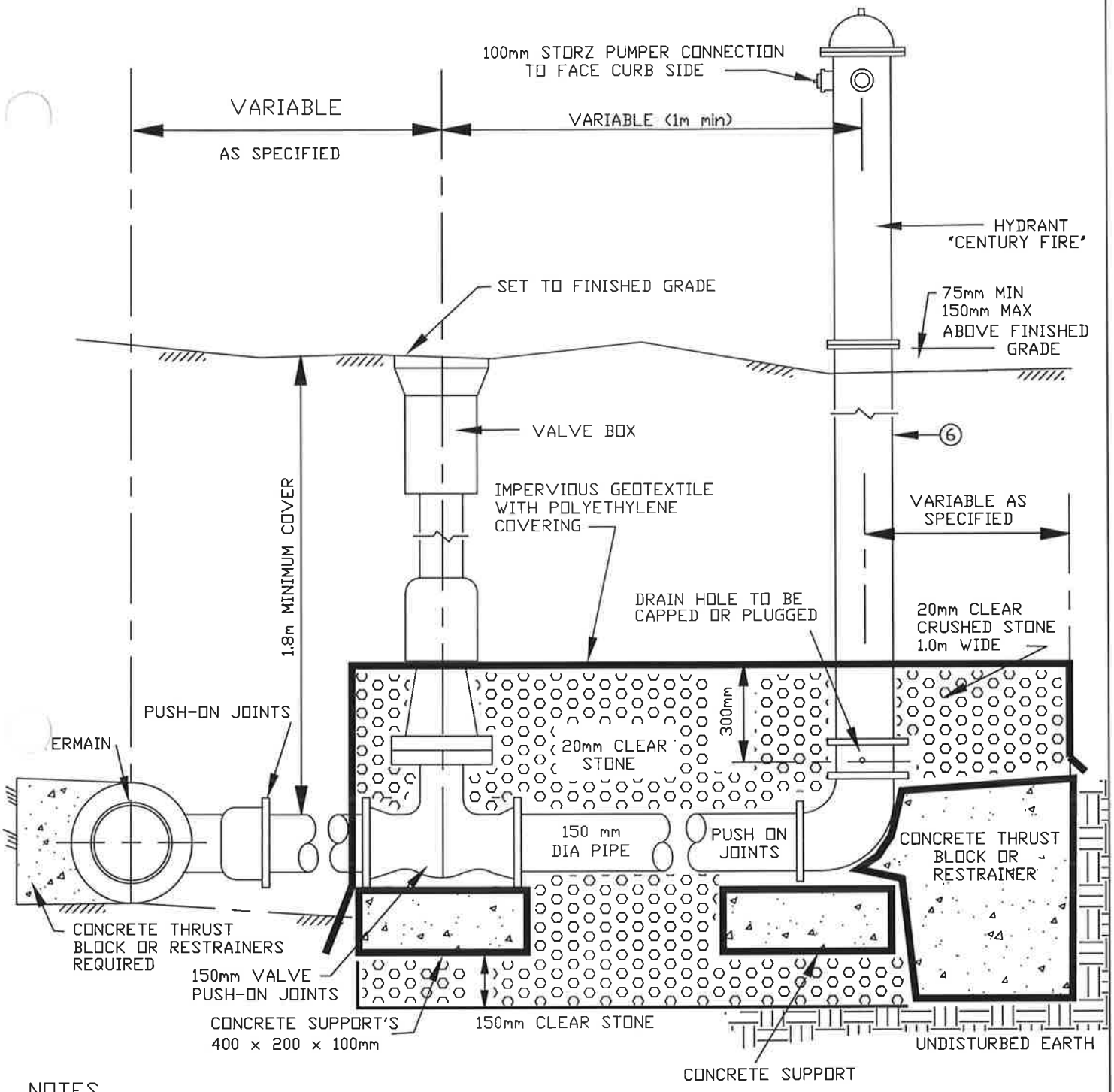
# DIVISION 5.0
# CITY OF SARNIA
# STANDARD
# DRAWINGS

# 2020

## STANDARD DRAWINGS

| # | Drawing # | Revision Detail | Drawing Description |
|---|---|---|---|
| | 87-SF | | Sewer Lateral Drop Pipe |
| | 95-SF | | Hydrant Installation |
| | 100-SF | | Standard Residential Meter Pit |
| | | | |
| | 101-SF | | Water Chamber For Water Meters Pressure Varying Mains |
| | 102-SF | | Pump Station No. 1 Modification for Muffin Monster |
| | 106-SF | | Typical 50mm Watermain Blowoff |
| | 107-SF | | Water Distribution System |
| | 108-F | | Standard Curb Cuts for Residential Driveways |
| | 108-SF | | Granular Foundations – Storm and Sanitary Main Line and Service Laterals Trenches |
| | 109-F | Updated | Lot Servicing |
| | 110-F | | Rear Lot Catch Basin Detail |
| | 112-F | | Concrete Sidewalk |
| | 112-G | | Christina Street Concrete Sidewalk |
| | 112-SF | | Granular Foundations for Watermain and Water Service Trenches |
| | 113-SF | | Multi Use Trail Cross Section |
| | 113-SF-1 | | Fence Detail for Multi Use Trail |
| | 114-F | | Utility Location Local Road 20m Road Allowance |
| | 114-AF | | Utility Location Local Road 20m Road Allowance |
| | 115-SF | | Standard Meter Pit |
| | 119-F | | Alternate Detail For Combined Sidewalk - Curb and Gutter |
| | 120-F | | Driveway Culvert Cross Section |
| | 122-F | | Urban Industrial Commercial and Apartment Entrance |
| | 128-F | | Backyard Dry Well Installation |
| | 130-F | | Sample Lot Grading Plan |
| | 134-F | | Standard Location For Water Valves at Intersections |
| | 136-F | | Project Signboard |
| | 137-F | | Typical Service Entrances |
| | 138-F | | Insulation of Shallow Mains and Offsets |

| | | | |
|---|---|---|---|
| | 150-F | | Typical Temporary Water Service Blow Off Installation (Copper only) |
| | 150-G | | Typical Temporary Water Service Blow Off Installation |
| | 151-F | | Proposed Orifice Control Plate |
| | 152-F | | Street Name Sign Template |
| | 153-F | | Signalized Intersection Configurations of Pedestrian Crossing |
| | 154-F | | Location of Dropped Curbs at Controlled Intersections |
| | 155-F | | Tactile Walking Surface Indicator and Depressed Curb Detail |
| | 160 | | Typical Subdrain Detail |
| | 1882-S | | Extension Shute for Catchbasins |
| | 2064-S | | Standard Timber Markers for House Connections |
| | 2071-S1 | | Storm Subdrain Pipe |
| | 2485 | | Typical Wheelchair Ramps in Sidewalk Separate |
| | 2486 | | Typical Wheelchair Ramp in Sidewalk Adjacent to |
| | 2500 | | PVC Pipe Thrust Restraints |
| | 2600 | | Temporary Water Supply Detail |
| | 2700 | New | Sanitary Service Cleanout w/ 4m Extension |
| | 2800 | New | Temporary Steel Plate |
| | 3000 | New | 1.5m Chainlink Fence |




## NOTES

1. ALL CONCRETE THRUST BLOCKS TO BE POURED AGAINST UNDISTURBED GROUND AS PER OPSD 1103.02
2. POLYETHYLENE BOND BREAKER TO BE USED BETWEEN CONCRETE AND FITTINGS
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN
4. HYDRANT DRAIN HOLES ARE TO BE CAPPED OR PLUGGED
5. HYDRANTS SHALL BE A MIN. OF 1.98m LONG FROM THE SPRING LINE OF THE HYDRANT LEAD TO THE BREAK AWAY FLANGE UNLESS OTHERWISE REQUIRED.
6. PETROLATUM COATED AS PER ITEM #15 IN WATER MAIN TERIAL AND ITEM #1 IN GENERAL PROVISIONS
   UPPER BARREL TO BE PAINTED AS PER ITEM #9 IN WATER MAIN METHODS.
8. FIRE HYDRANTS FLOW TESTING AS PER WATERMAIN TESTING PROCEDURES - ITEM #9

| | | | |
|---|---|---|---|
| REV 9 | REVISED FOR 2018 SPEC. | 01/2018 | BL |
| REV 8 | REVISED FOR 2016 SPEC. | 01/2016 | DD |
| REV 7 | FIXED DIM , ADDED NOTES 6-9 | 05/2014 | E.C. |

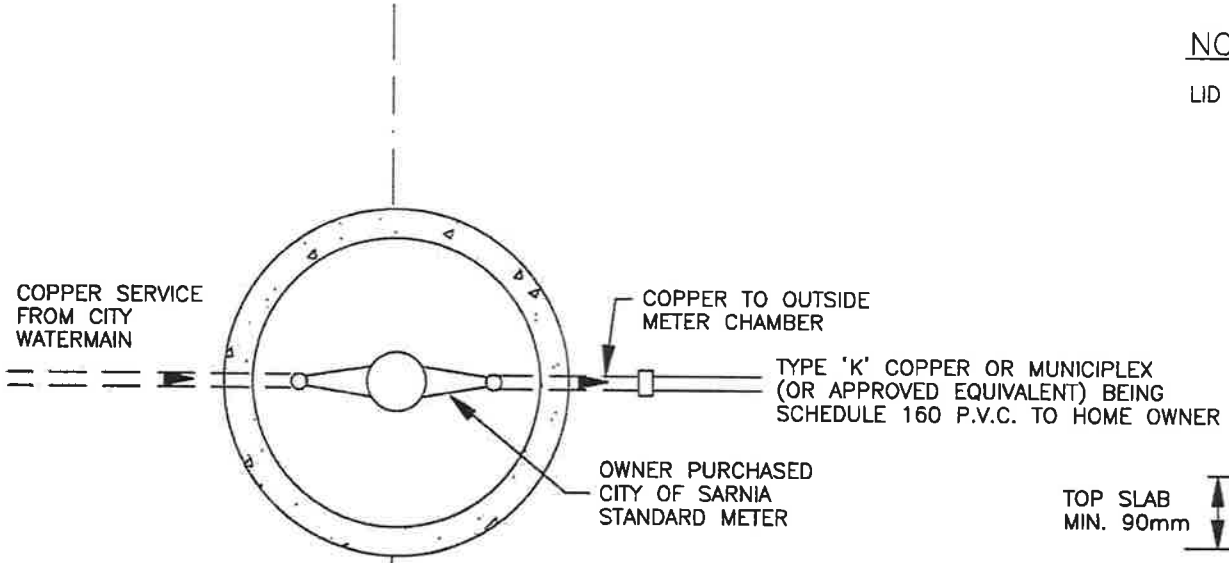
CITY OF SARNIA

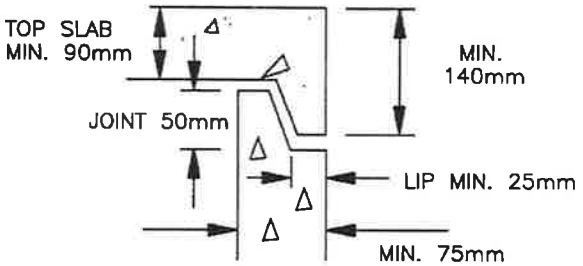
# HYDRANT INSTALLATION

| | | |
|---|---|---|
| APPROVED BY: S.W. | | FIELD BOOK# |
| DRAWN BY: J.R. | SCALE: N.T.S. | DWG.# 95-SF |
| CHK'D BY: T.W. | DATE: JAN-1993 | |

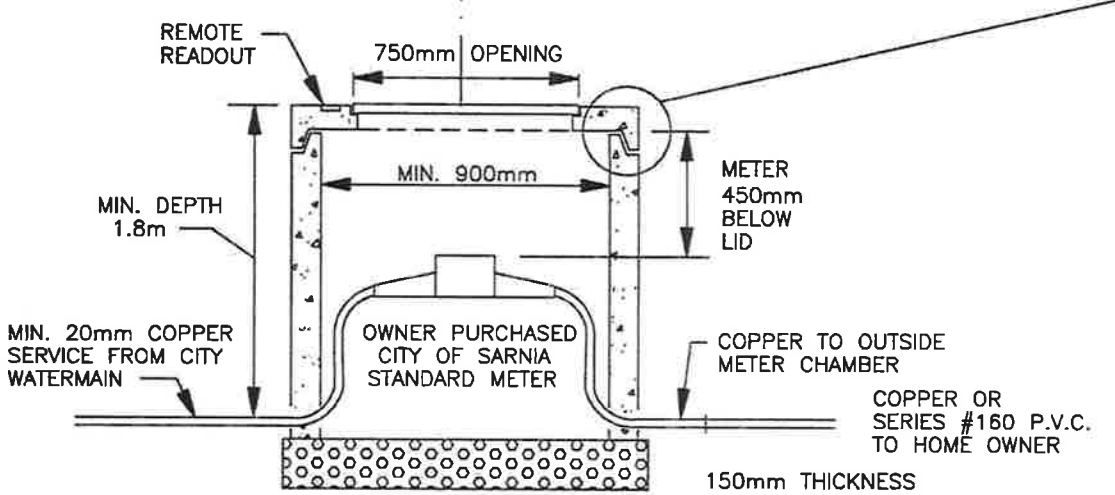
NOTE:

LID AND INSIDE WALLS TO BE INSULATED.




JOINT DETAIL

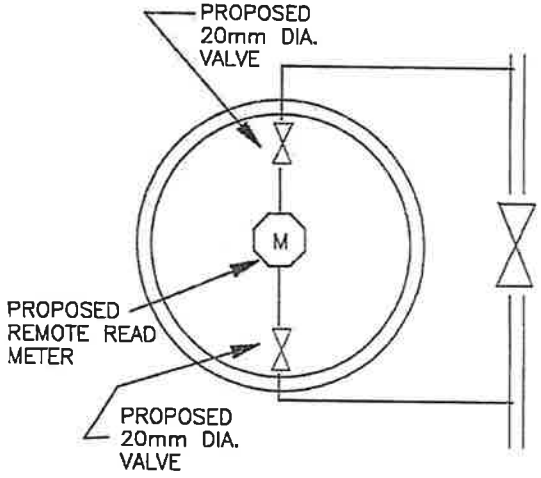



| | | | |
|---|---|---|---|
| | | | |
| 1 | REVISED FOR 2016 SPEC. | 01/16 | |
| REV.# | DESCRIPTION | DATE | AP.BY |

# CITY OF SARNIA

## STANDARD RESIDENTIAL METER PIT

| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: J.Roberts | SCALE: N.T.S. | DWG.No. |
| CHK' BY: | DATE: 01/98 | 100-SF |




MOORE TOWNSHIP PRESSURE WATERMAIN

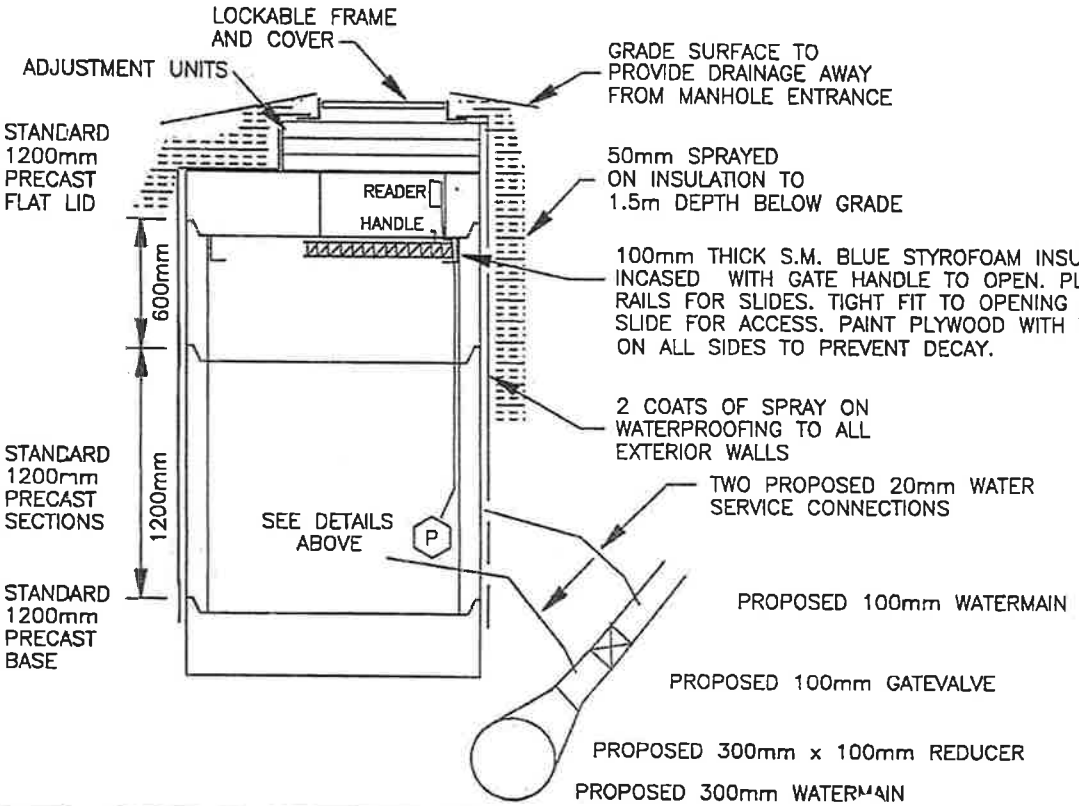
PROPOSED 20mm SERVICE

PROPOSED 100mm GATEVALVE

PROPOSED 20mm SERVICE

CITY OF SARNIA PRESSURE WATERMAIN

NOTE :
PROPOSED WATER METER TO BE WIRED TO REMOTE READER FASTENED TO THE MANHOLE OPENING. MUST BE READABLE FROM GROUND LEVEL BY REMOVING MANHOLE LID.




GRADE SURFACE TO PROVIDE DRAINAGE AWAY FROM MANHOLE ENTRANCE

50mm SPRAYED ON INSULATION TO 1.5m DEPTH BELOW GRADE

100mm THICK S.M. BLUE STYROFOAM INSULATION – PLYWOOD INCASED WITH GATE HANDLE TO OPEN. PLACE ANGLE IRON RAILS FOR SLIDES. TIGHT FIT TO OPENING ABLE TO SLIDE FOR ACCESS. PAINT PLYWOOD WITH TAR COAT ON ALL SIDES TO PREVENT DECAY.

2 COATS OF SPRAY ON WATERPROOFING TO ALL EXTERIOR WALLS

TWO PROPOSED 20mm WATER SERVICE CONNECTIONS

PROPOSED 100mm WATERMAIN

PROPOSED 100mm GATEVALVE

PROPOSED 300mm x 100mm REDUCER

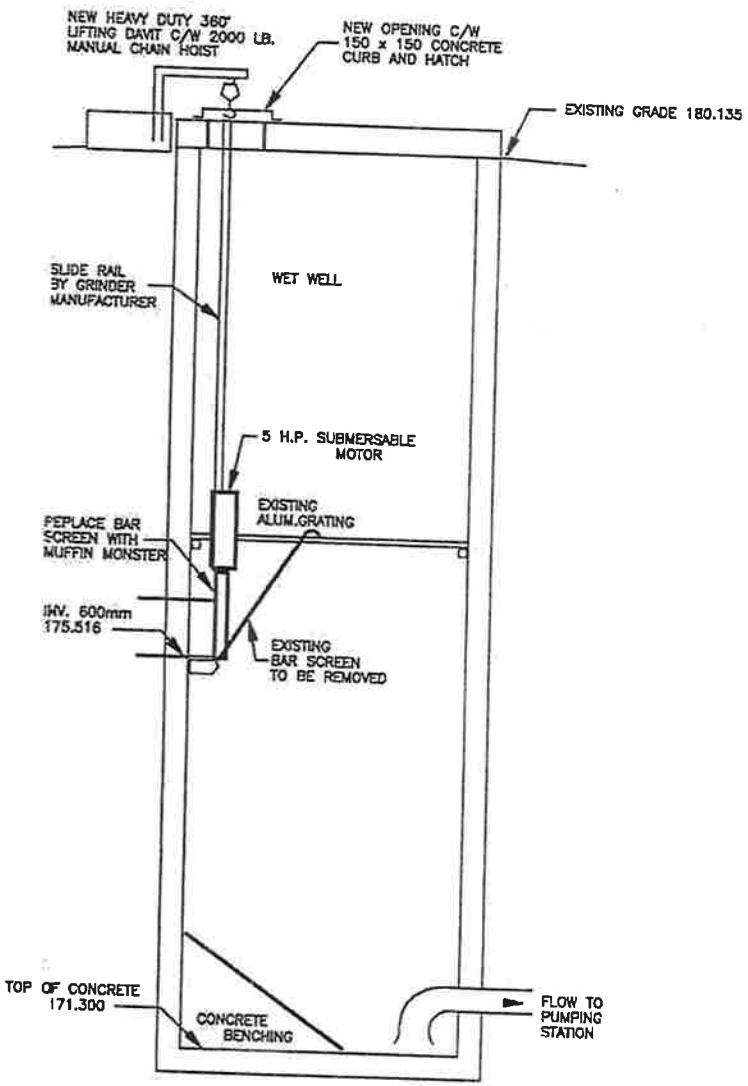
PROPOSED 300mm WATERMAIN

| | | | |
|---|---|---|---|
| # 1 | GENERAL REVISIONS | 12/00 | |
| REV.# | DESCRIPTION | DATE | AP.BY |

# CITY OF SARNIA

## WATERMAIN CHAMBER FOR WATER METERS ON PRESSURE VARYING MAINS

| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: J.Roberts | SCALE: N.T.S. | DWG.No. |
| CHK' BY: | DATE:11/2000 | 101–SF |




## CONSTRUCTION NOTES:

1. EXISTING BAR SCREEN ASSEMBLY SHALL BE REMOVED.
2. SUPPLY AND INSTALL MUFFIN MONSTER ON SEWER INLET ASSEMBLY AS PER THE MANUFACTURERS RECOMMENDATIONS.
3. THE MUFFIN MONSTER SHALL BE INSTALLED A MINIMUM OF 150mm FROM THE FACE OF THE WET WELL WALL TO ALLOW FOR OVERFLOW SHOULD THE MUFFIN MONSTER FAIL.
4. SUPPLY AND INSTALL THE 5 H.P. SUBMERSABLE MOTOR TO THE TOP OF THE MUFFIN MONSTER, AS PER THE MANUFACTURERS RECOMMENDATIONS.
5. GROUT/SEAL OPENINGS BETWEEN MUFFIN MONSTER UNIT AND EXISTING INLET CHANNEL.
6. SLIDE RAIL TO BE INSTALLED AS PER THE MANUFACTURERS RECOMMENDATIONS.
7. THE CONTRACTOR SHALL SUPPLY AND INSTALL ELECTICAL POWER TO THE NEW UNIT IN ACCORDANCE WITH THE APPLICABLE ELECTRICAL CODES. POWER DISCONNECT TO BE INSTALLED AT ELECTRICAL PANEL.
8. THE EXISTING ALUMINIM GRADING SHALL BE REPLACED AS NECESSARY TO ACCOMMODATE THE NEW INSTALLATION.
9. THE 150mm x 150mm CONCRETE CURB SHALL BE REINFORCED WITH 20M REINFORCING STEEL AND DOWELLED INTO THE TOP SLAB OF THE EXISTING WET WELL WITH 20M DOWELS @ 300mm SPACING.
10. NEW ALUMINIM BILCO HATCH TO BE INSTALLED AS PER THE MANUFACTURERS RECOMMENDATIONS.

## GENERAL NOTES:

1. ALL WORK SHALL BE COMPLETED TO MEET THE CITY OF SARNIA CONTRACT SPECIFICATIONS, ONTARIO PROVINCIAL SPECIFICATIONS, THE ONTARIO BUILDING CODE AND THE OCCUPATIONAL HEALTH AND SAFETY ACT. (OHSA)
2. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO COMMENCING THE WORK.
3. THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES AND STRUCTURES AND SHALL ASSUME LIABILITY SHOULD ANY DAMAGE OCCUR TO THEM.
4. SEWAGE WET WELL IS CLASSIFIED AS A CLASS II, GROUP D, DIVISION II HAZARDOUS LOCATION AND ELECTRICAL WORK IN WET WELL SHALL COMPLY WITH THE APPROPRIATE PORTION OF SECTION 18 OF THE ONTARIO ELECTRICAL SAFETY CODE.

| | | | |
|---|---|---|---|
| REV.1 | | | |
| REV.# | DESCRIPTION | DATE | AP.BY |

# CITY OF SARNIA

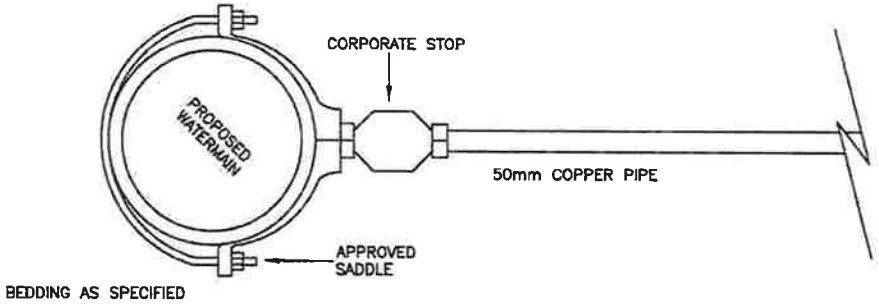
## PUMP STATION No 1 MODIFICATION FOR MUFFIN MONSTER

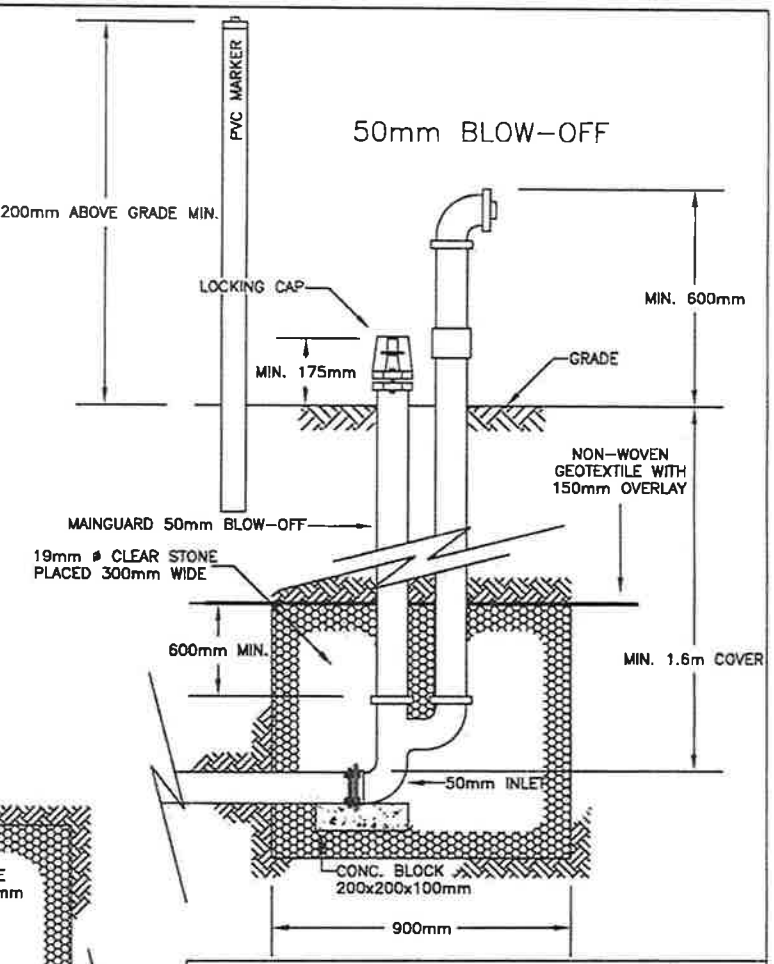
| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: J.R. | SCALE: N.T.S. | DWG.No. |
| CHK' BY: | DATE: 02/01 | 102-SF |

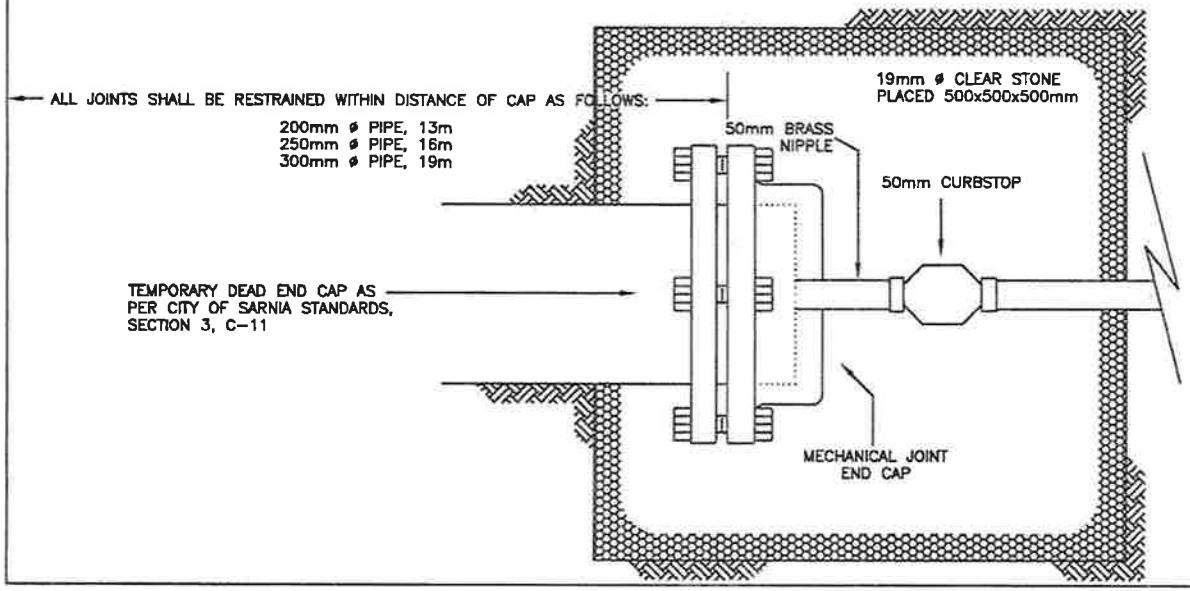
## NOTES:

1) BLOW-OFFS WILL BE FURNISHED WITH A 50mm MJ INLET, A NON-TURNING OPERATING ROD AND SHALL OPEN TO THE LEFT. ALL OF THE WORKING PARTS SHALL BE OF BRONZE-TO-BRONZE DESIGN, AND BE SERVICEABLE FROM ABOVE GRADE WITH NO DIGGING. UNITS SHALL OPERATE WITH A STANDARD 2" GATE VALVE WRENCH. WHEN OPEN, VALVE SHALL BE 100% UNOBSTRUCTED AND DRAIN HOLE SHALL BE COVERED. THE OUTLET SHALL BE 2" FIP WITH PLUG AND EXTEND A MINIMUM OF 600mm " ABOVE THE GROUND, AS MANUFACTURED BY KUPFERLE FOUNDRY CO., ST. LOUIS, MO. MODEL #77, OR APPROVED EQUAL.

2) CONTRACTOR TO CONTACT SARNIA PUBLIC WORKS TO PLACE LOCK DURING WATERMAIN COMMISIONING



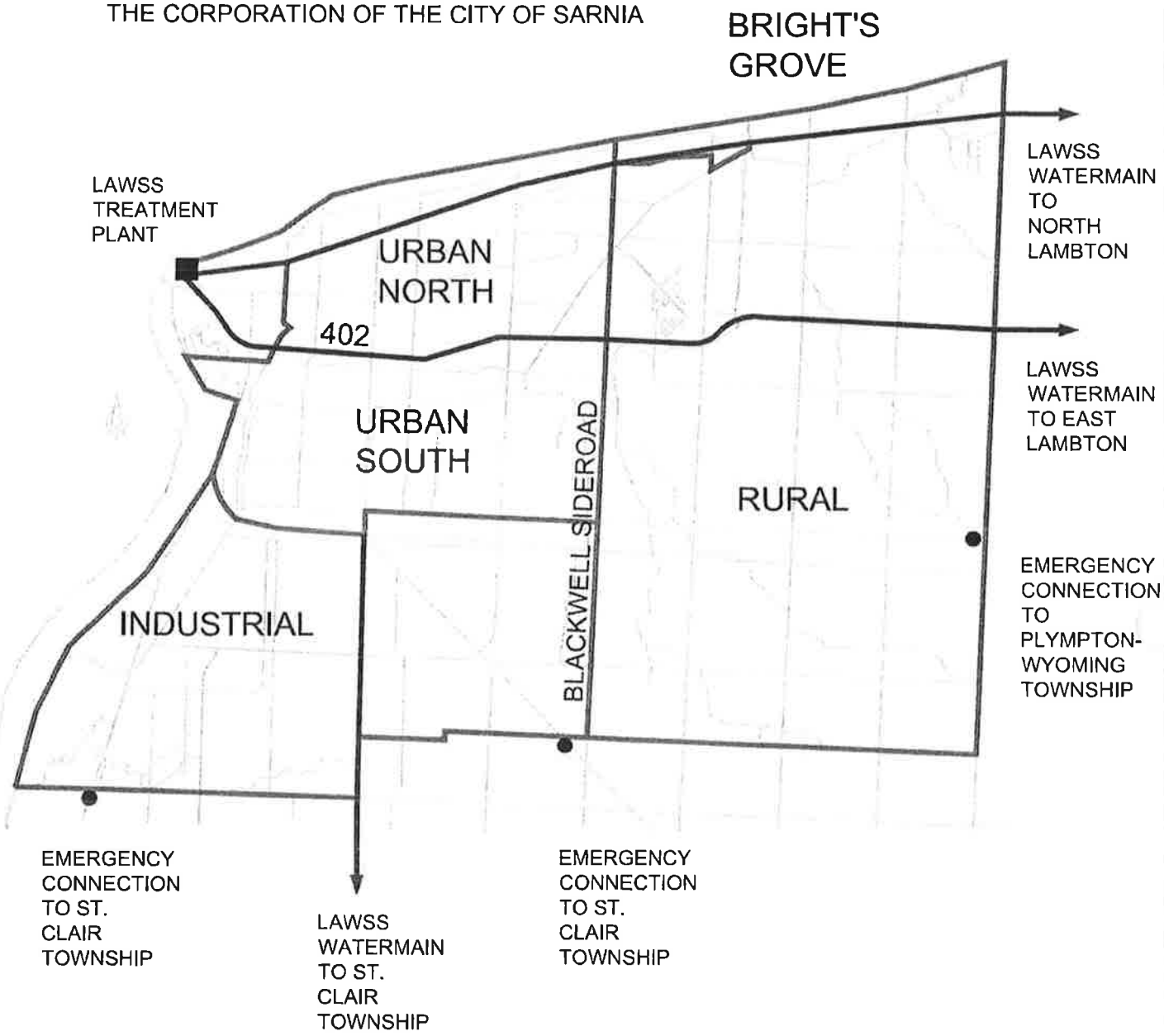

| REV.# | DESCRIPTION | DATE | APP.BY |
|---|---|---|---|
| 1 | REVISED FOR 2016 SPEC. | JAN/16 | |

# CITY OF SARNIA

## TYPICAL 50mm WATERMAIN BLOWOFF (MAINGUARD HYDRANT)

| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: C.H. | SCALE: N.T.S. | DWG.No. 106-SF |
| CHK' BY: | DATE: 02/08 | |

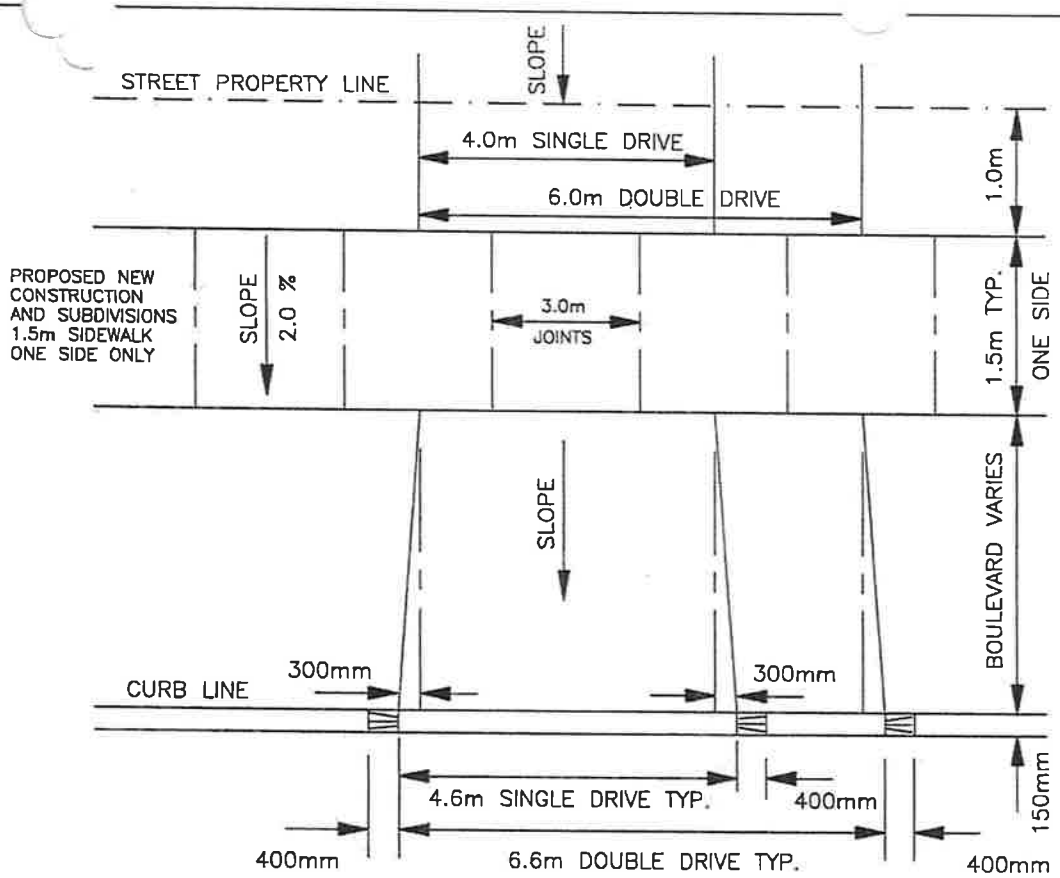
THE CORPORATION OF THE CITY OF SARNIA




# CITY OF SARNIA

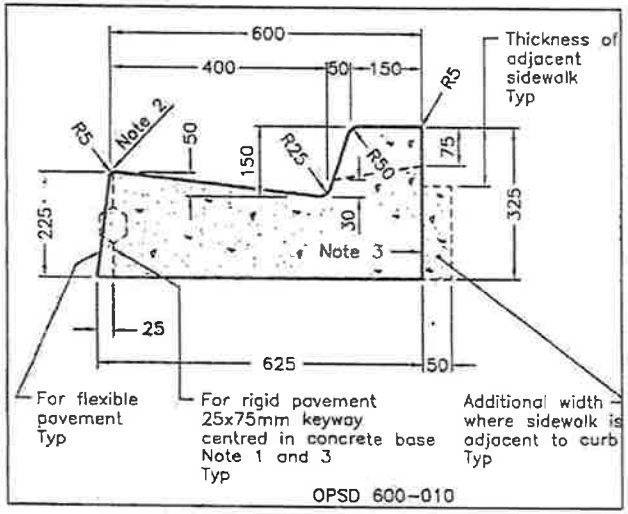
## WATER DISTRIBUTION SYSTEM

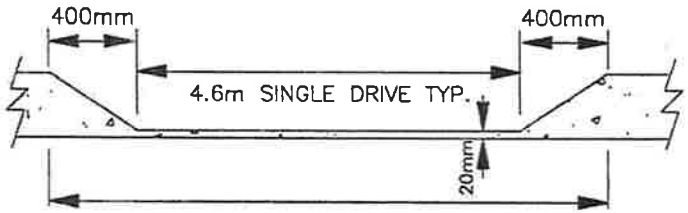
| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: OG | SCALE: N.T.S. | DWG.No. 107-SF |
| CHK' BY: | DATE: 04/08 | |




## NOTES:

1. ALL DIMENSIONS ARE IN METRIC UNITS UNLESS OTHERWISE NOTED.
2. CONCRETE TO BE 30 MPa AT 28 DAYS TO OPSS 1350 AND CITY OF SARNIA STANDARD SPECIFICATION No. 5 FOR CURB AND GUTTER.
3. DRIVEWAY JOINTS AT CURB AND GUTTER AND SIDEWALK SHALL BE COLD JOINTS.
4. CONTROL JOINTS SHALL BE SAWCUT IN DRIVEWAYS TO PROVIDE MAXIMUM AREAS OF 9.0 SQ. m. WITH A MAXIMUM SPACING BETWEEN JOINTS OF 3.0 m. AND AT THE CENTERLINE OF DRIVEWAYS GREATER THAN 3.6 m. IN WIDTH. SAW CUTS SHALL BE A MINIMUM OF 40mm DEEP.




