

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

TITLE: Trunk Main Pipe Typical Section (Sea Park to Davara - 7/10)

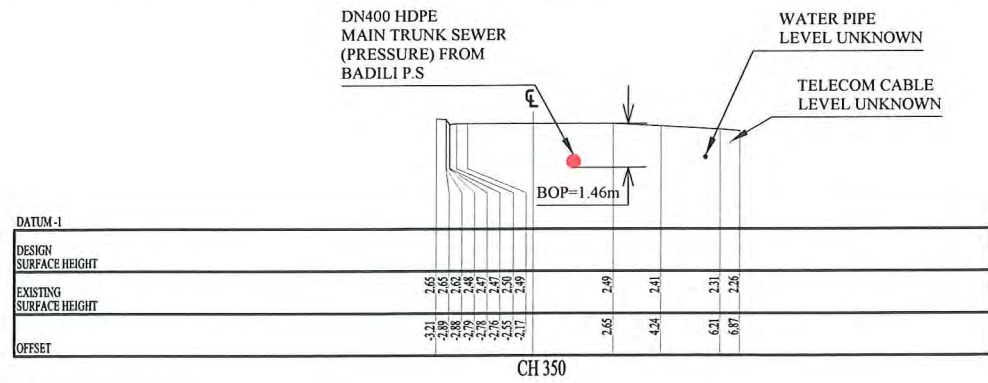
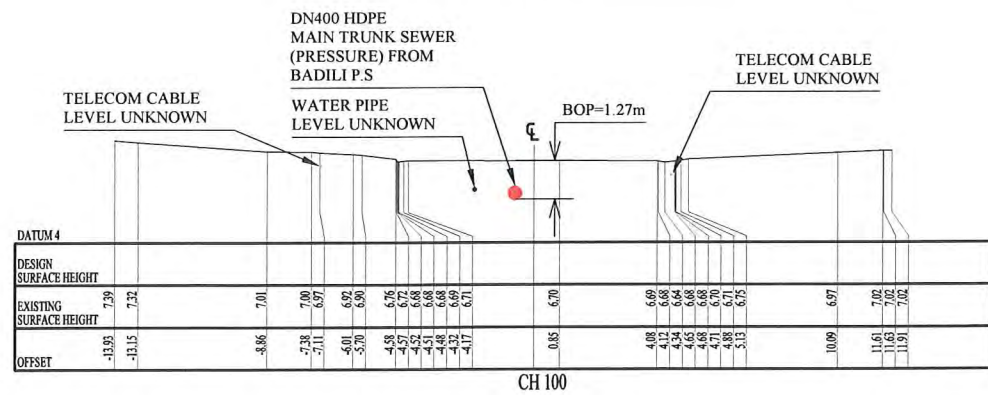
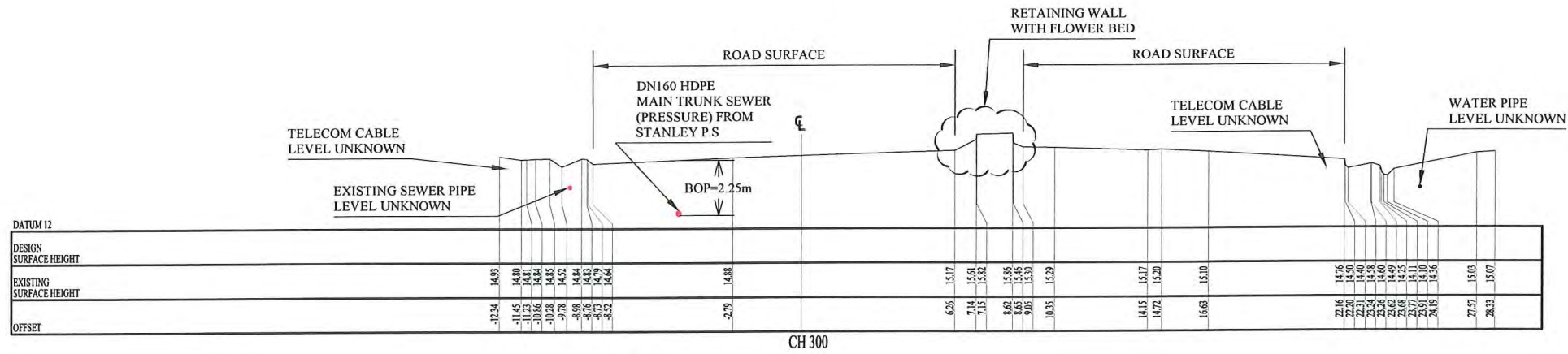
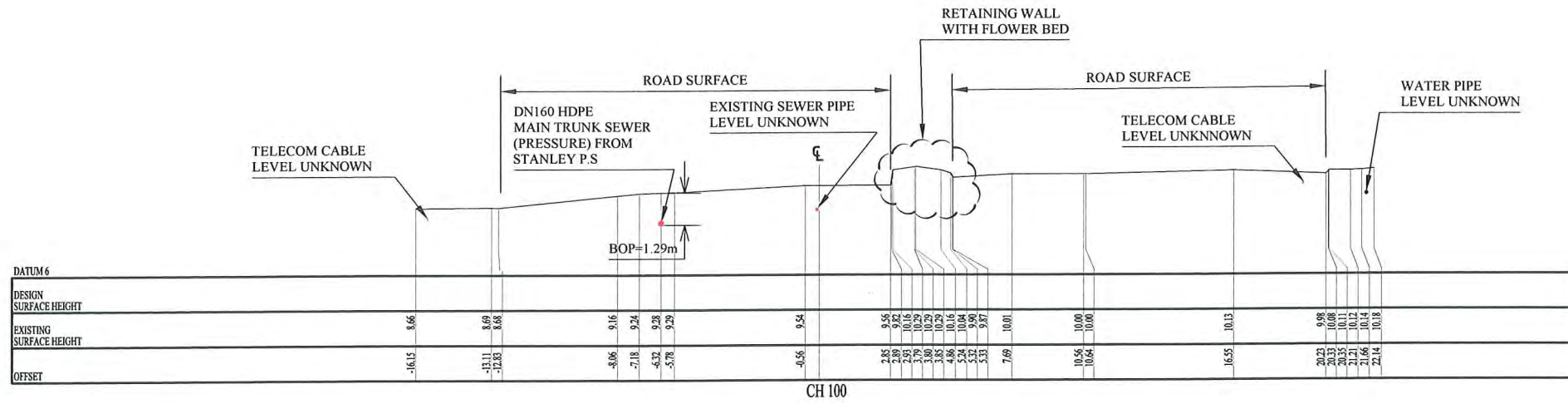
CLIENT: INDEPENDENT PUBLIC BUSINESS CORPORATION  
 PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT  
 PROJECT MANAGEMENT UNIT (PMU)  
 JAPAN INTERNATIONAL COOPERATION AGENCY

CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN

NOTES:

REVISIONS		
REV.	DATE	DESCRIPTION

APPROVED by PMU: Project Director Lot G.Zauya  
 CHECKED by CONSULTANT: Project Manager T.Fuji  
 DATE: 1. Dec 2011  
 SCALE: 1/250  
 DRAWING NO.: PI-62



**PROJECT:** PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

**CLIENT:** INDEPENDENT PUBLIC BUSINESS CORPORATION  
PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT  
PROJECT MANAGEMENT UNIT (PMU)  
JAPAN INTERNATIONAL COOPERATION AGENCY

**CONSULTANTS:** NJS CONSULTANTS CO., LTD. - JAPAN

**TITLE:** Trunk Main Pipe Typical Section (Stanley to Davara and Badili to Receiving Well (1) - 8/10)

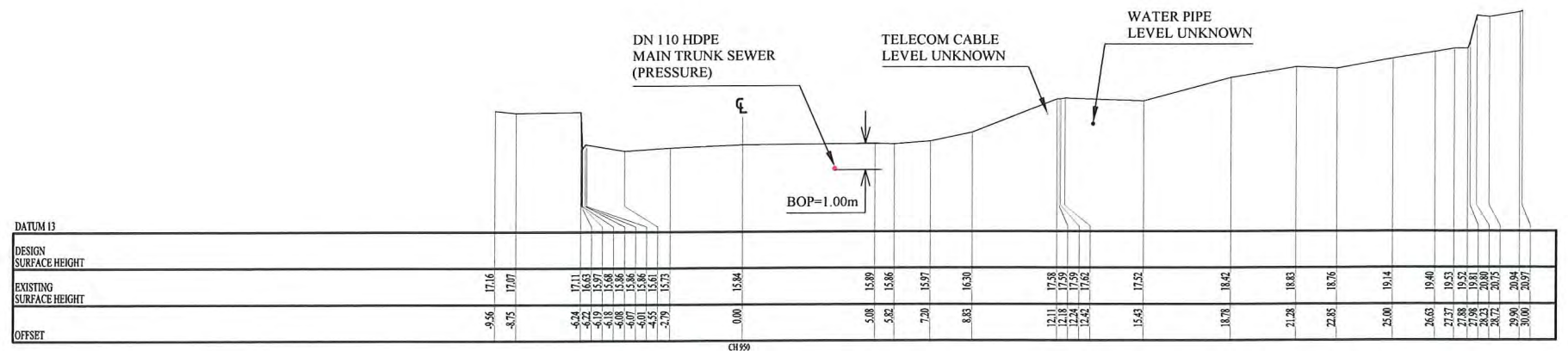
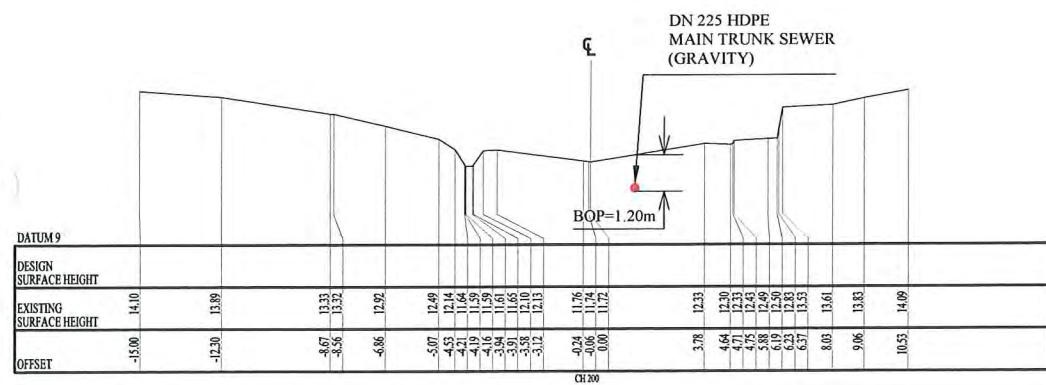
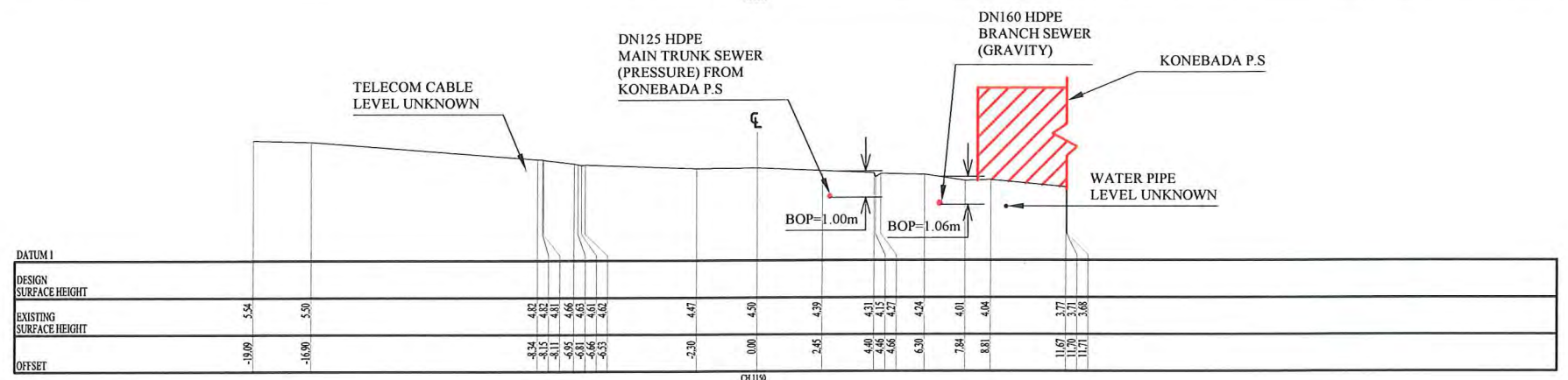
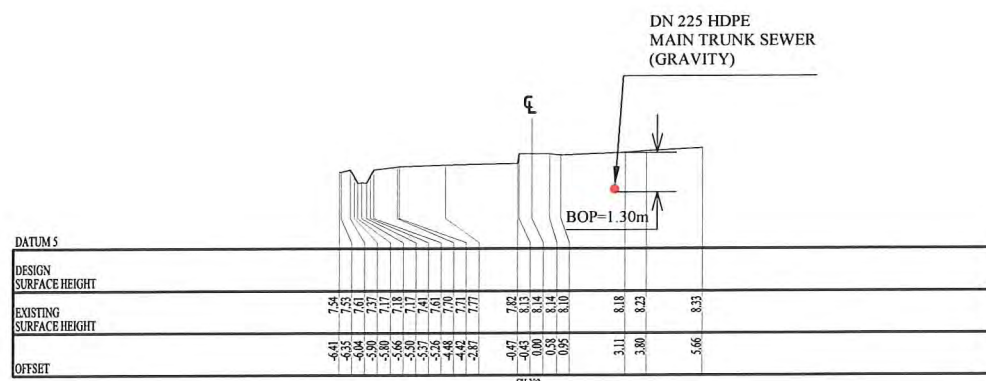
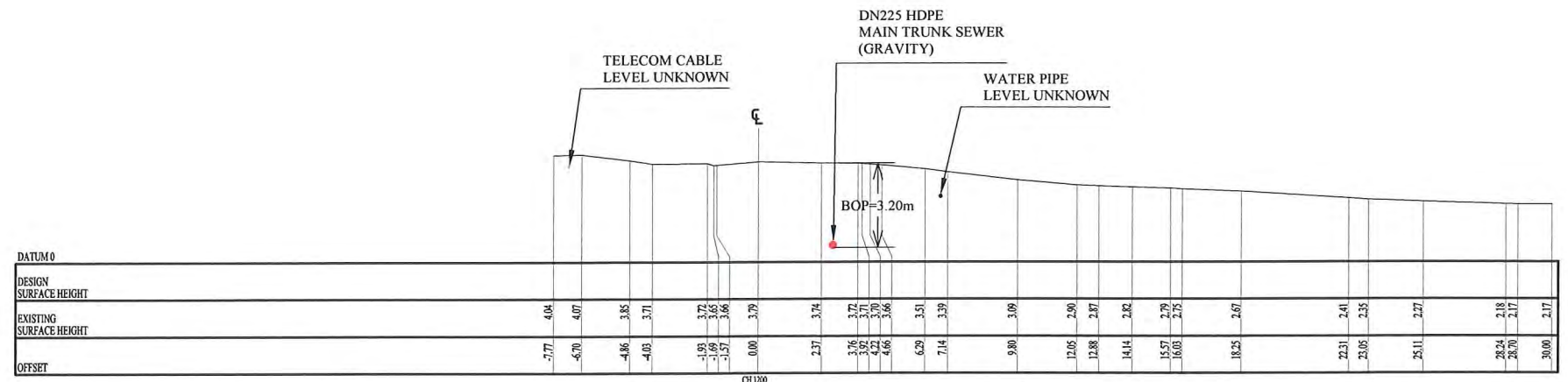
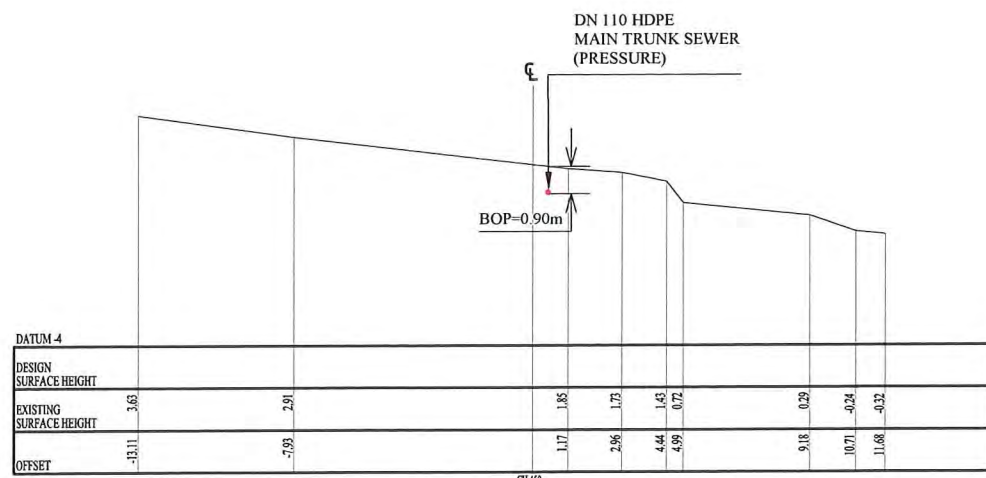
**NOTES:**

REVISIONS		
REV.	DATE	DESCRIPTION

**APPROVED BY PMU:** Project Director Lot G.Zauya  
**CHECKED BY CONSULTANT:** Project Manager T.Fuji

**DATE:** 1. Dec 2011  
**SCALE:** 1/250

**DATE:** 1. Dec 2011  
**DRAWING NO.:** PI-63



PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

TITLE: Trunk Main Pipe Typical Section (Kila Police to Receiving Well (1) - 9/10)

CLIENT: INDEPENDENT PUBLIC BUSINESS CORPORATION  
 PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT  
 PROJECT MANAGEMENT UNIT (PMU)  
 JICA JAPAN INTERNATIONAL COOPERATION AGENCY

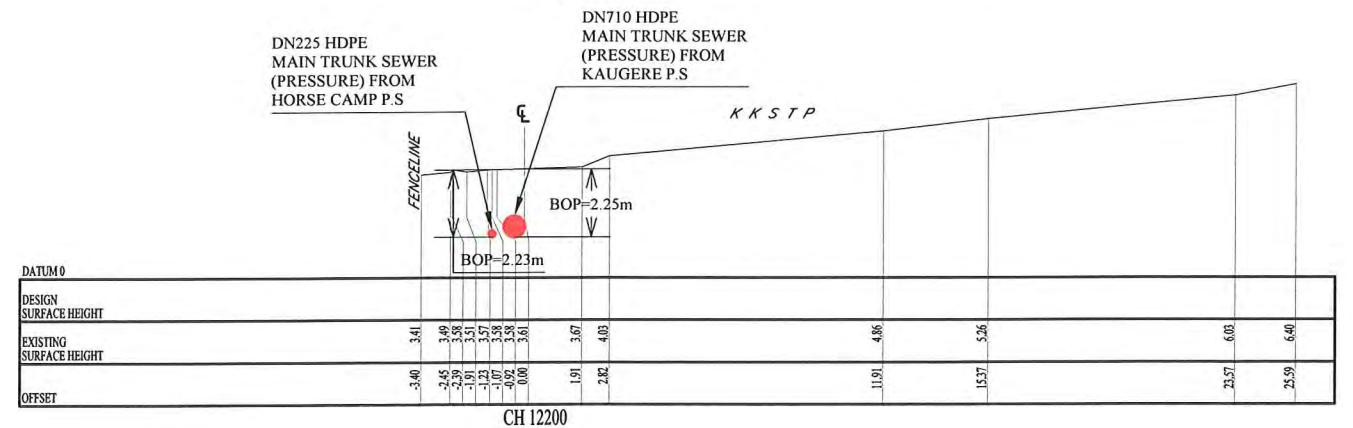
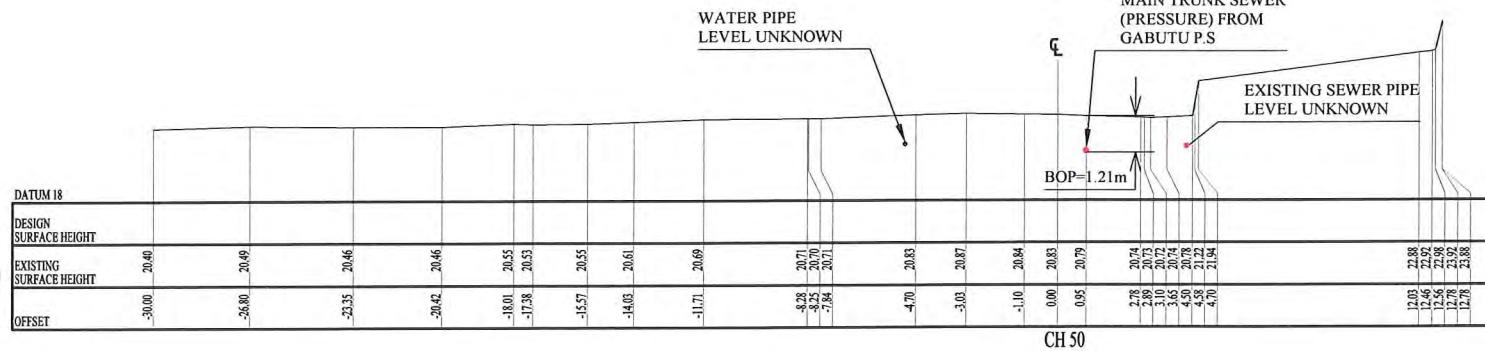
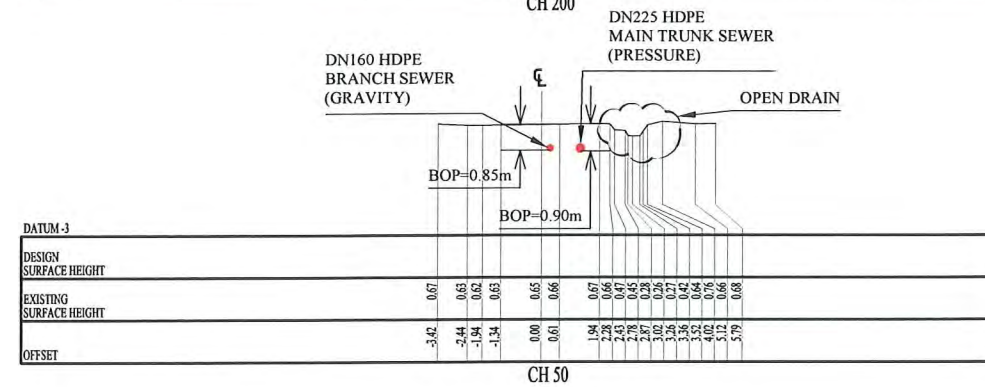
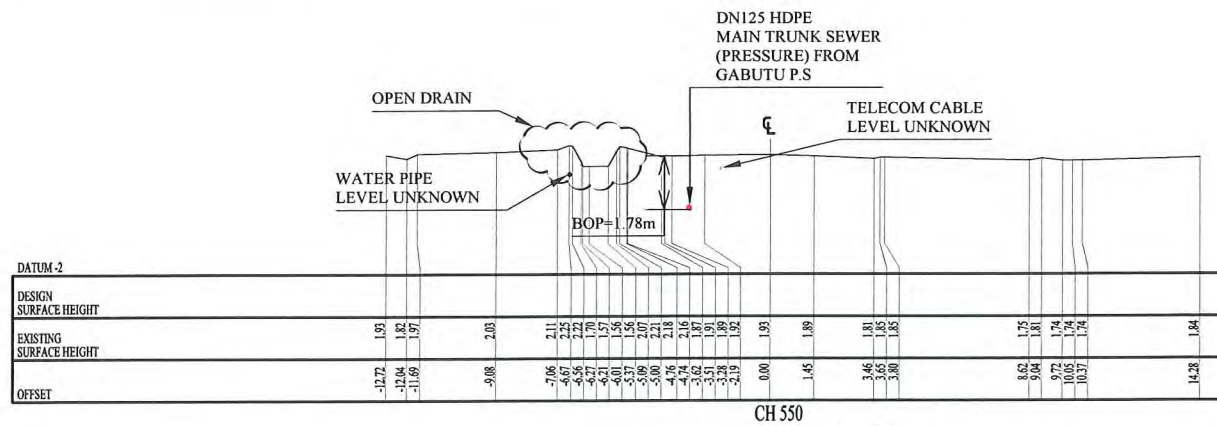
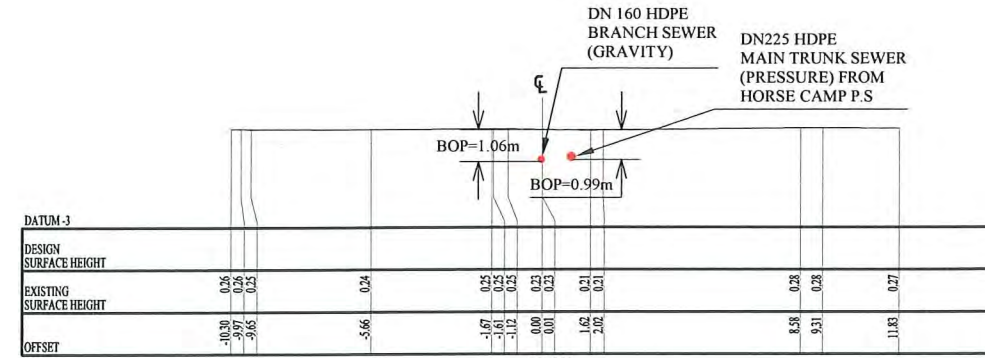
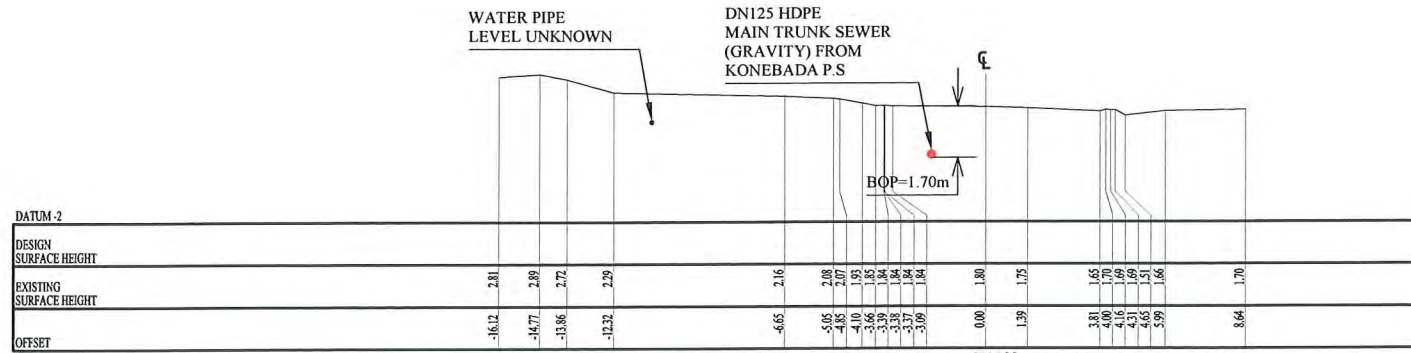
CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN

