1. The Contractor shall install commercially manufactured wye branches appropriate and compatible to the materials used in the street sewer (lateral or trunk lines). Where the house service piping is of a different material than the street sewer, the fittings and transition pieces shall be specially designed for the connections of the different materials and shall meet with the approval of the City of Rockledge Wastewater Treatment department. The type and locations of sewer service connecting lines may be tentatively shown on the drawings.

2. The Contractor shall serve two (2) properties whenever possible with a six inch (6") lateral and a six inch by four inch (6" x 4") double wye. All laterals shall be brought to the property line. When there are sidewalks, the sanitary sewer wyes shall be extended past the sidewalk on the property owner's side. All laterals shall be a minimum of three feet (3') and a maximum of four feet (4') in depth, determined from the crown of the proposed finished road elevation, and no more than 50 feet from the trunk line.

3. All service lines shall be stubbed out of the wye with 4" SDR 3034 PVC and brought two feet (2') or greater above the crown of the road, with glued permanent caps. The purpose of the stub-out is to facilitate the location of the service wye by the plumber. Connection to the City's sewer service lateral is to be made at the h" x 4" wye, NOT the stub-out 90 bums are not acceptable.

4 Where wye branch service connections or plugged wyes cannot be used due to the depth, the Contractor shall furnish all materials and construct risers or chimneys as shown on the drawings. When connecting pipe cannot be adequately supported on undisturbed earth, it shall be supported on a concrete cradle.

5. The Engineer shall provide three (3) SEALED copies of AS-BUILTS to the City of Rockledge Wastewater Treatment department prior to receiving final inspection which shall include 3 sealed copies of the final plat.

6 The Engineer shall maintain an as build of the actual sewer service locations and record these service lines and wyes on the final as-builts to be submitted. The as-builts shall include the location of the wye branch and the end of the sewer service, referenced to the next downstream manhole of each run, and the offset of the end of the service, referenced from the centerline of the main sewage pipe, as well as the depth at the end of the service. The end of the service pipe shall be marked with a metallic tape reflector fastened to the end of the pipe.

7. Surveyed front lot corners (staked) by a registered Surveyor shall be accomplished prior to final inspection.

Water Main and Storm Drain Crossings:

A. Water Mains

1. In all cases where sewer mains cross water mains with a minimum of less than 18 inches of clear distance between the top of the sewer and the bottom of the water main, the sewer shall be ductile iron pipe for a distance of ten feet (10') on either side of the point of crossing.

B. Storm Drains:

1. In all cases where sewer mains cross storm drains with a minimum of less than 18 inches of clear distance between the top of the sewer and the bottom of the storm drain, the sewer shall be either ductile iron pipe of concrete-encased PVC pipe for a distance of ten feet (10') on either side of the point of crossing.

Field Testing of Sewers:

A. Closed Circuit Television Inspection:

1. All sewer main lines and Lateral services shall be inspected between manholes by a closed-circuit television camera especially designed for and adapted to this purpose. The Contractor shall employ a reputable testing agency for this inspection, which shall be subject to the City's approval. The City will provide a representative to be present to view the screen when the inspection is in progress during normal working hours. The Contractor shall provide suitable methods of measuring and locating defects found in the lines and shall enter such data in a log.

2. Lateral service lines will be inspected by closed-circuit television camera after other utilities have been installed; gas, power, cable, and phone.

3. Lines found defective shall be corrected as directed by the City and the repaired lines shall be reinspected with the television camera until found acceptable.

4 Television inspection shall be required upon completion of the sewer and prior to the capping of the road.

5. A copy of the television inspection tapes shall be provided to the City.

6 "0" infiltration from any line or manhole shall be the norm;

7. Pressure or vacuum test may be required at the discretion of the City.

Backfill:

Backfilling of utility trenches will not be allowed until the work has been approved by the City, pressure-tested if required, and the City indicates that backfilling may proceed. Any work which is covered or concealed without the knowledge and consent of the City, shall be uncovered or exposed for inspection at no cost to the City. Partial backfill may be made to restrain the pipe during pressure testing.

A. Backfill Material:

1. Materials shall be non-cohesive, non-plastic material free from all debris, lumps and clods. Backfill material placed within one foot (1') of piping and appurtenances shall not contain any stones or rocks larger than one inch (1") in diameter; for PVC pipe, or 2 inches (2") in diameter, for all other pipe.

No stones or rocks larger than six inches (6") in diameter will be permitted in any backfill.

