Vannex International Limited

Proposed Temporary Battery Recycling Plant and Associated Filling of Land

Sewerage Impact Assessment

Vannex International Limited

Reference: P527783

Revision: 1

2026-05-08

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Document control record

Document prepared by:

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Author signature		Approver signature	
Name	Murphy Wong	Name	Jeffrey Chan
Title	Assistant Civil Engineer	Title	Executive Director

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Appendix

1 Introduction

1.1 Background

1.1.1 Vannex International Limited is seeking planning permission to establish a temporary battery recycling plant for a period of three years at Lot 215 RP (Part) in D.D.78, Ta Kwu Ling, New Territories. The proposed sewerage plan is provided in **Figure 4.1**. The site is currently vacant and is located adjacent to the Northeast New Territories Landfill. The relocation is necessary due to government land resumption at Hung Shui Kiu for the Yuen Long South Development.

1.1.2 The proposed development is planned to have trial operation in mid or late 2027. The facility will operate within an enclosed structure, with working hours restricted to 9:00 a.m. to 6:00 p.m., Monday to Saturday, and no operation on Sundays or public holidays.

1.1.3 Aurecon Hong Kong Limited has been appointed to carry out a Sewerage Impact Assessment (SIA) in compliance with the Environmental Protection Department (EPD) and Drainage Services Department (DSD) requirements. The assessment focuses on estimating the total volume of wastewater generated by the plant per day and proposing a practical solution for its disposal. The proposed arrangement is to discharge the collected wastewater into the Flow Chamber FCH1005171 through the underground plastic pipe, subject to EPD and DSD approval. Regular monitoring of wastewater quality will be carried out by an independent laboratory to ensure compliance with EPD standards.

1.2 Objective of the Sewerage Impact Assessment

1.2.1 The objective of this Sewerage Impact Assessment (SIA) Report is to propose a practical solution to deal with the sewage generated by the temporary battery recycling plant.

1.2.2 This Report is structured as follows:

- Section 1 provides the project background of this Report and describes the project details relevant to the SIA;
- Section 2 presents the assessment methodology;
- Section 3 proposes the sewage disposal arrangement;
- Section 4 provides the conclusion to the SIA.

1.3 Abbreviations

1.3.1 The following table lists out the abbreviations for expressions adopted in this Report:

Abbreviation	Full Expression
ADWF	Average Dry Weather Flow
DI	Departmental Instruction
DSD	Drainage Services Department
EPD	Environmental Protection Department
SIA	Sewerage Impact Assessment
SPS	Sewage Pumping Station
WSD	Water Supplies Department

2 Existing Conditions

2.1 The Proposed Battery Recycling Plant

2.1.1 The proposed temporary battery recycling plant is located at Lot 215 RP (Part) in D.D.78, Ta Kwu Ling, adjacent to the Northeast New Territories Landfill, occupying a vacant site of approximately 2,268 m². The recycling plant operates between 09:00hrs and 18:00hrs.

2.1.2 The major sources of sewage at the facility mainly come from the staff toilets and the manufacturing activities. There are residual condensation water from the steam boiler and the carbonization furnace which are collected by the floor drainage system. This will also be discharged as sewage. No kitchen nor shower services are provided at the plant.

2.2 Existing Sewerage

2.2.1 There is no existing public sewerage in the vicinity of the site. Existing leachate collected from the nearby landfill site is conveyed to the DSD N.E.N.T. Landfill Leachate Pumping Station adjacent to the proposed site, and is pumped away via a twin 150mm dia rising mains, leading to Shek Wu Hui STW.

2.2.2 Based on consultation with EPD and DSD, it is understood that the above pumping station would undergo E&M upgrading works under Conract No. DC/2021/02 North East New Territories Sewerage System Upgrade planned for completion by mid 2027. Drawings obtained from DSD are enclosed in **Appendix A**.

3 Assessment Methodology

3.1 Guidelines and Standards

3.1.1 The Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning (GESF) version 1.0 issued by the Environmental Protection Department (EPD) have been adopted for estimation of the sewage produced by the battery recycling plant.