NOTES:

REVISIONS		
REV.	DATE	DESCRIPTION

APPROVED by PMU:  
 Project Director  
 Lot G.Zauya  
 CHECKED by CONSULTANT  
 Project Manager  
 T.Fuji

DATE: 1. Dec 2011  
 DATE: 1. Dec 2011  
 SCALE: 1/250  
 DRAWING NO.: PI-64



PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP) TITLE: Trunk Main Pipe Typical Section (Kila Police to Receiving Well (1) and Horsecamp to STP -10/10)

CLIENT: INDEPENDENT PUBLIC BUSINESS CORPORATION  
 PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT  
 PROJECT MANAGEMENT UNIT (PMU)  
 JICA JAPAN INTERNATIONAL COOPERATION AGENCY

CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN

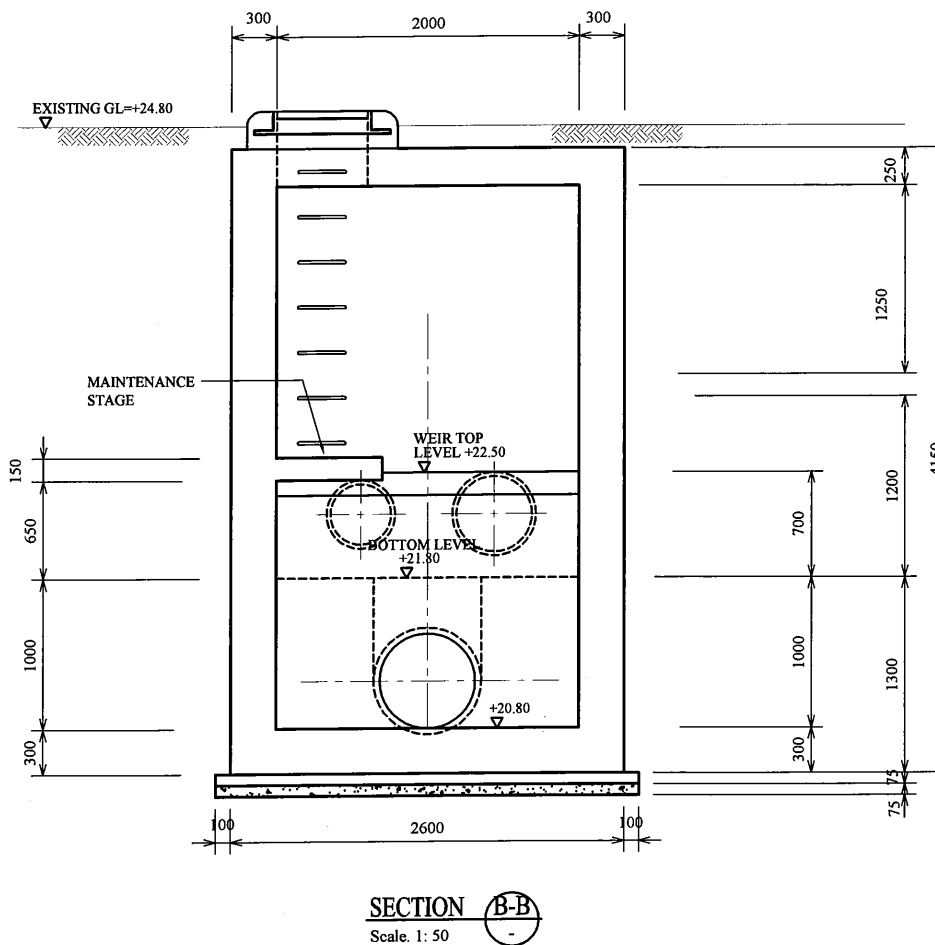
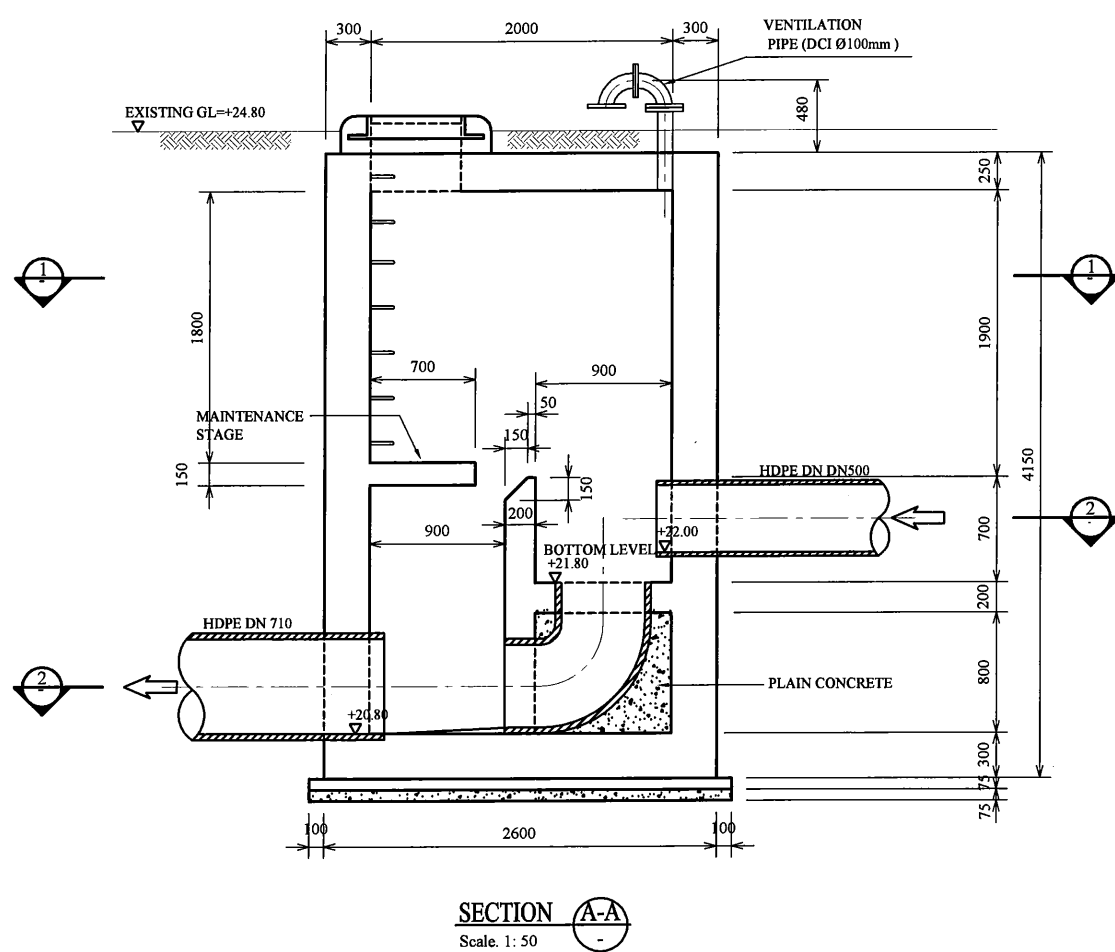
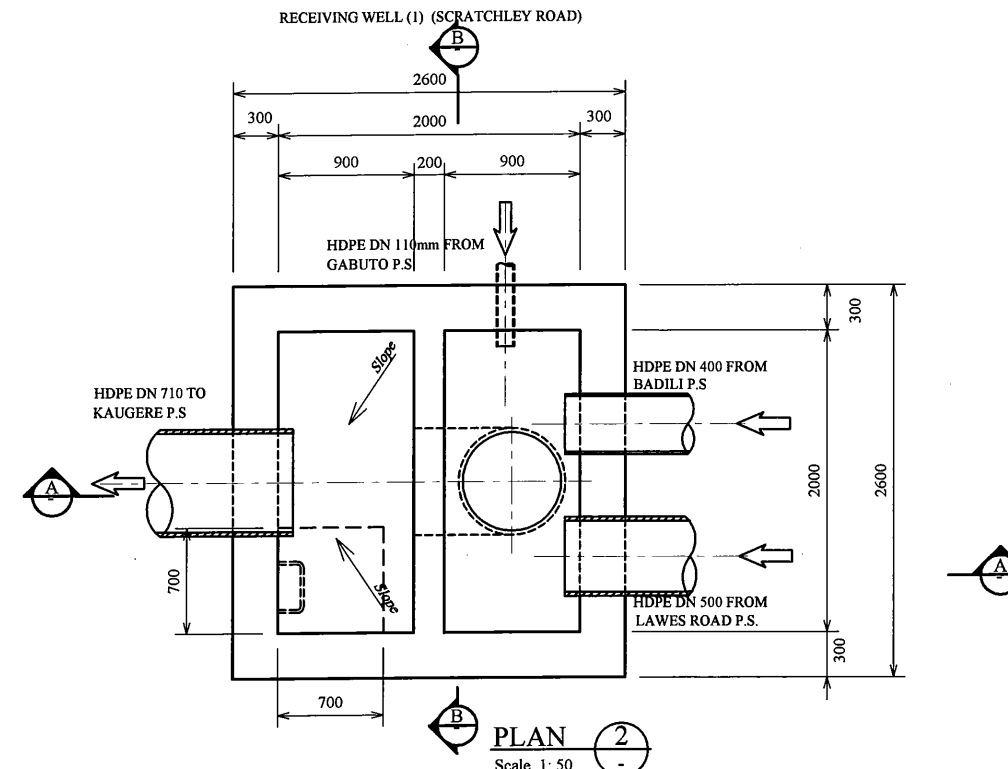
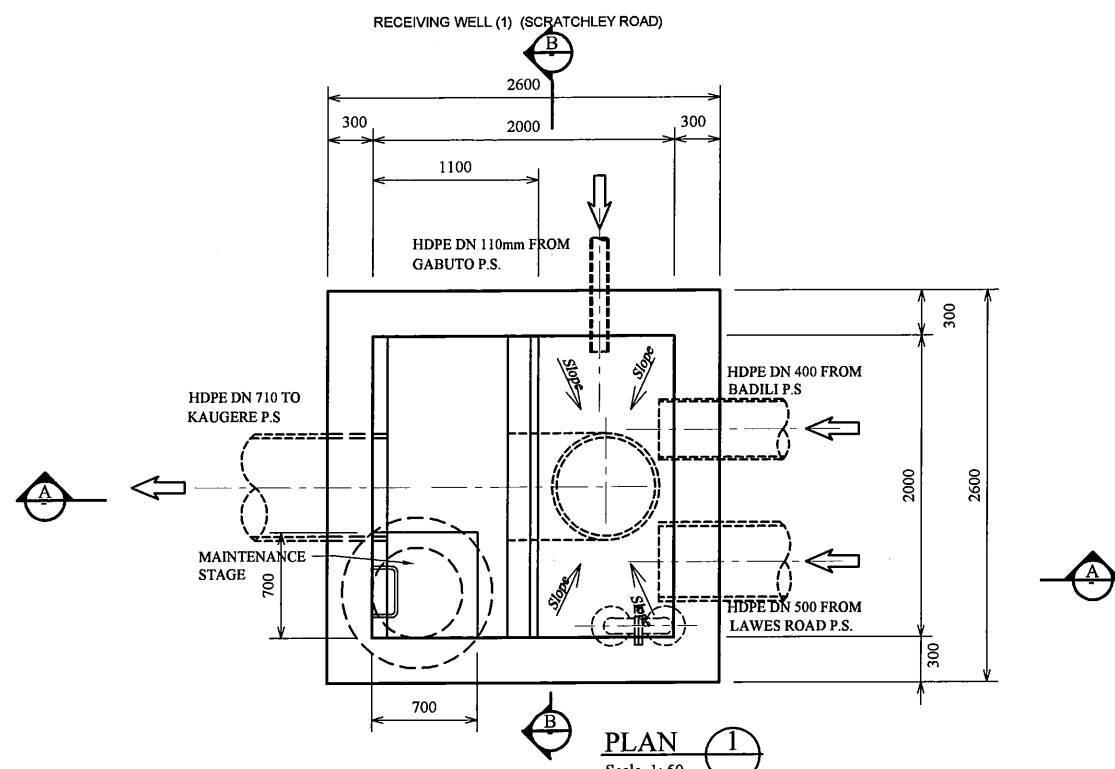
NOTES:

REVISIONS		
REV.	DATE	DESCRIPTION

APPROVED by PMU: Project Director Lot G.Zauya  
 CHECKED by CONSULTANT: Project Manager T.Fuji

DATE: 1. Dec 2011 SCALE: 1/250  
 DATE: 1. Dec 2011 DRAWING NO.: PI-65

NOTE  
ALL THE INNER SURFACE OF  
CONCRETE WALL TO BE PAINTED  
WITH CORROSION PROTECTION  
SPECIFIED IN THE PARTICULAR  
SPECIFICATION



PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

CLIENT: INDEPENDENT PUBLIC BUSINESS CORPORATION  
PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT  
PROJECT MANAGEMENT UNIT (PMU)  
JICA JAPAN INTERNATIONAL COOPERATION AGENCY

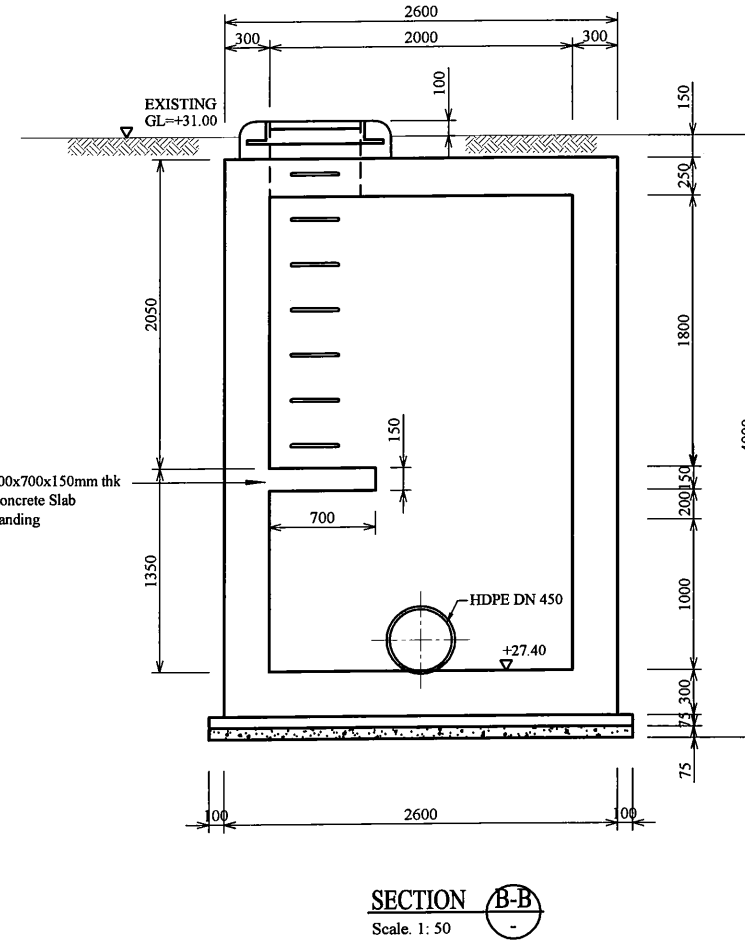
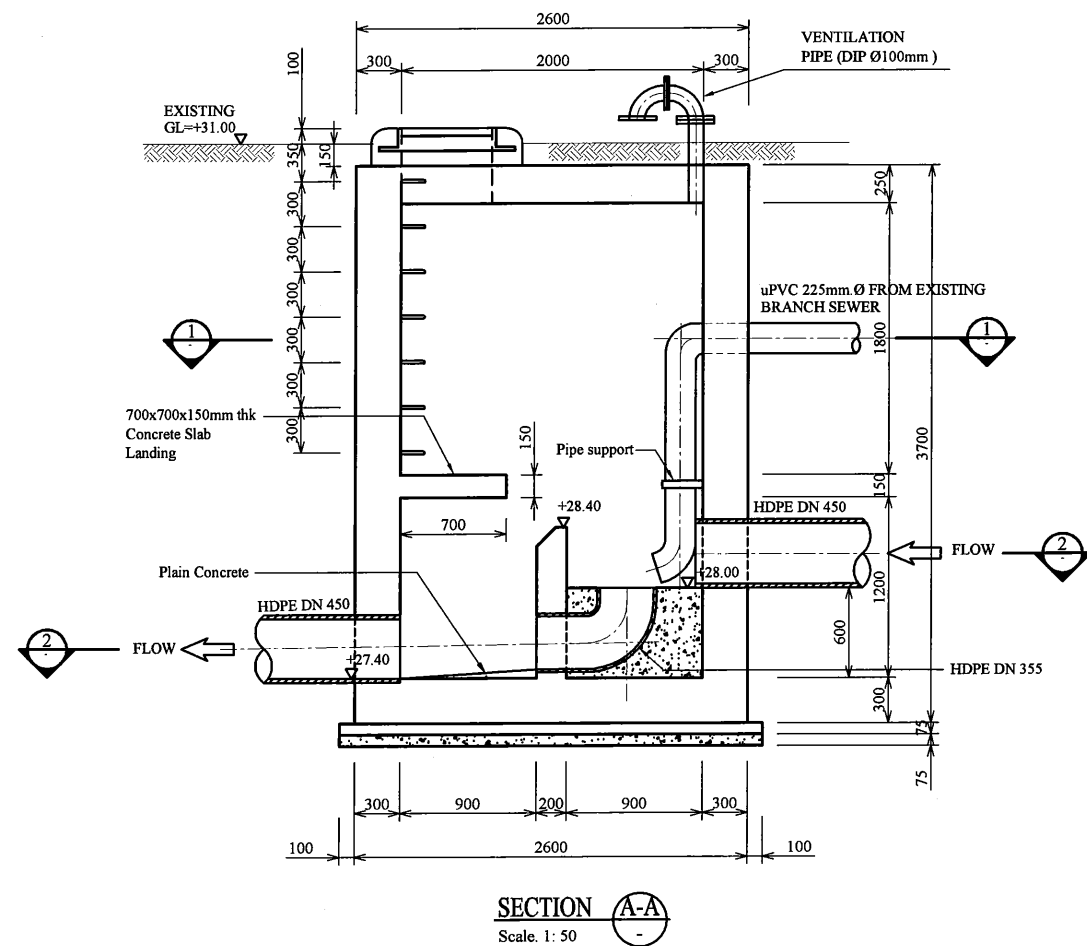
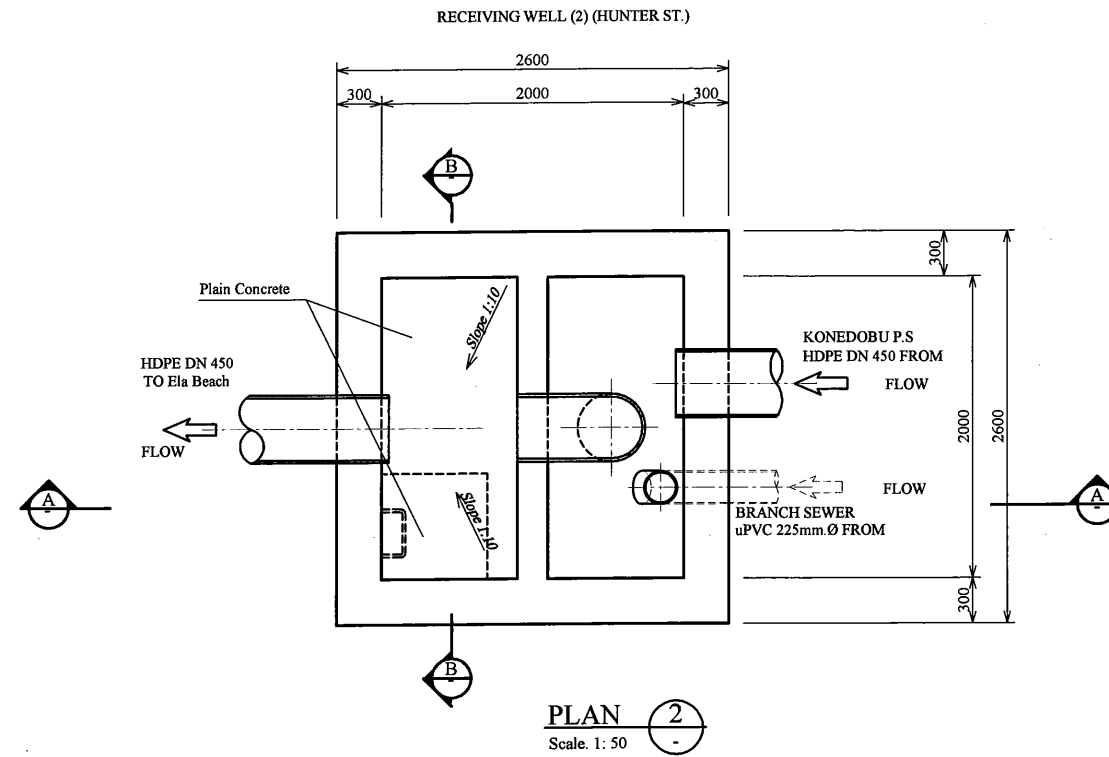
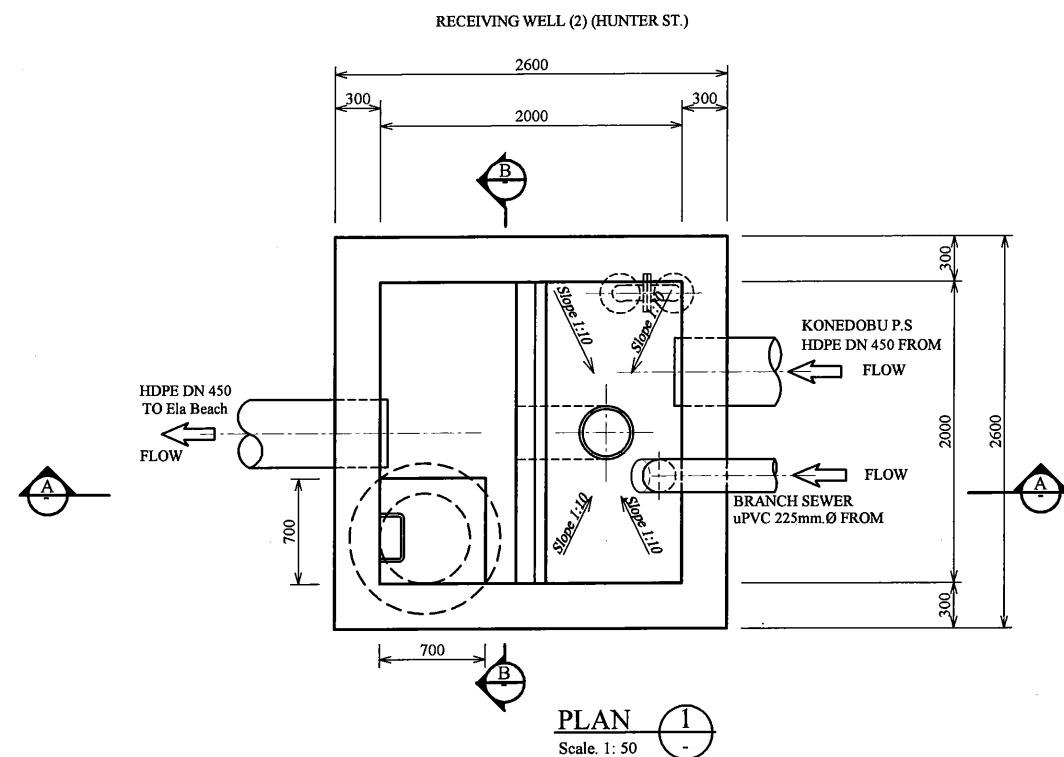
CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN

TITLE: RECEIVING WELL (1) PLAN & SECTION

NOTES:

REVISIONS		
REV.	DATE	DESCRIPTION

APPROVED by PMU: Project Director Lot G.Zauya	DATE: 1. Dec 2011	SCALE: 1/50
CHECKED by CONSULTANT Project Manager T.Fuji	DATE: 1. Dec 2011	DRAWING NO.: PI-67



PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

TITLE: RECEIVING WELL (2) PLAN & SECTION

CLIENT: **IPBC** INDEPENDENT PUBLIC BUSINESS CORPORATION  
 PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT  
 PROJECT MANAGEMENT UNIT (PMU)  
**JICA** JAPAN INTERNATIONAL COOPERATION AGENCY

CONSULTANTS: **NJS** NJS CONSULTANTS CO., LTD. - JAPAN

NOTES:

