

## SECTION 7

### WASTEWATER

#### 7-1 General

The purpose of this section is to define the general requirements for the design of wastewater infrastructure and to provide typical construction details for the improvements. The City of Belton Public Works Department should be consulted if variations from these standards are anticipated.

#### 7-2 Master Plan

All wastewater improvements design must be sized and located according to the land use projected in the comprehensive Master Plan. Also, the City of Belton periodically updates the Wastewater Master Plan which should be used as guidance during the design process.

#### 7-3 Water Improvements

##### A. Design Standards

All wastewater improvements must be designed in accordance with Chapter 317 – Design Criteria for Sewerage System by the Texas Natural Resource Conservation Commission.

##### B. Materials

There are two primary materials that may be used as sanitary sewer mains, services and fittings.

##### 1. Polyvinyl chloride PVC

- a. Gravity uses – SDR 35 (0-10 feet) and/or SDR 26 (> 10 feet), meeting requirements of ASTM specification D-3034
- b. Force Mains – AWWA C900

2. Size of piping will be that necessary to serve a particular development but shall in no case be less than 6-inches in diameter. Any over-sizing required will be paid by the City of Belton.

##### C. Appurtenances

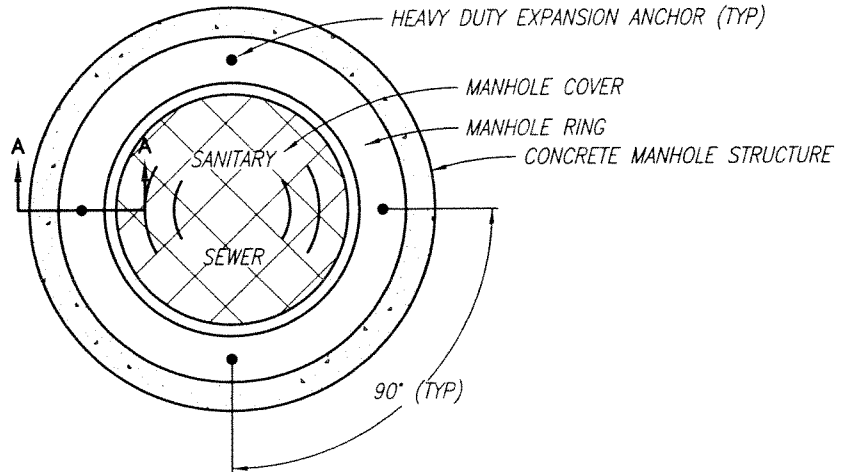
Manholes, cleanouts and other associated items for completion of a wastewater system are shown on the following detail sheets as to material types and dimensions.

7-4 Testing

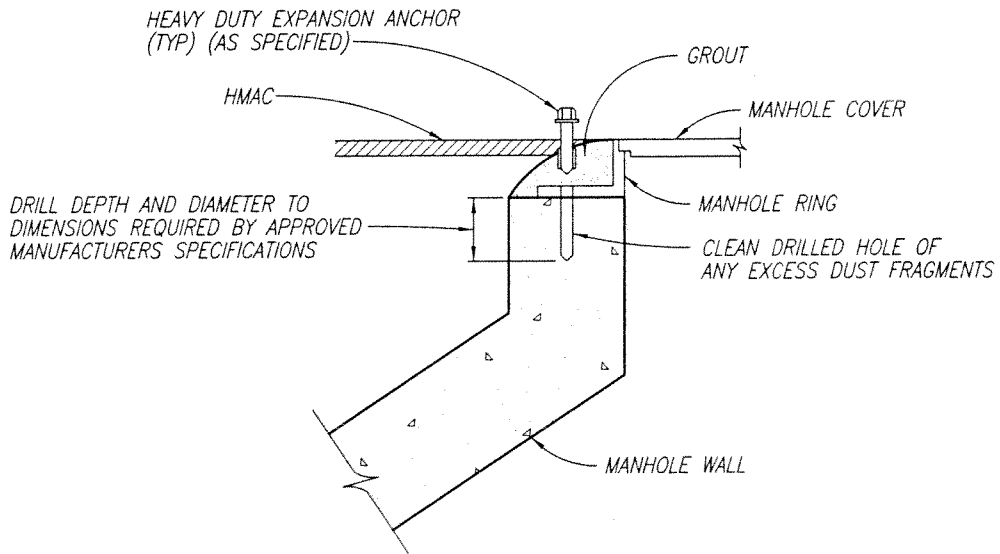
Testing of installed improvements shall meet all Texas Natural Resource Conservation Commission requirements and guidelines.

