



City of Myrtle Beach
SOUTH CAROLINA

PURCHASING AND
MATERIALS MANAGEMENT

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ADDENDUM 002

21-B0004

Arts and Innovation District

August 19, 2020

The following questions were asked and addressed. Also, please find additional documents attached.

PLANNING DEPARTMENT

1. **Comment** - Please provide quantities for bid items 38, Asphalt Repair and 39, 6" Compacted Asphalt Millings.

Response - See Revised Unit Price form.

2. **Comment** - Please provide details for bid item 48, concrete Driveway Repair and Valley Gutter Repair.

Response - In the sewer line roadway cut at the Roadway Entrance / Exist into the parking lot off Oak Street.

3. **Comment** - Are the Bidders to include vacuum testing of existing manholes?

Response - No.

4. **Comment** - Will existing manholes require coating?

Response - No.

-
5. **Comment** - Demolition of asphalt, sidewalk, curb & gutter is not shown on the Demo drawing where C-410 calls for the new 4" grinder station. Are bidders to include removal and replacement of asphalt, sidewalk and curb & gutter with Bid Item 29?

Response - *That is correct.*

6. **Comment** - Please clarify size of new drainage pipe shown NE of brewery on drawings C-301. Demo drawing best shows this where sidewalk is to be removed for the new line.

Response - *15" PCPP See Revised Sheet C-301.*

Thank you,



Ruth Burleson Garigen/Buyer
City of Myrtle Beach/Purchasing

DOCUMENT 004322 - UNIT PRICES FORM

1.1 BID INFORMATION

- A. Bidder: _____.
- B. Project Name: Arts and Innovation District Phase 1A - Water, Sewer and Drainage
- C. Owner: The City of Myrtle Beach
- D. Engineer: DDC Engineers, Inc.
- E. Engineer Project Number: 20034E

1.2 BID FORM SUPPLEMENT

- A. This form is required to be attached to the Bid Form.

1.3 UNIT PRICES

NOTE: The undersigned hereby proposes to furnish all labor, equipment and materials. Bids shall include sales tax and all other applicable taxes and fees. Bid prices shall also include all utility work proposed, demolition, bypass pumping, dewatering operations, sheeting, well pointing, pedestrian control, signage, barricades, traffic control, silt fencing, and erosion control for the following proposal. The contractor must ensure that residents, condo guest, etc. are not disturbed by the noise generated from bypass sewage pumping operations, and any noise reduction techniques must be included in the bid prices. If any noise complaints are received the contractor will be required to change noise reduction, and/or construction methods immediately. All materials that are removed during the construction of the project must be disposed of appropriately by the contractor at the contractor's expense, or unless listed as a salvaged by The City of Myrtle Beach and must be included in the prices below. All flanged bolts and nuts to be stainless steel. All DIP lines and fitting to be sewer coat or approved equal. Bids shall include sales tax and other applicable taxes and fees. Any work required as shown on the plans or called for in the specifications not specifically listed in the price schedules, should be included in the most closely relates work item listed. The Contractor is to include all sleeves required to make any tie-ins to the existing or proposed lines in the overall pipe price. There will be no items listed in the Unit Prices for sleeves. The Contractor is to verify the pipe material prior to bidding and order any tapping sleeves and bid accordingly.

Item	Description	Engr's Est.	Unit	Unit Price	Amount
1.	Mobilization	1	LS	\$	\$
2.	Demolition	1	LS	\$	\$
3.	8" SDR 35 PVC Gravity Sewer (0' - 6') Deep	75	LF	\$	\$
4.	8" SDR 35 PVC Gravity Sewer (6' - 8') Deep	528	LF	\$	\$

ARTS AND INNOVATION DISTRICT PHASE 1A
ENGINEER PROJECT NUMBER 20034E

Item	Description	Engr's Est.	Unit	Unit Price	Amount
5.	8" SDR 35 PVC Gravity Sewer (8' - 10') Deep	101	LF	\$	\$
6.	4" Diameter Concrete Manhole (0' - 6') Deep	1	EA	\$	\$
7.	4" Diameter Concrete Manhole (6' to 8') Deep	4	EA	\$	\$
8.	4" Diameter Concrete Manhole (8' to 10') Deep	2	EA	\$	\$
9.	Construct 4' Diameter Manhole Over Existing Sewer Line (6' to 8') Deep	1	EA	\$	\$
10.	Short Single Sewer Service (20 LF and Under in Length)	11	EA	\$	\$
11.	Long Single Sewer Service (21 LF and Longer in Length)	8	EA	\$	\$
12.	Flowable Fill Existing 8" PVC Sewer Line	425	LF	\$	\$
13.	Remove Top 5' of Existing Manhole and Fill With Flowable Fill	2	EA	\$	\$
14.	6" PVC Sewer Service Out of the Back Manhole #7 (Depth shown on sewer profile)	70	LF	\$	\$
15.	6" C-900 DR-18 PVC Water Line	680	LF	\$	\$
16.	6" MJ 45° Bend Restrained	12	EA	\$	\$
17.	6" MJ 90° Bend Restrained	3	EA	\$	\$
18.	6" x 6" MJ Tee Restrained	9	EA	\$	\$
19.	6" x 4" MJ Reducer Restrained to Tie-In 4" Existing Fire Lines	2	EA	\$	\$
20.	Cut In 6" MJ 45° Bend Restrained	2	EA	\$	\$
21.	6" MJ Gate Valve w/ Box Restrained	9	EA	\$	\$
22.	1" Water Service Complete Includes Tie-In to Existing Water Meters	5	EA	\$	\$
23.	Cut and Plug Existing 2" PVC Water Line In Place (Abandon Water Line)	1	EA	\$	\$
24.	Cut and Plug Existing 4" Water Line in Place (Abandon Water Line)	1	EA	\$	\$
25.	Cut and Plug Existing 6" Water Line in Place (Abandon Water Line)	2	EA	\$	\$
26.	Fire Hydrant Assembly Complete	3	EA	\$	\$

