

# STORMWATER DRAWINGS

## TABLE OF CONTENTS

		<u>DELETED</u>
313.	PIPE BEDDING & TRENCH BACK FILL - STORM & SANITARY SEWER & WATER PIPE	603 604
601-1.	FLOW CONTROL MANHOLE, PAGE 1 OF 2	610-2
601-2.	FLOW CONTROL MANHOLE, PAGE 2 OF 2	613-1
602-1.	HIGH FLOW BYPASS MANHOLE, PAGE 1 OF 2	615
602-2.	HIGH FLOW BYPASS MANHOLE, PAGE 2 OF 2	618
605.	PIPE ANCHOR WALL	
606.	BORE CASING	
607.	POLLUTION CONTROL MANHOLE	
608.	MANHOLE FOR LARGE DIAMETER PIPE (PIPE 27" AND LARGER)	
609.	PRECAST CURB INLET 1 1/2 A, 2 1/2 A, 4 A	
610-1.	CATCH BASIN	
610-3.	FRAMES AND GRATES G-1, G-2, TYPE 3	
610-4.	TYPE G-1, G-2, TYPE 3 CATCH BASIN WITH SUMP	
610-5.	TYPE 4 CATCH BASIN DETAIL	
611-1.	AREA DRAINAGE BASIN OR FIELD INLET	
611-2.	DITCH INLET	
612.	STORM SEWER SERVICE	
613-2.	POLLUTION CONTROL MANHOLE WITH OUTSIDE DROP	
614.	CARRY THROUGH MANHOLE - STORM	
616.	SUBSURFACE DRAIN DETAIL	
619.	ROADSIDE STORMWATER PLANTER - PLAN VIEW	
620.	ROADSIDE STORMWATER PLANTER - ELEVATION	
621.	ROADSIDE STORMWATER PLANTER - SECTION	
622.	ROADSIDE STORMWATER PLANTER - DETAIL	
623.	CURB CUT SCUPPER AND SEDIMENT CATCH BASIN	
624.	ROADSIDE STORMWATER PLANTER - CONCRETE CHECK DAM	
625.	WATERPROOF LINER ATTACHMENT AND PIPE BOOT	
626.	BEEHIVE OVERFLOW STRUCTURE	
627.	STORMWATER PLANTER FACILITY CLEANOUTS	
630.	ROADSIDE STORMWATER PLANTER - PLANT SPACING	
631.	TREE WELL IN STORMWATER PLANTER	
632.	STORM OUTFALL	
633.	CHAIN LINK FENCE AND GATE	



WITHIN STREET OR  
SURFACED AREAS

OUTSIDE STREET OR SURFACED AREAS  
AS APPROVED BY CITY ENGINEER

SEE NOTE 3

EXISTING  
SECTION

CLASS B 3/4"-0"  
GRANULAR BACKFILL  
COMPAKTED TO 95%  
MAXIMUM RELATIVE  
DENSITY AS PER  
AASHTO T180.

SEE NOTE 7 FOR  
ARTERIAL & COLLECTOR  
STREET DESIGNATIONS.

CLASS A NATIVE TO 85%  
MAXIMUM RELATIVE DENSITY  
AS PER AASHTO T99.

VARIABLE DEPTH OF CUT

PIPE ZONE

12"

BEDDING

6"

PIPE DIA. + 18"  
MINIMUM

PIPE BEDDING &  
ZONE MATERIAL 3/4"-0".

TRENCH FOUNDATION  
STABILIZATION AS  
REQUIRED.

NOTES:

1. ALL CUTS IN PAVEMENT SHALL BE SAW CUT.
2. ALL PAVEMENT PATCH JOINTS AND ALL CUT EDGES SHALL BE SAND SEALED PER ODOT SPECS AND OREGON CITY SPECIAL PROVISIONS SEC-00744.51.
3. REFER TO OREGON CITY PAVEMENT CUT STANDARDS AND STANDARD DETAIL DRAWINGS 532, 533 & 534.
4. THIS TRENCH BACKFILL REQUIREMENT APPLIES TO ALL UNDERGROUND CONDUITS.
5. CLASS "B" BACKFILL SHALL EXTEND 3 FEET BEYOND EDGE OF STREET OR SURFACED AREA.
6. BACKFILL SHALL BE PLACED AND COMPAKTED IN A MAX. OF 24-INCH LIFTS. COMPAKCTION TESTING REQUIRED AT A FREQUENCY OF 1 TEST EVERY 100 FEET OF TRENCH MINIMUM.
7. EXISTING ARTERIAL & COLLECTOR STREET DESIGNATIONS REQUIRE CLSM (aka CDF) PER ODOT STANDARDS, SEC-00442 FOR ALL TRENCH TRANSVERSE OR PERPENDICULAR CROSSINGS OF VEHICLE TRAVEL LANES.



Public Works Standard Drawings

PIPE BEDDING AND TRENCH BACKFILL -  
STORM & SANITARY SEWER & WATER PIPE

SCALE NTS

DATE JAN '23 REV.

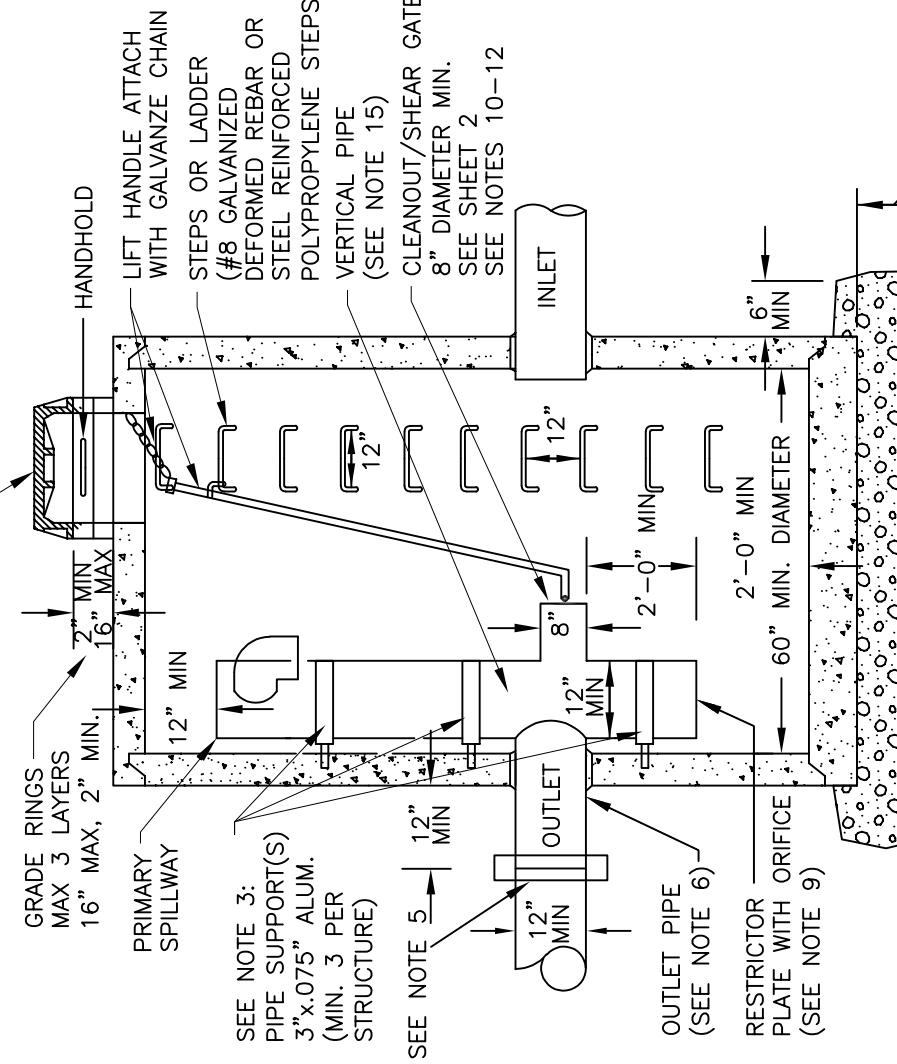
ENGR. DW DRAWN KAE

DRAWING NO. 313

NOTES:

1. EXCEPT AS SHOWN OR NOTED, UNITS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
2. FLAT TOP SHALL BE H-20 LOAD RATED WITH NO COVER.
3. PIPE SUPPORTS AND RESTRICTOR/SEPARATOR SHALL BE OF THE SAME MATERIAL, AND BE ANCHORED AT 3' MAX SPACING BY 5/8" DIA. STAINLESS STEEL EXPANSION BOLTS OR EMBEDDED 2" IN WALL.
4. THE RESTRICTOR/SEPARATOR SHALL BE FABRICATED FROM .060" (MM) ALUMINUM, IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF AASHTO M 36, M 196, M197, AND M 274.
5. OUTLET SHALL BE CONNECTED TO CULVERT OR SEWER PIPE WITH A STANDARD COUPLING BAND FOR CORRUGATED METAL PIPE, OR GROUTED INTO THE BELL OF CONCRETE PIPE.

STANDARD BOLT DOWN CAST IRON FRAME AND COVER WHEN IN PUBLIC ROADWAY OR PAVED AREA. ALUMINUM MANHOLE FRAME AND COVER IN LANDSCAPED AREAS OUTSIDE OF PUBLIC ROAD RIGHT-OF-WAY.



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5. OUTLET SHALL BE CONNECTED TO CULVERT OR SEWER PIPE WITH A STANDARD COUPLING BAND FOR CORRUGATED METAL PIPE, OR GROUTED INTO THE BELL OF CONCRETE PIPE.

6. THE VERTICAL RISER STEM OF THE RESTRICTOR/SEPARATOR SHALL BE THE SAME DIAMETER AS THE HORIZONTAL OUTLET PIPE, WITH AN 12" MINIMUM DIAMETER.

7. FRAME AND LADDER OR STEPS ARE TO BE OFFSET SO THAT:

A. CLEANOUT GATE IS VISIBLE FROM TOP.  
B. CLIMB-DOWN SPACE IS CLEAR OF RISER AND GATE.  
C. FRAME IS CLEAR OF CURB (IF ANY EXISTS).

8. MULTI-ORIFICE ELBOWS MAY BE LOCATED AS SHOWN OR ALL ON ONE SIDE OF RISER TO ASSURE LADDER CLEARANCE, SIZE OF ELBOWS AND PLACEMENT TO BE DETERMINED BY THE ENGINEER.

9. RESTRICTOR PLATE WITH ORIFICE AS SPECIFIED IN THE CONTRACT PLANS. SPECIFIED OPENING TO BE CUT ROUND AND SMOOTH.

10. CLEANOUT/SHEAR GATE: ALUMINUM ALLOY PER ASTM B-26-ZG-32a OR CAST IRON ASTM A48 CLASS 30B AS REQUIRED. LIFT HANDLE EITHER SOLID OR TUBING WITH ADJUSTABLE HOOK AS REQUIRED. NEOPRENE RUBBER GASKET REQUIRED BETWEEN RISER MOUNTING FLANGE AND GATE FLANGE. MATING SURFACES OF LID AND BODY TO BE MACHINED FOR PROPER FIT. FLANGE MOUNTING BOLTS SHALL BE 3/8" DIA STAINLESS.

11. ALTERNATE CLEANOUT/SHEAR GATES TO THE DESIGN SHOWN ON SHEET 2 ARE ACCEPTABLE, PROVIDED THEY MEET THE MATERIAL SPECIFICATIONS ABOVE AND HAVE A SIX BOLT, 10 3/8" BOLT CIRCLE FOR BOLTING THE FLANGE CONNECTION.

12. GATE SHALL NOT OPEN BEYOND THE CLEAR OPENING BY LIMITED HINGE MOVEMENT, STOP TAB, OR SOME OTHER DEVICE.

13. PRECAST CONCRETE MANHOLE CONSTRUCTED IN ACCORDANCE WITH ASTM C478.

14. SEE SHEET 2 FOR DETAILS ON ELBOW AND FOR PLAN VIEW.

15. MATERIAL OF VERTICAL PIPE SHALL BE HDPE, PVC, OR OTHER APPROVED MATERIAL.

12" MIN. 3/4" MINUS AGGREGATE  
BASE MATERIAL

**SECTION A-A**  
**FLOW CONTROL MANHOLE**

COMPACTED NATIVE MATERIAL

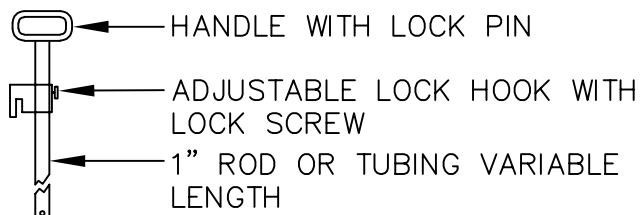
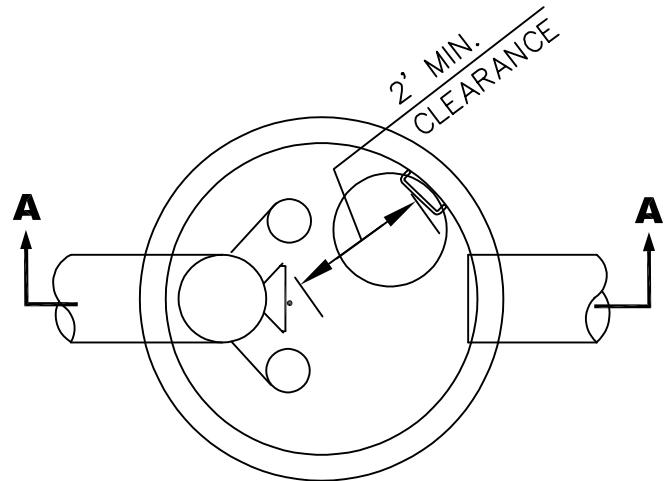
Public Works Standard Drawings

FLOW CONTROL MANHOLE -  
STORMWATER DETENTION TEE RISER TYPE



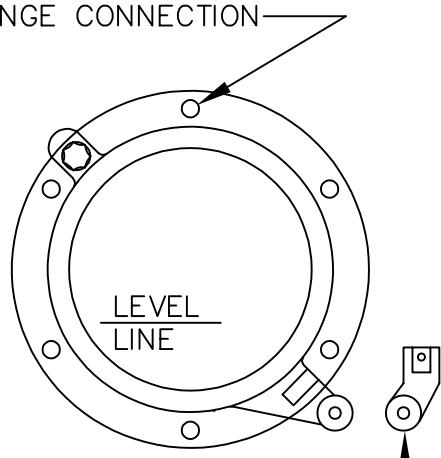
SCALE	NTS	
DATE	JAN '23	REV.
ENGR.	DW	DRAWN KAE
DRAWING NO.	601-1	

ALTERNATES ARE ACCEPTABLE  
PROVIDED MATERIAL  
SPECIFICATIONS ARE MET AND  
FLANGE BOLT PATTERN MATCHES.



### LIFT HANDLE

SIX EVENLY SPACED HOLES ON 10  
3/8" BOLT CIRCLE FOR BOLTING  
TO FLANGE CONNECTION



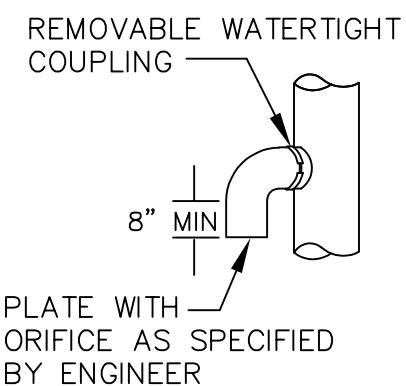
### FRONT

LIFT HANDLE SHALL BE ATTACHED  
PER MANUFACTURER'S  
RECOMMENDATIONS

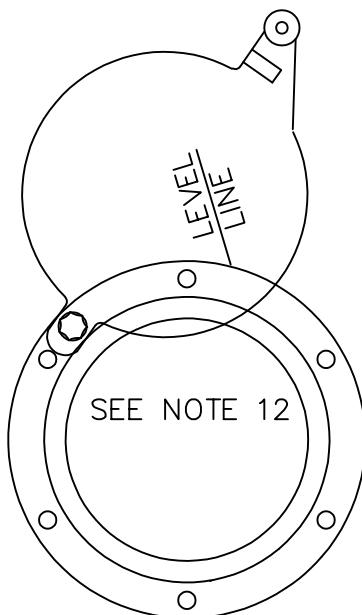
### CLEANOUT/SHEAR GATE



### SIDE



### ELBOW DETAIL



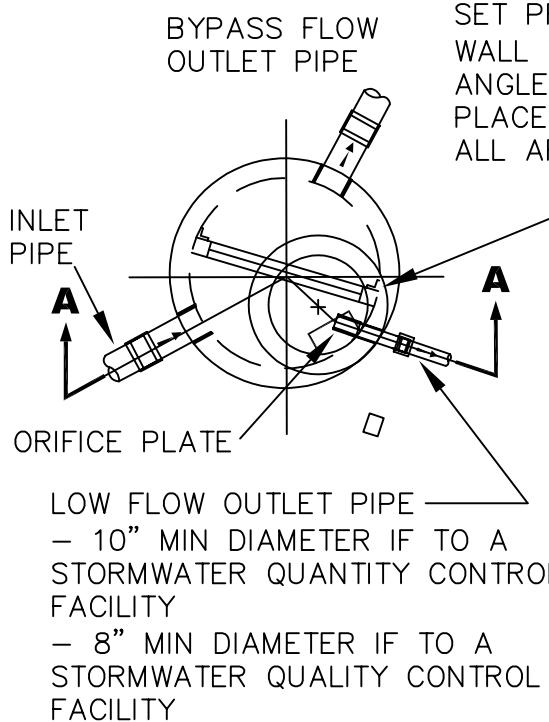
### MAXIMUM OPENING OF GATE



Public Works Standard Drawings

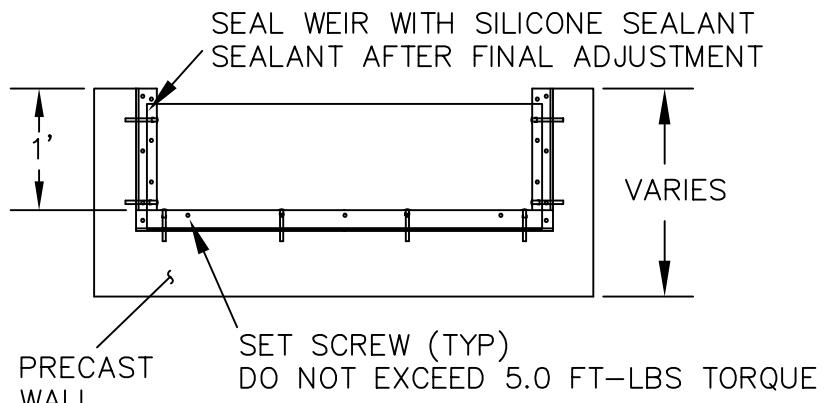
FLOW CONTROL MANHOLE -  
STORMWATER DETENTION TEE RISER TYPE

SCALE	NTS
DATE	JAN '23
REV.	
ENGR.	DW
DRAWN	KAE
DRAWING NO.	601-2

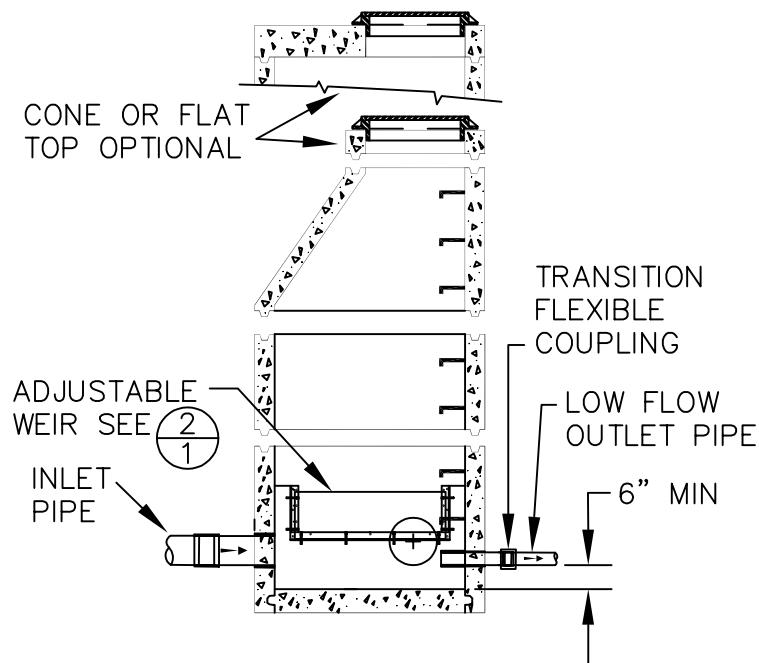


### HIGH FLOW BYPASS PLAN VIEW

SET PRECAST WEIR  
WALL WITH 2" x 2"  
ANGLE AND GROUT IN  
PLACE BOTH SIDES  
ALL AROUND



### HIGH FLOW BYPASS WEIR DETAIL

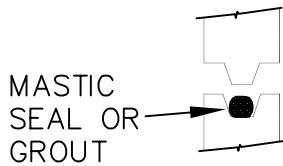


### HIGH FLOW BYPASS SECTION VIEW

#### TOP UNIT

STANDARD CAST IRON FRAME  
AND COVERS ARE AVAILABLE  
IN A 3" SUBURBAN AND 7"  
STANDARD.

FLAT TOP SLABS COME WITH  
OPENINGS OFFSET TO ONE  
SIDE OR CENTERED IN SLAB.  
HS-20 LOADING CAPABLE.



#### KEYLOCK JOINT

#### NOTE:

1. MANHOLE MATERIAL AND  
INSTALLATION PER DRAWING 301.



## SPECIFICATIONS

### PART 1 SUBMITTALS

PRECASTER TO SUBMIT SHOP DRAWING TO CONTRACTOR FOR ENGINEER'S APPROVAL.

### PART 2 PRODUCTS

#### 2.1 FLOW KIT COMPONENTS

- A. PVC PIPING: ALL INTERNAL PVC PIPING AND FITTINGS SHALL MEET ASTM D1785.
- B. SLIDE GATE VALVE: SHALL BE CONSTRUCTED OF PVC WITH STAINLESS STEEL SHAFT AND ALUMINUM HANDLE.
- C. THE WEIR: SHALL BE CONSTRUCTED OF PVC, FRP, PLASTIC AND STAINLESS STEEL.
- D. STEEL REINFORCED POLYPROPYLENE STEPS ARE INSTALLED AS REQUIRED.
- E. ORIFICE PLATE: SHALL BE CONSTRUCTED OF PVC OR STAINLESS STEEL.
- F. FLOW KIT COMPONENTS ARE AVAILABLE FROM LOCAL SUPPLIERS.

