MOTT MACDONALD

Tai Shue Wan Development at Ocean Park

Detailed Design Report for the Sewerage Facilities

September 2021

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Tai Shue Wan Development at Ocean Park

Detailed Design Report for the Sewerage Facilities

September 2021

Mott MacDonald Hong Kong Limited
registered in Hong Kong no. 236497

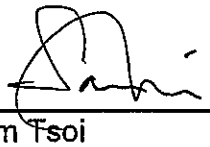
Pursuant to Condition 2.12 of Environmental Permit No. EP-487/2014/A, this Detailed Design Report of the Sewerage Facilities has been reviewed and certified by the Environmental Team Leader (ETL) and verified by the Independent Environmental Checker (IEC).

Certified by:

Gary Chow
Environmental Team Leader (ETL)
Mott MacDonald Hong Kong Limited

Date: 17 Sep 2021

Verified by:



Sam Tsoi
Independent Environmental Checker (IEC)
Ove Arup & Partners Hong Kong Limited

Date: 20 Sep 2021

Information class: Standard

Contents

1 Introduction

1.1 Background

Under the Environmental Impact Assessment (EIA) Ordinance, the EIA Report and the Environmental Monitoring and Audit (EM&A) Manual (Register No.: AEIAR-184/2014) prepared for the "Tai Shue Wan Development at Ocean Park" (the Project) were approved by the Environmental Protection Department (EPD) on 27 August 2014. The Environmental Permit (EP) has been subject to variation and the current Permit No. is EP-487/2014/A issued on 10 January 2018.

In Section 7.3.2 of the EIA report, it is stated that the sewage generated from the Project and the existing facilities of Ocean Park at Tai Shue Wan (ADWF 1,286.1 m^3/day) will be collected by a network within the Project area to a pump room within the proposed Water Park building. Sewage will be temporarily collected in a sump pit with a minimum size of 12m^3 and then conveyed by twin rising main, 2 x 150mm diameter, up the hillside. The sewage will be discharged ultimately to an existing 450mm diameter sewer via the government sewerage manhole: FMH7056262 at Nam Long Shan Area.

As mentioned in Section 7.6 of the EIA report, the adverse impact to the sewerage system due to the Project was not anticipated. Nevertheless, potential septicity impacts caused by increased retention time meaning the available dissolved oxygen and nitrate consumed by the biomass and the effluent should be minimised. Appropriate design measures as recommended in the approved EIA report should be considered and adopted to avoid septicity problem and associated odour impact arising from the sewerage facilities of the Project.

As stipulated in Condition 2.12 of the EP, the Permit Holder shall, no later than one month before the operation of the rising mains (as shown in **Appendix A**), submit four hard copies and one electronic copy of a Detailed Design Report for Sewerage Facilities to the Director of Environmental Protection for approval. The Report shall be certified by the Environmental Team (ET) Leader and verified by the Independent Environmental Checker (IEC) as conforming to the information and recommendations contained in the approved EIA report. No operation of the rising mains shall be allowed prior to the approval of the Report.

Mott MacDonald Hong Kong Limited has been commissioned by the Ocean Park Corporation to prepare and submit the Detailed Design Report for Sewerage Facilities to meet Condition 2.12 of the EP.

2 Minimisation of Septicity Problem and Associated Odour Impact

2.1 Overview of Proposed Mitigation Measures recommended in the Approved EIA Report

To control the septicity problem and associated odour impact of sewage caused by the operation of the sewage pumping facilities and associated rising mains, the following preventive measures have been recommended in the approved EIA Report:-

1. The retention time of sewage in the sump pit shall be minimised and shall be not exceeding 30 minutes;
2. The rising main would be constructed using ductile iron pipes with epoxy internal linings complying with BS EN 589:1995;
3. The design minimum velocity within the rising mains shall be 1m/s at full bore condition; and
4. Direct injection of chemical could also be used.

2.2 Sewage Discharge Estimation and Disposal Arrangement

The approved EIA was prepared based on the estimated ADWF of 1,286.1 m^3/day for the existing and proposed facilities including the proposed Water Park Development, future Spa Hotel and Fisherman's Wharf Hotel. In accordance with the updated sewage discharge estimation (ADWF) received from the Project Designer for the aforesaid facilities is about 1,023.83 m^3/day (see **Appendix B**). The updated sewage flow is below the estimated ADWF under the approved EIA and this shall be considered acceptance as the sewage flow is less than the previous assessed flow rate in the approved EIA Report.

The sewage disposal arrangement by pumping as recommended in the approved EIA has been adopted in the Project. A set of sewerage design drawings has been collected and the information are presented in **Appendix C**. Based on the received design drawings and as confirmed by the Permit Holder, one duty 300mm rising main and one standby 300mm rising main has been adopted in the Project.

2.3 Retention Time of Sewage in the Sump Pit

As stipulated in Section 7.7.1 of the approved EIA Report, the sewage sump pit shall be designed to limit the sewage retention time in the sump pit to not exceeding 30 minutes.

Based on the design calculation as enclosed in **Appendix D**, the current designed pump rate of the sewage facilities is about 100 L/s and the pump sump has been designed to have a volume of about 48m^3 for handling of the design peak flow. The retention time required for a pumping cycle during peak flow period is calculated to be about 15.1 minutes which is not exceeding 30 minutes as stated the approved EIA report.

The design retention time of sewage in the sump pit is considered satisfying the requirement of retention time as stated in the approved EIA report.

2.4 Self-Cleansing Velocity of Rising Main

As mentioned in Section 7.7.1 of the approved EIA, the designed sewage pumping system shall be designed in accordance with the Sewerage Manual published by the Drainage Services Department (DSD) and the requirement on self-cleansing velocity shall also be achieved. The

design minimum velocity within the rising mains would be 1m/s at full bore condition as suggested in the Sewerage Manual Part 1 to avoid the septic and odour problems.

As confirmed by the Permit Holder (see **Appendix E**), one duty 300mm rising main and one standby 300mm rising main are provided to convey the sewage from the sump pit to public sewerage systems. Based on the designed pump rate of 100 L/s, the self-cleansing velocity of the rising main is about 1.41 m/s which is acceptable.

The calculation for self-cleansing velocity of the rising main is provided in **Appendix D**.

2.5 Direct Injection of Chemicals

In Section 7.7.1 of the EIA report, direct injection of chemicals is suggested to be used to control septicity. The sewerage system of the Project is designed with calcium nitrate injection to the sewage tank with a frequency of 10 kg/hr for septicity control (see **Appendix F** and **Appendix G**).

2.6 Use of Materials

The rising mains are constructed from ductile iron pipes and fittings to BS EN598 Class K12, flange joints to BS 4504 PN16 with sulphate-resisting high alumina cement mortar as the internal lining (refer to the material schedule provided in **Appendix F**). Although epoxy internal lining has been suggested for the ductile iron pipes, Ductile iron pipe lined internally with cement mortar is not uncommon in Hong Kong. The material schedule has been submitted and approved by Building Department for use of the Project; thus, it is considered that use of sulphate-resisting high alumina cement mortar, instead of previously suggested epoxy, as internal lining of the ductile iron pipes is acceptance.

3 Conclusion

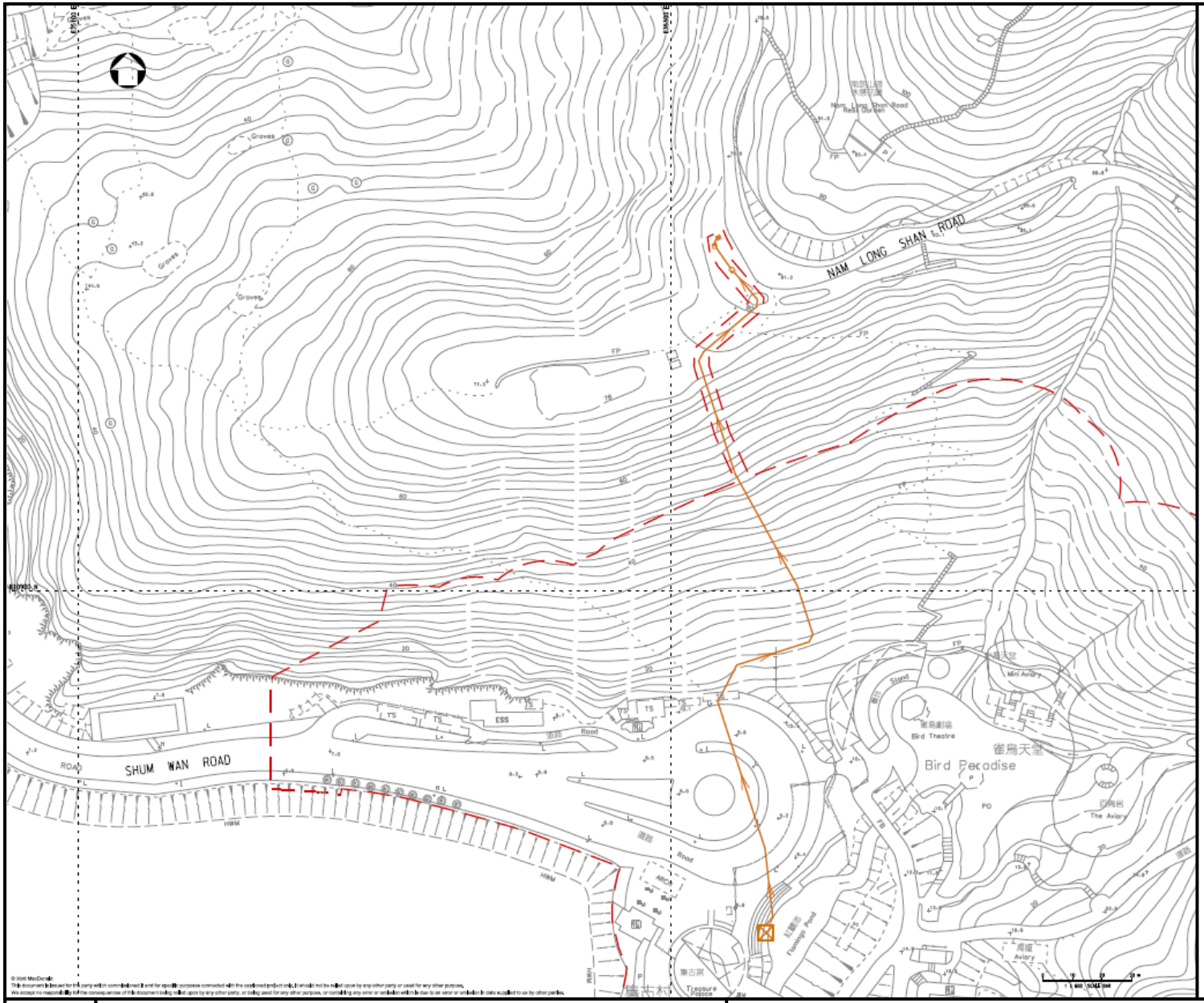
To prevent septicity from occurring in the sewage pump pit and rising mains, mitigation measures have been thoughtfully considered and adopted under the detailed design stage in accordance with the information and recommendations contained in the approved EIA Report.

The current designed pump rate of 100 L/s of the sewage facilities provided the retention time of 15.1 minutes for the sump pit which is less than 30 minutes mentioned in Section 7.7.1 of the approved EIA report to avoid the septic and odour problems.

Direct injection of calcium nitrate into the sewage tank has been designed in the control of septicity. Furthermore, the rising mains are constructed from ductile iron pipes and fittings complying with BS EN 598:1995 with sulphate-resisting high alumina cement mortar as the internal lining. In addition, the self-cleansing velocity of the rising mains is 1.41 m/s which is greater than the designed minimum velocity of 1m/s at full bore condition as suggested in the Sewerage Manual Part 1.

In conclusion, it is considered that the information and recommendations contained in the approved EIA report for potential septicity problem and associated odour impact have been adopted in the detailed design of the sewerage facilities.

Appendix A Location of Proposed Rising Main and Sewage Facilities



Project Title: Tai Shue Wan Development at Ocean Park
工程項目名稱：海洋公園大樹灣發展計劃

Environmental Permit No. : EP-487/2014/A
環境許可證編號 : EP-487/2014/A

Figure 4: Location of Proposed Rising Main and Sewage Facilities
圖 4 ：擬定污水泵喉及污水設施的位置
(This figure was prepared based on VEP Application Document (No. VEP-539/2017))
(本圖是根據申請更改環境許可證申請文件(No. VEP-539/2017)編制)

Appendix B Sewerage Rising Mains Design Report

ME1831 - TSW - Waterpark & Future Hotels
Sewage Discharge Estimation

Rev.: 0

Date : 17-六月-14

Based on the architectural layout plan received from Aedas on 16 May 2014.

1. Sewage Discharge Estimation for Waterpark & Existing Ocean Park Facilities

Discharge From Population

Building / Activity Area	Source	Population (person)	Daily Water Discharge Rate (l/person/day)	Daily Water Discharge (m^3/day)	No. of Opening Hour (Hours)	Opening Hours
Waterpark	Guest	*Note 10 10500	*Note 1 20	210.00	14	9am - 11pm
	Staff	*Note 8 500	*Note 2 80	40.00	14	9am - 11pm
			Sub-total	250.00 (a)		

Discharge From F&B

Source	GFA (m^2) *Note 9	UFA (m^2) *Note 4	No. of Guest *Note 12	No. of Employee *Note 13	Daily Water Discharge Rate (l/person/day) *Note 5	Daily Water Discharge (m3/day)	No. of Opening Hour (Hours)	Opening Hours
L1 - Restaurant 1	1080	756	504	50	1580	79.63	14	9am - 11pm
L1 - Restaurant 2	645	452	301	30	1580	47.56	14	9am - 11pm
L1 - Canteen	275	193	128	13	1580	20.28	14	9am - 11pm
L2 - Restaurant 1	406	284	189	19	1580	29.94	14	9am - 11pm
L2 - Restaurant 2	135	95	63	6	1580	9.95	14	9am - 11pm
L3 - Snack Bar	80	56	37	4	1580	5.90	14	9am - 11pm
				Sub-total		193.26 (b)		

Demand From Cleansing Water

Source	No. of Cleansing Point *Note 8	Water Consumption of Each Point (L/ Point)	Daily Water Discharge (m^3/day)	No. of Opening Hour (Hours)	Opening Hours
Cleansing Water	100	45	4.5	14	9am - 11pm
		Sub-total	4.50 (c)		

Discharge From Existing TSW Facilities

Source	Meter No.	Existing Meter Reading (m^3/day)	Estimated Daily Water Discharge due to extended operating hours (m3/day)	No. of Opening Hour (Hours)	Opening Hours
Development Headland & Inter-Mediate Rides	M10-600668	*Note 6 0.40	0.47	14	9am - 11pm
Headland and Intermediate Rides Flume Ride	M11-480038	*Note 7 60.00	70.00	14	9am - 11pm
		Sub-total	70.47 (d)		

Total Daily Water Discharge (m3/day) ((a) + (b) + (c)+ (d))	**518.22**	
Unit Contribution Flow (m3/person/day)	**0.27**	*Note 5
Contributing Population (Person)	**1919.34**	*Note 14
Peaking Factor	**5.00**	*Note 3
Total Peak Discharge Flow Rate (l/s)	**51.41**	
Proposed Main Sewer Size (mm dia.)	**300.00**	*Note 11
Velocity of Discharge (m/s)	**1.33**	*Note 11
Gradient	**1:150**	*Note 11

2. Sewage Discharge Estimation for Fisherman's Wharf Hotel

Discharge From Future Hotel - Fisherman's Wharf Hotel								
Source	No. of Guestroom	Population Density (No. of Employee/ room)		No. of Employee	Daily Water Discharge Rate (l/person/day) *Note 5	Daily Water Discharge (m3/day)		Opening Hours
Fisherman's Wharf Hotel	460	*Note 8	0.5	230	1580	363.40		24 hours a day *Note 8
					Sub-total	363.40	(e)	

Total Daily Water Discharge (m3/day) (e)	**363.40**	
Unit Contribution Flow (m3/person/day)	**0.27**	*Note 5
Contributing Population (Person)	**1345.93**	*Note 14
Peaking Factor	**5.00**	*Note 3
Total Peak Discharge Flow Rate (l/s)	**21.03**	
Proposed Main Sewer Size (mm dia.)	**200.00**	*Note 11
Velocity of Discharge (m/s)	**1.40**	*Note 11
Gradient	**1:90**	*Note 11

3. Sewage Discharge Estimation for Spa Hotel

Discharge From Future Hotel - Spa Hotel								
Source	No. of Guestroom	Population Density (No. of Employee/ room)		No. of Employee	Daily Water Discharge Rate (l/person/day) *Note 5	Daily Water Discharge (m3/day)		Opening Hours
Spa Hotel	180	*Note 8	0.5	90	1580	142.20		24 hours a day *Note 8
					Sub-total	142.20	(f)	

Total Daily Water Discharge (m3/day) (f)	**142.20**	
Unit Contribution Flow (m3/person/day)	**0.27**	*Note 5
Contributing Population (Person)	**526.67**	*Note 14
Peaking Factor	**6.00**	*Note 3
Total Peak Discharge Flow Rate (l/s)	**9.88**	
Proposed Main Sewer Size (mm dia.)	**150.00**	*Note 11
Velocity of Discharge (m/s)	**1.37**	*Note 11
Gradient	**1:70**	*Note 11

4. Main Sewer Sizing

Total Daily Water Discharge (m3/day) (f)	**1023.83**	
Unit Contribution Flow (m3/person/day)	**0.27**	*Note 5
Contributing Population (Person)	**3791.96**	*Note 14
Peaking Factor	**5.00**	*Note 3
Total Peak Discharge Flow Rate (l/s)	**80.62**	
Proposed Main Sewer Size (mm dia.)	**375.00**	*Note 11
Velocity of Discharge (m/s)	**1.35**	*Note 11
Gradient	**1:180**	*Note 11

Source	Peak Discharge Flow Rate (l/s)	
Water Park	51.41	
Fisherman's Wharf Hotel	21.03	
Spa Hotel	9.88	
Main Sewer	**80.62**	**(Take 90 L/s)**
Proposed Main Sewer Size (mm dia.)	**375**	
Velocity of Discharge (m/s)	**1.35**	
Gradient	**1:180**	

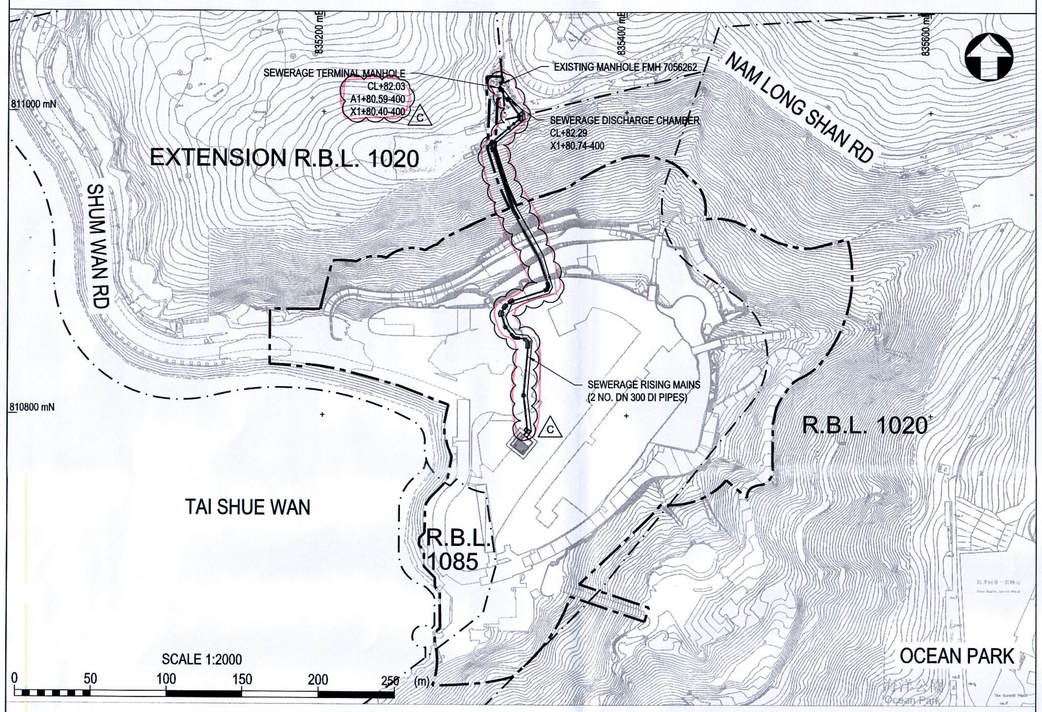
*Note 1: Data taken from "Plumbing Engineering Services Design Guide - Hot and cold water supplies",
Table 2: Daily Water Demand - Sports Changing - Swimming Pool: 20L/ person.
*Note 2: Data taken from "EPD/TP 1/05 Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning", Table T-2 - Commercial Employee: 80 L/day.
*Note 3: Data taken from "EPD/TP 1/05 Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning", Table T-5 - Peaking Factors.
*Note 4: Assume 70% of the GFA is UFA.
*Note 5: Data taken from Section 12.1 "EPD/TP 1/05 Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning"
*Note 6: By referring to the Meter Reading in April of "Average Daily Consumption" table of the bill (Charge No.: 90930800009) for "Development Headland & Inter-Mediate Rides" and taking the peak value in the entire year.
*Note 7: By referring to the Meter Reading in January of "Average Daily Consumption" table of the bill (Charge No.: 74650000008) for "Headland and Intermediate Rides Flume Ride" and taking the peak value in the entire year.
*Note 8: Figures estimated by Meinhardt.
*Note 9: Data taken from the architectural layout plan received from Aedas on 3 April 2014'
*Note 10: Figures taken from "100% Schematic Design Report" received on 7 Feb 2014 From Aedas.
*Note 11: Take 2/3 bore in pipe sizing.
*Note 12: Assume 1 guest occupies 1 .5m^2 of the seating area.
*Note 13: Assume 1 employee serves 10 guests.
*Note 14: According to "EPD/TP 1/05 Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning", Contributing Population is the Calculated Average Flow (m3/day) divided by UFF of Restaurants & Hotels and Commercial Employee.

Appendix C Sewage Design Drawings

Remark

All occurrences of local head loss included in the design drawings (i.e. bends, elbows, valves, tee etc.) are considered in the hydraulic design. Please refer to Appendix D for design calculation.

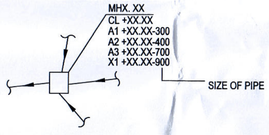
LOCATION KEY PLAN



LEGEND:

- WORKING SITE BOUNDARY
- CP — CATCHPIT
- DP — DRAINPIT
- DM — DRAINAGE MANHOLE (WHERE E1 ETC IS MANHOLE TYPE)
- SM E1 — SEWERAGE MANHOLE (WHERE E1 ETC IS MANHOLE TYPE)
- 300 D — DRAINAGE PIPE
- 300 S — SEWERAGE PIPE
- 300 S (RM) — SEWERAGE RISING MAIN PIPE
- ℄ — ALIGNMENT CENTERLINE
- xxx UC — U CHANNEL (xxx = WIDTH)
- xxx SC — STEPPED CHANNEL (xxx = WIDTH)
- ROCK FACE
- SOIL FACE
- CUT SLOPE
- xxx UC — EXISTING U-CHANNEL TO BE ABANDONED
- xxx SC — EXISTING STEPPED CHANNEL TO BE ABANDONED
- EXISTING STORMWATER DRAINAGE PIPE
- EXISTING STORMWATER DRAINAGE PIPE TO BE ABANDONED
- EXISTING SEWER
- EXISTING SEWER TO BE ABANDONED
- EXISTING JOINT CHAMBER
- EXISTING CATCHPIT
- EXISTING CATCHPIT TO BE ABANDONED
- EXISTING ROAD GULLY
- EXISTING ROAD GULLY TO BE ABANDONED
- EXISTING STORMWATER DRAINAGE MANHOLE
- EXISTING STORMWATER DRAINAGE MANHOLE TO BE ABANDONED
- EXISTING SEWERAGE MANHOLE
- EXISTING SEWERAGE MANHOLE TO BE ABANDONED

MANHOLE LEGEND:



CL COVER LEVEL
X1 INVERT LEVEL OF OUTLET PIPE
A1 INVERT LEVEL OF FIRST INLET PIPE, ROTATING CLOCKWISE FROM THE OUTLET PIPE
A2 INVERT LEVEL OF SECOND INLET PIPE, ROTATING CLOCKWISE FROM THE OUTLET PIPE
A3 INVERT LEVEL OF THIRD INLET PIPE, ROTATING CLOCKWISE FROM THE OUTLET PIPE

2020 NOV 19 P 5:18

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED.
2. ALL LEVELS ARE IN METRES ABOVE PRINCIPAL DATUM.
3. ALL EXISTING PIPES AND UTILITIES SHOWN ON DRAWINGS ARE INDICATIVE ONLY AND BASED ON AVAILABLE RECORDS. THE CONTRACTOR SHALL LOCATE ALL EXISTING PIPES AND UTILITIES ON SITE AND REPORT ANY DISCREPANCIES TO THE PROJECT MANAGER.
4. THE CONTRACTOR SHALL ORGANIZE HIS INSTALLATION WORK FOR ANY UTILITY SERVICE SUCH THAT IT SHALL NOT CAUSE CONFLICT OR DISRUPTION WITH ANY DUCT, PIPE, CABLE OR ANY OTHER UTILITY WORKS OR DRAINAGE WORKS PREVIOUSLY INSTALLED.
5. STRUCTURAL DETAILS WILL BE UNDER SEPARATE SUBMISSION.
6. Proposed works outside lot boundary are for information only and not for approval

DRAINAGE AND SEWERAGE NOTES:

1. ALL PIPES AND FITTINGS FOR SEWER APPLICATION SHALL BE DUCTILE IRON (DI) PIPES COMPLYING WITH BS EN 598 : 2007.
2. ALL PIPES AND FITTINGS FOR SEWER APPLICATION SHALL BE LINED INTERNALLY WITH HIGH ALUMINA CEMENT MORTAR CONFORMING TO BS EN 598 : 2007.
3. DI PIPES SHALL BE EXTERNALLY COATED WITH METALLIC ZINC IN ACCORDANCE WITH BS 4772 : 1998 CLAUSE 3.1 AND ALL FITTINGS SHALL BE EXTERNALLY COATED WITH A COATING OF ZINC RICH PAINT IN ACCORDANCE WITH BS 4772 : 1998 CLAUSE 3.1.5(b). AFTER ZINC COATING, PIPES AND FITTING SHALL BE COATED EXTERNALLY WITH A FINISHING LAYER OF THE ONE OF THE FOLLOWING MATERIALS AS SPECIFIED IN BS 4772 : 1998 CLAUSE 3.3 :
   (a) BITUMEN BASED HOT APPLIED COATING MATERIAL BS4147 : 1980 TYPE I GRADE C.
   (b) BITUMEN BASED COLD APPLIED COATING MATERIAL TO BS 3416 : 1975 TYPE II.
4. BURIED PIPES SHALL HAVE PUSH-FIT JOINTS WITH NITRILE GASKETS.
5. DIRECTIONAL CHANGE OF PIPELINES SHALL BE MADE AT MANHOLES ONLY.
6. ALL PIPELINES BETWEEN MANHOLES SHALL BE CONSTRUCTED WITH ONE KIND OF MATERIAL ONLY.
7. PIPES IN AND OUT OF MANHOLES ARE TO BE SHORT/CUT PIPE LENGTHS (AS SPECIFIED IN GENERAL SPECIFICATION FOR CIVIL ENGINEERING WORKS 2006 EDITION) AND SHALL BE BUILT IN MONOLITHIC WITH THE MANHOLE. THE PIPE ENDS PROJECTING BEYOND THE MANHOLE WALLS SHALL BE SURROUNDED IN GRADE 30D/20 CONCRETE 150mm THICK.
8. THE INTERNAL CONDITIONS OF THE EXISTING DRAIN / SEWERS RUNNING ADJACENT TO THE SITE SHALL BE CHECKED BY THE CONTRACTOR WITH CCTV SURVEY PRIOR TO COMMENCEMENT AND UPON COMPLETION OF THE WORKS TO PROJECT MANAGER'S SATISFACTION. THE CONTRACTOR SHALL AGREE WITH PROJECT MANAGER THE EXTENT OF CCTV SURVEY PRIOR TO THE CCTV WORKS.
9. DUCTILE IRON (DI) MANHOLE COVERS SHALL FOLLOW THE FOLLOWING REQUIREMENTS :

   9.1 GENERAL
   (a) DI MANHOLE COVERS SHALL BE SUPPLIED WITH FRAMES AND SHALL CONFORM TO BS EN 124.
   (b) ALLOWANCE SHALL BE MADE FOR MACHINING WHERE APPLICABLE.
   (c) SHARP EDGES SHALL BE REMOVED.
   (d) THE CASTING OF MARKINGS SHALL BE CLEARLY LEGIBLE.

   9.2 TEST LOADS AND WEIGHTS
   D.I. MANHOLE COVERS AND FRAMES SHALL BE DESIGNED AND TESTED IN ACCORDANCE WITH BS EN 124.

   9.3 COATINGS
   (a) MANHOLE COVERS AND FRAMES SHALL BE COATED WITH 2 LAYERS OF BLACK NON-TOXIC WATER-BASED BITUMEN COATING TO BS 3416.
   (b) ALL CASTINGS SHALL BE THOROUGHLY CLEANED AND FREE OF MOULD, SAND, RUST OR ANY OTHER IMPURITY BEFORE APPLYING THE PROTECTIVE COATING.

   9.4 OTHER
   (a) THE MANHOLE COVERS SHALL BE COMPATIBLE WITH THEIR SEATINGS. THESE SEATINGS SHALL BE MANFACTURED IN SUCH A WAY AS TO ENSURE STABILITY AND QUIETNESS IN USE.
   (b) ALL CAST UNITS SHALL BE CLEANLY CAST AND FREE FROM AIR HOLES, SAND HOLES AND ANY SURFACE DEFECTS.
   (c) MANHOLE FRAMES SHALL BE BEDDED UPON BEDDING MATERIAL WHICH IS NON-SHRINK AND HAS A COMPRESSIVE STRENGTH EXCEEDING 30 N/mm2.
   (d) THE PATTERN OF THE STRUCTURAL SUPPORT ELEMENTS OF THE COVERS AND THE WEBS OF THE FRAMES SHALL BE SUBMITTED TO THE PROJECT MANAGER FOR APPROVAL.

10. THE MANHOLE COVERS AND FRAMES ARE NOT SHOWN ON THE GENERAL ARRANGEMENT PLANS OF EACH MANHOLE TYPE FOR CLARITY.
11. ABANDONED PIPE OPENINGS IN MANHOLE WALLS SHALL BE INFILLED WITH MASS CONCRETE ACROSS THE FULL THICKNESS OF THE WALLS.

SEWERAGE RISING MAIN NOTES:

1. ALL PIPES AND FITTINGS FOR SEWER APPLICATION SHALL BE DUCTILE IRON (DI) PIPES COMPLYING WITH BS EN 598 : 2007.
2. ALL PIPES AND FITTINGS FOR SEWER APPLICATION SHALL BE LINED INTERNALLY WITH HIGH ALUMINA CEMENT MORTAR CONFORMING TO BS EN 598 : 2007.
3. DI PIPES SHALL BE EXTERNALLY COATED WITH METALLIC ZINC IN ACCORDANCE WITH BS 4772 : 1998 CLAUSE 3.1 AND ALL FITTINGS SHALL BE EXTERNALLY COATED WITH A COATING OF ZINC RICH PAINT IN ACCORDANCE WITH BS 4772 : 1998 CLAUSE 3.1.5(b). AFTER ZINC COATING, PIPES AND FITTING SHALL BE COATED EXTERNALLY WITH A FINISHING LAYER OF THE ONE OF THE FOLLOWING MATERIALS AS SPECIFIED IN BS 4772 : 1998 CLAUSE 3.3 :
   (a) BITUMEN BASED HOT APPLIED COATING MATERIAL BS4147 : 1980 TYPE I GRADE C.
   (b) BITUMEN BASED COLD APPLIED COATING MATERIAL TO BS 3416 : 1975 TYPE II.
4. BURIED PIPES SHALL HAVE PUSH-FIT JOINTS WITH NITRILE GASKETS.
5. NON-BUIRED PIPES SHALL HAVE FLANGE JOINTS TO PRESSURE RATING PN16 WITH FULL FACE NITRILE GASKETS AND MILD STEEL (GRADE 4.6) BOLTS, NUTS AND WASHERS RILSAN COATED.
6. BURIED PIPES SHALL BE LAID IN TRENCHES WITH COMPACTED GRANULAR BEDDING MATERIAL AND GRANULAR SURROUND COMPACTED IN 300mm THICK LAYERS.
7. PIPES LAID IN TROUGHS AND ON SOIL SLOPES SHALL BE SUPPORTED ON REINFORCED CONCRETE PLINTHS.
8. PIPES ON ROCK SLOPES SHALL BE LAID IN PREFORMED SLOTS IN ROCK FACES AND SHALL BE SUPPORTED BY T32 ROCK DOWELS WITH REINFORCED CONCRETE PIPE COLLARS.

BD REF. NO. BD 4/2029/13

NOTES FOR GROUT AND PIPE SUPPORT ANCHORS:

1. CEMENT GROUT SHALL HAVE A 28-DAY EQUIVALENT CUBE COMPRESSIVE STRENGTH OF 30N/mm2. WATER CEMENT RATIO OF GROUT SHOULD NOT EXCEED 0.45.
2. CEMENT GROUT CUBES SHALL BE 100mm CUBES TESTED IN ACCORDANCE WITH CLAUSE 7.181 OF THE GENERAL SPECIFICATION FOR CIVIL ENGINEERING WORKS, 2006 EDITION (HONG KONG GOVERNMENT).
3. PIPE SUPPORT ANCHORS SHALL BE 32mm DIAMETER HIGH YIELD STEEL BAR WITH YIELD STRENGTH, fy=460N/mm2 COMPLYING WITH CS2-2012.
4. THE MINIMUM DRILL HOLE DIAMETER IN ROCK IS EQUAL TO DIAMETER OF ROCK ANCHOR PLUS 20mm.
5. THE MINIMUM BOND LENGTH IN ROCK FOR ALL ROCK ANCHORS IS 1.0M.

