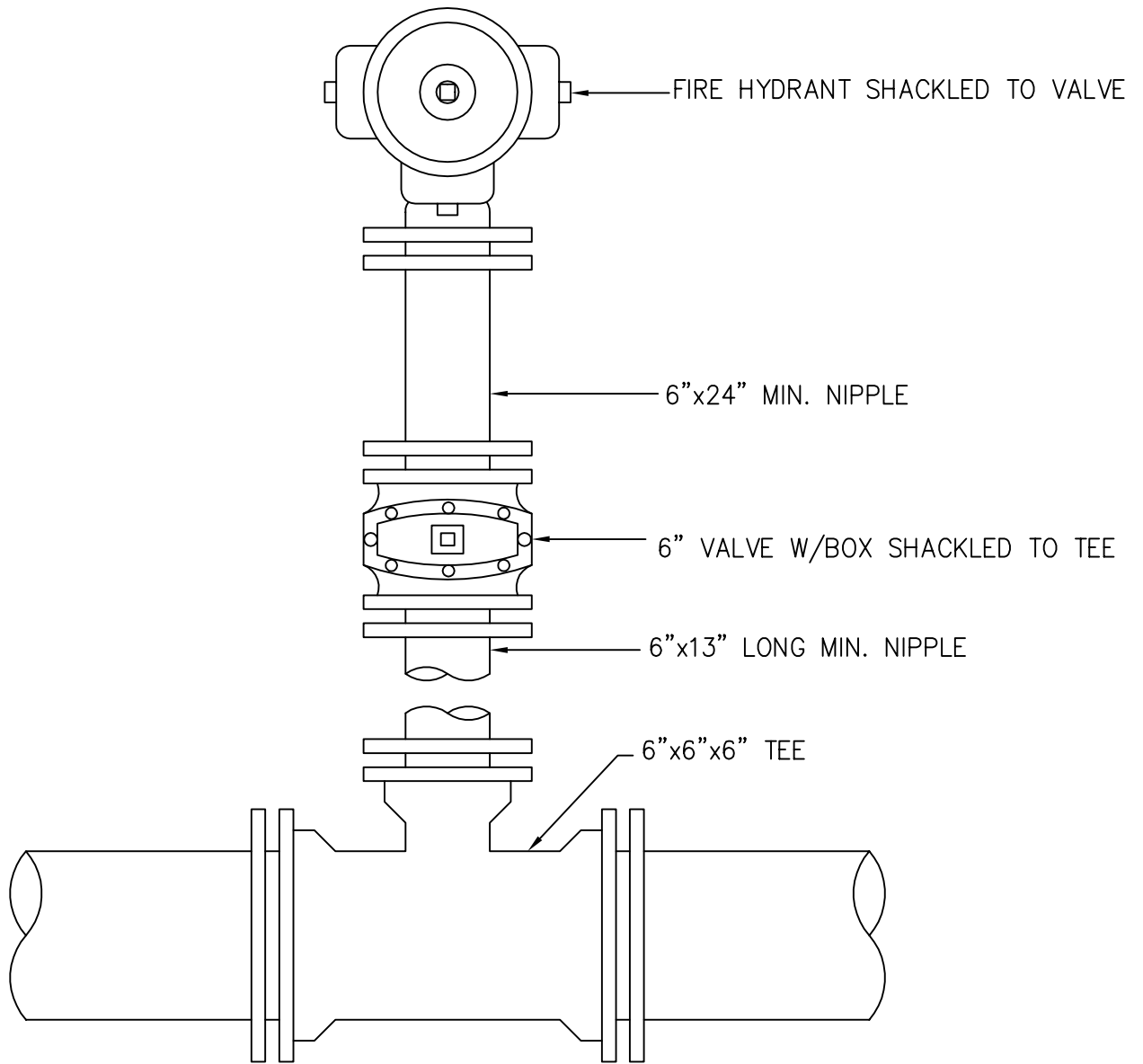


Water Details

W1	Fire Hydrant Assembly (Type I)
W2	Fire Hydrant Assembly (Type II)
W3	Fire Hydrant Assembly (Type III)
W4	Fire Hydrant Assembly (Type IV)
W5	General Location of Fire Hydrants (Reference to Curb & Sidewalk)
W6	Butterfly Valve Installation
W7	Round Way Connection
W8	Blow-Off Installation
W9	Restraint of Bends
W10	Restraint of Tees
W11	Length & Method of Restraint
W12	Methods of Restraining
W13	Number & Diameter of Restraining Rods
W14	Bent Eye Bolt
W15	Tie Rods, Nuts, & Washers
W16	Restraining Valves on Dead Ends
W17	Tee Blocking Detail
W18	Elbow Blocking Detail
W20	General Location of Fire Hydrants (Reference to Sheet)
W21A	Water Service Connection New Construction
W21B	Water Service Connection Curb Stop
W21C	Water Service Connection Retrofit
W23	Water Main Air Valve Structure
W24	Water Main Specifications



NOTE:
THIS ARRANGEMENT CAN BE USED ON ALL SIZES OF MAINS

FIRE HYDRANT ASSEMBLY (TYPE I)



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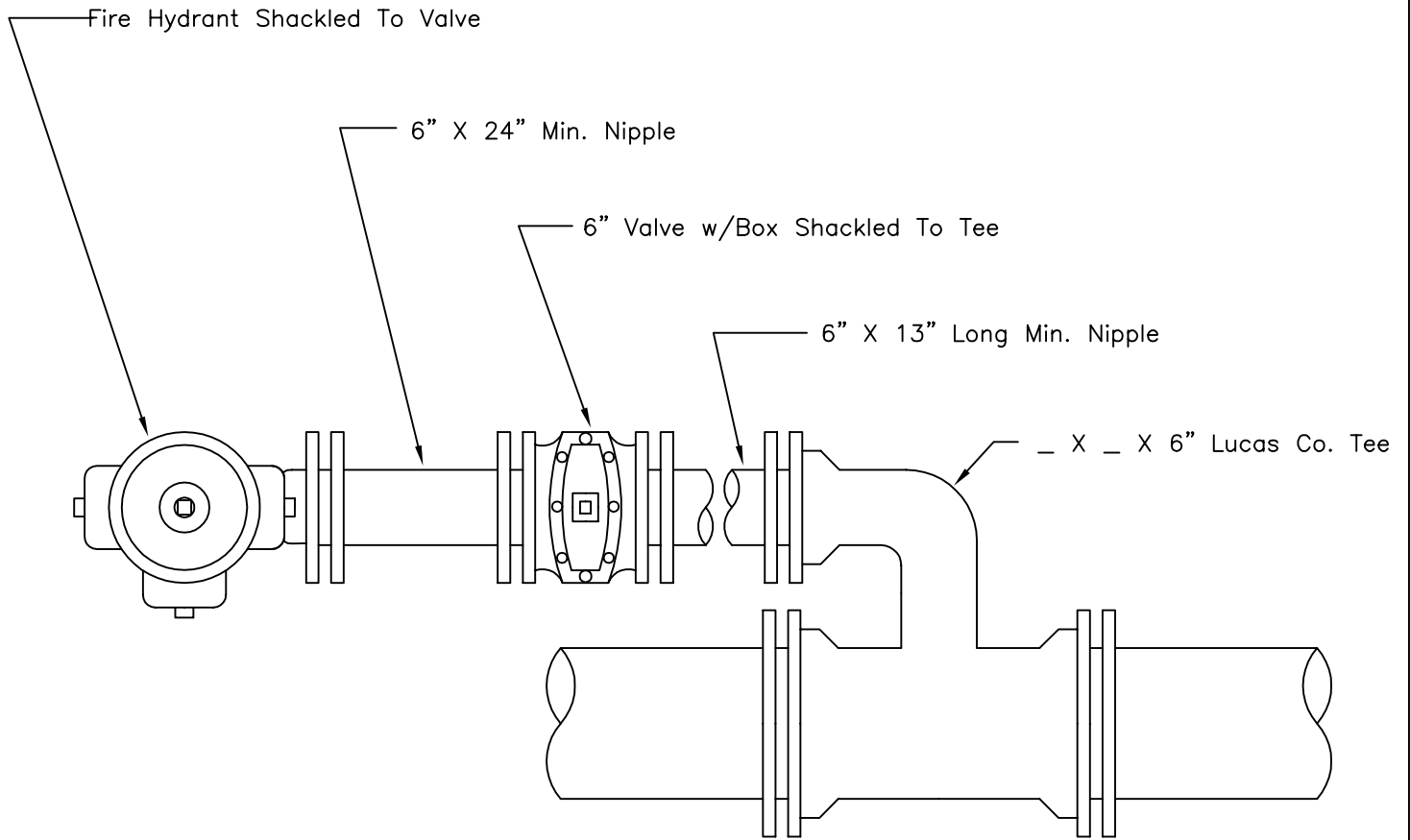
Fire Hydrant Assembly (Type I)

9-13-2017

Scale: N.T.S

W1

JF



NOTE:

This Arrangement Can Be Used On All Mains To And Including 12" In Size

FIRE HYDRANT ASSEMBLY (TYPE II)



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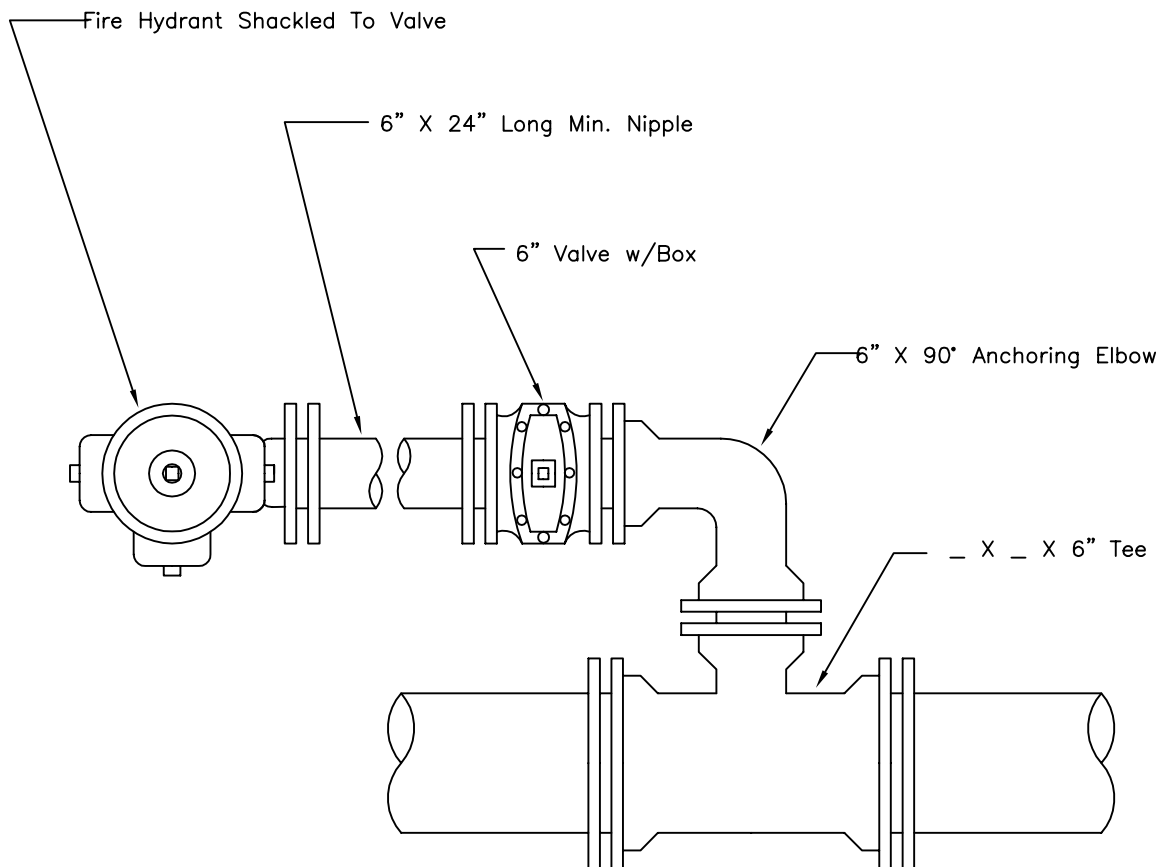
Fire Hydrant Assembly (Type II)