#### 2.2 PRE-CAST CONCRETE STRUCTURE COMPONENTS

- A. PRECAST CONCRETE: SHALL BE PROVIDED ACCORDING TO DRAWING 301.
- B. JOINT SEALANT: SHALL BE CONSEAL CS-101 OR ENGINEER APPROVED EQUIVALENT.

#### 2.3 CONTRACTOR PROVIDED COMPONENTS

- A. CONCRETE (FOR CONCRETE NOT COVERED BY PRE-CAST SPECIFICATION ABOVE): SHALL BE 3000 PSI, 28 DAY STRENGTH, 3/4 INCH ROUND ROCK, 4 INCH SLUMP MAXIMUM, PLACED WITHIN 90 MINUTES OF INITIAL MIXING.
- B. SILICONE SEALANT: SHALL BE PURE RTV SILICONE CONFORMING TO FEDERAL SPECIFICATION NUMBER TT S001543A TT S0023C OR ENGINEER APPROVED.
- C. GROUT: SHALL BE NON-SHRINK GROUT MEETING THE REQUIREMENTS OF CORPS OF ENGINEERS CRD-C588. SPECIMENS MOLDED, CURED AND TESTED IN ACCORDANCE WITH ASTM C-109 SHALL HAVE MINIMUM COMPRESSIVE STRENGTH OF 6,200 PSI. GROUT SHALL NOT EXHIBIT VISIBLE BLEEDING.
- D. SUB-BASE: SHALL BE SIX (6) INCH MINIMUM OF 3/4 INCH MINUS ROCK, 95% COMPACTION. COMPACT UNDISTURBED SUB-GRADE MATERIALS TO 95% OF MAXIMUM DENSITY AT +/- 2% OF OPTIMUM MOISTURE. UNSUITABLE MATERIAL BELOW SUB-GRADE SHALL BE REPLACED TO SITE ENGINEER'S APPROVAL.
- E. BACKFILL: SHALL BE 3/4 INCH MINUS ROCK (95% COMPACTION), OR AS OTHERWISE SPECIFIED IN THE PROJECTS GENERAL TECHNICAL SPECIFICATIONS.

### PART 3 EXECUTION

#### 3.1 PRECAST CONCRETE MANHOLE – PER DRAWING 301

- A. CONTRACTOR TO GROUT ALL INLET AND OUTLET PIPES FLUSH WITH INTERIOR WALL. CONTRACTOR TO GROUT INTERIOR WALLS.
- B. BOOTS: FOR NEW MANHOLES, USE KOR-N-SEAL BOOTS (OR EQUAL). CONNECTIONS TO EXISTING MANHOLES SHALL USE SANDED PVC COLLAR WITH GASKETED JOINT. FLEXIBLE JOINT SHALL BE NO GREATER THAN 18" FROM EXTERIOR MANHOLE WALL.

#### 3.2 WEIRS

AT PROJECT COMPLETION, WEIRS SHALL BE SET TO SPECIFIED ELEVATION, LEVEL AND SEALED AT ALL JOINTS WITH SILICONE SEALANT. SEALANT SHALL BE WORKED INTO JOINT FROM BOTH SIDES.

#### 3.3 CLEANUP

REMOVE ALL EXCESS MATERIALS, ROCKS, ROOTS, OR FOREIGN MATERIAL, LEAVING THE SITE IN A CLEAN, COMPLETE CONDITION APPROVED BY THE ENGINEER. ALL PVC AND FIBERGLASS FILTER COMPONENTS SHALL BE FREE OF ANY FOREIGN MATERIALS, INCLUDING CONCRETE AND EXCESS SEALANT.

#### 3.4 PVC PIPING

SHALL BE JOINDED IN ACCORDANCE WITH ASTM D2564.

### BASIC OPERATIONS MAINTENANCE GUIDELINES

- A. MINIMUM ANNUAL MAINTENANCE INCLUDES INSPECTION OF COMPONENTS AND REMOVAL OF SEDIMENTS.
- B. INSPECT SYSTEM CONDITION IN THE EVENT OF A 5 YEAR STORM OR GREATER.

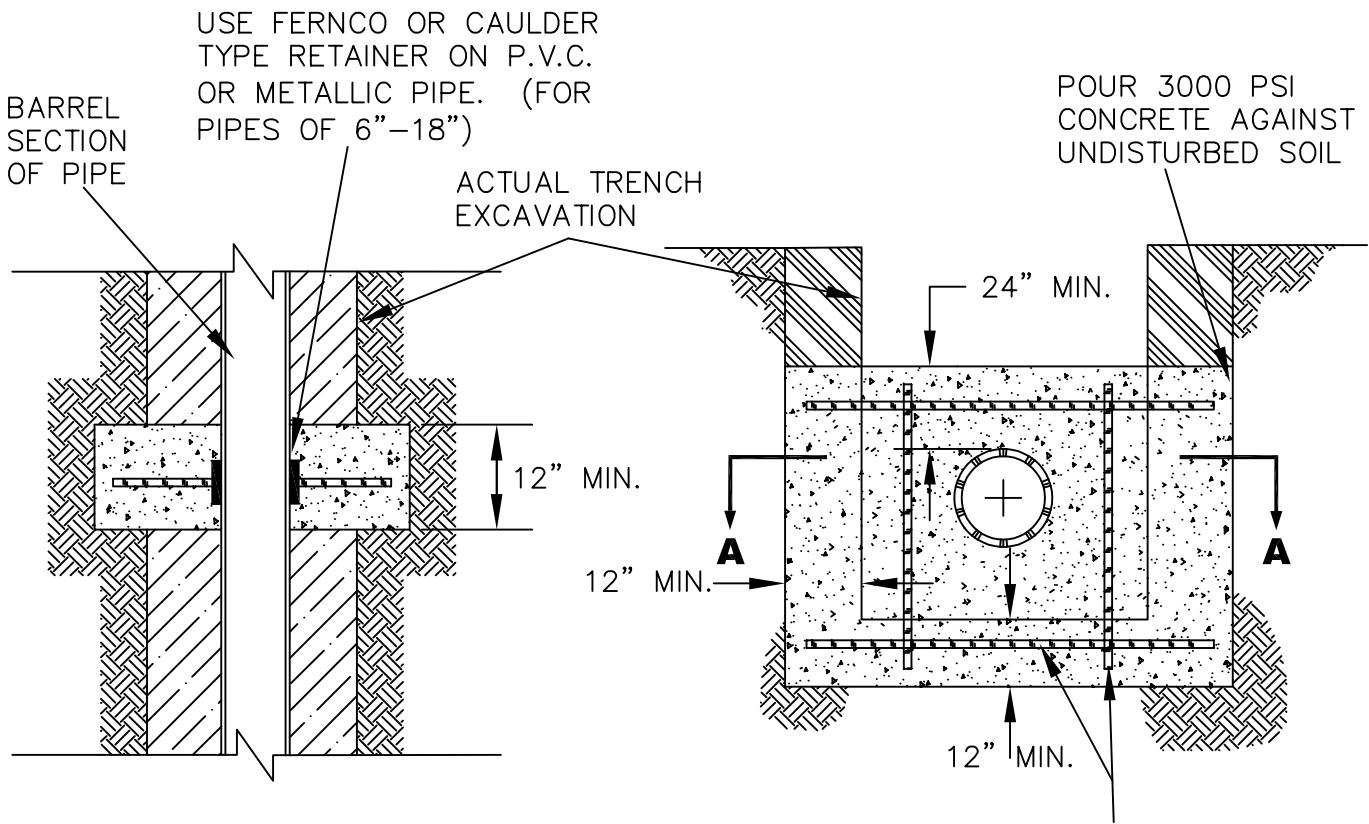
NOTE: FOLLOW ALL LOCAL, STATE, & FEDERAL SAFETY GUIDELINES.



Public Works Standard Drawings

HIGH FLOW BYPASS MANHOLE

SCALE	NTS
DATE JAN '23	REV.
ENGR. DW	DRAWN KAE
DRAWING NO.	602-2



**SECTION A - A**

#4 REBAR VERT. & HORZ.  
@12" O.C. OUTSIDE OF PIPE  
3" CLEAR.

**ELEVATION**

CONCRETE ANCHOR WALLS (CLASS 3000) SHALL BE CONSTRUCTED USING FORMS WHEN SEWERS, STORM DRAINS, AND OTHER PIPELINES ARE CONSTRUCTED WITH SLOPES 20 PERCENT OR GREATER. REMOVE FORMS PRIOR TO BACKFILLING TRENCH.

**MIN. SPACING OF ANCHOR WALLS:**

<u>SLOPE:</u> 20–35%	<u>SPACING:</u> 35 FEET
35–50%	25 FEET
>50%	15 FEET OR SPECIAL DESIGN



Public Works Standard Drawings

PIPE ANCHOR WALL

SCALE	NTS
DATE	JAN '23
REV.	
ENGR.	DW
DRAWN	KAE
DRAWING NO.	605

SEAL THE AREA BETWEEN THE END OF THE CASING AND PIPE BY FORCING GROUT INTO THE SPACE AROUND THE PERIPHERY OF THE PIPE FOR THE DIMENSIONS SHOWN.

FERNCO COUPLING OR APPROVED ALTERNATE

18" MAX. 24" MIN.

SMOOTH STEEL PIPE CASING

STORMWATER PIPE

FILL BORE PIT WITH 3/4"-0 COMP. BACKFILL MATERIAL.

FILL SPACE WITH LEAN GROUT, PEA GRAVEL, OR SAND. BEGIN AT THE FAR END AND FILL BACK TOWARD THE INSERTION HOLE

### PIPE SEAL DETAIL

CASING PIPE:

6"-12" DIA. - 1/4" MIN. THICKNESS

15"-24" DIA. - 5/16" MIN. THICKNESS

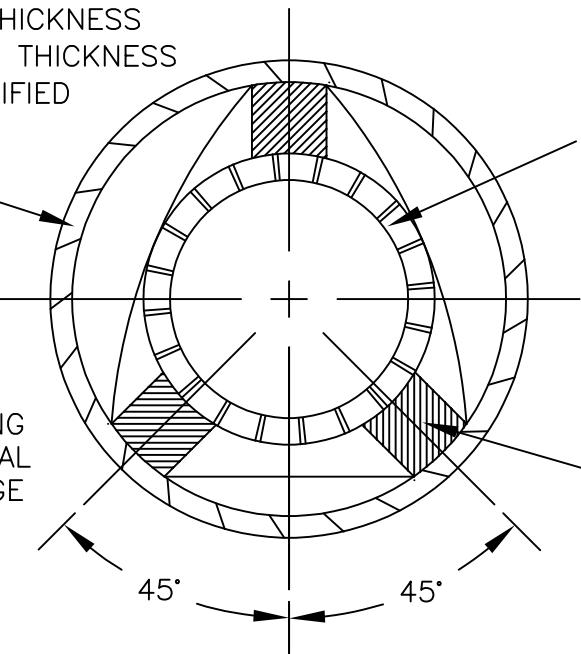
LARGER THAN 24", AS SPECIFIED

BY ENGINEER

NOTCH BLOCKING AT BANDING LOCATIONS. BANDING MATERIAL SHALL BE MIN. OF 20 GAUGE STAINLESS STEEL, 1" WIDE.

PIPE AS SPECIFIED

4"X4" WESTERN RED CEDAR OR PRESSURE TREATED FIR BLOCKS CONTINUOUS EXCEPT AT JOINTS. PROVIDE 1' TO 2' GAP IN SKIDS AT JOINTS AND EVERY 6' FOR PIPE SECTIONS LONGER THAN 8'. BAND TO PIPE AT 5' MAX. CENTERS WITH MIN. OF 2 BANDS PER PIPE SECTION.



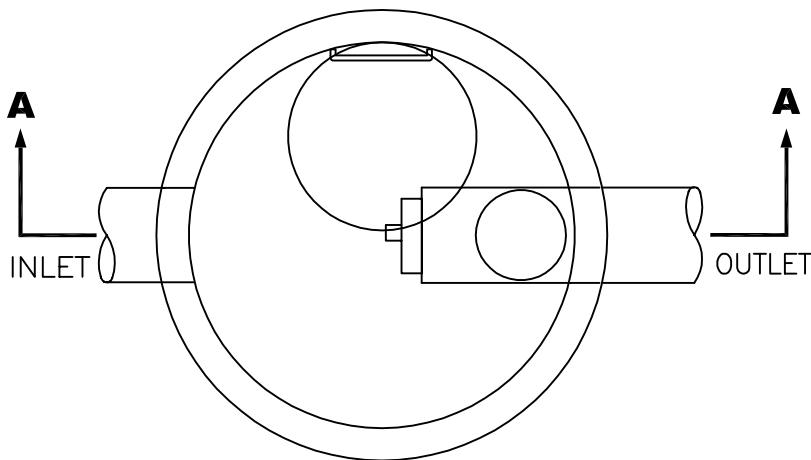
### CASING SECTION

Public Works Standard Drawings

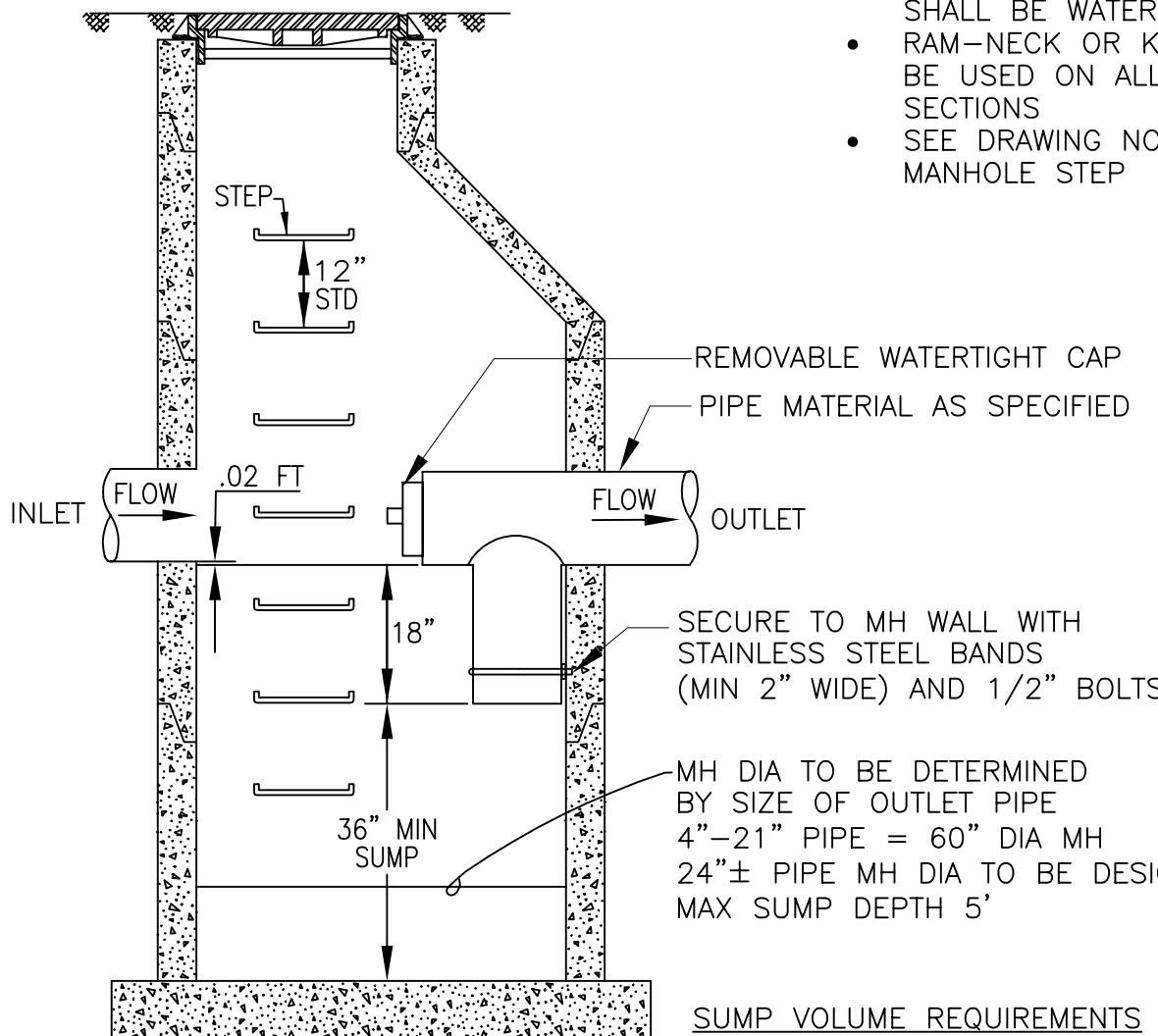


BORE CASING

SCALE		NTS	
DATE		JAN '23	REV.
ENGR.	DW	DRAWN KAE	
		DRAWING NO.	606



**PLAN**



**SECTION A-A**

**NOTES:**

- MANHOLE TO CONFORM WITH DRAWING NO. 301
- MANHOLE PIPE CONNECTIONS PER DRAWING 301
- MANHOLE FRAME AND COVER AS SPECIFIED SEE DRAWING 305
- ALL PIPES ENTERING OR EXITING SHALL BE WATER TIGHT
- RAM-NECK OR KENT- SEAL TO BE USED ON ALL MANHOLE SECTIONS
- SEE DRAWING NO. 307 MANHOLE STEP

**SUMP VOLUME REQUIREMENTS**

SINGLE FAMILY RESIDENTIAL

3.5 CF/ACRE

MULTI FAMILY RESIDENTIAL

22.0 CF/ACRE

COMMERCIAL/INDUSTRIAL

94.0 CF/ACRE



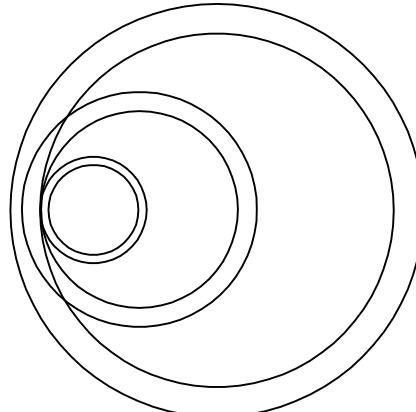
Public Works Standard Drawings

**POLLUTION CONTROL MANHOLE**

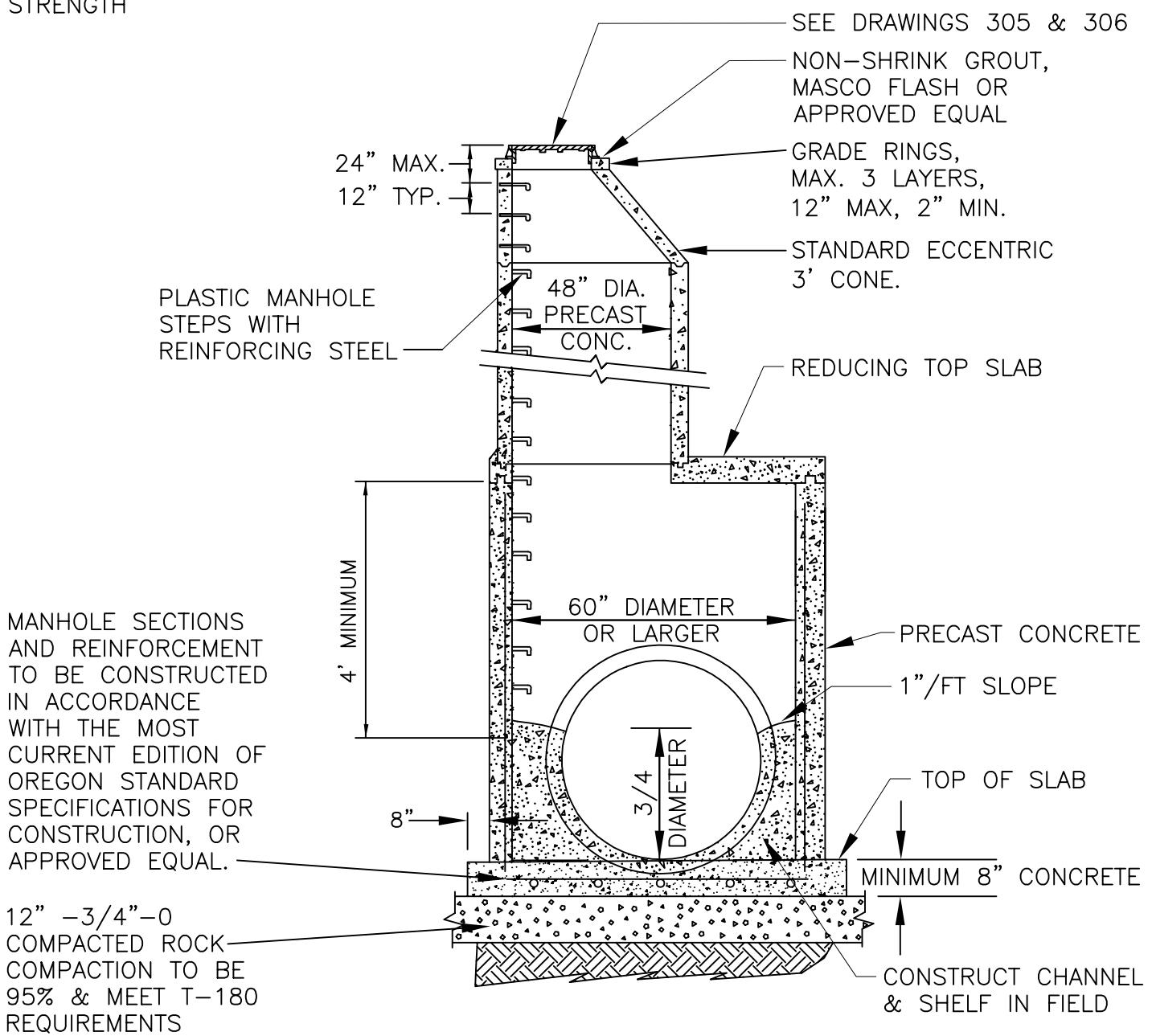
SCALE	NTS	
DATE	JAN '23	REV.
ENGR.	DW	DRAWN
DRAWING NO.	607	KAE

NOTES:

1. MANHOLE FRAME AND COVER AS SPECIFIED. SEE DRAWINGS 305 AND 306.
2. ALL PIPES ENTERING OR EXITING SHALL BE WATER TIGHT
3. CHANNELS TO BE 3/4 VERTICAL HEIGHT OF PIPE-SMOOTH FINISH
4. INSIDE DROP MAXIMUM 2' VERTICAL DISTANCE INVERT TO INVERT
5. ALL CONCRETE TO BE MINIMUM 4000 PSI COMPRESSIVE STRENGTH



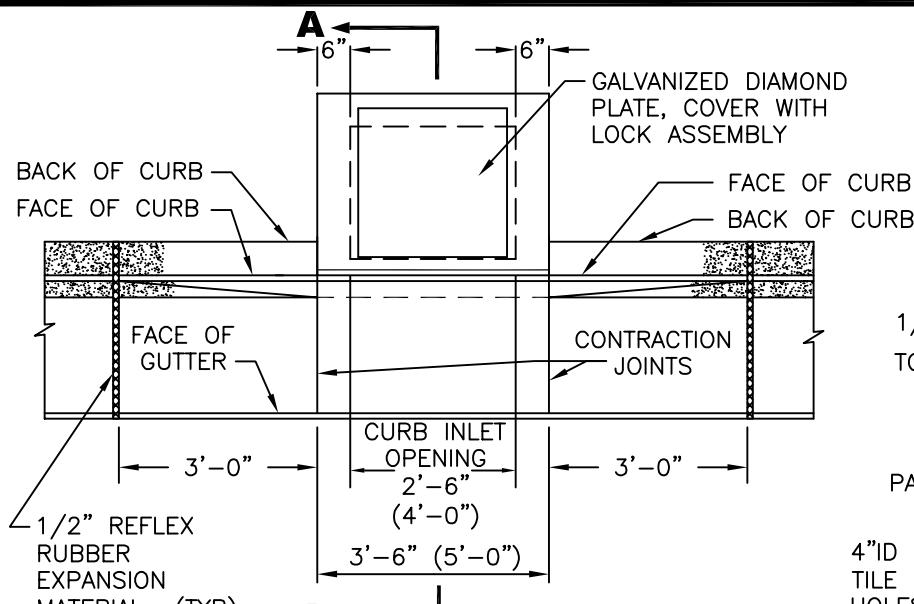
**REDUCING TOP SLAB**



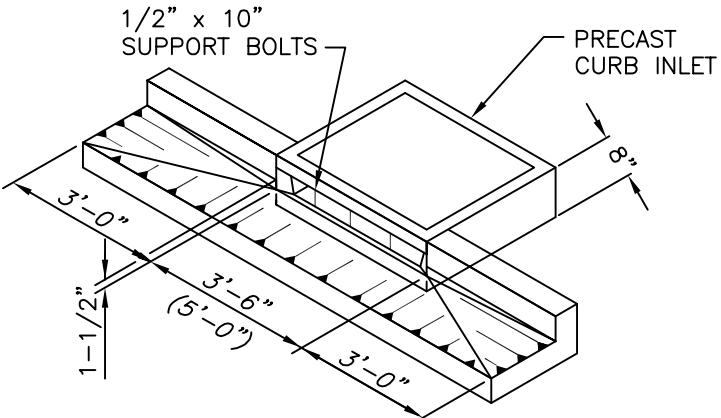
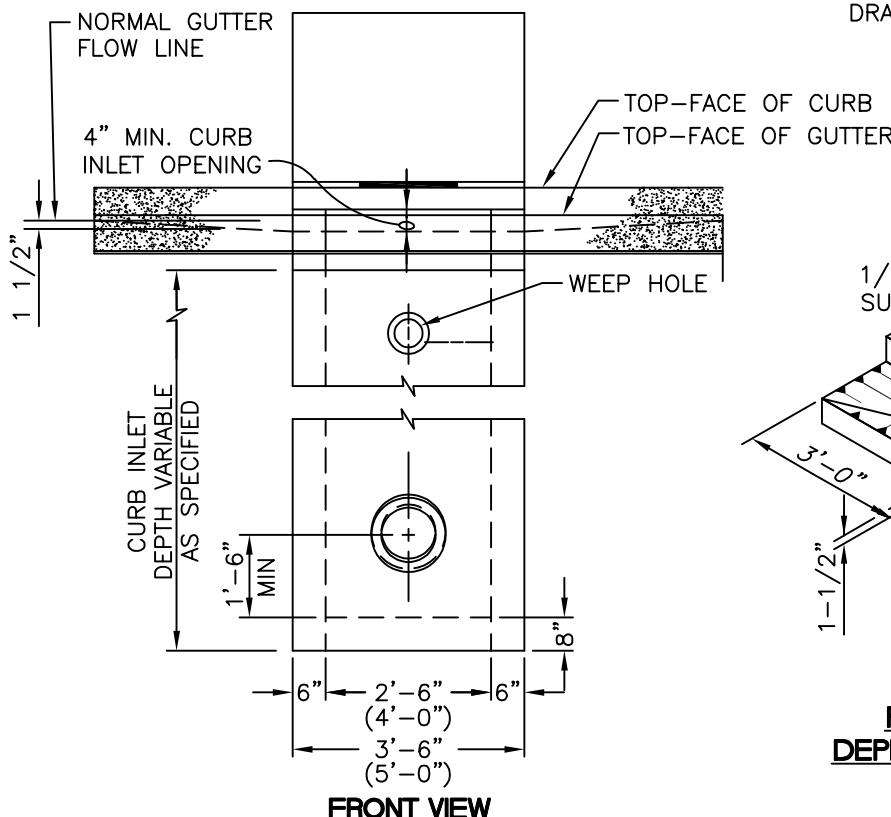
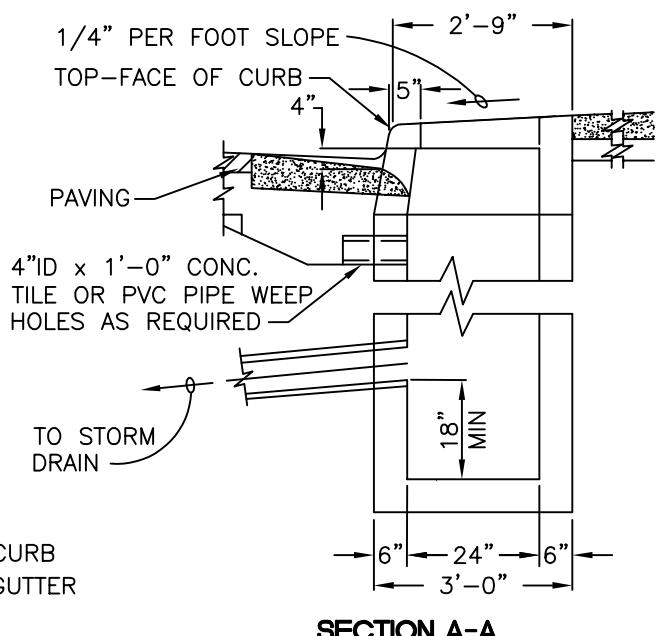
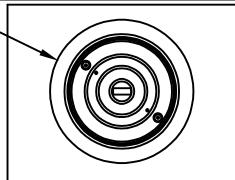
Public Works Standard Drawings

MANHOLE FOR LARGE DIAMETER PIPE  
(PIPE 27" AND LARGER)

SCALE	NTS
DATE JAN '23	REV.
ENGR. DW	DRAWN KAE
DRAWING NO.	608



MANHOLE RING  
AND COVER  
SEE DRAWING 305



NOTES:

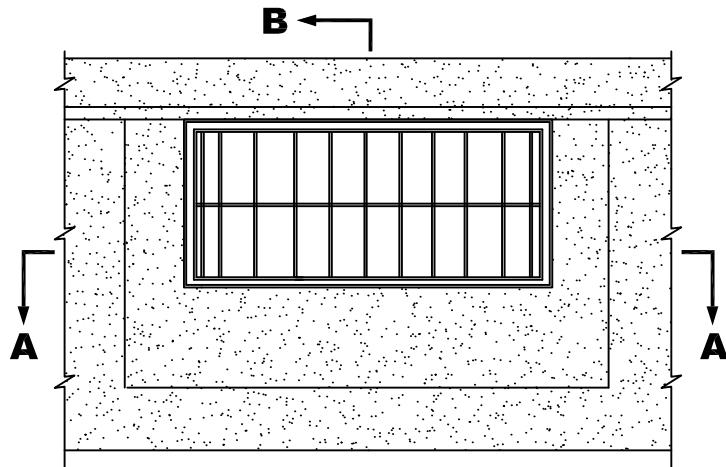
1. CURB INLET TOP AND BASE SHALL MEET H-20  
LOADING
2. CONCRETE STRENGTH SHALL BE 3000 PSI.
3. ALL FABRICATED METAL PARTS SHALL BE HOT-DIPPED  
GALVANIZED AFTER FABRICATION.
4. FOR STEEP GRADES USE STD. PRECAST INLET WITH  
4'-0" OPENING OR TWO 2'-6" OPENING INLETS.
5. CURB INLET BASE MAY BE PRECAST OR  
CAST-IN-PLACE.
6. DIMENSIONS SHOWN ABOVE IN PARENTHESES ARE FOR  
4A INLETS. A 1 1/2 A INLET SHALL HAVE A CURB  
INLET OPENING WIDTH OF 1'-6" AND AN OUTSIDE  
WIDTH OF 2'-6"; ALL OTHER DIMENSIONS AND DETAILS  
SHALL BE AS SHOWN.



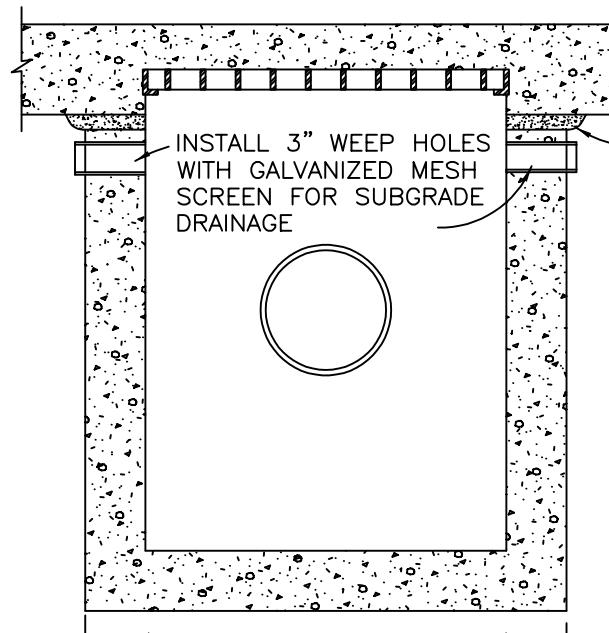
Public Works Standard Drawings

PRECAST CURB INLET  
1 1/2 A, 2 21/2 A, 4 A

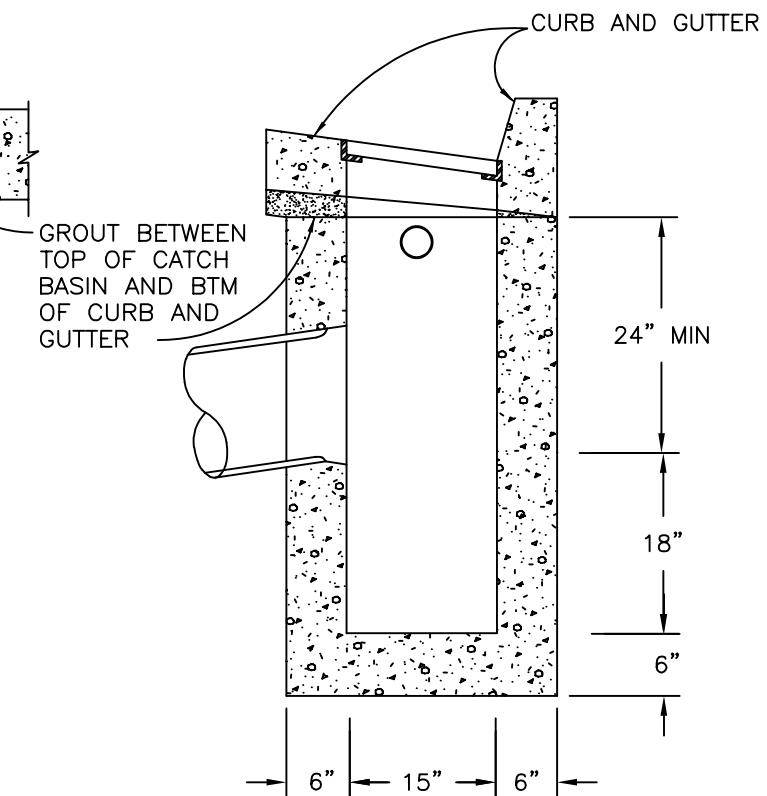
SCALE	NTS
DATE	JAN '23
REV.	
ENGR.	DW
DRAWN	KAE
DRAWING NO.	609



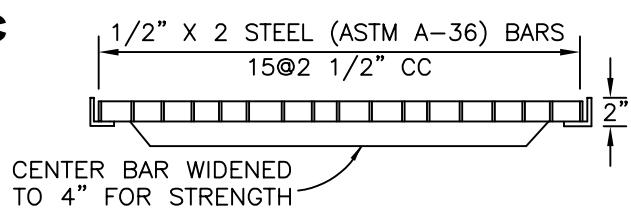
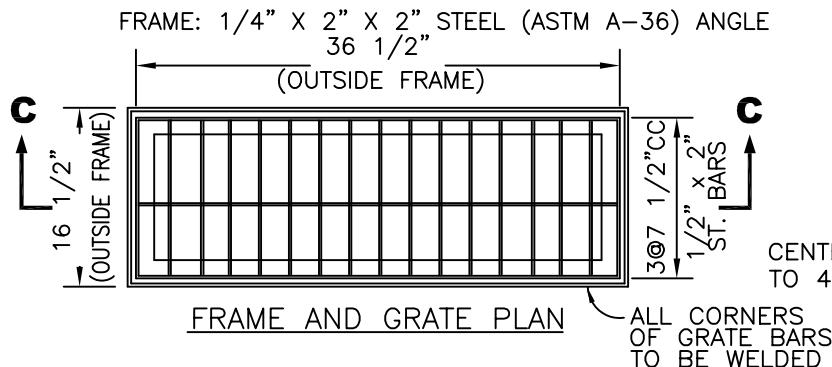
**PLAN**



**SECTION A-A**



**SECTION B-B**



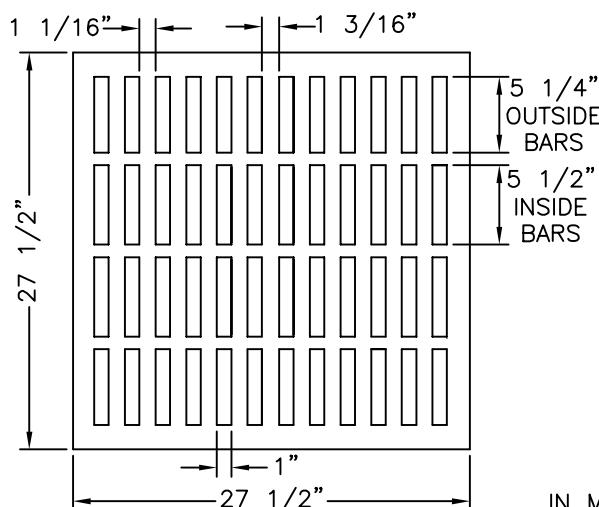
**SECTION C-C**



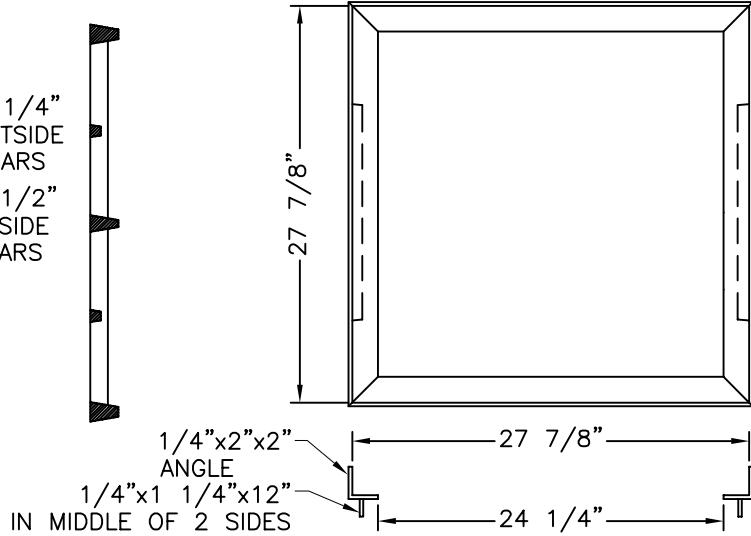
Public Works Standard Drawings

CATCH BASIN

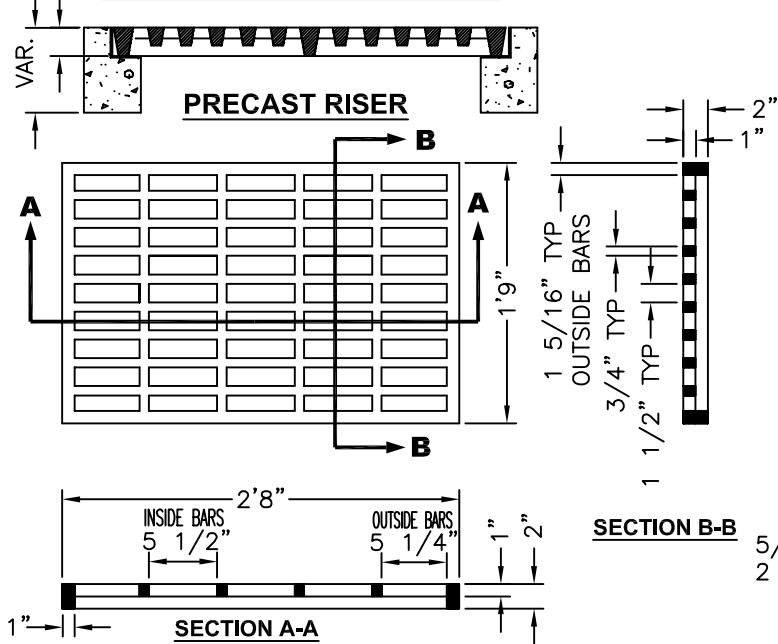
SCALE		NTS
DATE		REV.
ENGR.	DW	DRAWN
		KAE
		DRAWING NO. 610-1



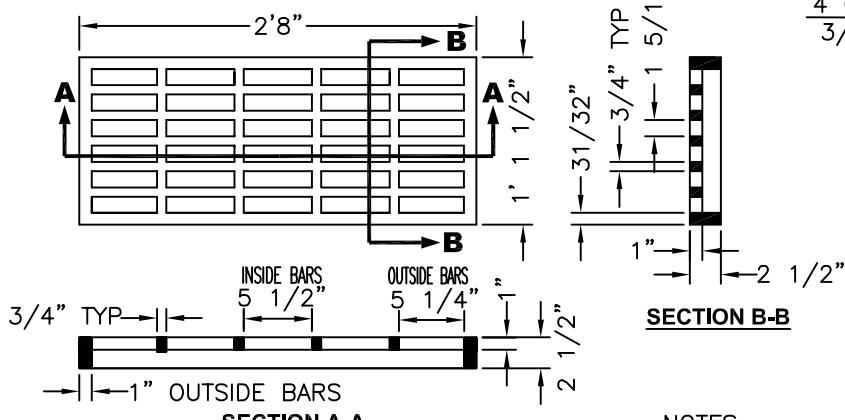
**TYPE 3 CATCH BASIN GRATE**



**TYPE 3 FRAME - STEEL**



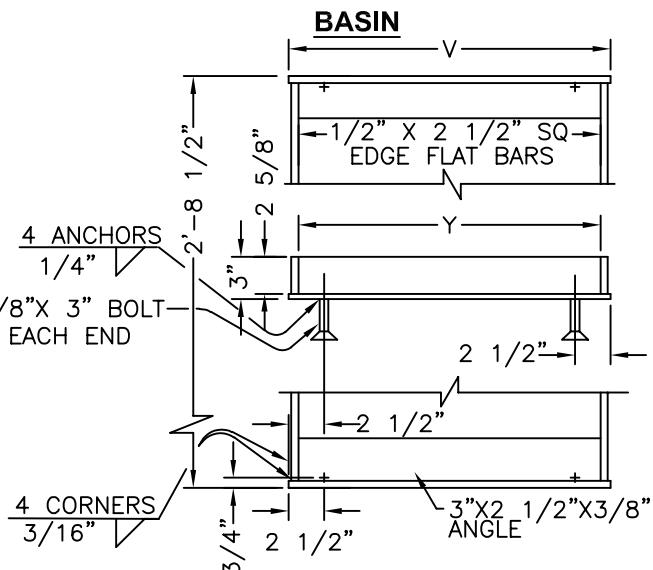
**G-1 CATCH BASIN - 1 EACH/UNIT**



**G-2 CATCH BASIN 2 EACH/UNIT**  
**CAST IRON GRATES**

**SECTION B-B**

**OPTIONAL CAST IRON FRAME  
FOR A MORTAR-ON TYPE 3 CATCH**



**G-1 AND G-2 FRAME**

INLET TYPE	V	Y
G-1, CG-1	1'-10 3/4"	1'-9 3/8"
G-2, CG-2	2'-4 3/4"	2'-3 3/8"

**NOTES:**

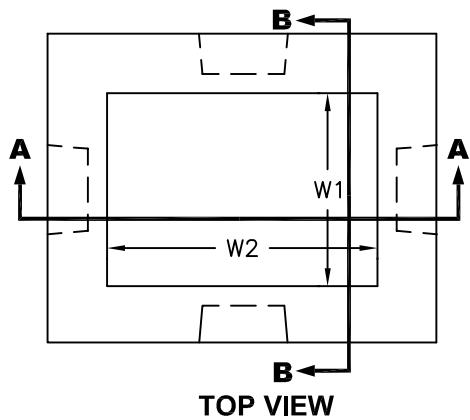
CATCH BASIN, FRAME AND GRATES SHALL MEET H20 LOADING



Public Works Standard Drawings

**FRAMES AND GRATES**  
**G-1, G-2, TYPE 3**

SCALE	NTS
DATE	JAN '23
REV.	
ENGR.	DW
DRAWN	KAE
DRAWING NO.	610-3



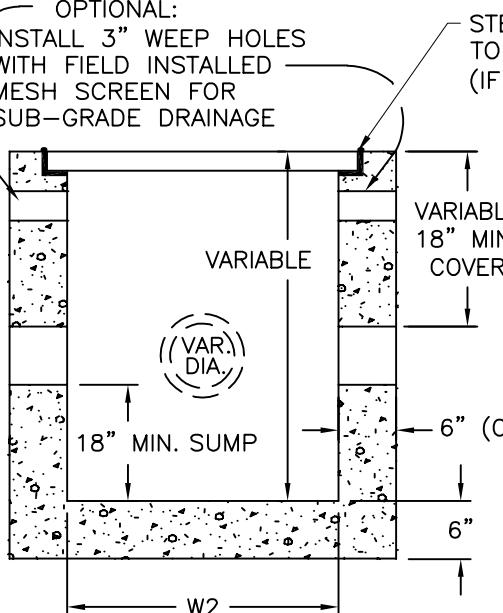
INLET TYPE	W	W <sub>1</sub>	W <sub>2</sub>
G-1	2'-8 7/8"	1'-8 7/8"	2'-4 1/4"
G-2	3'-3 3/8"	2' 3 3/8"	2'-4 1/4"
TYPE-3	2'-8"	2"-0"	2'-0"

NOTES:

1. CONCRETE STRENGTH SHALL BE 3000 PSI.
2. PRECAST BASE WALLS SHALL BE A MINIMUM 4" THICK. CAST-IN-PLACE BASE WALLS SHALL BE 6" THICK.
3. "X" DIMENSION ASSUMES A 24" GUTTER. ADD 6" FOR AN 18" GUTTER.
4. CATCH BASIN AND GRATE SHALL MEET H-20 LOADING.
5. FOR FRAME AND GRATES SEE DRAWING 610-3.

