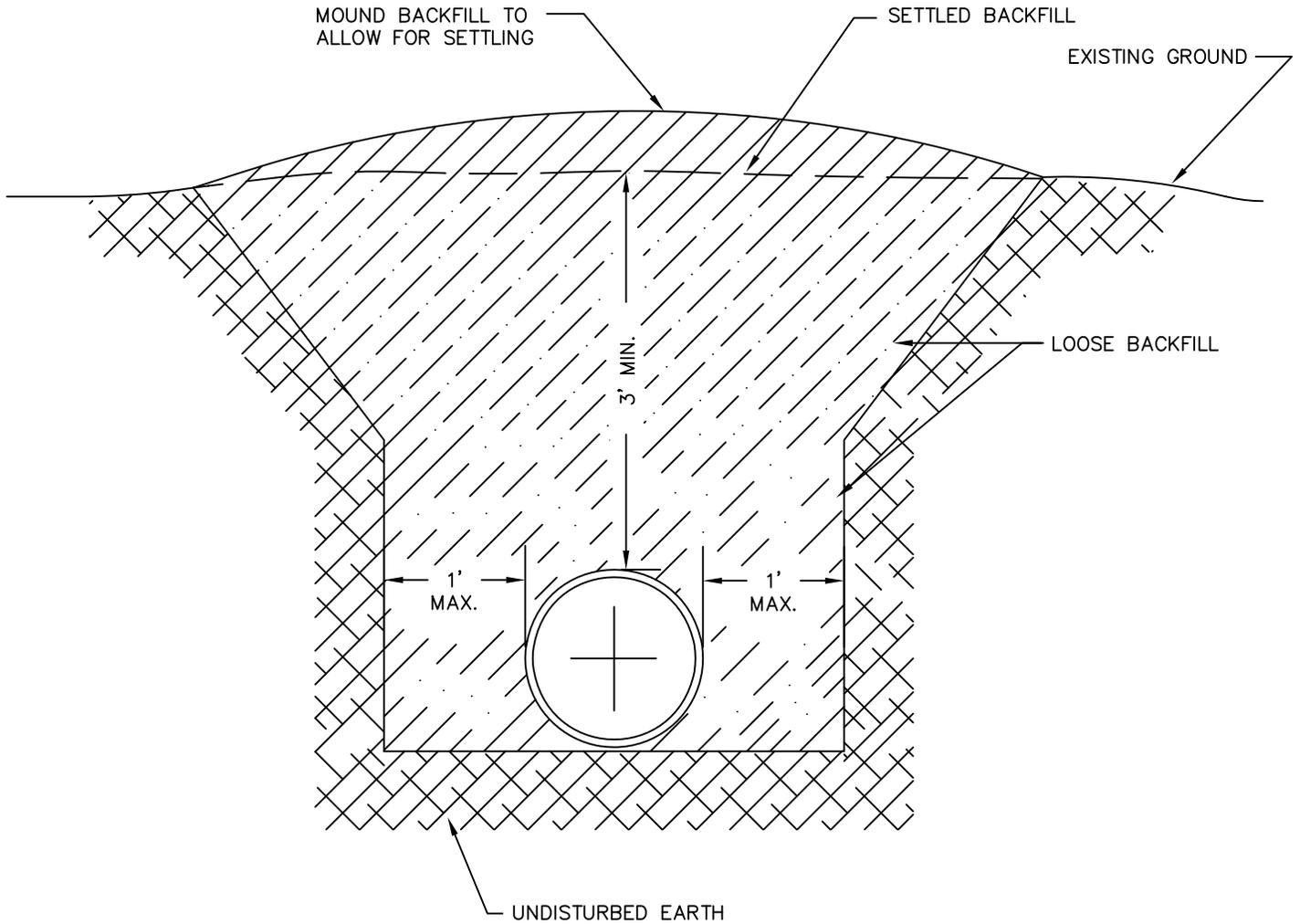


**NOTE:**

1. SENSUS OMNI METER WITH RADIO READ CAPABILITY
2. ALL PIPE & FITTINGS ABOVE GRADE SHALL BE FLANGED
3. ALL PIPING, FITTINGS AND SUPPORTS TO BE PAINTED. COLOR TO BE SELECTED BY COUNTY.

**ABOVE GROUND METER SET 3" AND LARGER**  
**WITH BACKFLOW PREVENTER DEVICE**

UPDATED JUNE 2019



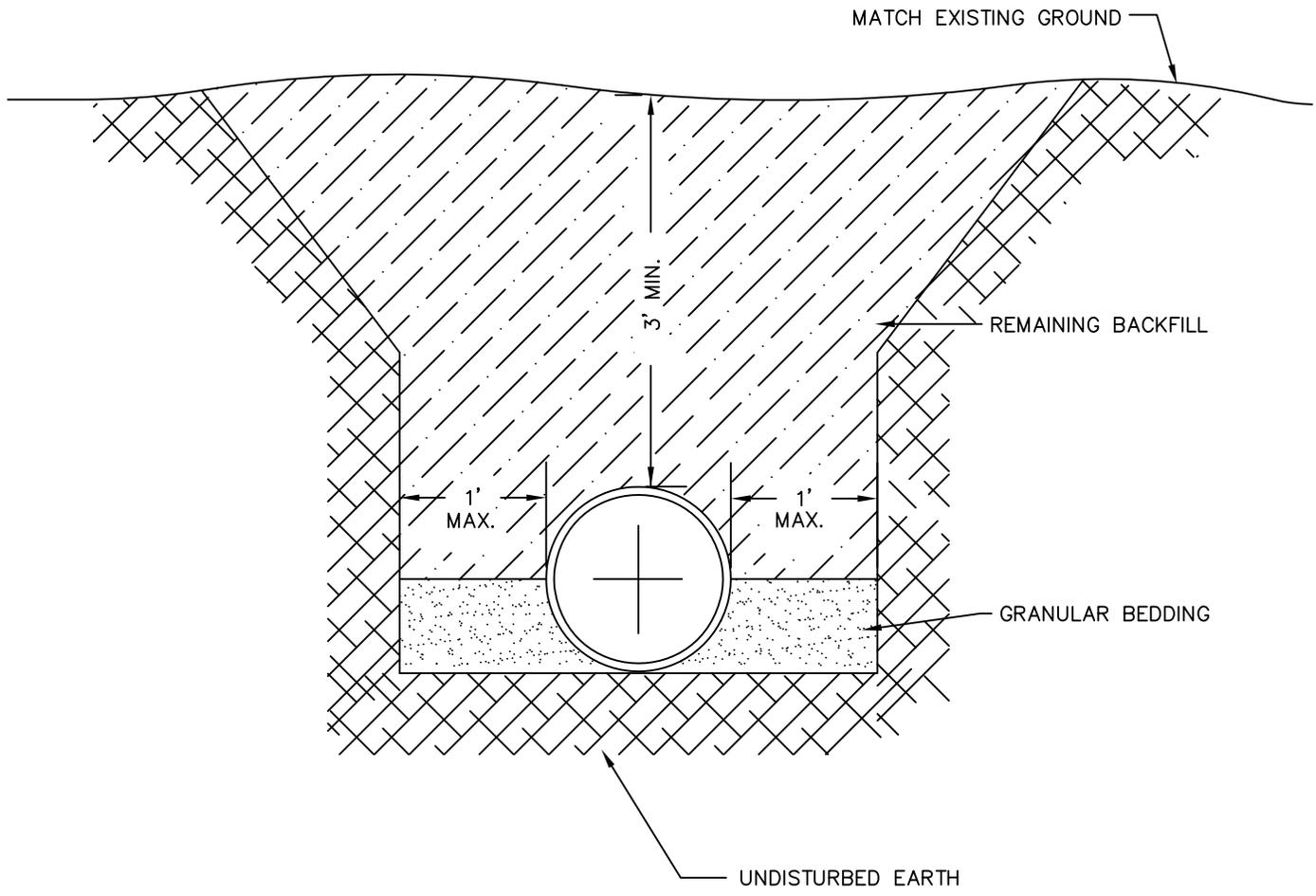
### NOTES

1. PIPE SHALL BE FULLY SUPPORTED FOR ITS ENTIRE LENGTH BY UNDISTURBED EARTH. DIG OUT HOLLOW AT PIPE BELL.
2. TRENCH SHALL BE DRY DURING PLACEMENT
3. BACKFILL SHALL BE FREE OF UNSUITABLE MATERIAL SUCH AS LARGE ROCK, MUCK, STICKS, ROOTS & OTHER DEBRIS.
4. ALL BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 95% OF AASHTO T-180 MODIFIED PROCTOR WHEN LOCATED GREATER THAN 4 FEET FROM THE EDGE OF PAVEMENT OR BACK OF CURB.
5. ALL BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 98% OF AASHTO T-180 MODIFIED PROCTOR WHEN LOCATED LESS THAN 4 FEET FROM THE EDGE OF PAVEMENT OR BACK OF CURB.

## TYPICAL TYPE I TRENCH DETAIL

(GRANULAR SOILS)

UPDATED JUNE 2016



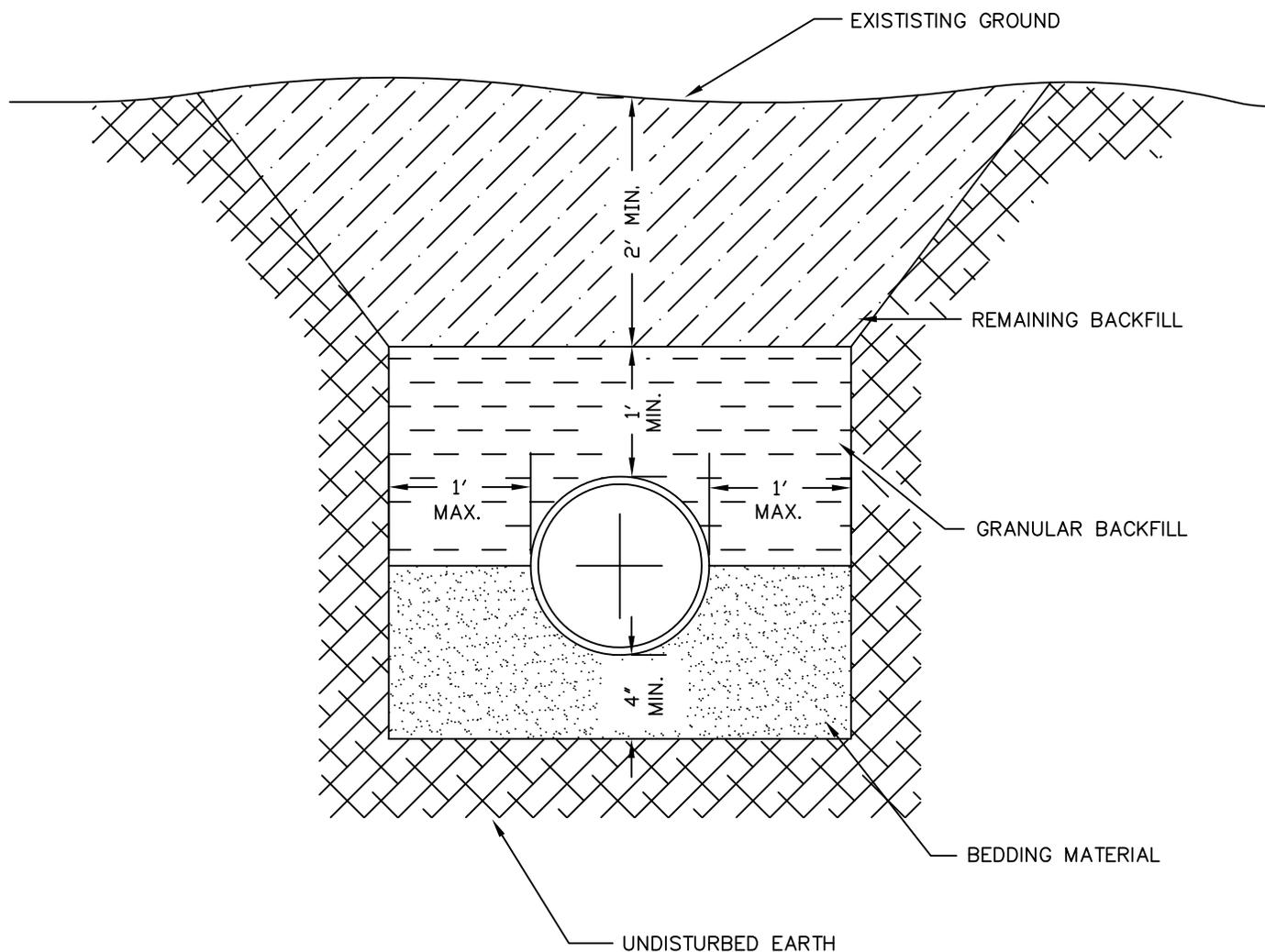
NOTES

1. PIPE SHALL BE FULLY SUPPORTED FOR ITS ENTIRE LENGTH WITH APPROPRIATE COMPACTION UNDER PIPE HAUNCHES.
2. TRENCH SHALL BE DRY DURING PLACEMENT
3. BACKFILL SHALL BE FREE OF UNSUITABLE MATERIAL SUCH AS LARGE ROCK, MUCK, STICKS, ROOTS & OTHER DEBRIS.
4. ALL BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 95% OF AASHTO T-180 MODIFIED PROCTOR WHEN LOCATED GREATER THAN 4 FEET FROM THE EDGE OF PAVEMENT OR BACK OF CURB.
5. ALL BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 98% OF AASHTO T-180 MODIFIED PROCTOR WHEN LOCATED LESS THAN 4 FEET FROM THE EDGE OF PAVEMENT OR BACK OF CURB.

**TYPICAL TYPE 2 TRENCH DETAIL**

(SILTS AND CLAYS)

UPDATED JUNE 2016



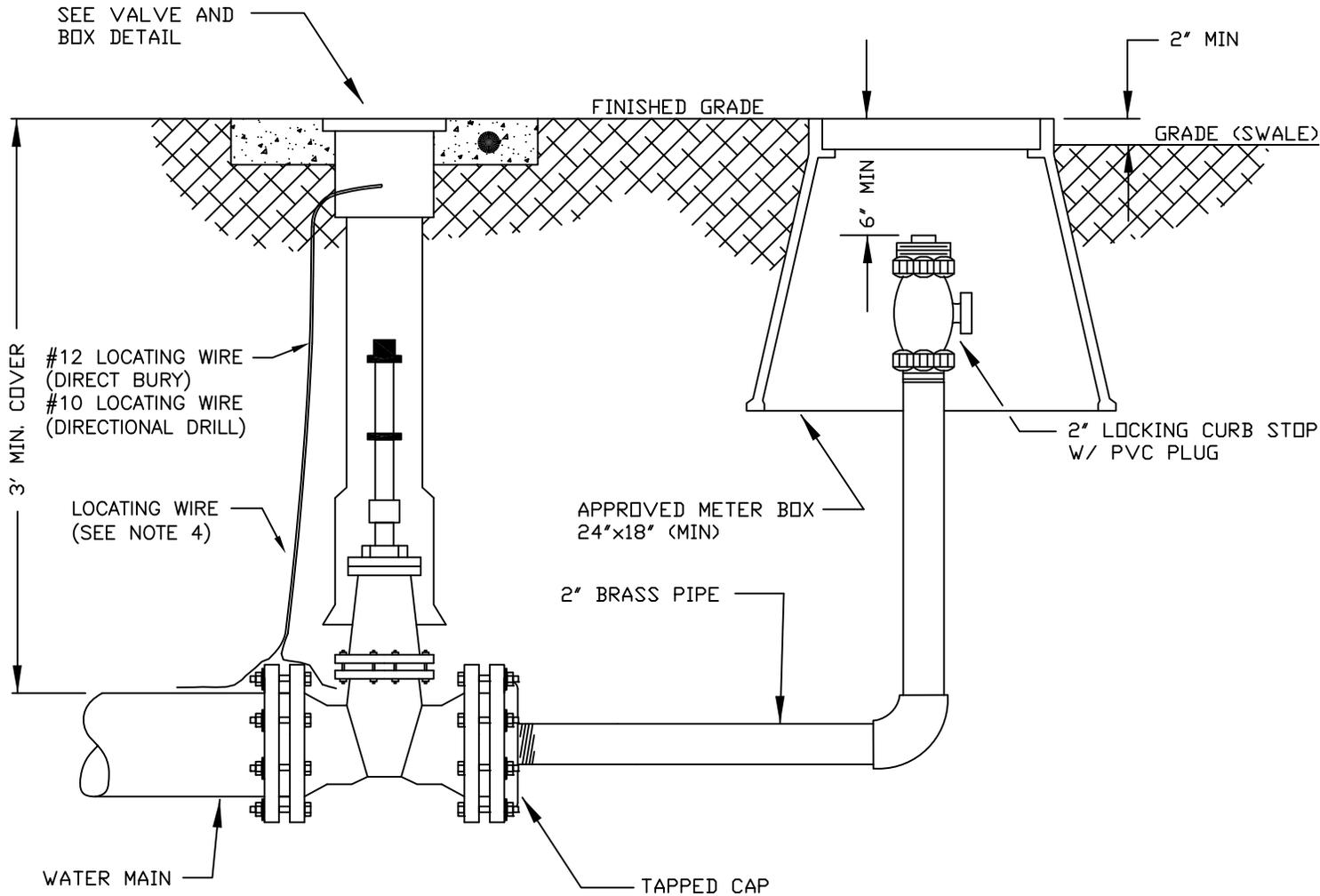
### NOTES

1. PIPE SHALL BE FULLY SUPPORTED FOR ITS ENTIRE LENGTH WITH APPROPRIATE COMPACTION UNDER PIPE HAUNCHES.
2. TRENCH SHALL BE DRY DURING PLACEMENT
3. BACKFILL SHALL BE FREE OF UNSUITABLE MATERIAL SUCH AS LARGE ROCK, MUCK, STICKS, ROOTS & OTHER DEBRIS.
4. ALL BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 95% OF AASHTO T-180 MODIFIED PROCTOR WHEN LOCATED GREATER THAN 4 FEET FROM THE EDGE OF PAVEMENT OR BACK OF CURB.
5. ALL BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 98% OF AASHTO T-180 MODIFIED PROCTOR WHEN LOCATED LESS THAN 4 FEET FROM THE EDGE OF PAVEMENT OR BACK OF CURB.

