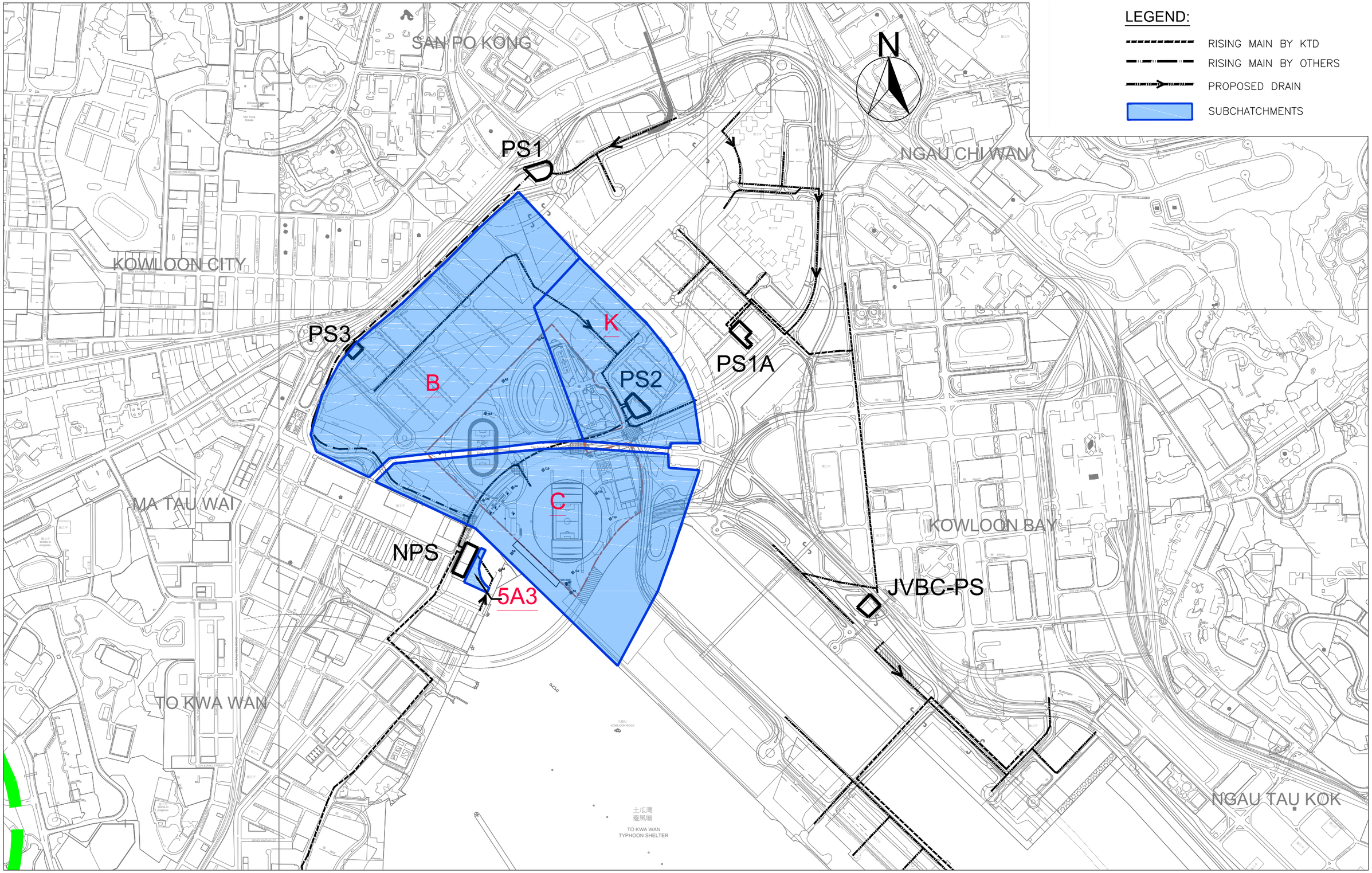
Appendix 7.3

Sewer Sub-Catchments of Pumping Station NPS and PS2 & Preliminary Sewerage Calculation



Appendix 7.3 (i) : SEWER SUB-CATCHMENTS OF PUMPING STATION OF NPS AND PS2

ARCHITECTURAL SERVICES DEPARTMENT

The joint venture of
Cinotech Consultants Ltd. and
Maurice Lee & Associates Ltd. .

Sub-Consultant
MVA SYSTRA GROUP

Drafting by	RW	01/16
Designed by	ML	01/16
Checked by	ML	01/16
Approved by	ML	01/16

SCALE: N.T.S @ A3 SIZE

PROJECT: Kai Tak Multi-purpose Sports Complex

DRAWING NO: Appendix 7.3(i)

REV: –

Filename: Z:\Project Files\HA Projects\HA900-HA999\HA921 (PA3031) EIA & TIA Kai Tak\22-Drg out\150616-SIA\SIA-appendix 7.3?i?_160824.dwg

A sewer on the north of Kai Tak Tunnel collecting sewage from from FDP1 to FDP4 successively for Public Sports Ground and Indoor Sports Centre then joining a 750mm twin pipe leading to Pumping Station PS2 at the junction of Road L6 and Road D2, hereinafter called Sewer No. 1.

Use	Types of Population	Estimated Population	Unit Flow Factor (m^3/person/day)	Estimated Flow (m^3/day)
Public Sports Ground	Spectator	7,000	0.032	224
	Permanent	40	0.28	11.2
	Temporary	350	0.064	22.4
			TOTAL (m^3/day)	**257.60**
			Through Foul Water Discharge Point FDP1 (m3/day)	50.0
			Through Foul Water Discharge Point FDP2 (m3/day)	207.6
Indoor Sports Centre	Spectator	5,400	0.032	172.8
	Permanent	55	0.28	15.4
	Temporary	55	0.064	3.52
			TOTAL (m^3/day)	**191.72**
			through Foul Water Discharge Point FDP3 (m3/day)	191.72

A 600mm sewer collecting sewage from the Main Stadium discharges into a 750mm diameter sewer subsequently discharges into Pumping Station NPS

Main Stadium	Spectator	50,000	0.032	1,600.00
	Permanent	30	0.28	8.40
	Temporary	5,125	0.064	328.00
Retail Area	Employee	2,280	0.28	638.40
	Visitor	2,105	0.016	33.68
			TOTAL (m^3/day)	**2,608.48**
			Through Foul Water Discharge Point FDP4 (m3/day)	80.00
			Through Foul Water Discharge Point FDP5 (m3/day)	1,856.40

A 300mm sewer collecting sewage from Hotel Block and Office Block, discharges into a 750mm diameter sewer subsequently discharges into Pumping Station NPS

Hotel Area	Resident	480	0.37	177.60
	Employee	300	1.58	474.00
Office Area	Employee	800	0.28	224.00
			TOTAL (m^3/day)	**875.60**
			through Foul Water Discharge Point FDP6 (m3/day)	875.60

MAURICE LEE & ASSOCIATES LTD. 李榮謙建築工程師事務所有限公司	Project:	Consultancy Services to carry out Environmental Impact Assessment and Traffic Impact Assessment Studies for the Multi-purpose Sports Complex at Kai Tak Area				Project No.:	HA921
	Title:	Draft Sewage Capacity Check for Pumping Station PS2					
	Prepared	MicL	Chkd	ML	Date	18-Feb-15	Page
	Revised		Chkd		Date		Rev.( ) Draft

Estimation of Sewage Flow in MPSC for (3) Further Updating

Sewage Capacity Check for Pumping Station PS2

Worst Case Scenario for PS2

The maximum population in the MPSC for this case would be 7,000 seats (public sports ground) + 5,400 seats (indoor sports Centre) + employees for public sports ground and indoor sports arena.

Therefore, the ADWF in the MPSC for this case would be the sum of ADWF of Spectators, permanent and temporary employees in Public Sports Ground and Indoor Sports Centre.

Estimated Peak Flow of Pumping Station PS2

	Items	Unit	Estimated Peak Flow	Remarks
a.	ADWF of Catchment B	m^3/day	11,681	(Extracted from Infrastructure Review Report (IRR) of KTD Engineering Study CE35/2006(CE)) Table 4.22
b.	ADWF of Catchment K	m^3/day	3,713	
c.	Peaking Factor	-	2	
d.	Peak Flow of Upstream Catchment	L/s	356.34	
e.	ADWF of MPSC	m^3/day	449.32	-
k.	Contributing population for ADWF of MPS	-	1,664	Contributing population =Calculated total average flow (m3/day)/ 0.27 (m3/person/day) from clause 12.1 of EPD's GESF (2005))
f.	Peaking Factor adopted for MPSC (Including Stormwater Allowance)	-	4.0	Based on contributing population (Extracted from Table T-5 of EPD's GESF (2005))(b) Sewage Treatment Works, Preliminary Treatment Works and Pumping Stations
g.	Peak Flow of MPSC	L/s	20.8	(e x f x 1,000 / 24 / 60 / 60)
h.	MTR SCL	L/s	18	(Extracted from IRR of KTD Engineering Study CE35/2006(CE))
i.	**Estimated Peak Flow of PS2**	**L/s**	**395**	(Sum of peak flow of item d, g and h)
j.	**Design Flow of PS2**	**L/s**	**501**	(Extracted from IRR of KTD Engineering Study CE35/2006(CE))

Remarks:

Peaking factor of 4 (with stormwater allowance) is adopted for MPSC in the assessment of PS2 where the Contributing population range in the MPSC in this case is less than 10000.

MAURICE LEE & ASSOCIATES LTD. 李榮護建築工程師事務所有限公司	Project:	Consultancy Services to carry out Environmental Impact Assessment and Traffic Impact Assessment Studies for the Multi-purpose Sports Complex at Kai Tak Area			Project No.: HA921
	Title:	Draft Sewage Capacity Check for Pumping Station NPS			
	Prepared	MicL	Chkd ML	Date 18-Feb-15	Page
	Revised		Chkd	Date	Rev.( ) Draft

Estimation of Sewage Flow in MPSC for (3) Further Updating

Sewage Capacity Check for Pumping Station NPS

All the sewage generated from MPSC will be discharged into NPS.

Worst Case Scenario for NPS

The maximum population in the MPSC for this case would be 7,000 seats (public sports ground)+50,000 seats (main stadium) + 5,400 seats (indoor sports Centre) + employees for public sports ground, main stadium and indoor sports arena + hotels/retail/office area.

Therefore, the ADWF in the MPSC for this case would be the sum of ADWF of Spectators in public sports ground, Main Stadium and Indoor Sports Centre, permanent and temporary employees in the public sports ground, Main Stadium and Indoor Sports Centre, residents and employees in Hotel Area, employees and visitors in Retail Area and employees in Office Area.

The Location of Catchments B,K,C and 5A3 is shown in Appendix 7.3 (i).

Estimated Peak Flow of Pumping Station NPS

	Items	Unit	Estimated Peak Flow	Remarks
a.	ADWF of Catchment B	m^3/day	11,681	(Extracted from Infrastructure Review Report (IRR) of KTD Engineering Study CE35/2006(CE)) Table 4.23
b.	ADWF of Catchment K	m^3/day	3,713	
c.	ADWF of Catchment C（including CKR's administration building）	m^3/day	28	
d.	ADWF of Catchment 5A3	m^3/day	31	
e.	Peaking Factor	-	2.0	
f.	Peak Flow of Upstream Catchment	L/s	358	
g.	ADWF of MPSC	m^3/day	3,933	-
n.	Contributing population for MPSC	-	14,568	Contributing population =Calculated total average flow (m3/day)/ 0.27(m3/person/day) from clause 12.1 of EPD's GESF (2005))
h.	Peaking Factor adopted for MPSC (Including Stormwater Allowance)	-	3.5	(Extracted from Table T-5 of EPD's GESF (2005))(b) Sewage Treatment Works, Preliminary Treatment Works and Pumping Stations
i.	Peak Flow of MPSC	L/s	159	(g x h x 1,000 / 24 / 60 / 60)
j.	MTR SCL	L/s	18	(Extracted from Infrastructure Review Report (IRR) of KTD Engineering Study CE35/2006(CE))
k.	DWFI	L/s	214	
l.	**Estimated Peak Flow of NPS**	**L/s**	**749**	(Sum of peak flow of item f, i, j and k)
m.	**Design Flow of NPS**	**L/s**	**805**	(Extracted from IRR of KTD Engineering Study CE35/2006(CE))

Remarks:

Peaking factor of 3.5 (with stormwater allowance) is adopted for MPSC in the assessment of PS2 where the Contributing population range in the MPSC in this case is 10,000 – 25,000 and the upstream sewers are known and newly laid.

