

PLAN VIEW
Scale : 1:500

HDPE PIPE BENDING POINT COORDINATES

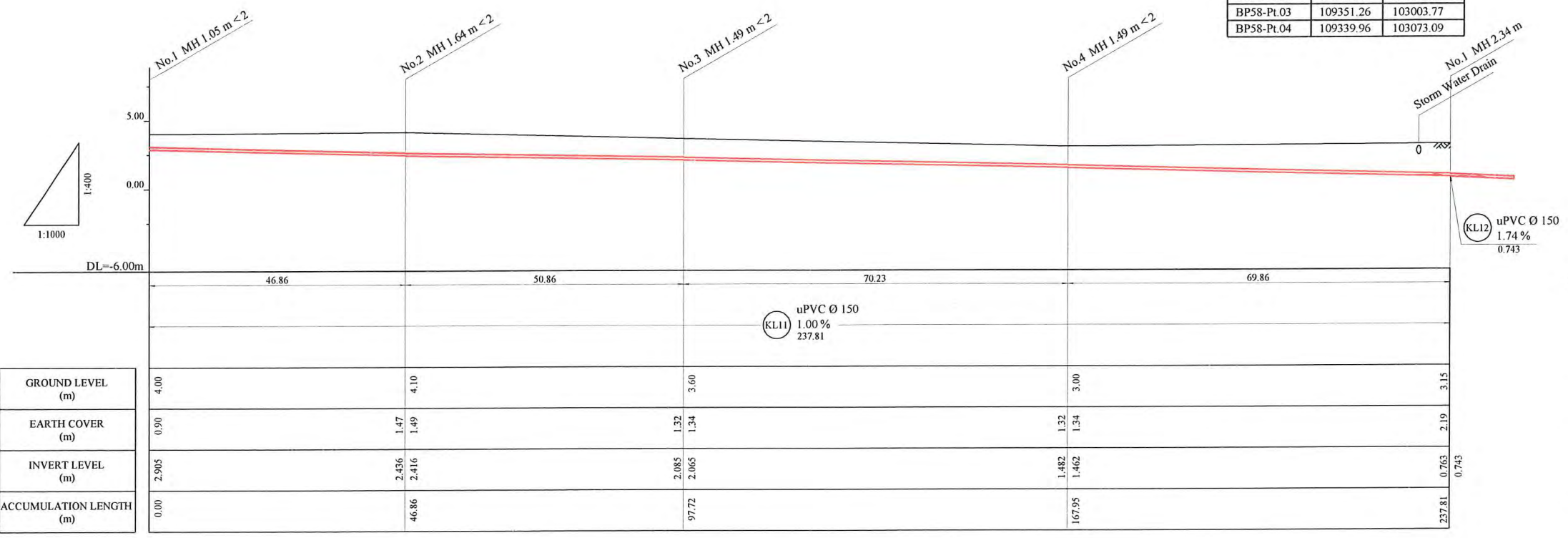
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BP58-Pt.01	109374.04	102908.86
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BP58-Pt.04	109339.96	103073.09

LEGEND

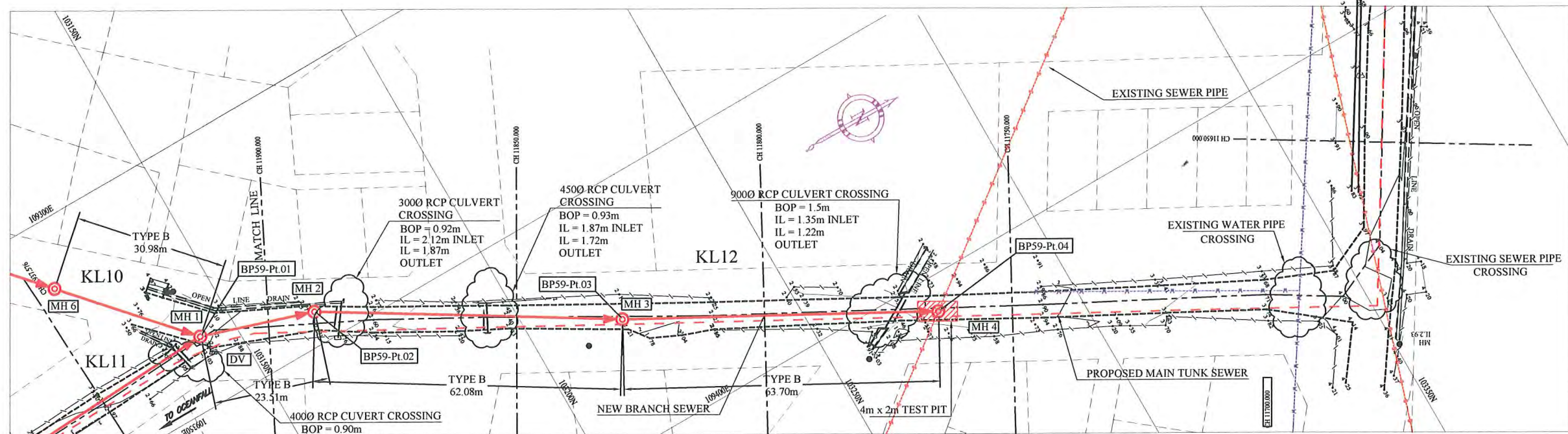
- PROPOSED SEWER
- NEW MANHOLE
- ⊙ EXISTING MANHOLE TO BE MODIFIED
- ⊕ POWER POLE WITH OVERHEAD POWER LINES
- ⊕ POWER POLE WITH LIGHT
- ⊕ ELECTRICITY TRANSMISSION TOWER
- ⊕ ELECTRICITY PIT
- ⊕ UNDER GROUND POWER CABLE
- ⊕ TELECOM PIT
- ⊕ TELECOM MARKER POST
- ⊕ TELECOM LINE
- ⊕ WATER VALVE BOX
- ⊕ STOP VALVE
- ⊕ WATER TAP
- ⊕ FIRE HYDRANT
- ⊕ WATER METER
- ⊕ EXISTING SEWER PIPE
- ⊕ TREE
- ⊕ WATER LINE
- ⊕ FENCE LINE WITH GATE
- ⊕ BITUMEN SEALED ROAD

NOTE: CADASTRAL BOUNDARIES TAKEN FROM DCDB

- LOCATION OF UNDERGROUND UTILITIES SHOWN ON THESE PLANS ARE APPROXIMATE ONLY. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING AND MAINTAINING ALL EXISTING UTILITIES IN OPERATION.
- UNDERGROUND UTILITY SERVICES TO RESIDENTIAL, PUBLIC AND COMMERCIAL BUILDINGS OR OTHER FACILITIES HAVE NOT BEEN SHOWN BUT SHALL BE LOCATED AND PROTECTED IN A SIMILAR MANNER AS DESCRIBED ABOVE BY THE CONTRACTOR
- INVERT MODIFICATION IS INCLUDED IN THE CONTRACT
INVERT LEVEL OF NEW PIPE ≥ EXISTING PIPE BOTTOM LEVEL +20mm
INVERT LEVEL OF NEW PIPE - EXISTING PIPE BOTTOM LEVEL ≥ +600mm
DROP PIPE IS REQUIRED
- MINIMUM COVER IS 60cm FOR UNPAVED ROAD
90cm FOR ASPHALT/CONCRETE PAVED ROAD IF NOT DESCRIBED ON THE DRAWING
Type A - Soil/others
Type B - Asphalt(Road)
Type C - Walkway (Concrete)



PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)		TITLE: Branch Sewer Pipe Plan and Profile (Kila kila_KL11)																
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:	<table border="1" style="width: 100%;"> <thead> <tr> <th colspan="3">REVISIONS</th> </tr> <tr> <th>REV.</th> <th>DATE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	REVISIONS			REV.	DATE	DESCRIPTION									
REVISIONS																		
REV.	DATE	DESCRIPTION																
APPROVED by PMU: Project Director Lot G.Zauya		DATE: 1. Dec 2011	SCALE: 1/1000															
CHECKED by CONSULTANT Project Manager T.Fuji		DATE: 1. Dec 2011	DRAWING NO.: BP-58															



PLAN VIEW
Scale : 1:1000

HDPE PIPE BENDING POINT CORDINATES

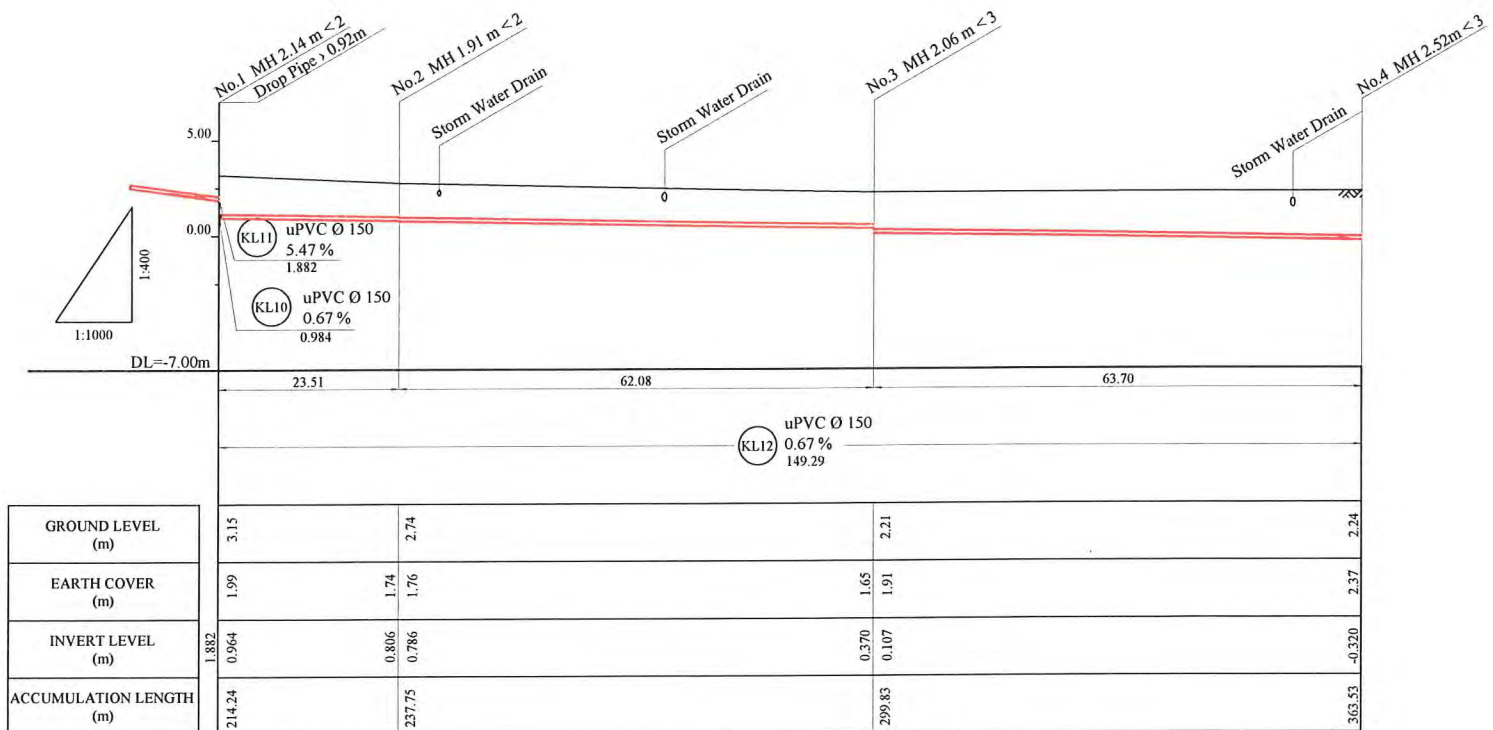
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BP59-Pt.04	109406.75	103273.93

LEGEND

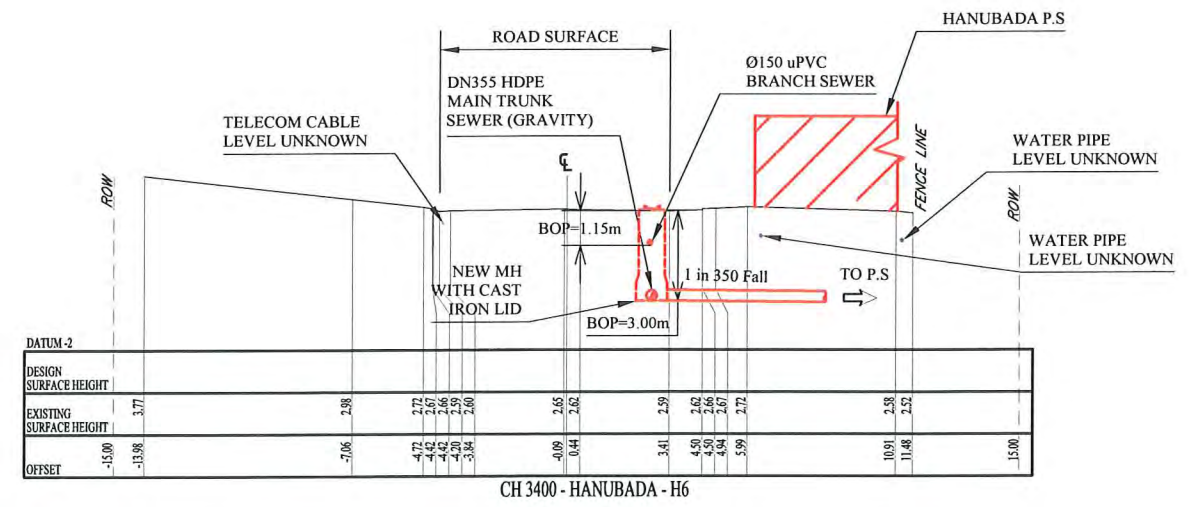
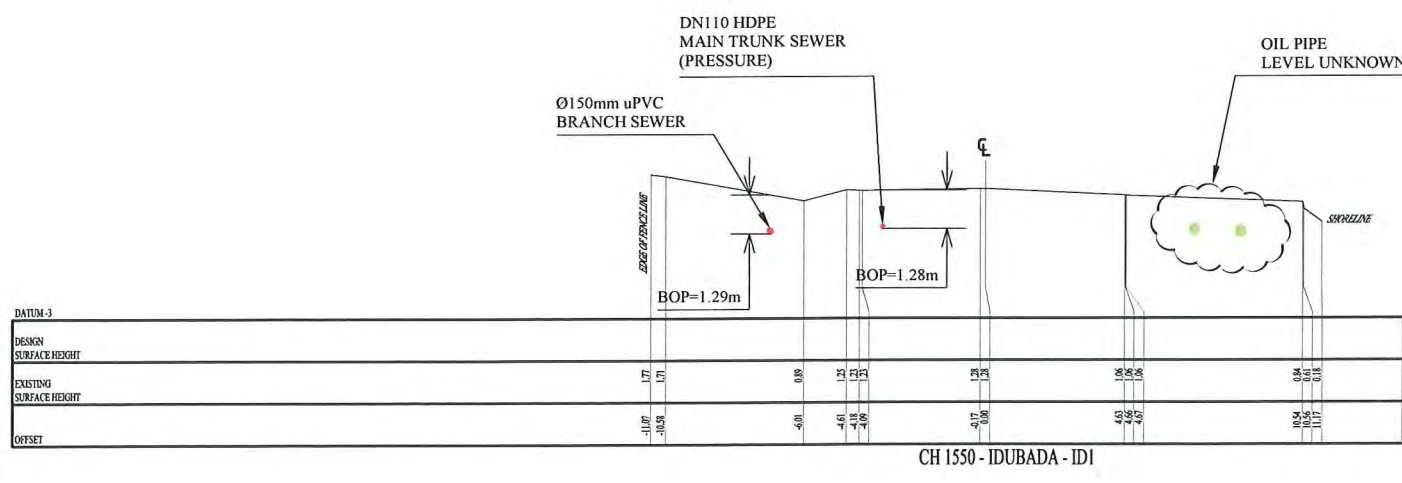
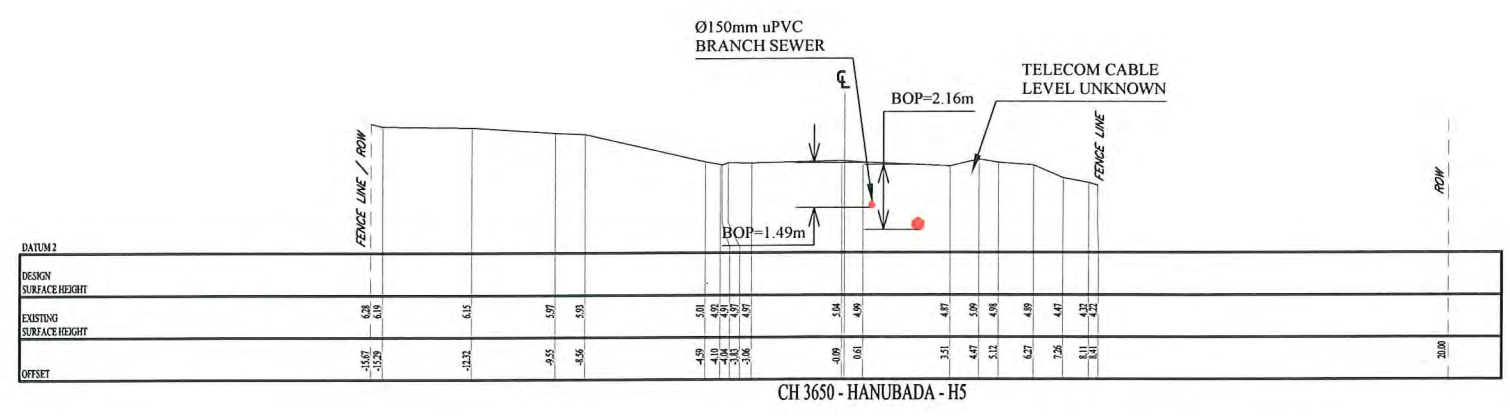
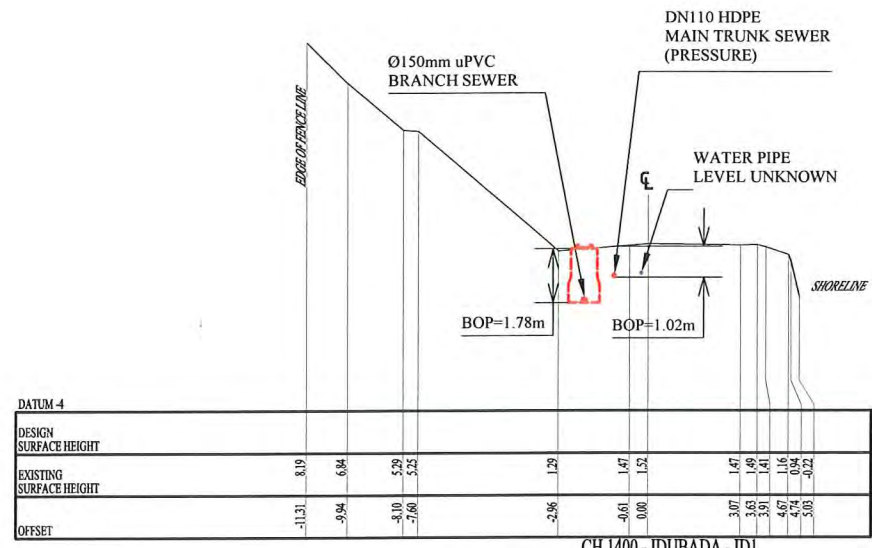
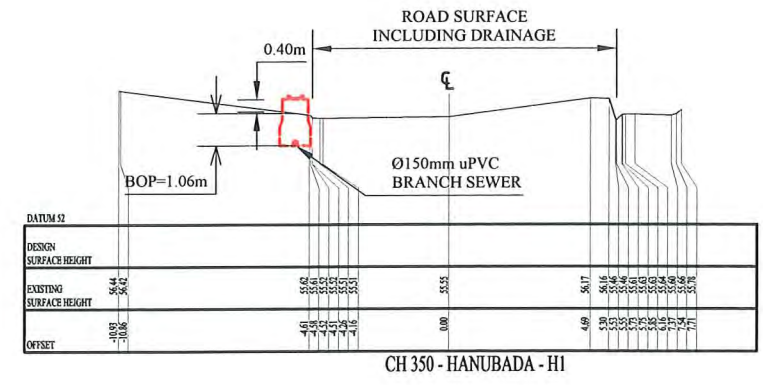
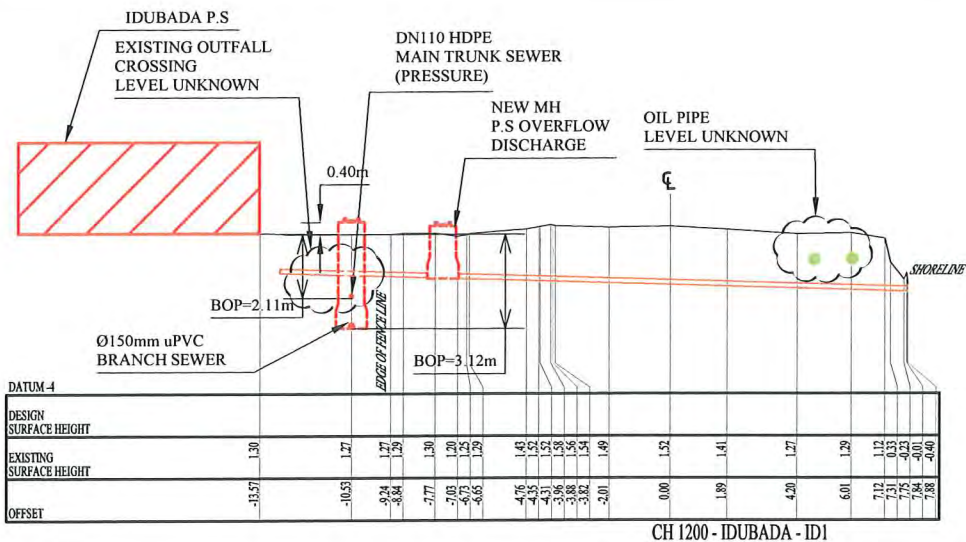
	PROPOSED SEWER
	NEW MANHOLE
	EXISTING MANHOLE TO BE MODIFIED
	POWER POLE WITH OVERHEAD POWER LINES
	POWER POLE WITH LIGHT
	ELECTRICITY TRANSMISSION TOWER
	ELECTRICITY PIT
	UNDER GROUND POWER CABLE
	TELECOM PIT
	TELECOM MARKER POST
	TELECOM LINE
	WATER VALVE BOX
	STOP VALVE
	WATER TAP
	FIRE HYDRANT
	WATER METER
	EXISTING SEWER PIPE
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	BITUMEN SEALED ROAD

