



U *DAYTONA BEACH* UTILITIES DEPARTMENT

STANDARD DETAILS



2024-2025

POTABLE WATER

REVISED JANUARY 2024

RECLAIMED WATER

SANITARY SEWER

STORMWATER

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT
125 BASIN ST., STE. 100
DAYTONA BEACH, FL 32114

THE CITY OF DAYTONA BEACH
UTILITIES DETAILS
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THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT
125 BASIN STREET, STE. 100
DAYTONA BEACH, FL 32114

UTILITIES DEPARTMENT STANDARD GENERAL NOTES

1. ALL CONSTRUCTION, DRAINAGE STRUCTURES AND OTHER SITE IMPROVEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST EDITIONS OF FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD PLANS AND SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OR THE CITY'S LAND DEVELOPMENT CODE REQUIREMENTS, STANDARD CONSTRUCTION DETAILS & STANDARD SPECIFICATIONS, WHICHEVER IS MORE STRINGENT.
2. ALL STATIONS AND OFFSETS REFER TO CENTERLINE CONSTRUCTION UNLESS OTHERWISE NOTED IN PLANS.
3. ALL UNDERGROUND UTILITIES HAVE BEEN LOCATED HORIZONTALLY AND VERTICALLY BASED ON THE BEST INFORMATION AVAILABLE AND SHOULD BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THAT CERTAIN UTILITIES MAY EXIST WHICH ARE NOT SHOWN ON THE PLANS.
4. THE CONTRACTOR SHALL NOTIFY ALL UTILITY OWNERS 2 BUSINESS DAYS PRIOR TO ANY EXCAVATION. (CALL SUNSHINE 1-800-432-4770)
PLEASE CONTACT THE COMPANIES LISTED BELOW FOR CURRENT PHONE NUMBERS

APPARENT UTILITY OWNERS:

ADVANCED CABLING SOLUTIONS, INC.
AT&T

SPECTRUM

CENTURY LINK
CITY OF DAYTONA BEACH UTILITIES (DISPATCH)
CITY OF DAYTONA BEACH PUBLIC WORKS
FLA. GAS TRANS
FPL

FPL FIBERNER LLC

LEVEL 3 COMMUNICATIONS
MCI
SPRINT
SUNESY, LLC
TECO PEOPLE GAS
TOWER, INC.
VOLUSIA COUNTY

5. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF EXISTING UTILITIES PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES AND TO DETERMINE IF OTHER UTILITIES WILL BE ENCOUNTERED DURING THE COURSE OF THE WORK AND TAKE STEPS NECESSARY TO PROVIDE FOR THEIR PROTECTION (I.E. SHEETING, DE-WATERING, ETC.). CONTRACTOR TO NOTIFY DESIGN ENGINEER OF ANY DISCREPANCIES OR CONFLICTS IMMEDIATELY.
6. IF ANY NGVD MONUMENT WITHIN THE LIMITS OF CONSTRUCTION NOTIFY:

GEODETTIC INFORMATION CENTER
ATTN: MARK MAINTENANCE SECTION
6001 EXECUTIVE BOULEVARD
ROCKVILLE, MARYLAND 20852
TELEPHONE: (301) 443-8319

7. ANY PUBLIC LAND CORNER WITHIN THE LIMITS OF CONSTRUCTION IS TO BE PROTECTED. IF A CORNER MONUMENT IS IN DANGER OF BEING DESTROYED AND HAS NOT BEEN PROPERLY REFERENCED, THE PROJECT ENGINEER SHOULD NOTIFY THE PROJECT MANAGER WITHOUT DELAY BY TELEPHONE. IT SHALL BE THE CONTRACTOR'S FULL RESPONSIBILITY TO REPLACE/RESTORE ANY PROPERTY CORNER DISTURBED BY CONSTRUCTION ACTIVITIES.
8. SIGNS SHALL BE RELOCATED IN EQUAL OR BETTER THAN PRE-CONSTRUCTION CONDITION AT THEIR EXISTING STATION ACCORDING TO F.D.O.T. ROADWAY AND TRAFFIC DESIGN STANDARDS (LATEST EDITION).
9. SIGNS SHALL BE STOCK PILED BY THE CONTRACTOR, ANY EXISTING SIGNS DAMAGED DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR AT THE CONTRACTORS COST.
10. ALL EXISTING DRAINAGE STRUCTURES AND UTILITIES WITHIN THE CONSTRUCTION LIMITS SHALL REMAIN, UNLESS OTHERWISE NOTED IN PLANS.

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11. BENCHMARK DATUM IS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD-88) AND STATE PLANE COORDINATES ARE BASED UPON NAD 83.
12. TEMPORARY DRAINAGE SHALL BE PROVIDED DURING CONSTRUCTION TO ELIMINATE ANY FLOODING OF PRIVATE PROPERTY, OR VEHICULAR TRAVEL LANES.
13. ALL STORM SEWER LINES AND INLETS SHALL BE CLEANED OF DEBRIS AND ERODED MATERIALS AS REQUIRED BY THE CITY AND STATE AT FINAL STAGES OF CONSTRUCTION AND PRIOR TO FINAL ACCEPTANCES.
14. ANY DRAINAGE PROBLEMS CREATED BY CONSTRUCTION, OR EXISTING BEFORE CONSTRUCTION AND NOT ALLEVIATED, SHOULD BE BROUGHT TO THE ATTENTION OF THE CITY PROJECT MANAGER AT THE TIME OF DISCOVERY.
15. ALL UNSUITABLE SOILS AND UNSUITABLE MATERIALS (SUCH AS CLAY, ORGANICS, ROCK, CEMENTED COQUINA, DEBRIS, ETC.) SHALL BE REMOVED, DISPOSED OF AND REPLACED WITH DRY COMPACTED GRANULAR MATERIAL SATISFACTORY TO THE CITY. THE COST OF ALL WORK AND MATERIALS IS TO BE INCLUDED IN THE UNIT PRICE OF THE ASSOCIATED CONSTRUCTION ITEMS UNLESS OTHERWISE SHOWN IN THE PLANS.
16. NO ALTERNATE PIPE OR PAVEMENT MATERIAL WILL BE ALLOWED UNLESS OTHERWISE NOTED IN PLANS AND ACCEPTED BY THE CITY PROJECT MANAGER IN WRITING.
17. ALL DELINEATED WETLAND AREAS SHALL BE STAKED AND FENCED WITH TYPE III SILT FENCING PRIOR TO CONSTRUCTION. FENCING SHALL NOT BE REMOVED UNTIL ALL CONSTRUCTION IS COMPLETED.
18. THE EROSION, SEDIMENT, AND TURBIDITY CONTROL MEASURES DELINEATED ARE THE MINIMUM REQUIRED. ADDITIONAL EROSION CONTROLS MAY BE NEEDED, DEPENDING UPON THE ACTUAL SITE CONDITIONS, JURISDICTIONAL AGENCY PERMIT REQUIREMENTS AND CONSTRUCTION OPERATIONS. ADDITIONAL CONTROL MEASURES MAYBE REQUIRED ON SITE DEPENDING UPON ANY UNFORESEEN FIELD ISSUES THAT OCCUR DURING CONSTRUCTION.
19. STAKED SILT FENCE SHALL BE UTILIZED TO CONTROL EROSION AND RELEASE OF SUSPENDED SOLIDS AND SEDIMENT. TRACKING CONTROL DEVICES SHALL BE USED TO PREVENT THE OFFSITE TRANSPORT OF SEDIMENT BY MOTORIZED VEHICLES. IF CONTROL MEASURES DO NOT PROVE SATISFACTORY, WORK SHALL CEASE UNTIL NEW MEASURES ARE ADOPTED WITH SATISFACTORY RESULTS, AS PER FDOT REQUIREMENTS.
20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS AS WELL AS THE REQUIREMENTS OF ST. JOHNS RIVER WATER MANAGEMENT DISTRICT, FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP) AND E.P.A. (NPDES), CONTRACTOR SHALL ESTABLISH BEST MANAGEMENT PRACTICES AND EROSION CONTROL METHODS PRIOR TO COMMENCING ANY SITE CLEARING OR DEMOLITION AND SHALL MAINTAIN THOSE BARRIERS UNTIL FINAL ACCEPTANCE OF THE PROJECT.
21. ALL EROSION AND SEDIMENT TRACKING CONTROL DEVICES SHALL BE INSPECTED DAILY AND IMMEDIATELY FOLLOWING A RAINFALL EVENT PER NPDES STORMWATER PERMITTING REQUIREMENTS. ANY DEFICIENCIES FOUND IN THE EROSION CONTROL MEASURES SHALL BE REPAIRED IMMEDIATELY. THE CONTRACTOR SHALL KEEP A LOG BOOK DOCUMENTING THESE DAILY INSPECTIONS, DEFICIENCIES AND REMEDIAL ACTIONS.
22. LIMITS OF SILT FENCE ARE APPROXIMATE AND ARE TO BE ADJUSTED AS NECESSARY TO MEET FIELD CONDITIONS AS DIRECTED BY THE ENGINEER.
23. DRIVEWAYS OR CITY APPROVED ALTERNATIVE ONSITE ACCESS SHALL BE MAINTAINED DURING CONSTRUCTION.
24. MAINTENANCE OF TRAFFIC WILL BE IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAY CONSTRUCTION, MAINTENANCE AND UTILITY OPERATIONS" AND "THE FDOT ROADWAY AND TRAFFIC DESIGN STANDARDS" LATEST EDITIONS.
25. ACCESS TO SIDE ROADS MUST BE PROVIDED AT ALL TIMES. TEMPORARY CONNECTIONS SHALL BE PROVIDED AT INTERSECTIONS AS DIRECTED BY THE CITY'S REPRESENTATIVE. EXISTING SIDE ROAD SIGNING IS TO REMAIN OR BE ADJUSTED AS REQUIRED DURING EACH CONSTRUCTION PHASE TO MAINTAIN CONTROL OF SIDE ROAD TRAFFIC. LOCAL RESIDENTS AND BUSINESSES WITHIN THE AREA OF CONSTRUCTION SHALL BE GIVEN REASONABLE ACCESS TO THEIR PROPERTY DURING ALL PHASES OF CONSTRUCTION.

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UTILITIES DEPARTMENT



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26. EXISTING DRIVEWAYS WITHIN THE LIMITS OF THIS PROJECT ARE TO BE REPLACED AT THE SAME LOCATION AND WIDTH WITH THE SAME TYPE OF MATERIAL, UNLESS OTHERWISE SHOWN IN THE PLANS. CONTRACTOR SHALL MAINTAIN ACCESS TO PROPERTY.
27. MAINTENANCE OF TRAFFIC: THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING VEHICULAR AND PEDESTRIAN TRAFFIC SAFELY THROUGH THE WORK ZONE AT ALL TIMES. FDOT STANDARD INDEX 102 SERIES SHALL BE APPLIED AS A MINIMUM STANDARD. ANY SIDEWALK, LANE OR ROAD CLOSURE REQUIRES REVIEW AND APPROVAL IN ADVANCE AND A SEVEN (7) DAY MINIMUM NOTICE TO CITY OF DAYTONA BEACH TRAFFIC OPERATIONS AND CITY OF DAYTONA BEACH'S INFORMATION OFFICER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING APPROVAL FROM THE CITY OF DAYTONA BEACH PUBLIC WORKS DEPARTMENT FOR AN APPROVED MAINTENANCE OF TRAFFIC PLAN.
28. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING THE NDPES STORMWATER PERMIT 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITIES PER FDEP REQUIREMENTS.
29. THE CONTRACTOR SHALL PROVIDE A DETAILED DEWATERING PLAN FOR REVIEW AND APPROVAL PRIOR TO WORK COMMENCING ALONG THE FORCE MAIN ROUTE.
30. THE CONTRACTOR SHALL REPLACE ALL DISTURBED AREAS IN KIND AND INSTALL SOD (SEED & MULCH) PER THE CITY DETAIL, SEE THE CONSTRUCTION DETAILS IN THIS SET FOR THE SPECIFIC SODDING OR SEED & MULCH CITY DETAIL.
31. THE CONTRACTOR WILL CALL IN UTILITY LOCATES PRIOR TO ANY COMMENCEMENT OF CONSTRUCTION ACTIVITIES. IF THERE ARE ANY CONFLICTS WITH THE PROPOSED PROJECT, THE CONTRACTOR SHALL REACH OUT AND INFORM THE CITY OF THESE CONFLICTS.
32. CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL REQUIRED PERMITS, THE CONTRACTOR SHALL MAINTAIN COPIES OF ALL RELEVANT PERMITS AND CONSTRUCTION DOCUMENTS AVAILABLE ON THE JOB SITE AT ALL TIMES.
33. CONTRACTOR TO MAINTAIN THE SITE IN A SAFE AND SECURE MANNER TO PROTECT PUBLIC SAFETY AND THE CONDITIONS OF THE IMPROVEMENTS.
34. THE CONTRACTOR SHALL MAINTAIN, AT THE JOB SITE, A RECORD COPY OF ALL CONSTRUCTION DRAWINGS AND SPECIFICATIONS ON WHICH ALL FIELD CHANGES ARE TO BE SHOWN. THESE CHANGES ARE TO BE INCORPORATED IN THE "AS-BUILT" SURVEY FURNISHED TO THE ENGINEER.
35. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE AN "AS-BUILT" SURVEY. THE SURVEY SHALL BE PREPARED IN ACCORDANCE WITH APPROPRIATE GOVERNMENTAL REGULATIONS, BE PREPARED ON THE DESIGN/PERMITTED PLANS. ELECTRONIC AUTOCAD AND PDF COPIES OF THE AS-BUILT SURVEY SHALL BE PROVIDED TO THE ENGINEER OF RECORD. THE "AS-BUILT" SHALL BE SIGNED AND SEALED BY A FLORIDA REGISTERED PROFESSIONAL LAND SURVEYOR.
36. WHEN SHUT DOWN OF UTILITY SERVICE IS REQUIRED AND CANNOT BE AVOIDED, THE DURATION OF SHUT DOWN SHALL BE MINIMIZED AND COORDINATED WITH THE PROPERTY OWNER/RESIDENT AND COMMUNICATED TO THE CITY AT LEAST TWO (2) WEEKS IN ADVANCE.
37. CONTRACTOR SHALL PROVIDE A SECURE STORAGE AREA FOR ALL MATERIALS DURING CONSTRUCTION/DRILLING.
38. SITE RESTORATION AND CLEAN UP SHALL BE ACCOMPLISHED BY THE CONTRACTOR IN ACCORDANCE WITH CITY STANDARDS.



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POTABLE WATER CONSTRUCTION & DESIGN STANDARDS

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 GROUND WATER FROM A CONSTRUCTION SITE, ENCLOSED VAULT, COFFERDAM, 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 BIENNIAL 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 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 ENDTRACE POLY-TUBE OR APPROVED EQUAL COILED AND CAPPED WITH AN ELSTER HYDROSERT 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 (TAPS ON MONDAY – THURSDAY ONLY).
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.

**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**POTABLE WATER
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POTABLE WATER CONSTRUCTION & DESIGN STANDARDS (CONT')

14. WHERE POTABLE WATER AND SANITARY SEWER MAINS CROSS WITH LESS THAN SIX (6) INCHES OF VERTICAL CLEARANCE OR WHERE THE SEWER MAIN IS ABOVE THE WATER MAIN, MEDIATION MUST BE REVIEWED AND APPROVED BY FDEP.
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. 3 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.
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. THE CITY "PROHIBITS THE USE OF PIPE DOPE" TO BE USED WITH THE CONSTRUCTION OF THREADED CONNECTIONS TO THE WATERMAINS AND LINES.
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 160 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. THE RESTRAINED JOINT LENGTHS SHALL BE SHOWN ON PLANS PROVIDED BY EOR.
22. ALL FITTINGS, VALVES, ETC. SHALL BE DUCTILE IRON CEMENT LINED (MJ OR FLANGED) AND SHALL BE RESTRAINED. THE CITY PROHIBITS THE USE OF CROSS FITTINGS.
23. ALL RESTRAINED PIPE BELL JOINTS SHALL USE BELL RESTRAINTS OR GRIPPER TYPE GASKETS CAN BE USED FOR DUCTILE IRON PIPE JOINTS. CONCRETE THRUST BLOCKS ARE NOT PERMITTED.
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. (NOT APPLICABLE TO FIRE HYDRANTS.
26. ALL FITTINGS SHALL MEET MINIMUM RESTRAINT REQUIREMENTS PER ANSI/AWWA AND ABAA TO ALL PRESSURE PIPES UNDER THE ROADWAYS SHALL BE RESTRAINED.
27. METER LENGTHS 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'. THE DEPTHS OF THE WATER LINES FOR 3/4" TO 8" METERS IS 3' OF COVER, AND 10" AND LARGER METERS IS 4' OF COVER.

THE CITY OF DAYTONA BEACH
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POTABLE WATER
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**POTABLE WATER CONSTRUCTION & DESIGN STANDARDS
(CONT')**

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 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. REUSE WATER MAY ONLY BE USED FOR PIGGING OF LINES 14" OR LARGER AT THE CITY'S DIRECTION AND BE DIRECTLY DISCHARGED TO A SANITARY CONNECTION, APPROVED BY THE CITY.
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:
 - A) POTABLE WATER SERVICE-REDUCED PRESSURE ZONE (RPZ)(BFP)
 - B) FIRE LINE SERVICING A FIRE SPRINKLER SYSTEM AND/OR PRIVATE FIRE HYDRANT-DOUBLE CHECK VALVE ASSEMBLY
 - C) FIRE LINE-DOUBLE CHECK VALVE ASSEMBLY
37. IN CASES WHERE A WATER LINE SERVES BOTH DOMESTIC AND FIRE SERVICES, A REDUCED PRESSURE ZONE BFP IS REQUIRED.
38. ALL JACK & BORES REQUIRED FOR COMMERCIAL DEVELOPMENT SHALL BE PERFORMED AT THE SOLE COST OF THE OWNER\DEVELOPER.
39. ALL C-900 DR-18 PVC PIPE REQUIREMENTS REFERENCE TO THE C-900 STANDARDS.
40. CHLORINATED WATER MUST BE DECHLORINATED PRIOR TO DISCHARGE INTO ANY JURISDICTIONAL WETLAND OR WATER BODY PER AWWA STANDARD, ANSI/AWWA C655.

**THE CITY OF DAYTONA BEACH
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**POTABLE WATER
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POTABLE WATER 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. TEST RESULTS ARE TO BE PROVIDED TO THE CITY ON ALL PUBLIC UTILITIES.
2. ON ALL PROJECTS OTHER THAN THOSE INITIATED BY THE CITY THE CONTRACTOR SHALL EMPLOY AN INDEPENDENT TESTING LABORATORY AT THEIR 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 POTABLE WATER MAINS SHALL BE FLUSHED, DISINFECTED, PRESSURE TESTED AND BACTERIOLOGICALLY 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, UNTHREADED 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. WATER MAINS SHALL BE PRESSURE TESTED AT 150 PSI FOR 2 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.

ALLOWABLE LEAKAGE PER 1000 FT. OF PIPELINE * -GPH

AVERAGE PRESSURE TEST (PSI)	NOMINAL PIPE DIAMETER - INCHES																AVERAGE TEST PRESSURE (PSI)		
	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48	54		60	64
450	0.48	0.64	0.95	1.27	1.59	1.91	2.23	2.55	2.87	3.18	3.82	4.78	5.73	6.69	7.64	8.60	9.56	10.19	450
400	0.45	0.60	0.90	1.20	1.50	1.80	2.10	2.40	2.70	3.00	3.60	4.50	5.41	6.31	7.21	8.11	9.01	9.61	400
350	0.42	0.56	0.84	1.12	1.40	1.69	1.97	2.25	2.53	2.81	3.37	4.21	5.06	5.90	6.74	7.58	8.43	8.99	350
300	0.39	0.52	0.78	1.04	1.30	1.56	1.82	2.08	2.34	2.60	3.12	3.90	4.68	5.46	6.24	7.02	7.80	8.32	300
275	0.37	0.50	0.75	1.00	1.24	1.49	1.74	1.99	2.24	2.49	2.99	3.73	4.48	5.23	5.98	6.72	7.47	7.97	275
250	0.36	0.47	0.71	0.95	1.19	1.42	1.66	1.90	2.14	2.37	2.85	3.56	4.27	4.99	5.70	6.41	7.12	7.60	250
225	0.34	0.45	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.25	2.70	3.38	4.05	4.73	5.41	6.03	6.76	7.21	225
200	0.32	0.43	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.12	2.55	3.19	3.82	4.46	5.09	5.73	6.37	6.80	200
175	0.30	0.40	0.59	0.80	0.99	1.19	1.39	1.59	1.79	1.98	2.38	2.98	3.58	4.17	4.77	5.36	5.96	6.36	175
150	0.28	0.37	0.55	0.74	0.92	1.10	1.29	1.47	1.66	1.84	2.21	2.76	3.31	3.86	4.41	4.97	5.52	5.88	150
125	0.25	0.34	0.50	0.67	0.84	1.01	1.18	1.34	1.51	1.68	2.01	2.52	3.02	3.53	4.03	4.53	5.04	5.37	125
100	0.23	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.80	2.25	2.70	3.15	3.60	4.05	4.50	4.80	100

* 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:

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

- 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)

**THE CITY OF DAYTONA BEACH
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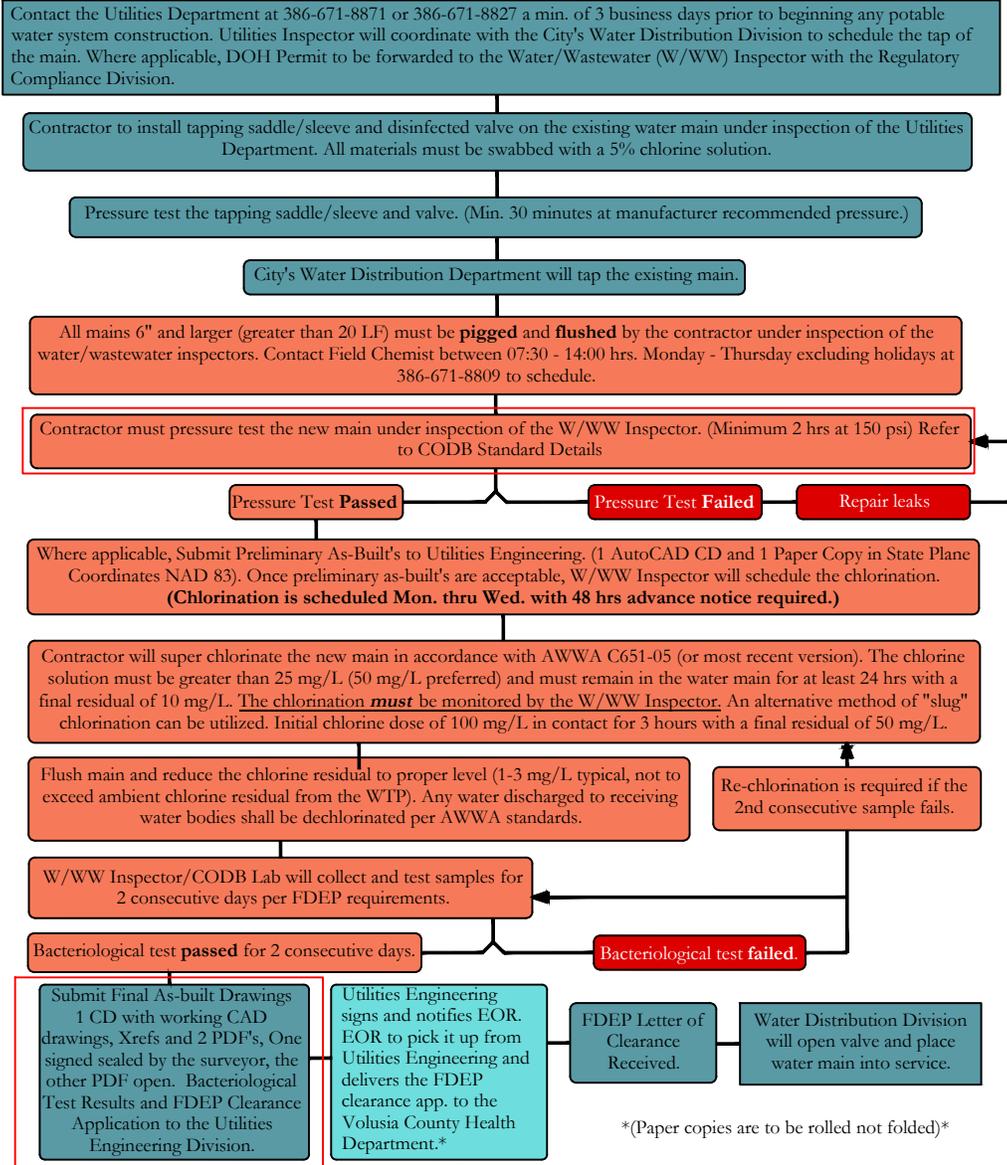


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GUIDELINES FOR THE ACCEPTANCE OF NEW WATER MAINS FROM CONTRACTORS



*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.

**THE CITY OF DAYTONA BEACH
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**GUIDELINES FOR THE
ACCEPTANCE OF NEW
WATER MAINS FROM
CONTRACTORS
W-5**

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WATER—TABLE OF DAILY FLOWS FOR VARIOUS OCCUPANCIES

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

*** 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.

REUSE WATER DEMAND:

DESIGN REUSE WATER DEMAND SHALL BE BASED ON A MINIMUM AVERAGE WEEKLY RATE OF 1- INCH OF IRRIGATION PER SQUARE FOOT OF IRRIGABLE AREA...

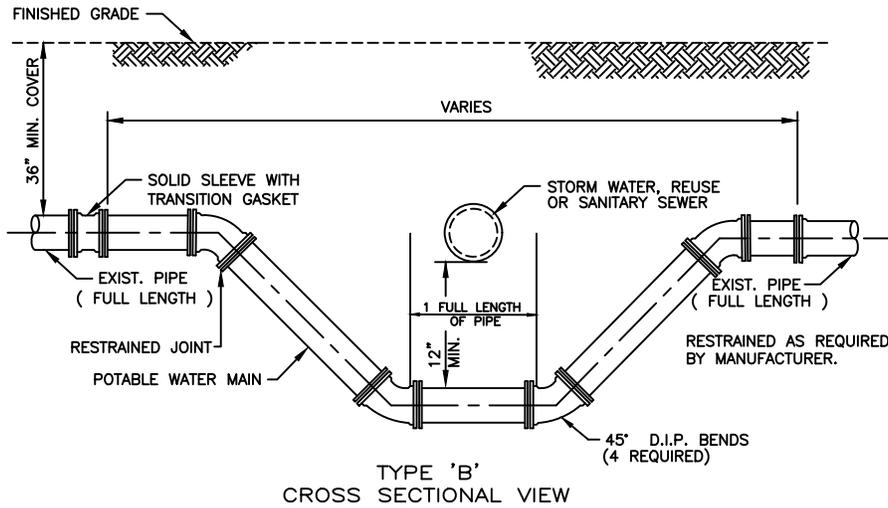
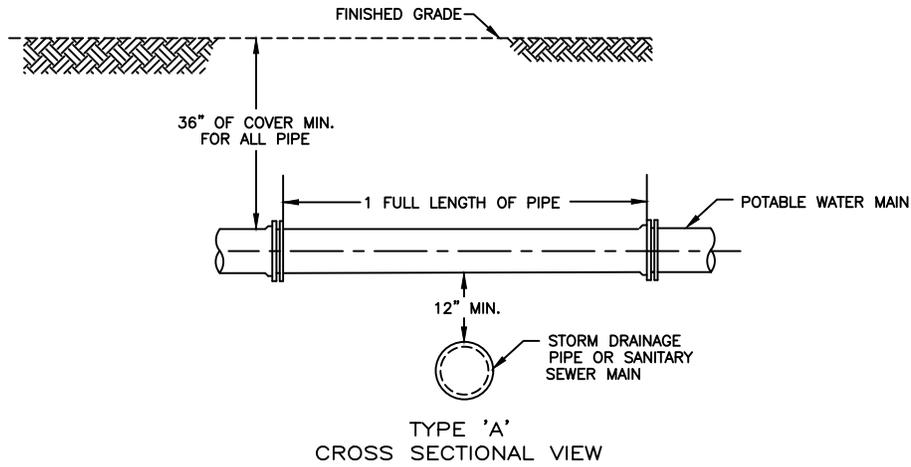
**THE CITY OF DAYTONA BEACH
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**TABLE OF DAILY
FLOWS FOR VARIOUS
OCCUPANCIES
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TYPICAL PIPE CROSSING DETAIL



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 BY DEFLECTION METHOD MAY BE ACCEPTABLE IF EXISTING FIELD CONDITIONS PERMIT AND APPROVAL IS RECEIVED FROM CODB.
4. LENGTH OF SECTION BASED ON MINIMUM LENGTH AS DETERMINED BY EBAA RESTRAINED JOINT TABLE.
5. INSTALL RESTRAINED JOINTS, AS REQUIRED, FROM DEFLECTION POINT IN BOTH DIRECTIONS (20' MIN.).
6. ALL FITTINGS SHALL BE D.I.P. CEMENT LINED.

**THE CITY OF DAYTONA BEACH
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**TYPICAL PIPE
CROSSING DETAIL
W-7**

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WATER MAIN SEPARATION CHART

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

Other Pipe	Horizontal Separation	Crossings (1)	Joint Spacing @ Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)	<p style="text-align: center;">Water Main 3 ft. minimum</p>	<p style="text-align: center;">Water Main 12 inches is the minimum, except for storm sewer, then 6 inches is the minimum and 12 inches is preferred</p>	<p style="text-align: center;">Alternate 3 ft. minimum</p>
Vacuum Sanitary Sewer	<p style="text-align: center;">Water Main 10 ft. preferred 3 ft. minimum</p>	<p style="text-align: center;">Water Main 12 inches is preferred 6 inches minimum</p>	<p style="text-align: center;">Alternate 3ft. minimum</p>
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)	<p style="text-align: center;">Water Main 10 ft. preferred 6 ft. minimum (3)</p>	<p style="text-align: center;">12 inches is the minimum, except for gravity sewer, then 6 inches is the minimum and 12 inches is preferred</p>	<p style="text-align: center;">Alternate 6 ft. minimum</p>
On-Site Sewage Treatment & Disposal System	<p style="text-align: center;">10 ft. minimum</p>	<p style="text-align: center;">---</p>	<p style="text-align: center;">---</p>

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

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

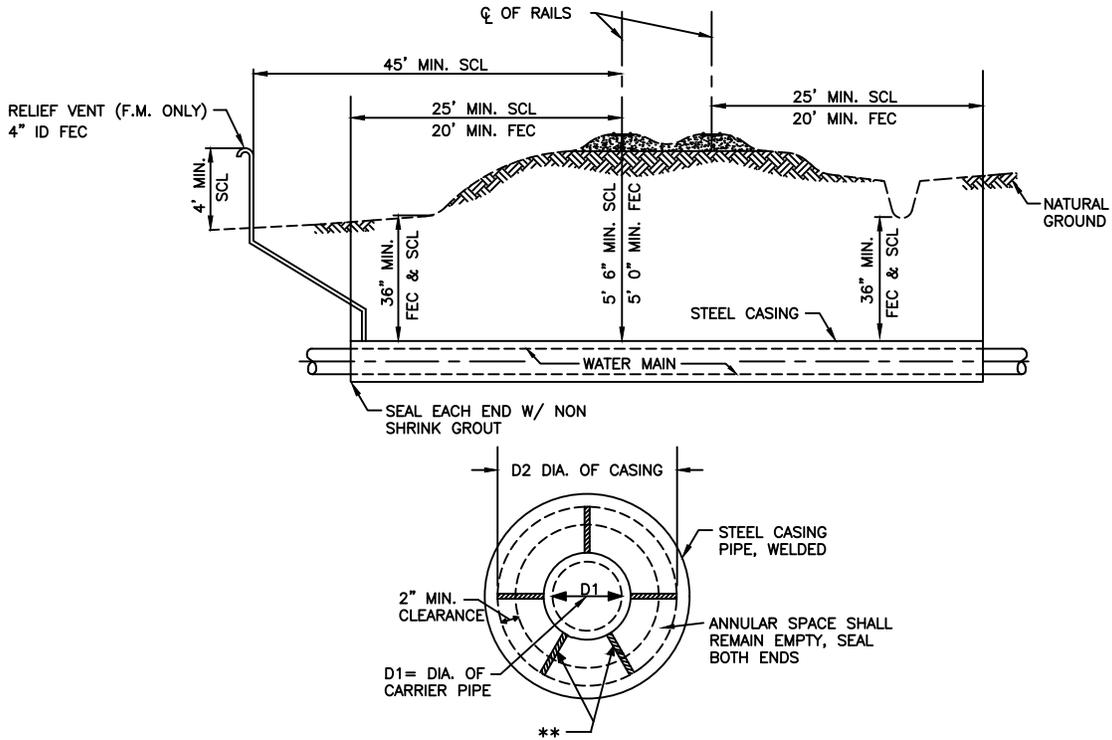
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**WATER MAIN
SEPARATION CHART
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TYPICAL RAILROAD CROSSING DETAIL



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.)														
CARRIER PIPE NOM. DIA. (D1)	4	6	8	10	12	14	16	18	20	24	30	36	42	48
CASING PIPE NOM. DIA. (D2)	14	16	18	22	24	30	30	30	36	36	48	54	60	66
WALL THICKNESS-INCHES *	PER AUTHORITY HAVING JURISDICTION													

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 APPURTENANCES. CERTIFICATION OF CASING PIPE IS REQUIRED.
 4. GROUTING OF SPACE BETWEEN CASING AND CARRIER PIPE NOT REQUIRED UNLESS NEGATIVE FLOTATION 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 FDOT STANDARDS.
- ** SPECIALLY DESIGNED SPACERS SHALL BE USED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. USE CASCADE CASING SPACERS OR PRE-APPROVED EQUAL.

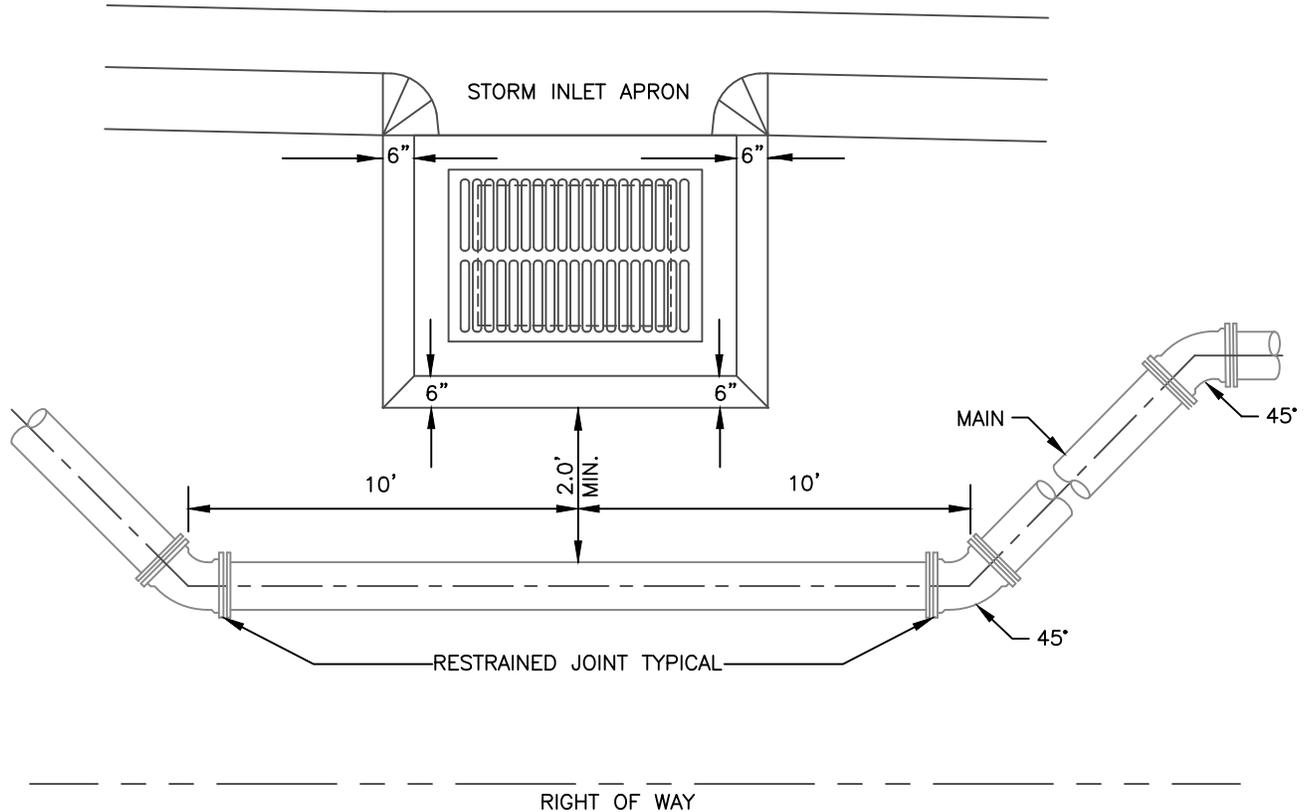
**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**TYPICAL RAILROAD
CROSSING DETAIL
W-9**

FY-2024-2025
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WATER MAIN INSTALLATION BETWEEN STORM INLET AND R.O.W. DETAIL



PLAN VIEW
NTS

NOTES:

1. MAIN MAY PASS OVER STORM LINE IF 36" OF COVER IS PROVIDED OVER WATER MAIN AND 6 FOOT VERT. SEPARATION IS MAINTAINED.
2. PIPE MAY BE DEFLECTED AROUND DRAINAGE INLET IN ACCORDANCE WITH THE RESTRAINED JOINT GUIDELINES OF THE EBAA.

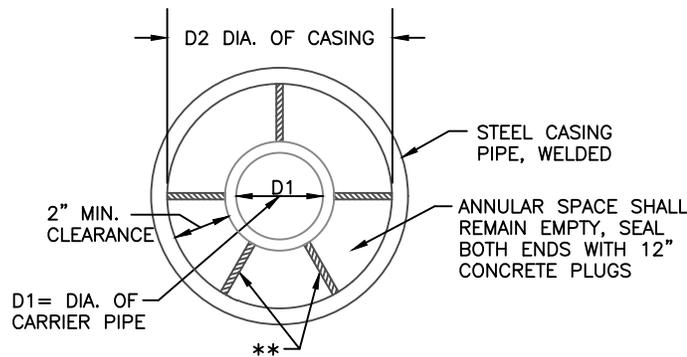
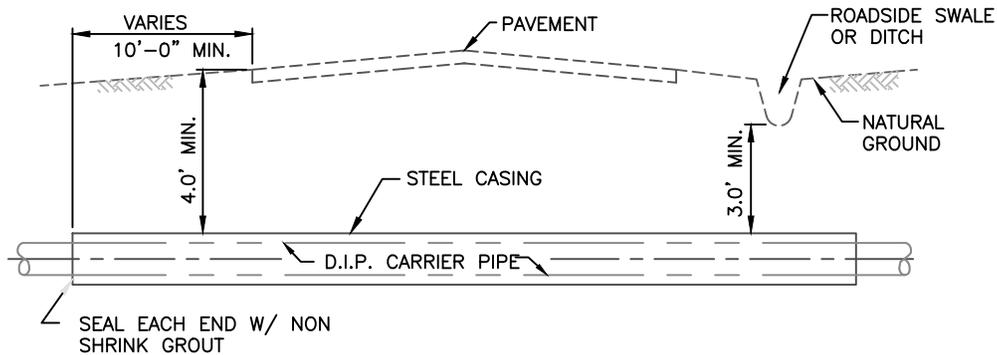
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**WATER MAIN
INSTALLATION BETWEEN
STORM INLET AND ROW
DETAIL W-10**

FY-2024-2025
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TYPICAL BORE & JACK DETAIL



NTS

CARRIER PIPE AND CASING PIPE SIZES (MIN.)												
CARRIER PIPE NOM. DIA. (D1)	4	6	8	12	16	18	20	24	30	36	42	48
CASING PIPE NOM. DIA. (D2)	14	16	18	24	30	30	36	36	48	54	60	66
WALL THICKNESS-INCHES *	PER AUTHORITY HAVING JURISDICTION											

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 APPURTENANCES. 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

**THE CITY OF DAYTONA BEACH
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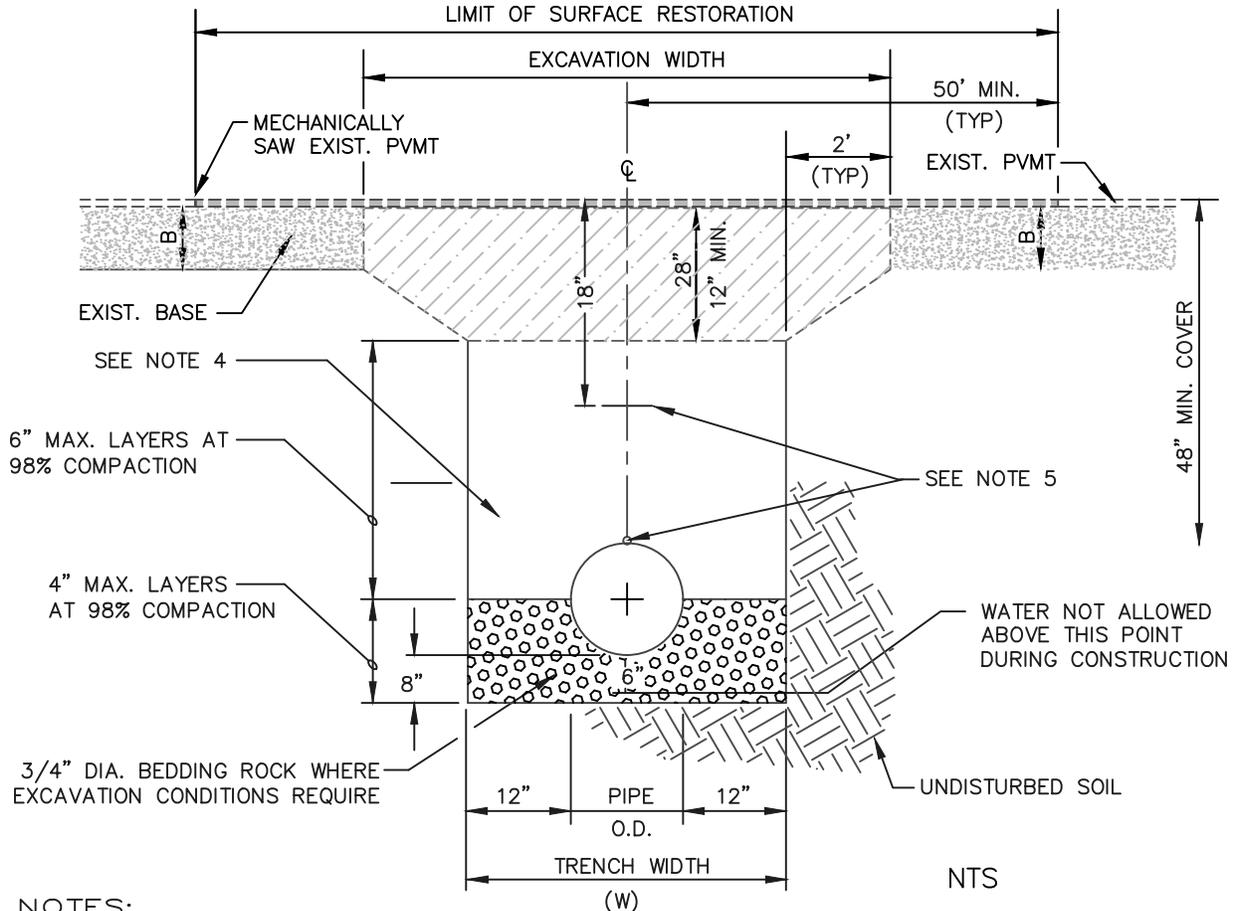


**TYPICAL BORE
& JACK DETAIL
W-11**

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PAVEMENT CUT & PATCH DETAIL

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.



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. SATISFACTORY FILL MATERIALS ARE ASTM D2487 SOIL CLASSIFICATION GROUPS GW, GP, SW, AND SP. UNSATISFACTORY SOIL MATERIALS ARE ASTM D248 SOIL CLASSIFICATION GROUPS GC, SC, ML, MH, CL, CH, OL, OH, AND PT. ALL FILL MATERIAL FROM ON AND OFF-SITE SOURCES SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. ALL FILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, TRASH, OR OTHER OBJECTIONABLE MATERIAL.
5. INSTALL METALLIC TAPE AND UF #12 INSULATED SINGLE STRAND COPPER WIRE ALONG LENGTH OF PIPE. LEADER WOULD INDICATED WIRE & TAPE LOCATIONS.
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.

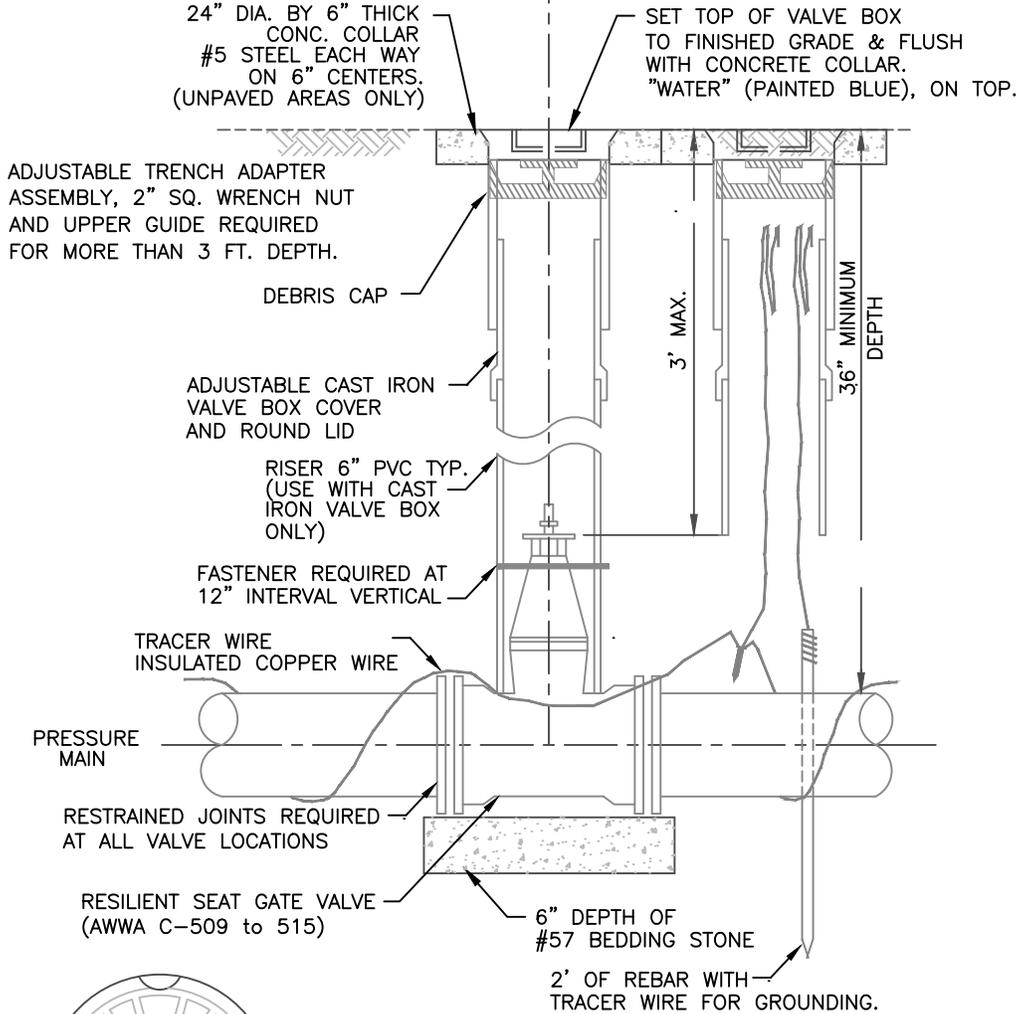
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**PAVEMENT CUT &
PATCH DETAIL
W-12**

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WATER VALVE & VALVE BOX DETAIL



POTABLE WATER
COVER

NOTES:

1. SEE CODB'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 WITH IN 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
5. BRASS ID VALVE MARKER TAG TO BE INSTALLED IN CONCRETE COLLAR.