HA921 Check the impact of new sewerage system from MPSC to the pipe leading to Pumping Station

(I) Design Synopsis

The MPSC sewers impact assessment is based on the CEDD KAI TAK DEVELOPMENT - Stage 4 infrastructure at former north apron area Sewerage design Contract No. KL/2012/03 and Stage 5A infrastructure at former north apron area

(1) Roughness coefficients (Ks) to be adopted by CEDD design for different pipes and conditions are as follows:
Ks = 0.6mm for vitrified clay pipes; Ks = 1.5mm for precast concrete pipes.
（Refer to Appendix 7.4）

(2) Siltation, gradient of pipes and appropriate pipe roughness are refered to Appendix 7.3 page 10 to page 21 working drawings by CEDD under CEDD confirms that Siltation is not considered duringdesign of the sewers since pipelines are newly laid and clean.
（Refer to Appendix 7.4）

(3) The peaking factor (Including Stormwater Allowance) for checking sewer capacity is refered to Part (a) of Table T-5 under GESF.

(4) According to Sewerage Manual by Drainage Services Department
Minimum velocity to achieve self-cleansing conditions= 1 m/s, for sewers of diameter up to 900mm
Maximum velocity at peak flow shall be limited to 3 m/s

(5) CEDD confirms that the infrastructure provisions by CEDD areable to cater for the updated sewage estimation of MPSC.
（Refer to Appendix 7.4）

(II) **MPSC Sewer To PS2**

A sewer on the north of Kai Tak Tunnel collecting sewage from from FDP1 to FDP4 successively for Public Sports Ground and Indoor Sports Centre then joining a 750mm twin pipe leading to Pumping Station PS2 at the junction of Road L6 and Road D2, hereinafter called Sewer No. 1.
(Drawings refered to Appendix 7.3 page 10 to 20 and Manhole & Pipe Schedule refered to Page 13 and 15)

(1) The 300mm sewer pipe collecting sewage from Public Sports Ground through Foulwater Discharge Point FDP 1
(Drawing refered to page 10 and Manhole&Pipe details refered to Page 13 and 21)

Pipe Size	Up Stream Manhole	Down Stream Manhole	Estimated ADWF from Public Sports Ground		Contributing population for ADWF	Peaking Factor for sewers (including stormwater allowance)	Peak Flow	Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart			
											Velocity	Required Velocity	Capacity of pipe	
(DN)			m^3/day	l/sec			(l/sec)		mm		(m/sec)	(m/sec)	(l/sec)	
300	FMH10_71a	FMH10_71	50	0.58	185	8	4.63	precast concrete pipe	1.5	1 in 200	1	>=1 and <3	69.2	OK!

(2) The sewage from FDP 1 discharge into DN375 Sewer No. 1 at FMH10-71 with upstream from Sung Wong Toi Park. Then the DN375 connect to 600mm sewer through FMH10_70.
(Drawing refered to page 10 and Manhole & Pipe details refered to Page 13)

The Estimated ADWF from FDP1= 50 m^3/day

Upstream from Sung Wong Toi Park= 8.4 m^3/day (Extracted from Infrastructure Review Report (IRR) of KTD Engineering Study CE35/2006(CE) Appendix 4.02-2 Page 123 Estimated Flow of Sub-Catchment B Sub-Planning

Estimated ADWF from Public Sports Ground and Upstream from Sung Wong Toi Park= 8.4+50= 58.4 m^3/day

Pipe Size	Up Stream Manhole	Down Stream Manhole	Estimated ADWF from Public Sports Ground and Upstream from Sung Wong Toi Park		Contributing population for ADWF	Peaking Factor for sewers (including stormwater allowance)	Peak Flow	Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart			
											Velocity	Required Velocity	Capacity of pipe	
(DN)			m^3/day	l/sec			l/sec		mm		(m/sec)	(m/sec)	(l/sec)	
375	FMH10_71	FMH10_70	58.40	0.68	216	8	5.41	precast concrete pipe	1.5	1 in 200	1.1	>=1 and <3	120	OK!

Pipe Size	Up Stream Manhole	Down Stream Manhole	Estimated ADWF from Public Sports Ground and Upstream from Sung Wong Toi Park		Contributing population for ADWF	Peaking Factor for sewers (including stormwater allowance)	Peak Flow	Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart			
											Velocity	Required Velocity	Capacity of pipe	
(DN)			m^3/day	l/sec			l/sec		mm		(m/sec)	(m/sec)	(l/sec)	
600	FMH10_70	FMH10_80	58.40	0.68	216	8	5.41	precast concrete pipe	1.5	1 in 240	1.4	>=1 and <3	400	OK!

(3) The 300mm sewer pipe collecting sewage from Public Sports Ground through Foulwater Discharge Point FDP 2 (Drawing refered to page 10 and Manhole & Pipe details refered to Page 13 and 21)

Pipe Size	Up Stream Manhole	Down Stream Manhole	Estimated ADWF from Public Sports Ground		Contributing population for ADWF	Peaking Factor for sewers (including stormwater allowance)	Peak Flow	Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart			
											Velocity	Required Velocity	Capacity of pipe	
(DN)			m^3/day	l/sec			l/sec		mm		(m/sec)	(m/sec)	(l/sec)	
300	FMH10_80a	FMH10_80	207.6	2.40	769	8	19.22	precast concrete pipe	1.5	1 in 150	1.1	>=1 and <3	80	OK!

(4) The sewage from FDP 2 discharge into Sewer No. 1 at FMH10-80 and the Sewer enlarge from DN600 to DN750. (Drawing refered to page 10 & 11 and Manhole & Pipe details refered to Page 13)

Pipe Size	Up Stream Manhole	Down Stream Manhole	Estimated ADWF from Public Sports Ground and upstream		Contributing population for ADWF	Peaking Factor for sewers (including stormwater allowance)	Peak Flow	Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart			
											Velocity	Required Velocity	Capacity of pipe	
(DN)			m^3/day	l/sec			l/sec		mm		(m/sec)	(m/sec)	(l/sec)	
750	FMH10_80	FMH10_270	266.00	3.08	985	8	24.63	precast concrete pipe	1.5	1 in 250	1.6	>=1 and <3	700	OK!

(5) The 300mm sewer pipe collecting sewage from Indoor Sports Centre through Foulwater Discharge Point FDP 3 (Drawing refered to page 11 and Manhole & Pipe details refered to Page 13 and 21)

Pipe Size	Up Stream Manhole	Down Stream Manhole	Estimated ADWF from Public Sports Ground and Indoor Sports Centre		Contributing population for ADWF	Peaking Factor for sewers (including stormwater allowance)	Peak Flow	Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart			
											Velocity	Required Velocity	Capacity of pipe	
(DN)			m^3/day	l/sec			l/sec		mm		(m/sec)	(m/sec)	(l/sec)	
300	FMH10_270a	FMH10_270	191.72	2.22	710	8	17.75	precast concrete pipe	1.5	1 in 150	1.1	>=1 and <3	80	OK!

(6) The sewage from FDP 3 discharge into Sewer No. 2 at FMH10-270 and the Sewer enlarge from DN750 to DN900. Then the DN900 connect to 750mm twin pipe. (Drawing refered to page 11 & 12 and Manhole & Pipe details refered to Page 13)

Pipe Size	Up Stream Manhole	Down Stream Manhole	Estimated ADWF from Public Sports Ground and Indoor Sports Centre and Catchment Area B		Contributing population for ADWF	Peaking Factor for sewers (including stormwater allowance)	Peak Flow	Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart			
											Velocity	Required Velocity	Capacity of pipe	
(DN)			m^3/day	l/sec			l/sec		mm		(m/sec)	(m/sec)	(l/sec)	
900	FMH10_270	FMH10_290	457.72	5.30	1695	6	31.79	precast concrete pipe	1.5	1 in 250	1.8	>=1 and <3	1200	OK!

(7) The 750mm twin pipe to Pumping Station PS2
(Drawing refered to page 12 & 14 and Manhole & Pipe details refered to Page 13 & 15)

Twin Pipe Size	Up Stream Manhole	Down Stream Manhole	Design Peak Flow of PS2		Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart			
								Velocity	Required Velocity	Capacity of twin pipe	
(DN)			m^3/day	l/sec		mm		(m/sec)	(m/sec)	(l/sec)	
750	FMH10_290	FMH10_340	43286.40	501.00	precast concrete pipe	1.5	1 in 250	1.5	>=1 and <3	1200	OK!

Twin Pipe Size	Up Stream Manhole	Down Stream Manhole	Design Peak Flow of PS2		Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart			
								Velocity	Required Velocity	Capacity of twin pipe	
(DN)			m^3/day	l/sec		mm		(m/sec)	(m/sec)	(l/sec)	
750	FMH10_340	FMH10_345	43286.40	501.00	precast concrete pipe	1.5	1 in 216	1.6	>=1 and <3	1300	OK!

Twin Pipe Size	Up Stream Manhole	Down Stream Manhole	Design Peak Flow of PS2		Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart			
								Velocity	Required Velocity	Capacity of twin pipe	
(DN)			m^3/day	l/sec		mm		(m/sec)	(m/sec)	(l/sec)	
750	FMH10_345	FMH10_350	43286.40	501.00	precast concrete pipe	1.5	1 in 200	1.7	>=1 and <3	1400	OK!

(8) The 300mm sewer pipe collecting sewage from Indoor Sports Centre through Foulwater Discharge Point FDP 4
(Drawing refered to page 14 and Manhole & Pipe details refered to Page 13,15 and 21)

Pipe Size	Up Stream Manhole	Down Stream Manhole	Estimated ADWF from Public Sports Ground and Indoor Sports Centre		Contributing population for ADWF	Peaking Factor for sewers (including stormwater allowance)	Peak Flow	Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart			
											Velocity	Required Velocity	Capacity of pipe	
(DN)			m^3/day	l/sec			l/sec		mm		(m/sec)	(m/sec)	(l/sec)	
300	2D1_1A	FMH10_350	80.00	0.93	296	8	7.41	vitrified clay pipes	0.6	1 in 240	1	>=1 and <3	63.1	OK!

(9) The sewage from FDP 4 discharge into Sewer No. 1 at FMH10-350 and connect to 750mm twin pipe.
(Drawing refered to page 14 & 16 and Manhole & Pipe details refered to Page 13 & 15)

Twin Pipe Size	Up Stream Manhole	Down Stream Manhole	Design Peak Flow of PS2		Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart			
								Velocity	Required Velocity	Capacity of twin pipe	
(DN)			m^3/day	l/sec		mm		(m/sec)	(m/sec)	(l/sec)	
750	FMH10_350	FMH10_370	43286.40	501.00	precast concrete pipe	1.5	1 in 188	1.8	>=1 and <3	1600	OK!

Twin Pipe Size	Up Stream Manhole	Down Stream Manhole	Design Peak Flow of PS2		Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart			
								Velocity	Required Velocity	Capacity of twin pipe	
(DN)			m^3/day	l/sec		mm		(m/sec)	(m/sec)	(l/sec)	
750	FMH10_370	PS2	43286.40	501.00	precast concrete pipe	1.5	1 in 160	2	>=1 and <3	1800	OK!

As the sewer line is adequate to collect sewage from the Public Sports Ground and Indoor Sports Centre to the PS2, including catchment for the 750mm twin pipe, no upgrading works is required. No adverse impact will be imposed.

(III) **Sewer From PS2 To NPS (Drawing refered to page 16 to 21)**

A 600mm sewer collecting sewage from FDP5 for the Main Stadium and a 300mm sewer collecting sewage from FDP6 for Hotel Block and Office Block, both discharge into a 750mm diameter sewer along Road D2 which subsequently discharges into Pumping Station NPS, hereinafter called Sewer No. 2.

(Drawings refered to Appendix 7.3 page 16 to 20 and Manhole & Pipe Schedule refered to Page 15)

(1) 600 mm dia. sewer from Main Stadium discharge from proposed foulwater discharge points FDP5
(Drawing refered to page 17 & 19 and Latest Pipe details refered to Page 21)

Pipe Size	Up Stream Manhole	Down Stream Manhole	Estimated ADWF Flow of Main Stadium		Contributing population for ADWF	Peaking Factor for sewers (including stormwater allowance)	Peak Flow	Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart			
											Velocity	Required Velocity	Capacity of pipe	
(DN)			m^3/day	l/sec			l/sec		mm		(m/sec)	(m/sec)	(l/sec)	
600	FMH120_10	FMH120_20	1,856.40	21.49	6876	5	107.43	precast concrete pipe	1.5	1 in 163	1.7	>=1 and <3	480	OK!

