

Item C811 – Pipe Culverts, Sewers, Drains, and Drainage Structures

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C811.1 Description. This work consists of the construction, repair, replacement, or adjustment of conduits and drainage structures, as specified. The work done shall conform to ODOT Supplemental Specification 811, Conduit and Drainage Structures, latest edition, and shall include the following Centerville supplemental specifications.

C811.2 General Construction Methods. Prior to beginning work, the contractor is to meet with the Engineer at the site so that there is a clear understanding of the work expected. It may be necessary for the contractor to excavate around the conduit or drainage structure so that the Engineer can determine the problem and direct work. Caution shall be used so as to not damage existing facilities. It will be the Contractor's responsibility to repair or replace any facilities damaged during the removal process.

C811.3 Bedding and Backfill. Furnish structural backfill for bedding and backfill only from natural gravel sources. Slag and recycled materials are not permitted. Low strength mortar/CFD/flowable fill is not to be used without permission from the City Engineer. The bedding is to be a minimum 6" below to 6" above the bottom of conduits and drainage structures. Bedding shall be #57 washed stone for concrete pipe and #57 crushed stone for plastic pipe. Backfill under drivable surfaces is to be ODOT 703.11 Type 1 or 2, well graded (no sand), placed and compacted in 6" lifts.

C811.4 Conduits. Unless otherwise directed, pipe within the Right of Way is to be reinforced concrete pipe per ODOT 706.02 (Class IV with proper cover). Outside of the Right of Way, pipe shall be ODOT Type B conduit. All pipes into or out of ponds shall be reinforced concrete pipe. Unless otherwise directed, an excavation is not to remain open for more than 24 hours.

Unless otherwise directed, the Contractor shall replace all pavement, sidewalk, grass or other surfaces disturbed to a condition equal to that existing before the work was started, furnishing all materials, labor, equipment, etc. as part of this item. Payment for restoration of grass will be made under Items C659 or C660, unless otherwise specified.

C811.5 Drainage Structures. All grates near a paved surface shall be “bicycle-friendly”. Where applicable, vane grates are to be used. Patching and sealing is to be performed with a mix of Portland Cement, sand, and Type M mortar. Restoration of all disturbed areas shall be done with like materials (topsoil and grass, asphalt, concrete, stone backfill, etc), and shall be included as part of this Item. The contractor is to take special care when working on manholes and catch basins not to cause damage, which would become the responsibility of the contractor to repair. An excavation is not to remain open for more than five days. Excavations in the roadway shall be plated at all times that work is not being performed, unless otherwise directed by the City Engineer.

C811.6 Manholes. Final height of cover or grate is to be flush (0” – ¼” below) with final asphalt surface.

All manhole lids shall be free for removal and shall not contain tack coat or asphaltic material that would hinder its removal. Lids will be removed by the City Engineer and inspected. Lips shall be cleaned and lids set in place and aligned properly.

C811.6.1 Manholes – Adjusted to Grade. (Either raising or lowering) shall be done by the following method:

Carefully remove and clean the existing frame, adjust the height of supporting walls as necessary and reset the frame in a bed of mortar or concrete. Any adjustment greater than 1” shall require brick and mortar or concrete adjustment rings. When using concrete adjustment rings, a maximum of two total rings may be used for a total of no more than 12” of rise from the top of the cone or flat top. Metal riser rings are not permitted, unless directed by the City Engineer. The manhole shall be surrounded by ODOT Item 301, Asphalt Concrete Base, to a minimum of 6” deep on residential roads and 12” deep on arterial roads.. The top of the ODOT Item 301 shall be a minimum of 2” below the final pavement surface, unless otherwise directed by the City Engineer, on roads to be immediately paved. For adjustments to be completed after final paving operations have been completed, Item C441, Asphalt Concrete Surface Course shall

be placed 2" thick in two lifts to the surface, unless otherwise directed by the City Engineer, above the specified ODOT Item 301, Asphalt Concrete Base.

If a manhole is found to have a broken concrete ring, the contractor may be directed to remove the existing concrete ring and reset the existing frame as detailed above.