THE CITY OF DAYTONA BEACH
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WATER VALVE & VALVE
BOX DETAIL
W-13

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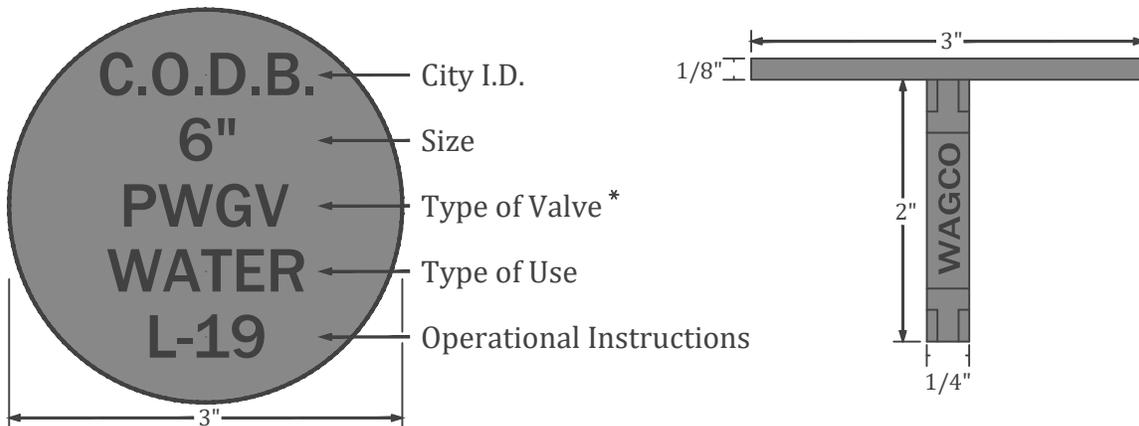
WATER VALVE MARKER/TAG

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

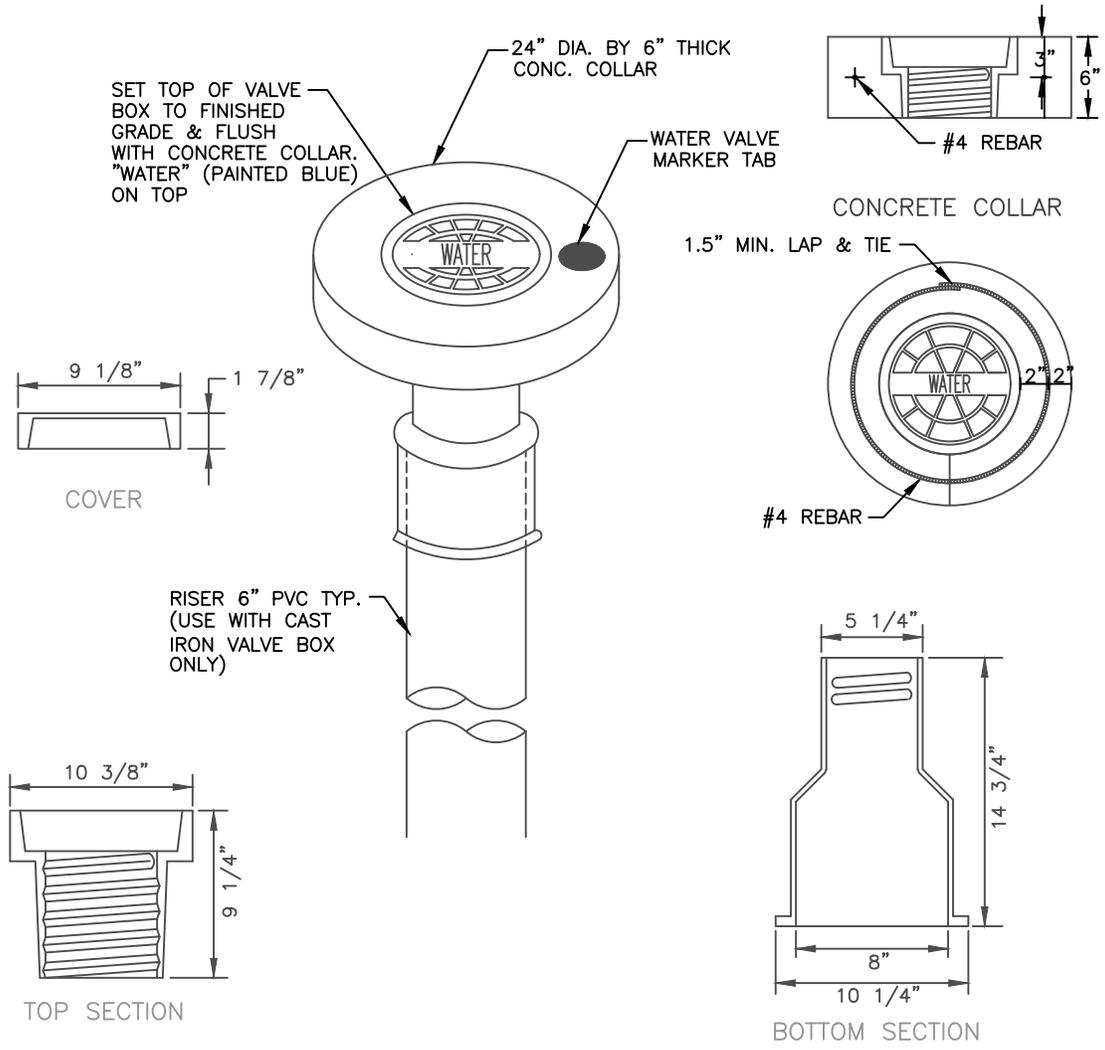
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UTILITIES DEPARTMENT**



**WATER VALVE
MARKER/TAG
W-14**

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MAIN VALVE BOX DETAIL



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.

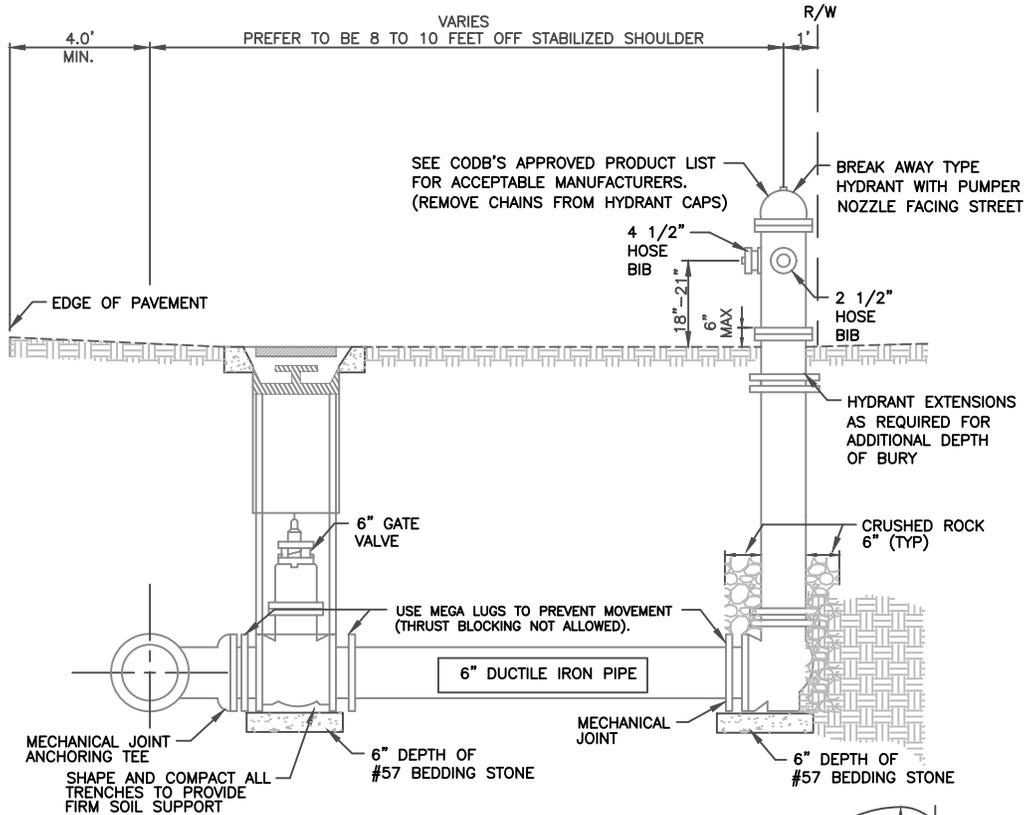
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**MAIN VALVE
BOX DETAIL
W-15**

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FIRE HYDRANT ASSEMBLY DETAIL

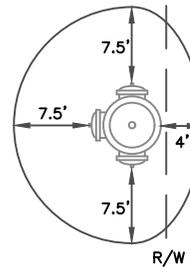


NOTES:

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 151 OSHA YELLOW PRIOR TO ACCEPTANCE BY THE CITY.

11. BONNET COLOR PROVIDED TO THE CONTRACTOR BY THE CITY

REFLECTIVE PAVEMENT MARKER



MIN. HORIZONTAL CLEARANCE REQUIRED

PLAN VIEW OF HYDRANT LOCATION

- RED BONNET = 499 GPM OR LESS
- ORANGE BONNET = 500 - 999 GPM
- GREEN BONNET = 1000 - 1499 GPM
- BLUE BONNET = 1500 GPM OR MORE

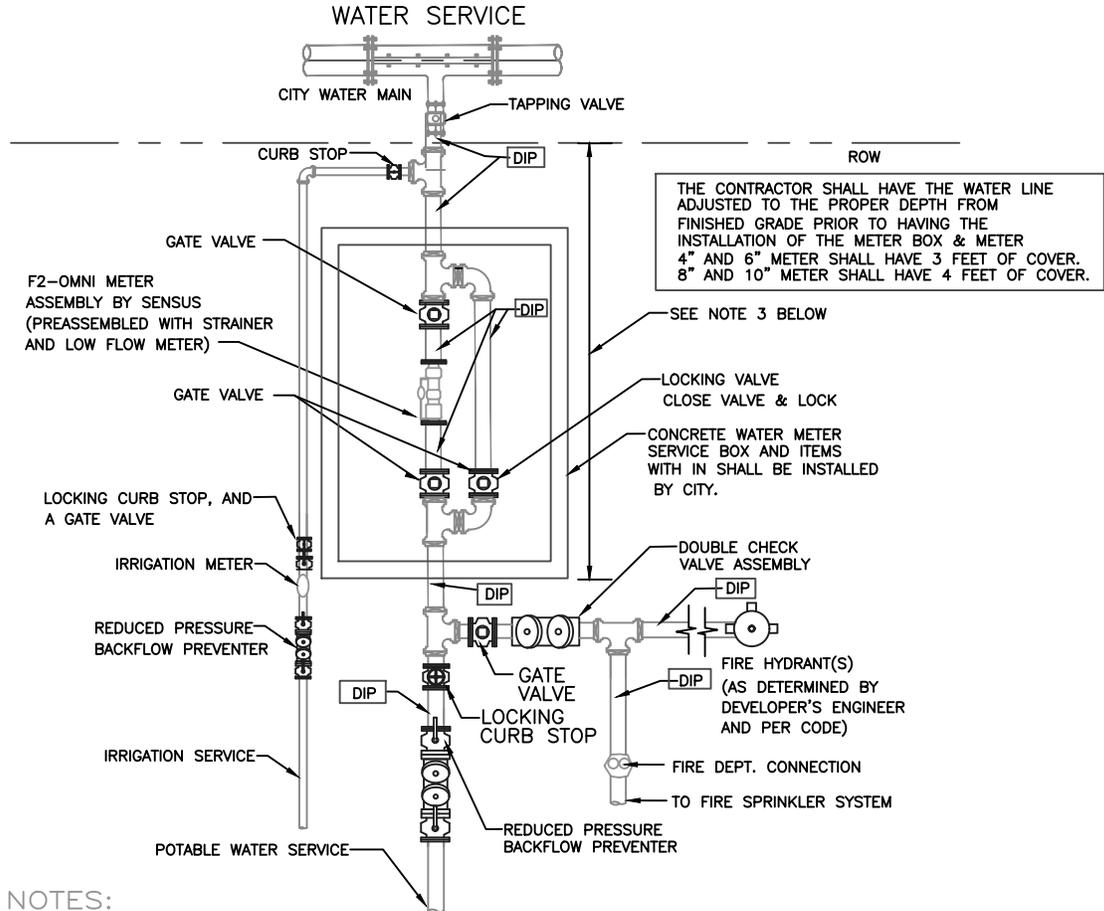
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UTILITIES DEPARTMENT**



**FIRE HYDRANT
ASSEMBLY DETAIL
W-16**

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FIRE/DOMESTIC/IRRIGATION CONNECTION DETAIL



NOTES:

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 W/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 FDOT, COUNTY, OR CITY STANDARDS; ASSOCIATED MOT, AND ALL WORK BEHIND THE WATER METER. THE CITY WILL TAP THE MAIN, AND SET THE METER. AFTER PRESSURE TEST IS WITNESSED BY CITY INSPECTOR AND LINE HAS BEEN CHLORINATED.
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
4. IF REUSE IS IN THE AREA AND AVAILABLE, THEN A SEPARATE CONNECTION TO THE REUSE MAIN WE BE REQUIRED FOR IRRIGATION SERVICE.

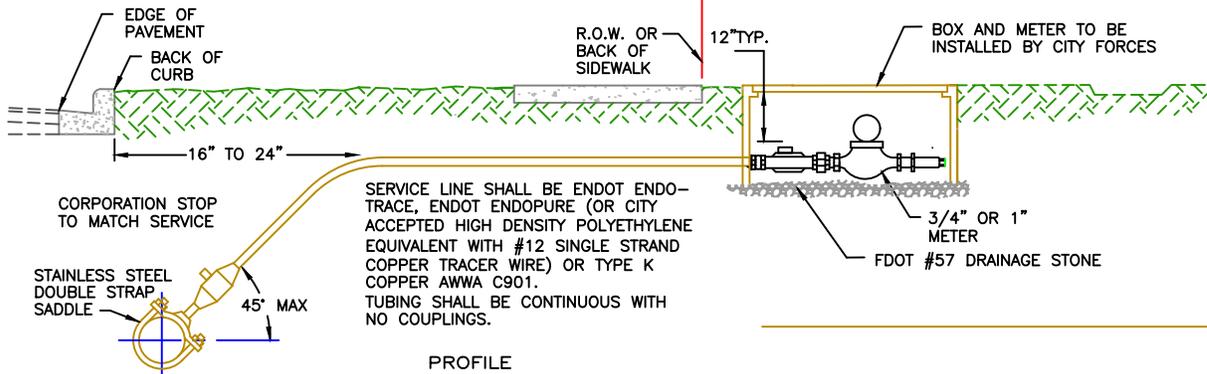
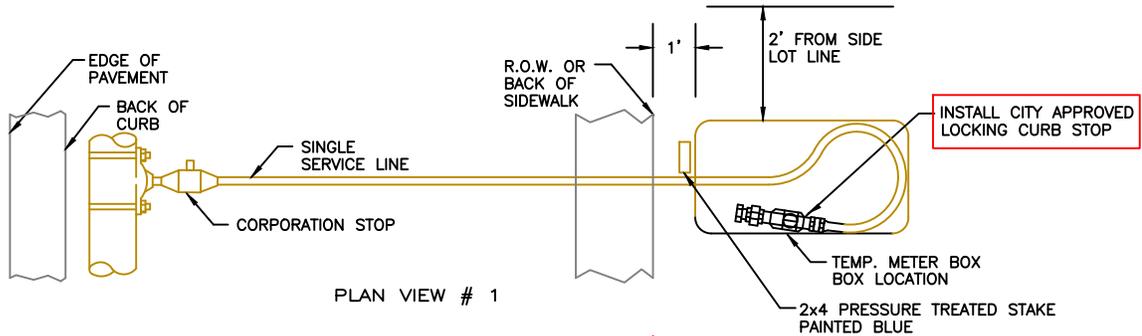
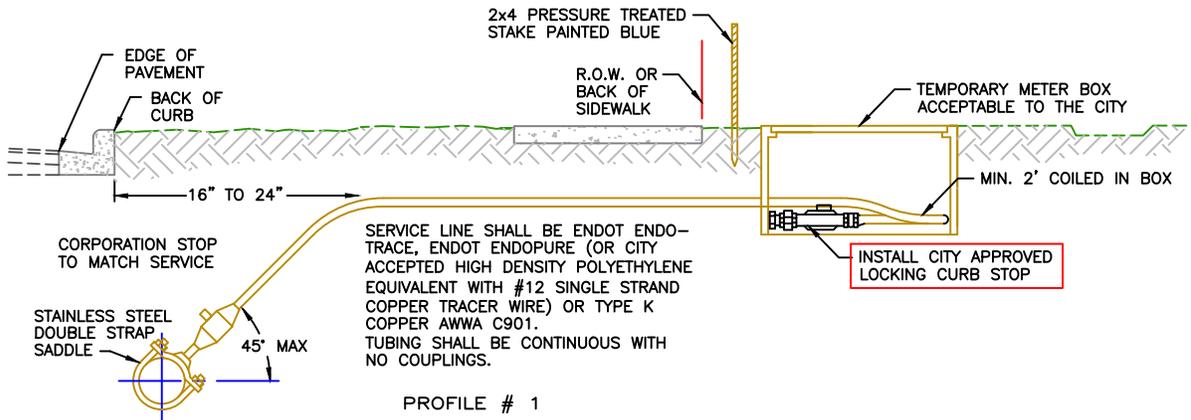
**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**FIRE/DOMESTIC/IRRIGATION
CONNECTION DETAIL
W-17**

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WATER SERVICE CONNECTION (PAGE 1 OF 2)



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 (DOUBLE CHECK) ARE REQUIRED ON RESIDENTIAL WATER CONNECTIONS. THEY ARE TO BE SUPPLIED AND INSTALLED BY THE DEVELOPER/BUILDER, AT NO COST TO THE CITY. TO BE INSTALLED ON THE CUSTOMER'S SIDE OF THE METER.
4. POTABLE IRRIGATION METERS REQUIRE AN APPROVED BACKFLOW PREVENTER.
5. SERVICE SADDLES SHALL BE STAINLESS STEEL STRAPS-EPOXY COATED.
6. 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.
7. 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.
8. SEE CITY SPECIFICATION NO. 15049 TRACER WIRE AND ALARM TAPE.

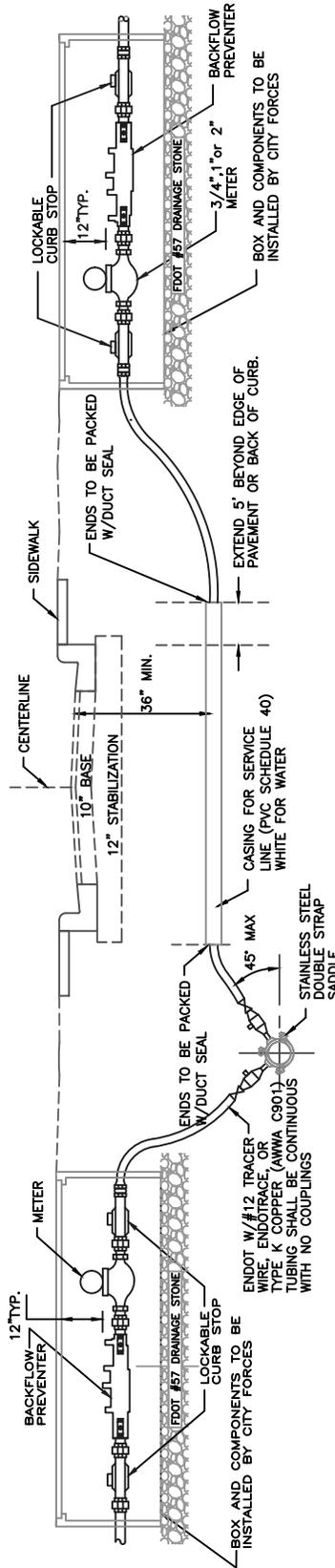
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UTILITIES DEPARTMENT**



**WATER SERVICE
CONNECTION
(PAGE 1 OF 2)
W-18**

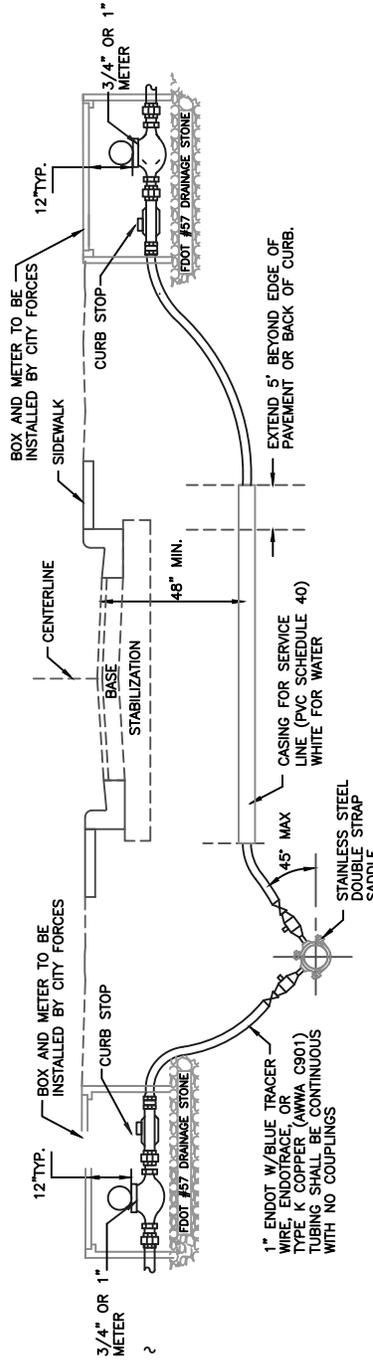
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WATER SERVICE CONNECTION (UNDER ROAD) (PAGE 2 OF 2)



NOTES:

1. SERVICE BOX AND METER TO BE FURNISHED BY THE CITY.
2. METER SHALL BE INSTALLED 1' BEHIND THE R/W.
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"x4" AT 24" ABOVE GROUND) TOP PAINTED WITH THE COLOR OF THE UTILITY SERVICE AND WITH THE LOT NUMBERS IT SERVES.
5. MINIMUM RESIDENTIAL DOMESTIC METER SHALL BE 3/4"
6. ALL COMMERCIAL PROPERTY METERS MUST BE SIZED BY THE ENGINEER-OF-RECORD.
7. THE MINIMUM INSIDE CASING DIAMETER SHALL BE 2" FOR SERVICE LINES GREATER THAN 1" INSIDE DIAMETER. THE CASING SHALL BE TWICE THE SIZE OF THE SERVICE LINE OUTSIDE DIAMETER.
8. INSTALL A BLUE TRACER WIRE ALONG ALL NON-METALLIC SERVICE LINES.



NOTES:

1. SERVICE BOX AND METER TO BE FURNISHED BY THE CITY.
2. METER SHALL BE INSTALLED 1' BEHIND THE R/W.
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"x4" AT 24" ABOVE GROUND) TOP PAINTED WITH THE COLOR OF THE UTILITY SERVICE AND WITH THE LOT NUMBERS IT SERVES.
5. MINIMUM RESIDENTIAL DOMESTIC METER SHALL BE 3/4"
6. ALL COMMERCIAL PROPERTY METERS MUST BE SIZED BY THE ENGINEER-OF-RECORD.
7. THE MINIMUM INSIDE CASING DIAMETER SHALL BE 2" FOR SERVICE LINES GREATER THAN 1" INSIDE DIAMETER. THE CASING SHALL BE TWICE THE SIZE OF THE SERVICE LINE OUTSIDE DIAMETER.
8. INSTALL A BLUE TRACER WIRE ALONG ALL NON-METALLIC SERVICE LINES.

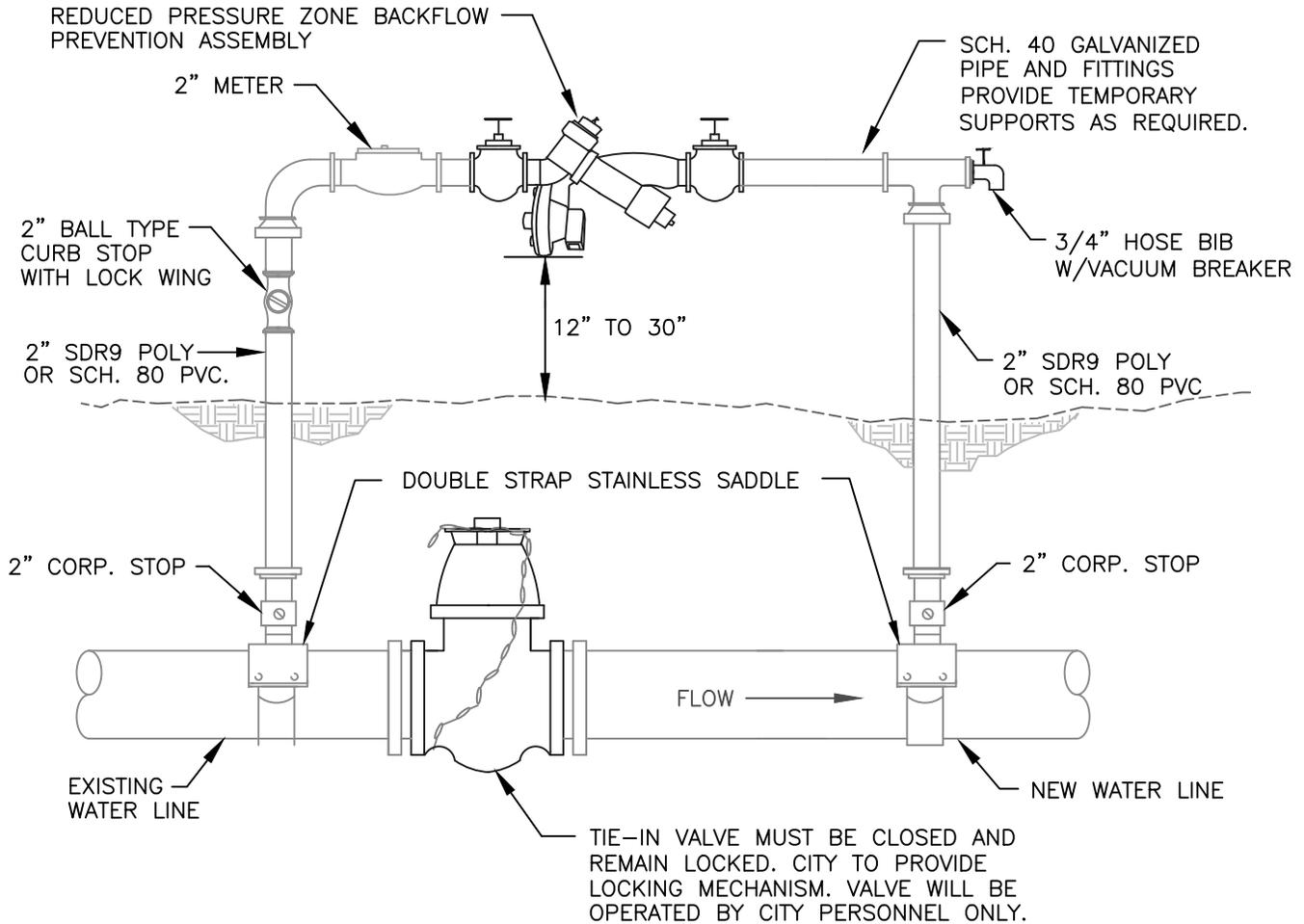
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**WATER SERVICE
CONNECTION (UNDER
ROAD) (PAGE 2 OF 2)
W-19**

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TEMPORARY FILL CONNECTION DETAIL



PROFILE VIEW
NTS

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.

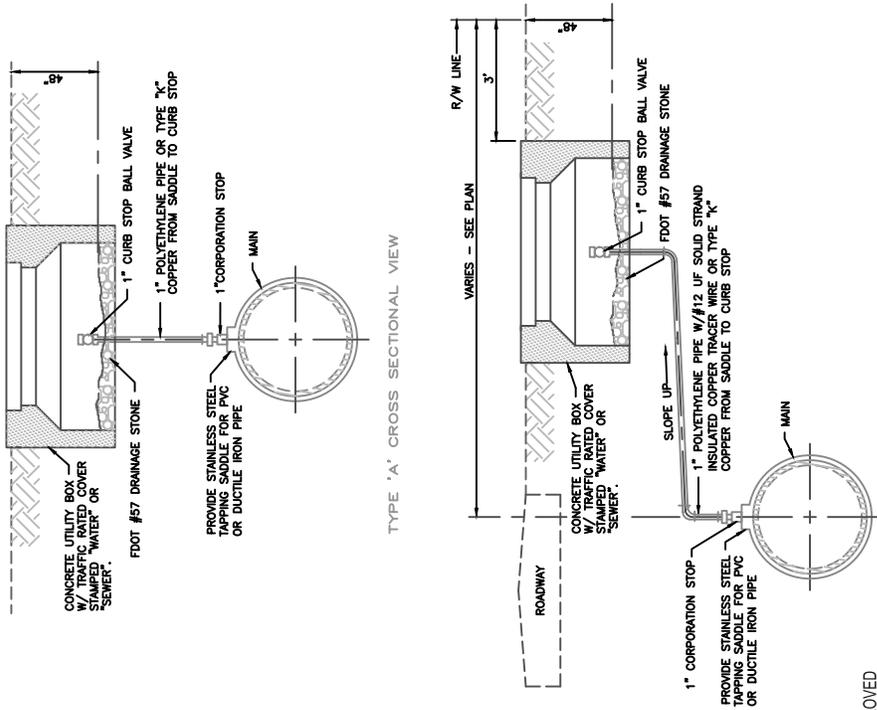
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UTILITIES DEPARTMENT**



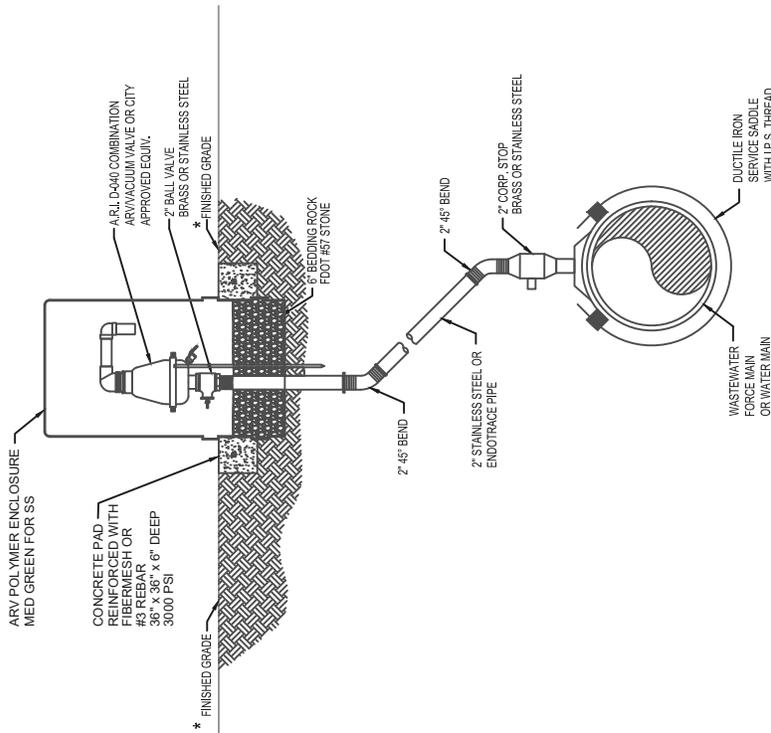
**TEMPORARY FILL
CONNECTION DETAIL
W-20**

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AIR RELEASE VALVE DETAIL



NOTES:
 ACCEPTABLE MANUFACTURERS: (SEE COOB'S APPROVED PRODUCT LIST)
MANUAL AIR RELEASE VALVE DETAIL
 NTS



- 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 PERMANENTLY 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.
 7. PIPE SIZES UP TO 12" - USE 2" SADDLE.
 8. PIPE SIZES 14" THRU 36" - USE A 4" TEE M.J. 4" PLUG VALVE M.J. WITH 4" x 2" TAPPED PLUG.
 9. PIPE SIZES LARGER THAN 36" - USE A 6" TEE M.J. 6" PLUG VALVE M.J. WITH 6" x 4" TAPPED PLUG.
 10. THE SIZE OF ARV IS DETERMINED BY THE EOR BASED ON PRESSURE, HYDRAULICS AND FLOW ARY LOCATIONS TO BE FINALIZED AFTER REVIEW OF PRELIMINARY AS-BUILT DATA.

OFFSET AIR/VAC RELEASE VALVE
 NTS

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 UTILITIES DEPARTMENT**

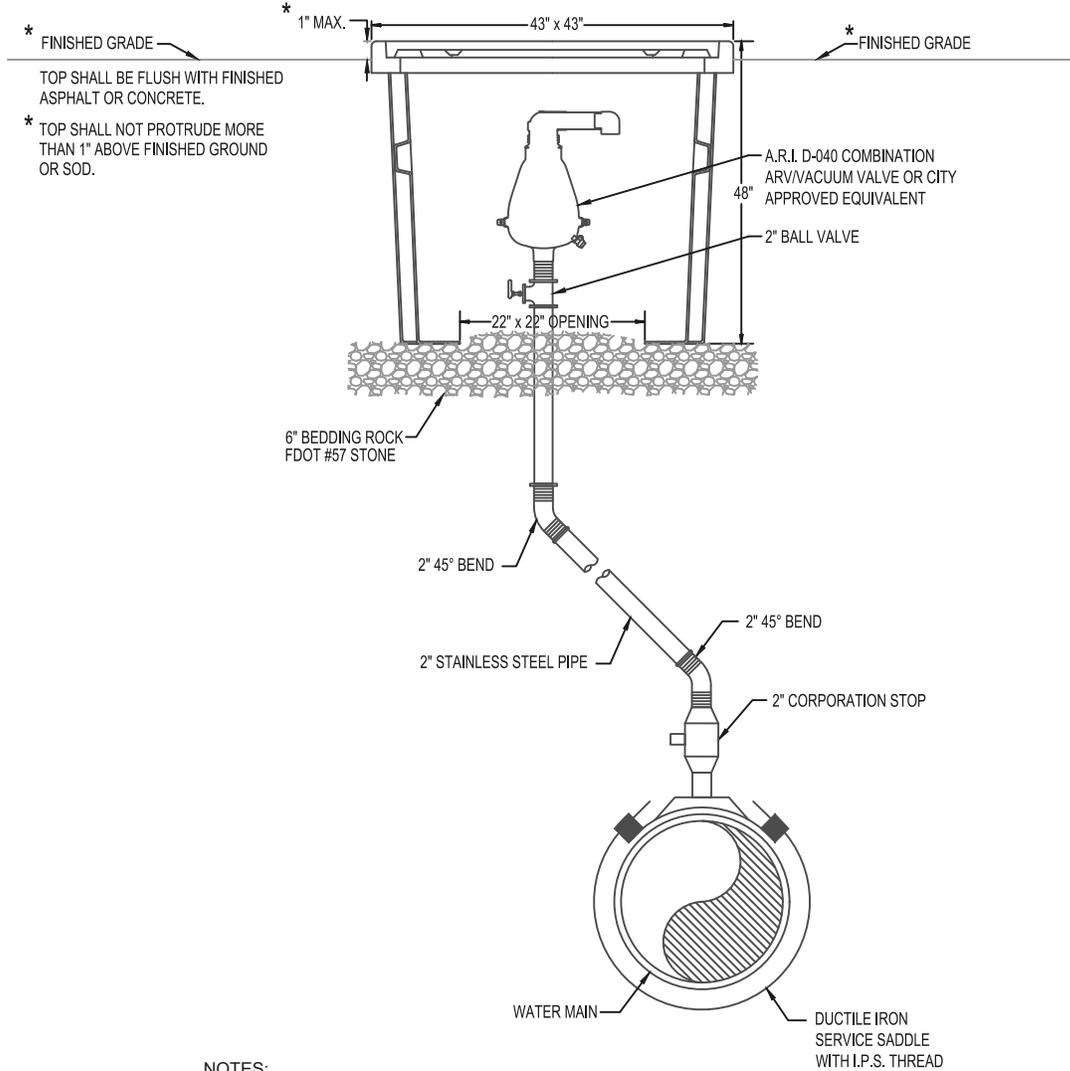


**AIR RELEASE
 VALVE DETAIL
 W-21**

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AUTOMATIC ARV/VACUUM VALVE DETAIL

CDR SYSTEMS GROUP
A13-3636-48 402 BOX
OR CITY APPROVED EQUIV.
RATED FOR CITY ACCEPTABLE
TRAFFIC BEARING FOR THE
LOCATION.



NOTES:

1. AIR RELEASE VALVE 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 PERMANENTLY 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.
7. PIPE SIZES UP TO 12" - USE 2" SADDLE.
8. PIPE SIZES 14" THRU 36" - USE A 4" TEE MJ, 4" PLUG VALVE MJ, WITH 4" x 2" TAPPED PLUG.
9. PIPE SIZES LARGER THAN 36" - USE A 6" TEE MJ, 6" PLUG VALVE MJ, WITH 6" x 4" TAPPED PLUG.
10. THE SIZE OF ARV IS DETERMINED BY E.O.R. PRESSURE, FLOW AND HYDRAULICS.
11. ARV LOCATIONS TO BE FINALIZED AFTER REVIEW OF PRELIMINARY AS-BUILT DATA.

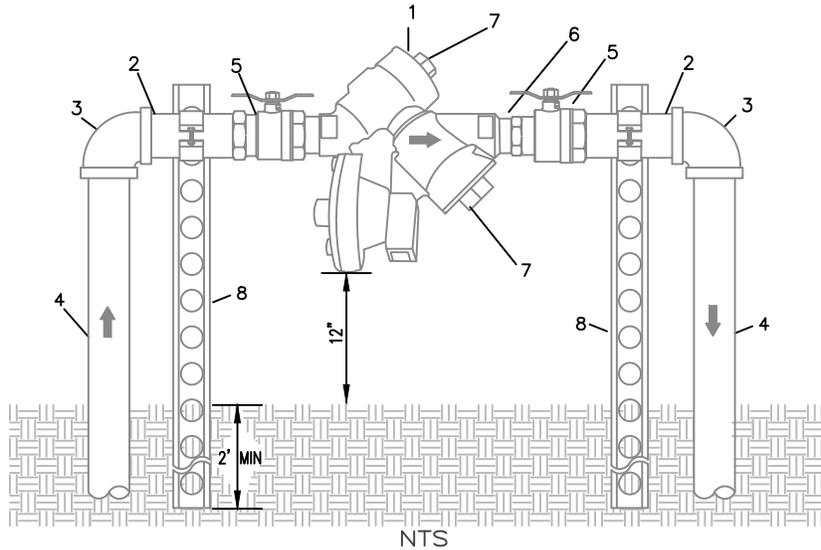
**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**AUTOMATIC ARV/VACUUM
VALVE DETAIL
W-22**

FY-2024-2025
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Drawn By: MAL
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COMMERCIAL REDUCED PRESSURE ZONE
 BACKFLOW PREVENTER, SINGLE SERVICE
 $\frac{3}{4}$ " , 1" , 1-1/2" OR 2" (PAGE 1 OF 3)



MATERIALS		
ITEM	QUANT.	DESCRIPTION
1	1	BACKFLOW PREVENTER ASSEMBLY
2	2	NOM. NIPPLES - BRASS
3	2	90° ELBOWS - GALV. OR PVC (SCH 80)
4	2	VARIES RISER - GALV.
5	2	BALL VALVE
6	1	UNION
7	*	TEST PORTS (SEE NOTES)
8	2	SS BRACKETS W/SS CLAMPS

NOTES:

1. ACCEPTABLE MANUFACTURERS: (SEE CODB'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 REQUIRES SS BRACKETS W/SS CLAMPS.

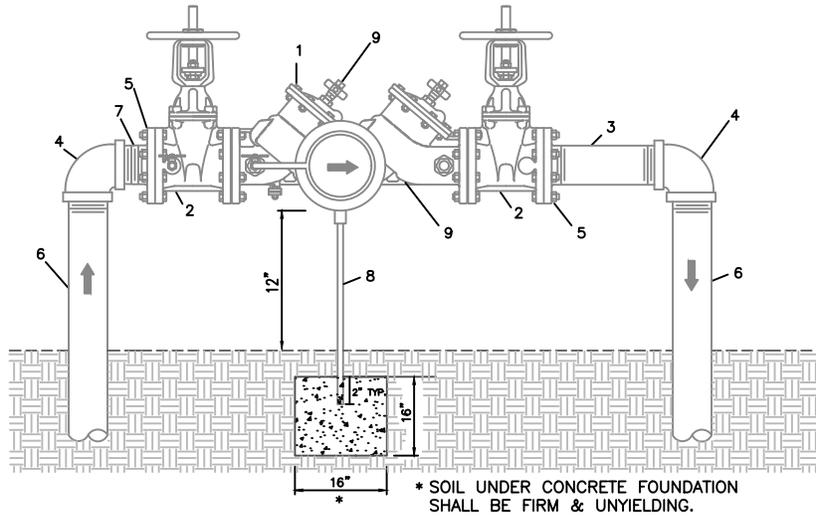
THE CITY OF DAYTONA BEACH
 UTILITIES DEPARTMENT



COMMERCIAL
 REDUCED PRESSURE ZONE
 BACKFLOW PREVENTER, SINGLE
 SERVICE $\frac{3}{4}$ " , 1" , 1-1/2" OR 2"
 (PAGE 1 OF 3)
 W-23

FY-2024-2025
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COMMERCIAL REDUCED PRESSURE ZONE
BACKFLOW PREVENTER, SINGLE SERVICE
3" OR 4" (PAGE 2 OF 3)



NTS

MATERIALS		
ITEM	QUANT.	DESCRIPTION
1	1	VALVE, REDUCED PRESSURE BACKFLOW PREVENTER
2	2	VALVE, GATE, C.I., F-F
3	1	NIPPLE, GALV. (12" LONG) (OPT.)
4	2	ELBOW, GALV. - 90°
5	2	FLANGE, STEEL PIPE, SCREW-TYPE
6	2	RISER, GALV. (42" LONG)
7	1	NIPPLE, GALV. (6" LONG)
8	1	SEE NOTES
9	*	SEE NOTES

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)

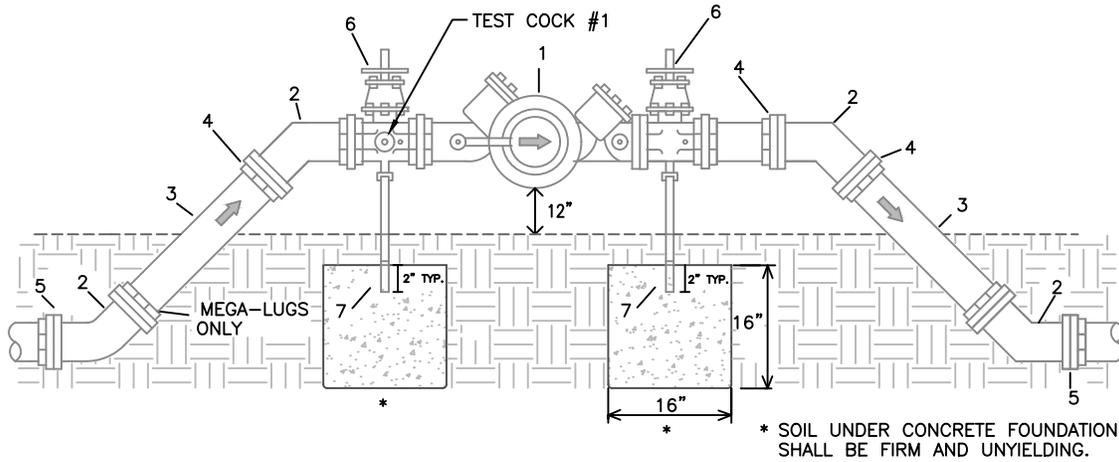
THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



COMMERCIAL
REDUCED PRESSURE ZONE
BACKFLOW PREVENTER, SINGLE
SERVICE 3" OR 4" (PAGE 2 OF 3)
W-24

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**COMMERCIAL REDUCED PRESSURE ZONE
BACKFLOW PREVENTER, SINGLE SERVICE
6" OR 8" (PAGE 3 OF 3)**



NTS

MATERIALS		
ITEM	QUANT.	DESCRIPTION
1	1	VALVE, REDUCED PRESSURE PRINCIPLE
2	4	ELBOW -45°
3	2	D.I.P. RISER PIPE
4	3	ADAPTER FLANGE D.I.P.
5	2	ADAPTER FLANGE D.I.P.
6	2	VALVE, GATE, C.I., F-F
7	SEE NOTES	

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)

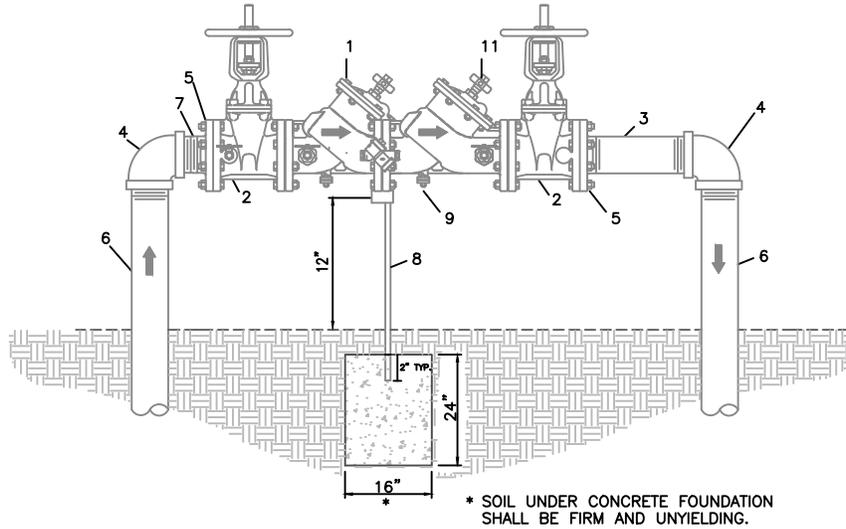
**THE CITY OF DAYTONA BEACH
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**COMMERCIAL
REDUCED PRESSURE ZONE
BACKFLOW PREVENTER, SINGLE
SERVICE 6" OR 8" (PAGE 3 OF 3)
W-25**

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COMMERCIAL DOUBLE CHECK VALVE ASSEMBLY BACKFLOW PREVENTER LINE



MATERIALS		
ITEM	QUANT.	DESCRIPTION
1	1	VALVE, DOUBLE CHECK BACKFLOW PREVENTER
2	2	VALVE, GATE, C.I., F-F
3	1	NIPPLE (2" TO 3" GALV.) (DIP FOR ALL OTHER SIZES) (12" LONG) (OPT.)
4	2	ELBOW 90° (2" TO 3" GALV.) (DIP FOR ALL OTHER SIZES)
5	2	FLANGE, STEEL PIPE, SCREW-TYPE
6	2	RISER, (2" TO 3" GALV.) (DIP FOR ALL OTHER SIZES) (42" LONG)
7	1	NIPPLE (2" TO 3" GALV.) (DIP FOR ALL OTHER SIZES) (6" LONG)
8	1	SEE NOTES
9	*	SEE NOTES

NOTES:

1. ACCEPTABLE MANUFACTURERS: (SEE CODB'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"x16"x24" MIN.)
6. (ITEM 9) TEST PORTS (QUANTITY/LOCATIONS DEPENDING ON MANUFACTURER)

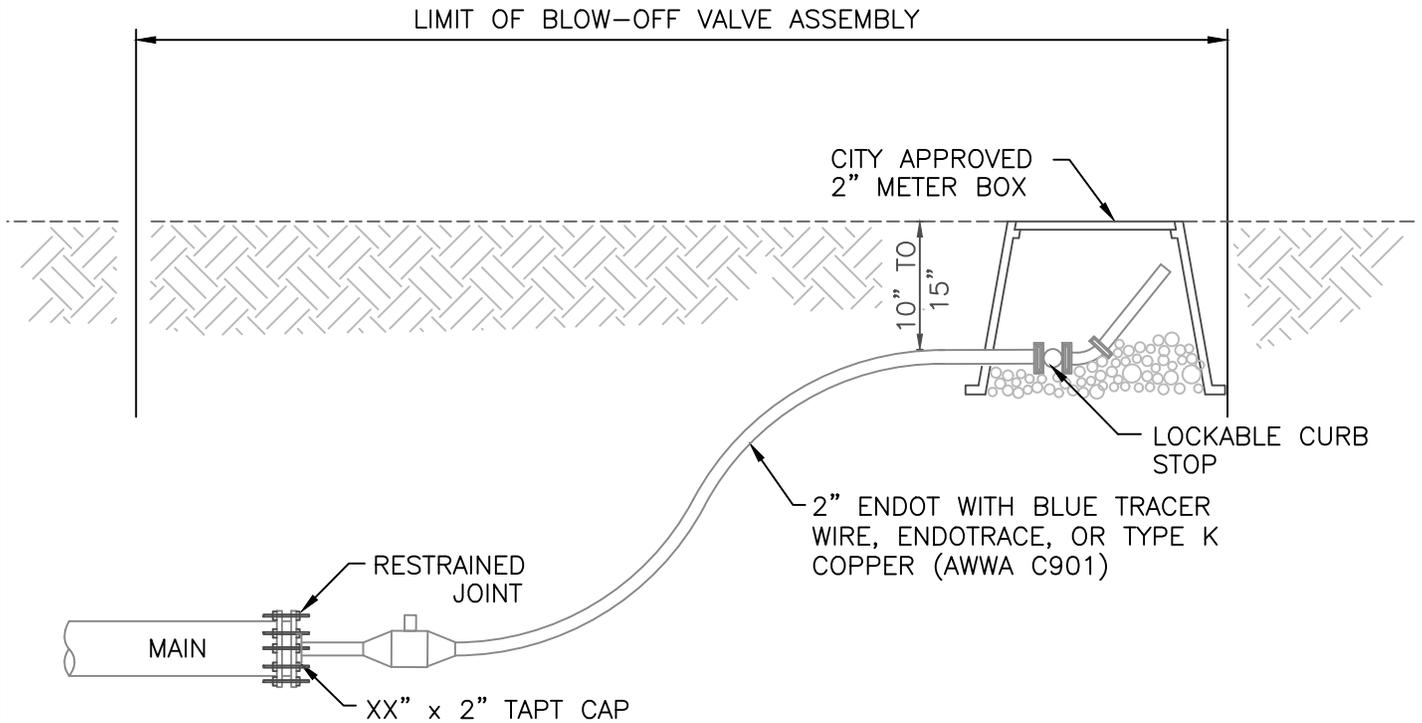
**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**COMMERCIAL
DOUBLE CHECK VALVE ASSEMBLY
BACKFLOW PREVENTER LINE
W-26**

FY-2024-2025
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STANDARD 2" BLOW-OFF VALVE ASSEMBLY DETAIL



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.

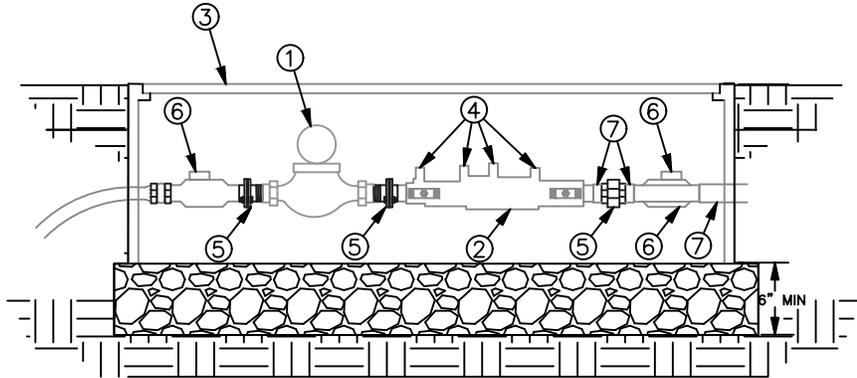
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STANDARD 2" BLOW-OFF VALVE
ASSEMBLY DETAIL
W-27

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RESIDENTIAL DOUBLE CHECK VALVE & METER ASSEMBLY FOR DOMESTIC WATER SERVICE



MATERIALS		
ITEM	QUAN.	DESCRIPTION
1	1	WATER METER
2	1	DOUBLE CHECK VALVE ASSEMBLY* (ZURN WILKINS MODEL 350 XL) (INCLUDES BALL VALVES)
3	1	METER BOX
4	4	TEST COCKS W/NO-LEAD BRASS PLUGS
5	3	NO LEAD BRASS UNION OR METER FLANGE
6	2	LOCKING CURB STOP
7	3	NIPPLES

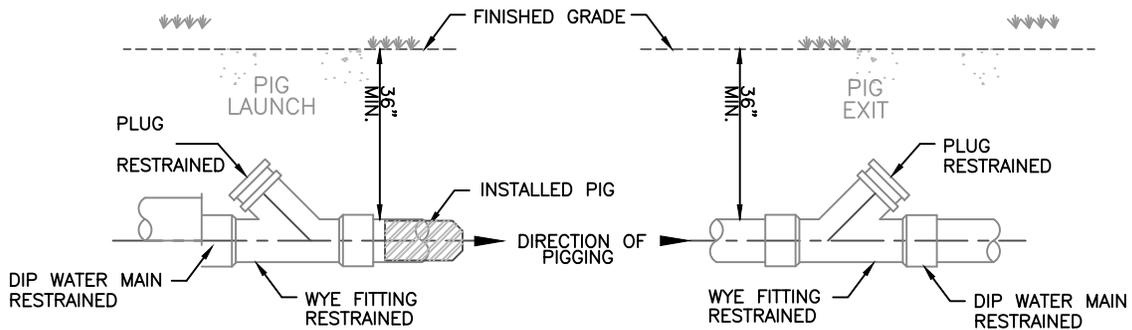
* DUAL CHECK VALVES ARE NOT ALLOWED

NOTES:

1. ACCEPTABLE MANUFACTURERS: (SEE CODB'S ACCEPTABLE PRODUCT LIST)
2. TEST PORTS (QUANTITY/LOCATIONS DEPENDING ON MANUFACTURER)
3. FOR 3/4" - 2" METERS 11" x 32" VALVE BOX DIMENSIONS: 36 1/4"(L) x 14 1/4"(W) x 12"(D)
4. INSTALLATION OF METER AND DOUBLE CHECK VALVE MUST BE CENTERED

IN VALVE VAULT.