STANDARD CURB CUTS AT DRIVEWAYS

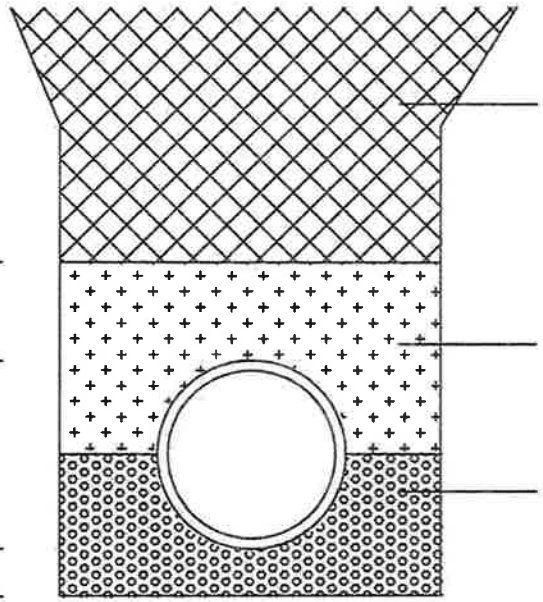
| REV.# | DESCRIPTION | DATE | APPR. |
|---|---|---|---|
| REV#9 | CHANGED CURB DETAIL | 05/14 | E.C. |
| REV#8 | REVISED FOR 2005 SPEC. | 02/05 | J.R. |
| REV#7 | SIDEWALK WIDTH&OFFSET | 02/03 | J.R. |

CITY OF SARNIA

PROPOSED SUBDIVISIONS
STANDARD CURB CUTS
FOR SINGLE AND DOUBLE
RESIDENTIAL DRIVEWAYS

| | | |
|---|---|---|
| APPROVED BY: | | |
| DRAWN BY: J.R. | SCALE: N.T.S. | DWG No. 108-F |
| CHK'D BY: | DATE: 11/97 | |

PLOT 1000 : 500



MAIN LINE – BACKFILL AS PER CITY OF SARNIA SPECIFICATIONS

SERVICE LATERALS – BACKFILL GRAN "B" TYPE 1 IN BOULEVARD

300mm

GRANULAR "A" PIPE COVER USING 100% S.P.D.

BEDDED MINIMUM 150mm

COMPACTED GRANULAR CLEAR CRUSHED 20mm STONE TO SPRING LINE USING S.B.C.M.

# GRANULAR FOUNDATIONS FOR STORM AND SANITARY MAIN LINE AND SERVICE LATERALS TRENCHES

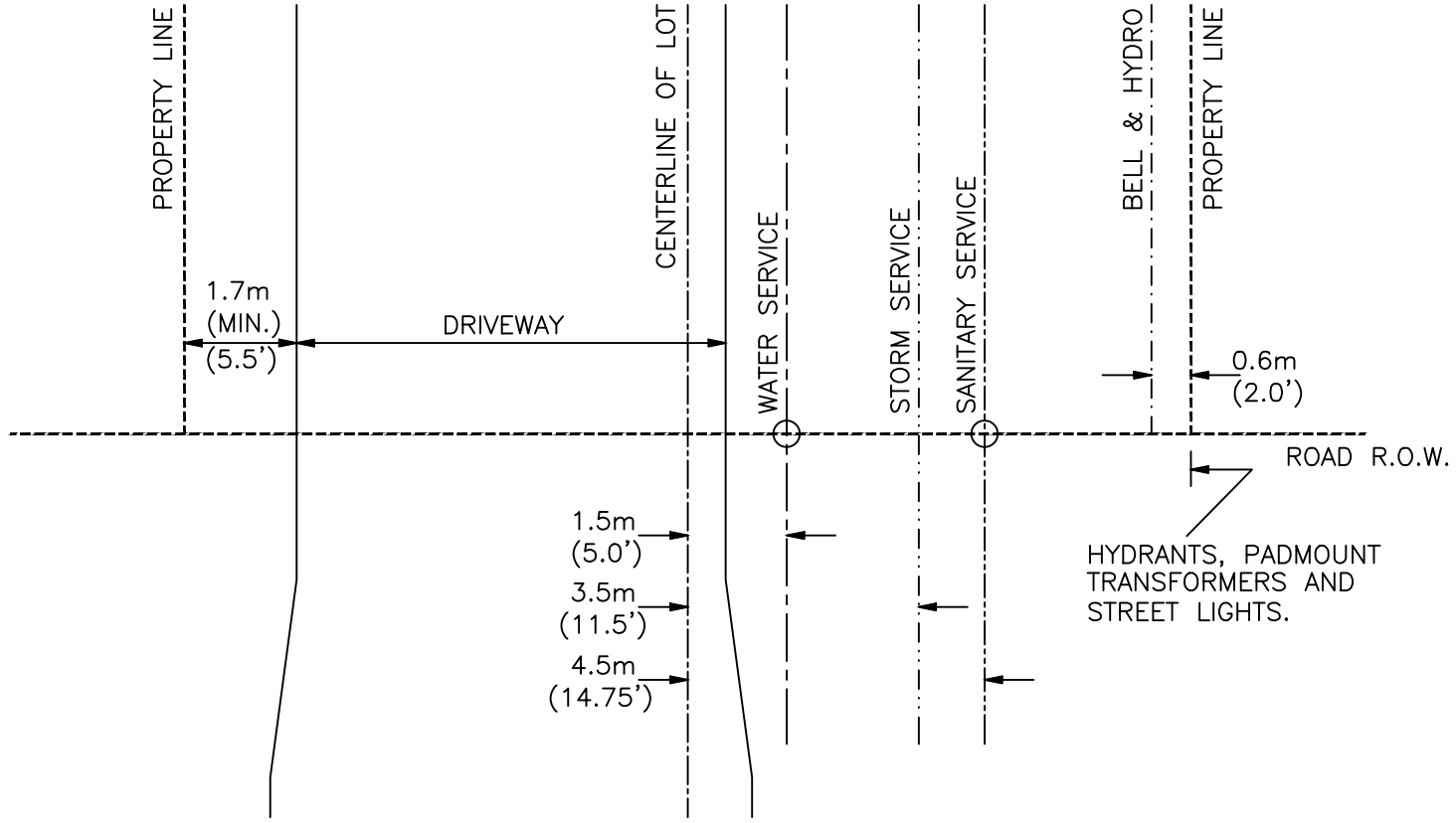
N.T.S.

| REV.# | DESCRIPTION | DATE | AP.BY |
|---|---|---|---|
| REV.2 | REMOVED BEDROCK SOURCE | 05/14 | E.C. |
| REV.1 | GENERAL REVISION | JAN/09 | |

## CITY OF SARNIA

GRANULAR FOUNDATIONS FOR STORM AND SANITARY MAIN LINE AND SERVICE LATERALS TRENCHES

| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: DS | SCALE: N.T.S. | DWG.No. |
| CHK' BY: | DATE: JAN/ | 108–SF |




NOTES:

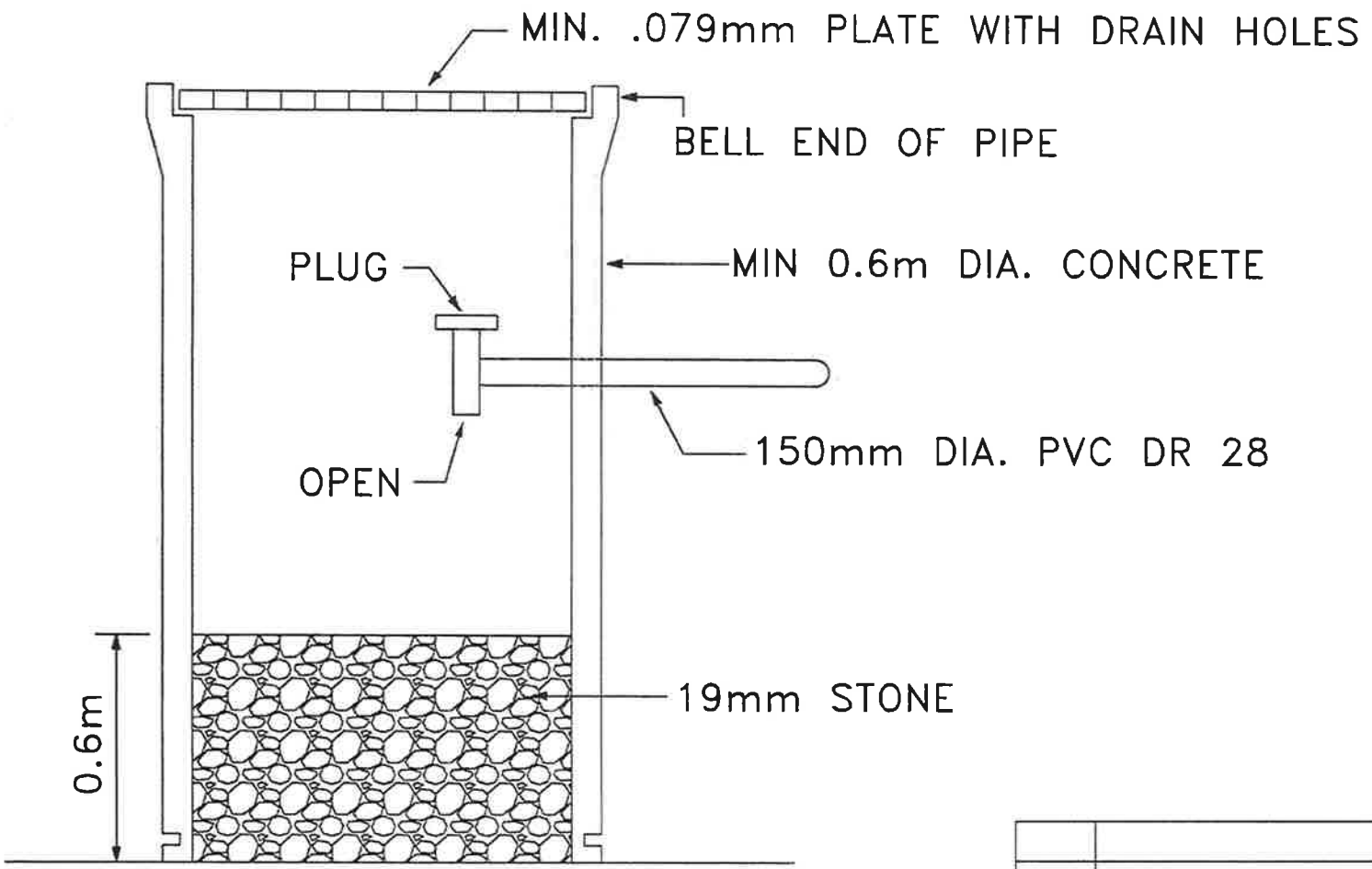
1. ALL HYDRANTS, PADMOUNTS TRANSFORMERS AND STREET LIGHT POLES ARE TO BE INSTALLED ON THE LOT LINES AND ONLY IN ACCORDANCE WITH FIGURE 1 & 2.
2. DRIVEWAY SHALL BE LOCATED ON THE OPPOSITE SIDE OF THE LOT TO THAT OF A PADMOUNTED TRANSFORMER.
3. WATER SERVICES SHALL BE INSTALLED 1.5m (5.0') OFFSET FROM THE CENTERLINE OF SINGLE LOTS AND 1.0m (3.0') TO THE RIGHT AND LEFT OF CENTERLINE FOR SEMI–DETACHED LOTS
4. STORM P.D.C. SHALL BE INSTALLED 3.5m (11.5') RIGHT OF CENTERLINE OF SINGLE LOTS AND 3.0m (10.0') TO THE RIGHT AND LEFT OF CENTERLINE FOR SEMI–DETACHED LOTS.
5. SANITARY P.D.C. SHALL BE INSTALLED 4.5m (14.75') RIGHT OF CENTERLINE OF SINGLE LOTS AND 4.0m (13.0') TO THE RIGHT AND LEFT OF CENTERLINE FOR SEMI–DETACHED LOTS.
6. BELL AND HYDRO TO BE INSTALLED IN COMMON TRENCH 0.6m (2.0') FROM EITHER PROPERTY LINES.
7. TYPICAL 15m +/– LOT

| REV.# | DESCRIPTION | DATE | APP.BY |
|---|---|---|---|
| # 4 | UPDATED SERVICE OFFSETS AND ASTHETICS | 20/19 | |
| # 3 | UPDATED ASTHETICS | 05/14 | |
| # 2 | CHANGE STM & SAN. | 06/94 | |
| # 1 | ADD STORM P.D.C. | 12/91 | |

CITY OF SARNIA

# LOT SERVICING

| | | | |
|---|---|---|---|
| APPROVED BY: | | FIELD BOOK# | *TOTAL STATION* |
| DRAWN BY: *DS* | SCALE: *N.T.S.* | DWG. # | 109–F |
| CHK'D BY: | DATE: *OCT 1997* | | |




NOTE:

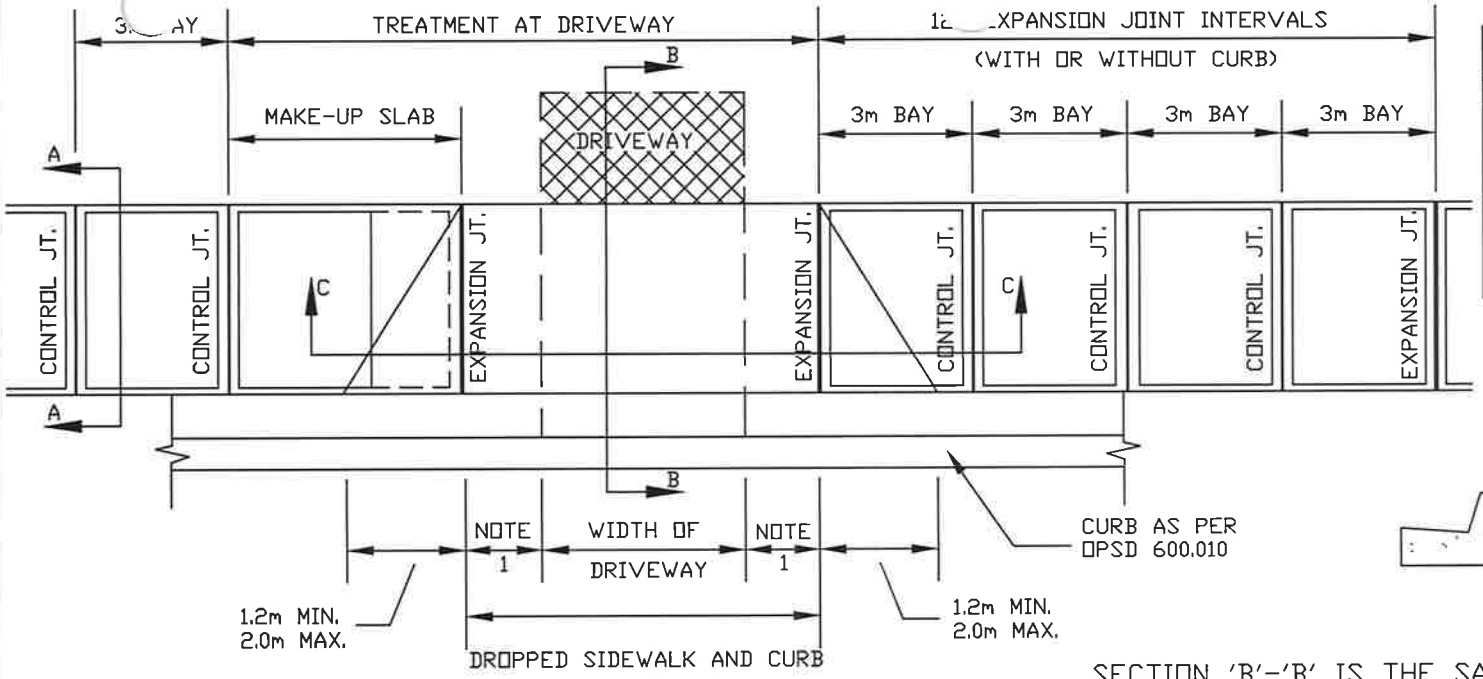
AT OWNER'S REQUEST PLACE SCREEN ON BOTTOM OF OUTLET AND FILL ENTIRE CATCH BASIN WITH STONE FOR SAFETY

| REV.# | DESCRIPTION | DATE | AP.BY |
|---|---|---|---|
| | | | |
| | | | |

# CITY OF SARNIA

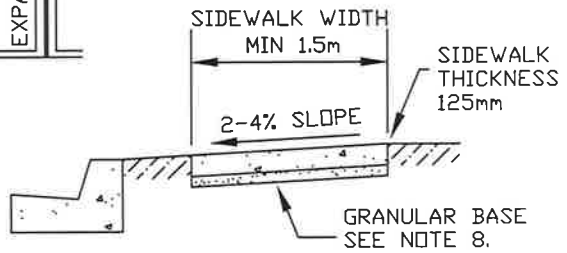
## REAR LOT CATCH BASIN DETAIL

| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: E.C. | SCALE: N.T.S. | DWG.No. 110-F |
| CHK'D BY: OD | DATE: MAY/14 | |



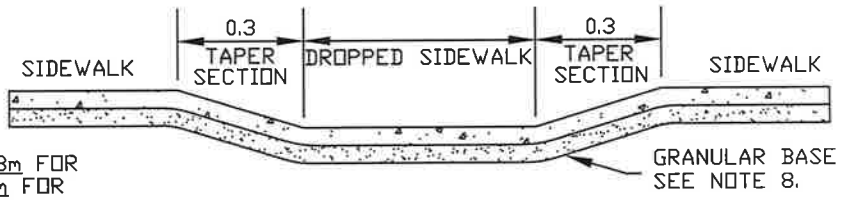

PLAN

| SIDEWALK THICKNESS TABLE | |
|---|---|
| LOCATION OR USE | THICKNESS (mm) |
| NORMAL DRIVEWAY ACCESS LOTS FRONTING ON STREET | 125mm |
| ACROSS COMMERCIAL AND INDUSTRIAL DRIVEWAY | 200mm |

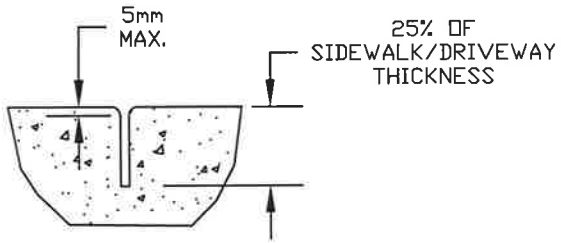



SECTION 'A'-'A'

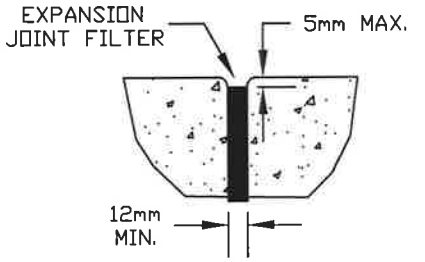
SECTION 'B'-'B' IS THE SAME AS SECTION 'A'-'A' ON OPSD. 351.01




SECTION 'C'-'C'
OPSD 310.010




CONTROL JOINT DETAIL




EXPANSION JOINT DETAIL

## NOTES:

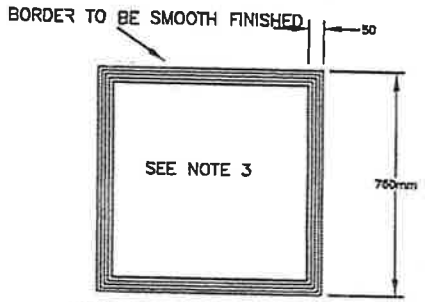
1. DISTANCE INDICATED SHALL BE 0.3m FOR RESIDENTIAL DRIVEWAYS, AND 1.5m FOR RESIDENTIAL PARKING LOTS, SCHOOLS, APARTMENTS, ETC.
2. EXPANSION JOINTS ARE REQUIRED IN SIDEWALK AT INTERVALS OF 12m AND TO ISOLATE OBSTRUCTION FROM SIDEWALK; EG. HYDRANTS, LIGHT STANDARDS, ETC.
3. REINFORCEMENTS, IF REQUIRED, AS PER SPECIFICATIONS.
4. CONTROL JOINTS SHALL HAVE STANDARD SPACING OF 3.0m.
5. ALL CONCRETE EDGES OF BAYS TO BE FINISHED WITH EDGERS, 5mm RADIUS.
6. SIDEWALK CROSSFALL TO BE MAINTAINED AT MINIMUM COMMENSURATE WITH DEPARTURE OR BREAKOVER REQUIRMENTS.
7. ALL DIMENSIONS ARE IN METRIC UNITS.
8. 100mm GRAN 'A'(LIMESTONE) BASE IS TO BE PLACED UNDER SIDEWALKS.

| REV.# | DISCRIPTION | DATE: | APPROVED |
|---|---|---|---|
| REV 2 | FIXED DIM , CHANGED REF. | 01/18 | B.L. |
| REV 1 | FIXED DIM , CHANGED REF. | 05/14 | E.C. |

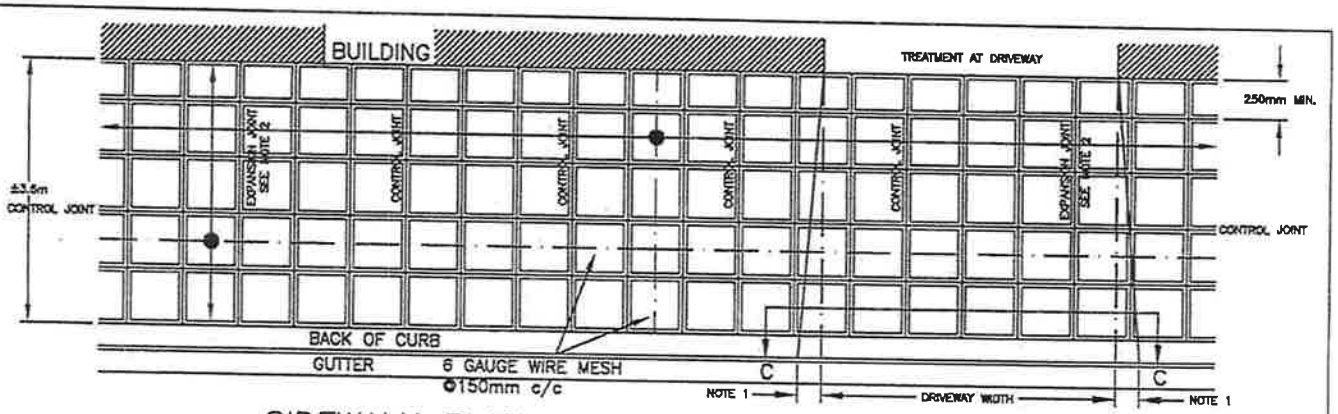
CITY OF SARNIA

# CONCRETE SIDEWALK

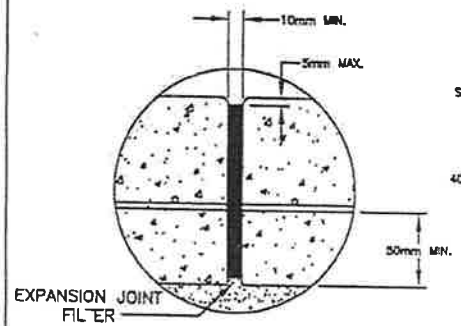
| | | |
|---|---|---|
| APPROVED BY: T.W. | | 112-F |
| DRAWN BY: J. RAMSAY | SCALE: N.T.S. | |
| CH'K BY: J. ROBERTS | DATE: 02/03 | |




STANDARD PANEL

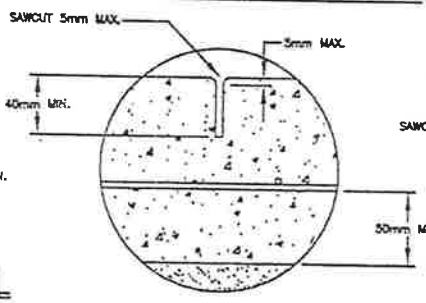


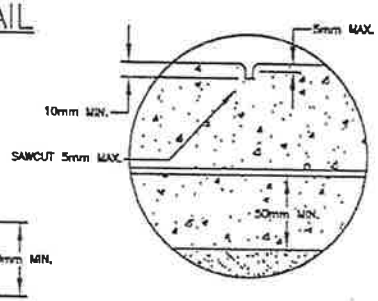

SIDEWALK PLAN



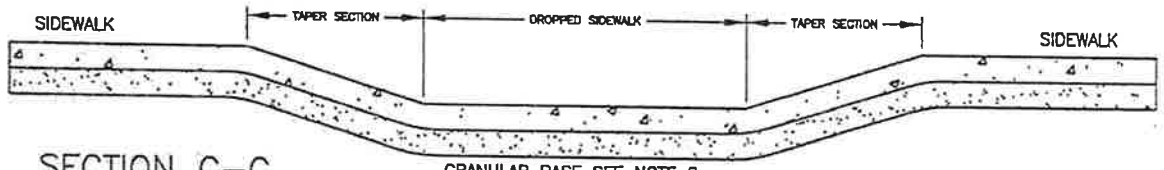

EXPANSION JOINT DETAIL

CONTROL JOINT DETAIL

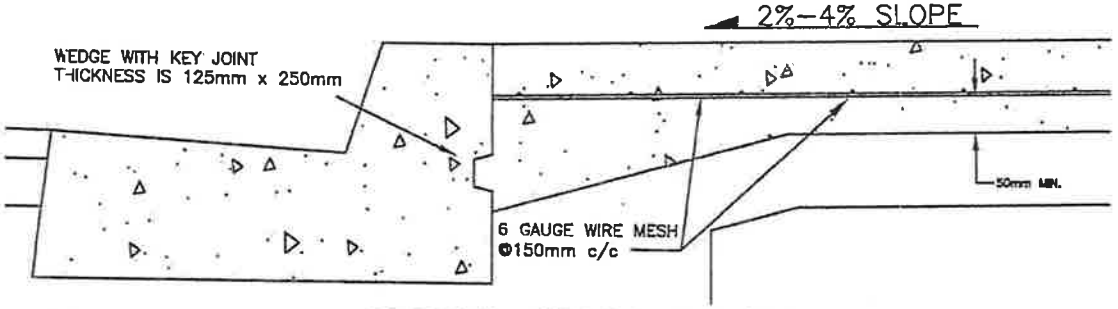



DUMMY JOINT DETAIL




SECTION C–C
N.T.S.




TYPIICAL CROSS SECTION

## NOTES:

1. TAPER WIDTH AT BOC SHALL BE 0.3m FOR RESIDENTIAL DRIVEWAYS, ADN 1.5m FOR COMMERCIAL PARKING LOTS, SCHOOLS AND APARTMENTS.

2. EXPANSION JOINTS ARE REQUIRED IN SIDEWALK AT 12m INTERVALS MAXIMUM AND TO ISOLATE OBSTRUCTION FROM SIDEWALK; EG. HYDRANTS, LIGHT STANDARDS, ETC.

3. MEDIUM BROOM FINISH IS REQUIRED FOR CONCRETE SURFACE.

4. DUMMY JOINTS SHALL BE STANDARD SPACING OF 760mm, WITH CONTROL JOINTS AT AS STANDARD 2280mm SPACING.

5. ALL CONCRETE EDGES OF BAYS TO BE FINISHED WITH 50mm EDGERS, 5mm RADIUS.

6. SIDEWALK CROSSFALL TO BE MAINTAINED AT MINIMUM COMMENSURATE WITH DEPARTURE OR BREAKOVER REQUIRMENTS.

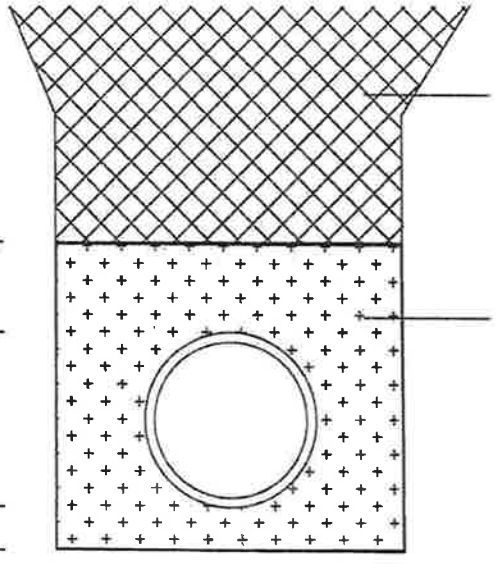
7. ALL DIMENSIONS ARE IN METRIC UNITS

8. 100mm GRAN "A" BASE IS TO BE PLACED UNDER SIDEWALKS IN CLAY AREAS

# CITY OF SARNIA

## CHRISTINA STREET CONCRETE SIDEWALK

| | | |
|---|---|---|
| APPROVED BY: | | 112–G |
| DRAWN BY: C. HARPER | SCALE: N.T.S. | |
| CH'K BY: | DATE: 01/08 | |




MAIN LINE – BACKFILL AS PER CITY OF SARNIA SPECIFICATIONS
WATER SERVICES – BACKFILL GRAN "B" TYPE 1 IN BOULEVARD

GRANULAR "A" PIPE BEDDING AND COVER USING 100% S.P.D.

# GRANULAR FOUNDATIONS FOR WATERMAIN MAIN LINE

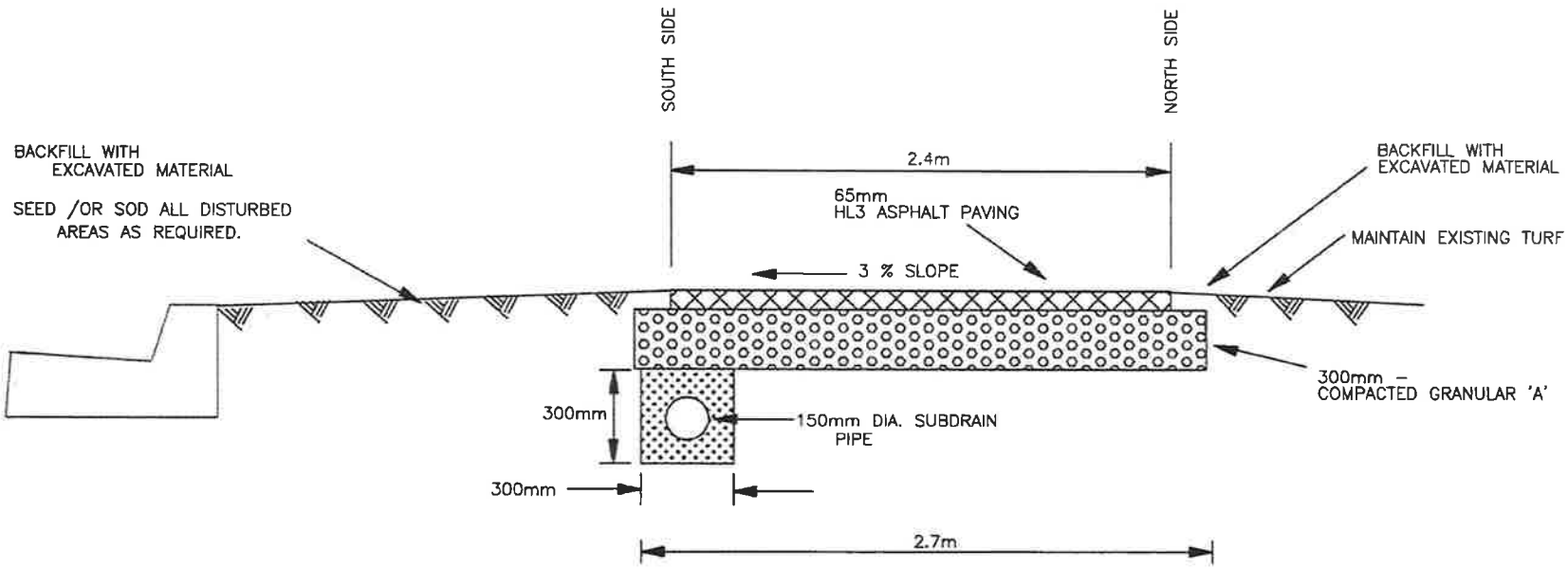
N.T.S.

| | | | |
|---|---|---|---|
| | | | |
| REV 1 | DELETED BEDROCK SOURCE | 05/14 | E.C. |
| REV.# | DESCRIPTION | DATE | AP.BY |

## CITY OF SARNIA

GRANULAR FOUNDATIONS
FOR WATER MAIN LINE
AND WATER SERVICE TRENCHES.

| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: DS | SCALE: N.T.S. | DWG.No. 112-SF |
| CHK' BY: | DATE: NOV/09 | |




PROPOSED MULTI – USE PATH
TYPICAL CROSS SECTION TO BE USED IN GRASS AREA

NOTE

SUBGRADE COMPACTED TO 98% S.P.D.

