SECTION 604

MISCELLANEOUS DRAINAGE

SECTION 604.10 CONCRETE HEADWALLS, DROP INLETS AND MANHOLES

604.10.1 Description. This work shall consist of constructing concrete headwalls, drop inlets and manholes in accordance with these specifications, as shown on the plans or as directed by the engineer.

604.10.2 Material. All material shall be in accordance with Division 1000, Material Details, and specifically as follows:

Item	Section
Precast Drainage Units	1033
Reinforcing Steel for Concrete	1036

604.10.2.1 All concrete, except that portion placed monolithic with paved surfaces, shall be Class B. Concrete for inverts shall be either Class B or concrete of a commercial mixture in accordance with Sec 501. Material, proportioning, mixing, slump and transporting shall be in accordance with Sec 501. Concrete shall be placed, finished and cured in accordance with Sec 703.

604.10.2.2 Steps for concrete manholes and drop inlets may be cast iron, aluminum alloy or polypropylene plastic coated reinforcing steel. The portion of the step to be embedded in the concrete shall have a configuration that will prevent any pullout. These steps shall withstand a single concentrated load of 300 pounds (135 kg) without distortion on that portion protruding from the wall. The minimum width of rungs or cleats shall be 10 inches (250 mm) and shall be shaped to prevent the foot from slipping off the side. The step shall project a minimum distance of 4 inches (100 mm) from the wall of the riser or cone section measured from the point of embedment. The steps shall be embedded a minimum distance of 3 inches (75 mm) and shall be spaced vertically at a maximum distance of 16 inches (400 mm).

604.10.2.3 Steps for drop inlets may be steel step bars as shown on the plans or steps meeting the above requirements.

604.10.3 Construction Requirements.

604.10.3.1 All pipe built into the walls of the structure shall fit flush with the inside face of the wall. A joint, consisting of one layer of commercially available 55 pound (2666 g/m^2) smooth roll roofing, a heavy coat of bituminous material or other appropriate bond breaker, shall be placed around that portion of the pipe extending into the walls of the structure. Steps shall clear all pipes and shall be built in the wall as designated by the engineer. Reinforcement of these structures shall be in accordance with Sec 706, and the excavation shall be in accordance with Sec 206.

604.10.3.2 Steps for concrete manholes and drop inlets shall be embedded by casting in place, mortaring or by friction fit. Steps cast in place shall be set through the forms and secured against displacement before concrete is placed. The cavity receptacle for steps placed by

friction fit shall be formed by casting in place a removable mold recommended for use by the manufacturer of the step.

604.10.3.3 New manholes for existing sewers shall be constructed as shown on the plans. Cutting the existing sewer will be required to provide inlet and outlet connections to the new structure, and a bypass line shall be provided around construction at all locations where continuous sewer service will be required. Any portion of an existing sewer that is damaged in constructing the new manhole shall be repaired or replaced at the contractor's expense with new material of a type matching the old.

604.10.4 Basis of Payment.

604.10.4.1 The accepted quantity of concrete headwalls, drop inlets and manholes will be paid for in the following manner:

(a) Class B concrete will be measured and paid for in accordance with Sec 703 for miscellaneous concrete.

(b) Reinforcing steel will be measured and paid for in accordance with Sec 706.

(c) Excavation will be measured and paid for in accordance with Sec 206.

604.10.4.2 No direct payment will be made for:

(a) Maintaining service or for cutting the existing sewer.

(b) Weep holes, including excavation, permeable granular backfill, 4-inch (100 mm) drain tile, screen for inlet or any other work incidental thereto.

(c) Manhole steps.

SECTION 604.20 ADJUSTING DRAINAGE FACILITIES

604.20.1 Description. This work shall consist of adjusting manholes, catch basins, inlets and similar items as shown on the plans. Existing frames and covers shall be salvaged and reused if specified in the contract. New manhole steps shall be provided as necessary. New manhole adjusting rings (adapters) shall be provided if specified in the contract.

604.20.2 Basis of Payment. The accepted adjustments of manholes, catch basins and inlets will be paid for at the contract unit price for each of the pay items included in the contract. No direct payment will be made for steps or adjusting rings.

SECTION 604.30 ADJUSTING HOUSE SEWER CONNECTIONS

604.30.1 Description. This work shall consist of laying or relaying sanitary sewer house connections that are to be relocated or that are to be reconnected to new sewers or temporarily removed to permit the installation of other items in the contract.

