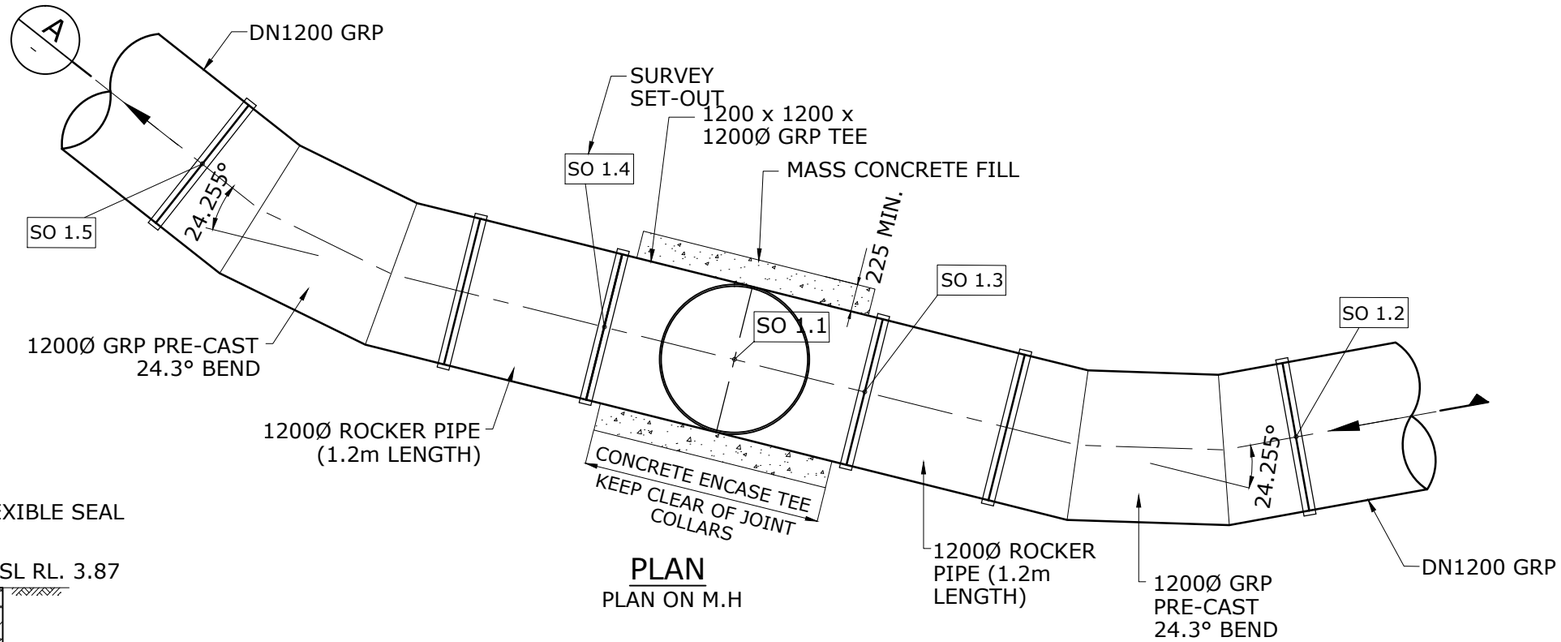
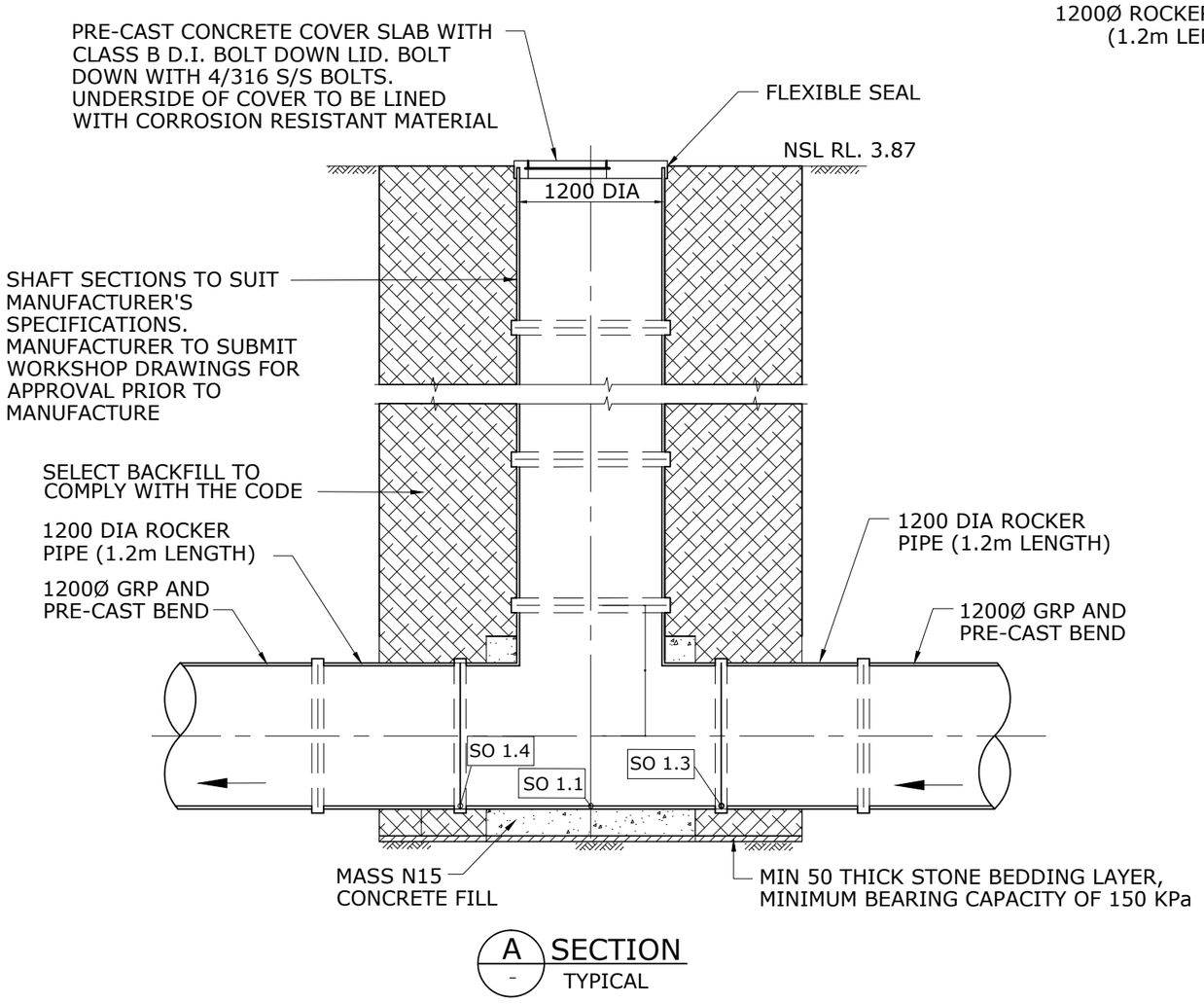


PLAN
PLAN ON M.H



A SECTION
TYPICAL

DESIGN INPUT BY RPEQ REQUIRED FOR TRAFFIC LOADS, STRUCTURAL STEEL DESIGN AND NATIVE SOIL CONDITIONS, REFER NOTES

USE IN QUU AND UNITYWATER AREAS SUBJECT TO SPECIFIC APPROVAL

NOTES

1. MANHOLE SHAFT TO BE SUITABLE TO SUPPORT DESIGN TRAFFIC LOAD.
2. COVER SLAB TO BE DESIGNED AND SUPPLIED BY MANHOLE MANUFACTURER.
3. ALL MATERIALS REQUIRED FOR MANHOLE INSTALLATION TO BE SUPPLIED BY MANHOLE SUPPLIER WITH EXCEPTION OF BACKFILL MATERIALS AND IN-SITU CONCRETE.
4. VARIATIONS TO DESIGN SUBJECT TO APPROVAL BY SEQ-SP.
5. SUPPLIER TO SPECIFY EXTENTS, LOCATION AND VOLUME OF CONCRETE REQUIRED FOR PREVENTING FLOTATION. NO CONCRETE ALLOWED OVER FLEXIBLE JOINTS.
6. ALL INTERNAL EXPOSED SURFACES TO BE CORROSION RESISTANT.
7. MANUFACTURER TO PROVIDE DETAIL DRAWINGS FOR APPROVAL PRIOR TO MANUFACTURE.
8. ALL GRP TEES, BENDS AND RISER COMPONENTS SHALL BE MINIMUM STIFFNESS OF SN10,000.

REV. No.	DATE	DESCRIPTION	AUTH.