(2) 300 mm dia. sewer from Hotel Block and Office Block discharge from proposed foulwater discharge points FDP6
(Drawing refered to page 17 to 20 and Latest Pipe details refered to Page 21)

Pipe Size	Up Stream Manhole	Down Stream Manhole	Estimated ADWF Flow of Hotel Block and Office Block		Contributing population for ADWF	Peaking Factor (including stormwater allowance)	Peak Flow	Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart		
											Velocity	Required Velocity	Capacity of pipe
(DN)			m^3/day	l/sec			l/sec		mm		(m/sec)	(m/sec)	(l/sec)
300	FMH125_40	FMH125_50	875.60	10.13	3243	6	60.81	vitrified clay pipe	0.6	1 in 80	1.7	>=1 and <3	109.6

(3) Single 750 mm dia. sewer along Road D2 receiving the sewers from FDP5 for MPSC
Chainage from 442 meter to 636 meter, Drawing refered to 17 & 19

Pipe Size	Up Stream Manhole	Down Stream Manhole	Design Peak Flow of NPS		Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart			
								Velocity	Required Velocity	Capacity	
(DN)			m^3/day	l/sec		mm		(m/sec)	(m/sec)	(l/sec)	
750	DC1	FMH120_60	69552	805.00	precast concrete pipe	1.5	1 in 80	2.7	>=1 and <3	1200	OK!

As the 750mm sewer line is adequate to collect sewage from the Main Stadium, Hotel and Office Block to NPS, including the rising mains from PS2, no upgrading works is required for the sewer. No adverse impact will be imposed. If necessary the infrastructure provisions by CEDD would cater for the updated sewage estimation of MPSC.

(4) 750mm twin pipe to Pumping Station NPS

Twin Pipe Size	Up Stream Manhole	Down Stream Manhole	Design Peak Flow of NPS		Pipe Material	Pipe Roughness Ks	Gradient	Based on Chart			
								Velocity	Required Velocity	Capacity of twin pipe	
(DN)			m^3/day	l/sec		mm		(m/sec)	(m/sec)	(l/sec)	
750	FMH120_60	FMH120_80	69552	805.00	precast concrete pipe	1.5	1 in 95	2.5	>=1 and <3	2200	OK!

As the sewer line is adequate to collect sewage from the Main Stadium, Hotel and Office Block to NPS, including the rising mains from PS2, no upgrading works is required for the rising mains. No adverse impact will be imposed.

List of surfaces with roughness k_s = 0.6 mm

Good examples of	Old tuberculated water mains with slight attack
	Concrete pipes, monolithic construction against rough forms
	Glazed brickwork
Normal examples of	Rusty wrought iron
	Wood stave pipes, planed plank conduits
	Concrete pipes, monolithic construction against steel forms
	uPVC sewers slimed to about half depth; velocity when flowing half full approximately 0.75 m/s
	Asbestos cement sewers slimed to about half depth; velocity, when flowing half full, approximately 1.2m/s
Poor examples of	Uncoated cast iron
	Tate relined pipes
	Precast concrete pipes with 'O' ring joints
	Clayware sewers slimed to about half depth; velocity, when flowing half full, approximately 1.2m/s
	Sewer rising mains, mean velocity 1 m/s

Discharge Q (l/s) *for pipes flowing full*

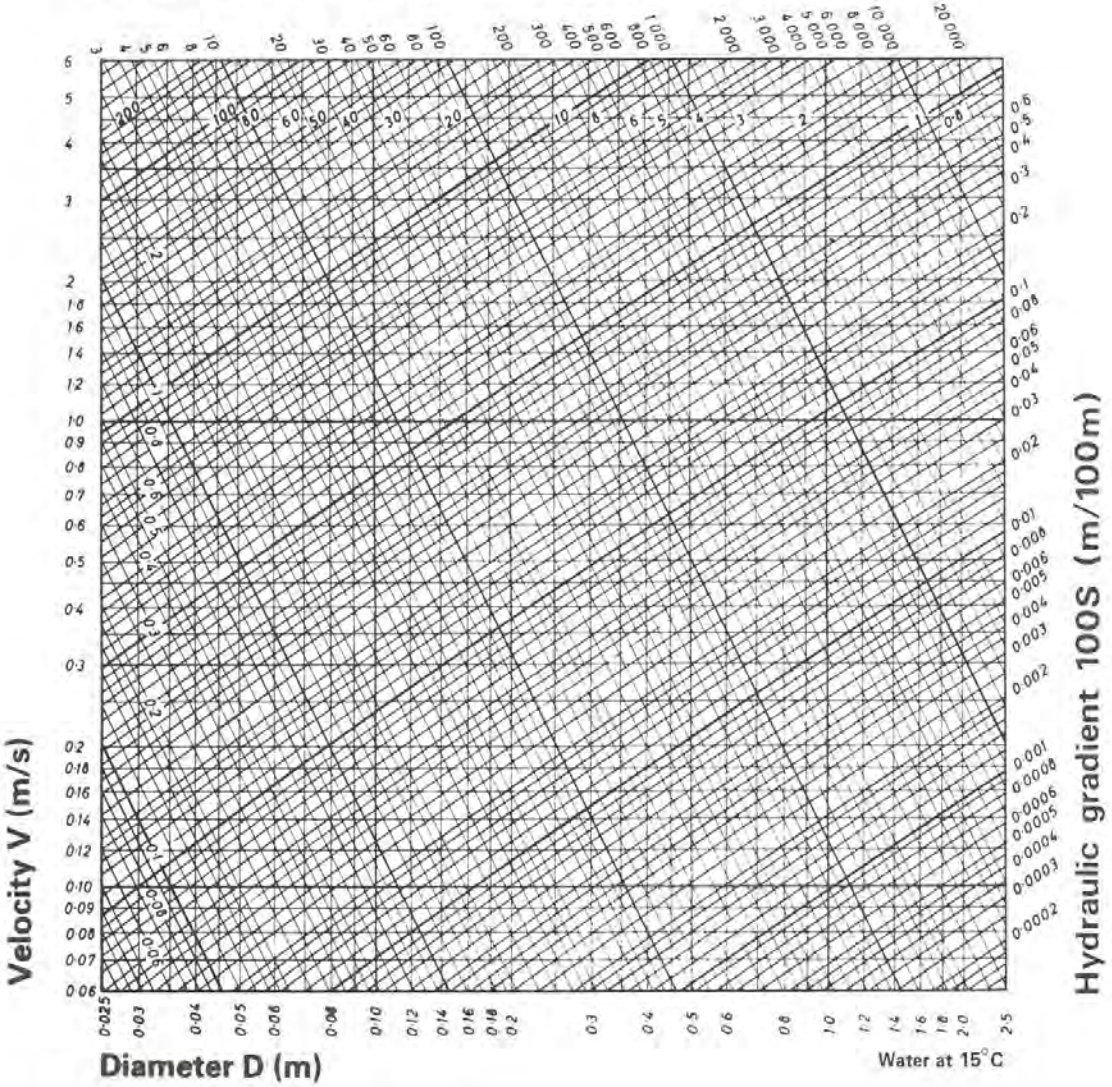


Fig 8 $k_s = 0{\cdot}6$ mm

List of surfaces with roughness k_s = 1.5 mm

Good examples of	Old tuberculated water mains with moderate attack Well pointed brickwork
Normal examples of	Old tuberculated water mains with slight attack Glazed brickwork Clayware sewers slimed to about half depth; velocity, when flowing half full, approximately 0.75m/s Concrete sewers, spun or vertically cast, slimed to about half depth; velocity, when flowing half full, approximately 1.2m/s
Poor examples of	Wood stave pipes, planed plank conduits Asbestos cement sewers slimed to about half depth; velocity, when flowing half full, approximately 1.2m/s

Discharge Q (l/s) *for pipes flowing full*

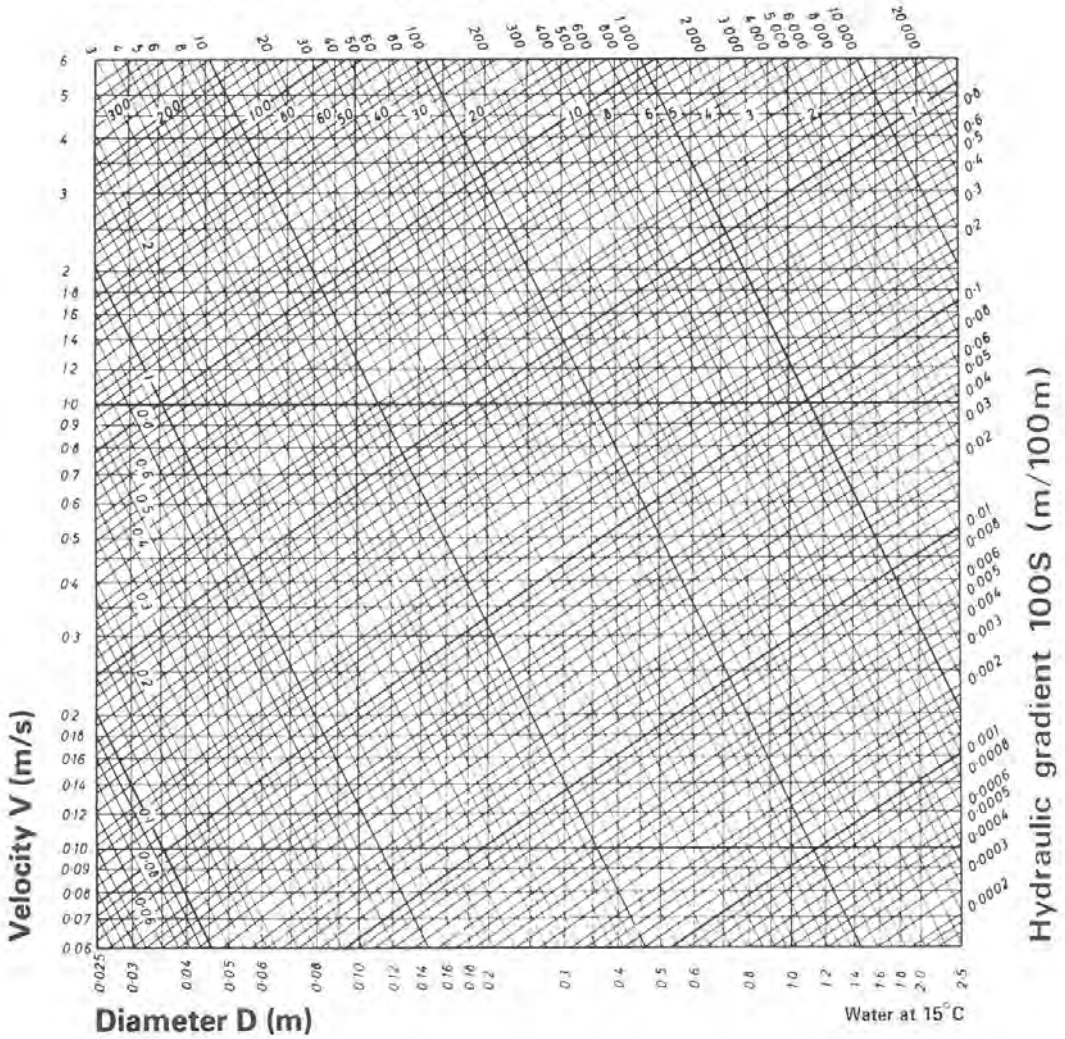


Fig 9 k_s = 1·5 mm

820800 N

820900 N

837800 E

837900 E

ROAD L16

SWT1_1

SWTP1_1

SWTP1_2

SWTP1_3

FMH10_45

FMH10_44

FMH10_43

FMH10_51

FMH10_53

FMH10_54

FMH10_41

FMH10_40

FMH25_10

2A7_1

2A6_1

2B6_1

2B5_1

2B4_1

FMH10_50

FMH10_55

FMH10_60

Ø300

Ø375

Ø150

Ø450

Ø225

Ø600

Ø750

FUTURE CONNECTION TO
SUNG WONG TOI PARK

FMH10_74

FMH10_73

FMH10_72

FMH10_71

FMH10_70

FMH10_80

SS1_1

FUTURE CONNECTION
TO STATION SQUARE

BOX CULVERT B6

BOX CULVERT B1

BOX CULVERT B3

BOX CULVERT B4

2D1_1

2D1_1a

FMH10_71a

FUTURE CONNECTION TO
STATION SQUARE

FDP1

FUTURE CONNECTION TO
MPSC

2D1_2

2D1_2a

FMH10_80a

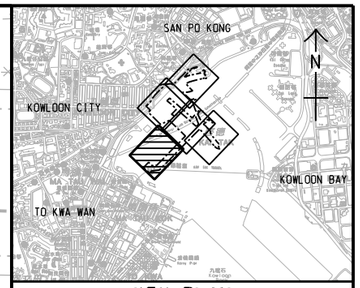
FUTURE CONNECTION TO
STATION SQUARE

FDP2

N TO

KAI TAK TUNNE

CUT LINE_C-C
SEE DRAWING NO. 60102100/5A/1344



KEY PLAN

SCALE A1 1 : 25000
A3 1 : 50000

NOTES:

1. FOR NOTES AND LEGEND SEE DRAWING NO. 60102100/5A/1341.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING NOS. 60102100/5A/1341, 1342, 1344 AND 1345.

