

SECTION S604 - CATCH BASIN AND SEWER MANHOLE

S604-1 DESCRIPTION

Work consists of construction, modification or repair of catch basin and field inlet structures; and adjustment or replacement of sewer manhole frame and cover as required in Contract Documents and as directed by Project Manager.

References to NYSDOT specifications are to be in accordance with latest edition of *NYSDOT Standard Specifications (US Customary Units)*.

S604-2 MATERIALS

S604-2.01 General

Bar reinforcement is to be grade 60 in accordance with NYSDOT Section 709-01 Bar Reinforcement, Grade 60.

Brick is to be first quality, sound, hard-burned common sewer brick, culled of all irregular, unsound or damaged brick, in accordance with ASTM Designation C32 grade SS.

Exterior damp proofing material is to be two coats of Hi-Build Bituminous Coating 35-J-10 as manufactured by Mobil Corporation, or Koppers Bitumastic Super Service Black as manufactured by Koppers Company, Inc, or approved equivalent.

Interior damp proofing material is to be two coats of Tamms Duralkote 500 epoxy as manufactured by Dural International Corporation, or approved equivalent.

Grout is to be non-shrink type grout with minimum compressive strength of 4000 psi at 24 hours in accordance with NYSDOT Section 701-05 Concrete Grouting and Anchoring Material.

Joint compound is to be Mainstay Joint Compound, Sikaflex-1A, Sonolastic NP11 as manufactured by Sonneborn, or approved equivalent.

Portland cement mortar is to be in accordance with ASTM Designation C270, Type M, Mortar for Unit Masonry.

Cement mortar for plugging abandoned lateral pipe is to be regular cement mortar, Type II cement.

Select granular backfill (sewer) material for backfilling around catch basin, field inlet and sewer manhole structures, is to be in accordance with Section S203 Excavation and Embankment.

Stone bedding material for leveling course under catch basin and field inlet structures is to be in accordance with Section S203 Excavation and Embankment.

Recycled materials, pulverized or recycled portland cement concrete aggregate (RCA) and brick, reclaimed asphalt pavement (RAP), and Corian® are unacceptable for use as backfill and bedding materials, unless specifically authorized in writing by City Engineer.

S604-2.02 Catch Basin, Field Inlet

A. General

Concrete to be used for catch basin/field inlet structure is to have minimum 28 day compressive strength of 4,000 psi, constructed in accordance with NYSDOT Sections 704-03 Precast Concrete – General and 706-04 Precast Concrete Drainage Units.

Structure is to be supplied complete with frame and grate, and minimum 2 ton lifting eyes or hooks.

Castings and assemblies are to be rated heavy-duty designed for AASHTO HS-20-44 highway loading plus 30 percent impact minimum, at discretion of City Engineer

B. Type A/B Catch Basin Frame and Grate

Frame and grate are to be fabricated galvanized steel reticulate type per Syracuse Castings Model NYSDOT #1 for Type A, and #3 for Type B, or approved equivalent; and in accordance with Section R655 Frame and Grate.

C. Type C Catch Basin

Type C catch basin is to be cast-in-place concrete structure, with frame and grate, trap and underdrain check valve.

Catch basin frame and grate is to be per Syracuse Castings Model NYSDOT #9, or approved equivalent.

Catch basin trap is to be cast iron hooded type per Neenah R-3701-8 as manufactured by Neenah Foundry Company, or approved equivalent; or tee wye with threaded clean-out plug on top side.

Underdrain check valve is to be capable of preventing water from backing up into underdrain pipe.

D. Type D Catch Basin

Type D catch basin is to be Type B catch basin structure, frame and grate with additional access frame and cover.

Access frame is to be welded steel, and access cover 1/4 inch diamond plate, rib reinforced hot rolled steel, hot dipped galvanized, in accordance with ASTM A36, ASTM A48-83 Class 30B, and ASTM 123.

E. Field Inlet

Field inlet is to be cast-in-place Type A catch basin structure, with concave shaped frame and grate.

Frame and grate is to be heavy duty cast iron type per Neenah R-3205 as manufactured by Neenah Foundry Company, or approved equivalent.

F. Concrete Collar

Concrete collar is to be either 4000 psi or micro-fiber reinforced Class D concrete, as required in Contract Documents.

