

Storm & Sanitary Sewers

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REV.	REVISION DATE	APPROVED

DRAWING INDEX STORM & SANITARY SEWERS

ISSUE DATE: SEPTEMBER 2018

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Storm & Sanitary Sewers

Sheet Number	Sheet Title	Description
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DRAWING INDEX STORM & SANITARY SEWERS

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NOTES:

1. PRECAST MAINTENANCE HOLE SECTIONS TO CONFORM TO ASTM SPECIFICATION C478. PRECAST SECTIONS TO BE FREE OF MANUFACTURING DEFECTS AND UNDAMAGED, SET PLUMB AND TRUE TO LINE AND GRADE. JOINTS TONGUE AND HALF GROOVE AS SHOWN WITH RUBBER GASKET 'O'-RING TO CONFORM TO ASTM SPECIFICATION C443.
2. SITE CAST CONCRETE SHALL BE IN ACCORDANCE WITH THE CONTRACT SPECIFICATION FOR STRUCTURAL CONCRETE AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa AT 28 DAYS.
3. WHEN CONSTRUCTING TWIN MAINTENANCE HOLES, SEWERS MAY BE SPLAYED OUT OF ALIGNMENT TO GIVE MAINTENANCE HOLE CONSTRUCTION CLEARANCE.
4. WHEN CONSTRUCTING MAINTENANCE HOLE ON TWINNED SERVICES, SEWER & MAINTENANCE HOLE ALIGNMENTS TO BE ADJUSTED TO GIVE CLEARANCE BETWEEN MH AND ADJACENT PIPE. CHANNEL OFFSETS PREFERRED TO AVOID DEFLECTION OF PIPE. MINIMUM 150mm REQUIRED BETWEEN OUTSIDE MH WALL AND OUTSIDE PIPE WALL.
5. *MAXIMUM DEPTH TO FIRST RUNG IS 500mm. WHEN HAND HOLD IS INSTALLED BETWEEN TOP AND FIRST RUNG AS PER MMCD, MAXIMUM DEPTH MAY BE INCREASED TO 660mm.
6. NO RUNGS ARE PERMITTED IN OR ABOVE THE PRECAST LID.
7. MAINTENANCE HOLE LID & FRAME MUST BE PURCHASED FROM THE CITY OF VANCOUVER.
8. MINIMUM BENCH WIDTH IS 0.30m MEASURED AT WIDEST PART OF BENCH.
9. REINFORCING STEEL SHALL CONFORM TO G30.18, GRADE 400W.
10. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

PIPE DIAMETER	MINIMUM MAINTENANCE HOLE DIAMETER	COVER
150 - 450	1050	No. 2 OR BOLT DOWN
525 - 675	1200	No. 2 OR BOLT DOWN
750 - 1050	1350	No. 2 OR BOLT DOWN
1200	1500 OR TEE	No. 2 OR BOLT DOWN
1350 - 1500	1800 OR TEE	No. 2 OR BOLT DOWN
1650 - 2100	2400 OR TEE	No. 2 OR BOLT DOWN

20mm GALVANIZED, ALUMINUM, OR POLY-ENCASED LADDER RUNGS AT 300mm O.C. CAST INTO WALL AS PER MMCD S1

SLOPE BENCHING 300mm HORIZONTAL TO 25mm VERTICAL UP FROM LEVEL OF MAIN PIPE CROWN

BENCHING BROUGHT UP TO CROWN OF HIGHEST PIPE AND FINISHED TO TROWEL SMOOTHNESS

15M @ 150

75 COVER (TYP.)

20M @ 200

ELEVATION

CHANNEL IN BENCHING TO BE SMOOTH SWEEP BEND FOR UNOBSTRUCTED FLOW

PIPE TO BE HAUNCHED IN CONCRETE TO BELL OR SPIGOT

REFER TO CITY OF VANCOUVER DETAIL DRAWINGS FOR COVER No.2 (DWG S5.2), FRAME No.13. (DWG S5.7), FRAME No.18 (DWG S5.10/S5.11) & BOLT-DOWN COVER (DWG S5.12)

BRICK OR GRADE RINGS TO SET FRAME ELEVATION

MORTAR JOINT (TYP.)

PLAN

PRECAST REINFORCED MAINTENANCE HOLE RISERS CONFORMING TO ASTM C478. JOINTS TO BE 'O' RING WITH RUBBER GASKETS CONFORMING TO ASTM C443.

150 MIN.

CAST IN SITU BASE 200mm MIN. BELOW PIPE OUTSIDE DIAMETER (250mm MIN. FOR 1500-3050 MHs)

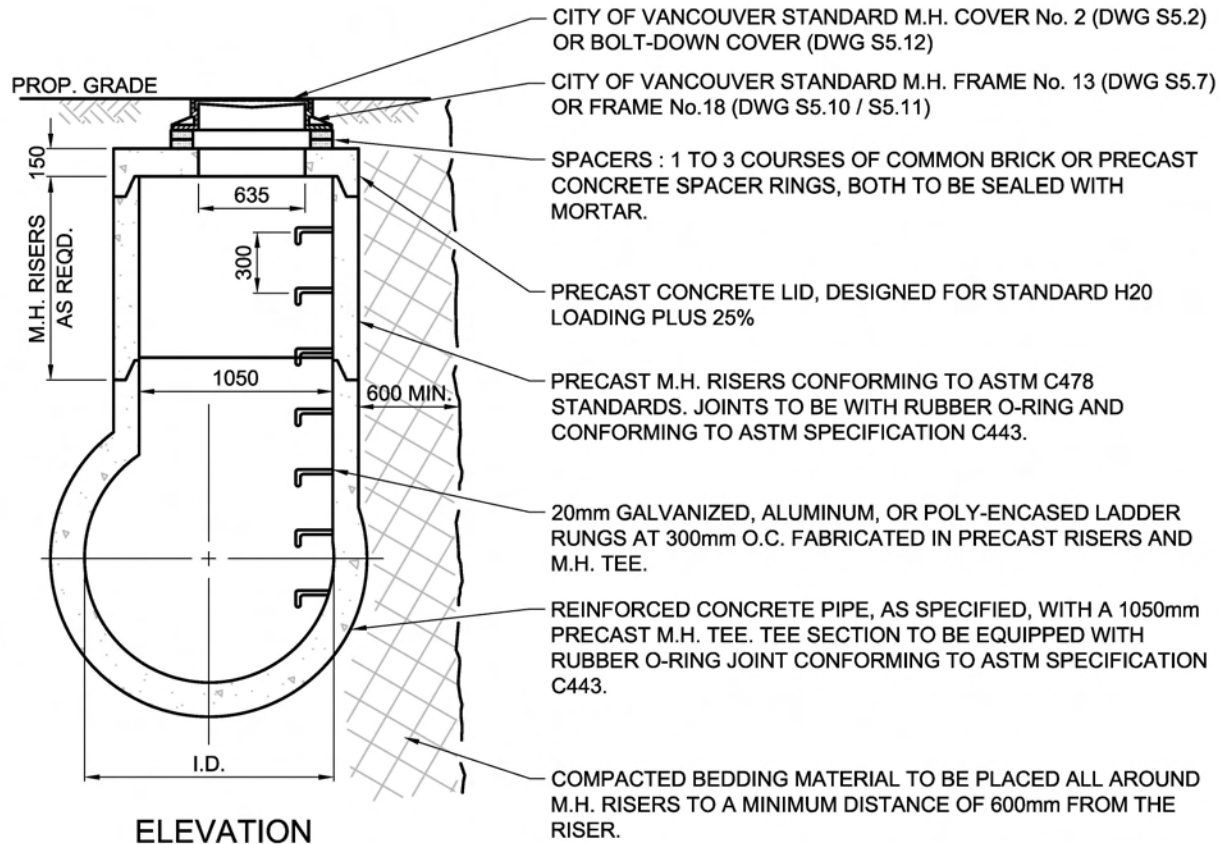
SCALE: N.T.S.

MAINTENANCE HOLES
STANDARD MAINTENANCE HOLE

ISSUE DATE: SEPTEMBER 2018

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NOTES:

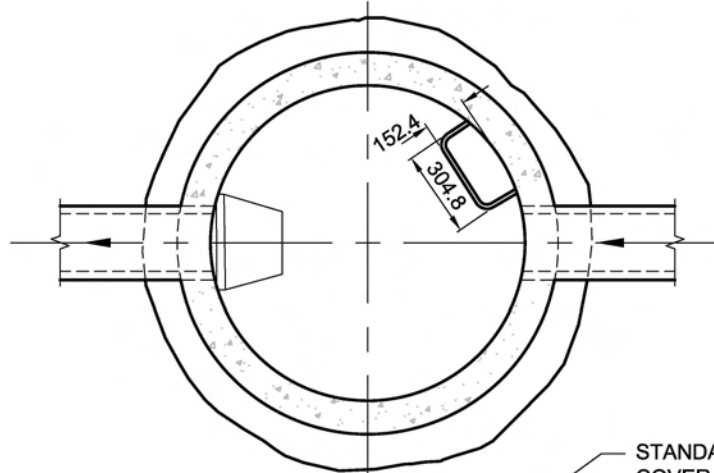
1. PRECAST MAINTENANCE HOLE SECTIONS TO CONFORM TO ASTM SPECIFICATION C478. PRECAST SECTIONS TO BE FREE OF MANUFACTURING DEFECTS AND UNDAMAGED, SET PLUMB AND TRUE TO LINE AND GRADE. JOINTS TONGUE AND HALF GROOVE AS SHOWN WITH RUBBER GASKET 'O'-RING TO CONFORM TO ASTM SPECIFICATION C443.
2. SITE CAST CONCRETE SHALL BE IN ACCORDANCE WITH THE CONTRACT SPECIFICATION FOR STRUCTURAL CONCRETE AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa AT 28 DAYS.
3. WHEN CONSTRUCTING TWIN MAINTENANCE HOLES ONLY THE STORM SEWERS MAY BE SPLAYED OUT OF ALIGNMENT TO GIVE MAINTENANCE HOLE CONSTRUCTION CLEARANCE.
4. WHEN CONSTRUCTING MAINTENANCE HOLE ON TWINNED SERVICES, ALIGNMENTS TO BE ADJUSTED TO GIVE CLEARANCE BETWEEN MH AND ADJACENT PIPE. CHANNEL OFFSETS PREFERRED TO AVOID DEFLECTION OF PIPE. MINIMUM 150mm REQUIRED BETWEEN OUTSIDE MH WALL AND OUTSIDE PIPE WALL.
5. MAXIMUM DEPTH TO FIRST RUNG IS 500mm. WHEN HAND HOLD IS INSTALLED BETWEEN TOP AND FIRST RUNG AS PER MMCD, MAXIMUM DEPTH MAY BE INCREASED TO 660mm.
6. NO RUNGS ARE PERMITTED IN OR ABOVE THE PRECAST LID.
7. MAINTENANCE HOLE LID & FRAME MUST BE PURCHASED FROM THE CITY OF VANCOUVER.
8. MINIMUM BENCH WIDTH IS 0.30m MEASURED AT WIDEST PART OF BENCH.
9. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

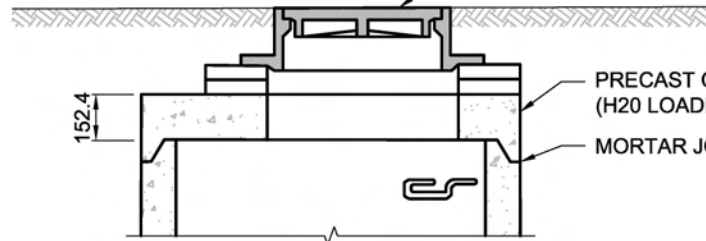
MAINTENANCE HOLES
PRECAST TEE MAINTENANCE HOLE

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: K. DER



PLAN

STANDARD CAST IRON
COVER NO. 1 (DWG S5.1)
AND FRAME NO. 12 (DWG S5.6)

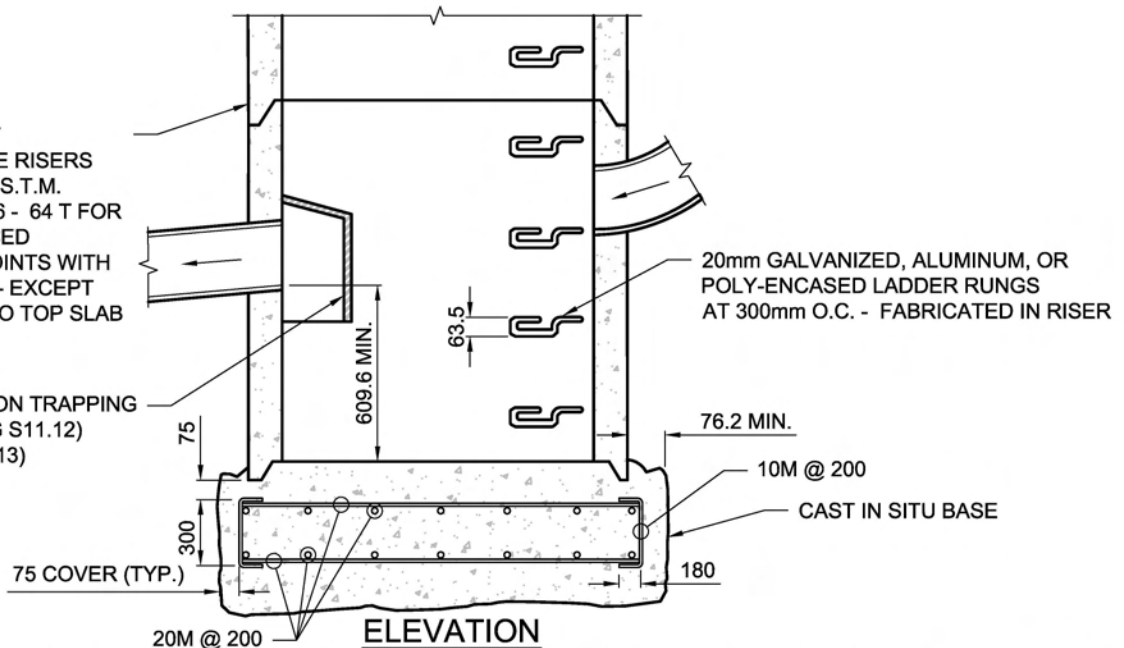


PRECAST CONCRETE LID
(H20 LOADING PLUS 25%)

MORTAR JOINT

1050mm Ø PRECAST
MAINTENANCE HOLE RISERS
CONFORMING TO A.S.T.M.
SPECIFICATION C 76 - 64 T FOR
CLASS II REINFORCED
CONCRETE PIPE. JOINTS WITH
RUBBER GASKETS - EXCEPT
MORTARED JOINT TO TOP SLAB

STANDARD CAST IRON TRAPPING
HOODS NO. 1A (DWG S11.12)
AND 9/9A (DWG S11.13)



20mm GALVANIZED, ALUMINUM, OR
POLY-ENCASED LADDER RUNGS
AT 300mm O.C. - FABRICATED IN RISER

76.2 MIN.

10M @ 200

CAST IN SITU BASE

ELEVATION

NOTES:

1. SITE CAST CONCRETE SHALL BE IN ACCORDANCE WITH THE CONTRACT SPECIFICATION FOR STRUCTURAL CONCRETE AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 28 MPa AT 28 DAYS.
2. MAXIMUM DEPTH TO FIRST RUNG IS 500mm. WHEN HAND HOLD IS INSTALLED BETWEEN TOP AND FIRST RUNG AS PER MMCD, MAXIMUM DEPTH MAY BE INCREASED TO 660mm.
3. NO RUNGS ARE PERMITTED IN OR ABOVE THE PRECAST LID.
4. MAINTENANCE HOLE LID & FRAME MUST BE PURCHASED FROM THE CITY OF VANCOUVER.
5. REINFORCING STEEL SHALL CONFORM TO G30.18, GRADE 400W.
6. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

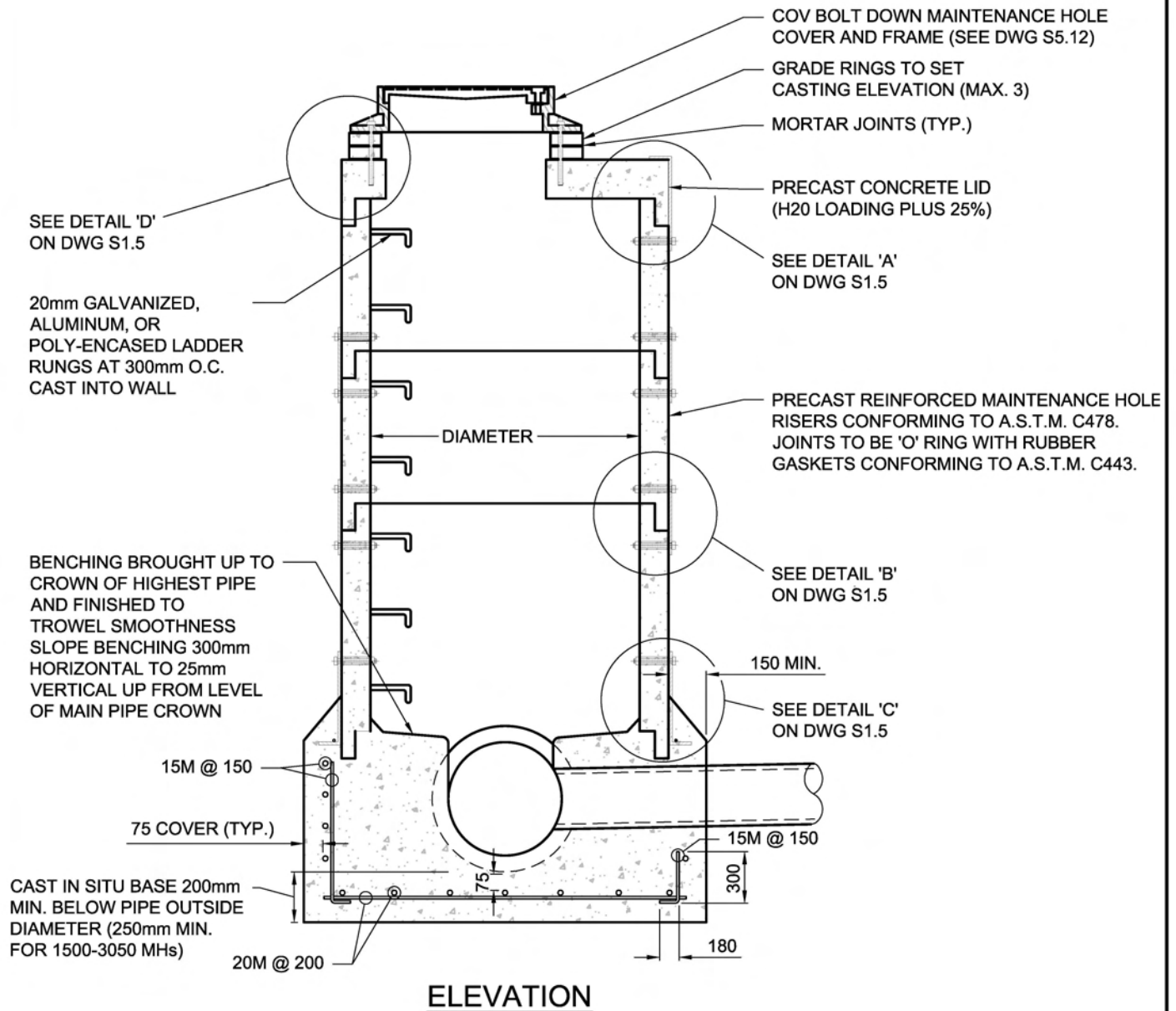
SCALE: N.T.S.

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**MAINTENANCE HOLES
PRECAST SILT TRAP**

ISSUE DATE: SEPTEMBER 2018

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NOTES:

1. NOTES ON S1.1 APPLY.
2. MAXIMUM SURCHARGE 3.0m.
3. DESIGN IS NOT MEANT FOR SUSTAINED WORKING PRESSURES.
4. TWO ANCHORS REQUIRED FOR EACH JOINT, 180 DEGREES APART. ANCHORS TO BE STAGGERED JOINT TO JOINT.
5. ALL STEEL PLATES, NUT, BOLTS, AND WASHERS, TO BE HOT DIP GALVANIZED UNLESS SPECIFIED DIFFERENTLY.
6. MINIMUM BENCH WIDTH IS 0.30m MEASURED AT WIDEST PART OF BENCH.
7. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

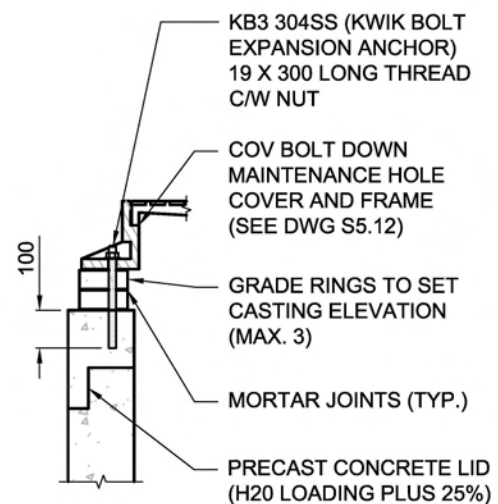
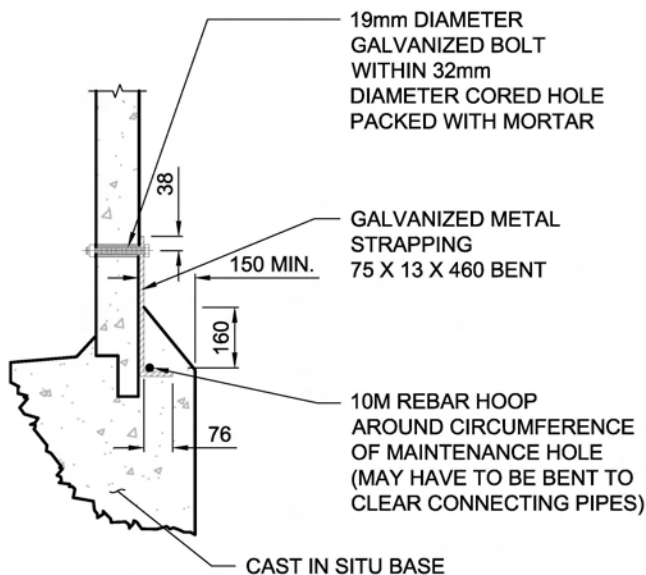
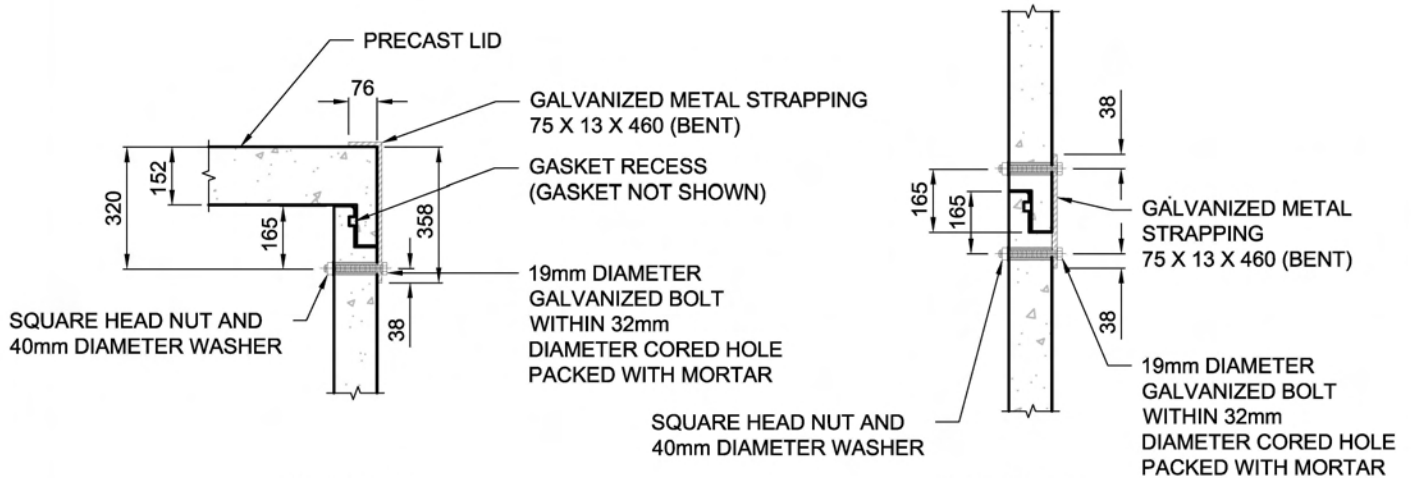
SCALE: N.T.S.

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MAINTENANCE HOLES
PRESSURE MAINTENANCE HOLE

ISSUE DATE: SEPTEMBER 2018

APPROVED BY: K. DER



NOTES:

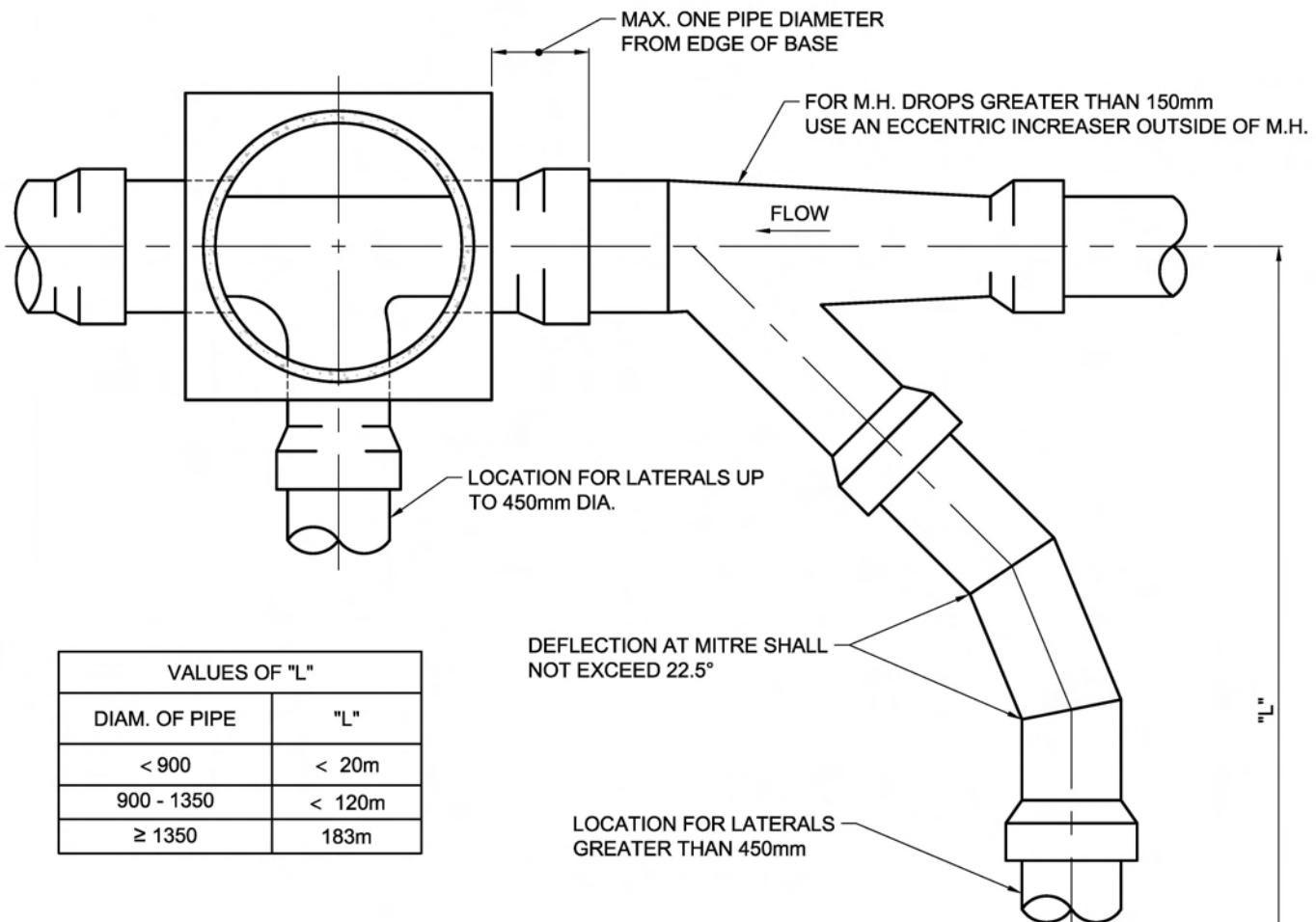
1. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

