.176	Ok
F1. 7a(Ph11)	F1.7	400	1	12.6	29.02	28.89	1.0	100.0	E	4,017	5,277	812.44	1,051.84	1.3	1367.39	-	5064	5	0.079	0.126	0.010	1.506	0.189	0.419	Ok
F1.7	F1.8	400	1	19.5	28.89	28.70	1.0	100.0			5,277		1,051.84	1.3	1367.39	-	5064	5	0.079	0.126	0.010	1.506	0.189	0.419	Ok
F1.8	F1.9	400	1	12.9	28.70	28.48	1.7	60.0			5,277		1,051.84	1.3	1367.39	-	5064	5	0.079	0.126	0.017	1.945	0.244	0.324	Ok
F1.9	F1.10	400	1	17.6	28.48	28.19	1.7	60.1			5,277		1,051.84	1.3	1367.39	-	5064	5	0.079	0.126	0.017	1.944	0.244	0.324	Ok
F1.10	TMF1	400	1	9.8	28.04	27.83	2.1	47.1			5,277		1,051.84	1.3	1367.39	-	5064	5	0.079	0.126	0.021	2.196	0.276	0.287	Ok
TMF1	FMH4016483	450	1	22.0	27.68	26.63	4.7	21.0	F	8,292	13,569	1,744.25	2,796.09	1.3	3634.91	-	13463	4	0.168	0.159	0.048	3.564	0.567	0.297	Ok
FMH4016483	FMH4016445	450	1	8	26.63	24.42	27.6	3.6			13,569		2,796.09	1.3	3634.91	-	13463	4	0.168	0.159	0.276	8.569	1.363	0.123	Ok
FMH4016445	FMH4016446	450	1	4	24.42	22.08	58.5	1.7			13,569		2,796.09	1.3	3634.91	-	13463	4	0.168	0.159	0.585	12.471	1.983	0.085	Ok
FMH4016446	FMH4084547	450	1	3	22.08	21.02	35.3	2.8			13,569		2,796.09	1.3	3634.91	-	13463	4	0.168	0.159	0.353	9.691	1.541	0.109	Ok
FMH4084547	FMH4084548	450	1	3	21.02	20.39	21.0	4.8			13,569		2,796.09	1.3	3634.91	-	13463	4	0.168	0.159	0.210	7.471	1.188	0.142	Ok
FMH4084548	FMH4084580	450	1	8	20.13	19.88	3.1	32.0			13,569		2,796.09	1.3	3634.91	-	13463	4	0.168	0.159	0.031	2.880	0.458	0.367	Ok
FMH4084580	FMH4084581	450	1	51	19.58	19.07	1.0	100.0	H	1,718	15,287	374.27	3,170.36	1.3	4121.47	-	15265	4	0.191	0.159	0.010	1.628	0.259	0.737	Ok
FMH4084581	FMH4084582	450	1	38	18.77	18.02	2.0	50.0	G,H	2,841	18,128	613.61	3,783.97	1.3	4919.16	-	18219	4	0.228	0.159	0.020	2.304	0.366	0.622	Ok
FMH4084582	FMH4016450	450	1	17	18.02	17.45	3.3	30.0	G	1,967	20,095	422.86	4,206.83	1.3	5468.88	-	20255	4	0.253	0.159	0.033	2.975	0.473	0.535	Ok
FMH4016450	FMH4016451	450	1	39	17.45	17.01	1.1	88.6	G		20,095	25.20	4,232.03	1.3	5501.64	-	20376	4	0.255	0.159	0.011	1.730	0.275	0.926	Ok
FMH4016451	FMH4016452	450	1	26	15.99	15.18	3.1	32.1	H	941	21,036	203.37	4,435.40	1.3	5766.02	-	21356	4	0.267	0.159	0.031	2.876	0.457	0.584	Ok
FMH4016452	FMH4045054	525	1	5	15.18	14.47	14.2	7.0			21,036		4,435.40	1.3	5766.02	-	21356	4	0.267	0.216	0.142	6.797	1.471	0.181	Ok
FMH4045054	FMH4016656	525	1	27	15.18	14.47	2.6	38.0	I	3,166	24,202	669.67	5,105.07	1.3	6636.59	-	24580	4	0.307	0.216	0.026	2.924	0.633	0.485	Ok
FMH4016656	FMH4016453	525	1	7	14.47	14.35	1.7	58.3	J, K	2,243	26,445	426.12	5,531.19	1.3	7190.54	-	26632	4	0.333	0.216	0.017	2.360	0.511	0.651	Ok
FMH4016453	FMH4077723	600	1	28	14.35	14.186	0.6	170.7	J	2,877	29,322	546.63	6,077.82	1.3	7901.16	-	29264	4	0.366	0.283	0.006	1.504	0.425	0.861	Ok
FMH4077723	FMH4016454	600	1	16	14.156	14.04	0.7	137.9			29,322		6,077.82	1.3	7901.16	-	29264	4	0.366	0.283	0.007	1.674	0.473	0.773	Ok
FMH4016454	FMH4077722	600	1	17	14.04	13.618	2.5	40.3	K	446	29,768	120.42	6,198.24	1.3	8057.71	-	29843	4	0.373	0.283	0.025	3.099	0.876	0.426	Ok
FMH4077722	FMH4016455	600	1	17	13.598	13.113	2.9	35.1			29,768		6,198.24	1.3	8057.71	-	29843	4	0.373	0.283	0.029	3.323	0.940	0.397	Ok
FMH4016455	FMH4016456	600	1	40	15.24	13.24	5.0	20.0			29,768		6,198.24	1.3	8057.71	-	29843	4	0.373	0.283	0.050	4.400	1.244	0.300	Ok
FMH4016456	FMH4016457	600	1	40	13.24	12.5	1.9	54.1			29,768		6,198.24	1.3	8057.71	-	29843	4	0.373	0.283	0.019	2.675	0.756	0.493	Ok
FMH4016457	FMH4016458	600	1	24	12.5	11.59	3.8	26.4	L	476	30,244	128.52	6,326.76	1.3	8224.79	-	30462	4	0.381	0.283	0.038	3.831	1.083	0.352	Ok
FMH4016458	FMH4016459	600	1	26	11.59	9.76	7.0	14.2	M	819	31,063	224.33	6,551.09	1.3	8516.41	-	31542	4	0.394	0.283	0.070	5.221	1.476	0.267	Ok
FMH4016459	FMH4016460	600	1	17	9.76	9.23	3.1	32.1			31,063		6,551.09	1.3	8516.41	-	31542	4	0.394	0.283	0.031	3.474	0.982	0.402	Ok
FMH4016460	FMH4016461	600	1	12	9.23	8.98	2.1	48.0	O	1,030	32,093	284.87	6,835.96	1.3	8886.75	-	32914	4	0.411	0.283	0.021	2.839	0.803	0.512	Ok
MH DF2.02	MH DF2.03	225	1	24.0	30.23	29.99	1.0	100.0	Z3	504	504	33.12	33.12	1.3	43.06	-	159	8	0.004	0.040	0.010	1.024	0.041	0.097	Ok
MH DF2.03	MH DF2.04	225	1	17.6	29.95	29.80	0.8	123.1	B3, B5	1,102	1,606	209.38	242.50	1.3	315.25	-	1168	6	0.022	0.040	0.008	0.923	0.037	0.592	Ok
MH DF2.04	MH DF2.05	225	1	12.0	29.80	29.69	1.0	104.3			1,606		242.50	1.3	315.25	-	1168	6	0.022	0.040	0.010	1.002	0.040	0.547	Ok
MH DF2.05	MH DF1.07	225	1	7.2	29.69	29.45	3.3	30.6			1,606		242.50	1.3	315.25	-	1168	6	0.022	0.040	0.033	1.852	0.074	0.296	Ok
MH DF1.02	MH DF1.03	300	1	18.4	30.59	30.43	0.9	115.0	Z2	1,260	1,260	239.40	239.40	1.3	311.22	-	1153	6	0.022	0.071	0.009	1.159	0.082	0.264	Ok
MH DF1.03	MH DF1.04	300	1	19.2	30.43	30.28	0.8	125.5	B1	922	2,182	175.18	414.58	1.3	538.95	-	1996	6	0.037	0.071	0.008	1.110	0.078	0.480	Ok
MH DF1.04	MH DF1.05	375	1	15.2	30.20	30.10	0.7	142.1			2,182		414.58	1.3	538.95	-	1996	6	0.037	0.110	0.007	1.210	0.134	0.279	Ok
MH DF1.05	MH DF1.06	375	1	17.6	30.10	29.98	0.6	155.8			2,182		414.58	1.3	538.95	-	1996	6	0.037	0.110	0.006	1.156	0.128	0.292	Ok
MH DF1.06	MH DF1.06a	375	1	35.2	29.98	29.72	0.8	132.8	B2	728	2,910	138.32	552.90	1.3	718.77	-	2662	6	0.050	0.110	0.008	1.252	0.138	0.362	Ok
MH DF1.06a	MH DF1.07	375	1	40.0	29.72	29.45	0.7	150.9			2,910		552.90	1.3	718.77	-	2662	6	0.050	0.110	0.007	1.174	0.130	0.384	Ok
MH DF1.07	MH F3.6	450	1	8.0	29.38	29.33	0.6	181.8	B3, B5, B4, Z3	2,136	5,046	343.20	896.10	1.3	1164.93	-	4315	6	0.081	0.159	0.006	1.207	0.192	0.421	Ok
MH F3.6	M.H. FC	450	1	8.0	29.32	29.26	0.7	133.3			5,046		896.10	1.3	1164.93	-	4315	6	0.081	0.159	0.007	1.410	0.224	0.361	Ok
M.H. FC	FLH4026942	450	1	45.2	29.26	28.60	1.5	68.4			5,046		896.10	1.3	1164.93	-	4315	6	0.081	0.159	0.015	1.969	0.313	0.258	Ok
FLH4026942	FMH4084602	450	1	10.9	28.60	28.55	0.5	217.2			5,046		896.10	1.3	1164.93	-	4315	6	0.081	0.159	0.005	1.104	0.176	0.460	Ok
FMH4084602	FMH4084601	450	1	32.1	28.54	28.41	0.4	247.1			5,046		896.10	1.3	1164.93	-	4315	6	0.081	0.159	0.004	1.035	0.165	0.490	Ok
FMH4084601	FMH4016665	450	1	6.8	28.36	28.27	1.3	75.4			5,046		896.10	1.3	1164.93	-	4315	6	0.081	0.159	0.013	1.875	0.298	0.271	Ok
FMH4016665	FMH4016272	600	1	12.7	28.27	27.81	3.6	27.5			5,046		896.10	1.3	1164.93	-	4315	6	0.081	0.283	0.036	3.749	1.060	0.076	Ok
FHM4016272	FHM4016273	600	1	19.5	27.81	27.58	1.2	84.7	A	18,058	23,104	4,032.79	4,928.89	1.3	6407.56	5.09	23732	4	0.381	0.283	0.012	2.136	0.604	0.632	Ok
FHM4016273	FHM4016274	600	1	24.7	25.50	25.18	1.3	77.2			23,104		4,928.89	1.3	6407.56	-	23732	4	0.381	0.283	0.013	2.237	0.633	0.603	Ok
FHM4016274	FHM4016275	675	1	29.7	23.87	23.08	2.7	37.5			23,104		4,928.89	1.3	6407.56	-	23732	4	0.381	0.358	0.027	3.466	1.240	0.308	Ok
FHM4016275	FHM4016276	675	1	31.8	22.77	22.27	1.6	63.6			23,104		4,928.89	1.3	6407.56	-	23732	4	0.381	0.358	0.016	2.663	0.953	0.400	Ok
FHM4016276	FMH4016465	675	1	27.9	20.42	18.03	8.6	11.7			23,104		4,928.89	1.3	6407.56	-	23732	4	0.381	0.358	0.086	6.220	2.226	0.171	Ok
FMH4016465	FMH4016277	675	1	4.8	18.03	17.88	3.2	31.7	D	810	23,914	47.04	4,975.93	1.3	6468.71	-	23958	4	0.384	0.358	0.032	3.775	1.351	0.284	Ok
FMH4016277	FMH4016278	675	1	25.1	17.88	17.42	1.8	54.5	C	5,300	29,214	1,007	5,982.93	1.3	7777.81	-	28807	4	0.445	0.358	0.018	2.876	1.029	0.432	Ok
FMH4016278	FMH4016279	675	1	30.2	15.89	15.28	2.0	49.6			29,214		5,982.93	1.3	7777.81	-	28807	4	0.445	0.358	0.020	3.016	1.079	0.412	Ok
FMH4016279	FMH4016280	675	1	29.1	13.79	13.43	1.2	80.7			29,214		5,982.93	1.3	7777.81	-	28807	4	0.445	0.358	0.012	2.364	0.846	0.526	Ok
FMH4016280	FMH4016281	750	1	60.04	12.12	9.01	5.2	19.3			29,214		5,982.93	1.3	7777.81	-	28807	4	0.445	0.442	0.052	5.176	2.287	0.195	Ok
FMH4016281	FMH4016282	750	1	91.0	9.01	7.18	2.0	49.7	E-O, Z1	32,093	61,307	6,835.96	12,818.888	1.3	16664.55	-	61721	4	0.843	0.442	0.020	3.224	1.424	0.592	Ok

Notes:

1. Contributing Population = Accu. ADWF*24*3600/0.27, the peak flow factor refer to contributing population
2. The Colebrook-White Equation is used to determine the velocity

$$V = -\sqrt{(8gDs)}\log\left(\frac{k_s}{3.7D} + \frac{2.51v}{D\sqrt{(2gDs)}}\right)$$

V = mean velocity (m/s) R = hydraulic radius (m) k_s = roughness (m) s = frictional slope (energy gradient due to frictional loss)
g = gravitational acceleration (m/s2) D = pipe diameter (m) v = kinematic viscosity of fluid (m^2/s)

3. The derivation of backwash flow from swimming pools are presended in Appendix F

Table 2 Sewerage Impact Assessment after Proposed Development

Existing Sewerage System

Roughness Coefficient for Existing Sewer (<600mm) , KS = 3.00 mm (Slimmed Clayware in Poor Condition)
Roughness Coefficient for Upgraded/ New Pipe, K_S = 1.50 mm (HDPE Pipe in Poor Condition)
Roughness Coefficient, K_S = 0.15 mm (Ductile iron, polyethylene lining, push-fit joints in Poor Condition)
Kinematic Viscosity, n = 0.000001 m^2/sec @ 20°C