Class D concrete is to be reinforced with Synthetic Micro-Fibers in accordance with NYSDOT Section 502 Portland Cement Concrete, and ASTM Designation C 1116 Classification 4.1.3 Type III Synthetic Fiber-Reinforced Concrete or Shotcrete. Fiber reinforcement is to be 100 percent virgin fibrillated polypropylene micro-fibers engineered and designed for use in concrete, 1/2 to 1-1/2 inches, without containing any reprocessed olefin material. Application rate is to be per manufacturer's written instructions, but not less than 1.50 pounds per cubic yard.

S604-2.03 Sewer Manhole

A. General

Concrete for encasement is to be Class K concrete in accordance with Section S504 Portland Cement Concrete.

Castings and assemblies are to be rated heavy-duty designed for AASHTO HS-20-44 highway loading plus 30 percent impact minimum, at discretion of City Engineer.

B. Adjustment Rings, Flat Top Slab and Risers

Adjustment rings, flat top slab and risers are to be precast concrete with minimum 28 day compressive strength of 4,000 psi, constructed in accordance with ASTM C478 AND NYSDOT Sections 704-03 Precast Concrete – General and 706-04 Precast Concrete Drainage Units.

Units are to be supplied complete with minimum 4 ton lifting eyes or hooks where applicable.

C. Sewer Manhole Frame and Cover

Manhole frame and cover are to be 9 inch tall per ej 1310Z1 for frame and ej 131094 for cover as manufactured by EJ Group, Inc., or approved equivalent.

Manhole frame and cover are to be cast iron, made of tough, close-grained, gray iron without admixture of any cinder iron or metal of inferior quality, in accordance with ASTM Designation A48, Class 30B.

Watertight manhole frame and cover are to be heavy-duty with inner cover bolt and lock bar as required by Monroe County Pure Waters.

D. Concrete Collar

Class D concrete is to be reinforced with Synthetic Micro-Fibers in accordance with NYSDOT Section 502 Portland Cement Concrete, and ASTM Designation C 1116 Classification 4.1.3 Type III Synthetic Fiber-Reinforced Concrete or Shotcrete. Fiber reinforcement is to be 100 percent virgin fibrillated polypropylene micro-fibers engineered and designed for use in concrete, 1/2 to 1-1/2 inches, without containing any reprocessed olefin material. Application rate is to be per manufacturer's written instructions, but not less than 1.50 pounds per cubic yard.

S604-3 CONSTRUCTION DETAILS

S604-3.01 General

Manufacturer's shop drawings are to be submitted to City for approval as required in General Conditions Article 6, Section 6.13 Shop Drawings and Samples.

District must have access to its facilities at all times. If at any time District cannot access its facilities, it will be responsibility of Contractor to provide access. Contractor is to supply MCPW Dispatch Center with an emergency contact phone list, and will contact Contractor in event access is necessary.

Construct all sewer appurtenances in accordance with these specifications and with the specifications of Rochester Pure Waters District (RPWD).

Notify Monroe County Pure Waters (MCPW) minimum of 48 hours in advance when planning on working adjacent to existing Monroe County fiber optic utilities/facilities, by calling (585) 753-7600, option 5.

RPWD must have access to its facilities at all times. If at any time RPWD cannot access its facilities, Contractor must provide such access. Contractor must provide emergency contact phone number to Monroe County Dispatch Center before commencing any work.

Take appropriate measures to prevent dirt, debris and construction materials from entering sewer appurtenances during construction of project. Any such invasive materials are to be removed immediately and contaminated appurtenance thoroughly cleaned.

RPWD must be notified immediately in event of any damage to existing sewer appurtenances, by calling (585) 753-7600, option 1. All repairs are to be performed in presence of representative of RPWD and are to be made in accordance with requirements of RPWD.

Sewer main or lateral pipe that is broken during construction, is to be repaired in accordance with Section S601 Sewer Lateral and Connection.

In event where existing catch basin is damaged or broken during Contractors construction activities, any and all repairs must be done in accordance with these specifications and with the specifications of RPWD as follows:

- brick catch basins are to be repaired using red sewer brick in accordance with ASTM C32, Grade SS
- use Type S mortar
- lateral pipe is to be repaired with SDR-21 PVC pipe and Fernco pipe couplers
- damaged poured concrete riser section is to be completely removed and replaced with new poured concrete riser
- damaged concrete catch basin structure is to be completely removed and replaced with new concrete catch basin structure

Stone bedding leveling course and select granular backfill (sewer) materials are to be placed in accordance with requirements of Section S203 Excavation and Embankment. No structure is to be backfilled until mortar has completely set.