REV. 修訂	DESCRIPTION 內容摘要	D.C.	P.C. CHECKED 查核	DATE 日期

CEDD 土木工程拓展署 Civil Engineering and Development Department

KAI TAK DEVELOPMENT

KAI TAK DEVELOPMENT –
STAGE 5A INFRASTRUCTURE AT FORMER NORTH APRON AREA

SEWERAGE - LAYOUT PLAN

SHEET 3 OF 5

AECOM

DRG.NO. 圖紙編號 60102100/5A/01343

DESIGNED BY 設計	CONTRACT NO. 合約編號 KL/2015/02	P. Dir. APPROVED 批准人
DRAWN BY 繪圖 AHL	STATUS 階段	
SCALE 比例 A1 1 : 500 A3 1 : 1000		
DIMENSIONS ARE IN 尺寸單位 METRES		

Plot File by : 2016/1/25 AHL

P:\PROJECTS\60102100\DRAWING\CONTRACT\5A\1000\5A_1343.dgn

CUT LINE B-B
SEE DRAWING NO. 60102100/5A/1341

838100 E

838200 E

820900 N

820800 N

CUT LINE C-C
SEE DRAWING NO. 60102100/5A/1343

CUT LINE D-D
SEE DRAWING NO. 60102100/5A/1345

LUNG TSUN STONE BRIDGE PRESERVATION CORRIDOR

FMH25_30
FMH25_40
FMH50_30
FMH50_50
FMH10_90
FMH10_270
FMH10_271
FMH10_280
FMH10_270a
FMH10_290
FMH60_10
FMH60_20
FMH60_40
FMH60_50
FMH60_60
FMH60_70
LTSB1_2
SS1_2
FMH10_300
2A1_1
2B1_1
2B2_1
2B3_1
2D1_3
2D1_3a
1M2_1

Ø375
Ø450
Ø300
Ø750
Ø900
Ø225
2×Ø750

FUTURE CONNECTION TO SITE 2B2

FUTURE CONNECTION TO SITE 2B1

FUTURE CONNECTION TO LTSB AND STATION SQUARE

FUTURE CONNECTION TO STATION SQUARE

FUTURE CONNECTION TO STATION SQUARE

FUTURE CONNECTION TO MPSC

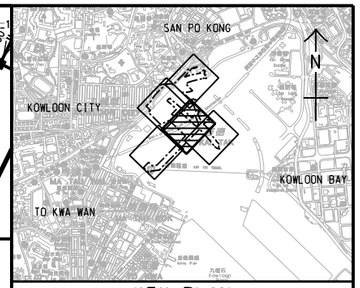
BOX CULVERT B4

BOX CULVERT B2

TWIN BOX CULVERT B5

TO BE CONSTRUCTED BY OTHERS

FDP3



KEY PLAN
SCALE A1 1 : 25000
A3 1 : 50000

NOTES:

1. FOR NOTES AND LEGEND SEE DRAWING NO. 60102100/5A/1341.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING NOS. 60102100/5A/1341 TO 1343, AND 1345.

REV. 修訂	DESCRIPTION 內容摘要	D.E.	P.E. CHECKED 查核	DATE 日期

CEDD 土木工程拓展署 Civil Engineering and Development Department

KAI TAK DEVELOPMENT

KAI TAK DEVELOPMENT –
STAGE 5A INFRASTRUCTURE AT FORMER NORTH APRON AREA

SEWERAGE - LAYOUT PLAN

SHEET 4 OF 5

AECOM

DRG.NO. 圖紙編號: 60102100/5A/01344

DESIGNED BY 設計	CONTRACT NO. 合約編號: KL/2015/02	P. Dir. APPROVED 批准人
DRAWN BY 繪圖: AHL	STATUS 報告	
SCALE 比例: A1 1 : 500, A3 1 : 1000		
DIMENSIONS ARE IN 尺寸單位: METRES		

Plot File by : 2016/1/25 ANHL

P:\PROJECTS\60102100\DRAWING\CONTRACT\5A\1000\5A_1344.dgn

820900 N

821000 N

838300 E

FMH10_280

FMH60_70

FMH10_290

Ø900

Ø450

2xØ750

SS1_2

FMH10_300

2D1_3

Ø150

Ø150

2D1_3a

FMH10_270a

FUTURE CONNECTION TO STATION SQUARE AND MPSC

FDP3

CUT LINE D-D

SEE DRAWING NO. 60102100/5A/1344

TWIN BOX CULVERT B5

2xØ750

TO BE CONSTRUCTED BY OTHERS

FMH10_310

2xØ750

FMH10_320

2xØ750

FMH10_330

2xØ750

1K3_1

Ø300

FMH10_345

2xØ750

FMH10_340

Ø300

FMH70_30

Ø300

FMH70_20

Ø300

2D1_1

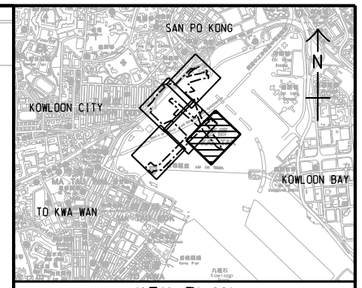
2xØ750

Ø300

FMH10_350

BOX CULVERT TO BE CONSTRUCTED BY OTHERS

ROAD L6



KEY PLAN

SCALE A1 1 : 25000
A3 1 : 50000

NOTES:

1. FOR NOTES AND LEGEND SEE DRAWING NO. 60102100/5A/1341.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING NOS. 60102100/5A/1341 TO 1344.

REV. 修訂	DESCRIPTION 內容摘要	D.E.	P.E. CHECKED 審核	DATE 日期

土木工程拓展署
Civil Engineering and Development Department

KAI TAK DEVELOPMENT

KAI TAK DEVELOPMENT –
STAGE 5A INFRASTRUCTURE AT FORMER NORTH APRON AREA

SEWERAGE - LAYOUT PLAN

SHEET 5 OF 5

AECOM

DRG.NO. 圖紙編號 60102100/5A/01345

DESIGNED BY 設計	CONTRACT NO. 合約編號 KL/2015/02	P. Dir. APPROVED 批准人
DRAWN BY 繪圖 AHL	STATUS 階段	
SCALE 比例 A1 1 : 500 A3 1 : 1000		
DIMENSIONS ARE IN 尺寸單位 METRES		

Plot File by : 2015/12/29 ZENGFX

p:\projects\60102100\drawing\contract\5a\1000\5A_1345.dgn

MANHOLE SCHEDULE

U/S M.H.	D/S M.H.	U/S G.L. (mPD)	D/S G.L. (mPD)	GRADIENT 1 IN	U/S I.L. (mPD)	D/S I.L. (mPD)	PIPE SIZE (mm)	U/S M.H.TYPE	PIPE MATERIAL	BEDDING TYPE
FMH10_74	FMH10_73	6.100	6.450	350	4.830	4.719	225	D1	CONCRETE	B
FMH10_73	FMH10_72	6.450	6.400	320	4.569	4.478	300	E1	CONCRETE	B
FMH10_72	FMH10_71	6.400	6.380	320	4.478	4.383	300	E1	CONCRETE	B
FMH10_71	FMH10_70	6.380	5.912	200	4.383	3.983	300	E1	CONCRETE	B
FMH10_70	FMH10_80	5.912	5.450	240	0.549	0.256	600	L/BACKDROP3	CONCRETE	C.S.
FMH10_80	FMH10_90	5.450	5.250	250	0.106	-0.250	750	L/BACKDROP3	CONCRETE	C.S.
FMH10_90	FMH10_270	5.250	5.150	250	-1.006	-1.386	750	S1	CONCRETE	C.S.
FMH10_270	FMH10_271	5.150	5.250	250	-1.536	-1.826	900	S1	CONCRETE	C.S.
FMH10_271	FMH10_280	5.250	5.350	250	-1.926	-2.052	900	S1	CONCRETE	C.S.
FMH10_280	FMH10_290	5.350	5.500	250	-2.052	-2.212	900	S1	CONCRETE	C.S.
FMH10_290	FMH10_300	5.500	5.500	250	-2.212	-2.465	750	S2	CONCRETE	C.S.
FMH10_300	FMH10_310	5.500	5.500	250	-2.465	-2.637	750	S3	CONCRETE	C.S.
SWTP1_2	FMH10_74	6.100	6.100	350	4.850	4.830	225	TEMPORARY PLUG	CONCRETE	B
SS1_1	FMH10_73	6.450	6.450	350	5.200	5.088	225	TEMPORARY PLUG	CONCRETE	B
2D1_1	FMH10_71a	6.056	6.380	200	4.631	4.613	300	TEMPORARY PLUG	CONCRETE	B
2D1_1a	FMH10_71a	6.056	6.380	200	4.631	4.613	300	TEMPORARY PLUG	CONCRETE	B
FMH10_71a	FMH10_71	6.380	6.380	200	4.613	4.468	300	E1	CONCRETE	B
2D1_2	FMH10_80a	6.250	5.450	150	5.025	5.001	300	TEMPORARY PLUG	CONCRETE	B
2D1_2a	FMH10_80a	6.250	5.450	150	5.025	5.001	300	TEMPORARY PLUG	CONCRETE	B
FMH10_80a	FMH10_80	5.450	5.450	150	5.001	4.730	300	D1	CONCRETE	B
2D1_3	FMH10_270a	5.200	5.150	150	-0.650	-0.674	300	TEMPORARY PLUG	CONCRETE	B
2D1_3a	FMH10_270a	5.200	5.150	150	-0.650	-0.674	300	TEMPORARY PLUG	CONCRETE	B
FMH10_270a	FMH10_270	5.150	5.150	150	-0.674	-0.946	300	L	CONCRETE	B
LTSB1_2	FMH10_280	5.250	5.350	240	3.750	3.662	225	TEMPORARY PLUG	CONCRETE	B
SS1_2	FMH10_300	5.500	5.500	100	3.138	3.120	225	TEMPORARY PLUG	CONCRETE	B

MANHOLE SCHEDULE

U/S M.H.	D/S M.H.	U/S G.L. (mPD)	D/S G.L. (mPD)	GRADIENT 1 IN	U/S I.L. (mPD)	D/S I.L. (mPD)	PIPE SIZE (mm)	U/S M.H.TYPE	PIPE MATERIAL	BEDDING TYPE
FMH50_10	FMH50_10a	6.040	6.150	240	4.719	4.645	375	D1	CONCRETE	B
FMH50_10a	FMH50_20	6.150	6.300	240	4.645	4.591	375	E1	CONCRETE	B
FMH50_20	FMH50_30	6.300	6.200	240	4.191	3.877	375	E1	CONCRETE	B
FMH50_30	FMH50_50	6.200	5.970	240	3.877	3.543	375	E1	CONCRETE	B
FMH50_50	FMH10_270	5.970	5.150	150	3.543	3.373	375	E1	CONCRETE	B
2A2_1	FMH50_10	6.040	6.040	240	4.840	4.794	300	TEMPORARY PLUG	CONCRETE	B
2A3_1	FMH50_10	6.040	6.040	240	4.896	4.794	300	TEMPORARY PLUG	CONCRETE	B
LTSB1_1	FMH50_10a	6.150	6.150	240	4.808	4.720	300	TEMPORARY PLUG	CONCRETE	B
2B1_1	FMH50_50	5.970	5.970	120	3.661	3.618	300	TEMPORARY PLUG	CONCRETE	B
2B2_1	FMH50_50	5.970	5.970	120	3.709	3.618	300	TEMPORARY PLUG	CONCRETE	B
FMH60_10	FMH60_20	6.200	6.200	220	3.621	3.465	450	E1		B
FMH60_20	FMH60_40	6.200	6.200	220	3.465	3.214	450	E1	CONCRETE	B
FMH60_40	FMH60_50	6.200	6.200	220	3.214	3.032	450	E1	CONCRETE	B
FMH60_50	FMH60_60	6.200	6.200	220	3.032	2.850	450	F1	CONCRETE	B
FMH60_60	FMH60_70	6.200	6.200	220	2.850	2.686	450	F1	CONCRETE	B
FMH60_70	FMH10_290	6.200	5.500	220	2.686	2.641	450	F1	CONCRETE	B
2A1_1	FMH60_10	6.200	6.200	240	3.806	3.771	300	TEMPORARY PLUG	CONCRETE	B
1M1_1	FMH60_10	6.200	6.200	240	3.790	3.621	450	TEMPORARY PLUG	CONCRETE	B
1M2_1	FMH60_10	6.200	6.200	240	3.807	3.771	300	TEMPORARY PLUG	CONCRETE	B

NOTES:

1. FOR GENERAL NOTES AND ABBREVIATION SEE DRAWING NO. 60102100/5A/1340.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING NOS. 60102100/5A/1341 TO 1345.
3. FOR DETAILS OF STANDARD MANHOLE, SEE DSD STANDARD DRAWINGS.
4. FOR DETAILS OF SPECIAL MANHOLES, SEE DRAWING NOS. 60102100/5A/1350 TO 1353.
5. FOR DETAILS OF CONCRETE SURROUND FOR PIPES, SEE DRAWING NO. 60102100/5A/1349.
6. THE EXACT INVERT LEVELS OF FMH10_310, U/S AND D/S SHOULD MATCH WITH THE INVERT LEVELS OF UPSTREAM OR DOWNSTREAM SEWER AND SHOULD BE DETERMINED ON SITE.

