



CITY OF ORANGE CITY SANITARY SEWER STANDARD CONSTRUCTION DETAILS

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CITY OF ORANGE CITY

SANITARY SEWER

STANDARD CONSTRUCTION DETAILS

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SANITARY SEWER DESIGN NOTES

1. ALL GRAVITY SANITARY SEWER MAINS SHALL BE 8" DIAMETER MINIMUM. COMMERCIAL SERVICE LATERALS WITH MULTIPLE CONNECTIONS SHALL BE GREEN 6" DIA. OR LARGER. ALL SINGLE FAMILY RESIDENTIAL SERVICE LATERALS SHALL BE 4" - SINGLE SERVICES.
2. ALL GRAVITY SANITARY SEWER LINES SHALL BE GREEN PVC SDR 26, ASTM D-3034. IN PLACES WHERE A MINIMUM COVER OF 4.0' CANNOT BE MAINTAINED, AWWA C-900 OR C-905 GREEN PVC DR-25, CLASS 100 OR CONCRETE ENCASEMENT SHALL BE USED. WATER LINES, RECLAIMED LINES, AND STORM DRAINAGE CROSSINGS SHALL ALSO FOLLOW THE CONCRETE ENCASEMENT REQUIREMENT PER THESE STANDARDS AND AS PER REGULATORY REQUIREMENTS.
3. MINIMUM GRAVITY SANITARY SEWER SLOPES ARE AS FOLLOWS:

 8" PIPE 0.40 %
 10" PIPE 0.30 %
 12" PIPE 0.22 %
4. MAXIMUM DEPTH OF SANITARY MANHOLES SHALL BE 15.0'. MAXIMUM DEPTH OF LIFT STATION WET WELLS SHALL BE 20.0'.
5. GRAVITY SANITARY SEWER LINES SHALL BE INSTALLED WHENEVER POSSIBLE UNDER PAVED AREAS WITHIN PUBLIC RIGHTS-OF-WAY. UTILITY EASEMENTS SHALL BE PROVIDED WHENEVER PUBLICLY-OWNED SEWER LINES ARE CONSTRUCTED OUTSIDE OF A PUBLIC RIGHT-OF-WAY.
6. ALL TESTING REQUIRED BY THE CITY SHALL BE PAID FOR BY THE CONTRACTOR / DEVELOPER.
7. ALL LOCAL COLLECTION SANITARY SEWER MANHOLES SHALL BE PRECAST WITH A MINIMUM INSIDE DIAMETER OF 4 FEET.
8. STANDARD MANHOLES SHALL BE LOCATED AT INTERVALS NOT EXCEEDING 350 FEET.
9. INDIVIDUAL SANITARY SERVICE ON NEW CONSTRUCTION SHALL NOT BE CONNECTED DIRECTLY INTO MANHOLES, AND MUST BE CONNECTED TO SEWER MAIN LINES BY USE OF WYE CONNECTIONS, UNLESS OTHERWISE APPROVED BY THE CITY.
10. FOR SINGLE FAMILY HOMES, SINGLE FOUR INCH SEWER SERVICES LATERALS SHALL BE CONSTRUCTED AT EACH LOT OR UNIT AND LOCATED ON THE DOWNSTREAM SIDE OF THE LOT CENTER LINE. THESE SERVICES SHALL BE EXTENDED 4 FEET ABOVE GROUND AT THE PROPERTY LINE WITH A PVC RISER AND PLUG BEING EASILY VISIBLE FROM THE ROAD. RUBBER SEAL FITTINGS SHALL BE USED ON ALL LINES. NO GLUED JOINTS ARE PERMITTED ON LATERALS.
11. FOR MULTI-FAMILY AND COMMERCIAL SITES, SIX INCH MINIMUM SEWER SERVICES AND CLEANOUTS SHALL BE PROVIDED AS APPROVED BY THE CITY.
12. SANITARY SEWER LIFT STATIONS AND FORCE MAINS, SIZE, MATERIAL, AND DESIGNS SHALL BE APPROVED BY THE CITY. LIFT STATIONS SHALL BE CONSTRUCTED WITH A MINIMUM WET WELL INTERIOR DIAMETER OF 6.0 FEET.
13. 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.
14. SANITARY SEWER DROP MANHOLES SHALL ONLY BE USED UNDER SPECIAL CONDITIONS AS APPROVED BY THE CITY. DROPS LESS THAN 2.0' SHALL NOT BE ALLOWED.
15. ALL SANITARY SEWER FORCE MAINS, INCLUDING FITTINGS, SHALL BE DIP WITH PROTECTO 401, PVC AWWA C-900, OR C-905 (COLOR "GREEN") (PRESSURE FITTINGS, PRESSURE CLASS 150 OR C-907).