PROPOSED PATH GRADE SHALL BE DETERMINED IN FIELD USING EXISTING LAND SURFACE AS A GUIDE.

JOIN EXISTING GROUND AND ASPHALT ROADWAYS USING A SMOOTH TRANSITION.

SEED /OR SOD ALL DISTURBED AREAS AS REQUIRED.

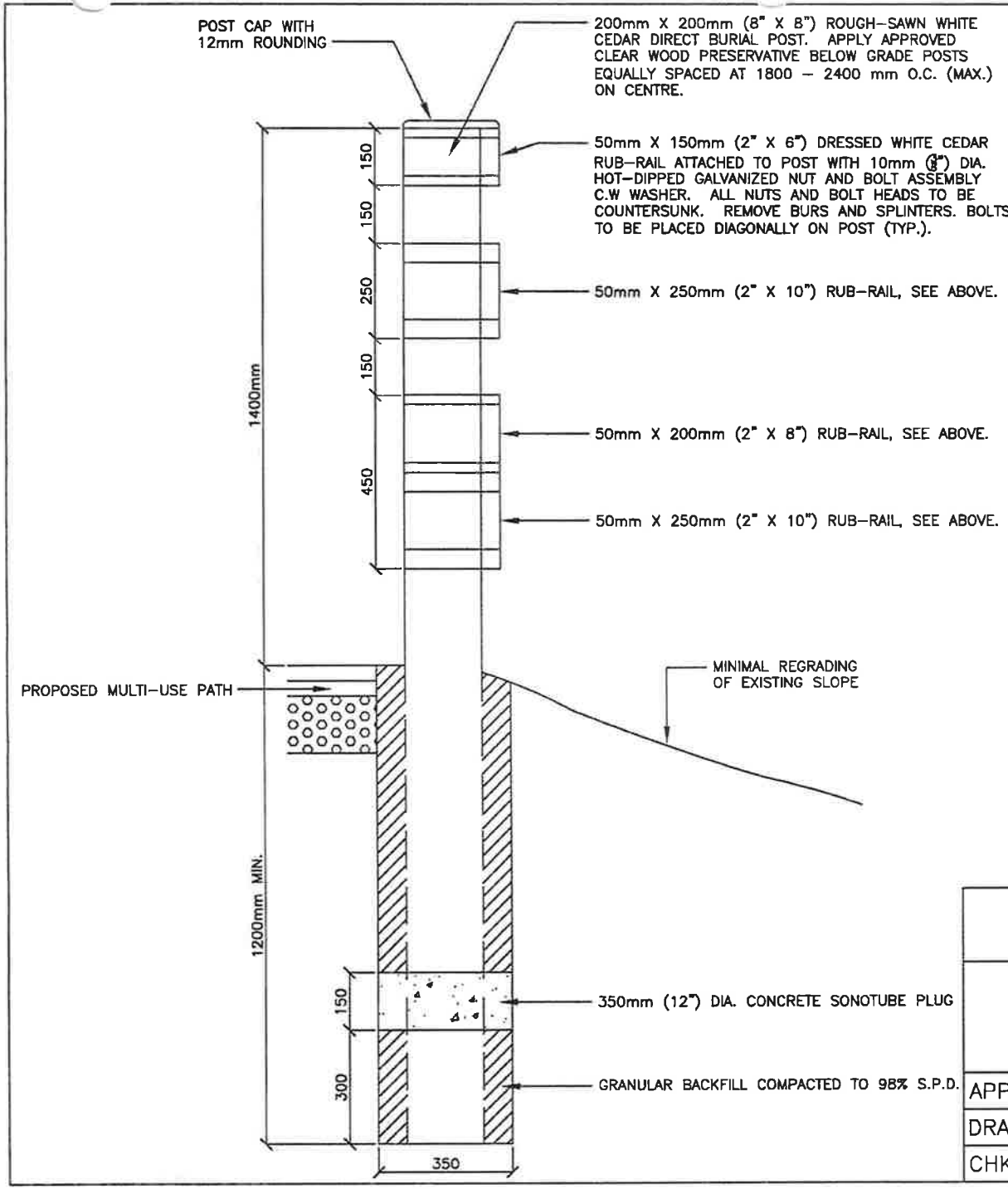
PROPOSED SUBDRAIN TO BE CONNECTED TO PROPOSED CATCHBASINS

# CITY OF SARNIA

TYPICAL CROSS SECTION

PROPOSED MULTI – USE PATH

| | | |
|---|---|---|
| APPROVED BY: | | |
| DRAWN BY: DS | SCALE: N.T.S. | DWG.No. |
| CHK' BY: | DATE: DEC/09 | 13–SF |

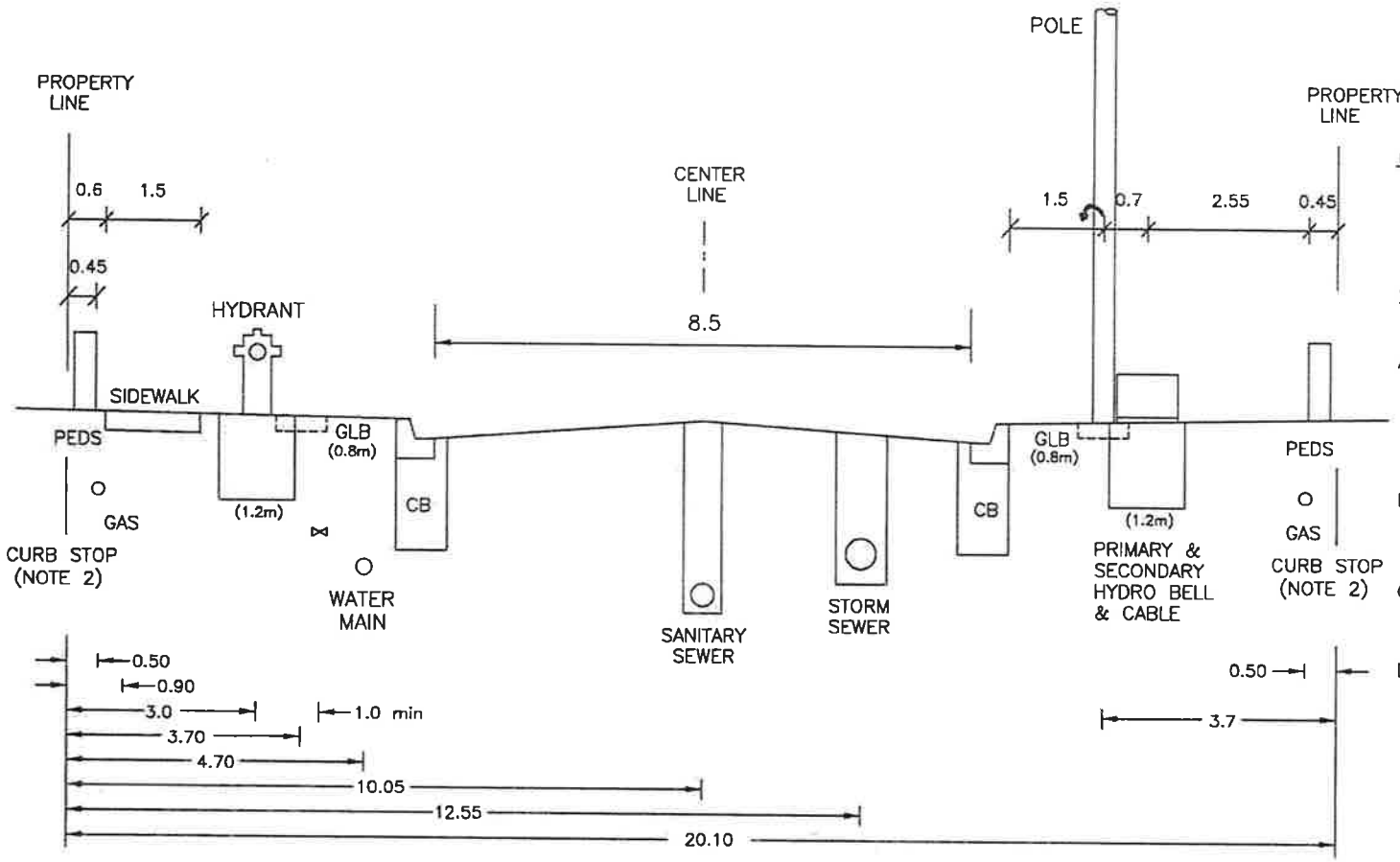



NOTES
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.

# CITY OF SARNIA

## TYPICAL FENCE DETAILS PROPOSED MULTI-USE PATH

| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: O.GEORGE | SCALE: NTS | DWG.No. 113-SF-1 |
| CHK' BY: | DATE:4/08 | |




NOTES

1. STORM SEWERS AND SANITARY SEWERS TO BE LOCATED BETWEEN CURBS.
2. CURB STOPS TO BE LOCATED ON THE PROPERTY LINE.

A. TELEPHONE, HYDRO AND LIGHTING TO BE LOCATED ON COMMON UTILITY POLE ON EITHER OR BOTH SIDES OF ROAD.

B. SIDEWALKS MAY BE LOCATED ON EITHER, BOTH OR NEITHER SIDE OF THE ROADWAY.

C. SIDEWALKS TO BE 1.5m WIDE AND OFFSET 0.6m FROM PROPERTY LINE.

D. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.

NEW SUBDIVISIONS:

CENTRE LINE LOCATIONS OF UTILITY TRENCHES ON A 20m ROAD ALLOWANCE

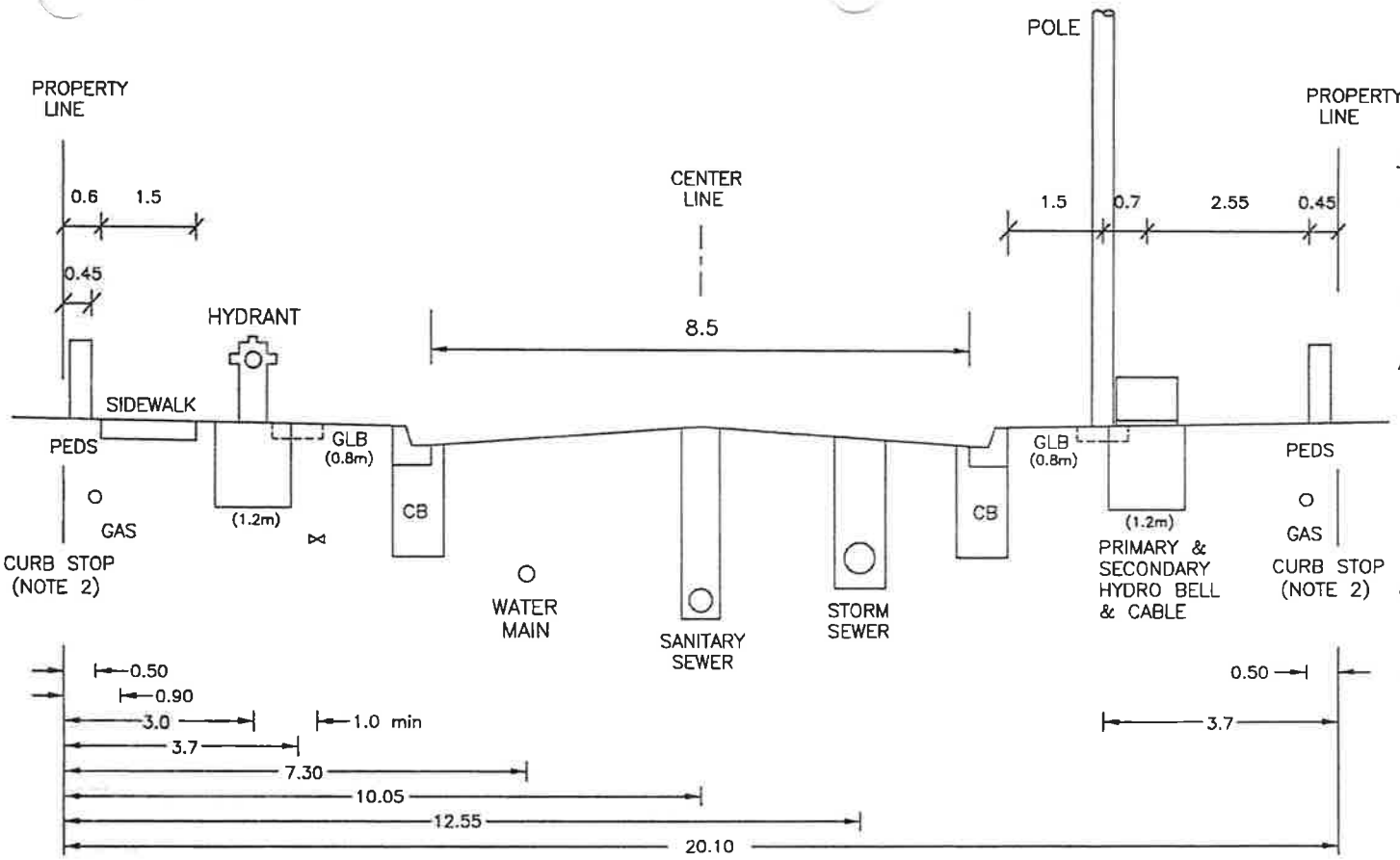
| DESCRIPTIONS | CURB STOPS | GAS | HYDRO OR JOINT HYDRO TELEPHONE | HYDRANTS | POLES | GLB | WATER MAIN |
|---|---|---|---|---|---|---|---|
| DISTANCE TO CENTRE LINE OF UTILITY FROM PROPERTY LINE | 0.0 | 0.5 | 3.0 | 3.0 | 3.7 | 3.7 | 4.7 |
| MINIMUM DEPTH OF COVER | 1.8 | 1.0 | 0.9 | N/A | N/A | N/A | 1.8 |

| REV.# | DESCRIPTION | DATE | AP.BY |
|---|---|---|---|
| REV.6 | VARIOUS REVISIONS | 08/16 | |
| REV.5 | REVISED FOR 2016 SPEC. | 01/16 | |
| REV.4 | REVISED FOR 2014 SPEC. | 01/14 | |

# CITY OF SARNIA

## UTILITY LOCATION LOCAL ROAD 20m ROAD ALLOWANCE

| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: J.Roberts | SCALE: N.T.S. | DWG.No. |
| CHK' BY: | DATE: 12/97 | 14-F |




NOTES

1. STORM SEWERS AND SANITARY SEWERS TO BE LOCATED BETWEEN CURBS.
2. CURB STOPS TO BE LOCATED ON THE PROPERTY LINE.

A. TELEPHONE, HYDRO AND LIGHTING TO BE LOCATED ON COMMON UTILITY POLE ON EITHER OR BOTH SIDES OF ROAD.

B. SIDEWALKS MAY BE LOCATED ON EITHER, BOTH OR NEITHER SIDE OF THE ROADWAY.

C. SIDEWALKS TO BE 1.5m WIDE AND OFFSET 0.6m FROM PROPERTY LINE.

D. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.

NEW SUBDIVISIONS:

CENTRE LINE LOCATIONS OF UTILITY TRENCHES ON A 20m ROAD ALLOWANCE

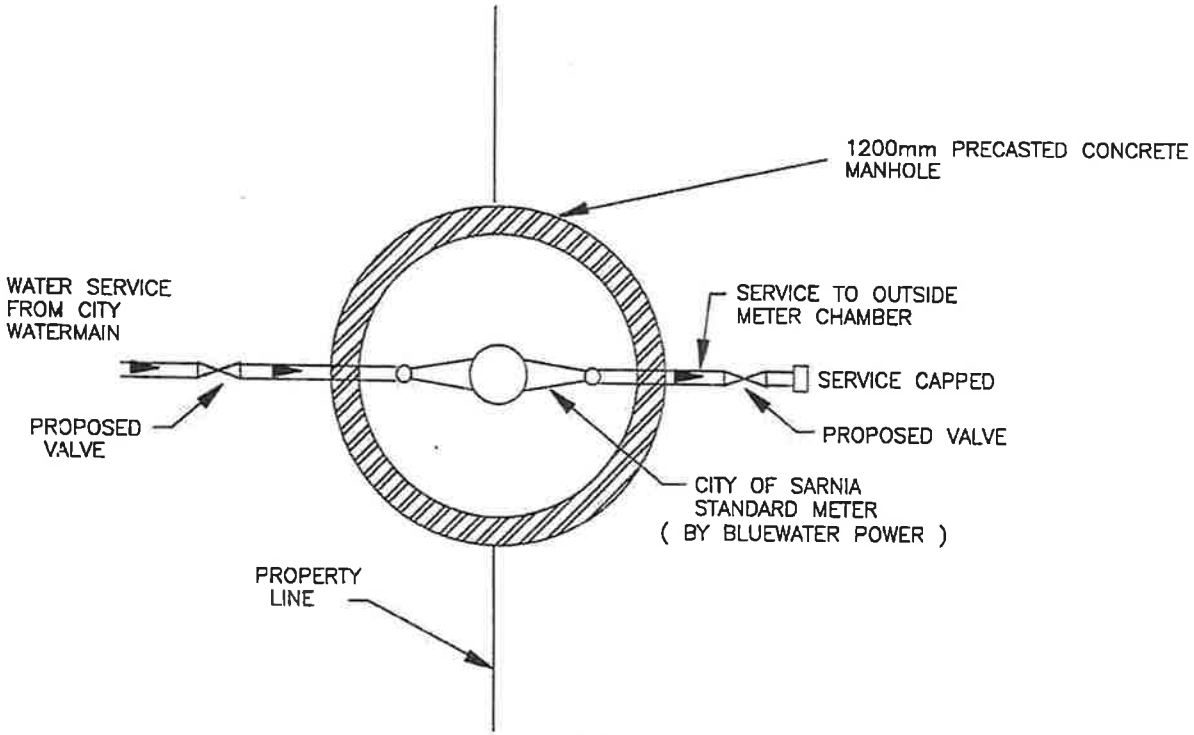
| DESCRIPTIONS | CURB STOPS | GAS | HYDRO OR JOINT HYDRO TELEPHONE | HYDRANTS | POLES | GLB | WATER MAIN |
|---|---|---|---|---|---|---|---|
| DISTANCE TO CENTRE LINE OF UTILITY FROM PROPERTY LINE | 0.0 | 0.5 | 3.0 | 3.0 | 3.7 | 3.7 | 7.3 |
| MINIMUM DEPTH OF COVER | 1.8 | 1.0 | 0.9 | N/A | N/A | N/A | 1.8 |

| REV.# | DESCRIPTION | DATE | AP.BY |
|---|---|---|---|
| REV.6 | VARIOUS REVISIONS | 08/16 | |
| REV.5 | REVISED FOR 2016 SPEC. | 01/16 | |
| REV.4 | REVISED FOR 2014 SPEC. | 01/14 | |

# CITY OF SARNIA

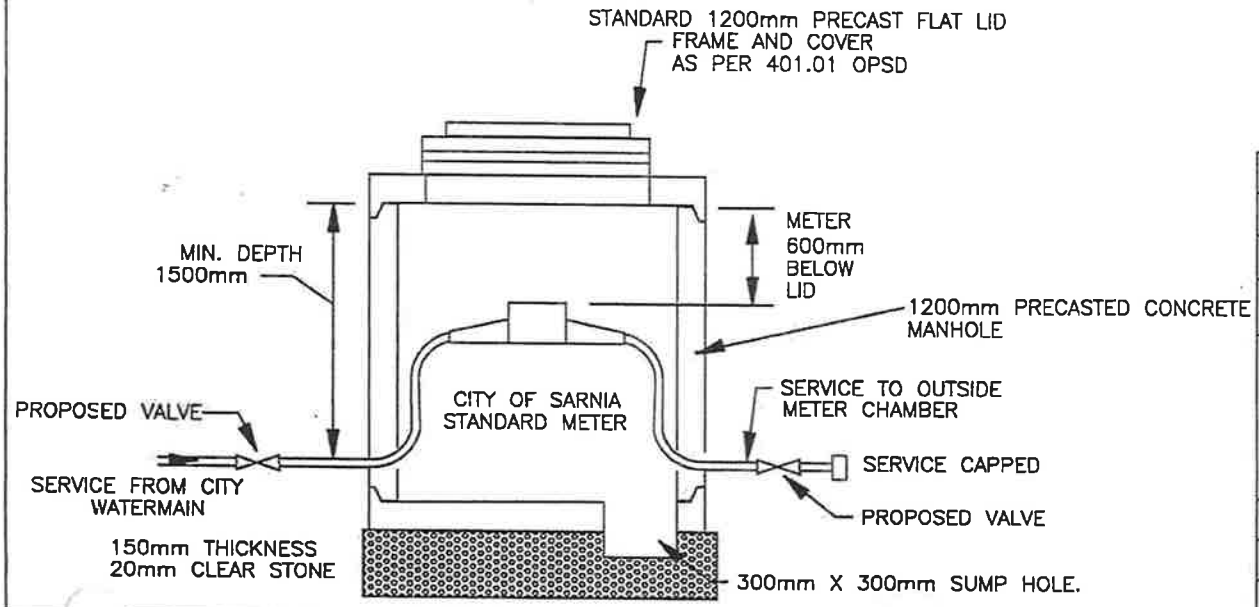
## UTILITY LOCATION
## LOCAL ROAD
## 20m ROAD ALLOWANCE

| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: J.Roberts | SCALE: N.T.S. | DWG.No. 114A–F |
| CHK' BY: | DATE: 12/97 | |




NOTE:

1. LID TO BE COVERED WITH 100mm RIGID S.M. BLUE STYROFOAM INSULTION
2. 2 –COATS OF SPRAY ON WATERPROOFING TO ALL WALLS
3. 50mm SPRAYED ON INSULATION TO MANHOLE BELOW GRADE.
4. STANDARD METER AND READER TO BE SUPPLY AND INSTALLED BY BLUEWATER POWER.
5. DUAL CHECK BACKFLOW PREVENTER TO BE SUPPLY AND INSTALLED BY BLUEWATER POWER.

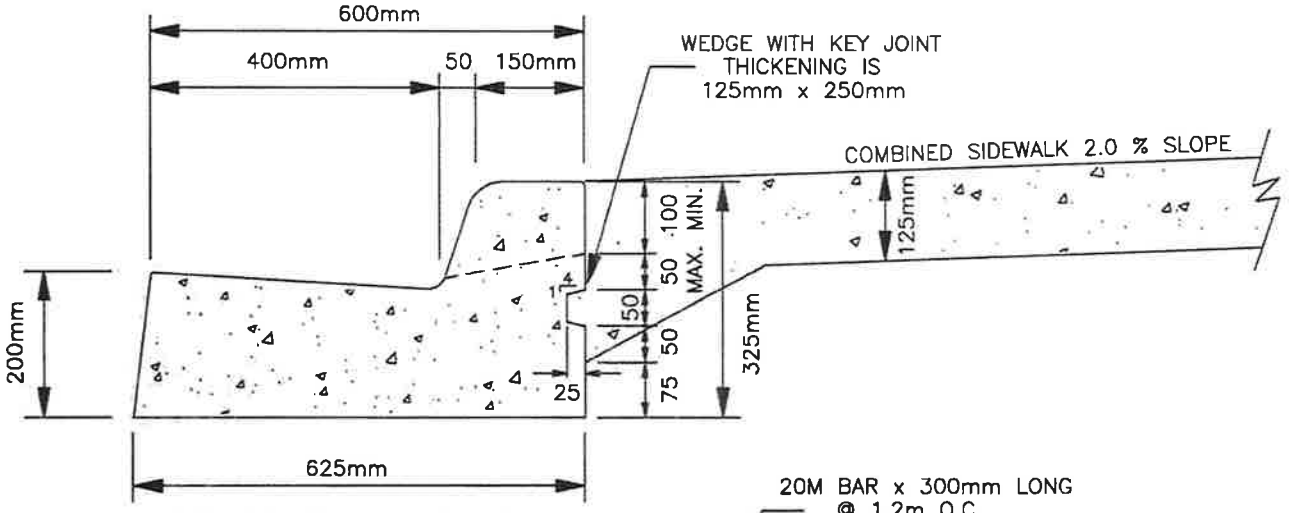



| REV.# | DESCRIPTION | DATE | AP.BY |
|---|---|---|---|
| | | | |
| | | | |

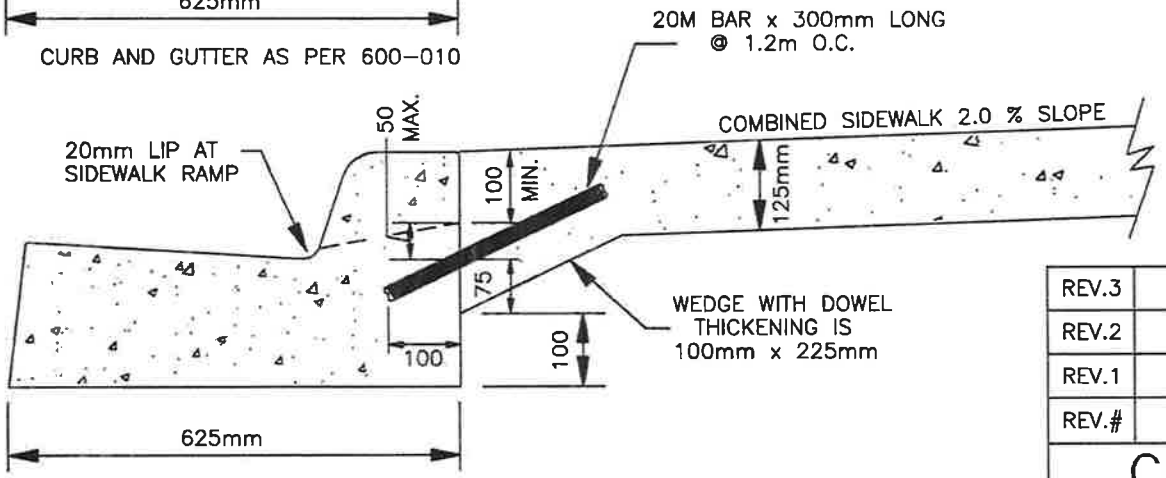
# CITY OF SARNIA

## STANDARD METER PIT

| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: DS | SCALE: N.T.S. | DWG.No. |
| CHK' BY: | DATE: JUNE/11 | 115–SF |




CURB AND GUTTER AS PER 600–010




CURB AND GUTTER AS PER 600–010

NOTE:

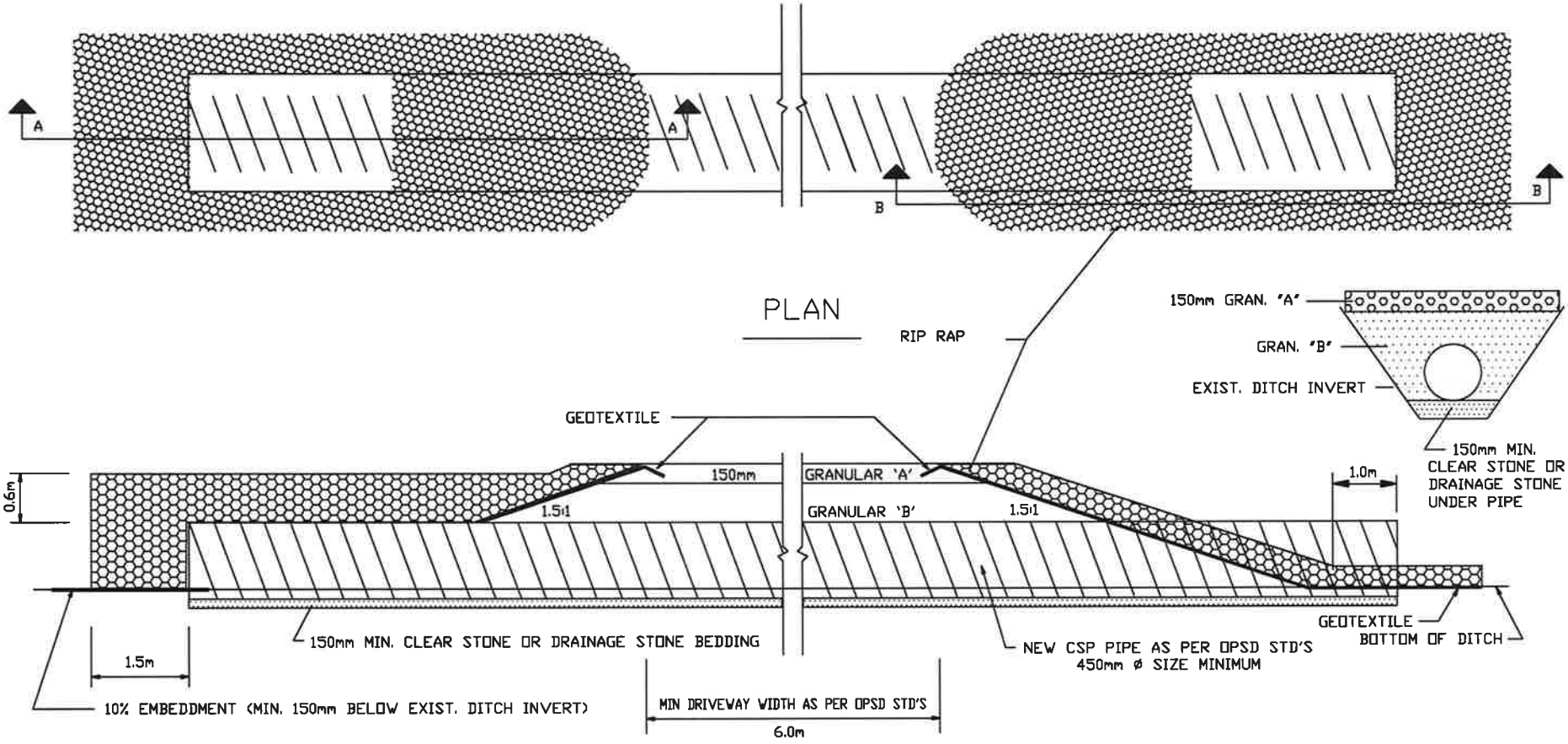
WHERE BARS ARE TO BE DRILLED INTO EXISTING CONCRETE CURB – 20M BARS ARE TO BE EMBEDDED 100mm INTO THE EXISTING CURB.

| REV.# | DESCRIPTION | DATE | AP.BY |
|---|---|---|---|
| REV.3 | CHANGED CURB DETAIL | 05/14 | E.C. |
| REV.2 | REVISED FOR 1999 SPEC. | 03/99 | J.R. |
| REV.1 | REDRAWN FOR ACAD FILES | 12/97 | J.R. |

# CITY OF SARNIA

## ALTERNATE DETAIL FOR COMBINED SIDEWALK AND CURB AND GUTTER

| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: J.Roberts | SCALE: N.T.S. | DWG.No. 119–F |
| CHK' BY: | DATE: 12/97 | |




SECTION A-A

SECTION B-B

## NOTES

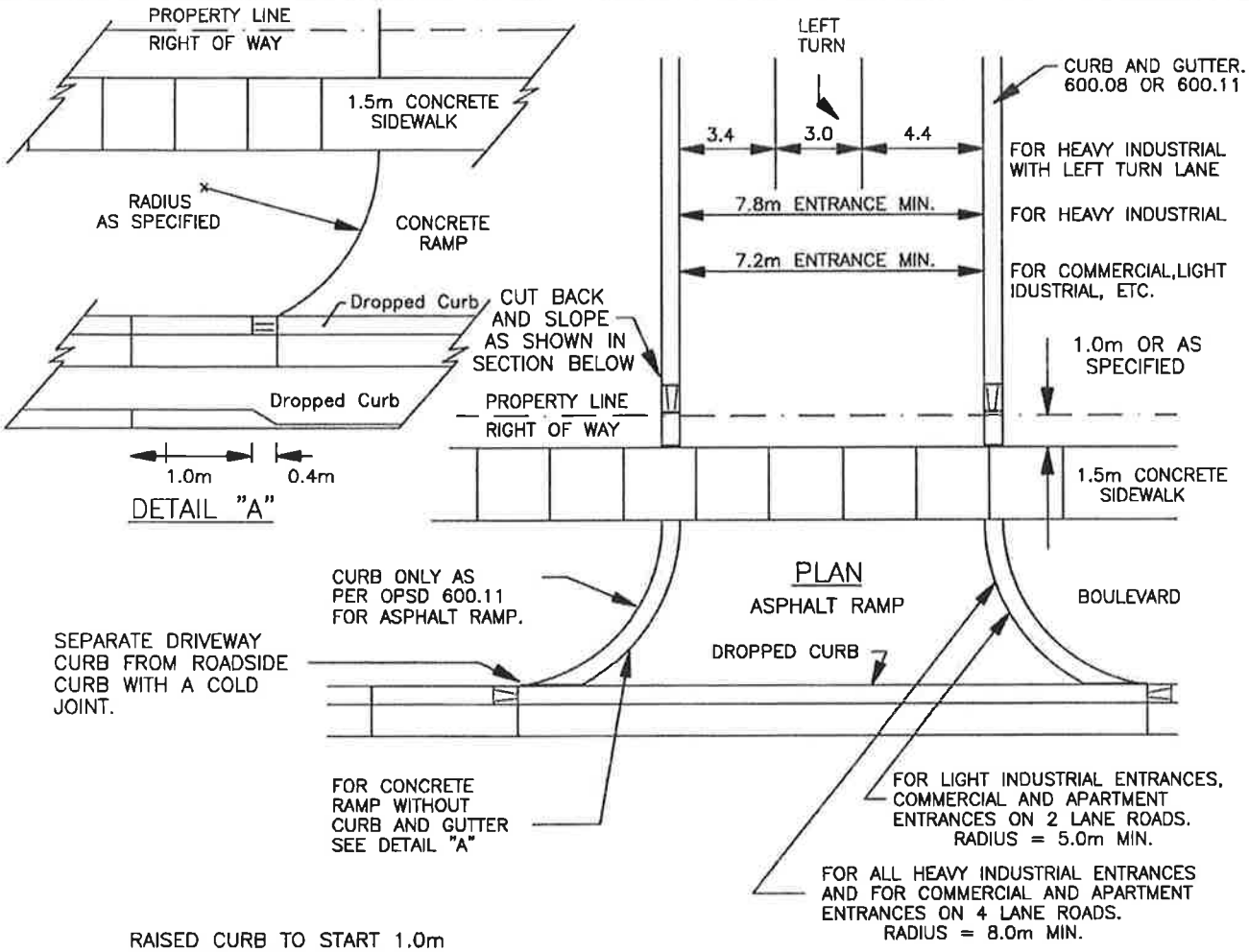
SEE OPSD 810.01 FOR INSTALLATION OF
GEOTEXTILE FABRIC AND RIP-RAP
RIP RAP TO BE CRUSHED ROCK 100mm TO 250mm DIA., LAID 400mm THICK
(CONCRETE RUBBLE NOT ACCEPTABLE) SEE OPSS 1004
GEOTEXTILE FABRIC SHALL BE NON-WOVEN FABRIC AS PER OPSS CLASS 2
USE TERRAFIX 270 R OR EQUAL