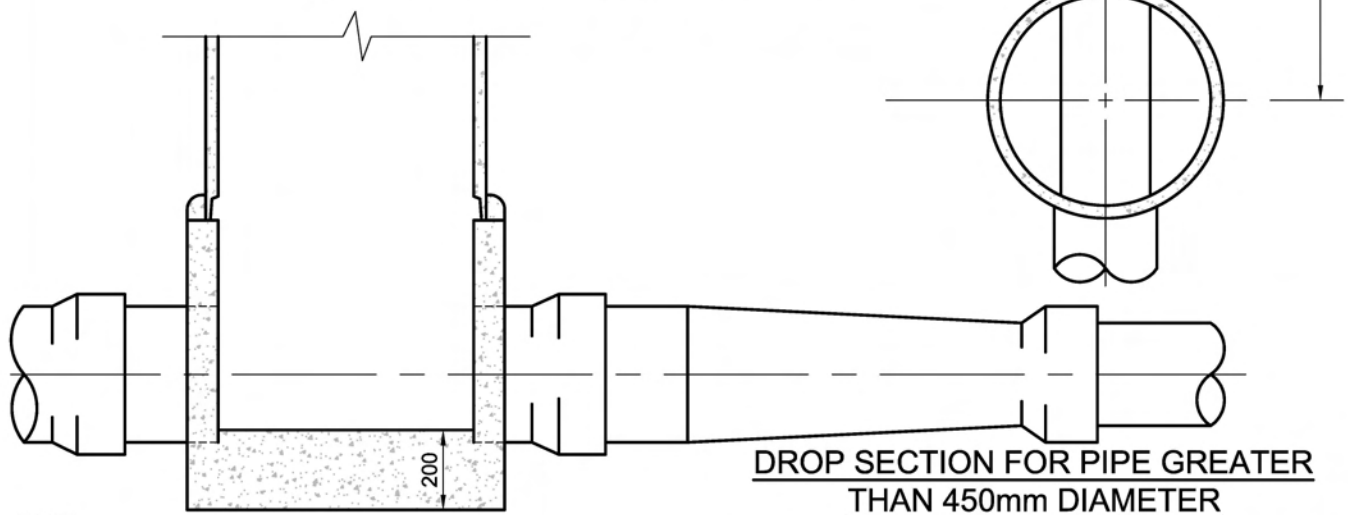
MAINTENANCE HOLES
PRESSURE MAINTENANCE HOLE

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VALUES OF "L"	
DIAM. OF PIPE	"L"
< 900	< 20m
900 - 1350	< 120m
≥ 1350	183m

**MAINTENANCE HOLE BASE SECTION FOR SEWERS
GREATER THAN 450mm DIAMETER**



NOTE:

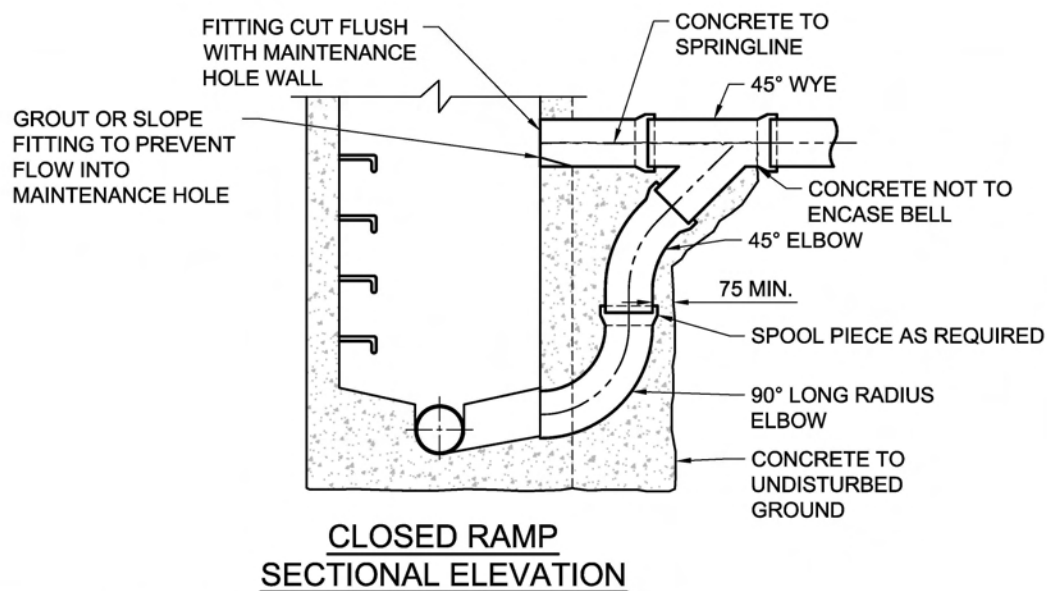
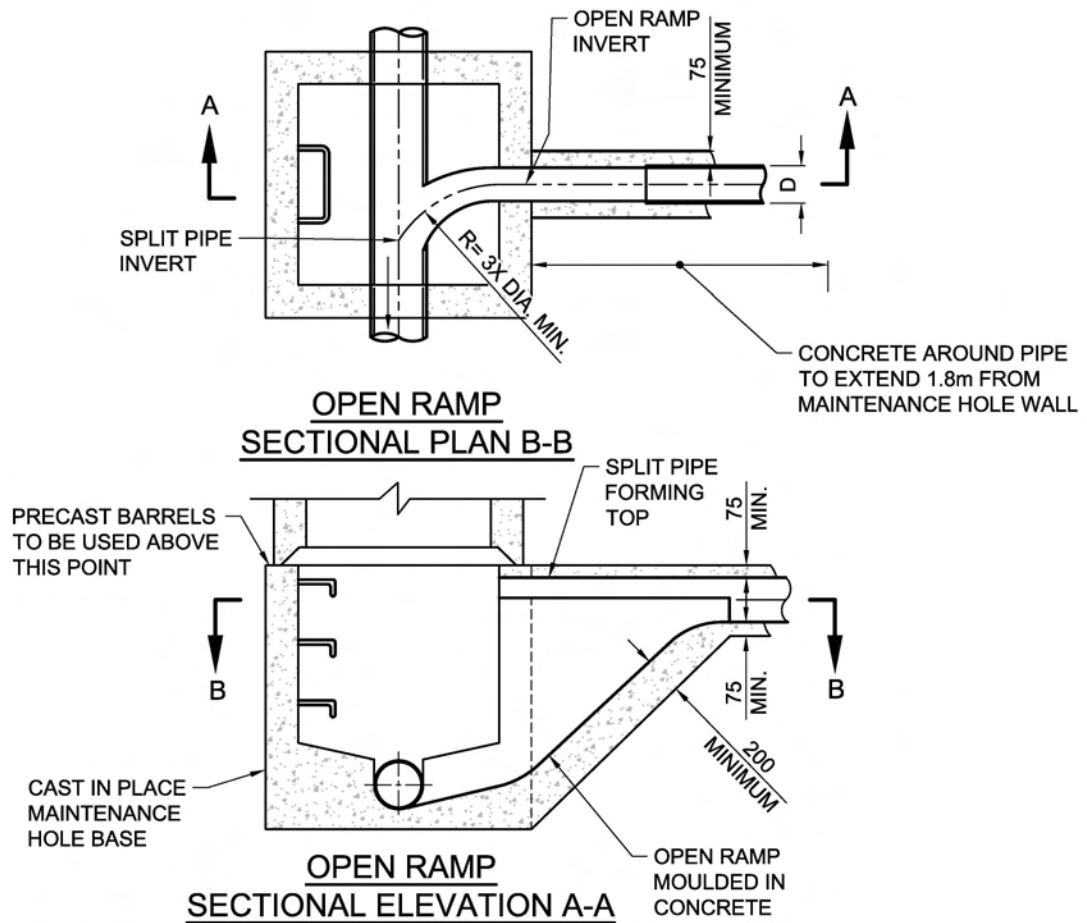
1. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

SCALE: N.T.S.

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**MAINTENANCE HOLES
STANDARD MAINTENANCE HOLE CONNECTION DETAILS**

ISSUE DATE: SEPTEMBER 2018
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NOTES:

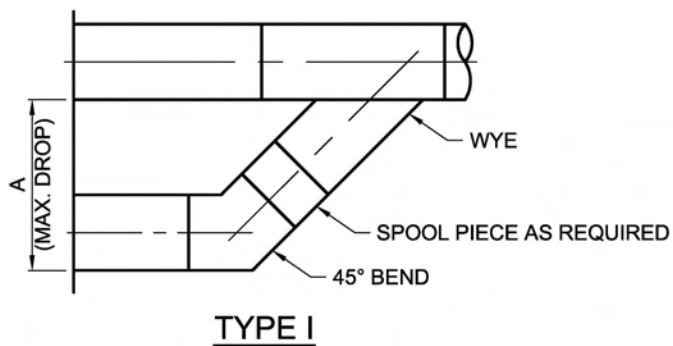
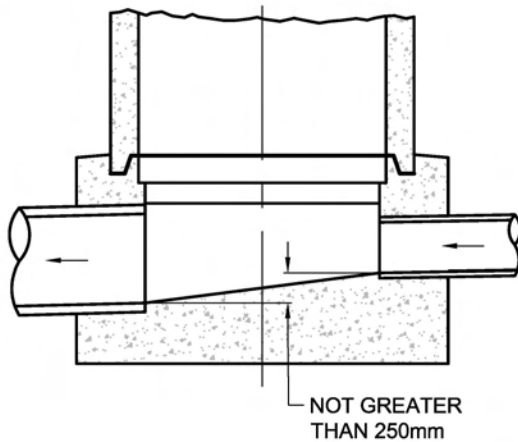
1. REFER TO DESIGN CRITERIA MANUAL FOR LIMITATIONS OF EACH STRUCTURE TYPE.
2. AT THE END OF THE RAMPS THE DROP IN MH SHALL BE WITHIN 30-250mm.
3. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

SCALE: N.T.S.

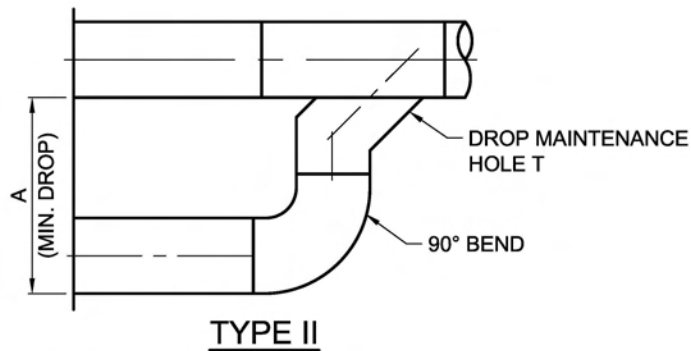
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**MAINTENANCE HOLES
OPEN AND CLOSED RAMP STRUCTURES**

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TYPE I				
	150mm	200mm	250mm	300mm
A	470mm	530mm	560mm	650mm



TYPE II				
	150mm	200mm	250mm	300mm
A	640mm	650mm	700mm	760mm

NOTES:

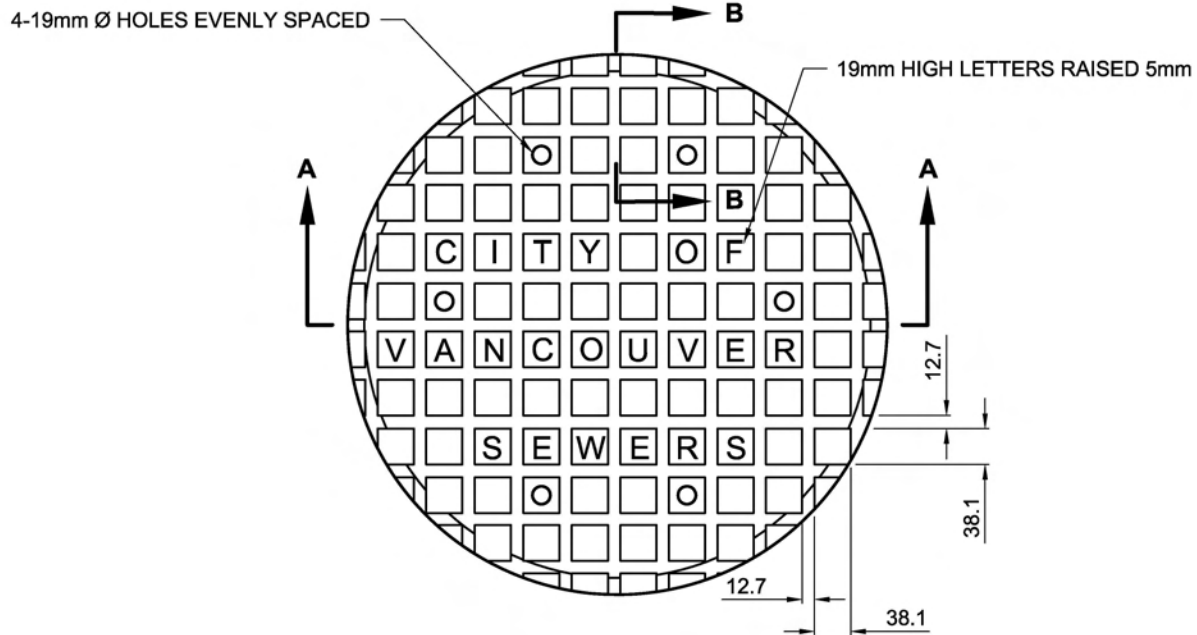
1. MAXIMUM DROP THROUGH MAINTENANCE HOLE NOT GREATER THAN 250mm

SCALE: N.T.S.

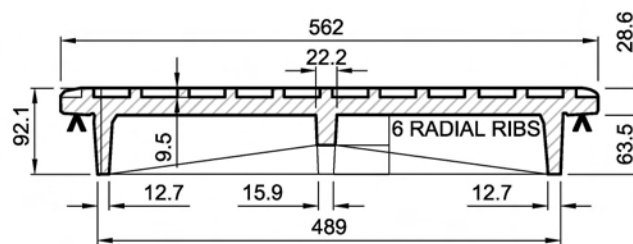
REV.	REVISION DATE	APPROVED

MAINTENANCE HOLES
CLOSED RAMPS TO 375mm

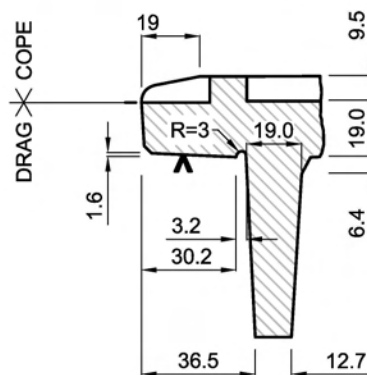
ISSUE DATE: SEPTEMBER 2018
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PLAN



SECTION A - A



SECTION B-B

NOTES:

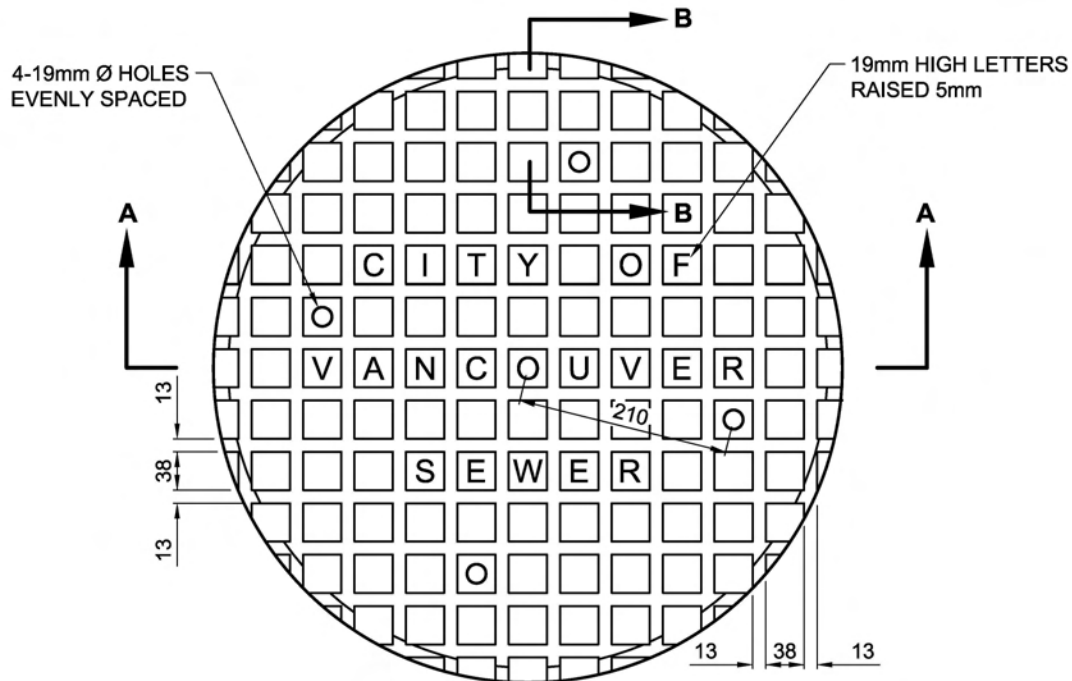
1. FOR MAINTENANCE HOLE FRAME NO. 12 (DWG S5.6).
2. (▲) INDICATES 1.6mm HAS BEEN ALLOWED ON THE PATTERN FOR MACHINING.
3. LID PATTERN TO BE PER LATEST LID DESIGNS.
4. CONFIRM TOLERANCES PRIOR TO CASTING AS PER SPECIFICATIONS.
5. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

SCALE: N.T.S.

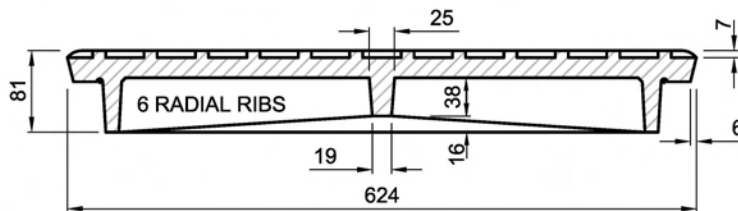
REV.	REVISION DATE	APPROVED

MAINTENANCE HOLES
COVER NO. 1 FOR FRAME NO. 12

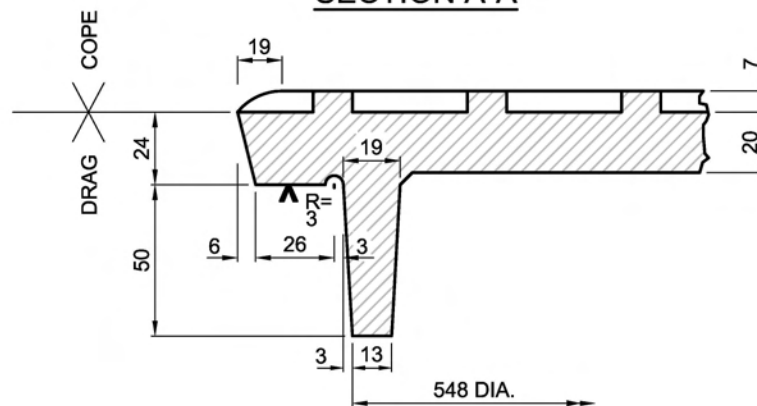
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PLAN



SECTION A-A



SECTION B-B

NOTES:

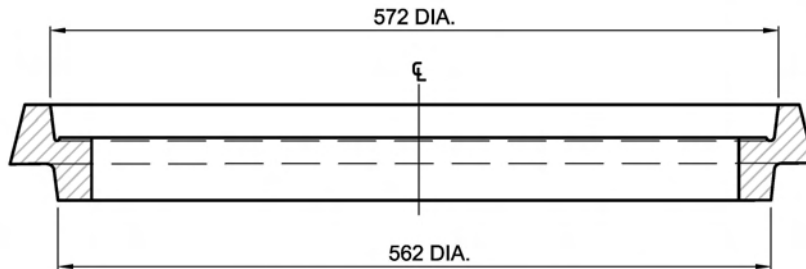
1. FOR MAINTENANCE HOLE FRAME NO.13 (DWG S5.7).
2. (▲) INDICATES 1.6mm HAS BEEN ALLOWED ON THE PATTERN FOR MACHINING.
3. LID PATTERN TO BE PER LATEST LID DESIGNS.
4. CONFIRM TOLERANCES PRIOR TO CASTING AS PER SPECIFICATIONS.
5. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

SCALE: N.T.S.

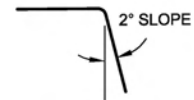
REV.	REVISION DATE	APPROVED

MAINTENANCE HOLES
COVER NO. 2 FOR FRAME NO. 13

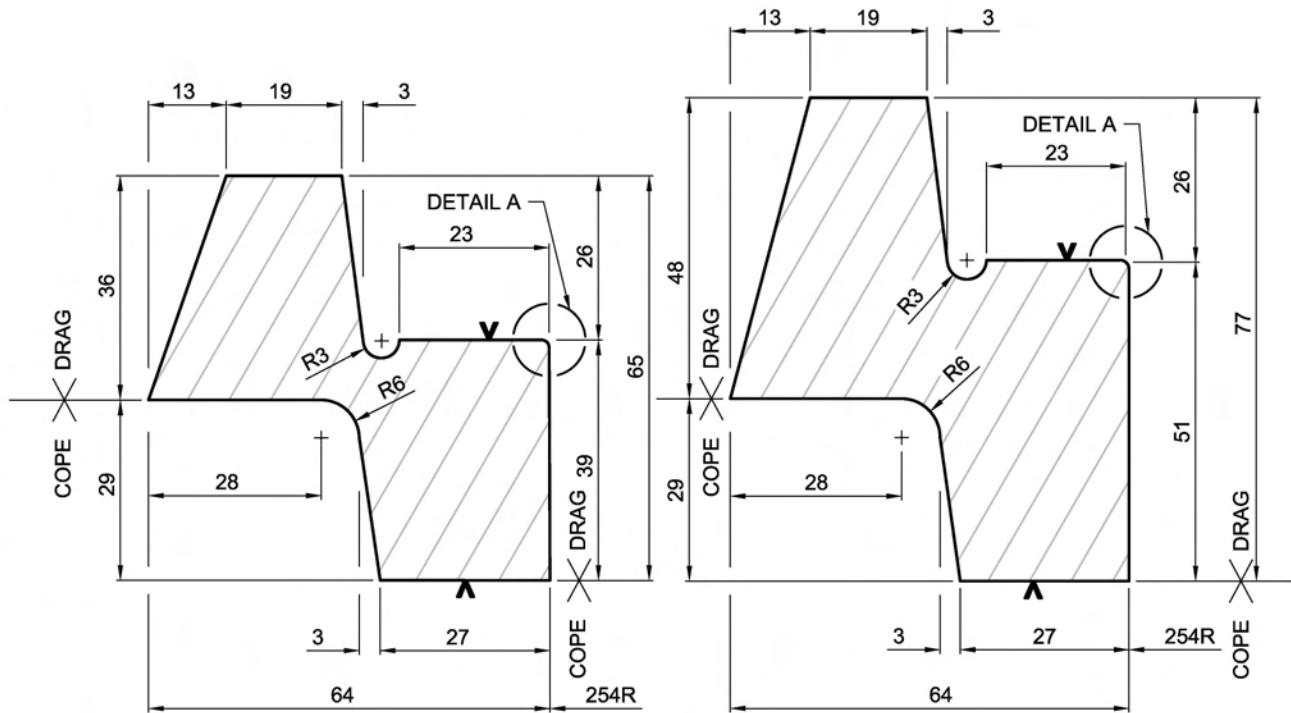
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SECTIONAL ELEVATION



DETAIL A



39mm LIFT

51mm LIFT

TYPICAL SECTIONS

NOTES:

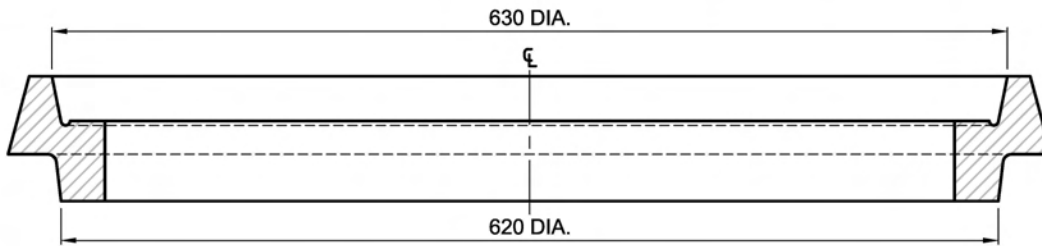
1. FOR MAINTENANCE HOLE FRAME NO. 12 (DWG S5.6) & COVER NO. 1 (DWG S5.1).
2. (▲) INDICATES 1.6mm HAS BEEN ALLOWED ON THE PATTERN FOR MACHINING.
3. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

SCALE: N.T.S.

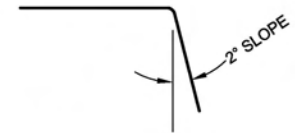
REV.	REVISION DATE	APPROVED

MAINTENANCE HOLES
EXTENSION RING FOR FRAME NO. 12 & COVER NO. 1

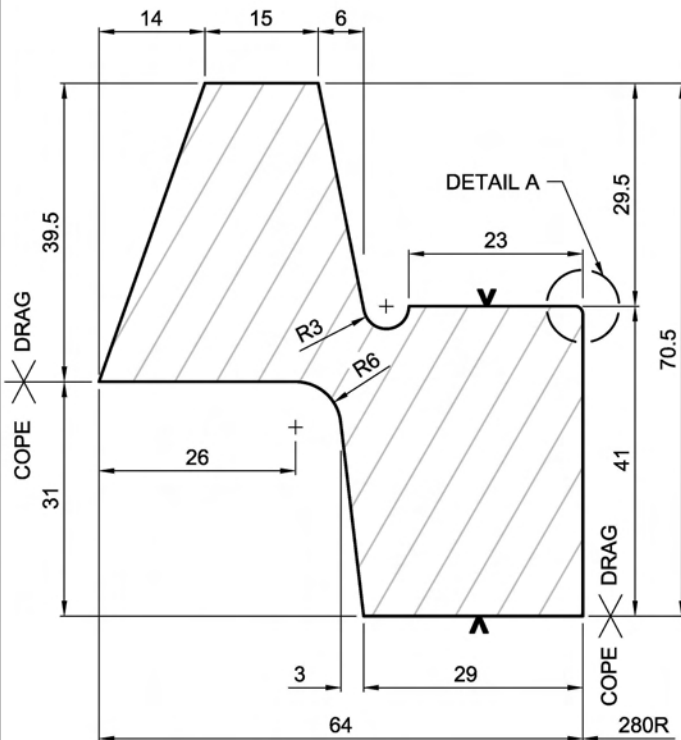
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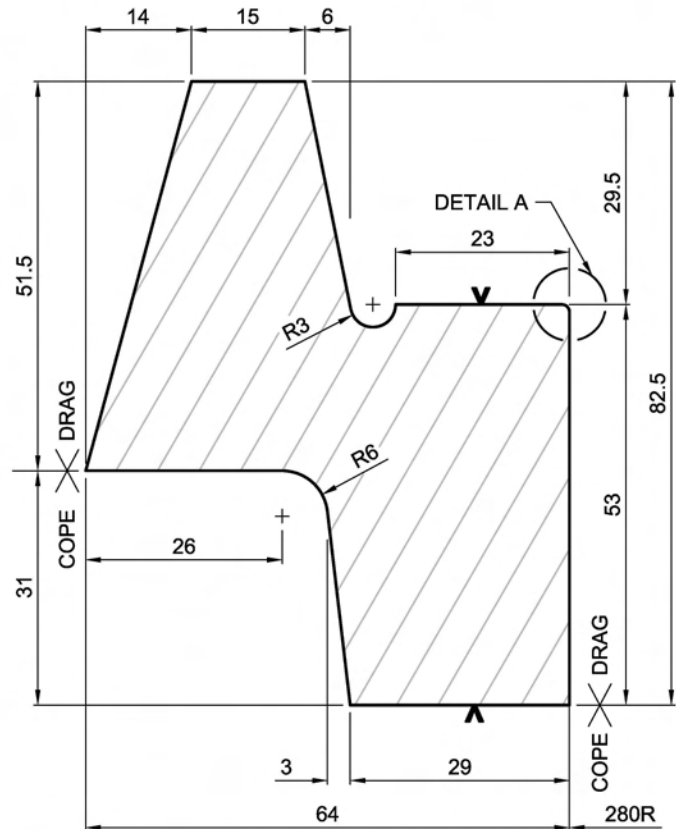
SECTIONAL ELEVATION



DETAIL A



41mm LIFT



53mm LIFT

TYPICAL SECTIONS

NOTES:

1. FOR MAINTENANCE HOLE FRAME NO. 13 (DWG S5.7) & COVER NO. 2 (DWG S5.2).
2. (▲) INDICATES 1.6mm HAS BEEN ALLOWED ON THE PATTERN FOR MACHINING.
3. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

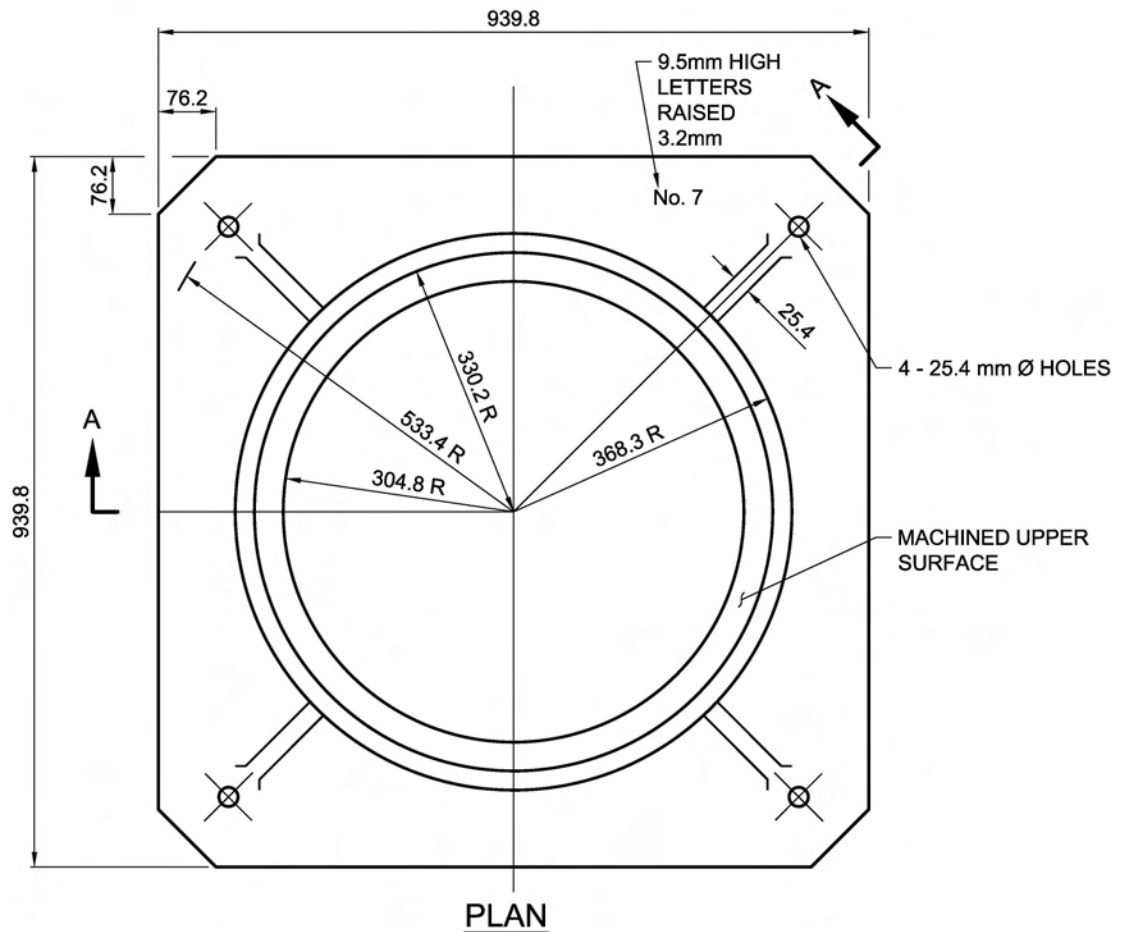
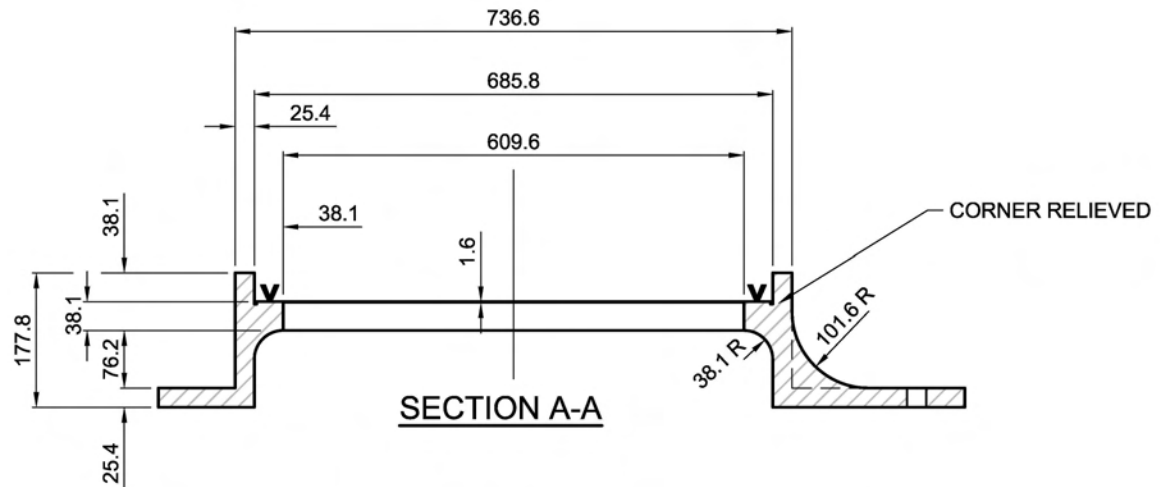
SCALE: N.T.S.