C811.6.2 Manholes – Minor Repair. Minor Repair of a manhole shall include all or any combination of the following: cleaning debris from the bottom of a manhole, patching and mortar finishing with new concrete interior joints within the manhole, placing a new concrete bottom, channeling the flowline(s) as appropriate, and/or resetting the existing casting. All existing frames, grates, and/or lids are to be re-used, unless otherwise directed by the City Engineer. The City may supply a new casting at no additional cost to the City, if necessary.

C811.6.3 Manholes – Major Repair. Major repair of a manhole shall be performed as directed by the Engineer and shall include all or any combination of the following: replacing or setting a new precast flat top, rebuilding/replacing the vertical wall/barrel section up to 4 feet (from the bottom of the casting to the crown of the pipe), patching and mortar finishing with concrete on all interior walls, setting the casting to grade, and proper backfill on rebuilt section. It will also include full restoration around manhole. All existing frames, grates, and/or lids are to be re-used, unless otherwise directed by the City Engineer. The City may supply a new casting at no additional cost to the City, if necessary.

Pipe connections to manholes are included in this item. If the pipe entering a manhole is too short, collapsed, or damaged, it is to be replaced to the first sound joint, unless otherwise directed. The City Engineer may allow a PVC pipe to be used as an extension to extend pipes that are too short, maximum of 6" (fully encased in concrete). Pipe work is to be performed and paid under Item C811.

C811.6.4 Manholes – Replacement of Casting shall be performed as directed by the City Engineer and shall include supplying and replacing the iron casting and patching and mortar finishing with new concrete interior joints within the manhole.

C811.6.5 Manholes – Installation/Replacement shall be performed as directed by the City Engineer and shall include any or all of the following: removal and disposal of the existing manhole including all spoils and metal (all metal castings in usable condition shall be returned to the City); installation of a new pre-cast manhole including the frame and/or grate; setting the casting to proposed grade, placement of a 6 inch PVC sleeve for future use (if directed by the City Engineer), placing a new concrete bottom, channeling the flowline(s) as appropriate, connection of all pipes into the manhole including patching and mortar finishing with concrete all interior walls, applying concrete collars to the exterior of pipe connections, and backfill of all void space surrounding the new manhole. As directed by the City Engineer,

the new manhole may need to be moved up to 5' feet in order to allow the existing pipes to be properly connected to the manhole.

Shop drawings for pre-cast structures shall be submitted to the City Engineer and approved prior to ordering the structures.

Pipe connections to manholes are included in this item. If the pipe entering a manhole is too short, collapsed or damaged, it is to be replaced to the first sound joint, unless otherwise directed. The City Engineer may allow a PVC pipe to be used as an extension to extend pipes that are too short, maximum of 6" (not under pavement), and fully encased in concrete. Pipes under pavement must be RCP. Pipe work is to be performed and paid under Item C811.

C811.7 Catch Basins. All catch basins shall be pre-cast units unless the City Engineer permits the use of solid concrete block or cast in place concrete at Engineer's discretion. The use of block is not permitted for catch basin bottoms. All pre-cast structures shall take into account the adjacent curb type to provide a smooth transition.

Concrete curb tie-ins and all backfill around the repaired catch basin shall take place within five days of initial excavation. If necessary, gravel and possibly temporary asphalt may be needed across the disturbed area in front of the catch basin until all asphalt work is complete.

All storm structures installed, repaired, or rebuilt shall include a 4 inch perforated sump line/conduit that inlets into the bottom of the structure for additional drainage (6' in length in #8 washed stone backfill), underdrain connections (if necessary, and the placement of a 4 inch PVC sleeve for future use and/or tying in private drainage lines (on the house side, unless otherwise directed by the City Engineer).

Pipe connections to catch basins and manholes are included in this item. If the pipe entering a catch basin is too short, collapsed or damaged, it is to be replaced to the first sound joint, unless otherwise directed. The City Engineer may allow a PVC pipe to be used as an extension to extend pipes that are too short, maximum of 6" (fully encased in concrete). Pipes under pavement must be RCP. Pipe work is to be performed and paid under Item C811.

Type B catch basins require the use of a center support approved by the City Engineer.

