

City of Orlando Wastewater Division

Reclaimed Water System Design and Construction Specifications

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1. IN ADDITION TO THE REQUIREMENTS STATED HEREIN, THE RECLAIMED WATER MAINS IN THE VICINITY OF STORM OR SANITARY SEWERS, FORCE MAINS OR POTABLE WATER LINES SHALL COMPLY WITH THE APPLICABLE PROVISIONS OF CHAPTER 62-604, F.A.C., CHAPTER 62-610, F.A.C., THE REQUIREMENTS OF THE WATER PURVEYOR OR OTHER APPROVED STANDARDS.
2. THERE SHALL BE NO PHYSICAL CONNECTIONS BETWEEN A PUBLIC OR PRIVATE POTABLE WATER SUPPLY SYSTEM AND THE RECLAIMED WATER SYSTEM, OR ANY OTHER RECLAIMED WATER PIPE OR APPURTENANCE, WHICH WOULD PERMIT THE PASSAGE OF ANY RECLAIMED WATER, POLLUTED WATER, WASTEWATER OR ANY OTHER WATER INTO THE POTABLE WATER SUPPLY. NO RECLAIMED WATER PIPE SHALL PASS THROUGH OR COME INTO CONTACT WITH ANY PART OF A SANITARY SEWER OR STORM WATER MANHOLE.
3. CROSS CONNECTION CONTROL SHALL BE IN ACCORDANCE WITH RULES AND REQUIREMENTS OF THE DEPARTMENT OF ENVIRONMENTAL PROTECTION IN CHAPTER 62-555, F.A.C., "PERMITTING AND CONSTRUCTION OF PUBLIC WATER SYSTEMS".
4. THE RECLAIMED WATER MAIN SHALL BE ON THE OPPOSITE SIDE OF THE STREET OR AS FAR AWAY FROM THE POTABLE WATER MAIN AS PRACTICAL.
5. A MINIMUM DISTANCE OF AT LEAST 3 FEET HORIZONTALLY SHALL SEPARATE ALL RECLAIMED WATER MAINS FROM POTABLE, SANITARY, AND STORM WATER PIPES. THE DISTANCE SHALL BE MEASURED FROM OUTSIDE EDGE TO OUTSIDE EDGE. IF IT IS NOT PRACTICAL TO MAINTAIN A 3 FOOT HORIZONTAL SEPARATION DISTANCE BETWEEN A POTABLE LINE AND A RECLAIM LINE, THEN THE RECLAIM WATER MAIN SHALL BE LAID IN A SEPARATE TRENCH OR ON A SHELF OF UNDISTURBED EARTH AT LEAST 18 INCHES ABOVE THE TOP OF SEWER PIPES AND 18" BELOW POTABLE WATER PIPES. WHEN A RECLAIM WATER MAIN PARALLELS A SEWER PIPE, AND A SEPARATION OF AT LEAST 3' CANNOT BE MAINTAINED, ALTERNATE CONSTRUCTION METHODS OR MATERIALS MAY BE USED WITH APPROVAL OF FDEP, AND THE CITY OF ORLANDO.
6. PIPES SHALL NOT CROSS ANY OTHER PIPES OR UTILITIES AT AN ANGLE LESS THAN 60 DEGREES.
7. WHERE RECLAIM WATER PIPES CROSS WATER OR SEWER PIPES, A MINIMUM VERTICAL SEPARATION OF 18 INCHES SHALL BE MAINTAINED BETWEEN THE BOTTOM OF THE UPPER PIPE AND THE TOP OF THE LOWER PIPE, WITH THE CLEANER WATER ON TOP. THE CROSSING SHALL BE ARRANGED SUCH THAT THE PIPE JOINT SHALL BE EQUIDISTANT AND CENTERED ON THE CROSSING. WHERE A RECLAIMED WATER MAIN PASSES UNDER A SANITARY SEWER OR STORM WATER SEWER, ADEQUATE STRUCTURAL SUPPORTS SHALL BE PROVIDED FOR THE SEWER PIPE TO MAINTAIN LINE AND GRADE. WHERE THE 18" SEPARATION IS NOT PRACTICAL, ALTERNATE CONSTRUCTION METHODS OR MATERIALS MAY BE USED WITH APPROVAL OF FDEP AND THE CITY OF ORLANDO.
8. WHERE A RECLAIM WATER PIPE CONFLICTS WITH AN EXISTING POTABLE WATER PIPE WITH LESS THAN 18 INCHES VERTICAL CLEARANCE, THEN THE RECLAIM WATER PIPE SHALL BE DUCTILE IRON PIPE (DIP) AND THE RECLAIM WATER PIPE SHALL BE ARRANGED TO MEET THE CROSSING REQUIREMENTS DESCRIBED ABOVE.
9. WHERE A RECLAIM WATER PIPE CROSSES AN EXISTING SEWER PIPE WITH LESS THAN 18 INCHES VERTICAL CLEARANCE, THEN THE RECLAIM WATER PIPE SHALL BE DUCTILE IRON PIPE (DIP) AND THE SEWER PIPE SHALL BE ENCASED IN CONCRETE.
10. ALL RECLAIM WATER DISTRIBUTION SYSTEM PIPE SHALL HAVE A MINIMUM OF THIRTY-SIX (36) INCHES OF COVER, UNLESS OTHERWISE DIRECTED BY THE CITY OF ORLANDO PROJECT MANAGER OR THEIR REPRESENTATIVE.
11. A PRE-CONSTRUCTION MEETING FOR THE INSTALLATION OF RECLAIM WATER FACILITIES IS REQUIRED. CONTACT: CITY OF ORLANDO WASTEWATER DIVISION, ENVIRONMENTAL CONTROL SECTION @ 407-246-2664.
12. THE CONTRACTOR SHALL CALL "SUNSHINE ONE CALL" AT 1-800-432-4770 TWO (2) WORKING DAYS BEFORE EXCAVATING IN THE CONSTRUCTION AREA.
13. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/CONTRACTOR TO ENSURE THAT ALL REQUIRED PERMITS ARE IN-HAND BEFORE BEGINNING ANY CONSTRUCTION.



RECLAIMED WATER CONSTRUCTION SPECIFICATIONS

RGN-1

14. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSTALL LOCATOR BALLS AT 100' INTERVALS ALONG STRAIGHT RECLAIM WATER MAIN RUNS (EVERY 20' ON DEFLECTED RUNS), AND EVERY 5' ON BRANCH FITTINGS OR INTERSECTIONS. LOCATOR BALLS MUST ALSO BE PLACED AT EVERY BRANCH, TURN, VALVE, TAP, OUTLET, END, AND METER BOX IN THE SYSTEM. ASBUILT DRAWINGS SHALL REFLECT THE PRECISE LOCATIONS OF EACH OF THESE BALLS EXPRESSED IN X-Y COORDINATES PER FLORIDA 0901 EASTERN ZONE (1983 SURVEY FEET). LOCATOR BALLS SHALL BE PURPLE 3-M 1400 SERIES (ELECTRONIC MARKER SYSTEMS), 1428-XR/ID EXTENDED RANGE 5' DEPTH BALL MARKER FOR GENERAL PURPOSE / RECLAIMED WATER APPLICATION. SEE DRAWING FOR MORE DETAIL.
15. ALL CONSTRUCTION OF THE RECLAIM WATER DISTRIBUTION SYSTEM SHALL MEET CURRENT REQUIREMENTS OF FDEP, AWWA, CITY OF ORLANDO AND ORLANDO UTILITIES COMMISSION FOR MATERIALS OF CONSTRUCTION, DESIGN, AND INSTALLATION.
16. MATERIALS, DESIGN AND CONSTRUCTION METHODS FOR STREETS AND STORM DRAINAGE CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE REQUIREMENTS OF THE CITY OF ORLANDO, ORANGE COUNTY, AASHTO, FDOT, AND ALL OTHER AGENCIES THAT MAY EXERT JURISDICTION.
17. THE CONTRACTOR SHALL USE THE CITY OF ORLANDO ROADWAY AND TRAFFIC DESIGN STANDARDS, 1991 ADDITION, ENGINEERING STANDARDS MANUAL & DETAILS, AND FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS LATEST EDITION, FOR CONSTRUCTION ITEM DETAILS, UNLESS A SPECIFIC DETAIL IS PROVIDED HEREIN. ANY REFERENCE TO THE ESM SHALL REFER TO THE CITY OF ORLANDO ENGINEERING STANDARDS MANUAL AND DRAWINGS AVAILABLE AT THE CITY OF ORLANDO WEBSITE.
18. ALL EXISTING UNDERGROUND UTILITIES THAT ARE ACTIVE SHALL REMAIN IN PLACE UNTIL THE NEW FACILITIES ARE OPERATIONAL.
19. UNDER NO CIRCUMSTANCES SHALL THE ACTIVITIES OF THE CONTRACTOR OR HIS SUBCONTRACTORS CAUSE ANY INTERRUPTIONS TO THE SERVICE OPERATION OF EXISTING UTILITIES WITHOUT WRITTEN AUTHORIZATION FROM THE AUTHORIZED REPRESENTATIVE.
20. RESIDENT AND BUSINESS ACCESS SHALL BE MAINTAINED AT ALL TIMES. IF UNABLE TO DO SO, THE CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE AFFECTED BUSINESSES AND RESIDENTS A MINIMUM OF (1) ONE WEEK IN ADVANCE TO COORDINATE ALTERNATIVE ACCESS ARRANGEMENTS.
21. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE VARIOUS UTILITIES AND TO MAKE THE NECESSARY ARRANGEMENTS FOR ANY RELOCATION OF THESE UTILITIES, WITH THE OWNER OF THE UTILITY, PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITY. THE CONTRACTOR SHALL ENSURE THAT THE UTILITY OWNERS AND THE CITY OF ORLANDO PROJECT MANAGER ARE PROPERLY NOTIFIED OF ANY TEMPORARY DISRUPTION OF SERVICE AT LEAST 1 WEEK IN ADVANCE.
22. BEFORE CONSTRUCTION, IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL UTILITY LOCATIONS, POSITIONS, ELEVATIONS AND DIMENSIONS BY UTILIZING EXPLORATORY (HAND) EXCAVATION WHICH SHALL BE MADE 48 HOURS OR 1,000 FEET IN ADVANCE OF THE WORK, WHICHEVER IS GREATER. IF THERE IS A POTENTIAL CONFLICT, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY. ANY DAMAGE TO UTILITIES, STRUCTURES AND /OR SERVICES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE IN A MANNER APPROVED BY AND COORDINATED WITH THE UTILITY OWNER.
23. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN CROSSING AN UNDERGROUND UTILITY, WHETHER SHOWN ON THESE PLANS OR FIELD LOCATED. ALL UTILITIES WHICH INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE RELOCATED BY THE RESPECTIVE UTILITY COMPANIES AND THE CONTRACTOR SHALL COOPERATE WITH THEM DURING THE RELOCATION OPERATIONS. ANY DELAYS, COSTS OR INCONVENIENCE OF THE VARIOUS UTILITY CONFLICTS SHALL BE INCIDENTAL TO THE CONTRACT AND NO EXTRA COSTS WILL BE CHARGED TO THE CITY.
24. FOR CONNECTIONS TO AN EXISTING PIPE, THE CONTRACTOR SHALL EXCAVATE THE CONNECTION SITE TO VERIFY THE PIPE TYPE, SIZE AND CONDITION, AND CHECK FOR OBSTRUCTIONS AND JOINT LOCATIONS PRIOR TO ORDERING MATERIALS AND INSTALLATION OF THE NEW PIPELINE.
25. THE CONTRACTOR HAS THE OPTION TO MOVE/RELOCATE THE ALIGNMENT (HORIZONTAL OR VERTICAL) TO AVOID CONFLICT WITH EXISTING UTILITIES OR FOR EASE OF WORK, SUBJECT TO APPROVAL FROM THE CITY. IF THE CONTRACTOR CHANGES THE VERTICAL ALIGNMENT, THE CONTRACTOR SHALL INSTALL ALL NECESSARY AIR RELEASE VALVES AND FITTINGS AT HIS EXPENSE.



RECLAIMED WATER CONSTRUCTION SPECIFICATIONS

RGN-2

26. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RELOCATION OF ANY EXISTING IRRIGATION SYSTEM OR PRIVATE UTILITY APPURTENANCES WHICH CANNOT BE ADEQUATELY PROTECTED DURING CONSTRUCTION OF THE RECLAIM WATER PIPING.
27. ALL PRIVATE AND PUBLIC PROPERTY AFFECTED BY THIS WORK SHALL BE RESTORED TO A CONDITION EQUAL TO OR BETTER THAN THE CONDITION EXISTING BEFORE COMMENCING CONSTRUCTION WORK.
28. WHEN ENCOUNTERED, UNSUITABLE MATERIALS SHALL BE REMOVED FROM THE EXCAVATED MATERIALS AND BACK FILLED WITH SUITABLE MATERIALS. UNSUITABLE MATERIALS SHALL BE REMOVED FROM THE JOB SITE AND DISPOSED OF IN A TIMELY AND LEGAL MANNER AND APPROVED BY THE CITY.
29. INLETS AND CATCH BASINS SHALL BE PROTECTED FROM SEDIMENT UNTIL THE COMPLETION OF ALL CONSTRUCTION OPERATIONS. EROSION CONTROL AT ALL INLET DRAINAGE STRUCTURES DURING CONSTRUCTION SHALL BE DONE IN ACCORDANCE WITH DRAWINGS R-30(A-H).
30. PRIOR TO BEGINNING ANY CLEARING ACTIVITIES ON CITY PROPERTY, THE CONTRACTOR SHALL GET APPROVAL FROM PARKS DEPARTMENT FOR TREE REMOVAL, THEN CLEARLY MARK WITH FLAGGING TAPE OR OTHER APPROVED METHOD, ALL EXISTING TREES TO REMAIN ON THE PROJECT SITE. ALL TREES TO BE REMOVED SHALL BE MARKED WITH SPRAY PAINT OR OTHER APPROVED METHOD SO THAT DURING CLEARING, THERE ARE NO MISUNDERSTANDING AS TO WHICH TREES ARE TO BE REMOVED AND WHICH ARE TO REMAIN.
31. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPLACEMENT OF DAMAGED TREES WITH TREES OF SIMILAR QUALITIES, SIZE AND SPECIES AT NO COST TO THE CITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF NEWLY PLANTED GRASS OR VEGETATION UNTIL THE WORK HAS BEEN ACCEPTED BY THE CITY.
32. DEWATERING SYSTEM SHALL BE UTILIZED BY THE CONTRACTOR IN ACCORDANCE WITH GOOD STANDARD PRACTICES AND MUST BE SUFFICIENT ENOUGH TO LOWER THE WATER LEVEL IN ADVANCE OF EXCAVATION TO KEEP THE TRENCH BOTTOM AND SIDES FIRM AND DRY, AT LEAST 2' MINIMUM BELOW THE TRENCH BOTTOM. POLLUTED WATER SHALL NOT BE DISCHARGED INTO SANITARY SEWER, STORM SYSTEM, OR BODIES OF WATER. ANY DISCHARGE INTO SANITARY SEWER SYSTEM SHALL BE PRE-APPROVED BY THE WASTEWATER DIVISION.
33. EXCAVATIONS SHALL CONFORM TO THE REQUIREMENTS OF THE TRENCH SAFETY ACT. THE DISPOSAL OF EXCESS EARTHWORK MATERIALS SHALL BE THE RESPONSIBILITY/PROPERTY OF THE CONTRACTOR.
34. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF EMBANKMENTS AND SHALL REPLACE ANY PORTION WHICH HAS BECOME DISPLACED DUE TO EROSION OR DUE TO CARELESSNESS OR NEGLIGENCE ON THE PART OF THE CONTRACTOR.
35. TEMPORARY DRAINAGE SHALL BE PROVIDED DURING CONSTRUCTION TO ELIMINATE ANY FLOODING OF PRIVATE PROPERTY AND EXISTING ROADWAYS CAUSED BY CONSTRUCTION ACTIVITIES. CONTRACTOR SHALL PROVIDE ADDITIONAL DRAINAGE AT NO EXTRA COST TO THE OWNER.
36. HYDROSTATIC PRESSURE AND LEAKAGE TESTS SHALL BE CONDUCTED ONLY FOR INSTALLED FACILITIES. ALL TEST SHALL BE COMPLETED AND ACCEPTED BY THE CITY ENGINEER BEFORE ANY PAVEMENT IS PUT IN PLACE.
37. ALL PIPING SHALL BE CLEAN AND FREE OF ALL DIRT, DEBRIS, AND BIOLOGY. BEFORE PRESSURE TESTING.
38. LEAKAGE TESTS SHALL BE CONDUCTED FOR A MINIMUM OF 2 HOURS AT A MINIMUM PRESSURE OF 150 PSI. ANY DISCERNIBLE PRESSURE DROP OVER THE FOUR HOUR TEST PERIOD SHALL CONSTITUTE FAILURE OF THE PRESSURE TEST. PRESSURE TEST MUST BE WITNESSED BY A CITY OF ORLANDO PROJECT MANAGER OR HIS APPOINTED REPRESENTATIVE.
39. ISOLATE THE MAINS PRIOR TO TESTING. AVOID ANY CROSS-CONNECTIONS WITH THE POTABLE WATER SYSTEMS DURING TESTING. NEW FACILITIES MAY BE CONNECTED TO THE EXISTING RECLAIMED WATER LINES ONLY FOLLOWING COMPLETION AND APPROVAL OF TESTING.
40. OPEN VENT AT THE HIGH POINTS OF THE INSTALLATION TO PURGE ALL AIR FROM THE SYSTEM WHILE BEING FILLED WITH WATER.



RECLAIMED WATER CONSTRUCTION SPECIFICATIONS

RGN-3

41. IF LEAKAGE IS INDICATED BY ANY DISCERNIBLE PRESSURE DROP OVER THE TWO HOUR TEST PERIOD, LOCATE THE CAUSE OF THE LEAKS, REPAIR COMPONENTS AND REPEAT THE LEAKAGE TEST. ALL LEAKAGE SHALL BE ELIMINATED.
42. ALL HYDROSTATIC TESTING SHALL BE IN ACCORDANCE WITH ANSI/AWWA C600-93 SECTION 4 FOR D.I. PIPE AND ANSI/AWWA C605 SECTION 7 FOR PVC PIPE. TEST PRESSURE SHALL BE 200 PSI.
43. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING A MAINTENANCE OF TRAFFIC (MOT) PLAN TO THE CITY OF ORLANDO FOR APPROVAL, THAT IS SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF FLORIDA WHO SPECIALIZES IN TRAFFIC ENGINEERING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND MAINTENANCE OF ADEQUATE TRAFFIC CONTROL DEVICES AND BARRIERS, FOR THE PROTECTION OF PEDESTRIANS AND THE WORKERS.
44. PUBLIC ROADS AND PAVED DRIVE CROSSINGS SHALL BE BACK-FILLED WITH GRANULAR MATERIAL AND TOPPED WITH 12" THICK OF LIME ROCK BASE COURSE MATERIAL. BACKFILL SHALL BE COMPACTED TO 99% MODIFIED PROCTOR OF THE MINIMUM DRY DENSITY PER AASHTO T-801, OR ASTM D1557. ALL EDGES OF REPAIR AREAS SHALL SAW CUT STRAIGHT AND NEAT.
45. EXISTING PAVEMENT MARKINGS AND MESSAGES SHALL BE INVENTORIED AND REPLACED BY THE CONTRACTOR, UNLESS OTHERWISE SPECIFIED IN THE PLANS OR LATEST DESIGN STANDARDS. ALL PERMANENT PAVEMENT MARKINGS SHALL BE ALKYD THERMOPLASTIC. TEMPORARY MARKINGS SHALL BE TAPED AND ALL CONFLICTING MARKINGS SHALL BE COMPLETELY REMOVED.
46. CONCRETE FORMS SHALL BE CONSTRUCTED FROM SOUND WOOD, METAL OR OTHER APPROVED MATERIALS. FORMS SHALL BE SUITABLE TO PROVIDE A FLAT, UNIFORM SURFACE AND TO WITHSTAND CONSTRUCTION LOADS WITHOUT SAGGING OR DEFLECTING. WOOD FORMS IN CONTACT WITH THE CONCRETE SHALL BE COATED WITH A EFFECTIVE RELEASE AGENT. FORMS SHALL REMAIN IN PLACE PER ACI 301 AND ACI 347. FORMS SHALL REMAIN STRAIGHT, LEVEL, PLUMB AND TRUE TO SHAPE TO WITHIN ¼" PER 10'.
47. MOLDING, BEVELS OR OTHER TYPES OF CHAMFER STRIPS SHALL BE PLACED TO PRODUCE A 3/4-INCH CHAMFER AT ALL HORIZONTAL AND VERTICAL PROJECTION CORNERS AND FOR BLOCKOUTS.
48. CONCRETE REINFORCEMENT SHALL BE NEW, RUST FREE STEEL BARS THAT CONFORM TO ASTM A615, GRADE 60. TIE WIRE SHALL BE A MINIMUM OF 16-GAUGE, BLACK ANNEALED WIRE. CHAIRS SHALL BE PROVIDED AS NECESSARY TO PREVENT DISPLACEMENT DURING POUR.
49. SYNTHETIC REINFORCING FIBER MAY USED IN LIEU OF STEEL REINFORCEMENT BARS FOR SMALL (LESS THAN 50 SQ.FT.) SLAB ON GRADE CONSTRUCTION. FIBERS SHALL BE 100% POLYPROPYLENE THAT ARE COLLATED AND FIBRILLATED AS MANUFACTURED BY FIBERMESH COMPANY OF SYNTHETIC INDUSTRIES. FIBER LENGTH AND QUANTITY SHALL BE IN COMPLIANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, AND SOILS MUST BE COMPACTED TO 95% DRY DENSITY.
50. MINIMUM REINFORCEMENT STEEL AND CONCRETE COVER SHALL BE IN ACCORDANCE WITH ACI-318
51. CONCRETE SHALL BE 3000 PSI STRENGTH, AND SHALL BE PRODUCED AND PLACED IN ACCORDANCE WITH ACI STANDARDS AND MUST MEET THE 28-DAY STRENGTH REQUIREMENTS.
52. ALL RECLAIM WATER PIPING SHALL BE DESIGNED, RATED, INSTALLED AND RESTRAINED TO WITHSTAND 150 PSI CONTINUOUS PRESSURE UPSTREAM OF THE PRESSURE REDUCING VALVE. PVC PIPE IS ALLOWED ONLY FOR 8" DIAMETER PIPING AND SMALLER. DUCTILE IRON PIPE MUST BE USED FOR ALL SIZES GREATER THAN 8" DIAMETER.



RECLAIMED WATER CONSTRUCTION SPECIFICATIONS

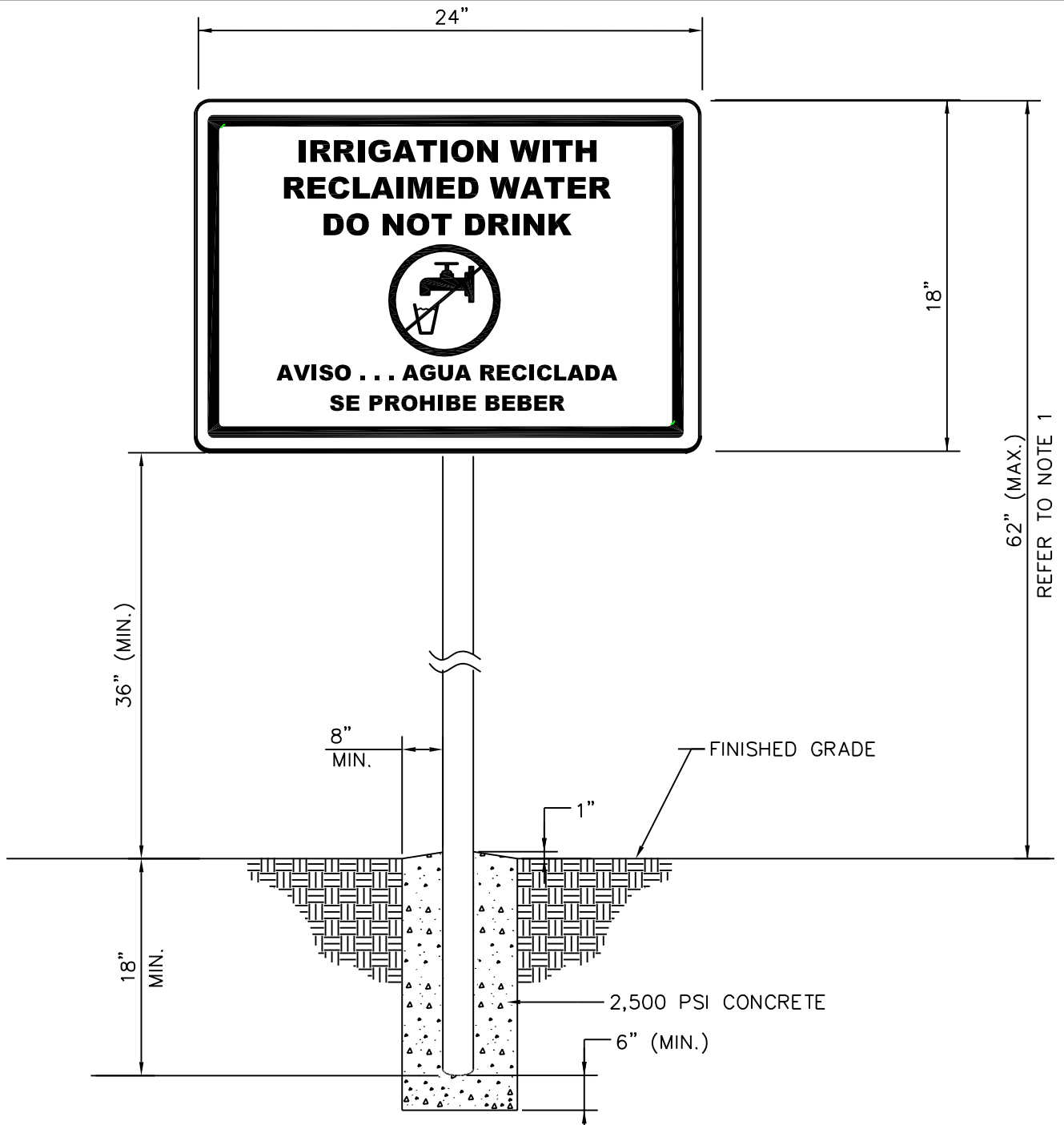
RGN-4

53. THRUST BLOCKS SHALL NOT BE USED FOR PRESSURE OR MOMENTUM RESTRAINT, EXCEPT WHERE IT CAN BE PROVEN THAT NO OTHER MEANS EXIST TO RESTRAIN AGAINST THE REQUIRED 200 PSI LINE PRESSURE. IN SUCH INSTANCES, THRUST BLOCKS WILL BE USED IN CONJUNCTION WITH MECHANICAL TYPE RESTRAINT SYSTEMS TO SUPPLEMENT THE CAPACITY OF THE MECHANICAL RESTRAINT SYSTEM.
54. A COMPLETE SET OF AS BUILT DRAWINGS (36" X 24" HARD COPY & AutoCAD FILE), AND ALL INSPECTION AND TEST RECORDS MUST BE SUBMITTED TO THE CITY OF ORLANDO AND APPROVED BEFORE THE NEW RECLAIM WATER SYSTEM IS ALLOWED TO BE PUT INTO SERVICE. THE DRAWINGS MUST INCLUDE ACCURATE LAYOUT, SIZING, PROJECTED FLOWS, AND STATE PLANE COORDINATES FOR ALL VALVES, PIPING BENDS, BRANCHES, ENDS, OUTLETS, CONNECTION POINTS, METER BOXES AND LOCATOR BALLS, OR ANY ITEM LISTED ABOVE.
55. ALL SERVICE LINES WILL BE LAID OUT AND CONSTRUCTED 90 DEGREES FROM THE RECLAIM WATER MAIN AND ROUTED IN A STRAIGHT PATH FROM THE MAIN TO THE METER BOX.
56. ALL RECLAIM WATER PIPING AND VALVE BOX COVERS AND LIDS SHALL BE COLORED PANTONE 522C PURPLE.
57. ALL SERVICE SADDLES SHALL BE NON-STRAP TYPE. BANDED CLAMP TYPE SADDLES ARE ALLOWED PROVIDED THEY ARE SINGLE PIECE FULL WIDTH BANDS OR CLAMPING SHELL EQUAL TO OR GREATER THAN THE WIDEST DIMENSION OF THE SERVICE SIDE OF THE ASSEMBLY.
58. ALL MAIN TAPS SHALL BE CONSTRUCTED USING A FLANGED, FULL IRON BODY SPLIT TEE, FUSION BONDED EPOXY STEEL TAPPING SLEEVE, OR A 304 STAINLESS STEEL TAPPING SLEEVE. .
59. HORIZONTAL DIRECTIONAL DRILLS SHALL BE PERFORMED BY LICENSED UNDERGROUND CONTRACTORS WITH NO LESS THAN 5 YEARS OF EXPERIENCE WITH PULLS OF SIMILAR LENGTH AND DIAMETER. SELECTION OF MATERIALS AND ROUTE SHALL BE CARRIED OUT BY A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF FLORIDA, BASED ON A SITE SPECIFIC GEOTECHNICAL ANALYSIS. ALL UTILITIES AND STRUCTURES CROSSING THE PATH OR WITHIN 25 FEET OF THE HDD SHALL BE POSITIVELY LOCATED AND IDENTIFIED BEFORE AND DURING THE PERFORMANCE OF THE HDD.