REV. 修訂	DESCRIPTION 內容摘要	D.E.	P.E. CHECKED 查核	DATE 日期

土木工程拓展署
Civil Engineering and Development Department

KAI TAK DEVELOPMENT

KAI TAK DEVELOPMENT -
STAGE 5A INFRASTRUCTURE AT FORMER NORTH APRON AREA

SEWERAGE - MANHOLE SCHEDULE

AECOM

DRG.NO. 圖紙編號 60102100/5A/01348

DESIGNED BY 設計	CONTRACT NO. 合約編號 KL/2015/02	P. Dir. APPROVED 批准人
DRAWN BY 繪圖 CRH	STATUS 報告	
SCALE 比例		
DIMENSIONS ARE IN 尺寸單位 METRES		

Plot File by : 2016/1/25 ANHL

P:\PROJECTS\60102100\DRAWING\CONTRACT\5A\1000\5A_1348.dgn

838400 E

MANHOLE TO BE CONNECTED WITH PIPE
CONSTRUCT BY OTHERS

FMH10_310

2xØ750

FMH10_320

SITE 1K/2

2xØ750

FMH10_330

2xØ750

838500 E

KAI TAK NULLAH

TO BE CONSTRUCTION
BY OTHERS

820800 N

BOX CULVERT B5
2x5000(W)x4000(H)

1K3_1

Ø300

FMH10_345

2xØ750

FMH10_340

Ø300

FMH70_30

Ø300

FMH70_20

1K1_1

Ø300

FDP4

2D1_1

Ø300

2xØ750

ROAD L6

FMH10_350

LAY-BY

SITE 1L/3

SITE 1L/2

TO BE CONSTRUCTION
BY OTHERS

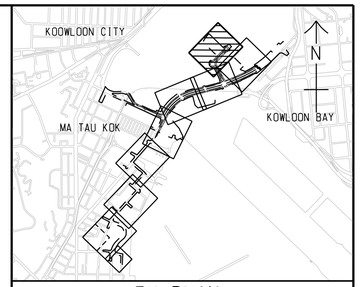
2xØ750

820700 N

FMH10_360

CUT LINE A-A

SEE DRAWING NOS.
60102100/S4/5001 AND 5003



KEY PLAN
SCALE A1 1 : 25000
A3 1 : 50000

NOTES:

1. FOR NOTES AND LEGEND, REFER TO DRAWING NO. 60102100/S4/5001.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60102100/S4/5001 AND 5003 TO 5008.

REV. 修訂	DESCRIPTION 內容摘要	D.C. P.C. CHECKED 複核	DATE 日期
A	WORKING DRAWING	DYHP SCWC	OCT.13
-	TENDER DRAWING	DYHP SCWC	MAR.13

土木工程拓展署
CEDD Civil Engineering and Development Department

KAI TAK DEVELOPMENT

KAI TAK DEVELOPMENT -
STAGE 4 INFRASTRUCTURE AT
FORMER NORTH APRON AREA

SEWERAGE - LAYOUT PLAN

SHEET 2 OF 8

AECOM

DRG.NO. 圖紙編號: 60102100/S4/5002A

DESIGNED BY 設計: LXL	CONTRACT NO. 合約編號: KL/2012/03	P. Dir. APPROVED 批准人: DML
DRAWN BY 繪圖: GXH	STATUS 階段: WORKING DRAWING	
SCALE 比例: A1 1 : 500, A3 1 : 1000		
DIMENSIONS ARE IN 尺寸單位: METRES		

Plot File by : 2013-3-4 RONGYH

p:\projects\60102100\drawing\contract\s4\S4_5002.dgn

MANHOLE SCHEDULE

U/S M.H.	D/S M.H.	U/S G.L. (mPD)	D/S G.L. (mPD)	GRADIENT 1 IN	U/S I.L. (mPD)	D/S I.L. (mPD)	PIPE SIZE (mm)	U/S M.H. TYPE	PIPE MATERIAL	BEDDING	PIPE CLASS	REMARK
FMH10_310	FMH10_320	5.50	5.50	250	-3.22	-3.45	2x750	S1	CONCRETE	C.S.	H	NOTE 8
FMH10_320	FMH10_330	5.50	5.50	250	-3.45	-3.77	2x750	S1	CONCRETE	C.S.	H	
FMH10_330	FMH10_340	5.50	5.84	250	-3.77	-3.89	2x750	S1	CONCRETE	C.S.	H	
FMH10_340	FMH10_345	5.84	6.26	216	-3.89	-4.17	2x750	S2/BACKDROP3	CONCRETE	C.S.	H	
FMH10_345	FMH10_350	6.26	6.25	200	-4.17	-4.35	2x750	S2/BACKDROP3	CONCRETE	C.S.	H	
FMH10_350	FMH10_360	6.25	5.38	188	-4.35	-4.62	2x750	S1/BACKDROP3	CONCRETE	C.S.	H	
FMH10_360	FMH10_370	5.38	5.46	188	-4.62	-4.89	2x750	S1	CONCRETE	C.S.	H	
FMH10_370	PS2	5.46	5.44	160	-4.89	-4.98	2x750	S2/BACKDROP3	CONCRETE	C.S.	H	
1K1_1	FMH70_20	5.90	5.75	240	3.35	3.25	300	E1	V.C.	B	120	
FMH70_20	FMH70_30	5.75	5.66	200	3.25	3.11	300	E1	V.C.	B	120	
FMH70_30	FMH10_340	5.66	5.84	200	3.11	2.96	300	E1	V.C.	B	120	
1K3_1	FMH10_345	6.36	6.26	240	3.20	3.12	300	F1	V.C.	B	120	
2D1_1	FMH10_350	6.36	6.25	240	4.24	4.08	300	F1	V.C.	B	120	
FMH90_20	FMH90_30	5.12	5.33	140	3.68	3.40	300	D1	V.C.	B	120	
FMH90_30	FMH90_40	5.33	5.38	140	3.40	3.15	300	E1	V.C.	B	120	
FMH90_40	FMH90_50	5.38	5.16	140	3.15	2.87	300	E1	V.C.	B	120	
FMH90_50	FMH90_60	5.16	4.98	140	2.87	2.67	300	E1	V.C.	B	120	
FMH90_60	FMH90_65	4.98	5.03	140	2.67	2.48	300	E1	V.C.	B	120	
FMH90_65	FMH90_70	5.03	4.75	140	1.88	1.76	300	F1	V.C.	B	120	
FMH90_70	FMH90_80	4.75	5.11	140	1.76	1.53	300	E1	V.C.	B	120	
FMH90_80	FMH10_370	5.11	5.46	140	1.53	1.35	300	F1	V.C.	B	120	
1P1_1	FMH90_20	5.19	5.12	240	3.89	3.81	300	D1	V.C.	B	120	
1L4_1	FMH90_20	5.15	5.12	240	3.75	3.68	300	D1	V.C.	B	120	
1L1_1	FMH100_10	5.60	5.00	240	3.80	3.78	300	E1	V.C.	B	120	
FMH100_10	FMH100_20	5.00	4.90	240	3.78	3.62	300	D1	V.C.	B	120	
FMH100_20	FMH100_30	4.90	5.02	240	3.62	3.51	300	D1	V.C.	B	120	
FMH100_30	FMH100_40	5.02	5.20	240	3.48	3.32	300	E1	V.C.	B	120	
FMH100_40	FMH100_50	5.20	5.25	240	3.32	3.19	300	E1	V.C.	B	120	
FMH100_50	FMH90_50	5.25	5.16	140	3.19	3.02	300	E1	V.C.	B	120	
1L2_1	FMH100_30	5.20	5.02	240	3.50	3.48	300	E1	V.C.	B	120	
1L3_1	FMH100_50	5.20	5.25	240	3.50	3.48	300	E1	V.C.	B	120	
FMH110_90	FMH110_100	5.88	5.88	240	3.53	3.47	300	E1	V.C.	B	120	
FMH110_100	FMH110_110	5.88	5.88	90	2.87	2.68	300	F1	V.C.	B	120	
FMH110_110	FMH90_65	5.88	5.03	90	2.68	2.46	300	F1	V.C.	B	120	
FMH120_10	DC1	4.91	5.99	100	2.16	1.76	600	E1	CONCRETE	B	H	
DC1	FMH120_30	5.99	5.56	80	1.61	0.79	750	DISCHARGE CHAMBER DC1	CONCRETE	B	H	
FMH120_30	FMH120_40	5.56	5.07	80	0.79	0.15	750	L	CONCRETE	B	H	
FMH120_40	FMH120_50	5.07	4.57	80	0.15	-0.40	750	L	CONCRETE	B	H	
FMH120_50	FMH120_60	4.57	4.28	80	-0.40	-0.78	750	L/BACKDROP3	CONCRETE	B	H	
FMH120_60	FMH120_70	4.28	4.05	95	-1.32	-2.16	2x750	S6	CONCRETE	C.S.	H	BY TRENCHLESS METHOD
FMH120_70	FMH120_80	4.05	3.90	95	-2.16	-2.41	2x750	S6/BACKDROP3	CONCRETE	B	H	
FMH120_80	NPS	3.90	3.76	120	-2.41	-2.45	2x900	S2/BACKDROP2	CONCRETE	B	H	
FMH125_40	FMH120_50	4.26	4.57	240	2.61	2.46	300	E1	V.C.	B	120	

MANHOLE SCHEDULE

U/S M.H.	D/S M.H.	U/S G.L. (mPD)	D/S G.L. (mPD)	GRADIENT 1 IN	U/S I.L. (mPD)	D/S I.L. (mPD)	PIPE SIZE (mm)	U/S M.H. TYPE	PIPE MATERIAL	BEDDING	PIPE CLASS	REMARK
FMH130_60	FMH130_70	3.61	3.62	250	0.87	0.80	450	E1	V.C.	B	120	
FMH130_70	FMH130_80	3.62	3.65	250	0.80	0.64	450	E1	V.C.	B	120	
FMH130_80	FMH130_90	3.65	3.85	250	0.64	0.56	450	F1	V.C.	B	120	
FMH130_90	FMH120_80	3.85	3.90	90	0.41	0.09	600	F1	CONCRETE	B	H	
DWF1	FMH140_10	4.10	4.10	150	0.26	0.22	450	-	V.C.	C.S.	120	NOTE 5
FMH140_10	FMH120_70	4.10	4.05	150	0.15	-0.05	525	-	V.C.	C.S.	120	NOTE 7
DC2	FMH1	5.65	5.47	185	3.90	3.73	2x750	DISCHARGE CHAMBER DC2	CONCRETE	C.S.	H	
FMH1	FMH2	5.47	5.30	185	3.73	3.57	2x750	S3	CONCRETE	C.S.	H	
FMH2	FMH3	5.30	5.22	185	3.57	3.50	2x750	S3	CONCRETE	C.S.	H	
FMH3	FMH4	5.22	5.38	185	3.50	3.38	2x750	S3	CONCRETE	C.S.	H	
FMH4	FMH5	5.38	5.58	185	3.38	3.22	2x750	S3	CONCRETE	C.S.	H	
FMH5	FMH6	5.58	5.12	185	3.22	3.01	2x750	S3	CONCRETE	C.S.	H	
FMH6	FMH7	5.12	4.74	185	3.01	2.90	2x750	S3	CONCRETE	C.S.	H	
FMH7	FMH8	4.74	4.85	185	2.90	2.80	2x750	S3	CONCRETE	C.S.	H	
FMH8	FMH9	4.85	4.48	185	2.80	2.75	2x750	S3	CONCRETE	C.S.	H	
FMH9	FMH10	4.48	4.40	240	1.10	1.03	2x900	S3/BACKDROP2	CONCRETE	C.S.	H	
FMH10	FMH11	4.40	5.10	240	0.63	0.60	2x900	S3	CONCRETE	C.S.	H	
FMH11	FMH4025954	5.10	5.42	240	0.05	0.04	900	S5	CONCRETE	C.S.	H	
B1	FMH2	5.32	5.30	240	3.99	3.95	300	D1	V.C.	B	120	
B2	FMH3	5.22	5.22	240	3.55	3.50	300	E1	V.C.	B	120	
B3	FMH2	5.12	5.30	240	3.62	3.57	300	E1	V.C.	B	120	