US Manhole	DS Manhole	Pipe Size (mm)	No. of Pipe	Approx. Length (m)	US I.L. (mPD)	DS I.L. (mPD)	Gradient		Catchment	Population		ADWF (m^3/day)		Catchment Factor Patf	$Q_{AVERAGE}$ (m^3/day)	Backwash Flow Rate from Swimming Pools (m^3/min)	Contributing Population	Peak Flow Factor	PDWF (m^3/s)	Area of Flow (m^2)	Slope	Velocity (m/s)	Capacity (m^3/s)	Peak Flow/ Capacity	Capacity> ADWF ?
							%	1 in	Increment	Increment	Accu.	Increment	Accu.												
		(a)	(b)										(c)	(d)	(e) =(c) x (d)	(m)	(f) = (e) /0.27	(h)	(i) = (e) x (h)/3600/24) + (m) / 60	(j) =((a)^2 /4) x(b) x π /100000		(k)	(l) = (j) x (k)	(i) / (l)	
TM1	FMH4016441	300	1	44.0	30.10	29.71	0.9	112.8	A1	504	504	94.12	94.12	1.3	122.36	-	453	8	0.011	0.071	0.009	1.171	0.083	0.136	Ok
FMH4016441	FI. 1(Ph12)	300	1	6.4	29.71	29.62	1.4	73.6			504		94.12	1.3	122.36	-	453	8	0.011	0.071	0.014	1.450	0.103	0.110	Ok
FI. 1(Ph12)	FI. 7a(Ph11)	300	1	15.2	29.36	29.06	2.0	50.8			504		94.12	1.3	122.36	-	453	8	0.011	0.071	0.020	1.745	0.123	0.092	Ok
FI. 7a(Ph11)	FI.7	400	1	12.6	29.02	28.89	1.0	100.0	E	4,017	4,521	812.44	906.56	1.3	1178.53	-	4365	6	0.082	0.126	0.010	1.506	0.189	0.433	Ok
FI.7	FI.8	400	1	19.5	28.89	28.70	1.0	100.0			4,521		906.56	1.3	1178.53	-	4365	6	0.082	0.126	0.010	1.506	0.189	0.433	Ok
FI.8	FI.9	400	1	12.9	28.70	28.48	1.7	60.0			4,521		906.56	1.3	1178.53	-	4365	6	0.082	0.126	0.017	1.945	0.244	0.335	Ok
FI.9	FI.10	400	1	17.6	28.48	28.19	1.7	60.1			4,521		906.56	1.3	1178.53	-	4365	6	0.082	0.126	0.017	1.944	0.244	0.335	Ok
FI.10	TMF1	400	1	9.8	28.04	27.83	2.1	47.1			4,521		906.56	1.3	1178.53	-	4365	6	0.082	0.126	0.021	2.196	0.276	0.297	Ok
TMF1	FMH4016483	450	1	22.0	27.68	26.63	4.7	21.0	F	8,292	12,813	1,744.25	2,650.81	1.3	3446.05	-	12763	4	0.160	0.159	0.048	3.564	0.567	0.281	Ok
FMH4016483	FMH4016445	450	1	8.0	26.63	24.42	27.6	3.6			12,813		2,650.81	1.3	3446.05	-	12763	4	0.160	0.159	0.276	8.569	1.363	0.117	Ok
FMH4016445	FMH4016446	450	1	4.0	24.42	22.08	58.5	1.7			12,813		2,650.81	1.3	3446.05	-	12763	4	0.160	0.159	0.585	12.471	1.983	0.080	Ok
FMH4016446	FMH4084547	450	1	3.0	22.08	21.02	35.3	2.8			12,813		2,650.81	1.3	3446.05	-	12763	4	0.160	0.159	0.353	9.691	1.541	0.104	Ok
FMH4084547	FMH4084548	450	1	3.0	21.02	20.39	21.0	4.8			12,813		2,650.81	1.3	3446.05	-	12763	4	0.160	0.159	0.210	7.471	1.188	0.134	Ok
FMH4084548	FMH4084580	450	1	8.0	20.13	19.88	3.1	32.0			12,813		2,650.81	1.3	3446.05	-	12763	4	0.160	0.159	0.031	2.880	0.458	0.348	Ok
FMH4084580	FMH4084581	450	1	51.0	19.58	19.07	1.0	100.0	H	1,718	14,531	374.27	3,025.08	1.3	3932.60	-	14565	4	0.182	0.159	0.010	1.628	0.259	0.703	Ok
FMH4084581	FMH4084582	450	1	37.5	18.77	18.02	2.0	50.0	G,H	2,841	17,372	613.61	3,638.69	1.3	4730.29	-	17520	4	0.219	0.159	0.020	2.304	0.366	0.598	Ok
FMH4084582	FMH4016450	450	1	17.1	18.02	17.45	3.3	30.0	G	1,967	19,339	422.86	4,061.55	1.3	5280.01	-	19556	4	0.244	0.159	0.033	2.975	0.473	0.517	Ok
FMH4016450	FMH4016451	450	1	39.0	17.45	17.01	1.1	88.6	G		19,339	25.20	4,086.75	1.3	5312.77	-	19677	4	0.246	0.159	0.011	1.730	0.275	0.894	Ok
FMH4016451	FMH4016452	450	1	26.0	15.99	15.18	3.1	32.1	H	941	20,280	203.37	4,290.12	1.3	5577.15	-	20656	4	0.258	0.159	0.031	2.876	0.457	0.565	Ok
FMH4016452	FMH4045054	525	1	5.0	15.18	14.47	14.2	7.0			20,280		4,290.12	1.3	5577.15	-	20656	4	0.258	0.216	0.142	6.797	1.471	0.176	Ok
FMH4045054	FMH4016656	525	1	27.0	15.18	14.47	2.6	38.0	I	3,166	23,446	669.67	4,959.79	1.3	6447.72	-	23880	4	0.299	0.216	0.026	2.924	0.633	0.472	Ok
FMH4016656	FMH4016453	525	1	7.0	14.47	14.35	1.7	58.3	J, K	2,243	25,689	426.12	5,385.91	1.3	7001.68	-	25932	4	0.324	0.216	0.017	2.360	0.511	0.634	Ok
FMH4016453	FMH4077723	600	1	28.0	14.35	14.19	0.6	170.7	J	2,877	28,566	546.63	5,932.54	1.3	7712.30	-	28564	4	0.357	0.283	0.006	1.504	0.425	0.840	Ok
FMH4077723	FMH4016454	600	1	16.0	14.16	14.04	0.7	137.9			28,566		5,932.54	1.3	7712.30	-	28564	4	0.357	0.283	0.007	1.674	0.473	0.755	Ok
FMH4016454	FMH4077722	600	1	17.0	14.04	13.62	2.5	40.3	K	446	29,012	120.42	6,052.96	1.3	7868.85	-	29144	4	0.364	0.283	0.025	3.099	0.876	0.416	Ok
FMH4077722	FMH4016455	600	1	17.0	13.60	13.11	2.9	35.1			29,012		6,052.96	1.3	7868.85	-	29144	4	0.364	0.283	0.029	3.323	0.940	0.388	Ok
FMH4016455	FMH4016456	600	1	40.0	15.24	13.24	5.0	20.0			29,012		6,052.96	1.3	7868.85	-	29144	4	0.364	0.283	0.050	4.400	1.244	0.293	Ok
FMH4016456	FMH4016457	600	1	40.0	13.24	12.50	1.9	54.1			29,012		6,052.96	1.3	7868.85	-	29144	4	0.364	0.283	0.019	2.675	0.756	0.482	Ok
FMH4016457	FMH4016458	600	1	24.0	12.50	11.59	3.8	26.4	L	476	29,488	128.52	6,181.48	1.3	8035.92	-	29763	4	0.372	0.283	0.038	3.831	1.083	0.344	Ok
FMH4016458	FMH4016459	600	1	26.0	11.59	9.76	7.0	14.2	M	819	30,307	224.33	6,405.81	1.3	8327.55	-	30843	4	0.386	0.283	0.070	5.221	1.476	0.261	Ok
FMH4016459	FMH4016460	600	1	17.0	9.76	9.23	3.1	32.1			30,307		6,405.81	1.3	8327.55	-	30843	4	0.386	0.283	0.031	3.474	0.982	0.393	Ok
FMH4016460	FMH4016461	600	1	12.0	9.23	8.98	2.1	48.0	O	1,030	31,337	284.87	6,690.68	1.3	8697.88	-	32214	4	0.403	0.283	0.021	2.839	0.803	0.501	Ok
TM3	MH DF2.03	225	1	24.0	30.23	29.99	1.0	100.0	A3	3,190	3,190	947.43	947.43	1.3	1231.66	-	4562	6	0.086	0.040	0.010	1.024	0.041	2.086	Not OK
MH DF2.03	MH DF2.04	225	1	17.6	29.95	29.80	0.8	123.1	B3, B5	1,102	4,292	209.38	1,156.81	1.3	1503.85	-	5570	5	0.087	0.040	0.008	0.923	0.037	2.352	Not OK
MH DF2.04	MH DF2.05	225	1	12.0	29.80	29.69	1.0	104.3			4,292		1,156.81	1.3	1503.85	-	5570	5	0.087	0.040	0.010	1.002	0.040	2.176	Not OK
MH DF2.05	MH DF1.07	225	1	7.2	29.69	29.45	3.3	30.6			4,292		1,156.81	1.3	1503.85	-	5570	5	0.087	0.040	0.033	1.852	0.074	1.176	Not OK
MH DF1.02	MH DF1.03	300	1	18.4	30.59	30.43	0.9	115.0	A2	3,190	3,190	947.43	947.43	1.3	1231.66	-	4562	6	0.086	0.071	0.009	1.159	0.082	1.043	Not OK
MH DF1.03	MH DF1.04	300	1	19.2	30.43	30.28	0.8	125.5	B1	922	4,112	175.18	1,122.61	1.3	1459.39	-	5405	5	0.084	0.071	0.008	1.110	0.078	1.083	Not OK
MH DF1.04	MH DF1.05	375	1	15.2	30.20	30.10	0.7	142.1			4,112		1,122.61	1.3	1459.39	-	5405	5	0.084	0.110	0.007	1.210	0.134	0.630	Ok
MH DF1.05	MH DF1.06	375	1	17.6	30.10	29.98	0.6	155.8			4,112		1,122.61	1.3	1459.39	-	5405	5	0.084	0.110	0.006	1.156	0.128	0.660	Ok
MH DF1.06	MH DF1.06a	375	1	35.2	29.98	29.72	0.8	132.8	B2	728	4,840	138.32	1,260.93	1.3	1639.21	-	6071	5	0.095	0.110	0.008	1.252	0.138	0.687	Ok
MH DF1.06a	MH DF1.07	375	1	40.0	29.72	29.45	0.7	150.9			4,840		1,260.93	1.3	1639.21	-	6071	5	0.095	0.110	0.007	1.174	0.130	0.730	Ok
MH DF1.07	MH F3.6	450	1	8.0	29.38	29.33	0.6	181.8	A3, B3, B5, B4	4,822	9,662	1,257.51	2,518.44	1.3	3273.97	-	12126	4	0.152	0.159	0.006	1.207	0.192	0.789	Ok
MH F3.6	M.H. FC	450	1	8.0	29.32	29.26	0.7	133.3			9,662		2,518.44	1.3	3273.97	-	12126	4	0.152	0.159	0.007	1.410	0.224	0.677	Ok
M.H. FC	FLH4026942	450	1	45.2	29.26	28.60	1.5	68.4			9,662		2,518.44	1.3	3273.97	-	12126	4	0.152	0.159	0.015	1.969	0.313	0.484	Ok
FLH4026942	FMH4084602	450	1	10.9	28.60	28.55	0.5	217.2			9,662		2,518.44	1.3	3273.97	-	12126	4	0.152	0.159	0.005	1.104	0.176	0.861	Ok
FMH4084602	FMH4084601	450	1	32.1	28.54	28.41	0.4	247.1			9,662		2,518.44	1.3	3273.97	-	12126	4	0.152	0.159	0.004	1.035	0.165	0.919	Ok
FMH4084601	FMH4016665	450	1	6.8	28.36	28.27	1.3	75.4			9,662		2,518.44	1.3	3273.97	-	12126	4	0.152	0.159	0.013	1.875	0.298	0.509	Ok
FMH4016665	FMH4016272	600	1	12.7	28.27	27.81	3.6	27.5			9,662		2,518.44	1.3	3273.97	-	12126	4	0.152	0.283	0.036	3.749	1.060	0.143	Ok
FMH4016272	FMH4016273	600	1	19.5	27.81	27.58	1.2	84.7	A	18,058	27,720	4,032.79	6,551.23	1.3	8516.60	5.09	31543	4	0.479	0.283	0.012	2.136	0.604	0.793	Ok
FMH4016273	FMH4016274	600	1	24.7	25.50	25.18	1.3	77.2			27,720		6,551.23	1.3	8516.60	-	31543	4	0.479	0.283	0.013	2.237	0.633	0.757	Ok
FMH4016274	FMH4016275	675	1	29.7	23.87	23.08	2.7	37.5			27,720		6,551.23	1.3	8516.60	-	31543	4	0.479	0.358	0.027	3.466	1.240	0.386	Ok
FMH4016275	FMH4016276	675	1	31.8	22.77	22.27	1.6	63.6			27,720		6,551.23	1.3	8516.60	-	31543	4	0.479	0.358	0.016	2.663	0.953	0.503	Ok
FMH4016276	FMH4016465	675	1	27.9	20.42	18.03	8.6	11.7			27,720		6,551.23	1.3	8516.60	-	31543	4	0.479	0.358	0.086	6.220	2.226	0.215	Ok
FMH4016465	FMH4016277	675	1	4.8	18.03	17.88	3.2	31.7	D	810	28,530	47.04	6,598.27	1.3	8577.75	-	31769	4	0.482	0.358	0.032	3.775	1.351	0.357	Ok
FMH4016277	FMH4016278	675	1	25.1	17.88	17.42	1.8	54.5	C	5,300	33,830	1,007.00	7,605.27	1.3	9886.85	-	36618	4	0.543	0.358	0.018	2.876	1.029	0.527	Ok
FMH4016278	FMH4016279	675	1	30.2	15.89	15.28	2.0	49.6			33,830		7,605.27	1.3	9886.85	-	36618	4	0.543	0.358	0.020	3.016	1.079	0.503	Ok
FMH4016279	FMH4016280	675	1	29.1	13.79	13.43	1.2	80.7			33,830		7,605.27	1.3	9886.85	-	36618	4	0.543	0.358	0.012	2.364	0.846	0.641	Ok
FMH4016280	FMH4016281	750	1	60.0	12.12	9.01	5.2	19.3			33,830		7,605.27	1.3	9886.85	-	36618	4	0.543	0.442	0.052	5.176	2.287	0.237	Ok
FMH4016281	FMH4016282	750	1	91.0	9.01	7.18	2.0	49.7	E-O, A1	31,337	65,167	6,690.68	14,295.95	1.3	18584.73	-	68832	4	0.832	0.442	0.020	3.224	1.424	0.585	Ok

Proposed Sewerage System

US Manhole	DS Manhole	Pipe Size (mm)	No. of Pipe	Approx. Length (m)	US I.L. (mPD)	DS I.L. (mPD)	Gradient		Catchment	Population		ADWF (m^3/day)		Catchment Factor Patf (Refer to Table T-4 of Appendix D)	$Q_{AVERAGE}$ (m^3/day)	Backwash Flow Rate from The Sparkle (m^3/min)	Contributing Population	Peak Flow Factor (Refer to Table T-5 of Appendix D)	PDWF (m^3/s)	Area of Flow (m^2)	Slope	Velocity (m/s)	Capacity (m^3/s)	Peak Flow/ Capacity	Capacity> ADWF ?
							%	1 in	Increment	Increment	Accu.	Increment	Accu.												
		(a)	(b)										(c)	(d)	(e) =(c) x (d)	(m)	(f) = (e) /0.27	(h)	(i) = ((e) x (h)/3600/24) + (m)/60	(j) =((a)^2 /4) x(b) x π /100000		(k)	(l) = (j) x (k)	(i) / (l)	
Proposed Terminal Manhole TM1 (Utilized TM1 to replace existing FMH4016440)	FMH4016441	300	1	44.0	30.100	29.710	0.900	112.800	A1	504	504	84.72	84.72	1.3	110.14	-	408	8	0.010	0.071	0.009	1.171	0.083	0.123	Ok
Proposed Terminal Manhole TM2	MH DF1.02	350	1	3.5	30.500	30.480	0.667	150.000	A2	3,190	3,190	947.43	947.43	1.3	1,231.66	-	4562	6	0.086	0.096	0.006	1.513	0.146	0.586	Ok
Proposed Terminal Manhole TM3 (Utilized TM3 to replace existing MH DF 2.02)	MH DF2.03	355	1	22.0	29.880	29.740	0.667	150.000	A3	3,190	3,190	947.43	947.43	1.3	1,231.66	-	4562	6	0.086	0.099	0.006	1.234	0.122	0.701	Ok

Notes:
1. Contributing Population = Accu. ADWF*24*3600/0.27, the peak flow factor refer to contributing population
2. The Colebrook-White Equation is used to determine the velocity

$$V = -\sqrt{(8\,gDs)}\log\left(\frac{k_s}{3.7D} + \frac{2.51\nu}{D\sqrt{(2\,gDs)}}\right)$$

V = mean velocity (m/s); g = gravitational acceleration (m/s2); R = hydraulic radius (m); D = pipe diameter (m); k_s = roughness (m); ν = kinematic viscosity of fluid (m^2/s); s = frictional slope (energy gradient due to frictional loss)

3. The derivation of backwash flow from swimming pools are presended in Appendix F
4. Inner diameter of 300mm is assumed for DN355 HDPE pipe

Table 3 Sewerage Impact Assessment after Proposed Development with Imporvement

Existing Sewerage System

Roughness Coefficient for Exisiting Sewer (<600mm) , KS = 3.00 mm (Slimmed Clayware in Poor Condition)
Roughness Coefficient for Upgraded/ New Pipe, K_S = 1.50 mm (HDPE Pipe in Poor Condition)
Roughness Coefficient, K_S = 0.15 mm (Ductile iron, polyethylene lining, push-fit joints in Poor Condition)
Kinematic Viscosity, n = 0.000001 m^2/sec @ 20°C

