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1. The city’s utilities department shall be given a minimum of 3 business days advance notice (not including holidays or weekends) prior to beginning any potable water system construction.

2. A permit shall be required prior to engaging in any dewatering or construction activity that changes the impervious area of land. Dewatering activities include the removal of groundwater from a construction site, enclosed vault, cofferdam, or trench, allowing construction or maintenance in a dry environment. Site specific dewatering permits shall require payment of a per acre fee based on the size of the development. General purpose permits shall require an annual fee based on a biannual schedule of dewatering activities discharging directly into the city’s MS4 conveyance system. Dewatering permit applications can be found at https://www.codb.us/index.aspx?pid=262.

    Fees are subject to Article 7, Section 7.2 of the land development code and must be submitted with the permit application to the city of Daytona Beach Storm Water Coordinator at 125 Basin Street, Suite 100, Daytona Beach, Florida 32114 prior to any use of the city’s MS4 conveyance system. Failure to comply will result in immediate termination of access to the city’s MS4 system.

3. All work performed on potable water facilities owned or proposed to be owned by the city shall be constructed by an underground utility contractor or general contractor licensed in the state of Florida and registered with the city.

4. Upon construction completion and acceptance of the system, it is the design engineer’s responsibility to ensure that the system is properly certified and accepted by the department of health, and that as-built drawings meeting the city’s requirements are provided to the city and accepted prior to any use of the system.

5. The water distribution system shall be designed to comply with the city’s fire (water) flow code.

6. Each water service termination shall be marked with 2” x 4” pressure treated lumber extending 4’ above grade directly in front of the meter box with 2” of endotrace poly-tube or approved equal coiled and capped with an elster hydrorost cap inside each meter box.

7. All water services shall be marked with a “\" saw cut into the curb.

8. All water valves shall be marked with an "X" saw cut into the curb.

9. All tapping of mains (12” or smaller) shall be performed by city personnel. Scheduling of these connections requires a minimum of 3 business days advance notice and shall be coordinated with the city inspector.

10. The plans shall include right of way lines and stationing and offsets from the center line of construction.

11. Dewatering activities shall keep the groundwater elevation a minimum of 6 inches below the water main being installed.

12. All water mains shall be installed on a firm unyielding foundation with all unsuitable material (muck, rock, coquina, etc.) removed and replaced with clean granular material.

13. Trenches shall be backfilled with material acceptable to the city with a minimum compaction of 98% in paved areas and 95% in unpaved areas in accordance with AASHTO T-180 Modified Proctor test.
14. WHERE POTABLE WATER AND SANITARY SEWER MAINS CROSS WITH LESS THAN TWELVE (12) INCHES OF VERTICAL CLEARANCE OR WHERE THE SEWER MAIN IS ABOVE THE WATER MAIN, MEDIATION MUST BE REVIEWED AND APPROVED BY DEP.

15. WATER MAINS SHALL BE CONSTRUCTED A MINIMUM OF 4 FEET BEHIND THE BACK OF CURB OR THE EDGE OF ROADWAY PAVEMENT, WHICHEVER IS GREATER, AS MEASURED FROM OUTSIDE WALL OF THE WATER MAIN.

16. A INCH METALIZED PIPE LOCATION TAPE SHALL BE LOCATED 15 INCHES TO 24 INCHES BELOW FINISHED GRADE OR AS SPECIFIED BY THE MANUFACTURER FOR ALL WATER LINES. BLUE TRACER WIRE SHALL BE ATTACHED TO ALL PIPES. WIRE RUNS SHALL BE CONNECTED WITH SILICONE FILLED WIRE CONNECTORS. SERVICES SHALL BE CONNECTED TO THE MAIN WIRE WITH SILICONE FILLED WIRE CONNECTORS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE AND TEST FOR CONTINUITY (SEE CITY SPECIFICATION #15049 TRACER WIRE AND ALARMING TAPE). TRACER WIRE SHALL BE TESTED FOR CONTINUITY UNDER THE SUPERVISION OF A CITY REPRESENTATIVE AFTER INSTALLATION. IF A METER BOX IS NOT WITHIN 100 FEET OF A VALVE AND VALVE BOX AN ADDITIONAL VALVE BOX FOR TRACER WIRE IS REQUIRED.

17. SINGLE RESIDENTIAL WATER SERVICES SHALL BE A MINIMUM 1-INCH ENDOT, ENDOTRACE OR APPROVED EQUAL POLY-TUBE (MEETING THE SPECIFICATIONS OF NSF-14, AND AWWA C901.)

18. ALL WATER MAINS SHALL BE NSF-APPROVED FOR POTABLE WATER USE AND HAVE A MINIMUM COVER OF 36-INCHES.

19. WATER MAINS LESS THAN 18” MAY USE POLYVINYL CHLORIDE (PVC) C900, OR C905, SHALL MEET AWWA REQUIREMENTS AND HAVE A MINIMUM DIMENSION RATIO (DR-18) PRESSURE CLASS 150. WATER MAINS 18” AND LARGER SHALL BE DUCTILE IRON PIPE (D.I.P.), CLASS 350, CEMENT LINED. ALL NON-DUCTILE IRON PIPE HORIZONTAL DIRECTIONAL DRILL WATER MAINS SHALL HAVE A MINIMUM WORKING PRESSURE OF 150 PSI. THE CITY MAY REQUIRE A HIGHER PRESSURE RATING BASED ON SITE CONDITIONS. INSIDE DIAMETER OF NON-D.I.P., HORIZONTAL DIRECTIONAL DRILL PIPE SHALL MATCH THE INSIDE DIAMETER OF CONNECTING PIPES. ALL GASKETS SHALL BE LUBRICATED BEFORE INSTALLATION.

20. DIRECTIONAL DRILLS SHALL HAVE FUSED MJ ADAPTERS.

21. ALL POTABLE WATER MAINS SHALL USE THRUST RESTRAINT AS CALCULATED BY A PROGRAM AVAILABLE AT EBAA.COM

22. ALL FITTINGS, VALVES, ETC. SHALL BE DUCTILE IRON (MJ OR FLANGED) AND SHALL BE RESTRAINED.

23. ALL RESTRAINED PIPE BELL JOINTS SHALL USE BELL RESTRAINTS OR GRIPPER TYPE GASKETS CAN BE USED FOR DUCTILE IRON PIPE JOINTS.

24. WATER VALVES SHALL BE INSTALLED AT ALL STREET INTERSECTIONS AND AT A MAXIMUM SPACING OF 750 FEET. SPACING OF VALVES ON PRIMARY TRANSMISSION MAINS WILL BE DETERMINED BY THE CITY.

25. VALVES SHALL BE INSTALLED ON ALL LEGS OF WATER MAIN TEEs EXCEPT ONE.

26. ALL FITTINGS SHALL MEET MINIMUM RESTRAINT REQUIREMENTS PER ANSI/AWWA/EBAA, AND ALL PRESSURE PIPES UNDER THE ROADWAYS SHALL BE RESTRAINED.

27. METER LENGTH REQUIRED FOR WATER METERS INSTALLATION ARE AS FOLLOWS:
3/4” TO 2” METER Requires 6', 4” METER Requires 12', 6” AND 8” METER Requires 14’, AND A 10” METER Requires 20'.
POTABLE WATER CONSTRUCTION & DESIGN STANDARDS

(cont’d)

28. ALL WATER VALVE BOXES SHALL BE ADJUSTED, INCLUDING DEBRIS CAP, AND CONCRETE COLLAR TO FINISHED GRADE. VALVE BOX LIDS SHALL BE PAINTED BLUE TO MAKE THEM CLEARLY VISIBLE.

29. UPON FINAL ACCEPTANCE OF NEW WATER SYSTEMS, WATER VALVES SHALL BE COMPLETELY OPENED BY CITY UTILITIES PERSONNEL. THE CONTRACTOR SHALL NOT OPERATE ANY EXISTING VALVES WITHOUT A CITY REPRESENTATIVE PRESENT.

30. ALL VALVES 2 INCHES AND SMALLER SHALL BE CURB STOPS. VALVES LARGER THAN 2 INCHES SHALL BE GATE VALVES.

31. A MINIMUM OF ONE FIRE HYDRANT SHALL BE LOCATED AT EVERY INTERSECTION. OTHER FIRE HYDRANTS SHALL BE LOCATED TO PRODUCE A MAXIMUM 500 FOOT RADIUS OF COVERAGE. ALL FIRE HYDRANTS SHALL BE INSTALLED IN EASILY ACCESSIBLE LOCATIONS FOR FIRE PERSONNEL. THE PRIMARY HYDRANT PORT IS SHALL FACE THE STREET.

32. THE CONTRACTOR SHALL PIG ALL PIPES 6 INCHES OR LARGER IN DIAMETER, LAUNCHING AND EXTRACTION POINTS SHALL BE DETERMINED BY THE CONTRACTOR AND CITY REPRESENTATIVE.

33. FOR PIPE FLUSHING, PIGGING, TESTING, AND TIE-IN CONNECTIONS, THE CITY RESERVES THE RIGHT TO REQUIRE WORK TO BE PERFORMED DURING PERIODS OF LOW FLOW (MIDNIGHT TO 8 A.M.) THE CONTRACTOR SHALL COORDINATE WITH THE CITY REPRESENTATIVE AND WATER PLANT OPERATIONS TO SCHEDULE THE DATE AND TIME FOR THESE ACTIVITIES.

34. THE CITY RESERVES THE RIGHT TO PERFORM THE SAMPLING AND ANALYSIS FOR BACTERIOLOGICAL CLEARANCE OF THE WATER MAIN. ANY RETESTING WILL BE AT THE CONTRACTORS EXPENSE.

35. POTABLE WATER LINES SHALL NOT BE USED OR PLACED INTO SERVICE UNTIL CLEARANCE IS ACCEPTED BY VOLUSIA COUNTY HEALTH DEPARTMENT AND THE CITY OF DAYTONA BEACH.

36. BACKFLOW PREVENTERS (BFP) SHALL BE PLACED ON ALL POTABLE AND FIRE LINES SERVING COMMERCIAL AND RESIDENTIAL PROPERTIES. THE TYPE OF BACKFLOW PREVENTERS REQUIRED ARE AS FOLLOWS:

- POTABLE WATER SERVICE, REDUCED PRESSURE ZONE (RPZ) (BFP)
- FIRE LINE SERVICING A FIRE SPRINKLER SYSTEM AND/OR PRIVATE FIRE HYDRANT; DOUBLE CHECK VALVE ASSEMBLY
- FIRE LINE; DOUBLE CHECK VALVE ASSEMBLY

IN CASES WHERE A WATER LINE SERVES BOTH DOMESTIC AND FIRE SERVICES, A REDUCED PRESSURE ZONE BFP IS REQUIRED.

37. ALL JACK & BORES REQUIRED FOR COMMERCIAL DEVELOPMENT SHALL BE PERFORMED AT THE SOLE COST OF THE OWNER/DEVELOPER.

38. ALL C-900 DR-18 PVC PIPE REQUIREMENTS REFERENCE TO THE C-900 STANDARDS.

39. CHLORINATED WATER MUST BE DECHLORINATED PRIOR TO DISCHARGE INTO ANY JURISDICTIONAL WETLAND OR WATER BODY PER AWWA STANDARD, ANSI/AWWA C655.
1. IT IS THE CONTRACTOR’S RESPONSIBILITY TO PROVIDE TRENCH COMPACTION TESTS AT POINTS 12 INCHES ABOVE THE PIPE AND AT 12-INCH VERTICAL INTERVALS TO FINISHED GRADE AT A MAXIMUM HORIZONTAL SPACING OF 300 FEET.

2. ON ALL PROJECTS OTHER THAN THOSE INITIATED BY THE CITY THE CONTRACTOR SHALL EMPLOY AN INDEPENDENT TESTING LABORATORY AT HIS OWN EXPENSE TO INSURE THAT COMPACTATION OF ALL FILL MATERIAL IS COMPLETED PROPERLY. ON ALL CITY PROJECTS THE TESTING WILL BE DONE IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. IDENTIFICATION OF TEST LOCATIONS SHALL BE CLEARLY INDICATED ON TEST REPORTS. TEST RESULTS SHALL BE FORWARD PROMPTLY TO THE CITY’S INSPECTOR.

3. ALL POTABLE WATER MAINS SHALL BE FLUSHED, DISINFECTED, PRESSURE TESTED AND BAG TIEROLOGICALLY CLEARED FOR SERVICE WHEN APPROPRIATE IN ACCORDANCE WITH THE LATEST AWWA STANDARDS AND THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION REQUIREMENTS.

THE CONTRACTOR SHALL NOTIFY THE CITY’S DESIGNATED INSPECTOR WHO SHALL COORDINATE WITH CITY PERSONNEL AT THE WATER TREATMENT PLANT AT LEAST 3 BUSINESS DAYS PRIOR TO BEGINNING FLUSHING THE MAINS BEFORE PRESSURE TESTING. THE CITY MAY REQUIRE WORK TO BE PERFORMED DURING PERIODS OF LOW FLOW (MIDNIGHT TO 8 AM). THE DATE AND TIME SCHEDULE FOR FLUSHING AND PIGGING MUST BE APPROVED BY THE WATER PLANT OPERATIONS.

NO HOSE OR FIRE HYDRANT SHALL BE USED IN THE COLLECTION OF BACTERIOLOGICAL SAMPLES. THE SAMPLING TAP MUST BE DEDICATED, CLEAN, DISINFECTED AND FLUSHED PRIOR TO SAMPLING. SAMPLING TAP SHALL BE SMOOTH, UNTHEEDED 1/2 INCH HOSE BIB. DISINFECTION AND SAMPLING SHALL BE SCHEDULED AT THE CITY’S CONVENIENCE.

4. PRESSURE TEST FOR TAPPING SADDLES AND VALVES FOR A MINIMUM OF 30 MINUTES AT 150 PSI OR 30 MINUTES AT MANUFACTURER’S RECOMMENDED TESTING PRESSURE.

5. WATERMANS SHALL BE PRESSURE TESTED AT 150 PSI FOR 3 HOURS. TESTING SHALL BE IN ACCORDANCE WITH AWWA C-600 AND AWWA C-605 AS APPLICABLE WITH ALLOWABLE LEAKAGE TO BE BASED ON THE TABLE BELOW.

<table>
<thead>
<tr>
<th>PRESSURE</th>
<th>ALLOWABLE LEAKAGE PER 1000 FT. OF PIPELINE</th>
<th>AVERAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(PSI)</td>
<td></td>
<td>TEST</td>
</tr>
<tr>
<td>450</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>300</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>275</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>225</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>200</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>175</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>150</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>125</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>100</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOMINAL PIPE DIAMETER</th>
<th>4 INCHES</th>
<th>6 INCHES</th>
<th>8 INCHES</th>
<th>10 INCHES</th>
<th>12 INCHES</th>
<th>14 INCHES</th>
<th>16 INCHES</th>
<th>18 INCHES</th>
<th>20 INCHES</th>
<th>24 INCHES</th>
<th>30 INCHES</th>
<th>36 INCHES</th>
<th>42 INCHES</th>
<th>48 INCHES</th>
<th>54 INCHES</th>
<th>60 INCHES</th>
<th>64 INCHES</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSI</td>
<td>450</td>
<td>300</td>
<td>275</td>
<td>225</td>
<td>200</td>
<td>175</td>
<td>150</td>
<td>125</td>
<td>100</td>
<td>75</td>
<td>60</td>
<td>50</td>
<td>40</td>
<td>30</td>
<td>25</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

*IF THE PIPELINE UNDER TEST CONTAINS SECTIONS OF VARIOUS DIAMETERS, THE ALLOWABLE LEAKAGE WILL BE THE SUM OF THE COMPUTED LEAKAGE FOR EACH SIZE.

WHERE:

L = ALLOWABLE LEAKAGE, IN GALLONS PER HOUR
S = LENGTH OF PIPE TESTED, IN FEET
D = NOMINAL DIAMETER OF PIPE, IN INCHES
P = AVERAGE TEST PRESSURE DURING THE LEAKAGE TEST, IN POUNDS PER SQUARE INCH (GAUGE)
Guidelines for the Acceptance of New Water Mains from Contractors

Contact the Utilities Department at 386-671-8871 or 386-671-8827 a min. of 3 business days prior to beginning any potable water system contraction. Utilities Inspector will coordinate with the City’s Water Distribution Division to schedule the tap of the main. Where applicable, DOH Permit to be forwarded to the Water/Wastewater (W/WW) Inspector with the Regulatory Compliance Division.

Contractor to install tapping saddle/sleeve and disinfected valve on the existing water main under inspection of the Utilities Department. All materials must be swabbed with a 5% chlorine solution.

Pressure test the tapping saddle/sleeve and valve. (Min. 30 minutes at manufacturer recommended pressure.)

City’s Water Distribution Department will tap the existing main.

All mains 6” and larger (greater than 20 LF) must be pigged and flushed by the contractor under inspection of the water/wastewater inspectors. Contact Field Chemist between 07:30 - 14:00 hrs. Monday - Thursday excluding holidays at 386-671-8809 to schedule.

Contractor must pressure test the new main under inspection of the W/WW Inspector. (Minimum 3 hrs at 150 psi) Refer to CODB Standard Details

Pressure Test Passed

Pressure Test Failed

Repair leaks

Where applicable, Submit Preliminary As-Builts to Utilities Engineering. (1 AutoCAD CD and 1 Paper Copy in State Plane Coordinates NAD 83). Once preliminary as-builts are acceptable, W/WW Inspector will schedule the chlorination. (Chlorination is scheduled Mon. thru Wed. with 48 hrs advance notice required.)

Contractor will super chlorinate the new main in accordance with AWWA C651-05 (or most recent version). The chlorine solution must be greater than 25 mg/L (50 mg/L preferred) and must remain in the water main for at least 24 hrs with a final residual of 10 mg/L. The chlorination must be monitored by the W/WW Inspector. An alternative method of “slug” chlorination can be utilized. Initial chlorine dose of 100 mg/L in contact for 3 hours with a final residual of 50 mg/L.

Flush main and reduce the chlorine residual to proper level (1-3 mg/L typical, not to exceed ambient chlorine residual from the WTP). Any water discharged to receiving water bodies shall be dechlorinated per AWWA standards.

Re-chlorination is required if the 2nd consecutive sample fails.

Flush main and reduce the chlorine residual to proper level (1-3 mg/L typical, not to exceed ambient chlorine residual from the WTP). Any water discharged to receiving water bodies shall be dechlorinated per AWWA standards.

W/WW Inspector/CODB Lab will collect and test samples for 2 consecutive days per FDEP requirements.

Bacteriological test passed for 2 consecutive days.

Bacteriological test failed.

Submit Final As-built Drawings:
2 Paper Copies* signed and sealed by the surveyor, 1 CD with working CAD drawings and PDF’s. Bacteriological Test Results and FDEP Clearance Application to the Utilities Engineering Division.

Utilities Engineering signs and delivers the FDEP clearance app. to the Health Department.*

FDEP Letter of Clearance Received.

Water Distribution Division will open valve and place water main into service.

*(Paper copies are to be rolled not folded)*

*Should the bacteriological samples expire prior to DOH submittal re-chlorination and re-sampling will be required at the contractor’s cost using the City personnel and laboratory.

These guidelines apply to all connections to the Water Distribution system to include services (potable and irrigation) as well as dedicated fire lines.
WATER - TABLE OF DAILY FLOWS FOR VARIOUS OCCUPANCIES

<table>
<thead>
<tr>
<th>Types of Establishments</th>
<th>Flow Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartments</td>
<td>300 gpd</td>
</tr>
<tr>
<td>Banquet hall (per seat)</td>
<td>15 gpd</td>
</tr>
<tr>
<td>Bars and cocktail lounges</td>
<td>5 gpcd</td>
</tr>
<tr>
<td>Bathroom (non-residential)</td>
<td>250 gpd</td>
</tr>
<tr>
<td>Beauty shop (per seat)</td>
<td>150 gpd</td>
</tr>
<tr>
<td>Boarding schools (students and staff)</td>
<td>50 gpd</td>
</tr>
<tr>
<td>Boarding houses</td>
<td>50 gpcd</td>
</tr>
<tr>
<td>Bowling alleys (toilet wastes only, per lane)</td>
<td>75 gpd</td>
</tr>
<tr>
<td>Country clubs, per member</td>
<td>15 gpcd</td>
</tr>
<tr>
<td>Day schools (with cafeteria, no gymnasium or showers)</td>
<td>8 gpcd</td>
</tr>
<tr>
<td>Day schools (with cafeterias, gymnasiums &amp; showers)</td>
<td>20 gpcd</td>
</tr>
<tr>
<td>Day workers at office and schools</td>
<td>15 gpcd</td>
</tr>
<tr>
<td>Dentist, per wet chair</td>
<td>200 gpd</td>
</tr>
<tr>
<td>Drive-in theaters (per car space)</td>
<td>5 gpd</td>
</tr>
<tr>
<td>Factories (with showers)</td>
<td>25 gpcd</td>
</tr>
<tr>
<td>Factories (no showers)</td>
<td>10 gpd/100 sq. ft.</td>
</tr>
<tr>
<td>Funeral home</td>
<td>10 gpd/100 sq. ft.</td>
</tr>
<tr>
<td>Gas stations (no car wash)</td>
<td>400 gpd</td>
</tr>
<tr>
<td>Hospitals (with laundry) (per bed)</td>
<td>200 gpd</td>
</tr>
<tr>
<td>Hospitals (no laundry) (per bed)</td>
<td>150 gpd</td>
</tr>
<tr>
<td>Hotels and motels (per room &amp; unit)</td>
<td>100 gpd</td>
</tr>
<tr>
<td>Laundromat (per washing machine)</td>
<td>200 gpcd</td>
</tr>
<tr>
<td>Mobile home park (per trailer)</td>
<td>200 gpd</td>
</tr>
<tr>
<td>Movie theaters, auditoriums, churches (per seat)</td>
<td>3 gpd</td>
</tr>
<tr>
<td>Nursing homes</td>
<td>125 gpd/100 sq. ft.</td>
</tr>
<tr>
<td>Office buildings</td>
<td>10 gpd/100 sq. ft.</td>
</tr>
<tr>
<td>Public institutions (other than those listed herein)</td>
<td>75 gpcd</td>
</tr>
<tr>
<td>Restaurants (per seat)</td>
<td>35 gpd</td>
</tr>
<tr>
<td>Restaurants (take-out)</td>
<td>35 gpd/100 sq. ft. (350 gpd min.)</td>
</tr>
<tr>
<td>Restaurants (Fast Food) (per seat)</td>
<td>25 gpd</td>
</tr>
<tr>
<td>Single-family residence</td>
<td>300 gpd</td>
</tr>
<tr>
<td>Townhouse residence</td>
<td>300 gpd</td>
</tr>
<tr>
<td>Shopping centers</td>
<td>10 gpd/100 sq. ft.</td>
</tr>
<tr>
<td>Stadiums, frontons, ball parks, etc. (per seat)</td>
<td>3 gpd</td>
</tr>
<tr>
<td>Stores, without kitchen wastes</td>
<td>5 gpd/100 sq. ft.</td>
</tr>
<tr>
<td>Speculative buildings</td>
<td>10 gpd plus 10 gpd/100 sq. ft.</td>
</tr>
<tr>
<td>Warehouses</td>
<td>30 gpd plus 10 gpd/1,000 sq. ft.</td>
</tr>
</tbody>
</table>

*** CITY WILL CONSIDER ALTERNATE FLOW RATES FOR VARIOUS ESTABLISHMENTS IF THE EOR CAN PROVIDE SUPPORTING DATA.***

WATER DESIGN BASIS

AVERAGE DAILY, MAXIMUM DAILY AND PEAK FLOWS

ENGINEER TO DETERMINE AVERAGE DAILY, MAXIMUM DAILY AND PEAK HOUR FLOWS FOR CITY REVIEW AND APPROVAL..