NOTES:

1. FOR GENERAL NOTES AND ABBREVIATION REFER TO DRAWING NO. 60102100/S4/5000.
2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWING NOS. 60102100/S4/5001 TO 5008.
3. FOR DETAILS OF STANDARD MANHOLE, REFER TO DSD STANDARD DRAWINGS.
4. FOR DETAILS OF SPECIAL MANHOLES AND DISCHARGE CHAMBERS, REFER TO DRAWING NOS. 60102100/S4/5301 TO 5307 AND 5313 TO 5314.
5. FOR DETAILS OF DWF1, REFER TO DRAWING NO. 60102100/S4/5312.
6. FOR DETAILS OF CONCRETE SURROUND FOR TWIN PIPES, REFER TO DRAWING NO. 60102100/S4/5311.
7. FMH140_10 IS SPECIAL MANHOLE TYPE S3 WITH A BASKET SCREEN INSIDE AND THE DETAILS REFER TO DRAWING NO. 60102100/S4/5312.
8. THE EXACT INVERT LEVEL OF FMH10_310 SHOULD MATCH WITH THE INVERT LEVEL OF UPSTREAM SEWER AND SHOULD BE DETERMINED ON SITE.

REV. 修訂	DESCRIPTION 內容摘要	D.C. CHECKED 準核	P.C. CHECKED 準核	DATE 日期
D	WORKING DRAWING	DYHP	SCWC	OCT.13
C	TENDER ADDENDUM NO.4	DYHP	SCWC	APR.13
B	TENDER ADDENDUM NO.2	DYHP	SCWC	MAR.13
A	TENDER ADDENDUM NO.1	DYHP	SCWC	MAR.13
-	TENDER DRAWING	DYHP	SCWC	MAR.13

CEDD 土木工程拓展署 Civil Engineering and Development Department

KAI TAK DEVELOPMENT

KAI TAK DEVELOPMENT -
STAGE 4 INFRASTRUCTURE AT
FORMER NORTH APRON AREA

SEWERAGE - MANHOLE SCHEDULE

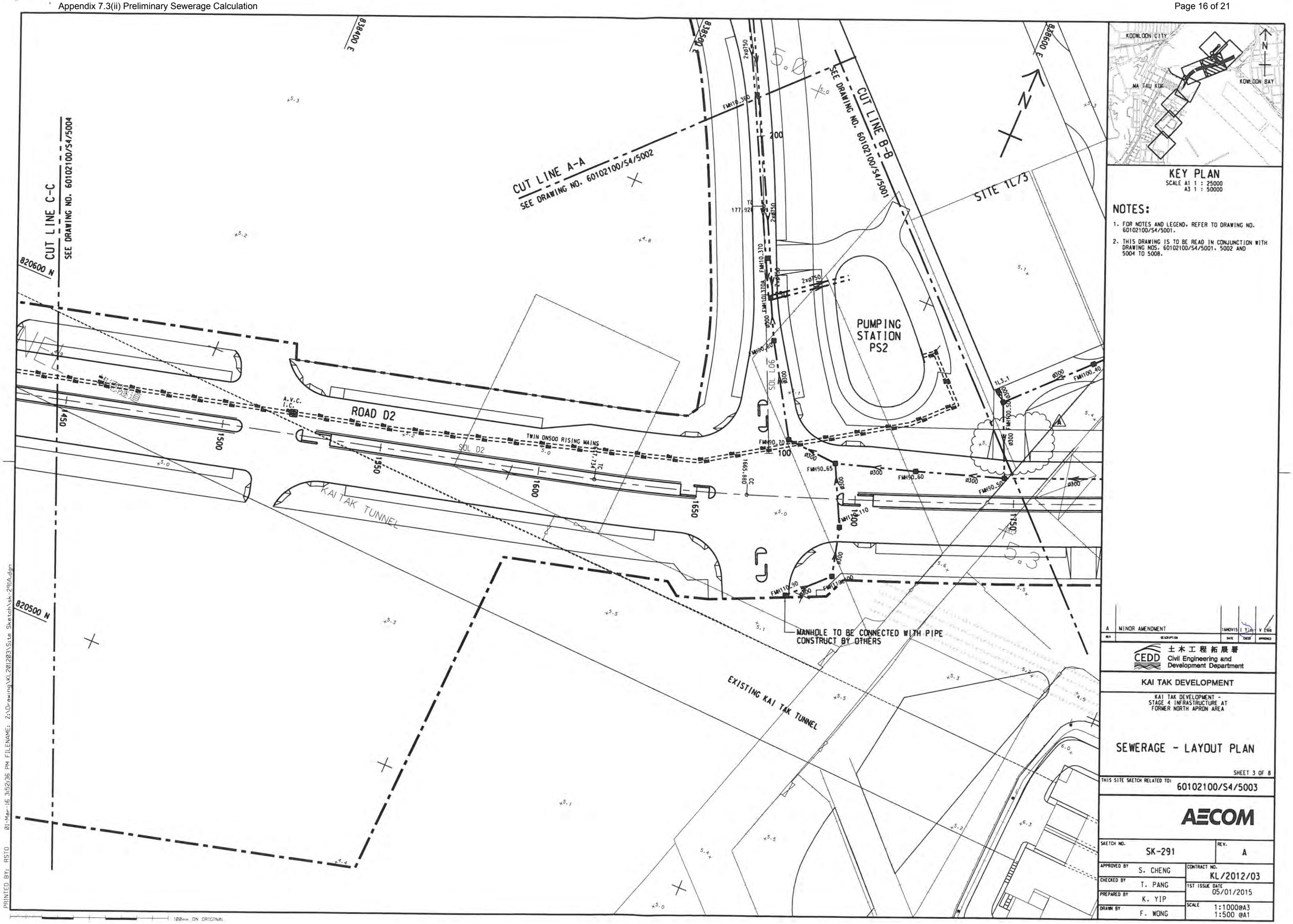
AECOM

DRG.NO. 圖紙編號: 60102100/S4/5101D

DESIGNED BY 設計: LXL	CONTRACT NO. 合約編號: KL/2012/03	P. Dir. APPROVED 批准人: DML	
DRAWN BY 繪圖: GXH	STATUS 階段: WORKING DRAWING		
SCALE 比例: N.T.S.			
DIMENSIONS ARE IN 尺寸單位: MILLIMETRES	© COPYRIGHT RESERVED 版權所有		

Plot File by : 2013-4-8 GUOXH

P:\PROJECTS\60102100\DRAWING\CONTRACT\S4\S4_5101.dgn



KEY PLAN
SCALE A1 1 : 25000
A3 1 : 50000

NOTES:

1. FOR NOTES AND LEGEND, REFER TO DRAWING NO. 60102100/S4/5001.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60102100/S4/5001, 5002 AND 5004 TO 5008.

REV	DESCRIPTION	DATE	CHECK	APPROVED
A	MINOR AMENDMENT	16NOV15		

CEDD 土木工程拓展署 Civil Engineering and Development Department

KAI TAK DEVELOPMENT

KAI TAK DEVELOPMENT -
STAGE 4 INFRASTRUCTURE AT
FORMER NORTH APRON AREA

SEWERAGE - LAYOUT PLAN

SHEET 3 OF 8

THIS SITE SKETCH RELATED TO: 60102100/S4/5003

AECOM

SKETCH NO.	REV.
SK-291	A

APPROVED BY: S. CHENG	CONTRACT NO.: KL/2012/03
CHECKED BY: T. PANG	1ST ISSUE DATE: 05/01/2015
PREPARED BY: K. YIP	SCALE: 1:1000@A3, 1:500 @A1
DRAWN BY: F. WONG	

PRINTED BY: RSTO 01-Mar-16 3:52:36 PM FILENAME: Z:\Drawing\KL\201203\Site Sketch\sk-291A.dgn

100mm ON ORIGINAL

838100 E

838200 E

838300 E

820500 N

820400 N

EXISTING KAI TAK TUNNEL

TWIN DN500 RISING MAINS

DC1

FMH120_20

FMH120_30

FMH120_40

FMH120_50

FMH120_15

FMH120_10

FMH125_40

(NOTE 3)
FMH120_55

ø750

ø500

ø600

1300

1250

1200

1150

1100

1350

1400

1450

CT
1412.342

ROAD D2

FDP5

FDP6

MANHOLE TO BE
CONNECTED WITH PIPE
CONSTRUCT BY OTHERS

MANHOLE TO BE
CONNECTED WITH PIPE
CONSTRUCT BY OTHERS

CUT LINE D-D
SEE DRAWING NO. 60102100/S4/5005

CUT LINE C-C
SEE DRAWING NO. 60102100/S4/5003

A

B

KOWLOON CITY

MA TAU KOK

KOWLOON BAY

N

KEY PLAN

SCALE A1 1 : 25000
A3 1 : 50000

NOTES:

1. FOR NOTES AND LEGEND, REFER TO DRAWING NO. 60102100/S4/5001.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60102100/S4/5001 TO 5003 AND 5005 TO 5008.
3. LOCATION OF FMH120_55 TO BE DETERMINED ON SITE.