RECLAIMED WATER CONSTRUCTION SPECIFICATIONS

RGN-5



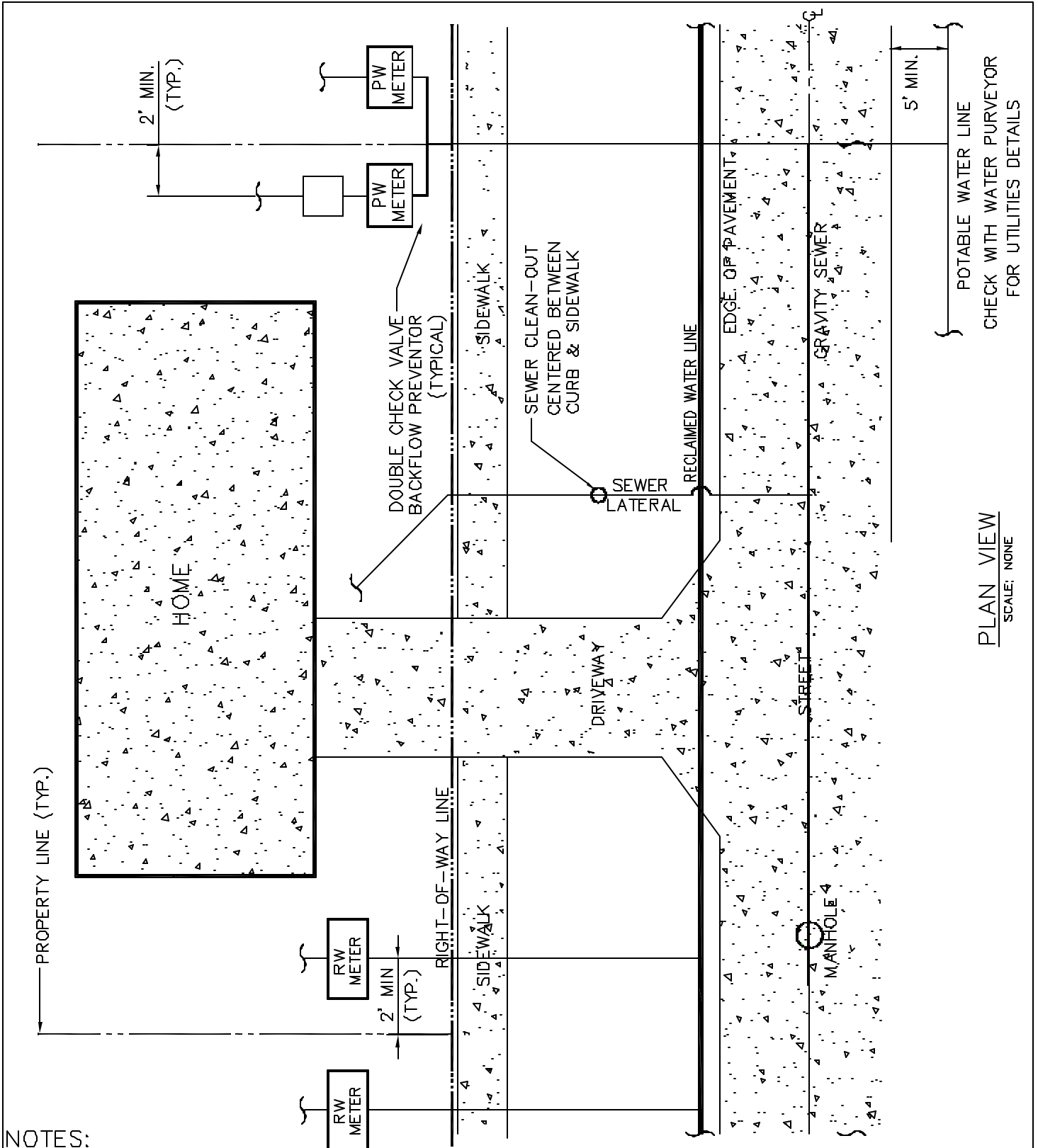
NOTES:

1. HEIGHT OF SIGN WILL DEPEND ON LOCATION AND SURROUNDING LANDSCAPE PLANT TYPES. IN ALL CASES, THE SIGN SHALL BE CLEARLY VISIBLE TO THE PUBLIC.(IN ACCORDANCE W/62.6210 POLICY)
2. POST SHALL BE 2 $\frac{3}{8}$ " OD, SEAMLESS, EXTRUDED, SCHEDULE 80 ALUMINUM PIPE. POST SHALL BE 6061-T6 ALLOY AND CONFORM TO ASTM B429. POST SHALL HAVE A MILL FINISH.
3. MOUNTING HARDWARE SHALL BE TYPE 316 STAINLESS STEEL OR ALUMINUM.
4. SIGN POST SHALL BE PLACED BY THE CONTRACTOR IN ACCORDANCE WITH THE PLANS OR AS APPROVED BY THE CITY. SIGN POST SHALL BE INSTALLED PLUMB AND LEVEL.
5. BACKGROUND OF SIGN SHALL BE PANTONE PURPLE 522C, BORDER AND LETTERS SHALL BE BLACK HEVETICA, SWISS 721 COREL OR APPROVED EQUAL .
6. ENGINEERING GRADE REFLECTIVE MATERIALS SHALL BE USED.
7. SIGN MATERIAL SHALL BE OF 14 GAUGE ANODIZED ALUMINUM.



SIGN POST INSTALLATION

R-01



PLAN VIEW
SCALE: NONE

POTABLE WATER LINE
CHECK WITH WATER PURVEYOR
FOR UTILITIES DETAILS

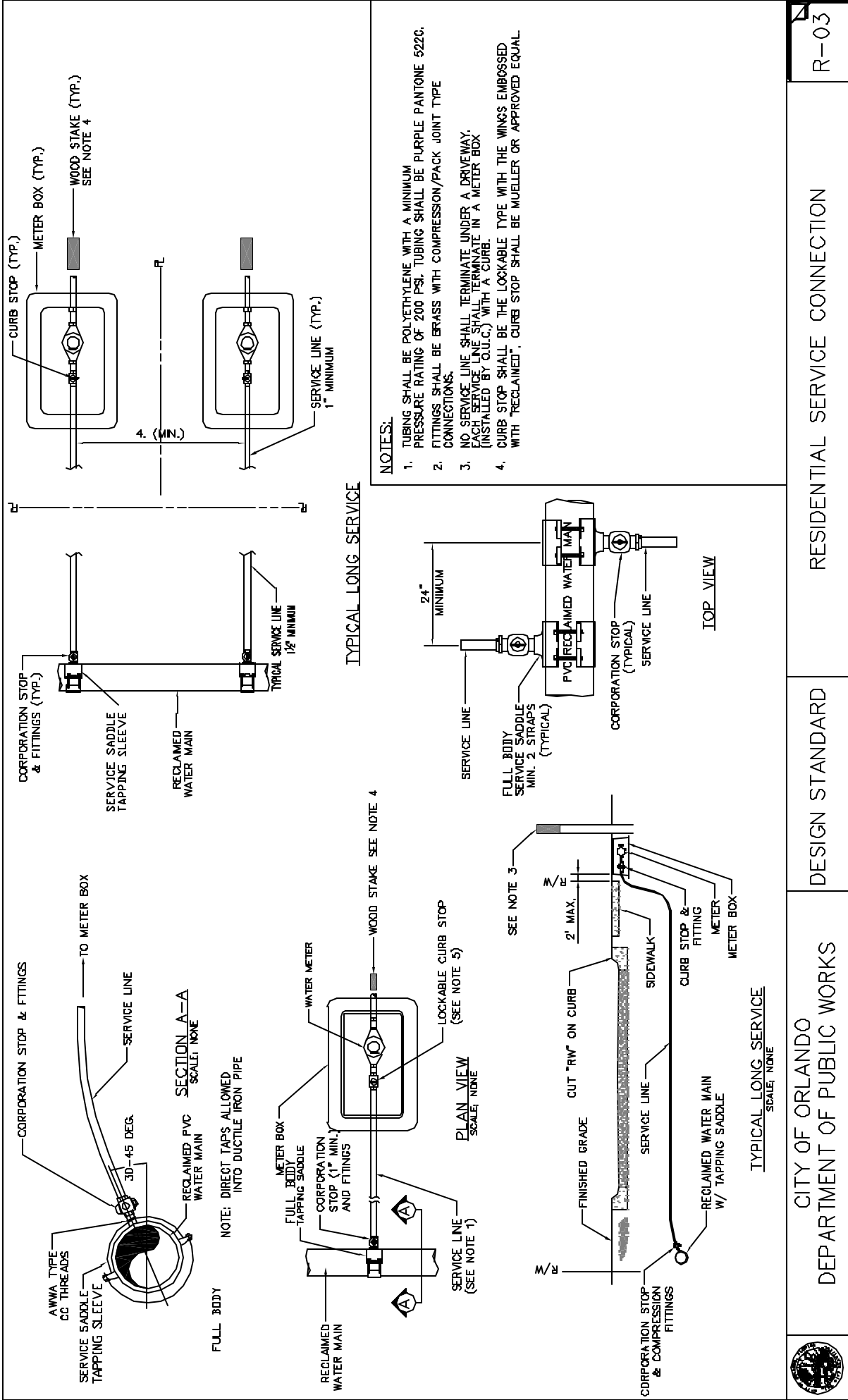
NOTES:

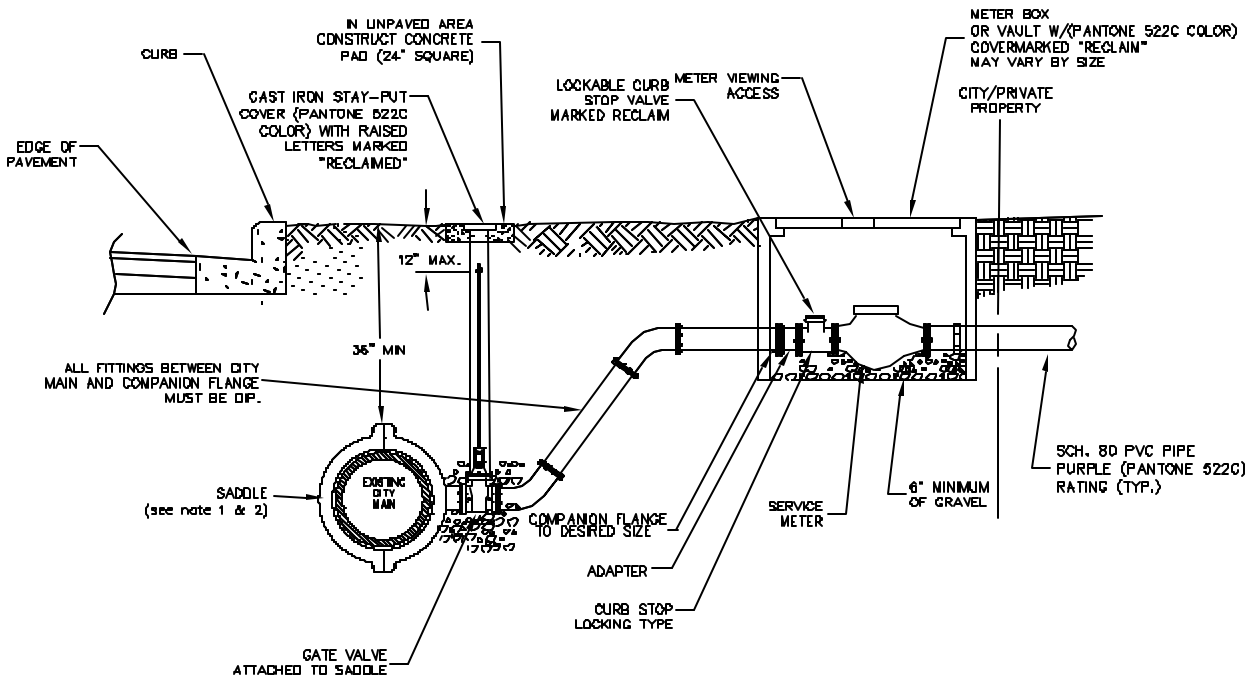
1. REFER TO RW- 15 FOR MINIMUM HORIZONTAL SPACING REQUIREMENTS AND RW-16 FOR MINIMUM VERTICAL REQUIREMENTS.
2. BACK FLOW PREVENTOR SHALL BE INSTALL IN ACCORDANCE WITH THE WATER PURVEYOR'S SPECIFICATIONS.



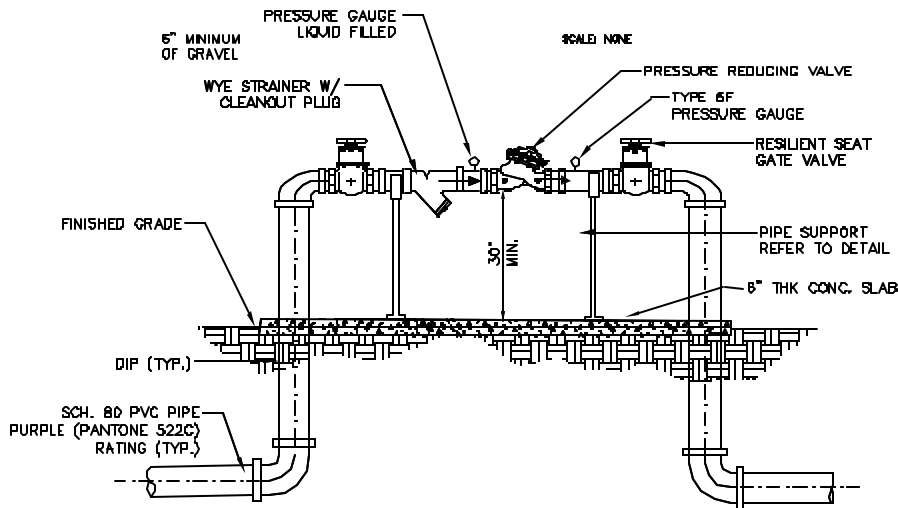
TYPICAL RESIDENTIAL UTILITY LAYOUT
SINGLE SERVICE CONNECTIONS

R-02





MAINLINE CONNECTION DETAIL



ABOVE GROUND ASSEMBLY DETAIL

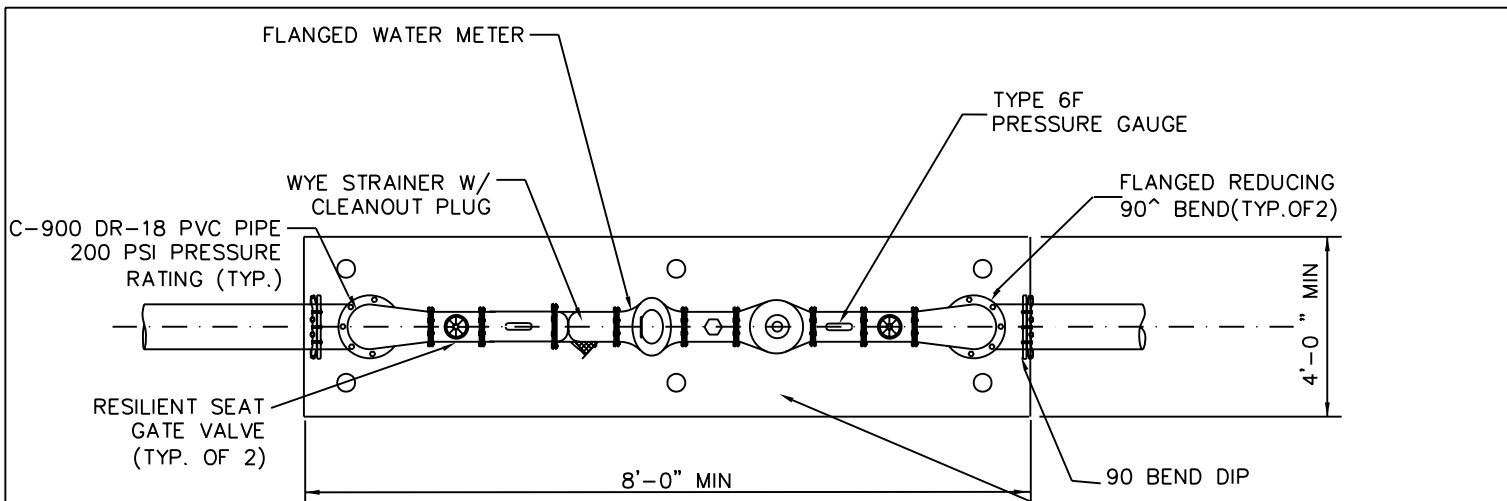
NOTES:

1. Saddle to be made with 24" x 3" flanged "SPLIT-TEE" design saddle w/ s.s.(304) construction. (Strap saddles not permitted)
2. Minimum of 3" tapping valve with resilient wedge / seat design.
3. Valve will have a standard 2" square actuator nut and valve access riser
4. Meter, Meterbox & installation will be supplied by Orlando Utilities Commission, with developer / owner paying initial cost for meter installation and account set-up, all other devices to be purchased and installed by Owner / developer.
5. All necessary applications, permits, & contracts with Office of Legal Affairs must be completed as well as having an inspection of the irrigation system, Prior to delivery of reclaim water product. Subsequent to annual Inspections thereafter.
6. Piping from mainline to meter installation to be 90 degrees for locating purposes.
7. Caution tape to be buried 12"- 18" above utilities.
8. All above ground assemblies shall be painted with pantone 522c color paint.

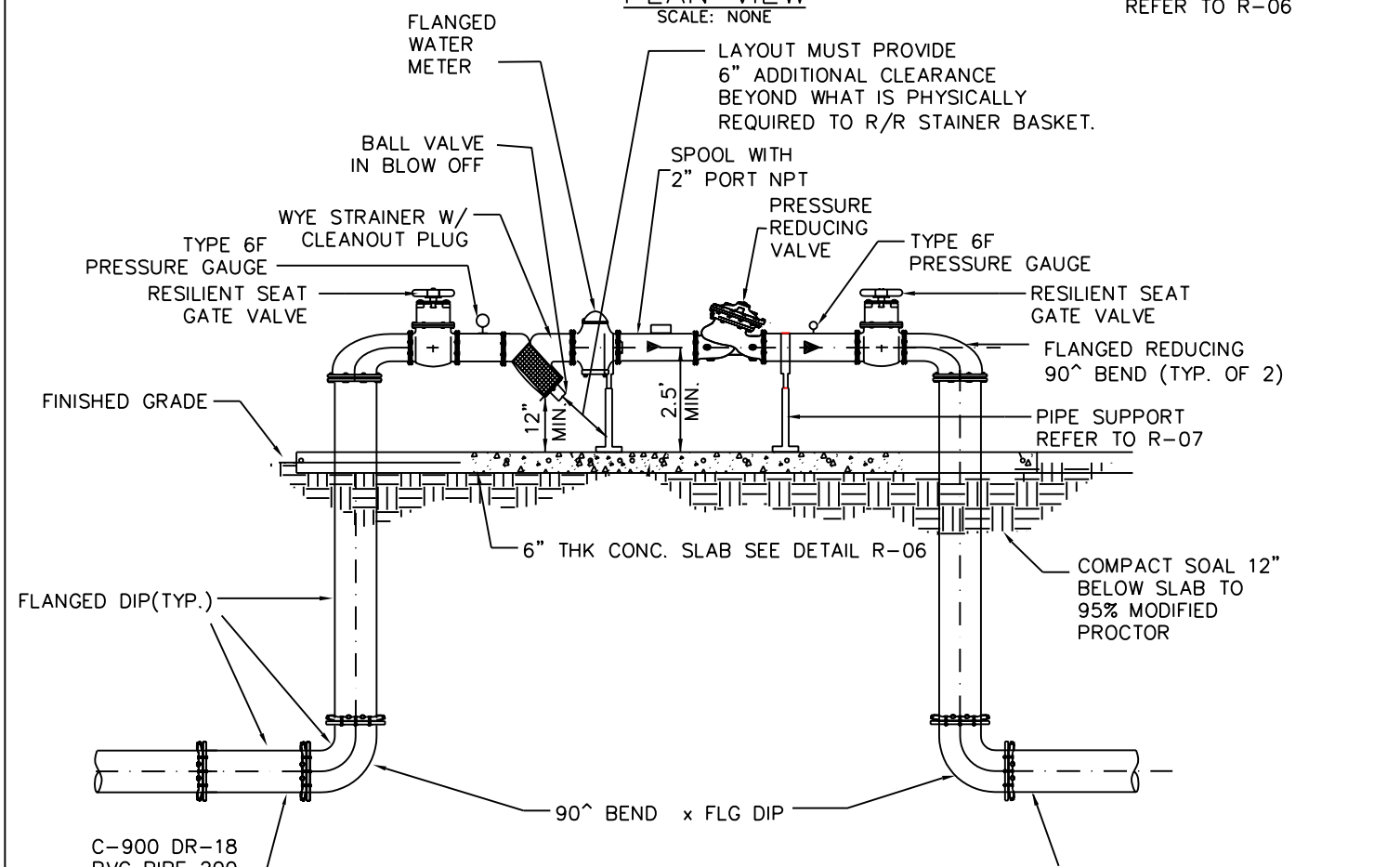


COMMERCIAL ABOVE GROUND
RECLAIM WATER METER
INSTALLATION DETAIL FOR 2"

R-04



PLAN VIEW
SCALE: NONE



PROFILE VIEW
SCALE: NONE

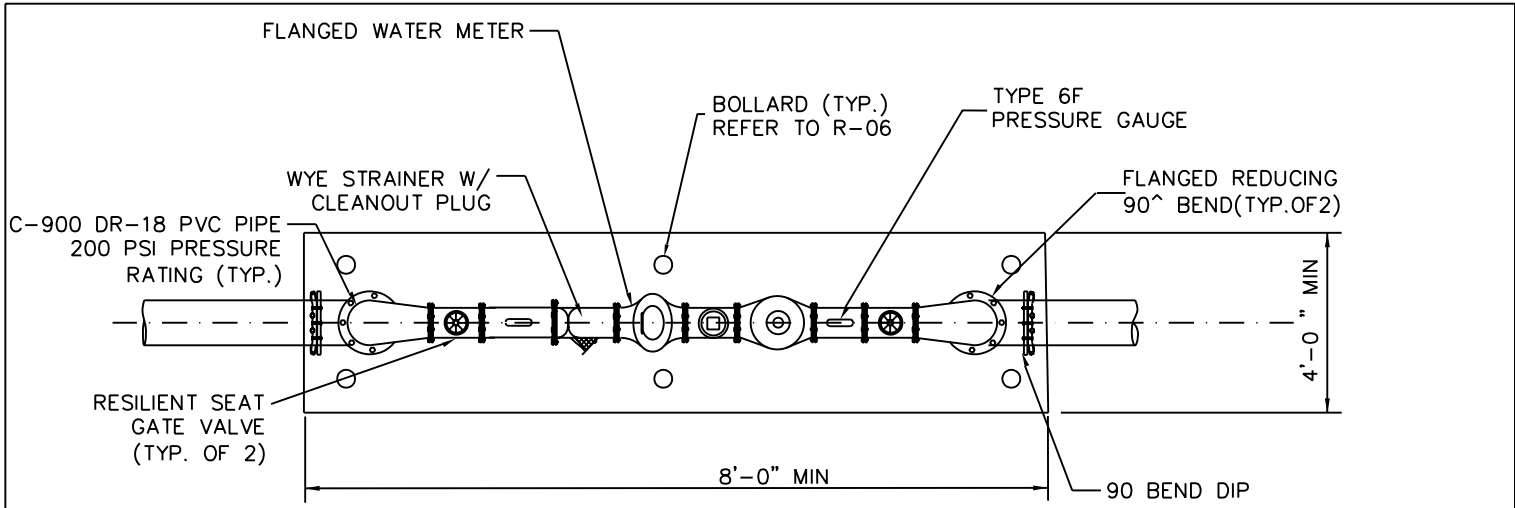
NOTES:

1. PIPE 3" AND LARGER SHALL BE FLANGED DIP WITH A MINIMUM RATING OF 200 PSI.
2. ABOVE GROUND PIPE SHALL BE PAINTED WITH TWO COATS OF PANTONE 522C CARBOLINE CARBOTHANE 134 HB, OR APPROVED EQUAL.
3. SPOOLS 3" AND LARGER ARE TO BE A MIN OF 12" LOHG.