FIRE FLOW REQUIREMENTS

Fire flow requirements shall be determined in accordance with the applicable local fire department codes and/or ISO standards.
NOTES:

1. TYPE "A" CROSSING SHALL BE THE PREFERRED CONFIGURATION. TYPE "B" MAY BE USED ONLY UPON SPECIFIC APPROVAL.

2. ADDITIONAL RESTRAINTS MAY BE REQUIRED FOR VERTICAL BENDS.

3. LOWERING OF EXISTING WATER MAIN & FORCE MAIN BY DEFLECTION METHOD MAY BE ACCEPTABLE IF EXISTING FIELD CONDITIONS PERMIT AND APPROVAL IS RECEIVED FROM COBB.

4. LENGTH OF SECTION BASED ON MINIMUM LENGTH AS DETERMINED BY EBAA RESTRAINED JOINT MANUAL.

5. INSTALL RESTRAINED JOINTS, AS REQUIRED, FROM DEFLECTION POINT IN BOTH DIRECTIONS (20' MIN.).
LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH F.A.C. RULE 62-555.314

(1) Water main should cross above other pipe. When water main must be below other pipe, the minimum separation is 12 inches.

(2) Stormwater Force Main, Storm Sewer, Reclaimed Water not 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) Storm Sewer, Sanitary Sewer Force Main, Vacuum Sanitary Sewer, Sanitary Sewer, Reclaimed Water 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.
TYPICAL RAILROAD CROSSING

NOTE TO ENGINEER: CROSSING DETAIL SHALL BE TO SCALE AND SHOW EXISTING UTILITIES, CLEARANCES, CASING LENGTH, LOCATION OF PAVED ROAD AND LIMITS OF RIGHT-OF-WAY.

CARRIER PIPE AND CASING PIPE SIZES (MIN.)

<table>
<thead>
<tr>
<th>CARRIER PIPE NOM. DIA. (D1)</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>24</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASING PIPE NOM. DIA. (D2)</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>22</td>
<td>24</td>
<td>30</td>
<td>30</td>
<td>36</td>
<td>36</td>
<td>48</td>
<td>54</td>
<td>60</td>
<td>66</td>
</tr>
</tbody>
</table>

WALL THICKNESS—INCHES:

1. MINIMUM COVER FOR TOP OF CASING TO R/R BASE SHALL BE 5.6' (SCL), 5.0' (FEC).
2. MINIMUM COVER FOR TOP OF CASING ON ALL GROUND COVER SHALL BE 3.0'.
3. ROTATION OF CARRIER PIPE INSIDE THE CASING PIPE WILL NOT BE PERMITTED, RESTRAINED MECHANICAL OR FLANGED JOINT PIPE SHALL BE USED TO HELP PREVENT SUCH ROTATION.
4. SHOP DRAWINGS SHALL BE SUBMITTED OF CASING & CARRIER PIPE INSTALLATION FOR APPROVAL PRIOR TO FABRICATION OF PIPING, CASING, AND APPORTIONEMENTS. CERTIFICATION OF CASING PIPE IS REQUIRED.
5. WELDING OF CASING PIPE TO BE DONE BY CERTIFIED WELDER. ALL ENDS OF CASING PIPE SHALL BE CHAMFERED PRIOR TO ANY WELDING. SEAL END OF CASING PIPE WITH NON SHRINK GROUT.
6. CITY INSPECTOR SHALL BE PRESENT THROUGHOUT ALL BORE AND JACK ACTIVITIES.

* WITHIN THE CITY OF DAYTONA BEACH RIGHT OF WAY, USE CURRENT FOOT STANDARDS.
** SPECIALLY DESIGNED SPACERS SHALL BE USED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. USE CASCADE CASING SPACERS OR PRE-APPROVED EQUAL.

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT
NOTES:

1. MAIN MAY PASS OVER STORM LINE IF 36" OF COVER IS PROVIDED OVER WATER MAIN.

2. PIPE MAY BE DEFLECTED AROUND DRAINAGE INLET IN ACCORDANCE WITH THE RESTRAINED JOINT GUIDELINES OF THE ERAA.
NOTES:
1. MINIMUM COVER FOR TOP OF CASING ON ALL CITY STREETS SHALL BE 3.0'
2. ROTATION OF CARRIER PIPE INSIDE THE CASING PIPE WILL NOT BE PERMITTED, RESTRAINED MECHANICAL OR FLANGED JOINT PIPE SHALL BE USED TO HELP PREVENT SUCH ROTATION.
3. SHOP DRAWINGS OF CASING & CARRIER PIPE INSTALLATION SHALL BE SUBMITTED FOR APPROVAL PRIOR TO FABRICATION OF PIPING, CASING, AND APPURTEINANCES. CERTIFICATION OF CASING PIPE IS REQUIRED.
4. WELDING OF CASING PIPE TO BE DONE BY STATE CERTIFIED WELDER. ALL ENDS OF CASING PIPE SHALL BE CHAMFERED PRIOR TO ANY WELDING. SEAL END OF CASING PIPE WITH NON SHRINK GROUT.
5. CITY INSPECTOR SHALL BE PRESENT THROUGHOUT ALL BORE AND JACK ACTIVITIES.
* WITHIN VOLUSIA COUNTY RIGHT OF WAY, USE CURRENT FDOT STANDARDS.
** SPECIALLY DESIGNED SPACERS SHALL BE USED IN ACCORDANCE WITH MANUFACTURER’S SPECIFICATIONS, USE CASCADE CASING SPACERS OR APPROVED EQUAL.

NOTE TO ENGINEER: CROSSING DETAIL SHALL BE TO SCALE AND SHOW EXISTING UTILITIES, CLEARANCES, CASING LENGTH, LOCATION OF PAVED ROAD AND LIMITS OF RIGHT OF WAY.

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THE CITY OF DAYTONA BEACH

UTILITIES DEPARTMENT

TYPICAL

BORE AND JACK

DETAIL

W-11
NOTE: TO DETERMINE THE MOST CURRENT REQUIREMENTS FOR STABILIZATION MATERIAL, BASE MATERIAL, AND ASPHALT MATERIAL PATCH AND THE REPLACEMENT DIMENSIONS CONTACT CITY ENGINEER IN THE PUBLIC WORKS DEPT AT 386-671-8610.

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THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT

PAVEMENT CUT AND PATCH DETAIL W-12

NOTES:

1. WHERE SOIL CONDITIONS CAN NOT BE MAINTAINED AS SHOWN ABOVE, PROVIDE APPROVED METHOD OF CONSTRUCTION.

2. SHEETING WILL BE REQUIRED AS DETERMINED IN THE FIELD.

3. COMPACTION PERCENTAGES SHOWN REFER TO A.A.S.H.T.O. T-180: PROVIDE COMPACTION TEST REPORTS TO CITY INSPECTOR.

4. MECHANICAL COMPACTION NOT ALLOWED BELOW THIS LEVEL.

5. FOR PVC PIPE ONLY – INSTALL METALLIC TAPE AND UF #12 INSULATED SINGLE STRAND COPPER WIRE OVER FULL LENGTH OF PIPE.

6. THE CONTRACTOR SHALL, UNLESS OTHERWISE NOTED, RESTORE ALL STRIPING, PAVEMENT MARKINGS, DELINEATORS, SIGNAGE AND TRAFFIC SIGNAL SYSTEM COMPONENTS DISTURBED DURING CONSTRUCTION ACTIVITIES. COST OF ALL WORK AND MATERIALS WILL BE CONSIDERED INCIDENTAL TO PATCH MATERIAL ITEMS.
1. SEE COOB'S APPROVED PRODUCT LIST FOR ACCEPTABLE MANUFACTURERS.

2. INSTALL RESTRAINED JOINTS, AS REQUIRED, FROM DEFLECTION POINT IN BOTH DIRECTIONS (20' MIN.)

3. IF A WATER METER BOX IS NOT WITHIN 200 FEET OF A VALVE & VALVE BOX, THEN IT Requires AN ADDITIONAL VALVE BOX FOR TRACER WIRE.

4. TRACER WIRE SHALL BE A MINIMUM 12 GAUGE WITH A TENSILE STRENGTH/BREAK LOAD OF 452 LBS. SEE TRACER WIRE SPECIFICATION #15049.
SPECIFICATIONS

ITEM: Brass ID Anti-Theft Marker

MATERIAL: SOLID CAST BRASS/Copper and Zinc Casting

DESCRIPTION: 3" Cast Brass Disc 1/8" Thick with 1/4" Brass "Theft Proof" Anchor pin.

Top surface to be engraved with 1/4" to 3/8" Capital letters.

*PWGV  Potable Water Gate Valve
RWGV  Reclaimed Water Gate Valve
SSGV  Sanitary Sewer Gate Valve
SSPV  Sanitary Sewer Plug Valve
NOTE:
1. WATER MAIN VALVE BOX AND COVER SHALL BE ADJUSTABLE SCREW TYPE.
2. TRACER WIRE TO BE INSTALLED ON ALL NON-METALLIC MAINS. 12 GAUGE MINIMUM SOLID COPPER TRACER WIRE W/452 LB TENSILE STRENGTH/ BREAK LOAD REQUIRED.
NOTES:
1. HYDRANTS SHALL BE OF THE SELF DRAINING TYPE.
2. HYDRANTS ARE TO BE SUPPLIED FROM THE MANUFACTURER WITH A SILVER PRIMER.
3. HOSE BIBS TO BE AMERICAN STANDARD THREADS.
4. RESTRAINED JOINTS REQUIRED. THRUST BLOCKS ARE NOT PERMITTED.
5. ADJUSTABLE TRENCH ADAPTOR ASSY. REQUIRED FOR ALL VALVES GREATER THAN 3" DEEP.
6. INSTALL AT SIDE LOT LINES OR AT CORNERS OF ROADWAY RIGHT-OF-WAY INTERSECTIONS (TYPICAL).
7. INSTALL AT 500 RADIUS OF COVERAGE.
8. REFLECTIVE PAVEMENT MARKER INSTALLED 3' INTO PAVEMENT (TYPICAL).
9. FIRE HYDRANT TESTING SHALL BE FLOWED THRU THE 2 1/2" OPENINGS. TEST RESULTS SHALL BE ACTUAL NOT ESTIMATED. FLOW TESTING SHALL BE SUBMITTED TO THE CITY AS LISTED:
   - ACTUAL GPM
   - STATIC (PSI)
   - RESIDUAL (PSI)
   - THE CITY WILL DETERMINE THE COLOR OF THE BONNET.
10. FIRE HYDRANT BODY SHALL BE PAINTED COLOR 1ST OSHA YELLOW PRIOR TO ACCEPTANCE BY THE CITY.

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THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT

FIRE HYDRANT ASSEMBLY DETAIL
W-16

RED BONNET = 499 GPM OR LESS
ORANGE BONNET = 500 – 999 GPM
GREEN BONNET = 1000 – 1499 GPM
BLUE BONNET = 1500 GPM OR MORE
1. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER’S ENGINEER TO DETERMINE THE APPROPRIATE SIZE OF THE SERVICE CONNECTION AND TO COORDINATE THE LOCATION OF THE FIRE DEPARTMENT CONNECTION WITH THE CITY FIRE DEPARTMENT PERSONNEL.

2. CONTRACTOR IS RESPONSIBLE FOR UNCOVERING THE WATERMAIN, INSTALLING THE TAPPING SADDLE/TAPPING VALVE & BOX (ON ANY SERVICE LARGER THAN 2”), ANY RESTORATION ACTIVITIES TO FOOT, COUNTY, OR CITY STANDARDS, ASSOCIATED MOT, AND ALL WORK BEHIND THE WATER METER. THE CITY WILL TAP THE MAIN, INSTALL THE SERVICE AND SET THE METER.

3. METER LENGTHS REQUIRED FOR INSTALLATION OF WATER METER AND METER VAULT
   4” METER REQUIRES 12 FEET
   6” AND 8” METERS REQUIRE 14 FEET
   10” METER REQUIRES 20 FEET

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT

FIRE/DOMESTIC/IRRIGATION CONNECTION
DETAIL W–17

TABLE OF CONTENTS
NOTES:
1. METER AND METER BOX SHALL BE FURNISHED BY CITY FORCES, AFTER WATER SERVICE CONNECTION HAS BEEN REQUESTED AND FEE’S HAVE BEEN PAID.
2. METER SHALL BE INSTALLED BEHIND SIDEWALK OR R.O.W. AS SHOWN.
3. BACKFLOW PREVENTION DEVICES (REDUCED PRESSURE ZONE) MAY BE REQUIRED ON WATER CONNECTIONS THEY ARE TO BE SUPPLIED AND INSTALLED BY THE HOUSE OWNER/BUILDER AT HIS COST TO THE CITY.
4. TO BE INSTALLED ON THE CUSTOMER’S SIDE OF THE METER.
5. IRRIGATION METERS REQUIRE AN APPROVED BACKFLOW PREVENTER.
6. SERVICE SADDLES SHALL BE STAINLESS STEEL STRAPS—EPoxy COATED.
7. ALL METER LOCATIONS ON COMMERCIAL SITES SHALL BE LOCATED AS SHOWN ON THE CITY APPROVED SITE PLAN AND FIELD VERIFIED HORIZONTALLY & VERTICALLY BY THE OWNER OR OWNER’S REPRESENTATIVE.
8. CONTRACTOR IS TO SUPPLY METER BOXES AS SHOWN IN PROFILE #1 AND PLAN VIEW #1 WHEN BUILDING A SUBDIVISION TYPE DEVELOPMENT, WHERE THERE WILL BE A SERVICE OR SERVICES THAT WILL NOT REQUIRE A WATER CONNECTION AS SOON AS THE WATER LINE HAS BEEN INSTALLED, PRESSURED TESTED, CHLORINATED AND CLEARED FOR USE.
9. SEE CITY SPECIFICATION NO. 15049 TRACER WIRE AND ALARM TAPE.

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT
NOTES:
1. USE THIS DETAIL IF FIRE HYDRANT IS UNAVAILABLE.
2. PROVIDE SUPPORT, HIGH VISIBILITY CONSTRUCTION FENCING AND/OR PROTECTIVE MEASURES TO PREVENT ABOVE GROUND PIPE BEING BROKEN.
3. REMOVE TEMPORARY BYPASS PRIOR TO PLACING LINE IN SERVICE.
NOTES:

1. VALVES SHALL BE CENTERED IN THE BOX
2. ROCK SHALL BE COMPACTED TO A FIRM AND UNYIELDING CONDITION
3. PIPING BETWEEN THE VALVE AND MAIN SHALL BE CONFIGURED TO BEST FIT FOR THE SITE CONDITION AS APPROVED BY THE CITY
4. TOP OF BOX ON SANITARY FORCE MAIN SHALL BE CLEARLY PERMANENTLY LABELED AS SANITARY FM.
5. TOP OF ALL BOXES SHALL BE CLEARLY AND PERMANENTLY LABELED AS TO VALVE TYPE (AIR RELEASE, VACUUM, OR AIR/VAC COMBINATION).

MANUAL AIR RELEASE VALVE DETAIL

OFFSET AIR/VAC RELEASE VALVE

A.R.I. D-025 COMBINATION ARV/VACUUM VALVE OR CITY APPROVED EQUIV.
2" BALL VALVE BRASS OR STAINLESS STEEL FINISHED GRADE
2" STAINLESS STEEL OR DUCTILE IRON SERVICE SADDLE WITH IPS. THREAD WASTEWATER FORCE MAIN OR WATER MAIN

NOTE:

* FDOT #57 STONE BEST FIT FOR THE SITE CONDITION AS APPROVED BY THE CITY
CDR SYSTEMS GROUP
A13-3636-48 402 BOX
OR CITY APPROVED EQUIV.
RATED FOR CITY ACCEPTABLE
TRAFFIC BEARING FOR THE
LOCATION.

NOTES:
1. VALVES SHALL BE CENTERED IN THE BOX
2. ROCK SHALL BE COMPACTED TO A FIRM AND UNYIELDING CONDITION
3. PIPING BETWEEN THE VALVE AND MAIN SHALL BE CONFIGURED TO
   BEST FIT FOR THE SITE CONDITION AS APPROVED BY THE CITY
4. TOP OF BOX ON WATER MAIN SHALL BE CLEARLY PERMANENTLY
   LABELED AS WATER.
5. TOP OF ALL BOXES SHALL BE CLEARLY AND PERMANANTLY LABELED AS TO
   VALVE TYPE (AIR RELEASE, VACUUM, OR AIR/VAC COMBINATION).
6. AIR RELEASE VALVE SHALL BE INSTALLED AFTER HIGH POINTS HAVE
   BEEN DETERMINED.
### MATERIALS

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<td>2</td>
<td>SS BRACKETS W/SS CLAMPS</td>
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### NOTES:

1. ACCEPTABLE MANUFACTURERS: (SEE CODE’S ACCEPTABLE PRODUCT LIST)
2. FIELD ADJUST AND CUT ITEM 4 TO THE PROPER LENGTH.
3. THE RISER & ELBOW TO BE PAINTED 136 OSHA RED FOR COMMERCIAL FIRE SERVICE, 137 OSHA BLUE FOR COMMERCIAL DOMESTIC SERVICE.
4. TEST PORTS (QUANTITY/LOCATIONS DEPENDING ON MANUFACTURER)
5. PVC PIPE REQUIRE SS BRACKETS W/SS CLAMPS

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THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT

COMMERCIAL
REDUCED PRESSURE ZONE BACKFLOW PREVENTER, SINGLE SERVICE

3/4" 1-1/2" or 2"
### MATERIALS

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<td>RISER, GALV. (42” LONG)</td>
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<td>NIPPLE, GALV. (6” LONG)</td>
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<tr>
<td>9</td>
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<td>SEE NOTES</td>
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**NOTES:**

1. ACCEPTABLE MANUFACTURERS: (SEE ACCEPTABLE PRODUCTS LIST)
2. FIELD ADJUST AND CUT ITEM 6 & ITEM 8 (PIPE SUPPORT) TO THE PROPER LENGTH.
3. THE RISER & ELBOW TO BE PAINTED 136 OSHA RED FOR COMMERCIAL FIRE SERVICE, 137 OSHA BLUE FOR COMMERCIAL DOMESTIC SERVICE.
4. ITEM 8: 2” GALV. IRON PIPE/CONCRETE FOUNDATION (16”x16”x16” MIN.)
5. ITEM 9: TEST PORTS (QUANTITY/LOCATIONS DEPENDING ON MANUFACTURER)
NOTES:

1. ACCEPTABLE MANUFACTURERS: (SEE CODB’S ACCEPTABLE PRODUCT LIST)
2. FIELD ADJUST AND CUT ITEM 3 & ITEM 7 (PIPE SUPPORT) TO THE PROPER LENGTH.
3. THE RISER & ELBOW TO BE PAINTED 136 OSHA RED FOR COMMERCIAL FIRE SERVICE, 137 OSHA BLUE FOR COMMERCIAL DOMESTIC SERVICE.
4. 2” GALV. IRON PIPE/CONCRETE FOUNDATION (16”x16”x16” MIN.)
5. TEST PORTS (QUANTITY/LOCATIONS DEPENDING ON MANUFACTURER)
MATERIALS

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<td>VALVE, GATE, C.I., F-F</td>
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<td>ELBOW 90° (2&quot; TO 3” GALV.) (DIP FOR ALL OTHER SIZES)</td>
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<td>FLANGE, STEEL PIPE, SCREW-TYPE</td>
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<tr>
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<td>2</td>
<td>RISER, (2” TO 3” GALV.) (DIP FOR ALL OTHER SIZES) (42&quot; LONG)</td>
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<td>SEE NOTES</td>
</tr>
<tr>
<td>9</td>
<td>*</td>
<td>SEE NOTES</td>
</tr>
</tbody>
</table>

NOTE:

1. ACCEPTABLE MANUFACTURERS: (SEE CDB’S ACCEPTABLE PRODUCT LIST)
2. FIELD ADJUST AND CUT ITEM 6 & ITEM 8 (PIPE SUPPORT) TO THE PROPER LENGTH.
3. BFP 4” AND GREATER SHALL BE DIP. BELOW 4” SHALL BE GALV.
4. THE RISER & ELBOW TO BE PAINTED 136 OSHA RED FOR COMMERCIAL FIRE SERVICE, 137 OSHA BLUE FOR COMMERCIAL DOMESTIC SERVICE.
5. (ITEM 8) 2” GALV. IRON PIPE/CONCRETE FOUNDATION (16”x18”x24” MIN.)
6. (ITEM 9) TEST PORTS (QUANTITY/LOCATIONS DEPENDING ON MANUFACTURER)
LIMIT OF BLOW-OFF VALVE ASSEMBLY

PRECAST CONCRETE METER BOX

LOCKABLE CURB STOP

2" ENDOT WITH BLUE TRACER WIRE, ENDOTRACE, OR TYPE K COPPER (AWWA C901)

NOTE: INSTALL RESTRAINED JOINTS ON MAIN FOR MINIMUM OF 20' IN EACH DIRECTION FROM THE CORPORATION STOP.

1. ALL TEMPORARY BLOW-OFFS INSTALLED FOR SAMPLING PURPOSES MUST BE REMOVED BY CONTRACTOR.
Products that are submitted to the city engineering division prior to beginning project construction and are acceptable to the city may be substituted on a case by case basis for the products on the acceptable products list.