**ANCHOR ASSEMBLY FOR  
RING AND LID TO MANHOLE STRUCTURE**

MANHOLES LOCATED IN DRAINAGE AREAS  
THAT ARE SUBJECT TO HIGH WATER  
NOT TO SCALE



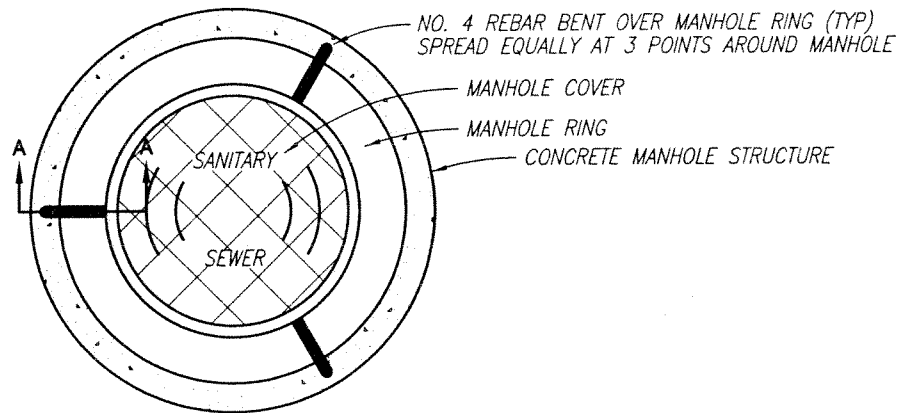
**MANHOLE COVER TOP PLAN**



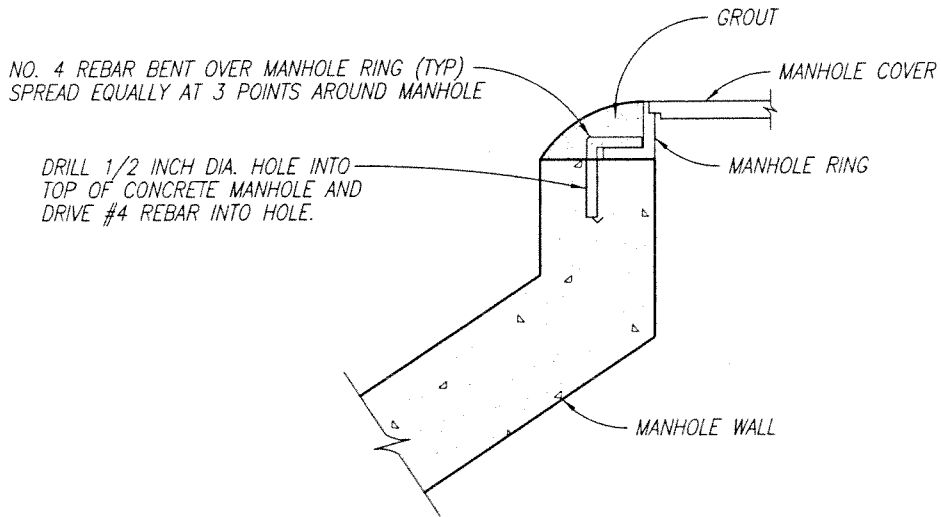
**HEAVY DUTY EXPANSION ANCHOR  
SECTION A-A**

**ALTERNATE ANCHOR ASSEMBLY FOR  
RING AND LID TO MANHOLE STRUCTURE**

MANHOLES LOCATED IN DRAINAGE AREAS  
THAT ARE SUBJECT TO HIGH WATER  
NOT TO SCALE



**MANHOLE COVER TOP PLAN**

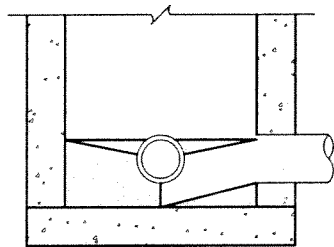
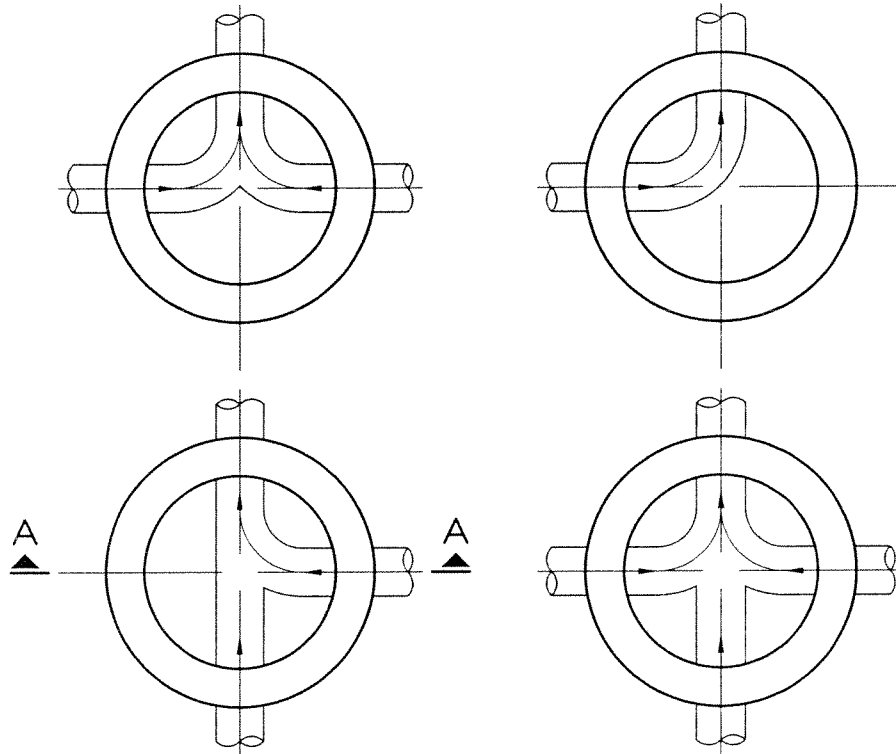


**SECTION A-A**

NOT TO SCALE

## FLOW PATTERNS FOR INVERT CHANNELS

NOT TO SCALE



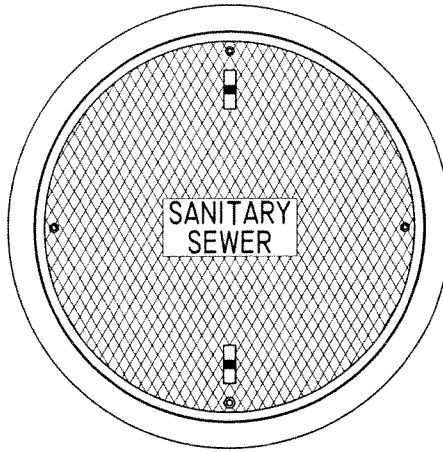
SECTION "A-A"

### NOTES:

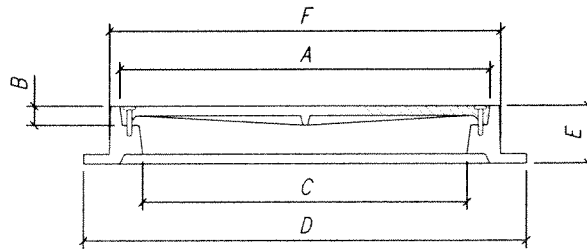
1. INVERT CHANNELS TO BE CONSTRUCTED FOR SMOOTH FLOW WITH NO OBSTRUCTIONS.
2. SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS PROVIDING FOR SMOOTH FLOW.
3. CHANNELS FOR FUTURE CONSTRUCTIONS (STUBS) SHALL BE CONSTRUCTED, FILLED WITH SAND, AND COVERED WITH 1" OF MORTAR.
4. SLOPE MANHOLE ITSELF WITH A 1:2 SLOPE FROM MANHOLE WALL TO CHANNEL.
5. INVERT SHALL BE A MINIMUM OF 1/2 THE DIAMETER OF THE LARGEST PIPE OR 4" DEEP.