ARTS AND INNOVATION DISTRICT PHASE 1A
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Item	Description	Engr's Est.	Unit	Unit Price	Amount
27.	Tie-In Into Existing Manhole (6' to 8' Deep)	1	EA	\$	\$
28.	Tie-In Into Existing Sewer Service	18	EA	\$	\$
29.	Duplex Grinder Station with Valve Vault (See Standard Detail Sheet C-404)	1	EA	\$	\$
30.	2" PVC Schedule 40 Force Main into Manhole #4 from Valve Vault to manhole (includes all sidewalk and curb repair in this item)	1	LS	\$	\$
31.	15" PCPP Pipe and Bedding Complete	270	LF	\$	\$
32.	8" HDPE Pipe	40	LF	\$	\$
33.	6" HDPE Pipe	56	LF	\$	\$
34.	Nyloplast 24" Drainage Basin w/24" ADA Pedestrian Grate	6	EA	\$	\$
35.	3' x 3' Concrete Catch Basin	2	EA	\$	\$
36.	Concrete Sidewalk Repair	650	SQFT	\$	\$
37.	Concrete Curb and Gutter	80	LF	\$	\$
38.	Asphalt Repair	1250	LF	\$	\$
39.	6" of Compacted Asphalt Millings	1725	SQFT	\$	\$
40.	Temporary Parking Lot Stripping (see sheet C-502)	1	LS	\$	\$
41.	15" x 6" HDPE (Wye)	3	EA	\$	\$
42.	8" x 6" HDPE (Wye)	1	EA	\$	\$
43.	8" HDPE 90° Bend	2	EA	\$	\$
44.	6" HDPE 90° Bend	6	EA	\$	\$
45.	12" HDPE Turf Basin with ADA Grate Over Existing 10" PVC Storm Drainage Line	1	EA	\$	\$
46.	Tie-In Into Existing Storm Drainage Line	2	EA	\$	\$
47.	Remove Existing Fire Hydrant and Plug	1	EA	\$	\$
48.	Concrete Driveway Repair and Valley Gutter Repair (Oak Street)	1	LS	\$	\$
49.	Tapped 6" MJ Plug on the 6"x 6" MJ Tee	6	EA	\$	\$

TOTAL BID: _____

DOCUMENT 330561 – CONCRETE SEWER MANHOLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Contractor shall furnish and install round precast concrete sewer manhole base sections, adjusting rings, covers, pipe connectors, inverts and accessories complete.

1.3 RELATED SECTIONS

- A. Section 312000 - Earth Moving.
- B. Section 333010 - Sanitary Sewer Gravity.

1.4 UNIT PRICE - MEASUREMENT AND PAYMENT

- A. Basis of Measurement for Payment:

1. Standard Manhole: Measurement for payment will be made from actual field measurements to the nearest 0.1 foot from the lowest pipe invert to the top of the frame.
2. Transition Manhole: Measurement for payment of the larger diameter bottom portion will be made from actual field measurements to the nearest 0.1 foot from the lowest pipe invert to the top of the transition cone or top. Measurement for payment of the 4-foot diameter entranceway will be made from actual field measurements to the nearest 0.1 foot from the top of the transition cone or top to the top of the frame.

- B. Basis of Payment:

1. Payment for manholes will be made at the unit prices stated in the proposal and will include excavating and backfilling, and furnishing and installation of concrete manhole sections, cover and frame, pipe inlet and outlet connections, invert, and accessories. Additional payment for Drop Connections will be made at the unit prices stated in the proposal, and shall include all necessary pipe, pipe fittings, larger manhole sections and straps to secure drop pipe.

1.5 REFERENCES

- A. Prestressed Concrete Institute: Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products.
- B. National Precast Concrete Association: Quality Control Manual for Precast Concrete Plants.
- C. American Society for Testing and Materials:

1. ASTM C478 - Standard Specification for Precast Reinforced Concrete Manhole Sections.
 2. ASTM C890 - Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.
 3. ASTM C891 - Standard Practice for Installation of Underground Precast Concrete Utility Structures.
 4. ASTM C923 - Standard Specification for Resilient Connectors between Reinforced Concrete Manhole Structures, Pipes and Laterals.
 5. ASTM-C1244 – Standard Vacuum testing Precast Concrete Manholes.
- D. American Association of State Highway and Transportation Officials: Standard Specification for Joints for Circular Concrete Sewer and Culvert Pipe Using Flexible Watertight Gaskets (AASHTO M198).
- E. American Concrete Institute: Building Code Requirements for Reinforced Concrete (ACI 318).
- F. Occupational Safety and Health Administration: Standard 1926.704 - Requirements for Precast Concrete.

1.6 SUBMITTALS

- A. Completed Certificate from this Specification Section sealed by a Registered Professional Architect/Engineer on the staff of the Precast Concrete Manufacturer.
- B. Copy of Certificate or Report showing that the Precast Concrete Manufacturer conforms to form on Page 221315-10 of this Section.
- C. Schedule of Precast Components to be provided on the project, charting the following:
1. Sheet number where the manhole plan and profile is shown on the Plans.
 2. Line number (when there is more than one line on the project).
 3. Manhole number and station number.
 4. Invert Elevation of the effluent and influent pipes as shown on the Plans.
 5. Top Elevation of the manhole frame as Shown on the Plans.
 6. Top elevation of manhole base slab as calculated.
 7. Total height of manhole required from top of base slab to top of frame.
 8. Total height of assembled base, risers and cone or top to be provided from top of base to top of cone or top.
 9. Total height of grade rings required.
 10. Manufacturer's Part No. or Catalogue No. and number required of each base, riser, cone and grade ring to be provided for the manhole.