US Manhole	DS Manhole	Pipe Size (mm) (a)	No. of Pipe (b)	Approx. Length (m)	US I.L. (mPD)	DS I.L. (mPD)	Gradient %	Gradient 1 in	Catchment Increment	Population Increment	Population Accu.	ADWF (m^3/day) Increment	ADWF (m^3/day) Accu. (c)	Catchment Factor Pcif (d)	$Q_{AVERAGE}$ (m3/day) (e) =(c) x (d)	Backwash Flow Rate from Swimming Pools (m3/min) (m)	Contributing Population (f) = (e) /0.27	Peak Flow Factor (h)	PDWF (m^3/s) (i) = (e) x (h)/3600/24) + (m) / 60	Area of Flow (m^2) (j) =((a)^2 /4) x(b) x π /100000	Slope	Velocity (m/s) (k)	Capacity (m^3/s) (l) = (j) x (k)	Peak Flow/ Capacity (i) / (l)	Capacity> ADWF ?
TM1	FMH4016441	300	1	44.0	30.10	29.71	0.9	112.8	A1	504	504	94.12	94.12	1.3	122.36	-	453	8	0.011	0.071	0.009	1.171	0.083	0.136	Ok
FMH4016441	FI. 1(Ph12)	300	1	6.4	29.71	29.62	1.4	73.6			504		94.12	1.3	122.36	-	453	8	0.011	0.071	0.014	1.450	0.103	0.110	Ok
FI. 1(Ph12)	FI. 7a(Ph11)	300	1	15.2	29.36	29.06	2.0	50.8			504		94.12	1.3	122.36	-	453	8	0.011	0.071	0.020	1.745	0.123	0.092	Ok
FI. 7a(Ph11)	FI.7	400	1	12.6	29.02	28.89	1.0	100.0	E	4017	4521	812.44	906.56	1.3	1178.53	-	4365	6	0.082	0.126	0.010	1.506	0.189	0.433	Ok
FI.7	FI.8	400	1	19.5	28.89	28.70	1.0	100.0			4521		906.56	1.3	1178.53	-	4365	6	0.082	0.126	0.010	1.506	0.189	0.433	Ok
FI.8	FI.9	400	1	12.9	28.70	28.48	1.7	60.0			4521		906.56	1.3	1178.53	-	4365	6	0.082	0.126	0.017	1.945	0.244	0.335	Ok
FI.9	FI.10	400	1	17.6	28.48	28.19	1.7	60.1			4521		906.56	1.3	1178.53	-	4365	6	0.082	0.126	0.017	1.944	0.244	0.335	Ok
FI.10	TMF1	400	1	9.8	28.04	27.83	2.1	47.1			4521		906.56	1.3	1178.53	-	4365	6	0.082	0.126	0.021	2.196	0.276	0.297	Ok
TMF1	FMH4016483	450	1	22.0	27.68	26.63	4.7	21.0	F	8292	12813	1744.25	2650.81	1.3	3446.05	-	12763	4	0.160	0.159	0.048	3.564	0.567	0.281	Ok
FMH4016483	FMH4016445	450	1	8.0	26.63	24.42	27.6	3.6			12813		2650.81	1.3	3446.05	-	12763	4	0.160	0.159	0.276	8.569	1.363	0.117	Ok
FMH4016445	FMH4016446	450	1	4.0	24.42	22.08	58.5	1.7			12813		2650.81	1.3	3446.05	-	12763	4	0.160	0.159	0.585	12.471	1.983	0.080	Ok
FMH4016446	FMH4084547	450	1	3.0	22.08	21.02	35.3	2.8			12813		2650.81	1.3	3446.05	-	12763	4	0.160	0.159	0.353	9.691	1.541	0.104	Ok
FMH4084547	FMH4084548	450	1	3.0	21.02	20.39	21.0	4.8			12813		2650.81	1.3	3446.05	-	12763	4	0.160	0.159	0.210	7.471	1.188	0.134	Ok
FMH4084548	FMH4084580	450	1	8.0	20.13	19.88	3.1	32.0			12813		2650.81	1.3	3446.05	-	12763	4	0.160	0.159	0.031	2.880	0.458	0.348	Ok
FMH4084580	FMH4084581	450	1	51.0	19.58	19.07	1.0	100.0	H	1,718	14531	374.27	3025.08	1.3	3932.60	-	14565	4	0.182	0.159	0.010	1.628	0.259	0.703	Ok
FMH4084581	FMH4084582	450	1	37.5	18.77	18.02	2.0	50.0	G,H	2,841	17372	613.61	3638.69	1.3	4730.30	-	17520	4	0.219	0.159	0.020	2.304	0.366	0.598	Ok
FMH4084582	FMH4016450	450	1	17.1	18.02	17.45	3.3	30.0	G	1,967	19339	422.86	4061.55	1.3	5280.02	-	19556	4	0.244	0.159	0.033	2.975	0.473	0.517	Ok
FMH4016450	FMH4016451	450	1	39.0	17.45	17.01	1.1	88.6	G		19339	25.20	4086.75	1.3	5312.78	-	19677	4	0.246	0.159	0.011	1.730	0.275	0.894	Ok
FMH4016451	FMH4016452	450	1	26.0	15.99	15.18	3.1	32.1	H	941	20280	203.37	4290.12	1.3	5577.16	-	20656	4	0.258	0.159	0.031	2.876	0.457	0.565	Ok
FMH4016452	FMH4045054	525	1	5.0	15.18	14.47	14.2	7.0			20280		4290.12	1.3	5577.16	-	20656	4	0.258	0.216	0.142	6.797	1.471	0.176	Ok
FMH4045054	FMH4016656	525	1	27.0	15.18	14.47	2.6	38.0	I	3,166	23446	669.67	4959.79	1.3	6447.73	-	23880	4	0.299	0.216	0.026	2.924	0.633	0.472	Ok
FMH4016656	FMH4016453	525	1	7.0	14.47	14.35	1.7	58.3	J, K	2,243	25689	426.12	5385.91	1.3	7001.68	-	25932	4	0.324	0.216	0.017	2.360	0.511	0.634	Ok
FMH4016453	FMH4077723	600	1	28.0	14.35	14.19	0.6	170.7	J	2,877	28566	546.63	5932.54	1.3	7712.30	-	28564	4	0.357	0.283	0.006	1.504	0.425	0.840	Ok
FMH4077723	FMH4016454	600	1	16.0	14.16	14.04	0.7	137.9			28566		5932.54	1.3	7712.30	-	28564	4	0.357	0.283	0.007	1.674	0.473	0.755	Ok
FMH4016454	FMH4077722	600	1	17.0	14.04	13.62	2.5	40.3	K	446	29012	120.42	6052.96	1.3	7868.85	-	29144	4	0.364	0.283	0.025	3.099	0.876	0.416	Ok
FMH4077722	FMH4016455	600	1	17.0	13.60	13.11	2.9	35.1			29012		6052.96	1.3	7868.85	-	29144	4	0.364	0.283	0.029	3.323	0.940	0.388	Ok
FMH4016455	FMH4016456	600	1	40.0	15.24	13.24	5.0	20.0			29012		6052.96	1.3	7868.85	-	29144	4	0.364	0.283	0.050	4.400	1.244	0.293	Ok
FMH4016456	FMH4016457	600	1	40.0	13.24	12.50	1.9	54.1			29012		6052.96	1.3	7868.85	-	29144	4	0.364	0.283	0.019	2.675	0.756	0.482	Ok
FMH4016457	FMH4016458	600	1	24.0	12.50	11.59	3.8	26.4	L	476	29488	128.52	6181.48	1.3	8035.92	-	29763	4	0.372	0.283	0.038	3.831	1.083	0.344	Ok
FMH4016458	FMH4016459	600	1	26.0	11.59	9.76	7.0	14.2	M	819	30307	224.33	6405.81	1.3	8327.55	-	30843	4	0.386	0.283	0.070	5.221	1.476	0.261	Ok
FMH4016459	FMH4016460	600	1	17.0	9.76	9.23	3.1	32.1			30307		6405.81	1.3	8327.55	-	30843	4	0.386	0.283	0.031	3.474	0.982	0.393	Ok
FMH4016460	FMH4016461	600	1	12.0	9.23	8.98	2.1	48.0	O	1030	31337	284.87	6690.68	1.3	8697.88	-	32214	4	0.403	0.283	0.021	2.839	0.803	0.501	Ok
TM3	MH DF2.03	355	1	22.0	29.88	29.74	0.7	150.0	A3	3190	3190	947.43	947.43	1.3	1231.66	-	4562	6	0.086	0.099	0.007	1.263	0.125	0.684	Ok
MH DF2.03	MH DF2.04	355	1	18.4	29.74	29.61	0.7	150.0	B3, B5	1102	4292	209.38	1156.81	1.3	1503.85	-	5570	5	0.087	0.099	0.007	1.263	0.125	0.696	Ok
MH DF2.04	MH DF2.05	355	1	12.0	29.61	29.53	0.7	150.0			4292		1156.81	1.3	1503.85	-	5570	5	0.087	0.099	0.007	1.263	0.125	0.696	Ok
MH DF2.05	MH DF1.07	355	1	6.5	29.53	29.45	1.2	81.3			4292		1156.81	1.3	1503.85	-	5570	5	0.087	0.099	0.012	1.696	0.168	0.518	Ok
MH DF1.02	MH DF1.03	350	1	18.5	30.48	30.39	0.5	200.0	A2	3190	3190	947.43	947.43	1.3	1231.66	-	4562	6	0.086	0.096	0.005	1.412	0.136	0.629	Ok
MH DF1.03	MH DF1.04	350	1	22.0	30.39	30.28	0.5	200.0	B1	922	4112	175.18	1122.61	1.3	1459.39	-	5405	5	0.084	0.096	0.005	1.412	0.136	0.621	Ok
MH DF1.04	MH DF1.05	375	1	15.2	30.20	30.10	0.7	142.1			4112		1122.61	1.3	1459.39	-	5405	5	0.084	0.110	0.007	1.210	0.134	0.630	Ok
MH DF1.05	MH DF1.06	375	1	17.6	30.10	29.98	0.6	155.8			4112		1122.61	1.3	1459.39	-	5405	5	0.084	0.110	0.006	1.156	0.128	0.660	Ok
MH DF1.06	MH DF1.06a	375	1	35.2	29.98	29.72	0.8	132.8	B2	728	4840	138.32	1260.93	1.3	1639.21	-	6071	5	0.095	0.110	0.008	1.252	0.138	0.687	Ok
MH DF1.06a	MH DF1.07	375	1	40.0	29.72	29.45	0.7	150.9			4840		1260.93	1.3	1639.21	-	6071	5	0.095	0.110	0.007	1.174	0.130	0.730	Ok
MH DF1.07	MH F3.6	450	1	8.0	29.38	29.33	0.6	181.8	A3, B3, B5, B4	4822	9662	1257.51	2518.44	1.3	3273.97	-	12126	4	0.152	0.159	0.006	1.207	0.192	0.789	Ok
MH F3.6	M.H. FC	450	1	8.0	29.32	29.26	0.7	133.3			9662		2518.44	1.3	3273.97	-	12126	4	0.152	0.159	0.007	1.410	0.224	0.677	Ok
M.H. FC	FLH4026942	450	1	45.2	29.26	28.60	1.5	68.4			9662		2518.44	1.3	3273.97	-	12126	4	0.152	0.159	0.015	1.969	0.313	0.484	Ok
FLH4026942	FMH4084602	450	1	10.9	28.60	28.55	0.5	217.2			9662		2518.44	1.3	3273.97	-	12126	4	0.152	0.159	0.005	1.104	0.176	0.861	Ok
FMH4084602	FMH4084601	450	1	32.1	28.54	28.41	0.4	247.1			9662		2518.44	1.3	3273.97	-	12126	4	0.152	0.159	0.004	1.035	0.165	0.919	Ok
FMH4084601	FMH4016665	450	1	6.8	28.36	28.27	1.3	75.4			9662		2518.44	1.3	3273.97	-	12126	4	0.152	0.159	0.013	1.875	0.298	0.509	Ok
FMH4016665	FMH4016272	600	1	12.7	28.27	27.81	3.6	27.5			9662		2518.44	1.3	3273.97	-	12126	4	0.152	0.283	0.036	3.749	1.060	0.143	Ok
FHM4016272	FHM4016273	600	1	19.5	27.81	27.58	1.2	84.7	A	18058	27720	4032.79	6551.23	1.3	8516.60	5.09	31543	4	0.479	0.283	0.012	2.136	0.604	0.793	Ok
FHM4016273	FHM4016274	600	1	24.7	25.50	25.18	1.3	77.2			27720		6551.23	1.3	8516.60	-	31543	4	0.479	0.283	0.013	2.237	0.633	0.757	Ok
FHM4016274	FHM4016275	675	1	29.7	23.87	23.08	2.7	37.5			27720		6551.23	1.3	8516.60	-	31543	4	0.479	0.358	0.027	3.466	1.240	0.386	Ok
FHM4016275	FHM4016276	675	1	31.8	22.77	22.27	1.6	63.6			27720		6551.23	1.3	8516.60	-	31543	4	0.479	0.358	0.016	2.663	0.953	0.503	Ok
FHM4016276	FMH4016465	675	1	27.9	20.42	18.03	8.6	11.7			27720		6551.23	1.3	8516.60	-	31543	4	0.479	0.358	0.086	6.220	2.226	0.215	Ok
FMH4016465	FMH4016277	675	1	4.8	18.03	17.88	3.2	31.7	D	810	28530	47.04	6598.27	1.3	8577.75	-	31769	4	0.482	0.358	0.032	3.775	1.351	0.357	Ok
FMH4016277	FMH4016278	675	1	25.1	17.88	17.42	1.8	54.5	C	5300	33830	1007.00	7605.27	1.3	9886.85	-	36618	4	0.543	0.358	0.018	2.876	1.029	0.527	Ok
FMH4016278	FMH4016279	675	1	30.2	15.89	15.28	2.0	49.6			33830		7605.27	1.3	9886.85	-	36618	4	0.543	0.358	0.020	3.016	1.079	0.503	Ok
FMH4016279	FMH4016280	675	1	29.1	13.79	13.43	1.2	80.7			33830		7605.27	1.3	9886.85	-	36618	4	0.543	0.358	0.012	2.364	0.846	0.641	Ok
FMH4016280	FMH4016281	750	1	60.0	12.12	9.01	5.2	19.3			33830		7605.27	1.3	9886.85	-	36618	4	0.543	0.442	0.052	5.176	2.287	0.237	Ok
FMH4016281	FMH4016282	750	1	91.0	9.01	7.18	2.0	49.7	E-O, A1	31,337	65167	6,690.68	14295.95	1.3	18584.74	-	68832	4	0.832	0.442	0.020	3.224	1.424	0.585	Ok

Proposed Sewerage System

US Manhole	DS Manhole	Pipe Size (mm) (a)	No. of Pipe (b)	Approx. Length (m)	US I.L. (mPD)	DS I.L. (mPD)	Gradient %	Gradient 1 in	Catchment Increment	Population Increment	Population Accu.	ADWF (m^3/day) Increment	ADWF (m^3/day) Accu. (c)	Catchment Factor Pcif (Refer to Table T-4 of Appendix D) (d)	$Q_{AVERAGE}$ (m3/day) (e) =(c) x (d)	Backwash Flow Rate from The Sparkle (m3/min) (m)	Contributing Population (f) = (e) /0.27	Peak Flow Factor (Refer to Table T-5 of Appendix D) (h)	PDWF (m^3/s) (i) = ((e) x (h)/3600/24) + (m)/60	Area of Flow (m^2) (j) =((a)^2 /4) x(b) x π /100000	Slope	Velocity (m/s) (k)	Capacity (m^3/s) (l) = (j) x (k)	Peak Flow/ Capacity (i) / (l)	Capacity> ADWF ?
Proposed Terminal Manhole TM1 (Utilized TM1 to replace existing FMH4016440)	FMH4016441	300	1	44.0	30.100	29.710	0.900	112.800	A1	504	504	84.72	84.72	1.3	110.14	-	408	8	0.010	0.071	0.009	1.171	0.083	0.123	Ok
Proposed Terminal Manhole TM2	MH DF1.02	350	1	3.5	30.500	30.480	0.667	150.000	A2	3190	3190	947.43	947.43	1.3	1,231.66	-	4562	6	0.086	0.096	0.006	1.513	0.146	0.586	Ok
Proposed Terminal Manhole TM3 (Utilized TM3 to replace existing MH DF 2.02)	MH DF2.03	355	1	22.0	29.880	29.740	0.667	150.000	A3	3190	3190	947.43	947.43	1.3	1,231.66	-	4562	6	0.086	0.099	0.006	1.234	0.122	0.701	Ok

Notes:
1. Contributing Population = Accu. ADWF*24*3600/0.27, the peak flow factor refer to contributing population
2. The Colebrook-White Equation is used to determine the velocity

$$V = -\sqrt{(8\,gDs)}\log\left(\frac{k_s}{3.7\,D} + \frac{2.51\,v}{D\sqrt{(2\,gDs)}}\right)$$

V = mean velocity (m/s); g = gravitational acceleration (m/s2); R = hydraulic radius (m); D = pipe diameter (m); k_s = roughness (m); v = kinematic viscosity of fluid (m^2/s); s = frictional slope (energy gradient due to frictional loss)

3. The derivation of backwash flow from swimming pools are presended in Appendix F
4. Inner diameter of 300mm and 355mm is assumed for DN355 HDPE pipe and DN400 HDPE pipe respectively.

Appendix D
Reference Tables from EPD's Guidelines Section 7

Table T-1 Unit Flow Factor for Domestic Flows

Location	Unit	Datum (2002) (m^3/d)	Increase per Annum (m3/d)	Planning for Future (m^3/day)
Domestic (housing type specific)				
Public rental	Person	0.19	-	0.19
Private R1	Person	0.19	-	0.19
R2	Person	0.27	-	0.27
R3	Person	0.34	0.003	0.37
R4	Person	0.34	0.003	0.37
Traditional Village	Person	0.15	-	0.15
Modern Village	Person	0.27	-	0.27
Institutional and special class	Person	0.19	-	0.19
Temporary and non-domestic	Person	0.15	-	0.15
Mobile residents	Person	0.19	-	0.19
Domestic (catchment specific)				
General- Permanent housing (for catchment wide planning)				
- Sandy Bay	Person	0.32	0.003	0.35
- Stanley, Discovery Bay	Person	0.29	-	0.29
- Shek O	Person	0.28	0.007	0.35
- Outlying Islands, Sai Kung	Person	0.26	0.001	0.27
- Yuen Long, Mui Wo	Person	0.23	0.002	0.25
- Aberdeen, Wan Chai, North Lantau	Person	0.23	-	0.23
- Sha Tin, Tai Po	Person	0.21	-	0.22
- San Wai	Person	0.20	0.003	0.23
-Wah Fu, Shek Wu Hui	Person	0.20	0.001	0.21
- Northwest Kowloon, Tuen Mun, Central, North Point	Person	0.20	-	0.20
- Ap Lei Chau, Chai Wan, Shau Kei Wan, Central Kowloon, East Kowloon, Kwai Chung, Tsing Yi, Tseung Kwan O	Person	0.19	-	0.19
General – Other housing (catchment wide planning				
- All catchments	person	0.175	-	0.175

Notes of Table 1:

(1) For planning a new sewerage system, the planning unit flow factors should be used. Adequate allowance should be provided in the proposed sewerage system to ensure that the sewerage system will be adequate for the worst possible future development scenarios.

(2) Permanent housing comprises public rental housing, subsidized sales flats and private permanent housing (R1, R2, R3 and R4). Other housing consists of non-domestic, institutional & special classes, and temporary housing.

Table T-2 : Unit Flow Factors of Commercial Flows and Student Flows

Location	Unit	Planning For Future (m3/d)
Commercial employee	Employee	0.08
Commercial employee		
(a) Specific trades:	Employee	
J2 Electricity Gas & Water	Employee	0.250
J3 Transport, Storage & Communication	Employee	0.100
J4 Wholesale & Retail	Employee	0.200
J5 Import & Export	Employee	-
J6 Finance, Insurance, Real Estate & Business Services	Employee	-
J7 Agriculture & Fishing	Employee	-
J8 Mining & Quarrying	Employee	-
J9 Construction	Employee	0.150
J10 Restaurants & Hotels	Employee	1.500
J11 Community, Social & Personal Services	Employee	0.200
J12 Public Administration	Employee	-
(b) General –territorial average	Employee	0.200
School student	Person	0.040

Notes of Table T-2:

(1) For planning of a new sewerage system, the planning unit flow factors should be used and the worst possible combination of commercial flows for the future development scenarios should be considered to ensure that the sewerage system under planning will be sustainable.

(2) For job types J10 and J11, the “per-employee” unit flow factor takes into account the flows of customers and/or tenants.

(3) The total unit flow generated from an employee in a particular trade is the sum of the unit flow factor of employee and the unit flow factor of commercial activities of a particular trade under consideration.

Table T-3 : Unit Flow Factors for Industrial Flows

	Unit	Datum (2002) (m^3/day)	Increase per Annum (m^3/day)	Planning for Future (m^3/day)
Industrial employee	employee	0.080		0.080
Industrial activities J1 Manufacturing		See Note 1		See Note 1
- Territorial average	employee	0.560	-	0.560
- Hong Kong Island (except Aberdeen & Ap Lei Chau), San Po Kong(3)	employee	0.250	-	0.250
- North West Kowloon	employee	0.350	-	0.450
- East Kowloon (everall), Sha Tin, Lantau Island (except Mui Wo)	employee	0.450	-	0.450
- Cental Kowloon, North District, Aberdeen, Ap Lei Chau	employee	0.550	-	0.550
- Tsuen Wan, Kwai Chung	employee	0.650	-	0.650
- Tai Po	employee	0.750	-	0.750
- Tuen Mun, Tseung Kwan O, Yau Tong(3), Cheung Chau, Mui Wo	employee	1.000	-	1.000
- Tsing Yi	employee	1.500	-	1.500
- Sai Kung, Yuen Long	employee	2.000	-	2.000

Notes of Table T-3:

(1) Quantities of industrial discharges depend on the natures of individual industries. Local industrial discharges may vary significantly from one industrial premises to another and are best determined by updated flow survey data and water consumption records. The catchment-dependent unit flow factors for industrial flows in this table provide a means to estimate industrial flows for a catchment-wide sewerage facility, such as sewage treatment works and major sewage pumping stations. They may form a basis for refinement and adjustments when suitable latest survey results and water consumption data are available. They would be subject to periodic updates of EPD. As the actual per-employee unit flow factor of any local industrial area may vary significantly from these unit flow factors, caution must be taken in applying these factors direct to any local individual industrial premises.

(2) The total unit flow generated from an employee in a particular trade is the sum of the flows due to the employee and the unit flow factor for a particular trade under consideration.

(3) Yau Tong and San Po Kong are sub-catchments of the East Kowloon catchment. Figures are provided for reference for planning local sewage infrastructure.

Table T-4 : Catchment Inflow Factors, P_{CIF}

Catchment	Catchment Inflow Factor
Central, North Point, Sandy Bay, Wan Chai, Wah Fu, Stanley, Cental Kowloon, Yuen Long, San Wai, North District, Tai Po, North Lantau, Mui Wo	1.00
Chai Wan, Tuen Mun, Kwai Chung, Tsing Yi, East Kowloon	1.10
Sha Tin	1.15
Tseung Kwan O	1.20
Shau Kei Wan	1.25
Aberdeen, Ap Lei Chau, Sai Kung, North West Kowloon	1.30
Cheung Chau, Shek O	1.50

Notes of Table T-4:

(1) Catchment inflow factors will be updated regularly by EPD.

(2) For calculating the total peak flow from a new development area within a catchment of high inflow factors, the catchment inflow factor may not be applicable to the new development. However, it will be applicable in assessing the downstream existing sewerage facilities.

Table T-5 : Peaking Factors, P

Population Range	Peaking Factor (including stormwater allowance) for facility with existing upstream sewerage	Peaking Factor (excluding stormwater allowance) for facility with new upstream sewerage
(a) For sewers		
<1,000	8	6
1,000 – 5,000	6	5
5,000 – 10,000	5	4
10,000 – 50,000	4	3
>50,000	$\text{Max}\left(\frac{7.3}{N^{0.15}}, 2.4\right)$	$\text{Max}\left(\frac{6}{N^{0.175}}, 1.6\right)$
(b) Sewage Treatment Works, Preliminary Treatment Works and Pumping Stations		
<10,000	4	3
10,000 – 25,000	3.5	2.5
25,000 – 50,000	3	2
>50,000	$\text{Max}\left(\frac{3.9}{N^{0.065}}, 2.4\right)$	$\text{Max}\left(\frac{2.6}{N^{0.065}}, 1.6\right)$

Notes of Table T-5:

(1) N is the contributing population in thousands.

