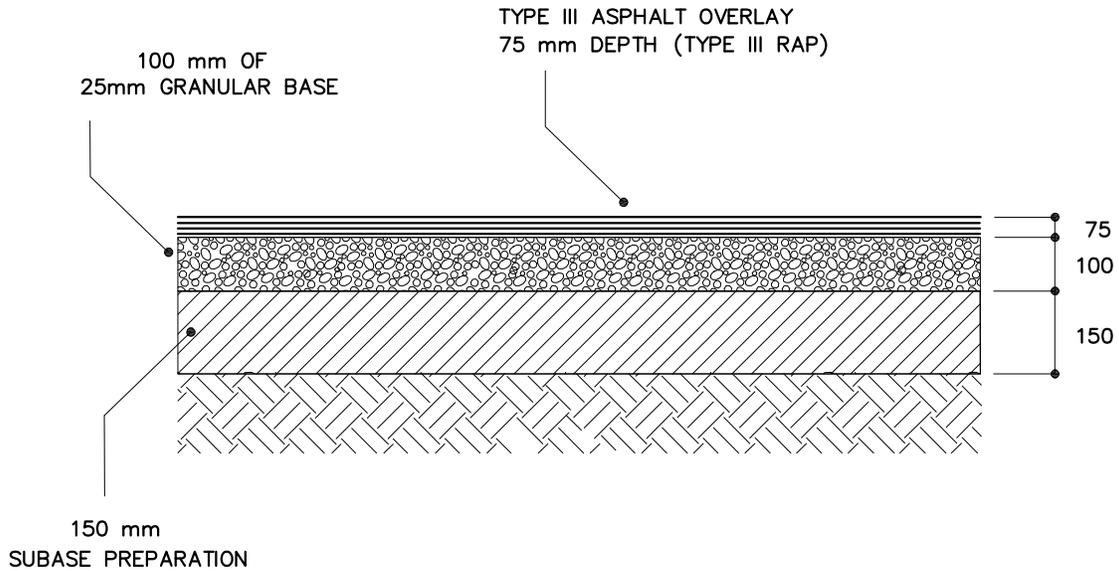


GENERAL NOTES

- PATHWAYS CONSTRUCTED ADJACENT TO CONCRETE CURBS WILL BE CONSTRUCTED TO TIE INTO THE TOP OF THE CURB & WILL BE CONSTRUCTED WITH 2% CROSS-SLOPE FROM THIS POINT
- TRAILS THAT INTERSECT ROADWAYS WILL BE CONSTRUCTED WITH DROPPED CURB CONCRETE CURB & GUTTER & 1.37M WIDE SIDEWALK WHEELCHAIR RAMPS TO BE CONSTRUCTED AS PER CURRENT CITY OF LETHBRIDGE INFRASTRUCTURE SERVICES ENGINEERING STANDARDS
- EXCAVATE TO A DEPTH OF 175mm APPROX & DISPOSE OFFSITE OR AS DIRECTED BY THE ENGINEER
- CONTRACTOR WILL REMOVE AN ADDITIONAL 1.0M OF TOPSOIL ON EACH SIDE OF THE TRAIL WHERE THE FINISHED ELEV OF THE PATHWAY VARIES MORE THAN 100mm FROM EXISTING TERRAIN
- RESTORE DISTURBED AREAS WITH A MIN DEPTH OF 100mm SALVAGED TOPSOIL SUPPLY & PLACE SEED OR SOD



SECTION

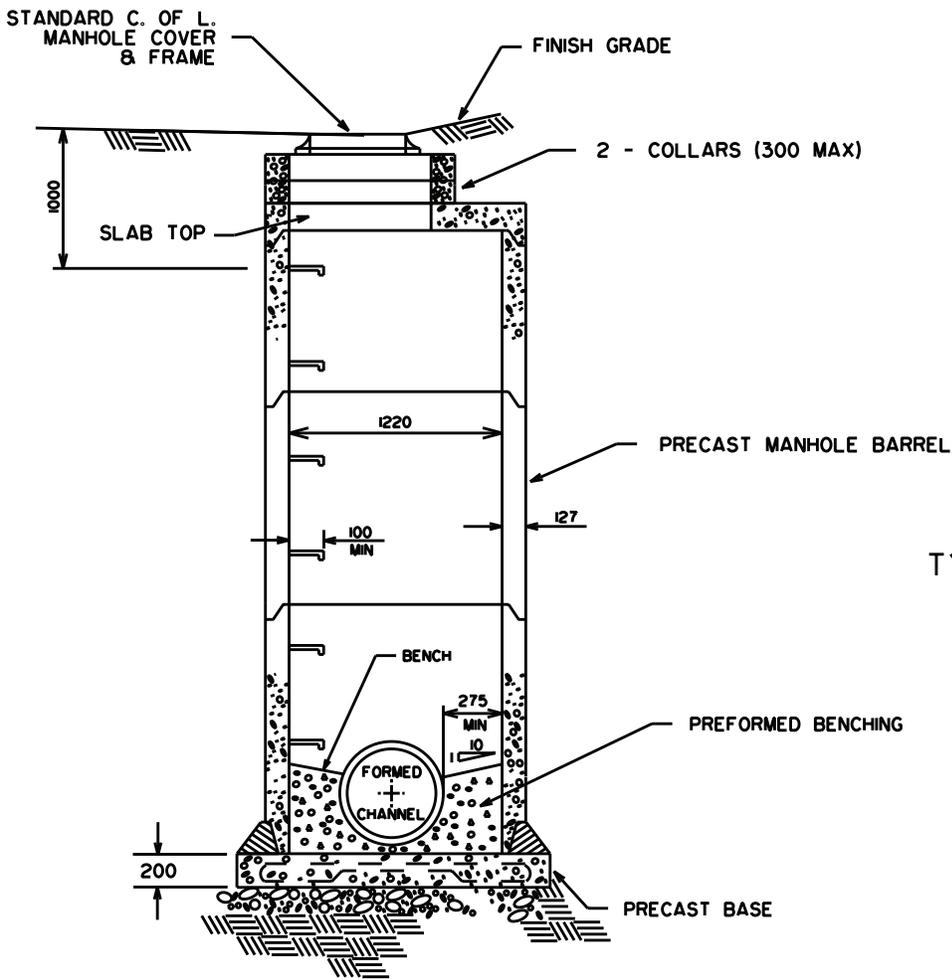
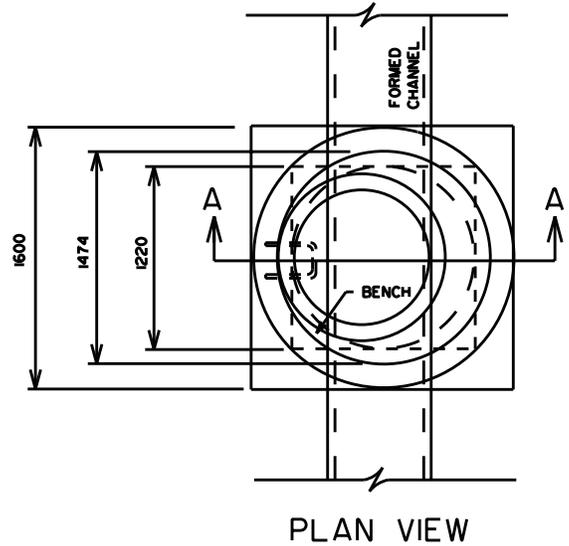


CITY OF
Lethbridge

INFRASTRUCTURE SERVICES
REGIONAL TRAIL

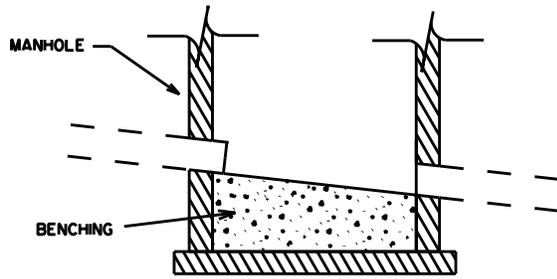
| | |
|---------------|-----------------------|
| REVISIONS | |
| 1. 12-01-2004 | SETBACK STANDARD 3.5m |
| | |
| DRAWN | GD |
| SCALE | NOT TO SCALE |
| DATE | 10-15-2000 |
| DWG NO | 4.1 |

- NOTE: - PRECAST MANHOLE SECTIONS TO CONFORM TO A.S.T.M. DESIGNATION C478 (LATEST EDITION)
- ALL JOINTS TO BE SEALED WITH FLEXIBLE BUTYL RESIN SEALANT OR TYLOX SUPERSEAL GASKET
 - ALL DIMENSIONS IN mm
 - LADDER RUNGS SHALL BE CLEAR OF ALL LATERALS
 - MANHOLE STEPS AT 400 o/c
 - FOR BENCHING DETAIL SEE DRAWINGS S-07
 - CEMENT TO BE TYPE 50 (SULPHATE RESISTANT)

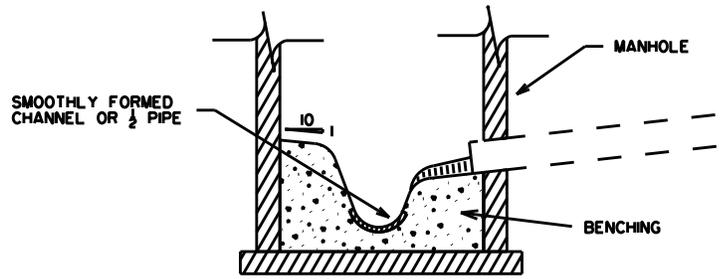


NOTE: TO BE USED ONLY WHEN CONNECTING TO EXISTING MAINS 600 mm DIAMETER & SMALLER.

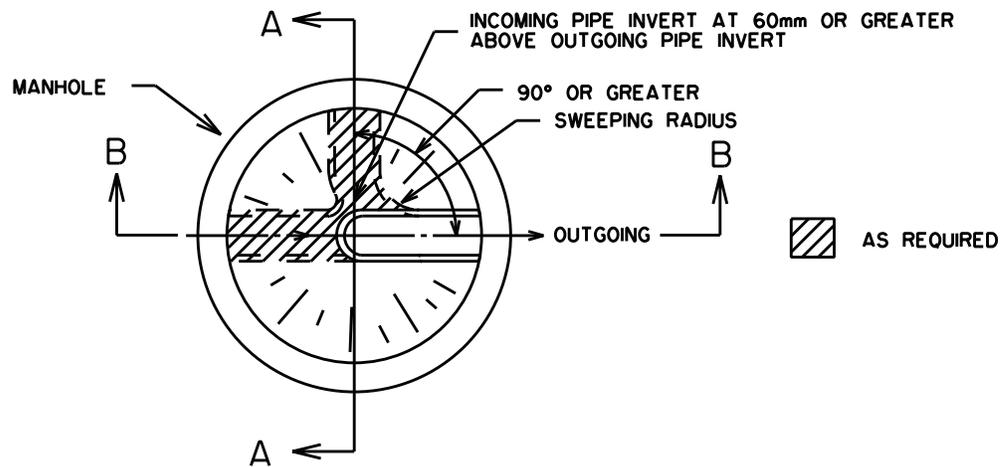
| | | | |
|--------------|--|----------|----------|
| REVISED |  <p>CITY OF <i>Lethbridge</i> INFRASTRUCTURE SERVICES</p> | DRAWN | P.R.A. |
| NOV 15, 2004 | | CHECKED | |
| DEC 14, 2005 | | APPROVED | |
| FEB 3, 2010 | | SCALE | N.T.S. |
| | | DATE | 97/03/08 |
| | STANDARD MANHOLE TYPE I | DWG NO | S-01 |



SECTION B-B
TYPICAL BENCHING



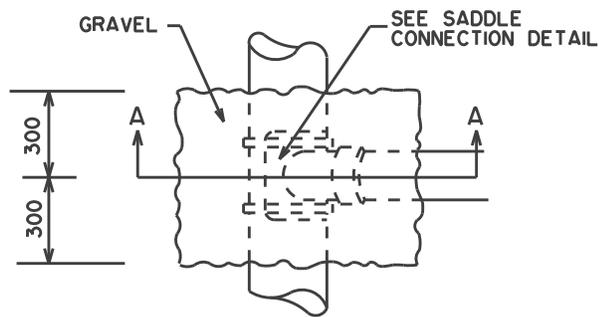
SECTION A-A
TYPICAL BENCHING



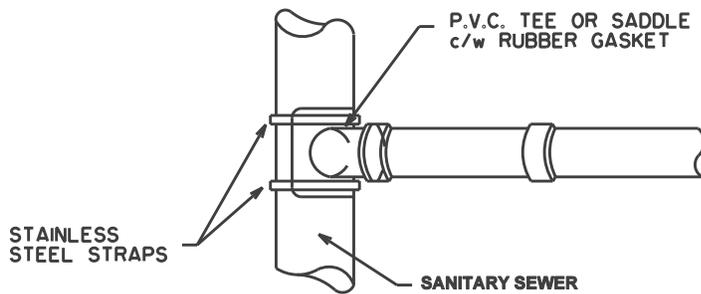
NOTE: - ALL DIMENSIONS IN MILLIMETERS.

- BENCHING SLOPE TO BE 10 : 1 FROM SPRING LINE OF PIPE (1/2 WAY UP)
- ON SANITARY SEWER USE EXTERIOR DROP MANHOLE WHEN INCOMING PIPE INVERT IS 600 OR GREATER ABOVE OUTGOING PIPE INVERT.
- NO SHARP CORNERS.
- BENCHING CONCRETE TO BE TYPE 50 SULPHATE RESISTANT CEMENT. MINIMUM COMPRESSIVE STRENGTH TO BE 30 MPa @ 28 DAYS.
- 30 mm DROP ACROSS M.H. BETWEEN INCOMING & OUTGOING INVERTS FOR PIPE GRADE UP TO 2%.
- 60 mm DROP ACROSS M.H. BETWEEN INCOMING & OUTGOING INVERTS FOR PIPE GRADES > 2%. AND < = 5%. ALSO FOR 90° TURNS.
- DROP ACROSS M.H. BETWEEN INCOMING & OUTGOING INVERTS TO BE @ GRADE OF PIPE FOR PIPE GRADES > 5%
- ALL INCOMING PIPE MUST BE GROUTED TO BE FLUSH WITH BENCHING IN MANHOLES.

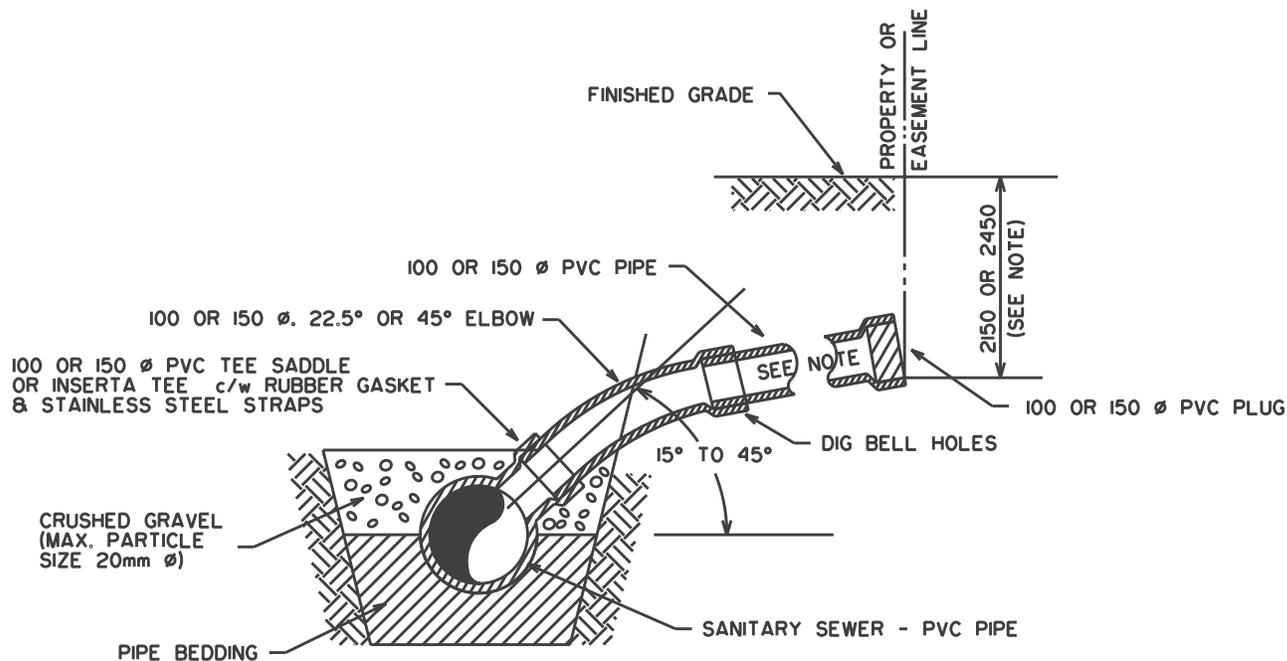
| | | | |
|------------------------------|--|----------|----------|
| REVISED |  <p style="text-align: center;">CITY OF <i>Lethbridge</i> INFRASTRUCTURE SERVICES</p> | DRAWN | P.R.A. |
| DEC 3/07 | | CHECKED | |
| FEB 5/10 | | APPROVED | |
| | | SCALE | N.T.S. |
| | | DATE | 97/02/18 |
| | | DWG NO | S-07 |
| TYPICAL BENCHING IN MANHOLES | | | |



PLAN



SADDLE CONNECTION DETAIL

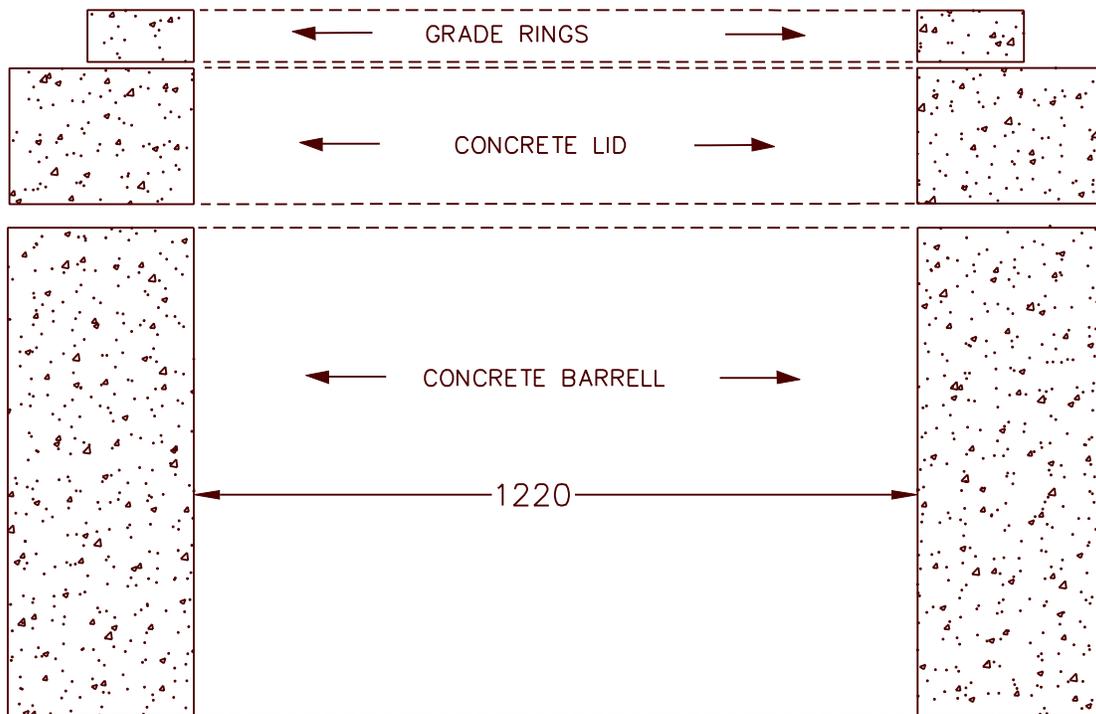
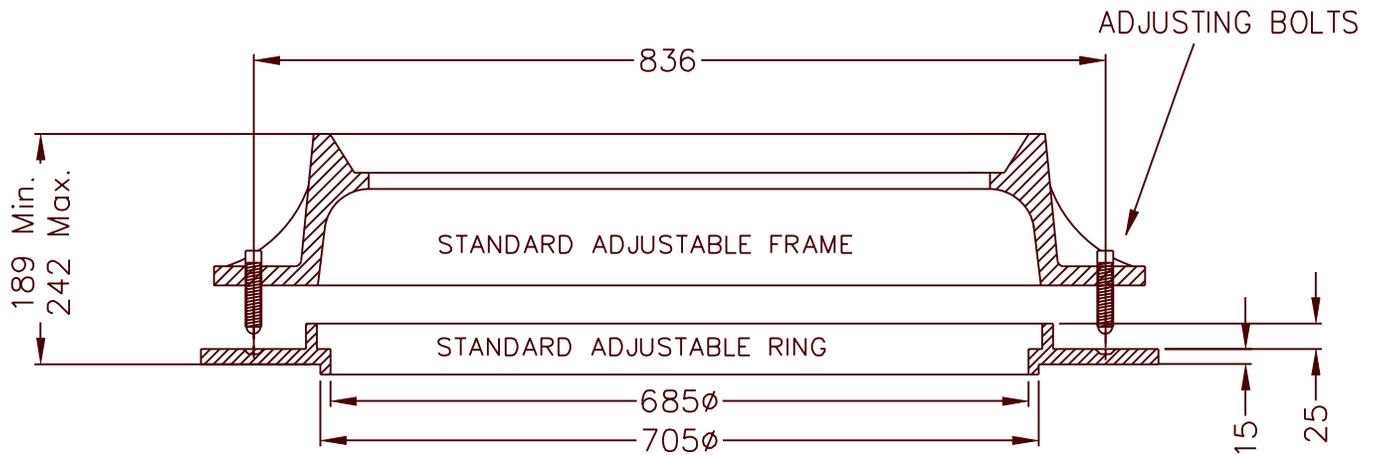