3.2 Total Sewerage Discharged

3.2.1 To estimate sewage discharged, the following equations are adopted:

- Estimated Sewage Discharged = Number of Employees × Unit Flow Factors for Industrial Flows
- Estimated Sewage Discharged = Number of Employees × Unit Flow Factors for industrial activities in North District

3.3 Peaking Factor

3.3.1 The estimated workforce of the plant is 60.

3.3.2 Peaking Factor will be adopted for estimation of peak water flow in line with the EPD Technical Paper Report no. EPD/TP1/05, Table T-5 as follows:

- Peaking Factor = 6 for population <1000 (excluding stormwater allowance) Daily Sewerage Production

3.4 Estimation of Sewerage Discharged

3.4.1 The calculation considers wastewater arising from the steam generator, carbonization furnace, and general domestic use within the facility. According to Table 3 – Unit Flow Factors for Industrial Flows in GESF of EPD, the unit flow factor of each manufacturing employee is 0.08 person/m^3/day and the unit flow factor for industrial activities in North District is 0.55 person/m^3/day.

3.4.2 **Tables 3.1 – 3.3** below summarized the sewage produced by the plant:

Table 3.1 Calculations of Average Dry Weather Flow for Industrial Employee

Employee Population	Unit Flow Factor (person/m^3/day)	Average Dry Weather Flow (m^3/d)
60	0.08	4.80
60	0.55	33.00

Table 3.2 Calculations of Total Average Dry Weather Flow

Source of Wastewater	Descriptions	Estimated Volume (m^3/day)
Steam Boiler Residual Water	Filtered water produced during steam generation, based on installation of four carbonization furnaces.	0.2
Carbonization Furnace	Excess steam discharge (non-contaminated) by four carbonization furnaces.	0.1
Foul water from industrial employee	ADWF	37.80
Total	Combined ADWF	**38.10**

Table 3.3 Calculations of Peak Flow

Combined ADWF (m^3/day)	Peaking Factor	Operating Hours (Note 1)	Peak Flow (L/s)
38.10	6	9	7.06

Note 1: Operating hours of the recycling plant is 09:00 to 18:00

3.4.3 The average dry weather flow (ADWF) from the proposed battery recycling plant is 38.10m^3/day. Given the operating hours of the battery plant being 9 hours daily, with a peaking factor of 6 based on the population of the site, the estimated peak flow will be 7.06L/s.

4 Proposed Sewerage

4.1 Proposed Sewerage Connection

4.1.1 It is proposed that a 100 mm dia rising main be constructed to convey the sewage from the recycling plant for discharge to the existing wetwell (at roof level of the wetwell) of the nearby NENT Landfill Leachate SPS, for onward conveyance to the Shek Wu Hui STW.

4.1.2 The quantity of the discharge of 7.06L/s is expected to be insignificant compared to the capacity of the existing SPS, and therefore no adverse impact to the SPS is expected.

4.1.3 The proposed sewerage is presented in **Figure 4.1**.

4.1.4 Prior to implemention of the proposed sewerage, the proponent shall submit the design of the sewerage connecton details to DSD for agreement before commencement of the works.

4.2 Calculation of Proposed Sewerage Pipe

4.2.1 The total length of the propsoed rising main is about 120m.

Table 4.1 Hydraulic Capacity Check for 100 mm Rising Main

Existing Flow	Full Bore Velocity, Vo	Full Bore Capacity, Qo	Utilisation
L/s	m/s	m^3/s	%
7.06	1.10	0.08	81.72