# MANHOLE SET

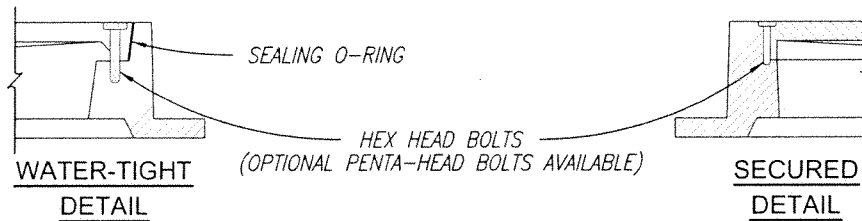
NOT TO SCALE



NOTE:  
LID SHALL HAVE TWO (2)  
TYPE 5 - CORE #0400  
STEEL PICK BARS.



PLEASE SPECIFY TOP OR BOTTOM FLANGE WHEN ORDERING.  
THESE CASTINGS ARE ALSO AVAILABLE IN A SECURED CONFIGURATION AS SHOWN.  
THE WATER-TIGHT MANHOLE SETS SHOWN FEATURE FOUR STAINLESS STEEL  
BOLTS IN COUNTERSUNK POCKETS AND A SEALING O-RING IN A SQUARE  
BOTTOM GROVE IN THE RING SET.  
BOLTING PADS REDUCE THE STANDARD CLEAR OPENING BY 2" TO 3".



	DIMENSIONS INCHES						LID		RING		SET	
	A	B	C	D	E	F	CASTING	WEIGHT	CASTING	WEIGHT	CASTING	WEIGHT
V1600-5(standard)	38 1/2	2	33 1/2	46	6	40 5/8	1159874	277 LBS	1239861	343 LBS	1559872	660 LBS
* V2600-5(bolt down)	38 1/2	2	33 1/2	46	6	40 5/8	1159874	277 LBS	1239861	343 LBS	1559872	660 LBS

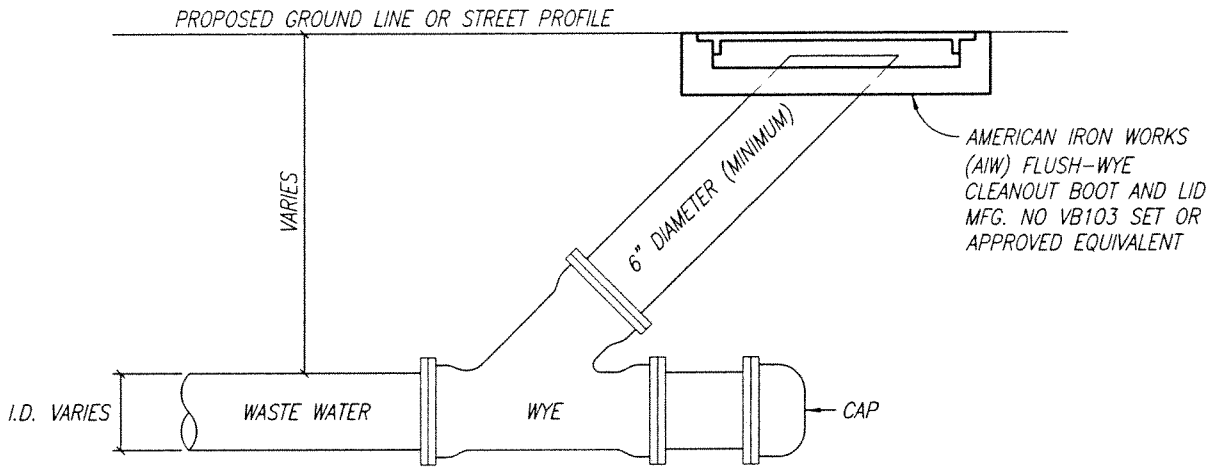
\* = FLOOD PLAIN

NOTES:

1. THIS DETAIL SHOWS BOLTED CONFIGURATIONS ONLY. THE DESIGN ENGINEER SHOULD SPECIFY ON THE CONSTRUCTION DRAWINGS WHETHER BOLTED LIDS ARE REQUIRED OR NOT. THE CITY OF BELTON ALLOWS BOTH APPLICATIONS DEPENDING ON THE PROPOSED LOCATION OF THE IMPROVEMENTS.
2. NON-WATER TIGHT MANHOLES TO BE PLACED IN STREET OR ON NON-DRAINAGE AREAS.
3. WATER TIGHT MANHOLES TO BE PLACED IN DRAINAGE AREAS.
4. SEE MANHOLE RING ANCHORING DETAILS.

**CLEANOUT AT TERMINATION OF  
WASTE WATER TRUNK LINE IN STREET PROPER,  
STREET RIGHT-OF-WAY OR EASEMENT**

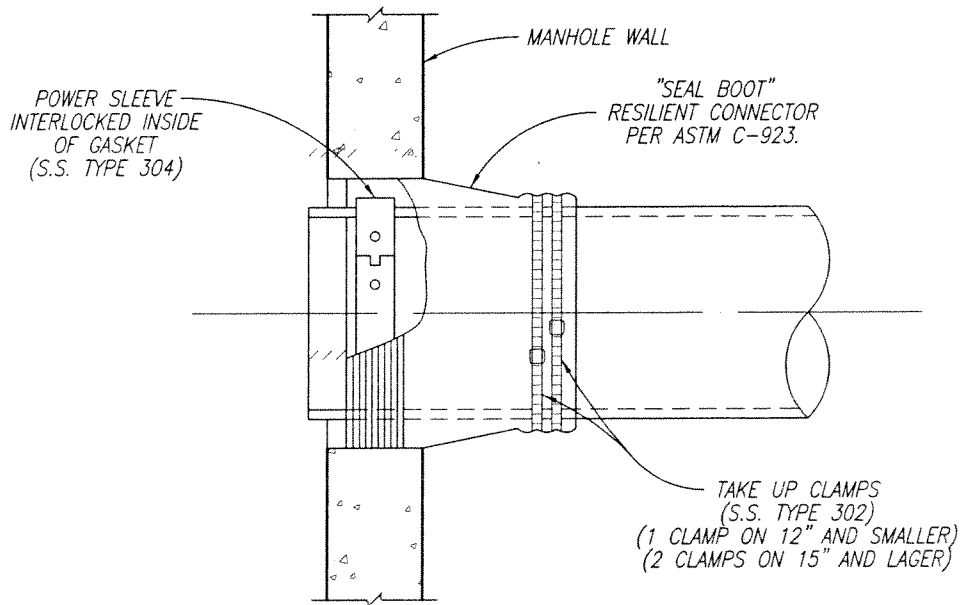
NOT TO SCALE



NOTE: ALL PIPE MATERIAL SHALL BE  
SDR 35 OR BETTER.