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16. SANITARY SEWER MANHOLES WHICH HAVE SEWER FORCE MAINS DISCHARGING DIRECTLY INTO THEM SHALL BE FIBERGLASS OR POLY-ETHYLENE LINED OR EPOXY LINED. RETRO-FITTING OF MANHOLES WITH LINERS SHALL BE REQUIRED WHEN NEW FORCE MAIN CONNECTIONS ARE MADE. FIBERGLASS SHALL BE A MINIMUM 1/2" THICKNESS UNLESS APPROVED OTHERWISE BY THE CITY. OTHER TYPES OF LINING METHODS AND MATERIALS MAY BE CONSIDERED ON A CASE BY CASE BASIS. UNDER SPECIAL CIRCUMSTANCES WHERE HYDROGEN SULFIDE IS A MAJOR CONCERN MANHOLES UPSTREAM AND/OR DOWNSTREAM OF THE FORCE MAIN TIE-IN OR WET WELL MAY ALSO BE REQUIRED TO HAVE LININGS INSTALLED.
17. ALL SANITARY SEWER MANHOLES SHALL HAVE ALL INTERIOR SURFACES COATED WITH THREE (3) COATS OF WHITE/GRAY OVER RED OVER BLACK EW-1 EPOXY PAINT WITH A TOTAL OF 12 MILS DRY FILM THICKNESS OR BLACK COAL-TAR EPOXY WITH A TOTAL OF 16 MILS THICKNESS. OUTSIDE SURFACE TO BE COATED WITH TWO (2) COATS OF BLACK OVER BLACK EW-1 EPOXY PAINT WITH A TOTAL OF 8 MILS OR ONE (1) COAT OF BLACK COAL-TAR EPOXY WITH A TOTAL OF 8 MILS. ALL COATS SHALL BE APPLIED AT THE FACTORY EXCEPT MINOR FIELD TOUCH UP AT JOINTS AND AT MANHOLE NECK.
18. ALL MANHOLES CONSTRUCTED IN SIDE YARDS, BACKYARDS, AND EASEMENTS OUTSIDE OF THE RIGHT-OF-WAY SHALL BE OUTFITTED WITH FIBERGLASS OR EPOXY LINERS IN COMPLIANCE WITH ASTM-3753 OR OTHER TYPES OF LINERS APPROVED BY THE CITY. IN ADDITION THE CITY MAY REQUIRE LINERS TO BE INSTALLED IN OTHER AREAS WHERE THE PUBLIC UTILITIES DEPARTMENT BELIEVES THE NEED IS JUSTIFIED SUCH AS IMMEDIATELY UPSTREAM OF FORCE MAINS CONNECTING TO GRAVITY MAINS.
19. ALL SEWER LINES WHICH ARE CONSTRUCTED OUTSIDE OF PUBLIC RIGHTS-OF-WAY 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.
20. CONTEC A-2000 PVC PIPE SHALL NOT BE ALLOWED FOR USE.
21. FOR CONSTRUCTION PURPOSES, THE PLANS SHALL DIMENSION THE LOCATION OF ALL FORCE MAINS, MEASURED FROM THE BACK OF CURB (OR EDGE OF PAVEMENT, IF NO CURBING EXISTS).
22. ALL HDPE PIPE INSTALLED FOR SEWAGE FORCE MAINS SHALL BE SDR 11 WITH #10 COPPPER HEAD TRACER WIRE UNLESS SPECIFICALLY NOTED OTHERWISE. THE HDPE PIPE SHALL BE SIZED TO MATCH THE EXTERNAL DIAMETER OF THE PVC TO WHICH IT IS ATTACHED.
23. LANDSCAPE PLANS SHALL CLEARLY DEPICT THE DESIGN LOCATION OF PLANTINGS RELATIVE TO THE LOCATION OF PUBLIC UTILITIES AND STORMWATER INFRASTRUCTURE IN ORDER TO EVALUATE POTENTIAL CONFLICTS.
24. GREASE INTERCEPTORS ARE REQUIRED FOR ALL COMMERCIAL BUILDINGS HAVING KITCHEN, FOOD PREPARATION OR SERVING FACILITIES AND / OR MISCELLANEOUS USES. GREASE INTERCEPTORS CONSTRUCTED EXTERNAL TO BUILDINGS SHALL BE SIZED IN ACCORDANCE WITH FAC 64-E-6. CALCULATIONS TO DETERMINE SIZING REQUIREMENTS SHALL BE SUBMITTED AS PART OF BUILDING PERMITTING. AN INSPECTION MANHOLE MAY BE REQUIRED IMMEDIATELY DOWN STREAM OF THE GREASE INTERCEPTOR FOR INSPECTION PURPOSES, AS DEEMED APPROPRIATE BY THE CITY.
25. WHERE POTABLE WATER AND SANITARY SEWER MAINS CROSS WITH LESS THAN (18) INCHES OF VERTICAL CLEARANCE OR WHERE THE SEWER MAIN IS ABOVE THE WATER MAIN, THE SEWER MAIN SHALL BE ENCASED WITH CONCRETE OR ENCLOSED IN A WATER TIGHT CARRIER PIPE, OR PRESSURE RATED PVC PIPE (MEETING THE AWWA C-900 OR C-905 SPECIFICATION) FOR A MINIMUM LENGTH OF (20) FEET, CENTERED ON THE POINT OF CROSSING. A MINIMUM HORIZONTAL SEPARATION OF (10) FEET (EDGE TO EDGE) BETWEEN POTABLE WATER MAINS AND SEWER MAINS SHALL BE MAINTAINED WHEN AT ALL POSSIBLE. WHEN THE 10-FOOT HORIZONTAL SEPARATION CANNOT BE MAINTAINED THE WATER MAIN SHALL BE



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INSTALLED IN A SEPARATE TRENCH OR ON AN UNDISTURBED EARTH SHELF AT LEAST 18" ABOVE THE SEWAGE MAIN. ALTERNATIVELY, THE SEWER MAIN SHALL BE ENCASED WITH CONCRETE OR ENCLOSED IN A WATER TIGHT CARRIER PIPE, OR UPGRADED TO PRESSURE RATED PVC PIPE (MEETING AWWA C-900 OR C-905 SPECIFICATION) AND PRESSURE TESTED AT 150 PSI TO ASSURE WATER TIGHTNESS PRIOR TO BACKFILLING.

26. CEMENT USED IN CONCRETE MIX FOR PRECAST STRUCTURES SHALL BE TYPE II, ACID RESISTANT AND SULFIDE RESISTANT CONCRETE.
27. MORTAR TO CONTAIN "HYDRATITE" OR APPROVED EQUAL, TO PREVENT SHRINKAGE.
28. PROFILE VIEWS SHALL BE PROVIDED FOR ALL SEWER MAINS. PROFILE VIEWS SHALL BE ON THE SAME SHEET AS THE ASSOCIATED PLAN VIEW AND SHALL INCLUDE THE FOLLOWING INFORMATION:
 - A. SIZE, SLOPE, LENGTH AND CLASS OF PIPE
 - B. MANHOLE RIM AND INVERT ELEVATIONS
 - C. UTILITY CROSSINGS WITH VERTICAL SEPERATION
 - D. SHOW PROPOSED SEWER AND EXISTING UTILITY
 - E. EXISTING GROUND PROFILE
 - F. MATCH LINE
 - G. VICINITY MAP
 - H. PROFILE VIEW STATIONS TO COINCIDE WITH PLAN VIEW STATIONS