4.2.2 The hydraulic check confirms that the proposed 100 mm rising main can adequately convey the peak flow of 7.06 L/s.

5 Conclusion

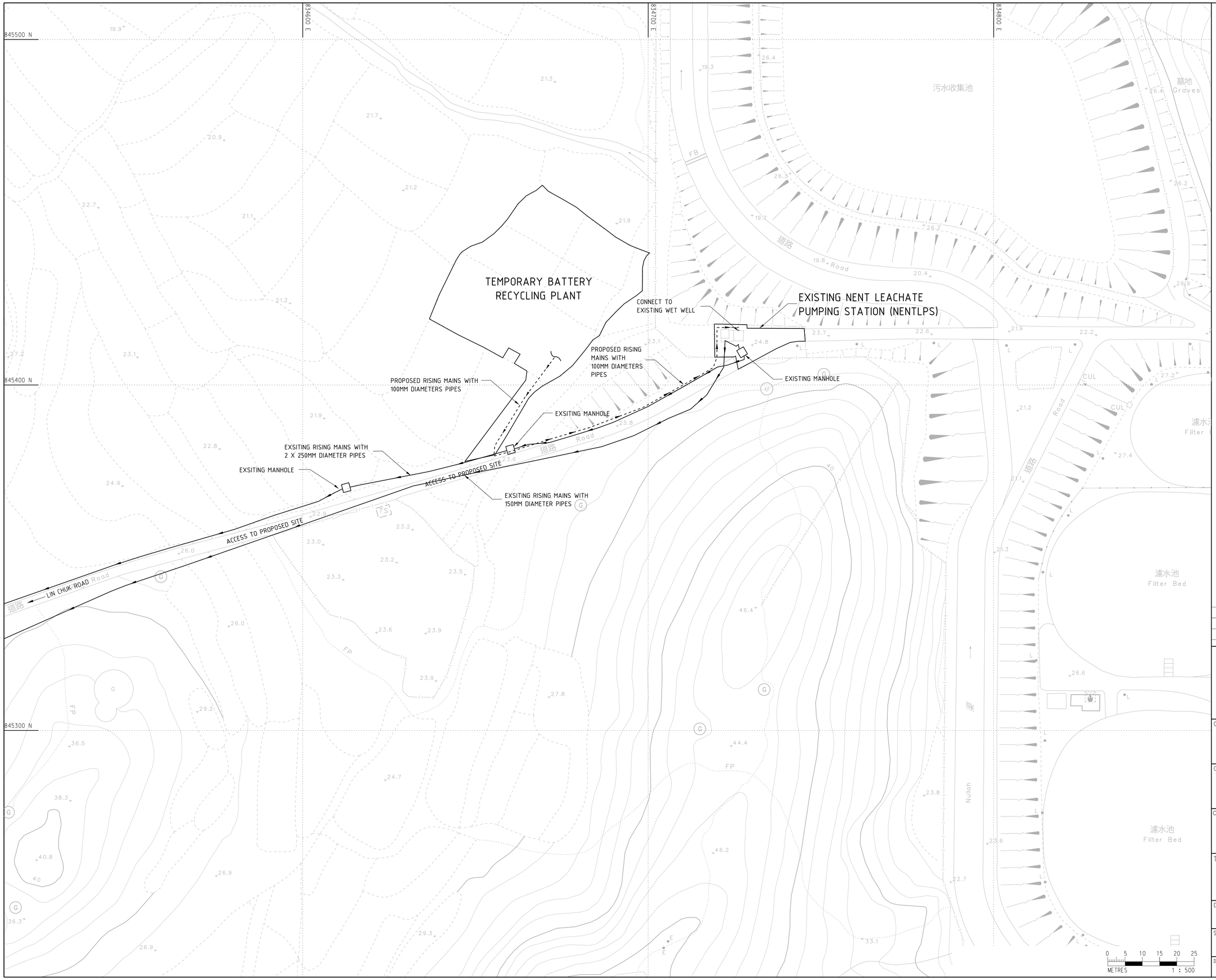
5.1.1 The proposed battery recycling plant by Vannex International Limited is proposed to going into trial production by mid to late 2027. Sewage generated from the plant, which consists of condensed vapour from the boilers and employee toilets would amount to a ADWF of 38.10m^3, and a peak flow of about 7L/s based on the operation of 9 hours daily.

5.1.2 There is no public sewerage system in the vicinity of the site. The exisitng DSD NENT Leachate Pumpign Station nearby the site currently receives leachate collected from the nearby landfill and conveys this to Shek Wu Hui STW via a twin 150mm dia rising main system. E&M upgrade to the pumping station is currently planned for completion by mid 2027.

5.1.3 The sewage from the proposed battery recyling plant is proposed to be discharged to the wetwell of the pumping station (ie. M/H FCH100517) after the upgrading of the pumping station via a 100mm dia rising main to be constructed by the proponent for sewage discharge to the existing wetwell of the NENT Leachate PS.

5.1.4 Prior to the commencement of construction, the proponent shall submit the particulars of the connection details to DSD for agreement before work starts.

Figure 4.1
Proposed Sewerage Plan



LEGEND:

- EXSITING RISING MAIN (SEWER)
- EXISTING MANHOLE
- PROPOSED P.E. PIPE

REV.	DESCRIPTION	PREPARED	CHECKED	DATE

CLIENT

VANNEX INTERNATIONAL LIMITED

CONSULTANT

aurecon

CONTRACTOR

TITLE

PROPOSED SEWERAGE PLAN

DRG. NO.

