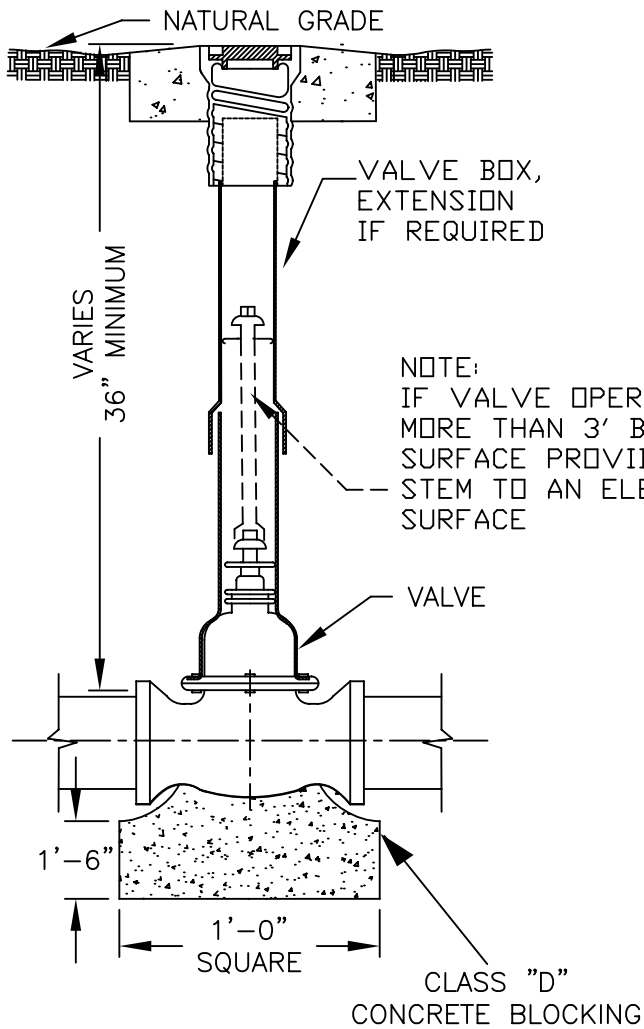


VALVE BOX\* AND COVER. 14" VALVE AND SMALLER. TYLER 6855 SERIES, W/DROP LID MARKED "WATER". OR APPROVED EQUAL. DOMESTIC ONLY.

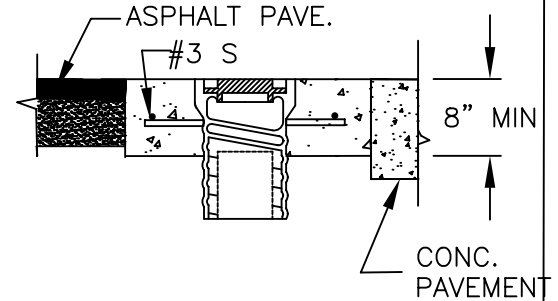
\*USE EXTENSION WHERE NECESSARY

VALVES NOT SUBJECT TO TRAFFIC

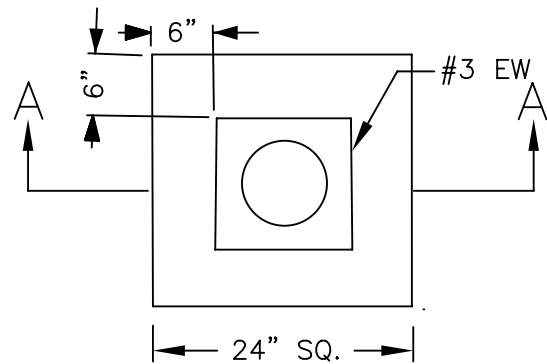


ELEVATION

VALVES WITHIN ROADWAYS OR OTHER PAVED OR SURFACED AREAS



SECTION A-A



STEEL REQUIRED  
IN CONCRETE BLOCKOUT  
IN NON- TRAFFIC AREA

PLAN

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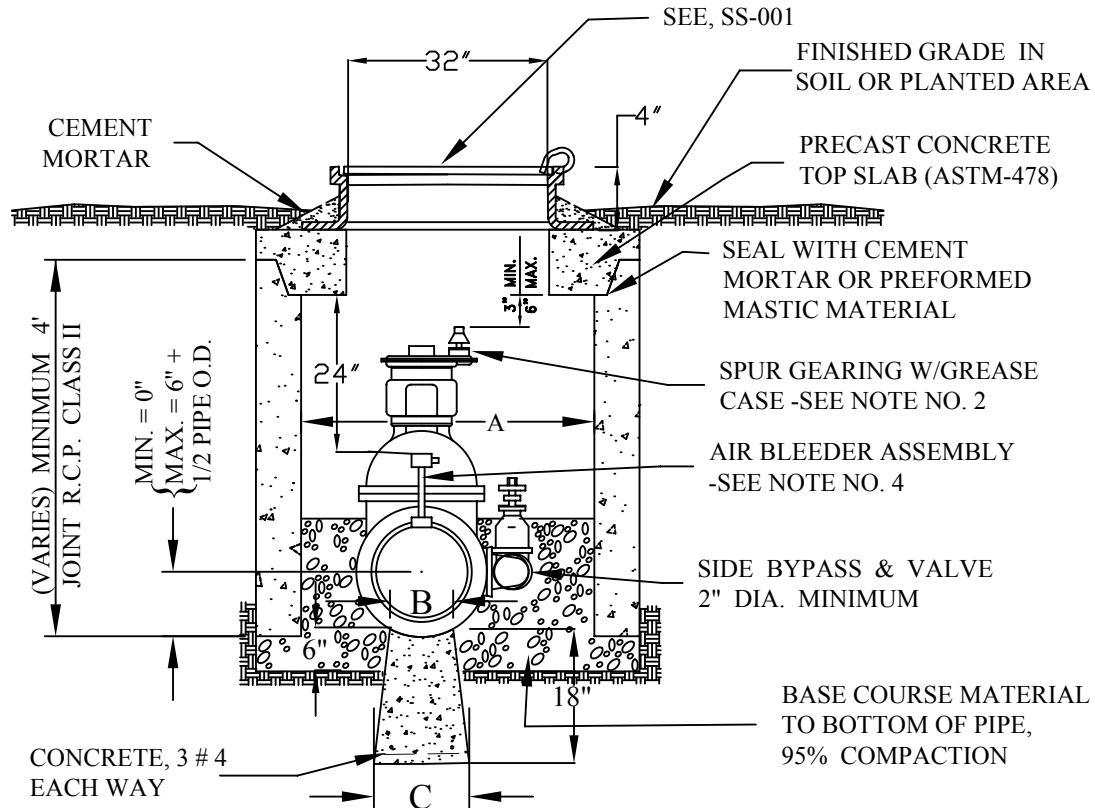


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GATE VALVE  
AND BOX  
WM-001

GATE VALVE & BOX  
INSTALLATION  
16-INCH AND LARGER

SEE DRAWING WM-003  
FOR SQUARE BOX  
ALTERNATE PLAN



PIPE SIZE	"A"	"B"	"C"
16"	52"	10" SQ.	16" SQ.
18"	54"	12" SQ.	18" SQ.
20"	56"	14" SQ.	20" SQ.
24"	60"	16" SQ.	24" SQ.

NOTES:

1. PLACE 1/2" EXPANSION JOINT MATERIAL AROUND WATER PIPE WHERE IT PASSES THROUGH CONCRETE VAULT.
2. VALVES 16" AND LARGER SHALL HAVE SPUR GEARING WITH GREASE CASE.
3. NOTE: LARGER DIAMETER R.C.P. MAY BE REQUIRED DEPENDENT UPON MANUFACTURER'S STANDARD SIZE FOR GATE VALVE.
4. PROVIDE CORPORATION WITH COPPER RISER AND CURB STOP AT A MAXIMUM OF 12" FROM EACH END OF GATE VALVE AS SHOWN. CORPORATION AND CURB STOP SIZES SHALL BE 1". EXTEND RISER TO WITHIN 24" OF TOP OF MANHOLE.
5. VALVES, BYPASS, CORPORATION STOP AND PIPING SHALL BE DESIGNED TO OPERATE AT THE MAXIMUM PRESSURES AS DESCRIBED IN THE SPECIFICATIONS.