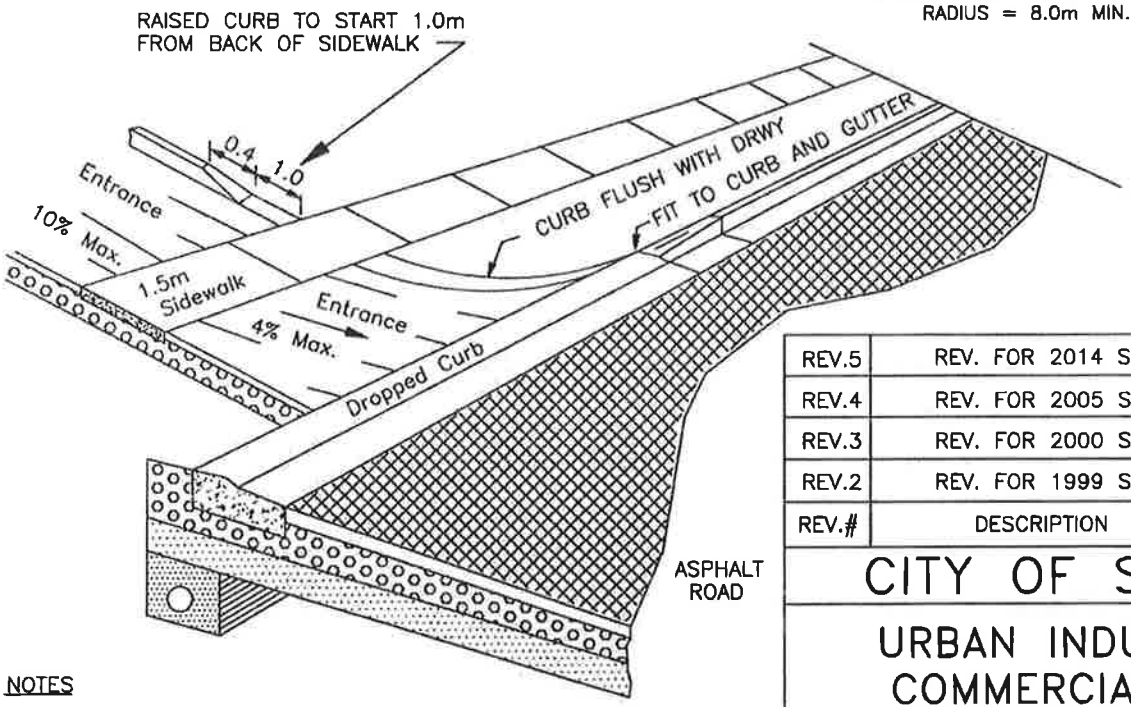
| REV.# | DESCRIPTION | DATE | APP.BY |
|---|---|---|---|
| #1 | REVISED FOR 2019 SPEC. | 01/19 | D.M. |

CITY OF SARNIA

# TYPICAL DRIVEWAY CULVERT STANDARD (MAX. 30m LENGTH)

| | | |
|---|---|---|
| APPROVED BY: | | DATE: JAN 19 |
| DRAWN BY: | SCALE: N. T. S. | DWG.# 120-F |




NOTES

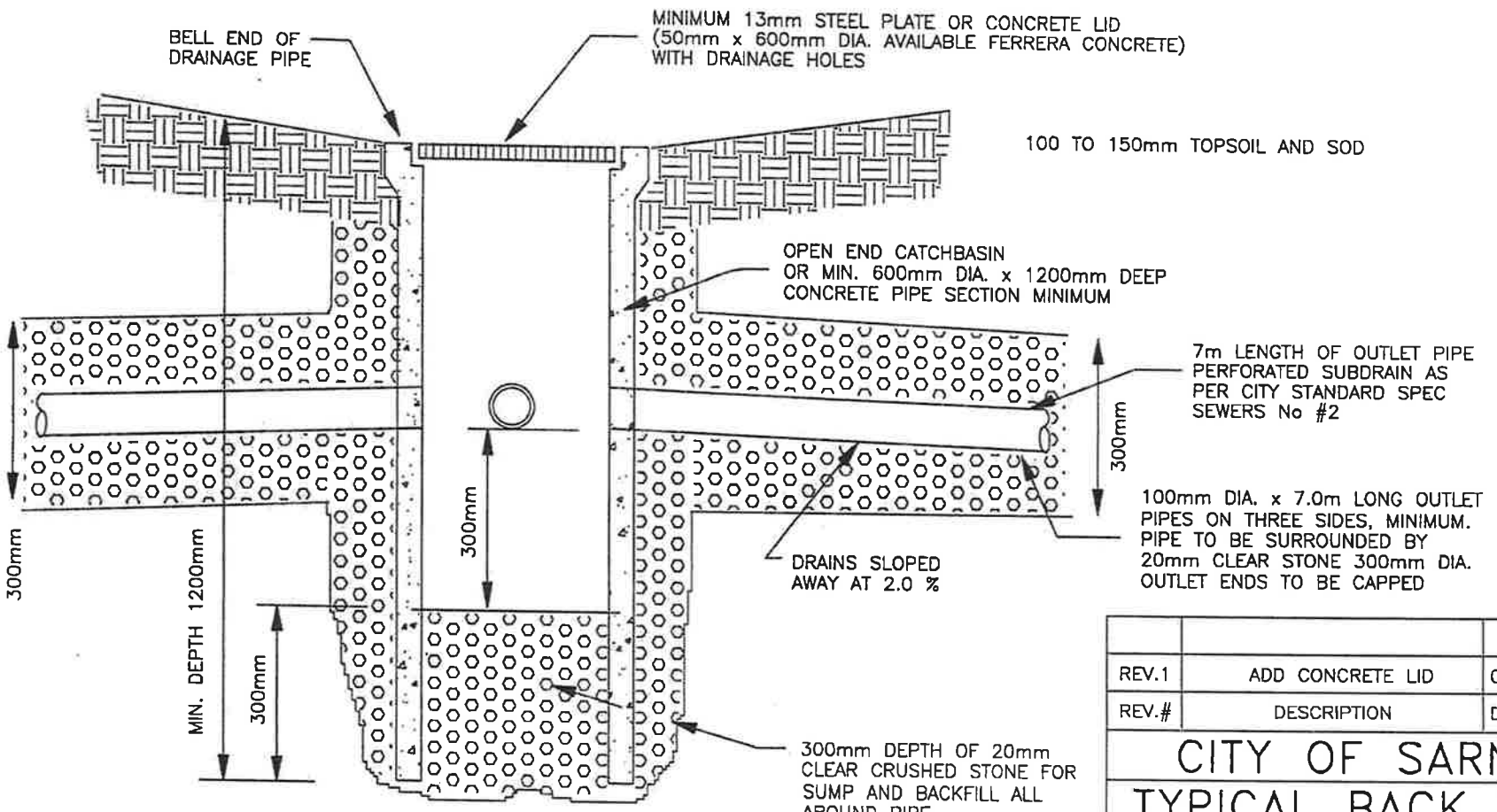
A. MINIMUM DIMENSIONS ARE INDICATED. MAXIMUM DIMENSIONS AS SPECIFIED.
B. PAVEMENT AND SIDEWALK STRUCTURE AT ENTRANCES SHALL BE CONSTRUCTED USING MATERIALS AND THICKNESSES AS SPECIFIED ELSEWHERE.
C. ALL DIMENSIONS ARE IN MILLIMETRES OR METRES UNLESS OTHERWISE SHOWN.

| REV.# | DESCRIPTION | DATE | AP.BY |
|---|---|---|---|
| REV.5 | REV. FOR 2014 SPEC | 05/14 | E.C. |
| REV.4 | REV. FOR 2005 SPEC. | 02/05 | J.R. |
| REV.3 | REV. FOR 2000 SPEC. | 02/00 | J.R. |
| REV.2 | REV. FOR 1999 SPEC. | 03/99 | J.R. |

# CITY OF SARNIA

## URBAN INDUSTRIAL, COMMERCIAL AND APARTMENT ENTRANCES

| | | |
|---|---|---|
| APPROVED BY: | | DK. |
| DRAWN BY: J.Roberts | SCALE: N.T.S. | DWG.No. 122-F |
| CHK' BY: | DATE: 12/97 | |



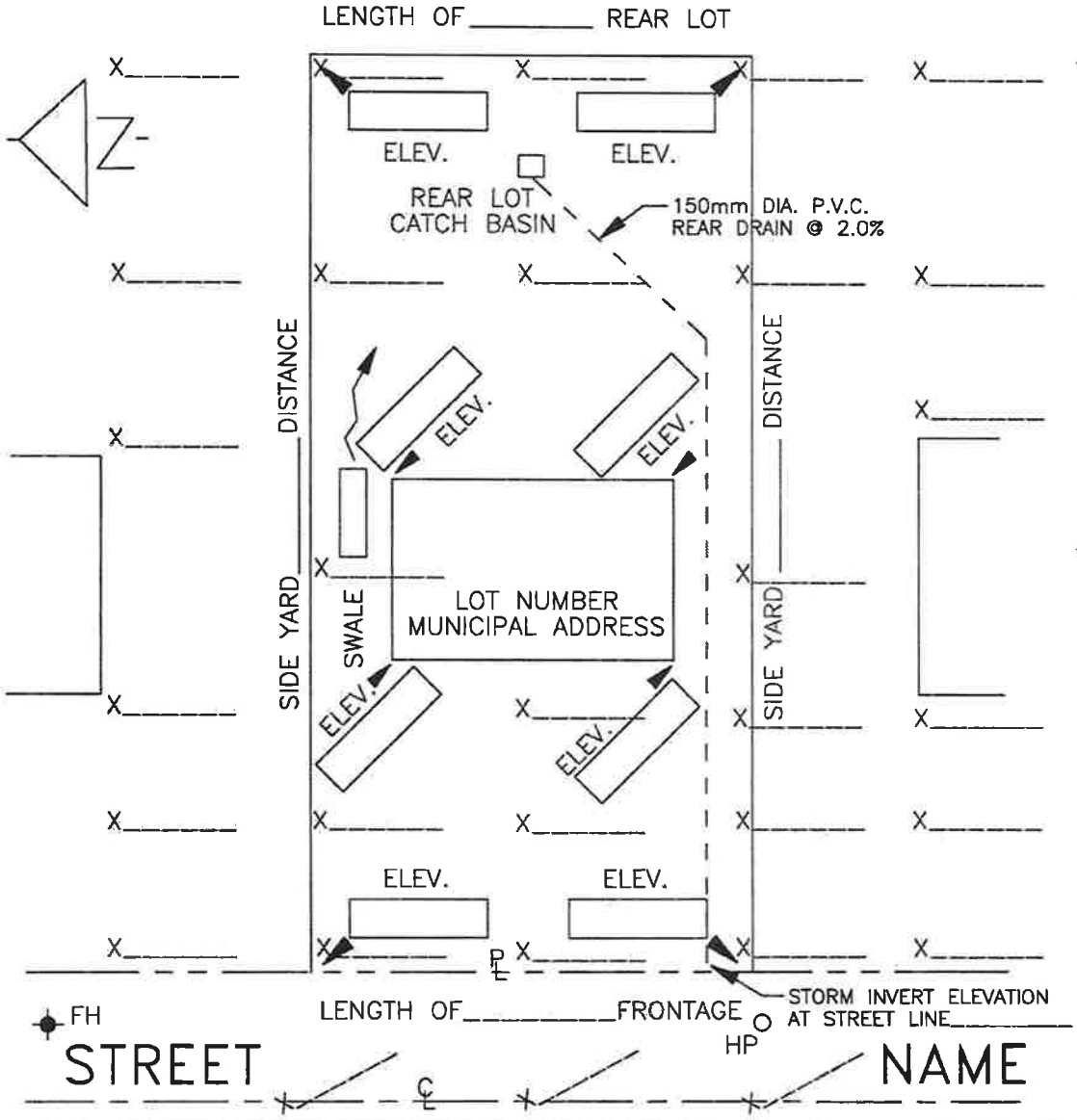

# TYPICAL BACK YARD DRY WELL

| | | | |
|---|---|---|---|
| | | | |
| REV.1 | ADD CONCRETE LID | 02/03 | J.R. |
| REV.# | DESCRIPTION | DATE | AP.BY |

## CITY OF SARNIA

## TYPICAL BACK YARD DRY WELL INSTALLATION

| | | |
|---|---|---|
| APPROVED BY: S.W. | | BK. |
| DRAWN BY: J.Roberts | SCALE: N.T.S. | DWG.No. 1[illegible]3-F |
| CHK' BY: T.W. | DATE: 2/2000 | |




# SAMPLE INFILL

## CERTIFIED LOT GRADING PLAN

OF ALL OF _____

PART_____PLAN_____

IN THE

CITY OF SARNIA

SCALE : 1 : 500

PROPOSED ELEVATION (m) ELEV.

EXISTING ELEVATION (10m GRID) X_____

FINAL ELEVATIONS TO BE ± 0.050m OF PROPOSED

## NOTES

MIN. GRADE AT FOUNDATION (FRONT) _____m

MIN. GRADE AT FOUNDATION (REAR) _____m

DRIVEWAY ELEV. AT GARAGE ENTRANCE _____m

DRIVEWAY HAS A _____% AVE. SLOPE TO ROAD

REAR LOT CATCH BASIN GRADE ELEV. _____m

REAR LOT CATCH BASIN INVERT ELEV. _____m

SHOW SIDE YARD SWALE ELEVATIONS ☐

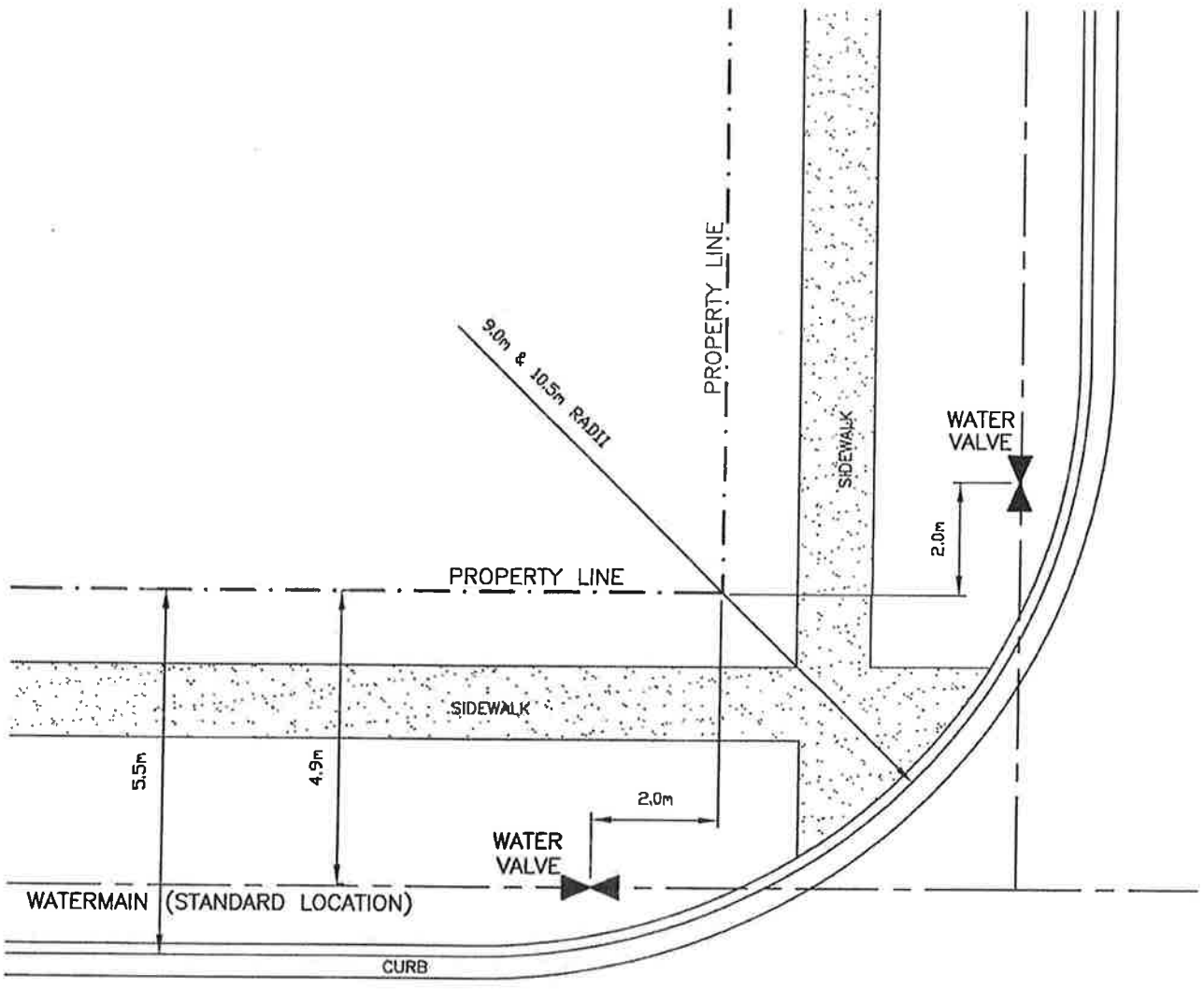
## ENGINEER'S CERTIFICATE :

I HEREBY CERTIFY THAT THE GRADING AND APPURTENANT DRAINAGE WORKS COMPLY WITH PART 3.1.17.1 AND/OR 9.14.6.1 OF THE ONTARIO BUILDING CODE WITH RESPECT TO GRADING.

ENGINEER'S SEAL AND SIGNATURE

| | | |
|---|---|---|
| COMPANY _____ | GEODETIC BENCH MARK ELEVATION _____ | |
| | DESCRIPTION _____ | |
| DRAWN BY: _____ | CHK' BY: _____ | DATE: _____ |

CITY OF SARNIA 130-F




NOTES:

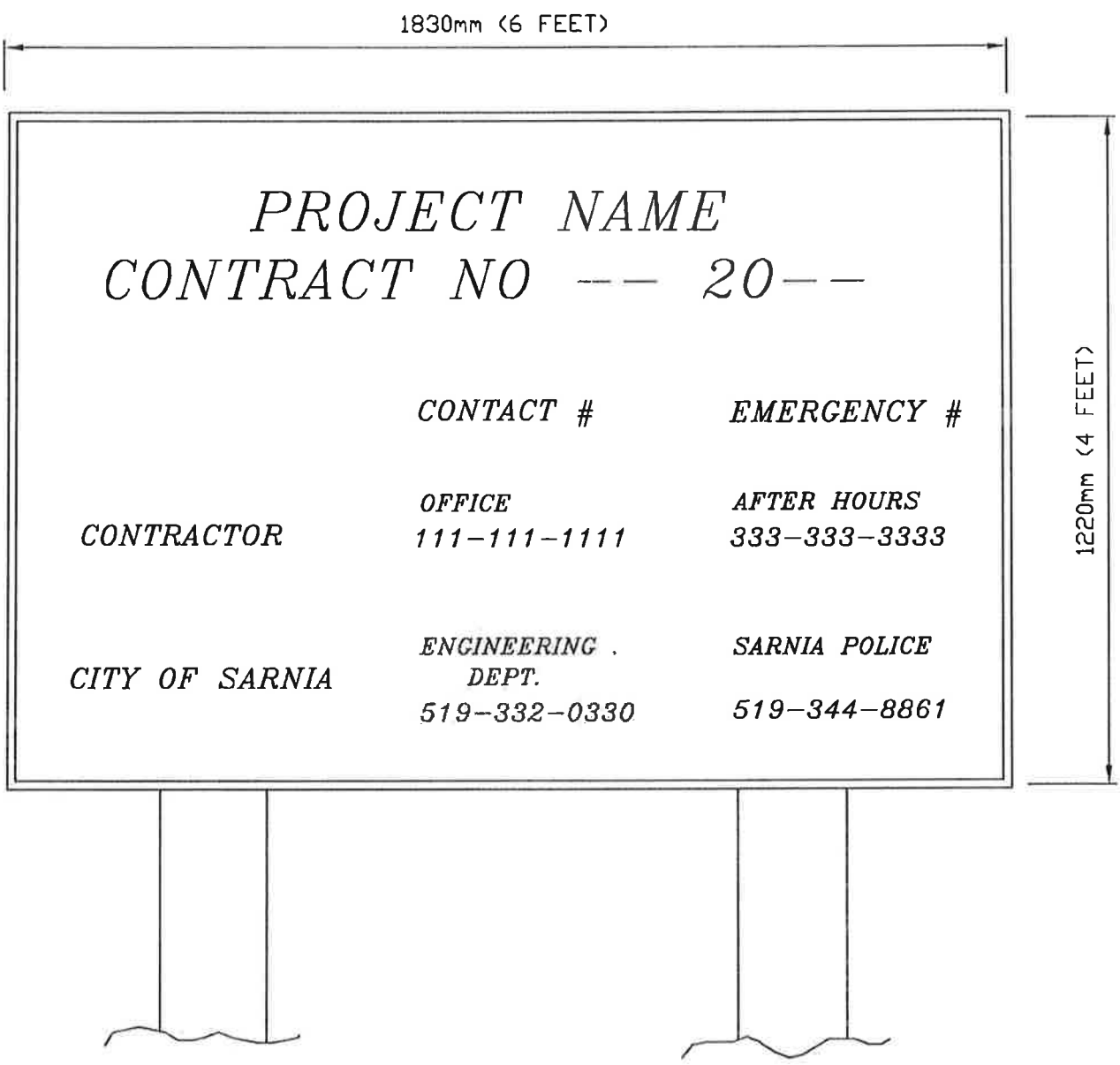
THIS STANDARD MAY NOT APPLY IF CURBS ARE MORE THAN 5.5m FROM PROPERTY LINE. THE OBJECTIVE IS TO PREVENT VALVES FROM BEING IN THE GUTTER.

| | | | |
|---|---|---|---|
| | | | |
| REV.1 | | | |
| REV.# | DESCRIPTION | DATE | AP.BY |

# CITY OF SARNIA

## STANDARD LOCATION FOR WATER VALVES AT INTERSECTIONS WITH 9.0m & 10.5m CURB RADII

| | | |
|---|---|---|
| APPROVED BY: T.W. | | BK. |
| DRAWN BY: J.RAMSAY | SCALE: N.T.S. | DWG.No. 134-F |
| CHK' BY: J.ROBERTS | DATE: 02/03 | |




# NOTES:

THE CONTRACTOR SHALL SUPPLY AND ERECT SIGNBOARDS AT LOCATIONS DESIGNATED BY ENGINEER. THE SIGNBOARD SHALL BE 1220mm (4 FEET) HIGH AND 1830mm (6 FEET)WIDE. A SUITABLE FRAMEWORK SHALL BE SUPPLIED AND ERECTED BY THE CONTRACTOR TO SUPPORT THE SIGN. NO ADDITIONAL SIGNS OR NOTICES OTHER THAN REQUIRED FOR TRAFFIC AND PEDESTRIAN INSTRUCTIONS AND PUBLIC WARNING MAY BE EXHIBITED ON THE SITE WITHOUT THE APPROVAL OF THE ENGINEER.
LETTERING SHALL BE GREEN ON A WHITE BACKGROUD THE SIGNBOARD SHALL BE ERECTED IN POSITION, AND MOVED WITH THE PROGRESS OF WORK, AS DIRECTED BY CITY ENGINEER.

| | | | |
|---|---|---|---|
| | | | |
| REV.1 | REVISED | 11/09 | |
| REV.# | DESCRIPTION | DATE | AP.BY |

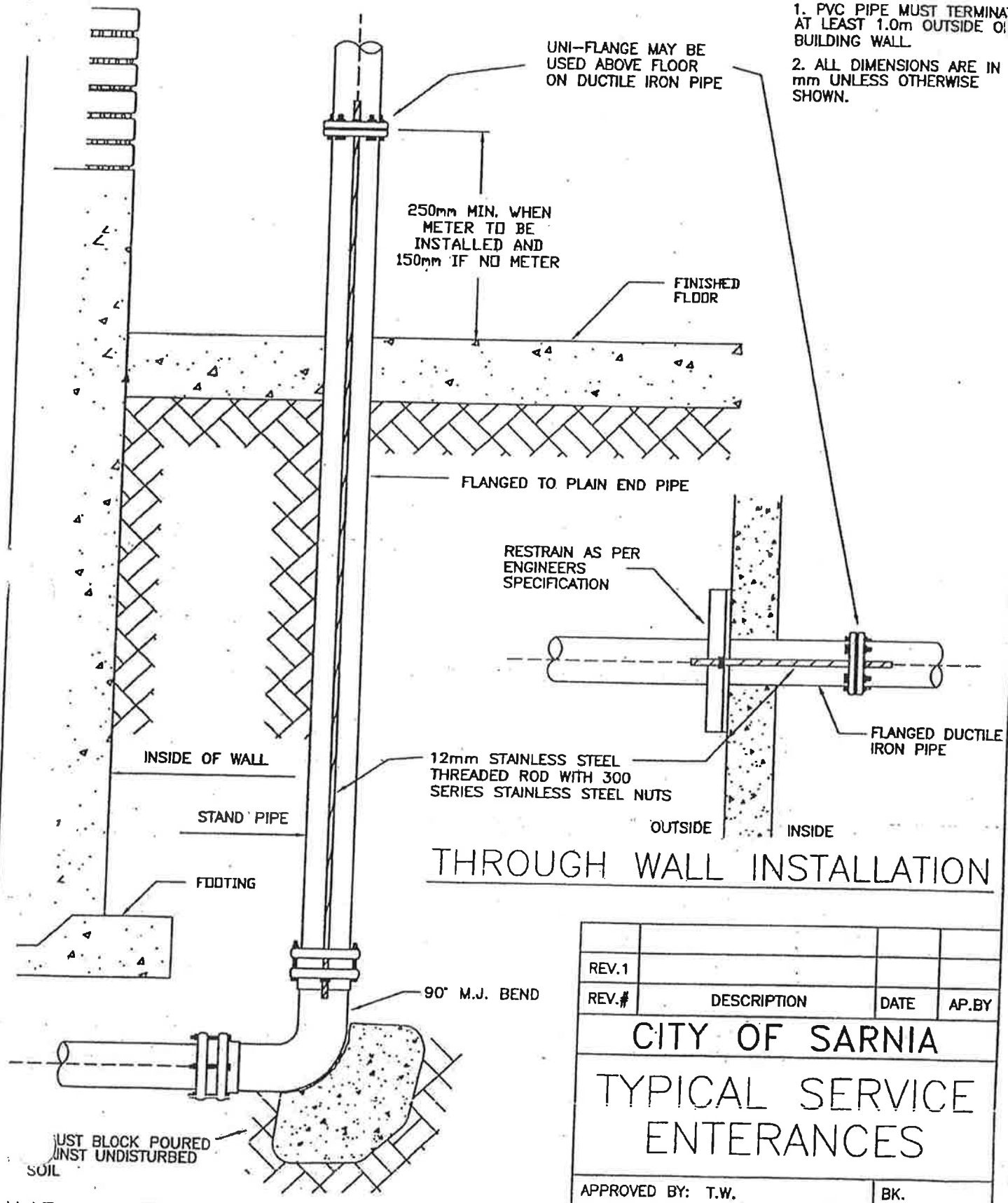
## CITY OF SARNIA

## PROJECT SIGNBOARD

| | | |
|---|---|---|
| APPROVED BY: T.W. | | BK. |
| DRAWN BY: J.RAMSAY | SCALE: N.T.S. | DWG.No. 136-F |
| CHK' BY: J.ROBERTS | DATE: 02/03 | |

NOTES:

1. PVC PIPE MUST TERMINAT AT LEAST 1.0m OUTSIDE O BUILDING WALL.
2. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SHOWN.




UNDER FOOTING INSTALLATION

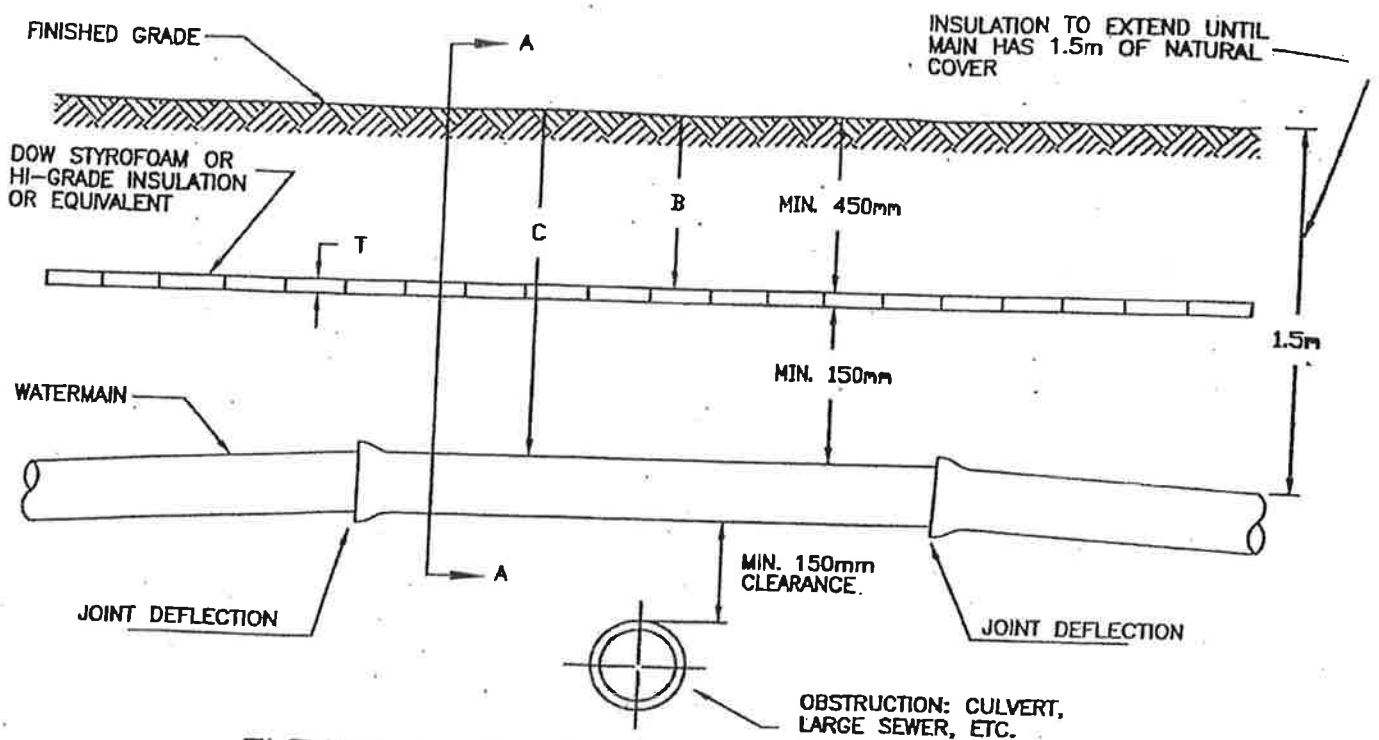
THROUGH WALL INSTALLATION

| REV.# | DESCRIPTION | DATE | AP.BY |
|---|---|---|---|
| | | | |
| REV.1 | | | |

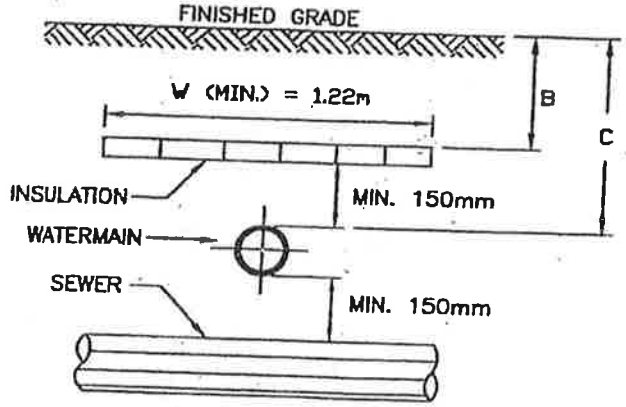
# CITY OF SARNIA

# TYPICAL SERVICE ENTERANCES

| | | |
|---|---|---|
| APPROVED BY: T.W. | | BK. |
| DRAWN BY: J.RAMSAY | SCALE: N.T.S. | DWG.No. 137-F |
| CHK' BY: J.ROBERTS | DATE: 02/03 | |




ELEVATION OF JOINT DEFLECTION OFFSET




SECTION "A–A"

| INSULATION THICKNESS | | INSULATION WIDTH | |
|---|---|---|---|
| C (m) | T (mm) | B (m) | W (m) |
| 0.60 | 75 | 0.45 | 2.44 |
| 0.75 | 75 | 0.60 | 1.83 |
| 0.90 | 50 | 0.75 | 1.54 |
| 1.09 | 50 | 0.90 | 1.22 |
| 1.20 | 25 | | |
| 1.35 | 25 | | |

NOTES:

1. MINIMUM COMPRESSIVE STRENGTH OF INSULATION TO BE 275kpa. INSULLATION SHALL BE INSTALLED IN THICKNESS REQUIRED. IN STRICT ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS. INSULATION SHALL BE INSTALLED OVER 150mm OF FINE GRANULAR FILL SCREEDED SMOOTH.

   BUTT INSULATION TIGHTLY TOGETHER WITHOUT GAPS, STAGGERED END JOINTS IF MORE THAN ONE LAYER USED.

   TO HOLD IN PLACE, PIN INSULATION BOARD TO GROUND WITH 200mm LONG WOODED PINS. 2 PINS PER BOARD.

   IF TWO LAYERS OF INSULATION ARE USED, PIN ONLY THE TOP LAYER THROUGH THE FIRST LAYER USING PINS 150mm LONGER THAN THE COMBINED THICKNESS OF THE TWO LAYERS OF INSULATION.
   PLACE AT LEAST 200mm OF FINE GRANULAR FILL OVER INSULATION BEFORE USING COMPACTION EQUIPMENT.