RESIDENTIAL PIG LAUNCH / RECEIVING ASSEMBLY



PROFILE VIEWS

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



RESIDENTIAL DOUBLE CHECK VALVE
& METER ASSEMBLY PIG
LAUNCH/RECEIVING
W-28

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The City of Daytona Beach Utilities Department

List of Acceptable Products

POTABLE WATER

FY-2023-2024

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.

TABLE OF CONTENTS

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



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The City of Daytona Beach Utilities Department

List of Acceptable Products

POTABLE WATER

FY-2024-2025

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.

TABLE OF CONTENTS

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 $\frac{3}{4}$ ", 1", 1 $\frac{1}{2}$ ", 2"
Approved RPZBP, Single Service 3", 4"
Approved RPZBP, Single Service 6", 8"

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



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The City of Daytona Beach Utilities Department

List of Acceptable Products

POTABLE WATER

FY-2024-2025

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.

Water Category 1 of 6: VALVES AND ACCESSORIES

Air, Vacuum or Air/Vac Combination Release Valves

- | | |
|---------|-------------------------------|
| 1. APCO | 1. 200 |
| 2. ARI | 2. ARI, D-040 / S-050 / S-010 |

Air Release Valve Enclosure

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

Blow Off Valve

- | | |
|-------------------------|-----------------------|
| 1. Hydro Guard | 1. Automatic Blow Off |
| 2. Kupferle Foundry Co. | 2. Series TF 550 |
| 3. Water Plus | 3. Series VB 2000 |

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

- | | |
|---------------------------|------------------|
| 1. American Flow Control | 1. C509 and C515 |
| 2. Mueller | 2. C509 and C515 |
| 3. Clow | 3. C509 and C515 |
| 4. Kennedy | 4. C509 and C515 |
| 5. US Pipe | 5. C509 and C515 |
| 6. American AVK | 6. C509 and C515 |
| 7. East Jordan Iron Works | 7. C509 and C515 |

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

- | | |
|--------------------------|------------------|
| 1. American Flow Control | 1. Series 2500 |
| 2. Clow | 2. Series F-6100 |
| 3. Mueller | 3. Series A2361 |
| 4. US Pipe | 4. Series 5460 |
| 5. Kennedy | 5. Series 4571 |
| 6. M&H | 6. Series 4067 |



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List of Acceptable Products

POTABLE WATER

FY-2024-2025

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.

Gate Valves 12" and Smaller (resilient seated only)

- | | |
|--------------------------|-----------------------|
| 1. American Flow Control | 1. Series 2500 |
| 2. American R/D | 2. Series 2000 |
| 3. AVK | 3. Series 25 |
| 4. Clow | 4. Series F-6100 |
| 5. Kennedy | 5. Series 4571 |
| 6. M&H | 6. Series 4067 |
| 7. Mueller | 7. Series A2360, 2361 |
| 8. US Pipe | 8. Metroseal 250 |

} **McWane
Owned**

Sample Station

- | | |
|---------------|----------------|
| 1. Water Plus | 1. Series 200A |
|---------------|----------------|

Tapping Valves (resilient seated only)

- | | |
|--------------------------|------------------|
| 1. American Flow Control | 1. Series 2500 |
| 2. AVK | 2. Series 25 |
| 3. Clow | 3. Series F-6114 |
| 4. Kennedy | 4. Series 4950 |
| 5. M&H | 5. Series 4751 |
| 6. Mueller | 6. T2360 & T2361 |
| 7. US Pipe | 7. Metroseal 250 |
| 8. Waterous | 8. Series 500 |

Water Category 2 of 6: SERVICE MATERIALS

Corporation Stems - Ball Type 1" & 2" (w / AWWA taper CC threads only / corporation joint outlet for CTS)

- | | |
|----------------|-------------|
| 1. Ford | 1. FB1000 |
| 2. McDonald | 2. 4701B-22 |
| 3. Mueller | 3. B-25008N |
| 4. Cambridge | 4. 301-AB |
| 5. James Jones | 5. J-1900W |

Curb Stops - Straight Valves (curb stop to be ball type, reduced port FIP x FIP 3/4" x 3/4")

- | | |
|----------------|-----------------|
| 1. Ford | 1. B41-444 W-NL |
| 2. McDonald | 2. 6101W |
| 3. Mueller | 3. B20200-R |
| 4. Cambridge | 4. 224-FF |
| 5. James Jones | 5. J-1900W |

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 | 1. Commercial & Residential (concrete & composite) |
| 2. CDR | 2. Commercial & Residential (concrete & composite) |
| 3. Glasmaster | 3. Commercial & Residential (concrete & composite) |
| 4. Old Castle | 4. Commercial & Residential (concrete & composite) |



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List of Acceptable Products

POTABLE WATER

FY-2024-2025

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.

Curb Stops - locking Straight Valves (ball type compression by FIP, 1" & 2" CTS O.D. tubing by $\frac{3}{4}$ ", 1" & 2" FIP)

- | | |
|-------------|--|
| 1. Ford | 1. B41-343-QNL, B41-444-QNL, B41-777-QNL |
| 2. McDonald | 2. 76102WQ, |
| 3. Mueller | 3. B-25172N, B-25163N |

Curb Stops - locking Straight Valves
(ball type compression by compression (3/4"X3/4", 1"X1" OR 2"X2"))

- | | |
|-------------|--|
| 1. Ford | 1. B44-343-QNL, B44-444-QNL, B44-777-QNL |
| 2. McDonald | 2. 76000G |
| 3. Mueller | 3. B-25209N |

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

- | | |
|--------------|-----------------------------------|
| 1. Endot | 1. Endot w/#14 wire |
| 2. Endotrace | 2. Endotrace |
| 3. ADS | 3. Poly Flex water service tubing |

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 $\frac{3}{4}$ " x 7 $\frac{1}{2}$ ")

- | | |
|----------------|---------------------|
| 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 |



The City of Daytona Beach Utilities Department

List of Acceptable Products

POTABLE WATER

FY-2024-2025

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.

U Branch Assembly with Angle Ball Valves (1" x 3/4" x 7 1/2")

- | | |
|----------------|---------------|
| 1. Cambridge | 1. UVB-43-42W |
| 2. McDonald | 2. 09U2BW |
| 3. Mueller | 3. P-153363 |
| 4. Ford | 4. 172-BM750 |
| 5. James Jones | 5. J-2216 |

Water Category 3 of 6: PIPE MATERIALS

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 |
| 4. Power Seal | 4. Model 4810ES |
| 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



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The City of Daytona Beach Utilities Department

List of Acceptable Products

POTABLE WATER

FY-2024-2025

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.

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)

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. American 2. Assured Flow Sales 3. Griffin 4. Nappco/Sigma 5. Star 6. Union/Tyler 7. US Pipe 8. SIP Industries | <ol style="list-style-type: none"> 1. Gradelock 7. Permafuse or cement lined |
|---|--|

Restrained Joints - DIP

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. American 2. EBAA Iron Inc. 3. Ford 4. Star 5. US Pipe 6. Sigma 7. Mueller 8. Romac 9. SIP Industries | <ol style="list-style-type: none"> 1. Fast Grip Gasket 2. Mega-lug series 1100, series 1700 restraint, 2003 PV series RS-3800 restrainer 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 |
|---|---|

Restrained Joints -PVC C900 (DR-18)

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Sigma Corp. 2. EBAA Iron Inc. | <ol style="list-style-type: none"> 1. PV-LOK Series PWP for Bell Joint Restraint (CIOD) 2. Series 1900 |
|---|--|

Tapping Sleeves:

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. American Flow Control 2. Clow 3. Mueller 4. US Pipe | <ol style="list-style-type: none"> 1. Series 2800 2. Series F-5205, F-5207 3. Series H-615, H-616, H-619 4. Series T-9 |
|---|--|

Note: TAPPING SLEEVES FOR SIZE ON SIZE TAPS SHALL USE A MUELLER MECHICAL JOINT SLEEVE FOR CENTRIFUGAL C.I., D.I.P., AND PVC C-900 DR-18 PIPE.



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List of Acceptable Products

POTABLE WATER

FY-2024-2025

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.

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

- | | |
|----------------|---------------------------|
| 1. Smith Blair | 1. Style 622, Style 623 |
| 2. JCM | 2. Series 412, Series 414 |

Water Category 5 of 6: Hydrants

Hydrants

- | | |
|--------------------------|--|
| 1. Mueller | 1. A-423 |
| 2. Kennedy | 2. Guardian (K-81-A, K-81-D) |
| 3. American Flow Control | 3. American Darling B84B (5 1/4" only) |
| 4. Clow | 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 | 1. 825 Y |
| 2. Watts | 2. Model 909, Model 919, Model 2009MZ |
| 3. Conbraco/Apollo | 3. 40-200 |
| 4. Wilkins | 4. 975-375 XL |

Approved RPZBP - Single service 3", 4"

- | | |
|--------------------|-------------------|
| 1. Febco | 1. 825 Y |
| 2. Watts | 2. Model 909 OS&Y |
| 3. Conbraco/Apollo | 3. 40-200 |
| 4. Cla-Val | 4. RP-1 |
| 5. Wilkins | |

Approved RPZBP - Single service 6", 8"

- | | |
|--------------------|-------------------|
| 1. Febco | 1. 825 Y |
| 2. Watts | 2. Model 909 OS&Y |
| 3. Conbraco/Apollo | 3. 40-200 |
| 4. Cla-Val | 4. RP-1 |
| 5. Wilkins | |



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THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



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RECLAIMED WATER DESIGN AND CONSTRUCTION NOTES

1. THE CITY'S UTILITIES DEPARTMENT (386-671-8815) SHALL BE GIVEN A MINIMUM OF THREE BUSINESS DAYS NOTICE (NOT INCLUDING HOLIDAYS) PRIOR TO BEGINNING ANY RECLAIMED WATER SYSTEM CONSTRUCTION. 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 GROUND WATER FROM A CONSTRUCTION SITE, ENCLOSED VAULT, COFFERDAM, 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 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=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.
2. 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.
3. 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 WATER PLANT OPERATIONS.
4. 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.**
5. 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.
6. 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.
7. ALL RECLAIMED WATER HAND-OPERATED CONNECTIONS AND OUTLETS SHALL BE CONTAINED IN UNDER-GROUND 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.
8. OUTLETS SHALL BE LOCKED OR REQUIRE A SPECIAL TOOL FOR OPERATION.
9. A 75 FOOT SETBACK DISTANCE SHALL BE PROVIDED FROM PUBLIC ACCESS RECLAIMED WETTED AREAS TO PUBLIC OR PRIVATE POTABLE WATER SUPPLY WELLS.
10. LOW TRAJECTORY NOZZLES ARE REQUIRED WITHIN 100 FEET OF PUBLIC EATING, DRINKING OR BATHING FACILITIES.
11. 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.
12. 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.

**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**RECLAIMED WATER
DESIGN AND
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RECLAIMED WATER DESIGN AND CONSTRUCTION NOTES

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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. 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 STANDARD OUTSIDE DIMENSION RATIO (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.
16. 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.
17. ALL RECLAIMED WATER MAINS SHALL HAVE A MINIMUM COVER OF 36 INCHES. IN SPECIAL CASES WHERE IT IS IMPOSSIBLE OR INAPPROPRIATE TO PROVIDE ADEQUATE COVER, DUCTILE IRON PRESSURE CLASS 350 OR CONCRETE ENCASMENT/PROTECTIVE SLAB MAY BE USED AT THE DISCRETION OF THE UTILITIES DEPARTMENT. ALL NON PAINTED RECLAIMED PIPE SHALL BE PAINTED WITH AN EPOXY PAINT (PANTONE PURPLE) TO CLEARLY MARK THE RECLAIM PIPE. THE PIPE 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.
18. RECLAIMED WATER MAINS SHALL BE PURPLE PVC, DR-18 AWWA CLASS C-900 OR C-905, CL 150, OR DIP PRESSURE CLASS 350, STANDARD CEMENT LINED (PAINTED PANTONE PURPLE) UNLESS APPROVED OTHERWISE BY THE CITY.
19. 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.
20. INSIDE DIAMETER OF HORIZONTAL DIRECTIONAL DRILL PIPE SHALL MATCH THE INSIDE DIAMETER OF CONNECTING PIPES. ALL GASKETS SHALL BE LUBRICATED BEFORE INSTALLATION.
21. DIRECTIONAL DRILLS SHALL HAVE FUSED MJ ADAPTERS.
22. ALL RECLAIMED WATER MAINS SHALL USE THRUST RESTRAINT AS CALCULATED BY A PROGRAM AVAILABLE AT EBAA.COM, THE RESTRAINED JOINT LENGTHS SHALL BE SHOWN ON PLANS PROVIDED BY ENGINEER OF RECORD.
23. ALL FITTINGS, VALVES, ETC. SHALL BE DUCTILE IRON (MJ OR FLANGED) AND SHALL BE RESTRAINED. THE CITY PROHIBITS THE USE OF CROSS FITTING.
24. BELL RESTRAINTS OR GRIPPER TYPE GASKETS CAN BE USED FOR ALL RESTRAINED PIPE BELL JOINTS. CONCRETE THRUST BLOCKS ARE NOT PERMITTED.
25. VALVES SHALL BE PLACED AT ALL STREET INTERSECTIONS AND AT MAXIMUM SPACINGS OF 750 FEET.
26. VALVES SHALL BE INSTALLED ON ALL LEGS EXCEPT ONE AT ALL RECLAIMED WATER MAIN TEES AND CROSSES.
27. ALL VALVES SHALL BE ADJUSTED TO FINISH GRADE AND CAPS SHALL BE PAINTED PURPLE.
28. 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.
29. IN AREAS WHERE RECLAIMED WATER IS AVAILABLE, RECLAIMED WATER WILL BE UTILIZED IN THE PRESSURE TESTING OF NEW NON-POTABLE WATER LINES.
30. RECLAIMED WATER MAINS SHALL NOT BE PLACED IN SERVICE UNTIL A PRESSURE TEST AT 150 PSI FOR 2 HOURS HAS PASSED AND THE RESULTS ARE FORWARDED TO THE CITY.
31. THE CONTRACTOR SHALL PERFORM RECLAIMED WATER TAPS WITH A CITY REPRESENTATIVE PRESENT.

THE CITY OF DAYTONA BEACH
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RECLAIMED WATER
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RECLAIMED WATER DESIGN AND CONSTRUCTION NOTES

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31. THE CITY RESERVES THE RIGHT TO REQUIRE TIE-IN 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 SLEEVES AND VALVES SHALL BE A MINIMUM OF 30 MINUTES AT 150 PSI OR 30 MINUTES AT THE MANUFACTURER'S RECOMMENDED TESTING PRESSURE.
36. 3 INCH WIDE 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 STORMWATER 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.

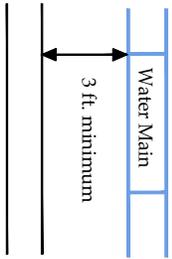
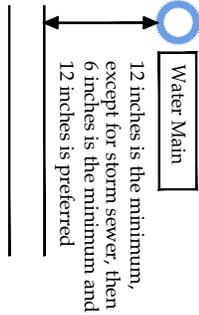
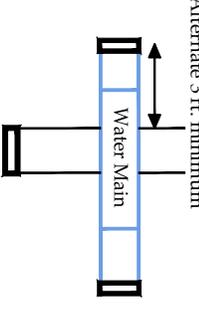
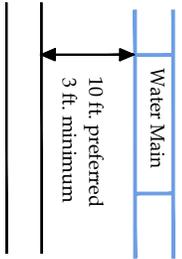
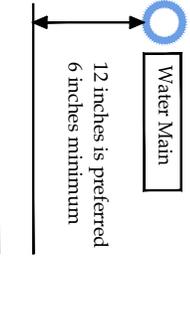
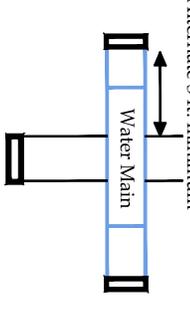
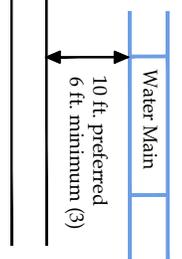
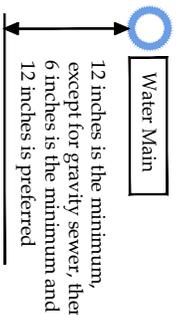
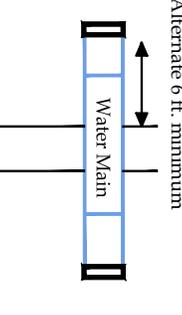
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RECLAIMED WATER
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LOCATION OF PUBLIC WATER SYSTEM MAINS IN ACCORDANCE WITH F.A.C. RULE 62-555.314

Other Pipe	Horizontal Separation	Crossings (1)	Joint Spacing @ Crossings (Full Joint Centered)
Storm Sewer, Stormwater Force Main, Reclaimed Water (2)	 <p>Water Main 3 ft. minimum</p>	 <p>Water Main 12 inches is the minimum, except for storm sewer, then 6 inches is the minimum and 12 inches is preferred</p>	 <p>Alternate 3 ft. minimum</p>
Vacuum Sanitary Sewer	 <p>Water Main 10 ft. preferred 3 ft. minimum</p>	 <p>Water Main 12 inches is preferred 6 inches minimum</p>	 <p>Alternate 3 ft. minimum</p>
Gravity or Pressure Sanitary Sewer, Sanitary Sewer Force Main, Reclaimed Water (4)	 <p>Water Main 10 ft. preferred 6 ft. minimum (3)</p>	 <p>Water Main 12 inches is the minimum, except for gravity sewer, then 6 inches is the minimum and 12 inches is preferred</p>	 <p>Alternate 6 ft. minimum</p>
On-Site Sewage Treatment & Disposal System	<p>10 ft. minimum</p>	<p>---</p>	<p>---</p>

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

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

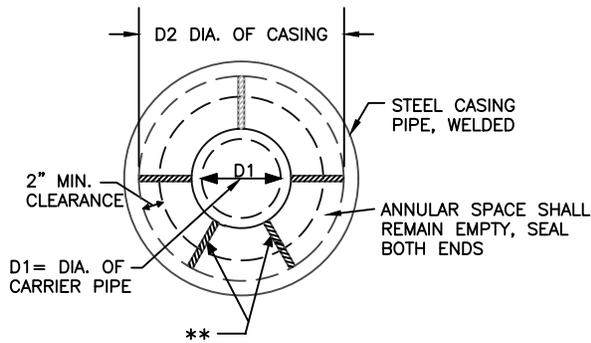
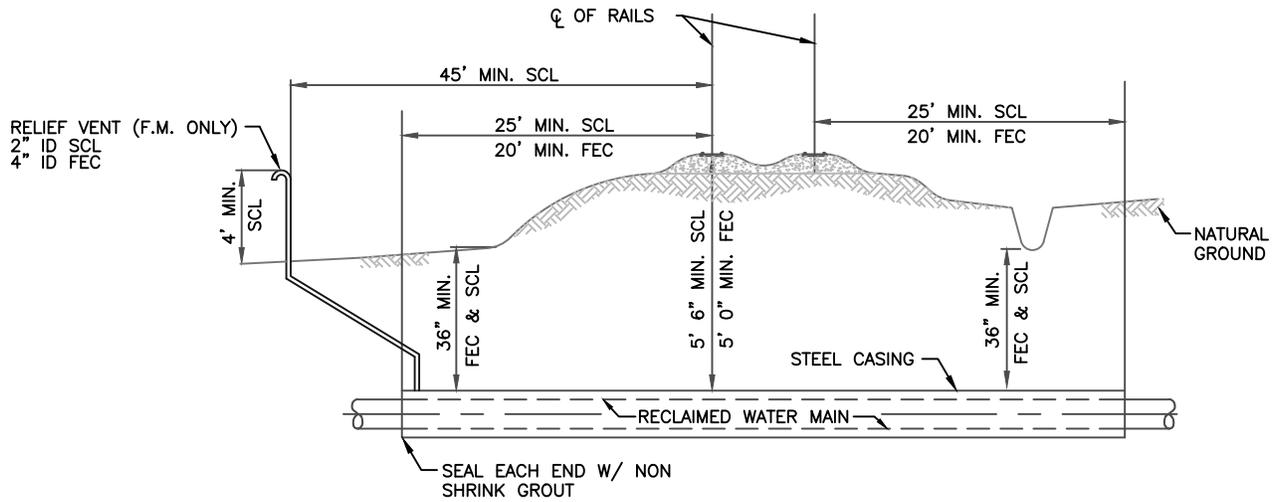
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WATER MAIN
SEPARATION CHART
RW-4

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TYPICAL RAILROAD CROSSING DETAIL



TYPICAL RAILROAD CROSSING NTS

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.)														
CARRIER PIPE NOM. DIA. (D1)	4	6	8	10	12	14	16	18	20	24	30	36	42	48
CASING PIPE NOM. DIA. (D2)	14	16	18	22	24	30	30	30	36	36	48	54	60	66
WALL THICKNESS-INCHES *	PER AUTHORITY HAVING JURISDICTION													

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 APPURTENANCES. CERTIFICATION OF CASING PIPE IS REQUIRED.
 4. GROUTING OF SPACE BETWEEN CASING AND CARRIER PIPE NOT REQUIRED UNLESS NEGATIVE FLOTATION 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 FDOT STANDARDS.
 ** SPECIALLY DESIGNED SPACERS SHALL BE USED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. USE CASCADE CASING SPACERS OR PRE-APPROVED EQUAL.

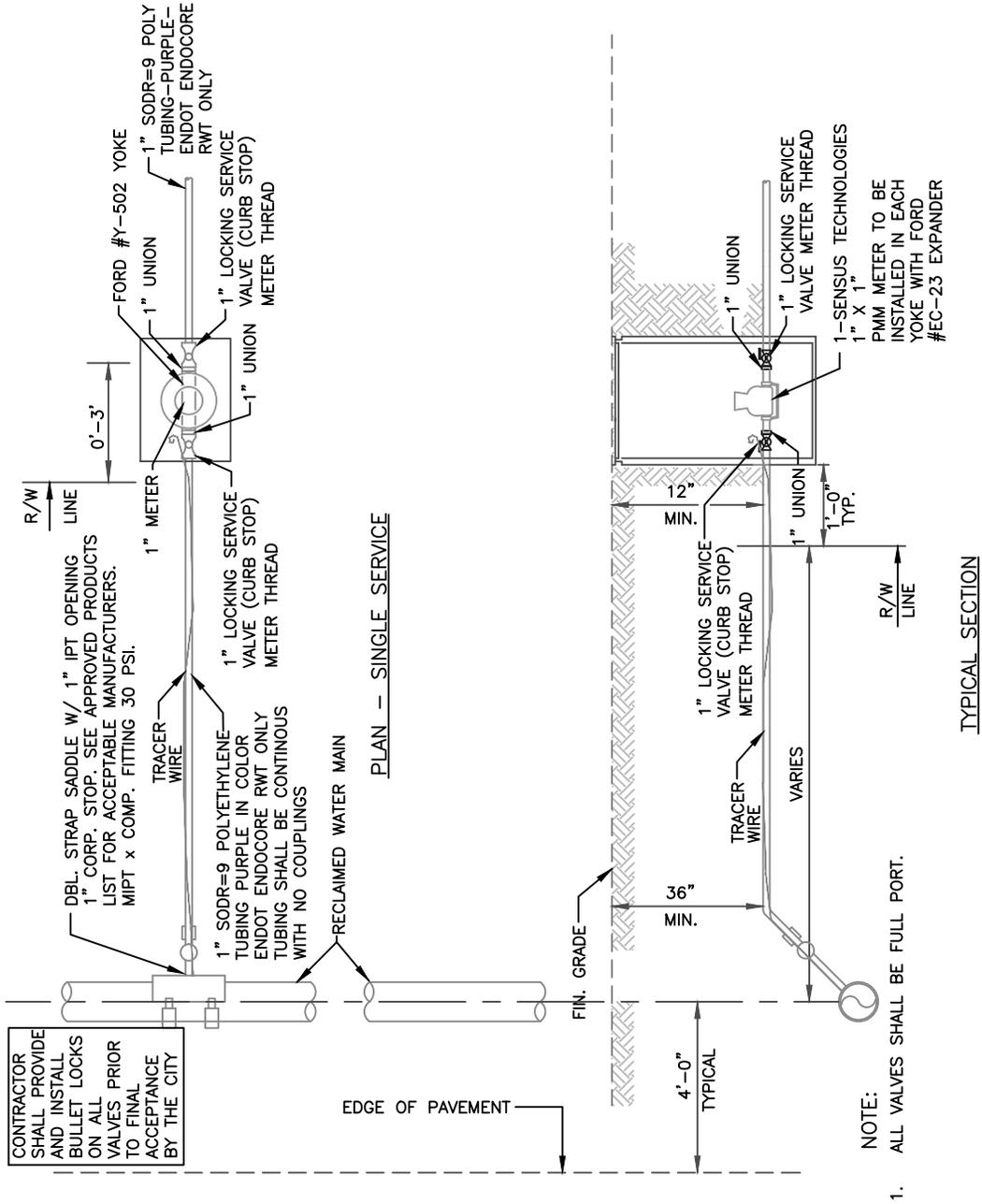
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**TYPICAL RAILROAD
CROSSING DETAIL
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IRRIGATION (SPRINKLER) SERVICE CONNECTION DETAIL



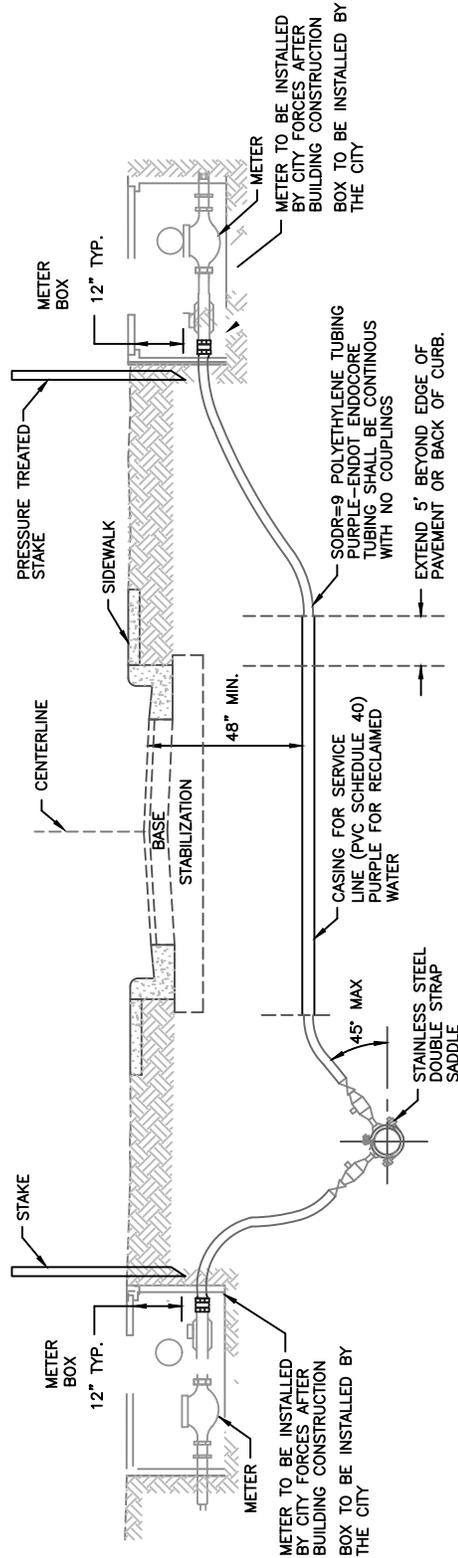
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**IRRIGATION
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CONNECTION DETAIL
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IRRIGATION (SPRINKLER) SERVICE (UNDER ROAD) DETAIL



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 PROPRIETARY 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.

**THE CITY OF DAYTONA BEACH
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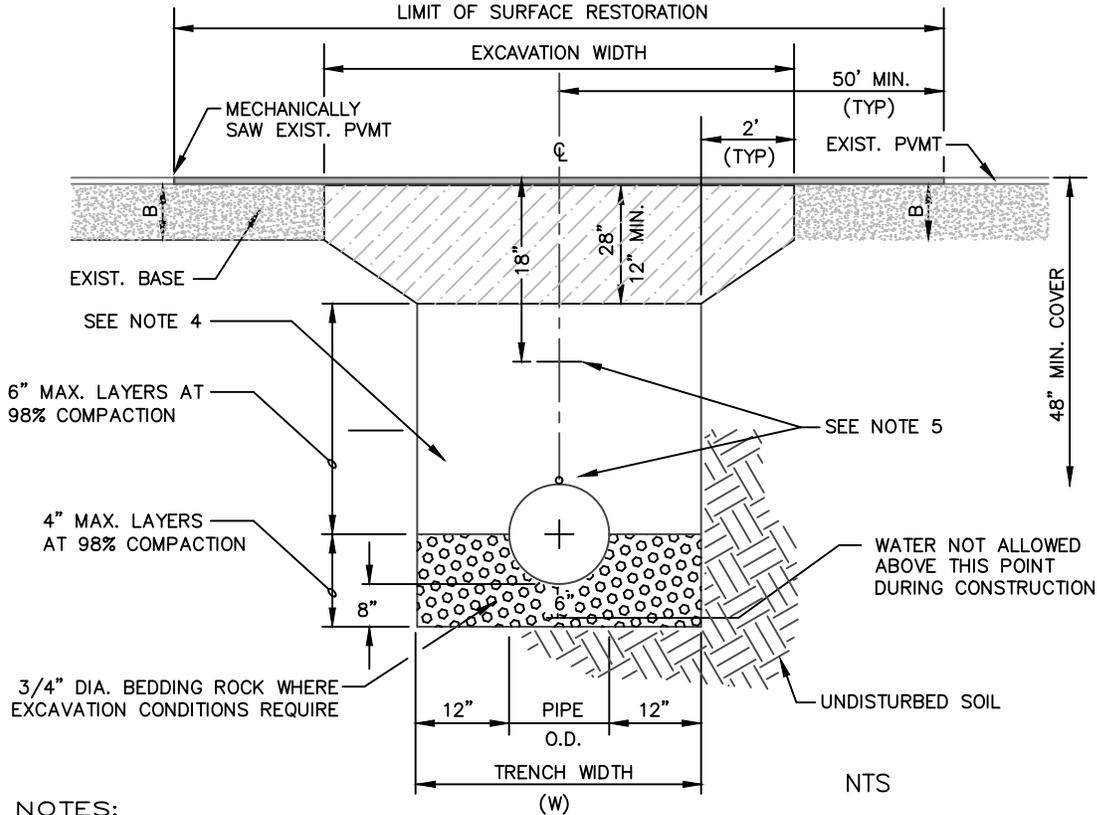


**IRRIGATION
(SPRINKLER) SERVICE
(UNDER ROAD) DETAIL
RW-7**

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PAVEMENT CUT AND PATCH DETAIL

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.



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. SATISFACTORY FILL MATERIALS ARE ASTM D2487 SOIL CLASSIFICATION GROUPS GW, GP, SW, AND SP. UNSATISFACTORY SOIL MATERIALS ARE ASTM D248 SOIL CLASSIFICATION GROUPS GC, SC, ML, MH, CL, CH, OL, OH, AND PT. ALL FILL MATERIAL FROM ON AND OFF-SITE SOURCES SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. ALL FILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, TRASH, OR OTHER OBJECTIONABLE MATERIAL.
5. 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.

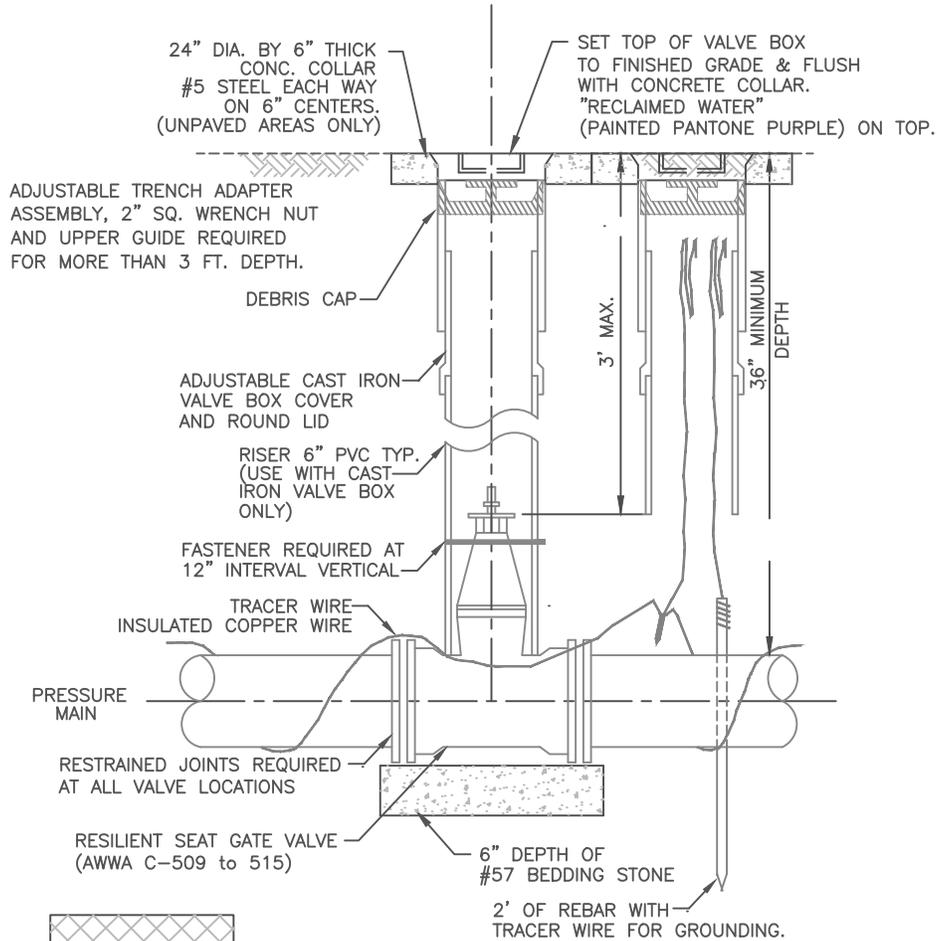
**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**PAVEMENT CUT AND
PATCH DETAIL
RW-8**

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VALVE AND VALVE BOX DETAIL



RECLAIMED WATER COVER

NOTES:

1. SEE CODB'S APPROVED PRODUCT LIST FOR ACCEPTABLE MANUFACTURERS.
2. IF A RECLAIMED WATER METER BOX IS NOT WITH IN 200 FEET OF A VALVE & VALVE BOX, THEN IT REQUIRES AN ADDITIONAL VALVE BOX FOR TRACER WIRE.
3. TRACER WIRE SHALL BE A MINIMUM 12 GAUGE WITH A TENSILE STRENGTH/BREAK LOAD OF 452 LBS. SEE TRACER WIRE SPECIFICATION #15049
4. BRASS ID VALVE MARKER TAG TO BE INSTALLED IN CONCRETE COLLAR.

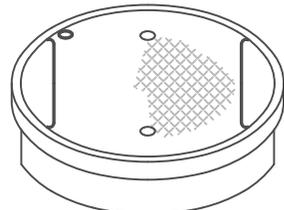
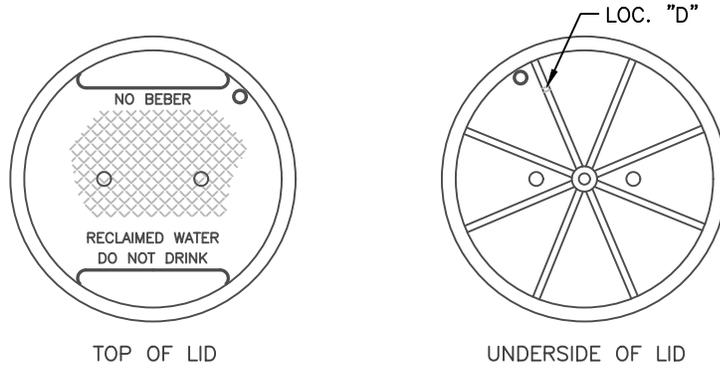
**THE CITY OF DAYTONA BEACH
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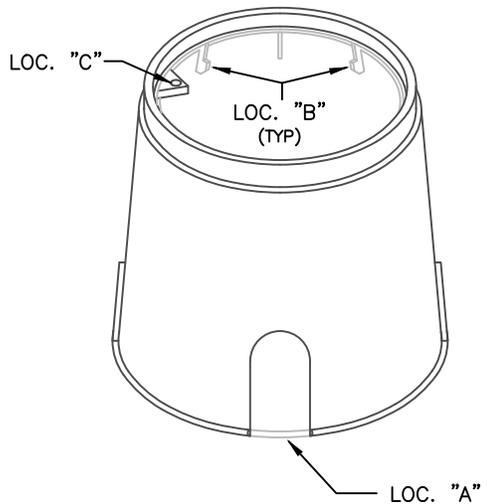
**VALVE AND VALVE
BOX DETAIL
RW-9**

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CARSON PLASTIC VALVE BOX DETAIL



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

**THE CITY OF DAYTONA BEACH
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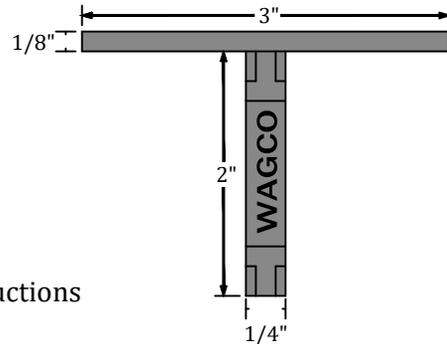
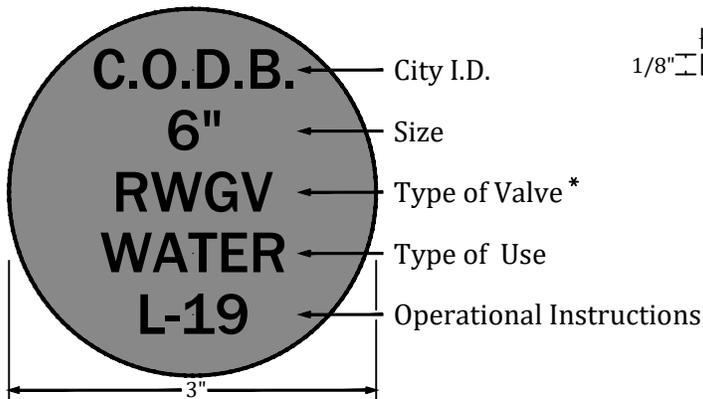
**CARSON PLASTIC
VALVE BOX DETAIL
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RECLAIMED WATER VALVE MARKER/TAG DETAIL

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

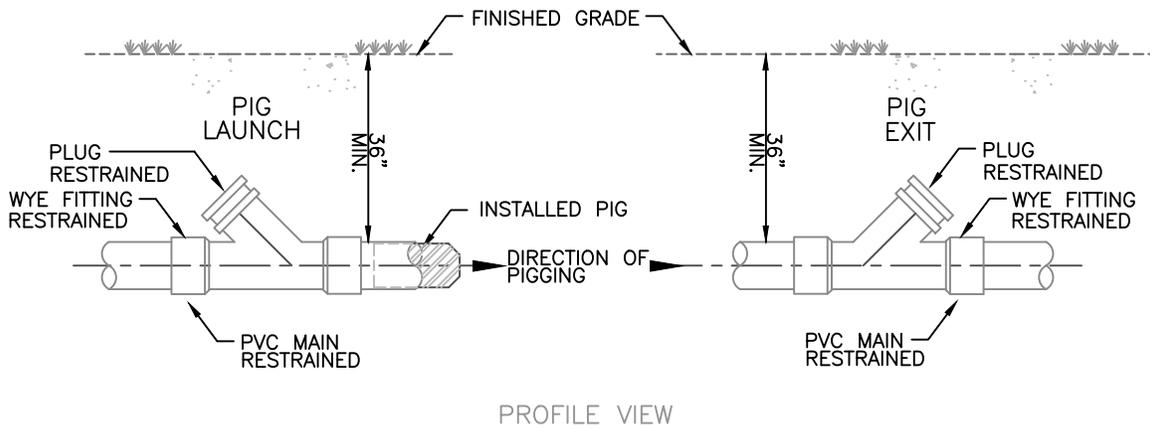
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RECLAIMED WATER VALVE
MARKER/TAG DETAIL
RW-11

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PIG LAUNCH & RECEIVING FITTINGS RECLAIMED WATER MAIN NTS



NOTES:

1. ALL MATERIALS TO BE PANTONE PURPLE.

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**PIG LAUNCH AND
RECEIVING DETAIL
RW-12**

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RECLAIMED WATER IN USE SIGN



NTS

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RECLAIMED WATER
IN USE SIGN
RW-13

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The City of Daytona Beach Utilities Department

List of Acceptable Products

RECLAIMED WATER

FY-2024-2025

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

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



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The City of Daytona Beach Utilities Department

List of Acceptable Products

RECLAIMED WATER

FY-2024-2025

Reclaimed Water Category 1 of 4: VALVES AND ACCESSORIES

Air, Vacuum or Air/Vac Combination Release Valves

- | | |
|------------------|-------------------------------|
| 1. APCO | 1. 200 |
| 2. ARI | 2. ARI, D-040 / S-050 / S-010 |
| 3. Crispin | 3. PL10 |
| 4. GA Industries | 4. 920 |
| 5. Val-Matic | 5. VM-38, VM-45 |

Air Release Valve Enclosure

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

Blow Off Valve

- | | |
|-------------------------|-----------------------|
| 1. Hydro Guard | 1. Automatic Blow Off |
| 2. Kupferle Foundry Co. | 2. Series TF 550 |
| 3. Water Plus | 3. Series VB 2000 |

Gate Valves - general (resilient seat)

AWWA C509 and C515

- | | |
|---------------------------|------------------|
| 1. American Flow Control | 1. C509 and C515 |
| 2. Mueller | 2. C509 (only) |
| 3. Clow | 3. C509 (only) |
| 4. Kennedy | 4. C509 (only) |
| 5. US Pipe | 5. C509 (only) |
| 6. American AVK | 6. C509 (only) |
| 7. East Jordan Iron Works | 7. C509 and C515 |

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

- | | |
|--------------------------|------------------|
| 1. American Flow Control | 1. Series 2500 |
| 2. Clow | 2. Series F-6100 |
| 3. Mueller | 3. Series A2361 |
| 4. US Pipe | 4. Series 5460 |
| 5. Kennedy | 5. Series 4571 |
| 6. M&H | 6. Series 4067 |

**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



RECLAIMED WATER
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The City of Daytona Beach Utilities Department

List of Acceptable Products

RECLAIMED WATER

FY-2024-2025

Gate Valves 12" and Smaller (resilient seated only)

- | | |
|--------------------------|------------------|
| 1. American Flow Control | 1. Series 2500 |
| 2. American R/D | 2. Series 2000 |
| 3. AVK | 3. Series 25 |
| 4. Clow | 4. Series F-6100 |
| 5. Kennedy | 5. Series 4571 |
| 6. M&H | 6. Series 4067 |
| 7. Mueller | 7. Series A2360 |
| 8. US Pipe | 8. Metroseal 250 |
| 9. Waterous | 9. Series 500 |

} McWane
} Owned

Tapping Valves (resilient seated only)

- | | |
|--------------------------|------------------|
| 1. American Flow Control | 1. Series 2500 |
| 2. AVK | 2. Series 25 |
| 3. Clow | 3. Series F-6114 |
| 4. Kennedy | 4. Series 4950 |
| 5. M&H | 5. Series 4751 |
| 6. Mueller | 6. T2360 & A2361 |
| 7. US Pipe | 7. Metroseal 250 |
| 8. Waterous | 8. Series 500 |

Reclaimed Water Category 2 of 4: SERVICE MATERIALS

Corporation Stops - Ball Type 1" & 2" (w / AWWA taper CC threads only / pack joint outlet for CTS)

- | | |
|-------------|-------------|
| 1. Ford | 1. FB1000 |
| 2. McDonald | 2. 4701B-22 |
| 3. Mueller | 3. B-25008N |

Curb Stops - locking Straight Valves (ball type compression by FIP, 1" & 2" CTS O.D. tubing by 3/4", 1" & 2" FIP)

- | | |
|-------------|--|
| 1. Ford | 1. B41-343-QNL, B41-444-QNL, B41-777-QNL |
| 2. McDonald | 2. 76102WQ, |
| 3. Mueller | 3. B-25172N, B-25163N |

Curb Stops - locking Straight Valves (ball type compression by compression (3/4"X3/4", 1"X1" OR 2"X2"))

- | | |
|-------------|--|
| 1. Ford | 1. B44-343-QNL, B44-444-QNL, B44-777-QNL |
| 2. McDonald | 2. 76000G |
| 3. Mueller | 3. B-25209N |

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



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The City of Daytona Beach Utilities Department

List of Acceptable Products

RECLAIMED WATER

FY-2024-2025

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

- | | |
|--------------|-----------------------------------|
| 1. Endot | 1. Endotrace #14 wire |
| 2. Endotrace | 2. Endotrace |
| 3. ADS | 3. Poly Flex water service tubing |

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 |

Reclaimed Water Category 3 of 4: PIPE MATERIALS

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 |
| 4. Power Seal | 4. Model 4810ES |
| 5. PSI | 5. Model C, S, & W |

**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



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The City of Daytona Beach Utilities Department

List of Acceptable Products

RECLAIMED WATER

FY-2024-2025

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 | 1. Gradelock |
| 2. Assured Flow Sales | |
| 3. Griffin | |
| 4. Nappco/Sigma | |
| 5. Star | |
| 6. Union/Tyler | |
| 7. US Pipe | 7. Permafuse or cement lined |
| 8. SIP Industries | |

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UTILITIES DEPARTMENT



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The City of Daytona Beach Utilities Department

List of Acceptable Products

RECLAIMED WATER

FY-2023-2024

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 | 1. Gradelock |
| 2. Assured Flow Sales | |
| 3. Griffin | |
| 4. Nappco/Sigma | |
| 5. Star | |
| 6. Union/Tyler | |
| 7. US Pipe | 7. Permafuse or cement lined |
| 8. SIP Industries | |

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The City of Daytona Beach Utilities Department

List of Acceptable Products

RECLAIMED WATER

FY- 2024-2025

Restrained Joints - DIP

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. American 2. EBAA Iron Inc.
 3. Ford 4. Star
 5. US Pipe 6. Sigma 7. Mueller 8. Romac 9. SIP Industries | <ol style="list-style-type: none"> 1. Fast Grip Gasket 2. Mega-lug series 1100, series 1700 restraint, 2003 PV series RS-3800 restrainer 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

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. American Flow Control 2. Clow 3. Mueller 4. US Pipe 5. Smith Blair 6. JCM | <ol style="list-style-type: none"> 1. Series 2800 2. Series F-5205, F-5207 3. Series H-615, H-616, H-619 4. Series T-9 5. Style 622, Style 623 6. Series 412, Series 414 |
|---|--|

**THE CITY OF DAYTONA BEACH
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THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



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SANITARY SEWER CONSTRUCTION & DESIGN STANDARDS

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. UTILITIES IDENTIFIED AS PRIVATE SHALL BE CONSTRUCTED TO CITY OF DAYTONA BEACH'S UTILITIES STANDARDS.
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://ww.codb.us/indez.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 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. MAINLINE TOLERANCES FOR SANITARY SEWER VERTICAL DEFLECTION SHALL BE NO MORE THAN 0.5" IN DEPTH AND NOT EXCEEDING THREE (3) FEET IN LENGTH.
4. UPON COMPLETION, THE CONTRACTOR SHALL PROVIDE THE CITY 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, BENCHES AND FLOW CHANNELS 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. CCTV SEWER VIDEOS AND AS-BUILT DOCUMENTS MUST BE REVIEWED AND APPROVED BY THE EOR STATING COMPLIANCE WITH CITY STANDARDS PRIOR TO REVIEW BY THE CITY. CCTV MUST BE PERFORMED WITH CITY INSPECTOR AND/OR ENGINEER OF RECORD PRESENT.
5. 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.
6. 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. 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. PLANS SHALL DIMENSION THE LOCATION OF ALL FORCE MAINS, VALVES, MANHOLES & LATERALS FROM THE BASELINE OF CONSTRUCTION AND FROM THE RIGHT-OF-WAY LINE.
11. LANDSCAPE PLANS SHALL CLEARLY DEPICT THE LOCATION OF PLANTINGS RELATIVE TO THE LOCATION OF PUBLIC UTILITIES AND STORM WATER INFRASTRUCTURE.
12. THE CITY'S AS-BUILT DRAWING REQUIREMENTS ARE ATTACHED TO THE BACK OF THE UTILITIES DEPARTMENT'S STANDARD DETAILS.