9-13-2017

Scale: N.T.S

W2

JF



NOTE:
 This Arrangement Can Be Used On All Sizes Of Mains

FIRE HYDRANT ASSEMBLY (TYPE III)



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 Engineering & Public Works

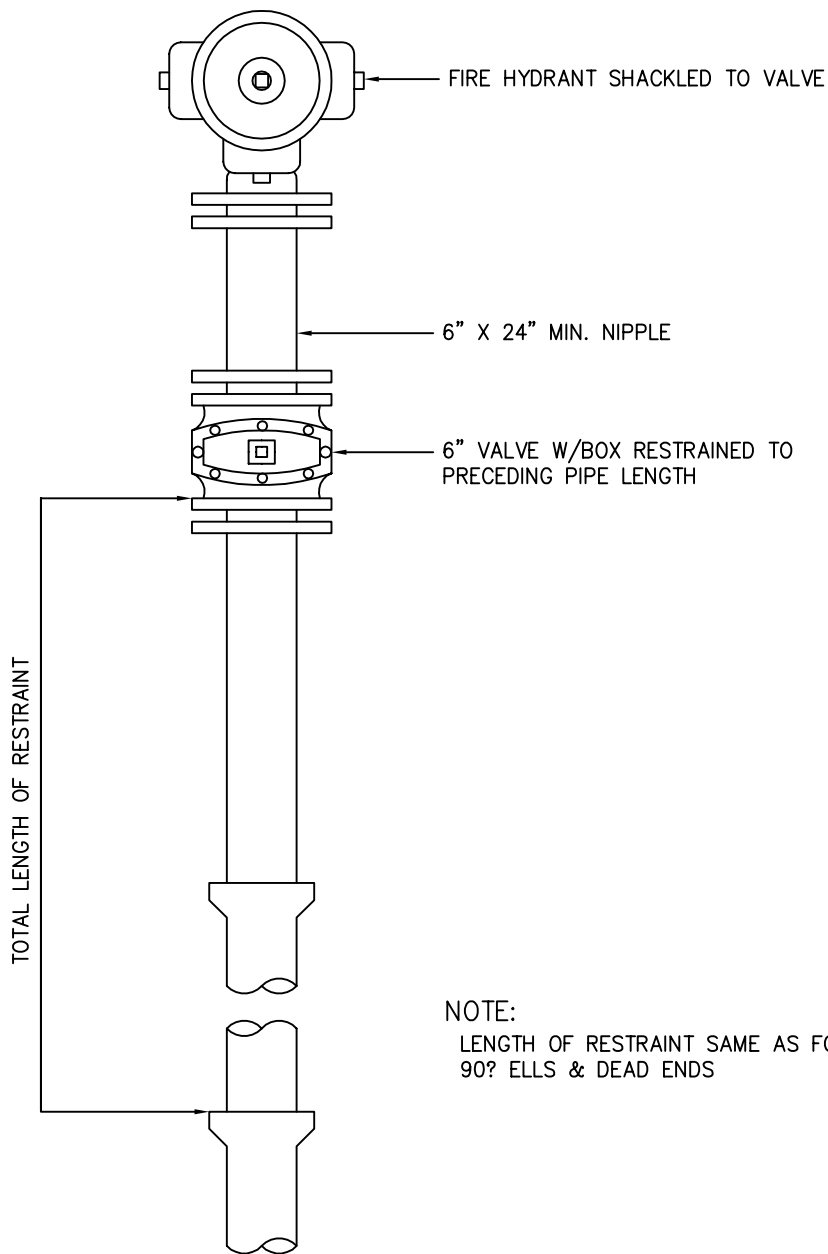
Fire Hydrant Assembly (Type III)

9-13-2017

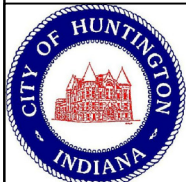
Scale: N.T.S

W3

JF



FIRE HYDRANT ASSEMBLY (TYPE IV)



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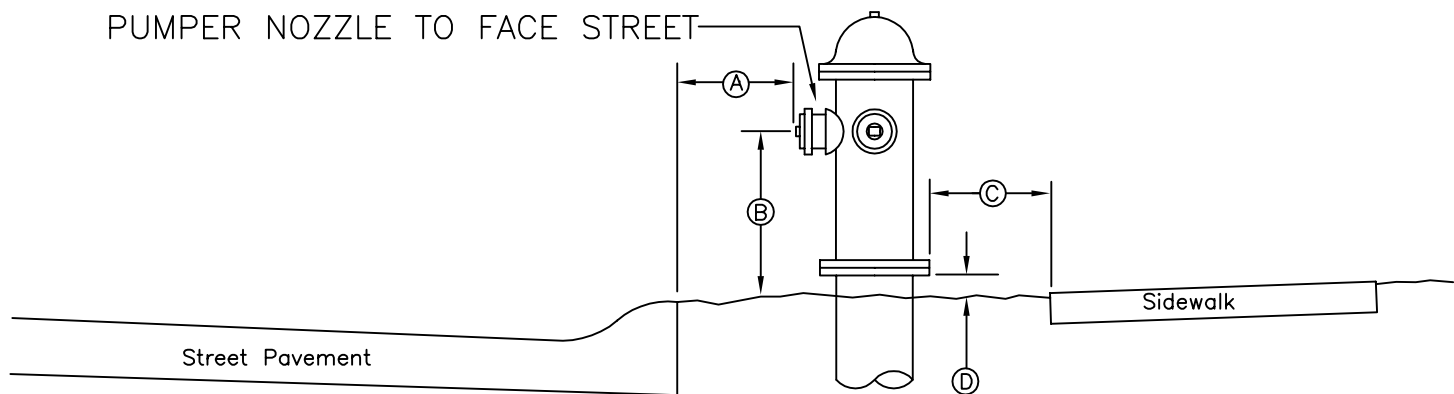
Fire Hydrant Assembly (Type IV)

9-13-2017

Scale: N.T.S

W4

JF

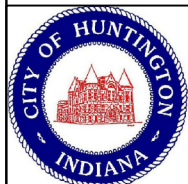


- Ⓐ Pumper Nozzle Min. 3'-6", Max. 4'-0" From Back Of Curb.
- Ⓑ Pumper Nozzle Min. 1'-7", Max. 2'-1" Above Ground Line.
- Ⓒ No Part Of Hydrant Closer Than 6" To Sidewalk.
- Ⓓ Min.2", Max.8" Above Grade To Flange Or Ground Line Mark On Hydrant.

NOTES:

- 1) Fire Hydrant Assembly Item To Include, Fire Hydrant, Auxiliary Valve & Riser Box, And All Tees, Fittings, Pipes, Etc. To And Include Main Tee.
- 2) Where Fire Hydrants Must Be Located In A Paved Area, Knock-out Blocks A Minimum Of 5'X 5' With Expansion Joints On All Sides Are To Be Provided.

*GENERAL LOCATION OF FIRE HYDRANTS
(REFERENCE TO CURB & SIDEWALK)*



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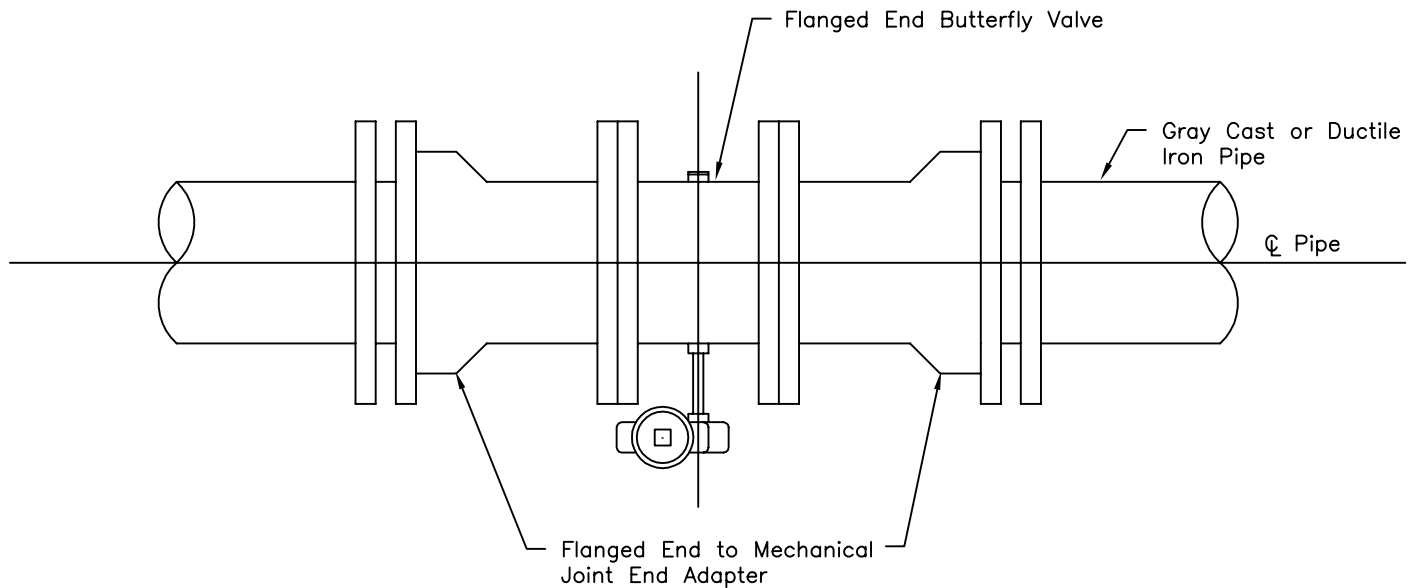
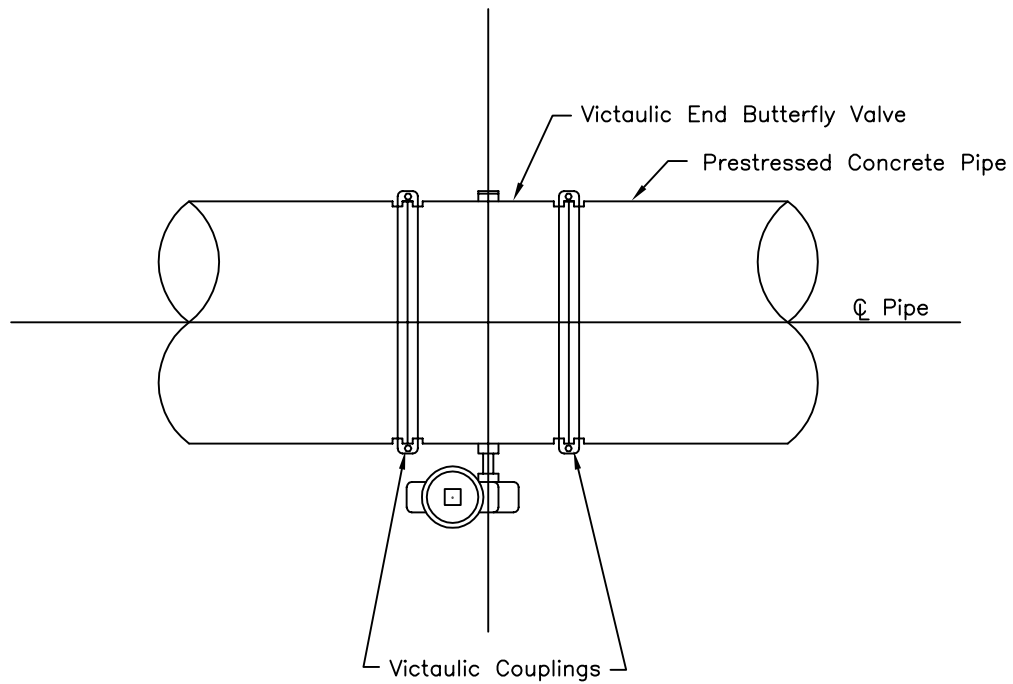
General Location of Fire Hydrants
(Reference to Curb & Sidewalk)