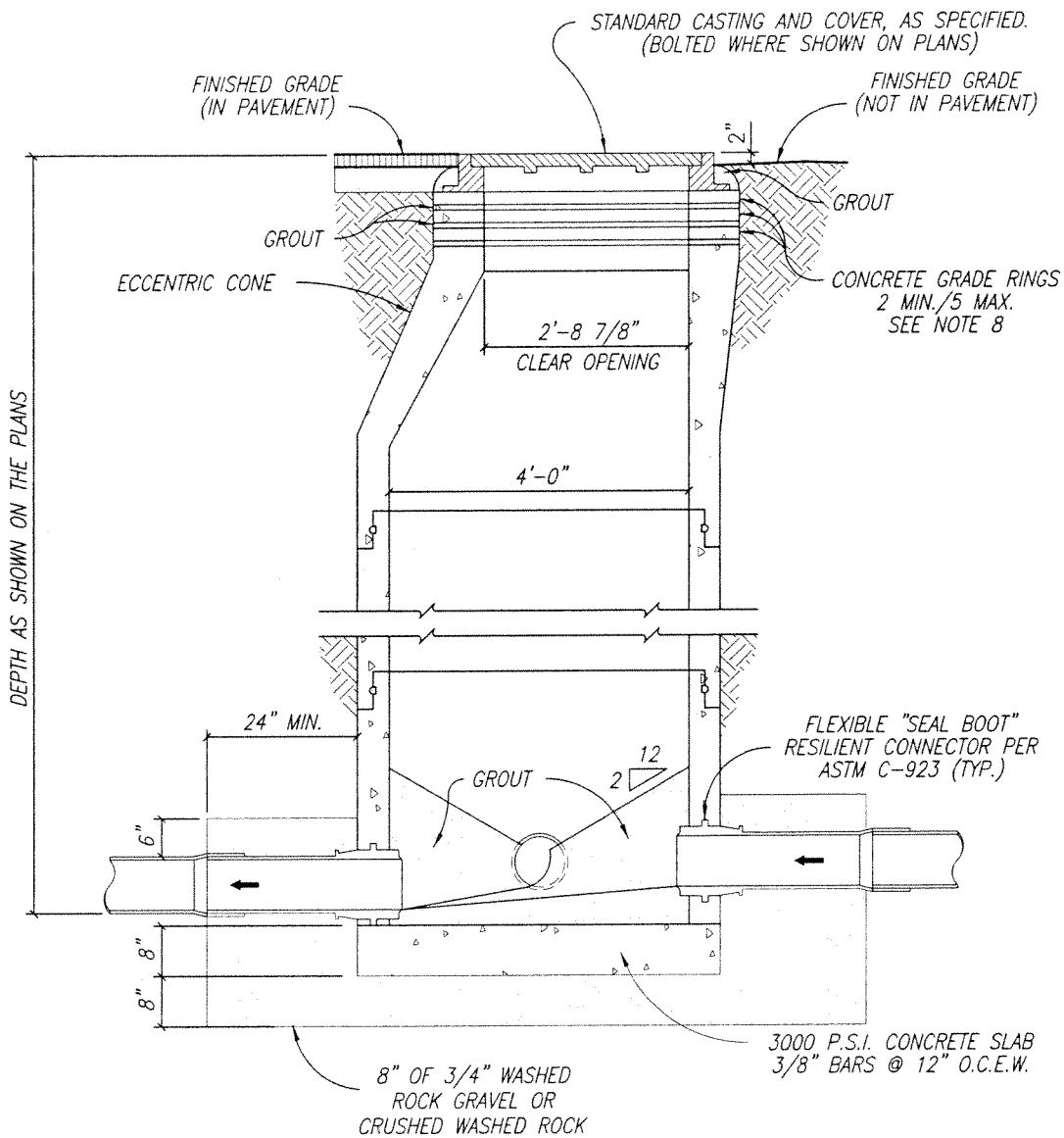
**FLEXIBLE "SEAL BOOT" CONNECTOR**

NOT TO SCALE



NOTES:

ALL FITTINGS SHALL BE SAME MATERIAL SPECIFICATION AS THE MAIN WITH REGARDS  
TO MATERIAL, S.D.R., AND A.S.T.M. DESIGNATIONS.