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**Water Category 1 of 6: VALVES AND ACCESSORIES**
- Air Release Valves
- Air Release Valves Enclosure
- Blow Off Valve
- Gate Valves General
- Gate Valves 16-inch through 48-inch
- Gate Valves 12-inch and Smaller (resilient seated only)
- Tapping Valves (resilient seated only)

**Water Category 2 of 6: SERVICE MATERIALS**
- Corporation Stops (ball type)
- Curb Stops Straight Valves
- **CTS Polyethylene Tubing**
- Service Saddles
- U Branch
- U Branch Assemblies with Angle Ball Valves

**Water Category 3 of 6: PIPE MATERIALS**
- Casing Spacers (all sizes)
- Casing End Seals
- Ductile Iron / Cast Iron Cement Lined
- PCCP Transmission Lines Greater than 30-inch
- C-900 (DR-18) PVC PRESSURE PIPE (PRESSURE CLASS 150)
The City of Daytona Beach Utilities Department
List of Acceptable Products

Potable Water

FY–19/20

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Water Category 4 of 6: PIPE FITTINGS

Expansion Joints
Fittings C153 SSB / C110 Flange
Restrained Joints - Ductile Iron Pipe
Restrained Joints - PVC C900 (DR-18)
Tapping Sleeves
Tapping Sleeves - Fabricated Steel

Water Category 5 of 6: HYDRANTS

Approved Hydrants

Water Category 6 of 6: REDUCED PRESSURE ZONE BACKFLOW PREVENTER

Approved RPZBP, Single Service ⅜", 1", 1½", 2"
Approved RPZBP, Single Service 3", 4"
Approved RPZBP, Single Service 6", 8"
# Water Category 1 of 6: VALVES AND ACCESSORIES

## Air, Vacuum or Air/Vac Combination Release Valves

1. APCO
2. ARI

## Air Release Valve Enclosure

1. Water Plus
   - No. 30 (131632)
   - No. 40 (171730)
2. CDR
3. GlasMasters

## Blow Off Valve

1. Hydro Guard
2. Kupferle Foundry Co.
3. Water Plus

1. Automatic Blow Off
   - Series TF 550
2. Series VB 2000

## Gate Valves - general (resilient seat)

AWWA C509 and C515

1. American Flow Control
2. Mueller
3. Clow
4. Kennedy
5. US Pipe
6. American AVK
7. East Jordan Iron Works

1. C509 and C515
2. C509 and C515
3. C509 and C515
4. C509 and C515
5. C509 and C515
6. C509 and C515
7. C509 and C515

## Gate Valves 16" - 48" (resilient seated only w/side actuators)

1. American Flow Control
2. Clow
3. Mueller
4. US Pipe
5. Kennedy
6. M&H

1. Series 2500
2. Series F-6100
3. Series A2361
4. Series 5460
5. Series 4571
6. Series 4067

## Boxes & Vaults

1. CDR
2. Boxes & Vaults
3. Boxes & Vaults

## GlasMasters

1. Boxes & Vaults
Gate Valves 12" and Smaller (resilient seated only)
1. American Flow Control
2. American R/D
3. AVK
4. Clow
5. Kennedy
6. M&H
7. Mueller
8. US Pipe
9. Waterous

Sample Station
1. Water Plus

Tapping Valves (resilient seated only)
1. American Flow Control
2. AVK
3. Clow
4. Kennedy
5. M&H
6. Mueller
7. US Pipe
8. Waterous

Corporation Stops - Ball Type 1" & 2" (w/ AWWA taper CC threads only / pack joint outlet for CTS)
1. Ford
2. McDonald
3. Mueller
4. Cambridge
5. James Jones

Curb Stops - Straight Valves (curb stop to be ball type, reduced port FIP x FIP ¾" x ¾"
1. Ford
2. McDonald
3. Mueller
4. Cambridge
5. James Jones

Vaults, Meter Boxes & Lids - (all water meter box lids must be fabricated with an off-center hole that will accept an AMR transceiver unit.)
1. Armorcast
2. CDR
3. Glasmaster
4. Old Castle
5. Commercial & Residential (concrete & composite)
6. Commercial & Residential (concrete & composite)
7. Commercial & Residential (concrete & composite)
Curb Stops - Straight Valves (ball type compression by meter, 1" & 2" CTS O.D. tubing by ½" x ¾" & 2" meter)

1. Ford
   1. B43-342W, BFA43-777W
2. McDonald
   2. 6100MW-22
3. Mueller
   3. P24350, B24337, B24335
4. Cambridge
   4. 242-BT, 212BMF
5. James Jones

Curb Stops - Straight Valves (ball type compression by compression)

1. Ford
   1. B44-444W, B41-233WQ - 344WQ
2. McDonald
   2. 6100W-22
3. Mueller
   3. P-25146
4. Cambridge
   4. 224-BB
5. James Jones
   5. J-1949W

Polyethylene Tubing - (blue w/ UV protection (SDR-9) 1" & 2" only)

1. Endot
   1. Endot w/#14 wire
   2. Endotrace

Service Saddles - Epoxy or nylon-coated stainless steel 18-8 type 304 straps

1. Smith Blair
   1. Series 393, Series 397, Series 313
2. Ford
   2. Series FC202
3. JCM
   3. Series 406
4. Mueller
   4. DR2S, DR2SOD
5. Romac
   5. Series 202NS, Series 284
6. Cambridge
   6. Series 403
7. Cascade
   7. CNS2

U Branch (1" x ¾" x 7½")

1. Ford
   1. U-48-43, V-42
2. McDonald
   2. 08U2M, 207 Model
3. Mueller
   3. P-15363
4. Cambridge
   4. 172-BM750
5. James Jones
   5. J-2613
## Water Category 3 of 6: PIPE MATERIALS

### U Branch Assembly with Angle Ball Valves (1" x \( \frac{3}{4} \)" x 7 \( \frac{1}{2} \)"")
1. Cambridge 1. UVB-43-42W
2. McDonald 2. 09U2BW
4. Ford 4. 172-BM750
5. James Jones 5. J-2216

### Casing Spacers (all sizes) Stainless steel w/ vinyl runners
1. Advanced Products 1. Series SS
2. Cascade 2. Series CCS/ CCPS/ AZ
3. BMW 3. BMW-SS
4. Power Seal 4. Model 4810
5. PSI 5. Series S-G-2
6. PSI-Ranger 6. Ranger II
7. RACI 7. S/T, F/G, P/Q, M/N, E/H

### Casing End Seals
1. Advanced Products 1. Model AC & AW
2. BMW 2. BMW wrap around end seal
3. Cascade 3. Model CCES
5. PSI 5. Model C, S, & W

### Ductile Iron/ Cast Iron Cement Lined (class 350)
1. American 4. McWane
2. Clow 5. US Pipe
3. Griffin 6. Tyton

### C-900 (DR-18) PVC PRESSURE PIPE (PRESSURE CLASS 150)(Blue Pipe)
1. North American Corp.
2. Blue Brute (C900) JM Eagle
3. Certain Teed
Water Category 4 of 6: PIPE FITTINGS

Expansion Joint
1. EBAA Iron
2. Mercer
3. Metraflex
4. Proco

Fittings - C153 SSB/C110 (cement or fusion bonded epoxy lined)
1. American
2. Assured Flow Sales
3. Griffin
4. Nappco/Sigma
5. Star
6. Union/Tyler
7. US Pipe
8. SIP Industries

Restrained Joints - DIP
1. American
2. EBAA Iron Inc.
3. Ford
4. Star
5. US Pipe
6. Sigma
7. Mueller
8. Romac
9. SIP Industries

Restrained Joints - PVC C900 (DR-18)
1. Sigma Corp.
2. EBAA Iron Inc.

Tapping Sleeves - Mechanical joint for all taps on cast iron, ductile iron, all taps including size on size
1. American Flow Control
2. Clow
3. Mueller
4. US Pipe

1. Series 2800
2. Series F-5205, F-5207
4. Series T-9

1. Fast Grip Gasket
3. UFR-1400, 1300C series
4. Star Grip series 3000, All Grip series 3600
5. Field Loc Gasket
6. One-LOK SLD (3-36")
7. Aquagrip Restraint System
8. Grip Rings
9. EZ-Grips

1. PV-LOK Series PWP for Bell Joint Restraint (CIOD)
2. Series 1900

The City of Daytona Beach Utilities Department
List of Acceptable Products

Potable Water FY-19/20
**Potable Water**

**Tapping Sleeves** - Fabricated steel, mechanical joint, fusion bonded epoxy coated

1. Smith Blair
2. JCM

1. **Style 622**, Style 623
2. **Series 412**, Series 414

**Water Category 5 of 6: Hydrants**

**Hydrants**

1. Mueller
2. Kennedy
3. American Flow Control
4. Clow

1. A-423
2. Guardian (K-81-A, K-81-D)
3. American Darling B84B (5 1/4" only)
4. Medallion (5 1/4")

**Water Category 6 of 6: Reduced Pressure Zone Backflow Preventer**

**Approved RPZBP** - Single service 3/4", 1", 1 1/2", 2"

1. Febco
2. Watts
3. Conbraco/Apollo
4. Wilkins

1. 825 Y
2. Model 909, Model 919, Model 2009MZ
3. 40-200
4. 975-375 XL

**Approved RPZBP** - Single service 3", 4"

1. Febco
2. Watts
3. Conbraco/Apollo
4. Cla-Val
5. Wilkins

1. 825 Y
2. Model 909 OS&Y
3. 40-200
4. RP-1

**Approved RPZBP** - Single service 6", 8"

1. Febco
2. Watts
3. Conbraco/Apollo
4. Cla-Val
5. Wilkins

1. 825 Y
2. Model 909 OS&Y
3. 40-200
4. RP-1
# Reclaimed Water Details

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<td>RW-18</td>
<td>Reclaimed Water Approved Products (Page 5 of 6)</td>
</tr>
<tr>
<td></td>
<td>RW-19</td>
<td>Reclaimed Water Approved Products (Page 6 of 6)</td>
</tr>
</tbody>
</table>
1. The City’s Utilities Department (671-8815) shall be given a minimum of three business days' notice (not including holidays) prior to beginning any reclaimed water system construction.

2. A permit shall be required prior to engaging in any dewatering or construction activity that changes the impervious area of land. Dewatering activities include the removal of groundwater from a construction site, enclosed vault, sump, or trench, allowing construction or maintenance in a dry environment. Site-specific dewatering permits shall require payment of a per-acre fee based on the size of the development. General purpose permits shall require an annual fee based on a biannual schedule of dewatering activities. Discharging directly into the city’s MS4 conveyance system, dewatering permit applications can be found at [https://www.cddcn.org/index.aspx?nid=202](https://www.cddcn.org/index.aspx?nid=202). Fees are subject to Article 7, Section 7.2 of the Land Development Code and must be submitted with the permit application to the City of Daytona Beach Storm Water Coordinator at 125 Basin Street, Suite 100, Daytona Beach, Florida 32114. Prior to any use of the city’s MS4 conveyance system, failure to comply will result in immediate termination of access to the city’s MS4 system.

3. Reclaimed water service endings shall be secured by wire to 2” x 4” pressure treated stakes, approximately 2’ above grade or may be placed in reclaimed water meter boxes provided by the contractor at the time of final subdivision inspection.

4. For pipe flushing, pigging, testing, and tie-in connections, the City reserves the right to require work to be performed during periods of low flow (midnight to 8 A.M.) in order to minimize service disruption to existing customers. The contractor shall coordinate and schedule with the City representative the date and time that must be approved by the water plant operations.

5. It is the contractor’s responsibility to supply “as-built drawings” to the City prior to any use of the system. **See City of Daytona Beach as-built requirements**

6. All reclaimed water services shall be marked along the outside edge of curb with a “◊” or by metal tabs set into pavement. Valves and blow-offs for reclaimed water mains shall be marked by a “+” set into the pavement and painted with purple enamel.

7. Reclaimed water services shall be located at side lot lines alternating with potable water service locations. In instances where reclaimed water services must be offset, the services may be offset from the lot line a maximum distance of 2 feet.

8. All reclaimed water hand-operated connections and outlets shall be contained in underground service vaults and appropriately tagged or labeled to warn the public and employees that the water is not intended for drinking or swimming. Any significant irrigation site utilizing reclaimed water, such as an athletic field, golf course, park or pond, is required to post a 12” x 12” reclaimed water sign warning the public and employees that reclaimed water is not intended for drinking or swimming. This sign shall be placed at the entrance to the site and the location of the private reuse system. See ‘reclaimed water in use’ detail.

9. Vaults for outlets shall be locked or require a special tool for operation.

10. A 75 foot setback distance shall be provided from public access reclaimed wetted areas to public or private potable water supply wells.

11. Low trajectory nozzles are required within 100 feet of public eating, drinking or bathing facilities.

12. All reclaimed water mains shall be installed on a firm foundation with all unsuitable material (muck, rock, coquina, etc.) removed and replaced with clean granular material.

13. Trenches shall be backfilled with material acceptable to the City with a minimum compaction of 95% in unpaved areas and 98% in paved areas in accordance with AASHTO T-180.
14. IT IS THE CONTRACTOR’S RESPONSIBILITY TO PROVIDE TRENCH COMPACTION TESTS AT POINTS 12 INCHES ABOVE THE PIPE AND AT 12 INCHES VERTICAL INTERVALS TO FINISH GRADE AT A MAXIMUM SPACING OF EVERY 300 FEET.

15. "METALIZED PIPE LOCATION TAPE SHALL BE INSTALLED 15” TO 24” BELOW FINISHED GRADE OR AS SPECIFIED BY MANUFACTURER FOR ALL PVC LINES, AND A SINGLE STRAND INSULATED COPPER TRACER WIRE SHALL BE ATTACHED TO ALL PVC PIPE. WIRE RUNS SHALL BE CONNECTED WITH SILICONE-FILLED WIRE CONNECTORS. EACH RUN SHALL TERMINATE AT EVERY VALVE. SEE STANDARD DETAIL "MAIN VALVE BOX" FOR INSTALLATION OF WIRE ON RISER PIPE. SERVICES SHALL BE CONNECTED TO THE MAIN WIRE WITH SILICONE FILLED CONNECTORS. IT IS THE CONTRACTOR’S RESPONSIBILITY TO ENSURE CONTINUITY AND TEST FOR CONTINUITY (SEE CITY SPECIFICATIONS #15049 TRACER WIRE AND ALARMING TAPE).

16. ALL SINGLE RESIDENTIAL WATER SERVICES SHALL BE 1” SERVICES SHALL BE CTS. 3408 HIGH DENSITY POLYETHYLENE TUBING RATED FOR A MINIMUM OF 200 PSI WITH SODR 9 (CTS). THE TUBING SHALL HAVE A VIRGIN HIGH DENSITY POLYETHYLENE CENTER FOR WHICH THE MANUFACTURER SHALL FURNISH A CERTIFICATE OF PURITY. THE TUBING SHALL BE PURPLE IN COLOR AND SHALL HAVE THE WORDS "RECLAIMED WATER" PERMANENTLY PRINTED ON THE OUTSIDE, THE TUBING SHALL HAVE U.V. PROTECTION AND SHALL NOT BE AFFECTED BY DIRECT SUNLIGHT. THE TUBING SHALL COMPLY WITH OR EXCEED THE APPLICABLE STANDARDS OF A.S.T.M. D1248, D3350, D2239, D2737, N.S.F.—14 AND A.W.W.A. C901 AND SHALL COME WITH A LIFETIME WARRANTY. APPROVED SIZES: 1” AND 2” DIAMETERS.

17. RECLAIMED WATER MAINS SHALL BE INSTALLED 4 FEET OFF THE BACK OF THE CURB ON THE OPPOSITE SIDE OF THE ROAD OF THE POTABLE WATER MAINS, OR AS APPROVED BY THE CITY. RECLAIMED WATER MAINS SHOULD NOT BE INSTALLED UNDER SIDEWALK.

18. ALL RECLAIMED WATER MAINS SHALL HAVE A MINIMUM COVER OF 36 INCHES. IN SPECIAL CASES WHERE IT IS IMPOSSIBLE OR INAPPROPRIATE TO PROVIDE ADEQUATE COVE, DUCTILE IRON PRESSURE CLASS 350 OR CONCRETE ENCASMENT/PROTECTIVE SLAB MAY BE USED AT THE DISCRETION OF THE UTILITIES DEPARTMENT. ALL DIP SHALL HAVE 2” PURPLE STRIPES PAINTED AT 12 O’CLOCK, 3 O’CLOCK, 6 O’CLOCK AND 9 O’CLOCK FOR THE FULL LENGTH OF PIPE. NON PAINTED RECLAIMED PIPE OR PIPES SHALL BE PAINTED WITH AN EPOXY PAINT (PANTONE PURPLE) TO CLEARLY MARK THE RECLAIM PIPE OR PIPES.

19. RECLAIMED WATER MAINS SHALL BE PURPLE PVC, OR 18 AWWA CLASS C-900 OR C-905, CL 150, OR DIAMETER PRESSURE CLASS 350, STANDARD CEMENT LINED (PAINTED PANTONE PURPLE) UNLESS APPROVED OTHERWISE BY THE CITY. ALL HORIZONTAL DIRECTIONAL DRILLS SHALL HAVE A MINIMUM WORKING PRESSURE OF 160 PSI. THE CITY MAY REQUIRE A HIGHER PRESSURE RATING BASED ON SITE CONDITIONS. INSIDE DIAMETER OF HORIZONTAL DIRECTIONAL DRILL PIPE SHALL MATCH THE INSIDE DIAMETER OF CONNECTING PIPES. ALL GASKETS SHALL BE LUBRICATED BEFORE INSTALLATION.

20. DIRECTIONAL DRILLS SHALL HAVE FUSED MJ ADAPTERS.

21. ALL RECLAIMED WATER MAINS SHALL USE THRUST RESTRAINT AS CALCULATED BY A PROGRAM AVAILABLE AT FBA.COM

22. ALL FITTINGS, VALVES, ETC. SHALL BE DUCTILE IRON (MJ OR FLANGED) AND SHALL BE RESTRAINED.

23. BELL RESTRAINTS OR GRIPPER TYPE GASKETS SHALL BE USED FOR ALL RESTRAINED PIPE BELL JOINTS.

24. VALVES SHALL BE PLACED AT ALL STREET INTERSECTIONS AND AT MAXIMUM SPACINGS OF 750 FEET.

25. VALVES SHALL BE INSTALLED ON ALL LEGS EXCEPT ONE AT ALL RECLAIMED WATER MAIN TEES AND CROSSES.

26. ALL VALVES SHALL BE ADJUSTED TO FINISH GRADE AND CAPS SHALL BE PAINTED PURPLE.

27. THE CONTRACTOR IS REQUIRED TO PIG ALL RECLAIMED WATER MAINS EQUAL TO OR GREATER THAN 6” IN DIAMETER AND PRIMARY DISTRIBUTION MAINS LOCATED ON COLLECTOR AND ARTERIAL ROADWAYS. LAUNCHING AND EXTRACTION POINTS SHALL BE DETERMINED BY THE CONTRACTOR.

28. IN AREAS WHERE RECLAIMED WATER IS AVAILABLE, RECLAIMED WATER WILL BE UTILIZED IN THE PRESSURE TESTING OF NEW NON-POTABLE WATER LINES.

29. RECLAIMED WATER MAINS SHALL NOT BE PLACED IN SERVICE UNTIL A PRESSURE TEST AT 150 PSI FOR 3 HOURS HAS PASSED AND THE RESULTS ARE FORWARD TO THE CITY.

30. THE CONTRACTOR SHALL PERFORM RECLAIMED WATER TAPS WITH A CITY REPRESENTATIVE PRESENT.
31. With respect to tie-in connections, the City reserves the right to require connections to be performed during periods of low flow.

32. The plans shall include the proposed locations of all reclaimed water mains measured from the back of curb (edge of pavement if no curb exists) and the right-of-way line.

33. Landscape plans shall clearly depict the design location of plantings relative to the location of public utilities and storm water infrastructure.

34. The reclaimed water main shall not be placed in service until an approved backflow preventer has been installed on the customer's potable service line.

35. Pressure tests for tapping saddles and valves shall be a minimum of 30 minutes at 150 psi or 30 minutes at the manufacturer's recommended testing pressure.

36. A inch metalized pipe location tape shall be located 15 inches to 24 inches below finished grade or as specified by the manufacturer for all water lines. Blue tracer wire shall be attached to all pipes. Wire runs shall be connected with silicone filled wire connectors. Services shall be connected to the main wire with silicone filled wire connectors. It is the contractor's responsibility to ensure and test for continuity (see City Specification #15049). Tracer wire and alarming tape. Tracer wire shall be tested for continuity under the supervision of a City representative after installation. If a meter box is not within 200 feet of a valve and valve box an additional valve box for tracer wire is required.

37. All fittings shall meet minimum restraint requirements per ANSI/AWWA/EBAA, and all pressure pipes under the roadways shall be restrained.

38. In areas where reclaimed water is not available, the contractor is required to use the necessary backflow prevention devices to transfer potable water to non-potable water lines to perform the required pressure test.

39. Where potable water mains, reclaimed water mains, force mains, sanitary sewer mains or storm water mains cross with less than 12 inches of vertical clearance or where the sewer or the reclaimed water main is above the water main, mediation must be reviewed and approved by FDEP.
LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH F.A.C. RULE 62-555.314

<table>
<thead>
<tr>
<th>Crossings (1)</th>
<th>Horizontal Separation</th>
<th>Other Pipe</th>
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</thead>
<tbody>
<tr>
<td>Water Main</td>
<td>Water Main</td>
<td></td>
</tr>
<tr>
<td>3 ft. minimum</td>
<td>10 ft. preferred</td>
<td></td>
</tr>
<tr>
<td>Alternate 3 ft. minimum</td>
<td>6 ft. preferred (3)</td>
<td></td>
</tr>
<tr>
<td>Joint Spacing @ Crossings (1)</td>
<td>Water Main</td>
<td>Water Main</td>
</tr>
<tr>
<td>12 inches is the minimum and 6 inches is the minimum and except for gravity sewer, then 12 inches is the minimum except for storm sewer.</td>
<td>12 inches is the minimum</td>
<td>12 inches is the minimum</td>
</tr>
<tr>
<td>Stormwater Force Main</td>
<td>Reclaimed Water</td>
<td>Sanitary Sewer</td>
</tr>
<tr>
<td>Vacuum Sanitary Sewer</td>
<td>Wastewater System</td>
<td>Sanitary Sewer</td>
</tr>
<tr>
<td>3 ft. minimum</td>
<td>10 ft. preferred</td>
<td>12 inches is preferred</td>
</tr>
<tr>
<td>6 inches is preferred</td>
<td>6 ft. preferred (3)</td>
<td>12 inches is preferred</td>
</tr>
</tbody>
</table>

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 is 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.
NOTICE TO ENGINEER: CROSSING DETAIL SHALL BE TO SCALE.

AND SHOW EXISTING UTILITIES, CLEARANCES, CASING LENGTH,
LOCATION OF PAVED ROAD AND LIMITS OF RIGHT-OF-WAY.

CARRIER PIPE AND CASING PIPE SIZES (MIN.)

<table>
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<tr>
<th>CARRIER PIPE NOM. DIA. (D1)</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
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<th>30</th>
<th>36</th>
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<th>48</th>
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</thead>
<tbody>
<tr>
<td>CASING PIPE NOM. DIA. (D2)</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>22</td>
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<td>48</td>
<td>54</td>
<td>60</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>WALL THICKNESS—INCHES *</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>22</td>
<td>24</td>
<td>30</td>
<td>30</td>
<td>36</td>
<td>36</td>
<td>48</td>
<td>54</td>
<td>60</td>
<td>66</td>
<td></td>
</tr>
</tbody>
</table>

NOTES:

1. MINIMUM COVER FOR TOP OF CASING TO R/R BASE SHALL BE 5.6' (SCL) 5.0' (FEC).
   MINIMUM COVER FOR TOP OF CASING ON ALL GROUND COVER SHALL BE 3.0'.

2. ROTATION OF CARRIER PIPE INSIDE THE CASING PIPE WILL NOT BE PERMITTED, RESTRAINED MECHANICAL
   OR FLANGED JOINT PIPE SHALL BE USED TO HELP PREVENT SUCH ROTATION.

3. SHOP DRAWINGS SHALL BE SUBMITTED OF CASING & CARRIER PIPE INSTALLATION FOR APPROVAL PRIOR
   TO FABRICATION OF PIPING, CASING, AND APPURTEINANCES. CERTIFICATION OF CASING PIPE IS REQUIRED.

4. GROUTING OF SPACE BETWEEN CASING AND CARRIER PIPE NOT REQUIRED UNLESS NEGATIVE FLOATATION EXISTS.

5. WELDING OF CASING PIPE TO BE DONE BY CERTIFIED WELDER. ALL ENDS OF CASING PIPE SHALL BE
   CHAMFERED PRIOR TO ANY WELDING. SEAL END OF CASING PIPE WITH NON SHRINK GROUT.

6. CITY INSPECTOR SHALL BE PRESENT THROUGHOUT ALL BORE AND JACK ACTIVITIES.

* WITHIN THE CITY OF DAYTONA BEACH RIGHT OF WAY, USE CURRENT FOOT STANDARDS.

** SPECIALLY DESIGNED SPACERS SHALL BE USED IN ACCORDANCE WITH MANUFACTURER'S
SPECIFICATIONS. USE CASCADE CASING SPACERS OR PRE-APPROVED EQUAL.

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT

TYPICAL RAILROAD CROSSING
TYPICAL RAILROAD CROSSING DETAIL
RW-5
CONTRACTOR SHALL PROVIDE AND INSTALL BULLET LOCKS ON ALL VALVES PRIOR TO FINAL ACCEPTANCE BY THE CITY.

DBL STRAP SADDLE W/ 1" IPT OPENING 1" CORP STOP. SEE APPROVED PRODUCTS LIST FOR ACCEPTABLE MANUFACTURERS. MIPT x COMP. FITTING 30 PSI.

1" SDR-9 POLYETHYLENE TUBING PURPLE IN COLOR ENDOT ENDOCORE RWT ONLY. TUBING SHALL BE CONTINUOUS WITH NO COUPLINGS.

