

Rotatable Swing Joint to be Positioned to Eliminate Stress on Service Tubing - Swing Joint will not Obstruct Shut-Off Valve

1" Threaded Corporation Stop
 1½" Threaded Corporation Stop
 2" Threaded Corporation Stop
 or approved equal. See Note 5

Add 10 Gauge
 Tracer Wire

Water Main

Ductile Iron Service Saddle
 w/ Stainless Steel Band and Epoxy
 Coated Ductile Iron Body or Approved
 Equal.

45° Max. & 3' Min. Cover from Road Surface on 2" Taps
 (Deflect Main Down as Necessary, See Note 5)

1¼" X 1" 90° Ell, Brass;
 1½" x 1½" 90° Ell, Brass or
 2" x 2" 90° Ell, Brass

Curb Stop with Lock Wing and Compression
 Inlet (¾" or 1" Use Meter Swivel Nut, 1½"
 or 2" Use FIP Outlet) or Approved Equal

Water Service Tubing, SDR 9, PE4710

1", 1½" or 2" Comp x MIP Adapter

1", 1½" or 2" 90° Ell, Brass

1" x 2", 1½" x 2" or 2" x 2" 90° Nipple Brass

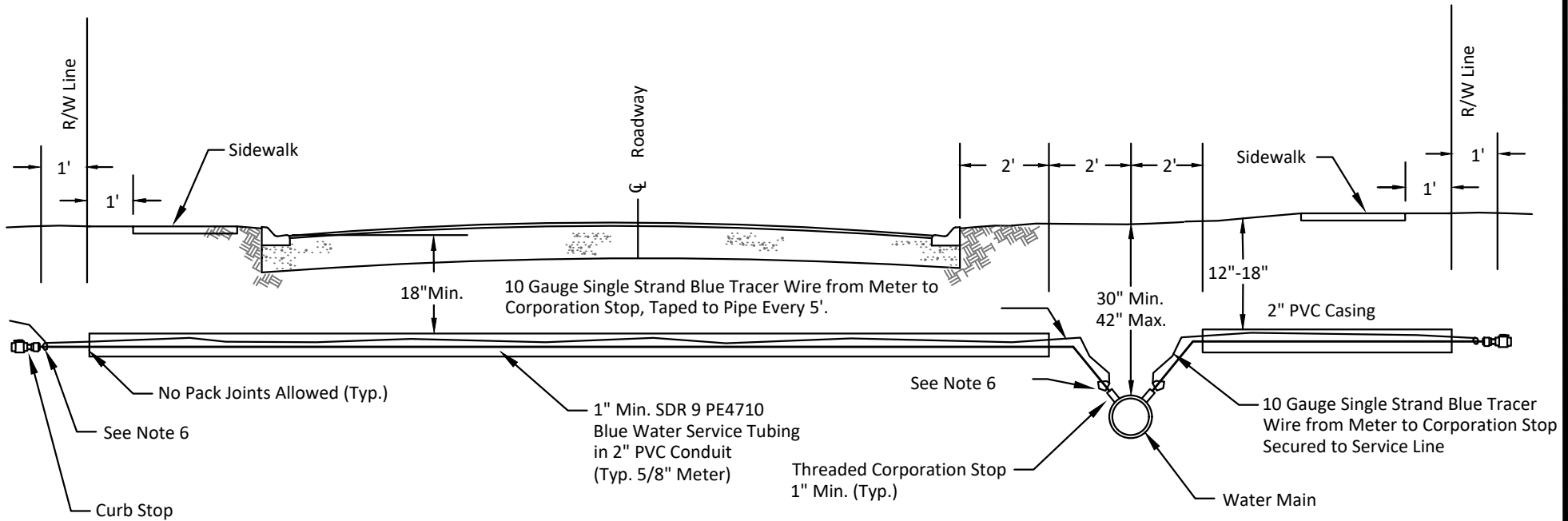
N.T.S.

NOTES:

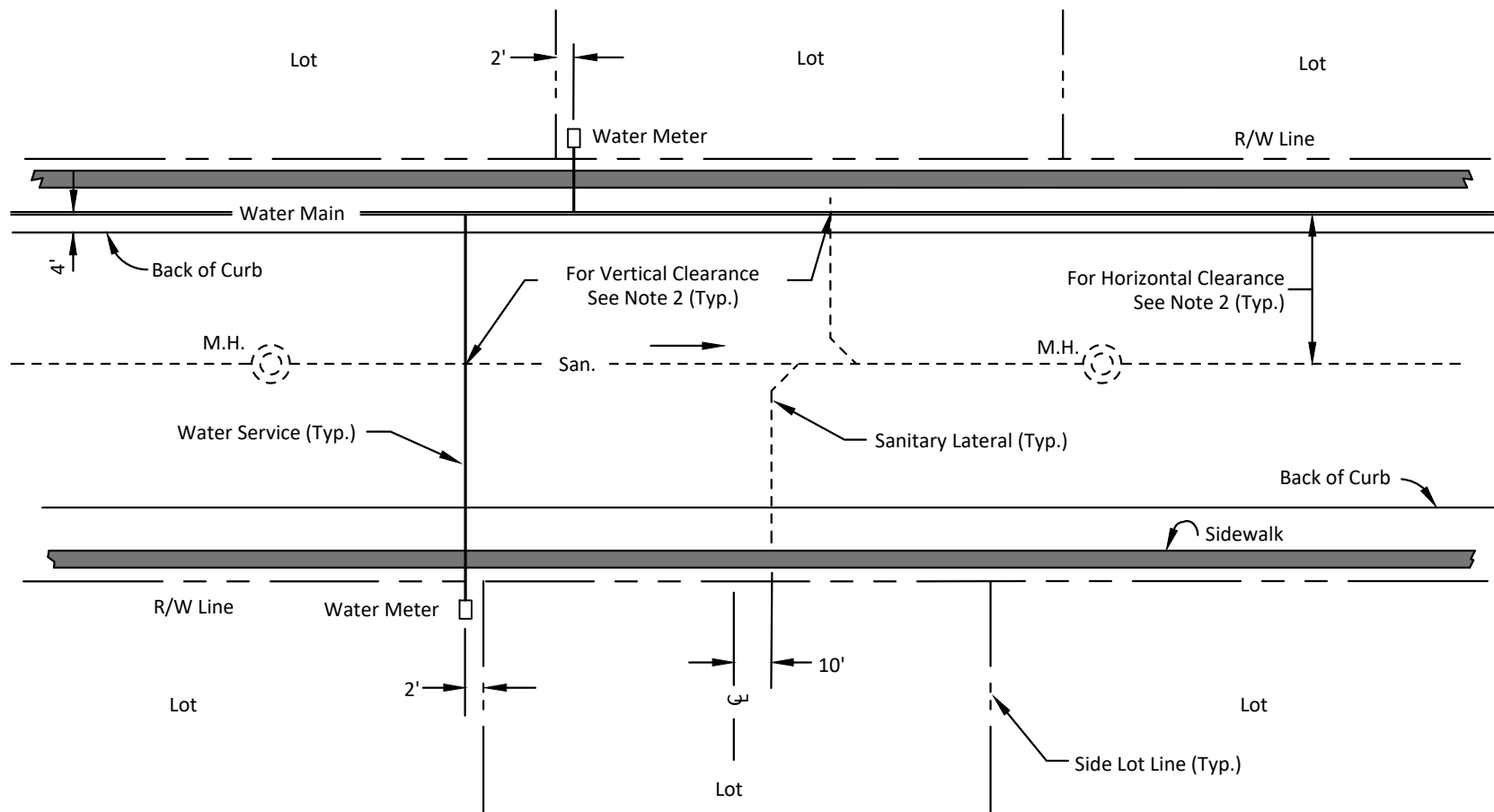
1. Contractor to Stake Service Connections, Which are to be 2' From Side Lot Line on Either Side of Lot (See Index 401 Sheet 3 of 3)
 These Services to be Consistent Within the Subdivision
 Driveways Shall not be Built over Meters or Service Taps
 Meters or Service Taps Shall not be Installed Within or Under Driveways
2. All Lines Shall be Chlorinated and Pressure Tested (Test for two hours @ 150 PSI) Under the Direction of the Construction Inspector
 After Successful Completion of the Testing and Chlorination, Standard Operating Pressure Shall Remain on the System at all Times
3. 10' Separation Required Between Parallel Water & Sanitary Sewer Lines
4. Service Saddles Shall be Required for all Service Connections to Mains
5. Taps Should be made on a 45° Angle from Top of Pipe
 For Cover Less than 30", City of Clearwater Engineering Department Approval is Required
6. Minimum Distance Between Service Taps to not be Less than 36"
7. Minimum 5' Separation Between Potable & Reclaim Services - See Index. No. 501
8. Curb Stop to be Located Approx. 1' from the Back of Right-Of-Way
9. Insert Stiffeners at Corporation Stop and Curb Stop
10. See also City of Clearwater's Technical Specification Section IV and Preferred Product List

NOTES:

1. PVC Casing Shall be 2x the Size of the Service Line and Appropriately Color Coded
2. PVC Conduit to be Between 18"-24" Below the Surface Measured from the Top of Face of Curb
3. Water Mains to be Min. 36" Below Grade and Approx. 4' from Back of Curb
4. Curb Stop to be Located Approx. 1' from the Right-Of-Way
5. Casing to be Continuous, 2' from Tap to 2' to Curb Stop
6. Connect 10 Gauge Tracer Wire with Tie Wraps at Corporation Stop and at Curb Stop.
Provide 1' Min. Excess Length of Tracer Wire in Meter Box
7. Insert Stiffeners at Corporation Stop and Curb Stop
8. Service Lines 90° from Main to Meter
9. See also City of Clearwater's Technical Specifications Section IV and Preferred Product List



N.T.S.



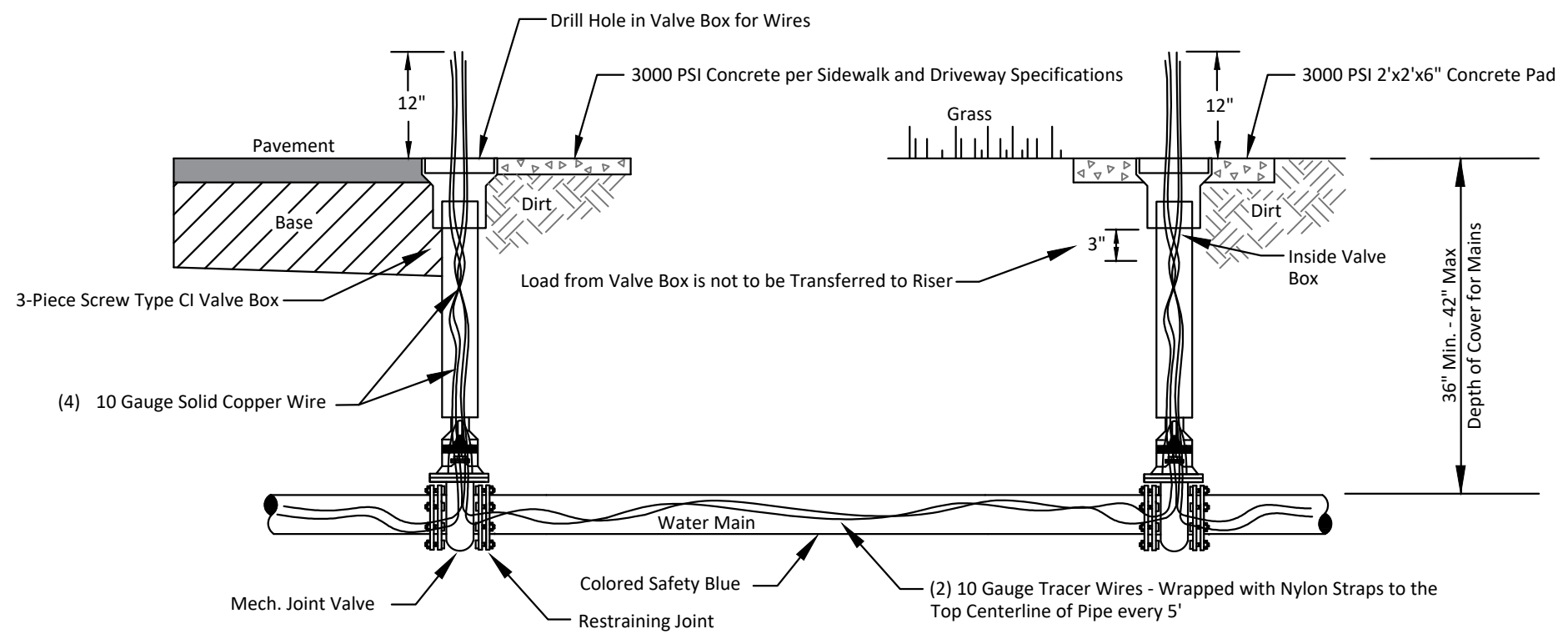
N.T.S.

NOTES:

1. See Index 401, Sheet 1 of 3, Note 2 Regarding Water Meter and Service Tap Locations Under Driveways
2. Vertical and Horizontal Clearance Between Potable Water Main and Sanitary Sewer Lateral at each Intersection to be per FDEP Requirements - See F.A.C. Rule 62-555
3. See also City of Clearwater's Technical Specification Section IV and Preferred Product List

ROADWAY/SIDEWALK INSTALLATION

GREEN SPACE INSTALLATION



SECTION VIEW
N.T.S.

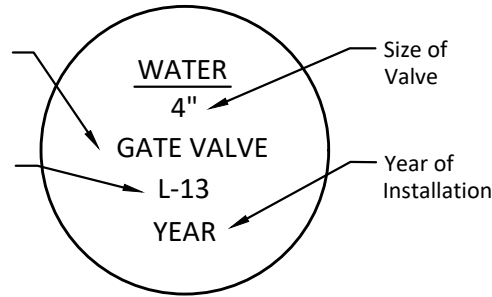
- NOTES:
1. Must Center Operation Nut in Box
 2. Gate Valves Shall be Open Left Turn Only
 3. Valve Key Extensions Required on Valves with Operator Nut over 3' Deep
 4. Tracer Wire Required in all Applications Including on Ductile Iron Pipe and Colored "Safety Blue"
 5. See also City of Clearwater's Technical Specification Section IV and Preferred Product List

NOTES:

1. Extension on Valve Box Shall be set so as to Reserve 1/2 of the Adjustment Length for Future use
2. Valve Key Extension Required on Valves with Operator Nut over 3' Deep
3. Install 3" Brass Identification Disk in Concrete, per Detail Below
4. Terminate Insulated, Solid 12 Gauge Copper Tracer Wire at 12" Above Box Cover
5. Valve Box to be Centered in Concrete Slab Green Space only
A Concrete Slab Shall not be Installed Where the Valve Box is Located Inside Pavement
6. See also City of Clearwater's Technical Specification Section IV and Preferred Product List

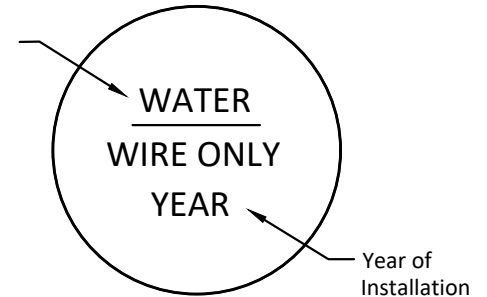
Type of Valve:
Butterfly, Gate,
or Plug

Direction &
Number of
Turns to
Open Valve



**3" BRASS IDENTIFICATION
DISK-VALVE**
N.T.S.

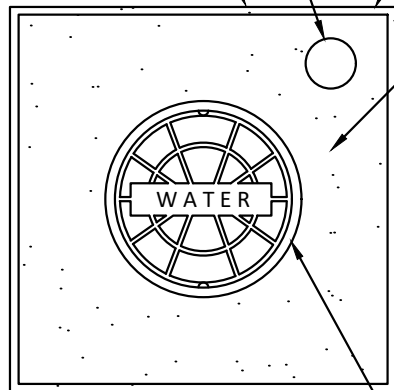
Type of
Service



**3" BRASS IDENTIFICATION
DISK-TRACER WIRE STATION**
N.T.S.

3" Brass Identification Disk
2'x2'x6" Concrete Pad

Expansion Joint Material
on All Sides Adjacent
to Concrete.