NOTE: CADASTRAL BOUNDARIES TAKEN FROM DCDB

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- MINIMUM COVER IS 60cm FOR UNPAVED ROAD
 90cm FOR ASPHALT/CONCRETE PAVED ROAD IF NOT DESCRIBED ON THE DRAWING
 Type A - Manhole (Concrete)
 Type B - Asphalt (Road)



PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)		TITLE: Trunk Main Pipe Plan and Profile (Kila kila_KL12)	
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:	APPROVED by PMU: Project Director Lot G.Zauya
		REVISIONS	DATE: 1. Dec 2011
		DATE: 1. Dec 2011	SCALE: 1/1000
		CHECKED by CONSULTANT Project Manager T. Fuji	DRAWING NO.: BP-59



PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

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

TITLE: Branch Sewer Pipe Cross-Section (Idubada and Hanubada)

NOTES:

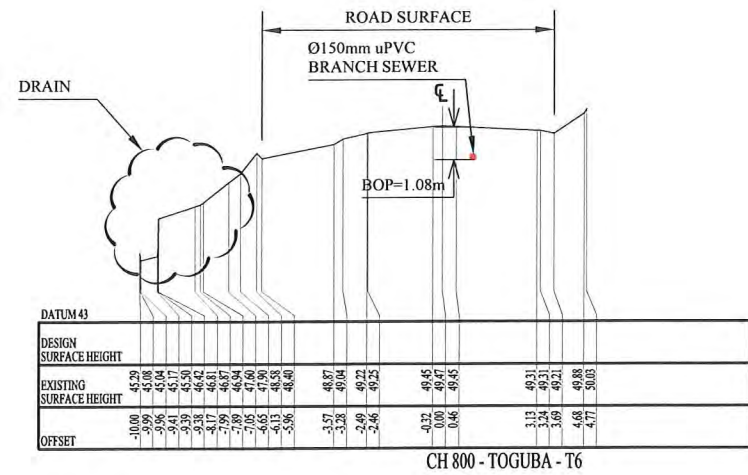
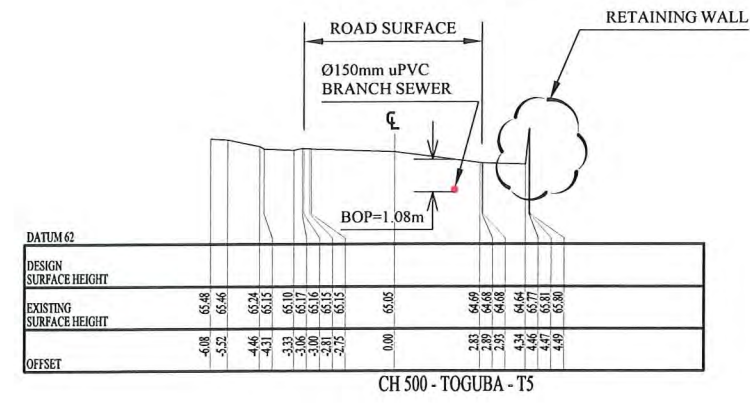
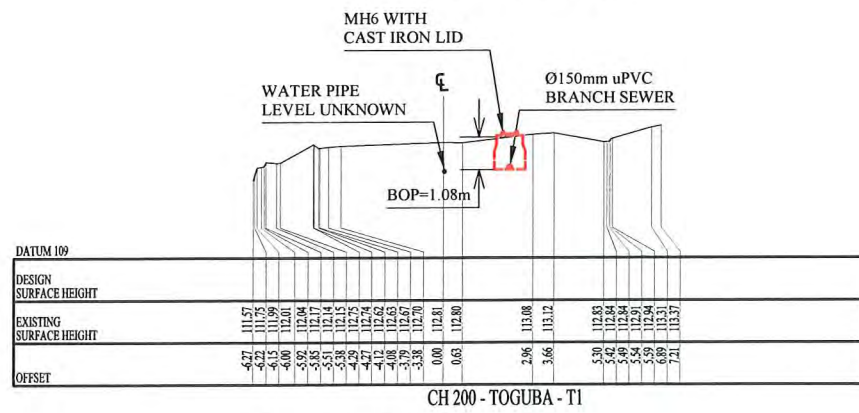
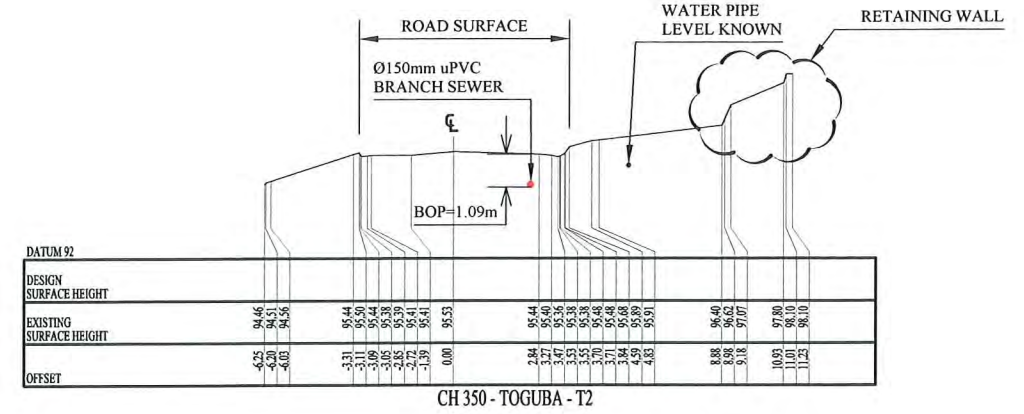
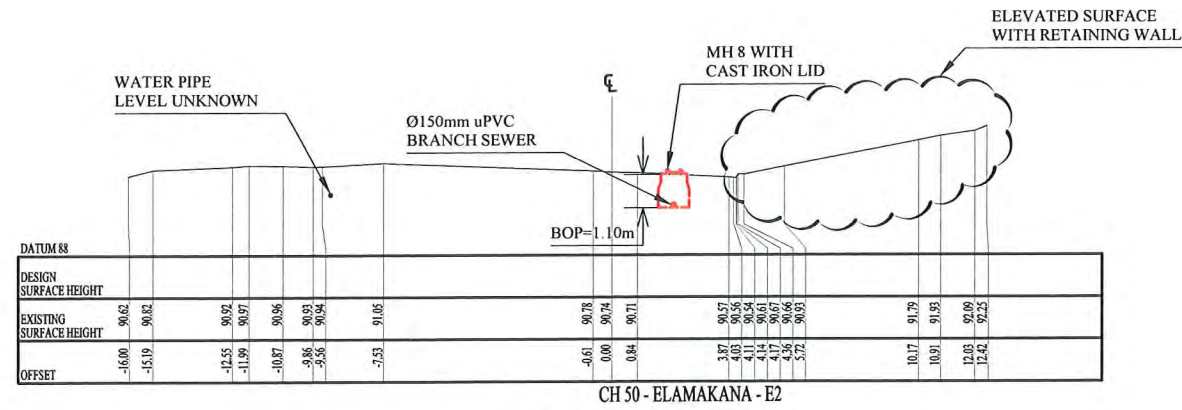
REVISIONS		
REV.	DATE	DESCRIPTION

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.: BP-60



PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

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

CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN

IPBC INDEPENDENT PUBLIC BUSINESS CORPORATION
 jica JAPAN INTERNATIONAL COOPERATION AGENCY

TITLE: Branch Sewer Pipe Cross-Section (Elamakana and Tuaguba)

NOTES:

REVISIONS		
REV.	DATE	DESCRIPTION

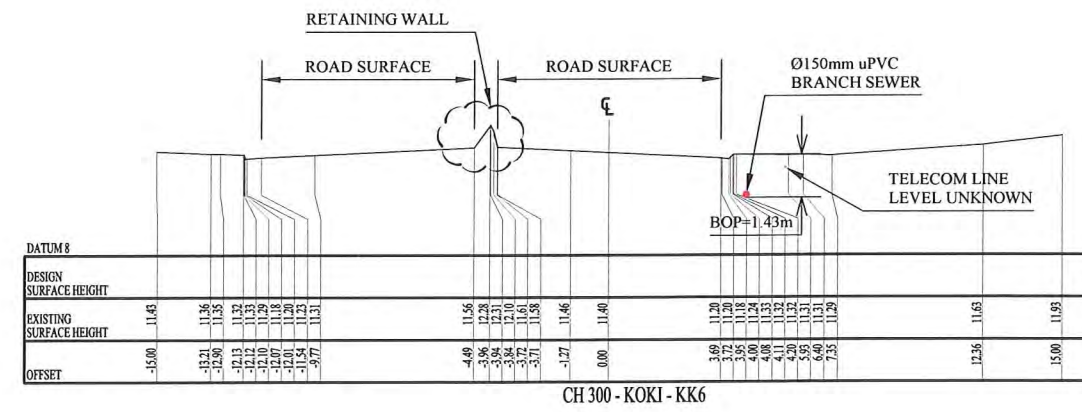
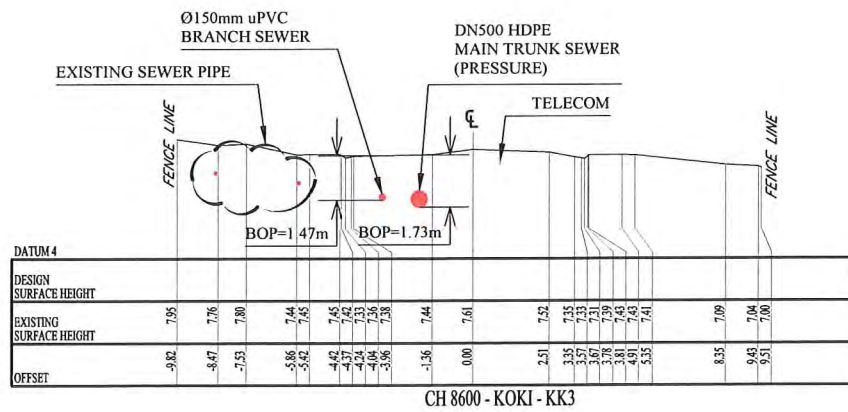
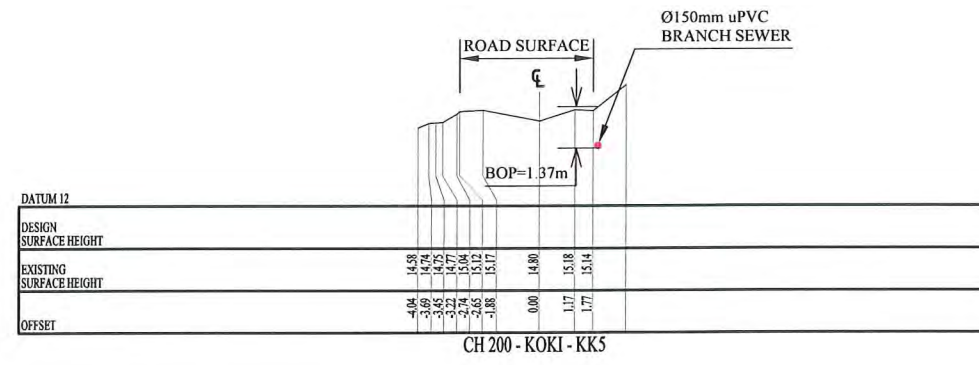
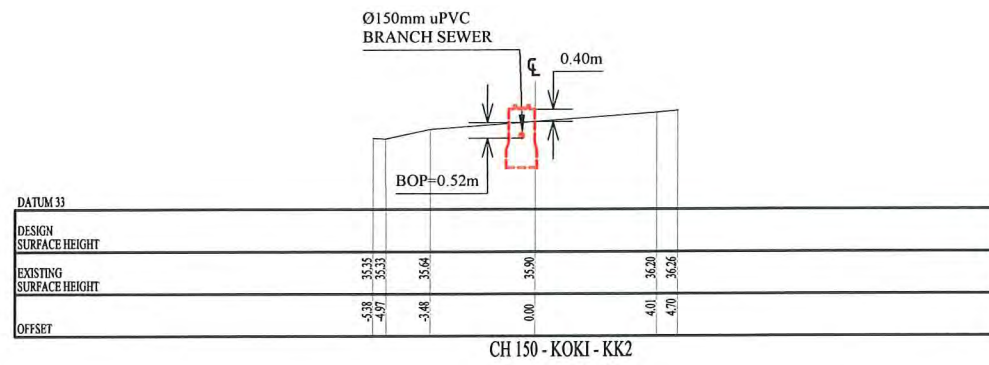
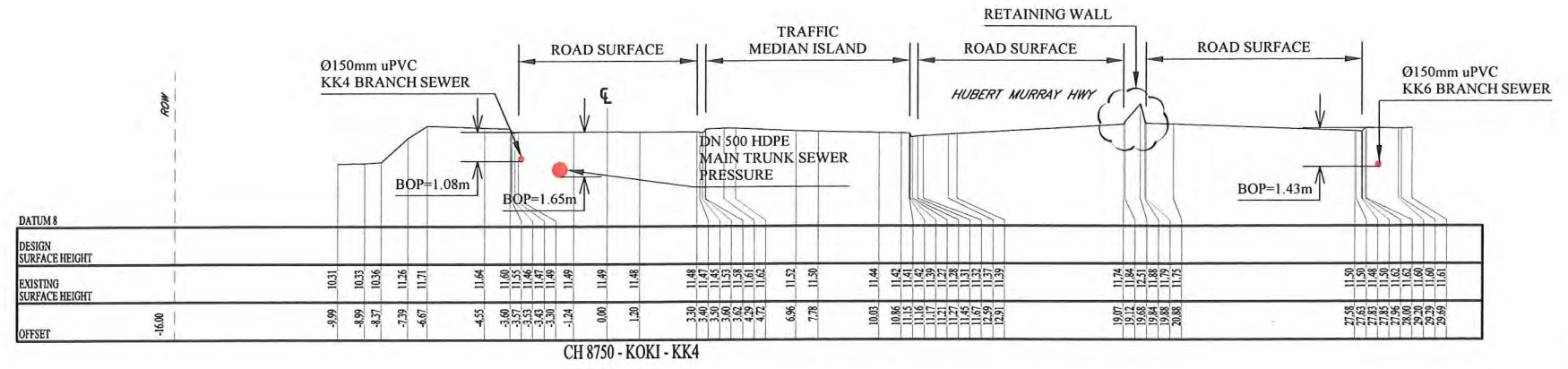
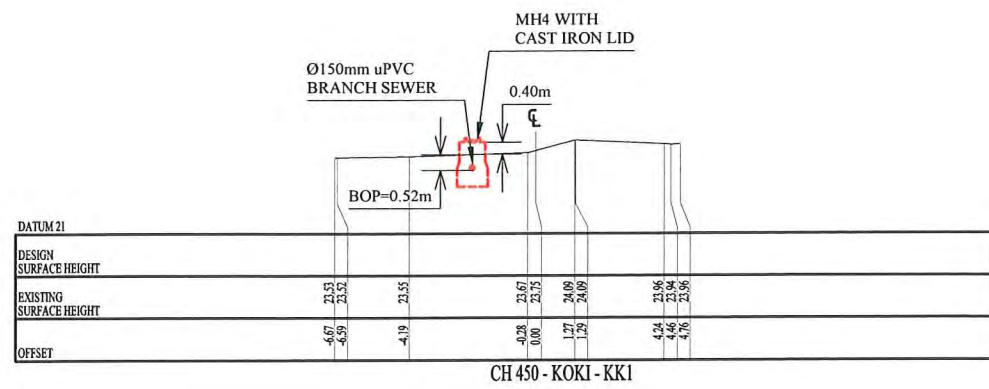
APPROVED by PMU:
 Project Director
 Lot G.Zauya

CHECKED by CONSULTANT
 Project Manager
 T.Fuji

DATE: 1. Dec 2011

SCALE: 1/250

DRAWING NO.: BP-61



PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

TITLE: Branch Sewer Pipe Cross-Section (Koki)

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

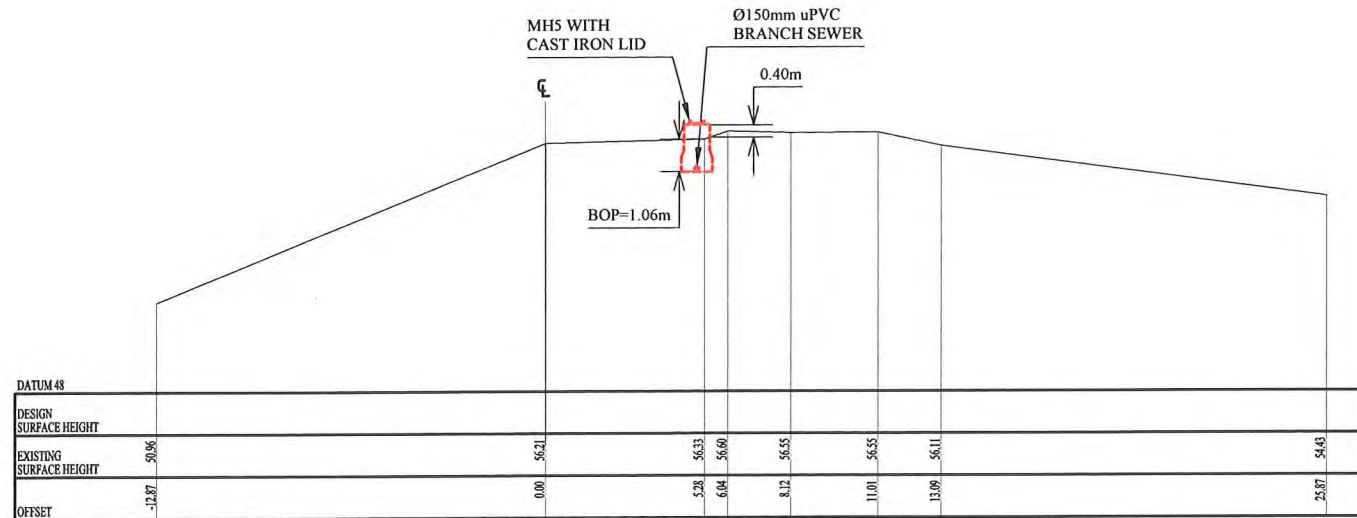
CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN

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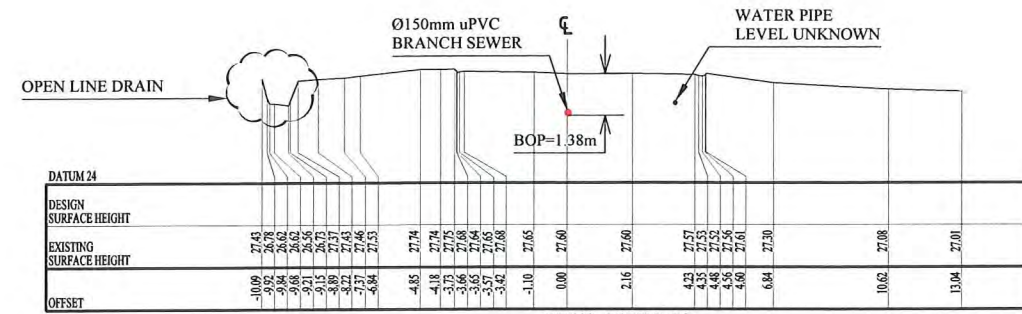
REVISIONS		
REV.	DATE	DESCRIPTION

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

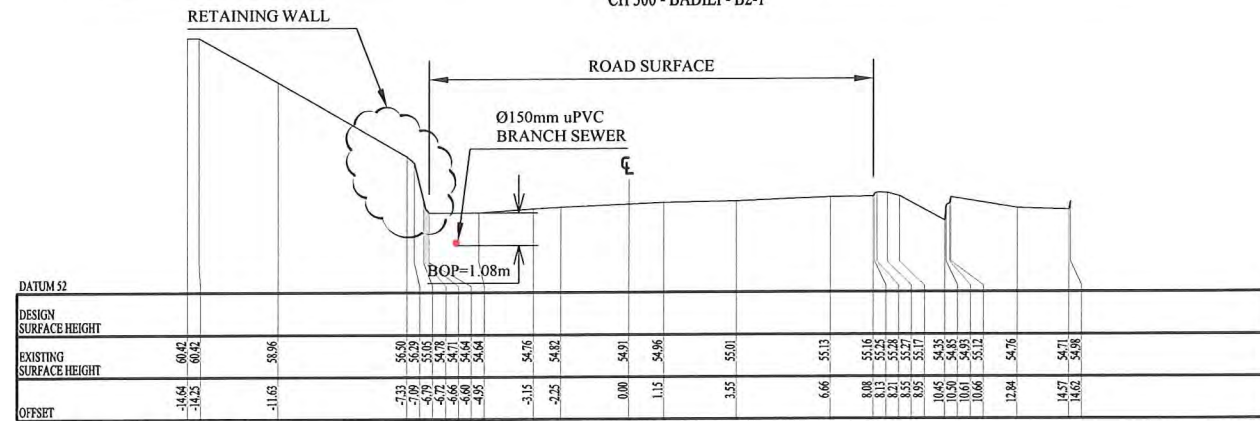
DATE: 1. Dec 2011
 SCALE: 1/250
 DATE: 1. Dec 2011
 DRAWING NO.: BP-62