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1. THE CITY'S PUBLIC UTILITIES DEPARTMENT (386) 775-5444 SHALL BE GIVEN A MINIMUM OF 2 BUSINESS DAYS ADVANCE NOTICE (NOT INCLUDING HOLIDAYS OR WEEKENDS) PRIOR TO BEGINNING ANY SANITARY SEWER CONSTRUCTION.
2. ALL GRAVITY SANITARY SEWER LINES SHALL BE GREEN PVC SDR 26, ASTM D-3034. IN PLACES WHERE A MINIMUM COVER OF 4.0' CANNOT BE MAINTAINED, AWWA C-900 OR C-905 GREEN PVC DR-25, CLASS 100 OR CONCRETE ENCASEMENT SHALL BE USED. WATER LINES, RECLAIMED LINES, AND STORM DRAINAGE CROSSINGS SHALL ALSO FOLLOW THE CONCRETE ENCASEMENT REQUIREMENT PER THESE STANDARDS AND AS PER REGULATORY REQUIREMENTS.
3. GRAVITY SANITARY SEWER LINE CONSTRUCTION SHALL BE ACCOMPLISHED BY THE USE OF A LASER INSTRUMENT UNLESS ANOTHER METHOD IS PREVIOUSLY APPROVED BY THE CITY.
4. THE CONTRACTOR SHALL AT ALL TIMES, DURING PIPE LAYING OPERATIONS DEWATER THE GROUND SUFFICIENTLY TO KEEP THE GROUNDWATER ELEVATION A MINIMUM OF 6" BELOW THE PIPE BEING LAID WITHIN THE AREA OF THE TRENCH.
5. ALL PIPES SHALL BE LAID 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.
6. ON ALL EXCAVATION AND BACKFILLING THE CONTRACTOR SHALL PROVIDE ADEQUATE SHEETING AND BRACING IN ACCORDANCE TO O.S.H.A. GUIDELINE IN ORDER TO PROVIDE FOR THE SAFETY OF WORKMEN, AS WELL AS REPRESENTATIVES OF THE CITY, THE DESIGN ENGINEER, AND THE DEVELOPER.
7. ALL TRENCHES SHALL BE BACKFILLED WITH ACCEPTABLE MATERIAL AND COMPACTED TO THE SPECIFIED MINIMUM COMPACTION (95% IN UNPAVED AREAS AND 98% IN PAVED AREAS) OF THE OPTIMUM DENSITY OF THAT MATERIAL BASED ON THE AASHTO T-180 MODIFIED PROCTOR TEST.
8. THE CONTRACTOR SHALL EMPLOY AN INDEPENDENT TESTING LABORATORY AT HIS OWN EXPENSE TO INSURE THAT COMPACTION OF ALL FILL MATERIAL IS COMPLETED PROPERLY. TESTS SHALL BE DONE ONE FOOT ABOVE THE PIPE AND THEN AT ONE FOOT VERTICAL INTERVALS UNTIL FINAL GRADE IS REACHED. TESTING SHALL BE COMPLETED AND TEST DOCUMENTS SUBMITTED TO THE CITY AT A MINIMUM FREQUENCY OF ONE SET OF TESTS BETWEEN EACH MANHOLE 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.
9. THE CONTRACTOR SHALL INSTALL A METALLIZED FOIL LOCATOR TAPE, OR SIMILAR DEVICE AS MAY BE APPROVED BY THE CITY FOR THE FULL LENGTH OF ALL PVC SEWAGE FORCE MAINS. THIS PIPE LOCATOR AID SHALL BE INSTALLED BETWEEN 15" AND 24" BELOW FINISHED GRADE OR AS DIRECTED BY THE MANUFACTURER. TAPE SHALL BE COLOR CODED GREEN FOR SANITARY SEWER AND FORCE MAIN. A CONTINUOUS NO. 10 COPPER HEAD WIRE SHALL BE INSTALLED WITH WIRE BROUGHT UP AT ALL VALVES.
10. ALL TESTING REQUIRED BY THE CITY SHALL BE PAID FOR BY THE CONTRACTOR / DEVELOPER.
11. MANHOLE RIMS SHALL MATCH FLUSH WITH THE FINISH GRADE ELEVATION IN PAVED AREAS AND A MINIMUM OF 0.2 FEET AND MAXIMUM OF 0.5 FEET ABOVE GRADE GENERALLY IN UNPAVED AREAS.
12. THE CONTRACTOR SHALL CONSTRUCT SANITARY SEWER MANHOLES IN SUCH A WAY THAT SEWER LINES DO NOT INTERSECT SEALED JOINTS BETWEEN SECTIONS OF THE MANHOLE.
13. RUBBER BOOTS AND 316 STAINLESS STEEL BANDS SHALL BE UTILIZED IN THE CONNECTION OF THE SEWER MAIN TO THE MANHOLES (SEE STANDARD MANHOLE AND BOOT DETAILS).