11. Each Pipe size and type and its Connector's part number, distance from top of base slab, and degrees clockwise from center line of steps.
- D. Detail of each Precast Concrete Manhole Section to be provided, sealed by the Registered Professional Architect/Engineer employed by the Manufacturer showing or charting the following:
1. Manufacturer's Part No. or Catalogue No.
 2. Inside diameter and lay length excluding base slab.
 3. Wall thickness and base or top thickness where applicable.
 4. Handling weight and lifting hole or loop description and locations.
 5. Wire size, spacing, location, and steel area provided per vertical foot.
 6. Reinforcing bar grade, size, spacing and location.
 7. Design load for Flat Slab or Transition Tops.
 8. Step locations.
 9. Concrete Mix No. and design strength.
 10. Height, width, slope and annular space of the tongue and groove.
- E. Contractor shall submit manufacturer's technical descriptions of manhole, rings, and covers.
- F. Pipe Connector Details, Material Specification and pipe installation procedure.
- G. Joint Material Details and Material Specifications. Calculations showing the Flexible Joint Sealant cross section is greater than the joint's annular space times its height shall be provided when butyl rope internal seals are proposed.
- H. Lifting Device and Hole Details that include design loads.
- I. At the request of the Architect/Engineer or Owner, submit the following:
1. Structural analysis and design calculations for Flat Slab Top and Transition Top Precast Components, performed in accordance with the References of this Specification, showing that allowable stresses will not be exceeded. All calculations must be sealed by a Registered Professional Architect/Engineer employed by the Precast Concrete Manufacturer.
 2. Calculations or test results verifying that the lifting device components and holes are designed in accordance with OSHA Standard 1926.704.
 3. Concrete 28-day compression strength results for every day production of Precast Components for the project was performed, showing the required strength according to the guidelines established in ACI 318.
 4. Reinforcing and Cement mill reports for materials used in the Manufacture of Precast Components for this project.
 5. The above test reports for similar Precast Components recently produced, submitted prior to production of Precast Components for this project.

1.7 QUALIFICATIONS

- A. The Precast Manufacturer shall comply with one of the following requirements:
1. Manufacture Precast Components for the project in a plant certified in the Prestressed Concrete Institute's (PCI) Plant Certification Program.
 2. Manufacture Precast Components for the project in a plant certified in the National Precast Concrete Association's (NPCA) Plant Certification Program.
 3. Retain an independent testing or consulting engineering firm approved by the Architect/Engineer for Precast Plant Inspection. The basis for Plant Inspection shall be the National Precast Concrete Association Quality Control Manual or the Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products. The above firm shall inspect the Precast Plant 2 weeks prior to and at 1 week intervals during production of materials for this project and issue a report, certified by a Registered Architect/Engineer that materials, methods, products, and quality control meet the requirements of the above quality control manuals.
- B. The Precast Manufacturer shall have a recognized Quality Improvement Process installed at the manufacturing facility.
- C. The Precast Manufacturer shall employ at least one Registered Professional Architect/Engineer at the manufacturing facility through the life of the project.
- D. Concrete compressive strength testing shall be performed in a laboratory inspected by the CCRL of the National Bureau of Standards. Testing shall be performed by Grade I ACI Certified Laboratory Technicians or by Level I PCI Certified Technicians.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Maintain materials and surrounding air temperature to minimum 50 degrees F prior to, during, and 48 hours after completion of masonry, grouting or concreting work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Concrete shall conform to ASTM C478 and as follows:
1. Compressive strength: 5000 psi minimum at 28 days.
 2. Air Content: 4 percent minimum.
 3. Alkalinity: Adequate to provide a Life Factor, $A_z = \text{Calcium Carbonate Equivalent times Cover over Reinforcement}$, no less than 0.35 for bases, risers and cones.
 4. Cementitious Materials: Minimum of 564 pounds per c.y.
 5. Coarse Aggregates: ASTM C33. Sound, Crushed, Angular Granitic Stone only. Smooth or rounded stone shall not be used.

6. Fine Aggregates: ASTM C33. Free from organic impurities.
 7. Chemical Admixtures: ASTM C494. Calcium Chloride or admixtures containing calcium chloride shall not be used.
 8. Air Entraining Admixtures: ASTM C260.
- B. Reinforcing steel shall be ASTM A615 grade 60 deformed bar, ASTM A82 wire or ASTM A185 welded wire fabric.
- C. Lift loops shall be ASTM A416 steel strand. Lifting loops made from deformed bars are not allowed.
- D. All manhole joints to be primed with a joint primer conSeal CS-50 or and approved equal prior to installation of butyl rubber.
- E. Flexible Joint Sealants shall be butyl rubber based conforming to Federal Specification SS-S-210A, AASHTO M-198, Type B - Butyl Rubber and as follows: maximum of 1% volatile matter and suitable for application temperatures between 10 and 100 degrees F.
- F. Epoxy Gels for interior patching of wall penetrations shall be a 2-component, solvent-free, moisture-insensitive, high modulus, high-strength, structural epoxy paste adhesive meeting ASTM C-881, Type I and II, Grade 3, Class B and C, Epoxy Resin Adhesive.
- G. Manhole Frames and Covers:
1. Manhole frames and covers shall be iron casting conforming to ANSI/ASTMA 48, Class 30C Iron. Minimum manhole cover diameter shall be 30 inches and the manhole ring and cover assembly shall not weight less than 300 pounds. Standard frames and covers shall be EJIW 30 ¼" diameter model number 14802 frame and 1322A cover or equivalent.
 2. Watertight frames and covers if required shall be 32 ½" watertight EJIW 14802 frame with 1480 AL CLGS cover or approved equal.
 3. All frames and covers to be AASHTO M306-10 complaint.
- H. All exterior manhole joints to have any exterior joint wrap ConWrap CS-212 or approved equal in conjunction with a concrete primer.
- I. All manholes to have the interior of the manhole lined with a Three Layer Modified Polymer Stress Skin Panel Liner with a minimum off 500 mils thickness from bench to rim, the Invert/Channel shall be a 100 mils single layer after the manhole has been vacuum tested. See Attachment (A) Manhole Specification

2.2 COMPONENTS

- A. Precast Component Fabrication and Manufacture shall be as described in this paragraph and as described in the paragraphs for the specific components.
1. Precast Manufacturing shall be in conformance with ASTM C478. Wall and inside slab finishes resulting from casting against forms standard for the industry shall be acceptable. Exterior slab surfaces shall have a float finish. Small surface holes, normal color variations, normal form joint marks, and minor depressions, chips and spalls will be

tolerated. Dimensional tolerances shall be those set forth in the appropriate References and specified below.