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MAINTENANCE HOLES
EXTENSION RING FOR FRAME NO. 13 & COVER NO. 2

ISSUE DATE: SEPTEMBER 2018

APPROVED BY: K. DER



NOTES:

1. ALL CORNERS TO HAVE 3.2 RADIUS UNLESS OTHERWISE SPECIFIED.
2. ALL SURFACES MARKED (V) TO BE MACHINED.
3. FOR USE WITH COVER NO. 8.
4. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

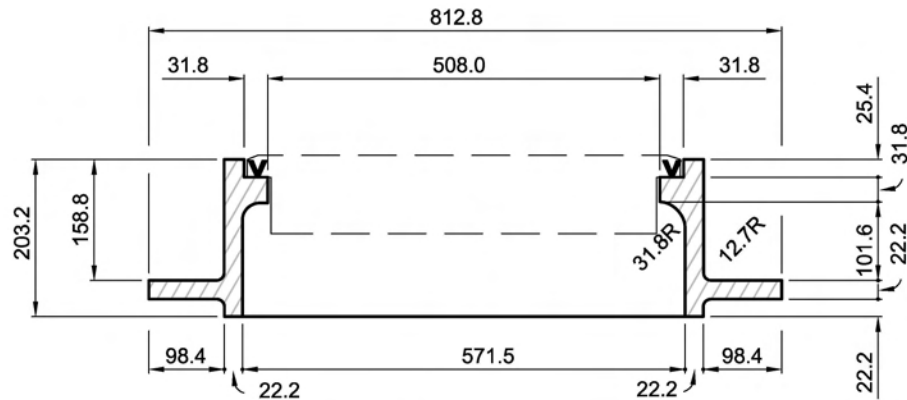
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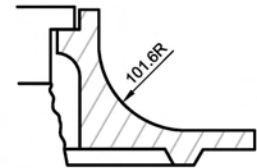
MAINTENANCE HOLES
FRAME NO. 7 FOR COVER NO. 8

ISSUE DATE: SEPTEMBER 2018

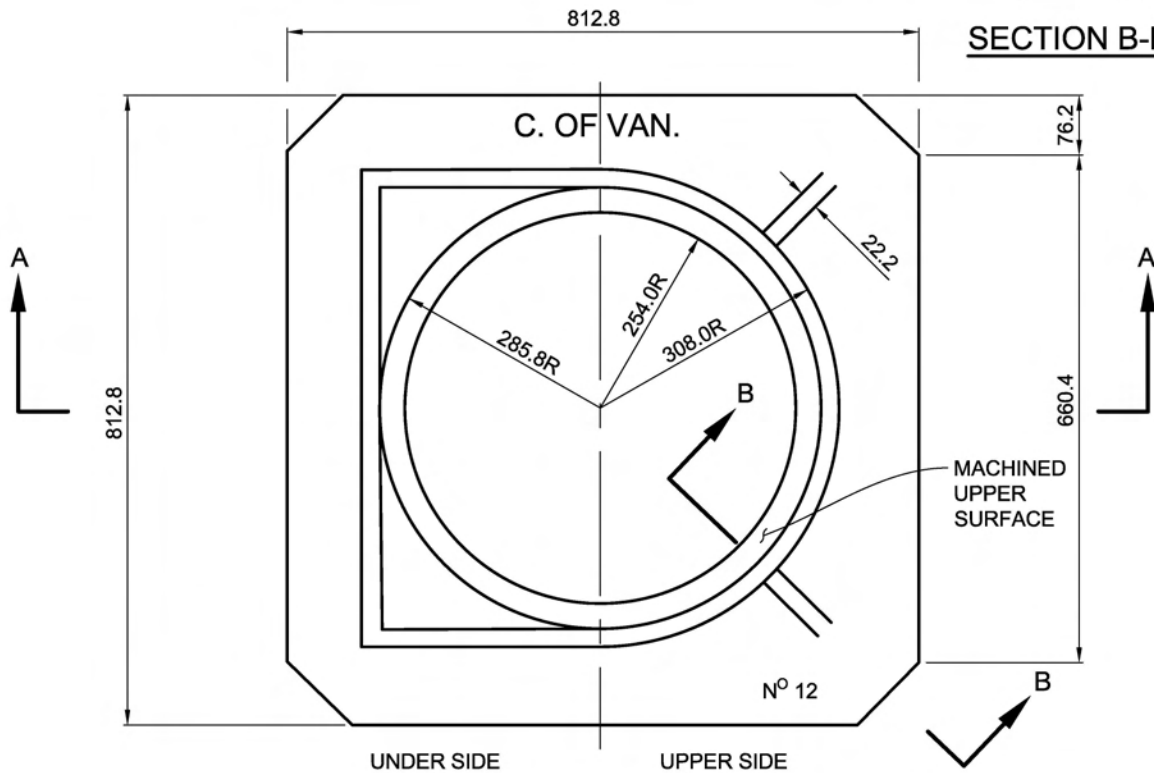
APPROVED BY: K. DER



SECTION A-A



SECTION B-B



PLAN

NOTES:

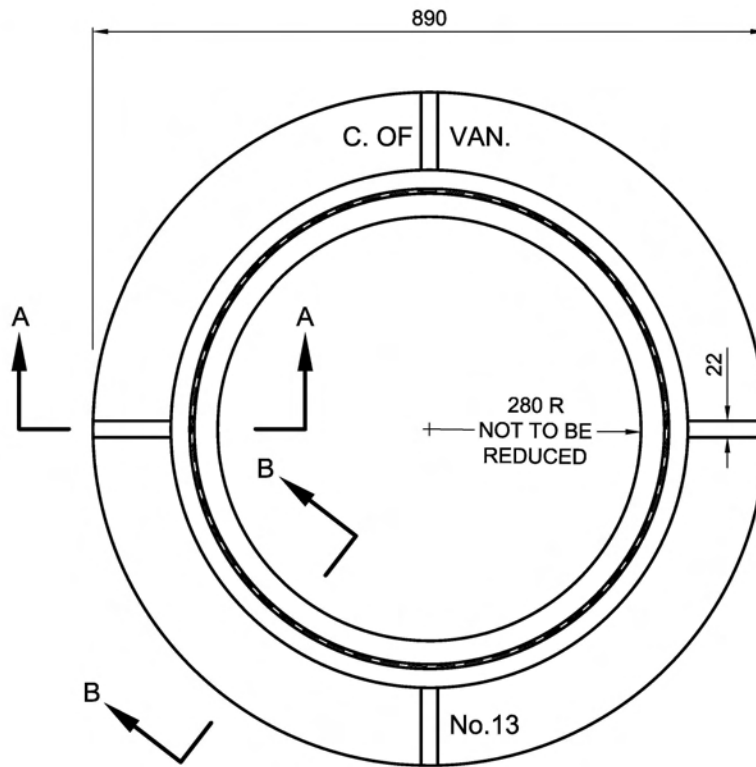
1. C. OF VAN. & NO 12 TO BE ON CASTINGS IN RAISED FIGURES.
2. ALL SURFACES MARKED (▼) TO BE MACHINED.
3. FOR USE WITH COVER NO. 1 (DWG S5.1).
4. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

MAINTENANCE HOLES
FRAME NO. 12 FOR COVER NO. 1

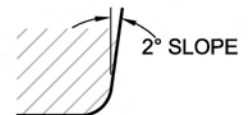
ISSUE DATE: SEPTEMBER 2018
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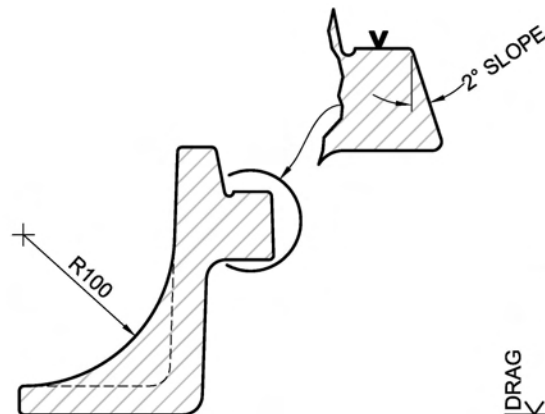
PLAN



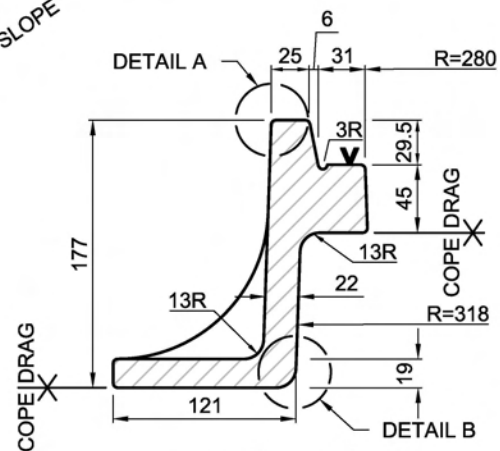
DETAIL A



DETAIL B



SECTION A-A



SECTION B-B

NOTES:

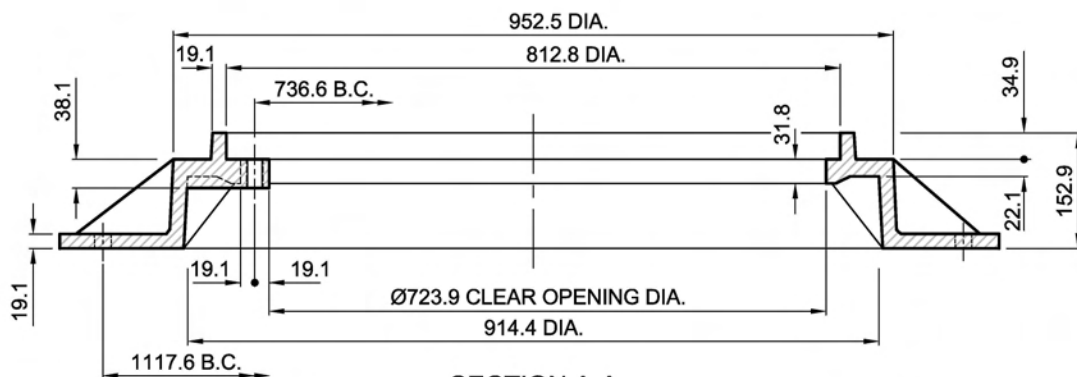
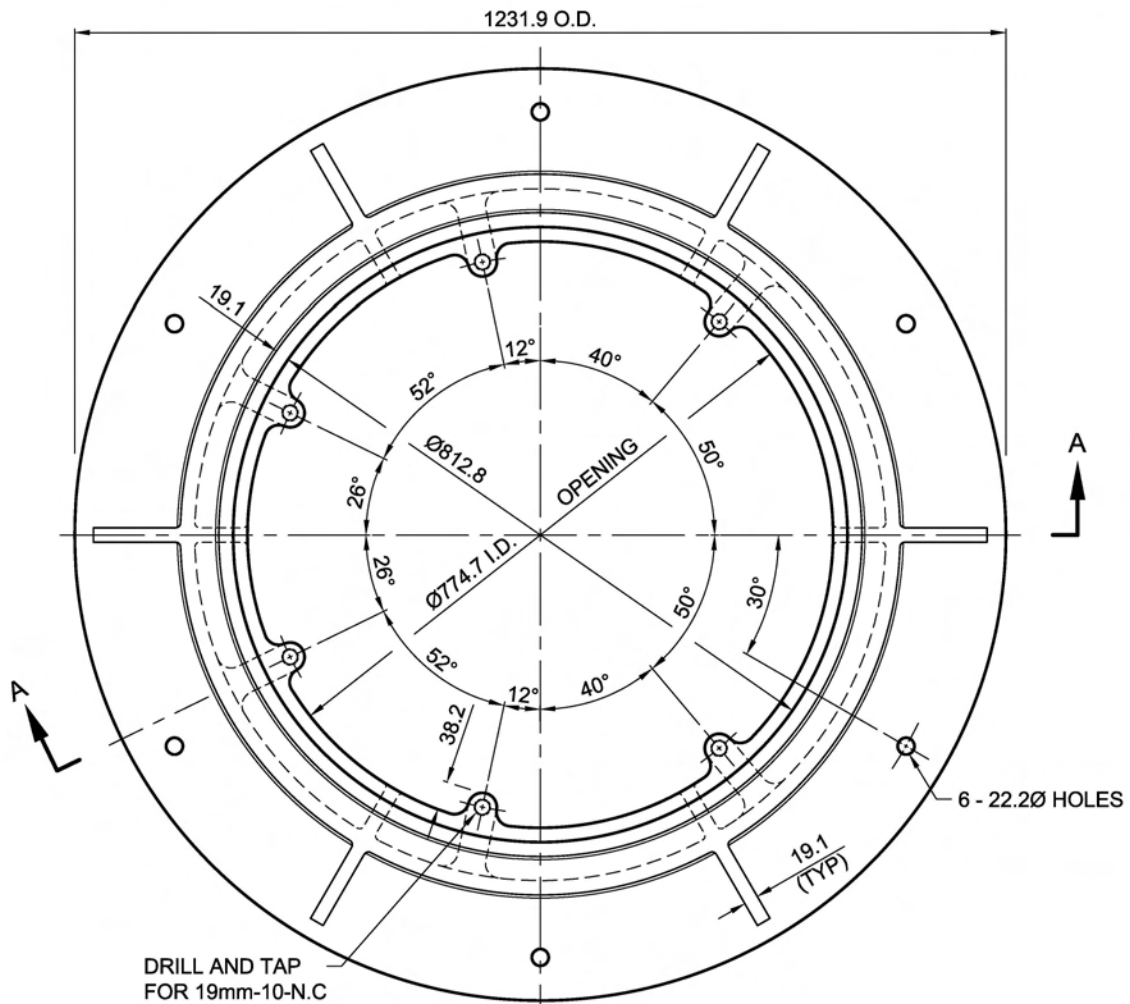
1. (V) INDICATES 1.6mm HAS BEEN ALLOWED ON THE PATTERN FOR MACHINING.
2. C. OF VAN. & No.13 TO BE ON CASTINGS IN RAISED FIGURES.
3. UNLESS OTHERWISE SPECIFIED ALL CORNERS TO HAVE 3mm RADIUS.
4. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

MAINTENANCE HOLES
FRAME NO. 13 FOR COVER NO. 2

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: K. DER



NOTES:

1. MAINTENANCE HOLE FRAMES AND COVERS MUST BE INTERCHANGEABLE.
2. TOLERANCE ON DIMENSIONS MARKED \pm SHALL BE 0.79mm AFTER MACHINING.
3. CAST IRON SPECIFICATION ASTM A 48-CLASS 30B, OR DUCTILE IRON GRADE 65-45-12, OR STEEL GRADE 70-40.
4. LID AND OFFSET RING PATTERN TO BE STANDARD CITY OF VANCOUVER RECESSED SQUARES.
5. USE WITH MAINTENANCE HOLE COVER NO. 21 AND OFFSET RING COVER NO. 19.
6. FOR LOCKING DEVICE AND LIFTING KEY, REQUEST FROM CITY OF VANCOUVER.
7. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

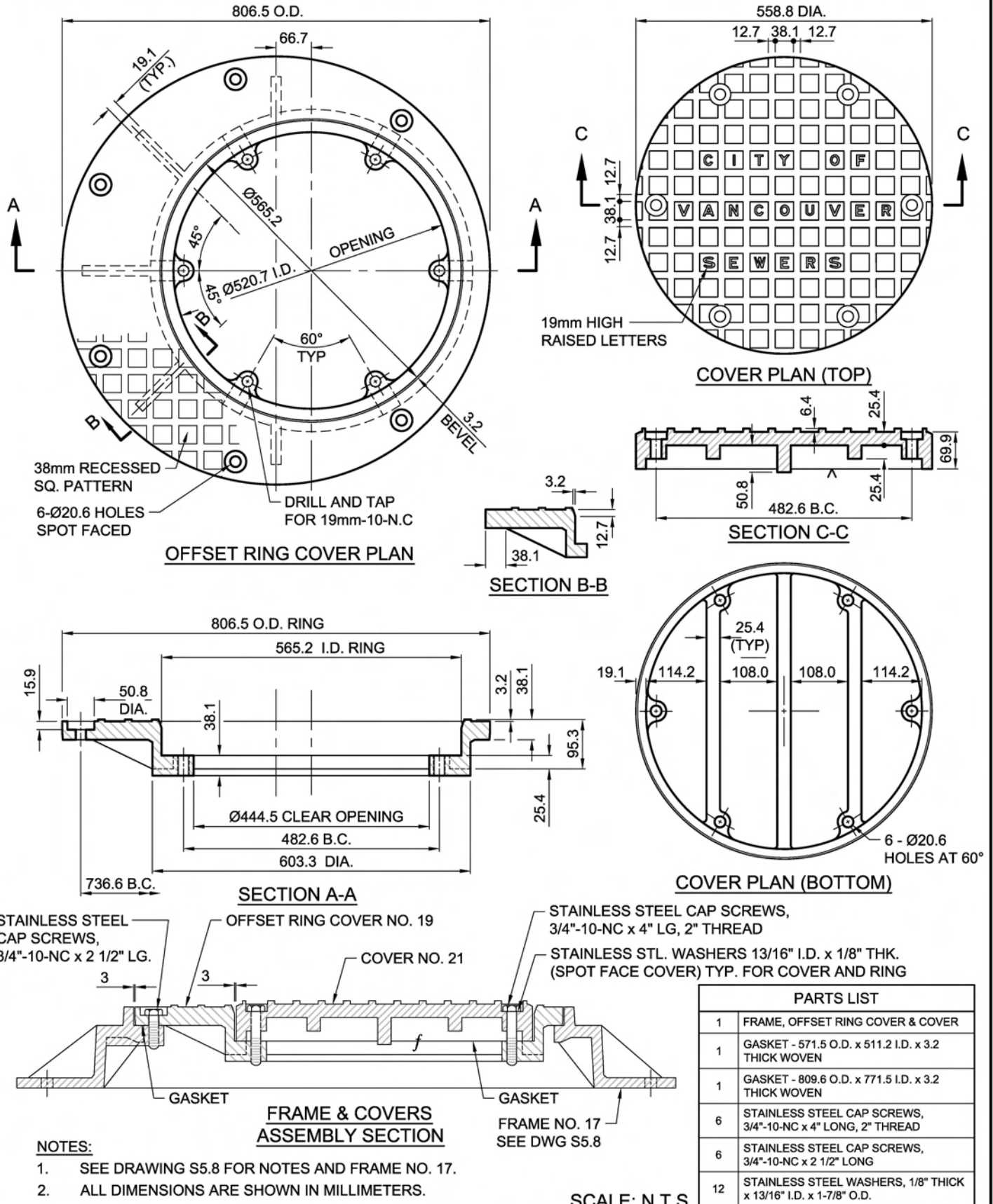
SCALE: N.T.S.

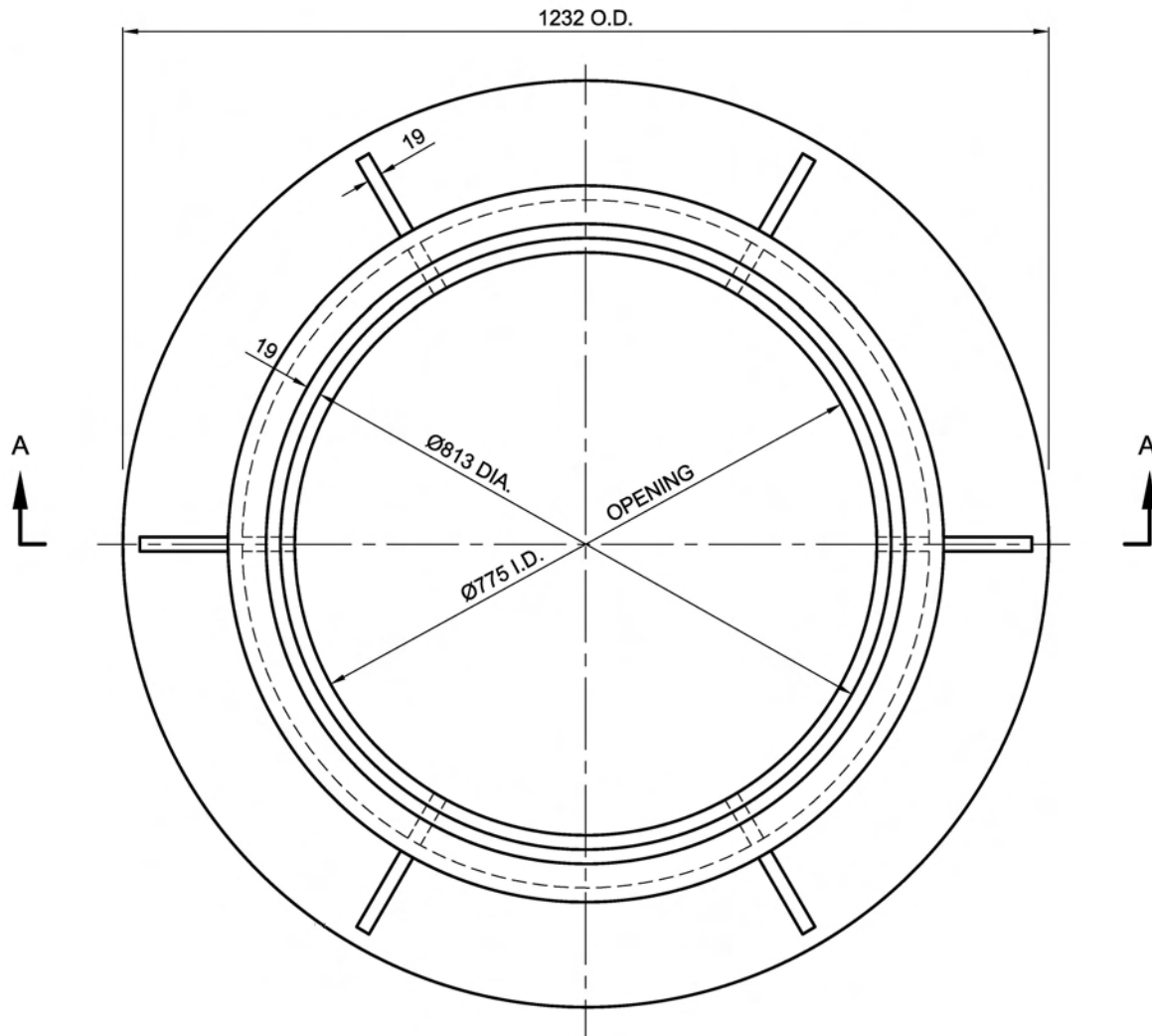
REV.	REVISION DATE	APPROVED

MAINTENANCE HOLES
FRAME NO. 17

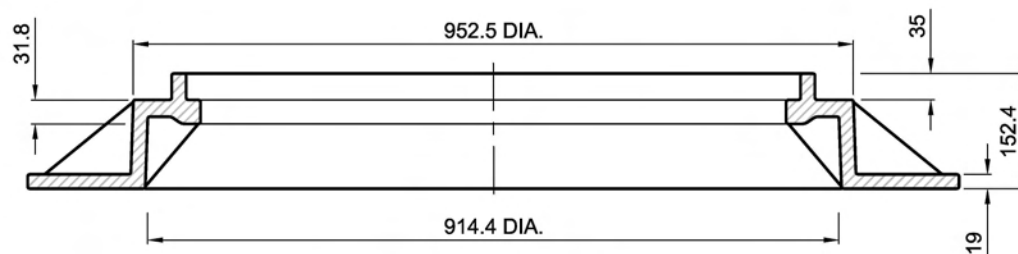
ISSUE DATE: SEPTEMBER 2018

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PLAN



SECTION A-A

NOTES:

1. ALL SURFACES MARKED (▲) TO BE MACHINED.
2. MAINTENANCE HOLE FRAMES AND COVER MUST BE INTERCHANGEABLE.
3. TOLERANCE ON DIMENSIONS MARKED \pm SHALL BE 0.80mm AFTER MACHINING.
4. CAST IRON SPECIFICATION ASTM A 48-CLASS 30B, OR DUCTILE IRON GRADE 65-45-12, OR STEEL GRADE 70-40.
5. LID AND OFFSET RING PATTERN TO BE STANDARD CITY OF VANCOUVER RECESSED SQUARES.
6. USE WITH MAINTENANCE HOLE COVER NO. 22 & OFFSET RING COVER NO. 20.
7. FOR LOCKING DEVICE AND LIFTING KEY, REQUEST FROM CITY OF VANCOUVER.
8. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