SEQ WATER
SERVICE PROVIDERS

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

SEWERAGE STANDARD DRAWING

"Z1" TYPE NON-TRAFFICABLE
TYPICAL GRP MH OPTION DN1200
AND LARGER SEWERS

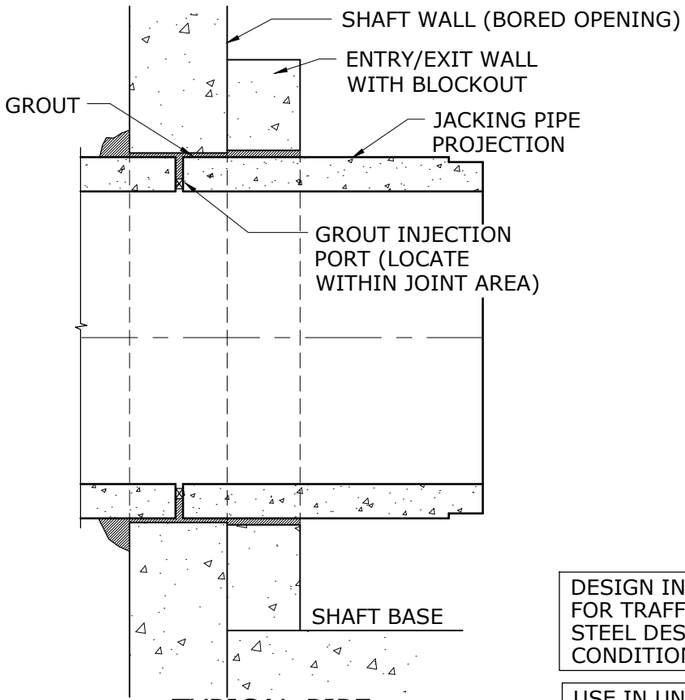
GCCC	LCC	RCC	QUU	UW

DRAWING No.
SEQ-SEW-1310-1

VERSION
A

NOT TO SCALE

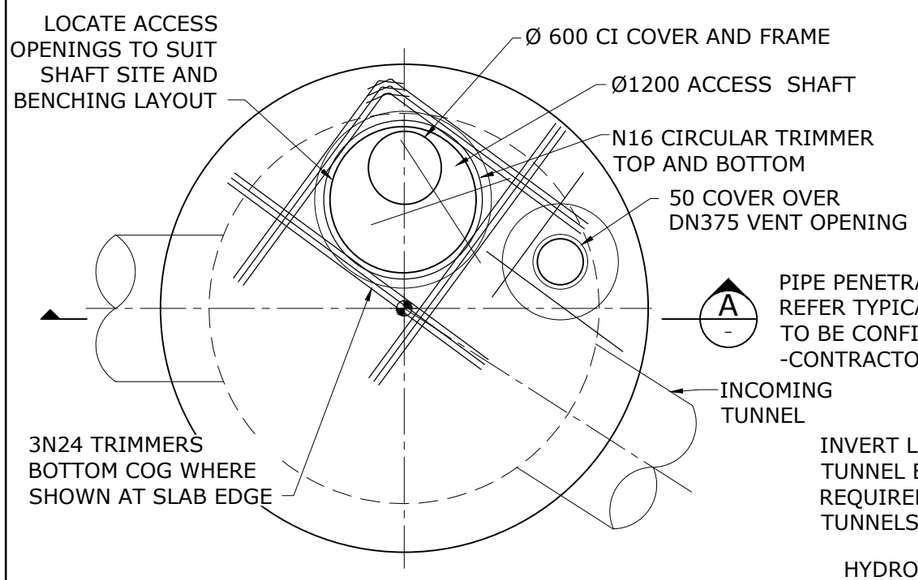
ORG DATE:
1/1/2013



TYPICAL PIPE PENETRATION DETAIL

DESIGN INPUT BY RPEQ REQUIRED FOR TRAFFIC LOADS, STRUCTURAL STEEL DESIGN AND NATIVE SOIL CONDITIONS, REFER NOTES.

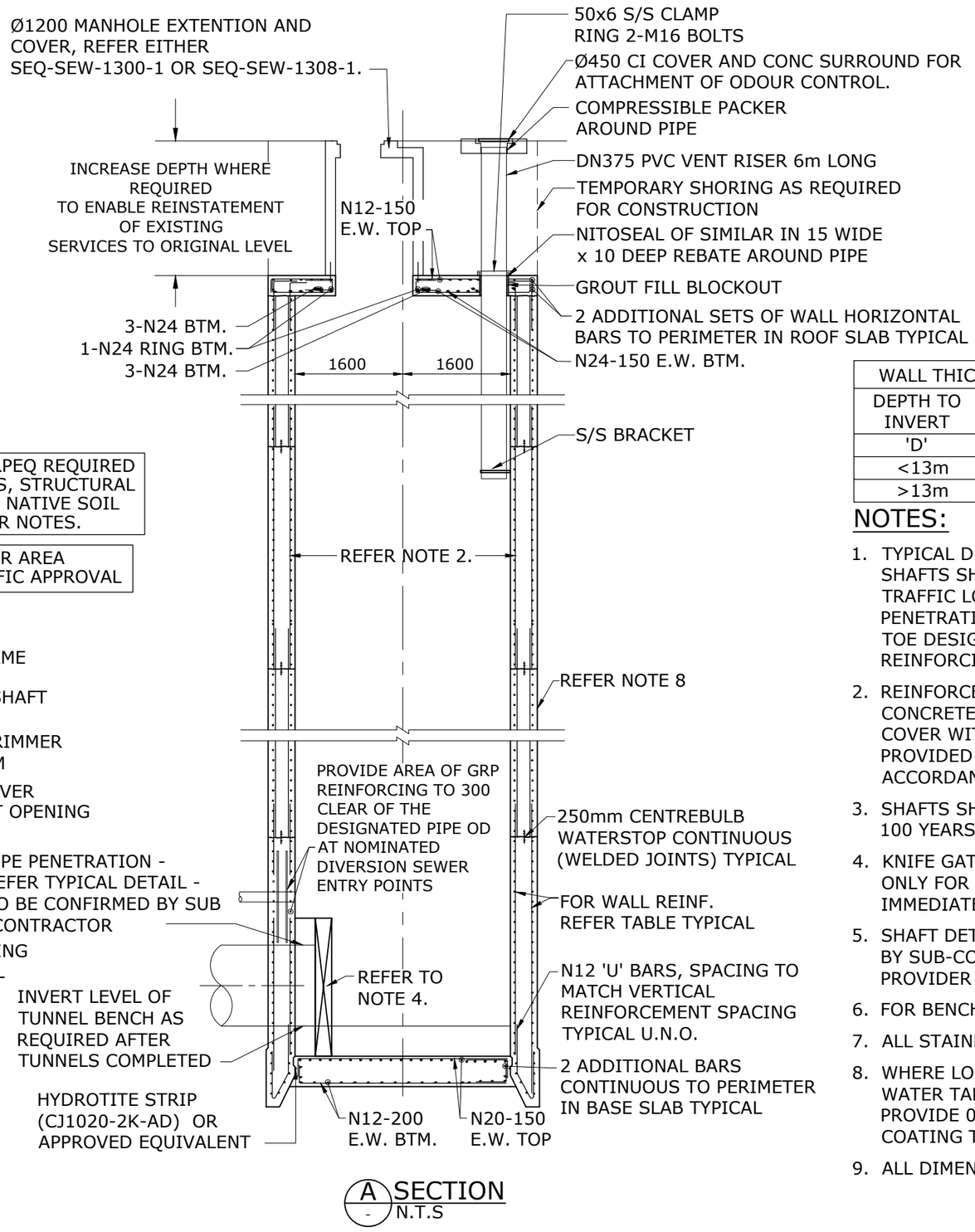
USE IN UNITYWATER AREA SUBJECT TO SPECIFIC APPROVAL



PLAN - RECEPTION SHAFT ROOF SLAB

MAIN REINFORCEMENT OMITTED FOR CLARITY

DENOTES SETOUT POINT
REFER TO SHAFT SITE PLANS FOR COORDINATES



A SECTION

N.T.S

WALL THICKNESS AND REINFORCING		
DEPTH TO INVERT	WALL THICKNESS	WALL
'D'	'T'	REINFORCING
<13m	425	N16-150 EW EF
>13m	500	N16-125 EW EF

NOTES:

1. TYPICAL DETAILS SHOWN. PERMANENT WORKS SHAFTS SHALL BE INDIVIDUALLY DESIGNED FOR TRAFFIC LOADING, JACKING FORCES, PENETRATION SEALING, ANTI FLOATATION, SHAFT TOE DESIGN FOR SOIL CONDITIONS, REINFORCING STEEL AND VENTILATION.
2. REINFORCEMENT AS PER STRUCTURAL DESIGN. CONCRETE SHALL BE S40 MINIMUM WITH 75 COVER WITH ALL INTERNAL SURFACES TO BE PROVIDED WITH A PE PROTECTIVE COATING IN ACCORDANCE WITH THE CODE.
3. SHAFTS SHALL HAVE A MINIMUM DESIGN LIFE OF 100 YEARS.
4. KNIFE GATE DETAILS AS PER THE CODE REQUIRED ONLY FOR COLLECTION MANHOLE LOCATED IMMEDIATELY UP STREAM OF PUMP STATION.
5. SHAFT DETAILS ARE SUBJECT TO CONFIRMATION BY SUB-CONTRACTOR AND APPROVAL BY SERVICE PROVIDER PRIOR TO WORKS COMMENCING.
6. FOR BENCHING DETAILS REFER SEQ-SEW-1309-1.
7. ALL STAINLESS STEEL TO BE GRADE 316.
8. WHERE LOCATED IN AGGRESSIVE SOILS, HIGH WATER TABLE AND SALINE ENVIRONMENTS, PROVIDE 0.3 THICK SOLVENT FREE EPOXY COATING TO OUTSIDE FACE OF WALL.
9. ALL DIMENSIONS ARE IN MILLIMETRES.

REV. No.	DATE	DESCRIPTION	AUTH.

SEQ WATER
SERVICE PROVIDERS

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

SEWERAGE STANDARD DRAWING

"Z2" TYPE TYPICAL TUNNEL
JACKING SHAFT - CAISSON OPTION

GCCC	LCC	RCC	QUU	UW

DRAWING No.