2. Joint Surfaces between Bases, risers and Cones shall be manufactured to the joint surface design and tolerance requirements of ASTM C361. The maximum slope of the vertical surface shall be 2 degrees. The maximum annular space at the base of the joint shall be 0.10". The minimum height of the joint shall be 4".
 3. Lift Inserts and Holes shall be sized for a precision fit with the lift devices, shall comply with OSHA 1926.704, and shall not penetrate through the manhole wall.
- B. Precast Base Sections shall be cast monolithically without construction joints or with an approved galvanized or PVC waterstop in the cold joint between the base slab and the walls. The bottom step in base sections shall be a maximum of 26" from the top of the base slab. The width of the base extensions on Extended Base Manholes shall be no less than the base slab thickness.
- C. Precast Riser Sections shall have a minimum lay length of 16 inches.
- D. Precast Concentric And Eccentric Cone Sections shall have an inside diameter at the top of 30". The width of the top ledge shall be no less than the wall thickness required for the cone section. Concentric cones shall be used only for Shallow Manholes.
- E. Precast Transition Cone Sections shall provide an eccentric transition from 60 inch and larger manholes to 48-inch diameter risers, cones, and flat slab top sections. The minimum slope angle for the cone wall shall be 45 degrees.
- F. Precast Transition Top Sections shall provide an eccentric transition from 60 inch and larger manholes to 48-inch diameter risers, cones, and flat slab top sections. Transition Top sections shall be furnished with vents as shown on the manhole details. The maximum amount of fill over the transition top section shall be 20 feet. Transition Tops shall not be used in areas subject to vehicle traffic.
- G. Precast Flat Slab Top Sections shall have an inside diameter at the top of 30" and shall be designed for HS-20 traffic loadings as defined in ASTM C890. Items to be cast into Special Flat Slab Tops shall be sized to fit within the manhole ID and the top and bottom surfaces.
- H. Precast Grade Rings shall be used to adjust ring and covers to finished grade. No more than 10 vertical inches of grade rings will be allowed per manhole. Grade Rings shall conform to ASTM C478 and shall be no less than 4" in height.
- I. Precast Inverts shall meet the following requirements:
1. Pipe openings shall provide clearance for pipe projecting a minimum of 2" inside the manhole. The height of the transition from the pipe opening to the invert trough shall be equal to $\frac{1}{2}$ of the Opening ID minus Pipe ID, plus or minus $\frac{1}{4}$ ". The crown of small I.D. pipe shall be no lower than the crown of the outlet pipe. When the fall between the inlet and the outlet holes is greater than 4", the inlet end of the trough shall be below the inlet pipe invert and aligned horizontally within 1".
 2. Invert Troughs shall be formed and finished to provide a consistent slope from the pipe outlet to the inlets up to 4" fall. The minimum fall shall be 1". The minimum outside bending radius from influent to effluent shall be 1.5 times the pipe I.D. A $\frac{1}{2}$ " radius shall be provided at the intersection of 2 or more channels. The minimum concrete thickness from the bottom of the trough to the bottom of the base shall be 7".

3. Invert Benches shall have a float finish with a uniform 2-1/2" slope, plus or minus 1", from the high point at the manhole wall to the low point at invert trough. A 1/4" radius shall be provided at the edge of the bench and trough.
 4. Depressions, high spots, voids, chips, or fractures over 1/4 inch in diameter or depth shall be filled with a sand cement paste and finished to a texture reasonably consistent with that of the formed surface.
- J. Pipe To Manhole Connectors shall conform to ASTM C923. The location of the pipe connectors shall vary from the location shown on the Project Plans no more than 1/2 inch vertically and 5 degrees horizontally. Provide for control of the pipe OD to within the tolerances of the connector on flexible pipes larger than 12 inches.
- K. Joints between Precast Components shall be sealed internally between the tongue and the groove and additionally around the external perimeter as follows:
1. External Seals shall consist of a polyethylene backed flat butyl rubber sheet no less than 1/16" thick and 6" wide applied to the outside perimeter of the joint.
 2. Internal Seals shall consist of a plastic or paper-backed butyl rubber rope no less than 14 feet long and having a cross-sectional area no less than the annular space times the height of the joint.
 3. At the option of the Contractor, Internal Seals may consist of an O-Ring Gasket conforming to ASTM C443, installed according to the Precast Manufacturer's recommendation.
- L. Rings and Covers shall be equal to those shown on the manhole details. Materials shall be gray cast iron Class 30, suitable for Highway Traffic Loads or 16,000-pound wheel loads.
- M. Lifting devices for handling Precast Components shall be provided by the Precast Manufacturer and shall comply with OSHA Standard 1926.704.
- N. Coatings: Where shown on the plans, the interior of the manhole walls shall be coated with a Three Layer Modified Polymer Stress Skin Panel Liner with a minimum of 500 mils thickness from bench to rim. The channel/Invert should be sprayed with a single 100 mils layer.

2.3 CONFIGURATION

- A. Manholes are to be constructed as specified and as shown on the detail sheets.
- B. The number of joints shall be minimized. Do not use riser sections for manholes up to twelve feet tall and no more than 1 riser for each additional 5 feet in height. One additional section will be allowed for transition manholes.
- C. Where service lines enter manholes, locate them above the bench of the invert.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Inspect Manhole Components prior to unloading from the delivery truck.

3.2 PREPARATION

- A. **PRODUCT DELIVERY, STORAGE, AND HANDLING:** Coordinate delivery with the manufacturer, handle and store the Manhole Components in accordance with ASTM C891 and the manufacturer's recommendations using methods that will prevent damage to the components and their joint surfaces.

3.3 PLACING MANHOLE SECTIONS

- A. Excavate to the required depth and remove materials that are unstable or unsuitable for a good foundation. Prepare a level, compacted foundation extending 6" beyond the manhole base.
- B. Set base plumb and level, aligning manhole invert with pipe invert.
- C. Secure Pipe Connectors to Pipe according to the Connector Manufacturer instructions. When pipe stub outs are installed, provide restraint from longitudinal movement before backfill.
- D. Thoroughly clean bells and spigots to remove dirt and other foreign materials that may prevent sealing. Unroll the Butyl Sealant rope directly against base of spigot. Leave prospective wrapper attached until sealant is entirely unrolled against spigot. Do not stretch. Overlap from side to side - not top to bottom. Follow Precast Manufacturer instructions when installing O-rings.
- E. Set risers and cones so that steps align, taking particular care to clean, prepare and seal joints.
- F. After joining manhole sections, apply the butyl sealant sheet around the outside perimeter of the joint.
- G. Lift Holes leaving less than 2" of wall thickness shall be plugged from the outside using a sand cement mortar, then covered with butyl sealant sheet. Lift Holes penetrating the wall shall be additionally sealed with an interior application of an epoxy gel 1/8" thick extending 2" beyond the penetration.
- H. Set the manhole frames to the required elevation using no more than 10" of precast concrete grade rings, sealing all joints between cone, adjusting rings, and manhole frame with the butyl sealant rope and sheet.
- I. Perform the final finishing to the manhole interior by filling all chips or fractures greater than 1/2" in length, width or depth and depressions more than 1/2" deep in inverts with a sand cement mortar. Do not fill the joints between the precast concrete sections. Clean the interior of the manhole, removing all dirt, spills or other foreign matter.