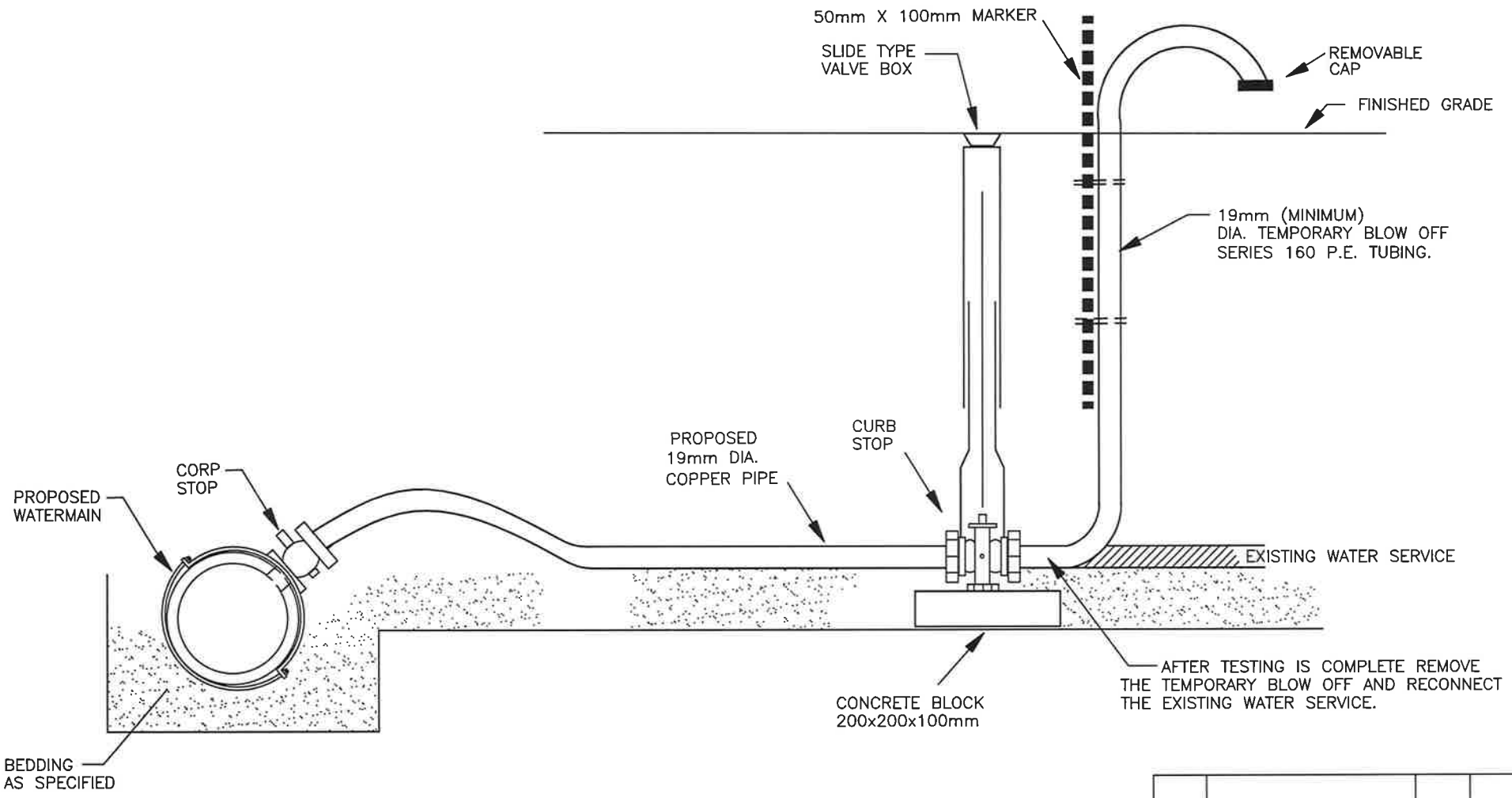
2. ALL DIMENSIONS ARE IN mm UNLESS SHOWN OTHERWISE.

| REV.# | DESCRIPTION | DATE | AP.BY |
|---|---|---|---|
| | | | |
| REV.1 | | | |

# CITY OF SARNIA

## INSULATION OF SHALLOW MAINS AND OFFSETS

| | | |
|---|---|---|
| APPROVED BY: T.W. | | BK. |
| DRAWN BY: J.RAMSAY | SCALE: N.T.S. | DWG.No. 138–F |
| CHK' BY: J.ROBERTS | DATE: 02/03 | |




| REV.# | DESCRIPTION | DATE | AP.BY |
|---|---|---|---|
| | | | |
| | | | |

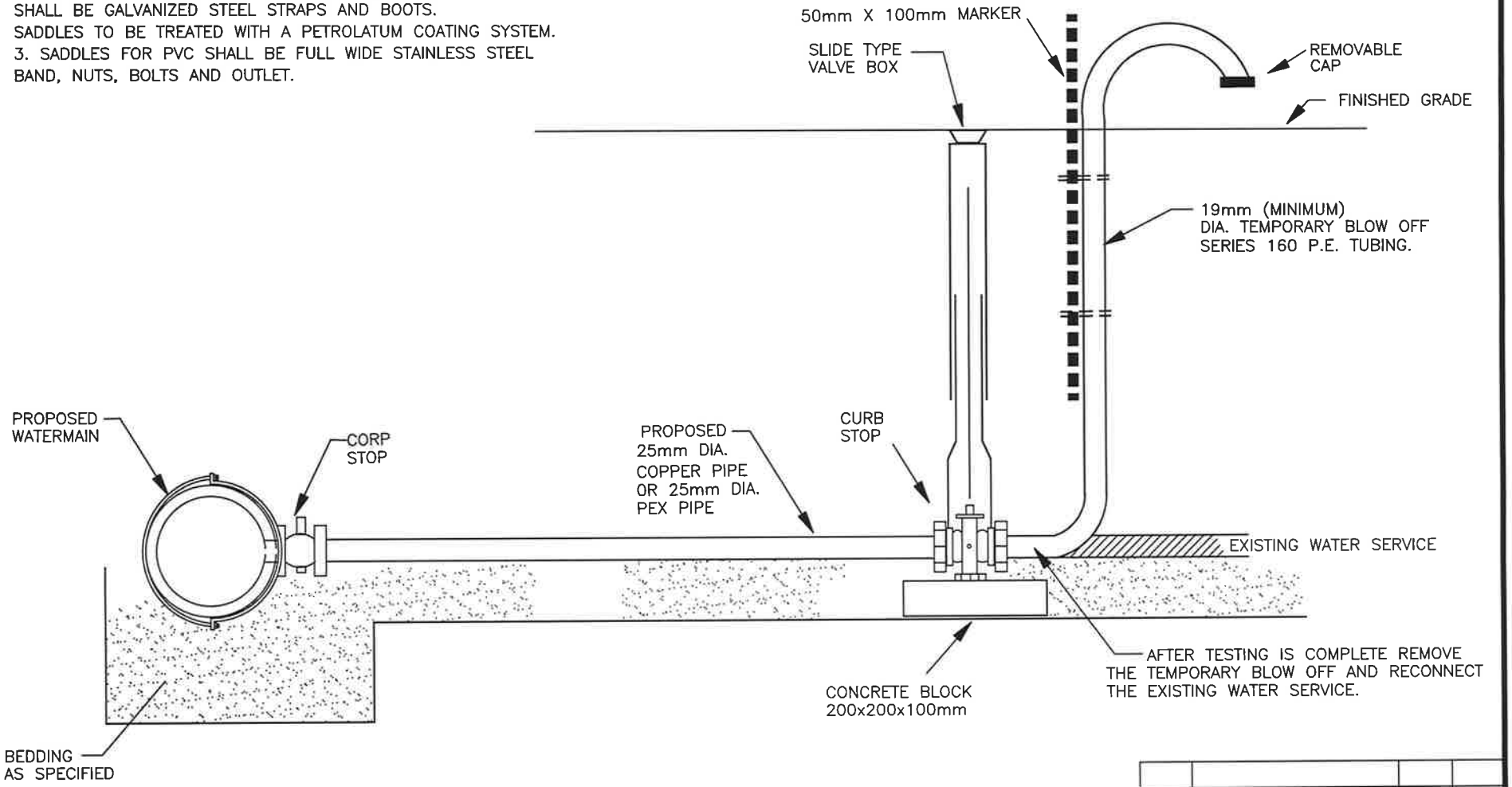
# CITY OF SARNIA

## TYPICAL TEMPORARY WATER SERVICE BLOW OFF INSTALLATION (COPPER ONLY)

| | | |
|---|---|---|
| APPROVED BY: RW | | BK. |
| DRAWN BY: DS | SCALE: | DWG.No. 150–F |
| CHK' BY: RW | DATE: | |

NOTES:

1. ALL PEX TUBING TO BE INSTALLED WITH TRACER WIRE.
2. SADDLES FOR CI,DI & ASBESTOS CEMENT PIPE SHALL BE GALVANIZED STEEL STRAPS AND BOOTS. SADDLES TO BE TREATED WITH A PETROLATUM COATING SYSTEM.
3. SADDLES FOR PVC SHALL BE FULL WIDE STAINLESS STEEL BAND, NUTS, BOLTS AND OUTLET.



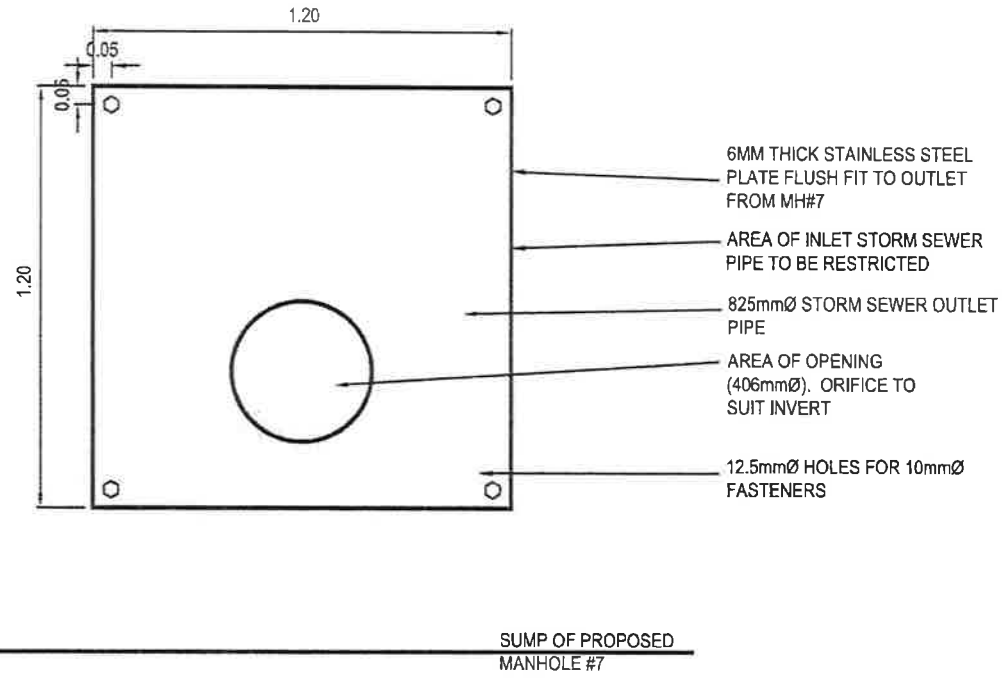

NOTE –
1"ø PEX / 1"ø COPPER OR ABOVE

| REV.# | DESCRIPTION | DATE | AP.BY |
|---|---|---|---|
| 1 | REVISION FOR 2018 | 01/18 | BL |

# CITY OF SARNIA

## TYPICAL TEMPORARY WATER SERVICE BLOW OFF INSTALLATION

| | | | |
|---|---|---|---|
| APPROVED BY: RW | | | BK. |
| DRAWN BY: DS | SCALE: N.T.S. | | DWG.No. 150–G |
| CHK' BY: RW | DATE: Jan/13 | | |




| REV.# | DESCRIPTION | DATE | APP.BY |
|---|---|---|---|
| REV.1 | | | |

CITY OF SARNIA

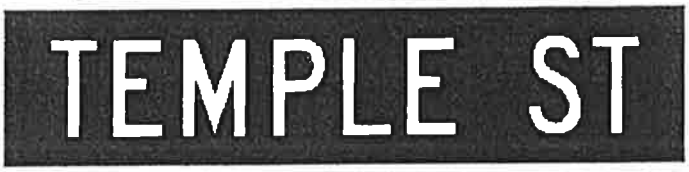
# PROPOSED ORIFICE CONTROL PLATE

| | | | |
|---|---|---|---|
| APPROVED BY: | P.R. | | FIELD BOOK# |
| DRAWN BY: | G.H. | SCALE: 1:20 | DWG.# 151-F |
| CHK'D BY: | | DATE: MAY 2014 | |

# 6.25" Ext. w/4" text
# Highway Gothic Condensed font

6.25" X 54 cm


6.25" X 69 cm




6.25" X 76 cm

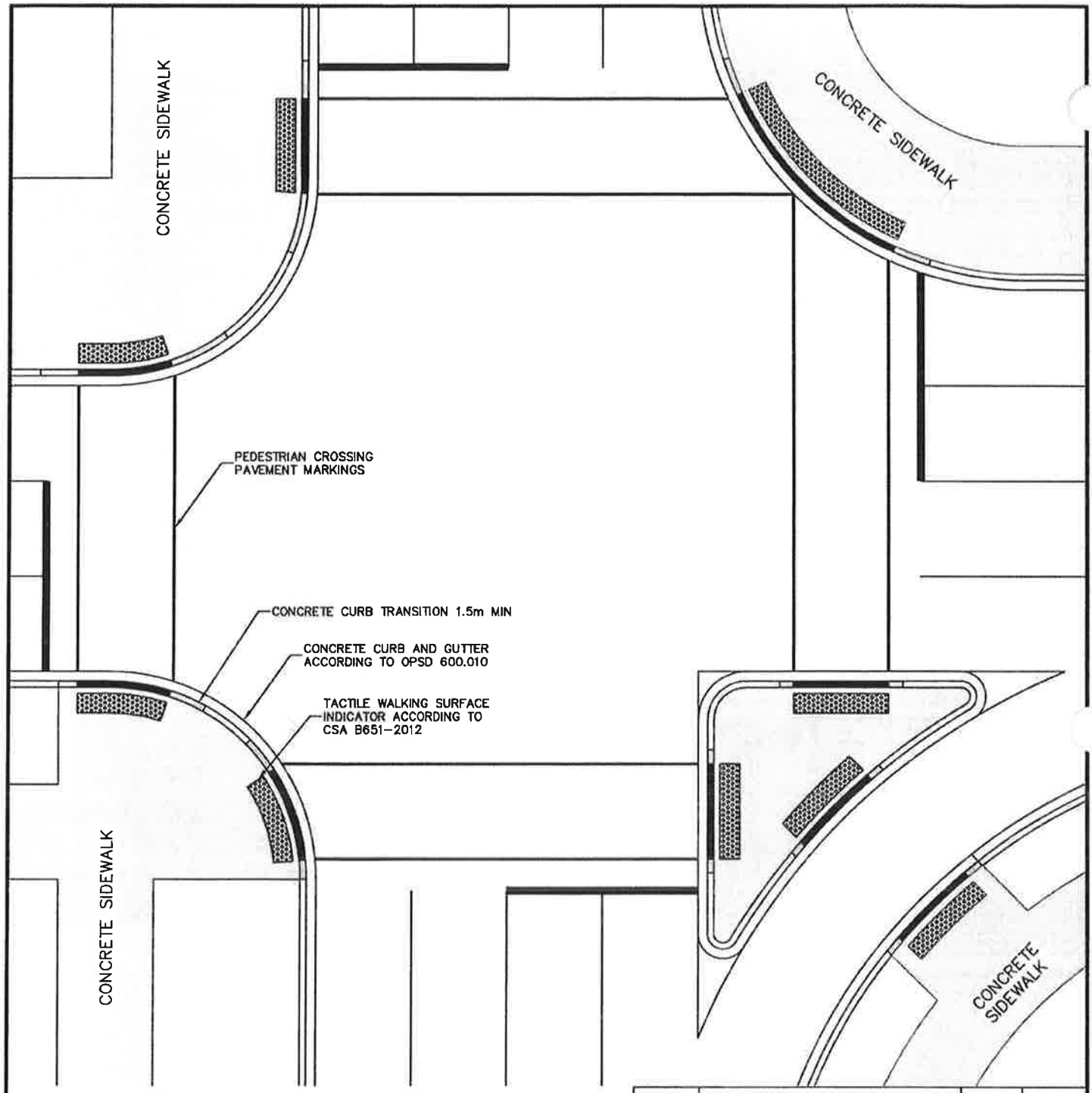

6.25" X 91cm


| REV.1 | | | |
|---|---|---|---|
| REV.# | DESCRIPTION | DATE | AP.BY |

CITY OF SARNIA

STREET NAME
SIGN TEMPLATE

| APPROVED BY: | | BK. |
|---|---|---|
| DRAWN BY: OD | SCALE: N.T.S. | DWG.No. 152-F |
| CHK' BY: | DATE: FEB 2014 | |




NOTES

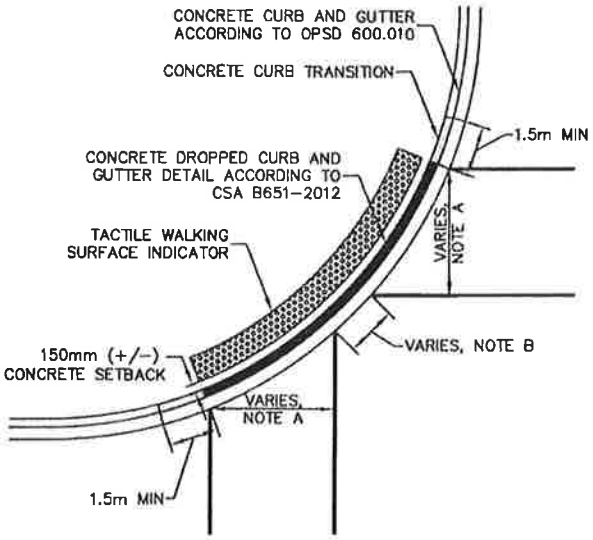
1. DROPPED CURBS ARE TO BE PROVIDED FOR WIDTH OF ALL PEDESTRIAN CROSSING MARKINGS 1.5m MIN.
2. TACTILE WALKING SURFACE INDICATORS ARE TO BE INSTALLED AT ALL PEDESTRIAN CROSSINGS IN CONJUNCTION WITH ALL ROAD AND SIDEWALK CONSTRUCTION RECONSTRUCTION PROJECTS.
3. EACH LOCATION IS SITE SPECIFIC AND CONSULTATION WITH THE CITY OF SARNIA MAY BE REQUIRED FOR NON TYPICAL INTERSECTIONS AND PEDESTRIAN CROSSINGS.
4. REFER TO 154-F FOR DETAILS ABOUT LOCATION OF TACTILE WALKING SURFACE INDICATORS, CURB CUTS AND SIDEWALK RAMPS.

| REV.# | DESCRIPTION | DATE | AP.BY |
|---|---|---|---|
| REV.1 | | | |

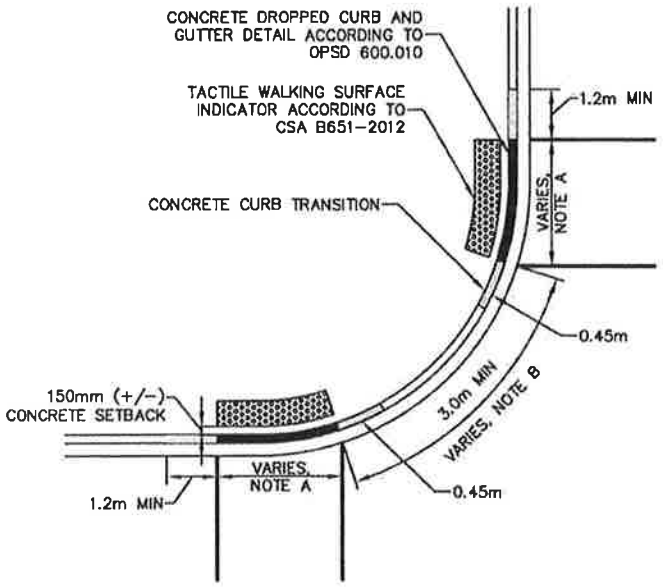
# CITY OF SARNIA

## SIGNALIZED INTERSECTION CONFIGURATIONS OF PEDESTRIAN CROSSINGS

| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: OD | SCALE: N.T.S. | DWG.No. 153-F |
| CHK' BY: | DATE: FEB 2014 | |




## CONTINUOUS DROPPED CURB AT INTERSECTION CORNER




## TWO SEPARATED DROPPED CURBS AT INTERSECTION CORNER

NOTES

A. 2.5m MINIMUM FOR PEDESTRIAN CROSSING PAVEMENT MARKINGS.

B. WHEN DISTANCE IS LESS THAN 3.0m USE CONTINUOUS DROPPED CURB AT INTERSECTION CORNER. WHEN DISTANCE IS GREATER THAN OR EQUAL TO 3.0m USE TWO SEPARATED DROPPED CURBS AT INTERSECTION CORNER.

1. DROPPED CURB TO BE PROVIDED FOR WIDTH OF ALL PEDESTRIAN CROSSINGS 1.5m MIN.

2. TACTILE WALKING SURFACE INDICATORS TO BE PROVIDED ONLY WITHIN WIDTH OF PEDESTRIAN CROSSINGS.

3. TACTILE WALKING SURFACE INDICATORS ARE TO BE INSTALLED AT ALL PEDESTRIAN CROSSINGS IN CONJUNCTION WITH ALL ROAD AND SIDEWALK CONSTRUCTION AND RECONSTRUCTION.

4. EACH LOCATION IS SITE SPECIFIC AND CONSULTATION WITH THE CITY OF SARNIA MAY BE REQUIRED FOR NON TYPICAL INTERSECTIONS AND PEDESTRIAN CROSSINGS.

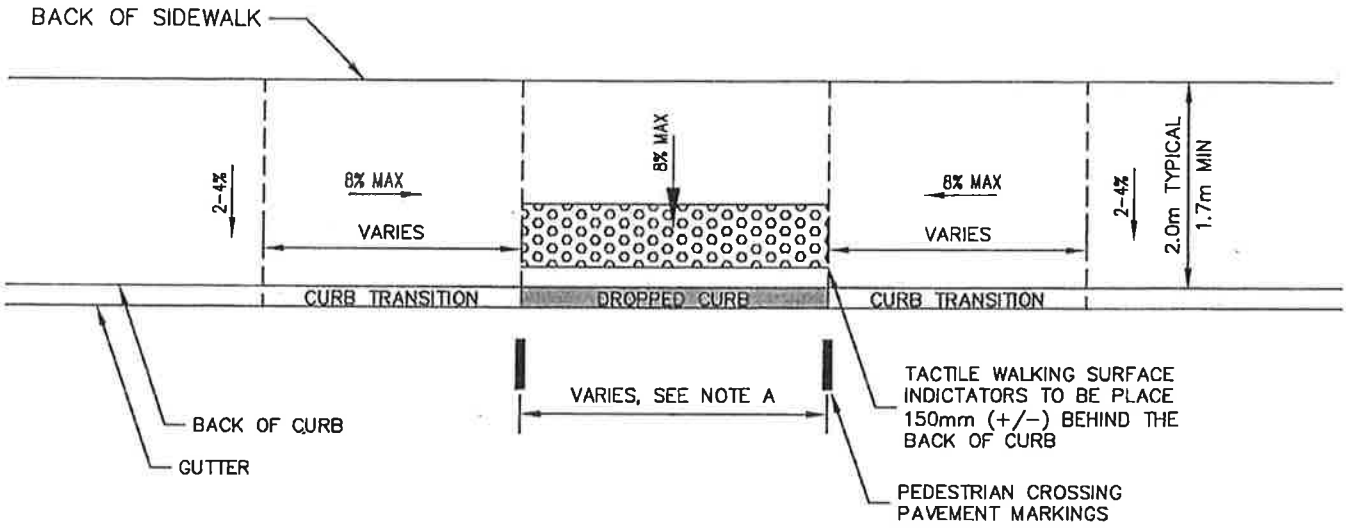
5. REFER TO 153-F FOR VARIOUS CONFIGURATIONS OF PEDESTRIAN CROSSINGS AT SIGNALIZED INTERSECTIONS.

| REV.1 | REVISED FOR 2016 SPEC. | 01/16 | |
|---|---|---|---|
| REV.# | DESCRIPTION | DATE | AP.BY |

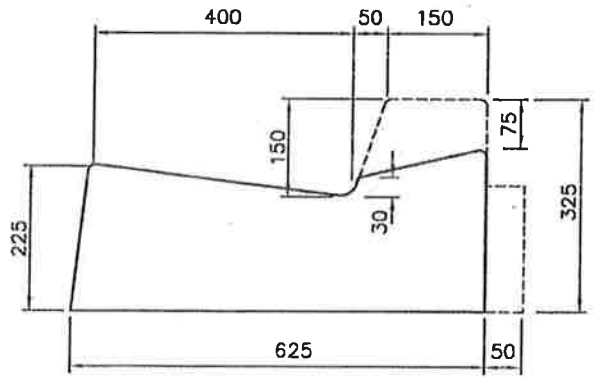
# CITY OF SARNIA

## LOCATION OF DROPPED CURBS AT CONTROLLED INTERSECTIONS

| APPROVED BY: | | BK. |
|---|---|---|
| DRAWN BY: OD | SCALE: N.T.S. | DWG.No. 154-F |
| CHK' BY: | DATE: FEB 2014 | |




# TACTILE WALKING SURFACE INDICATOR AND DEPRESSED CURB




## DROPPED CURB

NOTES

A. 2.5m MINIMUM FOR PEDESTRIAN CROSSING PAVEMENT MARKINGS.

1. REFER TO 154-F FOR INFORMATION ABOUT THE LOCATION OF DROPPED CURBS.

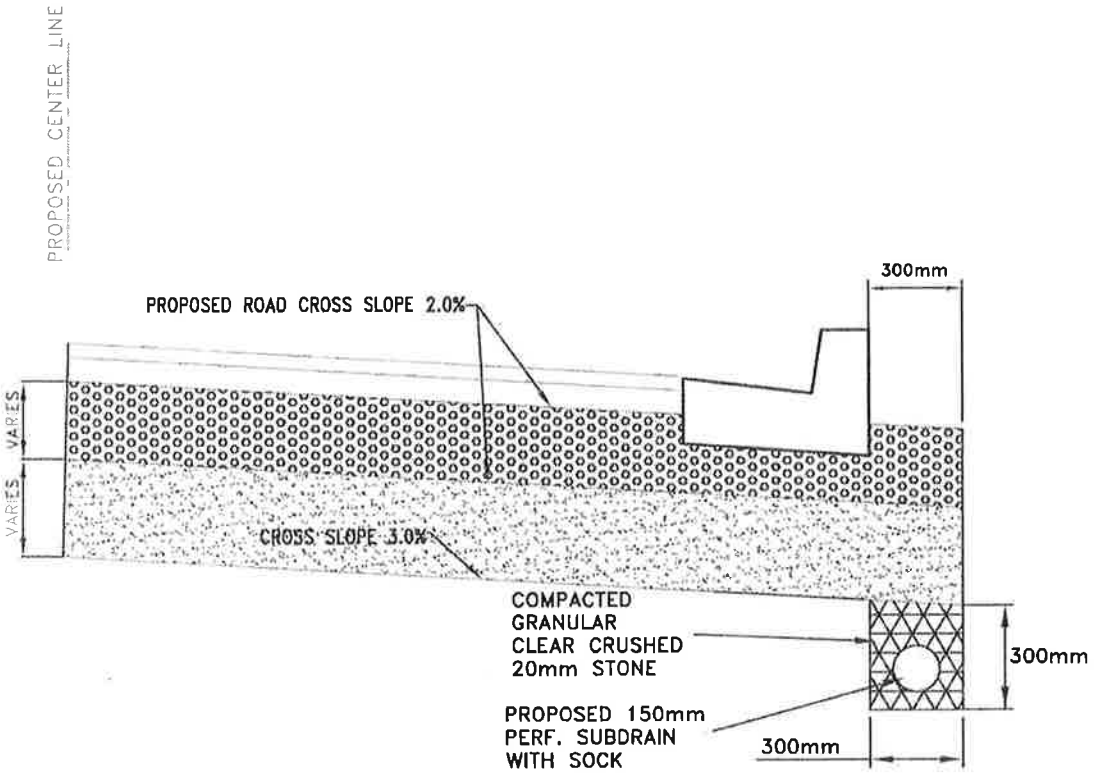
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.

| REV.1 | | | |
|---|---|---|---|
| REV.# | DESCRIPTION | DATE | AP.BY |

CITY OF SARNIA

TACTILE WALKING SURFACE INDICATOR AND DEPRESSED CURB DETAIL

| APPROVED BY: | | BK. |
|---|---|---|
| DRAWN BY: OD | SCALE: N.T.S. | DWG.No. 155-F |
| CHK' BY: | DATE: FEB 2014 | |




TYPICAL CROSS SECTION TO BE USED FOR DIAGRAMATIC VIEW ONLY

NOTE:

ROAD WIDTHS ARE EDGE OF PAVEMENT TO EDGE OF PAVEMENT

CONTRACTOR TO PROVIDE CURB AND SIDEWALK CONNECTIONS WITH A SMOOTH TRANSITION

LOT LINES ARE SHOWN APPROXIMATE ONLY, NOT TO BE USED AS LEGAL DOCUMENTATION

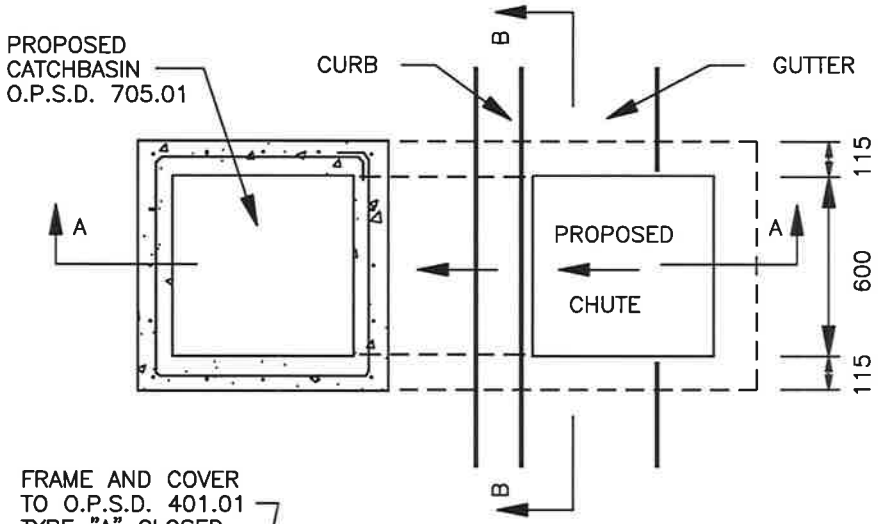
ALL EXISTING INFORMATION IN THIS DRAWING ARE PROVIDED ONLY FOR THE ASSISTANCE OF THE CONTRACTOR AND THEIR ACCURACY IS NOT GUARANTEED.

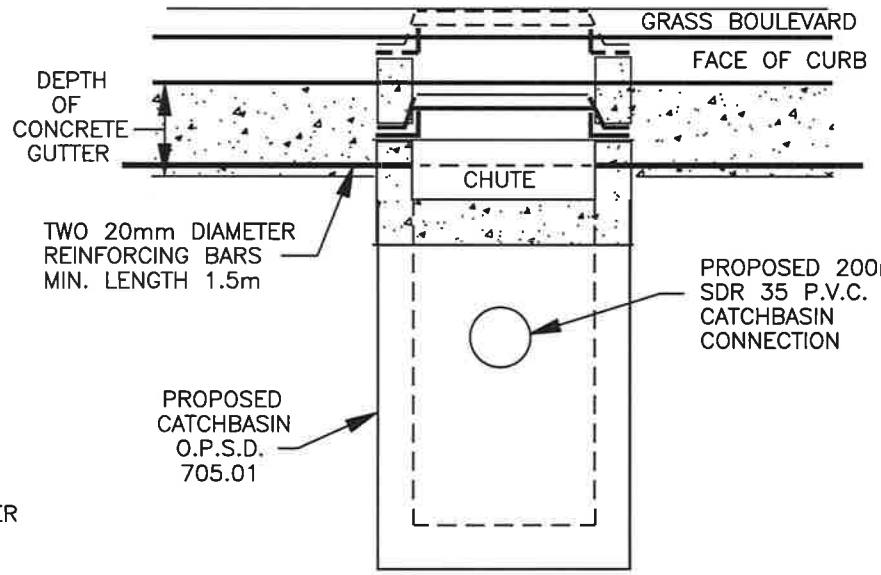
| REV.1 | | | |
|---|---|---|---|
| REV.# | DESCRIPTION | DATE | AP.BY |

CITY OF SARNIA

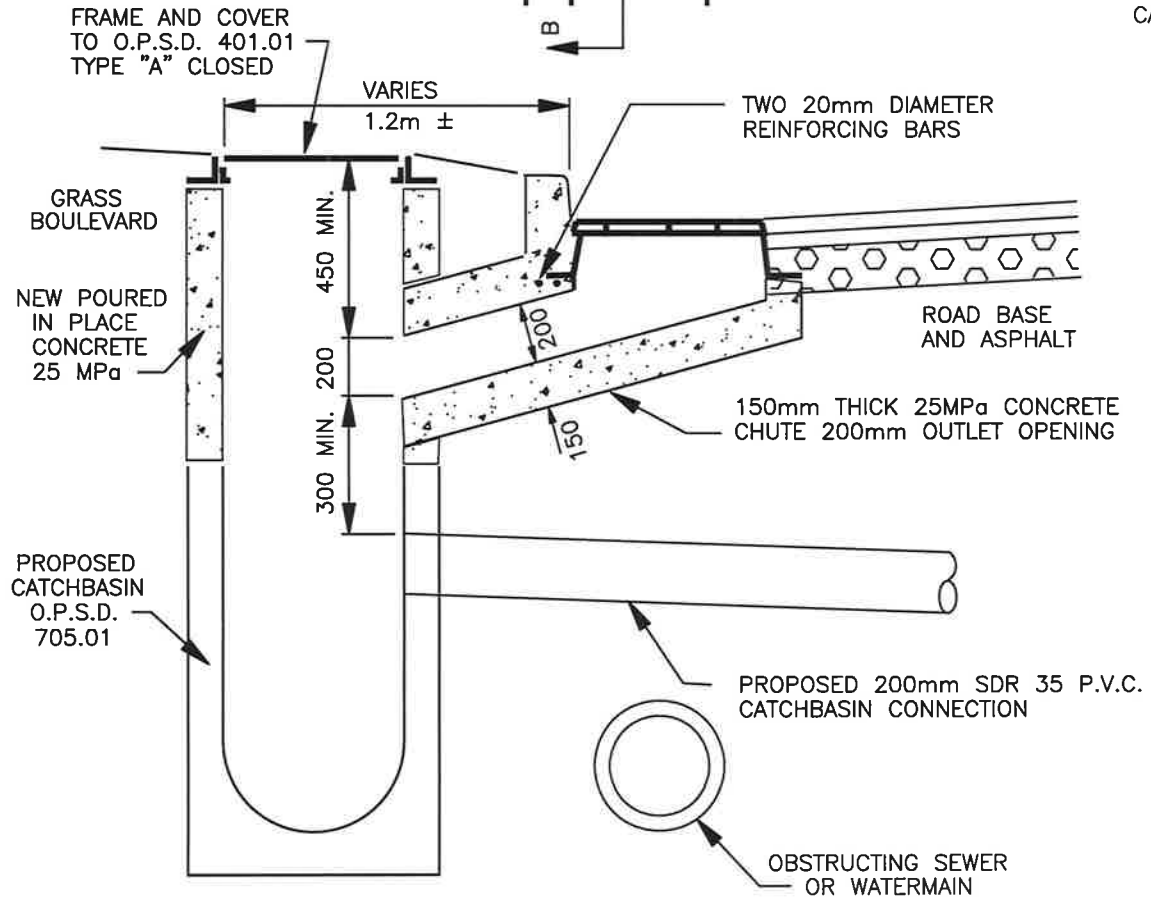
# TYPICAL SUBDRAIN DETAIL

| APPROVED BY: | | BK. |
|---|---|---|
| DRAWN BY: OD | SCALE: N.T.S. | DWG.No. 160 |
| CHK' BY: | DATE: JAN 2016 | |




SECTION B–B




SECTION A–A

| | | | |
|---|---|---|---|
| | | | |
| REV.1 | REDRAWN FOR ACAD FILE | 04/99 | J.R. |
| REV.# | DESCRIPTION | DATE | AP.BY |

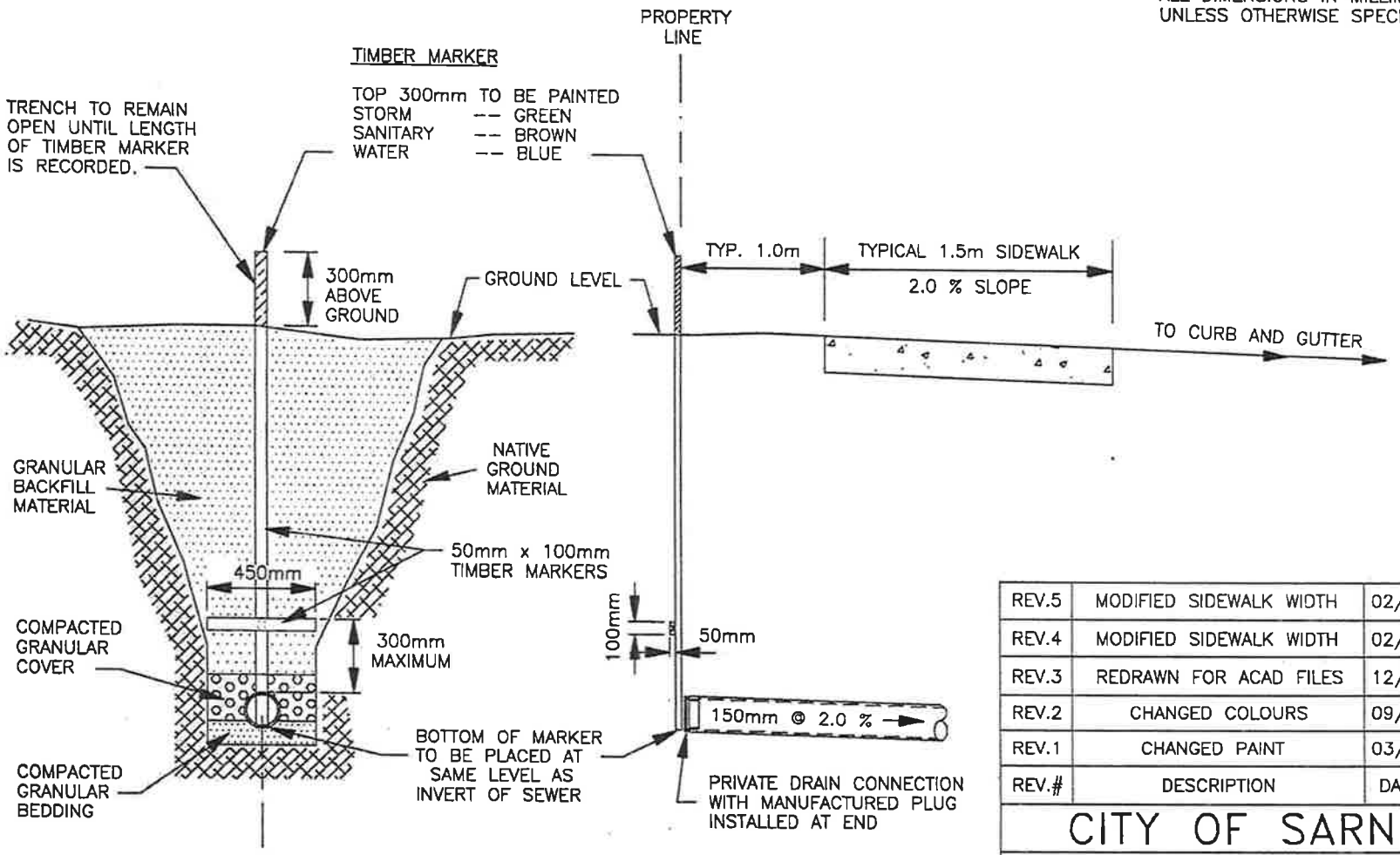
# CITY OF SARNIA

## PROPOSED PLAN OF EXTENSION CHUTE FOR CATCHBASIN

| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: J.Roberts | SCALE: N.T.S | DWG.No. |
| CHK' BY: | DATE: 04/9 | 1882–S |

NOTES

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.