SEQ-SEW-1311-1

VERSION

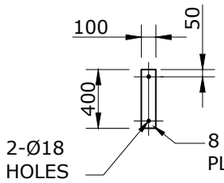
A

NOT TO SCALE

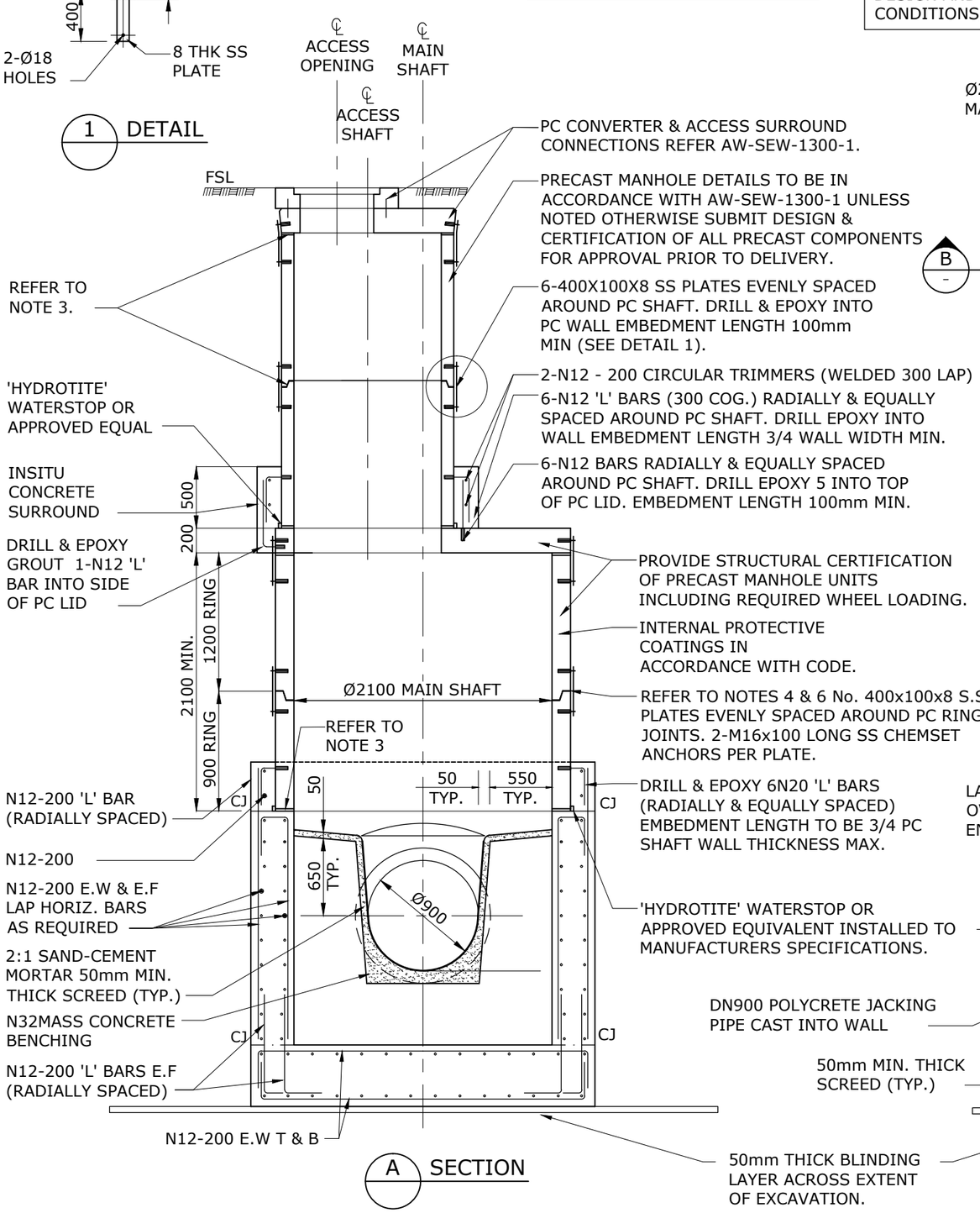
ORG DATE: 1/1/2013

USE IN UNITYWATER AREA
SUBJECT TO SPECIFIC APPROVAL

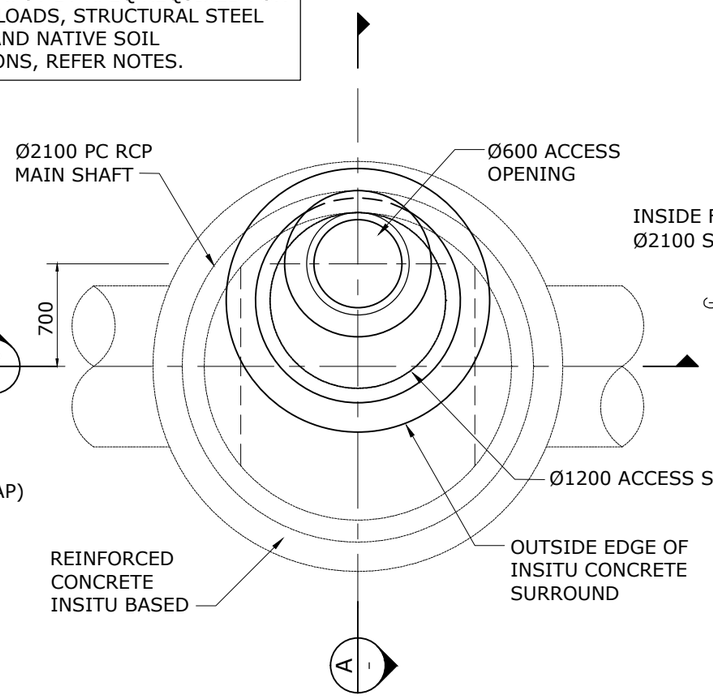
DESIGN INPUT BY RPEQ REQUIRED FOR TRAFFIC LOADS, STRUCTURAL STEEL DESIGN AND NATIVE SOIL CONDITIONS, REFER NOTES.



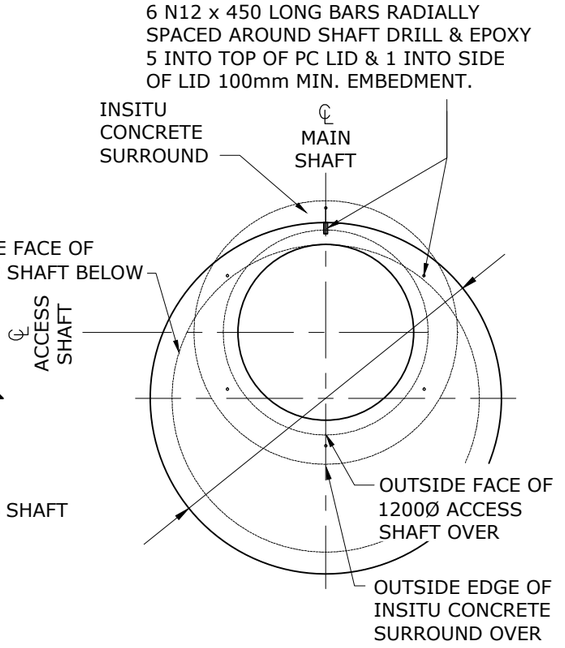
1 DETAIL



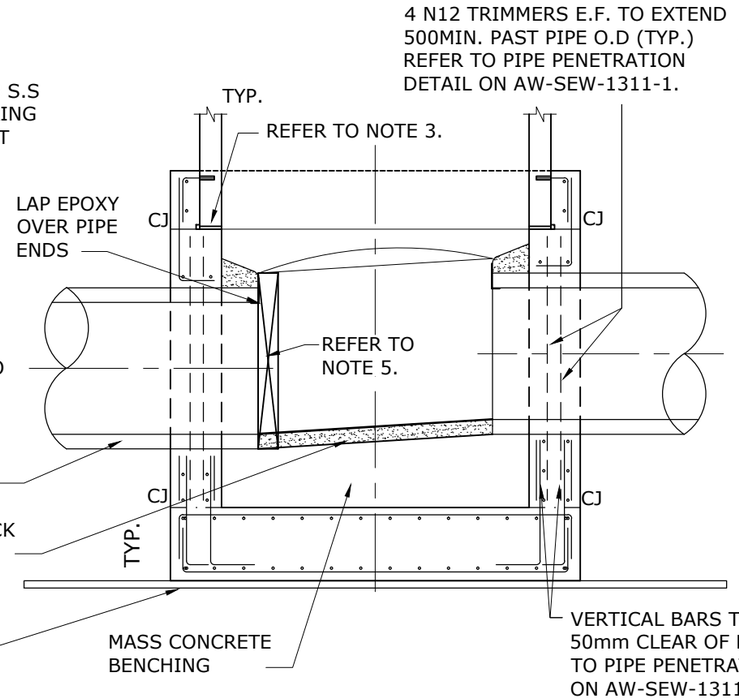
A SECTION



MANHOLE ACCESS PLAN



SHAFT PC ROOF SLAB PLAN



NOTES:

1. TYPICAL DETAILS SHOWN, PERMANENT WORKS SHAFTS SHALL BE INDIVIDUALLY DESIGNED FOR TRAFFIC LOADING, JACKING FORCES, SHAFT TOE DESIGN FOR SOIL CONDITIONS, REINFORCING STEEL & VENTILATION.
2. FORMAT SHOWN FOR USE WHERE DEPTH IS 8.0M AND TEMPORARY WORKS (SHEETPILE) USED. FLOATATION CONTROL SHALL BE DESIGNED FOR EACH STRUCTURE.
3. 'MEGAPOXY' OR APPROVED MASTIC SEALANT IS TO BE PLACED BETWEEN ALL SHAFT JOINTS. ALL JOINTS ARE TO BE POINTED INTERNALLY.
4. EXTERNAL STRAPPING TO BE SS316 FOR ALL COMPONENTS.
5. KNIFE GATE DETAILS REFER TO CODE. REQUIRED ONLY FOR COLLECTION MANHOLE LOCATED IMMEDIATELY UP STREAM OF PUMP STATION.
6. ALL CAST INSITU CONCRETE S40 WITH 75mm COVER TO REINFORCEMENT.
7. ALL DIMENSIONS ARE IN MILLIMETRES.

REV. No.	DATE	DESCRIPTION	AUTH.

