

UNIT #1A – 2010 CURRIE BLVD.  
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# **THE MANITOBA WATER SERVICES BOARD**

## **APPENDIX**

# **STANDARD CONSTRUCTION DRAWINGS**

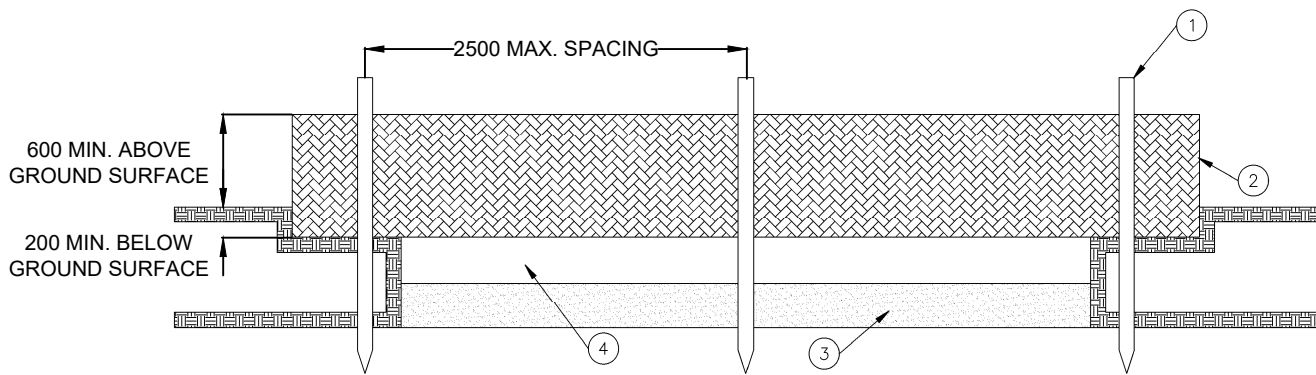


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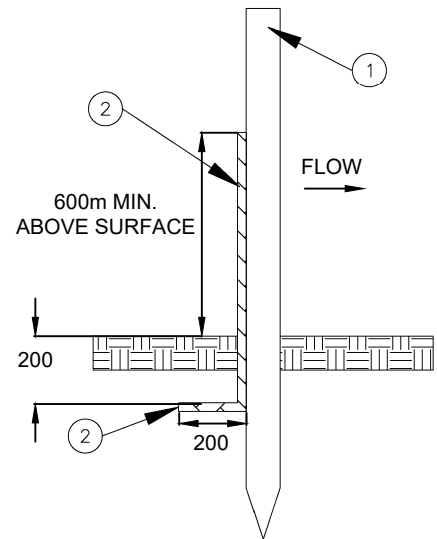
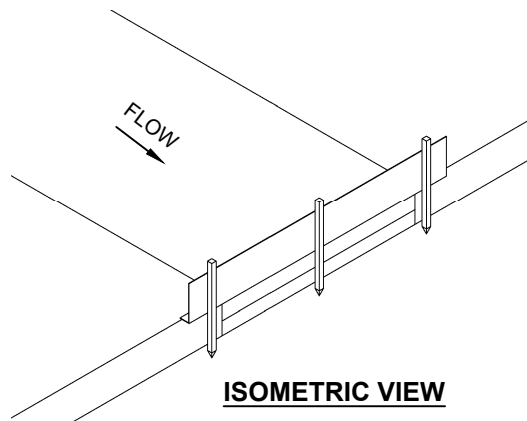
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**SILT FENCE DETAIL**



**SILT FENCE SECTION**

**NOTES:**

1. FENCE POST (WOODEN OR STEEL).
2. FILTER FABRIC.
3. WATERWAY BOTTOM.
4. WATERWAY
5. 200 X 200 TRENCH, BURY BOTTOM 400 OF FABRIC AND ANCHOR W/ COMPACTED BACKFILL MATERIAL.
6. THE HEIGHT OF THE SILT FENCE SHALL NOT EXCEED 914.
7. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO LENGTH TO AVOID THE USE OF JOINTS.
8. POSTS SHALL BE SPACED A MAX. OF 2.5m APART AND DRIVEN SECURELY INTO THE GROUND A MIN. OF 600.
9. A TRENCH SHALL BE EXCAVATED APPROX. 200 WIDE BY THE 200 DEEP TO ANCHOR THE FABRIC ON THE UPSLOPE SIDE OF THE POSTS.
10. THE FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE POSTS.

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**SILT FENCE DETAIL**



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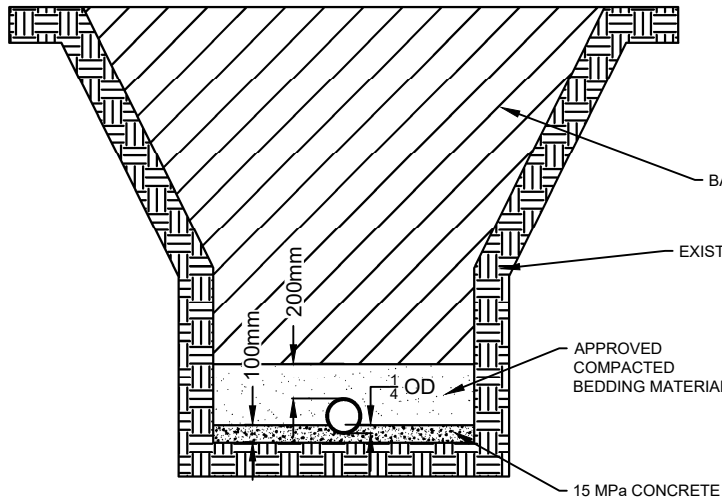
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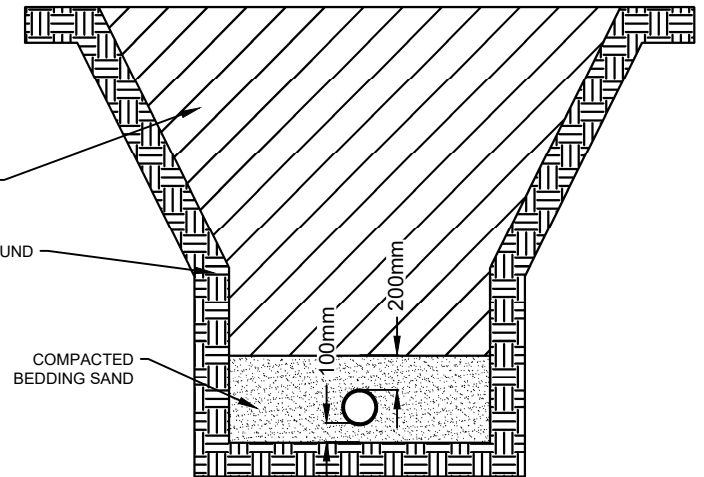
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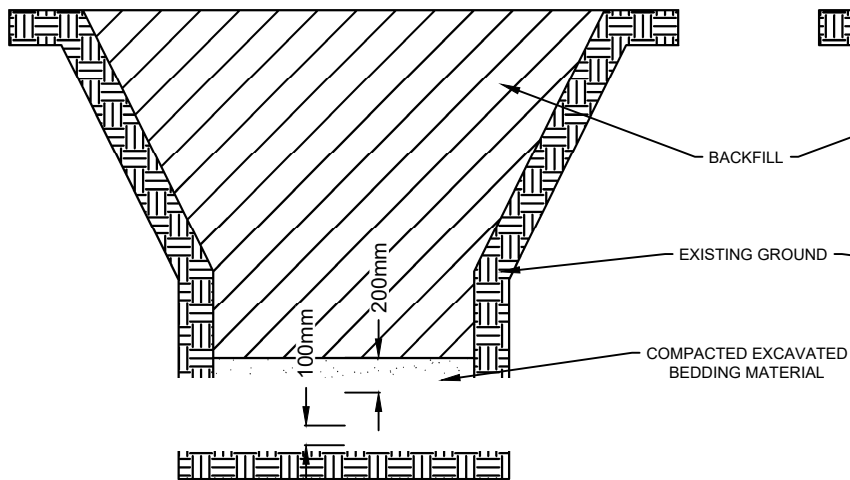
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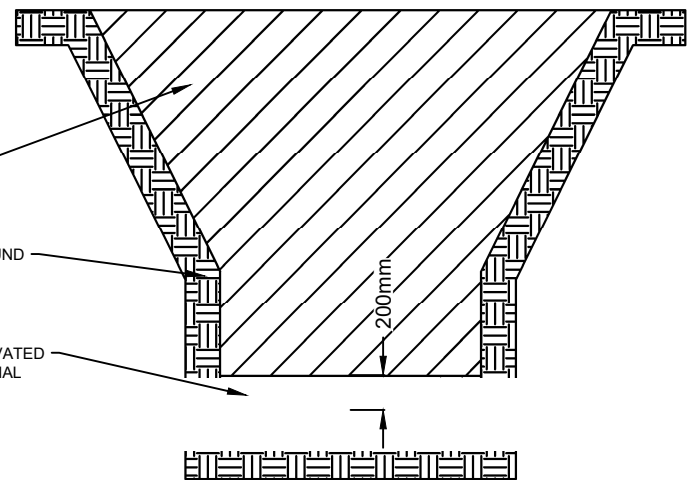
**CLASS "A" BEDDING**



**CLASS "B" BEDDING**



**CLASS "C" BEDDING**



**CLASS "D" BEDDING**

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**TYPICAL PIPE BEDDING DETAIL**



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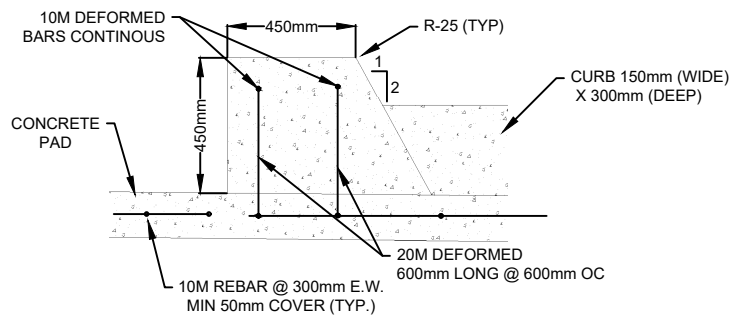
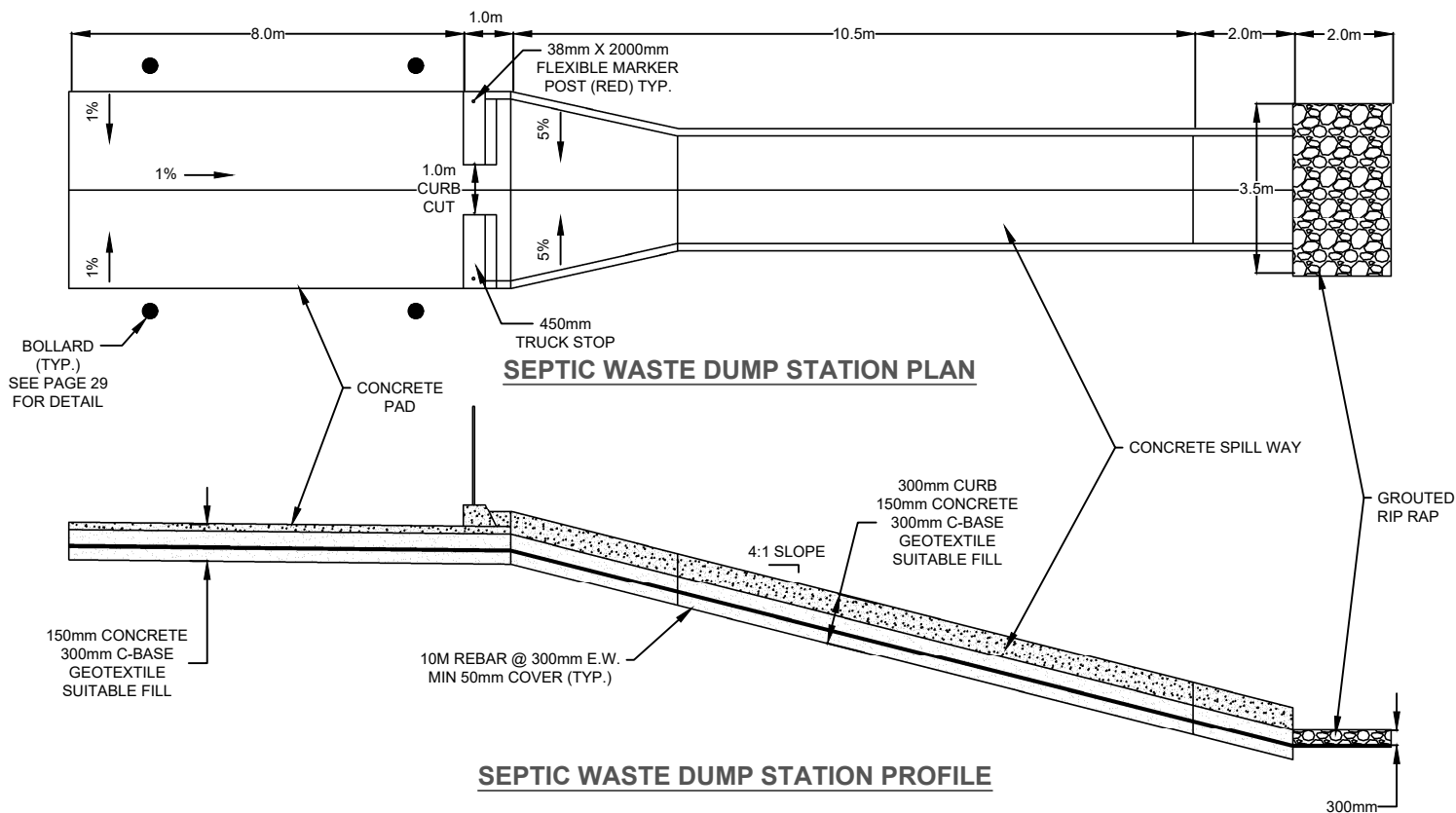
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STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

## SEPTIC WASTE DUMP STATION



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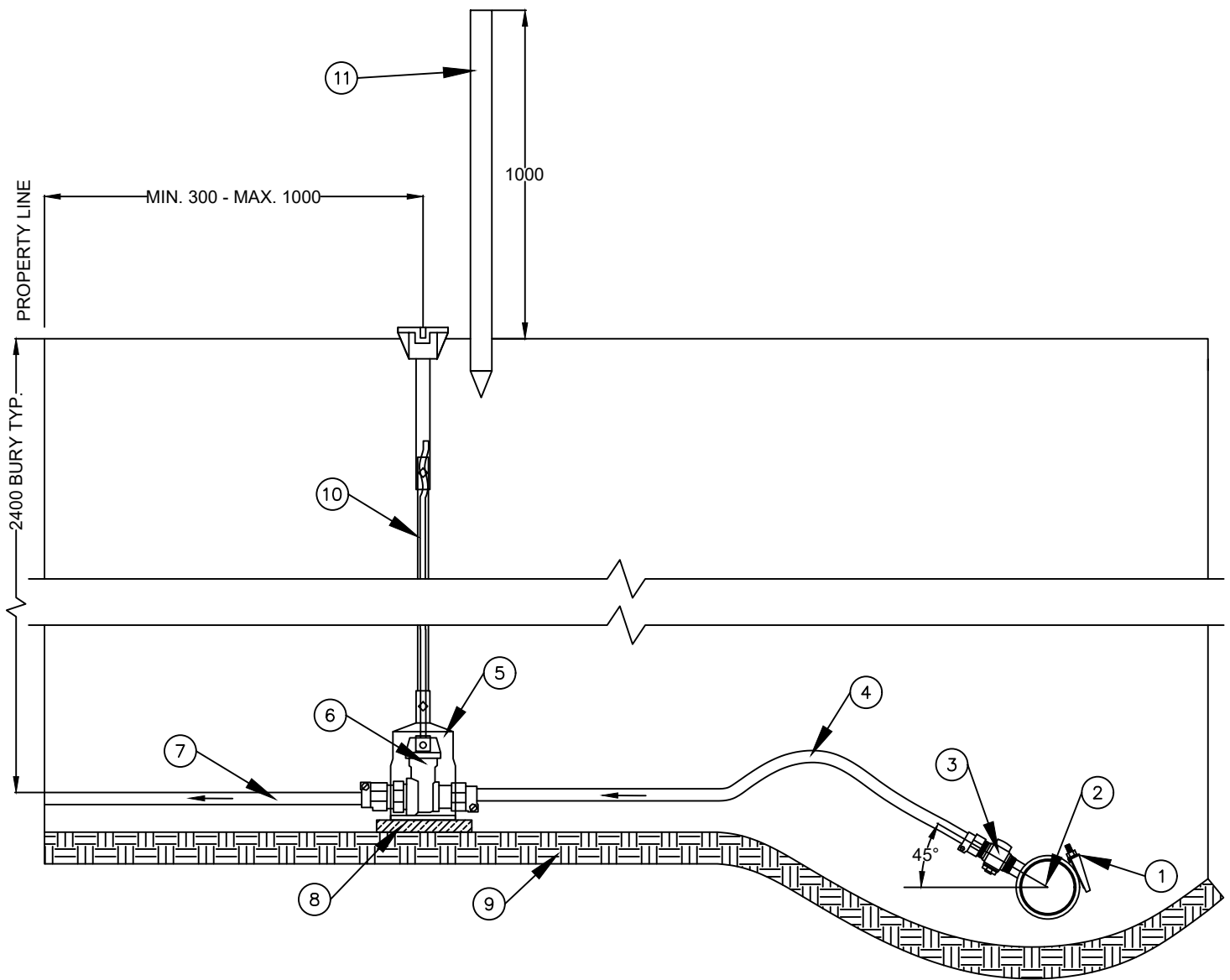
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**NOTES:**

1. SERVICE SADDLE W/ STANDARD CORPORATION THREAD.
2. WATERMAIN (SIZE VARIES).
3. MAIN STOP.
4. GOOSE NECK.
5. CURBSTOP BOX ADJUSTABLE FOR 2-3M BURY.
6. CURBSTOP (NO DRAIN).
7. TYPE "K" SOFT COPPER TUBING.
8. 38 X 191 X 300 PRESSURE TREATED WOOD PLANK OR CONCRETE PLACED ON SOLID UNDISTURBED EARTH.
9. UNDISTURBED EARTH.
10. STAINLESS STEEL ROD.
11. DRIVABLE, FLEXIBLE MARKER (INFORMATION STICKER SUPPLIED BY MWSB).

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**SERVICE CONNECTION DETAIL (COPPER)**



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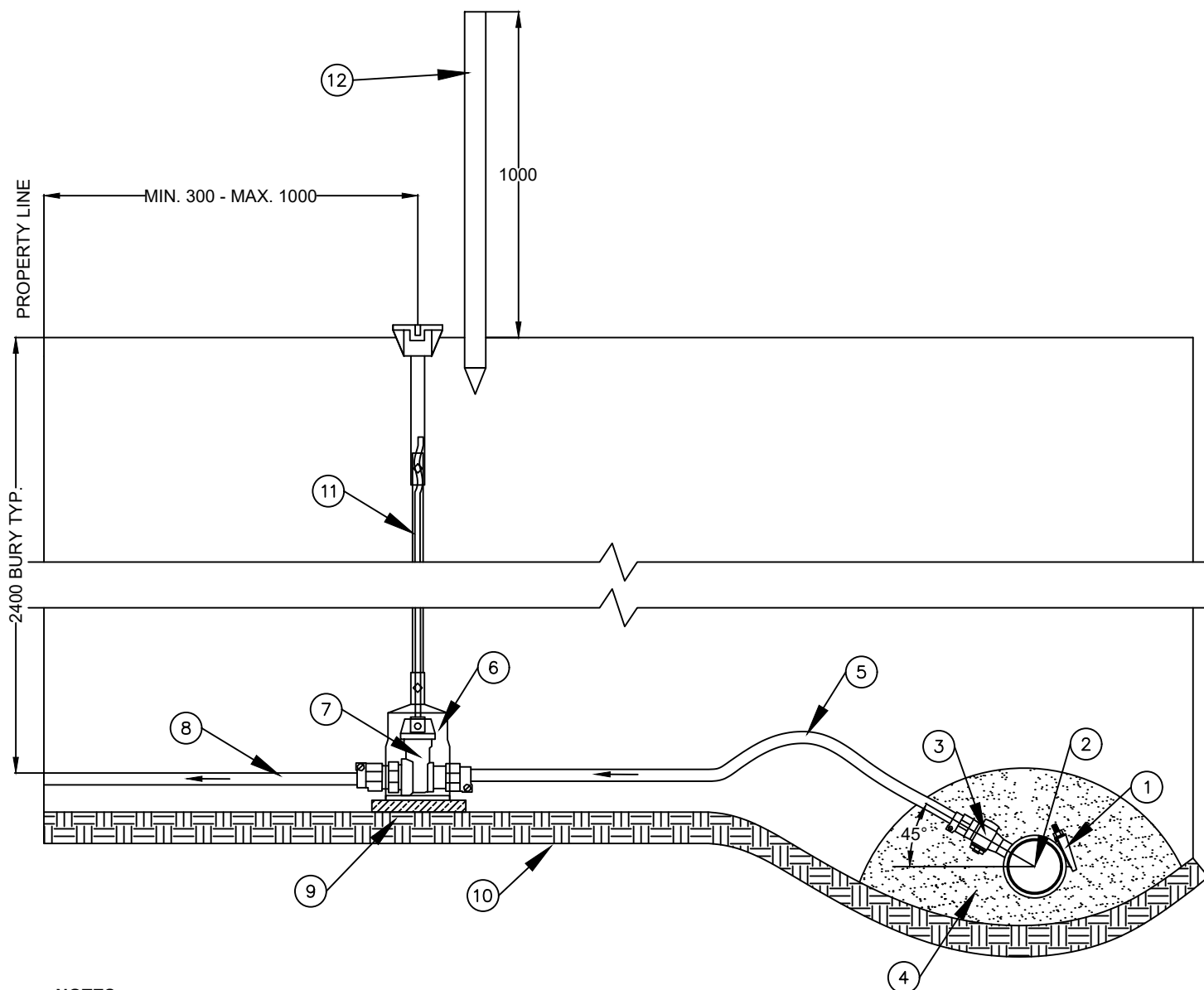
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**NOTES:**

1. SERVICE SADDLE W/ STANDARD CORPORATION THREAD.
2. WATERMAIN (SIZE VARIES).
3. COMPRESSION COUPLING C/W STAINLESS STEEL TUBE LINER AS REQUIRED.
4. CLASS "B" SAND BEDDING.
5. GOOSE NECK.
6. CURBSTOP BOX ADJUSTABLE FOR 2-3M BURY.
7. CURBSTOP (NO DRAIN).
8. HDPE WATER SERVICE LINE.
9. 38 X 191 X 300 PRESSURE TREATED WOOD PLANK OR CONCRETE PLACED ON SOLID UNDISTURBED EARTH.
10. UNDISTURBED EARTH.
11. STAINLESS STEEL ROD.
12. DRIVABLE, FLEXIBLE MARKER (INFORMATION STICKER SUPPLIED BY MWSB).