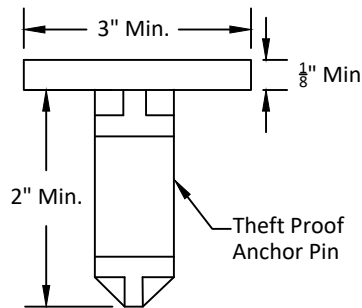


Cover Inscribed WATER and
Colored Safety Blue

3000 PSI Concrete
(Min.) w/ No.4
Rebar Around
Perimeter or No.6
WWF

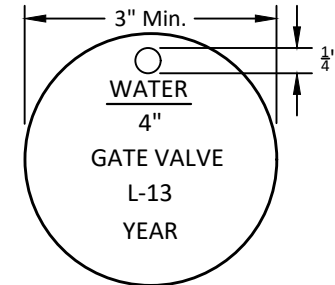
**WATER VALVE BOX
CONCRETE PAD PLAN VIEW**
N.T.S.

IDENTIFICATION DISC EXAMPLE



Disc to be Embedded in Pad

OUTSIDE PAVEMENT
N.T.S.



Disc To Be Hanging in the Box Anchored
to the Locating Wire

INSIDE PAVEMENT
N.T.S.

PVC PIPE, FEET									
PIPE SIZE									
		4"	6"	8"	10"	12"	16"	20"	24"
11.25°	H-B	3	4	5	6	6	8	9	11
	VU-B	3	4	5	6	6	8	9	11
	VD-B	6	9	11	13	16	20	24	28
22.5°	H-B	5	7	9	11	12	16	18	21
	VU-B	5	7	9	11	12	16	18	21
	VD-B	12	17	22	27	31	40	48	56
45°	H-B	10	14	18	22	25	32	38	43
	VU-B	10	14	18	22	25	32	38	43
	VD-B	25	35	46	55	65	82	99	115
90°	H-B	24	33	44	52	60	76	91	104
	VU-B	24	33	44	52	60	76	91	104
	VD-B	61	85	111	132	155	198	238	277
DEAD END PLUG & VALVE		61	85	111	132	155	198	238	277
TEE		61	85	111	132	155	198	238	277

DUCTILE IRON PIPE, FEET									
PIPE SIZE									
		4"	6"	8"	10"	12"	16"	20"	24"
11.25°	H-B	2	3	4	5	6	7	8	9
	VU-B	2	3	4	5	6	7	8	9
	VD-B	5	6	8	10	11	14	17	20
22.5°	H-B	5	6	8	9	11	13	16	18
	VU-B	5	6	8	9	11	13	16	18
	VD-B	9	12	16	19	22	28	34	39
45°	H-B	9	12	16	19	22	27	33	37
	VU-B	9	12	16	19	22	27	33	37
	VD-B	18	25	32	39	45	58	69	81
90°	H-B	21	29	37	44	52	65	78	90
	VU-B	21	29	37	44	52	65	78	90
	VD-B	43	59	78	93	109	139	167	194
DEAD END PLUG & VALVE		43	59	78	93	109	139	167	194
TEE		43	59	78	93	109	139	167	194

MINIMUM DESIGN CRITERIA

Bedding Type: 3
 Design Pressure: 150 PSI
 Safety Factor: 1.5
 Depth Of Cover: 3.0 FT
 Soil Designation: SM (Sand-Silt)

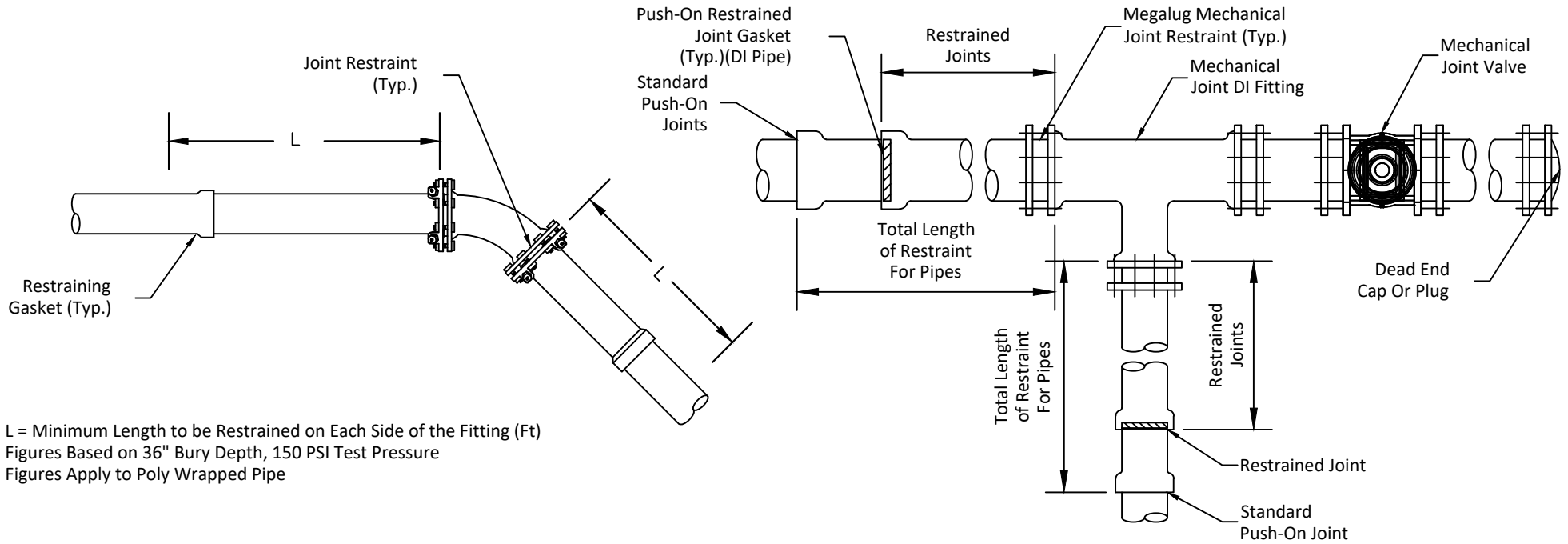
MINIMUM FOOTAGE OF PIPE RESTRAINT

H-B: Horizontal Bend
 VU-B: Vertical-Up Bend
 VD-B: Vertical-Down Bend

The Restrained Joint Pipeline Lengths Shown in these Tables are Calculated for a Single Fitting only
 Restrained Joint Pipeline Lengths Required for Combinations of Fittings Shall be Determined on a Case by Case Basis by the Engineer of Record
 Combinations of Fittings Would Include Vertical Offsets, Combined Vertical Offsets, Horizontal Offsets and Combined Horizontal Offsets as Defined in the DIPRA Design Guideline, "Thrust Restraints Design for Ductile Iron Pipe"

NOTES:

1. See also City of Clearwater's Technical Specification Section IV and Preferred Product List



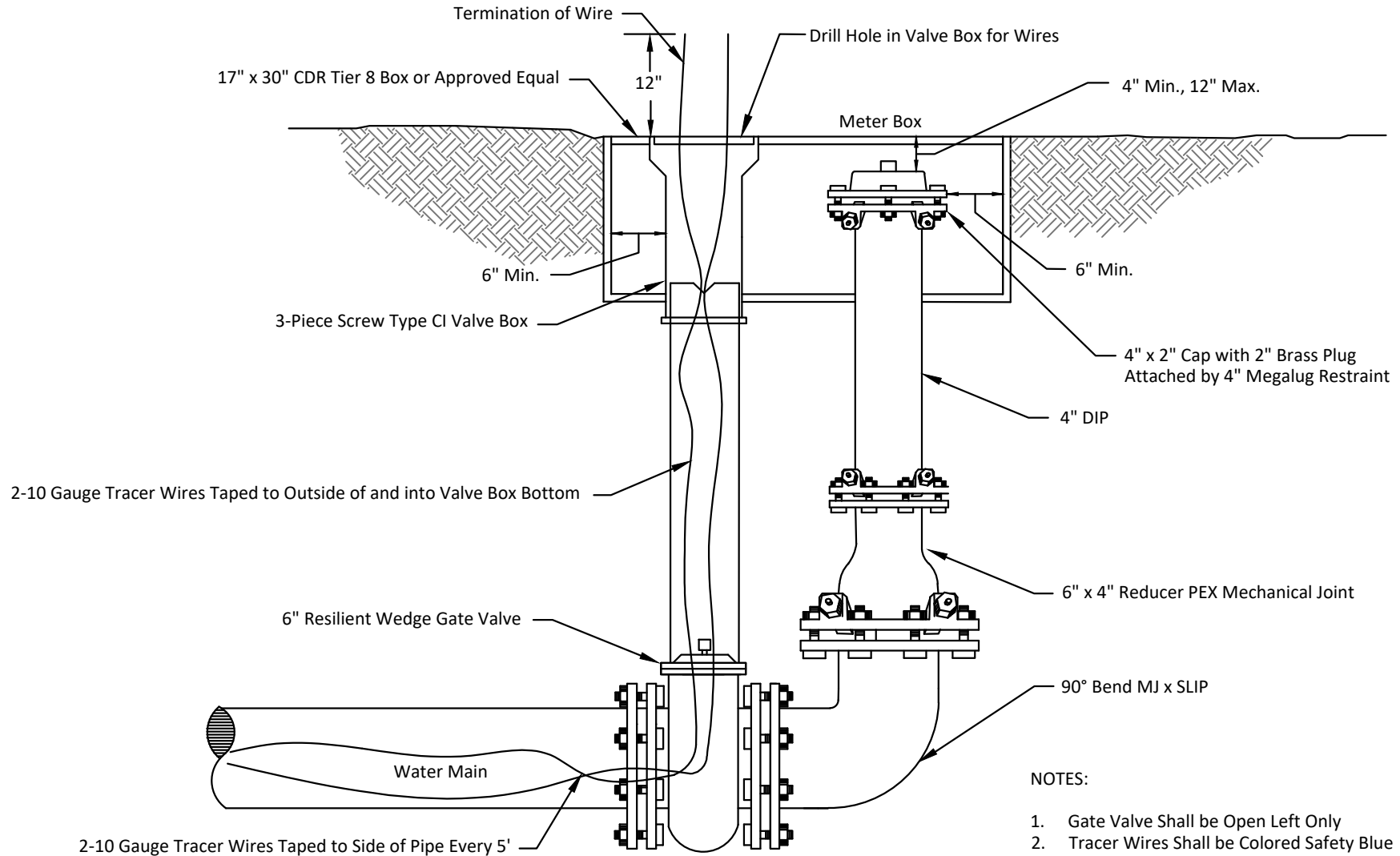
L = Minimum Length to be Restrained on Each Side of the Fitting (Ft)
 Figures Based on 36" Bury Depth, 150 PSI Test Pressure
 Figures Apply to Poly Wrapped Pipe

The Following Joints Must Be Restrained In All Applications:

1. Bend - Inlet And Outlet
2. Tee - Inlet And Outlets
3. Offsets - Inlet And Outlets
4. Caps
5. Plugs
6. Dead Ends
7. Hydrant Runouts Shall Be Restrained As Dead Ends

NOTES:

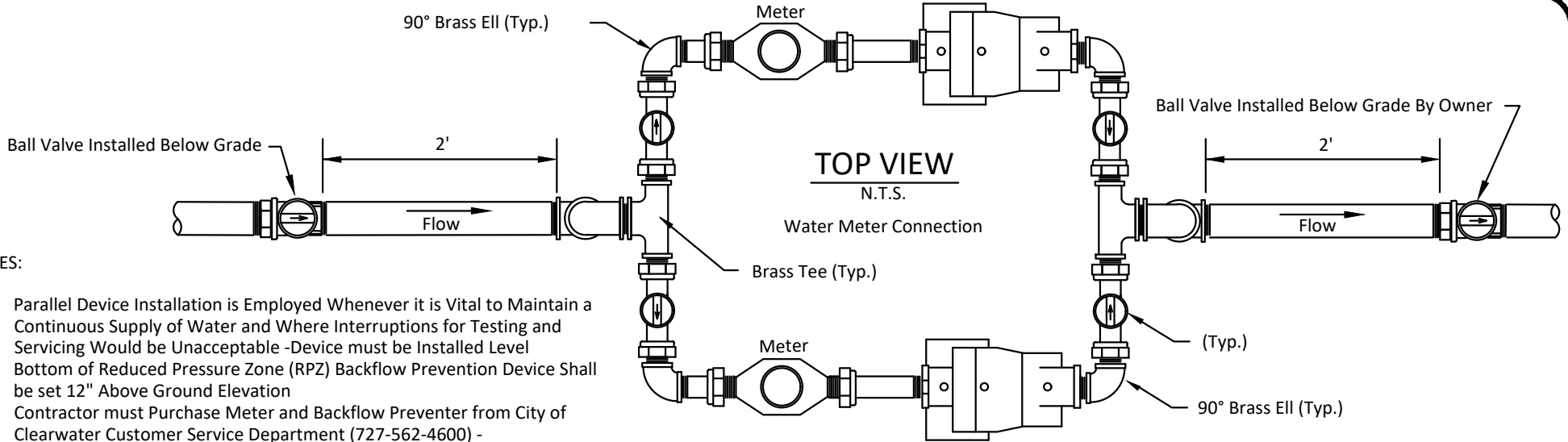
1. Water Mains Larger than 12" will be Ductile Iron Pipe Only
2. For Lengths of Pipe and Number of Joints to be Restrained - see Table on Index No. 403, Sheet 1 of 2
3. Only Ductile Iron Pipe Fittings Shall be used at Joints to be Restrained Unless Otherwise Specified by the Engineer of Record
4. Restrained Joint Lengths Shown were Calculated using the On-Line DIPRA Thrust Restraint Calculator Program Based on the DIPRA "Thrust Restraint for Ductile Iron Pipe" Design Guideline
5. All Restraints Shall meet the Specifications Defined in the City of Clearwater Technical Specifications
6. See also City of Clearwater Technical Specifications Section IV and Preferred Product List



N.T.S.