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14. INDIVIDUAL SANITARY SERVICE ON NEW CONSTRUCTION SHALL NOT BE CONNECTED DIRECTLY INTO MANHOLES, AND MUST BE CONNECTED TO SEWER MAIN LINES BY USE OF WYE CONNECTIONS, UNLESS OTHERWISE APPROVED BY THE CITY.
15. FOR SINGLE FAMILY HOMES, SINGLE FOUR INCH SEWER SERVICES LATERALS SHALL BE CONSTRUCTED AT EACH LOT OR UNIT AND LOCATED ON THE DOWNSTREAM SIDE OF THE LOT CENTER LINE. THESE SERVICES SHALL BE EXTENDED 4 FEET ABOVE GROUND AT THE PROPERTY LINE WITH A PVC RISER AND PLUG BEING EASILY VISIBLE FROM THE ROAD. RUBBER SEAL FITTINGS SHALL BE USED ON ALL LINES. NO GLUED JOINTS ARE PERMITTED ON LATERALS.
16. ALL SANITARY SEWER MANHOLE COVERS SHALL HAVE THE WORDS "ORANGE CITY FLORIDA SANITARY SEWER" CAST INTO THEM.
17. FORCE MAIN SYSTEMS SHALL BE PRESSURE TESTED AT 100 PSI STATIC PRESSURE FOR A PERIOD OF 2 HOURS PER AWWA STANDARDS.
18. ALL SANITARY SEWER FORCE MAINS SHALL USE A THRUST RESTRAINT JOINT METHOD IN COMPLIANCE WITH THE DUCTILE IRON PIPE RESEARCH ASSOCIATION GUIDELINES MODIFIED TO ACCOMMODATE PVC PIPE BY FOLLOWING THE RECOMMENDED INCREASE IN RESTRAINT LENGTH CORRESPONDING TO THE INSTALLATION OF POLYETHYLENE WRAP. IN NO INSTANCE SHALL THRUST BLOCKS BE PERMITTED.
19. THE CITY MAY REQUIRE ALL NEW SANITARY SEWER GRAVITY SYSTEMS TO BE SMOKE TESTED PRIOR TO FINAL ACCEPTANCE. ALL TESTING MUST BE DONE IN THE PRESENCE OF THE CITY'S DESIGNATED SITE INSPECTOR.
20. THE CITY OF ORANGE CITY RESERVES THE RIGHT TO REQUIRE THE DEVELOPER TO PERFORM VACUUM TESTING OF ALL SANITARY MANHOLES, AIR TEST SEWER MAINS, AND REQUIRES THAT ALL SANITARY SEWER MAIN LINES BE TELEVISED PRIOR TO FINAL ACCEPTANCE. LATERALS SHALL BE TELEVISED UPON DEMAND BY THE CITY PRIOR TO FINAL ACCEPTANCE WHEN IT IS SUSPECTED THAT A PROBLEM EXISTS.
21. ALL SEWER MAINS, PRIOR TO FINAL ACCEPTANCE BY THE CITY AND PRIOR TO ANY FINAL PAVING OPERATIONS, SHALL BE TELEVISED AND SUBMITTED TO THE CITY USING A "PAN AND TILT CAMERA" WITH DEPTH GAUGE IN FRONT OF THE CAMERA BY A CITY APPROVED CONTRACTOR. THE CAMERA SHALL RUN FROM DOWN STREAM MANHOLE TO UP STREAM MANHOLE. CITY INSPECTOR SHALL BE NOTIFIED IN ADVANCE AND BE PRESENT DURING THE TELEVISIONING OF THE SEWER SYSTEM. THE VIDEO SHALL BE NON-STOP WITH AUDIO DESCRIBING WHAT IS BEING REVIEWED. WRITTEN VIDEO LOGS DESCRIBING THE CONDITION OF THE LINES SHALL ACCOMPANY THE VIDEO SUBMISSION TO THE CITY PRIOR TO COMMENCING ANY INSTALLATION OF ASPHALT OR CONCRETE PAVEMENT. THE CITY MAY REQUIRE ADDITIONAL VIDEO TAPING, VIDEO TAPING OF LATERALS, AND/OR INFILTRATION/EXFILTRATION TESTS IF DEFECTS ARE APPARENT OR WORKMANSHIP IS QUESTIONABLE.
22. ALL SEWER LINES WHICH ARE CONSTRUCTED OUTSIDE OF PUBLIC RIGHTS-OF-WAY 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.
23. SEWER LATERAL LOCATIONS SHALL BE MARKED ALONG THE OUTSIDE OF THE CURB WITH A SAW CUT "S", OR BY A METAL TAB SET INTO THE PAVEMENT.
24. 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 PERSONALLY INSPECT ALL JOINT SEALS PRIOR TO BACKFILLING OPERATIONS.
25. ALL PROPOSED SEWER FORCE MAINS SHALL BE FLUSHED, PRESSURE TESTED, PIGGED 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



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SITE INSPECTOR WHO SHALL COORDINATE WITH CITY PERSONNEL AT THE WATER OR WASTEWATER TREATMENT PLANT (AS APPROPRIATE) AT LEAST 2 BUSINESS DAYS PRIOR TO BEGINNING A FULL-DIAMETER FLUSH OF THE MAINS AND PRIOR TO THE COMMENCEMENT OF PRESSURE TESTING (SUBJECT TO AVAILABILITY).

26. THE CONTRACTOR SHALL BE REQUIRED TO PIG ALL FORCE MAINS IN EXCESS OF 6" IN DIAMETER AND PRIMARY TRANSMISSION MAINS LOCATED ON COLLECTOR AND ARTERIAL ROADWAYS. LAUNCHING AND EXTRACTION POINTS SHALL BE DETERMINED BY THE CONTRACTOR. ALL PIGGING OPERATIONS SHALL BE WITNESSED BY A ORANGE CITY REPRESENTATIVE OR CITY INSPECTOR.
27. 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 SUCH AS A JCM-210 OVERSIZED DUCTILE IRON COUPLING OR AN APPROVED EQUAL MAY BE ALLOWED BY SPECIAL APPROVAL BY THE CITY.
28. ALL IN-LINE SANITARY SEWER FORCE MAIN VALVES SHALL BE RESILIENT SEAT (AWWA C-509 OR C-515) VALVES FEATURING AN EPOXY LINED DUCTILE IRON BODY.
29. ALL TAPPING OF PRESSURE MAINS AND CORING OF MANHOLES SHALL BE PERFORMED BY THE CITY AND BILLED IN ACCORDANCE WITH THE ADOPTED FEE RESOLUTION. SCHEDULING OF THESE CONNECTIONS SHALL REQUIRE A MINIMUM 2 BUSINESS DAYS NOTIFICATION DIRECTED TO THE CITY'S DESIGNATED SITE INSPECTOR WHO SHALL COORDINATE THE WORK DIRECTLY WITH THE PUBLIC UTILITIES DEPARTMENT. SUBSEQUENTLY, THE CONNECTION SHALL BE SCHEDULED TO COMMENCE BETWEEN 8:00 A.M. AND NOON ON THE APPROPRIATE DAY ESTABLISHED BY CITY. 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.
30. ALL WORK PERFORMED ON SANITARY SEWER FACILITIES OWNED OR PROPOSED TO BE OWNED BY THE CITY SHALL BE CONSTRUCTED BY AN UNDERGROUND UTILITY CONTRACTOR, OR LICENSED GENERAL CONTRACTOR, WHO IS LICENSED IN THE STATE OF FLORIDA AND REGISTERED WITH THE CITY.
31. UPON CONSTRUCTION COMPLETION AND ACCEPTANCE OF THE SYSTEM, IT SHALL BE 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 PRIOR TO ANY USE OF THE SYSTEM.
32. FOR CONSTRUCTION PURPOSES, THE PLANS SHALL DIMENSION THE LOCATION, OF ALL FORCE MAINS MEASURED FROM THE BACK OF CURB (OR EDGE OF PAVEMENT, IF NO CURBING EXISTS).
33. ALL HDPE PIPE INSTALLED FOR SEWAGE FORCE MAINS SHALL BE SDR 11 WITH #10 COPPER HEAD TRACER WIRE UNLESS SPECIFICALLY NOTED OTHERWISE. THE HDPE PIPE SHALL BE SIZED TO MATCH THE EXTERNAL DIAMETER OF THE PVC TO WHICH IT IS ATTACHED.
34. ALL P.V.C. PIPE SHALL BE STORED IN SUCH A WAY AS TO PREVENT WARPING, DEFLECTION, OR DEFORMATION. ANY PIPE DEEMED TO BE MISSHAPED IN ANY WAY FOR ANY REASON SHALL BE REJECTED.
35. NO USED, RE-USED, RUSTED, SECOND HAND, OR ANY MATERIAL THAT IS NOT NEW SHALL BE USED IN ANY UTILITY IMPROVEMENT PROJECTS WITHIN THE CITY'S SERVICE AREA.
36. WHERE POTABLE WATER AND SANITARY SEWER MAINS CROSS WITH LESS THAN (18) INCHES OF VERTICAL CLEARANCE OR WHERE THE SEWER MAIN IS ABOVE THE WATER MAIN, THE SEPARATION OF THE MAINS SHALL BE IN COMPLIANCE WITH F.A.C. RULE 62.55.314. ALTERNATIVELY, THE SEWER MAIN SHALL BE ENCASED WITH CONCRETE OR ENCLOSED IN A WATER TIGHT CARRIER PIPE, OR UPGRADED TO PRESSURE