SECTION A-A

FOR SEWERS LESS THAN 3700 DEEP

- NOTE:
- 150 Ø SERVICES AT MIN 1%
 - 100 Ø SERVICES AT MINIMUM 2%
 - ALL P.V.C. PIPE TO BE MUNICIPAL STUB SEWER PIPE, A.S.T.M. D3034, DR 28
 - WHEN LOT SLOPES FROM BACK TO FRONT, THE DEPTH AT P/L TO BE 2150.
 - WHEN LOT SLOPED FRONT TO BACK, THE DEPTH AT P/L TO BE 2450.
 - SEWER SERVICES MUST TERMINATE WITH A BELL END
 - SADDLES TO BE 400mm APART MIN.
 - ALL DIMENSIONS ARE IN MILLIMETERS

| | | | |
|---|--|----------|----------|
| REVISED |  <p style="text-align: center;">CITY OF <i>Lethbridge</i> INFRASTRUCTURE SERVICES</p> | DRAWN | P.R.A. |
| | | CHECKED | |
| | | APPROVED | |
| | | SCALE | N.T.S. |
| | | DATE | 97/03/10 |
| | | DWG NO | S-08 |
| P.V.C. SEWER SERVICE CONNECTION FOR MAINS LESS THAN 3.7 DEEP | | | |



RING - DUCTILE IRON 65-45-12.
 BOLTS - 5/8" NC LOW ALLOY HIGH STRENGTH.
 BOLTS - AVAILABLE IN 6" IF NEEDED.

REVISED



CITY OF
Lethbridge

INFRASTRUCTURE SERVICES

ADJUSTABLE FRAME INSTALLATION

DRAWN

CHECKED

APPROVED

SCALE

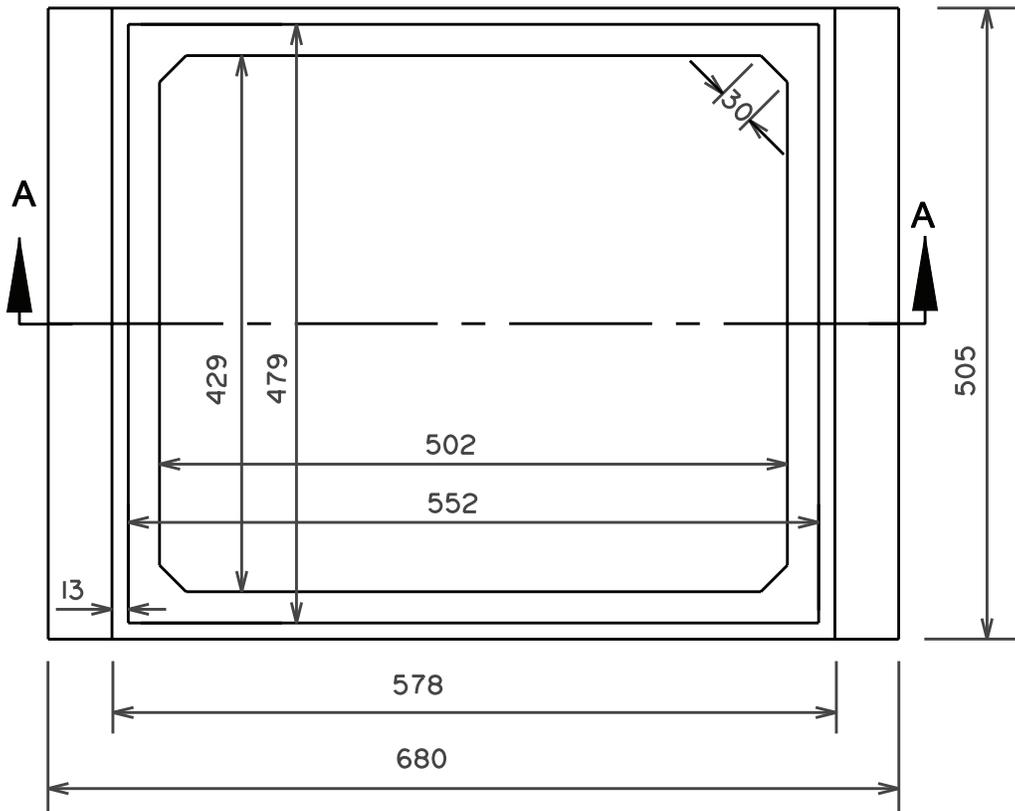
NTS

DATE

SEPT 10/2010

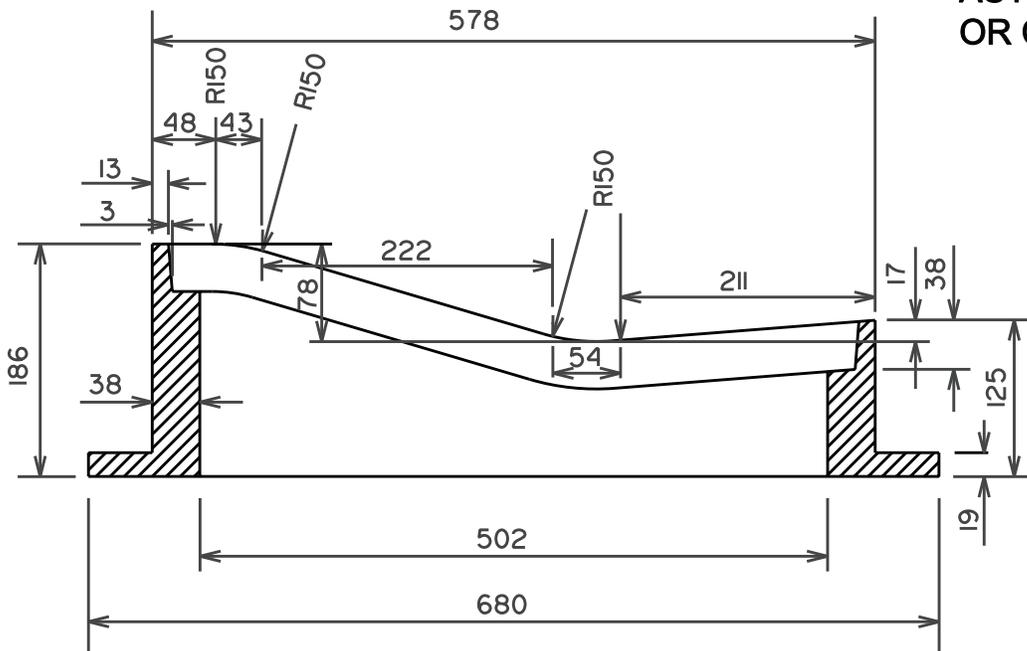
DWG NO

S-10-C



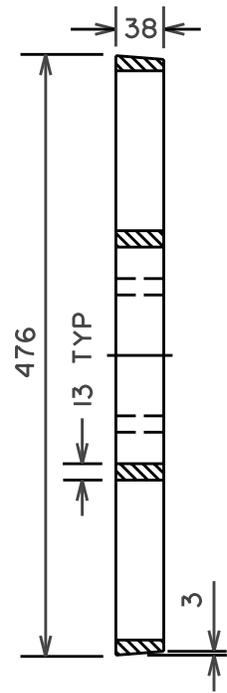
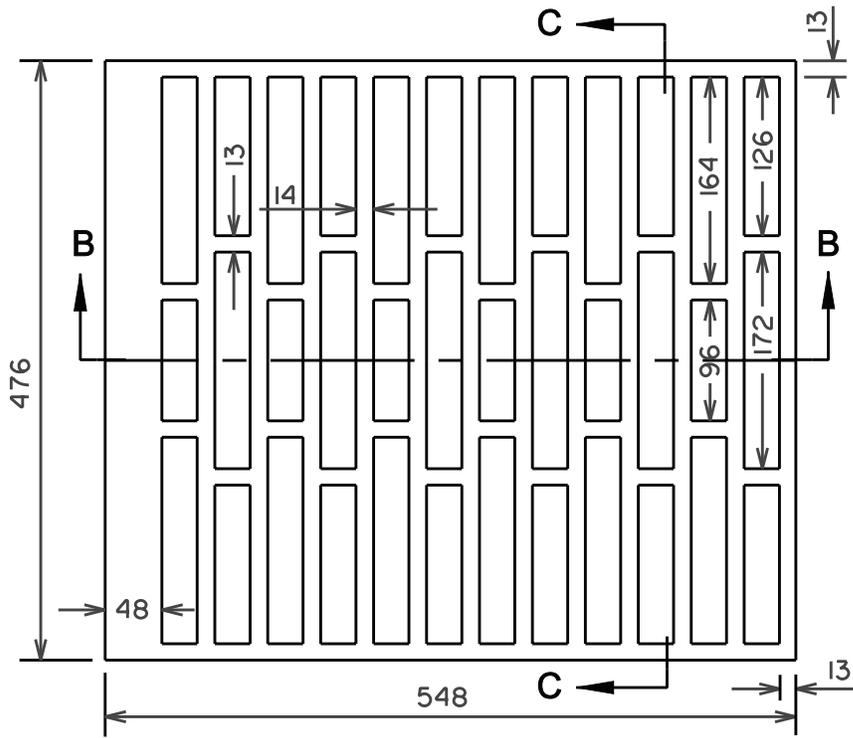
PLAN

FRAME MATERIAL :
CAST IRON
ASTM A48 CL 25B
OR CL 30

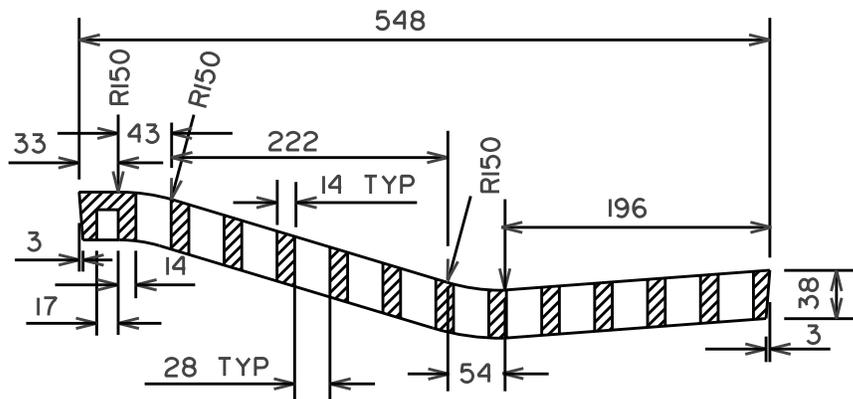


SECTION A-A

| | | | |
|---------|---|----------|-------------|
| REVISED |  <p>CITY OF <i>Lethbridge</i> INFRASTRUCTURE SERVICES</p> <p>SINGLE CATCH BASIN FRAME ROLLED CURB TYPE</p> | DRAWN | D.F. |
| | | CHECKED | |
| | | APPROVED | |
| | | SCALE | NTS |
| | | DATE | NOV 25/2004 |
| | | DWG NO | S-II |



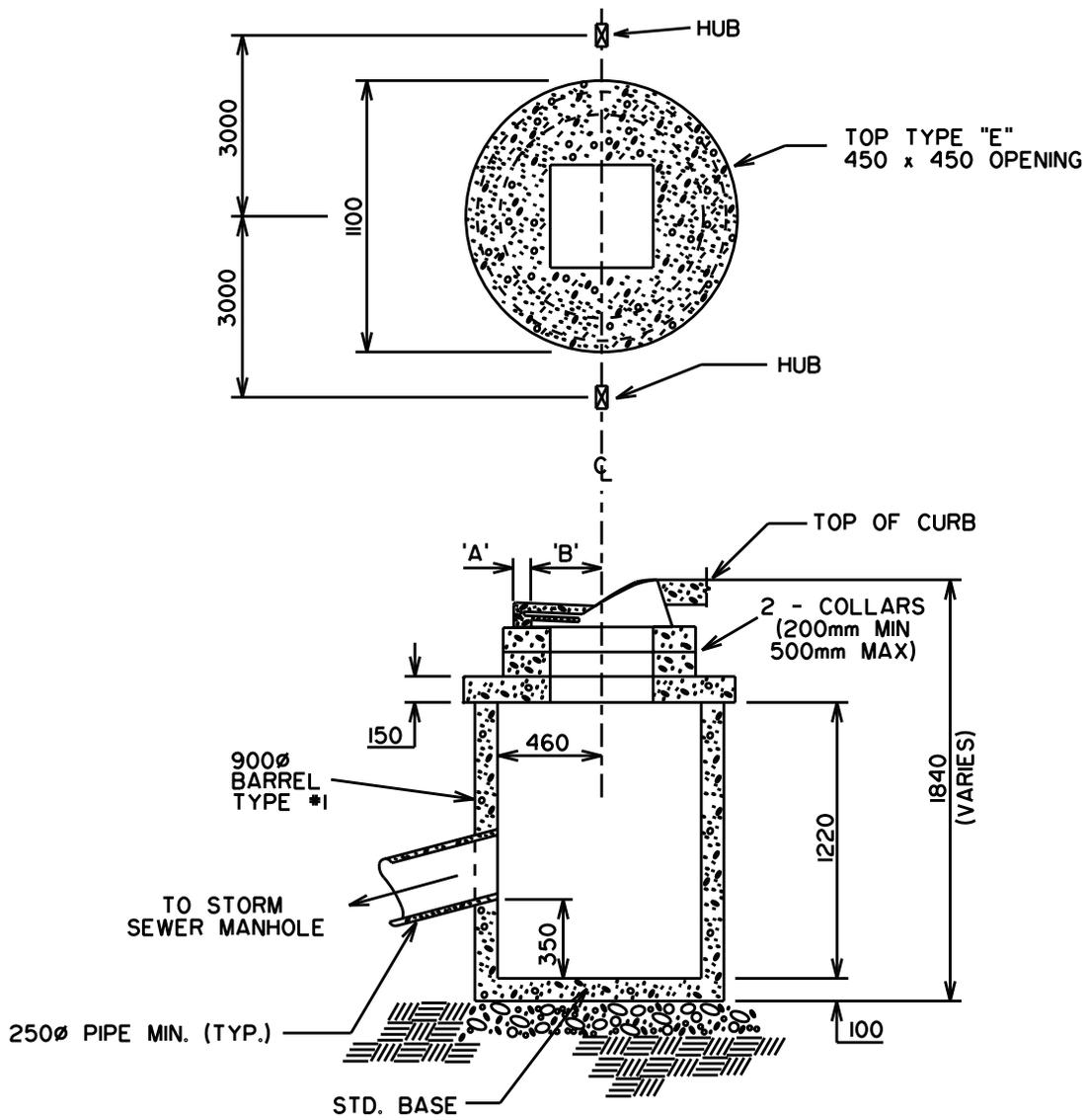
SECTION C-C



SECTION B-B

GRATE MATERIAL :
DUCTILE IRON
ASTM A536
GRADE 60-40-18

| | | | |
|---------|--|----------|-------------|
| REVISED |  CITY OF <i>Lethbridge</i> INFRASTRUCTURE SERVICES | DRAWN | D.F. |
| | | CHECKED | |
| | | APPROVED | |
| | | SCALE | NTS |
| | | DATE | NOV 25/2004 |
| | CATCH BASIN GRATE ROLLED CURB TYPE | DWG NO | S-IIB |

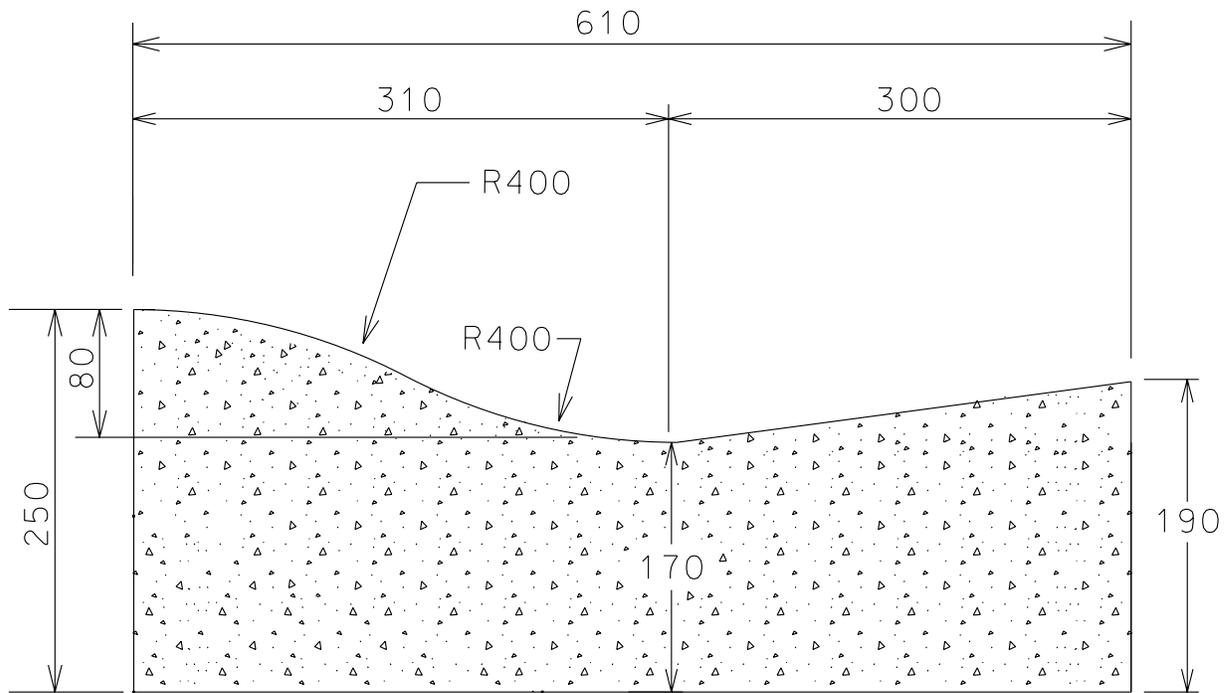


| CURB & GUTTER WIDTH | DIMENSION | |
|---------------------|-----------|-------|
| | 'A' | 'B' |
| 600mm | 75mm | 300mm |
| 690mm | 100mm | 300mm |