RECLAIMED WATER MAIN

PLAN - SINGLE SERVICE

1" LOCKING SERVICE VALVE (CURB STOP) METER THREAD

FORD #Y-502 YOKE 1" UNION

1" SDR-9 POLY TUBING-PURPLE ENDOT ENDOCORE RWT ONLY

1" LOCKING SERVICE VALVE (CURB STOP) METER THREAD

NOTE:
1. ALL VALVES SHALL BE FULL PORT.

FIN. GRADE

4'-0" TYPICAL

36" MIN.

1" LOCKING SERVICE VALVE (CURB STOP) METER THREAD

1" UNION

1" UNION

1" UNION

1" UNION

TYPICAL SECTION

PMM METER TO BE INSTALLED IN EACH YOKE WITH FORD #EC-23 EXPANDER
NOTES:

1. SERVICE BOX AND METER TO BE FURNISHED BY THE CITY.
2. METER SHALL BE INSTALLED ON R/W SIDE OF THE SIDEWALK.
3. MINIMUM SEPARATION BETWEEN CURB AND METER BOX AND BETWEEN METER BOX AND SIDEWALK.
4. CONTRACTOR TO LOCATE CURB STOP BY PLACING A STAKE (2"X2" SQUARE AT 24" ABOVE GROUND) TOP PAINTED WITH THE COLOR OF THE UTILITY SERVICE AND WITH THE LOT NUMBERS IT SERVES.
5. MINIMUM RESIDENTIAL METER SHALL BE 1".
6. ALL COMMERCIAL PROPERTY'S METERS MUST BE SIZED BY THE ENGINEER-OF-RECORD.
7. ALL PROPOSED LINES (WHIPS) SHALL BE PLACED IN A METER BOX WITH CURB STOP ON THE END. NO WHIPS TO BE LEFT ABOVE GROUND.
NOTE: TO DETERMINE THE MOST CURRENT REQUIREMENTS FOR STABILIZATION MATERIAL, BASE MATERIAL, AND ASPHALT MATERIAL PATCH AND THE REPLACEMENT DIMENSIONS CONTACT CITY ENGINEER IN THE PUBLIC WORKS DEPT AT 386-671-8610.

LIMIT OF SURFACE RESTORATION

EXCAVATION WIDTH

MECHANICALLY SAW EXIST. PVMT

10' MIN [(TYP)]

EXIST. PVMT

SEE NOTE 5

WATER NOT ALLOWED ABOVE THIS POINT DURING CONSTRUCTION

UNDISTURBED SOIL

SEE NOTE 4

4” MAX. LAYERS AT 98% COMPACTION

6” MAX. LAYERS AT 98% COMPACTION

3/4” DIA. BEDDING ROCK WHERE EXCAVATION CONDITIONS REQUIRE

TRENCH WIDTH

12” PIPE O.D.

12” (W)

NOTES:

1. WHERE SOIL CONDITIONS CAN NOT BE MAINTAINED AS SHOWN ABOVE, PROVIDE APPROVED METHOD OF CONSTRUCTION.

2. SHEETING WILL BE REQUISITED AS DETERMINED IN THE FIELD.

3. COMPACTION PERCENTAGES SHOWN REFER TO A.A.S.H.T.O. T-180. PROVIDE COMPACTION TEST REPORTS TO CITY INSPECTOR.

4. MECHANICAL COMPACTION NOT ALLOWED BELOW THIS LEVEL.

5. FOR PVC PIPE ONLY – INSTALL METALLIC TAPE AND UF #12 INSULATED SINGLE STRAND COPPER WIRE OVER FULL LENGTH OF PIPE.

6. THE CONTRACTOR SHALL, UNLESS OTHERWISE NOTED, RESTORE ALL STRIPING, PAVEMENT MARKINGS, DELINEATORS, SIGNAGE AND TRAFFIC SIGNAL SYSTEM COMPONENTS DISTURBED DURING CONSTRUCTION ACTIVITIES. COST OF ALL WORK AND MATERIALS WILL BE CONSIDERED INCIDENTAL TO PATCH MATERIAL ITEMS.

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT

PAVEMENT CUT AND PATCH
DETAIL
RW-8

TABLE OF CONTENTS
RECLAIMED WATER

18" DIA. BY 6" THICK TONG COLLAR
#5 STEEL EACH WAY ON 6" CENTERS
(UNPAVED AREAS ONLY)

ADJUSTABLE TRENCH ADAPTER
ASSEMBLY, 2" SQ. WRENCH NUT
AND UPPER GUIDE REQUIRED
FOR MORE THAN 3 FT. DEPTH.

DEBRIS CAP

ADJUSTABLE CAST IRON VALVE BOX COVER
AND ROUND LID

RISER 6" PVC TYP.
(DISP. WITH CAST IRON VALVE BOX ONLY)

FASTENER REQUIRED AT 12" INTERVAL VERTICAL

TRACER WIRE
INSULATED COPPER WIRE

PRESSURE MAIN

REstrained JOINTS REQUIRED
AT ALL VALVE LOCATIONS

RESILIENT SEAT GATE VALVE
(AWWA C-509 to 515)

6" DEPTH OF
#57 BEDDING STONE
2' OF REBAR WITH
TRACER WIRE FOR GROUNDING.

NOTES:
1. SEE COBB’S APPROVED PRODUCT LIST
   FOR ACCEPTABLE MANUFACTURERS.
2. INSTALL RESTRAINED JOINTS, AS REQUIRED, FROM
   DEFLECTION POINT IN BOTH DIRECTIONS (20" MIN.)
3. IF A RECLAIMED WATER METER BOX IS NOT WITHIN
   200 FEET OF A VALVE & VALVE BOX, THEN IT REQUIRES
   AN ADDITIONAL VALVE BOX FOR TRACER WIRE.
4. TRACER WIRE SHALL BE A MINIMUM 12 GAUGE WITH
   A TENSILE STRENGTH/BREAK LOAD OF 452 LBS.
   SEE TRACER WIRE SPECIFICATION #T5049

RECLAIMED WATER COVER

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FY-19/20
Drawing Date: 01/08
Drawn By: LEP
Checked By: LP
Scale: N/S
Revision Date: 01/19
File Name: Valve and Box Rw-9
**CARSON #91012T LID**

PANTONE PURPLE IN COLOR TO BE MARKED IN 1/2" RAISED LETTERS: "RECLAIMED WATER. DO NOT DRINK".

THE LID SHALL HAVE TWO 1" DIAMETER FINGER HOLES. THE TWO LOCKING TABS ON THE LID ARE TO BE REMOVED. THE LID IS TO BE ATTACHED TO THE #91012 BOX AS DESCRIBED BELOW.

**CARSON #91012 PLASTIC VALVE BOX**

PANTONE PURPLE IN COLOR. CONNECTOR STRAP AT LOCATION "A" TO BE REMOVED ALONG WITH TABS AT LOCATION "B". THE LID IS TO BE ATTACHED TO THE BOX WITH A 1/16" STRANDED STAINLESS STEEL CABLE LOOPED AND SLEEVED THROUGH LOCATION "C" OF THE BOX AND LOCATION "D" OF THE LID TO ALLOW THE LID TO CLEAR THE BOX SIX TO SEVEN INCHES WHEN LIFTED.

**NOTE:** ONLY IF REQUIRED BY CITY
SPECIFICATIONS

ITEM: Brass ID Anti-Theft Marker

MATERIAL: SOLID CAST BRASS/Copper and Zinc Casting

DESCRIPTION: 3" Cast Brass Disc 1/8" Thick with 1/4" Brass "Theft Proof" Anchor pin.

Top surface to be engraved with 1/4" to 3/8" Capital letters.

City I.D.
Size
Type of Valve *
Type of Use
Operational Instructions

*PWGV  Potable Water Gate Valve
RWGV  Reclaimed Water Gate Valve
SSGV  Sanitary Sewer Gate Valve
SSPV  Sanitary Sewer Plug Valve

TABLE OF CONTENTS

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT

RECLAIMED WATER VALVE
MARKER/TAG
DETAIL
RW-11
D.R.I.P.

RECLAIMED WATER

Do Not Drink / No Beber
Do Not Swim / No Nadar
The City of Daytona Beach Utilities Department
List of Acceptable Products

| Reclaimed Water | FY-19/20 |

Products that are submitted to the city engineering division prior to beginning project construction and are approved by the city may be substituted on a case by case basis for the products on the acceptable products list.

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**Reclaimed Water Category 1 of 4: VALVES AND ACCESSORIES**
- Air Release Valves
- Air Release Valves Enclosure
- Blow Off Valve
- Gate Valves General
- Gate Valves 16-inch through 48-inch
- Gate Valves 12-inch and Smaller (resilient seated only)
- Tapping Valves (resilient seated only)

**Reclaimed Water Category 2 of 4: SERVICE MATERIALS**
- Corporation Stops (ball type)
- Curb Stops Straight Valves Locking
- CTS Polyethylene Tubing
- Service Saddles

**Reclaimed Water Category 3 of 4: PIPE MATERIALS**
- Casing Spacers (all sizes)
- Casing End Seals
- Ductile Iron / Cast Iron Cement Lined
- PCCP Transmission Lines Greater than 30-inch
- PVC, DR-18

**Reclaimed Water Category 4 of 4: PIPE FITTINGS**
- Expansion Joints
- Fittings C153 SSB / C110 Flange
- Restrained Joints - Ductile Iron Pipe
- Tapping Sleeves
- Tapping Sleeves - Fabricated Steel
Reclaimed Water Category 1 of 4: VALVES AND ACCESSORIES

### Air, Vacuum or Air/Vac Combination Release Valves
1. APCO  
2. ARI  
3. Crispin  
4. GA Industries  
5. Val-Matic

<table>
<thead>
<tr>
<th>Category</th>
<th>Manufacturer</th>
<th>Model(s)</th>
</tr>
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<tbody>
<tr>
<td>Air, Vacuum or Air/Vac Combination Release Valves</td>
<td>APCO</td>
<td>200</td>
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<tr>
<td>Air, Vacuum or Air/Vac Combination Release Valves</td>
<td>ARI</td>
<td>D-040 / S-050 / S-010</td>
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<tr>
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<td>Crispin</td>
<td>PL10</td>
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<tr>
<td>Air, Vacuum or Air/Vac Combination Release Valves</td>
<td>GA Industries</td>
<td>920</td>
</tr>
<tr>
<td>Air, Vacuum or Air/Vac Combination Release Valves</td>
<td>Val-Matic</td>
<td>VM-38, VM-45</td>
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</table>

### Air Release Valve Enclosure
1. Water Plus
2. CDR
3. GlasMasters

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<thead>
<tr>
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<th>Manufacturer</th>
<th>Model(s)</th>
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<tr>
<td>Air Release Valve Enclosure</td>
<td>Water Plus</td>
<td>No. 30 (131632)</td>
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<td>Water Plus</td>
<td>No. 40 (171730)</td>
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<td>Air Release Valve Enclosure</td>
<td>CDR</td>
<td>Boxes &amp; Vaults</td>
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<tr>
<td>Air Release Valve Enclosure</td>
<td>GlasMasters</td>
<td>Boxes &amp; Vaults</td>
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### Blow Off Valve
1. Hydro Guard
2. Kupferle Foundry Co.
3. Water Plus

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<thead>
<tr>
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<th>Manufacturer</th>
<th>Model(s)</th>
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<td>Hydro Guard</td>
<td>Automatic Blow Off</td>
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<tr>
<td>Blow Off Valve</td>
<td>Kupferle Foundry Co.</td>
<td>Series TF 550</td>
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<tr>
<td>Blow Off Valve</td>
<td>Water Plus</td>
<td>Series VB 2000</td>
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### Gate Valves - general (resilient seat)
AWWA C509 and C515

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<th>Category</th>
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<th>Model(s)</th>
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<tbody>
<tr>
<td>Gate Valves - general (resilient seat)</td>
<td>American Flow Control</td>
<td>C509 and C515</td>
</tr>
<tr>
<td>Gate Valves - general (resilient seat)</td>
<td>Mueller</td>
<td>C509 (only)</td>
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<td>Gate Valves - general (resilient seat)</td>
<td>Clow</td>
<td>C509 (only)</td>
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<td>Kennedy</td>
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<td>US Pipe</td>
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<tr>
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<td>American AVK</td>
<td>C509 (only)</td>
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<td>Gate Valves - general (resilient seat)</td>
<td>East Jordan Iron Works</td>
<td>C509 and C515</td>
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### Gate Valves 16" - 48" (resilient seated only w/side actuators)

<table>
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<tr>
<th>Category</th>
<th>Manufacturer</th>
<th>Model(s)</th>
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<td>Gate Valves 16&quot; - 48&quot; (resilient seated only w/side actuators)</td>
<td>American Flow Control</td>
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<td>M&amp;H</td>
<td>Series 4067</td>
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</table>
Reclaimed Water Category 2 of 4: SERVICE MATERIALS

Gate Valves 12" and Smaller (resilient seated only)
1. American Flow Control
2. American R/D
3. AVK
4. Clow
5. Kennedy
6. M&H
7. Mueller
8. US Pipe
9. Waterous

Tapping Valves (resilient seated only)
1. American Flow Control
2. AVK
3. Clow
4. Kennedy
5. M&H
6. Mueller
7. US Pipe
8. Waterous

Corporation Stops - Ball Type 1" & 2" (w/ AWWA taper CC threads only / pack joint outlet for CTS)
1. Ford
2. McDonald
3. Mueller
4. Cambridge
5. James Jones

Locking Curb Stops - Straight Valves (curb stop to be ball type, reduced port FIP x FIP 1" x 1")
1. Ford
2. McDonald
3. Mueller
4. Cambridge
5. James Jones
### Reclaimed Water Category 3 of 4: PIPE MATERIALS

**Polyethylene Tubing** - (purple w/ UV protection (SDR-9) 1" & 2" only)

<table>
<thead>
<tr>
<th>Brand</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endot</td>
<td>1. Endot trace #14 wire</td>
</tr>
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</table>

**Service Saddles** - Epoxy or nylon-coated stainless steel 18-8 type 304 straps

<table>
<thead>
<tr>
<th>Brand</th>
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<tbody>
<tr>
<td>Smith Blair</td>
<td>1. Series 393, Series 397, Series 313</td>
</tr>
<tr>
<td>Ford</td>
<td>2. Series FC202</td>
</tr>
<tr>
<td>JCM</td>
<td>3. Series 406</td>
</tr>
<tr>
<td>Mueller</td>
<td>4. DR2S, DR2SOD</td>
</tr>
<tr>
<td>Romac</td>
<td>5. Series 202NS, Series 284</td>
</tr>
<tr>
<td>Cambridge</td>
<td>6. Series 403</td>
</tr>
<tr>
<td>Cascade</td>
<td>7. CNS2</td>
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</table>

**Casing Spacers** (all sizes) Stainless steel w/ vinyl runners

<table>
<thead>
<tr>
<th>Brand</th>
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<tr>
<td>Advanced Products</td>
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<tr>
<td>Cascade</td>
<td>2. Series CCS/ CCPS/ AZ</td>
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<tr>
<td>BMW</td>
<td>3. BMW-SS</td>
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<tr>
<td>Power Seal</td>
<td>4. Model 4810</td>
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<tr>
<td>PSI</td>
<td>5. Series S-G-2</td>
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<td>PSI-Ranger</td>
<td>6. Ranger II</td>
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<tr>
<td>RACI</td>
<td>7. S/T, F/G, P/Q, M/N, E/H</td>
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**Casing End Seals**

<table>
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<tr>
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<td>1. Model AC &amp; AW</td>
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<tr>
<td>BMW</td>
<td>2. BMW wrap around end seal</td>
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<tr>
<td>Cascade</td>
<td>3. Model CCES</td>
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<td>Power Seal</td>
<td>4. Model 4810ES</td>
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<tr>
<td>PSI</td>
<td>5. Model C, S, &amp; W</td>
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</tbody>
</table>
The City of Daytona Beach Utilities Department
List of Acceptable Products

Reclaimed Water

Ductile Iron/ Cast Iron Cement Lined (class 350)
1. American
2. Clow
3. Griffin
4. McWane
5. US Pipe

PVC, DR-18, Purple Pipe
1. Freedom
2. Diamond
3. NapCo
4. JM
5. Certa-Lok

Reclaimed Water Category 4 of 4: PIPE FITTINGS

Expansion Joint
1. EBAA Iron
2. Mercer
3. Metraflex
4. Proco

Fittings - C153 SSB/C110 (cement or fusion bonded epoxy lined)
1. American
2. Assured Flow Sales
3. Griffin
4. Nappco/Sigma
5. Star
6. Union/Tyler
7. US Pipe
8. SIP Industries
1. Gradelock
7. Permafuse or cement lined
The City of Daytona Beach Utilities Department
List of Acceptable Products

**Reclaimed Water**

**FY-19/20**

**Restrained Joints - DIP**

1. American
2. EBAA Iron Inc.
3. Ford
4. Star
5. US Pipe
6. Sigma
7. Mueller
8. Romac
9. SIP Industries

1. Fast Grip Gasket
3. UFR-1400, 1300C series
4. Star Grip series 3000,
   All Grip series 3600
5. Field Loc Gasket
6. One-LOK SLD (3-36")
7. Aquagrip Restraint System
8. Grip Rings
9. EZ - Grips

**Tapping Sleeves - Mechanical joint for all taps on cast iron, ductile iron, all taps including size on size**

1. American Flow Control
2. Clow
3. Mueller
4. US Pipe
5. Smith Blair
6. JCM
7. Sigma
8. Romac
9. SIP Industries
10. Mueller

1. Series 2800
2. Series F-5205, F-5207
4. Series T-9
5. Style 622, Style 623
6. Series 412, Series 414
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<td>WASTE WATER DAILY FLOWS</td>
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<td>RESIDENTIAL SANITARY LATERAL</td>
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<td>COMMERCIAL SANITARY LATERAL</td>
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<td>S-9B</td>
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<td>MANUAL AIR VALVE</td>
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<td>PIG LAUNCH</td>
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<td>GRINDER STATION</td>
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<td>SANITARY SEWER LIFT STATION STANDARD DETAIL (SHEET 1 OF 7)</td>
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<td>SANITARY SEWER LIFT STATION CONTROL &amp; RTU DIAGRAMS (SHEET 2 OF 7)</td>
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<td>SANITARY SEWER LIFT STATION SERVICE RACK DETAIL WITH FREE STANDING PUMP CONTROL PANEL (SHEET 3 OF 7)</td>
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<td>SANITARY SEWER ACCEPTABLE PRODUCTS (PAGE 1 OF 6)</td>
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</tr>
<tr>
<td>S-24</td>
<td>SANITARY SEWER ACCEPTABLE PRODUCTS (PAGE 6 OF 6)</td>
</tr>
</tbody>
</table>
1. The city’s utilities department shall be given a minimum of 3 business days advance notice (not including holidays) prior to beginning any sanitary sewer construction.

2. A permit shall be required prior to engaging in any dewatering activities, or in activities, or in any construction activity that changes the impervious area of land. Dewatering activities include the removal of ground water from a construction site, enclosed vault, cofferdam, or trenchers, allowing construction or maintenance to be one in the dry, or any activity which changes the impervious area of land. Site specific dewatering permits shall require payment of a per acre fee based on the size of the development. General purpose permits shall require an annual fee based on a bi-annual schedule of dewatering activities discharging directly into the city’s MS4 conveyance system. Dewatering permit applications can be found at https://www.codb.us/index.aspx?nid=282. Fees are subject to Article 7, Section 7.2 of the Land Development Code and must be submitted with the permit application to City of Daytona Beach Storm Water Coordinator at 125 Basin Street, Suite 100, Daytona Beach, Florida 32114 prior to any use of MS4. Failure to comply will result in the immediate termination of access to the city’s MS4 system.

3. Upon completion, the contractor shall provide the city’s utilities department with a CCTV inspection log on DVD and a printed report for all gravity mains and laterals constructed. All work, with the exception of final grade adjustment to manholes and benches shall be completed prior to commencing the CCTV inspection. The contractor shall coordinate the CCTV inspection time with the city utility inspector prior to initiating the work. Final paving shall not commence until approval is received from the city utility inspector.

4. Sewer lateral locations shall be marked along the outside of the curb with a saw cut “V” or by a metal tab set into the pavement.

5. The contractor shall be required to pig all force mains equal to or greater than 6” in diameter and primary transmission mains located on collector and arterial roadways.

6. Launching and extraction points shall be determined by the city.

7. With respect to tie-in connections and coring operations, the city reserves the right to require connections to be performed during periods of low flow (midnight to 6:00 a.m.) in order to minimize service disruption to existing customers.

8. All work on sanitary sewer facilities owned or proposed to be owned by the city shall be performed by an underground utility contractor or general contractor licensed in the state of Florida and registered with the city.

9. Upon construction completion and acceptance of the system, it is the design engineer’s responsibility to ensure that the system is properly certified and accepted by the Florida Department of Environmental Protection and as-builts are provided to the city’s utilities department prior to any use of the system.

10. Landscape plans shall clearly depict the location of plantings relative to the location of public utilities and storm water infrastructure.

11. The city’s as-built drawing requirements are attached to the back of the utilities department’s standard details.
12. All gravity sanitary sewer mains shall be a minimum of 8” diameter. Commercial service laterals shall be green and a minimum of 6” in diameter, or larger. All single family residential service laterals shall be 6” single services with clean outs installed at property lines.

13. All gravity sanitary sewer mains shall be green PVC SDR-26, ASTM D-3034, or C-900 DR-18 minimum pressure class 150. In places where a minimum cover of 4 feet cannot be maintained or in depths of 10 feet or greater, C-900 or C-905 green PVC DR-18, minimum pressure class 150 shall be used.

14. For single family homes, single six inch sewer service laterals shall be constructed at each lot or unit and located on the downstream side of the lot center line. These services shall be extended 4 feet above ground at the property line with a PVC riser and plug easily visible from the road. Rubber seal fittings shall be used on all lines. No glued joints are permitted on laterals.

15. For multi-family and commercial sites, six inch minimum sewer services and cleanouts shall be provided as approved by the City.

16. Force mains less than 18” may use PVC C900 or C905 DR-18. Force mains 18” and larger shall be ductile iron pipe (D.I.P.), class 350, epoxy lined. All non ductile iron pipe horizontal directional drill force mains shall have a minimum working pressure of 150 PSI. The City may require a higher pressure rating depending on site conditions. Inside diameter of non D.I.P. horizontal directional drill pipe shall match the inside diameter of connecting pipes. Directional drills shall have fused MJ adapters.

17. Force main minimum depth of cover shall be 48”. All force mains shall be distinctly marked by green stripes or colored green.

18. All fittings, valves, etc., shall be ductile iron (MJ or flanged), and restrained. All force mains shall use thrust restraint as calculated by a program available at (EBAA.com).

19. All restrained pipe bell joints shall use bell restraints. Gripper type gaskets can be used for ductile iron pipe joints.

20. As a general rule, the number of joints shall be limited whenever possible, in special cases where a point repair to an 8” to 12” PVC sewer main is required, the proper rigid wrap around sleeve may be allowed by city special approval.

21. All in-line sanitary sewer force main valves shall be plug valves unless otherwise noted. Valves shall be installed at each end of the force main and on stub outs.

22. All C-900 PVC pipe requirements reference the C-900 standards. DR upgrades for burst protection may be required when using the C-900 standards.

23. Minimum gravity sanitary sewer slopes are as follows: 8” pipe 0.40%, 10” pipe 0.28%, 12” pipe 0.22%, 16” pipe 0.15%, or otherwise noted by utilities dept.

24. Gravity sanitary sewer lines shall be installed whenever possible under paved areas within public right-of-way. Utility easements shall be provided whenever publicly-owned sewer lines are constructed outside of a public right-of-way.

25. Gravity sanitary sewer line construction shall be accomplished by the use of a laser instrument unless another method is approved by the City.