SEQ WATER
SERVICE PROVIDERS

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

SEWERAGE STANDARD DRAWING

"Z3" TYPE TYPICAL TUNNEL
RECEIVAL SHAFT MANHOLE OPTION

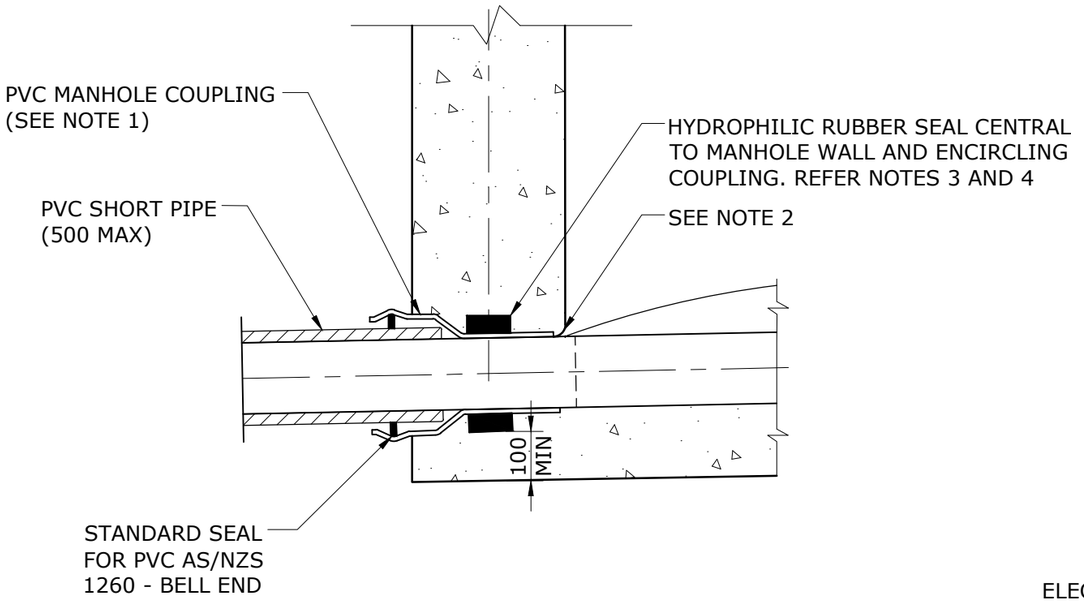
GCCC	LCC	RCC	QUU	UW

DRAWING No.
SEQ-SEW-1312-1

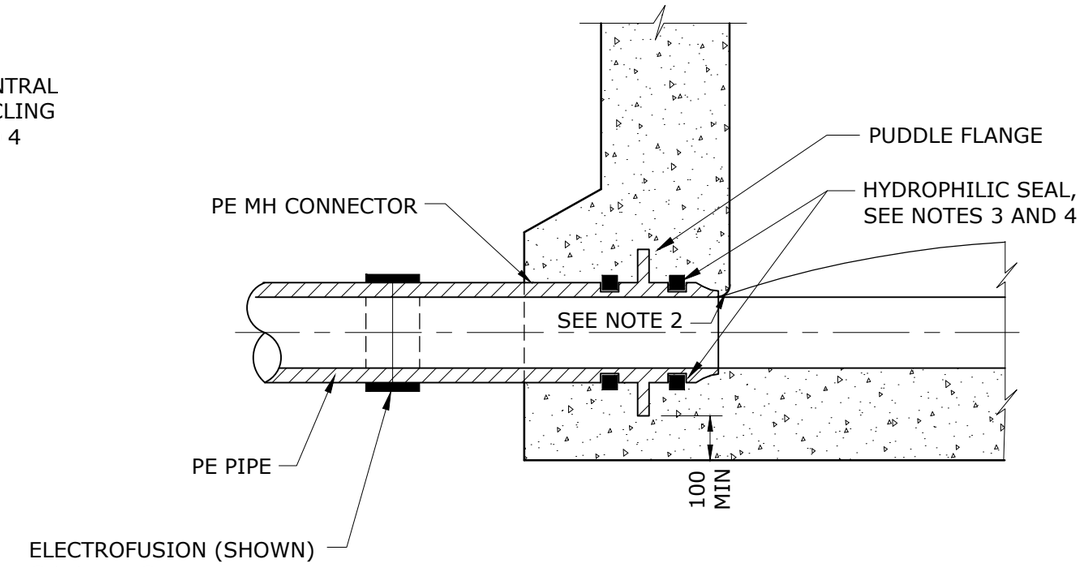
VERSION
A

NOT TO SCALE

ORG DATE:
1/1/2013



CONNECTION PVC - PVC
(SEE NOTE 1)



CONNECTION PE - PE

NOTES:

1. FOR CONNECTIONS TO OTHER PIPE MATERIALS SEE SEQ-SEW-1302-1. HYDROPHILIC SEALS TO ALL PIPE MATERIALS.
2. FORM ROUNDED NOSING ON INLET AND OUTLET PIPES TO PREVENT DAMAGE TO JETTING EQUIPMENT, CCTV CABLES AND GUIDES.
3. HYDROPHYLLIC RUBBER SEALS SHALL BE MINIMUM OF 6x25 AND SHALL FULLY ENCIRCLE THE PIPE FITTING WITH A MINIMUM 50 OVERLAP THAT IS IN CONTRACT WITH IT'S SELF.
4. FIX AND MAKE CONTINUOUS THE HYDROPHYLLIC RUBBER SEAL WITH GUN GRADE HYDROPHYLLIC WATERSTOP MASTIC BEAD.

REV. No.	DATE	DESCRIPTION	AUTH.

SEQ WATER
SERVICE PROVIDERS

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

SEWERAGE STANDARD DRAWING

MAINTENANCE HOLE
SEWER CONNECTION DETAILS
ALL PIPE MATERIALS

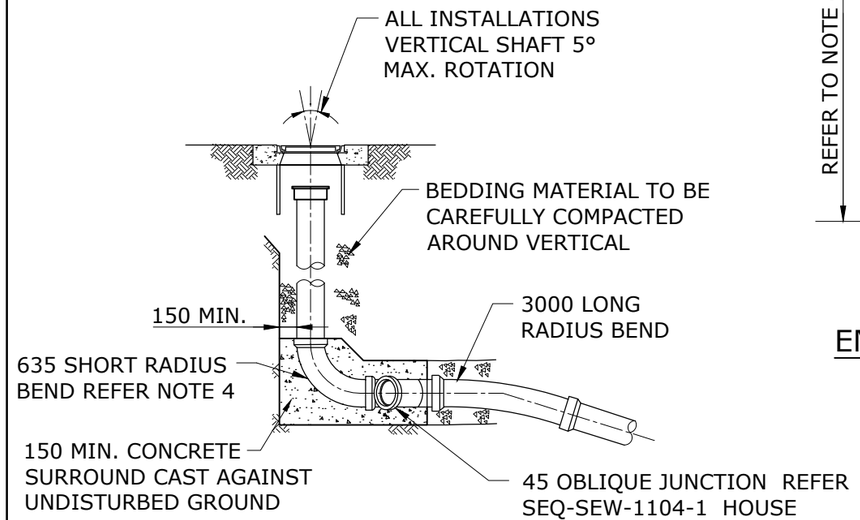
GCCC	LCC	RCC	QUU	UW

DRAWING No. SEQ-SEW-1313-1

VERSION A

NOT TO SCALE

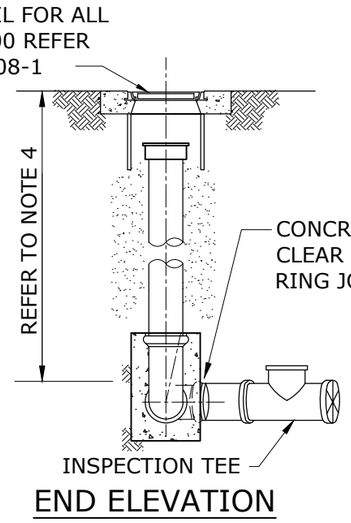
ORG DATE: 1/1/2013



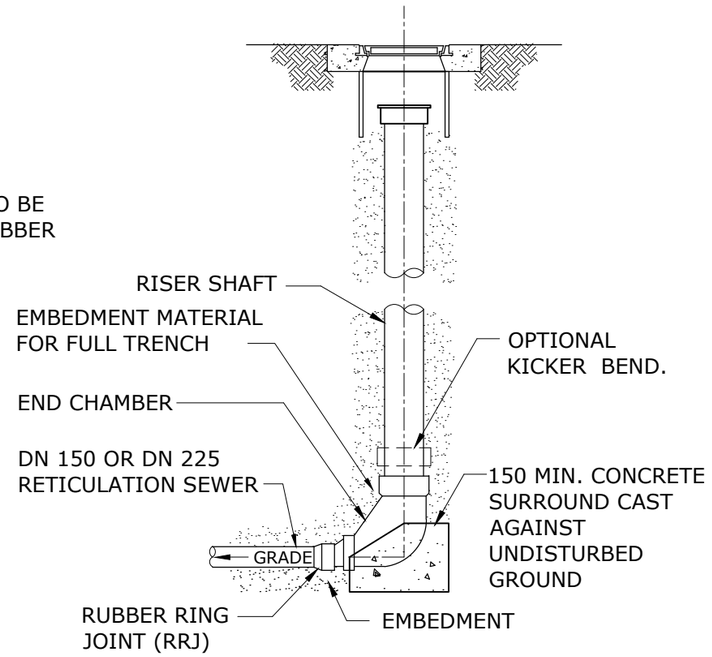
ELEVATION

RODDING END AT SEWER END

Ø150 ONLY



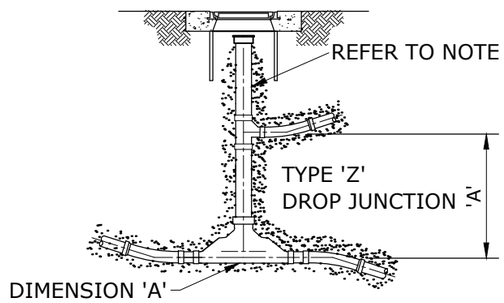
END ELEVATION



ELEVATION

TERMINAL MAINTENANCE SHAFT

(TYPE 'G'-6 & 'N'-1)



uPVC MAINTENANCE SHAFT

(TYPE "G" Ø225 SHAFT)