FIGURE 4.1

SCALE	DATE	REV.
	8/5/2026	

DIMENSIONS ARE IN METERS

DATE : 8/5/2026 TIME : 2:39:50 pm PLOT DRIVER : _AUR-GEN-A1-CO.pltcfg PENTABLE : _AUR-GEN-PEN.tbl
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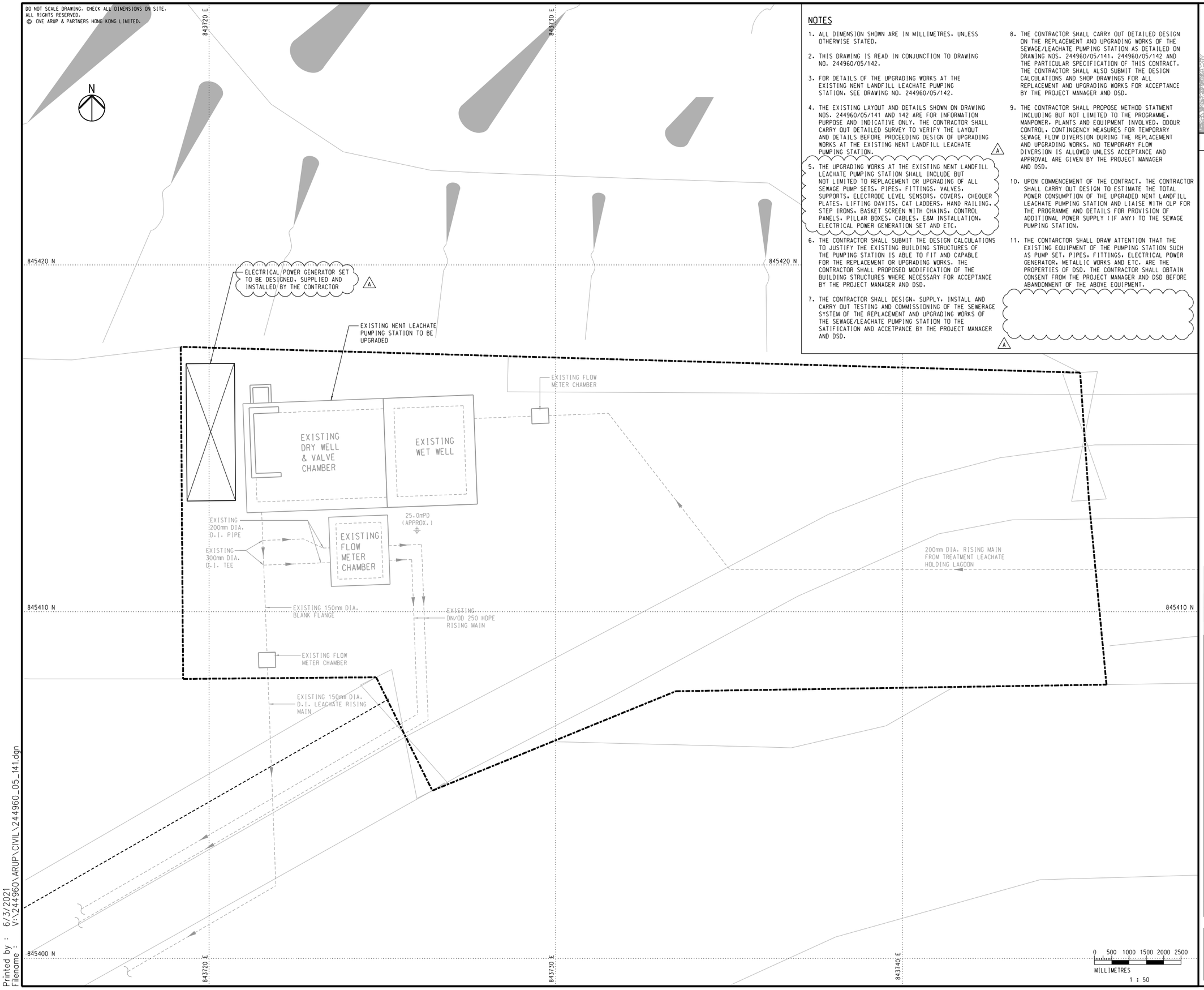
Appendix A
Drawings from Contract No. DC/2021/02