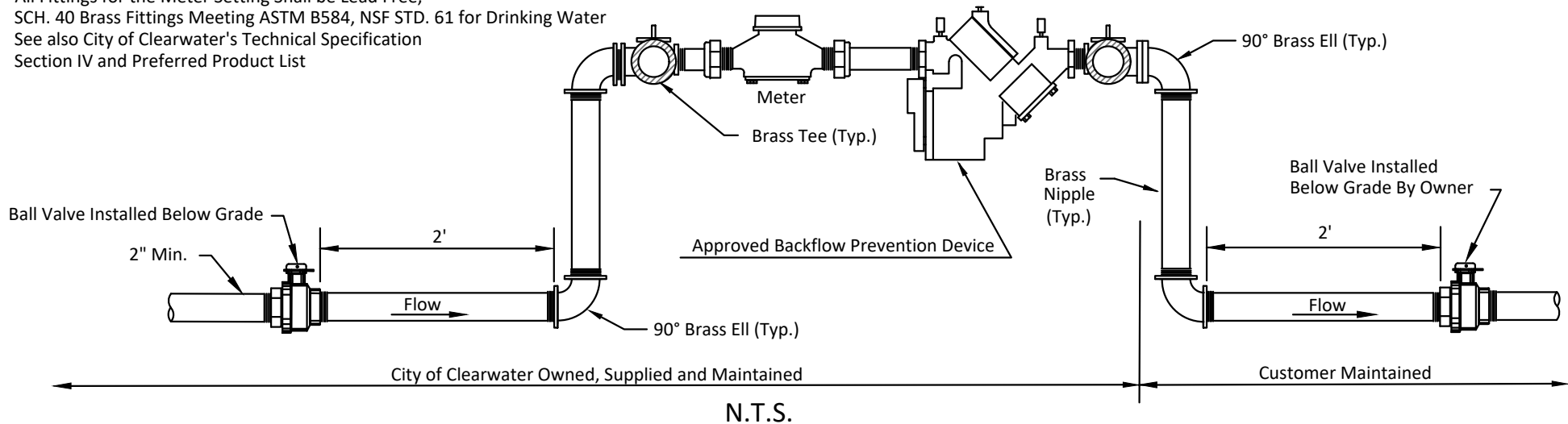
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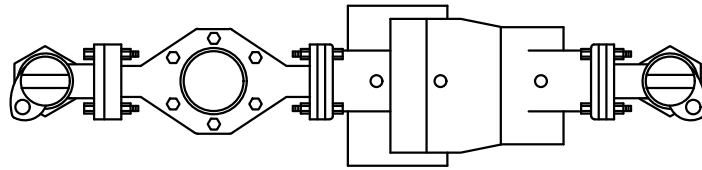
1. Gate Valve Shall be Open Left Only
2. Tracer Wires Shall be Colored Safety Blue
3. In Load Bearing Traffic Areas, use 90 Degree Spigot Inside Valve Box to Accommodate a Larger Composite Valve Box - Box Shall be set to Grade
4. See also City of Clearwater's Technical Specification Section IV and Preferred Product List



NOTES:

1. Parallel Device Installation is Employed Whenever it is Vital to Maintain a Continuous Supply of Water and Where Interruptions for Testing and Servicing Would be Unacceptable -Device must be Installed Level
2. Bottom of Reduced Pressure Zone (RPZ) Backflow Prevention Device Shall be set 12" Above Ground Elevation
3. Contractor must Purchase Meter and Backflow Preventer from City of Clearwater Customer Service Department (727-562-4600) - City of Clearwater will Install
4. Minimum of 3' Clearance Around Device
5. All Piping for the Meter Setting Shall be Lead Free, SCH. 40 Brass Pipe Meeting ASTM B687, NSF STD. 61 for Drinking Water
6. All Fittings for the Meter Setting Shall be Lead Free, SCH. 40 Brass Fittings Meeting ASTM B584, NSF STD. 61 for Drinking Water
7. See also City of Clearwater's Technical Specification Section IV and Preferred Product List



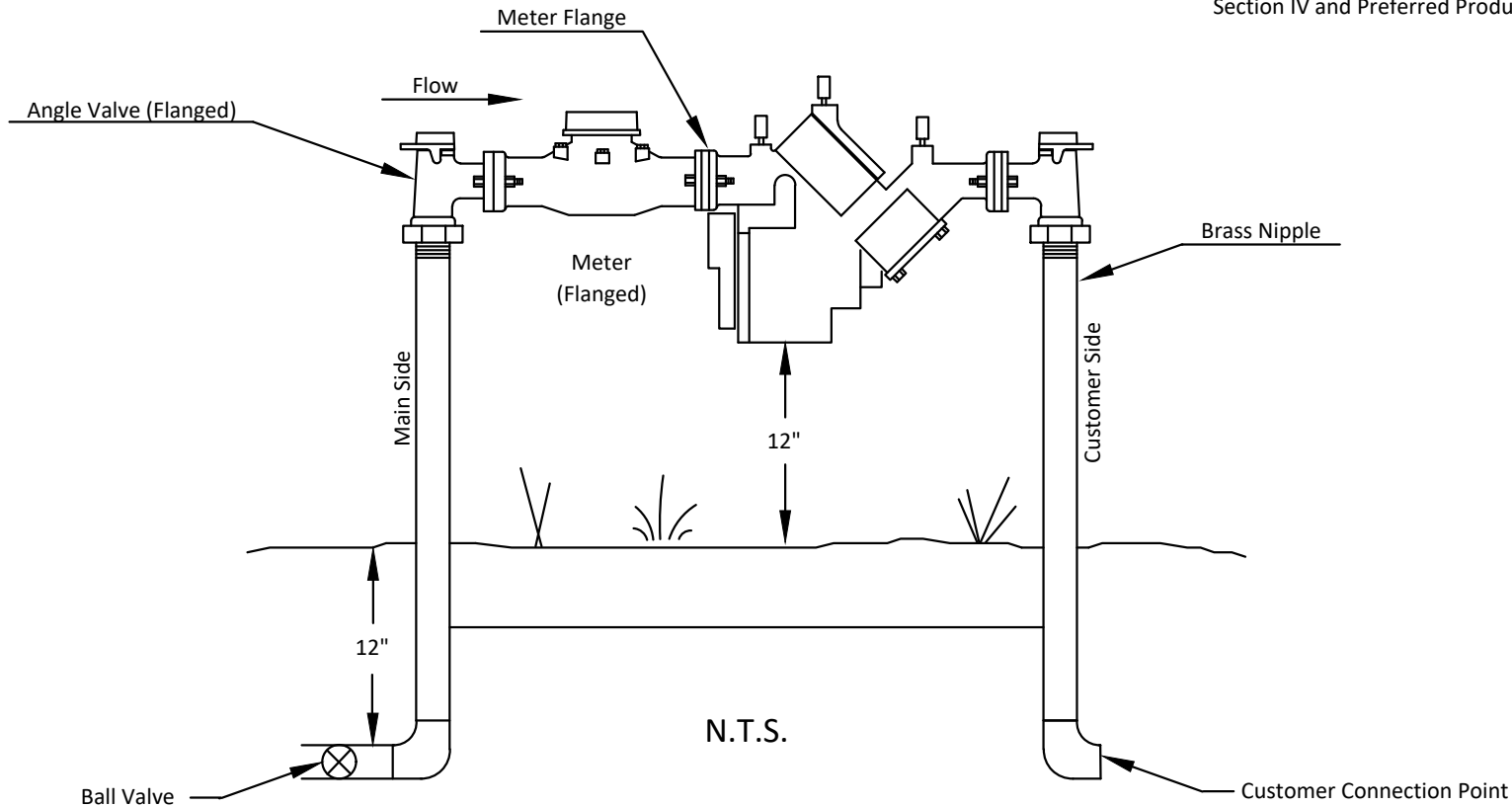


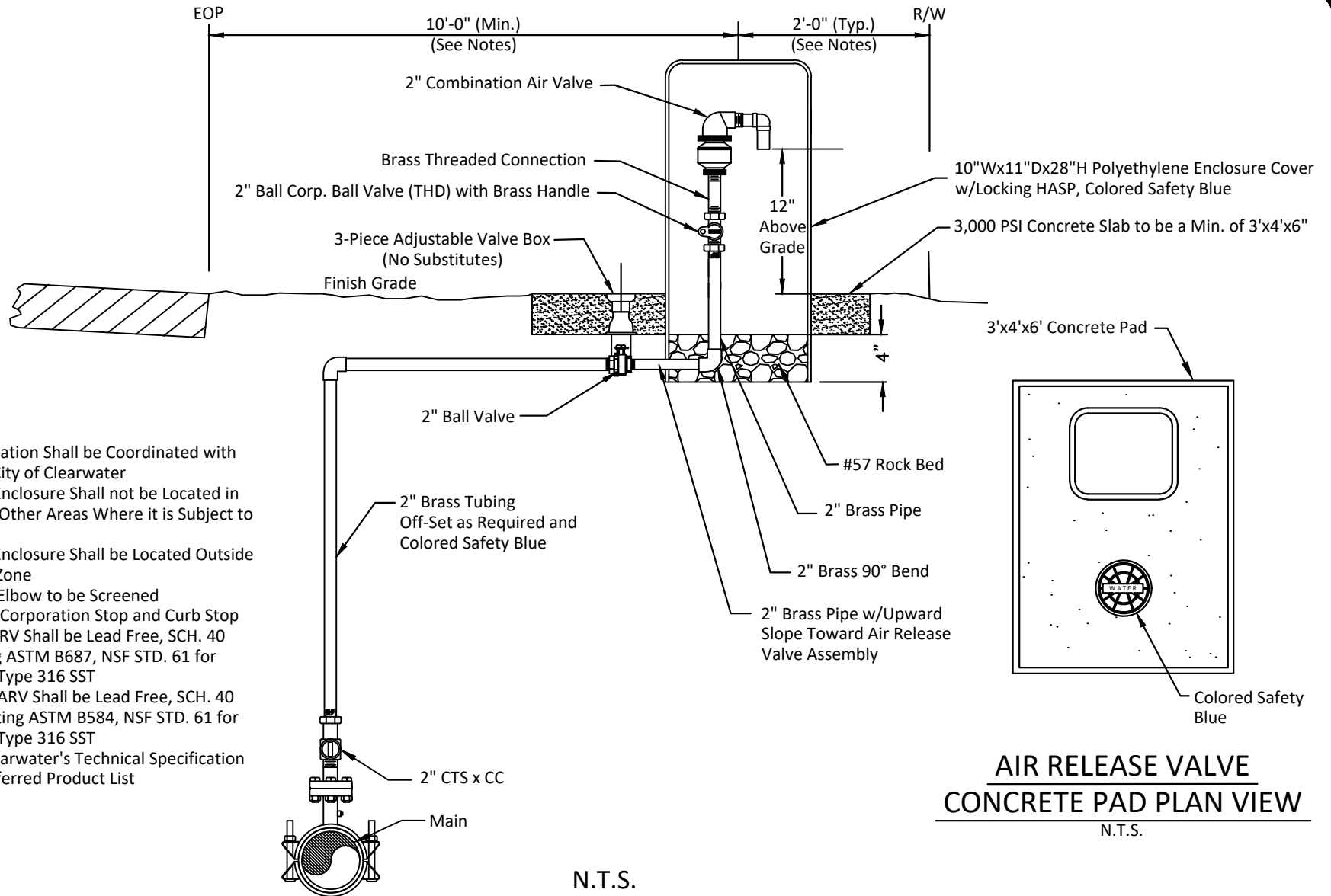
TOP VIEW

N.T.S.

NOTES:

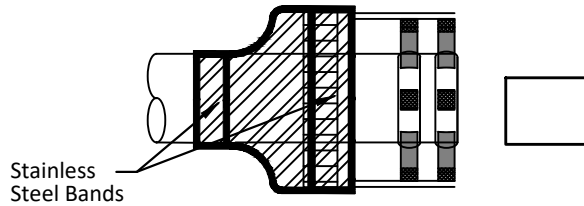
1. Contractor must Purchase Meter and Backflow Preventer from City of Clearwater Customer Service Department (727-562-4600) - City will Install
2. All Piping for the Meter Setting Shall be Lead Free, SCH. 40 Brass Pipe Meeting ASTM B687, NSF STD. 61 for Drinking Water
3. All Fittings for the Meter Setting Shall be Lead Free, SCH. 40 Brass Fittings Meeting ASTM B584, NSF STD. 61 for Drinking Water
4. See also City of Clearwater's Technical Specification Section IV and Preferred Product List





NOTES:

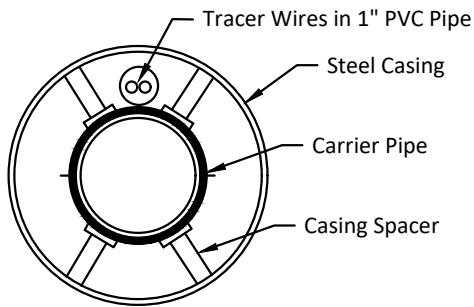
1. Final Enclosure Location Shall be Coordinated with and Approved by City of Clearwater
2. Air Release Valve Enclosure Shall not be Located in Drainage Swale or Other Areas Where it is Subject to Submergence
3. Air Release Valve Enclosure Shall be Located Outside of Clear Recovery Zone
4. Downward Facing Elbow to be Screened
5. Insert stiffeners at Corporation Stop and Curb Stop
6. All Piping for the ARV Shall be Lead Free, SCH. 40 Brass Pipe Meeting ASTM B687, NSF STD. 61 for Drinking Water or Type 316 SST
7. All Fittings for the ARV Shall be Lead Free, SCH. 40 Brass Fittings Meeting ASTM B584, NSF STD. 61 for Drinking Water or Type 316 SST
8. See also City of Clearwater's Technical Specification Section IV and Preferred Product List



CASING END SEAL DETAIL

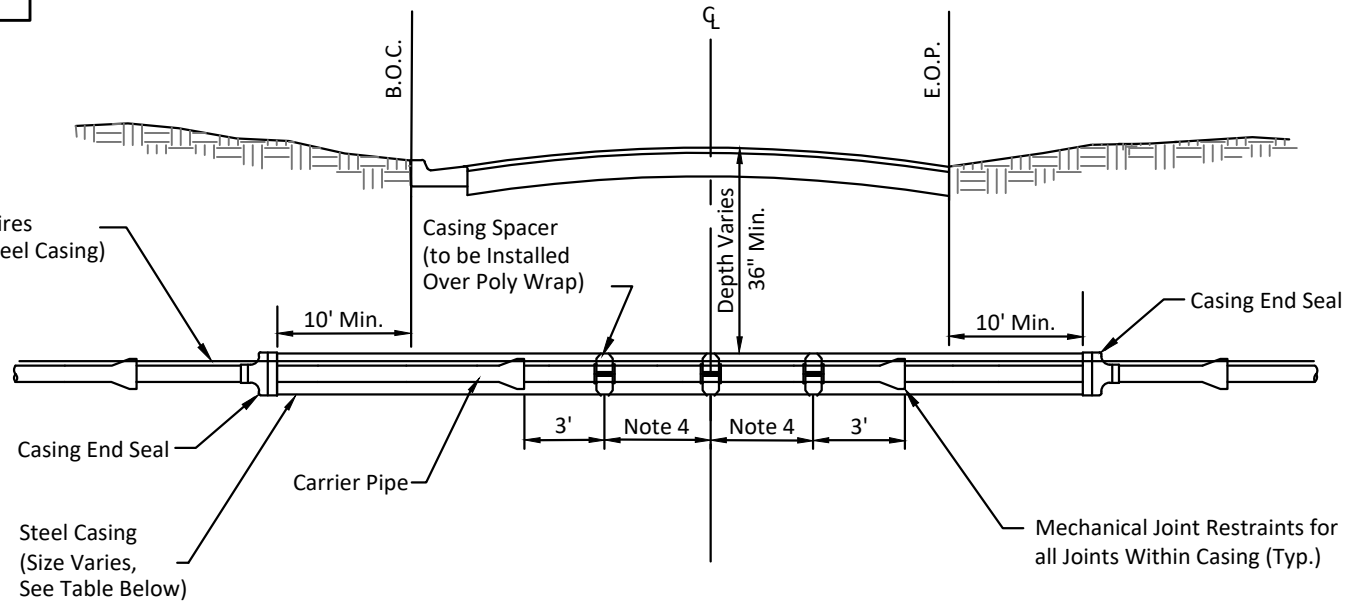
N.T.S.