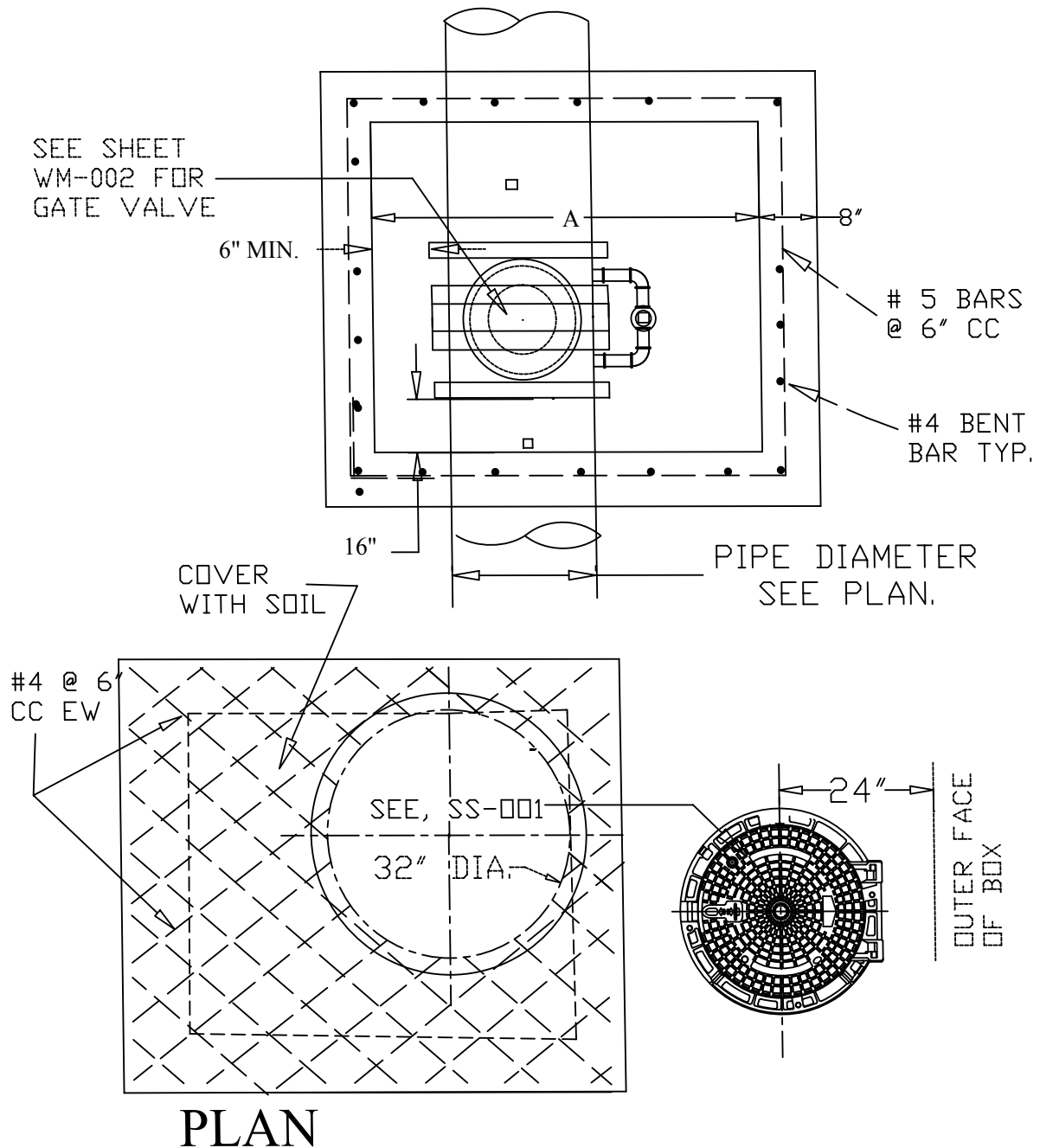
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VALVE & BOX  
16" & GREATER  
WM-002

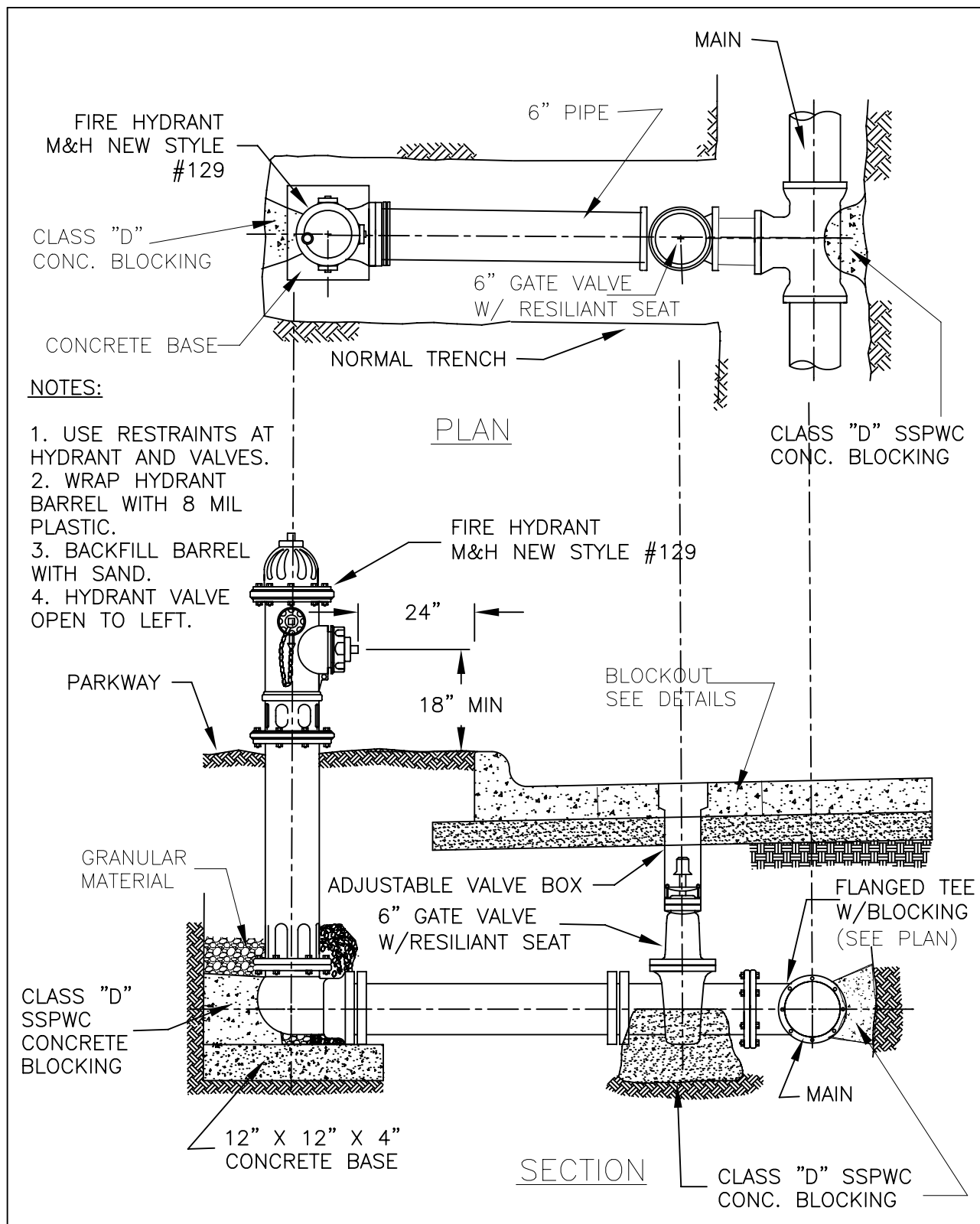
SQUARE BOX FOR GATE  
VALVE 16-INCH AND LARGER