C811.7.1 Catch Basins – Minor Repair of a catch basin shall be performed as directed by the City Engineer and shall include all or any combination of the following: removal of debris from catch basin, sealing all cracks and voids in the structure with City specified mortar mix, pour new concrete structure floor, resetting the casting to grade, and remove and/or replace concrete border around the hood of Type "D" box. All existing frames, grates,

and/or lids are to be re-used, unless otherwise directed by City Engineer. The City may supply a new casting at no additional cost to the City.

C811.7.2 Catch Basins – Major Repair of a catch basin shall be performed as directed by the Engineer and shall include all or any combination of the following: replacing or setting a new precast top; resetting the pipe, replacing the apron; rebuilding up to 50 percent of walls; placing concrete for a new bottom; applying concrete collars to the exterior of pipe connections, and/or patching and mortar finishing with new concrete all interior walls of the catch basin. All existing frames, grates and lids are to be re-used, unless otherwise directed by City Engineer. The City may supply a new casting at no additional cost to the City.

If curb is to be replaced through a catch basin throat but no work is to be conducted on the catch basin itself, such work will be paid under Item 609 – Curbing. No payment will be made for catch basin repair.

C811.7.3 Catch Basin – Replacement of Casting shall be performed as directed by the City Engineer and shall include supplying and replacing the iron casting (including pre-cast top if applicable) and patching and mortar finishing with new concrete all interior walls of the catch basin.

C811.7.4 Catch Basins – Installation/Replacement shall be performed as directed by the City Engineer and shall include any or all of the following: removal and disposal of the existing catch basin including all spoils and metal (all metal castings in usable condition shall be returned to the City); installation of a new pre-cast catch basin including the casting; placement of a new concrete bottom, connection of all pipes into the basin including patching and mortar finishing with concrete all interior walls within the basin; apply concrete collars to the exterior of all pipe connections; and backfill of all void space surrounding the new catch basin. Use 2-inch low tops for ODOT Type 3 rolled curb.

Shop drawings for pre-cast structures shall be submitted to the City Engineer and approved prior to ordering the structures.

C811.8 Concrete Collar Repair. Offset joints, voids, and other deterioration of pipes and/or connections shall be repaired by applying a concrete collar. Collar shall fully encase the offset joint, fill all voids, and shall not be placed in such a way that would hinder the internal capacity of the pipe. Unless otherwise directed, the Contractor shall replace all pavement, sidewalk, grass, or other surfaces disturbed to a condition equal to that of existing before the work was started, furnishing all materials, labor, and equipment as a part of this Item. All required excavation shall be included as a part of this Item. Payment for restoration of grass will be made under Items C659 or C660.

C811.9 Conduit, Manhole and Catch Basin Restoration. Prior to asphalt restoration, all vertical edges shall be cleaned and coated with asphalt material per ODOT 401.14. Any gutter to be overlaid shall also be coated per ODOT 401.14.

On asphalt streets, restoration shall be 4” of ODOT Item 304, Aggregate Base and ODOT Item 301, Asphalt Concrete Base, minimum 6” for a residential street and 12” for an arterial street, unless otherwise directed, compacted in lifts. On residential streets that will not be resurfaced within 1 year, restoration shall be 4” of Item 301 and 2” of Item C441 Asphalt Surface Course. On arterial streets that will not be resurfaced, restoration shall be 10” of Item 301 and 2” of Item C441 Asphalt Surface Course. All surface joints are to be sealed with a 4” AC ribbon.

C811.10 Basis of Payment. The price bid for this item shall include all labor, equipment and materials necessary for the construction, repair, replacement, or adjustment of conduits and drainage structures according to these specifications, including all necessary restoration.

Payment for accepted quantities will be made at the unit price bid for:

Item	Unit	Description
C811	Lineal Foot	___” Pipe, Type “___”
C811	Each	___” Pipe, Repaired with Concrete Collar
C811	Each	Manhole, Adjusted to Grade
C811	Each	Manhole, Minor Repair
C811	Each	Manhole, Major Repair
C811	Each	Manhole, Replacement of Casting
C811	Each	Manhole, Type “___”
C811	Each	Catch Basin, Minor Repair
C811	Each	Catch Basin, Major Repair
C811	Each	Catch Basin, Replacement of Casting
C811	Each	Catch Basin, Type “___”