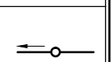
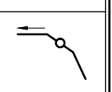
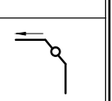
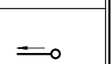
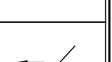
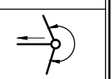
MAINTENANCE SHAFT DROP DETAILS
DIMENSION 'A'

	TYPE 'K' & 'L'		TYPE 'G'		TYPE 'H'		TYPE 'J'	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
TYPE 'Z'	REFER TYPE 'X'		805	2000	950	2000	750	2000
TYPE 'V'	REFER SEQ-SEW-1303-1		00	30	00	30	00	00

NOTES:

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH STANDARD DRAWINGS SEQ-SEW-1308-1 AND SEQ-SEW-1314-2.
2. ALL MAINTENANCE SHAFTS WITH 225 DIA. RISERS MAY UTILISE TYPE 'Z' DROP JUNCTIONS TO EFFECT HIGH LEVEL ENTRIES SUBJECT TO SPECIFIC FITTINGS HEIGHTS AND INSTALLATION DESIGN, REFER MAINTENANCE SHAFT DROP DETAILS DIMENSION 'A'.
3. FOR TYPICAL SEWERAGE PIPE INSTALLATION DETAILS REFER TO STD DWG SEQ-SEW-1200 SET.
4. RODDING END SHOWN SUITABLE FOR SEWER DEPTHS ≥800. FOR DEPTHS OF 600 TO 800 USE IPLEX BEND #DR 0315088 AND SPIGOT ACCESS COUPLING #D209150 OR EQUAL.
5. TRENCH DRAINAGE SHALL CONFORM TO THE DETAILS PROVIDED IN THE STANDARD DRAWINGS.

MAINTENANCE SHAFT TYPE AND APPROVED ITEM

uPVC	TYPE 'G' - 1 45° TEE AYMROO DWG No. #. AYM 1260-11	
	TYPE 'G' - 2 90° TEE ABOVE & IPLEX PART No. #. D00222545	
	TYPE 'G' - 3 STRAIGHT AYMROO DWG No. #. AYM 1260-10.1	
	- 	
	TYPE 'G' - 5 90° TEE AYMROO DWG No. #. AYM 1260-5.1	
	TYPE 'G' - 6 END - TERMINAL MS AYMROO DWG No. #. AYM 1260-7.1	
POLY-PROPYLENE	TYPE 'H' - 1 SMS PART No. #. 400mm STRAIGHT	
	TYPE 'H' - 2 SMS PART No. #. 400mm JUNCTION - L/R 45°	
	TYPE 'H' - 3 EZIPIT CLASS B L/R 45°	
	TYPE 'H' - 4 EZIPIT CLASS D L/R 45°	
CONCRETE	TYPE 'M' DN600 CLASS B &D	
POLY-ETHYLENE	TYPE 'J' -1 TYPE 'K' -1 TYPE 'L' -1 TYPE 'N' -1 ROD END	
ALL	TYPE 'Z' DROP JUNCTION FOR TYPE 'G', 'H' & 'J' MAINTENANCE SHAFTS RISER JUNCTION - AYMROO DWG No.# AYM 1260-9 (EQUAL IS ACCEPTABLE)	

REV. No.	DATE	DESCRIPTION	AUTH.

SEQ WATER
SERVICE PROVIDERS

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

SEWERAGE STANDARD DRAWING

MAINTENANCE STRUCTURES FOR DN225 AND SMALLER RIGSS TYPICAL ARRANGEMENT DETAILS

GCCC	LCC	RCC	QUU	UW

DRAWING No.