2. Selected backfill material containing no stones or rocks larger than two inches (2") shall be placed in twelve-inch (12") layers and thoroughly tamped to a depth of 24 inches over the top of the pipe. Particular attention and care shall be exercised in obtaining thorough support for the branch of all service connection fittings. Care shall be taken to preserve the alignment and gradient of the installed pipe.

3. After the backfill has been placed to a level of 24 inches over the pipe, the remainder of the backfill shall be placed in layers, not to exceed twenty-four inches (24"), and compacted with mechanical vibrators or other suitable equipment to obtain a density of the backfilled material of not less than 98% of its maximum density using the T-180 method.

4 After selected backfill has been placed to a depth of 24 inches over the sewer pipe, backfilling shall proceed to a depth of 48 inches over the pipe by placing the backfill material in twenty-four inches (24") layers and thoroughly compacting it with mechanical vibrators. Backfill in this portion of the work shall be compacted to 98% of maximum density of the material using the T-180 method.

5. After the backfill has been placed to a level of 48 inches over the sewer pipe, the remainder of the backfill shall be placed in layers, not to exceed twenty-four inches (24"), and compacted with mechanical vibrators or other suitable equipment to obtain a density of the backfilled material of not less than 98% of its maximum density using the T-180 method.

6 Laboratory and field density test shall be performed by a reputable independent engineering firm on site to secure density test conducted at depth. Of every forty-eight inches (48"), and at distance of every one hundred feet (100') and twice at each manhole directly opposite of each other and within four feet (4') of the manhole. And at road grade prior to subgrade and at all other locations requested by the City.

7 Trench backfill which does not comply with the specified densities, as indicated by such test, shall be rewerked and recompacted, until the required compaction is secured, at no expense to the City.

Jack and Bores:

A. Encasement Materials.

All casings shall conform to the applicable ASTM and the following additional requirements:

1. Must be chemically compatible with any material it will transport or otherwise contact.

2. All encasement pipes shall be new and of round, smooth, watertight construction.

3. Use of casings with coating protective coatings will not be allowed.

B. Joints and Couplings

1. Steel Pipes

a) Couplings shall be tight, tack welded, and sufficiently rigid to prevent misalignment during driving or pushing operation.

b) Welded joints shall be made in a neat workman like manner by a certified welder and shall be air tight and conform to the entire circumference of the pipe.

2. Plastic Pipes

a) Couplings shall meet or exceed all applicable ASTM strength and composition standards for the particular pipe being used.

C. Drilling Fluids

1. Drilling fluids used to lubricate the auger and facilitate the removal of cuttings, they shall consist of biodegradable materials. Spoil, drilling fluids, and loose cuttings shall be contained and removed for proper disposal.

D. Casing Spacers

1. Casing spacers shall be projection type totally non-metallic spacers constructed of the preformed sections of high-density polyethylene.

2. Casing spacers shall be used to install the carrier pipe inside the encasement pipe. Casing spacers shall fasten tightly onto carrier pipe so when the carrier pipe is being installed the spacers will not move along the pipeline.

3. Casing spacers shall be spaced at a maximum of 10' and a maximum of 2' from the bells. Double spacers shall be installed at each end of the casing.

4. Casing ends shall be sealed with wrap around end seals made of rubber and stainless steel bands.

Directional Boring

A. General

1. The method of guidance utilized in locating and steering the pilot string from entry to exit shall be state of the art equipment. Readings

shall be recorded after the advancement of each successive drill pipe and the readings plotted. A copy of recordings shall be submitted to City of Rockledge Wastewater Treatment/Reclamation Facility.

2. The minimum clearance of 2' between existing utilities shall be maintained.

3. Lateral position at exit shall be no further than 3' left or right of planned centerline.

4. Horizontal positioning shall be no further that 3' short of proposed exit location.

5. Entrance and exit shall have a minimum distance of 4' from the edge of pavement.

B. Drilling Slurry

1. The open borehole may be stabilized by means of bentonite drilling slurry being pumped through the inside diameter of the drill pipe and through the openings of the reamer. The slurry will also serve as an agent to carry out the loose cuttings to the surface through the annulus of the borehole. These cuttings, and slurry are to be contained at the exit hole and entry side of directional bore in pits or holding tanks and then disposed of properly.

2. A complete list of drilling fluids and mixtures to be used in the directional operation shall be submitted to the City of Rockledge Wastewater Treatment/Reclamation Facility with their respective MSDS sheets.

C. Testing

1. Hydrostatic test will be made of Polyethylene pipe prior to installation in the borehole. Testing shall follow a four hour test per City of Rockledge Technical Force Main Specifications for force mains and in the City of Rockledge Technical Sewer Specifications.