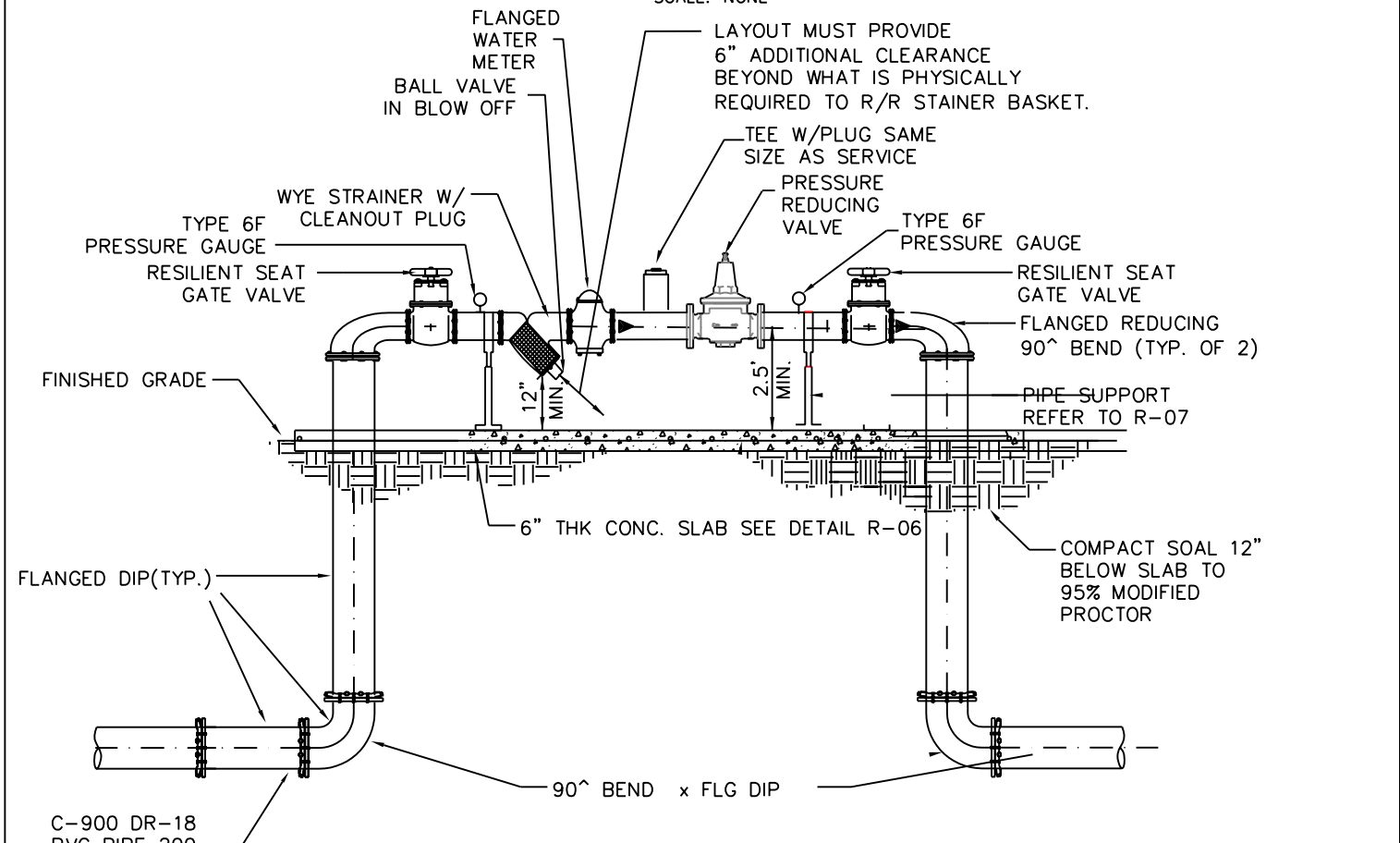


**COMMERCIAL SERVICE CONNECTION
ABOVE-GRADE 3" AND LARGER**

R-05



PLAN VIEW
SCALE: NONE



PROFILE VIEW
SCALE: NONE

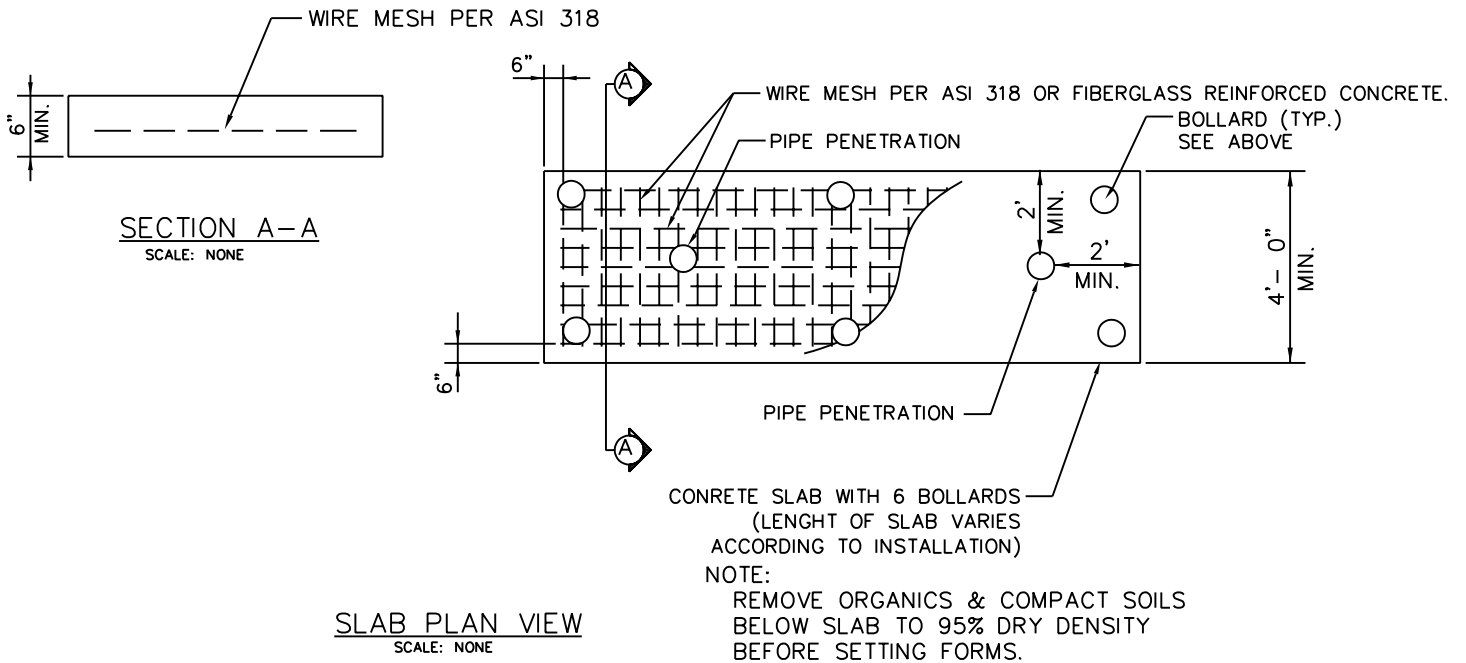
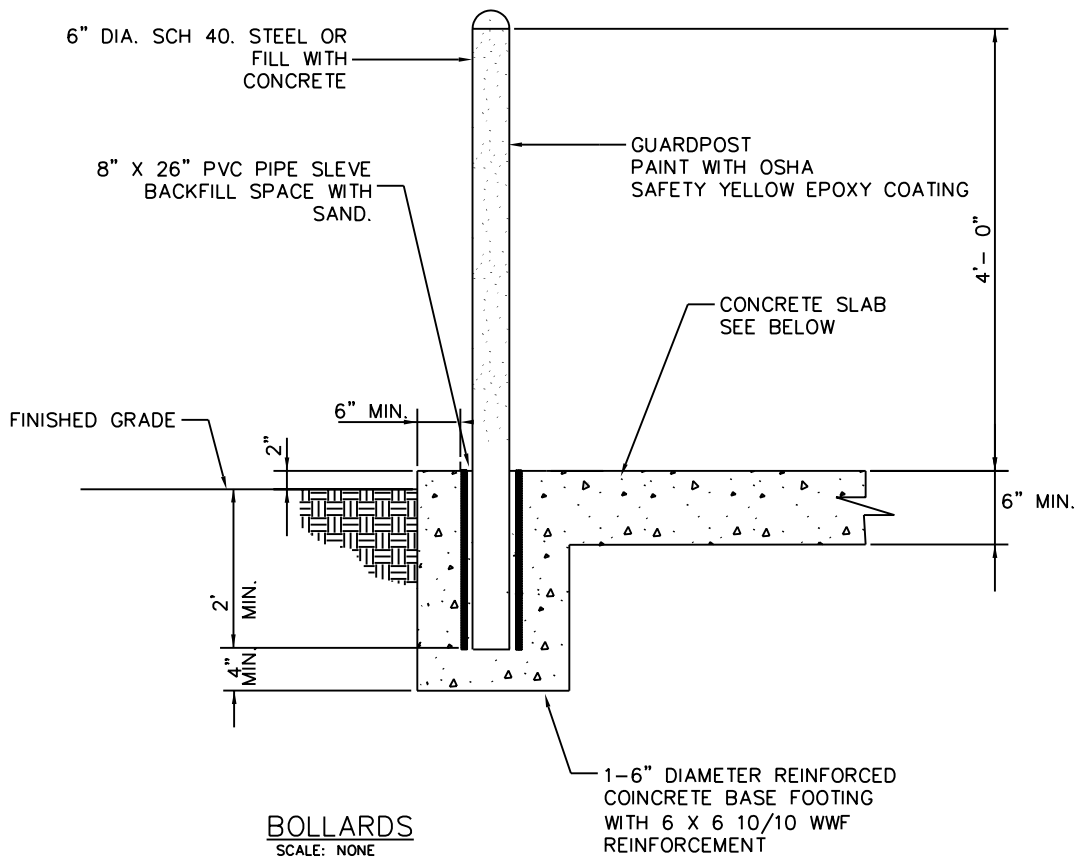
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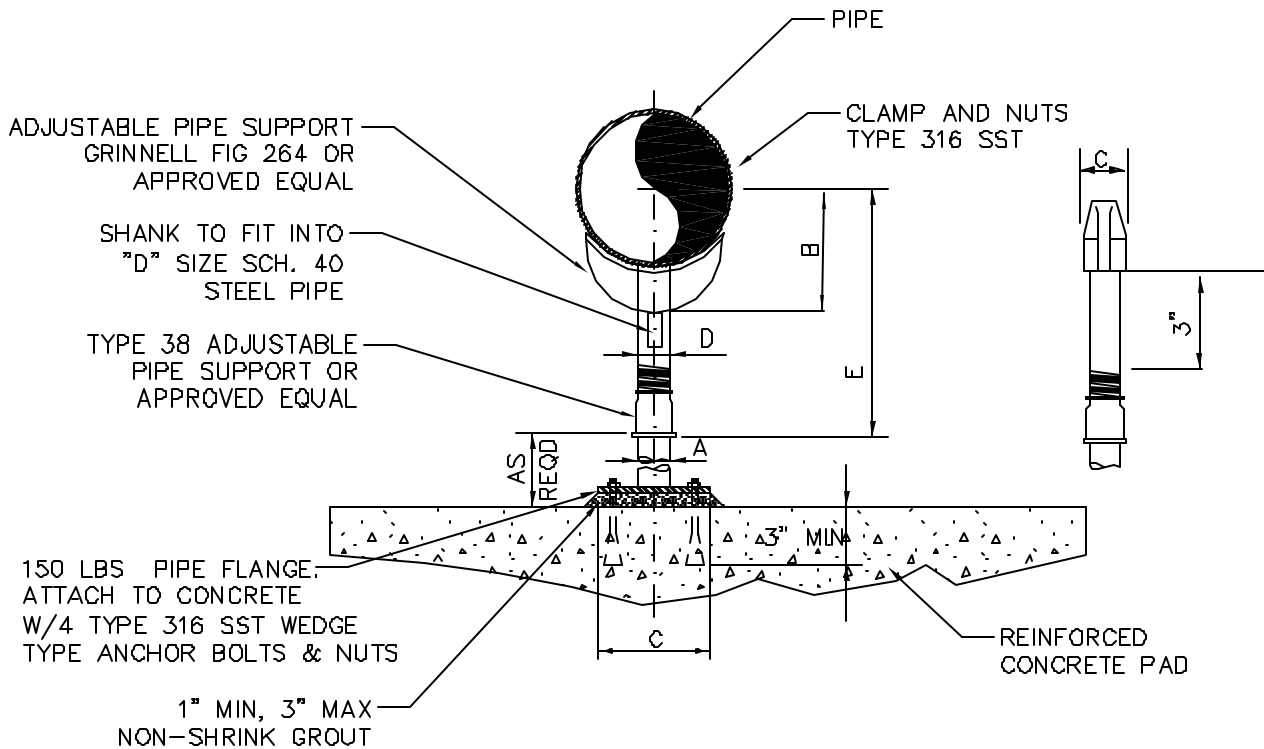
1. ABOVE GROUND PIPE SHALL BE PAINTED WITH TWO COATS OF PANTONE 522C CARBOLINE CARBOTHANE 134 HB, OR APPROVED EQUAL.



**COMMERCIAL SERVICE CONNECTION
ABOVE-GRADE 2" OR SMALLER**

R-05A





PROFILE
SCALE: NONE

NOTES:

1. ALL MATERIALS OF CONSTRUCTION SHALL BE 304 OR 316 STAINLESS STEEL.
2. MASON TYPE "W" OR KORFUND KORPAD 40, UNDER SUPPORT FOOT WHEN PIPING IS TO BE ISOLATED OR FIRST SUPPORT ADJACENT TO MECHANICAL EQUIPMENT.
3. FOR BASE, HEIGHT, AND FLANGE DIMENSION, REFER TO TABLE.
4. PIPE SUPPORTS NOT REQUIRED FOR 2" & SMALLER WITH LESS THAN 4' SPAN BETWEEN INLET & OUTLET PIPES.

Fig 264: Loads (lbs) * Weight (lbs) * Dimensions (in)

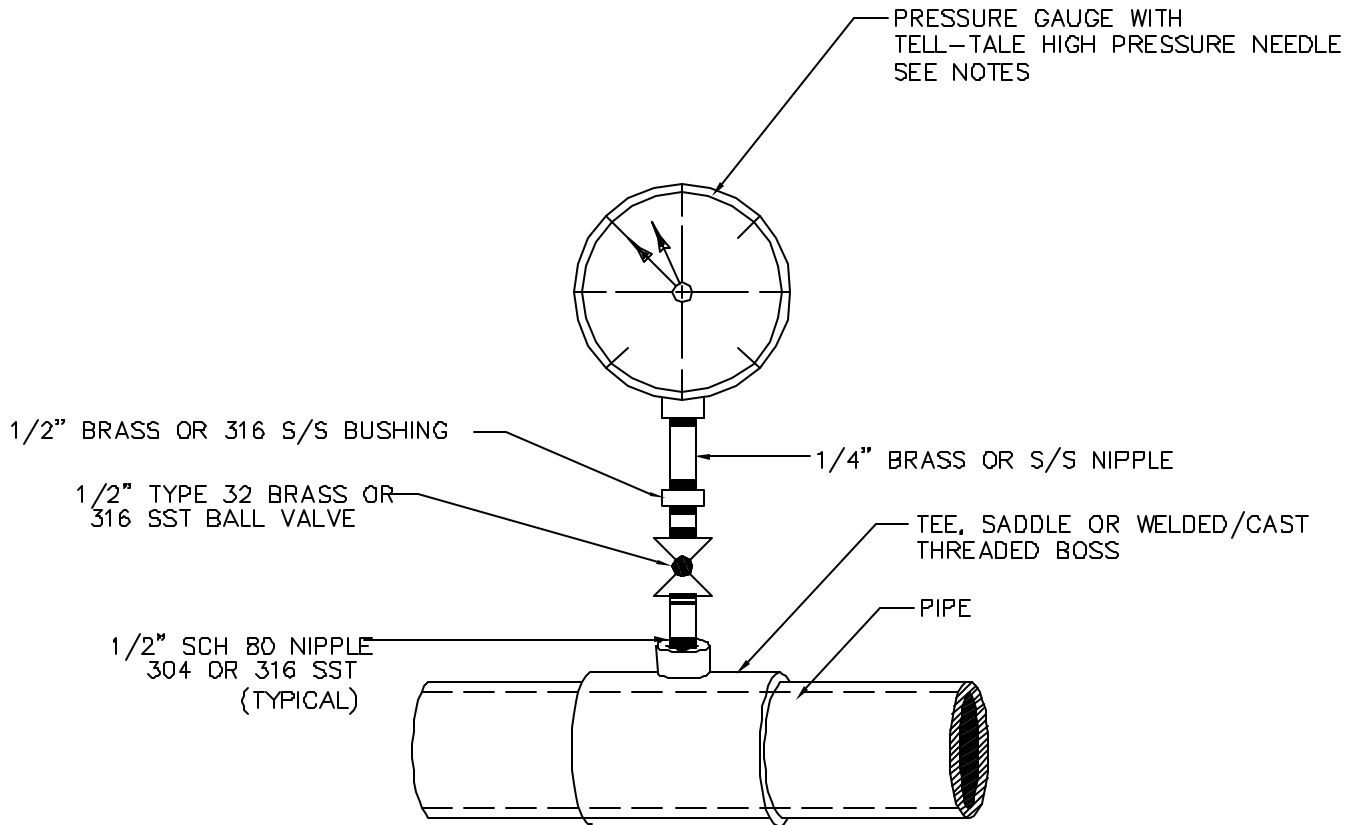
Pipe Size	Weight		A	B	D	E		Width C
	Complete	Saddle Only				Min	Max	
2.5	9.0	4.8	2.5	3.5	1.5	8	13	3
3	9.2	5.0		3.75		8.25	13.25	
3.5	9.4	5.2		4		8.5	13.5	
4	15.0	7.6	3	4.25	2.5	9.25	14	3.625
5	16.7	8.3		8.875		10	14.75	
6	17.7	10.3		5.5		10.5	15.25	
8	20.2	12.8		6.875		11.75	16.5	
10	25.2	17.8		8.5		13.5	18.25	
12	29.0	21.6		9.9375		15	19.75	
14	40.2	38.0	4	10.9375	3	16.25	20.75	4.625
16	53.2	42.0		12.375		17.75	22.25	
18	70.8	51.0		13.875		19.5	24	
20	104.8	85.0	6	15.375	3.5	21	25.5	6.75
24	137.0	110.0		17.9375		23.75	28.25	
30	170.0	150.0		21.3125		27	31.5	
32	181.0	161.1		22.5		28.25	32.75	
36	249.0	229.0	6	24.5	4	30.25	34.75	8.75

* The special cast iron reducer may be furnished with a hexed shaped smaller end.



PIPE SUPPORTS

R-07



NOTES:

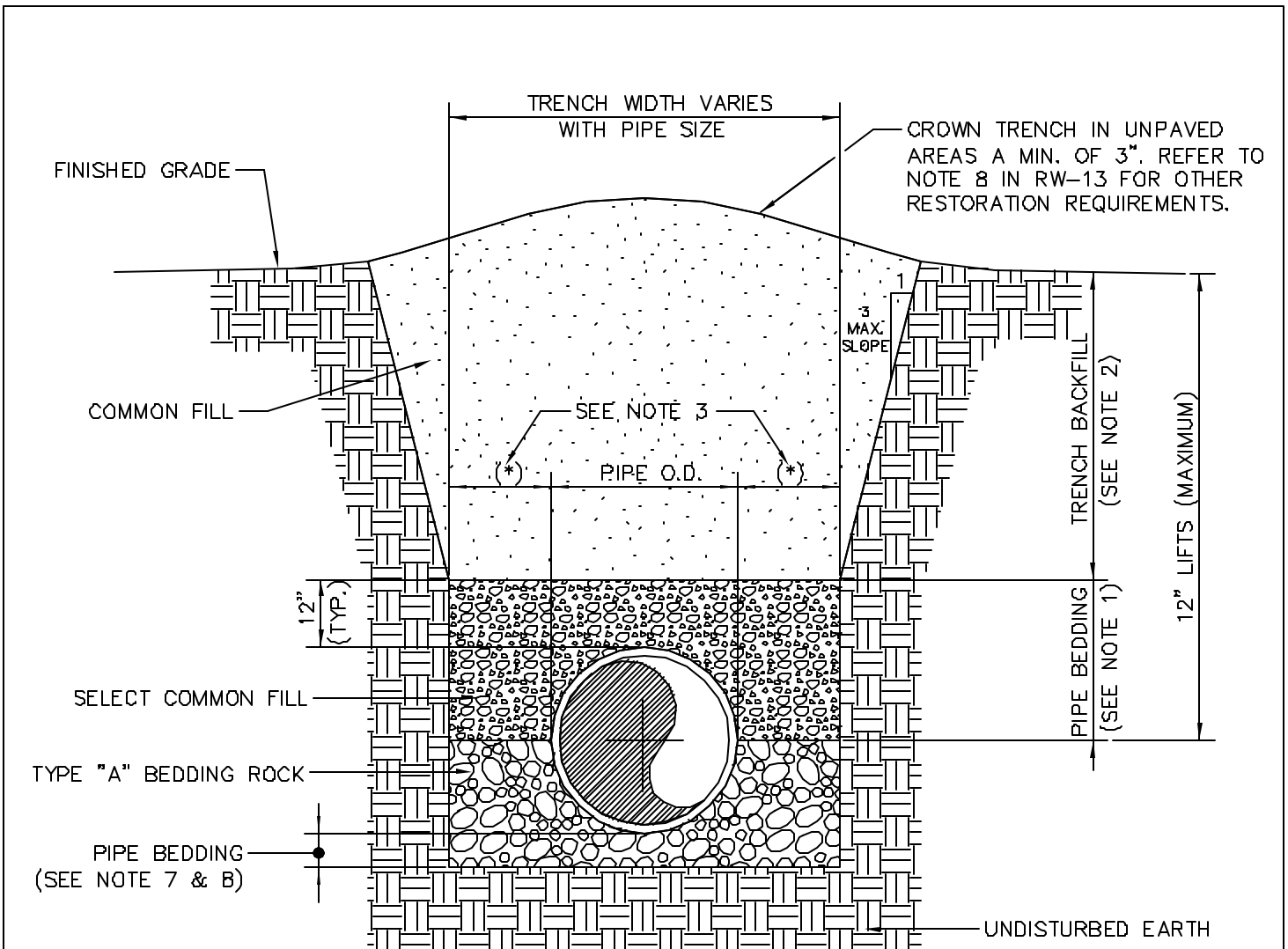
1. USE 2.5" DIA. S/S LIQUID FILLED WEATHER PROOF (PSI RANGE 0 - 160) PRESSURE GAUGES FOR PIPE SIZES LESS THAN 4" DIAMETER W/ MAXIMUM POINTER NEEDLE & 1/4" NPT LOWER MOUNT
2. USE 4.5" DIA. S/S LIQUID FILLED WEATHER PROOF PRESSURE GAUGES FOR PIPE SIZES 4" DIAMETER OR GREATER. W/ MAXIMUM POINTER NEEDLE & 1/2" NPT LOWER MOUNT.