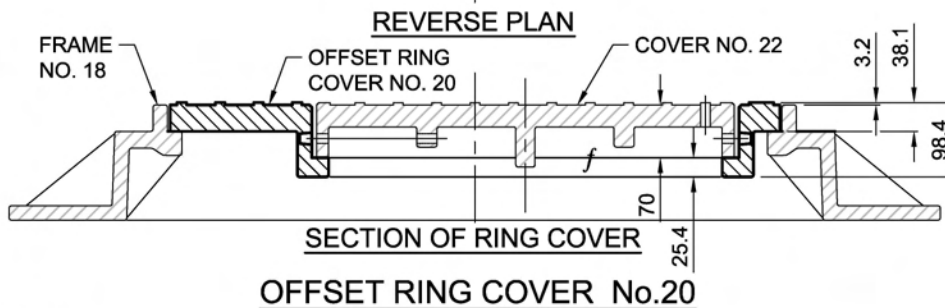
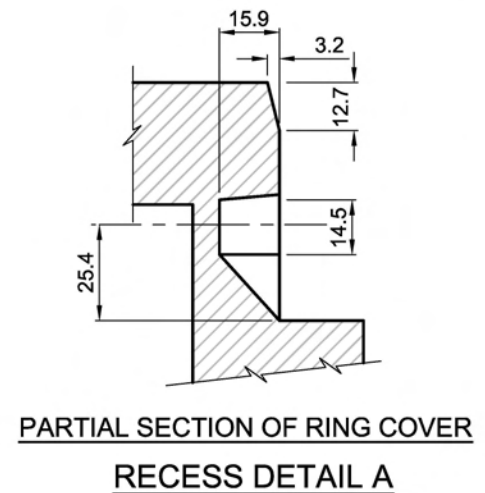
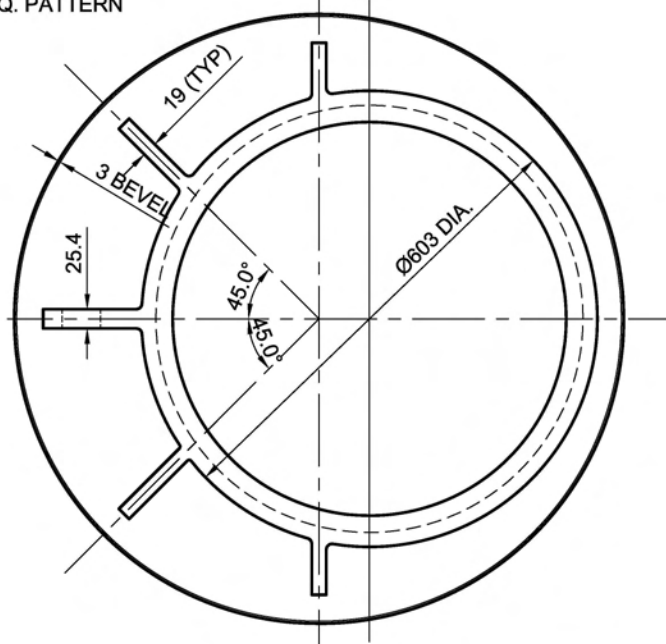
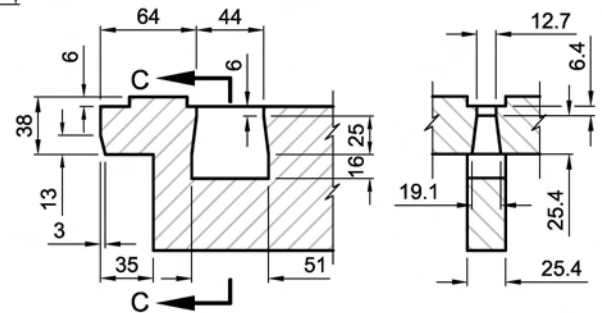
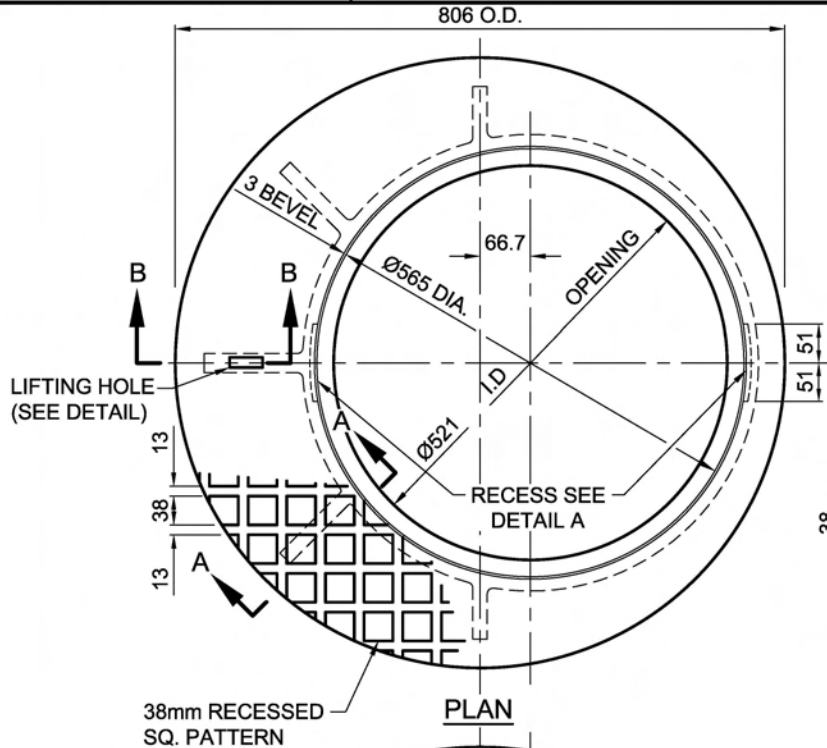
SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

MAINTENANCE HOLES
FRAME NO. 18

ISSUE DATE: SEPTEMBER 2018

APPROVED BY: K. DER



PARTS LIST	
FRAME, OFFSET RING COVER & COVER	
LATCH	
SPRING	
GALV. BOLT, 3/8"-16-NC x 3-1/2" LONG	
CAP SCREWS, 5/8"-11-NC x 1 1/2" LONG	

NOTES:

- SEE NOTES ON DWG S5.10.

SCALE: N.T.S.

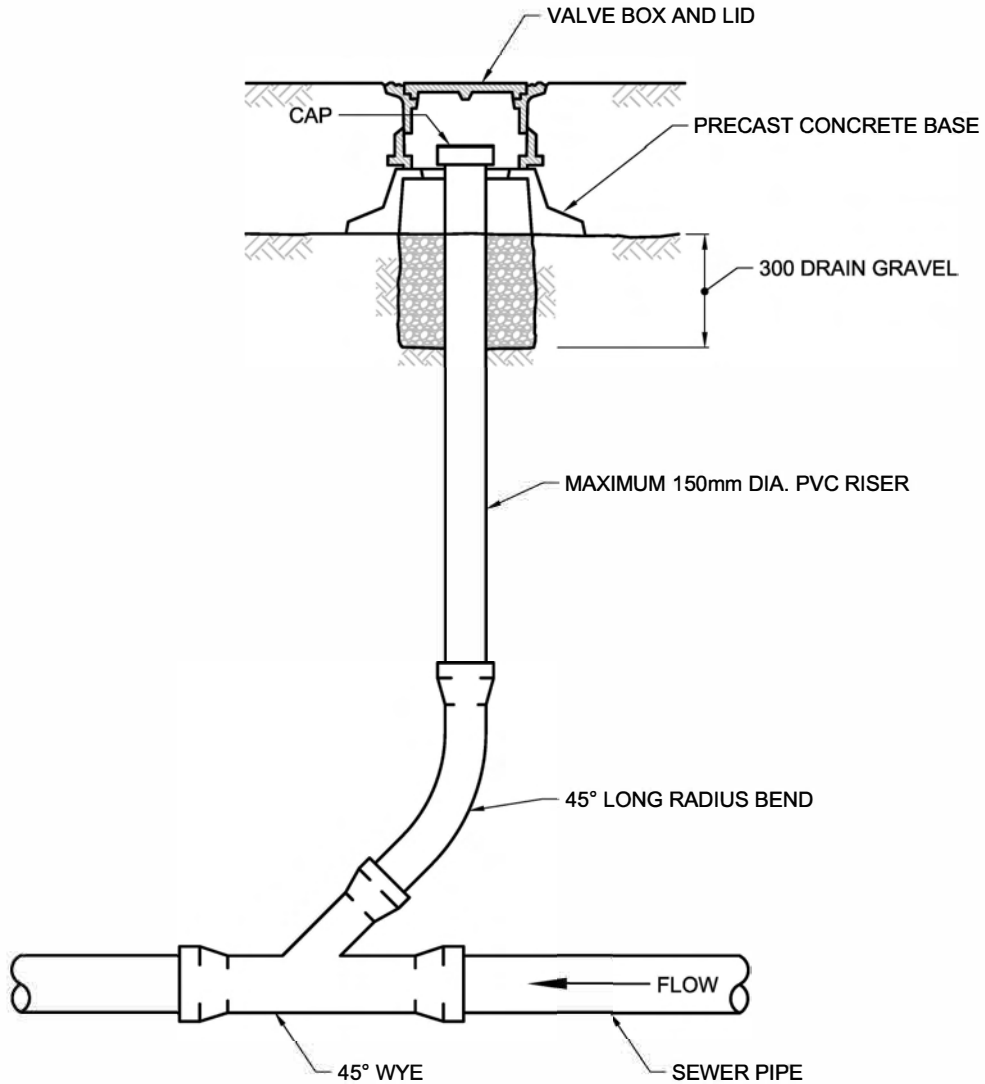
REV.	REVISION DATE	APPROVED

MAINTENANCE HOLES
OFFSET RING COVER NO. 20

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: K. DER

SCALE: N.T.S.

APPROVED BY: K.DER



NOTES:

1. REFER TO DWG S17.2 & DWG S17.3 FOR VALVE BOX AND LID DETAILS.
2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

**SEWER CLEANOUTS
DETAILS**

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: K.DER

SEWER CONNECTION STANDARDS

1. CONNECTIONS MUST ENTER SEWERS THROUGH STANDARD MANUFACTURED WYES OR MANUFACTURED SADDLES. (SEE TABLE 1).
2. IF A NEW WYE IS REQUIRED ON A STREET SEWER MAIN, A SHORT SECTION OF MAIN SHALL BE REPLACED WITH A MANUFACTURED WYE.
3. CONNECTING CONCRETE OR CLAY SEWER MAINS TO PVC WYES TO BE MADE BY APPROVED MANUFACTURED ADAPTORS.
4. ALL CONNECTION PIPING, INCLUDING BENDS AND FITTINGS, WILL BE OF POLYVINYL CHLORIDE (P.V.C.) PIPE CONFORMING TO ASTM D3034 UNLESS OTHERWISE NOTED.
5. CHANGES IN PIPE DIRECTION OR GRADE GREATER THAN THE RECOMMENDED JOINT TOLERANCES MUST BE MADE USING MANUFACTURED LONG RADIUS BENDS. (SHORT RADIUS BEND IF NECESSARY)
6. CONNECTIONS SHALL BE LAID SIDE-BY-SIDE AND AT THE SAME INVERT AT THE PROPERTY LINE UNLESS OTHERWISE AUTHORIZED.
7. STORM AND SANITARY CONNECTIONS SHALL TERMINATE AT RIGHT ANGLES AT THE PROPERTY LINE AND AT A MINIMUM 2% GRADE. (1.7-2.5% TOLERANCE) SEE SEWER DESIGN STANDARD DRAWING S7.4 FOR INSTALLATION IN PEAT AREAS.
8. THE SANITARY CONNECTION IS TO BE LEFT OF THE STORM CONNECTION WHEN LOOKING AT THE PROPERTY LINE FROM THE SEWER MAIN UNLESS STATED OTHERWISE ON THE SEWER PERMIT.
9. MINIMUM COVER AT THE CROWN OF PIPE TO BE 1.0m. MAXIMUM DEPTH AT PROPERTY LINE TO BE 2.4m.
10. GRANULAR BEDDING MATERIAL IS TO BE 19mm CLEAR CRUSH GRAVEL.
11. BACKFILL MATERIAL AS PER CONSTRUCTION SPECIFICATION OR APPROVED RECYCLED AGGREGATE PRODUCT COMPACTED TO A MINIMUM OF 95% MODIFIED PROCTOR.
12. EXCEPTIONS TO THIS STANDARD TO BE AUTHORIZED BY THE CITY ENGINEER.
13. IF IC CONFLICTS WITH EXISTING UTILITIES OR OBSTRUCTION, INSTALL IC AS CLOSE TO PROPERTY LINE AS PRACTICALLY FEASIBLE.
14. MAINTENANCE HOLES CAN BE USED FOR ALL TIE-INS TO SEWER MAINS.
15. INSPECTION CHAMBERS ARE NOT REQUIRED ON NEW CONNECTIONS WHERE THE NEAREST EDGE OF THE SEWER MAIN IS WITHIN 1.2m OF THE PROPERTY LINE.
16. FOR CONCRETE MAINS, PVC WYES ARE TO BE PRE-FABRICATED INTO CONCRETE PIPES OR MANUFACTURED WYES.
17. INSERT-A-TEES CAN ONLY BE USED ON EXISTING SEWER MAINS.

Table 1 - Connection Type and Size

Connection Diameter (mm)	Main Material and Size																		Connection Material 1.0 m and greater cover
	Conc rete Main (See Note 16)						Vitrified Clay Main					PVC Main							
	150	200	250	300	375	450+	150	200	250	300	375	150	200	250	300	375	450	525	
100	PVC WYE, CONC WYE	PVC WYE, TAP-N- TEE, VC HUB	PVC WYE, TAP-N- TEE, VC HUB	PVC WYE, TAP-N- TEE, VC HUB	PVC WYE, TAP-N- TEE, VC HUB	PVC WYE, TAP-N- TEE, VC HUB	VC / PVC WYE	TAP-N- TEE, VC / PVC WYE	TAP-N- TEE, VC / PVC WYE	TAP-N- TEE, VC / PVC WYE	TAP-N- TEE, VC / PVC WYE	PVC WYE	PVC WYE	PVC WYE	INSERT-A -TEE, PVC WYE	INSERT-A -TEE, PVC WYE	INSERT-A -TEE, PVC WYE	INSERT-A -TEE, PVC WYE	PVC SDR 28
150	PVC WYE, CONC WYE	PVC WYE, TAP-N- TEE, VC HUB	PVC WYE, TAP-N- TEE, VC HUB	PVC WYE, TAP-N- TEE, VC HUB	PVC WYE, TAP-N- TEE, VC HUB	PVC WYE, TAP-N- TEE, VC HUB	VC / PVC WYE	TAP-N- TEE, VC / PVC WYE	TAP-N- TEE, VC / PVC WYE	TAP-N- TEE, VC / PVC WYE	TAP-N- TEE, VC / PVC WYE	PVC WYE	PVC WYE	PVC WYE	INSERT-A -TEE, PVC WYE	INSERT-A -TEE, PVC WYE	INSERT-A -TEE, PVC WYE	INSERT-A -TEE, PVC WYE	PVC SDR 28
200	CONC / PVC WYE	CONC / PVC WYE	CONC / PVC WYE	CONC / PVC WYE	CONC / PVC WYE, VC HUB	PVC WYE, VC HUB	VC / PVC WYE	VC / PVC WYE	VC / PVC WYE	VC / PVC WYE	VC / PVC WYE	PVC WYE	PVC WYE	PVC WYE	INSERT-A -TEE, PVC WYE	INSERT-A -TEE, PVC WYE	INSERT-A -TEE, PVC WYE	INSERT-A -TEE, PVC WYE	PVC SDR 35
250	MH	CONC / PVC WYE	CONC / PVC WYE	CONC / PVC WYE	CONC / PVC WYE	PVC WYE, VC HUB	MH	VC / PVC WYE	VC / PVC WYE	VC / PVC WYE	VC / PVC WYE	MH	PVC WYE	PVC WYE	PVC WYE	PVC WYE	INSERT-A -TEE, PVC WYE	INSERT-A -TEE, PVC WYE	PVC SDR 35
300	MH	MH	CONC / PVC WYE	CONC / PVC WYE	CONC / PVC WYE	CONC / PVC WYE	MH	MH	VC / PVC WYE	VC / PVC WYE	VC / PVC WYE	MH	MH	PVC WYE	PVC WYE	PVC WYE	INSERT-A -TEE, PVC WYE	INSERT-A -TEE, PVC WYE	PVC SDR 35
375	MH	MH	MH	CONC / PVC WYE	CONC / PVC WYE	CONC / PVC WYE	MH	MH	MH	VC / PVC WYE	VC / PVC WYE	MH	MH	MH	PVC WYE	PVC WYE	PVC WYE	INSERT-A -TEE, PVC WYE	PVC SDR 35
450	MH	MH	MH	MH	CONC / PVC WYE	CONC / PVC WYE	MH	MH	MH	MH	MH	MH	MH	MH	MH	MH	MH	MH	ASTM C76 CL IV RC

*Note: For concrete mains, PVC wyes are to be pre-cast into concrete pipes

SCALE: N.T.S.

			SERVICES CONNECTIONS AND CATCH BASIN LEAD DETAILS	ISSUE DATE: SEPTEMBER 2018
				APPROVED BY: K. DER
REV.	REVISION DATE	APPROVED		

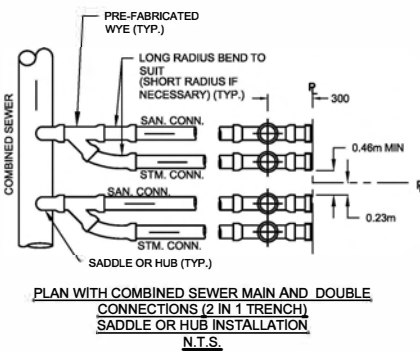
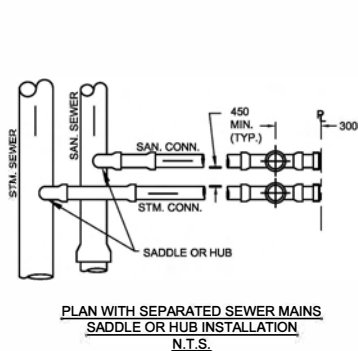
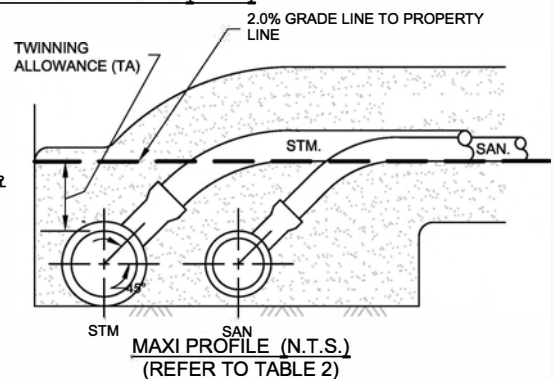
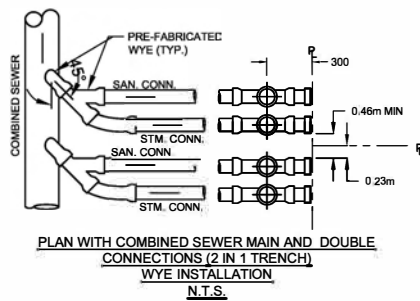
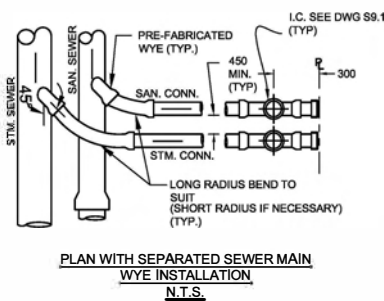
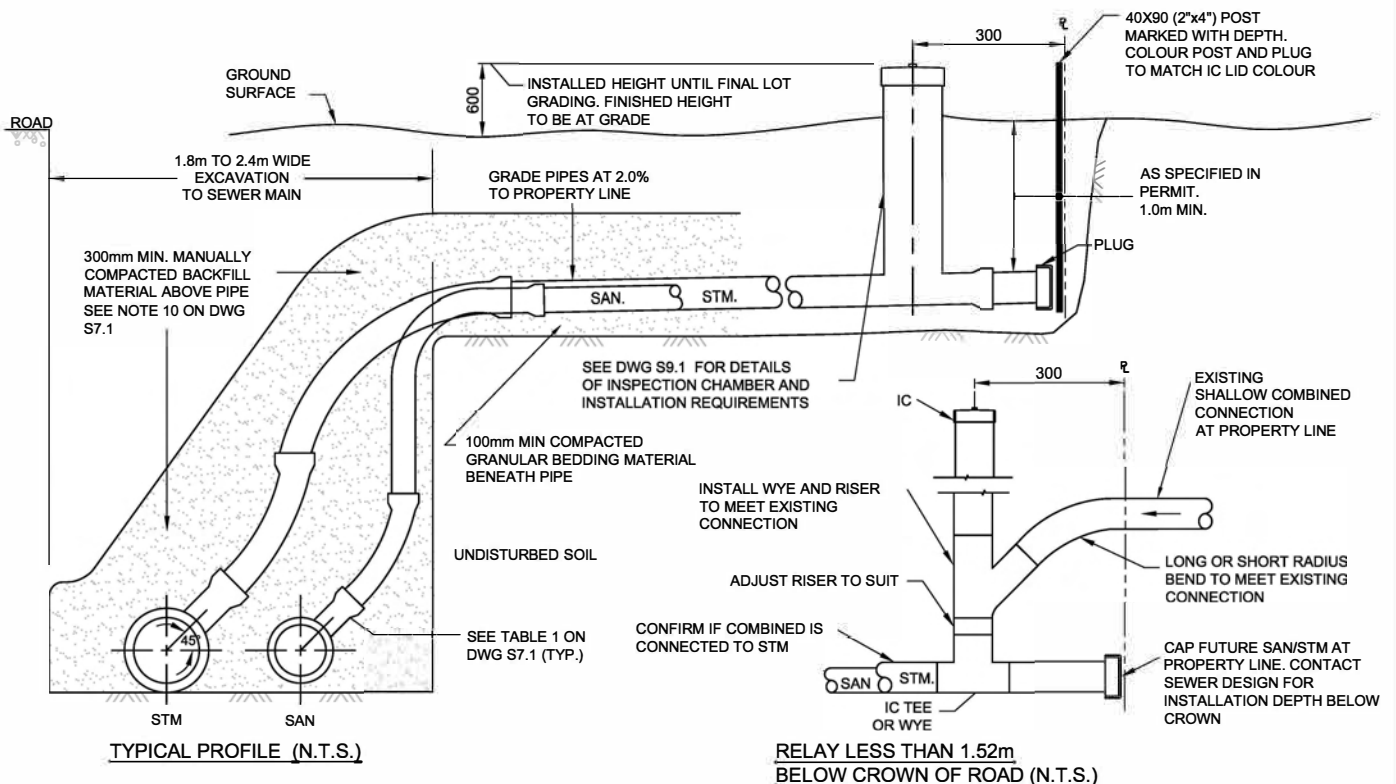


TABLE 2
TWINNING ALLOWANCE (TA)

LARGEST MAIN DIAMETER	COMBINED MAIN	SEPARATED MAINS (FROM HIGHEST OBVERT)
150-250mm	300mm	300mm
251mm-675mm	1.5X DIAMETER OF COMBINED MAIN	400mm
676mm+	1.5X DIAMETER OF COMBINED MAIN	500mm

NOTES:

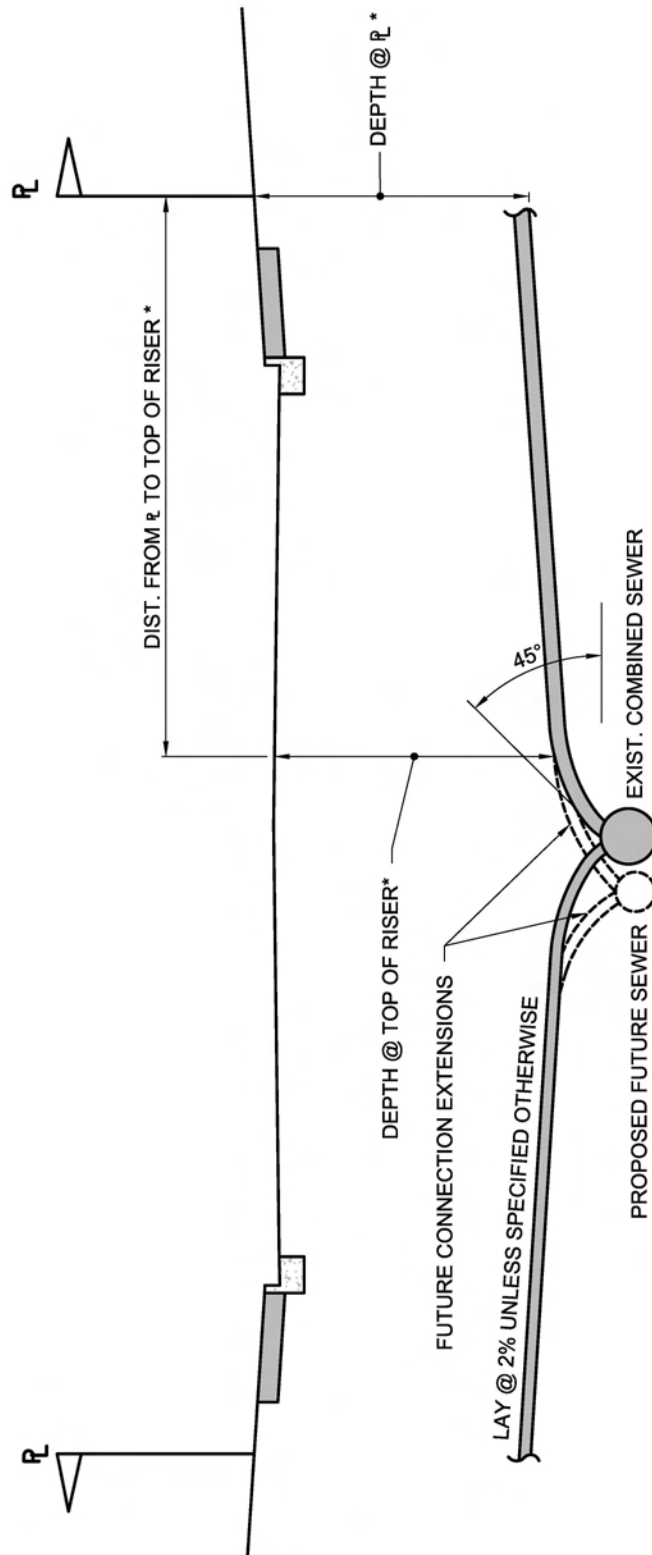
- EXCEPTIONS TO BE APPROVED BY THE ENGINEER OF RECORD.
- ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

SERVICES
CONNECTIONS AND CATCH BASIN LEAD DETAILS

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: K. DER



SCALE: N.T.S.

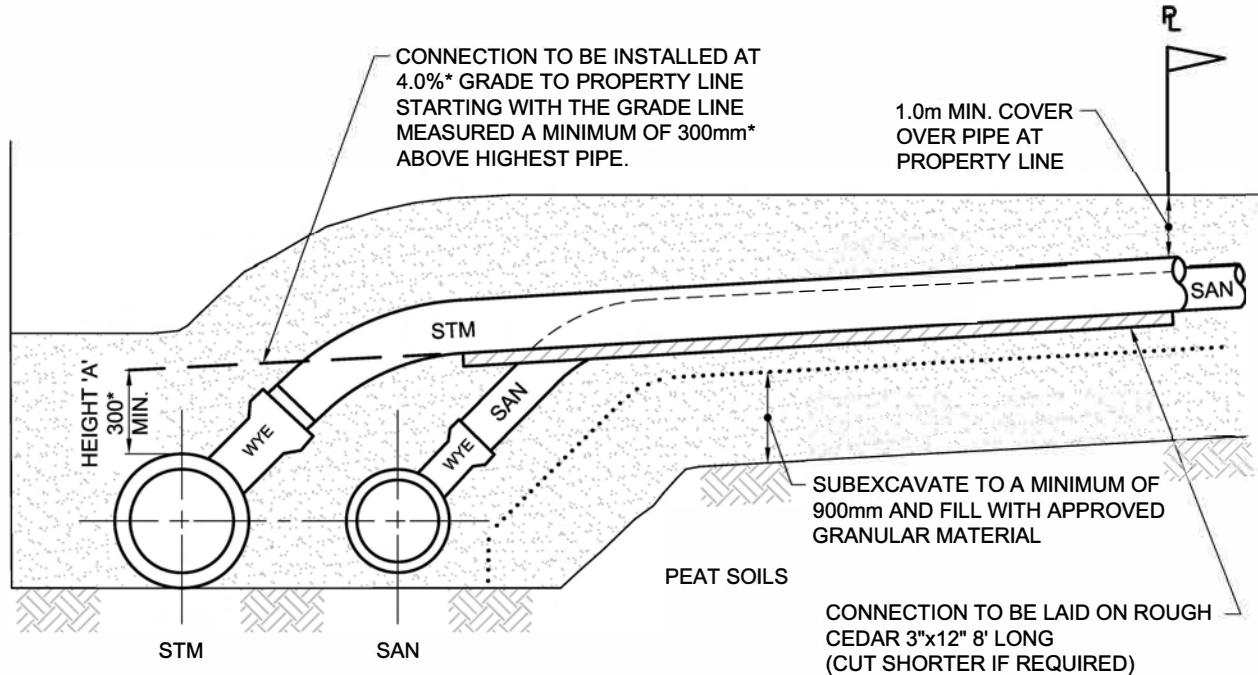
NOTE:
* TO BE RECORDED ON CONNECTION RECORD.

REV.	REVISION DATE	APPROVED

SERVICES
CONSTRUCTION DETAILS

ISSUE DATE: SEPTEMBER 2018

APPROVED BY: K. DER



* SUBJECT TO CHANGE IN ACCORDANCE WITH THE NOTES.