Plan Approved
LIE Fung-yu, Fanny
Senior Building Surveyor
for BUILDING AUTHORITY
- 5 JAN 2021

"Statement II : The works shown on these plans are Type II works (Drainage - Sewerage Rising Mains) in respect of which consent is applied for the purpose of Fast Track consent application under regulation 33 of the Building (Administration) Regulations."

CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

LEGEND:

B — DRAWING REVISION

Note: This plan has been processed on a curtailed check basis under the centralized processing system as promulgated in PNAP ADM-19. The duties of the authorized person, registered structural engineer and/or registered geotechnical engineer concerned as specified under section 4(3)(b) and the provision of section 14(2)(c) of the Buildings Ordinance are of particular relevance in this regard.

Rev.	Description	Issue Date	App Initial
C	BD SUBMISSION	19/11/20	
B	BD APPROVAL	10/08/18	
B	BD SUBMISSION	09/07/18	
A	BD APPROVAL	22/01/18	
A	BD SUBMISSION	01/12/17	
-	BD APPROVAL	26/06/15	
-	BD SUBMISSION	27/04/15	

Original by	Date	Draw	Check	App
CC	01.12.17	FN	CWC	NH

Client
Ocean Park Corporation

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M&E Engineer
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4/F Wah Ming Centre,
421 Queen's Road West, Hong Kong

Waterpark Design Consultant
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100 Park Avenue, Beaver Dam,
WI 53916, USA

Together with Other Specialist Consultants
Urbis Limited
Lanbase Surveyors Limited
MVA Hong Kong Limited
Vision Planning Consultants Ltd.
Intelibuild Technyx Asia Limited
Shen Milsom & Wilke
Lighting Planners Associates (HK) Ltd.
Food Service Consultants, Ltd.
Advanced Aquarium Technologies
Studio Hanson Roberts

Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SUBMISSION
SEWERAGE RISING MAINS
GENERAL NOTES

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2000.dwg	09.07.18	AS SHOWN@A1

Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2000	C	DD

BD REF. NO. BD 4/2029/13

Notes

1. FOR GENERAL NOTES AND LEGEND REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.

Note: This plan has been processed on a curtailed check basis under the centralized processing system as promulgated in PNAP ADM-19. The duties of the authorized person, registered structural engineer and/or registered geotechnical engineer concerned as specified under section 4(3)(b) and the provision of section 14(2)(c) of the Buildings Ordinance are of particular relevance in this regard.

Plan Approved

LIE Fung-yu, Fanny
Senior Building Surveyor
for BUILDING AUTHORITY
- 5 JAN 2021

"Statement II : The works shown on these plans are Type II works (Drainage - Sewerage Rising Mains) in respect of which consent is applied for the purpose of Fast Track consent application under regulation 33 of the Building (Administration) Regulations."

Rev.	Description	Issue Date	App Initial
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A	BD APPROVAL	22/01/18	
A	BD SUBMISSION	01/12/17	
-	BD APPROVAL	26/06/15	
-	BD SUBMISSION	27/04/15	

Original by	Date	Draw	Check	App
CC	18/03/15	FN	CWC	NH

Client

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Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SUBMISSION
SEWERAGE RISING MAINS
KEY PLAN

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2120.dwg	01.12.17	1:1000 @ A1

Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2120	B	DD

This drawing is to be read in conjunction with all related drawings. Do not scale from this drawing. All dimensions must be checked and verified on site before commencing any work or producing shop drawings. The originator should be notified immediately of any discrepancy. This drawing is copyright and remains the property of Aedas.

CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

NORTH

0 10M 25M 50M 100M

(SCALE: 1=1000)

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BUILDINGS DEPARTMENT

ABERDEEN CH 香港仔

EXTENSION
R.B.L. 1020

SB 10_2121

SB 10_2122

SB 10_2123

R.B.L. 1085

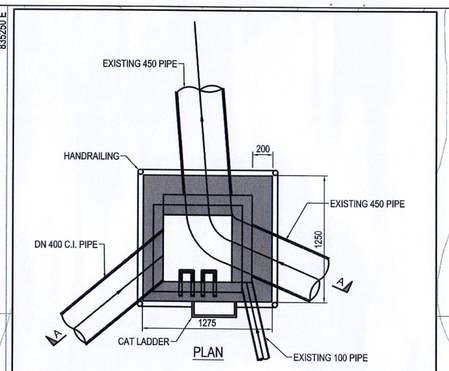
R.B.L. 1020

811000 N
810900 N
810800 N
810700 N
810600 N

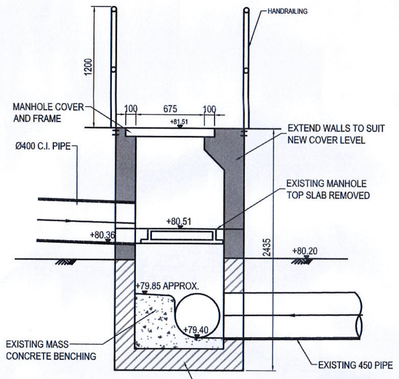
835000 E
835100 E
835200 E
835300 E
835400 E
835500 E

Ocean Park 海洋公園

BD REF. NO. BD 4/2029/13



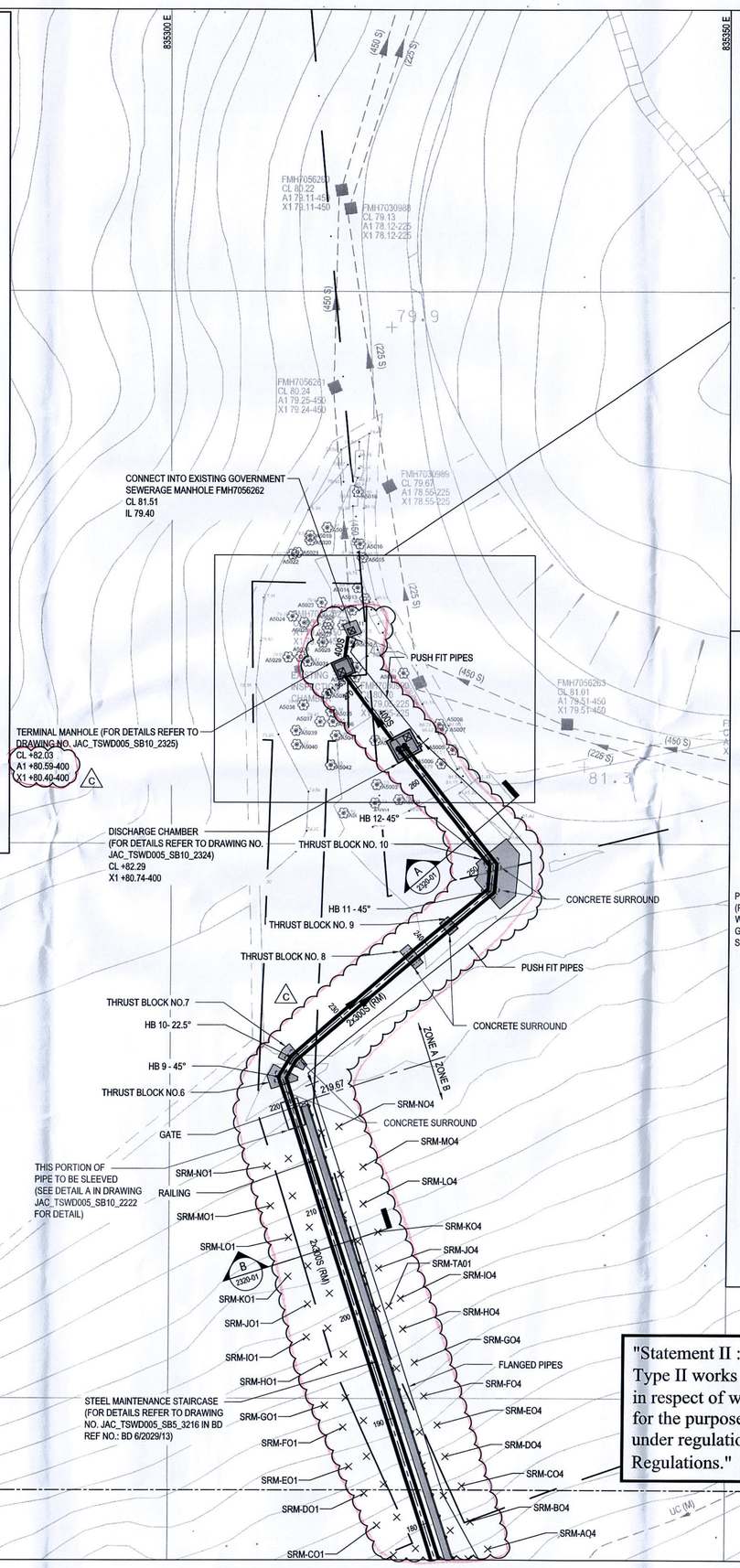
PLAN

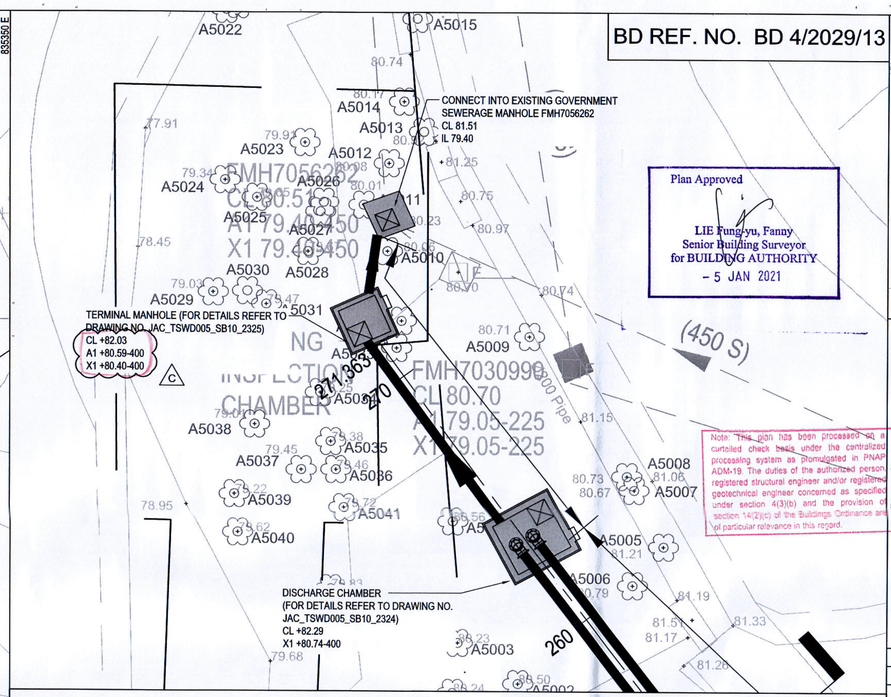


SECTION A - A

EXISTING GOVERNMENT SEWERAGE MANHOLE FMH7056262 - GENERAL ARRANGEMENT (NTS)

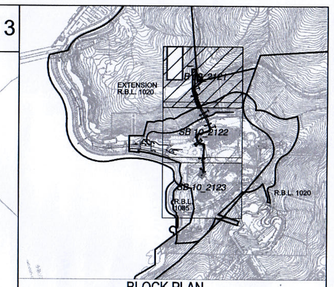
(FOR INFORMATION ONLY)



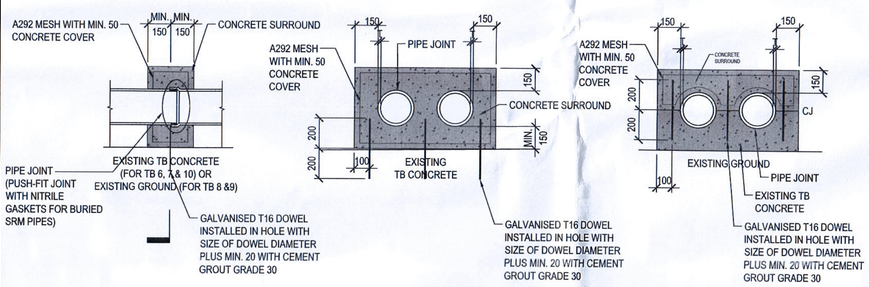


Plan Approved

LIE Fung-yu, Fanny
Senior Building Surveyor
for BUILDING AUTHORITY
– 5 JAN 2021



BLOCK PLAN
SCALE 1:7500



SECTIONAL ELEVATION OF CONCRETE SURROUND
NTS

SECTION A-A (FOR TB 6, 7 & 10)
NTS

SECTION A-A (FOR TB 8 & 9)
NTS

NOTES:
1. 'T' DENOTES THICKNESS OF PIPE JOINT.
2. CONCRETE MIX TO BE GRADE 20D/20 WITH MINIMUM CEMENTITIOUS CONTENT OF 330 kg/m³.

CONCRETE SURROUND AT PIPE JOINT FOR SRM PIPES (APPLICABLE FOR BURIED PORTION OF PIPELINES ONLY)

(FOR INFORMATION ONLY NOT FOR APPROVAL)

"Statement II : The works shown on these plans are Type II works (Drainage - Sewerage Rising Mains) in respect of which consent is applied for the purpose of Fast Track consent application under regulation 33 of the Building (Administration) Regulations."

CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

NORTH
0 5M 10M 15M 25M
(SCALE: 1=250)

Notes

1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.
2. FOR SETOUT CO-ORDIANTES, MANHOLE, PIPES AND FITTINGS SCHEDULE REFER TO DRAWING NO. JAC_TSWD005_SB10_2129.
3. FOR LEVELS REFER TO PROFILE DRAWING NOS. JAC_TSWD005_SB10_2221, 2222, 2223.
4. EXISTING BUILDINGS, SLOPES, ROADS, DRAINAGE AND UTILITIES ARE SHOWN IN GREY SCALE.
5. HB = HORIZONTAL BEND FITTINGS
6. FOR DETAILS OF THRUST BLOCKS REFER TO DRAWINGS NOS. JAC_TSWD005_SB11_2327-01 AND 02 IN BD REF NO.: BD 3/2029/13

LEGEND:

CONCRETE SURROUND AT PIPE JOINT FOR BURIED PORTION OF SRM PIPES

Rev.	Description	Issue Date	App Initial
C	BD SUBMISSION	19/11/20	
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A	BD SUBMISSION	01/12/17	
-	BD APPROVAL	26/06/15	
-	BD SUBMISSION	27/04/15	

Original by	Date	Draw	Check	App
CC	18/03/15	PDC	CWC	NH

Client
Ocean Park Corporation

Lead Consultant & Interior Design Consultant
Aedas Limited
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Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

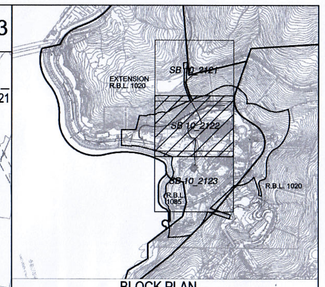
Drawing Title
DRAINAGE SUBMISSION
SEWERAGE RISING MAINS
PLAN (SHEET 1 OF 3)

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2121.dwg	28.08.20	1:250 @ A1

Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2121	C	DD

BD REF. NO. BD 4/2029/13

MATCH LINE
JAC_TSWD005_SB10_2121



BLOCK PLAN
SCALE 1:7500

Notes

1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.
2. FOR SPECIFIC NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2121.

LEGEND:

SRM-AO1 SOIL NAIL (UNDER SEPARATE SUBMISSION)

SRM-TAO1 TEST SOIL NAIL (UNDER SEPARATE SUBMISSION)

Plan Approved
LIE Fung-yu, Fanny
Senior Building Surveyor
for BUILDING AUTHORITY
- 5 JAN 2021

Rev.	Description	Issue Date	App Initial
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A	BD SUBMISSION	01/12/17	
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-	BD SUBMISSION	27/04/15	

Original by	Date	Draw	Check	App
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Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SUBMISSION
SEWERAGE RISING MAINS
PLAN (SHEET 2 OF 3)

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2122.dwg	28.08.20	1:250 @ A1

Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2122	C	DD

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CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

NORTH
0 5M 10M 15M 25M
(SCALE: 1=250)

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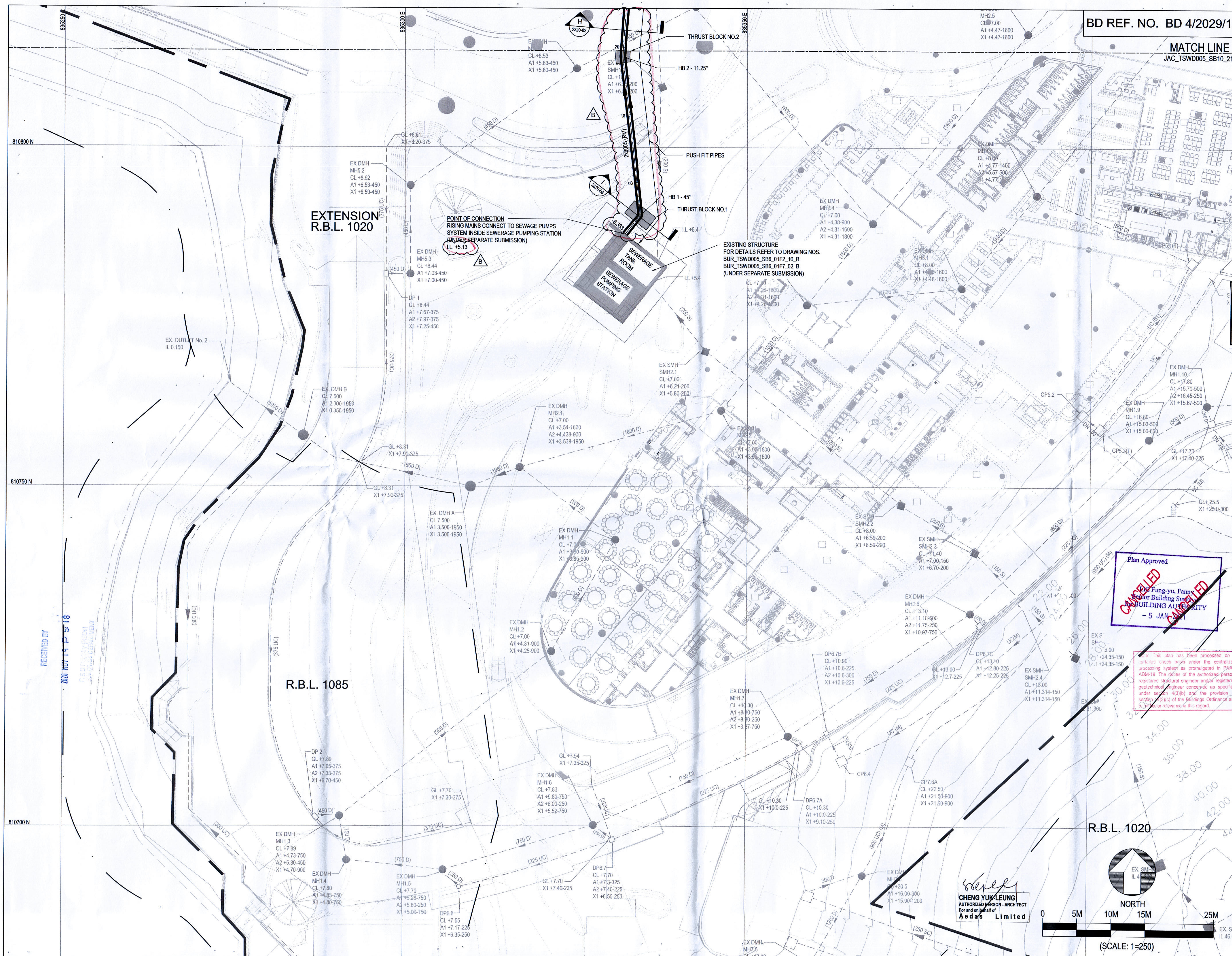
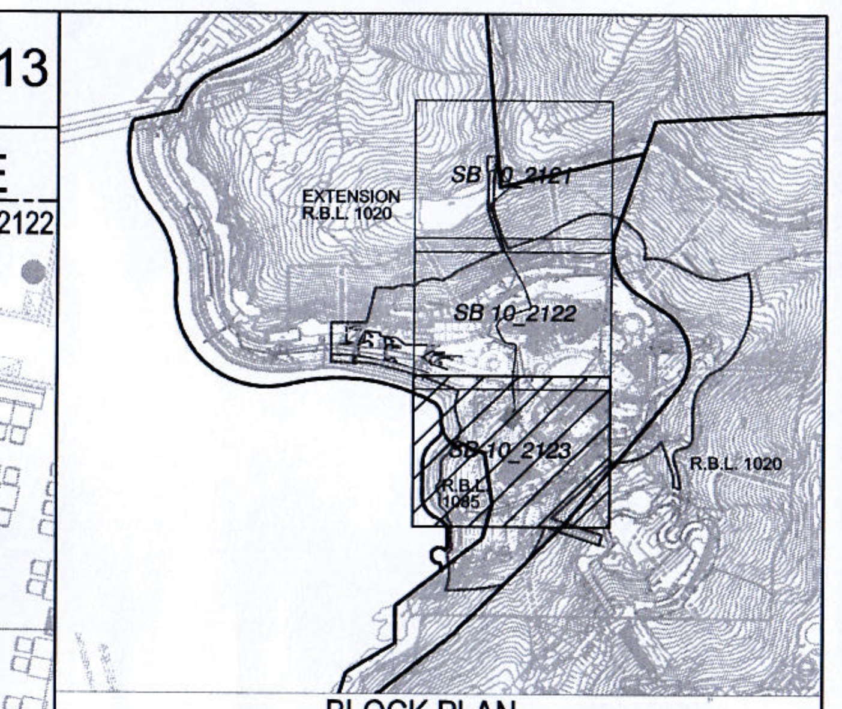
BD REF. NO. BD 4/2029/13





Notes

1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.
2. FOR SPECIFIC NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2121.

Plan Approved
LIE Fung-yu, Fanny
Senior Building Surveyor
for BUILDING AUTHORITY
- 5 JAN 2021

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-	BD SUBMISSION	27/04/15	

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Project

OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title

TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title

DRAINAGE SUBMISSION
SEWERAGE RISING MAINS
PLAN (SHEET 3 OF 3)

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2123.dwg	01.12.17	1:250 @ A1

Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2123	B	DD

BD REF. NO. BD 4/2029/13

SCHEDULE OF SEWERAGE SYSTEM

Manhole Number		Invert out	Invert in	Pipe / Channel							Manhole / Catchpit for (a)					
FROM	TO	(a)	(b)	Size	Pipe length	Gradient		Type	Material	Strength	Cover level	Depth to invert	Manhole Type	Manhole Cover Size	Grade / Class	Double Seal (DS) / Single Seal (SS)
(a)	(b)	(mPD)	(mPD)	(m)	(m)	(%)	1 in			(class)	(mPD)	(m)				
RISING MAIN	DISCHARGE CHAMBER	-	79.14	0.300	-	-	-	UNDERGROUND PIPE (PUSH FIT)& EXPOSED PIPE (FLANGE JOINT)	DUCTILE IRON	K9	-	-	-	-	-	-
DISCHARGE CHAMBER	TERMINAL MH	80.74	80.63	0.400	8.56	1.3%	77.82	EXPOSED PIPE (FLANGE JOINT)	DUCTILE IRON	K9	82.29	1.55	DISCHARGE CHMABER	675X675	E600	SS
TERMINAL MH	FMH7056262	80.48 (DTL)	80.45	0.400	1.68	1.8%	55.97	EXPOSED PIPE (FLANGE JOINT)	CAST IRON	CLASS 1	82.08	1.60	TERMINAL MANHOLE	450X450	GRADE 150	DS

SCHEDULE OF SEWERAGE RISING MAINS SYSTEM (TWIN DN300 DI PARALLEL PIPES)
PIPE SETTING OUT SCHEDULE

POINT	LOACTION	CHAINAGE (m)	COORDINATES		HORIZONTAL DEFLECTION	LENGTH (m)	CENTER-LINE LEVEL (mPD)	VERTICAL DEFLECTION	LEVEL DIFFERENCE (m)	TYPE
			EASTING	NORTHING						
1	PUMP ROOM OUTLET FLANGE	-8.38	835332.188	810787.279	-	0	5.65	-	0	BURIED
2	HB1	-4.87	835334.380	810790.027	45.00	3.70	5.65	-	0	BURIED
3	HB2	18.62	835331.840	810813.370	11.25	23.34	5.65	-	0	BURIED
3A1	HB2A1	54.33	835334.790	810848.960	45.00	35.67	-	-	-	BURIED
3A2	HB2A2	56.70	835333.240	810850.760	45.00	2.30	-	-	-	BURIED
3B	HB2B	64.33	835325.630	810851.270	45.00	7.61	-	-	-	BURIED
3C	HB2C	73.45	835319.920	810858.380	11.25	9.25	-	-	-	BURIED
4	HB3	82.93	835316.710	810867.300	45.00	10.23	5.65	-	0	BURIED
4A	HB3A	88.26	835319.251	810871.988	22.50	3.21	-	-	-	BURIED
5	HB4	96.67	835346.790	810833.030	22.50	7.02	5.65	-	0	BURIED
6	HB5	118.28	835348.060	810885.500	45.00	24.59	5.65	-	0	BURIED
7	HB6	121.05	835348.046	810885.464	45.00	2.49	5.65	-	0	BURIED
8	VB1	121.97	835347.755	810886.369	-	0.95	5.65	45.00	0	BURIED
9	VB2	124.59	835346.957	810888.856	-	3.69	8.26	45.00	2.61	EXPOSED
10	VB3	124.59	835346.957	810888.856	-	7.67	15.81	45.00	7.55	EXPOSED
11	VB4	126.29	835346.400	810890.470	-	2.71	17.85	45.00	1.94	EXPOSED
12	HB7	138.60	835342.385	810902.108	11.25	11.56	17.85	-	0	EXPOSED
13	VB5	138.93	835342.273	810902.417	-	0.92	17.94	45.00	0	EXPOSED
14	VB6	140.02	835341.904	810903.438	-	1.50	16.92	45.00	1.17	EXPOSED
15	VB7	140.02	835341.904	810903.438	-	4.24	22.64	45.00	3.73	EXPOSED
16	VB8	141.41	835341.338	810904.712	-	1.89	24.21	45.00	1.45	EXPOSED
17	VB9	153.93	835335.152	810915.589	-	12.68	24.45	45.00	0	EXPOSED
18	VB10	155.33	835334.472	810916.813	-	1.83	25.52	45.00	1.42	EXPOSED
19	VB11	155.33	835334.472	810916.813	-	3.83	29.61	45.00	4.09	EXPOSED
20	VB12	156.20	835334.050	810917.574	-	1.17	30.40	45.00	1.39	EXPOSED
21	VB13	160.49	835331.963	810921.330	-	4.18	30.40	45.00	0	EXPOSED
22	VB14	161.37	835331.537	810922.095	-	1.31	31.33	45.00	0.88	EXPOSED
23	VB15	161.37	835331.537	810922.095	-	4.60	35.65	11.25	4.32	EXPOSED
24	VB16	161.51	835331.469	810922.219	-	0.69	36.35	22.50	0.69	EXPOSED
25	VB17	168.55	835328.024	810928.360	-	12.23	46.86	45.00	10.41	EXPOSED
26	VB18	171.54	835326.710	810931.040	-	3.16	47.56	22.50	0.63	EXPOSED
27	HB8	176.46	835324.130	810935.230	11.25	12.04	54.86	-	6.71	EXPOSED
28	VB19	210.09	835313.840	810967.250	-	34.58	72.28	11.25	19.21	EXPOSED
29	VB20	218.47	835311.300	810975.240	-	9.16	76.65	22.50	3.50	EXPOSED
30	HB9	222.35	835310.080	810978.920	45.00	2.30	76.68	-	0	BURIED
31	HB10	224.34	835311.070	810980.640	22.50	3.72	76.70	-	0	BURIED
32	VB21	236.40	835320.156	810988.577	-	11.86	76.81	22.50	0	BURIED
33	VB22	242.39	835324.728	810992.455	-	6.49	78.28	22.50	2.49	BURIED
34	HB11	247.51	835328.620	810995.780	45.00	5.56	79.45	-	-	BURIED
35	HB12	249.85	835328.810	810998.110	45.00	2.10	79.60	-	-	BURIED
36	BELL MOUTH	262.14	835321.042	811008.210	-	-	81.29	-	-	-

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2020 NOV 19 P 5:18
BUILDINGS DEPARTMENT

Notes
1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.
2. FOR LOCATION OF DRAINAGE REFER TO DRAWINGS NOS. JAC_TSWD005_SB10_2121 TO 2123.

Plan Approved
LIE Kung-yu, Fanny
Senior Building Surveyor
for BUILDING AUTHORITY
- 5 JAN 2021

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Note: This plan has been processed on a curtailed check basis under the centralized processing system as promulgated in PNAP ADM-19. The duties of the authorized person, registered structural engineer and/or registered geotechnical engineer concerned as specified under section 4(3)(b) and the provision of section 14(2)(c) of the Buildings Ordinance are of particular relevance in this regard.

CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

Rev.	Description	Issue Date	App Initial
C	BD SUBMISSION	19/11/20	
B	BD APPROVAL	22/01/18	
B	BD SUBMISSION	01/12/17	
A	1ST AMENDMENT	26/02/16	
-	BD APPROVAL	26/06/15	
-	BD SUBMISSION	27/04/15	

Original by	Date	Draw	Check	App
CC	18/03/15	FN	CWC	NH

Client
Ocean Park Corporation

Lead Consultant & Interior Design Consultant
Aedas Limited
31/F One Island East
18 Westlands Road
Quarry Bay
Hong Kong

Structural and Façade Engineers
Buro Happold
3507-3509, Hopewell Centre,
183 Queen's Road East, Wan Chai,
Hong Kong

Civil & Geotechnical Consultant
Jacobs China Limited
15th Floor, Cornwall House, Taikoo Place,
979 King's Road, Quarry Bay, HK

M&E Engineer
Meinhardt
4/F Wah Ming Centre,
421 Queen's Road West, Hong Kong

Waterpark Design Consultant
Water Technology Inc.
100 Park Avenue, Beaver Dam,
WI 53916, USA

Together with Other Specialist Consultants
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Shen Milsom & Wilke
Lanbase Surveyors Limited
Lighting Planners Associates (HK) Ltd.
MVA Hong Kong Limited
Food Service Consultants, Ltd.
Vision Planning Consultants Ltd.
Advanced Aquarium Technologies
Intelibuild Technyx Asia Limited
Studio Hanson Roberts

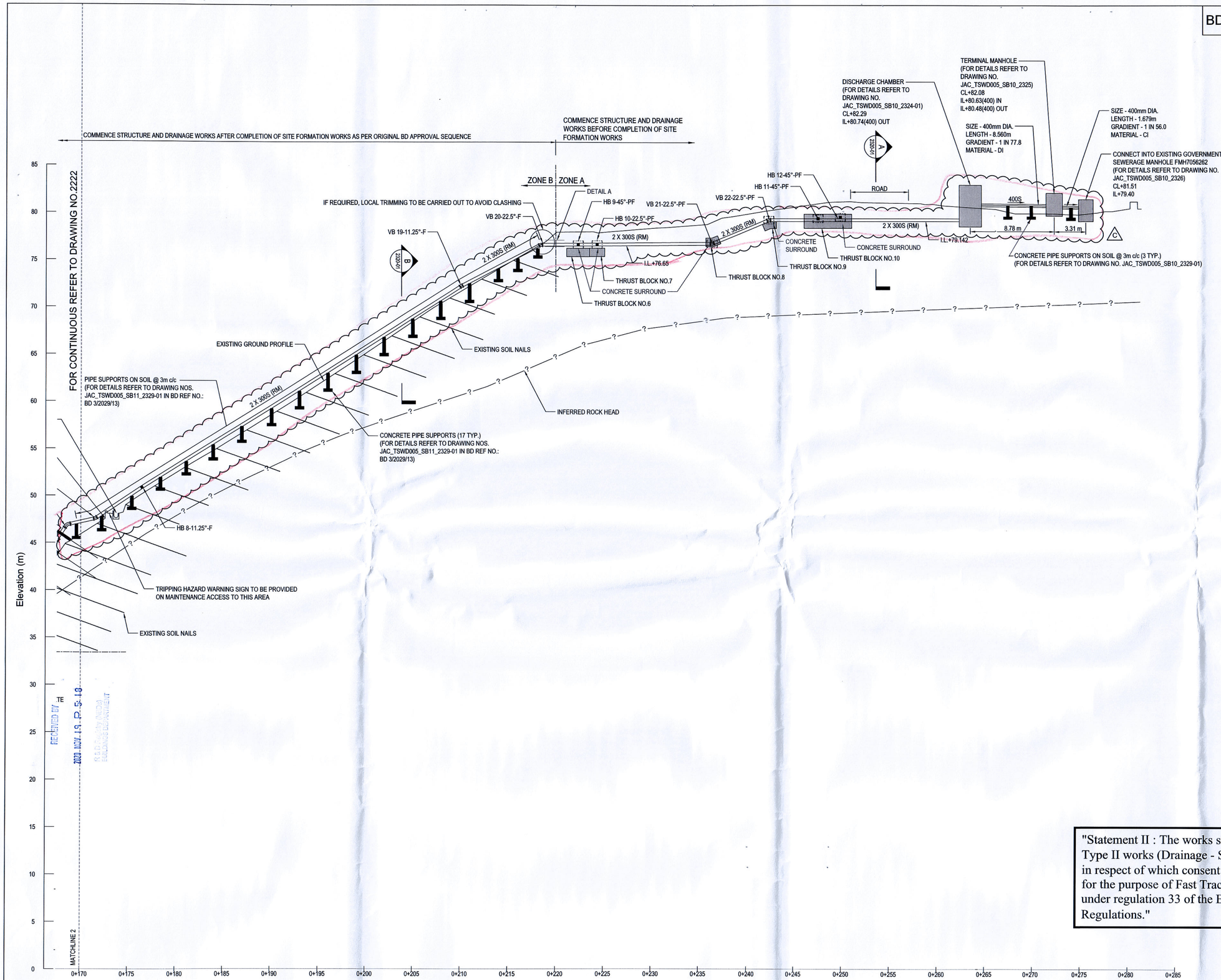
Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SUBMISSION
SEWERAGE RISING MAINS
MANHOLE AND PIPE SCHEDULE

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2129.dwg	18.11.20	AS SHOWN
Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2129	C	DD

BD REF. NO. BD 4/2029/13



SEWERAGE RISING MAIN AND SEWERAGE PROFILE
SCALE 1:200

SCALE 1:200
0 5 10 15 20 25 (m)

RECEIVED BY TE 2020 NOV 19 P 5:18 B.A.D. Section (North) BUILDING DEPARTMENT

Note: This plan has been processed on a curtailed check basis under the centralized processing system as promulgated in PNAP ADM-19. The duties of the authorized person, registered structural engineer and/or registered geotechnical engineer concerned as specified under section 14(3)(b) and the provision of section 14(2)(c) of the Buildings Ordinance are of particular relevance in this regard.