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- RATED PVC PIPE (MEETING AWWA C-900 OR C-905 SPECIFICATION) AND PRESSURE TESTED AT 150 PSI TO ASSURE WATER TIGHTNESS PRIOR TO BACKFILLING.
37. CEMENT USED IN CONCRETE MIX FOR PRECAST STRUCTURES SHALL BE TYPE II, ACID RESISTANT AND SULFIDE RESISTANT CONCRETE.
 38. MORTAR TO CONTAIN "HYDRATITE" OR APPROVED EQUAL, TO PREVENT SHRINKAGE
 39. CONTRACTORS SHALL PROVIDE THICKER MANHOLE WALLS AND BASES AS REQUIRED TO PREVENT FLOTATION BASED ON HIGH GROUND WATER TABLE ELEVATIONS AS DETERMINED USING ACCEPTED ENGINEERING PRACTICES AND/OR APPROVED BY PUBLIC UTILITIES DEPT.
 40. SHOP DRAWINGS FOR ALL STRUCTURES SHALL BE SUBMITTED TO AND APPROVED BY THE DESIGN ENGINEER PRIOR TO INSTALLATION WITH TWO COPIES FORWARDED BY THE DESIGN ENGINEER TO THE CITY.
 41. NO BUG HOLES OR HONEYCOMB WILL BE ACCEPTED.
 42. ALL SANITARY SEWER MANHOLES SHALL HAVE ALL INTERIOR SURFACES COATED WITH THREE (3) COATS OF WHITE/GRAY OVER RED OVER BLACK EW-1 EPOXY PAINT WITH A TOTAL OF 12 MILS THICKNESS OR BLACK COAL-TAR EPOXY WITH A TOTAL OF 16 MILS THICKNESS. OUTSIDE SURFACE TO BE COATED WITH TWO (2) COATS OF BLACK OVER BLACK EW-1 EPOXY PAINT WITH A TOTAL OF 8 MILS AND ONE (1) COAT OF BLACK COAL-TAR EPOXY WITH A TOTAL OF 8 MILS. ALL COATS SHALL BE APPLIED AT THE FACTORY EXCEPT MINOR FIELD TOUCH UP AT JOINTS AND AT MANHOLE NECK.
 43. IN ADDITION TO THE CONTINUOUS TRACER WIRE INSTALLED DIRECTLY ON TOP OF THE PIPE, ALL FORCE MAINS AND RECLAIM MAINS SHALL BE INSTALLED WITH ELECTRONIC MARKERS SO THAT A MARKER WILL BE LOCATED AT ONE HUNDRED FOOT (100') INTERVALS ALONG THE PIPELINE LENGTH. MARKERS SHALL ALSO BE PLACED AT CHANGES IN DIRECTION, TEES, OR OTHER POINTS OF CONNECTION AND AS DIRECTED BY THE ENGINEER. ON GRAVITY SEWER SYSTEMS, MARKERS WILL ONLY BE PLACED AT THE TERMINAL ENDS OF THE SERVICE LATERALS. MARKER BALLS SHALL BE PLACED IN A POSITION DIRECTLY ABOVE THE PIPE AND HAND BACKFILLED ONE (1) FOOT ABOVE THE BALL TO PREVENT DAMAGE OR MOVEMENT DURING SUBSEQUENT BACKFILLING. DEPTH OF BURIAL SHALL NOT BE LESS THAN ONE AND ONE HALF FEET (1½') NOR MORE THAN TWO FEET (2'). MARKER BALLS SHALL CONSIST OF A PASSIVE DEVICE CAPABLE OF REFLECTING A SPECIFICALLY DESIGNATED REPULSE FREQUENCY TUNED TO THE UTILITY BEING INSTALLED. BALLS SHALL BE FOUR INCHES (4") IN DIAMETER WITH A HIGH DENSITY POLYETHYLENE SHELL. MARKER BALLS SHALL BE COLOR CODED IN ACCORDANCE WITH AMERICAN PUBLIC WORKS ASSOCIATION'S UTILITY LOCATION AND COORDINATING COUNCIL STANDARDS.