INSTALLING CATCH BASINS

- ALL JOINTS IN PRECAST SECTIONS TO BE SEALED WITH FLEXIBLE BUTYL RUBBER SEALANT (OR APPROVED EQUAL).
- PRECAST SECTION TO CONFORM TO A.S.T.M. C-478 (LATEST EDITION).
- ALL COVERS TO MEET CITY OF LETHBRIDGE STANDARDS.
- NO GRAVEL REQUIRED IF BASE IS SET ON UNDISTURBED SOIL. OTHERWISE 150 MINIMUM THICKNESS.
- ALL DIMENSIONS ARE IN MILLIMETRES.
- CEMENT TO BE TYPE 50 (SULFATE RESISTANT).

| | | | |
|---------|--|----------|----------|
| REVISED |  <p>CITY OF <i>Lethbridge</i> INFRASTRUCTURE SERVICES</p> | DRAWN | C.R.S. |
| | | CHECKED | |
| | | APPROVED | |
| | | SCALE | N.T.S. |
| | | DATE | 97/03/06 |
| | | DWG NO | S-14 |
| | CATCH BASIN ROLLED CURB | | |



| |
|-------------------------|
| REVISED |
| |
| |
| |
| |
| REVISED 03/14/07 R.J.K. |

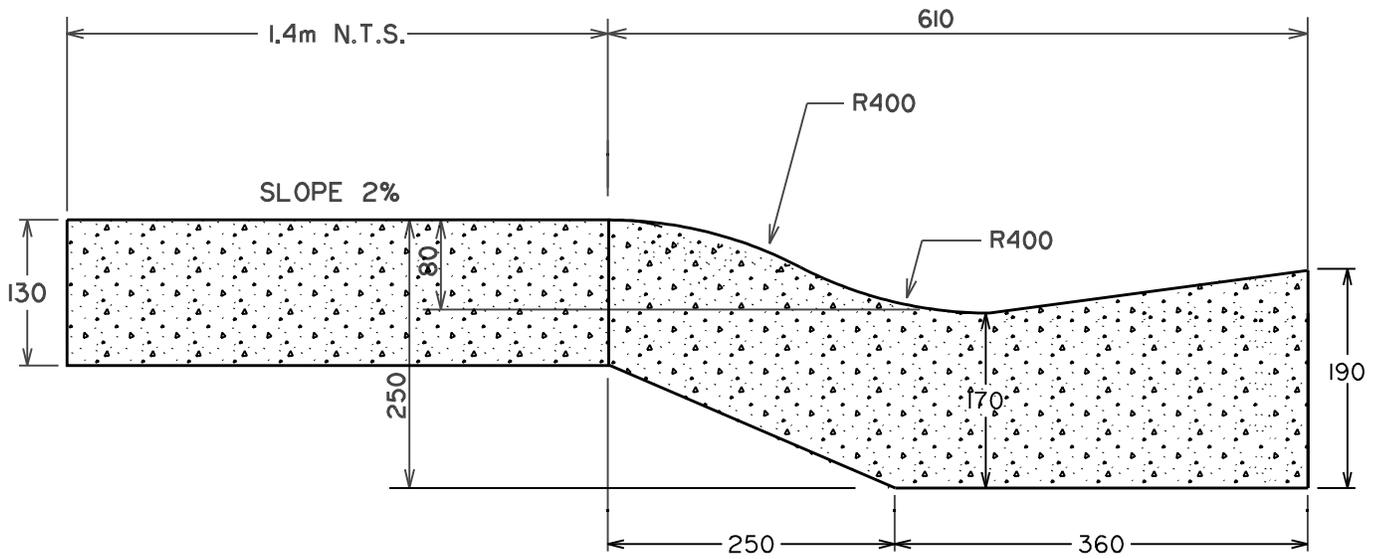


CITY OF
Lethbridge

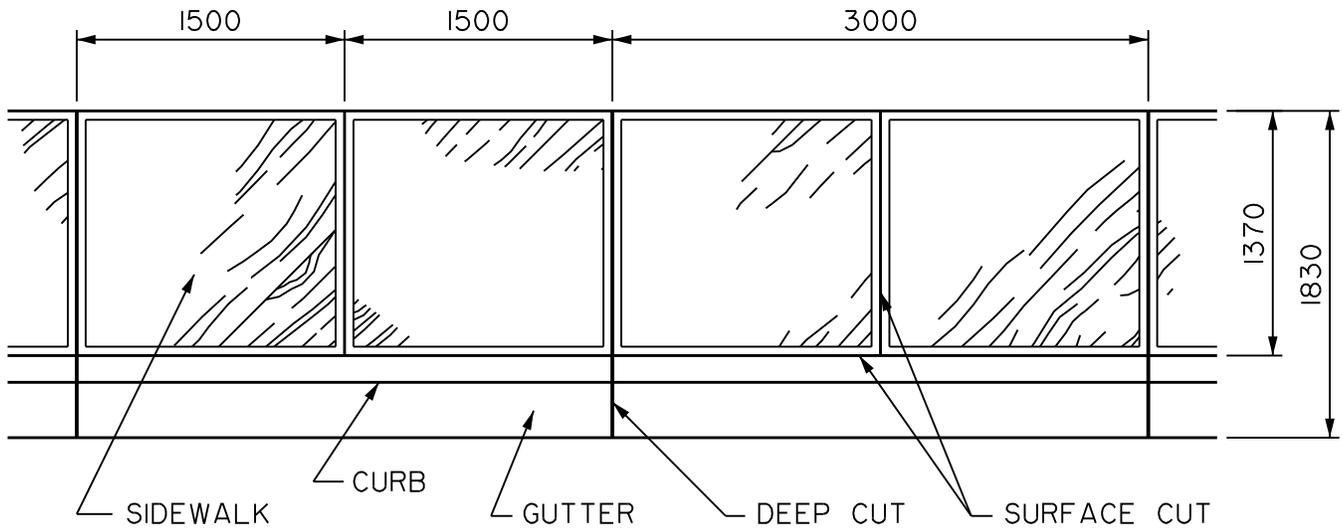
INFRASTRUCTURE SERVICES

**LOW PROFILE
ROLLED CURB**

| | |
|----------|--------------|
| DRAWN | R. J. K |
| CHECKED | R. A. B. |
| APPROVED | |
| SCALE | NTS |
| DATE | OCT 31/2005 |
| DWG NO | STR-06.1.dgn |



| | | | |
|---|--|----------|-------------|
| REVISED |  <p>CITY OF <i>Lethbridge</i> INFRASTRUCTURE SERVICES</p> | DRAWN | D.Mc. |
| | | CHECKED | |
| | | APPROVED | |
| | | SCALE | NTS |
| | | DATE | OCT 31/2005 |
| | | DWG NO | STR-09.dgn |
| COMBINED SIDEWALK ROLLED CURB GUTTER | | | |



- NOTE:**
- SIDEWALK SURFACE TO BE BRUSHED FINISHED
 - 6mm x 32mm DEEP EXPANSION JOINT TO BE LOCATED AT 3000mm INTERVAL.



City of Lethbridge
INFRASTRUCTURE

SIDEWALK JOINTING

DRAWN jrg

CHECKED

APPROVED

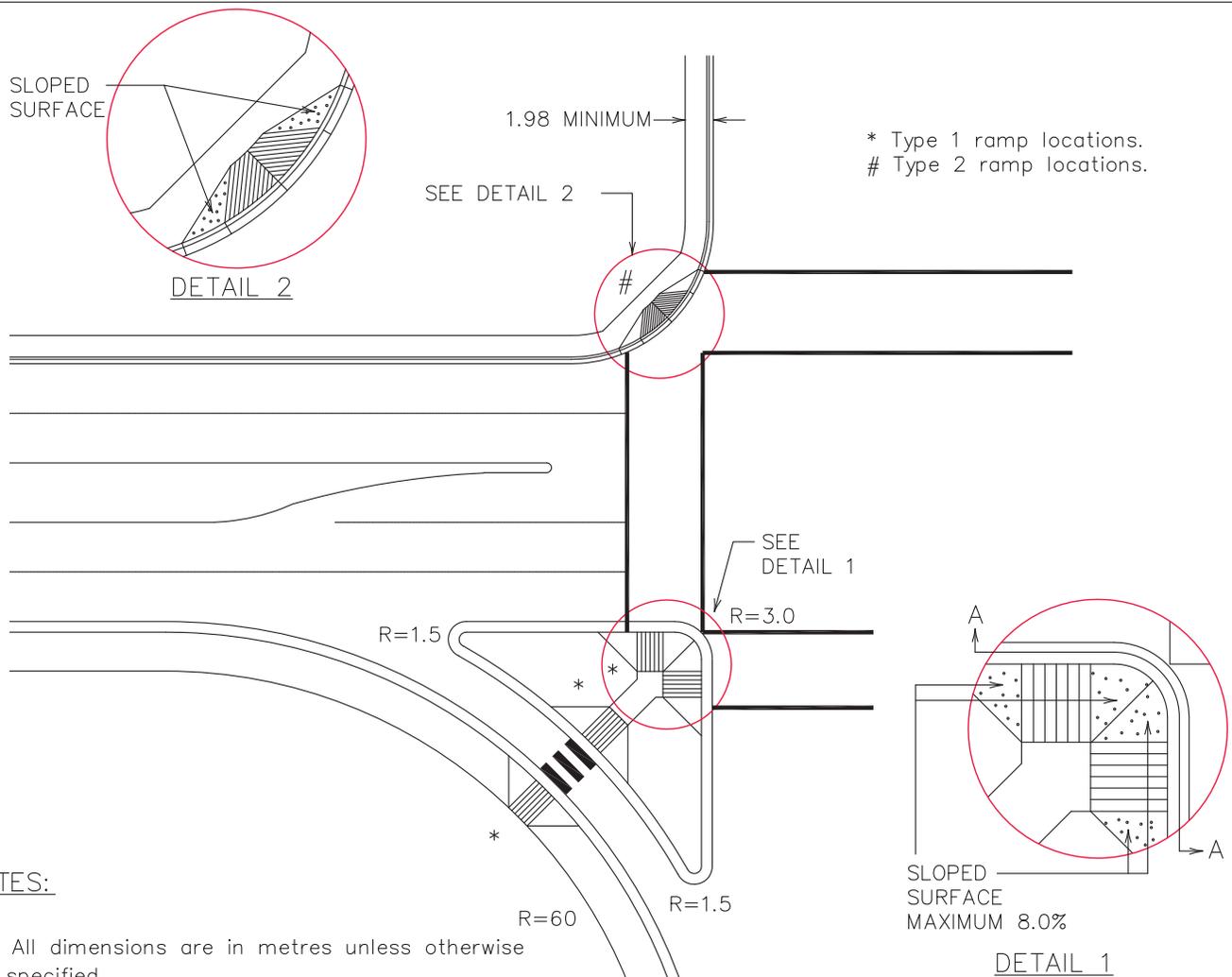
SCALE N.T.S.

DATE 99/05/03

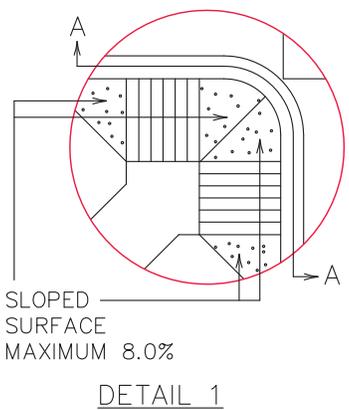
REV. DATE

DWG NO

STR_10

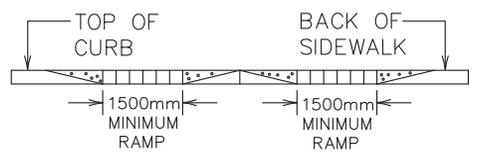


* Type 1 ramp locations.
Type 2 ramp locations.

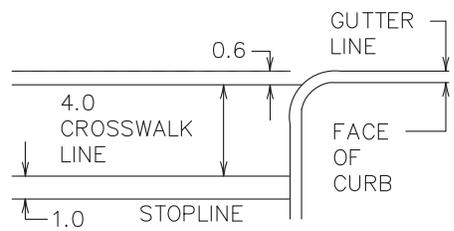


NOTES:

- All dimensions are in metres unless otherwise specified.
- Sidewalk ramps must provide access directly to crosswalks.
- The selection of curb ramp type is dependent on the location of the crosswalk relative to the curb face. Where the curb return radius is greater than or equal to 4.0m one Type 2 ramp can be used. Where the curb return radius is less than 4.0m two Type 1 ramps are required.
- Where crosswalks are controlled by signals with a push-button system, the sidewalks and ramps must allow access by wheelchair to the pushbutton.
- Refer to Drawing Nos. STR 11.1 and 11.2 for details of Type 1 and Type 2 ramps.
- On a sharp corner where two Type 1 ramps are being used, the slope on the flared areas between the two ramps can be less than the 0.08 m/m maximum shown. This will provide a smoother sidewalk for general use especially for pedestrians who are not using the crosswalk.



SECTION A-A



DETAIL SHOWING CROSSWALK DIMENSIONS

| DATE | REVISION | BY |
|-------|---------------|--------|
| 02/11 | REVISED SHAPE | R.J.K. |
| | | |
| | | |
| | | |
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| | | |
| | | |
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| FILE: | str_11.0.dwg | |

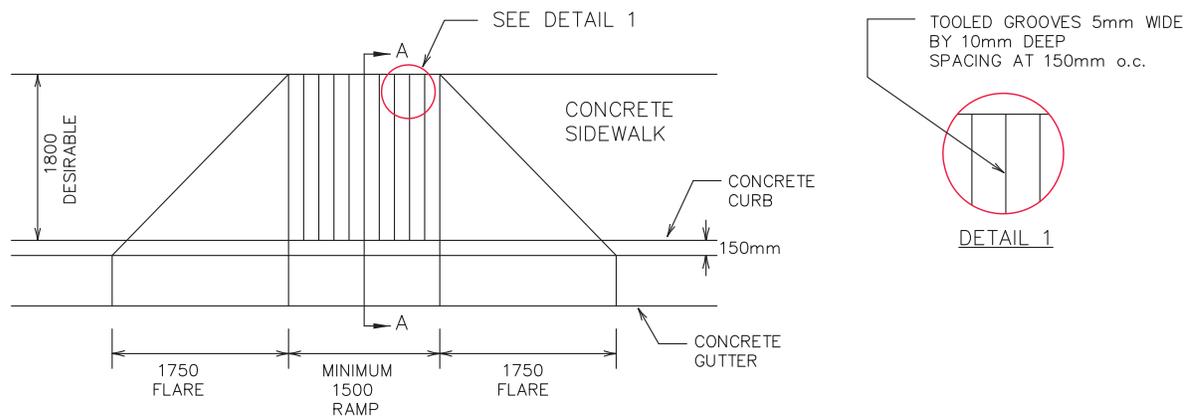


CITY OF
Lethbridge

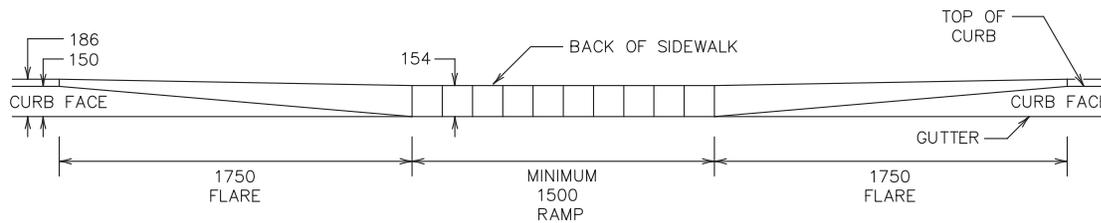
INFRASTRUCTURE SERVICES

TYPICAL LAYOUT OF CROSSWALKS AND LOCATION AND TYPE OF SIDEWALK RAMPS AT URBAN INTERSECTIONS

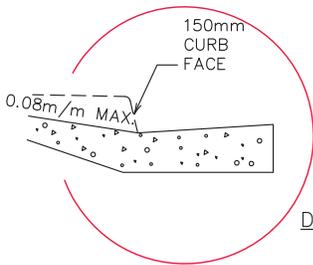
| | |
|-----------|------------|
| DRAWN: | C.R.S. |
| DESIGN: | R.J.K. |
| CHECKED: | R.A.B. |
| APPROVED: | D.L.J. |
| SCALE: | N.T.S. |
| DATE: | 02/10/1991 |
| DWG NO: | STR 11.0 |



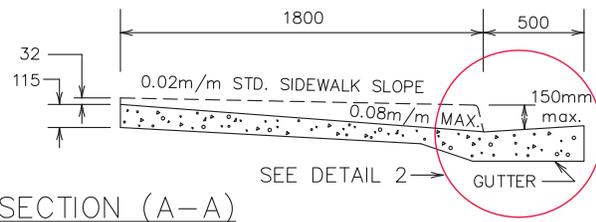
TYPICAL PLAN VIEW



TYPICAL ELEVATION



DETAIL 2



TYPICAL CROSS SECTION (A-A)

NOTES:

- All dimensions are in millimetres unless otherwise specified.
- Ramps for users of wheelchairs/bicycles should be located at all junctions of crosswalks and sidewalks.
- Grooves on sidewalk ramps are to alert persons who are visually impaired of the curb-cut and a street crossing.
- Where crosswalks are controlled by signals with a push-button system, the sidewalks and ramps must allow access by wheelchair to the push-button.
- Concrete sidewalks, curbs and ramps to be poured monolithically.
- Minimum width of ramp is 1500mm. It may be necessary to build wider ramps in busy urban areas where the volume of pedestrian traffic is high.
- Maximum ramp slope is 0.08m/m.
- Where the sidewalk is less than 1800mm wide, the 0.08m/m maximum slope should not be exceeded and therefore the back of the sidewalk must be lowered accordingly.
- Refer to Drawing No. STR 11.0 for typical layout of crosswalks and location and the type of ramp to be used.
- For details of typical ramps for 90 degree corners, refer to Drawing No. STR 11.2.

| DATE | REVISION | BY |
|-------|--------------|----|
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| | | |
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| FILE: | str_11.1.dwg | |