Appendix E
Source of Reference for Population and Flow Factor

Average household size[1]

No. of persons

	2010	2015	2020
All types of housing	**2.9**	**2.9**	**2.8**
Public permanent housing[2]	3.0	2.9	2.8
Rental housing	*2.9*	*2.7*	*2.7*
Subsidised sale flats	*3.2*	*3.1*	*2.8*
Private permanent housing[3]	2.9	2.9	2.8
Temporary housing[4]	2.5	2.5	2.6

Stock of flats by type of permanent housing

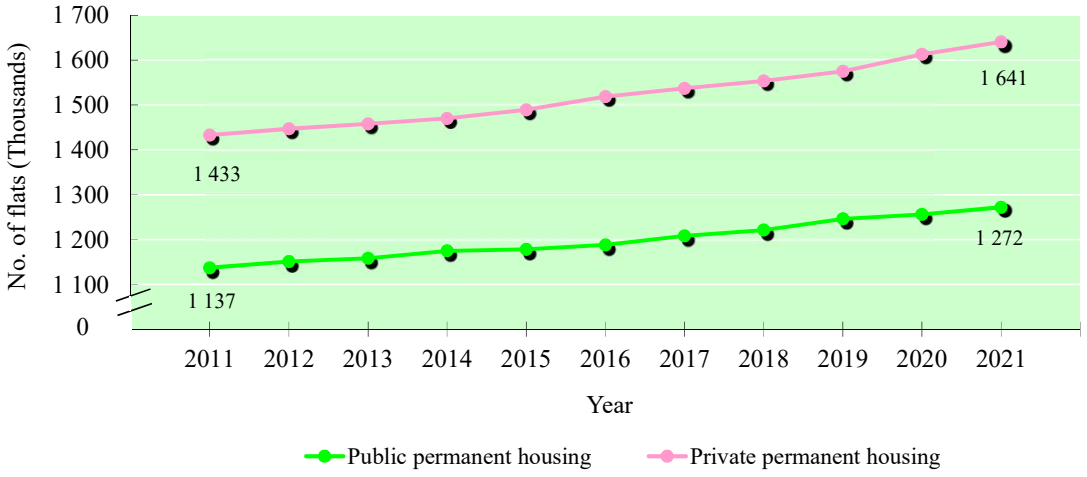
(as at end March of the year)

Thousands ('000)

	2011	2016	2021
Overall	**2 570**	**2 707**	**2 913**
Public permanent housing[5]	1 137	1 188	1 272
Rental housing	*746*	*789*	*844*
Subsidised sale flats	*391*	*399*	*428*
Private permanent housing[6]	1 433	1 519	1 641

Stock of flats in public and private permanent housing

(as at end March of the year)



Stock of HA PRH flats by age of block

(as at end March of the year)

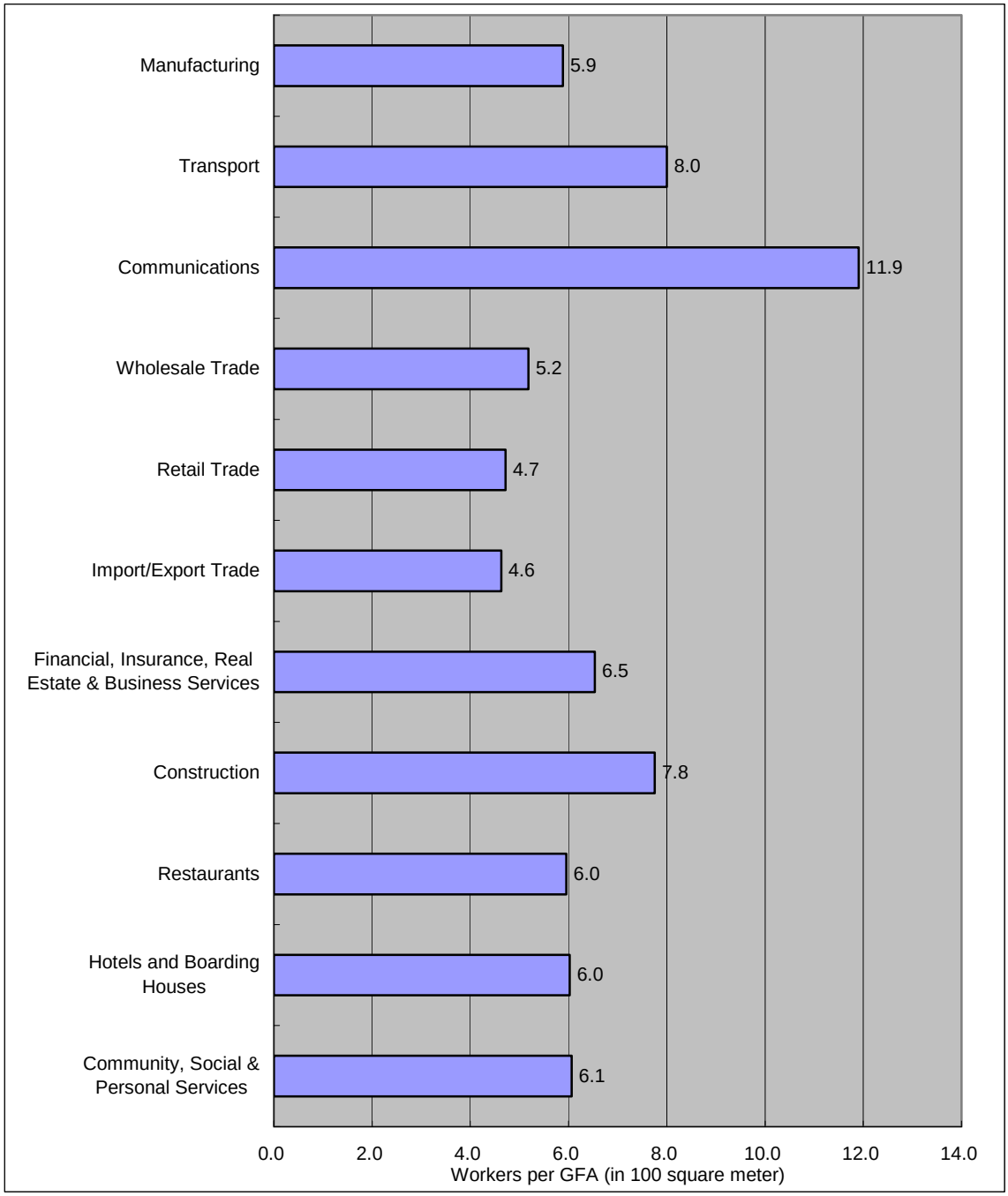
Thousands ('000)

	2011	2016	2021
Overall	**708**	**750**	**805**
0 - 5 years	74	71	77
6 - 10 years	141	68	62
11 - 15 years	85	140	68
16 - 20 years	90	84	139
21 - 25 years	69	86	84
26 - 30 years	130	59	83
31 - 35 years	83	129	51
36 years and over	35	114	241

Non-Grade A Offices

For Non-Grade A Offices, industry groups with higher worker density included Communications (11.9), Transport (8.0) and Construction (7.8). (Figure 12)

Figure 12: Worker Density in Non-Grade A Offices by Industry Group



Notional Staffing Establishment

Home Care Services for Frail Elderly Persons[1]	
Capacity: 70 places	
Rank / Post	**No. of Staff**
Social Work Officer	0.125
Assistant Social Work Officer	0.70
Social Work Assistant	1.00
Registered Nurse	1.60
Enrolled Nurse	1.50
Occupational Therapist I / Physiotherapist I	0.260
Occupational Therapist II / Physiotherapist II	1.00
Speech Therapist	0.417
Dietitian	0.50
Personal Care Worker	7.408
Clerical Assistant	1.00

Remarks: The above notional staffing establishment is used solely for the purpose of calculating recurrent subvention and should not be used for benchmarking the manpower and staff mix of the subvented service unit. Non-governmental organisations have the flexibility to deploy subvention and arrange suitable manpower to meet the requirements as set out in Funding and Service Agreements and are accountable for the service and staffing needs.

[1] Home Care Services for Frail Elderly Persons refer to Enhanced Home and Community Care Services or Integrated Home Care Services (Frail Cases).

Notional Staffing Establishment

Youth Outreaching Team	
Capacity : N.A.	
Ranks/Posts	**No. of Staff**
Social Work Officer	1
Assistant Social Work Officer	4
Social Work Assistant	6
Assistant Clerical Officer	1
Clerical Assistant	1
Office Assistant	1

Remarks: The above notional staffing establishment is used solely for the purpose of calculating recurrent subvention and should not be used for benchmarking the manpower and staff mix of the subvented service unit. Non-governmental organisations, which are held publicly accountable for use of public funds, have the flexibility to deploy subvention and arrange suitable manpower to meet the requirements as set out in Funding and Service Agreements and are accountable for the service and staffing needs.

Notional Staffing Establishment

Integrated Community Centre for Mental Wellness (ICCMW)	
Scale: One Notional Team	
Ranks/ Posts	**No. of Staff**
Social Work Officer	1.56
Assistant Social Work Officer	10.08
Social Work Assistant	9.2
Registered Nurse (Psychiatric)	2
Occupational Therapist I	1.13
Occupational Therapist II	1
Occupational Therapist Assistant	2
Welfare Worker	6.13
Clerical Assistant	1
Workman II	1

Remarks: The above notional staffing establishment is used solely for the purpose of calculating recurrent subvention and should not be used for benchmarking the manpower and staff mix of the subvented service unit. Non-governmental organisations, which are held publicly accountable for use of public funds, have the flexibility to deploy subvention and arrange suitable manpower to meet the requirements as set out in Funding and Service Agreements and are accountable for the service and staffing needs.

Notional Staffing Establishment

Community Rehabilitation Day Centre (CRDC)	
Capaicty: a centre serving 60 daily attendance in rehabilitation training programme and 5 places in day care service for severely disabled persons	
Ranks/ Posts	**No. of Staff**
Social Work Officer	0.24
Occupational Therapist I/ Physiotherapist I	1
Social Work Assistant	1
Registered Nurse	1
Physiotherapist II	1
Occupational Therapist II	1.25
Occupational Therapist Assistant	1.5
Welfare Worker	1.5
Motor Driver	2
Personal Care Worker	3.952
Workman II	1

Remarks: The above notional staffing establishment is used solely for the purpose of calculating recurrent subvention and should not be used for benchmarking the manpower and staff mix of the subvented service unit. Non-governmental organisations, which are held publicly accountable for use of public funds, have the flexibility to deploy subvention and arrange suitable manpower to meet the requirements as set out in Funding and Service Agreements and are accountable for the service and staffing needs.

Notional Staffing Establishment[1]

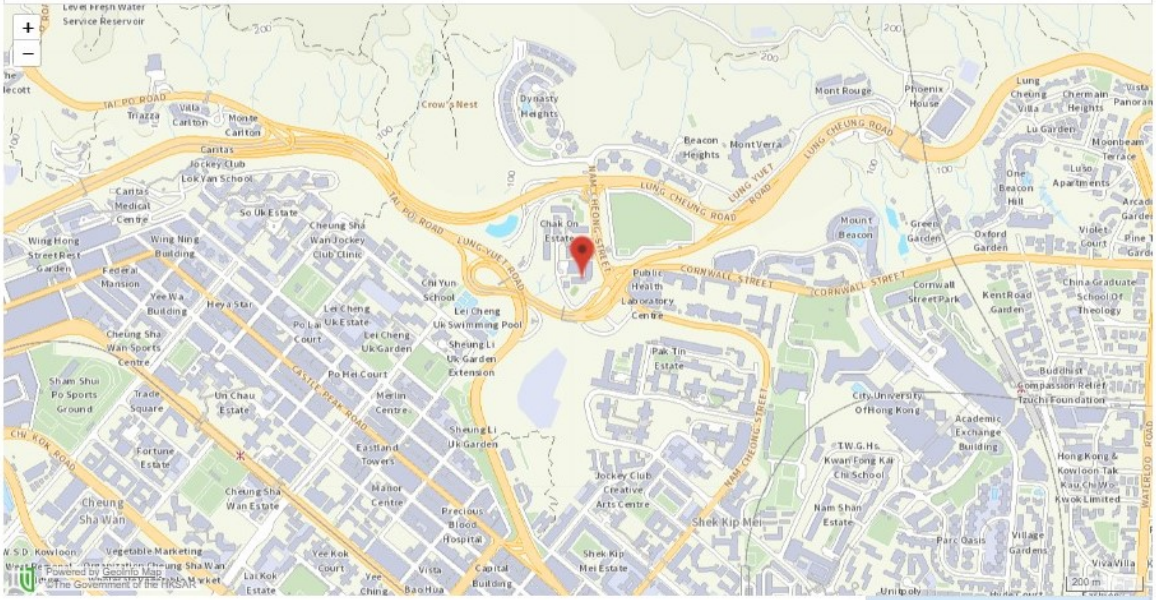
District Elderly Community Centre (DECC)	
Capacity: Not applicable	
Ranks/ Posts	**No. of Staff**
Social Work Officer	1
Nursing Officer [2]	0.5
Occupational Therapist I/ Physiotherapist I	1
Assistant Social Work Officer	5
Senior Social Work Assistant	3
Social Work Assistant	5
Senior Welfare Worker	1
Welfare Worker	1
Personal Care Worker	2
Clerical Officer II/ Assistant Clerical Officer	1
Clerical Assistant	1
Workman II	3

Remarks:

[1] The above notional staffing establishment is used solely for the purpose of calculating recurrent subvention and should not be used for benchmarking the manpower and staff mix of the subvented service unit. Non-governmental organisations, which are held publicly accountable for use of public funds, have the flexibility to deploy subvention and arrange suitable manpower to meet the requirements as set out in Funding and Service Agreements and are accountable for the service and staffing needs.

[2] Nursing Officer is equivalent to Advanced Practicing Nurse under Dementia Community Support Scheme (DCSS) which is classified as essential staff under the Funding and Service Agreement of DCSS.

Chak On Estate, Sham Shui Po, Kowloon



Type of Estate:	Public Rental Housing	
Year of Intake:	1983	
Type(s) of Block(s):	Old Slab, Single I	
No. of Blocks:	4	
Name of Block(s):	Fu Chak House Wing Chak House	Lai Chak House Wah Chak House
No. of Rental Flats:	1 900 As at 31.3.2022	
Flat Size (m^2):	11.3 - 39.1	
No. of Households:	1 800 As at 31.3.2022	
Authorised Population:	3 800 As at 31.3.2022	
Estate Management Advisory Committee	Formed	

Quick Links

Learn More About

› Typical floor plans

Dynasty Heights

Dynasty Heights

帝景峰

8 Yin Ping Road

S.A. GFA

Transaction

*According to avg. price in Centaline Find Property

Price/ ft² by trans. (S.A.) in Apr

$19,349/ft² Previous Month --

Price by listing

$9.3M - **$75**M

Transactions Volume

2

Price/ ft² by listing

$16,077 - $37,961/ft²

Sell (34 Records)

Rent/ ft² by trans. (S.A.) in Apr

$-- Previous Month --

Rent by listing

$23,000 - $50,000

Transactions Volume

--

Rent/ ft² by listing

$37 - $44/ft²

Rent (6 Records)

Photo Floor Plan

Dynasty Heights Introduction

DYNASTY HEIGHTS is located in Sham Shui Po District (Address: 8 YIN PING ROAD, HMA: Lung Ping). The Date of Occupation starts from 1997.11.16. There are a total of 3 phases, 22 blocks, providing 592 residential units. The saleable area of DYNASTY HEIGHTS ranges from 435 sq.ft. to 2,404 sq.ft. . Primary One Admission School Net for DYNASTY HEIGHTS is 40. DYNASTY HEIGHTS belongs to Sham Shui Po District for Secondary School Places Allocation Scheme.

Estate Info

1997/11 - 1999/1	3 Phase(s)	22 Block(s)	592
Date of Occupation Permit	No. of Phases	No. of Blocks	No. of Units

Address/ Area 8 Yin Ping Road

Category Club

School Net Primary: 40 · Secondary: Sham Shui Po District

Developer CHINA OVERSEAS/SINO/NAN FUNG/CHINACHEM GROUP/發展置地

Other Facilities

Swimming Pool、Tennis Court、Terrence Garden

Beacon Heights

畢架山花園

1-19 Lung Ping Road

S.A. GFA

Transaction

*According to avg. price in Centaline Find Property

Price/ ft² by trans. (S.A.) in Apr

$14,011/ft² Previous Month ↓ 5.75%

Price by listing

$12.8M - $27.5M

Transactions Volume

1

Price/ ft² by listing

$14,144 - $28,263/ft²

Sell (25 Records) >

Rent/ ft² by trans. (S.A.) in Apr

$-- Previous Month --

Rent by listing

$27,000 - $80,000

Transactions Volume

--

Rent/ ft² by listing

$30 - $73/ft²

Rent (15 Records) >

Photo Floor Plan

Beacon Heights Introduction

BEACON HEIGHTS is located in Sham Shui Po District (Address: 1-19 LUNG PING ROAD, HMA: Lung Ping). The Date of Occupation starts from 1985.08.13. There are a total of 14 blocks, providing 642 residential units. The saleable area of BEACON HEIGHTS rangesfrom 807 sq.ft. to 1,312 sq.ft. . Primary One Admission School Net for BEACON HEIGHTS is 40. BEACON HEIGHTS belongs to Sham Shui Po District for Secondary School Places Allocation Scheme.

Estate Info

1985/8 - 1987/6	14 Block(s)	642
Date of Occupation Permit	No. of Blocks	No. of Units

Address/ Area 1-19 Lung Ping Road

School Net Primary: 40 - Secondary: Sham Shui Po District

Developer SWIRE

Other Facilities

Swimming Pool、Tennis Court、Landscape Garden

MONT ROUGE 1st Hand Trans. Record (Land Reg.)

Latest Status

Calculated based on S.A.

Powered by HOUSE730

HONG KONG BAPTIST MR. & MRS. AU SHUE HUNG REHABILITATION AND HEALTHCARE HOME LIMITED

LORCHE Number: L1242



Nature of Service Providing Unit

- [x] Residential Care Home for the Elderly (RCHE)
- [ ] RCHE joining Care and Attention Place Bought Place Scheme (Enhanced Bought Place Scheme)
- [x] RCHE joining Nursing Home Place Purchase Scheme (NHPPS)
- [ ] Recognised Service Provider of Pilot Scheme on Residential Care Service Voucher (RCSV) for the Elderly
- [ ] Recognised Service Provider of Pilot Scheme on Community Care Service Voucher (CCSV) for the Elderly

Download Publicity Materials (RCHE) (N/A)

Download Publicity Materials (RCSV) (N/A)

Download Publicity Materials (CCSV) (N/A)

Download Fee Charging Table (RCHE) (Chinese Version Only)

Download Fee Charging Table of RSP under RCSV (N/A)

Download Supplementary Information (CCSV) (N/A)

Contact Means -

District:	Kowloon City
Address:	"PART OF G/F, 1/F & 3/F AND WHOLE FLOOR OF 4/F-8/F, NO. 55 CORNWALL STREET, KOWLOON TONG, KOWLOON"
Telephone Number:	2776 8338
Additional Telephone Number:	Nil
Fax Number:	2311 9122
Email Address:	ashrh8188@gmail.com
Website:	http://www.ashrh.org.hk

Residential Places -

Types of Residential Care Homes:	Self-financing Home (joining Nursing Home Place Purchase Scheme)
Types of Places Based on Care Level:	Care and Attention Places, Nursing Home Places
Number of Subsidised Places:	112
Number of Non-subsidised Places:	126
Gender of Service Target:	Male, Female

Licence +

Service Quality +

Staffing, Facilities and Services -

Staffing (Types and Numbers):	Home Manager: 1.00 Ancillary Worker (Full-time): 12.00 Care Worker (Full-time): 27.00 Health Worker (Full-time): 10.00 Health Worker (Part-time): 2.00 Dietician (Part-time): 1.00 Nurse (Full-time): 17.00 Nurse (Part-time): 2.00 Physiotherapist (Full-time): 1.00 Programme Assistant (Full-time): 1.00 Social Worker (Full-time): 2.00

Mont Verra

緹外

3 Lung Kui Road

S.A. GFA

Transaction

*According to avg. price in Centaline Find Property

Price/ ft² by trans. (S.A.) in Apr

$--

Previous Month --

Price by listing

--

Transactions Volume

--

Price/ ft² by listing

--

Sell (0 Records)

Rent/ ft² by trans. (S.A.) in Apr

$--

Previous Month --

Rent by listing

--

Transactions Volume

--

Rent/ ft² by listing

--

Rent (0 Records)

Floor Plan

Mont Verra Introduction

MONT VERRA is located in Sham Shui Po District (Address: 3 LUNG KUI ROAD, HMA: Lung Ping). The Date of Occupation starts from 2020.11.1. There are a total of 5 apartments, 3 houses, providing 64 residential units. The saleable area of MONT VERRA ranges3466 sq.ft. to 11692 sq.ft. Primary One Admission School Net for MONT VERRA is 40. MONT VERRA belongs to Sham Shui Po District for Secondary School Places Allocation Scheme.