3.4 SCHEDULES

- A. **Typical Manhole:** Construct Typical Manholes as shown on the detail sheet for all manholes taller than 5 feet measured from the invert to the top of ring.
- B. **Shallow Manhole:** Construct Shallow Manholes as shown on the detail sheet for all manholes up to 5 feet measured from the invert to the top of ring.
- C. **Extended Base Manhole:** Construct Extended Base Manholes where shown on the plans.
- D. **Transition Manhole:** Construct Transition Manholes where manholes greater than 4 feet in diameter are shown on the plans.

- E. Drop Manhole Connections: Construct Drop Manhole Connections where the difference in invert elevations between the influent and effluent pipes is greater than 24 inches above the influent pipe diameter. Provide Inside Drop Manholes inside diameters increased over Typical Manhole inside diameters by at least the inside diameter of the drop connection pipe.

3.5 MANHOLE TESTING

- A. Testing: all manholes installed as part of the contract shall be tested for leakage after assembly and prior to backfilling. The test method shall be the vacuum test.
- B. The Contractor shall provide all materials, labor, and equipment necessary to perform the manhole testing. Testing equipment shall be subject to approval by the Architect/Engineer.
- C. The Architect/Engineer and Owner shall be contacted prior to testing to schedule the test time such that the Owner's Representative may be present. The Owner's Representative shall be present during all testing unless otherwise approved by the Owner.
- D. All lift holes shall be plugged from the outside with an approved non-shrink grout.
- E. All pipes entering the manhole shall be plugged, taking care to securely brace the plug from being drawn into the manhole.
- F. A vacuum of ten inches (10") (5 psig) of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to nine inches (9") (4.5 psig). The manhole shall pass if the time is greater than sixty (60) seconds for 48" diameter, 75 seconds for 60" diameter, 90 seconds for 72" diameter manholes.
- G. If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout while the vacuum is still being drawn. Retesting shall proceed until a satisfactory test is obtained.
- H. All visible leaks shall be corrected regardless of the results of the testing.
- I. All leaks shall be repaired in a manner approved by the Architect/Engineer.

END OF DOCUMENT 330561

SEWER MANHOLES AND COVERS
CERTIFICATION

Project: _____ Structures Included: _____

Location: _____ Precast Manufacturer: _____
Owner: _____ Plant Location: _____

This is to certify the materials and manufacture of the Precast Components to be supplied for the Project described above will conform to the Project Specifications, specifically:

1. The Manufacturing Plant described above will maintain Certification through the Project construction life under the National Precast Concrete Association Plant Certification Program, Prestressed Concrete Institute Plant Certification Program, or through testing to be performed by _____ in accordance with Section 221315, Paragraph 1.5A of the Specifications.
2. A recognized Quality Improvement Process has been developed and is in place at the manufacturing facility described above. The Precast Manufacturer's Quality Policy is attached to this Certification.
3. _____ is a Registered Professional Architect/Engineer and will be employed by the Precast Manufacturer at the facility described above during the life of the construction of the Project.
4. All concrete compression strength testing for Precast Components will be performed in a laboratory inspected by the CCRL of the National Bureau of Standards. Testing will be performed by Technicians certified under ACI or PCI Certification Programs.
5. All components to be supplied will conform to Section 330561 Paragraph 2.2 of the Project Specifications, including the Precast Components structural design requirements as established by reference in Section 330561, Paragraph 1.5 of the Specifications.
6. Materials used in the manufacture of Components for the Project will conform to Section 330561, Paragraph 2.1 of the Specifications. Raw Material Certificates of Compliance are attached to this Certification.

Respectfully Submitted by: _____ Date: _____
(Architect/Engineer described in Item 3 above, Seal, Signature, and Date below)