## TYPICAL TYPE 3 TRENCH DETAIL

UPDATED JUNE 2016

(HIGHLY ORGANIC  
SOILS "PEAT")



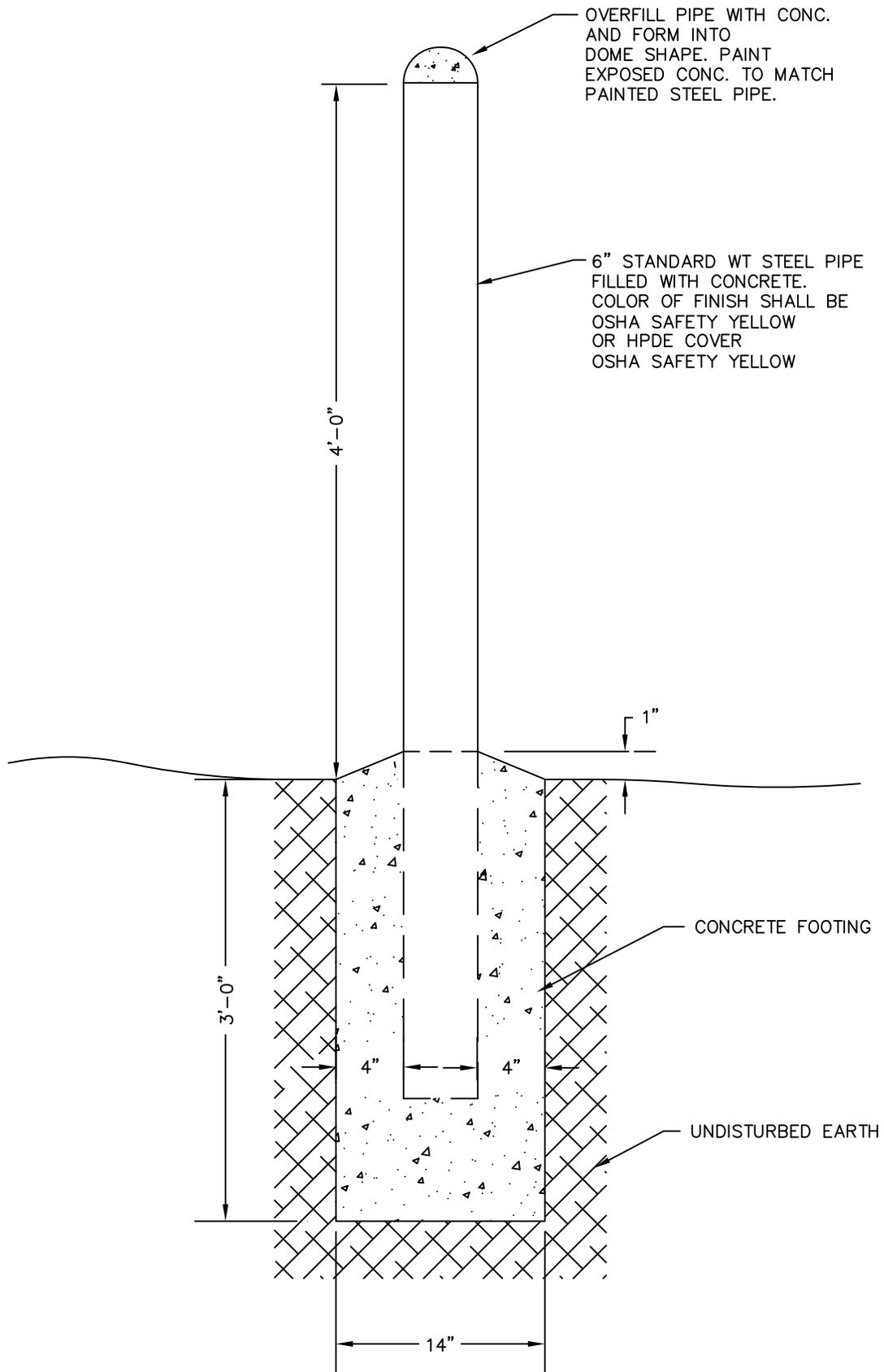
NOTES:

1. LOCATE WIRE AND LOCATE TAPE (TWO TYPES) SHALL BE ON ALL PIPES.
2. BLOW-OFF TO BE LOCATED AT ALL DEAD END LINES, AND AT PHASE LIMITS.
3. ALL MATERIALS ARE TO BE PER VOLUSIA COUNTY APPROVED MANUFACTURERS' PRODUCT LIST.
4. LOCATING WIRE SHALL BE CONTINUOUS INSIDE THE VALVE BOX AND SHOULD EXTEND 12" ABOVE TOP OF COLLAR. WIRE SHALL BE COLOR CODED TO MATCH THE UTILITY INSTALLED

**BLOW-OFF DETAIL**

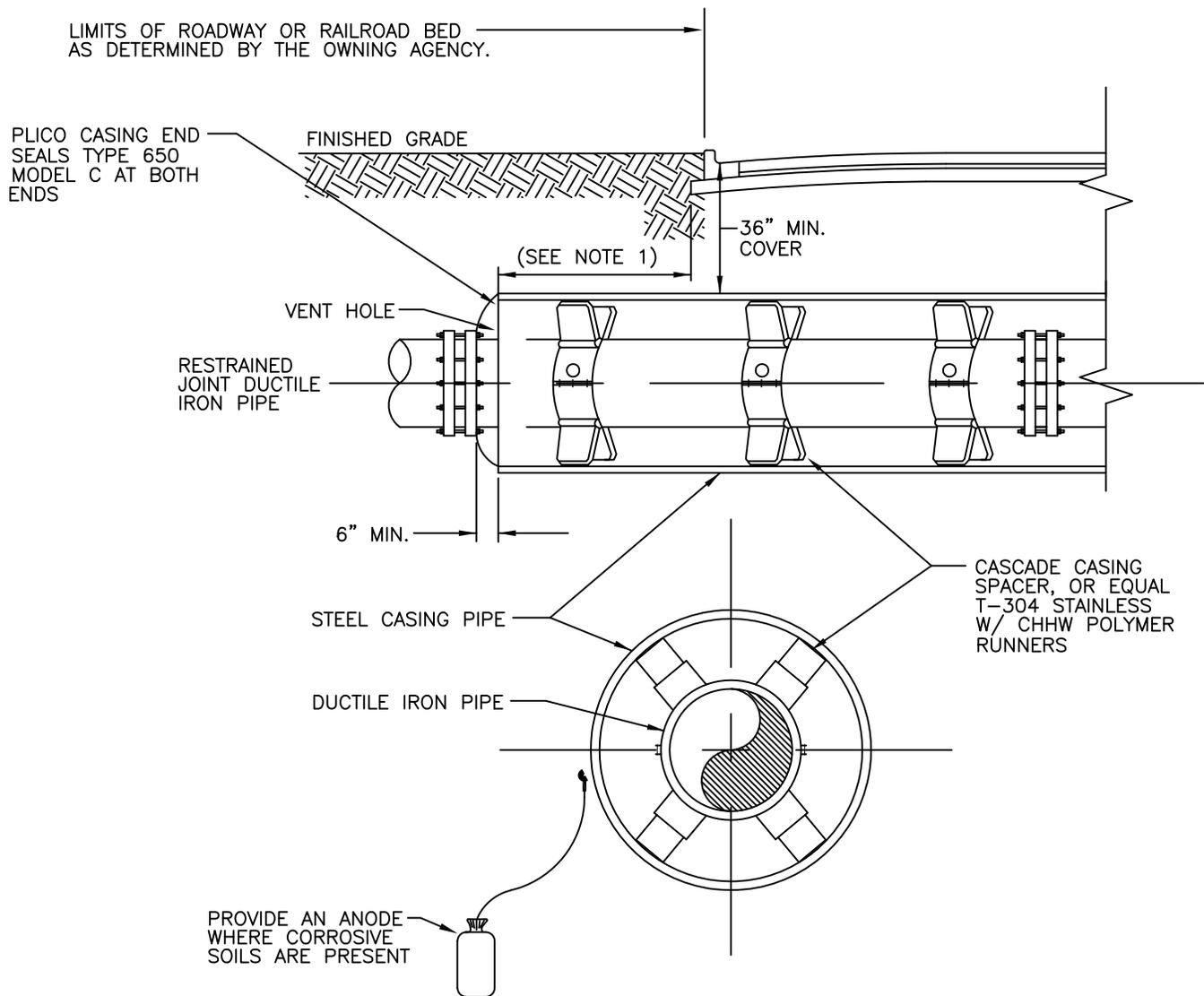
NTS

UPDATED JUNE 2019



**BOLLARD DETAIL**

UPDATED JUNE 2016

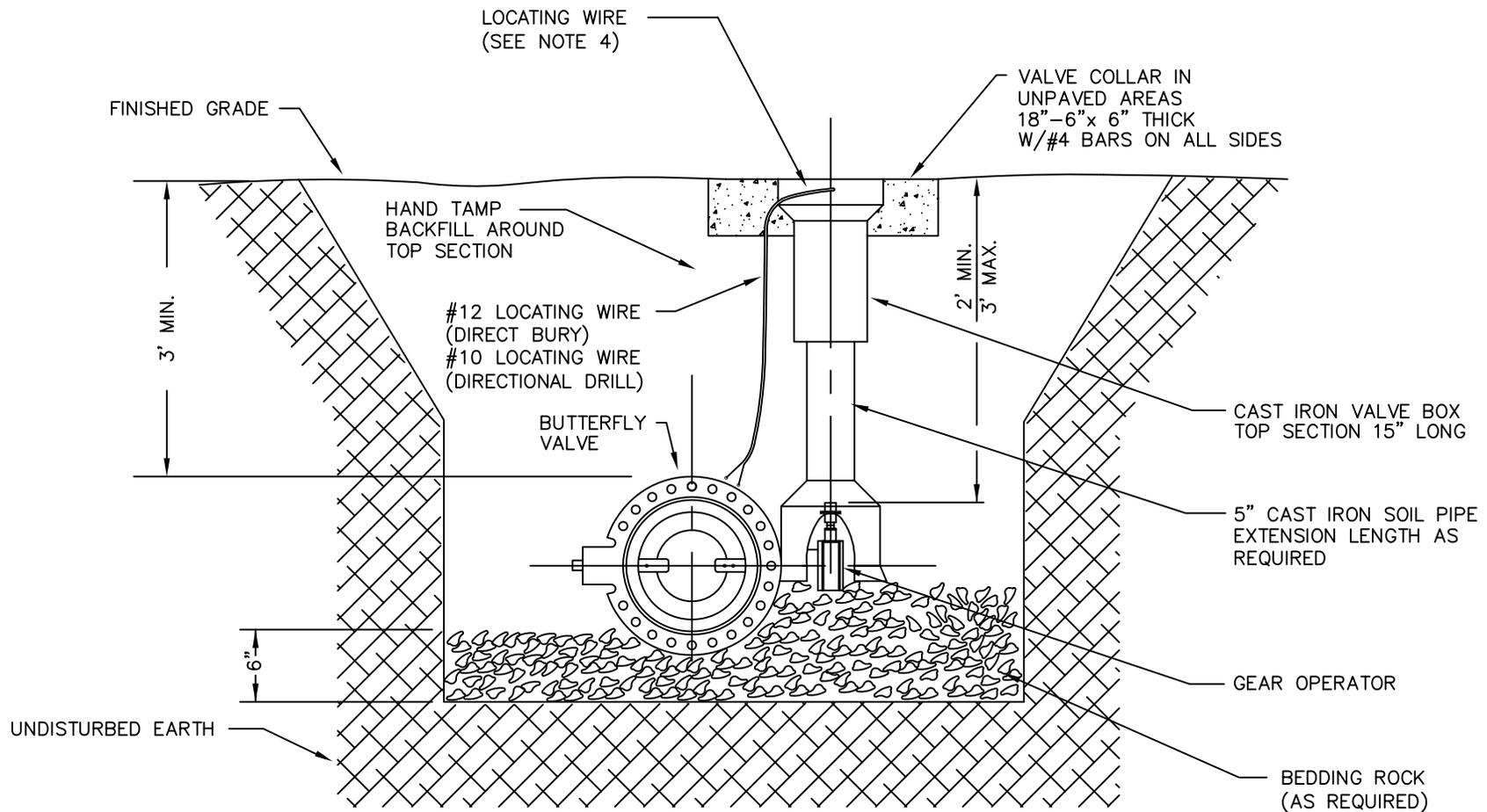


**NOTES:**

1. DEPTH OF COVER AND CASING EXTENSION BEYOND PAVEMENT OR R/R TRACKS SHALL BE AS REQUIRED BY THE REGULATORY AUTHORITY. ON COUNTY ROADS WHERE PRACTICAL, CASING SHALL EXTEND 8' BEYOND EDGE OF PAVEMENT AND SHALL NOT BE LESS THAN 6' BEYOND EDGE OF PAVEMENT IN ANY CASE.
2. CASING SPACERS AND END SEALS TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
3. STEEL CASING PIPE MATERIAL, SIZE AND COATINGS SHALL BE AS REQUIRED BY F.D.O.T.
3. LOCATE WIRE AND LOCATE TAPE (TWO TYPES) SHALL BE ON ALL PARTS.

**BORE AND JACK CASING INSTALLATION DETAIL**

UPDATED JUNE 2016



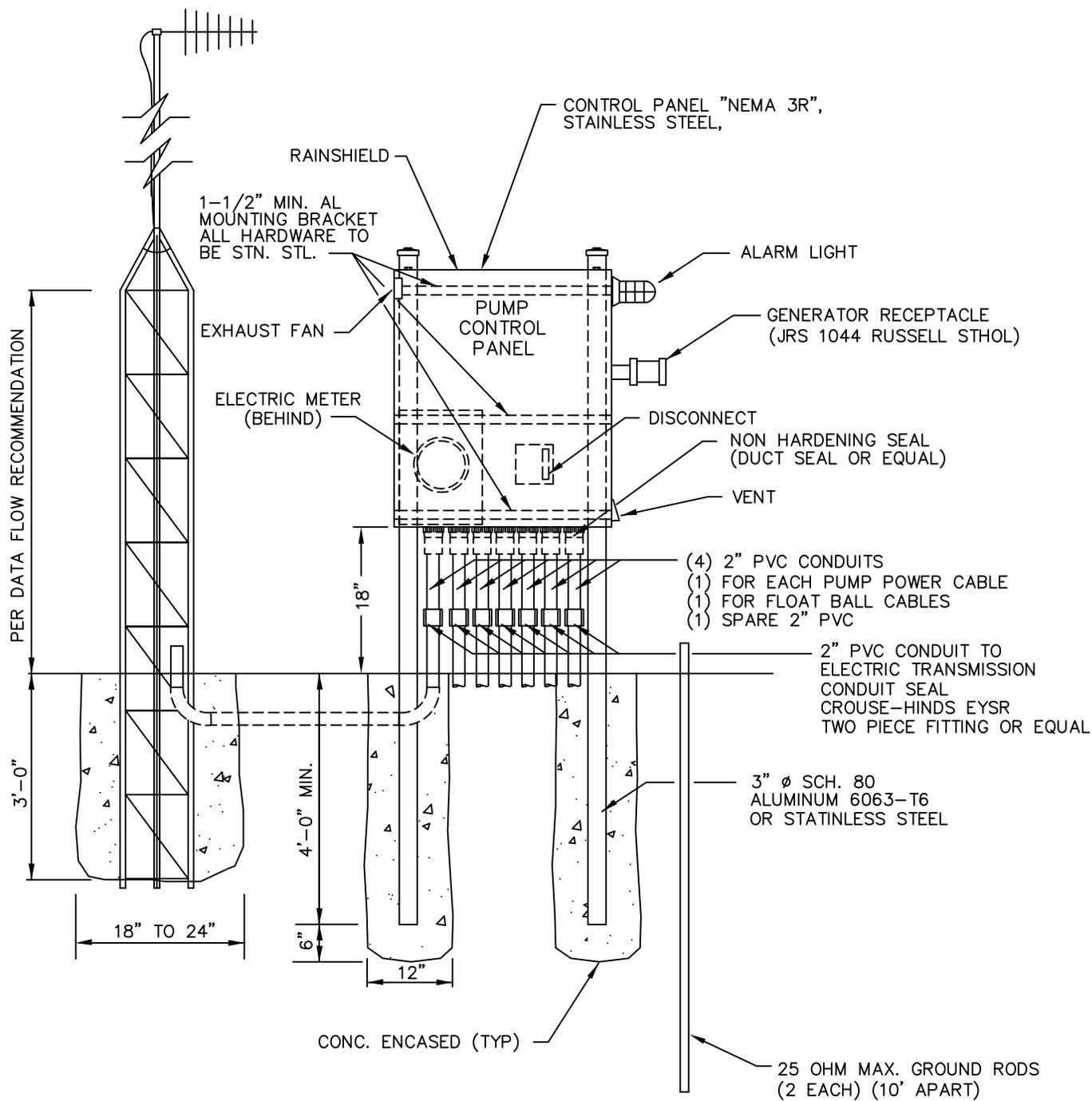
### NOTES

1. PVC EXTENSIONS SHALL NOT BE USED ON VALVE BOX INSTALLATION
2. ALL WATER SHUT-OFF VALVES SIXTEEN INCHES AND LARGER SHALL BE BUTTERFLY VALVES
3. VALVE OPERATOR NUTS SHALL BE BETWEEN 2'-3' BELOW GRADE. IF OPERATOR NUTS ARE GREATER THAN 3' BELOW FINISH GRADE EXTENSION STEMS SHALL BE INSTALLED. SEE DETAIL FOR VALVE EXTENSION STEMS IN VOLUSIA COUNTY FIGURES & DETAILS.
4. LOCATING WIRE SHALL BE CONTINUOUS AND SHOULD EXTEND 12" ABOVE TOP OF COLLAR. WIRE SHALL BE COLOR CODED TO MATCH THE UTILITY INSTALLED

## **BUTTERFLY VALVE AND BOX DETAIL**

FOR 16" AND LARGER VALVES

UPDATED JUNE 2016



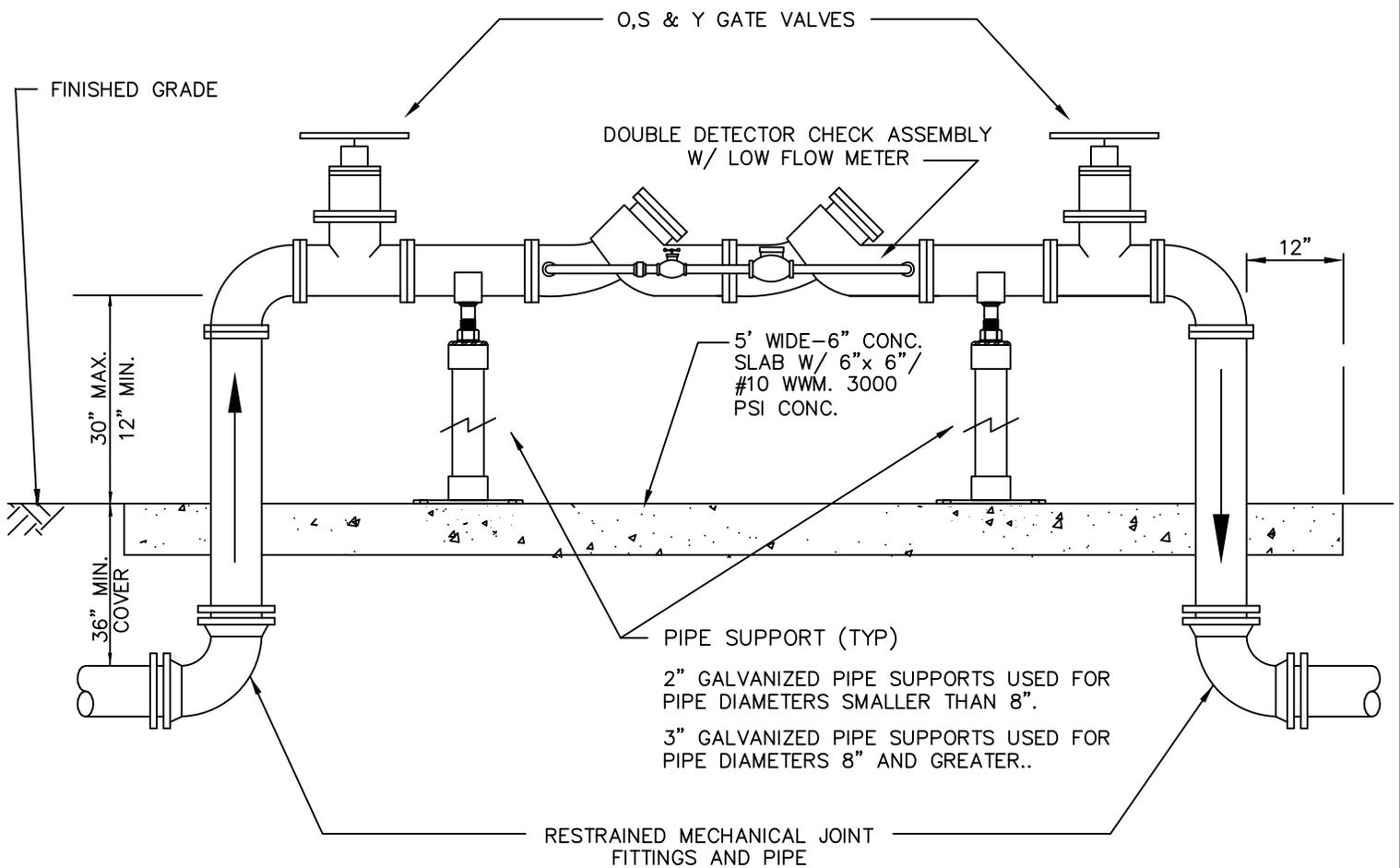
**NOTES**

1. DRAWING IS SHOWN FOR 230 VOLT POWER SUPPLY. THE ELECTRICAL UTILITY SHALL DETERMINE THE SERVICE CONFIGURATION.
2. POWER SUPPLY SHALL BE UNDERGROUND ON THE LIFT STATION SITE AND SHALL BE 3 PHASE FROM A 3 PHASE SOURCE ONLY.