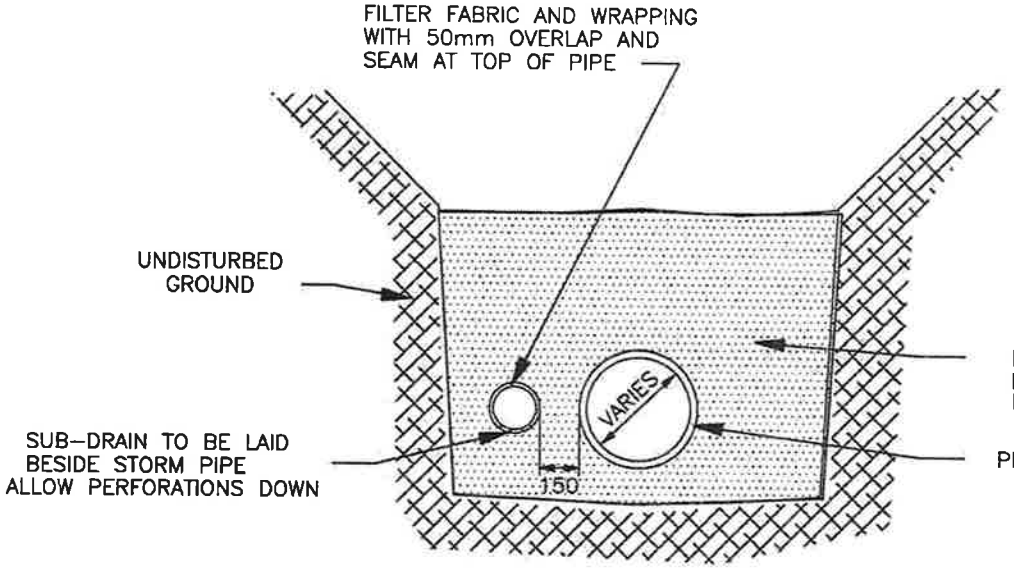



| REV.# | DESCRIPTION | DATE | AP.BY |
|---|---|---|---|
| REV.5 | MODIFIED SIDEWALK WIDTH | 02/05 | J.R. |
| REV.4 | MODIFIED SIDEWALK WIDTH | 02/03 | J.R. |
| REV.3 | REDRAWN FOR ACAD FILES | 12/97 | J.R. |
| REV.2 | CHANGED COLOURS | 09/93 | |
| REV.1 | CHANGED PAINT | 03/92 | |

# CITY OF SARNIA

## STANDARD 50mm x 100mm TIMBER MARKER FOR HOUSE CONNECTIONS

| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: J.Roberts | SCALE: N.T.S. | DWG.No. 2064-S |
| CHK' BY: | DATE: 12/97 | |




DETAIL "B"

– PROPOSED STORM SEWER

## NOTES:

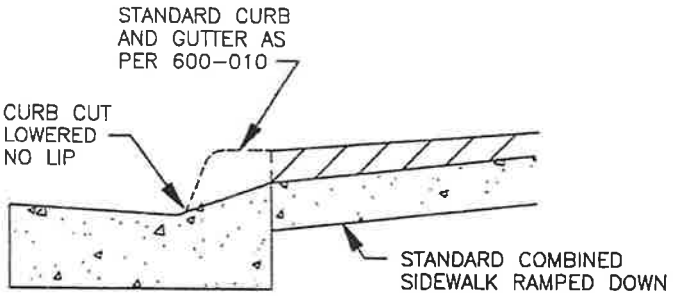
1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. SUB–DRAINS TO BE 150mm DIAMETER PERFORATED PIPE AS PER STANDARD SPECIFICATIONS.
3. SUB–DRAINS TO EXTEND FROM THE MANHOLE IN EACH DIRECTION OF THE STORM SEWER A DISTANCE OF 6.0m.
4. SUB–DRAINS WILL BE INSTALLED INTO A MANUFACTURER PROVIDED HOLE IN THE MANHOLE OR A CORED HOLE. THESE HOLES MAY BE ON THE SIDE OF THE MANHOLE WITH A TEE CONNECTION.

| REV.# | DESCRIPTION | DATE | AP.BY |
|---|---|---|---|
| | | | |
| | | | |

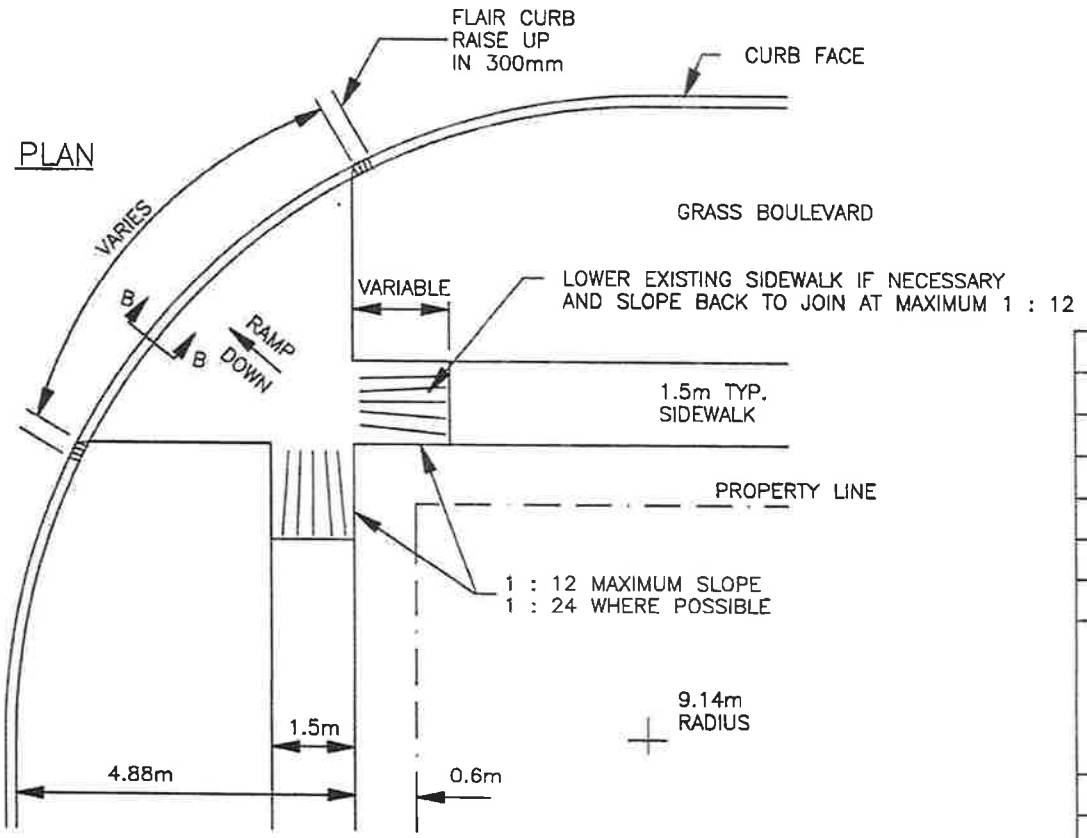
# CITY OF SARNIA

## STANDARD METHOD OF INSTALLING 150mm STORM SUB–DRAIN PIPE PARALLEL TO STORM SEWER

| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: DS | SCALE: N.T.S. | DWG.No. |
| CHK' BY: RW | DATE: 11/09 | 2071–S1 |




SECTION "B" – "B"




## NOTES:

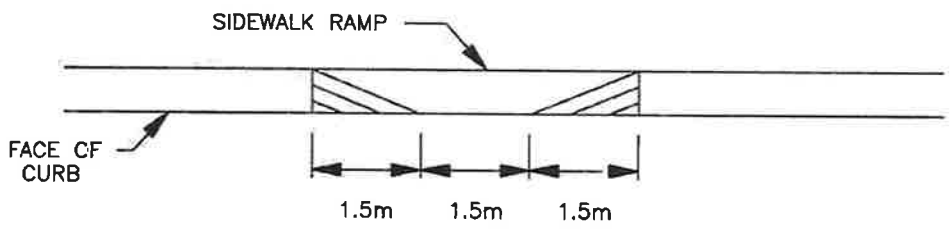
1. MAXIMUM SLOPE TO BE 1 : 12
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
3. DIMENSIONS AND SLOPES WILL VARY WITH RADIUS OF CURB AND GUTTER AND WIDTH OF BOULEVARD.

| REV.# | DESCRIPTION | DATE | AP. BY |
|---|---|---|---|
| #6 | REPRINT FOR 2005 SPEC. | 02/05 | J.R. |
| #5 | REPRINT FOR 2003 SPEC. | 02/03 | J.R. |
| #4 | REVISED FOR 2000 SPEC. | 02/00 | J.R. |
| #3 | REVISED FOR 1999 SPEC. | 03/99 | J.R. |
| #2 | REVISED FOR ACAD FILE | 11/97 | J.R. |
| #7 | EDIT FOR 2014 SPEC. | 05/14 | E.C. |

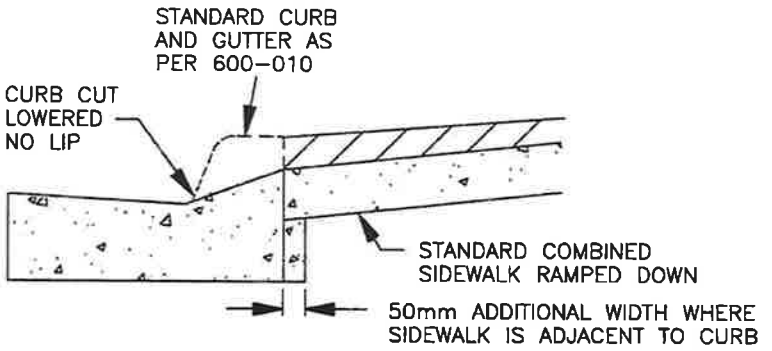
# CITY OF SARNIA

# TYPICAL WHEELCHAIR RAMP IN SIDEWALK SEPARATE FROM CURB AND GUTTER

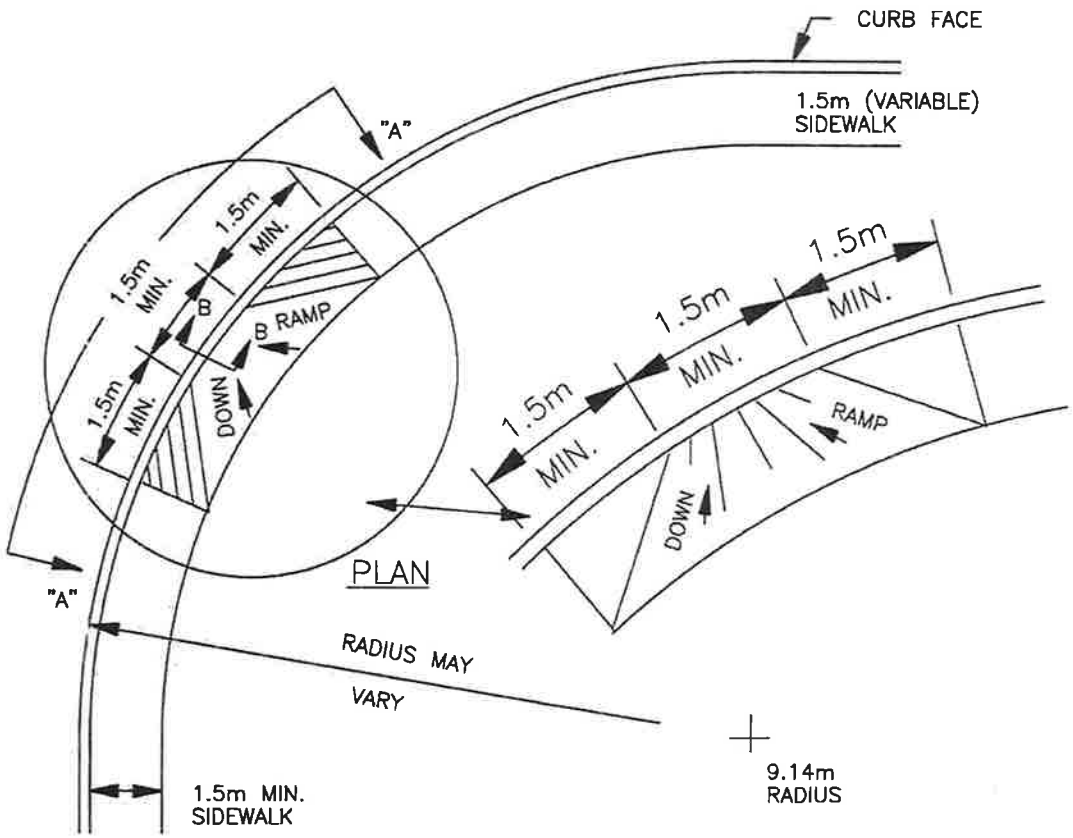
| | | |
|---|---|---|
| APPROVED BY: | | BK No. |
| DRAWN BY: J.Roberts | SCALE: N.T.S. | DWG No. 2485 |
| CHECKED BY: | DATE: 11/97 | |




SECTION "A" – "A"




SECTION "B" – "B"




PLAN

NOTES:

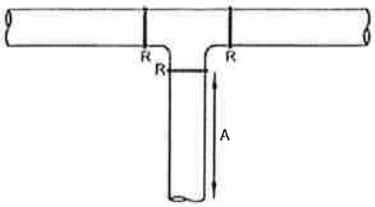
1. MAXIMUM SLOPE TO BE 1 : 12
2. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SPECIFIED.
3. DIMENSIONS AND SLOPES WILL VARY WITH RADIUS OF CURB AND GUTTER AND WIDTH OF SIDEWALK.

| REV.# | DESCRIPTION | DATE | AP. BY |
|---|---|---|---|
| #6 | EDITED FOR 2014 SPEC. | 05/14 | E.C. |
| #5 | EDITED FOR 2000 SPEC. | 02/00 | J.R. |
| #4 | EDITED FOR 1999 SPEC. | 03/99 | J.R. |
| #3 | REVISED FOR ACAD FILES | 11/97 | J.R. |
| #2 | ADD DUMMY JOINTS | 03/92 | |
| #1 | ADD NOTE # 3 | 02/92 | |

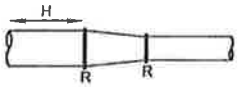
CITY OF SARNIA

# TYPICAL WHEELCHAIR RAMP IN SIDEWALK ADJACENT TO CURB AND GUTTER

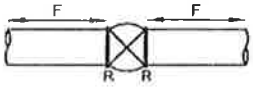
| | | |
|---|---|---|
| APPROVED BY: | | BK No. |
| DRAWN BY: J.Roberts | SCALE: N.T.S. | DWG No. 2186 |
| CHECKED BY: | DATE: 11/97 | |



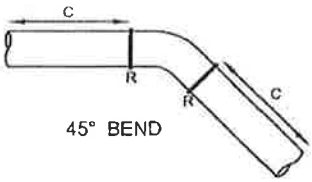

TEE



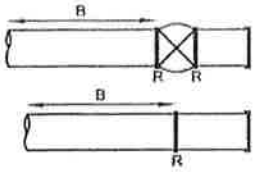

REDUCER



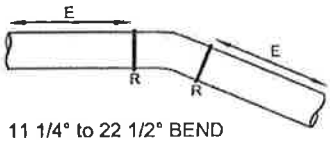

INLINE VALVE



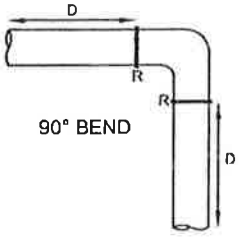

45° BEND



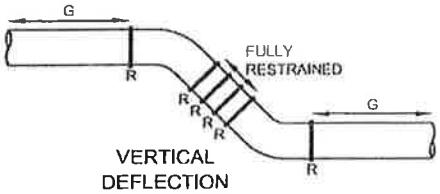

DEAD END




11 1/4° to 22 1/2° BEND




90° BEND




VERTICAL
DEFLECTION

| PVC PIPE THRUST RESTRAINT<br>MIN. LENGTH OF PVC WM. TO BE RESTRAINED (m) | | | | | |
|---|---|---|---|---|---|
| PIPE DIA. / LENGTH | 100 mm (4") | 150 mm (6") | 200 mm (8") | 250 mm (10") | 300 mm (12") |
| A | 7.0 | 7.0 | 7.0 | 14.0 | 14.0 |
| B | 14.0 | 14.0 | 20.0 | 20.0 | 25.0 |
| C | 7.0 | 7.0 | 7.0 | 14.0 | 14.0 |
| D | 7.0 | 7.0 | 14.0 | 14.0 | 14.0 |
| E | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |
| F | 7.0 | 14.0 | 20.0 | 20.0 | 25.0 |
| G | 7.0 | 7.0 | 7.0 | 14.0 | 14.0 |
| H | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 |

NOTE:

- 'R' DENOTES RESTRAINT DEVICE

- RESTRAINT LENGTHS BASED ON CLAY TYPE SOIL CONDITIONS TYPICALLY FOUND AT A DEPTH OF 1.5M. REFER TO ASTM D2487 FOR COMPLETE DESCRIPTION, IN AREAS WHERE SAND IS PREVALENT OR PIPE IS SITUATED BELOW WATER TABLE, RESTRAINED LENGTHS WILL BE DETERMINED BY THE ENGINEER.

- REDUCER DIMENSION 'H' ASSUMES ONE REDUCTION IN PIPE SIZE. IF REDUCTION IS GREATER THAN ONE PIPE SIZE, RESTRAINED LENGTH WILL BE DETERMINED BY THE ENGINEER.

- RESTRAINT SYSTEMS OVER 300MMØ TO BE DETERMINED BY MANUFACTURER.

- PVC WATERMAIN PIPE WITH STANDARD GRANULAR 'A' EMBEDMENT MATERIAL.

- DESIGN FOR RESTRAINT SYSTEMS WHEN CONNECTING TO EXISTING INFRASTRUCTURE WILL BE AT THE DISCRETION OF THE CITY ENGINEER.

- ALL RESTRAINERS TO HAVE PETROLATUM AND PETROLEUM COATED SYSTEM.

| REV.# | DESCRIPTION | DATE | AP.BY |
|---|---|---|---|
| | | | |
| | | | |

CITY OF SARNIA

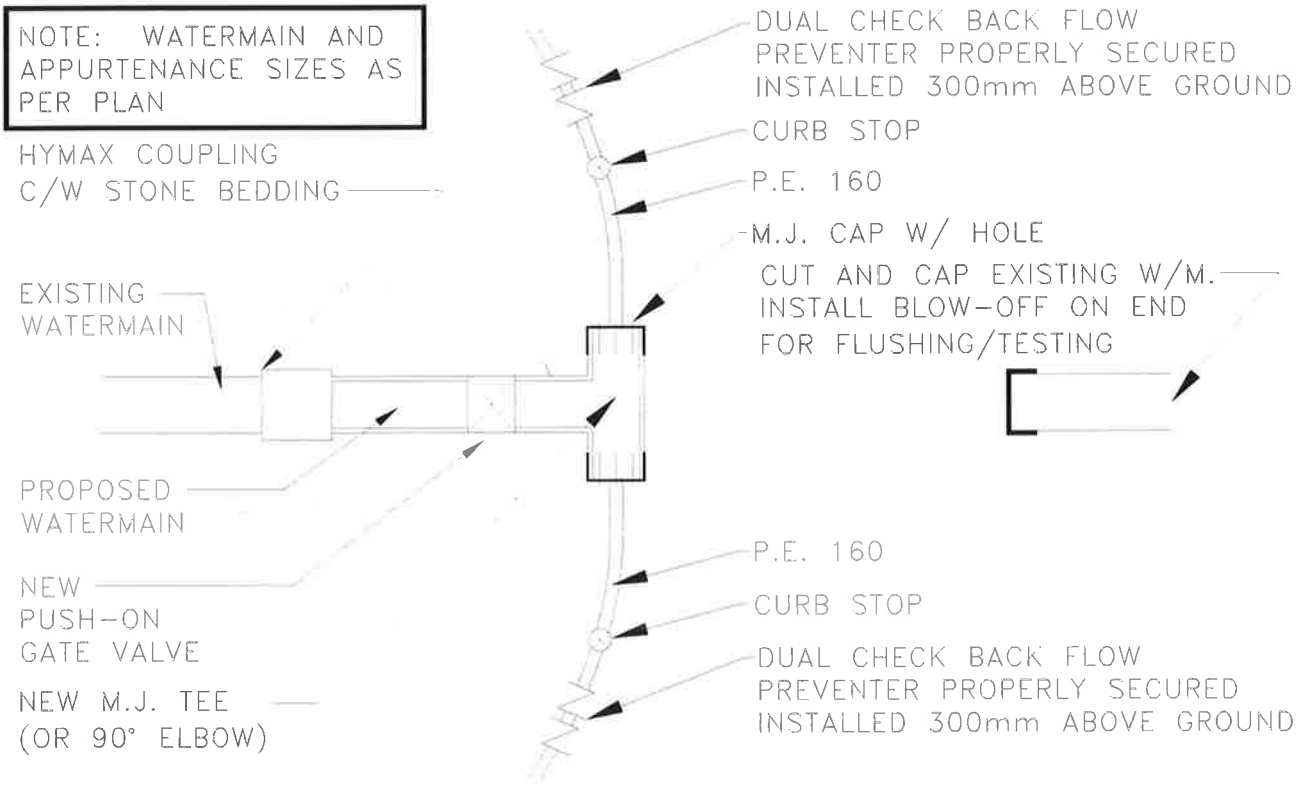
PVC PIPE THRUST RESTRAINTS

| | | |
|---|---|---|
| APPROVED BY: RW | | BK. |
| DRAWN BY: OD | SCALE: N.T.S. | DWG.No. 2500 |
| CHK' BY: BL | DATE: MAR'14 | |

NOTE: TEMPORARY WATER SIZE DICTATED BY NUMBER OF PROPERTIES SERVED. REFER TO TENDER SPECIFICATIONS AND DRAWINGS

ONCE TEMPORARY WATER IS IN SERVICE, EXISTING W/M MUST BE CUT AND CAPPED, AND TAKEN OUT OF SERVICE

NOTE: WATERMAIN AND APPURTENANCE SIZES AS PER PLAN

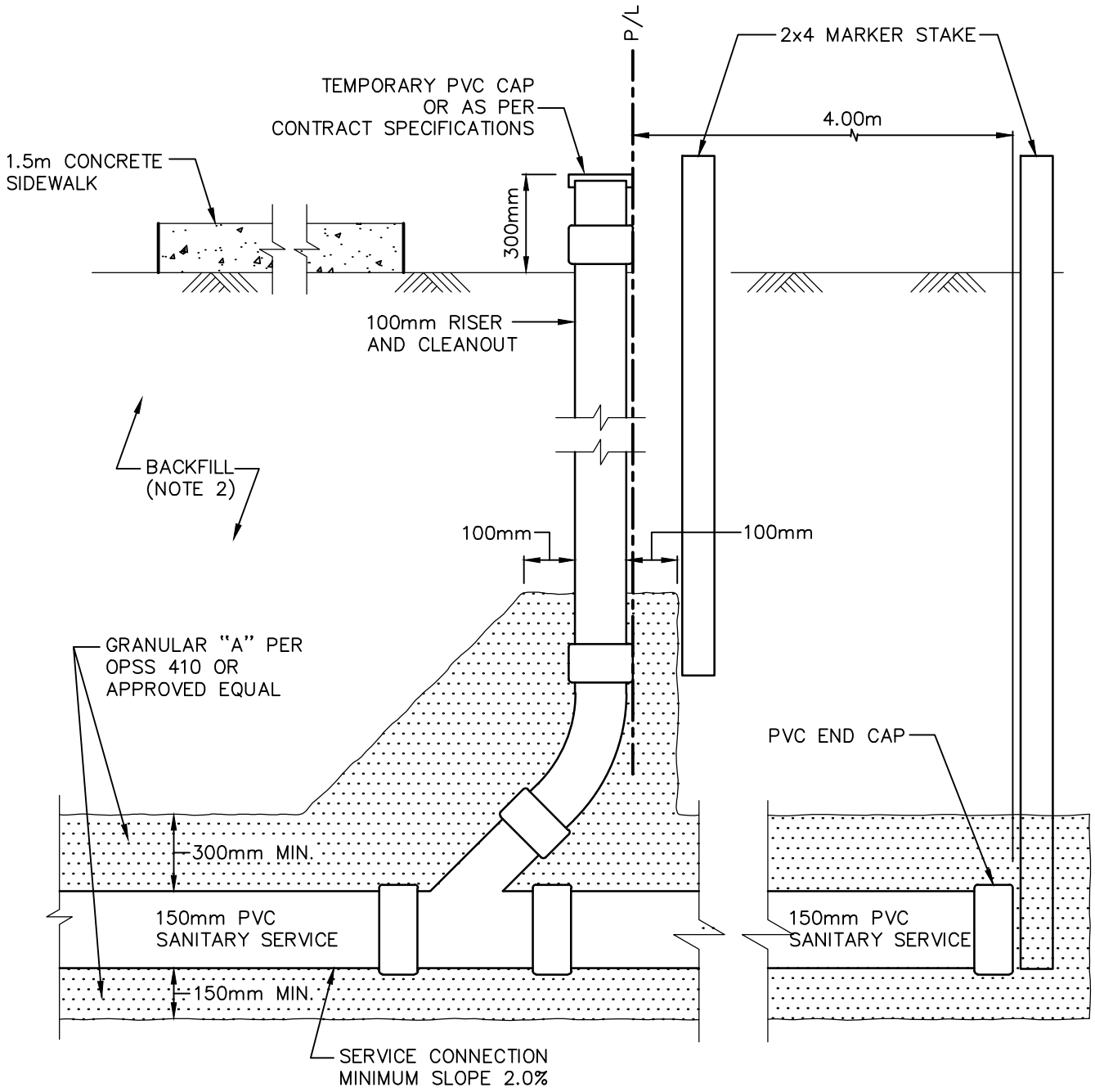



# CITY OF SARNIA

## TYP. TEMPORARY WATER SUPPLY DETAIL

| | | |
|---|---|---|
| APPROVED BY: | | BK. |
| DRAWN BY: G.H. | SCALE: N.T.S. | DWG.No. 2600 |
| CHK' BY: | DATE: JAN 2010 | |

REV: JAN 2019



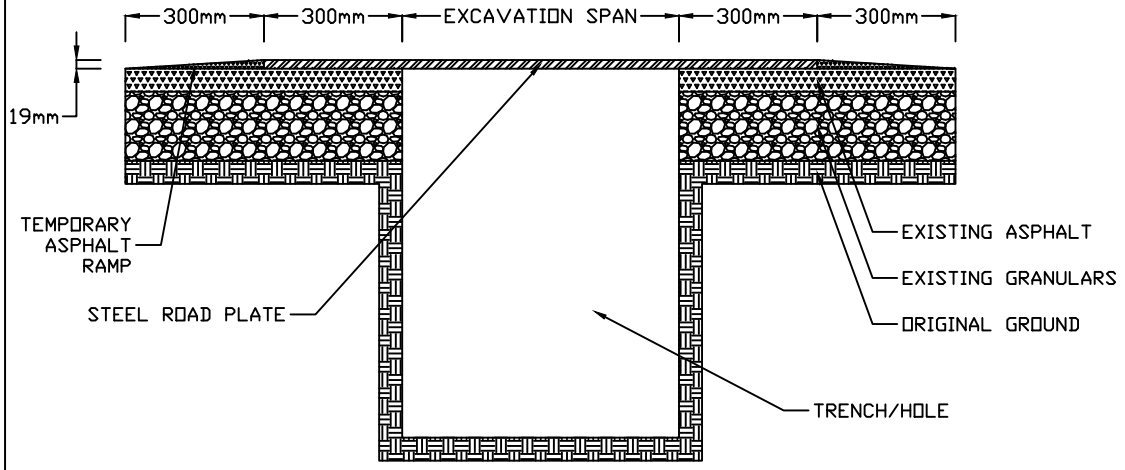

NOTE:

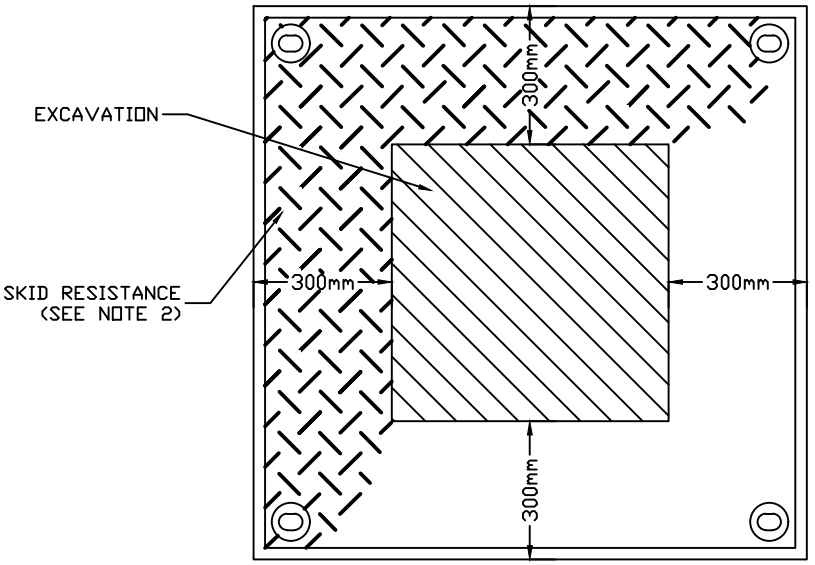
1. SIZE OF SANITARY SERVICE TO BE AS NOTED IN THE CITY OF SARNIA STANDARD SPECIFICATIONS.
2. BACKFILL OF SERVICE UNDER THE ROAD PLATFORM SHALL MATCH THE MAINLINE SANITARY SEWER BACKFILL. BACKFILL BEYOND THE ROAD PLATFORM SHALL BE AS PER THE CITY OF SARNIA SPECIFICATIONS.
3. ALL JOINTS SHALL BE GLUED

# CITY OF SARNIA

## SANITARY SERVICE CLEANOUT DETAIL WITH 4m EXTENSION

| | | |
|---|---|---|
| APPROVED BY: | | |
| DRAWN BY: | SCALE: N.T.S. | DWG.No. 2700 |
| CHK' BY: | DATE: SEPT 2019 | |




NOTES:

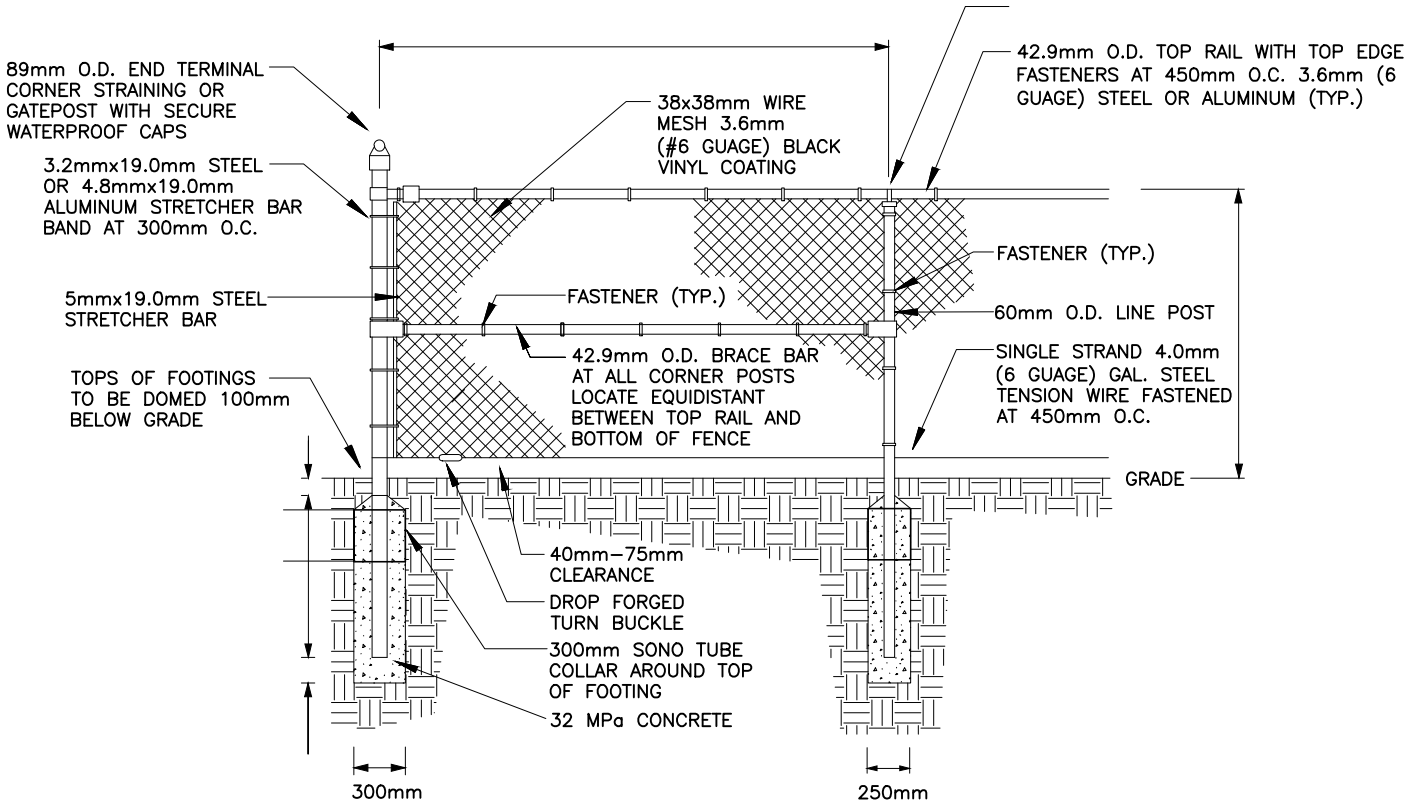
1. PROVIDE TEMPORARY STEEL PLATES ONLY WHEN AN EXCAVATION IN OR NEAR THE ROADWAY NEEDS TO BE COVERED FOR TEMPORARY TRAFFIC OPERATION OR PEDESTRIAN USE UNTIL THE EXCAVATION CAN BE PROPERLY BACKFILLED.
2. ENSURE THAT IN ALL CASES THE TOP STEEL PLATES ARE SKID RESISTANT BY PROVIDING $\frac{1}{8}$" HIGH BY 1" LONG BEAD WELDS APPROXIMATELY 2" CENTER TO CENTER EACH WAY OVER THE ENTIRE RIDING SURFACE.
3. SECURE PLATE FROM LATERAL AND VERTICAL MOVEMENT USING ANCHOR BOLTS .
4. THE CONTRACTOR IS RESPONSIBLE FOR INSPECTION AND MAINTENANCE OF STEEL PLATES AND HOT MIX ASPHALT RAMPS AS NECESSARY TO ENSURE SAFE CONTINUOUS OPERATION.
5. ENSURE THAT ALL STEEL PLATES WITHIN THE RIGHT-OF-WAY, USED IN OR OUT OF THE ROADWAY, ARE WITHOUT DEFORMATION. INSPECTORS CAN DETERMINE THE TRUENESS OF STEEL PLATES BY USING A STRAIGHT EDGE AND SHOULD REJECT ANY PLATE THAT IS PERMANENTLY DEFORMED.
6. MINIMUM THICKNESS OF PLATES SHALL BE $\frac{3}{4}$".
7. STEEL PLATES SHALL BE PAINTED YELLOW.