STANDARD CONNECTION INSTALLATION IN PEAT SOILS

NOTES:

1. CONNECTIONS MUST BE INSTALLED IN ACCORDANCE WITH DWG S7.1 AND DWG S7.2 EXCEPT FOR THE VARIATIONS SHOWN IN THIS STANDARD.
2. A SURVEY MUST BE DONE TO ENSURE THAT THE INSTALLATION WILL HAVE THE PROPER GRADE AND GIVE A 1.0m OR MORE GROUND COVER OVER THE CONNECTION AT THE PROPERTY LINE.
3. A 1.0m MINIMUM COVER OVER THE CONNECTION MUST OCCUR UNDER THE TRAVELLED PORTION OF ROADS AND LANES UNLESS DUCTILE IRON PIPE IS USED. (A CONCRETE COVER IS NOT TO BE USED FOR PIPE PROTECTION IN PEAT AREAS).
4. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

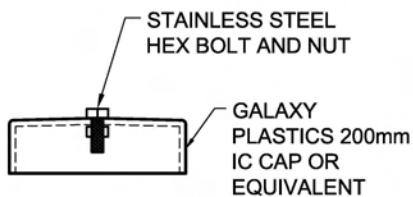
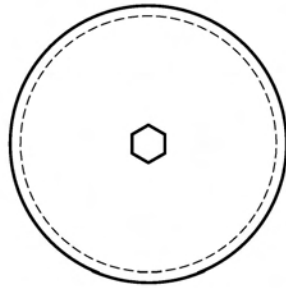
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REV.	REVISION DATE	APPROVED

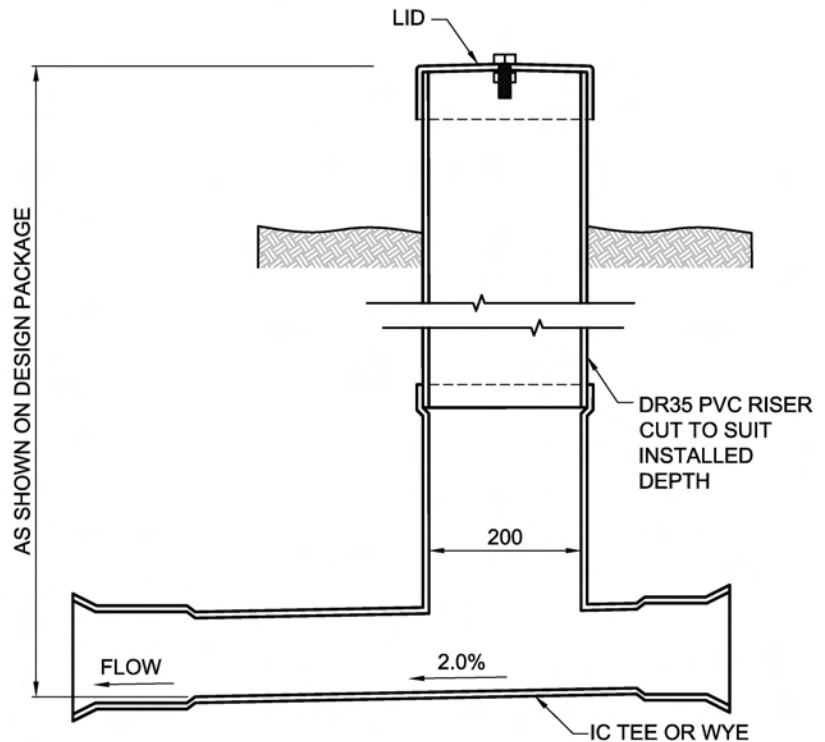
SERVICES
SERVICES IN PEAT AREAS

ISSUE DATE: SEPTEMBER 2018

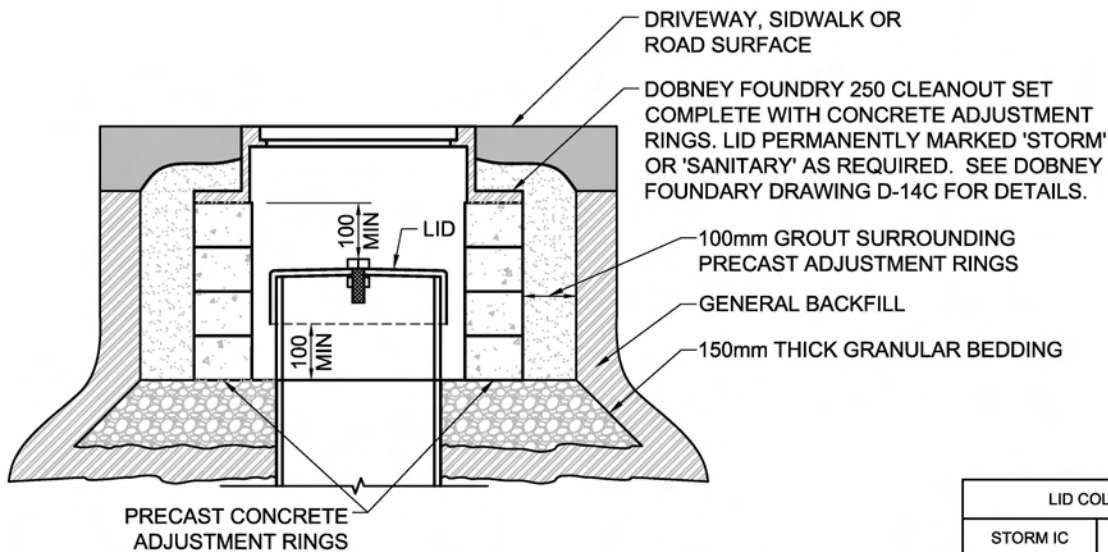
APPROVED BY: K. DER



LID DETAIL



INSTALLATION IN BOULEVARD



INSTALLATION IN DRIVEWAY, SIDEWALK, AND ROAD

LID COLORS	
STORM IC	GREEN
SANITARY IC	RED

NOTES:

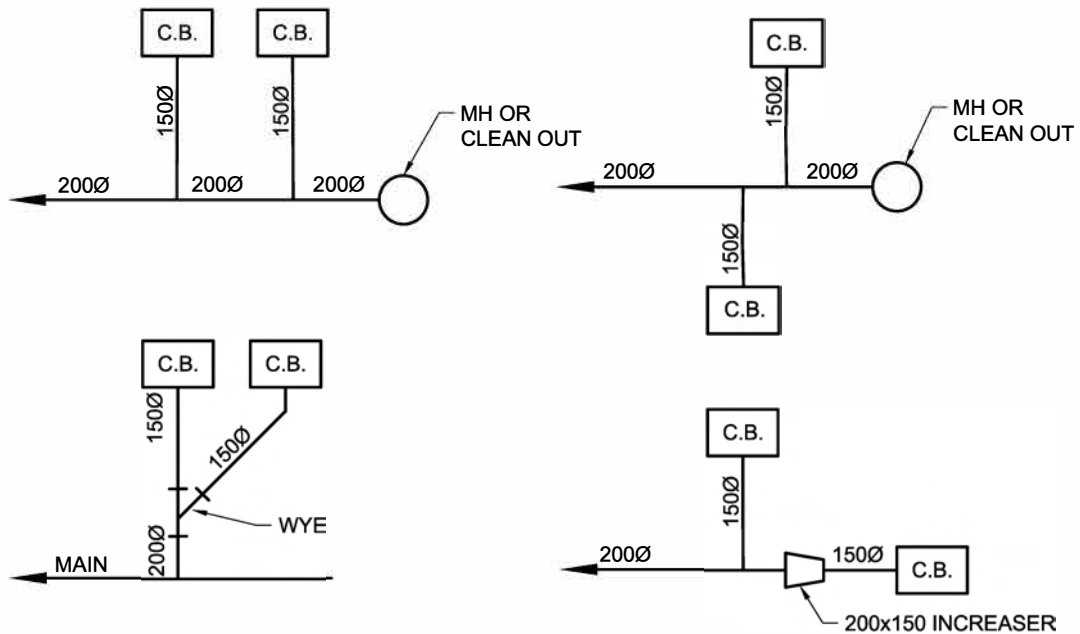
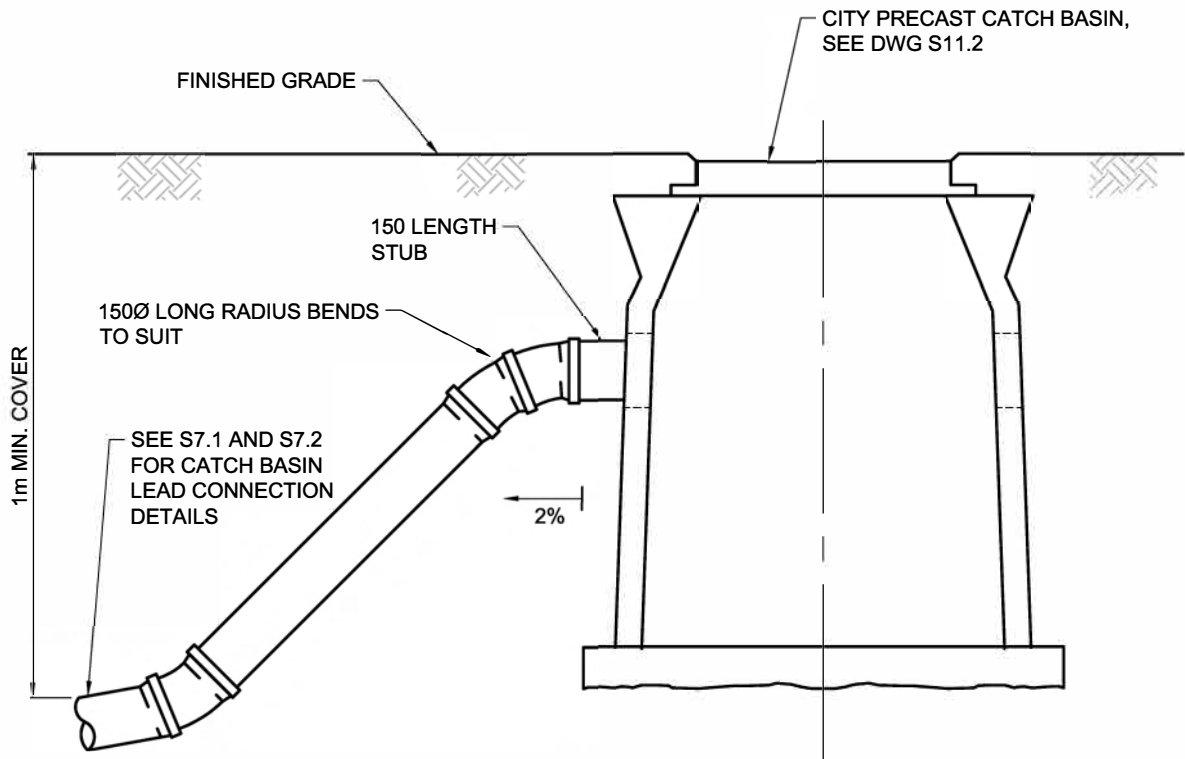
1. REFER TO DWG S7.2 FOR INSTALLATION REQUIREMENTS.
2. INSPECTION CHAMBER TO BE APPROVED MANUFACTURED FITTING.
3. REFER TO CONTRACT DRAWINGS FOR SITE SPECIFIC DIMENSIONS.
4. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

**INSPECTION CHAMBERS
100mm TO 375mm SEWER CONNECTIONS**

ISSUE DATE: SEPTEMBER 2018
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ACCEPTABLE CONFIGURATIONS

NOTE:

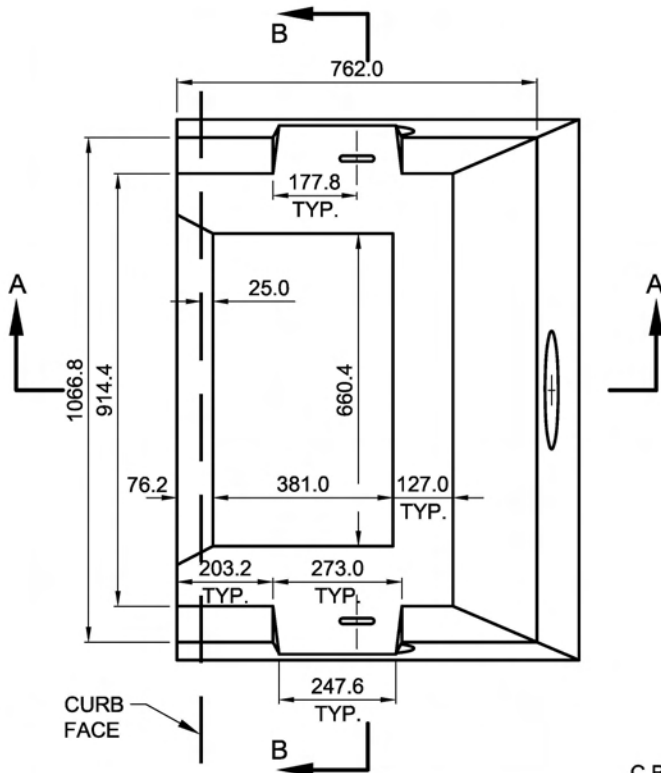
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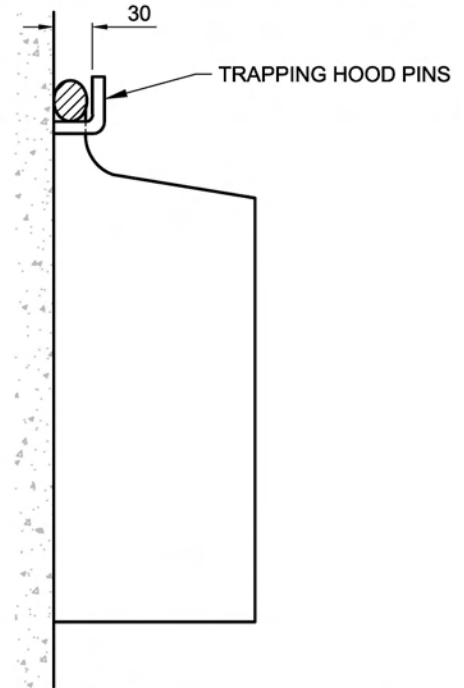
REV.	REVISION DATE	APPROVED

CATCHBASINS
INSTALLATION & CONNECTION

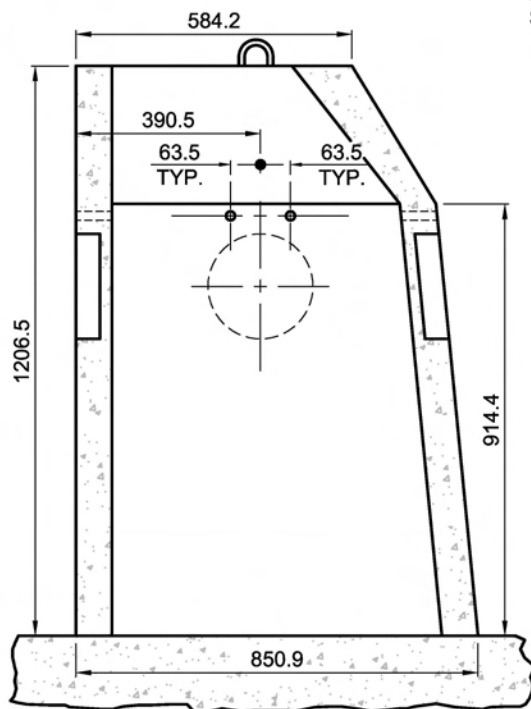
ISSUE DATE: SEPTEMBER 2018
APPROVED BY: K.DER



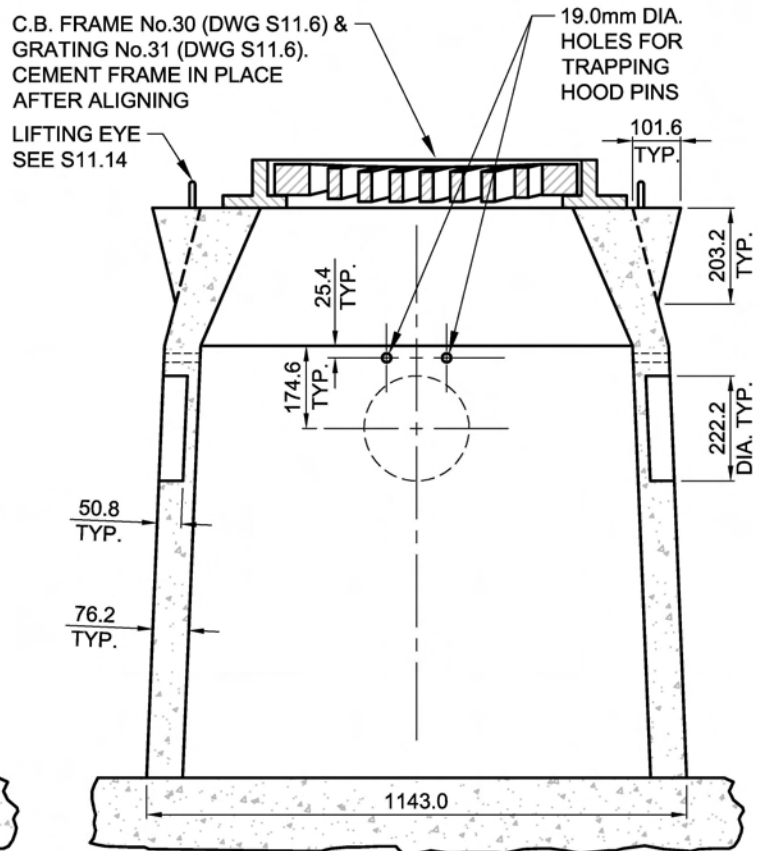
PLAN



TRAPPING HOOD INSTALLATION DETAIL



SECTION A-A



SECTION B-B

NOTE:

1. CATCHBASIN TO BE PURCHASED FROM CITY OF VANCOUVER.
2. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

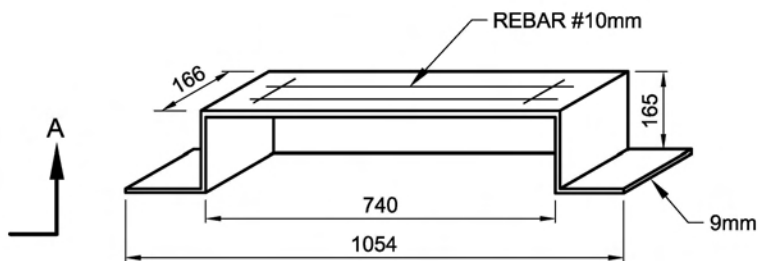
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REV.	REVISION DATE	APPROVED

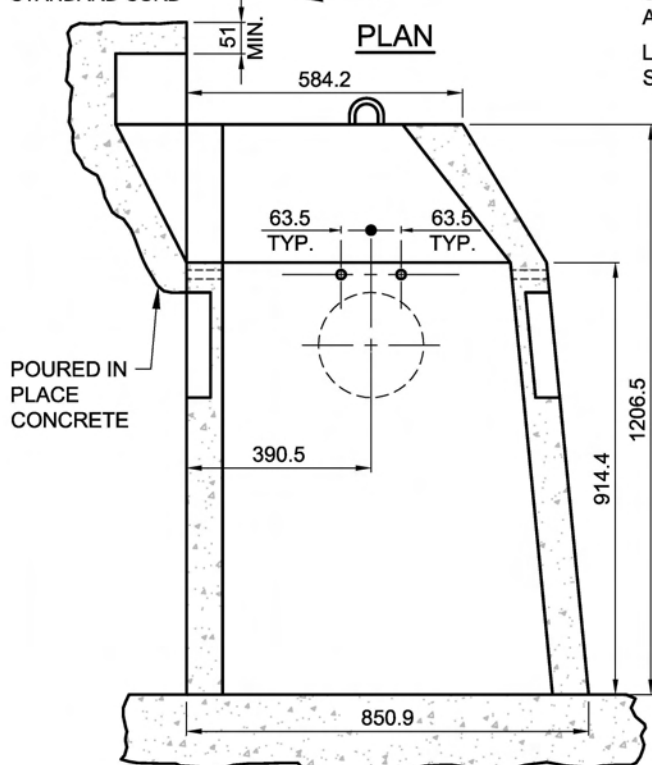
**CATCHBASINS
PRECAST CONCRETE CATCHBASIN**

ISSUE DATE: SEPTEMBER 2018

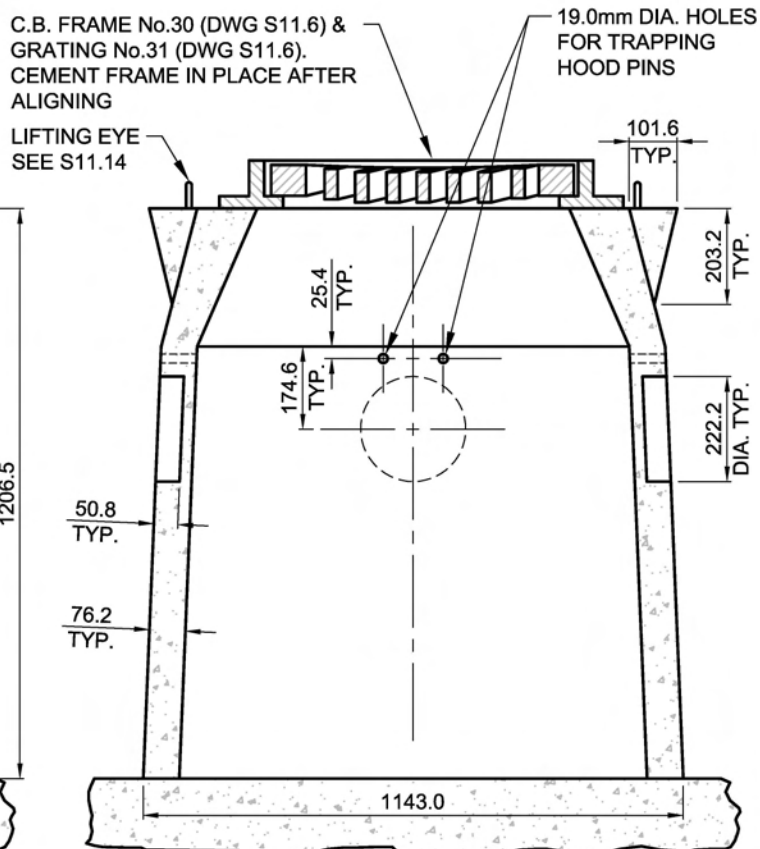
APPROVED BY: K. DER



CURB INLET

CITY OF VANCOUVER
STANDARD CURB

SECTION A-A



SECTION B-B

NOTES:

1. SEE DWG S11.2 FOR TRAPPING HOOD INSTALLATION DETAIL.
2. CATCHBASIN TO BE PURCHASED FROM CITY OF VANCOUVER.
3. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

SCALE: N.T.S.

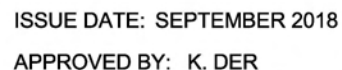
REV.	REVISION DATE	APPROVED
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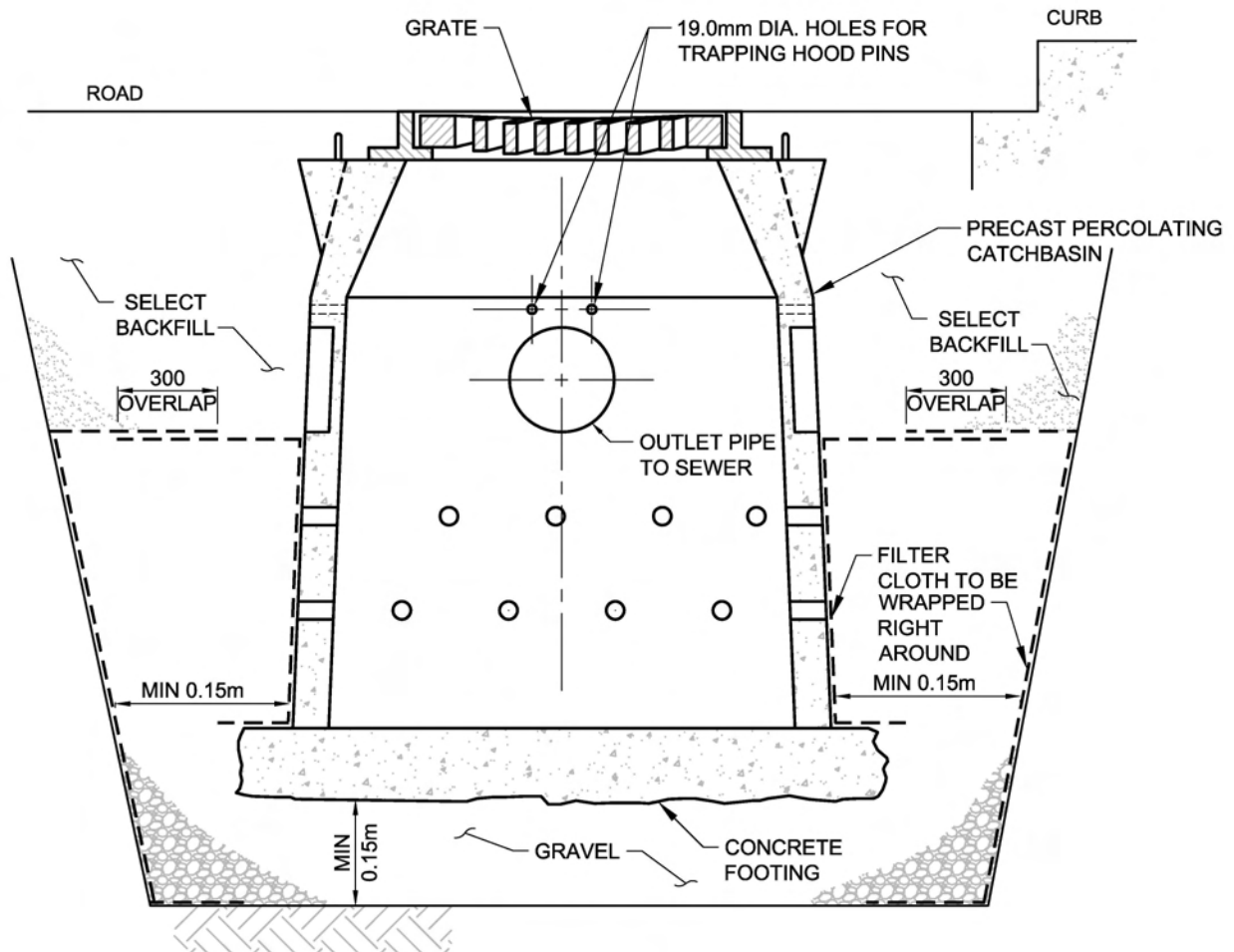
CATCHBASINS

PRECAST CONCRETE CURB INLET CATCHBASIN

ISSUE DATE: SEPTEMBER 2018

APPROVED BY: K. DER





INSTALLATION DETAILS

NOTES:

1. MINIMUM GRAVEL THICKNESS IS 0.15m.
2. FILTER CLOTH TO BE TREVIRA 1125, AMOCO 4553 OR EQUIVALENT.
3. GRAVEL TO BE CLEAN WITH NOT MORE THAN 3% PASSING 4.75mm SIEVE (DRAIN ROCK).
4. SEE DWG S11.4 FOR CATCHBASIN DETAILS.
5. SEE DWG S11.2 FOR TRAPPING HOOD INSTALLATION DETAIL.
6. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