26. During pipe installation dewater the ground sufficiently to keep the groundwater elevation a minimum of 6” below the pipe being installed within the area of the trench.

27. All pipes shall be installed on a firm foundation, soft or spongy bedding for pipes is not acceptable. Any unsuitable material shall be removed and replaced with a dry, compacted, granular material satisfactory to the City.

28. On all excavation and backfilling the contractor shall provide adequate sheeting and bracing in order to provide a safe working environment.

29. All trenches shall be backfilled with acceptable material and compacted to the specified minimum compaction (95% in unpaved areas and 98% in paved areas) and the optimum density based on the AASHTO T-180 modified proctor test.

30. All gaskets shall be lubricated before installation.
31. The contractor shall install a #12-gauge minimum copper tracer wire taped to the top of the pipe at intervals no greater than 4 feet. Copper wire shall have a minimum tensile strength/break load of 452 lbs. and requires approval by the City for the full length of all sewer force mains. The pipe locator tape shall be installed between 15” and 24” below finished grade or as directed by the manufacturer. Tape shall be color coded green for force mains. Locator wire shall terminate at a location and in a manner convenient for city locator staff.

32. Tracer wire shall be tested for continuity under supervision of a City representative after installation.

33. All sewer lines constructed outside of public right-of-ways within side yards, backyards, and other poorly accessible areas shall be constructed of green C-900 PVC. Absolutely no use of plastic styrene fittings shall be allowed.

34. All local collection sanitary sewer manholes shall be precast with a minimum inside diameter of 4 feet. Manholes over 6 feet deep shall have a minimum 4 ft tall precast bottom section.

35. Standard manholes shall be located at intervals not exceeding 400 feet.

36. Manhole rims shall be flush with the finish grade elevation in paved areas and a minimum of 0.5 feet and maximum of 1.0 foot above grade in unpaved areas.

37. The contractor shall construct sanitary sewer manholes in such a way that sewer lines do not intersect sealed joints between sections of the manhole.

38. Individual sanitary services shall not be connected directly into manholes and must be connected to sewer mains by use of wye connections unless otherwise approved by the City.

39. Sanitary sewer drop manholes shall only be used under special conditions as approved by the City. Drops less than 3.0’ are not allowed. Inside drops are not allowed.

40. Sanitary sewer manholes with sewer force mains discharging directly into them shall be fiberglass or polyethylene lined. Retro-fitting of manholes with liners is required when new connections are made. fiberglass shall be a minimum 1/2” thick unless approved otherwise by the City. Other lining methods and materials may be considered on a case-by-case basis. Under circumstances where hydrogen sulfide is a significant concern, manholes upstream and/or downstream of the force main tie-in may be required to have linings installed.

41. EZ-Wrap plastic, as manufactured by Press Seal Gasket Corporation, shall be used on the outside of all manhole and wetwell joints. Apply one layer of 9” wrap centered on each joint. A City inspector shall inspect all joint seals prior to backfilling operations.

42. Contractor for developments with the potential to discharge industrial or commercial waste into the sewer system shall construct and maintain at the owner’s expense a suitable control manhole or manhole downstream of any treatment, storage, or other approved works. Prior to the city’s collection system to facilitate observation, measurement, and sampling of all waste, including all domestic sewage from the establishment.

43. Control manhole or manholes shall be constructed at locations easily accessible at all times to city personnel for sampling.

44. Sanitary sewer lift stations and force mains shall be approved by the City. Lift stations shall be constructed with a minimum wet well as shown in the lift station detail.

45. It shall be the responsibility of the design engineer to prepare and submit flotation calculations to size the base of the wet well, and any manholes as deemed necessary by the City.

46. All fittings shall meet the minimum restraint requirements per ANSI/AWWA/DIPRA, and all pressure pipes under roadways shall be restrained.
SANITARY SEWER
CONSTRUCTION & DESIGN STANDARDS

TESTING REQUIREMENTS:

1. THE CONTRACTOR SHALL EMPLOY AN INDEPENDENT TESTING LABORATORY AT HIS OWN EXPENSE TO INSURE COMPACTION OF ALL FILL MATERIAL IS COMPLETED PROPERLY. TESTS SHALL BE DONE ONE FOOT ABOVE THE PIPE AND AT ONE FOOT VERTICAL INTERVALS UNTIL FINAL GRADE IS REACHED. TESTS SHALL BE COMPLETED A MINIMUM FREQUENCY OF ONE SET OF TESTS EACH 300 FOOT LENGTH OF PIPING AND ONE ADDITIONAL SET OF TESTS AT EVERY MANHOLE. IDENTIFICATION OF TEST LOCATIONS SHALL BE CLEARLY INDICATED ON TEST REPORTS. TEST RESULTS SHALL BE FORWARD PROMPTLY TO THE CITY'S DESIGNATED SITE INSPECTOR.

2. ALL TESTING REQUIRED BY THE CITY SHALL BE PAID FOR BY THE CONTRACTOR / DEVELOPER.

3. THE CITY OF DAYTONA BEACH RESERVES THE RIGHT TO REQUIRE THE DEVELOPER TO PERFORM VACUUM TESTING OF ALL SANITARY MANHOLES AND TO AIR TEST SEWER MAINS.

4. ALL PROPOSED SEWER FORCE MAINS SHALL BE FLUSHED, PRESSURE TESTED AND CLEARED FOR SERVICE IN ACCORDANCE WITH THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION REQUIREMENTS. THE CONTRACTOR SHALL NOTIFY THE CITY'S DESIGNATED SITE INSPECTOR AT LEAST 3 BUSINESS DAYS PRIOR TO BEGINNING A FULL-DIAMETER FLUSH OF THE MAINS FOR PRESSURE TESTING.

5. SANITARY SEWER FORCE MAINS SHALL BE PRESSURE TESTED TO 100 PSI FOR 2 HOURS WITH ALLOWABLE LEAKAGE BASED ON THE TABLE BELOW.

<table>
<thead>
<tr>
<th>PRESSURE (PSI)</th>
<th>AVERAGE TEST</th>
<th>NOMINAL PIPE DIAMETER - INCHES</th>
<th>PRESSURE (PSI)</th>
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</table>

ALLOWABLE LEAKAGE PER 1000 FT. OF PIPELINE * –GPH

* IF THE PIPELINE UNDER TEST CONTAINS SECTIONS OF VARIOUS DIAMETERS, THE ALLOWABLE LEAKAGE WILL BE THE SUM OF THE COMPUTED LEAKAGE FOR EACH SIZE.

L = \frac{SD \sqrt{P}}{133,200}

WHERE:

L = ALLOWABLE LEAKAGE, IN GALLONS PER HOUR

S = LENGTH OF PIPE TESTED, IN FEET

D = NOMINAL DIAMETER OF Pipe, IN INCHES

P = AVERAGE TEST PRESSURE DURING THE LEAKAGE TEST, IN POUNDS PER SQUARE INCH (GAUGE)
### Types of Establishments

<table>
<thead>
<tr>
<th>Establishment</th>
<th>Flow Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apartments</td>
<td>300 gpd</td>
</tr>
<tr>
<td>Banquet hall (per seat)</td>
<td>15 gpd</td>
</tr>
<tr>
<td>Bars and cocktail lounges</td>
<td>5 gpd</td>
</tr>
<tr>
<td>Bathroom (non-residential)</td>
<td>250 gpd</td>
</tr>
<tr>
<td>Beauty shop (per seat)</td>
<td>150 gpd</td>
</tr>
<tr>
<td>Boarding schools (students and staff)</td>
<td>50 gpd</td>
</tr>
<tr>
<td>Boarding houses</td>
<td>50 gpcd</td>
</tr>
<tr>
<td>Bowling alleys (toilet wastes only, per lane)</td>
<td>75 gpd</td>
</tr>
<tr>
<td>Country clubs, per member</td>
<td>15 gpcd</td>
</tr>
<tr>
<td>Day schools (with cafeteria, no gymnasia or showers)</td>
<td>8 gpcd</td>
</tr>
<tr>
<td>Day schools (with cafeterias, gymnasia &amp; showers)</td>
<td>20 gpcd</td>
</tr>
<tr>
<td>Day workers at office and schools</td>
<td>15 gpcd</td>
</tr>
<tr>
<td>Dentist, per wet chair</td>
<td>200 gpd</td>
</tr>
<tr>
<td>Drive-in theaters (per car space)</td>
<td>5 gpd</td>
</tr>
<tr>
<td>Factories (with showers)</td>
<td>25 gpcd</td>
</tr>
<tr>
<td>Factories (no showers)</td>
<td>10 gpd/100 sq. ft.</td>
</tr>
<tr>
<td>Funeral home</td>
<td>10 gpd/100 sq. ft.</td>
</tr>
<tr>
<td>Gas stations (no car wash)</td>
<td>400 gpd</td>
</tr>
<tr>
<td>Hospitals (with laundry) (per bed)</td>
<td>200 gpd</td>
</tr>
<tr>
<td>Hospitals (no laundry) (per bed)</td>
<td>150 gpd</td>
</tr>
<tr>
<td>Hotels and motels (per room &amp; unit)</td>
<td>100 gpd</td>
</tr>
<tr>
<td>Laundromat (per washing machine)</td>
<td>200 gpcd</td>
</tr>
<tr>
<td>Mobile home park (per trailer)</td>
<td>200 gpd</td>
</tr>
<tr>
<td>Movie theaters, auditoriums, churches (per seat)</td>
<td>3 gpd</td>
</tr>
<tr>
<td>Nursing homes</td>
<td>125 gpd/100 sq. ft.</td>
</tr>
<tr>
<td>Office buildings</td>
<td>10 gpd/100 sq. ft.</td>
</tr>
<tr>
<td>Public institutions (other than those listed herein)</td>
<td>75 gpcd</td>
</tr>
<tr>
<td>Restaurants (per seat)</td>
<td>35 gpd</td>
</tr>
<tr>
<td>Restaurants (take-out)</td>
<td>35 gpd/100 sq. ft. (350 gpd min.)</td>
</tr>
<tr>
<td>Restaurants (Fast Food) (per seat)</td>
<td>25 gpd</td>
</tr>
<tr>
<td>Single-family residence</td>
<td>300 gpd</td>
</tr>
<tr>
<td>Townhouse residence</td>
<td>300 gpd</td>
</tr>
<tr>
<td>Shopping centers</td>
<td>10 gpd/100 sq. ft.</td>
</tr>
<tr>
<td>Stadiums, frontons, ball parks, etc. (per seat)</td>
<td>3 gpd</td>
</tr>
<tr>
<td>Stores, without kitchen wastes</td>
<td>5 gpd/100 sq. ft.</td>
</tr>
<tr>
<td>Speculative buildings</td>
<td>10 gpd plus 10 gpd/100 sq. ft.</td>
</tr>
<tr>
<td>Warehouses</td>
<td>30 gpd plus 10 gpd/1,000 sq. ft.</td>
</tr>
</tbody>
</table>

*** CITY WILL CONSIDER ALTERNATE FLOW RATES FOR VARIOUS ESTABLISHMENTS IF THE EOR CAN PROVIDE SUPPORTING DOCUMENTATION.***

### SEWER DESIGN BASIS

**AVERAGE DAILY FLOW AND PEAK DESIGN FLOW**

ENGINEER TO DETERMINE AVERAGE DAILY AND PEAK DESIGN FLOW

**DESIGN CALCULATIONS**

DEVELOPER’S ENGINEER shall submit signed, sealed and dated design calculations with the PLANS for all sewer projects. Calculations shall show that sewers will have sufficient hydraulic capacity to transport all design flows.
TYPICAL RAILROAD CROSSING

NOTE TO ENGINEER: CROSSING DETAIL SHALL BE TO SCALE AND SHOW EXISTING UTILITIES, CLEARANCES, CASING LENGTH, LOCATION OF PAVED ROAD AND LIMITS OF RIGHT-OF-WAY.

CARRIER PIPE AND CASING PIPE SIZES (MIN.)

<table>
<thead>
<tr>
<th>CARRIER PIPE NOM. DIA. (D1)</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>24</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASING PIPE NOM. DIA. (D2)</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>22</td>
<td>24</td>
<td>30</td>
<td>30</td>
<td>36</td>
<td>36</td>
<td>48</td>
<td>54</td>
<td>60</td>
<td>66</td>
<td></td>
</tr>
</tbody>
</table>

WALL THICKNESS—INCHES *

NOTES:
1. MINIMUM COVER FOR TOP OF CASING TO R/R BASE SHALL BE 5.6’ (SCL) 5’ (FEC).
2. MINIMUM COVER FOR TOP OF CASING ON ALL GROUND COVER SHALL BE 3.0’.
3. ROTATION OF CARRIER PIPE INSIDE THE CASING PIPE WILL NOT BE PERMITTED, RESTRAINED MECHANICAL OR FLANGED JOINT PIPE SHALL BE USED TO HELP PREVENT SUCH ROTATION.
4. GROUTING OF SPACE BETWEEN CASING AND CARRIER PIPE NOT REQUIRED UNLESS NEGATIVE FLATOTATION EXISTS.
5. WELDING OF CASING PIPE TO BE DONE BY CERTIFIED WELDER. ALL ENDS OF CASING PIPE SHALL BE CHAMFERED PRIOR TO ANY WELDING. SEAL END OF CASING PIPE WITH NON SHRINK GROUT.
6. CITY INSPECTOR SHALL BE PRESENT THROUGHOUT ALL BORE AND JACK ACTIVITIES.
7. WITHIN THE CITY OF DAYTONA BEACH RIGHT OF WAY, USE CURRENT FOOT STANDARDS.
8. Specially designed spacers shall be used in accordance with manufacturer’s specifications. Use Cascade casing spacers or pre-approved equal.
NOTE: TO DETERMINE THE MOST CURRENT REQUIREMENTS FOR STABILIZATION MATERIAL, BASE MATERIAL, AND ASPHALT MATERIAL PATCH AND THE REPLACEMENT DIMENSIONS CONTACT CITY ENGINEER IN THE PUBLIC WORKS DEPT AT 386-671-8610.

LIMIT OF SURFACE RESTORATION

MECHANICALLY SAW EXIST. PVMT

10' MIN. (TYP)

EXIST. PVMT

EXCAVATION WIDTH

2' (TYP)

SEE NOTE 5

46" MIN. COVER

SEE NOTE 4

6" MAX. LAYERS AT 98% COMPACTION

EXIST. BASE

4" MAX. LAYERS AT 98% COMPACTION

WATER NOT ALLOWED ABOVE THIS POINT DURING CONSTRUCTION

3/4" DIA. BEDDING ROCK WHERE EXCAVATION CONDITIONS REQUIRE

UNDISTURBED SOIL

12" PIPE O.D.

TRENCH WIDTH

(w)

NOTES:

1. WHERE SOIL CONDITIONS CAN NOT BE MAINTAINED AS SHOWN ABOVE, PROVIDE APPROVED METHOD OF CONSTRUCTION.

2. SHEETING WILL BE REQUIRED AS DETERMINED IN THE FIELD.

3. COMPACTION PERCENTAGES SHOWN REFER TO A.A.S.H.T.O. T-180 PROVIDE COMPACTION TEST REPORTS TO CITY INSPECTOR.

4. MECHANICAL COMPACTION NOT ALLOWED BELOW THIS LEVEL

5. FOR PVC PIPE ONLY - INSTALL METALLIC TAPE AND UF #12 INSULATED SINGLE STRAND COPPER WIRE OVER FULL LENGTH OF PIPE.

6. THE CONTRACTOR SHALL, UNLESS OTHERWISE NOTED, RESTORE ALL STRIPING, PAVEMENT MARKINGS, DELINATORS, SIGNAGE AND TRAFFIC SIGNAL SYSTEM COMPONENTS DISTURBED DURING CONSTRUCTION ACTIVITIES. COST OF ALL WORK AND MATERIALS WILL BE CONSIDERED INCIDENTAL TO PATCH MATERIAL ITEMS.
NOTES:
1. SERVICE CONNECTION DETAILS ARE BASED ON PVC PIPE AND FITTINGS.
2. SEWER CLEANOUTS NOT IN PAVEMENT SHALL HAVE CONCRETE COLLAR 18"X18"X6" AROUND THEIR TOPS AND MUST BE INSTALLED AND ADJUSTED TO FINISHED GRADE AT THE RIGHT-OF-WAY/PROPERTY LINE
NOTES:
1. MANHOLE IS TO BE TYPE P (ALT A OR B) AND COMPLY WITH FDOT STANDARD PLANS
2. MANHOLE HEIGHT SHALL BE THREE TIMES THE OD OF THE LATERAL BUT NO LESS THAN 18".
3. WHEN VCP (CLAY) MAIN IS ENCOUNTERED UTILIZE A PVC WYE WITH TWO PVC TO VCP COUPLINGS FOR SERVICE CONNECTION
4. ALL BENCHES AND INFURTS SHALL COMPLY TO OUR STANDARDS IN SANITARY SEWER MANHOLE AND GENERAL NOTES.

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT

COMMERCIAL SANITARY LATERAL DETAIL
S-9 A
IN-LINE CLEANOUT

TERMINAL CLEANOUT

NOTE:
CONCRETE COLLAR REQUIRED IN UNPAVED AREAS
1. ON TRANSITIONS BETWEEN LARGER DIAMETER AND SMALLER SEWER COLLECTORS, INVERTS OF SEWERS SHALL BE MATCHED.
2. LAST 60' OF F.M. 12" PIPING ENTERING SEWER MANHOLE SHALL BE P.V.C. C-900 PLACED AT A NEGATIVE GRADE. 15' AND ABOVE SHALL BE P.V.C. C-800.
3. NON-PENETRATING PICK HOLES IN ALL CONCRETE SECTIONS.
4. DFT = DRY FILM THICKNESS
5. 0.1" – DROP ACROSS MANHOLE TYP. (MEASURED DIA. OF CONCRETE RING)
6. MANHOLES 8' DEEP OR GREATER SHALL HAVE A MIN. 4' HIGH WALL BASE.
7. ANY PIPE ENTERING MANHOLE MUST HAVE A RUBBER BOOT CONNECTION.
8. MORTAR TO CONTAIN "HYDRATITE", OR APPROVED EQUAL, TO PREVENT SHRINKAGE.
9. SUB-GRADE BENEATH MANHOLES SHALL BE UNDISTURBED GRANULAR UNSATURATED SOIL
   NO. 57 AGGREGATE STONE SHALL BE USED IN WET CONDITIONS AND/OR WHERE UNSUITABLE MATERIAL IS ENCOUNTERED.
10. CONTRACTOR SHALL PROVIDE THICKER MANHOLE WALLS AND BASES AS REQUIRED TO PREVENT FLOTTATION BASED ON HISTORIC HIGH GROUND WATER TABLE ELEVATIONS AS DETERMINED USING ACCEPTED ENGINEERING PRACTICES AND/OR APPROVED BY UTILITIES DEPARTMENT.
11. SHOP DRAWINGS FOR ALL STRUCTURES SHALL BE SUBMITTED TO AND APPROVED BY THE DESIGN ENGINEER PRIOR TO INSTALLATION.
12. NO IRREGULARITIES OR HONEYCOMB WILL BE ACCEPTED.
13. ENDS OF THE TOP AND BOTTOM SECTIONS OF THE MANHOLE SHALL FIT FLUSH TOGETHER.
12" RING OF CONCRETE TO BE PLACED AROUND MANHOLE FRAME PRIOR TO PAVING OF ROADWAY. FINISHED ELEVATION OF CONCRETE RING TO BE ADJUSTED TO ACCOMMODATE PROPOSED ASPHALT THICKNESS AND CROSS SLOPE.

FLOW

NO PENETRATIONS OF THE MANHOLE WALL WILL BE ALLOWED WITHIN 4' OF THE CONSTRUCTION JOINT BETWEEN THE CONE AND MANHOLE BOTTOM UNLESS PRIOR APPROVAL IS RECEIVED FROM THE CODE UTILITIES ENGINEERING DIVISION.

PUSH ON FITTING

SOIL TO BE COMPACTED TO 98 % AASHTO.

4" MIN.

POURED IN PLACE 3000 PSI CONC. FOR DROP CONNECTION M.H. ONLY

UNDISTURBED FIRM SOIL BASE

BREAKOUT TOP OF PIPE

CONC. BENCH TO COVER NO MORE THAN 50% OF PIPE DIAM.

FLOW

FORMED CHANNEL

RECONSTRUCT INVERTS AS REQ'D.

NOTE:
GENERAL NOTES ON 'SANITARY SEWER MANHOLE AND GENERAL NOTES' DETAIL APPLY HERE

1. DROPS OF MORE THAN THREE FEET SHALL REQUIRE AN OUTSIDE DROP

2. NO RISER RINGS SHALL BE USED FOR NEW CONSTRUCTION.

3. ALL CONCRETE INSIDE THE MANHOLE SHALL BE PAINTED.
NOTES:

1. FLOW CHANNELS SHALL HAVE THE SAME SLOPES AS THE SEWERS THEY ARE CONNECTED TO. (EXCEPT THAT AT CHANGES OF DIRECTION EXCEEDING 45°, THE DROP SHALL BE 0.1' MINIMUM)

2. NO STANDING WATER WILL BE ALLOWED.

3. FORM BENCH IN MANHOLE FROM MID-LINE OF 8" PIPE TO WALL OF MANHOLE, 3/4" PER FT. OF SLOPE. FOR LARGER PIPE, CONSTRUCT FROM INSIDE CROWN OF PIPE WITH 3/4" PER FT. OF SLOPE TO WALL.

4. ALL CONCRETE INSIDE THE MANHOLE SHALL BE PAINTED.
MANHOLE PIPE CONNECTION DETAIL
FOR NEW CONNECTIONS IN EXISTING MANHOLES

INSIDE WALL

PRES-PRIMED JOINT SURFACE

PRE-PRIMED JOINT SURFACES

PRE-MOLDED PLASTIC JOINT SEALER WITH PROTECTIVE WRAPPER (REMOVED)

COMPLETED JOINT WITH SQUEEZE OUT

RAM-NECK

INSIDE WALL

INSTALL EZ-WRAP PLASTIC OR EQUAL AT ALL JOINTS (9" MINIMUM WIDTH)

NOTES:
1. ALL NEW CONNECTIONS TO EXISTING SANITARY SEWER MANHOLES SHALL UTILIZE A CORING METHOD AND THE IN-FIELD INSTALLATION OF A RUBBER BOOT INTO THE MANHOLE.
2. BOOTS SHALL BE SNAPED IN PLACE AND WATER TIGHT.
NOTES:

1. UNLESS DETAILED PLANS SHOW OTHERWISE, ALL MANHOLE RING AND COVER CASTINGS IN PAVED AREAS ARE TO BE ADJUSTED TO FINAL GRADE, SEALED AND SECURED IN PLACE WITH A CONCRETE COLLAR AFTER THE ROAD BASE IS PLACED AND JUST PRIOR TO PLACEMENT OF ASPHALT WEARING SURFACE.

2. CONCRETE COLLAR AROUND MANHOLE FRAME IS REQUIRED IN PAVED AREAS ONLY.
NOTES:

1. SEE COOB’S APPROVED PRODUCT LIST FOR ACCEPTABLE MANUFACTURERS.

2. INSTALL RESTRAINED JOINTS, AS REQUIRED, FROM DEFLECTION POINT IN BOTH DIRECTIONS (20’ MIN.)

3. TRACER WIRE SHALL BE A MINIMUM 12 GAUGE WITH A TENSILE STRENGTH/BREAK LOAD OF 452 LBS.
   SEE TRACER WIRE SPECIFICATION #15049
SPECIFICATIONS

ITEM: Brass ID Anti-Theft Marker

MATERIAL: SOLID CAST BRASS/Copper and Zinc Casting

DESCRIPTION: 3" Cast Brass Disc 1/8" Thick with 1/4" Brass "Theft Proof" Anchor pin.

