SECTION 02720

STORM DRAINAGE

PART 1—GENERAL

1.1 SUMMARY

A. Section Includes: Storm sewerage system piping and appurtenances as indicated on the Drawings.

B. Related Sections:

1. Section 02200 - Earthwork: Excavation and backfill for storm sewerage system piping and structures.
2. Section 03300 - Cast-In-Place Concrete: Concrete work for storm sewerage structures.

1.2 SUBMITTALS

A. Product Data: Manufacturer's product data and installation instructions for storm sewerage materials and products.

B. Record Drawings: Installed storm sewer piping and structures, in accordance with "Section 01770 - Closeout Procedures".

1.3 QUALITY ASSURANCE

A. Sewerage and Water Board of New Orleans Standards: Comply with applicable standards of the City of New Orleans Department of Public Works and the Sewerage and Water Board of New Orleans Network Engineering Dept., unless requirements specified in this Section are more restrictive.

B. Environmental Compliance: Comply with applicable portions of local environmental agency regulations pertaining to storm sewerage systems.

C. Louisiana D.O.T.D. Standards: Comply with applicable standards of the Louisiana Department of Transportation and Development, unless requirements specified in this section are more restrictive.

1.4 PROJECT CONDITIONS

A. Site Information: Perform site survey, research public utility records, and verify existing utility locations. Verify that storm sewerage system can be installed in compliance with Contract Documents and referenced standards. Locate existing storm sewerage system piping and structures that are to be extended or adjusted.

B. Sequencing and Scheduling: Coordinate connection to public sewer with utility company. Coordinate connection to building storm drain system with Division 15 installer. Coordinate with other site utility work.

C. Protection: Protect storm sewerage during and after installation from other construction activities and from entry of soil, construction materials, waterborne trash and debris, liquid pollutants, and other foreign materials.

PART 2—PRODUCTS

2.1 PIPE AND FITTINGS

A. General: Provide pipe and pipe fitting materials compatible with each other. Where more than one type of materials or products is indicated, selection is Installer's option.

B. Polyvinyl Chloride Pipe (PVC): Bell and spigot ribbed polyvinyl culvert pipe (RPVCCP), minimum pipe stiffness of 46; ASTM F949-96 (Contech: A-2000 for gravity service).

C. Reinforced Concrete Sewer Pipe and Fittings: ASTM C 76, Class III, Wall B, for rubber gasket joints.

2.2 STRUCTURES

A. General: Comply with applicable "Quality Assurance" standards.

B. Construction: Construct catch basins as indicated. Provide steps at structures deeper than 36 inches.

C. Brick: Brick and mortar, of minimum depth indicated.
1. Base, Channel, and Bench: Concrete.
2. Wall: ASTM C 62, Grade SW, manhole brick; 8-inch minimum thickness, with top to match frame and cover.
3. Steps: Built into sidewall at 12-inch intervals.
4. Mortar and Parging: ASTM C 270, Type S, using ASTM C 150, Type II Portland cement.

D. Concrete: Cast-in-place concrete with a 28-day compressive strength of not less than 4000 psi.

2.3 RELATED MATERIALS

A. Steps: Wide enough for an adult to place both feet on one step and designed to prevent lateral slippage off the step.
1. Material: 3/4" wrought iron.

B. Gratings, Frames and Covers: ASTM A 48-83, Class 30, cast iron.

C. Gravel Bedding: #610 Crushed Limestone, washed or unwashed, reasonably free from sticks, mud, clay, organic matter, and other detrimental materials, compacted to 95% dry density per ASTM D-1557.

PART 3—EXECUTION

3.1 INSTALLATION, GENERAL

A. General Locations and Arrangements: Drawings indicate the general location and arrangement of the storm sewerage system. Install the system as indicated, to the extent practical.

B. Install piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings in accordance with manufacturer's recommendations for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line and pull past each joint as it is completed.

C. Install piping pitched down in direction of flow, at indicated slope.

D. Extend storm sewerage system piping and connect to existing storm drains, of sizes and in locations indicated.

3.2 EXCAVATION AND BACKFILL

A. General: Comply with applicable requirements of "Section 02200 - Earthwork", as supplemented herein.

B. Excavating: All excavations shall be open cuts with vertical sides, unless otherwise approved. Excavate for laying pipe and for storm sewer structures to lines and grades indicated, with width ample for laying and joining pipe, formwork construction and removal, and other necessary construction operations.