**CONTROL PANEL/ ANTENNA ELEVATION**

N.T.S.

UPDATED JUNE 2019



- NOTES:
1. ALL PIPE & FITTINGS ABOVE GRADE SHALL BE FLANGED
  2. ALL PIPING, FITTINGS AND SUPPORTS TO BE PAINTED. COLOR TO BE SELECTED BY COUNTY.
  3. DOUBLE DETECTOR CHECK ASSEMBLY SHALL HAVE A FUSED EPOXY COATED CAST IRON BODY.
  4. ASSEMBLY SHALL BE EQUIPPED WITH A LOW FLOW METERING DEVICE TO DETECT LEAKS.

## **DOUBLE DETECTOR CHECK ASSEMBLY**

FOR FIRE PROTECTION ONLY

UPDATED JUNE 2019

### **Electronic Marker Balls for Gravity Mains**

Electronic Balls shall be provided at one foot from the termination of all sanitary sewer service laterals. Balls shall be Scotchmark model 1404, Electronic Full-Range Marker manufactured by 3M.

### **Electronic Marker Balls for Sewer Force Mains**

Electronic Balls shall be provided at fittings, valves, crosses, tees, changes in direction and every 100-ft on straight sections of pipe. Balls shall also be provided at the termination of sewer services. Electronic marker Balls shall be Scotchmark model 1404, Electronic Full-Range Marker Balls manufactured by 3M.

### **Electronic Marker Balls for Potable Water Mains**

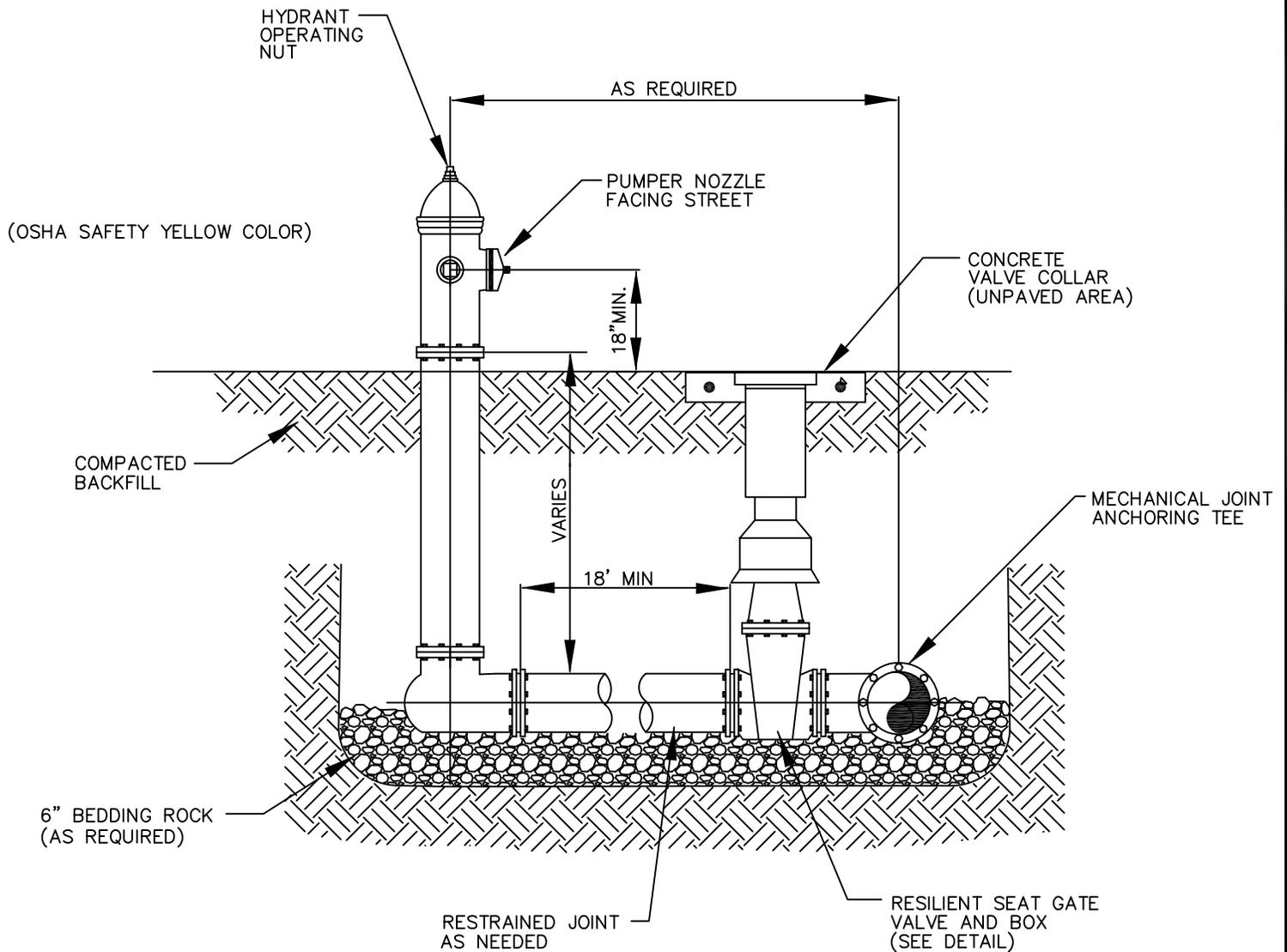
Electronic Balls shall be provided at fittings, valves, crosses, tees, changes in direction and every 100-ft on straight sections of pipe. Balls shall also be provided at the termination of water services. Balls shall be Scotchmark model 1403, Electronic Full-Range Marker Balls manufactured by 3M.

### **Electronic Marker Balls for Reclaimed Water Mains**

Electronic Balls shall be at fittings, valves, crosses, tees, changes in direction and every 100-ft on straight sections of pipe. Balls shall also be provided at the termination of water services. Balls shall be Scotchmark model 1408, Electronic Full-Range Marker Balls manufactured by 3M.

## **ELECTRONIC MARKER**

UPDATED JUNE 2016



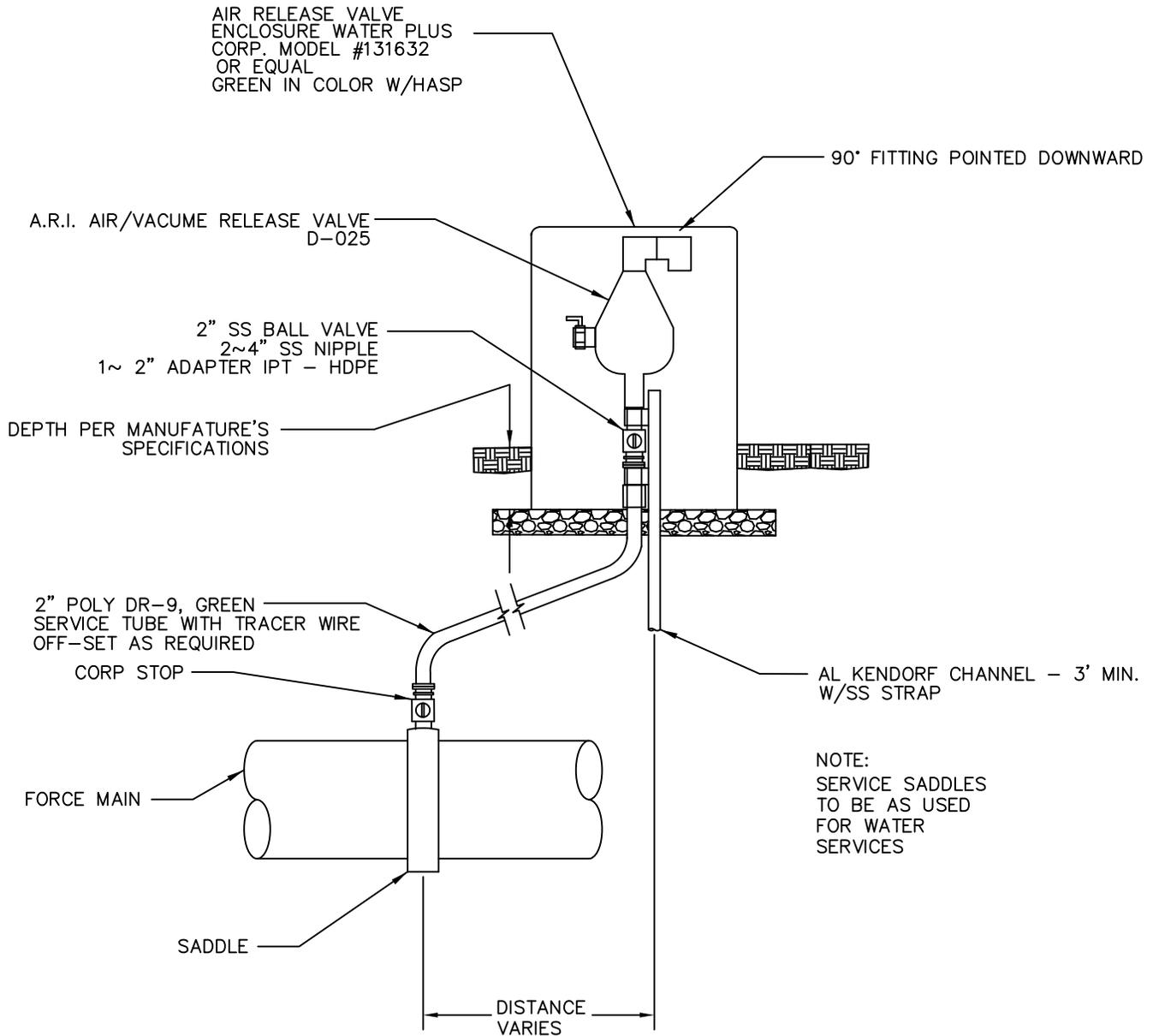
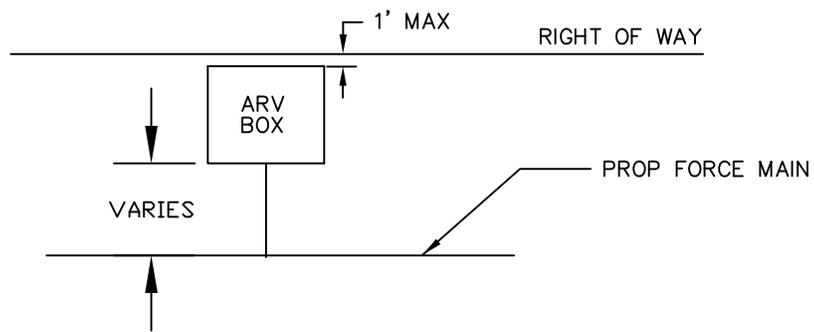
**NOTES:**

1. FIRE HYDRANT TO BE LOCATED 5' TO 10' FROM EDGE OF PAVEMENT.
2. VALVE BOX SHALL BE SCREW TYPE ADJUSTABLE AND COVER SHALL BE MARKED: WATER.
3. FIRE HYDRANTS CANNOT BE LOCATED WITHIN THE RADIUS OF STREET CORNERS.
4. ABOVE GROUND OBSTRUCTIONS MAY BE LOCATED NO CLOSER THAN 3' FROM FIRE HYDRANTS.
5. FIRE HYDRANT SHALL BE SUPPLIED WITHOUT WEEP HOLE, OR WITH A PERMANENTLY PLUGGED WEEP HOLE.
6. FIRE HYDRANT SHALL COMPLY VOLUSIA COUNTY SPECIFICATIONS, APPENDIX A, LIST OF APPROVED MANUFACTURERS AND MATERIALS.
7. ALL FIRE HYDRANT PIPING SHALL BE RESTRAINED BY MEGA-LUGS.
8. LOCATE WIRE AND LOCATE TAPE SHALL BE INSTALLED ON ALL PIPES.
9. A BLUE REFLECTOR SHALL BE INSTALLED ON THE PAVEMENT ADJACENT TO THE FIRE HYDRANT.

**FIRE HYDRANT ASSEMBLY DETAIL**

N.T.S.

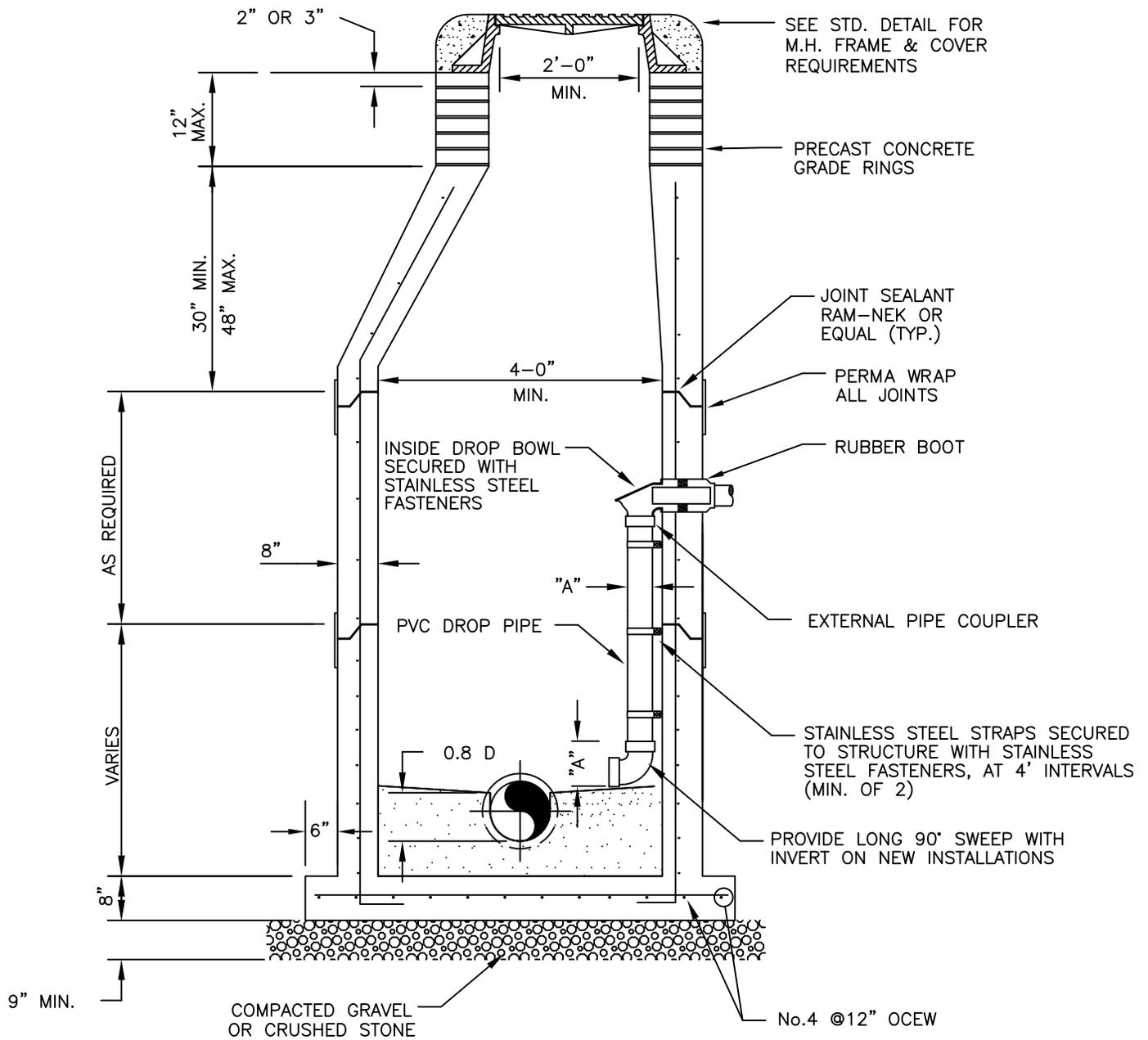
UPDATED JUNE 2019



## SANITARY FORCE MAIN AIR AND VACUUM RELEASE VALVE

**ARI D-025  
OR EQUAL**

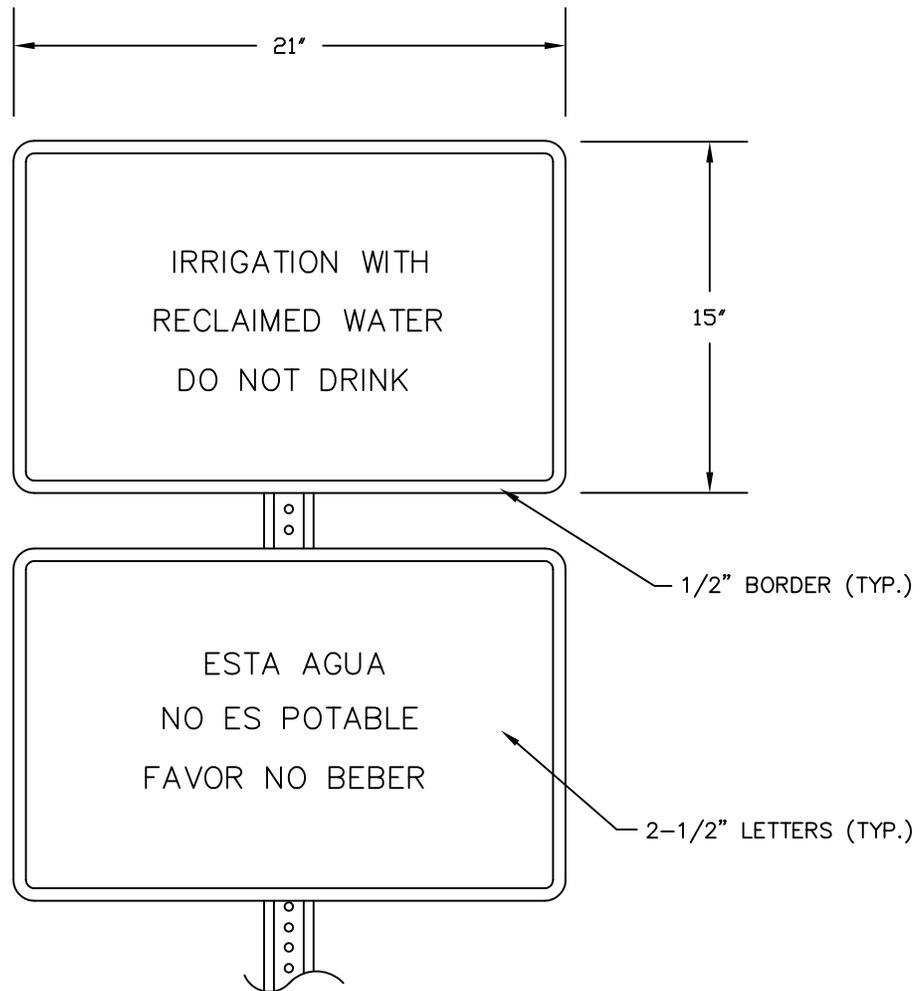
NTS      UPDATED JUNE 2019



## INSIDE DROP DETAIL

UPDATED JUNE 2019

FOR NEW INSTALLATIONS AND RETROFIT  
OF EXISTING MANHOLES/WET WELLS



#### NOTES

1. HEIGHT OF SIGN WILL DEPEND ON LOCATION AND SURROUNDING LANDSCAPE PLANT TYPES. IN ALL CASES, THE SIGN SHALL BE VISIBLE TO THE PUBLIC.
2. BACKGROUND SHALL BE 3M SCOTCHLITE 710 PROCESS COLOR OR EQUIVALENT. (FEDERAL HIGHWAY SIGN COLOR)
3. SIGN LETTERS SHALL BE REFLECTIVE MATERIALS EQUIVALENT. (FEDERAL HIGHWAY SIGN COLOR)
4. POST SHALL BE U CHANNEL, 2 LB. HOT ROLLED HIGH TENSILE RAIL OR OR BILLET STEEL WITH GALVANIZED FINISH PER ASTM A-123.
5. MOUNTING HARDWARE SHALL BE STAINLESS STEEL.
6. MINIMUM DEPTH OF BURIAL OF SIGN POST SHALL BE 4'.
7. SIGN BLANK SHALL BE REFLECTIVE ALUMINUM 0.080" THICK.