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VALVE &  
SQUARE BOX  
16" & GREATER  
WM-003



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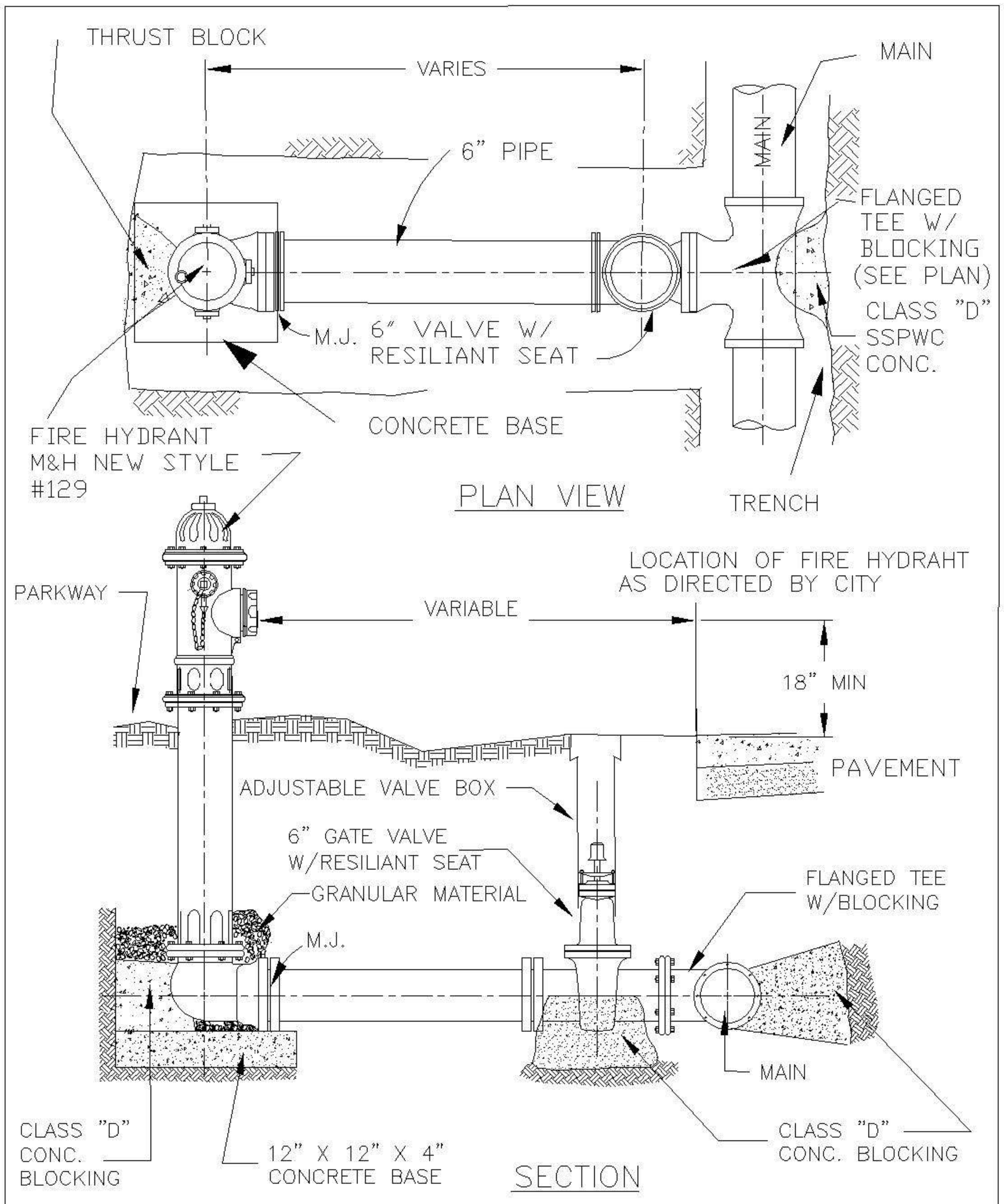
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FIRE  
HYDRANT  
WM-004





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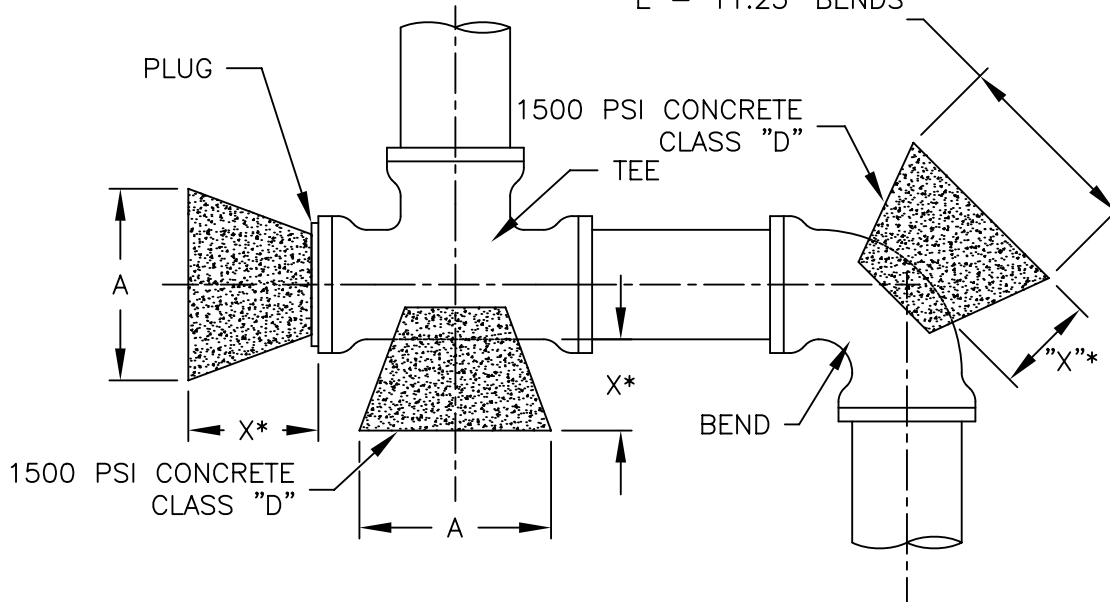


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**FIRE HYDRANT  
 OFF PAVEMENT  
 WM-005**

NOTE: USE RETAINING  
GLANDS AT BENDS

B — 90° BENDS  
C — 45° BENDS  
D — 22.5° BENDS  
E — 11.25° BENDS



HORIZONTAL BLOCKING TABLE

\* DIMENSION "X" TO BE A MINIMUM OF (1) FOOT, BUT IS TO BE INCREASED WHERE NECESSARY TO PROVIDE BEARING AGAINST UNDISTURBED TRENCH.