REVISIONS		
REV.	DATE	DESCRIPTION

APPROVED by PMU:  
 Project Director  
 Lot G.Zauya

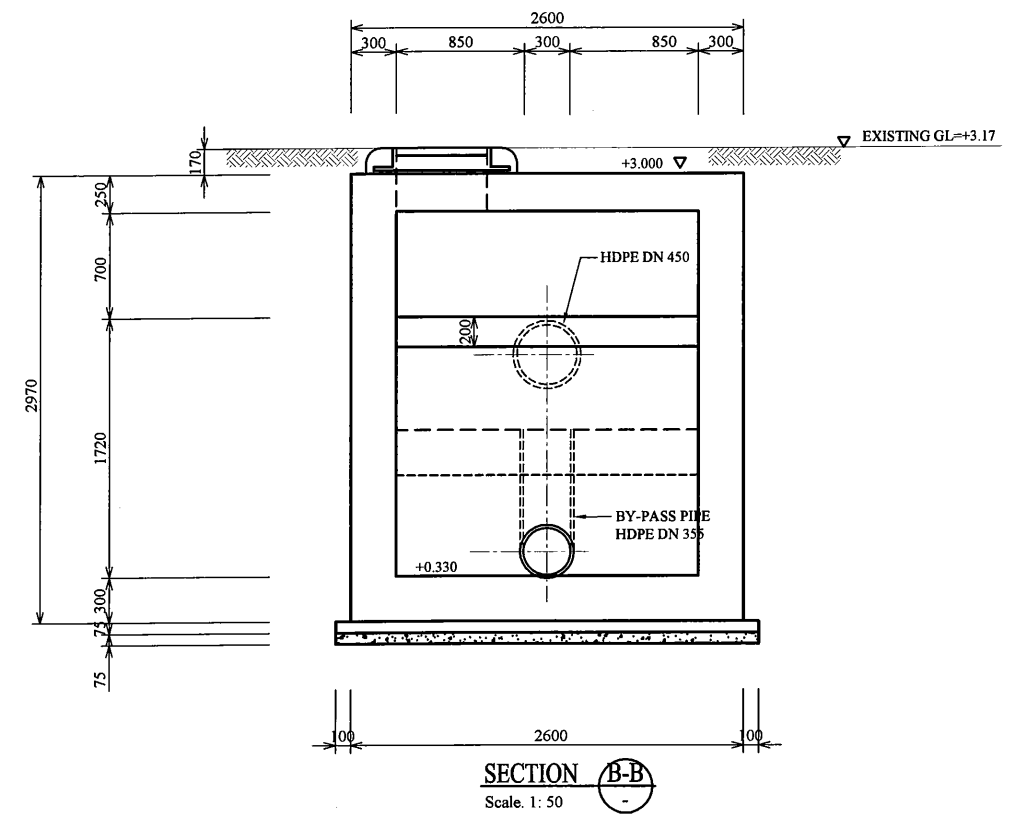
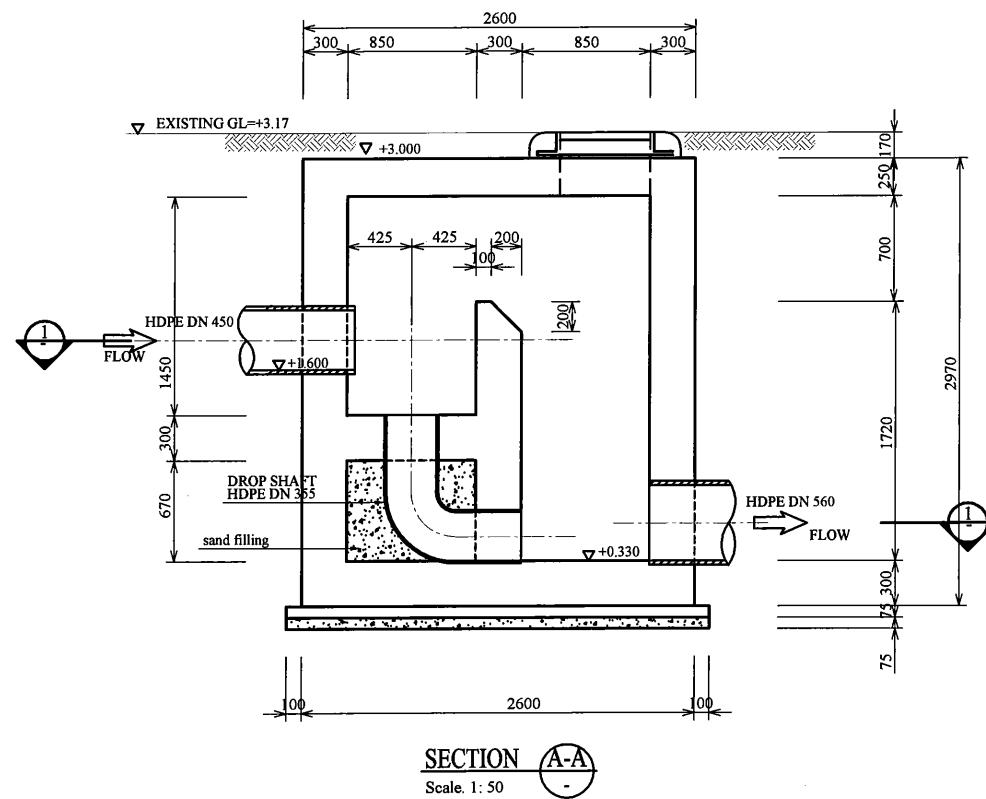
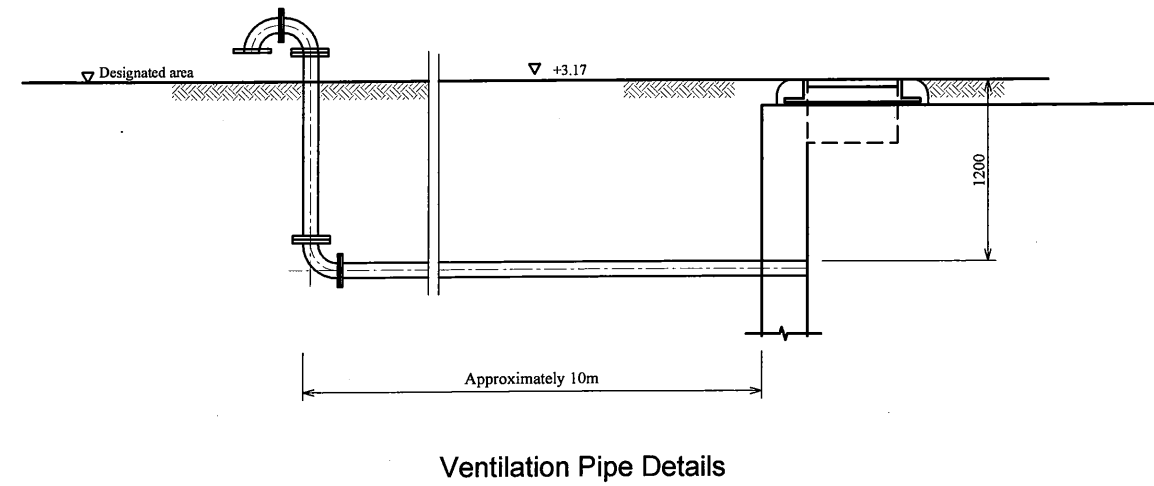
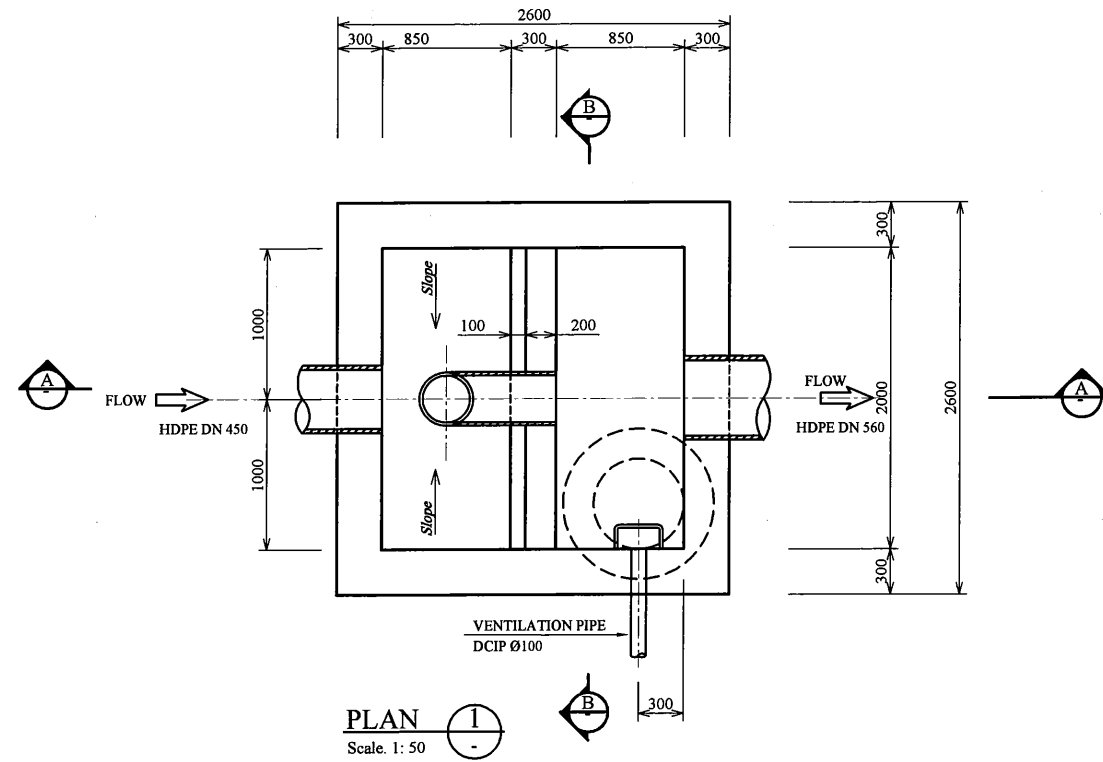
CHECKED by CONSULTANT  
 Project Manager  
 T.Fuji

DATE: 1. Dec 2011

DATE: 1. Dec 2011



SCALE: 1/50


DRAWING NO.: PI-68



PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

TITLE: SEWERAGE PRESSURE REDUCING WELL PLAN AND SECTION

CLIENT:  INDEPENDENT PUBLIC BUSINESS CORPORATION  
PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT  
PROJECT MANAGEMENT UNIT (PMU)  
 JAPAN INTERNATIONAL COOPERATION AGENCY

CONSULTANTS:  NJS CONSULTANTS CO., LTD. - JAPAN

NOTES:

REVISIONS		
REV.	DATE	DESCRIPTION

APPROVED by PMU:  
Project Director  
Lot G.Zauya

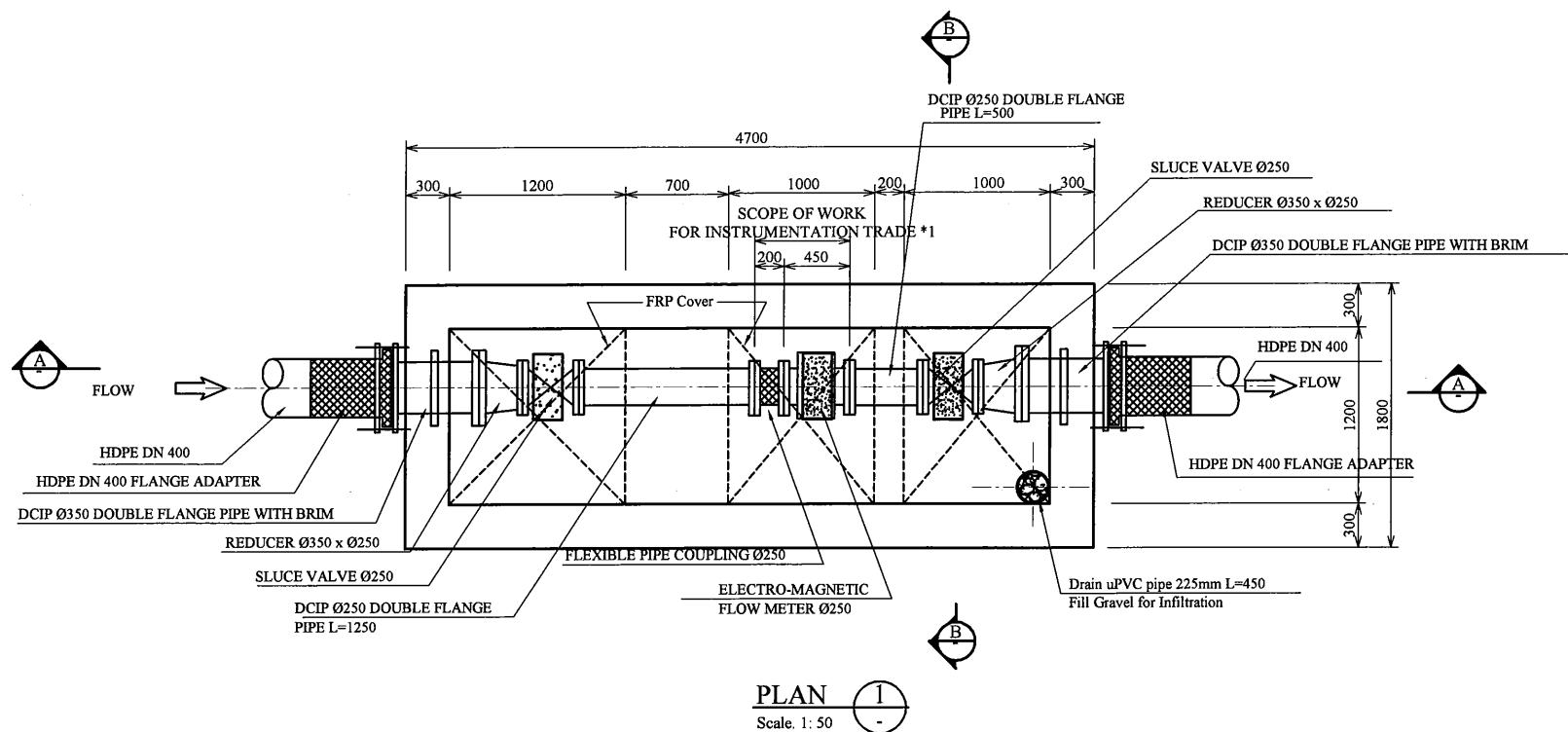
CHECKED by CONSULTANT  
Project Manager  
T.Fuji

DATE:  
1. Dec 2011

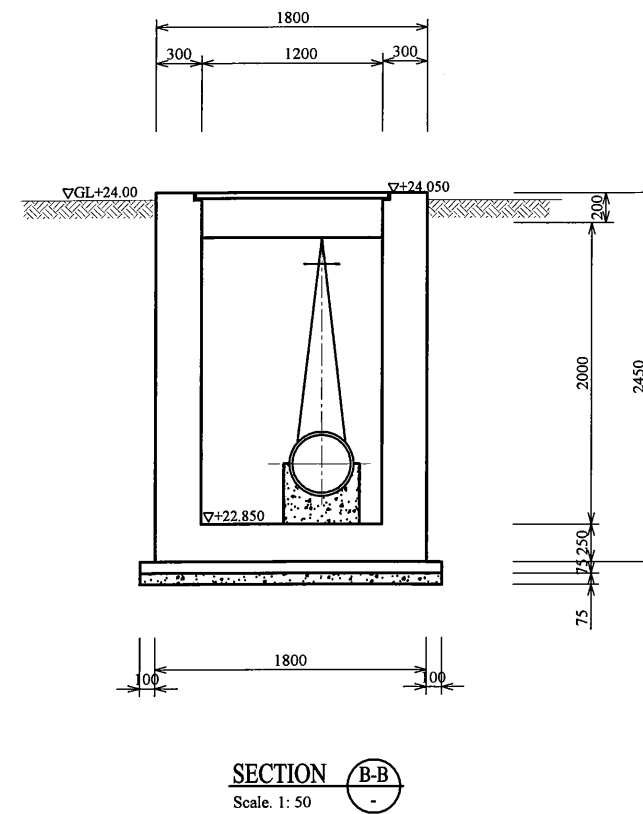
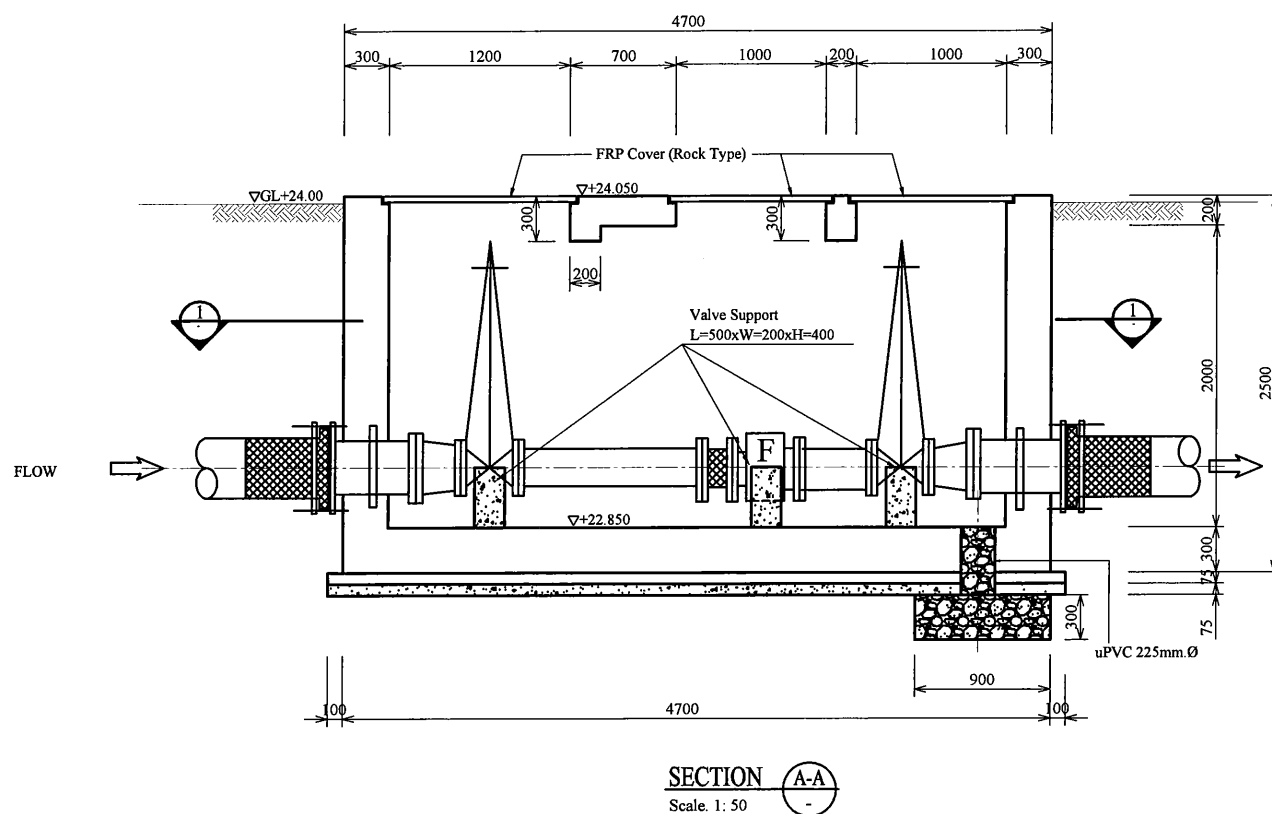
DATE:  
1. Dec 2011

SCALE:  
1/50

DRAWING NO.:  
P1-69



\*NOTE 1:  
THE ELECTRO MAGNETIC-FLOW METER WITH THE FLEXIBLE PIPE COUPLING SHALL BE SUPPLIED AND INSTALLED BY THE INSTRUMENTATION SUB-CONTRACTOR THROUGH CLOSE COORDINATION WITH THE MAIN CONTRACTOR TO MAKE THE FLOW METER SET COMPLETE



PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

TITLE: FLOW METER CHAMBER PLAN & SECTIONS

CLIENT: **IPBC** INDEPENDENT PUBLIC BUSINESS CORPORATION  
PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT  
PROJECT MANAGEMENT UNIT (PMU)  
**JICA** JAPAN INTERNATIONAL COOPERATION AGENCY

CONSULTANTS: **NJS** NJS CONSULTANTS CO., LTD. - JAPAN

NOTES:

REVISIONS		
REV.	DATE	DESCRIPTION

APPROVED by PMU:  
Project Director  
Lot G. Zauya

CHECKED by CONSULTANT  
Project Manager  
T. Fuji

DATE:  
1. Dec 2011

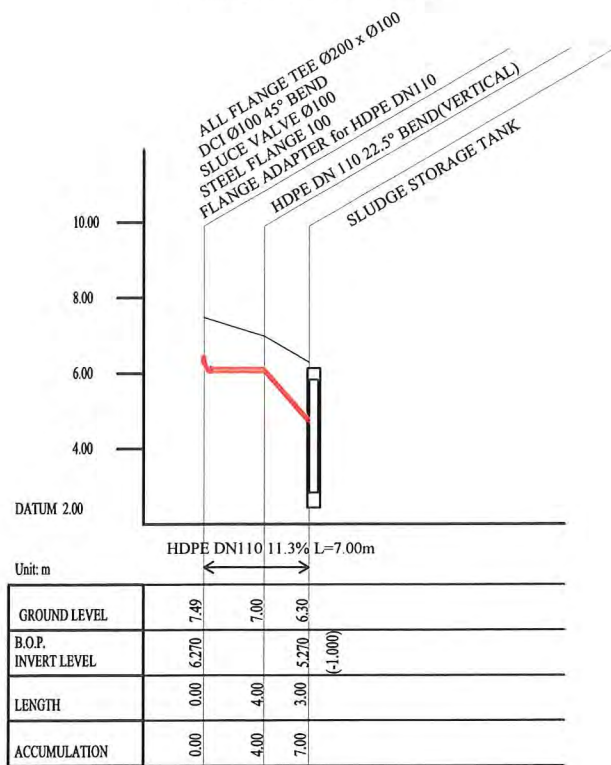
DATE:  
1. Dec 2011

SCALE:  
1/50

DRAWING NO.:  
PI-70

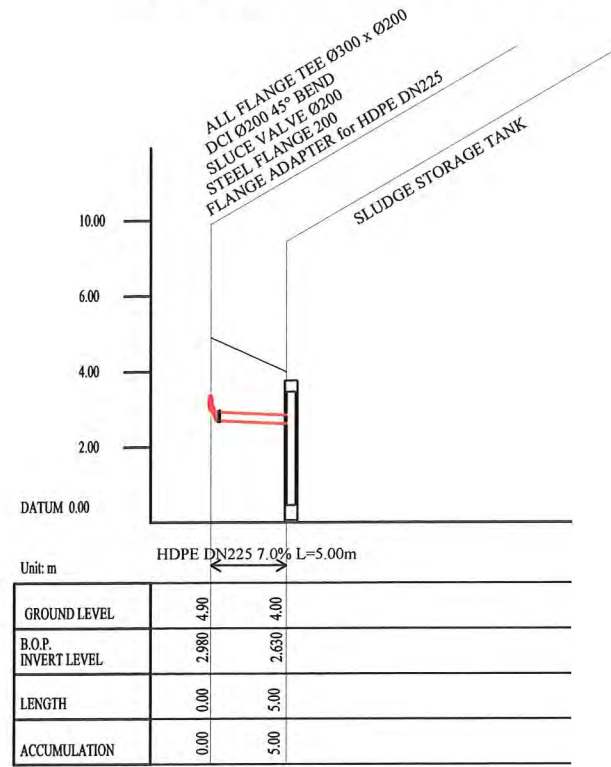


Drainage-1 (Boe Vagi Road)



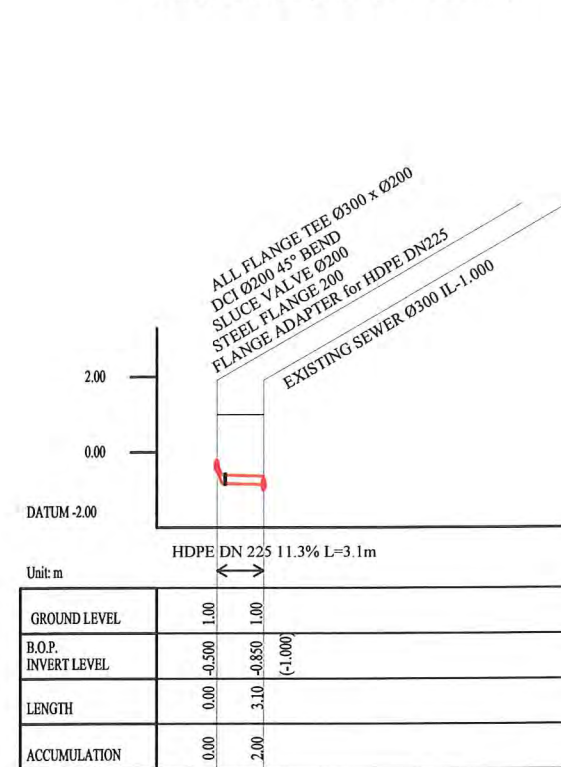
SCALES HOR 1 : 500 VER 1 : 200

Drainage-2 (Champion PARADE Hanuabada)



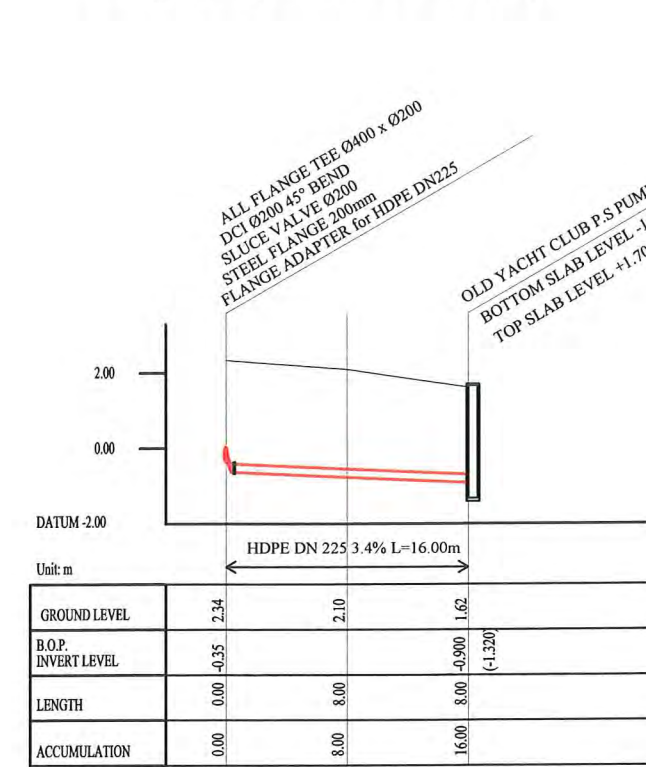
SCALES HOR 1 : 500 VER 1 : 200

Drainage-3 (Champion Parade - Stadium)



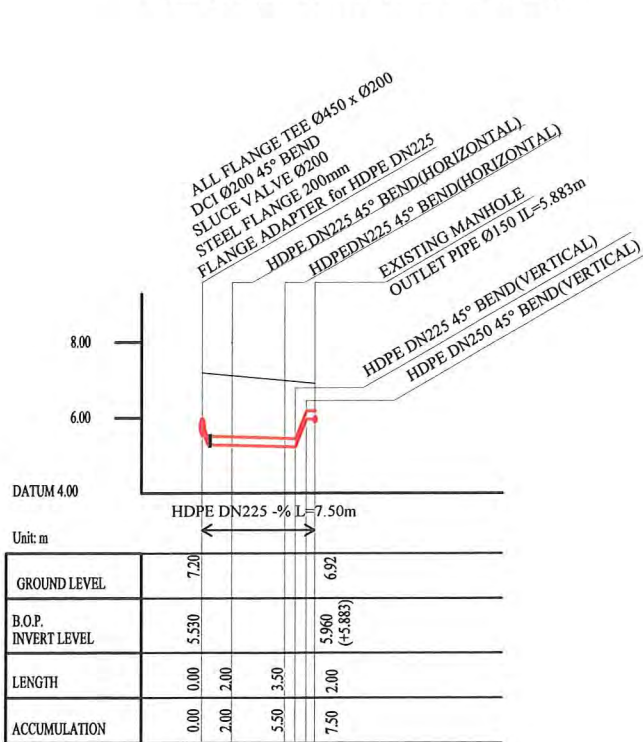
SCALES HOR 1 : 500 VER 1 : 200

Drainage-4 (Champion Parade - Old Yacht Club)