(2) 10 Gauge HDD Tracer Wires
(Installed in 1" PVC Pipe While in Steel Casing)



STREET WITH CURB

STREET WITHOUT CURB

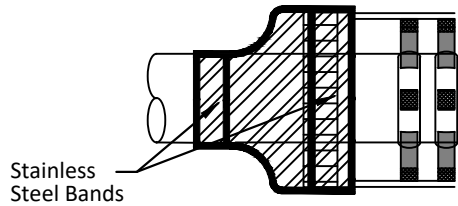


N.T.S.

NOTES:

1. All Pipe Installed Within the Casing Shall be Ductile Iron or Approved by the City Engineer
2. (2) 10 Gauge HDD Tracer Wires will be used over Ductile Iron Pipe
3. Approved Casing Spacers must be Installed to keep Pipe Centered in Casing
4. Distance Between Casing Spacers Shall be per Manufacturer Specification or Maximum 6.5', Whichever is more Stringent
5. See also City of Clearwater's Technical Specification Section IV and Preferred Product List

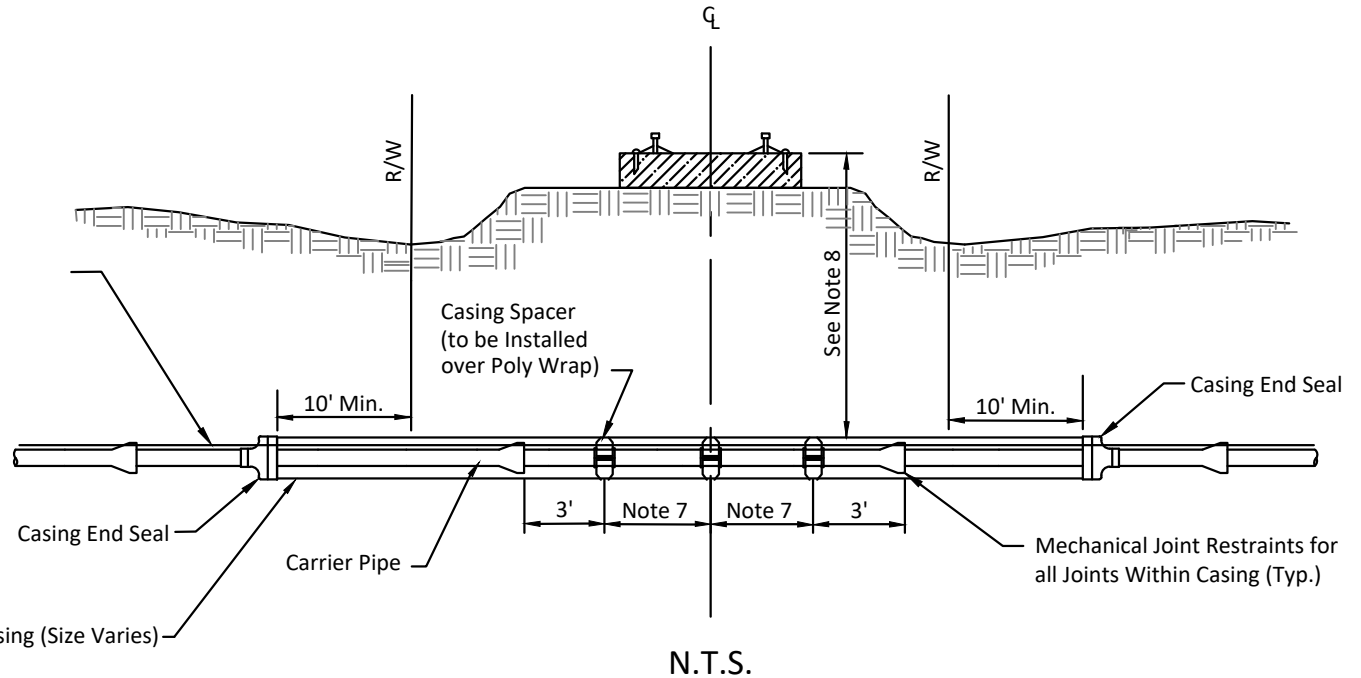
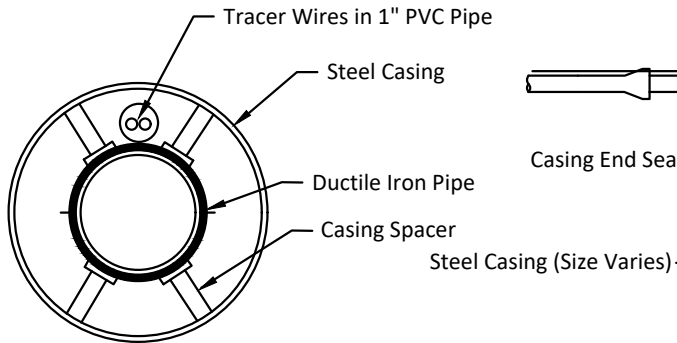
CARRIER PIPE NOMINAL DIAMETER	4	6	8	10	12	16	20	24	30	36	42
MINIMUM CASING OUTSIDE DIAMETER (INCHES)	16	16	18	20	24	30	36	42	48	54	60
MINIMUM CASING WALL THICKNESS (INCHES)	.250"	.250"	.250"	.250"	.250"	.312"	.375"	.500"	.500"	.500"	.500"



CASING END SEAL DETAIL

N.T.S.

(2) 10 Gauge HDD Tracer Wires
(Installed in 1" PVC Pipe while in
Steel Casing)



N.T.S.

NOTES:

1. CSX Permit Required for Work Under Railway Right-Of-Way
2. All Pipe Installed Within the Casing Shall be Ductile Iron or Approved by the City Engineer
3. (2) 10 Gauge HDD Tracer Wires will be used over Ductile Iron Pipe
4. All Pipes Within Casing to be Restrained by Restraining Gaskets
5. All Materials to meet Latest FDOT Standards
6. Approved Casing Spacers must be Installed to keep Pipe Centered in Casing

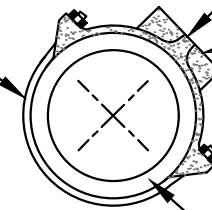
7. Distance Between Casing Spacers Shall be per Manufacturer Specification or Maximum 6.5', Whichever is more Stringent
8. Distance from Top of Railway Cross Ties to Top of Casing Shall be 5' Min. or as Required by the Permitting Railroad
9. See also City of Clearwater's Technical Specification Section IV and Preferred Product List

CARRIER PIPE NOMINAL DIAMETER	4	6	8	10	12	16	20	24	30	36	42
MINIMUM CASING OUTSIDE DIAMETER (INCHES)	16	16	18	20	24	30	36	42	48	54	60
MINIMUM CASING WALL THICKNESS (INCHES)	.250"	.250"	.250"	.250"	.250"	.312"	.375"	.500"	.500"	.500"	.500"

Ductile Iron Service Saddle w/Stainless Steel Band or Approved Equal

Add Stainless Steel Plug

Plug the Saddle



Water Main

3/4" Straight Meter Valve with Lock Wing and Compression Inlet or Approved Equal

PLUGGED CHLORINATION/SAMPLE POINT

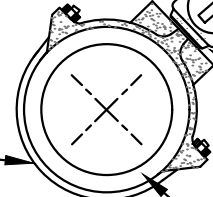
N.T.S.

3/4" Threaded Corporation Stop or Approved Equal (Tap at 45° angle)



3/4" Water Service Tubing, SDR 9, PE4710

Ductile Iron Service Saddle w/Stainless Steel Band or Approved Equal



Water Main

Plug Saddle After use is Completed, Under Direct Observation by City of Clearwater Construction Inspector

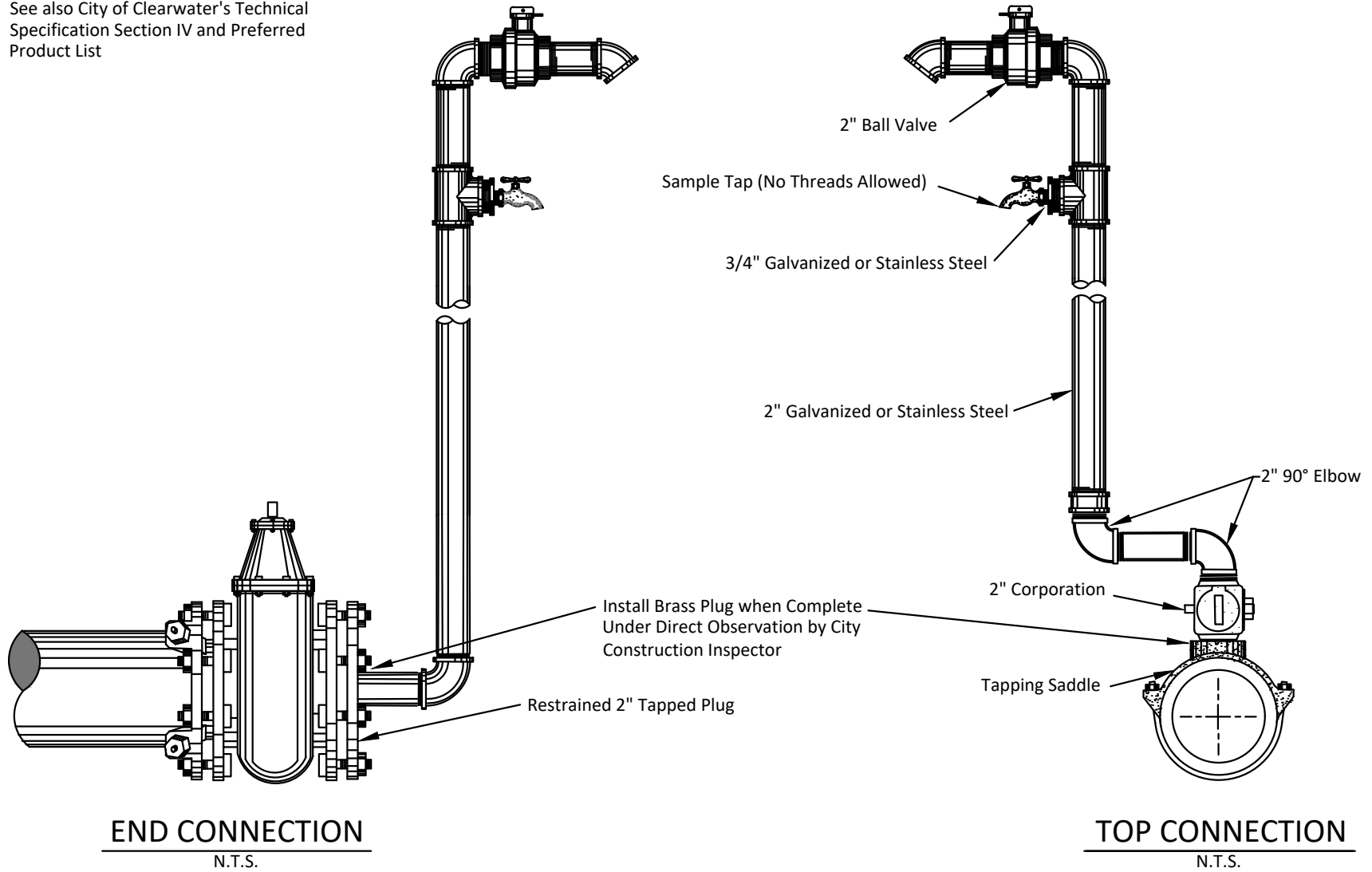
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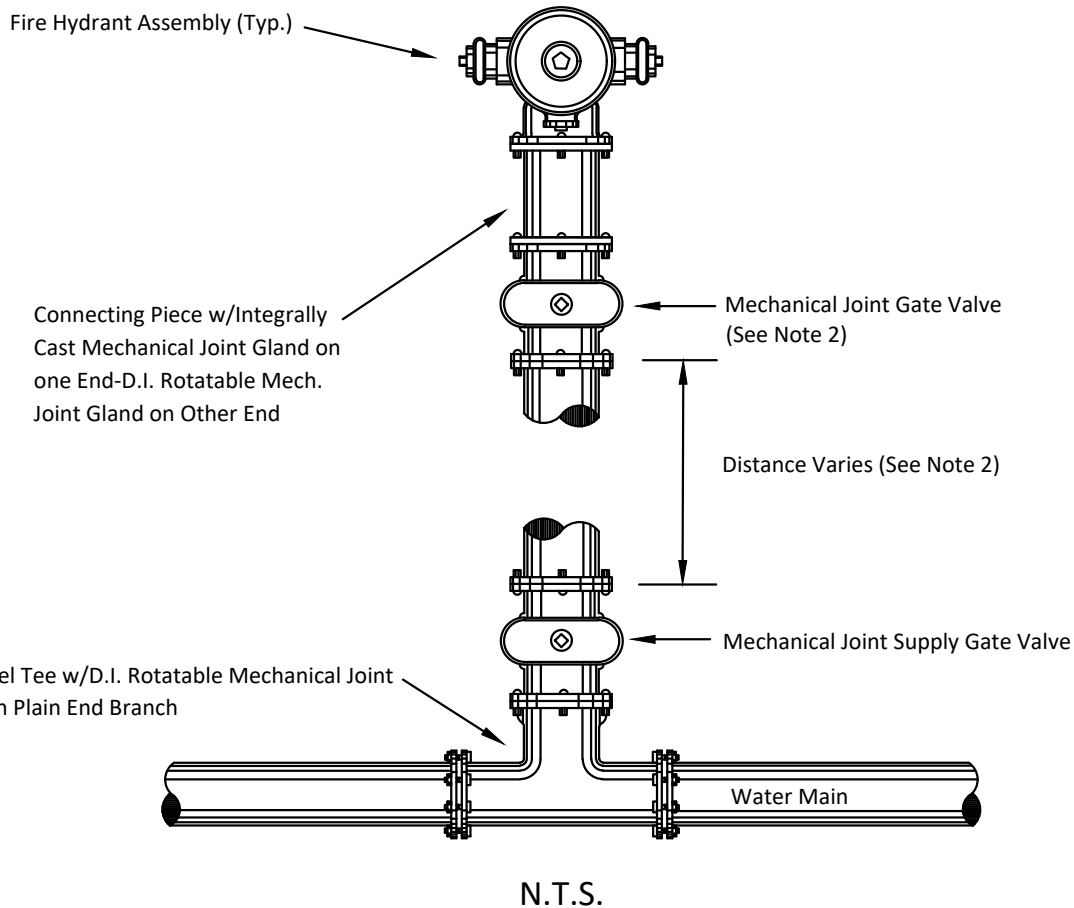
NOTES:

1. Insert Stiffeners at Corporation Stop and Curb Stop
2. See also City of Clearwater's Technical Specification Section IV and Preferred Product List

NOTES

1. See also City of Clearwater's Technical Specification Section IV and Preferred Product List





NOTES:

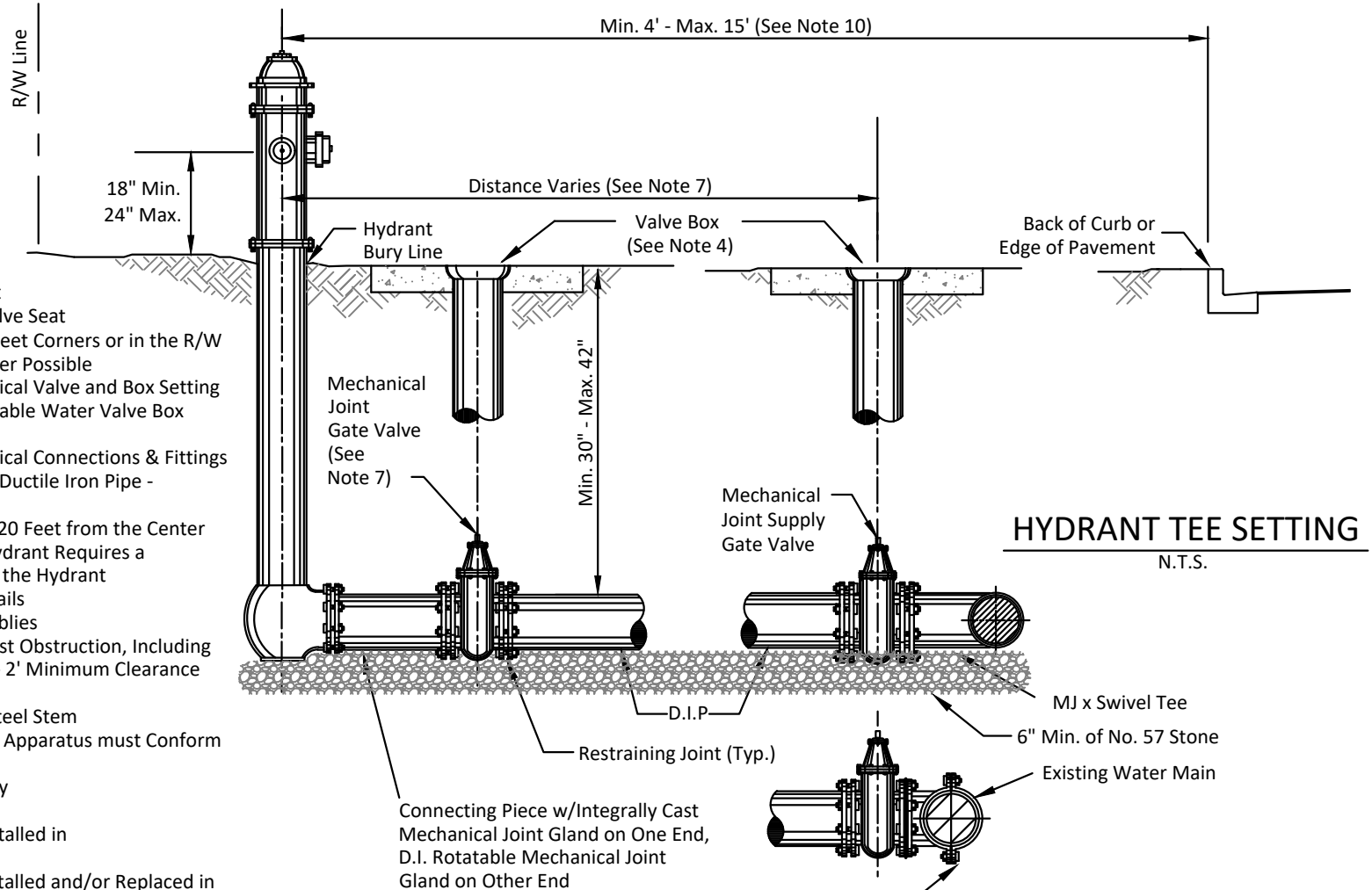
1. All Joints must be Restrained and must be Ductile Iron Pipe
2. A Mechanical Joint Gate Valve is Required at the Hydrant on Hydrant Runouts Greater than 20' from Center of Supply Valve to the Center of the Hydrant
3. Hydrant Sets can be Purchased and Installed by the City (DOES NOT INCLUDE TAP) 727-562-4600
4. All Hydrants must have Stainless Steel Stems
5. All Hydrants must be Installed Plumb.
6. 4' Minimum Clearance from Nearest Obstruction, Including Back of Curb and Vehicular Travel -2' Minimum Clearance from Sidewalk
7. All Clearances for Fire Department Apparatus must Conform with Latest NFPA Fire Code
8. See also City of Clearwater's Technical Specification Section IV and Preferred Product List

ONLY APPROVED

- Kennedy Guardian No. K-81D
- Mueller Super Centurion No. 250
- American Darling B-84-B-5
- AVK-Nostalgie 2780
- EJ Co. Watermaster 5CD250

NOTES:

1. Steamer Connection to Face Street
2. All Fire Hydrants to have 5 1/4" Valve Seat
3. Fire Hydrants Shall be Placed at Street Corners or in the R/W Adjacent to Side Lot Lines Whenever Possible
4. See Index 402, Sheet 1 of 2 for Typical Valve and Box Setting and Index 402, Sheet 2 of 2 for Potable Water Valve Box Concrete Pad
5. See Index 409, Sheet 1 of 3 for Typical Connections & Fittings
6. Hydrant Runouts Shall be made of Ductile Iron Pipe - All Joints shall be Restrained
7. On Hydrant Runouts Greater than 20 Feet from the Center of Supply Valve to the Center of Hydrant Requires a Mechanical Joint Isolation Valve at the Hydrant
8. See Index 407, for Jack & Bore Details
9. No Lift Kits Allowed on new Assemblies
10. 4' Minimum Clearance from Nearest Obstruction, Including Back of Curb and Vehicular Travel - 2' Minimum Clearance from Sidewalk
11. All Hydrants must have Stainless Steel Stem
12. All Clearances for Fire Department Apparatus must Conform with Latest NFPA Fire Code
13. Gate Valves Shall be Open Left Only
14. Hydrant must be Installed Plumb
15. Reflective Blue Marker Shall be Installed in Road as Necessary
Reflective Blue Marker Shall be Installed and/or Replaced in the Roadway as Necessary in the Center of the Closest Travel Lane to the Fire Hydrant
Contact City of Clearwater Fire Department to Install the Blue Marker at 727-562-4334
16. See also City of Clearwater's Technical Specification Section IV and Preferred Product List



HYDRANT TEE SETTING

N.T.S.

OPTIONAL TAPPING SLEEVE AND VALVE SETTING

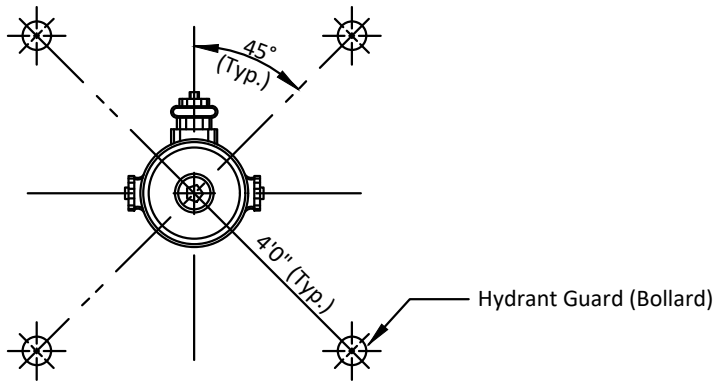
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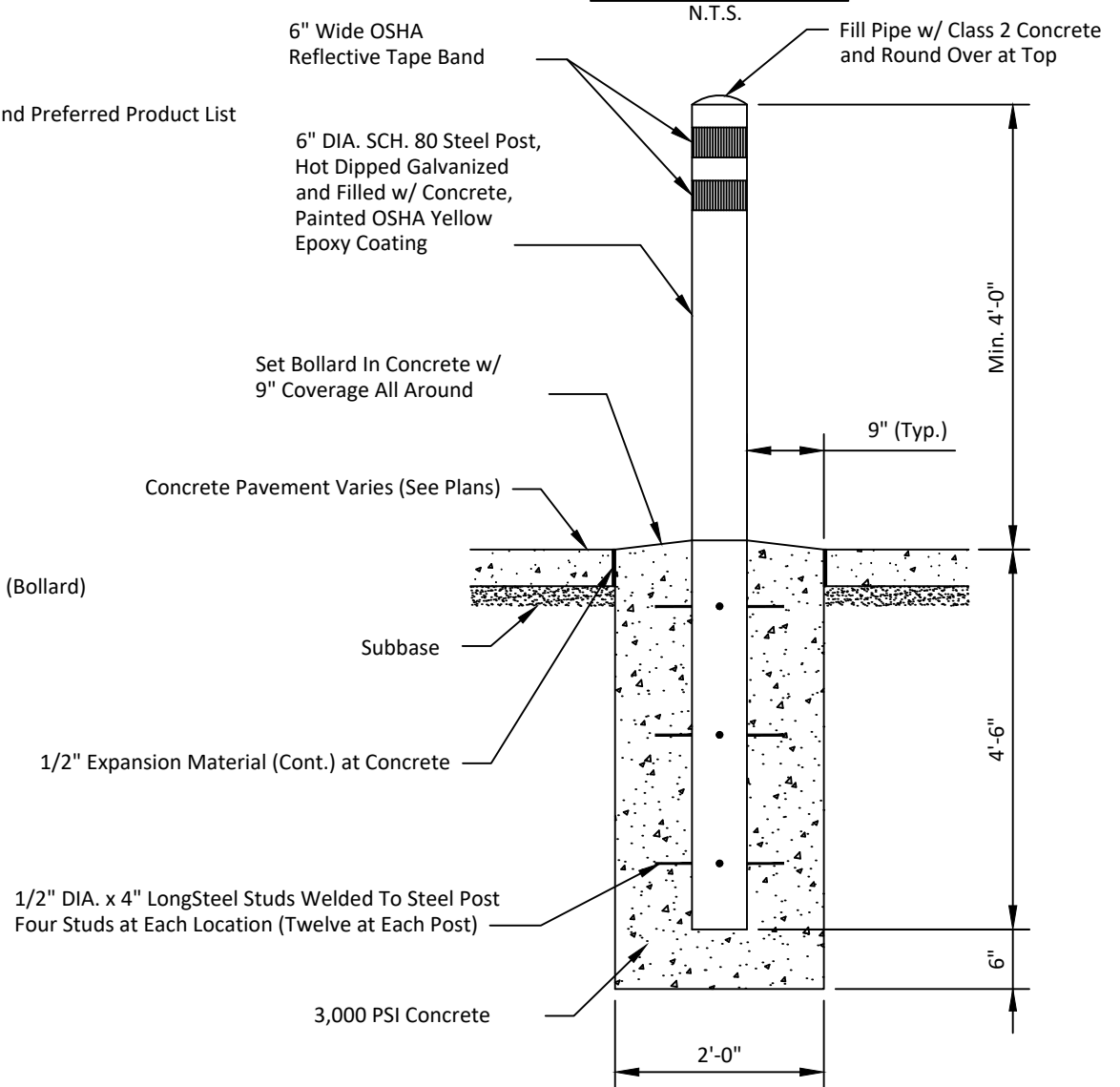
1. Grind All Edges Smooth
2. Coat in Accordance with Contract Specifications
3. Maximum Separation Between Bollards Shall be 6'-0"
4. See also City of Clearwater's Technical Specification Section IV and Preferred Product List

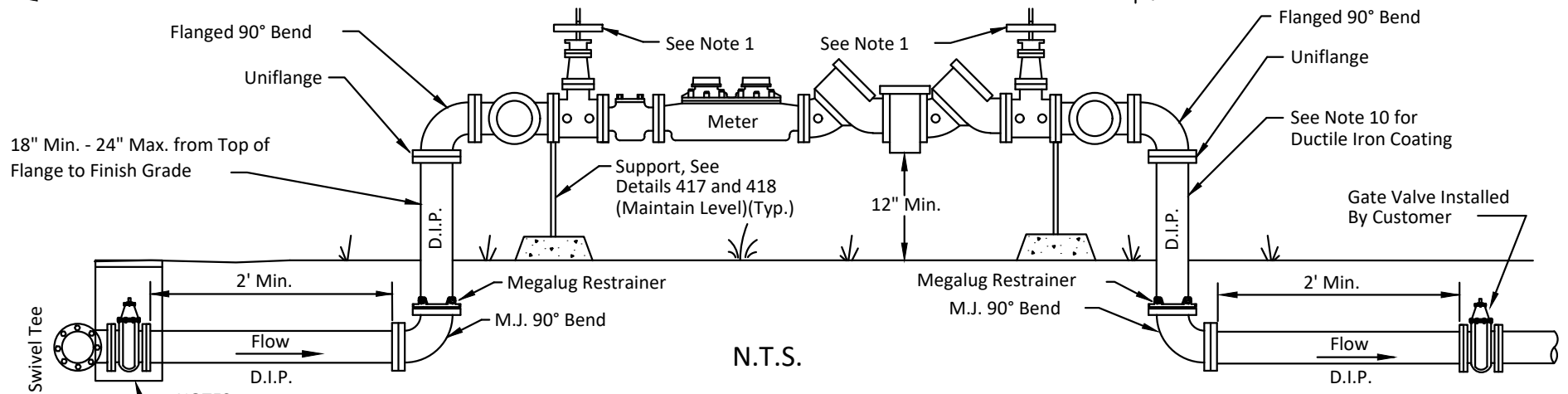
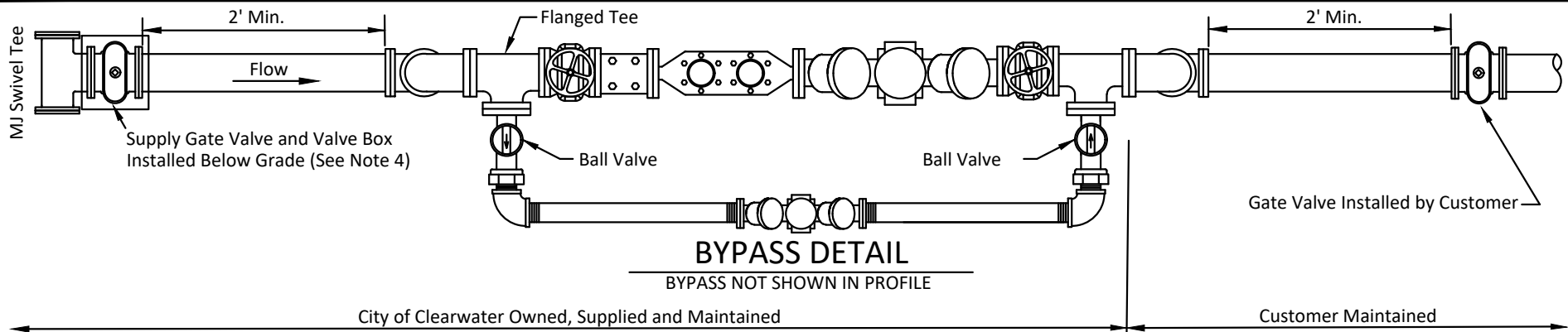
LAYOUT

N.T.S.