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**SERVICE CONNECTION DETAIL (HDPE)**



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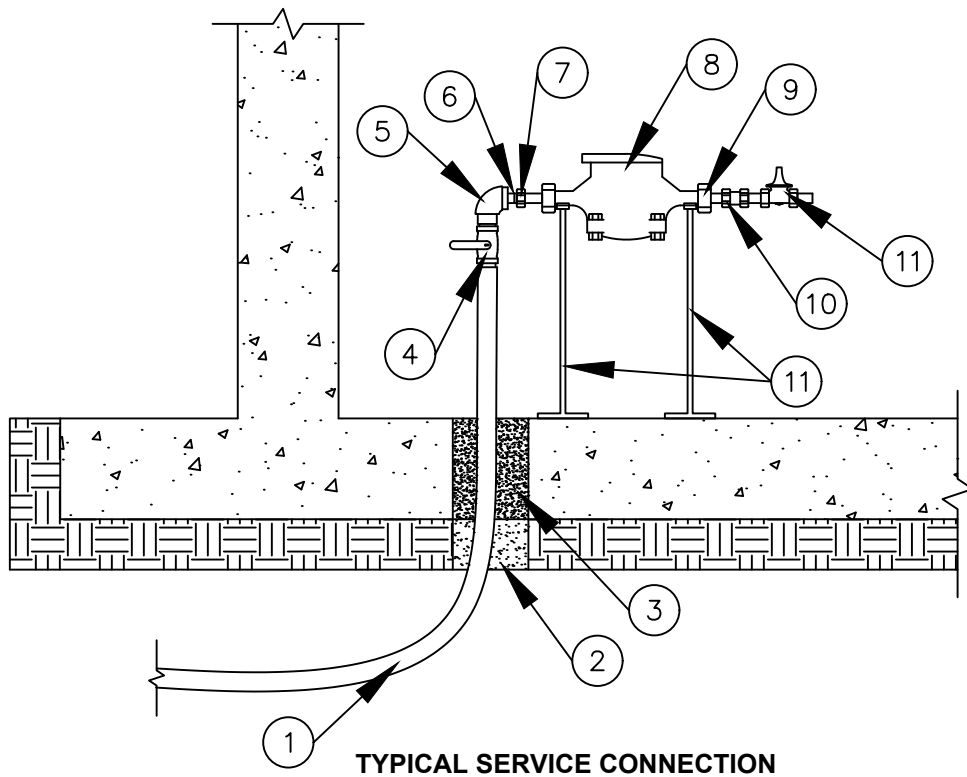
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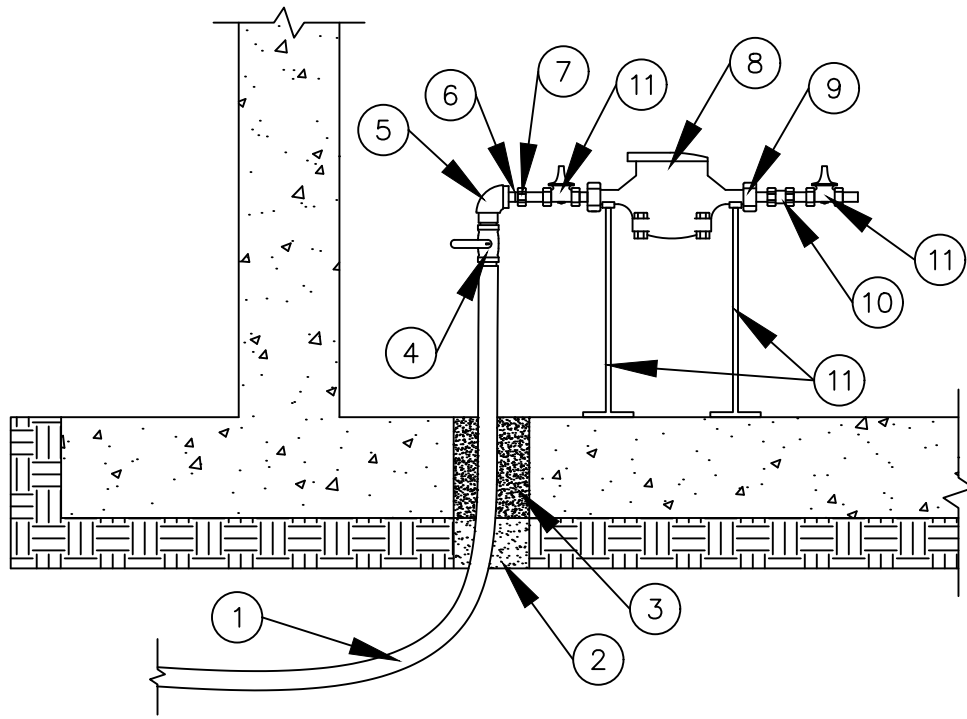
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**TYPICAL SERVICE CONNECTION**

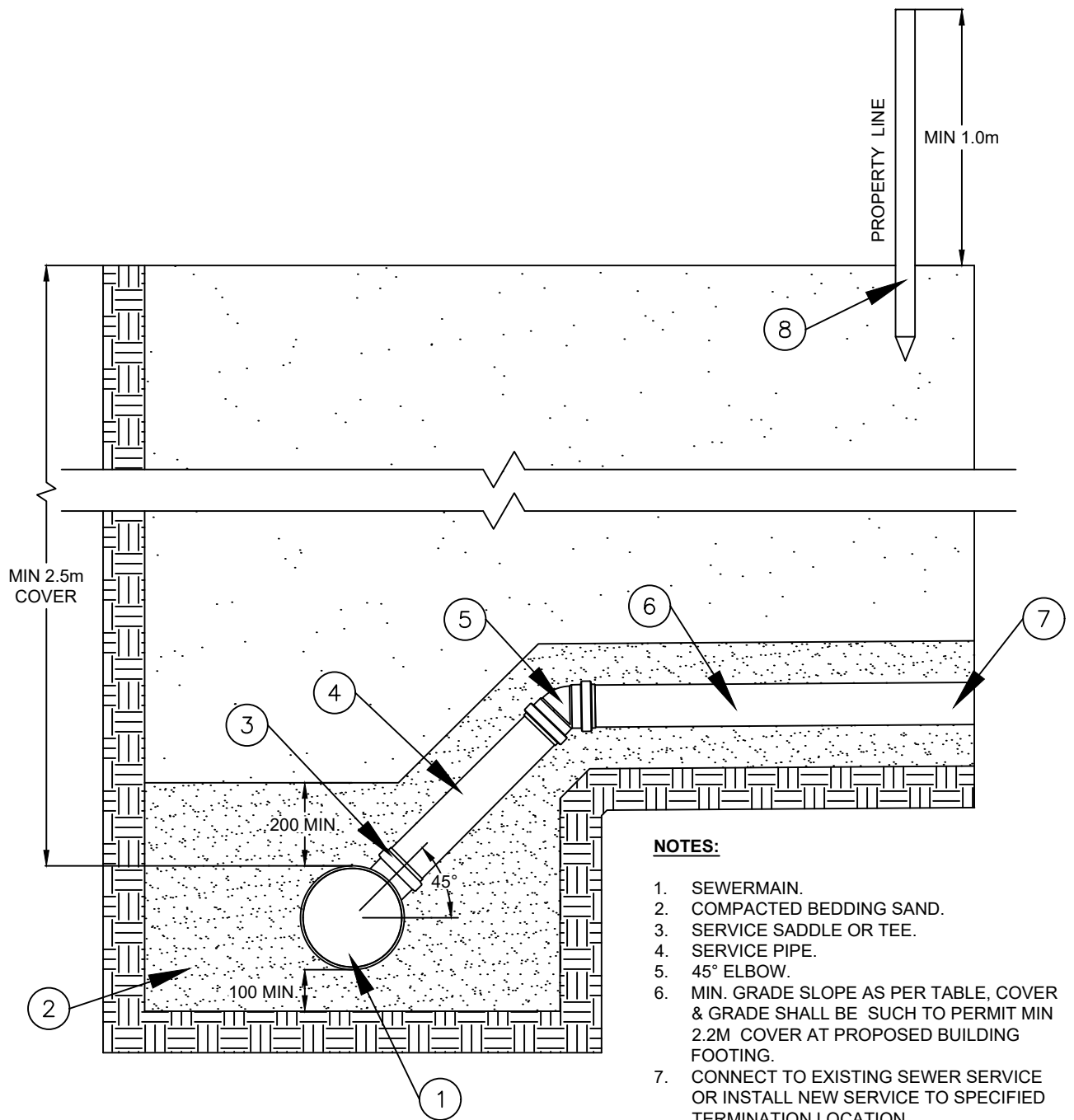


**SERVICE CONNECTION C/W DOUBLE PRV**

**NOTES:**

1. SERVICE PIPE.
2. COMPACTED SAND.
3. CLASS "B" SAND BEDDING.
4. NON-SHRINK GROUT.
5. BRONZE BALL VALVE.
6. ELBOW.
7. NIPPLE.
8. DUAL CHECK VALVE.
9. WATER METER C/W WIRE TO REMOTE READ ASSEMBLY.
10. TAIL PIECE.
11. FLOW CONTROL VALVE.
12. PRESSURE REDUCING VALVE (IF REQUIRED).
13. SUPPORTS.

STANDARD CONSTRUCTION SPECIFICATIONS <b>THE MANITOBA WATER SERVICES BOARD</b> PROVINCE OF MANITOBA				<b>SERVICE CONNECTION METER DETAIL</b>		
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**NOTES:**

1. SEWERMAIN.
2. COMPACTED BEDDING SAND.
3. SERVICE SADDLE OR TEE.
4. SERVICE PIPE.
5. 45° ELBOW.
6. MIN. GRADE SLOPE AS PER TABLE, COVER & GRADE SHALL BE SUCH TO PERMIT MIN 2.2M COVER AT PROPOSED BUILDING FOOTING.
7. CONNECT TO EXISTING SEWER SERVICE OR INSTALL NEW SERVICE TO SPECIFIED TERMINATION LOCATION.
8. 38 X 84 WOOD STAKE, PAINTED RED. DRIVEN INTO GROUND AT PROPERTY LINE.

**MIN. PERMISSIBLE GRADE % (SLOPE)**

MATERIAL	100mm Ø	150mm Ø
CONCRETE	1.20%	0.65%
PVC	0.40%	0.25%

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**STANDARD SEWER SERVICE CONNECTION**



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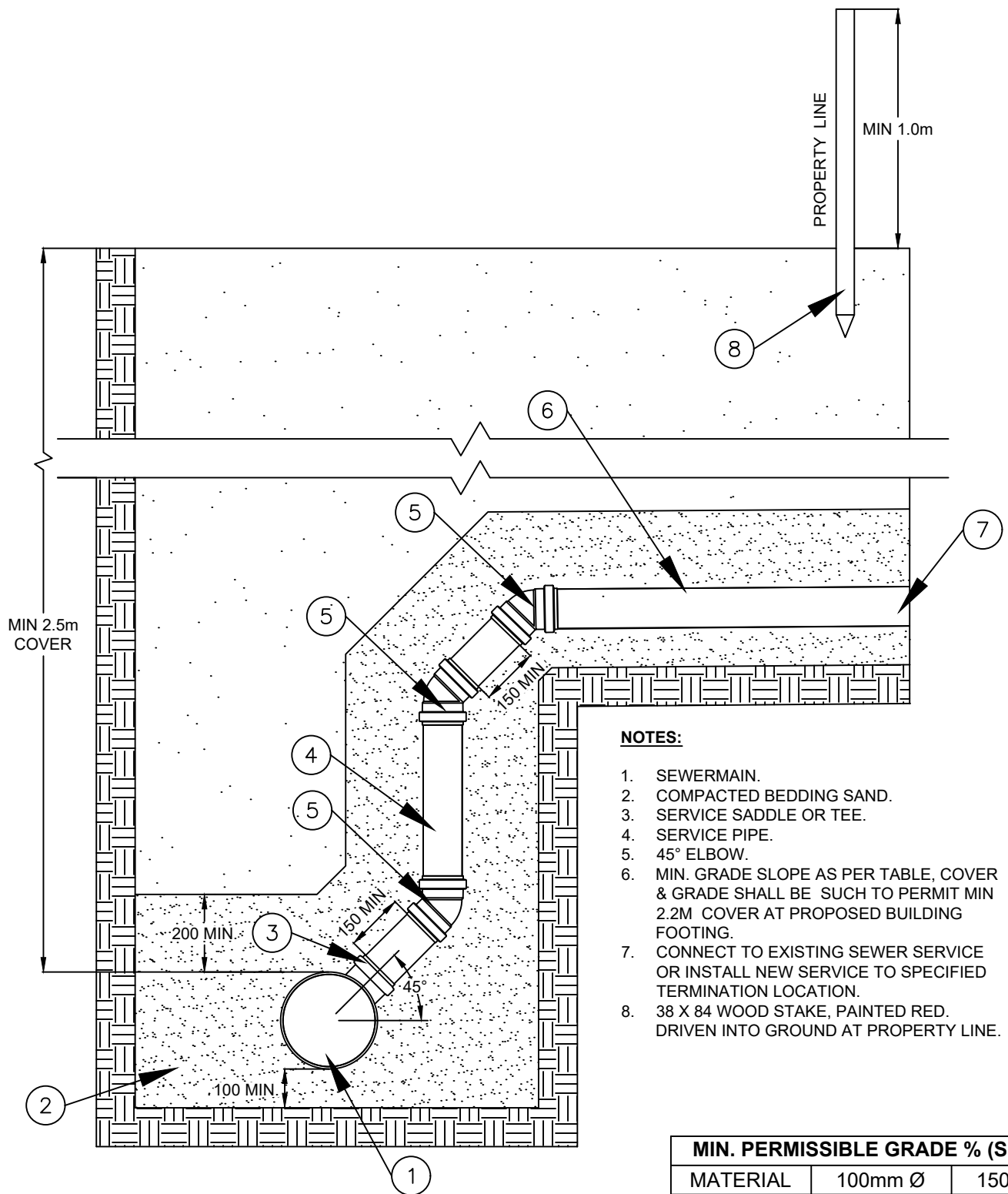
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**NOTES:**

1. SEWERMAIN.
2. COMPACTED BEDDING SAND.
3. SERVICE SADDLE OR TEE.
4. SERVICE PIPE.
5. 45° ELBOW.
6. MIN. GRADE SLOPE AS PER TABLE, COVER & GRADE SHALL BE SUCH TO PERMIT MIN 2.2M COVER AT PROPOSED BUILDING FOOTING.
7. CONNECT TO EXISTING SEWER SERVICE OR INSTALL NEW SERVICE TO SPECIFIED TERMINATION LOCATION.
8. 38 X 84 WOOD STAKE, PAINTED RED. DRIVEN INTO GROUND AT PROPERTY LINE.

MIN. PERMISSIBLE GRADE % (SLOPE)		
MATERIAL	100mm Ø	150mm Ø
CONCRETE	1.20%	0.65%
PVC	0.40%	0.25%

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**DEEP SEWER SERVICE CONNECTION**



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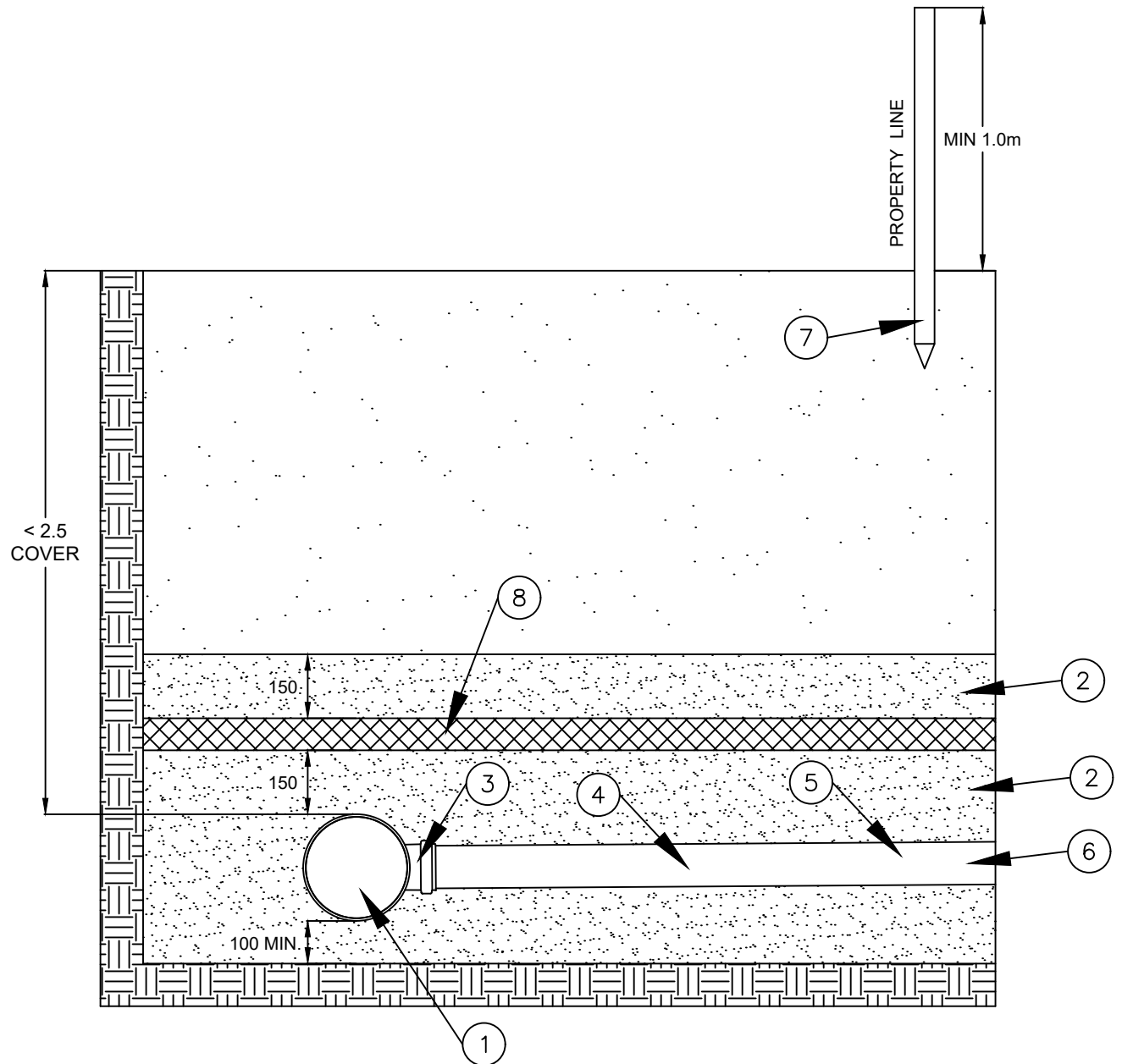
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#### NOTES:

1. SEWERMAIN.
2. COMPACTED BEDDING SAND.
3. SERVICE SADDLE OR TEE.
4. SERVICE PIPE.
5. MIN. GRADE SLOPE AS PER TABLE, COVER & GRADE SHALL BE SUCH TO PERMIT MIN 2.2M COVER AT PROPOSED BUILDING FOOTING.
6. CONNECT TO EXISTING SEWER SERVICE OR INSTALL NEW SERVICE TO SPECIFIED TERMINATION LOCATION.
7. 38 X 84 WOOD STAKE, PAINTED RED. DRIVEN INTO GROUND AT PROPERTY LINE.
8. 75 EXTRUDED POLYSTYRENE RIDGED INSULATION WITH STAGGERED JOINTS (TWO 38 LAYERS).

MIN. PERMISSIBLE GRADE % (SLOPE)		
MATERIAL	100mm Ø	150mm Ø
CONCRETE	1.20%	0.65%
PVC	0.40%	0.25%

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**SHALLOW SEWER SERVICE CONNECTION**  
 (REQUIRES ENGINEERS WRITTEN APPROVAL)



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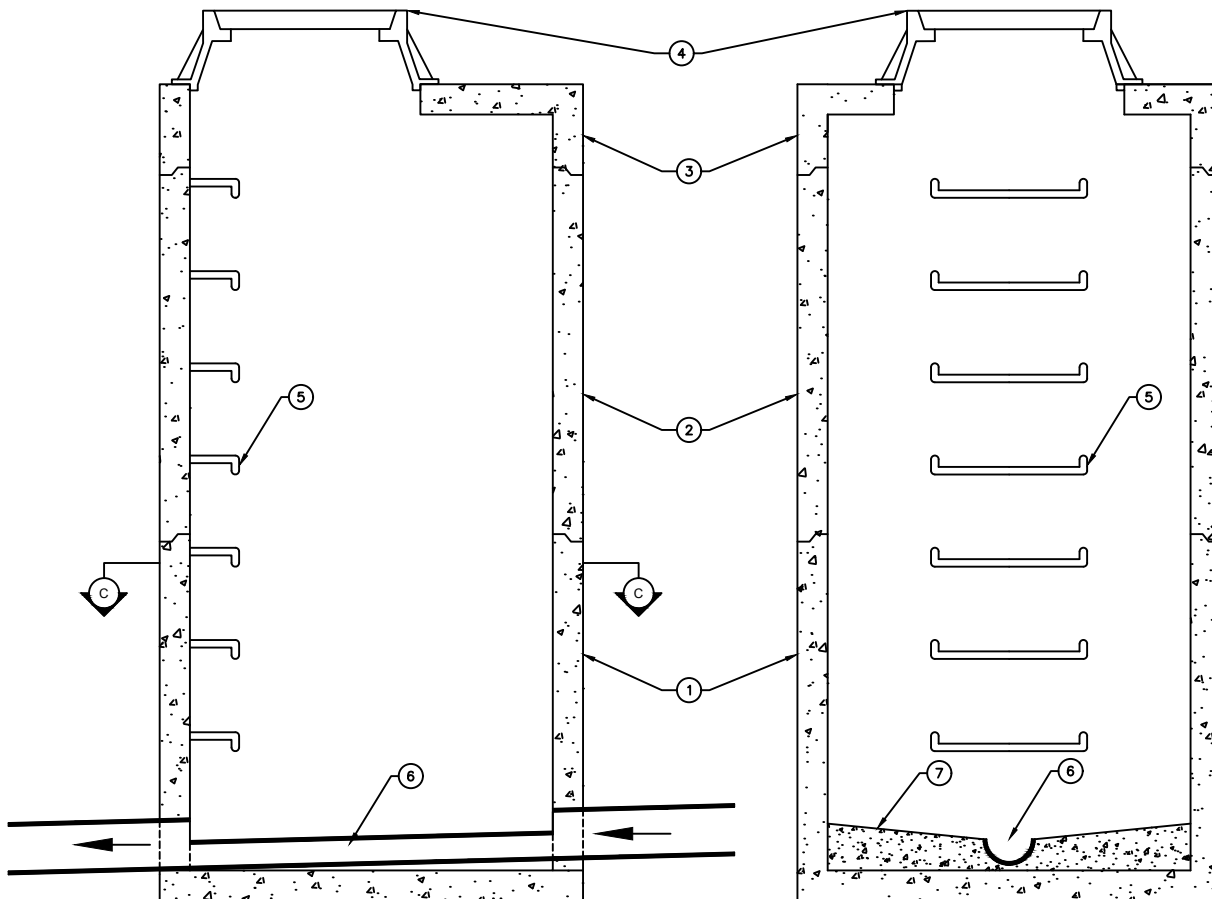
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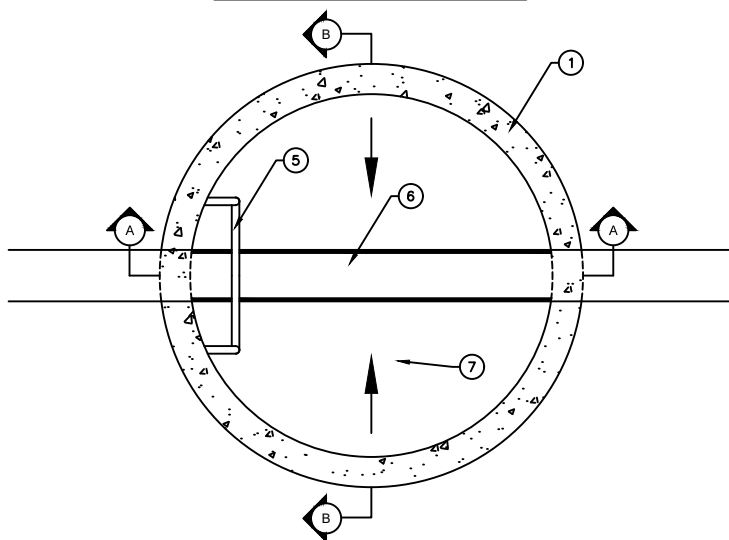


**MANHOLE SECTION A-A**

**MANHOLE SECTION B-B**

**NOTES:**

1. 1200 Ø x 1200 C/W PRECAST FLOOR.
2. 1200 Ø X 1200 BARREL.
3. 1200 Ø X 750 Ø FLAT TOP REDUCER
4. FRAME AND COVER UNIT.
5. CAST-IN-PLACE ALUMINUM RINGS 305mm ON CENTER.
6. SEWER PIPE TO BE RUN THROUGH MANHOLE AND TOP HALF SECTION TO BE CUT AWAY TO PERMIT OPEN SEMI-CIRCULAR FLOW CHANNEL TO BE FORMED.
7. CONCRETE GROUT BENCHING TO SLOPE 10:1 TOWARDS CHANNEL.
8. ELEVATION OF TOP OF FRAME & COVER UNIT TO BE AT SPECIFIED FINISH GRADE:
  - 8.1. ± 12mm FOR UNITS INSTALLED IN ROADWAYS.
  - 8.2. ± 25mm OTHERWISE.
9. FULL PRECAST FLOOR OMITTED FOR MANHOLES TO BE INSTALLED OVER EXISTING SEWER LINES. CAST-IN-PLACE CONCRETE REQUIRED TO COMPLETE THE FLOOR.
10. THE OUTSIDE OF THE PRECAST MANHOLE SECTIONS SHALL BE WRAPPED WITH 6mil THICK POLYETHYLENE WHICH SHALL BE TAPED TIGHTLY WITH DUCT TAPE PRIOR TO THE PLACEMENT OF THE BACKFILL. THE POLYETHYLENE WRAPPING SHALL EXTEND FROM THE TOP OF THE MANHOLE TO THE MANHOLE BASE SECTION.