**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**SANITARY SEWER
CONSTRUCTION &
DESIGN STANDARDS
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SANITARY SEWER CONSTRUCTION & DESIGN STANDARDS (CONT')

13. ALL GRAVITY SANITARY SEWER MAINS SHALL BE A MINIMUM OF 8" DIAMETER.
14. 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.
15. ALL GRAVITY SANITARY SEWER MAINS SHALL BE GREEN PVC SDR-26, ASTM D-3034, OR C-900 DR-18. IN PLACES WHERE A MINIMUM COVER OF 4 FEET CANNOT BE MAINTAINED OR IN DEPTHS OF 10 FEET OR GREATER (CUT TO INVERT) MAINS SHALL BE C-900 DR-18.
16. 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. AT THE END OF SERVICES LATERALS INSTALL A LOCATIONS MARKER WITHA 3M ELECTRONICE MARKER SYSTEM (EMS) FULL RANGE MARKERS, WITH A 2"x4"x4' PRESSURE TREATED STAKE PAINTED GREEN VISIBLE FROM THE ROAD. RUBBER SEAL FITTINGS SHALL BE USED ON ALL LINES. NO GLUED JOINTS ARE PERMITTED ON LATERALS.
17. FOR MULTI-FAMILY AND COMMERCIAL SITES, SIX INCH MINIMUM SEWER SERVICES AND CLEANOUTS SHALL BE PROVIDED AS APPROVED BY THE CITY.
18. 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 AND HORIZONTAL DIRECTIONAL DRILL FORCE MAINS SHALL HAVE A MINIMUM WORKING PRESSURE OF 160 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.
19. FORCE MAIN MINIMUM DEPTH OF COVER SHALL BE 48". ALL FORCE MAINS SHALL BE DISTINCTLY MARKED BY GREEN STRIPES OR COLORED GREEN.
20. 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). THE RESTRAINED JOINT LENGTHS SHALL BE SHOWN ON THE PLANS PROVIDED BY THE ENGINEER OF RECORD.
21. ALL RESTRAINED PIPE BELL JOINTS SHALL USE BELL RESTRAINTS. GRIPPER TYPE GASKETS CAN BE USED FOR DUCTILE IRON PIPE JOINTS. CONCRETE THRUST BLOCKS ARE NOT PERMITTED.
22. 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.
23. ALL IN-LINE SANITARY SEWER FORCE MAIN VALVES SHALL BE FULL PORT PLUG VALVES UNLESS OTHERWISE NOTED. VALVES SHALL BE INSTALLED AT EACH END OF THE FORCE MAIN AND ON STUB OUTS.
24. ALL C-900 PVC DR-18 PIPE REQUIREMENTS REFERENCE THE C-900 STANDARDS.
25. MINIMUM GRAVITY SANITARY SEWER SLOPES ARE AS FOLLOWS: 8" PIPE 0.40%, 10" PIPE 0.28%, 12" PIPE 0.22%, 15" PIPE 0.15%, OR OTHERWISE NOTED BY UTILITIES DEPT. MANHOLES SHALL HAVE AT LEAST 1 TENTH FALL FROM INCOMING INVERT OR INVERTS TO THE OUT GOING INVERT IN THE MANHOLE.
26. GRAVITY SANITARY SEWER LINE CONSTRUCTION SHALL BE ACCOMPLISHED BY THE USE OF A LASER INSTRUMENT UNLESS ANOTHER METHOD IS APPROVED BY THE CITY.
27. 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.
28. 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.
29. ON ALL EXCAVATION AND BACKFILLING THE CONTRACTOR SHALL PROVIDE ADEQUATE SHEETING AND BRACING IN ORDER TO PROVIDE A SAFE WORKING ENVIRONMENT.
30. 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.
31. ALL GASKETS SHALL BE LUBRICATED BEFORE INSTALLATION.
32. THE CONTRACTOR SHALL INSTALL A #12-GAUGE MINIMUM COPPER TRACER WIRE TAPED TO THE TOP OF THE PIPE AT INTERVALS NO GREATER 4 FEET. COPPER WIRE SHALL HAVE A MIN. TENSILE STRENGTH/BREAK LOAD OF 452 LBS. AND REQUIRES APPROVAL BY THE CITY FOR THE FULL LENGHT 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. THE TAPE SHALL BE COLOR CODED GREEN FOR FORCE MAINS. LOCATER WIRE SHALL TERMINATE AT A LOCATION AND IN MANNER CONVENIENT FOR THE CITY LOCATER STAFF.

**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**SANITARY SEWER
CONSTRUCTION &
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SANITARY SEWER CONSTRUCTION & DESIGN STANDARDS (CONT')

34. TRACER WIRE SHALL BE TESTED FOR CONTINUITY UNDER SUPERVISION OF A CITY REPRESENTATIVE AFTER INSTALLATION.
35. 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.
36. 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 PRE-CAST BOTTOM SECTION.
37. STANDARD MANHOLES SHALL BE LOCATED AT INTERVALS NOT EXCEEDING 400 FEET.
38. 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. ALL MANHOLES SHALL HAVE A INFLOW DEFENDER INFLOW DISH (RAIN/STORMWATER DISH) INSTALLED UNDER MANHOLE LID PRIOR TO INSPECTION.
39. THE CONTRACTOR SHALL CONSTRUCT SANITARY SEWER MANHOLES IN SUCH A WAY THAT SEWER LINES DO NOT INTERSECT SEALED JOINTS BETWEEN SECTIONS OF THE MANHOLE.
40. 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.
41. SANITARY SEWER DROP MANHOLES SHALL ONLY BE USED UNDER SPECIAL CONDITIONS AS APPROVED BY THE CITY. DROPS ARE REQUIRED FOR SEWERS ENTERING MANHOLES AT 2.0' OR ABOVE THE THE BOTTOM INVERT OF THE MANHOLE.
42. SANITARY SEWER MANHOLES WITH SEWER FORCE MAINS DISCHARGING DIRECTLY INTO THEM SHALL BE FIBERGLASS OR POLY-ETHYLENE 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.
43. 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.
44. 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 MANHOLES 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.
45. CONTROL MANHOLE OR MANHOLES SHALL BE CONSTRUCTED AT LOCATIONS EASILY ACCESSIBLE AT ALL TIMES TO CITY PERSONNEL FOR SAMPLING.
46. 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.
47. 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.
48. ALL FITTINGS SHALL MEET THE MINIMUM RESTRAINT REQUIREMENTS PER ANSI/AWWA/DIPRA, AND ALL PRESSURE PIPES UNDER ROADWAYS SHALL BE RESTRAINED.
49. LOW PRESSURE SANITARY SEWER SYSTEMS ARE NOT PERMITTED IN RESIDENTIAL OR COMMERCIAL SUBDIVISIONS.
50. SANITARY SEWER SYSTEMS SHALL BE RE-TELEVISED IN THEIR ENTIRETY, CITY REVIEWED AND APPROVED 30 DAYS PRIOR TO THE MAINTENANCE BOND BEING RELEASED.

**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**SANITARY SEWER
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**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 FORWARDED 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 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.

ALLOWABLE LEAKAGE PER 1000 FT. OF PIPELINE * -GPH

AVERAGE TEST PRESSURE (PSI)	NOMINAL PIPE DIAMETER - INCHES																AVERAGE TEST PRESSURE (PSI)		
	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48	54		60	64
450	0.48	0.64	0.95	1.27	1.59	1.91	2.23	2.55	2.87	3.18	3.82	4.78	5.73	6.69	7.64	8.60	9.56	10.19	450
400	0.45	0.60	0.90	1.20	1.50	1.80	2.10	2.40	2.70	3.00	3.60	4.50	5.41	6.31	7.21	8.11	9.01	9.61	400
350	0.42	0.56	0.84	1.12	1.40	1.69	1.97	2.25	2.53	2.81	3.37	4.21	5.06	5.90	6.74	7.58	8.43	8.99	350
300	0.39	0.52	0.78	1.04	1.30	1.56	1.82	2.08	2.34	2.60	3.12	3.90	4.68	5.46	6.24	7.02	7.80	8.32	300
275	0.37	0.50	0.75	1.00	1.24	1.49	1.74	1.99	2.24	2.49	2.99	3.73	4.48	5.23	5.98	6.72	7.47	7.97	275
250	0.36	0.47	0.71	0.95	1.19	1.42	1.66	1.90	2.14	2.37	2.85	3.56	4.27	4.99	5.70	6.41	7.12	7.60	250
225	0.34	0.45	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.25	2.70	3.38	4.05	4.73	5.41	6.03	6.76	7.21	225
200	0.32	0.43	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.12	2.55	3.19	3.82	4.46	5.09	5.73	6.37	6.80	200
175	0.30	0.40	0.59	0.80	0.99	1.19	1.39	1.59	1.79	1.98	2.38	2.98	3.58	4.17	4.77	5.36	5.96	6.36	175
150	0.28	0.37	0.55	0.74	0.92	1.10	1.29	1.47	1.66	1.84	2.21	2.76	3.31	3.86	4.41	4.97	5.52	5.88	150
125	0.25	0.34	0.50	0.67	0.84	1.01	1.18	1.34	1.51	1.68	2.01	2.52	3.02	3.53	4.03	4.53	5.04	5.37	125
100	0.23	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.80	2.25	2.70	3.15	3.60	4.05	4.50	4.80	100

* 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)

**THE CITY OF DAYTONA BEACH
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**SANITARY SEWER
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TABLE OF DAILY FLOWS FOR WASTE WATER

Waste Water - Table of Daily Flows

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

*** 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.

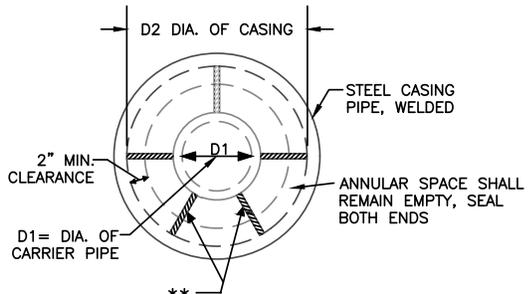
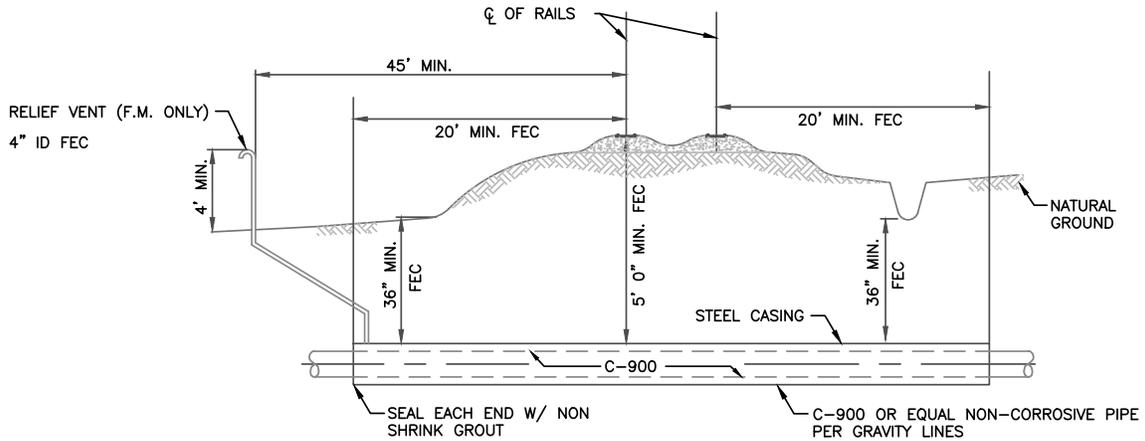
THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



TABLE OF DAILY FLOWS
FOR WASTE WATER
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TYPICAL RAILROAD CROSSING DETAIL



TYPICAL RAILROAD CROSSING NTS

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.)														
CARRIER PIPE NOM. DIA. (D1)	4	6	8	10	12	14	16	18	20	24	30	36	42	48
CASING PIPE NOM. DIA. (D2)	14	16	18	22	24	30	30	30	36	36	48	54	60	66
WALL THICKNESS—INCHES *	PER AUTHORITY HAVING JURISDICTION													

NOTES:

1. MINIMUM COVER FOR TOP OF CASING TO R/R BASE SHALL BE 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 FLOTATION 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 FDOT 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**



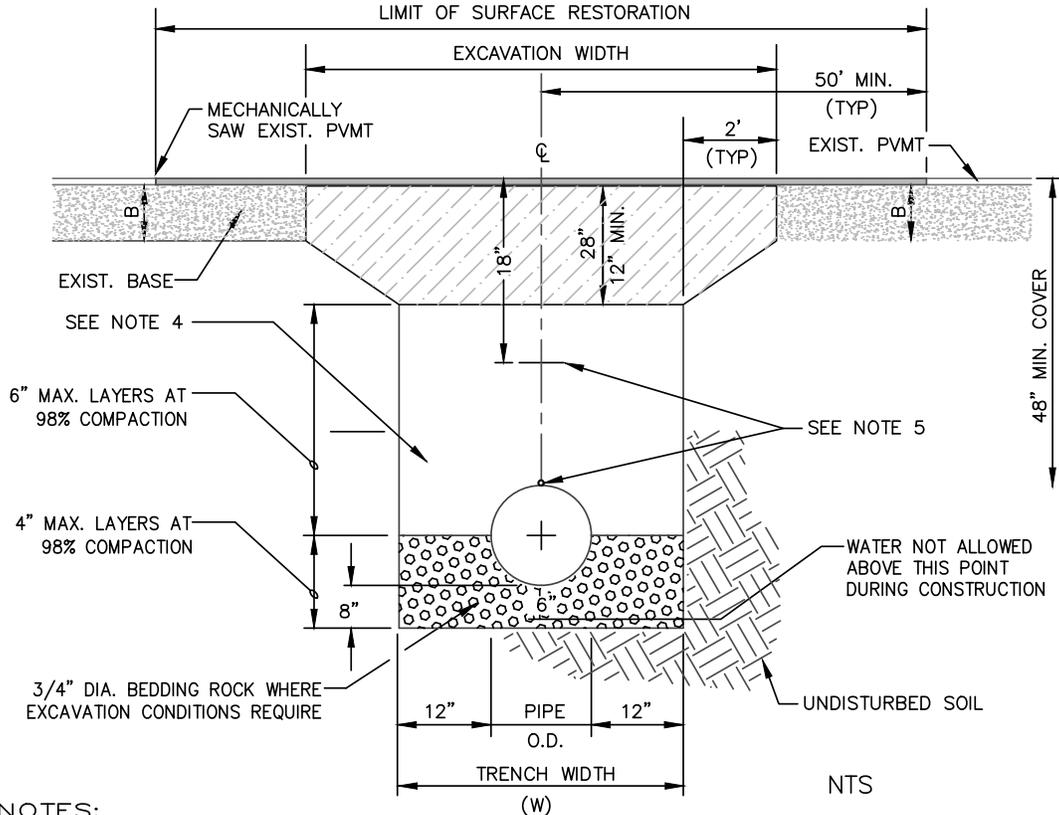
**TYPICAL RAILROAD
CROSSING DETAIL
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PAVEMENT CUT AND PATCH DETAIL

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.



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. SATISFACTORY FILL MATERIALS ARE ASTM D2487 SOIL CLASSIFICATION GROUPS GW, GP, SW, AND SP. UNSATISFACTORY SOIL MATERIALS ARE ASTM D248 SOIL CLASSIFICATION GROUPS GC, SC, ML, MH, CL, CH, OL, OH, AND PT. ALL FILL MATERIAL FROM ON AND OFF-SITE SOURCES SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. ALL FILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, TRASH, OR OTHER OBJECTIONABLE MATERIAL.
5. 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.

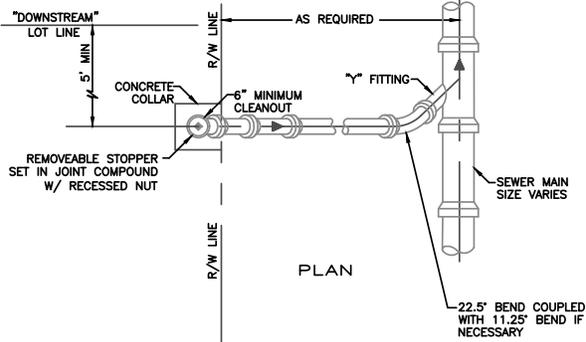
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**PAVEMENT CUT AND
PATCH DETAIL**
S-7

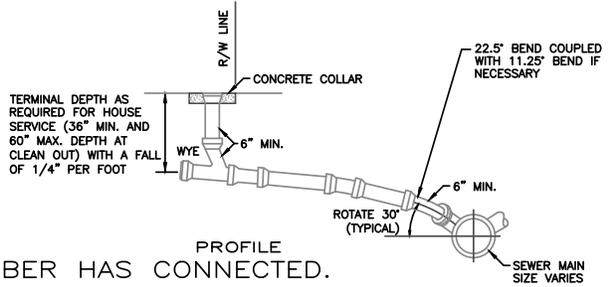
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RESIDENTIAL SANITARY LATERAL DETAIL

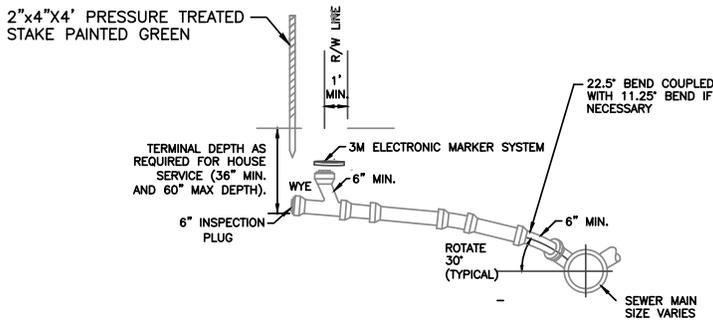


NOTES:

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
3. WHEN VCP (CLAY) MAIN IS ENCOUNTERED UTILIZE A PVC WYE WITH TWO PVC TO VCP COUPLINGS FOR SERVICE CONNECTION

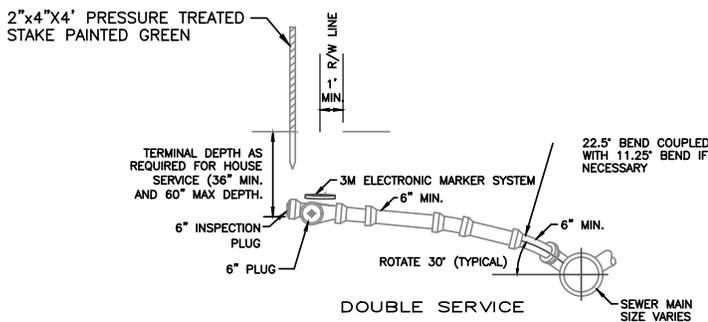


PHASE 2 AFTER PLUMBER HAS CONNECTED.



SEWER SERVICE CONNECTION NOTES

1. SERVICE LATERALS MUST BE LOCATED IN FRONT OF THE PROPERTY TO BE SERVED.
2. SERVICE LATERALS SHALL EXTEND 1 FOOT OFF OF RIGHT OF WAY LINE.
3. SERVICE LATERALS SHALL BE LOCATED TO AVOID CONFLICT WITH OTHER UTILITIES.
4. SERVICE LATERAL LOCATIONS SHALL BE MARKED WITH A 3M ELECTRONIC MARKER SYSTEM (EMS) FULL RANGE MARKERS.
5. ALL SERVICES SHALL BE SIX INCHES IN DIAMETER.
6. SERVICE CONNECTIONS SHALL NOT TERMINATE DIRECTLY INTO A MANHOLE.
7. SERVICE LATERAL LOCATIONS SHALL BE MARKED ALONG THE OUTSIDE EDGE OF CURB WITH A SAWCUT "S" OR BY A METAL TAB SET INTO THE PAVEMENT FOR ROADWAYS WITHOUT CURB.
8. INSTALL A 2"x4"x4' PRESSURE TREATED STAKE PAINTED GREEN AT THE END OF THE LATERAL.
9. CC WILL NOT BE ISSUED UNTIL ALL LATERALS HAVE BEEN VIDEOED AND CAPPED AS SHOWN.



PHASE 1 BEFORE HOMES ARE CONSTRUCTED

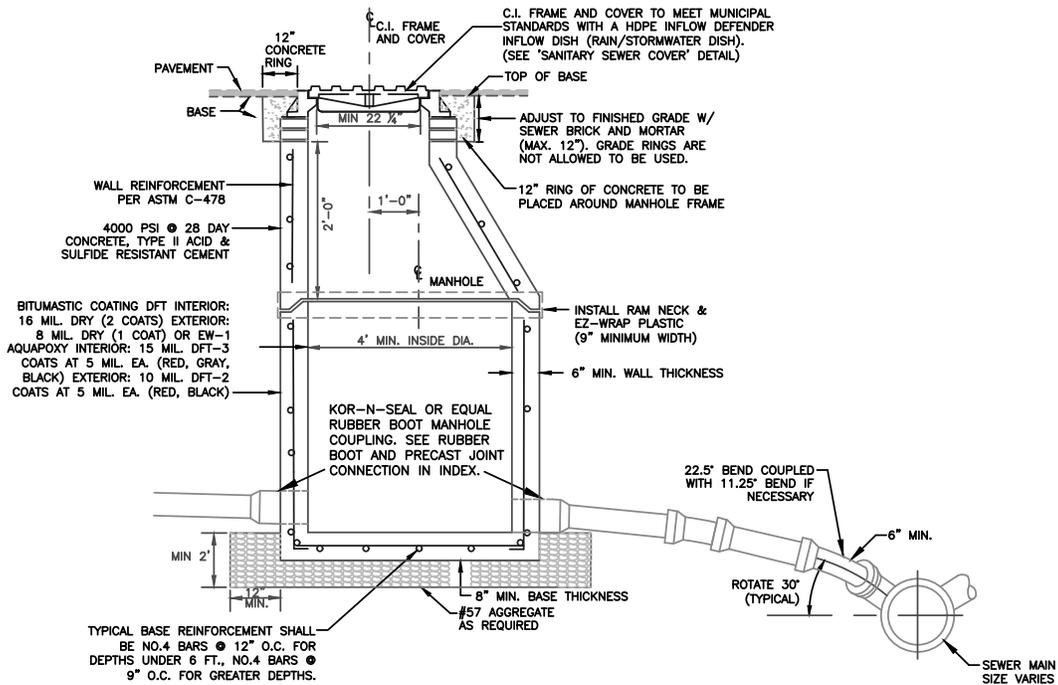
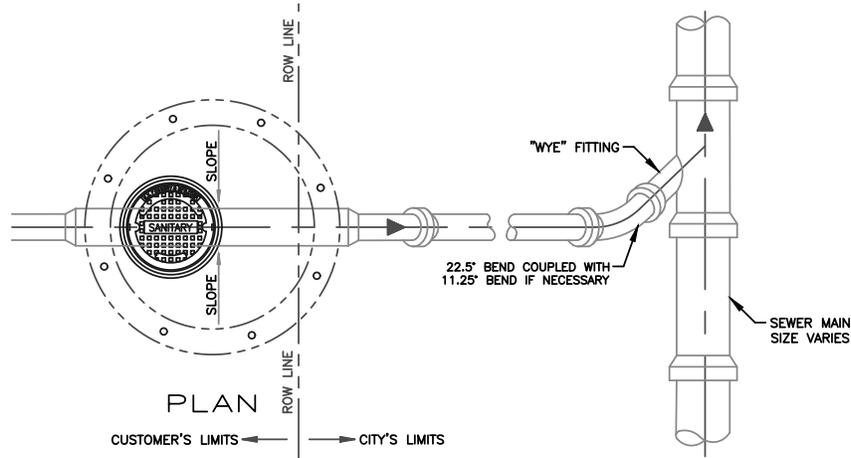
**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**RESIDENTIAL SANITARY
LATERAL DETAIL
S-8**

FY-2024-2025
Drawing Date: Jan-08
Revision Date: Jan 2024
Drawn By: MAL
Checked By: JMP
Scale: NTS
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COMMERCIAL SANITARY LATERAL DETAIL



- 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 O.D. 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 INVERTS SHALL COMPLY TO OUR STANDARDS IN 'SANITARY SEWER MANHOLE AND GENERAL NOTES'.
 5. A HDPE INFLOW DEFENDER, INFLOW DISH (RAIN/STORMWATER DISH) SHALL BE INSTALLED UNDER EVERY SANITARY MANHOLE LID.
 6. ADDITIONAL DEPTH OF STONE MAY BE REQUIRED FOR GROUND CONDITIONS.

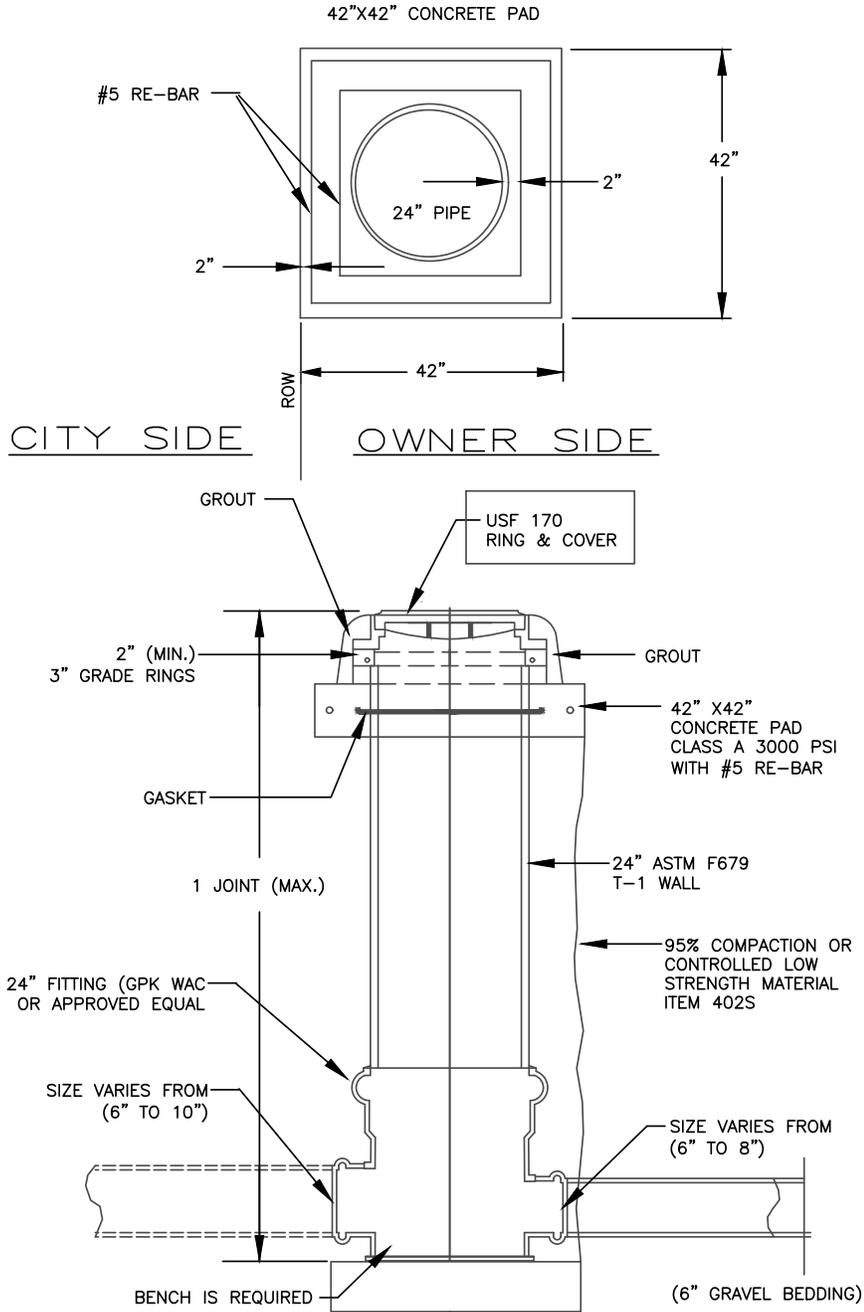
THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



COMMERCIAL
SANITARY LATERAL
DETAIL S-9A

FY-2024-2025
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Detail No.: S-9A
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ALTERNATE COMMERCIAL SANITARY NON-TRAFFIC BEARING DETAIL



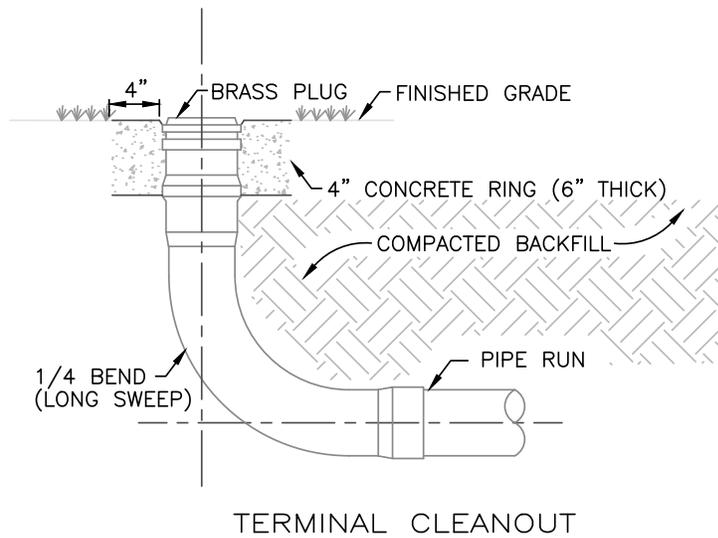
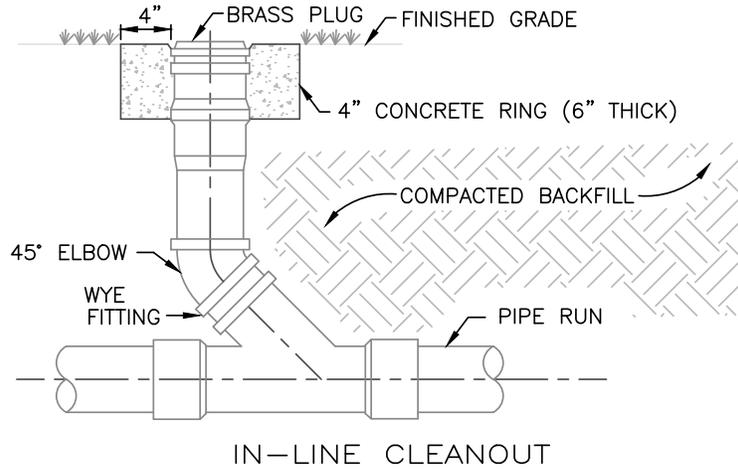
THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



ALTERNATE
COMMERCIAL SANITARY
NON-TRAFFIC BEARING
DETAIL S-9B

FY-2024-2025
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SANITARY CLEANOUT DETAIL



NOTE:
CONCRETE COLLAR REQUIRED IN UNPAVED AREAS

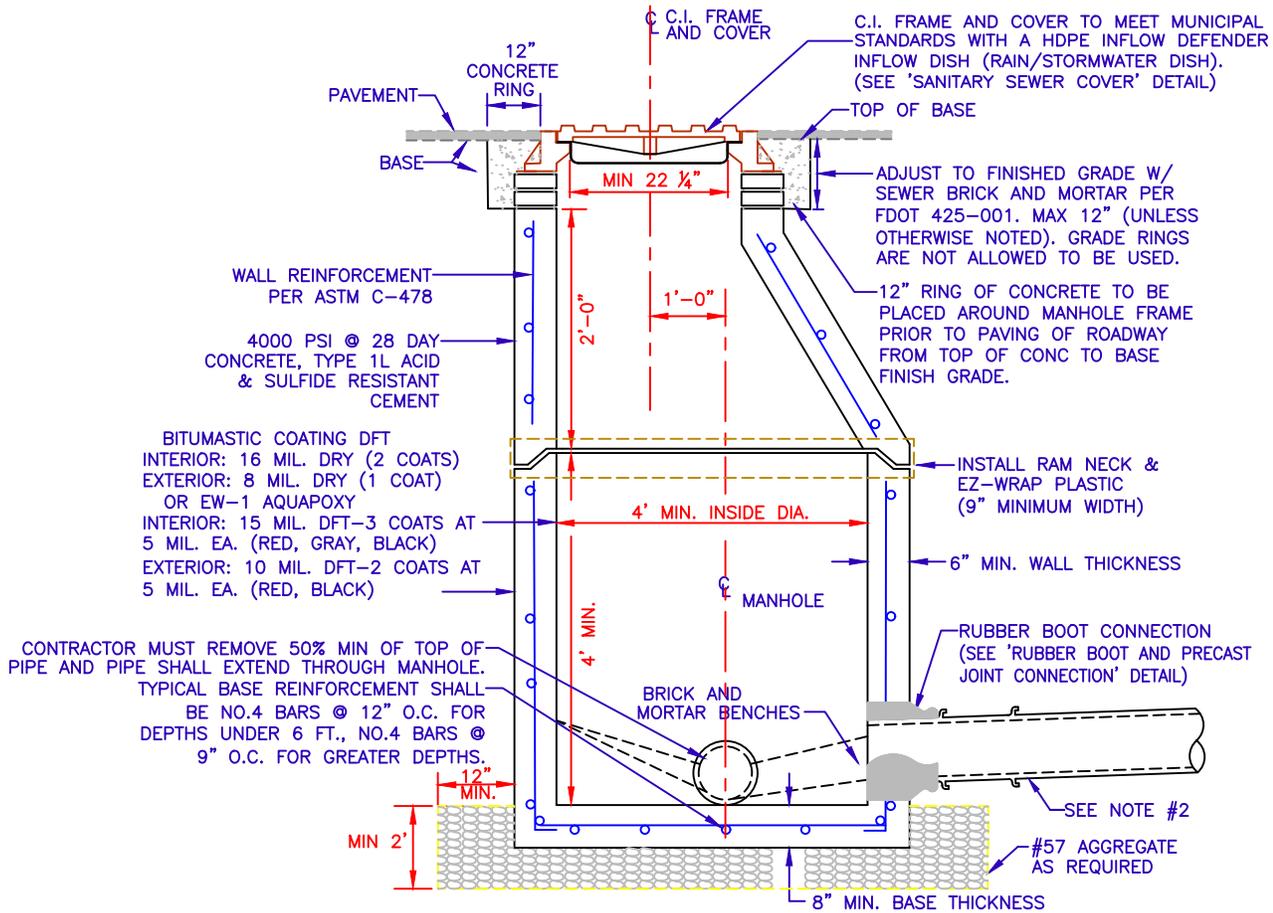
THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



**SANITARY LATERAL
CLEANOUT DETAIL**
S-10

FY-2024-2025
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SANITARY SEWER MANHOLE AND GENERAL NOTES



CROSS SECTIONAL VIEW
NTS

NOTES:

1. ON TRANSITIONS BETWEEN LARGER DIAMETER AND SMALLER SEWER COLLECTORS, INVERTS OF SEWERS SHALL BE MATCHED.
2. LAST 60' OF SEWER 12" PIPING ENTERING SEWER MANHOLE SHALL BE PVC C-900 PLACED AT A NEGATIVE GRADE. 15" AND ABOVE SHALL BE PVC C-905.
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 FLOTATION 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.
14. FIRST MANHOLE GOING IN TO THE WET WELL SHALL BE LINE WITH AGRU GRIP LINING SYSTEM.
15. A HDPE INFLOW DEFENDER, INFLOW DISH (RAIN/STORMWATER DISH) SHALL BE INSTALLED UNDER EVERY SANITARY MANHOLE LID.
16. ADDITIONAL STONE DEPTH MAY BE REQUIRED DEPENDING ON SOIL CONDITIONS.

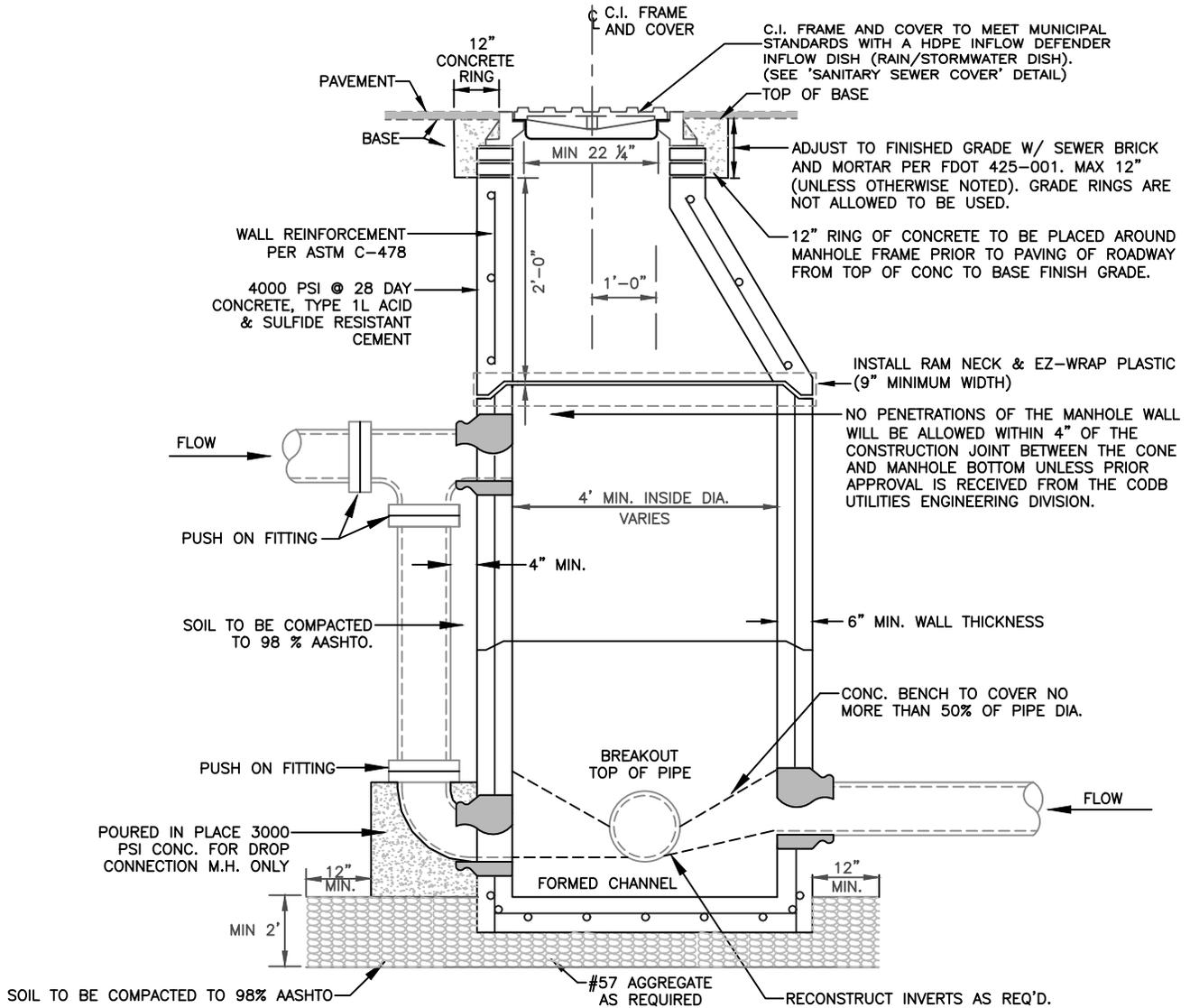
**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**SANITARY SEWER
MANHOLE AND
GENERAL NOTES
S-11**

FY-2024-2025
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OUTSIDE DROP SANITARY MANHOLE DETAIL



NOTE:

CROSS SECTIONAL VIEW

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

1. DROPS OF MORE THAN TWO 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.
4. A HDPE INFLOW DEFENDER, INFLOW DISH (RAIN/STORMWATER DISH) SHALL BE INSTALLED UNDER EVERY SANITARY MANHOLE LID.
5. ADDITIONAL STONE DEPTH MAY BE REQUIRED DEPENDING ON SOIL CONDITIONS.

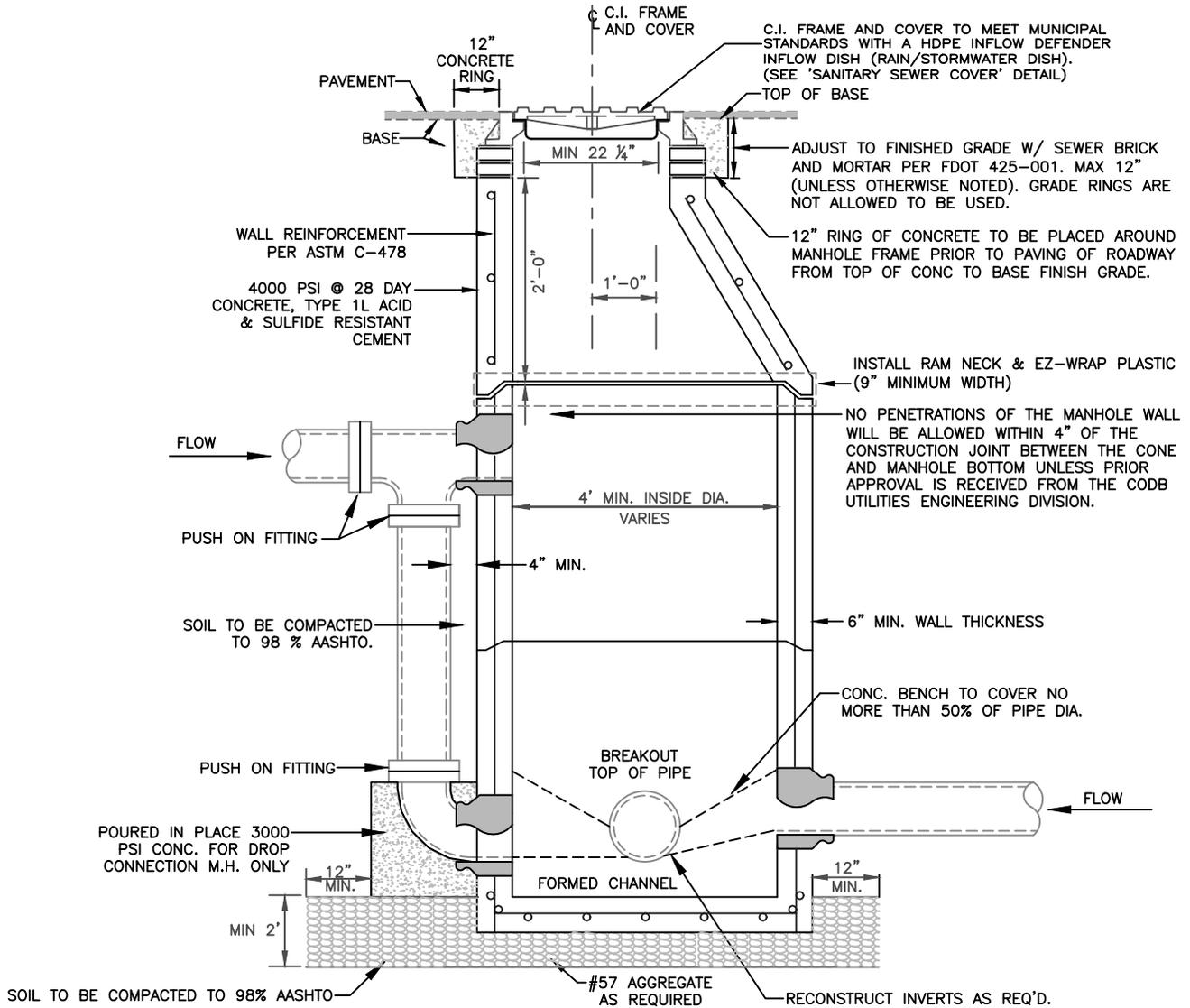
THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



OUTSIDE DROP
SANITARY MANHOLE
DETAIL
S-12

FY-2024-2025
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OUTSIDE DROP SANITARY MANHOLE DETAIL



NOTE:

CROSS SECTIONAL VIEW

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

1. DROPS OF MORE THAN TWO 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.
4. A HDPE INFLOW DEFENDER, INFLOW DISH (RAIN/STORMWATER DISH) SHALL BE INSTALLED UNDER EVERY SANITARY MANHOLE LID.
5. ADDITIONAL STONE DEPTH MAY BE REQUIRED DEPENDING ON SOIL CONDITIONS.

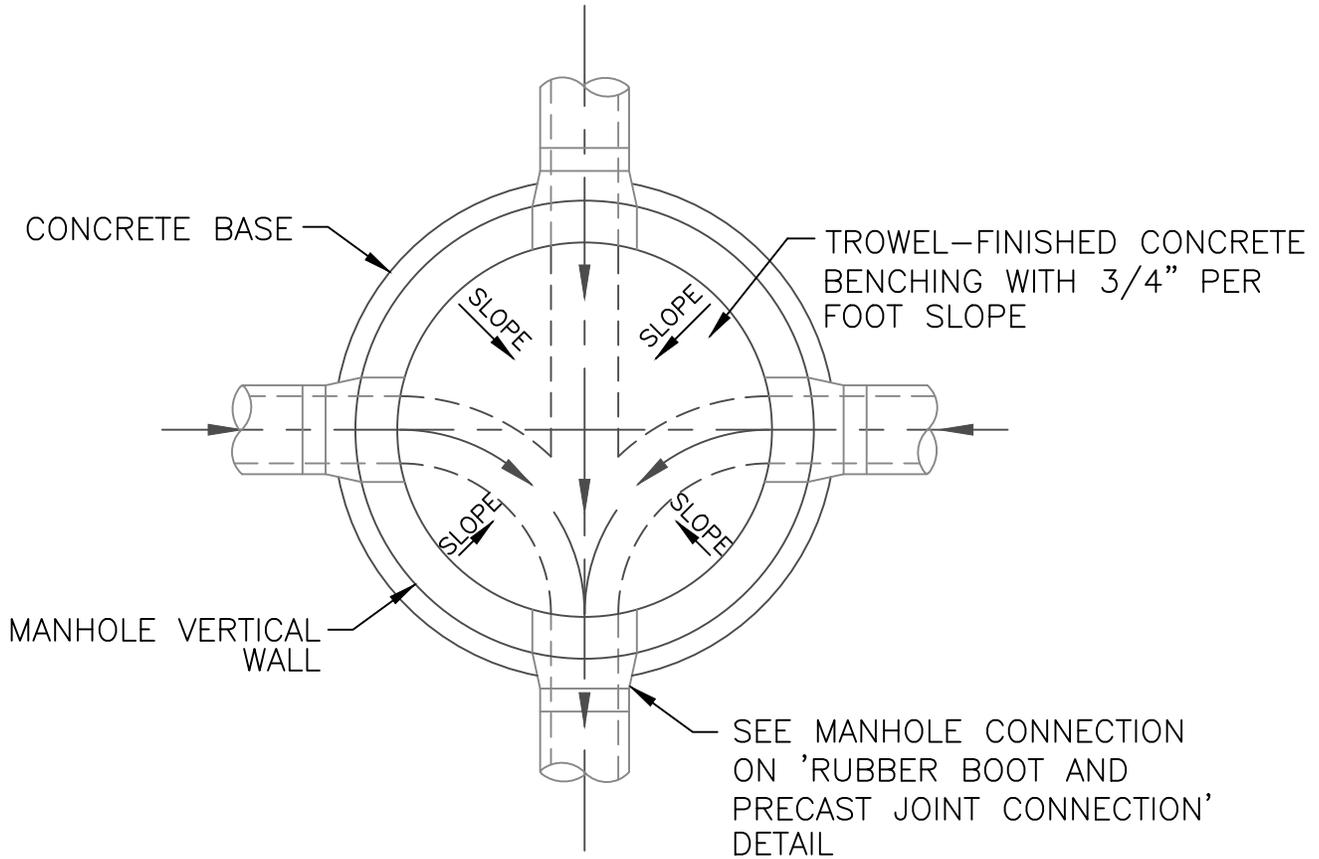
THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



OUTSIDE DROP
SANITARY MANHOLE
DETAIL
S-12

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SANITARY MANHOLE INVERT DETAIL



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.

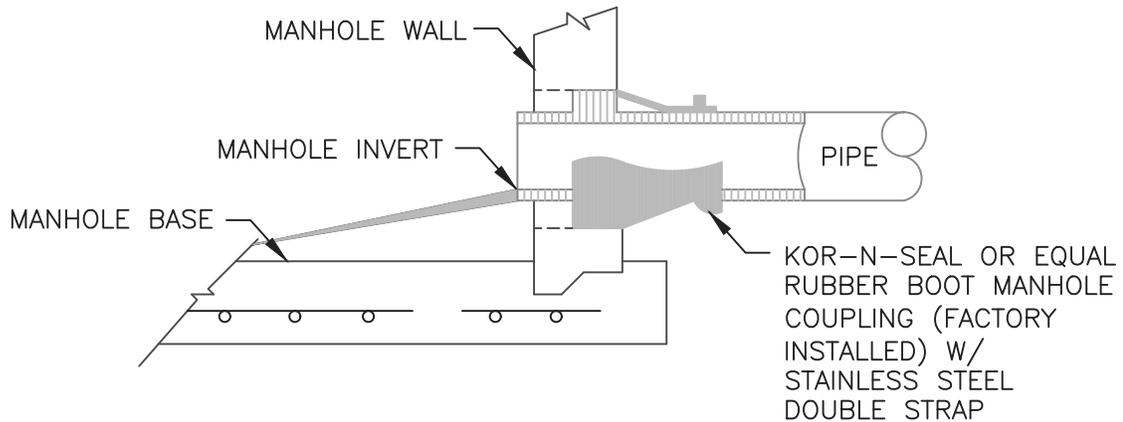
THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



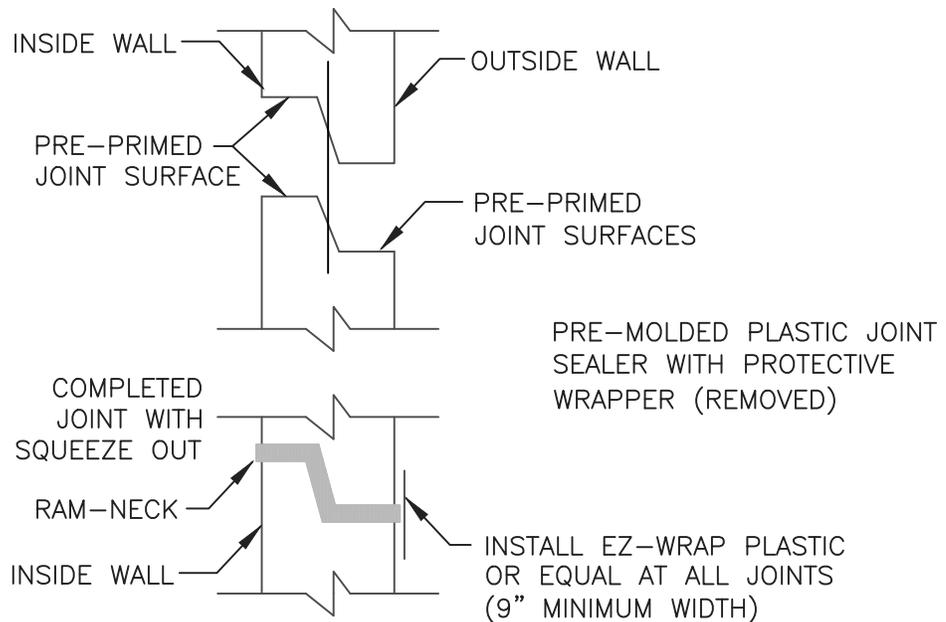
SANITARY MANHOLE
INVERT DETAIL
S-13

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RUBBER BOOT AND PRECAST JOINT CONNECTION DETAIL



MANHOLE PIPE CONNECTION DETAIL FOR NEW CONNECTIONS IN EXISTING MANHOLES



PRECAST JOINT CONNECTION

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 SNAPPED IN PLACE AND WATER TIGHT.