Top surface to be engraved with 1/4" to 3/8" Capital letters.

C.O.D.B. 6" SSGV WATER L-19

City I.D. Size Type of Valve * Type of Use Operational Instructions

PWGV Potable Water Gate Valve RWGV Reclaimed Water Gate Valve SSGV Sanitary Sewer Gate Valve SSPV Sanitary Sewer Plug Valve

To be used on all valves. Embed in surface of concrete collar.
NOTES:

1. VALVES SHALL BE CENTERED IN THE BOX
2. ROCK SHALL BE COMPACTED TO A FIRM AND UNYIELDING CONDITION
3. PIPING BETWEEN THE VALVE AND MAIN SHALL BE CONFIGURED TO BEST FIT FOR THE SITE CONDITION AS APPROVED BY THE CITY
4. TOP OF BOX ON SANITARY FORCE MAIN SHALL BE CLEARLY PERMANENTLY LABELED AS SANITARY FM.
5. TOP OF ALL BOXES SHALL BE CLEARLY AND PERMANANTLY LABELED AS TO VALVE TYPE (AIR RELEASE, VACUUM, OR AIR/VAC COMBINATION).

OFFSET AIR/VAC RELEASE VALVE

NTS
NOTES:
1. VALVES SHALL BE CENTERED IN THE BOX
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OFFSET AIR/VAC RELEASE VALVE
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5. TOP OF ALL BOXES SHALL BE CLEARLY AND PERMANANTLY LABELED AS TO VALVE TYPE (AIR RELEASE, VACUUM, OR AIR/VAC COMBINATION).
6. IF BOX IS TO BE PLACED IN ROAD OR ADJACENT TO THE ROAD USE A HEAVY TRAFFIC BOX CDR SYSTEM GROUP, BOX # B14-3636-48 OR CITY APPROVED EQUIV. RATED FOR HEAVY TRAFFIC BEARING.

OFFSET AIR/VAC RELEASE VALVE

NTS
1. Cover for reinforcing bars shall be 2".
2. All bends, unless otherwise shown, shall be a 90° degree standard hook as defined in the latest edition of ACI 318.
3. Non-shrink grout for all openings. (Ramnek or approved equal)
4. Wet well AGRU Sure Grip liner to cover all vertical surfaces, bottom of top slab AGRU option 1 only. All joint shall be sealed by means of thermal welding performed by AGRU certified welders.
5. Hatch covers must allow for unrestricted vertical removal of the pumps and valves and have flush aluminum drop handle and an automatic hold open arm with release handle. (See wet well & valve vault hatch details).
6. Furnish and install wet well assembly.
7. Wet well concrete shall be type & reinforced concrete (4,000 psi).
8. Provide SS insect screen with 1/4" openings on vent pipe.
9. Provide high water alarm float.
10. The floats and cables shall be clearly labeled.
11. Engineer shall design site plan showing easement locations, access to the lift station, power supply route, antenna location & foundation, the influent sewer location, water supply route, and effluent force main route.
12. Grinder wet wells shall be a minimum of 8 feet diameter, with 8" walls.
13. The smart control cabinet shall be NEMA 4X stainless steel.
14. The grinder control cabinet shall shall have a solid cabinet door covering the controls for protection, maintenance, and security.
15. A CAT 5 cable shall be installed going from grinder control cabinet to the master control cabinet.

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**TABLE OF CONTENTS**

1. Grinder Wet Well
2. Valve Vault
3. Control Panel
4. Generator
5. Control Panel
6. Valve Vault
7. Wet Well

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**THE CITY OF DAYTONA BEACH**

**UTILITIES DEPARTMENT**

---

**IN-LINE CHANNEL**

Sanitary Sewer

**GRINDER UNIT**

---

**S-22**

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**THIS SHEET SHOWS THE MINIMUM INFORMATION AND THE BASIC OUTLINE OF FACILITIES REQUIRED. THIS DRAWING IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. A PROFESSIONAL ENGINEER SHALL BE REQUIRED TO CERTIFY ALL DETAILS.**
SERVICE RACK DETAIL WITH FREE STANDING PUMP CONTROL PANEL

THIS SHEET SHOWS THE MINIMUM INFORMATION AND THE BASIC OUTLINE OF FACILITIES REQUIRED. THIS DRAWING IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. A PROFESSIONAL ENGINEER SHALL CERTIFY ALL DETAILS.
SERVICE RACK DETAIL WITH RACK MOUNTED PUMP CONTROL PANEL

THIS SHEET SHOWS THE MINIMUM INFORMATION AND THE BASIC OUTLINE OF FACILITIES REQUIRED. THIS DRAWING IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. A PROFESSIONAL ENGINEER SHALL CERTIFY ALL DETAILS.

THE CITY OF DAYTONA BEACH UTILITIES DEPARTMENT

THEME RACK NOTES

1. PROVIDE ELECTRICAL SERVICE THICKEN PUMP CONTAINER AND ELECTRICAL DISTRIBUTION EQUIPMENT PER CODE REQUIREMENTS.
2. ALL MOUNTED HARDWARE SHALL BE 6'0" MINIMUM FLAT-CURVED PLATE LOCATED HAND AND FACE.
3. ALL OUTLET EXCLUSIONS, EXCEPT PUMP, SHALL BE 8" MIN. 8" FLAT-CURVED FLANGE, SCHEDULE 40, 150LB.
4. THE CONTROL PANEL SHALL CONTAIN CONTROLS AND FUSE CUBES FOR THE MOUNTED PUMPS, FURNISH PLATE, BRACKET, CONN. THE APARTMENTER. THE PANEL SHALL ALSO PROVIDE 60" 15' POWER FOR THE CONTROL, MOUNTING, AND OTHER ACCESSORIES ORDERED IN THE SPEC.
5. ALL CONDUIT SHALL BE 1" PANEL, EXCEPT TOXIC CONDURIT MOUNTING REQUIRED FOR CYLINDER AND 60" 15' VOLT. GUNNA CONNECTORS SHALL BE DRY WALL CONNECTORS.
6. PANEL BOXES, CONDUIT, WIRE AND EQUIPMENT TO BE USED FOR MANUFACTURER'S RECOMMENDATIONS AND CODE REQUIREMENTS.
7. ELVIRATOR AND CONDUIT WORKER SHALL BE USED IN ACCORDANCE WITH THE NATIONAL CODE. ALL CONDUIT WORKER SHALL BE FITTED SUCTION CONDUIT GASKETS AND TAPED JUNCTION BOXES.
8. ALL CONDUIT SHALL BE 1" PANEL, EXCEPT TOXIC CONDURIT MOUNTING REQUIRED FOR CYLINDER AND 60" 15' VOLT. GUNNA CONNECTORS SHALL BE DRY WALL CONNECTORS.
9. PANEL BOXES, CONDUIT, WIRE AND EQUIPMENT TO BE USED FOR MANUFACTURER'S RECOMMENDATIONS AND CODE REQUIREMENTS.
10. ELECTRICAL CONDUIT TO BE CORDING AS PVC RIGID PLUMB AND ALUMINUM ADAPTOR Bend.
11. ALL CONDUIT AND TUBULAR ENCLOSURES SHALL BE SCHEDULE 40 PVC.
12. UNDERGROUND CONDUIT SHALL BE HANDLED A MINIMUM OF 2" BELOW PLOWED SPACE.
13. ALL CONTROL PANELS SHALL BE U.S. MARKED AND WIRING SHOWN WITH ARTICLE 23 OF THE NEC.
14. WEIGHT BALANCED DUAL DRIVE UNITיר. UNIT ON SERVICE PANELS, PANEL AS SHOWN TO TOP OF SOCKET TO BE AT 7'-5" L.T.G.
15. CONDUIT HANGS FOR ELEVATOR AND PUMP SPACE HANGS TO BE CONN. AND MARKED OF THE CARRIER ON STRUCTURAL EXISTING.
16. CONDUIT MOUNTS HANG TO BE TIGHT AND SEPARATELY CONNECTED TO STRUCTURAL EXISTING.
17. PROVIDE PUMP FROM 4" PVC DUAL DRIVE UNIT, HANG TO BE ENCLOSED PER UNLESS MARKED OF THE PUMP AND ELECTRIC.
18. CONDUIT MOUNTS HANG TO BE TIGHT AND SEPARATELY CONNECTED TO STRUCTURAL EXISTING.
19. CONDUIT MOUNTS HANG TO BE TIGHT AND SEPARATELY CONNECTED TO STRUCTURAL EXISTING.
20. CONDUIT MOUNTS HANG TO BE TIGHT AND SEPARATELY CONNECTED TO STRUCTURAL EXISTING.
21. SERVICE BOX TO BE BURIED AND MARKED.
22. ELECTRICAL TERMINAL IS MARKED PER MANUFACTURER'S SPECIFICATIONS.
23. PANEL BOXES, CONDUIT, WIRE AND EQUIPMENT TO BE USED FOR MANUFACTURER'S RECOMMENDATIONS AND CODE REQUIREMENTS.
This sheet shows the minimum information and the basic outline of facilities required. This drawing is provided for informational purposes only. A professional engineer shall certify all details.
THIS SHEET SHOWS THE MINIMUM INFORMATION AND THE BASIC OUTLINE OF FACILITIES REQUIRED. THIS DRAWING IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. A PROFESSIONAL ENGINEER SHALL CERTIFY ALL DETAILS.
7. RECESSED LOCK BOXES ARE REQUIRED

This sheet shows the minimum information and the basic outline of facilities required. This drawing is provided for informational purposes only. A professional engineer shall certify all details.

SELECTED FEATURES:
1. OPEN HORIZONTAL SPRINGS
2. SLAMLOCK
3. MILLED LETTERING
4. BITUMINOUS COATING

NOTES:
1. MATERIAL: ALUMINUM
2. FINISH: MILL
3. LOADING: DESIGNED FOR ASPHALT H20 WHEEL LOADS WITH MAX DEFL. OF 1/150 OF THE SPAN. DESIGNED FOR OCCASIONAL TRAFFIC ONLY.
4. 316 SS NUTS & BOLTS
5. AREA OF FRAME IN CONTACT WITH CONCRETE TO BE PAINTED WITH BITUMINOUS COATING
6. APPROX HATCH WT: 253.88 LBS
7. RECESSED LOCK BOXES ARE REQUIRED
7. RECESSED LOCK BOXES REQUIRED
8. 316 S.S. OPEN HORIZONTAL COMPRESSION SPRINGS REQUIRED

THIS SHEET SHOWS THE MINIMUM INFORMATION AND THE BASIC OUTLINE OF FACILITIES REQUIRED. THIS DRAWING IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. A PROFESSIONAL ENGINEER SHALL CERTIFY ALL DETAILS.
San Sewer Category 1 of 4: PIPE MATERIALS

PVC, DR-18 OR DR-18 (C 900 OR C 905), SDR-26, Green Pipe
DIP/Cast Iron Epoxy Lined (Class 350) Pipe
Casing End Seals
Casing Spacers (all sizes) Stainless Steel w/Vinyl Runners

San Sewer Category 2 of 4: VALVES AND ACCESSORIES

Gate Valves - General (resilient seat)
Gate Valves - 12" and Smaller (resilient seated only)
Gate Valves 16" - 48" (resilient seated only w/ side actuators)
Plug Valves (full flow only)
Blow Off Valves
Air Vacuum or Air/Vac Combination Release Valves
Air Release Valve Enclosures
Valve Boxes

San Sewer Category 3 of 4: PIPE FITTINGS

PVC Sewer Pipe Fittings
Expansion Joints
DIP Sewer Pipe Fittings
Restrained Joints Ductile Iron Pipe
Restrained Joints Ductile Iron Pipe
Tapping Sleeves
Restraint Kits
Rubber Couplings

San Sewer Category 4 of 4: MANHOLE ACCESSORIES

PVC Pipe Manhole Adaptors
Manhole Lids, Frames, and Rings
Flexible Manhole Connectors
Manhole Linings
Category 1 of 4: PIPE MATERIALS

**PVC, Green Pipe**
1. North American Pipe
2. Diamond
3. NapCo
4. JM Eagle
5. National

**Ductile Iron/ Cast Iron Epoxy Coated w/Protecto 401 Lining**
1. American Cast Iron Pipe
2. McWane/Clow
3. Griffin
4. US Pipe
5. Tyton

**Casing End Seals**
1. Advanced Products
2. BMW
3. Cascade
4. Power Seal
5. PSI
6. CCI
7. Model AC & AW
8. BMW wrap around end seal
9. Model CCES
10. Model 4810ES
11. Model C, S, & W
12. Model ESW

**Casing Spacers (all sizes) Stainless steel w/ vinyl runners**
1. Advanced Products
2. Cascade
3. BMW
4. Power Seal
5. PSI
6. PSI-Ranger
7. RACI
8. CCI
9. Series SS
10. Series CCS/ CCPS/ AZ
11. BMW-SS
12. Model 4810
13. Series S·G·2
14. Ranger II
15. S/T, F/G, P/Q, M/N, E/H
16. CSS-8, CSS-12

The City of Daytona Beach Utilities Department
List of Acceptable Products

Sanitary Sewer
FY 19/20

Category 1 of 4: PIPE MATERIALS
Category 2 of 4: VALVES AND ACCESSORIES

**Gate Valves - General (resilient seat)**
AWWA C509 and C515

2. Mueller 2. C509 and C515
3. Clow 3. C509 and C515
5. US Pipe 5. C509 and C515
6. American AVK 6. C509 (only)

**Gate Valves 12" and Smaller (resilient seated only)**

1. American Flow Control 1. Series 2500
3. AVK 3. Series 25
4. Clow McWane Owned 4. Series F-6100
5. Kennedy 5. Series 4571
7. Mueller 7. Series A2360
8. US Pipe 8. Metroseal 250

**Gate Valves 16" - 48" (resilient seated only w/side actuators)**

1. American Flow Control 1. Series 2500
2. Clow 2. Series F-6100
4. US Pipe 4. Series 5460
5. Kennedy 5. Series 4571
The City of Daytona Beach Utilities Department
List of Acceptable Products

Sanitary Sewer

Plug Valves (full flow only)
1. Clow
2. Dresser
3. Dezurik
4. Mueller/Pratt
5. Milliken

Blow Off Valves
1. Hydro Guard
2. Kupferle Foundry Co.
3. Water Plus

Air, Vacuum or Air/Vac Combination Release Valves (No DI or Cast Iron allowed)
1. ARI
2. H-TEC

Air Release Valve Enclosure
1. Water Plus
2. CDR
3. GlasMasters

Valve Boxes - 5 1/4"
1. U S Foundry
2. East Jordan Iron Works
3. SIP Industries

Category 3 of 4: PIPE FITTINGS

PVC Sewer Pipe Fittings
1. Multi
2. Vassallo
3. Plastic Trends
4. Harco
5. American
6. Assured Flow Sales
7. Griffin
8. Nappco/Sigma
9. Star
10. Union/Tyler
11. US Pipe
12. GPK
13. Multi Fit
Expansion Joints
1. EBAA
2. Mercer
3. Metraflex
4. Proco

DIP Sewer Fittings
1. U.S. Pipe
2. McWane
3. Tyler Union
4. Star Pipe Products
5. American
6. Sigma
7. Mueller
8. Romac
9. U.S. Pipe/McWane
10. SIP Industries
11. Tyler Union

1. Mechanical Joint - SSB or Full Body
   21 - 10
2. Fast Grip Gasket
3. UFR-1400, 1300C series
4. Star Grip series 3000,
   All Grip series 3600
5. Field Loc Gasket
6. One-LOK SLD (3-36")
7. Aquagrip Restraint System
8. Grip Rings
9. Field LOC Gaskets for Tyton Joint DIP
10. EZ - Grips
11. TufGrip series 1000, series 1500, series 3000 (for bell joint)

Tapping Sleeves - Mechanical joint for all taps on cast iron, ductile iron, all taps
including size on size

1. American Flow Control
2. Clow
3. Mueller
4. US Pipe
5. Smith Blair
6. JCM

1. Series 2800
2. Series F-5205, F-5207
4. Series T-9
5. Series 622
6. Series 412

Restraint Kits
1. Star
2. Sigma
3. JCM
4. Ford
5. SIP Industries

Rubber Couplings
1. Fernco
2. Pipeconx

1. 1056
Category 4 of 4: MANHOLE ACCESSORIES

PVC Pipe Manhole Adaptors
1. Harrington Corp. 1. PVC Sewer Adapter

Manhole Lids, Frames & Rings
3. EJ USA Inc. 1. Series 1338
4. Ladtech 4. Riser ring

Flexible Manhole Connectors
1. Kor-N-Seal

Manhole Linings
1. Hanson Pipe Co.
2. GSE Studliner
3. Amerplate T-Lock
4. Agrusafe Sure Grip

The City of Daytona Beach Utilities Department
List of Acceptable Products
# Stormwater Details

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1. ALL MATERIALS, INSTALLATION AND SEDIMENT AND EROSION CONTROL FOR SUBDIVISIONS AND SITE PLANS SHALL CONFORM TO CITY STANDARDS, FDEP STANDARDS, FDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (LATEST EDITION), AND FDOT DESIGN STANDARDS (LATEST EDITION).

2. A PERMIT SHALL BE REQUIRED PRIOR TO ENGAGING IN ANY DEWATERING OR CONSTRUCTION ACTIVITY THAT CHANGES THE IMPERVIOUS AREA OF LAND. DEWATERING ACTIVITIES INCLUDE THE REMOVAL OF GROUNDWATER FROM A CONSTRUCTION SITE, ENCLOSED VAULT, SEDIMENT TRAP, OR TRENCHES, ALLOWING CONSTRUCTION OR MAINTENANCE IN A DRY ENVIRONMENT. SITE-SPECIFIC DEWATERING PERMITS SHALL REQUIRE PAYMENT OF A PER ACRE FEE BASED ON THE SIZE OF THE DEVELOPMENT. GENERAL PURPOSE PERMITS SHALL REQUIRE AN ANNUAL FEE BASED ON A BIENNUAL SCHEDULE OF DEWATERING ACTIVITIES DISCHARGING DIRECTLY INTO THE CITY’S MS4 CONVEYANCE SYSTEM. DEWATERING PERMIT APPLICATIONS CAN BE FOUND AT HTTPS://Www.Codb.us/index.aspx?nid=262.

FEES ARE SUBJECT TO ARTICLE 7, SECTION 7.2 OF THE LAND DEVELOPMENT CODE AND MUST BE SUBMITTED WITH THE PERMIT APPLICATION TO THE CITY OF DAYTONA BEACH STORM WATER COORDINATOR AT 125 BAY STREET, SUITE 100, DAYTONA BEACH, FLORIDA 32114 PRIOR TO ANY USE OF THE CITY’S MS4 CONVEYANCE SYSTEM. FAILURE TO COMPLY WILL RESULT IN IMMEDIATE TERMINATION OF ACCESS TO THE CITY’S MS4 SYSTEM.

3. CONTRACTOR SHALL FOLLOW REQUIRED EROSION AND SEDIMENT CONTROL PRACTICES AND INCLUDE AN EROSION CONTROL PLAN FOR REVIEW AND APPROVAL BY THE CITY PRIOR TO CONSTRUCTION. ALL CONSTRUCTION ACTIVITIES SHALL CONFORM TO THE CITY’S EROSION AND SEDIMENT CONTROL NOTES.


5. ALL DEVELOPMENT PLANS SHALL BE CONSISTENT WITH THE DAYTONA BEACH LAND DEVELOPMENT CODE, ARTICLE 6 DEVELOPMENT STANDARDS, SECTION 6.15.6.18 AND ARTICLE 7 SUBDIVISION AND INFRASTRUCTURE, SECTION 7.2.

6. STORMWATER MAINS SHALL HAVE A MINIMUM DRAINAGE MAINTENANCE EASEMENT AND ACCESS WIDTH OF 20 FEET. THE EASEMENT WIDTH MAY BE INCREASED DEPENDING UPON THE SIZE AND DEPTH OF PIPE.

7. CONCRETE EROSION CONTROL BMP’S MUST BE PROVIDED WHERE WALES OR CULVERTS INTERCEPT DRAINAGE DITCHES.

8. IN GENERAL, ALL RETENTION/DETENTION SITES MUST BE CONSTRUCTED AND VEGETATED PRIOR TO ANY ROAD, PARKING LOT, OR BUILDING CONSTRUCTION OR AS CURRENT PERMIT CONDITIONS DECTATE. SEWER AND WATER MAINS MAY BE INSTALLED PRIOR TO RETENTION/DETENTION SITE CONSTRUCTION IF DEWATERING IS NOT REQUIRED. BMP’S FOR EROSION AND SEDIMENT CONTROL SHALL BE IMPLEMENTED AS NECESSARY.

9. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY AND ALL DEWATERING PERMITS REQUIRED (SEE NOTE 2).

10. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REVIEW AND MAINTAIN A COPY OF THE SJRWMD, TAPDES, AND ALL OTHER JURISDICTIONAL PERMITS AT THE CONSTRUCTION SITE AND ABIDE BY ALL CONDITIONS OF THOSE PERMITS.
11. Landscape plans shall clearly depict the design location of temporary and permanent plantings relative to the location of public utilities and stormwater infrastructure in order to evaluate potential conflicts.

12. The maximum permissible slope of any new site grading is 1:3 (vertical:horizontal). This limit applies to all areas except stormwater conveyance and treatment systems which have a maximum side slope of 1:4 (except below the water table where steeper slopes are permissible).

13. All swales and ditches shall have a maximum permitted front (side) slope not steeper than 1:4. The maximum permitted back (side) slope shall be 1:3, provided that a 5' wide berm is installed. Design centerline and top-of-bank elevations shall be noted at intervals of 100' and at significant grade changes.

14. Swales that are normally dry and intended for conveyance of stormwater runoff and are not intended for retention shall have a minimum drainage maintenance easement width measuring 15 feet. Swaled areas intended for retention shall provide appropriate easement areas for access and maintenance measured upland from the top of bank. At a minimum, the easement shall measure 10 feet in width from the top of the swale.

15. Normal roadside swales are permitted to be constructed to a maximum depth of 18" below the outside edge of pavement or concrete curb.

16. When culverts are installed to maintain the flow of existing drainage ways where newly proposed roads would otherwise sever the drainage right-of-way, culverts crossing right-of-ways shall extend from right-of-way line to right-of-way line under the roadway. Culverts shall be designed to accommodate the flow from the 100 year - 24 hour storm event without flooding adjacent property or surcharging the said roadway.

17. Wet pond depths shall be eight feet minimum to fifteen feet maximum, measured from the top of bank.

18. When a wet pond is incorporated within a subdivision and is abutted by lots, such abutting lot lines shall extend into the lake proportionately encompassing all of the lake area.

19. Wet pond inflow and outlet structures shall generally be constructed with reinforced concrete and shall be subject to the approval of the City. Skimmers for wet ponds shall be constructed such that the bottom extends 6" below the normal water level and 6" above the overflow. For dry ponds, the skimmer bottom shall be set 6" below the lowest overflow elevation and 6" above the highest point of overflow. All skimmers shall be constructed of minimum 1/4" thick aluminum or fiberglass adequately supported to prevent deflection.

20. The City may request the Developer submit a report by a qualified hydrologist or hydrogeologist on the impact the wet pond will have on neighboring water table elevations both during construction and after lake completion. The City may require groundwater monitoring during the lake excavation.

21. Adequate maintenance berms, minimum 10' in width, shall be provided around the entire perimeter of all wet ponds and associated outfalls discharging into and out of lakes. Applicable cross sections shall be included on all final development plans.
22. Development plans for all stormwater management systems shall contain pop-off data (overflow), bottom elevation, normal water levels, mean annual seasonal high water elevation, treatment volume and corresponding elevation, 100 year high water levels, and the design tailwater elevation (if applicable).