**MANHOLE PLAN C-C**

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**TYPE 1 MANHOLE**  
 (FOR 200-600mm Ø SEWER MAINS)



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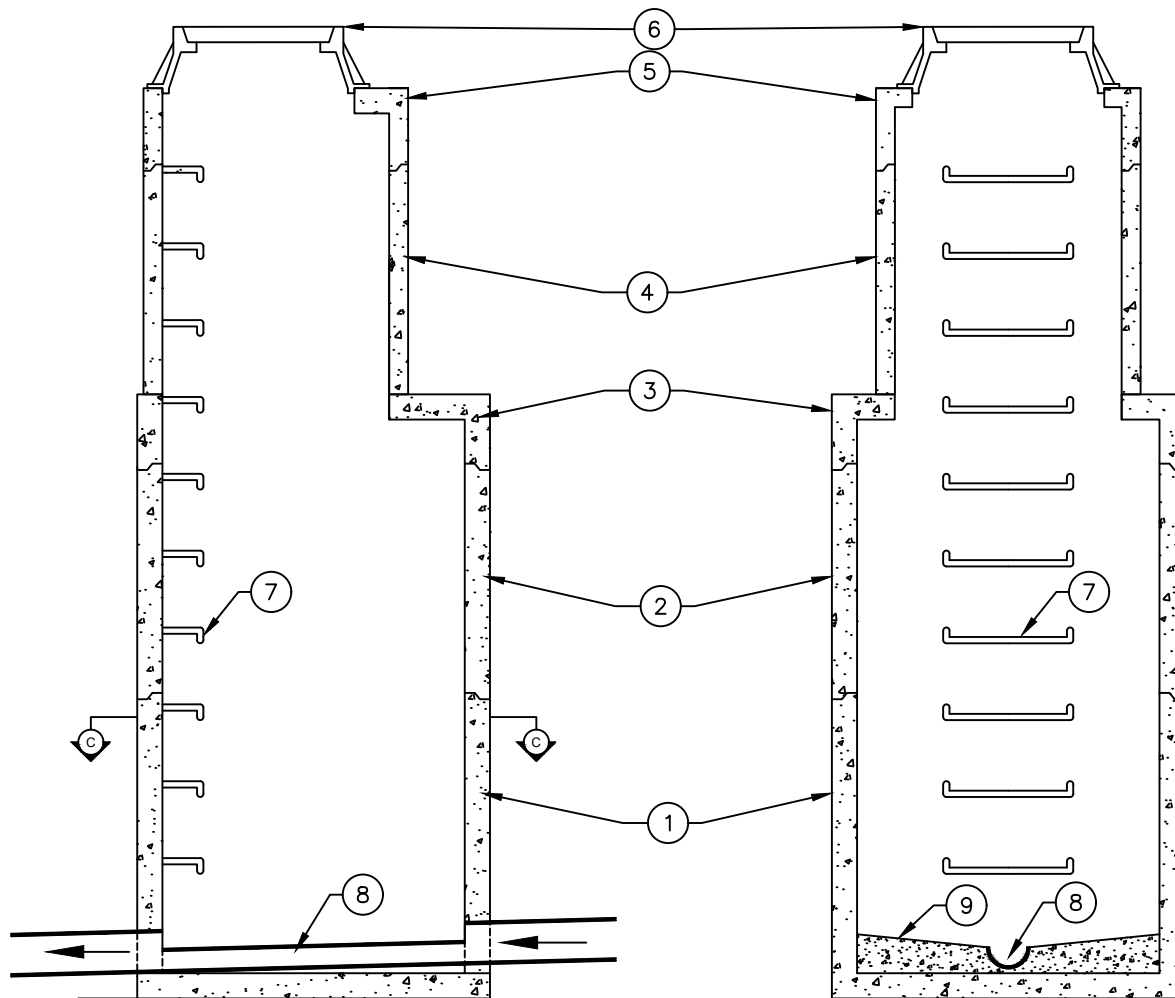
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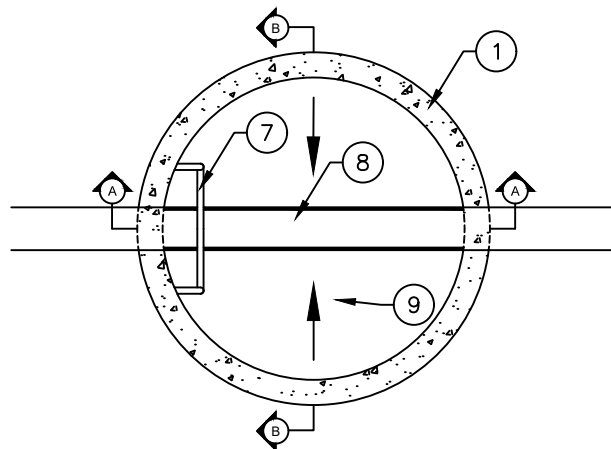


**MANHOLE SECTION A-A**

**MANHOLE SECTION B-B**

**NOTES:**

1. 1200 Ø x 1200 C/W PRECAST FLOOR.
2. 1200 Ø X 900 BARREL.
3. 1200 Ø X 900 Ø x 0.23 FLAT TOP REDUCER.
4. 900 Ø RISER SECTIONS AS REQUIRED.
5. 900 Ø X 750 Ø FLAT TOP REDUCER.
6. FRAME AND COVER UNIT.
7. CAST-IN-PLACE ALUMINUM RINGS 305mm ON CENTER.
8. SEWER PIPE TO BE RUN THROUGH MANHOLE AND TOP HALF SECTION TO BE CUT AWAY TO PERMIT OPEN SEMI-CIRCULAR FLOW CHANNEL TO BE FORMED.
9. CONCRETE GROUT BENCHING TO SLOPE 10:1 TOWARDS CHANNEL.
10. ELEVATION OF TOP OF FRAME & COVER UNIT TO BE AT SPECIFIED FINISH GRADE:
  - 10.1. ± 12mm FOR UNITS INSTALLED IN ROADWAYS.
  - 10.2. ± 25mm OTHERWISE.
11. COVER ADJUSTMENT LIFTER UNITS SHALL BE USED UP TO 100mm; CONCRETE RINGS TO BE USED
12. FULL PRECAST FLOOR OMITTED FOR MANHOLES TO BE INSTALLED OVER EXISTING SEWER LINES. CAST-IN-PLACE CONCRETE REQUIRED TO COMPLETE THE FLOOR.
13. THE OUTSIDE OF THE PRECAST MANHOLE SECTIONS SHALL BE WRAPPED WITH 0.15mm (6mil) THICK POLYETHYLENE WHICH SHALL BE TAPED TIGHTLY WITH DUCT TAPE PRIOR TO THE PLACEMENT OF THE BACKFILL. THE POLYETHYLENE WRAPPING SHALL EXTEND FROM THE TOP OF THE MANHOLE TO THE MANHOLE BASE SECTION.



**MANHOLE PLAN C-C**

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**TYPE 2 MANHOLE**  
 (FOR 200-600mm Ø SEWER MAINS)



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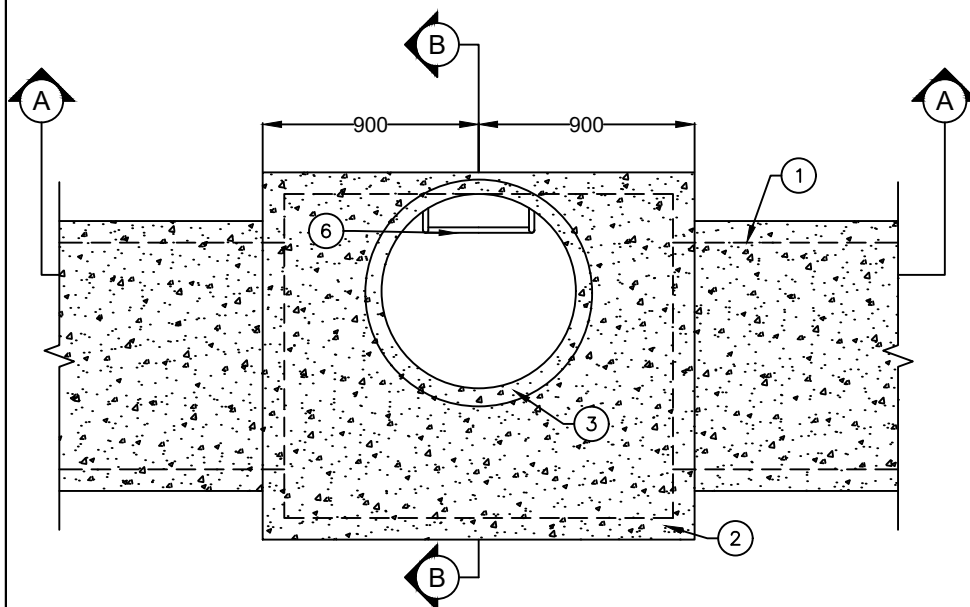
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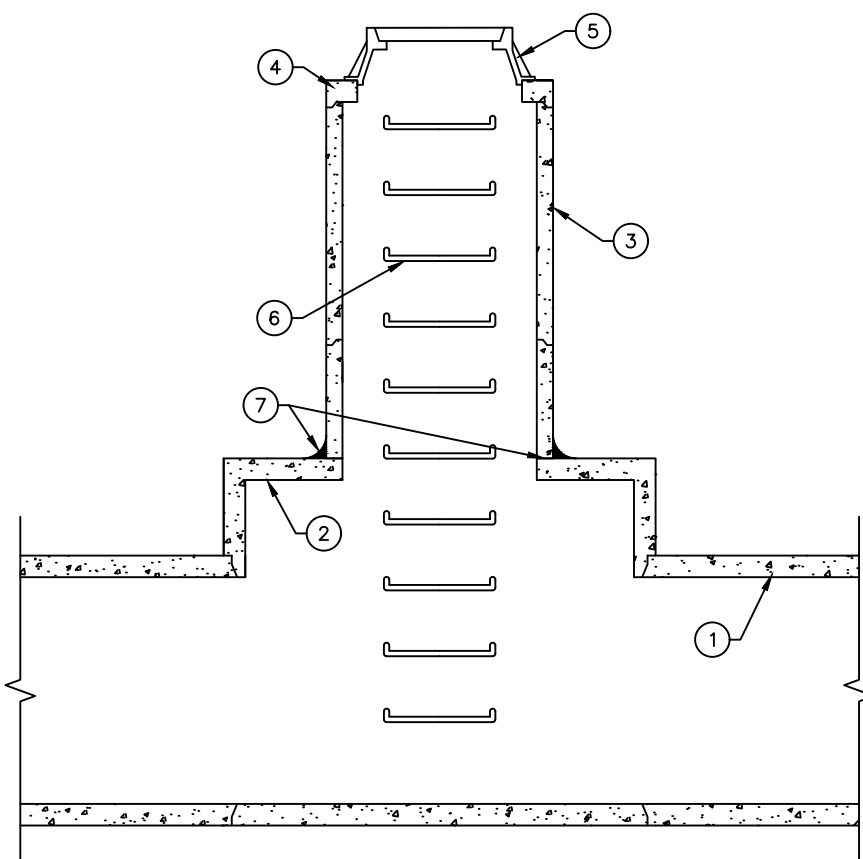
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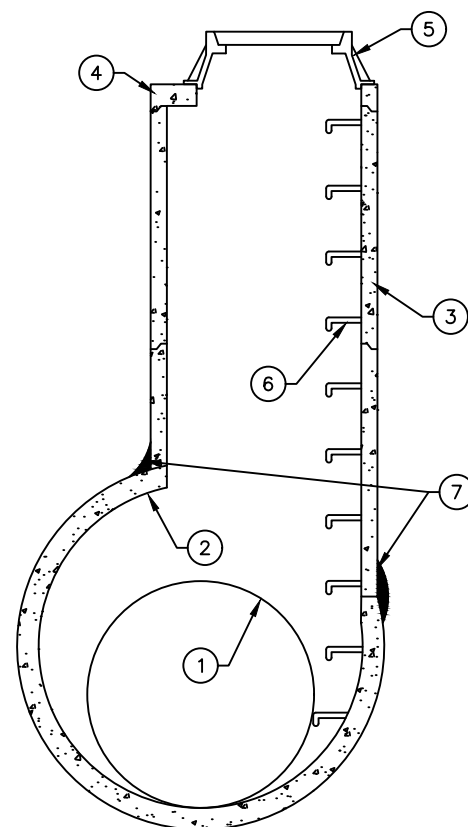


**MANHOLE PLAN**

- NOTES:**
1. EXISTING SEWER PIPE.
  2. MANHOLE BASE, 1200 Ø X 1800 BASE FOR 600-900 Ø SEWERS, 1500 Ø X 1800 BASE FOR 1050-1500 Ø SEWERS
  3. 900 Ø RISER SECTIONS AS REQUIRED.
  4. 900 Ø X 750Ø FLAT TOP REDUCER.
  5. FRAME AND COVER UNIT.
  6. CAST-IN-PLACE ALUMINUM MANHOLE RUNGS AT 305 ON CENTER
  7. GROUT.
  8. THE OUTSIDE OF THE PRECAST MANHOLE SECTIONS SHALL BE WRAPPED WITH 0.15mm (6mil) THICK POLYETHYLENE WHICH SHALL BE TAPED TIGHTLY WITH DUCT TAPE PRIOR TO THE PLACEMENT OF THE BACKFILL. THE POLYETHYLENE WRAPPING SHALL EXTEND FROM THE TOP OF THE MANHOLE TO THE MANHOLE BASE SECTION.



**MANHOLE PLAN A-A**



**MANHOLE PLAN B-B**

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**TYPE 3 MANHOLE**  
 (FOR 600-1500mm Ø SEWER MAINS)



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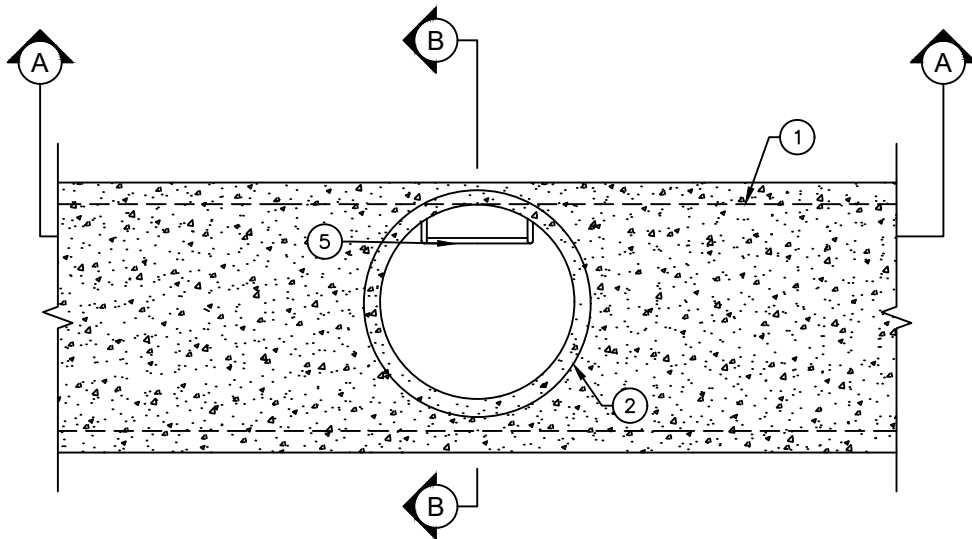
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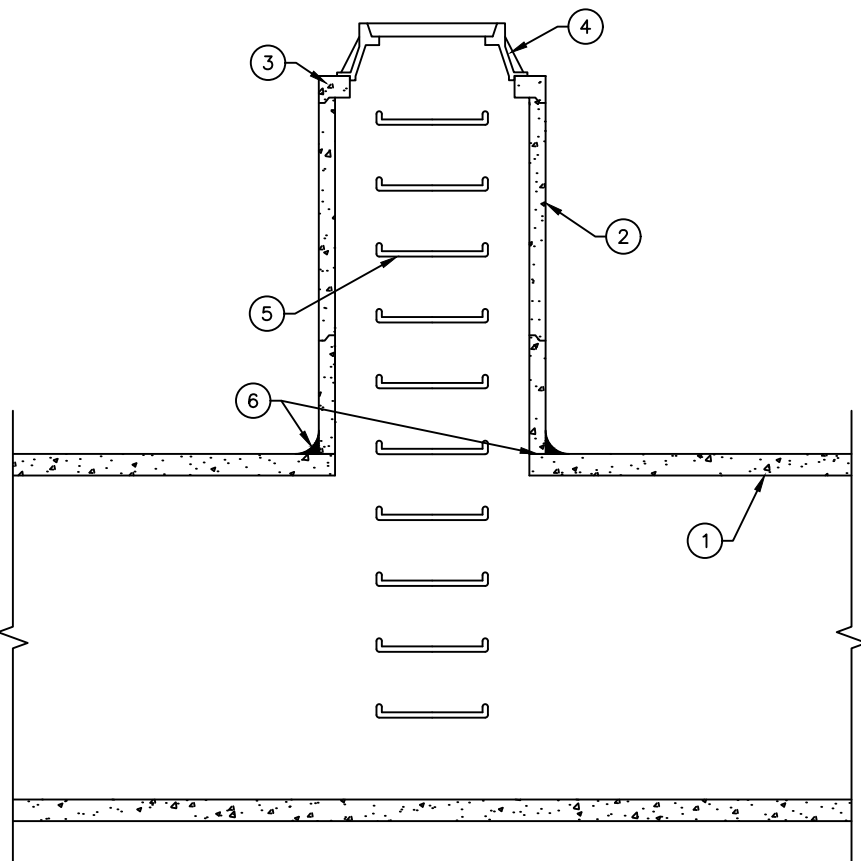
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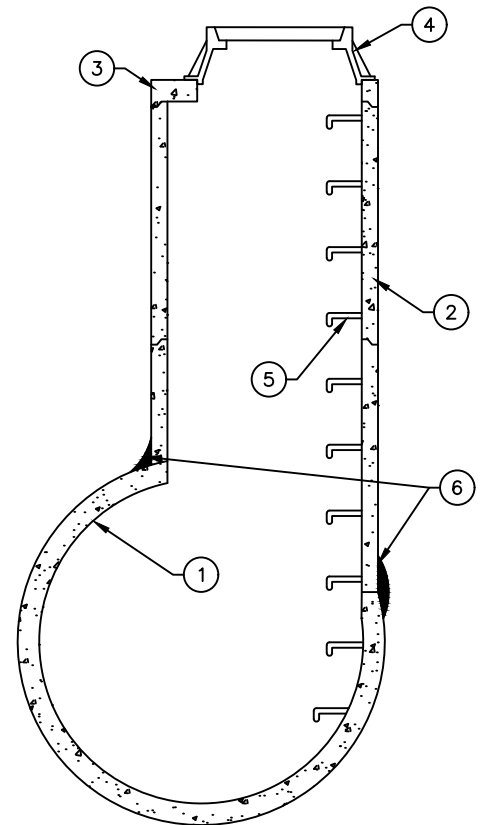


**MANHOLE PLAN**

- NOTES:**
1. EXISTING SEWER PIPE 1500 Ø or LARGER.
  2. 900 Ø RISER SECTIONS AS REQUIRED.
  3. 900 Ø X 750Ø FLAT TOP REDUCER.
  4. FRAME AND COVER UNIT.
  5. CAST-IN-PLACE ALUMINUM MANHOLE RUNGS AT 305 ON CENTER
  6. GROUT.
  7. THE OUTSIDE OF THE PRECAST MANHOLE SECTIONS SHALL BE WRAPPED WITH 0.15mm (6mil) THICK POLYETHYLENE WHICH SHALL BE TAPED TIGHTLY WITH DUCT TAPE PRIOR TO THE PLACEMENT OF THE BACKFILL. THE POLYETHYLENE WRAPPING SHALL EXTEND FROM THE TOP OF THE MANHOLE TO THE MANHOLE BASE SECTION.