OPTIONAL:

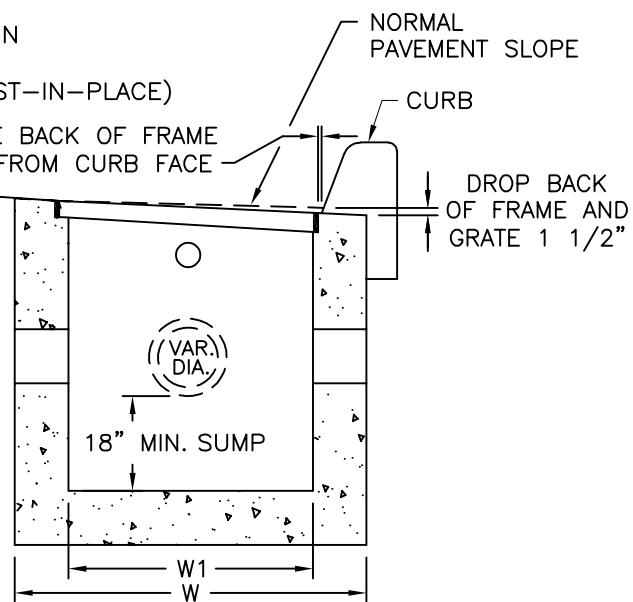
INSTALL 3" WEEP HOLES WITH FIELD INSTALLED MESH SCREEN FOR SUB-GRADE DRAINAGE



SECTION A-A

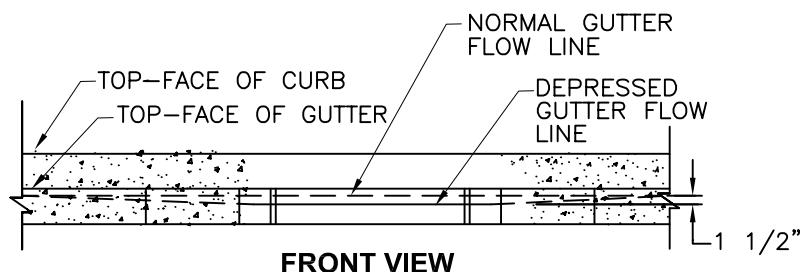
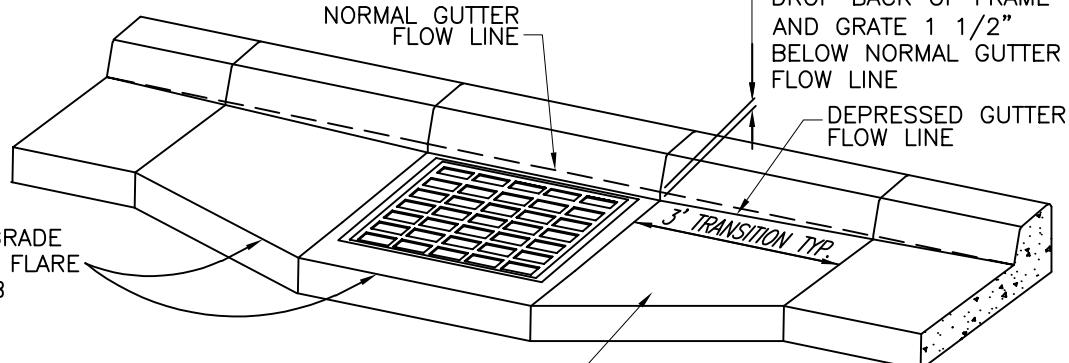
STEEL FRAME CAST IN TOP SLAB OR BASIN (IF TOP SLAB IS CAST-IN-PLACE)

LOCATE BACK OF FRAME 1/2" FROM CURB FACE



SECTION B-B

MATCH NORMAL PAVEMENT GRADE AT FRONT EDGE OF GUTTER FLARE AND CATCH BASIN TOP SLAB

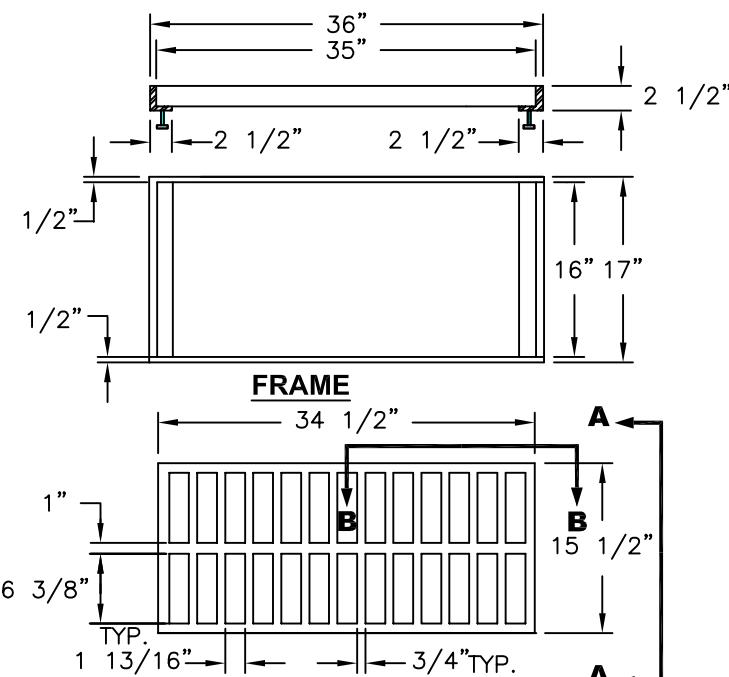


FRONT VIEW

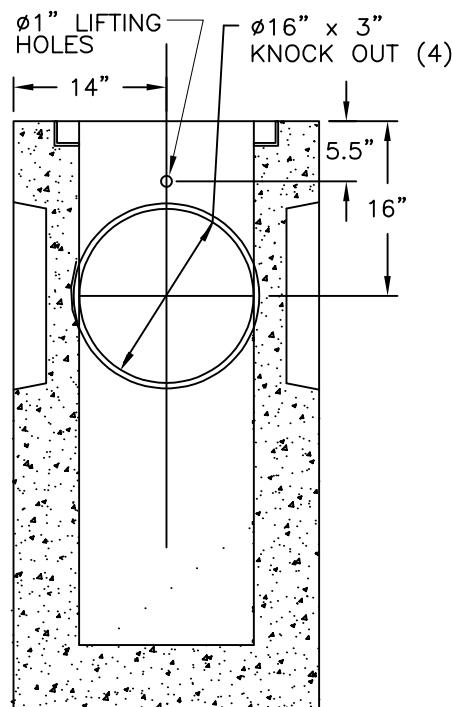
NOTE: PRECAST TOP SLAB SHOWN WITH GUTTER TRANSITION FLARE IF THE TOP SLAB IS CAST-IN-PLACE, NO FLARE IS REQUIRED IN THE TRANSITION SECTION: MATCH THE TOP FRONT EDGE OF THE FRAME AND THE TOP FRONT EDGE OF THE CAST-IN-PLACE TOP SLAB TO THE NORMAL PAVEMENT GRADE.



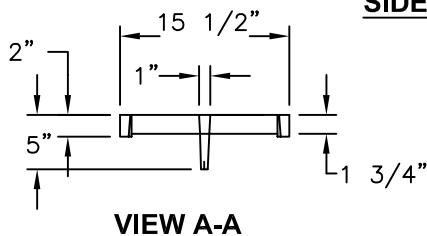
USE ASTM A-36 STEEL  
AND AWS E-7024  
WELDING ELECTRODES



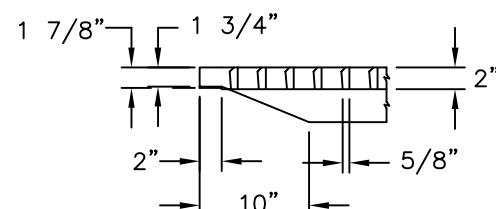
**BIKE-PROOF GRATE**



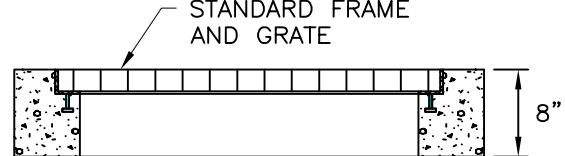
**SIDE**



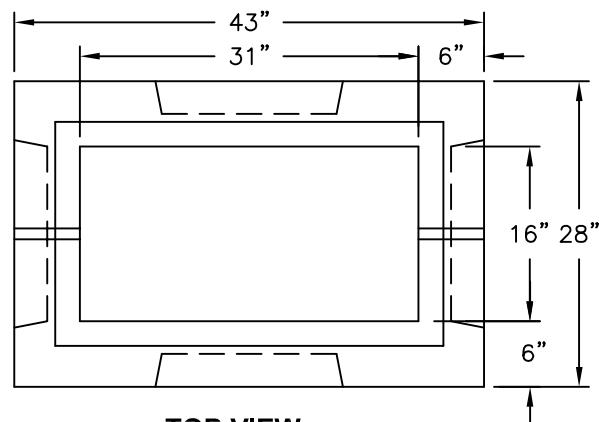
**VIEW A-A**



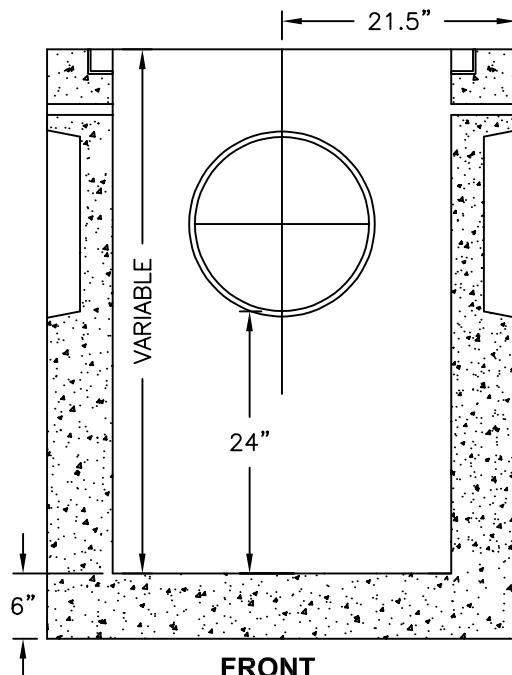
**VIEW B-B**



**INLET SECTION**



**TOP VIEW**



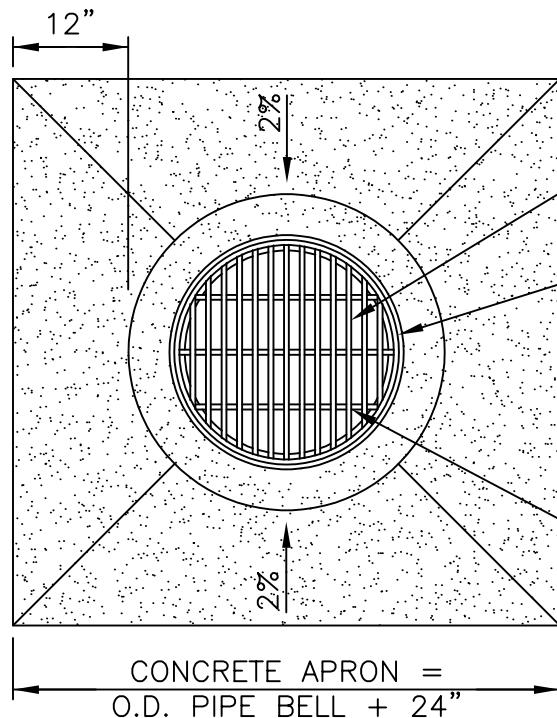
**FRONT**

Public Works Standard Drawings

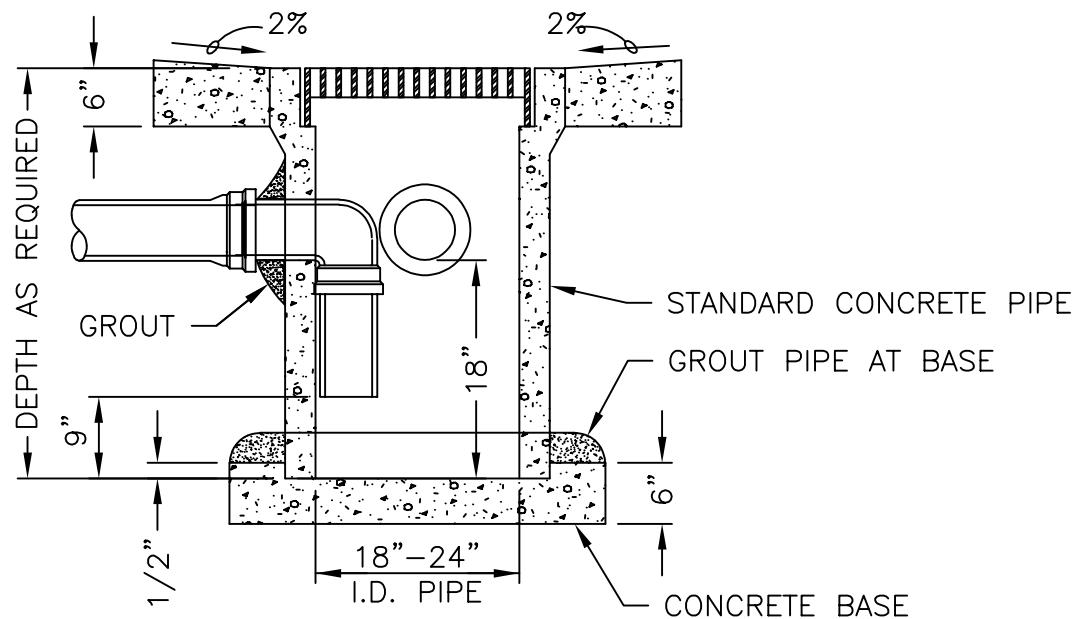


**TYPE 4  
CATCH BASIN DETAIL**

SCALE	NTS
DATE	JAN '23
REV.	
ENGR.	DW
DRAWN	KAE
DRAWING NO.	610-5



PLAN



SECTION A-A

NOTES:

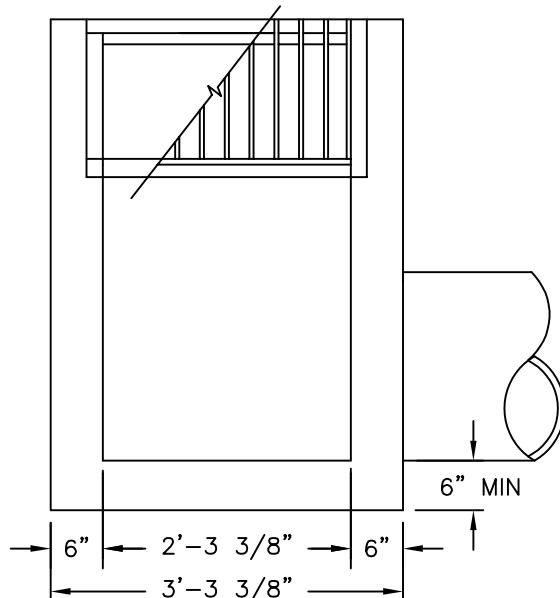
1. GRATES SHALL BE CONSTRUCTED FOR BICYCLE SAFETY.
2. PRECAST CONCRETE CATCH BASINS MAY BE USED WHEN SPECIFIED OR APPROVED.
3. NOT FOR USE IN VEHICULAR TRAFFIC AREAS.



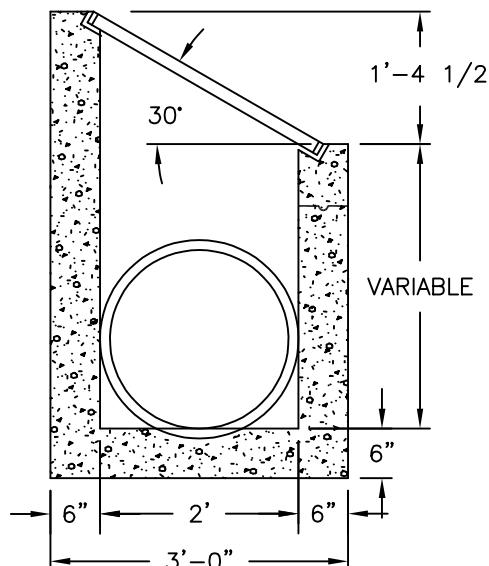
Public Works Standard Drawings

AREA DRAINAGE BASIN OR FIELD INLET

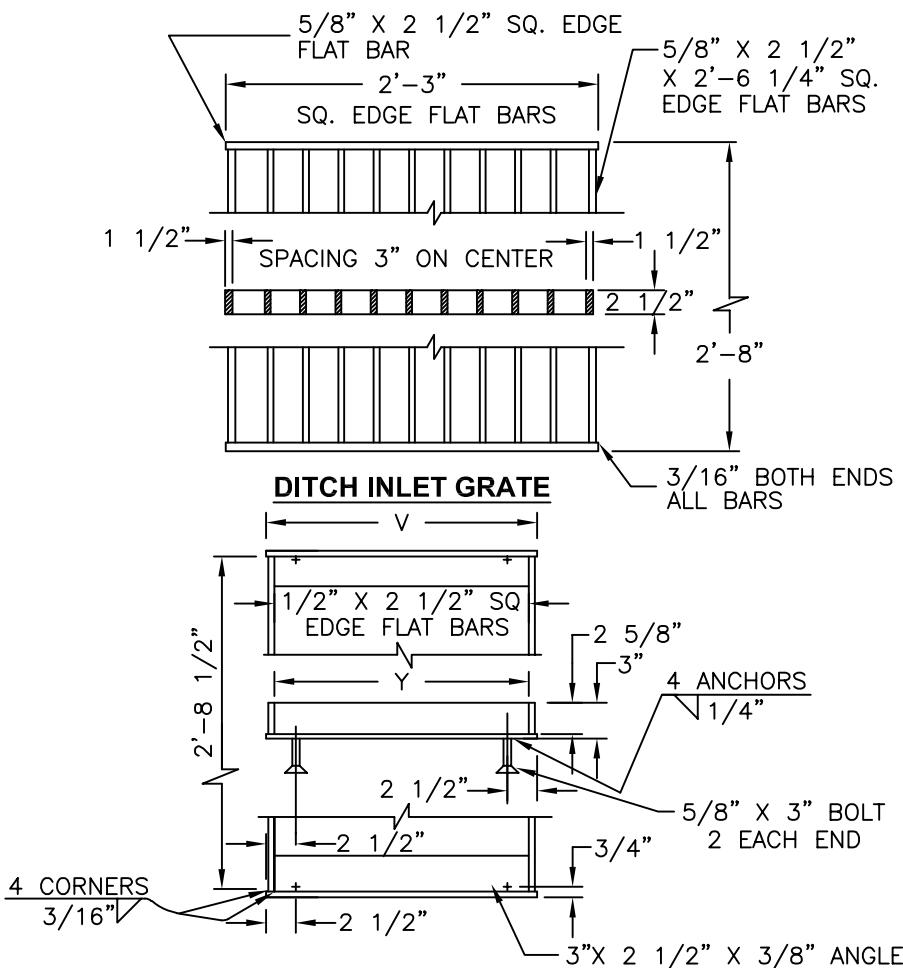
SCALE	NTS
DATE JAN '23	REV.
ENGR. DW	DRAWN KAE
DRAWING NO.	611-1



## SECTION B-B



## **SECTION A-A**



NOTE: 3/8" CROSS BARS SHALL BE FLUSH WITH THE GRATE SURFACE AND MAY BE FILLET WELDED, RESISTANCE WELDED OR ELECTROFORGED TO BEARING BARS.