PIPE SIZE	"X" DIM	PLUGS/TEES			90° BENDS			45° BENDS			22.5° BENDS			11.25° BENDS		
		"A"	AREA	VOL.	"B"	AREA	VOL.	"C"	AREA	VOL.	"D"	AREA	VOL.	"E"	AREA	VOL.
4"	1'-6"	1'-0"	0.83	0.05	1'-0"	0.83	0.05	1'-0"	0.83	0.05	1'-0"	0.83	0.05	1'-0"	0.83	0.05
6"	1'-6"	1'-0"	1.06	0.06	1'-2"	1.50	0.09	1'-0"	0.83	0.05	1'-0"	0.83	0.05	1'-0"	0.83	0.05
8"	1'-6"	1'-3"	1.89	0.11	1'-6"	2.66	0.15	1'-3"	1.44	0.08	1'-0"	0.83	0.05	1'-0"	0.83	0.05
10"	1'-6"	1'-9"	2.95	0.17	2'-0"	4.17	0.24	1'-6"	2.26	0.13	1'-3"	1.15	0.07	1'-0"	0.83	0.05
12"	1'-6"	2'-0"	4.25	0.24	2'-3"	6.00	0.34	1'-9"	3.25	0.18	1'-3"	1.65	0.10	1'-0"	0.83	0.05
16"	2'-0"	2'-7"	7.54	0.56	3'-0"	10.65	0.79	2'-3"	5.76	0.43	1'-8"	2.94	0.22	1'-2"	1.48	0.11
18"	2'-0"	2'-11"	7.70	0.57	3'-5"	10.89	0.82	2'-6"	5.89	0.44	1'-10"	3.01	0.22	1'-5"	1.51	0.11
20"	2'-0"	3'-8"	7.86	0.59	3'-9"	11.12	0.84	2'-9"	6.01	0.45	2'-0"	3.07	0.23	1'-7"	1.54	0.12
24"	2'-0"	3'-8"	11.33	0.84	4'-3"	16.00	1.20	3'-2"	8.65	0.65	2'-6"	4.42	0.33	1'-10"	2.22	0.17

NOTE: CALCULATIONS IN AREA COLUMN ARE MINIMUM Sq. Ft., CALCULATIONS IN VOLUME COLUMN ARE MAXIMUM Cu. Yd.

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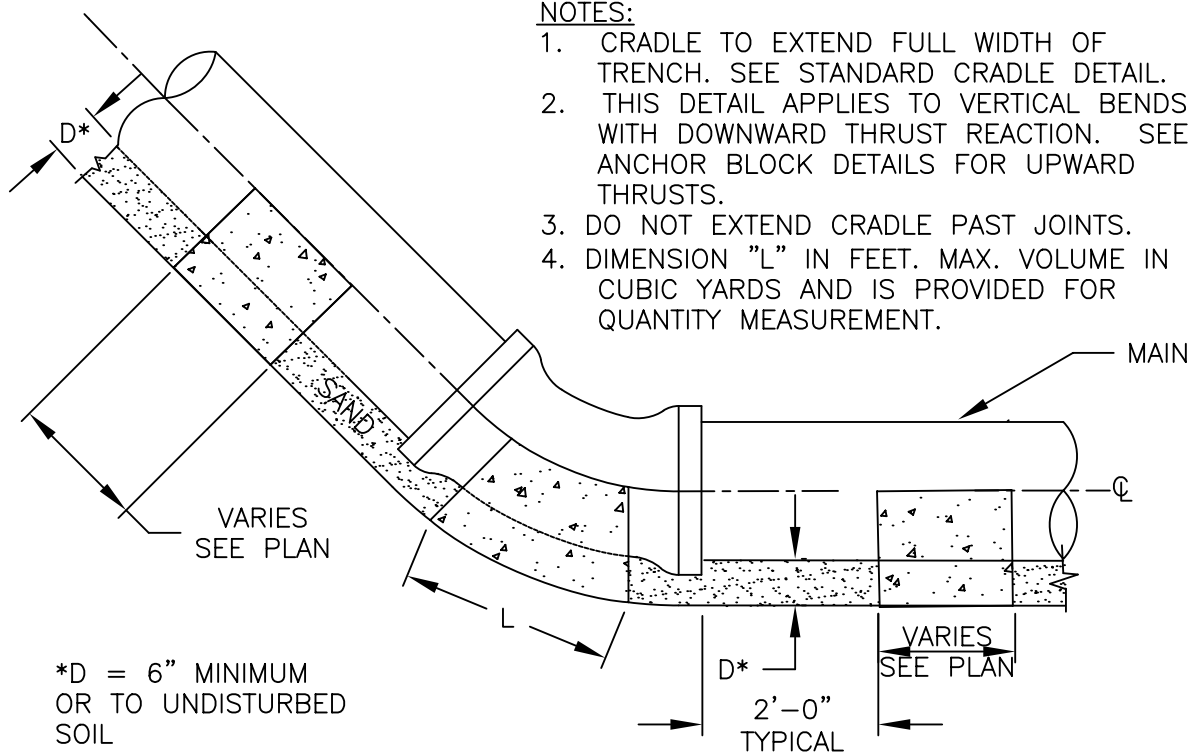


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HORIZ.  
BLOCKING  
WM-006



## CONCRETE CRADLE AT VERTICAL BENDS



### NOTES:

1. CRADLE TO EXTEND FULL WIDTH OF TRENCH. SEE STANDARD CRADLE DETAIL.
2. THIS DETAIL APPLIES TO VERTICAL BENDS WITH DOWNWARD THRUST REACTION. SEE ANCHOR BLOCK DETAILS FOR UPWARD THRUSTS.
3. DO NOT EXTEND CRADLE PAST JOINTS.
4. DIMENSION "L" IN FEET. MAX. VOLUME IN CUBIC YARDS AND IS PROVIDED FOR QUANTITY MEASUREMENT.

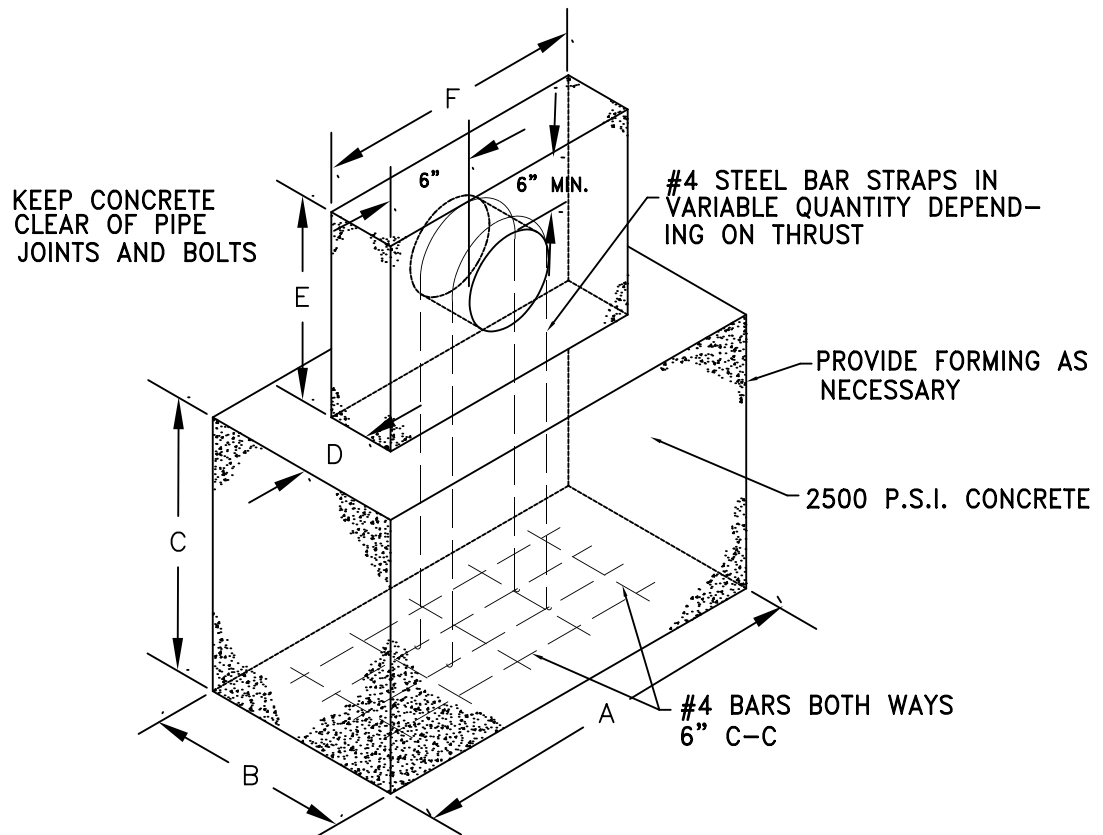
PIPE CLASS	PIPE SIZE	11°-15°		22°-30°		45°		90°	
		"L"	MAX VOL	"L"	MAX VOL	"L"	MAX VOL	"L"	MAX VOL
150	6"	0.42	0.02	0.45	0.02	0.50	0.02	1.00	0.04
150	8"	0.42	0.02	0.45	0.02	0.80	0.04	1.40	0.06
150	10"	0.42	0.03	0.58	0.03	1.15	0.06	2.03	0.11
150	12"	0.42	0.04	0.73	0.05	1.43	0.09	2.53	0.17
150	16"	0.42	0.08	0.74	0.14	1.48	0.27	2.61	0.48
150	18"	0.66	0.14	1.30	0.28	SEE PLAN SHEETS FOR BLOCKING REQUIREMENTS			
150	20"	0.77	0.18	1.53	0.36				
200	18"	0.88	0.18	1.74	0.37				
200	20"	1.03	0.24	2.04	0.48				
250	18"	1.05	0.22	2.03	0.43				
250	20"	1.20	0.28	2.38	0.56				