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AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

Notes
1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.
2. FOR PLAN DRAWINGS REFER TO DRAWING NOS. JAC_TSWD005_SB10_2121, 2122, 2123.
3. FOR SETTING OUT OF PIPE LEVELS REFER TO DRAWING NO. JAC_TSWD005_SB10_2129.
4. PIPE FIXING IN ROCK REFER TO DRAWING NO 2329-01.
5. FOR DETAILS OF THRUST BLOCKS REFER TO DRAWINGS NOS. JAC_TSWD005_SB10_2327-01 AND 2327-02.
6. FITTINGS
   6.1 HB = HORIZONTAL BEND
   6.2 VB = VERTICAL BENDS
   6.3 (PF) = PUSH FIT FITTINGS
   6.4 (F) = FLANGE FITTINGS

LEGEND:
B DRAWING REVISION

Plan Approved
LIE Fung-yu, Fanny
Senior Building Surveyor
for BUILDING AUTHORITY
- 5 JAN 2021

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A	BD SUBMISSION	20/10/17	
-	BD APPROVAL	26/06/15	
-	BD SUBMISSION	27/04/15	

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CC	18/03/15	FN	CWC	NH

Client
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Aedas Limited
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Vision Planning Consultants Ltd.	Advanced Aquarium Technologies
Intelibuild Technyx Asia Limited	Studio Hanson Roberts

Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SUBMISSION
SEWERAGE RISING MAINS
PROFILE (SHEET 1 OF 3)

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2221.dwg	09.07.18	1:200 @ A1

Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2221	C	DD

BD REF. NO. BD 4/2029/13

COMMENCE STRUCTURE AND DRAINAGE WORKS BEFORE COMPLETION OF SITE FORMATION WORKS

COMMENCE STRUCTURE AND DRAINAGE WORKS AFTER COMPLETION OF SITE FORMATION WORKS AS PER ORIGINAL BD APPROVAL SEQUENCE

COMMENCE STRUCTURE AND DRAINAGE WORKS BEFORE COMPLETION OF SITE FORMATION WORKS

FOR CONTINUOUS REFER TO DRAWING NO.2223

FOR CONTINUOUS REFER TO DRAWING NO.2221

ZONE D | ZONE C

ZONE C | ZONE B

ZONE B | ZONE A

Elevation (mPD)

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85

0+100 0+105 0+110 0+115 0+120 0+125 0+130 0+135 0+140 0+145 0+150 0+155 0+160 0+165 0+170 0+175 0+180 0+185 0+190 0+195 0+200 0+205 0+210 0+215 0+220 0+225 0+230 0+235

MATCHLINE

MATCHLINE 2

IF REQUIRED, LOCAL TRIMMING TO BE CARRIED OUT TO AVOID CLASHING

DETAIL A

VB 20-22.5°-F

VB 19-11.25°-F

VB 21-22.5°-PF

HB 9-45°-PF

HB 10-22.5°-PF

2 X 300S (RM)

I.L.+76.65

THRUST BLOCK NO.7

CONCRETE SURROUND

THRUST BLOCK NO.6

EXISTING GROUND PROFILE

EXISTING SOIL NAILS

INFERRED ROCK HEAD

PIPE SUPPORTS ON SOIL @ 3m c/c
(FOR DETAILS REFER TO DRAWING NOS. JAC_TSWD005_SB11_2329-01 IN BD REF NO.: BD 3/2029/13)

CONCRETE PIPE SUPPORTS (17 TYP.)
(FOR DETAILS REFER TO DRAWING NOS. JAC_TSWD005_SB11_2329-01 IN BD REF NO.: BD 3/2029/13)

U-CHANNEL

LOCAL CUTTING TO BE CARRIED OUT FOR CONSTRUCTION OF PIPE SUPPORT. AREA BEING AFFECTED TO BE REINSTATED BY MASS CONCRETE

VB 18-22.5°-F

VB 17-45°-F

HB 8-11.25°-F

PIPE FIXING IN ROCK
(FOR DETAILS REFER TO DRAWING NOS. JAC_TSWD005_SB11_2328-02 IN BD REF NO.: BD 3/2029/13)

PIPE TROUGH NO.3
(FOR DETAILS REFER TO DRAWING NOS. JAC_TSWD005_SB11_2328-02 IN BD REF NO.: BD 3/2029/13)

TRIPPING HAZARD WARNING SIGN TO BE PROVIDED ON MAINTENANCE ACCESS TO THIS AREA

EXISTING SOIL NAILS

VB 12-45°-F

VB 11-45°-F

VB 16-22.5°-F

VB 15-11.25°-F

STAIRS

THOROUGHFARE

VB 14-45°-F

+30.89 mPD

+29.70 mPD

PIPE TROUGH NO.2
(FOR DETAILS REFER TO DRAWING NOS. JAC_TSWD005_SB11_2328-02 IN BD REF NO.: BD 3/2029/13)

PIPE FIXING IN ROCK

MASS CONCRETE

VB 8-45°-F

PIPE FIXING IN ROCK

+26.65 mPD

IL 30.25

U CHANNEL

MASS CONCRETE

VB 13-45°-F

VB-10-45°-F

+23.75 mPD

STRUCTURAL GROUND BEAM (UNDER SEPARATE SUBMISSION)

MASS CONCRETE

VB 4 - 45° - F

IL 24.30

VB 9-45°-F

VB 7-45°-F

EXISTING 22KV BURIED CABLES

U-CHANNEL

CABLE SUPPORT TROUGH

+19.50 mPD

+17.15 mPD

VB 3 - 45° - F

MASS CONCRETE BUTTRESS (UNDER SEPARATE SUBMISSION)

VB 5-45°-F

IL 17.70

HB 7-11.25°-F

PIPE FIXING IN ROCK

VB 2 45° - F

U CHANNEL

HB 5 - 45° - PF

PIPE TROUGH NO.1
(FOR DETAILS REFER TO DRAWING NOS. JAC_TSWD005_SB11_2328-02 IN BD REF NO.: BD 3/2029/13)

VB 1 - 45° - PF

IL 5.50

HB 6 - 45° - PF

THRUST BLOCK NO.5

SEWERAGE RISING MAIN PROFILE

SCALE 1:200

SCALE 1:200

0 5 10 15 20 25 (m)

400 DIA. uPVC PIPE SLEEVE

APPROVED JOINT SEALANT

BACKING WITH APPROVED JOINT FILLER

DETAIL A

SCALE 1:25

(FOR INFORMATION ONLY NOF FOR APPROVAL)

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RECEIVED BY
2020 NOV 19 P 5:18
F & B Division (Kowloon)
BUILDINGS DEPARTMENT

CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

Notes

1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.
2. FOR SPECIFIC NOTES REFER TO JAC_TSWD005_SB10_2221.

LEGEND:

CONCRETE SURROUND AT PIPE JOINT FOR BURIED PORTION OF SRM PIPES (REFER TO DRAWING JAC_TSWD005_SB10_2121)

Note: This plan has been processed on a curtailed check basis under the centralized processing system as promulgated in PNAP ADM-19. The duties of the authorized person, registered structural engineer and/or registered geotechnical engineer concerned as specified under section 4(3)(b) and the provision of section 14(2)(c) of the Buildings Ordinance are of particular relevance in this regard.

Plan Approved
LIE Fung-yu, Fanny
Senior Building Surveyor
for BUILDING AUTHORITY
– 5 JAN 2021

Rev.	Description	Issue Date	App Initial
E	BD SUBMISSION	19/11/20	
D	BD SUBMISSION	03/07/20	
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Original by	Date	Draw	Check	App
CC	18/03/15	FN	CWC	NH

Client
Ocean Park Corporation

Lead Consultant & Interior Design Consultant
Aedas Limited
31/F One Island East
18 Westlands Road
Quarry Bay
Hong Kong

Structural and Façade Engineers
Buro Happold
3507-3509, Hopewell Centre,
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Vision Planning Consultants Ltd.	Advanced Aquarium Technologies
Intelibuild Technyx Asia Limited	Studio Hanson Roberts

Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SUBMISSION
SEWERAGE RISING MAINS
PROFILE (SHEET 2 OF 3)

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2222.dwg	28.08.20	1:200 @ A1

Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2222	E	DD

BD REF. NO. BD 4/2029/13

Notes
1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.
2. FOR SPECIFIC NOTES REFER TO JAC_TSWD005_SB10_2221.

LEGEND:

C DRAWING REVISION

COMMENCE STRUCTURE AND DRAINAGE WORKS BEFORE COMPLETION OF SITE FORMATION WORKS

FOR CONTINUOUS REFER TO DRAWING NO.2222

ZONE D | ZONE C

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Senior Building Surveyor
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- 5 JAN 2021

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-	BD APPROVAL	26/06/15	
-	BD SUBMISSION	27/04/15	

Original by	Date	Draw	Check	App
CC	18/03/15	FN	CWC	NH

Client
Ocean Park Corporation

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Aedas Limited
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Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SUBMISSION
SEWERAGE RISING MAINS
PROFILE (SHEET 3 OF 3)

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2223.dwg	09.07.18	1:200 @ A1

Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2223	D	DD

RECEIVED BY BUILDINGS DEPARTMENT 2020 NOV 19 P 5:18

Elevation (m)

85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0

EXISTING SEWERAGE PUMPING STATION
IL+5.13
D
I 232.02
H 232.02
G 232.02
F 232.02
EXISTING SITE FORMATION PROFILE
EX 200D IL+8.14
EX 600D IL+7.48
INFERRED ROCK HEAD
2 X 300S (RM)
HB 1 - 45° - PF
THRUST BLOCK NO.1
HB 2 - 11.25° - PF
EXISTING 450D I.L.+4.76
THRUST BLOCK NO.2
HB 2A1 - 45° - PF
THRUST BLOCK NO.2A
HB 2B - 45° - PF
HB 2A2 - 45° - PF
HB 2C - 11.25° - PF
THRUST BLOCK NO.2B
HB 3 - 45° - PF
THRUST BLOCK NO.2C
THRUST BLOCK NO.3
HB 3A - 22.5° - PF
THRUST BLOCK NO.3A
HB 4 - 45° - PF
THRUST BLOCK NO.4
IL 5.50
MASS CONCRETE
VB 4 - 45° - F
VB 3 - 45° - F
MASS CONCRETE BUTTRESS (UNDER SEPARATE SUBMISSION)
PIPE FIXING IN ROCK
VB 2 45° - F
U CHANNEL
HB 5 - 45° - PF
VB 1 - 45° - PF
HB 6 - 45° - PF
THRUST BLOCK NO.5
MATCHLINE
PIPE F

0-8.383 0-005 0+000 0+005 0+010 0+015 0+020 0+025 0+030 0+035 0+040 0+045 0+050 0+055 0+060 0+065 0+070 0+075 0+080 0+085 0+090 0+095 0+100 0+105 0+110 0+115 0+120 0+125

SEWERAGE RISING MAIN PROFILE
SCALE 1:200

SCALE 1:200
0 5 10 15 20 25 (m)

CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

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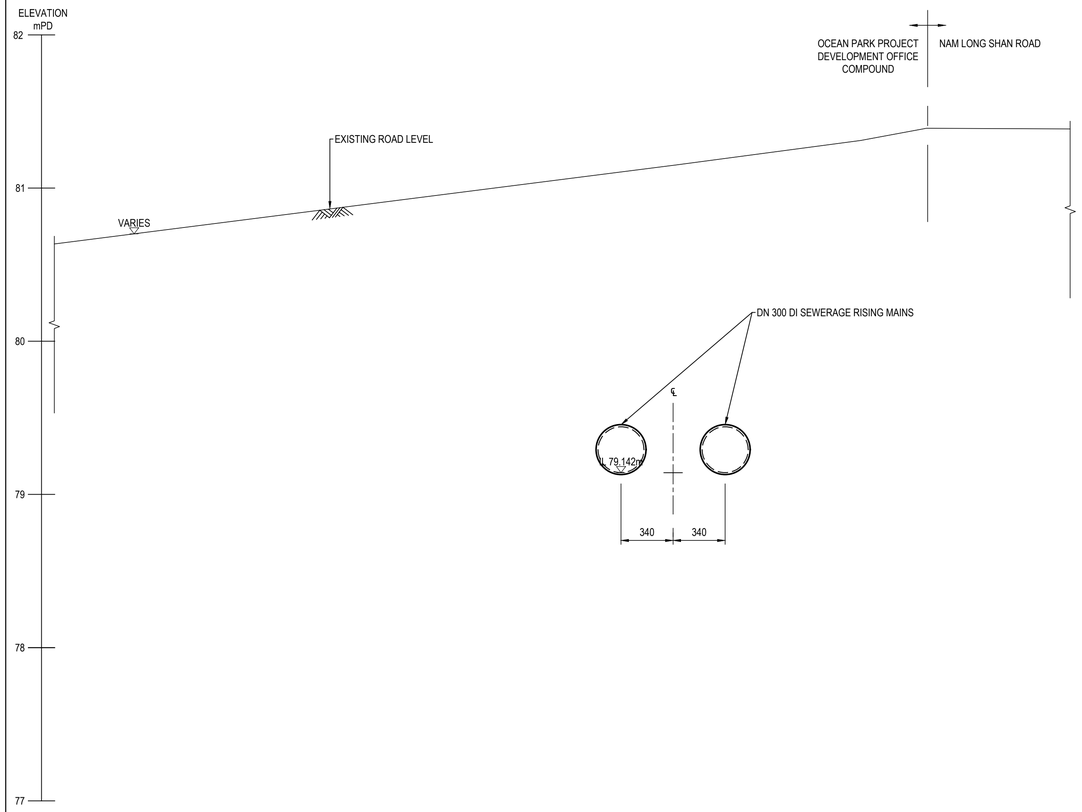
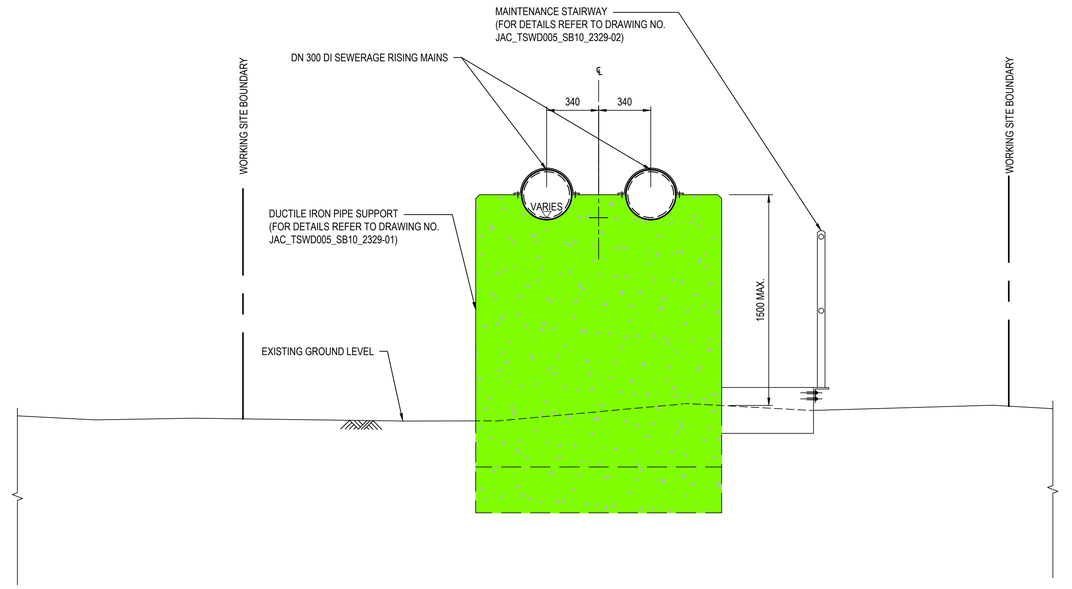
BD REF. NO. BD 4/2029/13



01 SECTION A-A (REFER TO DRAWING NO. 2221) SCALE 1:20



02 SECTION B-B (REFER TO DRAWING NO. 2221) SCALE 1:20

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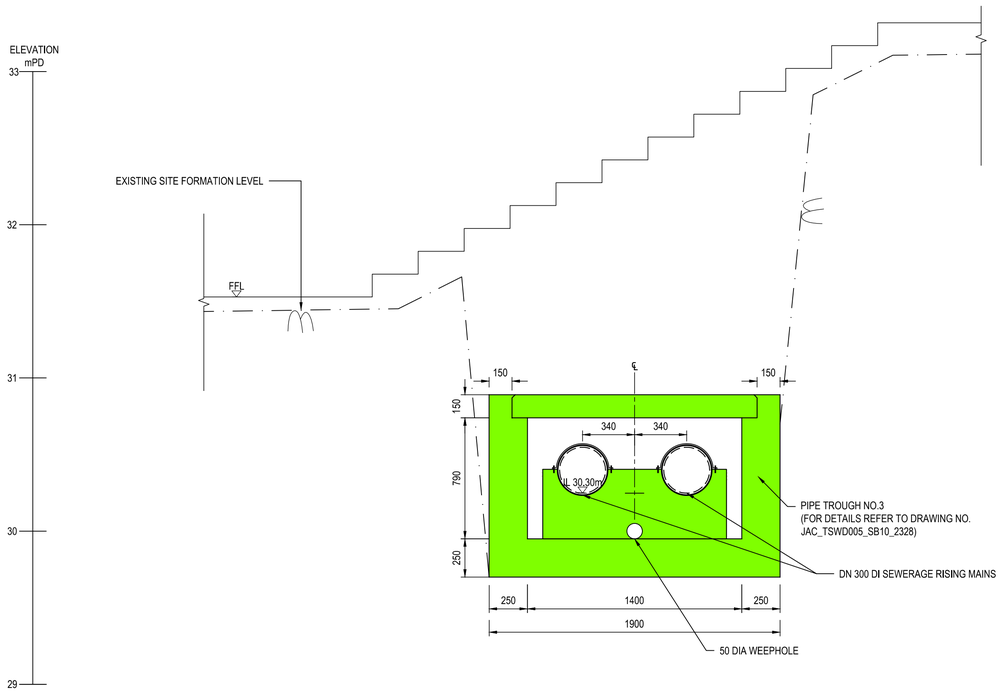
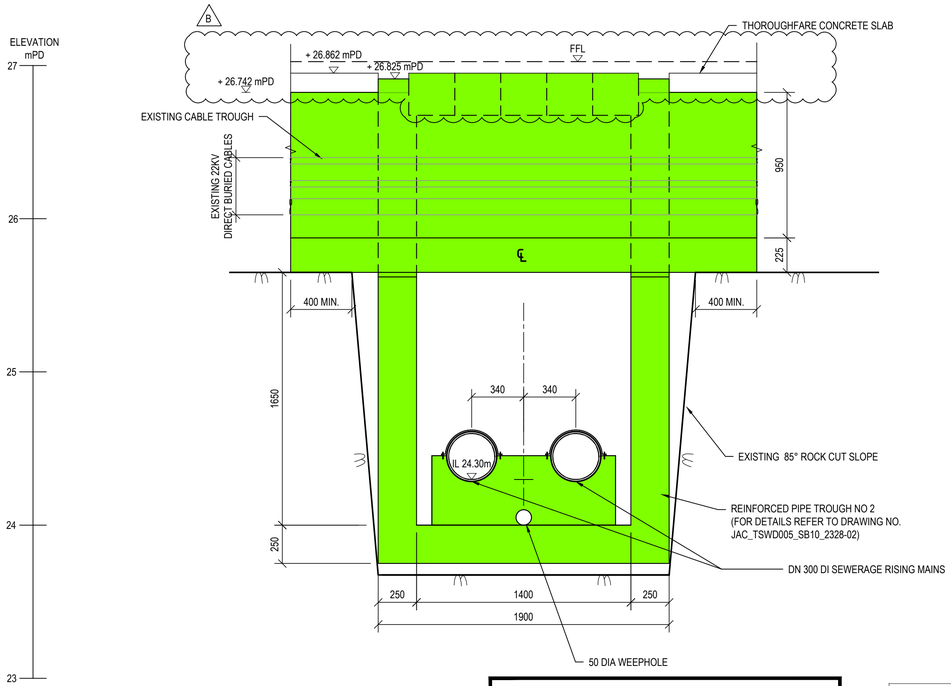


03 SECTION C-C (REFER TO DRAWING NO. 2222) SCALE 1:20



FOR INFORMATION ONLY

CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

04 SECTION D-D (REFER TO DRAWING NO. 2222) SCALE 1:20

Notes
1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.
2. FOR LOCATION OF SECTIONS REFER TO DRAWINGS NOS. JAC_TSWD005_SB10_2121 TO 2123.

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Original by	Date	Draw	Check	App
CC	18/03/15	PDC	CWC	NH

Client
Ocean Park Corporation

Lead Consultant & Interior Design Consultant
Aedas Limited
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Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

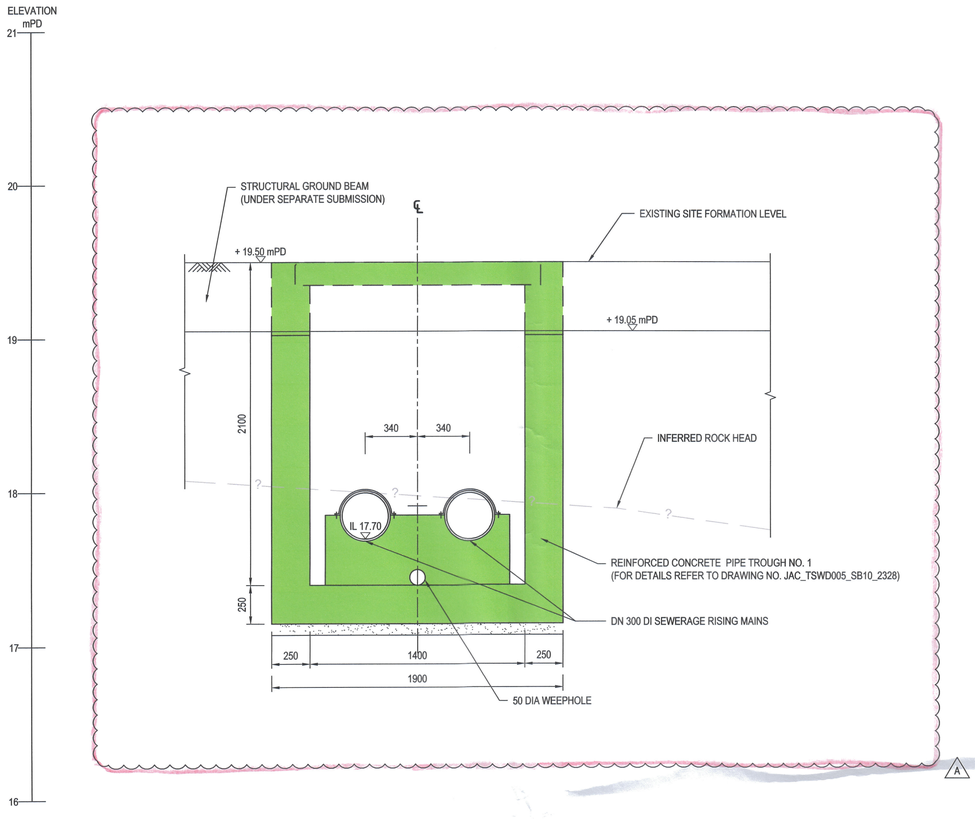
Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SUBMISSION
SEWERAGE RISING MAINS
SECTIONS (SHEET 1 OF 3)

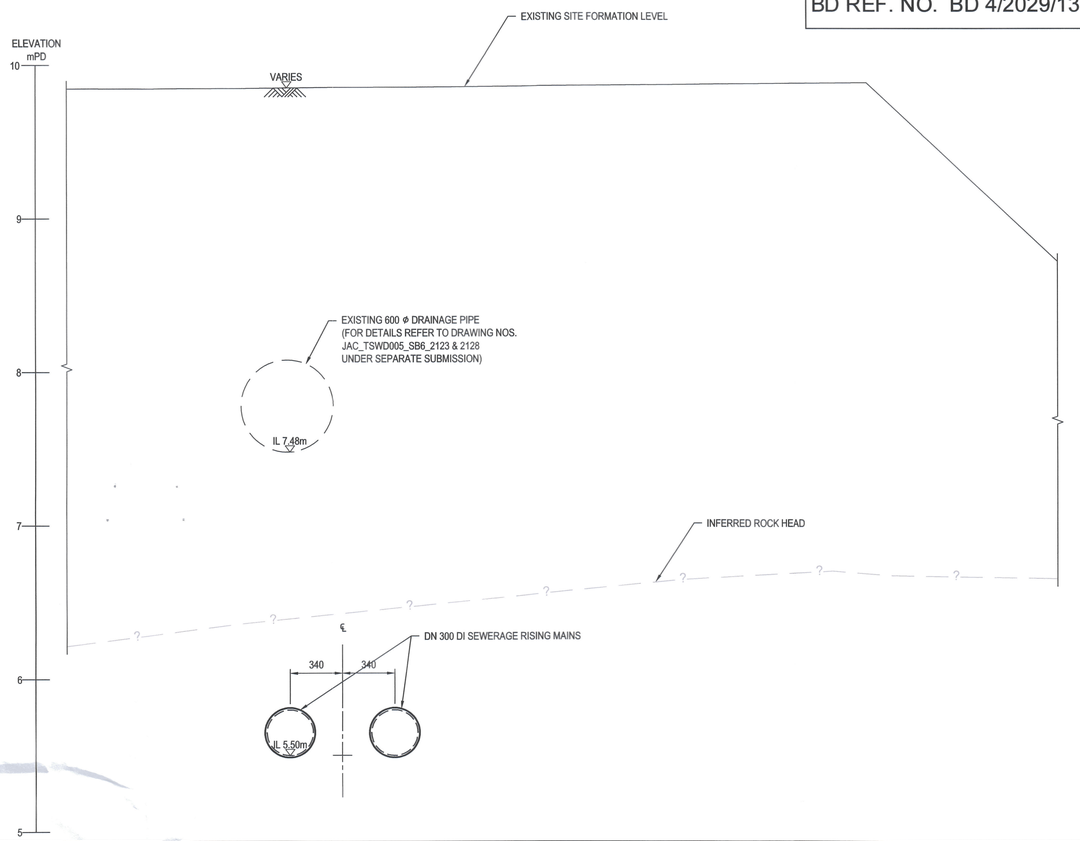
Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2320-01.dwg	03.07.2020	AS SHOWN@A1

Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2320-01	B	DD

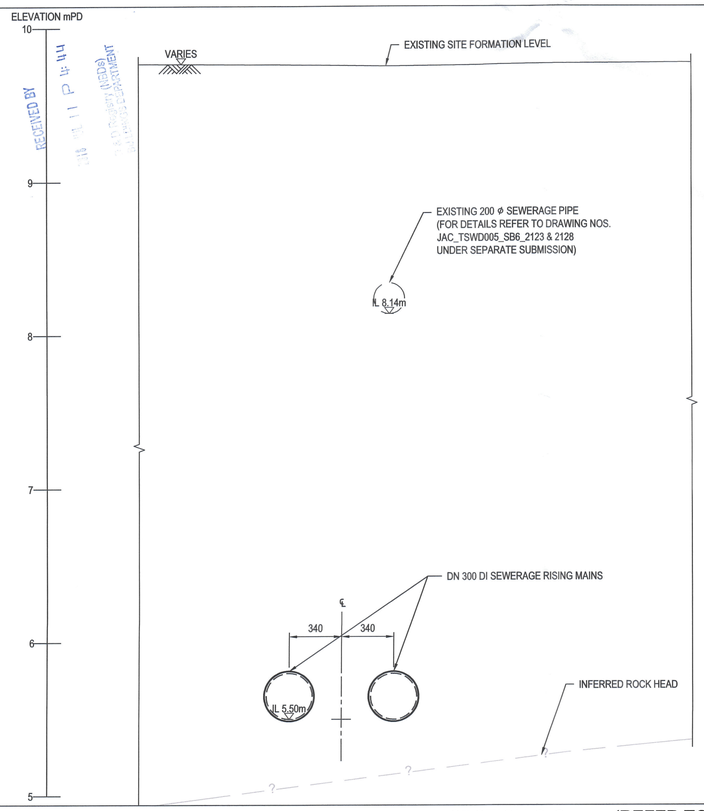
BD REF. NO. BD 4/2029/13



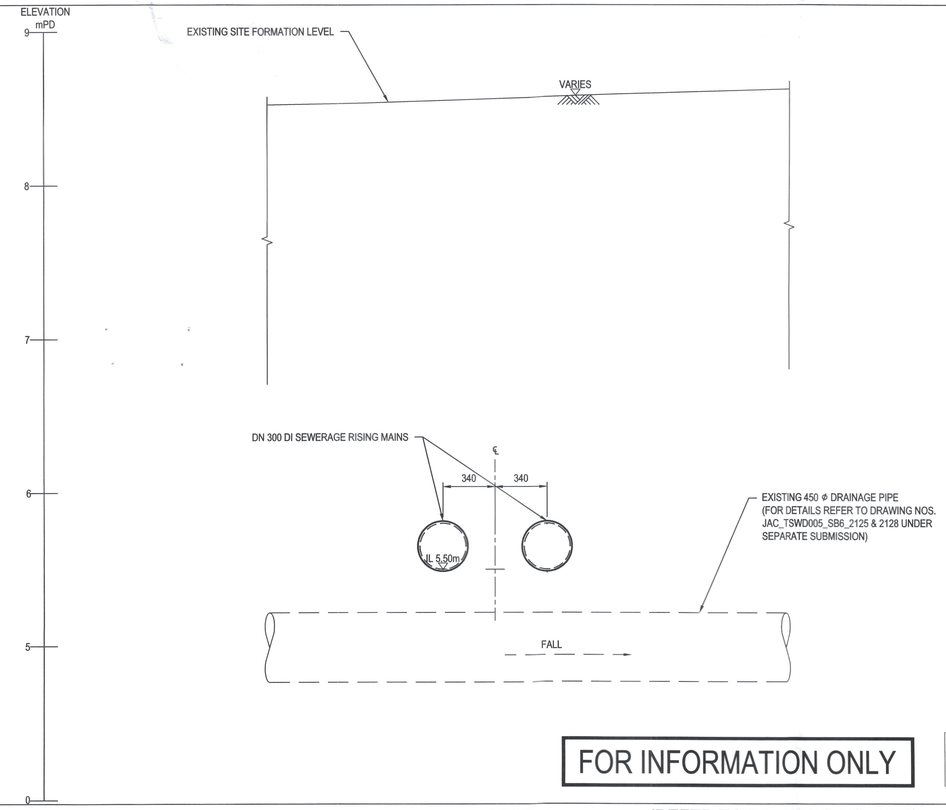
01 SECTION E-E (REFER TO DRAWING NO. 2222) SCALE 1:20



02 SECTION F-F (REFER TO DRAWING NO. 2223) SCALE 1:20



03 SECTION G-G (REFER TO DRAWING NO. 2223) SCALE 1:20



FOR INFORMATION ONLY

CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

04 SECTION H-H (REFER TO DRAWING NO. 2223) SCALE 1:20

Notes
1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.
2. FOR LOCATION OF SECTIONS REFER TO DRAWINGS NOS. JAC_TSWD005_SB10_2121 TO 2123.

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A	BD SUBMISSION	01/12/17	
-	BD APPROVAL	26/06/15	
-	BD SUBMISSION	27/04/15	

Original by	Date	Draw	Check	App
CC	18/03/15	FN	CWC	NH

Client
Ocean Park Corporation

Lead Consultant & Interior Design Consultant
Aedas Limited
31/F One Island East
18 Westlands Road
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Hong Kong

Structural and Façade Engineers
Buro Happold
3507-3509, Hopewell Centre,
183 Queen's Road East, Wan Chai,
Hong Kong

Civil & Geotechnical Consultant
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979 King's Road, Quarry Bay, HK

M&E Engineer
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421 Queen's Road West, Hong Kong

Waterpark Design Consultant
Water Technology Inc.
100 Park Avenue, Beaver Dam,
WI 53916, USA

Together with Other Specialist Consultants

Urbis Limited	Shen Milsom & Wilke
Lanbase Surveyors Limited	Lighting Planners Associates (HK) Ltd.
MVA Hong Kong Limited	Food Service Consultants, Ltd.
Vision Planning Consultants Ltd.	Advanced Aquarium Technologies
Intelibuild Technyx Asia Limited	Studio Hanson Roberts

Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SUBMISSION
SEWERAGE RISING MAINS
SECTIONS (SHEET 2 OF 3)

Computer file	Plot Date	Scale
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Drawing Number	Rev.	Issue status
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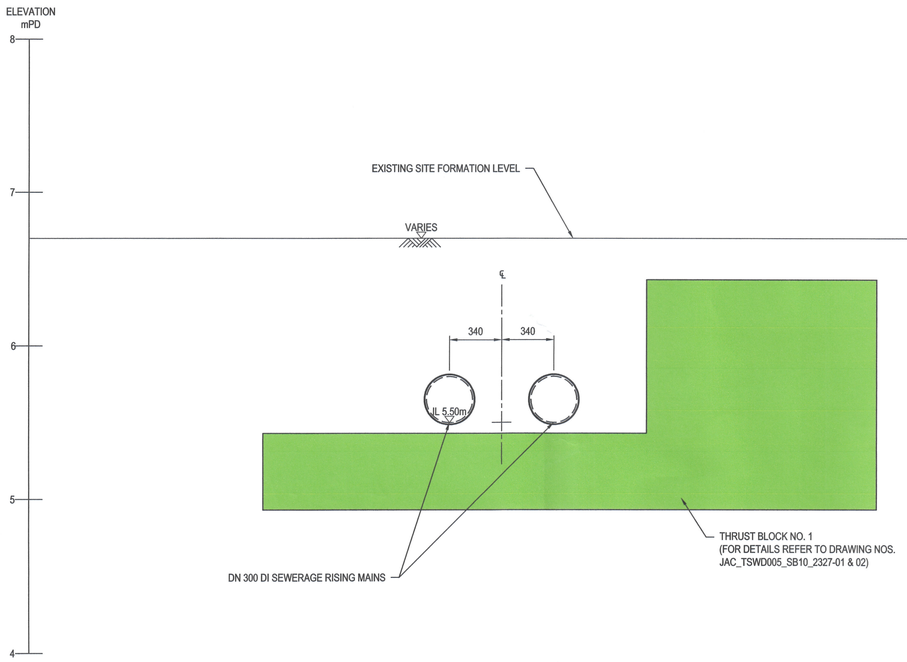

01 SECTION I-I (REFER TO DRAWING NO. 2223) SCALE 1:20

A

BD REF. NO. BD 4/2029/13

Notes
1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.
2. FOR LOCATION OF SECTIONS REFER TO DRAWINGS NOS. JAC_TSWD005_SB10_2121 TO 2123.