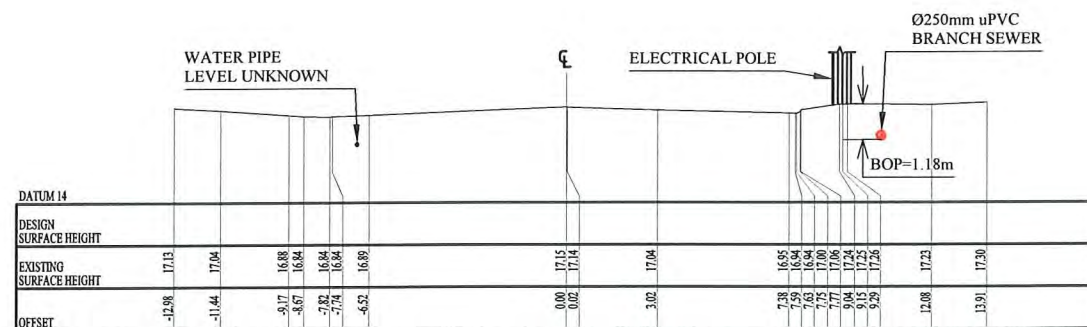
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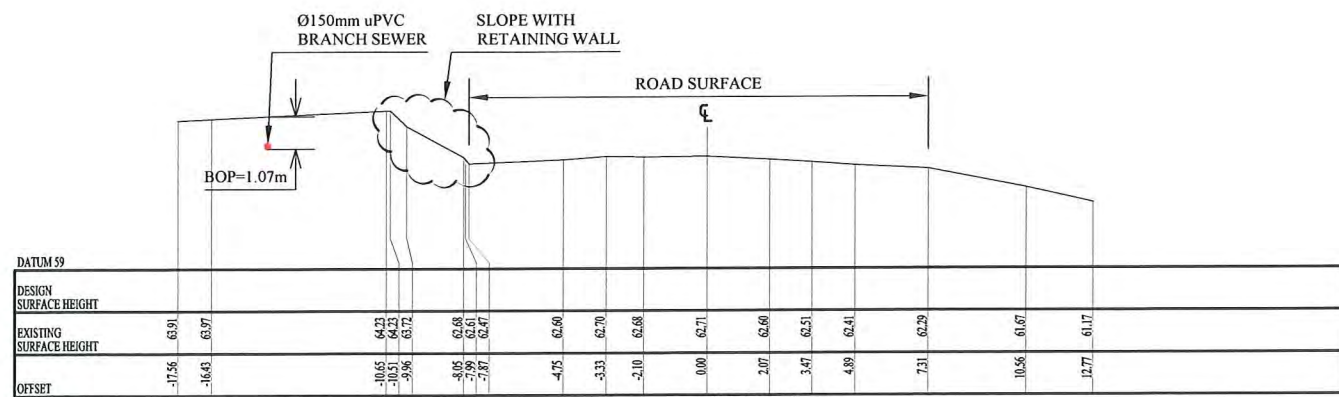
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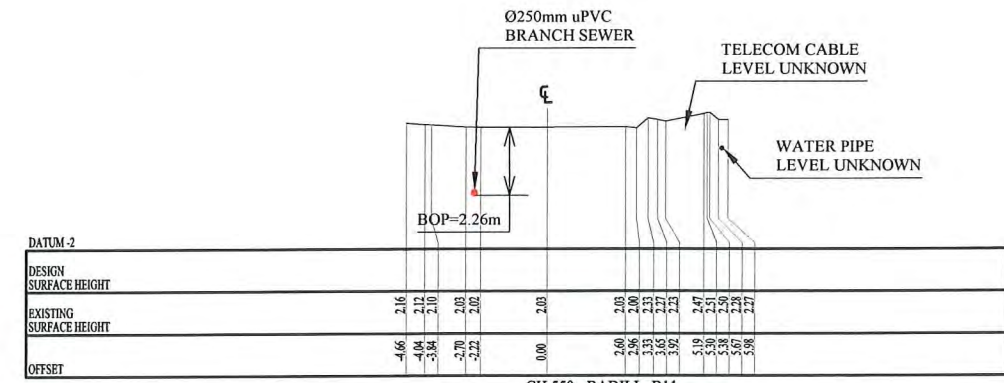
CH 750 - BADILI - B4



CH 100 - BADILI - B10



CH 900 - BADILI - B4



CH 550 - BADILI - B11

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

TITLE: Branch Sewer Pipe Cross-Section (Badili)

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

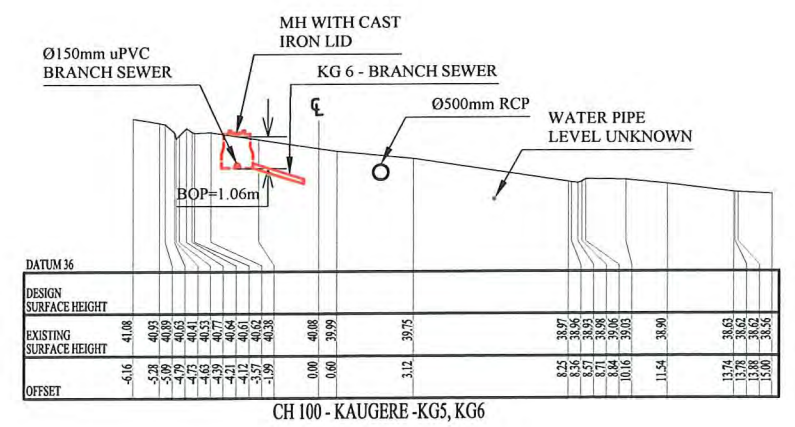
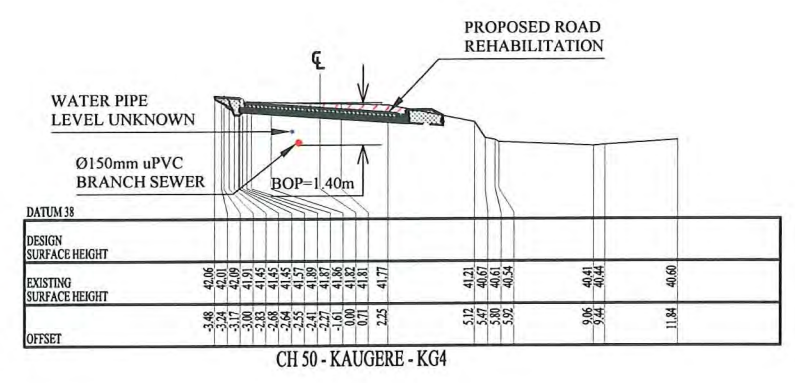
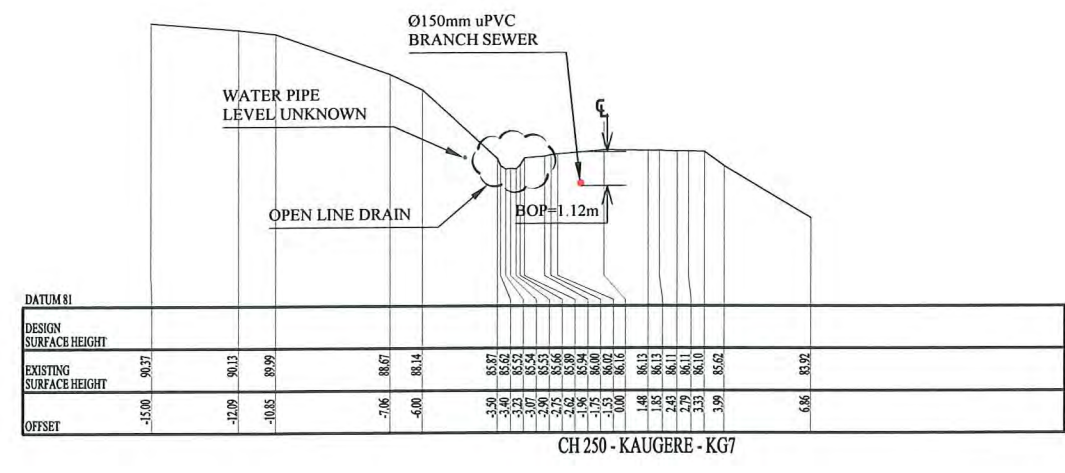
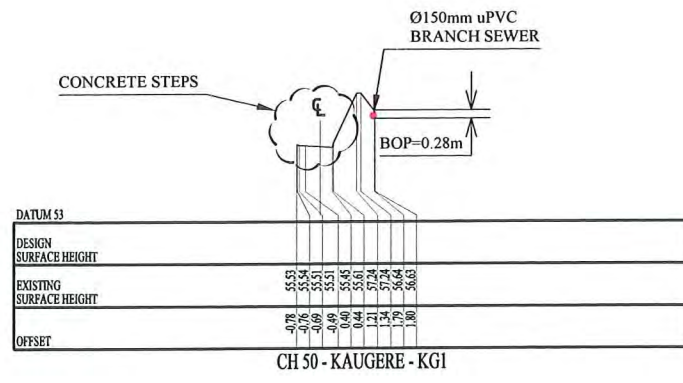
CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN

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.: BP-63



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: Branch Sewer Pipe Cross Section (Kaugere)

NOTES:

REVISIONS		
REV.	DATE	DESCRIPTION

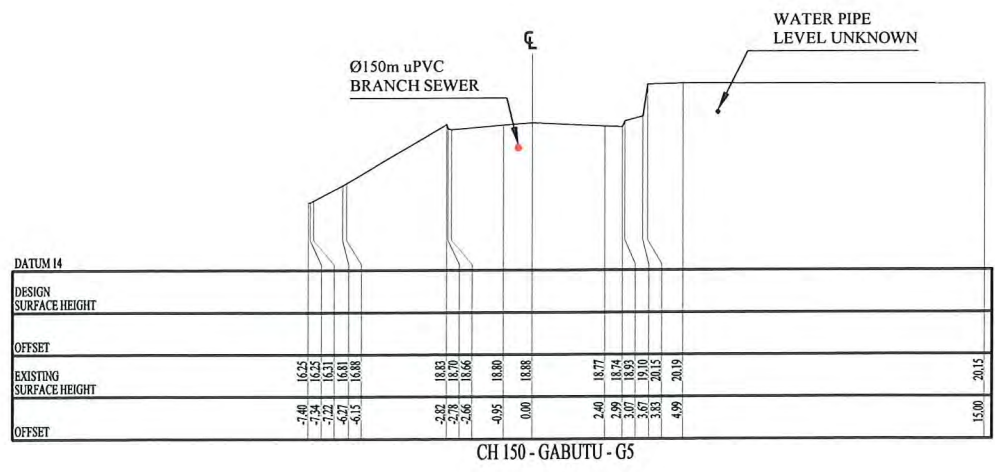
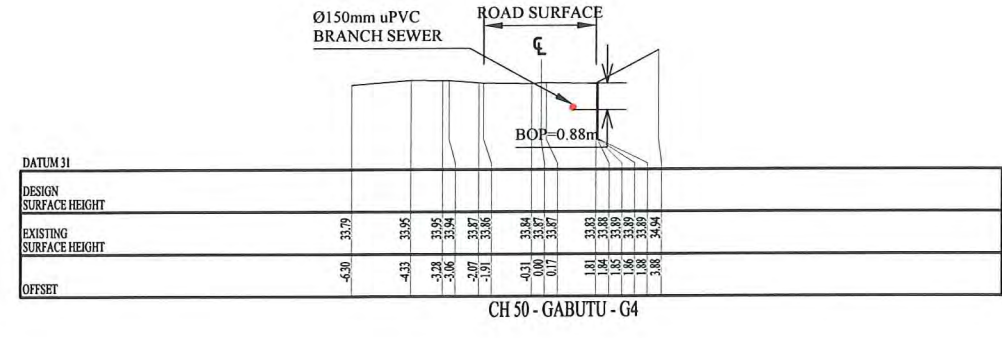
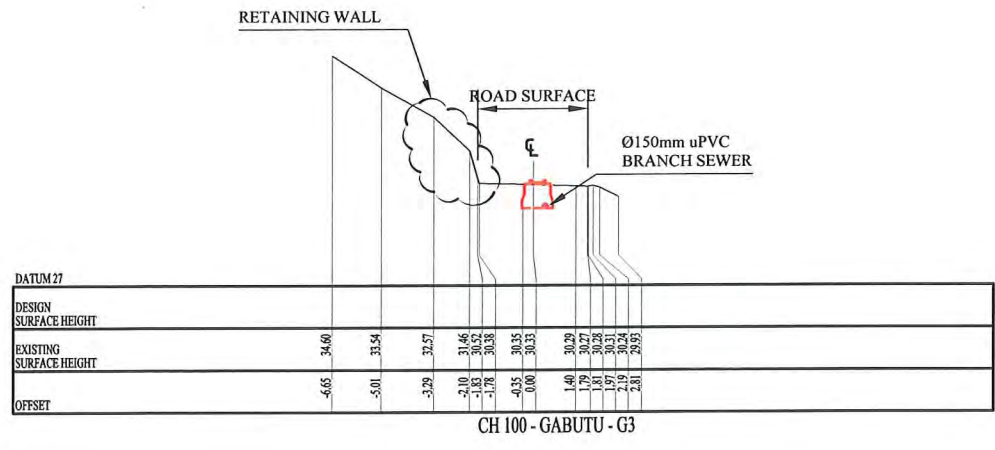
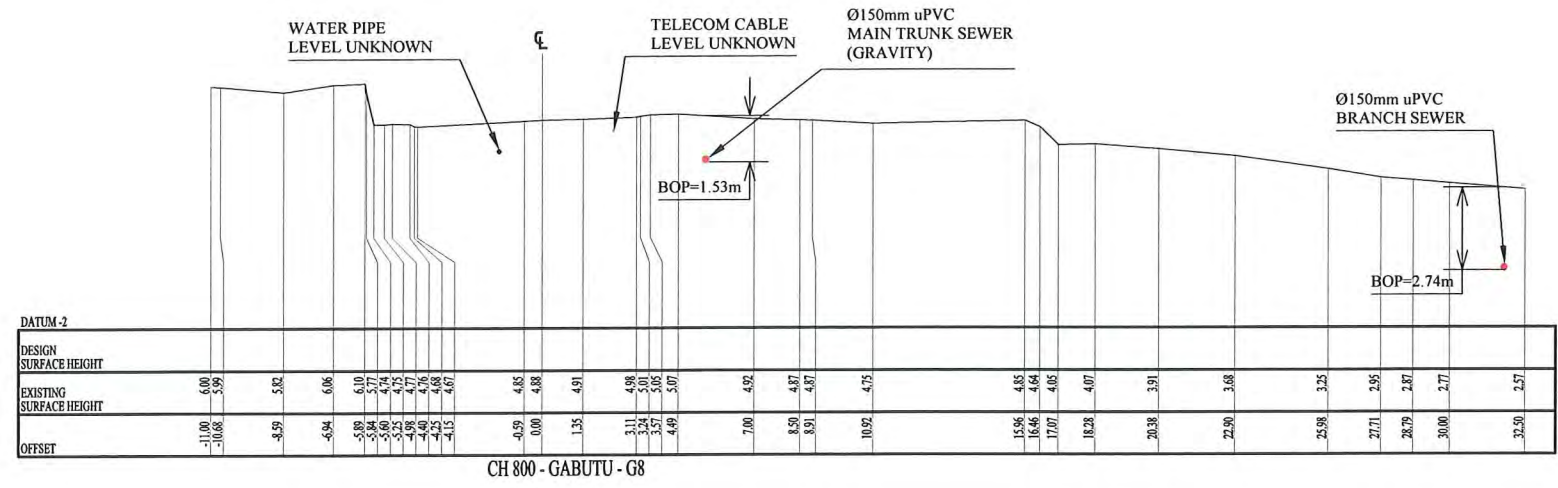
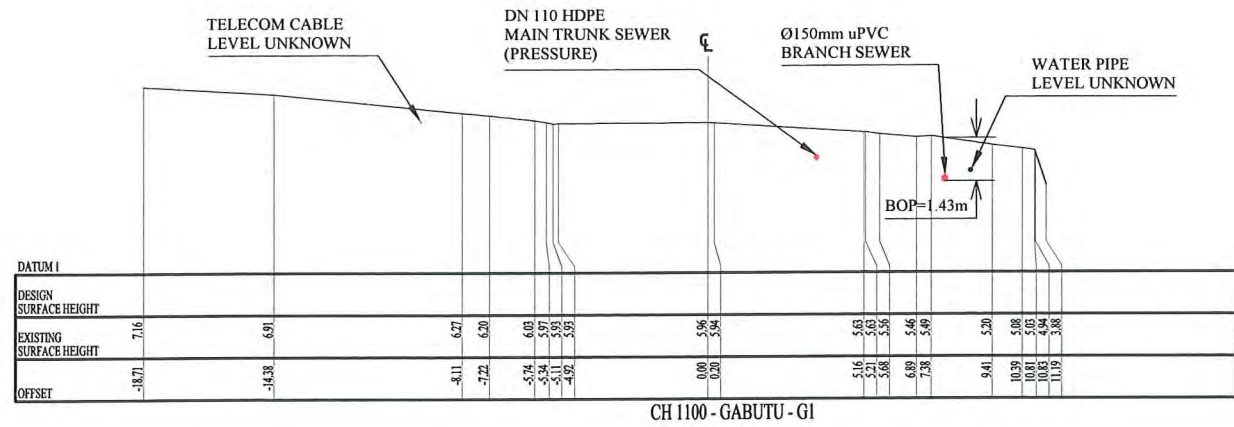
APPROVED by PMU:
Project Director
Lot G.Zauya

CHECKED by CONSULTANT
Project Manager
T.Fuji

DATE: 1. Dec 2011

SCALE: 1/250

DRAWING NO.: BP-64



PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

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

CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN

JICA JAPAN INTERNATIONAL COOPERATION AGENCY

TITLE: Branch Sewer Pipe Cross-Section (Gabutu)

NOTES:

REVISIONS		
REV.	DATE	DESCRIPTION

APPROVED by PMU:
Project Director
Lot G.Zauya

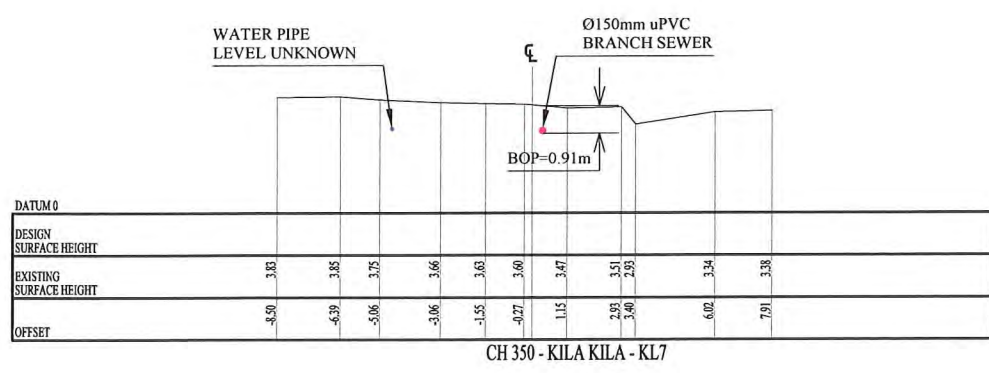
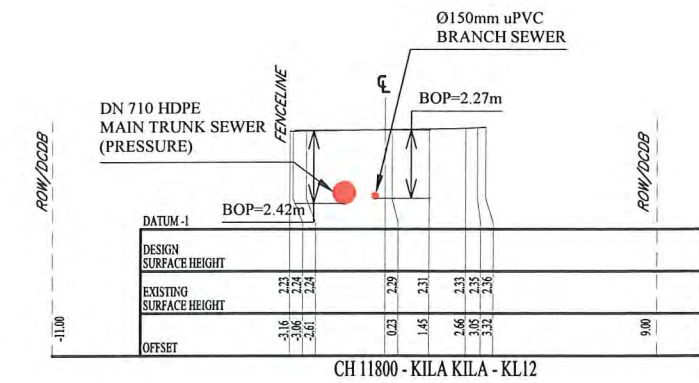
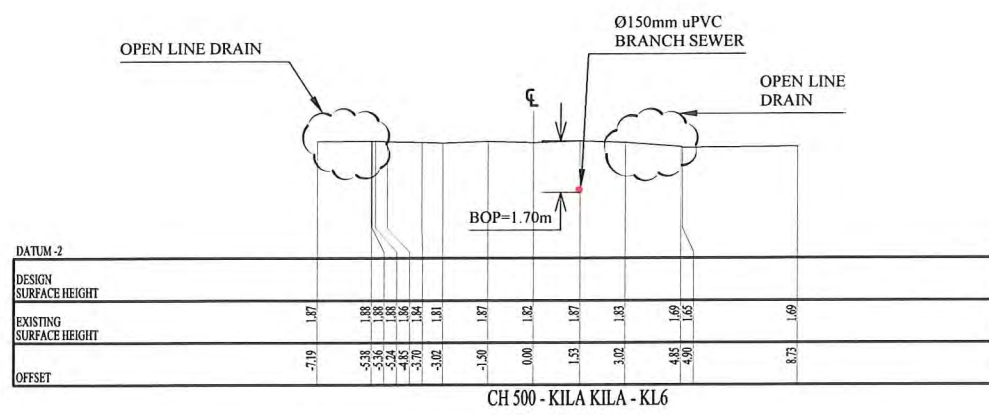
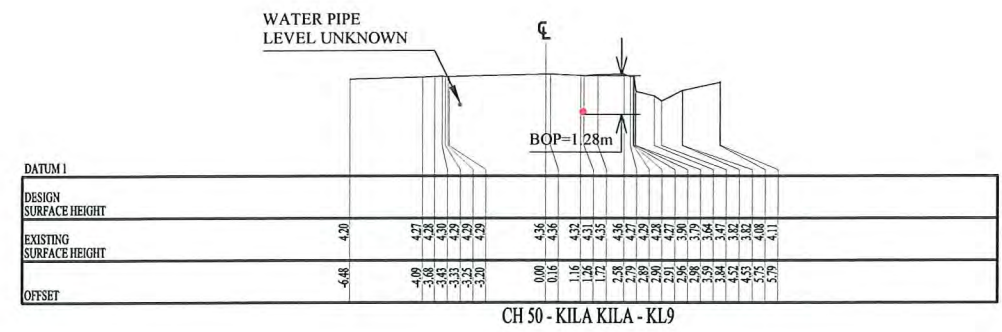
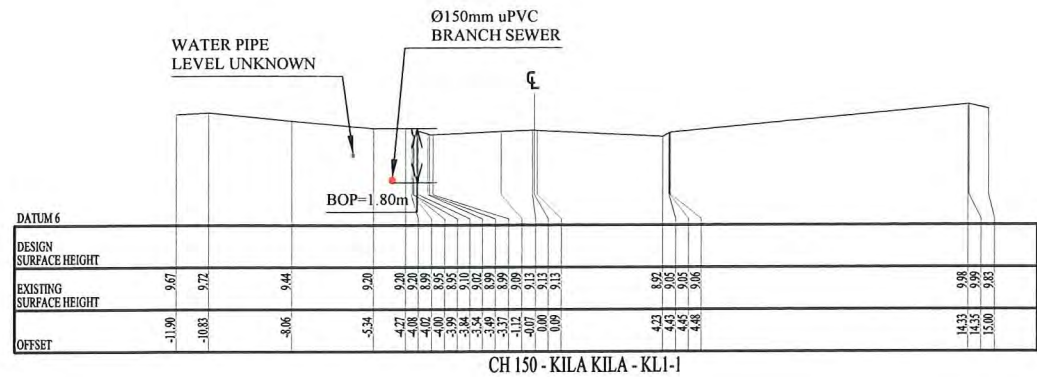
CHECKED by CONSULTANT
Project Manager
T.Fuji