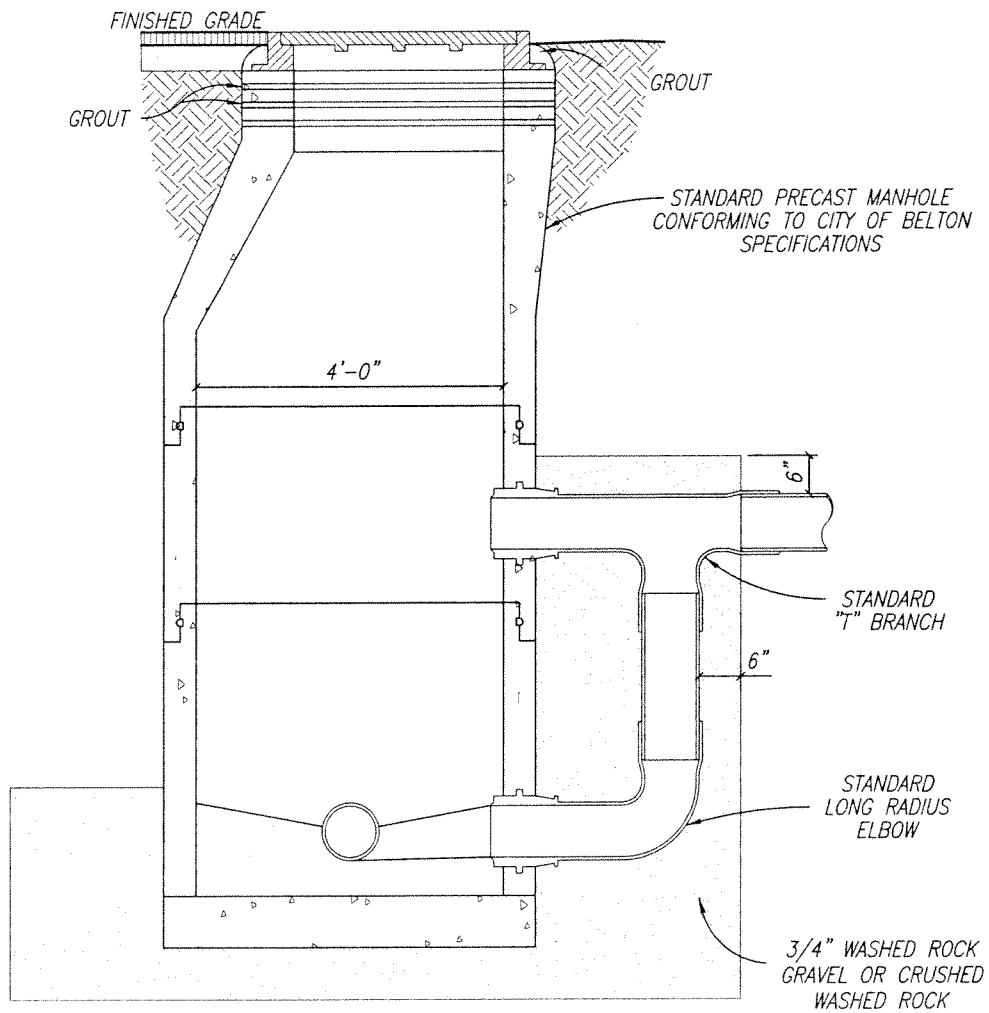
**NOTES:**

1. ALL MANHOLES SHALL BE 48" I.D., R.C.P., CLASS III, WITH RUBBER O-RING GASKET JOINTS CONFORMING TO ASTM C478, C433 AND C76, UNLESS NOTED OTHERWISE.
2. ALL MANHOLES SHALL HAVE WATER-TIGHT FRAME AND COVER, WITH A MINIMUM 30" CLEAR OPENING, AS MANUFACTURED BY WESTERN IRON WORKS (MODEL NO. WRM-36) OR VULCAN FOUNDRY (MODEL NO. V-7045-2) OR APPROVED EQUAL WITH "SANITARY SEWER" CAST IN COVER.
3. ALL MANHOLES SHALL BE CONCRETE WITH CAST IRON FRAME.
4. ALL MANHOLES SHALL HAVE AN ECCENTRIC OR CONCENTRIC LID.
5. MANHOLES MAY HAVE A FLAT LID, IF APPROVED BY CITY OF BELTON, BEING 12" THICK WITH A MINIMUM 30" OPENING, AS MANUFACTURED BY CALVERT CONCRETE OR APPROVED EQUAL M.F.G. CONFORMING TO ASTM C478, 5000 P.S.I. CONCRETE, TRAFFIC BEARING, AND O-RING JOINT CONFORMING TO ASTM C443.
6. INVERTS AND FLEXIBLE SEAL BOOTS, PER ASTM C-923, SHALL BE CAST INTO BASE SECTION.
7. MINIMUM DROP BETWEEN INVERTS SHALL BE ONE-TENTH OF A FOOT.
8. 2" INCH GRADE RINGS WITH AN I.D. TO MATCH FRAME CLEAR OPENING, MINIMUM OF 2, MAXIMUM OF 5 GRADE RINGS REQUIRED. ONLY IN STREET LOCATIONS WHERE ADJUSTMENTS MAY BE NECESSARY.
9. MANHOLES IN DRAINAGE AREAS WILL NOT USE GRADE RINGS AND MUST HAVE RING AND LID ANCHORED AS SHOWN ON ANCHORING DETAIL.