REV	DESCRIPTION	DATE	CHECK	APPROVED
B	MINOR AMENDMENT	20APR16	TP	WK LEUNG
A	MINOR AMENDMENT	24DEC15	TP	V LEE

CEDD 土木工程拓展署 Civil Engineering and Development Department

KAI TAK DEVELOPMENT

KAI TAK DEVELOPMENT -
STAGE 4 INFRASTRUCTURE AT
FORMER NORTH APRON AREA

SEWERAGE - LAYOUT PLAN

SHEET 4 OF 8

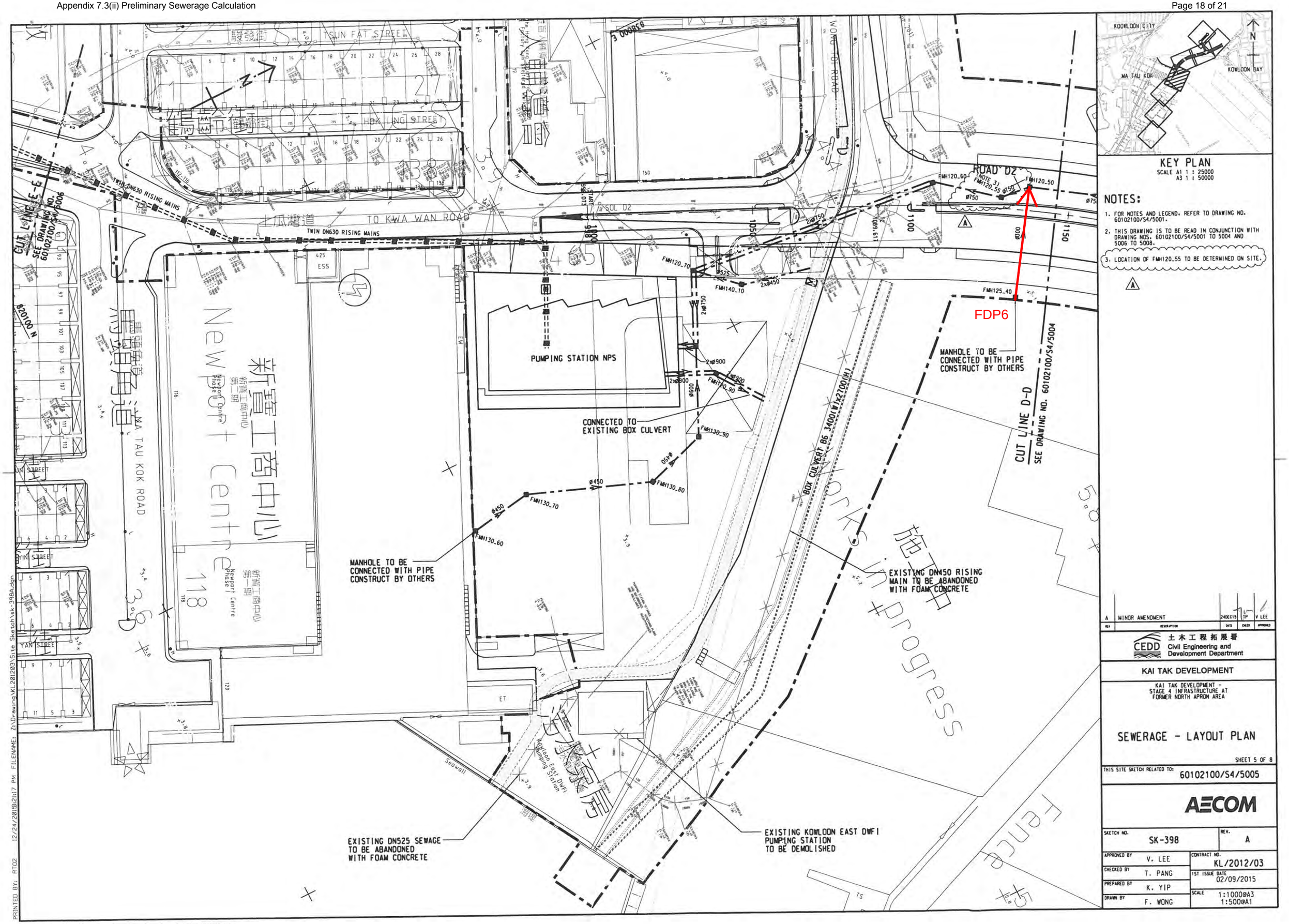
THIS SITE SKETCH RELATED TO: 60102100/S4/5004

AECOM

SKETCH NO. SK-212	REV. B
APPROVED BY V. LEE	CONTRACT NO. KL/2012/03
CHECKED BY T. PANG	1ST ISSUE DATE 27/08/2014
PREPARED BY K. YIP	SCALE 1:1000@A3 1:500@A1
DRAWN BY F. WONG	

PRINTED BY: RT02 21-Apr-16 5:25:40 PM FILENAME: Z:\Drawing\KL\2012\03\Site Sketch\SK-212B.dgn

189mm ON ORIGINAL



KEY PLAN

SCALE A1 1 : 25000
A3 1 : 50000

NOTES:

1. FOR NOTES AND LEGEND, REFER TO DRAWING NO. 60102100/S4/5001.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60102100/S4/5001 TO 5004 AND 5006 TO 5008.
3. LOCATION OF FMH120_55 TO BE DETERMINED ON SITE.

REV	DESCRIPTION	DATE	CHECK	APPROVED
A	MINOR AMENDMENT	240EC15	TP	V LEE

CEDD 土木工程拓展署 Civil Engineering and Development Department

KAI TAK DEVELOPMENT

KAI TAK DEVELOPMENT - STAGE 4 INFRASTRUCTURE AT FORMER NORTH APRON AREA

SEWERAGE - LAYOUT PLAN

SHEET 5 OF 8

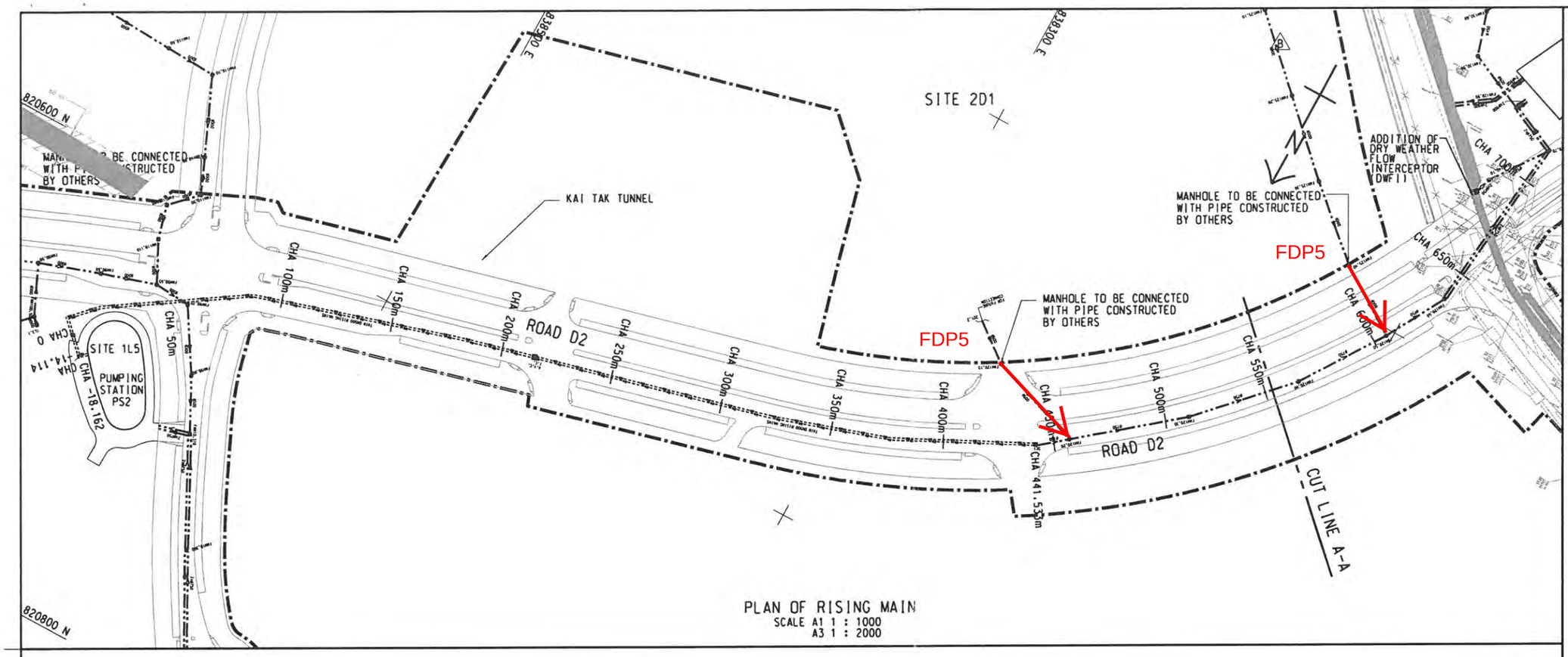
THIS SITE SKETCH RELATED TO: 60102100/S4/5005

AECOM

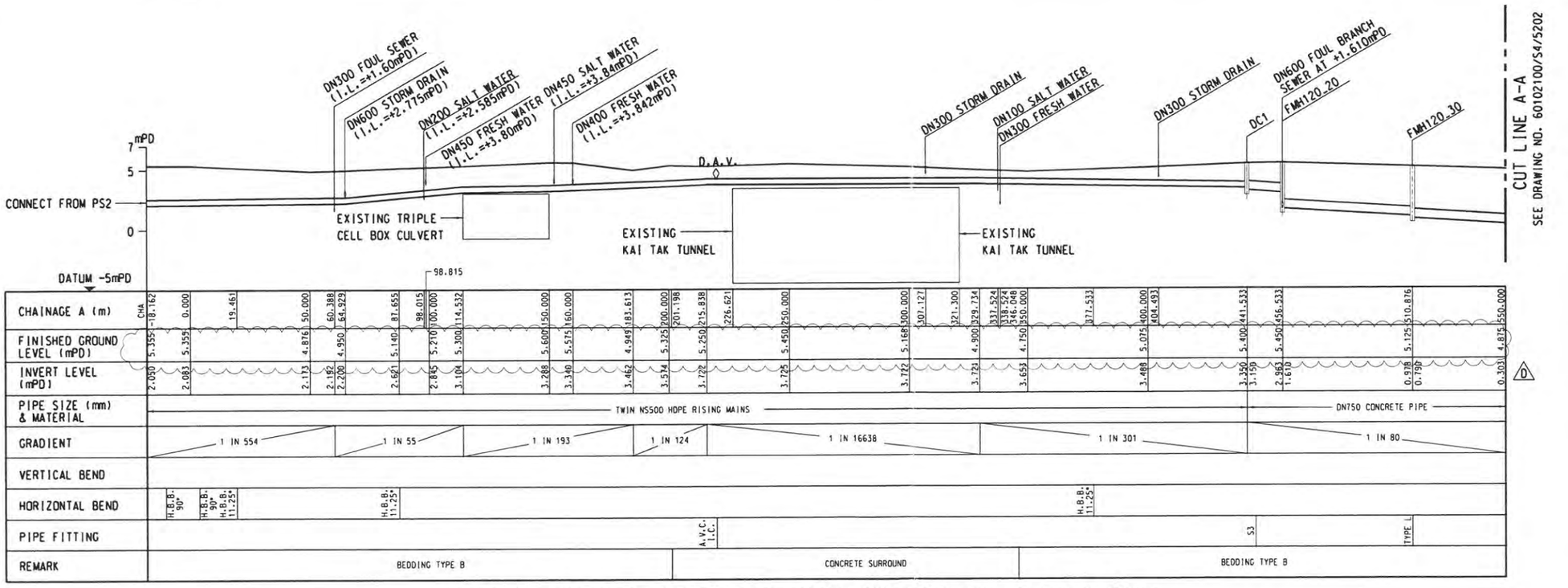
SKETCH NO.	SK-398
REV.	A
APPROVED BY	V. LEE
CHECKED BY	T. PANG
PREPARED BY	K. YIP
DRAWN BY	F. WONG
CONTRACT NO.	KL/2012/03
1ST ISSUE DATE	02/09/2015
SCALE	1:1000@A3 1:500@A1

PRINTED BY: RT02 12/24/2015 2:11:17 PM FILENAME: Z:\D-Drawing\KL\201203\Site Sketch\sk-398A.dgn

122mm ON ORIGINAL



PLAN OF RISING MAIN
SCALE A1 1 : 1000
A3 1 : 2000



LONGITUDINAL SECTION OF RISING MAINS AND GRAVITY PIPES (CHA -18.162 TO 550m)
SCALE HORIZONTAL A1 1 : 1000 SCALE VERTICAL A1 1 : 200
A3 1 : 2000 A3 1 : 400

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60102100/S4/5202.
2. LOCATIONS AND INVERT LEVELS OF ALL EXISTING UTILITIES AND STRUCTURES SHOWN IN THIS DRAWING ARE APPROXIMATE AND FOR INFORMATION ONLY. THE EXACT LOCATIONS AND INVERT LEVELS OF ALL EXISTING UTILITIES AND STRUCTURES SHALL BE VERIFIED AND DETERMINED ON SITE BEFORE ANY COMMENCEMENT OF LAYING OF RISING MAINS.