DATE: 1. Dec 2011

SCALE: 1/250

DATE: 1. Dec 2011

DRAWING NO.: BP-65



PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

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

CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN

CLIENT: JICA JAPAN INTERNATIONAL COOPERATION AGENCY

TITLE: Branch Sewer Pipe Cross-Section (Kila Kila)

NOTES:

REVISIONS		
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APPROVED by PMU:
Project Director
Lot G.Zauya

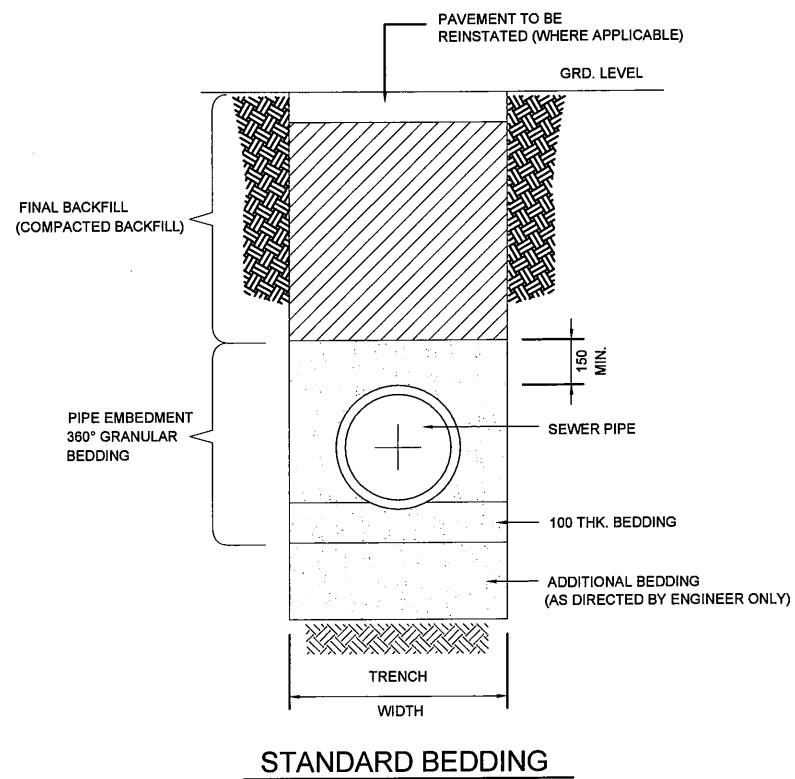
CHECKED by CONSULTANT
Project Manager
T.Fuji

DATE: 1. Dec 2011

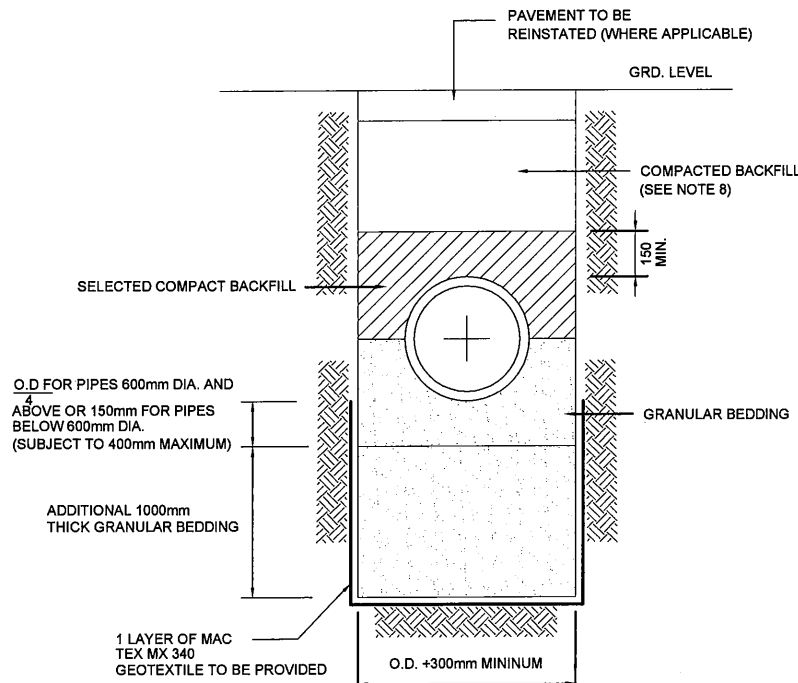
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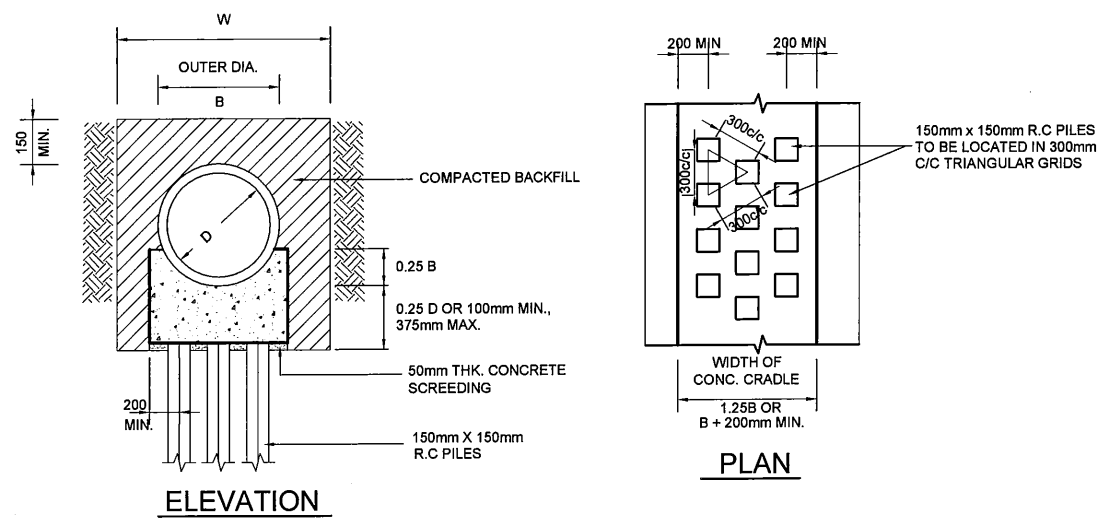
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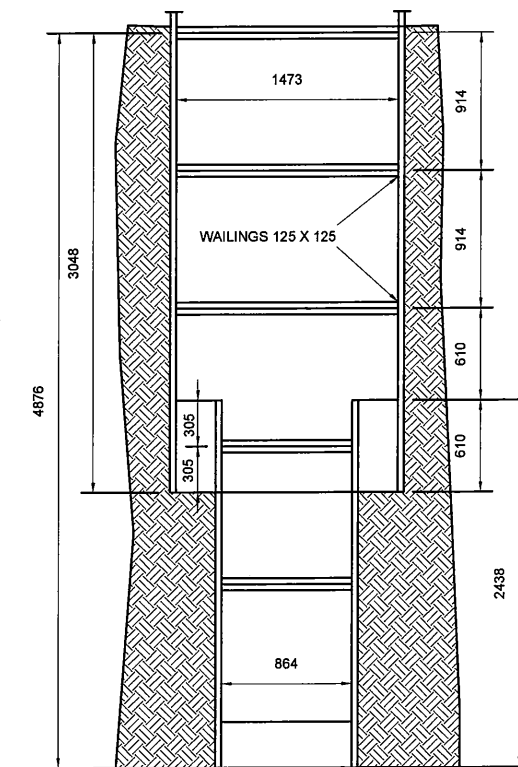
STANDARD BEDDING



BEDDING FOR (SOFT GROUND)



BEDDING FOR VERY SOFT GROUND



**TELESCOPIC SET GROUND SUPPORT
(FOR REFERENCE ONLY)**

NOTE

1. ALL HDPE CORRUGATED (PROFILE) DOUBLE WALL SEWER PIPE SHALL BE CONFIRMED TO DIN16961 OR EQUIVALENT;
2. THE RUBBER SEALANT RING MUST BE PLACED ONTO THE SECOND GROOVE FROM THE SPIGOT END;
3. STANDARD BEDDING IS TO BE USED FOR ALL PIPES UNLESS SHOWN OR DIRECTED BY ENGINEER;
4. MATERIAL FOR USE AS PIPE EMBEDMENT SHALL BE GRADED MANUFACTURED CRUSHED STONES OF MAXIMUM AGGREGATE SIZE 37.5mm, WITH LESS THAN 50% PASSING 4.75mm SIEVE. (EQUIVALENT TO CLASS 1B IN ASTM 2321)
5. PLACE EMBEDMENT MATERIALS BY METHODS THAT WILL NOT DISTURB OR DAMAGE THE PIPE. WORK IN OR TAMP THE HAUNCHING MATERIAL IN THE AREA BETWEEN THE BEDDING AND THE UNDERSIDE OF THE PIPE BEFORE PLACING AND COMPACTING THE REMAINDER OF THE EMBEDMENT IN THE PIPE ZONE. MINIMUM DENSITY OF COMPACTION SHALL BE SUCH THAT WITH THE SELECTED PIPE STIFFNESS AN AVERAGE MODULUS OF SOIL REACTION OF 6,900 kPa. MINIMUM COVER SHALL BE 150mm.
6. WHERE TRENCH WALLS ARE STABLE OR SUPPORTED, PROVIDE A WIDTH SUFFICIENT, BUT NOT GREATER THAN NECESSARY, TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER EMBEDMENT MATERIALS. THE SPACE BETWEEN THE PIPE AND TRENCH WALL MUST BE WIDER THAN THE COMPACTION EQUIPMENT USED IN THE PIPE ZONE. MINIMUM WIDTH SHALL NOT BE LESS THAN THE GREATER OF EITHER THE PIPE OUTSIDE DIAMETER PLUS 400mm OR THE PIPE OUTSIDE DIAMETER TIMES 1.25 PLUS 300mm.
7. FOR TESTING OF WATER TIGHTNESS, THE MAXIMUM ALLOWANCE INFILTRATION RATE IS 1 LITRE PER HOUR PER LINEAR METER INTERNAL DIAMETER OF PIPE.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF ALL TEMPORARY SHEET-PILING FOR THE TRENCHES FOR PIPE-LAYING AND THESE MUST BE SUBMITTED TO THE ENGINEER FOR HIS INFORMATION AND ACCEPTANCE. THE SHEET PILING MUST BE DESIGNED SO AS TO HAVE SUFFICIENT DEPTH TO PREVENT UPLIFT OF THE BASE LEVEL OF THE EXCAVATED TRENCH.
9. THE CONTRACTOR SHOULD ALSO TAKE NOTE THAT IN THE CASE WHERE HIGH WATER-TABLE IS ENCOUNTERED, HE SHALL MAKE ALLOWANCE FOR APPROPRIATE DEWATERING METHOD TO BE UTILISED IN ORDER THAT THE PIPE BEDDING CAN BE LAID IN THE DRY. APPROPRIATE METHOD OF CONSTRUCTION MUST BE USED TO PREVENT OF THE LAID SEWER LINE PRIOR TO BACK FILLING.
10. SOFT GROUND SHALL GENERALLY BE TAKEN TO BE THOSE SOILS HAVING A STRENGTH OF CU GREATER THAN 2.5kN/m², AS OBTAINED BY THE IN -SITU VANE SHEAR TEST. THE ENGINEER SHALL DETERMINE SUCH THE CLASSIFICATION AND EXTENT OF SUCH SOIL FOLLOWING FROM IN-SITU VANE SHEAR TEST CARRIED OUT BY THE CONTRACTOR.
11. VERY SOFT GROUND SHALL GENERALLY BE TAKEN TO BE THOSE SOILS HAVING A STRENGTH OF CU OF EQUAL OR LESS THAN 2.5kN/m², AS OBTAINED BY THE IN-SITU VANE SHEAR TEST. THE LENGTH OF PILES TO BE USED SHALL BE DETERMINED BY THE ENGINEER AFTER INVESTIGATION TO DETERMINE THE SOFT LAYER HAS BEEN CARRIED OUT BY THE CONTRACTOR.

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

TITLE: PIPE BED DETAILS (1)

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

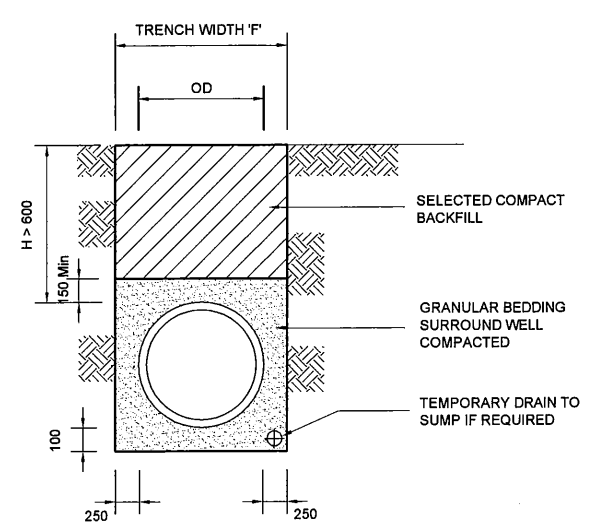
CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN

NOTES:

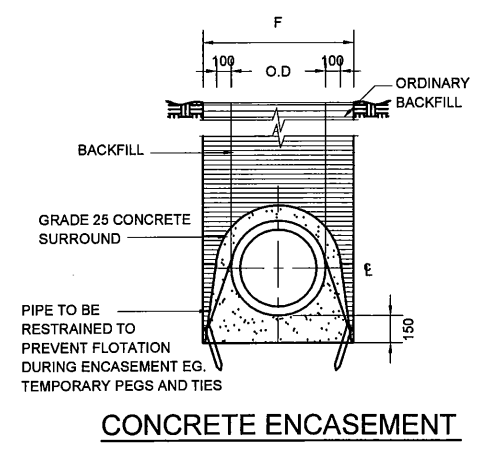
REVISIONS		
REV.	DATE	DESCRIPTION

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

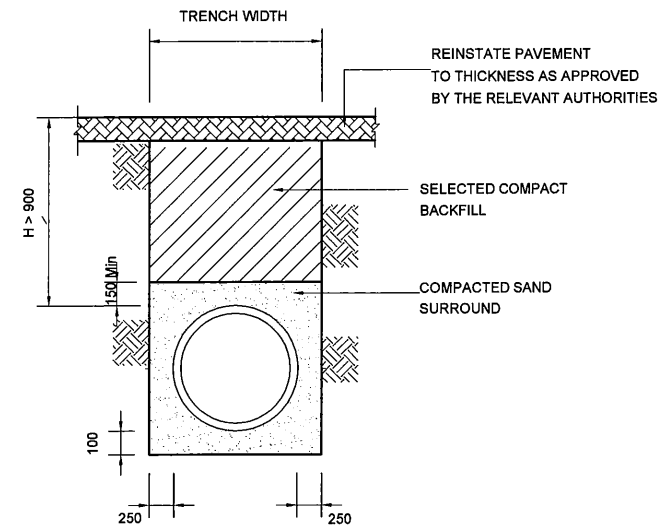
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DRAWING NO.: PGS-01



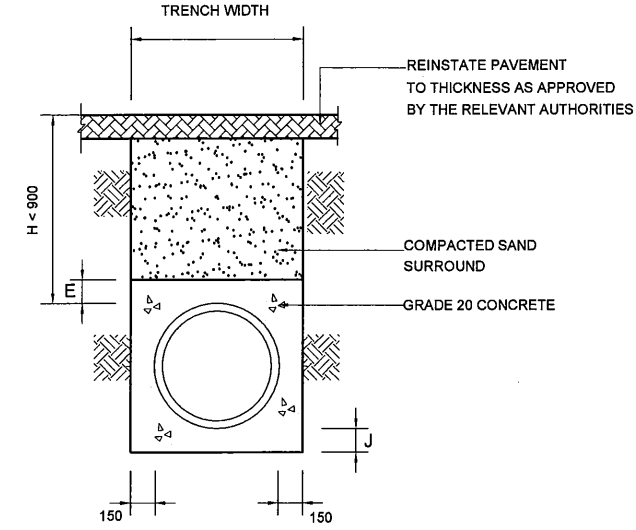
**BEDDING DETAILS
(NON VEHICULAR ACCESS)**



CONCRETE ENCASEMENT



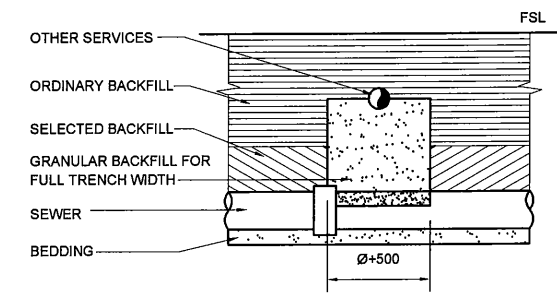
**BEDDING DETAILS
(UNDER VEHICULAR ACCESS)**



CONCRETE SURROUND/ENCASEMENT

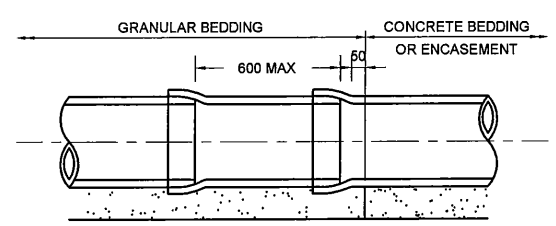
MINIMUM DIMENSIONS FOR CONCRETE ENCASEMENT

PIPE DIA. (mm)	J	E
100 - 375	100	100
450 - 525	125	125
600	150	150
675	175	150
750 - 900	200	150
1050 - 1350	250	200



**SPECIAL BACKFILL REQUIREMENTS
FOR SERVICE CROSSINGS**

NOTES:
SPECIAL BACKFILL REQUIREMENTS SHALL APPLY TO ALL SERVICES CROSSINGS INCLUDING WATER MAINS, PTC, CABLES, AND DUCTS UNDER GROUND ELCOM CABLES KERB AND CHANNEL DRAINAGE PIPE AND OPEN LINED DRAINS

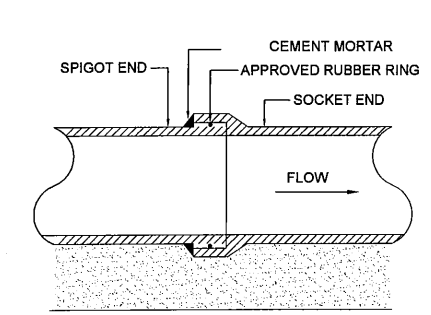


**TRANSITION BETWEEN
CONCRETE & GRANULAR BEDDING**

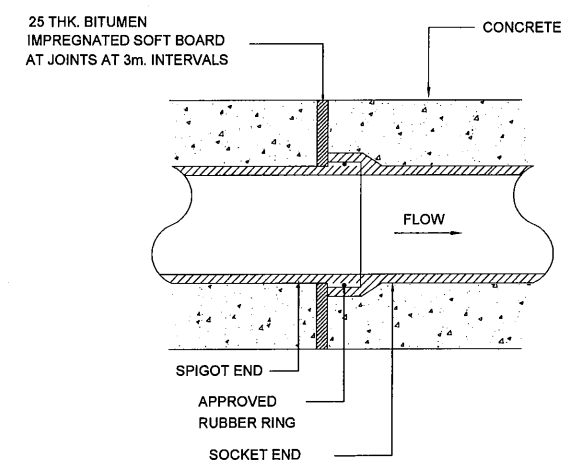
TRENCH CROSS SECTION TABLE

PIPE DIA. D	A	B	C	E	F-5mm
100	100	100	50	200	OD+450
150	100	100	50	240	OD+450
225	100	100	70	450	OD+450
300	100	100	90	550	OD+450

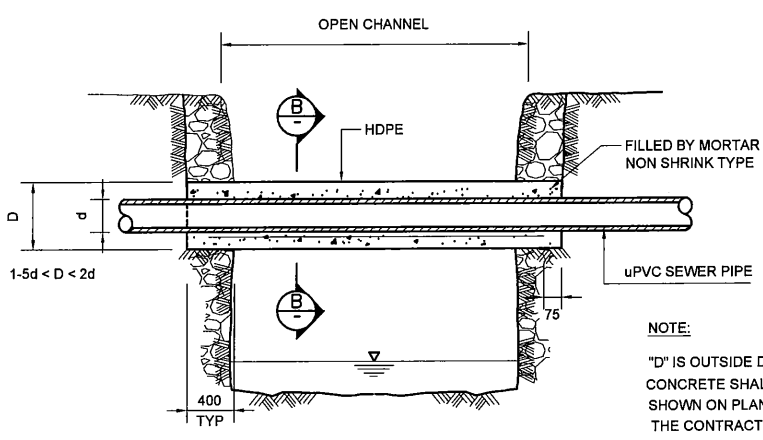
- NOTES:
- 1- SELECTED BACKFILL SHALL BE FREE FROM CLAY LUMPS RETAINED ON 75mm SIEVE AND ROCK RETAINED ON 25mm SIEVE
 - 2- ORDINARY BACKFILL SHALL BE FREE FROM ROCKS AND CLAY LUMPS RETAINED ON 150mm SIEVE
 - 3- GRANULAR BEDDING SHALL BE FINE CRUSHED ROCK OR COARSE SAND WITH NOT MORE THAN 5% PASSING THE 425um SIEVE



DETAIL OF PIPE JOINT

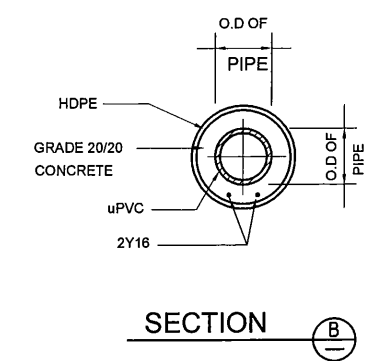


**DETAIL OF CONCRETE SURROUND/ENCASEMENT
FOR PIPE JOINT**

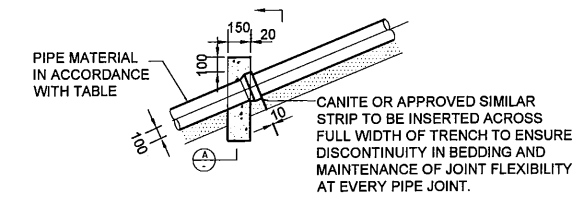


**STANDARD PIPE IN PIPE METHOD
FOR OPEN CHANNEL CROSSING**

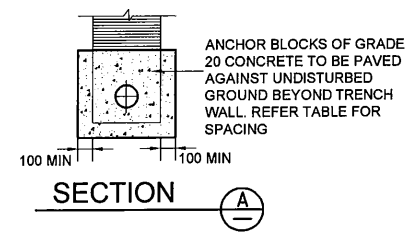
NOTE:
"D" IS OUTSIDE DIAMETER OF PIPE IN ALL CASES, CONCRETE SHALL BE EXTENDED BEYOND LENGTH SHOWN ON PLANS TO NEXT PIPE JOINT THE CONTRACTOR SHALL SUBMIT.