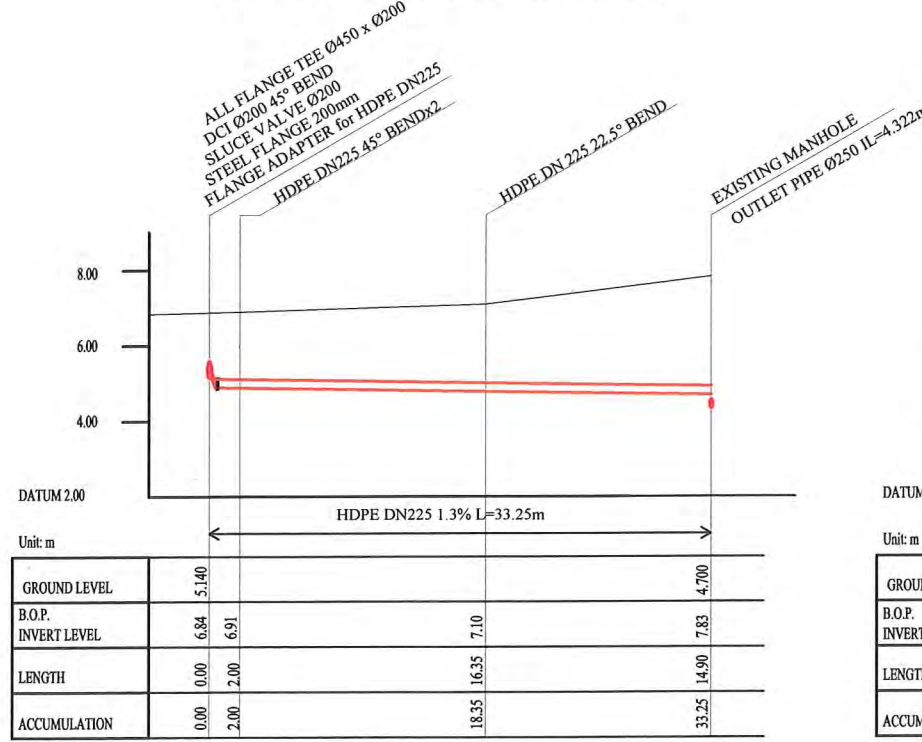
SCALES HOR 1 : 500 VER 1 : 200

Drainage-5 (LE HUNTE ROAD 1 - SVS shop)



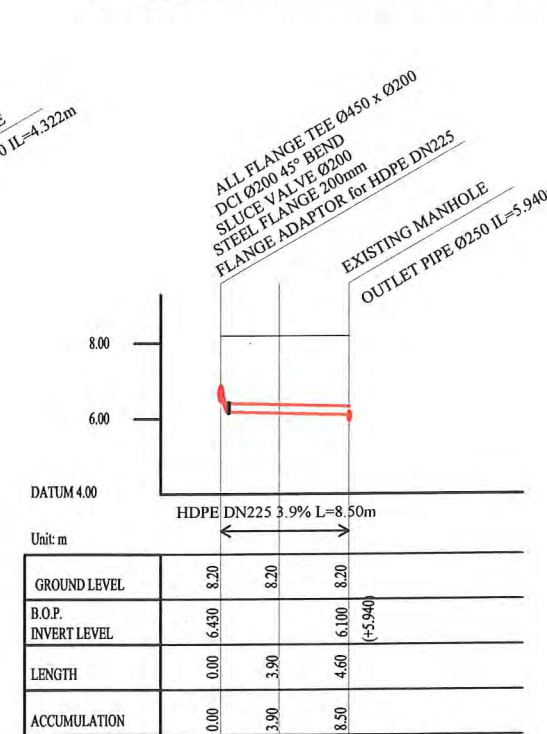
SCALES HOR 1 : 500 VER 1 : 200

Drainage-6 (LE HUNTE ROAD 2 - Salvation Army)



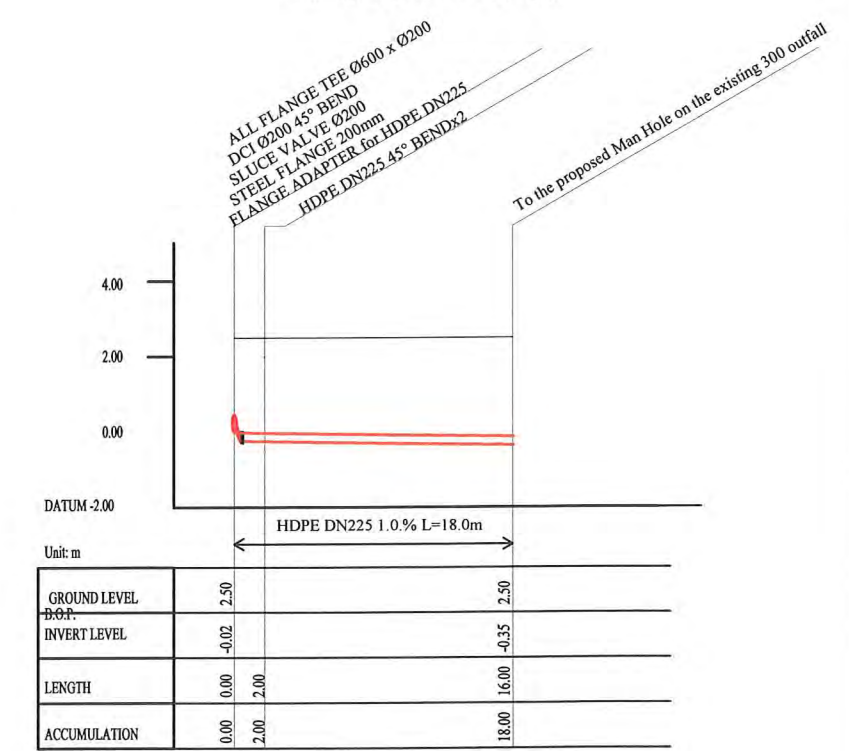
SCALES HOR 1 : 500 VER 1 : 200

Drainage-7 (SCRATCHLEY ROAD 1 - Ela Motor)



SCALES HOR 1 : 500 VER 1 : 200

Drainage-8 (Kila Kila Village)



SCALES HOR 1 : 500 VER 1 : 200

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

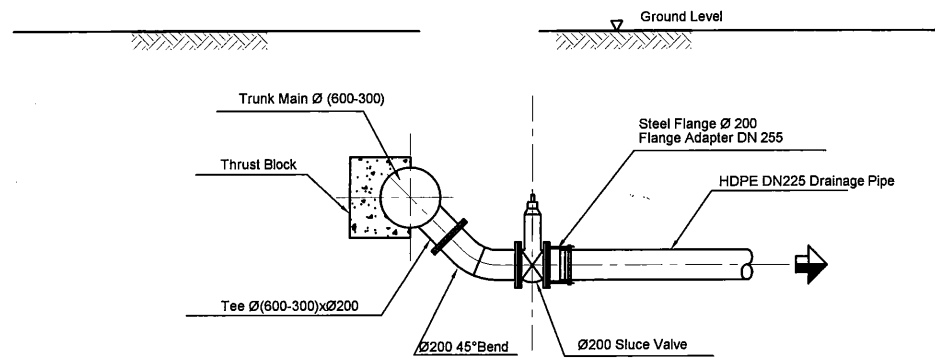
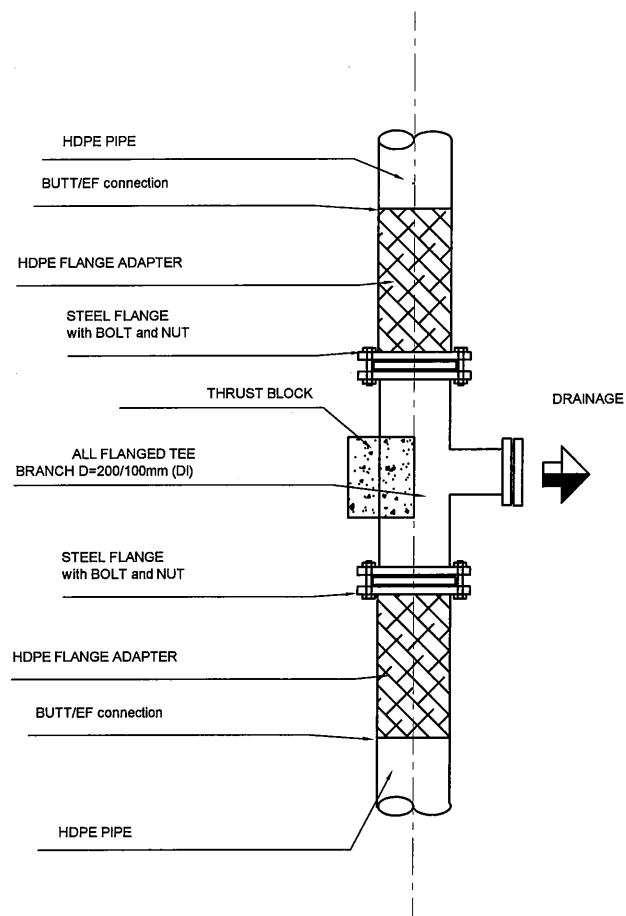
CLIENT: INDEPENDENT PUBLIC BUSINESS CORPORATION  
PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT  
PROJECT MANAGEMENT UNIT (PMU)  
JICA JAPAN INTERNATIONAL COOPERATION AGENCY

CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN

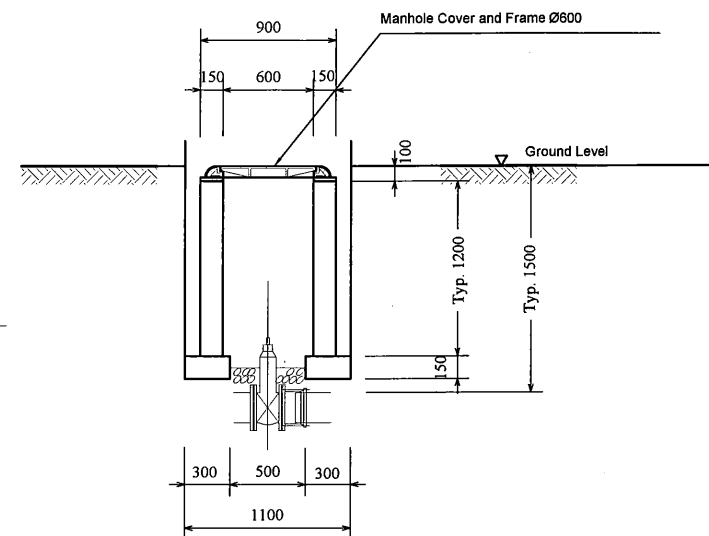
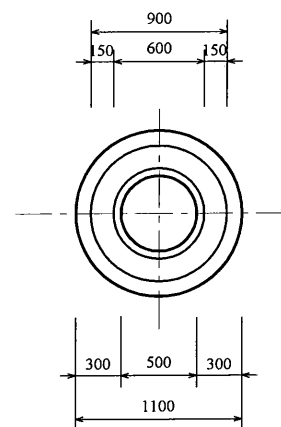
TITLE: DRAINAGE PIPE PROFILE

REVISIONS		
REV.	DATE	DESCRIPTION

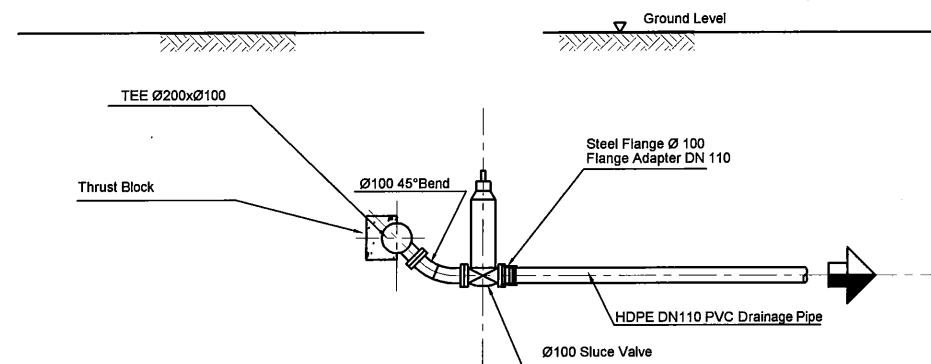
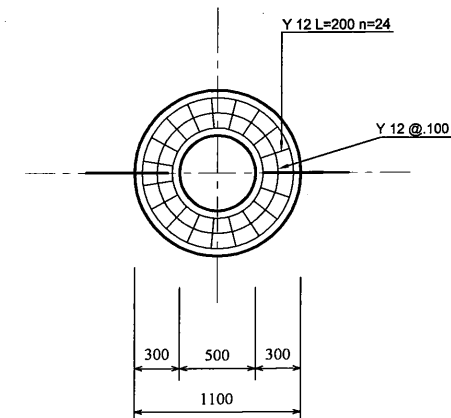
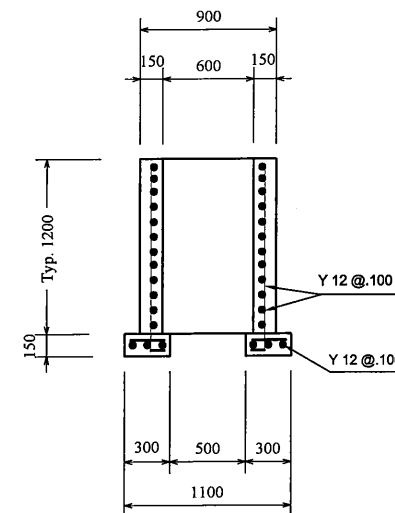
APPROVED by PMU: Project Director Lot G.Zauya	DATE: 1. Dec 2011	SCALE: AS SHOWN
CHECKED by CONSULTANT Project Manager T.Fuji	DATE: 1. Dec 2011	DRAWING NO.: PI-71



(Trunk Main Dia. HDPE 710 to 280)  
USE EQUIVALENT DCIP CHECKING THE RIGHT TABLE



(Trunk Main Dia. HDPE 225)



(Trunk Main Dia. HDPE 110)

TRUNK MAIN HDPE DN	EQUIVALENT DI dia.	REFERENCE
DN 110	Ø 100	
DN 125	Ø 100	Reduced to DN 110
DN 160	Ø 150	
DN 225	Ø 200	
DN 280	Ø 250	
DN 355	Ø 300	
DN 400	Ø 350	
DN 450	Ø 400	
DN 500	Ø 450	
DN 560	Ø 500	
DN 710	Ø 600	

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

TITLE: DRAINAGE STANDARD DETAILS

CLIENT: **IPBC** INDEPENDENT PUBLIC BUSINESS CORPORATION  
**JICA** JAPAN INTERNATIONAL COOPERATION AGENCY  
 INDEPENDENT PUBLIC BUSINESS CORPORATION  
 PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT  
 PROJECT MANAGEMENT UNIT (PMU)

CONSULTANTS: **NJS** NJS CONSULTANTS CO., LTD. - JAPAN

NOTES:

REVISIONS		
REV.	DATE	DESCRIPTION

APPROVED by PMU:  
Project Director  
Lot G.Zauya

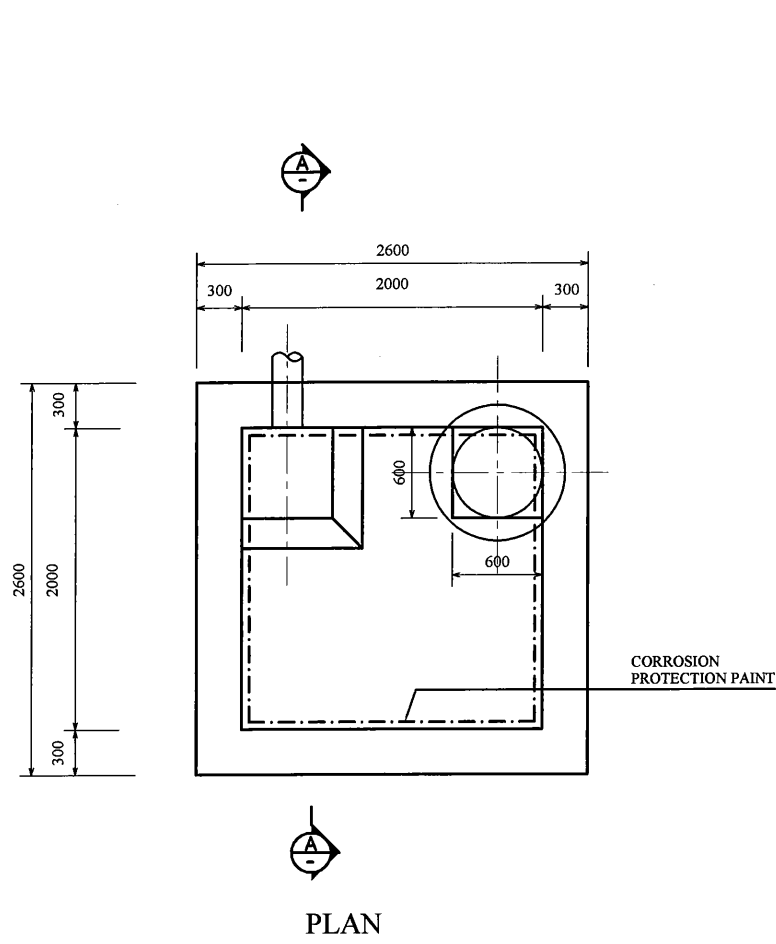
CHECKED by CONSULTANT  
Project Manager  
T.Fuji

DATE:  
1. Dec 2011

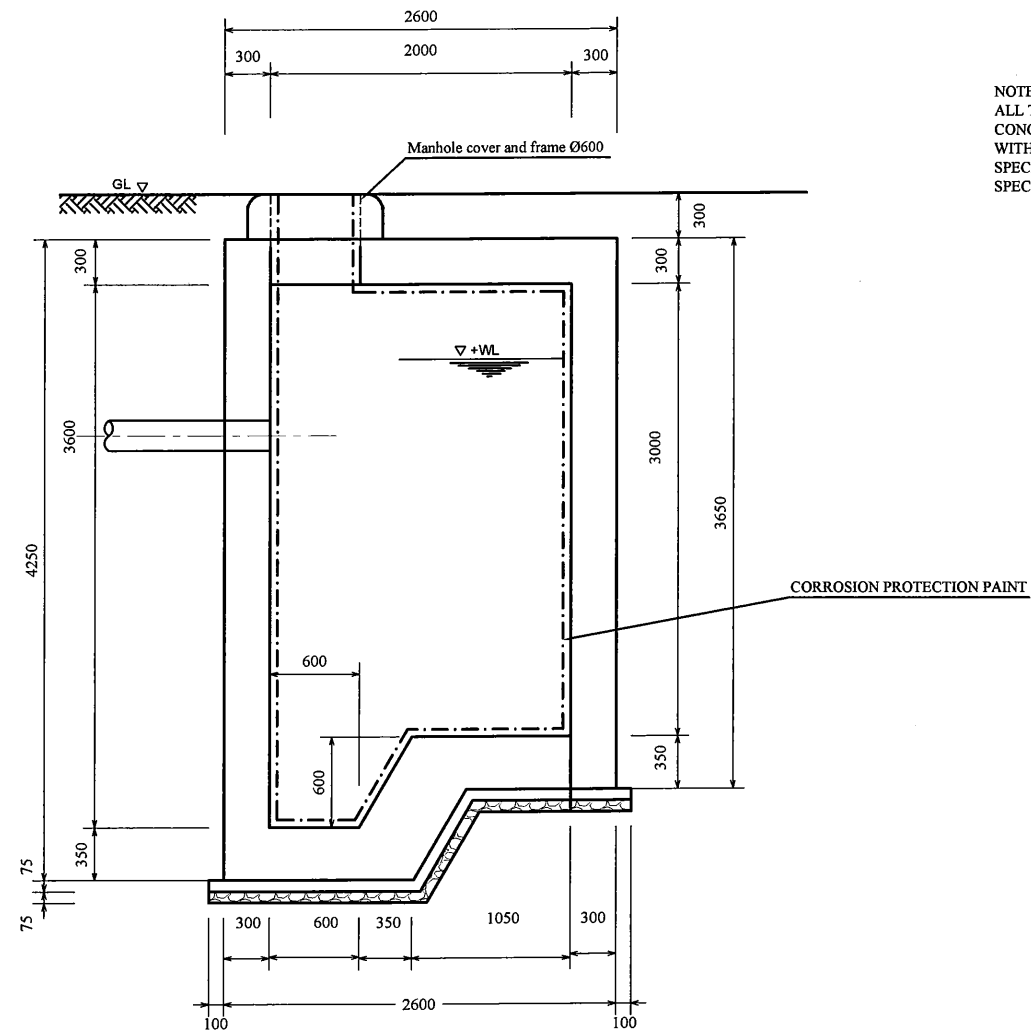
DATE:  
1. Dec 2011

SCALE:  
1/50

DRAWING NO.:  
PI-72



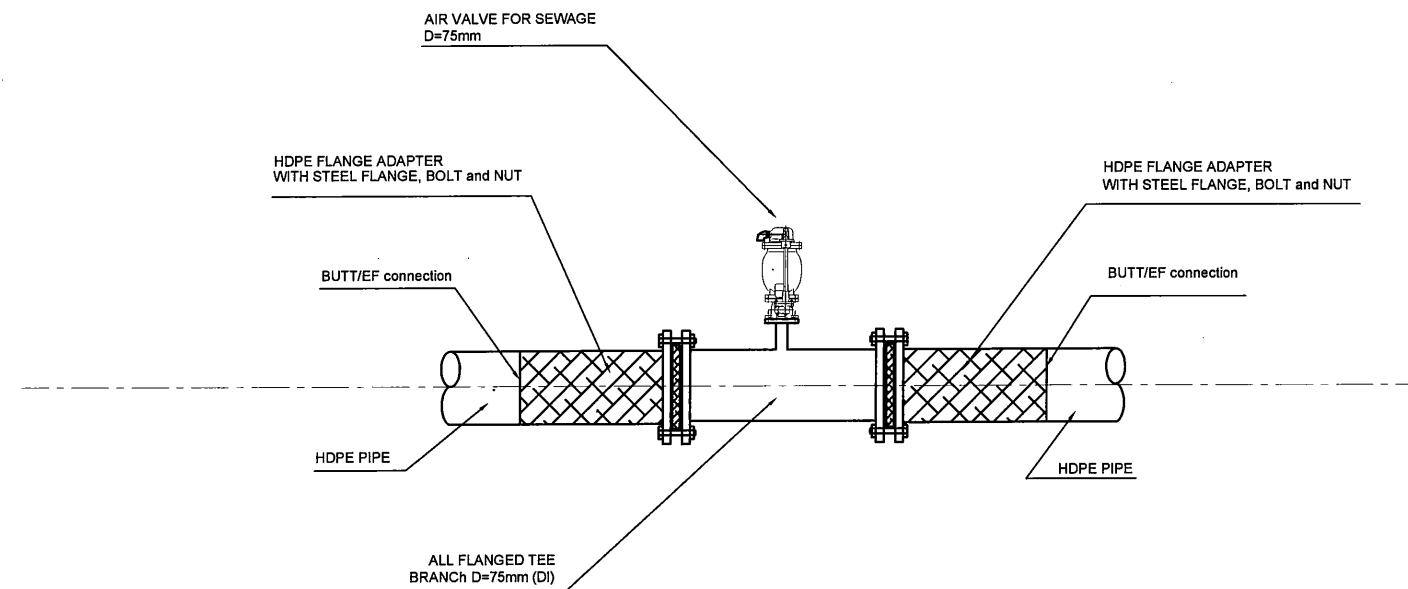
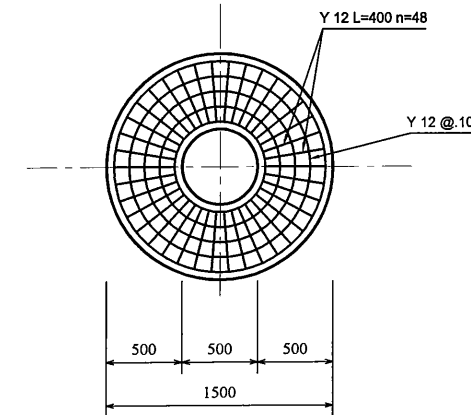
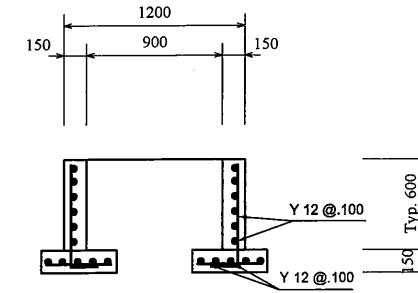
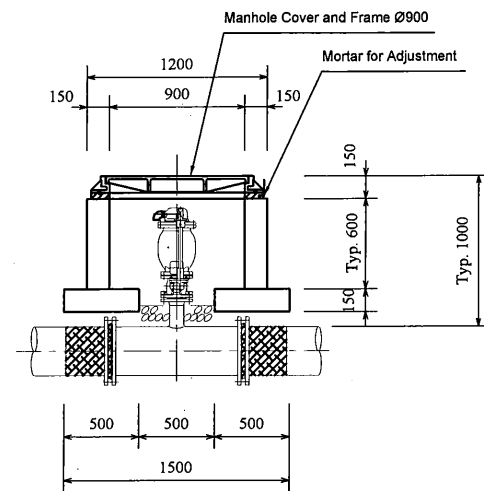
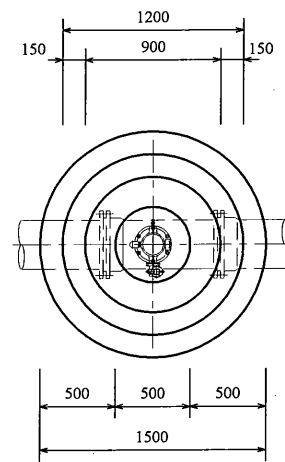
Detail of Drainage Tank