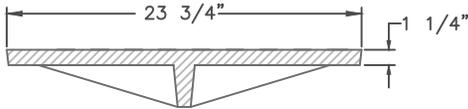
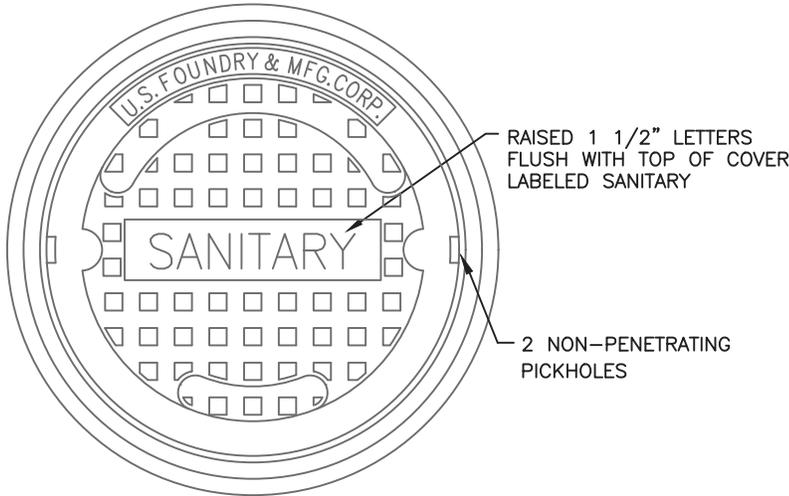
THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



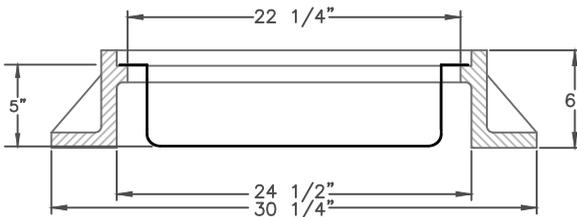
RUBBER BOOT AND
PRECAST JOINT
CONNECTION DETAIL
S-14

FY-2024-2025
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Checked By: JMP
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SANITARY SEWER COVER DETAIL



USF TYPE E MANHOLE COVER

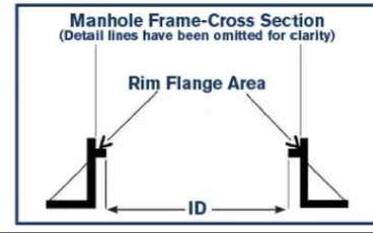


USF 170 MANHOLE RING

NOTES:

- 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.
- CONCRETE COLLAR AROUND MANHOLE FRAME IS REQUIRED IN PAVED AREAS ONLY.
- A HDPE INFLOW DEFENDER, INFLOW DISH (RAIN/STORMWATER DISH) SHALL BE INSTALLED UNDER EVERY SANITARY MANHOLE.

HDPE INFLOW DEFENDER



overview:

- THE USSI MANHOLE INFLOW DEFENDER (INFLOW DISH) WAS DESIGNED TO SIGNIFICANTLY ABATE RAINFALL "INFLOW FROM ENTERING THE SANITARY SEWER SYSTEM THROUGH THE MANHOLE COVER AND UPPER FRAME AREA. THE INFLOW DISH SHALL WITH STAND ALL GASES ASSOCIATED WITH WASTE WATER COLLECTION SYSTEMS. TO ENSURE A PROPER FIT, INFLOW DISHES ARE MANUFACTURED TO SPECIFIC MEASUREMENTS PROVIDED BY THE CLIENT. PLEASE SEE USSI INFLOW DEFENDER DISH MEASURING AND INSTALLATION PROCEDURES.

MEASURING AND INSTALLATION PROCEDURES:

- REMOVE THE MANHOLE COVER.
- CLEAN THE MANHOLE RIM FLANGE AREA OF DIRT AND DEBRIS TO INSURE ACCURATE MEASUREMENT.
- LOCATE MANHOLE FRAME INSIDE DIAMETER (ID) AND MEASURE ACROSS ID WITH A MINIMUM OF TWO DIMENSIONAL READINGS FOR ACCURACY—RECORD AND SMALLEST MEASUREMENT TO THE NEAREST 1/8".
- LOCATE MANHOLE OUTSIDE DIAMETER (OD) AND MEASURE ACROSS OD WITH A MINIMUM OF TWO DIMENSIONAL READINGS FOR ACCURACY—RECORD THE SMALLEST MEASUREMENT TO THE NEAREST 1/8".
- INSTALL INFLOW DISH AND REPLACE THE MANHOLE COVER.

**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**SANITARY SEWER
COVER DETAIL
S-15**

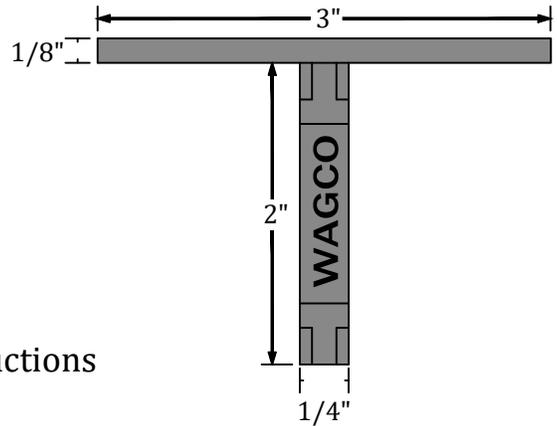
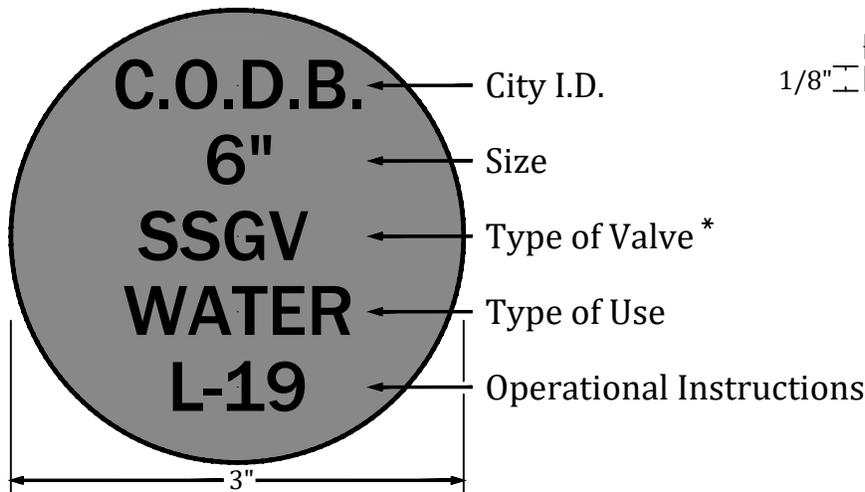
FY-2024-2025
Drawing Date: Jan-08
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Checked By: JMP
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SPECIFICATIONS

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

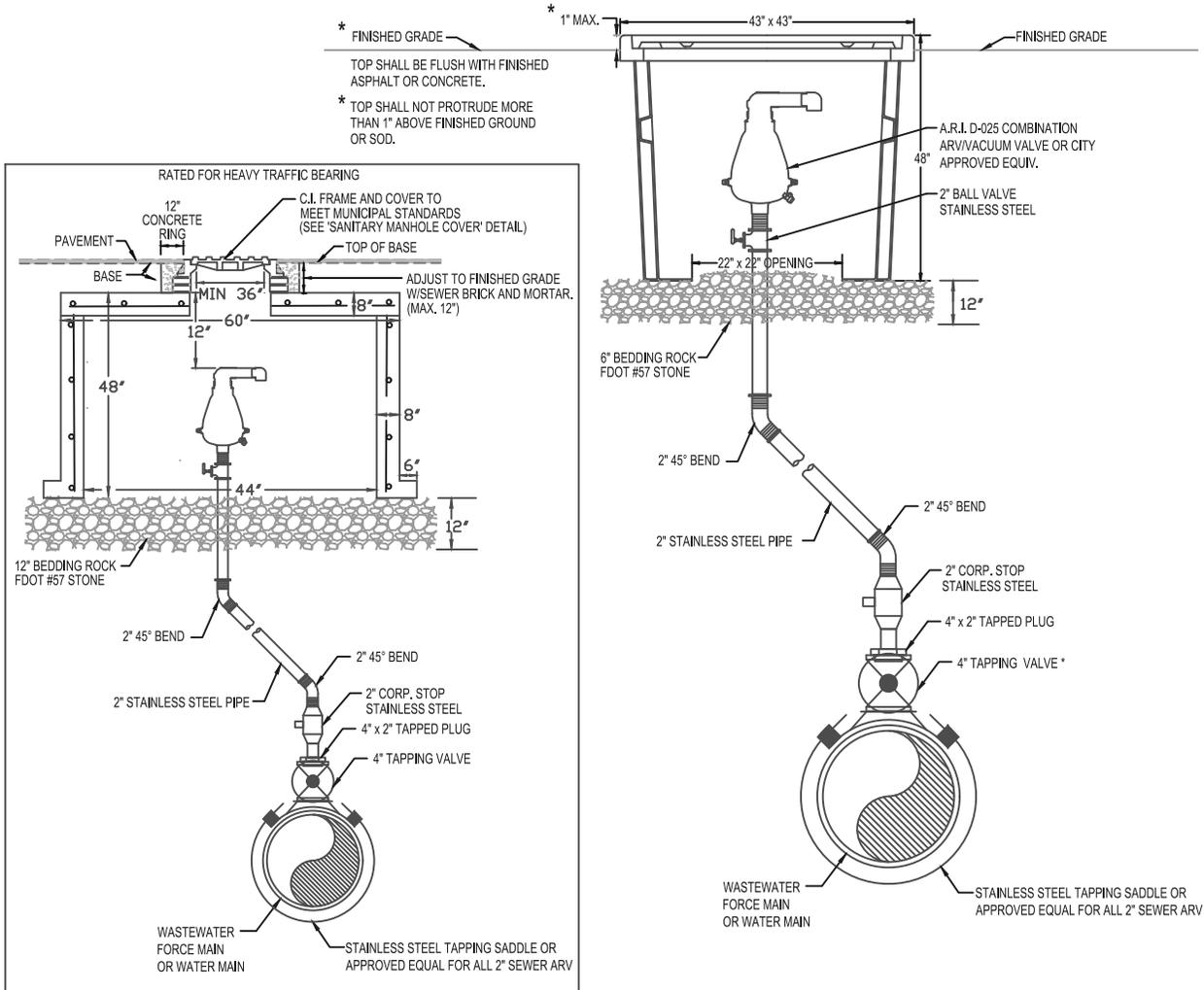
To be used on all valves.
 Embed in surface of concrete collar.



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AUTOMATIC ARV/VACUUM VALVE DETAIL

CDR SYSTEMS GROUP
A13-3636-48 402 BOX
OR CITY APPROVED EQUIV.
RATED FOR LIGHT TRAFFIC
BEARING.



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).
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.
7. PIPE SIZES UP TO 12" - USE 2" SADDLE.
8. PIPE SIZES 14" THRU 36" - USE A 4" TEE MJ, 4" PLUG VALVE MJ, WITH 4" x 2" TAPPED PLUG.
9. PIPE SIZES LARGER THAN 36" - USE A 6" TEE MJ, 6" PLUG VALVE MJ, WITH 6" x 4" TAPPED PLUG.
10. THE SIZE OF ARV IS DETERMINED BY PRESSURE, FLOW AND HYDRAULICS.
11. ARV LOCATIONS TO BE FINALIZED AFTER REVIEW OF PRELIMINARY AS-BUILT DATA.

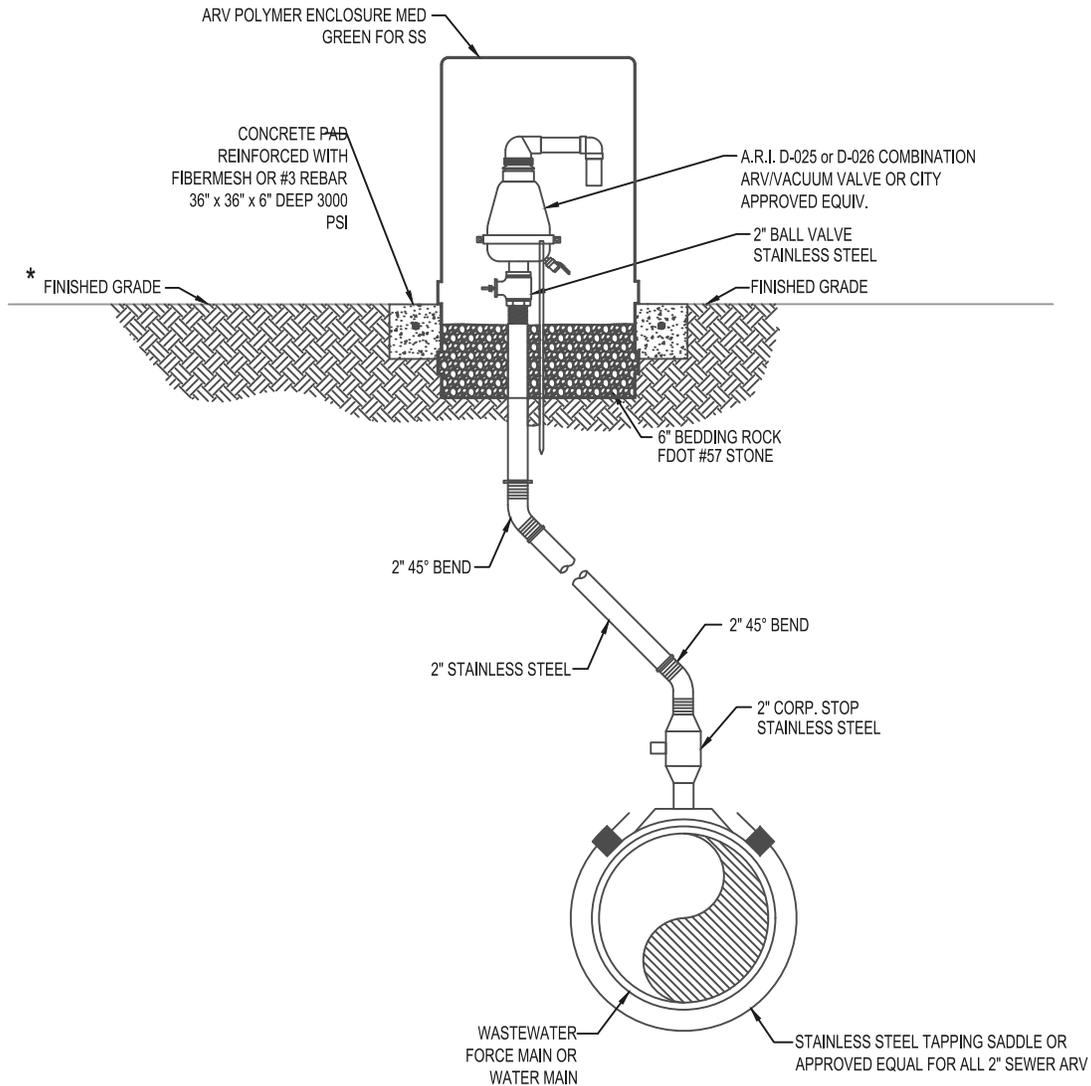
**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**AUTOMATIC
ARV/VACUUM VALVE
DETAIL
S-18**

FY-2024-2025
Drawing Date: Mar-10
Revision Date: Jan-2024
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Checked By: JMP
Scale: NTS
Detail No.: S-18
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AUTOMATIC ARV/VACUUM ABOVE GROUND VALVE DETAIL



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).
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.
- *7. PIPE SIZES UP TO 12" - USE 2" SADDLE.
- *8. PIPE SIZES 14" THRU 36" - USE A 4" TEE MJ, 4" PLUG VALVE MJ, WITH 4" x 2" TAPPED PLUG.
9. PIPE SIZES LARGER THAN 36" - USE A 6" TEE MJ, 6" PLUG VALVE MJ, WITH 6" x 4" TAPPED PLUG.
10. THE SIZE OF ARV IS DETERMINED BY PRESSURE, FLOW AND HYDRALICS.
11. ARV LOCATIONS TO BE FINALIZED AFTER REVIEW OF PRELIMINARY AS-BUILT DATA.

**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**

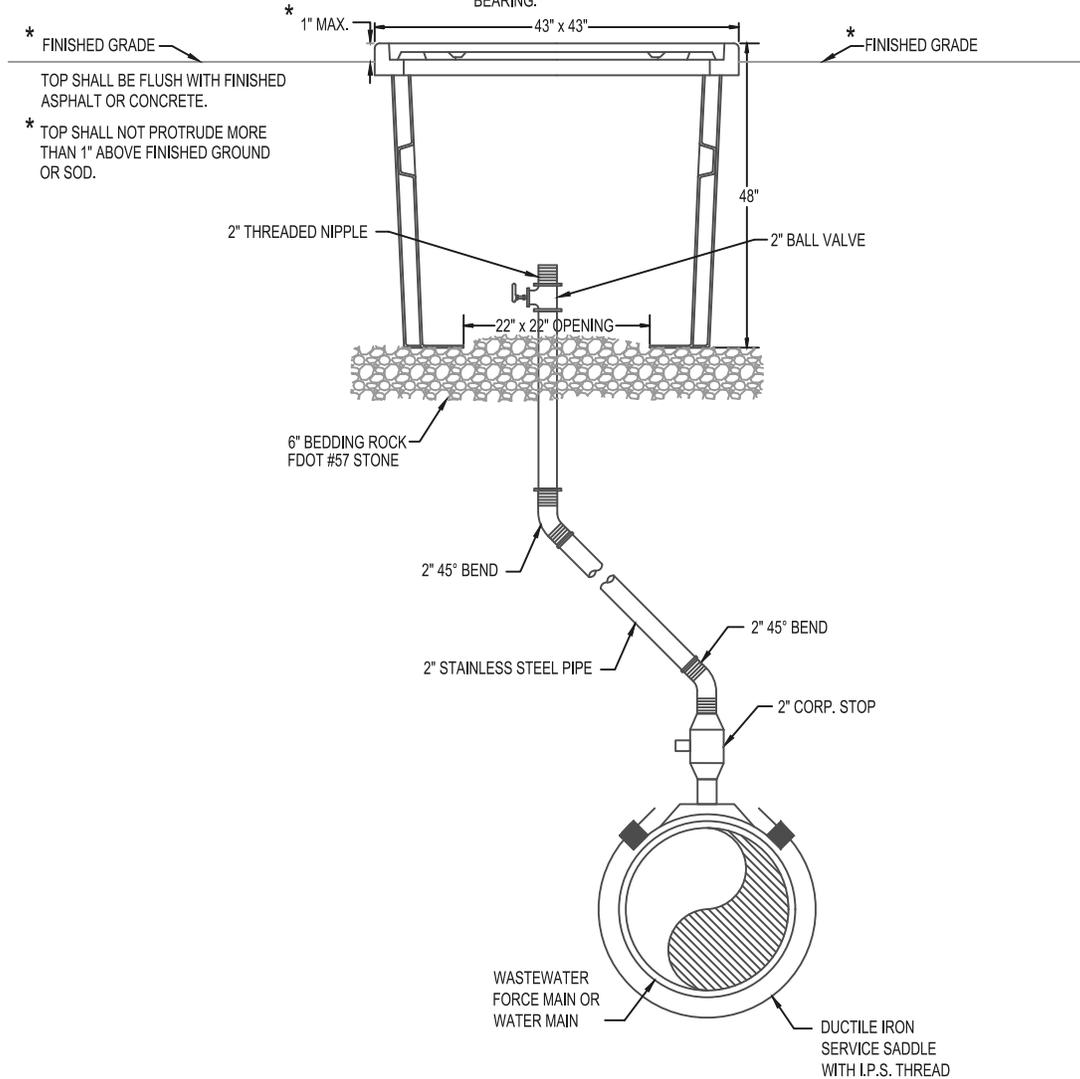


**AUTOMATIC
ARV/VACUUM ABOVE
GROUND VALVE DETAIL
S-19**

FY-2024-2025
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MANUAL AIR RELEASE VALVE DETAIL

CDR SYSTEMS GROUP
 B13-3636-48 402 BOX OR
 CITY APPROVED EQUIV.
 RATED FOR LIGHT TRAFFIC
 BEARING.



* FINISHED GRADE
 TOP SHALL BE FLUSH WITH FINISHED ASPHALT OR CONCRETE.
 * TOP SHALL NOT PROTRUDE MORE THAN 1\"/>

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).
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.
7. PIPE SIZES UP TO 12\"/>

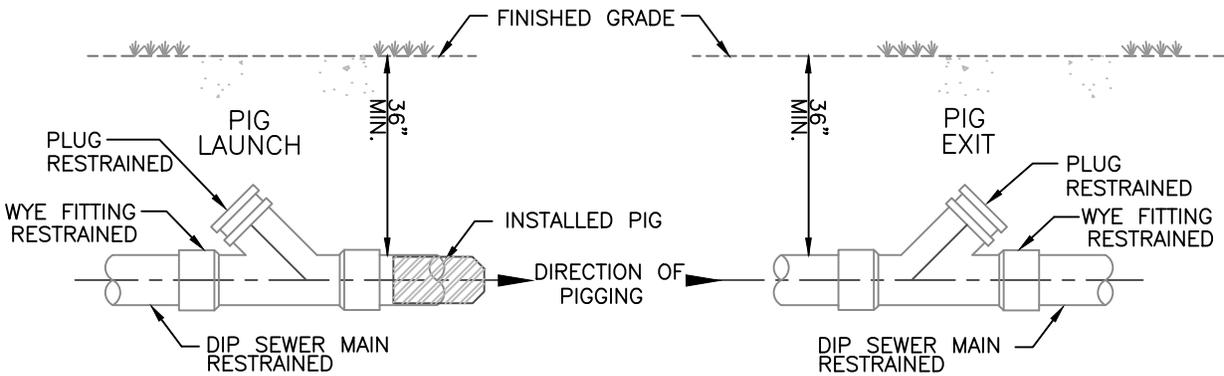
THE CITY OF DAYTONA BEACH
 UTILITIES DEPARTMENT



MANUAL AIR RELEASE
 VALVE DETAIL
 S-20

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PIG LAUNCH/RECEIVING AND VIDEO GUIDELINES



PROFILE VIEWS

PIG LAUNCH & RECEIVING FITTINGS FORCE MAIN NTS

GUIDELINES FOR THE VIDEOING OF SANITARY MAINS AND LATERALS

- THE LINE SHALL BE "WET". AT LEAST 10 GALLONS OF WATER RUN DOWN THE LINE PRIOR TO VIDEOING. THIS HELPS IN IDENTIFYING PROBLEM AREAS (DIPS AND FLAT SPOTS).
- ALL MANHOLE WORK, (BENCHES, PAINT AND TOP) SHALL BE COMPLETE AND ACCEPTED PRIOR TO VIDEO.
- ALL MAINS WILL BE CLEAN AND DEBRIS FREE PRIOR TO VIDEO.
- CALLOUTS FOR MANHOLE NUMBER, DIRECTION OF FLOW AND SERVICE WYES. ALSO CALL OUT DEFICIENCIES WHEN APPLICABLE.
- LOG REPORTS MUST BE INCLUDED WITH ALL VIDEOS.
- A DEPTH GAUGE ATTACHED TO THE FRONT OF THE CAMERA WITH READILY IDENTIFIABLE MARKS SHALL BE USED TO MEASURE WATER DEPTH IN ANY DIPS OR SAGS IN THE LINE.

**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**PIG LAUNCH/RECEIVING
AND VIDEO GUIDELINES
S-21**

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IN-LINE CHANNEL SANITARY SEWER GRINDER UNIT

GRINDER UNIT NOTES:

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. (RAM-NEK 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.
6. FURNISH AND INSTALL GRINDER ASSEMBLY.
7. WET WELL CONCRETE SHALL BE TYPE II 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,

GRINDER MOTOR DATA

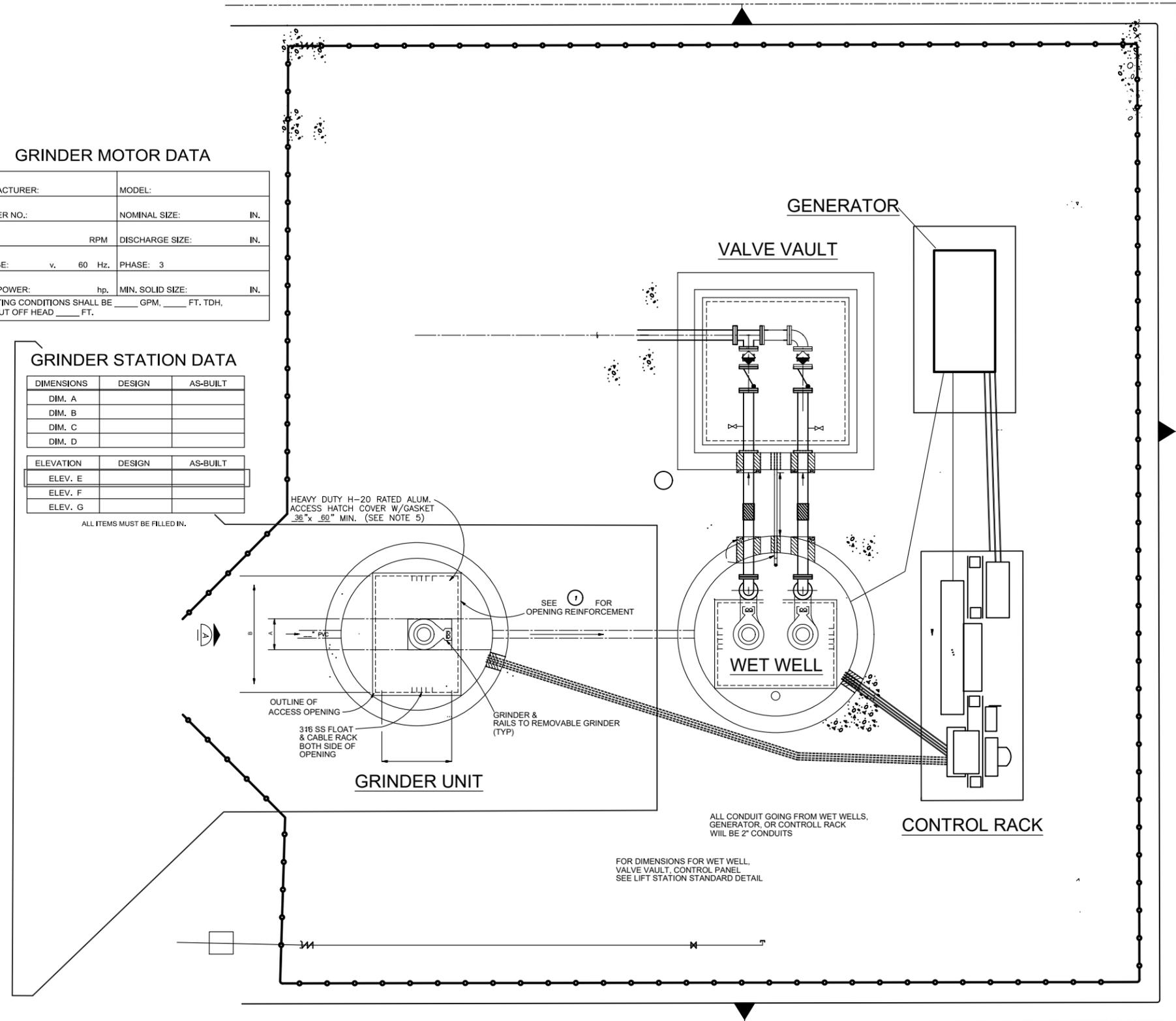
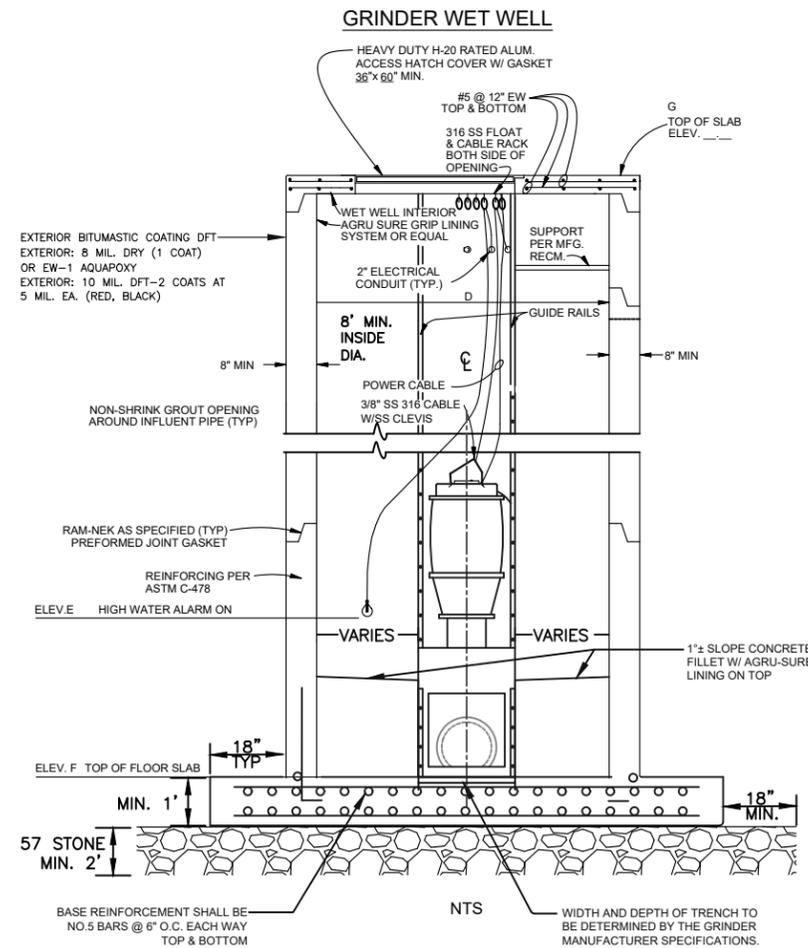
MANUFACTURER:		MODEL:	
IMPELLER NO.:	NOMINAL SIZE:	IN.	
SPEED:	RPM	DISCHARGE SIZE:	IN.
VOLTAGE:	v. 60 Hz.	PHASE:	3
HORSEPOWER:	hp.	MIN. SOLID SIZE:	IN.
OPERATING CONDITIONS SHALL BE _____ GPM, _____ FT. TDH, MIN. SHUT OFF HEAD _____ FT.			

GRINDER STATION DATA

DIMENSIONS	DESIGN	AS-BUILT
DIM. A		
DIM. B		
DIM. C		
DIM. D		

ELEVATION	DESIGN	AS-BUILT
ELEV. E		
ELEV. F		
ELEV. G		

ALL ITEMS MUST BE FILLED IN.



**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**

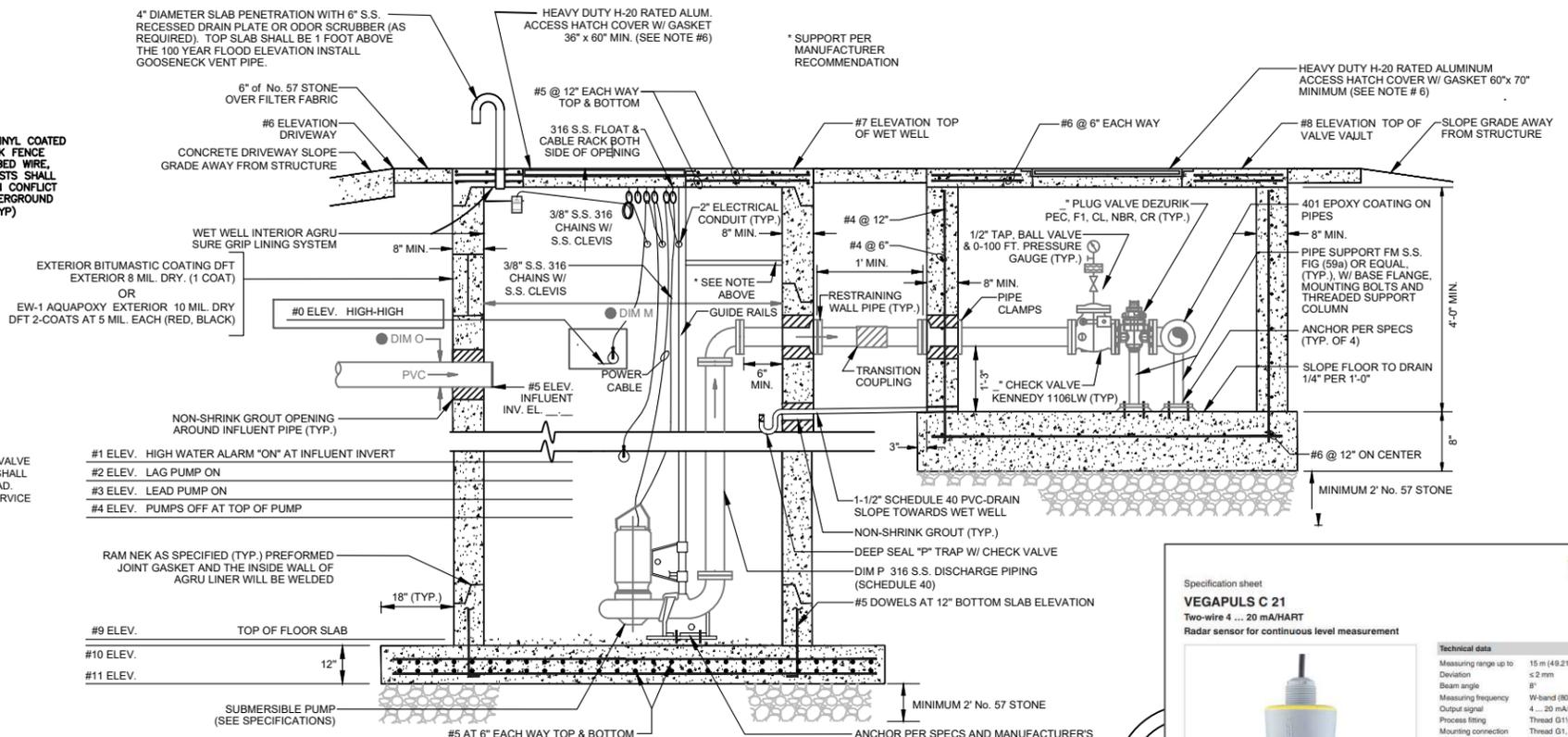
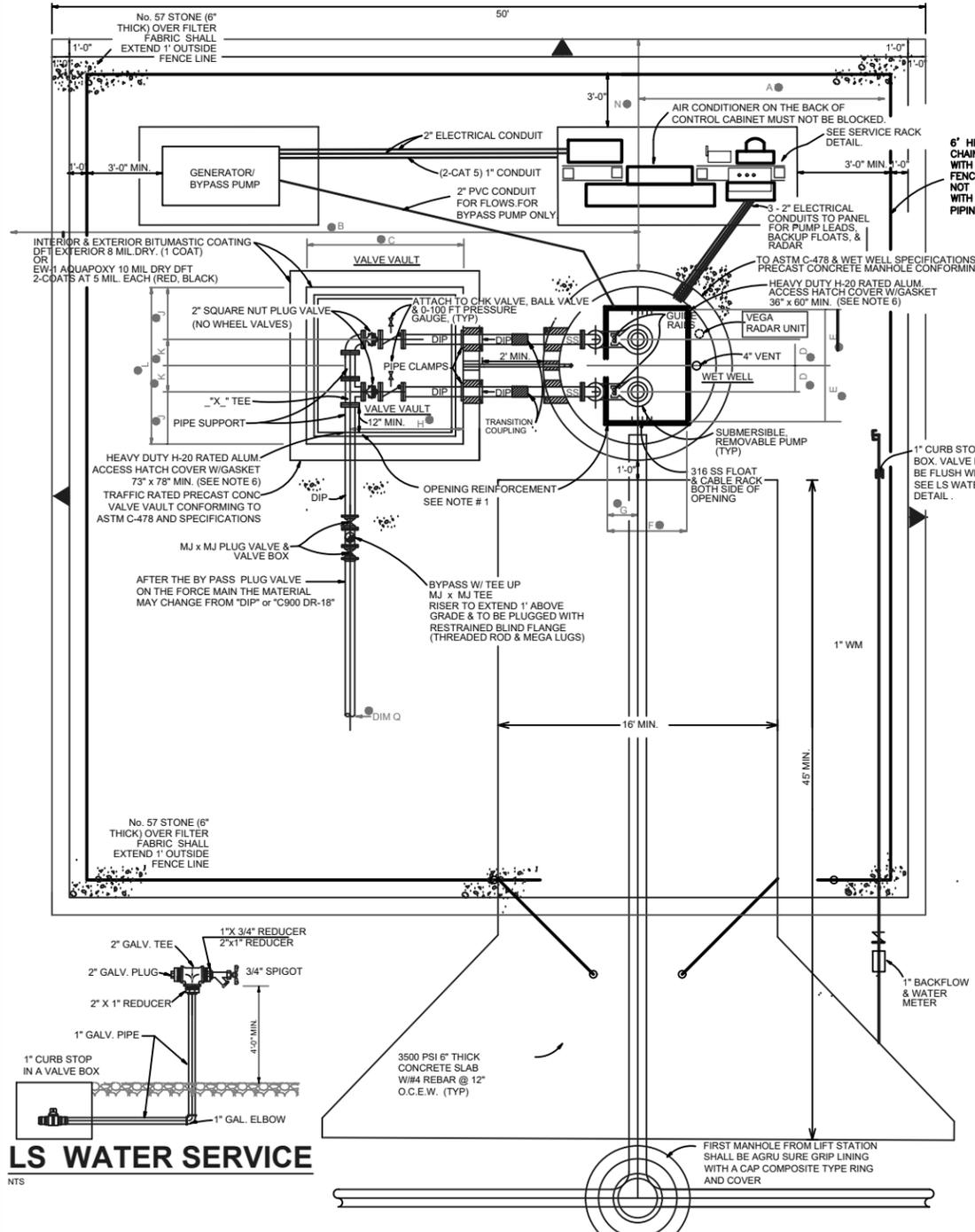


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**IN-LINE CHANNEL SANITARY
SEWER GRINDER UNIT
S-22**

FY-2024-2025
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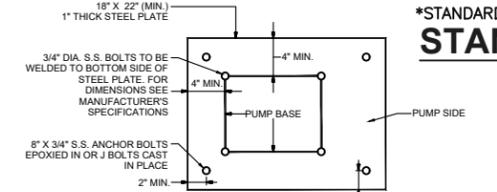
SANITARY SEWER LIFT STATION STANDARD DETAIL



Specification sheet
VEGAPULS C 21
Two-wire 4 ... 20 mA HART
Radar sensor for continuous level measurement

Technical data

Measuring range up to	15 m (49.21 ft)
Deviation	± 2 mm
Beam angle	8°
Measuring frequency	W-band (80 GHz technology)
Output signal	4 ... 20 mA HART
Process fitting	Thread G1, 1 1/2" NPT, R1
Mounting connection	Thread G1, 1 1/2" NPT, R1
Process pressure	-1 ... +3 bar (-100 ... +300 kPa); 14.5 ... +43.53 psig
Process temperature	-40 ... +80 °C (-40 ... +176 °F)
Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
Bluetooth standard	Bluetooth 5.0
Effective range top	20 m (62 ft)
Operating voltage	12 ... 35 V DC
Protection rating	IP69/IP68 (3 bar, 24 h) acc. to IEC 60529; Type 4X/6P acc. to UL 99



PUMP BASE ANCHOR PLATE

LIFT STATION DATA

DIMENSIONS	DESIGN	AS-BUILT
DIM. A		
DIM. B		
DIM. C		
DIM. D		
DIM. E		
DIM. F		
DIM. G		
DIM. H		
DIM. J		
DIM. K		
DIM. L		
DIM. M		
DIM. N		
DIM. O		
DIM. P		

DIM O = INFLUENT PIPE DIA GOING INTO WET WELL
DIM P = DISCHARGE PIPE DIA IN WET WELL FROM PUMP
DIM Q = DISCHARGE PIPE DIA OUT OF VALVE VAULT

STANDARD PRE-CAST SECTION

FLYGT PUMP DATA

MANUFACTURER:	MODEL:
IMPELLER NO.:	NOMINAL SIZE: IN.
SPEED: RPM	DISCHARGE SIZE: IN.
VOLTAGE: v. 60 Hz.	PHASE: 3
HORSEPOWER: hp.	MIN. SOLID SIZE: IN.
OPERATING CONDITIONS SHALL BE _____ GPM, _____ FT. TDH, MIN. SHUT OFF HEAD _____ FT.	
ONE OF THE PUMPS ARE REQUIRED TO HAVE THE FLYGT MIX - FLUSH SYSTEM MODEL 4901 FLUSH VALVE INSTALLED.	

ELEVATION	DESCRIPTION	DESIGN	AS-BUILT
#0 ELEV.	HIGH HIGH WATER		
#1 ELEV.	HIGH WATER ALARM ON		
#2 ELEV.	LAG PUMP ON		
#3 ELEV.	LEAD PUMP ON		
#4 ELEV.	PUMPS OFF AT 1' OFF BOTTOM OF WET WELL		
#5 ELEV.	INFLUENT PIPE INVERT		
#6 ELEV.	DRIVEWAY		
#7 ELEV.	TOP OF SLAB (WET WELL)		
#8 ELEV.	TOP OF SLAB (VALVE VAULT)		
#9 ELEV.	TOP OF FLOOR SLAB		
#10 ELEV.	BOTTOM OF FLOOR SLAB		
#11 ELEV.	BOTTOM OF WET WELL		
#12 ELEV.	BOTTOM OF TREMIE PLUG		

ALL ITEMS MUST BE FILLED IN.

WET WELL NOTES

- COVER FOR REINFORCING BARS SHALL BE 2".
- ALL BENDS, UNLESS OTHERWISE SHOWN, SHALL BE A 90 DEGREE STANDARD HOOK AS DEFINED IN THE LATEST EDITION OF ACI 318.
- NON-SHRINK GROUT FOR ALL OPENINGS.
- ALL INTERNAL STAINLESS STEEL SCH. 40 IS FLANGED (RAMNEK OR APPROVED EQUAL).
- 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).
- 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 DETAIL SHEETS S-26 & 7 OF 7).
- FURNISH AND INSTALL 2 TOTALLY SUBMERSIBLE PUMPS PER PUMP DATA TABLE. FLYGT ONLY.
- ALL VALVES ARE TO BE DEZURIK AND ALL CHECK VALVES ARE TO BE KENNEDY OR EQUAL.
- WET WELL AND VALVE VAULT CONCRETE SHALL BE TYPE II REINFORCED CONCRETE (4,000 PSI).
- PROVIDE SS INSECT SCREEN WITH 1/4" OPENINGS ON VENT PIPE.
- PROVIDE HIGH LEVEL FLOAT.
- VEGA RADAR PULS C-21 WILL BE INSTALLED IN ALL LIFT STATION. REPLACING THE TRANSDUCER IN THE WET WELL.
- 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.
- WET WELLS SHALL BE A MINIMUM OF 8 FEET DIAMETER, WITH 8" WALLS.
- A MUFFIN MONSTER OR CHOPPER PUMP MAY BE REQUIRED BY THE CITY.
- DEPTH OF INVERT SHALL NOT EXCEED 14 FEET.
- A MINIMUM OF 6 FEET SHALL BE MAINTAINED BETWEEN LOWEST INFLUENT INVERT AND WET WELL FLOOR.
- DISCHARGE PIPE SHALL BE 6" MINIMUM FOR PUBLIC USE AND 4" MINIMUM FOR PRIVATE USE.
- USE DUCTILE IRON PIPE, ONLY. AFTER THE TRANSITION COUPLING FROM THE WET WELL UNTIL THE LAST BYPASS VALVE COMING OUT OF LIFT STATION, THEN PVC PIPE CAN BE USED. ALL DUCTILE IRON AND FITTING SHALL BE P 401 LINED.
- WET WELL AND VALVE VAULT SHALL BE A MINIMUM ONE FOOT ABOVE THE 100 YEAR FLOOD ELEVATION OR ONE FOOT ABOVE OF ELEVATION OF ROAD (WHICHEVER IS GREATER).

THIS LIFT STATION IS A GRAPHICAL REPRESENTATION OF THE LAYOUT. ANY DEVIATION MUST GET PRIOR APPROVAL BY THE CITY OF DAYTONA BEACH UTILITIES DEPARTMENT.

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



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SANITARY SEWER LIFT
STATION STANDARD DETAIL
S-23 (SHEET 1 of 7)

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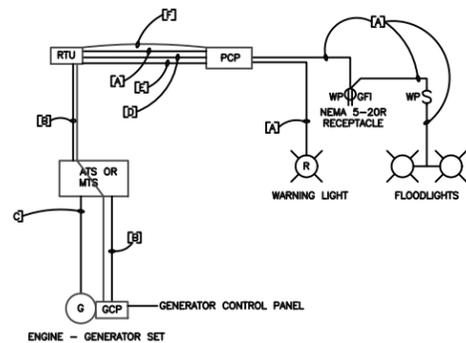
SUBMERSIBLE SANITARY WASTEWATER LIFT STATION CONTROL, RTU DIAGRAMS & SITE PLAN

GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST ADOPTED EDITIONS OF FLORIDA BUILDING CODE, THE NATIONAL ELECTRIC CODE, REGULATIONS AND STANDARDS OF AUTHORITIES HAVING JURISDICTION AND CITY OF DAYTONA BEACH PUBLIC UTILITIES DEPARTMENT STANDARDS.
2. PROVIDE ELECTRICAL SERVICE PANEL RACK CONFIGURED WITH ELECTRICAL DISTRIBUTION EQUIPMENT, EMERGENCY POWER AUTOMATIC TRANSFER SWITCH (ATS), REMOTE TERMINAL UNIT (RTU), AND APPURTENANCES AS SHOWN.
3. ALL CONDUCTORS SHALL BE STRANDED COPPER WITH THIN INSULATION FOR CIRCUITS UNDER 600 VOLTS.
4. FUSES, BREAKERS, CONDUITS, WIRE AND EQUIPMENT TO BE SIZED PER MANUFACTURER'S RECOMMENDATION AND/OR CODE REQUIREMENTS.
5. GENERATOR AND GENERATOR BREAKER SHALL BE SIZED TO ACCOMMODATE THE TOTAL CONNECTED LOAD. THE GENERATOR SHALL NOT EXCEED BOX OF IT'S RUNNING CAPACITY WITH ALL CONNECTED LOADS ON-LINE. ENGINEER SHALL BE RESPONSIBLE FOR THE SIZING OF THE GENERATOR. THE GENERATOR SUBMITTAL DOCUMENTS SHALL BE SIGNED AND SEALED BY A LICENSED ELECTRICAL ENGINEER, INCLUDING GENERATOR SELECTION/SIZING CALCULATIONS, INCLUDING THE COMPLIANCE TO MAXIMUM FREQUENCY AND VOLTAGE DIP LIMITS. FUEL TANK SHALL BE SIZED FOR 72 HOUR OPERATION UNDER FULL LOAD.
6. CONDUIT SIZE SHALL BE 3/4" MIN. TO 2".
7. ELECTRICAL CONDUIT TO BE SCHEDULE 40 PVC BELOW GRADE AND ALUMINUM ABOVE GRADE.
8. ALL CONCEALED CONDUIT AND FITTINGS IN CONCRETE SHALL BE SCHEDULE 80 PVC.
9. UNDERGROUND CONDUIT SHALL BE INSTALLED A MINIMUM OF 24" BELOW FINISHED GRADE.
10. ALL CONTROL PANELS SHALL BE U.L. LABELED AND SHALL COMPLY WITH ARTICLE 408 OF THE N.E.C.
11. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR REVIEW AND APPROVAL.
12. CONCRETE PADS FOR EQUIPMENT AND POWER RACK SIZING TO BE COORDINATED AND VERIFIED BY THE CIVIL OR STRUCTURAL ENGINEER OF RECORD.
13. CONTRACTOR SHALL SUBMIT SIGNED AND SEALED WIND LOAD CALCULATIONS FROM A STRUCTURAL ENGINEER LICENSED IN THE STATE OF FLORIDA. SERVICE PANEL RACK TO BE CERTIFIED PER LATEST ADOPTED EDITION OF THE FLORIDA BUILDING CODE.
14. PROVIDE ONE 3/4" x 10' COPPER-CLAD GROUND ROD MINIMUM, AND ONE #6 BARE COPPER CONDUCTOR MINIMUM FROM GROUND ROD TO GROUND LUG OR BUS AT EACH OF THREE LOCATIONS: ENGINE-GENERATOR, PUMP STATION, AND EQUIPMENT SERVICE RACK, UNLESS SHOWN OR NOTED OTHERWISE.
15. GROUND RODS SHALL BE COPPER CLAD STEEL, 3/4" x 10', DRIVEN SO TOP OF ROD 12" BELOW GRADE. ALL GROUNDING CONDUCTORS TO BE INSTALLED 30" BELOW GRADE. ALL CONNECTIONS TO GROUND RODS SHALL UTILIZE EXOTHERMIC WELDS (ERCO "CROWWELD" OR EQUAL), UNLESS OTHERWISE NOTED (BRONZE BOLTED CONNECTION IN TEST WELL). PROVIDE GROUND ROD TEST WELL WITH METAL COVER AND RAISED STAMPED LETTERING INDICATING "GROUND".
16. LIFT STATION IN RESIDENTIAL SUBDIVISIONS AND ALL INDUSTRIAL AND COMMERCIAL APPLICATIONS TO BE FENCED. LANDSCAPING MAY BE USED IN LIEU OF FENCING IN RESIDENTIAL AREAS, AS APPROVED.