PROFILE
SCALE: NONE



PRESSURE GAUGE INSTALLATION

R-08



NOTES:

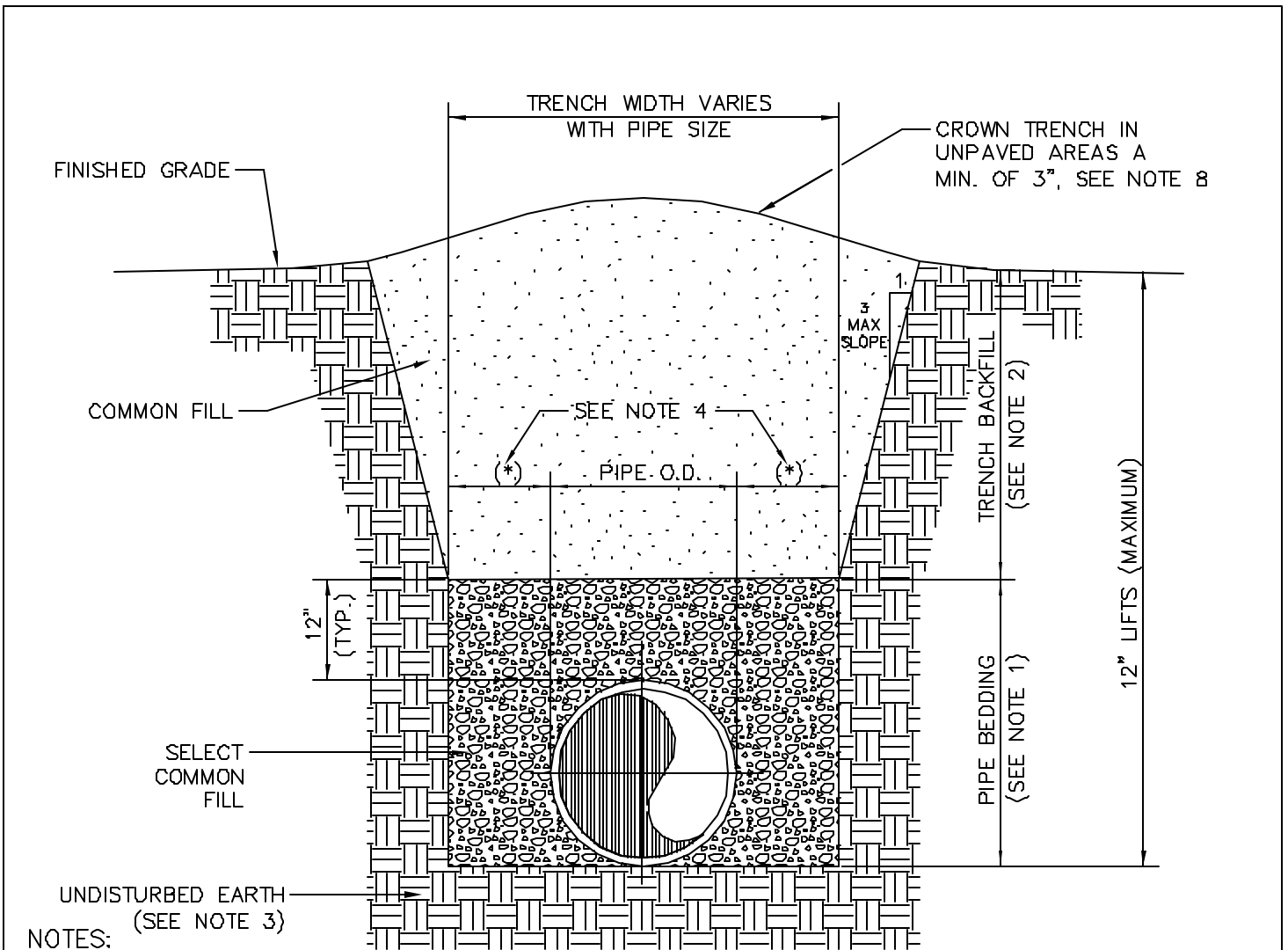
1. PIPE BEDDING: SELECT COMMON FILL ABOVE PIPE HAUNCHING SHALL BE COMPACTED TO MIN 95 % OF THE MAXIMUM DENSITY PER AASHTO T-180.
2. TRENCH BACKFILL: COMMON FILL SHALL BE COMPACTED TO MIN. 95% OF THE MAXIMUM DENSITY PER AASHTO T-180.
3. AN ASTERISK (*) INDICATES 15" MAXIMUM FOR A PIPE DIAMETER LESS THAN 24", AND 24" MAXIMUM FOR A PIPE DIAMETER 24" AND LARGER.
4. WATER SHALL NOT BE PERMITTED IN THE TRENCH DURING CONSTRUCTION.
5. PIPE SHALL BE INSTALLED WITH THE BELL FACING UPSTREAM IN THE DIRECTION OF FLOW.
6. TRENCH WALLS SHALL BE SHEETED IN AREAS WHERE SIDE SLOPES WOULD INTERFERE WITH EXISTING UTILITIES IMPROVEMENTS, OR EXTEND BEYOND THE EASEMENT OR RIGHT-OF-WAY LIMITS. EXCAVATION AND SHEETING AND BRACING SHALL BE DONE IN ACCORDANCE WITH THE TRENCH SAFETY ACT, AS AMENDED, (90-96 OF THE FLORIDA STATUTES) AND THE LATEST EDITION OF THE FDOT CONSTRUCTION MANUAL.
7. BEDDING ROCK DEPTH SHALL BE 4" MINIMUM FOR A PIPE DIAMETER LESS THAN 15", AND 6" MINIMUM FOR A PIPE DIAMETER 16" AND LARGER.
8. DEPTH OF REMOVAL FOR UNSUITABLE MATERIAL SHALL GOVERN THE DEPTH OF BEDDING ROCK BENEATH THE PIPE. UNSUITABLE MATERIAL SHALL BE REMOVED UNTIL A SUITABLE FOUNDATION IS ACHIEVED.

SCALE: NONE



TRENCHING WITH TYPE A BEDDING

R-09



NOTES:

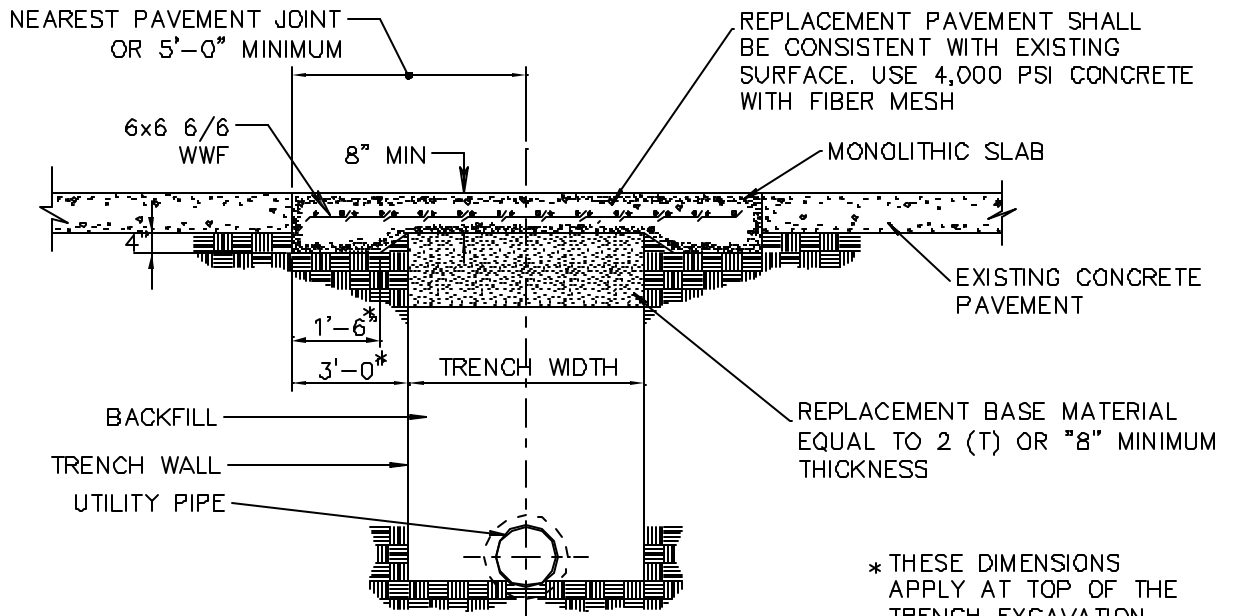
1. PIPE BEDDING: SELECT COMMON FILL ABOVE PIPE HAUNCHING SHALL BE COMPACTED TO MIN. 95% OF THE MAXIMUM DENSITY PER AASHTO T-180.
2. TRENCH BACKFILL: COMMON FILL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY PER AASHTO T-180.
3. PIPE BEDDING UTILIZING SELECT COMMON FILL MAY REQUIRE TYPE A BEDDING ROCK IN ACCORDANCE WITH RW-09
4. AN ASTERISK (*) INDICATES 15" MAXIMUM FOR PIPE A DIAMETER LESS THAN 24"; AND 24" MAXIMUM FOR A PIPE DIAMETER 24" AND LARGER.
5. WATER SHALL NOT BE PERMITTED IN THE TRENCH DURING CONSTRUCTION. MAINTAIN WATERLINE 2" BELOW TRENCH BOX.
6. PIPE SHALL BE INSTALLED WITH THE BELL FACING UPSTREAM WITH THE DIRECTION OF FLOW.
7. TRENCH WALLS SHALL BE SHEETED IN AREAS WHERE SIDE SLOPES WOULD INTERFERE WITH EXISTING UTILITIES IMPROVEMENTS, OR EXTEND BEYOND THE EASEMENT OR RIGHT-OF-WAY LIMITS. EXCAVATION AND SHEETING AND BRACING SHALL BE DONE IN ACCORDANCE WITH THE TRENCH SAFETY ACT, AS AMENDED, (90-96 OF THE FLORIDA STATUTES) AND THE LATEST EDITION OF THE FDOT CONSTRUCTION MANUAL.
8. SITE RESTORATION SHALL COMPLY WITH APPLICABLE RIGHT-OF-WAY UTILIZATION REGULATIONS AND ROAD CONSTRUCTION SPECIFICATIONS. DISTURBED AREAS THAT ARE CREATED BY CONSTRUCTION SHALL BE RESTORED TO, OR BETTER THAN, PRE-EXISTING SITE CONDITIONS.

SCALE: NONE



TRENCHING WITH TYPE B BEDDING

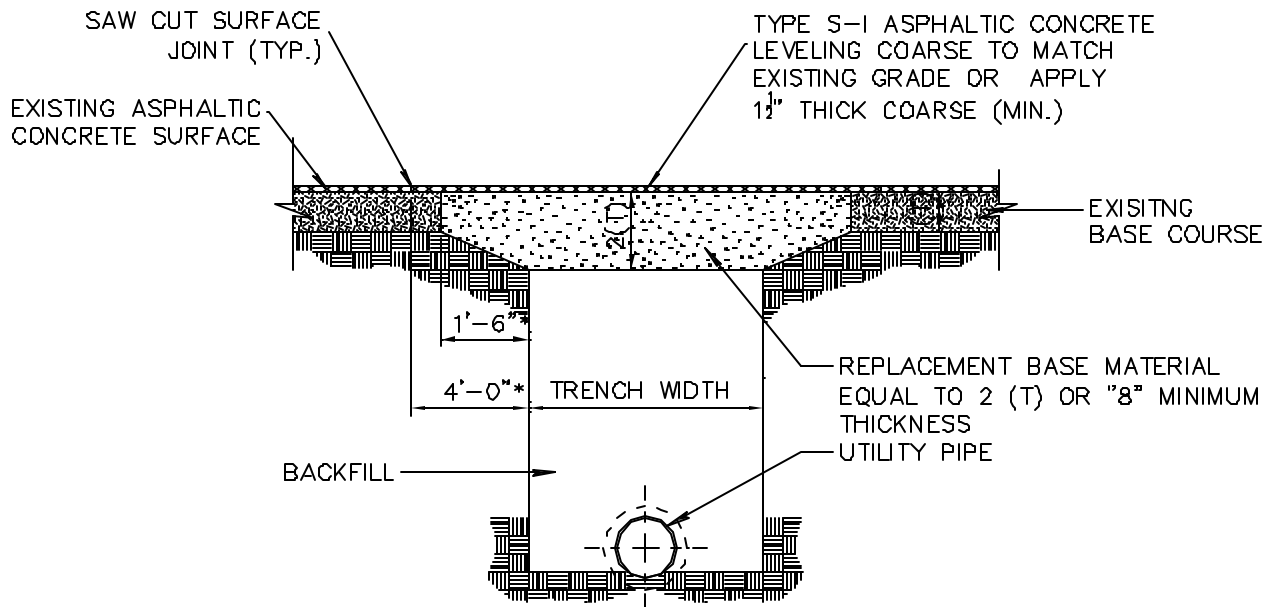
R-10



* THESE DIMENSIONS APPLY AT TOP OF THE TRENCH EXCAVATION. TRENCH WIDTH VARIES WITH PIPE SIZE.

CONCRETE SURFACES

SCALE: NONE



ASPHALT SURFACES

SCALE: NONE

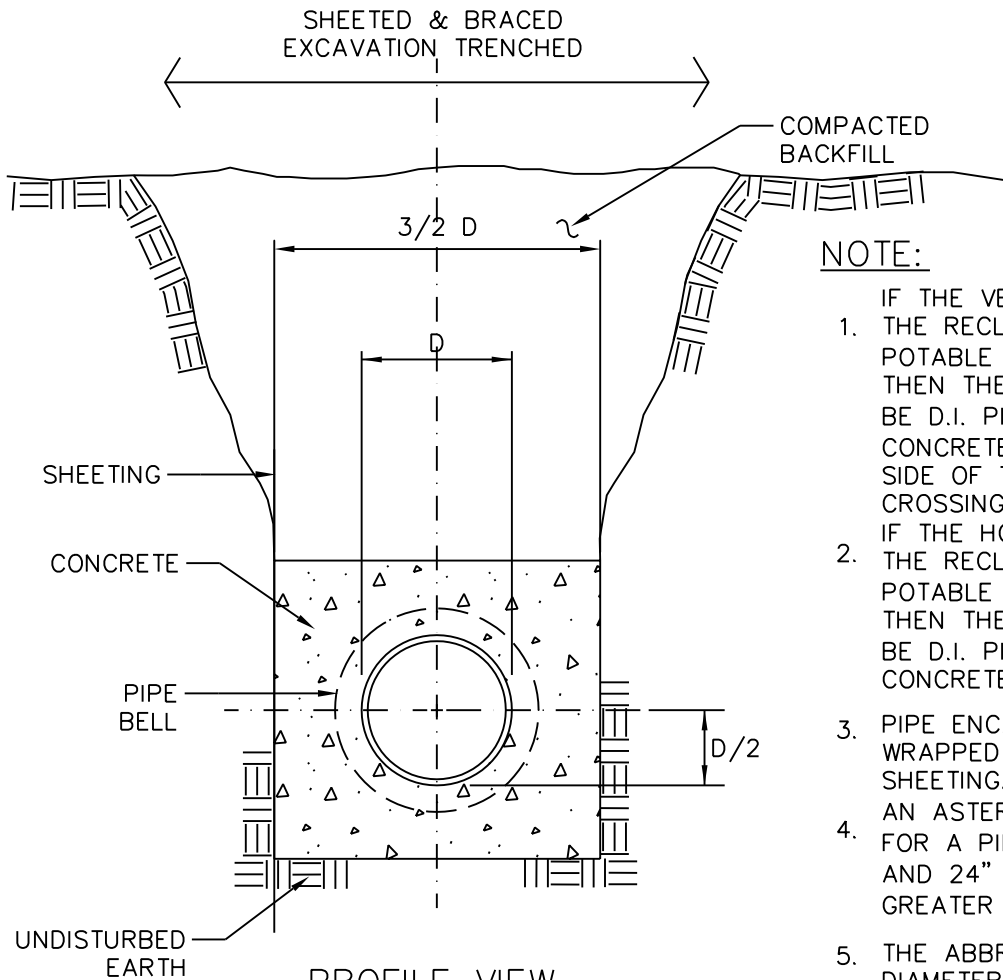
NOTES:

1. PUBLIC ROADS AND PAVED DRIVE CROSSINGS SHALL BE BACK-FILLED WITH GRANULAR MATERIAL AND TOPPED WITH 12" THICK OF LIME ROCK BASE COURSE MATERIAL. BACKFILL SHALL BE COMPACTED TO MIN 98% MODIFIED PROCTOR OF THE MINIMUM DRY DENSITY PER AASHTO T-801, OR ASTM D1557. REFER TO RW-12 FOR TYPE A BEDDING AND RW-13 FOR TYPE B BEDDING.
2. TRENCH WALLS SHALL BE SHEETED IN AREAS WHERE SIDE SLOPES WOULD INTERFERE WITH EXISTING UTILITIES IMPROVEMENTS, OR EXTEND BEYOND THE EASEMENT OR RIGHT-OF-WAY LIMITS.
3. EXCAVATION AND SHEETING AND BRACING SHALL COMPLY WITH THE TRENCH SAFETY ACT, AS AMENDED, (90-96 OF THE FLORIDA STATUTES) AND THE LATEST EDITION OF THE FDOT CONSTRUCTION MANUAL.
4. PAVEMENT AREAS SHALL BE RESTORED AND SHALL MATCH EXISTING GRADE. THE ENTIRE ROADWAY SECTION SHALL BE RESURFACED IF THE LONGITUDINAL CUT EXCEEDS 50% OF THE WIDTH OF THE ROADWAY.



TRENCHING IN PAVED AREAS

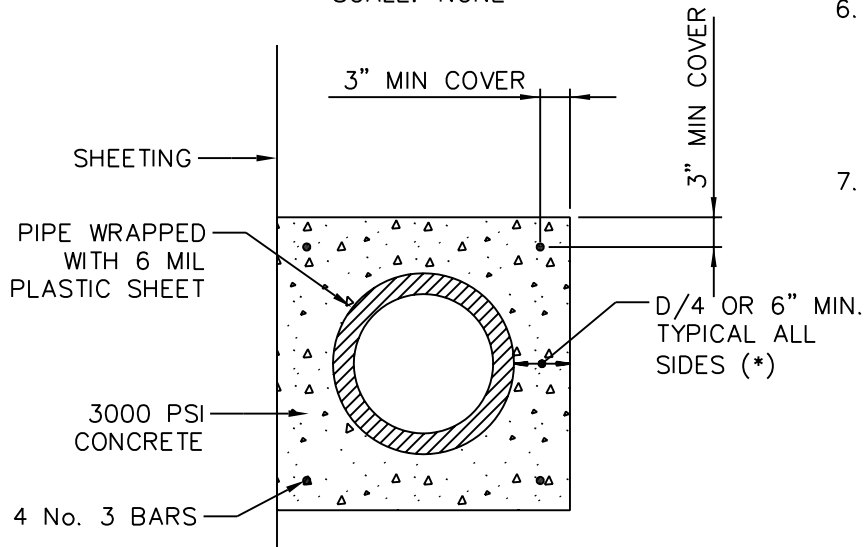
R-11



PROFILE VIEW
SCALE: NONE

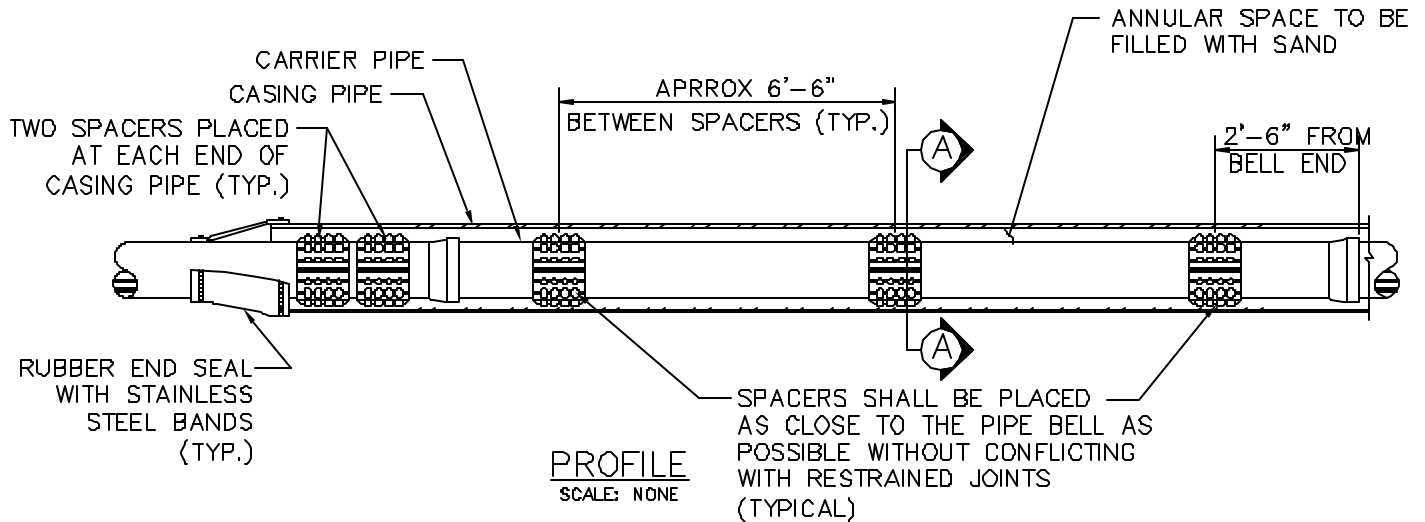
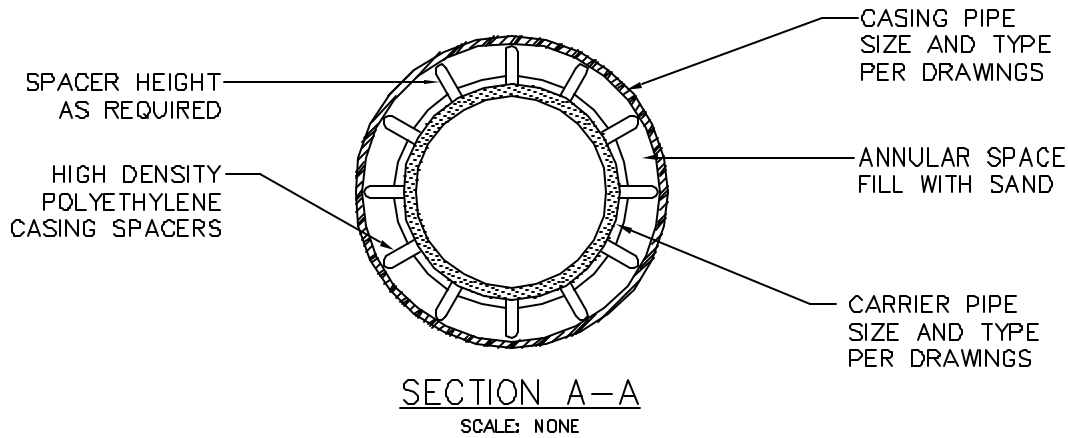
NOTE:

1. IF THE VERTICAL SEPARATION BETWEEN THE RECLAIMED WATER MAIN AND THE A POTABLE WATER MAIN, IS LESS THAN 12", THEN THE RECLAIMED WATER MAIN SHALL BE D.I. PIPE OR ENCASED IN 6" OF CONCRETE FOR A DISTANCE OF 10' EACH SIDE OF THE POTABLE WATER MAIN CROSSING.
2. IF THE HORIZONTAL SEPARATION BETWEEN THE RECLAIMED WATER MAIN AND THE POTABLE WATER MAIN IS LESS THAN 3', THEN THE RECLAIMED WATER MAIN SHALL BE D.I. PIPE, OR ENCASED IN 6" OF CONCRETE.
3. PIPE ENCASED WITH CONCRETE SHALL BE WRAPPED WITH 6 MIL. THICK HDPE SHEETING.
4. AN ASTERISK (*) INDICATES 15" MAXIMUM FOR A PIPE DIAMETER LESS THAN 24", AND 24" MAXIMUM FOR A PIPE DIAMETER GREATER THAN 24".
5. THE ABBREVIATION "D" REFERS TO PIPE DIAMETER.
6. REFER TO THE LATEST EDITION OF THE FDOT CONSTRUCTION MANUALS OR THE TRENCH SAFETY ACT, AS AMENDED, (1990-1996 OF THE FLORIDA STATUTES) FOR SHEETING AND BRACING STANDARDS DURING EXCAVATION.
7. FORMS MAY BE USED LIEU OF SHEETING OR UNDISTURBED EARTH FOR CONCRETE PLACEMENT.



FULL CONCRETE ENCASEMENT
SCALE: NONE





NOTES:

1. CASING SPACERS SHALL BE USED TO SECURE THE CARRIER PIPE INSIDE OF THE ENCASEMENT/CASING PIPE BY PROVIDING SUPPORT AROUND THE PERIPHERY OF THE PIPE. SHOULD THE PIPE TWIST AS IT IS PUSHED THROUGH THE CASING, THEN THE SPACERS SHALL BE THE PROJECTION TYPE WITH THE MINIMUM NUMBER OF PROJECTION TYPE SPACERS EQUAL TO THE NUMBER OF DIAMETER INCHES. FOR EXAMPLE, 8" PIPE SHALL HAVE A MINIMUM OF 8 PROJECTIONS AND 18" PIPE SHALL HAVE A MINIMUM OF 18 PROJECTIONS.
2. THE MAXIMUM SPAN BETWEEN SPACERS SHALL BE 6.5 FEET TO PREVENT SAGGING OF THE CARRIER PIPE. THE SPAN BETWEEN SPACERS SHOULD RESULT IN CONSERVATIVE LONG TERM SAFETY FACTOR PROVIDED TOTAL LOAD PER SPACER DOES NOT EXCEED THE MAXIMUM LOAD FOR PIPE FULL OF LIQUID PER SPACER LISTED IN THE LITERATURE. SPACER SHALL HAVE MINIMUM HEIGHT THAT CLEARS THE PIPE BELL OR AS OTHERWISE INDICATED ON DRAWINGS. CASING SPACERS SHALL USE DOUBLE BACKED TAPE PROVIDED WITH THE SPACERS TO FASTEN TIGHTLY ONTO THE CARRIER PIPE SO THAT THE SPACERS DO NOT MOVE DURING INSTALLATION.
3. CASING SPACERS SHALL BE PROJECTION TYPE, NON-CORROSIVE SPACERS WHICH ARE COMPOSED OF PREFORMED SECTIONS OF HIGH DENSITY POLYETHYLENE. SPACERS SHALL BE ISO 9002 CERTIFIED FOR STRENGTH AND QUALITY. PROJECTION TYPE SPACERS SHALL BE RACI TYPE SPACERS AS MARKETING BY PUBLIC WORKS MARKETING, INC., P.O. BOX 38174, DALLAS, TEXAS, 75238-0174, PHONE 214-340-4226 OR 800-517-0395, OR APPROVED EQUAL.
4. CASING SPACERS SHALL BE USED FOR ALL BORE AND JACK & MICRO TUNNELING INSTALLATIONS.
5. RESTRAINED JOINTS NOT SHOWN FOR CLARITY.
6. IF THE MANUFACTURER'S RECOMMENDED SPACING IS MORE STRINGENT THAT THE SPACING REQUIREMENTS SHOWN ABOVE, THEN THE MANUFACTURER'S RECOMMENDED SPACING SHALL APPLY.
7. CASING PIPE ENDS SHALL BE SEALED WITH PWM MODEL II WITH A 1/8" THICK RUBBER WRAP AROUND AND SECURED WITH STAINLESS STEEL BANDS.
8. CASING SPACERS SHALL BE EVENLY SPACED ALONG PIPE LENGTH.