A-A SECTION

NOTE  
ALL THE INNER SURFACE OF  
CONCRETE WALL TO BE PAINTED  
WITH CORROSION PROTECTION  
SPECIFIED IN THE PARTICULAR  
SPECIFICATION

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)		TITLE: DRAINAGE TANK PLAN & SECTION					
CLIENT: INDEPENDENT PUBLIC BUSINESS CORPORATION PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT PROJECT MANAGEMENT UNIT (PMU) JAPAN INTERNATIONAL COOPERATION AGENCY	CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN	NOTES:	REVISIONS		APPROVED by PMU: Project Director Lot G.Zauya	DATE: 1. Dec 2011	SCALE: 1/50
			REV.	DATE	DESCRIPTION	CHECKED by CONSULTANT Project Manager T.Fuji	DATE: 1. Dec 2011



BEFORE AND AFTER AIR VALVE  
HDPE IS CONNECTED TO DCI ACCORDING TO FOLLOWING TABLE

TRUNK MAIN HDPE DN	EQUIVALENT DI dia.	REFERENCE
DN 110	Ø 100	
DN 125	Ø 100	Reduced to DN 110
DN 160	Ø 150	
DN 225	Ø 200	
DN 280	Ø 250	
DN 355	Ø 300	
DN 400	Ø 350	
DN 450	Ø 400	
DN 500	Ø 450	
DN 560	Ø 500	
DN 710	Ø 600	

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

TITLE: AIR VALVE AND VALVE BOX DETAILS

CLIENT: **IPBC** INDEPENDENT PUBLIC BUSINESS CORPORATION  
PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT  
PROJECT MANAGEMENT UNIT (PMU)  
**JICA** JAPAN INTERNATIONAL COOPERATION AGENCY

CONSULTANTS: **NJS** NJS CONSULTANTS CO., LTD. - JAPAN

NOTES:

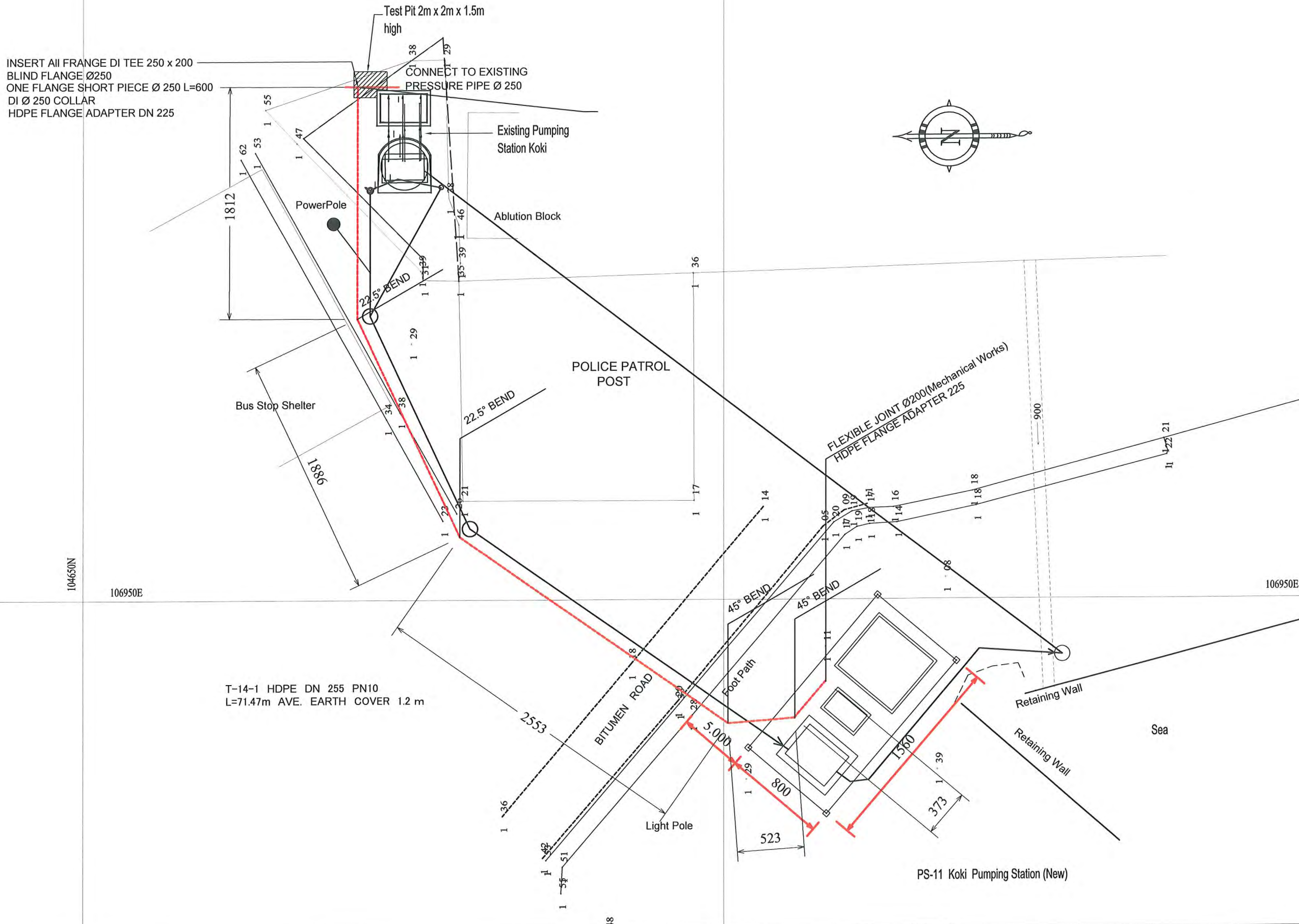
REVISIONS		
REV.	DATE	DESCRIPTION

APPROVED by PMU:  
Project Director  
Lot G. Zauya

CHECKED by CONSULTANT  
Project Manager  
T. Fuji

DATE: 1. Dec 2011  
SCALE: 1/50

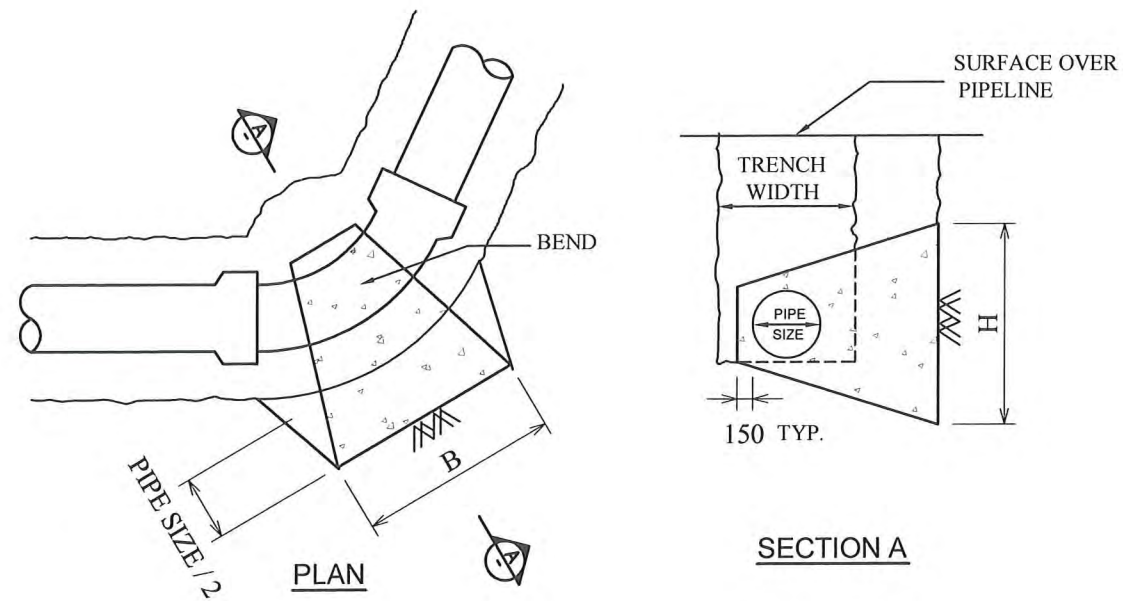
DATE: 1. Dec 2011  
DRAWING NO.: PI-74



INSERT ALL FRANGE DI TEE 250 x 200  
BLIND FLANGE Ø250  
ONE FLANGE SHORT PIECE Ø 250 L=600  
DI Ø 250 COLLAR  
HDPE FLANGE ADAPTER DN 225

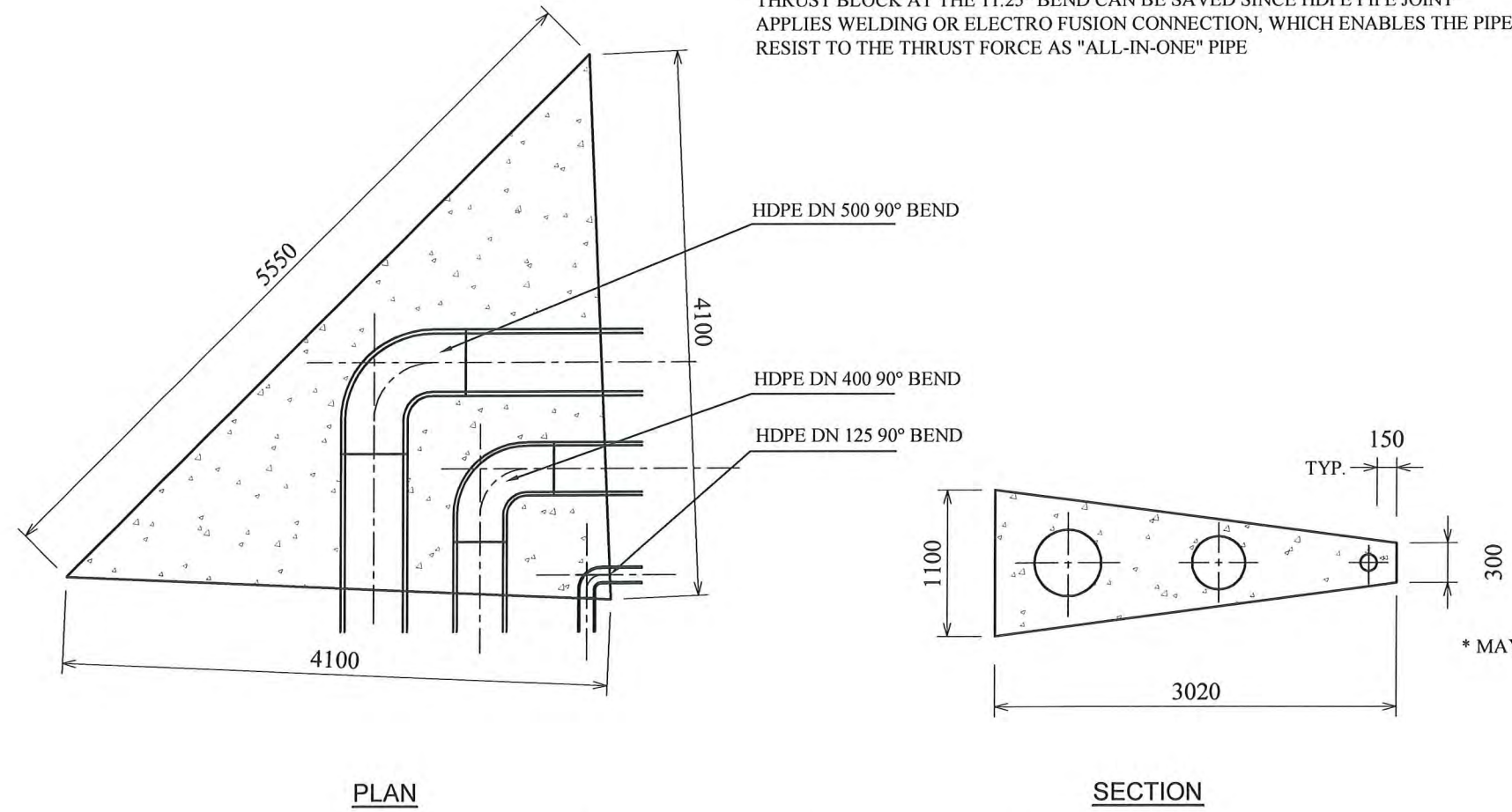
T-14-1 HDPE DN 255 PN10  
L=71.47m AVE. EARTH COVER 1.2 m

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)		TITLE: TRUNK MAIN PIPE CONNECTION PLAN (KOKI PUMPING STATION DETAILS)					
CLIENT: INDEPENDENT PUBLIC BUSINESS CORPORATION PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT PROJECT MANAGEMENT UNIT (PMU) JAPAN INTERNATIONAL COOPERATION AGENCY	CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN	NOTES:	REVISIONS		APPROVED by PMU: Project Director Lot G.Zauya	DATE: 1. Dec 2011	SCALE: 1/300
			REV.	DATE	DESCRIPTION	CHECKED by CONSULTANT Project Manager T.Fuji	DATE: 1. Dec 2011



\* MAY BE VARIED TO SUIT CONDITIONS WITH APPROVAL OF ENGINEER  
 THRUST BLOCK AT THE 11.25° BEND CAN BE SAVED SINCE HDPE PIPE JOINT  
 APPLIES WELDING OR ELECTRO FUSION CONNECTION, WHICH ENABLES THE PIPE TO  
 RESIST TO THE THRUST FORCE AS "ALL-IN-ONE" PIPE

DN=OD (mm)	Bend (θ) (degree)	Thrust Force	Required Area (m <sup>2</sup> )	Dimension	
		P (kN)		H (m)	W (m)
110	90	10	0.20	0.41	0.49
	45	5	0.10	0.41	0.24
	22.5	3	0.06	0.41	0.15
125	90	13	0.26	0.43	0.61
	45	7	0.14	0.43	0.33
	22.5	4	0.08	0.43	0.19
160	90	21	0.41	0.46	0.89
	45	12	0.23	0.46	0.50
	22.5	6	0.12	0.46	0.26
225	90	42	0.80	0.63	1.27
	45	23	0.44	0.63	0.70
	22.5	12	0.23	0.63	0.37
355	90	105	1.90	0.86	2.21
	45	57	1.03	0.86	1.20
	22.5	29	0.53	0.86	0.62
400	90	133	2.38	0.96	2.48
	45	72	1.29	0.96	1.34
	22.5	37	0.66	0.96	0.69
450	90	169	2.95	1.05	2.81
	45	91	1.59	1.05	1.51
	22.5	46	0.80	1.05	0.76
500	90	208	3.59	1.10	3.26
	45	113	1.95	1.10	1.77
	22.5	57	0.98	1.10	0.89
710	90	420	6.73	1.31	5.14
	45	227	3.64	1.31	2.78
	22.5	116	1.86	1.31	1.42



\* MAY BE VARIED TO SUIT CONDITIONS WITH APPROVAL OF ENGINEER

PLAN  
 SECTION  
 SAMPLE BLOCK FOR THREE PARALLEL BEND (SCRATCHLEY ROAD)

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)		TITLE: THRUST BLOCK DIMENSION (For Reference Only)					
CLIENT: INDEPENDENT PUBLIC BUSINESS CORPORATION PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT PROJECT MANAGEMENT UNIT (PMU) JAPAN INTERNATIONAL COOPERATION AGENCY	CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN	NOTES:	REVISIONS		APPROVED by PMU: Project Director Lot G.Zauya	DATE: 1. Dec 2011	SCALE: NTS
			REV.	DATE	DESCRIPTION	CHECKED by CONSULTANT Project Manager T.Fuji	DATE: 1. Dec 2011

**GENERAL**

- G1 This building is situated in an earthquake zone and has been designed and detailed to resist seismic forces. Any variation to either structural or non-structural elements may significantly alter the earthquake response of the building and impair its safety.  
ANY PROPOSED ALTERATIONS MUST BE REFERRED TO THE STRUCTURAL DESIGN ENGINEER.
- G2 These drawings shall be read in conjunction with all Architectural and other consultants Drawings and Specifications and with such other written instructions as may be issued during the course of contract. All discrepancies shall be referred to Superintendent for decision before proceeding with the work.
- G3 All dimensions relevant to setting out and off-site works shall be verified by the Contractor before construction and fabrication is commenced. The Engineers drawings shall not be scaled.
- G4 During construction the contractor shall be responsible for maintaining the structure in a stable condition and ensuring no part shall be overstressed under construction activities.
- G5 Workmanship and materials are to be in accordance with the relevant current PNGS and SAA standards including all amendments and the local statutory Authorities, except where varied by the the contract documents.
- G6 Requirements to comply with a particular code or standard is deemed to refer to the latest edition with all relevant amendments and to include all other codes or standards associated with or referred to in the noted code or standard.
- G7 No holes or chases other than those indicated on the structural drawings shall be made without the approval of the Superintendent.
- G8 Prior to ordering materials or carrying out any work that may be affected, the Contractor shall submit the following information for approval in accordance with the drawings and specification. These proposals shall include all information necessary for approval including the following:
- 1) Source and supplier of materials and products.
  - 2) Certificates and results of any tests already carried out.
  - 3) Details of tests to be carried out both on and off site.
  - 4) Location of any testing to be carried out off site.
  - 5) Details of any separate laboratory, authority or other body to carry out tests.
- The approval of substitution of materials shall be sought from the Superintendent.  
All dimensions are in millimetres unless stated otherwise. All levels are expressed in metres.
- G9 All props and formwork for beams and slabs shall be removed before construction of any masonry walls or partitions on the floor.
- G10 All Non-Load Bearing Walls shall be kept clear of the underside of beams and slabs clearance shall not be less than 20mm unless otherwise shown.
- G11 Where proprietary products are specified they shall be manufactured and used in accordance with the manufacturer's specifications and recommendations.
- G12 Design loads to Papua New Guinea Standard 1001.
- 1) Wind - Basic Design Velocity 28m/sec  
Terrain Category 1
  - 2) Seismic - Zone 4

**FOUNDATION**

- F1 Founding levels are provisional and are subject to the Superintendent's approval of the bearing strata.
- F2 Anticipated bearing material: Undisturbed Natural Ground.
- F3 Required allowable bearing strength of foundation material 550 kPa
- F4 All water and loose material shall be removed from the base prior to pouring any concrete.
- F5 Compacted fill under slabs and minor strip footings shall comply with the following:
- a) Material shall be selected from an approved source, shall be free of vegetable matter and ball of clay, and shall comply with the following requirements:
    - (i) CBR value after 4 days soaking, not less than 25 when compacted to at least 95% maximum dry density as determined by AS1289 Test No. E1.1
    - (ii) Maximum linear shrinkage 6%
    - (iii) Grading

SIEVE SIZE (mm)	BY WEIGHT PASSING
37.5	100
19.0	60 - 100
9.5	40 - 80
4.75	30 - 60
2.36	20 - 45
0.425	15 - 30
0.075	3 - 15

- (iv) The fraction passing the 75 micron sieve shall not exceed 2/3 that passing the 425 micron sieve.
  - (v) The fraction retained on the 2.36mm sieve shall consist of hard durable particles or fragments of stone, gravel or sand and shall not include any material that breaks up when alternately wetted and dried.
  - (vi) The fraction passing the 425 micron sieve shall have a liquid limit not greater than 30 and a plasticity index not greater than 10.
- F6 Over excavating under footings shall be made good with 10 MPa mass concrete.

**CONCRETE**

- C1 All workmanship and material shall be in accordance with PNG 1002.
- C2 Minimum cover (mm) to all reinforcement unless otherwise shown shall be as follows:  
REINFORCEMENT COVERS  
Minimum reinforcement cover requirements to be in accordance with PNG1002 - 1982 Exposure category listed below:  
Exterior faces of members (above ground) : 3  
Interior faces of members : 3  
Members below ground : 3  
In addition reinforcement cover shall not be less than :
- FOOTINGS : 75mm  
PEDESTAL : 75mm  
GROUND SLABS : 65mm TOP  
SUSPENDED SLABS : 65mm TOP  
BEAMS : 75mm EXPOSED FACE, INTERIOR FACE 65mm  
COLUMNS : 75mm IN GROUND, 65mm ABOVE GROUND  
RC WALLS : 75mm IN GROUND, 65mm ABOVE GROUND
- C3 Sizes of concrete elements do not include thickness of applied finishes.
- C4 Reinforcement is represented diagrammatically and not necessarily shown.
- C5 Splices in reinforcement shall be made only in the positions shown or as otherwise approved by the Superintendent.
- C6 Welding of reinforcement shall not be permitted.
- C7 All reinforcement shall be securely supported in its correct position during concreting by approved bar chains, spacers or support bars.
- C8 Reinforced symbols:  
"Y" denotes hot rolled deformed bars grade 410Y to AS 1302  
"S" denotes deformed bars grade 230S to AS 1302.  
"R" denotes plain round bars grade 230R to AS 1302.
- C9 Laps, unless noted otherwise, shall be : 40 x bar diameter for rounds and 350mm for fabric.
- C10 Bending radii, unless noted otherwise, shall be to PNGS 1002.
- C11 Cover will be maintained during casting concrete by the use of plastic chairs and/or mortar blocks 1:2 mix at maximum 500mm centres in each direction. For work in contact with the ground chairs are to be supported on sheet plates.
- C12 Reinforcement shall not be exposed for prolonged periods such as to permit the development of scale
- C13 Reinforcement and formwork are to be checked by the Superintendent prior to pouring. The Superintendent is to be given 24 hours notice for a check and a further 24 hours for any remedial work required prior to concrete placement.
- C14 All conduits to be placed above bottom reinforcement and below top reinforcement - minimum spacing between conduits 25mm.
- C15 Formwork shall be designed and constructed in accordance with AS 3610.
- C16 Concrete components and quality shall be as follows, unless noted otherwise;
- | Element         | F'c (MPa) | Water/Cement Ratio |
|-----------------|-----------|--------------------|
| Foundations     | 40        | 0.55               |
| Cover Slabs     | 40        | 0.55               |
| Base Slabs      | 40        | 0.55               |
| Suspended Slabs | 32        | 0.55               |
| Columns         | 32        | 0.55               |
| Mass Concrete   | 15        | 0.55               |
- C17 Three test cylinders are to be taken from each sample (sampling in accordance with PNGS 1002.) One cylinder to be tested at seven days, the other two at 28 days. Where ready mix concrete is supplied each truck will constitute a batch in applying PNGS 1002.
- C18 The Contractor shall submit for approval his proposals for curing of all insitu concrete work, at least 7 days prior to any pour taking place.
- C19 Construction Joints to be cleaned of all loose and foreign materials, scabbled and wetted immediately before continuing the following concreting. Construction Joints other than those indicated on the drawing shall not be made without approval.
- C20 Control Joints in the Ground Floor slab shall be provided by 6M centres UNO.

**CONCRETE MASONRY**

- B1 All concrete block masonry is to be executed in accordance with the current edition of:  
PNGS 1004 - Reinforced Masonry Structures Code.  
AS 2733 - Concrete Masonry Units.
- B2 Concrete masonry blocks shall have characteristics compressive strength of F'b = 12 MPa and 16 MPa at specific locations denoted as SW1 - SW39.
- B3 All blocks shall be laid dry and wetting shall not be permitted during or after laying.
- B4 Channel stretcher blocks and lintel blocks shall be used to form bond beams and lintels respectively. Top groove blocks shall be used elsewhere where horizontal reinforcement is required. Otherwise blocks shall conform to AS 2733.
- B5 All blocks must be cured for minimum of 28 days before transportation to site.
- B6 Clean out blocks are to be used for core filled cavities and all mortar droppings are to be removed from the bottom cavities before grouting.
- B7 Mortar shall comply with AS 1475, Part 1, Appendix A. The mix proportions of table A1 shall be adjusted to give an average compressive strength of 8 MPa.
- B8 Mortar joints to be 10mm thick with blocks fully bedded and perpends filled.
- B9 Grout for corefilling shall comply with AS 1475, Part 1, Section 2. Characteristic compressive strength F'c = 15 MPa Slump 225. Batching by volume is not permitted.

- B10 Corefilling is to be placed for the full height in lifts of not more than 1200mm in height. A minimum delay period of one hour and max, three hours shall be observed between lifts. All cores are to be filled unless noted otherwise.
- B11 Corefilling shall be thoroughly compacted into place with the aid of small immersion vibrators.
- B12 The corefilling at the top of each lift shall be kept down at a distance of 25mm from the top of the blockwork and this surface shall be thoroughly scabbled before any further blocks are laid or concrete poured.
- B13 Masonry walls shall be cured for at least three (3) days before corefilling is placed.
- B14 All masonry must be approved by the Superintendent before corefilling takes place.
- B15 Vertical reinforcement at any level shall be correctly positioned and securely tied to starters projecting from construction below prior to placing blocks.
- B16 Reinforcement is to be left undisturbed for at least 12 hours after corefilling. Any reinforcement showing signs of separation from the corefilling may render that section of the wall liable to rejection.
- B17 Minimum cover to reinforcement : 12mm from inside face of block.
- B18 Vertical bars shall be placed with laps at not less than 1600mm centres, unless noted otherwise.
- B19 Laps, unless noted otherwise, shall be : 40 x bar diameter.
- B20 All bars are to be copped around openings and openings are to have a bond beam over them.
- B21 At the completion of a day's work and during wet weather top and sides of all walls shall be covered to prevent rain penetration to cores or wetting of blocks.
- B22 Control joints in blockwork to be at 4m maximum spacing.

**STRUCTURAL STEELWORK**

- S1 All workmanship and materials shall be in accordance with PNGS 1003.
- S2 Steel grade - 300 MPa.
- S3 Plates, unless noted otherwise, shall be 8mm thick.
- S4 Bolts, unless noted otherwise, shall be 16mm diameter, Grade 4.6/s, bolts 20mm diameter and greater shall be Grade 8.8/s.
- S5 Welds, unless noted otherwise, shall be 6mm continuous fillet weld.
- S6 Welding electrodes shall be class E 41XX.
- S7 WELDing shall be performed by an experienced qualified operator in accordance with PNGS 1016.
- S8 The contractor shall verify that all members can be assembled and erected properly, prior to erection on site.
- S9 Before fabrication is commenced the Contractor shall submit copies of the shop drawings to the Superintendent for review. Review does not include checking of dimensions.
- S10 Reference shall be made to the Architect's drawings for additional drillings, cleats, fixings, etc.
- S11 The contractor shall provide and leave in place until permanent bracing elements are constructed, such temporary bracing as is necessary to stabilise the structure during erection.
- S12 The ends of all tubular members are to be sealed with nominal thickness plates and continuous fillet weld unless otherwise shown.
- S13 Unless otherwise specified all steelwork shall be sand blasted to remove all rust and scaled and painted one shop coat of inorganic zinc silicate primer min. 40 micron thickness. Members encased in concrete, fire spray or HSTF bolted connections must not be painted.
- S14 All base plates shall be temporarily supported and dry pack grouted with 3:1 sand cement grout in a just wet condition.
- S15 Cold formed steelwork shall comply with AS 1530, roll formed from hot-dipped zinc-rolled steel grade G450-Z200 to AS 1397.
- S16 All steelwork exposed to the weather including bolts and fixings shall be hot dipped galvanised unless noted otherwise.