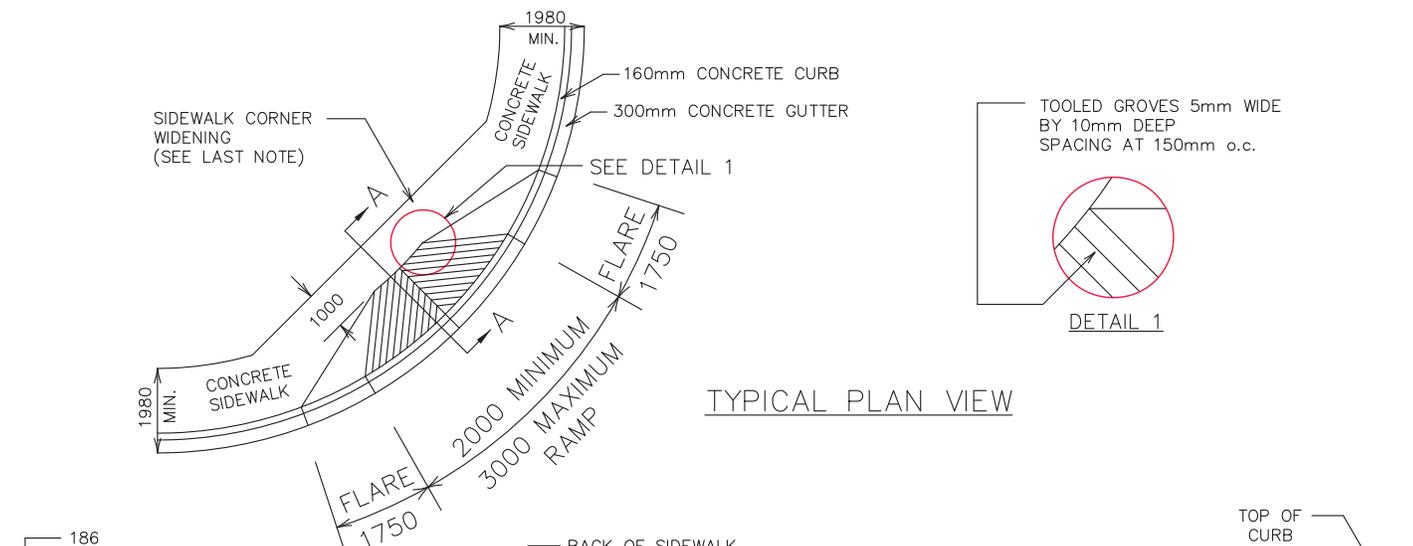


CITY OF
Lethbridge

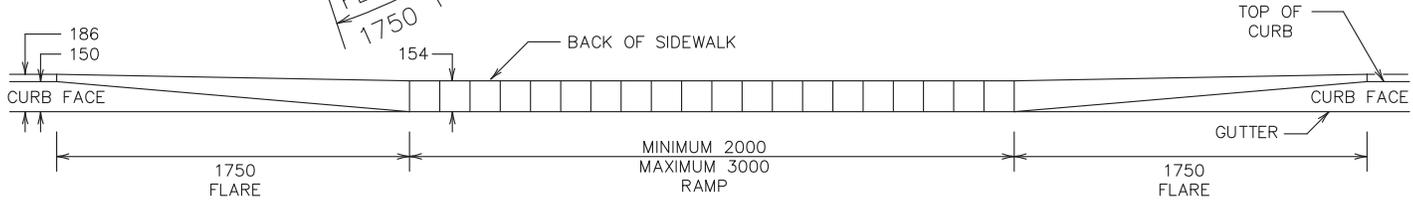
INFRASTRUCTURE SERVICES

CONCRETE SIDEWALK RAMP FOR
WHEELCHAIR OR BICYCLE
ON TANGENT (TYPE 1)

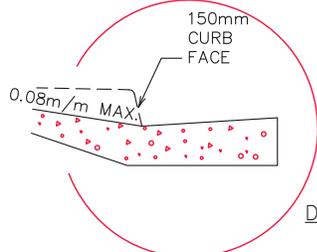
| | |
|-----------|------------|
| DRAWN: | C.R.S. |
| DESIGN: | C.R.S. |
| CHECKED: | P.R.A. |
| APPROVED: | B.L.H. |
| SCALE: | N.T.S. |
| DATE: | 10/10/1991 |
| DWG NO: | STR 11.1 |



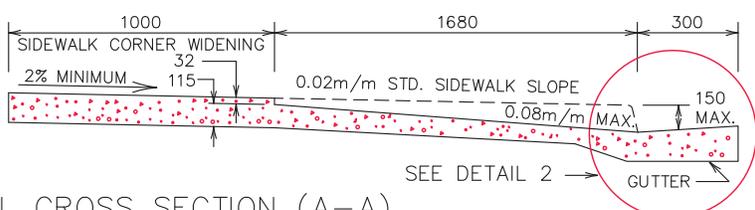
TYPICAL PLAN VIEW



TYPICAL ELEVATION



DETAIL 2



TYPICAL CROSS SECTION (A-A)

NOTES:

- All dimensions are in millimetres unless otherwise specified.
- Ramps for users of wheelchairs/bicycles should be located at all junctions of crosswalks and sidewalks. Ramp must be located within a crosswalk.
- Grooves on sidewalk ramps are to alert persons who are visually impaired of the curb-cut and a street crossing.
- Where crosswalks are controlled by signals with a push-button system, the sidewalks and ramps must allow access by wheelchair to the push-button.
- Concrete sidewalks, curbs and ramps to be poured monolithically.
- Minimum width of ramp is 2000mm. It may be necessary to build wider ramps in busy urban areas where the volume of pedestrian traffic is high.
- Maximum ramp slope is 0.08m/m.
- Where the sidewalk is less than 1800m wide, the 0.08m/m maximum slope should not be exceeded and therefore the back of the sidewalk must be lowered accordingly.
- Refer to Drawing No. STR 11.0 for typical layout of crosswalks and location and the type of ramp to be used.
- For details of typical ramps for tangent sections, refer to Drawing No. STR 11.1.
- Where right-of-way is available, the sidewalk is to be widened at corner locations as shown so that at least a 1.0m width of minimum 2% sloped sidewalk is provided adjacent to the ramp.

| DATE | REVISION | BY |
|-------|-----------------|--------|
| 02/11 | REVISED SHAPE | R.J.K. |
| 05/11 | RECORD REVISION | R.J.K. |
| 05/12 | SIZE REVISION | R.J.K. |
| | | |
| | | |
| | | |
| | | |
| FILE: | str_11.2.dwg | |

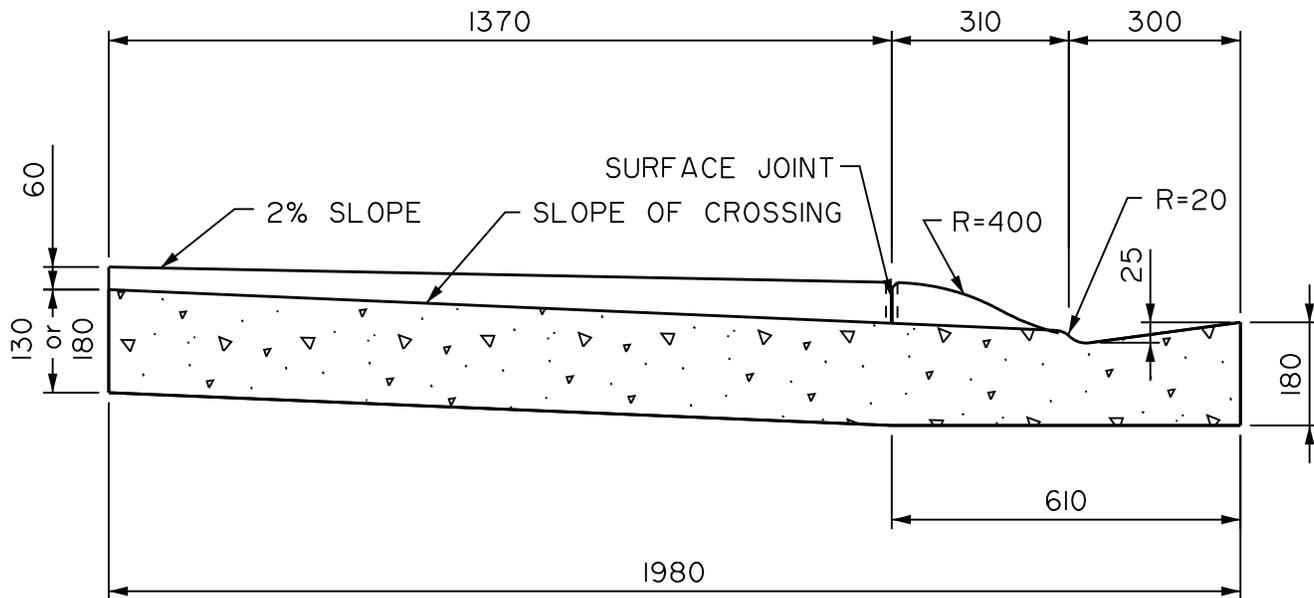


CITY OF
Lethbridge

INFRASTRUCTURE SERVICES

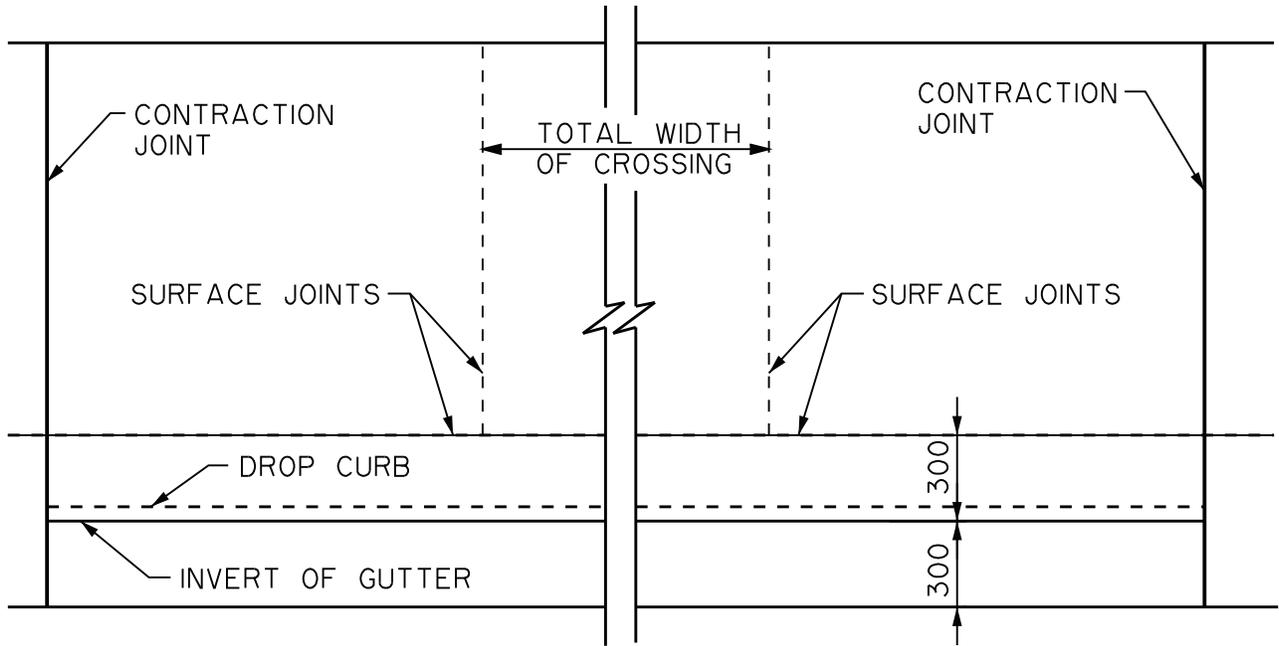
CONCRETE SIDEWALK RAMP FOR
WHEELCHAIR OR BICYCLE ON
CORNER (TYPE 2)

| | |
|-----------|------------|
| DRAWN: | C.R.S. |
| DESIGN: | R.J.K. |
| CHECKED: | R.A.B. |
| APPROVED: | D.L.J. |
| SCALE: | N.T.S. |
| DATE: | 10/11/1991 |
| DWG NO: | STR 11.2 |

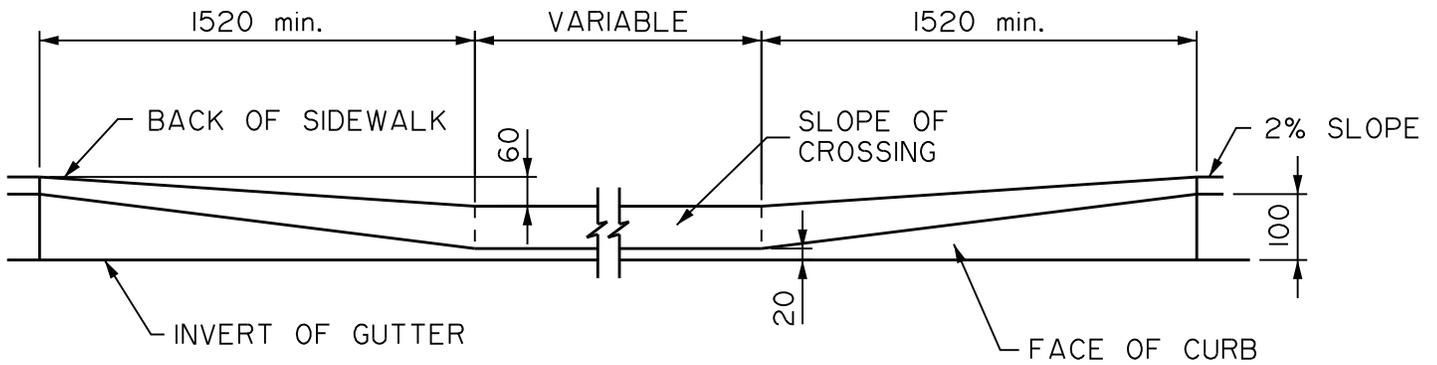


NOTE:
 - RESIDENTIAL CROSSING TO BE MIN. 130mm THICK.
 LANE OR COMMERCIAL CROSSING TO BE MIN.
 180mm THICK.

| | | | |
|---|---|-----------|----------|
| REVISION: CURB RADII TO 20. DI FROM TOP OF CROSSING TO SIDEWALK 60 |  City of Lethbridge INFRASTRUCTURE | DRAWN | jrg |
| | | CHECKED | |
| | APPROVED | | |
| | SCALE | N.T.S. | |
| | DATE | 99/05/03 | |
| CROSSING THROUGH COMBINED SIDEWALK ROLLED CURB AND GUTTER | | REV. DATE | 99/12/14 |
| | | DWG NO | STR_14_0 |



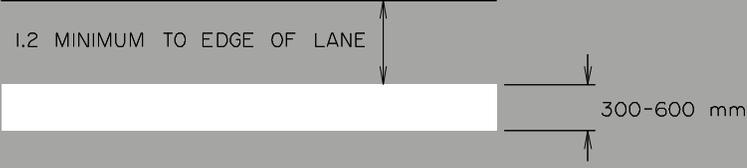
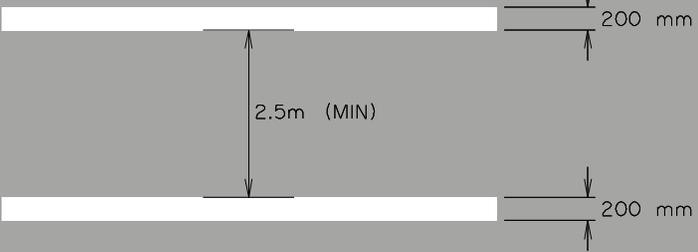
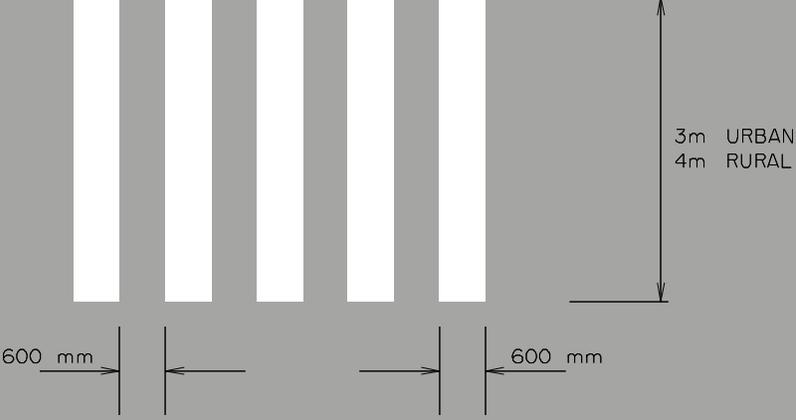
PLAN VIEW



FRONT VIEW

NOTE:
- BRUSH FINISH SURFACE

| | | | | |
|--|---|-----------|----------|----------|
| REVI: CHANGED CURB HEIGHT TO 20. BACK TO 60 |  City of Lethbridge INFRASTRUCTURE | DRAWN | jrg | |
| | | CHECKED | | |
| | CROSSING THROUGH COMBINED SIDEWALK STANDARD ROLLED CURB AND GUTTER | | APPROVED | |
| | | | SCALE | N.T.S. |
| | | | DATE | 99/05/03 |
| | | REV. DATE | | |
| | | DWG NO | STR_14_1 | |

| LINE TYPE | PATTERN | USE |
|--------------------|--|--------------------------------------|
| STOP BAR |  <p>1.2 MINIMUM TO EDGE OF LANE</p> <p>300-600 mm</p> | STOP LINE |
| STANDARD CROSSWALK |  <p>200 mm</p> <p>2.5m (MIN)</p> <p>200 mm</p> | STANDARD CROSSWALK |
| ZEBRA CROSSWALK |  <p>600 mm</p> <p>600 mm</p> <p>3m URBAN 4m RURAL</p> | ZEBRA CROSSWALK FOR ADDED VISIBILITY |

| | | | |
|-----|----------------------------------|------|--------|
| ▲ | | --- | |
| ▲ | Dwg. no. changed from TCS-C-3.01 | B.B. | Mar/03 |
| No. | DESCRIPTION | BY | DATE |

Alberta
TRANSPORTATION

FIGURE
TCS-C-301

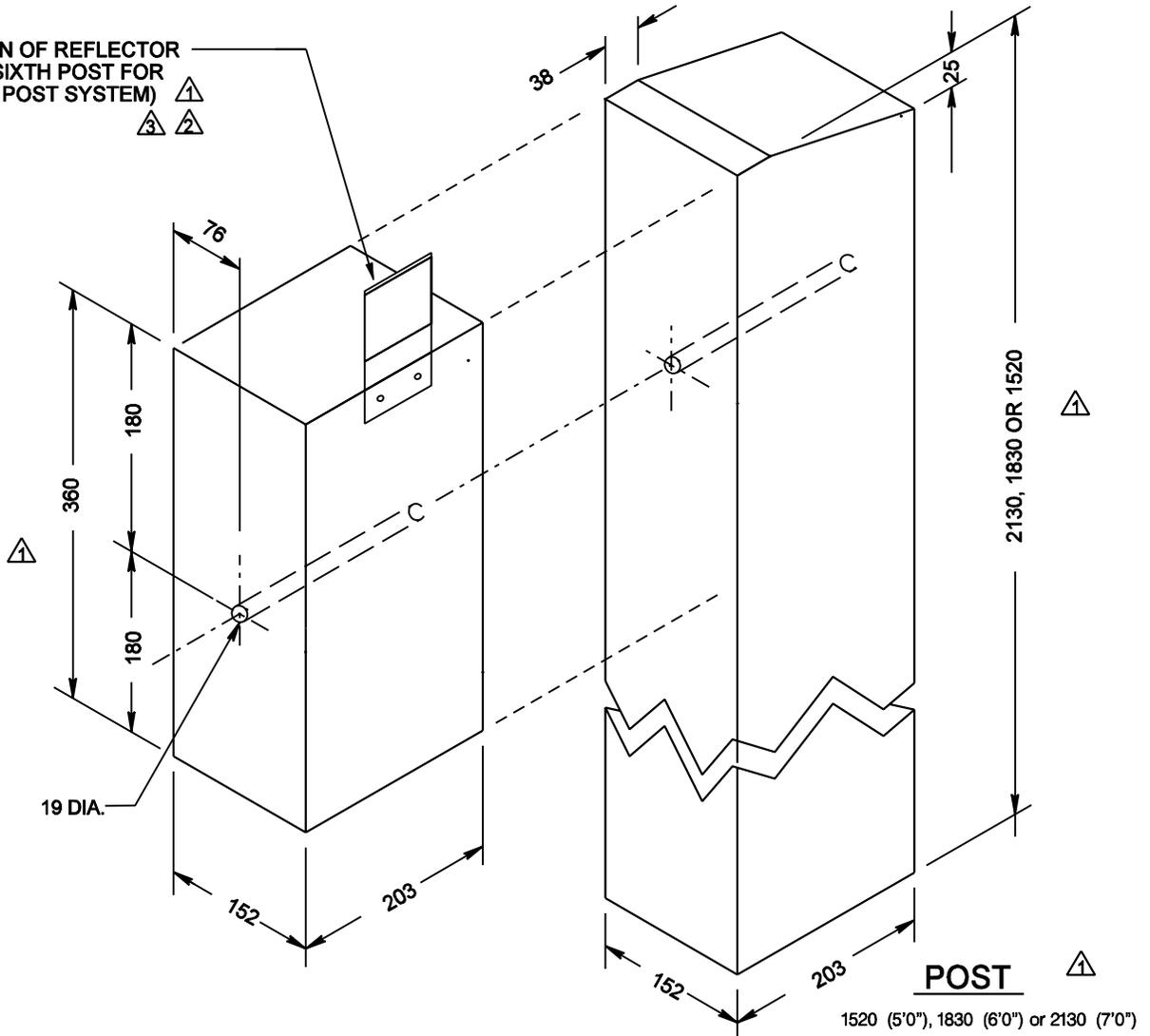
Date: MAY 1999

TRANSVERSE
PAVEMENT MARKINGS
DIMENSIONS AND DEFINITIONS

Prepared By: R.M. Checked By: S.J.M. Scale: N.T.S.