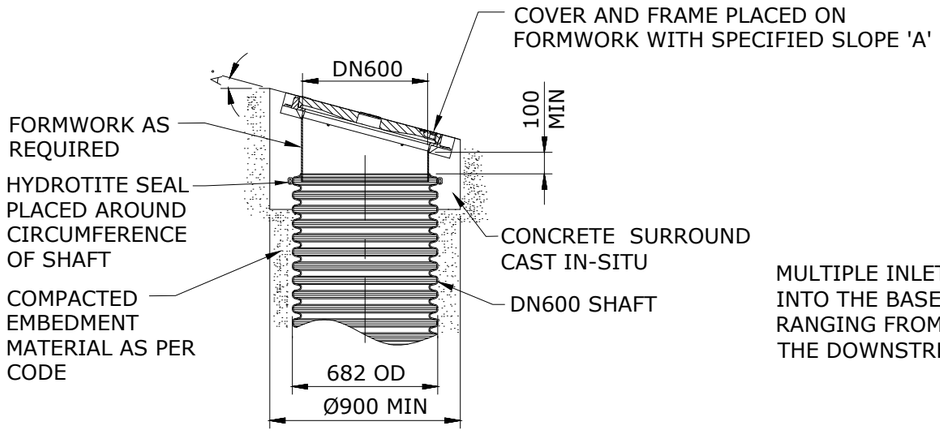
SEQ-SEW-1314-1

VERSION

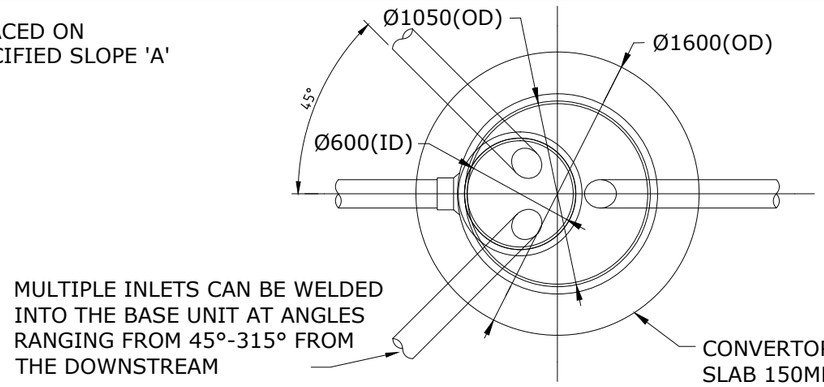
A

NOT TO SCALE

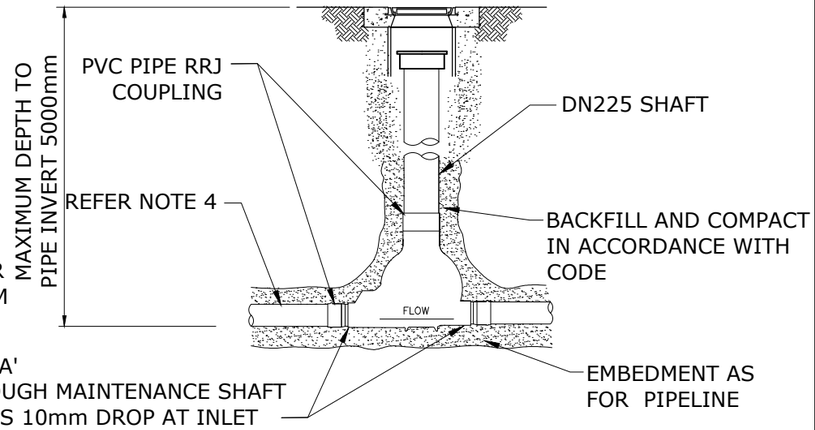
ORG DATE: 1/1/2013



TYPE 'H'3 COVER AND FRAME FOR SLOPED LOCATIONS

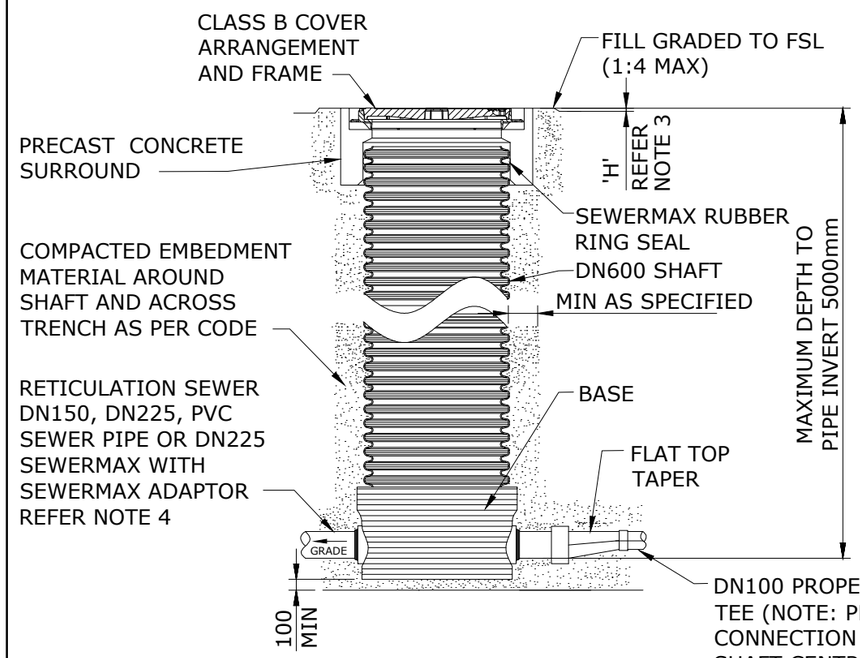


PLAN

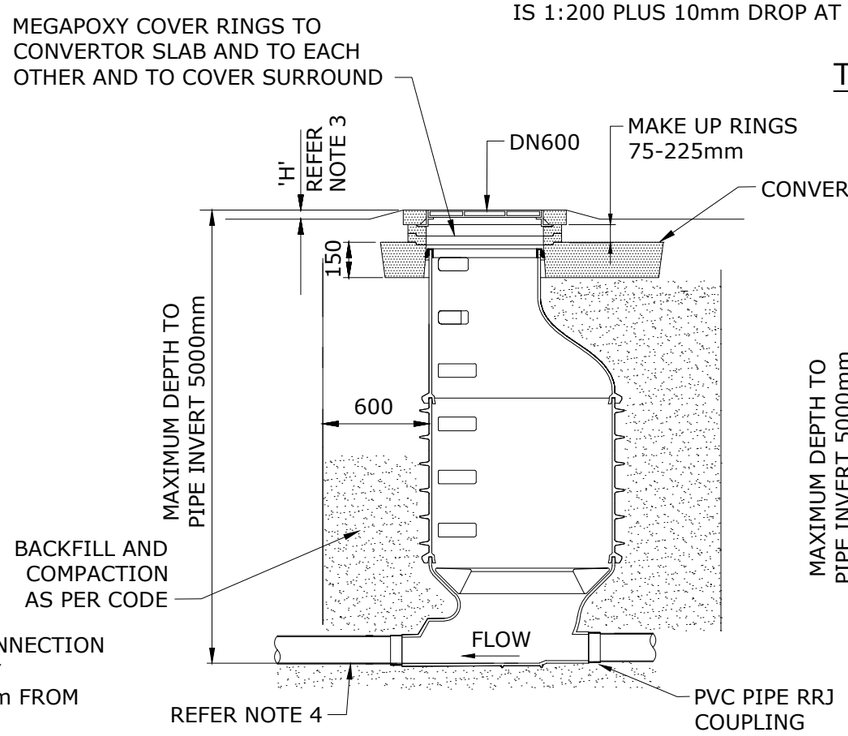


DIMENSION 'A'
GRADE THROUGH MAINTENANCE SHAFT IS 1:200 PLUS 10mm DROP AT INLET

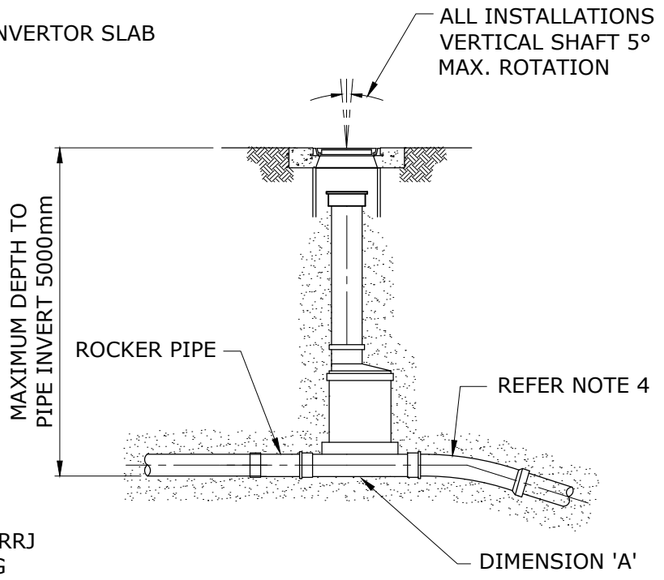
TYPE 'J'1 MAINTENANCE SHAFT



TYPE 'H'3 AND 'H'4 MAINTENANCE SHAFT



TYPE 'K'1 MAINTENANCE SHAFT
TYPE 'L'1 SIMILAR



TYPE 'H'1 AND 'H'2 MAINTENANCE SHAFT

NOTES :

1. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH STANDARD DRAWINGS SEQ-SEW-1308-1 AND SEQ-SEW-1314-1.
2. DIMENSION 'A' SHOWN ON SEQ-SEW-1314-1.
3. DIMENSION 'H' SHOWN ON SEQ-SEW-1308-1.
4. ALL MAINTENANCE SHAFTS SHALL HAVE 600 LONG ROCKER PIPES PROVIDED UPSTREAM AND DOWNSTREAM. LONG RADIUS BEND USE NEGATES THIS REQUIREMENT.

REV. No.	DATE	DESCRIPTION	AUTH.

SEQ WATER
SERVICE PROVIDERS

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

SEWERAGE STANDARD DRAWING

MAINTENANCE SHAFTS
MS AND VARIABLE BEND FOR RIGSS
TYPICAL ARRANGEMENT DETAILS

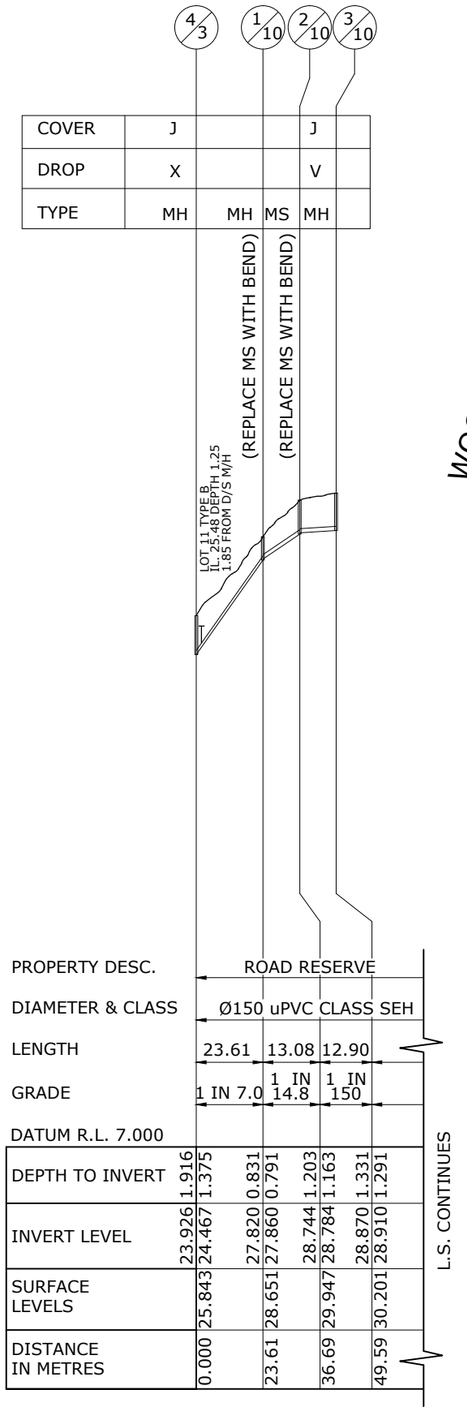
GCCC	LCC	RCC	QUU	UW

DRAWING No. SEQ-SEW-1314-2

VERSION A

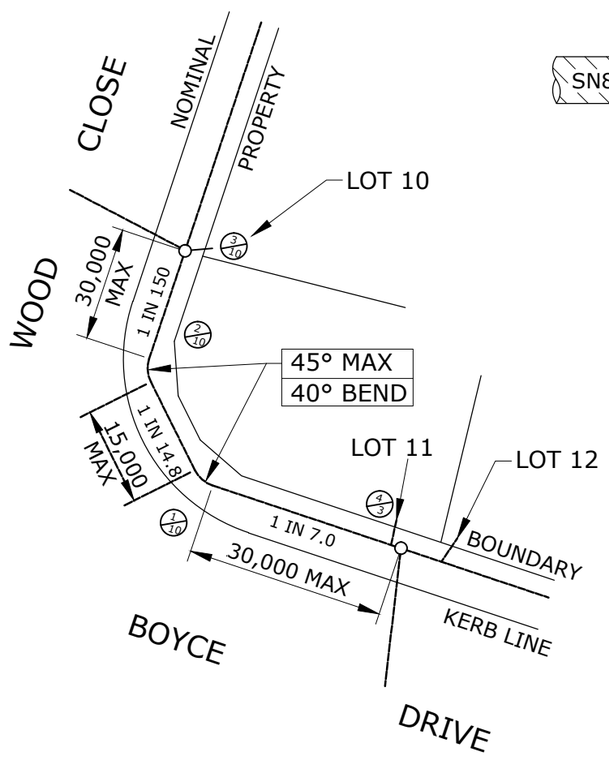
NOT TO SCALE

ORG DATE: 1/1/2013

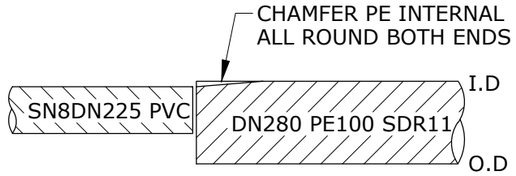


LONGITUDINAL SECTION

(ORIGINAL DESIGN SHOWING ACCESS STRUCTURES TO BE REPLACED BE LONG RADIUS BENDS)