Estate Info

2020/11	8 Block(s)	64
Date of Occupation Permit	No. of Blocks	No. of Units

Address/ Area 3 Lung Kui Road

Developer KERRY PROPERTIES

School Net Primary: 40 · Secondary: Sham Shui Po District

THE RUN RUN SHAW CREATIVE MEDIA CENTRE

Hong Kong, China

DATE
2010

STATUS
Completed

CLIENT
City University of Hong Kong

BUILDING SIZE
265,000 sq.ft

DESCRIPTION

An elegant, low-tech design placed at the service of high-tech invention. This nine-story crystalline building is designed to accommodate a range of flexible environments for research and experimentation.

Each space, whether self-contained or open, is unique. The dramatic central stair spirals upward with irregular twists and curves creating unexpected gathering spaces. Asymmetrical windows cut into the walls of lecture halls, classrooms and computer labs allowing for natural light to fill even the inner-most rooms of the Center. Interactive spaces flow in and around the sound stages, recording studios, screening rooms, exhibit and performance spaces, multipurpose theater, and other areas. More expansive than traditional passageways, but more intimate than formal classrooms, the spaces are designed to encourage impromptu exchanges and spontaneous collaboration.

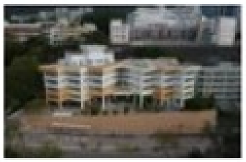
As the first university in Asia to offer the highest level of training in the creative media fields, the City University of Hong Kong specified and received 263,000 square feet of space, which serves approximately 2,000 students and 500 faculty and staff members. Secluded landscaped gardens to the north also contribute to the quality of life of the students and the general public alike.

"Daniel Libeskind's design substantiates the fact that evolved spaces can be effectively used to bolster evolved learning. It breaks all norms of a traditional centre of learning and thus inspires the student to do the same...break all convention, push the envelope and challenge the scope of the creative mind." – *Home Review* (January 2012)

The project was completed in 2010.

香港聖公會李嘉誠護理安老院

[illegible]



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- [x] 安老院
- [ ] [illegible]
- [ ] [illegible]
- [ ] [illegible]
- [ ] [illegible]

[illegible]

聯絡方法

地區:	深水埗區
地址:	九龍深水埗南昌街[illegible]號
聯絡號碼:	2776 1123
附加聯絡號碼:	沒有
傳真號碼:	2776 5975
電子郵箱:	lkacia@skhwc.org.hk
網址:	http://www.skhwc.org.hk

宿位

院舍類別:	津助安老院（只提供資助宿位）
[illegible]	[illegible]
資助宿位數目:	257
非資助宿位數目：	0
服務對象:	男, 女

牌照

服務詳表

人手、設施及服務

員工(種類及人數):	主管: 1.00 助理員 (全職): 42.00 護理員 (全職): 67.00 保健員 (全職): 4.00 護士 (全職): 19.00 護士 (兼職): 2.00 職業治療師 (全職): 2.00 物理治療師 (全職): 1.00 社會工作 (全職): 2.00 醫生: 1.00 言語治療師

附件IMC/21-22(1)/10

東華三院張明添中學

學校報告

2020/2021

學校管理

本校自 1997 年開始推行校本管理，在校董會下設立校政諮詢議會，以諮詢及監察學校運作。因應<<2004 年教育(修訂)條例>>的實施，本校於 2006 年 2 月 1 日成立法團校董會，進一步落實校本管理。法團校董會成員包括辦學團體代表、校長、教師、家長、校友及獨立人士。法團校董會每年召開三次會議，共同釐訂學校的發展項目，審批財政預算、人事安排及檢討工作成效，透過各主要持份者參與決策，提高學校管理的透明度及問責性，以促進學校的持續發展。

法團校董會的成員組合

辦學團體校董	替代辦學團體校董	校長校董	教員校董	替代教員校董	家長校董	替代家長校董	校友校董	獨立校董
6	1	1	1	1	1	1	1	1

學生資料

班級組織

班別數目

級別	中一	中二	中三	中四	中五	中六	總數
班數	4	4	4	4	4	4	24

學生人數

級別	中一	中二	中三	中四	中五	中六	總數
男生人數	73	79	61	60	51	38	362
女生人數	53	56	54	55	44	52	314
學生人數	126	135	115	115	95	90	676

教師資料

教師數目 (包括核准編制內及編制外的教師)

	校長	本地教師	外籍英語教師	總人數
數目	1	57	1	59

教師資歷

教師獲得的最高學歷

	碩士學位或以上	學士學位	專上非學位	中六/七	中五或以下
百分比	49	48	3	0	0

已接受專業訓練的教師

	已接受專業訓練的教師
百分比	100

已接受專科訓練的教師

	中文科教師	英文科教師	數學科教師
百分比	100	100	100

教學經驗

教師教學年資

	0至2年	3至5年	6至10年	超過10年
百分比	8.3	3.3	8.3	80.1

限閱文件 | Restricted

廠商會中學

CMA Secondary School

學校報告

2020 至 2021 年度

校監簽署：_____
（盧金榮博士）
日　期：2021 年 10 月 22 日

校長簽署：_____
（周修略先生）
日　期：2021 年 10 月 22 日

CMA SECONDARY SCHOOL 廠商會中學 CMA SECONDARY SCHOOL

校務報告（二零二零至二零二一年度）

周修略校長

辦學宗旨

本校秉承校訓「勤、藝、精、群」的精神，實踐全人教育及提供優質教育，並致力培養學生的品德修養和思辨能力，令他們建立正確的價值觀和積極的人生觀，成為明辨是非和富責任感的良好公民。

教育目標

學校：積極推行校本管理
- 建立公平合理的考績制度
- 營造全方位資訊科技教育環境
- 強化教與學
- 提倡身心健康教育
- 推動環保綠化校園

教師：樹立良師楷模
- 提升學生成績
- 利用資訊科技教學
- 加強教師與行政人員的溝通，倡導開放、接納、互勵互勉的精神
- 做好校本管理的工作
- 推動教師專業發展

學生：培養讀書風氣
- 培育固有中國傳統美德有為的青年
- 培訓同學尊重自律及守規愛校

我們的學校

學校簡介

本校由香港中華廠商聯合會創辦，於 1976 年建校，當時為一所政府津貼的全日制男校。創校初期為三年制中學，1981 年依政府指示，增辦中四、中五級課程，1992 年更開辦中六兩年制預科課程，中六、中七
級招收女生。由 2010/11 年度開始，本校獲批核轉辦男女校，由中一級
開始可以收取女生。

學校位於九龍深水埗南昌街半山，校舍總面積 6680 平方米，設有教學樓、舊翼專室座和新翼教學樓，有標準課室 30 間、小組課室 5 間、電腦室 2 間，、物理實驗室、化學實驗室、生物實驗室、機械編程工作室、基本科技室、基本設計室、視覺藝術室、體育室、音樂室、家政室、圖書館、英語角、校園電視台、多用途室、會議室、教員休息室等；此外，本校也成立了健教室暨生命教育資源中心及科研中心。

本校於 1976 年創校時推行職業先修教育，1997 年 9 月 1 日應教育署「職業先修及工業中學教育檢討報告書」的建議，更改校名，除去「職業先修」四字，即原本名為「香港中華廠商聯合會職業先修中學」的校名，現正名為「廠商會中學」（CMA Secondary School）。

教學語言

中一至中六級的科目，除英文科以外均以母語教學。

法團校董會架構及組合

	辦學團體	校長	教師	家長	校友	獨立人士
人數	8	1	2	2	1	1

註：本校法團校董會於 2008 年 8 月 30 日成立。

學校行政架構

副校長協助校長分別統領五個委員會：「學務」、「訓輔」、「學生成長」、「健康教育」及「活動」。各個委員會因應活動的性質而彼此協作，合辦各類型活動。

教職員編制

編制內教師(包括校長)	59 名	體育推廣主任	1 名
編制外教師	5 名	實驗室技術員	2 名
外籍英語教師	1 名	教學助理	7 名
言語治療師	1 名	活動助理	2 名
駐校社工	2 名	職員	10 名
		工友	10 名
教職員總人數：100 人			

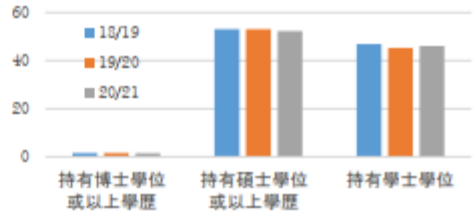
我們的教師

教師資歷

過去三年本校教師的數目（包括校長及 1 名 NET）：

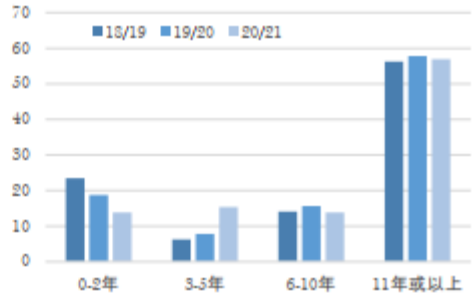
年度	教師數目
18/19	64 人(其中 6 名屬編制以外)
19/20	64 人(其中 5 名屬編制以外)
20/21	65 人(其中 5 名屬編制以外)

過去三年本校教師持有的最高學歷（百分率）：



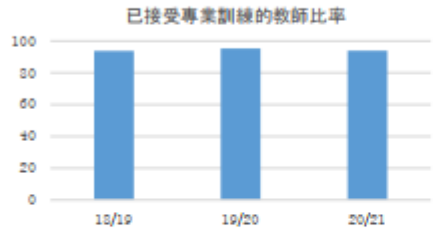
教學經驗

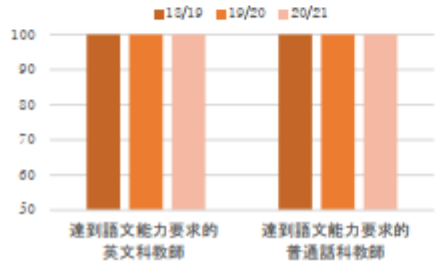
過去三年本校教師教學經驗的百分率：

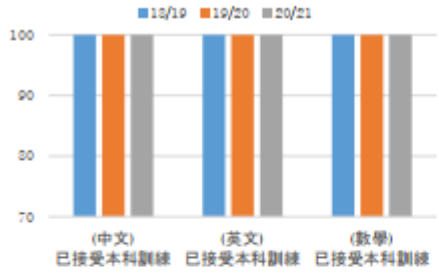


學校鼓勵及協助教師參與持續專業發展進修，包括提供專業發展進修資料及安排行政支援等。

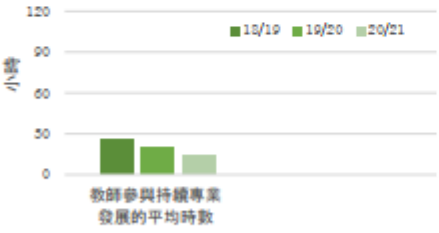
過去三年本校教師持有專業資歷、已接受本科訓練和達到語文能力要求的教師之百分率：





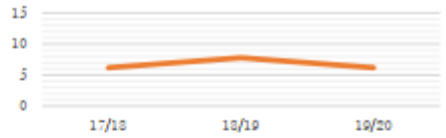


教師專業發展



*本學年的數據截至 2021 年 4 月 30 日

教師離職百分率：



我們的學生

班級組織

2020/2021 學年本校各級開設的班別數目及學生人數：

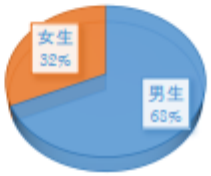
班別數目

級別	中一	中二	中三	中四	中五	中六	總數
班別	4	4	4	4	4	4	24

學生人數

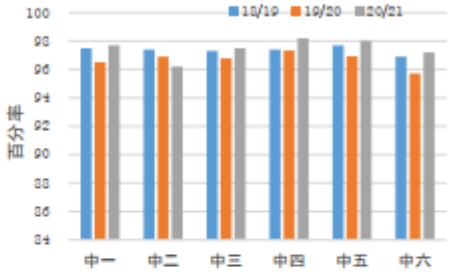
級別	中一	中二	中三	中四	中五	中六	總數
男生人數	85	83	92	82	75	63	480
女生人數	31	45	34	37	37	39	223
學生總數	116	128	126	119	112	102	703

男女生比例：



學生出席率

過去三年本校學生的出席率：



*包括網上教學日（數據截至 2021 年 4 月 30 日）

學校實際上課日數

年度	實際上學日數	考試的日數	整學年正常課堂上課的日數(不包括學校活動及考試日)
18/19	190	22	150
19/20	183	19	158*
20/21	197	21	164*

*包括網上教學日

學校網頁
https://cswcps.edu.hk/

長沙灣天主教小學
Cheung Sha Wan Catholic Primary School

地址：九龍長沙灣東京街7號　電話：2776 1423
電郵：csw@cswcps.edu.hk　傳真：2776 6201

校訊

2022年1月

校長的話

The Power of Yet

轉眼間我們在新校舍已生活了四個多月，回想過往兩年疫情使整個世界停滯不前，而我們卻忙過不停，不斷地向前進。在遷校前後，不同持分者對學校的未來定位也存在不同的意見。我校一直努力營造的並非「開心學校（HAPPY SCHOOL）」，反而我們更期望長天小的孩子能從不同的學習歷程中，掌握「面對挫折、勇於接受、調整心情，再重新出發」的四大成長過程，享受那份以汗水及淚水換來的幸福感。

對於孩子來說，學習具體的知識固然重要，但培養他們擁有樂觀、堅毅、柔韌的品質也許更爲重要。正如在成年人的世界裏，常提及一個概念：心態決定命運。當大家看待同一種事物，每個人採用不同的視角，採取不同的行動，證得截然不同的結果。「成長性思維」正正是近年興起的教育新概念，而最重要的是「成長性思維」是可以被教育和培養的。如果孩子說：「這個我做不了。」請提醒他們要在句尾加上yet，意味着：「你只是現在還做不了，但你已經開始在學着如何做了。」不是「做不了」而是「暫時未能做到」。對於一個小朋友來說，就是能這樣看待問題：

- 擁抱學習和成長
- 理解努力對智力成長的作用
- 擁有面對挫折的良好適應能力

我們尊重孩子的獨特性，期望長天小可善用新校舍的契機，透過校園三大特色「書香校園、體藝校園、環保校園」的課程規劃，師長們持續以愛與耐心去灌溉每一個小生命，使孩子們可隨心做夢及發光發熱，就如陳奕迅的歌曲《凡星》內的歌詞一樣：「誰都可發光，只要找對地方……假使相信就拼命去闖，泥濘路笑着走過；平凡像我亦可做我的主角。」

孩子們，校長最希望你們在六年小學生活中，學習欣賞自己及別人的優點，接納及積極改善個人不足之處，保持常存感恩的好心情來擁抱每一個明天。**Emmanuel！**

謝至美校長

學校資料

真理 義德

校監	校長	法團校董會	學校類別
李煜琦先生	謝棠英女士	已成立	資助/全日
辦學團體	校訓	宗教	創校年份
天主教香港教區	明理崇德 愛主愛人	天主教	1973
學校佔地面積	家教會/校友會	校車服務	教師人數
約6500平方米	有	有	51人

2021-2022年班級結構	小一	小二	小三	小四	小五	小六
班數 共26班	5	5	4	4	4	4

2022-2023年將開設5班小一，小一班數逐年遞增，至2025-2026年全校開設30班。

小一銜接

當兒童踏入小學的校園中，面對不同的難關，包括新環境、新教師、新同學，新的學習模式等，縱使他們順利升讀小學一年級，本校安排多項幼小銜接活動，幫助學生建立正面的學習態度和習慣，讓學生能在一個充滿關愛的校園學習，並盡快適應小學的學習生活。

9月適應月
第一週真半天上課，並設有高小同學及支援老師入班，照顧小一新生，以提升學生的自理能力，如抄寫手冊、收拾書包等。

幼小銜接課程
全年舉辦多個幼小銜接課程，滙集英文、STEM、視藝、體育等多元化活動，讓家長了解及體驗本校的課程及理念。

百日賽
為慶祝小一新生加入本校，特於開課後的一百天的時間設「小一百日賽」活動，讓老師、家長及學生共聚一堂，分享學生於新家庭的成長片段和喜樂。

評估政策
第一學段不設考試，利用紙筆和實作評估評核學生學習能力，第二、三學段的模擬試及期終考試，均設有老師讀卷。

小一新生家長座談會
開學前夕及9月下旬均會舉辦家長座談會，介紹本校的科務和班務，並設有會見班主任時間，讓家長們進一步了解學校的日常運作。

功課政策
學校每天透過手機應用程式(Parents app)發放「是日家課」供家長查閱，設功課緩衝期，第一學段不設任何網上功課，以減輕功課壓力。

小一常規訓練
開學初段，中文、英文、數學、常識均設有校本小一銜接課程，協助學生循序漸進地面對學習上的新挑戰。

小一適應期
每學年8月，透過不同活動體驗小學學習生活，讓學生預先認識班主任及同學，協助學生熟悉小學環境。

支援老師入班協作
學校增聘四名支援教師，以協作教學模式在課堂上支援小一學生，促進幼小銜接和教導自理能力，優化學與教。

Hong Kong Sze Yap Commercial and Industrial Association Wong Tai Shan Memorial College

School Report

2020 – 2021

School Information

Supervisor	Dr. Chan Hung Kee, MBE, JP
Principal	Ms. Chiu Lai Nga (BA, PCEd, MEd, MA)
District	Sham Shui Po
School Type	Aided
Student Population	749
Student Gender	Co-ed
School Size	About 5000 Sq. M
Sponsoring Body	The Hong Kong Sze Yap Commercial & Industrial Association
Incorporated Management Committee	Established
Religion	Not Applicable
Year of Commencement	1975
School Motto	Faithfulness, Forgiveness, Diligence and Intelligence
Parent-Teacher Association	Established
Student Union	Established
Alumni Association	Established

Information of Teaching Staff (including School Principal)

Total number of teachers: 61

Qualifications and Professional Training	**Percentage of teaching staff (%)**
• Teacher Certificate / Diploma in Education	97%
• Bachelor Degree	100%
• Master / Doctorate Degree or above	54%
• Special Education Training	34%

Working Experiences	**Percentage of teaching staff (%)**
• 0-4 years	25%
• 5-9 years	15%
• 10 years or above	60%

Po Tin Building

寶田大廈

39 Wai Chi Street

Add to bookmark | Share to

Find Property | Latest Trans. | Trans.

Price/ ft² by trans. (S.A.) in May	Previous Month	Rent/ ft² by trans. (S.A.) in May
$ --	--	$ --
Price by listing --		Rent by listing --
Transactions Volume --		Transactions Volume --
Price/ ft² by listing --		Rent/ ft² by listing --
Sell 0 Records >		Rent 0 Records >

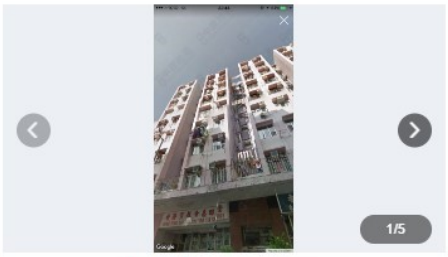


Photo | Floor Plan

Po Tin Building Estate Info

PO TIN BUILDING is located in Sham Shui Po District (Address: 39 WAI CHI STREET, HMA: Shek Kip Mei). The Date of Occupation starts from 1981.01.14. There are a total of 1 blocks, providing 63 residential units. The saleable area of PO TIN BUILDING ranges from 188 sq.ft. to 318 sq.ft. PO TIN BUILDING is near to the Shek Kip Mei MTR Station. Primary One Admission School Net for PO TIN BUILDING is 40. PO TIN BUILDING belongs to Sham Shui Po District for Secondary School Places Allocation Scheme.