End of Section
Revised February 1997

QUALITY ASSURANCE

A. Design Requirements

1. Force mains shall be laid with a minimum cover of 36" below the finished grade

2. PVC force mains six inches (6") and larger in diameter shall be constructed with cast iron fittings.

3. Forcemains four inches (4") and smaller in diameter shall be constructed of PVC pipe with PVC fittings.

B. Pipe Inspection

1. The contractor/owner shall obtain from the pipe manufacturer a certificate of inspection to the effect that the pipe and fitting supplied for a particular contract have been inspected at the Plant and that they meet the requirements of these specifications. All pipe and fittings shall be subjected to visual inspection at the time of delivery, also just before they are lowered into the trench to be laid, and joints or fittings that do not conform to these specifications will be rejected and must be removed from the site immediately by the contractor.

SUBMITTALS

A. Shop Drawings

1. In general, three (3) copies of the following shop drawings shall be submitted to the Wastewater Treatment Department for approval prior to construction.

a) Mill test certificates or certified test reports on pipe
b) Details of restrained and flexible joints
c) Valve vaults
d) Valve and valve boxes
e) Air release valves
f) Pipe laying schedule
g) Temporary plug and anchorage system for hydrostatic pressure test

JOB CONDITIONS

A. Water in Excavation

1. Water shall not be allowed in the trenches while the pipes are being laid and/or tested. The contractor shall not open more trench than the available pumping facilities are able to dewater to the satisfaction of the City. The contractor shall assume responsibility for disposing of all water so as not to injure or interfere with the normal drainage of the territory in which he is working and in compliance with OSHA Standards. In no case shall the pipelines being installed be used as drains for such water, and the ends of the pipe shall be kept properly and adequately blocked during construction by the use of approved stoppers and not by improvised equipment. All necessary precautions shall be taken to prevent the entrance of mud, sand or other obstructing matter into the pipelines. If on completion of the work any such material has entered the pipelines, it must be cleaned as directed by the City so that the entire system will be left clean and unobstructed.

MATERIALS

A Ductile Iron Pipe and Fittings

1. Ductile iron pipe shall conform to the requirements of ANSI Standard A21.51, Class 51 for four-inch (4") lines and Class 50 for all other sizes, unless otherwise specified. Joints for ductile iron pipe shall be mechanical or push-on joints, unless otherwise specified. Pipe interior shall be epoxy lined.

2. The material shall be a two component epoxy with the following minimum requirements.

a) A permeability rating of .15 perms when measured by ASTM D-1653-72.

b) A direct impact resistance of 100 in lbs. With no cracking when measured by ASTM D-2794.

c) The ability to build at least 20 mils. dry in one coat.

3. Fittings

a) All ductile iron fitting shall be mechanical joint or single gasket, push-on type with a minimum pressure rating of 350 psi and shall conform to the requirements for epoxy lined.

b) Mechanical joint and/or single gasket, push-on type fittings shall be polyethylene lined, seal coated and outside coated as specified above for ductile iron pipe.

4. Mechanical joints consisting of bell, socket, gland, gasket, bolts and nuts shall conform to ANSI Standard A21.11. Bolts shall be high strength, annealed, cast iron, or high strength low alloy steel, T-head type having hexagonal nuts. Bolts and nuts shall be machined true and nuts be tapped at right angles to a smooth bearing surface. Single seal gasket push-on type joints shall conform to the requirements of ANSI A21.11 and shall be "Tyton", "Fastite", "Super Bell Tite", or Wastewater Treatment Department approved equal.

5. Restrained joints that require field welding will not be acceptable, and the thickness of the pipe barrel remaining at grooves cut for restraint shall not be less than that required for the design wall thickness. Joints using set screws will not be acceptable. Restrained joints shall be furnished for 24-inch and larger pipe at changes in direction of the main.

CIVIL ENGINEER:
BERRY ENGINEERS LLC
3555 KEITH ST NW, SUITE 109 TEL: (423) 790-5880
CLEVELAND, TN 37312
CERTIFICATE OF AUTHORIZATION #30385

DEVELOPER:
HUTTON ROCKLEDGE MF LLC
736 CHERRY STREET
CHATTANOOGA, TN 37402

PROJECT:
ROCKLEDGE FLATS
190 BARTON BLVD
ROCKLEDGE, FL

BENJAMIN M. BERRY
LICENSE No 76300
STATE OF FLORIDA
PROFESSIONAL ENGINEER

REVISIONS		
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SHEET NAME:
CITY DETAILS

DATE:	11/01/2019
DRAWN BY:	JDS
CHECKED BY:	BMB
PROJECT NO.:	19018

SHEET NUMBER:
C-12