SECTION B



**ANCHOR BLOCKS FOR STEEP PIPE LINES
(GRADIENT GREATER THAN 20%)**



SECTION A

SPECIAL REQUIREMENTS FOR STEEP PIPELINES

GRADIENT	PIPE TYPE	BEDDING	ANCHOR BLOCK SPACING
20% TO 33%	NO SPECIAL REQUIREMENT	CEMENT STABILISED CRUSHED ROCK	10.0m
33% TO 100%	DUCTILE OR CAST IRON	CEMENT STABILISED CRUSHED ROCK	5.5m

- NOTES:
1. u.P.V.C. PIPES TO BE WRAPPED IN POLYTHENE SHEET OR BUILDING PAPER TO AVOID BONDING TO CONCRETE.
 2. STABILISED CRUSHED ROCK BEDDING SHALL CONSIST OF CRUSH ROCK IN ACCORDANCE WITH THE DOW. TYPE 'A' BASE COURSE SPECIFICATION WITH A MOISTURE CONTENT BETWEEN 0.0 AND +2.0% OF OPTIMUM TO WHICH 6.0% OF CEMENT HAS BEEN ADDED AND THOROUGHLY MIXED.

SPECIAL REQUIREMENT FOR STEEP PIPE LINES

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP) TITLE: PIPE BED DETAILS (2), PIPE JOINT AND CONCRETE SUPPORTS

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

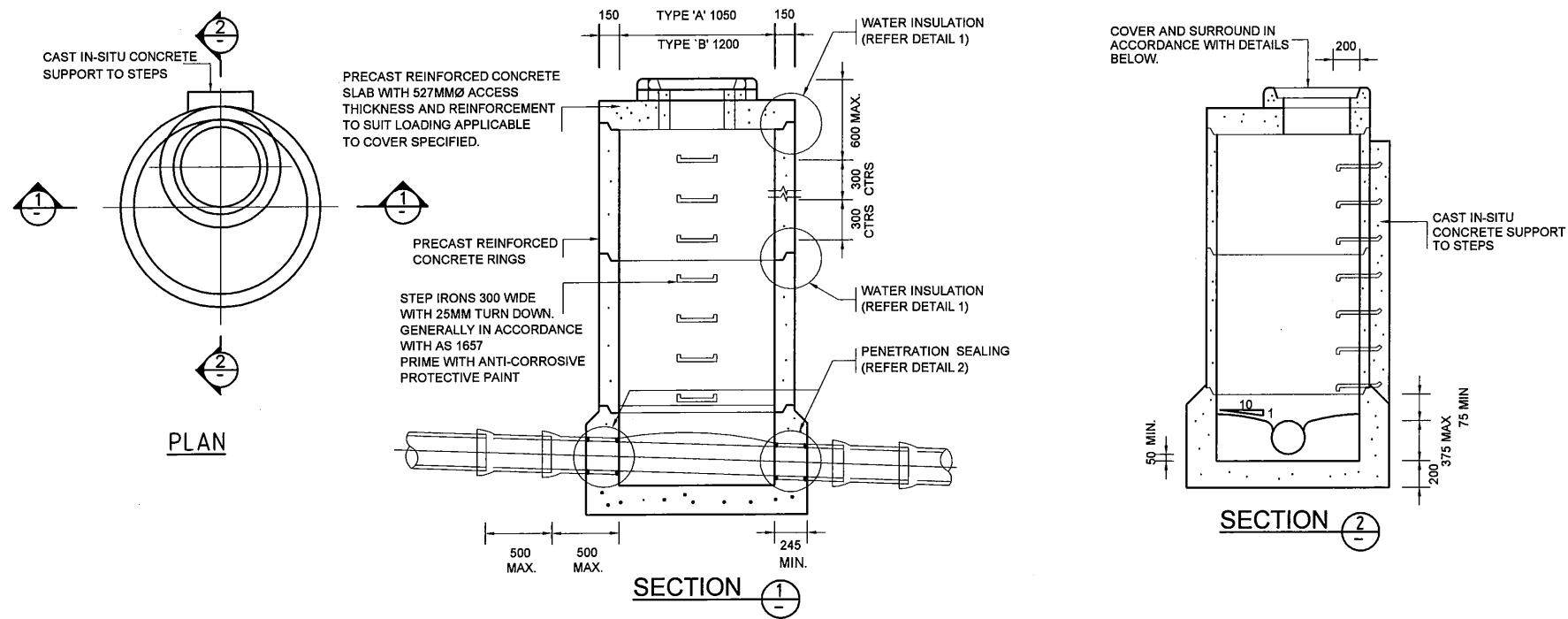
CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN

NOTES:

REVISIONS		
REV.	DATE	DESCRIPTION

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

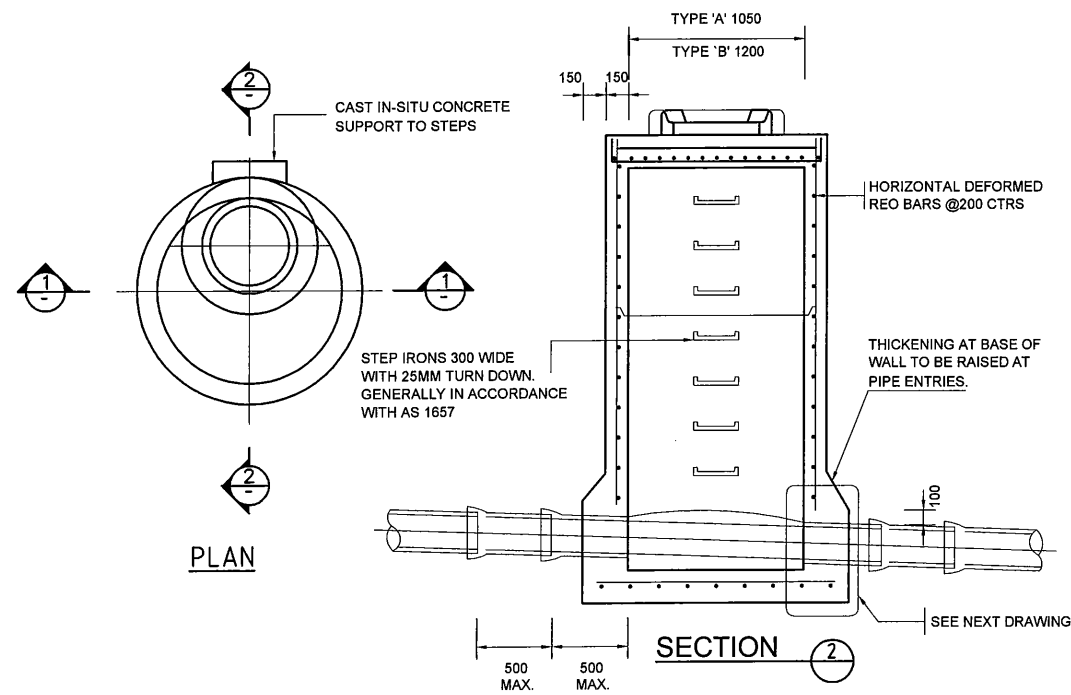
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DATE: 1. Dec 2011 DRAWING NO.: PGS-02



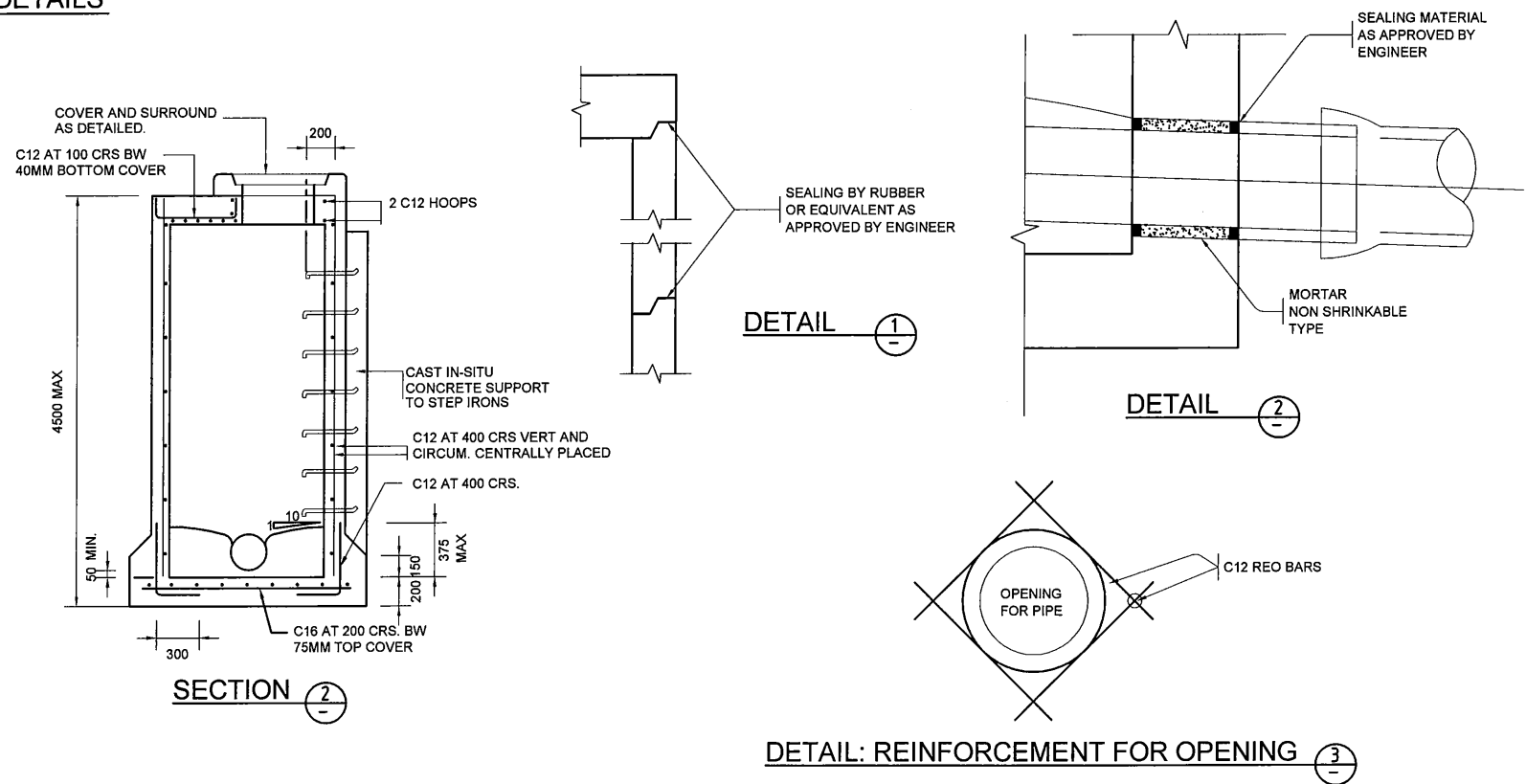
PRECAST MANHOLE DETAILS

NOTES:

- 1 TYPE 'B' MANHOLES SHALL BE USED FOR ALL SEWERS GREATER THAN 2 METRES DEEP (MEASURED TO INVERT LEVEL OF DOWNSTREAM SEWER) AND FOR MANHOLES LESS THAN 2 METRES WITH MORE THAN ONE BRANCH INLET.
- 2 TYPE 'A' MANHOLES SHALL BE USED FOR SEWERS LESS THAN 2 METRES DEEP WITH NO MORE THAN ONE BRANCH INLET.
- 3 MANHOLES MAY BE CAST INSITU OR PRECAST IN ACCORDANCE WITH THE DRAWINGS.
- 4 ALL CONCRETE USED IN MANHOLES SHALL BE GRADE 20 EXCEPT WHERE OTHERWISE NOTED. CEMENT SHALL BE TYPE D. SULPHATE RESISTING.
- 5 FOR UPSTREAM AND DOWNSTREAM SEWERS OF SAME DIAMETER THERE SHALL BE, IN ADDITION TO THE GRADE OF THE SEWERS THROUGH THE MANHOLE, A DROP IN I.L. FROM INLET TO OUTLET AS BELOW,
 $\theta = 0 \text{ TO } 90^\circ$ DROP = 0.02M
- 6 FROM UPSTREAM SEWERS AND BRANCHES OF SMALLER DIAMETER THAN THE DOWNSTREAM SEWER THERE SHALL BE A DROP IN INVERT LEVEL OF (D - D) FROM INLET TO OUTLET WHERE 'D' AND 'D' ARE THE LARGER AND SMALL DIAMETERS RESPECTIVELY.
- 7 FOR LARGER DROPS WHICH CANNOT BE ACCOMMODATED WITHIN THE MANHOLE BENCHING REFER TO 'MANHOLE DROP DETAILS.'



CAST IN-SITU MANHOLE DETAILS



DETAIL: REINFORCEMENT FOR OPENING

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

TITLE: PRECAST MANHOLE DETAILS

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

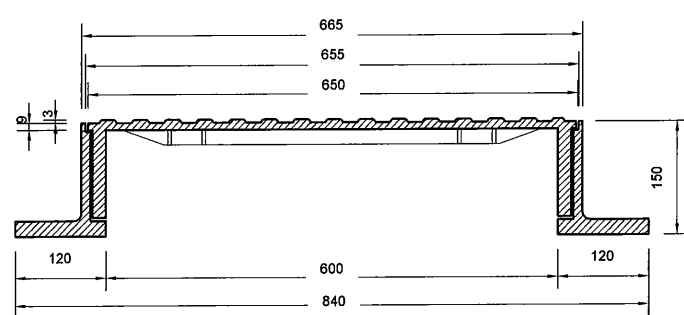
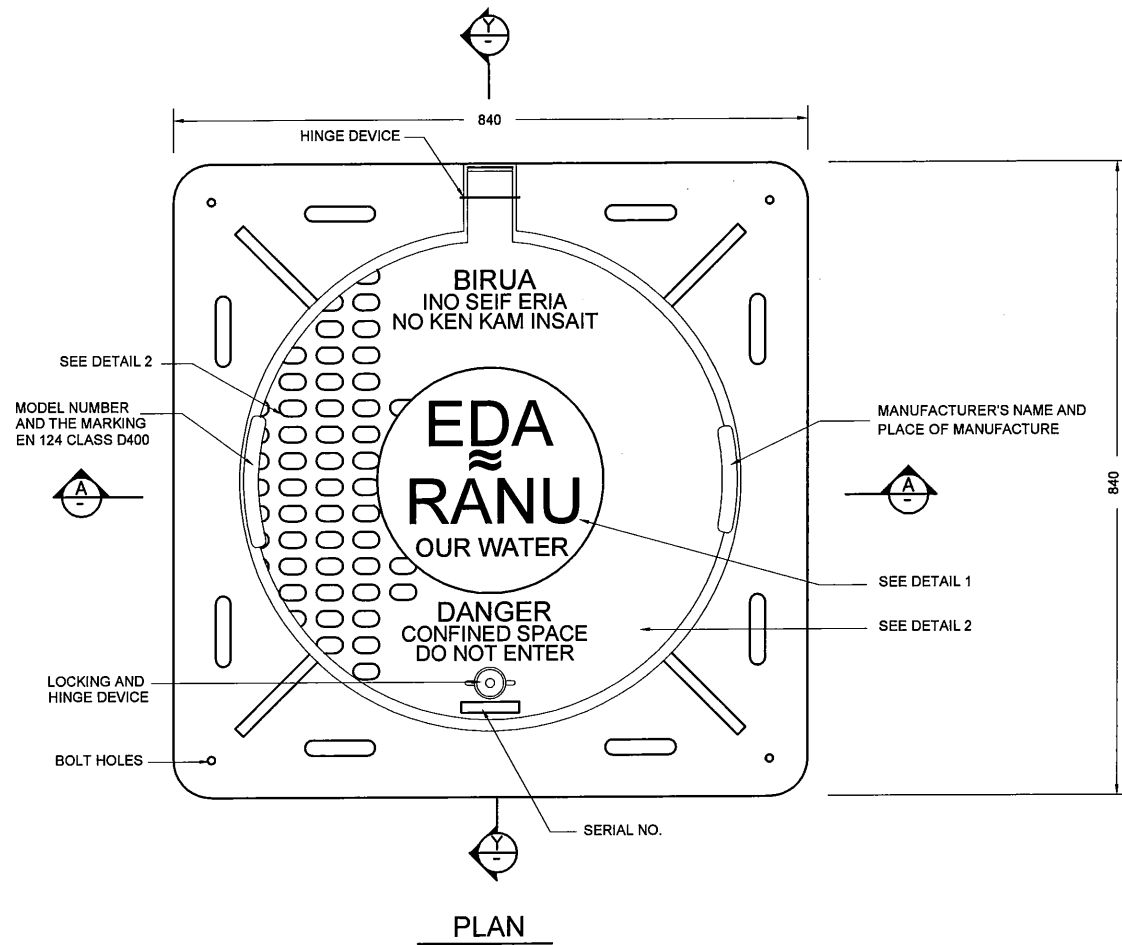
NOTES:

REVISIONS		
REV.	DATE	DESCRIPTION

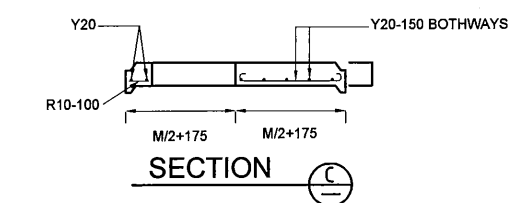
APPROVED by PMU:
 Project Director
 Lot G.Zauya
 CHECKED by CONSULTANT
 Project Manager
 T.Fuji

DATE: 1. Dec 2011
 DATE: 1. Dec 2011

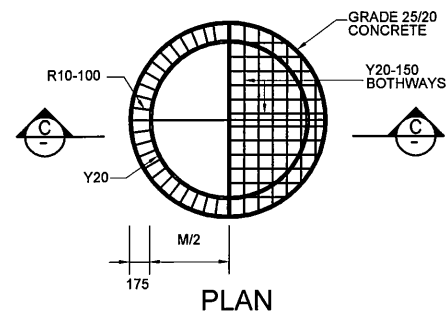
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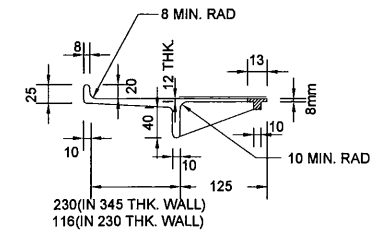
SECTION C-C