Existing sewer manhole, catch basin and field inlet castings and capstones are property of RPWD. Sewer manhole, catch basin and field inlet castings and capstones that are to be replaced or are no longer needed, are to be cleaned of all extraneous material and returned to MCPW Fleet Center, 145 Paul Road, Rochester, New York, Monday through Friday, between hours of 8:00AM and 3:00PM, inquire at main gate.

Structurally damaged castings are not to be salvaged, but are to be properly disposed of.

Catch basin and field inlet castings are to be bolted down tight so individual parts have continuous, full and uniform bearing contact with each other, and that cover/grate does not rock or move under influence of traffic or other loads. After tightening, bolts are to be unable to be loosened by hand.

Upon completion of work, structures are to be thoroughly damp proofed, cleaned of all extraneous material and kept clean until final acceptance of work.

Where existing catch basin or field inlet is to be removed, entire structure is to be removed and existing lateral pipe abandoned.

S604-3.02 Casting Installation and Tolerance

A. Installation - General

Grade level castings are to be set planar with surrounding surface, true to line and grade and pavement cross-slope, and on sound bearing. Top of cover/grate is to level with top of corresponding frame. Manhole covers must be no greater than 1/4 inch below/above top of frame.

During construction, castings are to be protected from displacement caused by Contractor's equipment and/or vehicular traffic that is being maintained on street.

Suitable measures are to be taken to ensure that cover/grate has full continuous and uniform bearing contact with corresponding frame, and is to be non-rocking when in place and when under influence of traffic or any other type of load bearing stress.

Castings that are covered or buried with construction of new paved surface material, are to be uncovered, cleaned and set to grade, and surrounding area restored.

Suitable methods to achieve non-rocking fit between cover/grate and corresponding frame will include, but not be limited to following:

- ground mating surfaces
- machined and milled mating surfaces (horizontal and vertical)
- match marked elements
- locking elements

If match marked elements are utilized, care is to be taken to retain identity of elements in order to correctly match them and assure proper fit.

Field repairs may include grinding or proper welding techniques for material involved. Repairs that involve welding will be allowed only on steel castings and only with prior approval of Project Manager. Repairs are to result in complete unit whose individual parts have continuous, full and uniform bearing contact with each other, and that cover/grate does not rock or move under influence of traffic or other loads.

B. Basis of Acceptance

Acceptable installation of grade level casting is where casting is installed with maximum vertical difference between top of casting and surrounding surface of 1/4 inch (0.25").

Deficient condition is where vertical difference is over 1/4 inch (0.25") but does not exceed 1/2 inch (0.50"). Deficient conditions are to be continually monitored for further deterioration and for possible future corrective action. In interim deficient condition is to be mitigated by transitioning surrounding surface with maximum 1V:6H slope.

Unacceptable installation is where vertical difference is over 1/2 inch (0.50"). Unacceptable installation must be corrected within 30 days of having been identified, with casting being reset to be within acceptable installation tolerance range.

If manhole cover is greater than 1/4 inch below/above top of frame, it is an unacceptable deficient condition that must be mitigated within 30 calendar days of having been identified.

S604-3.03 Catch Basin/Manhole Installation with Concrete Collar

A. General

Where required, concrete collar is to be provided for grade level catch basin and manhole castings that are located within asphalt, brick or other stone paver pavement areas. Separate concrete collar will not be required where castings are located within concrete pavement area, nor within concrete gutter section.

Concrete collar and castings are to be installed planar, true to line and grade, and cross-slope of surrounding pavement.

Concrete collar is to be constructed and castings set after final paving of top course has been completed, unless field conditions require otherwise, as recommended by Contractor and as approved by Project Manager. Care is to be taken not to damage finished top course of surrounding pavement area. Any damage is to be repaired by Contractor at their expense.

Concrete collar is to be constructed on sound well compacted subbase. Repair and thoroughly compact pavement subbase as necessary.

Before constructing concrete collar, edge between concrete collar and surrounding pavement is to be sealed with highway joint sealant in accordance with NYSDOT Section 705-02 Highway Joint Sealants.