**MANHOLE PLAN A-A**



**MANHOLE PLAN B-B**

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**TYPE 4 MANHOLE**  
 (FOR 1500mm Ø SEWER MAINS OR LARGER)



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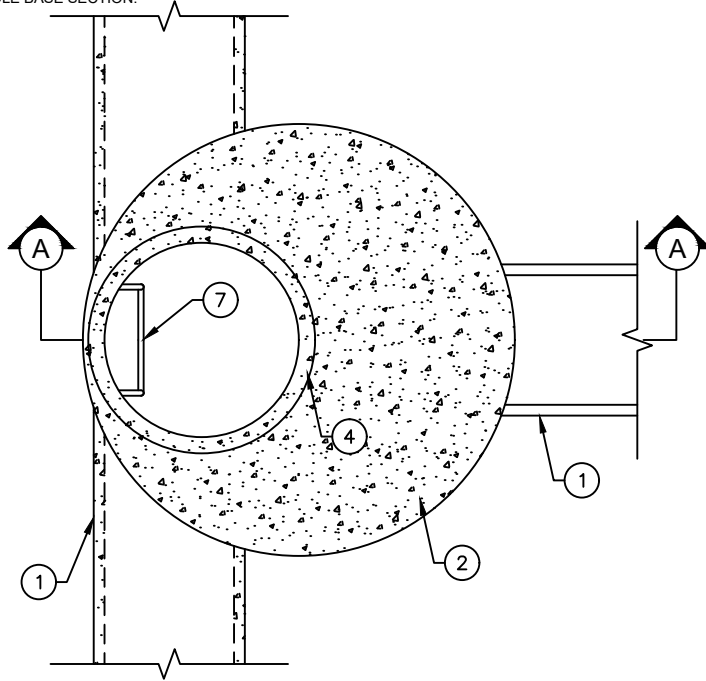
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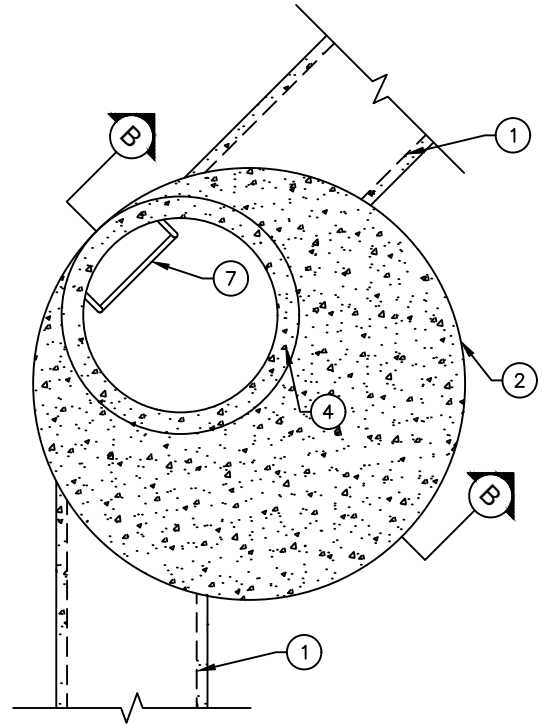


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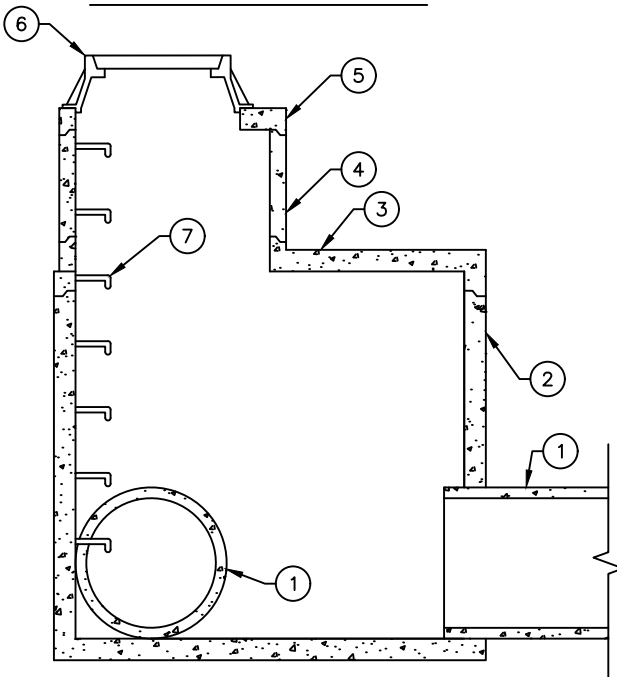
1. SEWER MAIN 600 Ø OR LARGER.
2. PRECAST BARREL 1350 Ø TO 2700 Ø, SHALL NOT BE LESS THAN THE LARGEST SEWER LINE CONNECTED TO IT.
3. FLAT ECCENTRIC REDUCER TO 900 Ø.
4. 900 Ø RISER SECTIONS.
5. 900 Ø X 750Ø FLAT TOP REDUCER.
6. FRAME AND COVER UNIT.
7. CAST-IN-PLACE ALUMINUM MANHOLE RUNGS AT 305 ON CENTER
8. THE OUTSIDE OF THE PRECAST MANHOLE SECTIONS SHALL BE WRAPPED WITH 0.15mm (6mil) THICK POLYETHYLENE WHICH SHALL BE TAPED TIGHTLY WITH DUCT TAPE PRIOR TO THE PLACEMENT OF THE BACKFILL. THE POLYETHYLENE WRAPPING SHALL EXTEND FROM THE TOP OF THE MANHOLE TO THE MANHOLE BASE SECTION.



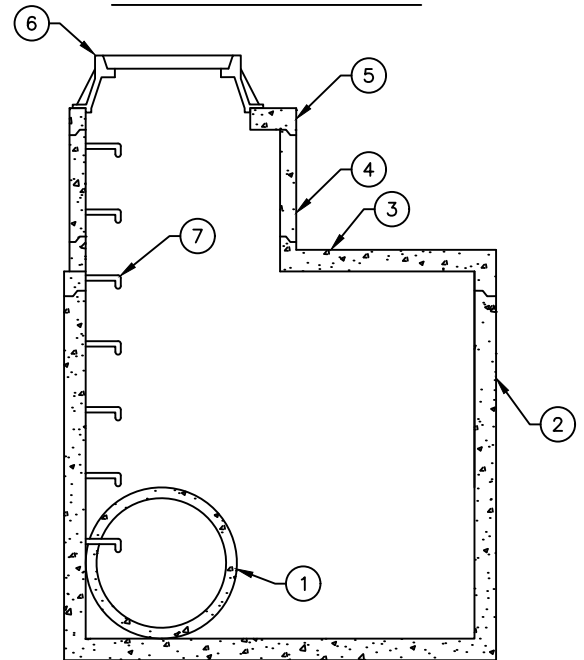
**MANHOLE INTERSECTING**



**MANHOLE DEFLECTING**



**MANHOLE PLAN A-A**



**MANHOLE PLAN B-B**

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**TYPE 5 MANHOLE**  
 (FOR WHERE SEWER MAINS DEFLECT OR INTERSECT)



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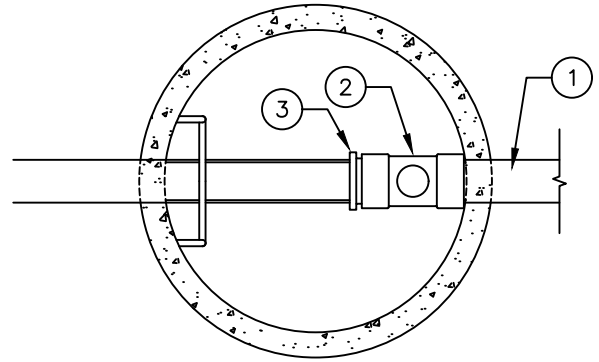
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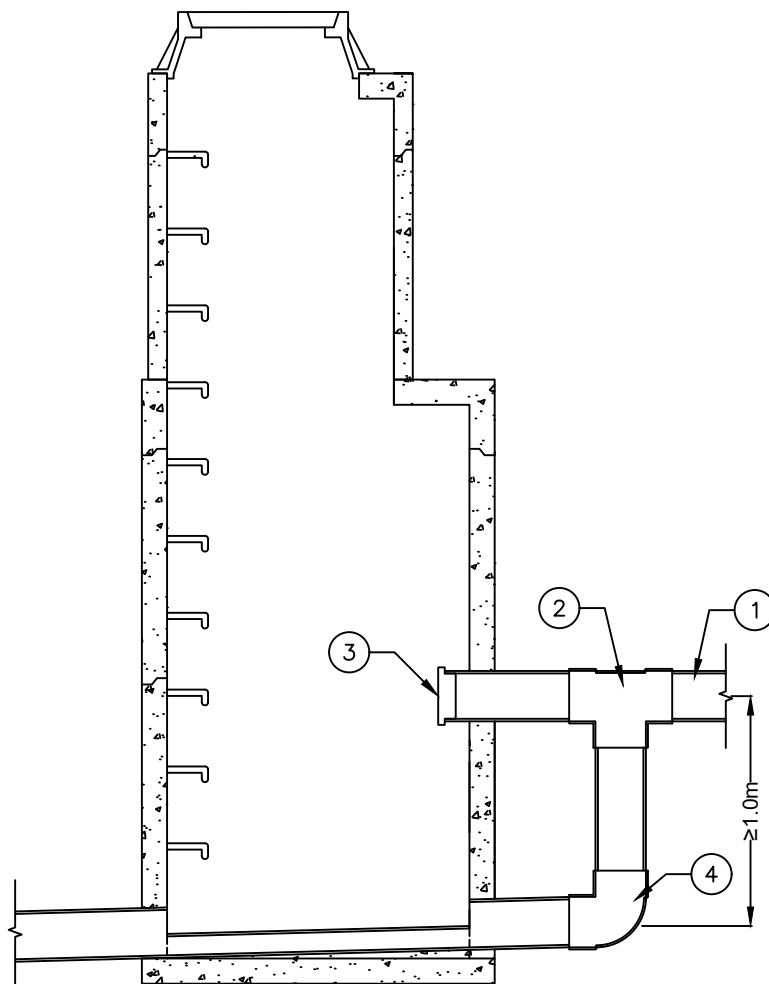
02 70 30

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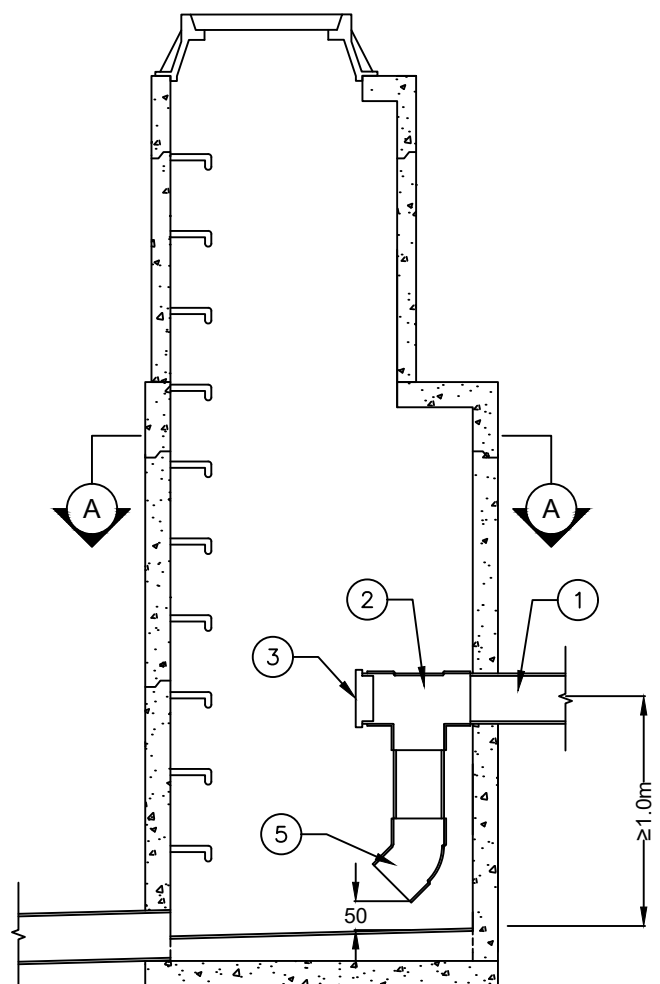
1. SEWER MAIN. 200 TO 375 Ø TO USE INTERNAL DROP PIPE, 400 Ø & LARGER TO USE EXTERNAL DROP PIPE.
2. TEE. ON INTERNAL DROP PIPE CUT 200 Ø HOLE OVER C OF DROP PIPE
3. PLUG.
4. 90° ELBOW.
5. 45° ELBOW.
6. REFER TO MANHOLE TYPE 2 FOR MANHOLE DETAILS.
7. EXTERNAL / INTERNAL DROP PIPE TO BE USED WHEN INCOMING SEWER MAIN ELEVATION IS GREATER THAN 1.0m ABOVE MANHOLE BASE.



**SECTION: A-A**



**MANHOLE PLAN: EXTERNAL  
DROP PIPE**



**MANHOLE PLAN: INTERNAL  
DROP PIPE**

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
PROVINCE OF MANITOBA

**TYPE 6 MANHOLE**  
(EXTERNAL / INTERNAL DROP PIPE FOR SEWER MAINS 200-600 Ø  
USING TYPE 2 MANHOLE)



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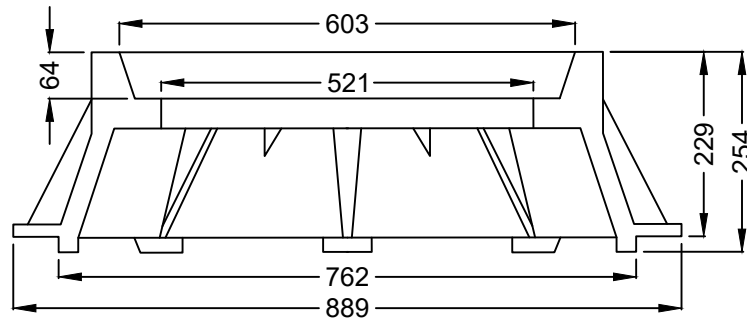
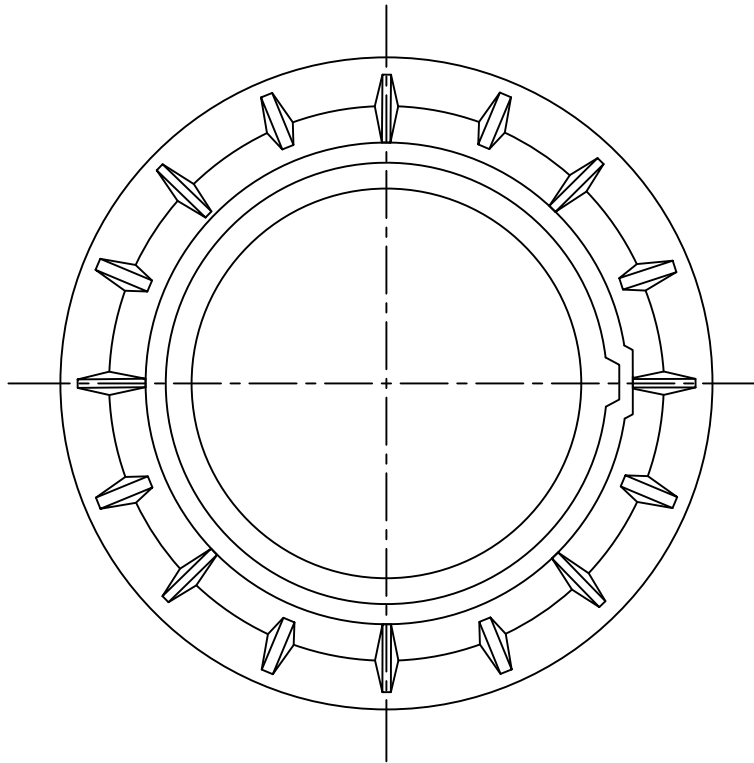
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**PAGE:**

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**SECTION NO:**

02 70 30



**FRAME WT. 103 Kg**

**NOTES:**

1. ALL UNITS INSTALLED IN ROADWAYS SHALL BE "MACHINED" FOR CLOSE TOLERANCE FIT BETWEEN FRAME AND COVER.
2. COVER TO BE CAST IRON WHENEVER PLACED INSIDE OF ROADWAY.

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**MANHOLE COVER UNIT & FRAME DETAIL**



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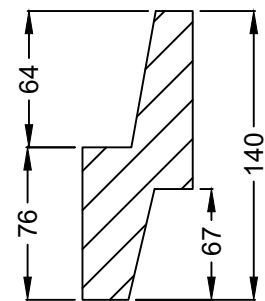
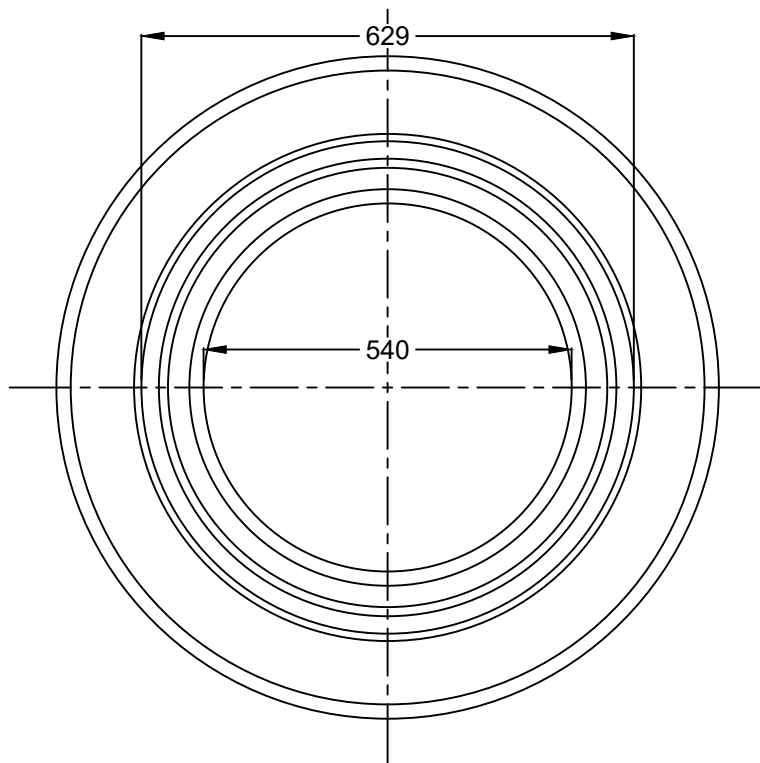
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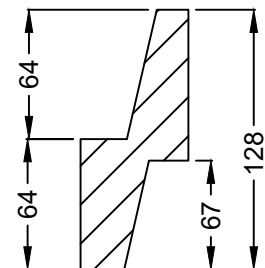
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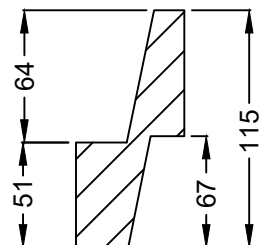
02 70 30



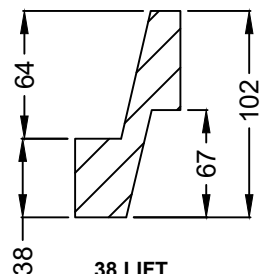
**76 LIFT**



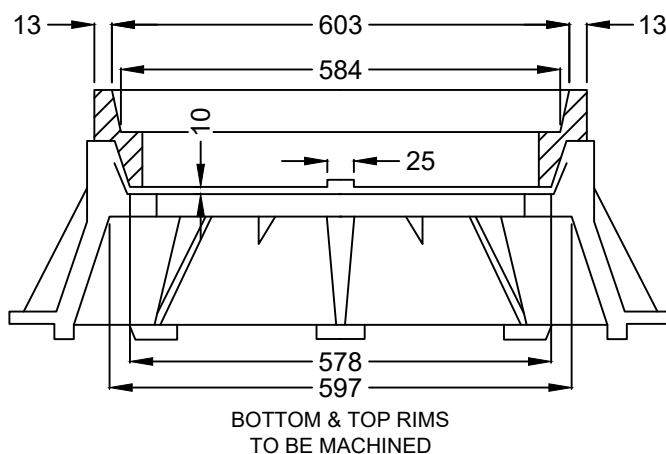
**64 LIFT**



**51 LIFT**



**38 LIFT**



STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**COVER LIFT RINGS**  
 (TO ADJUST TOP ELEVATIONS)



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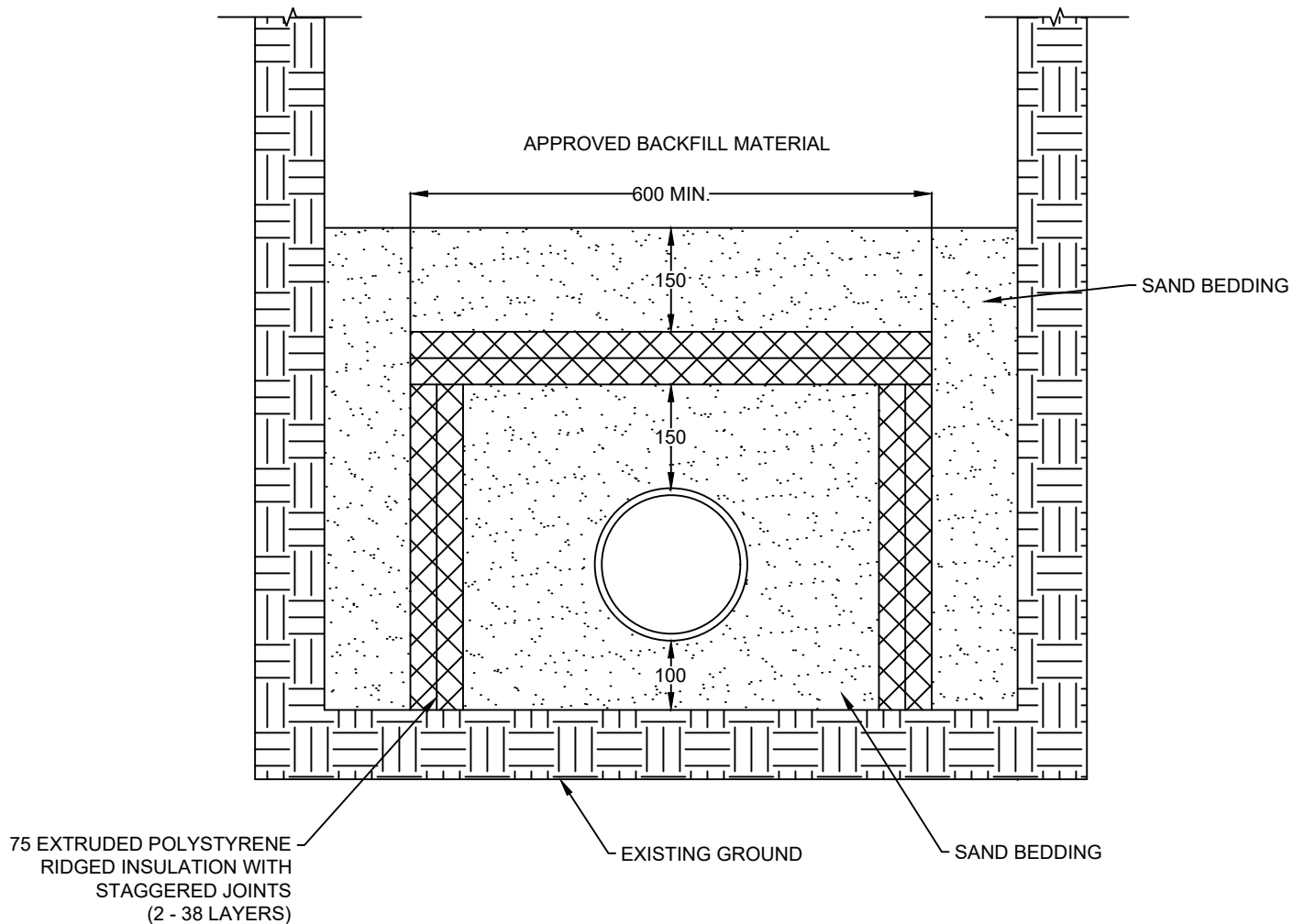
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**SECTION NO:**