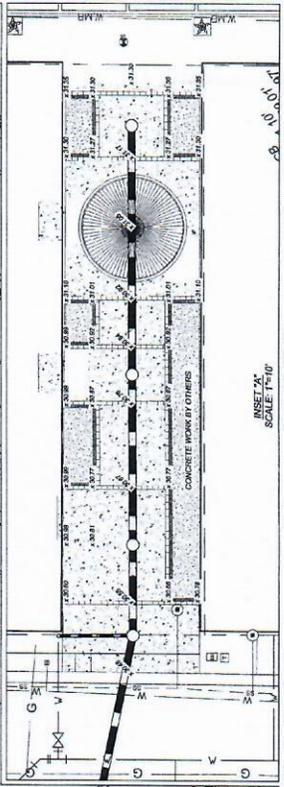
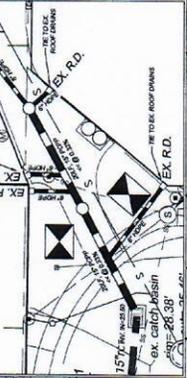
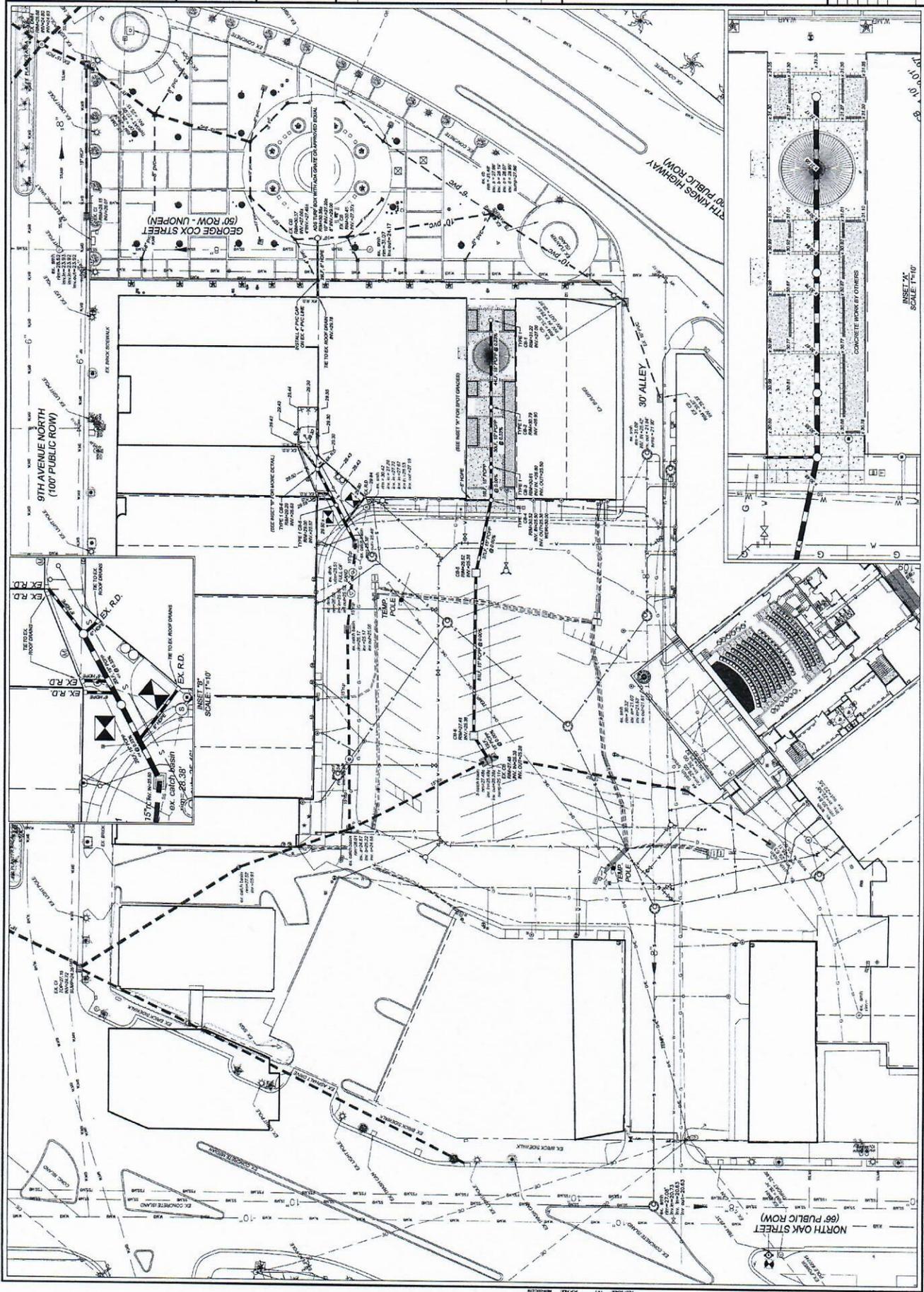
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NO.	DATE	REVISION DESCRIPTION
1	07/20/20	REVISION PER CITY OF WYTHE BEACH COMMENTS
2	07/20/20	ADD TYPE FOR THE QUALITY CONTROL DETAIL

GRADING AND DRAINAGE PLAN
 ARTS & INNOVATION DISTRICT - PHASE 1A
 Horry County, South Carolina
 PREPARED FOR: THE CITY OF WYTHE BEACH

SCALE: 1" = 20'
 DATE: 07/20/20
 DESIGNED BY: EDS
 DRAWN BY: EDS
 PROJECT NO.: 20006
 C-301



PREPARED BY: EDS
 CHECKED BY: EDS
 DATE: 07/20/20
 PROJECT NO.: 20006
 SHEET NO.: C-301
 TOTAL SHEETS: 301

**WATER DISTRIBUTION AND
SANITARY SEWER PLAN**

ARTS & INNOVATION DISTRICT - PHASE 1A

HORRY COUNTY, SOUTH CAROLINA

PREPARED FOR: THE CITY OF MYRTLE BEACH

NO.	DATE	REVISION DESCRIPTION
1	7/1/07	ISSUED WITH CITY OF MYRTLE BEACH REVIEW
2	7/1/07	REVISED PER CITY OF MYRTLE BEACH REVIEW
3	7/1/07	REVISED PER CITY OF MYRTLE BEACH REVIEW
4	7/1/07	REVISED PER CITY OF MYRTLE BEACH REVIEW
5	7/1/07	REVISED PER CITY OF MYRTLE BEACH REVIEW
6	7/1/07	REVISED PER CITY OF MYRTLE BEACH REVIEW
7	7/1/07	REVISED PER CITY OF MYRTLE BEACH REVIEW
8	7/1/07	REVISED PER CITY OF MYRTLE BEACH REVIEW
9	7/1/07	REVISED PER CITY OF MYRTLE BEACH REVIEW
10	7/1/07	REVISED PER CITY OF MYRTLE BEACH REVIEW

Professional Engineer Seal: State of South Carolina, License No. 29814, Date of Issue 7/1/07, Name: J. K. Simpson.