| REV. # | DESCRIPTION | DATE | AP.BY |
|---|---|---|---|

# CITY OF SARNIA

## PROPER USE OF STEEL ROAD PLATES

| | | |
|---|---|---|
| APPROVED BY: | | BK: |
| DRAWN BY: P.M. | SCALE: N.T.S. | DWG.No. 2800 |
| CHK' BY: | DATE: 08/19 | |




NOTES:

1. ALL FABRIC SHALL BE 3.6mm (#6 GAUGE WITH #11 GAUGE STEEL CORE) KNUCKLED AT TOP AND BOTTOM
2. THE VINYL COATING SHALL BE BLACK
3. ALL POSTS AND RAILS SHALL BE GALVANIZED STEEL PIPE 'STANDARD WEIGHT'. CONFORMING TO CURRENT SPECIFICATIONS FOR BLACK AND HOT DIPPED ZINC COATED (GAL.) WELDED AND SEAMLESS PIPE FOR ORDINARY USES, ASTM. DESIGNATION A120
4. ALL REQUIRED FITTINGS AND HARDWARE SHALL BE OF SUITABLE ALUMINUM OR A STEEL DUCTILE IRON ASTM SPECIFICATION (A152)
5. MINUMUM REQUIREMENT FOR ZINC COATING:
   WIRE=0.5 KG/M
   POSTS AND RAILS=0.5 KG/M
   FRAME AND BRACES=0.5 KG/M
   CAST FITTINGS=0.6 KG/M
   OTHER FITTINGS=0.6 KG/M
6. FABRICS SHALL BE INSTALLED ON THE MUNICIPAL SIDE OF THE FENCE POSTS

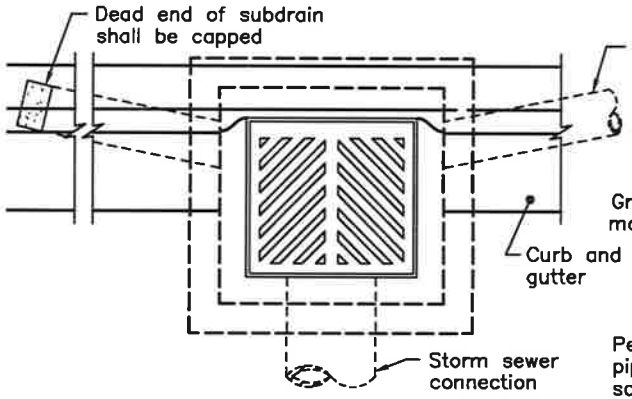
NOTE:
TO BE USED AS A GUIDELINE ONLY. NOT TO SCALE. REMOVE CITY TITLE BLACK AND REDRAW TO REPRESENT SITE SPECIFIC CONDITIONS. ALL SITE SPECIFIC CONDITIONS ARE TO BE CONFIRMED BY THE PROJECT CONSULTANT.

| REV.# | DESCRIPTION | DATE | APP.BY |
|---|---|---|---|

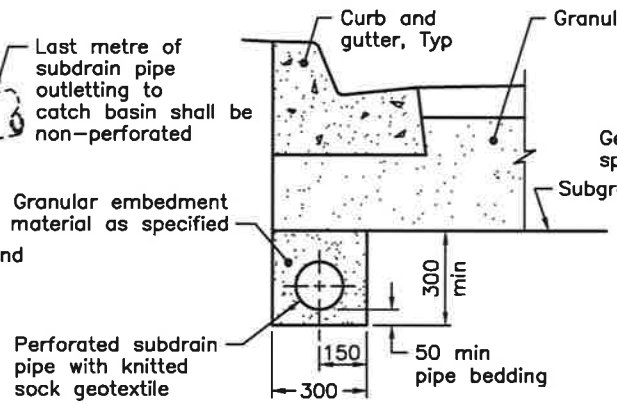
CITY OF SARNIA

# 1.5m CHAIN LINK FENCE DETAIL

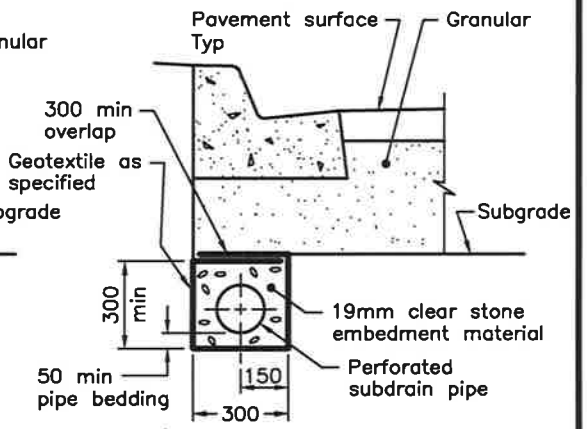
| | | |
|---|---|---|
| APPROVED BY: | | FIELD BOOK# *TOTAL STATION* |
| DRAWN BY: *DS* | SCALE: *N.T.S.* | DWG. # 3000 |
| CHK'D BY: | DATE: *NOV 2019* | |



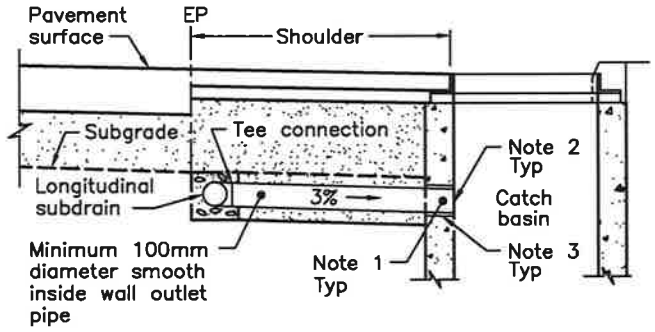

**LONGITUDINAL SUBDRAIN CONNECTION TO CATCH BASIN**




**UNWRAPPED TRENCH**




**WRAPPED TRENCH**




**LATERAL SUBDRAIN OUTLET PIPE CONNECTION TO CATCH BASIN**

NOTES:

1 Core hole diameter to allow outlet pipe into structure.

2 Install outlet pipe flush with inside face of catch basin.

3 Annular space around pipe shall be filled with non-shrink grout.

A Use compatible manufactured fittings for all connectors, couplings, and caps.

B Trench dimensions shown to accommodate 100 or 150mm diameter subdrain pipe.

C Longitudinal subdrain pipe shall be installed parallel to the grade of the gutter.

D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

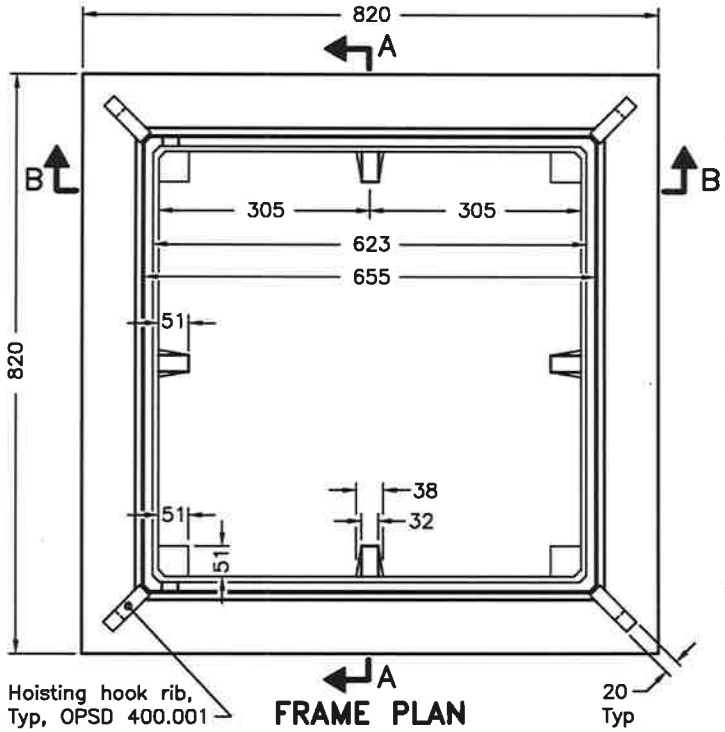
# SUBDRAIN PIPE CONNECTION AND OUTLET

URBAN SECTION

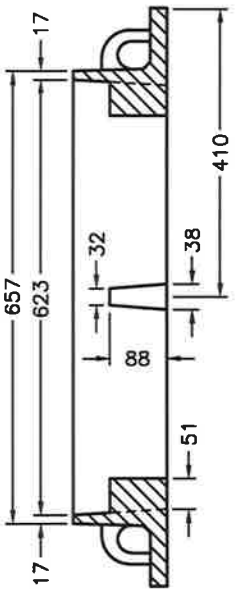
Nov 2017 | Rev 3

ONTARIO STANDARDS · MUNICIPAL - PROVINCIAL · OPS

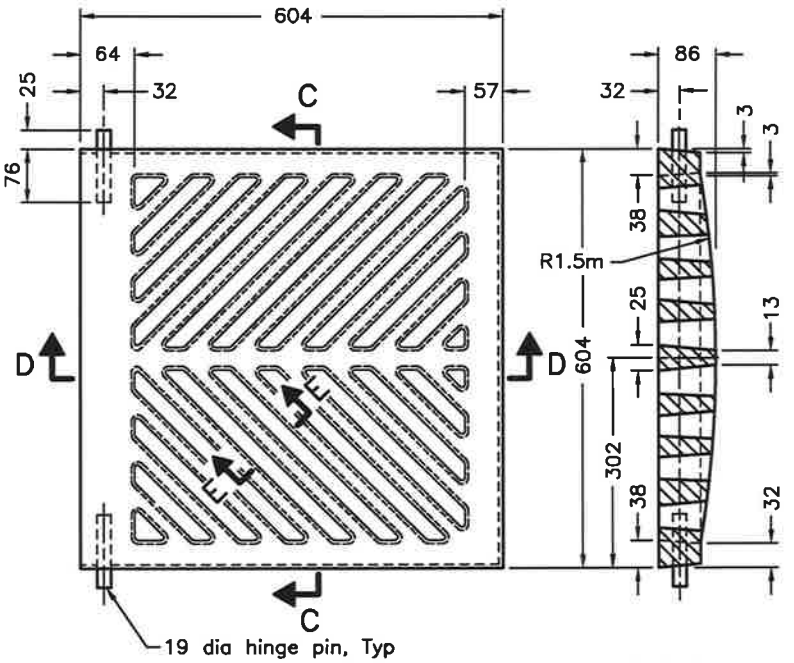
**OPSD 216.021**




FRAME PLAN



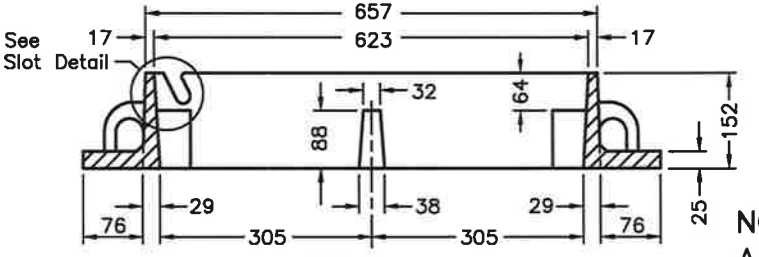

SECTION A–A



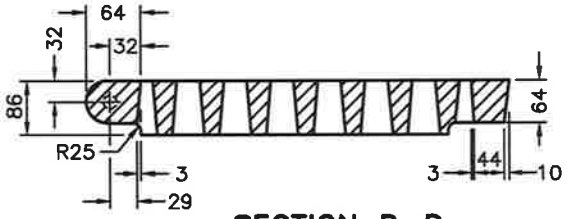

GRATE PLAN



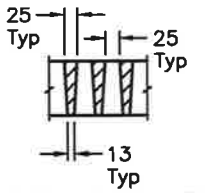

SECTION C–C



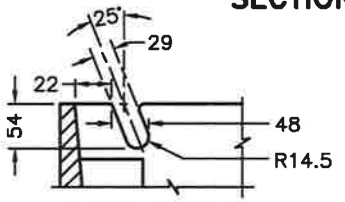

SECTION B–B




SECTION D–D




SECTION E–E




SLOT DETAIL

NOTES:

A This OPSD shall be read in conjunction with OPSD 610.010 and 610.020.

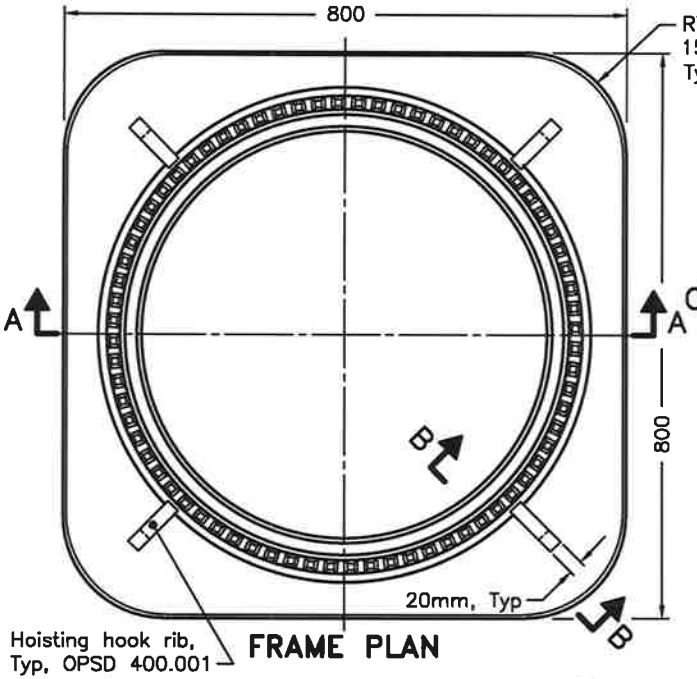
B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

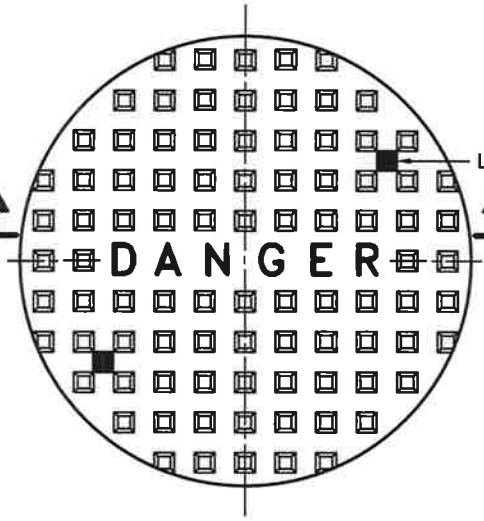
Nov 2018 | Rev 3

# CAST IRON, SQUARE FRAME WITH SQUARE FLAT GRATE FOR CATCH BASINS, HERRING BONE OPENINGS

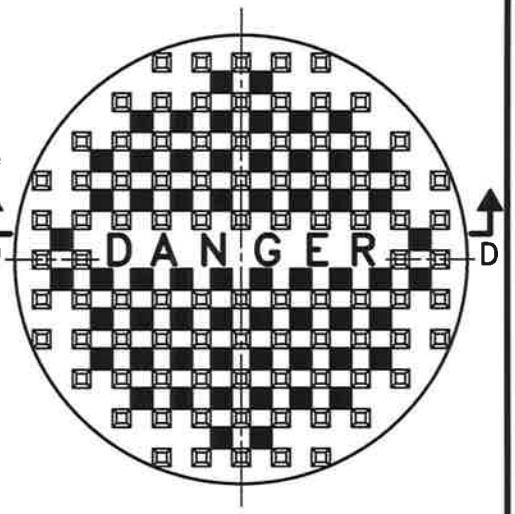
OPSD 400.020



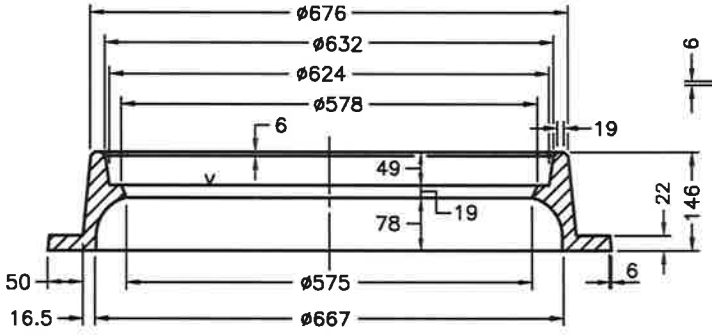

FRAME PLAN



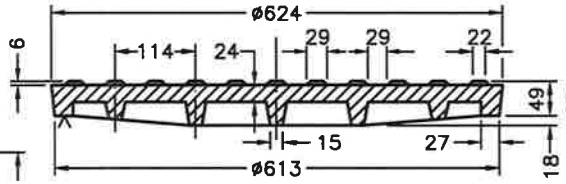

TYPE A
CLOSED COVER



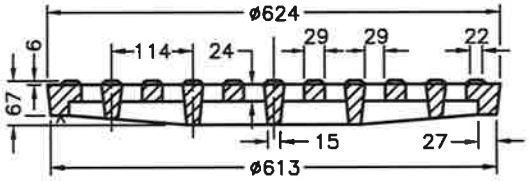

TYPE B
OPEN COVER




SECTION A–A




SECTION C–C

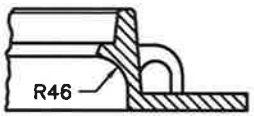



SECTION D–D

NOTES:

A Covers shall be Type A or Type B, as specified.

B All dimensions are in millimetres unless otherwise shown.



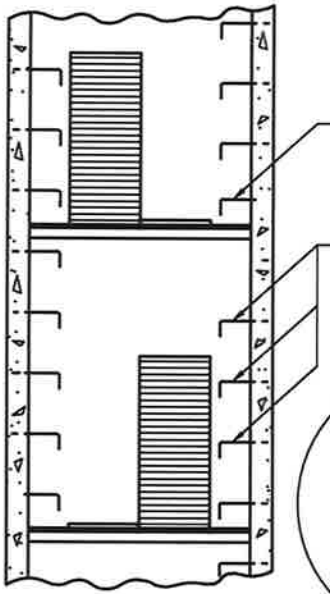

SECTION B–B

ONTARIO PROVINCIAL STANDARD DRAWING

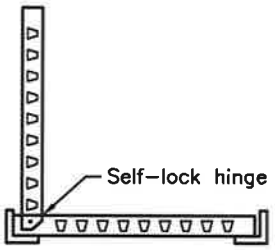
Nov 2018 | Rev 4

# CAST IRON, SQUARE FRAME WITH CIRCULAR CLOSED OR OPEN COVER FOR MAINTENANCE HOLES

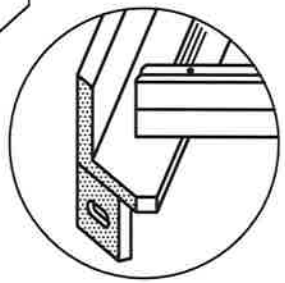
OPSD 401.010



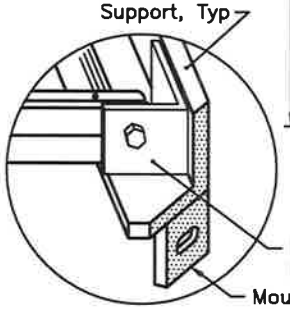

GRATING OPEN
SECTION A–A



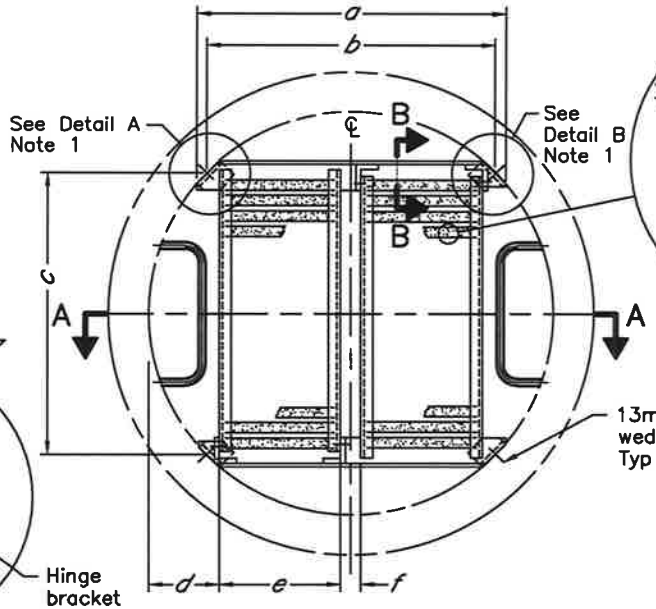

OPEN POSITION
SIDE VIEW



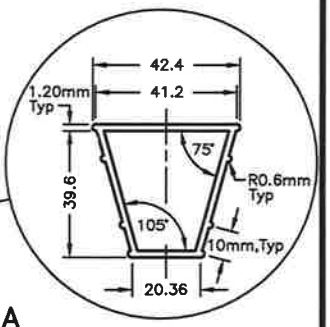
DETAIL A



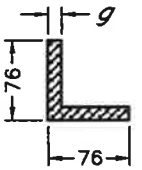

DETAIL B




DETAIL OF GRATING AND BOLT–ON SUPPORT
PLAN




GRATING RUNG
DETAIL




SECTION B–B

NOTES:

1 All hinge brackets and mounting brackets shall be welded all around to support angle.

A All aluminum in contact with concrete shall be thoroughly coated with asphalt paint.

B Maintenance hole depth between 5.0m and 10.0m, grate shall be placed at midpoint. Maintenance hole depth between 10.0m and 15.0m, grates shall be placed at third–points.

C All fasteners shall be 304 stainless steel.

D All welding shall be according to CSA W47.2 and W59.2.

E All aluminum components shall be 6000 series structural aluminum.

F All dimensions are in millimetres unless otherwise shown.

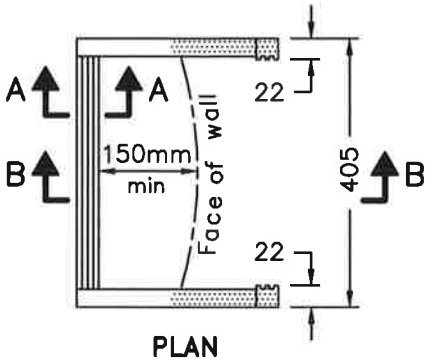
| MH Diameter | No of Grates | *a* | *b* | *c* | *d* | *e* | *f* | *g* |
|---|---|---|---|---|---|---|---|---|
| 1200 | 2 | 900 | 850 | 850 | 225 | 352 | 65 | 10 |
| 1500 | 2 | 1128 | 1078 | 1078 | 311 | 419 | 65 | 12 |
| 1800 | 3 | 1344 | 1293 | 1293 | 308 | 360 | 65 | 12 |
| 2400 | 4 | 1774 | 1724 | 1724 | 401 | 360 | 65 | 12 |

ONTARIO PROVINCIAL STANDARD DRAWING

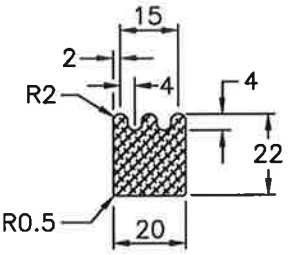
# ALUMINUM SAFETY PLATFORM FOR CIRCULAR MAINTENANCE HOLES

Nov 2018 | Rev 4

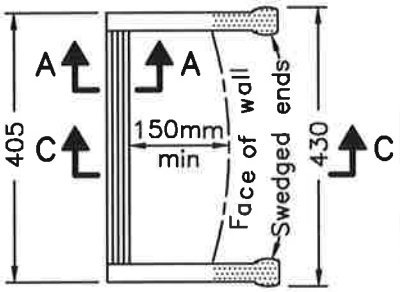
OPSD 404.020



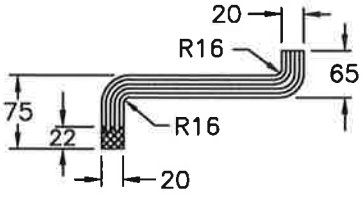

PLAN



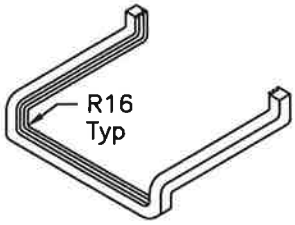

SECTION A–A



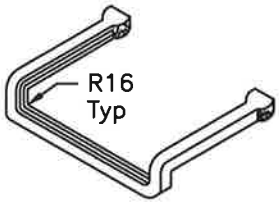

PLAN



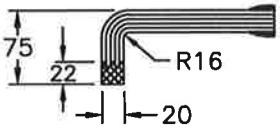

SECTION B–B




AUXILIARY VIEW



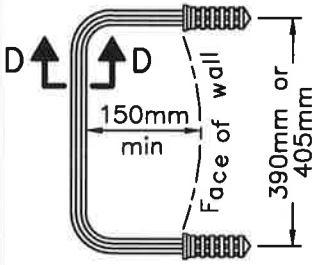

AUXILIARY VIEW



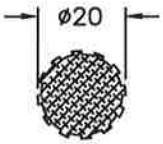

SECTION C–C

**TYPE A** **TYPE B**

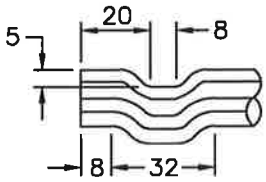
## RECTANGULAR ALUMINUM



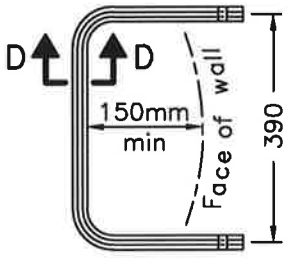

PLAN



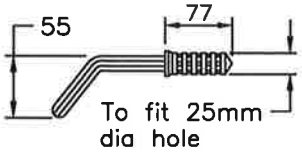

SECTION D–D



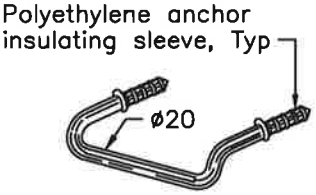

FORMED ANCHOR LOCK DETAIL



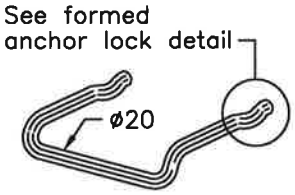

PLAN



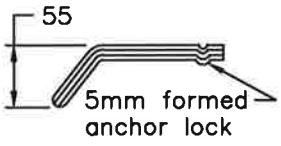

SIDE VIEW




AUXILIARY VIEW




AUXILIARY VIEW




SIDE VIEW

**TYPE A** **TYPE B**

## CIRCULAR ALUMINUM

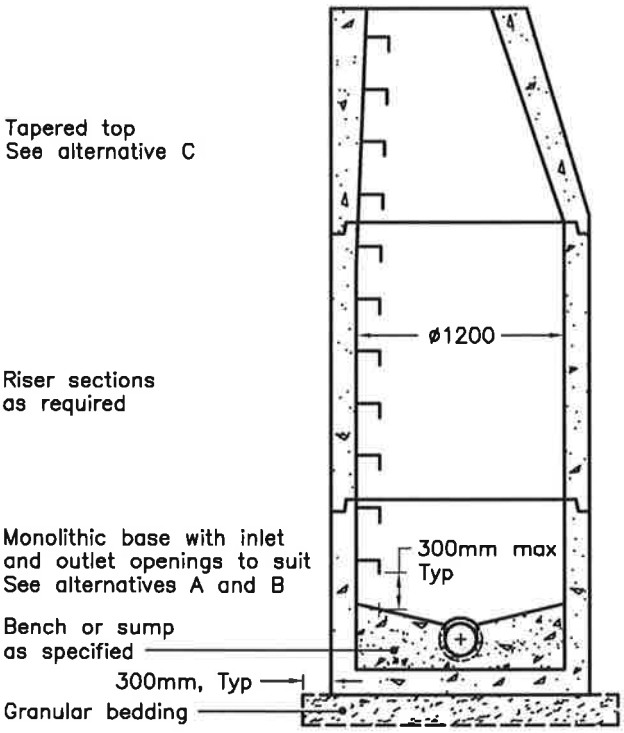
NOTES:

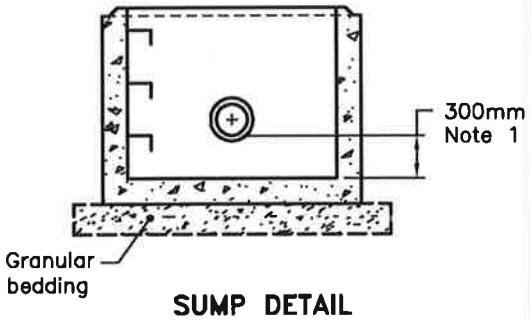
A All aluminum components shall be 6000 series structural aluminum.

B All aluminum in contact with concrete shall be thoroughly coated with asphalt paint.

C All dimensions are in millimetres unless otherwise shown.

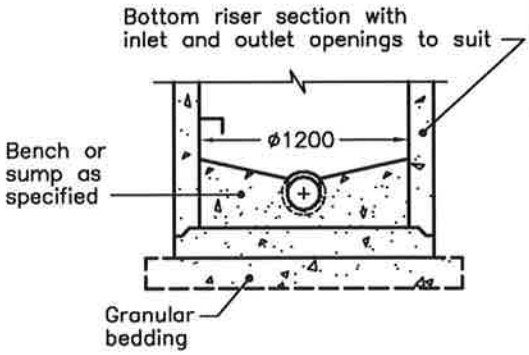
| ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2018 | Rev 4 |
|---|---|---|
| **MAINTENANCE HOLE STEPS**<br>SOLID | | |
| | | **OPSD 405.020** |



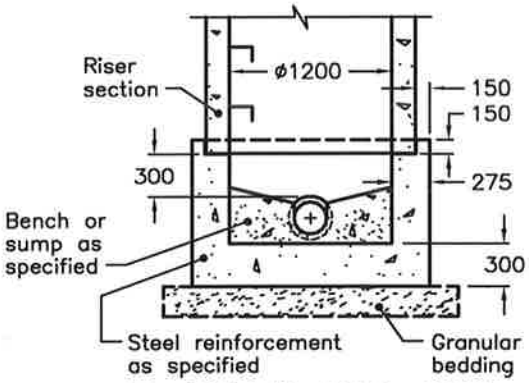




**SUMP DETAIL**

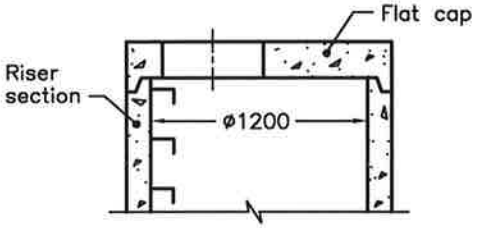
## ALTERNATIVES




**A PRECAST SLAB BASE**




**B CAST-IN-PLACE BASE**




**C PRECAST FLAT CAP**

## NOTES:

1 The sump is measured from the lowest invert.

A Granular backfill shall be placed to a minimum thickness of 300mm all around the maintenance hole.

B Precast concrete components shall be according to OPSD 701.030, 701.031, or 701.032.

C Structure exceeding 5.0m in depth shall include safety platform according to OPSD 404.020.

D Pipe support according to OPSD 708.020.

E For benching and pipe opening details, see OPSD 701.021.

F For adjustment unit and frame installation, see OPSD 704.010.

G All dimensions are nominal.

H All dimensions are in millimetres unless otherwise shown.

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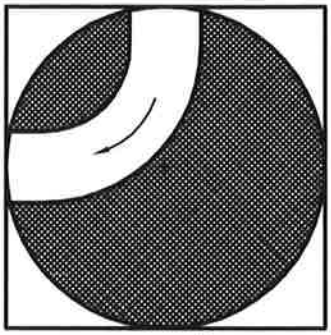
# PRECAST CONCRETE MAINTENANCE HOLE

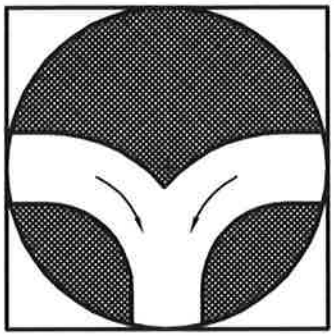
1200mm DIAMETER

ONTARIO STANDARDS MUNICIPAL - PROVINCIAL

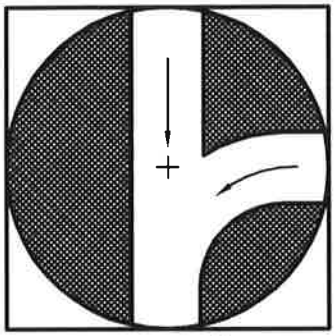
OPSD 701.010



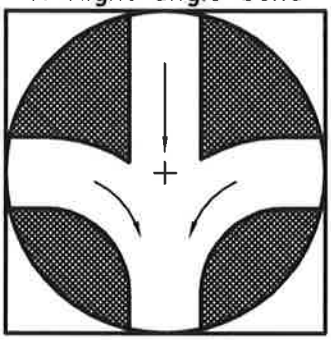
1. Right angle bend



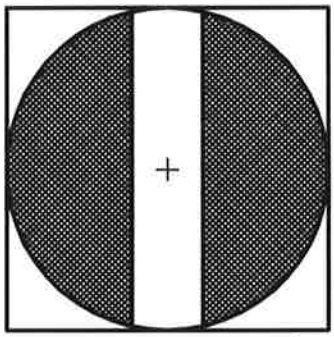
2. Tee connection



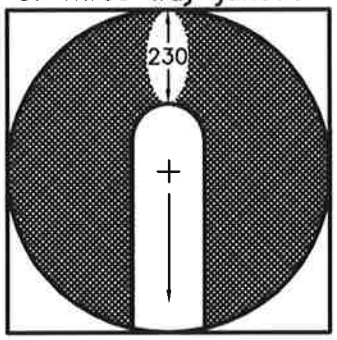
3. Three way junction



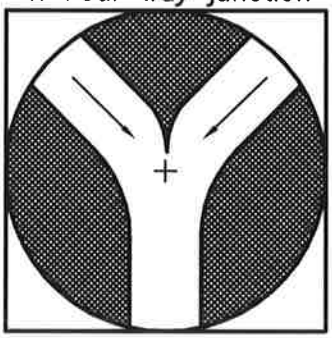
4. Four way junction



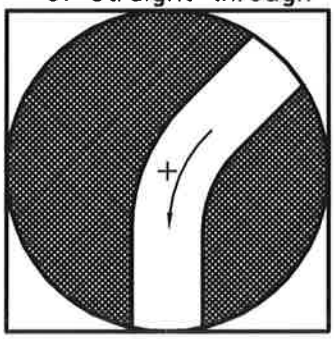
5. Straight through



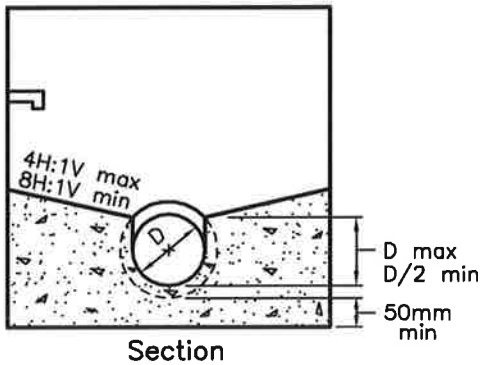

6. Dead end



7. Wye connection



8. 45° bend




Section

| MAXIMUM SIZE HOLE IN THE WALL IN PRECAST RISER SECTIONS | | | | | |
|---|---|---|---|---|---|
| Maintenance Hole Diameter | No. 1–4 | No. 5 and 6 | No. 8 | No.7 | |
| | | | | Inlet Hole | Outlet Hole |
| 1200 | 700 | 860 | 780 | 700 | 860 |
| 1500 | 860 | 1220 | 960 | 860 | 1170 |
| 1800 | 1220 | 1485 | 1220 | 1220 | 1485 |
| 2400 | 1485 | 2020 | 1760 | 1485 | 2020 |
| 3000 | 1930 | 2450 | 2300 | 1930 | 2450 |
| 3600 | 2470 | 3085 | 2730 | 2470 | 3085 |

## NOTES:

1 Slopes shall be maintained from the outlet hole opening for top of benching.

A Concrete for benching shall be 30MPa.

B When benching is hand–finshed, it shall be given wood float finish, channel shall be given steel trowel finish.

C Benching slope and height shall be as specified.

D When specified, maintenance holes that are 1200mm in diameter with a uniform channel for 200 or 250mm pipe may be prebenched at the manufacturer with standardized benching slope and channel orientation.

E All dimensions are nominal.

F All dimensions are in millimetres unless otherwise shown.