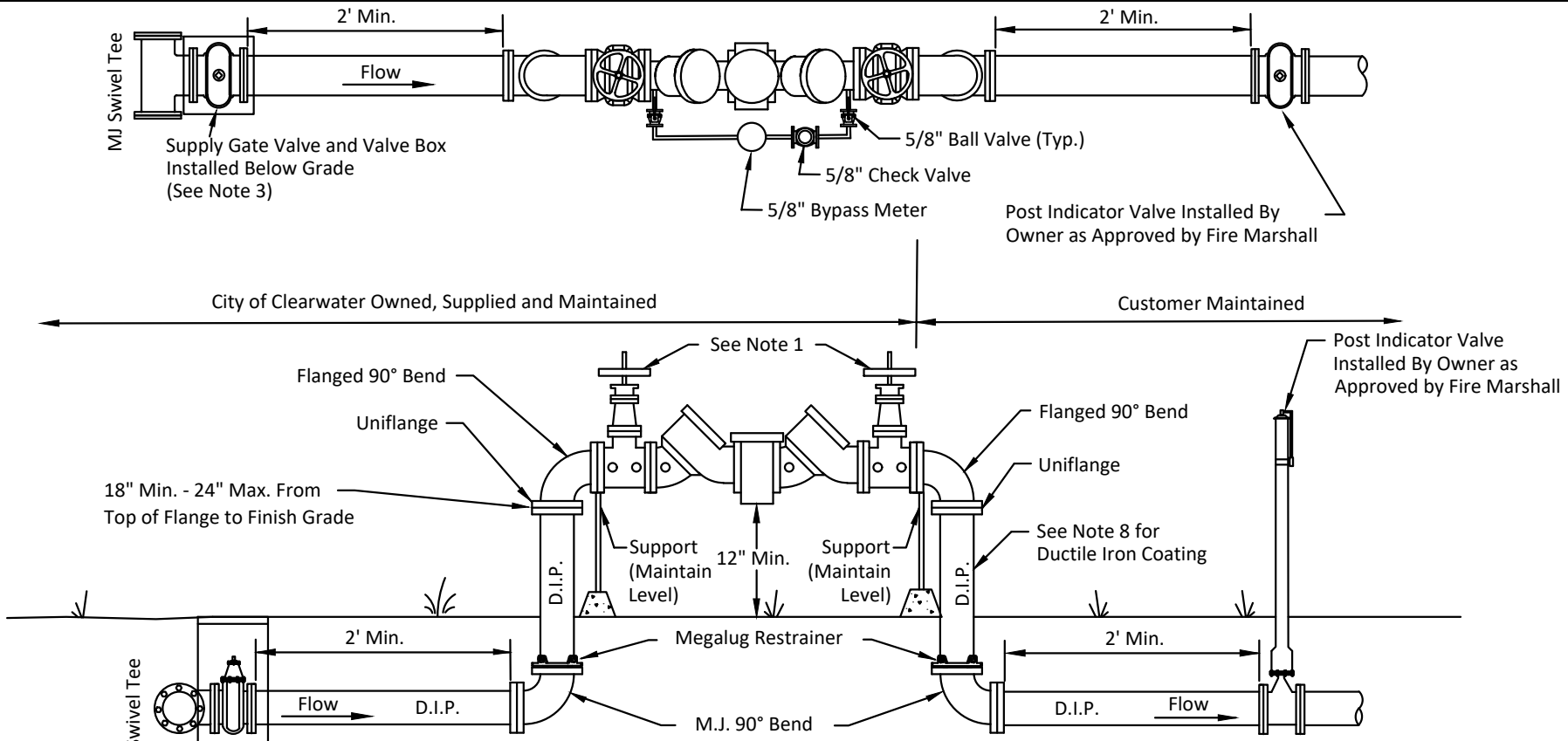
INSTALLATION





NOTES:

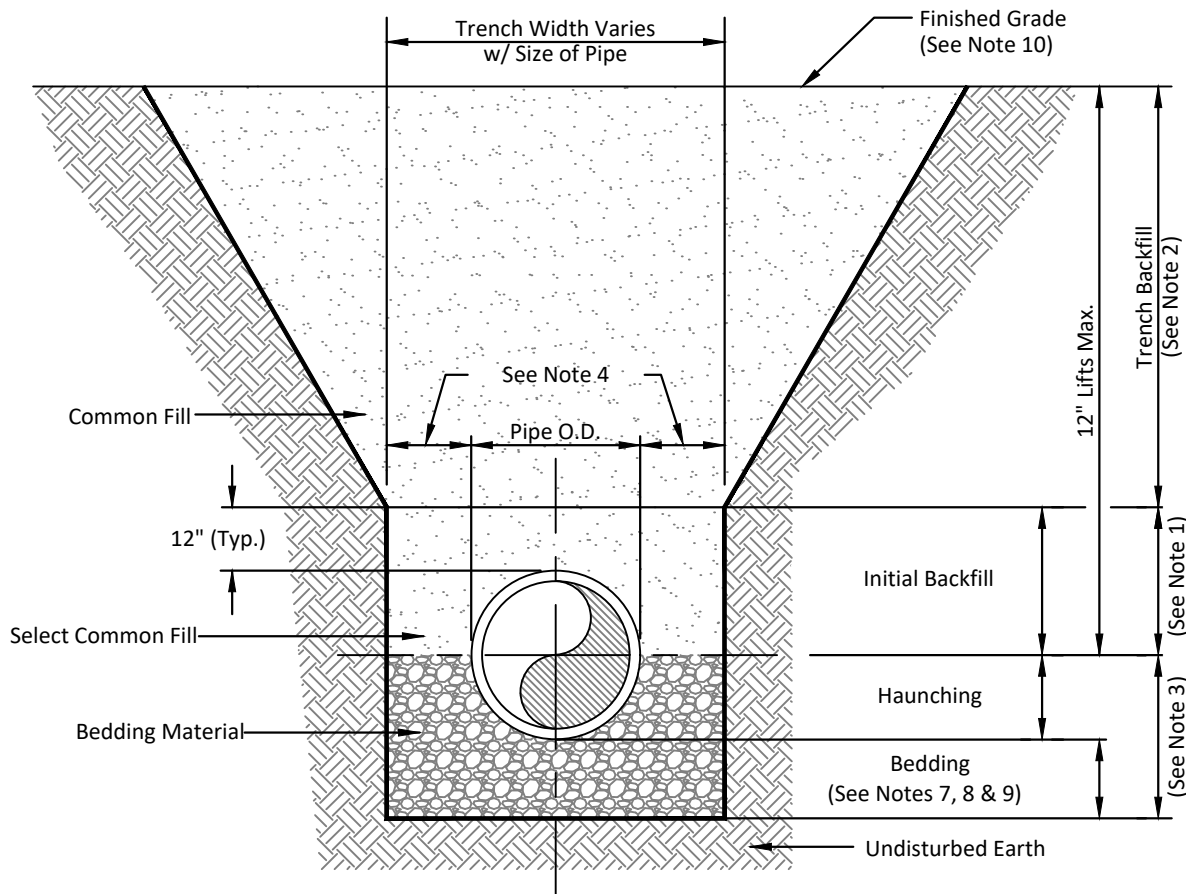
1. O S & Y Valve Handles will be Chained and Locked by City
2. Meter Sets will be Painted after Installation by Contractor
3. Bypass Pipe & Fittings Shall be Threaded Brass
4. Gate Valve Shall be set at Water Main
For all Water Meter Sets over 20 Feet from Water Main, an Additional Isolation Gate Valve Shall be Installed Within 2 Feet of the Device and all Bells must be Restrained
5. All Pipes Between the Water Main and Owner Installed Gate Valve Shall be Ductile Iron
6. 3" Meter Requires 4" Tap, Ductile Iron Pipe Service Line and 4" Ductile Iron Pipe Standpipes
7. Minimum of 3' Clearance from Back of Curb and Sidewalk
8. Minimum of 3' Clearance Around all Sides
9. No Concrete Slabs Allowed Under Device
10. All Above Ground Piping, Fittings, Valves, and Backflow Preventer Shall be Coated with Two Coats of Epoxy Coating Color Shall be Safety Blue for Potable Water or Red for Fire Line Unless Otherwise Directed by City
11. Contractor must Purchase Meter and Backflow Sets from the City of Clearwater Customer Service Department (727-562-4600) - City will install
12. For Installation, Contractor Shall Schedule with Clearwater Public Utility Department (727-562-4960 Ext. 7227)
13. See also City of Clearwater's Technical Specification Section IV and Preferred Product List



NOTES:

1. O S & Y Valve Handles will be Chained and Locked by City
2. DDCVA will be Painted After Installation by Contractor
3. Gate Valve Shall be set at Water Main
For all Fire Line Sets Over 20 Feet from water main, an Additional Isolation Gate Valve Shall be Installed Within 2' of Device
4. All Pipes Between the Water Main and Post Indicator Valve Shall be Ductile Iron - All Bells Restrained
5. Minimum of 3' Clearance from Back of Curb and Sidewalk
6. Minimum of 3' Clearance Around All Sides
7. No Concrete Slabs Allowed Under Device
8. All Above Ground Piping, Fittings, Valves, and Backflow Preventer Shall be Coated with Two Coats of Epoxy Coating
Color Shall be Ssafety Blue for Potable Water or Red for Fire Line Unless Otherwise Directed by City
9. Contractor must Purchase DDCVA Sets from the City of Clearwater Customer Service Department (727-562-4600) - City will Install
10. See also City of Clearwater's Technical Specification Section IV and Preferred Product List

N.T.S.



BEDDING AND TRENCHING

N.T.S.

NOTES:

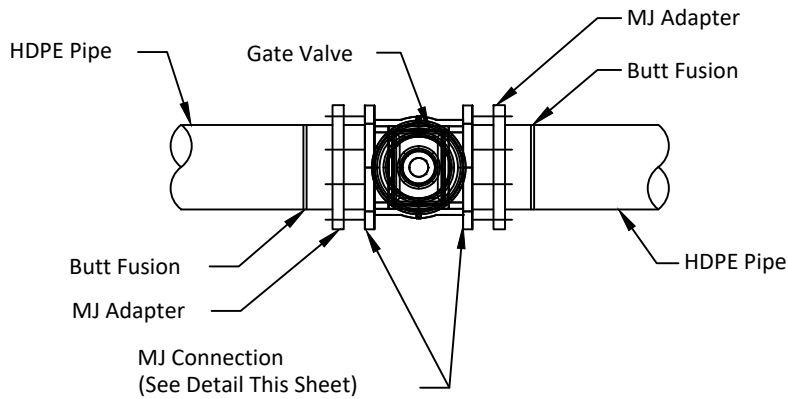
1. Initial Backfill: Select Common Fill Compacted to 95% (98% under Pavement) of the Maximum Density as per AASHTO T-180
2. Trench Backfill: Common Fill Compacted to 95% (98% under Pavement) of the Maximum Density as per AASHTO T-180
3. Type A Bedding Material Shall Conform to FDOT No. 57 aggregate
4. 15" Max. (12" Min.) for Pipe Diameter Less than 24" and 24" Max - (12" Min.) for Pipe Diameter 24" and Larger
5. Water Shall not be Permitted in the Trench During Construction Dewatering may be Necessary to Maintain the Water Table at a Minimum of 1-ft below the Bottom of the Trench until Sufficient Backfill is Placed to Maintain Dry Conditions Any Necessary Dewatering Shall be of the Responsibility of the Contractor
6. All Pipe to be Installed with Bell Facing Upstream to the Direction of the Flow
7. Bedding Material Shall be Required when Existing Soil Contains Organics, Clays, Debris, Other Unsuitable Material and as Directed by the City Engineer
8. Bedding Depth Shall be 4" Minimum for Pipe Diameter up to 12" and 6" Minimum for Pipe Diameter 16" and Larger
9. Depth for Removal of Unsuitable Material Shall Govern Depth of Bedding Rock Below the Pipe
For City projects and/or Work Within the Right-Of-Way, the City Inspector Shall Determine the Required Removal of Unsuitable Fill to Reach Suitable Foundation
For Private Developments, Outside of the Right-Of-Way, Engineer and/or Their Designee Shall Determine the Required Removal of Unsuitable Fill to Reach Suitable Foundation
10. Final Restoration in Improved Areas shall be in Compliance with all Applicable Regulations of Governing Agencies
Surface Restoration Within City of Clearwater Right-Of-Way Shall Comply with Requirements of City Right-Of-Way Utilization Regulations and Road Construction Specifications
11. See also City of Clearwater's Technical Specifications Section IV and Preferred Product List

HORIZONTAL AND VERTICAL UTILITY SEPARATION REQUIREMENTS

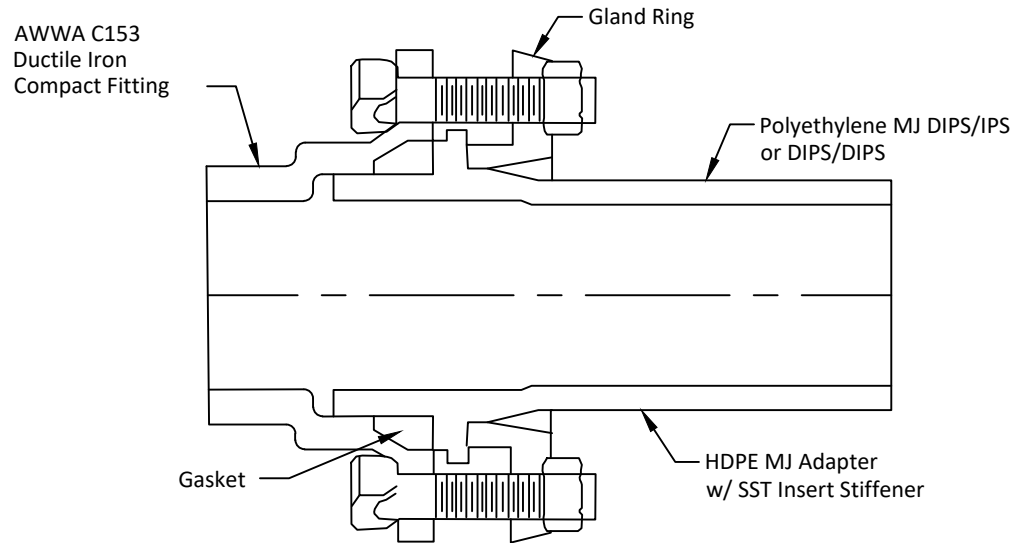
PROPOSED UTILITY	POTABLE WATER		RECLAIMED WATER		WASTEWATER FORCEMAIN		SANITARY SEWER		STORM SEWER		STRUCTURAL FOUNDATION, WALLS, ETC	ROADWAY RIGHTS-OF-WAY
	HORIZ	VERT	HORIZ	VERT	HORIZ	VERT	HORIZ	VERT	HORIZ	VERT	HORIZ	HORIZ
POTABLE WATER MAIN	4 FEET NOTE: 2	12"	4 FEET NOTES: 2 & 4	12" NOTE: 4	6 FEET NOTE: 4	12" / 18" NOTES: 3 & 4	6 FEET NOTE: 4	12" / 18" NOTES: 3 & 4	4 FEET NOTES: 2 & 4	12" / 18" NOTES: 3 & 4	15 FEET NOTE: 6	5 FEET NOTE: 2A
RECLAIMED WATER MAIN	4 FEET NOTES: 2 & 4	12" NOTE: 4	4 FEET NOTE: 2	12"	4 FEET NOTE: 2	12"	4 FEET NOTE: 2	12"	4 FEET NOTE: 2	12" / 18" NOTE: 3	15 FEET NOTE: 6	5 FEET NOTE: 2A
WASTEWATER FORCE MAIN	6 FEET NOTE: 4	12" / 18" NOTES: 3 & 4	4 FEET NOTE: 2	12"	4 FEET NOTE: 2	12"	4 FEET NOTE: 2	12"	4 FEET NOTE: 2	12" / 18" NOTE: 3	15 FEET NOTE: 6	5 FEET NOTE: 2A
SANITARY SEWER	6 FEET NOTE: 4	12" / 18" NOTES: 3 & 4	4 FEET NOTE: 2	12"	4 FEET NOTE: 2	12"	4 FEET NOTE: 2	12"	4 FEET NOTE: 2	12" / 18" NOTE: 3	VARIES PER DEPTH	5 FEET NOTE: 2A