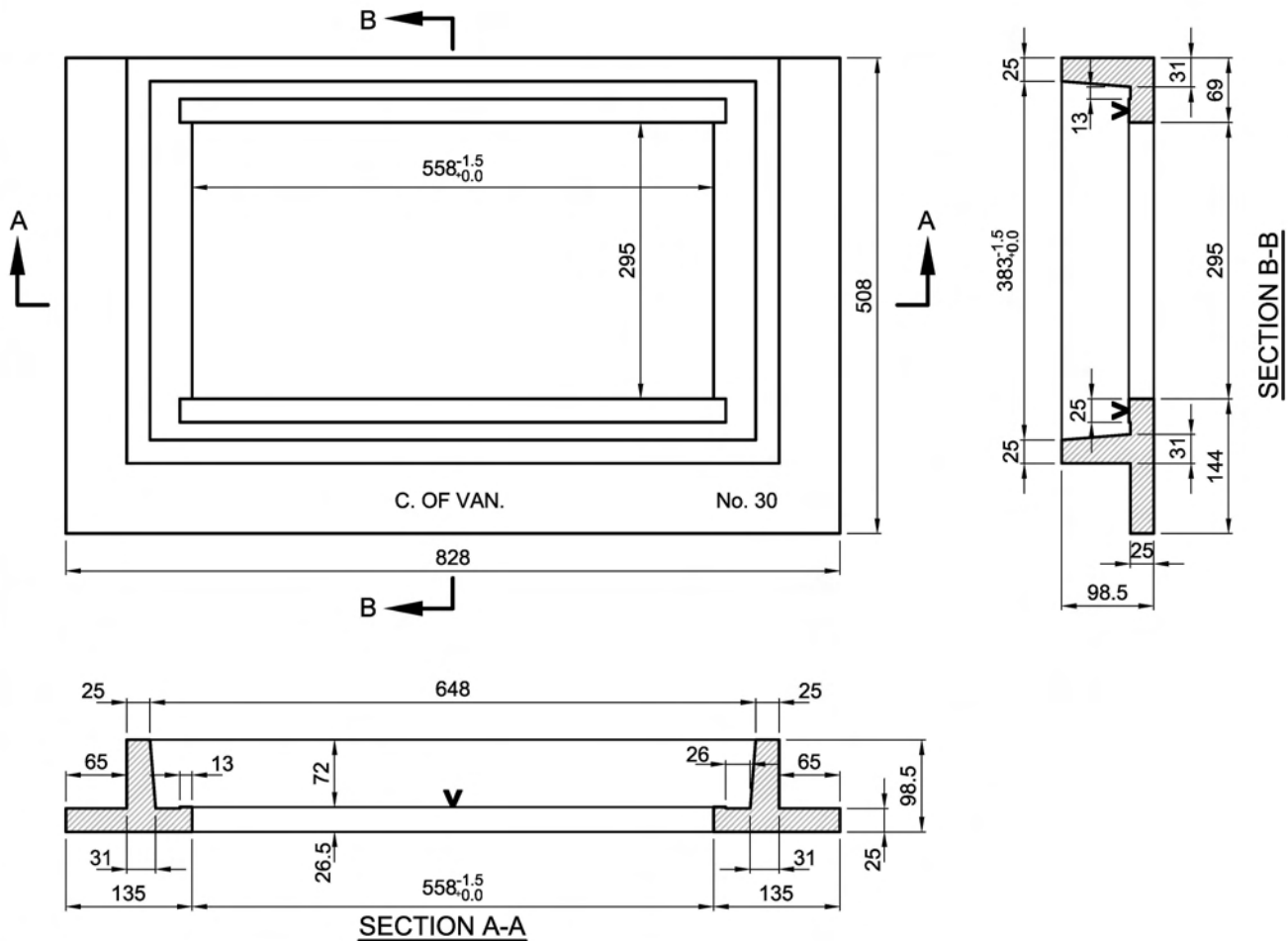
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REV.	REVISION DATE	APPROVED

CATCHBASINS
PRECAST CONCRETE PERCOLATING CATCHBASIN INSTALLATION

ISSUE DATE: SEPTEMBER 2018

APPROVED BY: K. DER



NOTES:

1. (▲) INDICATES 1.6mm HAS BEEN ALLOWED ON THE PATTERNS FOR MACHINING MATING PARTS.
2. SEE S11.7 FOR MATCHING GRATE.
3. #30 FRAME WT. = 190 lbs.
4. THE ACCEPTANCE WEIGHTS OF THESE CASTINGS SHALL BE DETERMINED AT THE BEGINNING OF THE SUPPLY CONTRACT WITH THE WEIGHT OF THE SAMPLE CASTINGS PROVIDED TO THE CITY.
5. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

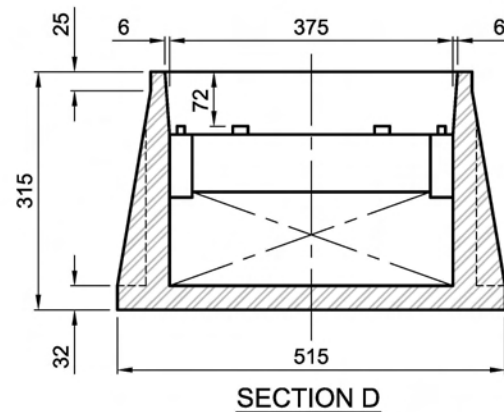
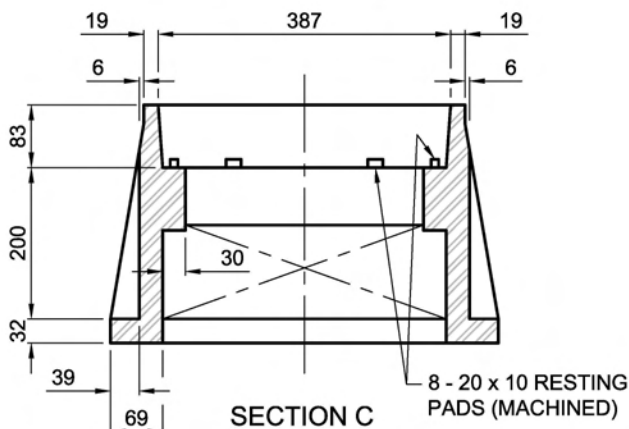
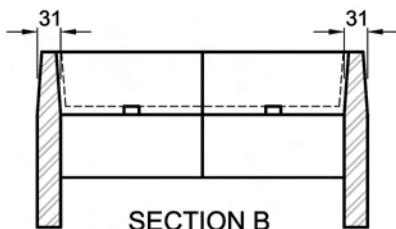
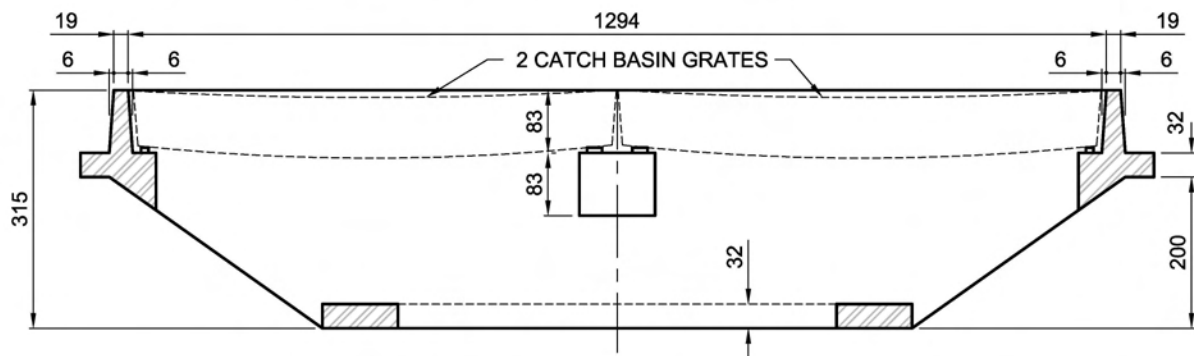
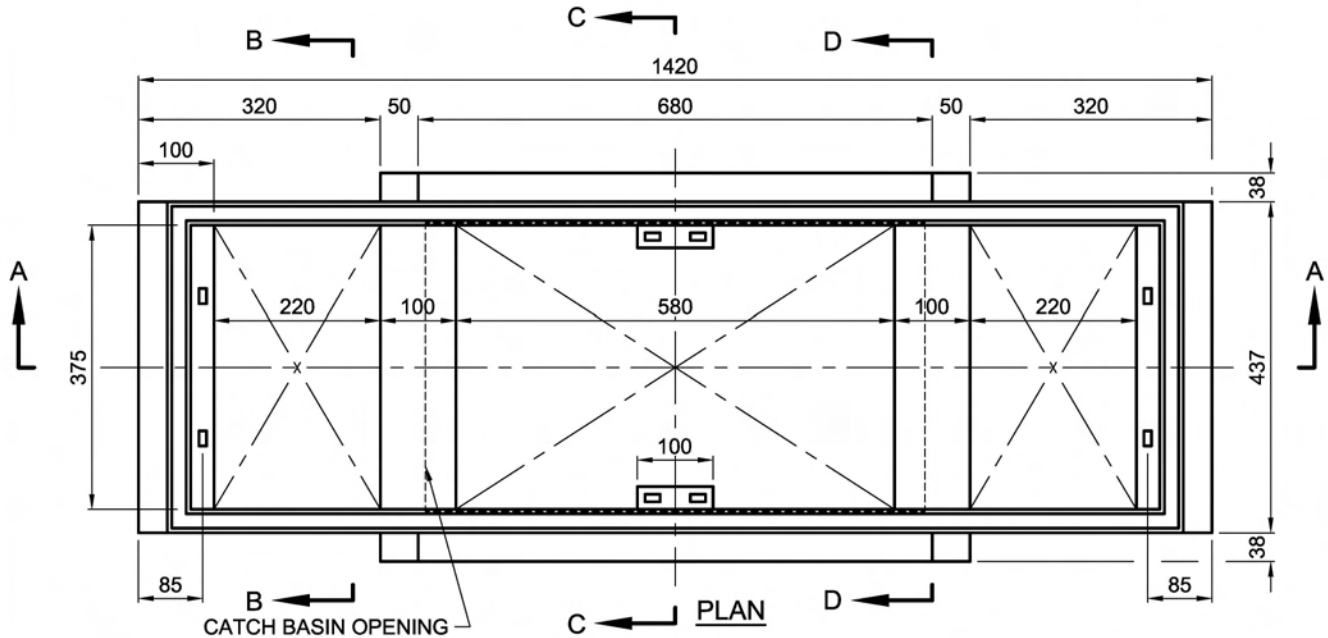
SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

CATCHBASINS
CATCHBASIN FRAME NO. 30

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: K. DER

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: K. DER



NOTES:

1. FRAME TO FIT CATCH BASIN GRATE S11.7
2. ALL MATERIAL TO BE CAST IRON

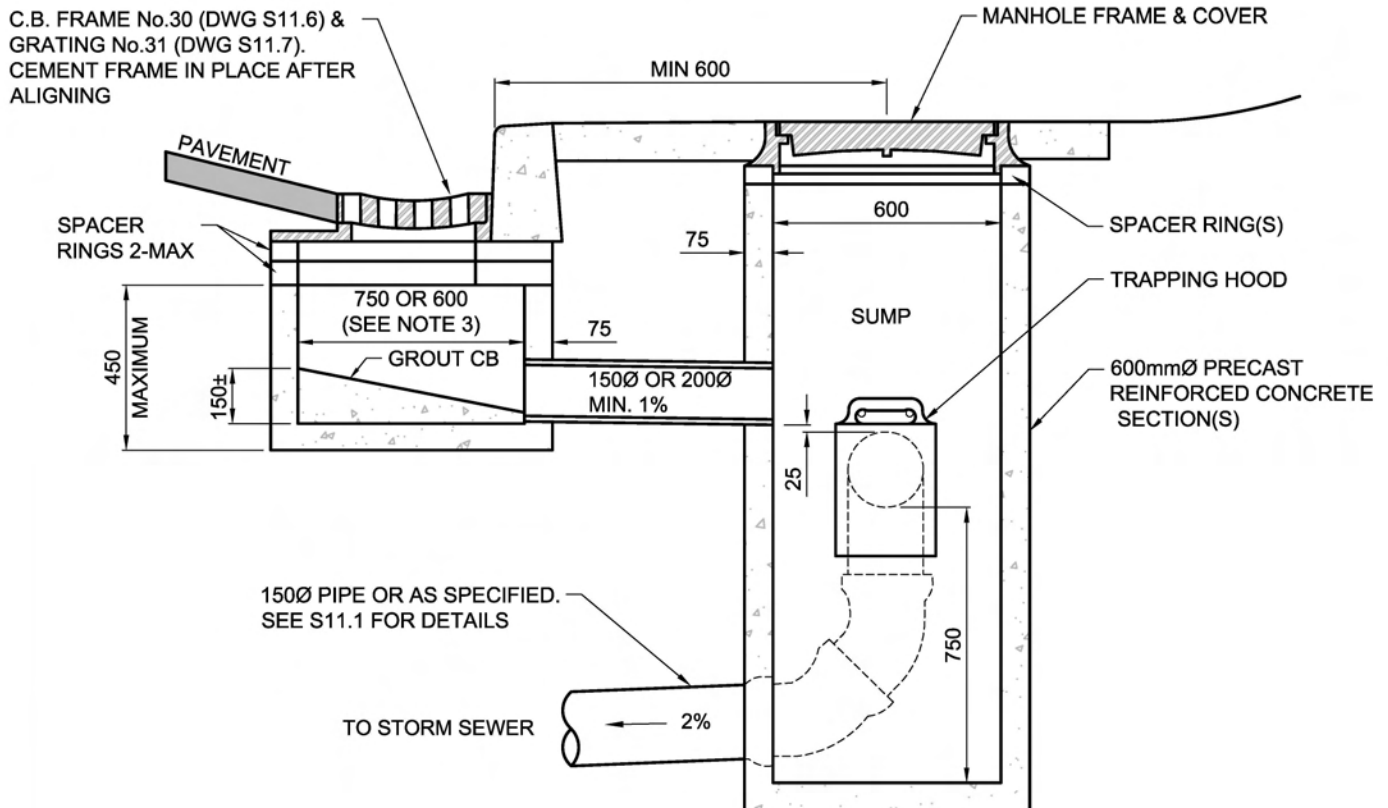
SCALE: N.T.S.

CATCHBASINS
TWIN INLET CATCH BASIN FRAME

ISSUE DATE: SEPTEMBER 2018

APPROVED BY: K. DER

REV. REVISION DATE APPROVED



NOTES:

1. WHEN SUMP IS INSTALLED ROADSIDE TO CATCHBASIN, CONNECTION PIPE FROM CB TO SUMP SHALL BE DUCTILE IRON OR CONCRETE ENCASED.
2. USE 750mm BARREL AT ALL SAG POINTS.
3. EXPANSION JOINT REQUIRED IN CURB AND GUTTER AT MIDDLE OF CB FRAME FOR 600mm BARREL INSTALLATIONS OR 1m EACH SIDE OF FRAME FOR 750mm BARREL INSTALLATIONS.
4. GROUT TO SEAL PIPE OPENING, LIFTING HOLES, TEMPORARY DRAIN HOLE(S), SECTIONS, AND SPACER RINGS, INSIDE AND OUT.
5. ALL DIMENSIONS IN MILLIMETERS.

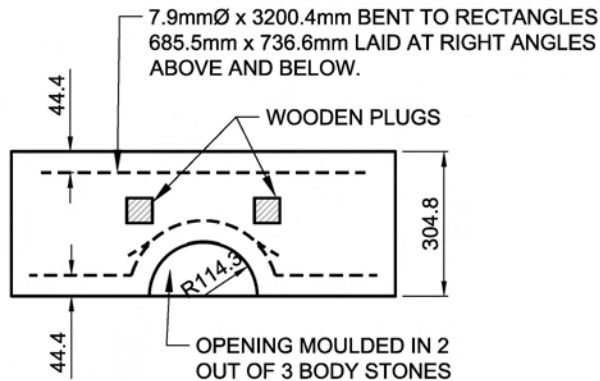
SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

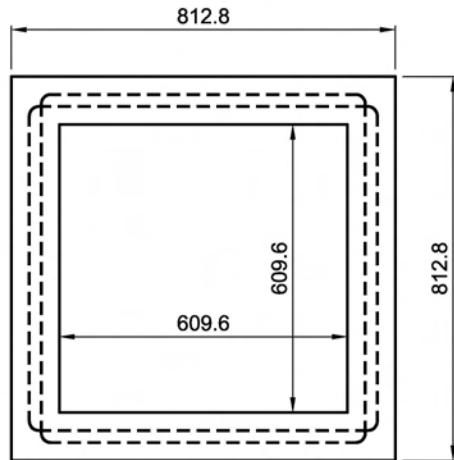
CATCHBASINS
TYPICAL OFFSET SUMP BASIN

ISSUE DATE: SEPTEMBER 2018

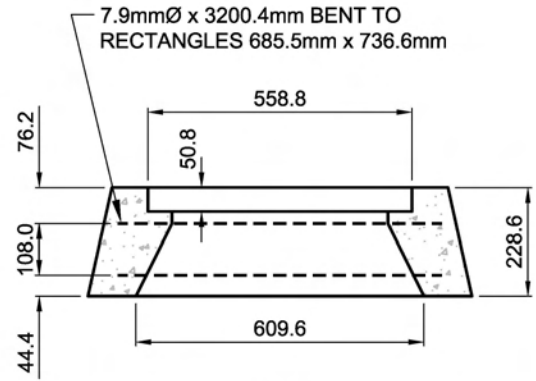
APPROVED BY: K. DER



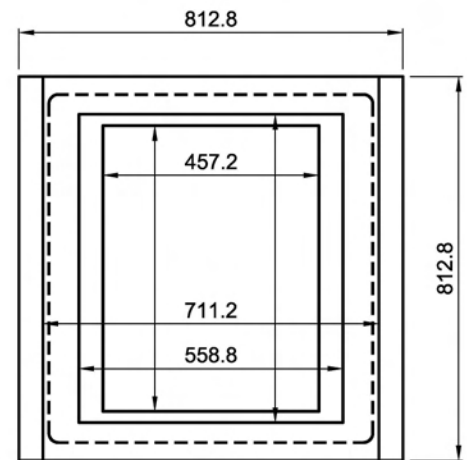
**ELEVATION OF
BODY STONE**



**PLAN OF
BODY STONE**

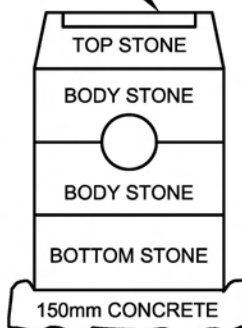


**SECTIONAL ELEVATION OF
TOP STONE**



**PLAN OF
TOP STONE**

GRATING NO. 32
(DWG S11.11)



SKETCH OF ASSEMBLY

DIRECTIONS FOR ASSEMBLY

- POUR A SLAB OF 20MPa CONCRETE 150mm THICK.
- PRESS BOTTOM STONE INTO FRESH CONCRETE.
- PLACE THE OTHER STONE AS SHOWN ON ASSEMBLY SHEET, LAYING UP EACH JOINT WITH A LAYER OF THIN MORTAR.
- CEMENT 150mm SEWER CONNECTION INTO RECESS.
- DRIVE HOOKS INTO WOODEN PLUGS AND HANG C.B. TRAP NO. 1A (DWG S11.12) OVER OUTLET.
- THEN PLACE C.B. GRATING NO. 32 (DWG S11.11) IN POSITION.

NOTE:

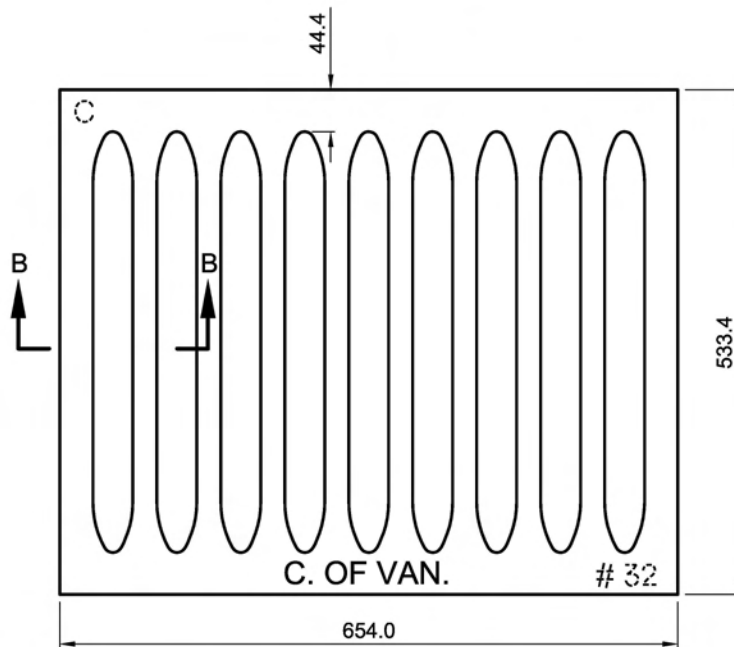
1. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

SCALE: N.T.S.

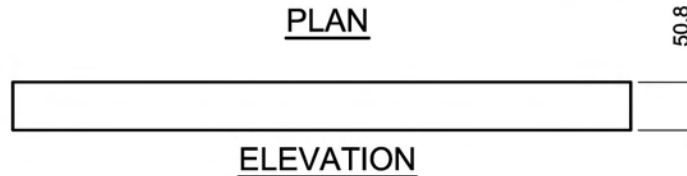
REV.	REVISION DATE	APPROVED

**CATCHBASINS
TEMPORARY SECTIONAL CONCRETE CATCHBASIN**

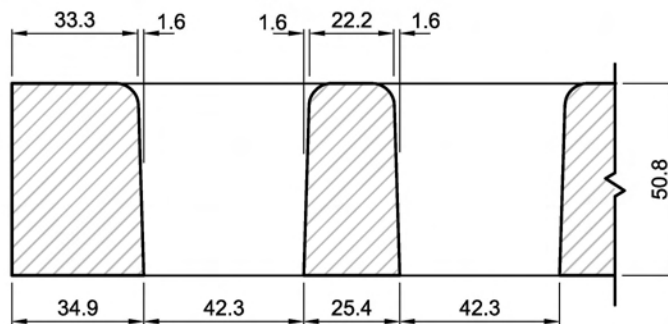
ISSUE DATE: SEPTEMBER 2018
APPROVED BY: K. DER



PLAN



ELEVATION



SECTION B-B

NOTES:

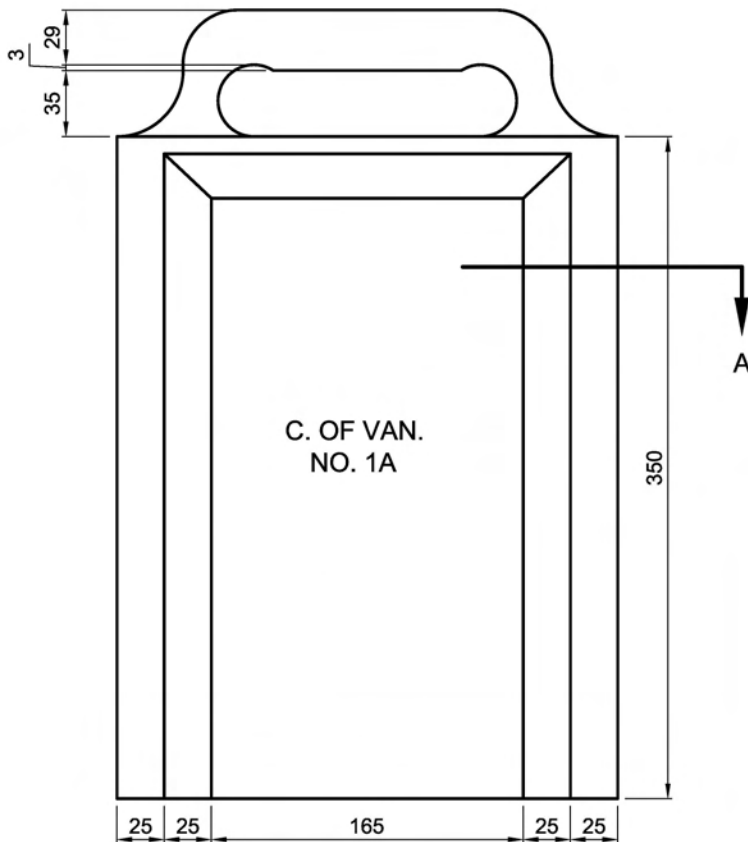
1. THE ACCEPTANCE WEIGHTS OF THESE CASTINGS SHALL BE DETERMINED AT THE BEGINNING OF THE SUPPLY CONTRACT WITH THE WEIGHT OF THE SAMPLE CASTINGS PROVIDED TO THE CITY.
2. MARK 'C' ON UNDERSIDE OF GRATING WHEN MADE OF CAST IRON.
3. MARK 'S' ON UNDERSIDE OF GRATING WHEN MADE OF CAST STEEL.
4. ALSO MARK #32 ON UNDERSIDE OF GRATING AS SHOWN ON PLAN ABOVE. MARK 'C. OF VAN.' TOP.
5. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.
6. THE ACCEPTABLE WEIGHTS OF THESE CASTINGS SHALL BE 65kg (143lbs)

SCALE: N.T.S.

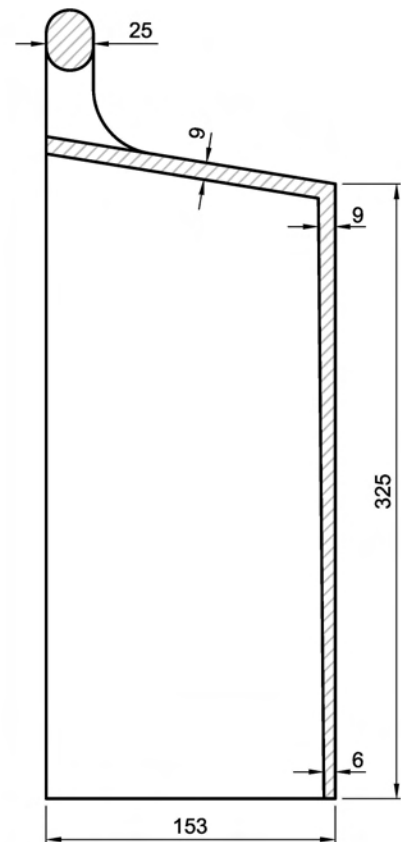
REV.	REVISION DATE	APPROVED

CATCHBASINS
SECTIONAL CONCRETE CATCHBASIN GRATING NO. 32

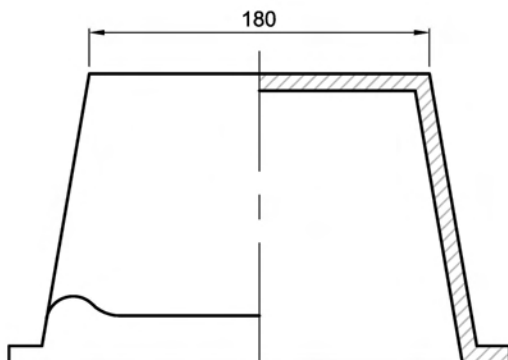
ISSUE DATE: SEPTEMBER 2018
APPROVED BY: K. DER



FRONT ELEVATION



SECTIONAL SIDE
ELEVATION



HALF PLAN

HALF SECTION
AT A

NOTES:

1. ALL IDENTIFICATION MARKS, C. OF VAN. NO. 1A TO BE SUNK IN CASTINGS.
2. THE ACCEPTANCE WEIGHTS OF THESE CASTINGS SHALL BE DETERMINED AT THE BEGINNING OF THE SUPPLY CONTRACT WITH THE WEIGHT OF THE SAMPLE CASTINGS PROVIDED TO THE CITY.
3. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

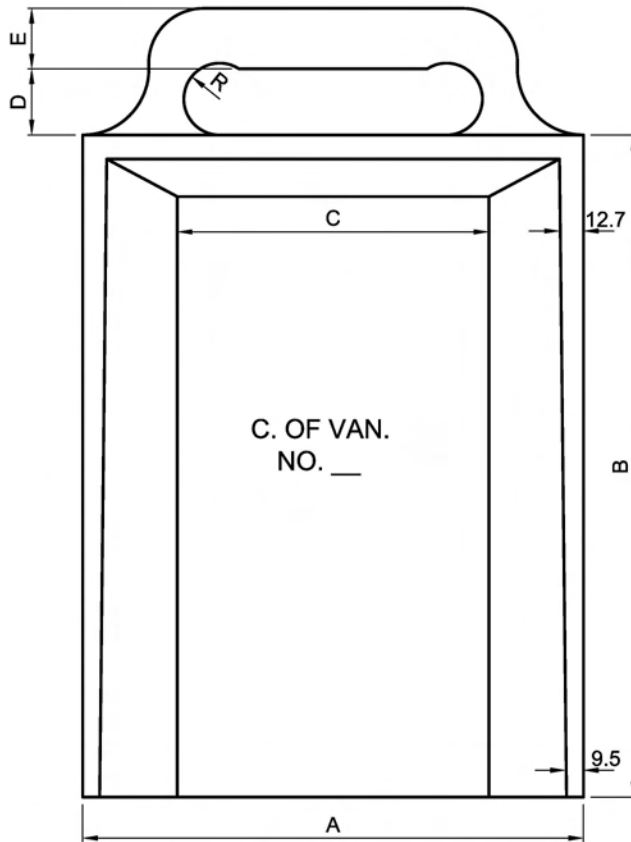
SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

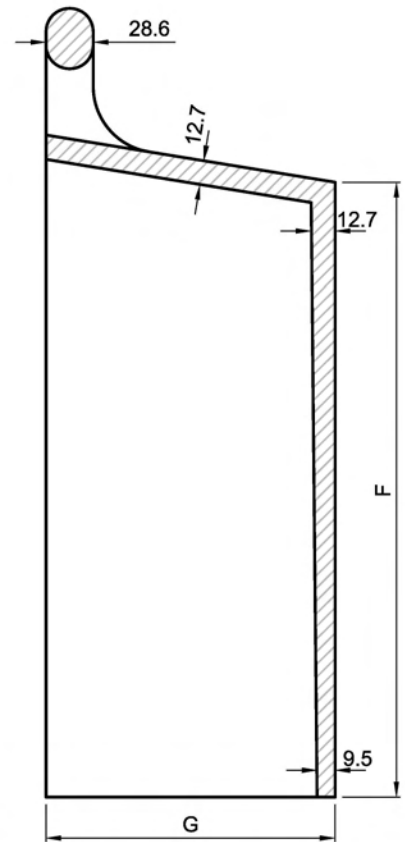
CATCHBASINS
CATCHBASIN TRAPPING HOOD NO. 1A