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**NOTES:**

1. INSULATION SHALL BE USED FOR WATERMAINS, SEWERMAINS AND SERVICE CONNECTIONS WHERE SPECIFIED.
2. ALL INSULATION SHALL BE EXTRUDED POLYSTYRENE RIDGED INSULATION FOR INGROUND APPLICATION.
3. TEES OR Y-BRANCHED FOR SERVICE CONNECTIONS SHALL BE CUT TO FIT AND ADDITIONAL INSULATION SHALL BE PROVIDED TO COMPLETELY ENCLOSED THE CONNECTION.
4. SAND BACKFILL SHALL BE CAREFULLY APPLIED BY HAND TO A DEPTH OF 150 OVER THE INSULATION. REMAINING TRENCH BACKFILL SHALL BE SUITABLE EXCAVATED MATERIAL

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**PIPE INSULATION DETAIL**



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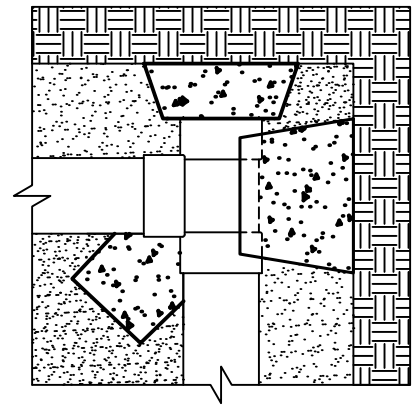
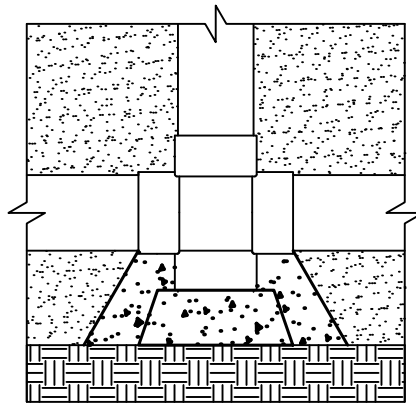
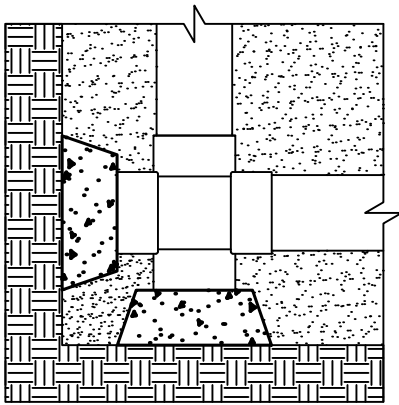
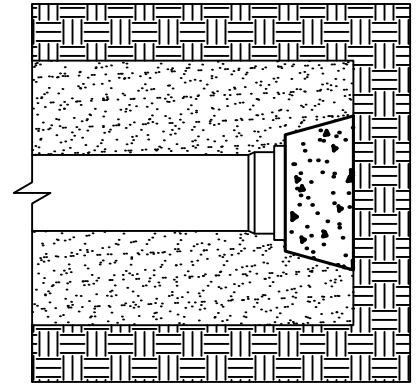
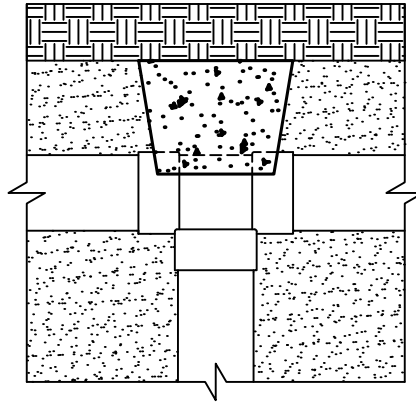
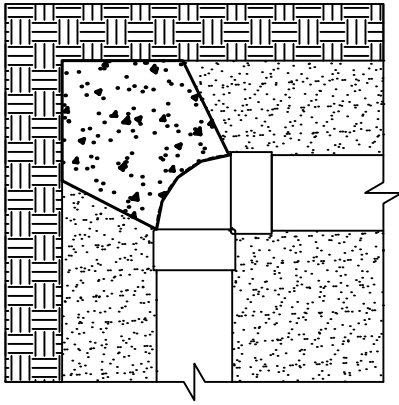
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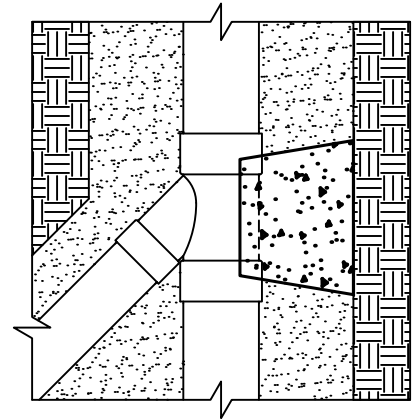
02 70 60



**TABLE 3.1**

**Minimum Bearing Areas (on undisturbed trench soil) For Thrust Blocks**

PIPE Ø (mm)	TEES & PLUGS & THRUST (m <sup>2</sup> )	90° BEND (m <sup>2</sup> )	45° BEND (m <sup>2</sup> )	22.5° BEND (m <sup>2</sup> )
50	0.2	0.3	0.2	0.1
75	0.2	0.3	0.2	0.1
100	0.2	0.3	0.2	0.1
150	0.4	0.5	0.3	0.2
200	0.6	0.9	0.5	0.3
250	1	1.5	0.8	0.4
300	1.5	2	1.2	0.6
350	2	2.7	1.5	0.8
400	2.6	4	2	1
450	3.2	4.5	2.5	1.3



STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**THRUST BLOCK INSTALLATION**



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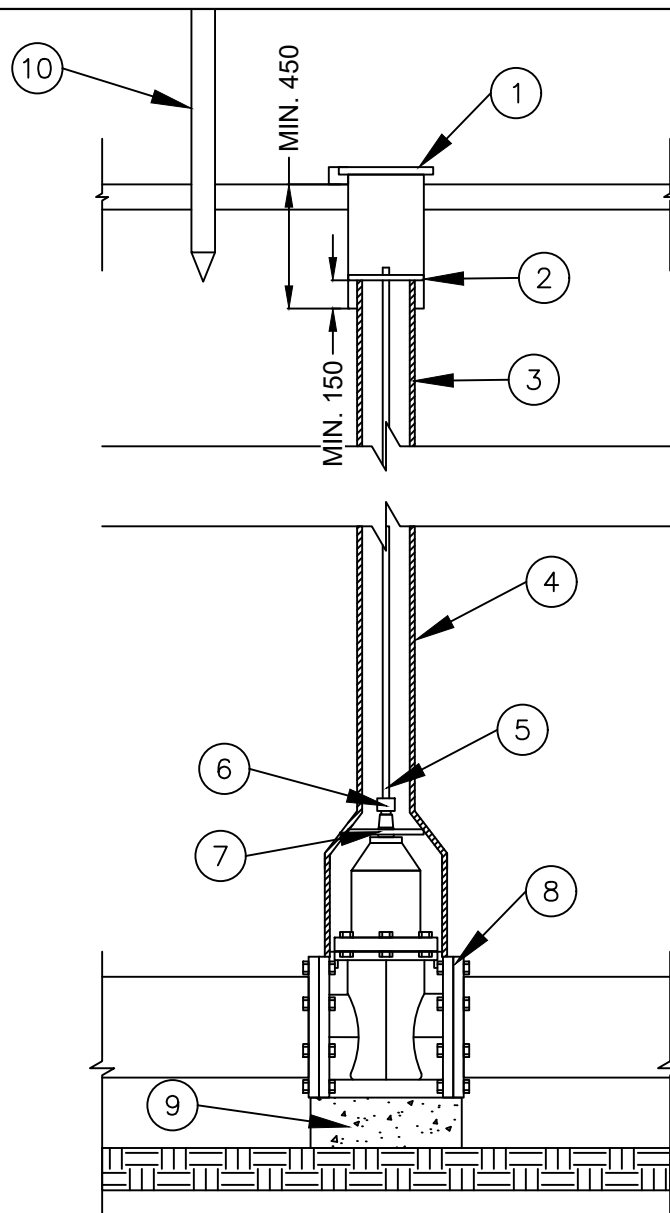
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1. DUCTILE IRON VALVE BOX COVER C/W HINGED LID & MARKER POST, "W" FOR WATER, "S" FOR SEWER.
2. STONE DISK.
3. PVC OR DUCTILE IRON VALVE BOX, TO BE PROTECTED BY LATERAL MOVEMENT DURING BACKFILL.
4. VALVE BOX LENGTH TO SUIT DEPTH OF PIPE .
5. MIN. 25mm SQUARE EXTENSION SPINDLE.
6. 60mm SQUARE OPERATING NUT.
7. CENTERING DISK.
8. AWWA C-905 GATE VALVE W/ JOINTS COMPATIBLE TO PIPE BEING USED.
9. MIN. 300 X 300 X 100 PRECAST CONCRETE BLOCK TO SUPPORT VALVE & REST ON TRENCH BED.
10. MARKER POST.

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

## GATE VALVE INSTALLATION



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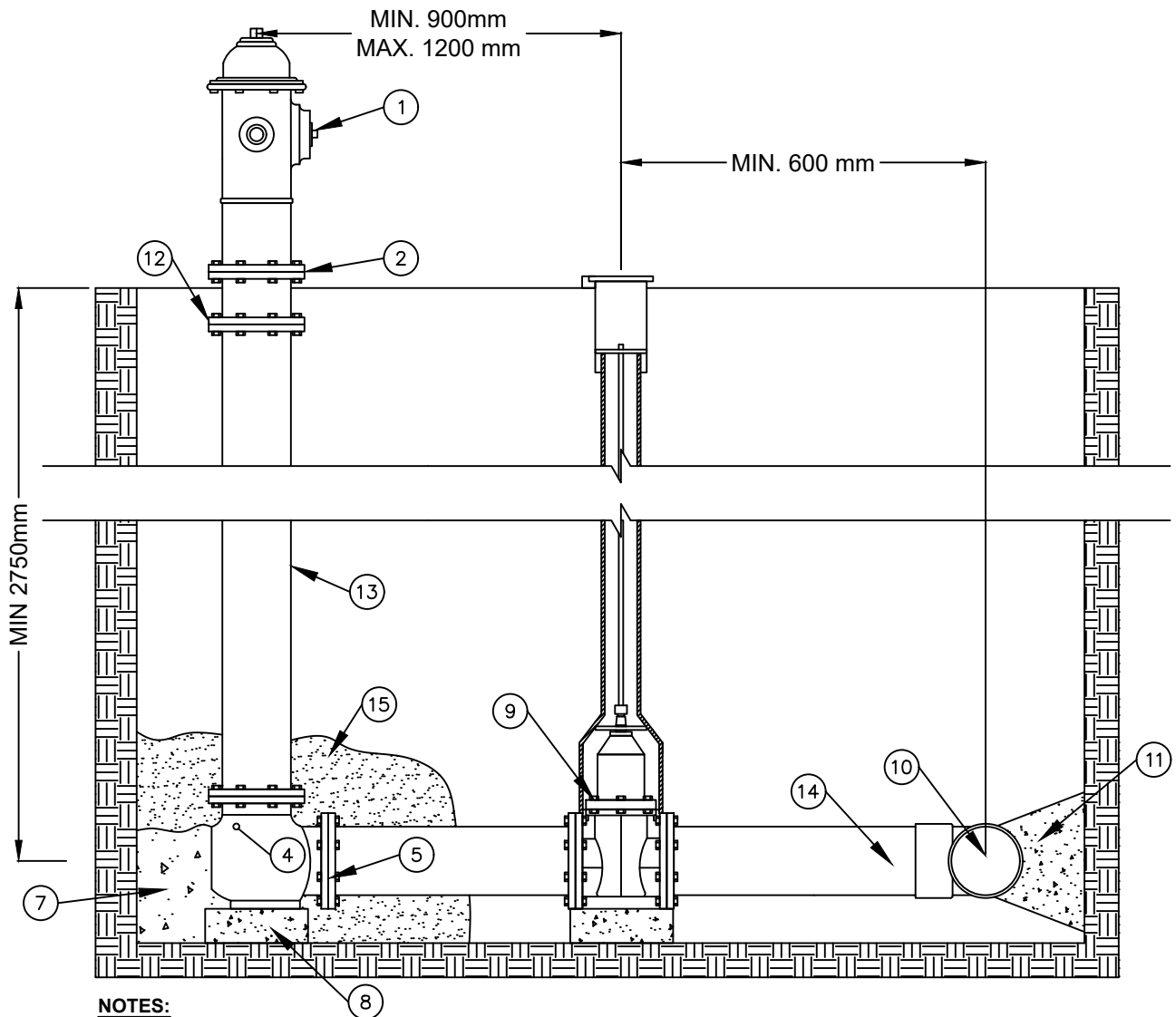
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**PAGE:**

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**SECTION NO:**

02 70 60



**NOTES:**

1. PUMPER NOZZLE SHALL FACE ROADWAY.
2. BODY FLANGE SHALL BE NO MORE THAN 150, AND NO LESS THAN 25 mm ABOVE PREVAILING GROUND ELEVATION
3. BURIAL DEPTH SHALL CONFORM TO THE INSTALLATION DEPTH OF THE WATERMAIN, AND PREVAILING GROUND ELEVATION, AND SHALL BE A MINIMUM OF 2.75 m.
4. DRAIN HOLES SHALL BE OPEN UNLESS OTHERWISE SPECIFIED IN SECTION 00 10 01, SPECIAL PROVISIONS.
5. JOINT TYPE SHALL BE COMPATIBLE WITH THE TYPE OF PIPE USED.
6. DRAIN HOLES SHALL DISCHARGE INTO A MINIMUM 0.2 CUBIC METER OF COARSE GRAVEL OR CRUSHED ROCK.
7. THRUST BLOCK SHALL BE CAST IN PLACE BETWEEN HYDRANT BOOT AND UNDISTURBED SOIL.
8. MINIMUM 300 X 300 X 100 mm CONCRETE PAD SHALL SUPPORT HYDRANT BOOT.
9. GATE VALVE AND BOX AS PER DETAIL PAGE 20 SECTION 02 70 60
10. TEE ON WATERMAIN.
11. THRUST BLOCK CAST IN PLACE BETWEEN TEE AND UNDISTURBED SOIL.
12. EXTENSION (BARREL AND SPINDLE) UNITS SHALL BE USED TO ADJUST THE ELEVATION OF THE GROUNDLINE FLANGE.
13. HYDRANT BARREL SHALL BE INSTALLED PLUMB.
14. REDUCERS / INCREASERS AS MAY BE REQUIRED SHALL BE INSTALLED TO MAKE 150 mm Ø HYDRANT INSTALLATION COMPATIBLE WITH Ø OF TEE.
15. SAND OR GRANULAR BACKFILL AROUND HYDRANT ASSEMBLY

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**STANDARD HYDRANT INSTALLATION**



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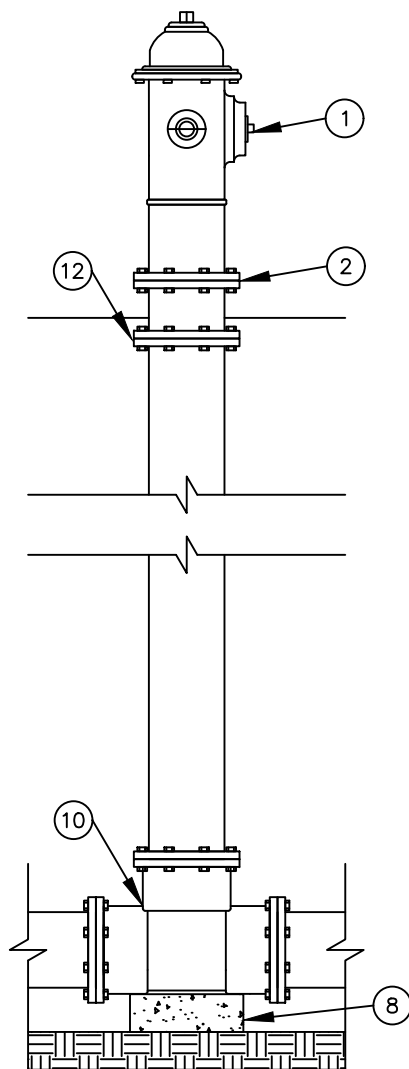
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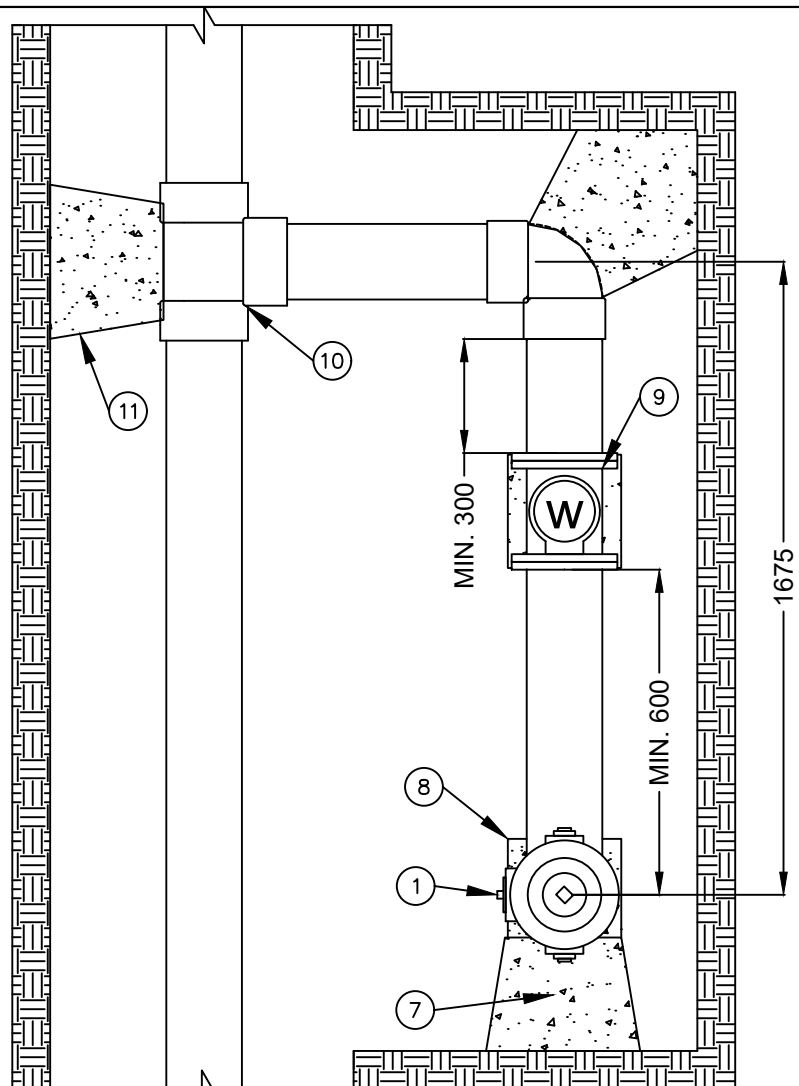
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02 70 60





**ON-LINE INSTALLATION**



**SHORT LEAD INSTALLATION**

**NOTES:**

1. PUMPER NOZZLE SHALL FACE ROADWAY.
2. BODY FLANGE SHALL BE NO MORE THAN 150, AND NO LESS THAN 25 mm ABOVE PREVAILING GROUND ELEVATION
3. BURIAL DEPTH SHALL CONFORM TO THE INSTALLATION DEPTH OF THE WATERMAIN, AND PREVAILING GROUND ELEVATION, AND SHALL BE A MINIMUM OF 2.75 m.
4. DRAIN HOLES SHALL BE OPEN UNLESS OTHERWISE SPECIFIED IN SECTION 01001, SPECIAL PROVISIONS.
5. JOINT TYPE SHALL BE COMPATIBLE WITH THE TYPE OF PIPE USED.
6. DRAIN HOLES SHALL DISCHARGE INTO A MINIMUM 0.2 CUBIC METER OF COARSE GRAVEL OR CRUSHED ROCK.
7. THRUST BLOCK SHALL BE CAST IN PLACE BETWEEN HYDRANT BOOT AND UNDISTURBED SOIL.