NOTES

1. ALL DIMENSION SHOWN ARE IN MILLIMETRES, UNLESS OTHERWISE STATED.
2. THIS DRAWING IS READ IN CONJUNCTION TO DRAWING NO. 244960/05/142.
3. FOR DETAILS OF THE UPGRADING WORKS AT THE EXISTING NENT LANDFILL LEACHATE PUMPING STATION, SEE DRAWING NO. 244960/05/142.
4. THE EXISTING LAYOUT AND DETAILS SHOWN ON DRAWING NOS. 244960/05/141 AND 142 ARE FOR INFORMATION PURPOSE AND INDICATIVE ONLY. THE CONTRACTOR SHALL CARRY OUT DETAILED SURVEY TO VERIFY THE LAYOUT AND DETAILS BEFORE PROCEEDING DESIGN OF UPGRADING WORKS AT THE EXISTING NENT LANDFILL LEACHATE PUMPING STATION. A
5. THE UPGRADING WORKS AT THE EXISTING NENT LANDFILL LEACHATE PUMPING STATION SHALL INCLUDE BUT NOT LIMITED TO REPLACEMENT OR UPGRADING OF ALL SEWAGE PUMP SETS, PIPES, FITTINGS, VALVES, SUPPORTS, ELECTRODE LEVEL SENSORS, COVERS, CHEQUER PLATES, LIFTING DAVITS, CAT LADDERS, HAND RAILING, STEP IRONS, BASKET SCREEN WITH CHAINS, CONTROL PANELS, PILLAR BOXES, CABLES, E&M INSTALLATION, ELECTRICAL POWER GENERATION SET AND ETC.
6. THE CONTRACTOR SHALL SUBMIT THE DESIGN CALCULATIONS TO JUSTIFY THE EXISTING BUILDING STRUCTURES OF THE PUMPING STATION IS ABLE TO FIT AND CAPABLE FOR THE REPLACEMENT OR UPGRADING WORKS. THE CONTRACTOR SHALL PROPOSED MODIFICATION OF THE BUILDING STRUCTURES WHERE NECESSARY FOR ACCEPTANCE BY THE PROJECT MANAGER AND DSD.
7. THE CONTRACTOR SHALL DESIGN, SUPPLY, INSTALL AND CARRY OUT TESTING AND COMMISSIONING OF THE SEWERAGE SYSTEM OF THE REPLACEMENT AND UPGRADING WORKS OF THE SEWAGE/LEACHATE PUMPING STATION TO THE SATIFICATION AND ACCETPANCE BY THE PROJECT MANAGER AND DSD.
8. THE CONTRACTOR SHALL CARRY OUT DETAILED DESIGN ON THE REPLACEMENT AND UPGRADING WORKS OF THE SEWAGE/LEACHATE PUMPING STATION AS DETAILED ON DRAWING NOS. 244960/05/141, 244960/05/142 AND THE PARTICULAR SPECIFICATION OF THIS CONTRACT. THE CONTRACTOR SHALL ALSO SUBMIT THE DESIGN CALCULATIONS AND SHOP DRAWINGS FOR ALL REPLACEMENT AND UPGRADING WORKS FOR ACCEPTANCE BY THE PROJECT MANAGER AND DSD.
9. THE CONTRACTOR SHALL PROPOSE METHOD STATMENT INCLUDING BUT NOT LIMITED TO THE PROGRAMME, MANPOWER, PLANTS AND EQUIPMENT INVOLVED, ODOUR CONTROL, CONTINGENCY MEASURES FOR TEMPORARY SEWAGE FLOW DIVERSION DURING THE REPLACEMENT AND UPGRADING WORKS. NO TEMPORARY FLOW DIVERSION IS ALLOWED UNLESS ACCEPTANCE AND APPROVAL ARE GIVEN BY THE PROJECT MANAGER AND DSD.
10. UPON COMMENCEMENT OF THE CONTRACT, THE CONTRACTOR SHALL CARRY OUT DESIGN TO ESTIMATE THE TOTAL POWER CONSUMPTION OF THE UPGRADED NENT LANDFILL LEACHATE PUMPING STATION AND LIAISE WITH CLP FOR THE PROGRAMME AND DETAILS FOR PROVISION OF ADDITIONAL POWER SUPPLY (IF ANY) TO THE SEWAGE PUMPING STATION.
11. THE CONTARCTOR SHALL DRAW ATTENTION THAT THE EXISTING EQUIPMENT OF THE PUMPING STATION SUCH AS PUMP SET, PIPES, FITTINGS, ELECTRICAL POWER GENERATOR, METALLIC WORKS AND ETC. ARE THE PROPERTIES OF DSD. THE CONTRACTOR SHALL OBTAIN CONSENT FROM THE PROJECT MANAGER AND DSD BEFORE ABANDONMENT OF THE ABOVE EQUIPMENT.