Rev.	Description	Issue Date	App Initial
A	BD SUBMISSION	01/12/17	
-	BD APPROVAL	26/06/15	
-	BD SUBMISSION	27/04/15	

Original by	Date	Drawn	Checked	App
CC	18/03/15	FN	CWC	NH

Client
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Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SUBMISSION
SEWERAGE RISING MAINS
SECTIONS (SHEET 3 OF 3)

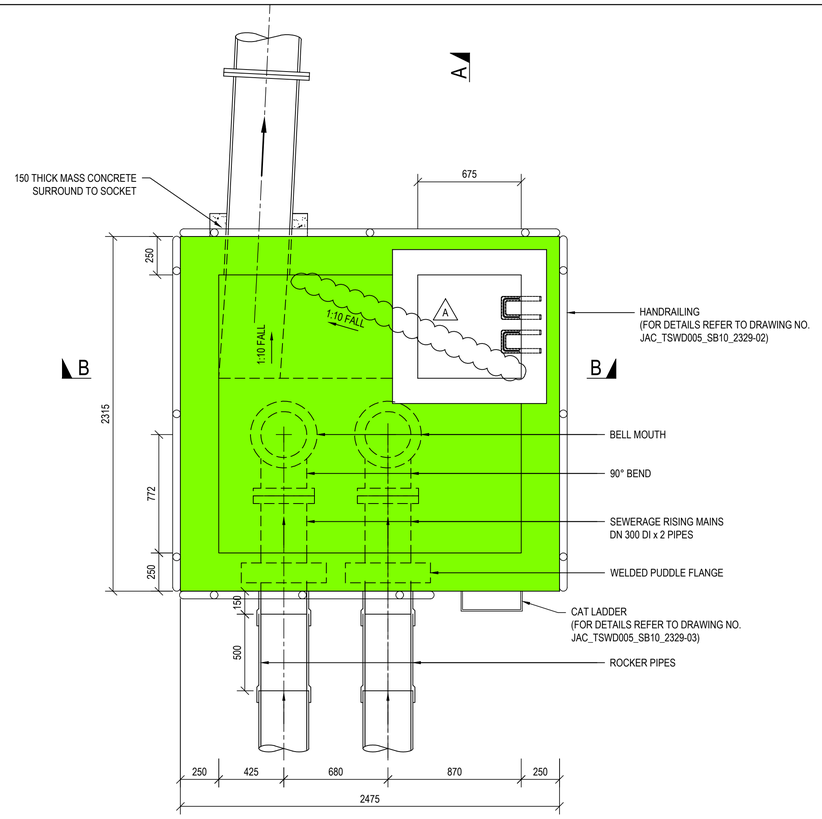
Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2320-03.dwg	01.12.17	AS SHOWN @A1

Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2320-03	A	DD

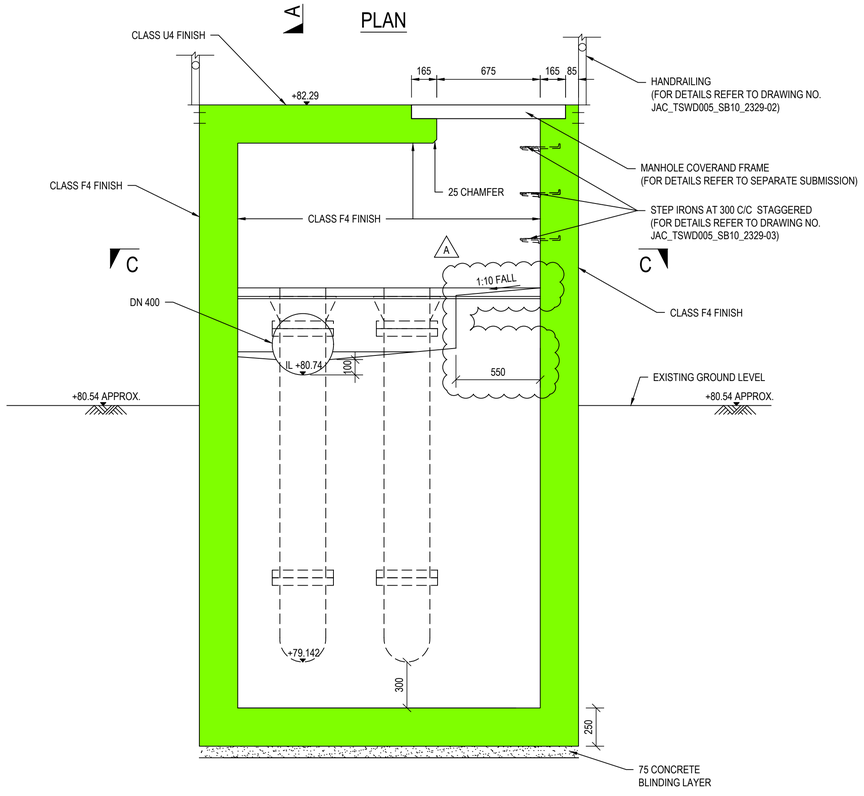
FOR INFORMATION ONLY

CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

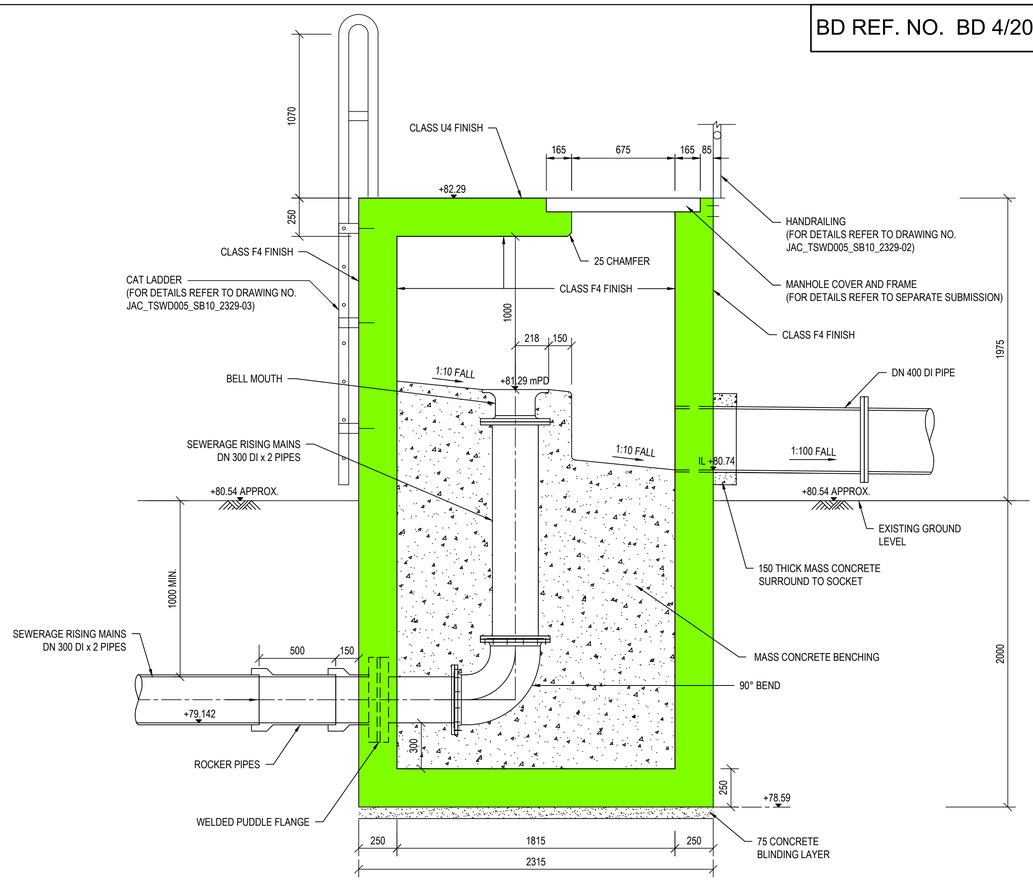
BD REF. NO. BD 4/2029/13



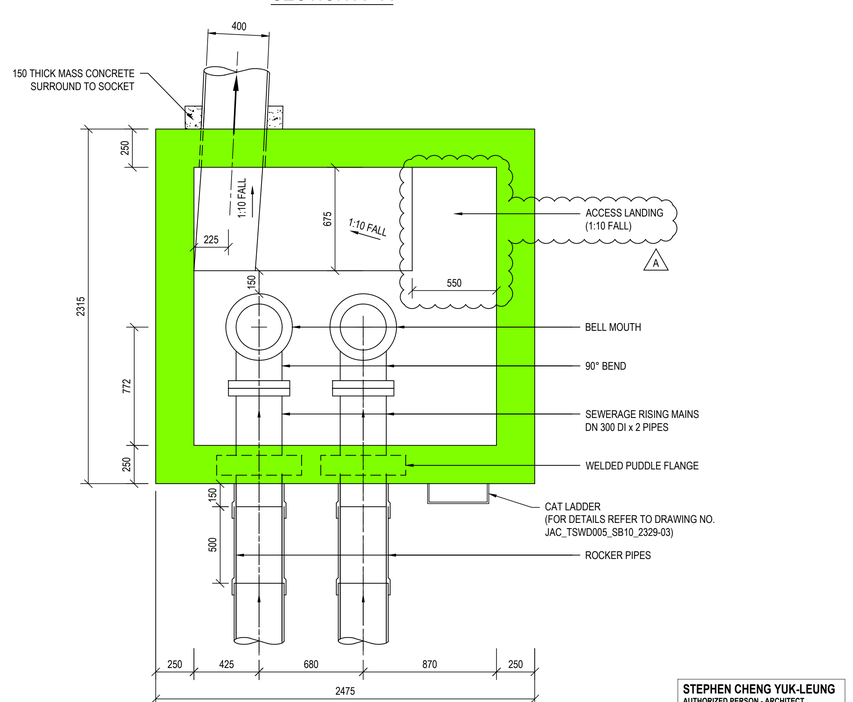
PLAN



SECTION B - B



SECTION A - A



SECTION C - C

STEPHEN CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

Notes
1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.

Rev.	Description	Issue Date	App Initial
A	BD SUBMISSION	03/07/20	
-	BD APPROVAL	26/06/15	
-	BD SUBMISSION	27/04/15	

Original by	Date	Draw	Check	App
CC	18/03/15	FN	RH	NH

Client
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Lead Consultant & Interior Design Consultant
Aedas Limited
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Hong Kong

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Intelibuild Technyx Asia Limited	Studio Hanson Roberts

Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

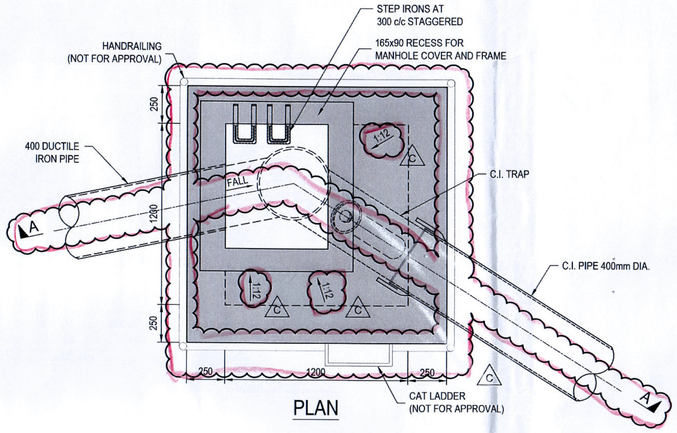
Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SUBMISSION
SEWERAGE DISCHARGE CHAMBER
GENERAL ARRANGEMENT

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2324.dwg	03.07.2020	AS SHOWN @A1

Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2324	A	DD

BD REF. NO. BD 4/2029/13



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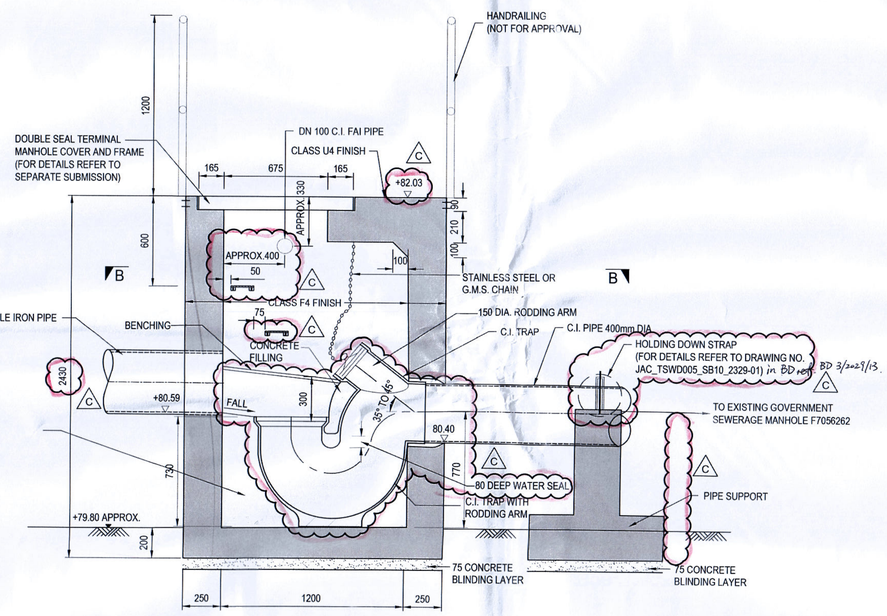
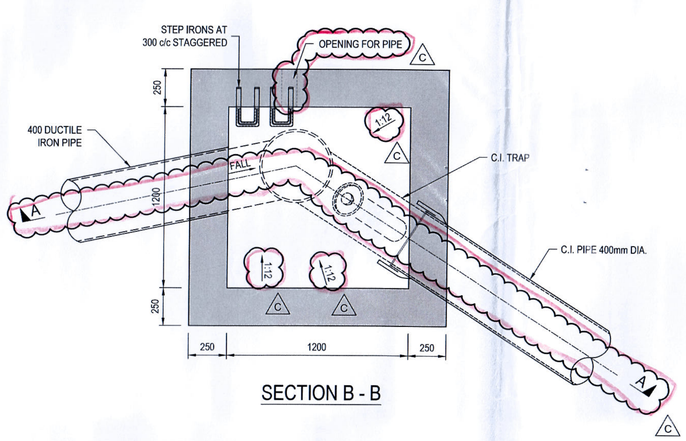


SECTION A - A



SECTION B - B

"Statement II : The works shown on these plans are Type II works (Drainage - Sewerage Rising Mains) in respect of which consent is applied for the purpose of Fast Track consent application under regulation 33 of the Building (Administration) Regulations."

CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

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2020 NOV 19 P 5:18
B.A.U. Review (ASD2)
BUILDING DEPARTMENT

Notes
1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.

Note: This plan has been processed on a curtailed check basis under the centralized processing system as promulgated in PNAP ADM-19. The duties of the authorized person, registered structural engineer and/or registered geotechnical engineer concerned as specified under section 4(3)(c) and the provision of section 14(2)(c) of the Buildings Ordinance are of particular relevance in this regard.

Plan Approved
LIE Fung-yu, Fanny
Senior Building Surveyor
for BUILDING AUTHORITY
- 5 JAN 2021

Rev.	Description	Issue Date	App Initial
C	BD SUBMISSION	19/11/20	
B	BD SUBMISSION	03/07/20	
A	BD APPROVAL	22/03/16	
A	1ST AMENDMENT	26/02/16	
-	BD APPROVAL	26/06/15	
-	BD SUBMISSION	27/04/15	

Original by	Date	Draw	Check	App
CC	18/03/15	PDC	RH	NH

Client
Ocean Park Corporation

Lead Consultant & Interior Design Consultant
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Intelibuild Technyx Asia Limited
Shen Milsom & Wilke
Lighting Planners Associates (HK) Ltd.
Food Service Consultants, Ltd.
Advanced Aquarium Technologies
Studio Hanson Roberts

Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

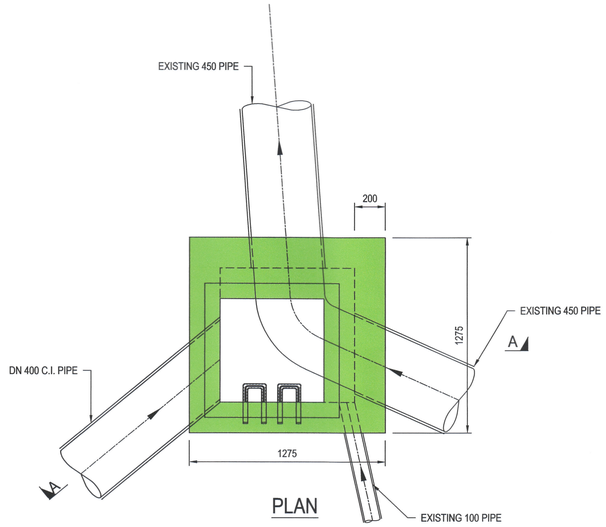
Drawing Title
DRAINAGE SUBMISSION
SEWERAGE TERMINAL MANHOLE
GENERAL ARRANGEMENT

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2325.dwg	18.11.20	AS SHOWN @A1

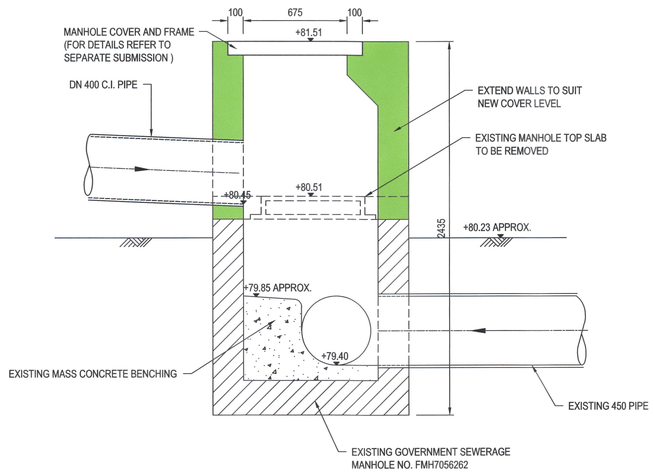
Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2325	C	DD

01 GENERAL ARRANGEMENT OF SEWERAGE TERMINAL MANHOLE SCALE 1:20

BD REF. NO.



PLAN



SECTION A - A

RECEIVED BY
2015 APR 27 P 3:41
R & D Section
BUILDINGS DEPARTMENT

Notes

1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.

Rev.	Description	Issue Date	App Initial
-	BD SUBMISSION	27/03/15	

Original by	Date	Draw	Check	App
CC	18/03/15	FN	RH	NH

Client

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Intelibuild Technyx Asia Limited	Studio Hanson Roberts

Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

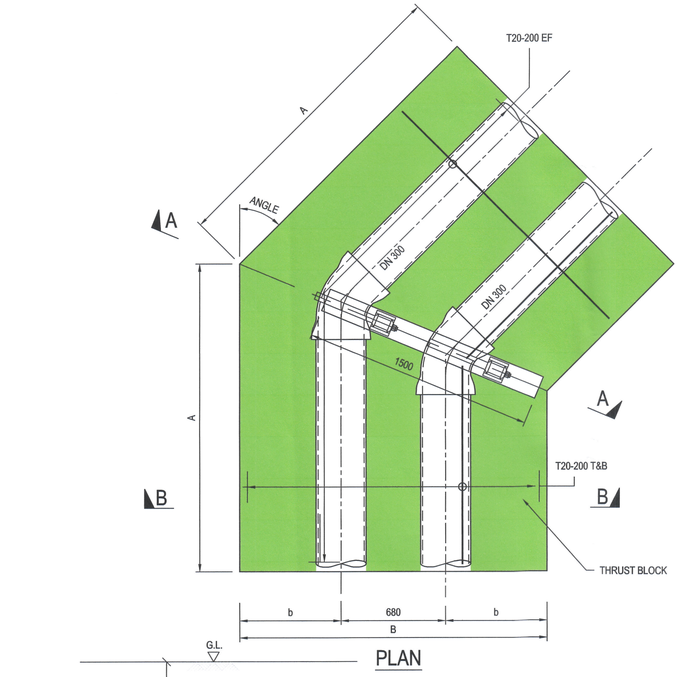
Drawing Title
DRAINAGE SUBMISSION
MODIFICATION OF EXISTING GOVERNMENT SEWERAGE MANHOLE NO. FMH7056262

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2326.dwg	26. 3. 15	AS SHOWN @A1

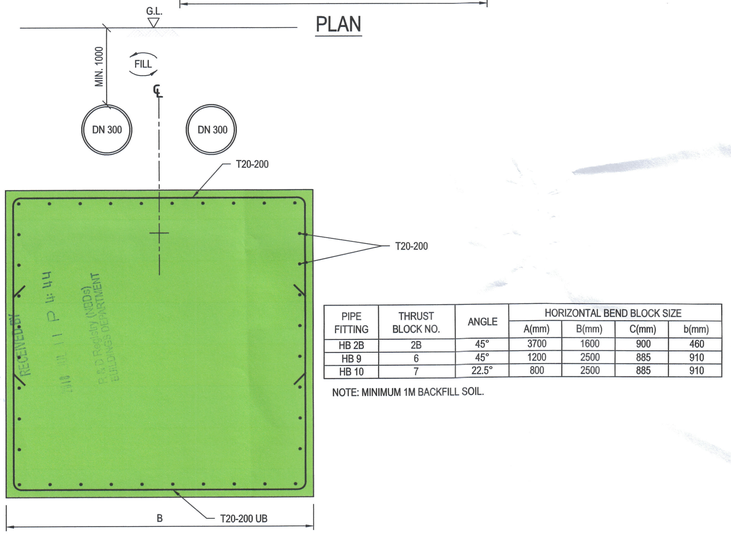
Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2326	-	DD

STEPHEN CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

BD REF. NO. BD 4/2029/13



PLAN

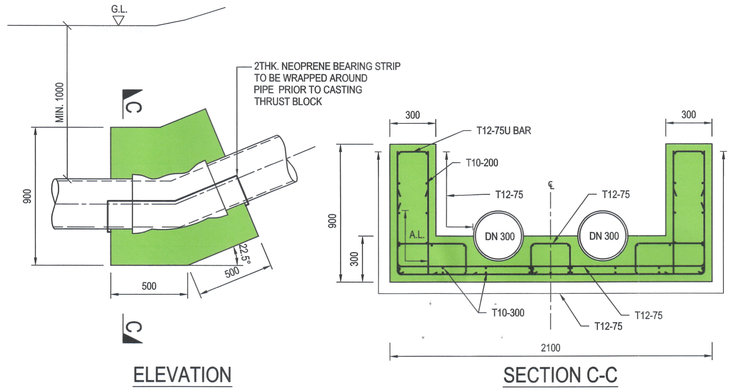


PIPE FITTING	THRUST BLOCK NO.	ANGLE	HORIZONTAL BEND BLOCK SIZE			
			A(mm)	B(mm)	C(mm)	b(mm)
HB 2B	2B	45°	3700	1600	900	460
HB 9	6	45°	1200	2500	885	910
HB 10	7	22.5°	800	2500	885	910

NOTE: MINIMUM 1M BACKFILL SOIL.

SECTION B-B

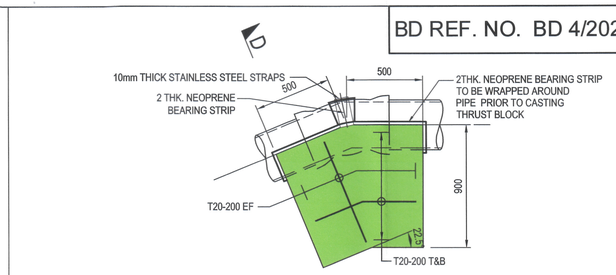
01 HORIZONTAL BEND THRUST BLOCK TYPE A 1:20



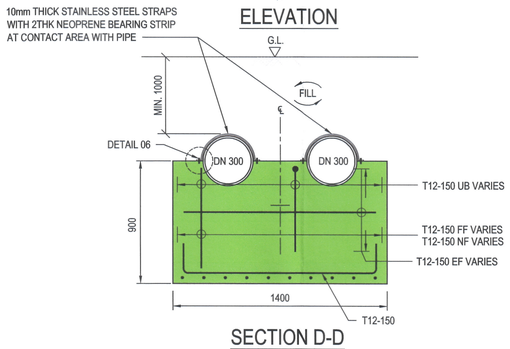
ELEVATION

SECTION C-C

02 22.5 DEG BOTTOM VERTICAL BEND - THRUST BLOCK NO.8 1:20

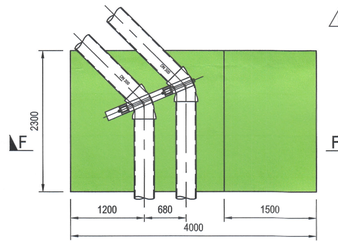


ELEVATION



SECTION D-D

03 22.5 DEG TOP VERTICAL BEND - THRUST BLOCK NO.9 1:20



PLAN
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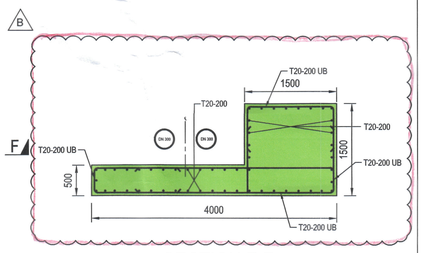
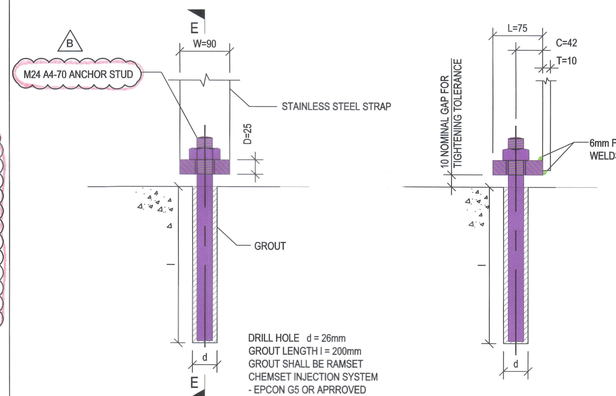


SECTION F-F
(SCALE 1:50)

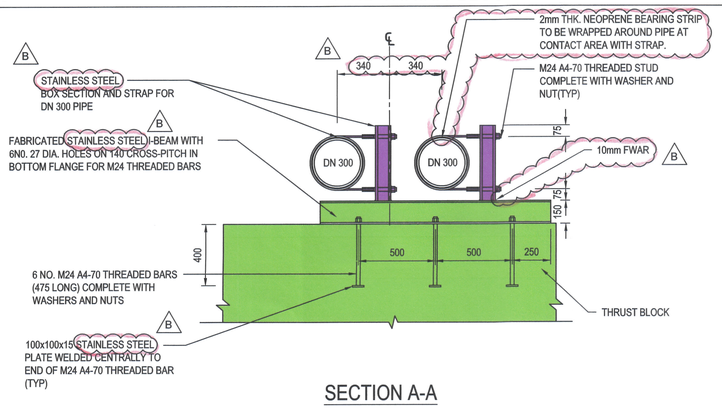
05 HORIZONTAL BEND THRUST BLOCK No.1 1:50



DETAIL 01
SCALE : N.T.S

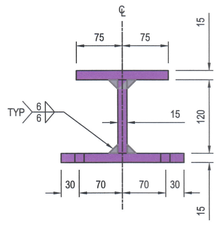
SECTION E - E
SCALE : N.T.S

06 DETAIL N.T.S.

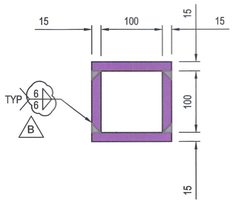


SECTION A-A

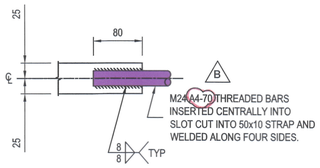
04 1:20



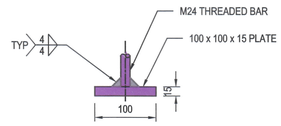
TYPICAL SECTION THROUGH
FABRICATED STAINLESS STEEL I-BEAM



TYPICAL SECTION THROUGH
FABRICATED STAINLESS STEEL
BOX SECTION



TYPICAL CONNECTION DETAIL
FOR M24 THREADED STUD
TO 50x10 STRAP



TYPICAL DETAIL OF
WELDED END PLATE

FOR INFORMATION ONLY

CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

07 1:5

Notes
1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.

"Statement II : The works shown on these plans are Type II works (Drainage - Sewerage Rising Mains) in respect of which consent is applied for the purpose of Fast Track consent application under regulation 33 of the Building (Administration) Regulations."

Rev.	Description	Issue Date	App Initial
B	BD SUBMISSION	09/07/18	
A	BD APPROVAL	22/01/18	
A	BD SUBMISSION	01/12/17	
-	BD APPROVAL	26/06/15	
-	BD SUBMISSION	27/04/15	

Original by	Date	Draw	Check	App
CC	18/03/15	FN	CWC	NH

Client
Ocean Park Corporation

Lead Consultant & Interior Design Consultant
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Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

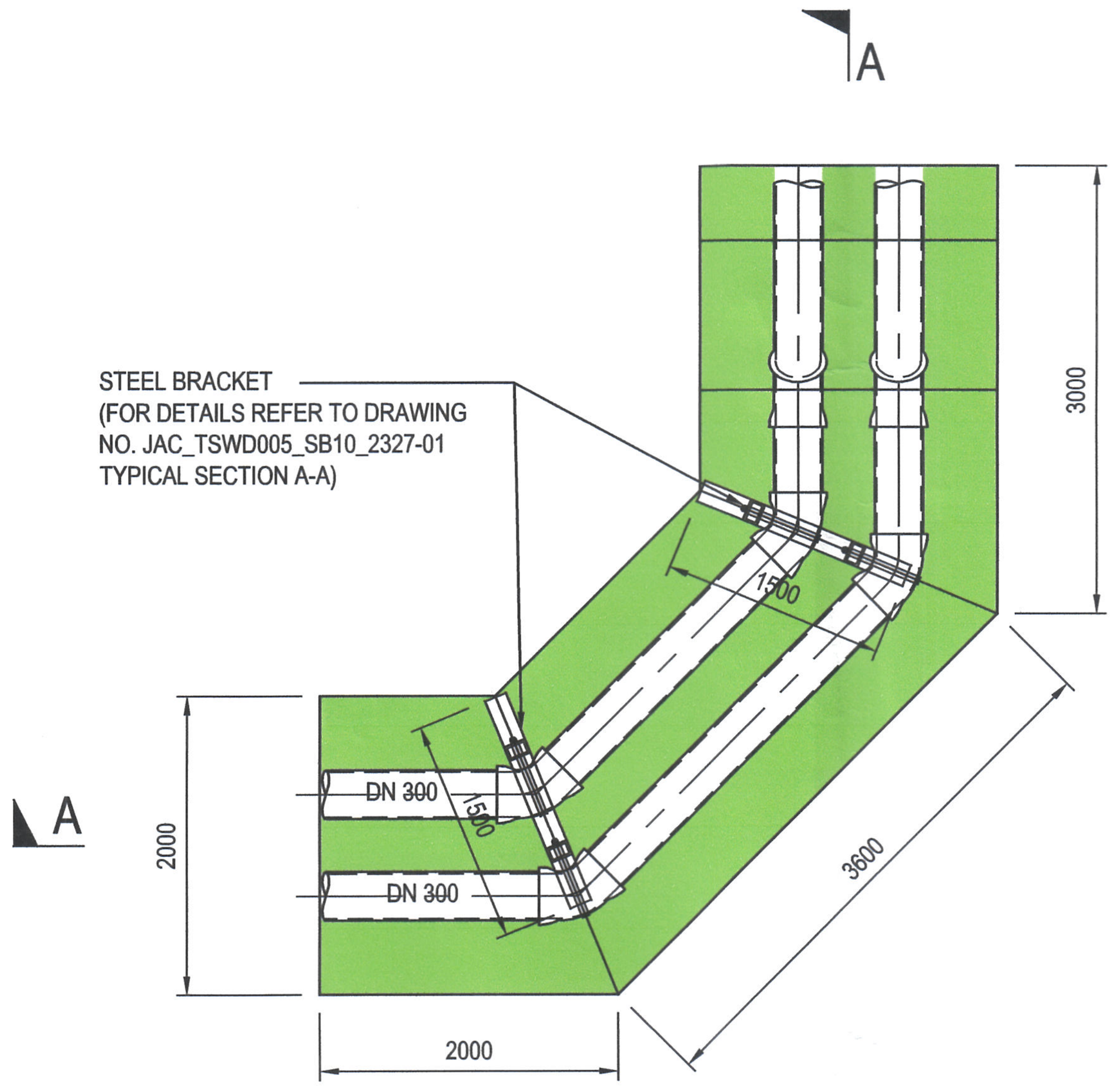
Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SUBMISSION
SEWERAGE RISING MAINS THRUST BLOCK
GENERAL ARRANGEMENT (SHEET 1 OF 2)

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2327-01.dwg	09.07.18	AS SHOWN
Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2327-01	B	DD

BD REF. NO. BD 4/2029/13

Notes
1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.