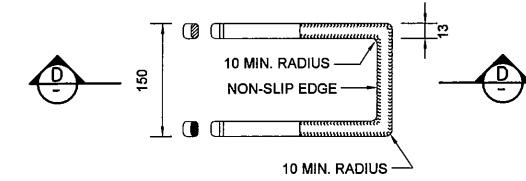
SECTION C-C



PLAN



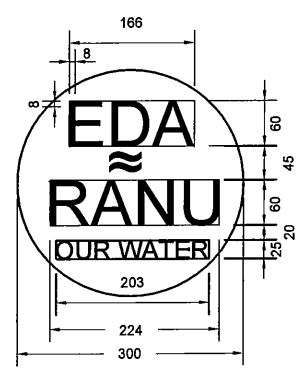
SECTION D-D



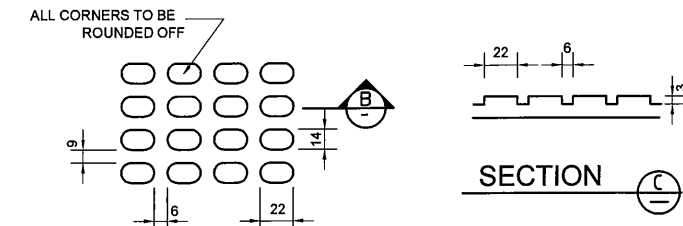
PLAN

FACTORY PRECAST INTERMEDIATE SLAB OR EQUIVALENT TO BS 5911

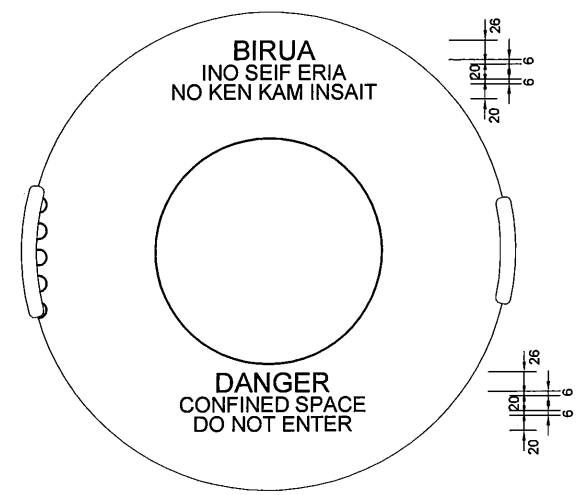
DETAILS OF TYPICAL STAINLESS STEEL STEP STANDARD : BS 1247 (1975)



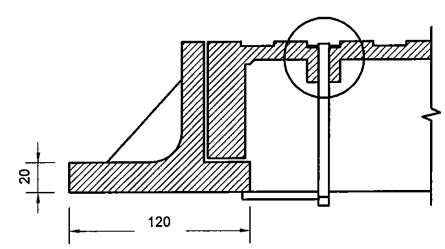
DETAIL 1 : EMBOSSED LOGO



DETAIL 2 : COVER SURFACE FINISH

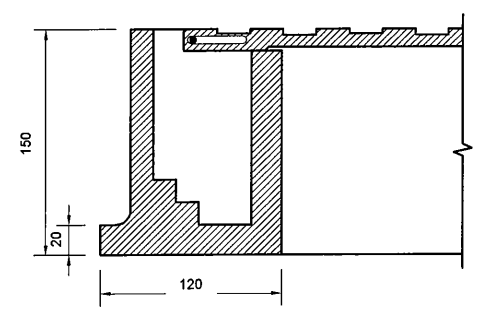


DETAIL 3 : EMBOSSED DESIGN



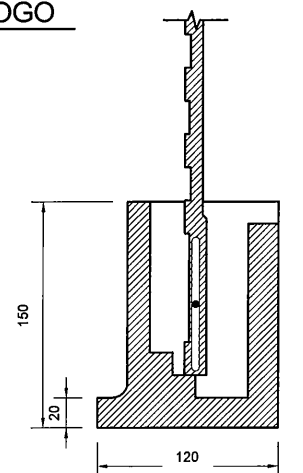
SECTION C-C

TYPICAL LOCKING DEVICE



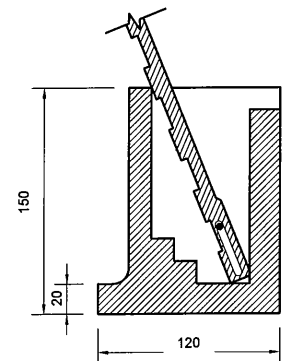
SECTION C-C

TYPICAL HINGE



SECTION C-C

COVER HINGED OPEN AT 90°



SECTION C-C

COVER HINGED OPEN AT MINIMUM 100°

NOTE
THIS MANHOLE LEVER IS USED FOR ALL NEW MANHOLES INSTALLED IN THIS PROJECT.
EXISTING MANHOLES TO BE CONNECTED UNDER TRAFFIC ROAD.

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

TITLE: DETAILS OF NEW STEEL MANHOLE COVER

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

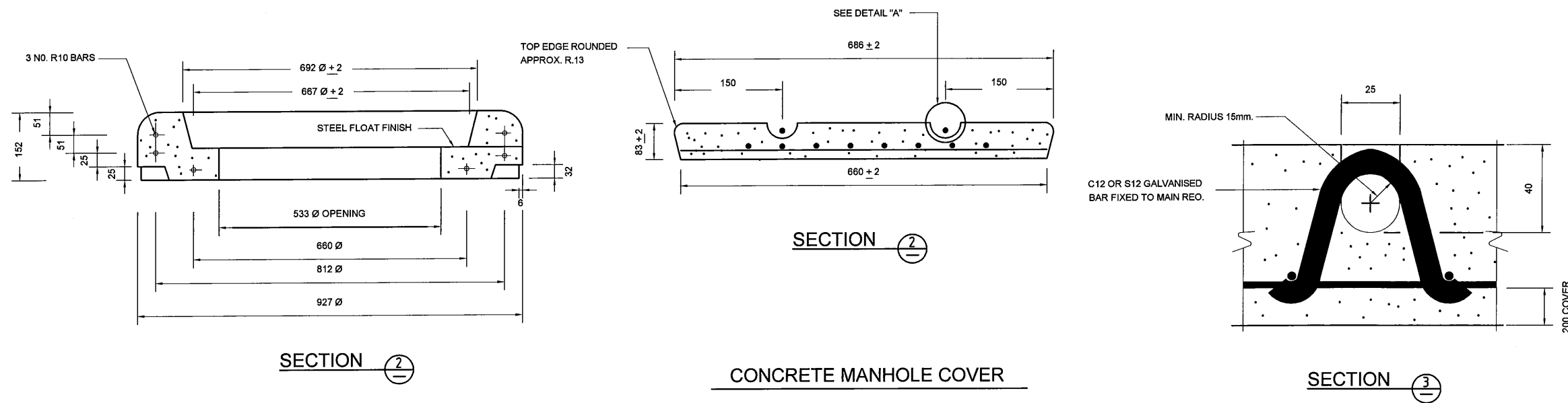
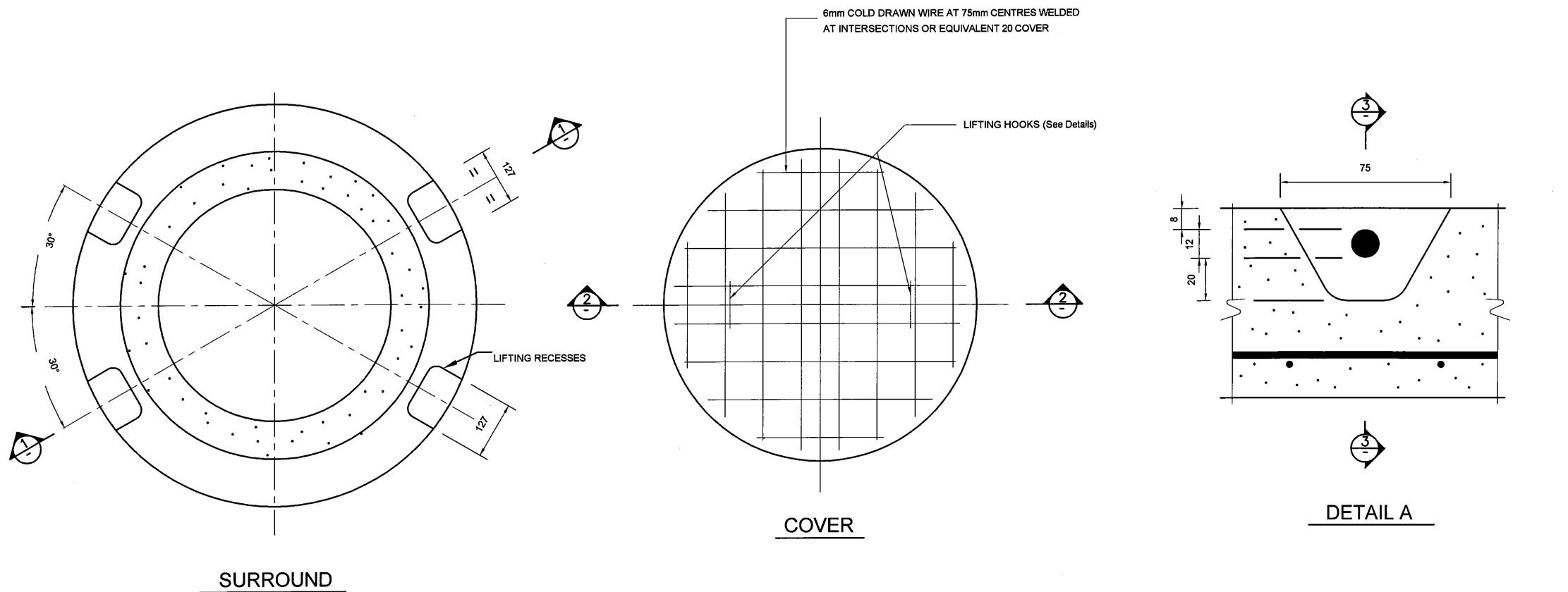
CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN

NOTES:

REVISIONS		
REV.	DATE	DESCRIPTION

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

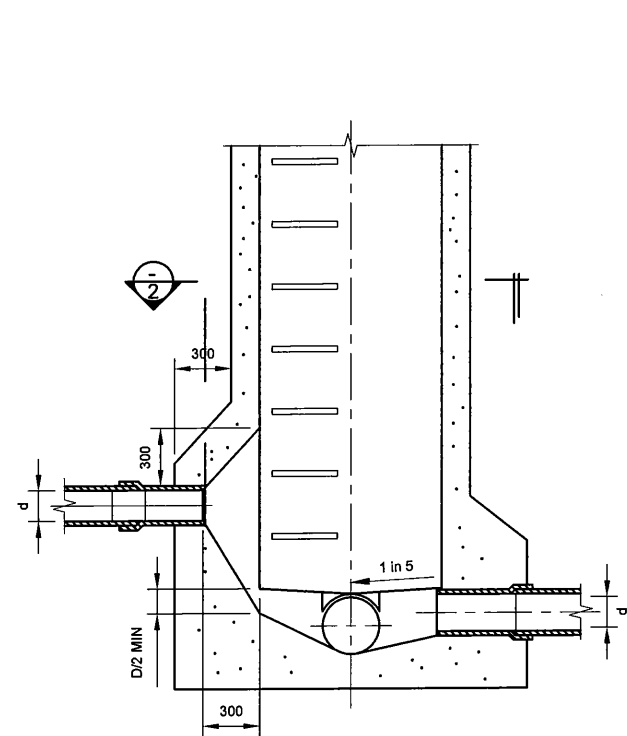
DATE: 1. Dec 2011
SCALE: NTS
DRAWING NO.: PGS-4



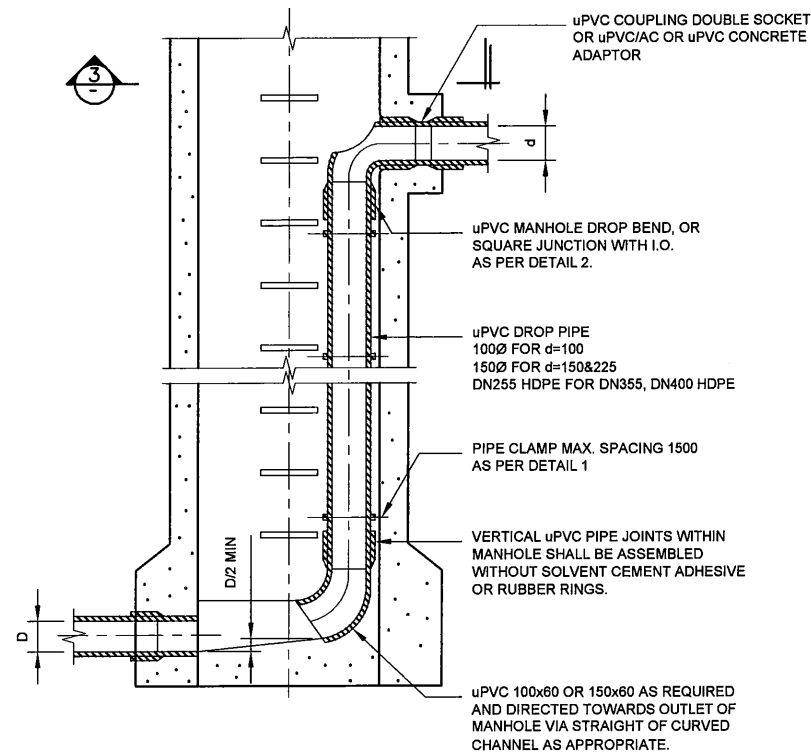
NOTE
 DO NOT USE FOR NEW MANHOLES
 USE ONLY FOR EXISTING MANHOLES
 UNDER NON-VEHICULAR CONDITIONS

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)		TITLE: DETAILS OF EXISTING CONCRETE MANHOLE COVER FOR REPLACEMENT			
CLIENT: INDEPENDENT PUBLIC BUSINESS CORPORATION JAPAN INTERNATIONAL COOPERATION AGENCY	CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN	NOTES:	APPROVED by PMU: Project Director Lot G.Zaulya	DATE: 1. Dec 2011	SCALE: NTS
			CHECKED by CONSULTANT Project Manager T.Fuji	DATE: 1. Dec 2011	DRAWING NO.: GS-5

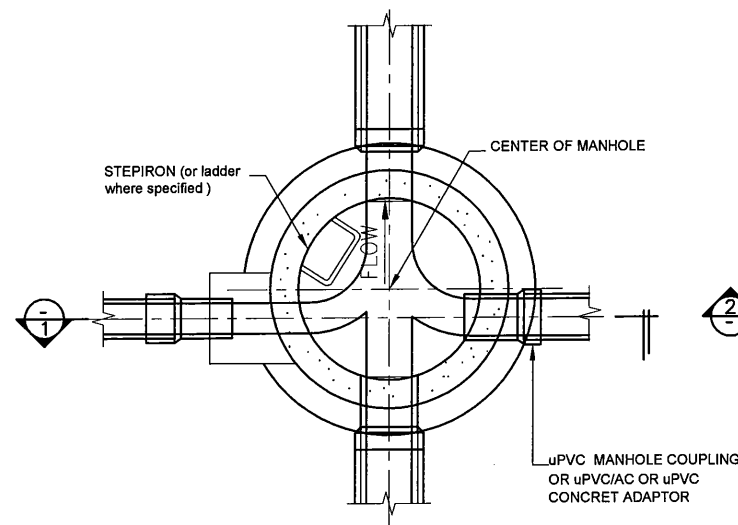
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REV.	DATE	DESCRIPTION



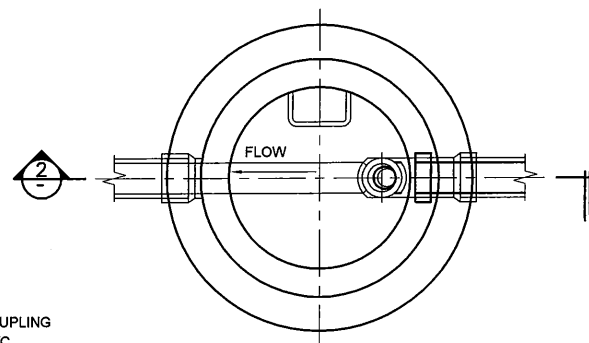
SECTION ①



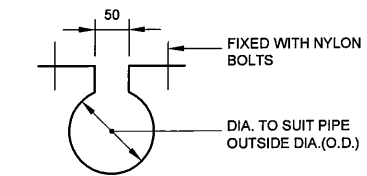
SECTION ②



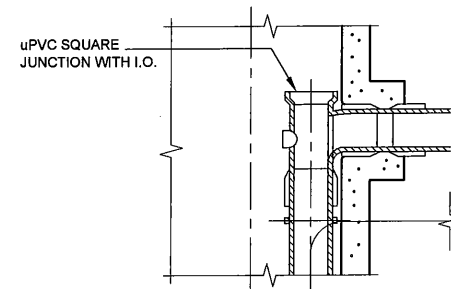
PLAN
DROP TYPE 1



PLAN
DROP TYPE 2



DETAIL 1 - PIPE CLAMP DETAIL



DETAIL 2

DROP TYPE	DROP RANGE
1	< 200mm
2*	200 to 600mm (see note)
3	> 600mm

* NOT PREFERRED

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

TITLE: PIPE CONNECTION AND DROP PIPE DETAILS OF MANHOLE (1)

CLIENT: **IPBC** INDEPENDENT PUBLIC BUSINESS CORPORATION
PMU 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

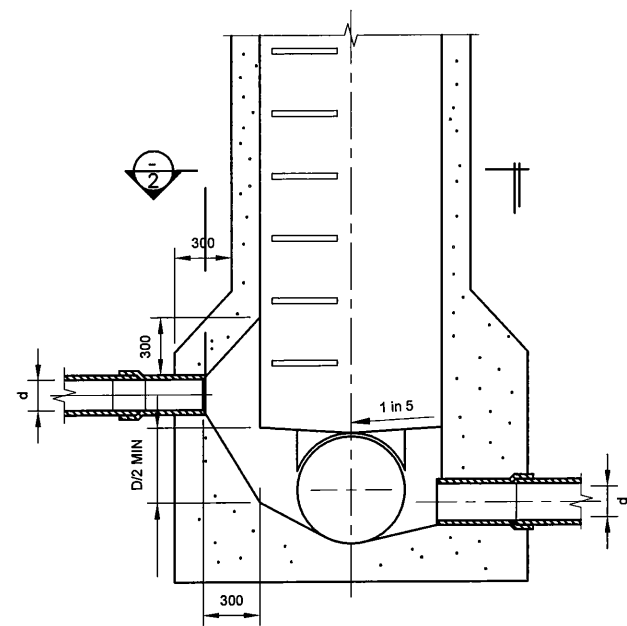
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Project Manager
T.Fuji

DATE:
1. Dec 2011

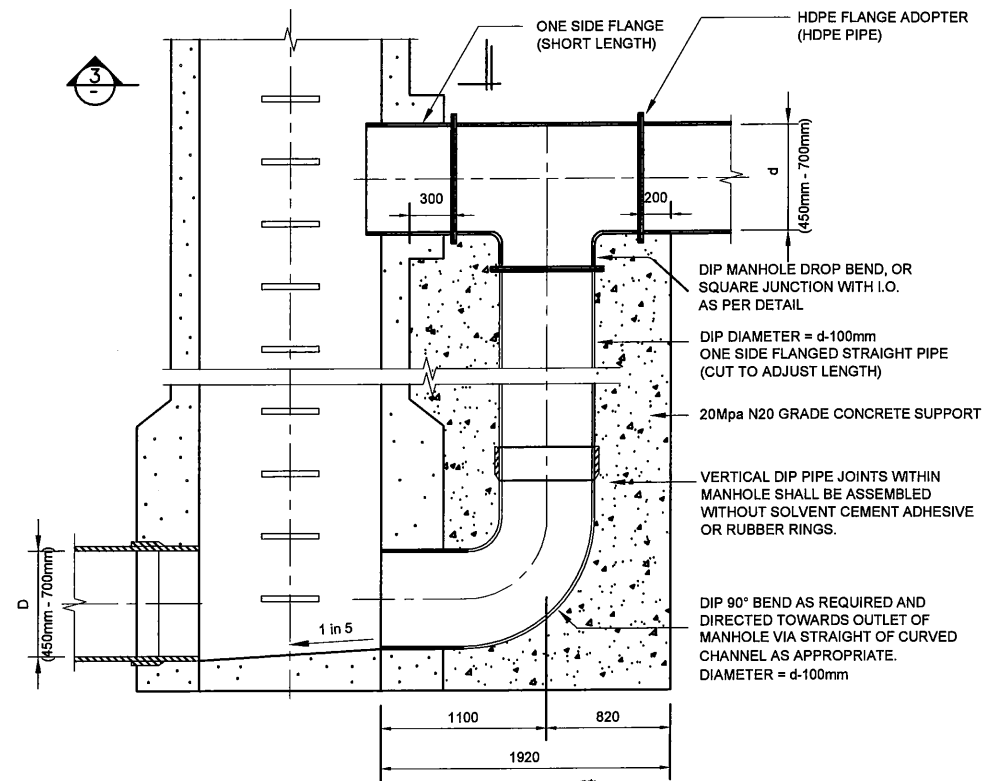
DATE:
1. Dec 2011

SCALE:
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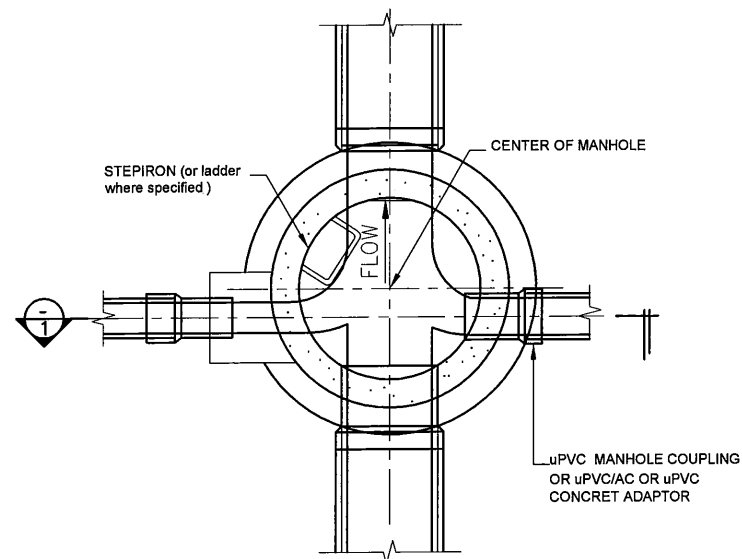
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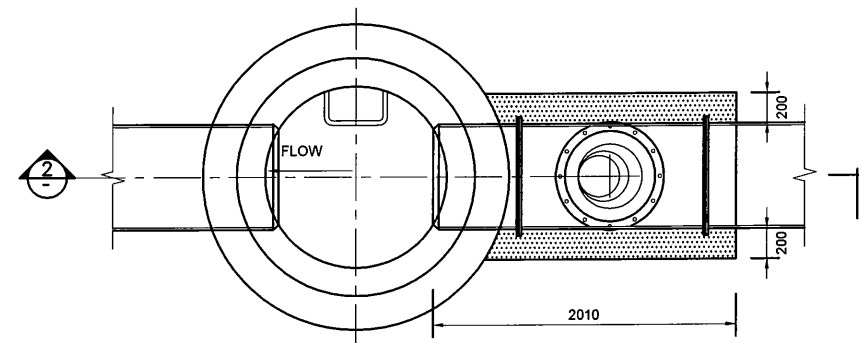
SECTION 1