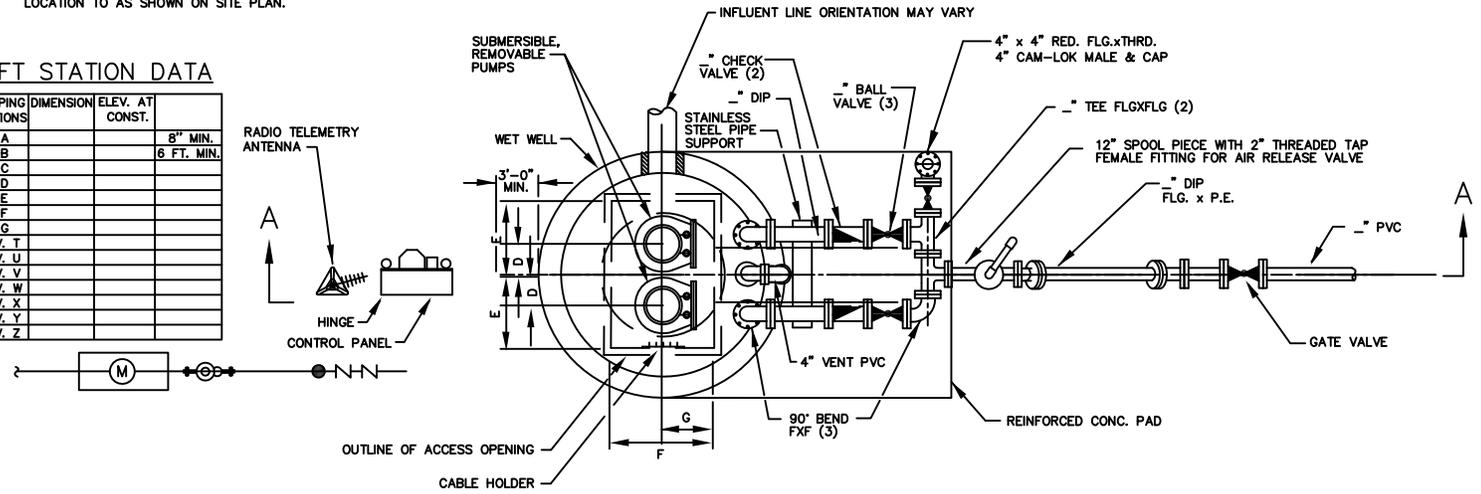
## **RECLAIMED WATER IRRIGATION SIGN**

UPDATED JUNE 2016

CONTRACTOR TO FURNISH 1" POLY-TUBE WATER SERVICE AND BOX. COUNTY TO FURNISH METER.  
 CONTRACTOR TO FURNISH 3/4" HOSE BIBB.  
 LOCATION TO AS SHOWN ON SITE PLAN.

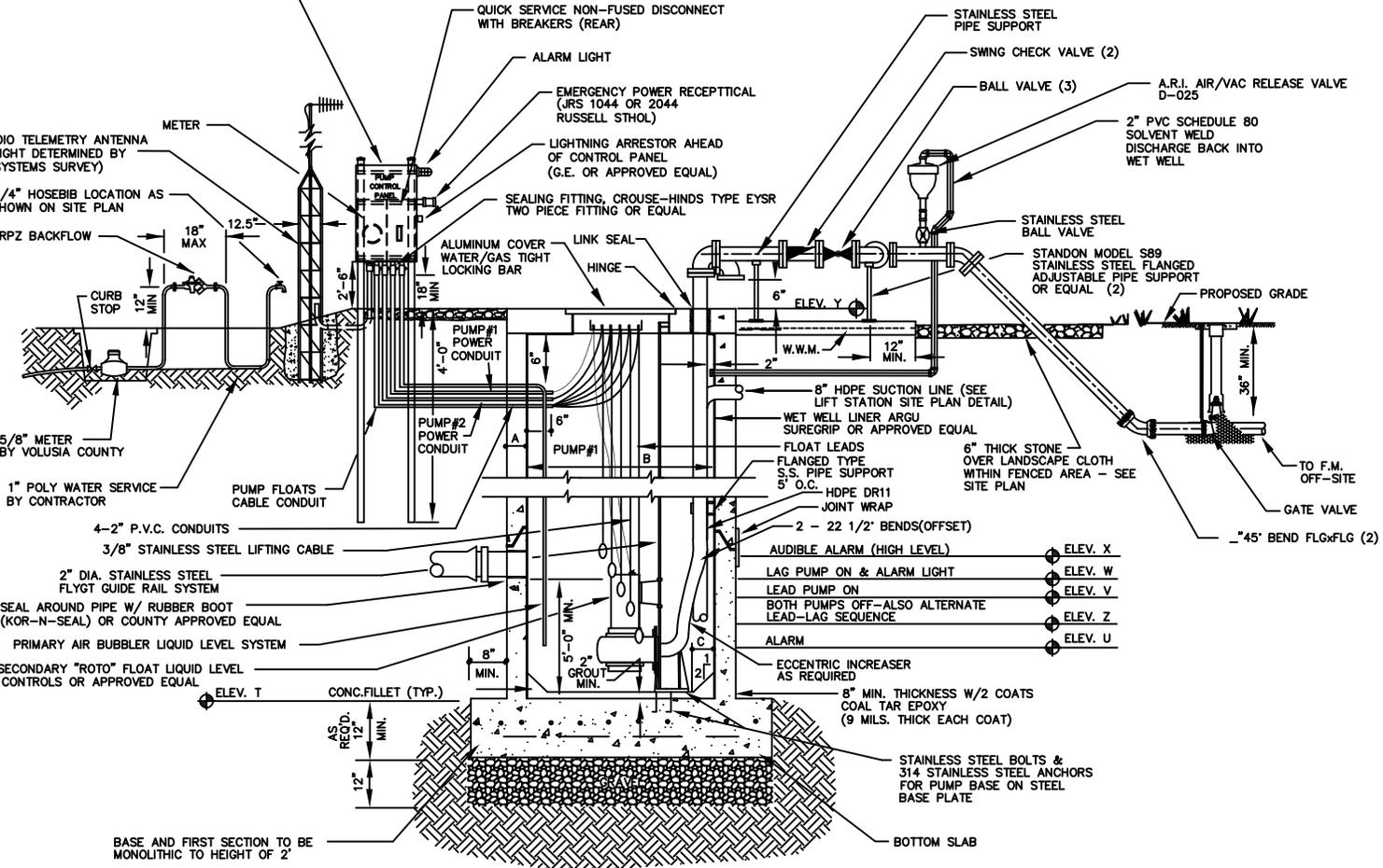
**LIFT STATION DATA**

PUMPING STATIONS	DIMENSION	ELEV. AT CONST.
DIM A		8" MIN.
DIM B		6 FT. MIN.
DIM C		
DIM D		
DIM E		
DIM F		
DIM G		
ELEV. T		
ELEV. U		
ELEV. V		
ELEV. W		
ELEV. X		
ELEV. Y		
ELEV. Z		



**PLAN**  
NOT TO SCALE

CONTROL PANEL "NEMA 3R"  
 2-3" ALUMINUM OR STAINLESS  
 PANEL SUPPORTS WITH CAPS  
 DOORS SHALL BE PROVIDED  
 PER THE CONTROL PANEL DETAIL,  
 FIGURE 2207



**PUMP DATA**

MANUFACTURER:	MODEL:
IMPELLER NO.:	NOMINAL SIZE:
SPEED: 1750 RPM	DISCHARGE SIZE:
VOLTAGE: 230/460	PHASE: 3
HORSEPOWER:	MIN. SOLID SIZE: 3"
OPERATING CONDITIONS SHALL BE _____ GPM @ _____ THD.	
MIN. SHUT OFF HEAD _____ FT.	

**SECTION A-A**  
NOT TO SCALE

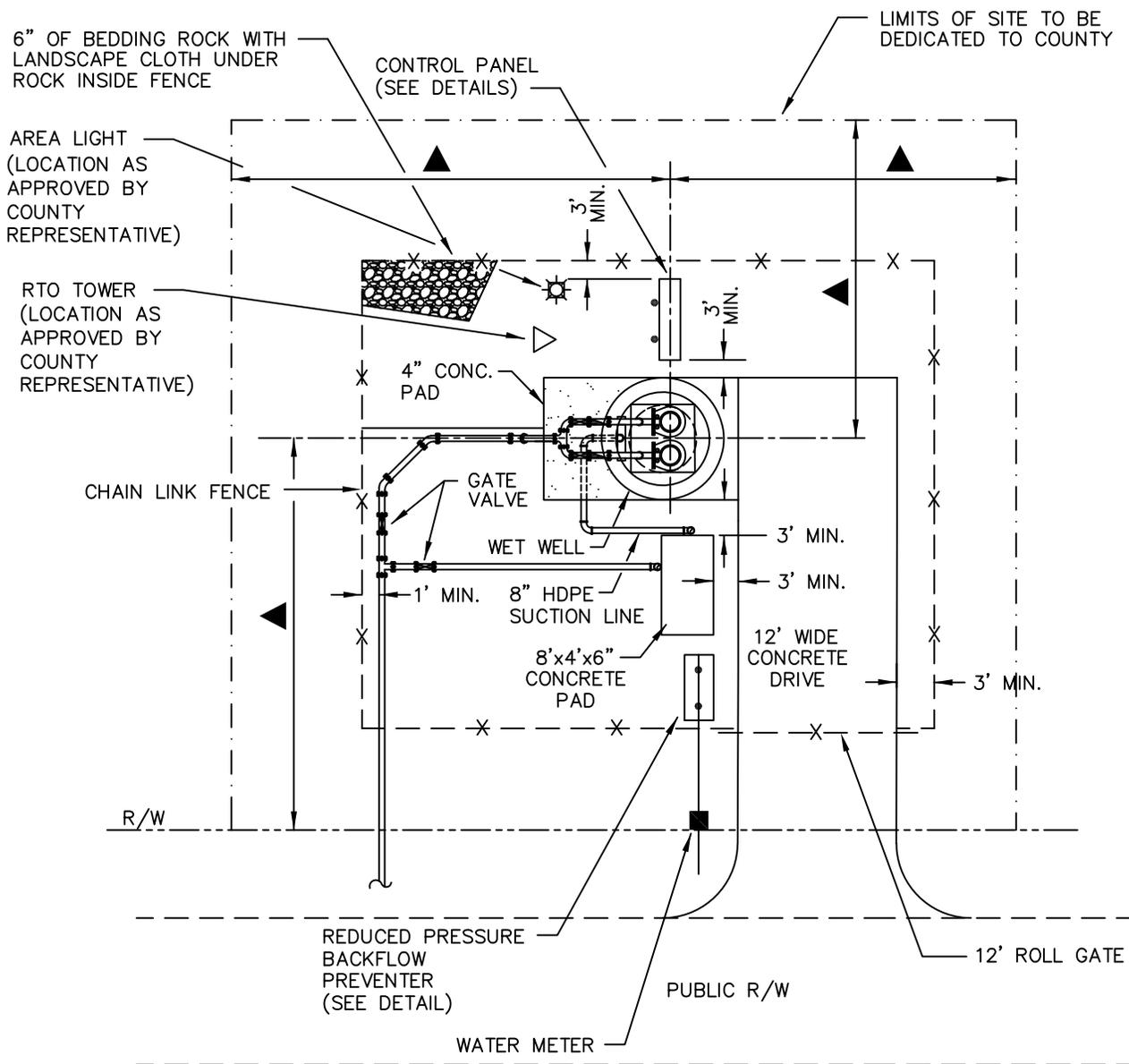
**LIFT STATION DETAIL**

UPDATED JUNE 2019

1. THE LIFT STATION SHALL BE DESIGNED IN ACCORDANCE WITH SECTIONS 61-63 OF VOLUSIA COUNTY'S UTILITY SPECIFICATIONS, AVAILABLE ONLINE AT [www.volusia.org/core/fileparse.php/4157/urlt/UtilitySpecifications\\_032714.pdf](http://www.volusia.org/core/fileparse.php/4157/urlt/UtilitySpecifications_032714.pdf)
2. SHOP DRAWINGS ARE REQUIRED FOR PUMPS, PIPING, VALVES, FITTINGS, ELECTRICAL EQUIPMENT AND PRE-CAST CONCRETE STRUCTURES.
3. ALL PRECAST STRUCTURES SHALL BE DESIGNED PER ACI 315 & 318 "MANUAL OF STANDARD PRACTICE".
4. ALL EXPOSED METAL, EXCLUDING STAINLESS STEEL OR ALUMINUM MATERIALS, SHALL BE PAINTED WITH (2) COATS OF EXTERIOR, OIL BASE, ENAMEL PAINT. PIPING SHALL COME WITH STD. RED PRIMER.
5. INTERIOR OF WET WELL SHALL BE LINED WITH HDPE, 2.0 MM THICKNESS, AS MANUFACTURED BY AGRU SURE-GRIP OR APPROVED EQUAL. THE OUTSIDE OF THE WET WELL SHALL BE COATED WITH 2 COATS OF WATER BASED CONCRETE COATING, 9 MILS THICK.
6. WET WELL ACCESS HATCHES SHALL BE MINIMUM 36"x 48", 1/4" THICK ALUMINUM FLOOR PLATE REINFORCED TO 150 P.S.F. LIVE LOAD. DOORS SHALL HAVE FLUSH ALUMINUM DROP HANDLE AND AN AUTOMATIC HOLD OPEN ARM WITH RELEASE HANDLE. ALL FASTENERS AND ACCESSORIES SHALL BE 316 STAINLESS STEEL. HATCH FRAMES TO BE INTEGRALLY CAST INTO CONCRETE TOPS. THE HATCHES SHALL BE SERIES W1R WITH A SERIES X RETRO-GRATE MANUFACTURED BY "HALLIDAY", OR APPROVED EQUAL.
7. ALL NUTS, BOLTS, WASHERS AND MISCELLANEOUS HARDWARE ARE TO BE 316 STAINLESS STEEL.
8. THE CONTRACTOR SHALL COORDINATE WITH THE POWER COMPANY. FOR ELECTRICAL SERVICE TO THE LIFT STATION SITE, AND SHALL MEET ALL POWER COMPANY REQUIREMENTS WITHOUT ADDITIONAL COMPENSATION.
9. ALL WET WELL JOINTS TO BE SEALED WITH "RAM-NEK" JOINT SEALER AND WRAPPED WITH 8" WIDE JOINT TAPE ON THE OUTSIDE PERIMETER.
10. ALL EXPOSED AND EMBEDDED CONDUITS TO BE PVC.
11. TESTING OF FORCE MAIN AND LIFT STATION SHALL BE REQUIRED. LIFT STATION SHALL BE TESTED WITH FIRST PUMP ON, SECOND PUMP ON, AND BOTH PUMPS ON.
12. ALL M.J. AND FLANGED D.I. PIPE AND FITTINGS SHALL BE POLYETHYLENE LINED (40 MILS. NOMINAL) CONFORMING TO ASTM D-1248.
13. ALL SUPPORTS AND HARDWARE FOR ELECTRICAL EQUIPMENT SHALL BE PVC COATED ALUMINUM OR STAINLESS STEEL.
14. THE ENTIRE AREA WITHIN THE SECURITY FENCE SHALL HAVE A MINIMUM OF 6" STONE OVER LAYER OF LANDSCAPE CLOTH.
15. THE LIFT STATION SHALL BE EQUIPPED WITH DATA FLOW SYSTEMS PUMP CONTROLS AND TELEMETRY EQUIPMENT. THE DATA FLOW SYSTEM CONTROLLER SHALL BE EQUIPPED WITH A TRANSMITTER AND ANTENNA CAPABLE OF COMMUNICATING WITH THE COUNTY'S S.W. WATER RECLAMATION FACILITY, AS WELL AS CONFORMING TO VOLUSIA COUNTY DATA FLOW STANDARDS.