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VERTICLE  
BLOCKING  
WM-007



**NOTE:**

DIMENSIONS WILL BE SPECIFIED IN DETAIL ON THE PLANS, AS DIRECTED BY THE ENGINEER

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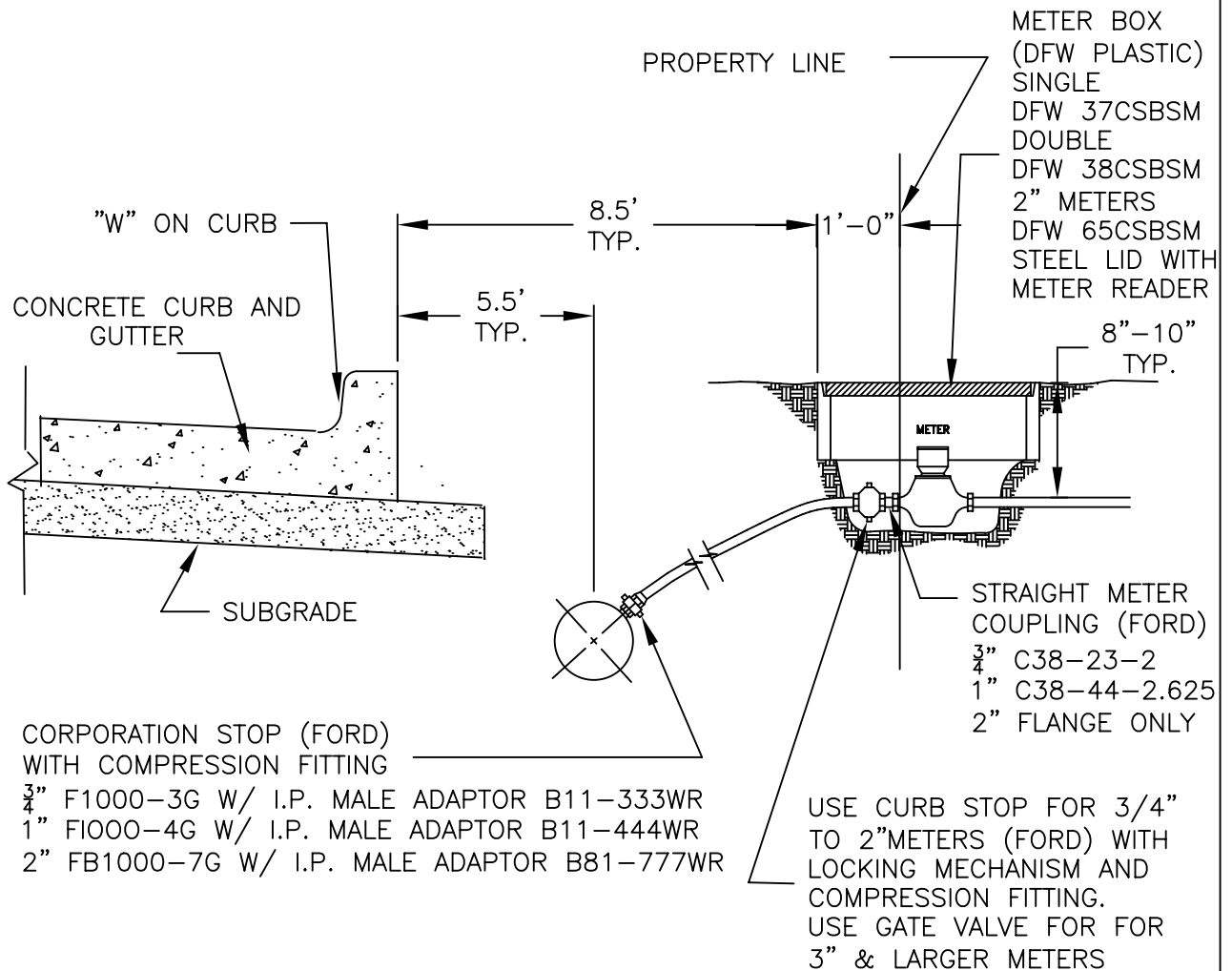
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CONC. STEP  
ANCHOR  
WM-008



NOTE:

1. METER BOXES ON PROPERTY LINE, CLOSE TO SIDEWALK, BUT NOT IN SIDEWALK. NOT TO BE SET IN DRIVE APPROACH.
2. SINGLE FAMILY SERVICES PIPING SHALL BE 3/4" MINIMUM DIAMETER.
3. TWO FAMILY SERVICES PIPING SHALL BE 1" MINIMUM DIAMETER GOING INTO ONE METER BOX.
4. SERVICE LINE PIPE SHALL BE TYPE "K", CLASS 1 ANNEALED COPPER WATER TUBING CONFORMING TO ASTM DESIGNATION B 88.
5. SERVICE TAPS LOCATIONS SHALL BE MARKED WITH A "W" ENGRAVED (GROUND) INTO THE CURB.