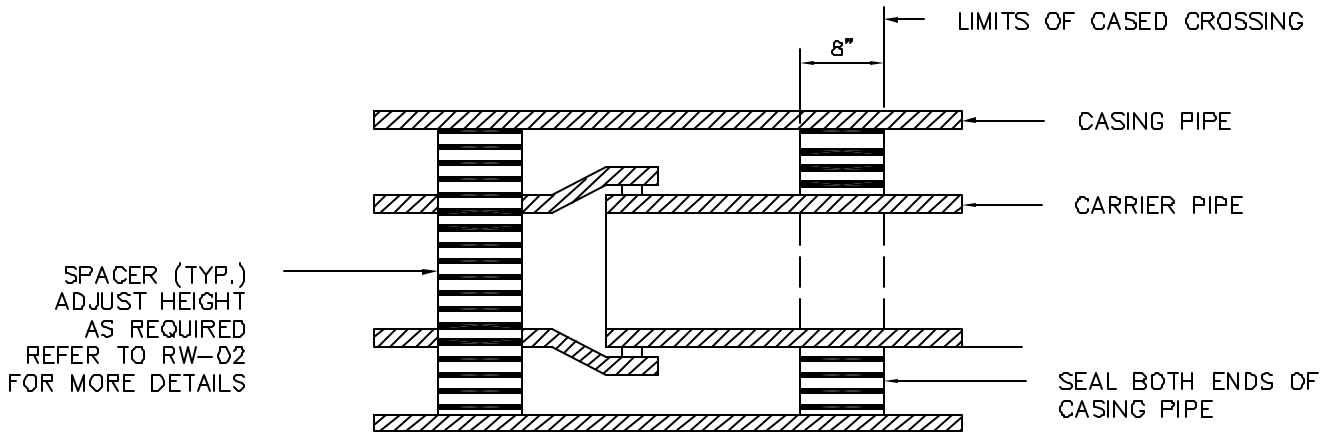


CASING PIPE SPACERS

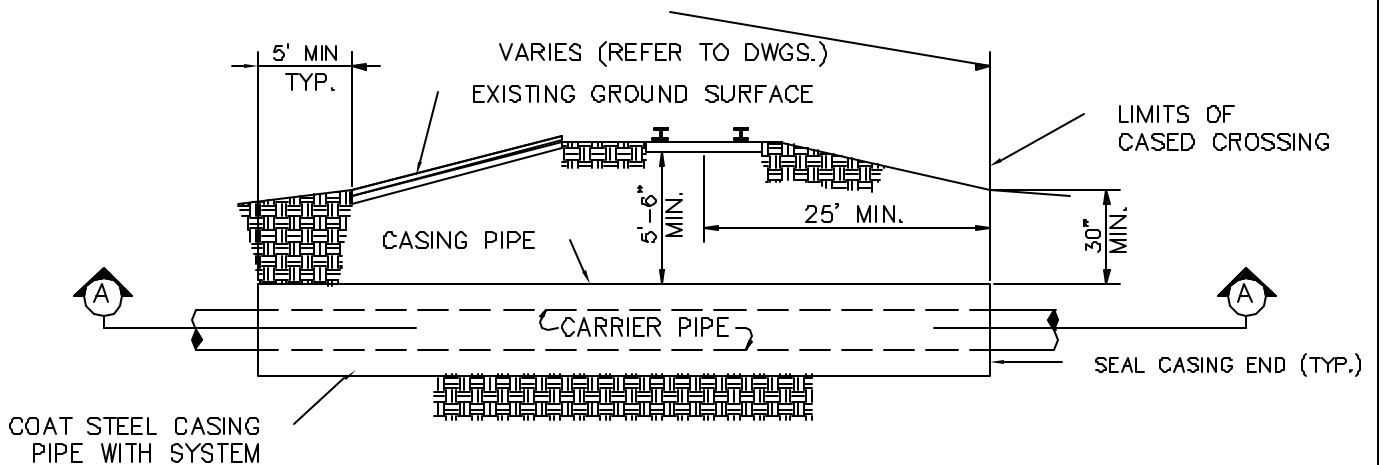
R-13

NOTE:

1. CARRIER PIPE SHALL BE SECURED WITH SPACERS.
2. CASING PIPE SHALL BE CARBON STEEL CYLINDERS CONFORMING WITH ASTM A 106, GRADE B. PIPE SHALL BE STANDARD WEIGHT PER ANSI B36.10. PIPE SHALL HAVE BEVELED ENDS CONFORMING WITH ANSI B16.25 FOR BUTT WELDING. FABRICATION SHALL COMPLY WITH ANSI B31.3, CHAPTER II. WELDS SHALL BE FULL PENETRATION AND FOLLOW THE PROCEDURE IN ASME BOILER AND PRESSURE VESSEL CODE.



SECTION A-A
SCALE: NONE

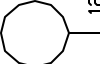
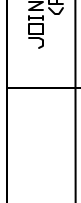
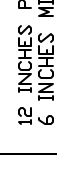
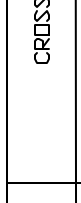




PROFILE
SCALE: NONE



CASING PIPE

LOCATION OF PUBLIC WATER SYSTEM MAIN IN ACCORDANCE WITH F.A.C. RULE 62-555.314

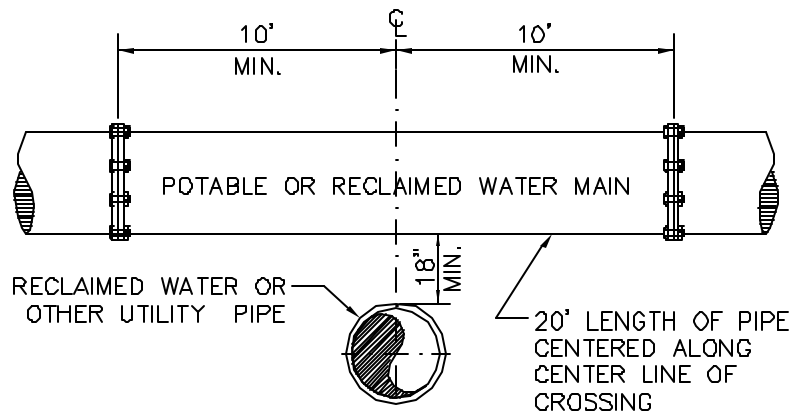
OTHER PIPE	HORIZONTAL SEPARATION	CROSSINGS (1)	JOINT SPACING @ CROSSINGS (FULL JOINT CENTERED)				
STORM SEWER STORMWATER FORCE MAIN RECLAIMED WATER (2)	<table border="1"> <tr> <td>WATER MAIN</td> <td>_____</td> </tr> <tr> <td>3 FT. MIN</td> <td>_____</td> </tr> </table>	WATER MAIN	_____	3 FT. MIN	_____	 <p>WATER MAIN</p> <p>12 INCHES IS THE MINIMUM, EXCEPT FOR STORM SEWER THEN 6 INCHES IS THE MINIMUM AND 12 INCHES IS PREFERRED</p>	 <p>ALTERNATE 3 FT. MINIMUM</p>
WATER MAIN	_____						
3 FT. MIN	_____						
VACUUM SANITARY SEWER	<table border="1"> <tr> <td>WATER MAIN</td> <td>_____</td> </tr> <tr> <td>10 FT. PREFERRED 3 FT. MIN</td> <td>_____</td> </tr> </table>	WATER MAIN	_____	10 FT. PREFERRED 3 FT. MIN	_____	 <p>WATER MAIN</p> <p>12 INCHES PREFERRED 6 INCHES MINIMUM</p>	 <p>ALTERNATE 3 FT. MINIMUM</p>
WATER MAIN	_____						
10 FT. PREFERRED 3 FT. MIN	_____						
GRAVITY OR PRESSURE SANITARY SEWER SANITARY SEWER FORCE MAIN RECLAIMED WATER (4)	<table border="1"> <tr> <td>WATER MAIN</td> <td>_____</td> </tr> <tr> <td>10 FT. PREFERRED 6 FT. MIN (3)</td> <td>_____</td> </tr> </table>	WATER MAIN	_____	10 FT. PREFERRED 6 FT. MIN (3)	_____	 <p>WATER MAIN</p> <p>12 INCHES IS THE MINIMUM, EXCEPT FOR STORM SEWER THEN 6 INCHES IS THE MINIMUM AND 12 INCHES IS PREFERRED</p>	 <p>ALTERNATE 6 FT. MINIMUM</p>
WATER MAIN	_____						
10 FT. PREFERRED 6 FT. MIN (3)	_____						
ON-SITE SEWAGE TREATMENT & DISPOSAL SYSTEM	10 FT. MIN						

(1) Water main should cross above other pipe. When water main must be below other pipe, the minimum separation is 12 inches.
 (2) Reclaimed water regulated under Part III of Chapter 62-610, F.A.C.
 (3) 3 ft. for gravity sanitary sewer where the bottom of the water main is laid at least 6 inches above the top of the gravity sanitary sewer.
 (4) Reclaimed water not regulated under Part III of Chapter 62-610, F.A.C.

Disclaimer- This document is provided for your convenience only. Please refer to F.A.C. Rule 62-555.314 for additional construction requirements.

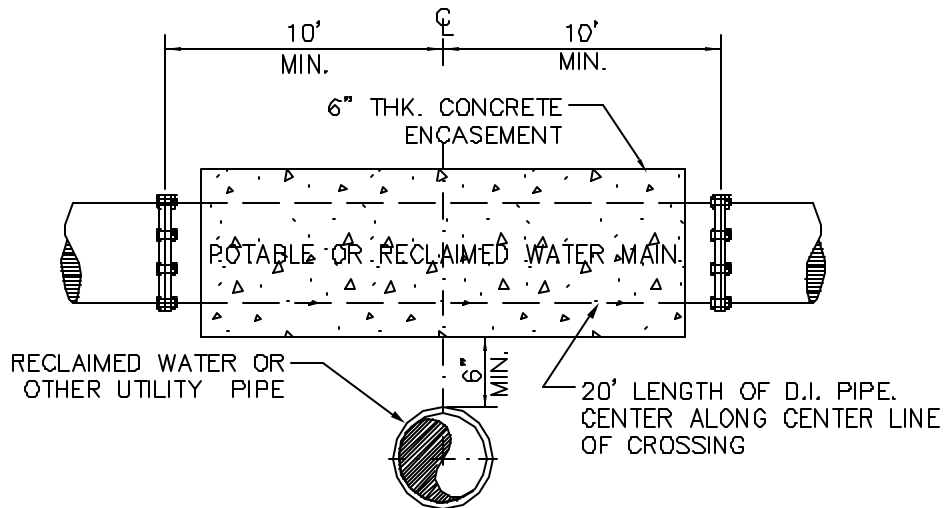


HORIZONTAL SEPARATION REQUIREMENTS
(F.A.C. Rule 62-555.314)



VERTICAL CLEARANCE @ 18" OR GREATER

SCALE: NONE



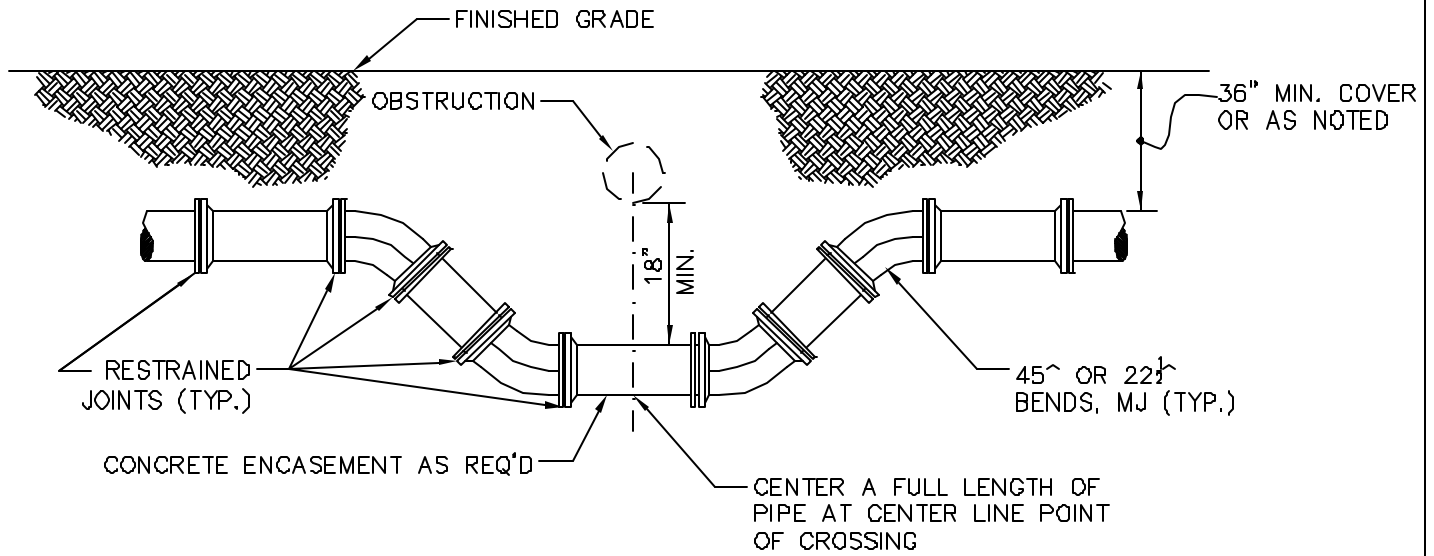
VERTICAL CLEARANCE @ LESS THAN 18"

SCALE: NONE

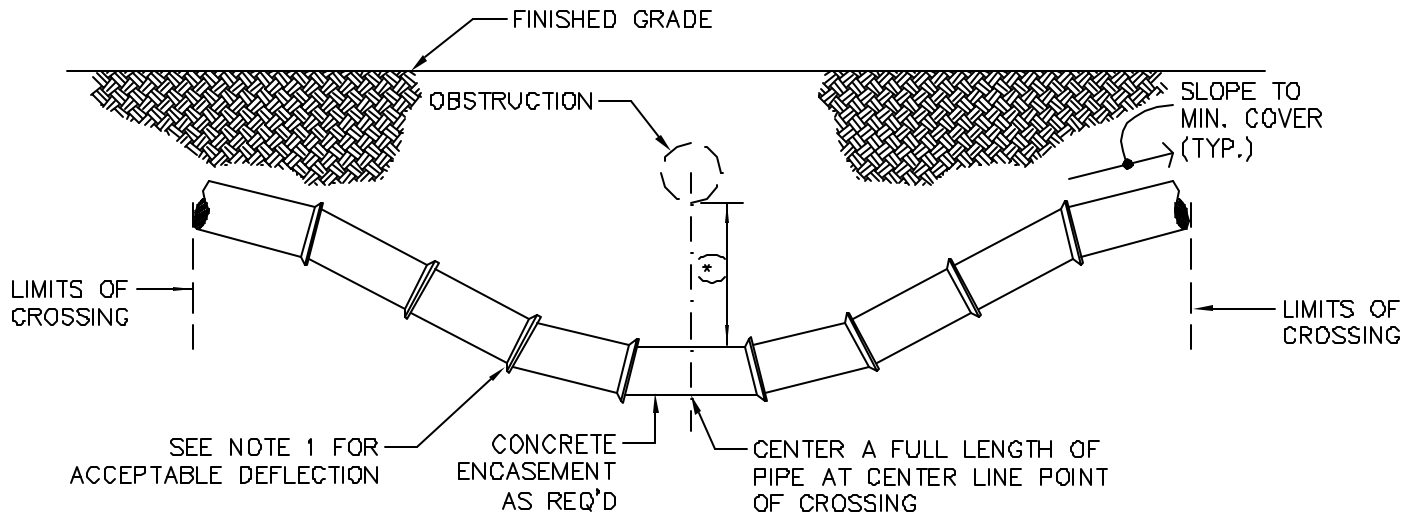
NOTES:

1. ALL JOINTS SHALL BE MECHANICALLY RESTRAINED WITHIN 20' OF EACH SIDE OF THE CROSSING.
2. DISTANCE BETWEEN JOINTS SHALL BE CENTERED AT POINT OF CROSSING.





FITTING TYPE
SCALE: NONE

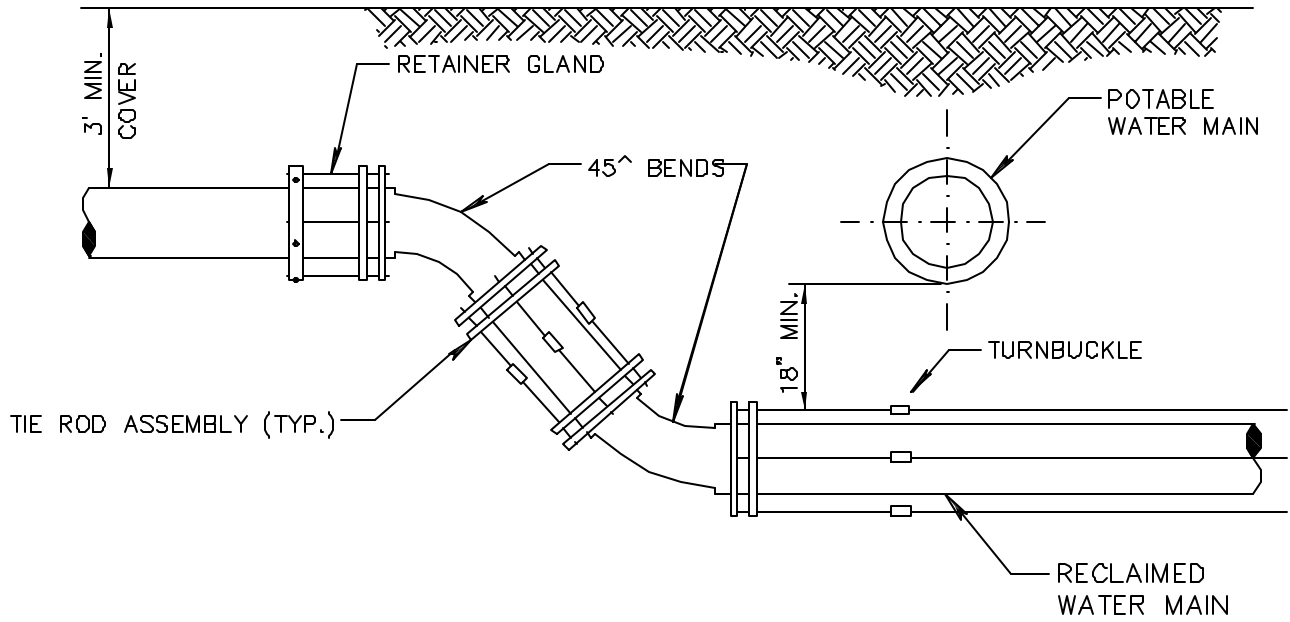


DEFLECTION TYPE
SCALE: NONE.

NOTES:

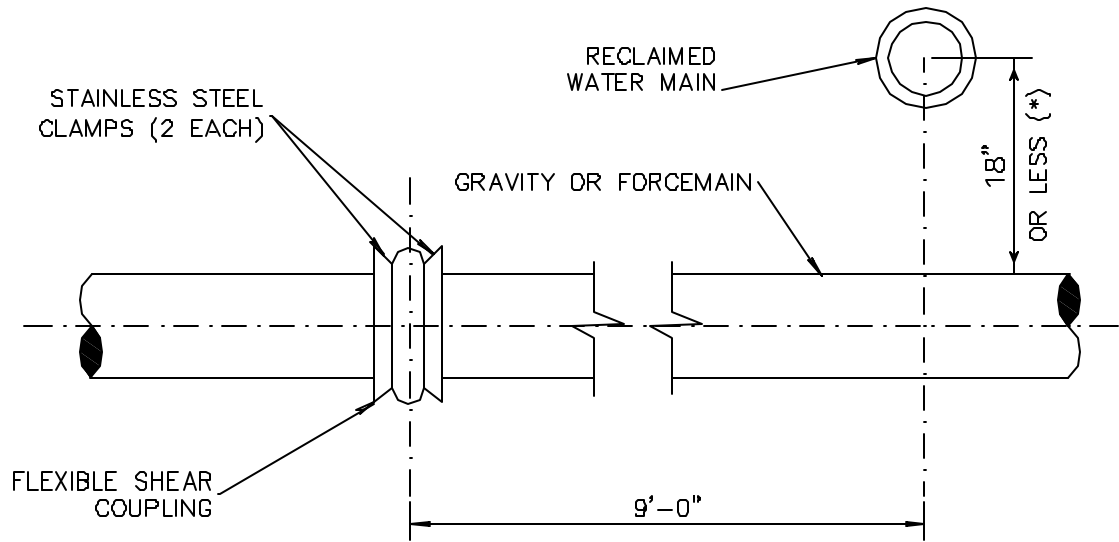
1. D.I.P. WITH MECHANICAL JOINTS OR CONCRETE ENCASEMENT SHALL BE REQUIRED IF MINIMUM CLEARANCE IS NOT ACHIEVABLE. REFER TO RW-06 FOR VERTICAL SEPARATION REQUIREMENTS.
2. THE DEFLECTION TYPE CROSSING SHALL BE USED WHENEVER POSSIBLE.
3. MAXIMUM JOINT DEFLECTION WITHIN THE LIMITS OF THE CROSSING SHALL NOT EXCEED 75% OF MANUFACTURER'S RECOMMENDED MAXIMUM ALLOWABLE AMOUNTS.
4. IF TIE RODS ARE USED FOR RESTRAINING, APPLY A MINIMUM OF TWO COATS COAL TRUE ENAMEL FOLLOWING ASSEMBLY.





WATER MAINS

SCALE: NONE



SEWER LINES

SCALE: NONE

(*) IF THE VERTICAL CLEARANCE IS LESS THAN 18", THEN THE PIPE SHALL BE DUCTILE IRON AND ENCASED WITH A MINIMUM OF 6" OF CONCRETE.



1" -90° SCH. 80 PVC
ELBOW (TYP.)

1" BRONZE TYPE 30
BALL VALVE W/ LEVER
HANDLE MxF 1 P.T. ENDS

COMPANION FLANGE (IF THREADED
PLUG VALVE IS USED)

1" AIR RELEASE VALVE
VALMATIC MODEL #38
OR APPROVED EQUAL

ALL PIPE FITTINGS TO BE 316
STAINLESS STEEL.
ALL PIPE NIPPLES
TO BE SCHEDULE 80
316 STAINLESS STEEL

CORE BORE FORCEMAIN AS
REQUIRED, INSTALL LINK SEAL
W/ 316 STAINLESS STEEL
HARDWARE BETWEEN PIPE AND
WALL

316 STAINLESS STEEL FULL BODY
FLANGED TAPPING SLEEVE WITH
MINIMUM 4" FLANGE
(OPTIONAL: FLANGED TEE WITH APPROVED LINING)

ELEVATION

SCALE: NONE



AIR RELEASE VALVE INSTALLATION ABOVE GRADE

R-19

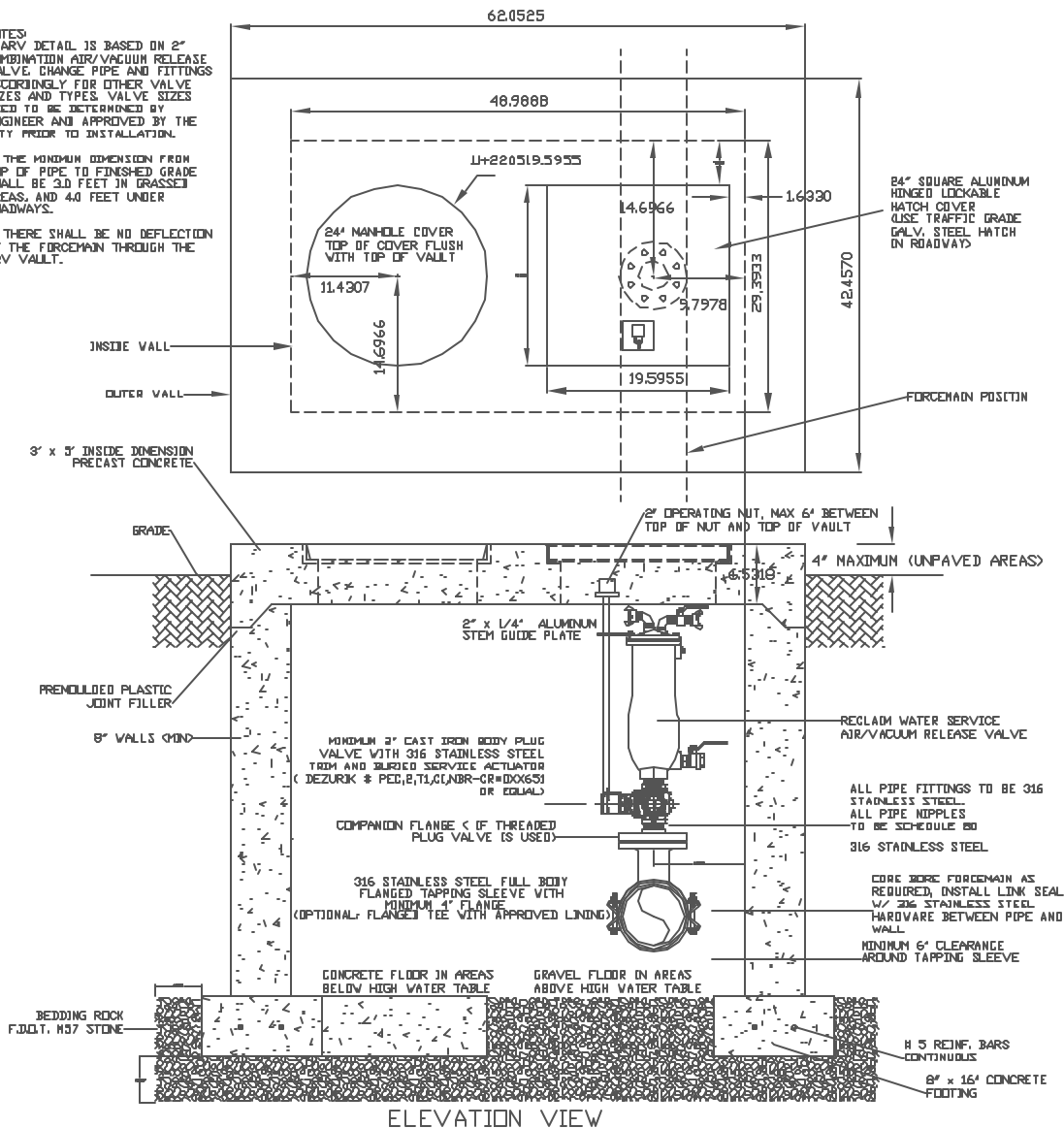
TOP VIEW

NOTES:

1. ARV DETAIL IS BASED ON 2" COMBINATION AIR/VACUUM RELEASE VALVE, CHANGE PIPE AND FITTINGS ACCORDINGLY FOR OTHER VALVE SIZES AND TYPES. VALVE SIZES NEED TO BE DETERMINED BY ENGINEER AND APPROVED BY THE CITY PRIOR TO INSTALLATION.