ISSUE DATE: SEPTEMBER 2018

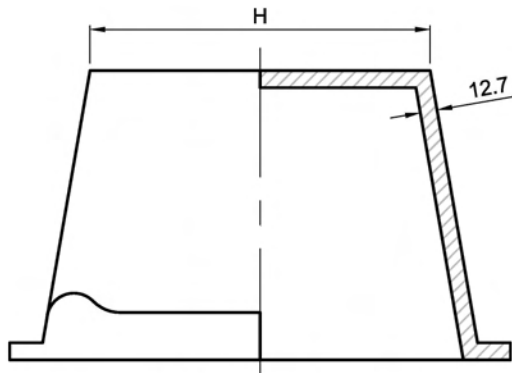
APPROVED BY: K. DER



FRONT ELEVATION



SECTIONAL SIDE ELEVATION



HALF PLAN

HALF SECTION

TYPE	OUTLET	A	B	C	D	E	F	G	H	R
9	203.2 & 254.0	342.9	412.8	190.5	31.8	31.8	368.3	215.9	215.9	17.5
9A	304.8	444.5	533.4	304.8	38.1	38.1	469.9	254.0	317.5	22.2

NOTES:

1. ALL IDENTIFICATION MARKS TO BE SUNK IN CASTING.
2. THE ACCEPTANCE WEIGHTS OF THESE CASTINGS SHALL BE DETERMINED AT THE BEGINNING OF THE SUPPLY CONTRACT WITH THE WEIGHT OF THE SAMPLE CASTINGS PROVIDED TO THE CITY.
3. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

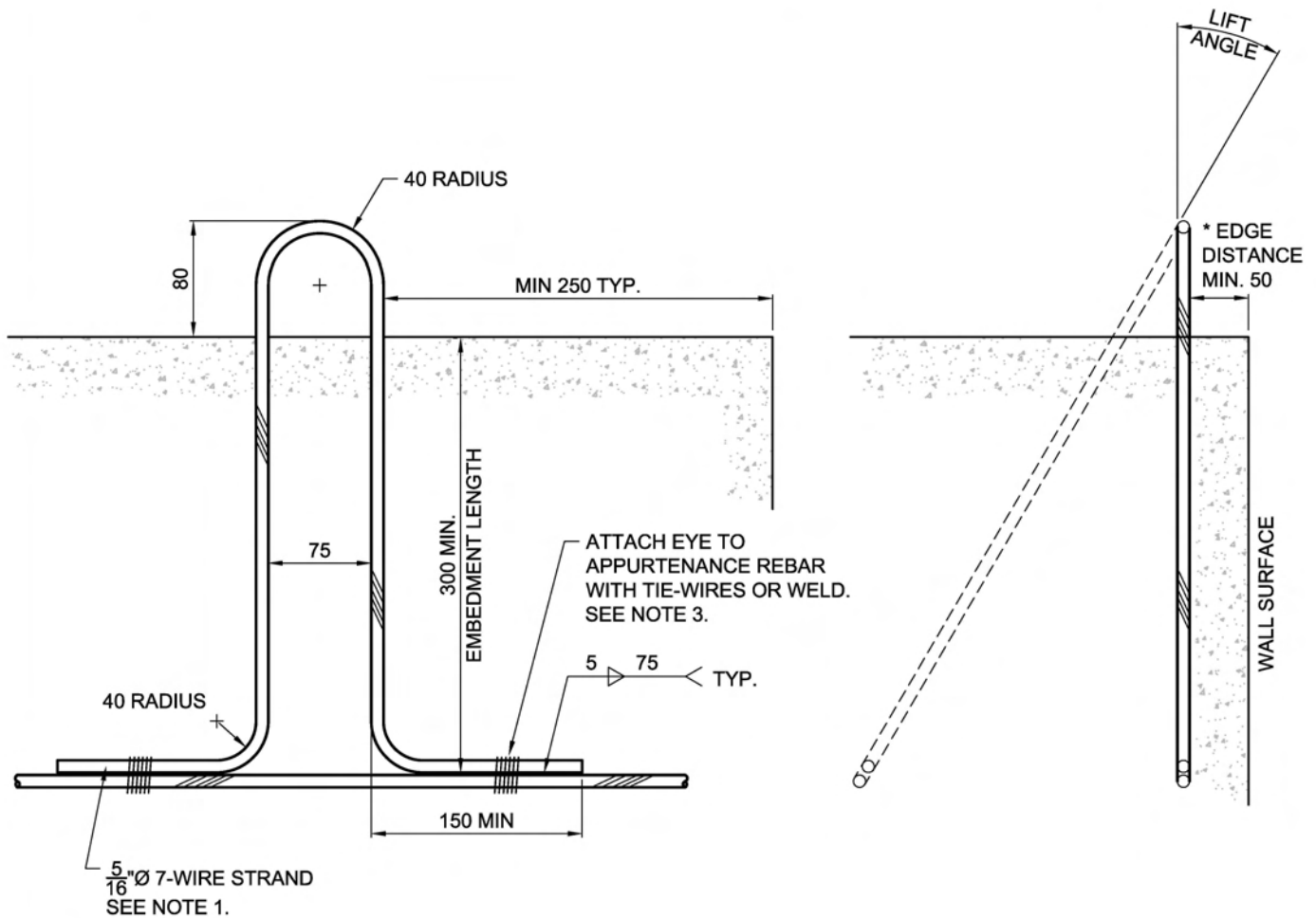
SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

CATCHBASINS
CATCHBASIN TRAPPING HOODS NO. 9 & 9A

ISSUE DATE: SEPTEMBER 2018

APPROVED BY: K. DER



NOTES:

1. FABRICATE EYE FROM $\frac{5}{16}$ " Ø UTILITIES GRADE GALVANIZED STEEL 7-WIRE STRAND MEETING ASTM A 475 (1976).
2. MAXIMUM ALLOWABLE VERTICAL LOAD PER EYE IS 1100 KG (2400 LB) FOR $\frac{5}{16}$ " Ø AND 1800 KG (4000 LB) FOR $\frac{3}{8}$ " Ø STRAND.
3. LIFT ANGLE NOT TO EXCEED 30° MINIMUM EDGE DISTANCE 50mm.
*EYE AND LIFT ANGLE MUST BE PARALLEL TO WALL SURFACE IF EDGE DISTANCE IS LESS THAN 300mm.
4. CONCRETE TO HAVE MINIMUM COMPRESSIVE STRENGTH OF 15 MPa FOR LIFTING.
5. ALL DIMENSIONS IN MILLIMETERS UNLESS NOTED OTHERWISE.

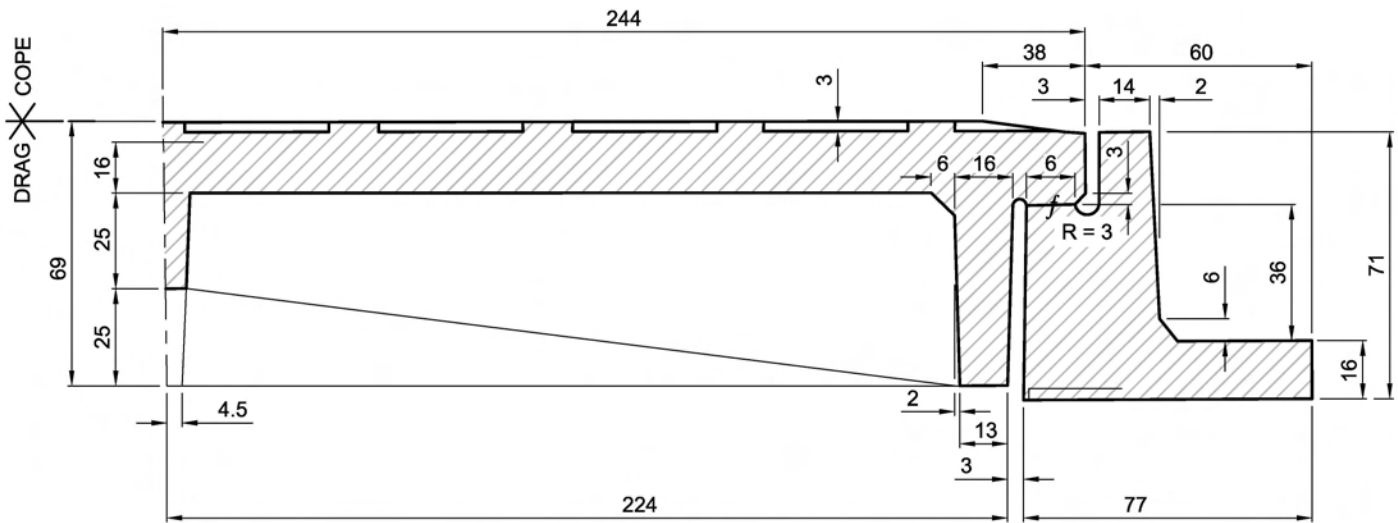
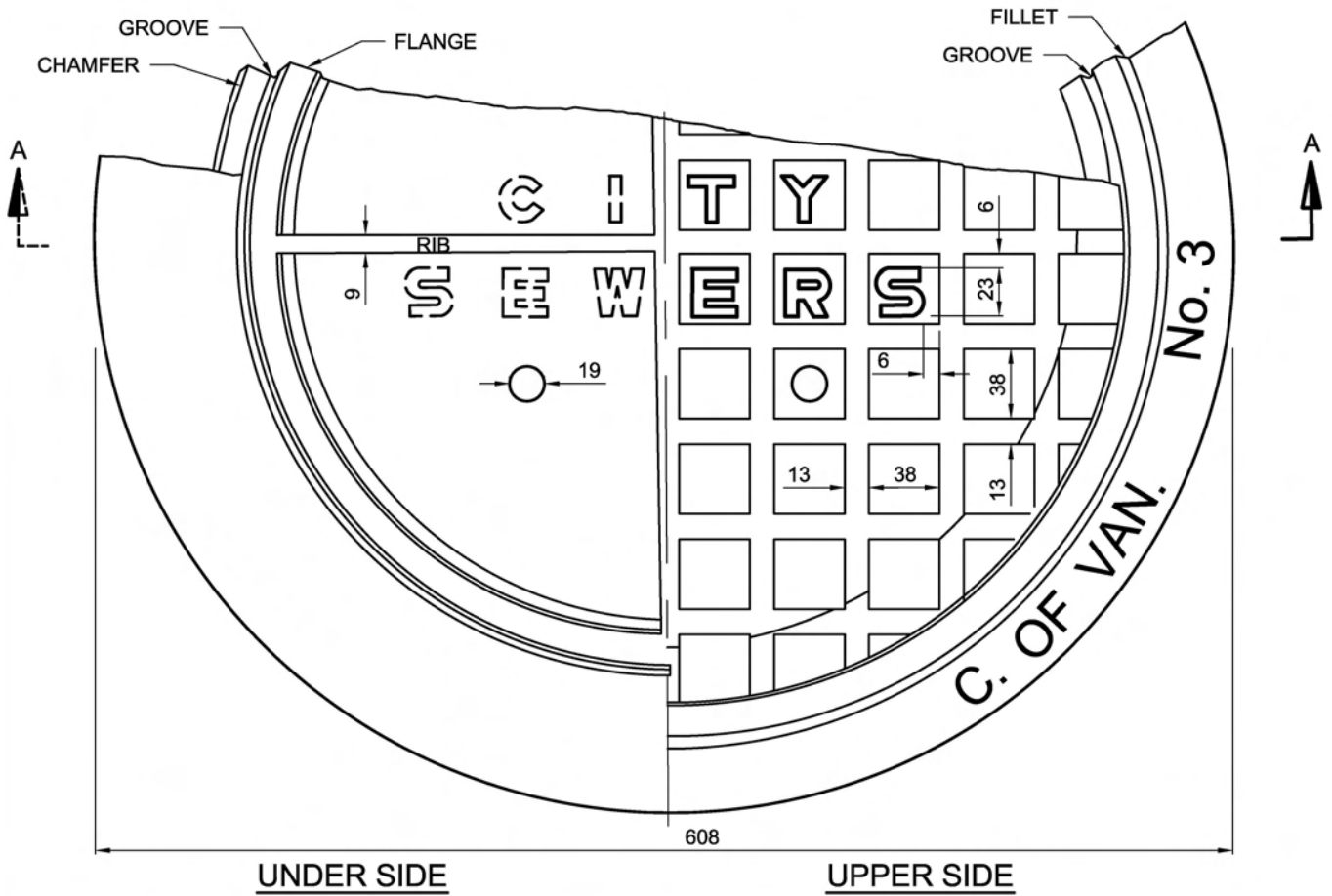
SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

CATCHBASINS
LIFTING EYES

ISSUE DATE: SEPTEMBER 2018

APPROVED BY: K. DER



HALF SECTION A - A

NOTES:

1. (f) INDICATES 1.6mm HAS BEEN ALLOWED ON THE PATTERNS FOR MACHINING MATING PARTS.
2. ALL DIMENSIONS IN MILLIMETERS UNLESS NOTED OTHERWISE.

SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

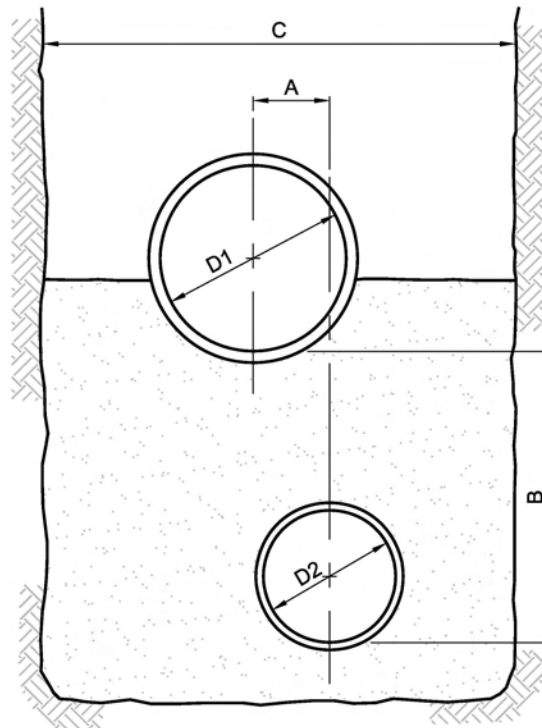
CATCHBASINS
FRAME NO. 3 & COVER NO. 4

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: K. DER

D1	150	200	250	300	375	450	525	600	750	900	1050	1200	1350	1500	1650	1800	
D2	150	150	150	150	150	150	150	150	150								150
A	76.2	76.2	101.6	152.4	171.4	215.9	241.3	304.8	323.8								
B	266.7	266.7	266.7	266.7	349.2	349.2	355.6	362.0	381.0								
D2		200	200	200	200	200	200	200	200	200							200
A		101.6	101.6	127.0	171.4	215.9	241.3	304.8	387.4	463.6							
B		323.8	323.8	330.2	393.7	406.4	406.4	419.1	444.5	444.5							
D2			250	250	250	250	250	250	250	250	250						250
A			152.4	101.6	152.4	152.4	177.8	228.6	304.8	419.1	508.0						
B			381.0	381.0	450.8	463.6	463.6	463.6	489.0	508.0	514.4						
D2			300	300	300	300	300	300	300	300	300	300	300				300
A			152.4	152.4	152.4	152.4	165.1	190.5	279.4	381.0	469.9	546.1	647.7				
B			495.3	495.3	520.7	520.7	520.7	533.4	552.4	584.2	584.2	584.2	546.1				
D2					375	375	375	375	375	375	375	375	375				375
A					228.6	304.8	304.8	381.0	215.9	317.5	406.4	482.6	584.2				
B					660.4	660.4	660.4	692.2	692.2	711.2	711.2	711.2	685.8				
D2						450	450	450	450	450	450	450	450				450
A						304.8	381.0	184.2	266.7	355.6	431.8	482.6					
B						736.6	755.6	781.0	793.8	793.8	793.8	768.4					

LEGEND:

D1 - I.D. OF STORM SEWER
D2 - I.D. OF SANITARY SEWER
A - HORIZONTAL OFFSET.
B - VERTICAL OFFSET
C - TRENCH WIDTH AS PER DWG G4.4



NOTE:

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

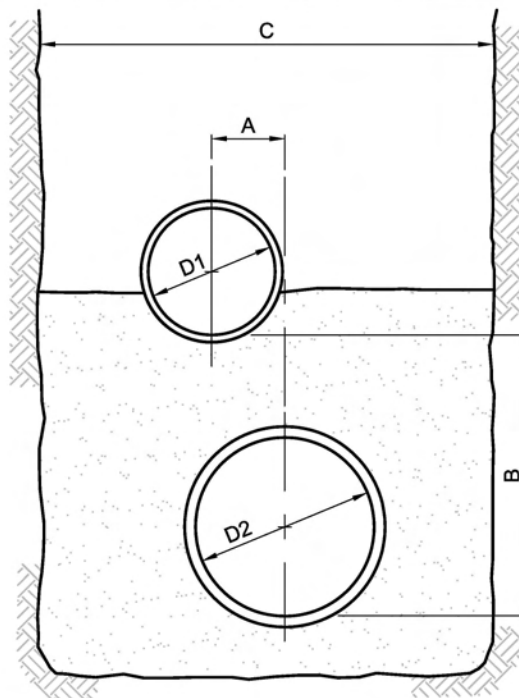
**TWIN SEWERS
VERTICAL SEPARATION**

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: K. DER

D1	150	200	250	300	375	450	525	600	675	750	
D2	150	150	150	150	150	150					150
A	76.2	101.6	101.6	152.4	203.2	304.8					
B	273.0	273.0	273.0	279.4	330.2	355.6					
D2	200	200	200	200	200	200					200
A	101.6	101.6	101.6	101.6	101.6	101.6					
B	323.8	323.8	330.2	330.2	406.4	406.4					
D2	250	250	250	250	250	250					250
A	101.6	101.6	152.4	177.8	203.2	228.6					
B	374.6	374.6	381.0	425.4	450.8	450.8					
D2	300	300	300	300	300	300	300				300
A	101.6	101.6	152.4	152.4	228.6	228.6	228.6				
B	431.8	431.8	444.5	444.5	508.0	520.7	533.4				
D2	375	375	375	375	375	375	375	375			375
A	152.4	152.4	152.4	228.6	228.6	304.8	304.8	381.0			
B	577.8	577.8	577.8	577.8	660.4	660.4	660.4	685.8			
D2	450	450	450	450	450	450	450	450			450
A	152.4	152.4	177.8	228.6	304.8	304.8	304.8	381.0			
B	660.4	660.4	660.4	673.1	736.6	736.6	736.6	755.6			
D2	525	525	525	525	525	525	525	525			525
A	152.4	152.4	203.2	228.6	304.8	304.8	304.8	381.0			
B	736.6	736.6	736.6	755.6	812.8	838.2	838.2	838.2			
D2	600	600	600	600	600	600	600	600			600
A	152.4	177.8	203.2	228.6	381.0	381.0	381.0	457.2			
B	825.5	825.5	838.2	850.9	908.0	908.0	908.0	914.4			
D2	675	675	675	675	675	675	675	675			675
A	228.6	228.6	254.0	254.0	304.8	381.0	381.0	457.2			
B	882.6	908.0	908.0	927.1	990.6	990.6	1016.0	1016.0			
D2	750	750	750	750	750	750	750	750			750
A	228.6	228.6	228.6	304.8	381.0	381.0	381.0	457.2			
B	990.6	990.6	990.6	1016.0	1066.8	1092.2	1092.2	1092.2			

LEGEND:

- D1 - I.D. OF SANITARY SEWER
- D2 - I.D. OF STORM SEWER
- A - HORIZONTAL OFFSET.
- B - VERTICAL OFFSET
- C - TRENCH WIDTH AS PER DWG G4.4



NOTE:

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

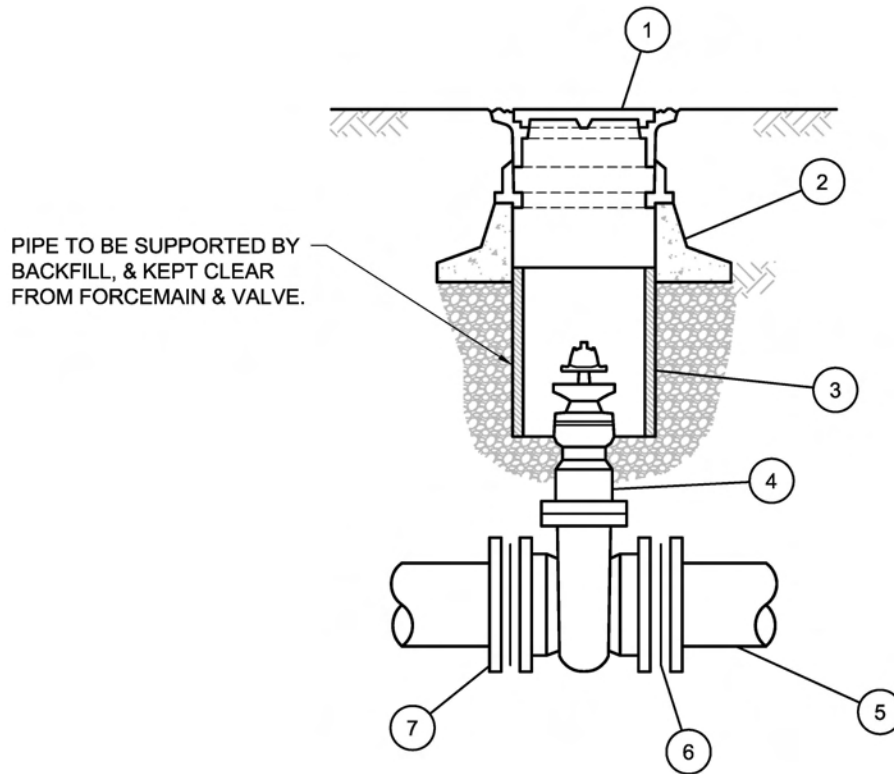
SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

**TWIN SEWERS
VERTICAL SEPARATION**

ISSUE DATE: SEPTEMBER 2018

APPROVED BY: K. DER



NOTES:

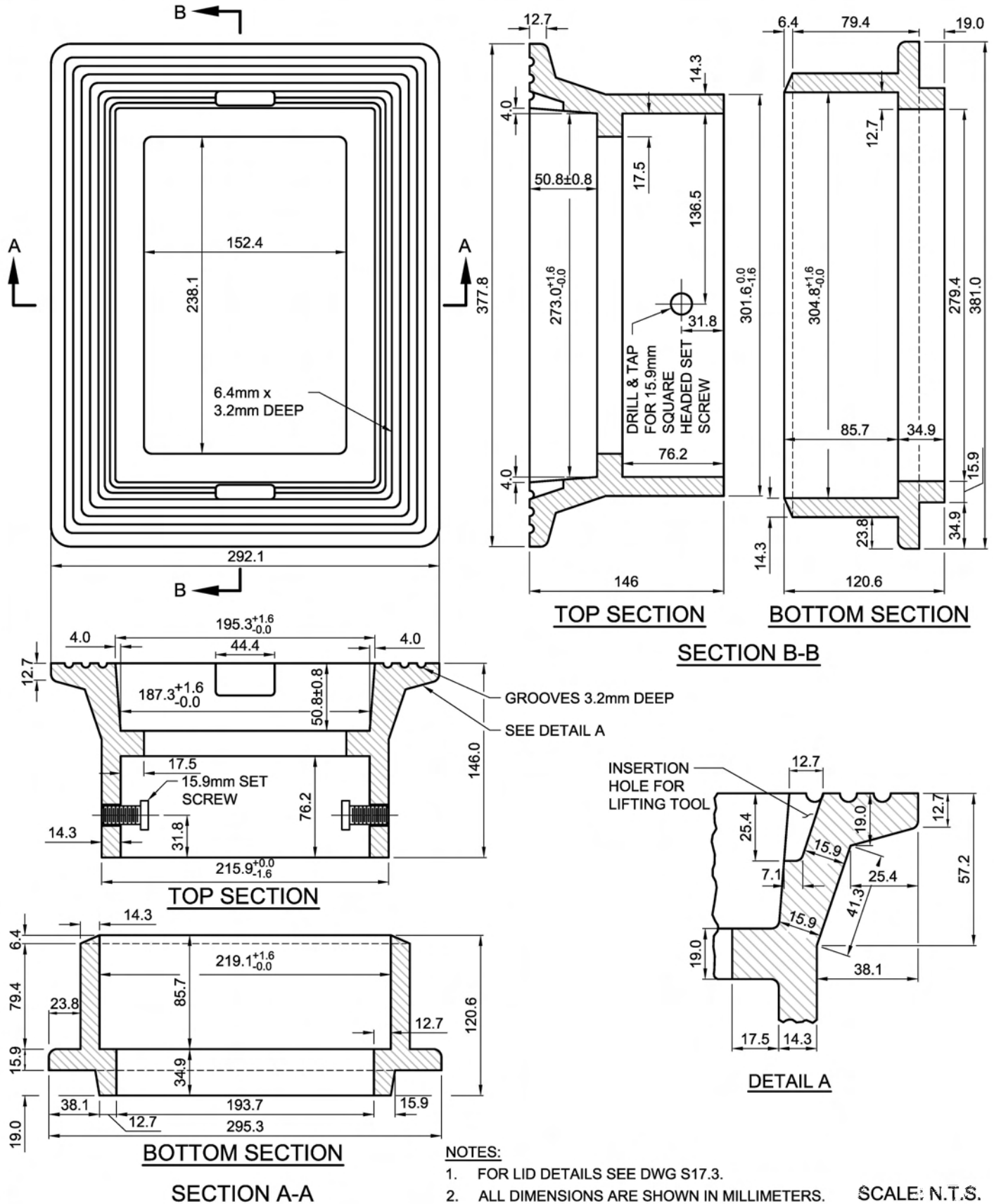
1. CAST IRON TELESCOPIC VALVE BOX, WITH SEWERS LID.
2. PRECAST CONCRETE VALVE BOX BASE.
3. VALVE EXTENSIONS PIPE - 250mm I.D. PVC
4. RESILIENT SEAT GATE VALVE WITH 2" SQ. NUT OPERATOR OR EQUIVALENT PRODUCTS APPROVED BY CITY ENGINEER.
FOR 75 DIA. AND 100 DIA. - CLOW FIG. 6102 FLG.xFLG. OR APPROVED EQUAL.
FOR 150 DIA. AND UP - MUELLER FIG. A-2360 - 40+ PUSH ON x PUSH ON, SIZE AS SHOWN ON DRAWING.
5. PVC PIPE
FOR 75 DIA. AND 100 DIA. - SERIES 200, SDR 21 SOLVENT WELD.
FOR 150 DIA. AND UP - AWWA C-900, DR 18, CLASS 150 - SIZE AS SHOWN ON DRAWING.
6. 3mm ($\frac{1}{8}$ ") THICK FULL FACE NEOPRENE GASKET.
7. FOR 75 DIA. AND 100 DIA. - PVC SOLVENT WELD FLANGE 865 kPa (125 lbs) RATING OR EQUIVALENT PRODUCTS APPROVED BY THE CITY ENGINEER.
FOR 150 DIA. AND UP - UNIFLANGE SERIES 1300 JOINT RESTRAINT (IF REQUIRED BY THE CITY ENGINEER) OR EQUIVALENT PRODUCTS APPROVED BY THE CITY ENGINEER.
8. BOLTS AND NUTS - SIZE AND QUANTITY AS REQUIRED.

SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

**FORCEMAINS
INLINE VALVE**

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: K. DER

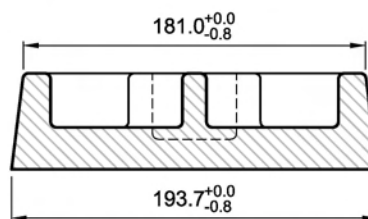


REV.	REVISION DATE	APPROVED

FORCEMAINS
VALVE BOX

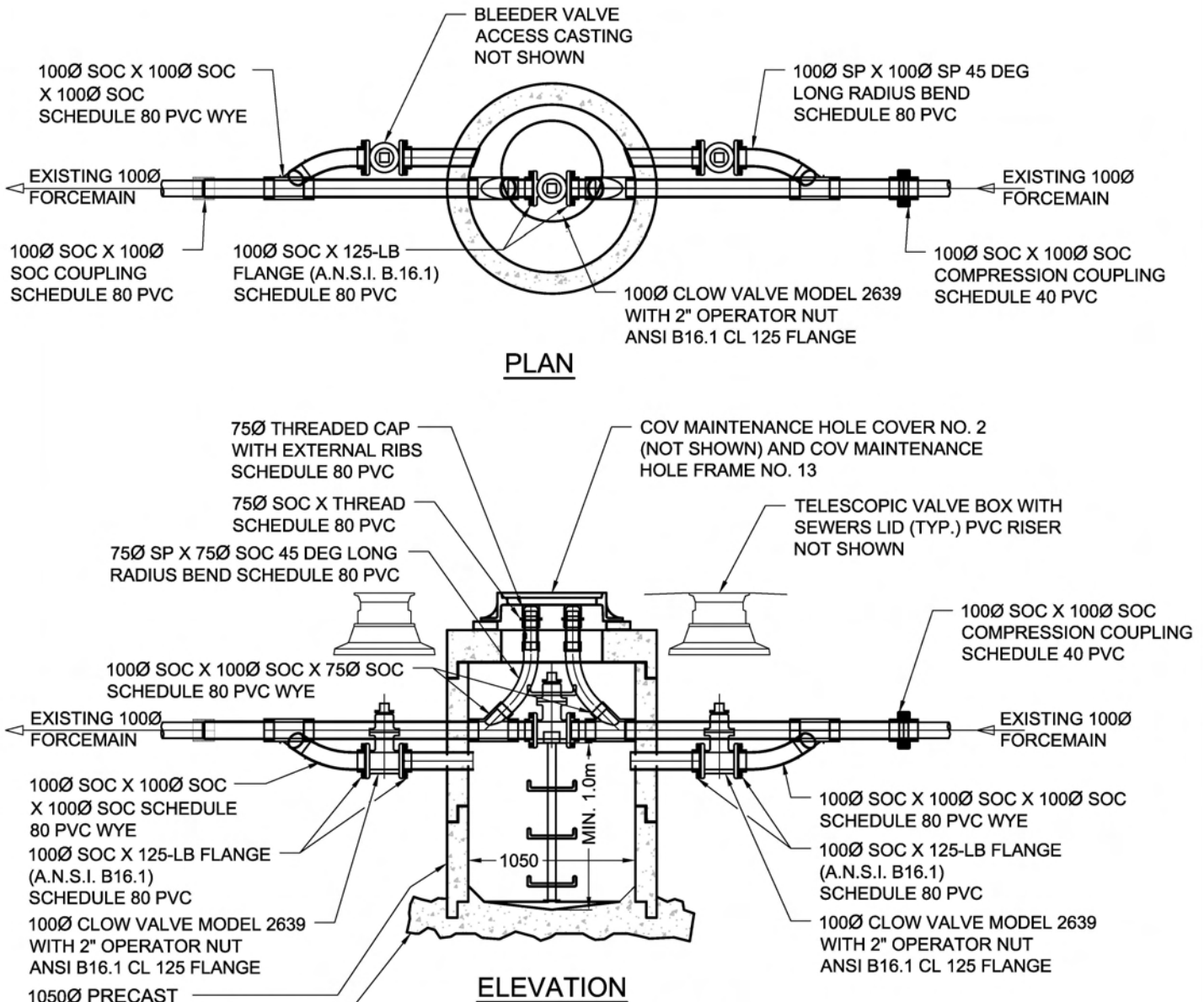
ISSUE DATE: SEPTEMBER 2018

APPROVED BY: K. DER



SCALE: N.T.S.