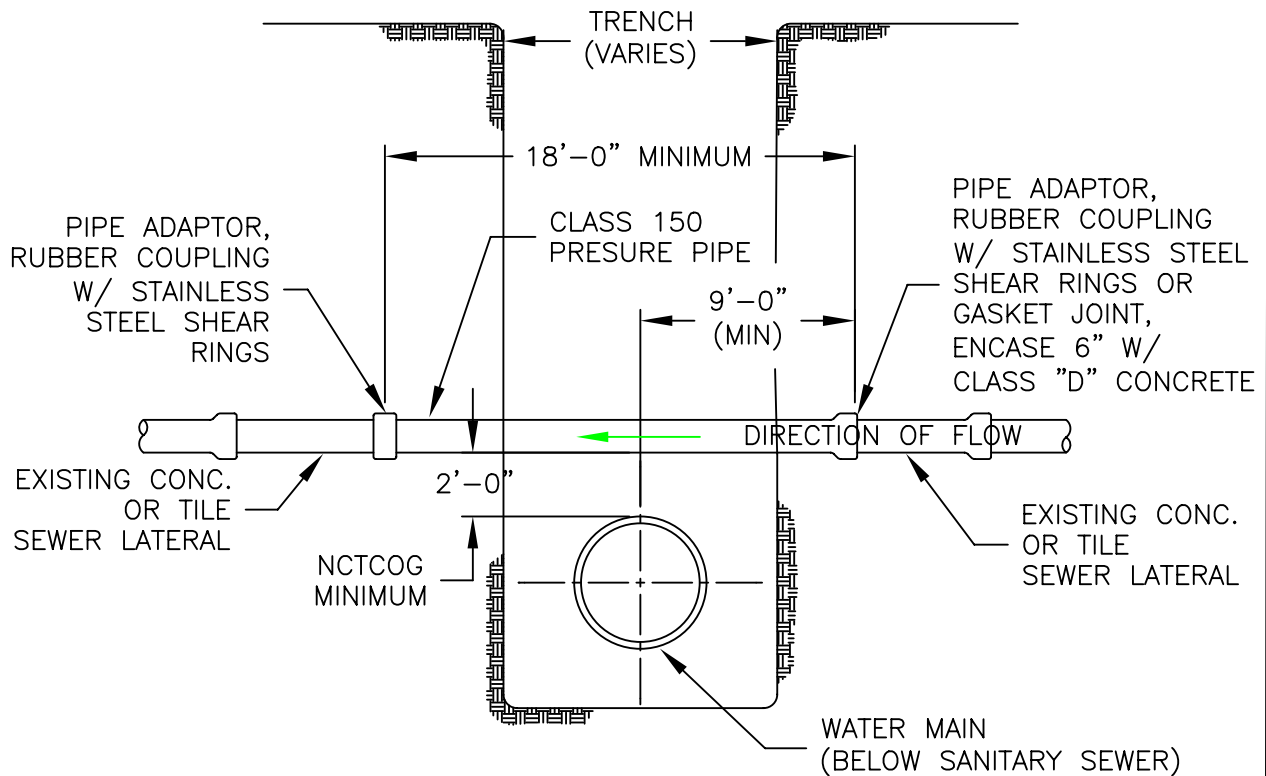


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WATER  
SERVICE  
CONNECTION  
WM-009



## CROSSING SECTION

### NOTE:

1. NO JOINTS WILL BE ALLOWED IN THE 18' OF PRESSURE PIPE. CONTRACTOR SHALL FURNISH CLASS 150 PRESSURE PIPE OF SUFFICIENT LENGTH TO ACHIEVE THIS.
2. WATER MAIN CROSSING ABOVE SANITARY SEWER AND AT LESS THAN NCTCOG SEPARATION REQUIREMENTS: CONTRACTOR SHALL EXCAVATE TO SANITARY SEWER AND REPLACE SEWER AS SHOWN ABOVE, OR ENCASE SEWER MAIN IN CONCRETE.

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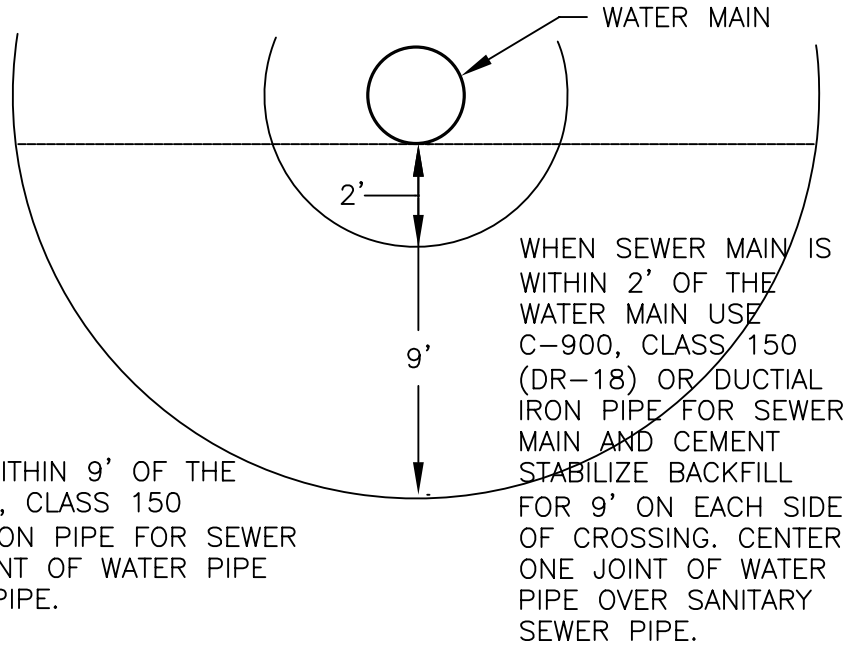
SAN. SEWER  
OVER WATER  
MAIN  
WM-010

LOCATE SANITARY  
SEWER MAIN BELOW  
WATER MAIN.

MAINTAIN ABSOLUTE 6"  
CLEARANCE BETWEEN WATER MAIN  
AND SANITARY SEWER MAIN.

REQUIREMENTS IF  
SEPERATION IS  
LESS THAN 10'

USE STANDARD  
PIPE MATERIAL IF  
THE WATER MAIN  
AND SEWER MAIN  
SEPARATION  
DISTANCE IS  
GREATER THAN 10'.



WHEN SEWER MAIN IS WITHIN 9' OF THE  
WATER LINE USE C-900, CLASS 150  
(DR-18) OR DUCTILE IRON PIPE FOR SEWER  
MAIN. CENTER ONE JOINT OF WATER PIPE  
OVER SANITARY SEWER PIPE.

NOTES:

1. THE SANITARY SEWER LINE SHALL BE LOCATED BELOW THE WATER LINE.
2. ONE WATER MAIN PIPE SEGMENT SHALL BE CENTERED OVER THE SANITARY SEWER PIPE SUCH THAT THE JOINTS OF THE WATER PIPE ARE EQUIDISTANT AND AT LEAST 9' HORIZONTALLY FROM THE CENTERLINE OF THE SANITARY SEWER PIPE.
3. WHERE CEMENT STABILIZED SAND BEDDING IS REQUIRED, THE CEMENT STABILIZED SAND SHALL HAVE A MINIMUM OF 10% CEMENT PER CUBIC YARD OF CEMENT STABILIZED SAND MIXTURE BASED ON LOOSE DRY WEIGHT VOLUME (AT LEAST 2.5 BAGS OF CEMENT PER CUBIC YARD OF MIXTURE). THE CEMENT STABILIZED SAND BEDDING SHALL BE A MINIMUM OF SIX INCHES ABOVE AND FOUR INCHES BELOW THE SANITARY SEWER PIPE.
4. MAINTAIN 9' SEPARATION BETWEEN FIRE HYDRANTS AND SANITARY SEWER LINES.
5. MAINTAIN 10' SEPARATION BETWEEN SANITARY SEWER MANHOLES AND WATER LINES.

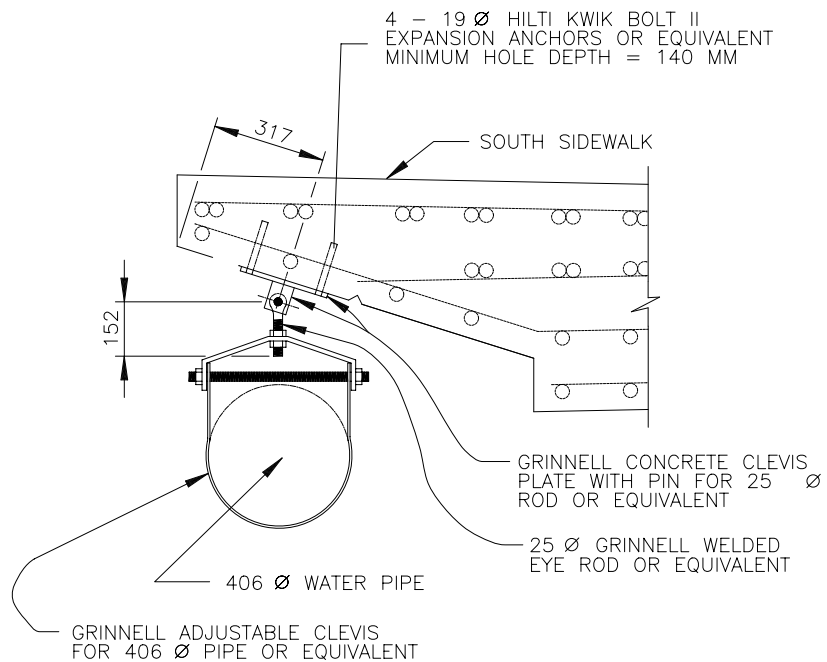
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SEP. WATER  
MAIN AND SAN.  
SEWER MAIN  
WM-011