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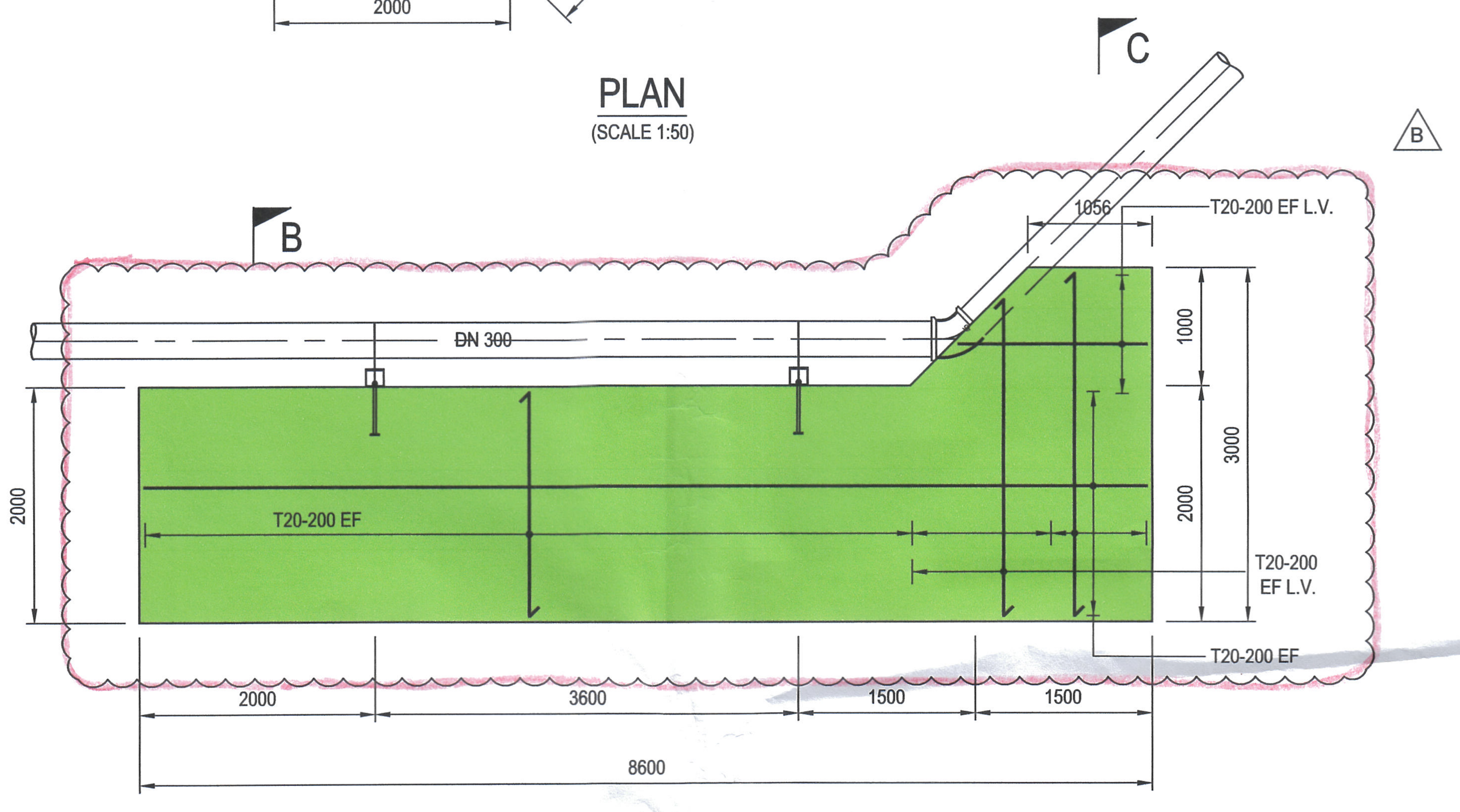

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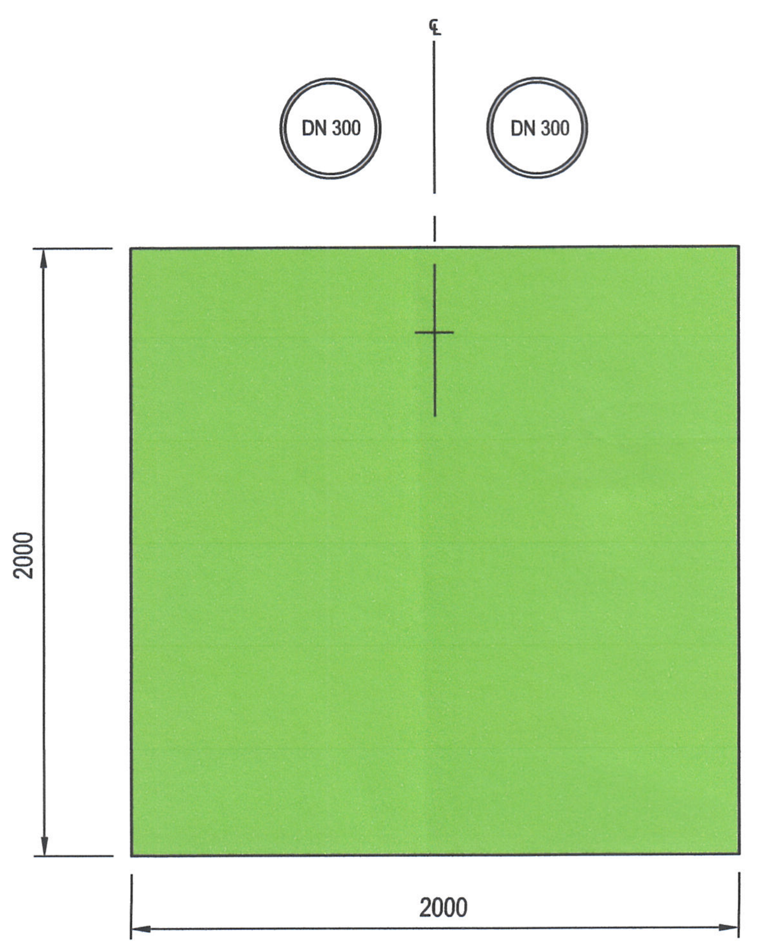
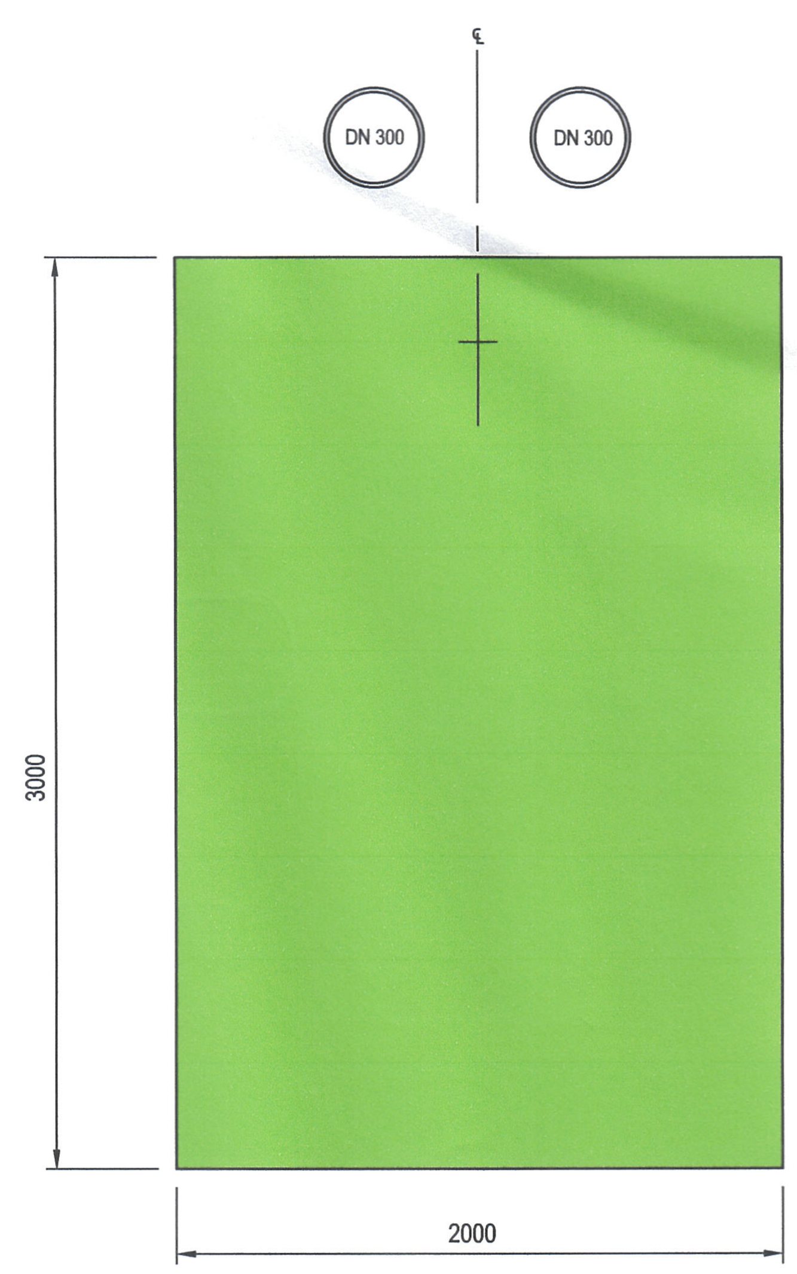
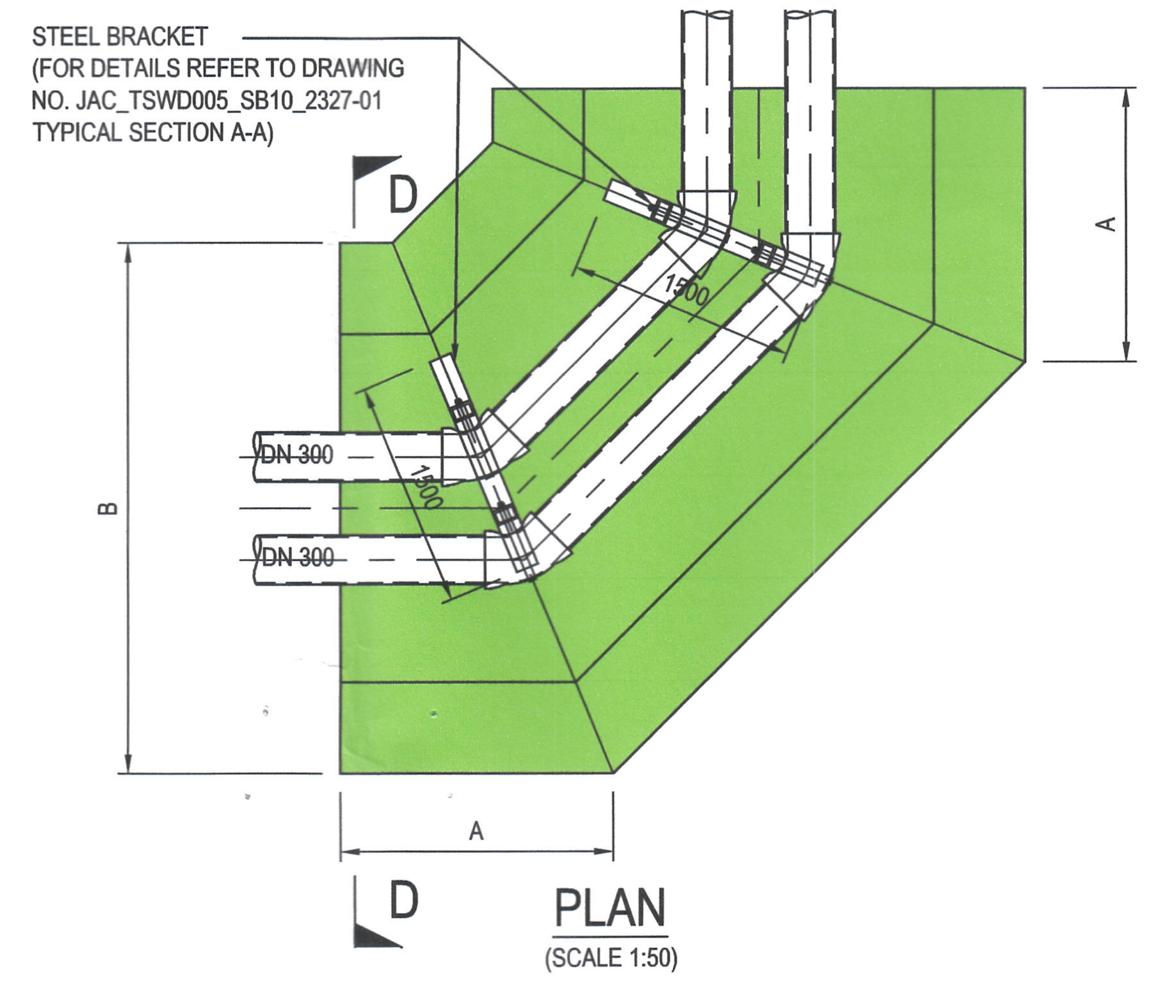


SECTION B-B
(SCALE 1:25)

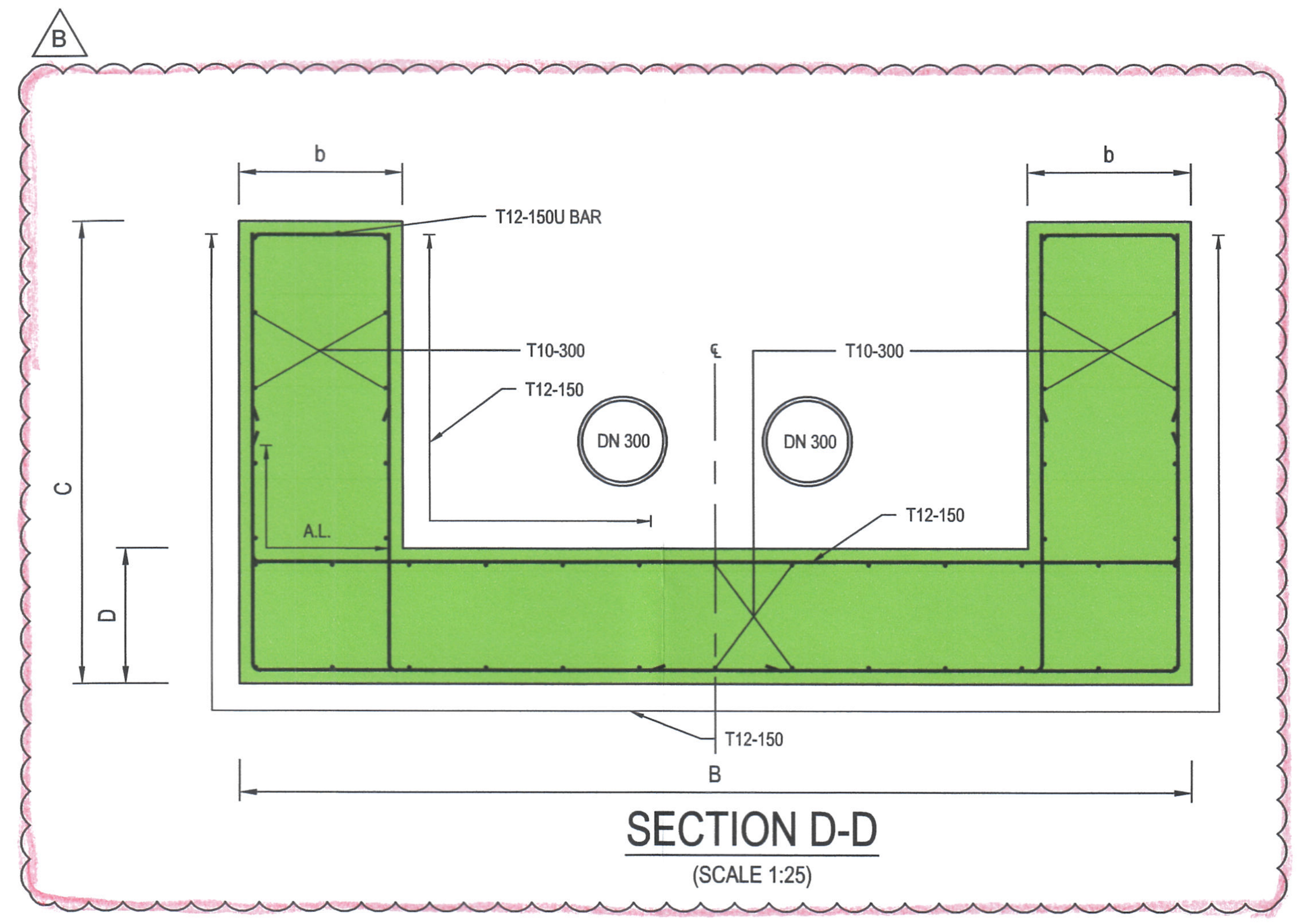


SECTION C-C
(SCALE 1:25)

01 THRUST BLOCK NO.5 FOR HB-5, HB-6 AND VB-1 1:25/50



PLAN
(SCALE 1:50)

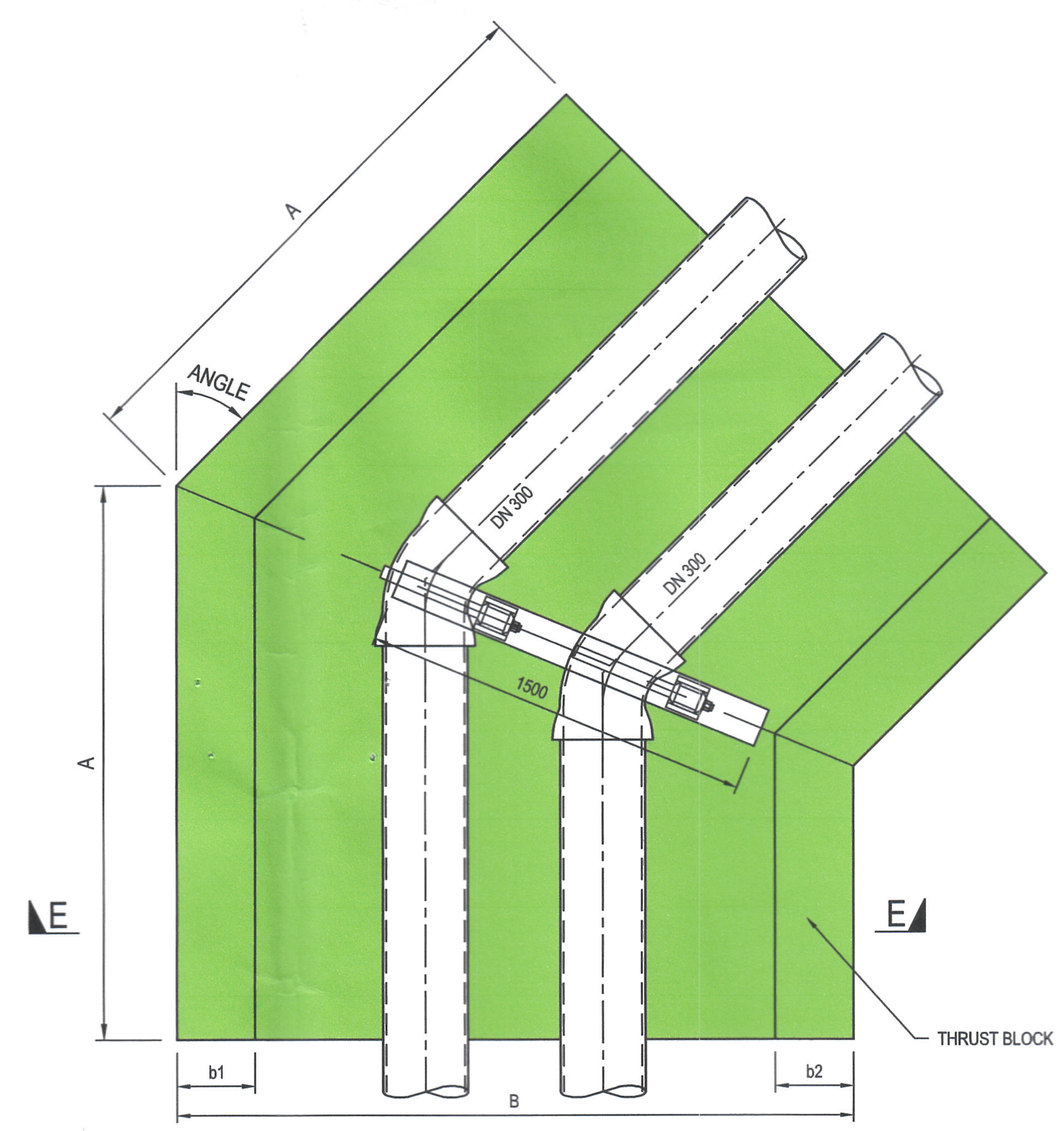


SECTION D-D
(SCALE 1:25)

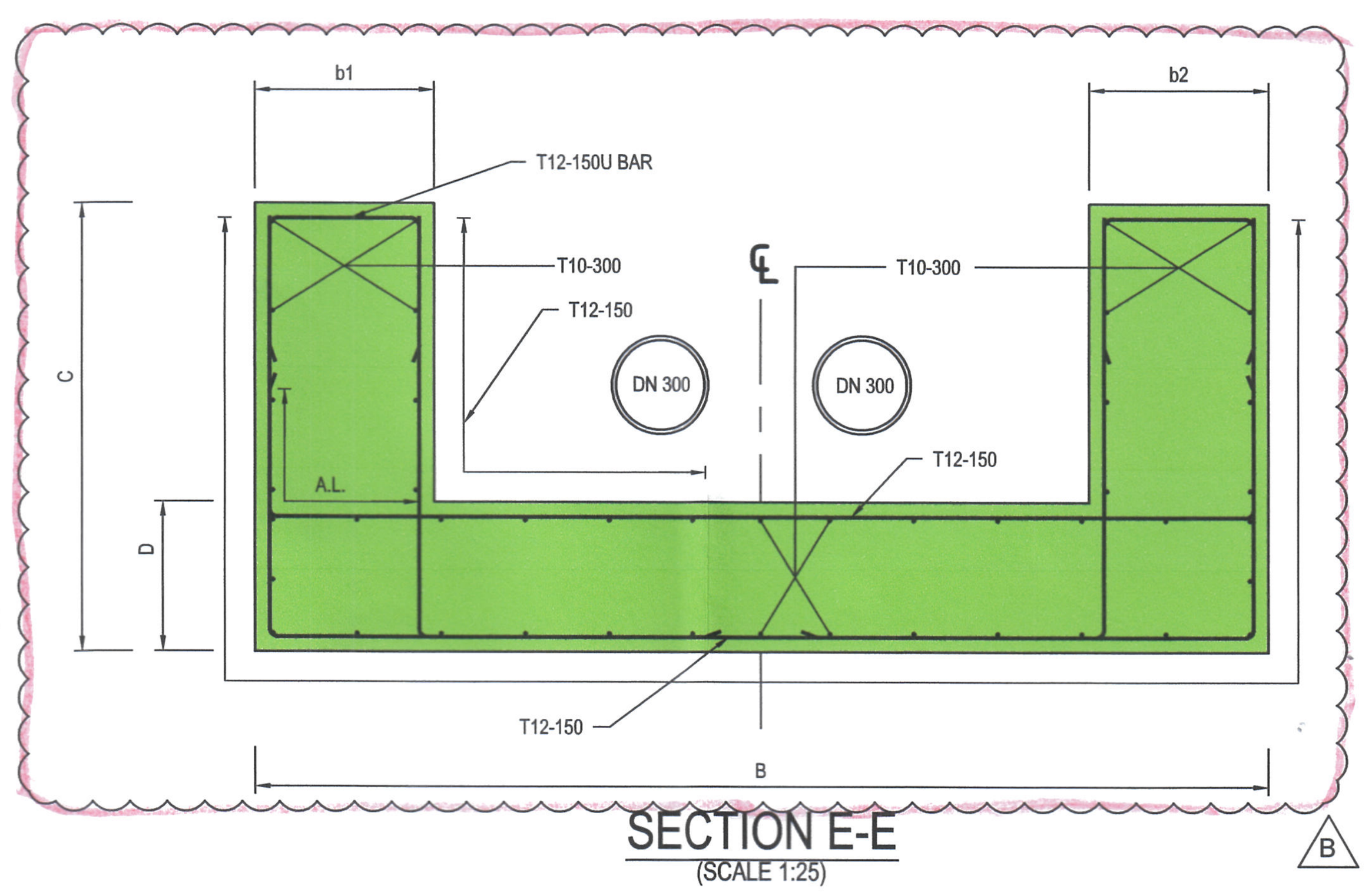
PIPE FITTING	THRUST BLOCK NO.	ANGLE	HORIZONTAL BEND BLOCK SIZE				
			A(mm)	B(mm)	C(mm)	D(mm)	b(mm)
HB 2A1	2A	45°	5000	2600	1500	500	300
HB 2A2	2A	45°	2000	2600	1500	500	300
HB 11	10	45°	1800	3500	1500	500	600
HB 12	10	45°	1800	3500	1500	500	600

NOTE: MINIMUM 1M BACKFILL SOIL.

02 HORIZONTAL BEND THRUST BLOCK TYPE B 1:25/50



PLAN
(SCALE 1:25)



SECTION E-E
(SCALE 1:25)

PIPE FITTING	THRUST BLOCK NO.	ANGLE	HORIZONTAL BEND BLOCK SIZE					
			A(mm)	B(mm)	C(mm)	b1(mm)	b2(mm)	D(mm)
HB 2	2	11.25°	1000	2100	1500	300	300	500
HB 2C	2C	11.25°	1000	2100	1500	300	300	500
HB 3	3	45°	2300	3400	1500	1100	500	500
HB 3A	3A	22.5°	1900	2400	1500	300	300	500
HB 4	4	45°	3000	2600	1500	300	300	500

NOTE: MINIMUM 1M BACKFILL SOIL.

FOR INFORMATION ONLY

CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

03 HORIZONTAL BEND THRUST BLOCK TYPE C 1:25

"Statement II : The works shown on these plans are Type II works (Drainage - Sewerage Rising Mains) in respect of which consent is applied for the purpose of Fast Track consent application under regulation 33 of the Building (Administration) Regulations."

Rev.	Description	Issue Date	App Initial
B	BD SUBMISSION	09/07/18	
B	BD APPROVAL	22/01/18	
A	BD SUBMISSION	01/12/17	
-	BD APPROVAL	26/06/15	
-	BD SUBMISSION	27/04/15	

Original by	Date	Draw	Check	App
CC	18/13/15	FN	CWC	NH

Client
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Lead Consultant & Interior Design Consultant
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31/F One Island East
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Structural and Façade Engineers
BUROHAPPOLD ENGINEERING
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Together with Other Specialist Consultants
Urbis Limited
Lanbase Surveyors Limited
MVA Hong Kong Limited
Vision Planning Consultants Ltd.
Intelibuild Technyx Asia Limited
Shen Milsom & Wilke
Lighting Planners Associates (HK) Ltd.
Food Service Consultants, Ltd.
Advanced Aquarium Technologies
Studio Hanson Roberts

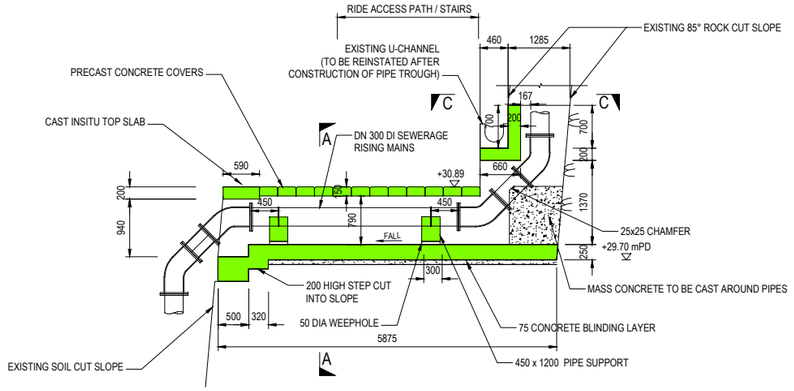
Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

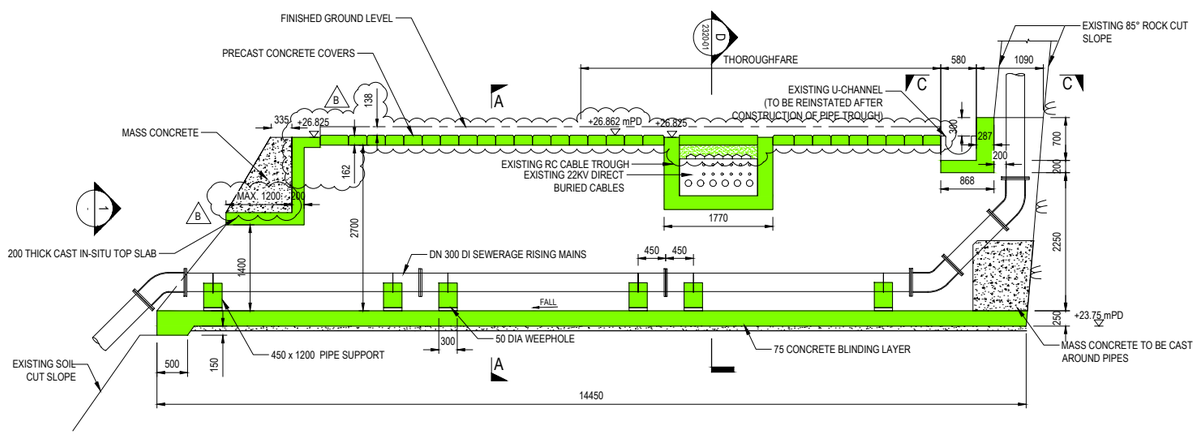
Drawing Title
DRAINAGE SUBMISSION
SEWERAGE RISING MAINS THRUST BLOCK
GENERAL ARRANGEMENT (SHEET 2 OF 2)

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2327-02.dwg	09.07.18	AS SHOWN @A1

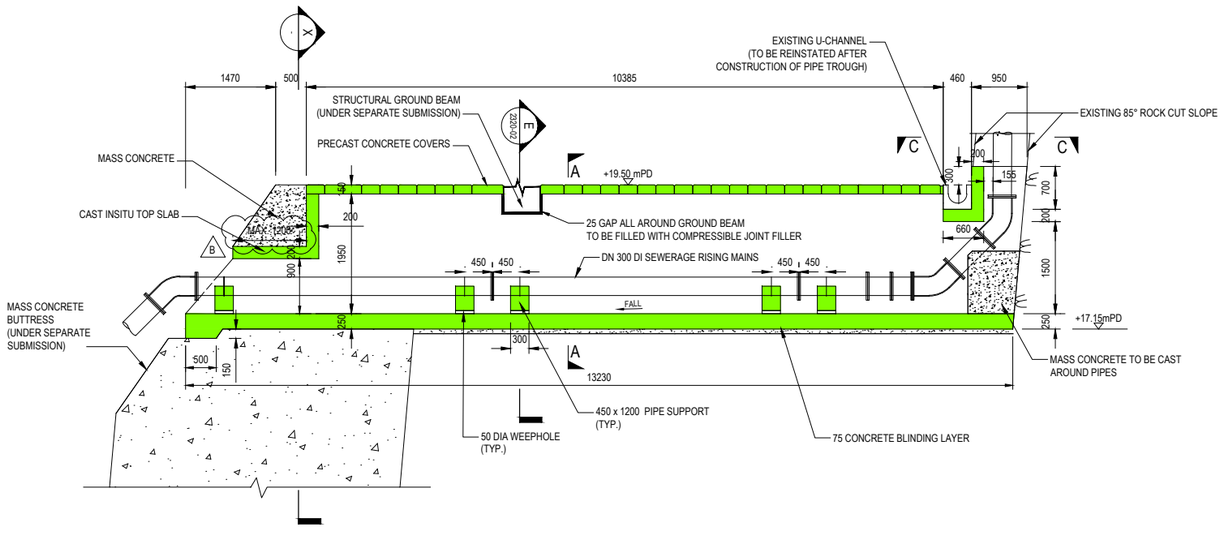
Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2327-02	B	DD



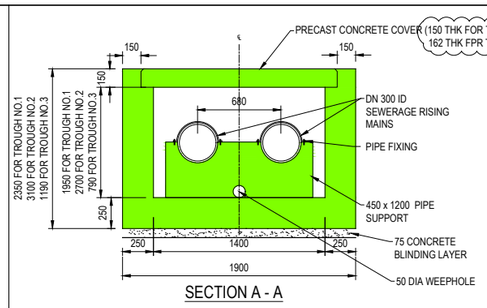
01 LONGITUDINAL SECTION 1C (FOR PIPE TROUGH NO. 3) SCALE 1:50



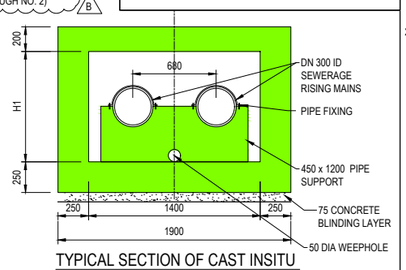
02 LONGITUDINAL SECTION 1B (FOR PIPE TROUGH NO. 2) SCALE 1:50



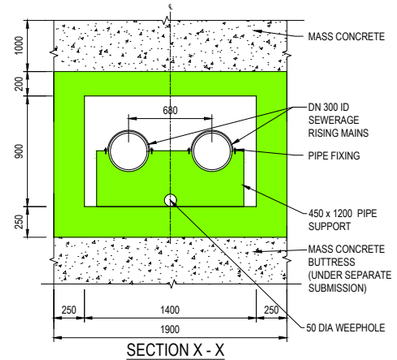
03 LONGITUDINAL SECTION 1A (FOR PIPE TROUGH NO. 1) SCALE 1:50



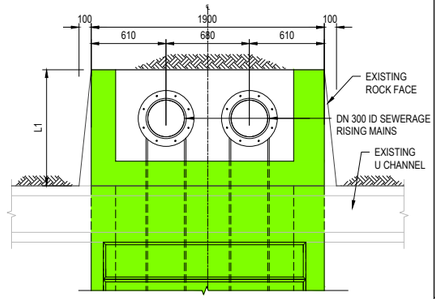
SECTION A - A



TYPICAL SECTION OF CAST INSITU PIPE TROUGH WITH TOP SLAB



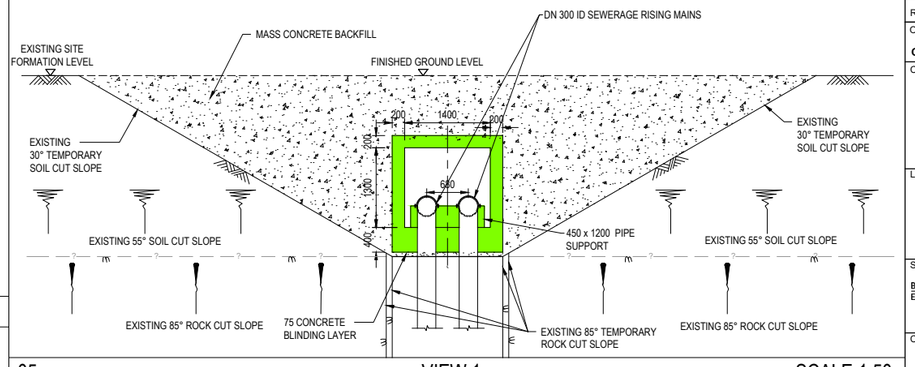
SECTION X - X



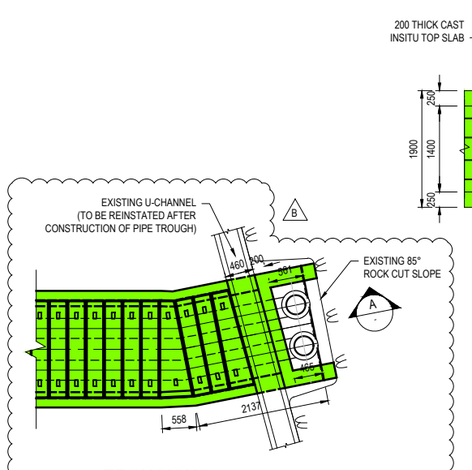
TYPICAL SECTION C - C

NOTE:
1. FOR L1 AND H1 REFER TO LONGITUDINAL SECTION 1A, 1B AND 1C .
2. FOR PIPE FIXING DETAILS, REFER TO DRAWING JAC_TSWD005_SB10_2329-01 DETAIL 03.