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: K. DER



NOTES:

1. ALL OTHER PIPES AND BENDS WHICH ARE NOT LABELLED ARE SCHEDULE 80 PVC
2. CLEAN-OUT RISER PIPES NOT SHOWN FOR CLARITY
3. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

INSTRUCTIONS FOR CLEAN-OUT OPERATION WITH FLUSHER TRUCK:

1. REMOVE ANY STANDING WATER FROM CHAMBER.
2. CLOSE THE 75mm LINE VALVE (2" NUT) INSIDE THE CHAMBER.
3. OPEN THE 100mm FORCEMAIN BLEEDER VALVE OUTSIDE OF THE CHAMBER TOWARDS THE DIRECTION TO BE CLEANED. SEWAGE WITHIN THE FORCEMAIN WILL BE DIRECTED INTO CHAMBER FOR REMOVAL WITH THE FLUSHER TRUCK.
4. ONCE FORCEMAIN PRESSURE IS RELIEVED THE CORRESPONDING THREADED CAP MAY BE REMOVED FOR ACCESS TO THE FORCEMAIN FOR THE FLUSHER TRUCK CLEANING HOSE. POSITION TRUCK SUCH THAT CLEANING HOSE GOES STRAIGHT DOWN INTO CLEANING PORT TO AVOID UNNECESSARY FORCES ON THE PVC PIPING.
5. FLUSH FORCEMAIN, VACUUMING DOWN SEWAGE LEVEL IN THE CHAMBER AS NEEDED.
6. FOLLOWING FORCEMAIN CLEANING, REINSTATE NORMAL FORCEMAIN OPERATION BY FIRMLY RE-INSTALLING THE CAP ON THE CLEANING PORT, CLOSING THE BLEED VALVE, AND OPENING THE MAIN LINE VALVE.
7. VACUUM ANY REMAINING SEWAGE FROM THE CHAMBER AND REPLACE MAINTENANCE HOLE COVER.
8. REFILLING OF THE FORCEMAIN IS NOT NECESSARY.

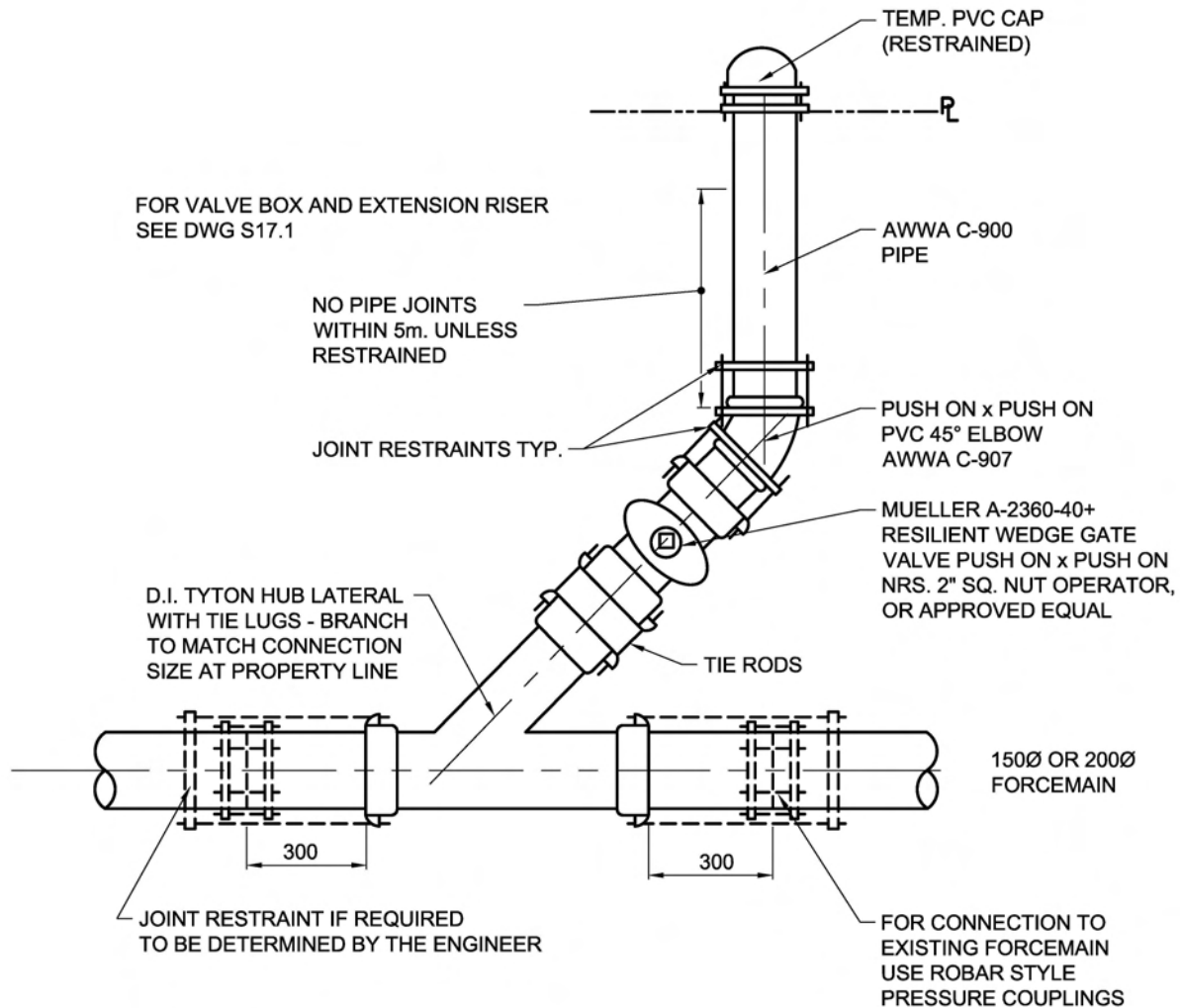
SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

**FORCEMAINS
CLEANOUT MAINTENANCE HOLE**

ISSUE DATE: SEPTEMBER 2018

APPROVED BY: K. DER



NOTES:

1. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

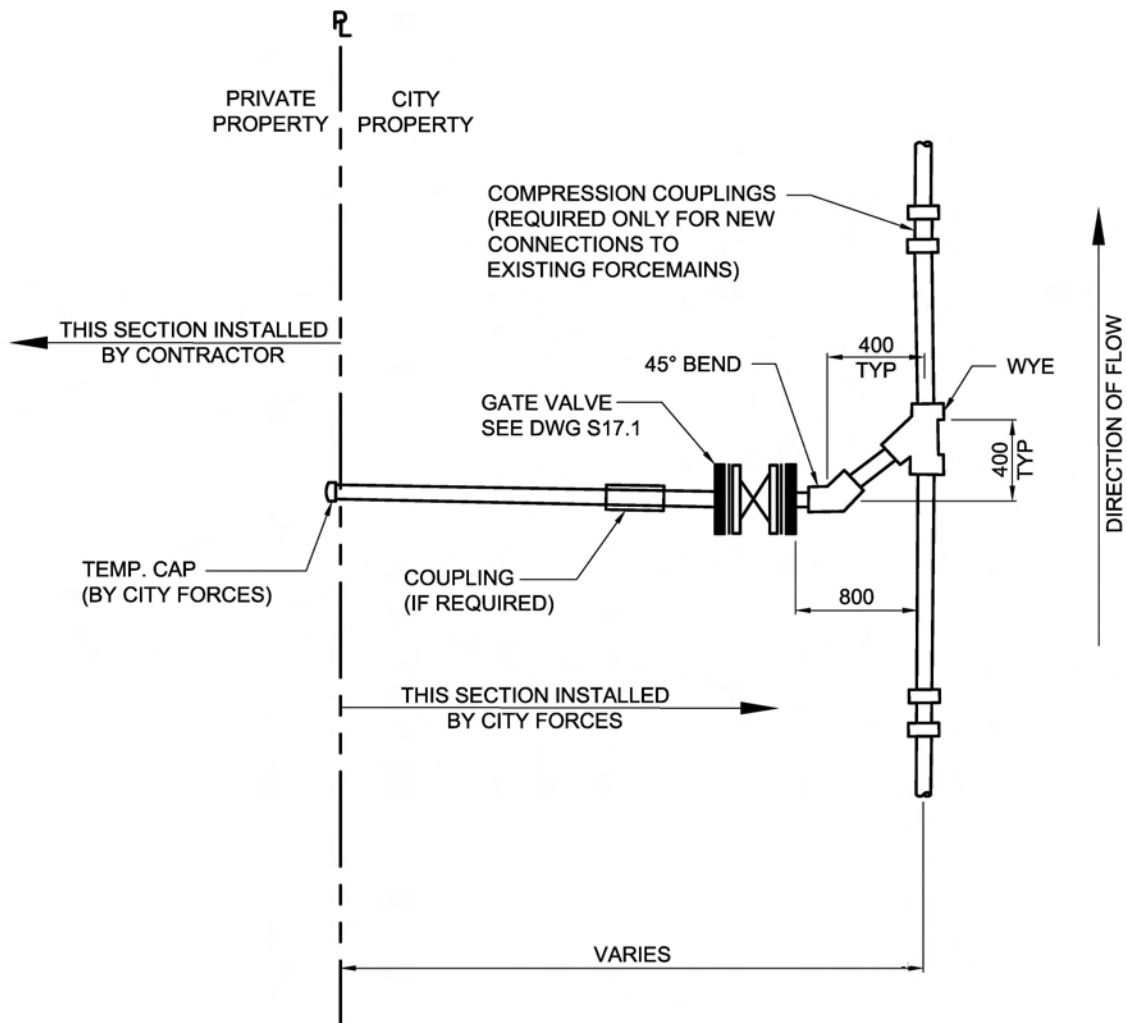
SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

FORCEMAINS
IN-LINE CONNECTION TO 150mm & 200mm FORCEMAINS

ISSUE DATE: SEPTEMBER 2018

APPROVED BY: K. DER



NOTE:

1. ALL P.V.C. ARE TO BE SCH.80 SOLVENT WELD
2. ALL DIMENSIONS IN MILLIMETERS UNLESS STATED OTHERWISE.

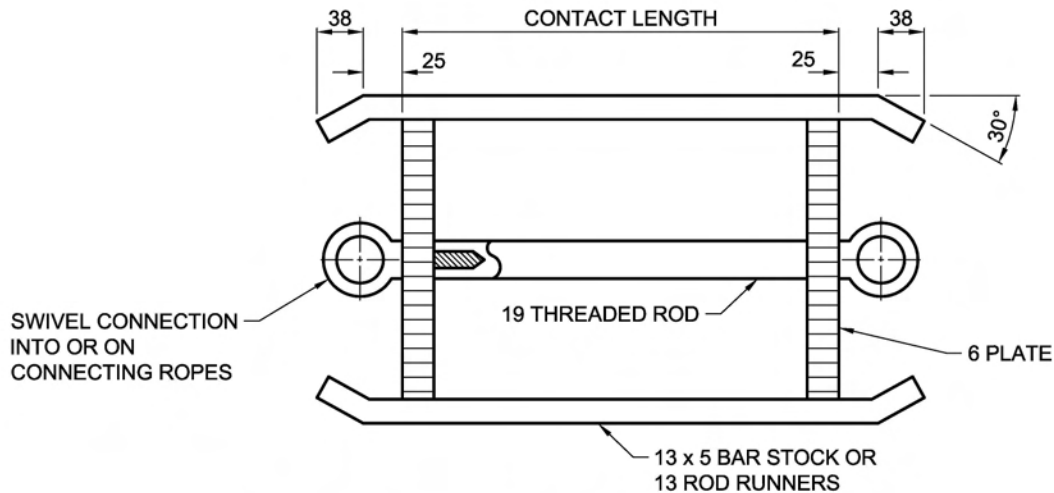
SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

FORCEMAINS
CONNECTION DETAILS FOR 75mm & 100mm FORCEMAINS

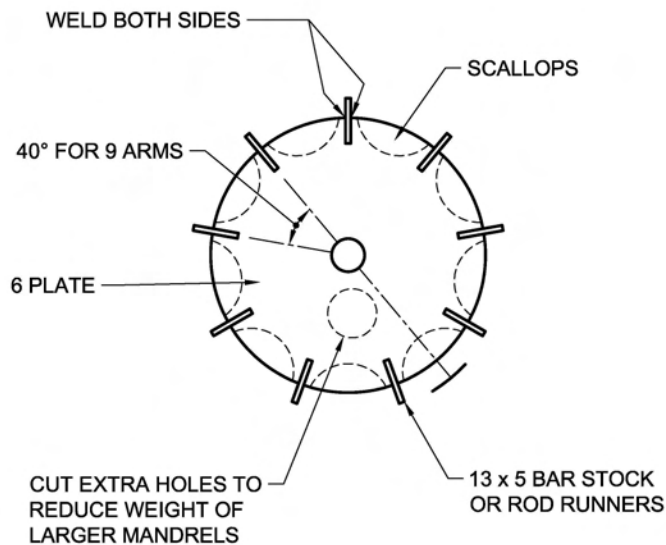
ISSUE DATE: SEPTEMBER 2018

APPROVED BY: K. DER

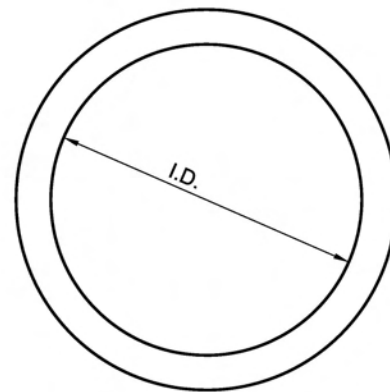


LONGITUDINAL SECTION OF MANDREL

INTERNAL DIAMETER (ID)=
COMPUTED DEFLECTED
DIAMETER ± 0.1 MILLIMETRE



TRANSVERSE SECTION OF MANDREL



END VIEW OF
PROVING RING

NOTE:

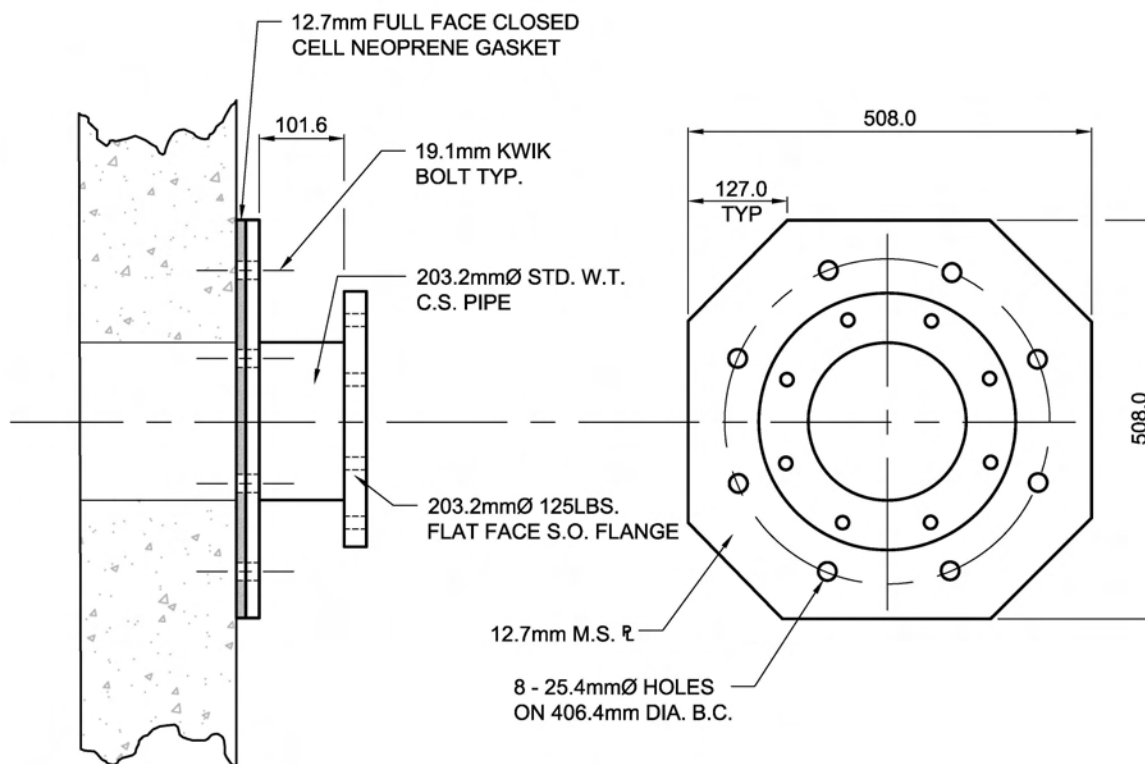
1. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

SCALE: N.T.S.

REV.	REVISION DATE	APPROVED

INSPECTION
MANDREL & PROVING RING

ISSUE DATE: SEPTEMBER 2018
APPROVED BY: K. DER



COAL TAR COAT

NOTE:

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS.

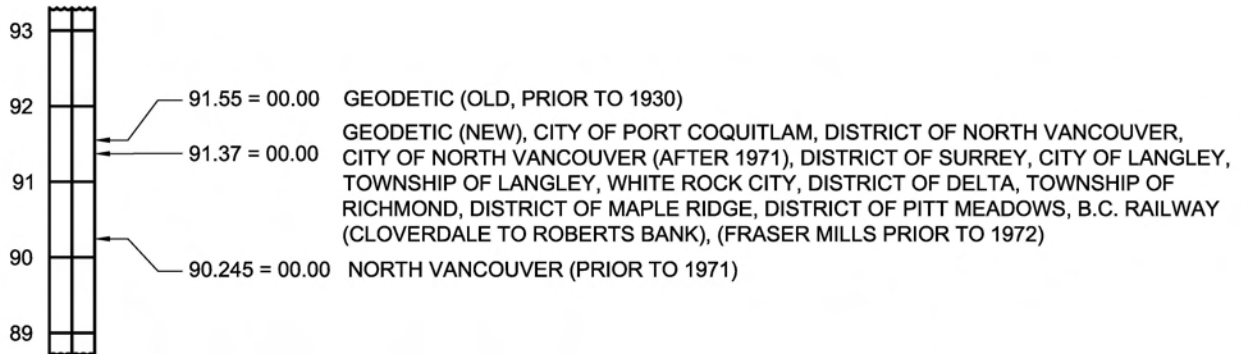
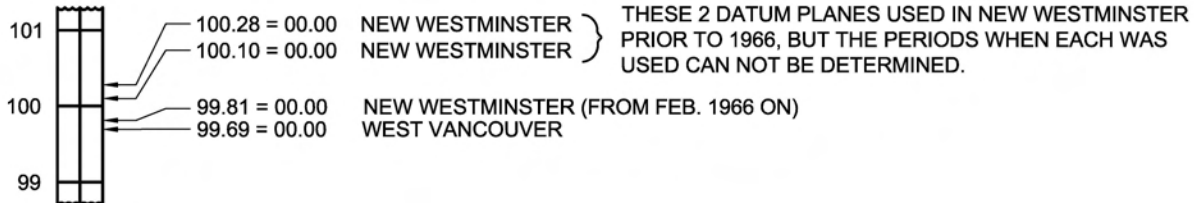
SCALE: N.T.S.

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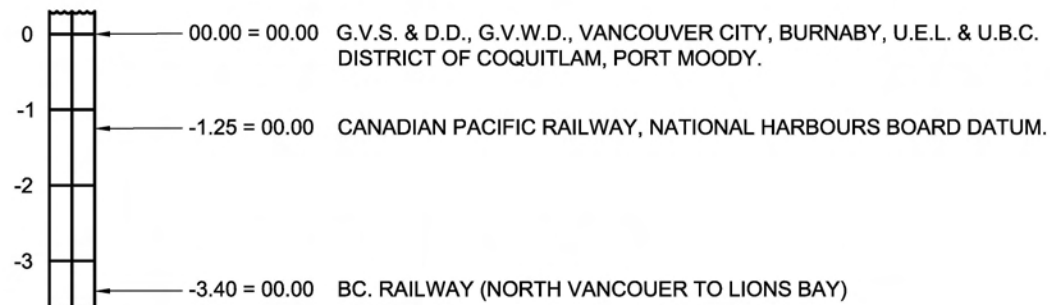
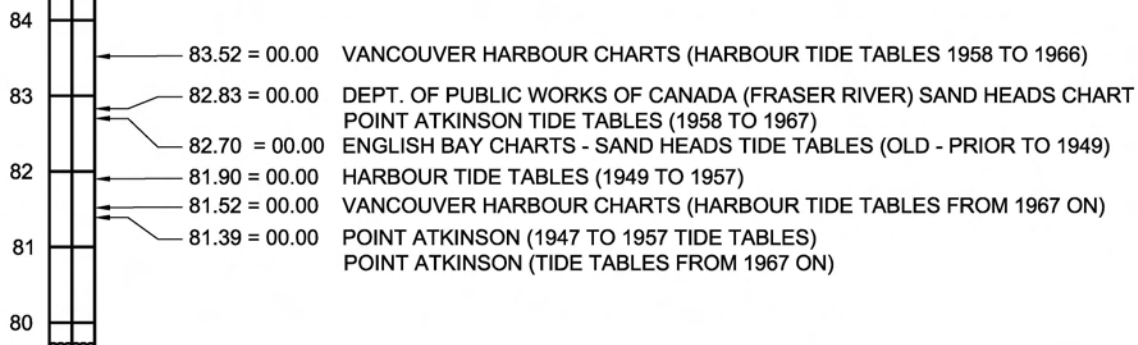
WET TAPPING
NOZZLE FOR WET TAPPING METRO VAN. INTERCEPTOR

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ELEVATION IN FEET



AS OF MAY, 1978 - CITY OF VANCOUVER IS ON METRIC - GEODETIC DATUM, e.g. IMPERIAL ELEV X 0.3048 - 27.85 m = GEODETIC ELEVATION.



SCALE: N.T.S.

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DATUM PLANES
HISTORIC CITY OF VANCOUVER DATUM PLANES

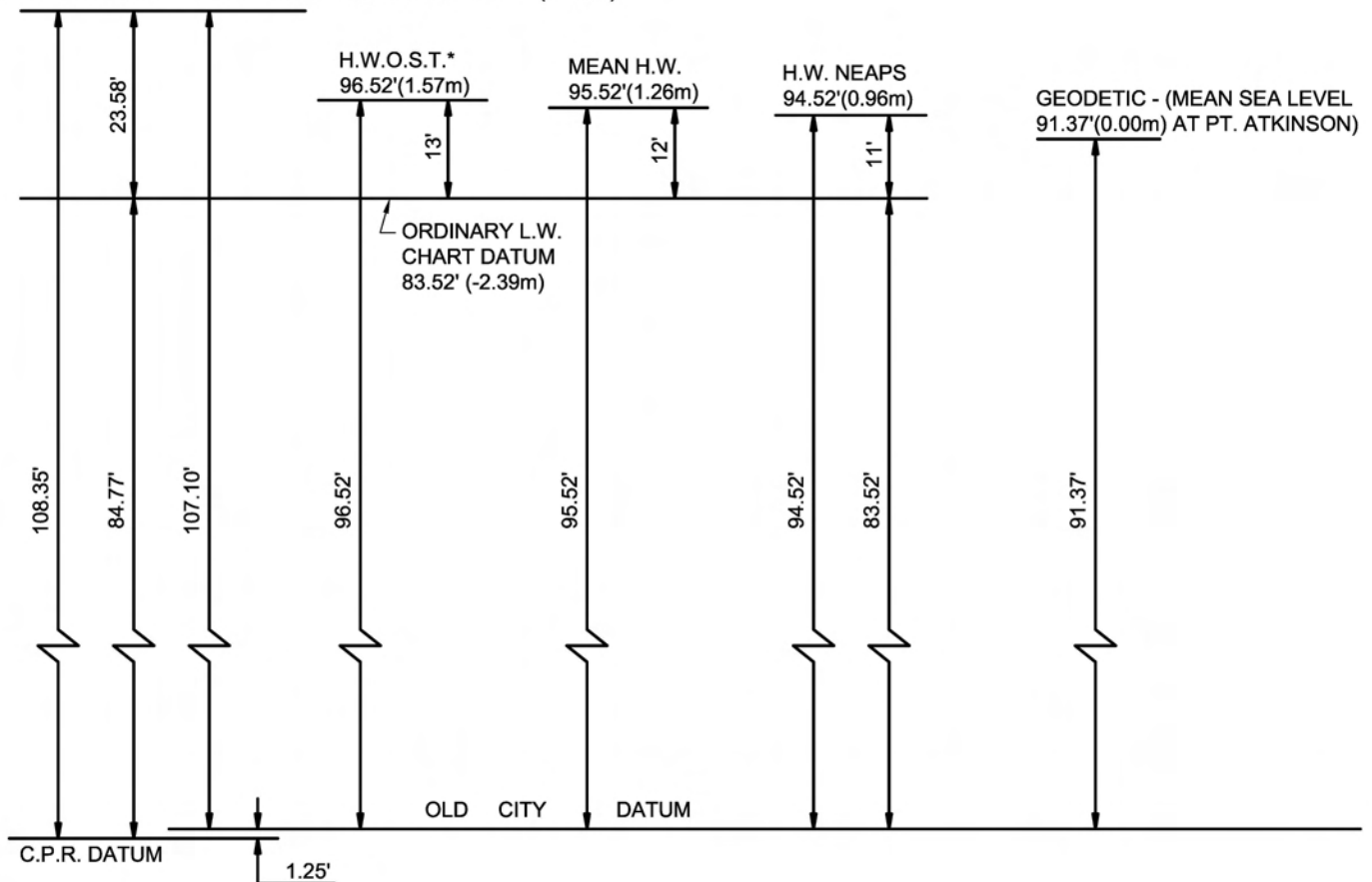
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DATUM PLANES RELATED TO MEAN SEA LEVEL (0.00 GEOGETIC DATUM)

FEET ABOVE CITY DATUM

91.370 (0.000 m)	CITY OF VANCOUVER, MEAN SEA LEVEL, OUTSIDE VAN. HARBOUR
91.554 (0.056 m)	CITY OF VANCOUVER, MEAN SEA LEVEL, VANCOUVER HARBOUR
102.200 (3.301 m)	FLOOD PLAIN
96.520 (1.570 m)	AVERAGE HIGH WATER MARK, VANCOUVER HARBOUR
94.942 (1.089 m)	AVERAGE HIGH WATER MARK, OUTSIDE VANCOUVER HARBOUR
83.520 (-2.393 m)	ORDINARY LOW WATER MARK, VANCOUVER HARBOUR
82.692 (-2.645 m)	ORDINARY LOW WATER MARK, OUTSIDE VANCOUVER HARBOUR
81.920 (-2.880 m)	TIDE TABLE ZERO, VANCOUVER HARBOUR (FROM 1949)
81.392 (-3.041 m)	TIDE TABLE ZERO, OUTSIDE HARBOUR (FROM 1949)

C.P.R. BENCH MARK ON STATION DOORSTEP 107.10' (4.79 m)



*H.W.O.S.T.= HIGH WATER ORDINARY SPRING TIDE.
REF. DRAWINGS LE 915 A & LE 915 B

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DATUM PLANES
CITY OF VANCOUVER DATUM PLANES

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