Section C3

LOCATION OF REFLECTOR
(EVERY SIXTH POST FOR
STRONG POST SYSTEM)



SPACER BLOCK

NOT REQUIRED FOR WEAK POST
W-BEAM GUARDRAIL SYSTEM

REFLECTOR

REFLECTOR COLOUR IS EITHER FLUORESCENT YELLOW OR WHITE SUCH THAT IT COMPLIES WITH THE PRINCIPLES FOR PAVEMENT EDGE LINES WITH RESPECT TO THEIR COLOUR.

REFLECTOR IS DOUBLE SIDED SHEETING 108mm x 76mm (MINIMUM) WHICH SHALL MEET ASTM D4956, TYPE X FOR LUMINANCE LEVEL. THE CONTRACTOR SHALL SELECT THE REFLECTOR FROM THE ALBERTA TRANSPORTATION PRODUCTS LIST.

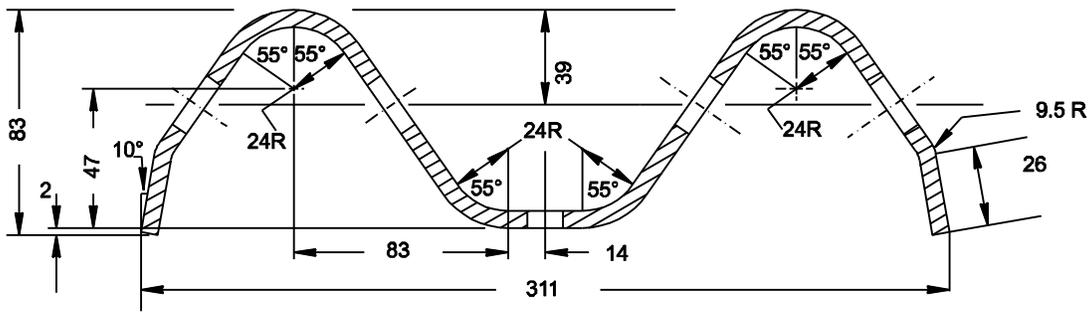
All dimensions are in millimetres unless otherwise indicated.

| | | | |
|-----|-------------------------------|------|----------|
| 3 | Reflector Type and Note Added | P.M. | 8 JUL 09 |
| 2 | Drawing Title and Reflector | P.M. | 5 JUN-07 |
| 1 | Post and Spacer Block | B.K. | 12/07/05 |
| No. | REVISIONS | BY | DATE |

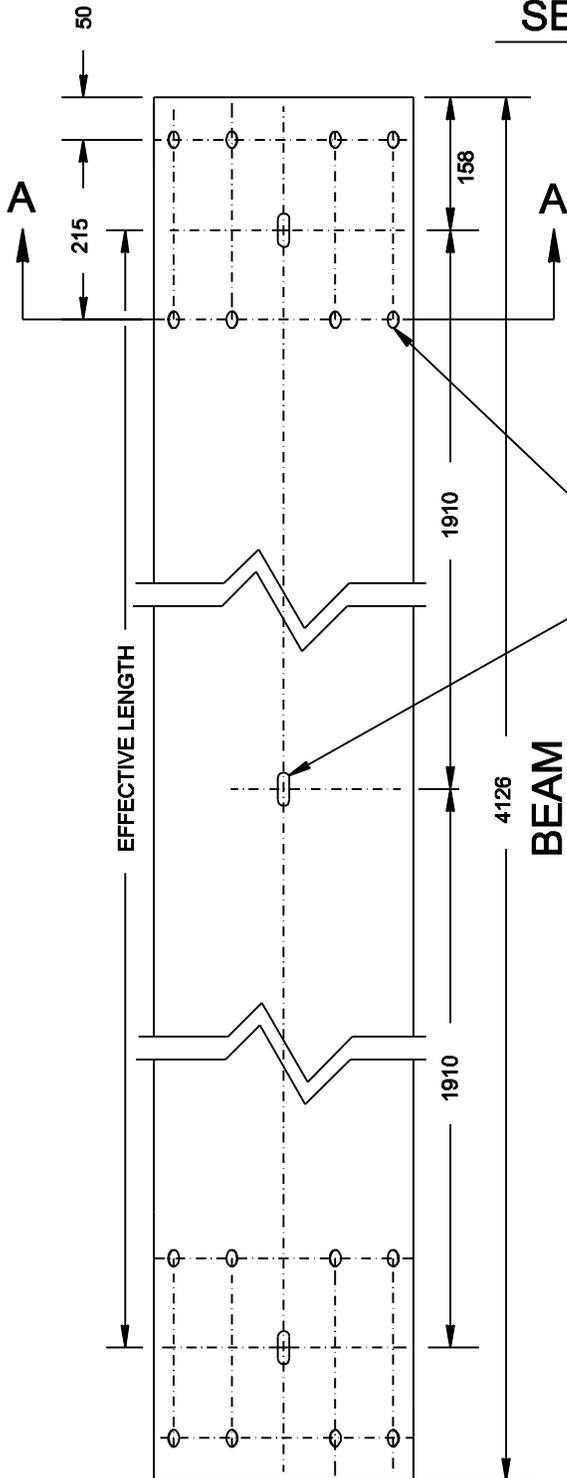
| | |
|---|--|
| <p>Approved: Original approved by Traffic Engineering Section Roadway Engineering Branch Alberta Transportation and Utilities</p> <p>Executive Director, Technical Standards Branch</p> | |
| <p>Date: NOVEMBER 11, 1992</p> | |

**W - BEAM GUARDRAIL
HARDWARE
WOOD SPACER BLOCK AND POST
STRONG POST SYSTEM**

| | | | |
|------------------|-----------------|---------------|-------------------|
| Prepared By: M.T | Checked By: B.K | Scale: N.T.S. | Dwg No.: TEB 3.01 |
|------------------|-----------------|---------------|-------------------|



SECTION A-A



16 - SLOTTED HOLES
23 X 29

3 - SLOTTED HOLES
19 X 63

EFFECTIVE LENGTH = 3820 (12' 6")

3 2 1

A FINISHED THICKNESS OF RAIL TO BE 2.82 mm
NOMINAL STEEL AND HOT DIPPED GALVANIZED
AFTER FABRICATION.

FOR 955 POST SPACING, SPECIFY RAIL ELEMENT
WITH HOLES AT 955 CENTRES.

| | | | |
|-----|-----------------|------|----------|
| △ | Revised Note | B.K. | 08/05/07 |
| △ | Steel Thickness | B.K. | 01/03/06 |
| △ | Steel Thickness | B.K. | 12/07/05 |
| No. | REVISIONS | BY | DATE |

Approved:
Original approved by
Traffic Operations Branch
Alberta Transportation and Utilities

Executive Director,
Technical Standards Branch

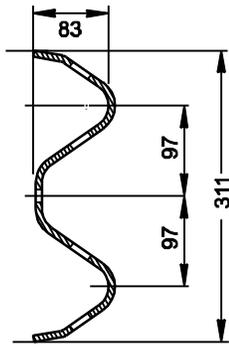


Date: NOVEMBER 11, 1992

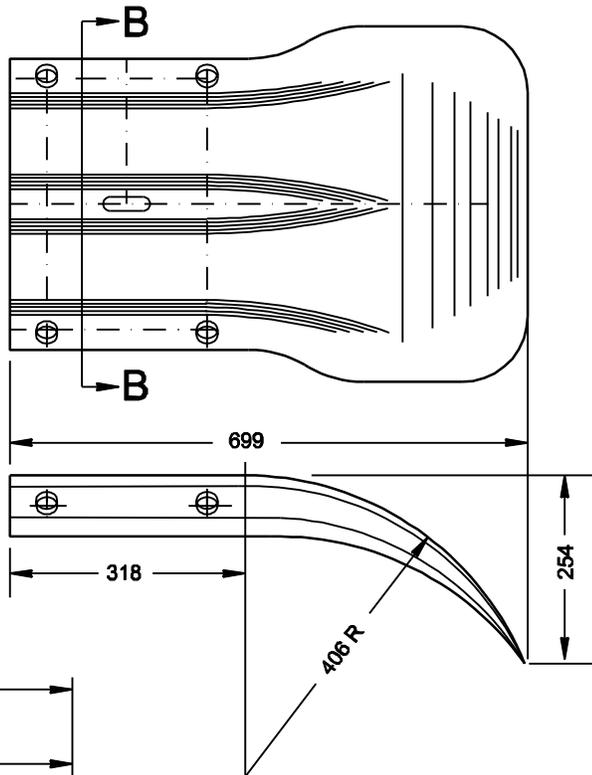
**W - BEAM GUARDRAIL
HARDWARE
RAIL DETAIL**

All dimensions are in millimetres unless otherwise indicated.

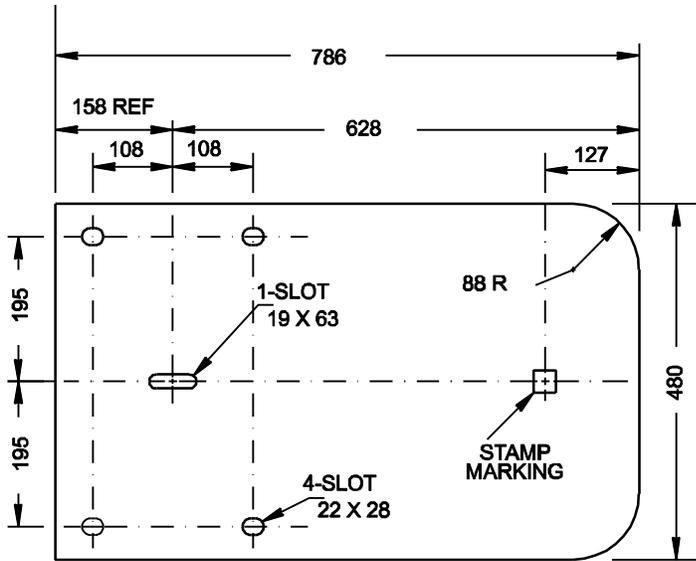
| | | | |
|---------------------|--------------------|------------------|----------------------|
| Prepared By: M.T | Checked By: B.K | Scale: N.T.S. | Dwg No.: TEB 3.02 |
|---------------------|--------------------|------------------|----------------------|



SECTION B - B



END SECTION



BLANK LAYOUT

THICKNESS OF STEEL=2.82mm AFTER GALVANIZING



| | | | |
|-----|-------------------|------|----------|
| 3 | Galvanizing added | B.K. | 08/05/07 |
| 2 | Steel Thickness | P.M. | 31/01/06 |
| 1 | Steel Thickness | B.K. | 12/07/05 |
| No. | REVISIONS | BY | DATE |

| | |
|---|--|
| <p>Approved:</p> <p>Original approved by Traffic Operations Branch Alberta Transportation and Utilities</p> <p>Executive Director, Technical Standards Branch</p> | |
| <p>Date: NOVEMBER 11, 1992</p> | |

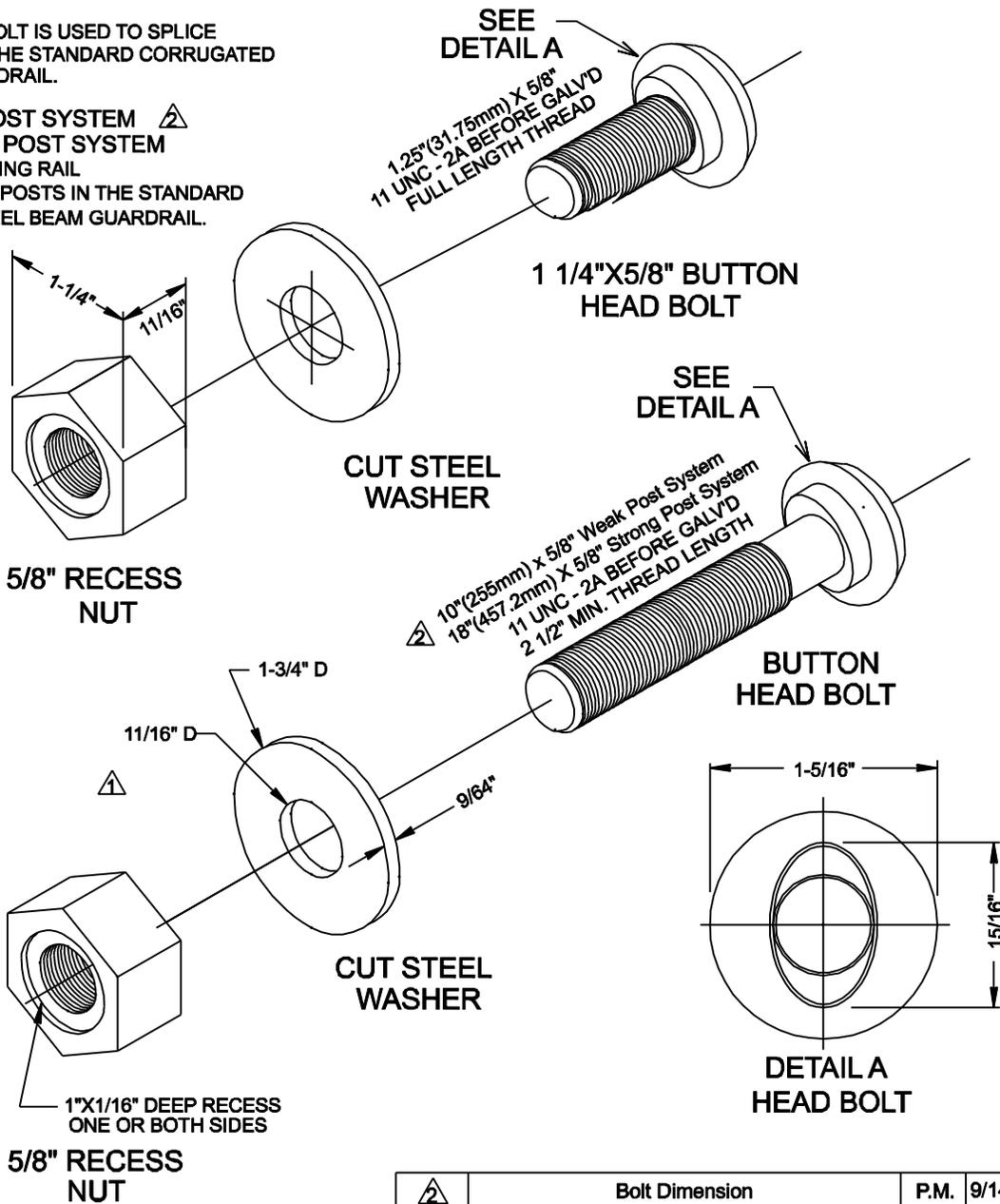
**W - BEAM GUARDRAIL
HARDWARE
END SECTION - WING**

| | | | |
|---------------------|--------------------|------------------|----------------------|
| Prepared By: M.T | Checked By: B.K | Scale: N.T.S. | Dwg No.: TEB 3.03 |
|---------------------|--------------------|------------------|----------------------|

All dimensions are in millimetres unless otherwise indicated.

(1-1/4" LENGTH) THIS BOLT IS USED TO SPLICE RAIL ELEMENTS USED IN THE STANDARD CORRUGATED SHEET STEEL BEAM GUARDRAIL.

(10" LENGTH) WEAK POST SYSTEM \triangle
 (18" LENGTH) STRONG POST SYSTEM
 THIS BOLT IS FOR FASTENING RAIL TO WOOD OR CONCRETE POSTS IN THE STANDARD CORRUGATED SHEET STEEL BEAM GUARDRAIL.



| | | | |
|-------------|----------------------------|------|----------|
| \triangle | Bolt Dimension | P.M. | 9/14/05 |
| \triangle | Rectangular Washer Removed | B.K. | 12/07/05 |
| No. | REVISIONS | BY | DATE |

Approved:
 Original approved by
 Traffic Operations Branch
 Alberta Transportation and Utilities

Executive Director,
 Technical Standards Branch



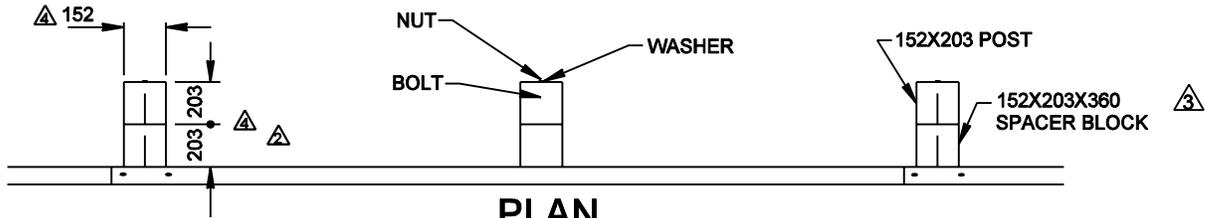
Date: DECEMBER 11, 1992

**W - BEAM GUARDRAIL
 HARDWARE
 BOLT, NUT AND WASHER**

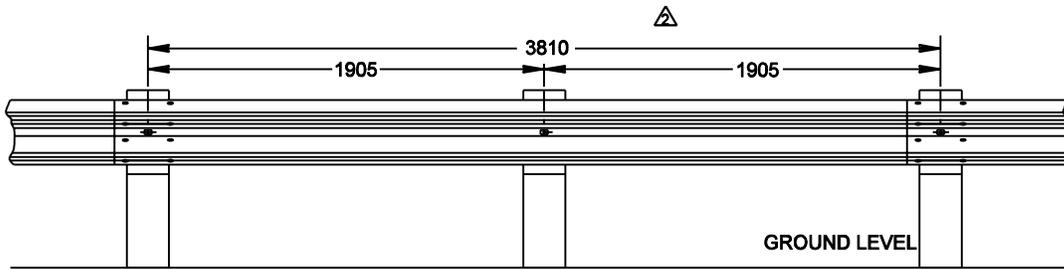
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF A.S.T.M A307 AND NUTS TO THE REQUIREMENT OF A.S.T.M A563, GRADE A OR BETTER, AND BE GALVANIZED IN ACCORDANCE WITH CSA G 164-M EXCEPT WHEN CORROSION RESISTANT STEEL IS REQUESTED IN WHICH CASE BOLTS AND NUTS SHALL BE MADE OF MATERIAL HAVING AN ATMOSPHERIC CORROSION RESISTANCE, APPROXIMATELY TWO TIMES THAT OF CARBON STRUCTURAL STEEL WITH COPPER AND SHALL NOT BE GALVANIZED.