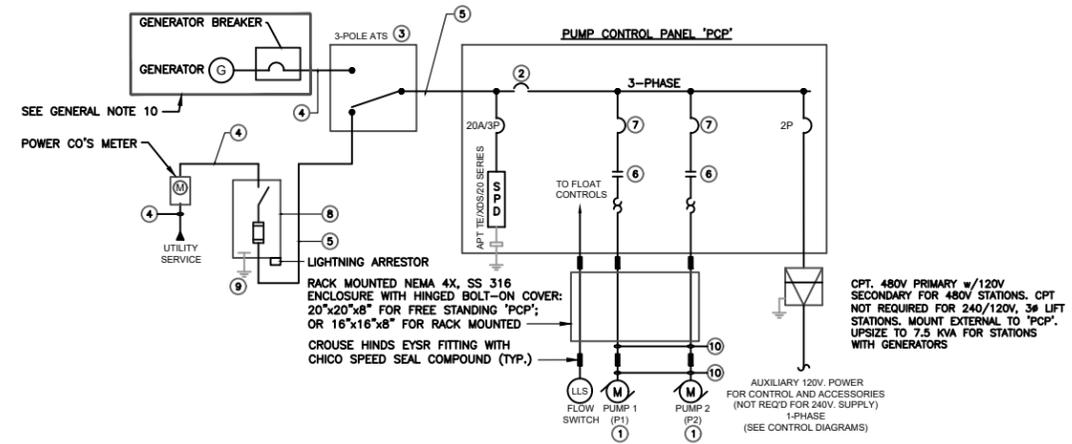
1	2	3	4	5	6	7	8	9	10	
PROPOSED VOLTAGE	PROPOSED MOTOR SIZE (HP)	PANEL MAIN BKR.	MTS OR ATS	SERVICE CONDUIT & CONDUCTORS	LOAD CONDUIT & CONDUCTORS	STARTER SIZE	MOTOR BREAKER	FUSED DISC/FUSES (SEE NOTES)	GROUND	PUMP CABLE CONDUIT SIZE
480V, 3φ, 3W	50HP ≥ 25 HP	200A,3P	200A,3P	4#3/0-2"	4#3/0 & 1#4GND-2"	3	125A,3P	200A,3P/200A	#2	PER N.E.C.
480V, 3φ, 3W	10HP ≤ X < 25 HP	200A,3P	200A,3P	4#3/0-2"	4#3/0 & 1#4GND-2"	2	70A,3P	200A,3P/200A	#2	PER N.E.C.
480V, 3φ, 3W	X < 10 HP	200A,3P	200A,3P	4#3/0-2"	4#3/0 & 1#4GND-2"	1	30A,3P	200A,3P/200A	#2	PER N.E.C.
240V, 3φ, 3W	15HP ≤ X ≤ 20 HP	200A,3P	200A,3P	4#3/0-2"	4#3/0 & 1#4GND-2"	3	125A,3P	200A,3P/200A	#2	PER N.E.C.
240V, 3φ, 3W	7.5HP ≤ X < 15 HP	100A,3P	100A,3P	4#2-1 1/2"	4#2 & 1#6GND-1 1/2"	2	80A,3P	100A,3P/100A	#6	PER N.E.C.
240V, 3φ, 3W	X < 7.5 HP	100A,3P	100A,3P	4#2-1 1/2"	4#2 & 1#6GND-1 1/2"	1	50A,3P	100A,3P/100A	#6	PER N.E.C.

NOTE: VARIABLE FREQUENCY DRIVES AS DIRECTED BY ENGINEERING STAFF (VARIABLE FREQUENCY DRIVES (VFD'S) AS MANUFACTURED BY DANFOSS.) ALL CABINETS TO BE PROVIDED WITH HEAT SINKING ENCLOSURE. ALL MOTORS 25 HP OR MORE SHALL HAVE VARIABLE FREQUENCY DRIVES (VFD'S)



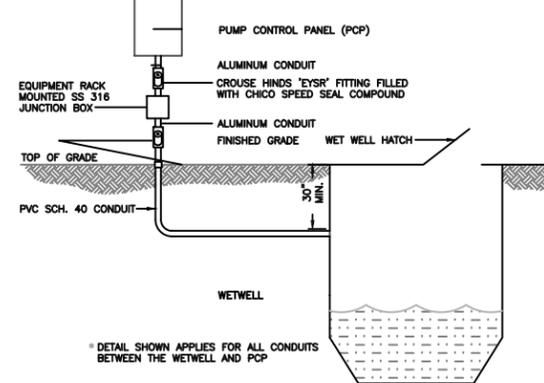
[A]=[3/4", 2#12 & 1#12 GND.] AC POWER, 120 V.
 [B]=[3/4", 4#14 & 1#12GND.]
 [C]=[3/4", 2#12 & 1#12 GND. FOR BATTERY CHARGER] & [1", 2#10 & 1#10G FOR JACKET WATER HEATER]
 [D]=[3/4", 10#14 & 1#14GND.] STATUS SIGNALS, PCP TO RTU
 [E]=[3/4", 2#16 TWISTED SHIELDED PAIR] ANALOG SIGNALS, PCP TO RTU
 [F]=CAT 5 CABLES

120V & SIGNAL RISER DIAGRAM



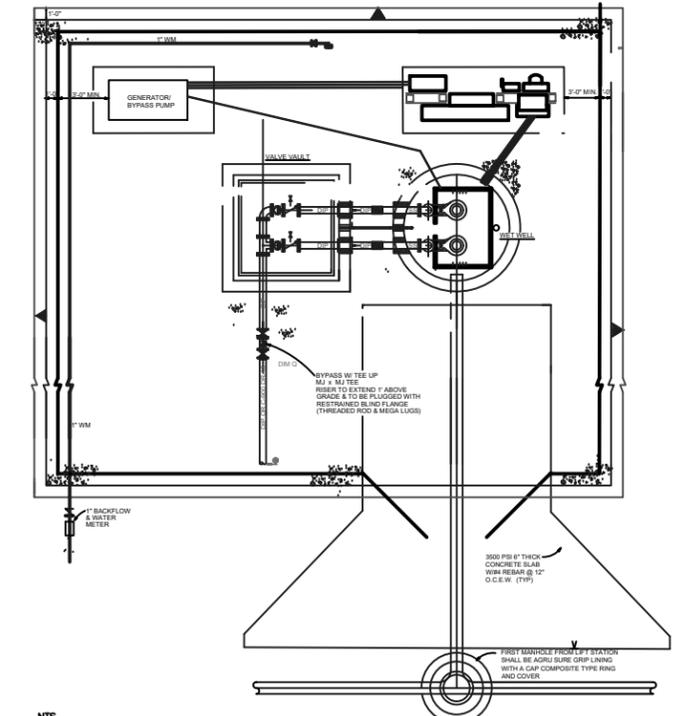
ONE LINE DIAGRAM

NTS



CONDUIT INSTALLATION DETAIL

NTS



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SUBMERSIBLE SANITARY WASTEWATER LIFT STATION CONTROL, RTU DIAGRAMS & SITE PLAN S-23 (SHEET 2 of 7)

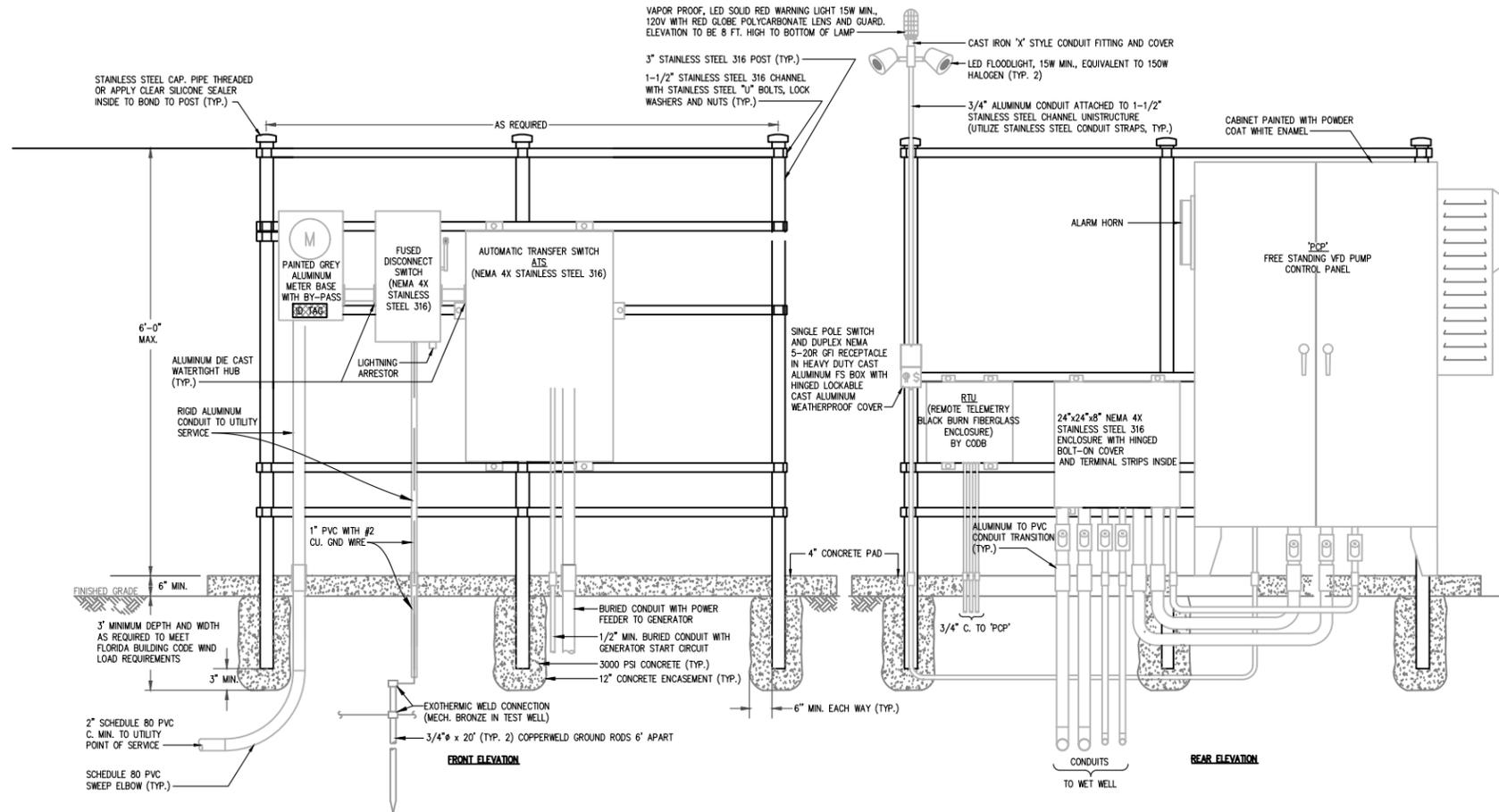
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THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



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SUBMERSIBLE SANITARY SEWER LIFT STATION SERVICE RACK DETAIL WITH FREE STANDING PUMP CONTROL PANEL



- ### SERVICE RACK NOTES
1. PROVIDE ELECTRICAL SERVICE PANEL RACK CONFIGURED WITH ELECTRICAL DISTRIBUTION EQUIPMENT, EMERGENCY POWER AUTOMATIC TRANSFER SWITCH (ATS), REMOTE TERMINAL UNIT (RTU), AND APPURTENANCES AS SHOWN.
 2. ALL MOUNTING HARDWARE SHALL BE #316 STAINLESS STEEL UTILIZING FLAT LOCK WASHERS AND NUTS.
 3. ALL OUTDOOR ENCLOSURES, EXCEPT RTU, SHALL BE NEMA 4X, 316 STAINLESS STEEL, SCHEDULE 40, WEATHERPROOF.
 4. THE CONTROL PANEL SHALL CONTAIN STARTERS AND OTHER DEVICES FOR THE WASTEWATER PUMPS, PRIMING PUMPS, BUBBLER SYSTEM, AND APPURTENANCES. THE PANEL SHALL ALSO PROVIDE 120 V POWER FOR THE LIGHTING, RECEPTACLE, AND OTHER MISCELLANEOUS NEEDS OF THE SITE.
 5. ALL CONDUCTORS SHALL BE DUAL RATED, STRANDED COPPER WITH THHN/THWN INSULATION FOR CIRCUITS UNDER 600 VOLTS. GROUND CONDUCTORS SHALL BE SOFT DRAWN COPPER.
 6. FUSES, BREAKERS, CONDUITS, WIRE AND EQUIPMENT TO BE SIZED PER MANUFACTURER'S RECOMMENDATION AND/OR CODE REQUIREMENTS.
 7. GENERATOR AND GENERATOR BREAKER SHALL BE SIZED TO ACCOMMODATE THE TOTAL CONNECTED LOAD. THE GENERATOR SHALL NOT EXCEED 80% OF ITS RUNNING CAPACITY WITH ALL CONNECTED LOADS ON-LINE. ENGINEER SHALL BE RESPONSIBLE FOR THE SIZING OF THE GENERATOR. THE GENERATOR SUBMITTAL DOCUMENTS SHALL BE SIGNED AND SEALED BY A LICENSED ELECTRICAL ENGINEER, INCLUDING GENERATOR SELECTION/SIZING CALCULATIONS, INCLUDING THE COMPLIANCE TO MAXIMUM FREQUENCY AND VOLTAGE DIP LIMITS. FUEL TANK SHALL BE SIZED FOR 72 HOUR OPERATION UNDER FULL LOAD.
 8. MINIMUM CONDUIT SIZE SHALL BE 3/4" ABOVE GRADE, AND 1" BELOW GRADE.
 9. PUMP MOTOR CONDUIT SHALL BE SIZED TO ME 40% CONDUIT FILL CODE REQUIREMENT.
 10. ELECTRICAL CONDUIT TO BE SCHEDULE 40 PVC BELOW GRADE AND ALUMINUM ABOVE GRADE.
 11. ALL CONCEALED CONDUIT AND FITTINGS IN CONCRETE SHALL BE SCHEDULE 80 PVC.
 12. UNDERGROUND CONDUIT SHALL BE INSTALLED A MINIMUM OF 24" BELOW FINISHED GRADE.
 13. ALL CONTROL PANELS SHALL BE U.L. LABELED AND SHALL COMPLY WITH ARTICLE 409 OF THE N.E.C.
 14. MOUNT BLACKBURN REMOTE TELEMETRY UNIT (RTU) ON SERVICE PANEL RACK AS SHOWN. TOP OF SCADA BOX TO BE AT 5'-6" A.F.G.
 15. CONCRETE PADS FOR EQUIPMENT AND POWER RACK SIZING TO BE COORDINATED AND VERIFIED BY THE CIVIL OR STRUCTURAL ENGINEER OF RECORD.
 16. CONTRACTOR SHALL SUBMIT SIGNED AND SEALED WIND LOAD CALCULATIONS FROM A STRUCTURAL ENGINEER LICENSED IN THE STATE OF FLORIDA. SERVICE PANEL RACK TO BE CERTIFIED PER LATEST ADOPTED EDITION OF THE FLORIDA BUILDING CODE.
 17. PROVIDE ONE 3/4" x 10' COPPER-CLAD GROUND ROD MINIMUM, AND ONE #6 BARE COPPER CONDUCTOR MINIMUM FROM GROUND ROD TO GROUND LUG OR BUS AT EACH OF THREE LOCATIONS: ENGINE-GENERATOR, PUMP STATION, AND EQUIPMENT SERVICE RACK, UNLESS SHOWN OR NOTED OTHERWISE.
 18. GROUND RODS SHALL BE COPPER CLAD STEEL, 3/4" x 10', DRIVEN SO TOP OF ROD 12" BELOW GRADE. ALL GROUNDING CONDUCTORS TO BE INSTALLED 30" BELOW GRADE. ALL CONNECTIONS TO GROUND RODS SHALL UTILIZE EXOTHERMIC WELDS (ERICO "CADWELD" OR EQUAL), UNLESS OTHERWISE NOTED (BRONZE BOLTED CONNECTION IN TEST WELL). PROVIDE GROUND ROD TEST WELL WITH METAL COVER AND RAISED STAMPED LETTERING INDICATING "GROUND".
 19. THE NEOPRENE HOSE FROM THE AIR PUMP TO THE WET WELL BUBBLER SHALL USE "KURI TEC KLEARON K010 PHTHALATE FREE BY KURIYAMA 1/2" I.O. X 1/2" O.D. 70F FOOD GRADE PVC NSF-51" OR EQUAL.
 20. SERVICE RACK TO BE BONDED AND GROUNDED.
 21. FREE STANDING PUMP CONTROL PANEL TO BE FACTORY EQUIPPED WITH WELDED GALVANIZED ATTACHMENT BRACKETS FOR RIGID INSTALLATION TO THE EQUIPMENT RACK ASSEMBLY.
 22. BLACKBURN CONTROLS LS MONITOR WITH ENCLOSURE LSMON-DB-CELL-ENCL SCADAPACK 312E REMOTE TERMINAL UNIT MODEL ATBUP312-EA55-AB10 BLACKBURN CONTROLS 407-847-8848.
 23. CAT 5 FIBER CABLES ARE TO BE INSTALLED
 - A. FROM THE CONTROL CABINET TO THE RTU CABINET.
 - B. FROM THE CONTROL CABINET TO THE GENERATOR/BY-PASS PUMP

SERVICE RACK DETAIL WITH FREE STANDING PUMP CONTROL PANEL

NTS

**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**

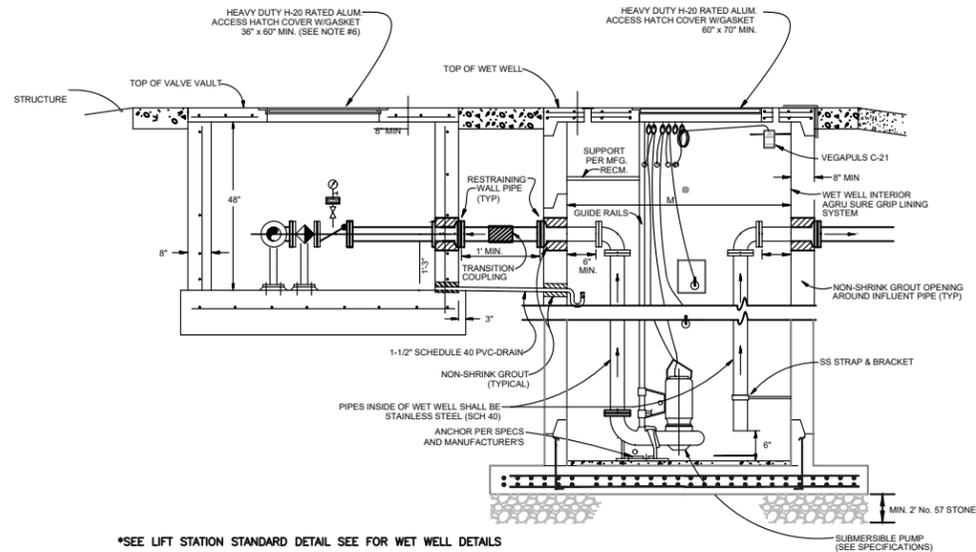


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**SUBMERSIBLE SANITARY SEWER
LIFT STATION SERVICE RACK
DETAIL WITH FREE STANDING
PUMP CONTROL PANEL
S-23 (SHEET 3 of 7)**

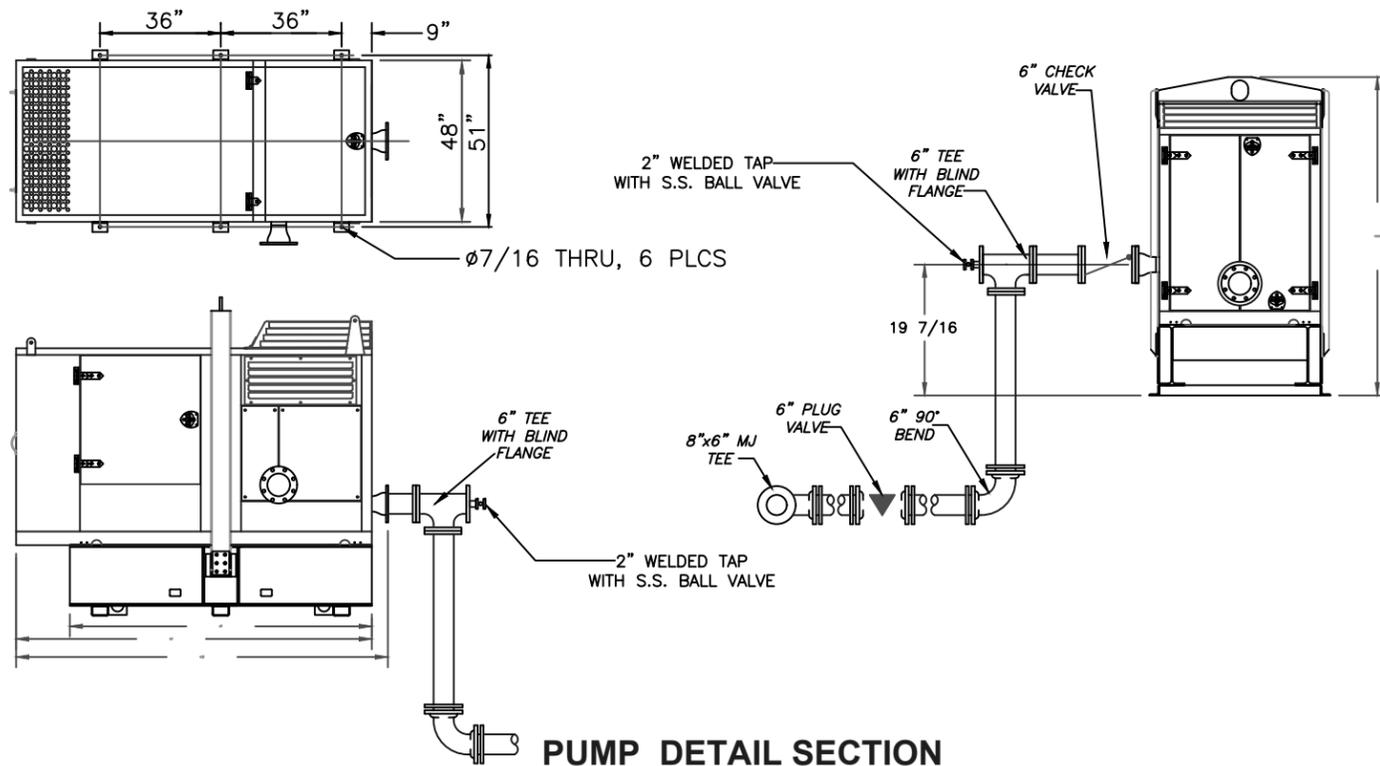
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SANITARY SEWER LIFT STATION BACKUP DIESEL PUMP DETAIL

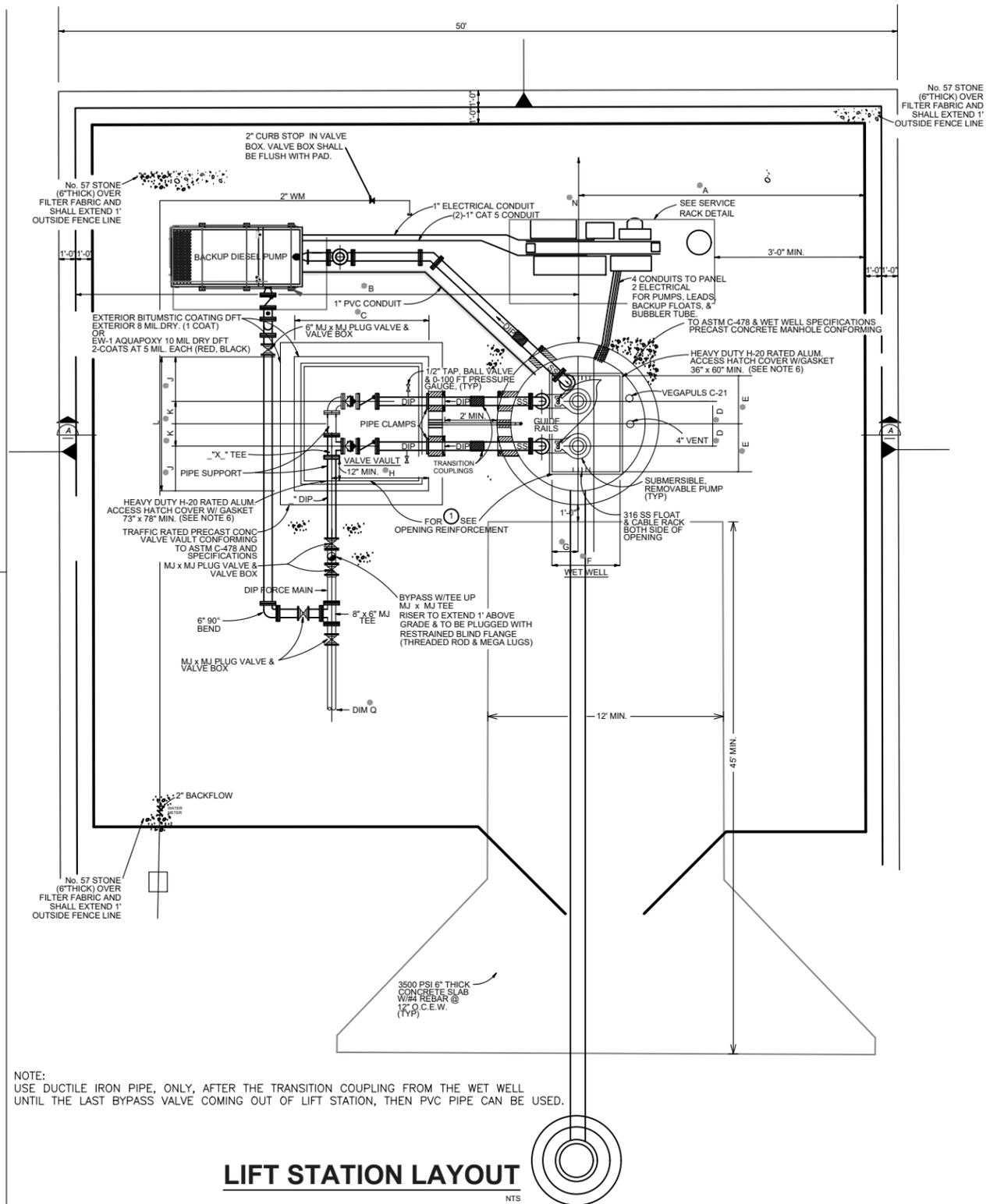


PUMP SUCTION PIPE DETAIL SECTION
NTS

NEW CHANGES:
1. REMOVED THE STILLING WELL, BUBBLER, AND TRANSMITTER.
2. INSTALLED VEGAPULS C-21 RADAR. INSTALL A HIGH HIGH FLOAT TO START THE PUMPS.



PUMP DETAIL SECTION
NTS



LIFT STATION LAYOUT
NTS

NOTE:
USE DUCTILE IRON PIPE, ONLY, AFTER THE TRANSITION COUPLING FROM THE WET WELL UNTIL THE LAST BYPASS VALVE COMING OUT OF LIFT STATION, THEN PVC PIPE CAN BE USED.

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



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**SANITARY SEWER LIFT STATION
BACKUP DIESEL PUMP DETAIL**
S-23 (SHEET 4 of 7)

FY-2024-2025
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WET WELL MOUNTED RESIDENTIAL WASTEWATER LIFT STATION GENERATOR SPECS & DETAILS

ENGINE-GENERATOR SYSTEM

PROVIDE A COMPLETE FACTORY ASSEMBLED ENGINE-GENERATOR UNIT TO PROVIDE AUTOMATIC STANDBY ELECTRICAL POWER FOR THE PUMPING STATION. AN AUTOMATIC TRANSFER SWITCH (ATS) SHALL ALSO BE PROVIDED TO SENSE LOSS OF UTILITY POWER AND TO INITIATE AUTOMATIC START OF THE ENGINE-GENERATOR UNIT AND THE TRANSFER OF POWER FROM THE UTILITY FEED. ALSO PROVIDE DRY CONTACT ENGINE START ENABLE TO RECEIVE A RUN SIGNAL UPON HIGH WETWELL LEVEL FROM LEVEL FLOAT IN LIFT STATION.

PROVIDE COMPLETE ENGINE FUEL SYSTEM, ELECTRONIC GOVERNOR SYSTEM, ENGINE COOLING SYSTEM, ELECTRIC STARTING SYSTEM COMPLETE WITH BATTERIES AND CHARGING SYSTEM, EXHAUST SYSTEM WITH SILENCER, VIBRATION ISOLATION SYSTEM, DIGITAL (MICROPROCESSOR-BASED) ELECTRONIC CONTROLS, OUTPUT METERING (RMS VOLTAGE, CURRENT, FREQUENCY, POWER FACTOR, AND KW HOURS), SOUND-INSULATED OUTDOOR WEATHER-PROOF ENCLOSURE, AND OTHER REQUIRED APPURTENANCES, ALL OF WHICH SHALL BE MOUNTED ON A HEAVY-DUTY STEEL BASE WHICH SHALL BE FIELD MOUNTED ON A CAST IN PLACE CONCRETE FOUNDATION AS SHOWN.

THE ENGINE SHALL BE A DIESEL FUELED (ASTM D975 #2 DIESEL FUEL), RADIATOR AND FAN COOLED. MINIMUM DISPLACEMENT SHALL BE 199 CUBIC INCHES, WITH A CAST IRON BLOCK. FOR GENERATORS RATED AT 100KW OR LARGER, THE ENGINE SHALL BE 6 CYLINDER TURBO CHARGED. THE HORSEPOWER RATING OF THE ENGINE AT IT'S MINIMUM TOLERANCE LEVEL SHALL BE SUFFICIENT TO DRIVE THE ALTERNATOR AND ALL CONNECTED ACCESSORIES.

THE AC GENERATOR SHALL BE: SYNCHRONOUS, FOUR POLE, WITH 2/3 PITCH STATOR WINDINGS, REVOLVING FIELD, DRIP-PROOF CONSTRUCTION, SINGLE PRE-LUBRICATED SEALED BEARING, AIR COOLED BY A DIRECT DRIVE CENTRIFUGAL BLOWER FAN, AND DIRECTLY CONNECTED TO THE ENGINE WITH FLEXIBLE DRIVE DISC. ALL INSULATION SYSTEM COMPONENTS SHALL MEET NEMA MG1 TEMPERATURE LIMITS FOR CLASS H INSULATION SYSTEM. ACTUAL TEMPERATURE RISE MEASURED BY RESISTANCE METHOD AT FULL LOAD SHALL NOT EXCEED 105 DEGREES CENTIGRADE.

THE GENERATOR SET SHALL BE PROVIDED WITH AN OUTDOOR, ALUMINUM SOUND-ATTENUATED ENCLOSURE. THE SILENCES SHALL BE INSIDE THE ENCLOSURE. THE ENCLOSURE SHALL REDUCE THE SOUND LEVEL OF THE GENERATOR SET WHILE OPERATING AT FULL RATED LOAD TO A MAXIMUM OF 85 DBA AT ANY LOCATION 21 FT FROM THE GENERATOR SET IN A FREE FIELD ENVIRONMENT. THE ENCLOSURE PACKAGE SHALL COMPLY WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE FOR ALL WIRING MATERIALS AND COMPONENT SPACING. ALL DOORS SHALL BE LOCKABLE, AND INCLUDE RETAINERS TO HOLD THE DOOR OPEN DURING SERVICE. ENCLOSURE ROOF SHALL BE CAMBERED TO PREVENT RAINWATER ACCUMULATION. OPENINGS SHALL BE SCREENED TO LIMIT ACCESS OF RODENTS INTO THE ENCLOSURE. PROVIDE CHART OF AVAILABLE COLOR SELECTIONS FOR SELECTION OF ENCLOSURE COLOR BY THE OWNER.

ALL ELECTRICAL POWER AND CONTROL INTERCONNECTIONS SHALL BE MADE WITHIN THE PERIMETER OF THE ENCLOSURE. A FACTORY-MOUNTED EXHAUST SILENCER SHALL BE INSTALLED INSIDE THE ENCLOSURE. ALL SHEET METAL SURFACES SHALL BE PRIMED FOR CORROSION PROTECTION AND FINISH PAINTED WITH THE MANUFACTURERS STANDARD COLOR USING A TWO STEP ELECTROCOATING PAINT PROCESS. THE PAINTING PROCESS SHALL RESULT IN A COATING THAT MEETS THE FOLLOWING REQUIREMENTS:

- PRIMER THICKNESS, 0.5-2.0 MILS.
- TOP COAT THICKNESS, 0.8-1.2 MILS.
- GLOSS, PER ASTM D523-89, 80%± PLUS OR MINUS 5%.
- GLOSS RETENTION AFTER ONE YEAR SHALL EXCEED 50%.
- CROSSHATCH ADHESION, PER ASTM D3359-93, 4B-5B. IMPACT RESISTANCE, PER ASTM D2794-93, 120-160 INCH-POUNDS.
- SALT SPRAY, PER ASTM B117-90, 1000+ HOURS.
- HUMIDITY, PER ASTM D2247-92, 1000+ HOURS.

THE ENGINE-GENERATOR UNIT SHALL INCLUDE THE NECESSARY FEATURES TO MEET THE REQUIREMENTS OF NFPA 70, NFPA 110, AND IEEE 446. THE UNIT SHALL BE MANUFACTURED BY CUMMINS OR CATERPILLAR.

SIZING CALCULATIONS MUST BE SIGNED AND SEALED BY A REGISTERED ELECTRICAL ENGINEER AND MEET THE GREATER OF THE TWO CONDITIONS LISTED BELOW:

1. UNDER VFD OPERATION, THE GENSET MUST BE SIZED TO HANDLE BOTH PUMPS RUNNING WITHOUT EXCEEDING 60% OF ITS RATED CAPACITY. THIS REQUIREMENT IS TO LIMIT THE HARMONIC DISTORTION.
2. UNDER NON-LINEAR LOADING (OR ACROSS THE LINE), THE GENSET MUST BE SIZED TO HANDLE BOTH PUMPS RUNNING UNDER A SEQUENTIAL START WITHOUT EXCEEDING 70% OF ITS RATED CAPACITY.

OUTPUT VOLTAGES (NOTE: MATCH UTILITY VALUES): 3-PHASE, 60 HZ, 4 WIRE
 RATED SPEED: 1,800 RPM
 MAXIMUM DIESEL CONSUMPTION AT FULL LOAD: ENGINEER TO SIZE. MIN. 72 HRS

- MAXIMUM VOLTAGE DIP: 20%
- MAXIMUM FREQUENCY DIP: 10%
- THE RANGE OF THE GENERATOR RATING SHALL BE SIZED NO LARGER THAN 2-2.5 TIMES THE RUNNING CONNECTED LOAD.

VOLTAGE REGULATION, NO LOAD TO FULL LOAD: +/- 1.0%
 RANDOM VOLTAGE VARIATION: +/- 1.0%
 FREQUENCY REGULATION: ISOCRONOUS
 RANDOM FREQUENCY VARIATION: +/- 0.6%
 OPERATE AT FULL LOAD FOR AMBIENT CONDITIONS: 100 DEG F, 40 DEG. C AT 100' MSL
 EXCITATION: PMG

THE ENGINE-GENERATOR SET SHALL START ON RECEIPT OF A START SIGNAL FROM THE AUTOMATIC TRANSFER SWITCH. THE START SIGNAL SHALL BE VIA HARDWIRED CONNECTION TO THE GENERATOR SET CONTROL, AND THE UNIT SHALL COMPLETE A TIME DELAY START PERIOD AS PROGRAMMED INTO THE CONTROL. START TIME: COMPLY WITH NFPA 110, LEVEL 1, TYPE 10, SYSTEM REQUIREMENTS. THE GENERATOR SET CONTROL SHALL INITIATE THE STARTING SEQUENCE WHICH SHALL INCLUDE: VERIFICATION THAT THE ENGINE IS ROTATING WHEN THE STARTER IS SIGNALLED.

ENGINE START AND ACCELERATION TO START DISCONNECT SPEED (IF THE ENGINE DOES NOT START, IT SHALL COMPLETE A CYCLE CRANKING PROCESS).

IF THE ENGINE DOES NOT START IT SHALL BE SHUT DOWN AND LOCKED OUT, AND THE CONTROL SYSTEM SHALL INDICATE "FAIL TO START".

THE ENGINE SHALL ACCELERATE TO RATED SPEED AND THE ALTERNATOR TO RATED VOLTAGE. EXCITATION SHALL BE DISABLED UNTIL THE ENGINE HAS EXCEEDED PROGRAMMED IDLE SPEED, AND REGULATED TO PREVENT OVER VOLTAGE CONDITIONS AND OSCILLATION AS THE ENGINE ACCELERATES AND THE ALTERNATOR BUILDS TO RATED VOLTAGE.

UPON REACHING RATED SPEED AND VOLTAGE, THE GENERATOR SET SHALL OPERATE AS DICTATED BY THE CONTROL SYSTEM IN ISOCRONOUS, SYNCHRONIZE, LOADSHARE, LOAD DEMAND, OR LOAD GOVERN STATE.

WHEN ALL START SIGNALS HAVE BEEN REMOVED FROM THE GENERATOR SET, IT SHALL COMPLETE A TIME DELAY STOP SEQUENCE. THE DURATION OF THE TIME DELAY STOP PERIOD SHALL BE ADJUSTABLE BY THE OPERATOR.

UPON COMPLETION OF THE TIME DELAY STOP PERIOD, THE GENERATOR SET CONTROL SHALL SWITCH OFF THE EXCITATION SYSTEM AND SHALL SHUT DOWN.

ANY START SIGNAL RECEIVED AFTER THE TIME STOP SEQUENCE HAS BEGUN SHALL IMMEDIATELY TERMINATE THE STOPPING SEQUENCE AND RETURN THE GENERATOR SET TO ISOCRONOUS OPERATION.

THE GENERATOR SET AND ASSOCIATED EQUIPMENT SHALL BE WARRANTED FOR A PERIOD OF NOT LESS THAN 5 YEARS FROM THE DATE OF COMMISSIONING AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP. THE WARRANTY SHALL BE COMPREHENSIVE. NO DEDUCTIBLES SHALL BE ALLOWED FOR TRAVEL TIME, SERVICE HOURS, REPAIR PARTS COST, ETC. GENERATOR UNIT SHALL MEET THE REQUIREMENTS OF ISO 9001 AND U.L. 2200.

DIESEL STORAGE SYSTEM

PROVIDE A DIESEL STORAGE AND SUPPLY SYSTEM FOR THE ENGINE GENERATOR CONFIGURED AS SHOWN. THE SYSTEM SHALL MEET THE REQUIREMENTS OF THE DIESEL FUEL CODE, THE APPLICABLE PROVISIONS OF FLORIDA STATUTES, CHAPTER 206.874, AND FLORIDA ADMINISTRATIVE CODE, CHAPTER SF-2.001 DIESEL FUEL TANK TO BE SIZED FOR 72 HOURS OF CONTINUOUS FUEL SUPPLY AT MAXIMUM DESIGNED LOAD AND SHALL MEET REQUIREMENTS FOR A COMPLETE INSTALLATION AS PER STATE AND LOCAL REQUIREMENTS.

THE GENERATOR SET AND ENCLOSURE SHALL BE MOUNTED AND SHIPPED TO THE JOBSITE ON THE FORMED STEEL SUB-BASE PROVIDED BY THE GENERATOR SUPPLIER. PROVISIONS FOR CRANE UNLOADING OF THE COMPLETE PACKAGE SHALL BE DESIGNED INTO THE BASE OF THE UNIT. 3/4" THICK NEOPRENE PADS SHALL BE INSTALLED BETWEEN THE FUEL TANK AND THE CONCRETE SLAB. A 500 GALLON BASE MOUNTED FUEL TANK SHALL BE ATTACHED TO THE CONCRETE SLAB WITH STAINLESS STEEL EXPANSION ANCHORS. THE BASE AND ENCLOSURE ASSEMBLY SHALL ALLOW ROOM WITHIN THE PACKAGE TO MOUNT AND MAINTAIN THE SPECIFIED BATTERY CHARGER, ENGINE STARTING BATTERIES, RACKS, AND CABLES, MAIN LINE CIRCUIT BREAKER, AND ENGINE-GENERATOR CONTROL PANEL, AND OTHER ITEMS AS SPECIFIED OR AS SHOWN ON THE DRAWINGS. THE WEIGHT OF THE ENTIRE UNIT CONSISTING OF GENERATOR SET, BASE, ENCLOSURE, AND ALL OTHER SPECIFIED ITEMS INCLUDING ALL LIQUIDS (I.E., FUEL OIL, LUBE OIL, AND COOLING WATER SHALL BE CALCULATED BY THE MANUFACTURER. THE BASE OF THE UNIT SHALL BE DESIGNED AND MANUFACTURED AS A HEAVY DUTY, FORMED STEEL CONSTRUCTION WITH FOUR (4) POINT LIFTING PROVISION TO SUPPORT THE CALCULATED WEIGHT. DETAILS AND MANUFACTURER'S CERTIFICATION OF THE BASE CONSTRUCTION SHALL BE INCLUDED WITH THE DRAWINGS SUBMITTED FOR APPROVAL AS WELL AS ALL WEIGHT CALCULATIONS. THE UNIT SHALL BE EQUIPPED WITH A DOUBLE WALL SUB-BASE UL142 FUEL STORAGE TANK AND SHALL BE SUPPLIED WITH A LOCKABLE, EXTERIOR LOCATED FILL CAP. ALL NECESSARY FUEL AND NORMAL AND EMERGENCY VENT LINES WITH VENT CAPS FOR PROPER ENGINE PERFORMANCE SHALL BE PROVIDED AS WELL AS A MEANS TO READILY DETECT THE FUEL LEVEL IN THE TANK WITHOUT THE USE OF A MEASURING STICK, VIA HIGH AND LOW LEVEL SWITCHES. THE FUEL TANK BASE MAXIMUM LENGTH & WIDTH DIMENSIONS SHALL BE AS NOTED ON THE DRAWINGS AND BE FORMED FROM CORROSION RESISTANT STEEL OF A MINIMUM METAL THICKNESS OF 0.25-INCH (1/4-INCH) AND SHALL BE FITTED WITH LOW FUEL LEVEL INNER WALL LEAK ALARM CONTACT FOR LOCAL AND REMOTE ANNUNCIATION. THE FUEL TANK HEIGHT SHALL NOT EXCEED 24 INCHES.

AUTOMATIC TRANSFER SWITCH

PROVIDE AN AUTOMATIC TRANSFER SWITCH (ATS) AS SHOWN. THE ATS SHALL BE RATED TO CARRY 100 PERCENT OF RATED CURRENT CONTINUOUSLY IN THE ENCLOSURE SUPPLIED, IN AMBIENT TEMPERATURES OF 40 TO +60 DEGREES C, RELATIVE HUMIDITY UP TO 95% (NON CONDENSING), AND ALTITUDES UP TO 1,000 FEET. TRANSFER SWITCH EQUIPMENT SHALL HAVE FAULT CURRENT RATINGS SUITABLE FOR USE IN THE APPLICATION, AS INDICATED BY THE AVAILABLE FAULT CURRENT AT THE SITE AS PER THE ELECTRIC UTILITY. THE ATS SHALL BE A CUMMINS, ASCO 3-POLE OR APPROVED EQUAL.

THE ATS SHALL BE DOUBLE THROW, ELECTRICALLY AND MECHANICALLY INTERLOCKED, AND MECHANICALLY HELD IN THE SOURCE 1 AND SOURCE 2 POSITIONS. THE TRANSFER SWITCH SHALL BE SPECIFICALLY DESIGNED TO TRANSFER TO THE BEST AVAILABLE SOURCE IF IT INADVERTENTLY STOPS IN A NEUTRAL POSITION. THE ATS SHALL BE ELECTRICALLY INTERLOCKED IN BOTH AUTOMATIC AND MANUAL OPERATION MODES TO PREVENT THE OPERATION SEQUENCE SPECIFIED. THE POWER TRANSFER MECHANISM SHALL INCLUDE PROVISIONS FOR MANUAL OPERATION UNDER LOAD WITH THE DOOR OF THE CABINET CLOSED. ALL WIRING SHALL BE TAGGED TO MATCH THE SCHEMATIC, SHALL BE UL LISTED 105 DEGREE C, 600 VOLT RATED, AND SIZED AS REQUIRED. CIRCUIT BOARDS SHALL BE CONNECTED WIRING HARNESSSES BY MEANS OF LOCKING DISCONNECT PLUG(S). THE 3-POLE ATS SHALL BE PROVIDED WITH A NEUTRAL BUS AND LUGS SIZED TO CARRY 100% OF THE ATS CURRENT RATING. FIELD CONTROL CONNECTIONS SHALL BE MADE ON A COMMON TERMINAL BLOCK THAT IS CLEARLY AND PERMANENTLY LABELED.

THE ATS SHALL INCORPORATE ADJUSTABLE TIME DELAYS FOR GENERATOR SET START (ADJUSTABLE IN A RANGE FROM 0-15 SECONDS); TRANSFER (ADJUSTABLE IN A RANGE FROM 0-120 SECONDS); RETRANSFER (ADJUSTABLE IN A RANGE FROM 0-30 MINUTES); AND GENERATOR STOP (COOLDOWN; ADJUSTABLE IN A RANGE OF 0-30 MINUTES), AND SHALL BE CONFIGURABLE TO CONTROL THE OPERATION TIME FROM SOURCE TO SOURCE (PROGRAM TRANSITION OPERATION) IN OPEN TRANSITION MODE. THE CONTROL SYSTEM SHALL BE CAPABLE OF ENABLING OR DISABLING THIS FEATURE, AND ADJUSTING THE TIME PERIOD TO A SPECIFIC VALUE. A PHASE BAND MONITOR OR SIMILAR DEVICE IS NOT AN ACCEPTABLE ALTERNATE FOR THIS FEATURE.

THE ATS SHALL PROVIDE AN ISOLATED NORMALLY HELD OPEN, AND CLOSE TO START RELAY CONTACT FOR STARTING OF THE ENGINE-GENERATOR SET. OUTPUT CONTACTS SHALL BE FORM C, FOR COMPATIBILITY. THE ATS SHALL PROVIDE RELAY CONTACTS TO INDICATE THE FOLLOWING CONDITIONS: SOURCE 1 AVAILABLE, LOAD CONNECTED TO SOURCE 1, SOURCE 2 AVAILABLE, SOURCE 2 CONNECTED TO LOAD.

THE ATS ENCLOSURE SHALL BE NEMA 4X 304 STAINLESS STEEL (OR BETTER, IF SHOWN OR NOTED), UL LISTED AND SHALL PROVIDE NEC REQUIRED WIRE BEND SPACE. THE CABINET DOOR SHALL BE KEY LOCKING. SEPARATE ENCLOSURES SHALL BE THE NEMA TYPE SPECIFIED. MANUAL OPERATING HANDLES AND ALL CONTROL SWITCHES (OTHER THAN KEY OPERATED SWITCHES) SHALL BE ACCESSIBLE TO AUTHORIZED PERSONNEL ONLY BY OPENING THE KEY LOCKING CABINET DOOR.

FACTORY TESTING: THE TRANSFER SWITCH SUPPLIER SHALL PERFORM A COMPLETE OPERATIONAL TEST ON THE TRANSFER SWITCH PRIOR TO SHIPPING FROM THE FACTORY. A CERTIFIED TEST REPORT SHALL BE AVAILABLE ON REQUEST. TEST PROCESS SHALL INCLUDE CALIBRATION OF VOLTAGE SENSORS.

AFTER INSTALLATION, THE SUPPLIER SHALL CONDUCT A COMPLETE OPERATION, BASIC MAINTENANCE, AND EMERGENCY SERVICE SEMINAR FOR UP TO 10 PERSONS EMPLOYED BY THE CITY. THE SEMINAR SHALL INCLUDE INSTRUCTION ON OPERATION OF THE TRANSFER EQUIPMENT, NORMAL TESTING AND EXERCISE, ADJUSTMENTS TO THE CONTROL SYSTEM AND EMERGENCY OPERATION PROCEDURES. THE CLASS DURATION SHALL BE AT LEAST 4 HOURS IN LENGTH, AND INCLUDE PRACTICAL OPERATION WITH THE INSTALLED EQUIPMENT.

REINFORCED CONCRETE EQUIPMENT PADS

PROVIDE BUILT-UP PAD AREA FOR NEW CONCRETE FOUNDATIONS TO ELEVATIONS AS SHOWN. USE CLEAN GRANULAR FILL IN 6-INCH LIFTS. GRANULAR FILL SHALL BE CLEAN SAND WITH NO MORE THAN 10% FINES PASSING THROUGH A NO.200 SIEVE. COMPACT TO 95% RELATIVE COMPACTION PER ASTM D1557. PROVIDE TEST REPORT FROM INDEPENDENT TEST LAB SATISFACTORY TO OWNER AND ENGINEER.

COORDINATE FORM PLACEMENT WITH PIPING AND ELECTRICAL CONDUITS AS SHOWN IN THESE DRAWINGS. FORMWORK FOR SLAB SHALL BE IN ACCORDANCE WITH ACI 347, FOR PLACEMENT OF CONCRETE IN ACCORDANCE WITH ACI 304R.

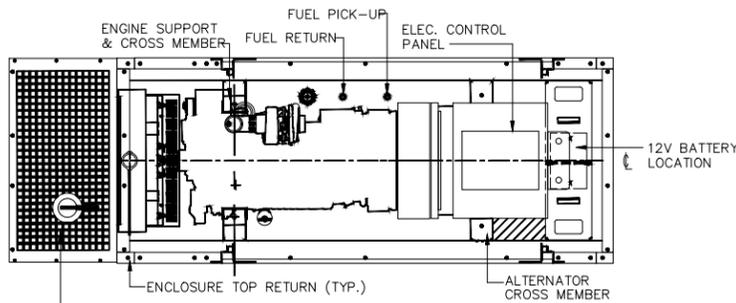
REINFORCING STEEL SHALL BE DEFORMED BARS IN ACCORDANCE WITH ASTM A615, GRADE 60, PLACED ON SUPPORTS IN ACCORDANCE WITH THE CRSI MANUAL OF STANDARD PRACTICE.

CONCRETE MIX SHALL UTILIZE TYPE II PORTLAND CEMENT WITH NATURAL AGGREGATE MEETING ASTM C150 AND ASTM C33 REQUIREMENTS RESPECTIVELY. THE MINIMUM 28-DAY STRENGTH SHALL BE 4,000 PSI. TAKE SAMPLES DURING POUR AND PROVIDE TEST CYLINDER BREAK REPORT FROM INDEPENDENT TEST LAB.

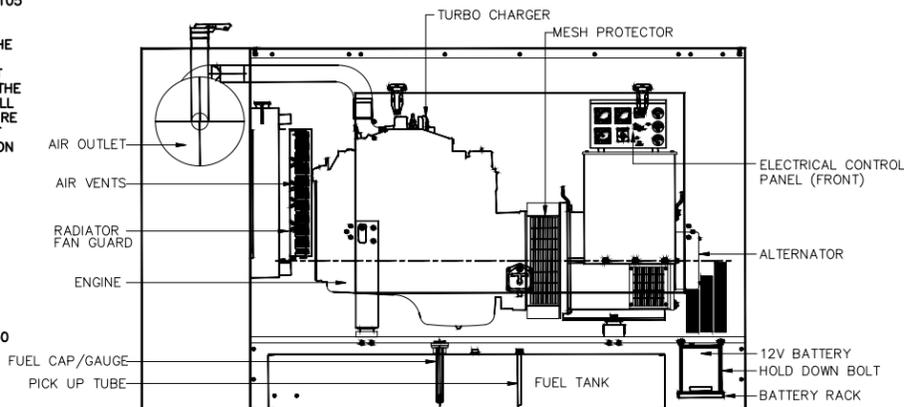
PLACE CONTROL JOINTS AS SHOWN. ROUND OFF ALL TOP EXPOSED EDGES WITH 0.25-INCH RADIUS EDGING TOOL.

PROTECT SURFACES AND WET CURE CONCRETE FOR A MINIMUM OF 7 DAYS AFTER PLACEMENT.

THE CONCRETE SUPPORT PAD FINISHED GRADE SHALL BE 18" ABOVE BASE FLOOD ELEVATION. FUEL TANK VENTS SHALL BE PROTECTED FROM FLOODING.