1981/1	1 Block(s)	63	5 min(s)
Date of Occupation Permit	No. of Blocks	No. of Units	Walking to Shek Kip Mei Station

Address/ Area **39 Wai Chi Street**

School Net **Primary: 40 · Secondary: Sham Shui Po District**

Fook Tin Building

福田大廈

38 Wai Chi Street

Add to bookmark | Share to

Find Property | Latest Trans. | Trans.

Price/ ft² by trans. (S.A.) in May
$12,520 /ft²

Previous Month
-20.5%

Price by listing
$3.9M - $3.9M

Transactions Volume
1

Price/ ft² by listing
$15,354 - $15,354/ft²

Sell 1 Records >

Rent/ ft² by trans. (S.A.) in May
$ --

Rent by listing
--

Transactions Volume
--

Rent/ ft² by listing
--

Rent 0 Records >

Photo

Fook Tin Building Estate Info

FOOK TIN BUILDING is located in Sham Shui Po District (Address: 38 WAI CHI STREET, HMA: Shek Kip Mei). The Date of Occupation starts from 1980.12.23. There are a total of 1 blocks, providing 96 residential units. The saleable area of FOOK TIN BUILDING ranges from 248 sq.ft. to 255 sq.ft. FOOK TIN BUILDING is near to the Shek Kip Mei MTR Station. Primary One Admission School Net for FOOK TIN BUILDING is 40. FOOK TIN BUILDING belongs to Sham Shui Po District for Secondary School Places Allocation Scheme.

1980/12	1 Block(s)	96	4 min(s)
Date of Occupation Permit	No. of Blocks	No. of Units	Walking to Shek Kip Mei Station

Pak Yuk Lau

白玉樓

1 Wai Chi Lane

Add to bookmark | Share to

Find Property | Latest Trans. | Trans.

Price/ ft² by trans. (S.A.) in May
$12,742 /ft²

Previous Month
-12.92%

Price by listing
$5M - $5M

Transactions Volume
1

Price/ ft² by listing
$13,736 - $13,736/ft²

Sell 1 Records >

Rent/ ft² by trans. (S.A.) in May
$ --

Rent by listing
--

Transactions Volume
--

Rent/ ft² by listing
--

Rent 0 Records >

1/6

Photo

Pak Yuk Lau Estate Info

PAK YUK LAU is located in Sham Shui Po District (Address: 1 WAI CHI LANE, HMA: Shek Kip Mei). The Date of Occupation starts from 1980.11.06. There are a total of 1 blocks, providing 85 residential units. The saleable area of PAK YUK LAU ranges from 252sq.ft. to 364 sq.ft. PAK YUK LAU is near to the Shek Kip Mei MTR Station. Primary One Admission School Net for PAK YUK LAU is 40. PAK YUK LAU belongs to Sham Shui Po District for Secondary School Places Allocation Scheme.

1980/11	1 Block(s)	85	4 min(s)
Date of Occupation Permit	No. of Blocks	No. of Units	Walking to Shek Kip Mei Station

Address/ Area **1 Wai Chi Lane**

School Net **Primary: 40 · Secondary: Sham Shui Po District**

Tin Fung Lau

田豐樓

3 Wai Chi Lane

Add to bookmark | Share to

Find Property | Latest Trans. | Trans.

Price/ ft² by trans. (S.A.) in May	Previous Month	Rent/ ft² by trans. (S.A.) in May
$ --	- -	$ --

Price by listing	Rent by listing
--	--
Transactions Volume	Transactions Volume
--	--
Price/ ft² by listing	Rent/ ft² by listing
--	--

Sell 0 Records >

Rent 0 Records >

1/6

Photo

Tin Fung Lau Estate Info

TIN FUNG LAU is located in Sham Shui Po District (Address: 3 WAI CHI LANE, HMA: Shek Kip Mei). The Date of Occupation starts from 1980.11.06. There are a total of 1 blocks, providing 85 residential units. The saleable area of TIN FUNG LAU ranges from 252 sq.ft. to 364 sq.ft. TIN FUNG LAU is near to the Shek Kip Mei MTR Station. Primary One Admission School Net for TIN FUNG LAU is 40. TIN FUNG LAU belongs to Sham Shui Po District for Secondary School Places Allocation Scheme.

1980/11	1 Block(s)	85	4 min(s)
Date of Occupation Permit	No. of Blocks	No. of Units	Walking to Shek Kip Mei Station

Address/ Area **3 Wai Chi Lane**

School Net **Primary: 40 · Secondary: Sham Shui Po District**

Kam Yuck Building

金玉大廈

2 Wai Chi Lane

Add to bookmark | Share to

Find Property | Latest Trans. | Trans.

Price/ ft² by trans. (S.A.) in May
$ --

Previous Month
- -

Price by listing
$3.78M - $3.78M

Transactions Volume
--

Price/ ft² by listing
$16,875 - $16,875/ft²

Sell 1 Records >

Rent/ ft² by trans. (S.A.) in May
$ --

Rent by listing
--

Transactions Volume
--

Rent/ ft² by listing
--

Rent 0 Records >

Photo | Floor Plan

Kam Yuck Building Estate Info

KAM YUCK BUILDING is located in Sham Shui Po District (Address: 2 WAI CHI LANE, HMA: Shek Kip Mei). The Date of Occupation starts from 1981.04.09. There are a total of 1 blocks, providing 178 residential units. The saleable area of KAM YUCK BUILDING ranges from 198 sq.ft. to 418 sq.ft. KAM YUCK BUILDING is near to the Shek Kip Mei MTR Station. Primary One Admission School Net for KAM YUCK BUILDING is 40. KAM YUCK BUILDING belongs to Sham Shui Po District for Secondary School Places Allocation Scheme.

1981/4	1 Block(s)	178	3 min(s)
Date of Occupation Permit	No. of Blocks	No. of Units	Walking to Shek Kip Mei Station

Address/ Area **2 Wai Chi Lane**

School Net **Primary: 40 · Secondary: Sham Shui Po District**

Nam Cheong Commercial Building

南昌戲院大廈

223-237 Nam Cheong Street

Price/ ft² by trans. (S.A.) in May	Previous Month	Rent/ ft² by trans. (S.A.) in May
$ --	- -	$ --
Price by listing --		Rent by listing --
Transactions Volume --		Transactions Volume --
Price/ ft² by listing --		Rent/ ft² by listing --
Sell 0 Records >		Rent 0 Records >

Photo

Nam Cheong Commercial Building Estate Info

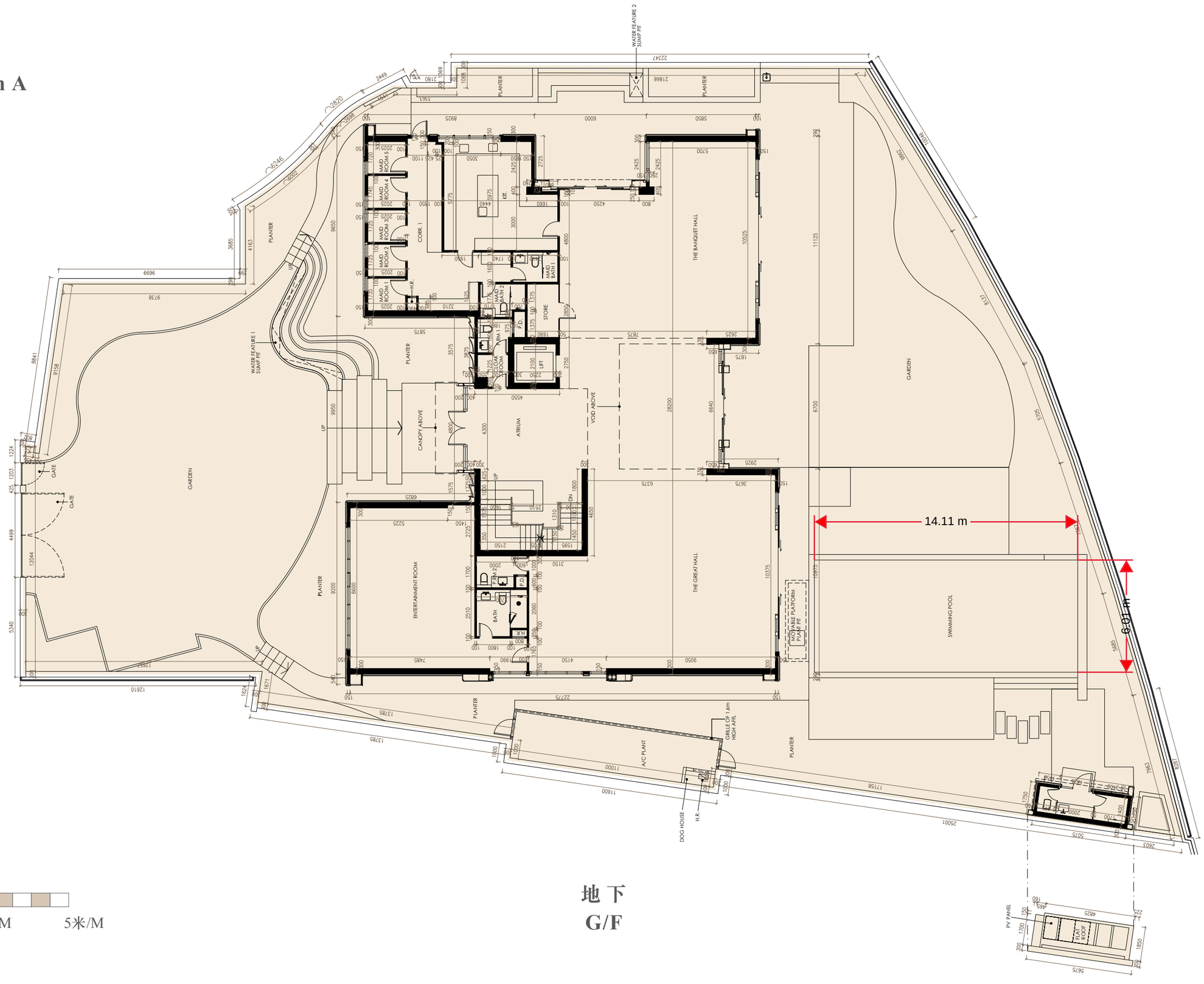
NAM CHEONG COMMERCIAL BUILDING is located in Sham Shui Po District (Address: 223-237 NAM CHEONG STREET, HMA: Shek Kip Mei). The Date of Occupation starts from 1974.12.12. There are a total of 1 blocks, providing 126 residential units. The saleable areaof NAM CHEONG COMMERCIAL BUILDING ranges from 347 sq.ft. to 496 sq.ft. NAM CHEONG COMMERCIAL BUILDING is near to the Shek Kip Mei MTR Station. Primary One Admission School Net for NAM CHEONG COMMERCIAL BUILDING is 40. NAM CHEONG COMMERCIAL BUILDING belongs to Sham Shui Po District for Secondary School Places Allocation Scheme.

1974/12	1 Block(s)	126	2 min(s)
Date of Occupation Permit	No. of Blocks	No. of Units	Walking to Shek Kip Mei Station

Address/ Area **223-237 Nam Cheong Street**

School Net **Primary: 40 · Secondary: Sham Shui Po District**

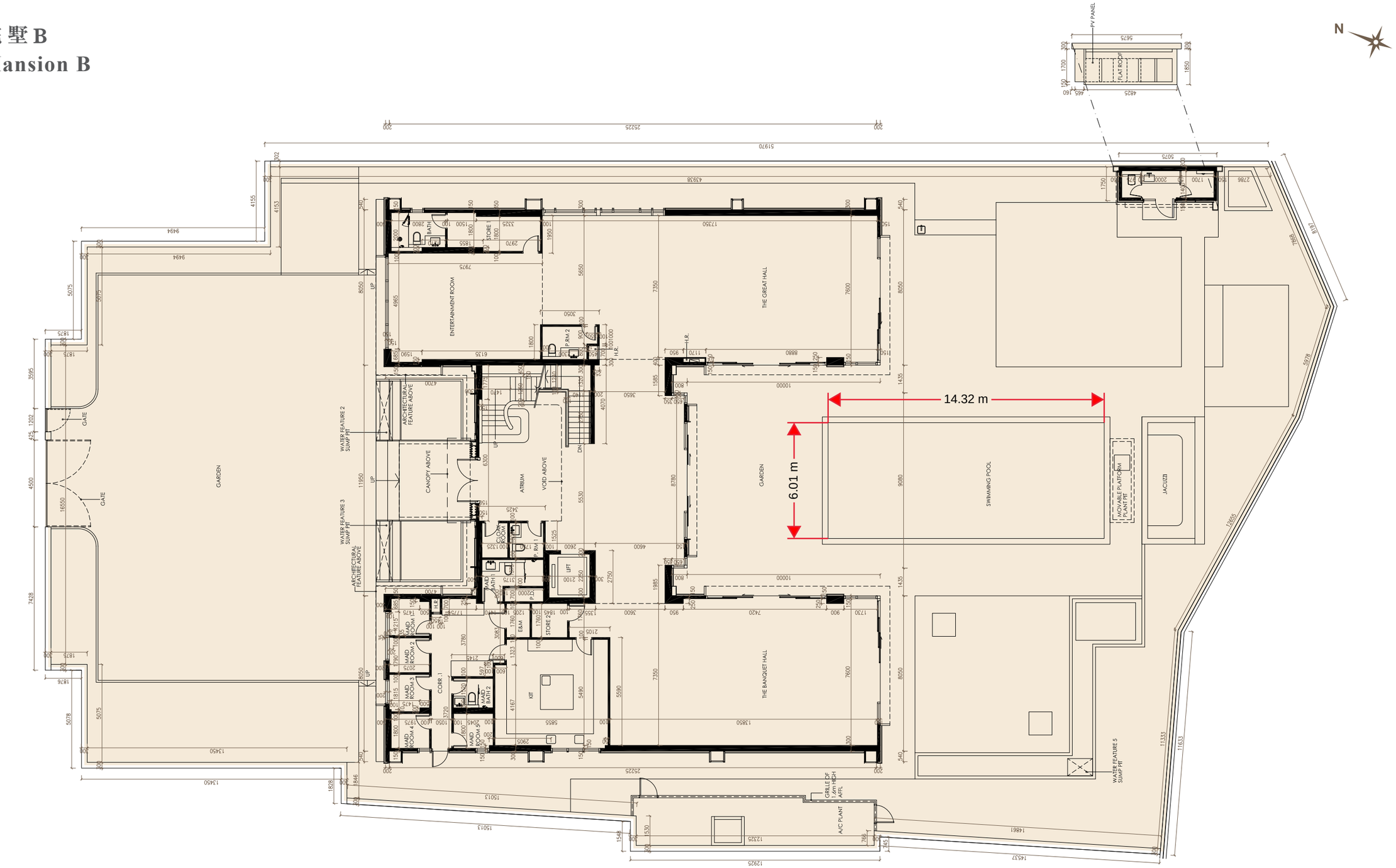
院墅A
Mansion A



比例
Scale : 0米/M 5米/M

地下
G/F

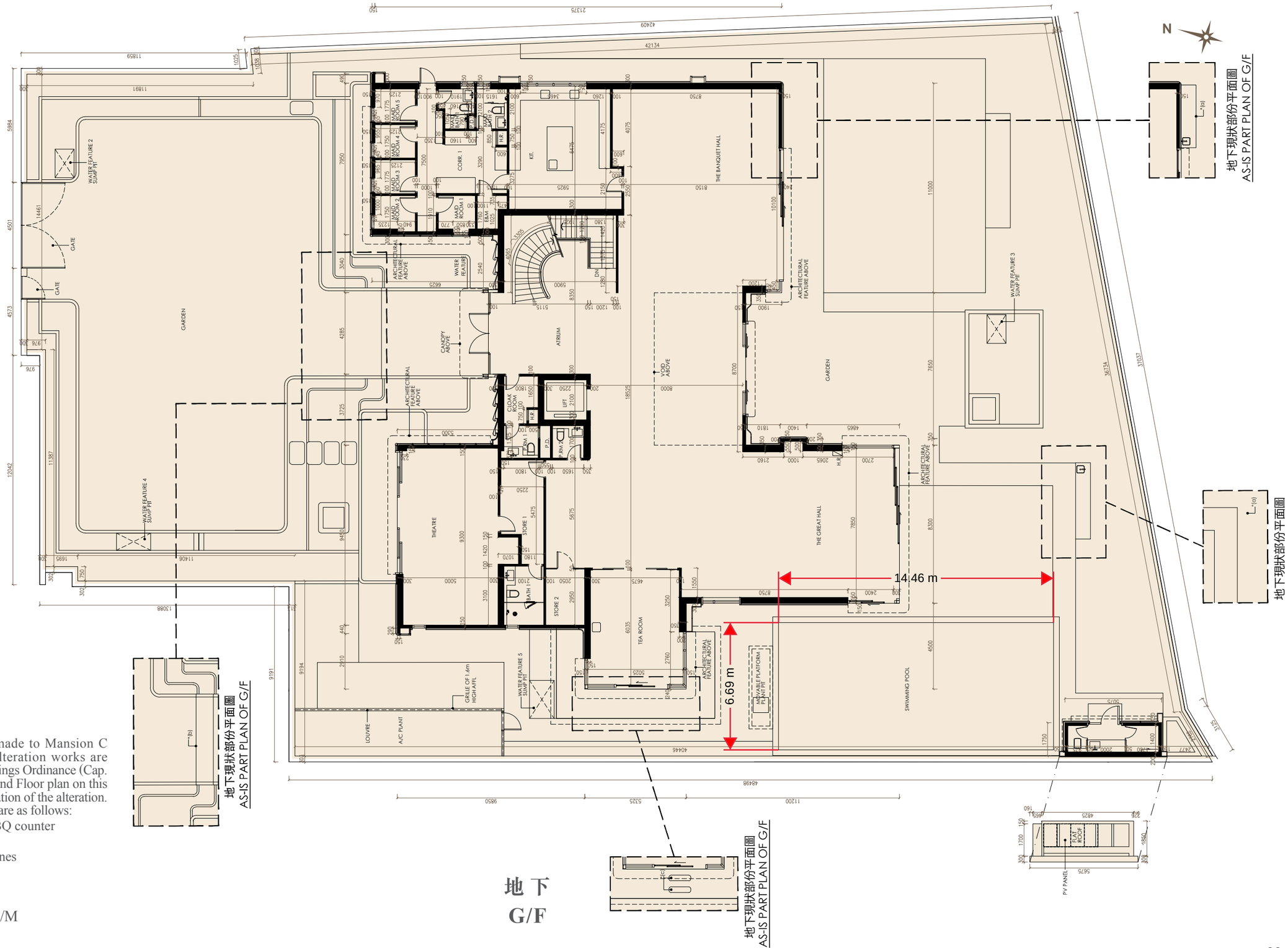
院墅B
Mansion B



比例
Scale :
0米/M 5米/M

地下
G/F

院墅C
Mansion C



備註：
地下的院墅C已被作出改動工程，該改動工程屬於《建築物條例》(第123章)下的豁免工程。本頁的地下現狀部分平面圖顯示改動的大約位置。有關改動的細節如下：
*(a). 遷移洗滌槽及燒烤枱面
*(b). 一級梯級增加
*(c). 兩塊墊腳石增加