All dimensions are in millimetres unless otherwise indicated.

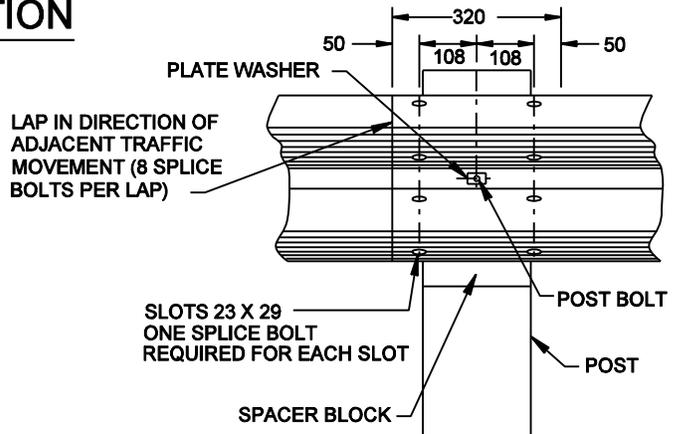
| | | | |
|------------------|-----------------|---------------|-------------------|
| Prepared By: M.T | Checked By: B.K | Scale: N.T.S. | Dwg No.: TEB 3.06 |
|------------------|-----------------|---------------|-------------------|



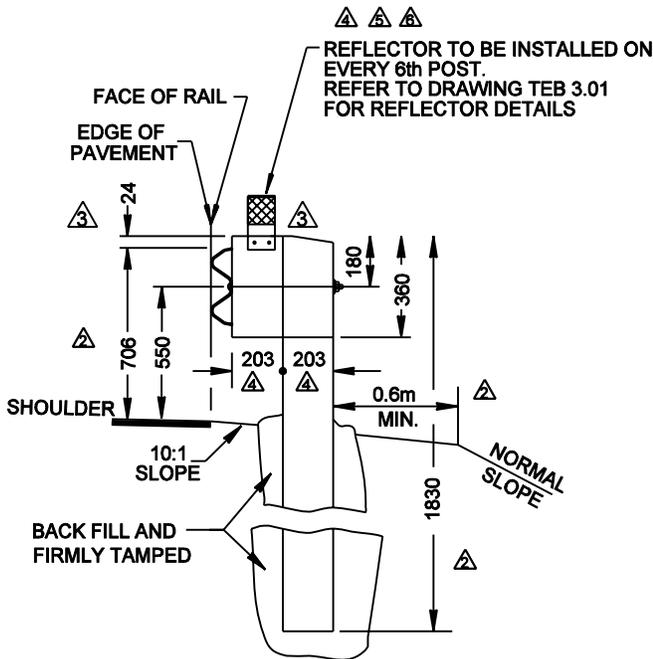
PLAN



ELEVATION



RAIL SPICE DETAIL



POST AND SPACER DETAILS

NOTE: THE STANDARD POST LENGTH FOR STRONG POST SYSTEM IS 1830mm (6'0"). OTHER POST LENGTHS MAY BE USED IF DIRECTED BY THE ENGINEER.

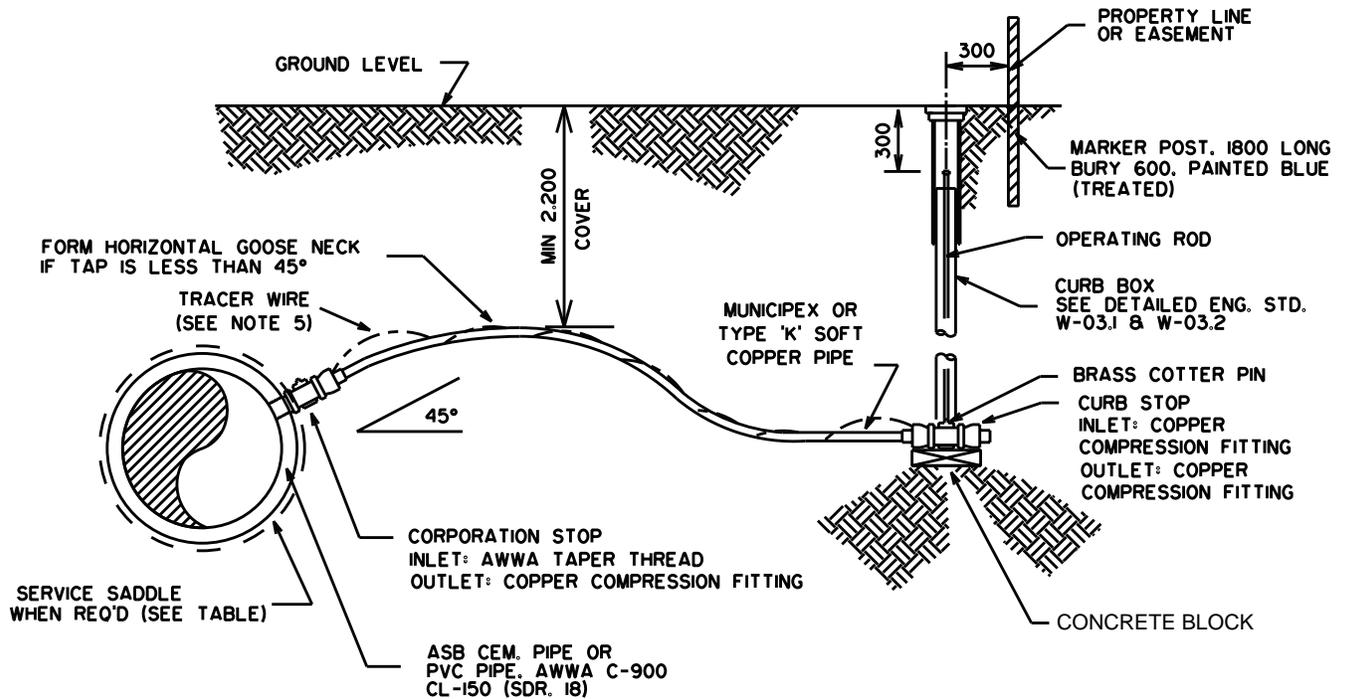
All dimensions are in millimetres unless otherwise indicated.

| | | | |
|-----|--|----|----------|
| 6 | Reflector Note Revised | PM | 8 JUL 09 |
| 5 | Reflector Note Revised (Include Type IX) | BK | 03/23/07 |
| 4 | Reflector Note and Added Post Dimensions | BK | 08/11/06 |
| 3 | Dimensions and Reflector Detail | BK | 12/07/05 |
| 2 | Notes and Dimensions | BK | 12-04 |
| 1 | | | 06-95 |
| No. | REVISIONS | BY | DATE |

| | |
|--|--|
| Approved: Original signed by A.D. Cherwenuk Executive Director, Technical Standards Branch | |
| Date: DECEMBER 11, 1992 | |

**STRONG POST W-BEAM
BLOCKED-OUT GUARDRAIL**

| | | | |
|------------------|-----------------|---------------|--------------------------|
| Prepared By: M.T | Checked By: B.K | Scale: N.T.S. | Dwg No.: TEB 3.09 |
|------------------|-----------------|---------------|--------------------------|

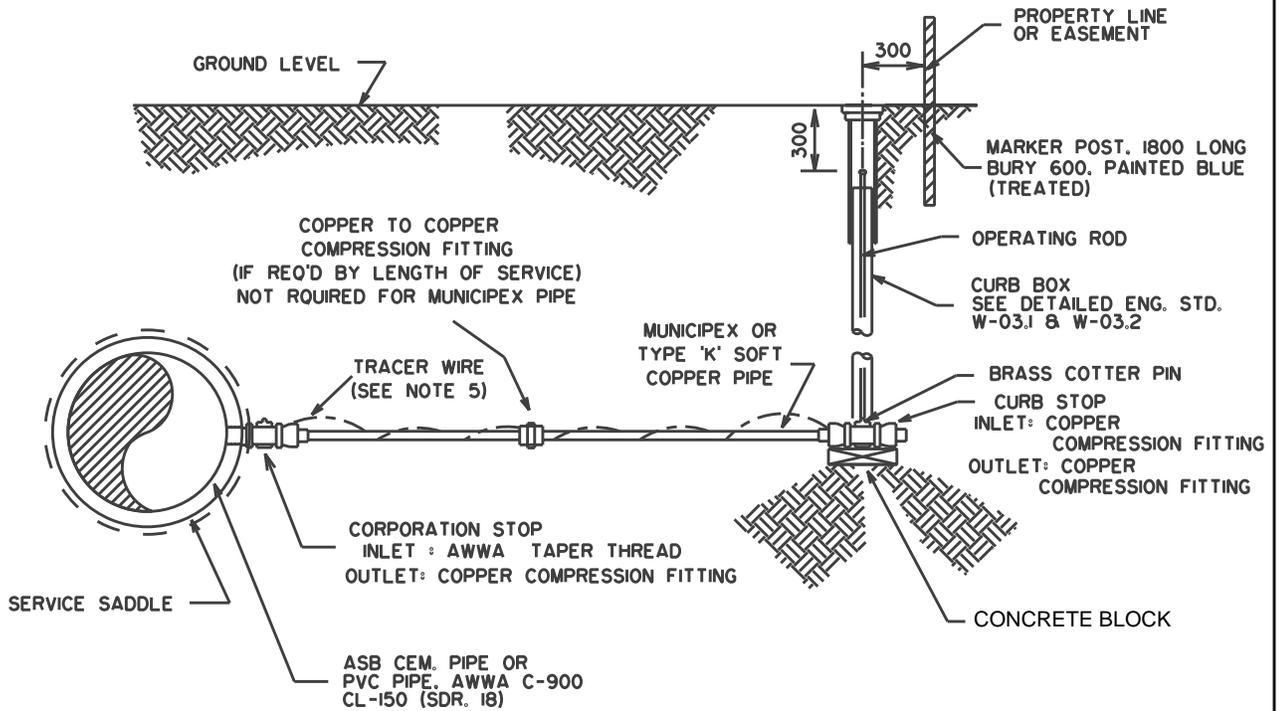


| PIPE SIZE | MAX SIZE OF OUTLET ALLOWED WITH CL 150 AC PIPE | | MAX SIZE OF OUTLET WITH PVC PIPE CL 150 (SDR.18) | |
|-----------|--|-------------------------------|--|-------------------------------|
| | CORPORATION STOP ONLY | CORP STOP WITH SERVICE SADDLE | CORPORATION STOP ONLY | CORP STOP WITH SERVICE SADDLE |
| 100 | - | 25 | 20 | 50 |
| 150 | - | 37 | 25 | 50 |
| 200 | - | 50 | 25 | 50 |
| 250 | - | 50 | 25 | 50 |
| 300 | - | 50 | 25 | 50 |
| 350 | - | 50 | 25 | 50 |
| 400 | - | 50 | 25 | 50 |

NOTES:

1. CORPORATION STOPS TO BE STAGGERED AND AT LEAST 400 mm APART.
2. CORPORATION STOPS TO BE 300 mm MIN. FROM END OF PIPE SECTION.
3. USE AWWA THREAD FOR ALL DIRECT TAPS & SERVICE SADDLE CONNECTIONS
4. FOR CONNECTIONS IN EXISTING AREAS, HORIZONTAL GOOSENECK TO BE FORMED IF DEPTH IS LESS THAN 1500 mm
5. TRACER WIRE SHALL BE INSTALLED IN CUL-DE-SACS AND WHERE SPECIFIED BY THE CITY ENGINEER.

| | | | |
|--------------|--|--|----------|
| REVISED |  <p>CITY OF <i>Lethbridge</i> INFRASTRUCTURE SERVICES</p> | DRAWN | P.R.A. |
| DEC 15, 2005 | | CHECKED | |
| | | APPROVED | |
| | | SCALE | N.T.S. |
| | | DATE | 97/03/11 |
| | | STANDARD FOR 20mm & 25mm WATER SERVICE | DWG NO |



| PIPE SIZE | MAX SIZE OF OUTLET ALLOWED WITH CL 150 AC PIPE | | MAX SIZE OF OUTLET WITH PVC PIPE CL 150 (SDR.18) | |
|-----------|--|-------------------------------|--|-------------------------------|
| | CORPORATION STOP ONLY | CORP STOP WITH SERVICE SADDLE | CORPORATION STOP ONLY | CORP STOP WITH SERVICE SADDLE |
| 100 | — | 25 | — | 50 |
| 150 | — | 37 | — | 50 |
| 200 | — | 50 | — | 50 |
| 250 | — | 50 | — | 50 |
| 300 | — | 50 | — | 50 |
| 350 | — | 50 | — | 50 |
| 400 | — | 50 | — | 50 |

NOTES:

- SERVICE SADDLE TO BE BRONZE BODY, AWWA THREAD, C/W DOUBLE STAINLESS STEEL STRAP FOR PIPE > 100mm Ø & SINGLE 50mm WIDE FOR STAINLESS STEEL STRAP FOR PIPE 100 mm Ø
- CORPORATION STOPS TO BE STAGGERED AND AT LEAST 400 mm APART.
- CORPORATION STOPS TO BE 300 mm MIN. FROM END OF PIPE SECTION.
- USE AWWA THREAD FOR ALL DIRECT TAPS
- TRACER WIRE SHALL BE INSTALLED IN CUL-DE-SACS AND WHERE SPECIFIED BY THE CITY ENGINEER.

| | | | |
|---------|--|----------|----------|
| REVISED |  <p style="text-align: center;">CITY OF <i>Lethbridge</i> INFRASTRUCTURE SERVICES</p> <p style="text-align: center;">STANDARD FOR 37mm & 50mm WATER SERVICE</p> | DRAWN | P.R.A. |
| | | CHECKED | |
| | | APPROVED | |
| | | SCALE | N.T.S. |
| | | DATE | 97/03/08 |
| | | DWG NO | W_03 |

FOR 20mm & 25mm VALVES

FOR 37mm & 50mm VALVES

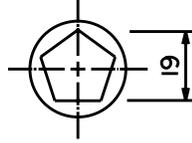
CAST-IRON, RIBBED LID c/w 32mm
PENTAGON HEAD BRASS PLUG

STANDARD I.P. THREAD

35
MIN

610 MIN
1000 MAX

TOP VIEW
BRASS PLUG



35
MIN

610 MIN
1000 MAX

TOP BOX SLIDER, 38mm SCHEDULE 40
GALVANIZED IRON PIPE

CASING, 25mm SCHEDULE 40
GALVANIZED IRON PIPE

15.875mm Ø STAINLESS STEEL ROD
SEE ENGINEERING STANDARD W-03B

10mm Ø GALVANIZED SET SCREW
OR THREADED JOINT

NECK I.D.
38mm

38

230

EPOXY COATED BOOT

15 92Ø

NECK I.D. 38mm

38

280

15 127Ø

REVISED



CITY OF
Lethbridge

INFRASTRUCTURE SERVICES

CURB STAND DETAIL
(SERVICE BOX)

DRAWN

CHECKED

APPROVED

SCALE

N.T.S.

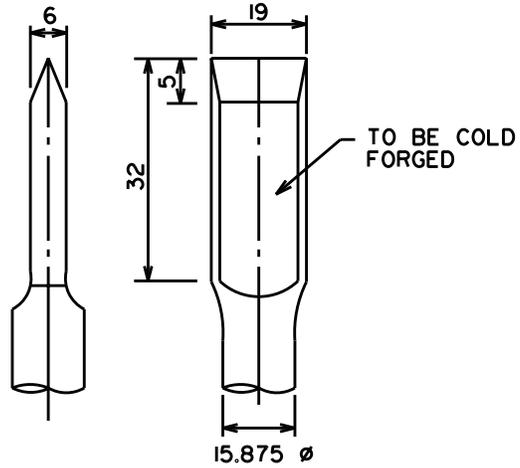
DATE

97/02/28

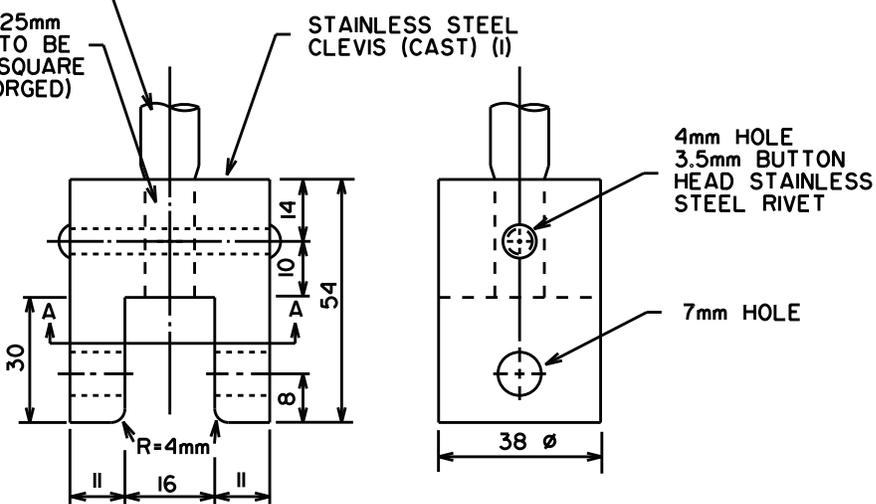
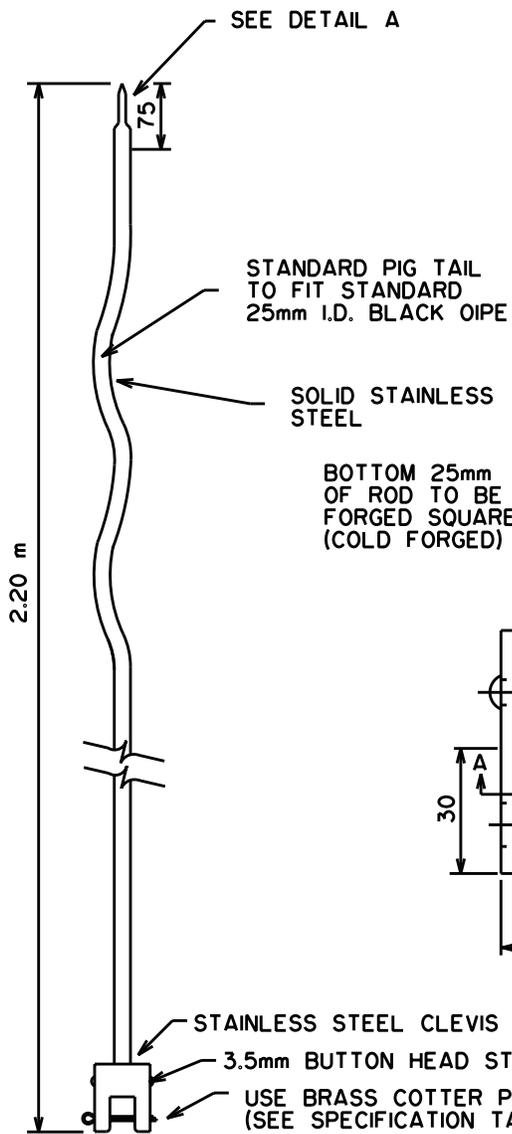
DWG NO