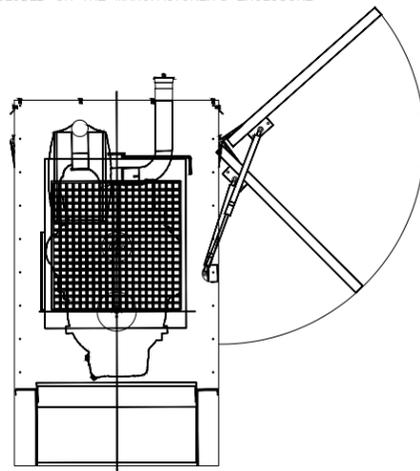


PLAN VIEW WITHOUT ROOF



LEFT SIDE VIEW

THE ENCLOSURE, GENERATOR AND BASE MOUNTED FUEL TANK SHALL BE CERTIFIED BY A LICENSED STRUCTURAL PROFESSIONAL ENGINEER LICENSED IN THE STATE OF FLORIDA AND TO BE DESIGNED AND RATED FOR A WIND LOAD RESISTANCE AS REQUIRED BY THE LATEST ADOPTED EDITION OF FLORIDA BUILDING CODE. PROVIDE TWO (2) ORIGINALS AND SIX (6) COPIES OF THE P.E. STAMPED CERTIFIED WIND LOAD CALCULATIONS REPORT INDICATING COMPLIANCE TO THE OWNER'S REPRESENTATIVE. THE ENCLOSURE WIND LOAD RATING SHALL BE INCLUDED ON THE MANUFACTURER'S ENCLOSURE DRAWINGS.



FRONT VIEW

**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



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**WET WELL MOUNTED RESIDENTIAL
WASTEWATER LIFT STATION
GENERATOR SPECS & DETAILS
S-23 (SHEET 5 of 7)**

FY-2024-2025
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WET WELL HATCH MINIMUM 36"X60" ALUMINUM SAMPLE DRAWING

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ORLANDO, FL
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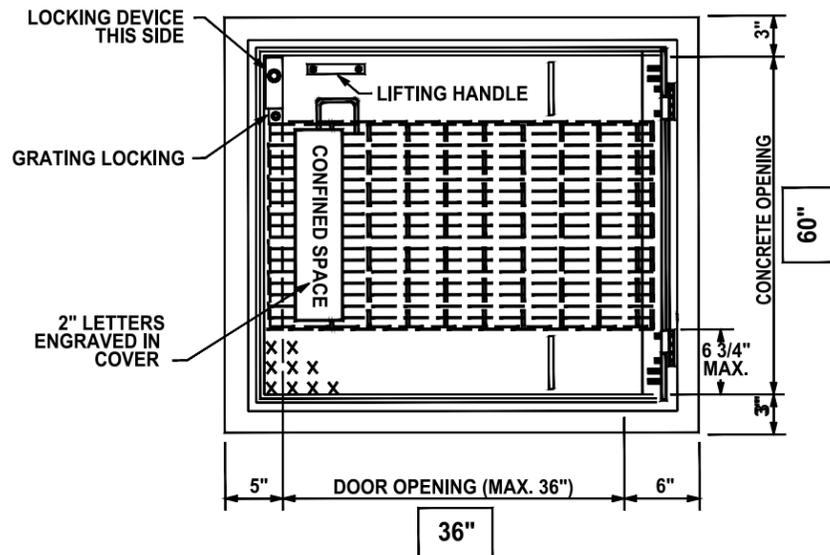


MODEL NO. H1R036060CBDP--Z
Z = CONFINED SPACE ENGRAVED IN COVER
COVER
QUANTITY: 1
DOCUMENT NO. Q12034
DATE: 9/17/20
LOCATION/TAG: DAYTONA

HALLIDAY PRODUCTS, INC.
ORLANDO, FL
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MODEL NO. X1SA37E60ECAAA
QUANTITY: 1
DOCUMENT NO. Q12034
DATE: 9/17/20
LOCATION/TAG: DAYTONA



STANDARD FEATURES:

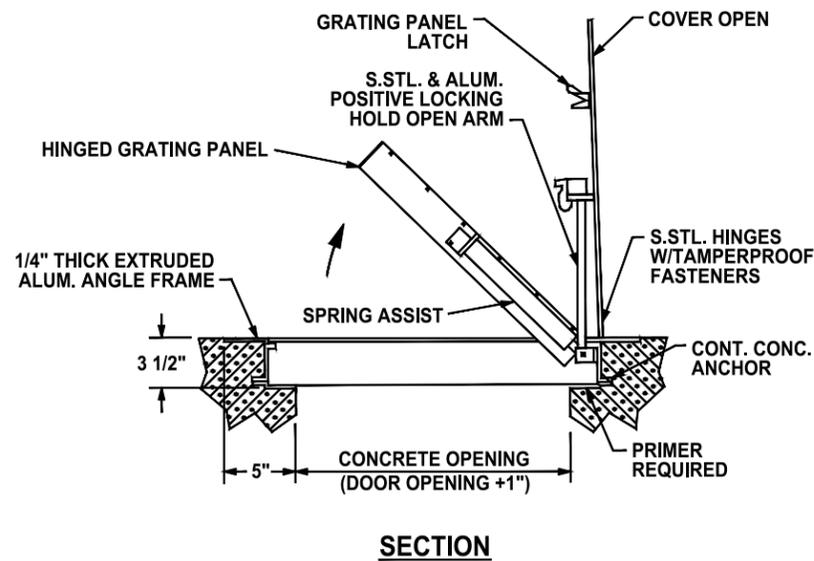
- 1/4 ALUMINUM TREAD PLATE COVER
- 1/4 THICK ALUM. ANGLE FRAME EXTRUSION
- T-316 STAINLESS STEEL HARDWARE
- S.STL. & ALUM. HOLD OPEN ARM
- S.STL. SLAM LOCK W/KEY
- RECESSED LIFT HANDLE (S)
- SPRING ASSIST (GRATING PANEL ONLY)
- HINGED AND LOCKABLE PROTECTIVE GRATING PANEL (POWDER COATED, SAFETY ORANGE COLOR)
- LIFETIME GUARANTEE
- H-20 LOAD RATING

OPTIONS/FEATURES:

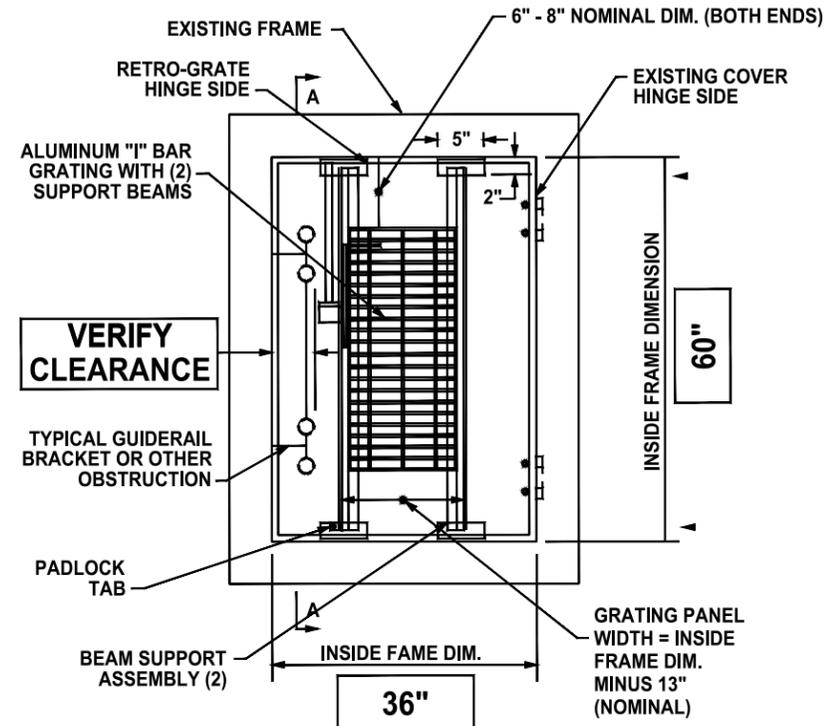
- RECESSED LOCK BOX
- BITUMINOUS COATING
- EPDM GASKET/CUSHION
- CONFINED SPACE ENGRAVED IN COVER

NOTES:

- 1) SUITABLE FOR USE IN OFF STREET LOCATION WHERE NOT SUBJECTED TO TRAFFIC.
- 2) PROVIDE A FULL BED OF CLASS "A" CONCRETE UNDER FRAME AND SUPPORT ANGLES.
- 3) STANDARD PRODUCT WARRANTY DOES NOT COVER CORROSION FROM CHLORINE CONTACT.



NOTE: COVER NOT SHOWN FOR CLARITY

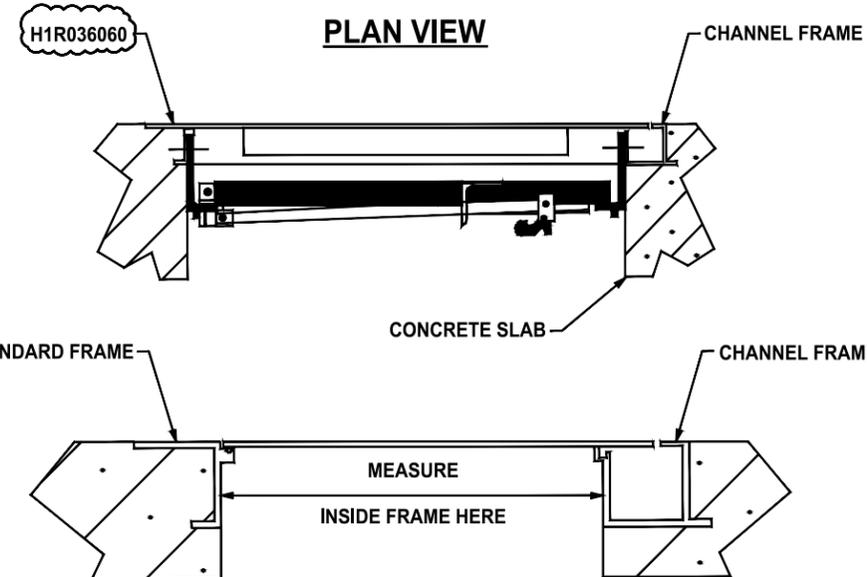


STANDARD FEATURES:

- HINGED ALUMINUM "I" BAR GRATING PANEL
- T-316 STAINLESS STEEL HARDWARE AND HOLD-OPEN ARM
- SPRING LOADED LIFT HANDLE
- 300 LB. PER SQ. FT. LOAD RATING
- 10 YEAR GUARANTEE
- PADLOCK TAB
- GRATING PANEL (POWDER COATED, SAFETY ORANGE COLOR)

MOUNTING HARDWARE

- SLEEVE ANCHOR (3/8" x 3" FH-P)



Important:
With any custom built item, it is imperative accurate information be relayed to the manufacturer. Carefully review the above information to insure there is no miscommunication with regard to the size of the existing opening, depth and condition of the concrete as well as obstructions which could adversely affect the operation of the Retro-Grate. All information including the tag/location must be shown in the above submittal drawing. If all information is correct, sign and date the submittal where shown and email to: sales@hallidayproducts.com or fax it to us @ 407-298-4534.

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT

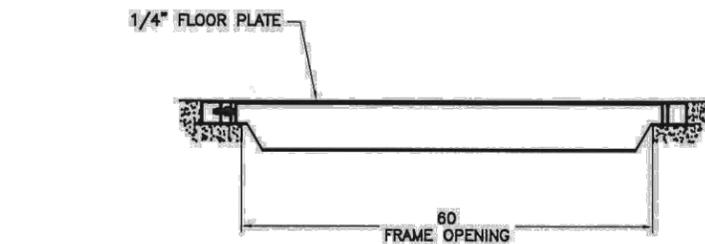
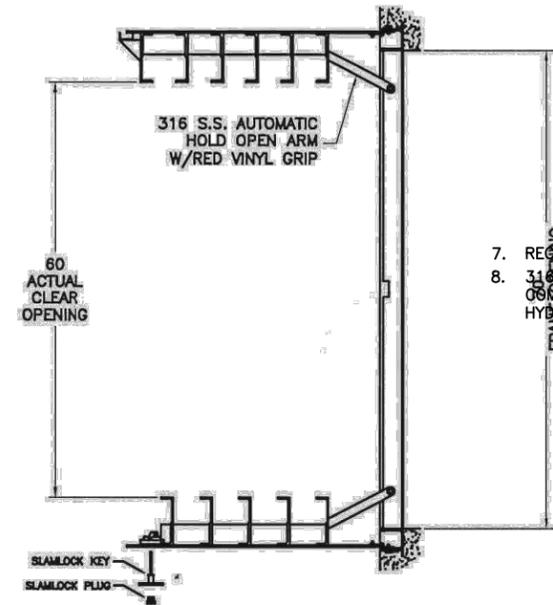
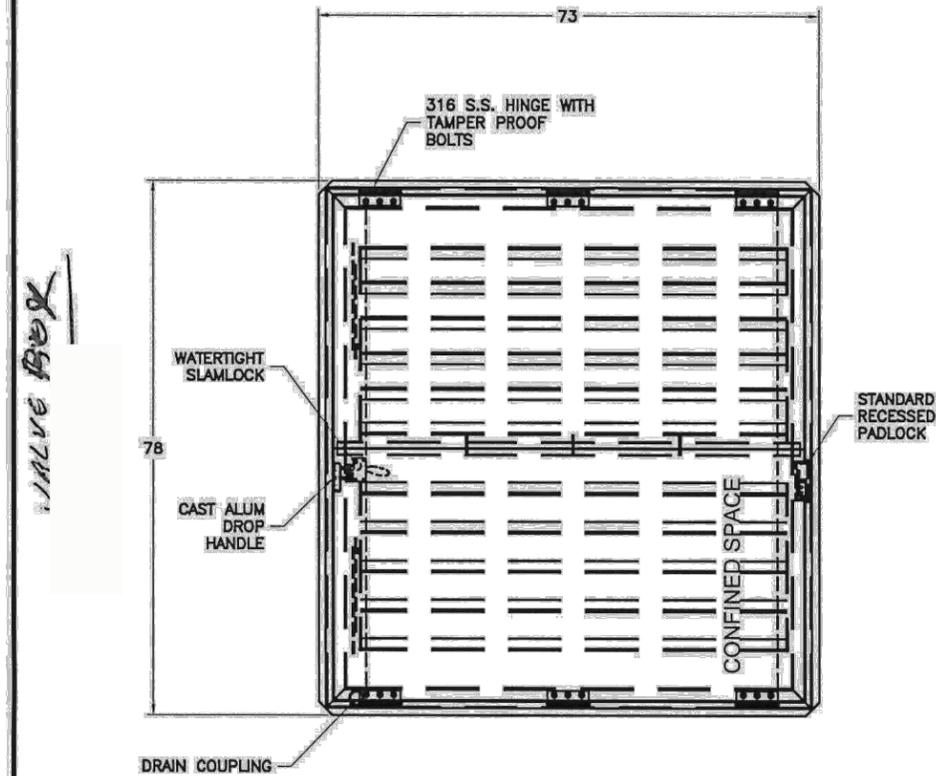


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WET WELL HATCH MINIMUM
36"X60" ALUMINUM SAMPLE
DRAWING S-23 (SHEET 6 of 7)

FY-2024-2025
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VALVE BOX HATCH SPRING LOADED MINIMUM 60"X70"
ALUMINUM SAMPLE DRAWING



SELECTED FEATURES

1. SLAMLOCK
2. STD. RECESSED PADLOCK
3. MILLED LETTERING
4. BITUMINOUS COATING
5. 2" MILLED LETTERING

NOTES

1. MATERIAL: ALUMINUM
2. FINISH: MILL
3. LOADING: DESIGNED FOR AASHTO 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: 447.65 LBS

7. RECESSED LOCK BOXES REQUIRED
8. 316 S.S OPEN HORIZONTAL COMPRESSION SPRINGS OR HYDRAULIC PISTONS ARE REQUIRED

ODOR REDUCTION GASKET/CUSHION



1/4" EXTRUDED TROUGH SECTION W/INTEGRAL CONT. ANCHOR FLANGE & GROOVE FOR GASKET/CUSHION
FRAME MAT'L: ALUMINUM 6063-T5

FRAME DETAIL

REVIEWED
By James Perkins at 3:12 pm, Aug 04, 2017

NOTE:
AS AN AUTOMATED DRAWING, THE DESIGN HAS NOT BEEN REVIEWED BY USFF ENGINEERING AND IS THEREFORE TO BE USED FOR REFERENCE ONLY. USFF RESERVES THE RIGHT TO ADJUST DIMENSIONS TO INSURE ADHERENCE TO CUSTOMER REQUIREMENTS AND PROPER OPERATION OF THE PRODUCT.

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INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M
BREAK ALL SHARP CORNERS & EDGES TO 0.01
TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTIONAL
INCHES = ± 1/16
1/16 = ± 1/32
1/32 = ± 1/64

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HIALEAH, FL

HATCH THD 60 X 70 ALUM

DWN. BY: BOB	SCALE: 1:30	SHEET: 1 OF 1	DATE: 04/10/17
CHK. BY: BOB	DWG # 1000063656	SHEET SIZE: A	REV: 0

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



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.

VALVE BOX HATCH SPRING
LOADED MINIMUM 60"X70"
ALUMINUM SAMPLE DRAWING
S-23 (SHEET 7 of 7)

FY-2024-2025
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THE CITY OF DAYTONA BEACH UTILITIES DEPARTMENT
LIST OF ACCEPTABLE PRODUCTS

Sanitary Sewer

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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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 ACCESORIES

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



THE CITY OF DAYTONA BEACH UTILITIES DEPARTMENT
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Category 1 of 4: PIPE MATERIALS

PVC, Green Pipe

1. North American Pipe
2. Diamond
3. NapCo
4. JM Eagle
5. National
6. Certain Teed

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
1. Model AC & AW
2. BMW wrap around end seal
3. Model CCES
4. Model 4810ES
5. Model C, S, & W
6. 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
1. Series SS
2. Series CCS/ CCPS/ AZ
3. BMW-SS
4. Model 4810
5. Series S-G-2
6. Ranger II
7. S/T, F/G, P/Q, M/N, E/H
8. CSS-8, CSS-12

THE CITY OF DAYTONA BEACH
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SANITARY SEWER
CONSTRUCTION &
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Category 2 of 4: VALVES AND ACCESSORIES

Gate Valves - General (resilient seat)

AWWA C509 and C515

- | | |
|---------------------------|------------------|
| 1. American Flow Control | 1. C509 and C515 |
| 2. Mueller | 2. C509 and C515 |
| 3. Clow | 3. C509 and C515 |
| 4. Kennedy | 4. C509 and C515 |
| 5. US Pipe | 5. C509 and C515 |
| 6. American AVK | 6. C509 (only) |
| 7. East Jordan Iron Works | 7. C509 and C515 |

Gate Valves 12" and Smaller (resilient seated only)

- | | |
|--------------------------|------------------|
| 1. American Flow Control | 1. Series 2500 |
| 2. American R/D | 2. Series 2000 |
| 3. AVK | 3. Series 25 |
| 4. Clow | 4. Series F-6100 |
| 5. Kennedy | 5. Series 4571 |
| 6. M&H | 6. Series 4067 |
| 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 |
| 3. Mueller | 3. Series A2361 |
| 4. US Pipe | 4. Series 5460 |
| 5. Kennedy | 5. Series 4571 |
| 6. M&H | 6. Series 4067 |

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Plug Valves (full flow only)

- | | |
|------------------|------------------------------------|
| 1. Clow | 1. Full Flow Series F-5412, F-5413 |
| 2. Dresser | 2. Series PEC |
| 3. Dezurik | 3. Permaseal Series |
| 4. Mueller/Pratt | |
| 3. Milliken | |

Blow Off Valves

- | | |
|-------------------------|------------------------------------|
| 1. Hydro Guard | 3. Series 625 (Eccentricity style) |
| 2. Kupferle Foundry Co. | 1. Automatic Blow Off |
| 3. Water Plus | 2. Series TF 550 |
| | 3. Series VB 2000 |

Air, Vacuum or Air/Vac Combination Release Valves (No DI or Cast Iron allowed)

- | | |
|--------|--|
| 1. ARI | 1. ARI, D-025 (NYLON OR STAINLESS STEEL - 316) |
|--------|--|

Air Release Valve Enclosure

- | | |
|----------------|--------------------|
| 1. Water Plus | 1. No. 30 (131632) |
| | No. 40 (171730) |
| 2. CDR | 2. Boxes & Vaults |
| 2. GlasMasters | 2. Boxes & Vaults |

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 | 1. Aqualite |
| 2. Vassallo | 2. Gask-O-Weld |
| 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 | |

**THE CITY OF DAYTONA BEACH
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Expansion Joints

1. EBAA
2. Mercer
3. Metraflex
4. Proco

DIP Sewer Fittings

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. U.S. Pipe 2. McWane 3. Tyler Union 4. Star Pipe Products 5. American | <ol style="list-style-type: none"> 1. Mechanical Joint - SSB or Full Body
21 - 10
AWWA C-110
A 21.53
C-153 |
|---|---|

Restrained Joints - DIP

All Grip series 3600

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. American 2. EBAA Iron Inc.
 3. Ford 4. Star 5. US Pipe 6. Sigma 7. Mueller 8. Romac 9. U.S. Pipe/McWane 10. SIP Industries 11. Tyler Union | <ol style="list-style-type: none"> 1. Fast Grip Gasket 2. Mega-lug series 1100, series 1700 restraint, 2003 PV series RS-3800 restrainer 3. UFR-1400, 1300C series 4. Star Grip series 3000, 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, and C-900 DR-18 PVC.

Tapping Sleeves for Size On Size shall use a Mueller Mechanical Joint Sleeve for Centrifugal C.I., D.I. P., and C-900 DR-18 PVC Pipe.

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. American Flow Control 2. Clow 3. Mueller 4. US Pipe 5. Smith Blair 6. JCM | <ol style="list-style-type: none"> 1. Series 2800 2. Series F-5205, F-5207 3. Series H-615, H-616, H-619 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

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Fernco 2. Pipeconx | <ol style="list-style-type: none"> 1. 1056 |
|--|---|

**THE CITY OF DAYTONA BEACH
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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.

Category 4 of 4: MANHOLE ACCESSORIES

PVC Pipe Manhole Adaptors

1. Harrington Corp.

1. PVC Sewer Adapter

Manhole Lids, Frames & Rings

1. U.S. Foundry
2. East Jordan Iron Works
3. EJ USA Inc.
4. Ladtech
5. Composite Access Products

1. Series 170, 420G, 580
1. Series 306
1. Series 1338
4. Riser ring
5. Riser ring & cover
5. A-1BK24S4-CO7DMDSS-H1

Flexible Manhole Connectors

1. Kor-N-Seal

Manhole Linings

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

Manhole HDPE adjustable Chimney liner & Lip Gasket

1. Hanson Pipe Co.

THE CITY OF DAYTONA BEACH
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SANITARY SEWER
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Grease Interceptors and Sand/Oil Separators

Fats, oils and grease will cause blockages in pipes which can result in backups and sanitary sewer overflows which create an environmental problem and damage pipes and structures. The purpose of the City of Daytona Beach's Fats, Oil & Grease (FOG) Program manual is to minimize the introduction of fat-soluble wastes to the collection system. The program provides specific standards for design, capacity, installation, maintenance, and administrative procedures required for devices.

- i. Nonresidential establishments (users) that prepare, process, or serve food or food products shall have an approved oil and grease interceptor. Nonresidential establishments that have the potential to discharge wastes containing residual petroleum-based oil and grease, such as commercial laundries, car washes, and automotive related facilities, shall have an approved oil/water separator. Other users may be required by the Utilities Director or designee to install an approved oil and grease interceptor or an oil/water separator, as appropriate, for the proper handling of wastes containing oil and grease exceeding two hundred thirty (230) mg/L by weight.
- ii. Other types of food manufacturing or food preparation enterprises, such as, but not limited to, commissaries, commercial kitchens, and caterers shall install an oil and grease interceptor. Oil and grease interceptors shall be sized on an individual case by case basis. A control manhole or inspection box for monitoring purposes shall be required and installed at the owner/operator's sole expense, as approved by the Utilities Director or designee.
- iii. Multifamily dwellings, such as triplexes, quadraplexes, townhouses, condominiums, apartment buildings, apartment complexes, or areas of intensified dwelling that are not designed with individual sanitary services for each individual unit shall be required to install a grease interceptor. The capacity of the grease interceptor shall be calculated based upon F.A.C. 62-6.013 or 64E6.

The City of Daytona Beach's Fats, Oil & Grease (FOG) Program manual shall serve as the controlling document for the design and maintenance of grease interceptors and oil/water separators. This manual can be located at the following site:

<https://www.codb.us/DocumentCenter/View/12775/FOG-MANUAL-2021>

THE CITY OF DAYTONA BEACH
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FOG
FAT, OIL & GREASE
DETAIL
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STORMWATER DETAILS

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STORMWATER DETAILS
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6-ST-0--Stormwater TOC.dwg

STORMWATER CONSTRUCTION NOTES

1. ALL SITE SPECIFIC, EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES AT A MINIMUM SHALL BE INSTALLED PER APPROVED SITE PLANS AND STORMWATER POLLUTION PREVENTION PLANS (SWPPP). EPSC DESIGN, INSTALLATION AND MAINTENANCE SHALL BE IN ACCORDANCE WITH THE STATE OF FLORIDA EROSION AND SEDIMENT CONTROL DESIGNER AND REVIEWER MANUAL CURRENT EDITION.
2. THE SITE WORK CONTRACTOR SHALL ENSURE IMPLEMENTATION OF APPROVED SWPPP AND INSTALLATION OF ALL APPROVED EROSION PREVENTION AND SEDIMENT CONTROL PRACTICES. **A PRECONSTRUCTION EROSION CONTROL INSPECTION SHALL BE SCHEDULED WITH CITY PERSONNEL PRIOR TO COMMENCEMENT OF ANY LAND DISTURBANCE ACTIVITIES.**
3. THE SITE WORK CONTRACTOR SHALL ENSURE THAT THE NPDES CONSTRUCTION GENERIC PERMIT (CGP) NOTICE OF INTENT (NOI) AND ANY REQUIRED DEWATERING PERMITS HAVE BEEN OBTAINED OR SUBMITTED PRIOR TO ANY LAND DISTURBANCE ACTIVITIES.
4. A CODB DEWATERING PERMIT IS REQUIRED PRIOR TO ENGAGING IN ANY DEWATERING OR CONSTRUCTION ACTIVITY THAT CHANGES THE IMPERVIOUS AREA OF LAND. PERMITTABLE DEWATERING ACTIVITIES INCLUDE; THE REMOVAL OF GROUND WATER FROM A CONSTRUCTION SITE, ENCLOSED VAULT, COFFERDAM, OR TRENCHES, ALLOWING CONSTRUCTION OR MAINTENANCE IN A DRY ENVIRONMENT. SITE SPECIFIC DEWATERING PERMITS REQUIRE PAYMENT OF A PER ACRE FEE BASED ON THE SIZE OF THE DEVELOPMENT AND GENERAL PURPOSE PERMITS REQUIRE AN ANNUAL FEE BASED ON A BIENNIAL SCHEDULE OF DEWATERING ACTIVITIES DISCHARGING DIRECTLY INTO THE CITY'S PHASE II MS4 STORMWATER CONVEYANCE SYSTEM. DEWATERING PERMITS MAY BE APPLIED FOR DIRECTLY THROUGH ETRAKIT. FEES ARE SUBJECT TO ARTICLE 7, SECTION 7.2 OF THE LAND DEVELOPMENT CODE AND MUST BE SUBMITTED WITH THE PERMIT APPLICATION PRIOR TO ANY USE OF THE CITY'S STORMWATER CONVEYANCE SYSTEM.
5. CONTRACTOR SHALL FOLLOW ALL OF THE CITY'S REQUIRED WASTE MANAGEMENT PRACTICES. ALL CONSTRUCTION, RENOVATION, AND DEMOLITION SITES ARE TO BE KEPT CLEAN AND FREE OF REFUSE, DEBRIS, AND LITTER DURING THE CONSTRUCTION, RENOVATION, OR DEMOLITION PROCESS. A CERTIFICATE OF OCCUPANCY FOR A NEWLY CONSTRUCTED OR RENOVATED BUILDING SHALL NOT BE ISSUED UNTIL ALL REFUSE AND LITTER CAUSED BY THE CONSTRUCTION OR REMODELING IS REMOVED FROM THE SITE PER THE DAYTONA BEACH CODE OF ORDINANCES CHAPTER 78 SECTION 78-5 AND 78-7.
6. 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
7. 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.
8. CONCRETE EROSION CONTROL BMP'S MUST BE PROVIDED WHERE SWALES OR CULVERTS INTERCEPT DRAINAGE DITCHES.
9. IN GENERAL, ALL RETENTION/DETENTION STRUCTURES SHOULD BE CONSTRUCTED TO ROUGH GRADE PRIOR TO ANY ROAD, PARKING LOT, OR BUILDING CONSTRUCTION OR AS PERMIT CONDITIONS DICTATE. SEWER AND WATER MAINS MAY BE INSTALLED PRIOR TO CONSTRUCTION OF RETENTION/DETENTION IF DEWATERING IS NOT REQUIRED. ADDITIONAL BMP'S FOR EROSION AND SEDIMENT CONTROL SHALL BE IMPLEMENTED AS NECESSARY.
10. IT IS THE RESPONSIBILITY OF ALL CONTRACTOR'S TO REVIEW AND MAINTAIN COPIES OF THE SJRWMD, ERP, NPDES CGP, SITE SPECIFIC SWPPP, AND ALL OTHER APPLICABLE PERMITS AT THE CONSTRUCTION SITE AT ALL TIMES.

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STORMWATER CONSTRUCTION NOTES (CONT')

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 AND AS NOTED BELOW).
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 ACCOMODATE 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 AND MEET SJRWMD CRITERIA.
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 CITY APPROVED EQUIVALENT AND BE ADEQUATELY SUPPORTED TO PREVENT DEFLECTION. ALL HARDWARE SHALL BE 316 STAINLESS STEEL.
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.

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STORMWATER CONSTRUCTION NOTES (CONT')

22. DEVELOPMENT PLANS FOR ALL STORMWATER MANAGEMENT SYSTEMS SHALL CONTAIN DISCHARGE DATA (OVERFLOW), BOTTOM ELEVATION, NORMAL WATER LEVELS, MEAN ANNUAL SEASONAL HIGH WATER TABLE ELEVATION, TREATMENT VOLUME AND CORRESPONDING ELEVATION, 25 YEAR/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.

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



STORMWATER
CONSTRUCTION NOTES
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ST-3

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STORMWATER CONSTRUCTION NOTES (CONT')

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.
31. ALL STORMWATER INLETS SHALL MEET FDOT CRITERIA IN THE FDOT DESIGN STANDARD LATEST EDITION.
32. ALL GASKETS SHALL BE LUBRICATED BEFORE BEING INSTALLED.
33. ALL FITTINGS SHALL MEET THE MINIMUM RESTRAINED REQUIREMENTS PER ANSI/AWWA AND EBAA. ALL PRESSURE PIPES UNDER THE ROADWAY SHALL BE RESTRAINED.
34. PROVIDE A MINIMUM OF 1'-0" OF FREEBOARD FROM THE HYDRAULIC GRADE LINE ELEVATION TO THE TOP OF GRATE FOR ALL INLETS AT THE 10 YEAR/24 HOUR DESIGN STORM AND 25 YEAR/24HOUR TAILWATER ELEVATION FOR THE SYSTEM.
35. PROVIDE A MINIMUM OF 1'-0" OF FREEBOARD FROM THE TOP OF BERM TO THE DESIGN HIGH WATER ELEVATION OF 25 YEAR /24 HOUR STORM FOR ALL RETENTION/DETENTION/COMPENSATING STORAGE PONDS.
36. PROVIDE A MINIMUM OF 1'-0" OF FREEBOARD FROM THE TOP OF BANK TO THE DESIGN HIGH WATER ELEVATION IN ALL DITCHES FOR THE 25 YEAR/24 HOUR STORM.
37. PIPE INVERTS IN ALL DETENTION/RETENTION/COMPENSATING STORAGE PONDS SHALL BE AT A MINIMUM OF 6" ABOVE THE THE POND BOTTOM ELEVATION.
38. ALL PIPE INVERTS IN DITCHES SHALL BE AT 6" ABOVE THE DITCH BOTTOM ELEVATION.
39. PROFILES MUST BE PROVIDED FOR ALL PROPOSED AND EXISTING STORM SEWER PIPES.
40. PROVIDE 1/2" PER FOOT (4%) MINIMUM SLOPE IN ALL GRASSED AREAS WHERE SHEET FLOW IS DESIRED, INCLUDING RESIDENTIAL LOTS.
41. PROVIDE STATION, OFFSET, AND ELEVATION AT MAXIMUM OF 200 FOOT INTERVALS FOR ALL WATER MAINS, RECLAIMED, SEWER, FORCEMAINS, AND APPURTENANCES (INCLUDING HYDRANTS AND VALVES) ON ALL CONSTRUCTION PLANS.
42. UPON APPROVAL BY ALL OTHER STATE AND LOCAL PERMITTING AGENCIES, THE STORMWATER REPORT MUST BE RESUBMITTED WITH THE CONSTRUCTION PLANS CLOUDING ANY CHANGES MADE TO THE PLANS OR STORMWATER REPORT THAT DIFFERS FROM THE ORIGINALLY SUBMITTED OR ORIGINALLY APPROVED SET OF CONSTRUCTION PLANS AND STORMWATER CALCULATIONS. A SUMMARY OF THOSE CHANGES MUST BE INCLUDED IN THE FINAL RE-SUBMITTAL. THIS SUBMITTAL MUST BE APPROVED BY CITY STAFF BEFORE A PRE-CONSTRUCTION MEETING OR SHOP DRAWINGS CAN BE SUBMITTED.



EROSION AND SEDIMENT CONTROL NOTES

1. ALL DEMOLITION AND CONSTRUCTION ACTIVITIES SHALL INCORPORATE APPROPRIATE BEST MANAGEMENT PRACTICES (BMP'S) TO PREVENT EROSION, OFFSITE SEDIMENTATION, AND THE POTENTIAL FOR DOWNSTREAM WATER QUALITY IMPACTS.
2. THE SITE WORK/GRADING AND UTILITIES CONTRACTOR SHALL AT A MINIMUM, ENSURE IMPLEMENTATION OF AN APPROVED EROSION PREVENTION AND SEDIMENT CONTROL PLAN IN ACCORDANCE WITH FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP) CONSTRUCTION ACTIVITY GUIDELINES.
3. A SITE SPECIFIC STORMWATER POLLUTION PREVENTION PLAN (SWPPP) SHALL BE SUBMITTED WITH THE PROPOSED SITE PLANS FOR REVIEW AND APPROVAL BY THE CITY PER THE CITY'S LAND DEVELOPMENT CODE (LDC) "ADDITIONAL APPLICATION REQUIREMENTS FOR SITE PLANS".
4. ALL APPLICABLE PERMITS, SWPPP, AND SITE SPECIFIC BMP'S SHALL BE INSPECTED BY THE CITY, PRIOR TO THE START OF ANY LAND DISTURBANCE ACTIVITIES. PRECONSTRUCTION EROSION CONTROL INSPECTIONS CAN BE SCHEDULED THROUGH PERMITS AND LICENSING.
5. THE SITE WORK CONTRACTOR SHALL MINIMIZE DISTURBANCES OF EXISTING WETLANDS, VEGETATION AND DRAINAGE PATTERNS ON ADJACENT PROPERTIES TO THE MAXIMUM EXTENT PRACTICABLE DURING CONSTRUCTION ACTIVITIES.
6. STORMWATER 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 BMP'S MUST BE IMPLEMENTED TO PREVENT SILTATION OF THESE TREATMENT SYSTEMS AND CONTROL STRUCTURES DURING CONSTRUCTION. SILTATION MUST BE REMOVED FROM THE STORMWATER SYSTEM WHEN HALF FULL AND IMMEDIATELY PRIOR TO FINAL GRADING AND STABILIZATION OF THE PROJECT.
7. THE OWNER AND OR, CONTRACTOR(S) IS RESPONSIBLE FOR IMPLEMENTATION AND MAINTENANCE OF ALL EROSION PREVENTION AND SEDIMENT CONTROL MEASURES AND PROJECT. SPECIFIC PERMIT REQUIREMENTS. BEST MANAGEMENT PRACTICES INSTALLED ONSITE SHALL BE INSPECTED AT LEAST ONCE EVERY SEVEN CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM EVENT THAT IS 0.50 INCHES OR GREATER (EVEN IF IT RAINS ON THE WEEKEND OR HOLIDAY). THE SITE SHALL BE INSPECTED AND THE INSPECTION DOCUMENTED BY A QUALIFIED INSPECTOR AND CORRECTIVE ACTIONS TAKEN AS NECESSARY.
8. THE SITE WORK/GRADING AND UTILITIES CONTRACTOR SHALL INITIATE STABILIZATION MEASURES WITHIN SEVEN CALENDAR DAYS AFTER CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED FOR ANY PORTION OF THE PROJECT. FINAL STABILIZATION IS DEFINED AS A UNIFORM PERENNIAL VEGETATIVE COVER WITH A DENSITY OF GROWTH OF AT LEAST 70% OR GREATER.
9. THE SITE WORK OWNER AND/OR CONTRACTOR(S) IS RESPONSIBLE FOR MAINTAINING THE PROJECT IN COMPLIANCE WITH ALL JURISDICTIONAL PERMITS AND THE CITY'S LAND DEVELOPMENT CODE REQUIREMENTS.
10. FOR ANY LAND DISTURBANCES OF ONE ACRE OR MORE, THE CONTRACTOR SHALL SUBMIT A COMPLETED NPDES CONSTRUCTION GENERIC PERMIT (CGP) NOTICE OF INTENT (NOI) TO THE FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION (FDEP) AT LEAST 2 CALENDAR DAYS PRIOR TO COMMENCEMENT OF CLEARING, GRADING, DEMOLITION, OR OTHER CONSTRUCTION RELATED LAND DISTURBANCE ACTIVITIES. THE NPDES CGP SHALL BE MAINTAINED UNTIL COMPLETION OF ALL CONSTRUCTION ACTIVITIES.
11. FOR PROJECTS THAT DISCHARGE STORMWATER INTO THE CITY'S MS4 STORMWATER CONVEYANCE SYSTEM, THE CITY'S MS4 MUST BE DESIGNATED AS A DISCHARGE LOCATION ON THE FDEP CGP NOI. IF DESIGNATED AS SUCH, A COPY OF THE NPDES CGP NOI OR ACKNOWLEDGEMENT LETTER MUST BE SUBMITTED TO THE CITY OF DAYTONA BEACH UTILITIES DEPARTMENT WITHIN 7 CALENDAR DAYS.

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



EROSION AND SEDIMENT
CONTROL NOTES
ST-5

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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 REORTS. 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 ENVIROMENTAL 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 * -GPH

AVERAGE TEST PRESSURE (PSI)	NOMINAL PIPE DIAMETER - INCHES																AVERAGE TEST PRESSURE (PSI)		
	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48	54		60	64
450	0.48	0.64	0.95	1.27	1.59	1.91	2.23	2.55	2.87	3.18	3.82	4.78	5.73	6.69	7.64	8.60	9.56	10.19	450
400	0.45	0.60	0.90	1.20	1.50	1.80	2.10	2.40	2.70	3.00	3.60	4.50	5.41	6.31	7.21	8.11	9.01	9.61	400
350	0.42	0.56	0.84	1.12	1.40	1.69	1.97	2.25	2.53	2.81	3.37	4.21	5.06	5.90	6.74	7.58	8.43	8.99	350
300	0.39	0.52	0.78	1.04	1.30	1.56	1.82	2.08	2.34	2.60	3.12	3.90	4.68	5.46	6.24	7.02	7.80	8.32	300
275	0.37	0.50	0.75	1.00	1.24	1.49	1.74	1.99	2.24	2.49	2.99	3.73	4.48	5.23	5.98	6.72	7.47	7.97	275
250	0.36	0.47	0.71	0.95	1.19	1.42	1.66	1.90	2.14	2.37	2.85	3.56	4.27	4.99	5.70	6.41	7.12	7.60	250
225	0.34	0.45	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.25	2.70	3.38	4.05	4.73	5.41	6.03	6.76	7.21	225
200	0.32	0.43	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.12	2.55	3.19	3.82	4.46	5.09	5.73	6.37	6.80	200
175	0.30	0.40	0.59	0.80	0.99	1.19	1.39	1.59	1.79	1.98	2.38	2.98	3.58	4.17	4.77	5.36	5.96	6.36	175
150	0.28	0.37	0.55	0.74	0.92	1.10	1.29	1.47	1.66	1.84	2.21	2.76	3.31	3.86	4.41	4.97	5.52	5.88	150
125	0.25	0.34	0.50	0.67	0.84	1.01	1.18	1.34	1.51	1.68	2.01	2.52	3.02	3.53	4.03	4.53	5.04	5.37	125
100	0.23	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.80	2.25	2.70	3.15	3.60	4.05	4.50	4.80	100

* 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:

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

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)

**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**STORMWATER FORCE
MAIN TESTING
REQUIREMENTS NOTES
ST-6**

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PIPE INSPECTION EVALUATION AND REPAIR

Section 8.13

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.



PIPE INSPECTION EVALUATION AND REPAIR

- (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 on CD's(DVD) (no flash drives).
- (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, size, designated direction of flow 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.
- (6) Provide a written report for each inspection with 'to' and 'from' manholes.

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.



PIPE INSPECTION EVALUATION AND REPAIR

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.

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



PIPE INSPECTION
EVALUATION AND REPAIR
(SHEET 3 of 4)
ST-9

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PIPE INSPECTION EVALUATION AND REPAIR

8.13.6.3 Repair Guidance

The Department maintains the expectation that all culvert installations will produce a 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

2. Spalling

3. Leaking Joints

Acceptable Repair Methods

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 Sepcifications

3. Mechanical Repair Sleeve

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.

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 430-001 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).

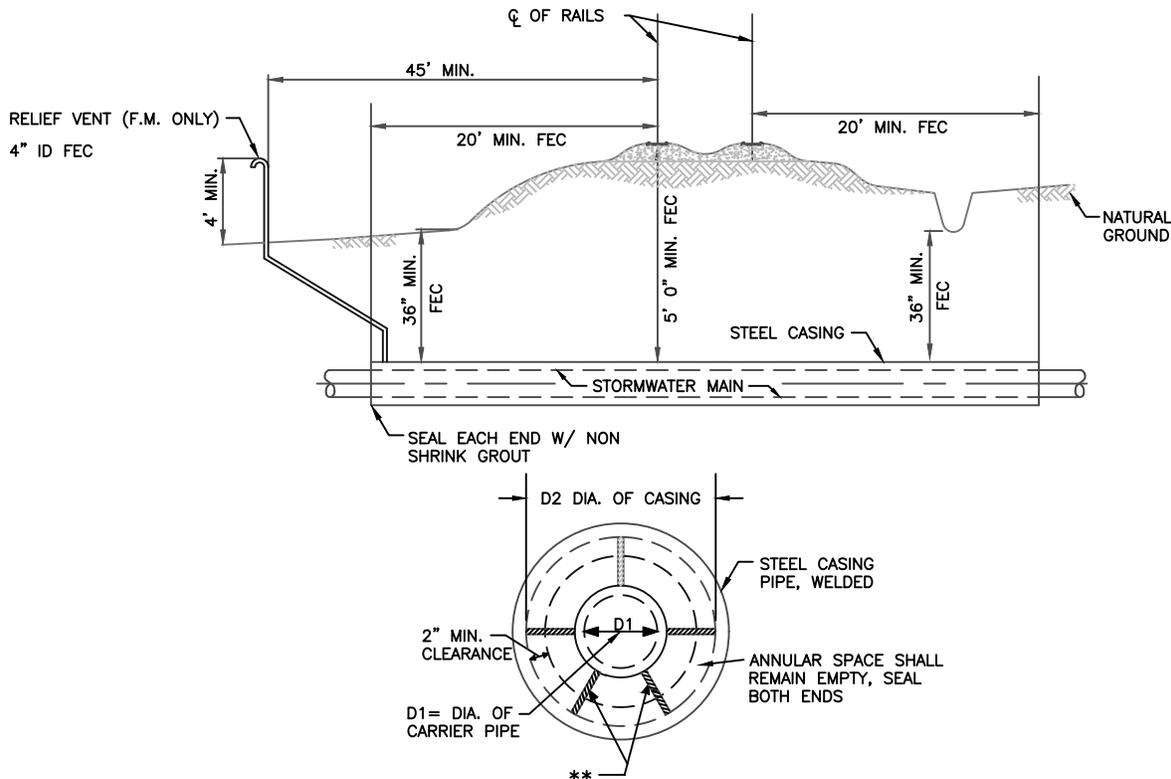
**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**PIPE REPAIR MATRIX–
STEEL REINFORCED
CONCRETE PIPE
ST–11**

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PAVEMENT CUT & PATCH DETAIL



TYPICAL RAILROAD CROSSING NTS

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.)														
CARRIER PIPE NOM. DIA. (D1)	4	6	8	10	12	14	16	18	20	24	30	36	42	48
CASING PIPE NOM. DIA. (D2)	14	16	18	22	24	30	30	30	36	36	48	54	60	66
WALL THICKNESS-INCHES *	PER AUTHORITY HAVING JURISDICTION													

NOTES:

1. MINIMUM COVER FOR TOP OF CASING TO R/R BASE SHALL BE 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 FLOTATION 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 FDOT STANDARDS.
- ** SPECIALLY DESIGNED SPACERS SHALL BE USED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. USE CASCADE CASING SPACERS OR PRE-APPROVED EQUAL.

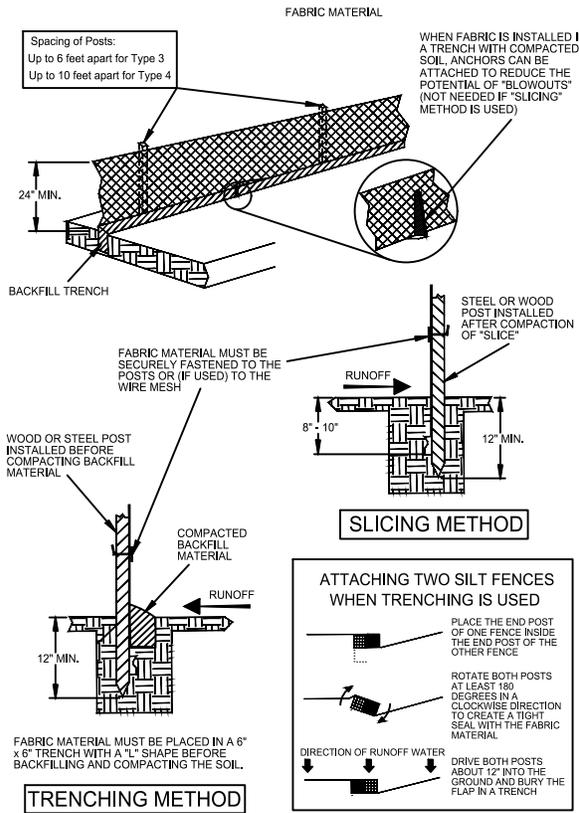
**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**TYPICAL RAILROAD
CROSSING DETAIL
ST-12**

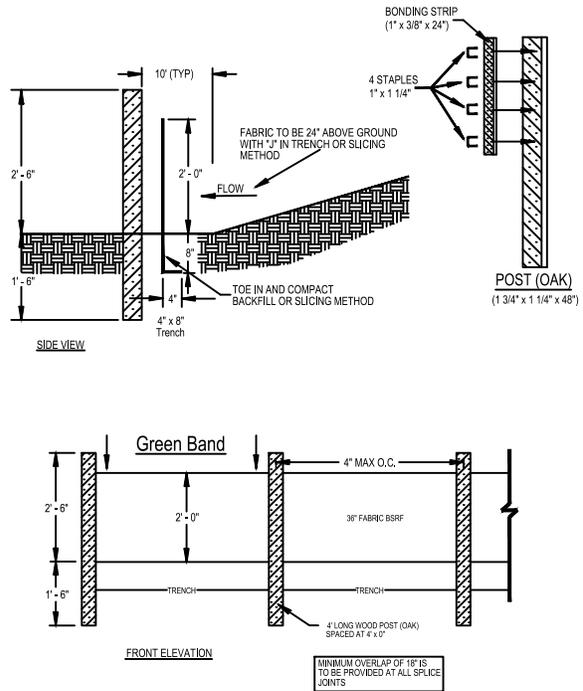
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STAKED SILT FENCE DETAIL



SILT FENCE BARRIER INSTALLATION

Approved Alternate
 FDOT - Staked Turbidity Barrier
 State of Florida Erosion & Sediment Control Designer & Reviewer Manual
 Belted Silt Retention Fence (Priority 1)



BELTED SILT RETENTION FENCE (BSRF) Priority 1 - Green Band

NOTES:

1. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE STATE OF FLORIDA EROSION AND SEDIMENT CONTROL DESIGNER AND REVIEWER MANUAL, JULY 2013 UPDATE.
2. CONTRACTOR SHALL PROVIDE AND MAINTAIN SITE SPECIFIC EROSION PREVENTION AND SEDIMENT CONTROL (EPSC) MEASURES TO TREAT ALL STORMWATER DISCHARGES DURING CONSTRUCTION. DEPENDING UPON FLOW VELOCITIES AND VOLUME, ADDITIONAL MEASURES MAY BE REQUIRED.
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.