Note:
Alteration works have been made to Mansion C on Ground Floor, and such alteration works are exempted works under the Buildings Ordinance (Cap. 123). The as-is part plan of Ground Floor plan on this page shows the approximate location of the alteration. Details of the relevant alteration are as follows:
*(a). Relocation of sink and BBQ counter
*(b). Addition of 1 step
*(c). Addition of 2 stepping stones

比例
Scale : 0米/M 5米/M

香港扶幼會附仁中心學校

Society of Boys' Centres Chak Yan Centre School

學校資料

學校名稱	香港扶幼會附仁中心學校
School Name	Society of Boys' Centres Chak Yan Centre School
中文地址	九龍深水埗歌和老街47號
英文地址	47 Cornwall Street, Shamshuipo, Kowloon
地區	深水埗區
服務類別	教育學校
電話	27783981
傳真	27761587
電郵地址	cycs@cycs.edu.hk
學校網址	http://www.cycs.edu.hk
辦學理念	我們尊重個人的獨特性和尊嚴，深信人和環境是可以改變，且互為影響。因此，學校致力締造一個和諧、健康的環境，以培養孩子首良的品格和發揮他們獨特的潛能。
校監姓名	鄧成名 先生
校長姓名	鄧智穎 女士
學校類別	津貼
學生性別	男
辦學團體	香港扶幼會
宗教	無
創校年份	1974年
校訓	自尊、自治、自立
學校面積	5,346平方米
學生人數	小學部：150人；中學部：165人
校內組織	法團校董會、家長教師會、校友會及學生協會。
宿舍設備	宿位166個，由社會福利署資助。
公共交通	由港鐵站（九龍塘或石硤尾）步行約15分鐘，巴士路線：28、28P、86C、E22。
校車服務	兩輛24座位冷氣小巴，用作接送學生往返學校及外出活動之用，分別由香港賽馬會慈善信託基金及莫若基金捐贈。

香港心理衛生會–康和學校

The Mental Health Association of Hong Kong - Cornwall School

學校資料

學校名稱	香港心理衛生會–康和學校
School Name	The Mental Health Association of Hong Kong - Cornwall School
中文地址	九龍深水埗歌和老街53號
英文地址	53 Cornwall Street, Shamshuipo, Kowloon
地區	深水埗區
服務類別	嚴重智障兒童學校
電話	2777 3081
傳真	2788 4677
電郵地址	info@mhahk-cws.edu.hk
學校網址	http://www.mhahk-cws.edu.hk
辦學理念	本校本着「有教無類」的「全人教育」精神，致力為嚴重弱智兒童提供優質教育、復康治療、住宿服務及愉快學習環境，協助有特殊需要的兒童在智能、體能及社交三方面獲得均衡發展，建構溫馨、養成良好品格，提高獨立生活能力，得以融入社會。 Our education purpose Aiming to offer life education in all aspects, we strive to provide good quality education, rehabilitation therapies, and long-term accommodation services to students who have severe physical and learning disabilities. Our school's name implies "Perfect Harmony Achievement". To encourage a balance in mental and physical growth, and to enhance self-management skills, so that students will serve the society in the future, we have been constantly building up a harmonious partnership with our student's parents in our community.
校監姓名	劉秀方 醫生
校長姓名	黃敏儀 女士
學校類別	津貼
學生性別	男女
辦學團體	香港心理衛生會
宗教	無
創校年份	1978年
校訓	健、樂、禮、群 School Motto: Healthy grow up Happily learn Politely treat people Actively involve in community
學校面積	逾萬呎樓面八千多平方米
學生人數	學額112名，老師60名

「32+8夢想成飛共慶喜年華」校慶活動，慶祝學校成立40周年的喜悅

特西林鄭月娥到訪學校

老師、家長成為故事大使，協同學生一同探索閱讀故事新體驗

香港心理衛生會–絲和學校

The Mental Health Association of Hong Kong - Cornwall School

教師資料

教師專業資歷 (人數)

基本師資訓練	33
特殊教育訓練	33
學士	28
碩士	5
博士	0
教師總數	33

專業人員資料 (人數)

言語治療師	2.5
職業治療師	1
物理治療師	1
社工	1.5
教育心理學家	0
護士	7
技師	0
職業治療助理	3.5
實驗室技術員	0
物理治療助理	1
其他	宿舍家長14人
專業人員總數	32

「32+8夢想尚飛共慶青年節」校慶活動，慶祝學校成立40周年的喜悅

特首林鄭月娥到訪學校

老師、家長成為故事大使，陪同學生一同探索閱讀故事新體驗

致：深水埗區議會規劃及交通事務委員會

資料文件

《香港理工大學達康路學生宿舍項目》

目的

1. 本文件旨在向深水埗區議會成員簡介香港理工大學(理大)於九龍塘達路興建學生宿舍的計劃。

背景

2. 大學教育資助委員會(教資會)於 2012/13 年度開始推行「3+3+4」新學制， 大學整體學生人數增加，對各項設施及資源的需求亦有所增長，當中，學生宿舍短缺正是其中一項急需解決的問題。教育局認為需要加快教資會支援大學發展學生宿舍。就此，立法會於 2018 年通過撥款設立宿舍發展基金*，讓宿位不足的六所資助大學加快興建學生宿舍，開展合共 15 個宿舍項目。

3. 本港土地資源短缺，適合作大學宿舍用途的土地極為罕有。教育局已預留九龍塘達康路地塊用作理大興建學生宿舍之用，理大早前就此項目向城市規劃委員會(城規會) 提交規劃申請，並於 2020 年 12 月 18 日舉行的城規會都會規劃小組委員會第 662 次會議中獲得通過。

4. 理大達康路宿舍項目旨在達致以下目的：

4.1 **增加宿位供應**：現時理大擁有兩座學生宿舍，分別位於紅磡紅荔道及何文田佛光街，合共提供約 4,600 個宿位。隨著本地及非本地學生數目上升，理大的宿位供不應求，以致部份同學未能獲得「四年一宿」安排，或需要尋找校園以外的住宿。新的學生宿舍將提供額外 1,680 個宿位，理大期望能藉此紓緩宿位供應緊張的情況，長遠而言惠及更多學生。

4.2 **鼓勵舍堂學習**：課堂以外，舍堂生活亦是高等教育的重要部分。透過不同的舍堂活動，學生得以互相學習和交流，有利他們的全人發展。此外，不少學生的家居環境狹窄，

* 立法會通過撥款設立宿舍發展基金
https://www.ugc.edu.hk/big5/ugc/about/press_speech_other/press/2018/pr07072018.html

宿舍可為他們提供更多私人空間，方便溫習之餘，亦讓他們學會獨立生活。

4.3 **擴闊學生視野**：政府的政策是要發展香港成為區域教育樞紐。透過增加學生宿舍的供應，將有助吸引優秀的非本地學生來港就讀，令本地高等教育界更趨國際化，從而擴闊本地學生的視野。

項目位置

5. 本項目位於九龍塘達康路的斜坡土地（即石硤尾分區計劃大綱核准圖編號 S/K4/29 指定為「政府、機構或社區（7）」土地），項目只涉及該土地的東面部分，毗鄰現時城市大學歌和老街宿舍群。(見附件 1)。車輛可從歌和老街經由達康路到達項目位置，從港鐵九龍塘站步行至項目位置約需 15 分鐘。

5.1 **基本資料**

位置	九龍塘達康路
地盤面積	約 12,280 平方米
用途	興建學生宿舍
總樓面面積	住用　　：約 33,150 平方米 非住用　：約 17,050 平方米 總計　　：約 50,200 平方米
幢數	4
合共提供宿位	1,680 個
預計動工時間	2022 年底
預計完工時間	2028 年

設計特點

6. 達康路學生宿舍包括位於南面的 Hall 1 和 Hall 2，以及位於北面的 Hall 3、Hall 4 及 Hall 5，建築物高度由 9 層至 15 層不等(包括地面層)。地下至 4 樓主要為人行通道、停車場、學生休閒設施，5 樓為一條連通各幢的公共走道及共享空間和部份宿舍單位，6 樓以上樓層則為學生宿舍。設計此項目時，理大希望能達致以下兩個目標:
   - 可持續地善用珍貴土地資源
   - 能於預定時間內提供所需宿位

7. 考慮到項目所在位置、地勢、附近景觀及建築物高度等環境因素和限制，達康路學生宿舍的設計方案將具備以下特點:

- 配合鄰近環境，建築物以扇形設計擺放，不阻礙附近建築物的視野，亦保留山脊線的自然景觀
- 建築物採用梯級式設計，以配合鄰近的山勢，並設有平台及戶外活動空間，加強空氣流通
- 宿舍面向達康路方向的立面會採用多層綠化空間的設計，種植植物以優化街道環境。另於宿舍範圍種植大量綠色植物，營造和諧而開揚的景觀
- 採取合適的建築高度，以大幅減少開挖幅度及地基和工地平整工程的所需時間，減低對鄰近社區的影響

外觀構思圖

初步諮詢工作

8. 理大在項目籌劃過程中一直與不同持份者保持溝通，以了解他們對項目的意見。

去年初，理大已展開初步諮詢工作，聯繫不同持份者，如:深水埗區議會主席楊彧先生、又一村當區區議員劉偉聰先生及項目鄰近屋苑之業戶代表，以講解項目的概念。

此外，理大根據城市規劃委員會(城規會)規劃申請第 16 條向城規會提出規劃許可申請，並就城規會在公眾諮詢過程中所收集的意見，向城規會再補充相關資料。

理大已把各項建議收集整理，以作優化項目之設計及工程管理方面的參考。往後，理大亦會就工程的開展及進程，與不同持份者保持溝通。

項目進度

9. 大學正優化項目的設計，預期於 2022 年底開展工程，並於 2028 年完成。

項目查詢

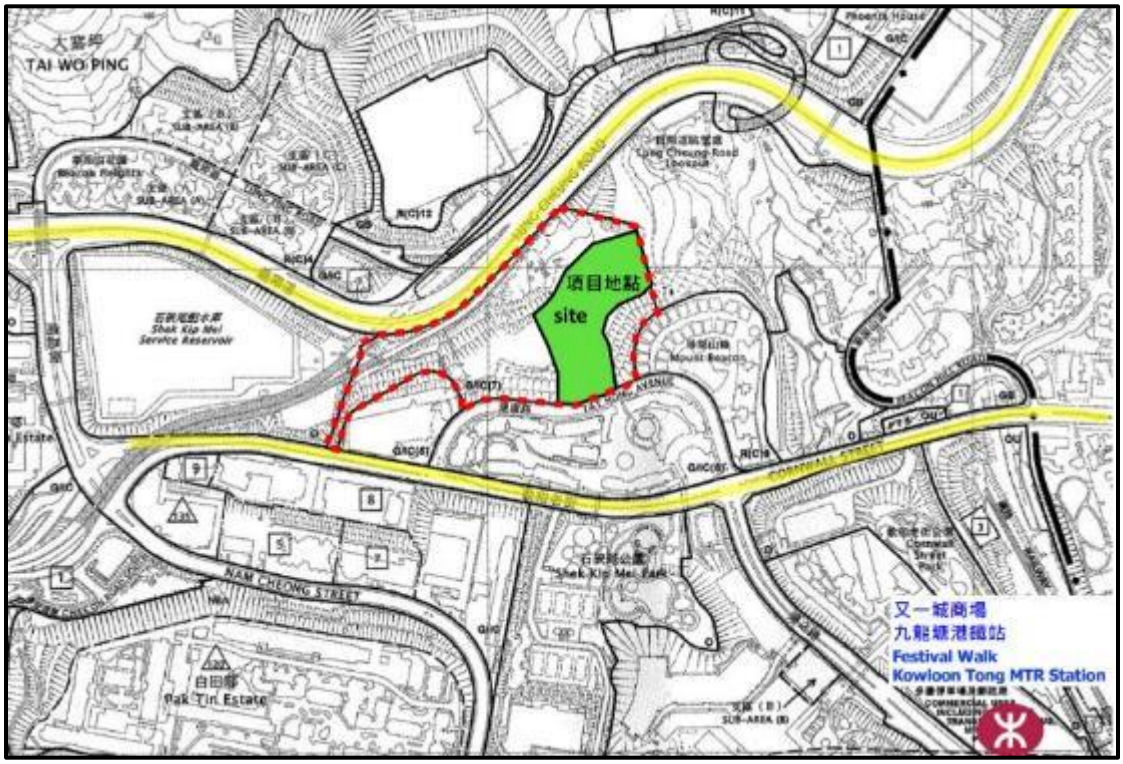
10. 議員如對本項目有任何查詢或建議，請與香港理工大學傳訊及公共事務處高級經理高昊先生(@kenrick.ko@polyu.edu.hk 或 2766 6374)聯絡。

附件: 項目地點及預期景觀

香港理工大學傳訊及公共事務處
2021 年 2 月 9 日

# # #

附件 1：項目地點



圖示：

---- 石硤尾分區「政府、機構或社區（７）」土地範圍

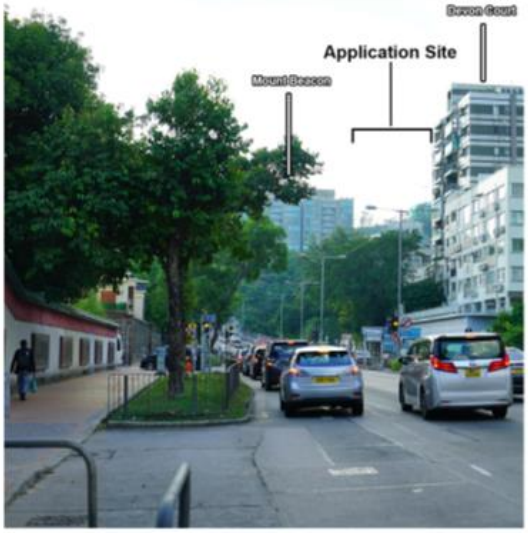
本項目範圍

附件 2：預期景觀

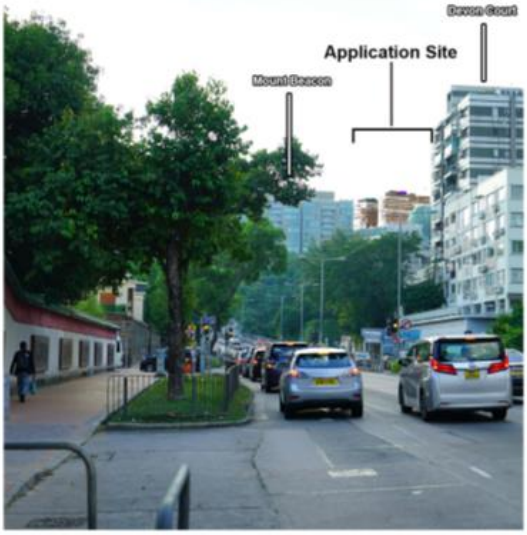
(1)由龍翔道方向眺望項目位置

(2)由歌和老街方向望向項目位置

EXISTING CONDITION

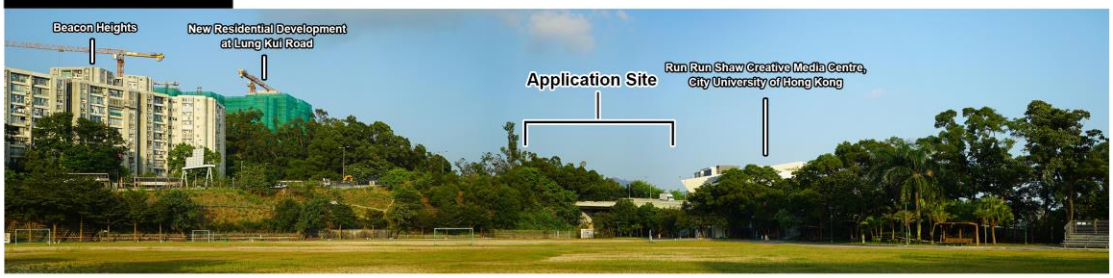


PROPOSED DEVELOPMENT

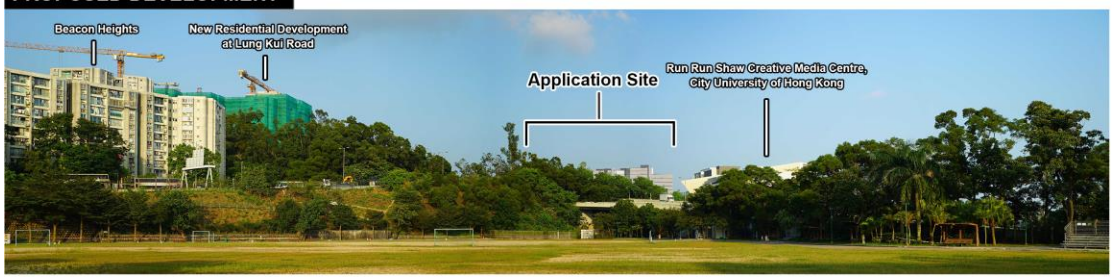


(3) 由石硤尾配水庫遊樂場望向項目位置

EXISTING CONDITION



PROPOSED DEVELOPMENT



Appendix F
Backwash Flow of Swimming Pool in Catchments

Backwash Calculation for Outdoor Swimming Pool at Dynasty Heights

Pool Volume	=	817.61	x	1.5	=	1226.415	(m3)	
		(Area from plan)		*(assumed of 1.5m in depth)*				

The turnover rate is longer 4 hours, in order to comply with the guildline from FSHD.
Therefore, a turnover rate 4 hours is assumed.
(24 /4 = 6 turnovers per day)

Pump Filtration Flow Rate	=	1226.415	/	6	=	204.40	(m3/hr)	

By making reference to sand filter model SM900, a filtration flow rate is 48m3/hr/m2.

Filtration Area Required	=	204.40	/	48	=	4.26	(m2)	
Filter Area of each Sand Filter	=	0.64	(m2)					
No. of Sand Filter required	=	4.26	/	0.64	=	6.65	say	7
Backwash Flowrate	=	424	(L / min)					
		(From catalogue)						

Assuming the backwash of the sand filter should be done one by one.

Duration of backwash	=	1	(min)					
		(Assumed)						
The backwash flow generated from the sand filter	=	424	x	7	x 1 =	2968	(L / min)	
					=	2.97	(m3/ min)	

Backwash Calculation for Outdoor Swimming Pool at Beacon Heights

Pool Volume	=	211.82	x	1.5	=	317.73	(m3)	
		(Area from plan)		*(assumed of 1.5m in depth)*				

The turnover rate is longer 4 hours, in order to comply with the guildline from FSHD.
Therefore, a turnover rate 4 hours is assumed.
(24 /4 = 6 turnovers per day)

Pump Filtration Flow Rate	=	317.73	/	6	=	52.96	(m3/hr)	

By making reference to sand filter model SM900, a filtration flow rate is 48m3/hr/m2.

Filtration Area Required	=	52.96	/	48	=	1.10	(m2)	
Filter Area of each Sand Filter	=	0.64	(m2)					
No. of Sand Filter required	=	1.10	/	0.64	=	1.72	say	2
Backwash Flowrate	=	424	(L / min)					
		(From catalogue)						

Assuming the backwash of the sand filter should be done one by one.