## DITCH INLET FRAME

INLET TYPE	V	Y	Y <sub>1</sub>	NO. OF BARS	TYPE
D	2'-4 3/4"	2'-3 3/8"	2'-3"	9	1

## NOTES:

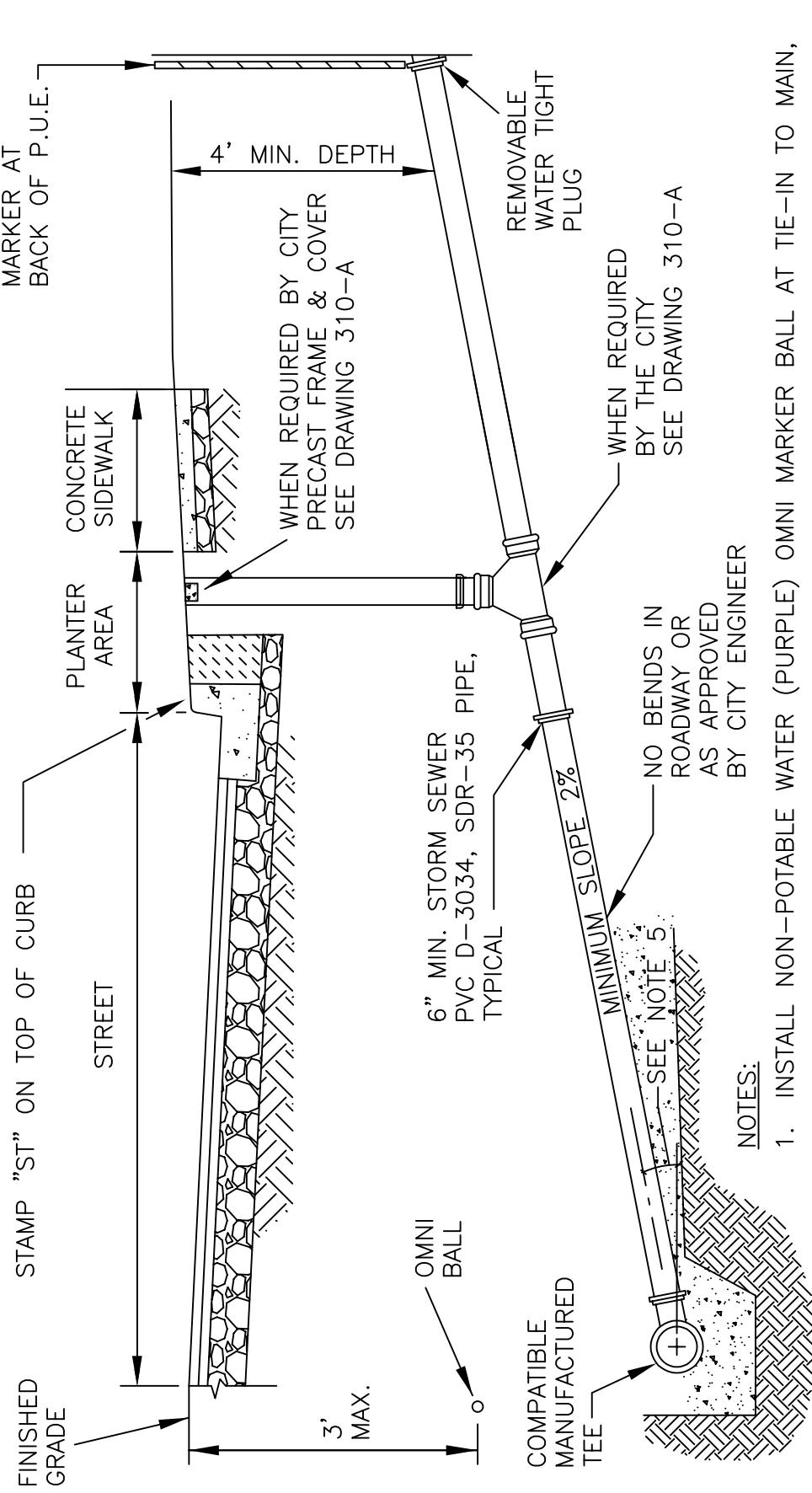
1. CONCRETE STRENGTH SHALL BE 3000 PSI.
2. G-2 GRATES MAY BE USED IF APPROVED BY THE ENGINEER.
3. CATCH BASIN, FRAME, AND GRATES SHALL MEET H2O LOADING.
4. INSIDE FRAME DIMENSIONS: 2'-3 3/8", 2'-8 1/2."



## Public Works Standard Drawings

### DITCH INI FT

SCALE	NTS	
DATE	JAN '23	REV.
ENGR.	DW	DRAWN KAE
DRAWING NO.		611-2



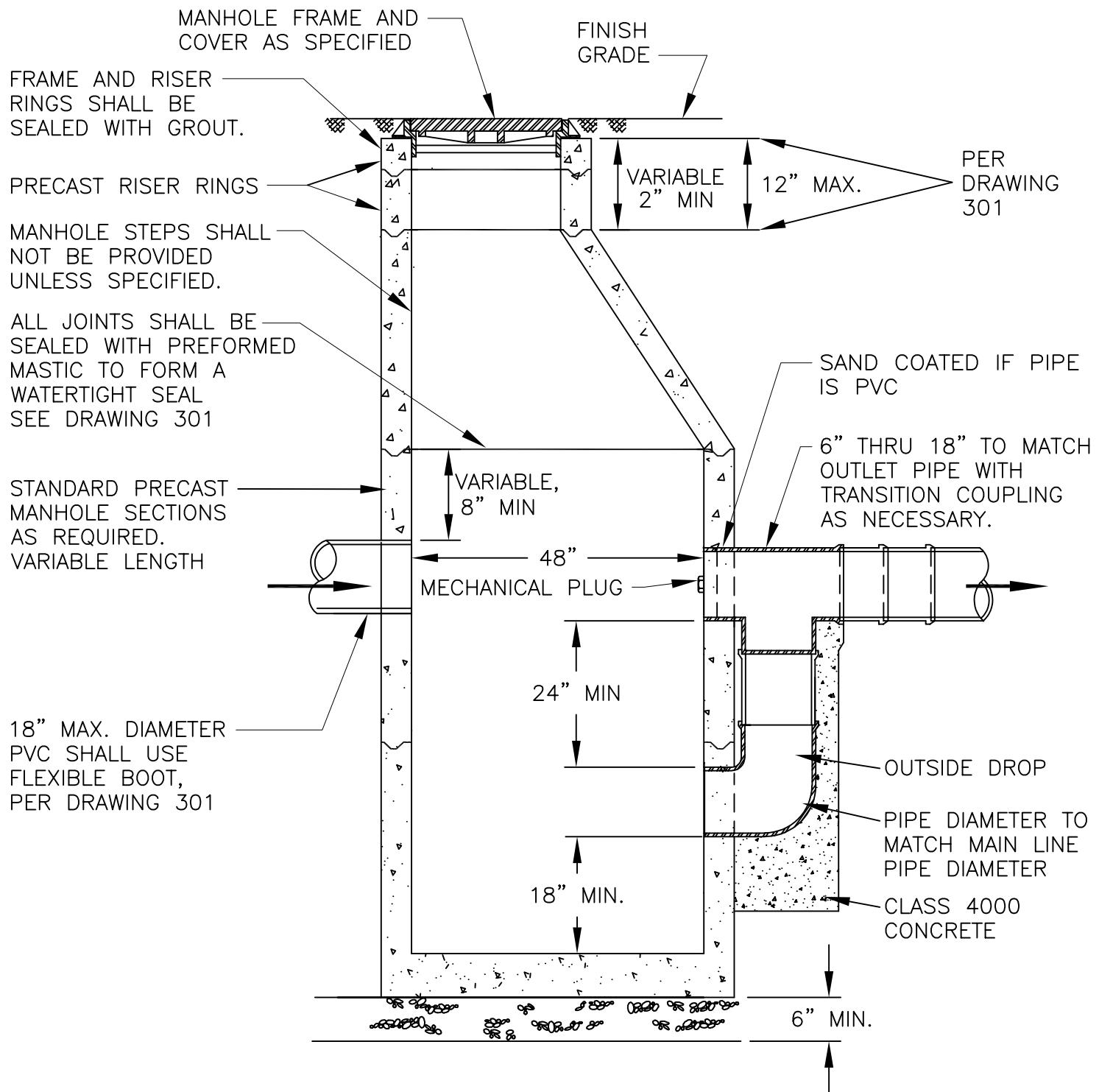
1. INSTALL NON-POTABLE WATER (PURPLE) OMNI MARKER BALL AT TIE-IN TO MAIN, 3' BELOW FINISHED GRADE. TEST OMNI BALL BEFORE INSTALLATION AND AGAIN AFTER FINISHED GRADE IS PLACED. OMNI BALL-NON-POTABLE WATER-PURPLE, FREQUENCY 66.35 KHz, MODEL 168, UPC 11050.
2. WHEN REQUIRED BY THE CITY, INSTALL 2-WAY CLEANOUT PER STANDARD DRAWING 310-A.
3. VIDEO INSPECT LATERAL BETWEEN MAINLINE AND CLEANOUT PER APWA/ODOT STANDARDS.
4. 2" x 4" TREATED STAKE FROM INVERT TO 1' ABOVE FINISH GRADE. SERVICE MARKER SHALL BE CONTINUOUS AND REMAIN VERTICAL AFTER BACKFILLING. END SHALL BE PAINTED WHITE WITH "STM" MARKED ON POST. (TYPICAL AT ALL SERVICES.)
5. CENTERLINE OF SERVICE OUTLET ON TEE SHALL BE ABOVE SPRINGLINE.
6. STORM SEWER SERVICE LINES SHALL BE 90° PERPENDICULAR TO STORM SEWER MAIN.



## Public Works Standard Drawings

### STORM SEWER SERVICE

SCALE	NTS	
DATE	JAN '23	REV.
ENGR.	DW	DRAWN
DRAWING NO.	612	KAE



NOTE:

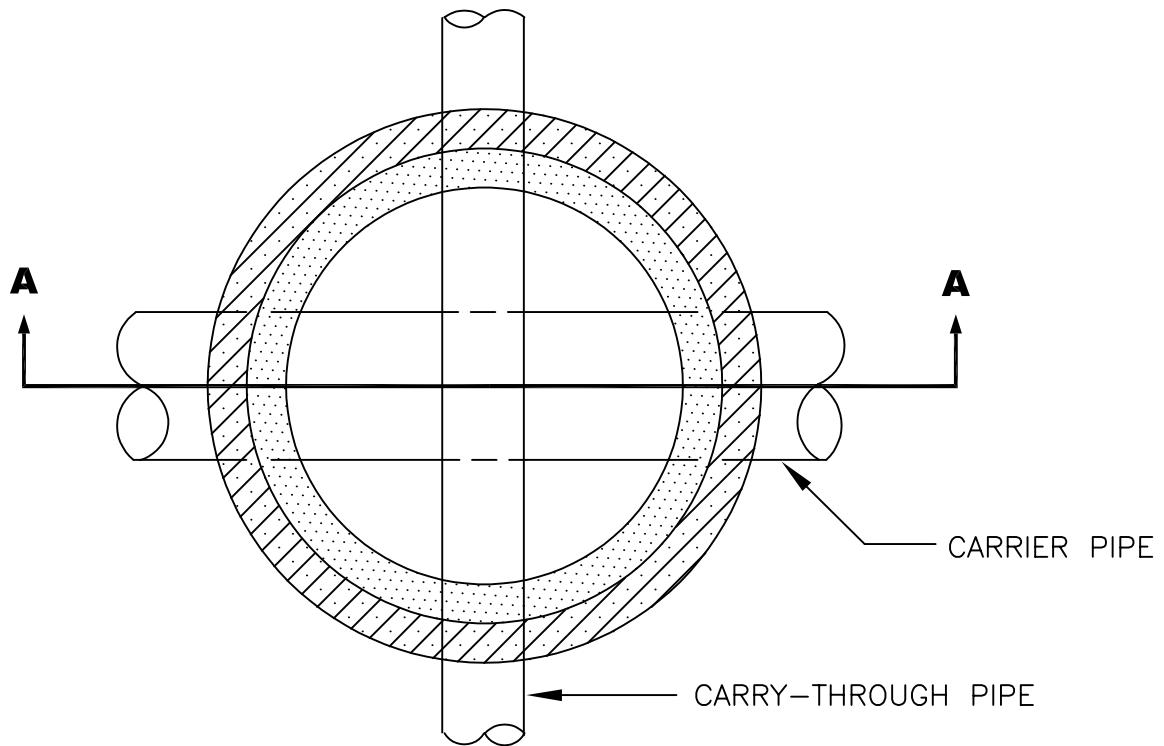
1. ALL PRECAST SECTIONS SHALL CONFORM TO REQUIREMENTS OUTLINED IN DRAWING 301.
2. ALL CONNECTING PIPE SHALL HAVE A FLEXIBLE JOINT WITHIN 18" OF MANHOLE WALL. FOR NEW MANHOLES, USE KOR-N-SEAL BOOTS (OR EQUAL). CONNECTIONS TO EXISTING MANHOLES SHALL USE SANDED PVC COLLAR WITH GASKETED JOINT. FLEXIBLE JOINT SHALL BE NO GREATER THAN 18" FROM EXTERIOR MANHOLE WALL. SEE DRAWING 301.
3. CONSTRUCT OUTSIDE DROP PER THE DETAIL FOR 'OUTSIDE DROP CONNECTION FOR MANHOLES. SEE DRAWING 303.



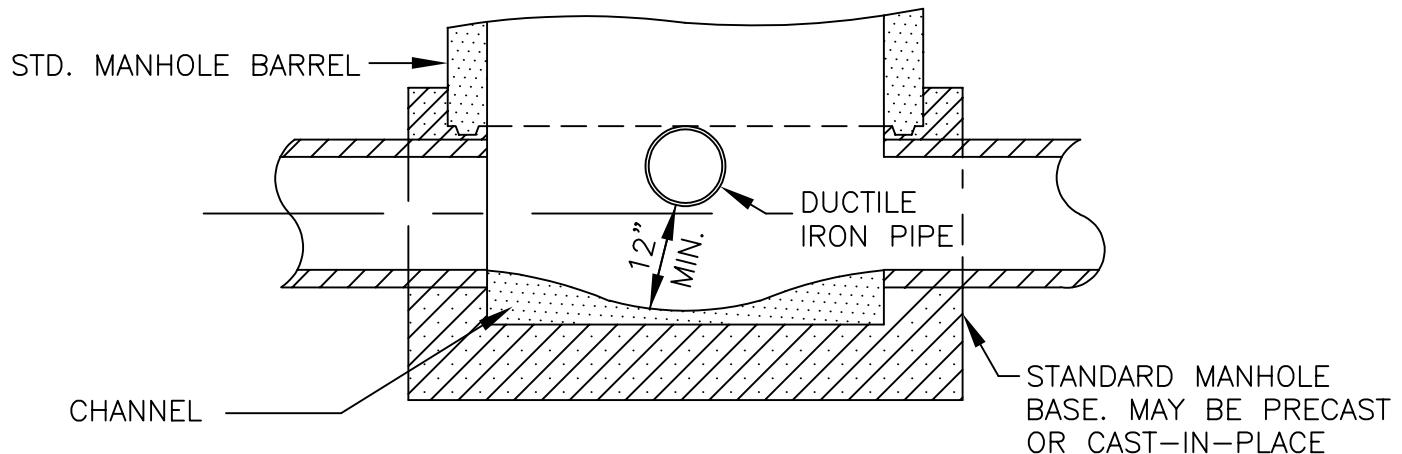
Public Works Standard Drawings

**POLLUTION CONTROL MANHOLE  
WITH OUTSIDE DROP**

SCALE NTS	
DATE JAN '23	REV.
ENGR. DW	DRAWN KAE
DRAWING NO. 613-2	



**PLAN VIEW**



**SECTION A-A**

**NOTES:**

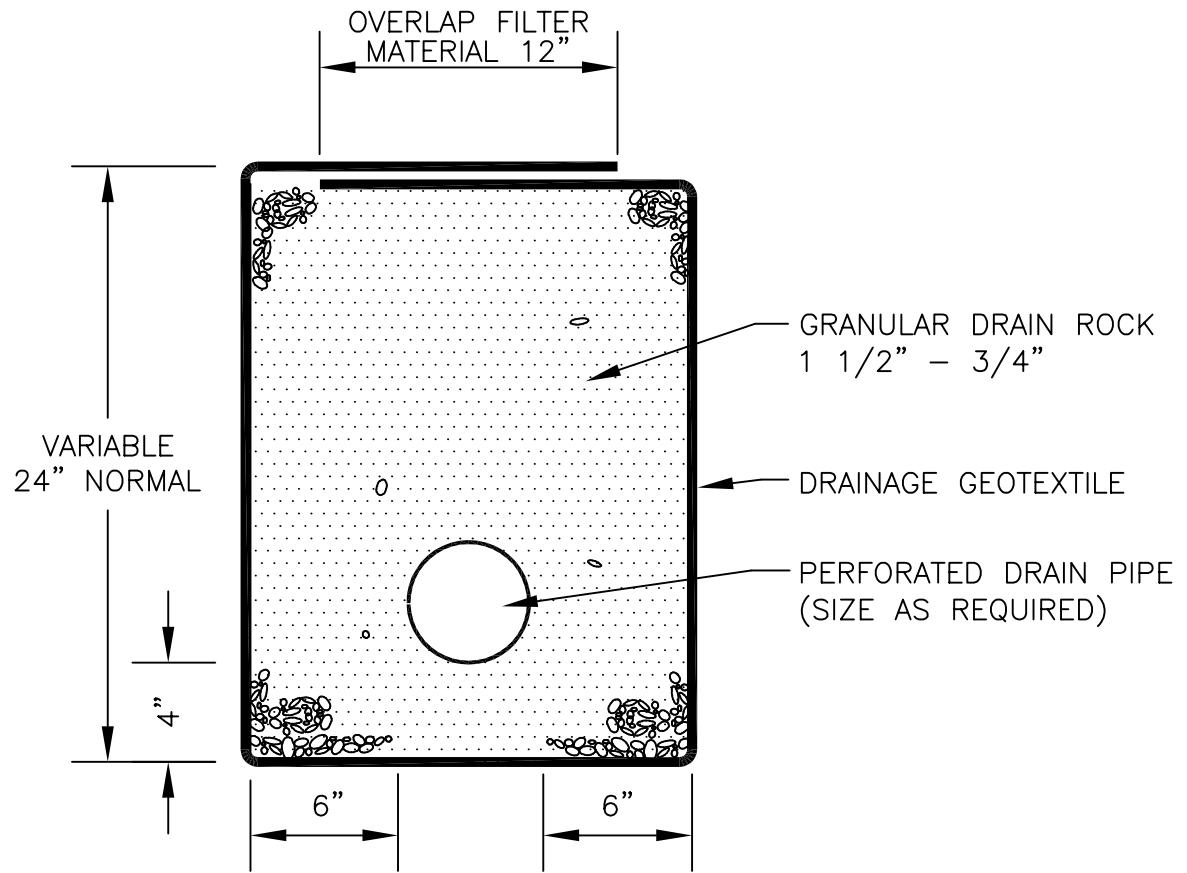
1. CARRY-THROUGH PIPE SHALL BE DUCTILE IRON.
2. THIS MANHOLE DESIGN SHALL BE USED ONLY AS DIRECTED BY THE ENGINEER TO MITIGATE UNAVOIDABLE GRADE CONFLICTS.



Public Works Standard Drawings

**CARRY THROUGH  
MANHOLE - STORM**

SCALE	NTS
DATE	JAN '23
REV.	
ENGR.	DW
DRAWN	KAE
DRAWING NO.	614



NOTES:

1. GRANULAR DRAIN ROCK PER ODOT STANDARD 00430-11.
2. DRAINAGE GEOTEXTILE PER ODOT STANDARD TABLE 02320-1.
3. PERFORATED DRAIN PIPE PER ODOT STANDARD 02415.00.

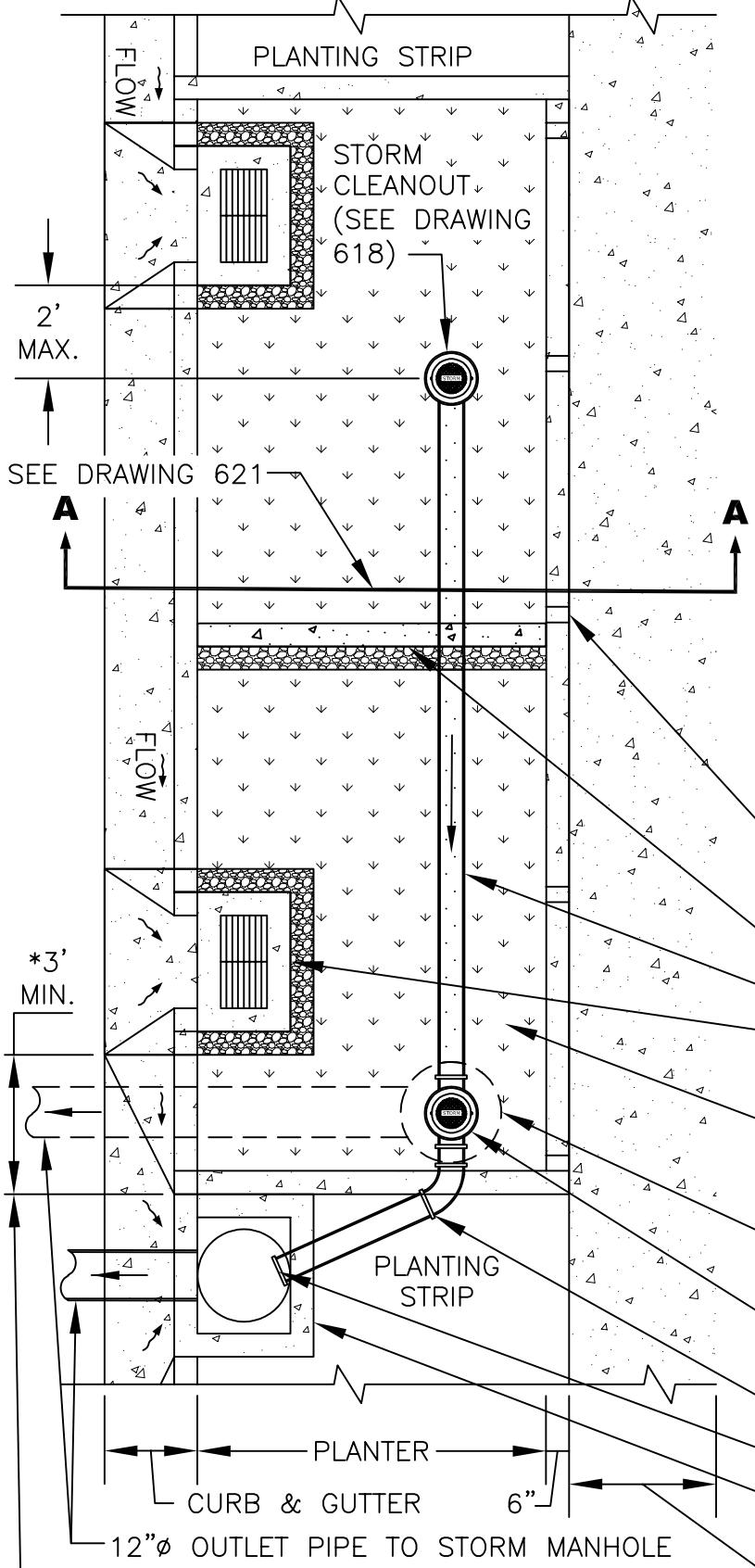


Public Works Standard Drawings

SUBSURFACE DRAIN DETAIL

SCALE	NTS	
DATE	JAN '23	REV.
ENGR.	DW	DRAWN
DRAWING NO.	KAE	
	616	

## PLAN VIEW



### NOTES:

1. THIS PLAN VIEW IS ONLY AN EXAMPLE, TO GUIDE ENGINEERED DESIGN.
2. PROVIDE BEGINNING AND ENDING STATIONS FOR EACH FACILITY. PROVIDE STATIONING AND/OR DIMENSIONS AND ELEVATIONS AT EACH INLET, OUTLET, CHECK DAM, PLANTER CORNER.
3. SIDEWALK ELEVATION MUST BE SET ABOVE CHECK DAM AND INLET ELEVATIONS TO ALLOW OVERFLOW TO DRAIN TO STREET BEFORE SIDEWALK.
4. PROPOSED UTILITY LINES TO BE LOCATED OUT OF FACILITY.
5. 4" WIDE NOTCH AT LOW POINT(S) OF SIDEWALK AND/OR EVERY 6FT.
6. BEEHIVE STRUCTURE TO BE UTILIZED WHEN OVERFLOW CANNOT BE CONVEYED TO AN APPROVED STORM INLET STRUCTURE IN LIEU OF DRAIN PIPE CONNECTING TO AN APPROVED STORM INLET STRUCTURE. BEEHIVE STRUCTURE TO HAVE 12"Ø OUTLET PIPE CONNECTING TO AN APPROVED OUTLET STRUCTURE SUCH AS A STORM MANHOLE, SEE DRAWING 626.
7. STORMWATER FACILITY GROWING MEDIUM SHALL MEET REQUIREMENTS OF APPENDIX A OF CITY STORMWATER MANUAL.
8. SEE DRAWING 620 FOR ROADSIDE STORMWATER PLANTER ELEVATION.