23. All storm sewers and culverts located in roadway right-of-ways and roadway easements shall be a minimum of Class III O-Ring Reinforced Concrete Pipe. Outside of roadway easements and R.O.W., pipe may be made of alternate materials including:

   A. Smooth inner wall high density
   Polyethylene (HDPE) in accordance with
   AASHTO M-294, AASHTO MP7, ASTM D3350 and
   ASTM D2412 for sizes up to 42” in diameter or

   B. PVC in accordance with the provision noted
   in the “sewer details” of these specifications.

24. All storm sewer pipe joints located in roadway right-of-ways and roadway easements shall be entirely wrapped with non-woven filter fabric with a minimum width of 24” and a minimum of 24” overlap. Gaskets are not permitted as an equivalent substitute for meeting this requirement. This practice is encouraged on private sites. Additionally, all joints shall be rubber gasketed for both round and elliptical pipe.

25. Depth of cover measured to the top of pipe (including the bell joint) shall be a minimum of 3 feet over RCP. Deviation from this requirement may be allowed by increasing the pipe’s structural strength. If an alternate material is approved, depth of cover shall meet manufacturer’s recommendation.

26. All storm drainage pipes located in roadway right-of-ways and roadway easements shall be a minimum of fifteen inch (15”) inside diameter or equivalent. Storm drainage pipes smaller than 15” are permitted on private site plans providing that maintenance shall be performed by the owner.

27. Stormwater force mains will use no. 12 insulated single strand copper wire shall be attached to all pipes and terminated at the valves in accordance with reclaim water valve and valve box detail. Tracer wire shall be tested for continuity under supervision by city representative after installation.

28. Storm inlets, manholes, and catch basins shall be FDOT compliant. Either poured in place or precast reinforced concrete structures are required at each change of pipe size or change in pipe direction. All structures shall comply with ASTM C-478 and shall have 6” thick walls. Thinner walls may be permitted providing the design is in accordance with FDOT standard plans. This requirement must be reflected on both the shop drawing and as-built plans. Structures placed in high traffic areas shall be of traffic bearing construction in accordance with FDOT standards.

29. Storm inlets shall be spaced in such a manner as to accept one hundred percent of the design storm runoff without impeding the flow of traffic. For roadway sections with design speeds of 45 MPH and less and without full width shoulders, spread resulting from a rainfall intensity of four inches per hour shall not exceed one-half of the travel lane adjacent to the gutter. For site plans, inlet spacing shall be designed to accept one hundred percent of the runoff from a rainfall intensity of four inches (4”) per hour without resulting in ponding of water around the inlet.
30. For connections between inlets with piping 15” in diameter and larger, the maximum distances between inlets and/or clean-out junction boxes shall be 300 feet. Culverts shall be sloped to maintain a minimum self-cleaning velocity of 2.5 feet per second using a Manning’s n of 0.012. Spacing for clean-outs and inlets for smaller piping shall be reduced and evaluated on a case by case basis.


32. All gaskets shall be lubricated before being installed.

33. All fittings shall meet the minimum restrained requirements per ANSI/AWWA/DIPRA, and all pressure pipes under the roadway shall be restrained.
1. Contractor is responsible for obtaining and making available onsite, all required federal, state, and local permits prior to commencement of construction. Any potential storm water discharges to the City’s permitted Municipal Separate Storm Sewer System (MS4) must be designated on the FDEP NPDES Construction Generic Permit and a copy of the Notice of Intent provided to the City of Daytona Beach Storm Water Coordinator. The contractor shall maintain compliance with all federal, state, and local permits requirements.

2. The contractor shall as a minimum, prepare and implement an erosion and sediment control plan in accordance with Florida Department of Environmental Protection (FDEP) guidelines.

3. Initial sediment and erosion control measures shall be installed and approved by the City prior to any land disturbing activities.

4. Prior to and during construction, the contractor shall implement and maintain all erosion and sediment control measures (best management practices) required to retain sediment onsite and to prevent violations of water quality standards. If a project-specific erosion and sediment control plan is approved as part of a permit, the practices must be in accordance with the approved plan. If specific site conditions require additional measures during any phase of construction or operation to prevent erosion or control of sediment, beyond those specified in the erosion and sediment control plan, the contractor shall implement additional best management practices as necessary.

5. Contractors shall minimize disturbances of existing vegetation and drainage patterns to maximum extent practicable. Stabilization measures shall be initiated for erosion and sediment control on disturbed areas as soon as practicable, but in no case more than 7 calendar days after the construction activity in that portion of the site has temporarily or permanently ceased.

6. Storm water retention, detention, storage and conveyance systems must be excavated to rough grade prior to building construction or placement of impervious surface within the area served by those systems. Adequate measures must be taken to prevent siltation of these treatment systems and control structures during construction. Siltation must be removed from the storm water system upon reaching 50% capacity and immediately prior to final grading and stabilization of the project.

7. City dewatering permits shall be obtained and approved prior to any dewatering into the City’s permitted MS4 system.
STORMWATER FORCE MAIN

CONSTRUCTION & DESIGN STANDARDS

TESTING REQUIREMENTS:

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE TRENCH COMPACTION TESTS AT POINTS 12 INCHES ABOVE THE PIPE AND AT 12-INCH VERTICAL INTERVALS TO FINISHED GRADE AT A MAXIMUM HORIZONTAL SPACING OF 300 FEET.

2. ON ALL PROJECTS OTHER THAN THOSE INITIATED BY THE CITY THE CONTRACTOR SHALL EMPLOY AN INDEPENDENT TESTING LABORATORY AT HIS OWN EXPENSE TO INSURE THAT COMPACTION OF ALL FILL MATERIAL IS COMPLETED PROPERLY. ON ALL CITY PROJECTS, THE TESTING WILL BE DONE IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. IDENTIFICATION OF TEST LOCATIONS SHALL BE CLEARLY INDICATED ON TEST REPORTS. TEST RESULTS SHALL BE FORWARDED PROMPTLY TO THE CITY'S INSPECTOR.

3. ALL STORMWATER FORCEMAINS SHALL BE FLUSHED, PRESSURE TESTED AND CLEARED FOR SERVICE IN ACCORDANCE WITH THE LATEST AWWA STANDARDS AND THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION REQUIREMENTS. THE CONTRACTOR SHALL NOTIFY THE CITY'S DESIGNATED INSPECTOR WHO SHALL COORDINATE WITH CITY PERSONNEL AT THE WATER OR WASTEWATER TREATMENT PLANT (AS APPROPRIATE), AT LEAST 2 (TWO) BUSINESS DAYS PRIOR TO BEGINNING A FULL-DIAMETER FLUSH OF THE MAINS PRIOR TO THE COMMENCEMENT OF PRESSURE TESTING (SUBJECT TO AVAILABILITY).

4. STORMWATER FORCEMAINS SHALL BE PRESSURE TESTED TO 150 PSI FOR 3 HOURS. TESTING SHALL BE IN ACCORDANCE WITH AWWA C-600 AND AWWA C-605 AS APPLICABLE, WITH ALLOWABLE LEAKAGE BASED ON THE TABLE BELOW.

| ALLOWABLE LEAKAGE PER 1000 FT. OF PIPELINE * |
|-----------------|-----------------|-----------------|
| AVERAGE PRESSURE | NOMINAL PIPE DIAMETER | INCHES | AVERAGE |
| PRESSURE | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | 36 | 42 | 48 | 54 | 60 | 64 | PSI |
| 400 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 |
| 400 | 0.42 | 0.42 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 |
| 350 | 0.35 | 0.35 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 |
| 300 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 |
| 250 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 |
| 225 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 |
| 200 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| 175 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 |
| 150 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |
| 125 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 | 0.12 |
| 100 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |

* THE PIPELINE UNDER TEST CONTAINS SECTIONS OF VARIOUS DIAMETERS, THE ALLOWABLE LEAKAGE WILL BE THE SUM OF THE COMPUTED LEAKAGE FOR EACH SIZE.

WHERE:

\[
L = \frac{SD \sqrt{P}}{133,200}
\]

- \( L \) = ALLOWABLE LEAKAGE, IN GALLONS PER HOUR
- \( S \) = LENGTH OF PIPE TESTED, IN FEET
- \( D \) = NOMINAL DIAMETER OF PIPE, IN INCHES
- \( P \) = AVERAGE TEST PRESSURE DURING THE LEAKAGE TEST, IN POUNDS PER SQUARE INCH (GAUGE)
8.13.1 Purpose

To assure consistent review of all post installation pipe inspections associated with construction projects.

8.13.2 Authority

Sections 20.23(4)(a) and 334.048, Florida Statutes (F.S.)

8.13.3 Reference

Section 430 of the FDOT Standard Specifications for Road and Bridge Construction

8.13.4 Review

The City Administrator will review all of the equipment, inspection and reporting criteria for post installation pipe inspection to ensure compliance with the Specifications, evaluate the nature and severity of any observed defects, and provide the Contractor with the Department’s perspective on pipe repairs that are necessary prior to final acceptance.

8.13.5 Preconstruction Conference

City Administrator Responsibilities

The City Administrator or their delegate shall provide a comprehensive review of the equipment, inspection and reporting criteria found in Section 430 of the FDOT Standard Specification to familiarize the Contractor with all of the requirements for post installation inspection. Discussion topics should include:

1. Providing certification statements to the Department from the Contractor doing the work that the laser profiling and measurement technology is in compliance with the calibration criteria found on the FDOT Department’s website.
(2) Discussion of all components of the pipe inspection report to be submitted to the Department.

(3) Providing the Department with a video report in the correct format and resolution.

(4) Providing the Department with video images that are clear, easy to review and correctly identified with their respective project number, structure number, pipe type and size, and any notes associated with the inspection.

(5) Ensuring that the video camera moves through all pipe runs at the speed designated in the Specifications and that all defects are documented in their entirety.

8.13.6 Report Review, Evaluation and Repair Guidance

City Administrator Responsibilities

The City Administrator or their delegate is responsible for reviewing and evaluating the laser profiling and video inspection reports as well as any proposed repair methods submitted by the Contractor. The City Administrator must ensure that each component of the pipe inspection and repair process is in compliance with the Specifications and completed before the culvert installation on a project can be accepted.

8.13.6.1 Report Review

The City Administrator is responsible for ensuring that the report submitted by the contractor meets the criteria found in Section 430 of the FDOT Standard Specifications before any defects are evaluated. If the contractor fails to submit the necessary certifications or reporting requirements, the CA is responsible for contacting the Contractor to inform them that their submittal does not meet the Specifications. The CA should be able to provide a list of deficiencies for the Contractor to review. Once any report deficiencies have been resolved, the CA can evaluate it for pipe defects.
8.13.6.2 Report Evaluation

When evaluating defects found in pipe inspection reports, the CA must consider policy previously set forth by the Department:

1. Cracking in concrete pipe: The Department relies on both ASTM C 76 and AASHTO LRFD Chp. 27 when evaluating cracks in concrete pipe. Cracks that are 0.01” or less and less than 12” in length should be recorded as an observation but are not candidates for repair unless there is evidence of active infiltration. Any crack exceeding the length and width tolerances must be evaluated by a Specialty Engineer as being acceptable or repaired.

2. Stains in pipe: Stains in concrete pipe are not considered a defect in need of repair unless the stain is associated with a crack in excess of the tolerances referenced in ASTM C 76 and AASHTO LRFD Chp. 27, active infiltration regardless of its location or size of crack, or any other defect eligible for repair. Stains in aluminized steel pipe shall be evaluated to determine the presence of damage to aluminized coating. Stains in thermoplastic pipe shall be evaluated to determine the presence of cracking.

3. Infiltration: The Specifications require that Storm, Cross and Gutter drains be water tight to 5 psi. If the Contractor has leaking pipe and states that the infiltration does not need to be repaired, he must demonstrate that the head pressure generated by the height of the water table exceeds that 5 psi requirement found in the Specification. If the water table head pressure does not exceed 5 psi at the top of the pipe than all infiltration must be repaired.

4. Joint gaps in optional pipe materials: The Specifications do not have joint gap tolerances for metal, PVC or HDPE pipes. Since there is no joint gap tolerance for these pipe types, the Contractor is not required to repair joints with gaps in them. Repair is limited to hanging gaskets, joint damage and infiltration.

5. Deflection: All optional pipe materials have a deflection tolerance of 5% or more of the certified actual mean diameter of the pipe. Any pipe with deflections greater than the 5% tolerance must be replaced or repaired at no cost to the Department. The only repair accepted by the Department at this time is to cut out the deflected sections and replace them using field joints.
8.13.6.3  Repair Guidance

The Department maintains the expectation that all culvert installations will produce defect free pipe that is installed in accordance with the Specifications. In the event that a defect is found in a pipe run, the first option of the Department would be to remove and replace at no cost. In situations where this is not practical, then consideration should be given to different repair remedies.

City Administrator Responsibilities: The City Administrator is responsible for reviewing proposed repair procedures submitted by the Contractor. Coordinate review of proposed repairs with the District Drainage Office to ensure hydraulic capacity is maintained. Proposed repair procedures should conform to the Pipe Repair Matrix as found on the FDOT Department’s website and the policy previously set forth by the Department. Specifically:

(1) Use of Grout for repair: The Department does not accept the hand application of grout for pipe repair. All proposed grout repairs must utilize pressurized injection to insure the grout completely fills the defect and any voids associated with it.

(2) Use of Cured in Place point repairs: the Department does not accept cured in place point repairs at this time due to quality assurance and maintenance concerns. All point repairs proposed by the Contractor must consist of steel, aluminum, and rubber per Section 948 of the Standard specifications.

In the event that a Contractor proposes a repair method that is not found on the Pipe Repair Matrix, it must be evaluated and accepted by the City’s Drainage Engineer prior to use.
Pipe Repair Matrix – Steel Reinforced Concrete Pipe

Problem Noted

1. Cracks
   1. Seal cracks using pressurized injection an approved chemical grout of either acrylamide base gel, acrylic base gel, urethane base gel or urethane base flow
   2. Pipe lining with materials and methods found in Section 431 of the FDOT Department’s Standards Specifications
   3. Mechanical Repair Sleeve

2. Spalling
   1. Spalling will be remediated by cleaning and removing any loose materials, if possible, and then applying a Portland cement grout or rapid setting mortar cement or grout or epoxy resin to the affected area.

3. Leaking Joints
   1. Pipe lining with materials and methods found in Section 431 of the FDOT Department’s Standards Specifications
   2. Internal Joint Seals
   3. Pressure injection of an acceptable chemical grout
   4. Concrete collars in accordance with Index 280 of the FDOT Department’s Design Standards.
   5. Mechanical Repair Sleeve

*Cracks that are 0.01 inches or greater in width and 12 inches or greater in length (ASTM C76) must be repaired or assessed by a Specialty engineer who can evaluate structural integrity, environmental conditions and the design service life of the culvert (AASHTO LRFD Chp. 27).
TYPICAL RAILROAD CROSSING

NOTE TO ENGINEER: CROSSING DETAIL SHALL BE TO SCALE
AND SHOW EXISTING UTILITIES, CLEARANCES, CASING LENGTH,
LOCATION OF PAVED ROAD AND LIMITS OF RIGHT-OF-WAY

<table>
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<tr>
<th>CARRIER PIPE AND CASING PIPE SIZES (MIN.)</th>
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<tr>
<td>CARRIER PIPE NOM. DIA. (D1)</td>
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<td>CASING PIPE NOM. DIA. (D2)</td>
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<tr>
<td>WALL THICKNESS—INCHES *</td>
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NOTES:
1. MINIMUM COVER FOR TOP OF CASING TO R/R BASE SHALL BE 5.5' (SCL). 5.0' (FEC).
   MINIMUM COVER FOR TOP OF CASING ON ALL GROUND COVER SHALL BE 3.0'.
2. ROTATION OF CARRIER PIPE INSIDE THE CASING PIPE WILL NOT BE PERMITTED. RESTRAINED MECHANICAL
   OR FLANGED JOINT PIPE SHALL BE USED TO HELP PREVENT SUCH ROTATION.
3. SHOP DRAWINGS SHALL BE SUBMITTED OF CASING & CARRIER PIPE INSTALLATION FOR APPROVAL PRIOR
   TO FABRICATION OF PIPING, CASING, AND APPURTENANCES. CERTIFICATION OF CASING PIPE IS REQUIRED.
4. GROUTING OF SPACE BETWEEN CASING AND CARRIER PIPE NOT REQUIRED UNLESS NEGATIVE FLOATATION EXISTS.
5. WELDING OF CASING PIPE TO BE DONE BY CERTIFIED WELDER. ALL ENDS OF CASING PIPE SHALL BE
   CHAMFERED PRIOR TO ANY WELDING. SEAL END OF CASING PIPE WITH NON SHRINK GROUT.
6. CITY INSPECTOR SHALL BE PRESENT THROUGHOUT ALL BORE AND JACK ACTIVITIES.
   * WITHIN THE CITY OF DAYTONA BEACH RIGHT OF WAY, USE CURRENT FOOT STANDARDS.
   ** SPECIALLY DESIGNED SPACERS SHALL BE USED IN ACCORDANCE WITH MANUFACTURER'S
   SPECIFICATIONS. USE CASCADE CASING SPACERS OR PRE-APPROVED EQUIVALENT.

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT

TYPICAL RAILROAD CROSSING
DETAIL
ST-12
**NOTES:**

1. MATERIALS, CONSTRUCTION METHODS AND MAINTENANCE SHALL BE IN ACCORDANCE WITH THE FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS AND DESIGN STANDARDS CURRENT EDITION.

2. CONTRACTOR SHALL PROVIDE SILT FENCES, TURBIDITY BARRIERS OR APPROVED BARRIERS AT ALL STORMWATER DISCHARGE POINTS FOR EROSION CONTROL AND SEDIMENT CONTROL DURING CONSTRUCTION. DEPENDING UPON FLOW VELOCITIES AND VOLUME, REDUNDANT (MULTIPLE) PARALLEL FENCES MAY BE NEEDED.

3. CONTRACTOR SHALL ROUGH GRADE STORMWATER SWALES AND RETENTION AREAS IN COMPLIANCE WITH BEST MANAGEMENT PRACTICES PRIOR TO CONSTRUCTION OF SITE IMPROVEMENTS.

4. CONTRACTOR SHALL MEET ALL PERMIT CONDITIONS AS ESTABLISHED BY THE CITY OF DAYTONA BEACH AND ALL OTHER APPLICABLE AGENCIES, INCLUDING BUT NOT LIMITED TO COUNTY, FDOT, STATE, FEDERAL, AND THE SJRWMD.
NOTE:
1. USE 18 OZ. NYLON REINFORCED PVC FABRIC FOR STANDING WATER. USE FILTER FABRIC FOR FLOWING WATER.

NOTICE:
COMPONENTS OF TYPES I AND II MAY BE SIMILAR OR IDENTICAL TO PROPRIETARY DESIGNS. ANY INFRINGEMENT ON THE PROPRIETARY RIGHTS OF THE DESIGNER SHALL BE THE SOLE RESPONSIBILITY OF THE USER. SUBSTITUTIONS FOR TYPES I AND II SHALL BE AS APPROVED BY THE CITY.
**EXFILTRATION TRENCH WITH PERFORATED PIPE**

**PERFORATED / SOLID PIPE TRANSITION**

**CLEAN COMPACT NATIVE BACKFILL MATERIAL**

**UNDISTURBED SOIL**

**TOP OF WASHED STONE EL = XX.X'**

**BOTTOM OF TRENCH EL = XX.X'**

**NOTE:**

SLotted pipe not in exfiltration trench to be wrapped with filter fabric per plans.

Specifications with a minimum 12" overlap.

**Narrow width of exfiltration trench as needed to install trench adjacent to utility poles & remaining trees. Notify utility owner a minimum of 4 working days prior to trenching adjacent to utility poles or other utilities requiring narrowing of exfiltration trench.

IF EXFILTRATION TRENCH IS TOO NARROW OR CONstrained AND IS CONSTRUCTED WITHOUT PIPE THE ENTIRE TRENCH PERIMETER WILL BE WRAPPED WITH FILTER FABRIC.

**END PERIMETER FILTER FABRIC AT BOTTOM OF PIPE**

**Washed Non-Calcareous #4 Stone**

**FOOT SPECs FOR ROAD & BRIDGE CONSTRUCTION (LATEST EDITION) DIVISION 3, SECTION 9B**

**END PERIMETER FILTER FABRIC AT BOTTOM OF PIPE**

**EL = XX.X'**

**Legend:**

ZZ = DIAMETER PIPE

XX.X = ELEVATION VALUE
FRENCH DRAIN SYSTEM

GENERAL NOTES

1. CONCRETE PIPE SHALL BE PLACED WITH THE SLOTS POSITIONED ON SIDES.
2. ALIGNMENT JOINTS ARE STANDARD (GASKETS NOT REQUIRED). RECORRUGATION OF METAL PIPE ENDS NOT REQUIRED.
3. PRIOR TO CONSTRUCTION BEGINNING THE CONTRACTOR MAY SUBMIT OTHER METHODS OF PROVIDING SLOTS HAVING EQUAL OR GREATER AREA OF OPENING, FOR APPROVAL BY THE ENGINEER AND CITY.
4. FILTER FABRIC SHALL BE SUBSURFACE DRAINAGE TYPE MEETING THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION. ALL FILTER FABRIC JOINTS SHALL LAP A MINIMUM OF ONE FOOT.
5. THE STANDARD CROSS SECTION SHALL BE CONSTRUCTED UNLESS OTHER SECTION(S) ARE DESCRIBED OR DETAILED IN THE PLANS.
6. FOR SUPPLEMENTAL DETAILS SEE FDOT STANDARD PLANS.
7. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PREVENT CONTAMINATION OF THE TRENCH WITH SAND, SILT AND FOREIGN MATERIAL.
8. THE 12" DIAMETER WEEP HOLE SHALL BE ELIMINATED, WHEN THE BOTTOM OF THE INLET IS BELOW THE NORMAL WATER TABLE, UNLESS OTHERWISE SHOWN IN THE PLANS.

DESIGN NOTES

1. PIPE INVERT SHOULD BE AT OR ABOVE THE NORMAL WATER TABLE WHENEVER POSSIBLE.
2. FRENCH DRAINS WITH MINOR DIMENSIONAL CHANGES OR OTHERWISE DIFFERENT FROM THE STANDARD CROSS-SECTION SHALL BE EITHER DESCRIBED OR DETAILED IN THE PLANS. FRENCH DRAINS WITH SIGNIFICANTLY DIFFERENT CROSS-SECTIONS SHALL BE DETAILED IN THE PLANS.
NOTE: TO DETERMINE THE MOST CURRENT REQUIREMENTS FOR STABILIZATION MATERIAL, BASE MATERIAL, AND ASPHALT MATERIAL PATCH AND THE REPLACEMENT DIMENSIONS CONTACT CITY ENGINEER IN THE PUBLIC WORKS DEPT AT 386-671-8610.

LIMIT OF SURFACE RESTORATION

MECHANICALLY SAW EXIST. PVMT

EXIST. BASE

SEE NOTE 4

6" MAX. LAYERS AT 98% COMPACTION

4" MAX. LAYERS AT 98% COMPACTION

3/4" DIA. BEDDING ROCK WHERE EXCAVATION CONDITIONS REQUIRE

12"

PIPE O.D.