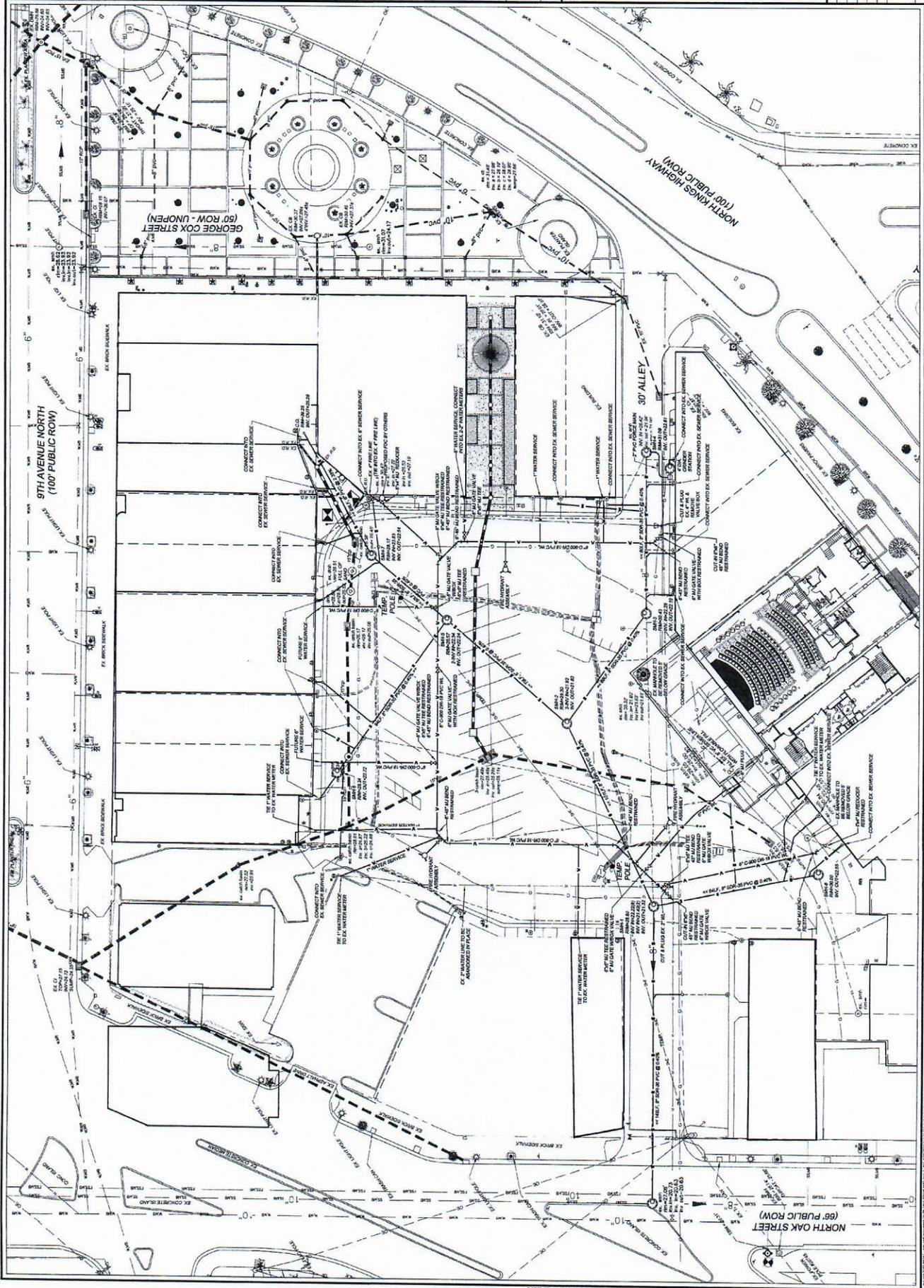
Professional Engineer Seal: State of South Carolina, License No. 20080, Date of Issue 7/1/07, Name: D. C. Simpson.

DDC ENGINEERS

1000 W. 10th Street, Myrtle Beach, SC 29577

Phone: 843.661.1111

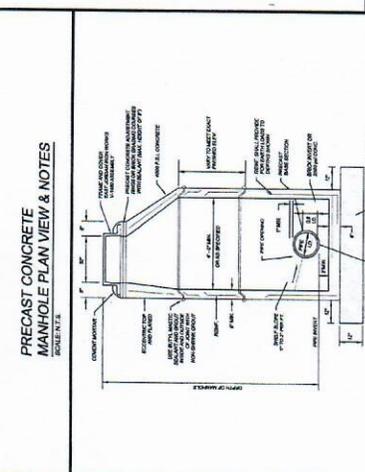
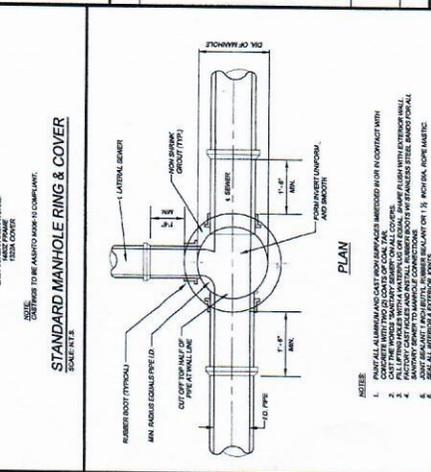
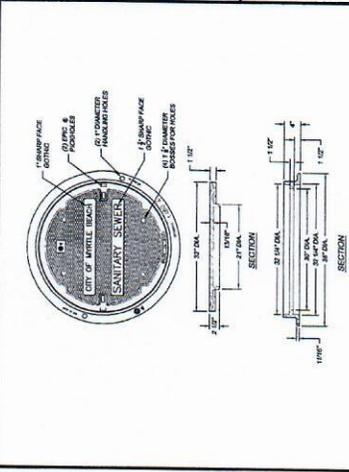
Website: www.ddcengineers.com