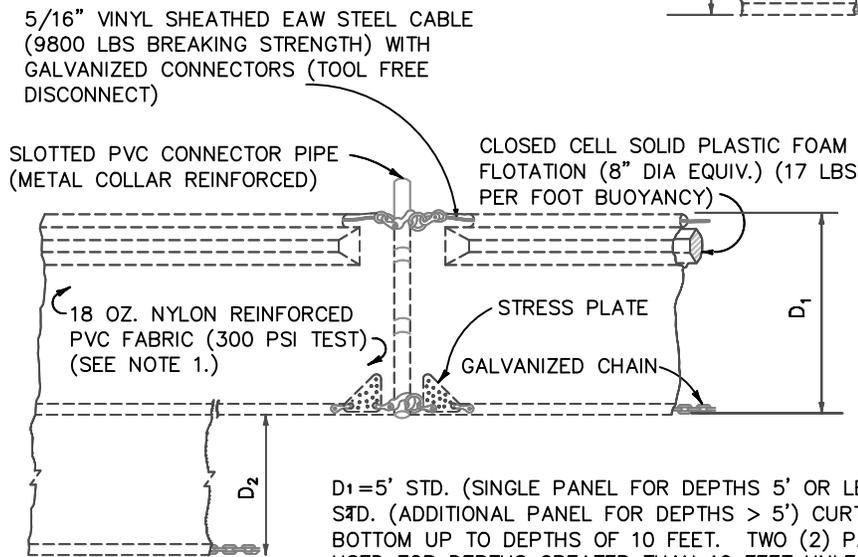
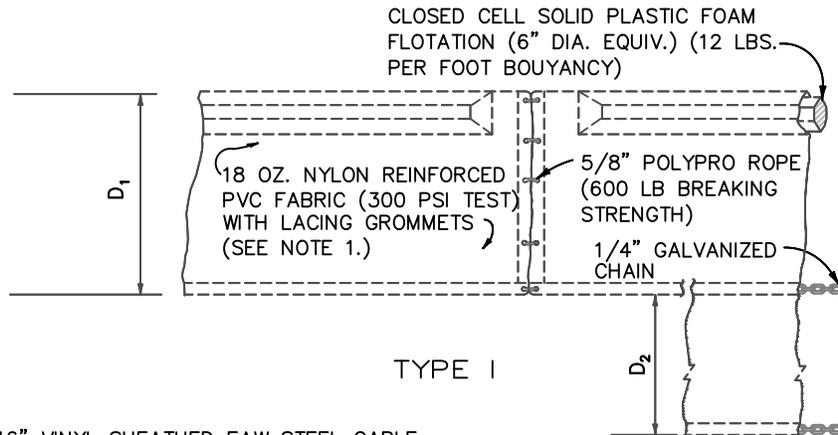
THE CITY OF DAYTONA BEACH
 UTILITIES DEPARTMENT



STAKED SILT
 FENCE DETAIL
 ST-13

FY-2024-2025
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FLOATING TURBIDITY BARRIER DETAIL



$D_1 = 5'$ STD. (SINGLE PANEL FOR DEPTHS 5' OR LESS) $D = 5'$ STD. (ADDITIONAL PANEL FOR DEPTHS > 5') CURTAIN TO REACH BOTTOM UP TO DEPTHS OF 10 FEET. TWO (2) PANELS TO BE USED FOR DEPTHS GREATER THAN 10 FEET UNLESS SPECIAL DEPTH CURTAINS SPECIFICALLY CALLED FOR IN THE PLANS OR AS DETERMINED BY THE ENGINEER.

NOTE:

1. USE 18 OZ. NYLON REINFORCED PVC FABRIC FOR STANDING WATER. USE FILTER FABRIC FOR FLOWING WATER.

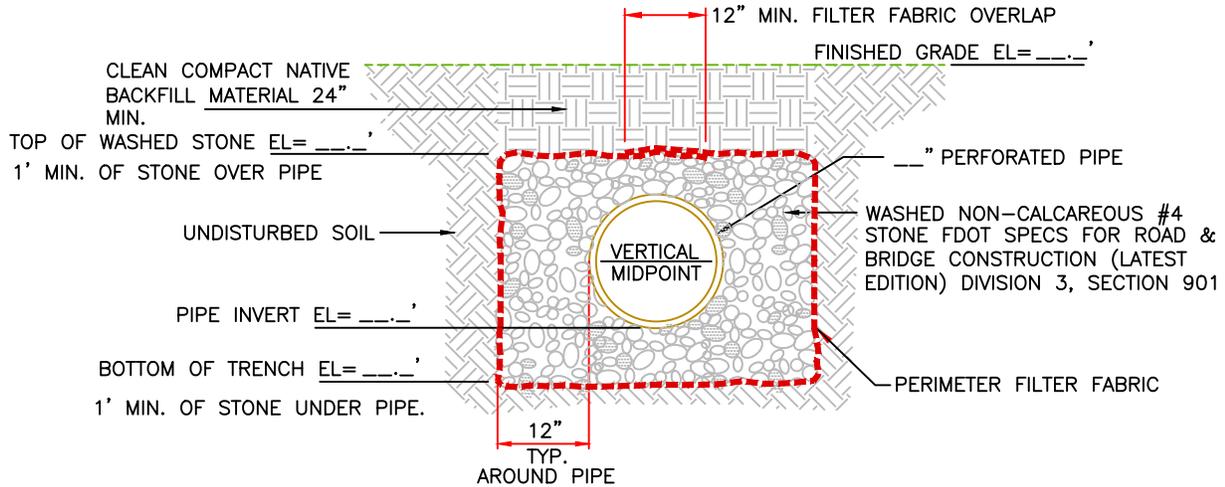
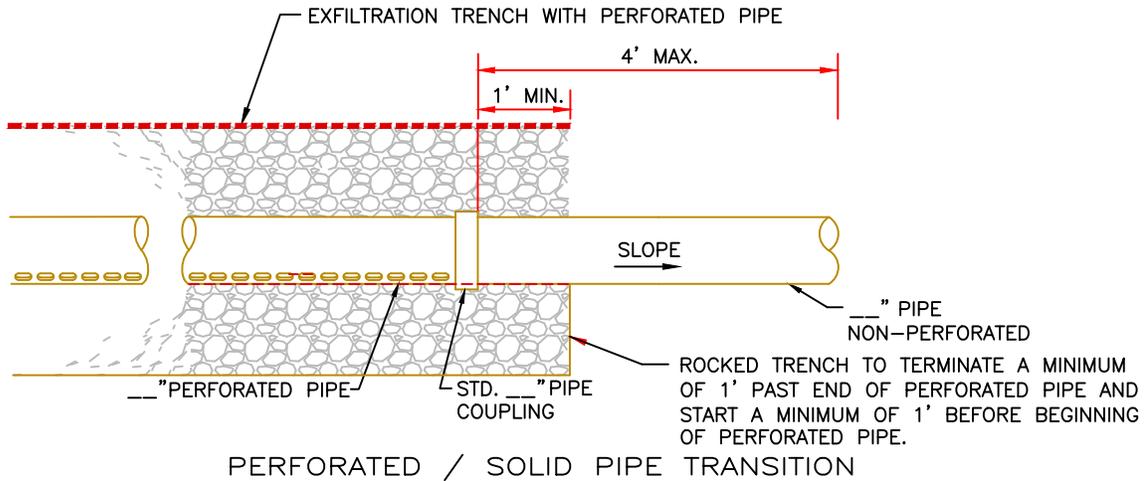
NOTICE:

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.



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EXFILTRATION TRENCH DETAIL



NOTE:

SLOTTED PIPE NOT IN EXFILTRATION TRENCH TO BE WRAPPED WITH FILTER FABRIC PER FDOT 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.



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FRENCH DRAIN SYSTEM NOTES

GENERAL NOTES

1. PIPE SHALL BE ANY OF THE OPTIONAL TYPES PERMITTED IN SECTION 443 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION, UNLESS OTHERWISE RESTRICTED IN THE PLANS. DISSIMILAR TYPES OF PIPE WILL NOT BE PERMITTED IN A CONTINUOUS RUN OF PIPE.
2. CONCRETE PIPE SHALL BE PLACED WITH THE SLOTS POSITIONED ON SIDES.
3. ALIGNMENT JOINTS ARE STANDARD (GASKETS NOT REQUIRED). RECORRUGATION OF METAL PIPE ENDS NOT REQUIRED.
4. 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.
5. 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.
6. THE STANDARD CROSS SECTION SHALL BE CONSTRUCTED UNLESS OTHER SECTION(S) ARE DESCRIBED OR DETAILED IN THE PLANS.
7. FOR SUPPLEMENTAL DETAILS SEE FDOT STANDARD PLANS.
8. THE CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PREVENT CONTAMINATION OF THE TRENCH WITH SAND, SILT AND FOREIGN MATERIALS.
9. 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.

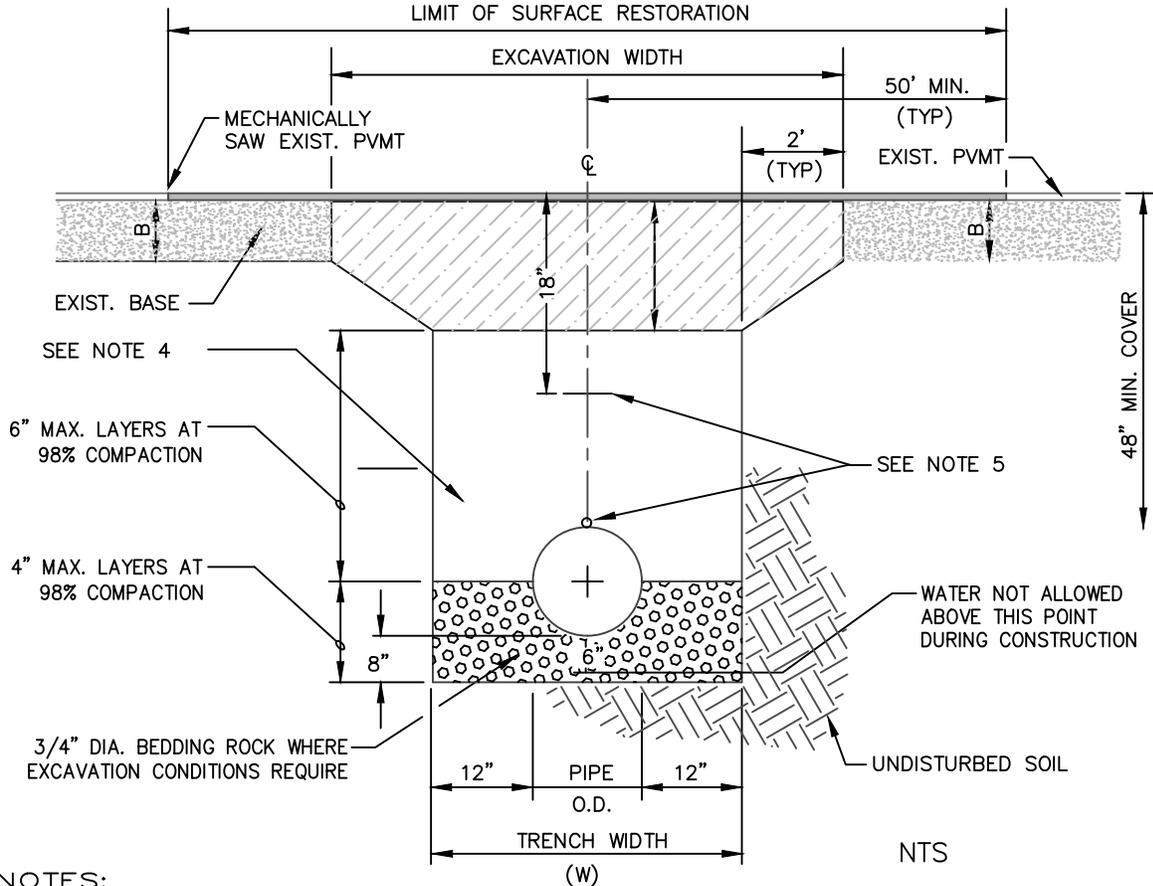
DESIGN NOTES

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.



PAVEMENT CUT & PATCH DETAIL

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.



NOTES:

- WHERE SOIL CONDITIONS CAN NOT BE MAINTAINED AS SHOWN ABOVE, PROVIDE APPROVED METHOD OF CONSTRUCTION.
- SHEETING WILL BE REQUIRED AS DETERMINED IN THE FIELD.
- COMPACTION PERCENTAGES SHOWN REFER TO A.A.S.H.T.O. T-180. PROVIDE COMPACTION TEST REPORTS TO CITY INSPECTOR.
- SATISFACTORY FILL MATERIALS ARE ASTM D2487 SOIL CLASSIFICATION GROUPS GW, GP, SW, AND SP. UNSATISFACTORY SOIL MATERIALS ARE ASTM D248 SOIL CLASSIFICATION GROUPS GC, SC, ML, MH, CL, CH, OL, OH, AND PT. ALL FILL MATERIAL FROM ON AND OFF-SITE SOURCES SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. ALL FILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, TRASH, OR OTHER OBJECTIONABLE MATERIAL.
- INSTALL METALLIC TAPE AND UF #12 INSULATED SINGLE STRAND COPPER WIRE ALONG FULL LENGTH OF PIPE.
- 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.

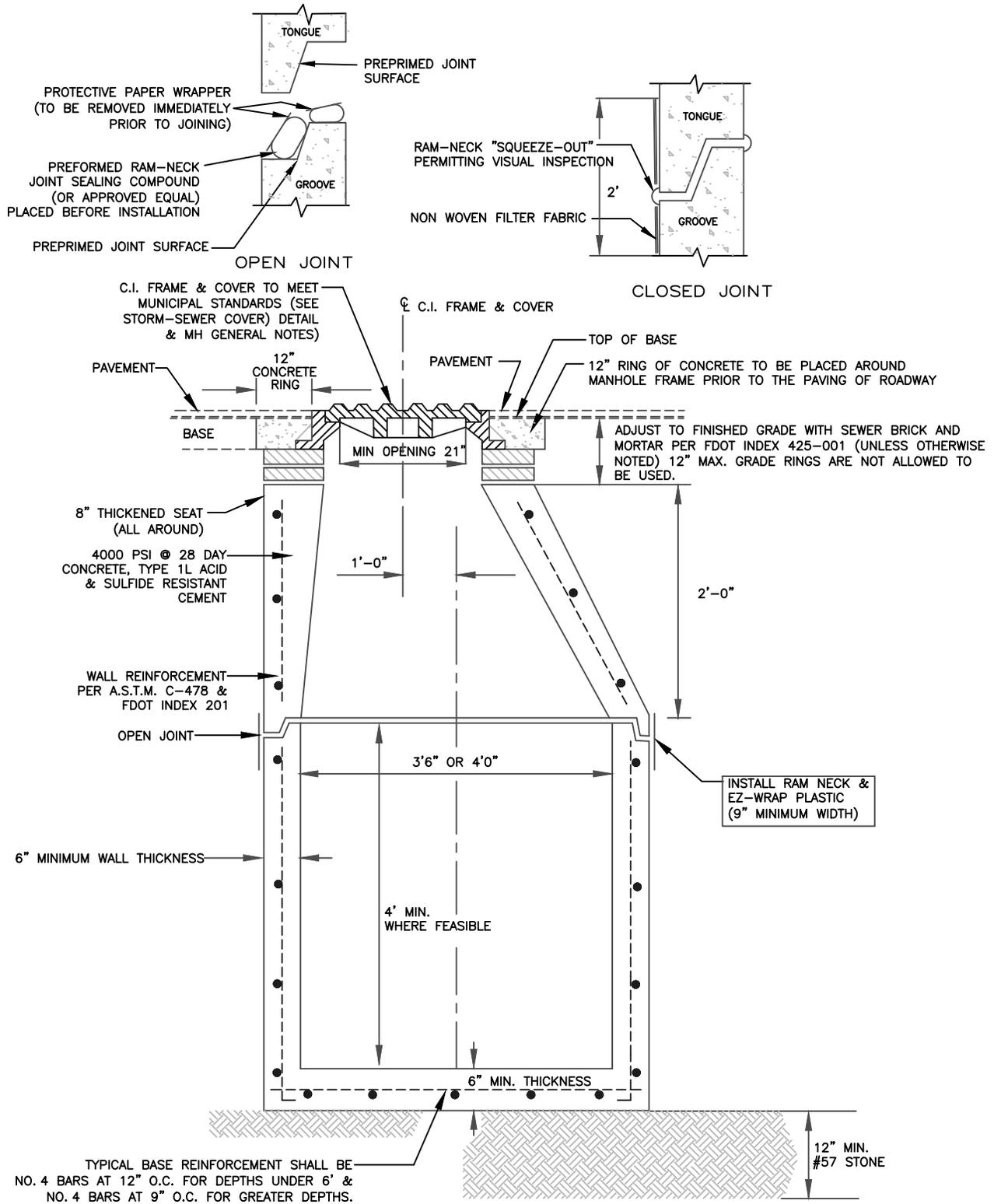
THE CITY OF DAYTONA BEACH
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PAVEMENT CUT &
PATCH DETAIL
ST-18

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STORMWATER MANHOLE DETAIL



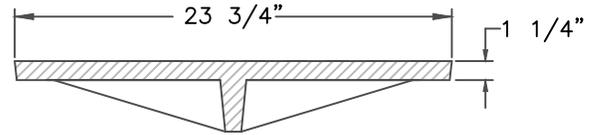
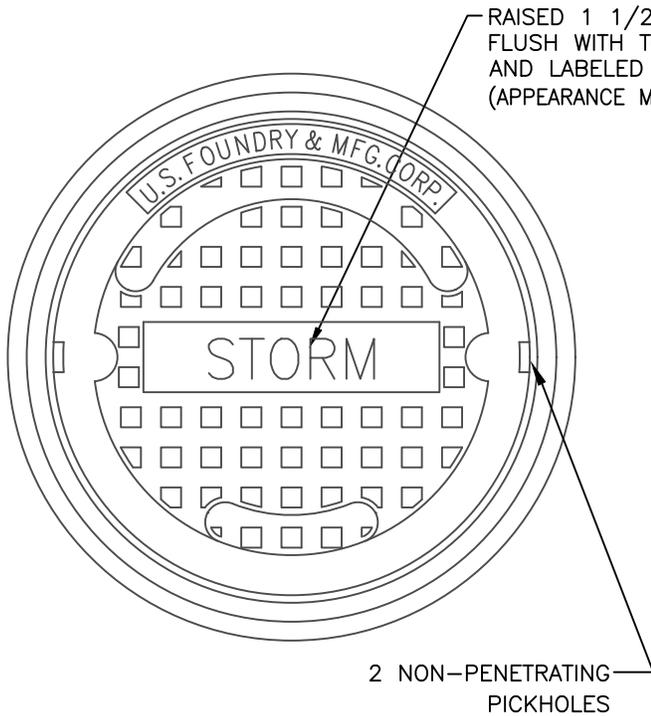
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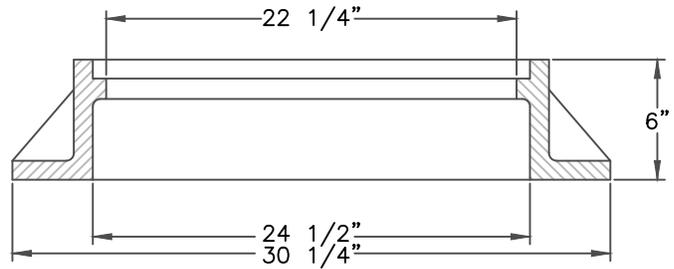
STORMWATER MANHOLE
DETAIL
ST-19

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Drawing Date: Jan-08
Revision Date: Jan-2024
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STORM SEWER COVER DETAIL & MANHOLE GENERAL NOTES



USF TYPE E MANHOLE COVER



USF 170 MANHOLE RING

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. 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. MANHOLES SHALL BE CLEARED OF ALL DEBRIS PRIOR TO CITY ACCEPTANCE AND SYSTEM USE.

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



STORM SEWER COVER
DETAIL & MANHOLE
GENERAL NOTES
ST-20

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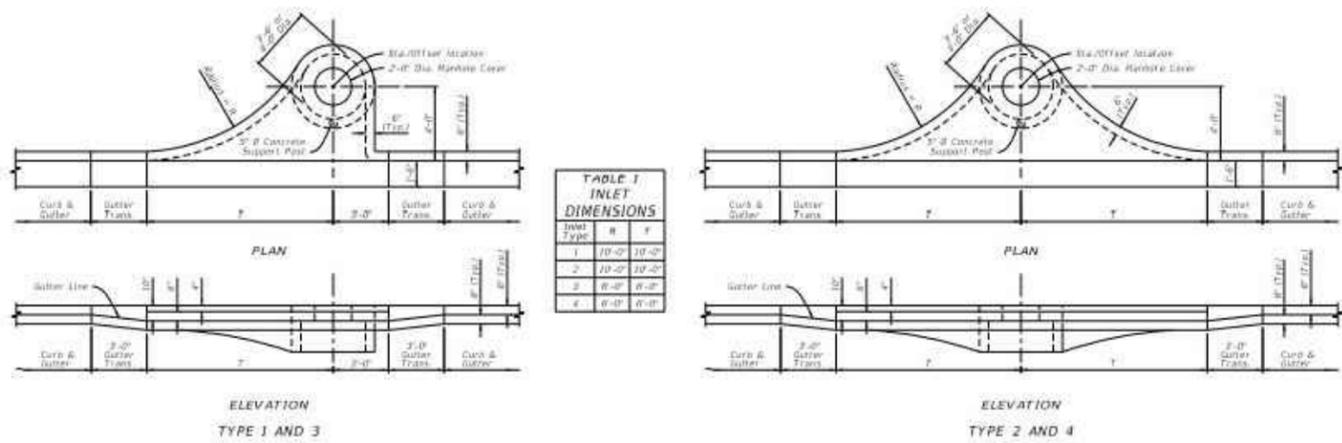
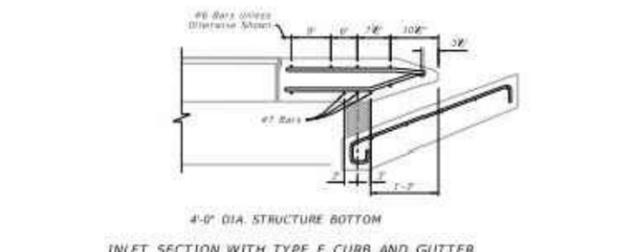
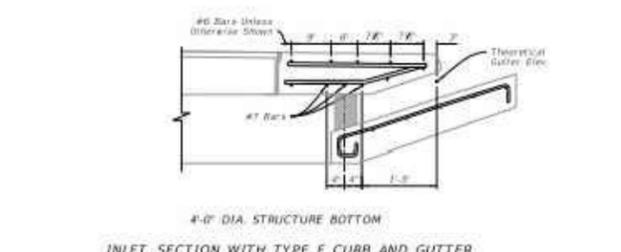
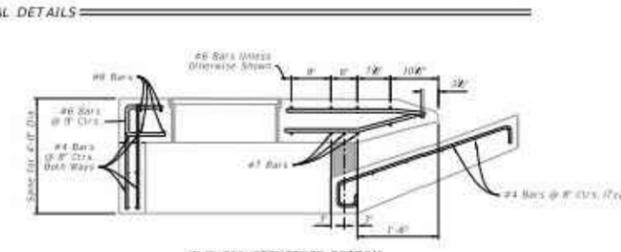
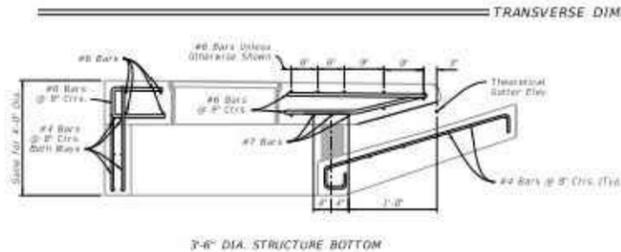
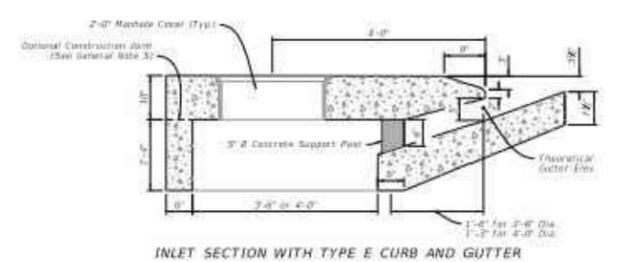
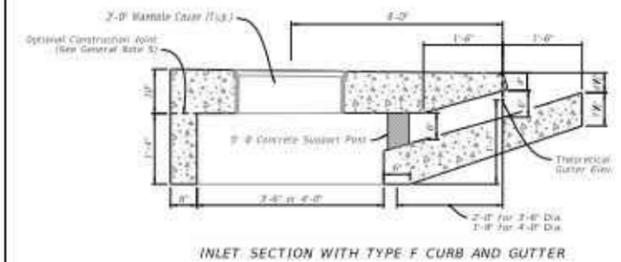
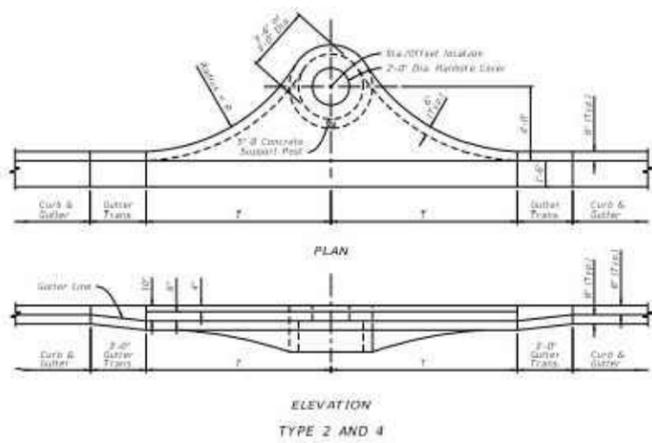


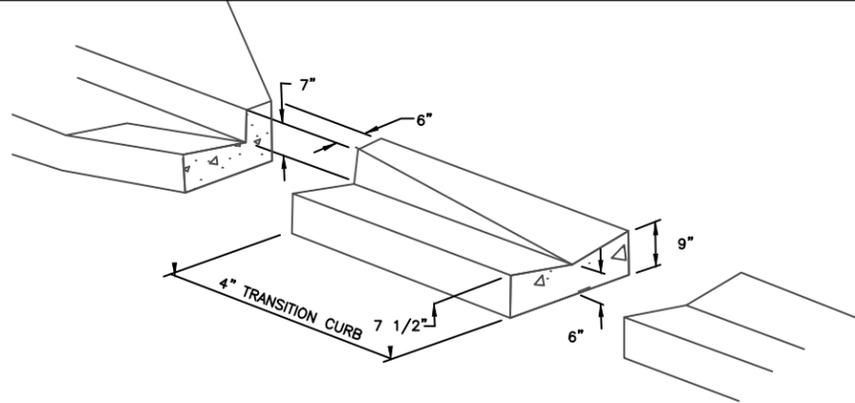
TABLE 1 INLET DIMENSIONS		
Inlet Type	H	F
1	10'-0"	10'-0"
2	10'-0"	10'-0"
3	8'-0"	8'-0"
4	8'-0"	8'-0"



NOTE:
For transverse section reinforcement, see Sheet 3.

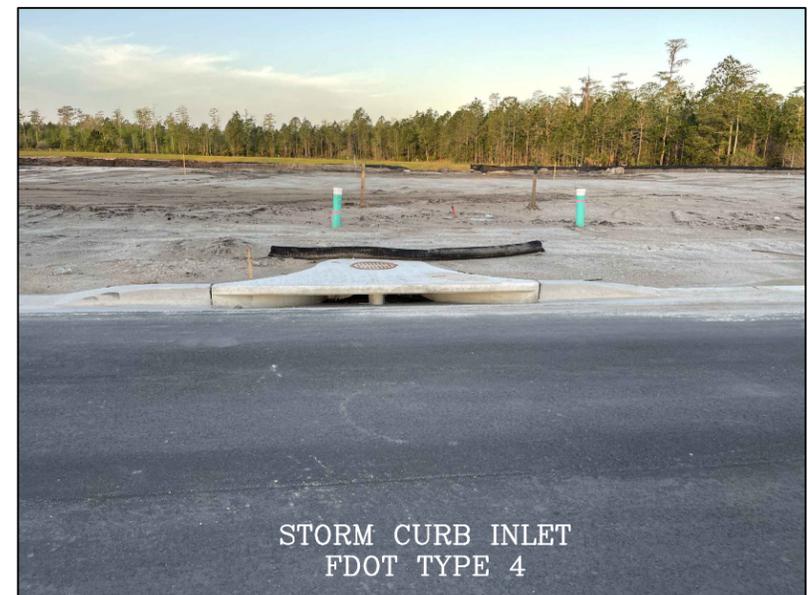
LAST REVISION 11/01/20	DESCRIPTION	FDOT FY 2021-22 STANDARD PLANS	CURB INLET TOP TYPES 1, 2, 3, AND 4	INDEX 425-020	SHEET 2 of 3
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LAST REVISION 11/01/20	DESCRIPTION	FDOT FY 2021-22 STANDARD PLANS	CURB INLET TOP TYPES 1, 2, 3, AND 4	INDEX 425-020	SHEET 3 of 3
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- GENERAL NOTES;
1. ALL STEEL BARS SHALL BE TIED TOGETHER
 2. CHAMFER ALL EXPOSED EDGES AND CORNERS $\frac{3}{4}$ ".
 3. REINFORCING STEEL SHALL BE GRADE 40 OR 60.
 4. ALL STEEL BARS SHALL HAVE $1 \frac{1}{2}$ " MINIMUM COVER.

TRANSITION CURB DETAIL



STORM CURB INLET
FDOT TYPE 4

THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT

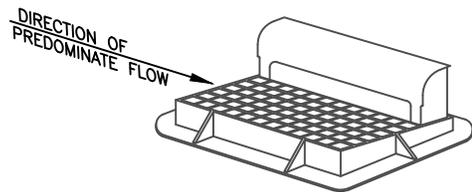
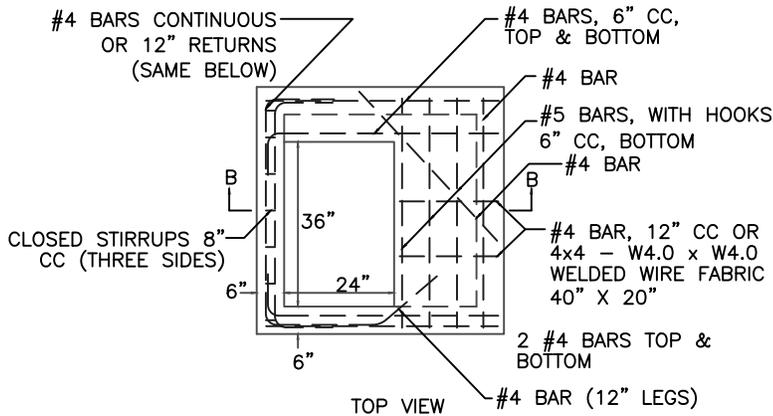


THIS SHEET SHOWS THE MINIMUM INFORMATION AND THE BASIC OUTLINE OF FACILITIES REQUIRED. THIS DRAWING IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. A PROFESSIONAL ENGINEER SHALL CERTIFY ALL DETAILS.

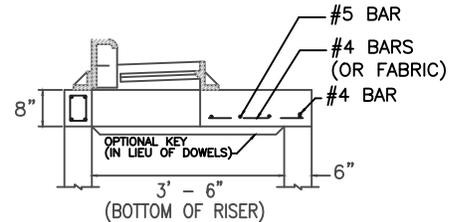
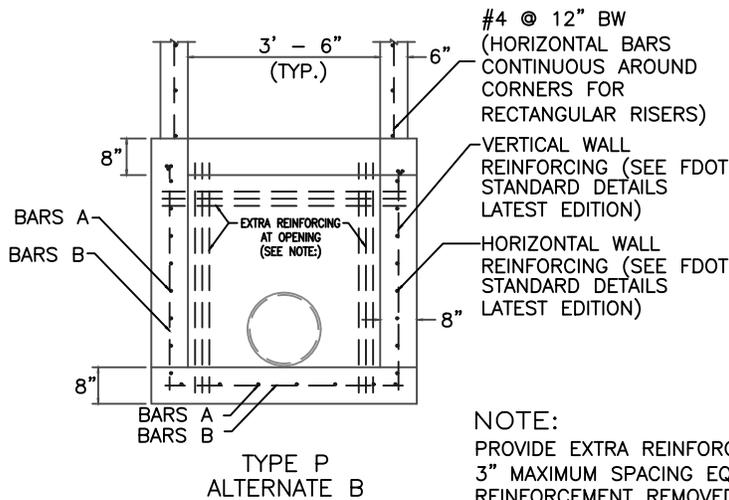
STORM CURB INLET
FDOT TYPE 4
ST-21

FY-2024-2025
DRAWING DATE: Jan-08
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UNDER CURB/GUTTER CATCH BASIN DETAIL



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



SECTION "B-B"
CURB INLET TOP
TYPE 9

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.

UNDER CURB/GUTTER CATCH BASIN DETAIL

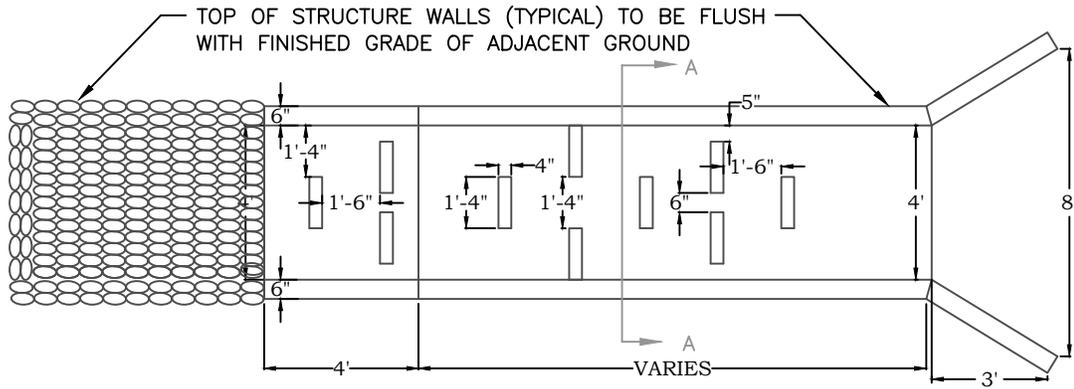
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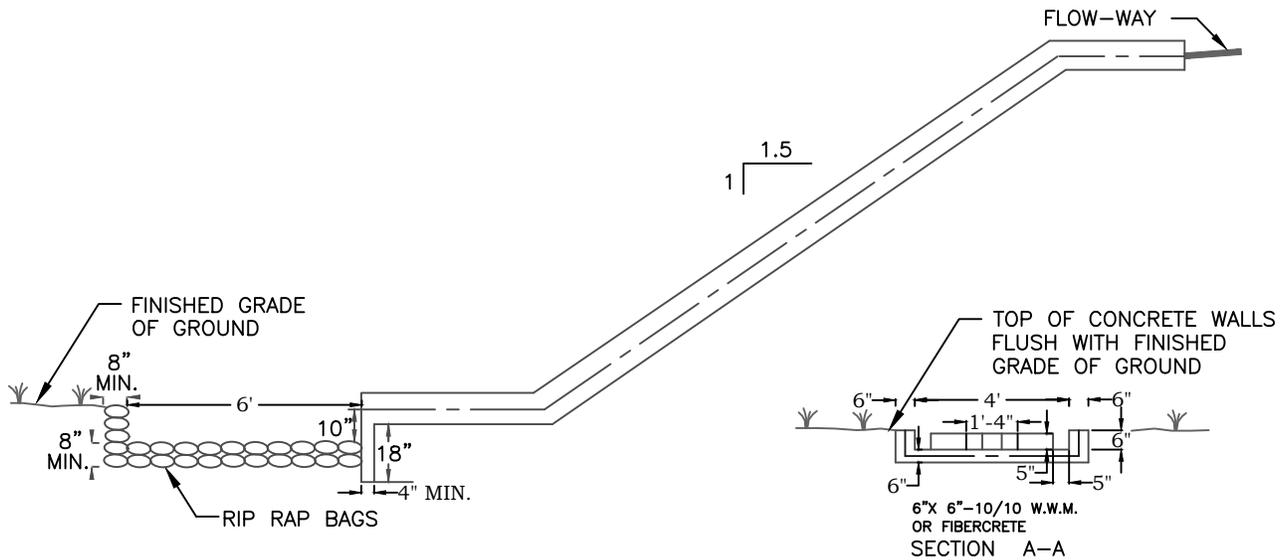
UNDER CURB/GUTTER
CATCH BASIN DETAIL
ST-22

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CONCRETE SPILLWAY DETAIL



PLAN VIEW



PROFILE VIEW

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.

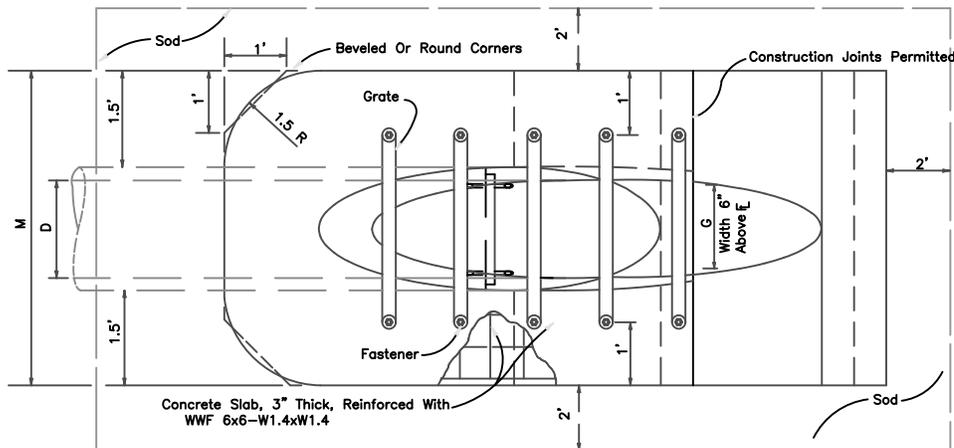


MITERED END SECTION DETAIL

DIMENSIONS & QUANTITIES												
D	X	A	B	C	E	F	G	M				N
								Single Pipe	Double Pipe	Triple Pipe	Quad Pipe	
15"	2'-7"	2.27'	4.09'	6.36'	4.03'	8'	1.22'	4.63'	7.21'	9.79'	12.37'	1.19'
18"	2'-10"	2.36'	5.12'	7.48'	5.03'	9'	1.41'	4.92'	7.75'	10.58'	13.42'	1.21'
24"	3'-5"	2.53'	7.18' ^Δ	9.71'	7.03' ^Δ	11'	1.73'	5.50'	8.92'	12.33'	15.75'	1.25'
30"	4'-3"	2.70'	9.25'	11.95'	9.03'	13'	2.00'	6.08'	10.33'	14.58'	18.83'	1.29'
36"	5'-1"	2.87'	11.31' [◇]	14.18'	11.03' [◇]	15'	2.24'	6.67'	11.75'	16.83'	21.92'	1.33'
42"	6'-0"	3.05'	13.37'	16.42'	13.03'	17'	2.45'	7.25'	13.25'	19.25'	25.25'	1.38'
48"	6'-9"	3.22'	15.43'	18.65'	15.03'	19'	2.65'	7.83'	14.58'	21.33'	28.08'	1.42'
54"	7'-8"	3.39'	17.49'	20.88'	17.03'	21'	2.83'	8.42'	16.08'	23.75'	31.42'	1.46'
60"	8'-6"	3.56'	19.55'	23.11'	19.03'	23'	3.00'	9.00'	17.50'	26.00'	34.50'	1.50'

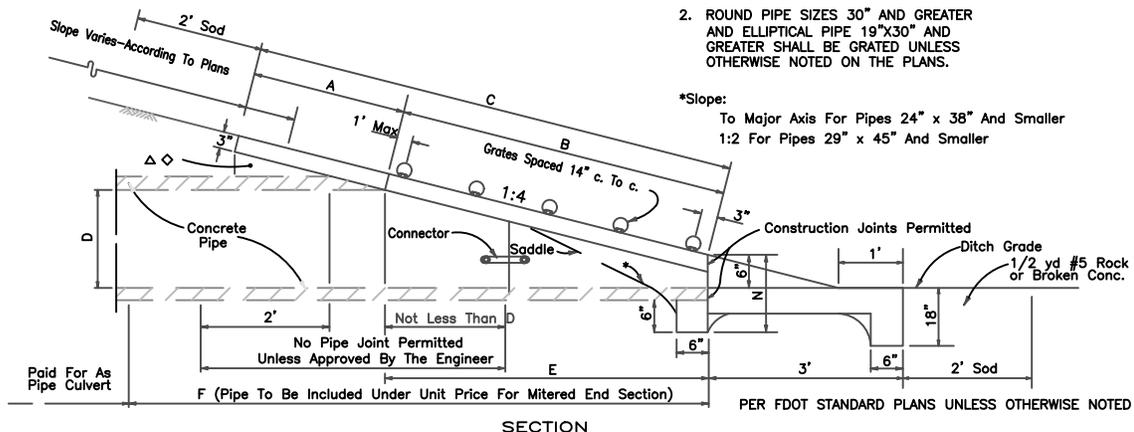
D	GRATE SIZES		CONCRETE (Cu. Yds.)				SODDING (Sq. Yds.)			
	Standard Weight Pipe	Extra Strong Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad Pipe	Single Pipe	Double Pipe	Triple Pipe	Quad Pipe
15"			0.81	1.23	1.64	2.06	8	10	11	12
18"			0.90	1.36	1.82	2.30	9	10	12	13
24"			1.08	1.67	2.27	2.91	10	12	13	15
30"		3"	1.29	2.08	2.89	3.69	12	14	15	17
36"		3"	1.47	2.50	3.50	4.46	13	15	17	20
42"			1.67	2.96	4.23	5.51	14	17	19	22
48"			1.89	3.41	4.91	6.42	15	18	21	24
54"	3"	4"	2.11	3.94	5.78	7.59	17	20	23	27
60"	3"	4"	2.37	4.54	6.69	8.85	18	22	25	29

^Δ 6.42' ^Δ 6.25' Dimensions permitted to allow use of 8' standard pipe lengths.
[◇] 10.40' [◇] 10.10' Dimensions permitted to allow use of 12' standard pipe lengths.
^{Δ ◇} Concrete slab shall be deepened to form bridge across crown of pipe. See section below.



TOP-VIEW SINGLE PIPE NOTES:

1. SEE STORMWATER CONSTRUCTION NOTES DETAILS.
2. ROUND PIPE SIZES 30" AND GREATER AND ELLIPTICAL PIPE 19"x30" AND GREATER SHALL BE GRATED UNLESS OTHERWISE NOTED ON THE PLANS.



SECTION

PER FDOT STANDARD PLANS UNLESS OTHERWISE NOTED

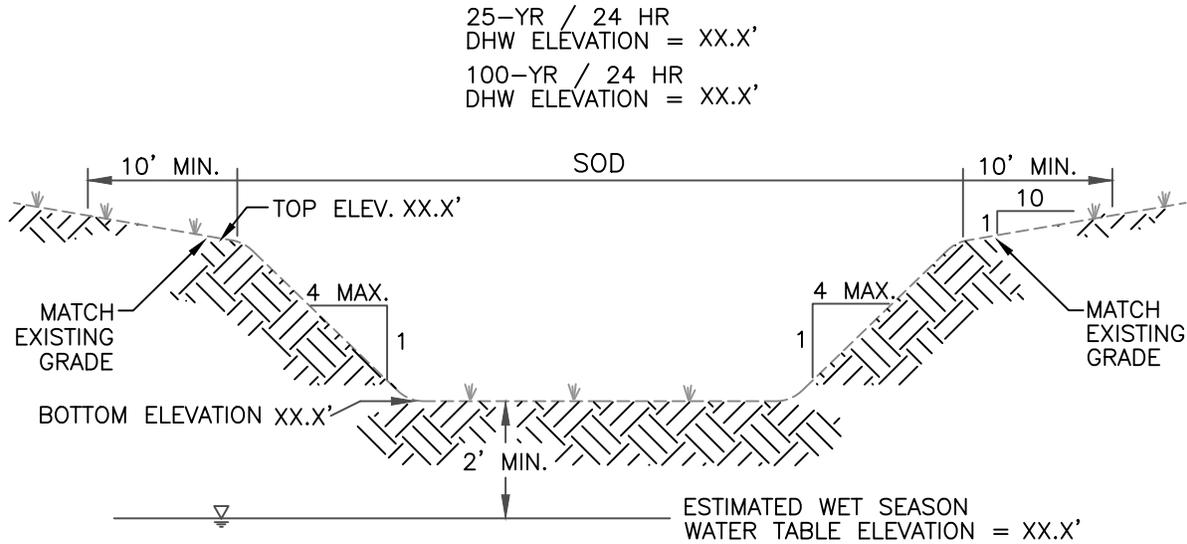
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MITERED END SECTION
DETAIL (SINGLE PIPE)
ST-24

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DRY POND CROSS SECTION DETAIL



CROSS SECTIONAL VIEW

NOTES:

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

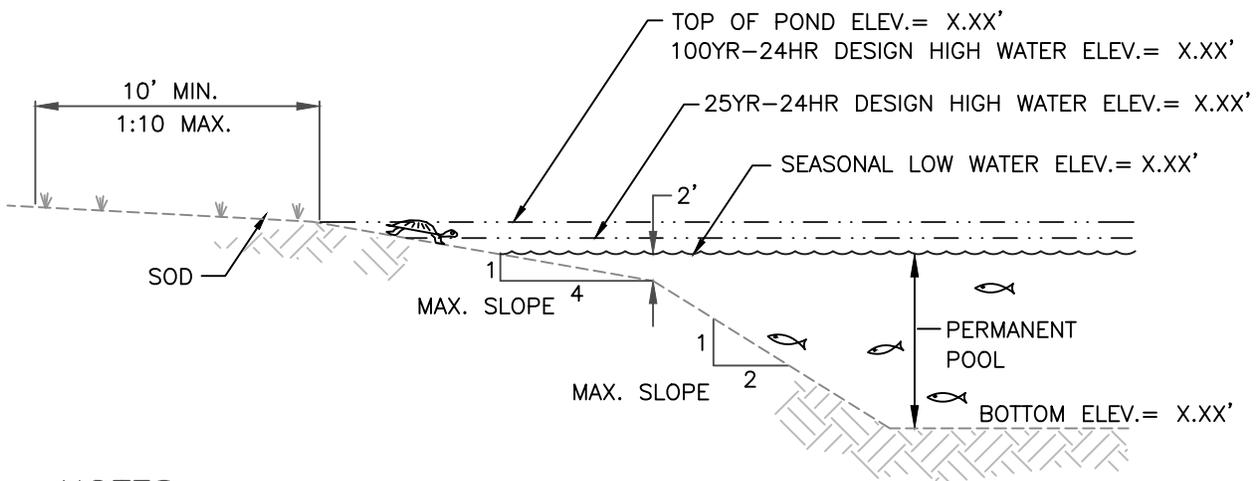
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DRY POND CROSS
SECTION DETAIL
ST-25

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WET POND CROSS SECTION DETAIL



NOTES:

1. SOD IS TO BE PLACED TO EDGE 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



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THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT



ST-XX

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Section 01720 AS-BUILTS/RECORD DOCUMENTS

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.



Section 01720 AS-BUILTS/RECORD DOCUMENTS (CONT'D)

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.

**THE CITY OF DAYTONA BEACH
UTILITIES DEPARTMENT**



**AS-BUILT DRAWING
REQUIREMENTS
(SHEET 2 of 7)**

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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.



Section 01720
AS-BUILTS/RECORD DOCUMENTS
(CONT'D)

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, and identify vertical separation.
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. Recorded Drawings are to be based on construction drawings and include both designed and constructed data , signed and sealed by a Florida licensed surveyor. The City will require the following items to be sent emailed and by hard copies. Item 1. Two PDF (One PDF as-built drawings shall also be electron signed and sealed by a the Surveyor. the second one not locked or signed.), 2. The as-built drawings to be provided, on 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.

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AS-BUILT DRAWING
REQUIREMENTS
(SHEET 4 of 7)

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AS-BUILTS/RECORD DOCUMENTS
(CONT'D)

- 25. Benchmark Datum utilizes monumentation from the North American Vertical Datum of 1929 with elevations adjusted to NGVD 1988 data. Any NAVD 1929 monument within the limits of construction is to be protected.
- 26. New conduits that are installed shall show location of tees and bends and record elevations every 100'. All shall be located by tying them to baseline/centerline construction (sta. & offset). Similarly, water mains, tees and bends shall be located in the same manner. All bends and tees shall be located by sub-meter GPS with station & offset, northerly & easterly, latitude & longitude and elevation data.

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 Record Drawings for each utility included in the plans. (water, reuse, sewer, forcemain, and stormwater). Contractor will need to upload to the City's sharepoint a copy of the AutoCAD, Xref's, and PFD's files for a review before sending the CD to the City. Once reviewed with no comments, the Contractor will need to email a request for the Sharepoint file information to be able to upload the Recorded Drawings materials. The final submittal shall include two (2) PFD's; one that is electronically signed and sealed, the other unrestricted, on a CD with working AutoCAD, Xref's files, and a set of PDF files. (Paper copies will no longer be required). When the Recorded Drawings are delivered for clearance of water line, they will be reviewed and are approved, and then can be scheduled for chlorination. CITY will not release the drinking water bacteriological laboratory report, and Clearance application to Volusia County Health Department until the As-built / Recorded Drawings 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.



Section 01720 AS-BUILTS/RECORD DOCUMENTS (CONT'D)

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

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

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

2" PVC CONDUIT
 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

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

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

All Material must be labeled (type of material and distance) Example:

(WM 8" C-900 DR-18, 250'), (WM 6" DIP 150'), (Sanitary 8" SDR26 295' 0.40%)(FM (FM 10" C-900DR-18 100'), or (FM 6" DIP 30')

**THE CITY OF DAYTONA BEACH
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**AS-BUILT DRAWING
 REQUIREMENTS
 (SHEET 6 of 7)**

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AS-BUILTS/RECORD DOCUMENTS
(CONT'D)

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 of the As-built conditions in Florida Statutes 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. THE AS BUILT /RECORD DRAWINGS SHALL BE PREPARED USING AUTOCAD FORMAT 2010 OR LATER. IN MODEL SPACE THE DRAWING (LABELING AND LINE WORK SHALL BE ON SEPARATE LAYERS). THE DRAWINGS 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

THE CITY OF DAYTONA BEACH
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AS-BUILT DRAWING
REQUIREMENTS
(SHEET 7 of 7)

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TRACER WIRE AND ALARMING TAPE

PART 1 - GENERAL REQUIREMENTS

1.1 SUMMARY

Furnish and install identification tape over the centerline of all buried potable water lines, reuse 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 Utility Representative.
- F. The wires shall each be continuous throughout the project, with splices made only by methods approved by the City's Project Representative.

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TRACER WIRE AND ALARMING TAPE

- 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 alkalis, 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 a maximum adhesive factor of 40 ounces per inch. Tape width shall be 3 inches and shall have the background color specified below, imprinted with black letters. Imprint shall be as specified below and shall repeat itself a minimum of once ever 2 feet for entire length of tape.
- C. Tape and Tracer wire background color and imprints shall be as follows:

<u>Imprint</u>	<u>Background Color</u>
"Caution Caution - Potable Water Line Buried Below"	Blue
"Caution Caution - Wastewater Force Main Buried Below"	Green
"Caution Caution - Reclaimed Water Main Buried Below"	Lavender
"Caution Caution - Raw Water Main Buried Below"	White

- D. Identification tape shall be "Underground Detectable Warning Tape" as manufactured by Presco, or approved equivalent.

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TRACER WIRE AND ALARMING TAPE

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, reclaimed 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. 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.

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THE CITY OF DAYTONA BEACH
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TRACER WIRE &
ALARMING TAPE
REQUIREMENTS
(SHEET 3 of 3)

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