W-03A

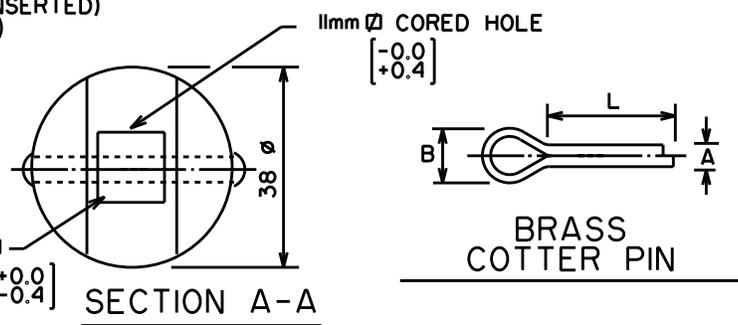
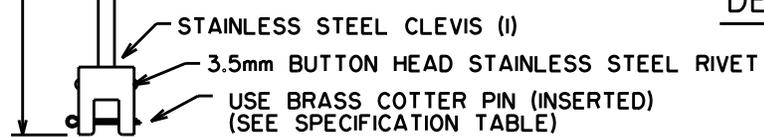
| COTTER PIN SPECIFICATIONS | | | | | |
|---------------------------|------------|-------|------------------------------|------------------|----------|
| NOMINAL DIAMETER | DIAMETER A | | OUTSIDE EYE DIAMETER B (MIN) | HOLE SIZE RECM'D | LENGTH L |
| | MAX | MIN | | | |
| 6.35mm | 5.7mm | 5.6mm | 12.7mm | 6.7mm | 55mm |



DETAIL A



DETAIL B



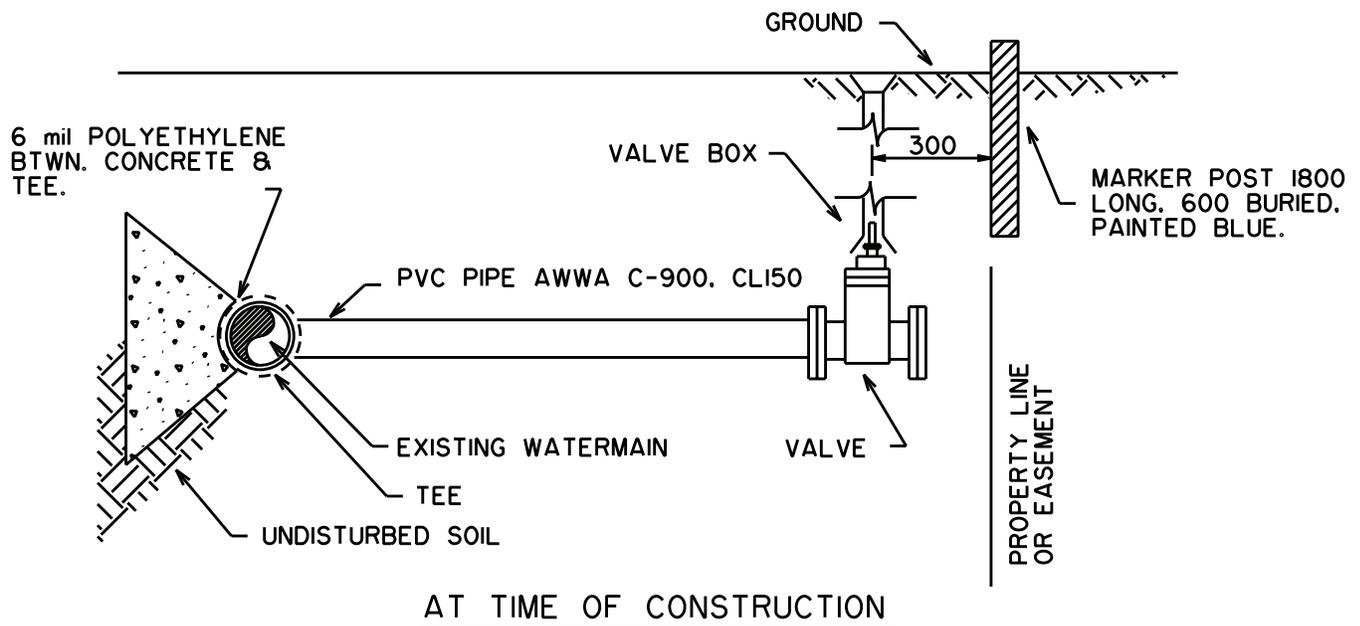
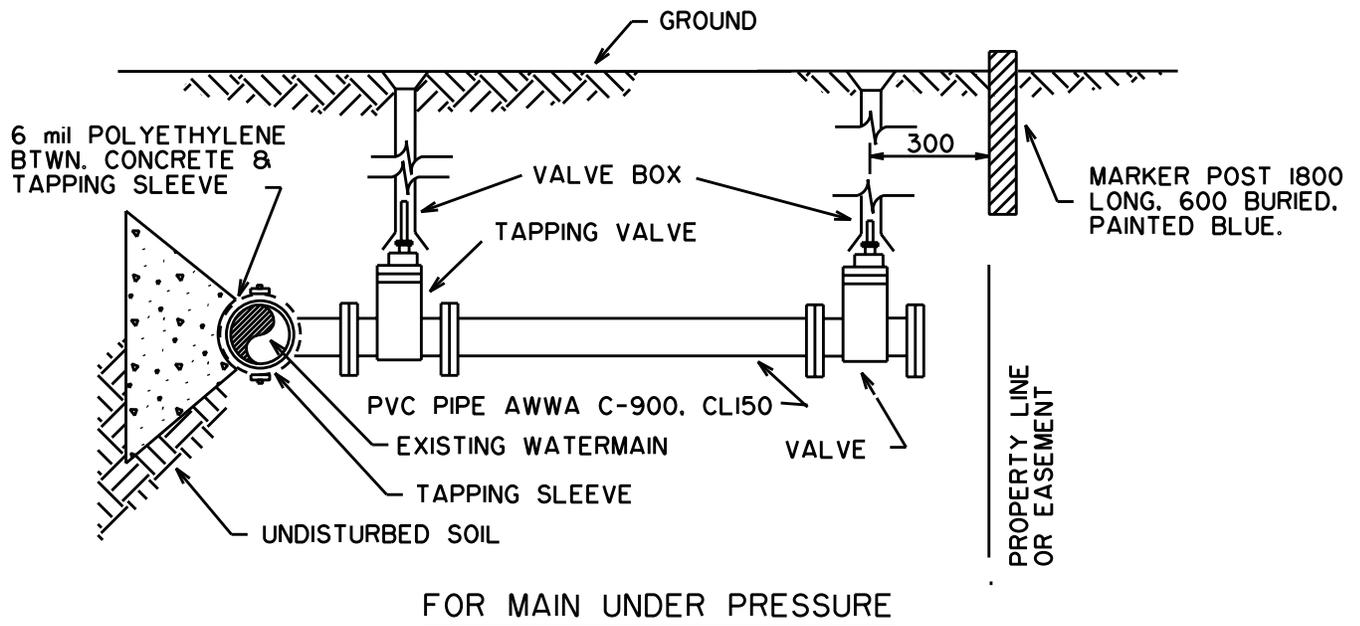
SECTION A-A

BRASS COTTER PIN

| |
|--------------------|
| REVISED |
| JAN 27, 2005 - (I) |
| |
| |
| |
| |

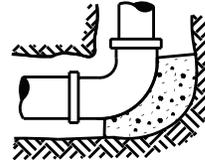
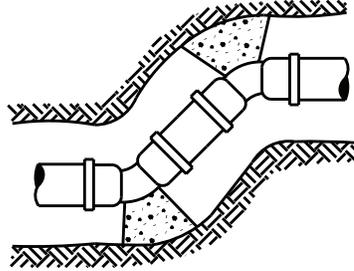
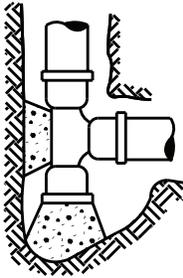
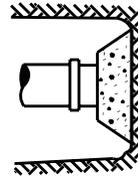
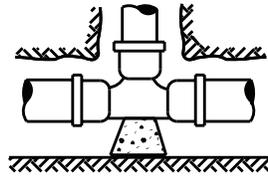
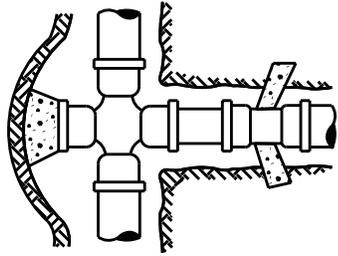

CITY OF
Lethbridge
INFRASTRUCTURE SERVICES
 CURB STAND OPERATING
 ROD DETAIL

| | |
|----------|----------|
| DRAWN | P.R.A. |
| CHECKED | |
| APPROVED | |
| SCALE | N.T.S. |
| DATE | 97/02/07 |
| DWG NO | W-03B |

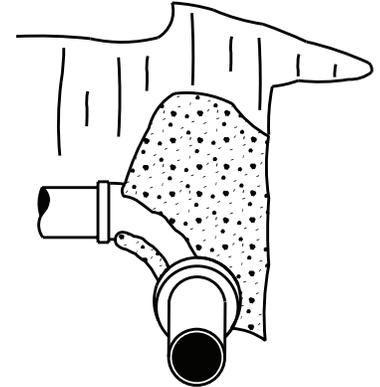


- NOTE: - ALL DIMENSIONS IN MILLIMETERS.
- THRUST BLOCKS TO BE AS PER "STANDARD FOR HORIZONTAL THRUST BLOCKING" DRAWING W-05.

| | | | |
|---------|--|----------|----------|
| REVISED |  <p>CITY OF <i>Lethbridge</i> INFRASTRUCTURE SERVICES</p> <p>STANDARD WATER SERVICE CONNECTIONS FOR 150mm & 200mm</p> | DRAWN | P.R.A. |
| | | CHECKED | |
| | | APPROVED | |
| | | SCALE | N.T.S. |
| | | DATE | 97/02/19 |
| | | DWG NO | W_04 |



FOR SMALL PIPE



FOR LARGE PIPE

LOCATION OF HORIZONTAL THRUST BLOCKS

TABLE "A"

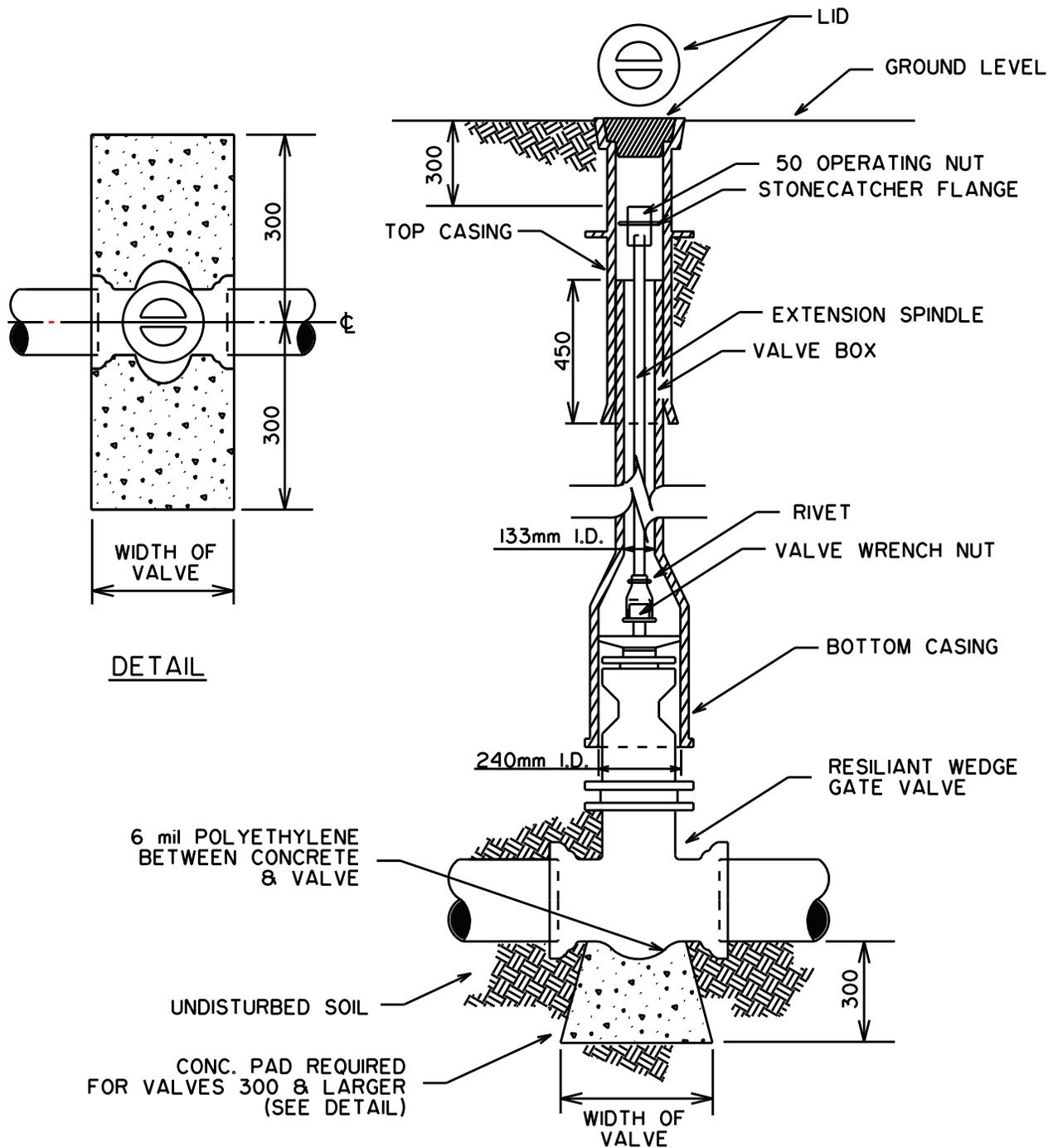
| THRUST BLOCK FACE AREA IN SQ. METRES AT FITTING FOR CL150 PIPE @ 1000kPa & SOIL BEARING CAPACITY OF 100 kPa | | | | | |
|---|------------------|----------|----------|--------------|--------------|
| PIPE SIZE | DEAD ENDS & TEES | 90° BEND | 45° BEND | 22 1/2° BEND | 11 1/4° BEND |
| 100 | 0.12 | 0.17 | 0.10 | 0.10 | 0.10 |
| 150 | 0.25 | 0.35 | 0.19 | 0.10 | 0.10 |
| 200 | 0.43 | 0.60 | 0.33 | 0.17 | 0.10 |
| 250 | 0.70 | 0.99 | 0.54 | 0.27 | 0.14 |
| 300 | 1.00 | 1.40 | 0.75 | 0.39 | 0.19 |
| 350 | 1.35 | 1.90 | 1.03 | 0.52 | 0.26 |
| 400 | 1.75 | 2.47 | 1.34 | 0.68 | 0.34 |
| 450 | 2.24 | 3.15 | 1.72 | 0.87 | 0.44 |
| 500 | 2.77 | 3.90 | 2.12 | 1.07 | 0.54 |
| 600 | 4.00 | 5.64 | 3.07 | 1.55 | 0.78 |
| 750 | 6.26 | 8.83 | 4.81 | 2.44 | 1.22 |
| 900 | 9.03 | 12.70 | 7.58 | 3.51 | 1.76 |

TABLE "B"

| SOIL TYPE | SAFE BEARING LOAD - kPa |
|----------------------------|-------------------------|
| SOFT CLAY; LOOSE SAND | 50 |
| MED. SOFT CLAY; DENSE SAND | 100 |
| DENSE CLAY TILL & GRAVEL | 150 |
| HARD SHALE | 500 |

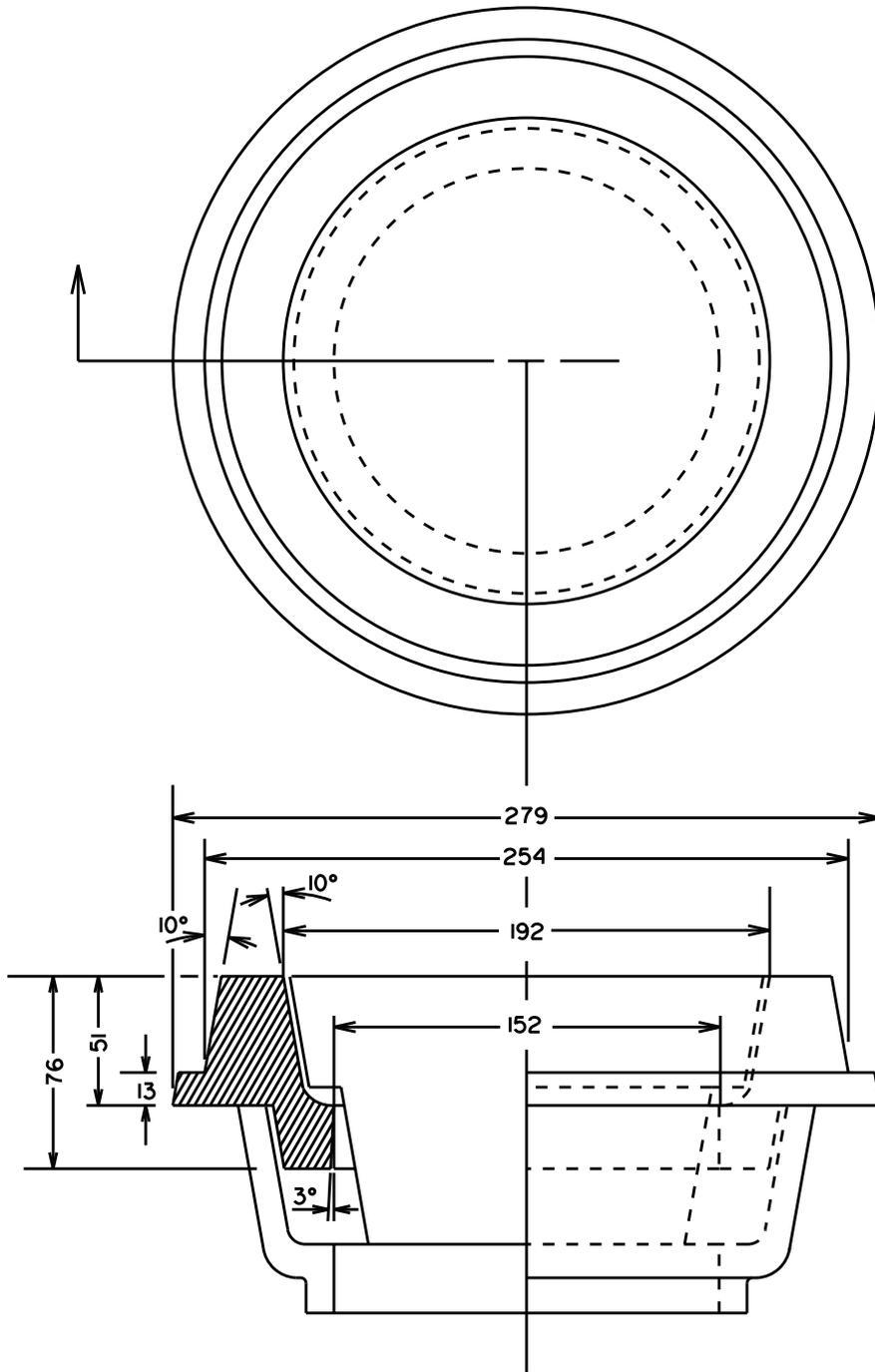
- NOTE: - CONCRETE THRUST BLOCKS ARE TO BE PLACED AT ALL TEES, BENDS, PLUGS, CAPS, PIPE DEFLECTIONS AND REDUCERS.
- CONCRETE THRUST BLOCKS SHALL EXTEND INTO UNDISTURBED SOIL. THRUST BLOCKS IN SOFT UNSTABLE SOILS WILL REQUIRE REMOVAL OF SOIL & REPLACEMENT WITH COMPACTABLE FILL OF SUFFICIENT STABILITY TO RESIST THRUST TO THE SATISFACTION OF THE ENGINEER.
 - THRUST BLOCKS SHALL BE OF CONCRETE OBTAINING A COMPRESSIVE STRENGTH OF AT LEAST 30 MPa @ 28 DAYS. CEMENT TO BE TYPE 50 (SULPHATE RESISTANT).
 - CONCRETE SHALL BE KEPT CLEAR OF BELLS AND SHALL NOT CONTACT THE PIPE. USE A MINIMUM OF 6 mil POLYETHYLENE BETWEEN CONCRETE AND ALL FITTING SURFACES.
 - ALL THRUST BLOCKS SHALL HAVE A MINIMUM FACE OF 0.10 m²
 - REDUCERS SHALL HAVE A TOTAL BEARING AREA EQUAL TO THAT OF AN 11 1/4° BEND BASED UPON THE LARGEST DIAMETER OF THE REDUCER.