# PIPE HANGER DETAIL



1 METER = 39.372 INCHES

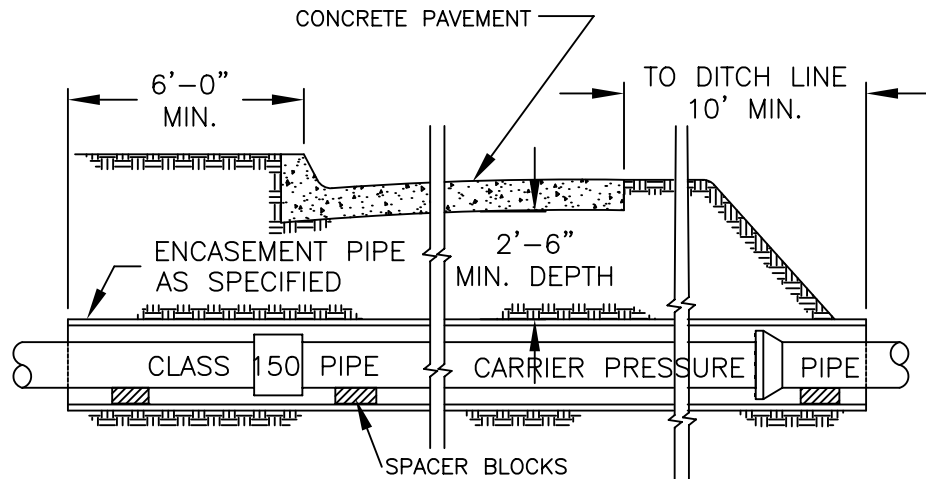
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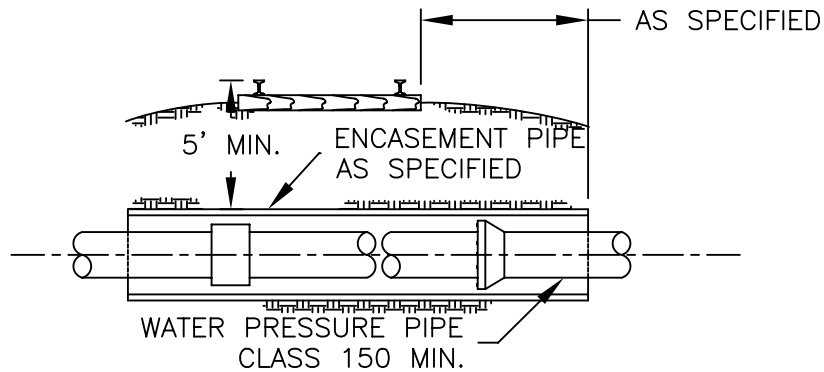
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BRIDGE  
PIPE  
HANGER  
WM-012



ENCASEMENT PIPE TO BE CAPPED AT BOTH ENDS WITH CONCRETE AND/OR IN ACCORDANCE WITH R.O.W. OWNER'S STANDARDS.



MINIMUM ENCASEMENT	
WATER PIPE SIZE	ENCASEMENT PIPE ID
8" C.I.	15" STEEL PIPE
10" C.I.	18" STEEL PIPE
12" C.I.	21" STEEL PIPE
14" CONC.	24" STEEL PIPE
16" CONC.	27" STEEL PIPE
18" CONC.	30" STEEL PIPE
20" CONC.	33" STEEL PIPE
24" CONC.	36" STEEL PIPE

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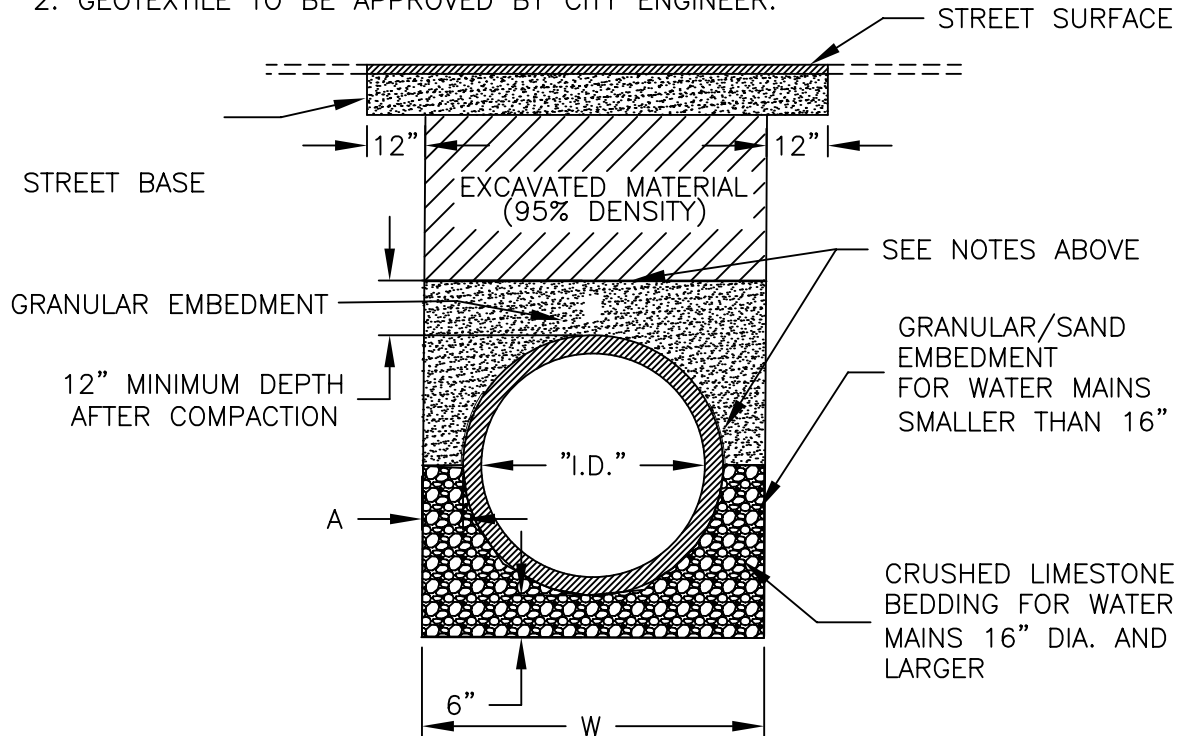
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BORED  
CROSSING  
WM-013



NOTE:

1. GEOTEXTILE TO PLACED BETWEEN CRUSHED LIMESTONE BEDDING MATERIAL AND GRANULAR EMBEDMENT. BETWEEN GRANULAR MATERIAL AND EXCAVATED MATERIAL.
2. GEOTEXTILE TO BE APPROVED BY CITY ENGINEER.



PIPE SIZE "I.D."	DITCH WIDTH "W" C.I. PIPE	DITCH WIDTH "W" PRETENSIONED	DITCH WIDTH "W" PRESTRESSED	DITCH WALL CLEARANCE "A"
2'-1/2"	2'-0"	-	-	-
4"	2'-0"	-	-	9.6"
6"	2'-0"	-	-	8.6"
8"	2'-0"	-	-	7.5"
10"	2'-0"	-	-	6.5"
12"	2'-2"	-	-	6"
16"	2'-6"	2'-7"	-	6"
20"	2'-10"	3'-0"	-	6"
24"	3'-2"	3'-4"	-	6"
30"	-	-	4'-6"	9"
36"	-	-	5'-0"	9"
42"	-	-	5'-7"	9"
48"	-	-	6'-2"	9"