**TIMBER**

- T1 Timber materials and workmanship shall comply with AS 1720.
- T2 Timber shall be seasoned to moisture content not exceeding 15%, unless noted otherwise.
- T3 Where unseasoned timber is specified, in no case shall timber be used having a moisture content exceeding 30% at the time of fabrication.
- T3 Timber shall have strength properties not less than that shown below:
- |                |       |
|----------------|-------|
| Stress Grade   | - F11 |
| Strength Group | - SD4 |
| Joint Group    | - J3  |
- In the absence of mechanical stress, grading timber shall be visually stress graded in accordance with AS 2082.
- T4 The Contractor is required to submit details of the proposed species of timber for approval. If unidentified species are proposed, evidence must be provided from the Papua New Guinea Office of Forestry of identification and compliance with the specified properties.
- T5 All sizes quoted are the final dressed sizes of finished timber unless noted otherwise.
- T6 The Contractor shall verify that all members can be assembled and erected properly.
- T7 Any variations shall be referred to the Superintendent for approval.

- T8 Steel Components shall comply with PNGS 1003 Steel grade 250.
- T9 Bolt holes are to be of same nominal diameter as bolts, drilled through assembled timber.
- T10 Washers, unless noted otherwise, shall be provided under all bolt heads and nuts as follows:  
Against timber, 65 x 65 x 5 square washers.  
Against steel, standard round washers.
- T11 All bolts, nuts and washers shall be galvanised in accordance with AS 1214.
- T12 All bolts shall be retightened at completion of construction.
- T13 Where necessary timber shall be chamfered locally to just clean fillet welds connection plates, etc.
- T14 Preservative treatment is to be provided as follows : dip diffused.

**DESIGN LOADS**

**BASEMENT LEVEL:**

DEAD LOAD:	29 kPa
LIVE LOAD:	0.25 kPa
STAIR:	4 kPa

This drawing is certified to comply with the Structural Engineering provisions of the Regulations under the Building Act Chapter 301 of the Revised Laws of Papua New Guinea

*Signature*

Name: Mr. L.J. Stocks  
Registered Structural Engineer No: 0394152

TENDER ISSUE

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

CLIENT: INDEPENDENT PUBLIC BUSINESS CORPORATION  
PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT  
PROJECT MANAGEMENT UNIT (PMU)  
JICA JAPAN INTERNATIONAL COOPERATION AGENCY

CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN

TITLE: KilaKila SPT. RECEIVING WELL 1&2, WATER PRESSURE REDUCING WELL, FLOW METER CHAMBER, & DRAINAGE TANK - STRUCTURAL NOTES, SHEET 1 OF 2

NOTES:

ISSUE	REV.	DATE	CHKED	DESCRIPTION	BY
TENDER	-	14/11/2011	LJS	ISSUE FOR TENDER	LKT

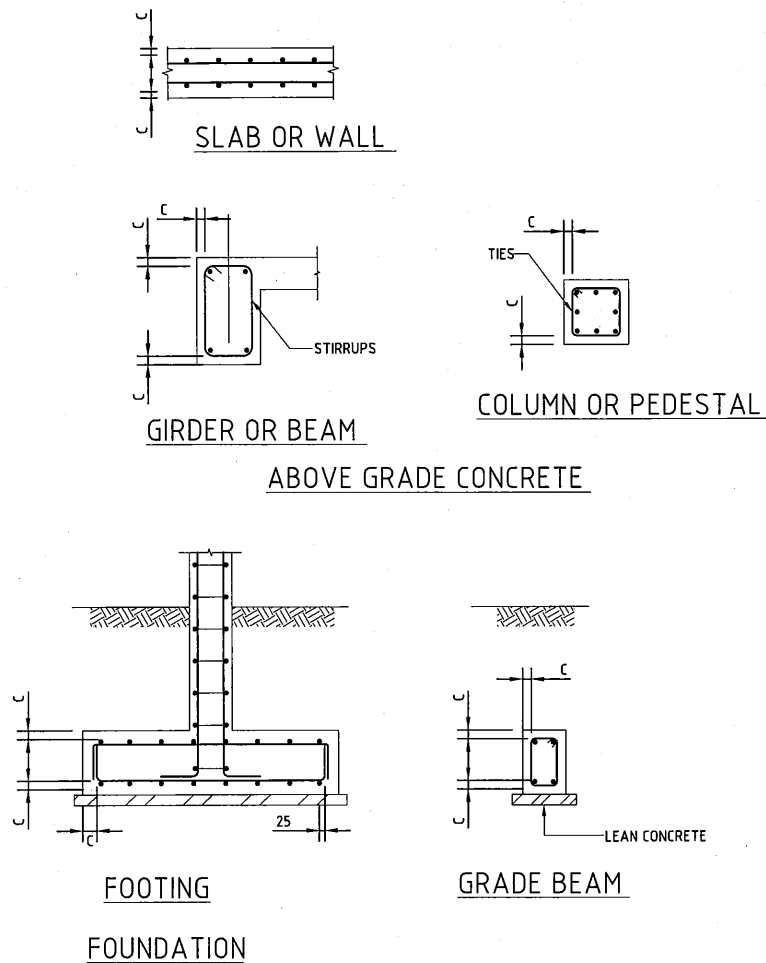
APPROVED by PMU:  
Project Director  
Lot G.Zauya

DATE: 1. Dec 2011  
SCALE: N.T.S.

CHECKED by CONSULTANT  
Project Manager  
T.Fuji

DATE: 1. Dec 2011  
DRAWING NO.: STP-S001

**MINIMUM CONCRETE COVER**

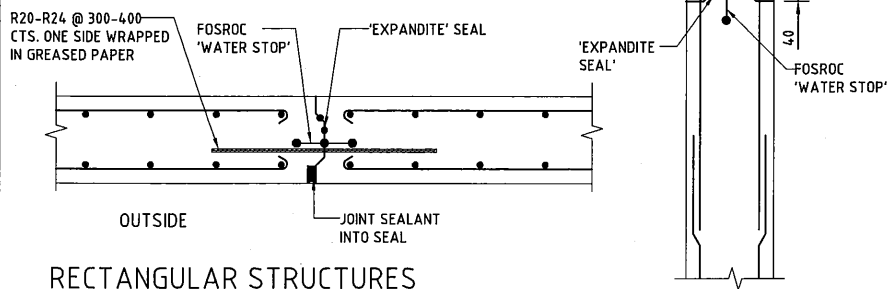


THE MINIMUM CONCRETE COVER OVER REINFORCING BARS SHALL BE AS INDICATED BELOW.

- ELEMENT EXPOSED TO WATER/SPILLAGE (CATCH BASIN/MANHOLE/SPILL BASIN etc) - 75mm
- OTHER STRUCTURE - 65mm

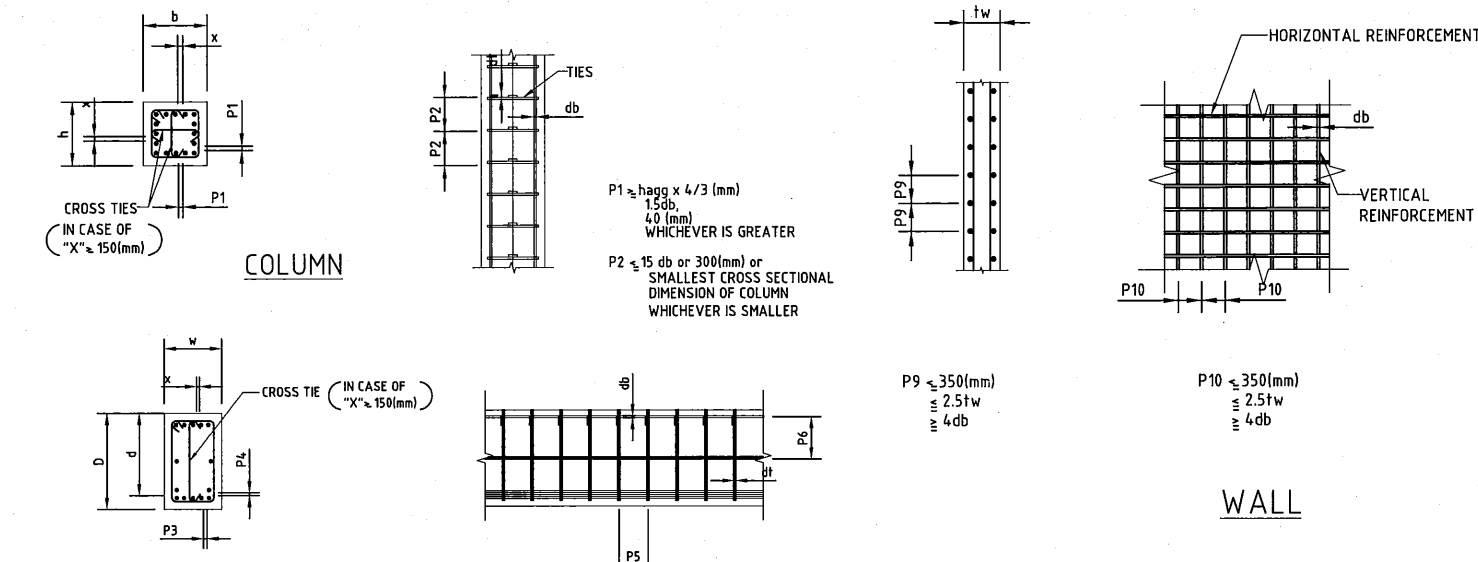
THE REQUIREMENTS STIPULATED ABOVE SHALL NOT BE APPLIED TO THE FOLLOWING REINFORCED CONCRETE ITEMS:

- a) CONCRETE PIPES - AS PER MANUFACTURER'S STANDARD.
  - b) FIREPROOFING (WITH GALVANISED WIRE MESH)
  - c) DITCH LINING/ SLOPE PROTECTION.
  - d) CONCRETE PAVING
- NOTE: FOR CONCRETE CAST AGAINST GROUND (WITHOUT FORMWORK) MINIMUM CONCRETE COVER (C) SHALL BE 75mm.



TYPICAL EXPANSION JOINT DETAIL FOR CIRCULAR LIQUID RETAINING STRUCTURE

**SPACING LIMITS**



**NOTES:**

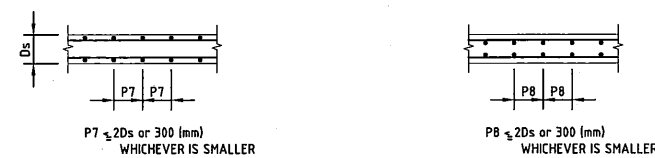
- FOR GENERAL NOTES, SEE DWG No. S001
- LEGEND  
 hagg : NOMINAL MAXIMUM SIZE OF AGGREGATE = 20mm  
 d : EFFECTIVE DEPTH  
 db : SIZE OF LONGITUDINAL BARS (mm)  
 N : BAR SYMBOL  
 df : SIZE OF TIES  
 s : SPACING  
 D : BEAM HEIGHT  
 w : BEAM WIDTH  
 b,h : COLUMN SECTION  
 tw : THICKNESS OF WALL

- SPACING OF TIES AND STIRRUPS SHALL BE IN ACCORDANCE WITH AS 3600-2001
- 1 TIES SPACING (P2) MAXIMUM TIE SPACING SHALL NOT EXCEED THE FOLLOWING VALUE  
 -15db  
 -SMALLEST CROSS SECTIONAL DIMENSION OF COLUMN  
 -300mm  
 WHICH EVER IS SMALLER
- 2 STIRRUP SPACING (P5) MAXIMUM STIRRUP SPACING SHALL NOT EXCEED THE FOLLOWING VALUE:  
 -D/2  
 -15db  
 -300mm  
 WHICH EVER IS SMALLER

NOTE : VERTICAL REINFORCEMENT NEED NOT BE ENCLOSED BY LATERAL TIES IF VERTICAL REINFORCEMENT AREA IS NOT GREATER THAN 0.01 TIMES GROSS CONCRETE AREA, OR WHERE VERTICAL REINFORCEMENT IS NOT REQUIRED AS COMPRESSION REINFORCEMENT.

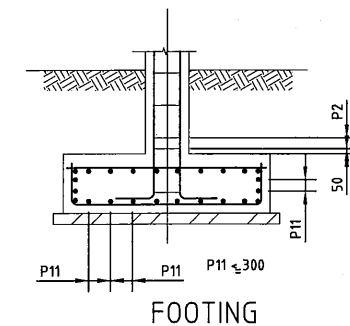
FOR WALLS GREATER THAN 200mm THICK, THE VERTICAL AND HORIZONTAL REINFORCEMENT SHALL BE PROVIDED IN TWO GRIDS, ONE NEAR EACH FACE OF THE WALL.

**GIRDER AND BEAM**  
 PRIMARY REINFORCEMENT      SECONDARY REINFORCEMENT

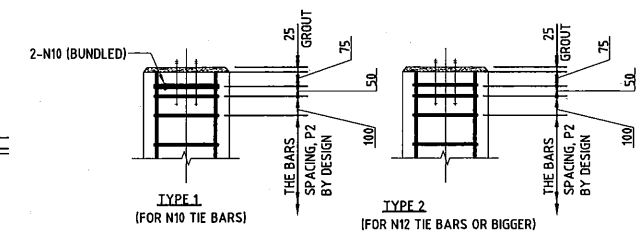


**SLAB**

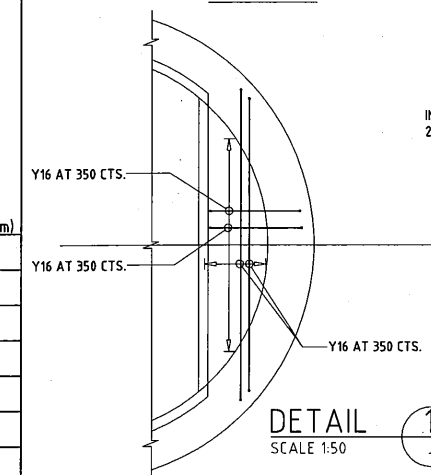
STANDARD HOOKS AND BENDS					
FOR MAIN REINFORCEMENT			FOR TIES AND STIRRUPS REINFORCEMENT		
BAR SIZE	MIN.BEND DIA.	MIN.EXTENSION	BAR SIZE	MIN.BEND DIA.	MIN.EXTENSION
	D1	L1    L2		D2	L3    L4
N12	60	120    70	N12	40	135    100
N16	80	135    70			
N20	100	160    80			
N24	120	195    100			
N28	140	225    115			
N32	160	260    130			
N36	180	290    145			
N40	200	320    160			



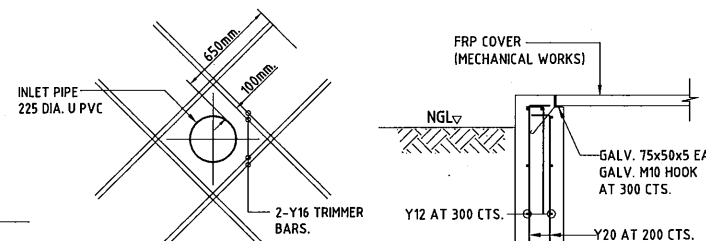
FOOTING



STIRRUP DETAIL FOR TOP OF PEDESTAL



DETAIL 1 SCALE 1:50



TYP. DETAIL SCALE 1:50

DETAIL 2 SCALE 1:50

This drawing is certified to comply with the Structural Engineering provisions of the Regulations under the Building Act Chapter 301 of the Revised Laws of Papua New Guinea

*[Signature]*

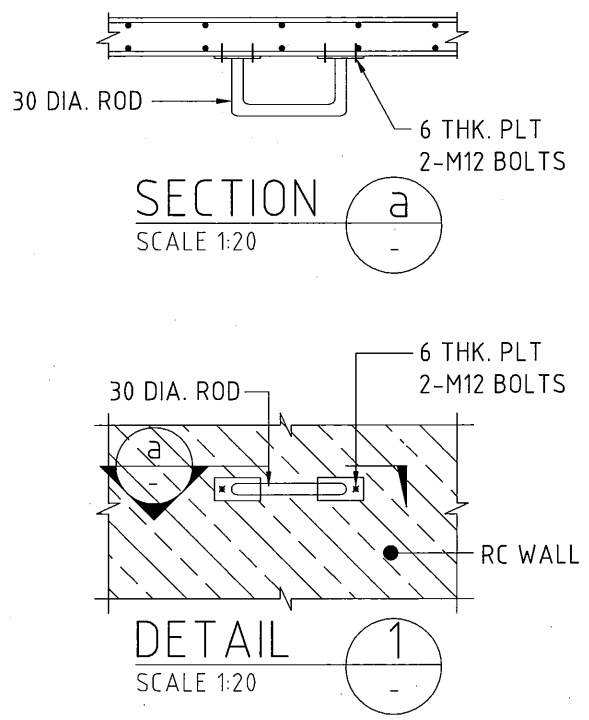
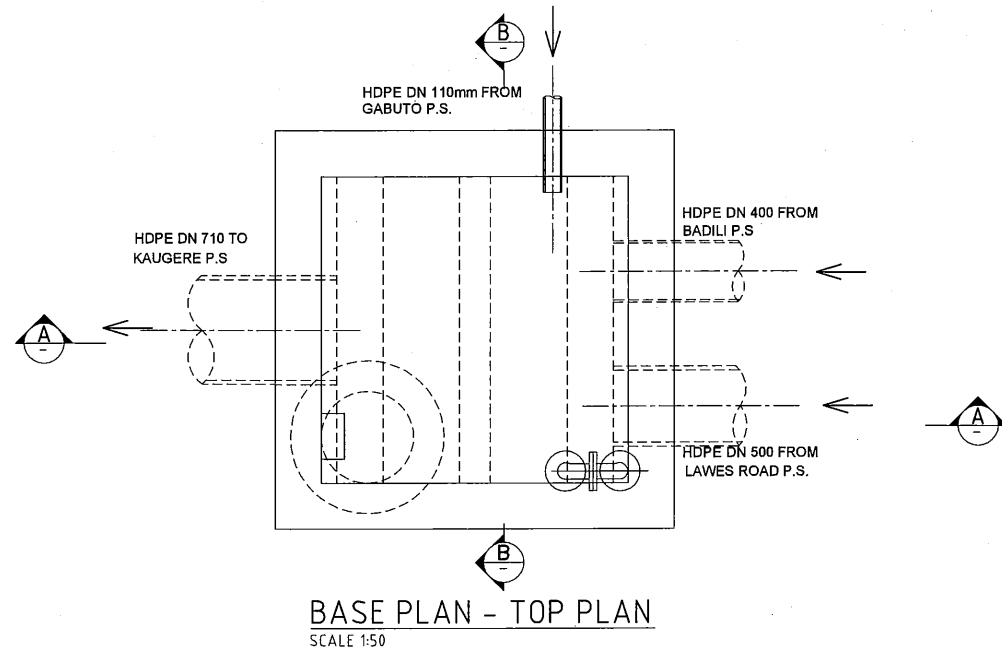
Name: Mr. L.J. Stocks  
 Registered Structural Engineer No: 0394152

TENDER ISSUE

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)		TITLE: KilaKila SPT. RECEIVING WELL 1&2, WATER PRESSURE REDUCING WELL, FLOW METER CHAMBER, & DRAINAGE TANK - STRUCTURAL NOTES, SHEET 2 OF 2													
CLIENT: IPBC INDEPENDENT PUBLIC BUSINESS CORPORATION PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT MANAGEMENT UNIT (PMU) JICA JAPAN INTERNATIONAL COOPERATION AGENCY	CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN	NOTES:	REVISIONS <table border="1"> <thead> <tr> <th>ISSUE</th> <th>REV.</th> <th>DATE</th> <th>CHKED</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td>TENDER</td> <td>-</td> <td>14/11/2011</td> <td>LJS</td> <td>ISSUE FOR TENDER</td> <td>CM</td> </tr> </tbody> </table>	ISSUE	REV.	DATE	CHKED	DESCRIPTION	BY	TENDER	-	14/11/2011	LJS	ISSUE FOR TENDER	CM
ISSUE	REV.	DATE	CHKED	DESCRIPTION	BY										
TENDER	-	14/11/2011	LJS	ISSUE FOR TENDER	CM										
APPROVED BY PMU: Project Director Lot G.Zauya		DATE: 1. Dec 2011	SCALE: N.T.S.												
CHECKED BY CONSULTANT Project Manager T.Fuji		DATE: 1. Dec 2011	DRAWING NO.: STP-S001a												



# RECEIVING WELL (1) (SCRATCHLEY ROAD)



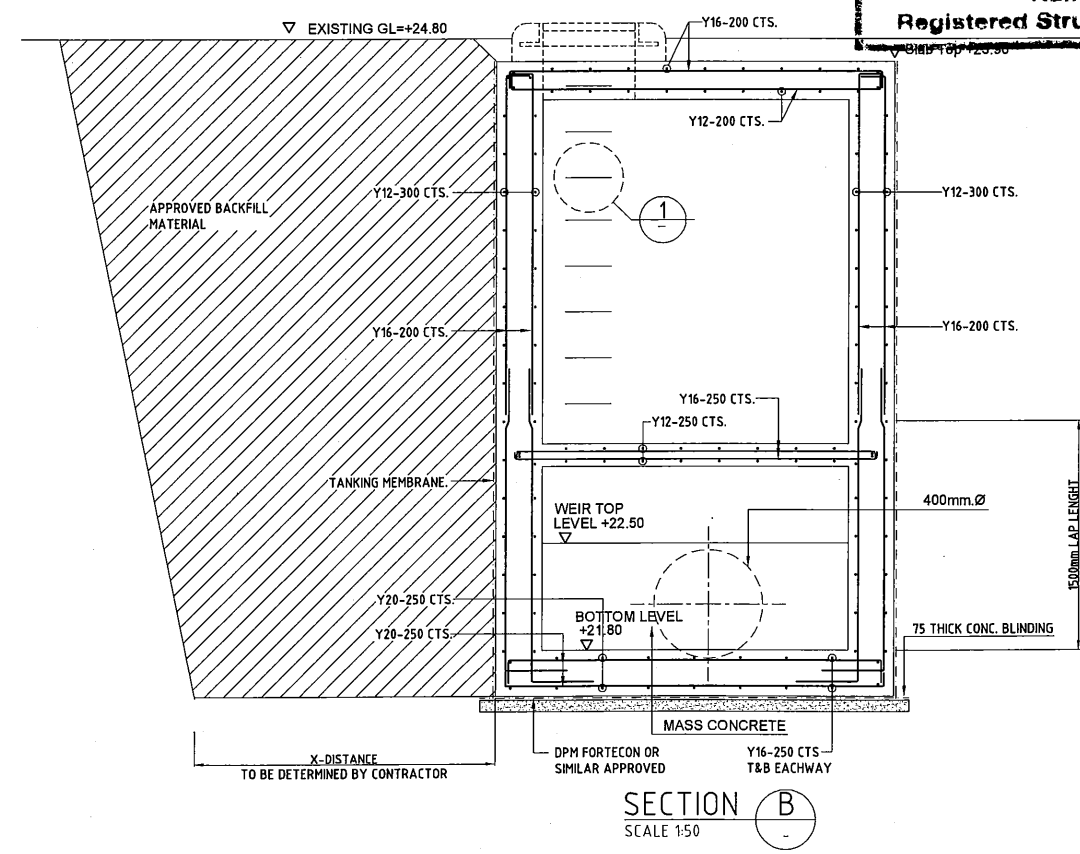
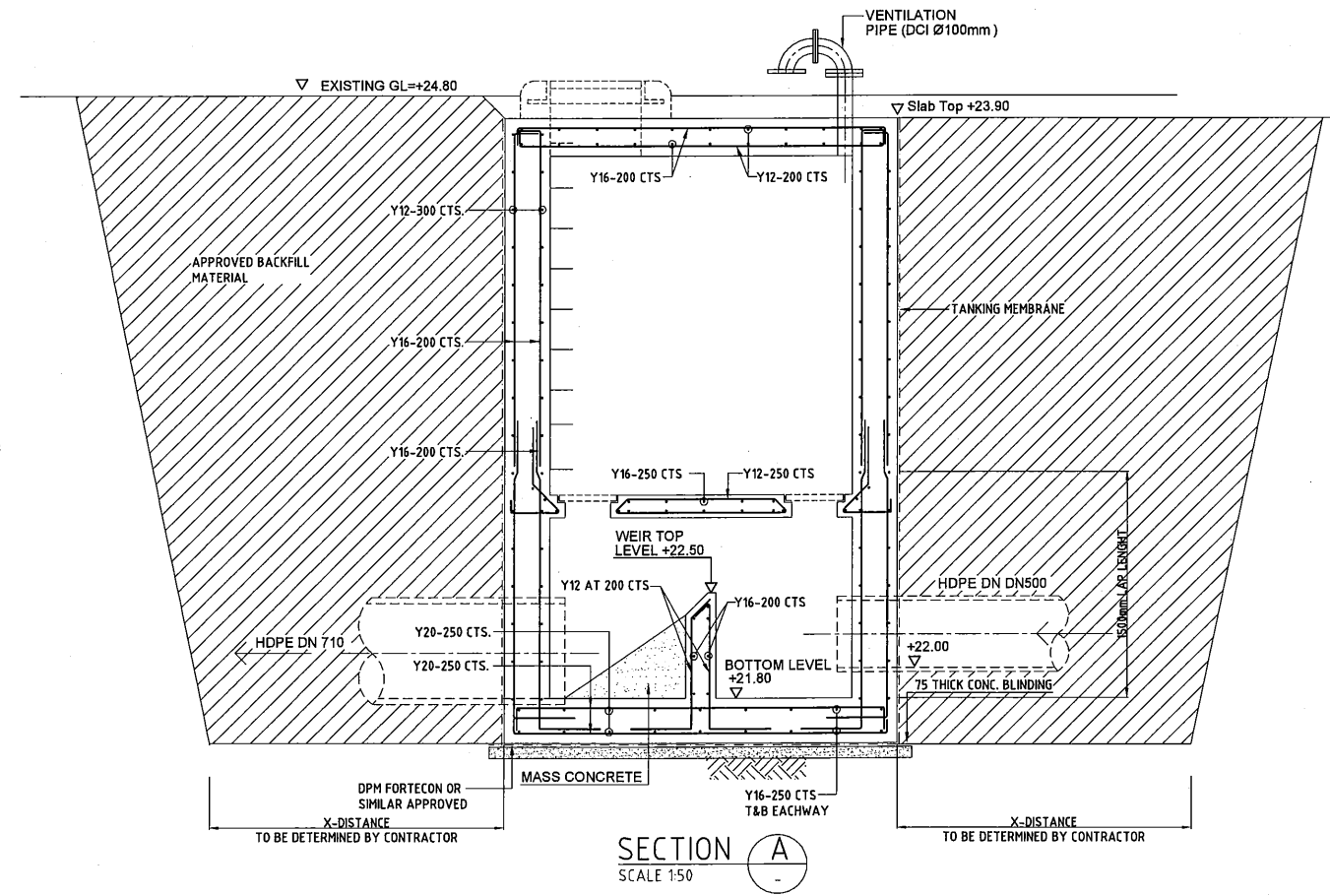
## NOTES:

1. THE EXTENT OF EXCAVATION REQUIRED FOR ADEQUATE WORKING SPACE SHALL BE DETERMINED BY THE CONTRACTOR.
2. REFER TO ARCHITECTURAL DRAWINGS FOR MISCELLANEOUS WORKS SUCH AS HANDRAILS, COVER, STEP LADDER, STAIR, STOP LOG AND EXPANSION JOINT.
3. CONCRETE GRADE: F'C = 40 MPa
4. MINIMUM COVER TO BE REINFORCED  
 WALL - 75mm  
 SLAB ON GROUND - 75mm  
 SUSPENDED SLABS - 65mm
5. THE ELECTRO MAGNETIC-FLOW METER WITH THE FLEXIBLE PIPE COUPLING SHALL BE SUPPLIED AND INSTALLED BY THE INSTRUMENTATION SUB-CONTRACTOR THROUGH CLOSE COORDINATION WITH THE MAIN CONTRACTOR TO MAKE THE FLOW METER COMPLETE.
6. BACKFILL MATERIAL SHALL BE ACCORDANCE WITH SPECIFICATIONS.