NOTES:

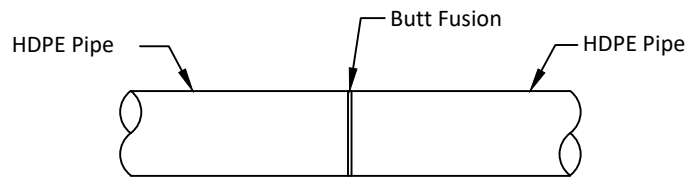
1. Distances Given are from Outside of Pipe to Outside of Pipe
2. (a) This Separation Requirement is to Provide Accessibility for Construction and Maintenance
(b) 4' Horizontal Separation for Utility Pipelines is the Minimum for Pipes with 3' of Cover
For Pipes Installed at Greater Depths, Provide an Additional Foot of Horizontal Separation for each Additional Foot of Depth
3. The 18" Separation Requirement Applies when the Wastewater Force Main, Sanitary Sewer or Storm Sewer Crosses Above the Utility Main and when the Storm Sewer Pipe has a Diameter Equal to or Greater than 24"- Otherwise the Required Separation is 12"
4. This Separation Requirement Complies with the Minimum FEP Separation Requirements Outlined in Chapter 62-555.314, FAC.
Variances from the FDEP Requirements must Comply with Chapter 62-555.314(5), FAC and must be Approved Individually by both FDEP and the City Utility Engineering Department
5. No Water Pipe Shall Pass Through or come in Contact with any Part of Sanitary Sewer or Storm Sewer Manhole or Structure
6. Separation of Pressure Utility Mains may be Reduced to 10' of Separation from Structural Foundations, Walls, etc if the Cover of the Utility Main is 4' or less and all Joints of the Utility are Restrained for a Minimum of 25' Outside the Structure Limits
7. See also City of Clearwater's Technical Specification Section IV and Preferred Product List



GATE VALVE RESTRAINT
N.T.S.



MJ CONNECTION
N.T.S.

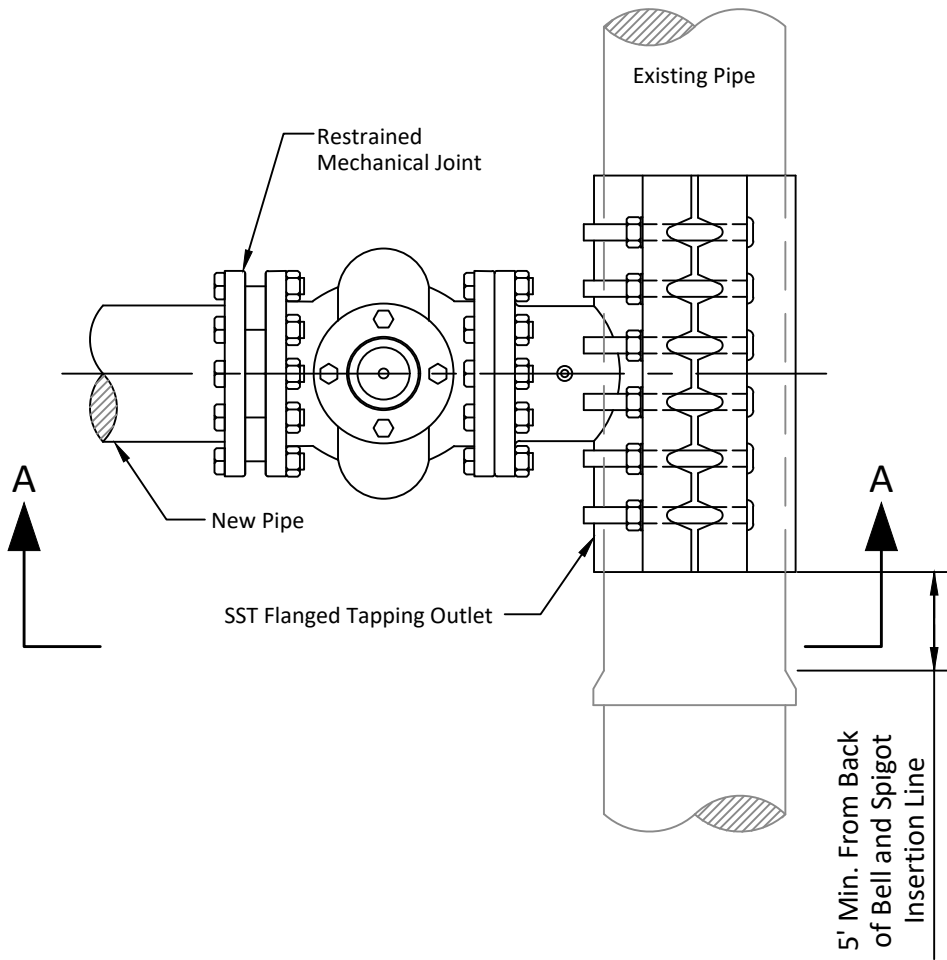


BUTT FUSION
N.T.S.

HDPE TO HDPE CONNECTIONS

NOTES:

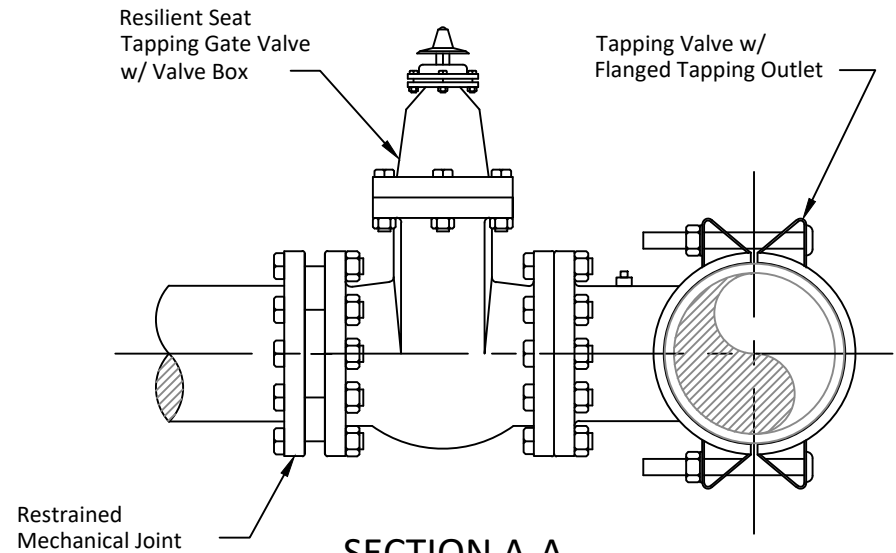
1. See also City of Clearwater's Technical Specification Section IV and Preferred Product List



PLAN
N.T.S.

NOTES:

1. Tapping Shall be Completed by a Specialty Contractor with Previous Experience in Tapping Pressurized Mains
The contractor Shall Provide all Necessary Information as Specified in the City's Technical Specifications to the City Engineering Department/Inspector to ensure that the Tapping Contractor is Acceptable
2. The Contractor Shall Provide 48 Hours Notice Prior to Tapping to the City Engineering Department/Inspector
3. The Contractor Shall be Responsible for Ensuring all Piping on the Tapped Pipeline is Properly Restrained Prior to Tapping
4. Specialty Contractor to Provide City Engineering Department/Inspector with Recovered Coupons from Tapping/Mains Drilled
5. See also City of Clearwater Technical Specifications Section IV and Preferred Product List



SECTION A-A
N.T.S.

SCHEDULE OF MINIMUM DIMENSIONS (INCHES)								TIE RODS REQUIRED	
PIPE SIZE	A	B	C	D	E	F	G	DIA (INCHES)	NUMBER
6	55	37	12	108	31	12	12	3/4	2
8	58	42	12	108	34	12	16	3/4	2
10	72	47	12	108	36	18	18	3/4	4
12	86	52	12	108	38	24	20	3/4	4
14	100	57	18	108	40	30	24	3/4	4
16	106	66	18	108	42	32	30	3/4	4

NOTE - Thrust Block Areas Computed on Basis of 1,500 LBS per SQ. FT. Soil Resistance Bearing

NOTES:

1. Minimum Compressive Strength for Concrete Shall be 3000 PSI
2. Bedding, Backfill and Compaction Shall be as Specified Elsewhere in the Standard Drawings and Specifications
3. All Form Boards Shall be Removed Prior to Backfill
4. Design Pressure: 150 PSI
5. Safety Factor = 1.5
6. Dimension "F" Shall be in Undisturbed Soil
7. Effective Thrust Restraint Area Shall be Against Undisturbed Soil Only
8. See also City of Clearwater's Technical Specification Section IV and Preferred Product List

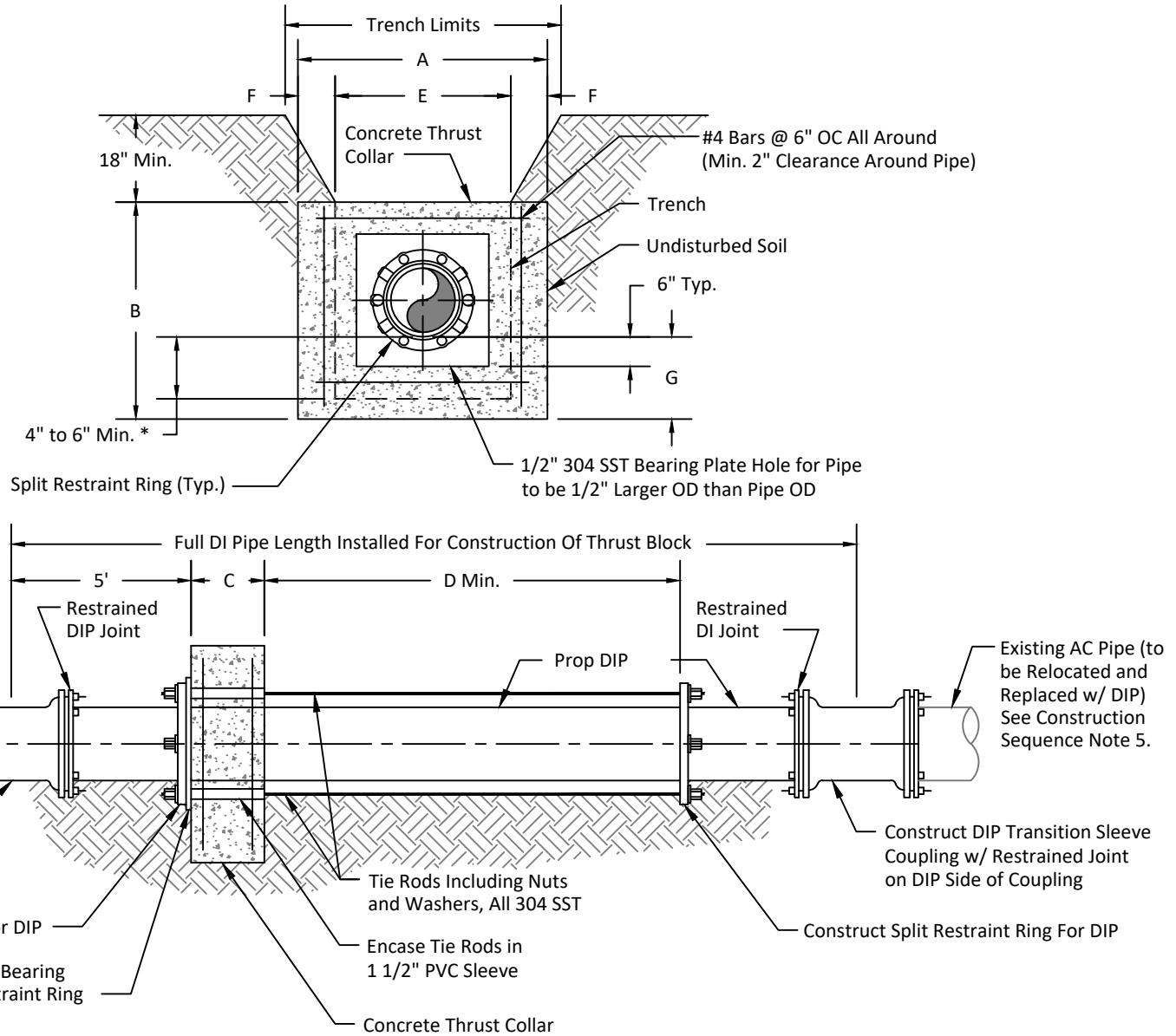
CONSTRUCTION SEQUENCE:

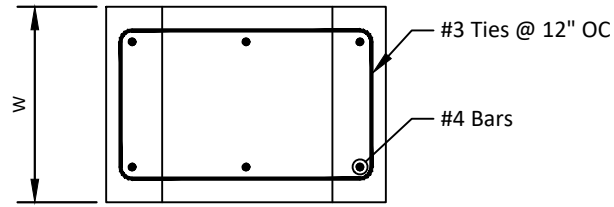
1. Contractor Shall Coordinate All Outages with UAO
2. Isolate Valves Either Side of Relocation
3. Drain Isolated Section of Pipe and Cut-In One Full Length of DI Pipe
4. Place Pipe Back into Service During Construction of Concrete Thrust Collar Assembly, Tie Rods and Coupling Restrainer on AC Pipe
Concrete Shall be Cured to a Minimum of 28 Day Compressive Strength Prior to Placing Load on Thrust Collar
5. Commence with Construction of Relocation only after All Steps Above have been Completed

* Bedding Depth

NOTES:

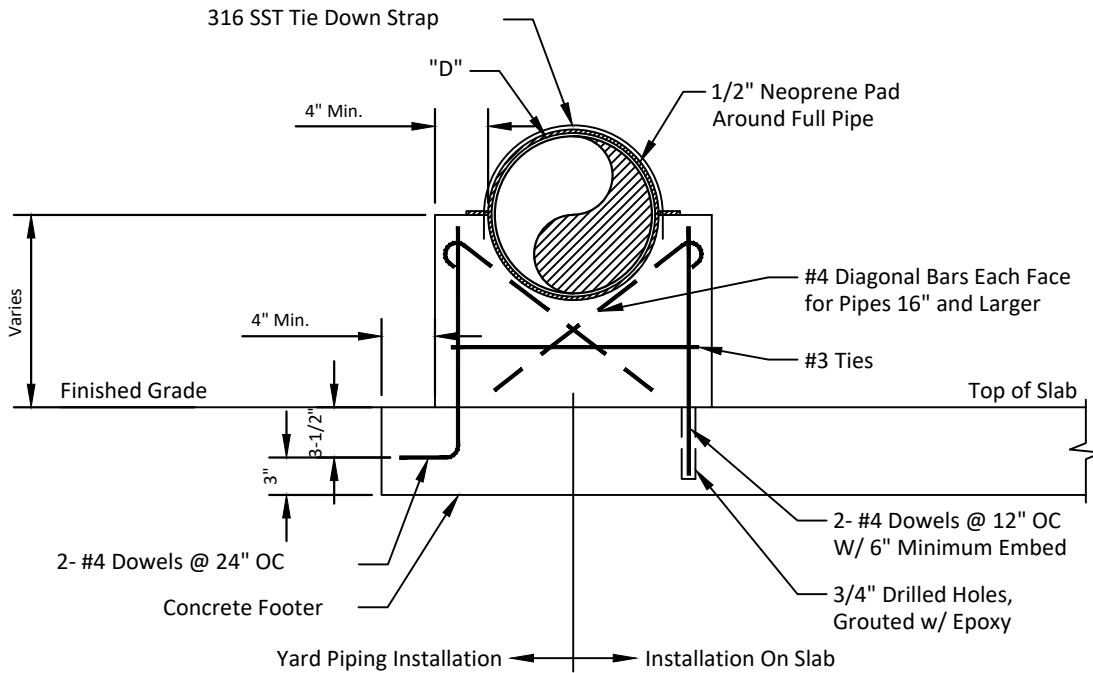
- See also City of Clearwater's Technical Specification Section IV and Preferred Product List





PLAN VIEW 30" THRU 60" PIPE

N.T.S.