9-13-2017

Scale: N.T.S

W5

JF



BUTTERFLY VALVE INSTALLATION



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Engineering & Public Works

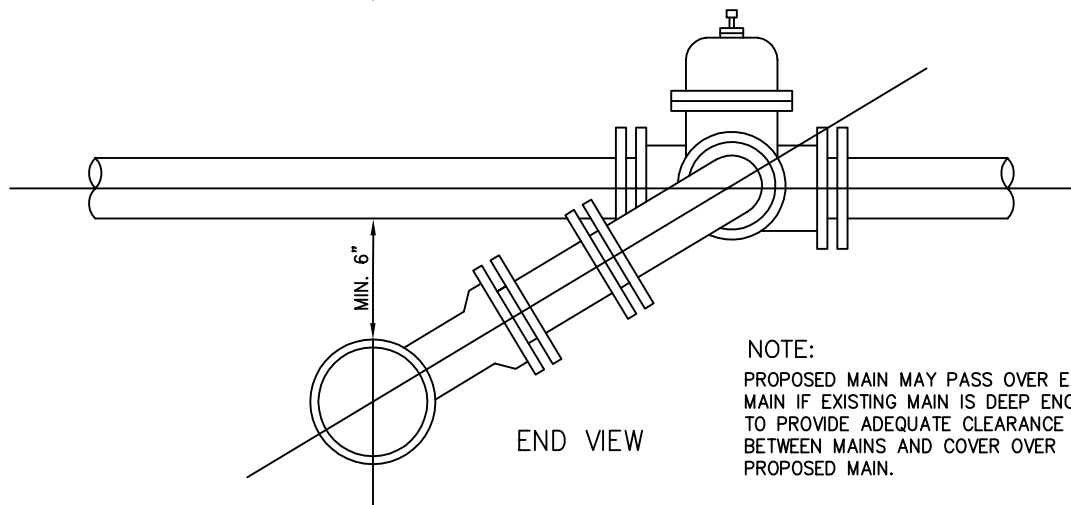
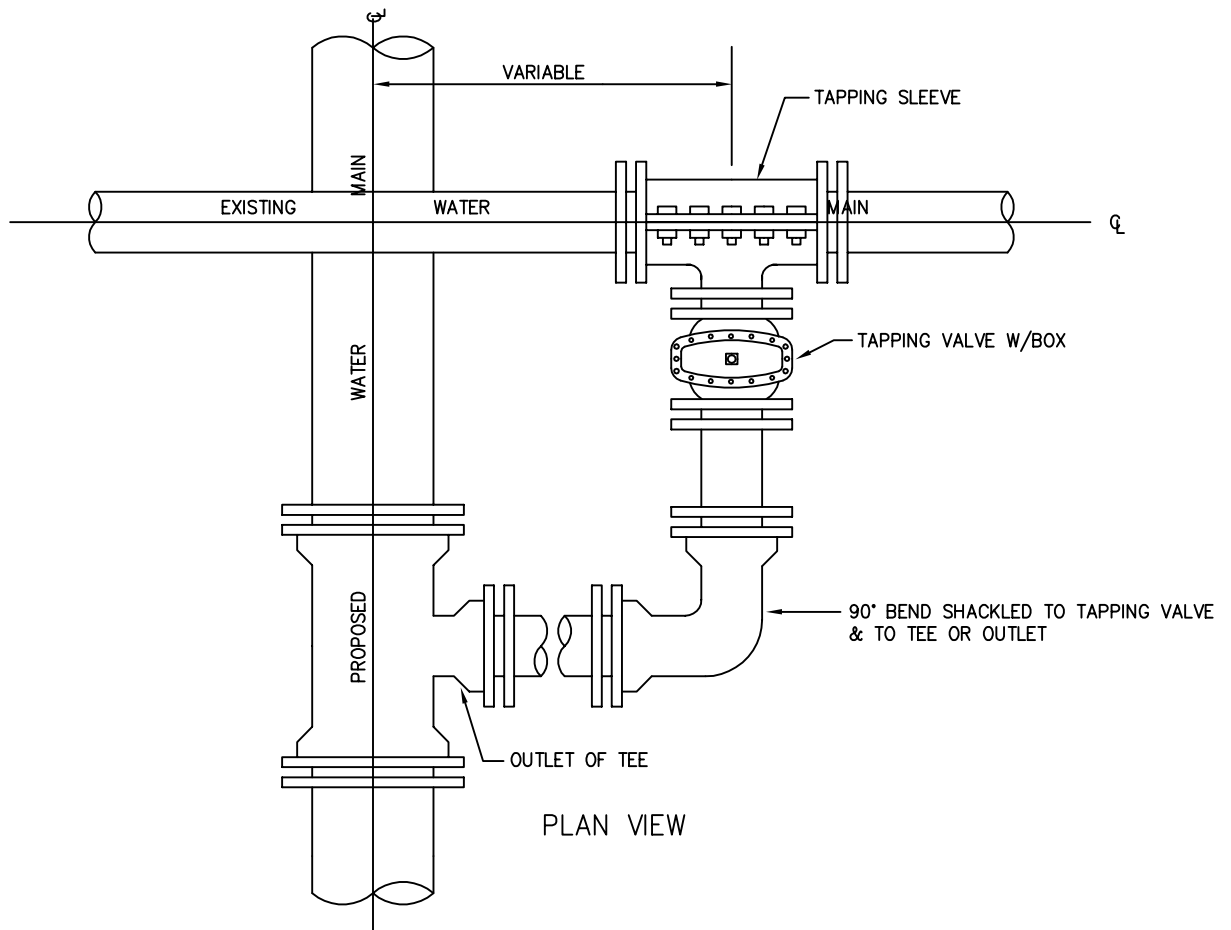
Butterfly Valve Installation

9-13-2017

Scale: N.T.S

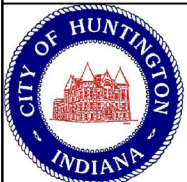
W6

JF



NOTE:
 PROPOSED MAIN MAY PASS OVER EXISTING
 MAIN IF EXISTING MAIN IS DEEP ENOUGH
 TO PROVIDE ADEQUATE CLEARANCE
 BETWEEN MAINS AND COVER OVER
 PROPOSED MAIN.

ROUND WAY CONNECTION



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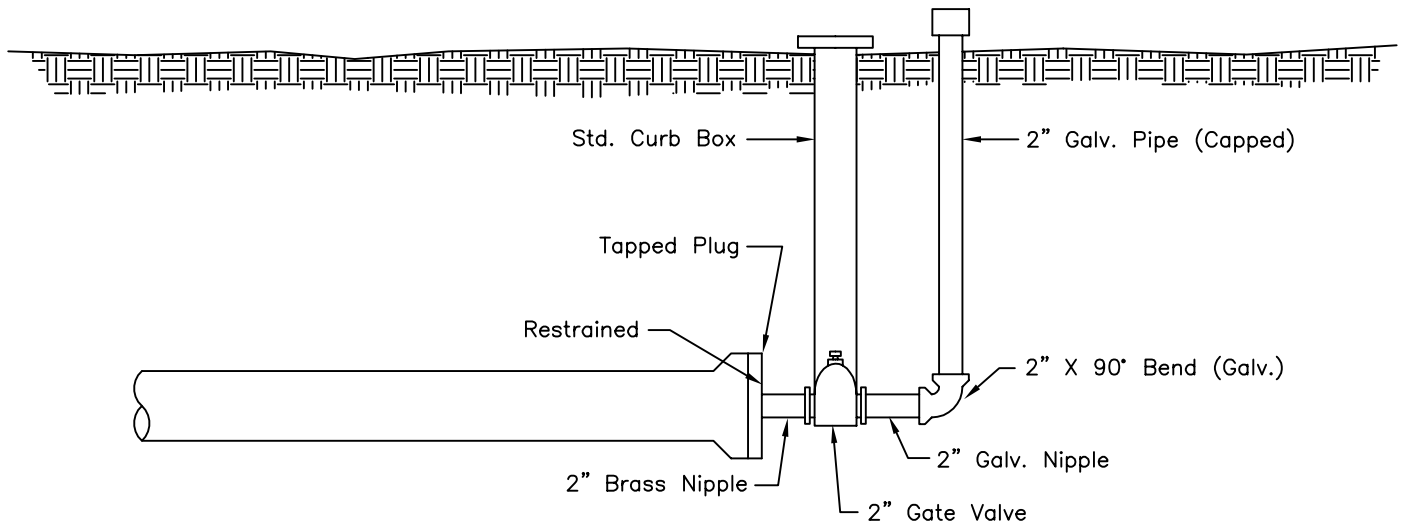
Round Way Connection