## **LIFT STATION NOTES**

UPDATED JUNE 2019



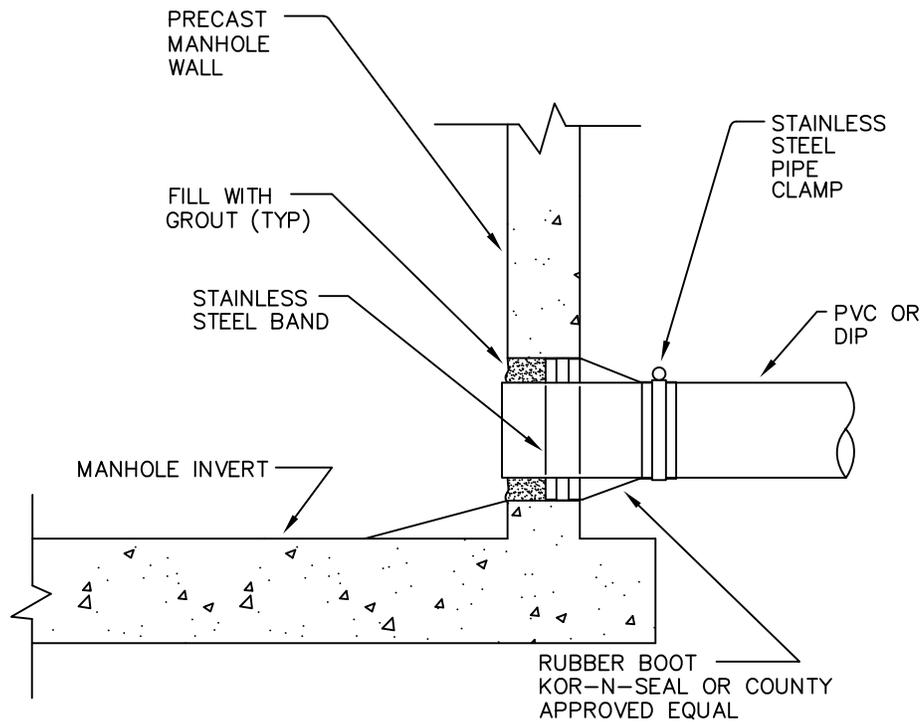
▲ THIS DIMENSION SHALL BE EQUAL TO THE DEPTH OF THE WET WELL OR GREATER, AS DETERMINED BY THE COUNTY

**NOTES:**

1. SEE LIFT STATION DETAIL SHEET FOR EQUIPMENT AND STRUCTURE DESIGN.
2. ENGINEER SHALL PROVIDE A SCALED (1"=20' MIN.) SITE SPECIFIC DETAIL.
3. THE HOA OR OTHER PRIVATE ENTITY SHALL BE RESPONSIBLE FOR MAINTENANCE IF LANDSCAPING IS INSTALLED

**LIFT STATION SITE PLAN**

UPDATED JUNE 2019



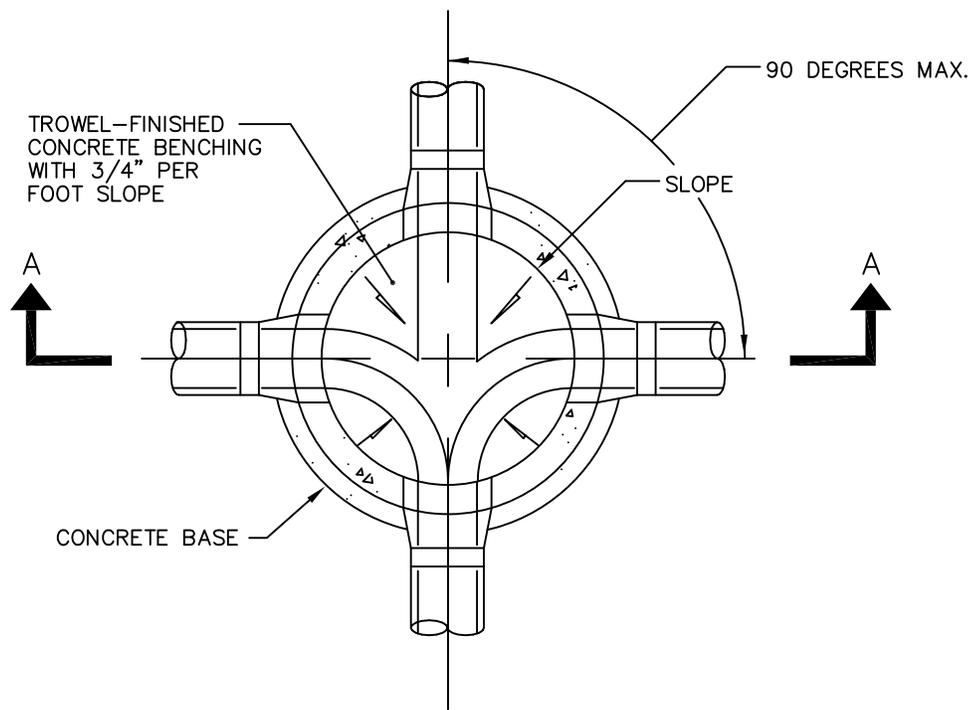
STANDARD PRECAST MANHOLE  
PIPE CONNECTION

NOTES:

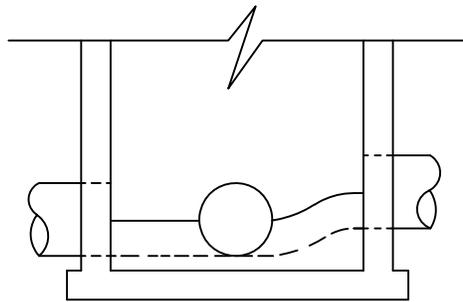
1. DROP PIPE AND FITTINGS SHALL BE OF EQUAL SIZE AND MATERIAL AS THE INFLUENT SEWER.
2. AN INSIDE DROP CONNECTION SHALL BE REQUIRED FOR ALL INFLUENT WHICH HAVE AN INVERT 18" OR MORE ABOVE THE MANHOLE INVERT.

**MANHOLE CONNECTION DETAILS**

UPDATED JUNE 2019



PLAN VIEW



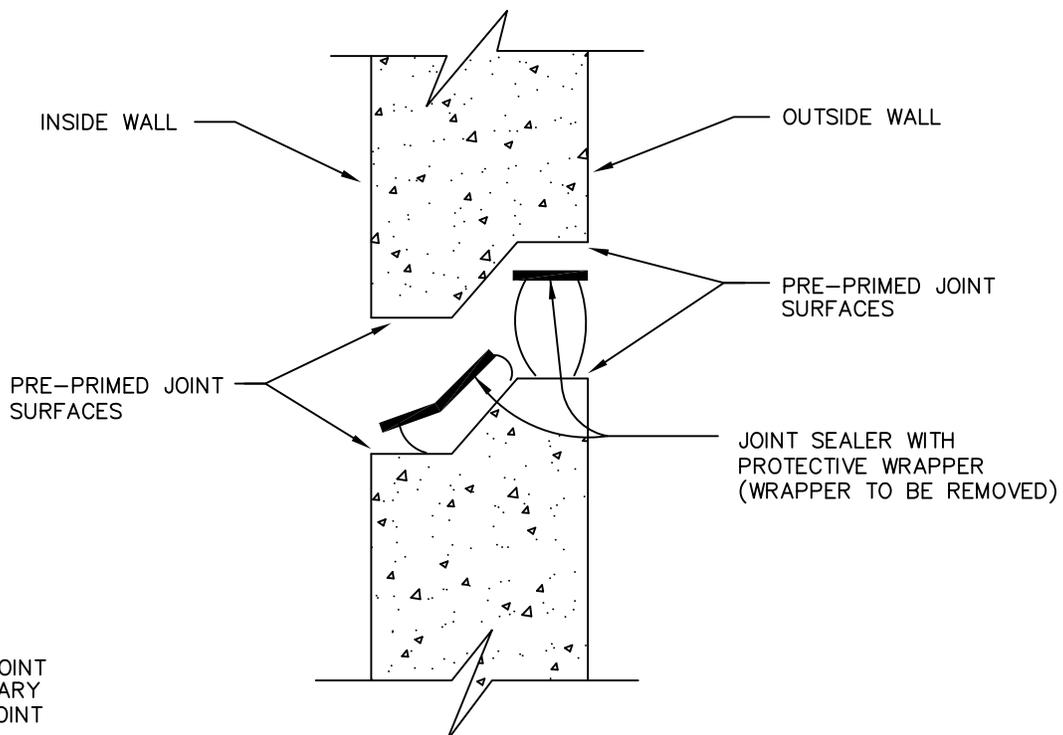
SECTION

NOTES

1. FLOW CHANNELS SHALL HAVE A MINIMUM SLOPE OF 0.40 FEET PER 100 FEET. NO STANDING WATER WILL BE PERMISSABLE.
2. ALL INVERT CHANNELS SHALL BE CONSTRUCTED TO OBTAIN A SMOOTH FLOW WITHOUT OBSTRUCTIONS.
3. SERVICE LATERALS SHALL NOT ENTER MANHOLES UNLESS SPECIFIED ON PLANS AND THEN MUST BE CONNECTED AS MAINS.
4. BRICK AND CONCRETE SHALL BE USED FOR FLOW CHANNEL BUILD UP.
5. SIDE OF FLOW CHANNEL SHALL BE AT LEAST HALF OF PIPE HEIGHT AT ALL POINTS.
6. PROPERLY SHAPED SPILLWAYS SHALL BE CONSTRUCTED BETWEEN PIPES WITH DIFFERENT INVERT ELEVATIONS TO PROVIDE FOR SMOOTH FLOWS.
7. LATERAL PIES SHALL NOT ENTER THE MANHOLE AT ANGLES GREATER THAN 90 DEGREES TO THE FLOW LINE.

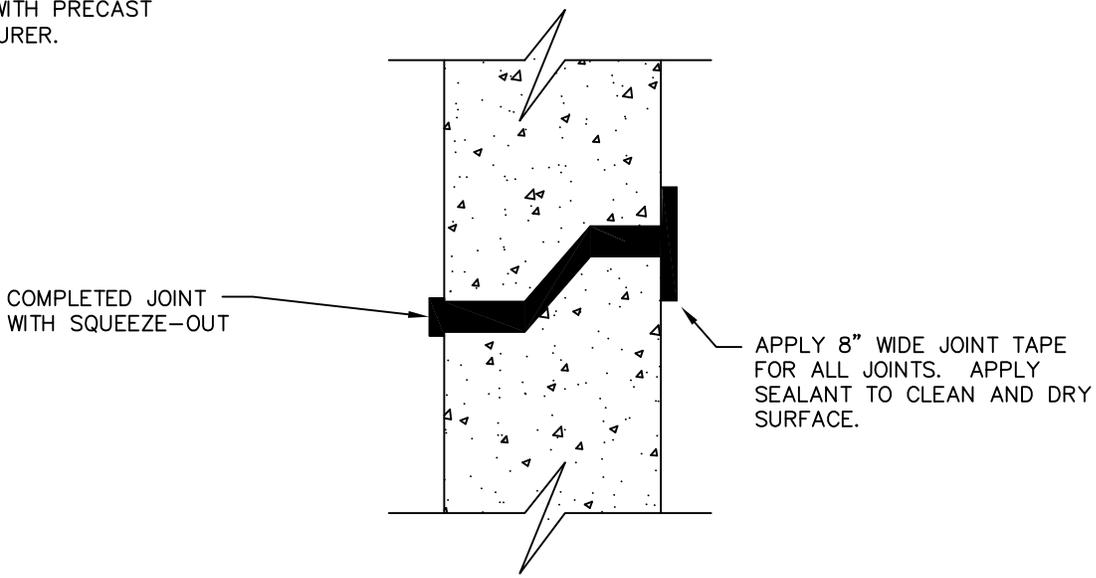
MANHOLE FLOW CHANNEL DETAIL

UPDATED JUNE 2019



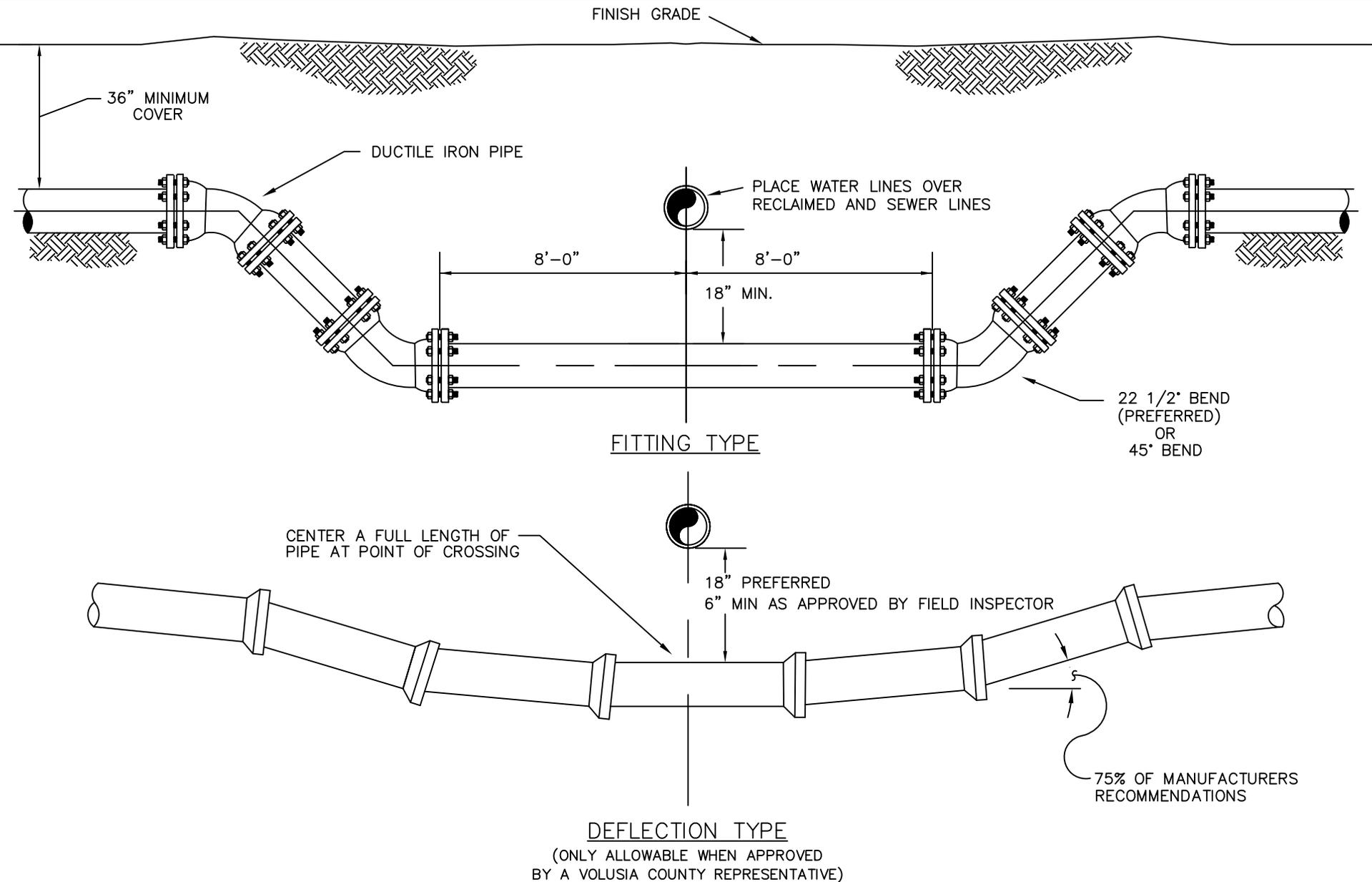
**NOTE**

PLACEMENT OF JOINT MATERIAL MAY VARY DEPENDING ON JOINT CONFIGURATION. CONSULT WITH PRECAST MANUFACTURER.



**MANHOLE JOINT DETAIL**  
**FOR PRECAST SECTIONS**

UPDATED JUNE 2016

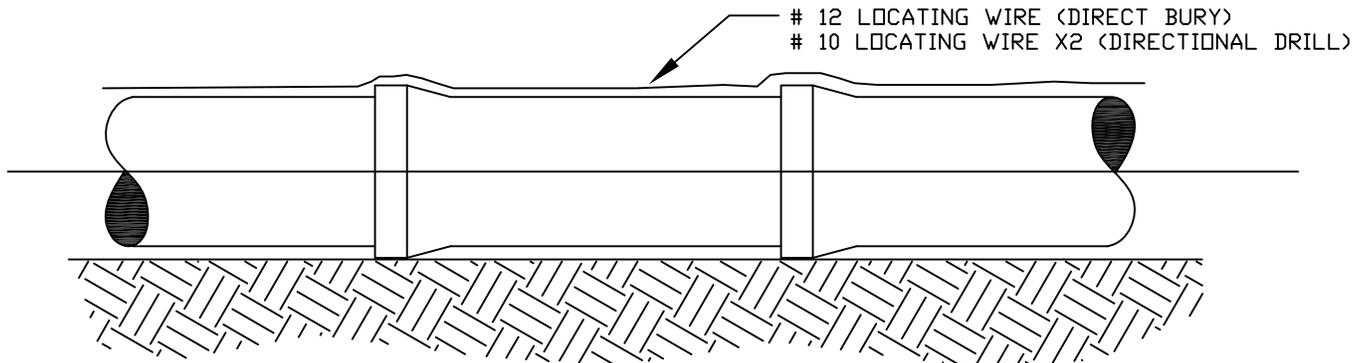
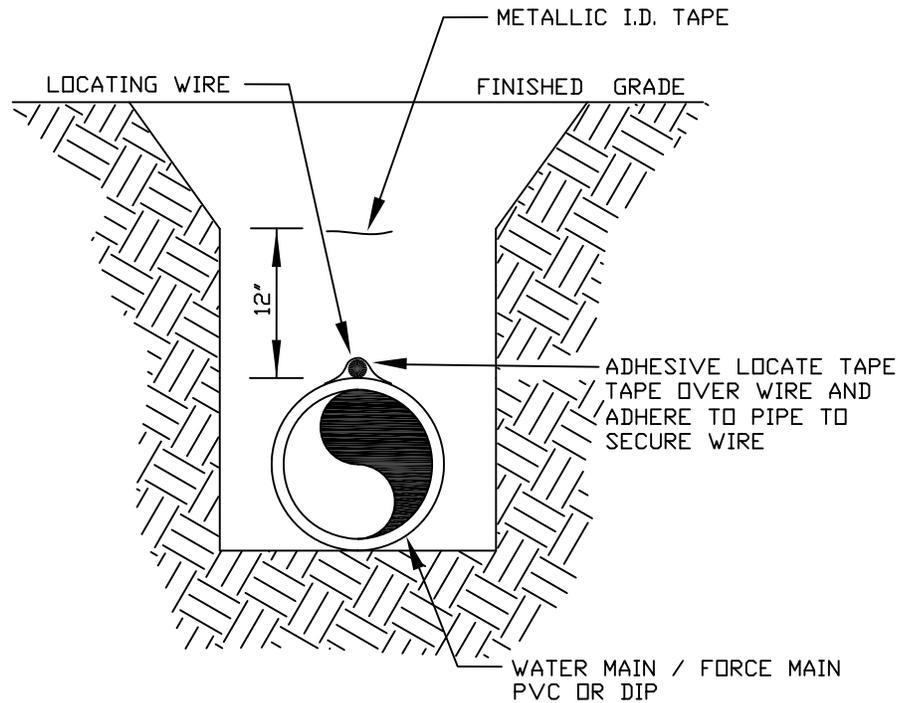


**NOTES:**

1. ABOVE METHODS ARE TO BE USED WHEN INSUFFICIENT COVER EXISTS TO ALLOW PRESSURE PIPE TO CROSS
2. ABOVE CONFLICT PIPE WITH 6" MIN. VERTICAL SEPARATION & MAINTAIN 36" COVER TO FINISHED GRADE.
3. FITTINGS SHALL BE RESTRAINED JOINT MEGALUGS.
4. DO NOT EXCEED 75% OF MANUFACTURERS RECOMMENDED MAXIMUM JOINT DEFLECTION, WHEN APPROVED BY A VOLUSIA COUNTY REPRESENTATIVE.
5. SEE TYPICAL PIPE CROSSING DETAIL.