B. Catch Basin at Curb - Original Installation

Concrete riser/collar for catch basins that abut up to curb is to extend up to pavement surface. Concrete riser/collar is to be minimum 8 inches wide, minimum 12 inches deep extending down and into keyway, and reinforced with #3 rebar. Outside edge of concrete is to be 8 inches from and parallel to outer most edge of frame, terminating at face of curb

Outer edges of concrete collar are to be saw cut along neat lines and to full depth of pavement with adjustable power hole cutter system, or power saw with diamond or abrasive blade designed for such work.

Scored and tooled joints are to be provided at minimum from corner of frame out to corner of concrete.

C. Catch Basin at Curb - Adjustment

Concrete collar for catch basins that abut up to curb is to be minimum 8 inches wide and minimum 8 inches deep for type A/B catch basins and 12 inches deep for capstone catch basins, as measured from top of pavement. Outside edge of concrete is to 8 inches from and parallel to outer most edge of frame, terminating at face of curb. Actual depth will typically be determined by either existing construction joint or sound concrete/brick. Exact depth will be based on actual field conditions, as recommended by Contractor and as approved by Project Manager.

Outer edges of concrete collar are to be saw cut along neat lines and to full depth of pavement with adjustable power hole cutter system, or power saw with diamond or abrasive blade designed for such work.

Concrete collar is to be tied into existing catch basin walls that do not keyway with minimum of (6) 8 inch long #5 dowels drilled and grouted into existing catch basin walls to form tight fit.

Scored and tooled joints are to be provided at minimum from corner of frame out to corner of concrete.

D. Catch Basin in Pavement Area

Concrete collar for catch basins that do not abut up to curb and are located within pavement area, is to completely encompass catch basin casting. Concrete collar is to be minimum 8 inches deep as measured from top of pavement, and 12 inches wide as measured from and parallel to outside edge of underlying catch basin structure. Actual depth will typically be determined by either existing construction joint or sound concrete/brick. Exact depth will be based on actual field conditions, as recommended by Contractor and as approved by Project Manager.

Outer edges of concrete collar are to be saw cut along neat lines and to full depth of pavement with adjustable power hole cutter system, or power saw with diamond or abrasive blade designed for such work.

Concrete collar is to be tied into existing catch basin walls that do not keyway with minimum of (6) 8 inch long #5 dowels drilled and grouted into existing catch basin walls to form tight fit.

Scored and tooled joints are to be provided at minimum from corner of frame out to corner of concrete.

E. Manhole – Round Concrete Collar

Concrete collar for manholes is to be round in shape completely encompassing manhole casting. Concrete collar is to be minimum 8 inches deep as measured from top of pavement, and 12 inches wide as measured from outer most edge of frame. Actual depth will typically be determined by either existing construction joint or sound concrete/brick. Exact depth will be based on actual field conditions, as recommended by Contractor and as approved by Project Manager.

Cut round shaped concrete collar using power hole cutter system with heavy-duty auger driven cutter/excavator and adjustable cutting diameter that is capable of cutting out and removing cut pavement section to required diameter and depth in one operation.

Scored and tooled joints are to be located at and rotate out from frame ribs.

E. Manhole – Alternate Concrete Collar

Where existing physical features conflict with construction of round concrete collar, square or other shaped concrete collar may be allowed, but only at discretion of City Engineer.

Concrete collar is to completely encompass manhole casting, with outer edge of square or other shaped concrete collar is to be parallel with pavement edge.

Concrete collar is to completely encompass manhole casting. Concrete collar is to be minimum 8 inches deep as measured from top of pavement, and is to extend out 12 inches as measured from outer most edge of frame. Actual depth will typically be determined by either existing construction joint or sound concrete/brick. Exact depth will be based on actual field conditions, as recommended by Contractor and as approved by Project Manager.

Outer edges of concrete collar are to be saw cut along neat lines and to full depth of pavement with adjustable power hole cutter system, or power saw with diamond or abrasive blade designed for such work.

Scored and tooled joints are to be located at and rotate out from frame ribs.

S604-3.04 Catch Basin, Field Inlet

Prior to ordering precast portion of new structure, verify proposed invert elevation, and size and direction of all lateral and underdrain pipes.

Catch basin frame is to be set parallel with curb line. Catch basin within radius area, mid-point of frame is to be set radial with radius curb.

Existing lateral pipe that is to be reconnected to new structure is to be thoroughly cleaned of all extraneous material before and after making connection.