STANDARD CONSTRUCTION DETAIL SANITARY SEWER CONSTRUCTION NOTES

FILE NAME
S2.DOC

DETAIL REF:
S-2

PUB. 6/14

LIFT STATION WET WELL DESIGN NOTES

1. SUBMERSIBLE DUPLEX WET WELL IS MINIMUM CONFIGURATION REQUIRED.
2. SEE CITY STANDARD DETAIL FOR EMERGENCY PUMP CONNECTION REQUIREMENTS.
3. SEE CITY STANDARD DETAIL FOR 1" HOSE BIBB AND REQUIREMENTS.
4. SEE CITY STANDARD ELECTRICAL DETAIL FOR ELECTRICAL REQUIREMENTS.
5. MINIMUM WET WELL DIAMETER IS 6.0 FT. MINIMUM REQUIRED DEPTH OF WET WELL BELOW LOWEST INVERT IS 3'-6". MINIMUM CONCRETE WALL THICKNESS IS 8".
6. STATION TOP TO BE MIN. OF 1 FT. ABOVE FINISHED GRADE AND THE SURROUNDING FINISHED GRADE ELEVATION AND ELECTRICAL PANELS SHALL BE NO LOWER THAN THE 100-YEAR BASE FLOOD ELEVATION.
7. ALL FENCING INSTALLED IN THE VICINITY OF LIFT STATIONS SHALL BE 6' HIGH CHAIN LINK PLASTIC COATED, BLACK IN COLOR, WOODEN SHADOW BOX, OR MASONRY WALL AS APPROVED BY THE DEPT. OF COMMUNITY DEVELOPMENT IN COMPLIANCE WITH THE ARCHITECTUAL AND LANDSCAPE REQUIREMENTS OF THE LDC. ANY SPECIAL FENCING APPROVED AND INSTALLED SHALL BE MAINTAINED BY THE PRIVATE ENTITY RESPONSIBLE. WALL/ FENCING SHALL BE INSTALLED WITH A MINIMUM OF 24" CLEARANCE FROM ALL ELECTRICAL / MECHANICAL EQUIPMENT.
8. SHOP DRAWINGS ARE REQUIRED FOR PUMPS, PIPING, VALVES, FITTINGS, ELECTRICAL EQUIPMENT AND PRE-CAST CONCRETE STRUCTURES.
9. ALL PRE -CAST STRUCTURES SHALL BE DESIGNED PER ACI 315 & 318 "MANUAL OF STANDARD PRACTICE". DETAIL REINFORCING DRAWINGS SHALL BE SUBMITTED WITH SHOP DRAWINGS.
10. ALL EXPOSED METAL, EXCLUDING STAINLESS STEEL OR ALUMINUM MATERIALS, SHALL BE PAINTED WITH (2) COATS OF EXTERIOR, OIL BASE, ENAMEL PAINT. PIPING SHALL COME WITH STD. RED PRIMER.
11. PRESSURE GAUGES SHALL BE STAINLESS STEEL WITH A STAINLESS STEEL DIAPHRAGM; 4-1/2" DIAL AND HAVE SUFFICIENT RANGE TO READ 20% ABOVE THE DESIGN HEAD CONDITION. (0-50 PSI)
12. INTERIOR OF WET WELL SHALL BE LINED WITH HDPE, 4.0 MM THICKNESS, AS MANUFACTURED BY AGRU SURE-GRIP, AS SUPPLIED BY HANSON PRECAST, OR APPROVED EQUAL. THE OUTSIDE OF THE WELL SHALL BE COATED WITH (2) COATS OF COAL TAR EXPOXY, 9 MIL THICK.
13. WET WELL ACCESS HATCHES SHALL BE MINIMUM 36"x48"x1/4" THICK ALUMINUM FLOOR PLATE REINFORCED TO 150 P.S.F. LIVE LOAD. DOORS SHALL HAVE FLUSH ALUMINUM DROP HANDLE AND AN AUTOMATIC HOLD OPEN ARM WITH RELEASE HANDLE. ALL FASTENERS AND ACCESSORIES SHALL BE 316 STAINLESS STEEL. HATCH FRAMES TO BE INTEGRALLY CAST INTO CONCRETE TOPS. THE HATCHES SHALL BE FLOOD TIGHT AS MANUFACTURED BY "HALLIDAY", OR APPROVED EQUAL.
14. THE UNDERSIDE OF ALUMINUM ACCESS COVERS AND ALL ALUMINUM SURFACES IN CONTACT WITH CONCRETE SHALL BE COATED WITH A SUITABLE BITUMINOUS PAINT. ALL NUTS, BOLTS, WASHERS AND MISCELLANEOUS HARDWARE ARE TO BE 316 STAINLESS STEEL.
15. THE CONTRACTOR SHALL COORDINATE WITH DUKE ENERGY FOR ELECTRICAL SERVICE TO THE LIFT STATION SITE, AND SHALL MEET ALL POWER COMPANY REQUIREMENT WITHOUT ADDITIONAL COMPENSATION.
16. ALL WET WELL AND VALVE BOX CONSTRUCTION JOINTS TO BE SEALED WITH "RAM-NECK" TAPE AND ANHYDROUS CEMENT TO LEAK FREE STATE.
17. ALL EXPOSED AND EMBEDDED CONDUITS TO BE PVC.
18. TESTING OF FORCE MAIN AND LIFT STATION SHALL BE REQUIRED. LIFT STATION SHALL BE TESTED WITH FIRST PUMP ON, SECOND PUMP ON, AND BOTH PUMP ON.
19. ALL M.J. AND FLANGED D.I. PIPE AND FITTINGS SHALL BE POLYETHYLENE LINED (40 MILS. NOMINAL) CONFORMING TO ASTM D-1248. EXTERIOR COATING SHALL BE COAL TAR EPOXY INSIDE WET WELL.



STANDARD CONSTRUCTION DETAIL LIFT STATION WET WELL DESIGN NOTES

PUB. 6/14

FILE NAME
S3.DOC

DETAIL REF:

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LIFT STATION WET WELL DESIGN NOTES

20. ALL SUPPORTS AND HARDWARE FOR ELECTRICAL EQUIPMENT SHALL BE ALUMINUM OR STAINLESS STEEL.
21. THE ENTIRE AREA WITHIN THE SECURITY FENCE SHALL HAVE A MINIMUM OF 6" STONE OVER LAYER OF LANDSCAPE CLOTH.
22. THE LIFT STATION SHALL BE EQUIPPED WITH PUMP CONTROLS AND TELEMETRY EQUIPMENT. THIS EQUIPMENT SHALL MEET ORANGE CITY'S CURRENT STANDARDS. THE DATA FLOW SYSTEM CONTROLLER SHALL BE EQUIPPED WITH A TRANSMITTER AND ANTENNA CAPABLE OF COMMUNICATING WITH SCI-TEXT SYSTEM.
23. NO PENETRATIONS THROUGH THE TOP OF THE CONTROL CABINET FOR LIGHTS OR HORNS SHALL BE PERMITTED.
24. INSTALL 4X4 PRESSURE TREATED POSTS AROUND THE INSIDE PERIMETER OF THE FENCE LINE TO CONTAIN THE GRAVEL.