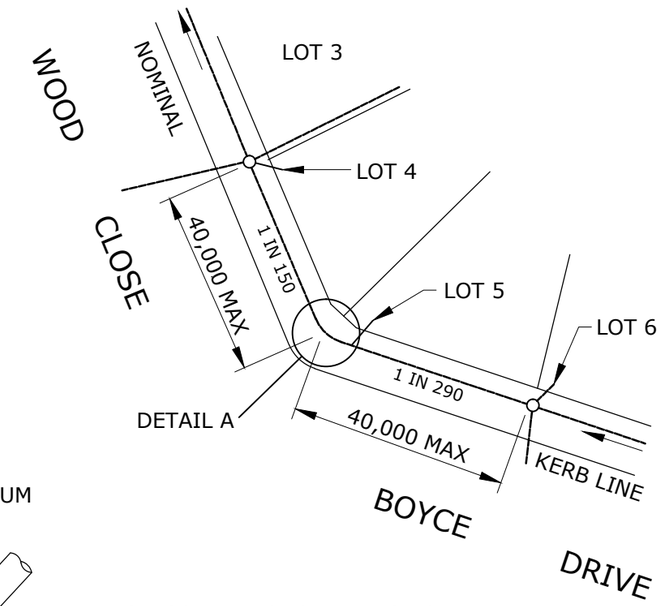


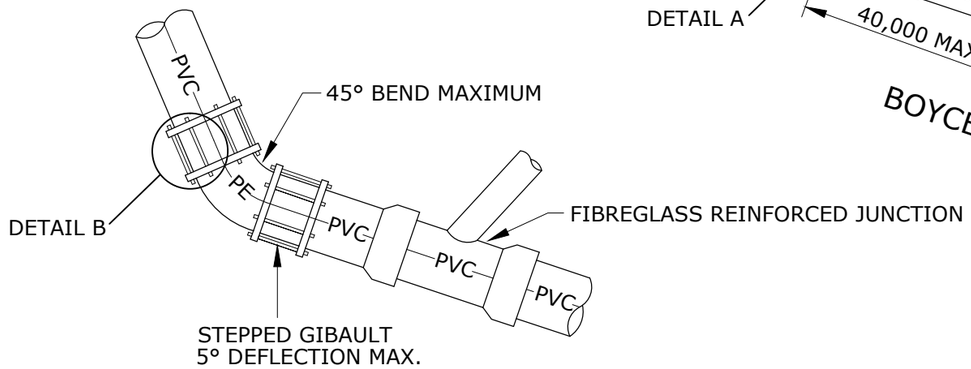
PLAN



DETAIL B

(PVC - PE)





DETAIL A

Ø 150 BENDS

(UNITYWATER USE BY APPROVAL)

NOTES:

1. IN-LINE, 3000 LONG RADIUS PVC SN8 FORMED BENDS ONLY. MOULDED PVC FITTINGS ARE NOT PERMITTED.
2. ONLY TWO (2) IN-LINE BENDS ARE PERMITTED TO BE USED TO EFFECT THE CHANGE OF DIRECTION AND GRADE AROUND A ROAD INTERSECTION/ CORNER WITH A MAXIMUM OF 75 METRES BETWEEN ACCESS STRUCTURES, SIMILAR CONCEPTS APPLY WITHIN ALLOTMENT.
3. THE GRADE OF THE SEWER LINE THROUGH THE TWO (2) BENDS SHALL MAINTAIN OR INCREASE IN GRADE TOWARDS THE DOWN STREAM END.

Ø 225 BENDS

(UNITYWATER USE BY APPROVAL)

NOTES:

1. PE100 SDR11 DN280 SWEEP BEND IN 30° AND 45° PERMITTED . USE AVK SUPA STEPPED COUPLING #602-268292-4-100 OR EQUAL.
2. FABRICATED PVC BENDS WITH 15° SEGMENTS TO 45° BEND ANGLE PERMITTED AND FIBREGLASS WRAPPED TO DETAILS IN SEQ-SEW-1104-1 NOTE4. USE PVC SOC-SOC COUPLINGS, NO DEFLECTION AVAILABLE AT RRJ.
3. MOULDED PVC FITTINGS ARE NOT PERMITTED AND ALL FABRICATION TO BE CERTIFIED TO AS/NZS 1260.
4. ONLY ONE DN225 BEND BETWEEN ACCESS STRUCTURES.
5. THE GRADE OF THE SEWER LINE THROUGH THE ONE (1) BEND SHALL MAINTAIN OR INCREASE IN GRADE TOWARDS THE DOWN STREAM END.

REV. No.	DATE	DESCRIPTION	AUTH.

SEQ WATER
SERVICE PROVIDERS

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

SEWERAGE STANDARD DRAWING

GRAVITY SEWERS RIGGS
TYPICAL IN-LINE BEND DETAILS

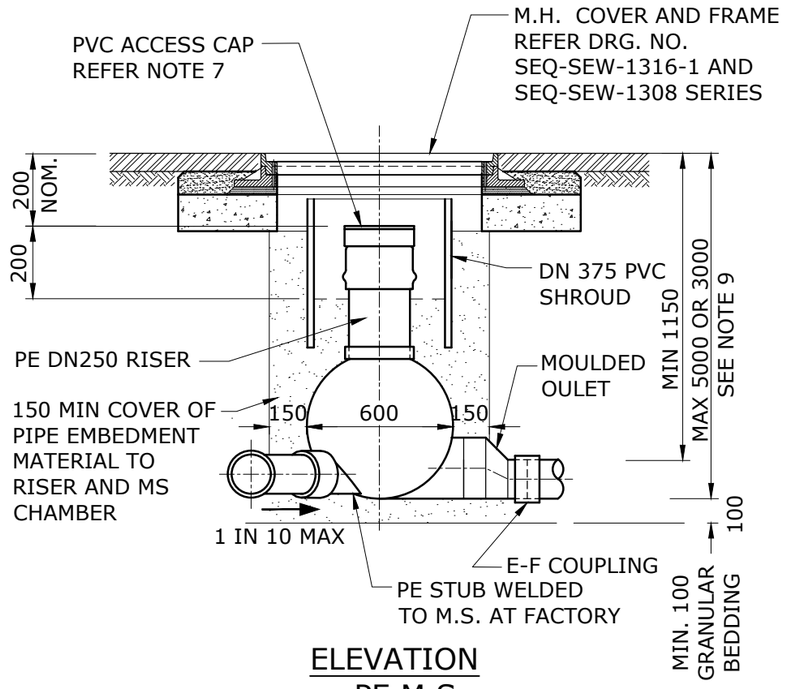
GCCC	LCC	RCC	QUU	UW

DRAWING No. SEQ-SEW-1314-3

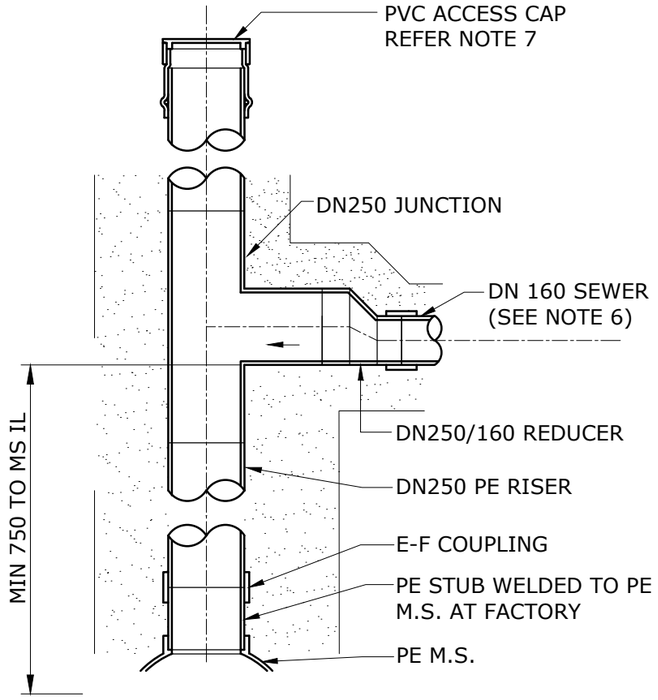
VERSION A

NOT TO SCALE

ORG DATE: 1/1/2013



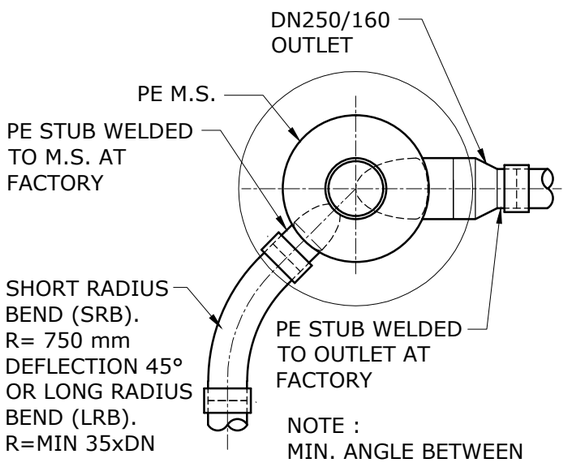
ELEVATION
PE M.S.



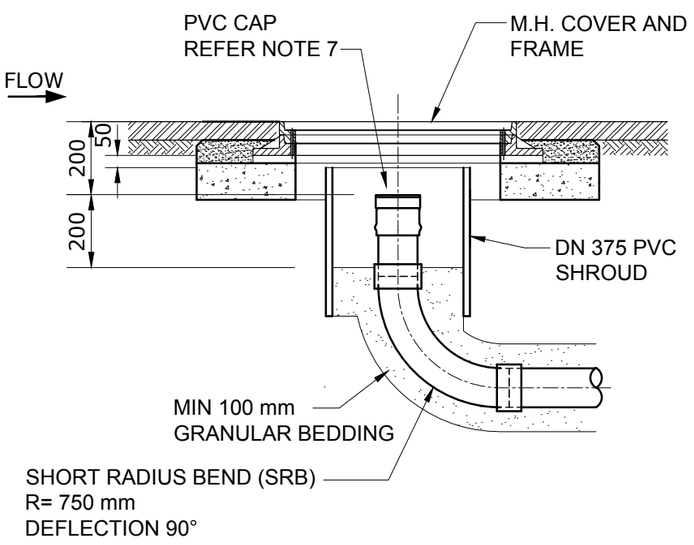
ELEVATION
PE SHAFT RISER DETAILS

NOTES:

1. THE DRAWING INDICATES A PARTICULAR MANUFACTURERS MS PRODUCT. ALTERNATIVE PE MS's MAY BE SUBMITTED FOR APPROVAL.
2. MS's SHALL BE MANUFACTURED FROM PE WITH A MATERIAL GRADES SUITABLE TO BE WELDED TO PE SEWER PIPE.
3. NUSEWERS PE PIPE SHALL BE MANUFACTURED FROM PE100 MATERIAL WITH A MIN. SDR OF 21 AND A WHITE INTERNAL SURFACE.
4. ALL PE/PE CONNECTIONS SHALL BE WELDED. PE PIPES SHALL BE JOINED BY BUTT WELDING OR E-F COUPLINGS USING PLASSON "LIGHTFIT" COUPLINGS OR SIMILAR APPROVED.
5. THE INVERT OF INLET CONNECTION TO THE MS SHALL BE 20mm ABOVE THE BASE OF THE MS. WHERE THE OUTLET SEWER IS LARGER THAN THE INLET CONNECTION, THE OBVERT LEVELS SHALL BE COMMON.
6. MS MAY HAVE A MAXIMUM OF 3 INLET CONNECTIONS (INCLUDING SEWERS AND PROPERTY CONNECTIONS) CONNECT INTO THE BASE. ONLY ONE DN160 INLET CONNECTION OR MAX 2 DN110 INLET CONNECTIONS TO THE RISER AT DIFFERENT LEVELS ARE PERMITTED, IN THIS CASE, MAX 2 INLET CONNECTIONS MAY CONNECT INTO THE BASE.
7. THE RISER CAP SHALL COMPRISE A PVC BAYONET CAP WITH A RRJ SEAL AND A PVC PIPE RRJ SOCKET.
8. THE CONCRETE BASE SLAB TO MH FRAME SHALL BE PLACED ON 250 mm COMPACTED ROAD BASE MATERIAL.
9. MAXIMUM DEPTH TO INVERT FOR A MS SHALL BE 5.0 m.
10. MH COVERS, FRAMES & SUPPORTS SHALL COMPLY WITH DRG. No. SEQ-SEW-1316-1.

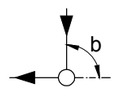
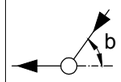
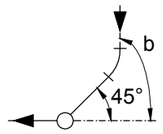
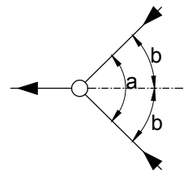
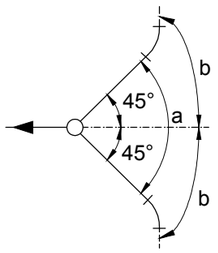


PLAN
PE M.S.
SEWER ENTRY 45°



ELEVATION
TERMINAL ENTRY POINT

TYPICAL INLET CONFIGURATIONS

INLET CONNECTION TO RISER	ALLOWABLE DEFLECTION 120° MAX				
INLET CONNECTION TO BASE	SINGLE INLET			MULTIPLE INLET	
	FLOW ≤ 12L/s	FLOW > 12L/s		ALLOWABLE ANGLE BETWEEN ANY TWO ADJACENT INLET: DN160/160 a≥45°; DN250/DN250 OR DN250/DN160 a≥65°	
	0 ≤ b ≤ 90°	0 ≤ b ≤ 60°	60 < b ≤ 90°	0 ≤ b ≤ 60°	60 < b ≤ 90°
					

REV. No.	DATE	DESCRIPTION	AUTH.

SEQ WATER
SERVICE PROVIDERS

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

SEWERAGE STANDARD DRAWING

PE NUSEWERS
TYPICAL MAINTENANCE SHAFT AND
TERMINAL ENTRY POINT

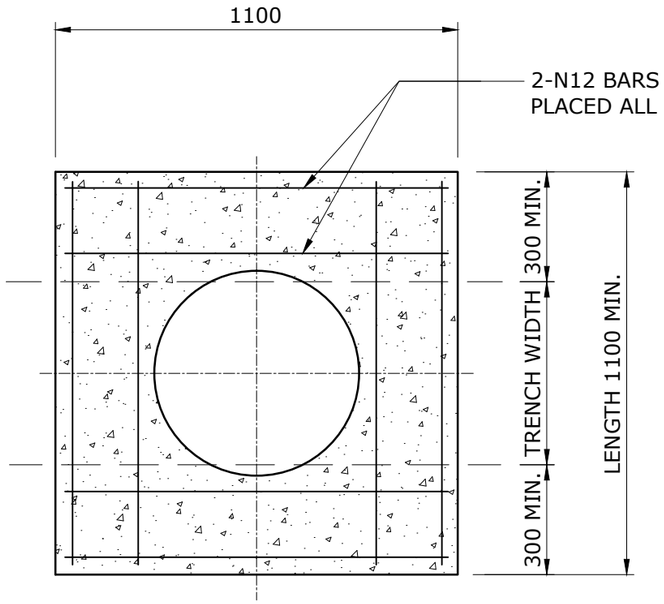
GCCC	LCC	RCC	QUU	UW

DRAWING No.
SEQ-SEW-1315-1

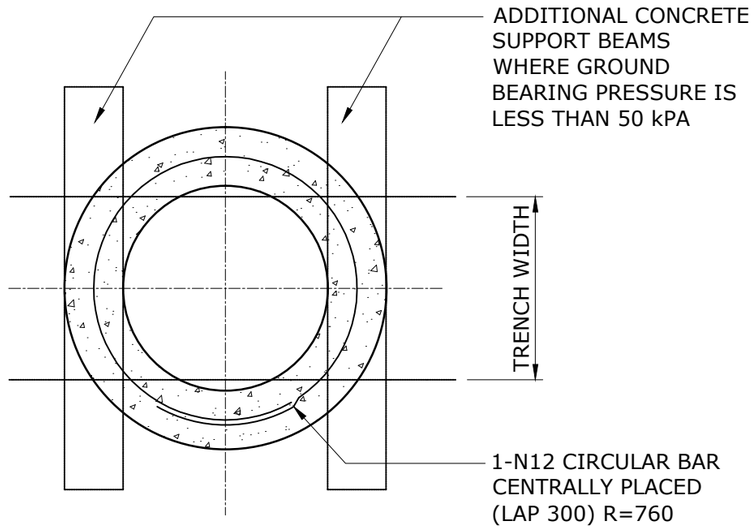
VERSION
A

NOT TO SCALE

ORG DATE:
1/1/2013



PLAN CONC. BASE

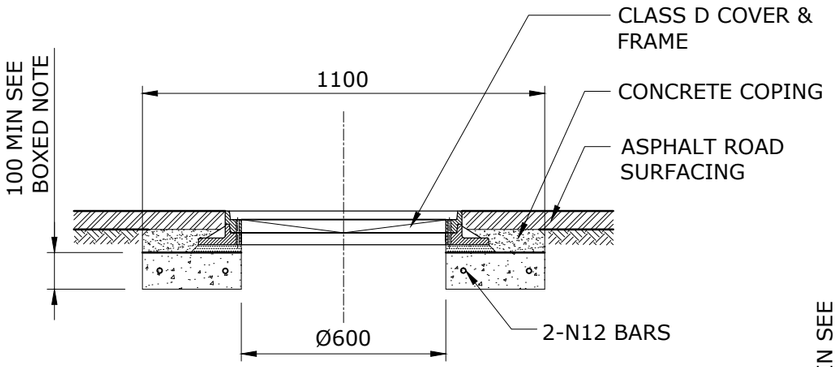


PLAN CONC. BASE

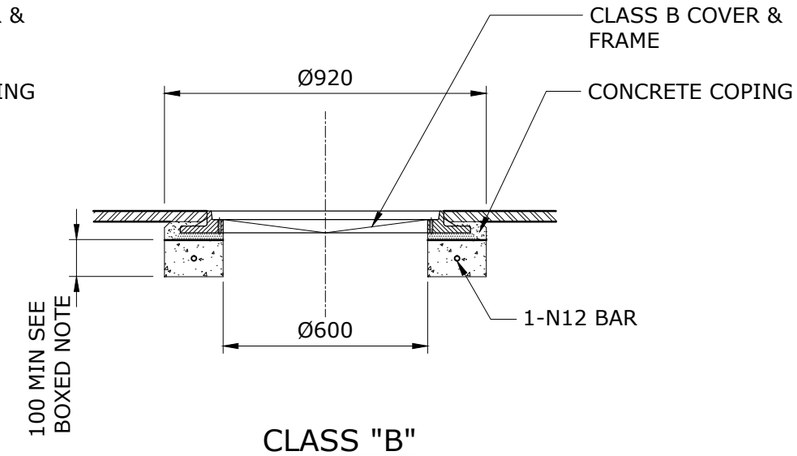
NOTES:

1. CONCRETE SHALL BE GRADE N40 TO WSA PS-357.
2. STEEL REINFORCEMENT SHALL BE DEFORMED GRADE 500.
3. DETAILS OF MAINTENANCE STRUCTURE COVERS AND FRAMES REFER TO DRG.No. SEQ-SEW-1308 SET.

DESIGN INPUT BY RPEQ REQUIRED FOR TRAFFIC LOADS, STRUCTURAL STEEL DESIGN AND NATIVE SOIL CONDITIONS.



CLASS "D"
TRAFFICABLE COVER DETAIL



CLASS "B"
NON-TRAFFICABLE COVER DETAIL

REV. No.	DATE	DESCRIPTION	AUTH.

SEQ WATER
SERVICE PROVIDERS

WORK PRACTICES MUST COMPLY WITH ALL APPLICABLE OCCUPATIONAL HEALTH & SAFETY LEGISLATION

SEWERAGE STANDARD DRAWING

PE NUSEWERS
TYPICAL MAINTENANCE STRUCTURE
COVER FRAME AND SUPPORT DETAILS

GCCC	LCC	RCC	QUU	UW

DRAWING No. SEQ-SEW-1316-1

VERSION A

NOT TO SCALE

ORG DATE: 1/1/2013