**STANDARD MANHOLE - SECTION**

NOT TO SCALE



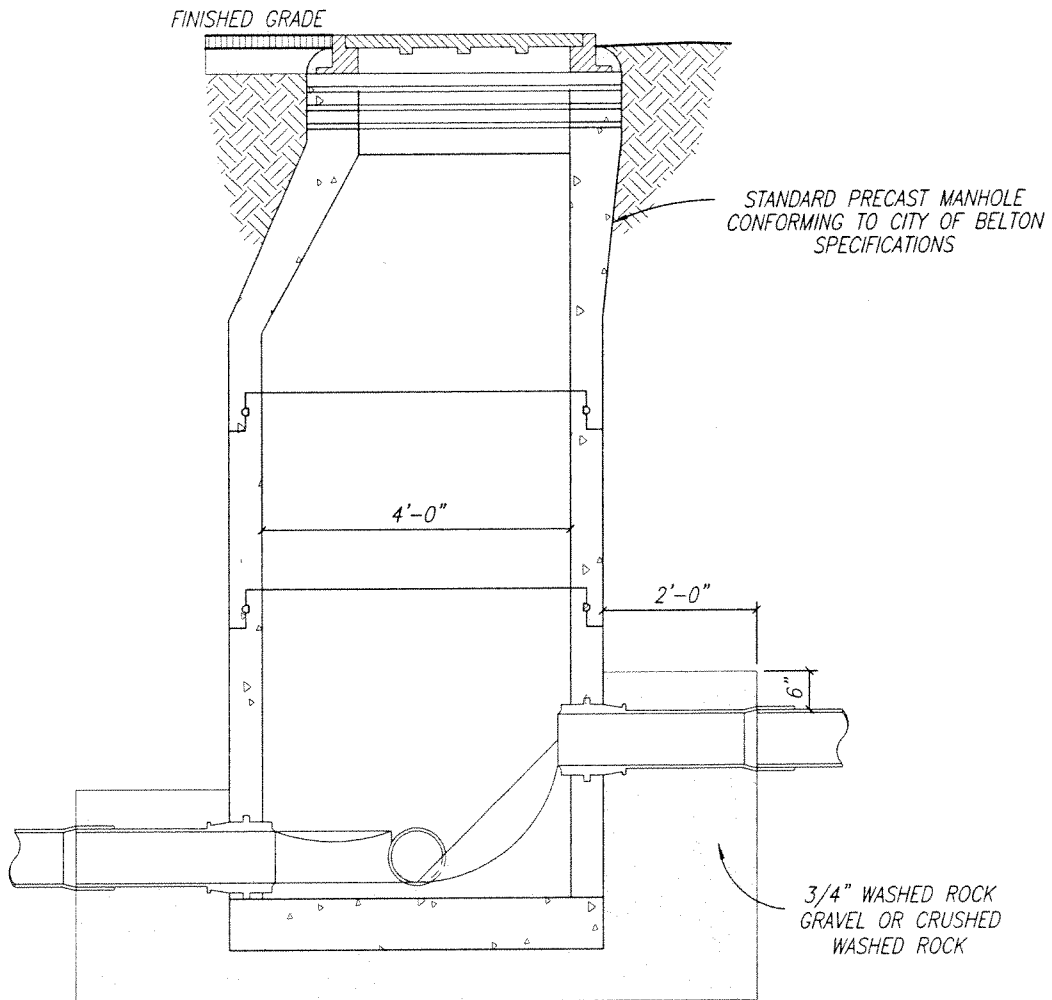


**NOTES:**

1. DROP CONNECTIONS SHALL BE REQUIRED WHENEVER AN INFLUENT WASTE WATER LINE IS LOCATED 24" OR MORE ABOVE THE MAIN INVERT CHANNEL.
2. A FLOW CHANNEL SHALL BE CONSTRUCTED INSIDE MANHOLE TO DIRECT INFLUENT INTO FLOW STREAM.
3. WHEN P.V.C. IS USED IN WASTE WATER LINES, SOLVENT TYPE JOINT P.V.C. FITTINGS MAY BE UTILIZED IN THE DROP ASSEMBLY ONLY.
4. MINIMUM PIPE SIZE FOR DROP IS 8".
5. SEE STANDARD DETAIL (STANDARD MANHOLE SECTION) FOR ADDITIONAL REQUIREMENT.

**DROP CONNECTION-PRECAST MANHOLE TYPE "A"**

NOT TO SCALE



**NOTES:**

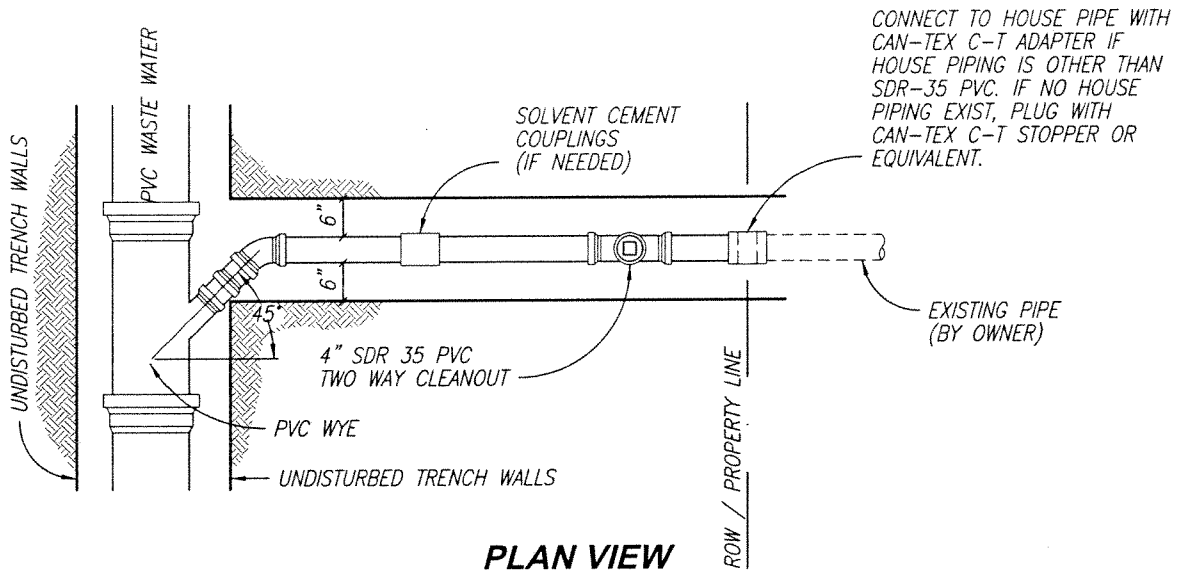
1. TO BE USED WHERE DROP IS 6" TO 2'-0".
2. A FLOW CHANNEL SHALL BE CONSTRUCTED INSIDE MANHOLE TO DIRECT INFLUENT INTO FLOW STREAM.
3. SEE STANDARD DETAIL (STANDARD MANHOLE SECTION) FOR ADDITIONAL REQUIREMENTS.