C. Pipe Trenches: Maximum trench width at a point 2 feet above the top of the pipe shall be the external diameter of the pipe plus 12 inches on each side of the pipe.

D. Pipe Bedding and Foundation: All storm sewers shall be constructed on limestone bedding as indicated and required by the regulatory agency having jurisdiction.

E. Trench Bottom: Accurately construct pipe beds to indicated slopes. Form bell holes at each joint so the pipe is fully and continuously supported on the pipe barrel.

F. Water Control: Provide means for the exclusion and removal of water in excavations. Remove water promptly to avoid construction delays and damage to trench bottom. Excavations shall be dry when pipe is laid and other construction is performed.

G. Sheeting and Bracing: Provide sheeting and bracing necessary to support excavation sides. Comply with requirements of the regulatory agency having jurisdiction. Unless otherwise approved or required, sheeting and bracing shall be removed and resulting voids filled as backfilling progresses.

H. Backfilling: After construction in trench is complete and approved and all formwork and other construction means are removed, backfill excavations in completed layers as indicated.

3.3 INSTALLATION OF PIPE AND PIPE FITTINGS

A. General: Install piping in accordance with governing authorities having jurisdiction, except where more stringent requirements are indicated. Protect pipe and joint materials from damage, dirt and foreign materials during storage, handling and installation.

B. Grade and Alignment Control: Provide adequate means for control of storm sewer system alignment and grades by means of batter boards, grade stakes, string lines and other aids, or use laser control methods. Check system line and grade continuously during construction.

C. Inspect piping before installation to detect apparent defects. Mark defective materials with white paint and promptly remove from site.

D. Joint Construction and Installation: Join and install pipe and fittings in accordance with manufacturer's recommendations for use of lubricants, cements, and other special installation requirements.

3.4 STRUCTURES

A. General: Install structures complete with accessories as indicated. Form continuous concrete channel and benches between inlets and outlet.

B. Concrete and Masonry Construction: Comply with applicable requirements of Divisions 3 and 4. Provide hot and cold weather protection as necessary. Do not perform subsequent construction or backfill structures when masonry and concrete is less than 24 hours old.

C. Set frames and grates or covers to elevations indicated, fully embedded in mortar or concrete.

D. Plaster masonry structures inside and outside with cement mortar.

3.5 TAP CONNECTIONS

A. Make connections to existing piping and underground structures so that finished work will conform as nearly as practicable to the requirements specified for new work.

B. Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris, concrete, or other extraneous material that may accumulate.

3.6 FIELD QUALITY CONTROL

A. **Testing:** Perform testing of completed piping in accordance with local authorities having jurisdiction.

B. **Cleaning:** Clear interior of piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed.

1. In large, accessible piping, brushes and brooms may be used for cleaning.
2. Place plugs in ends of uncompleted pipe at end of day or whenever work stops.
3. Flush piping between manholes, if required by local authority, to remove collected debris.

C. **Interior Inspection:** Inspect piping to determine whether line displacement or other damage has occurred.

1. Make inspections after pipe between manholes and manhole locations has been installed and approximately 2 feet of backfill is in place, and again at completion of project.
2. If inspection indicates poor alignment, debris, displaced pipe, infiltration, or other defects, correct such defects and re-inspect.

D. **Final inspection of the work** shall be made by the Architect prior to Substantial Completion. In order to be acceptable, the work must, at a minimum, comply with the following:

1. The pipe work shall be true to line and grade.
2. There shall be no cracked or broken pipe or fittings.
3. There shall be no defective joints.
4. The structures and lines shall be free from mud, trash, debris, and other foreign materials.
5. All trenches shall have been refilled after settlement and all excess materials and surplus soil have been removed, unless otherwise instructed by the Architect.
6. All sewer lines shall be subject to inspection by "Lamping" and/or any other test procedure specified. All materials, equipment and labor necessary for making the tests shall be provided by the Contractor at no extra cost to the Owner. All tests shall be performed in the presence of the Architect or his authorized representative.

END OF SECTION