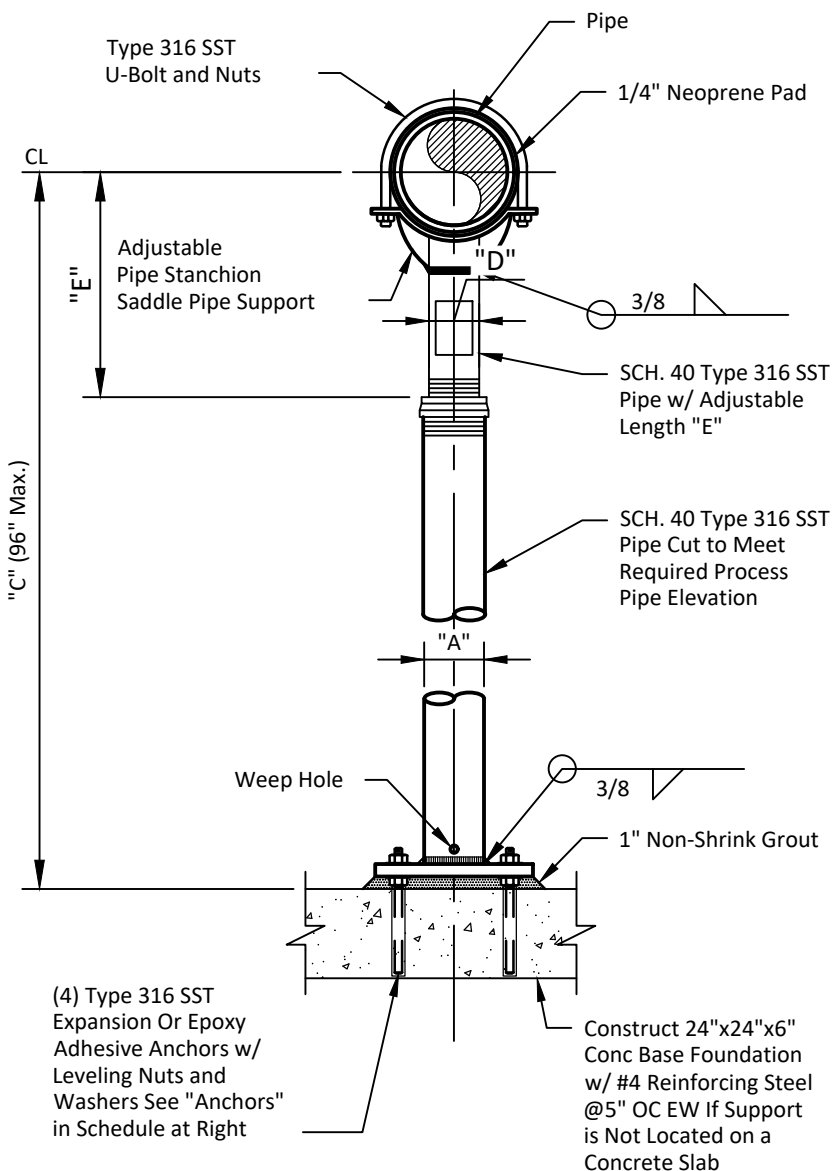
SECTION

N.T.S.

Pipe Diameter "D" (Inches)	Minimum Support Width "W" (Inches)
30, 36, & 42	16
48	20
54 & 60	24

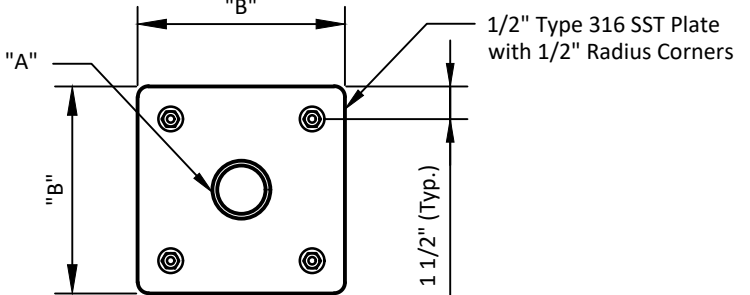
NOTES:

1. The Drawings Indicate Supports for Depiction Only
All Support Spacing and Type Shall be in Accordance with the Specifications
Support Spacing Shown on the Drawings Shall not Relieve the Contractor of Supplying and Installing Adequate Supports per the Specifications
2. Provide Concrete Footing "D"+24" by "W"+12" for all Finished Grade Applications
3. See also City of Clearwater's Technical Specification Section IV and Preferred Product List



FLOOR PIPE SUPPORT SCHEDULE
DIMENSIONS IN INCHES

PIPE SIZE	"A" OD	"B"	"D"	"E"		ANCHORS (NOTE 4)	
				MIN	MAX	DIA	EMBED
≤ 2 1/2	2 1/2	7	1 1/2	8	13	5/8	5
3	2 1/2	7	1 1/2	8 1/4	13 1/4	5/8	5
3 1/2	2 1/2	7	1 1/2	8 1/2	13 1/2	5/8	5
4	3	8	2 1/2	9 1/4	14	5/8	5
6	3	8	2 1/2	10 1/2	15 1/4	5/8	5
8	3	8	2 1/2	11 3/4	16 1/2	5/8	5
10	3	8	2 1/2	13 1/2	18 1/4	5/8	5
12	3	8	2 1/2	15	19 3/4	5/8	5
14	4	10	3	16 1/4	20 3/4	3/4	6 5/8
16	4	10	3	17 3/4	22 1/4	3/4	6 5/8
18	6	12	3 1/2	19 1/2	24	3/4	6 5/8
20	6	12	3 1/2	21	25 1/2	3/4	6 5/8
24	6	12	4	23 1/4	28 1/4	3/4	6 5/8
30	6	12	4	26 1/2	30 3/4	3/4	6 5/8
36	6	12	4	29 1/2	33 3/4	3/4	6 5/8



FLOOR PLATE - PLAN
N.T.S.

NOTES:

1. Not Intended for Thrust Restraint
2. Support Shall be Fabricated of Type 316 SST or Type 316L SST Materials
3. See Plans and Sections for Pipe Elevation Requirements (Dimensions "C" and "E") - Verify with Field Measurements
4. All Nuts, Bolts and Washers Shall be 316 SST, Including Anchors
5. See also City of Clearwater's Technical Specification Section IV and Preferred Product List

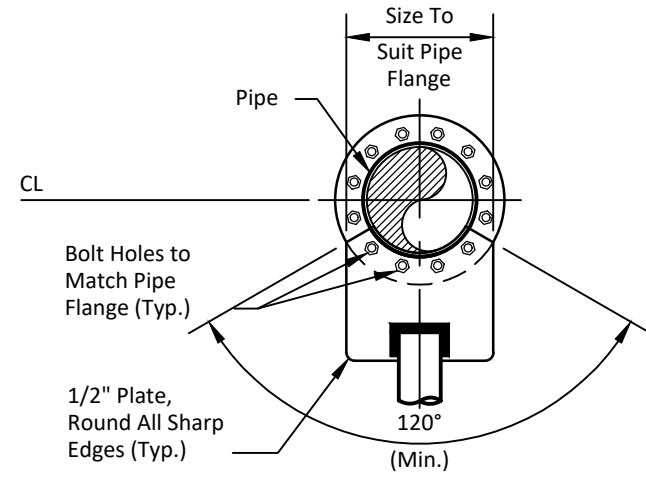
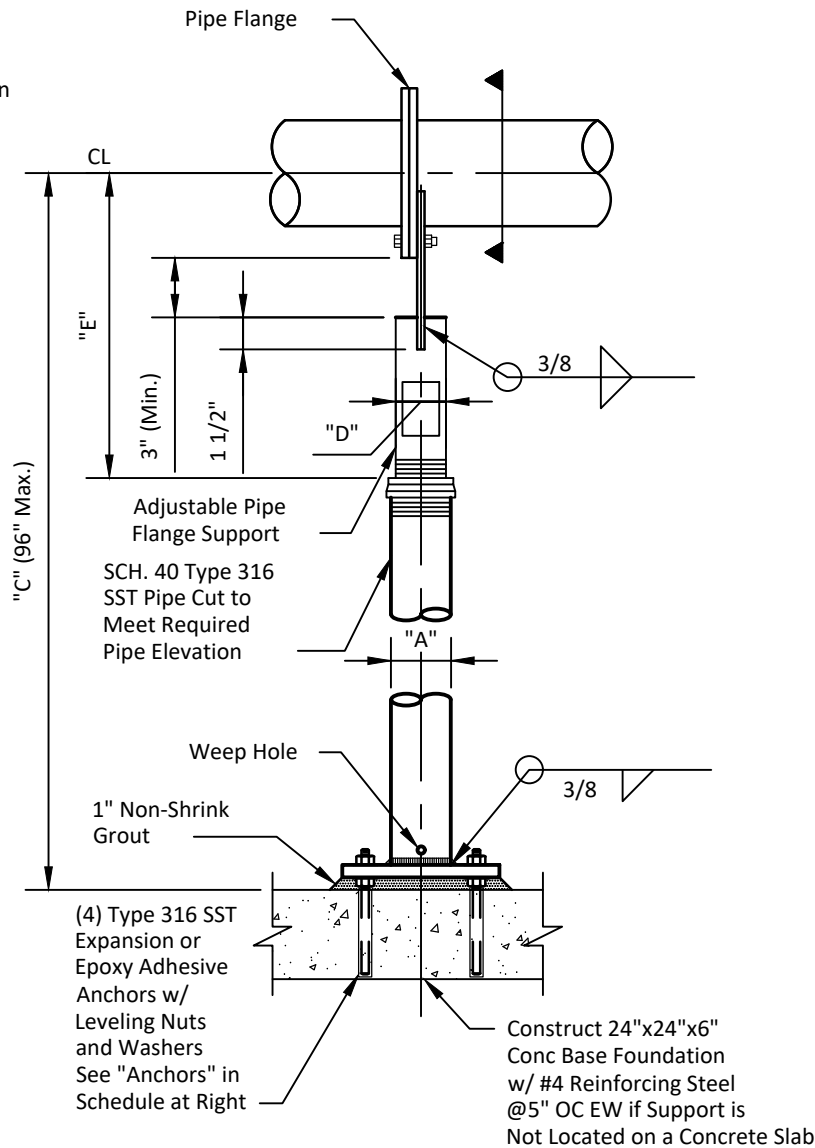
FLOOR PIPE SUPPORT SCHEDULE							
DIMENSIONS IN INCHES							
PIPE SIZE	"A" OD	"B"	"D"	"E"		ANCHORS (NOTE 4)	
				MIN	MAX	DIA	EMBED
≤ 2 1/2	2 1/2	7	1 1/2	8	13	5/8	5
3	2 1/2	7	1 1/2	8 1/4	13 1/4	5/8	5
3 1/2	2 1/2	7	1 1/2	8 1/2	13 1/2	5/8	5
4	3	8	2 1/2	9 1/4	14	5/8	5
6	3	8	2 1/2	10 1/2	15 1/4	5/8	5
8	3	8	2 1/2	11 3/4	16 1/2	5/8	5
10	3	8	2 1/2	13 1/2	18 1/4	5/8	5
12	3	8	2 1/2	15	19 3/4	5/8	5
14	4	10	3	16 1/4	20 3/4	3/4	6 5/8
16	4	10	3	17 3/4	22 1/4	3/4	6 5/8
18	6	12	3 1/2	19 1/2	24	3/4	6 5/8
20	6	12	3 1/2	21	25 1/2	3/4	6 5/8
24	6	12	4	23 1/4	28 1/4	3/4	6 5/8
30	6	12	4	26 1/2	30 3/4	3/4	6 5/8
36	6	12	4	29 1/2	33 3/4	3/4	6 5/8

NOTES:

1. Not Intended for Thrust Restraint
2. Support Shall be Fabricated of Type 316 SST or Type 316L SST Materials
3. See Plans and Sections for Pipe Elevation Requirements (Dimensions "C" and "E"), Verify with Field Measurements
4. All Nuts, Bolts and Washers Shall be 316 SST, Including Anchors
5. See also City of Clearwater's Technical Specification Section IV and Preferred Product List

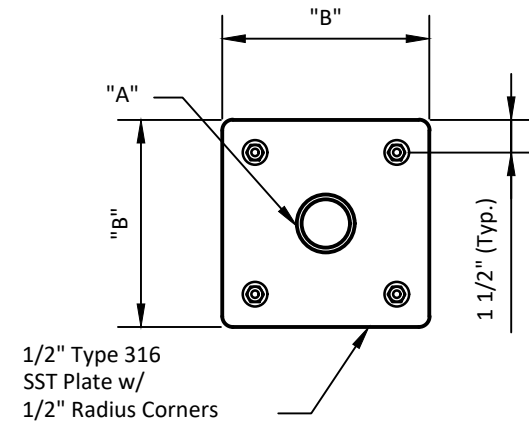
NOTES:

- See also City of Clearwater's Technical Specification Section IV and Preferred Product List



FLANGE CROSS SECTION

N.T.S.



FLOOR PLATE - PLAN

N.T.S.