9-13-2017

Scale: N.T.S

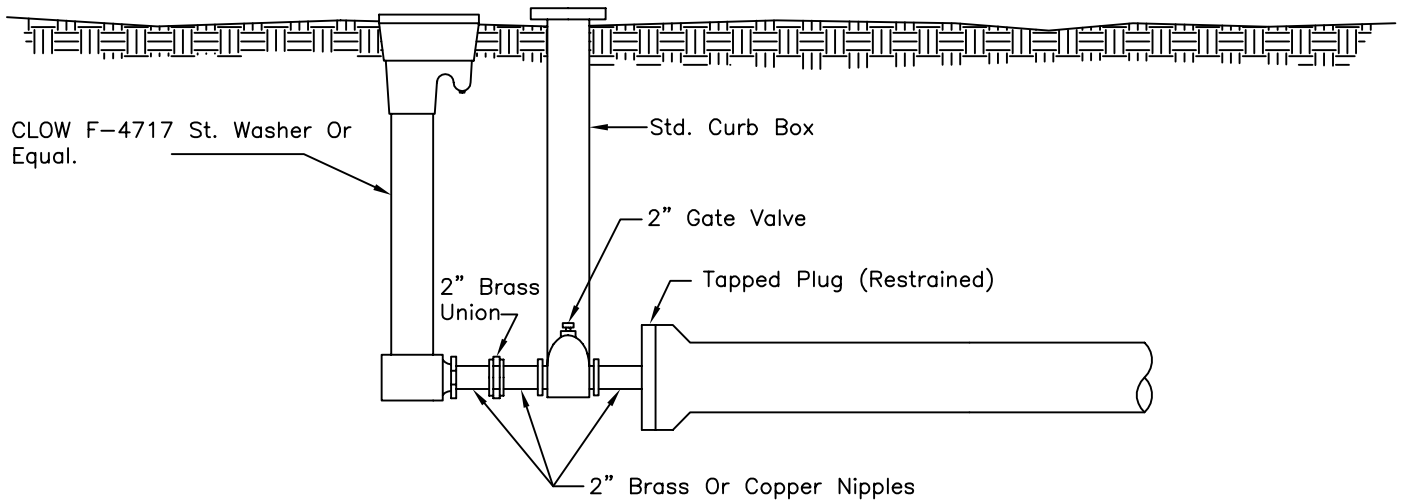
W7

JF



TEMPORARY BLOW-OFF INSTALLATION

PERMANENT BLOW-OFF INSTALLATION



BLOW-OFF INSTALLATION



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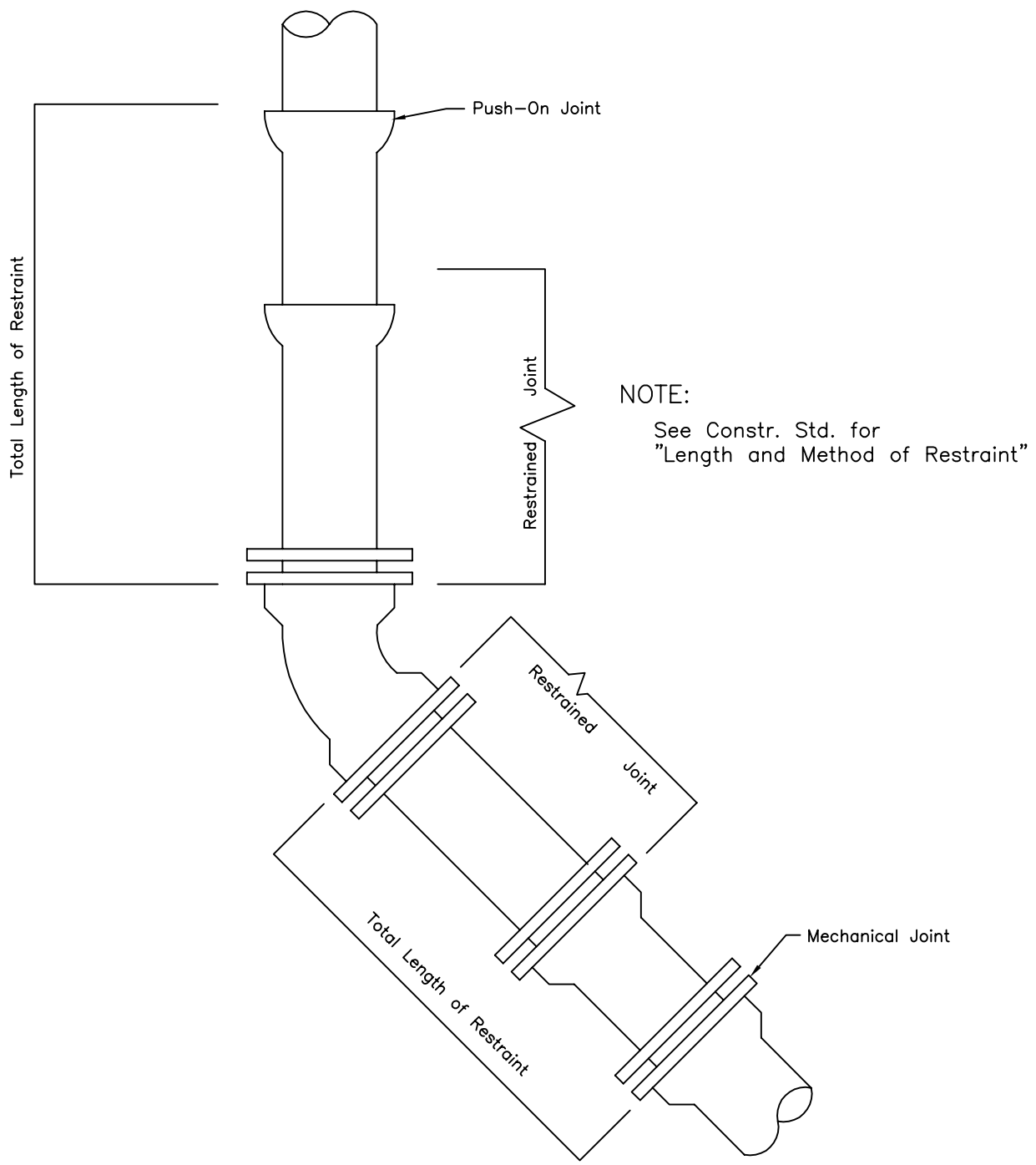
Blow-Off Installation

9-13-2017

Scale: N.T.S

W8

JF



RESTRAINT OF BENDS



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Engineering & Public Works

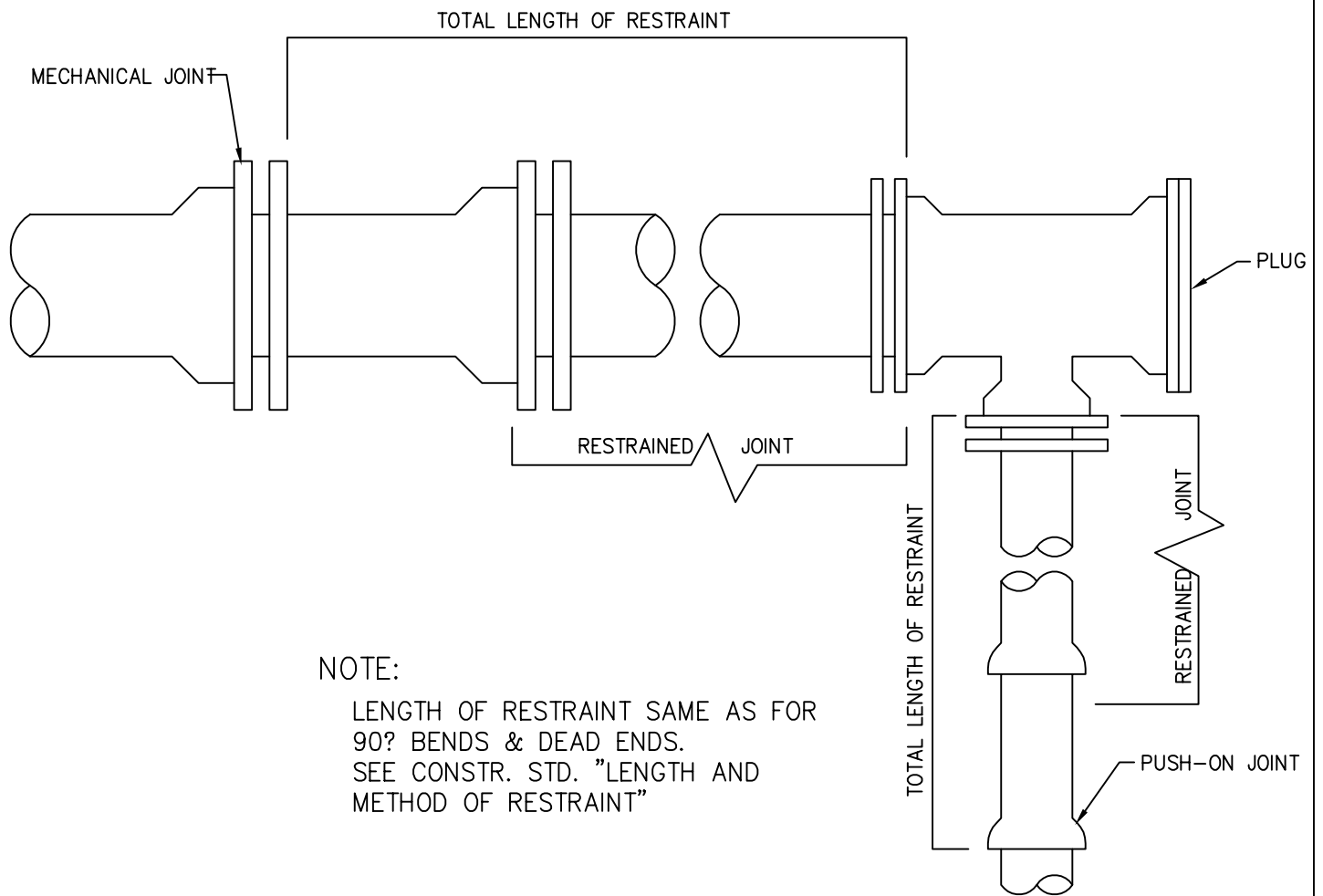
Restraint of Bends

9-13-2017

Scale: N.T.S

W9

JF



NOTE:

LENGTH OF RESTRAINT SAME AS FOR
 90° BENDS & DEAD ENDS.
 SEE CONSTR. STD. "LENGTH AND
 METHOD OF RESTRAINT"

RESTRAINT OF TEES



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Restraint of Tees

9-13-2017

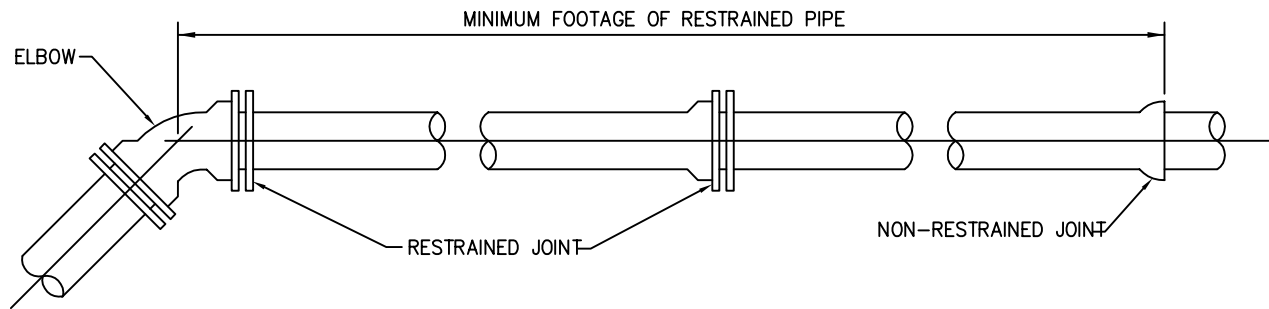
Scale: N.T.S

W10

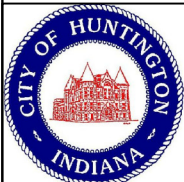
JF

**MINIMUM FOOTAGE OF RESTRAINED PIPE
FOR
VARIOUS DIAMETERS & DEGREES
CAST & DUCTILE IRON ELBOWS**

COVER DIA. MAIN	DEGREE OF ELBOW											
	11 1/4°			22 1/2°			45°			90° OR DEAD END		
	4'	5'	8'	4'	5'	8'	4'	5'	8'	4'	5'	8'
4"	-	-	-	-	-	-	3	3	2	10	8	5
6"	-	-	-	2	-	-	5	4	2	14	12	7
8"	-	-	-	2	2	-	6	5	3	20	16	10
10"	-	-	-	3	2	1	8	7	4	28	22	14
12"	-	-	-	3	3	2	12	9	6	39	30	19
16"	2	1	-	5	4	3	17	14	9	58	47	30
20"	2	2	-	6	5	3	22	18	12	75	62	40
24"	2	2	-	7	6	4	26	22	14	88	73	47
30"	3	2	-	9	7	5	29	26	18	104	86	57
36"	3	3	-	11	9	6	39	34	21	128	111	70
42"	3	3	-	12	10	7	42	35	24	139	116	78
48"	4	3	-	13	11	7	47	39	26	155	129	86
54"			-			8			30			98