**PIPE CONFLICT DETAIL**

UPDATED JUNE 2016



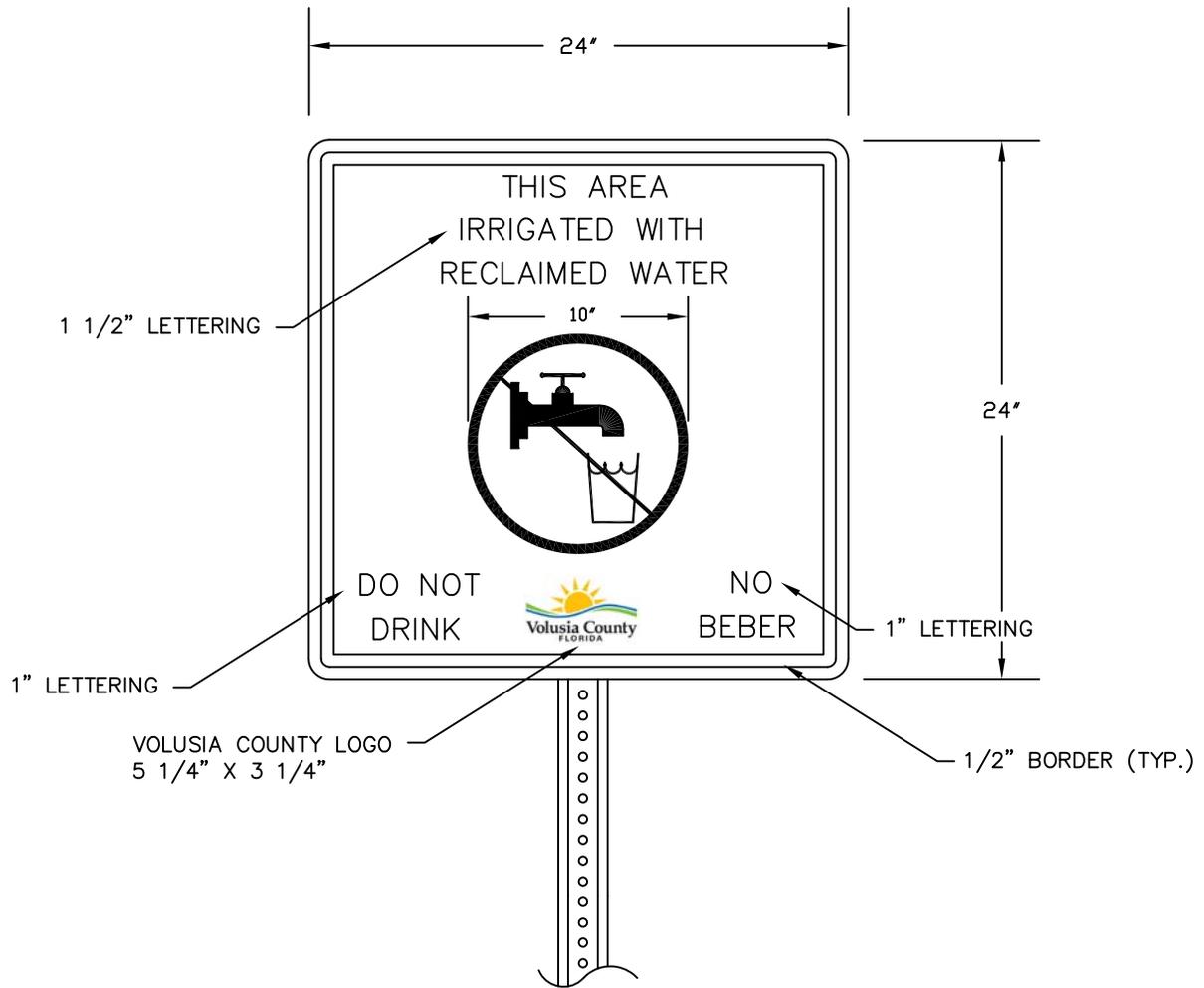
**NOTES:**

1. ALL PIPE SHALL REQUIRE INSULATED METALLIC LOCATING WIRE CAPABLE OF DETECTION BY A CABLE LOCATOR AND SHALL BE BURIED DIRECTLY ABOVE CENTERLINE OF PIPE.
2. LOCATING WIRE SHALL TERMINATE AT THE TOP OF EACH VALVE BOX AND BE CAPABLE OF EXTENDING 12' ABOVE TOP OF BOX IN SUCH A MANNER SO AS NOT TO INTERFERE WITH VALVE OPERATION (SEE GATE VALVE AND BOX DETAIL, FIGURE 2307).
3. ADHESIVE I.D. TAPE AS NECESSARY TO HOLD WIRE DIRECTLY ON THE TOP OF THE PIPE.
4. LOCATE WIRE AND LOCATE TAPE (TWO TYPES) SHALL BE ON ALL PIPES.
5. DIRECTIONAL DRILL INSTALLATION SHALL USE TWO SEPARATE COPPER CLAD SOLID STEEL WIRES, 10 GAUGE.
6. CONNECTIONS WILL BE GEL FILLED CONNECTORS.

**PVC PIPE LOCATING WIRE DETAIL**

N.T.S.

UPDATED JUNE 2019

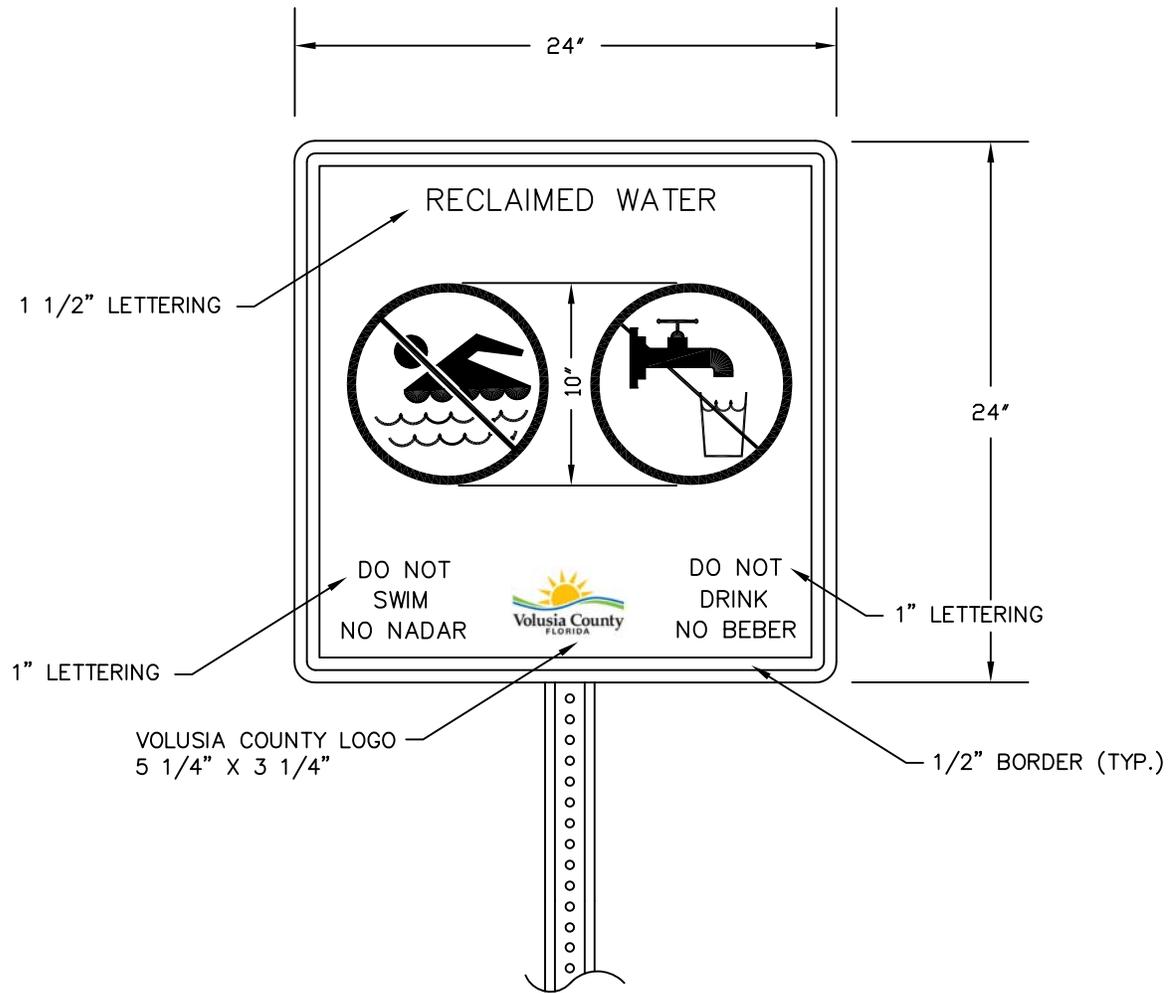


**NOTES**

1. HEIGHT OF SIGN WILL DEPEND ON LOCATION AND SURROUNDING LANDSCAPE PLANT TYPES. IN ALL CASES, THE SIGN SHALL BE VISIBLE TO THE PUBLIC.
2. SIGN LETTERS AND GRAPHIC SYMBOLS SHALL BE "PANTONE PURPLE" COLOR OR EQUIVALENT. (FEDERAL HIGHWAY SIGN COLOR)
3. BACKGROUND SHALL BE REFLECTIVE COLORED "WHITE" OR EQUIVALENT. (FEDERAL HIGHWAY SIGN COLOR)
4. POST SHALL BE U CHANNEL, 2 LB. HOT ROLLED HIGH TENSILE RAIL OR OR BILLET STEEL WITH GALVANIZED FINISH PER ASTM A-123.
5. MOUNTING HARDWARE SHALL BE STAINLESS STEEL.
6. MINIMUM DEPTH OF BURIAL OF SIGN POST SHALL BE 4'.
7. SIGN BLANK SHALL BE REFLECTIVE ALUMINUM 0.080" THICK.
8. VOLUSIA COUNTY LOGO SHALL NOT BE A DECAL.

**IRRIGATED WITH RECLAIMED WATER SIGN**

UPDATED JUNE 2016

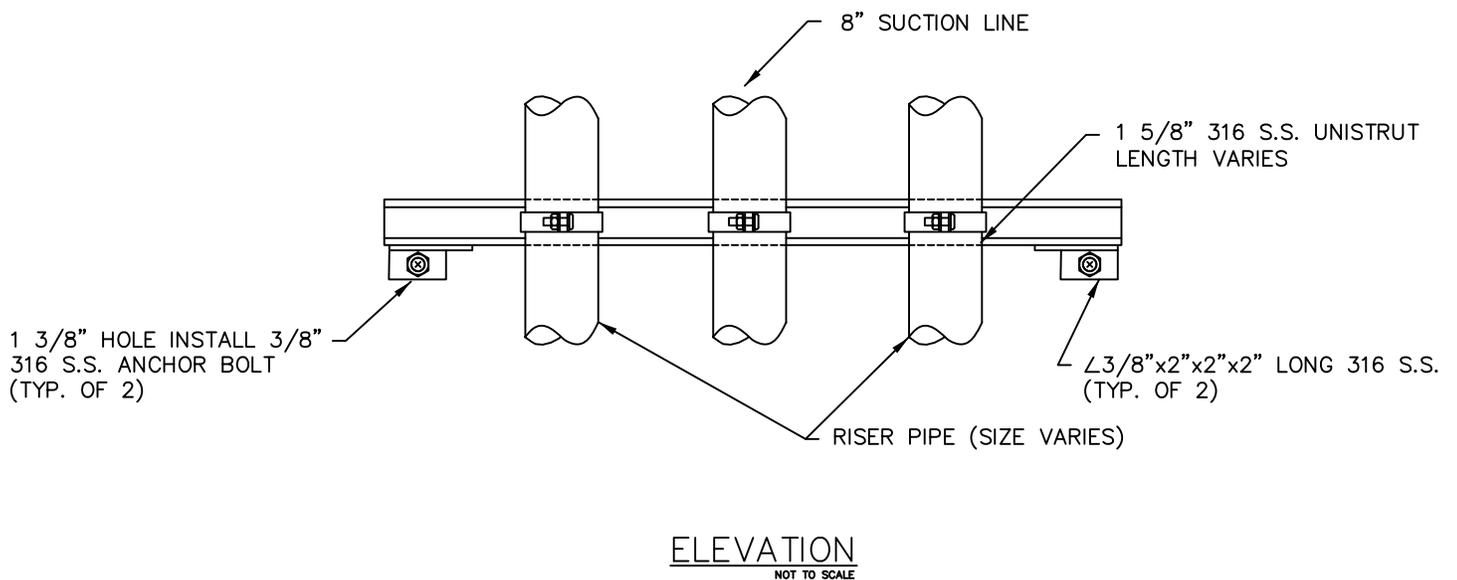
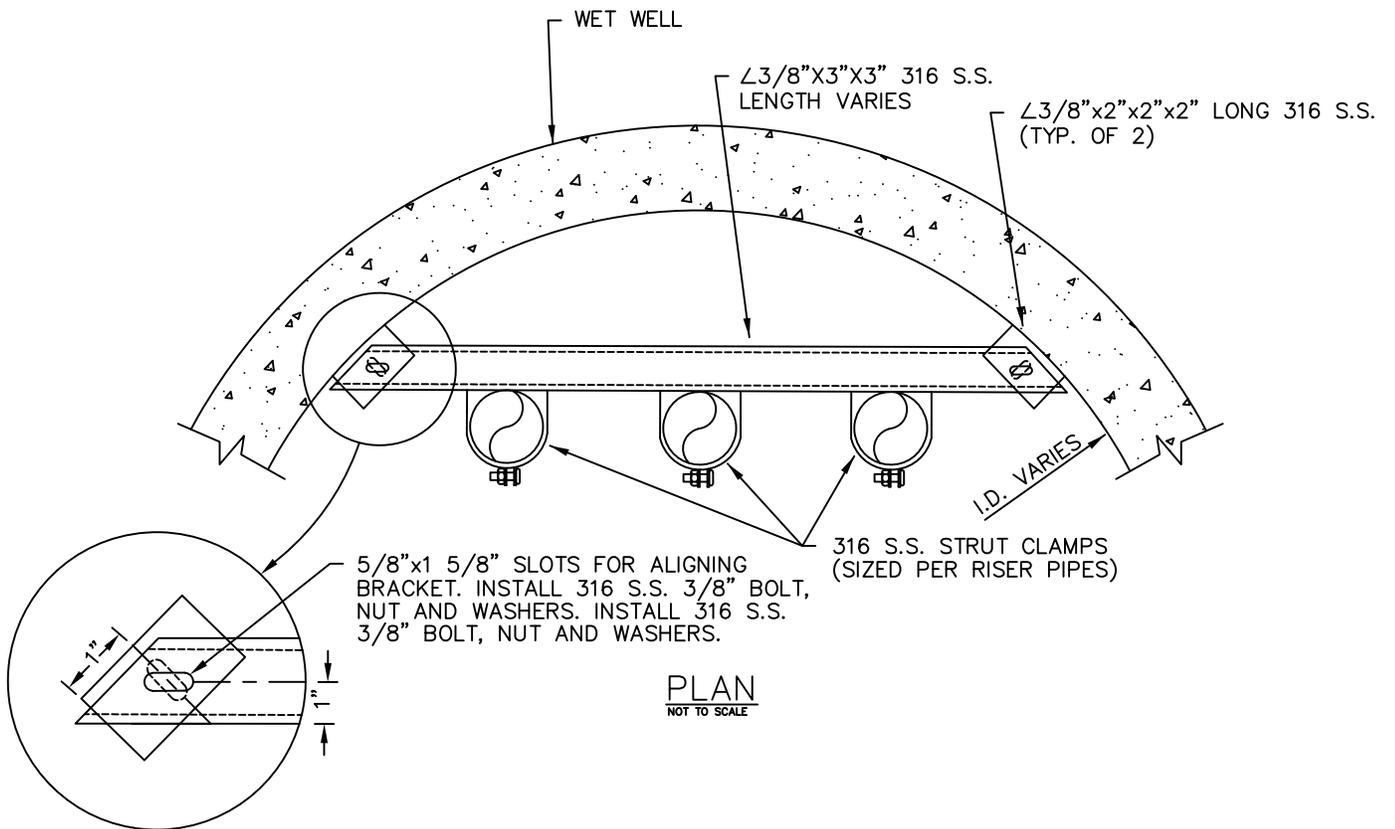


#### NOTES

1. HEIGHT OF SIGN WILL DEPEND ON LOCATION AND SURROUNDING LANDSCAPE PLANT TYPES. IN ALL CASES, THE SIGN SHALL BE VISIBLE TO THE PUBLIC.
2. SIGN LETTERS AND GRAPHIC SYMBOLS SHALL BE "PANTONE PURPLE" COLOR OR EQUIVALENT. (FEDERAL HIGHWAY SIGN COLOR)
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5. MOUNTING HARDWARE SHALL BE STAINLESS STEEL.
6. MINIMUM DEPTH OF BURIAL OF SIGN POST SHALL BE 4'.
7. SIGN BLANK SHALL BE REFLECTIVE ALUMINUM 0.080" THICK.
8. VOLUSIA COUNTY LOGO SHALL NOT BE A DECAL.

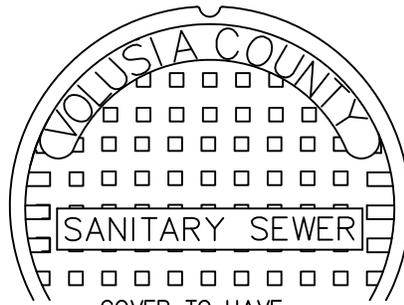
## **RECLAIMED WATER SIGN**

UPDATED JUNE 2016



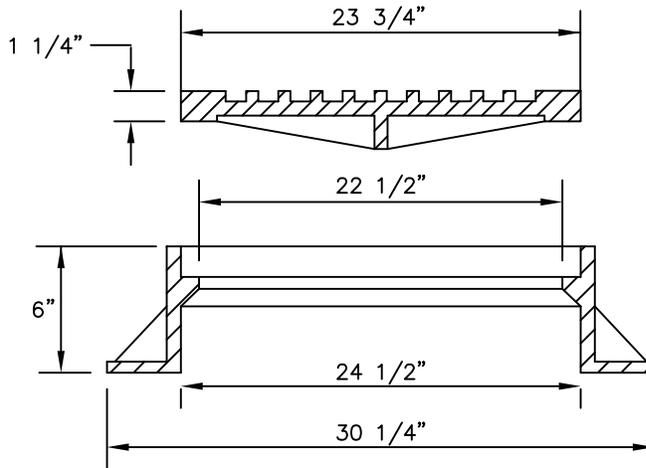
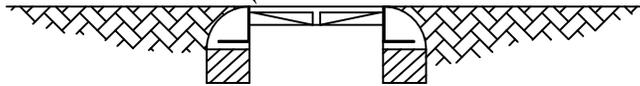
# RISER PIPE SUPPORT BRACKET DETAIL

UPDATED JUNE 2019



COVER TO HAVE  
NON-PENETRATING  
PICK HOLES

SET COVERS FLUSH WITH  
FINISHED ASPHALT



FRAME AND COVER TO BE TRAFFIC  
BEARING U.S. FOUNDRY #170-E, OR EQUAL.