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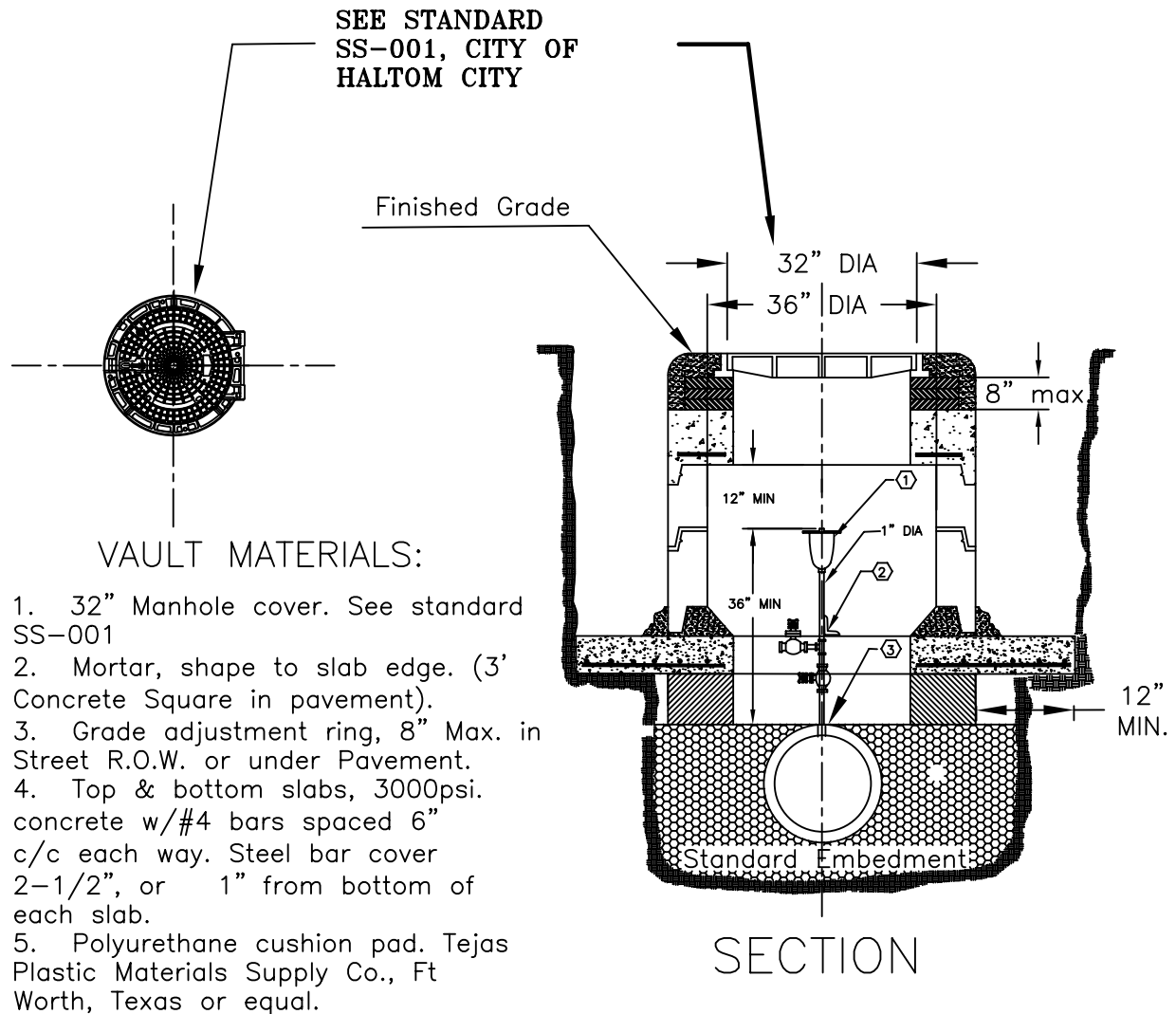


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**BACKFILL  
DITCH  
WIDTH  
WM-014**



### Bracket Materials for 1" Air Release Valve

1. 1" air release valve, 2 ea. gate valves, and 1 ea. tee.
2. Angle 1-1/4" x 1-1/4" x 1/4" x 46" with 1 ea. 3/8" DIA U-clamp. Each end of angle to be bolted to floor slab with 1/4" lag bolts. Angle to be treated with 2 coats of red lead primer prior to installation.
3. Water main with threaded insulator tap or tapping saddle.

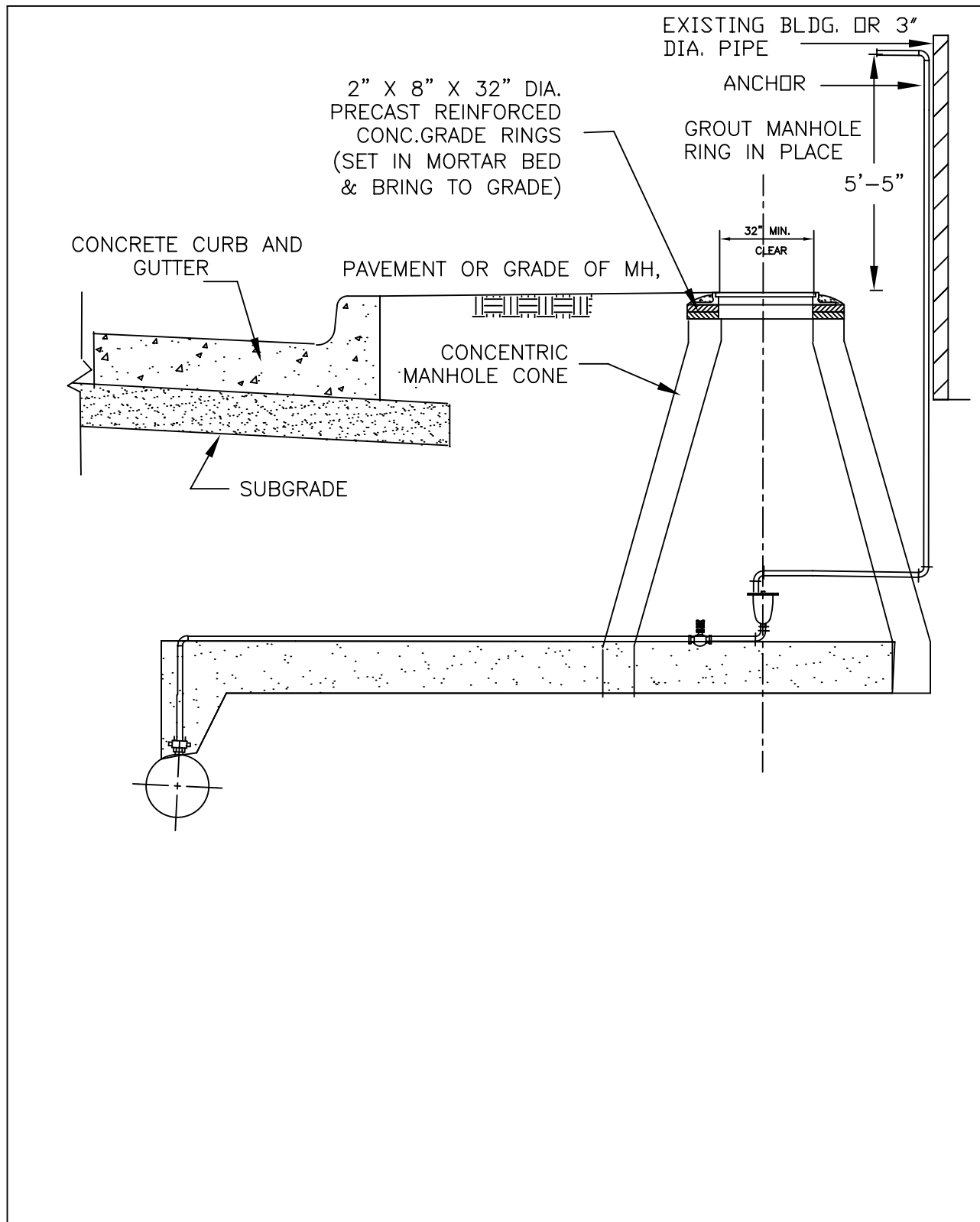
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1" AIR  
RELEASE  
VALVE  
WM-015



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OFFSET 1" AIR  
RELIEF VALVE  
WM-016