4" NOTCH FOR SIDEWALK DRAINAGE WHEN SIDEWALK IS ADJACENT (SEE NOTE 5 & DRAWING 621)

CHECK DAM (SEE DRAWING 624)

6"Ø PERFORATED DRAIN PIPE

SCUPPER AND SEDIMENT BASIN (SEE NOTE 2 & DRAWING 623)

GROWING MEDIUM (SEE NOTE 7 & DRAWING 630 FOR PLANTING REQUIREMENTS)

BEEHIVE OVERFLOW STRUCTURE \*(OPTIONAL, SEE NOTE 6)

2-WAY STORM CLEAN-OUT (SEE DRAWING 627)

6"Ø SOLID PIPE WITH 45° MAX. BEND

REMOVABLE CAP WITH ORIFICE

PRECAST CURB INLET (SEE NOTE 2 & DRAWING 609)

SIDEWALK PER CITY STANDARD

\*3' MIN. WHEN BEEHIVE OPTION IS USED,

1' MIN. WITH NO BEEHIVE



Public Works Standard Drawings

ROADSIDE STORMWATER PLANTER  
PLAN VIEW

SCALE NTS

DATE JAN '23 REV.

ENGR. DW DRAWN KAE

DRAWING NO. 619

TOP OF WATERTIGHT LINER  
(1" BELOW GROW MEDIUM ELEVATION)  
(SEE DRAWING 625)

PRECAST CURB INLET  
WITH 18" SUMP MIN.  
(SEE DRAWING 609)

PLANTER FACILITY  
ONE WAY CLEANOUT  
(SEE DRAWING 618)

OVERFLOW ELEVATION  
(3" MIN. BELOW  
SIDEWALK ELEVATION)

CURB CUT  
(SEE DRAWING 623)

18" MIN.  
24" MAX.

ROOT  
BARRIER

STREET TREE IN PLANTER  
(SEE DRAWING 631)  
2-WAY CLEANOUT  
(SEE DRAWING 627)

SEE NOTE 6

SCUPPER SPACING  
60' MAX.

GUTTER  
FLOW

6" PERFORATED  
DRAIN PIPE (1%  
SLOPE MINIMUM)

PLANTER WALL TYP.

6" SOLID OR  
PERFORATED PIPE  
WRAPPED WITH FILTER  
(1% SLOPE MINIMUM)

EXISTING  
SUBGRADE

DEEPPENED SECTION FOR  
TREE (SEE DRAWING 631)

6" SOLID PIPE  
REMOVABLE CAP WITH ORIFICE

12"Ø OUTLET PIPE TO STORM MANHOLE

NOTES:

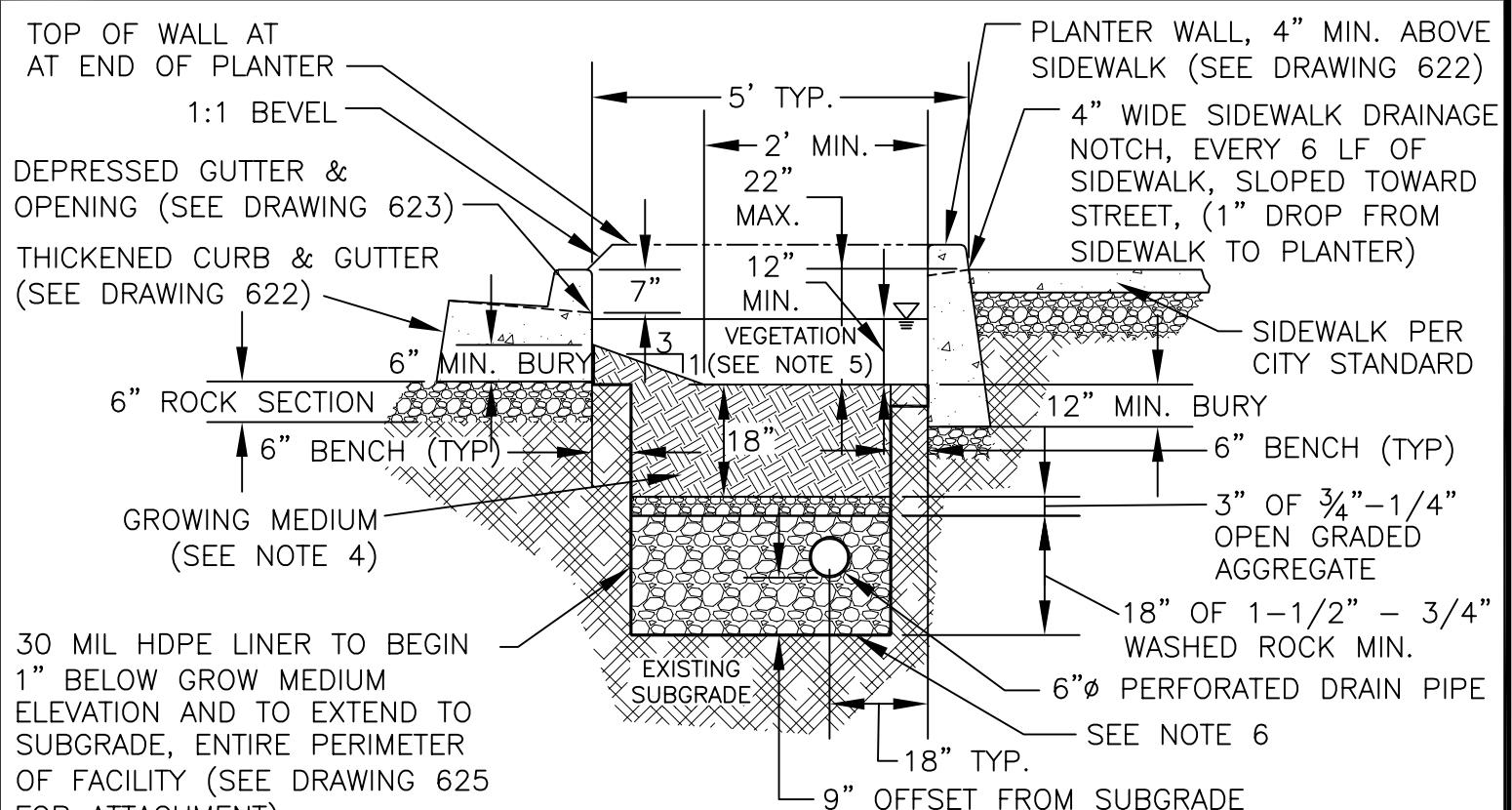
1. PROVIDE PROTECTION FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC PRIOR TO, DURING AND AFTER CONSTRUCTION.
2. SCUPPERS SHALL BE SPACED NO MORE THAN 60 FEET APART AND ONE AT EACH END OF A PLANTER.
3. SLOPE OF PLANTER TO NOT EXCEED 0.5%.
4. PIPE SHALL BE PVC D3034 SDR 35, 6" MINIMUM DIAMETER. PIPING MUST HAVE 1% SLOPE MINIMUM, BOTTOM OF PIPE SHALL BE SET AT 9" ABOVE EXISTING SUBGRADE.
5. ALL PIPE TO HAVE GASKET JOINTS AND GASKETED JOINT FITTINGS.
6. OVERFLOW
  - MUST FLOW TO APPROVED OUTLET STRUCTURE PER OREGON CITY STORMWATER MANUAL.
  - BEEHIVE STRUCTURE TO BE UTILIZED WHEN OVERFLOW CANNOT BE CONVEYED TO CURB INLET OR AN APPROVED STORM INLET STRUCTURE. SEE DRAWING 619 AND 626.
7. THIS ELEVATION VIEW IS ONLY AN EXAMPLE, TO GUIDE ENGINEERED DESIGN.



Public Works Standard Drawings

ROADSIDE STORMWATER PLANTER  
ELEVATION

SCALE	NTS
DATE JAN '23	REV.
ENGR. DW	DRAWN KAE
DRAWING NO.	620



## SECTION A-A

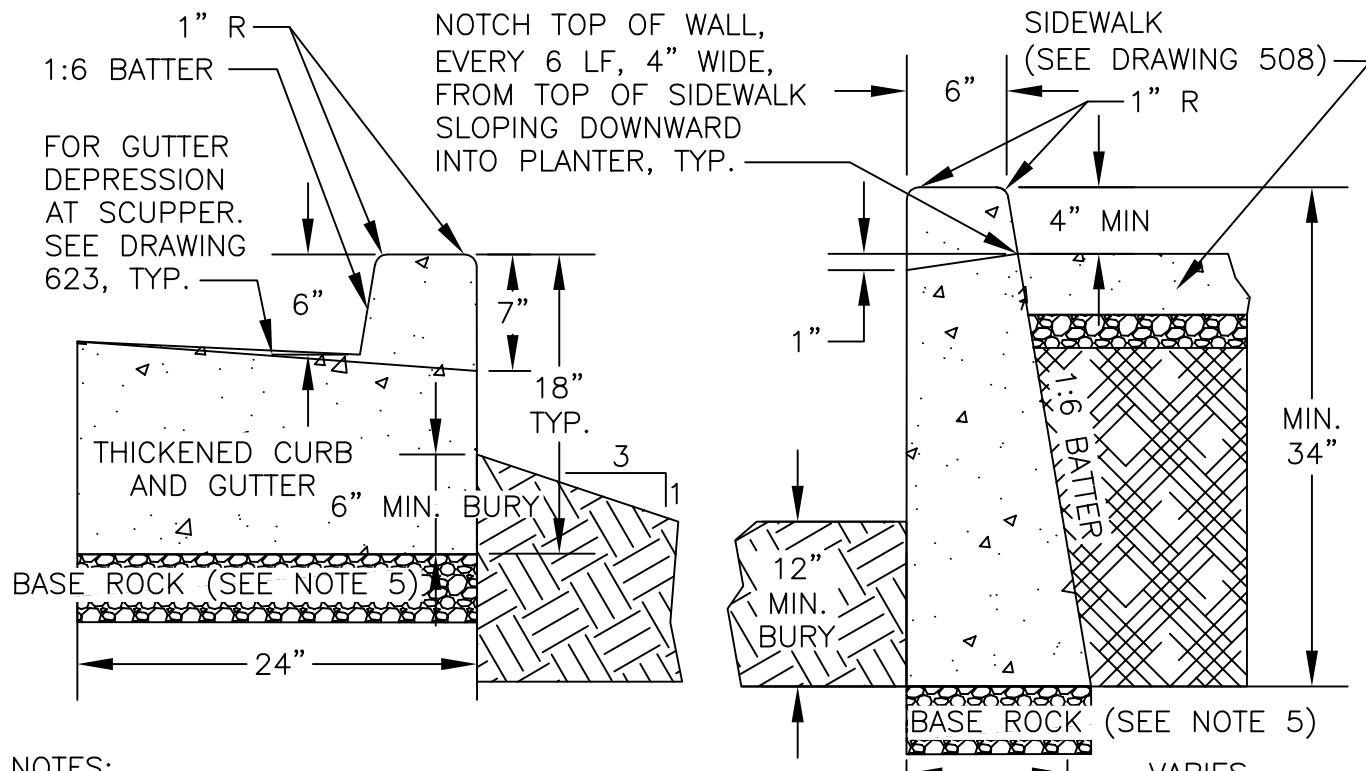
### PLANTER

## NOTES:

1. PROVIDE PROTECTION FROM ALL VEHICLE TRAFFIC, EQUIPMENT STAGING, AND FOOT TRAFFIC PRIOR TO, DURING AND AFTER CONSTRUCTION.
2. DIMENSIONS:
  - TOP OF GROWING MEDIUM TO OVERFLOW ELEVATION SHALL BE A MINIMUM OF 12".
  - TOP OF SIDEWALK ELEVATION ADJACENT TO PLANTER SHALL BE NO LESS THAN 3" ABOVE GUTTER ELEVATION.
  - TOP OF SIDEWALK ELEVATION ADJACENT TO PLANTER SHALL BE NO GREATER THAN 22" FROM TOP OF PLANTER GROWTH MEDIUM.
3. PIPING:
  - PIPE SHALL BE PVC D3034 SDR 35, 6" MINIMUM DIAMETER WITHIN PLANTER. PIPING MUST HAVE 1% SLOPE, BOTTOM OF PIPE SHALL BE SET AT 9" ABOVE EXISTING SUBGRADE.
  - OVERFLOW SHALL BE PIPED TO A STANDARD CURB INLET/CATCH BASIN STRUCTURE OR STORM MANHOLE, SEE DRAWING 619.
4. GROWING MEDIUM: SEE APPENDIX A OF STORMWATER MANUAL FOR SPECIFICATION.
5. VEGETATION: REFER TO PLANTING REQUIREMENTS IN APPENDIX A OF STORMWATER MANUAL, SEE DRAWING 630 FOR PLANT SPACING REQUIREMENTS.
6. WATERTIGHT LINER (SEE DRAWING 625 FOR LINER ATTACHMENT REQUIREMENTS):
  - WHEN WITHIN CONTAMINATED SOIL OR 10' OF STRUCTURE FOUNDATION OR PAVED STRUCTURAL SECTION OR UNDERGROUND STRUCTURES, BOTTOM OF FACILITY MUST BE LINED WITH A WATERTIGHT LINER.
  - LINER SHALL BE 30 MIL HDPE OR APPROVED EQUAL.
  - LINER SHALL BE PLACED AROUND ENTIRE PERIMETER OF FACILITY.
  - LINER REQUIRED UNLESS FACILITY'S BOTTOM AND SIDES ARE MONOLITHIC CONCRETE.
7. CHECK DAMS:
  - REINFORCED CONCRETE CHECK DAMS SHALL BE PLACED AT LEAST EVERY 30 FEET.
8. MINIMUM PLANTER WALL HEIGHT OF 34".



SCALE	NTS		
DATE	JUL '25	REV.	1
ENGR.	DW	DRAWN	KAE
DRAWING NO. 621			



NOTES:

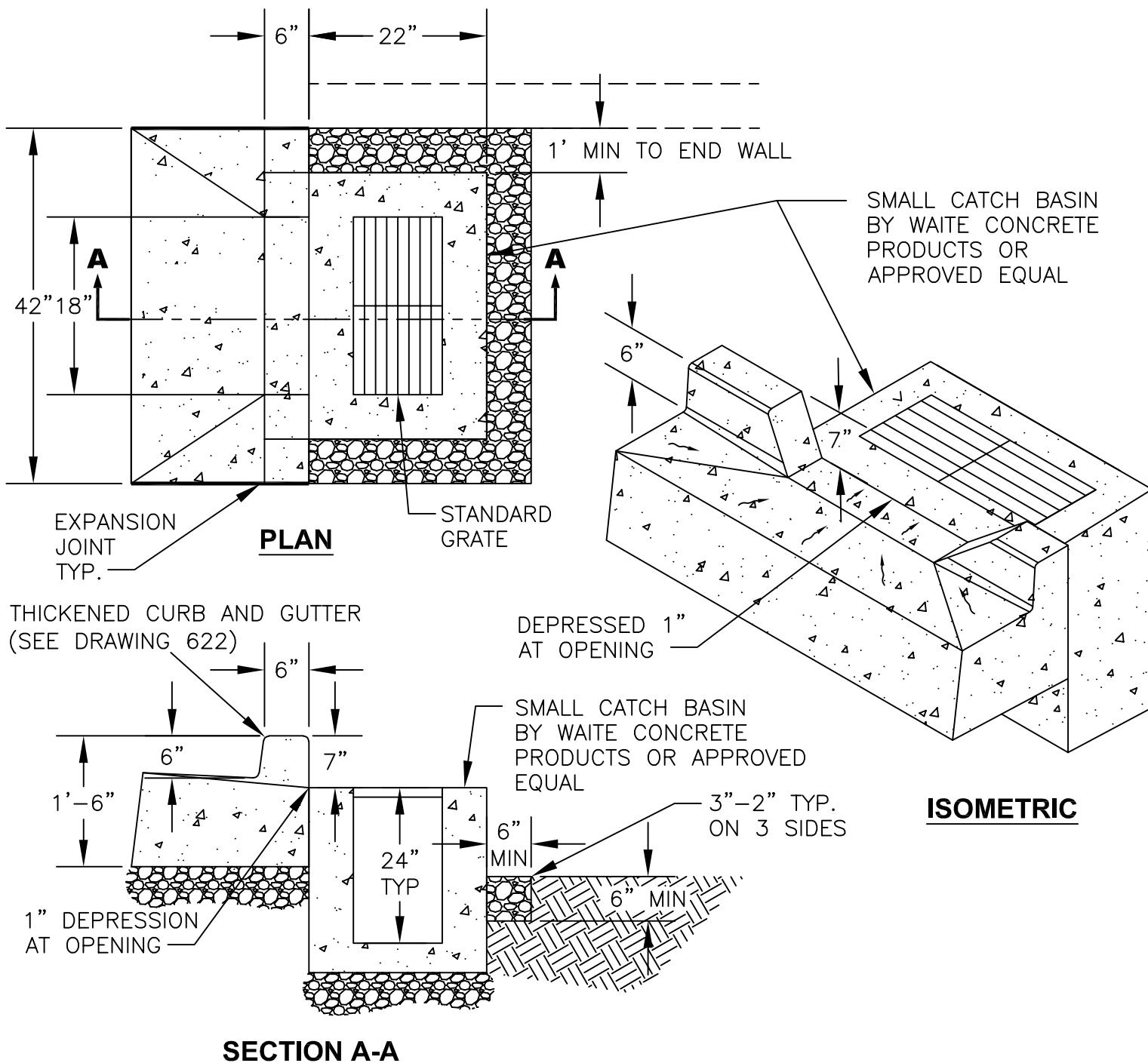
1. CONCRETE SHALL BE AIR-ENTRAINED MINIMUM 4.0% AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AFTER 28 DAYS.
2. ALL CONCRETE SURFACES SHALL BE SMOOTH AND FREE FROM DEFECTS AND SHALL HAVE A LIGHT BROOM TEXTURED FINISH.
3. EXPANSION JOINTS (CURB AND SIDEWALK ONLY):
  - A. TO BE PROVIDED:
    - 1) AT EACH COLD JOINT.
    - 2) AT EACH END OF DRIVEWAYS.
    - 3) AT EACH POINT OF TANGENCY OF THE CURB.
    - 4) AT LOCATIONS NECESSARY TO LIMIT SPACING TO 45 FEET.
  - B. MATERIAL TO BE USED IS "REFLEX RUBBER JOINT EXPANSION" JOINT MATERIAL, OR CITY APPROVED EQUAL, WITH A THICKNESS OF 1/2 INCH.
4. CONTRACTION JOINTS (CURB AND SIDEWALK ONLY):
  - A. SPACING TO BE NOT MORE THAN 10 FEET REGARDLESS OF LOCATION OF DRAINAGE NOTCH
  - B. THE DEPTH OF THE JOINT SHALL BE AT LEAST 1-1/2 INCHES WITH 1/2-INCH MAXIMUM RADIUS TROWEL JOINT.
  - C. PLACE JOINT ON EACH SIDE OF SCUPPER INLET (SEE DRAWING 623)
5. BASE ROCK TO BE 3/4"-0", 95% COMPACTION PER AASHTO T 180. BASE ROCK SHALL BE 6" MINIMUM IN DEPTH.
6. SIDEWALK CONTRACTION JOINTS SHALL BE PLACED IN LINE WITH ONE OF THE DRAINAGE NOTCH CORNERS.
7. SIDEWALK ELEVATION MUST BE SET ABOVE STREET INLET/OUTLET ELEVATIONS TO ALLOW OVERFLOW TO DRAIN TO STREET OR PIPED OVERFLOW SYSTEM AS APPLICABLE.
8. CHECK DAMS:
  - REINFORCED CONCRETE CHECK DAMS SHALL BE PLACED EVERY 30 FEET STARTING FROM UPPER END WALL
  - CHECK DAMS SPACING MAY BE DECREASED TO KEEP LONGITUDINAL SLOPE OF PLANTER FROM EXCEEDING .05%
9. THICKENED CURB AND GUTTER SHALL BE POURED MONOLITHICALLY.