LENGTH AND METHOD OF RESTRAINT



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Engineering & Public Works

Length & Method of Restraint

9-13-2017

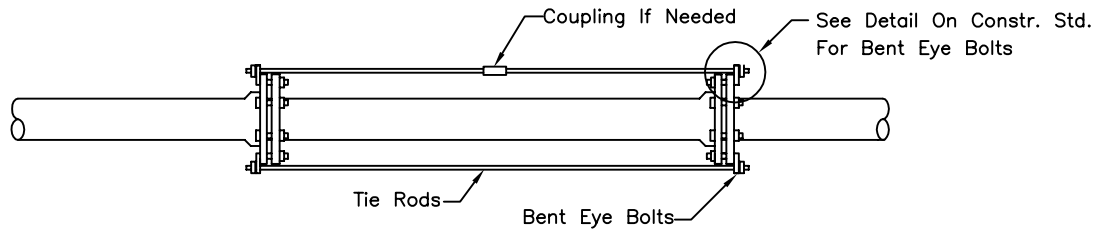
Scale: N.T.S

W11

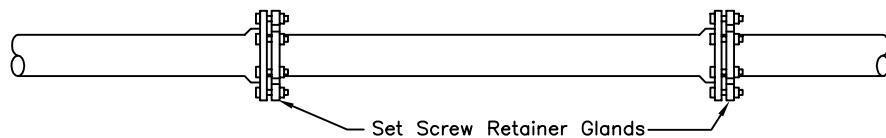
JF

METHODS OF RESTRAINING

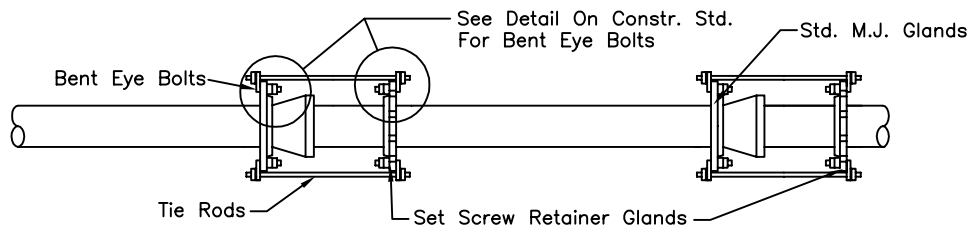
1. RESTRAINED JOINTS ON STANDARD M.J. PIPE



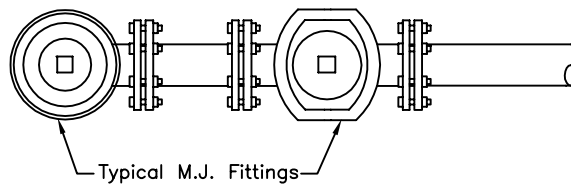
2. RESTRAINED JOINTS ON M.J. PIPE USING SET SCREW RETAINER GLANDS



3. RESTRAINED JOINTS ON SLIP JOINT PIPE



4. SELF ANCHORING NIPPLE OR PLAIN END PIPE w/2-M.J. SET SCREW RETAINER GLANDS



METHODS OF RESTRAINING



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Methods of Restraining

9-13-2017

Scale: N.T.S

W12

JF

FOR ANGLES OTHER THAN THOSE SHOWN BELOW, CONSULT PROJECT ENGINEER FOR NUMBER AND SIZE OF RESTRAINING RODS.

Dia.	11 1/4°	22 1/2°	45°	90° or DEAD END MAIN
4"	None Req'd.	None Req'd.	2-1/2"	2-1/2"
6"	None Req'd.	2-1/2"	2-1/2"	2-1/2"
8"	None Req'd.	2-1/2"	2-1/2"	4-1/2";4-5/8";2-3/4"
10"	None Req'd.	2-1/2"	2-1/2"	6-1/2";4-5/8";4-3/4"
12"	None Req'd.	2-1/2"	4-1/2" or 2-5/8"	8-1/2";6-5/8";4-3/4"
16"	2-1/2"	2-1/2"	4-1/2";4-5/8";2-3/4"	8-5/8" or 6-3/4"
20"	2-1/2"	2-1/2"	6-1/2";4-5/8";4-3/4"	12-5/8" or 8-3/4"
24"	2-1/2"	4-1/2" or 2-5/8"	8-1/2";6-5/8";4-3/4"	12-3/4"

ABOVE FIGURES BASED ON DESIGN CRITERIA AS FOLLOWS:

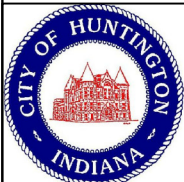
Internal Pressure = 200 psig (Incl. Water Hammer)

Safety Factor = 2.5 Min.

Ultimate Strength For Tie Rod Mat'l. = 75,000 psi

Thread Sizes = American Coarse, Loose Fit

NUMBER & DIA. OF RESTRAINING RODS TO USE FOR VARIOUS DEGREES OF ELBOWS AND SIZES OF PIPE



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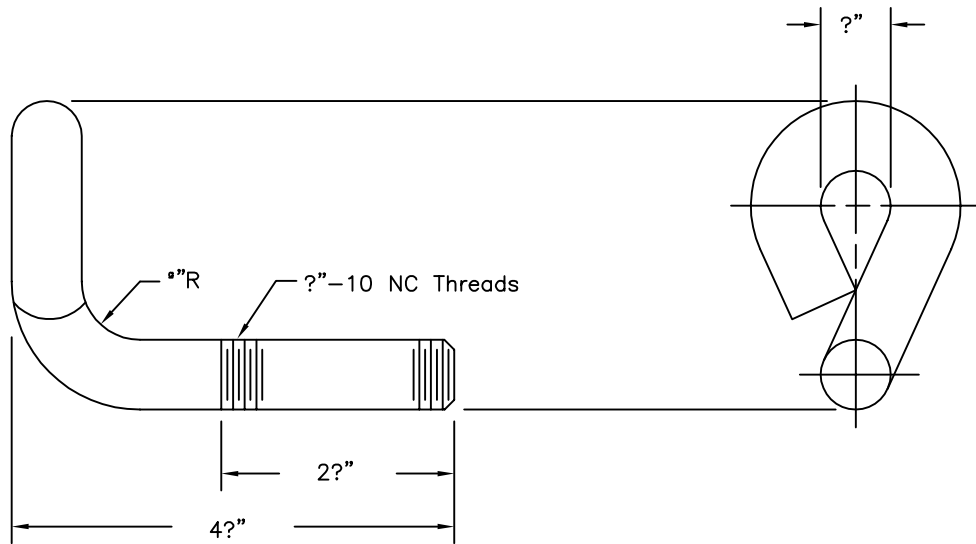
Number & Diameter of Restraining Rods

9-13-2017

Scale: N.T.S

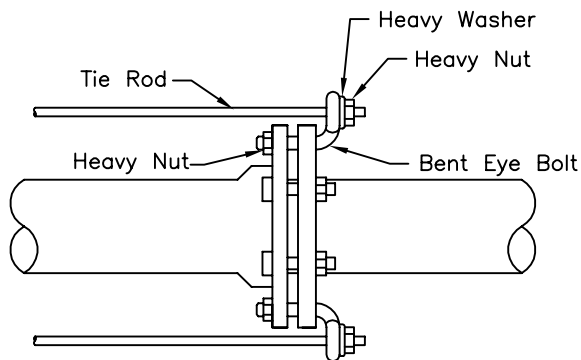
W13

JF

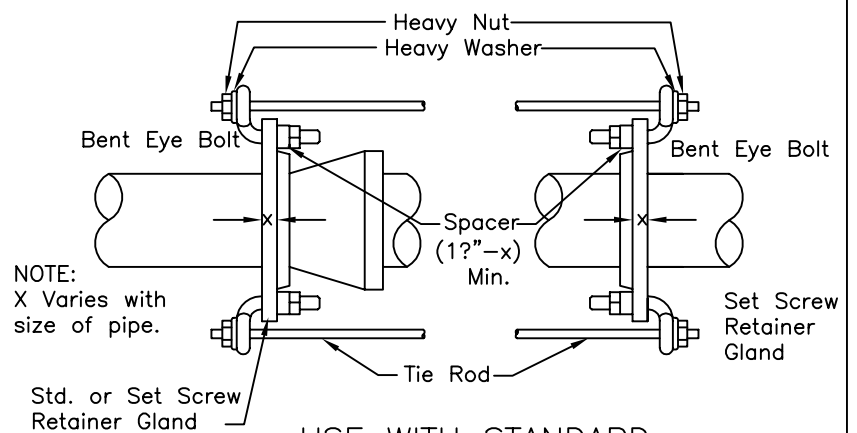


?" BENT EYE BOLT
 STAR INDUSTRIAL SUPPLY CORP.
 FIG. No. 7
 (OR EQUAL)

Material for Eye Bolts shall be same as construction for the Rods, Nuts & Washers



USE WITH COMPLETE MECHANICAL JOINT



NOTE:
 X Varies with size of pipe.

USE WITH STANDARD OR SET SCREW RETAINER GLAND ON SLIP JOINT AND PLAIN END PIPE

BENT EYE BOLTS



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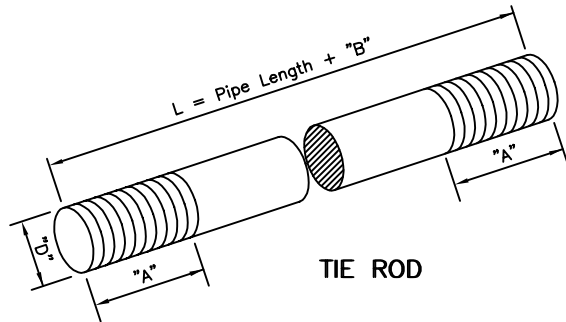
Bent Eye Bolt

9-13-2017

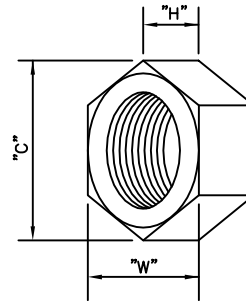
Scale: N.T.S

W14

JF



TIE ROD



ANSI HEAVY NUT
(Semi-finished)

All Tie Rods, Nuts, Washers shall be made of Cor-Ten, or equal, Corrosion Resistant Steel; or they shall be made of Cold Rolled Steel with a Minimum Tensile Strength of 75,000 P.S.I. and shall have a Minimum Thickness of Cadmium Plating of 6.0 Mils placed after threads are cut, and shall be coated with Yellow Chromate.

Tie Rods shall have a Minimum Thread Length of "A". However, they may be Threaded their full length.



HEAVY WASHER
(ANSI B27.2)

?” Rods, Nuts, and Washers shall be used in all Cases, Unless this size is not available and Written Approval is obtained from the Engineer.

TIE ROD DATA		
PIPE DIA.	"A" (Min.)	"B" (Min.)
4"	6?"	1?"
6"	6?"	1?"
8"	6?"	1?"
10"	6?"	1?"
12"	6?"	2"
16"	7?"	?"
20"	7?"	?"
24"	7?"	?"
30"	8?"	0
36"	8?"	?"