2. THE MINIMUM DIMENSION FROM TOP OF PIPE TO FINISHED GRADE SHALL BE 3.0 FEET IN GRASSY AREAS, AND 4.0 FEET UNDER ROADWAYS.

3. THERE SHALL BE NO DEFLECTION OF THE FORCEMAIN THROUGH THE ARV VAULT.



COMBINATION AIR & VACUUM RELEASE VALVE
N.T.S.

NOTES:

1. MANHOLE COVER SHALL BE LABELED "RECLAIMED WATER" AND SHALL COMPLY WITH H-20 FDOT STANDARDS DEPENDING ON THE APPLICATION.



COMBINATION AIR & VACUUM RELEASE VALVE

NOTES:

1. VALVE DETAILS ARE BASED ON 4" PLUG VALVE. CHANGE PIPE AND FITTINGS ACCORDINGLY FOR OTHER VALVE SIZES AND TYPES. VALVE SIZES TO BE DETERMINED BY ENGINEER AND APPROVED BY THE CITY PRIOR TO INSTALLATION.
2. THE MINIMUM DIMENSION FROM TOP OF PIPE TO FINISHED GRADE SHALL BE 3.0 FEET.
3. EXTENSION VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT FOR FUTURE USE FOR OTHER VALVE SIZES AND
4. 2" OPERATING NUT SHALL BE SET AT 6" BELOW GRADE AND APPROVED BY THE CITY PRIOR TO INSTALLATION.
5. INSTALL DRAINAGE ROCK TO A DEPTH OF 12" BELOW VALVE, UP TO A POINT 6" ABOVE THE BOTTOM OF VALVE BOX EXTENSION TUBE

SET COVER OF VALVE BOX AND CONCRETE PAD 1/4" BELOW GRADE IN PAVEMENT OR SHOULDER AND 2" ABOVE GRADE ELSEWHERE (TYP)

PROVIDE 2'-0" SQ X 6" THICK CONCRETE PAD

RECLAIM CAST IRON LID COLORED PANTONE 522C

FINISHED GRADE

COMPACT BACKFILL AROUND TOP SECTION

6" MIN

CAST IRON VALVE BOX TOP SECTION 15" LONG

EXTENSION ROD REQD W/ 2" OPERATING NUT 6" BELOW GRADE

5" CAST IRON SOIL PIPE EXTENSION LENGTH AS REQUIRED

VALVE ENDS AS SPECIFIED

GEAR OPERATOR

#5 REBAR, 2 REQD

DIA OF PIPE OR 12" MIN

LENGTH OF SUPPORT = VALVE LENGTH + 12"

#5 REBAR, 2 REQD

DIA OF

BURIED PLUG VALVE BOX SETTING

N. T. S.

PROVIDE 2'-0" SQ X 6" THICK CONCRETE PAD

RECLAIM CAST IRON LID COLORED PANTONE 522C

FINISHED GRADE

COMPACT BACKFILL AROUND TOP SECTION

6" MIN

CAST IRON VALVE BOX TOP SECTION 15" LONG

EXTENSION ROD REQD W/ 2" OPERATING NUT 6" BELOW GRADE

5" CAST IRON SOIL PIPE EXTENSION LENGTH AS REQUIRED

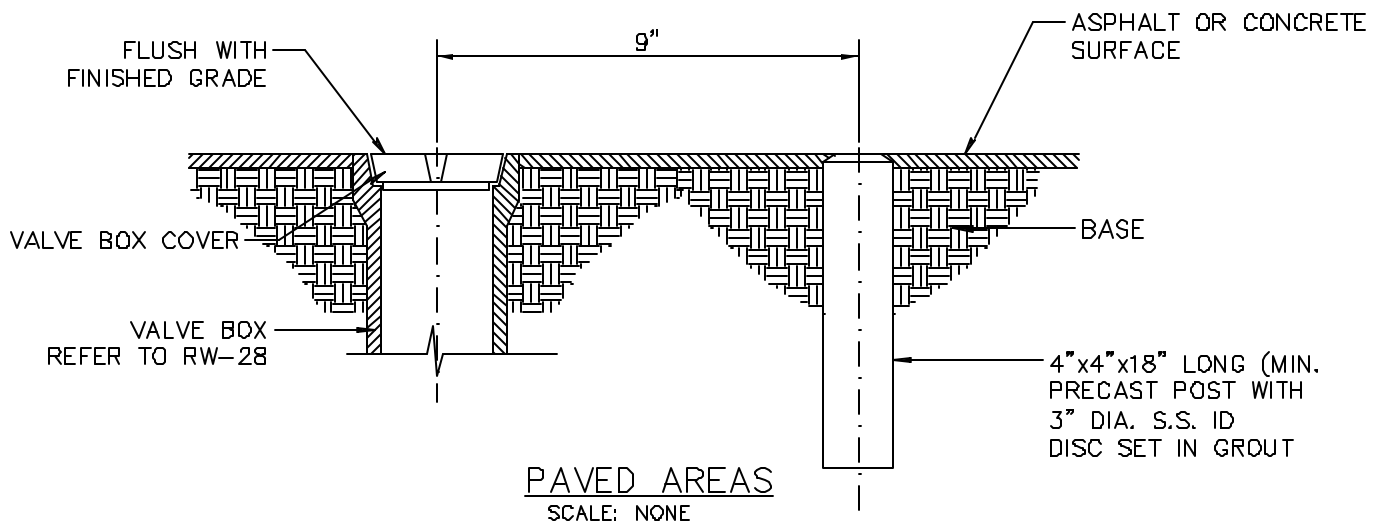
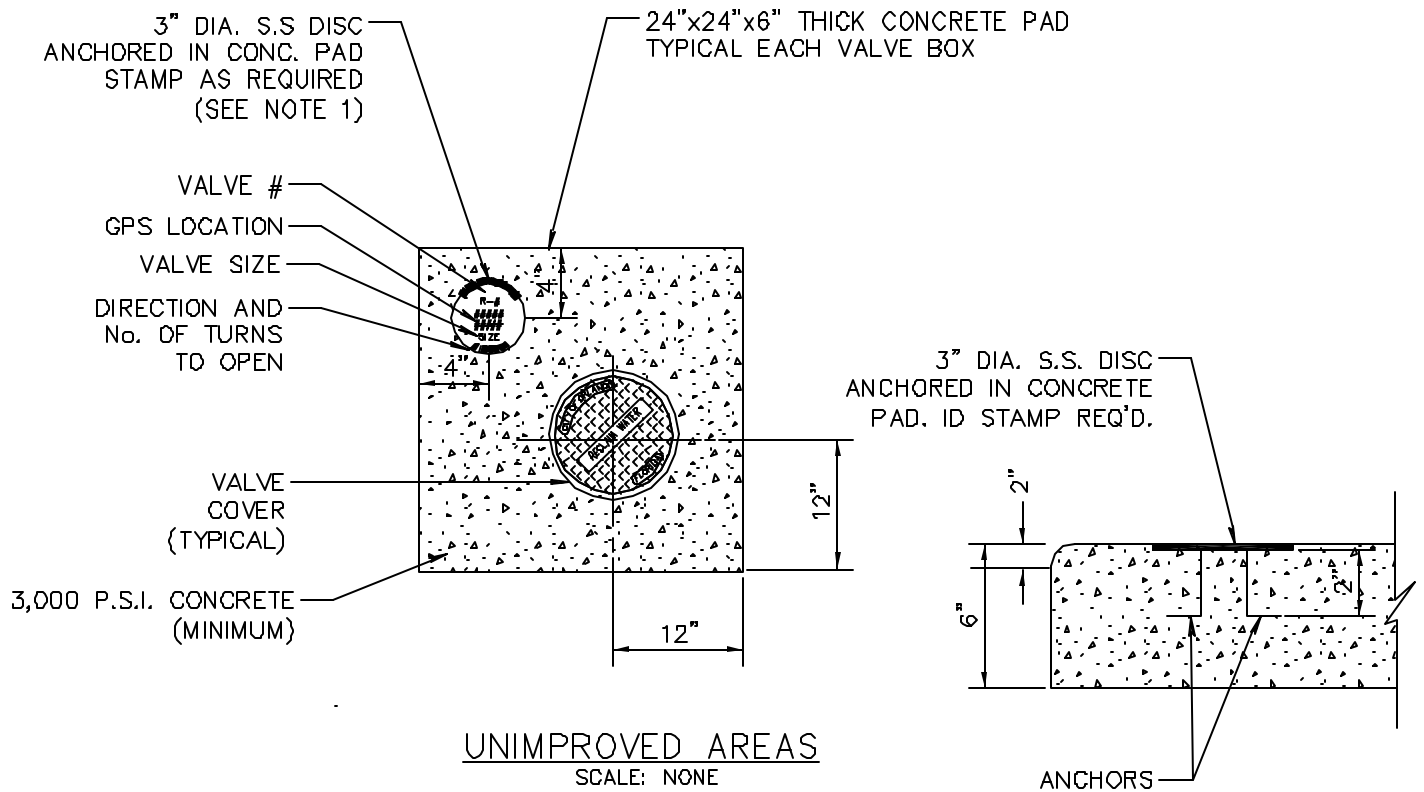
NOTE: CONCRETE BASE NOT REQUIRED FOR VALVES 18" OR SMALLER (TYP)

BURIED GATE VALVE BOX SETTING

N. T. S.



BURIED VALVE BOX SETTING



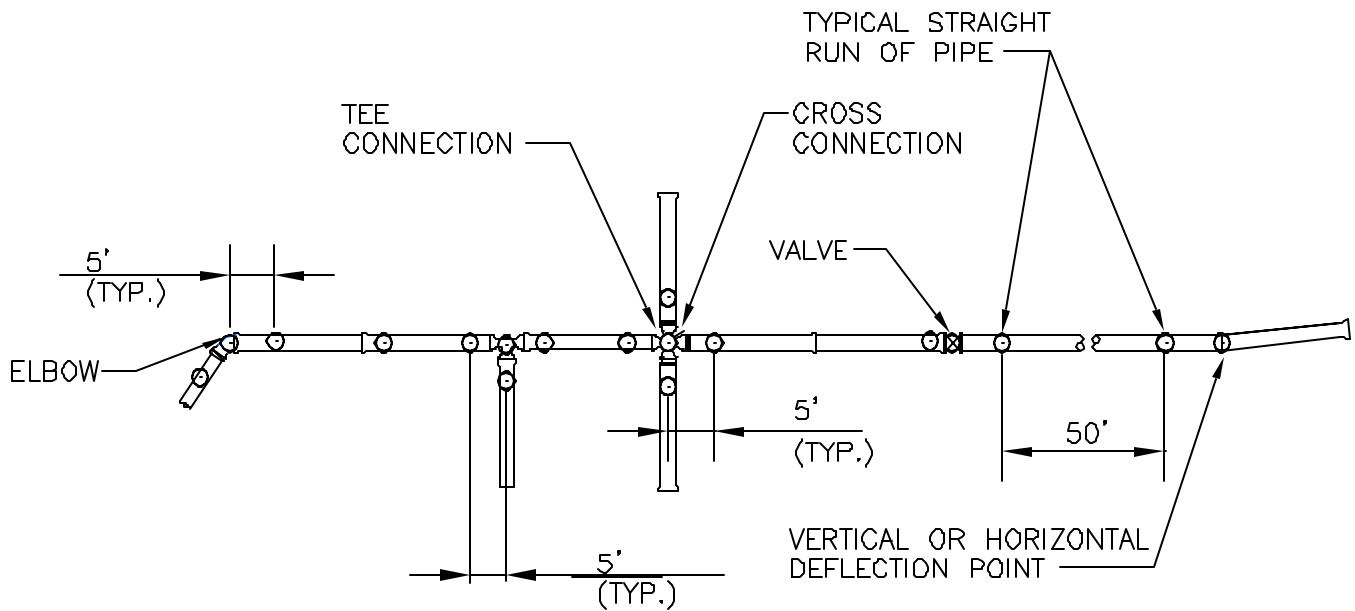
NOTES:

1. S.S. IDENTIFICATION DISC SHALL BE REQUIRED FOR ALL VALVES, INCLUDING AIR RELEASE VALVES.
2. IN PAVED AREAS, THE S.S. IDENTIFICATION DISC MAY BE MECHANICALLY ATTACHED TO THE BOTTOM OF THE VALVE BOX COVER, OR INSTALLED AS SHOWN ABOVE.
3. PAINT VALVE BOX COVER PURPLE PANTONE 522C.
4. THE VALVE # SHALL BE THE GPS LOCATION OF THE VALVE.



VALVE BOX COLLAR

R-22



1. ⊗ = TYPICAL LOCATIONS. (2' BELOW GRADE)
2. BALL/PLATE EVERY 100 FT. - ALSO VERTICAL AND HORIZONTAL DEFLECTION POINTS.
3. OTHER LOCATIONS AS DIRECTED BY THE OWNER
4. WARNING TAPE SHOULD BE 18" ABOVE PIPE



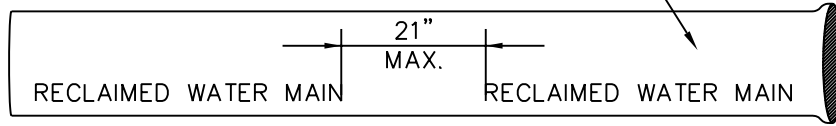
DETECTOR BALL LOCATION DETAIL

R-23

NONMETALLIC PIPE

SCALE: NONE

RECLAIMED WATER PIPING
PANTONE PURPLE 522C



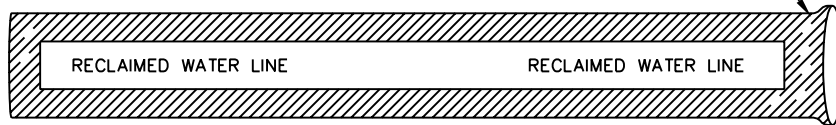
NOTES:

1. PIPE IDENTIFICATION: RECLAIMED WATER MAIN OR RECLAIMED WATER LINE.
2. THE LETTERING SHALL APPEAR ON A MINIMUM OF 3 SIDES OF THE PIPE AND SHALL RUN THE ENTIRE LENGTH OF THE PIPE.
3. LETTERING SHALL BE A MINIMUM OF $\frac{3}{8}$ " HIGH AND SHALL APPEAR AT INTERVALS NOT LESS THAN ONCE EVERY 21 INCHES, LETTERING SHALL RUN THE ENTIRE LENGTH OF THE PIPE.
4. LETTERING SHALL BE PERMANENTLY IMPREGNATED INTO THE PVC WITH INDELIBLE INK DURING THE PIPE MANUFACTURING PROCESS. STENCILING ON THE PIPE SURFACE IS STRICTLY PROHIBITED.

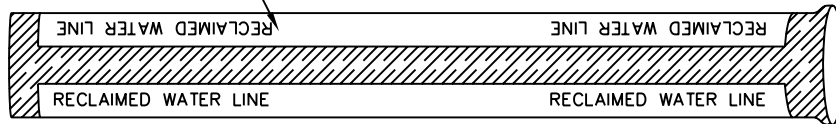
METALLIC PIPE

SCALE: NONE

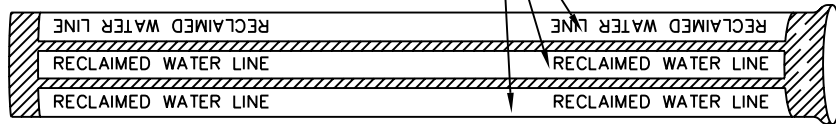
TYPICAL METALLIC PIPE



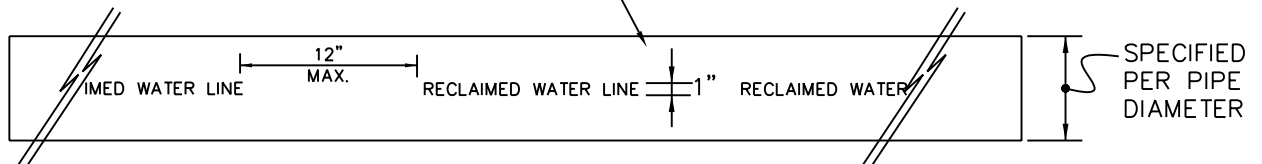
PAINTED PANTONE PURPLE 522C



LOCATE TAPE NEEDS TO BE
12" TO 18" ABOVE PIPE



PAPER BACKED ADHESIVE VINYL TAPE (TYPICAL)



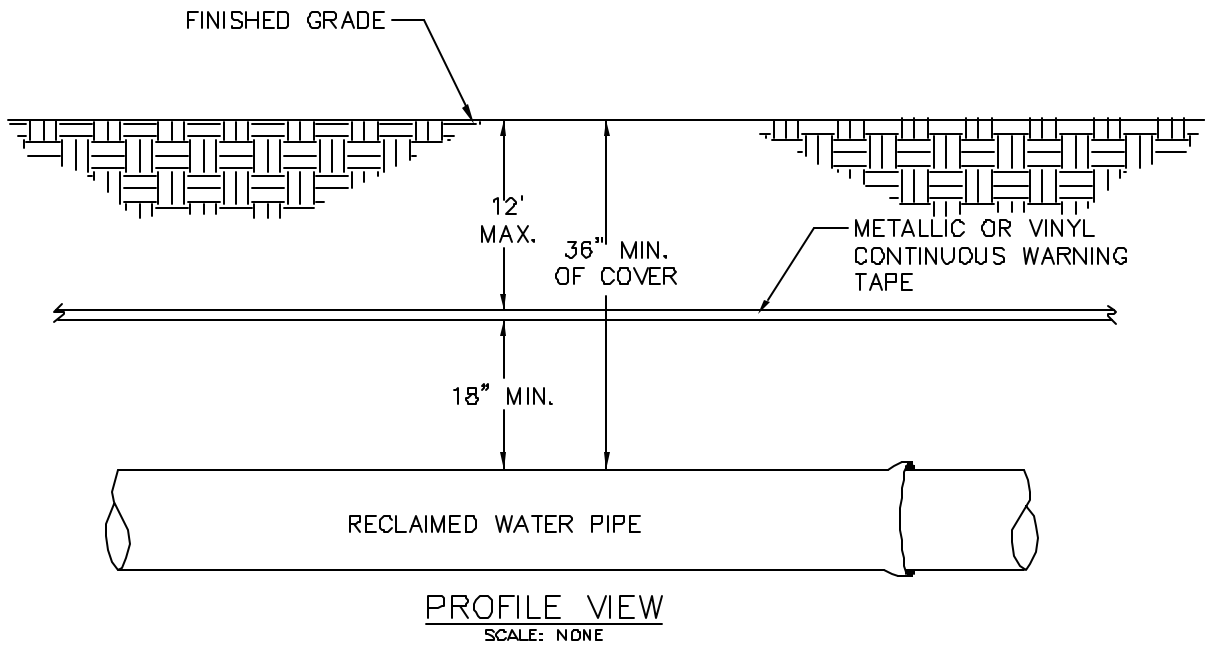
PLAN VIEW

SCALE: NONE

NOTES:

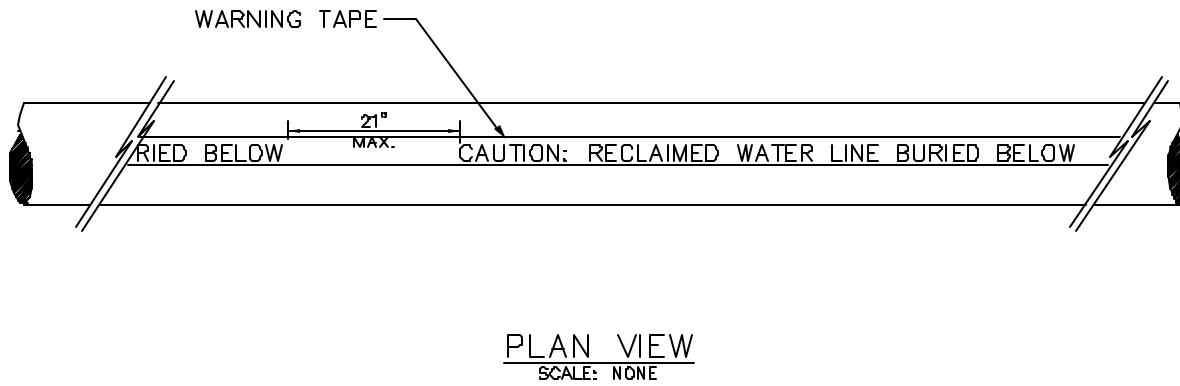
1. TAPE SHALL RUN FROM JOINT TO JOINT ALONG THE ENTIRE LENGTH OF THE PIPE.
2. PIPE IDENTIFICATION LETTERING SHALL BE AS DESCRIBED ABOVE.
3. TAPE SHALL BE PURPLE PANTONE 522C WITH BLACK LETTERING.





NOTES:

- ALL RECLAIMED WATER MAINS OR LINES SHALL BE INSTALLED WITH A CONTINUOUS METALLIC OR VINYL WARNING TAPE. THE WARNING TAPE SHALL BE BURIED NEARLY LEVEL ABOVE THE PIPE AND SHALL RUN CONTINUOUSLY OVER THE ENTIRE LENGTH OF PIPE. THE WARNING TAPE SHALL BE PURPLE (PANTONE 522C) WITH TYPICALLY SILVER/PURPLE W/BLACK 3" LETTERING, AND SHALL READ "CAUTION RECLAIMED WATER LINE BURIED BELOW", OR OTHER APPROVED WORDING.



DUCTILE IRON PIPE MINIMUM LENGTH (FT) OF RESTRAINED JOINTS EACH SIDE OF FITTINGS FOR HORIZONTAL BENDS

FITTING	PIPE SIZE									
	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
90° BEND	41'	58'	74'	89'	104'	118'	132'	145'	157'	181'
45° BEND	17'	24'	31'	37'	43'	49'	55'	60'	65'	75'
22.5° BEND	8'	12'	15'	18'	21'	24'	26'	29'	31'	36'
11.25° BEND	4'	6'	7'	9'	10'	12'	13'	14'	15'	18'
PLUG OR TEE	87'	123'	158'	191'	223'	225'	285'	315'	343'	399'
BRANCH OF TEE	65'	100'	136'	168'	200'	232'	262'	291'	319'	375'

NOTES:

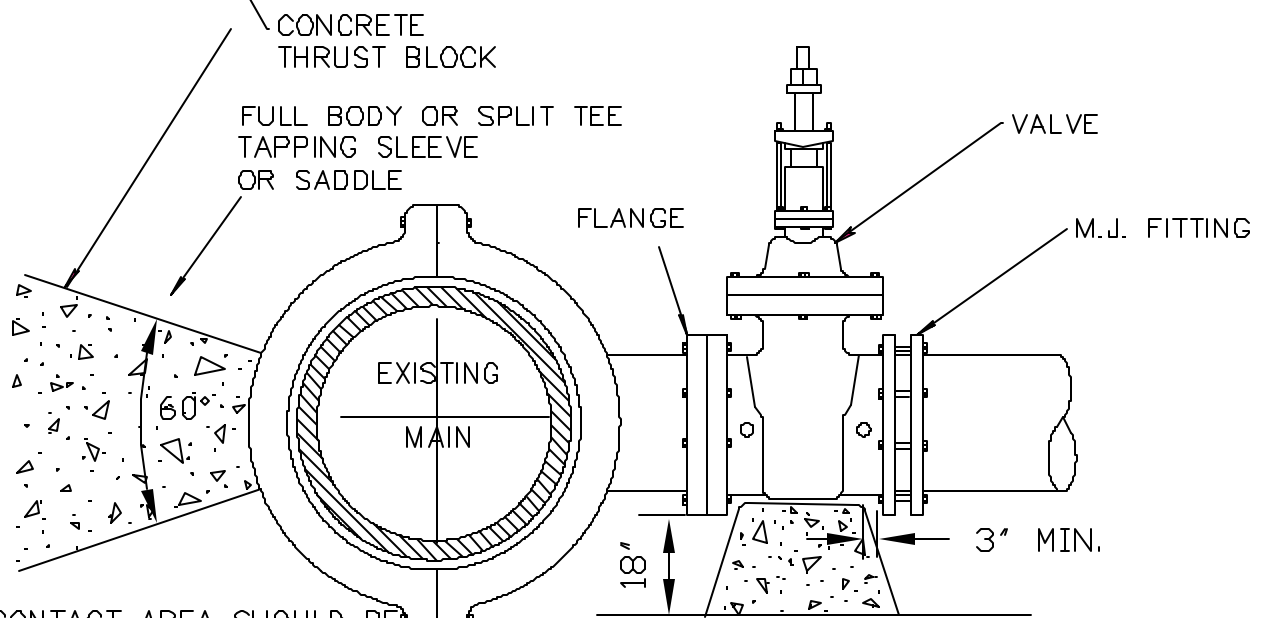
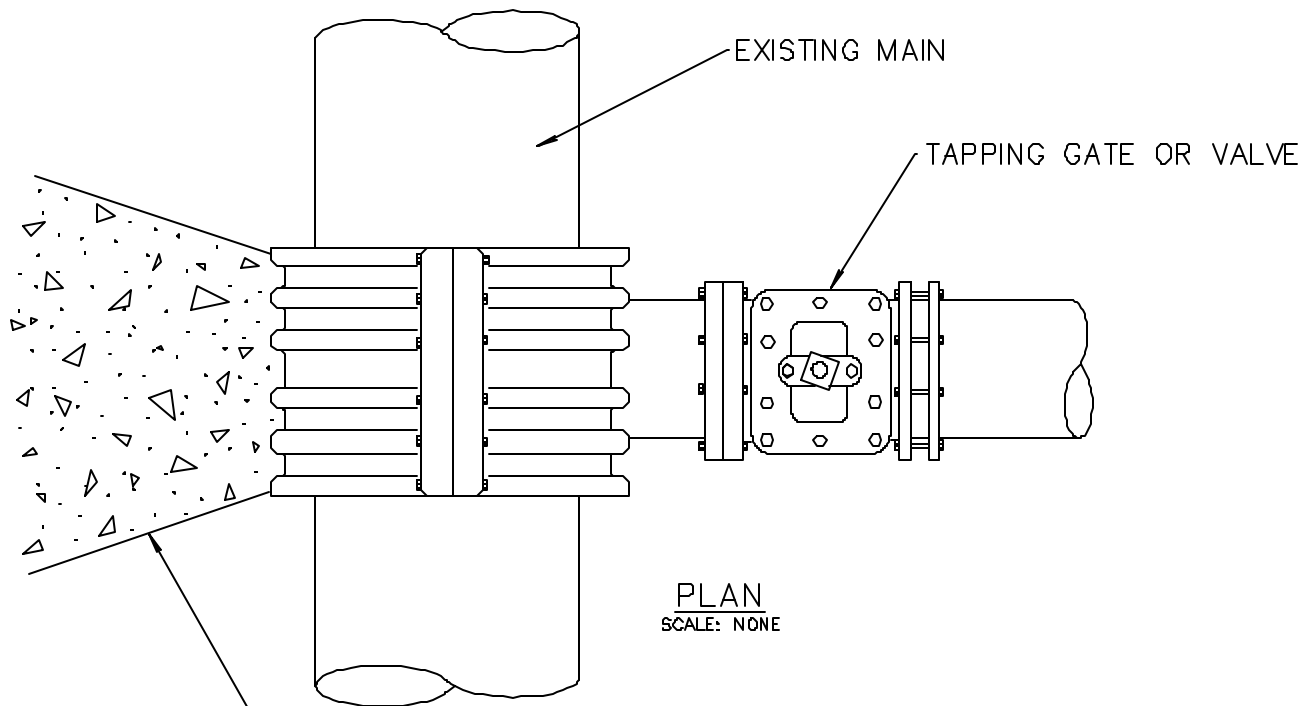
1. FITTINGS SHALL BE RESTRAINED JOINTS, UNLESS OTHERWISE INDICATED IN THE DRAWINGS.
2. TOTAL LENGTH OF PIPE WITH RESTRAINED JOINTS SHALL BE EQUAL TO OR GREATER THAN THE VALUES SHOWN IN THE TABLE ABOVE.
3. IF TWO OR MORE FITTINGS ARE PLACED TOGETHER, THEN THE TOTAL LENGTH OF RESTRAINED JOINTS SHALL BE GREATER THAN THE LENGTH OF PIPE SHOWN IN THE TABLE ABOVE FOR THE FITTING WITH THE NEXT LARGER ANGLE SIZE. THAT IS, FOR A 11 1/4° BEND AND 22 1/2° BEND USED CONSECUTIVELY, THEN THE MINIMUM LENGTH OF RESTRAINED JOINTS SHALL BE AS SHOWN IN THE ROW FOR A 45° BEND FOR THE SAME PIPE DIAMETER.
4. FOR REDUCER FITTINGS, THE LARGER PIPE DIAMETER SHALL BE USED TO DETERMINE THE MINIMUM LENGTH OF RESTRAINED JOINTS. THAT IS, FOR A 12"x8"x90° BEND, USE THE VALUE SHOWN IN THE TABLE FOR A 12" DIAMETER PIPE.
5. IN-LINE VALVES AND THROUGH-RUN OF TEES OUTSIDE OF THE LIMITS FOR RESTRAINED JOINTS DO NOT NEED TO BE RESTRAINED, UNLESS OTHERWISE INDICATED IN THE DRAWINGS.
6. LENGTHS SHOWN IN THE TABLE ABOVE HAVE BEEN CALCULATED IN ACCORDANCE WITH THE PROCEDURES SET FORTH IN THE LATEST EDITION OF "THRUST RESTRAINED DESIGN FOR DUCTILE IRON PIPE", AS PUBLISHED BY DIPRA. THE FOLLOWING ASSUMPTIONS WERE USED TO CALCULATE THE VALUES SHOWN IN THE TABLE ABOVE:

WORKING PRESSURE: <u>200 PSI</u> *	LAYING CONDITION: <u>2</u> *
SOIL DESIGNATION: <u>SAND/SILT</u> *	DEPTH OF COVER: <u>3 FEET</u> *
LAYING CONDITION: <u>#2</u> *	SAFETY FACTOR: <u>1.5</u> *

7. FOR PIPE ENCASED IN POLYETHYLENE, THE GIVEN LAYING LENGTH OF RESTRAINED JOINTS IN THE TABLE ABOVE SHALL BE INCREASE BY A FACTOR OF 1.50.

CONSULT MANUFACTURER FOR RESTRAINED LENGTHS FOR PVC PIPE.





CONTACT AREA SHOULD BE PROPERLY FORMED & SHALL NOT EXCEED 60 DEGREES & SHALL MAINTAIN 3" CLEARANCE FROM ANY JOINTS & FASTENERS. SLOPPY POURS SHALL BE REMOVED & RE-POURED. WRAP FITTINGS & VALVES W/30 MIL PLASTIC SHEET BEFORE POURING THRUST BLOCKS.

PROFILE
SCALE: NONE

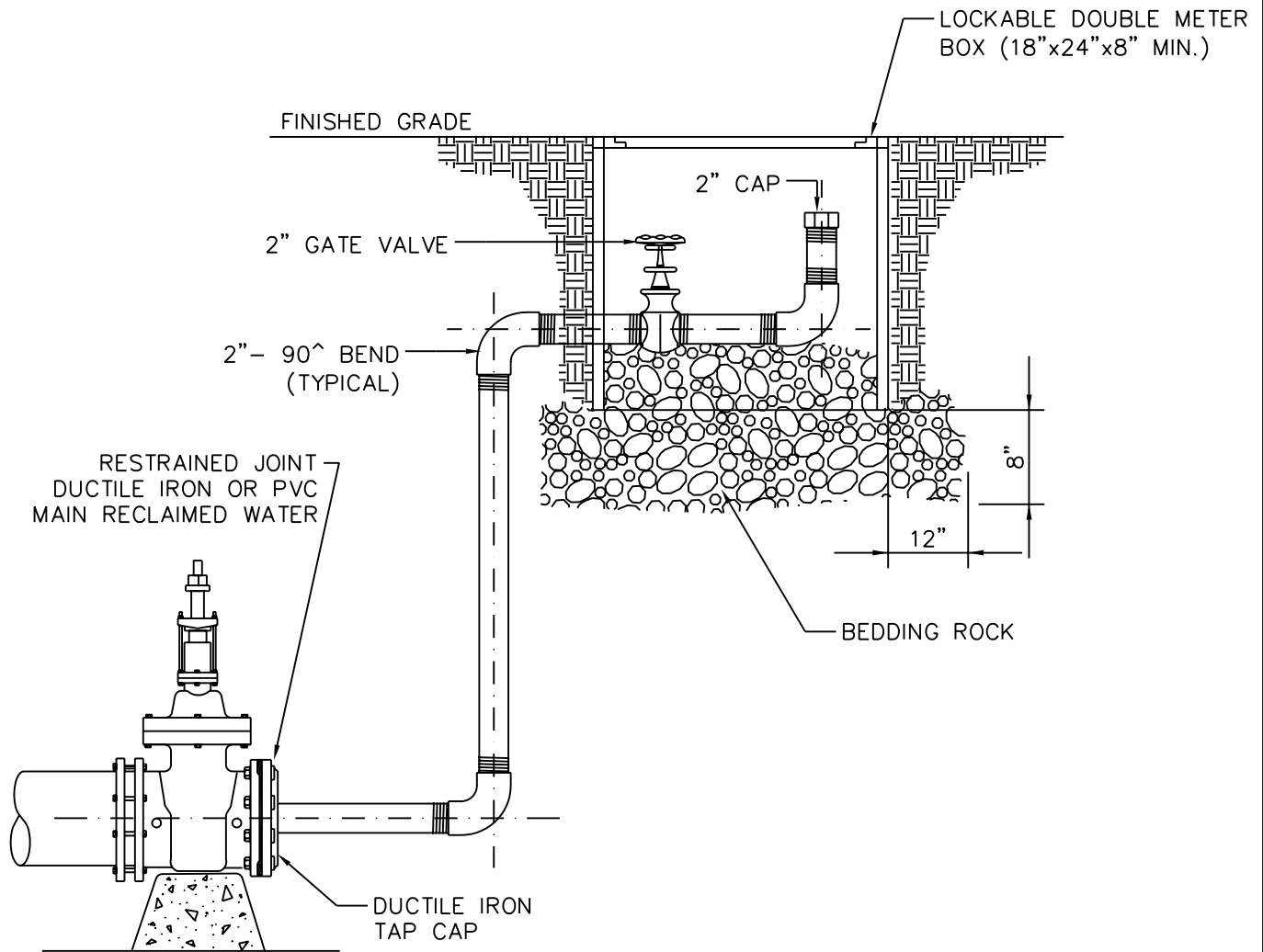
NOTES:

1. VALVE SUPPORT NOT REQUIRED FOR 18" VALVES & SMALLER.
2. CONCRETE SHALL BE 3000 PSI.



3" - 24" STANDARD TAPPING ASSEMBLY

R-27



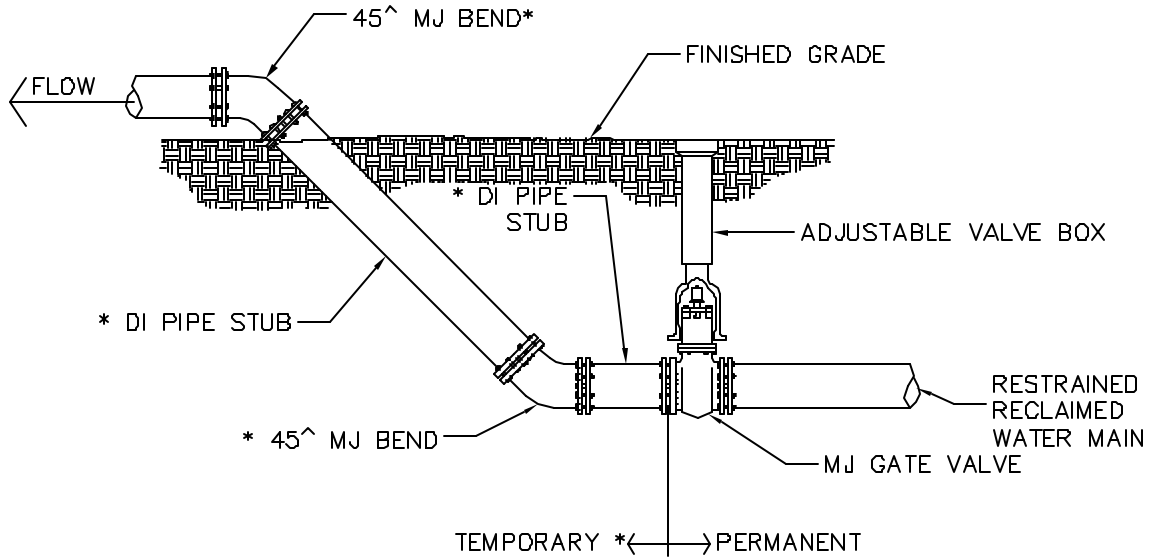
MAINS 4" AND LARGER

SCALE: NONE

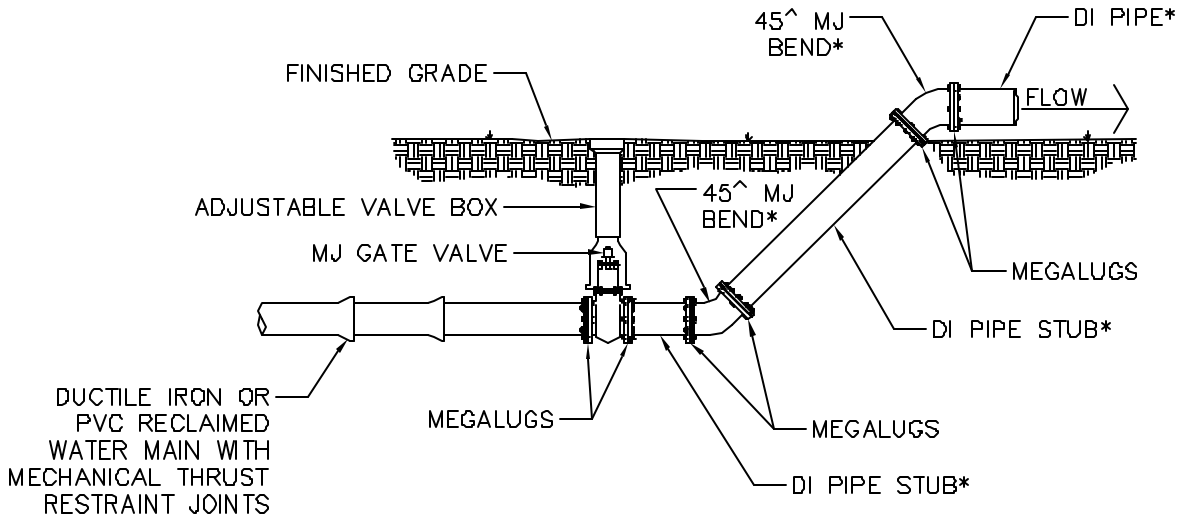
NOTE:

1. 2" PIPE AND FITTINGS SHALL BE SCHEDULE 40 STAINLESS STEEL, GALVANIZE STEEL OR BRASS PIPE RATED FOR A MINIMUM PRESSURE OF 200 PSI AND WITH THREADED (NPT) JOINTS
2. THIS IS A PERMANENT DEAD END BLOW-OFF INSTALLATION FOR RECLAIMED WATER MAINS LARGER THAN 4" IN DIAMETER. BLOW-OFF SHALL BE RESTRICTED FOR LINE MAINTENANCE AND SHOULD NOT BE USED FOR DISINFECTION PURPOSES.





FLANGED JOINTS
SCALE: NONE

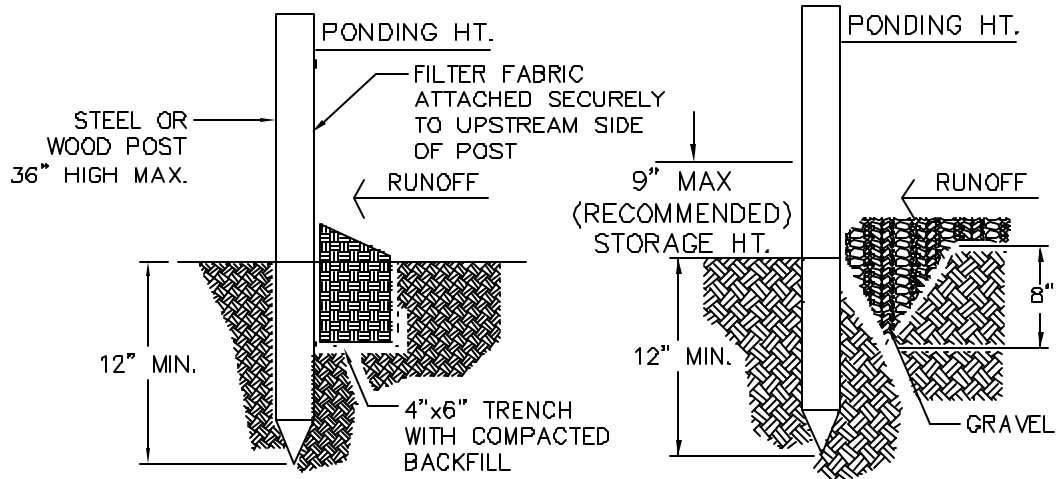
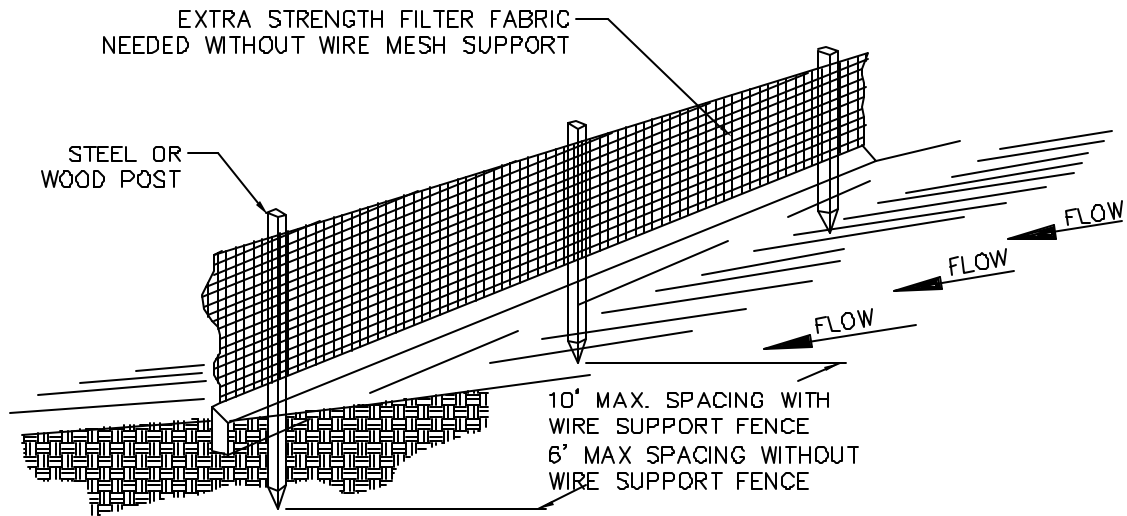


MECHANICAL JOINTS
SCALE: NONE

NOTES:

1. TEMPORARY FACILITIES ARE INDICATED WITH AN ASTERISK (*).
2. TEMPORARY BLOW-OFF SHALL BE THE SAME SIZE AS THE INSTALLED MAIN FOR PIPE SIZES UP TO 16" IN DIAMETER. PLACE BLIND FLANGE ON END OF MAIN AFTER FLUSHING AND TESTING.
3. BLOW-OFF FLOWS SHALL BE DIRECTED IN SUCH A MANNER FOR PROPER DRAINAGE AND DISCHARGE.





STANDARD DETAIL
TRENCH WITH NATIVE BACKFILL

ALTERNATE DETAIL
TRENCH WITH GRAVEL

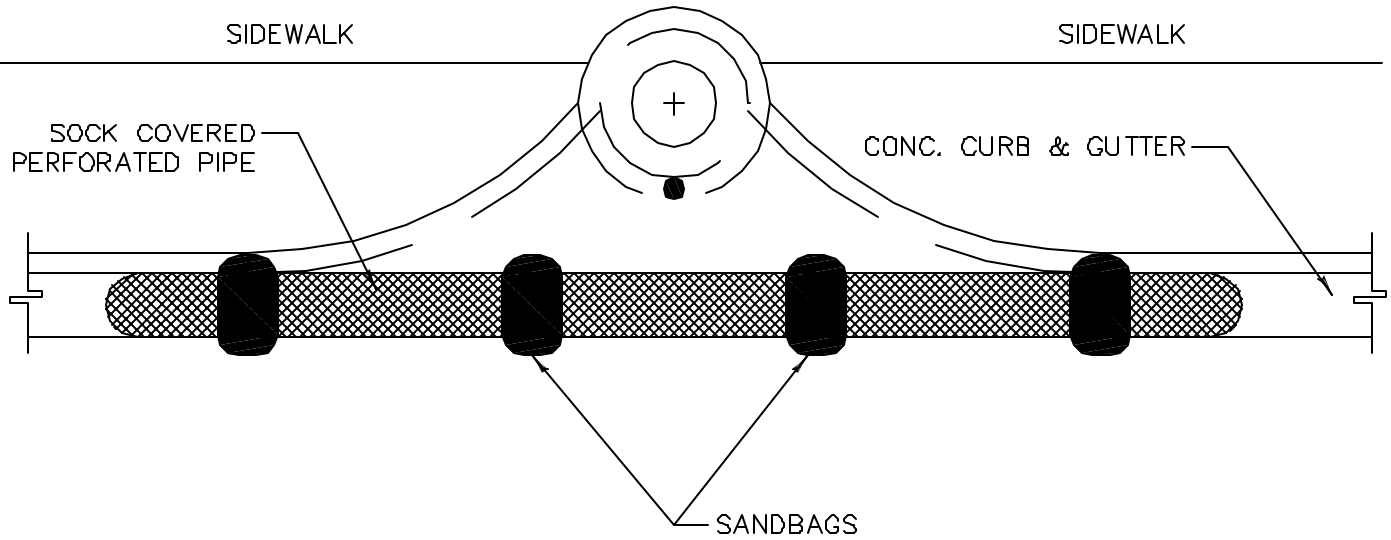
NOTES:

1. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY.
2. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.
3. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.



SILT FENCE

R-30A



PLAN VIEW

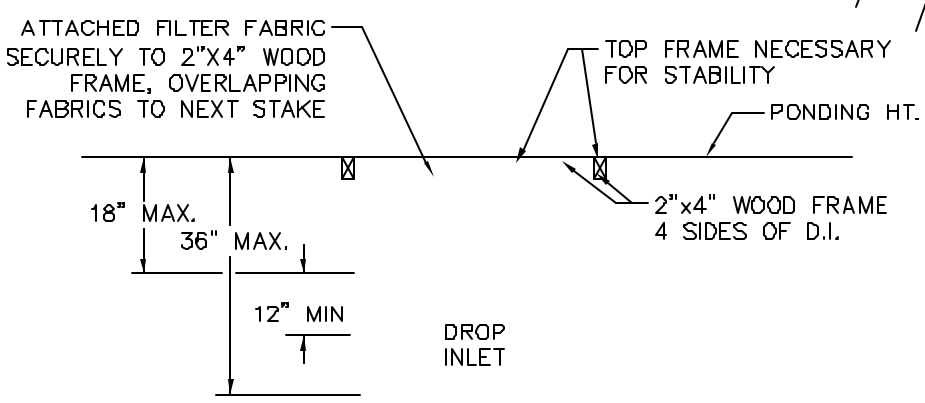
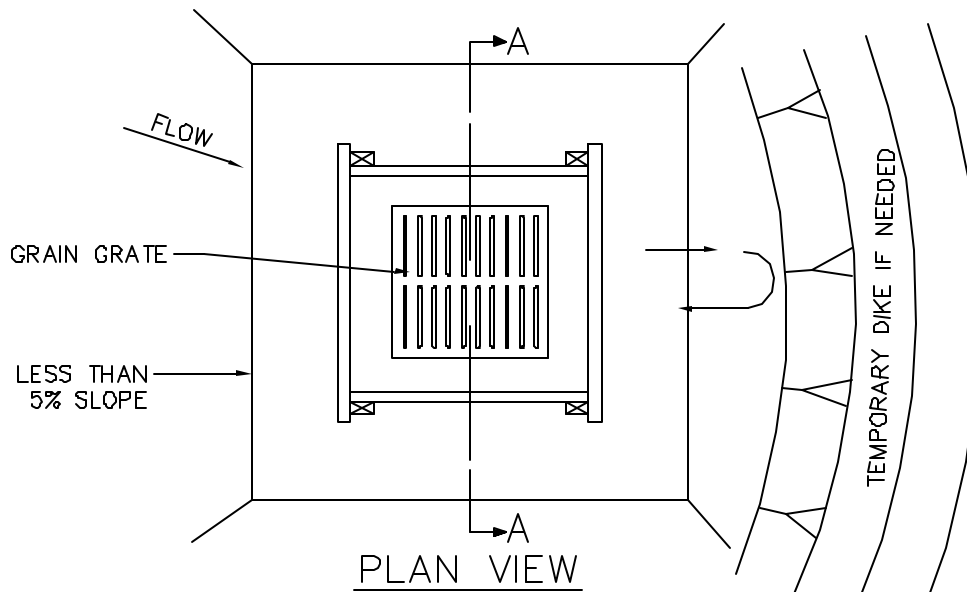
NOTES:

1. PLACE CURB TYPE SEDIMENT BARRIERS ON GENTLY SLOPING STREET SEGMENTS, WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
2. SANDBAGS OF EITHER BURLAP OR WOVEN GEOTEXTILE FABRIC ARE FILLED WITH GRAVEL LAYERED AND PACKED TIGHTLY.
3. LEAVE A ONE SANDBAG GAP IN THE TOP ROW TO PROVIDE A SPILLWAY FOR OVERFLOW.
4. INSPECT BARRIERS AND REMOVED SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.
5. AT THE END OF EACH WORKDAY, SWEEP OR SCRAPE UP SOIL TRACKED ONTO THE STREET.