Public Works Standard Drawings

ROADSIDE STORMWATER PLANTER WALL  
DETAIL

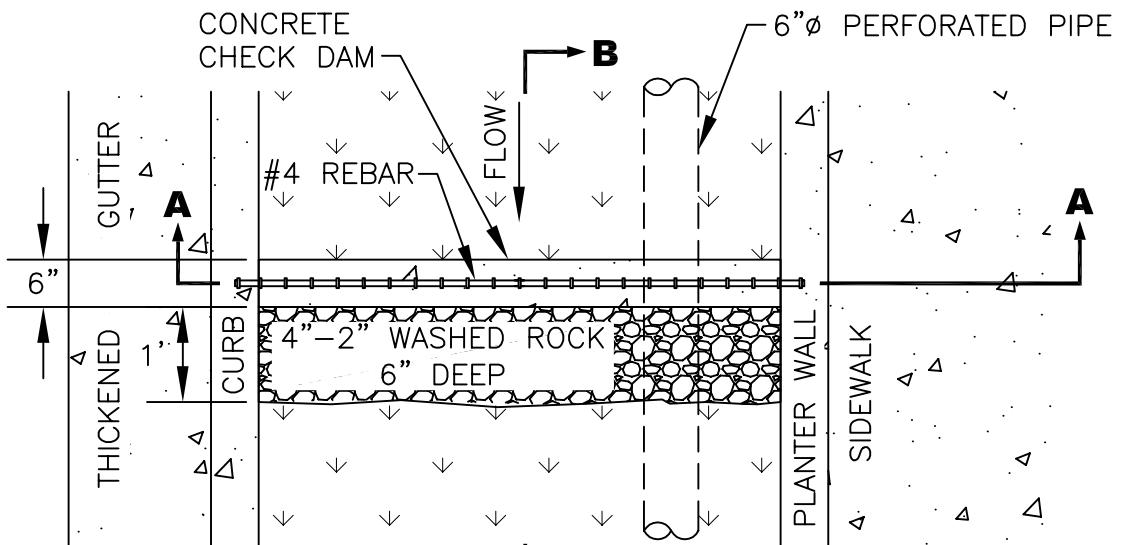
SCALE NTS	
DATE JUL '25	REV. 2
ENGR. DW	DRAWN KAE
DRAWING NO. 622	



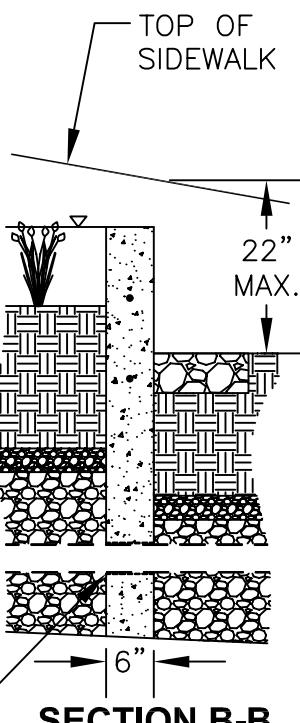
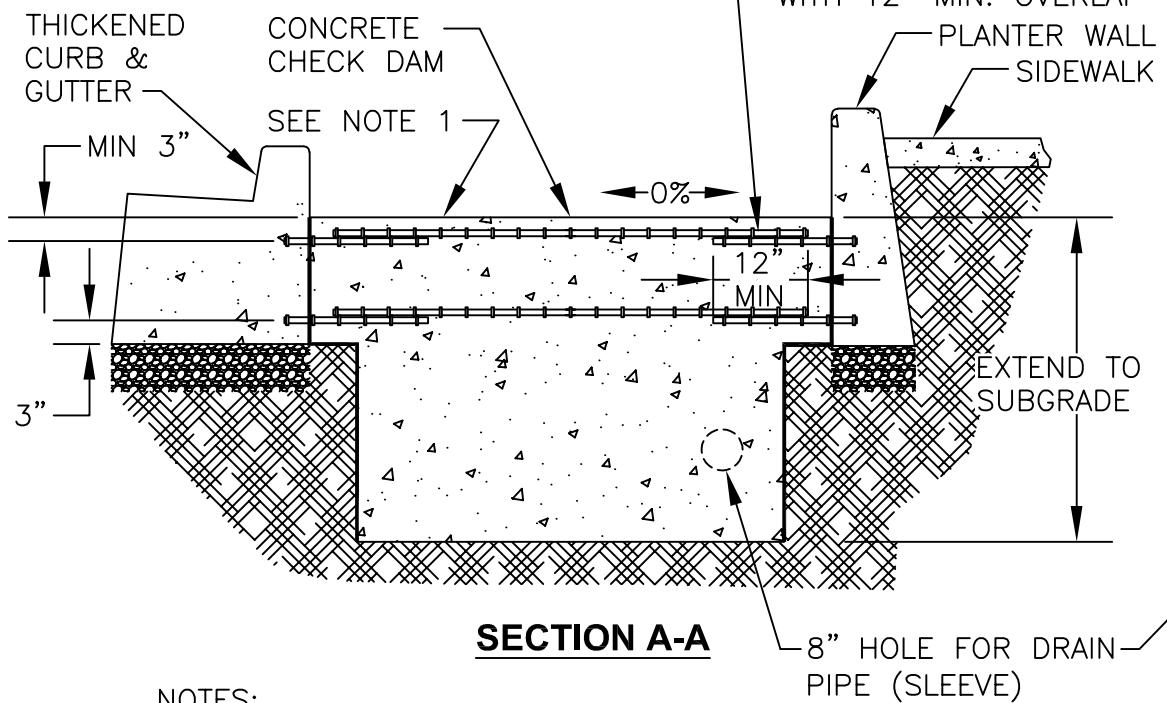
NOTES:

1. MATCH GUTTER PAN OF ADJACENT CURB AND GUTTER.
2. CATCH BASIN RIM SHALL BE LEVEL WITH DEPRESSED GUTTER ELEVATION.
3. CATCH BASIN SHALL BE PRECAST CONCRETE, INCLUDING BOTTOM.





**PLAN**



NOTES:

1. TOP OF CHECKDAM (TCD) ELEVATION TO BE AT LEAST 3" BELOW ADJACENT TOP OF CURB AND 1" BELOW UPSTREAM SCUPPER.
2. ENSURE THAT CHECK DAM ELEVATIONS DO NOT CAUSE STORMWATER TO OVERFLOW FROM UPSTREAM SCUPPER OR ONTO SIDEWALK.
3. ELEVATION DROP FROM TOP OF SIDEWALK TO DOWN STREAM SIDE OF CHECK DAM MUST NOT EXCEED 22".
4. CONCRETE TO BE 4,000 PSI WITH #4 REBAR EMBED 3" INTO CURB AND PLANTER WALL.



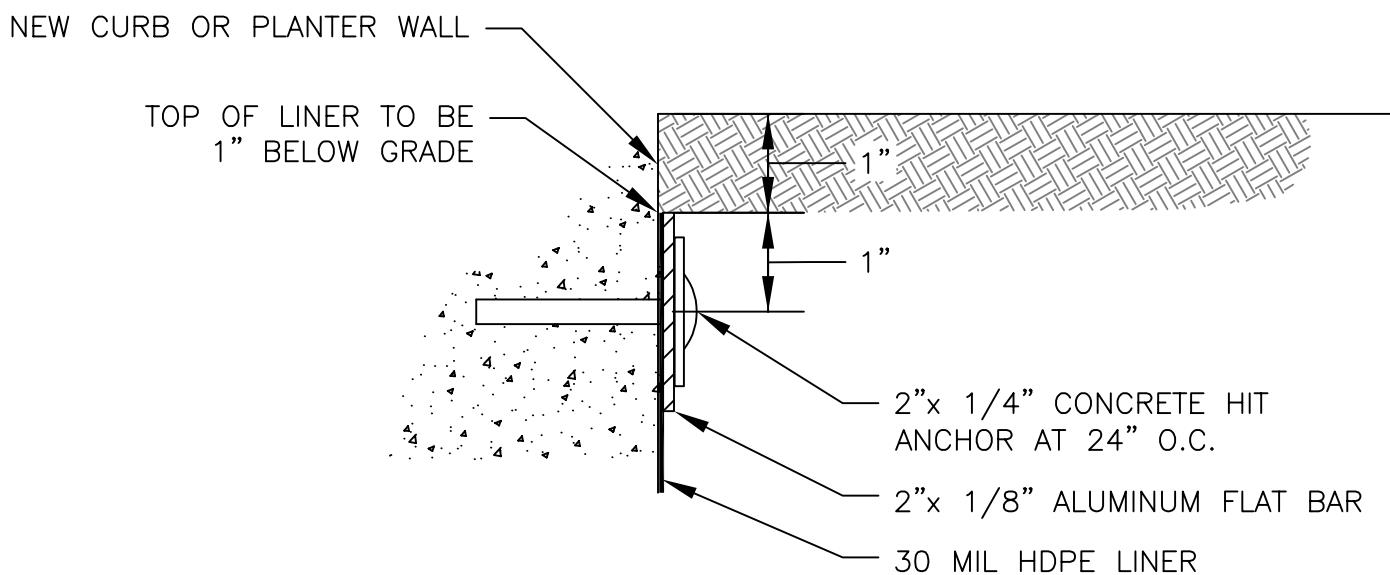
Public Works Standard Drawings

ROADSIDE STORMWATER PLANTER  
CONCRETE CHECK DAM

SCALE		NTS
DATE	JUL '23	REV. 1
ENGR.	DW	DRAWN KAE
DRAWING NO.		624

## CONSTRUCTION NOTES

1. ADHERE LINER TO CONCRETE W/SEALANT IF RECOMMENDED BY LINER MANUFACTURE.
2. SECURE LINER TO CONCRETE WITH 2" ALUMINUM FLAT BAR, PLACED AS DIRECTED.
3. ATTACH FLAT BAR WITH CONCRETE HIT ANCHORS, 24" O.C.
4. TRIM EXCESS LINER TO THE TOP OF THE FLAT BAR.
5. ATTACHING LINER TO MINIMIZE WRINKLES, CORNERS SHOULD BE CUT TO FIT WITHOUT WRINKLES.
6. LINER TO BEGIN 1" BELOW GRADE AND EXTEND DOWN TO SUBGRADE AND MINIMUM 1' INTO BOTTOM OF PLANTER.



## LINER ATTACHMENT

### NOTES:

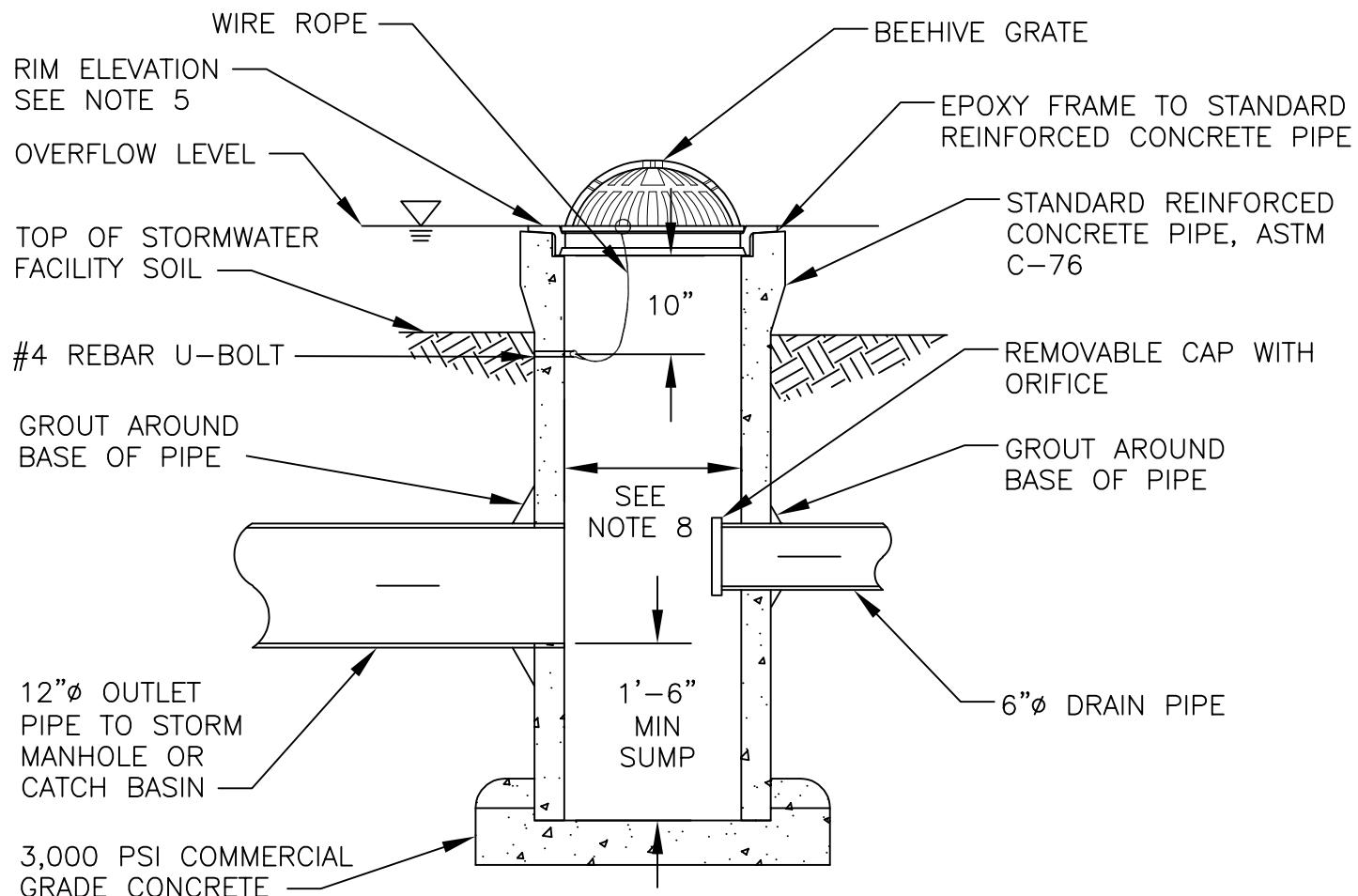
1. LINER MATERIALS TO BE HDPE LINER TO EXTEND FROM TOP OF 2" FLAT BAR TO SUBGRADE.
2. IN AREAS WITH CONTAMINATED SOILS THE FACILITY MUST BE COMPLETELY LINED WITH A 30 MIL LINER UNLESS FACILITY'S BOTTOM AND SIDES ARE MONOLITHIC CONCRETE.
3. PIPE BOOT: USE SEALANT OR STAINLESS STEEL BANDS TO ADHERE LINER TO PIPING, OR OTHER METHOD AS APPROVED BY THE CITY ENGINEER.



Public Works Standard Drawings

WATERPROOF LINER ATTACHMENT  
AND PIPE BOOT

SCALE	NTS
DATE JUL '23	REV. 1
ENGR. DW	DRAWN KAE
DRAWING NO.	625



#### NOTES

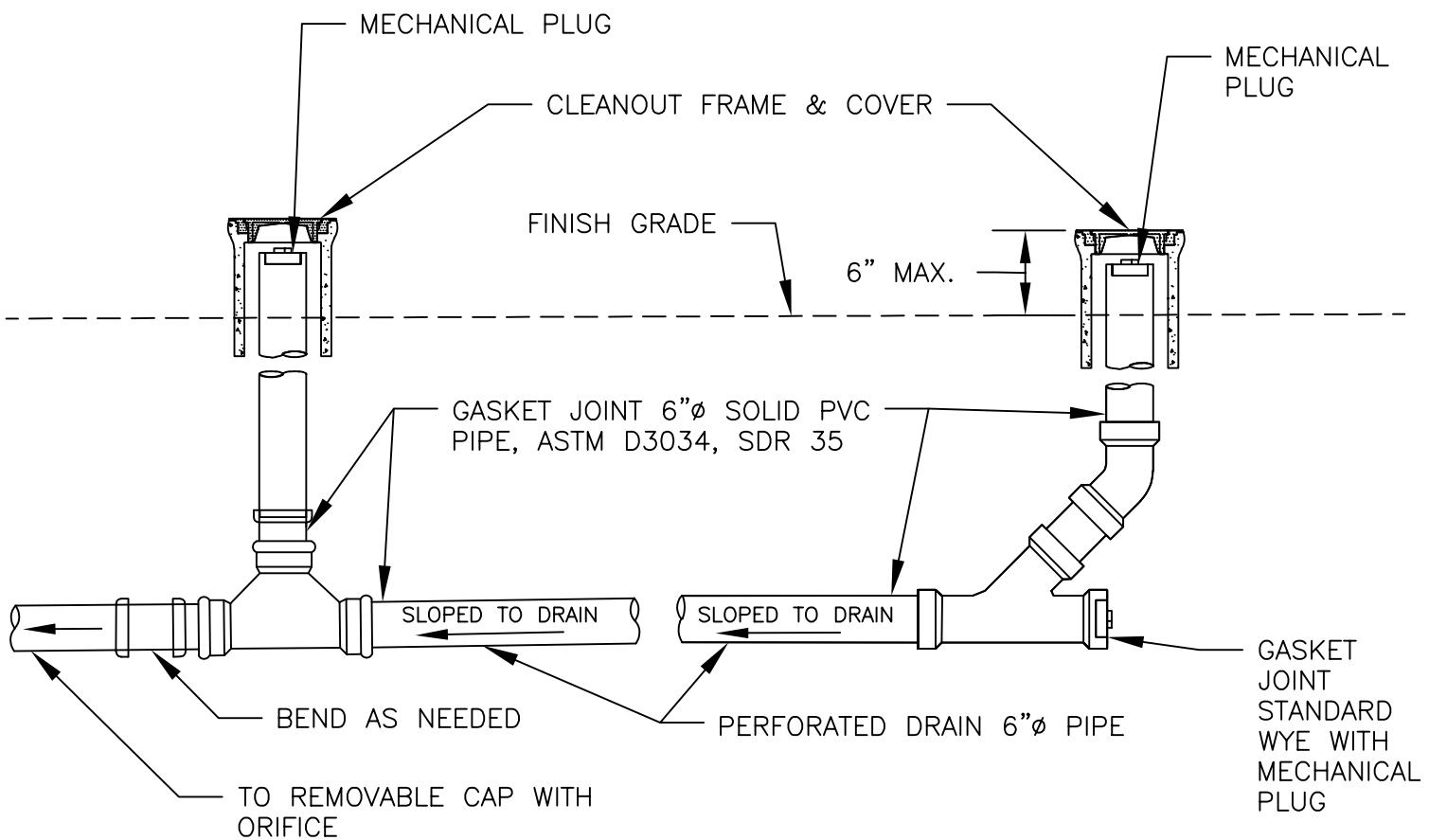
1. THIS CROSS-SECTIONAL VIEW IS ONLY AN EXAMPLE, ORIENTATION OF INLET AND OUTLET PIPES DEPENDS ON ENGINEERED DESIGN.
2. SECURE GRATE IN PLACE WITH 54" OF WIRE ROPE. LOOP ENDS OF WIRE ROPE AROUND U-BOLT AND GRATE. CRIMP EACH END OF WIRE ROPE WITH 3" OVERLAP.
3. DRILL 2" DEEP HOLES INTO PIPE AND EPOXY #4 REBAR U-BOLT (2"X 4") IN HOLES.
4. GRATE TO BE CAST IRON, ASTM A48 CL30.
5. BEEHIVE RIM ELEVATION MUST BE MINIMUM 1" BELOW NEAREST SCUPPER, MINIMUM 4" BELOW ADJACENT TOP OF CURB, AND 12" ABOVE GROW MEDIUM.
6. WIRE ROPE BETWEEN 1/8"-3/16" DIAMETER, STAINLESS STEEL, 7 STRANDS OF 19 WIRES.
7. INVERT ELEVATION OF INLET PIPE MUST BE NO LOWER THAN INVERT ELEVATION OF OUTLET PIPE.
8. MINIMUM 18" I.D., MAXIMUM 24" I.D.