A

A

KEY LOCATION PLAN

LEGEND

EXISTING RISING MAIN

WORKS BOUNDARY

PUMP DESIGN PARAMETERS

SEWAGE PUMP NO.	LP-11 (1 NO.), LP-12 (1 NO.)
FLOWRATE (EACH PUMP)	46.3 l/s (MINIMUM)
TOTAL HEAD	61.5m (MINIMUM)

Rev	Description	By	Date
A	TENDER ADDENDUM NO. 2	CM	06/21
-	TENDER DRAWING	CM	04/21

Consultant

ARUP

Contract No. and Title

Contract No. DC/2021/02

North East New Territories Sewerage System Upgrade

Drawing title

APPENDIX A
UPGRADING WORKS AT EXISTING NENT LANDFILL LEACHATE PUMPING STATION - GENERAL LAYOUT PLAN

Drawing no.			Rev.
244960/05/141			A
Drawn: CSK	Date: 04/21	Checked: JW	Approved: KK
Scale: 1:50 @A1		Status: CONTRACT	

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DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

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Printed by : 6/3/2021
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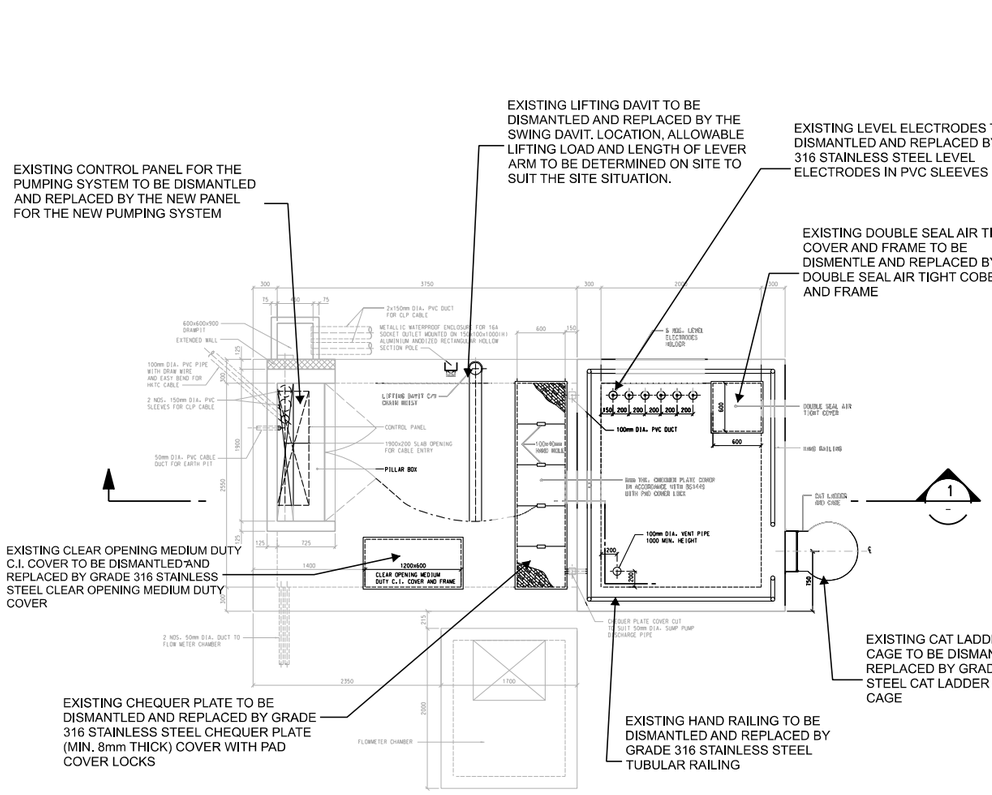