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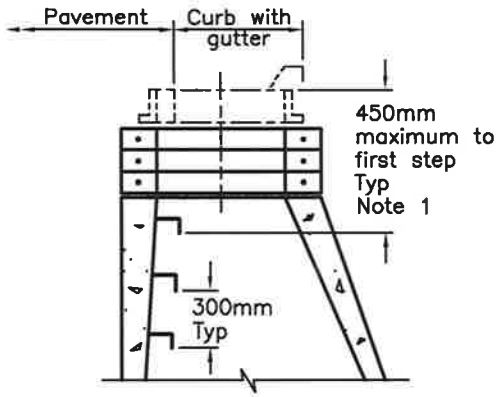
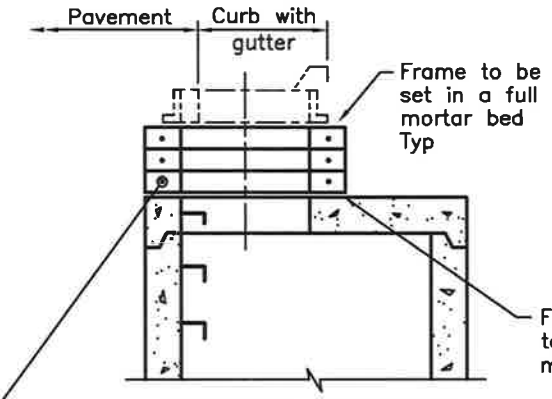
# MAINTENANCE HOLE BENCHING AND PIPE OPENING ALTERNATIVES

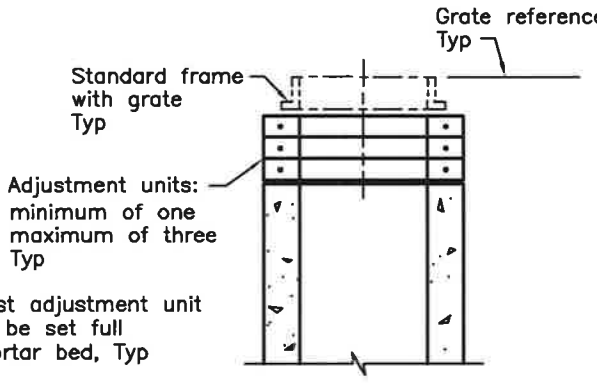
OPSD 701.021



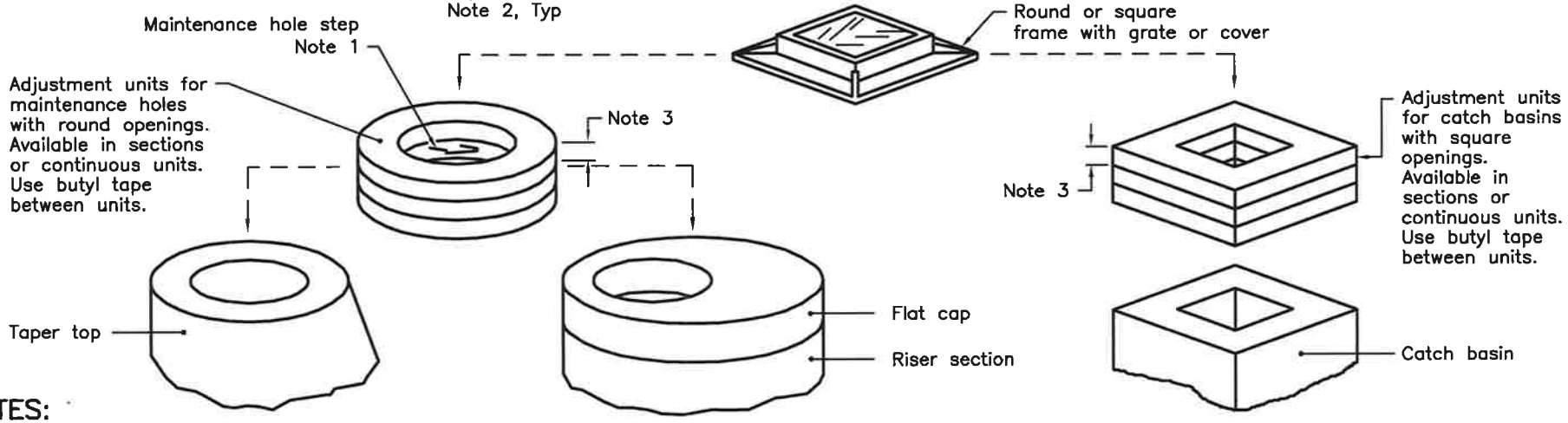

**SECTION THROUGH TAPER TOP**




**SECTION THROUGH FLAT CAP**




**SECTION THROUGH CATCH BASIN**




NOTES:

1 If first step is in an adjustment unit, the adjustment unit shall be of the type manufactured with a step in place.

2 Centre reinforcing in adjustment unit ±10mm.

3 Round and square adjustment units are available in sizes of 50, 75, 100, 150, and 300mm.

A Adjustment units shall not extend beyond the outside edge of the structure.

B All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

# PRECAST CONCRETE ADJUSTMENT UNITS FOR MAINTENANCE HOLES, CATCH BASINS, AND VALVE CHAMBERS

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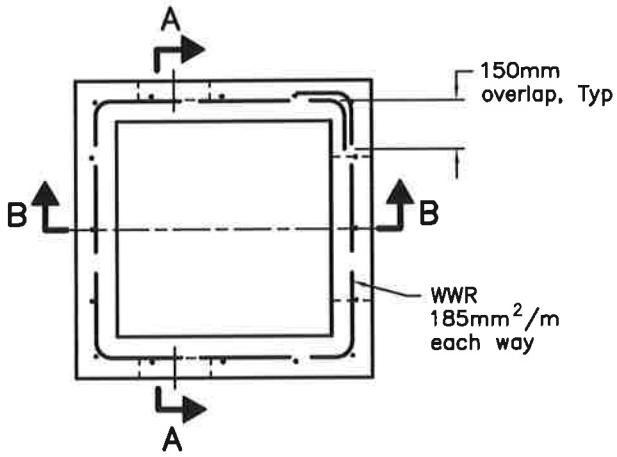
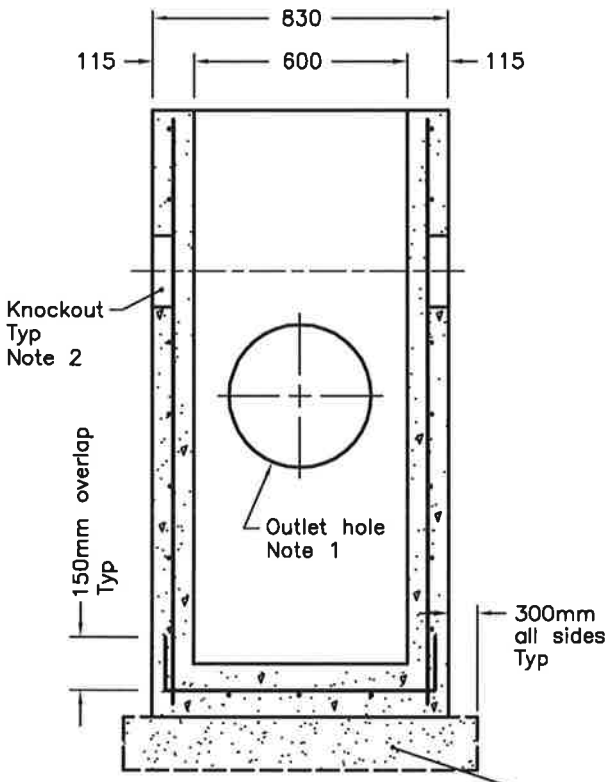
OPSD 704.010

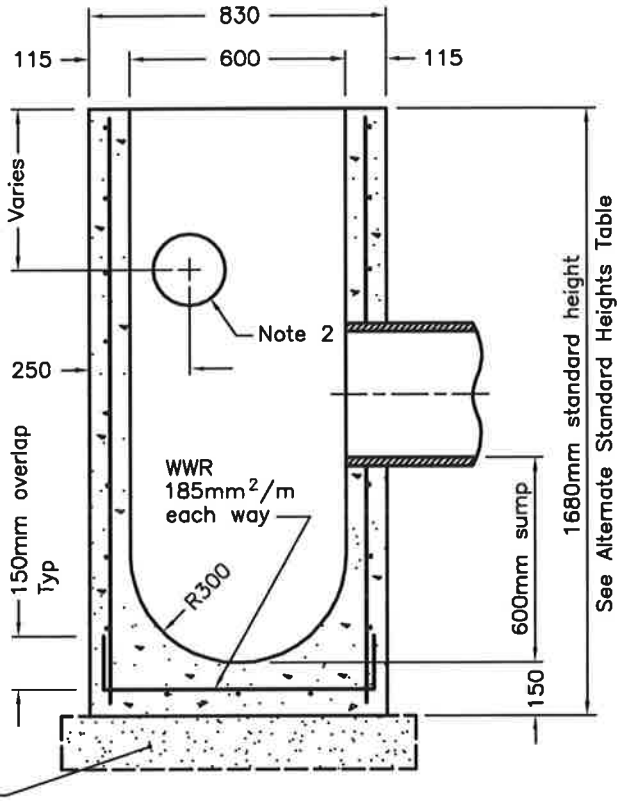
| ALTERNATE STANDARD HEIGHTS | |
|---|---|
| ALTERNATIVE | DIMENSION |
| A | 1980 |
| B | 1830 |
| C | 1520 |
| D | 1380 |




PLAN




SECTION A–A




SECTION B–B

## NOTES:

1 Outlet hole size 525mm diameter maximum, location as required.

2 200mm diameter knockout to accommodate subdrain. Knockout shall be 60mm deep.

A Centre reinforcing in base slab and walls ±20mm.

B Granular backfill shall be placed to a minimum thickness of 300mm all around the catch basin.

C Frame, grate, and adjustment units shall be installed according to OPSD 704.010.

D Pipe support shall be according to OPSD 708.020.

E All dimensions are nominal.

F All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING

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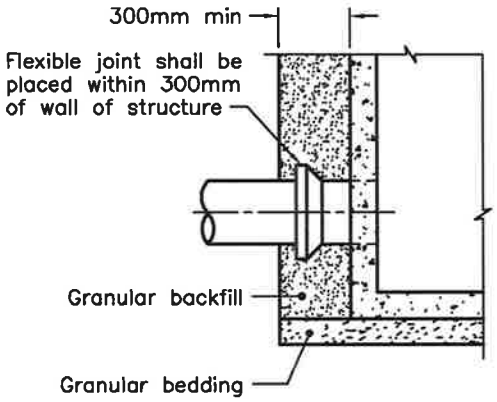
# PRECAST CONCRETE CATCH BASIN

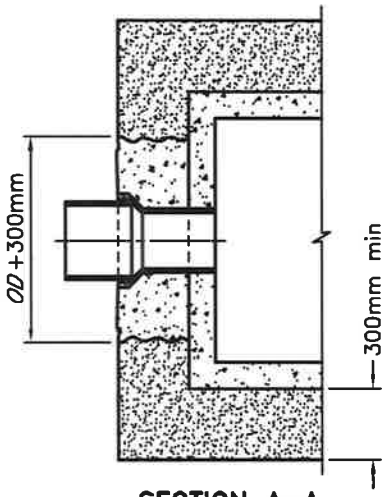
600x600mm

OPSD 705.010

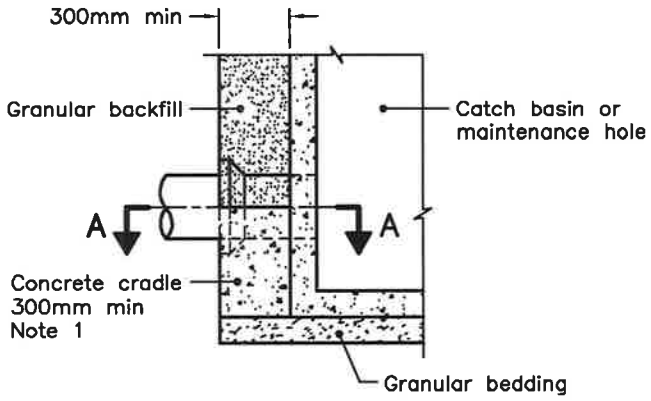



ELEVATION

**FLEXIBLE JOINT**
**RIGID AND FLEXIBLE PIPE**




SECTION A–A




ELEVATION

**CONCRETE CRADLE**
**RIGID PIPE**

For installation of these connectors refer to manufacturer's instructions.

A full length of pipe may be used in conjunction with a flexible watertight connector.

**FLEXIBLE, WATERTIGHT CONNECTOR**
**RIGID AND FLEXIBLE PIPE**

NOTES:

1 Pipe shall be supported with concrete or unshrinkable fill to the first pipe joint.

A All dimensions are in millimetres unless otherwise shown.

| ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2016 | Rev 4 |
|---|---|---|
| **SUPPORT FOR PIPE AT CATCH BASIN OR MAINTENANCE HOLE** | | |
| | **OPSD 708.020** | |

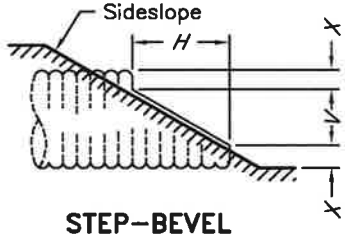
TABLE 1 – Step–Bevel for Circular Structural Plate Pipe

| Dia | H for bevels of | | V for bevels of | | X for bevels of | |
|---|---|---|---|---|---|---|
| | 1.5H:1V | 2H:1V | 1.5H:1V | 2H:1V | 1.5H:1V | 2H:1V |
| 1500 | 1830 | 1830 | 1220 | 910 | 140 | 295 |
| 1660 | 1830 | 1830 | 1220 | 910 | 220 | 375 |
| 1810 | 1830 | 2440 | 1220 | 1220 | 295 | 295 |
| 1970 | 1830 | 2440 | 1220 | 1220 | 375 | 375 |
| 2120 | 1830 | 3050 | 1220 | 1520 | 450 | 300 |
| 2280 | 1830 | 3050 | 1220 | 1520 | 530 | 380 |
| 2430 | 3050 | 3050 | 2030 | 1520 | 200 | 455 |
| 2590 | 3050 | 3050 | 2030 | 1520 | 280 | 535 |
| 2740 | 3050 | 3660 | 2030 | 1830 | 355 | 455 |
| 3050 | 3050 | 3660 | 2030 | 1830 | 510 | 610 |
| 3360 | 3050 | 3660 | 2030 | 1830 | 665 | 765 |
| 3670 | 3050 | 3660 | 2030 | 1830 | 820 | 920 |
| 3990 | 3050 | 3660 | 2030 | 1830 | 980 | 1080 |
| 4300 | 3660 | 3660 | 2440 | 1830 | 930 | 1235 |
| 4610 | 3660 | 3660 | 2440 | 1830 | 1085 | 1390 |
| 4920 | 3660 | 6100 | 2440 | 3050 | 1240 | 935 |
| 5230 | 6100 | 6100 | 4070 | 3050 | 580 | 1090 |
| 5540 | 6100 | 6100 | 4070 | 3050 | 735 | 1245 |
| 5850 | 6100 | 7320 | 4070 | 3660 | 890 | 1095 |
| 6160 | 6100 | 7320 | 4070 | 3660 | 1045 | 1250 |
| 6470 | 6100 | 7320 | 4070 | 3660 | 1200 | 1405 |
| 6780 | 6100 | 7320 | 4070 | 3660 | 1355 | 1560 |
| 7090 | 6100 | 7320 | 4070 | 3660 | 1510 | 1715 |
| 7400 | 6100 | 7320 | 4070 | 3660 | 1665 | 1870 |
| 7710 | 6100 | 7320 | 4070 | 3660 | 1820 | 2025 |
| 8020 | 6100 | 7320 | 4070 | 3660 | 1975 | 2180 |

TABLE 2 – Partial Bevel and Step–Bevel for Pipe–Arch Structural Plate Pipe

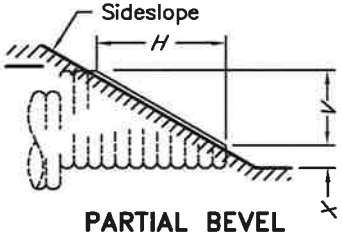
| Span | Rise | X | H for bevels of | | | V | Y for bevels of | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 1.5H:1V | 2H:1V | 3H:1V | | 1.5H:1V | 2H:1V | 3H:1V |
| 2060 | 1520 | 660 | 1290 | 1720 | 2580 | 860 | — | — | — |
| 2240 | 1630 | 660 | 1450 | 1940 | 2910 | 970 | — | — | — |
| 2440 | 1750 | 710 | 1560 | 2080 | 3050 | 1040 | — | — | 20 |
| 2590 | 1880 | 710 | 1750 | 2340 | 3050 | 1170 | — | — | 150 |
| 2690 | 2080 | 760 | 1980 | 2640 | 3050 | 1320 | — | — | 300 |
| 3100 | 1980 | 810 | 1750 | 2340 | 3050 | 1170 | — | — | 150 |
| 3400 | 2010 | 810 | 1800 | 2400 | 3050 | 1200 | — | — | 180 |
| 3730 | 2290 | 910 | 2070 | 2760 | 3050 | 1380 | — | — | 360 |
| 3890 | 2690 | *1090 | 2400 | 3050 | 3660 | 1600 | — | 80 | 380 |
| 4370 | 2870 | *1300 | 2360 | 3050 | 3660 | 1570 | — | 50 | 350 |
| 4720 | 3070 | *1240 | 2750 | 3050 | 3660 | 1830 | — | 310 | 610 |
| 5050 | 3330 | *1220 | 3050 | 3050 | 3660 | 2110 | 80 | 590 | 890 |
| 5490 | 3530 | *1300 | 3050 | 3660 | 3660 | 2230 | 200 | 400 | 1010 |
| 5890 | 3710 | *1370 | 3050 | 3660 | 3660 | 2340 | 310 | 510 | 1120 |
| 6250 | 3910 | *1300 | 3050 | 3660 | 3660 | 2610 | 580 | 780 | 1390 |
| 7040 | 4060 | 1370 | 3050 | 3660 | — | 2690 | 660 | 860 | — |
| 7620 | 4240 | 1500 | 3050 | 3660 | — | 2740 | 710 | 910 | — |

* Denotes dimension to top of corner plate.

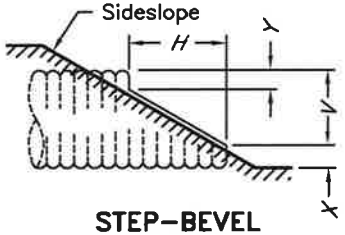



STEP–BEVEL

CIRCULAR STRUCTURAL PLATE PIPE




PARTIAL BEVEL




STEP–BEVEL

PIPE–ARCH STRUCTURAL PLATE PIPE

NOTES:

A Dimensions X, Y, V, and H are standardized by Corrugated Steel Pipe Institute.

B Dimensions for span and rise are nominal. Dimensions for bevel details are actual.

C All dimensions are in millimetres unless otherwise shown.

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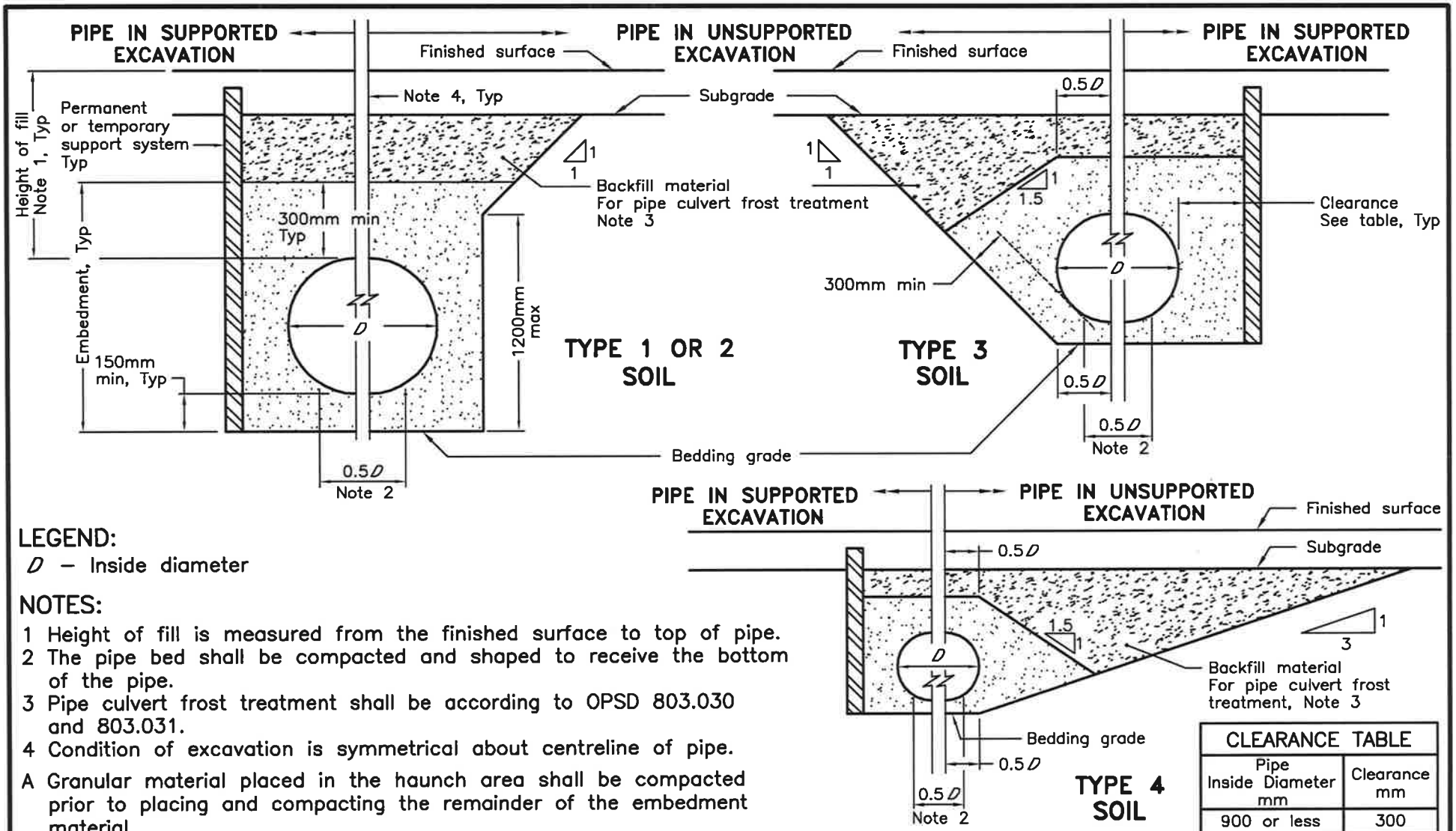
# BEVEL DETAILS
# CIRCULAR AND PIPE–ARCH
# STRUCTURAL PLATE CORRUGATED STEEL PIPE

ONTARIO STANDARDS · MUNICIPAL – PROVINCIAL · O P S

OPSD 801.030




## LEGEND:

*D* – Inside diameter

## NOTES:

1 Height of fill is measured from the finished surface to top of pipe.
2 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
3 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
4 Condition of excavation is symmetrical about centreline of pipe.

A Granular material placed in the haunch area shall be compacted prior to placing and compacting the remainder of the embedment material.

B Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.

C All dimensions are in metres unless otherwise shown.

| CLEARANCE TABLE | |
|---|---|
| Pipe Inside Diameter mm | Clearance mm |
| 900 or less | 300 |
| Over 900 | 500 |

ONTARIO PROVINCIAL STANDARD DRAWING

# FLEXIBLE PIPE EMBEDMENT AND BACKFILL EARTH EXCAVATION

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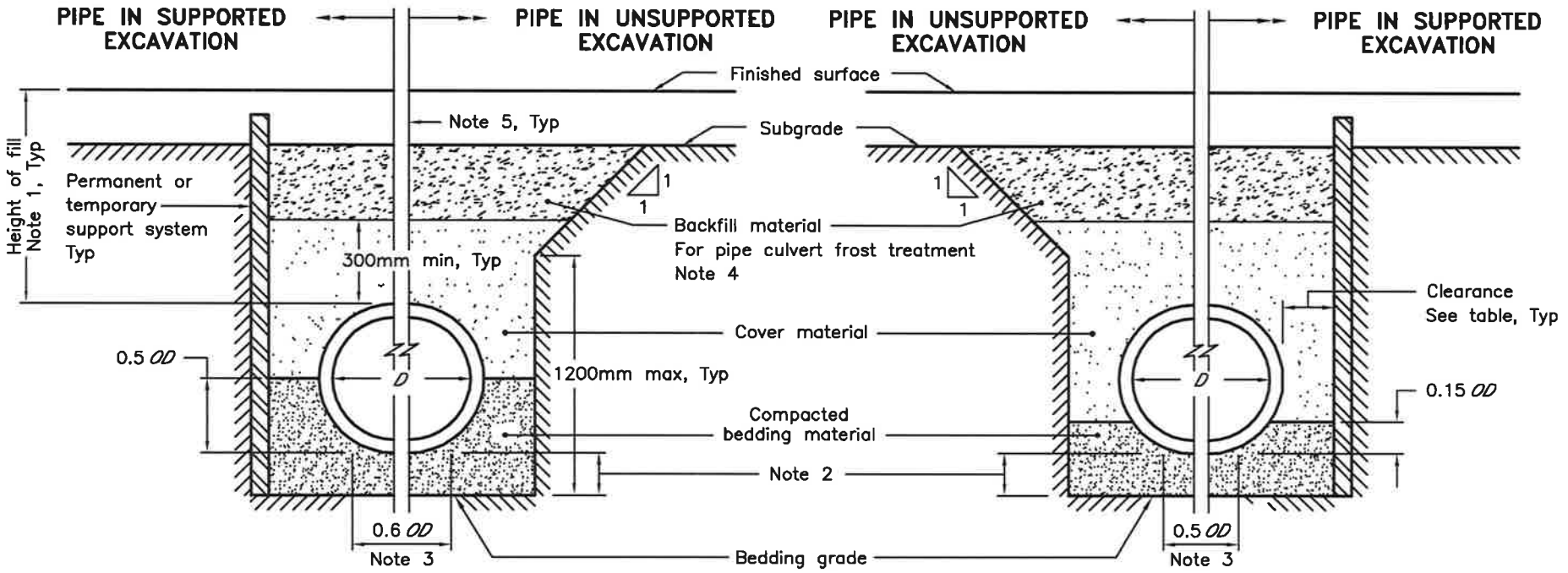
ONTARIO STANDARDS · MUNICIPAL – PROVINCIAL · O P S

**OPSD 802.010**




**CLASS B BEDDING** **CLASS C BEDDING**

NOTES:

1 Height of fill is measured from the finished surface to top of pipe.
2 The minimum bedding depth below the pipe shall be 0.15*D*. In no case shall this dimension be less than 150mm or greater than 300mm.
3 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
4 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
5 Condition of excavation is symmetrical about centreline of pipe.

A Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.

B All dimensions are in metres unless otherwise shown.

LEGEND:

*D* – Inside diameter
*OD* – Outside diameter

| CLEARANCE TABLE | |
|---|---|
| Pipe Inside Diameter mm | Clearance mm |
| 900 or less | 300 |
| Over 900 | 500 |

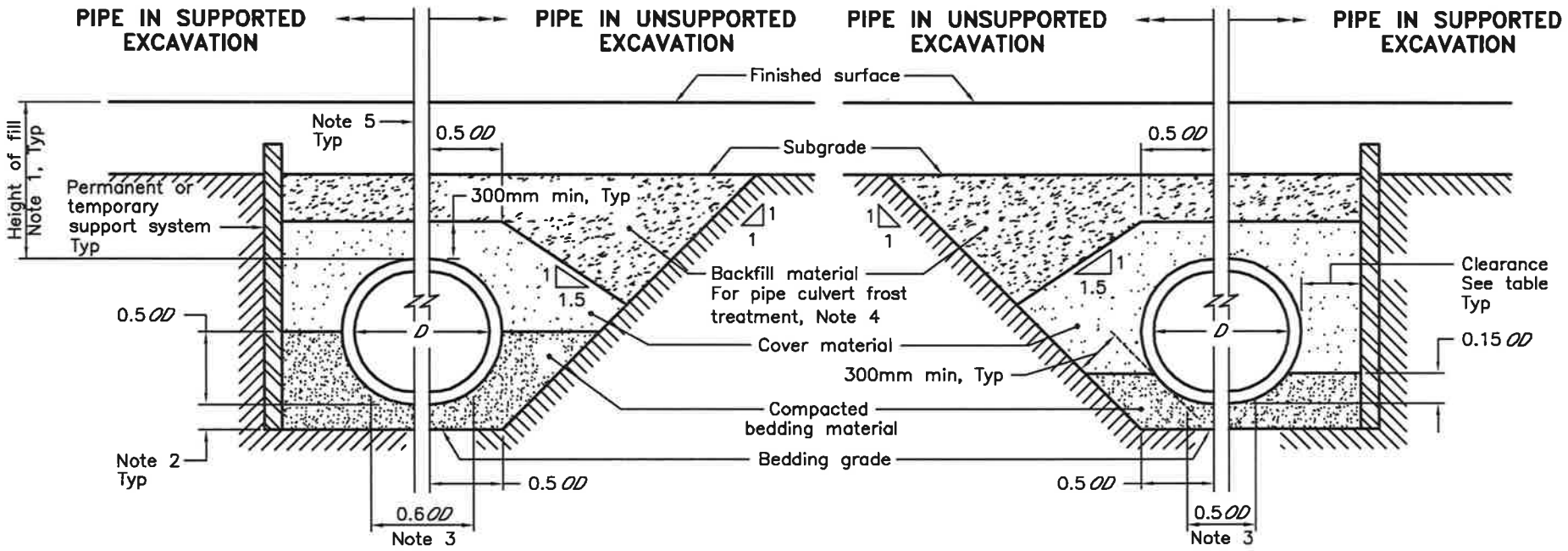
ONTARIO PROVINCIAL STANDARD DRAWING

# RIGID PIPE BEDDING, COVER, AND BACKFILL TYPE 1 OR 2 SOIL – EARTH EXCAVATION

Nov 2015 | Rev 3

ONTARIO STANDARDS MUNICIPAL – PROVINCIAL

**OPSD 802.030**




## NOTES:

1 Height of fill is measured from the finished surface to top of pipe.
2 The minimum bedding depth below the pipe shall be 0.15*D*. In no case shall this dimension be less than 150mm or greater than 300mm.
3 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
4 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
5 Condition of excavation is symmetrical about centreline of pipe.
A Soil types as defined in the Occupational Health and Safety Act and Regulations for Construction Projects.
B All dimensions are in metres unless otherwise shown.

## LEGEND:

*D* – Inside diameter
*OD* – Outside diameter

| CLEARANCE TABLE | |
|---|---|
| Pipe Inside Diameter mm | Clearance mm |
| 900 or less | 300 |
| Over 900 | 500 |

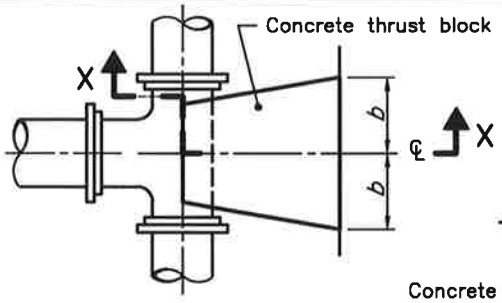
ONTARIO PROVINCIAL STANDARD DRAWING

# RIGID PIPE BEDDING, COVER, AND BACKFILL TYPE 3 SOIL – EARTH EXCAVATION

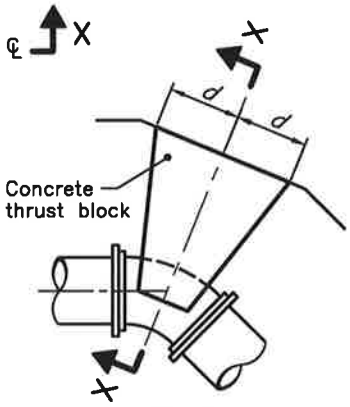
Nov 2015 | Rev 3

ONTARIO STANDARDS MUNICIPAL – PROVINCIAL

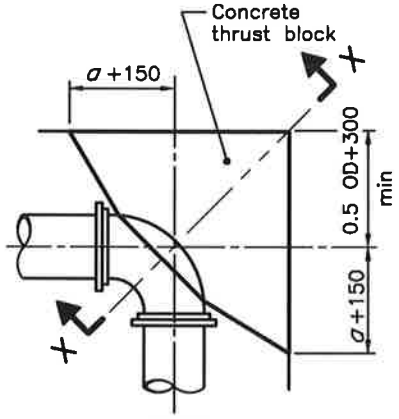
OPSD 802.031



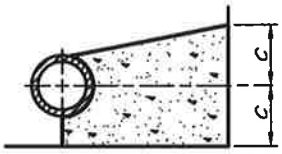

PLAN
TEE



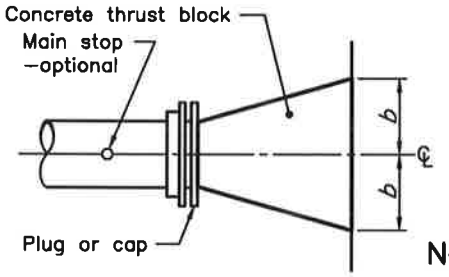

PLAN
TYPICAL BEND



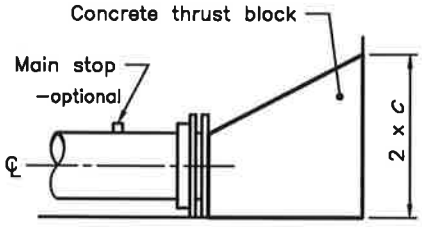

PLAN
90 BEND




SECTION X–X




PLAN
DEAD END




ELEVATION
DEAD END

**SOILS WITH TYPICAL BEARING STRENGTH OF 100 TO 199 kPa**

| PIPE DIA | Dimensions | | | |
|---|---|---|---|---|
| | *a* | *b* | *c* | *d* |
| 100 | 150 | 250 | 200 | 200 |
| 150 | 250 | 400 | 250 | 300 |
| 200 | 400 | 550 | 300 | 450 |
| 250 | 500 | 650 | 400 | 500 |
| 300 | 650 | 800 | 450 | 650 |
| 350 | 700 | 900 | 550 | 700 |
| 400 | 900 | 1050 | 600 | 850 |

**SOILS WITH TYPICAL BEARING STRENGTH OF 200 TO 299 kPa**

| PIPE DIA | Dimensions | | | |
|---|---|---|---|---|
| | *a* | *b* | *c* | *d* |
| 100 | 150 | 200 | 150 | 150 |
| 150 | 250 | 250 | 200 | 200 |
| 200 | 400 | 350 | 250 | 300 |
| 250 | 500 | 450 | 300 | 350 |
| 300 | 650 | 500 | 350 | 400 |
| 350 | 700 | 600 | 400 | 500 |
| 400 | 900 | 750 | 400 | 600 |

**SOILS WITH TYPICAL BEARING STRENGTH OF 300 kPa AND OVER**

| PIPE DIA | Dimensions | | | |
|---|---|---|---|---|
| | *a* | *b* | *c* | *d* |
| 100 | 150 | 150 | 150 | 150 |
| 150 | 250 | 200 | 200 | 200 |
| 200 | 400 | 300 | 200 | 250 |
| 250 | 500 | 400 | 250 | 300 |
| 300 | 650 | 450 | 300 | 300 |
| 350 | 700 | 550 | 350 | 350 |
| 400 | 900 | 650 | 350 | 450 |

NOTES:

A Concrete shall be placed to within 50mm of the face of the bell.

B Bond breaker shall be used between concrete and fittings.

C The above thrust block dimensions meet or exceed the MECP Watermain Design Criteria for Future Alterations Authorized Under a Drinking Water Works Permit.

D The assumptions made for the above calculations are:
- Maximum operating pressure of 690 kPa,
- Maximum surge pressure with a flow velocity change of 0.6 m/s of 790 kPa for Class 52 DI pipe and 240 kPa for PVC pipe.

E The tables apply to both ductile iron and PVC pipe. When one length exceeded the other, the longer length was used.

F All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2018 | Rev 3

# CONCRETE THRUST BLOCKS FOR TEES, PLUGS, AND HORIZONTAL BENDS

ONTARIO STANDARDS · MUNICIPAL – PROVINCIAL · O P S

OPSD 1103.010