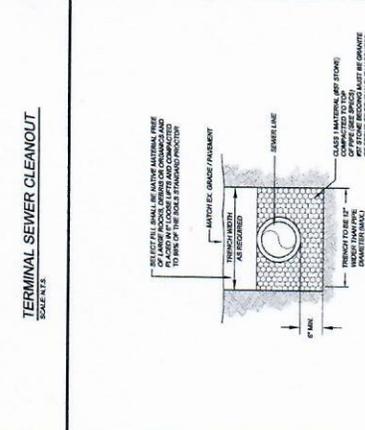
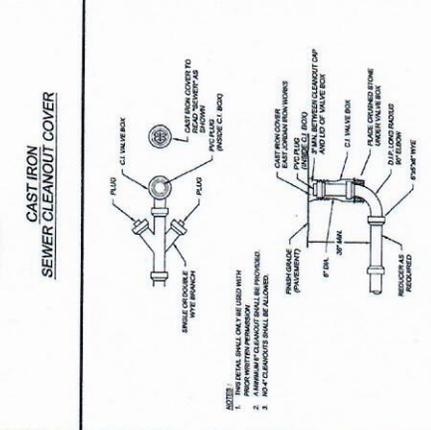
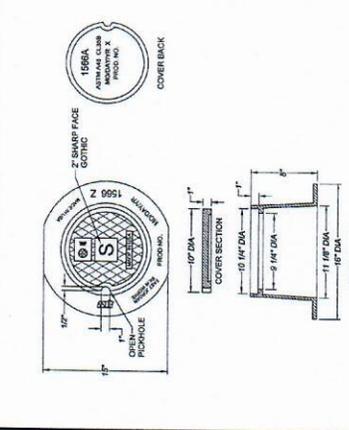
NO.	DATE	REVISION DESCRIPTION
1	1/18/18	ISSUED FOR CITY OF WYTHE BEACH COMMENTS
2	2/1/18	ISSUED FOR CITY OF WYTHE BEACH COMMENTS
3	2/1/18	ISSUED FOR CITY OF WYTHE BEACH COMMENTS
4	2/1/18	ISSUED FOR CITY OF WYTHE BEACH COMMENTS
5	2/1/18	ISSUED FOR CITY OF WYTHE BEACH COMMENTS
6	2/1/18	ISSUED FOR CITY OF WYTHE BEACH COMMENTS
7	2/1/18	ISSUED FOR CITY OF WYTHE BEACH COMMENTS
8	2/1/18	ISSUED FOR CITY OF WYTHE BEACH COMMENTS
9	2/1/18	ISSUED FOR CITY OF WYTHE BEACH COMMENTS
10	2/1/18	ISSUED FOR CITY OF WYTHE BEACH COMMENTS

PREPARED FOR: THE CITY OF WYTHE BEACH
 ARTS & INNOVATION DISTRICT - PHASE 1A
 SCALE: AS SHOWN
 DATE: 7/3/2018
 DESIGNED BY: BGS
 DRAWN BY: BGS
 PROJECT NO.: 201806
 JANUARY 2018

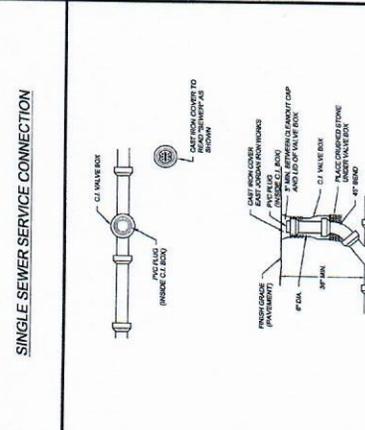
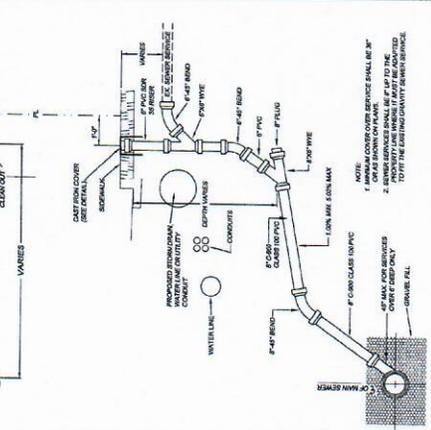
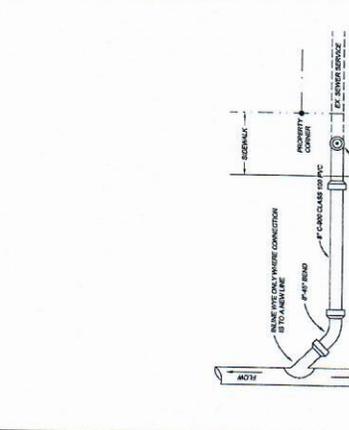
C-404
 PRECAST CONCRETE MANHOLE
 SCALE: 1/8" = 1'-0"



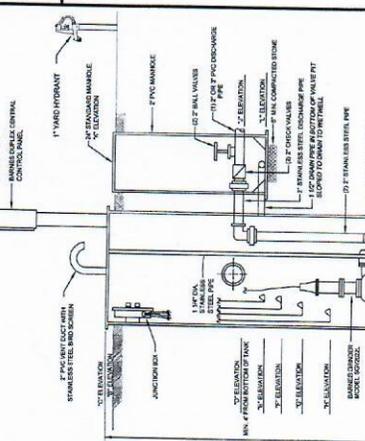
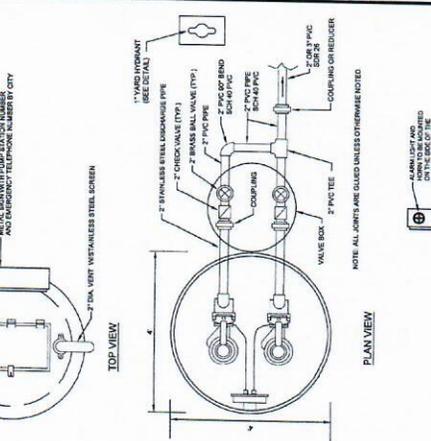
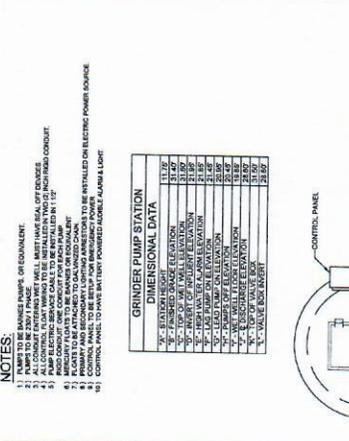
STANDARD PRECAST CONCRETE MANHOLE
 SCALE: 1/8" = 1'-0"



GRAVITY SEWER PIPE BEDDING PAVEMENT AREAS
 SCALE: 1/8" = 1'-0"



GRINDER PUMP STATION
 SCALE: 1/8" = 1'-0"



GRINDER PUMP STATION
 SCALE: 1/8" = 1'-0"

NOTES:
 1. PUMPS TO BE SERVICE PUMPS, OR EQUIVALENT.
 2. ALL CONCRETE EXTERIOR SURFACES SHALL BE FINISHED WITH A SMOOTH FINISH.
 3. PUMP ELECTRICAL SERVICE SHALL BE INSTALLED IN 1/2\"/>