LEGEND:

- SITE BOUNDARY
- GRAVITY SEWER AND MANHOLE
- SEWERAGE TWIN RISING MAINS
- SEWER DISCHARGE CHAMBER (DC)

ABBREVIATIONS:

I.C.	INSPECTION CHAMBER
D.A.V.	DOUBLE AIR VALVE
H.B.B.	HORIZONTAL BEND THRUST BLOCK

REV	DESCRIPTION	DATE	CHECK	APPROVED
D	MINOR REVISION	08OCT15	TP	S Cheng
C	MINOR REVISION	03MAR15	TP	S Cheng
B	MINOR REVISION	16SEP14	TP	S Cheng
A	MINOR REVISION	27AUG14	TP	S Cheng

CEDD 土木工程拓展署 Civil Engineering and Development Department

KAI TAK DEVELOPMENT

KAI TAK DEVELOPMENT - STAGE 4 INFRASTRUCTURE AT FORMER NORTH APRON AREA

SEWERAGE - NS500 TWIN RISING MAINS AND GRAVITY PIPES LONG PROFILE CHA

SHEET 1 OF 2

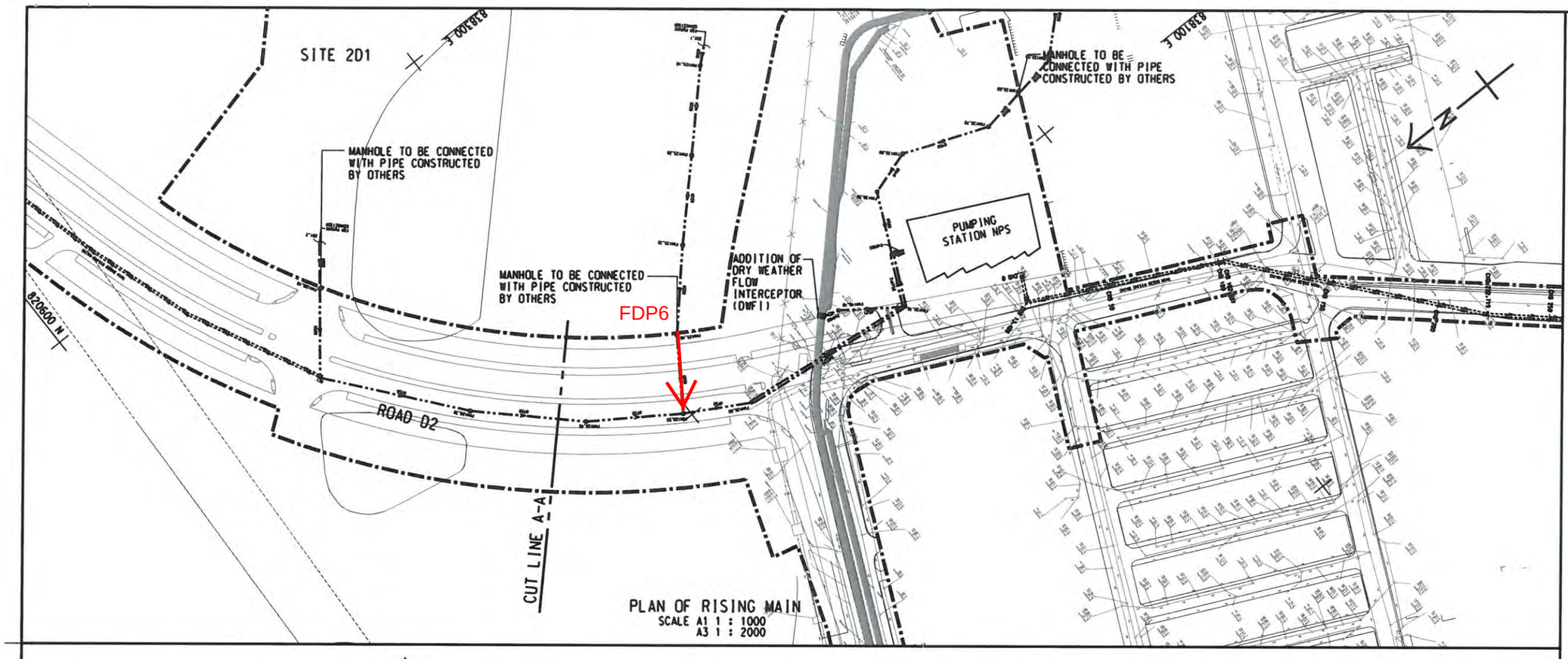
THIS SITE SKETCH RELATED TO: 60102100/S4/5201

AECOM

SKETCH NO.	SK-068
REV.	D
APPROVED BY	S. CHENG
CONTRACT NO.	KL/2012/03
CHECKED BY	T. PANG
1ST ISSUE DATE	14/05/2014
PREPARED BY	K. YIP
SCALE	AS SHOWN
DRAWN BY	F. WONG

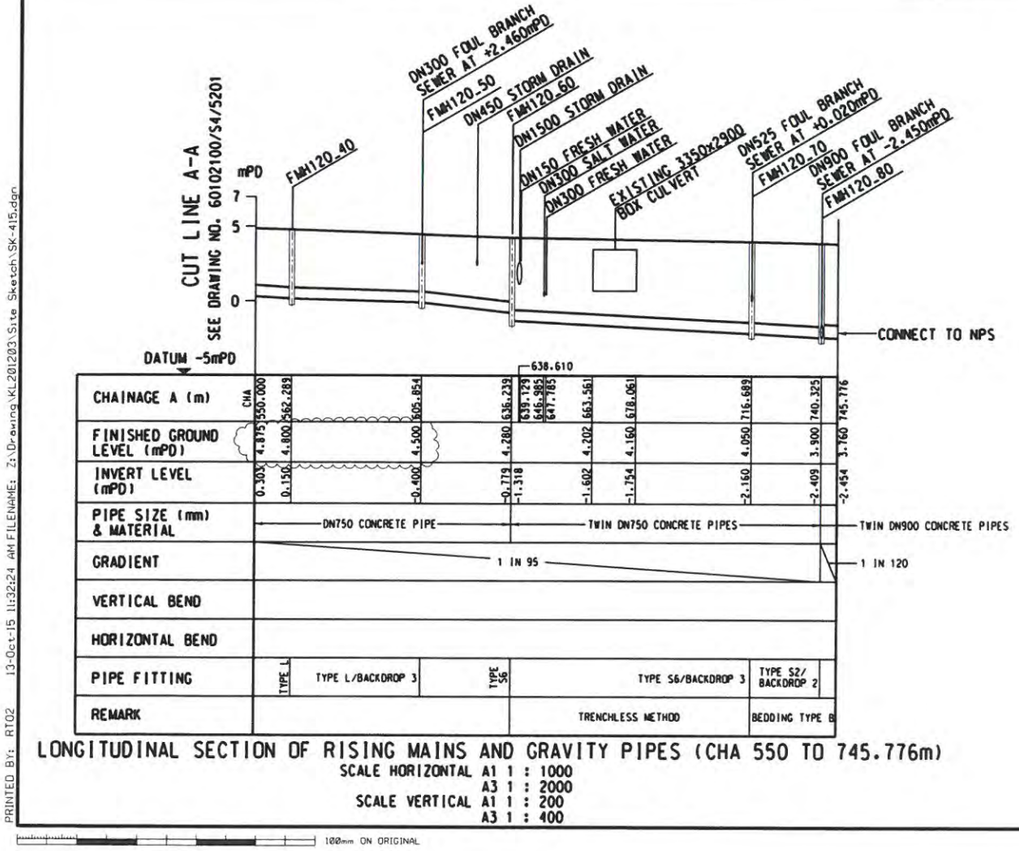
PRINTED BY: n102 09-Oct-15 10:52:11 AM FILENAME: Z:\Drawing\KL\2012\03\Site Sketch\SK-068D.dgn

102mm ON ORIGINAL



NOTES:

1. FOR GENERAL LEGEND AND ABBREVIATIONS, REFER TO DRAWING NO. 60102100/S4/5201.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH DRAWING NOS. 60102100/S4/5201.



LONGITUDINAL SECTION OF RISING MAINS AND GRAVITY PIPES (CHA 550 TO 745.776m)

SCALE HORIZONTAL A1 1 : 1000
A3 1 : 2000
SCALE VERTICAL A1 1 : 200
A3 1 : 400

100mm ON ORIGINAL

PRINTED BY: RTO2 13-Oct-15 11:32:24 AM FILENAME: Z:\Drawing\KL2012\03\Site Sketch\SK-415.dgn

REV	DESCRIPTION	DATE	CHECK	APPROVED

CEDD 土木工程拓展署 Civil Engineering and Development Department

KAI TAK DEVELOPMENT

KAI TAK DEVELOPMENT - STAGE 4 INFRASTRUCTURE AT FORMER NORTH APRON AREA

SEWERAGE - DN500 TWIN RISING MAINS AND GRAVITY PIPES LONG PROFILE CHA

SHEET 2 OF 2

THIS SITE SKETCH RELATED TO: 60102100/S4/5202C

AECOM

SKETCH NO.	SK-415
REV.	-
APPROVED BY	S. CHENG
CONTRACT NO.	KL/2012/03
CHECKED BY	T. PANG
1ST ISSUE DATE	09-10-2015
PREPARED BY	K. YIP
SCALE	AS SHOWN
DRAWN BY	F. WONG

LEGEND:

PROPOSED SEWERAGE DISCHARGE POINT

PROPOSED SEWERAGE NETWORK FROM CEDD CONSTRUCTION DRAWINGS

FDP1 (300Ø, 1:200)
PEAK RUNOFF = 16.19L/s
PIPE CAPACITY = 69.20L/s

C.L. +6.380
I.L. +4.468

300Ø (1:200)

FDP2 (300Ø 1:150)
PEAK RUNOFF = 61.48L/s
PIPE CAPACITY = 80.00L/s

C.L. +5.450
I.L. +4.730

600Ø

300Ø (1:150)

FDP3 (300Ø 1:150)
PEAK RUNOFF = 61.48L/s
PIPE CAPACITY = 80.00L/s

C.L. +5.150
I.L. -0.946

750Ø

300Ø (1:150)

900Ø

FDP4 (300Ø 1:240)
PEAK RUNOFF =2.59L/s
PIPE CAPACITY = 63.10L/s

300Ø 1:240

2X1,500

Road L6

PS2

C.L. +5.660
I.L. +4:240

C.L. +6.150
I.L. +4.080

C.L. +5.975
I.L. +1.610

C.L. +4.930
I.L. +3.410
R.I.L. +1.750

600Ø (1:163)

Road D2

750Ø

C.L. +4.910
I.L. +3.500

FDP5 (600Ø 1:163)
PEAK RUNOFF = 89.65L/s
PIPE CAPACITY = 480.20L/s

750Ø

300Ø (1:80)

C.L. +4.570
I.L. +1.230

C.L. +4.260
I.L. +0.790

FDP6 (300Ø 1:80)
PEAK RUNOFF = 73.84L/s
PIPE CAPACITY = 109.60L/s

Road D3

Central Kowloon Route

FUTURE'S LCSD PARK

N

NOTES:

1. PROPOSED SEWERAGE DISCHARGE POINT IS CAPABLE TO CATER FOR THE PROPOSED QUANTITY WHICH IS ESTIMATED FROM THE POPULATION DATA PROVIDED BY L&O.

2. THE LAYOUT PLAN IS REFERENCED FROM L&O'S MLP DATED ON MAY 24, 2016.

F.S.D. ref.:
D.L.O. ref.:

Notes :
1. DO NOT SCALE DRAWING, ALL DIMENSIONS SHOULD BE CHECKED ON SITE.
2. THE OWNERSHIP OF THE COPYRIGHT IN THIS DRAWING IS RETAINED BY THE BESLER WHOSE CONSENT MUST BE OBTAINED BEFORE ANY USE OR REPRODUCTION OF THE DRAWING OR ANY PART THEREOF CAN BE MADE.

Reference Drawings :

No.	DESCRIPTION	DATE	CHECKED

Client :
HOME AFFAIRS BUREAU
The Government of Hong Kong Special Administrative Region

Lead Consultant & Architect :
LEIGH & ORANGE LTD.
T 852 2899 9000
F 852 2806 0343
E info@leighorange.com

Stadium, Sports & Arena Design Specialist Sub-Consultant : JACKSON ARCHITECTURE

Civil, Structural & Geotechnical Sub-Consultant : WSP | PARSONS BRINCKERHOFF

Building Services Sub-Consultant : WSP | PARSONS BRINCKERHOFF

Traffic & Crowd Movement Specialist Sub-Consultant : WSP | PARSONS BRINCKERHOFF

Fire Engineering, Sustainability, Environmental Specialist Sub-Consultant : WSP | PARSONS BRINCKERHOFF

ICT & Acoustics Sub-Consultant : SM&W

Landscape + Turf Specialist Sub-Consultant :

Retractable Roof Specialist Sub-Consultant : sbp

Specialist, Architectural & Decorative Lighting Specialist Sub-Consultant : WEBB

Façade Design Specialist Sub-Consultant :

Catering Equipment Specialist Sub-Consultant : dkp

Security Strategy Specialist Sub-Consultant : jba consulting engineers

Universal Design Accessibility Specialist Sub-Consultant : UDA

Way Finding & Signage Specialist Sub-Consultant :

SRM & CDM Specialist Sub-Consultant : BMT Asia Pacific

Project :
Consultancy Agreement No. 9OD 113
Consultancy Agreement for Providing Technical Services for the Development of the Kai Tak Multi-purpose Sports Complex
Supplementary Information Dated 08/07/2016

Drawing Title :
LAYOUT PLAN OF PROPOSED SEWERAGE DISCHARGE POINTS

Designed By:- | Drawn By:-
Date:- 04/07/2016 | Approved:-
CAD REF:-
Scale:- 1:1250 (A0)
Drawing No:- CV000/SW001
Job No:- 15112 | Drawing Status:- Work Stage 1 | Rev. | A0