**DROP CONNECTION-PRECAST MANHOLE TYPE "B"**

NOT TO SCALE

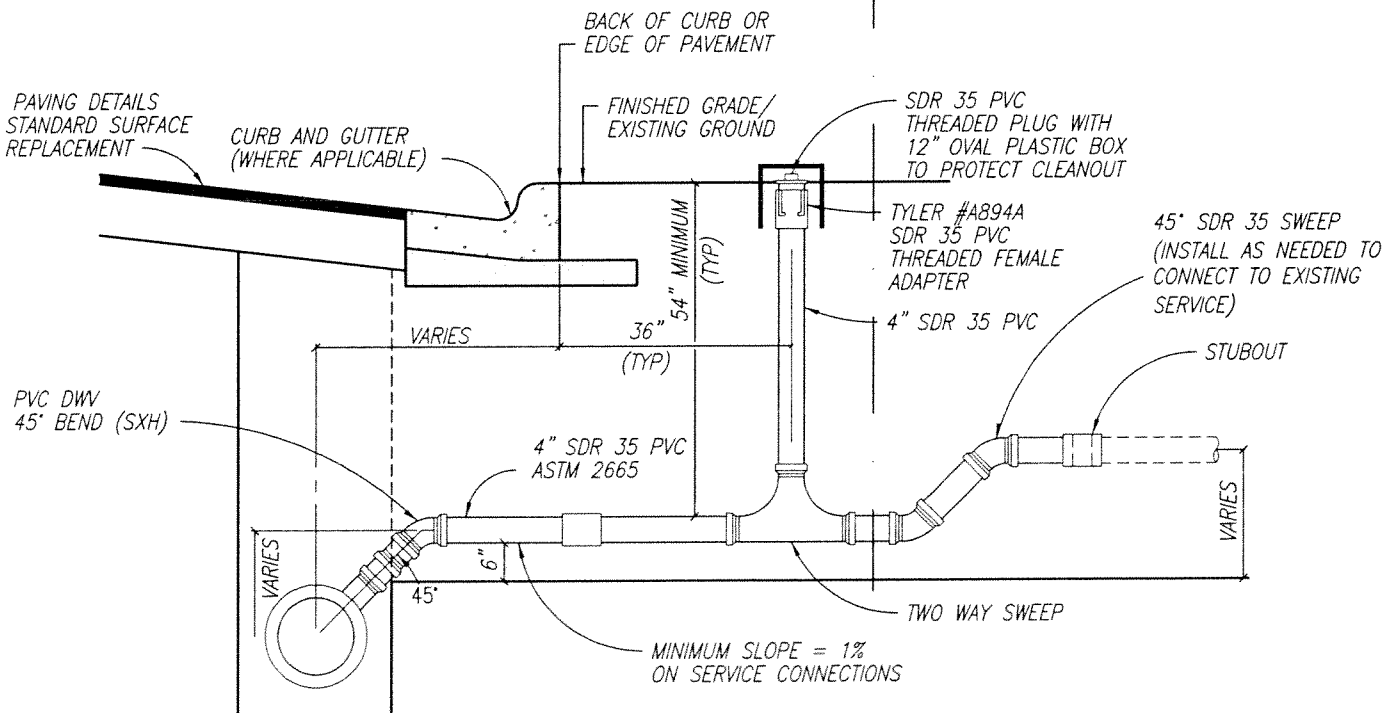
# 4" WASTEWATER SERVICE

NOT TO SCALE



APPLIES TO NEW AND EXISTING DEVELOPMENTS

APPLIES TO EXISTING DEVELOPED AREAS ONLY.

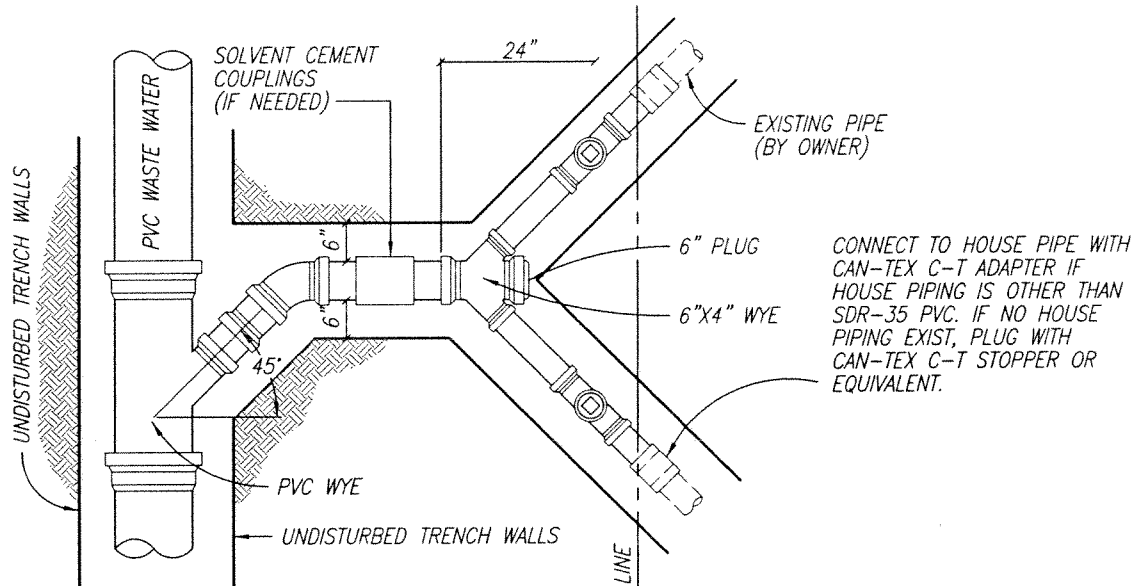


## SECTION VIEW

NOTE: 4" IS TYPICAL FOR SINGLE FAMILY HOME. BUSINESS OR INDUSTRY MAY NEED TO BE 6" OR LARGER.