This drawing is certified to comply with the Structural Engineering provisions of the Regulations under the Building Act Chapter 301 of the Revised Laws of Papua New Guinea

*[Signature]*

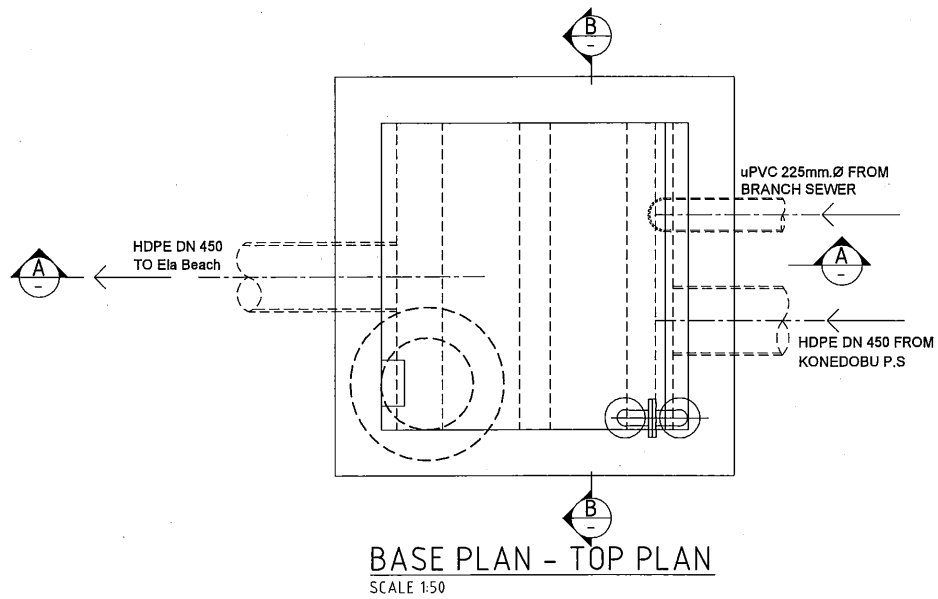
Name: Mr. L.J. Stocks  
 Registered Structural Engineer No: 0394152



TENER ISSUE

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)		TITLE: RECEIVING WELL (1) PLAN & SECTION																	
CLIENT: IPBC INDEPENDENT PUBLIC BUSINESS CORPORATION PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT PROJECT MANAGEMENT UNIT (PMU) JICA JAPAN INTERNATIONAL COOPERATION AGENCY	CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN	NOTES:	APPROVED by PMU: Project Director Lot G.Zauya CHECKED by CONSULTANT Project Manager T.Fuji																
		<table border="1"> <thead> <tr> <th>ISSUE</th> <th>REV.</th> <th>DATE</th> <th>CHKED</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td>TENDER</td> <td>-</td> <td>14/11/2011</td> <td>LJS</td> <td>ISSUE FOR TENDER</td> <td>LKT</td> </tr> </tbody> </table>	ISSUE	REV.	DATE	CHKED	DESCRIPTION	BY	TENDER	-	14/11/2011	LJS	ISSUE FOR TENDER	LKT	<table border="1"> <tr> <td>DATE: 1. Dec 2011</td> <td>SCALE: AS SHOWN</td> </tr> <tr> <td>DATE: 1. Dec 2011</td> <td>DRAWING NO.: P1-67</td> </tr> </table>	DATE: 1. Dec 2011	SCALE: AS SHOWN	DATE: 1. Dec 2011	DRAWING NO.: P1-67
ISSUE	REV.	DATE	CHKED	DESCRIPTION	BY														
TENDER	-	14/11/2011	LJS	ISSUE FOR TENDER	LKT														
DATE: 1. Dec 2011	SCALE: AS SHOWN																		
DATE: 1. Dec 2011	DRAWING NO.: P1-67																		

# RECEIVING WELL (2) (HUNTER ST.)



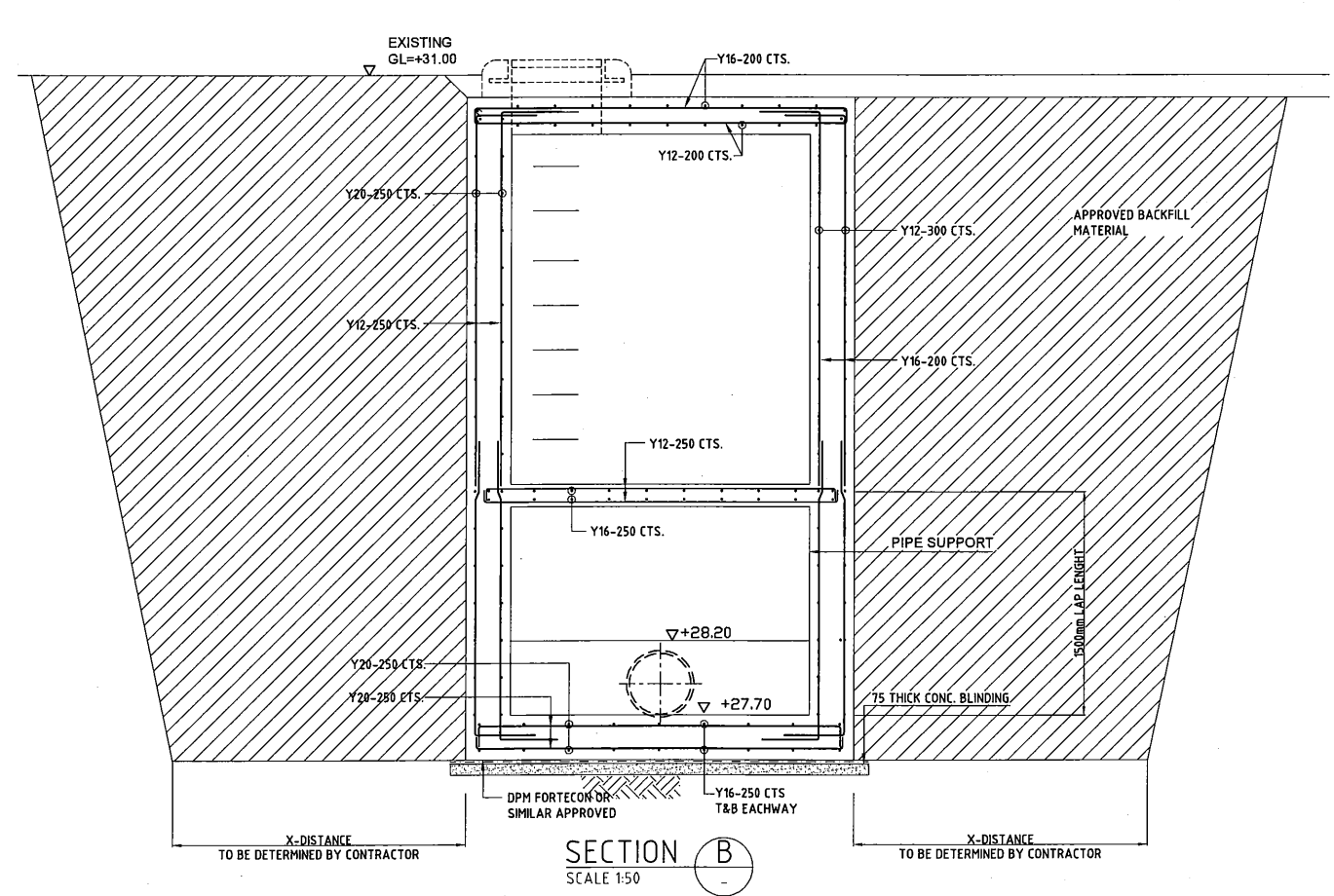
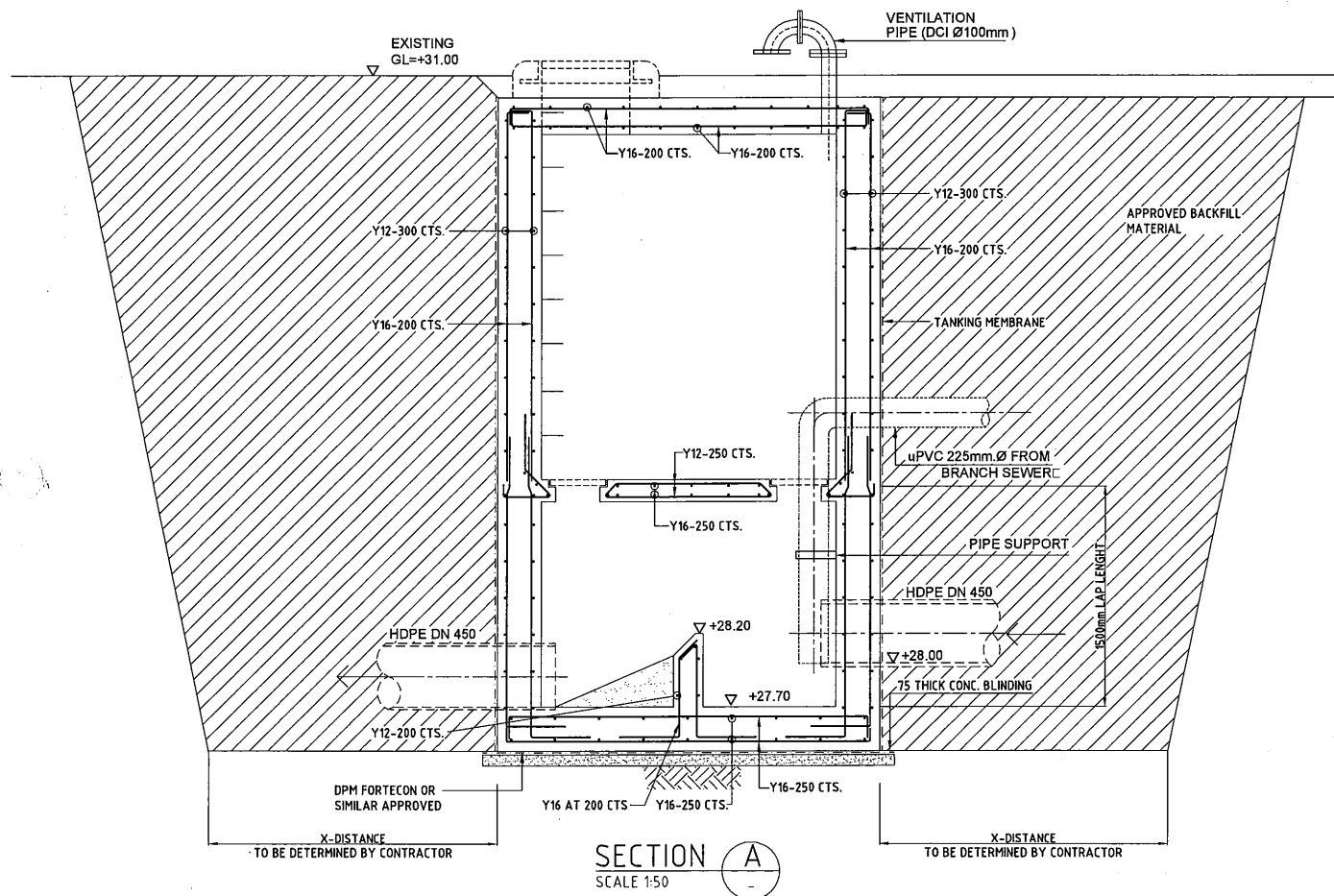
This drawing is certified to comply with the Structural Engineering provisions of the Regulations under the Building Act Chapter 301 of the Revised Laws of Papua New Guinea

*[Signature]*

Name: Mr. L.J. Stocks  
Registered Structural Engineer No: 0394152

## NOTES:

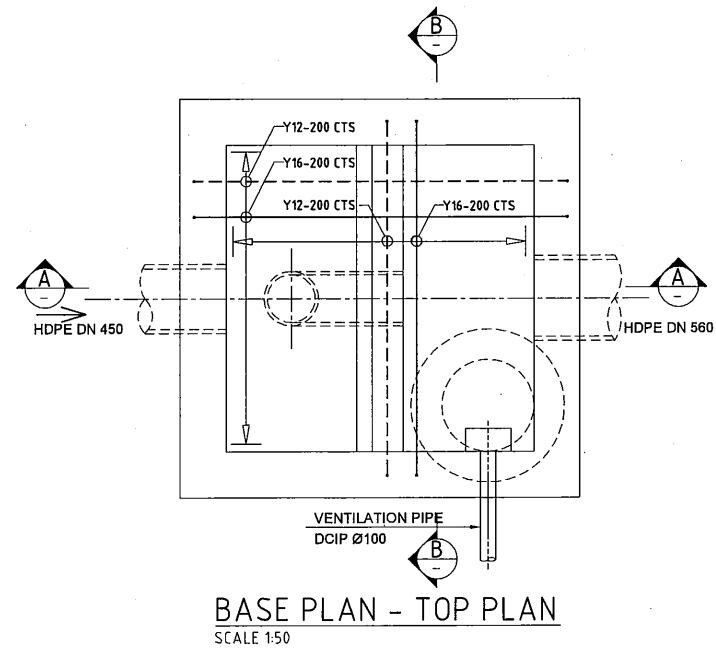
1. THE EXTENT OF EXCAVATION REQUIRED FOR ADEQUATE WORKING SPACE SHALL BE DETERMINED BY THE CONTRACTOR.
2. REFER TO ARCHITECTURAL DRAWINGS FOR MISCELLANEOUS WORKS SUCH AS HANDRAILS, COVER, STEP LADDER, STAIR, STOP LOG AND EXPANSION JOINT.
3. CONCRETE GRADE: F'C = 40 MPa
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WALL - 75mm  
SLAB ON GROUND - 75mm  
SUSPENDED SLABS - 65mm
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6. BACKFILL MATERIAL SHALL BE ACCORDANCE WITH SPECIFICATIONS.



TENDER ISSUE

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)		TITLE: RECEIVING WELL (2) PLAN & SECTION	
CLIENT:  INDEPENDENT PUBLIC BUSINESS CORPORATION PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT PROJECT MANAGEMENT UNIT (PMU)	CONSULTANTS:  NJS CONSULTANTS CO., LTD. - JAPAN	NOTES:	APPROVED by PMU: Project Director Lot G.Zauya
JAPAN INTERNATIONAL COOPERATION AGENCY			CHECKED by CONSULTANT Project Manager T.Fuji
			DATE: 1. Dec 2011
			SCALE: AS SHOWN
			DATE: 1. Dec 2011
			DRAWING NO.: PI-68

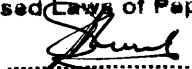
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ISSUE	REV.	DATE	CHKD	DESCRIPTION	BY
TENDER	-	14/11/2011	LJS	ISSUE FOR TENDER	LKT



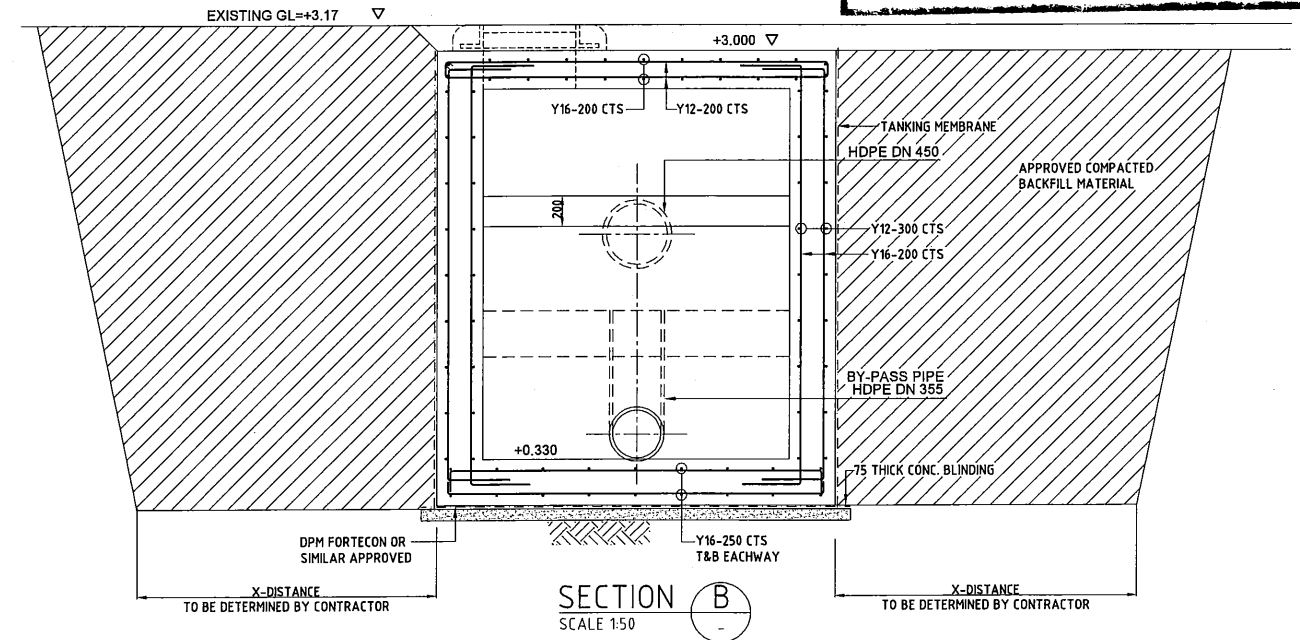
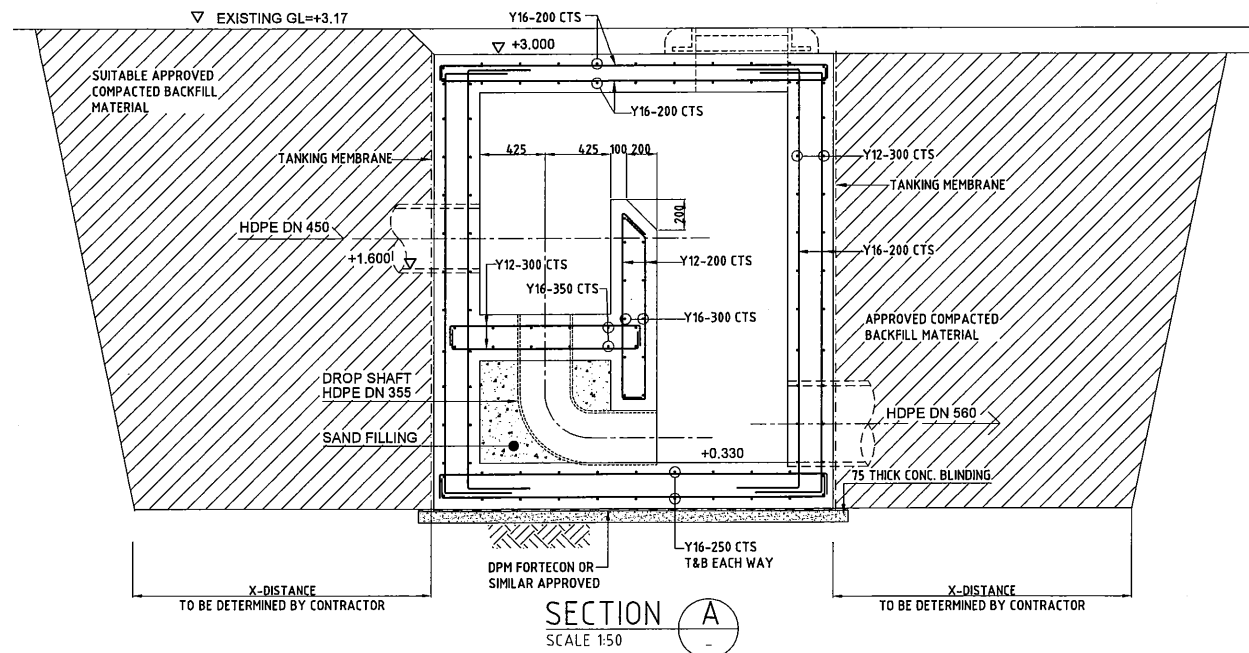
**NOTES:**

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6. BACKFILL MATERIAL SHALL BE ACCORDANCE WITH SPECIFICATIONS.

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**Name: Mr. L.J. Stocks**  
Registered Structural Engineer No: 0394152



TENDER ISSUE

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)		TITLE: WATER PRESSURE REDUCING WELL	
CLIENT:	INDEPENDENT PUBLIC BUSINESS CORPORATION PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT PROJECT MANAGEMENT UNIT (PMU) JICA JAPAN INTERNATIONAL COOPERATION AGENCY	CONSULTANTS:	NJS CONSULTANTS CO., LTD. - JAPAN

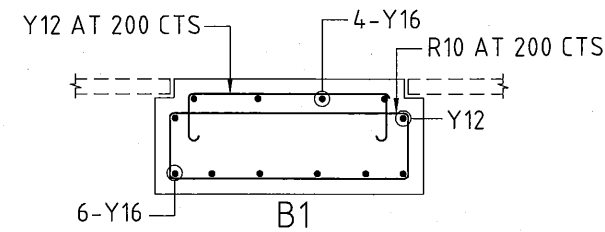
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	TENDER	-	14/11/2011	LJS	ISSUE FOR TENDER	LKT		
						CHECKED by CONSULTANT Project Manager T.Fuji	DATE: 1. Dec 2011	DRAWING NO.: P1-69

MEMBER SCHEDULE

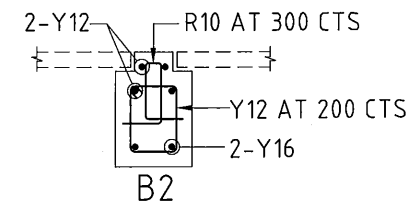
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B1	300 DP x 700 WD	RC BEAM
B2	300 DP x 200 WD	RC BEAM

NOTES:

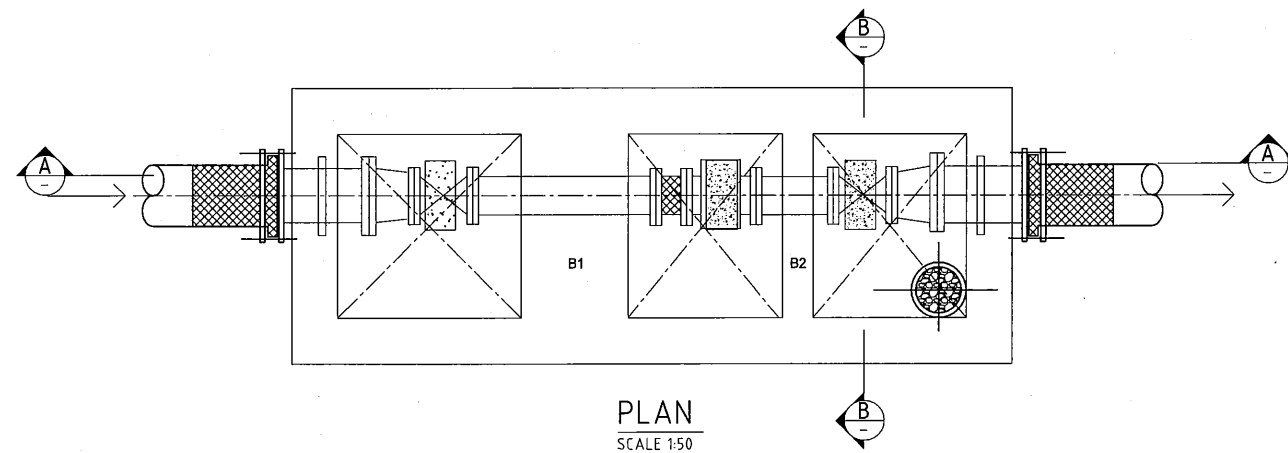
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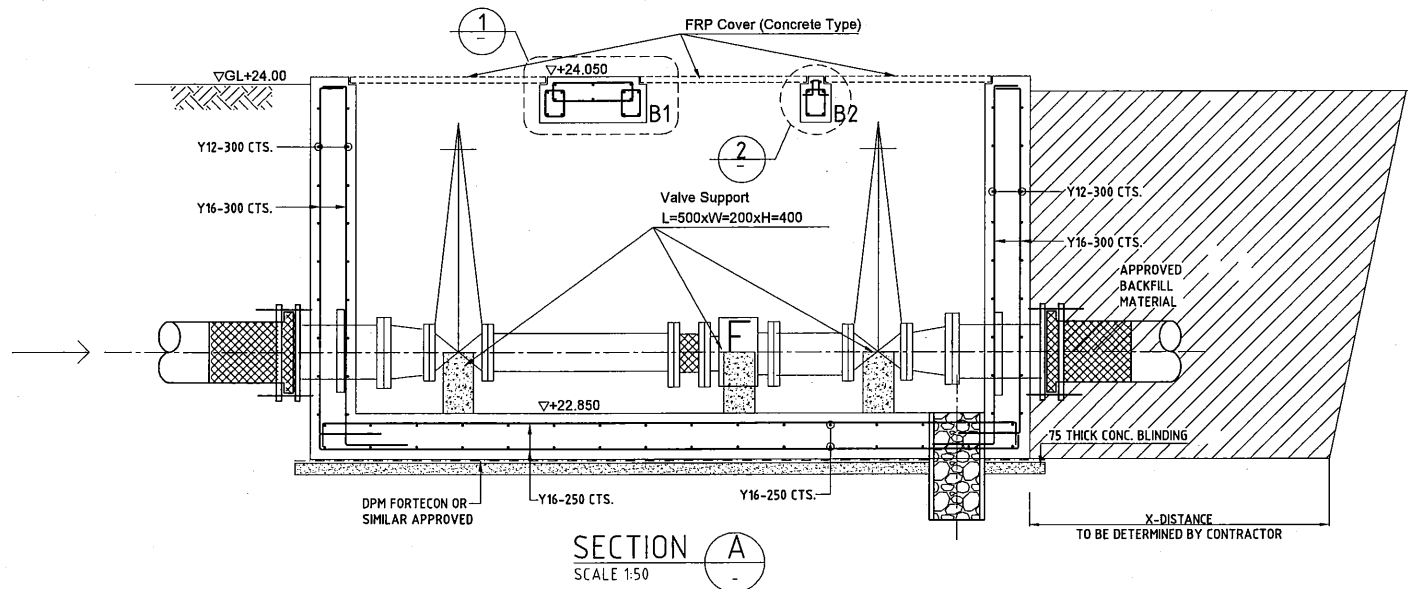
DETAIL 1  
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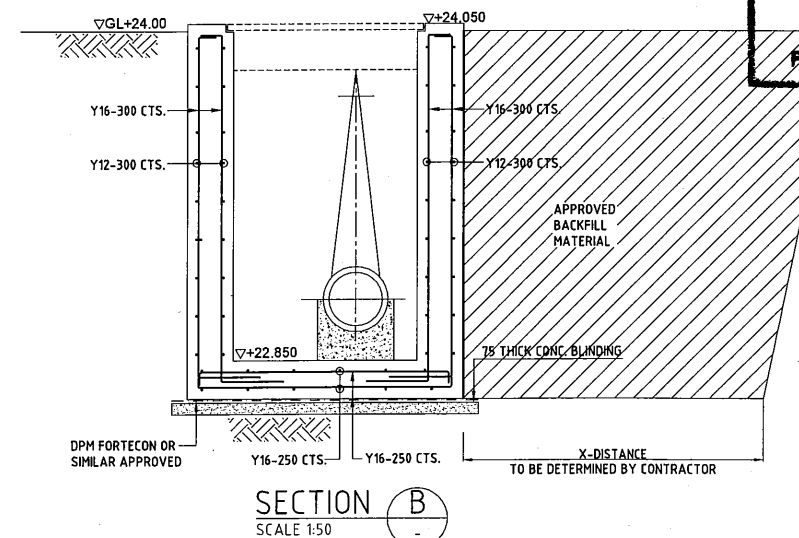
DETAIL 2  
SCALE 1:20



PLAN  
SCALE 1:50



SECTION A  
SCALE 1:50



SECTION B  
SCALE 1:50

This drawing is certified to comply with the Structural Engineering provisions of the Regulations under the Building Act Chapter 301 of the Revised Laws of Papua New Guinea

*[Signature]*

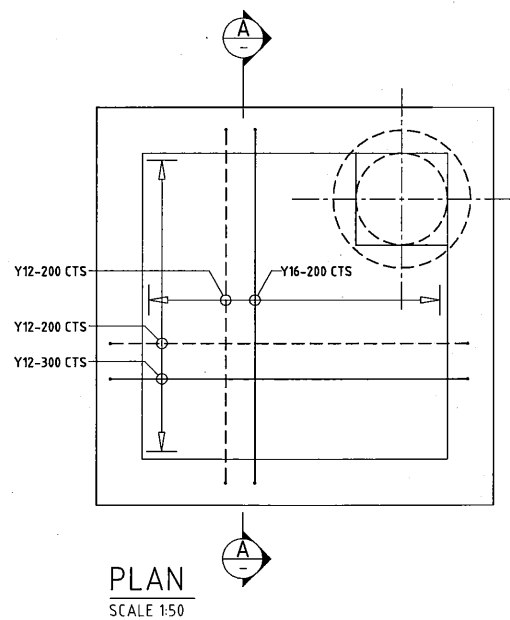
Name: Mr. L.J. Stocks  
Registered Structural Engineer No: 0394152

TENER ISSUE

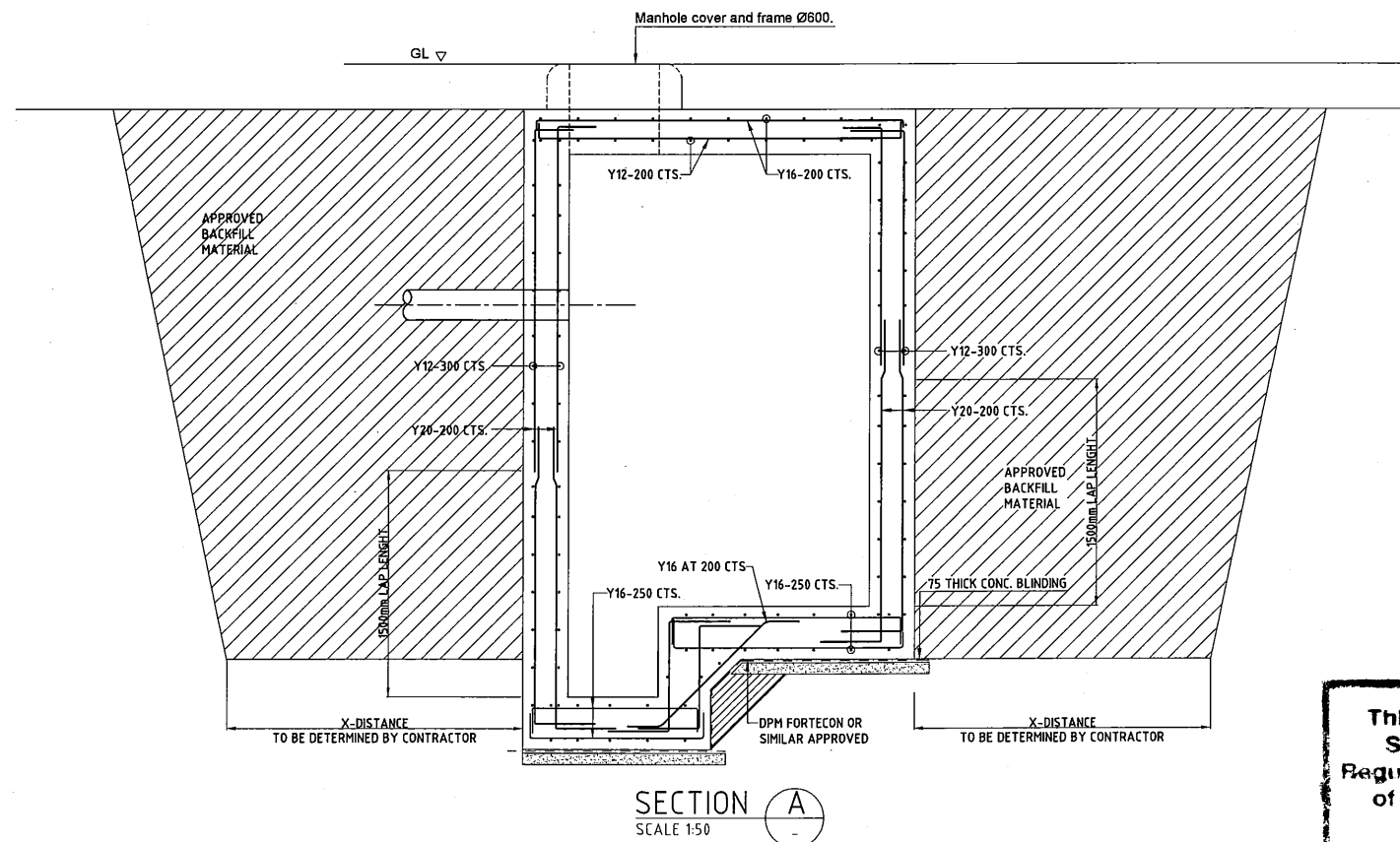
PROJECT:	PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)		TITLE:	FLOW METER CHAMBER PLAN & SECTION																																	
CLIENT:	INDEPENDENT PUBLIC BUSINESS CORPORATION JAPAN INTERNATIONAL COOPERATION AGENCY	CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN	NOTES:	<table border="1"> <thead> <tr> <th colspan="6">REVISIONS</th> </tr> <tr> <th>ISSUE</th> <th>REV.</th> <th>DATE</th> <th>CHKD</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td>TENDER</td> <td>-</td> <td>14/11/2011</td> <td>LJS</td> <td>ISSUE FOR TENDER</td> <td>LKT</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>				REVISIONS						ISSUE	REV.	DATE	CHKD	DESCRIPTION	BY	TENDER	-	14/11/2011	LJS	ISSUE FOR TENDER	LKT												
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APPROVED by PMU: Project Director Lot G.Zauya			DATE:	1. Dec 2011	SCALE:	AS SHOWN																															
CHECKED by CONSULTANT Project Manager T.Fuji			DATE:	1. Dec 2011	DRAWING NO.:	PI-70																															

**NOTES:**

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**DETAIL OF DRAINAGE TANK**



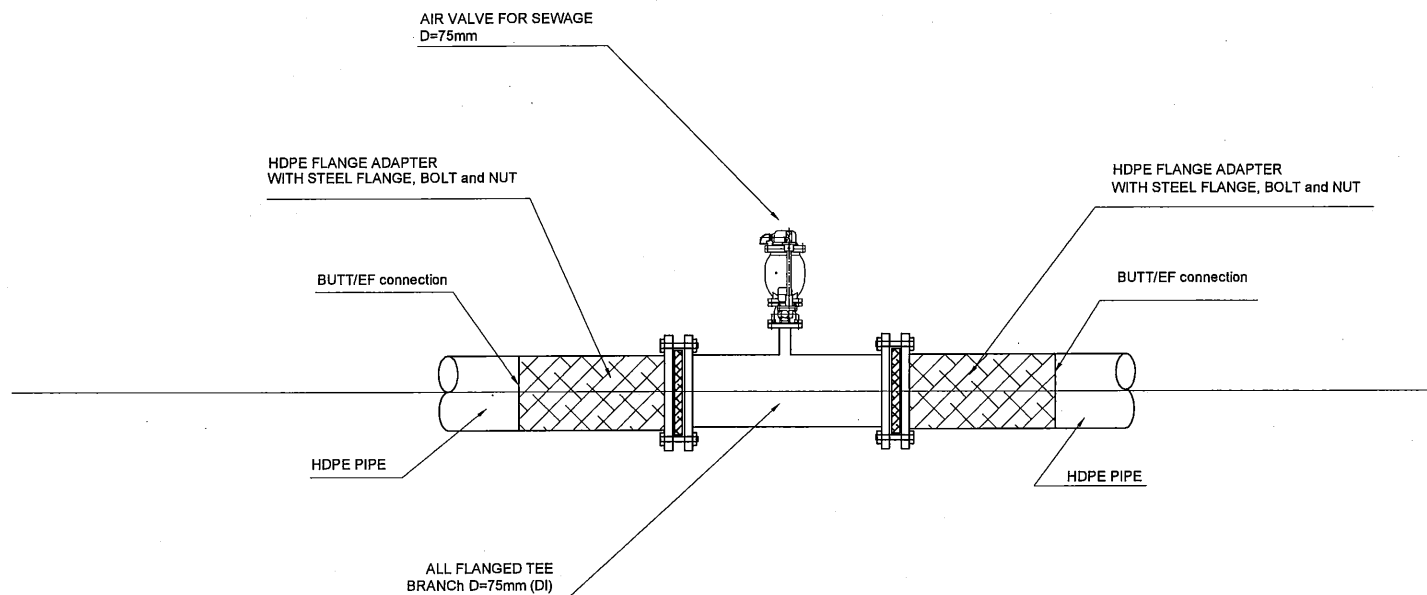
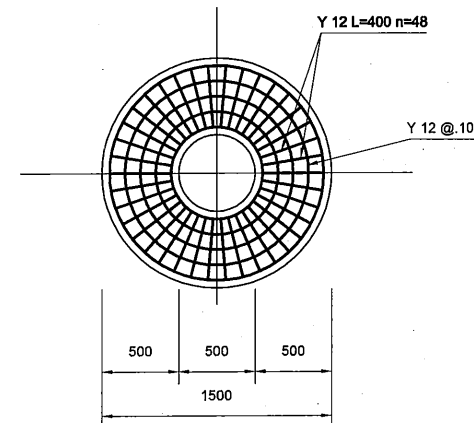
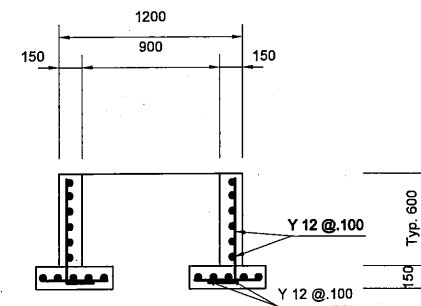
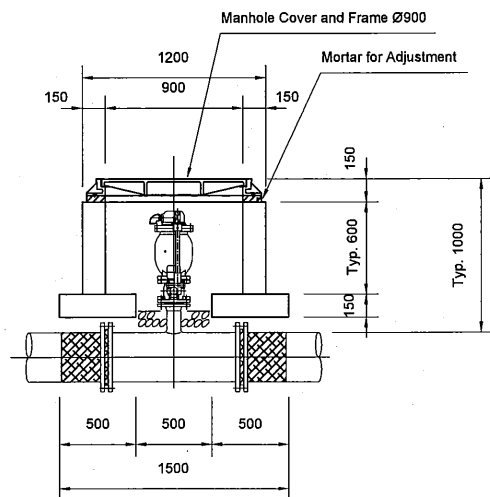
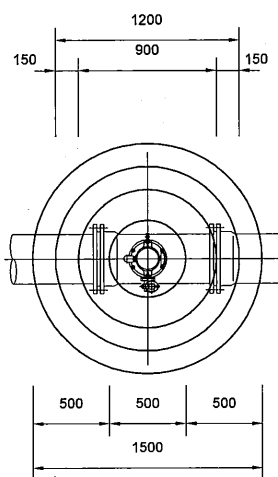
This drawing is certified to comply with the Structural Engineering provisions of the Regulations under the Building Act Chapter 301 of the Revised Laws of Papua New Guinea

*[Signature]*

Name: Mr. L.J. Stocks  
Registered Structural Engineer No: 0394152

TENDER ISSUE

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)		TITLE: DRAINAGE TANK PLAN																																
CLIENT:	INDEPENDENT PUBLIC BUSINESS CORPORATION PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT PROJECT MANAGEMENT UNIT (PMU) JICA JAPAN INTERNATIONAL COOPERATION AGENCY	CONSULTANTS:	NJS CONSULTANTS CO., LTD. - JAPAN	NOTES:																														
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		APPROVED by PMU: Project Director Lot G. Zauya		DATE: 1. Dec 2011	SCALE: AS SHOWN																													
		CHECKED by CONSULTANT Project Manager T. Fuji		DATE: 1. Dec 2011	DRAWING NO.: P1-73																													



BEFORE AND AFTER AIR VALVE  
HDPE IS CONNECTED TO DCI ACCORDING TO FOLLOWING TABLE

TRUNK MAIN HDPE DN	EQUIVALENT DI dia.	REFERENCE
DN 110	Ø 100	
DN 125	Ø 100	Reduced to DN 110
DN 160	Ø 150	
DN 225	Ø 200	
DN 280	Ø 250	
DN 355	Ø 300	
DN 400	Ø 350	
DN 450	Ø 400	
DN 500	Ø 450	
DN 580	Ø 500	
DN 710	Ø 600	

This drawing is certified to comply with the Structural Engineering provisions of the Regulations under the Building Act Chapter 30 of the Revised Laws of Papua New Guinea

*[Signature]*

Name: Mr. L.J. Stocks  
Registered Structural Engineer No: 0394152

TENDER ISSUE

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

CLIENT: INDEPENDENT PUBLIC BUSINESS CORPORATION  
PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT  
PROJECT MANAGEMENT UNIT (PMU)  
JICA JAPAN INTERNATIONAL COOPERATION AGENCY

CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN

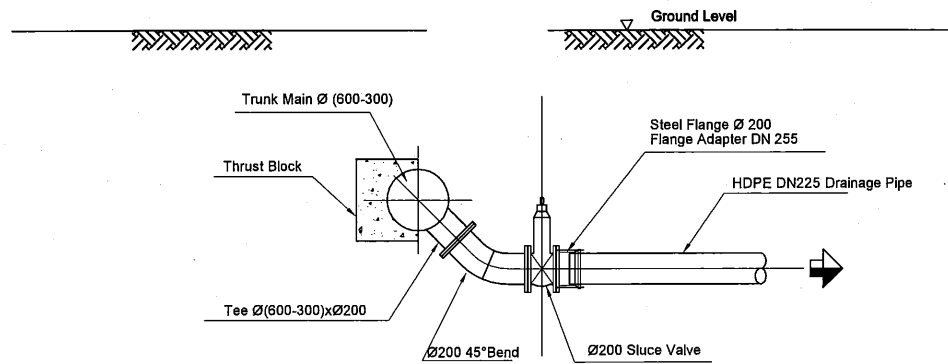
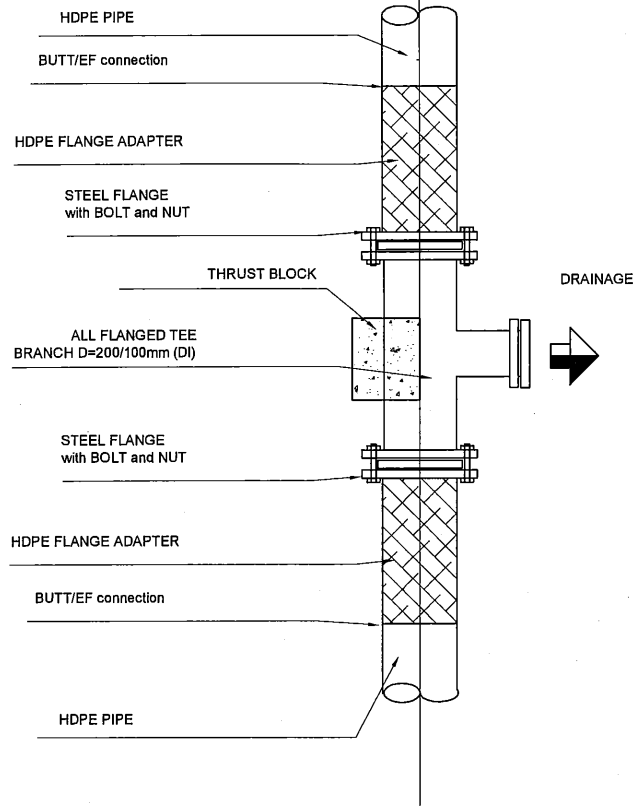
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TENDER	-	14/11/2011	LJS	ISSUE FOR TENDER	GV	

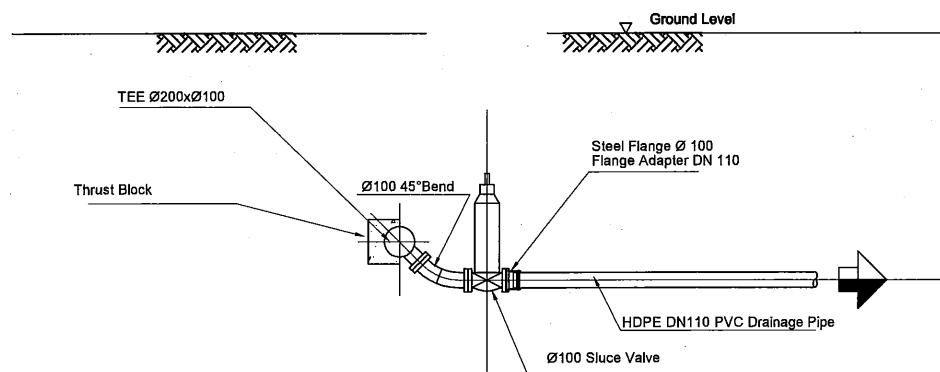
APPROVED by PMU: Project Director Lot G.Zauya  
DATE: 1. Dec 2011  
SCALE: 1/50

CHECKED by CONSULTANT: Project Manager T.Fuji  
DATE: 1. Dec 2011  
DRAWING NO.: PI-74

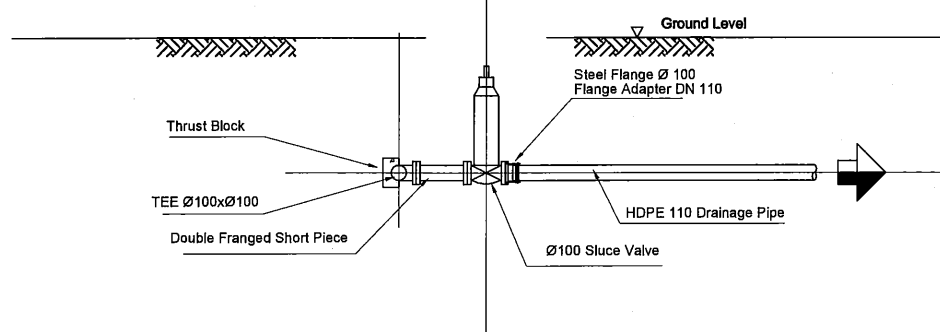


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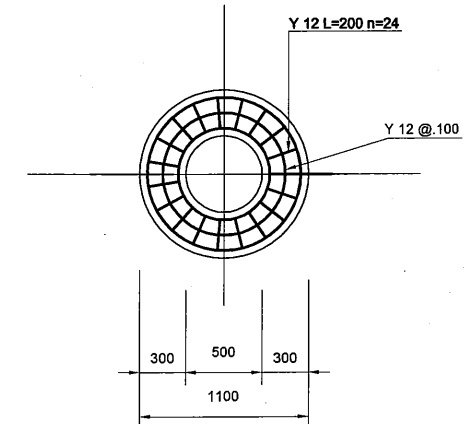
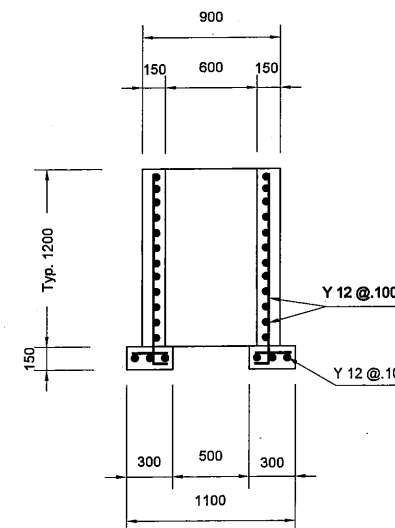
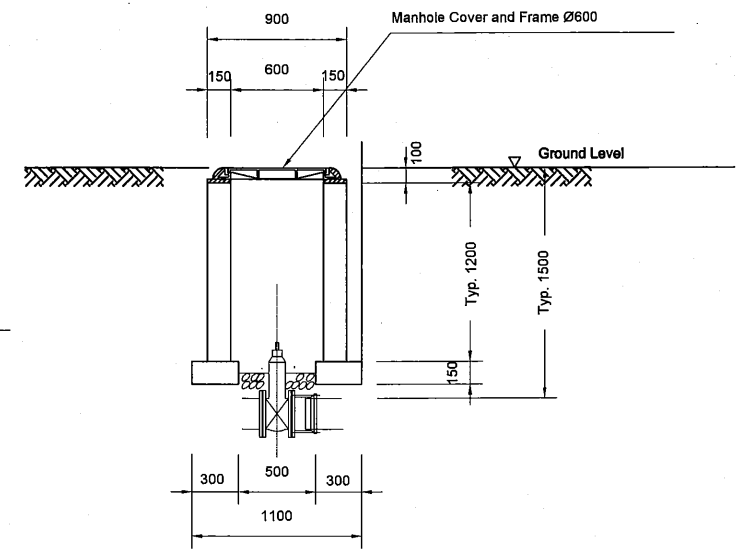
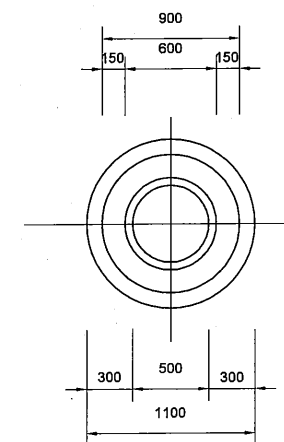


(Trunk Main Dia. HDPE 225)



(Trunk Main Dia. HDPE 110)

TRUNK MAIN HDPE DN	EQUIVALENT DI dia.	REFERENCE
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DN 125	Ø 100	Reduced to DN 110
DN 160	Ø 150	
DN 225	Ø 200	
DN 280	Ø 250	
DN 355	Ø 300	
DN 400	Ø 350	
DN 450	Ø 400	
DN 500	Ø 450	
DN 560	Ø 500	
DN 710	Ø 600	



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*[Signature]*

Member Mr. L.J. Sioaka  
Professional Structural Engineer No. 0034/152

TENER ISSUE

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

CLIENT: INDEPENDENT PUBLIC BUSINESS CORPORATION  
PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT  
PROJECT MANAGEMENT UNIT (PMU)  
 JAPAN INTERNATIONAL COOPERATION AGENCY

CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN

TITLE: DRAINAGE STANDARD DRAWING

NOTES:

REVISIONS					
ISSUE	REV.	DATE	CHKED	DESCRIPTION	BY
TENDER	-	14/11/2011	LJS	ISSUE FOR TENDER	GV

APPROVED by PMU:  
Project Director  
Lot G.Zauya

CHECKED by CONSULTANT  
Project Manager  
T.Fuji

DATE: 1. Dec 2011

SCALE: 1/50

DATE: 1. Dec 2011

DRAWING NO.: PI-72