Duration of backwash	=	1	(min)					
		(Assumed)						
The backwash flow generated from the sand filter	=	424	x	2	x 1 =	848	(L / min)	
					=	0.85	(m3/min)	

Backwash Calculation for Outdoor Swimming Pool at Mount Verra

Pool Volume	=	266	x	1.5	=	399	(m3)	
		(Area from plan)		*(assumed of 1.5m in depth)*				

Thet turnover rate is longer 4 hours, in order to comply with the guildline from FSHD.
Therefore, a turnover rate 4 hours is assumed.
(24 /4 = 6 turnovers per day)

Pump Filtration Flow Rate	=	399	/	6	=	66.50	(m3/hr)	

By making reference to sand filter model SM900, a filtration flow rate is 48m3/hr/m2.

Filtration Area Required	=	66.50	/	48	=	1.39	(m2)	
Filter Area of each Sand Filter	=	0.64	(m2)					
No. of Sand Filter required	=	1.39	/	0.64	=	2.16	say	3
Backwash Flowrate	=	424	(L / min)					
		(From catalogue)						

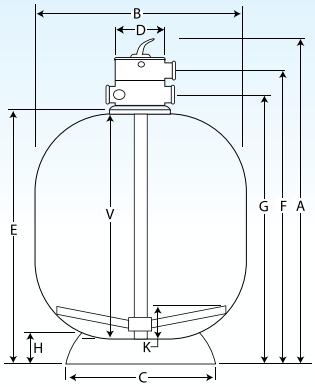
Assuming the backwash of the sand filter should be done one by one.

Duration of backwash	=	1	(min)					
		(Assumed)						
The backwash flow generated from the sand filter	=	424	x	3	x	1	=	1272 (L / min)
							=	1.27 (m3/min)

Micron Top Mount Technical Specification

Filter Model	Valve Size (mm)	Inner Diameter (mm)	Filter Area (m^2)	Bed Depth (mm)	Max. Flow (lpm)	Max. Pool Size** (litres)	Backwash flowrate (lpm)	Media Volume (litre)	Glass Pearl Media (kg)	Sand 16/30 (kg)	Zeoplus 1-2.2 (kg)
S500	40	500	0.20	280	157	57,000	131	65	105	95	78
S600	40	600	0.28	295	226	81,000	189	106	171	155	127
S602	50	600	0.28	295	226	81,000	189	106	171	155	127
S702	50	700	0.38	340	308	111,000	257	154	249	225	185
S750	50	750	0.44	340	353	127,000	295	178	288	260	214
S800	50	800	0.50	420	402	145,000	335	233	376	340	279
S900	50	900	0.64	420	509	183,000	424	322	520	470	386

Residential flow rate based on a velocity of 48m^3/hr/m^2. Max. pool size is based on a 6 hr turnover.



Micron Top Mount Dimension (mm)

Model	A	B	C	D	E	F	G	H	V	K
S500	864	505	443	180	625	731	672	69	525	94
S600	968	622	540	180	721	832	778	88	620	136
S602	1085	622	540	180	721	832	778	88	620	136
S702	1072	723	620	220	722	892	792	90	652	122
S750	1217	772	620	220	867	1037	937	90	773	127
S800	1157	810	620	220	807	977	877	90	713	111
S900	1234	910	620	220	884	1054	954	90	785	163

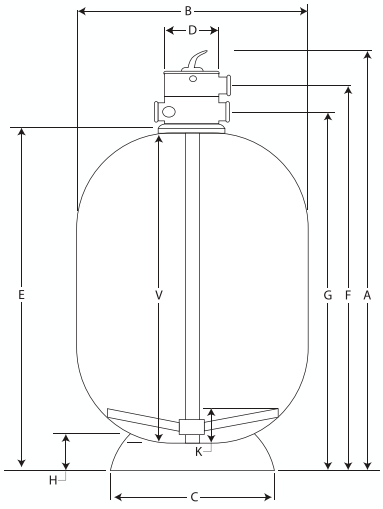
Micron Top Mount Deep Bed Filter

Micron Deep Bed Filters are designed with a guaranteed filter bed depth of 500mm, providing enhanced in-depth filtration and increased dirt capacity.

Micron Top Mount Deep Bed Technical Specification

Filter Model	Valve Size (mm)	Inner Diameter (mm)	Filter Area (m^2)	Bed Depth (mm)	Max. Flow (lpm)	Max. Pool Size** (litres)	Backwash flowrate (lpm)	Media Volume (litre)	Glass Pearl Media (kg)	Sand 16/30 (kg)	Zeoplus 1-2.2 (kg)
SD400	40	400	0.13	500	101	36,000	84	68	111	100	82
SD500	40	500	0.20	500	157	57,000	131	105	170	154	127
SD600	40	600	0.28	500	226	81,000	189	161	260	235	193
SD750	50	750	0.44	500	353	127,000	295	247	398	360	296
SD900	50	900	0.64	500	509	183,000	424	377	608	550	452

Residential flow rate based on a velocity of 48m^3/hr/m^2. Max. pool size is based on a 6 hr turnover.



Micron Top Mount Deep Bed Dimension (mm)

Model	A	B	C	D	E	F	G	H	V	K
SD400	1220	405	356	160	953	1084	1005	61	846	57
SD500	1220	505	443	160	953	1084	1005	69	846	57
SD600	1220	624	540	160	953	1084	1005	88	828	69
SD750	1320	776	678	220	970	1140	1040	120	838	125
SD900	1372	910	678	220	1022	1192	1092	120	880	172

Appendix G
Response to Comment Table

Response-to-Comment Table for Proposed Public Housing Development at Pak Tin Phase 12 - Sewerage Impact Assessment – Issue 3 (Draft Final) under our Letter ref. Q1021_HKHA_CB20180310_U04790 dated 25 October 2023

Comments from EPD through Email dated 28 December 2023	
Comments	**Responses**
Please find our comments on the report as follows:-	
Section 2.1.5	
• For household characteristics of population, the proposed development shall be referred as Ha Pak Tin in Sham Shui Po District instead of Kowloon Tong District Council Constituency Area. Please check and confirm.	Noted and revised to Sham Shui Po District, please kindly refer to section 2.1.5.
Section 2.2.1	
• Please include the UFF of R3 adopted in the hydraulic calculations. It appears that some upstream developments in catchment A have adopted UFF of R3	Noted, UFF of R3 is included in section 2.2.1.
• It is noted that the UFF for commercial employees has been adopted to estimate the sewage flow for "visitors" in the concerned catchments. Please provide justification (e.g. time spent / activity conducted by each visitor in the developments) to substantiate the assumption.	To derive the unit flow factor for visitors, it is assumed that visitors will be staying maximum 8 hrs per day for conservative. The sewage flow will be from two sources, one from flushing and the other from use of wash basin. The unit flow factors from flushing use, has assumed flushing water consumption of 0.1m3/person/day for 16 hours of typical domestic residents, employees and students usage. The unit flow factor from the wash basin use has assumed a consumption of 0.03m^3/person/day on 8 hours daily basis. This results in UFF of 0.08m^3/person/day.
Table 2.29 & RtC item 3(a)	
• Based on the best available information and RtC, please provide the source of reference for manholes FMH4016440 and FMH4016441 as indicated in the SIA report to demonstrate the existence of the manholes.	Please find the as-built drawing extracted by DSD from the Housing Authority attached in this RtoC for your record.

<table>
<tr><th colspan="2">Comments from EPD through Email dated 28 December 2023</th></tr>
<tr><th>Comments</th><th>Responses</th></tr>
<tr><td><u>Section 4.1.3</u></td><td></td></tr>
<tr><td>• It is noted that the sewage flow generated from the proposed development will be discharged into three different connection points (i.e. proposed Terminal Manhole TM1, TM2 and TM3). Please advise the breakdown of estimated sewage flow to be discharged to each Terminal Manhole with justification on the practicality of splitting the sewage flow in the assumed ratio in actual operation.</td><td>The proposed development will consist of 2 residential blocks and 1 welfare block, as indicated in Table 2.1 and 2.2 Remark, one of the residential blocks is assumed to fall under catchment A3 and A2 respectively. For the welfare block, the welfare block is assumed to be fall under catchment A1 as shown in Table 2.3 Remark. The remark of the captioned tables is highlighted for your easy reference and please kindly refer to the following summary table for the assumed ratio.
<table>
<tr><th>Proposed Terminal Manhole No.
(1)</th><th>Related Catchment
(2)</th><th>Population
(3)</th><th>ADWF (m^3/day)
(4)</th><th>Assumed Ratio
(5) = (4) / Total ADWF</th></tr>
<tr><td>TM1</td><td>A1</td><td>504</td><td>94.12</td><td>4.732</td></tr>
<tr><td>TM2</td><td>A2</td><td>3190</td><td>947.43</td><td>47.634</td></tr>
<tr><td>TM3</td><td>A3</td><td>3190</td><td>947.43</td><td>47.634</td></tr>
<tr><td colspan="3">Total ADWF of the proposed development:</td><td>1988.98</td><td>m^3/day</td></tr>
</table>
</td></tr>
<tr><td><u>Appendix A & Appendix C</u></td><td></td></tr>
<tr><td>• It is noted that the setting of some manholes (e.g. upstream and downstream invert levels) in the drawings of Appendix A and Appendix C are inconsistent with the DSD's record. Please check and confirm.</td><td>Noted and confirmed.</td></tr>
</table>

Appendix C	
• The invert levels of FMH4016455 (13.113 mPD) and FMH4016458 (12.5 mPD) are different from the best available information. Please check and provide the reference source.	Please be noted that the invert level of FMH4016455 (13.113 mPD) and FMH4016458 (**11.59 mPD**) is referred to the approved SIA Document No. L1070/C006/02, "Proposed Public Housing Redevelopment at Pak Tin Estate Phases 7, 8, 10, 11 & 13 Sewerage Impact Assessment (Draft Final Report)". **(i.e., The invert level of 12.5 mPD shall be referred to Manhole FMH4016457)**
• It appears that sewage flow generated from several catchments (e.g. catchments A3, E, F, G, H, I, J, K) will be discharged to multiple manholes as "increment" to the sewerage system. Please provide the breakdown of sewage flow contributed by each catchment to each sewer segment to facilitate review.	Please kindly refer to Appendix B for the sewage flow contributed by each catchment to each sewer segment, the captioned section is highlighted for your easy reference.
• The consultant is suggested to provide softcopy of the report (in pdf) and calculation spreadsheet (in Excel) in next submission to facilitate review.	Noted.

Comments from DSD under memo ref. (012PFS) in MS 11/SSP/4/0 Pt. received on 30 Oct 2023	
Comments	**Responses**
We refer to your above memorandum dated 30 October 2023 regarding the Sewerage Impact Assessment (SIA) Report for the captioned redevelopment and have no further comment on the SIA Report.	Noted.

Response-to-Comment Table for Proposed Public Housing Development at Pak Tin Phase 12 - Sewerage Impact Assessment – Issue 2 (Draft) under our Letter ref. Q1021_HKHA_CB20180310_U03306 dated 8 May 2023

Comments from EPD through Email dated 12 June 2023	
Comments	**Responses**
I have the following comments on the SIA report:	
1. Table 2.4 and 2.14 - It appears that ADWF from the planned housing development at Pak Tin Extension and Chak On Road South was inconsistent with that in the relevant SIA report. Please review.	Noted and revised.
2. Table 2.29 - Please review if the manhole at the downstream of MH DF2.05 should be MH DF1.07.	Noted and revised.
3. Appendix B -	
a) Please indicate FMH4016440 in the drawing.	No information had been found for Manhole FMH4016440 in Geoinfo Map.
b) Catchment A - Based on the best available information, there would be a new student hostel development at City University. The sewage from the proposed student hostel would be discharged to FMH4016299. Please update the table.	Noted and updated.
c) Catchment A - Based on the best available information, some buildings in the concerned sewerage catchment were omitted, for example, the new student hostel development at City University, dormitory of Society Of Boys' Centre Chak Yan Centre and The Mental Health Association of Hong Kong Cornwall School. Please check and revise the assessment.	Noted and updated.
d) Catchment O - Based on the best available information, some buildings in the concerned sewerage catchment were omitted, for example, Kam Yuk Shopping Centre, Maintown Plaza and Nam Cheong Theatre. Please check and revise the assessment.	Noted and updated.
4. Appendix C -	

Comments from EPD through Email dated 12 June 2023	
Comments	**Responses**
a) Please review if the amount of sewage discharged from FMH4084582 to FMH4016450 should be 448.06 m3/day.	Please be noted that the amount of sewage discharge from FMH4084582 to FMH4016450 should be 422.86 m3/day, as the sewage produced by the temporary driving test centre is discharge from FMH4016450 to FMH4016451.
b) Please supplement the hydraulic calculation for sewers between FMH4084580 and FMH4016449, and FMH4016449 and FMH4084581.	Based on the latest record drawing, manhole "FMH4016449" was abandoned/removed. The relevant drawing is attached in this RtC.
5. The consultant is suggested to provide softcopy of the report and the calculation spreadsheet (in Excel) in CD Rom format and all Response to Comments from EPD and DSD as appendix as well as highlight the revised / updated content of the SIA report in next submission to facilitate review.	Noted and supplemented.
6. Please be reminded that the implementation of local sewer connection / upgrading / diversion works shall meet the satisfaction of DSD. The consultant should seek DSD's view on the SIA.	Noted.

Comments from DSD under memo ref. (00ZVBY) in MS 11/SSP/4/0 Pt.7 received on 06 June 2023	
Comments	**Responses**
I refer to your above memorandum received on 06.06.2023 regarding the captioned submission and have the following comments.	
i) The following comments are for the consultants' reference and consideration. They are subject to the views and agreement of EPD as the planning authority of sewerage infrastructure. The Study has to meet the full satisfaction of EPD.	Noted.

Comments from DSD under memo ref. (00ZVBY) in MS 11/SSP/4/0 Pt.7 received on 06 June 2023	
Comments	**Responses**
ii) Table 2.14 - For the avoidance of doubt, the development under CE36/2021 shall be Temporary Driving Test Centre.	Noted and incorporated.
iii) Drawing No. Q1021/C010/001 - Please review the legend for "proposed manhole and pipe".	Noted and revised.
iv) Drawing No. Q1021/C010/001 - Site Boundary for the proposed development is missing.	Noted and revised.
v) Drawings - The pipe size for the connection pipe of Catchment A2 does not tally with the report.	Noted and revised.
vi) Appendix C - Please review the roughness coefficient of existing concrete sewer pipes.	Noted and revised.

Response-to-Comment Table for Proposed Public Housing Development at Pak Tin Phase 12 - Sewerage Impact Assessment – Issue 1 (Draft) under our Letter ref. Q1021_HKHA_CB20180310_T07396 dated 9 November 2022

Comments from EPD through Email dated 2 December 2022	
Comments	**Responses**
I have the following comments on the SIA report:	
1. Section 1.1.3 - Please provide the details of the non-domestic facilities in the proposed development.	The details of the non-domestic facilities are updated in Table 1.1 and Table 2.3.
2. Table 2.4 - a) Please advise if the planned housing development at Pak Tin Extension and Chak On Road South, and Pak Tin Community.	The said developments under CE36/2021(CE) are incorporated. Please refer to Table 2.4 and 2.14.

Comments from EPD through Email dated 2 December 2022	
Comments	**Responses**
b) Please advise if there is any swimming pools at Mount Rouge and Mount Verra.	Based on the sales brochures, swimming pool is only identified at Mount Verra. The relevant analysis is incorporated in Appendix C, Appendix E and Appendix F.
c) Please also adopt a more conservative domestic unit flow factor for Dynasty Heights, Beacon Heights, Mount Rouge, Mount Verra, and residents in Catchment K and L.	Noted. UFF for Private Domestic R3 is adopted for Dynasty Heights, Beacon Heights, Mount Rouge and Mount Verra whereas UFF for Private Domestic R2 is adopted for Catchment K and L.
3. Appendix A - a) Please enlarge the font size to clearly show the details of proposed sewerage works.	Noted and revised.
4. Appendix C - a) For those manholes with unknown or doubtful invert level (i.e. FMH4016465, FMH4077722, FMH4077723, FMH4084580, FMH4084581 and FMH4084582), manhole survey may be required to determine the actual invert levels and pipe capacity. Please agree with DSD on the result of manhole survey. The consultant should revise the hydraulic calculation based on the actual invert level of the concerned manholes.	Noted. This submission is circulated to DSD for comments.
b) Please supplement the hydraulic calculation for sewers between FMH4084580 and FMH4016449, and FMH4016449 and FMH4084581.	Noted and supplemented.
5.The consultant is suggested to provide softcopy of the report and the calculation spreadsheet (in Excel) in CD Rom format and all Response to Comments from EPD and DSD as appendix as well as highlight the revised / updated content of the SIA report in next submission to facilitate review.	Noted.

Comments from EPD through Email dated 2 December 2022	
Comments	**Responses**
6. Please be reminded that the implementation of local sewer connection / upgrading / diversion works shall meet the satisfaction of DSD. The consultant should seek DSD's view on the SIA.	Noted.

Comments from DSD under memo ref. (00XE4T) in MS 11/SSP/4/0 Pt.7 dated 20 December 2022	
Comments	**Responses**
I refer to your above memorandum dated 16.11.2022 regarding the captioned submission and have the following comments.	
i) The following comments are for the consultants' reference and consideration. They are subject to the views and agreement of EPD as the planning authority of sewerage infrastructure. The Study has to meet the full satisfaction of EPD.	Noted.
ii) Tables 2.1-2.3 – please elaborate on the basis and/or quote the reference for the assumption of residential population for the proposed development.	Noted and supplemented.
iii) Table 2.4 – Based on the best available information, the Driving Test Centre (DTC) is currently under redevelopment CE 36/2021(CE) with ADWF=809m^3/day.	Noted and incorporated.
iv) Based on best available information, a redevelopment at Yin Pin Road discharging to FMH4016305 with ADWF=294m^3/day shall be within Catchment A.	Noted and incorporated.
v) Table 2.13 – Please review if Blocks 9, 10 and 11 is referred.	Blocks 8, 9 and 10 of the proposed development under Pak Tin Phase 13 redevelopment are referred.
vi) Section 2.5.4 – HDPE pipes are preferred to be used from drainage operation and maintenance point of view.	Noted and revised.

Comments from DSD under memo ref. (00XE4T) in MS 11/SSP/4/0 Pt.7 dated 20 December 2022	
Comments	**Responses**
vii) Section 3.1.3 – Please clarify if the proposed upgrading works are to be implemented by project proponent	Noted. The proposed upgrading works will be implemented by HD.
viii) Appendix A – Please enlarge the font size for the manhole details (number and levels).	Noted and revised.
ix) Appendix A – The base plan is outdated for Catchment G, H & I. please review.	Noted. The plan is revised to reflect the redevelopments works for Catchment G, H and I.
x) Appendix C – According to the records of this department, sewer pipes larger than 600mm dia. Shall be concrete pipes, please review the roughness coefficient respectively.	Noted and revised.
xi) Appendix C – Manhole details for pipe segment between FMH4016441 and FMH4016483 do not tally with the records of this department, please review.	Noted and revised,
xii) Appendix C – FMH4016449 is missing in the assessment which should be the discharge point of Catchments G&H according to the records of this department,	Based on the latest record drawing, manhole "FMH4016449" was abandoned/removed. The Relevant drawing is attached in this RtC.
xiii) Appendix C – Please review if Tai Tin House and Telephone Exchange at Wai Chi Street discharges to FMH4016656.	Noted and incorporated.
xiv) Appendix C – Based on best available information, please include the sewerage flow of 25.2m^3/day from CE36/2021(CE) to FMH4016450.	Noted and incorporated.

Part Print of The DSD As-Built Drawing