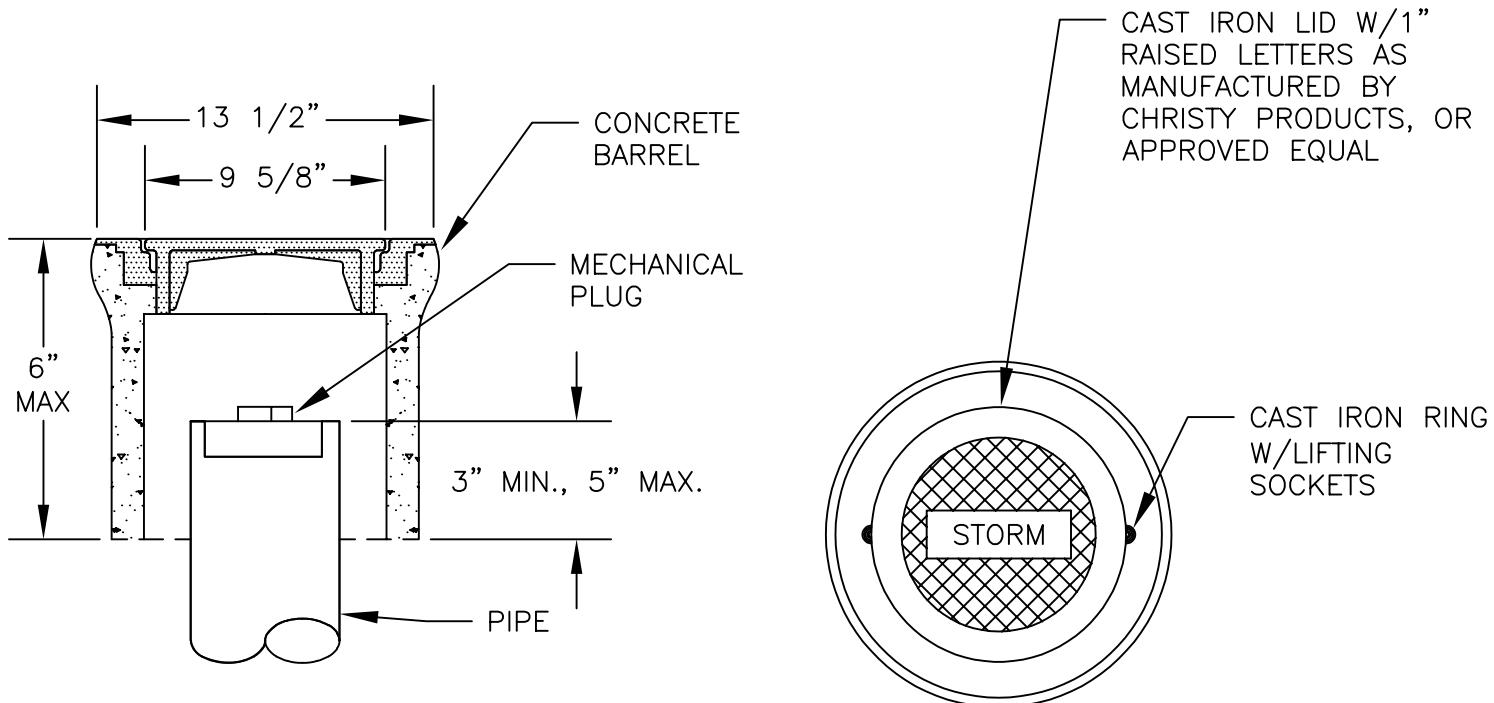
Public Works Standard Drawings

BEEHIVE OVERFLOW STRUCTURE

SCALE NTS	
DATE JUL '23	REV. 1
ENGR. DW	DRAWN KAE
DRAWING NO. 626	



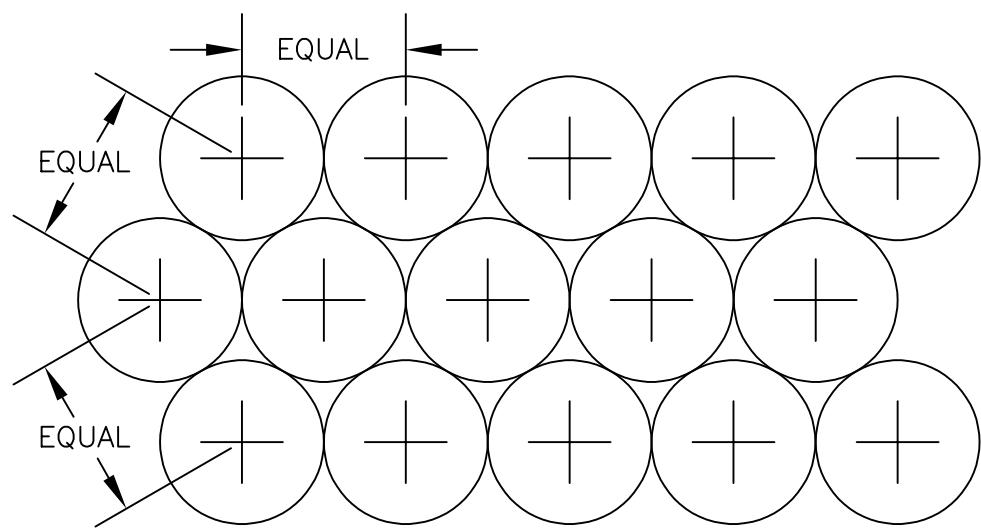
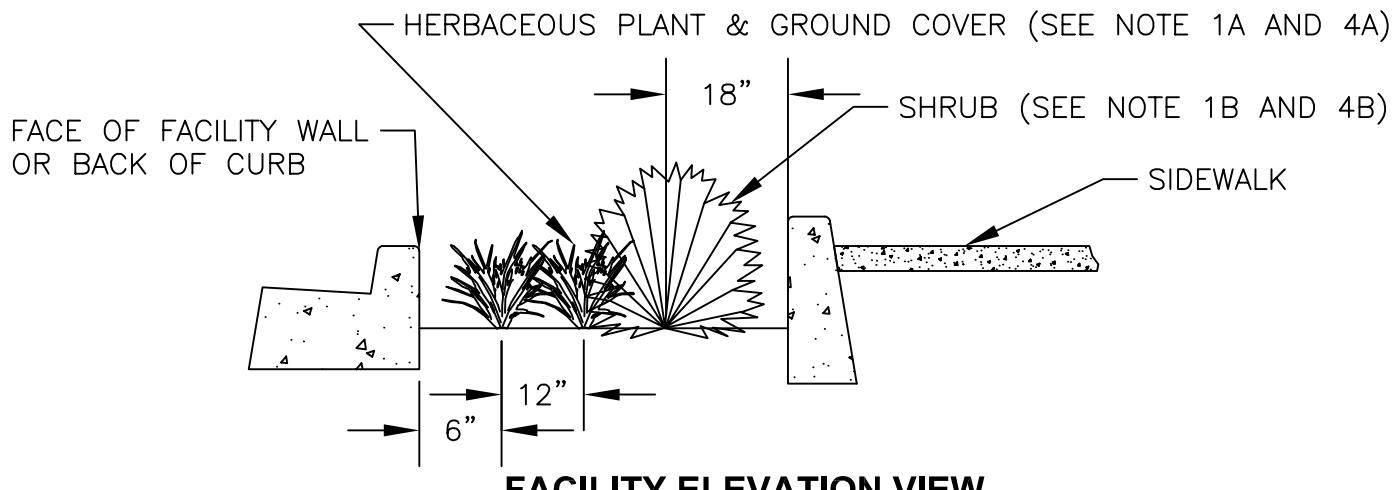
**SECTION VIEW**



Public Works Standard Drawings

STORMWATER PLANTER FACILITY  
CLEANOUTS

SCALE	NTS
DATE	JUL '23
ENGR.	DW
DRAWN	SP
DRAWING NO.	627



NOTES:

1. REFER TO PLANTING REQUIREMENTS IN APPENDIX A OF STORMWATER MANUAL.
  - A. HERBACEOUS PLANTS AND GROUNDCOVERS THAT REQUIRE MORE THAN 12" O.C. SPACING ARE PROHIBITED.
  - B. ONLY SMALL SHRUBS (NO MORE THAN 3' POTENTIAL HEIGHT) THAT REQUIRE NO MORE THAN 24" O.C. SPACING SHALL BE ALLOWED.
2. ALL PLANTS SHALL BE PLANTED AT EQUAL TRIANGULAR SPACING ON CENTER. INTERIOR PLANT SPACING MAY BE SLIGHTLY ADJUSTED TO ACHIEVE DESIRED EDGE SETBACKS.
3. PLANTING DENSITY SHALL AVERAGE NO LESS THAN 90 TO 115 PLANTS FOR EVERY 100 SQUARE FEET, DEPENDING ON PLANTING DIVERSITY.
4. PLANTS SHALL BE LOCATED SET BACK FROM FACILITY EDGES AS FOLLOWS:
  - A. HERBACEOUS PLANTS AND GROUNDCOVERS: 6" FROM CENTER OF PLANT TO FACE OF FACILITY WALL, BACK OF CURB OR SIDEWALK EDGE.
  - B. SHRUBS: 18" FROM CENTER OF PLANT TO FACE OF FACILITY WALL, BACK OF CURB OR SIDEWALK EDGE AND 24" O.C. FROM SHRUB TO SHRUB.



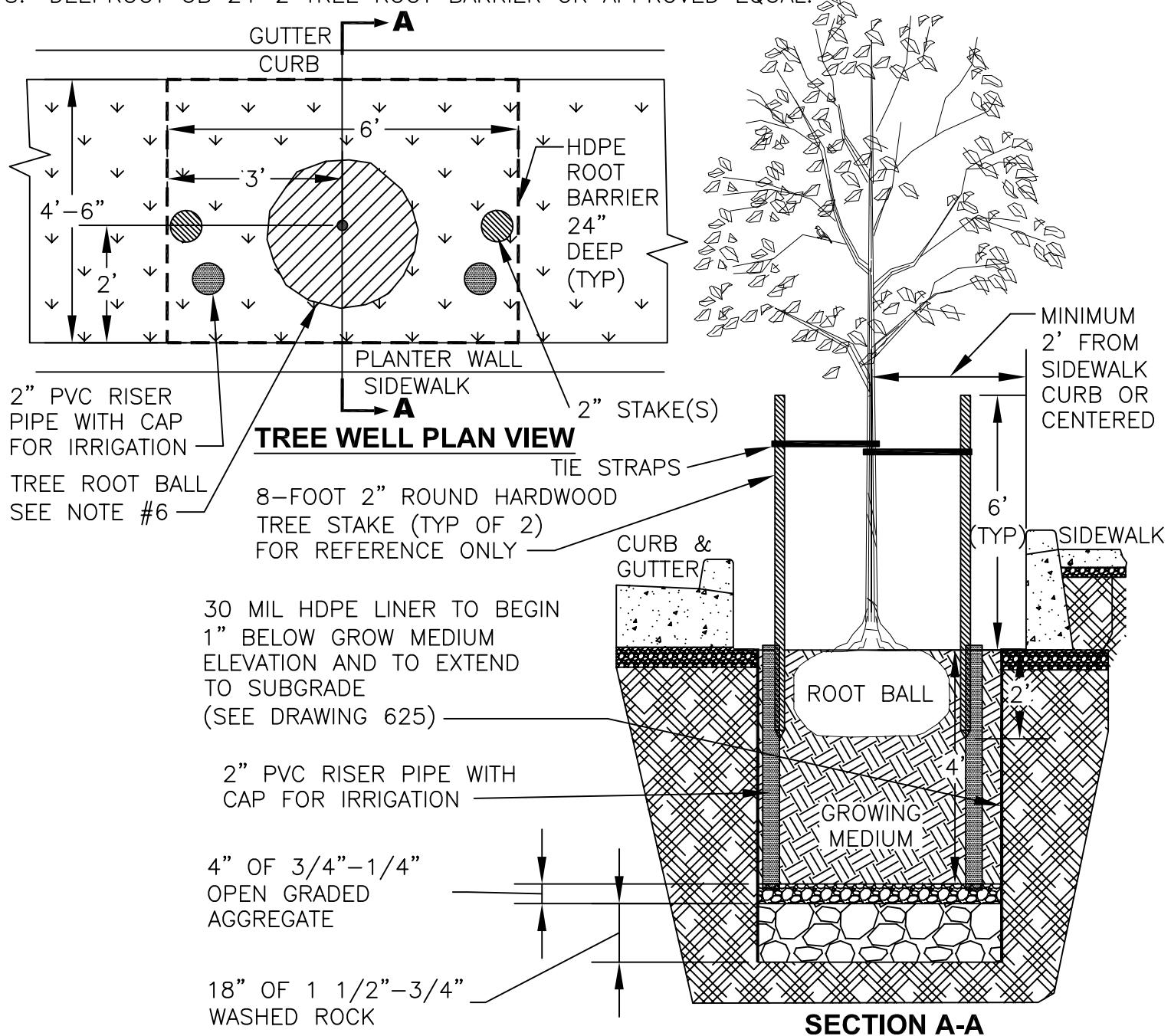
Public Works Standard Drawings

ROADSIDE STORMWATER PLANTER  
PLANT SPACING

SCALE	NTS	
DATE	JAN '23	REV.
ENGR.	DW	DRAWN
DRAWING NO.	630	

NOTES:

1. DISTANCE BETWEEN TREES VARIES, TYPICALLY ONE STREET TREE SHALL BE PLANTED FOR EVERY THIRTY-FIVE FEET OF PROPERTY FRONTAGE. THE TREE SPACING SHALL BE EVENLY DISTRIBUTED THROUGHOUT THE TOTAL DEVELOPMENT FRONTAGE.
2. STORMWATER FACILITY GROWING MEDIUM SHALL MEET REQUIREMENTS OF APPENDIX A OF CITY STORMWATER MANUAL.
3. ALL PROPOSED TREE SPECIES MUST MEET REQUIREMENTS IN APPENDIX A OF STORMWATER MANUAL.
4. TREES SHALL BE CENTERED IN THE PLANTING ZONE/TREE WELL.
5. SET TRUNK FLARE TWO INCHES ABOVE SOIL SURFACE.
6. REMOVE ALL TWINE, WIRE, ROOT BAGS, BURLAP, AND ALL OTHER NURSERY MATERIALS FROM TREE PRIOR TO BACKFILLING.
7. DRIVE TREE STAKE INTO SOIL OUTSIDE OF ROOT BALL.
8. DEEPROOT UB 24-2 TREE ROOT BARRIER OR APPROVED EQUAL.

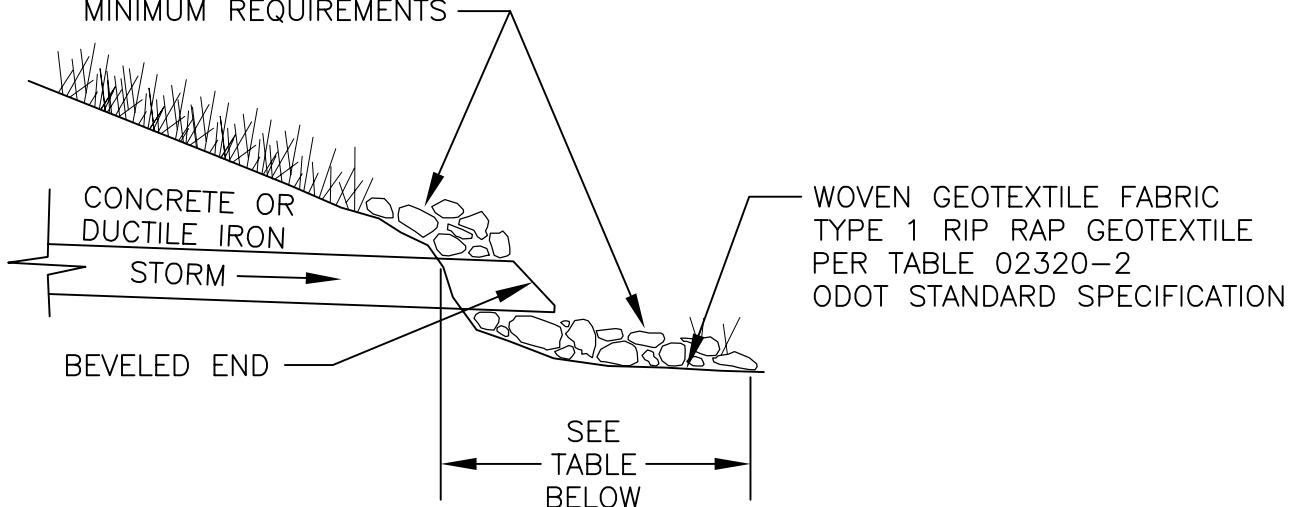


Public Works Standard Drawings

TREE WELL IN STORMWATER PLANTER

SCALE	NTS
DATE	JAN '23
REV.	
ENGR.	DW
DRAWN	KAE
DRAWING NO.	631

RIP RAP: SEE TABLE  
BELOW FOR TYPE AND  
MINIMUM REQUIREMENTS



### STORM OUTFALL DETAIL

N.T.S.

DISCHARGE VELOCITY AT DESIGN FLOW (fps)		MINIMUM REQUIRED PROTECTION DIMENSIONS				
GREATER THAN	LESS THAN OR EQUAL	TYPE	THICKNESS (ft)	WIDTH	LENGTH (USE GREATER OF)	HEIGHT OVER CROWN
0	5	ODOT CLASS 50 RIP RAP*	1.5	PIPE DIAMETER + 6 FT	8 FT OR 4 X PIPE DIAMETER	1 FT
5	10	ODOT CLASS 200 RIP RAP	2.5	GREATER OF: PIPE DIAMETER + 6 FT	12 FT OR 4 X PIPE DIAMETER	1 FT
10	ENGINEERED ENERGY DISSIPATER REQUIRED					

\* THE CITY MAY REQUIRE ODOT CLASS 100 RIP RAP IN AREAS WITH A LIKELIHOOD OF VANDALISM.

NOTE:

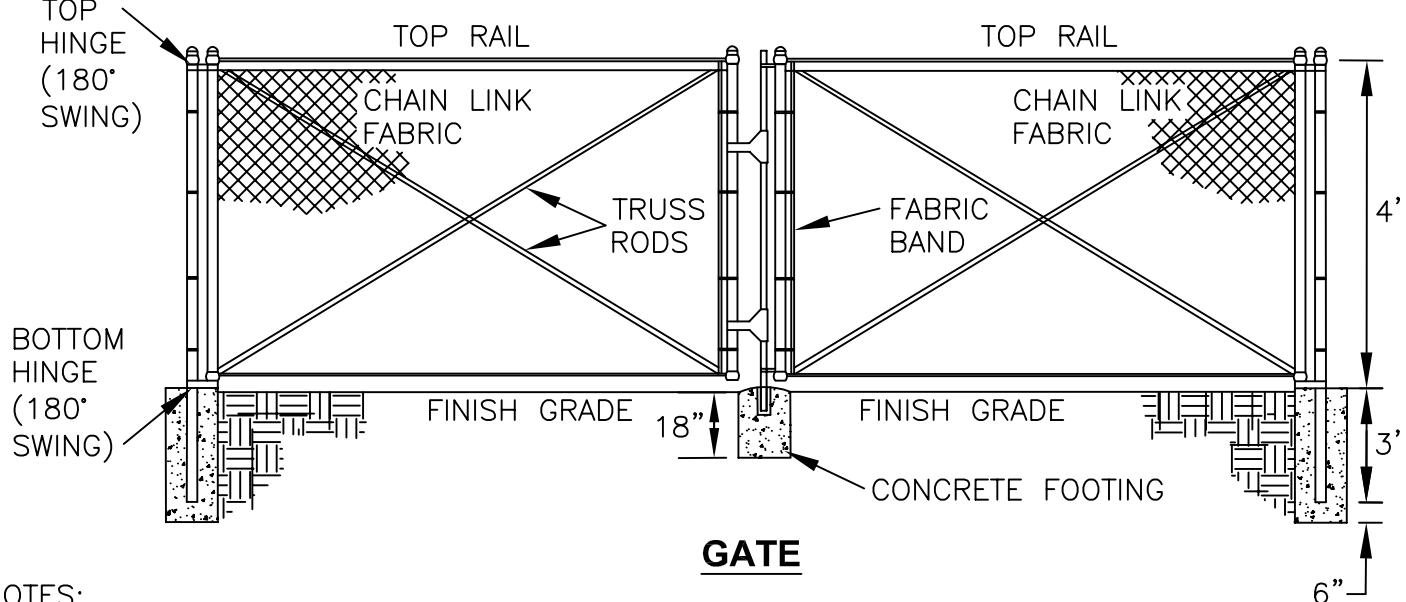
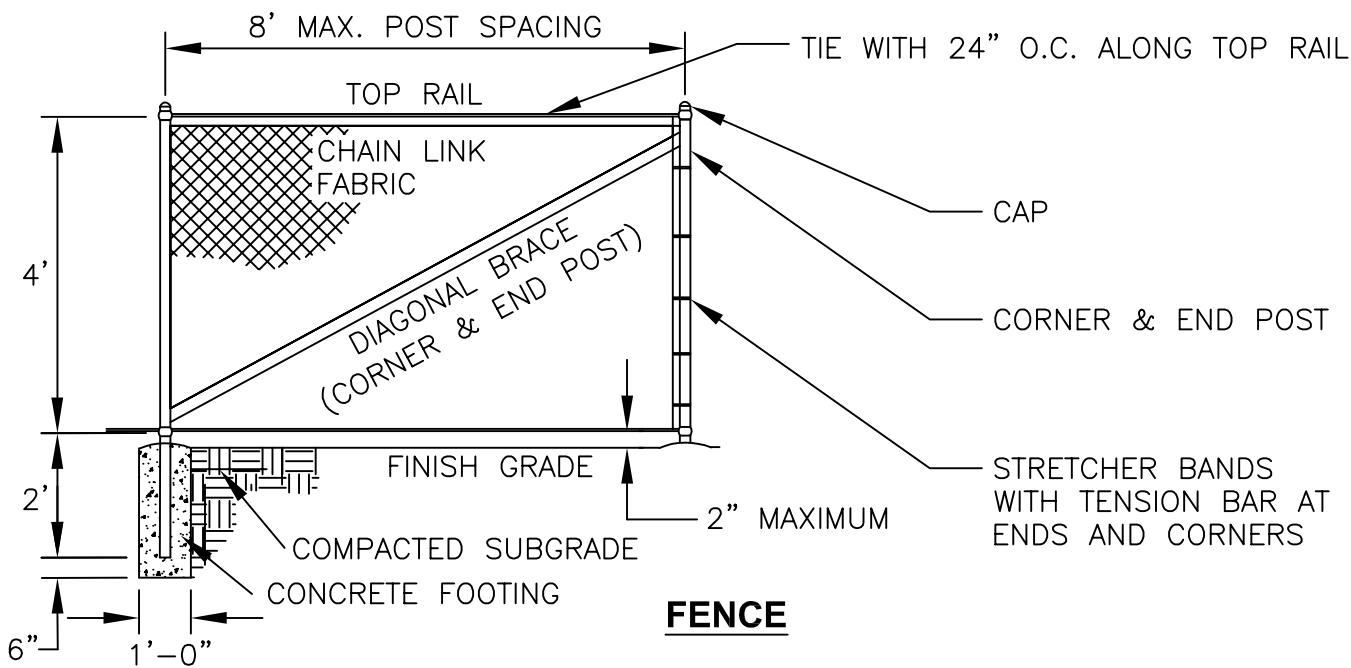
1. PIPE HEADWALLS SHALL BE REQUIRED WHERE PIPE MATERIAL OTHER THAN CONCRETE OR DUCTILE IRON IS EXPOSED IN THE DESIGN OF AN OUTLET OR INLET PIPE OR WHERE REQUIRED TO STABILIZE SLOPE. DETAILS OF ALL HEADWALLS AND END PROTECTION SHALL BE INCLUDED IN THE CONSTRUCTION DRAWINGS.



Public Works Standard Drawings

STORM OUTFALL

SCALE	NTS
DATE	JAN '23
REV.	
ENGR.	DW
DRAWN	KAE
DRAWING NO.	632



NOTES:

1. GATE AND FENCE SHALL BE DESIGNED TO CITY OF OREGON CITY CONSTRUCTION STANDARDS.
2. FENCE MATERIAL SHALL BE NO. 11 GAUGE GALVANIZED STEEL FABRIC WITH BONDED VINYL COATING (BLACK).
3. POSTS SHALL BE GALVANIZED STEEL, WITH TOP CAPS.
4. CROSS BARS SHALL CONNECT ADJACENT FENCE POSTS WITH DIAGONAL BRACES AT CORNERS AND ENDS.
5. SEE PLAN FOR LOCATION OF GATE AND FENCE.
6. ALL GATE AND FENCE MATERIALS (INCLUDING CHAIN LINK, FABRIC, POSTS, RAILS, ETC.) SHALL BE COVERED WITH BLACK-COLORED VINYL COATING. THE COLOR SHOULD BE THE SAME FOR ALL GATE AND FENCE MATERIALS.
7. CONCRETE FOOTING SHALL BE AS FOLLOWS:
  - \* FENCE – 12" MINIMUM DIAMETER X 30" DEEP, 3,000 PSI CONCRETE.
  - \* GATE – 12" MINIMUM DIAMETER X 42" DEEP, 3,000 PSI CONCRETE.



Public Works Standard Drawings

CHAIN LINK FENCE AND GATE

SCALE	NTS
DATE	JAN '23
REV.	
ENGR.	DW
DRAWN	KAE
DRAWING NO.	633