STANDARD CONSTRUCTION DETAIL
LIFT STATION WET WELL DESIGN NOTES

PUB. 6/14

FILE NAME
S3.DOC

DETAIL REF:

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LIFT STATION WET WELL CONSTRUCTION NOTES

1. SEE CITY STANDARD DETAIL FOR EMERGENCY PUMP CONNECTION REQUIREMENTS.
2. SEE CITY STANDARD DETAIL FOR 1" HOSE BIBB AND REQUIREMENTS.
3. SEE CITY STANDARD ELECTRICAL DETAIL FOR ELECTRICAL REQUIREMENTS.
4. ALL PIPING AND FITTINGS IN WET WELLS TO BE ASSEMBLED USING 316 STAINLESS STEEL BOLTS AND NUTS ONLY.
5. ALL DISCHARGE FITTINGS TO BE PVC RESTRAINED JOINT.
6. ALL SEWER LINES ENTERING AND EXITING MANHOLES SHALL BE SEALED UTILIZING RUBBER BOOTS OR OTHER CITY APPROVED INFILTRATION LIMITING METHODS.
7. WET WELL SECTIONS SHALL BE JOINED USING "RAMNECK" JOINT MATERIAL AND SHALL BE FREE FROM SEEPAGE PRIOR TO ACCEPTANCE. PROVIDE "EZ-WRAP" BUTYL ADHESIVE TAPE PER MANUFACTURER'S RECOMMENDATIONS AT EACH WETWELL SECTION EXTERIOR JOINT CIRCUMFERENCE.
8. NO SPLICES OR JUNCTION BOXES ARE ALLOWED FOR BALL FLOAT CORD INSTALLATION.
9. ALL LIFT STATIONS AND THE LAST MANHOLE COMING INTO A WETWELL SHALL BE FIBERGLASS LINED, AGRU SURE GRIP OR H.D.P.E. LINED, OR OTHER MATERIAL AS APPROVED BY THE CITY OF ORANGE CITY (ASTM D 3753).
10. WET WELL CONSTRUCTION SHALL BE REINFORCED CONCRETE IN ACCORDANCE WITH A.S.T.M. C-76, 4000 PSI AT 28 DAYS. ALTERNATE CONSTRUCTION SHALL BE PRECAST MONOLITHIC WITH BASE SLAB IN ACCORDANCE WITH A.S.T.M. C-478.
11. ELECTRICAL PERMIT TO BE OBTAINED FROM CITY OF ORANGE CITY (OR APPROPRIATE JURISDICTION) PRIOR TO BEGINNING WORK ON ANY ELECTRICAL WIRING, EQUIPMENT, ETC. ALL ELECTRICAL WIRING TO COMPLY WITH NATIONAL ELECTRICAL CODE.
12. THREE COPIES OF THE LIFT STATION OPERATING MANUAL OR CD TO BE PROVIDED TO THE UTILITIES DEPT. PRIOR TO FINAL ACCEPTANCE OF THE LIFT STATION.
13. EMERGENCY ELECTRICAL RECEPTACLE REQUIRED TO BE INSTALLED ON ELECTRICAL EQUIPMENT RACK, (SEE S-25).
14. EMERGENCY "HIGH LEVEL" WET WELL SOLID ALARM LIGHT REQUIRED IS HORN AUDIBLE ALARM REQUIRED.
15. LINKABLE FUSED ELECTRICAL DISCONNECT REQUIRED.
16. ALL PUMP STATION WIRING SHALL BE STANDARD COPPER. THREE PHASE POWER AND MOTORS REQUIRED.
17. RADIO TELEMETRY UNIT (RTU) TO BE PROVIDED BY DEVELOPER, CONTACT CITY OF ORANGE CITY FOR SPECIFICATIONS OR CONTACT DIRECTLY THE CURRENT SOLE SOURCE SUPPLIER DATA FLOW (TBD), TELEPHONE # 321-259-5009
18. DEVELOPER/CONTRACTOR TO PAY ALL INITIAL ELECTRICAL CONNECTION CHARGES, ETC. ON THE DAY OF FINAL ACCEPTANCE BY THE CITY, ALL FUTURE MONTHLY ELECTRICAL BILLS TO BE TAKEN OVER BY THE CITY OF ORANGE CITY UTILITIES DEPT. PLEASE CONTACT THE PUBLIC UTILITIES DEPARTMENT AT (386) 775-5447 TO TRANSFER POWER BILL OVER TO THE CITY.
19. 4" PVC CONDUIT FOR FLOAT WIRES SHALL BE INSTALLED FOR ALL OFFSET LIFT STATIONS.
20. GLYCERIN FILLED COMPOUND PRESSURE GAUGES ARE REQUIRED.
21. ALL FENCING INSTALLED IN THE VICINITY OF LIFT STATIONS SHALL BE 6' HIGH CHAIN LINK PLASTIC COATED, BLACK IN COLOR, WOODEN SHADOW BOX, OR MASONRY WALL AS APPROVED BY THE DEPT. OF COMMUNITY DEVELOPMENT IN COMPLIANCE WITH THE ARCHITECTUAL AND LANDSCAPE REQUIREMENTS OF THE LDC. ANY SPECIAL FENCING APPROVED AND INSTALLED SHALL BE MAINTAINED BY THE PRIVATE ENTITY RESPONSIBLE WALL/ FENCING SHALL BE INSTALLED WITH A MINIMUM OF 24" CLEARANCE FROM ALL ELECTRICAL / MECHANICAL EQUIPMENT.
22. LIFT STATION START-UP INSPECTIONS SHALL BE SCHEDULED AND COORDINATED THROUGH THE CITY'S SITE INSPECTOR (2 BUSINESS DAYS IN ADVANCE). UPON DETERMINING THAT ALL WORK IS COMPLETE AND READY THE



STANDARD CONSTRUCTION DETAIL LIFT STATION WET WELL CONSTRUCTION NOTES

FILE NAME
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LIFT STATION WET WELL CONSTRUCTION NOTES (CONT'D)

CITY INSPECTOR SHALL THEN NOTIFY THE CITY, CONTRACTOR, ENGINEER OF RECORD, POWER COMPANY, DATA FLOW, AND THE PUMP SUPPLIER OF THE OFFICIAL START-UP INSPECTION DATE AND TIME. UPON COMPLETION THE ENGINEER OF RECORD SHALL PROVIDE TO THE CITY A SUMMARY OF THE RESULTS OF THAT TEST AND A LIST OF ALL PUNCH LIST ITEMS OUTSTANDING.