8. MINIMUM 300 X 300 X 100 mm CONCRETE PAD.
9. GATE VALVE AND BOX AS PER DETAIL PAGE 20 SECTION 02 70 60
10. TEE ON WATERMAIN.
11. THRUST BLOCK CAST IN PLACE BETWEEN TEE AND UNDISTURBED SOIL.
12. EXTENSION (BARREL AND SPINDLE) UNITS SHALL BE USED TO ADJUST THE ELEVATION OF THE GROUNDLINE FLANGE.
13. HYDRANT BARREL SHALL BE INSTALLED PLUMB.
14. REDUCERS / INCREASERS AS MAY BE REQUIRED SHALL BE INSTALLED TO MAKE 150 mm Ø HYDRANT INSTALLATION COMPATIBLE WITH Ø OF TEE.
15. SAND OR GRANULAR BACKFILL AROUND HYDRANT ASSEMBLY

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**SPECIAL HYDRANT INSTALLATIONS**



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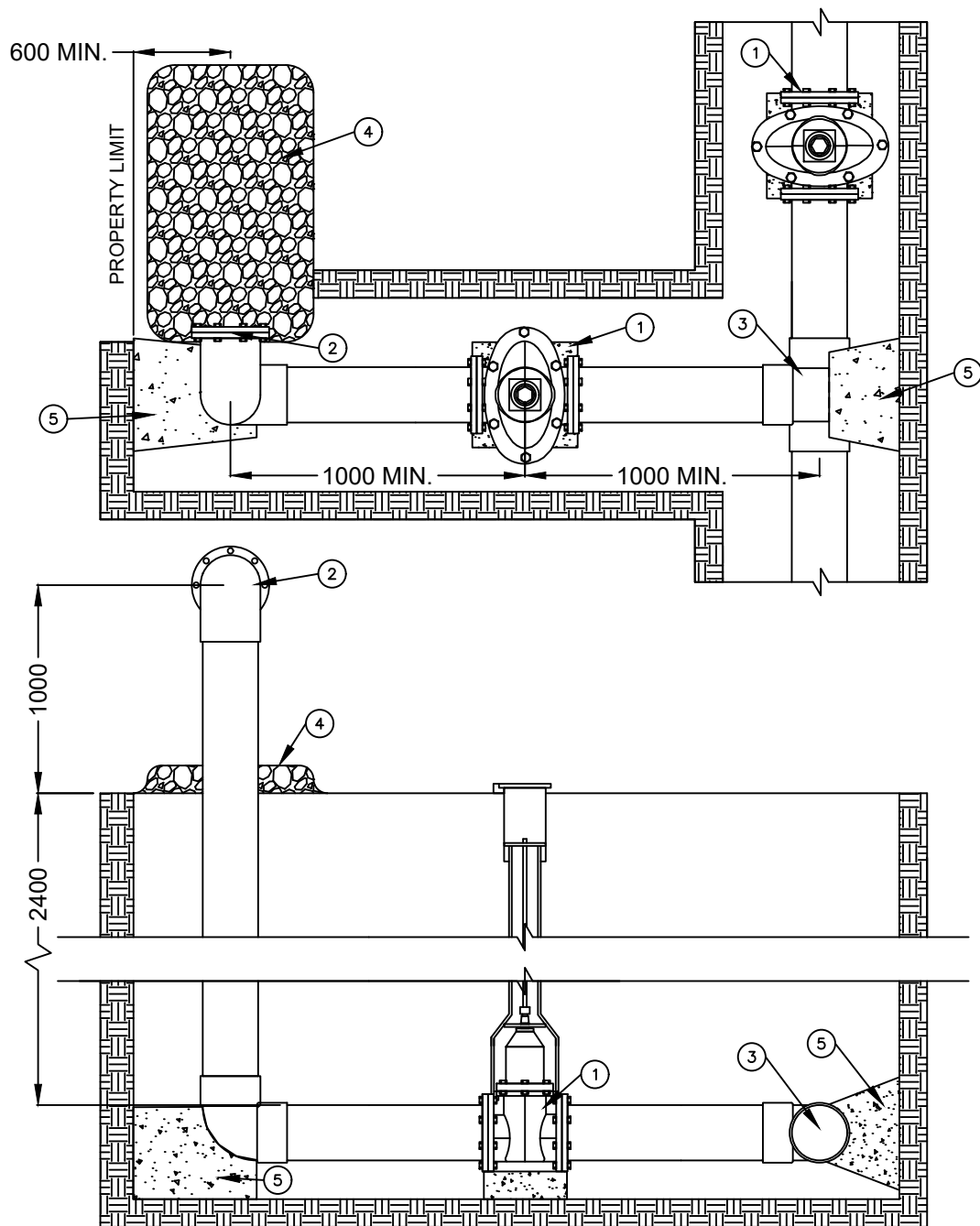
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**SECTION NO:**

02 70 60



- |   |   |
|---|---|
| 1. GATE VALVE AND BOX AS PER DETAIL PAGE 20 SECTION 20 70 60.   | 6. FLUSHOUT ASSEMBLY SHALL BE LOCATED AS DIRECTED BY ENGINEER AT THE SITE.                          |
| 2. SCHED 80 PVC FLUSHOUT STAND PIPE C/W BLIND FLANGE AND BOLTS. | 7. FITTING SIZE AND GATE VALVE SIZE SHALL BE THE SAME AS THE WATER PIPELINE FOR ANY GIVEN ASSEMBLY. |
| 3. TEE INSTALLED ON EXISTING WATER PIPELINE.                    | 8. ALL NUTS, BOLTS, AND WASHERS BURIED UNDERGROUND SHALL BE 304 / 316 STAINLESS STEEL.              |
| 4. RIP RAP, 1000 X 3000 X 600 DEEP.                             |   |
| 5. THRUST BLOCKS AS PER DETAIL PAGE 19 SECTION 20 70 60.        |   |

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

## OFFLINE FLUSHOUT ASSEMBLY



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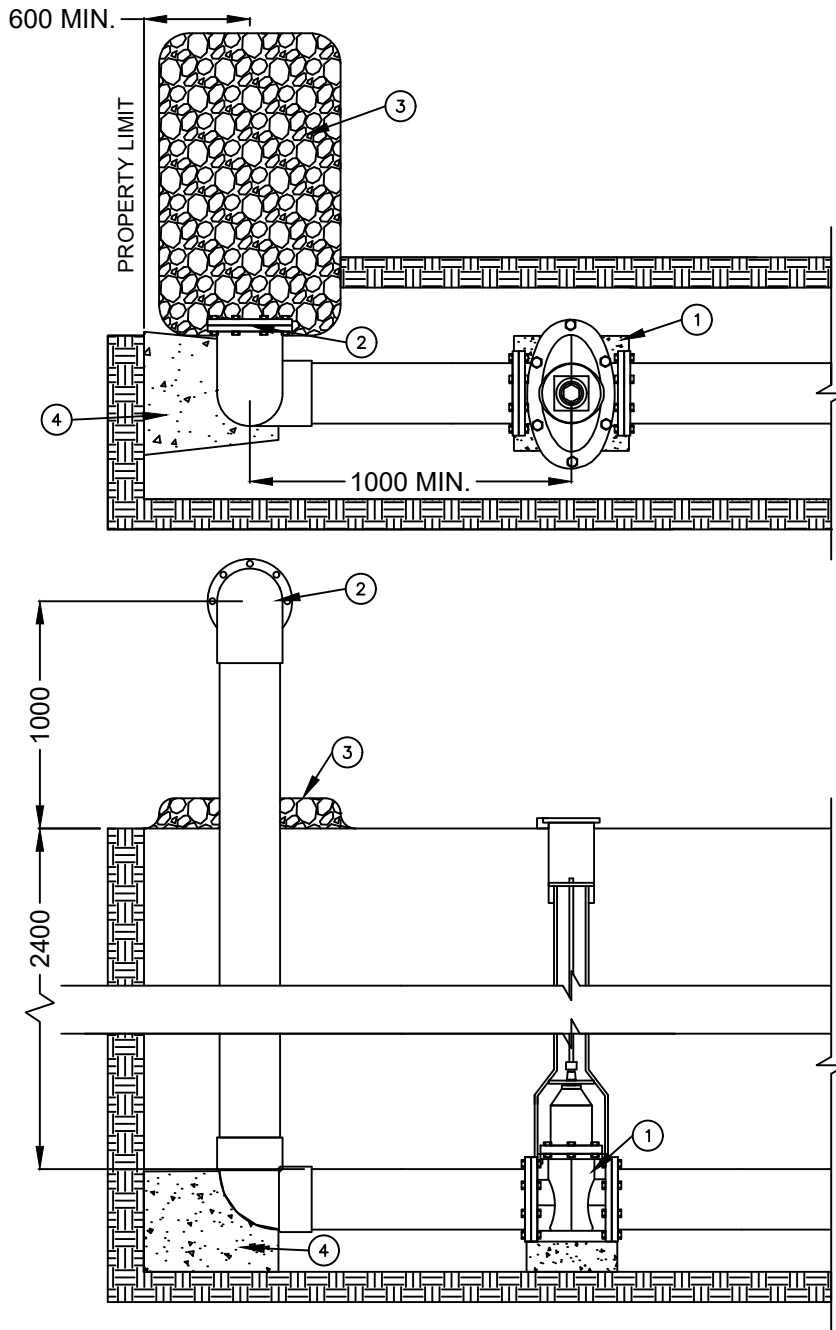
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**SECTION NO:**

02 70 60



1. GATE VALVE AND BOX AS PER DETAIL PAGE 20 SECTION 20 70 60.
2. SCHED 80 PVC FLUSHOUT STAND PIPE C/W BLIND FLANGE AND BOLTS.
3. RIP RAP, 1000 X 3000 X 600 DEEP.
4. THRUST BLOCKS AS PER DETAIL PAGE 19 SECTION 20 70 60.
5. FLUSHOUT ASSEMBLY SHALL BE LOCATED AS DIRECTED BY ENGINEER AT THE SITE.
6. FITTING SIZE AND GATE VALVE SIZE SHALL BE THE SAME AS THE WATER PIPELINE FOR ANY GIVEN ASSEMBLY.
7. ALL NUTS, BOLTS, AND WASHERS BURIED UNDERGROUND SHALL BE 304 / 316 STAINLESS STEEL.
8. END OF LINE FLUSHOUT ASSEMBLIES SHALL BE LOCATED 600 FROM PROPERTY LINE ON PROVINCIAL HIGHWAYS

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

## END OF LINE FLUSHOUT ASSEMBLY



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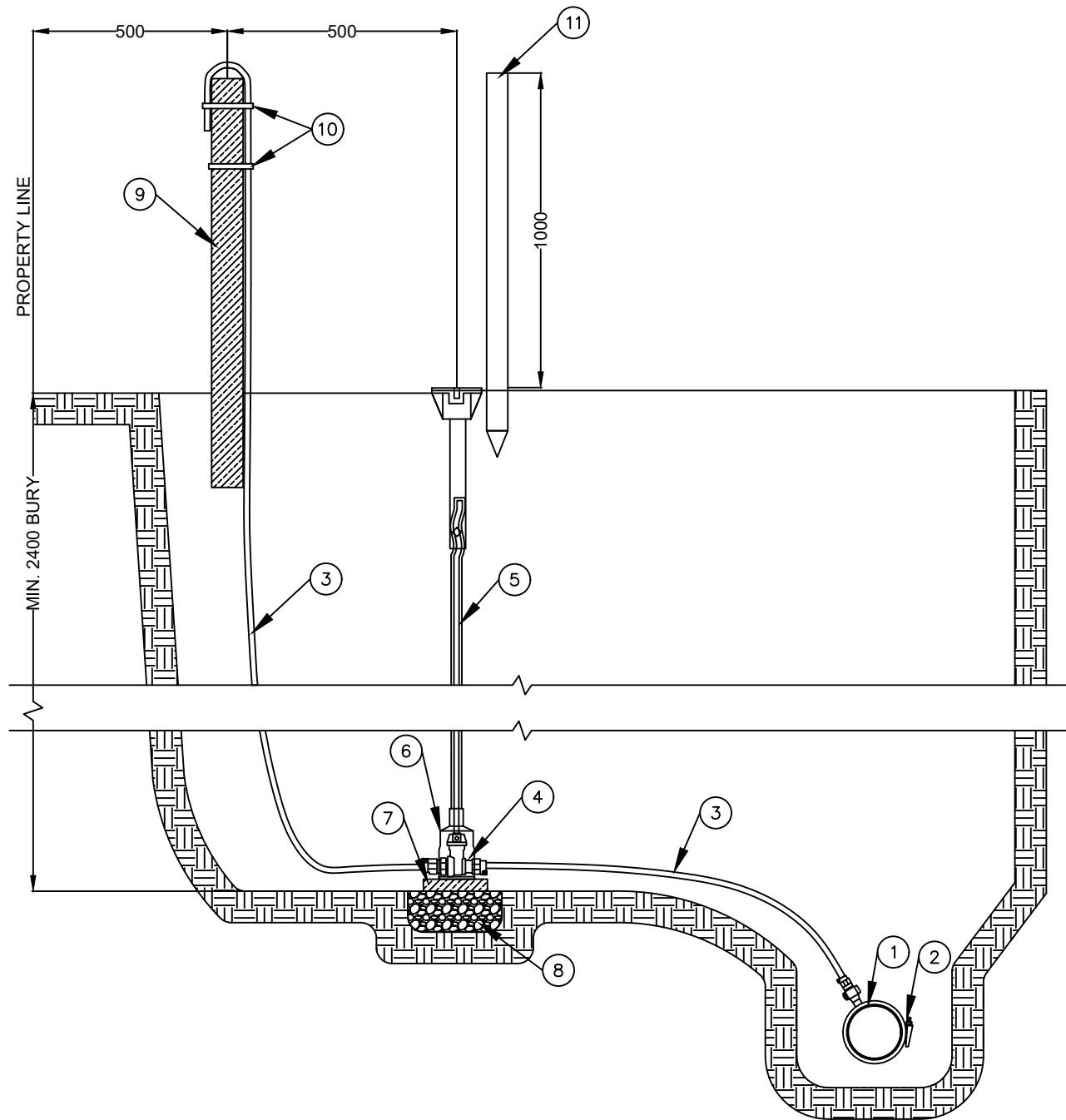
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**SECTION NO:**

02 70 60



1. WATER PIPELINE (VARIOUS SIZES).
2. ALL STAINLESS STEEL SADDLE.
3. TYPE "K" SOFT COPPER TUBING.
4. 19 CURBSTOP C/W DRAIN
5. STAINLESS STEEL ROD.
6. CURBSTOP BOX

7. 38 X 191 X 300 PRESSURE TREATED WOOD PLANK.
8. MIN 0.06m<sup>3</sup> GRAVEL SUMP
9. 100 X 100 PRESSURE TREATED WOODEN FENCE POST.
10. PIPE FASTENERS TO FENCE POST.
11. MARKER POST SEE PAGE 28 FOR DETAILS.

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

## AIR RELEASE INSTALLATION



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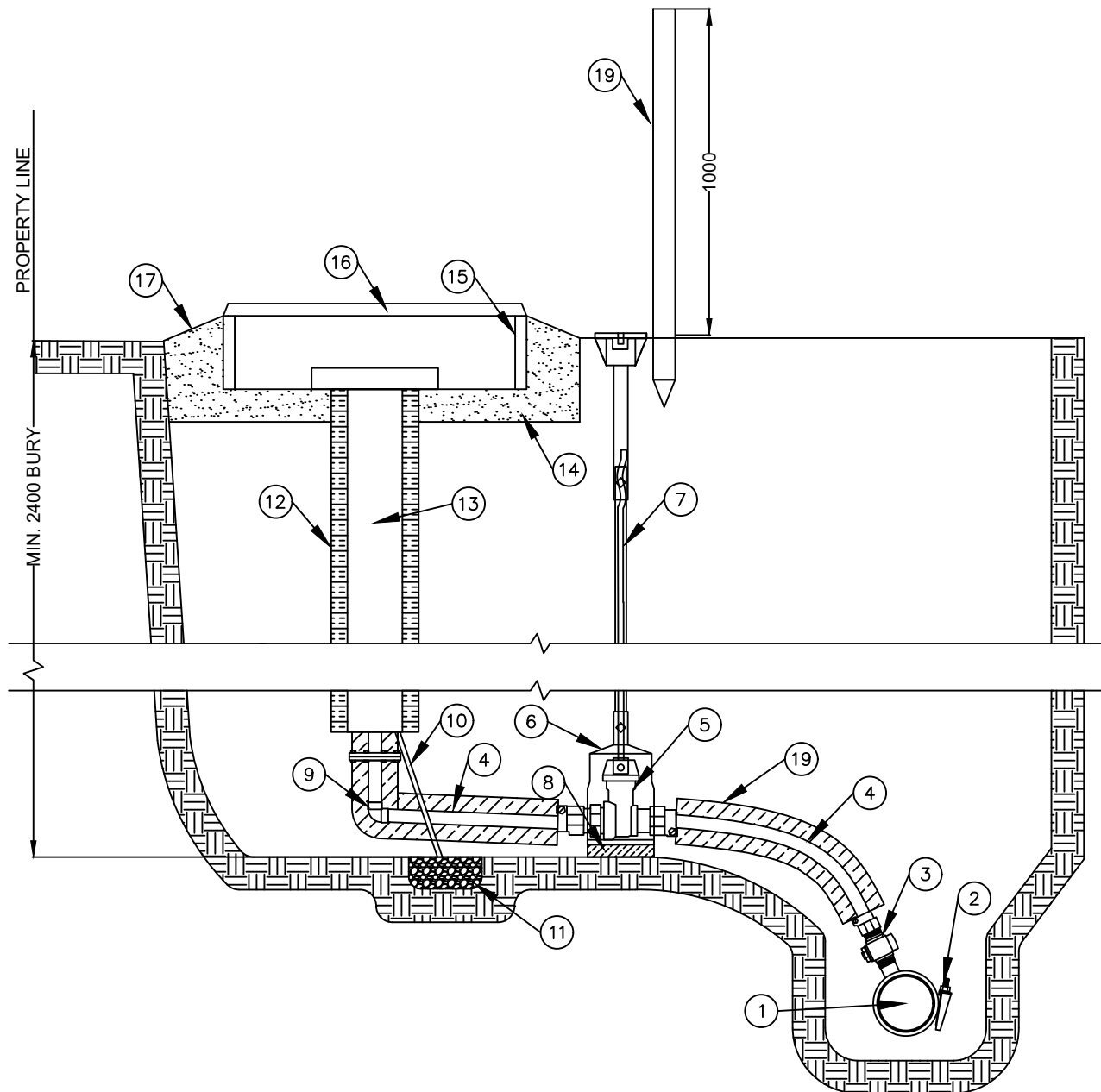
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**SECTION NO:**

02 70 60



- |  |   |
|--|---|
| 1. WATER PIPELINE (VARIOUS SIZES).               | 12. 50 HI-40 INSULATION.  |
| 2. ALL STAINLESS STEEL SADDLE.                   | 13. AIR /VAC / COMBO VALVE.   |
| 3. 50 MAIN STOP.                                 | 14. COMPACTED GRANULAR FILL.  |
| 4. 50 HDPE DR-17, SLOPED TOWARDS WATER PIPELINE. | 15. 1200 PRECAST CONCRETE OR COMPOSITE RING.  |
| 5. 50 CURBSTOP NO DRAIN                          | 16. MH FRAME WITH LIGHT ALUMINUM OR COMPOSITE LOCKABLE COVER.                             |
| 6. CURBSTOP BOX                                  | 17. POSITIVE DRAINAGE.  |
| 7. STAINLESS STEEL ROD.                          | 18. MARKER POST.  |
| 8. 38 X 191 X 300 PRESSURE TREATED WOOD PLANK.   | 19. ALL PIPE ABOVE STANDARD BURIAL DEPTH TO BE INSULATED BY PIPE INSULATION OR USE SD-18. |
| 9. ELBOW.  |   |
| 10. DRAIN.                                       |   |
| 11. MIN. 0.5m <sup>3</sup> GRAVEL SUMP.          |   |

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

## AIR - VAC VALVE INSTALLATION



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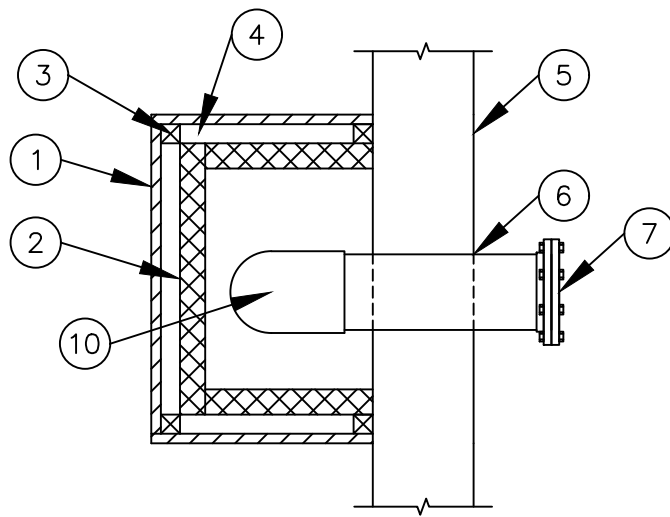
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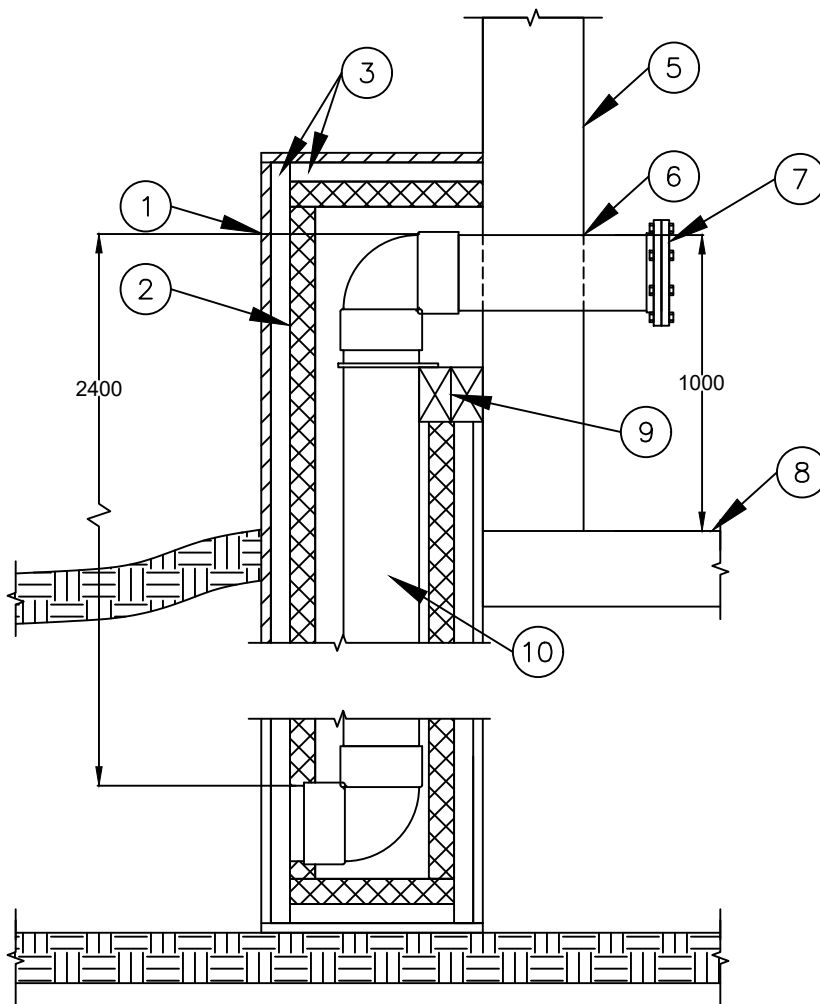
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**SECTION NO:**

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PLAN VIEW



1. 19 CONTINOUS PRESSURE TREATED PLYWOOD
2. 50 RIDGED INSULATION
3. 38 X 38
4. 38X38 CROSS BRACES @ 600
5. WALL
6. CORED HOLE THROUGH WALL
7. BLIND FLANGE
8. FLOOR
9. 2 - 38X88 @ 600 RAMSET TO WALL C/W PIPE SUPPORTS
10. PIPE

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**FROST BOX**



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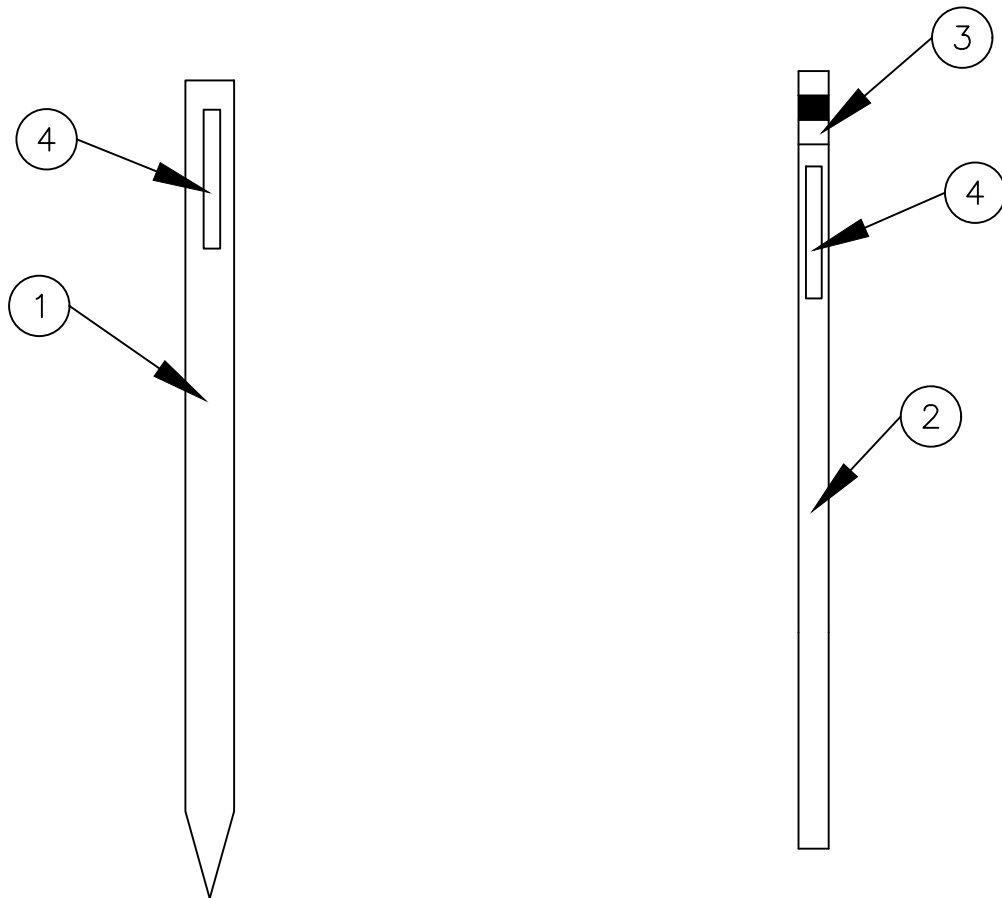
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**SECTION NO:**

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1. DRIVABLE, FLEXIBLE, BLUE MARKER.
2. 90 WHITE POLYPOST.
3. THREE 90 BANDS FULL CIRCUMFERENCE, 2 BANDS ORANGE RETRO-REFLECTIVE SHEETING MIN. LEVEL 3 (HIGH INTENSITY), 1 BAND OF BLACK VINYL.
4. INFORMATION STICKERS SUPPLIED BY OWNER.