NUT AND WASHER DATA							
"D"	NUTS				NUTS		
	No. Thds	"C"	"W"	"H"	I.D.	O.D.	"T"
?"	10	1§"	1?"	?"	?"	2"	5 ³ / ₃₂
"	11	1?"	1i"	"	«"	1?"	ϕ"
?"	13	1"	?"	?"	?"	1?"	3 ³ / ₃₂

TIE RODS, NUTS, AND WASHERS



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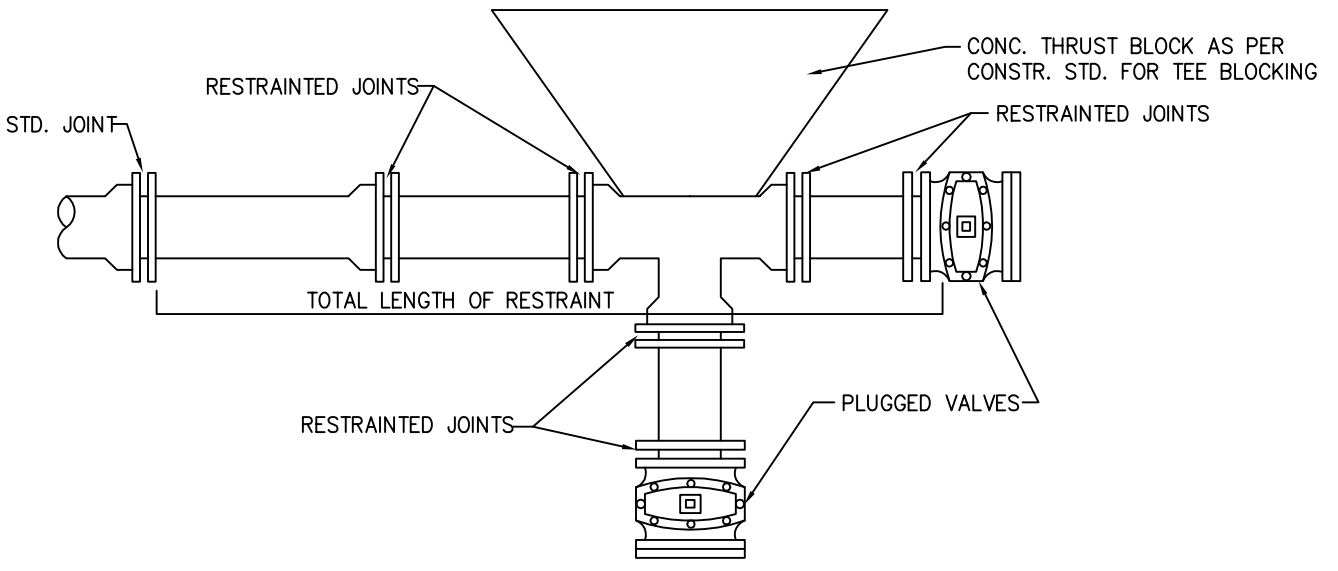
Tie Rods, Nuts, & Washers

9-13-2017

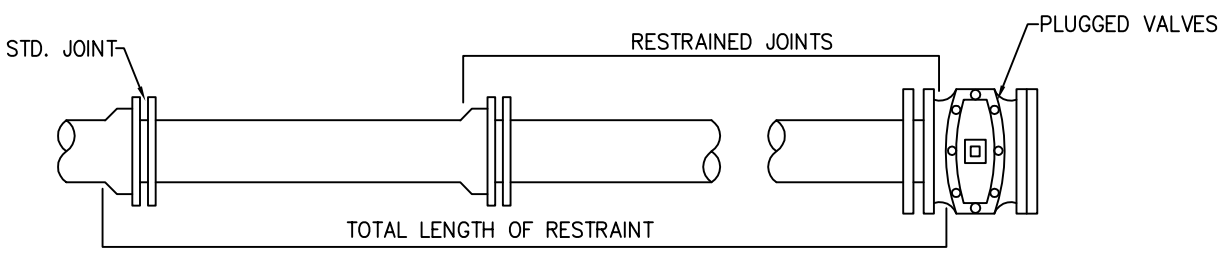
Scale: N.T.S

W15

JF



DEAD ENDS OF TEES



DEAD ENDS OF MAINS

NOTE:
 LENGTH OF RESTRAINT SAME AS FOR
 90° BENDS & DEAD ENDS.
 SEE CONSTR. STD. "LENGTH AND
 METHOD OF RESTRAINT"

RESTRAINING VALVES ON DEAD ENDS



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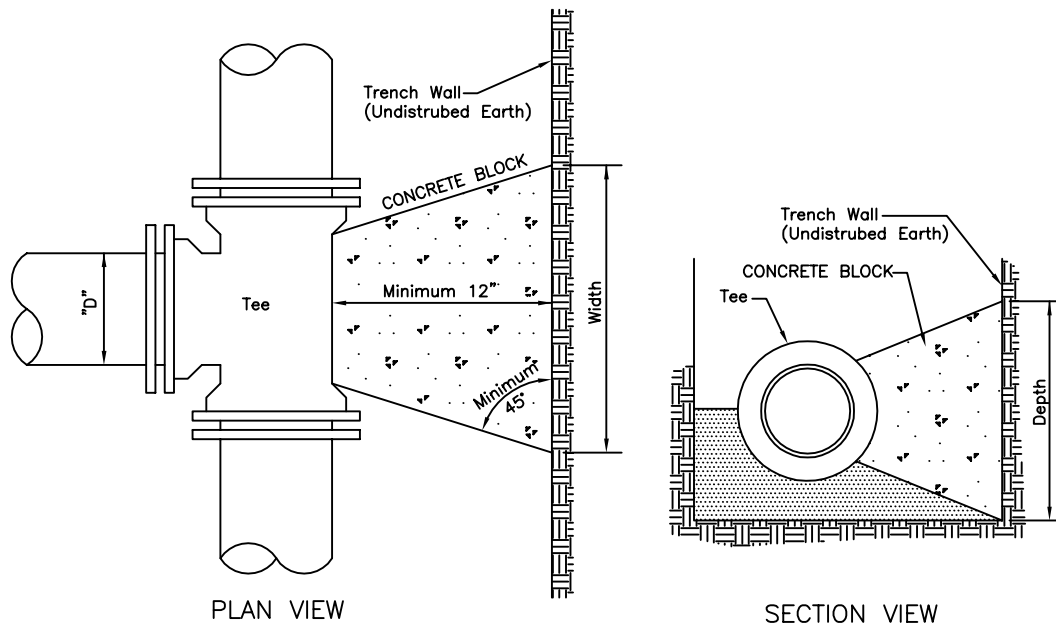
Restraining Valves on Dead Ends

9-13-2017

Scale: N.T.S

W16

JF



"D"	WIDTH	DEPTH
4"	2'-6"	1'-0"
6"	3'-3"	1'-6"
8"	4'-3"	2'-0"
10"	5'-3"	2'-6"
12"	6'-0"	3'-0"
16"	8'-0"	4'-0"
20"	9'-9"	5'-0"
24"	11'-6"	6'-0"

NOTE:

Concrete shall be kept a sufficient distance from joint for removal of all joint accessories including Bolts, and shall be of a Mix not leaner than 1 PART Cement to 2 PARTS Sand and 5 PARTS Stone and having a Compressive Strength of not less than 2500 psi after 28 Days.

TEE BLOCKING DETAIL



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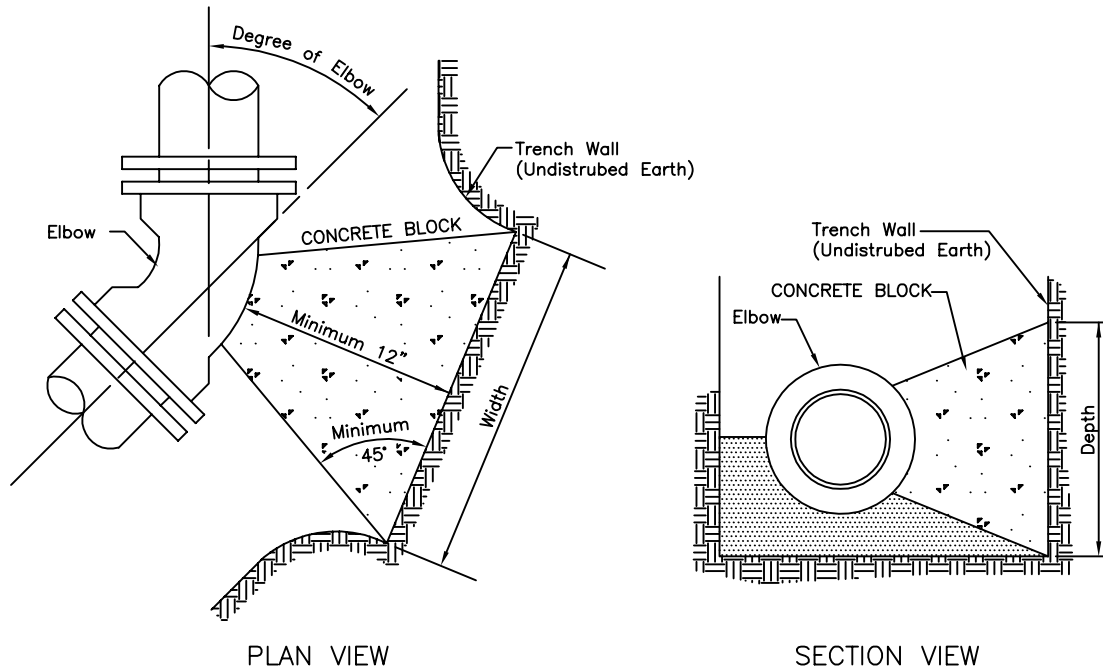
Tee Blocking Detail

9-13-2017

Scale: N.T.S

W17

JF



SIZE	11°		22°		45°		90°	
	W	D	W	D	W	D	W	D
4"	9"	9"	1'-0"	9"	1'-6"	1'-3"	2'-9"	1'-3"
6"	1'-0"	1'-0"	2'-0"	1'-0"	2'-6"	1'-6"	4'-3"	1'-6"
8"	1'-3"	1'-3"	2'-0"	1'-9"	3'-9"	1'-9"	6'-0"	2'-0"
10"	1'-9"	1'-6"	3'-0"	1'-9"	4'-0"	2'-6"	6'-3"	2'-6"
12"	2'-0"	1'-9"	3'-6"	2'-0"	4'-9"	3'-0"	7'-3"	3'-0"
16"	2'-9"	2'-3"	5'-6"	2'-3"	6'-0"	4'-0"	11'-3"	4'-0"
20"	3'-3"	2'-9"	5'-9"	3'-3"	7'-6"	5'-0"	13'-9"	5'-0"
24"	4'-6"	3'-0"	6'-9"	4'-0"	9'-0"	6'-0"	16'-6"	6'-0"

NOTE:

Concrete shall be kept a sufficient distance from joint for removal of all joint accessories including Bolts, and shall be of a Mix not leaner than 1 PART Cement to 2 PARTS Sand and 5 PARTS Stone and having a Compressive Strength of not less than 2500 psi after 28 Days.