SECTION 2



PLAN
DROP TYPE 1



PLAN
DROP TYPE 2

DROP TYPE	DROP RANGE
1	< 200mm
2*	200 to 600mm (see note)
3	> 600mm

* NOT PREFERRED

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

TITLE: PIPE CONNECTION AND DROP PIPE DETAILS OF MANHOLE (2)

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

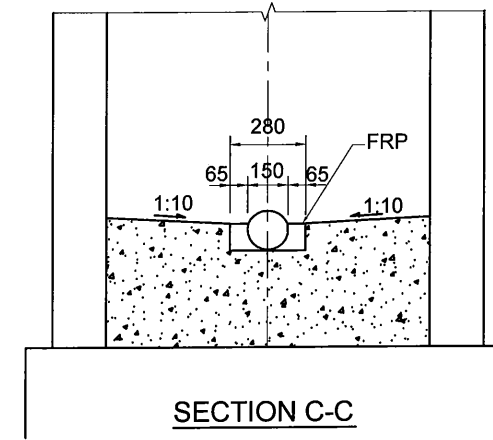
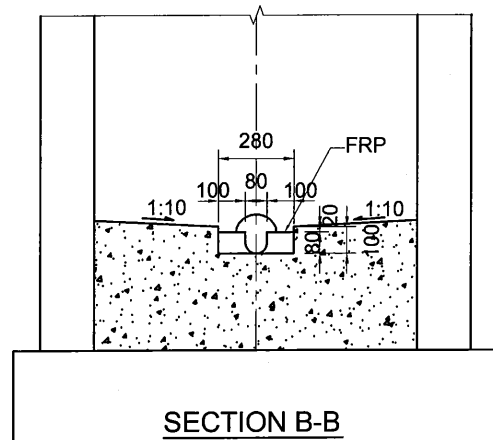
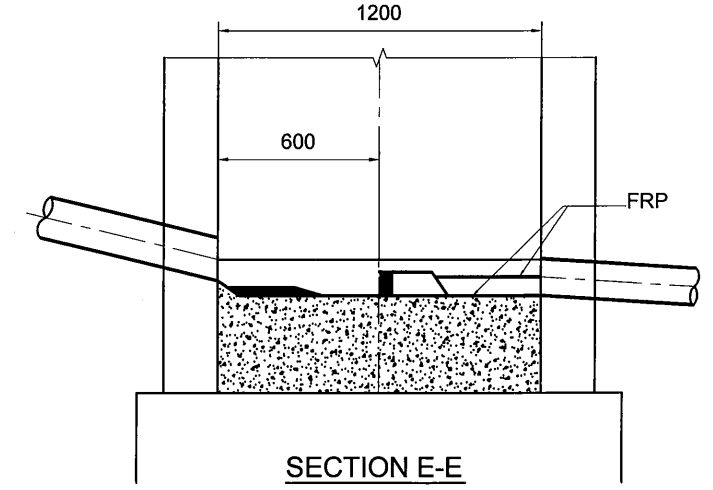
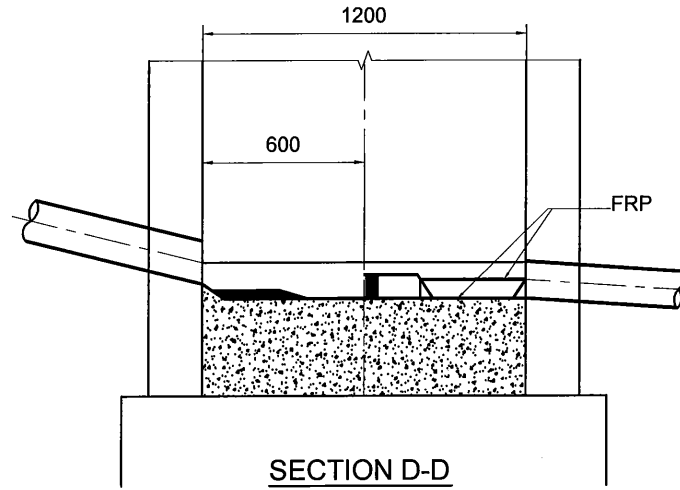
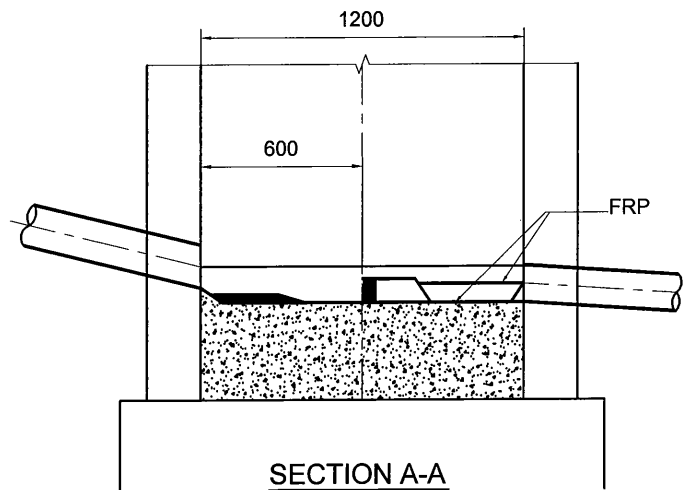
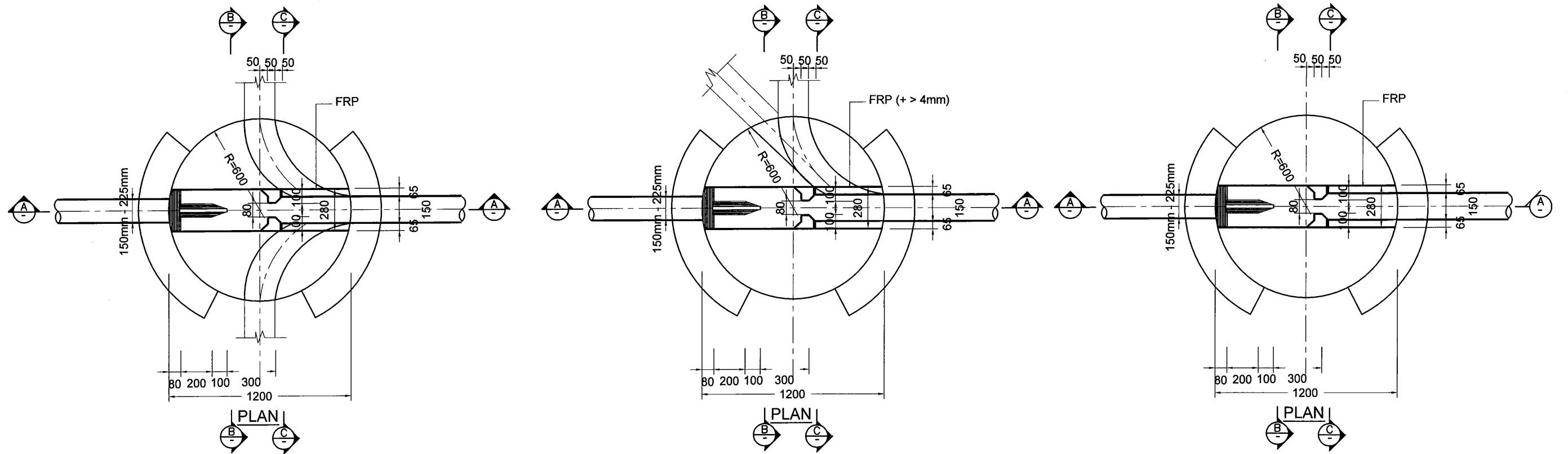
CHECKED by CONSULTANT
 Project Manager
 T. Fuji

DATE: 1. Dec 2011




DATE: 1. Dec 2011

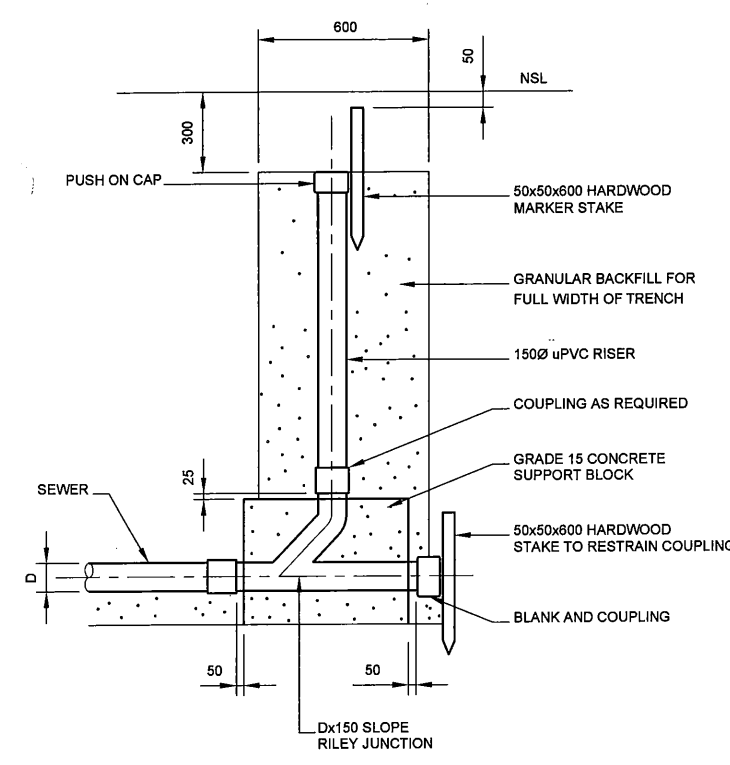
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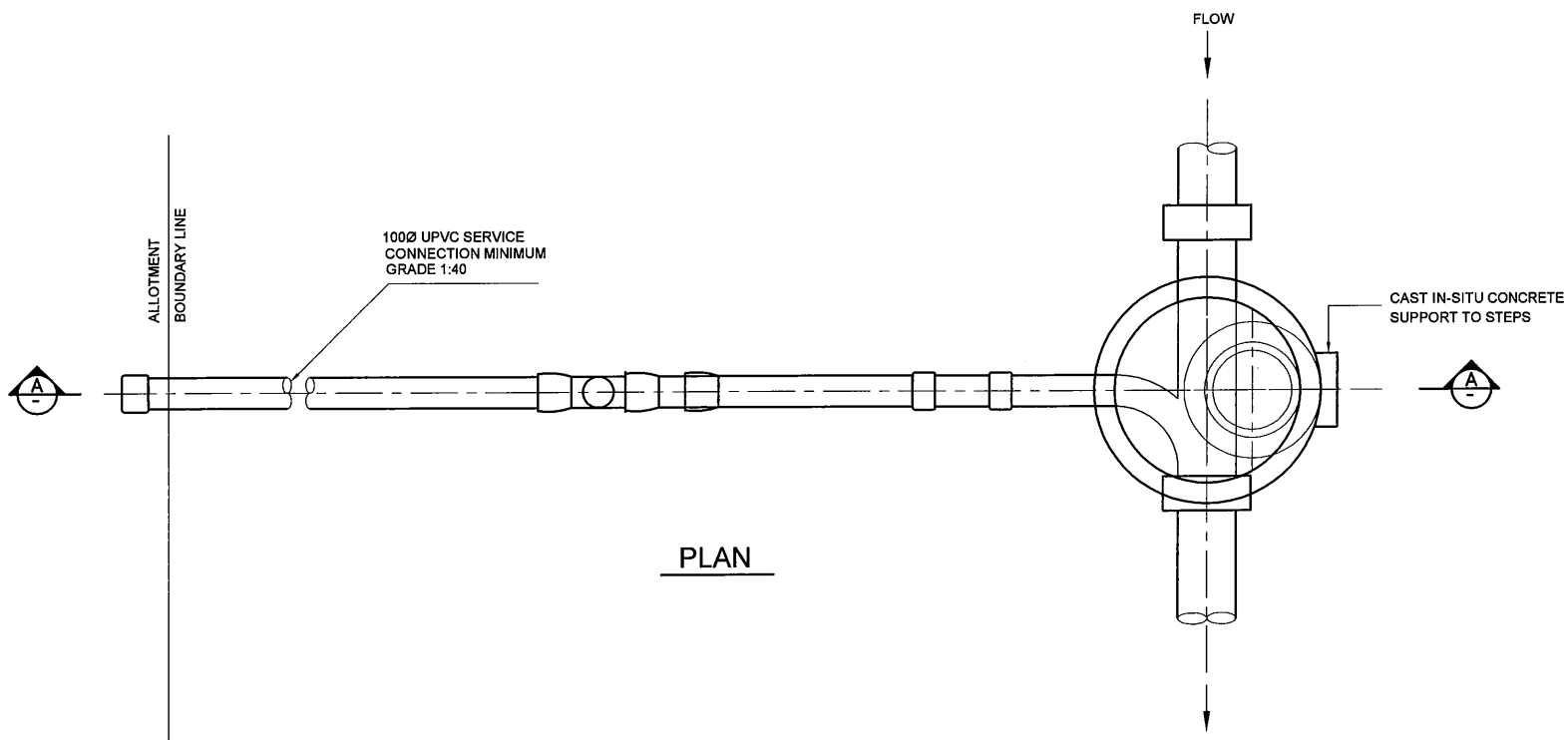


NOTE:
 THIS WORK WILL BE APPLIED FOR SMALLER DIAMETER OF PIPE (150mm TO 225mm) OF BRANCH SEWER MANHOLE AND PRESSURE REDUCING MANHOLE OF MAIN TRUNK SEWER
 THE CONTRACTOR SHALL SUBMIT THE DETAILED DRAWING AND SAMPLE OF FRP FORM TO BE APPROVED BY THE ENGINEER

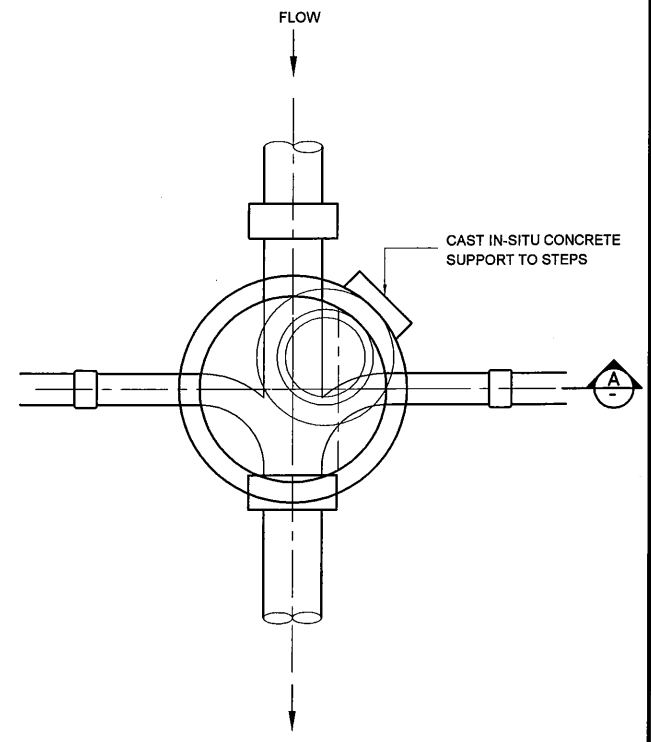
PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)		TITLE: DETAILS OF RETARDATION AND ENERGY DISSIPATION WORK FOR SMALLER PIPE																					
CLIENT:  INDEPENDENT PUBLIC BUSINESS CORPORATION PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT PROJECT MANAGEMENT UNIT (PMU)  JAPAN INTERNATIONAL COOPERATION AGENCY	CONSULTANTS:  NJS CONSULTANTS CO., LTD. - JAPAN	NOTES:	<table border="1"> <thead> <tr> <th colspan="3">REVISIONS</th> </tr> <tr> <th>REV.</th> <th>DATE</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>			REVISIONS			REV.	DATE	DESCRIPTION										APPROVED by PMU: Project Director Lot G.Zauya	DATE: 1. Dec 2011	SCALE: NTS
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REV.	DATE	DESCRIPTION																					
			CHECKED by CONSULTANT Project Manager T.Fuji	DATE: 1. Dec 2011	DRAWING NO.: PGS-08																		



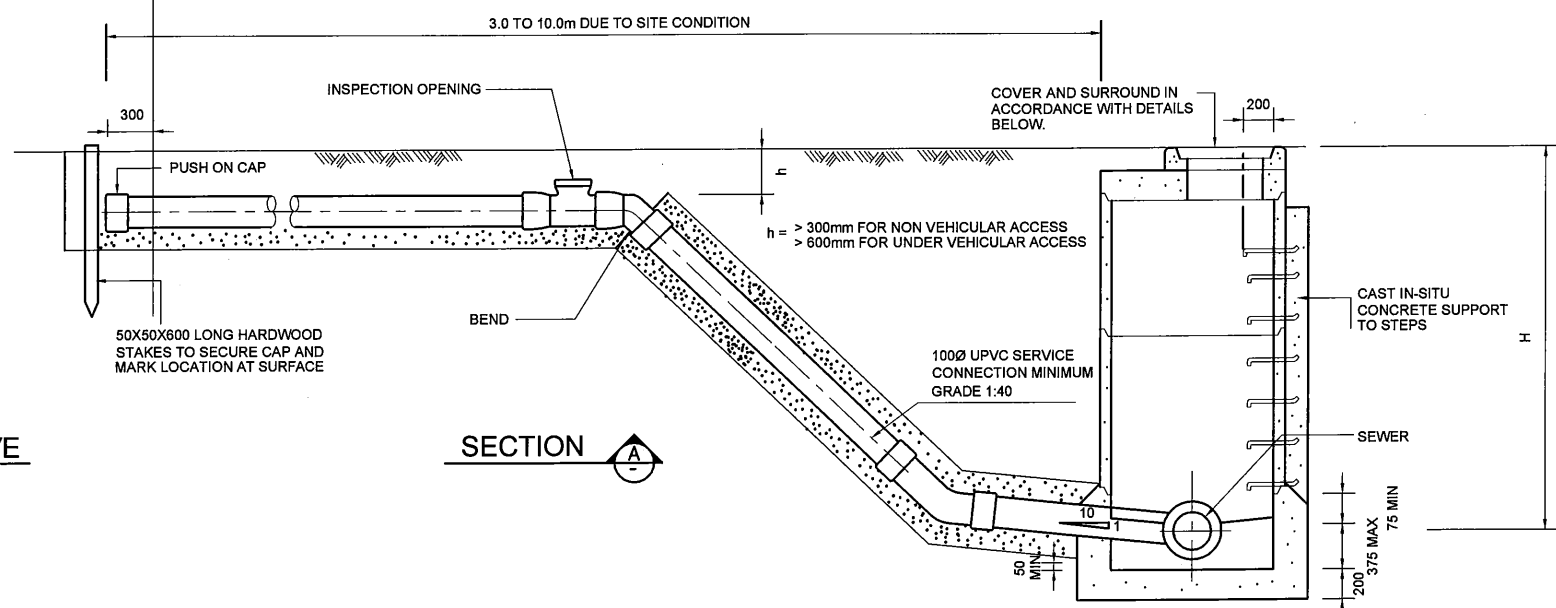
**INSPECTION SHAFT FOR HOUSE CONNECTION RESERVE
(AS REQUIRED)**



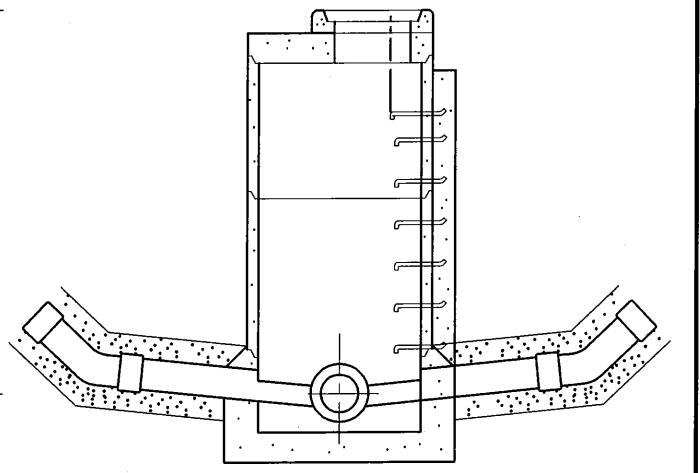
PLAN



PLAN (BOTH SIDE CONNECTION)



TYPICAL CONNECTION



TYPICAL CONNECTION

PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

TITLE: HOUSE CONNECTION RESERVE DETAILS

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

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

NOTES:

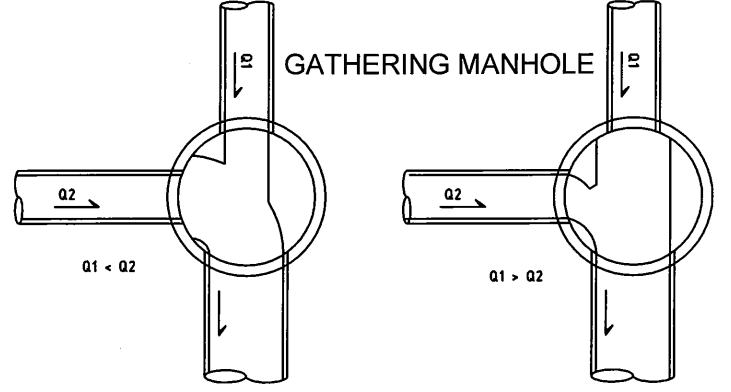
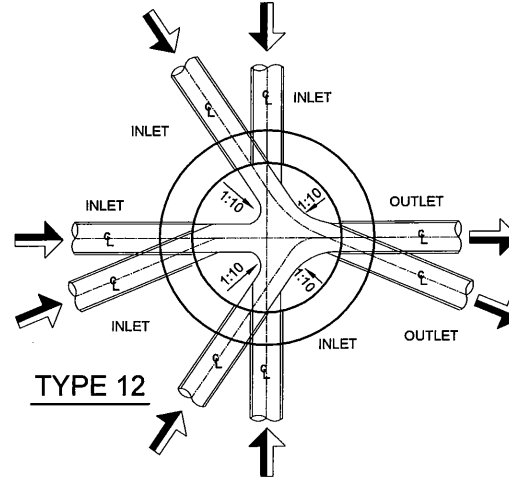
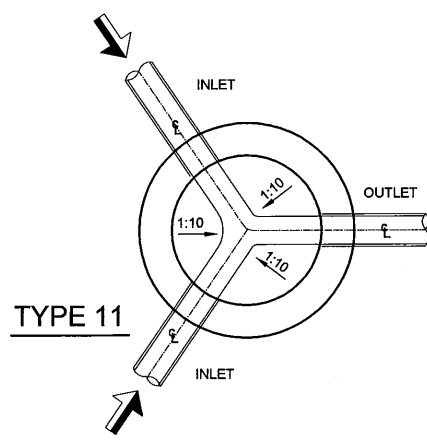
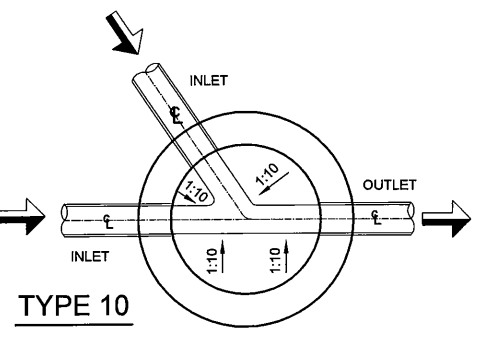
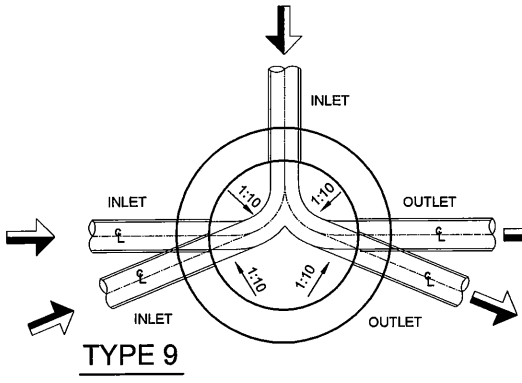
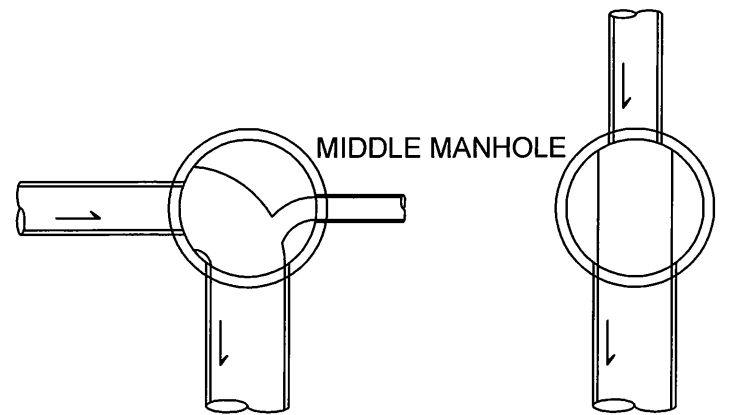
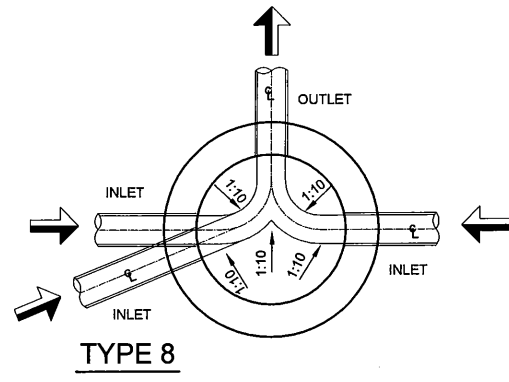
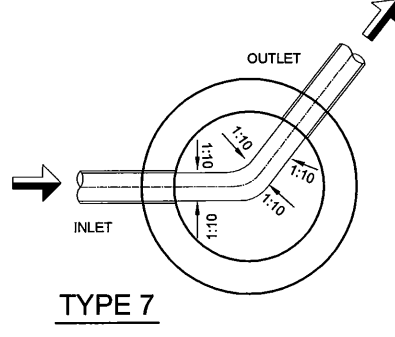
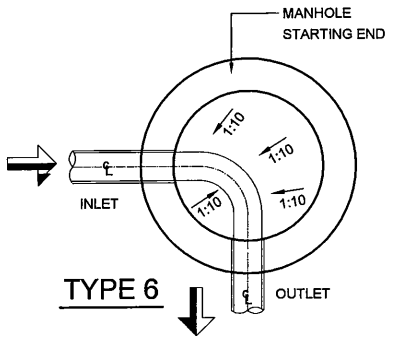
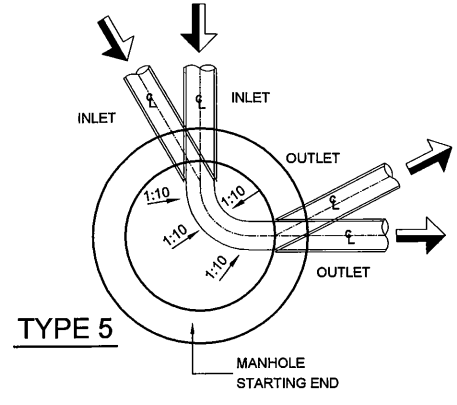
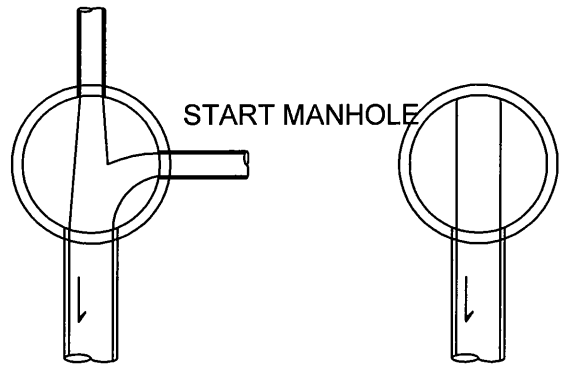
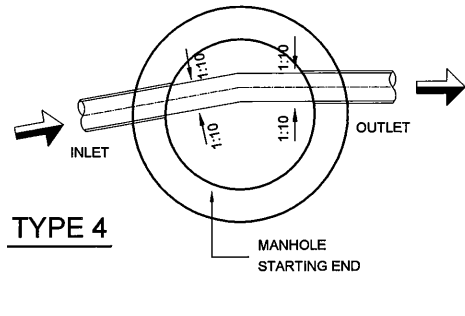
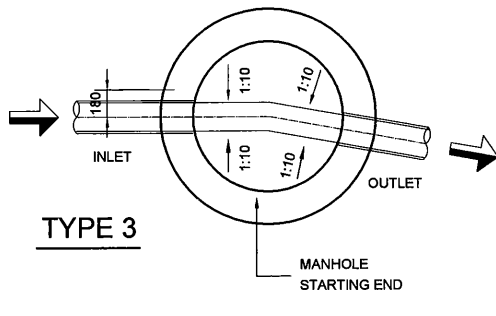
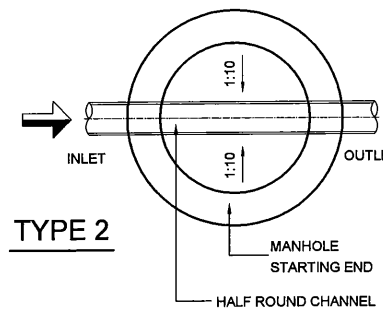
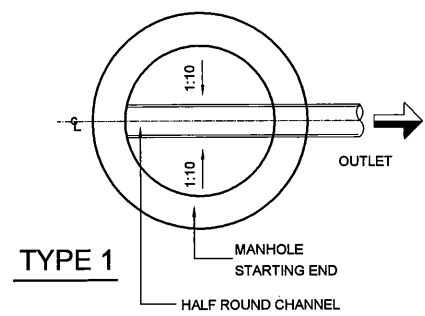
REVISIONS		
REV.	DATE	DESCRIPTION

APPROVED by PMU:
Project Director
Lot G.Zauya

CHECKED by CONSULTANT
Project Manager
T.Fuji

DATE: 1. Dec 2011
SCALE: NTS

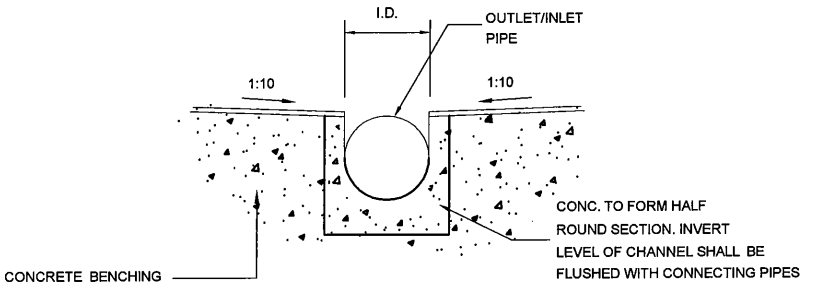
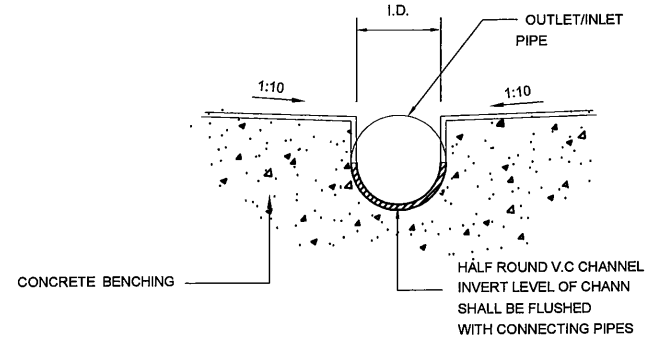
DATE: 1. Dec 2011
DRAWING NO.: PGS-09



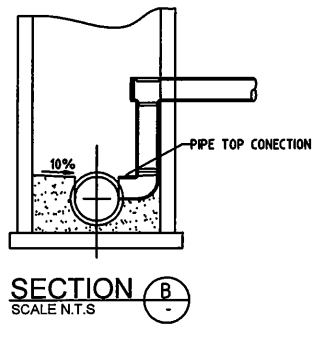
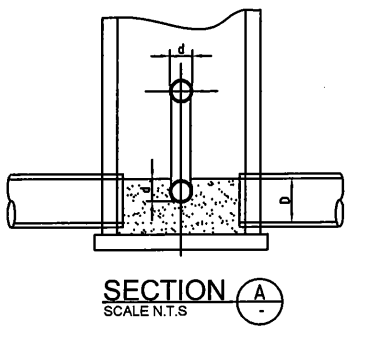
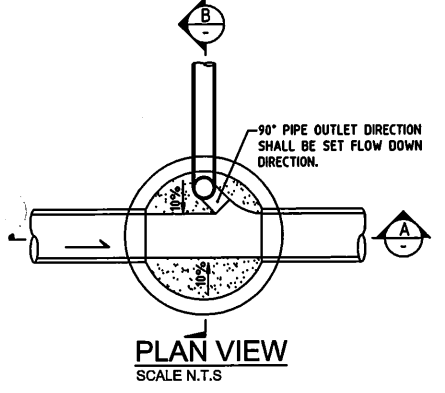
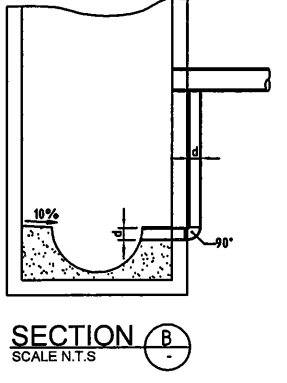
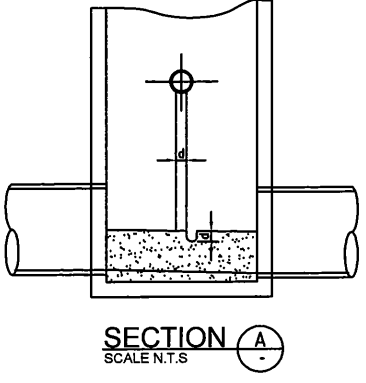
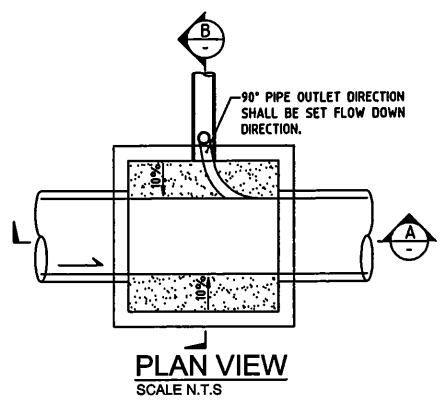
SECTIONAL PLANS & SECTIONS FOR VARIOUS ARRANGEMENTS OF INLET & OUTLET PIPES AT MANHOLES

APPLIED TYPE

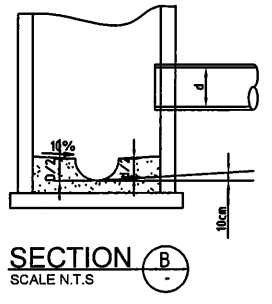
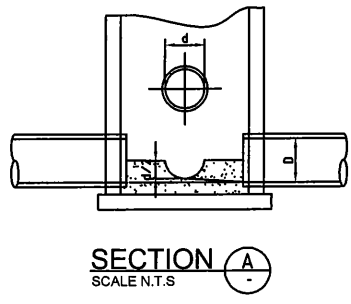
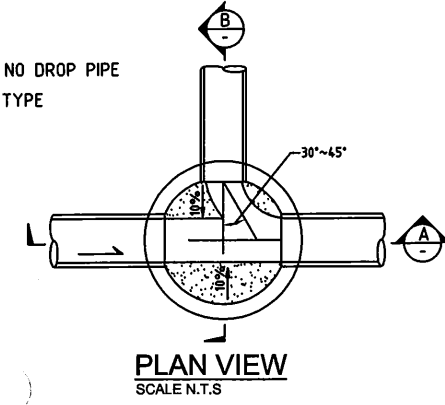
BASIC TYPE



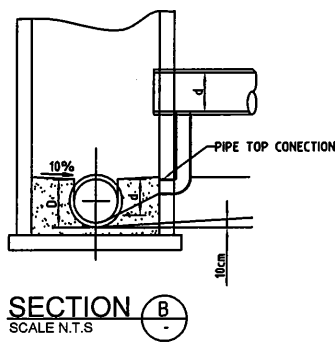
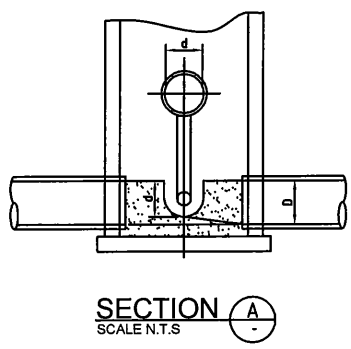
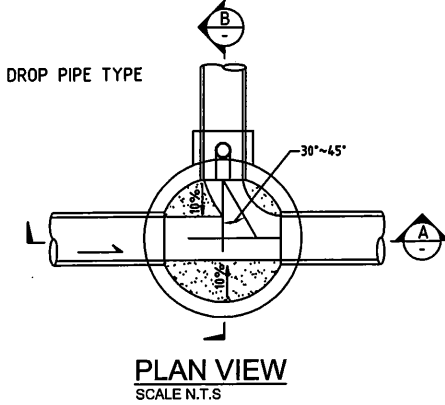
PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)		TITLE: INVERT DETAILS OF MANHOLES (1)	
CLIENT: IPBC INDEPENDENT PUBLIC BUSINESS CORPORATION PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT PROJECT MANAGEMENT UNIT (PMU) jica JAPAN INTERNATIONAL COOPERATION AGENCY	CONSULTANTS: NJS CONSULTANTS CO., LTD. - JAPAN	NOTES:	APPROVED by PMU: Project Director Lot G.Zauya
			CHECKED by CONSULTANT Project Manager T.Fuji
		REVISIONS	DATE: 1. Dec 2011
		REV. DATE DESCRIPTION	SCALE: NTS
			DATE: 1. Dec 2011
			DRAWING NO.: PGS-10



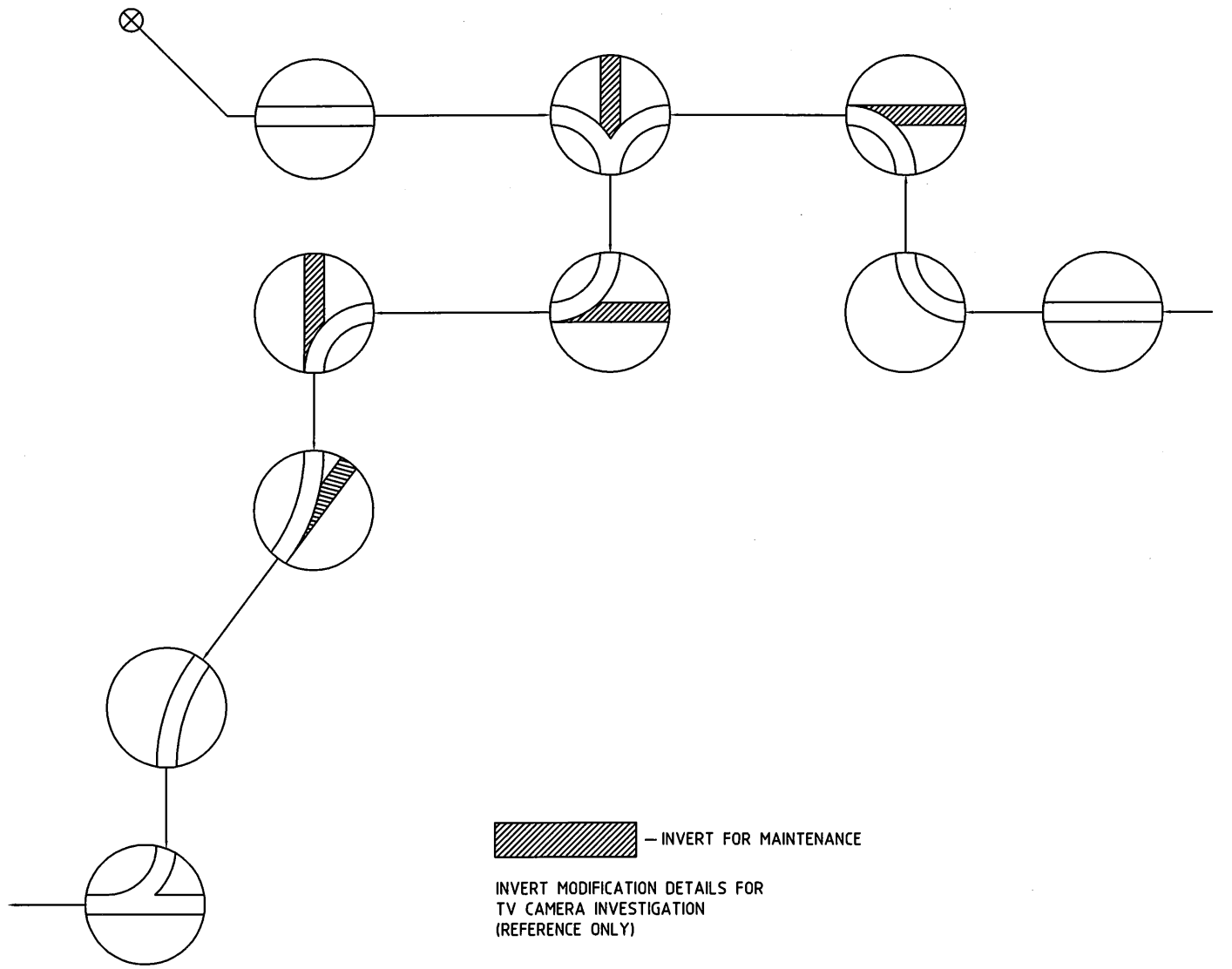
1) NO DROP PIPE TYPE



2) DROP PIPE TYPE



NOTE:
-INVERT HEIGHT SHALL BE 1/2 OF PIPE DIAMETER.
-DROP PIPE SHALL BE PIPE TOP CONNECTION.



PROJECT: PORT MORESBY SEWERAGE SYSTEM UPGRADING PROJECT (POMSSUP)

TITLE: INVERT DETAILS OF MANHOLES (1)

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: NTS

DATE: 1. Dec 2011
DRAWING NO.: PGS-11