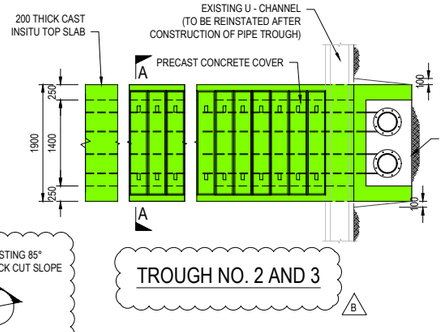
04 PIPE TROUGH SECTIONS SCALE 1:25



05 VIEW 1 SCALE 1:50



TROUGH NO. 1



TROUGH NO. 2 AND 3

06 GENERAL ARRANGEMENT OF TYPICAL PIPE TROUGH SCALE 1:50

BD REF. NO. BD 4/2029/13

Notes
1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.
2. FOR PLAN OF PIPE TROUGHS REFER TO DRAWING NO. JAC_TSWD005_SB10_2122.

LEGEND:
A DRAWING REVISION

FOR INFORMATION ONLY

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Rev.	Description	Issue Date	App Initial
B	BD SUBMISSION	03/07/20	
A	BD APPROVAL	10/08/18	
A	BD SUBMISSION	09/07/18	
-	BD APPROVAL	26/06/15	
-	BD SUBMISSION	27/04/15	

Original by	Date	Draw	Check	App
CC	18/03/15	PDC	CWC	NH

Client
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Hong Kong

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Waterpark Design Consultant
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Together with Other Specialist Consultants

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Lanbase Surveyors Limited	Lighting Planners Associates (HK) Ltd.
MVA Hong Kong Limited	Food Service Consultants, Ltd.
Vision Planning Consultants Ltd.	Advanced Aquarium Technologies
Intelibuild Technyx Asia Limited	Studio Hanson Roberts

Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SUBMISSION(FOR INFORMATION ONLY)
SEWERAGE RISING MAINS
PIPE TROUGHS GENERAL ARRANGEMENT

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2328.dwg	03.07.2020	AS SHOWN

Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2328	B	DD

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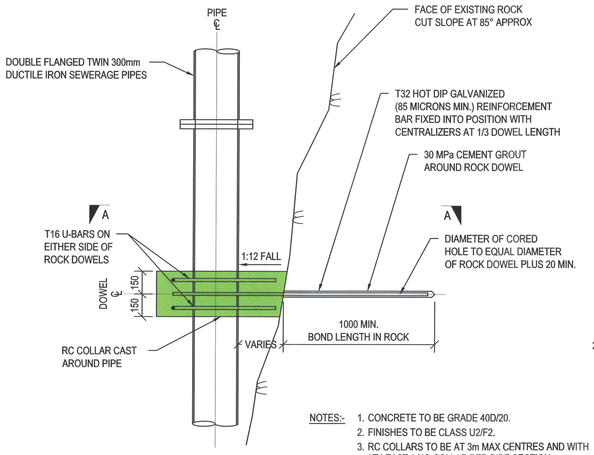
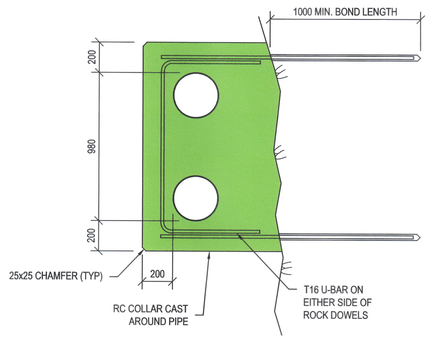
For and on behalf of
Aedas Limited

BD REF. NO. BD 4/2029/13



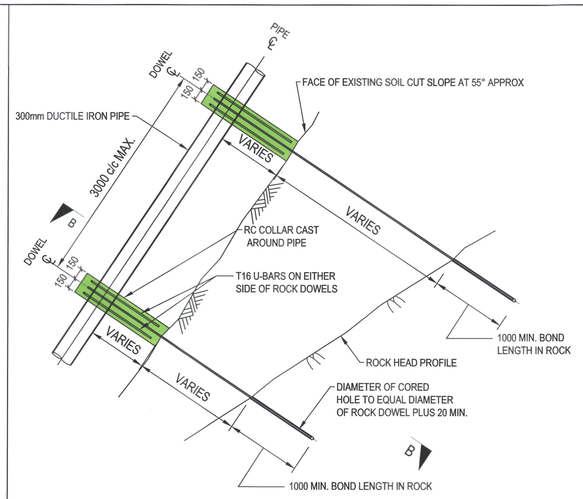
ELEVATION

NOTES:-
1. CONCRETE TO BE GRADE 40D/20.
2. FINISHES TO BE CLASS U2/F2.
3. RC COLLARS TO BE AT 3m MAX CENTRES AND WITH AT LEAST 1 NO COLLAR PER PIPE SECTION.



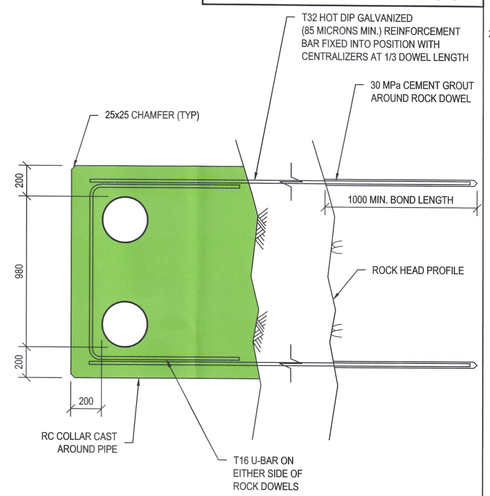
SECTION A - A

01 DETAIL OF PIPE FIXING TO ROCK FACE (STRUCTURAL DETAILS UNDER SEPARATE SUBMISSION) SCALE 1:20



ELEVATION
SCALE 1:50

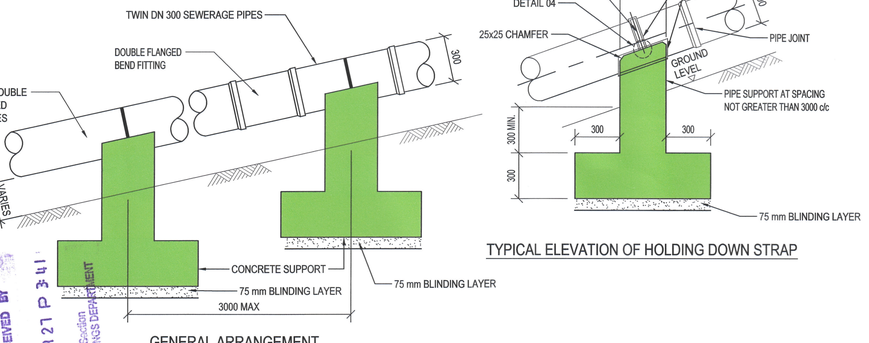
NOTES:
1. CONCRETE TO BE GRADE 40D/20.
2. FINISHES TO BE CLASS U2/F2.
3. RC COLLARS TO BE AT 3m MAX CENTRES AND WITH AT LEAST 1 NO COLLAR PER PIPE SECTION.



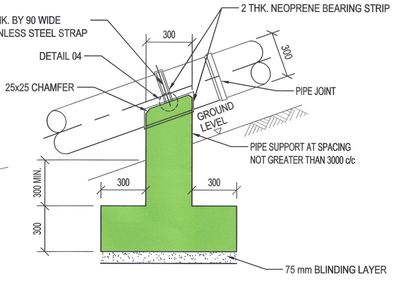
SECTION B - B
SCALE 1:20

02 DETAIL OF PIPE FIXING TO MIXED SOIL-ROCK FACE (STRUCTURAL DETAILS UNDER SEPARATE SUBMISSION) SCALE 1:20/50

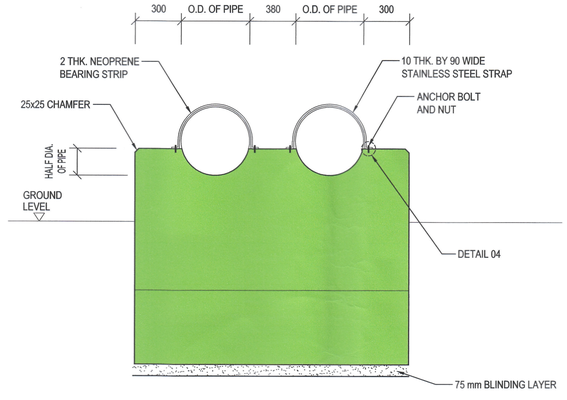
Notes
1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.
2. FOR LOCATIONS OF PIPE FIXINGS AND SUPPORTS REFER TO DRAWING NOS. JAC_TSWD005_SB10_2221 TO 2223.



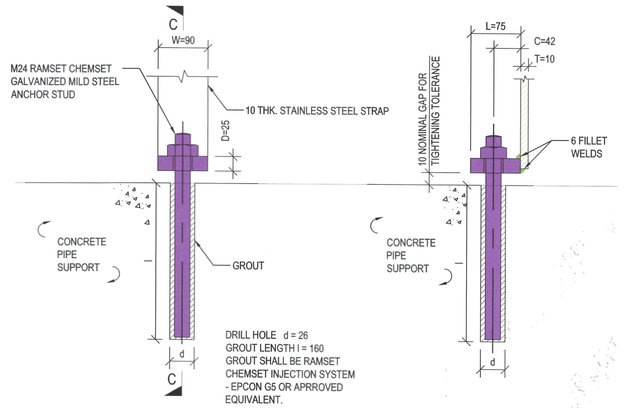
GENERAL ARRANGEMENT



TYPICAL ELEVATION OF HOLDING DOWN STRAP



TYPICAL SECTION OF CONCRETE SUPPORT AND HOLDING DOWN STRAPS



DETAIL 04
SCALE : N.T.S

SECTION C - C
SCALE : N.T.S

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R & D Section
BUILDINGS DEPARTMENT

STEPHEN CHENG YUK-LEUNG
AUTHORISED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

03 DETAIL OF PIPE SUPPORTS ON SOIL SCALE 1:20

Rev.	Description	Issue Date	App Initial
-	BD SUBMISSION	27/03/15	

Original by	Date	Draw	Check	App
CC	18/03/15	FN	RH	NH

Client
Ocean Park Corporation

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Hong Kong

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Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

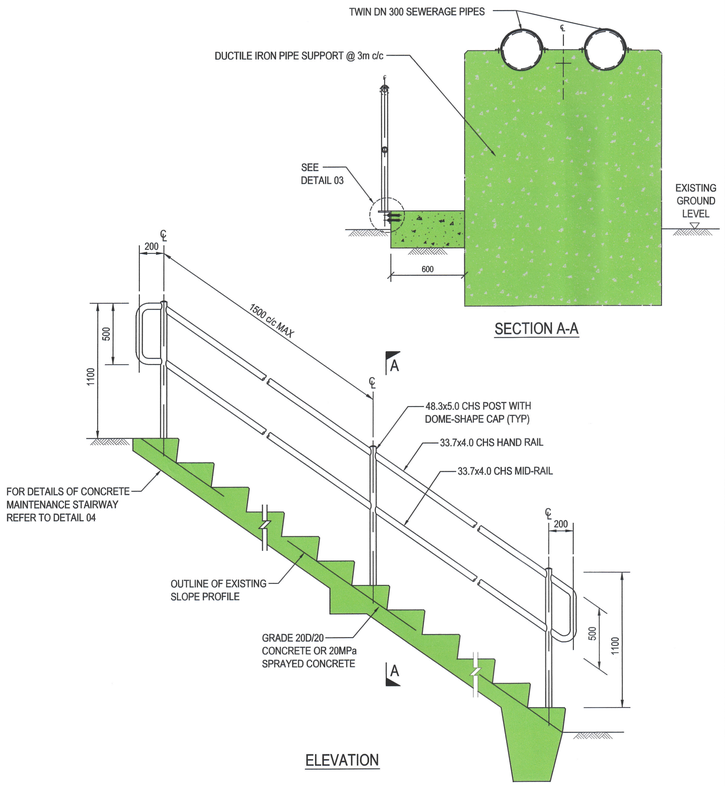
Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SUBMISSION (FOR INFORMATION ONLY)
SEWERAGE RISING MAINS
MISCELLANEOUS DETAILS (SHEET 1 OF 3)

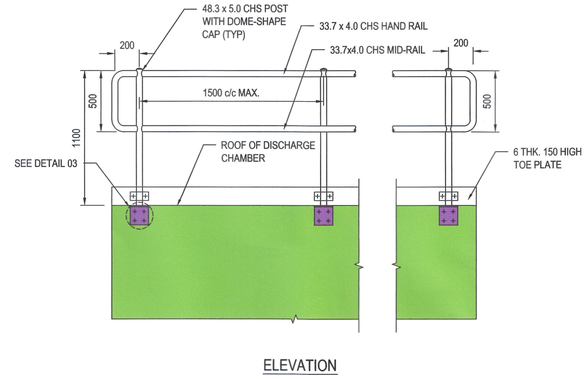
Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2329-01.dwg	27. 3. 15	AS SHOWN

Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2329-01	-	DD

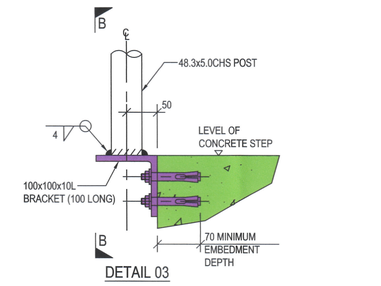
BD REF. NO. BD 4/2029/13



01 STEELWORK HANDRAILING TO MAINTENANCE STAIRWAY SCALE 1:25



02 STEELWORK HANDRAILING TO ROOF OF DISCHARGE CHAMBER SCALE 1:25



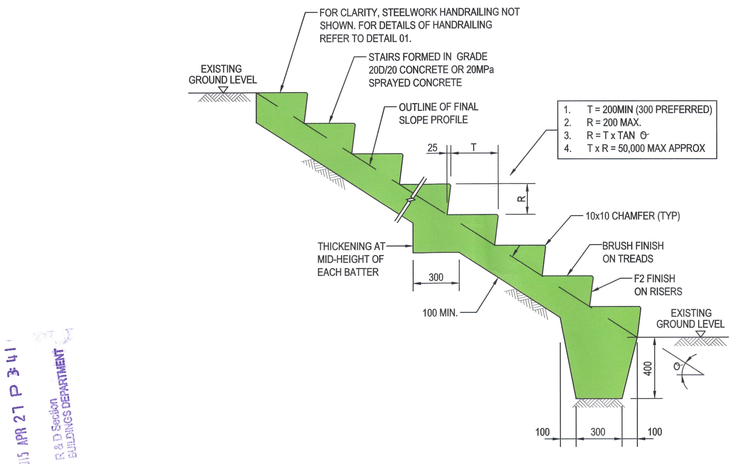
03 ANCHOR FIXING DETAILS SCALE 1:5

Notes

1. GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.
2. FOR LOCATION OF MAINTENANCE STAIRWAY REFER TO DRAWING NOS. JAC_TSWD005_SB10_2121 & 2122.
3. HANDRAILINGS TO BE INSTALLED ON THE SIDE(S) OF STAIRWAYS WHERE A PERSON IS LIABLE TO FALL OVER 2m.
4. ALL HANDRAILING STEELWORK SHALL BE GRADE S275J0 IN ACCORDANCE WITH BS EN 10025.
5. ALL HANDRAILING STEELWORK SHALL BE HOT DIP GALVANIZED WITH A MINIMUM ZINC COATING THICKNESS OF 85 MICRONS IN ACCORDANCE WITH BS EN ISO 1461.
6. ALL WELDS AND OTHER DAMAGED AREAS OF GALVANIZING SHALL BE TREATED WITH TWO COATS OF ZINC-RICH PAINT IN ACCORDANCE WITH GS CLAUSE 18.44.
7. ALL GALVANIZED STEELWORK HANDRAILING AND STEELWORK FOR LOCKABLE GATES SHALL BE OVERCOATED WITH PAINT SYSTEM E IN ACCORDANCE WITH GS CLAUSE 18.63. THE COLOUR OF THE FINISH COAT SHALL BE NO 225 LIGHT BRUNSWICK GREEN IN ACCORDANCE WITH BS 381C COLOUR CHARTS.
8. THE CONTRACTOR SHALL PREPARE SHOP DRAWINGS FOR ALL STEELWORK HANDRAILING IN ACCORDANCE WITH GS CLAUSE 19.22 AND SUBMITTED TO THE PROJECT MANAGER FOR APPROVAL PRIOR TO COMMENCING FABRICATION.
9. DOUBLE HAND RAILING SHOULD BE PROVIDED AT THE FIRST 20m OF THE MAINTENANCE STAIRWAY, MEASURED FROM THE LOCKABLE GATE ALONG THE INCLINED MAINTENANCE STAIRWAY.

Rev.	Description	Issue Date	App Initial
-	BD SUBMISSION	27/03/15	

Original by	Date	Draw	Check	App
CC	18/03/15	FN	RH	NH



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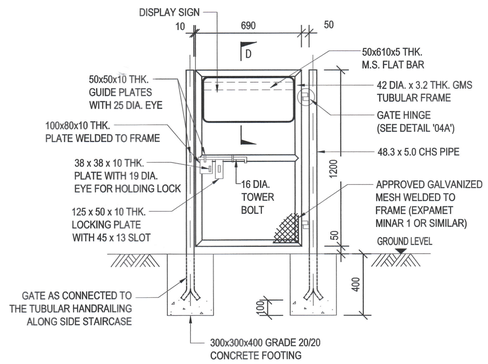
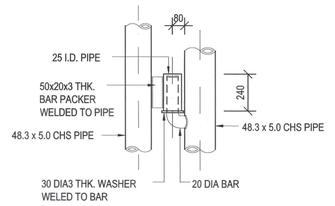
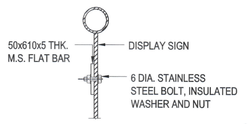
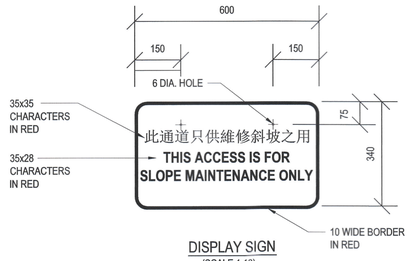
04 CONCRETE MAINTENANCE STAIRWAY SCALE 1:20









STEPHEN CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedes Limited

05 LOCKABLE GATE FOR MAINTENANCE STAIRWAY SCALE 1:20 / 1:10

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M&E Engineer
MEINHARDT Meinhardt
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OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
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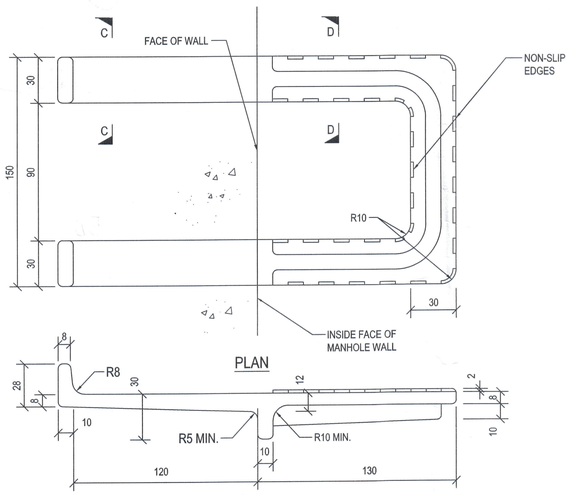
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SUBMISSION (FOR INFORMATION ONLY)
SEWERAGE RISING MAINS
MISCELLANEOUS DETAILS (SHEET 2 OF 3)

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2329-02.dwg	26. 3. 15	AS SHOWN

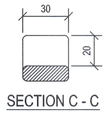
Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2329-02	-	DD

BD REF. NO. BD 4/2029/13

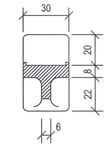


PLAN

ELEVATION



SECTION C - C



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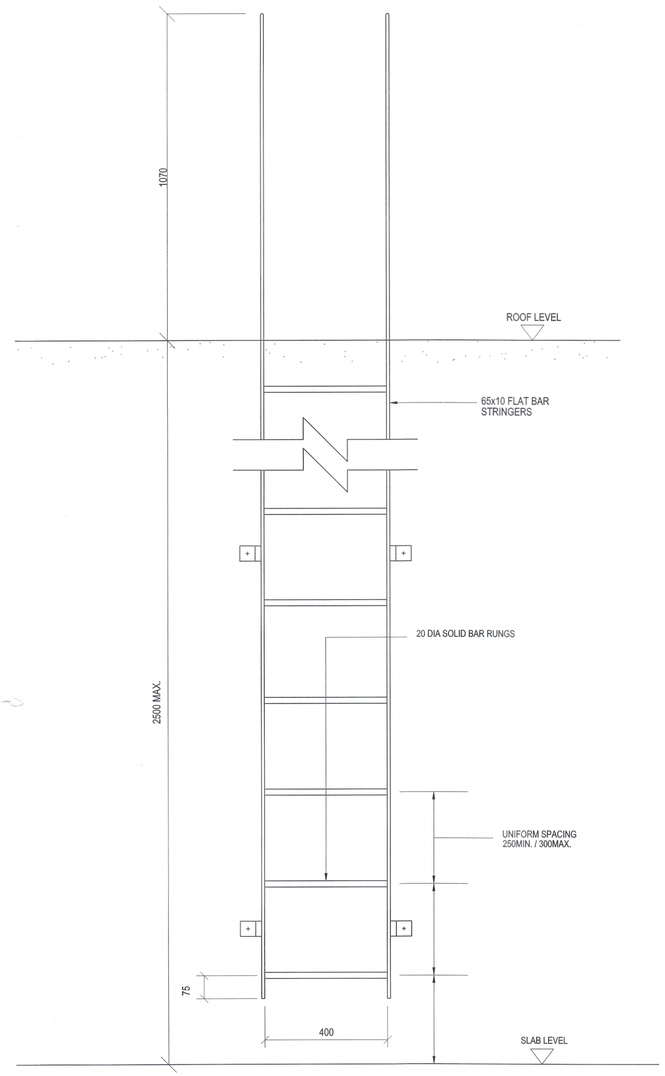

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R & D Section
BUILDINGS DEPARTMENT

STEPHEN CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

03 DETAILS OF CAST STEP IRONS IN MANHOLES AND CATCHPITS SCALE 1:2

04 CAT LADDER ARRANGEMENT SCALE 1:10

Notes

1. FOR GENERAL NOTES REFER TO DRAWING NO. JAC_TSWD005_SB10_2000.

Rev.	Description	Issue Date	App Initial
-	BD SUBMISSION	27/03/15	

Original by	Date	Draw	Check	App
CC	18/03/15	FN	RH	NH

Client

Ocean Park Corporation

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Hong Kong

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183 Queen's Road East, Wan Chai,
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M&E Engineer

Meinhardt
4/F Wah Ming Centre,
421 Queen's Road West, Hong Kong

Waterpark Design Consultant

Water Technology Inc.
100 Park Avenue, Beaver Dam,
WI 53916, USA

Together with Other Specialist Consultants

Urbis Limited	Shen Milsom & Wilke
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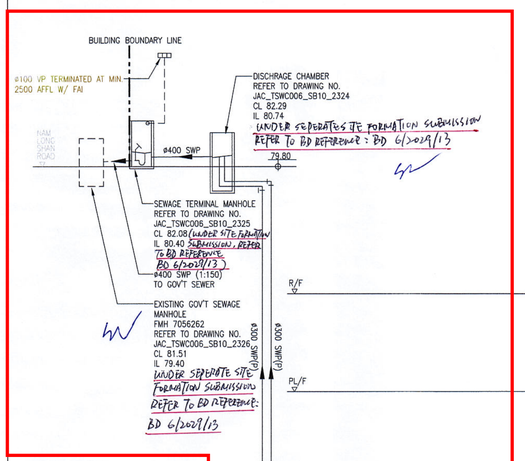
Vision Planning Consultants Ltd.	Advanced Aquarium Technologies
Intelibuild Technyx Asia Limited	Studio Hanson Roberts

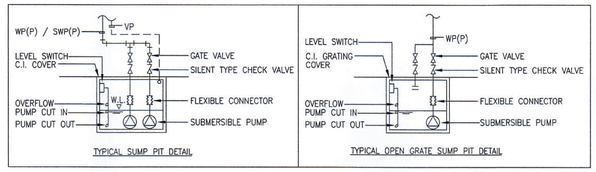
Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

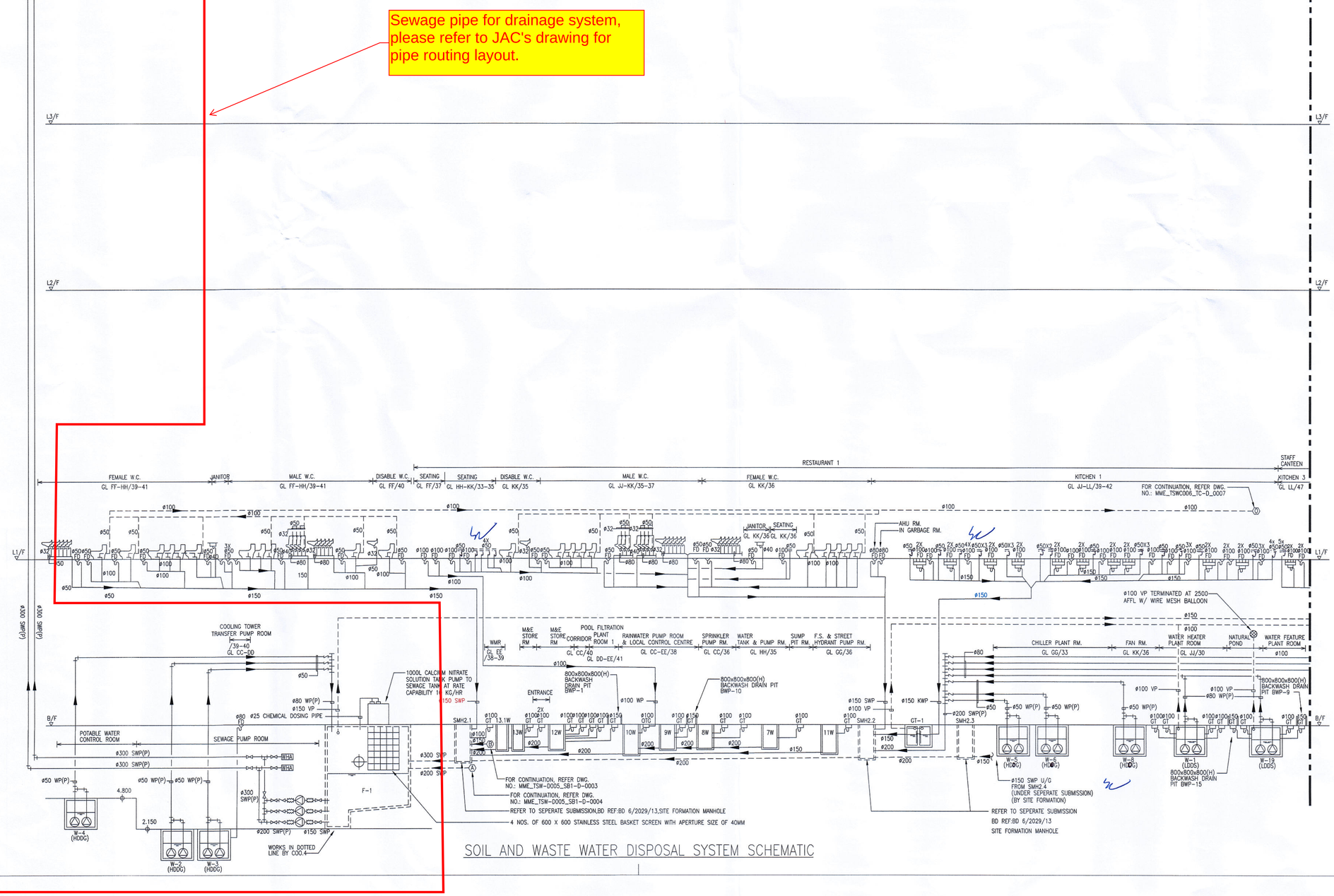
Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SUBMISSION(FOR INFORMATION ONLY)
SEWERAGE RISING MAINS
MISCELLANEOUS DETAILS (SHEET 3 OF 3)

Computer file	Plot Date	Scale
JAC_TSWD005_SB10_2329-03.dwg	27. 3. 15	AS SHOWN
Drawing Number	Rev.	Issue status
JAC_TSWD005_SB10_2329-03	-	DD







SOIL AND WASTE WATER DISPOSAL SYSTEM SCHEMATIC

BD REF : 4/2029/13

Note: This plan has been processed on a curtailed check basis under the centralized processing system as promulgated in PNAP ADM-19. The duties of the authorized person, registered structural engineer and/or registered geotechnical engineer concerned as specified under section 4(3)(b) and the provision of section 14(2)(c) of the Buildings Ordinance are of particular relevance in this regard.

Notes

Plan Approved
LIE Pang-yu, Fanay
Senior Building Surveyor
for BUILDING AUTHORITY
26 MAR 2021

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For and on behalf of
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A	BD SUBMISSION	11.05.15		

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Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SERVICES
DRAINAGE SCHEMATIC DIAGRAM
(SHEET 1)

Computer file	Plot Date	Scale
MME_TSW-D005_SB1-D-0002_07.DWG	11.05.15	N.T.S.
Drawing Number	**Rev.**	**Issue status**
MME_TSW-D005_SB1-D_0002	D	SB1

MATCHLINE

FOR CONTINUATION, REFER DWG. NO.:
MME_TSW-0005_SB1-D-1004

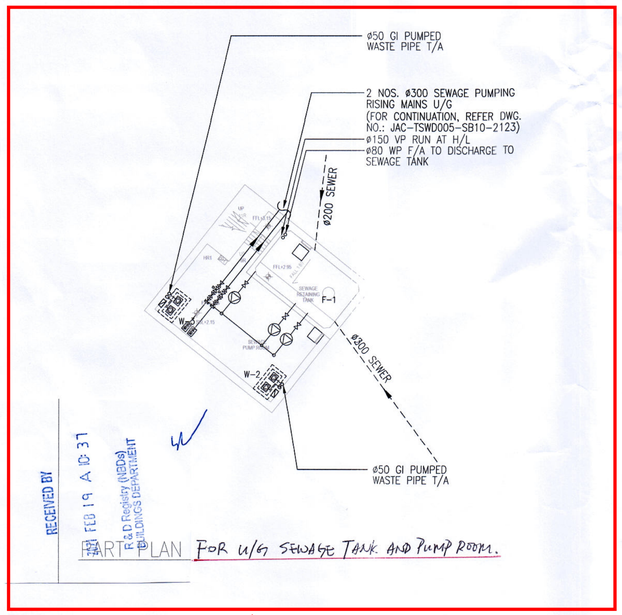
MANHOLE SCHEDULE

STORM WATER

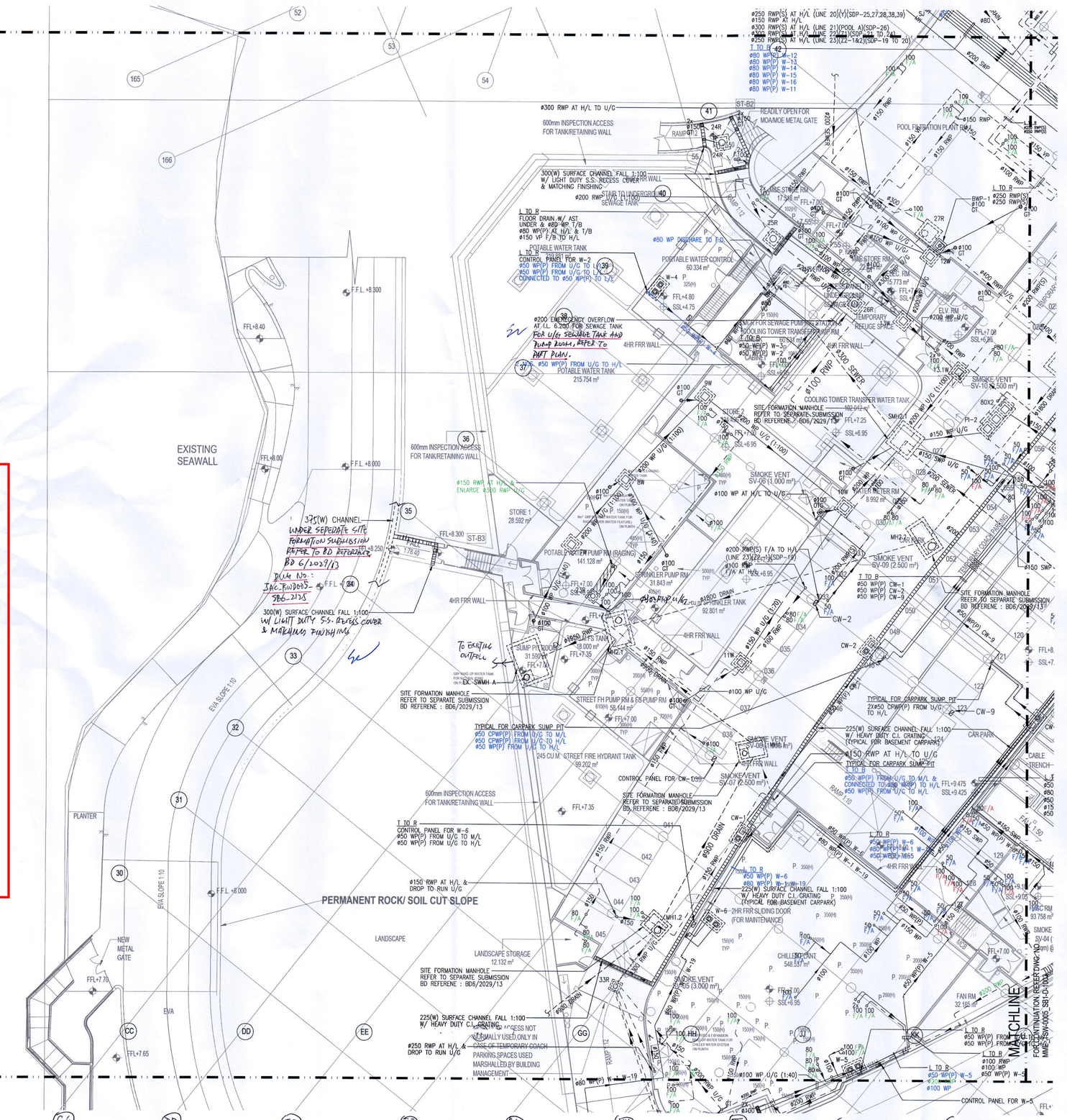
SMH NO.	F.F.L.	C.L.	I.L.	MANHOLE TYPE	COVER TYPE
33R	–	7.930	6.20	D	L.D.D.S.
23R	–	7.000	5.800	D	L.D.D.S.
24R	7.50	7.350	5.900	E	L.D.D.S.
25R	7.000	6.900	5.72	D	L.D.D.S.
26R	7.000	6.900	5.12	E	L.D.D.S.
27R	–	7.000	5.05	E	L.D.D.S.