MARKER POST LOCATIONS:

- VALVES
- CURB STOPS
- AIR RELEASES
- FLUSHOUT ASSEMBLIES
- METER CHAMBERS
- PRESSURE REDUCING CHAMBERS
- RAILWAY CROSSINGS
- WATERWAY CROSSINGS
- GAS / OIL PIPELINE CROSSINGS
- PR / PTH R.O.W. CROSSINGS

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**MARKER POSTS**



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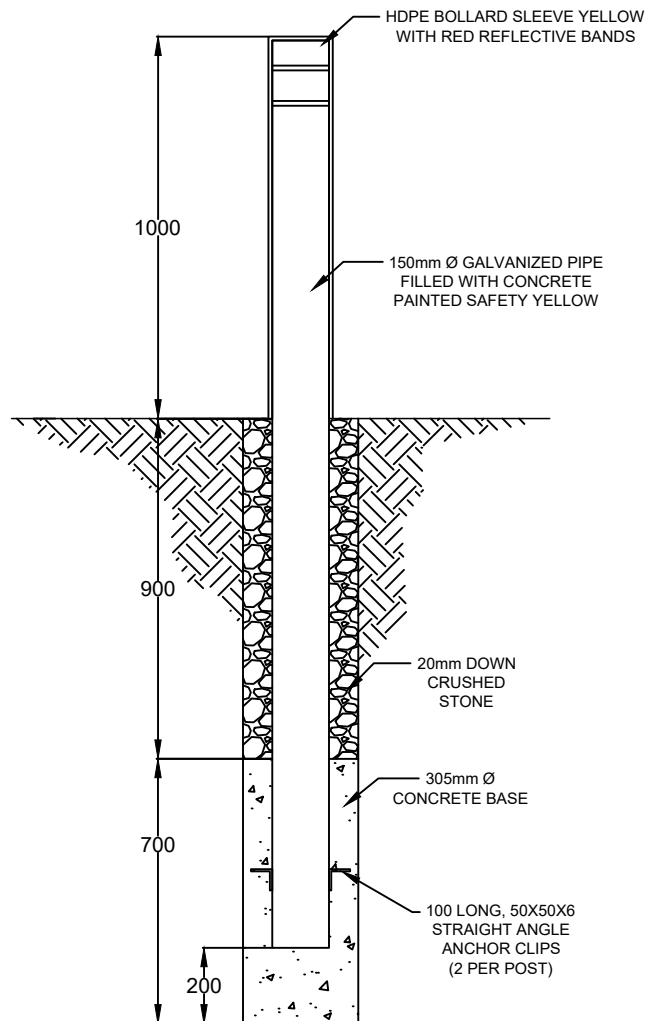
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**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**BOLLARDS**



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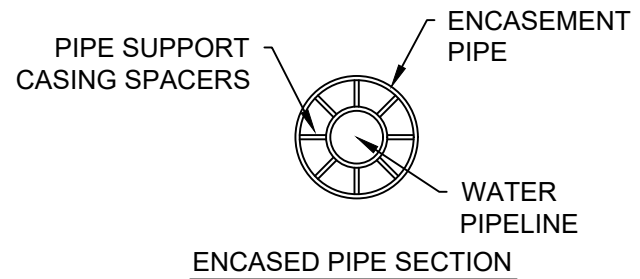
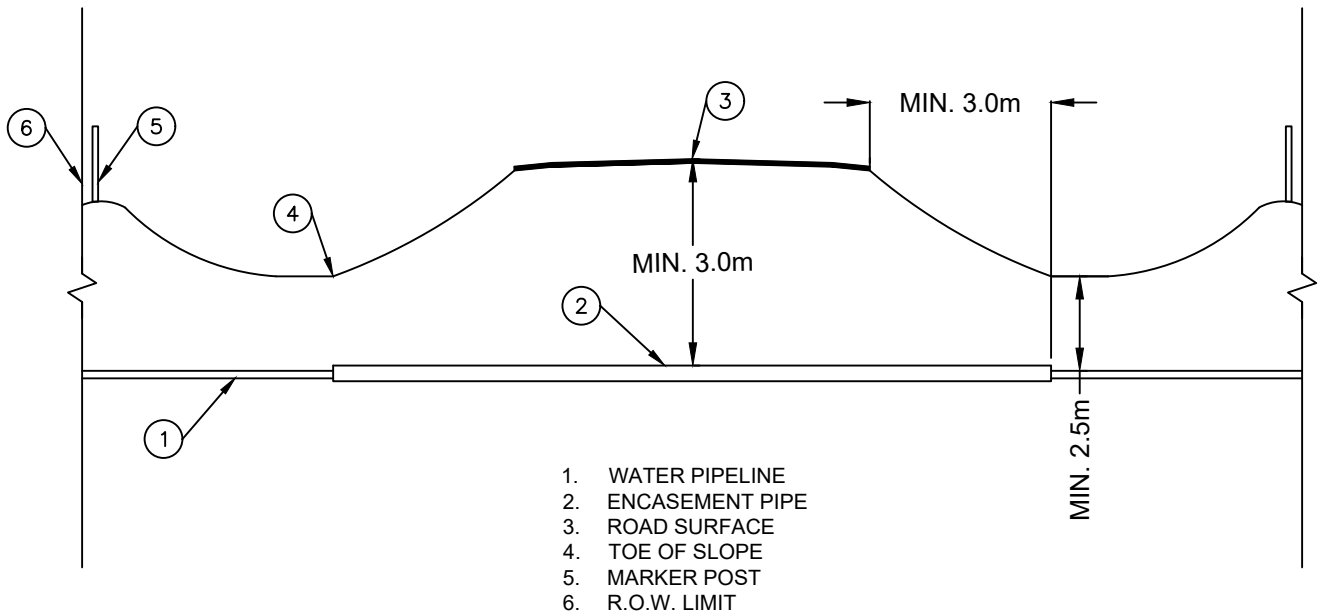
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02 70 60





**NOTES:**

- ENCASEMENT PIPE SHALL BE AT LEAST SERIES 160 PVC OR DR 17 HIGH DENSITY POLYETHYLENE.
- ENCASEMENT PIPE Ø FOR HDPE SHALL BE 50mm LARGER THAN THE Ø OF THE PIPELINE UP TO AND INCLUDING 100mm.
- ENCASEMENT PIPE Ø FOR PVC SHALL BE 50mm LARGER THAN THE Ø OF THE BELL OF THE PIPELINE UP TO AND INCLUDING 100mm.
- ENCASEMENT PIPE Ø FOR HDPE AND PVC SHALL BE 100mm LARGER THAN THE Ø OF THE PIPELINES FOR PIPELINES LARGER THAN 100mm.
- ENCASEMENT SHALL EXTEND A MINIMUM OF 3 METERS BEYOND THE EDGE OF THE SHOULDER OF THE ROADWAY OR TO THE TOE OF THE GRADE SLOPE/SIDE SLOPE OF THE ROADWAY WHICHEVER IS GREATER.
- THE DESIRED ANGLE OF CROSSING IS BETWEEN 70-90°
- PIPE SUPPORT CASING SPACERS REQUIRED FOR PVC ENCASEMENT ONLY.

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
PROVINCE OF MANITOBA

**PR & PTH CROSSING**



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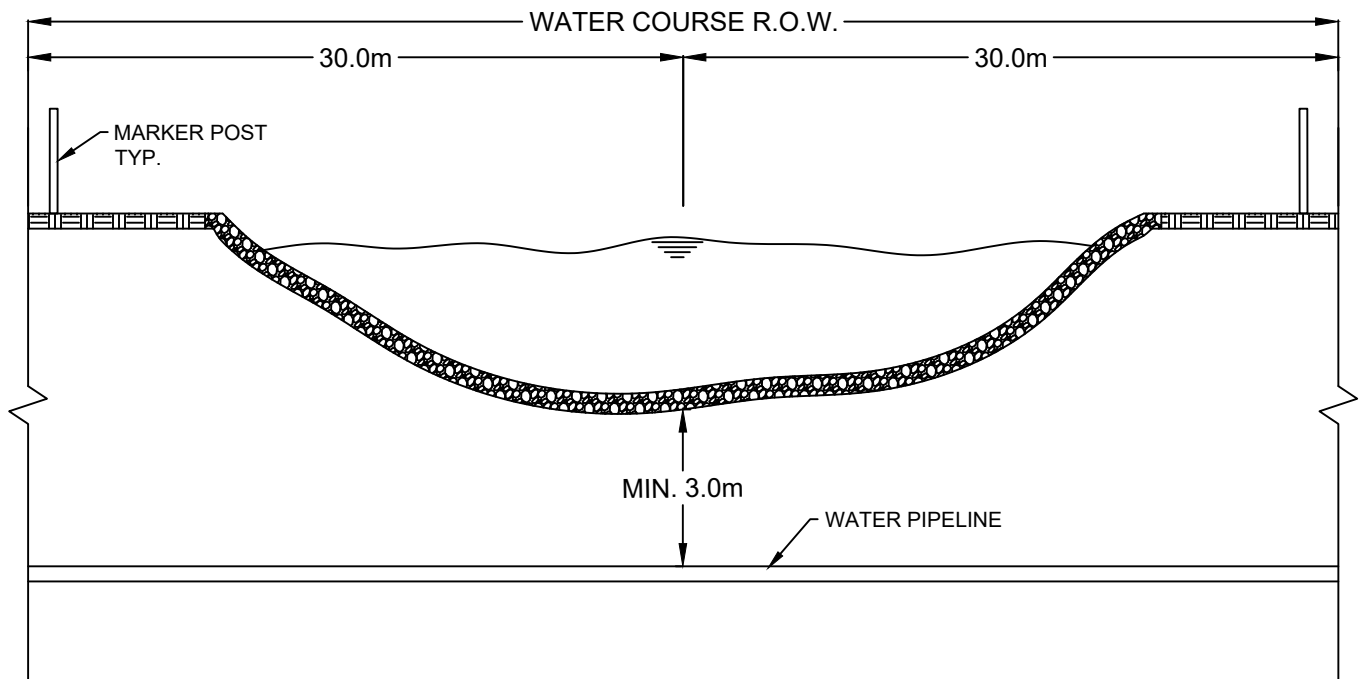
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02 70 70



- PIPE TO BE BURIED AT A DEPTH OF AT LEAST 3.0m FROM THE LOWEST POINT OF THE WATER COURSE AND THAT ELEVATION MAINTAINED THROUGHOUT R.O.W
- WHERE THE WATER COURSE R.O.W. IS NOT DEFINED, THE R.O.W. SHALL BE ASSUMED AS 30.0m ON EITHER SIDE OF THE CENTERLINE OF THE WATER COURSE.
- NO CONSTRUCTION SHALL TAKE PLACE WITHIN WATER COURSE R.O.W.

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

## WATER COURSE CROSSING



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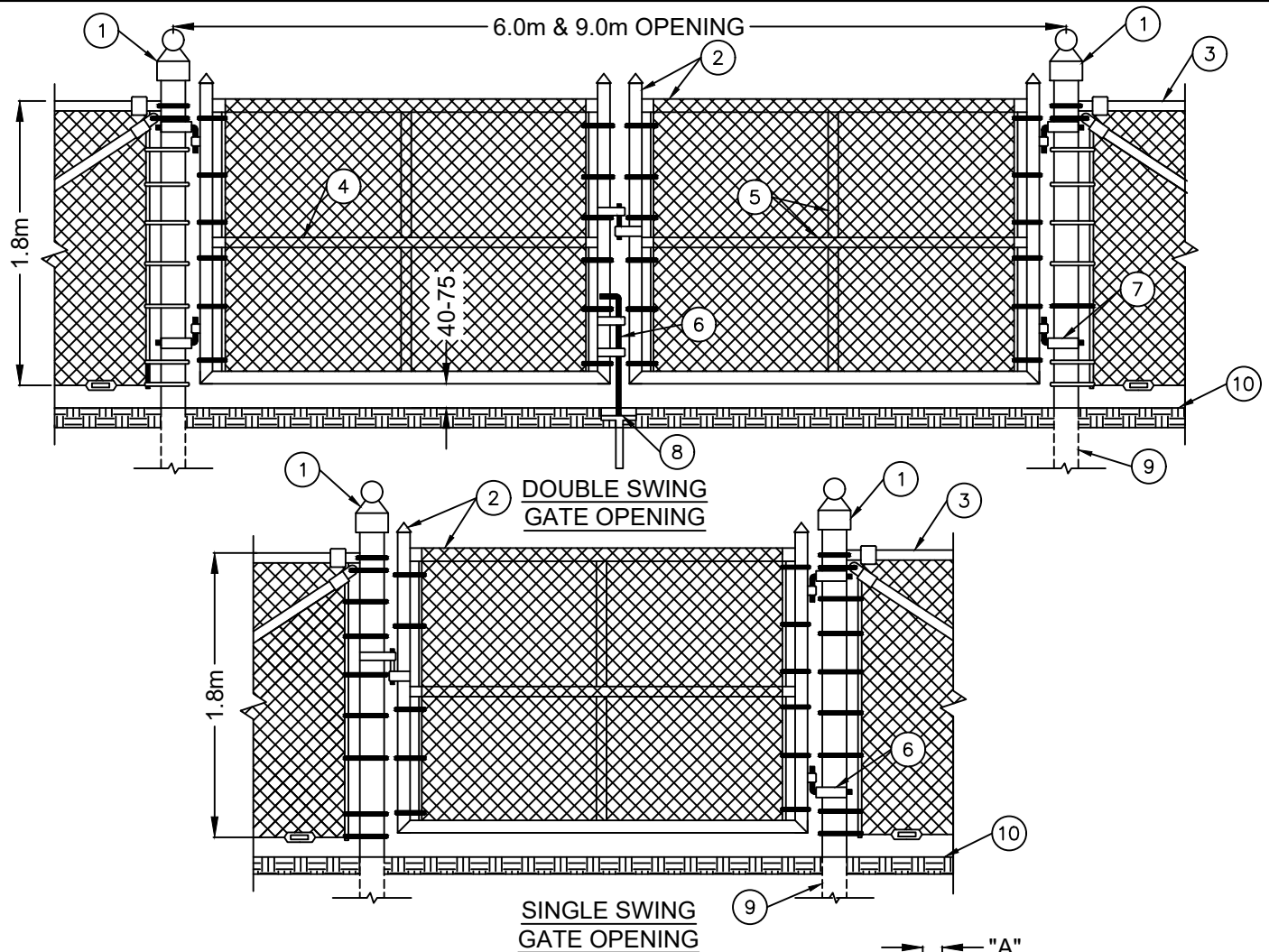
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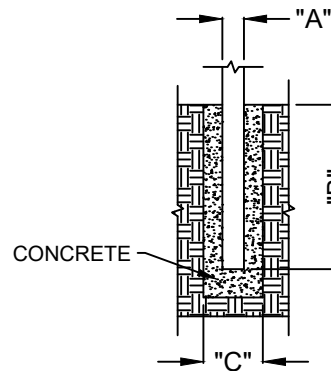
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**SECTION NO:**

02 70 80



1. GATE POST.
2. FRAME MEMBER.
3. TOP RAIL OR TOP WIRE.
4. INTERNAL BRACES 31.8mm MIN.
5. GATE LEAVES GREATER THAN 3.6m IN WIDTH ARE SUPPLIED WITH DIAGONAL BRACES.
6. DROP BOLT.
7. HINGE BOLT.
8. STEEL GATE CENTER REST
9. FOOTING, SEE DETAIL.
10. GROUND LINE



**GATE & POST DETAILS**

GATE TYPE & MAX OPENING(m)	FRAME MEMBER MIN. OD(mm)	POST DIA MIN. OD(mm)	POST LENGTH STANDARD(m)
SINGLE SWING			
3.0 DOUBLE SWING 6.0	42.9	88.9	2.6
SINGLE SWING 4.5 DOUBLE SWING 9.0	48.3	114.3	2.9

**FOOTING DETAILS**

POST OD(mm) "A"	FOOTING DEPTH(mm) "B"	POST HOLE WIDTH(mm) "C"
60.3	915.0	250.0
88.9	1370.0	350.0
114.3	1520.0	450.0

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

## CHAIN LINK FENCE GATES



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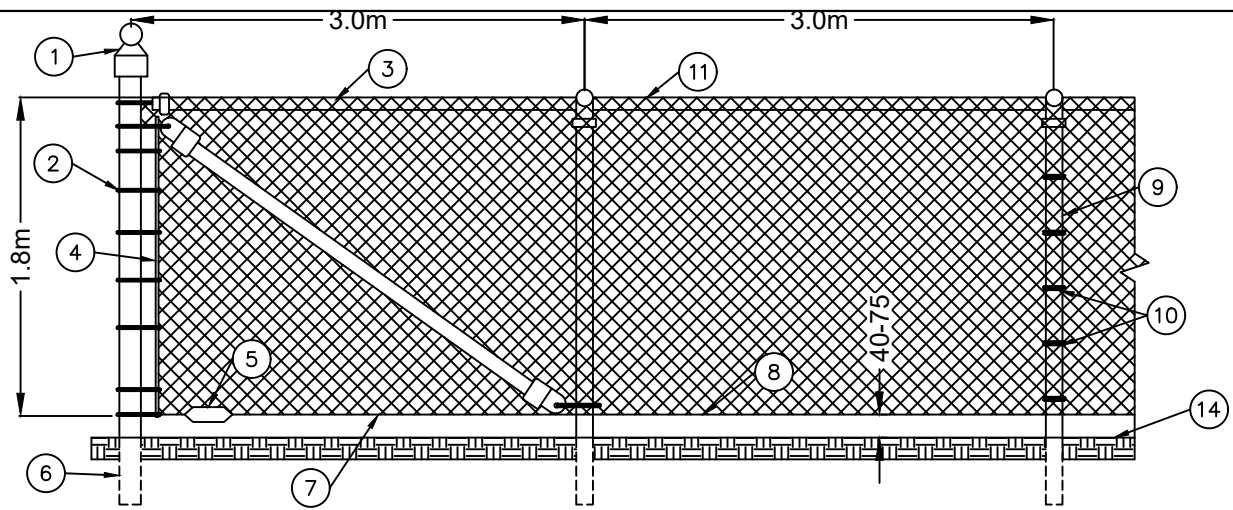
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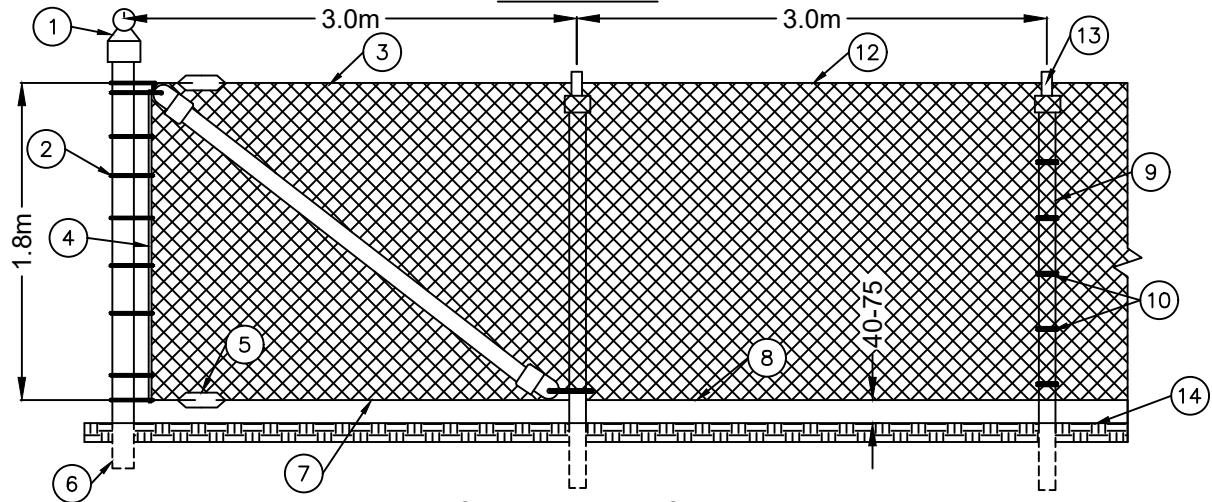
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**SECTION NO:**

02 71 10



**CHAIN LINK FENCE  
W/ TOP RAIL**

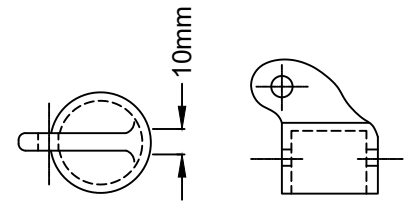


**CHAIN LINK FENCE  
W/ TOP WIRE**

- |  |  |
|--|--|
| 1. TERMINAL POST.                          | 8. KNUCKLED BOTTOM EDGE.                 |
| 2. STRETCHER BAR BANDS 400mm OC.           | 9. LINE POST.                            |
| 3. 42.9mm TOP RAIL.                        | 10. FASTENERS @ 400mm OC.                |
| 4. STEEL STRETCHER BAR, 5 X 19mm MIN.      | 11. BARBED TOP EDGE, FASTENERS 500mm OC. |
| 5. DROP FORGED TURNBUCKLE.                 | 12. 5mm Ø TOP WIRE, FASTENERS 500mm OC.  |
| 6. SEE FOOTING DETAIL ON PAGE 31.          | 13. LINE POST CAP, SEE DETAIL.           |
| 7. 3.5mm Ø BOTTOM WIRE, FASTENED 500mm OC. | 14. GROUND LINE.                         |