ELBOW BLOCKING DETAIL



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Engineering & Public Works

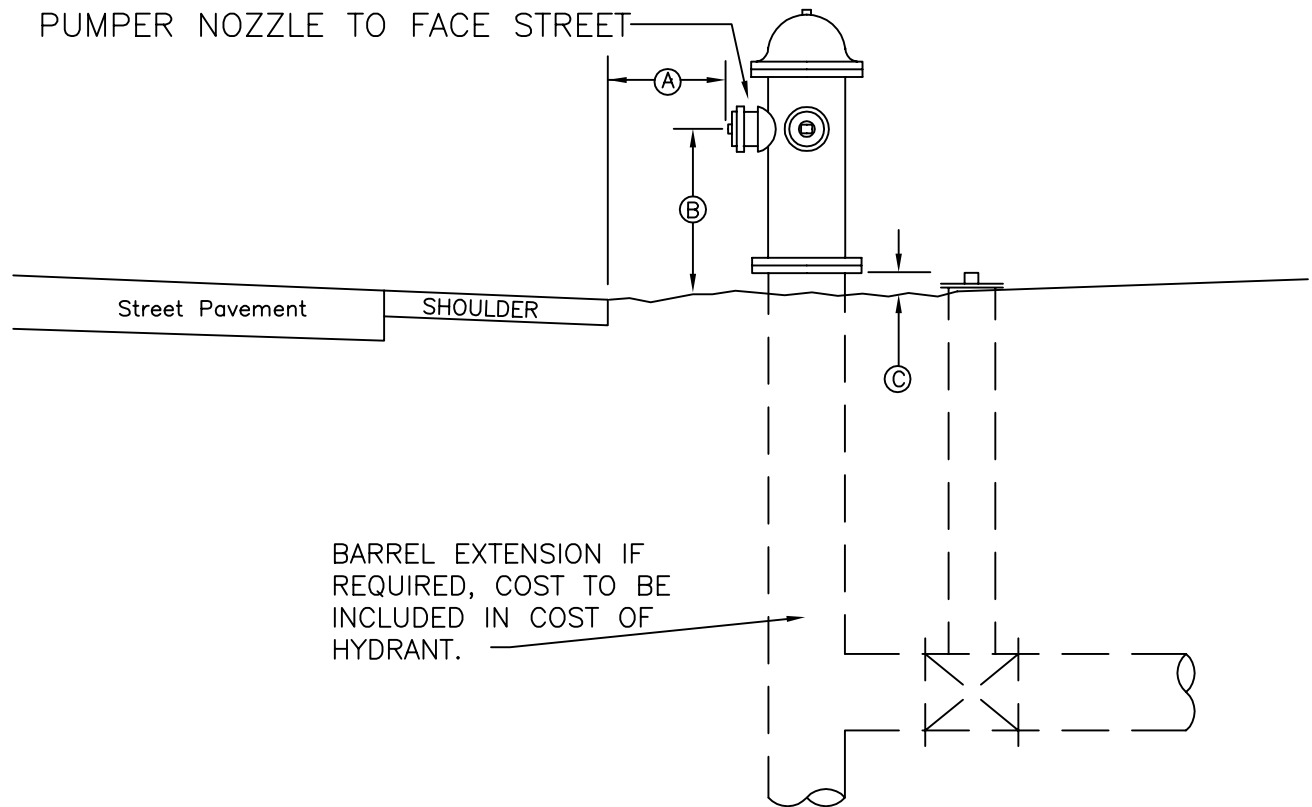
Elbow Blocking Detail

9-13-2017

Scale: N.T.S

W18

JF

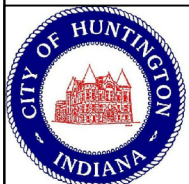


- (A) Pumper Nozzle Min. 3'-6", Max. 4'-0" From The Closer Of: Street Edge or Shoulder.
- (B) Pumper Nozzle Min. 1'-7", Max. 2'-1" Above Ground Line.
- (C) Min. 2", Max. 8" Above Grade to Flange or Ground Line Mark on Hydrant.

NOTES:

- 1) Fire Hydrant Assembly Item To Include, Fire Hydrant, Auxilary Valve & Riser Box, And All Tees, Fittings, Pipes, Etc. To And Include Main Tee.
- 2) Where Fire Hydrants Must Be Located In A Paved Area, Knock-out Blocks A Minimum Of 5'X 5' With Expansion Joints On All Sides Are To Be Provided.

*GENERAL LOCATION OF FIRE HYDRANTS
(REFERENCE TO STREET)*



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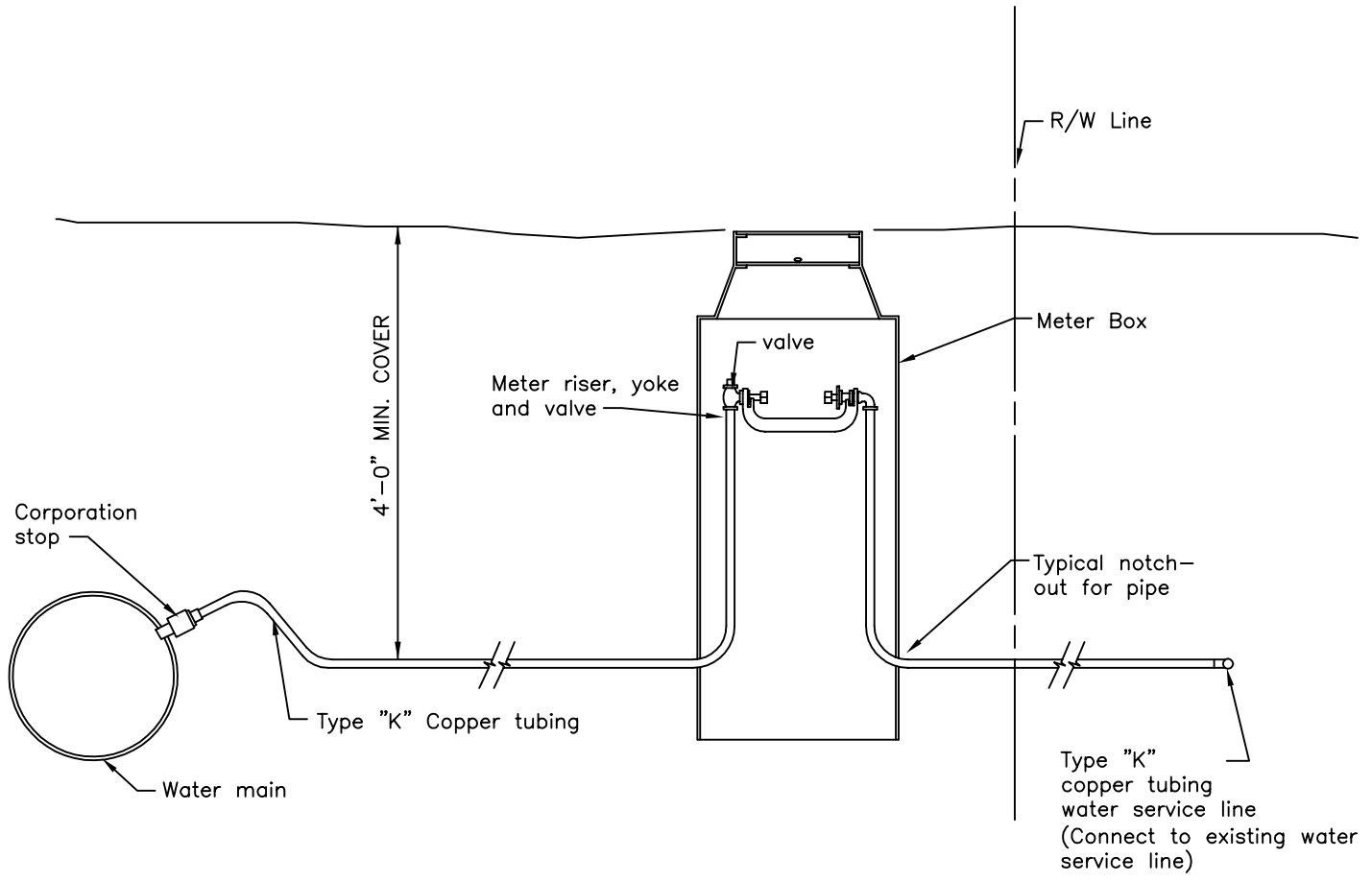
General Location of Fire Hydrants

9-13-2017

Scale: N.T.S

W20

JF



WATER SERVICE CONNECTION



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Engineering & Public Works

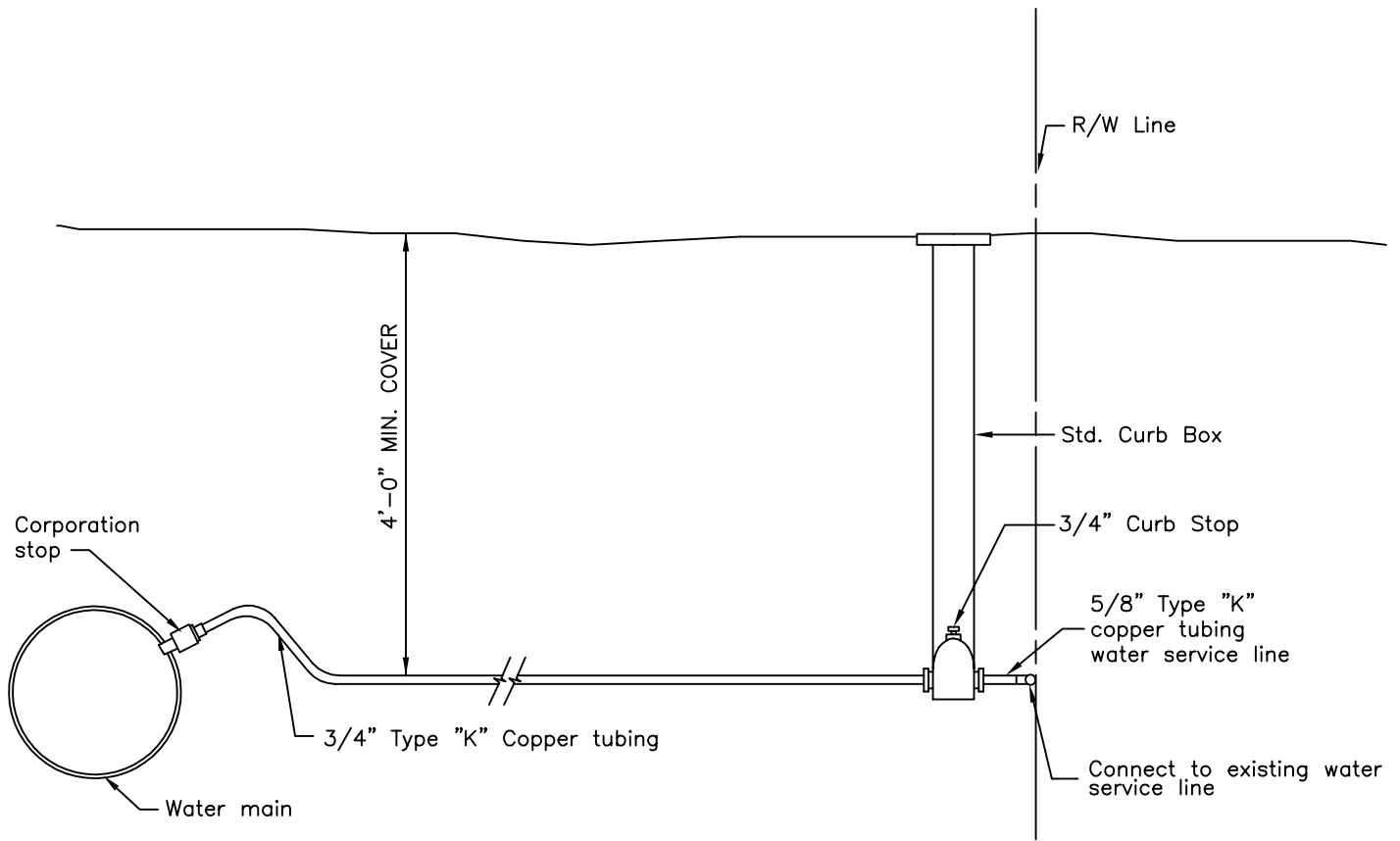
Water Service Connection New Construction