WASTE WATER

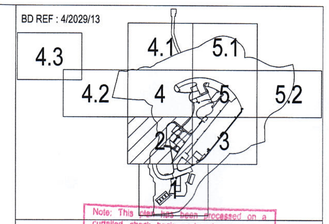
WMH NO.	F.F.L.	C.L.	I.L.	MANHOLE TYPE	COVER TYPE
7W	–	7.000	6.300	C	L.D.D.S.
8W	–	7.000	6.180	C	L.D.D.S.
9W	–	7.000	6.071	C	L.D.D.S.
10W	–	7.000	5.906	D	H.D.D.S.
11W	–	7.000	6.160	C	H.D.D.S.
12W	–	7.000	6.100	C	L.D.D.S.
13W	–	7.000	5.960	D	H.D.D.S.
13.1W	–	7.000	5.800	D	H.D.D.S.



Sewage pump room layout



BD REF : 4/2029/13



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LIE Fung-yi, Fanny
Senior Building Surveyor
for BUILDING AUTHORITY
26 MAR 2021

KWOK CHI CHEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

The works shown on these plans are Type II works (Drainage Works) in respect of which consent is applied for the purpose of Fast Track consent application under regulation 33 of the Building (Administration) Regulations.

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Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE LAYOUT -
BASEMENT FLOOR PLAN (ZONE 2)

Computer file	Plot Date	Scale
	11.05.15	1:200

Drawing Number	Rev.	Issue status
MME_TSW-D005-SB1-D-1002	D	SB1

Appendix D Calculation for the Sewage Tank/Pumps and Self-Cleansing Velocity

Sewage Tank / Pumps
Design Criteria and Calculation

Project Title: Ocean Park Tai Shue Wan Devemlopment

Project No.: ME1831

1. DESIGN CRITERIA / ASSUMPTION

1.1 The effective storage capacity of the Sewage Tank is based on the cut-in to cut-out level of the first operation.

1.2 The actuation of the Sewage pumps is designed by level switches set out as follows:-

a) The first Sewage pump will actuate when the effluent reach 300mm below the invert of the lowest discharge pipe into Sewage Tank.

b) The second Sewage pump will actuate simultaneously when the effluent reach 200mm below the invert of the lowest discharge pipe into the Sewage Tank.

c) All pumps will cut-out when the effluent level drops to 300mm above the bottom of the Sewage Tank.

d) Overflow alarm will signal when the effluent is 100mm below the invert of the lowest discharge pipe into the Sewage Tank.

e) Each of the Sewage pumps will start alternatively while the another one is failure.

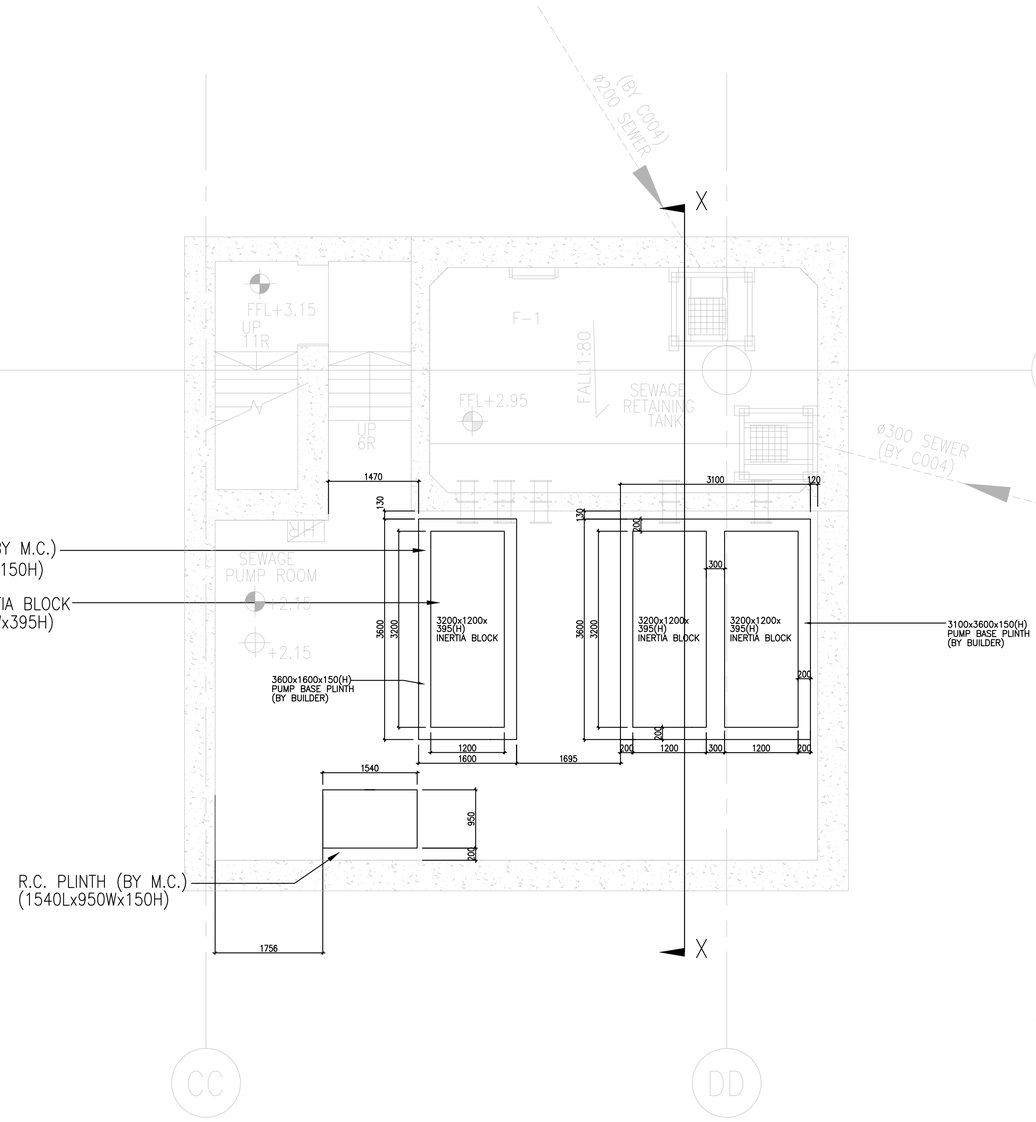
2. CALCULATION FOR THE SEWAGE TANK / PUMPS

Sewage Tank / Pumps

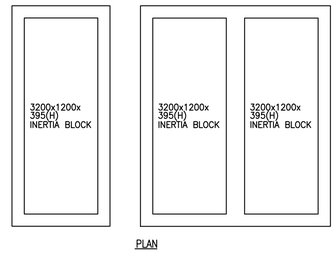
Sewage Discharge from Water Park	51.41 lit./s	Refer to Sewage Discharge Estimation
Sewage Discharge from Fullertron Hotel (Previously Fisherman's Whart Hotel)	21.03 lit./s	Refer to Sewage Discharge Estimation
Sewage Discharge from Fullertron Hotel (Previously Fisherman's Whart Hotel)	9.88 lit./s	Refer to Sewage Discharge Estimation
Total Daily Water Discharge Flow Rate	82.32 lit./s	Refer to Sewage Discharge Estimation
Volume of Sewage Tank	6.3 m X 3.6 m X 1.8 m = 40.824 m^3	
Time required to fill up 40.824 m^3 volume during peak flow periods	$\frac{40.824 \times 1000}{82.32 \times 60}$ = 8.265 min	Design Pump Rate
Peak capacity designated	100 lit./s	(2 Nos. 50 lit./s Sewage Pump for Duties and 1 No. for Standby)
Time required to pump 40.824 m^3 volume Sewage Tank	$\frac{40.824 \times 1000}{100 \times 60}$ = 6.804 min	Retention Time
Time required for pumping cycle during peak flow periods	8.265 min + 6.804 min = 15.069 min	
So, operating pump cycle per hour (Notes: E.P.D. requirement is less than 10 times)	$\frac{60}{15.069}$ = 3.98 (times)	

3. CONCLUSION

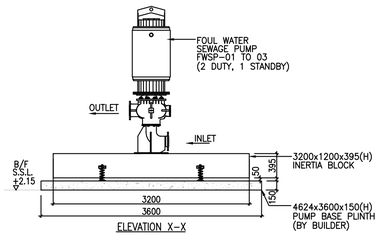
From the above calculation, it shows that the Sewages and pumps arrangement are adequate for working in the peak flow condition / periods and working smoothly during normal flow condition/periods. Power supply to all sump pumps will be connected to the essential service board and with back-up by emergency generator.



BUILDER'S WORK FOR SEWAGE PUMP ROOM
SCALE 1:50



PLAN



ELEVATION X-X

CALCULATION OF INERTIA BLOCK FOR FOUL WATER SEWAGE PUMP
FWSP-01 TO 03
WEIGHT OF PUMP = 1800kg
REQUIRED THE WEIGHT OF INERTIA BLOCK = 1800kg x 1 x 2 = 3600kg
DENSITY OF CONCRETE = 2400kg/m³
SIZE OF INERTIA BLOCK = 3.20m(L) x 1.20m(W) x 0.395m(H) = 1.5168m³
ACTUAL WEIGHT OF INERTIA BLOCK = 1.5168 x 2400 = 3640kg > 3600kg

CALCULATION OF INERTIA BLOCK FOR SEWAGE PUMP ROOM
SCALE 1:50

B

REFERENCE DRAWING:
ARCH.: AED_TSWC006_TC-A_01006 REV.B
STRCUTURE: BUR_TSWC006_TC-S_2603 REV.A
MME DRAINAGE: MME_TSWC006_TC-D_1002 REV.C
NOTES:
1) REFER TO PMI NO. NO. : TC006PMR-PMI_TSWC006_009
TC006PMR-PMI_TSWC006_139

Rev	Description	Date	Dra	Chk	App
B	THIRD ISSUE	06/03/20	ERY	IL	PY
A	SECOND ISSUE	31/01/18	JP	IL	PY
–	FIRST ISSUE	28/12/17	SZ	ERY	AC

Client
Ocean Park Corporation

Lead Consultant
Aedas Limited
31/F One Island East
18 Westlands Road Quarry Bay
Hong Kong

Project Title
OCEAN PARK
TAI SHUE WAN WATER WORLD PROJECT

Contract No. and Contract Title
TSW-C006
WATERPARK - MAIN BUILDING WORKS

Contractor
Gammon

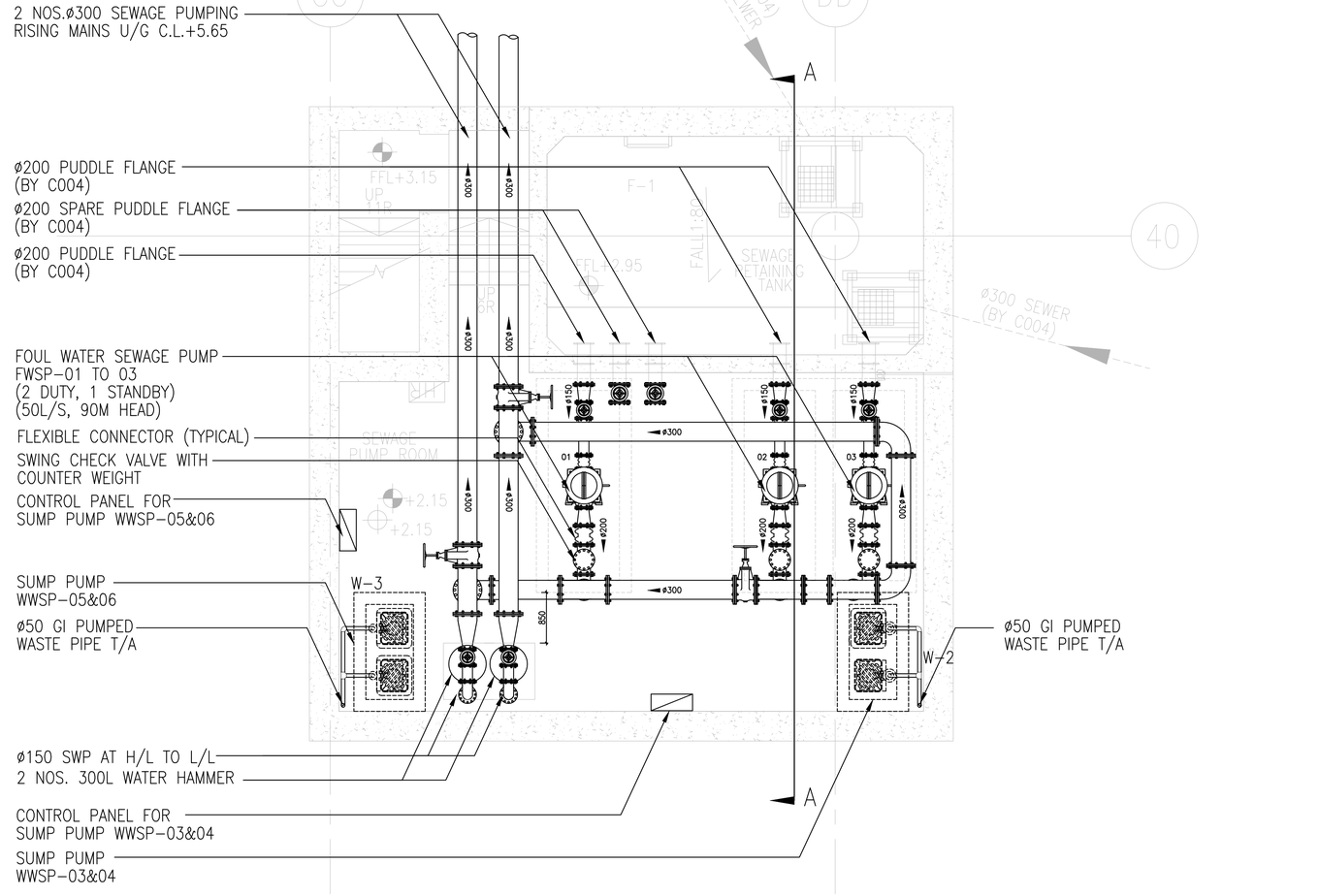
Specialized Contractor
Gammon E&M

Drawing Title
DRAINAGE SERVICES - PLANT ROOM DETAILS - BUILDER'S WORK FOR SEWAGE PUMP ROOM

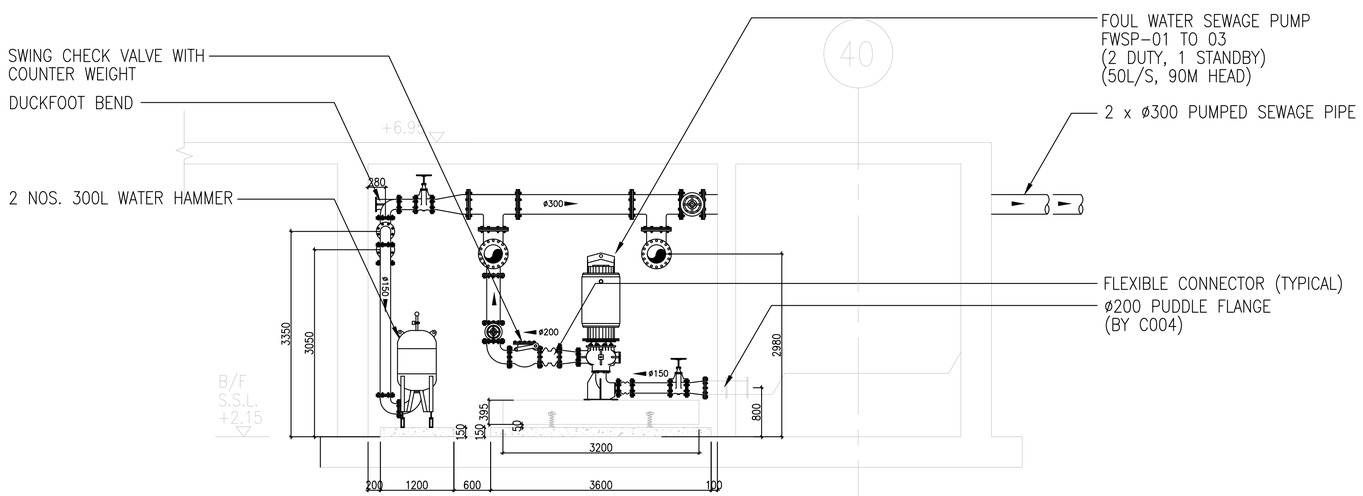
Drawn	MT	Scale	1:50 @A1
Drafted	ERY		
Checked	IL	Status	FOR SUBMISSION
Approved	PY		

Drawing No.
GEM_TSWC006_D_06028

Rev
B



DETAIL FOR SEWAGE PUMP ROOM
SCALE 1:50



SECTION AA
SCALE 1:50

B

REFERENCE DRAWING:
ARCH.: AED_TSWC006_TC-A_01006 REV.B
STRCUTURE: BUR_TSWC006_TC-S_2603 REV.A
MME DRAINAGE: MME_TSWC006_TC-D_1002 REV.C
NOTES:
1) REFER TO PMI NO. NO. : TC006PMR-PMI_TSWC006_009
TC006PMR-PMI_TSWC006_139

General Comments:-

1. The plant room layout and pipework shall be in-lined with the BD submission drawings.
2. The pump performance and specification shall refer to material submission / calculation.
3. The details of inertia block shall in-line with the relevant detail drawing in separated submission.
4. Pressure gauge shall be provided for valve. Field device (including pressure sensor, switch) detail drawings shall be provided.
5. Access panel and access space shall be provided for equipment.
6. BSI's site comment shall be incorporated .
7. Pump calculation shall be provided for substantiation of the water level and its BW location.

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DRAINAGE SERVICES - PLANT ROOM DETAILS - SEWAGE PUMP ROOM

Drawn	MT	Scale	1:50 @A1
Drafted	ERY		
Checked	IL	Status	FOR SUBMISSION
Approved	PY		

Drawing No.
GEM_TSWC006_D_06012

Rev

Office	Hong Kong	Job No	3375	Page No Rev No	
Job Title	OPC/TSWD/TSW-C006 Waterpark Main Works	Originator Date	CC 3/25/2015	Revised by Date	CCW 9/14/2021
Section	Sewerage Rising Mains - Hydraulic Check Total Head Loss	Checker Date	Ryan 3/25/2015	Re-checked by Date	KC 9/14/2021

Rising Main Design - Hydraulic Design

Design Information

design pump head = 100 m
design flow rate = 100 l/s
= 1.415 m/s
diameter of rising mains = 300 mm with 2 nos.
elevated head = 75.79 m

so, allowable head loss = 100 - 75.79 = 24.21 m

Local Head Loss

Intermediate losses	Head loss coefficient (K)		No. of piece	Resultant Head loss coefficient (K)
	Value	Source		
11.25 deg bend	0.15	Sewerage Manual (Part 1) Table 7 or Stormwater Drainage Manual Table 15, where Category (ii) Close Radius Bends are assumed	6	0.9
22.5 deg bend	0.15		8	1.2
45 deg bend	0.3		25	7.5
90 deg elbows	1	Sewerage Manual (Part 1) Table 7 or Stormwater Drainage Manual Table 15	3	3
Gate valve	0.12		4	0.48
Reflux (check) valve	1		1	1
Flexible connector	0		1	0
Tee	0.35		5	1.75
Sharp-edged entrance	0.5		1	0.5
Sudden enlargement for exit loss	1		2	2
			Total K =	**18.3**

total K = 18.33
local head loss = $K * V^2/2g$
= 18.33 x 1.415 ^2 / 2 / 9.81
= 1.87 m

Total Loss (Please refer to next page for the "Frictional Head Loss")

Total head loss = 1.87 + 2.433
= 4.303 m
< 24.21 m **OK!**

Office	Hong Kong	Job No	3375	Page No Rev No	
Job Title	OPC/TSWD/TSW-C006 Waterpark Main Works	Originator Date	CC 3/25/2015	Revised by Date	CCW 9/14/2021
Section	Sewerage Rising Mains - Hydraulic Check Total Head Loss	Checker Date	Ryan 3/25/2015	Re-checked by Date	KC 9/14/2021

Colebrook-White Equation - Determination of Frictional Head Loss

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

mean velocity, V	=	1.415	ms-1	(to be confirmed)
gravitational acc, g	=	9.81	ms-2	
hydraulic radius, R	=	0.15	m	
internal pipe dia, D	=	0.3	m	
pipeline roughness, ks	=	6E-04	m	(Table 5, Sewerage Design Manual Part 1)
kinematic viscosity of fluid, v	=	1.00E-06	m2/s	
hydraulic gradient, s	=	8.11E-03		(energy loss per unit length due to friction)

$$1.415 = -\sqrt{(8\times9.81\times0.3\times0.00811)}\ \log\left(\frac{0.0006}{3.7\times0.3} + \frac{2.51\times0.000001}{0.3\times\sqrt{(2\times9.81\times0.3\times0.00811)}}\right)$$

LHS = 1.415

RHS = -0.43697 log (0.000541 + 3.83E-05)

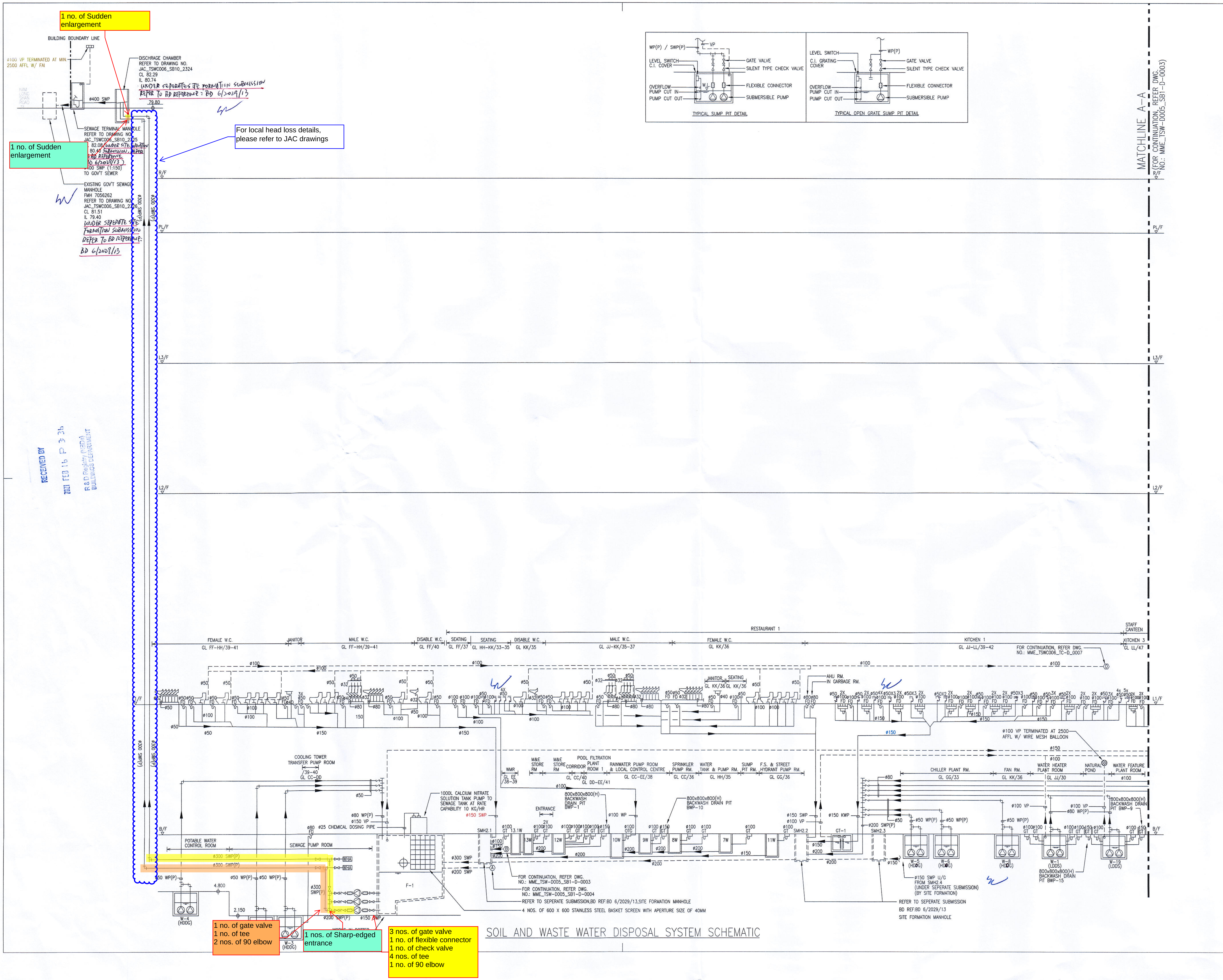
= 1.415

so the hydraulic gradient is 0.00811 .

for pipeline length = 300 m

head loss due to friction = 0.00811 x 300

= 2.433 m



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15th Floor, Cornwall House, Taikoo Place,
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M&E Engineer
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Water Technology Inc.
Ø100 Park Avenue, Beaver Dam,
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Together with Other Specialist Consultants

Urbis Limited	Shen Milsom & Wilke
Lanbase Surveyors Limited	Lighting Planners Associates (HK) Ltd.
MVA Hong Kong Limited	Food Service Consultants, Ltd.
Vision Planning Consultants Ltd.	Advanced Aquarium Technologies
Intelibuild Technyx Asia Limited	Studio Hanson Roberts

Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SERVICES
DRAINAGE SCHEMATIC DIAGRAM
(SHEET 1)

Computer file	Plot Date	Scale
MME_TSW-D005_SB1-D-0002_07.DWG	11.05.15	N.T.S.

Drawing Number	Rev.	Issue status
MME_TSW-D005_SB1-D_0002	D	SB1

HOMA
PUMPEN MIT SYSTEM

Performance Curve

MX3352-FU182

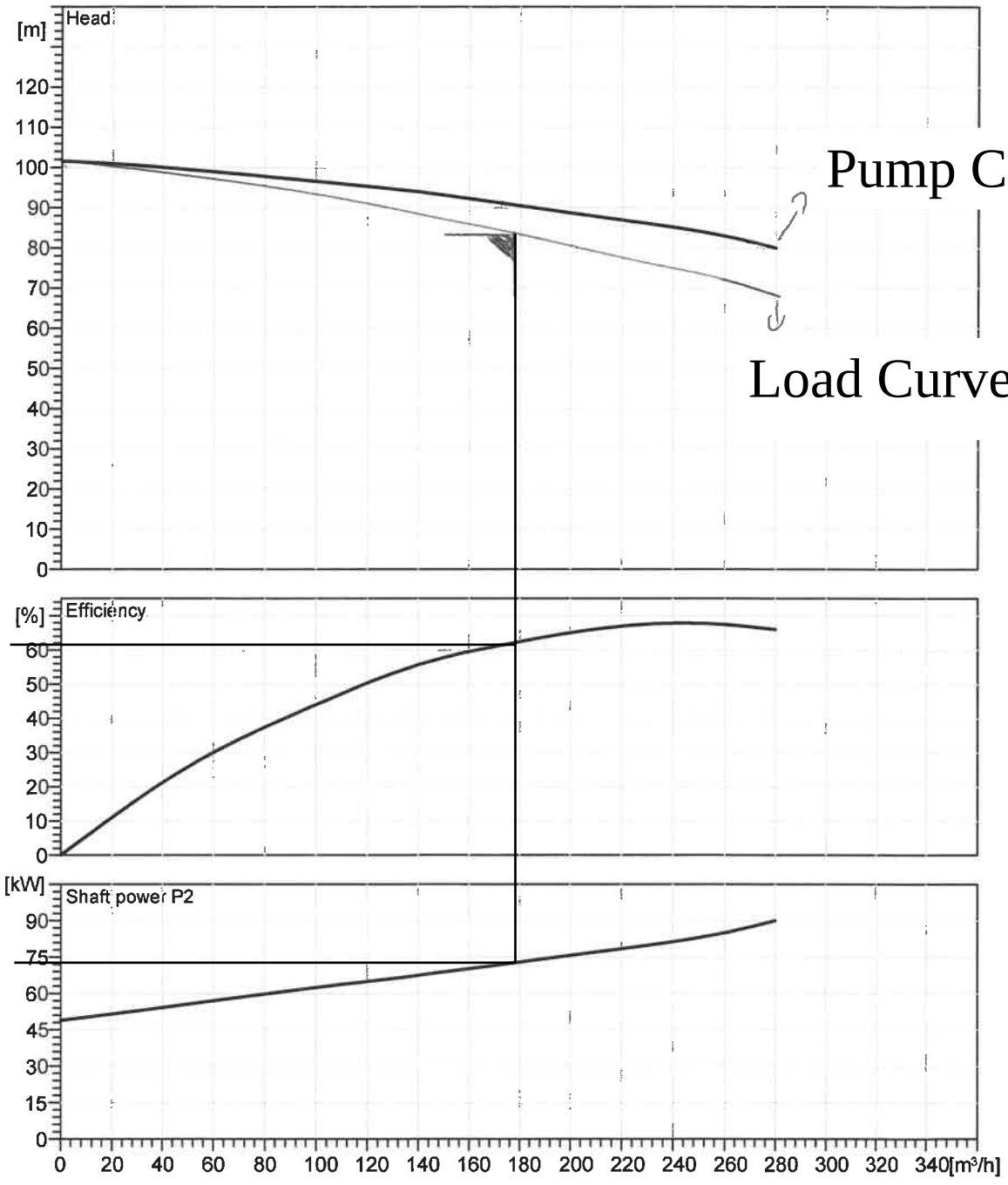
49.4 l/s, 83.5m
(85 mm orifice plate)

Impeller					
Impeller type: Single vane impeller	Solid size O: 50 mm	Max. O: 330 mm	Min. O: 220 mm	Sel. O: 249 mm	

Operating data				
Speed **2900 rpm**	Frequency: **50 Hz**	Duty point:	Shaft power P2:	Discharge port:

Power data referred to: Water, clean [100%]; 20°C, 0.9983kg/dm3; 1.005mm2/s

Testnorm: **ISO 9906/A**



Project	Project no.:	Created by:	Page:	Date:

Appendix E Supplementary Information on the Sewerage Facilities

Zoe Yeung

From: Polly Kan <polly.kan@oceanpark.com.hk>
Sent: 16 June 2021 16:12
To: Zoe Yeung
Cc: Gary Chow; Pei Kee Ng; Iverson Yip; May Tse
Subject: RE: EP-4887/2014/A_Ocean Park Tai Shue Wan_Confirmation/Clarification on Sewerage Information

Dear Zoe,

Please see our reply to your questions:

1) **Pipe material** - Our consultant, JAC, has advised that the adopted lining type is commonly adopted for sewerage pipe used for anti-corrosion and is better in erosion resistance.

2) **Achieve 1m/s at full bore condition of rising mains** - Our consultant, JAC, advised that the capacity of the pipe is capable of 130l/s. This was sized to ensure minimum flows could be met. The flow rate should be based on Meinhardt's designed pump system. According to Meinhardt's design, the flow rate is 100l/s and confirmed the calculated value is 1.35m/l.

3) **Operation arrangement of rising mains** - Confirm, 1 rising main pipe will be used while another one is for standby.

Regards,
Polly

From: Zoe Yeung [mailto:Zoe.Yeung@mottmac.com]
Sent: Wednesday, June 16, 2021 3:47 PM
To: Polly Kan
Cc: Gary Chow; Pei Kee Ng; Iverson Yip; May Tse
Subject: EP-4887/2014/A_Ocean Park Tai Shue Wan_Confirmation/Clarification on Sewerage Information

Dear Polly,

To supplement the Detailed Design Report for the Sewerage Facilities, grateful if you could confirm/ clarify on the three items below. Thank you very much.

1. **Pipe material**
   It is understood that High Alumina Cement Mortar is commonly used for sewerage pipes and is approved by BD.
   However, since the material stated in the EM&A manual is epoxy internal lining, could your consultant for pipe material please provide information/some key points to justify why the use of High Alumina Cement mortar is better than epoxy so that we can help to justify the change in the report to EPD?