TRENCH WIDTH

UNDISTURBED SOIL

NTS

NOTES:

1. WHERE SOIL CONDITIONS CAN NOT BE MAINTAINED AS SHOWN ABOVE, PROVIDE APPROVED METHOD OF CONSTRUCTION.

2. SHEETING WILL BE REQUIRED AS DETERMINED IN THE FIELD.

3. COMPACTION PERCENTAGES SHOWN REFER TO A.A.S.H.T.O. T-180. PROVIDE COMPACTION TEST REPORTS TO CITY INSPECTOR.

4. MECHANICAL COMPACTION NOT ALLOWED BELOW THIS LEVEL.

5. FOR PVC PIPE ONLY - INSTALL METALLIC TAPE AND UF #12 INSULATED SINGLE STRAND COPPER WIRE OVER FULL LENGTH OF PIPE.

6. THE CONTRACTOR SHALL, UNLESS OTHERWISE NOTED, RESTORE ALL STRIPING, PAVEMENT MARKINGS, DELINEATORS, SIGNAGE AND TRAFFIC SIGNAL SYSTEM COMPONENTS DISTURBED DURING CONSTRUCTION ACTIVITIES. COST OF ALL WORK AND MATERIALS WILL BE CONSIDERED INCIDENTAL TO PATCH MATERIAL ITEMS.

7. DEWATER TO KEEP WATER LEVEL AT A 6" MINIMUM BELOW PIPE BEING CONSTRUCTED.
NOTES:

1. MORTAR TO CONTAIN "HYDRATITE", OR APPROVED EQUAL, TO PREVENT SHRINKAGE.

2. SUB-GRADE BENEATH MANHOLES SHALL BE FIRM UNDISTURBED GRANULAR UNSATURATED SOIL.
   No. 57 AGGREGATE STONE SHALL BE USED IN WET CONDITIONS AND/OR WHERE UNSUITABLE
   MATERIAL IS ENCOUNTERED.

3. UNLESS DETAILED PLANS SHOW OTHERWISE, ALL MANHOLE RING AND COVER CASTINGS IN PAVED
   AREAS ARE TO BE ADJUSTED TO FINAL GRADE, SEALED AND SECURED IN PLACE WITH A CONCRETE
   COLLAR AFTER THE ROAD BASE IS PLACED AND JUST PRIOR TO PLACEMENT OF ASPHALT
   WEARING SURFACE.

4. CONTRACTOR SHALL PROVIDE THICKER MANHOLE WALLS AND BASES AS REQUIRED TO PREVENT
   FLOTATION BASED ON HISTORIC HIGH GROUND WATER TABLE ELEVATIONS AS DETERMINED USING
   ACCEPTED ENGINEERING PRACTICES AND/OR APPROVED BY THE UTILITIES DEPARTMENT.

5. CONCRETE COLLAR AROUND MANHOLE FRAME IS REQUIRED IN PAVED AREAS ONLY.

6. SHOP DRAWINGS FOR ALL STRUCTURES SHALL BE SUBMITTED TO AND APPROVED BY THE DESIGN
   ENGINEER PRIOR TO INSTALLATION.

7. NO BUG HOLES OR HONEYCOMB WILL BE ACCEPTED.

8. ENDS OF SECTION SHALL FIT FLUSH TOGETHER

9. MANHOLES SHALL BE CLEARED OF ALL DEBRIS PRIOR TO CITY ACCEPTANCE AND SYSTEM USE.
1/2" EXPANSION
J O I N T T Y P. I F
ADJACENT TO ANOTHER
CONCRETE STRUCTURE

BROOM FINISH

1' STRIP OF
SOD TYP.

VARIES

PLAN VIEW

TOP OF INLET TO RF 3" MIN.
6" MAX. BELOW EDGE OF PVMT.

VARIES

1' MIN.

4' OR 5'

2'

1'-4"

CUL-DE-SAC

R=1"

8"

1/4" H.T.
7-1/2"

3-#5 REINF.
RODS MIN. 2" CLR.

2" CLEARANCE

CATCH BASIN

4" THICK CONCRETE
SIDEWALK (6" THICK
DRIVEWAYS)

2-#5 REINF. RODS
MIN. 2" CLR.

#4 REBAR AT
12" ON CENTER
O N C E N T E R
BOTH WAYS

SECTION A-A

N T S

DIMENSIONS SHOWN ARE MINIMUM. FDOT STANDARD PLANS SHALL APPLY

THE CITY OF DAYTONA BEACH
ENGINEERING DIVISION

CONCRETE STORM
INLET & APRON

DETAIL
ST-21

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#4 BARS CONTINUOUS OR 12" RETURNS (SAME BELOW)

#4 BARS 6" CC TOP & BOTTOM

#4 BAR

#5 BARS WITH HOOKS 6" CC, BOTTOM

#4 BAR

#4 BAR 12" CC OR 4x4 = W4.0 x W4.0 WELDED WIRE FABRIC 40" x 20"

2 #4 BARS TOP & BOTTOM

#4 BAR (12" LEGS)

B

6"

36"

24"

6"

6"

CLOSED STIRRUPS 8" CC (THREE SIDES)

TOP VIEW

NOTE:
PROVIDE EXTRA REINFORCING EACH SIDE OF EACH OPENING AT 3" MAXIMUM SPACING EQUAL TO HALF THE AREA OF VERTICAL REINFORCEMENT REMOVED BY THE OPENING AND PROVIDE THE SAME AREA OF REINFORCEMENT ABOVE EACH OPENING AT 3" MAXIMUM SPACING AS REMOVED BY THE OPENING.

USF 5129, INLET FRAME & HOOD
USF 6176, HINGED GATE

USF 5129, INLET FRAME & HOOD

NOTE:

 vertical wall reinforcing (see fdot standard details)

horizontal wall reinforcing (see fdot standard details)

(below of riser)

section "b-b"

curb inlet top

6"

8"

3" - 6" (typ.)

6"

3" - 6"

8"

8"

BARS A

BARS B

BARS A

BARS B

6"

#4 @ 12" BW (HORIZONTAL BARS CONTINUOUS AROUND CORNERS FOR RECTANGULAR RISERS)

vertical wall reinforcing (see fdot standard details)

horizontal wall reinforcing (see fdot standard details)

(type p)

alternate b
TOP OF STRUCTURE WALLS (TYPICAL) TO BE FLUSH WITH FINISHED GRADE OF ADJACENT GROUND.

PLAN VIEW

PROFILE VIEW

RIP RAP BAGS

NOTES:

1. CONCRETE SPILLWAY TO BE 3500 P.S.I., 6" THICK (MIN).

2. PLACE SOD AT LEAST 5' IN BORDER WIDTH AROUND ALL STRUCTURE EDGES ABOVE STANDING WATER.

TOP OF CONCRETE WALLS FLUSH WITH FINISHED GRADE OF GROUND

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**Concrete (Cu. Yds.)**

**Sodding (Sq. Yds.)**

**Grate Sizes**

- Concrete slab shall be deepened to form bridge across crown of pipe. See section below.

**Dimensions permitted to allow use of 12" standard pipe lengths**

**Concrete slab thicknesses:**
- 3" Thick
- 4" Thick

**Per Foot Standard Plans Unless Otherwise Noted**

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**TOP VIEW SINGLE PIPE**

1. See Stormwater Construction Notes Details.
2. Round Pipe Sizes 10" and Greater.
3. All Filletines Must Be Made and Located.
4. All Pipe Joint Permits Must Be Approved By The Engineer.

**Slopes:**
- 1:2 for Pipes 24" x 48" and Smaller
- 1:12 for Pipes 24" x 48" and Smaller

**Construction Joints Permitted**

**Grate Spaced 14" c.c.**

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- City of Daytona Beach Engineering Division
- Mitered End Section Detail (Single Pipe) ST-24

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CROSS SECTIONAL VIEW

NOTES:
1. ESTIMATED WET SEASON WATER TABLE ELEVATION SHALL BE BASED UPON A SITE SPECIFIC GEOTECHNICAL SOIL BORING AND PROFESSIONAL ANALYSIS.
NOTES:

1. SOD IS TO BE PLACED TO FGDF OF WATER EXCEPT IN LITTORAL PLANTING AREAS.

2. A MINIMUM OF ONE FOOT OF FREEBOARD IS REQUIRED BETWEEN 100 YR-24 HR DESIGN HIGH WATER ELEVATION AND TOP OF BANK.

3. EXTEND LIMITS OF SODDING TO A MINIMUM OF TWO (2') BEYOND TOP OF BANK OR MATCH EXISTING GRADE, WHICHEVER IS GREATER.

4. PERMANENT POOL DEPTH & VOLUME SHALL MEET THE REQUIREMENTS OF THE SJRWMD.

NTS
PART 1 - GENERAL

1.1 SCOPE OF WORK

   A. This Section sets forth the requirements for preparing as-built/record drawings and documents for verification of construction and archiving.

   CONTRACTOR shall secure the services of a Florida licensed surveyor to collect data and prepare as-built/record drawings in accordance with City of Daytona Beach Utilities standards as follows:

1.2 REFERENCE:

   A. The preparation work shall be in accordance with this section and supplementary details in the City of Daytona Beach Utilities Department Standard Details, latest edition.

1.3 AS-BUILTS/RECORD DRAWINGS AND DOCUMENTS:

   In order to ensure that the project records are maintained to the highest standards and the information can easily be added to the City's electronic records the following information is required on all As-built/Record Drawings.

   A. The intent of these details for As-built/Record Drawings are required for all public facilities constructed. Prior to construction completion these as-built/record requirements will be reviewed to be certain the Contractor's surveyor has a clear understanding of what is required for completion of this work.

1. Pavement and curb widths shall be verified and dimensioned for each street at each block (for subdivisions) and as appropriate to confirm paving limits (on site plans).

2. All radii at intersections shall be verified and dimensioned. This information is to be clearly indicated on the as-built/record drawings.
3. Roadway elevation shall be recorded at all grade changes, 100' intervals along roadway, and other intervals as needed along all streets. Street centerline and curb invert elevations shall be recorded as noted. The as-built centerline profile of all streets shall also be shown on the plan and profile so it may be compared to the design profile grade lines. In the event that the as-built centerline longitudinal grade does not meet the City minimum standards, additional longitudinal grades of the adjacent curbing and similar roadway cross-section surveys to verify the correct cross slope, shall be required to verify that the system will function as originally designed.

4. Storm drainage structures shall be located and/or dimensioned from centerlines or lot lines as appropriate. Each structure shall be located by sub-meter GPS with Station & Offset, northerly & easterly, latitude, longitude, and elevation data.

5. Storm drainage pipe invert and inlet elevation shall be recorded and clearly denoted as As-built information. Design elevation shall be crossed out and as-built information written next to it.

6. Storm drainage pipe material, length, size shall be measured and/or verified. This information is to be clearly indicated as being as-built information.

7. All applicable topographic information pertinent to the on-site drainage system, such as ditches, swales, lakes, canals, etc. that are deemed necessary by the City to verify the functional performance of the storm system, shall be noted. Normally, recording elevation every 100 feet at the top of bank to toe of slope will be required. Measurements shall be taken and recorded in order to accurately tie down these features to the roadway centerlines and to plat lines. Whenever possible, contour lines shall be utilized to graphically describe these topographic features.

8. Retention areas shall have their top of bank and bottom elevations recorded. Actual measurements shall be taken and dimensions recorded of the size of all retention areas. Measurements shall be done from top of bank with side slopes indicated. Separate calculations shall be submitted to indicate required and provided retention volumes.

9. Actual materials used and elevations and dimensions of overflow weir structures and skimmers shall be noted on the as-built.

10. Storm drainage swale centerlines shall be located and elevations of flow line and top of bank shall be recorded every 100 feet. Side slopes shall also be indicated.
Section 01720
AS-BUILTS/RECORD DOCUMENTS
(CONT’D)

11. Sanitary sewer manholes shall be verified and dimensioned from street centerlines or lot lines as appropriate. Each structure shall be located by sub-meter GPS with station & offset, northerly & easterly, latitude, longitude, and elevation data. All rim and invert elevation shall be verified and recorded. This information shall be clearly indicated as being as-built information. Design elevations shall be crossed out and as-built information written next to it.

12. For subdivisions, proposed design finish floor elevations shall appear on all subdivision lots on the appropriate plan and profile sheet as well as on the master drainage plan.

13. Sanitary sewer line lengths, sizes, material, slope, etc., shall be verified and recorded, this information is to be clearly indicated as being as-built information.

14. Sewer Laterals shall be verified and recorded at the clean out locations, stationing and offset distances shall be measured from upstream manholes towards downstream manholes. Invert information at clean out shall be provided and be located by sub-meter GPS with station & offset, northerly & easterly, latitude, longitude, and elevation data.

15. Lift station and forcemain shall be verified and dimensioned from street centerlines or lot lines as appropriate. Forcemain depth and location including valves will be provided and tied to permanent above grade features. Dimensional and elevation information indicated on the approved plan shall be verified and recorded. This information shall be clearly indicated as being as-built information. Buried potable water lines and electrical service lines shall be clearly dimensioned, located and labeled. Each lift station shall be located by sub-meter GPS with station & offset, northerly & easterly, latitude, longitude and elevation data.

16. Curb cuts or metal tabs, used to mark sewer laterals, water services and water valves, shall be verified for presence and accuracy of location.

17. Potable and reclaimed water main lines shall be dimensioned off the baseline construction. Water main line material size, length and depth, placed shall be noted. Locations of valves shall also be tied to baseline construction. This information shall be clearly indicated as being as-built information.
18. Potable and reclaimed water valves, tees, bends, all services, and fire hydrants shall be located by tying them to baseline construction (Sta. & Offset). Similarly, force main valves, tees, and bends shall be located in the same manner. Stationing and offset distances shall be measured from upstream manholes to downstream manholes. All services, valves, tees, bends, and hydrants shall be located by sub-meter GPS with station & offset, northerly & easterly, latitude, longitude and elevation data.

19. For perpendicular crossings of storm water, sanitary sewer, potable water, or reclaimed water, the as-built plans shall clearly indicate which utilities are located over or under other utilities, as necessary.

20. Any special features such as, concrete flumes, lake banks, walls, fencing, etc. which are a part of the approved construction drawings should also be located and dimensioned.

21. If an approved subdivision plat or site plan shows a conservation easement, the project surveyor should provide the exact location of the specimen tree(s) from the right-of-way or property lines and proposed easement boundaries on the as-built drawing. The as-built location of these trees will help verify the sufficiency of the conservation easement prior to plat recording or certificate of occupancy.

22. When storm water, potable water, reclaimed water, or sanitary sewer improvements are located within an easement, the as-built drawing will accurately depict the location of the easement itself as well as the exact location of the improvements within the easement. This is required in order to verify that the improvements have been properly located and to ensure that future subsurface excavation to perform remedial repair can be accomplished without disturbance beyond the easement.

23. As-built drawings are to be prepared, signed and sealed by a Florida licensed surveyor. These as-built drawings shall also be signed and sealed by a Florida licensed engineer of record. Two (2) paper copy sets of as-built record drawings shall be provided, a CD with a digital copy in a compatible AutoCAD format, and PDF format.

24. Elevations shall be referenced to NAVD 1988 Data. As-built survey information shall be referenced to at least two Florida State Plane east coordinates NAD 83.
25. Benchmark Datum utilizes monumentation from the North American Vertical Datum of 1929 with elevations adjusted to NGVD 1988 data. Any NAVD 1929 monument with the limits of construction is to be protected.

1.4 SUBMITTALS

A. CONTRACTOR shall submit each month to CITY the Project Activity Summary that shows current construction activities and a copy of notices to agencies including the City regarding road closures; plus a record of events that will be needed in the future.

B. CONTRACTOR shall submit to CITY as required the proposed shut-off schedule, capping, temporary service scheduling, record of notices to customers and proposed roadway closings.

C. CONTRACTOR shall submit copies of published notices.

D. CONTRACTOR shall submit Final as-builts for each utility included in the plans. Send the two paper copies and the AutoCAD files for pre-approval. The final submittal shall include two (2) Paper Copies of Record (rolled, not folded), a CD with working AutoCAD files, and a set of PDF files (Mylars are no longer required). When the As-Builts are delivered for clearance of water lines (two paper signed and sealed copies), they will be scheduled for chlorination. CITY will not release the drinking water bacteriological laboratory report to Volusia County Health Department until the As-built information meets CITY requirements. CONTRACTOR will have 60 days from the time that the bacteriological samples are collected to submit any correction that needed to be done to the as-built and CD to CITY. If CONTRACTOR goes past the 60 days re-chlorination will be required and pay for the bacteriological laboratory report will be required. The following are minimum detail samples of how the As-built drawing information will need to be presented.
E. Here are examples of how to display and label valves, fittings, and pipes on the plans in model space. Include a location arrow going to the identified object:

Valve Example:
- **20" GATE VALVE**
  - STA. 22+23 (LT. 55.0')
  - LAT. = 29°12'53.009
  - LONG. = 81°04'03.355"W
  - N = 1,774,373.4058
  - E = 634,602.7566
  - TOP OF NUT ELEV. = 27.50
  - GROUND ELEV. = 30.50

Manhole Example:
- **Manhole No.25**
  - STA. 22+23 (LT. 55.0')
  - LAT. = 29°12'53.009
  - LONG. = 81°04'03.355"W
  - N = 1,774,373.4058
  - E = 634,602.7566
  - RIM ELEV. = 27.50
  - NORTH 15" RCP ELEV. = 8.50
  - WEST 24" CMP ELEV. = 7.50
  - BOTTOM ELEV. = 9.30

20" DIP WATER MAIN
- STA. 22+00 (RT. 55.0')
- LAT. = 29°12'50.009"N
- LONG. = 81°04'26.355"W
- N = 1,774,373.4058
- E = 634,602.7566
- TOP OF PIPE ELEV. = 27.50
- GROUND ELEV. = 30.50

(All Bench Marks used must be shown on the plans) Bench Mark Example:

BM#13
- STA. 20+33 (LT. 85.5')
- 3/4" Iron Rod with Plastic Cap...
- N = 1,774,373.4058
- E = 634,602.7566
- LAT. = 29°04'53.355"W
- LONG. = 81°04'53.355"W
- ELEV. = 32.55
PART 2 - EXECUTION

2.1 General

All drawings shall be prepared to True State Plane Coordinates. CONTRACTOR shall provide all materials, equipment, labor needed to prepare and submit accurate As-Built/Record Drawings.

A. It is acceptable to CITY if the surveyor utilizes an after the fact approach to collecting and verifying the location and depth by vertical PVC pipes placed by the CONTRACTOR as markers for this purpose. The surveyor shall verify to the accuracy defined in Florida Statues the As-built conditions and certify the Record Drawings.

B. CITY shall not be considered the best source of information for valve locations that may have been lost during final grading, the surveyor or CONTRACTOR shall excavate and properly mark all valve boxes and each valve shall have a tag or color coded to define water, sewer, or reuse water valves. The use of temporary PVC pipe markers color coded is acceptable so long as cross references are provided on the Record Drawings to prevent the tops from a water valve being placed on a sewer valve.

C. THE CONTRACTOR SHALL PROVIDE THE UTILITIES DEPARTMENT ENGINEERING DIVISION THE FINAL AS BUILT/RECORD DRAWINGS ON CD AND MYLARS. THE AS BUILT RECORD DRAWINGS SHALL BE PREPARED USING AUTOCAD FORMAT 2010 OR LATER. IN MODEL SPACE THE DRAWING SHALL BE IN FL83-EF (NAD83 FLORIDA STATE PLANES, EAST ZONE, US FOOT) STATE PLANE COORDINATES AND SHALL BE ABLE TO BE INSERTED INTO THE CITY’S OVERALL GIS SYSTEM. THE RECORD DRAWINGS SHALL ALSO BE PRINTED, SIGNED AND SEALED AS ALLOWED BY STATE OF FLORIDA REGULATIONS. A DISCLAIMER MAY BE NOTED IN A TRANSMITTAL LETTER PLUS THE SURVEYOR MAY ADD A SPECIAL NOTICE ON EACH SHEET REGARDING THE LOCATION OF THE TRUE ORIGINAL RECORD DRAWINGS OR PLACE LIMITS ON RESPONSIBILITY SHOULD SOMEONE IN THE FUTURE NEED TO MODIFY THE DRAWINGS.

D. Identify the source markers for the survey used for Record Drawings.

END OF SECTION
PART 1 - GENERAL REQUIREMENTS

1.1 SUMMARY

Furnish and install identification tape over the centerline of all buried potable water lines, wastewater force mains, gravity sewer and waste water effluent mains.

1.2 SUBMITTALS

Submit manufacture’s descriptive literature, illustrations, specifications and other pertinent data.

PART 2 - PRODUCTS

2.1 TRACER WIRE

A. All pipe (HDPE, PVC and DI) 4-inches and greater installed by open cut shall have one (1) 12-gauge minimum copper tracer wire taped to the top of the pipe at intervals no greater than 4-feet. Copper wire shall have a minimum tensile strength/break load of 452 lbs.

B. All pipe (HDPE, PVC or DI) installed by directional bore shall have two (2) 12-gauge extra high strength (EHS) carbon steel inner core reinforcement directional drilling tracer wires taped to the top of the pipe at intervals no greater than 4-feet. The wire shall have a minimum tensile strength/break load of 1,150 lbs.

C. The tracer wires shall have colored insulation matching the type of service provided in the main and be acceptable for direct burial.

D. The wire shall be tied to all valves, tees and fittings.

E. The tracer wires shall be brought up to the surface through a valve box or a 2-inch PVC pipe under direction of a City’s Representative.

F. The wires shall each be continuous throughout the project, with splices made only by methods approved by the City’s Project Representative.
G. All splices of the wires shall be made with watertight connections, utilizing direct bury splice kits as manufactured by 3M or approved equal. Bury splice kits shall be installed in accordance with manufacturer’s recommendations.

H. Tracer wire manufacturer shall be either Copperhead Industries or Proline Safety Products.

2.2 ALARMING TAPE

A. Identification Tape for Ductile Iron and Steel Pipe: Identification tape shall be metallic and manufactured of polyethylene so as to be highly resistant to alkalies, acids and other destructive agents found in soil, and shall have a minimum thickness of 5 mils with a minimum tensile strength of 22 pounds per inch and maximum adhesive factor of 40 ounces per inch. Tape width shall be 3 inches and shall have background color specified below, imprinted with black letters. Imprint shall be as specified below and shall repeat itself a minimum of once every 2 feet for entire length of tape.

B. Identification Tape for Polyvinyl Chloride Pipe: Identification tape shall be metallic and manufactured of polyethylene with minimum thickness of 4mil. The width shall be 3 inches and shall have background color specified below, imprinted with black letters. Imprint shall be as specified below and shall repeat itself a minimum of once every 2 feet for entire length of tape.

C. Tape background colors and imprints shall be as follows:

<table>
<thead>
<tr>
<th>Imprint</th>
<th>Background Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Caution Potable Water Line Buried Below”</td>
<td>Blue</td>
</tr>
<tr>
<td>“Caution Wastewater Force Main Buried Below”</td>
<td>Green</td>
</tr>
<tr>
<td>“Caution Reclaimed Water Main Buried Below”</td>
<td>Lavender</td>
</tr>
<tr>
<td>“Caution Raw Water Main Buried Below”</td>
<td>White</td>
</tr>
</tbody>
</table>

D. Identification tape shall be “Underground Detectable Warning Tape” as manufactured by Presco, can be purchased at Ferguson Supply 840 Jimmy Ann Drive, Daytona Beach (386) 274-4516 or approved equivalent.

PART 3-EXECUTION

3.1 INSTALLATION OF ALARMING TAPE

A. Alarming tape shall be installed for all buried pressure mains in accordance with the manufacturer’s installation instructions and specified herein.
B. For potable, raw, reuse water, and force mains, alarming tape shall be installed 18” below final grade.

3.2 INSTALLATION OF TRACER WIRE

A. Contractor shall perform a 12 volt DC electrical continuity test on all wires. No more than one volt of loss per 1000 feet of mainline pipe will be acceptable. A continuity test prior to final acceptance of the pipeline shall be required. Any cuts or breaks in the wire shall be repaired by the contractor at his expense.

B. The tracer wire shall be tested by Contractor and with the City’s Representative at the time of pressure testing. If the test fails, the Contractor is responsible for repairing the tracer wire

END OF SECTION