9-13-2017

Scale: N.T.S

W21A

JF



WATER SERVICE CONNECTION



CITY OF HUNTINGTON
Engineering & Public Works

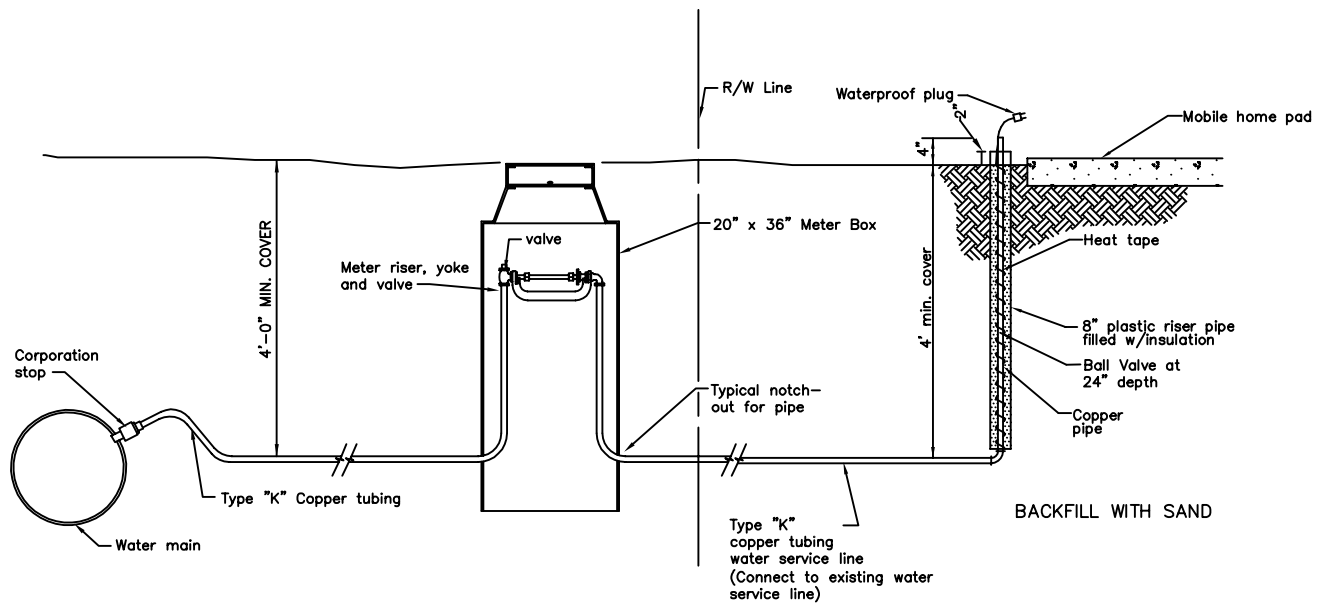
Water Service Connection Curb Stop

9-13-2017

Scale: N.T.S

W21B

JF



MANUFACTURED HOUSE PARK WATER SERVICE CONNECTION
ALTERNATE



CITY OF HUNTINGTON
Engineering & Public Works

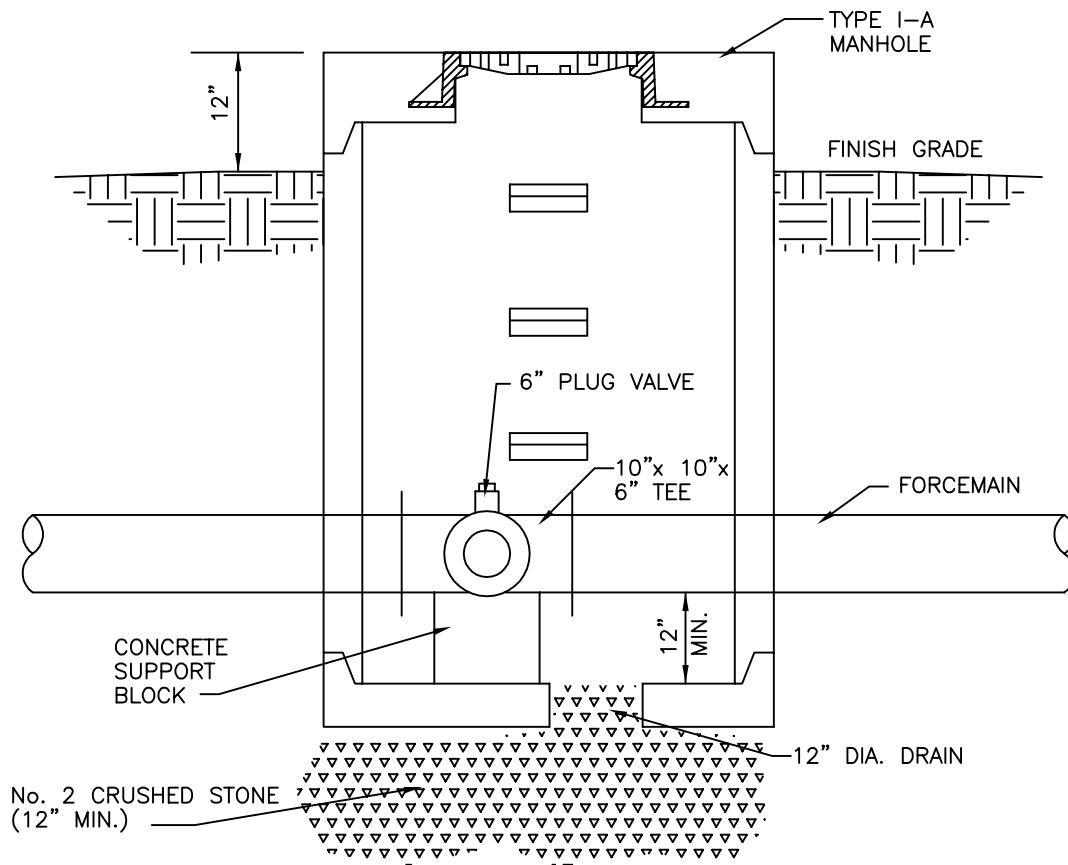
Manufactured House Park Water
Service Connection Alternate

9-13-2017

Scale: N.T.S

W21C

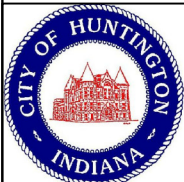
JF



LINE DRAIN STRUCTURE

NOTE:

ALL LINE DRAIN STRUCTURES SHALL BE FIELD LOCATED ON EACH LOW POINT ELEVATION ON THE FORCEMAIN. THE LOCATION OF EACH STRUCTURE ON THE PLAN SHEET IS APPROXIMATE.



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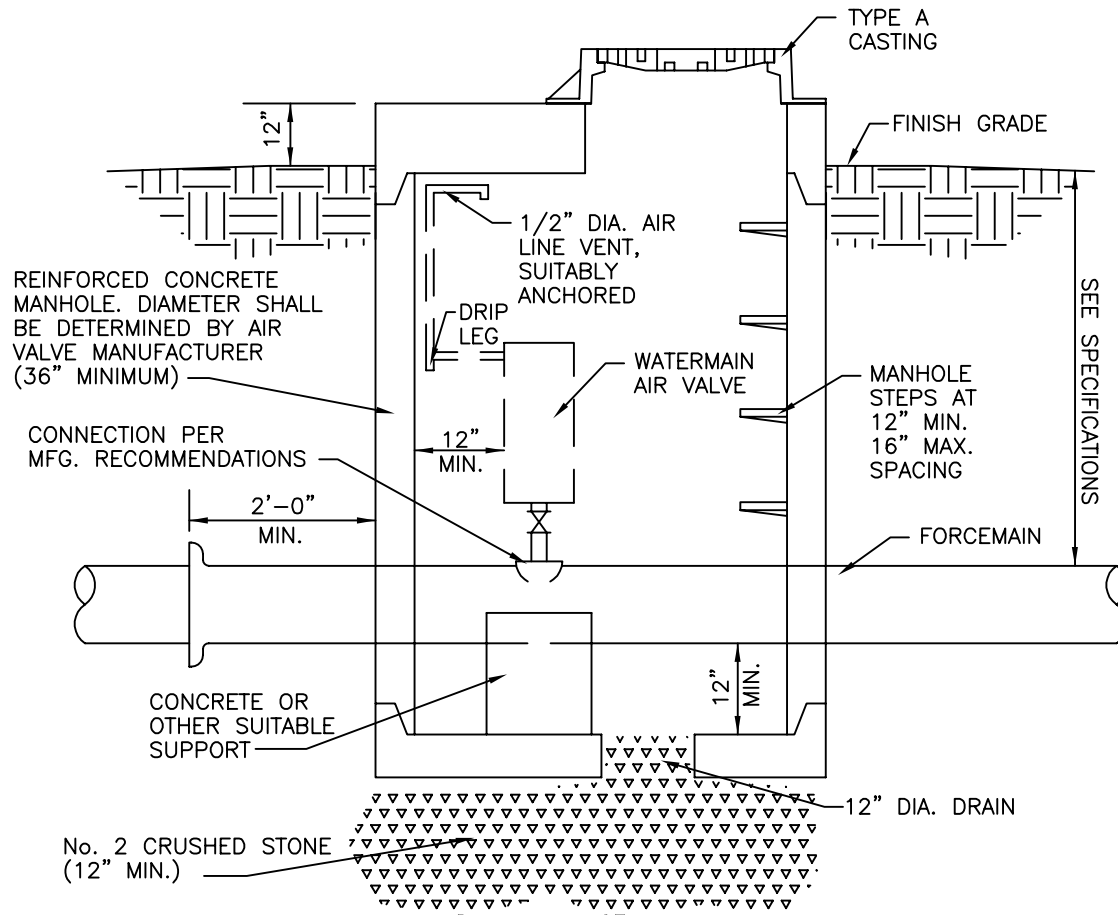
Line Drain Structure

9-13-2017

Scale: N.T.S

W22

JF



WATERMAIN AIR VALVE STRUCTURE

NOTE:

ALL AIR VALVE STRUCTURES SHALL BE FIELD LOCATED ON EACH HIGH POINT ELEVATION ON THE FORCEMAIN OR AS LOCATED ON THE DRAWINGS. THE LOCATION OF EACH STRUCTURE WHERE SHOWN ON THE DRAWINGS IS APPROXIMATE.



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Water Main Air Valve Structure

9-13-2017

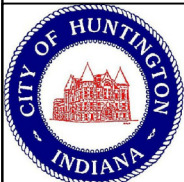
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WATER NOTES

1. Material and workmanship shall comply with requirements of the City of Syracuse.
2. All 12-inch water mains shall be Class 50 ductile iron pipe in accordance with ANSI Specification A21.51; with Class "B" bedding. Cost per lineal foot of pipe shall include all items necessary to complete and useable final products. Other lines shall be pvc Class 150, AWA 900 DR 18.
3. Contractor shall notify the City of Syracuse Engineering Department at least forty-eight (48) hours in advance of starting construction to make arrangements for inspection and shut down of existing water main, where required.
4. All permits, including street and road cut permits, necessary for the construction of this water main shall be secured and paid for by the Contractor and a copy furnished to the City of Syracuse Engineering Department before construction starts.
5. Water main to be installed with a minimum cover of 5'-0", with fire hydrants on the property side of the main. If 5'-0" cover cannot be maintained at sewer crossings, the main shall be installed under said sewer.
6. A minimum of 10 feet shall be maintained between water and sewer horizontally parallel and 18 inches between water and sewer vertically when crossing. At crossings, one full length of water pipe shall be located so both joints will be as far from the sewer as possible.
7. Unless otherwise approved in writing, all tees, plugs, dead ends and bends exceeding 11 1/4 degrees shall be restrained.
8. Contractor will install corporation, service and curb stops after pressure testing and disinfecting of water main. Contractor shall coordinate with Water Department to assure service installation at the appropriate times.
9. Special backfill to be used under all pavements.
10. The Contractor will do the required water sampling after sterilization. Samples will be taken to Certified lab for testing.
11. A set of "Record Drawings" shall be furnished by the Contractor to the City Engineer after construction.
12. The Contractor shall meet with the City Engineer at least 48 hours in advance of starting construction to review the following items:
 - a. Process a Water Tap Application form.
 - b. Provide a bond and certificate of insurance.
 - c. Discuss the method of filling, flushing and chlorination of water lines. Determine the number and location of chlorination lines, along with pressure testing procedures.
13. Where sanitary sewer and water mains cross, one full length of water main should be centered over the sanitary sewer, and the vertical clearance to be a minimum of 18 inches.
14. Class "B" Bedding to be used.
15. Gate valves are to be manufactured in accordance with AWWA C500 for double-seated valves, and C507 for resilient-seated valves and are to be left-hand open (counter clockwise).
16. If PVC water main is used, Contractor shall furnish and install #12 copper tracer wire in the trench with same being connected to all iron fittings and shall be brought to the surface through all main line valve boxes and hydrant auxiliary valve boxes.
17. Service taps shall be made by the Contractor during installation of the water main. Service taps are to be installed from the water main to the curb box and including the curb box. Any taps crossing the pavement shall be constructed as shown in the typical services fitting detail.



CITY OF HUNTINGTON
 Engineering & Public Works

Water Main Specifications

9-13-2017

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