#### POST DETAILS

POST TYPE	OD(mm)	POST DIA MIN. OD(mm)		POST LENGTH STANDARD(m)
		STANDARD(m)	RETAINING WALLS(m)	
LINE POST	60.3	2.6	2.0	88.9
END, CORNER, OR STRAINING POST	88.9	2.9	2.3	114.3



**LINE POST CAP, 62mm ID  
DETAIL**

**STANDARD CONSTRUCTION SPECIFICATIONS**  
**THE MANITOBA WATER SERVICES BOARD**  
PROVINCE OF MANITOBA

#### CHAIN LINK FENCE



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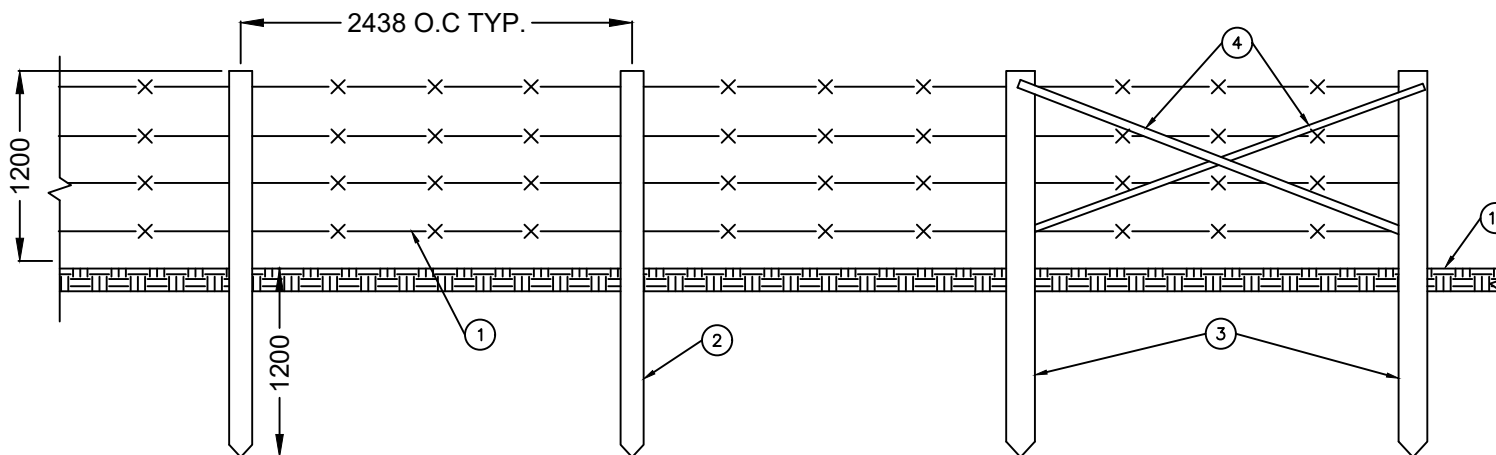
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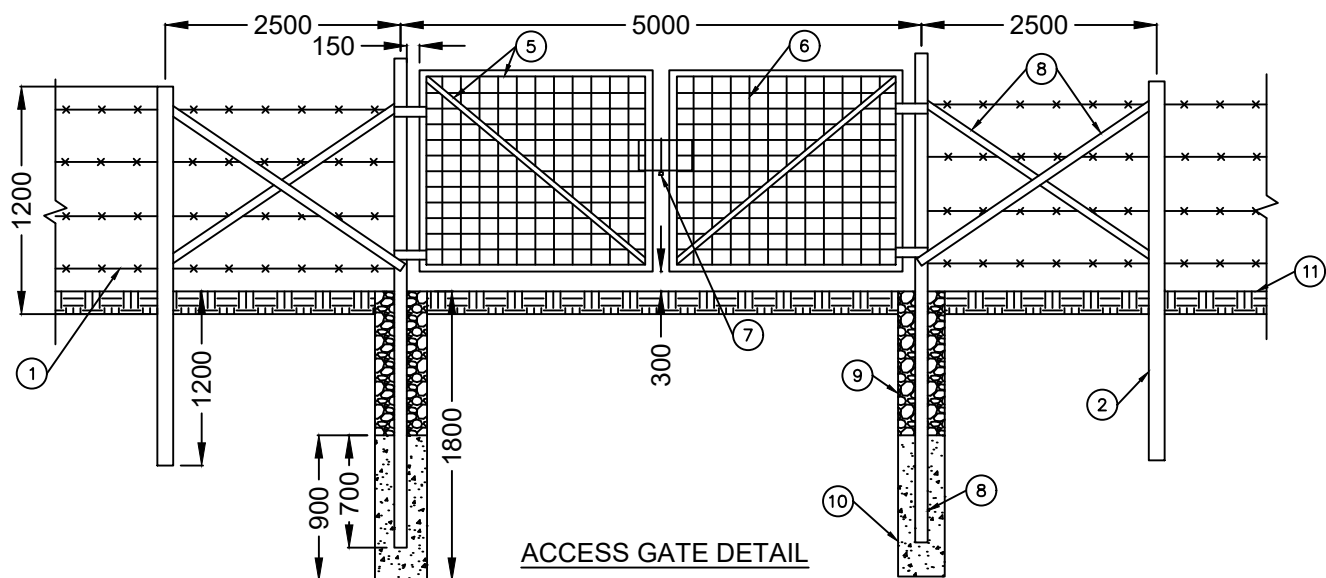
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**SECTION NO:**

02 71 10



**FENCE DETAIL**



**ACCESS GATE DETAIL**

1. 4 STANDS OF 12 GA. BARBED WIRE @ 300 SPACING
2. 90 Ø TREATED WOOD LINE POST.
3. 150 Ø TREATED WOOD CORNER POST.
4. 50 Ø TREATED WOOD LINE POST FOR CROSS BRACING. BRACING TO BE PROVIDED IN BOTH DIRECTIONS OF CORNER POST.

5. 43 Ø O.D GALV. STEEL PIPE.
6. 150 X 150 ENTRANCE GATE FABRIC.
7. LOCKING MECHANISM.
8. 90 Ø GALVANIZED STEEL PIPE.
9. CRUSHED STONE TAMPED IN PLACE.
10. 300 Ø CONCRETE FOOTING.
11. GROUND LINE.

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

**BARB WIRE FENCE**



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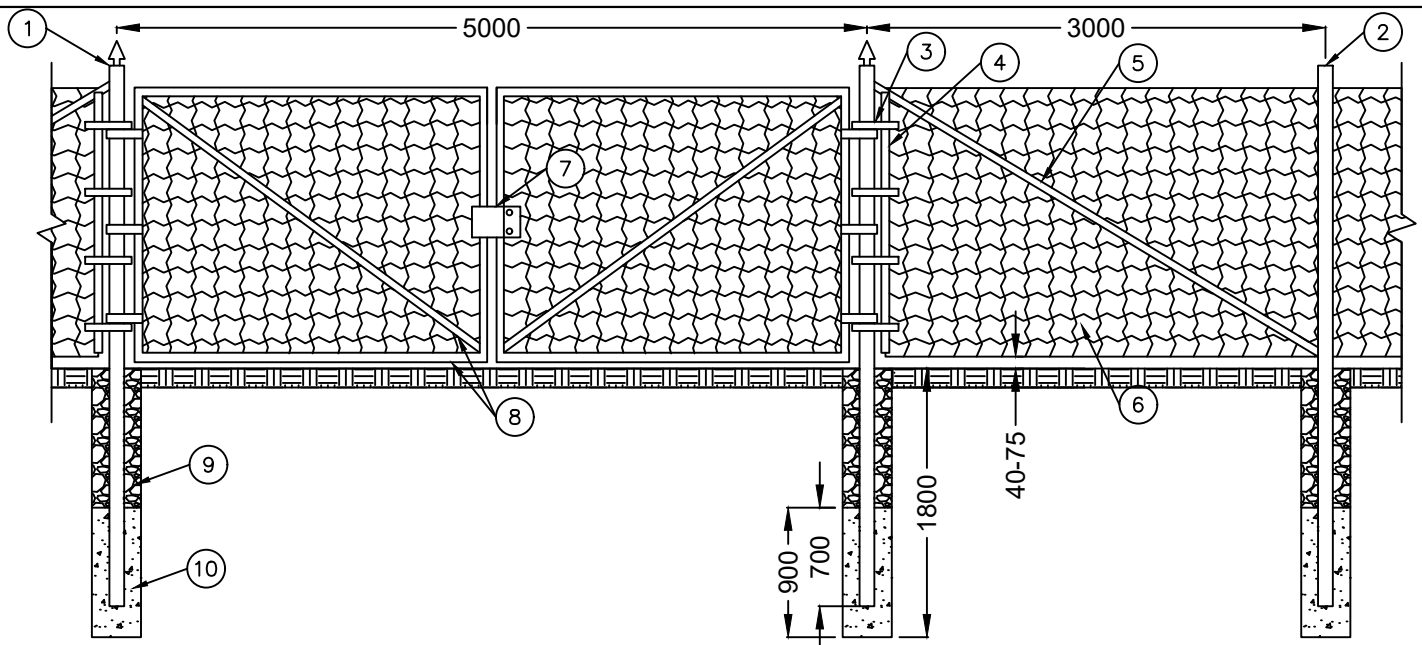
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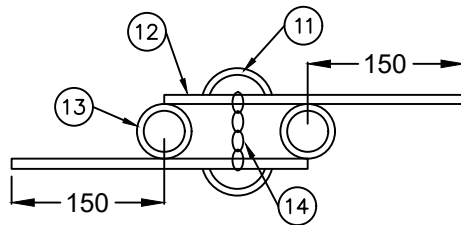
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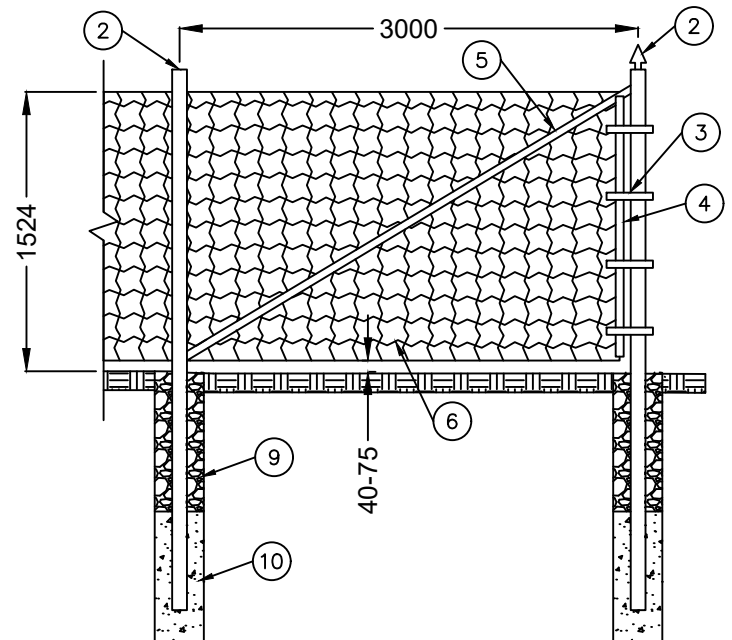
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ACCESS GATE DETAIL



LOCK DETAIL



CORNER POST

1. 90 O.D. GATE POST.
2. 90 O.D. CORNER POST OR TERMINAL POST.
3. TENSION BAND.
4. TENSION BAR.
5. 43 O.D. BRACE RAIL.
6. FIXED KNOT FENCE (10/60/6)
7. LOCKING MECHANISM.
8. 45 O.D. GALV. STEEL PIPE.
9. TAMPED CRUSHED STONE.

10. 300 Ø CONCRETE FOOTING.
11. 10 Ø ROD BENT TO 40 RADIUS, WELDED TO STEEL PLATE (TYP)
12. 200 WIDE BY 7 THICK STEEL PLATE, LENGTH TO BE FIELD DETERMINED TO PROVIDE 150 MIN OVERLAP. WELDED TO GATE FRAME.
13. GATE FRAME.
14. LOCK & CHAIN.

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

## MESH FENCE



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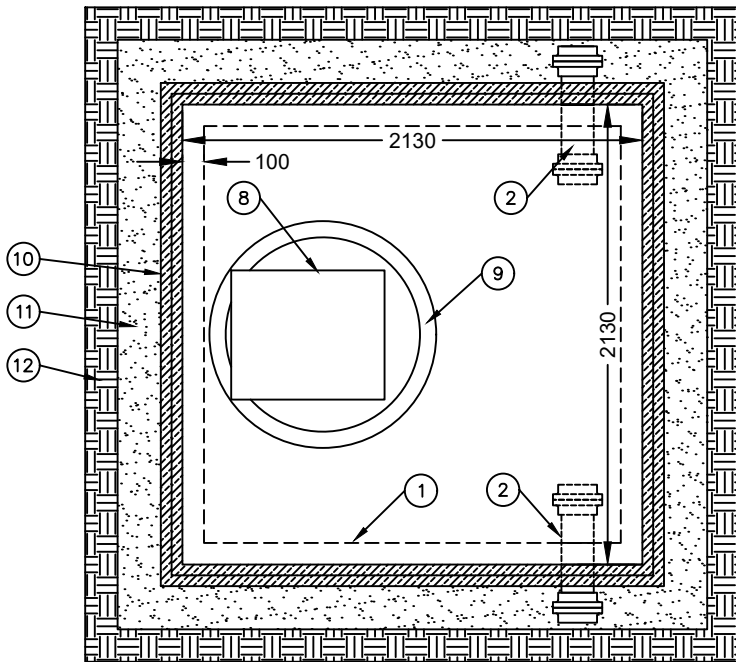
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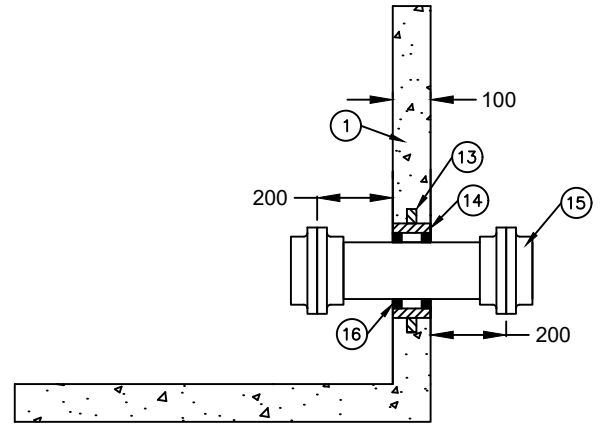
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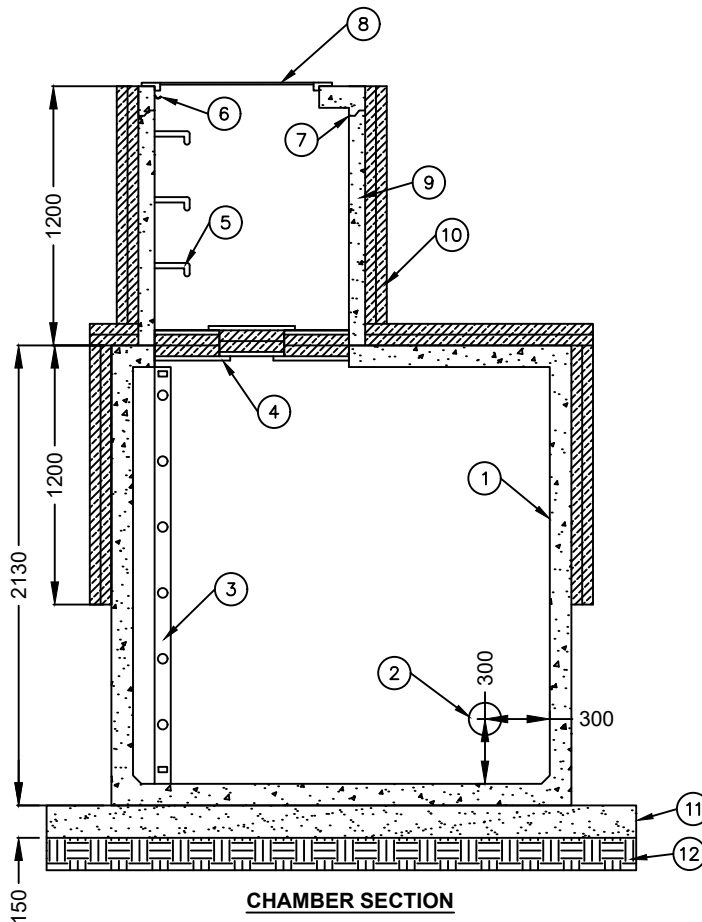
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**CHAMBER PLAN**



**PUDDLE CAST DETAIL**



**CHAMBER SECTION**

1. PRECAST CONCRETE CHAMBER, DAMP PROOF ALL EXTERIOR SURFACES WITH BITUMINOUS SEALANT (FACTORY APPLIED).
2. HOLE TO SUIT PIPELINE C/W PUDDLE CAST, SEE DETAIL.
3. ALUMINUM LADDER INCHORED TO TOP & BASE OF CHAMBER.
4. INSULATED HATCH IN THREE SECTIONS WITH REMOVAL ROPES (100 RIDGED INSULATION, 20 PRESSURE TREATED PLYWOOD BOTH SIDES, BOLTED TOGETHER, 50 OVERLAP BETWEEN SECTIONS).
5. ALUMINUM RUNGS @ 305.
6. ROPE HANGER.
7. SEALED JOINTS RAM-NEK GASKET OR EQUIVALENT.
8. ALUMINUM, COMPOSITE, OR GALVANIZED STEEL HINGED RECTANGULAR GASKETED COVER (0.6m<sup>2</sup>) C/W LOCKABLE HANDLE.
9. MANHOLE RISER 914 I.D., 3 MIL POLY WRAP AROUND RISER.
10. 100 RIDGED INSULATION.
11. COMPACTED GRANULAR BASE EXTENDED 300 AROUND CHAMBER.
12. UNDISTURBED GROUND.
13. PUDDLE FLANGE.
14. STAINLESS STEEL SCHED 40 PIPE SLEEVE.
15. FLANGED CONNECTION TO SUIT PIPE TYPE.
16. LINK SEAL, BOTH SIDES.
17. REBAR & CONCRETE SHALL BE MANUFACTURES DESIGN.
18. PRECAST CONCRETE CHAMBERS SHALL HAVE DIMENSIONS ±50mm.
19. USE LINKSEAL ON ALL PIPES PASSING THROUGH CHAMBER WALLS.
20. GROUT ALL JOINTS AND LIFTING HOLES AS REQUIRED TO PROVIDE A LEAKPROOF CHAMBER.
21. PROVIDE POLY WRAP AND EXTERNAL MANHOLE CHIMNEY SEAL ON MANHOLE/CHAMBER JOINT.

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

## CHAMBER



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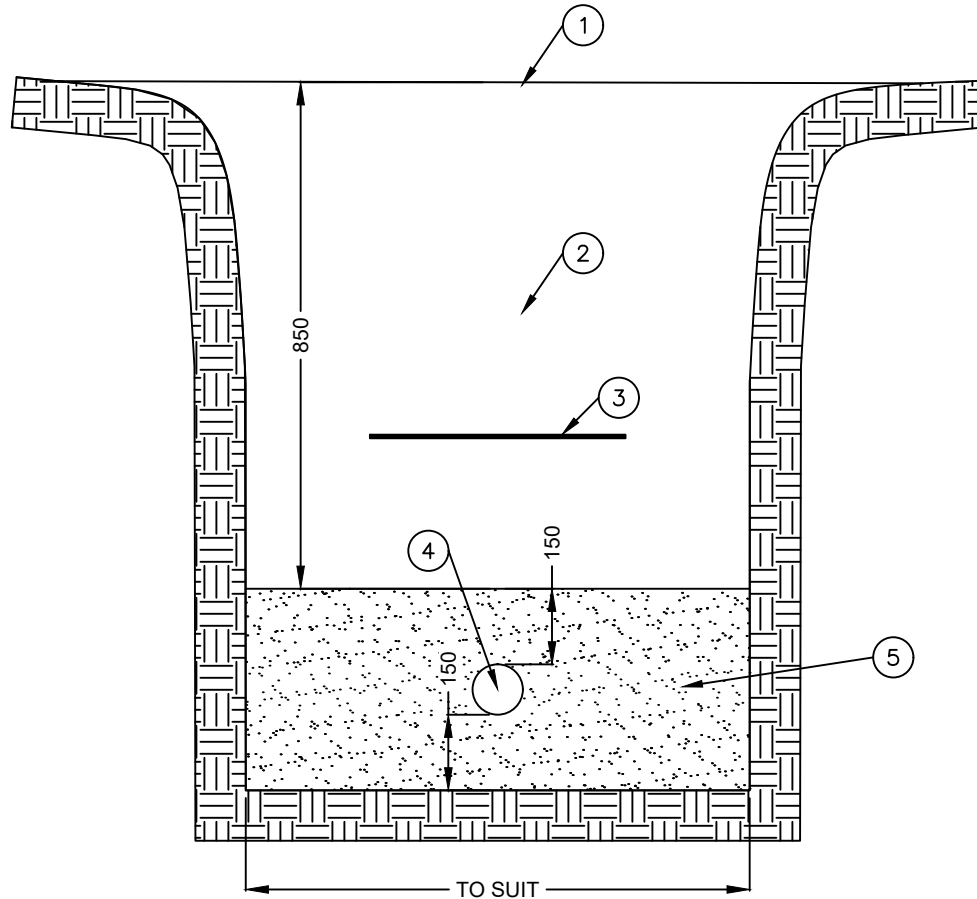
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**SECTION NO:**

02 72 80



1. FINISHED GRADE.
2. COMPACTED COMMON BACKFILL (95% MAX STANDARD PROCTOR DRY DENSITY).
3. 150 MARKING TAPE LABELED "BURIED ELECTRICAL CABLE".
4. CONTROL / POWER CABLE (DIRECT BURIED TECK).
5. BEDDING SAND.
6. ALL DIRECT BURIED CABLES, DUCTS, ETC., CROSSING OVER EACH OTHER OR OVER/UNDER OTHER TYPES OF UNDERGROUND SERVICE SHALL BE ENCASED IN WOOD PLANKS.
7. TREATED WOOD PLANKS SHALL BE PROVIDED OVER ALL BURIED CABLES, ETC., AND UNDER EXISTING OR FUTURE ROADS AND SIDEWALKS, WHEN INSTALLED IN AN OPEN TRENCH.
8. SLEEVES SHALL BE PROVIDED UNDER ALL PARKING, CONCRETE AND TRAFFIC AREAS.
9. WHERE CABLES ENTER THE BUILDING A VERTICAL 100 X 250 MM WHITE SIGN WITH BLACK WORDING ELECTRICAL CABLES SHALL BE SECURELY FASTENED TO THE BUILDING WALL APPROXIMATELY 300 MM ABOVE FINISHED GRADE.

STANDARD CONSTRUCTION SPECIFICATIONS  
**THE MANITOBA WATER SERVICES BOARD**  
 PROVINCE OF MANITOBA

## BURIED CABLE DETAIL



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**SECTION NO:**

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