NOTES:

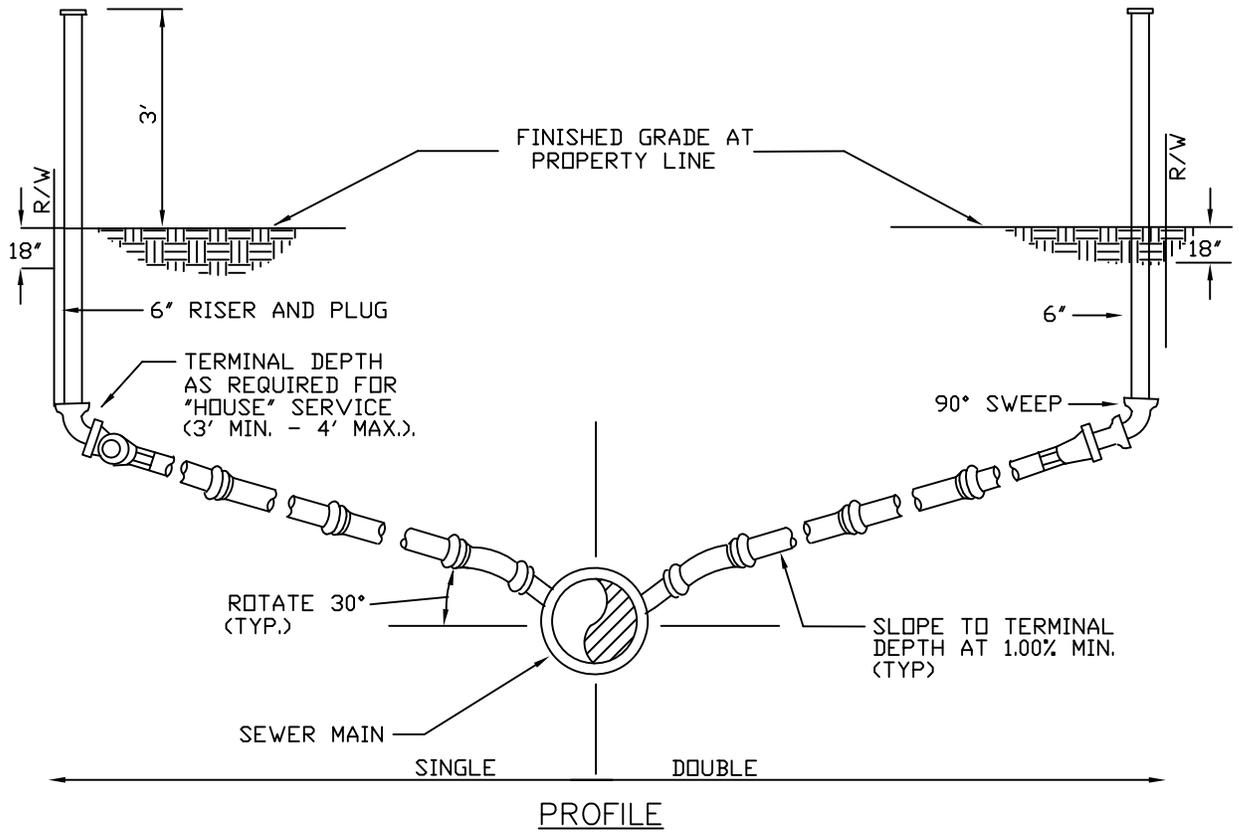
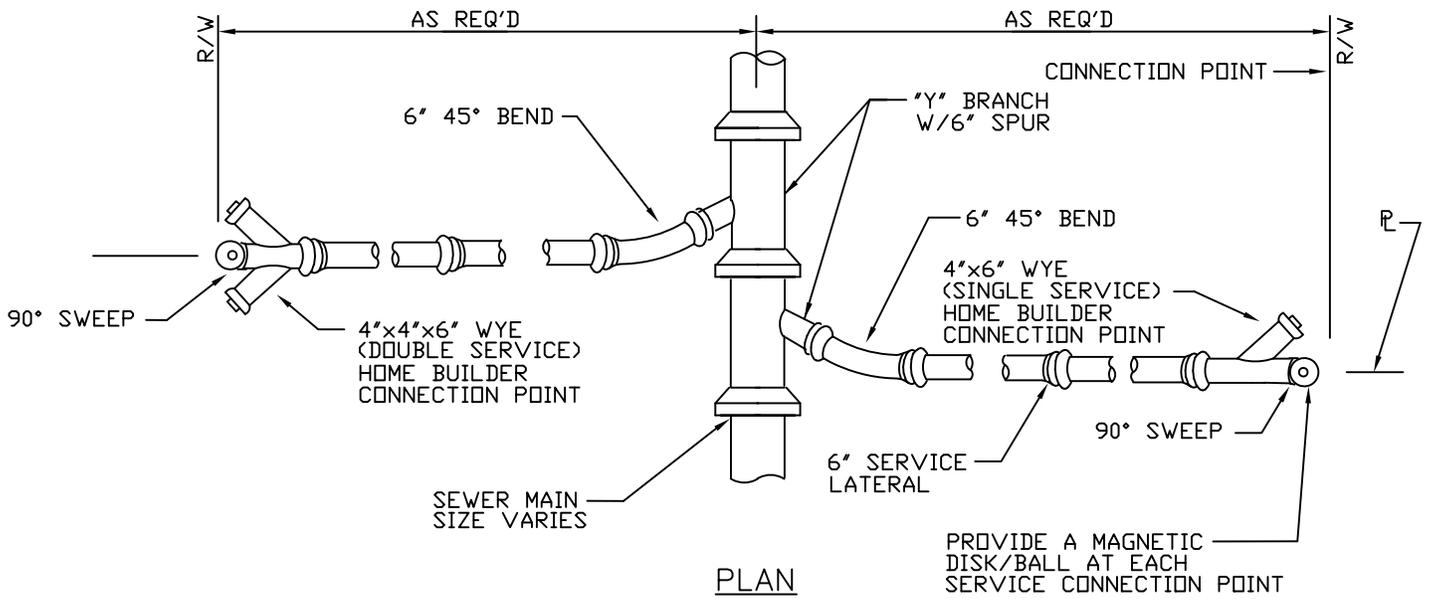
1. FRAME WEIGHT TO BE 150 LBS.
2. COVER WEIGHT TO BE 130 LBS.
3. COVER TO BE MARKED:

VOLUSIA  
COUNTY  
SANITARY  
SEWER

4. WEIGHTS TO BE STAMPED ON  
FRAME & COVER.
5. FRAME & COVER TO HAVE  
MACHINED SURFACES.

SANITARY MANHOLE  
FRAME AND COVER

UPDATED JUNE 2016



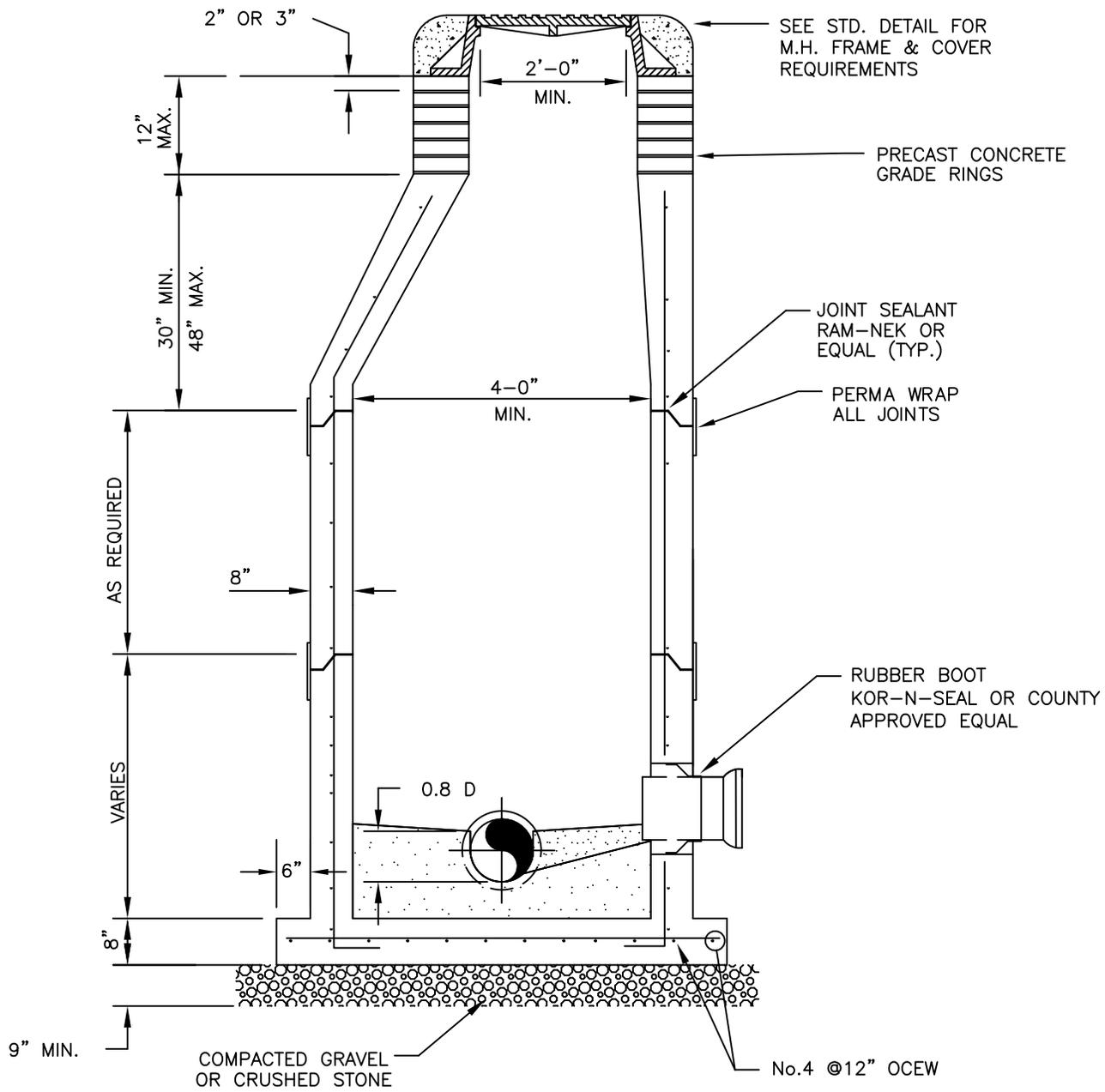
NOTES:

1. HOME BUILDING SHALL INSTALL A CLEANOUT TO THEIR CONNECTION POINT.
2. LOCATE SINGLE LATERAL AS CLOSE TO LOT AS POSSIBLE, 25' MAXIMUM.
3. INVERT OF SERVICE LATERAL SHALL NOT PROTRUDE INTO SEWER MAIN.

**SANITARY SERVICE LATERAL DETAIL**

UPDATED JUNE 2019





#### NOTES

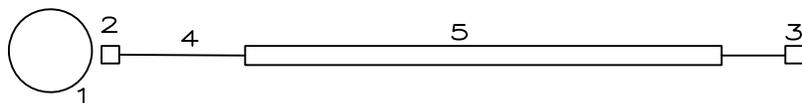
1. PRECAST CONCRETE TYPE 2 4000 P.S.I.
2. "RAM-NEK OR EQUAL AT ALL RISER JOINTS (1/2" THICK W/WIDTH AT LEAST 1/2 THE WALL THICKNESS) W/GROUT INSIDE AND OUTSIDE.
3. ALL OPENINGS SHALL BE SEALED WITH A WATERPROOF NON-SHRINKING GROUT.
4. FLOW CHANNELS SHALL BE FIELD CONSTRUCTED TO DIRECT FLOW STREAM.
5. LIFT HOLES ARE NOT PERMITTED FURNISH LIFTING CABLES.
6. ALL PIPE HOLES SHALL BE PRECAST OR CORE-DRILLED.
7. RUBBER BOOT MUST BE USED WITH ALL PIPE CONNECTIONS.
8. MANHOLES SHALL BE COATED INSIDE AND OUT WITH TWO COATS OF CS-55 WATER BASED CONCRETE COATING, MIN. 8 MILS PER COAT.

## STANDARD MANHOLE DETAIL

UPDATED JUNE 2019

## SINGLE SET, METER SET FOR 5/8", 3/4" AND 1" METERS

SINGLE SERVICE SET (WATER AND RECLAIM)

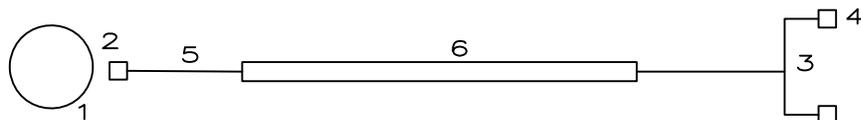


NO POLYTUBING UNDER ROAD ALLOWED WITHOUT 2" CASING

1. 1" TAPPING SADDLE CC THREAD, EPOXY COATED WITH STAINLESS STEEL STRA.
2. 1" CORPORATION STOP FORD FB1000-4-G (1" BALLVALVE, INLET, OUTLET) MUELLER EQUAL.
3. 1" CURB STOP, FORD B43-342W-NL (3/4" VALVE, 1" INLET PE END PACK JOINT-CTS, MUELLER EQUAL (THIS IS FOR 5/8" AND 3/4" METER SET). IF 1" METER SET USE FORD CURB STOP B41-344W-NL.
4. 1" 200 PSI, SDR 9 ENDOT ENOPURE BLUE WATER SERVICE TUBING (POTABLE), PURPLE (RECLAIMED) WITH TRACER WIRE.
5. 2" PVC SCHEDULE 40, CASING PIPE WHITE, IF INSTALLATION UNDER ROAD (PAVED OR DIRT).

## DOUBLE SET OR DUAL SET

METER SET FOR 5/8" AND 3/4" METERS (WATER ONLY)

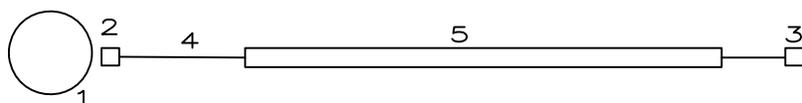


NO POLYTUBING UNDER ROAD ALLOWED WITHOUT 2" CASING

1. 1" TAPPING SADDLE CC THREAD, EPOXY COATED WITH STAINLESS STEEL STRAP.
2. 1" CORPORATION STOP FORD FB1000-4-G (1" BALLVALVE, INLET, OUTLET) MUELLER EQUAL.
3. 1" X 3/4" U BRANCH PACK JOINT-CTS FORD U48-43-NL 7.5 OR MUELLER H1460.
4. 3/4" CURB STOP, FORD B13-332W-NL OR MUELLER EQUAL.
5. 1" 200 PSI, SDR 9 ENDOT ENOPURE BLUE WATER SERVICE TUBING (POTABLE), PURPLE (RECLAIMED) WITH TRACER WIRE.
6. 2" PVC SCHEDULE 40, CASING PIPE WHITE, IF INSTALLATION UNDER ROAD (PAVED OR DIRT).

## 2" WATER SERVICE CONNECTION FOR 1 1/2" AND 2" METER SETS

(WATER AND RECLAIM)

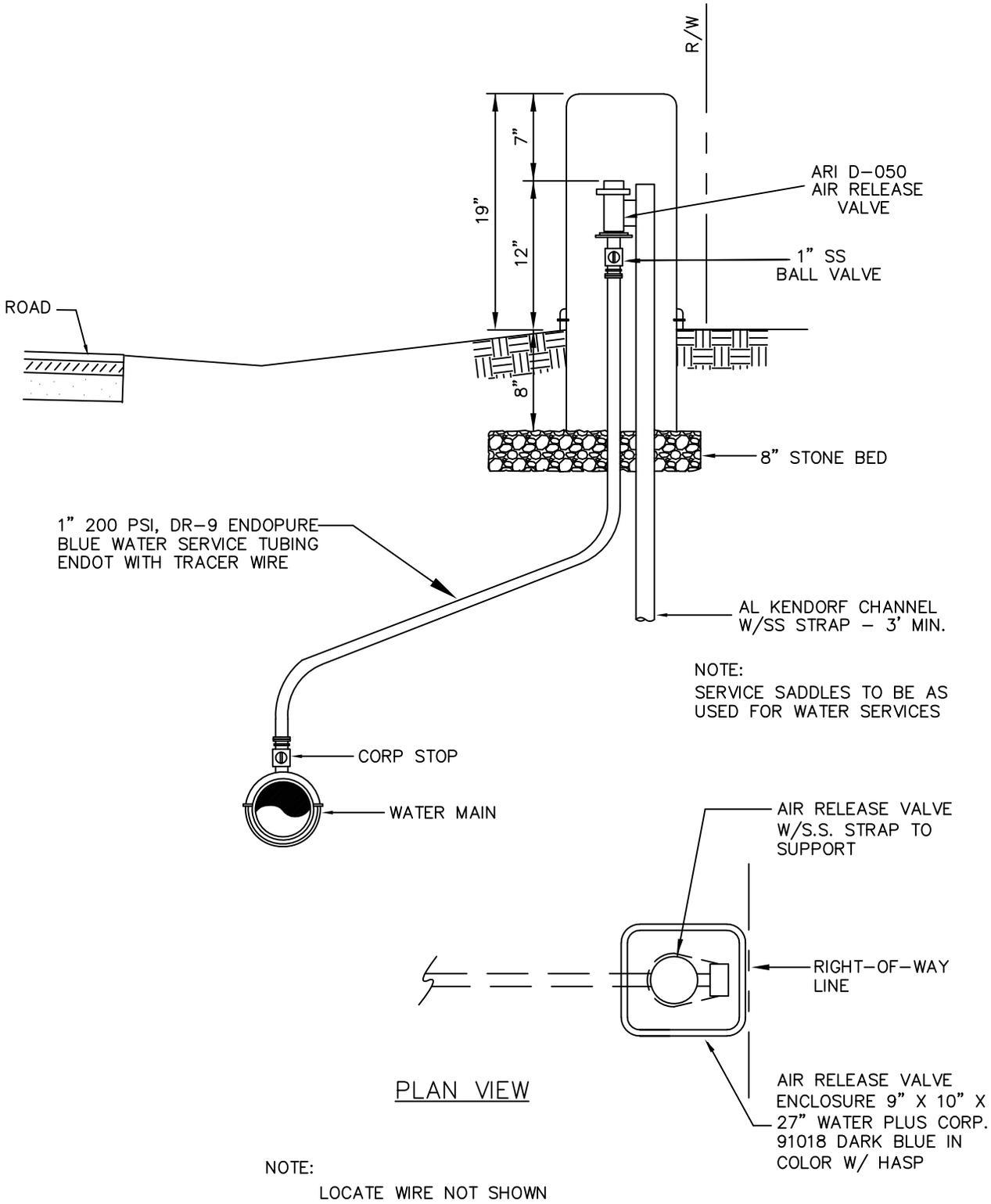


NO POLYTUBING UNDER ROAD ALLOWED WITHOUT 4" CASING

1. 2" TAPPING SADDLE CC THREAD, EPOXY COATED WITH STAINLESS STEEL STRAP,
2. 2" CORPORATION STOP FORD FB1101-7-G (2" BALLVALVE X IPT X CTS) MUELLER EQUAL..
3. 2" CURB STOP, BF43-777W-NL (2" VALVE, 2" CTS X 2" FLANGE) FLANGE WILL FIT 1 1/2" OR 2" FLANGE WATER METER.
4. 2" 200 PSI, SDR 9 ENDOT ENOPURE BLUE WATER SERVICE TUBING (POTABLE), PURPLE (RECLAIMED) WITH TRACER WIRE.
5. 4" PVC SCHEDULE 40, CASING PIPE WHITE, IF INSTALLATION UNDER ROAD (PAVED OR DIRT).