604.30.2 Material. The size and class of pipe to be used shall be in accordance with the local authority having jurisdiction over the installation of sewer connections. All material shall be in accordance with Division 1000, Material Details, and specifically as follows:

Item	Section
Vitrified Clay Sewer and Culvert Pipe	1030
Plastic Joint Compound for Pipe	1057.8
Mortar for Pipe Joints	1066

604.30.3 Construction Requirements. Excavation for the laying of pipe and for backfilling the trench shall be in accordance with Sec 726. The adjustment shall be made to the line and grade shown on the plans or as directed by the engineer. Where a house sewer connection is relocated or relaid above a water main, Class B concrete or concrete of a commercial mixture in accordance with Sec 501 shall be used to encase the sewer line a minimum thickness of 6 inches (150 mm). The encasement shall extend to a point where the normal distance from the sewer to the water main is a minimum of 10 feet (3 m).

604.30.4 Method of Measurement. Measurement of adjusting house sewer connections will be made to the nearest linear foot (0.5 m) along the geometrical center of the adjusted pipe.

604.30.5 Basis of Payment.

604.30.5.1 The accepted quantity of adjusted house sewer connections, complete in place, will be paid for at the contract unit price. Payment will be considered full compensation for all necessary pipe, tees, bends, wyes, the cutting of and joining new pipe to old pipe or structure, excavation, backfill, traps, fittings and items incidental thereto.

604.30.5.2 Payment for encasement, complete in place, will be paid for at the contract unit price.

SECTION 604.40 PIPE COLLARS

604.40.1 Description. This work shall consist of metal or concrete collars constructed around a pipe joint as shown on the plans or as directed by the engineer.

604.40.2 Material. All material shall be in accordance with Division 1000, Material Details, and specifically as follows:

Item	Section
Corrugated Metallic-Coated Steel Culvert Pipe, Pipe-Arches and End Sections	1020
Reinforcing Steel for Concrete	1036

604.40.2.1 Metal pipe for pipe collars shall be of the same thickness and shall have the same corrugation dimensions as the corrugated metal pipe to be connected.

604.40.2.2 Concrete used for collars shall be Class B or concrete of a commercial mixture in accordance with Sec 501.

Construction Requirements.

604.40.3.1 Pipe collars shall be provided for the following purposes:

(a) Extending existing pipes where the pipe required for the extension will not form a normal joint with the pipe in place.

(b) Connecting two different sizes of pipe

(c) Connecting two pipes of different material.

604.40.3.2 If the pipe collar design is not applicable to the type of pipe being extended, the pipe collar shall be modified to ensure a joint connection that will fit the pipe.

604.40.4 Basis of Payment. The accepted quantity of pipe collars will be paid for at the contract unit price.

SECTION 604.50 CONNECTING PIPE TO EXISTING STRUCTURES

604.50.1 Description. This work shall consist of joining new pipe to existing manholes, box culverts, drop inlet boxes or sewer pipes as shown on the plans or as directed by the engineer.

604.50.2 Construction Requirements. An opening for the new pipe shall be made through the walls or barrel of the existing structure or pipe at the proper location and grade. The new pipe shall be properly fitted into place, flush with the inner face of the existing masonry, or as nearly so as the engineer determines is practical. After the pipe is in place, the opening around the pipe shall be sealed watertight in a manner approved by the engineer. Any portion of an existing structure that is damaged in joining the new pipe shall be repaired or replaced, at the contractor's expense, with new material of a type matching the old. These requirements will be applicable in joining new pipe to another new pipe if the engineer determines the use of a manufactured connection joint is unnecessary.

604.50.3 Basis of Payment. No direct payment will be made for connecting pipe to existing structures.

SECTION 604.60 SLOTTED DRAINS

604.60.1 Description. This work shall consist of furnishing and installing slotted drains in accordance with these specifications, as shown on the plans or as directed by the engineer.

604.60.2 Material. All material shall be in accordance with Division 1000, Material Details, and specifically as follows:

Item	Section
Slotted Drain	1051

604.60.3 Construction Requirements.

604.60.3.1 The slotted drain shall be Type A, B or C as shown on the plans.

604.60.3.2 If Type C slotted drain is specified, the drain shall be installed such that the slanted spacer bars are facing upstream, sloped against the direction of the surface flow.

604.60.3.3 Unless otherwise shown on the plans, the slotted drain shall be placed on Class A Bedding in accordance with Sec 726 and backfilled to the top of the grate assembly with concrete meeting the requirements of Sec 609.10. The upper portion of the backfill may be placed in conjunction with the concrete curb or paving operations.

604.60.4 Method of Measurement. Final measurement will not be made except for authorized changes during construction or where appreciable errors are found in the contract quantity. Where required, measurement of slotted drain, complete in place, will be made to the nearest linear foot (0.5 m) along the geometric center of the drain. The revision or correction will be computed and added to or deducted from the contract quantity.

604.60.5 Basis of Payment. The accepted quantity of slotted drain, complete in place, including coupling devices and any other necessary fittings, will be paid for at the contract unit price. No direct payment will be made for concrete required for installation of the slotted drain.