# 6" DUAL WASTEWATER SERVICE

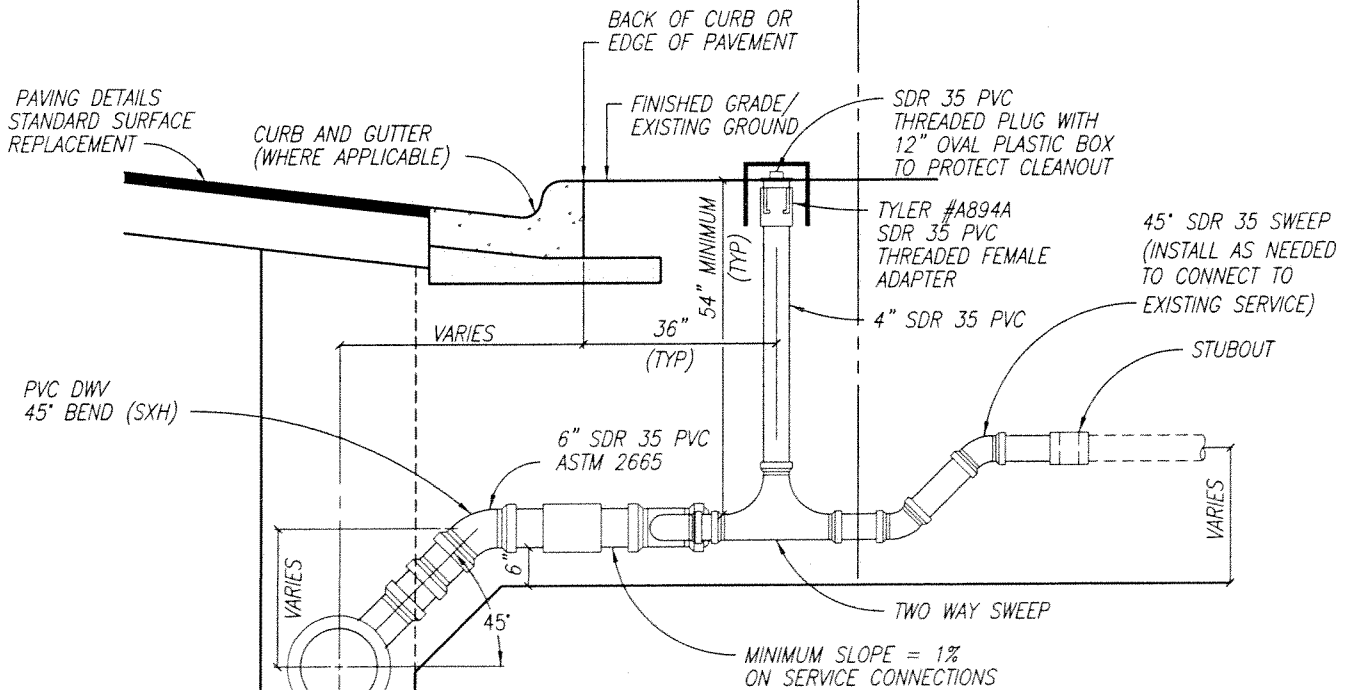
NOT TO SCALE



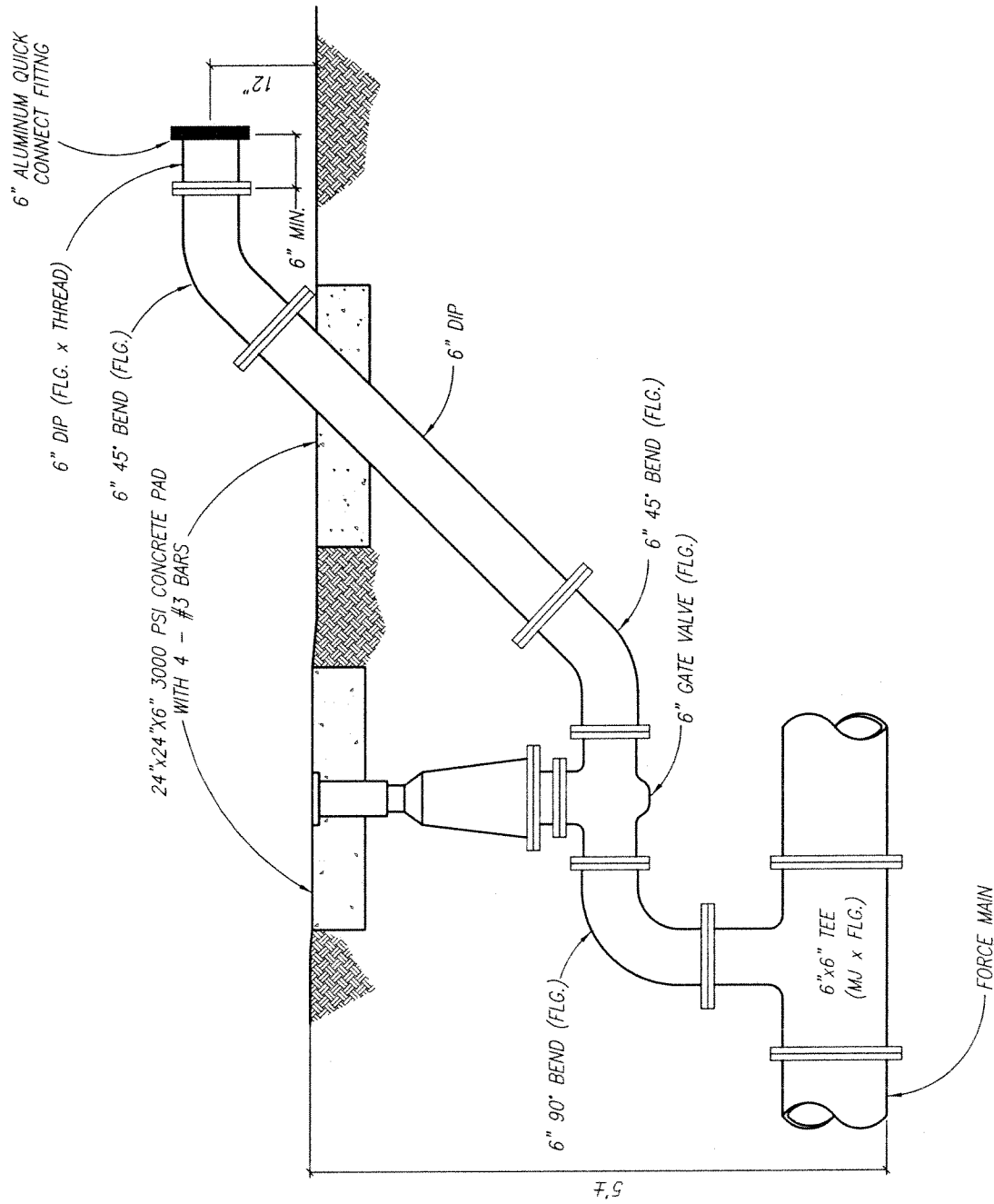
**PLAN VIEW**

APPLIES TO NEW AND EXISTING DEVELOPMENTS

APPLIES TO EXISTING DEVELOPED AREAS ONLY.



**SECTION VIEW**



**EMERGENCY PUMP CONNECTION**

NOT TO SCALE