| | | | |
|---------|--|----------|----------|
| REVISED |  <p>CITY OF <i>Lethbridge</i> INFRASTRUCTURE SERVICES</p> | DRAWN | P.R.A. |
| | | CHECKED | |
| | | APPROVED | |
| | | SCALE | N.T.S. |
| | | DATE | 97/02/12 |
| | HORIZONTAL THRUST BLOCKING | DWG NO | W-05 |



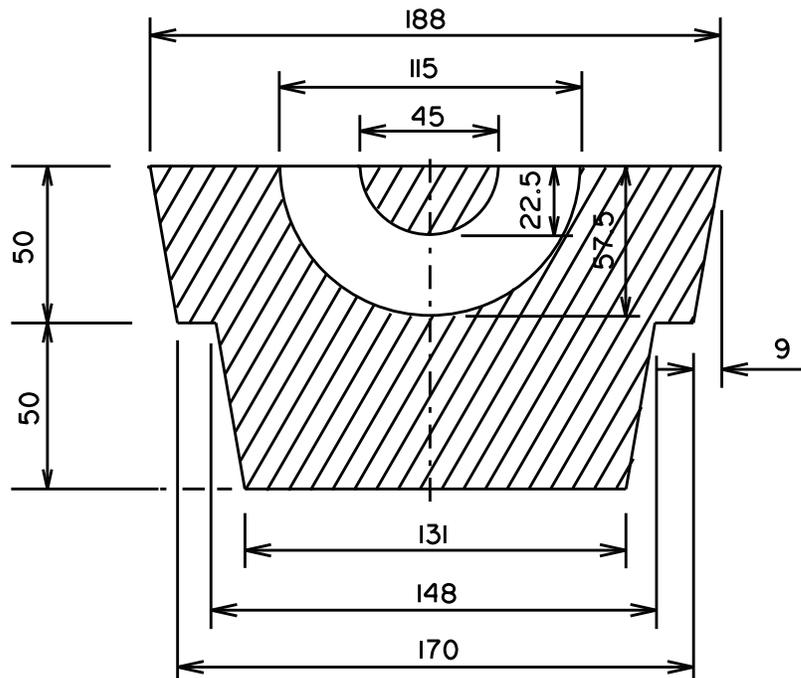
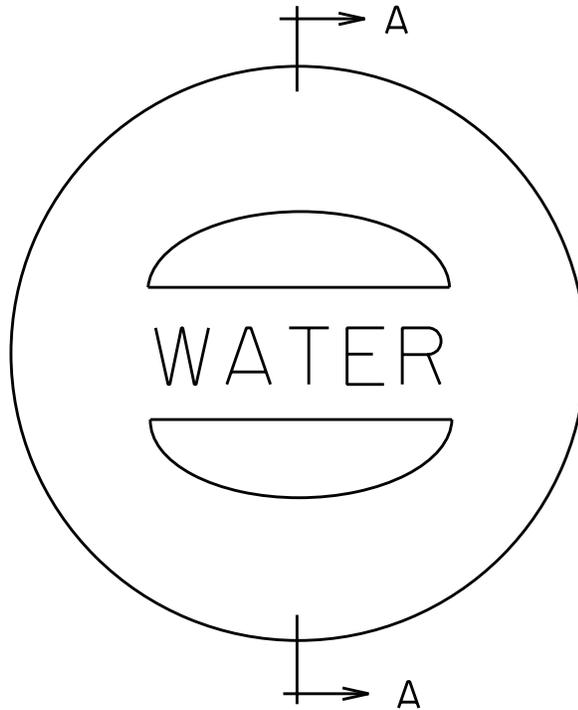
- NOTE:
- ALL DIMENSIONS ARE IN MILLIMETERS
 - ALL VALVES LEFT TURN TO OPEN (COUNTER-CLOCKWISE)
FOR MAIN SIZES 150mm TO 300mm
 - CONCRETE SHALL OBTAIN A MINIMUM COMPRESSIVE STRENGTH OF 30 MPa @ 28 DAYS. ALL CEMENT TO BE TYPE 50 (SULPHATE RESISTANT).

| | | | |
|----------------------------------|--|----------|----------|
| REVISED |  <p style="text-align: center;">CITY OF <i>Lethbridge</i> INFRASTRUCTURE SERVICES</p> | DRAWN | P.R.A. |
| | | CHECKED | |
| | | APPROVED | |
| | | SCALE | N.T.S. |
| | | DATE | 95/05/11 |
| | | DWG NO | W-07 |
| STANDARD GATE VALVE INSTALLATION | | | |



NOTE: ALL DIMENSIONS IN MILLIMETERS

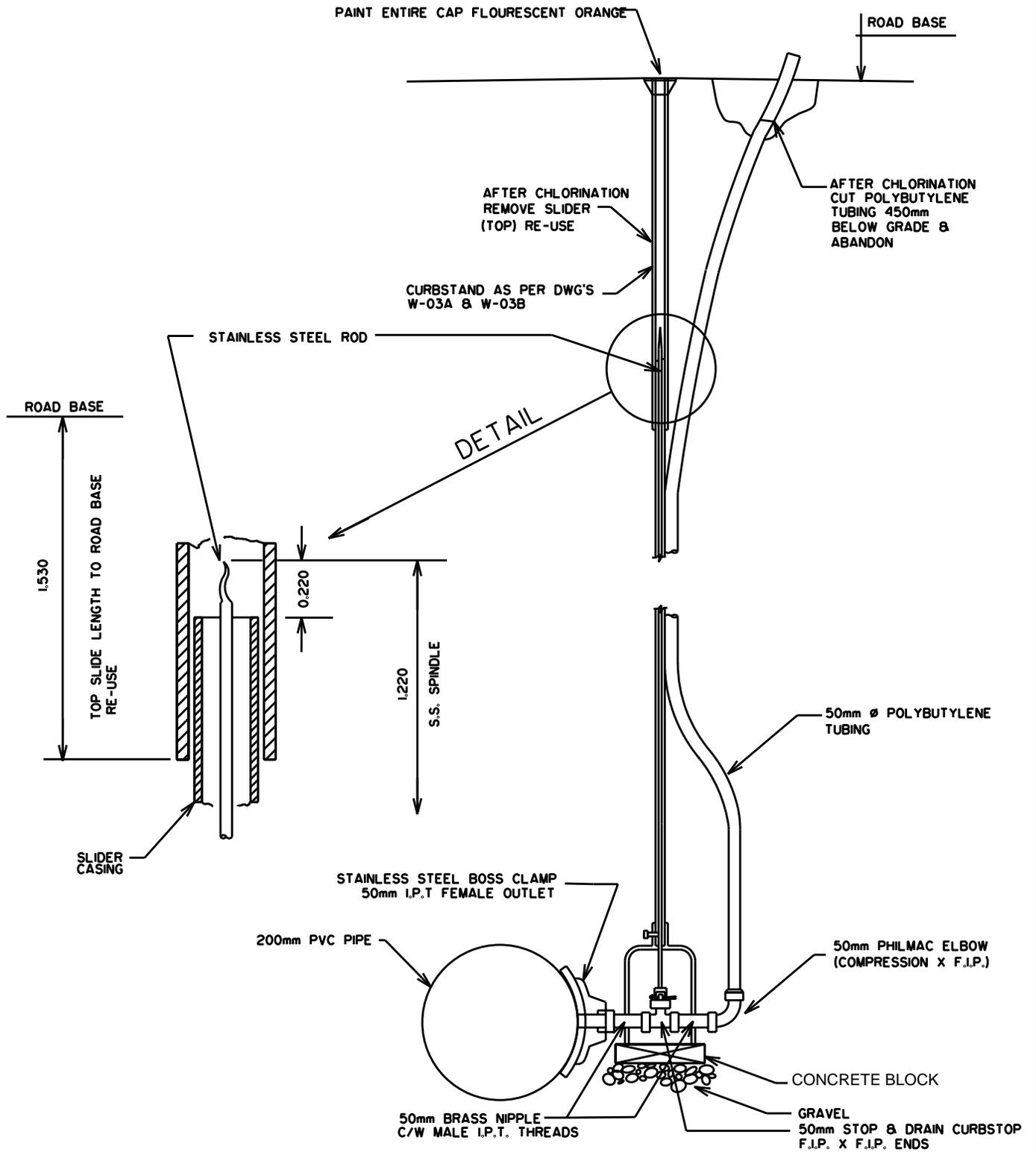
| | | | |
|-----------------|--|----------|----------|
| REVISED |  <p>CITY OF <i>Lethbridge</i> INFRASTRUCTURE SERVICES</p> | DRAWN | P.R.A. |
| | | CHECKED | |
| | | APPROVED | |
| | | SCALE | N.T.S. |
| | | DATE | 97/02/10 |
| | | DWG NO | W-12 |
| VALVE RISER BOX | | | |



SECTION A-A

NOTE: ALL DIMENSIONS IN MILLIMETERS

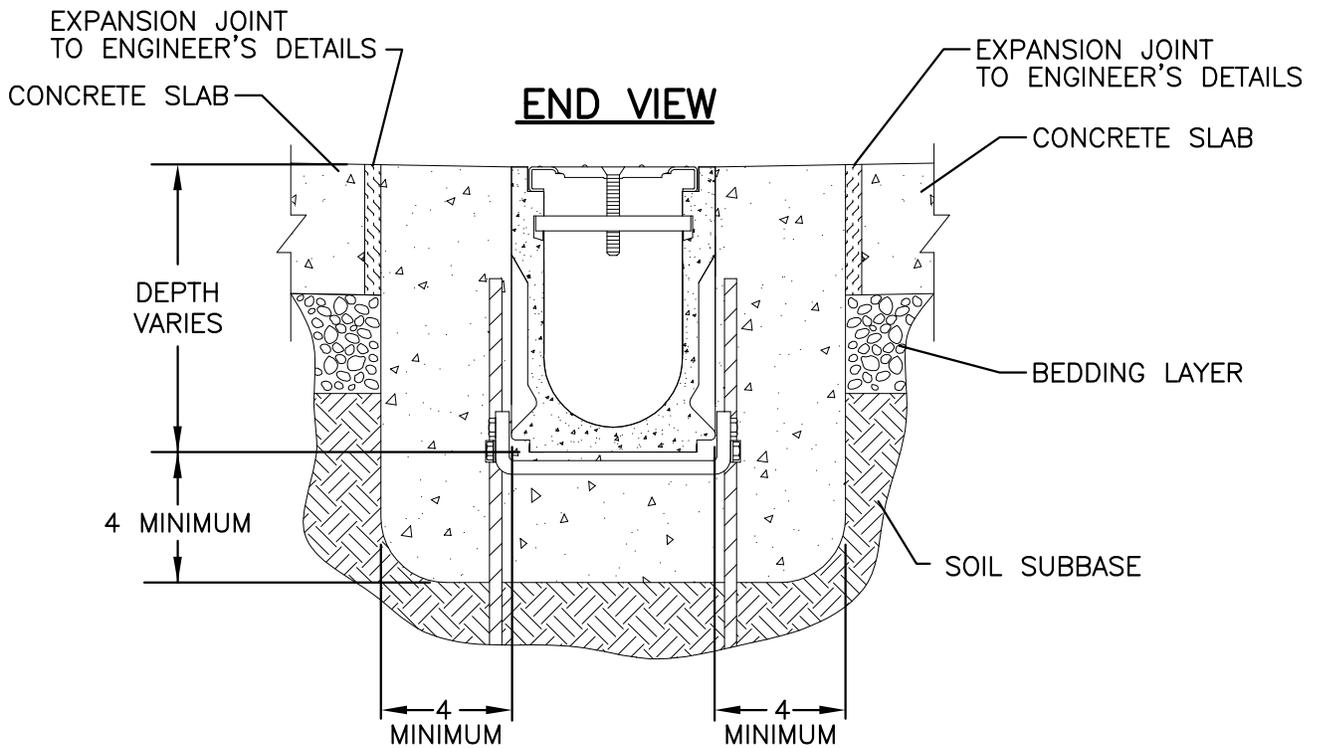
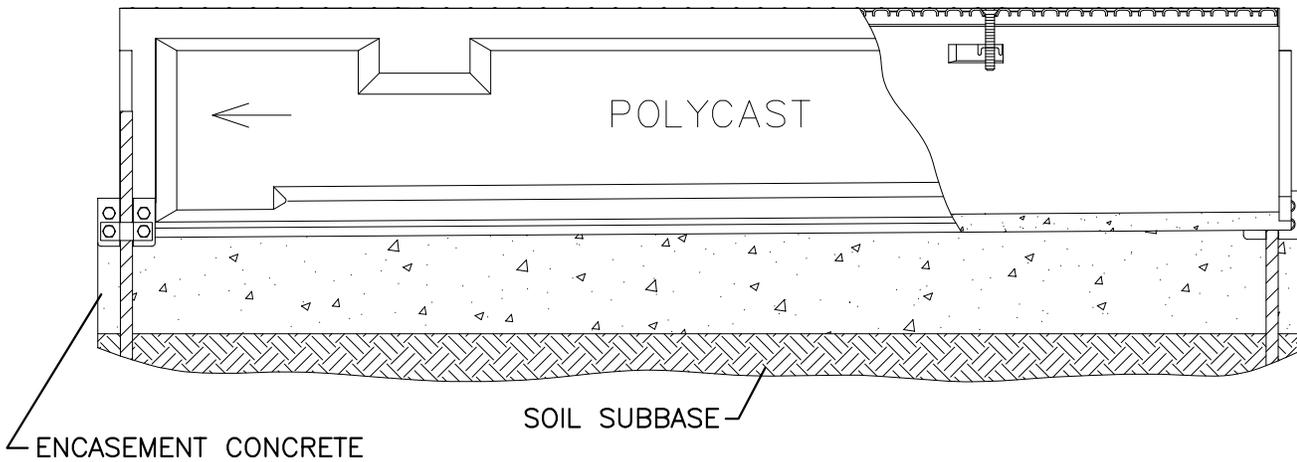
| | | | |
|---------------|--|----------|----------|
| REVISED |  <p>CITY OF <i>Lethbridge</i> INFRASTRUCTURE SERVICES</p> | DRAWN | D.F. |
| | | CHECKED | |
| | | APPROVED | |
| | | SCALE | N.T.S. |
| | | DATE | 06/12/08 |
| | | DWG NO | W-12A |
| VALVE BOX CAP | | | |



CHLORINATION SYSTEM

| | | | |
|---------|---|----------|----------|
| REVISED |  CITY OF <i>Lethbridge</i> INFRASTRUCTURE SERVICES FOR CHLORINATING & FLUSHING WATERMAINS | DRAWN | L.M.C |
| | | CHECKED | |
| | | APPROVED | |
| | | SCALE | N.T.S. |
| | | DATE | 97/02/01 |
| | | DWG NO | W-13 |

SIDE ELEVATION VIEW



NOTES:

- CONCRETE STRENGTH, THICKNESS AND REINFORCEMENT BE DETERMINED BY THE STRUCTURAL ENGINEER.
- REFER TO POLYCAST[®] INSTALLATION GUIDE FOR COMPLETE DETAILS.
- EXPANSION JOINTS SHOULD BE USED TO PROTECT THE CHANNEL AND CONCRETE ENCASEMENT.



3621 Industrial Park Drive
 Lenoir City, TN 37771
 Phone: 800-346-3061 or 865-986-9726
 Web: <http://www.polycastdrain.com>
 e-mail: hpsliterature@hubbell.com

POLYCAST[®] 600 SERIES INSTALLATION DETAIL

LITERATURE NO.

PC1705

DATE

9/22/11

PROPRIETARY INFORMATION—This drawing embodies proprietary and confidential information, and is loaned by Hubbell with the understanding that it will not be disclosed in part or whole, and/or be used for any purpose other than maintenance, fabrication, or installation, unless expressly authorized, and that it be returned on demand.

DISCLAIMER: The customer and the site architects, engineers, contractors and consultants are solely responsible for the selection, installation, and maintenance of all products purchased from Hubbell. POLYCAST[®] suggested concrete details are suggested minimums only; the customer's site planners and engineers are responsible for all site design, stability and integrity.



DG0641

600 Series

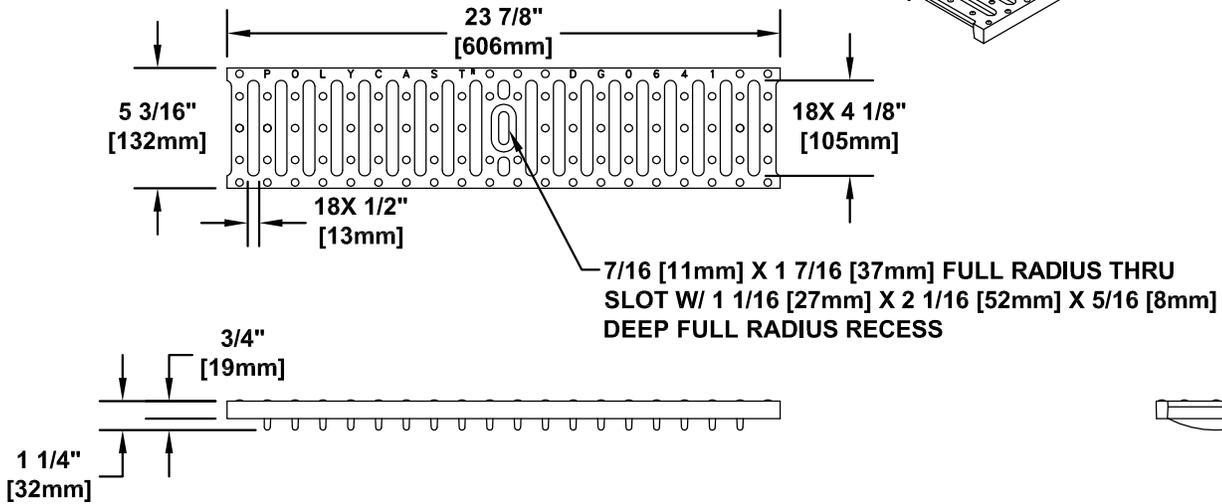
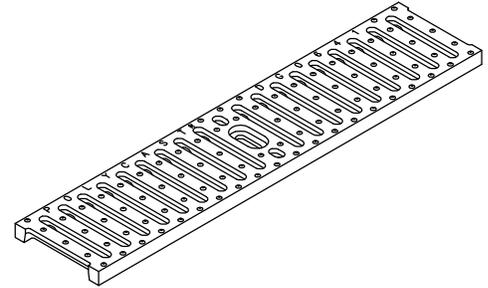
Cast Iron Slotted

PROJECT ID/
CONTRACT NO: _____

LOCATION: _____

ENGINEERING SPECIFICATION:

POLYCAST® DG0641 is appropriate for many general use conditions. Grating locking device Part No. DA0642B (not shown) should be used and maintained secure. The grate has 39% (40in²) of open area. The grate is made of ASTM A48 GR. 30-B or GR. 35-B and weighs approximately 14lbs [6.35kg]. The grate is only available in a 24" [610mm] length.



DIN APPLICATION LOAD CLASS C:
Curb sides, highway shoulders, and parking areas
Designed for a distributed pressure of 56,200 lbs (250 kN).

Meets the following Standards & Specifications:

- DIN 19580 / DIN EN 1433 Drainage Channels for Vehicular and Pedestrian Areas
- Australian Standard AS 3996-2006 Clause 3.3.6



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