2. **Achieve 1m/s at full bore condition of rising mains**
   Based on the received Appendix C - ME1831 - Sewage Discharge Estimation_20140617 (see file: #1 & #2 - Appendix C - ME1831 - Sewage Discharge Estimation_20140617), the estimated design peak flow is about 100 l/s for sewage sources from existing POC facilities, proposed Water Park Development, Proposed Spa Hotel and Proposed Fisherman's Wharf Hotel. However 130 l/s was adopted during the design of rising main in the Sewerage Rising Mains Design Report. Could you please confirm the design minimum velocity within the rising mains would achieve 1m/s at full bore condition?

3. **Operation arrangement of rising mains**

   According to the Sewerage Rising Mains Design Report, although a twin DN300 rising main is provided, it is understood that only 1 rising main will be used for conveying the sewage flow from the new pumping station to the discharge chamber. Could you please confirm on this operation arrangement (i.e. 1 rising main will be used while another one is for standby)?

Regards,

Zoe Yeung
D +852 2828 5950
zoe.yeung@mottmac.com

MOTT MACDONALD

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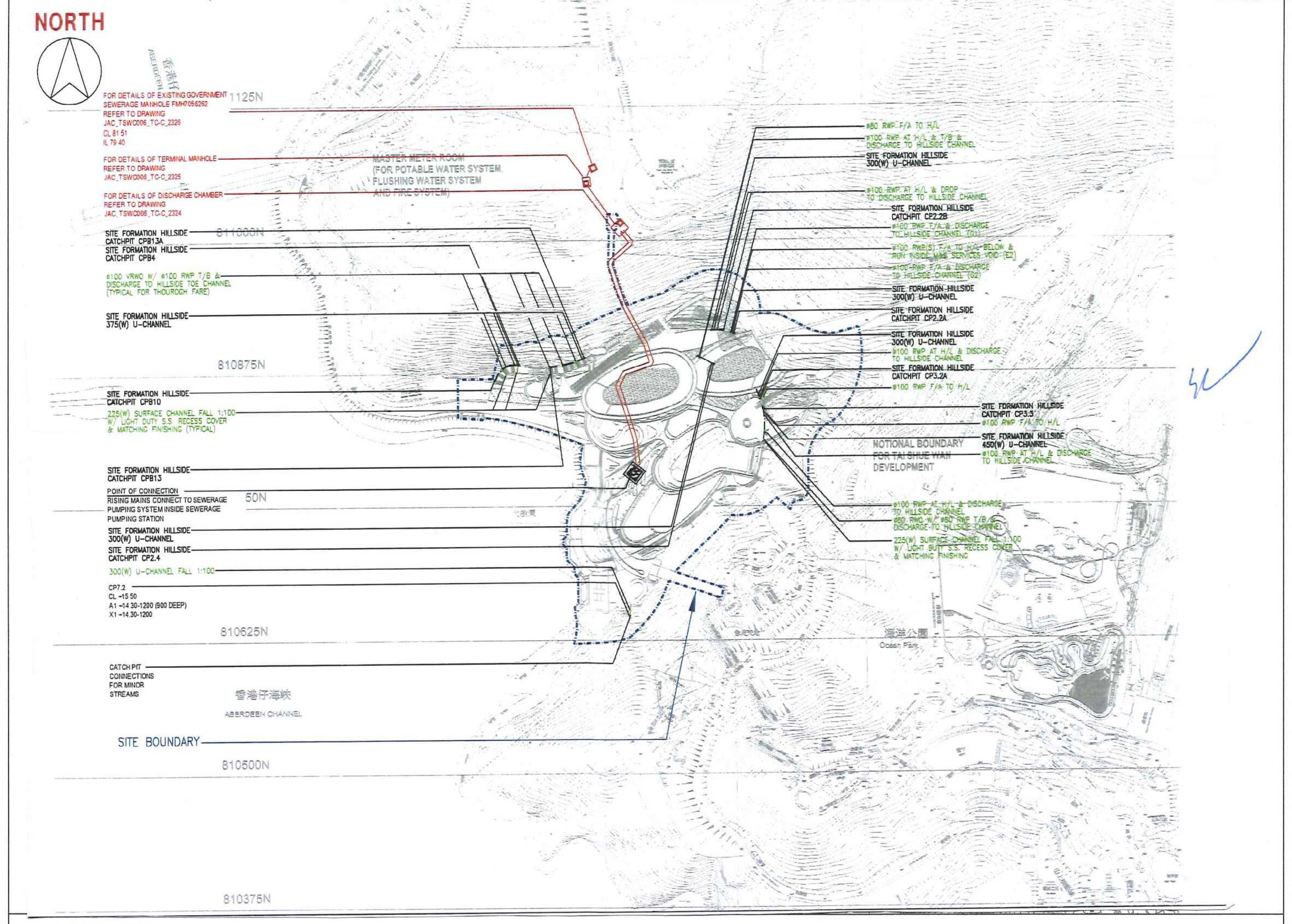
Our purpose **To improve society by considering social outcomes in everything we do;** relentlessly focusing on excellence and digital innovation, transforming our clients' businesses, our communities and employee opportunities. **This is how.**

Appendix F Material Schedule

BD Ref: 4/2029/13

SITE PLAN

SCALE: 1:4000



LEGEND

FIXTURE

ELEV.	PLAN	
		WATER CLOSET
		WASH BASIN
		WALL-HUNG URINAL
		BATH TUB
		SHOWER TRAY/SHOWER BASE
		KITCHEN SINK

PIPING

Line	Description
SWP / SP	SOIL PIPE / SOIL & WASTE PIPE
SWP(P)	PUMPED SOIL & WASTE PIPE
WP	WASTE PIPE
WP(P)	PUMPED WASTE PIPE
VP	VENT PIPE / ANTI-SYPHONAGE PIPE
RWP	RAINWATER PIPE
RWP(S)	RAINWATER PIPE (SYPHONIC)
RWP(P)	PUMPED RAINWATER PIPE
S	SUBSOIL DRAIN PIPE

DRAINAGE WORK MISCELLANEOUS

- SEWAGE MANHOLE
- STORM WATER MANHOLE
- R.C. WASTE WATER SUMP PIT W/ OPEN GRATING
- R.C. WASTE WATER SUMP PIT
- SAND TRAP
- CP — CATCH PIT
- SURFACE CHANNEL (FALL 1:100)
- SURFACE CHANNEL W/ COVER (FALL 1:100)
- FALL — CEMENT & SAND SCREEDING LAID TO FALL 1:100
- FAI — FRESH AIR INLET W/ ø100 C.I. VENT PIPE
- WIRE BALLOON
- RG — ROAD GULLY
- SUMERSIBLE PUMP
- GATE VALVE
- CHECK VALVE
- FLEXIBLE CONNECTOR
- SJ — SETTLEMENT JOINT
- R.C. PETROL INTERCEPTOR
- R.C. GREASE TRAP
- RWO — RAINWATER OUTLET
- RWO(S) — RAINWATER OUTLET (SYPHONIC)
- PD — PLANTER DRAIN
- VPD — VERTICAL PLANTER DRAIN
- OTG — OPEN TRAPPED GULLY WITH C.I. GRATING
- OTG — OPEN TRAPPED GULLY WITH BACK INLET PIPE
- FD — FLOOR DRAIN
- FD — FLOOR DRAIN WITH BACK INLET PIPE
- VFD — VERTICAL FLOOR DRAIN
- BIGT — BACK INLET TRAPPED GULLY WITH C.I. DOUBLE SEALED COVER & VENT
- LEVEL SWITCH
- BMS — B.M.S. INTERFACING PANEL
- MOTOR CONTROL PANEL
- FIRE RATED ENCLOSURE

R & D Registry Registered BUILDINGS DEPARTMENT

DRAWING LIST

DRAWING NO.	TITLE
MME_TSW-D005_SB1-D-0001	LEGEND, ABBREVIATION, GENERAL NOTES AND DRAWING LIST
MME_TSW-D005_SB1-D-0002	DRAINAGE SCHEMATIC DIAGRAM (SHEET 1)
MME_TSW-D005_SB1-D-0003	DRAINAGE SCHEMATIC DIAGRAM (SHEET 2)
MME_TSW-D005_SB1-D-0004	DRAINAGE SCHEMATIC DIAGRAM (SHEET 3)
MME_TSW-D005_SB1-D-0005	DRAINAGE SCHEMATIC DIAGRAM (SHEET 4)
MME_TSW-D005_SB1-D-0006	DRAINAGE SCHEMATIC DIAGRAM (SHEET 5)
MME_TSW-D005_SB1-D-0007	DRAINAGE SCHEMATIC DIAGRAM (SHEET 6)
MME_TSW-D005_SB1-D-1001	DRAINAGE LAYOUT – BASEMENT FLOOR PLAN (ZONE 1)
MME_TSW-D005_SB1-D-1002	DRAINAGE LAYOUT – BASEMENT FLOOR PLAN (ZONE 2)
MME_TSW-D005_SB1-D-1003	DRAINAGE LAYOUT – BASEMENT FLOOR PLAN (ZONE 3)
MME_TSW-D005_SB1-D-1004	DRAINAGE LAYOUT – BASEMENT FLOOR PLAN (ZONE 4)
MME_TSW-D005_SB1-D-1005	DRAINAGE LAYOUT – BASEMENT FLOOR PLAN (ZONE 5)
MME_TSW-D005_SB1-D-1101	DRAINAGE LAYOUT – LEVEL 1 FLOOR PLAN (ZONE 1)
MME_TSW-D005_SB1-D-1102	DRAINAGE LAYOUT – LEVEL 1 FLOOR PLAN (ZONE 2)
MME_TSW-D005_SB1-D-1103	DRAINAGE LAYOUT – LEVEL 1 FLOOR PLAN (ZONE 3)
MME_TSW-D005_SB1-D-1104	DRAINAGE LAYOUT – LEVEL 1 FLOOR PLAN (ZONE 4)
MME_TSW-D005_SB1-D-1104.1	NOT USED
MME_TSW-D005_SB1-D-1104.2	DRAINAGE LAYOUT – LEVEL 1 FLOOR PLAN (ZONE 4.2)
MME_TSW-D005_SB1-D-1104.3	DRAINAGE LAYOUT – LEVEL 1 FLOOR PLAN (ZONE 4.3)
MME_TSW-D005_SB1-D-1105	DRAINAGE LAYOUT – LEVEL 1 FLOOR PLAN (ZONE 5)
MME_TSW-D005_SB1-D-1201	NOT USED
MME_TSW-D005_SB1-D-1202	DRAINAGE LAYOUT – LEVEL 2 FLOOR PLAN (ZONE 2)
MME_TSW-D005_SB1-D-1203	DRAINAGE LAYOUT – LEVEL 2 FLOOR PLAN (ZONE 3)
MME_TSW-D005_SB1-D-1204	DRAINAGE LAYOUT – LEVEL 2 FLOOR PLAN (ZONE 4)
MME_TSW-D005_SB1-D-1205	DRAINAGE LAYOUT – LEVEL 2 FLOOR PLAN (ZONE 5)
MME_TSW-D005_SB1-D-1205.1	DRAINAGE LAYOUT – LEVEL 2 FLOOR PLAN (ZONE 5.1)
MME_TSW-D005_SB1-D-1301	NOT USED
MME_TSW-D005_SB1-D-1302	NOT USED
MME_TSW-D005_SB1-D-1303	NOT USED
MME_TSW-D005_SB1-D-1304	DRAINAGE LAYOUT – LEVEL 3 FLOOR PLAN (ZONE 4)
MME_TSW-D005_SB1-D-1304.1	DRAINAGE LAYOUT – LEVEL 3 FLOOR PLAN (ZONE 4.1)
MME_TSW-D005_SB1-D-1305	DRAINAGE LAYOUT – LEVEL 3 FLOOR PLAN (ZONE 5)
MME_TSW-D005_SB1-D-1305.1	DRAINAGE LAYOUT – LEVEL 3 FLOOR PLAN (ZONE 5.1)
MME_TSW-D005_SB1-D-1401	NOT USED
MME_TSW-D005_SB1-D-1402	NOT USED
MME_TSW-D005_SB1-D-1403	NOT USED
MME_TSW-D005_SB1-D-1404	DRAINAGE LAYOUT – PLATFORM LEVEL PLAN (ZONE 4)
MME_TSW-D005_SB1-D-1404.1	DRAINAGE LAYOUT – PLATFORM LEVEL PLAN (ZONE 4.1)
MME_TSW-D005_SB1-D-1405	DRAINAGE LAYOUT – PLATFORM LEVEL PLAN (ZONE 5)
MME_TSW-D005_SB1-D-1405.1	DRAINAGE LAYOUT – PLATFORM LEVEL PLAN (ZONE 5.1)
MME_TSW-D005_SB1-D-1501	NOT USED
MME_TSW-D005_SB1-D-1502	NOT USED
MME_TSW-D005_SB1-D-1503	NOT USED
MME_TSW-D005_SB1-D-1504	DRAINAGE LAYOUT – ROOF FLOOR PLAN (ZONE 4)
MME_TSW-D005_SB1-D-1505	DRAINAGE LAYOUT – ROOF FLOOR PLAN (ZONE 5)
MME_TSW-D005_SB1-D-1505.1	DRAINAGE LAYOUT – ROOF FLOOR PLAN (ZONE 5.1)
MME_TSW-D005_SB1-D-3001	DRAINAGE DETAILS (SHEET 1)
MME_TSW-D005_SB1-D-3002	DRAINAGE DETAILS (SHEET 2)
MME_TSW-D005_SB1-D-3003	DRAINAGE DETAILS (SHEET 3)
MME_TSW-D005_SB1-D-3004	DRAINAGE DETAILS (SHEET 4)
MME_TSW-D005_SB1-D-3005	DRAINAGE DETAILS (SHEET 5)

ABBREVIATION

W	WASTE
S	SEWAGE / SOIL
MH	MANHOLE
HD	HEAVY DUTY
MD	MEDIUM DUTY
LD	LIGHT DUTY
DS	DOUBLE SEAL
DD	DRIPTRAY DRAIN
SS	STAINLESS STEEL
CI	CAST IRON
GI	GALVANISED IRON
DI	DUCTILE IRON
CL	COVER LEVEL
IL	INVERT LEVEL
DTIL	DISCONNECTING TRAP INVERT LEVEL
BL	BOTTOM LEVEL
SP	SOIL PIPE
WP	WASTE PIPE
SWP	SOIL & WASTE PIPE
RWP	RAINWATER PIPE
CDP	CONDENSATE DRAIN PIPE
SSDP	SUB-SOIL DRAIN PIPE
CPWP	CARPARK WASTE WATER
VP	VENT PIPE
ASP	ANTI SYPHONEAGE PIPE
RWP(S)	SYPHONIC RAINWATER PIPE
SWP(P)	PUMPED SOIL AND WASTE PIPE
WP(P)	PUMPED WASTE PIPE
RWP(P)	PUMPED RAINWATER PIPE
CPWP(P)	PUMPED CARPARK WASTE WATER
F/A	FROM ABOVE
F/B	FROM BELOW
T/A	TO ABOVE
T/B	TO BELOW
F/L	FLOOR LEVEL
FFL	FINISHED FLOOR LEVEL
H/L	HIGH LEVEL
M/L	MID LEVEL
L/L	LOW LEVEL
H/LB	HIGH LEVEL BELOW
AFFL	ABOVE FINISHED FLOOR LEVEL
FRP	FIRE RATED PANEL ENCLOSURE
CE	CLEANING EYE
UD	URINAL DRAIN
SD	SHOWER DRAIN
WH	WEEP HOLE
SJ	SETTLEMENT JOINT
LDDS	LIGHT DUTY DOUBLE SEAL
HDDS	HEAVY DUTY DOUBLE SEAL
HDOG	HEAVY DUTY OPEN GRATING

MATERIAL SCHEDULE

TYPE OF PIPE	DIAMETER OF PIPE (mm)	MATERIAL OF PIPE
RAINWATER, VENT, WASTE, SOIL OR COMBINED SOIL AND WASTE PIPES (ABOVE GROUND)	32 & 40	· UPVC PIPE AND FITTINGS TO BS EN 5255
	50–400	· SOCKETLESS EPOXY COATED CAST IRON PIPES AND FITTINGS TO BS EN877 WITH SS316 FLEXIBLE COUPLING JOINT.
	450 & ABOVE	· DUCTILE IRON PIPES & FITTINGS TO BS EN598 CLASS K9, FLEXIBLE JOINT WITH INTERNAL CEMENT LINNING. FOR SOIL AND WASTE WATER, PIPES AND FITTINGS TO BE WITH SULPHATE RESISTING CEMENT LINING.
A/C CONDENSATE DRAIN PIPES (ABOVE GROUND)	40–ABOVE	· SOCKETLESS EPOXY COATED CAST IRON PIPES AND FITTINGS TO BS EN877 WITH SS316 FLEXIBLE COUPLING JOINT. ALL APPLIED WITH 13MM THICK CLOSED-CELL ELSTOMERIC THERMAL INSULATION TO BS 476 PART 6&7.
SYPHONIC RAINWATER PIPES (ABOVE GROUND)	100–250	· SOCKETLESS EPOXY COATED CAST IRON PIPES AND FITTINGS TO BS EN877 WITH SS316 FLEXIBLE COUPLING JOINT. ALL JOINTS SHALL BE PROVIDED WITH GRIP-COLLARS TO WITHSTAND A MINIMUM WORKING PRESSURE OF 10 BAR.
RAINWATER, VENT, WASTE, SOIL OR COMBINED SOIL AND WASTE PIPES (UNDERGROUND)	100–450	· CAST IRON PIPES AND FITTINGS TO BS 4622 WITH TYTON JOINTS OR RING GASKET JOINT
	450 & ABOVE	· DUCTILE IRON PIPES AND FITTINGS TO BS EN598, CLASS K9, FLEXIBLE JOINTS WITH INTERNAL CEMENT LINING. FOR SOIL AND WASTE WATER, PIPES AND FITTINGS TO BE WITH SULPHATE RESISTING CEMENT LINING.
PUMPED SOIL AND WASTE PIPE / WASTE PIPE RAINWATER PIPE	65–BELOW	· GALVANIZED STEEL PIPES TO BS 1387 HEAVY DUTY AND FITTINGS TO BS 143 AND 1256, ALL COMPLETED WITH INTERNAL PVC LINING.
	80 & ABOVE	· DUCTILE IRON PIPES AND FITTINGS TO BS EN598 CLASS K12, FLANGE JOINTS TO BS 4504 PN16 WITH INTERNAL CEMENT LINING. FOR SOIL AND WASTE WATER, PIPES AND FITTINGS TO BE WITH SULPHATE RESISTING CEMENT LINING.
SUB-SOIL DRAIN PIPE	50 & ABOVE	· PERFORATED OR SLOTTED PLASTIC PIPES AND FITTINGS TO BS 4962.

GENERAL NOTES

1. EVERY A.S.P. SHALL BE CONNECTED WITH BRANCH SOIL PIPE OR BRANCH WASTE PIPE AT A POINT NOT MORE THAN 300mm FROM THE TRAP OUTLET.
2. F.A.I. FOR TERMINAL MANHOLE VENTILATION SHALL BE FITTED WITH MICA FLAP BEHIND THE GRATING WHICH ACTS AS NON RETURN VALVE.
3. THE BEND OF SOIL, WASTE AND RAIN WATER PIPE SHALL HAVE AN OBTUSE ANGLE AND HAVE LARGEST PRACTICAL RADIUS OF CURVATURE, AND NOT CHANGE IN ANY WAY CROSS SECTION OF THE PIPE AND TO PROVIDE WITH A CLEANING EYE AT SIDE OF THE BEND.
4. EVERY DRAINAGE PIPE DISCHARGE TO A CHANNEL OR FLAT ROOF SHALL DISCHARGE AT A HEIGHT NOT MORE THAN 150mm ABOVE THE LEVEL OF THE CHANNEL WITH PIPE SHOE.
5. PRIOR TO SATISFACTORY TEST:
   A. NO PIPE SHALL BE PAINTED.
   B. NO UNDERGROUND PIPE SHALL BE SURROUNDED WITH CONCRETE.
6. WHERE THE WASTE PIPE FROM A WASTE FITMENT IS CONNECTED TO A SOIL PIPE. THE TRAP PROVIDED FOR WASTE FITMENT SHALL HAVE A WATER SEAL NOT LESS THAN 80mm AND BE VENTED BY MEANS OF A.S.P. OR ANTISYPHONE TRAP.
7. ALL G.I. PIPES WHICH ARE BURIED UNDERGROUND OR COME INTO DIRECT CONTACT WITH CONCRETE SHALL BE WRAPPED W/HESSIAN AND COATED W/BITUMEN.
8. FALL OF PIPES:

32mm–100mm	FALL	1 : 40
150mm	FALL	1 : 70
200mm AND 250mm	FALL	1 : 100
300mm AND 350mm	FALL	1 : 150
400mm AND ABOVE	FALL	1 : 200

9. ALL FLAT CHANNEL SHALL BE 225mm AND FALL 1:100 (UNLESS OTHERWISE INDICATED).
10. ALL DRAINAGE PLUG OFF POINT FOR FUTURE CONNECTION TO BE COMPLETED WITH 80mm DEEP SEAL ANTI-SYPHON TRAP.
11. FLOOR DRAIN SHALL BE WITH ø50 W.P. AND 80mm DEEP WATER SEAL ANTI-SYPHON TRAP UNLESS OTHERWISE SPECIFIED.
12. VERTICAL FLOOR DRAIN SHALL BE WITH ø50 W.P. AND ø80mm DEEP WATER SEAL ANTI-SYPHON TRAP UNLESS OTHERWISE SPECIFIED.
13. BASIN SHALL BE WITH ø32 W.P. AND 80mm DEEP WATER SEAL ANTI-SYPHON TRAP.
14. URINAL SHALL BE WITH ø40 S.P. AND ø32 V.P.
15. BATH TUB SHALL BE WITH ø40 W.P. AND 80mm DEEP WATER SEAL ANTI SYPHON TRAP.
16. SHOWER TRAY SHALL BE WITH ø50 W.P. AND 80mm DEEP WATER SEAL ANTI-SYPHON TRAP.
17. WATER CLOSET SHALL BE WITH ø100 S.P. AND ø50 V.P.
18. ALL MANHOLE COVERS SHALL BE OF DOUBLE-SEAL COVER UNLESS OTHERWISE INDICATED.
19. ALL MANHOLE COVERS ON DRIVEWAY SHALL BE OF CAST IRON HEAVY DUTY COVER.
20. ALL RWO SHALL BE INSTALLED WITH ANTI-SYPHON TRAP EXCEPT FOR THOSE INSTALLED AT ROOF.
21. ALL PIPEWORK PASSING THROUGH FIRE ESCAPE ROUTE SHALL BE ENCLOSED WITH FIRE RATED ENCLOSURE WITH RATING EQUAL TO THE FIRE COMPARTMENT.
22. ALL PIPEWORK PASSING THROUGH BUILDING EXPANSION JOINT AND EXTERNAL WALL SAHLL BE PROVIDED WITH A FLEXIBLE CONNECTOR OR EXPANSION JOINT.
23. ALL VENT PIPES SHALL BE TERMINATED NOT LESS THAN 1m ABOVE ROOF LEVEL WITH COPPER BALLOON UNLESS OTHERWISE STATED. FRESH AIR INLET SHALL BE TERMINATED AT 2.5m ABOVE FINISHED FLOOR LEVEL.
24. ALL SERVICES PIPEWORK SHALL BE KEPT AWAY FROM ESCAPE ROUTE UNLESS THERE IS NO OTHER MEANS FOR SERVICES RUN, IN WHICH CASE THEY SHALL BE PROVIDED WITH APPROPRIATE FIRE RATED ENCLOSURE.
25. ALL PIPEWORK, RUN INSIDE ELECTRICAL ROOMS, COMPUTER ROOMS SHALL BE PROVIDED WITH WATERPROOF STAINLESS STEEL TRAY, WHICH SHALL BE DRAINED TO THE NEAREST FLOOR DRAIN OUTLET.
26. ALL SERVICES AND PIPEWORK PASS THROUGH PLANT ROOMS, PROTECTIVE LOBBIES AND FIRE ESCAPE ROUTE SHALL BE WRAPPED IN WATERPROOF ENCLOSURE & FIRE RATED PROTECTIVE ENCLOSURE WITH APPROPRIATE FIRE RATING.
27. ALL UNDERGROUND DRAIN PIPES LAID INSIDE BUILDING SHALL BE CONCRETE SURROUND.
28. ALL PIPEWORK PASSING THROUGH COMPARTMENT WALL/FLOOR SHALL NOT BE MADE OF COMBUSTIBLE MATERIAL.
29. DUCTILE IRON SETTLEMENT JOINTS SHALL BE PROVIDED FOR ALL PIPEWORK CONNECTING FROM BUILDINGS TO EXTERNAL AREA. THE FLEXIBLE JOINTS SHALL BE CAPABLE TO STAND THE MINIMUM SETTLEMENT MOVEMENTS OF 100mm.
30. THE NECESSARY MITIGATION MEASURES IDENTIFIED IN THE DRAINAGE IMPACT ASSESSMENT (DIA) STUDY HAVE BEEN INCORPORATED INTO THE DRAINAGE PLAN.
31. FOR RAINWATER PIPE/RAINWATER OUTLET WHICH DISCHARGED TO A SURFACE CHANNEL, SHOULD DISCHARGE AT A HEIGHT NOT MORE THAN 150mm ABOVE THE LEVEL OF THE TOP OF THE CHANNEL AND INSTALLED WITH PIPE SHOE.

VALID FORM BD106

				Permit No.	HK3691 2015 (MOV)		
				Date of Granted Modification	13 Jul 2015		
Description	Condition	Location with Modification/ Exemption Granted	Date of Submission	Month	MAY	OCT	JUL
				Year	2015	2017	2020
				Rev.			
1 Building (Sanitary Fitments, Plumbing, Drainage Works & Latrines) Regulation 29(1) & 29(2) To permit the provision of cleaning access to be other than cleaning eyes	The conditions imposed in this paragraph are to be incorporated in the subsequent amendment plans for approval before the Form BA13 is submitted. A checklist of valid Forms BD106 is to be submitted at the time of the submission of Form BA13.	ABOVE GROUND			✓	✓	✓
2 Building (Sanitary Fitments, Plumbing, Drainage Works & Latrines) Regulation 44(4) To permit protection of cast iron pipes to be other than asphaltic coating							
3 Building (Sanitary Fitments, Plumbing, Drainage Works & Latrines) Regulation 50(2) To permit jointing of cast iron pipes to be other than lead caulking							

Legend : √ Still Applicable
X Not Applicable

Plan Approved
LIE Fung-yu, Fanny
Senior Building Surveyor
for BUILDING AUTHORITY
30 OCT 2020

Note: This plan has been processed on a curtailed check basis under the centralized processing system as promulgated in PNAP ADM-19. The duties of the authorized person, registered structural engineer and/or registered geotechnical engineer concerned as specified under section 4(3)(b) and the provision of section 14(2)(c) of the Buildings Ordinance are of particular relevance in this regard.

STATEMENT II: THE WORKS SHOWN ON THESE PLANS ARE TYPE II WORKS IN RESPECT OF WHICH THE BUILDING AUTHORITY'S CONSENT IS APPLIED FOR.

CHENG YUK-LEUNG
AUTHORIZED PERSON - ARCHITECT
For and on behalf of
Aedas Limited

Rev.	Description	Issue Date	Check Initial	App Initial
B	AMENDMENT SUBMISSION	19.06.20		
A	BD SUBMISSION	11.05.15		

Original by	Date	Draw	Check	App
MEINHARDT (M&E) LTD.	11.05.15	JY	YY	NMC

Client
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Lanbase Surveyors Limited	Lighting Planners Associates (HK) Ltd.
MVA Hong Kong Limited	Food Service Consultants, Ltd.
Vision Planning Consultants Ltd.	Advanced Aquarium Technologies
Intelibuild Technyx Asia Limited	Studio Hanson Roberts

Project
OCEAN PARK
TAI SHUE WAN DEVELOPMENT

Contract No. and Contract Title
TSW-D005
LEAD DESIGN CONSULTANT

Drawing Title
DRAINAGE SERVICES
LEGEND, ABBREVIATION, GENERAL NOTES AND DRAWING LIST

Computer file	Plot Date	Scale
	11.05.15	N.T.S.

Drawing Number	Rev.	Issue status
MME_TSW-D005_SB1-D-0001	B	SB1

Appendix G Chemical Injection Dosage Rate

Zoe Yeung

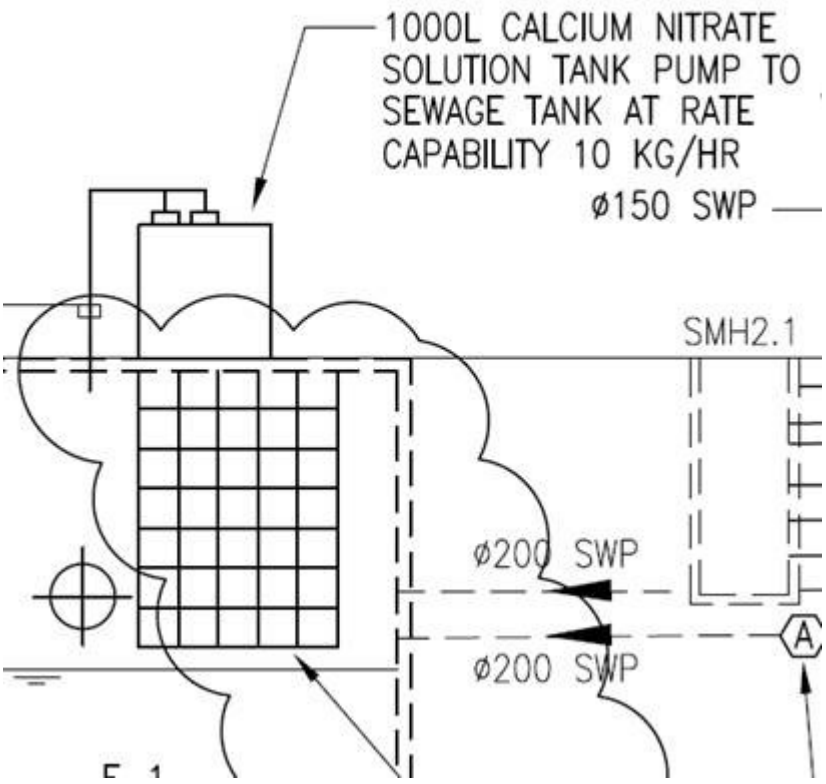
Subject: RE: Tai Shue Wan EP Condition 2.12_Detailed Design Report for the Sewerage Facilities: Request for information

From: Alan Ho <alanclho@meinhardt.com.hk>
Sent: 01 June 2021 13:19
To: Zoe Yeung <Zoe.Yeung@mottmac.com>
Cc: Gary Chow <Gary.Chow@mottmac.com>; May Tse <May.Tse@mottmac.com>; 'Polly Kan' <polly.kan@oceanpark.com.hk>; 'Lyman Lai MPL' <lyman.mpl.lai@oceanpark.com.hk>; me1831@meinhardt.com.hk
Subject: RE: Tai Shue Wan EP Condition 2.12_Detailed Design Report for the Sewerage Facilities: Request for information

Dear Zoe,

Please find GEM's reply as below:

1. Chemicals is direct injection to sewage tank.
2. Dosage rate of the chemical injection;
   1000L = 1000kg Calcium Nitrate Solution
   1 hr / 10kg
   1 day / 240kg
   1 day / 8 times
   1 time / 1 hr 15 min



Regards,
Alan

From: Sek Fai Fok [mailto:SekFai.Fok@gammonconstruction.com]
Sent: Friday, May 21, 2021 5:37 PM
To: Alan Ho; Eric Cheuk Hei Yu
Cc: 'Lyman Lai MPL'; me1831@meinhardt.com.hk; hswong@meinhardt.com.hk; 'Polly Kan'
Subject: RE: [E] RE: Tai Shue Wan EP Condition 2.12_Detailed Design Report for the Sewerage Facilities: Request for information (Reminder)

Dear Alan,

1. Chemicals is direct injection to sewage tank.
2. Dosage rate of the chemical injection;
   1000L = 1000kg Calcium Nitrate Solution
   1 hr / 10kg
   1 day / 240kg
   1 day / 8 times
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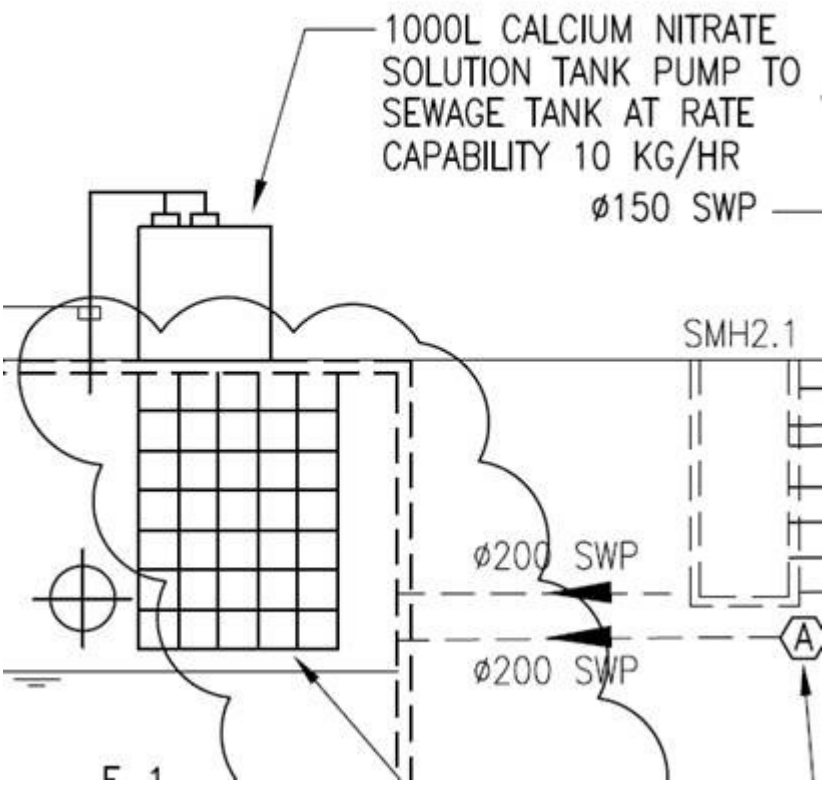

By fai