23. PUMP STATION FINAL INSPECTION AND ACCEPTANCE PROCEDURES:

- BEFORE FINAL APPROVAL OR ACCEPTANCE OF ANY PUMP STATION BY THE CITY, THERE SHALL BE FIELD INSPECTIONS MADE BY THE CITY'S REPRESENTATIVE AND INSPECTOR. THE FIELD INSPECTIONS SHALL SHOW THAT THE PUMP STATION IS FULLY OPERATIONAL AND ALL NECESSARY APPURTENANCES HAVE BEEN INSTALLED AND CONSTRUCTED IN ACCORDANCE WITH THE PLANS AND THE STANDARD CONSTRUCTION DETAILS AS APPROVED BY THE UTILITIES DEPARTMENT PRIOR TO CONSTRUCTION.
- UPON COMPLETION AND BEFORE ACCEPTANCE OF THE PUMP STATION INSTALLATION, THE CONTRACTOR SHALL TEST ALL THE PUMPING EQUIPMENT TO DEMONSTRATE SATISFACTORY PERFORMANCE. IF DEFICIENCIES OCCUR, THE CONTRACTOR SHALL CORRECT THEM ACCORDINGLY AND EQUIPMENT SHALL BE RETESTED.
- REPRESENTATIVES FROM THE PUMPING EQUIPMENT MANUFACTURER, DATA FLOW TELEMETRY (TBD), AND THE ELECTRICAL CONTRACTOR SHALL BE PRESENT AT THE PUMP STATION START-UP TESTING AND FOR THE FINAL SITE INSPECTION.
- ALL PUMP STATION EQUIPMENT SHALL BE TESTED AT THE START-UP. THE MANUFACTURER / CONTRACTOR SHALL PROVIDE A FORMAL TEST PROCEDURE AND FORMS FOR RECORDING DATA. THE TESTS SHALL BE PERFORMED BY THE CONTRACTOR IN THE PRESENCE OF A CITY REPRESENTATIVE AND CITY INSPECTOR. THE RECORDED FIELD DATA SHALL BE SUBMITTED TO THE UTILITIES DEPARTMENT ALONG WITH THE PUMP STATION ASBUILT AND PUMP STATION MAINTENANCE AND OPERATING MANUALS.
- ALL GROUND SURROUNDING THE PUMP STATION MUST BE GRADED IN # 57 STONE FINAL ACCEPTANCE OF THE PUMP STATION WILL NOT BE GIVEN UNTIL EFFECTIVE EROSION AND POSITIVE DRAINAGE CONTROL HAVE BEEN PROVIDED.
- PUMP STATIONS SHALL ONLY BE CONSIDERED AS ACCEPTABLE FOR OPERATION BY THE CITY UPON WRITTEN CONFIRMATION BY THE UTILITIES DEPARTMENT.
- IN THE EVENT THAT THE STATION OR ANY OF IT'S ASSOCIATED COMPONENTS ARE DETERMINED TO BE DEFICIENT AT THE START UP, THEN THE CITY RESERVES THE RIGHT TO REQUIRE A COMPLETE NEW START UP WITH ALL PARTIES PRESENT AS NOTED.
- UPON COMPLETION AND ACCEPTANCE, THE CITY SHALL NOTIFY THE ENGINEER OF RECORD.

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STANDARD CONSTRUCTION DETAIL
LIFT STATION WET WELL CONSTRUCTION NOTES

PUB. 6/14

FILE NAME
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DETAIL REF:
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City of Orange City Public Utilities Department

List of Approved Products

Sanitary Sewer & Force Main

Air Release Valves

MANUFACTURER	MODEL #
A.R.I.	D-025P (Plastic)

Gate Valves and Tapping Valves – Resilient Seated (AWWA C509 and C515) 24” or Smaller

MANUFACTURER	MODEL #
American AVK Co.	Series 3, 18, 25, 45, 55, & 66
Clow	Model 2638 and 2639
Mueller	A-2360, A-2361, T-2360 & T-2361
American Flow Control	Series 2500

Joints Restrained – PVC Only

MANUFACTURER	MODEL #
EBBA Iron Inc	Series 1500/1600 2000/2500/2800
Star Pipe	Stargrip Series 1000/1100/1200/4000
Sigma	One-Lock SLC PV-Lok for PVC
Smith-Blair	Cam-Lock (111 & 120) & Bell-Lock (115 & 165)



STANDARD CONSTRUCTION DETAIL
SANITARY SEWER & FORCE MAIN
APPROVED PRODUCTS

FILE NAME
S5.DOC

DETAIL REF:

S-5

City of Orange City Public Utilities Department
List of Approved Products

Sanitary Sewer & Force Main

Force Main Fittings – PVC and DIP Class 350 (with Protecto 401 Ceramic Epoxy),

C-900, C-905 or C-907

MANUFACTURER
Harco
Multi-Fittings
Plastic Trends
Head
Tyler/Union (Lined with Protecto 401 Ceramic Epoxy)

Manhole and Lift Station Wet Well Rehabilitation Liner

MANUFACTURER
Raven 405
HDPE – AGRU SURE GRIP



STANDARD CONSTRUCTION DETAIL
 SANITARY SEWER & FORCE MAIN
 APPROVED PRODUCTS

PUB. 6/14

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 S5.DOC

DETAIL REF:
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