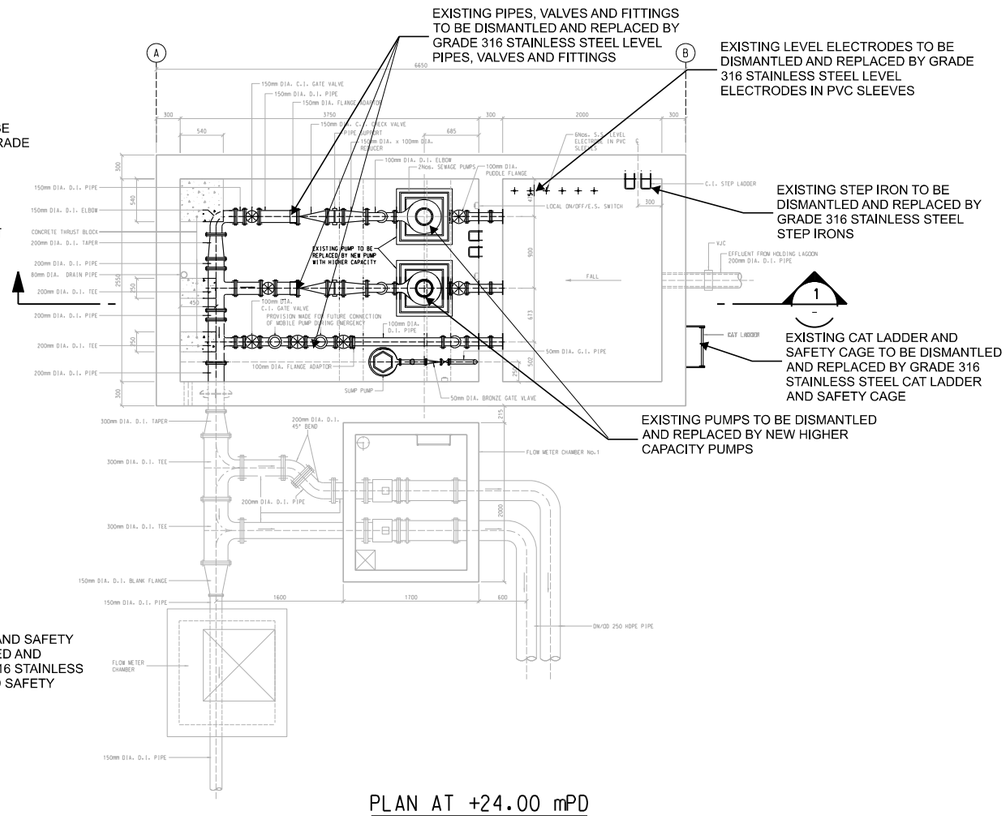

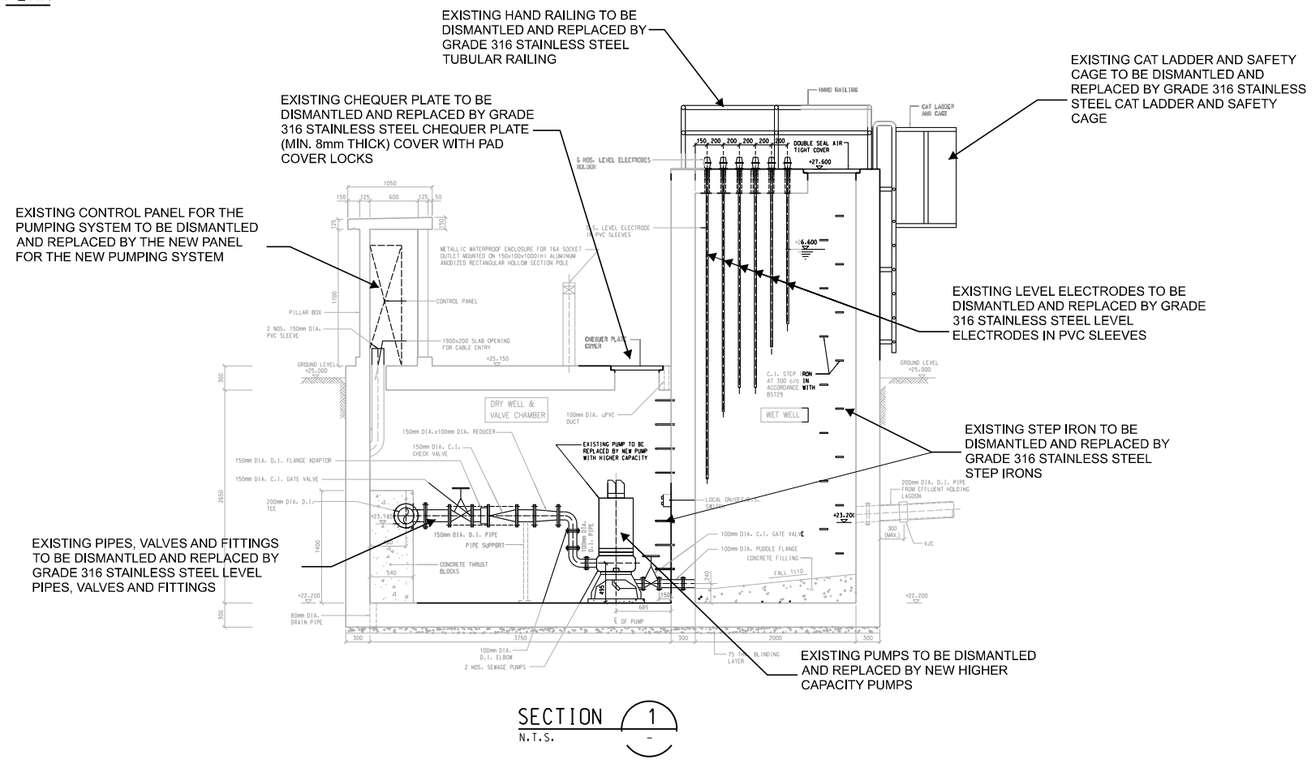

NOTES:

1. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN mm. ALL LEVEL ARE IN mPD.
2. THIS DRAWING IS READ IN JUNCTION TO DRAWING NO. 244960/05/141.
3. UNLESS OTHERWISE SPECIFIED, ALL METAL WORKS SHALL BE GRADE 316 STAINLESS STEEL.
4. THE CONTRACTOR SHALL PROPOSE FIXING DETAILS OF THE PUMP SETS, PIPE, FITTINGS AND VALVE INSIDE THE SEWAGE/LEACHATE PUMPING STATION.
5. THE UPGRADING WORKS AT THE EXISTING SEWAGE/ LEACHATE PUMPING STATION SHALL INCLUDE BUT NOT LIMITED TO REPLACEMENT OR UPGRADING OF ALL LEACHATE/SEWAGE PUMP SETS, PIPES, FITTINGS, VALVE, SUPPORTS, ELECTRODE LEVEL SENSORS, COVERS, CHEQUER PLATES, LIFTING DAVITS, CAT LADDERS, HAND RAILING, STEP IRONS, BASKET SCREEN WITH CHAINS, CONTROL PANELS, PILLAR BOXES, CABLES, E&M INSTALLATION, ELECTRICAL POWER GENERATION SET AND ETC. A
6. FOR DETAILS OF NEW HIGHER CAPACITY PUMPS TO BE INSTALLED, SEE RELEVANT CLAUSES OF THE PARTICULAR SPECIFICATION SECTION 30.
7. THE CONTRACTOR SHALL DESIGN THE BOX OUT DETAILS FOR THE REPLACED/UPGRADED PIPES PASSING THROUGH THE EXISTING WALLS AND SLAB FOR ACCEPTANCE BY THE PROJECT MANAGER.
8. THE CONTRACTOR SHALL EMPLOY A SPECIALIST FOR CARRYING OUT SURGE ANALYSIS OF THE PUMPING SYSTEM. WHERE AS REQUIRED, THE CONTRACTOR SHALL DESIGN THE SURGE PROTECTION FACILITIES AT THE SEWERAGE SYSTEM FOR ACCEPTANCE AND APPROVAL BY THE PROJECT MANAGER AND DSD. FOR DETAILS OF SURGE ANAYLSIS, SEE RELEVANT CLAUSES OF THE PARTICULAR SPECIFICATION SECTION 30.
9. THE CONTRACTOR SHALL IDENTIFY THE LOCATION AND PROVIDE DESIGN DETAILS FOR CONNECTION BETWEEN EXISTING AND REPLACED PIPES INSIDE AND OUTSIDE THE PUMPING STATION FOR ACCEPTANCE BY THE PROJECT MANAGER. A
10. THE CONTRACTOR IS NOT ALLOWED TO SHUT DOWN THE EXISTING PUMPS FOR REPLACEMENT OR UPGRADING WORKS WITHOUT AGREEMENT FROM THE PROJECT MANAGER AND DSD. THE CONTRACTOR SHALL SUBMIT DETAILED METHOD STATEMENT FOR TEMPORARY SEWAGE FLOW DIVERSION DURING REPLACEMENT OR UPGRADING WORKS FOR ACCEPTANCE AND APPROVAL BY THE PROJECT MANAGER AND DSD.

Rev	Description	By	Date
A	TENDER ADDENDUM NO. 2	CM	06/21
-	TENDER DRAWING	CM	04/21

Consultant

ARUP

Contract No. and Title

Contract No. DC/2021/02

North East New Territories Sewerage System Upgrade

Drawing title

APPENDIX A
UPGRADING WORKS AT EXISTING NENT LANDFILL LEACHATE PUMPING STATION - GENERAL LAYOUT PLAN

Drawing no.		Rev.
244960/05/142		A
Drawn: SYU	Date: 04/21	Checked: JW / Approved: KK
Scale: N.T.S.		Status: CONTRACT

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DRAINAGE SERVICES DEPARTMENT
GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION

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