# **WATER & RECLAIMED SERVICE DETAIL**

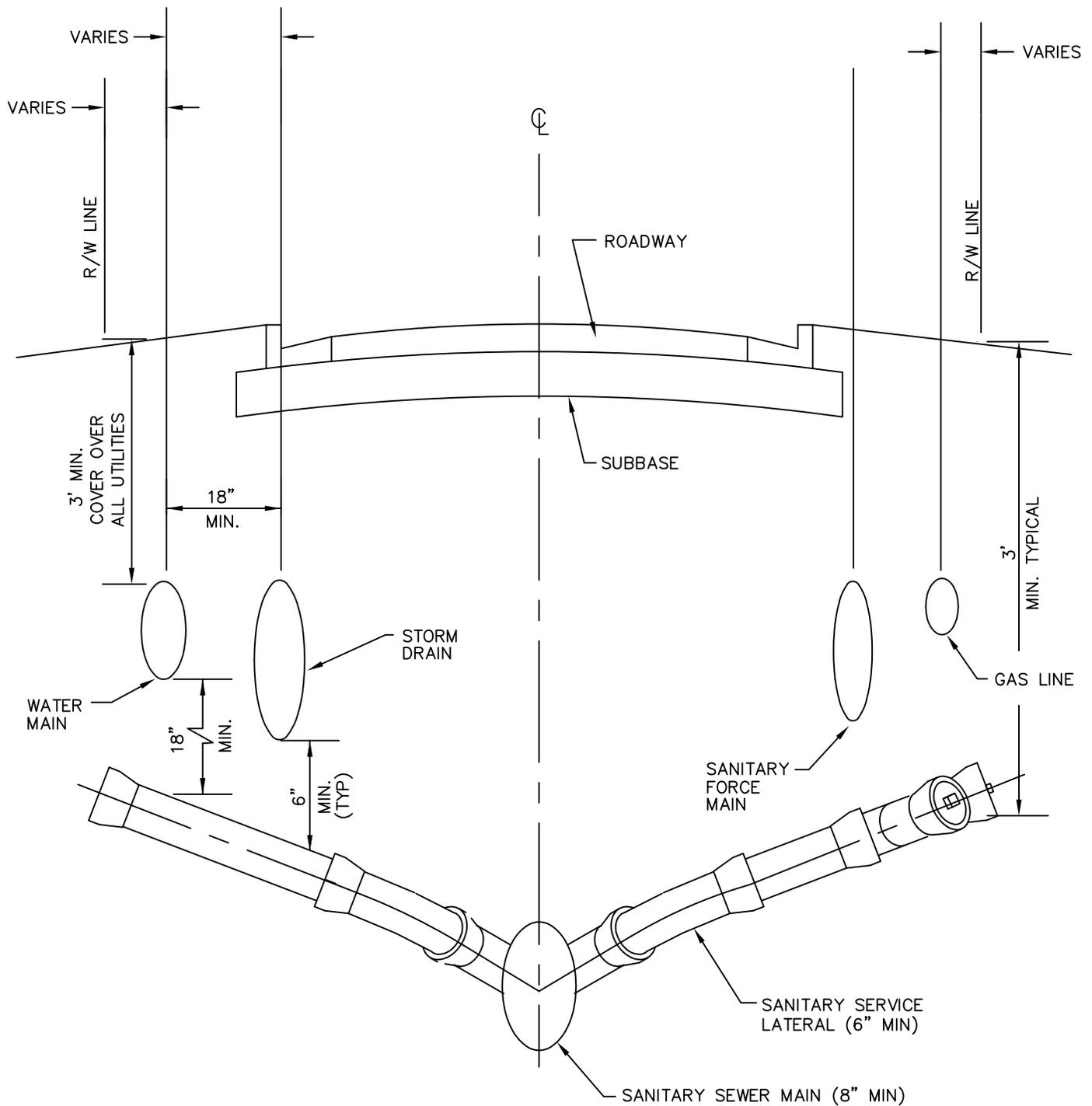
UPDATED JUNE 2019



**TYPICAL WATER MAIN  
AIR-RELEASE VALVE INSTALLATION**

NTS

UPDATED JUNE 2019

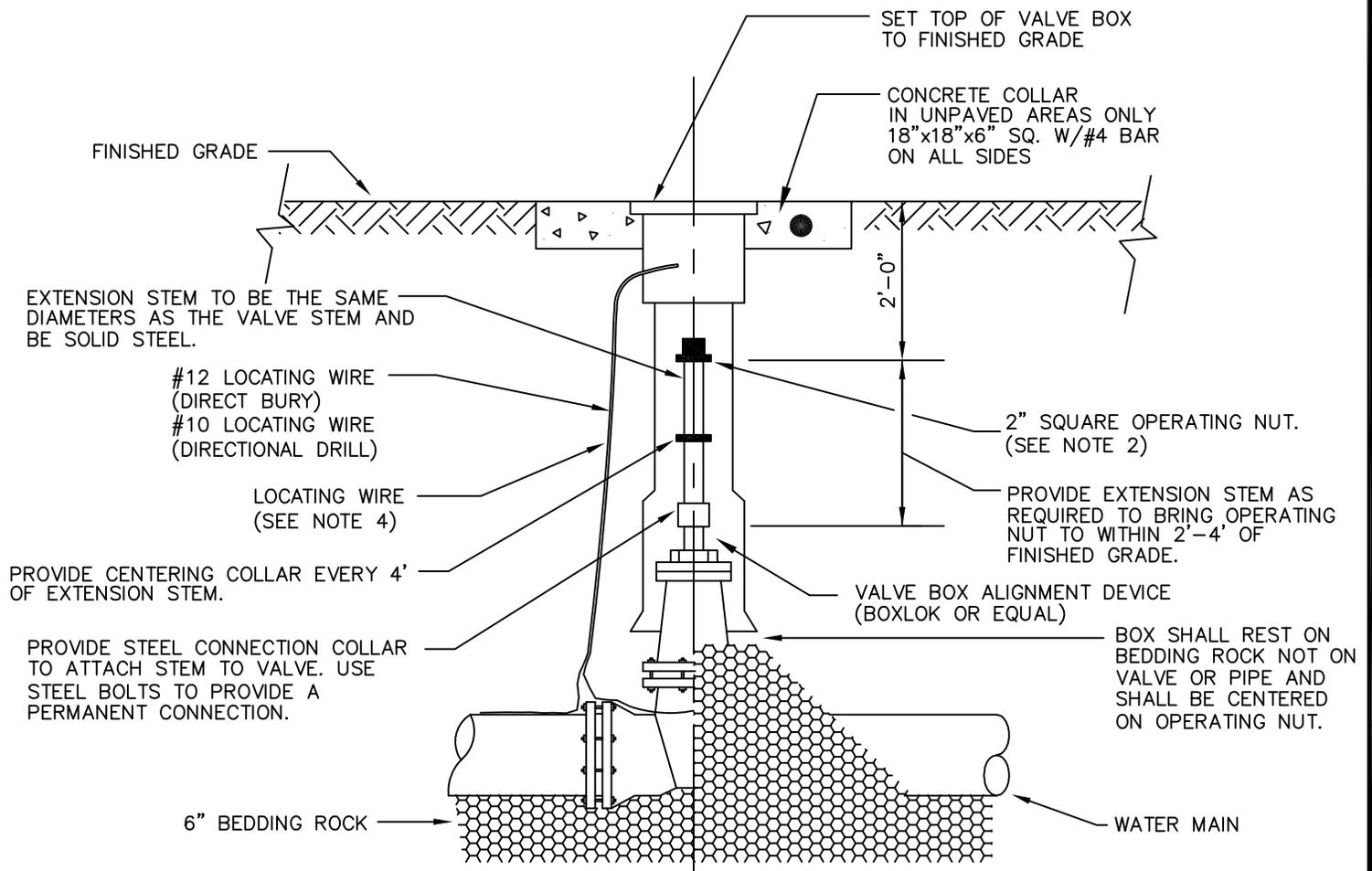


**NOTES**

1. STORM DRAIN MAY BE LOCATED ON EITHER SIDE OF ROAD.
2. SANITARY SEWER SERVICES ARE TO BE LAID OVER OR UNDER STORM DRAINS AS REQUIRED.
3. SANITARY SERVICE LATERAL SHALL HAVE A MINIMUM SLOPE OF 1.0%.
4. SANITARY SERVICE LATERALS TO BE A MINIMUM OF 6" DIA.
5. 18" SEPARATION SHALL BE MAINTAINED BETWEEN ALL PIPES WHEN POSSIBLE.

**TYPICAL UNDERGROUND UTILITIES LOCATION**

UPDATED JUNE 2019



**NOTES:**

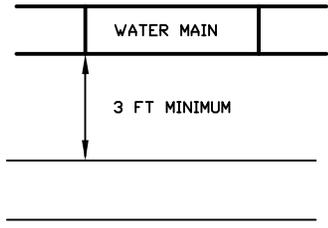
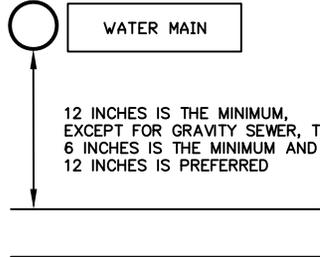
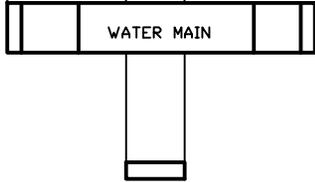
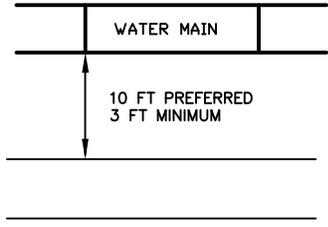
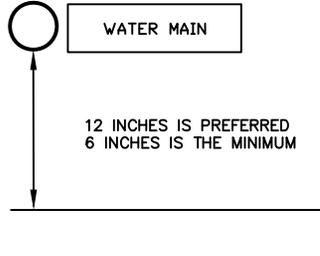
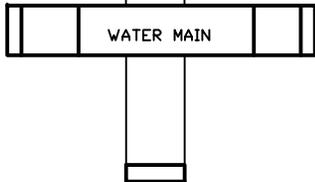
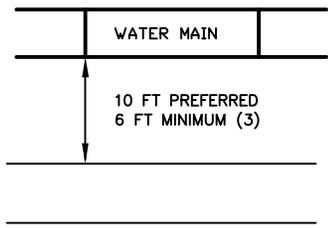
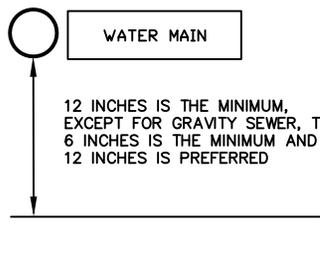
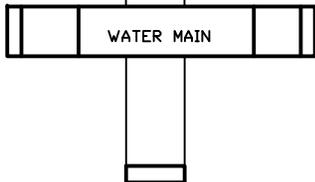
1. PVC EXTENSIONS SHALL BE USED ON VALVE BOX INSTALLATION.
2. THE ACTUATING NUT FOR DEEPER VALVES SHALL BE EXTENDED TO COME UP TO BETWEEN 2' & 4' DEPTH BELOW FINISHED GRADE. EXTENSION STEM SHALL BE PERMANENTLY ATTACHED TO VALVE ACTUATOR.
3. VALVE BOXES SHALL BE EITHER 2 OR 3 PIECES, DEPENDING ON DEPTH. THERE SHALL BE A TOP SECTION WITH A COVER APPROPRIATELY LABELED FOR THE SERVICE USE AND A BOTTOM BELL SECTION WHICH FITS OVER THE ACTUATOR NUT ON BEDDING ROCK. IF REQUIRED FOR EXTENSION CAST IRON SOIL PIPE MAY BE USED.
4. LOCATING WIRE SHALL BE CONTINUOUS INSIDE THE VALVE BOX AND SHOULD EXTEND 12" ABOVE TOP OF COLLAR. WIRE SHALL BE COLOR CODED TO MATCH THE UTILITY INSTALLED

**VALVE AND BOX DETAIL**

UPDATED JUNE 2016

VALVES 14" AND SMALLER

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

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

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.

## WATER MAIN SEPARATION DETAIL

UPDATED JUNE 2016

## SEPARATION REQUIREMENTS:

1. A MINIMUM HORIZONTAL SEPARATION OF TEN (10) FEET OUTSIDE SHALL BE MAINTAINED BETWEEN WATER MAINS AND SANITARY GRAVITY SEWER OR STORM SEWER LINES. (SEE DETAIL "A")
2. A MINIMUM HORIZONTAL SEPARATION OF THREE (3) FEET OUTSIDE TO OUTSIDE SHALL BE MAINTAINED BETWEEN WATER MAINS AND RECLAIMED WATER LINES CARRYING UNRESTRICTED PUBLIC ACCESS REUSE WATER OR WELL SUPPLY MAINS.
3. THERE SHALL BE AT LEAST A TEN (10) FOOT SEPARATION BETWEEN NEW WATER MAINS AND NEW SANITARY SEWER FORCE MAINS WITHOUT EXCEPTION. FIELD PROBLEMS SHALL BE REPORTED TO THE ENGINEER. SPECIAL SOLUTIONS MUST BE ACCEPTED BY D.E.P. PRIOR TO IMPLEMENTATION.
4. A MINIMUM VERTICAL SEPARTION OF EIGHTEEN (18) INCHES OUTSIDE TO OUTSIDE SHALL BE MAINTAINED BETWEEN WATER MAIN AND THE HAZARD LINES (I.E. SANITARY GRAVITY SEWER, STORM SEWER OR RECLAIMED WATER LINES). ONE FULL LENGTH OF PIPE SHALL BE CENTERED AT THE POINT OF CROSSING FOR BOTH PIPES.
5. THERE SHALL BE AN EIGHTEEN (18) INCH VERTICAL SEPARATION BETWEEN NEW WATER MAINS AND NEW SANITARY SEWER FORCE MAINS AT CROSSING WITHOUT EXCEPTION. WHERE IT IS NOT POSSIBLE TO MAINTAIN THE REQUIRED SEPARATION, CONFLICTS WITH EXISTING LINES SHALL BE REPORTED TO THE ENGINEER, SPECIAL SOLUTIONS MUST BE ACCEPTED BY D.E.P. PRIOR TO IMPLEMENTATION, AT PIPE CROSSINGS, THE PIPES SHALL BE SITUATED SUCH THAT THE JOINTS ARE AS FAR AS POSSIBLE FROM EACH OTHER.
6. NO WATER PIPE SHALL PASS THROUGH OR COME IN CONTACT WITH ANY PART OF A SANITARY SEWER MANHOLE OR STORM SEWER STRUCTURE.

## SOLUTIONS TO SEPARATION CONFLICTS

1. IN AREAS WHERE IT IS NOT PRACTICAL TO MAINTAIN THE REQUIRED SEPARATION, THE WATER MAIN MUST BE LAID IN A SEPARATE TRENCH OR ON AN UNDISTURBED EARTH SHELF LOCATED ON ONE SIDE OF THE SANITARY GRAVITY SEWER, STORM SEWER OR RECLAIMED WATER LINE AT SUCH AN ELEVATION THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE OTHER LINE. (SEE DETAIL "B")
2. IF THE MINIMUM ALLOWABLE (10') HORIZONTAL SEPARATION OR 18" VERTICAL IN A SEPARATE TRENCH CANNOT BE MAINTAINED, UPGRADE THE WATER MAIN TO DUCTILE IIRON IF THE OTHER LINE IS A STORM SEWER OR AN EXISTING SANITARY GRAVITY SEWER.
3. IF THE NON-CONFORMING LINE IS A NEW GRAVITY SANITARY SEWER, AND 10' HORIZONTAL SEPARATION OR 18" VERTICAL SEPARATION IN A SEPARATE TRENCH CANNOT BE MAINTAINED, THEN:
  - A. PLACE THE HAZARD LINE WITHIN A CONCRETE SEALED PVC SDR 35 CARRIER PIPE. (SEE DETAIL "C")
  - B. ENCASE THE HAZARD PIPE IN CONCRETE ENCASEMENT. DETAIL THIS SHEET
  - C. UPGRADE THE NEW GRAVITY SANITARY SEWER TO AWWA C-900, D.R. 18 PVC AND HYDROSTATICALLY TEST IT TO 150 PSI. AT PIPE CROSSINGS, THE PIPES SHALL BE SITUATED SUCH THAT THE JOINTS ARE AS FAR AS POSSIBLE FROM EACH OTHER.
4. IF THE HAZARD LINE IS A RECLAIMED WATER LINE AND THE ABOVE SEPARATION REQUIREMENTS ARE NOT MET, UPGRADE THE RECLAIMED WATER LINE MATERIAL TO DUCTILE IRON OR ENCASED PIPE IN CONCRETE.
5. WHEN THERE IS LESS THAN 18" OF VERTICAL CLEARANCE BETWEEN THE WATER MAIN AND STORM SEWER, AT THE POINT OF CROSSING. (SEE DETAIL "D")
6. WHEN THE WATER MAIN CROSSES BELOW THE HAZARD LINE, THE WATER MAIN SHALL HAVE A MINIMUM VERTICAL SEPARATION OF 18" FROM THE HAZARD LINE. ONE FULL LENGTH OF PIPE SHALL BE CENTERED AT THE POINT OF CROSSING (FOR BOTH PIPES WHEN CROSSING SANITARY SEWER). (SEE DETAIL "E")
7. SPECIAL STRUCTURAL SUPPORT OR CONCRETE SADDLES MAY BE NECESSARY AT THE CROSSING LOCATION.
8. IT IS PREFERABLE TO LAY THE WATER MAIN ABOVE THE CROSSING HAZARD. RECEIVE SPECIFIC APPROVAL BY D.E.P. PRIOR TO IMPLEMENTATION.

## **WATER MAIN SEPARATION NOTES**

UPDATED JUNE 2016

UTILITY RECORD DRAWING REQUIREMENTS

1. Record drawings shall be provided by the Contractor to Volusia County Utilities. The record drawings shall be signed and sealed by the engineer of record with the data provided by a Florida licensed surveyor. Record drawing information relative to all constructed utilities and structures shall include, but not be limited to, the following items:
  - a. Drawings shall depict actual location of all underground and above ground water, wastewater, and reclaimed water improvements and related appurtenances.
  - b. Drawings shall clearly depict all details not on the original contract drawings, but constructed in the field. The location of all equipment and piping relocation shall be accurately depicted to scale
  - c. The location of existing utilities where crossed or uncovered during the course of the work shall be depicted.
  - d. Dimensions between all manholes shall be field verified and depicted. The inverts and grade elevations of all lines entering and leaving manholes shall be depicted. Sewer laterals shall be accurately located and depicted.
  - e. The depth from finish grade to the top of potable water mains, reclaimed water mains and sewer force mains shall be indicated at all valve and fitting locations.
  - f. The record drawings shall consist of all sheets included in the construction plans.
  
2. The record drawings shall be submitted in the following format:
  - a. Five (5) sets of signed and sealed blue-line prints.
  - b. One (1) CD or DVD provided in AutoCAD 2004 (or later version) .dwg format and in Adobe PDF format. This data will be referenced by a minimum of three (3) coordinates in the Florida State Plane Coordinate System, East Zone in US Survey Feet. The horizontal datum is NAD83/(1990) HARN and the vertical datum is NAVD 88 Feet, in accordance with Florida Statutes, Chapter 177.151.