

SECTION 33 44 13

DRAINAGE STRUCTURES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Scope:

1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install all precast and masonry drainage structures, including drain inlets, catch basins, headwalls and similar structures.

B. General:

1. Structures shall conform in shape, size, dimensions, materials, and other respects to the details shown or as directed by the ENGINEER.
2. Cast iron frames, grates and covers shall be the standard frame and grate or cover, unless otherwise shown.
3. All concrete shall be Class "A" and shall conform to the requirements specified under Section 03 30 00, Cast-In-Place Concrete.
4. Inverts shall be as shown and shall conform accurately to the size and elevation of the adjoining pipes.

C. Related Sections:

1. Division 31, Applicable Sections on Earthwork.
2. Section 03 30 00, Cast-In-Place Concrete.
3. Section 05 50 13, Miscellaneous Metal Fabrications.
4. Section 05 56 00, Castings.

1.2 QUALITY ASSURANCE

A. Standards referenced in this Section are listed below:

1. American Society for Testing and Materials, (ASTM).
 - a. ASTM C 32, Specification for Sewer and Manhole Brick (Made from Clay or Shale).
 - b. ASTM C 139, Specification for Concrete Masonry Units for Construction of Catch Basins and Manholes.
 - c. ASTM C 140, Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
 - d. ASTM C 207, Specification for Hydrated Lime For Masonry Purposes.
 - e. ASTM C 478, Specification for Precast Reinforced Concrete Manhole Sections.

1.3 SUBMITTALS

- A. Action Submittals: Submit the following:
 - 1. Shop Drawings:
 - a. Submit drawings showing design and construction of all precast concrete.
 - 2. Samples:
 - a. Submit for approval samples of brick, block, gaskets and accessories, if any, for the structures.

PART 2 - PRODUCTS

2.1 PRECAST PRODUCTS

- A. Where shown or otherwise approved by ENGINEER, precast concrete shall be used for items such as area drains, catch basins, splash pads, etc. Layout and details shall be as shown and specified. Design shall be adequate to withstand all loads imposed, including earth pressure, vehicle loads and construction loading.
- B. Precast concrete sections shall conform to ASTM C 478, where applicable.
- C. Where precast structures are made up of various precast components such as base sections, riser sections and top sections, the joint between sections shall be the tongue and groove type.

2.3 MISCELLANEOUS METALS

- A. Metal frames, covers, grates, troughs and similar required items shall be provided as shown and in accordance with Division 05, Metals, and applicable Sections on Metal Fabrications.

PART 3 - EXECUTION

3.1 LAYING MASONRY

- A. Brick shall be satisfactorily wet when being laid and each brick shall be laid in mortar so as to form full bed, end and side joints in one operation. The joints shall not be wider than 3/8-inch, except when the bricks are laid radially, in which case the narrowest part of the joint shall not exceed 1/4-inch.
- B. For concrete block, the vertical keyways shall be completely filled with mortar.
- C. Each layer of brick for the grading ring shall be laid in a full bed of mortar and shall be thoroughly bonded.

3.2 GRADING RINGS

- A. Grading rings or brick stacks shall be used for all precast and masonry structures, where required. They shall be constructed on the top slab on which the frame will be placed. The height of the stack shall be such as is necessary to bring the frame to the proper grade, but in no case greater than 12-inches.

3.3 PRECAST ITEMS

- A. Precast products shall be placed on a concrete or crushed stone bed, set at the proper grade and carefully leveled and aligned.
- B. Backfill shall be carried up evenly on all sides of the structures to prevent overturning forces.

3.4 PIPE JOINT IN STRUCTURE BASE

- A. An approved joint shall be provided between each pipe entering and exiting the structure. Joint may be accomplished by the installation in the structure base of the bell end of a short pipe or by other means subject to approval of ENGINEER.
- B. Pipes shall not protrude inside the structure, but shall be cut in an approved manner to be flush with the inside wall of the structure.

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