CURB AND GUTTER SEDIMENT BARRIER

R-30B



SECTION A-A

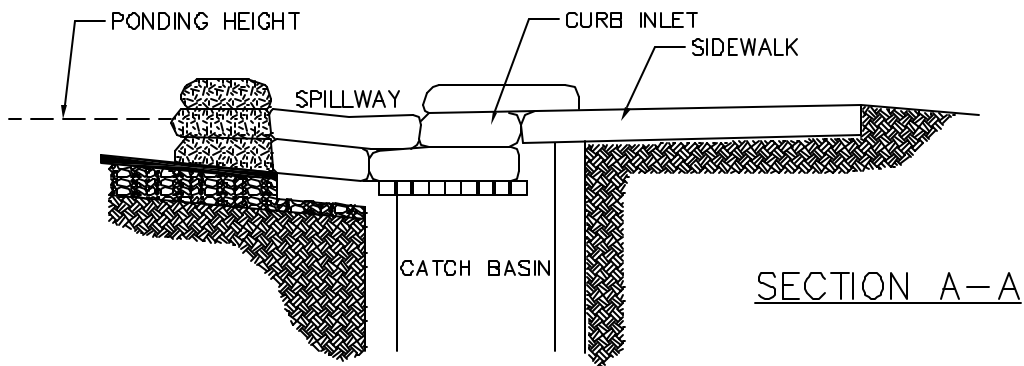
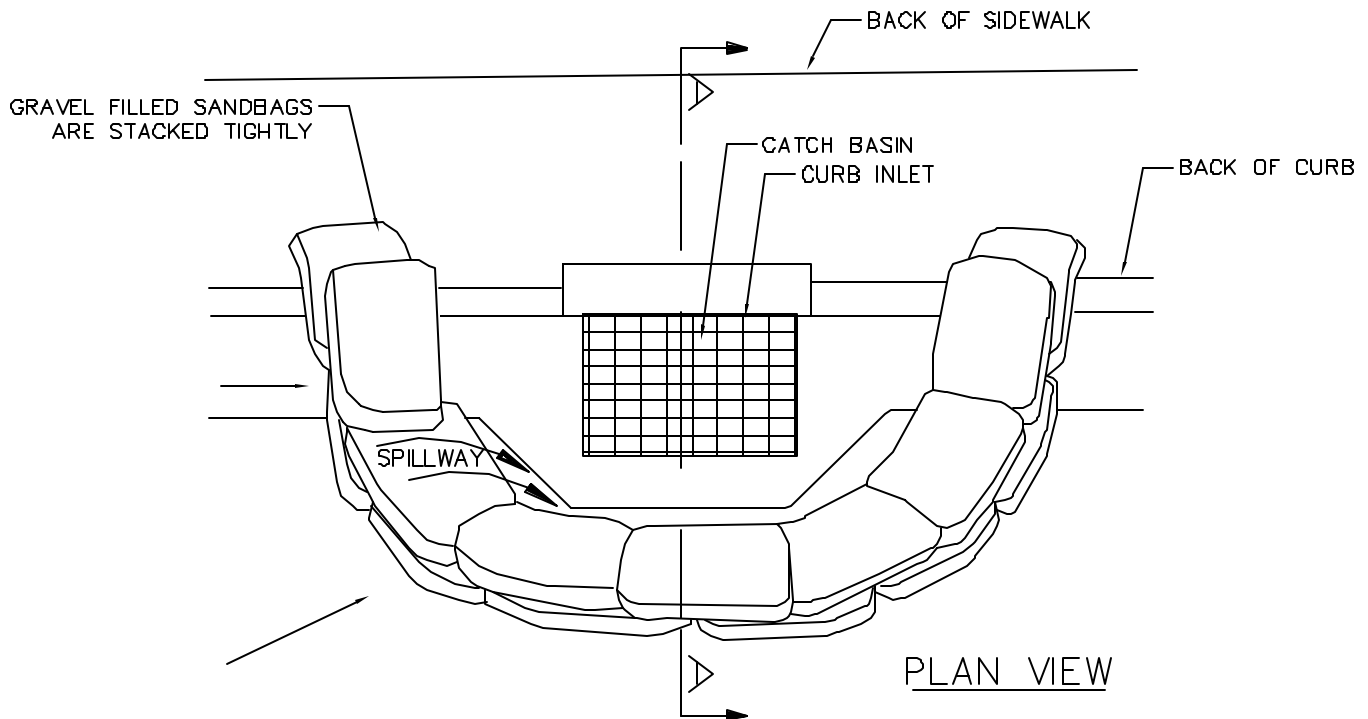
NOTES:

1. DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS. (LESS THAN 3%)
2. USE 2x4 WOOD OR EQUIVALENT METAL STAKES, (3 FT. MIN. LENGTH)
3. INSTALL 2x4 WOOD TOP FRAME TO INSURE STABILITY.
4. THE TOP OF THE FRAME (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWN SLOPE TO PREVENT RUNOFF FROM BY-PASSING THE INLET. A TEMPORARY DIKE MAY BE NECESSARY ON THE DOWN SLOPE SIDE OF THE STRUCTURE.



SILT FENCE DROP INLET SEDIMENT BARRIER

R-300



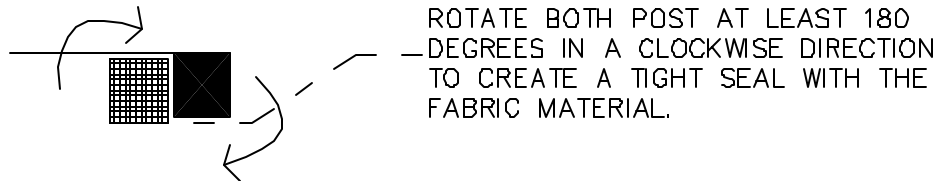
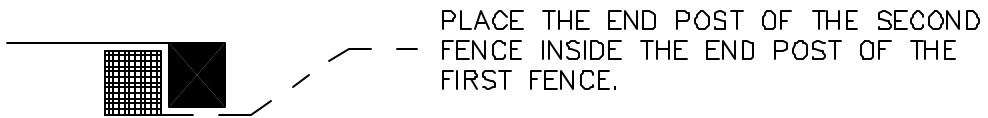
NOTES:

1. PLACE CURB TYPE SEDIMENT BARRIERS ON GENTLY SLOPING STREET SEDIMENTS, WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
2. SANDBAGS, OF EITHER BURLAP OR WOVEN GEOTEXTILE FABRIC, ARE FILLED WITH GRAVEL, LAYERED AND PACKED TIGHTLY.
3. LEAVE ONE SANDBAG GAP IN THE TOP ROW TO PROVIDE A SPILLWAY FOR OVERFLOW
4. INSPECT BARRIERS AND REMOVED SEDIMENT AFTER EACH STORM EVENT. SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY.

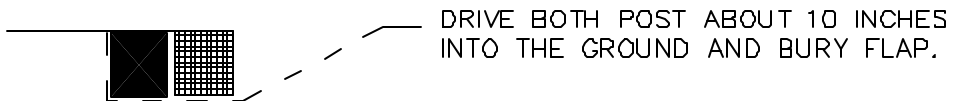


CURB INLET SEDIMENT BARRIER

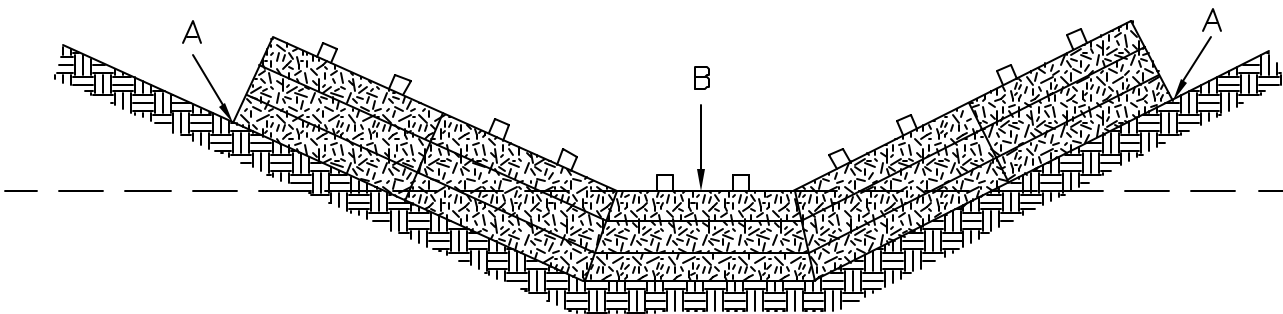
R-30D



DIRECTION OF RUNOFF WATERS



ATTACHING TWO SILT FENCES



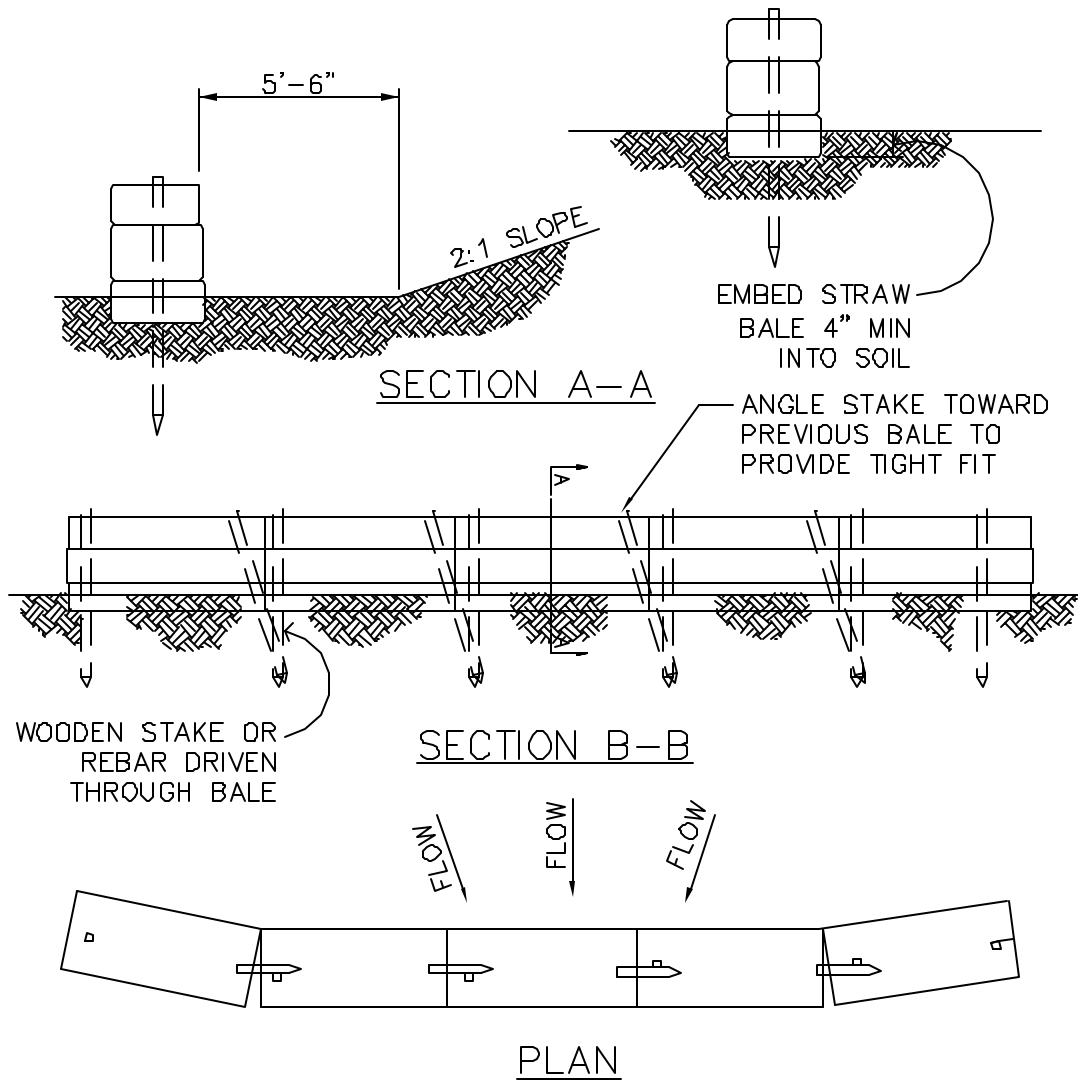
POINT A SHOULD BE HIGHER THAN POINT B

PROPER PLACEMENT OF STRAW BALE BARRIER IN DRAINAGE WAY



ATTACHING TWO SILT FENCE
&
PROPER PLACEMENT OF STRAW BALE BARRIER IN DRAINAGE WAY

R-30E



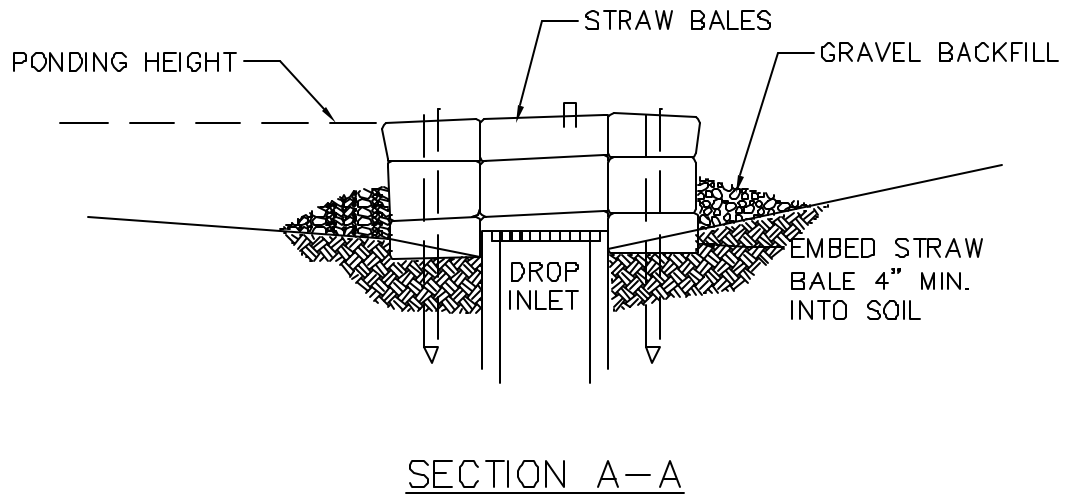
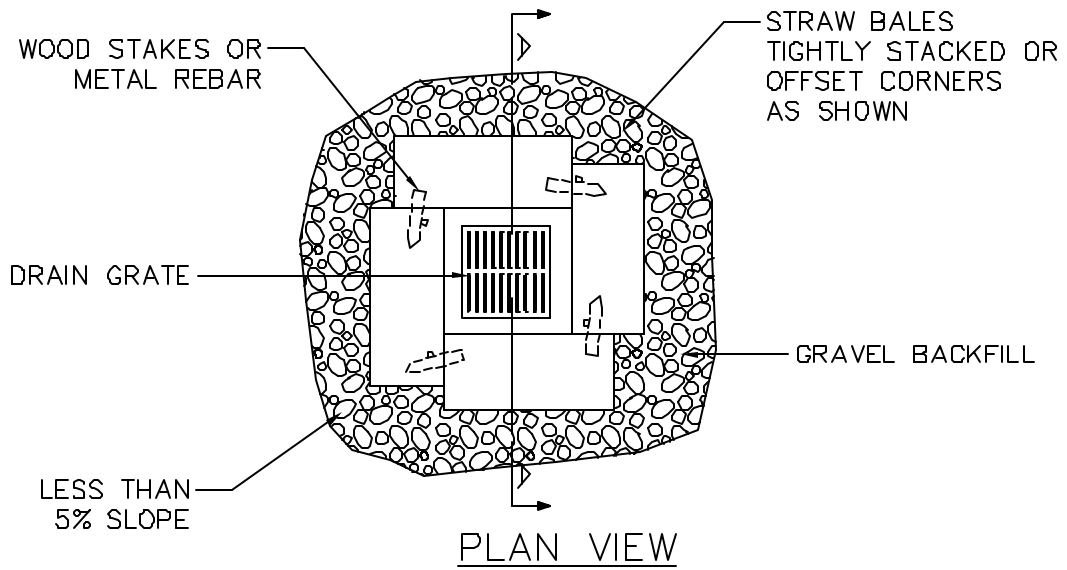
NOTES:

1. THE STRAW BALES SHALL BE PLACED ON SLOPE CONTOUR.
2. BALES TO BE PLACE IN A ROW WITH THE ENDS TIGHTLY ABUTTING. USE STRAW, ROCKS, OR FILTER FABRIC TO FILL GAPS BETWEEN THE BALES AND TAMP THE BACKFILL MATERIAL TO PREVENT EROSION OR FLOW AROUND BALES



STRAW BALE BARRIER

R-30F



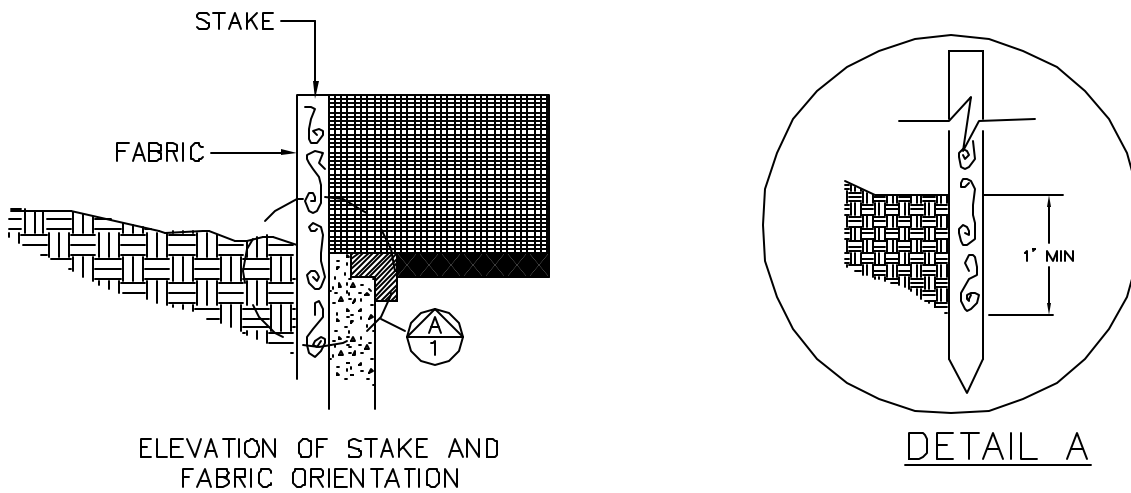
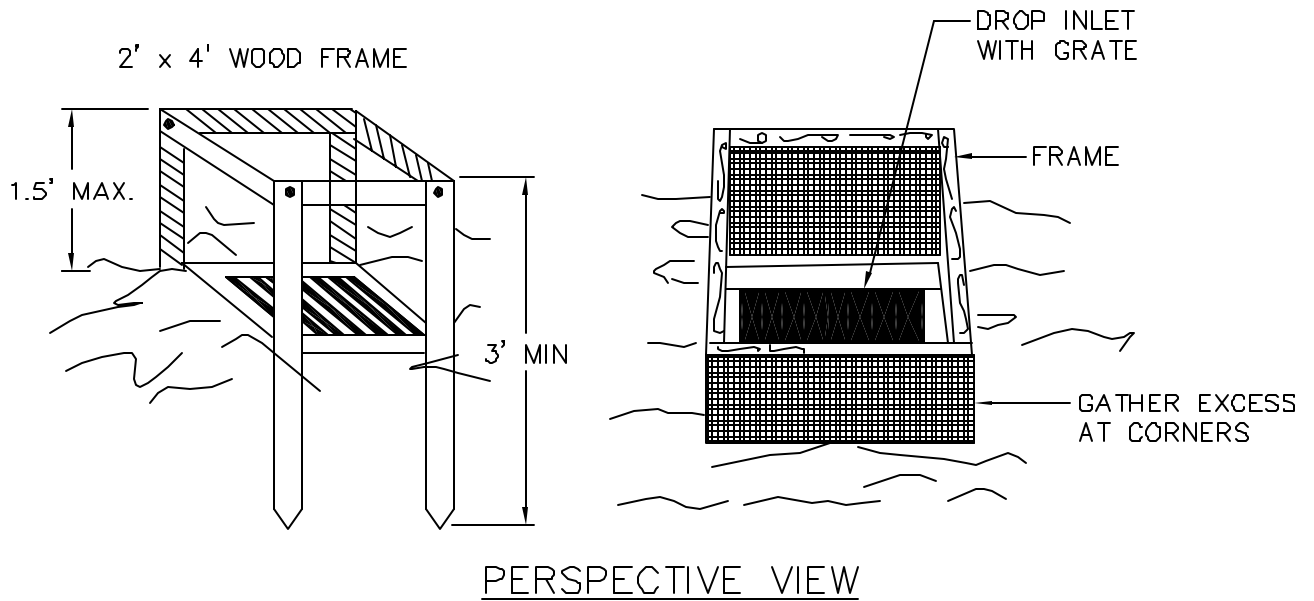
NOTES:

1. DROP INLET SEDIMENT BARRIERS ARE TO BE USED FOR SMALL, NEARLY LEVEL DRAINAGE AREAS. (LESS THAN 5%)
2. EMBED THE BALES 4" INTO THE SOIL AND OFFSET CORNERS OR PLACE BALES WITH ENDS TIGHTLY ABUTTING. GRAVEL BACKFILL WILL PREVENT EROSION OR FLOW AROUND THE BALES.
3. THE TOP OF THE STRUCTURE (PONDING HEIGHT) MUST BE WELL BELOW THE GROUND ELEVATION DOWN SLOPE TO PREVENT RUNOFF FROM BY-PASSING THE INLET. EXCAVATION OF A BASIN ADJACENT TO THE DROP INLET OR A TEMPORARY DIKE ON THE DOWN SLOPE OF THE STRUCTURE MAY BE NECESSARY.



DROP INLET SEDIMENT BARRIERS

R-30G

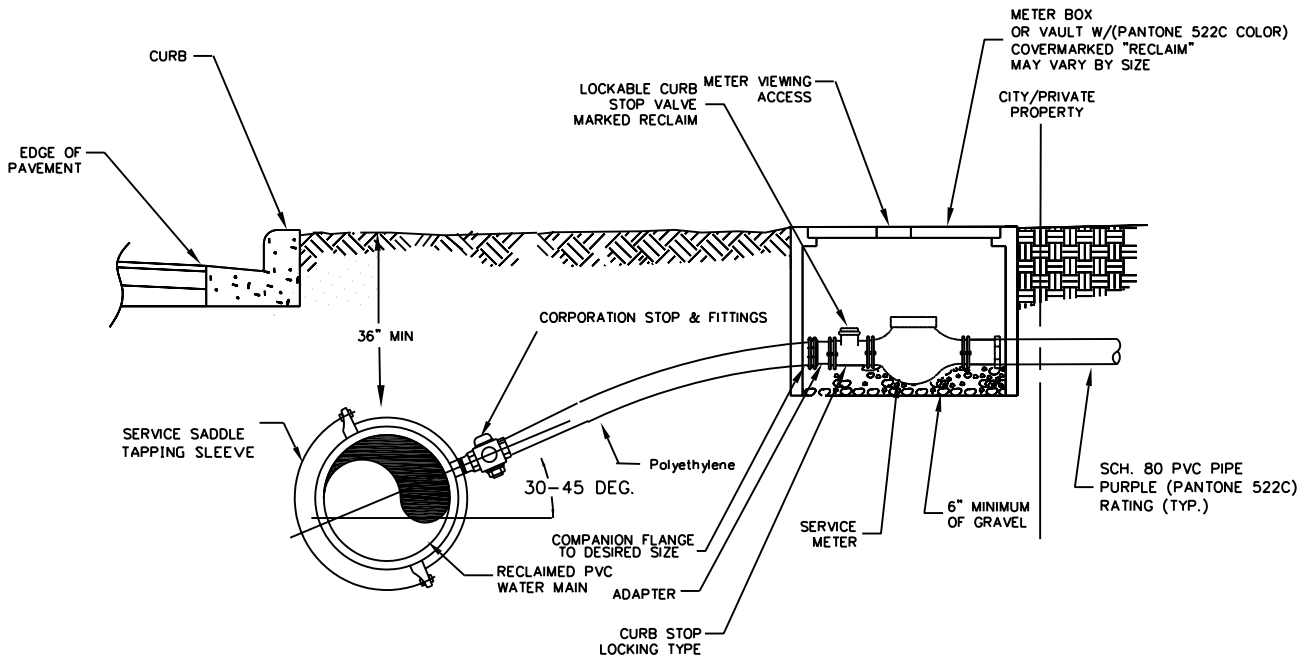


THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE THE INLET DRAINS A RELATIVELY FLAT AREA (SLOPE NO GREATER THAN 5%) WHERE THE INLET SHEET OR OVERLAND FLOWS (NOT EXCEEDING 1 C.F.S.) ARE TYPICAL. THE METHOD SHALL NOT APPLY TO INLETS RECEIVING CONCENTRATED FLOWS, SUCH AS IN STREET OR HIGHWAY MEDIANS



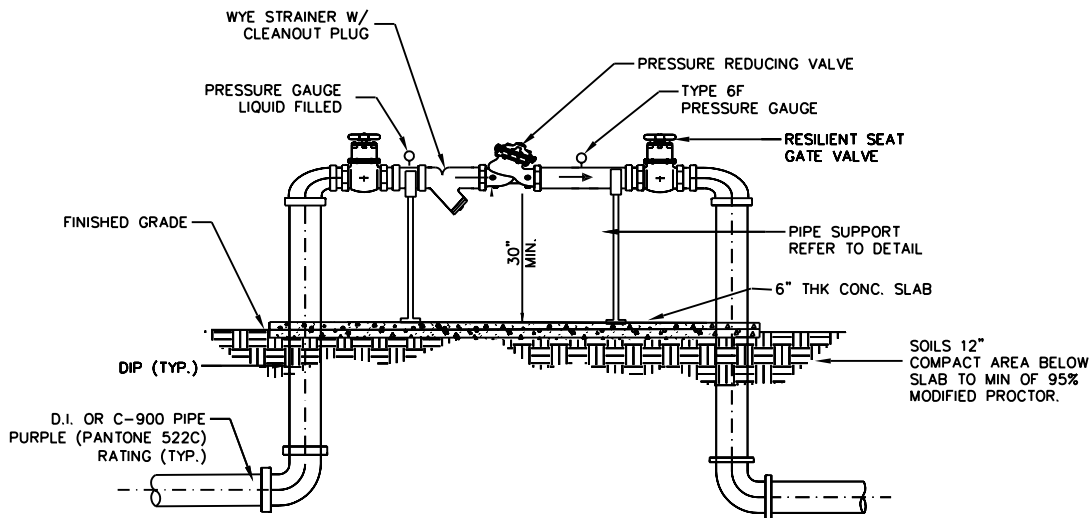
FILTER FABRIC DROP INLET SEDIMENT FILTER

R-30H



MAINLINE CONNECTION DETAIL W/ BELOW GROUND ASSEMBLY

SCALE: NONE



ABOVE GROUND ASSEMBLY DETAIL

SCALE: NONE

NOTES:

1. Saddle to be made of appropriate size flanged "SPLIT-TEE" design saddle w/ s.s.(304) construction. (Strap saddles not permitted)
2. Minimum of 4" tapping valve with resilient wedge / seat design.
3. Valve will have a standard 2" square actuator nut and valve access riser
4. Meter, Meterbox & installation will be supplied by Orlando Utilities Commission, with developer / owner paying initial cost for meter installation and account set-up, all other devices to be purchased and installed by Owner/ developer.
5. All necessary applications, permits, & contracts with Office of Legal Affairs must be completed as well as having an inspection of the irrigation system, Prior to delivery of reclaim water product. Subsequent to annual Inspections thereafter.
6. Piping from mainline to meter installation to be 90 degrees for locating purposes.
7. Caution tape to be buried 12"- 18" above utilities.
8. All above ground assemblies shall be painted with pantone 522c color paint.



**NON-COMMERCIAL
RECLAIM WATER METER
INSTALLATION DETAIL FOR 2"**