Lateral and underdrain pipe connections are to be made flush with inside face of structure and are to project outside of structure sufficient distance to allow for proper connection with adjoining lateral and underdrain pipe sections. Lateral and underdrain pipes are to fit neatly and tightly within structure wall, and connections are to be thoroughly sealed with epoxy grout and mortar.

Apply two coats of damp proof material to exterior and interior surfaces of structure, making sure that all surfaces are thoroughly covered.

Where required, provide concrete collar in accordance with Subsection S604-3.03 Catch Basin/Manhole Installation with Concrete Collar.

S604-3.05 Adjust Existing Catch Basin, Field Inlet Castings

Existing castings are to be removed and cleaned of all extraneous material. Any portions of existing structure walls that are damaged are to be repaired consistent with original construction. Remove and dispose existing concrete collar where appropriate.

Existing castings that are structurally sound are to be reset. Structurally damaged castings are to be properly disposed of, and replaced with new castings.

Scarify and/or remove top portion of existing structure walls to sufficient depth to accommodate new concrete collar on sound concrete/brick construction. Prior to forming and pouring new concrete collar, top surface of existing structure walls are to be coated with epoxy polysulfide grout meeting requirements of NYSDOT Material designation 721-03 Epoxy Polysulfide Grout. Concrete collar is to be tied into existing catch basin walls that do not have keyway with minimum of (6) 8 inch long #5 dowels drilled and grouted into existing catch basin walls to form tight fit.

Apply two coats of damp proof material to interior and exposed portion of exterior surfaces of structure, making sure that all surfaces are thoroughly covered.

Where required, provide concrete collar in accordance with Subsection S604-3.03 Catch Basin/Manhole Installation with Concrete Collar.

S604-3.06 Modify Existing Capstone Catch Basin

Existing structure walls are generally constructed of brick and mortar, with portion of structure being located under and behind curb line and topped off with medina capstone.

Existing castings that are structurally sound are to be reset. Structurally damaged castings are to be properly disposed of, and replaced with new castings.

Existing castings that are to be reset, long lines on back of frame are to be removed to accommodate new curb installation. Use extreme caution when removing lines so as not to damage remainder of frame.

All existing solid and structurally sound capstones and castings are to be carefully removed and cleaned of all extraneous material. Capstones and castings that are not to be reset are to be returned to MCPW. Capstone is to be cleaned in such manner as to be non-deleterious to material. Capstones and castings that are broken during excavation or salvage operations, or found to be unacceptable for re-use by Project Manager are to be properly disposed of.

Existing structure walls that are damaged are to be repaired consistent with original construction.

Existing structure walls are to be dismantled by hand to depth sufficient to accommodate new concrete lintel on sound brick construction, and installation of full length piece of curb. New concrete lintel is to be constructed across portion of existing structure that is located under and behind curb.

If necessary, use brick and mortar or concrete to adjust top of existing structure walls to grade before reinstalling existing castings, or installing new castings.

Apply two coats of damp proof material to exterior and interior surfaces of structure, making sure that all surfaces are thoroughly covered.

Where required, provide concrete collar in accordance with Subsections S604-3.03 Catch Basin/Manhole Installation with Concrete Collar and S604-3.05 Adjust Existing Catch Basin, Field Inlet Castings.

S604-3.07 Relocate Existing Catch Basin, Field Inlet

Existing castings are to be removed and cleaned of all extraneous material. Any portions of existing structure walls that are damaged are to be repaired consistent with original construction.

Existing castings that are structurally sound are to be reset. Structurally damaged castings are to be properly disposed of, and replaced with new castings.

Carefully excavate around existing structure in such manner as not to damage existing structure, completely exposing entire structure. Disconnect existing lateral and underdrain pipes. Carefully pick up, move and reinstall existing structure in its new location in such manner as not to damage existing structure. Existing structure that is damaged during excavation or salvage operations, or found to be unacceptable for re-use by Project Manager is to be disposed of.

Remove and dispose existing concrete collar where appropriate.

Scarify and/or remove top portion of existing structure walls to sufficient depth to accommodate new concrete collar on sound concrete/brick construction. Prior to forming and pouring new concrete collar, top surface of existing structure walls are to be coated with epoxy polysulfide grout meeting requirements of NYSDOT Material designation 721-03 Epoxy Polysulfide Grout. Concrete collar is to be tied into existing catch basin walls with minimum 6, 8 inch long #5 dowels drilled and grouted into existing catch basin walls to form tight fit.

Where existing lateral pipe is to be abandoned, open end of existing lateral pipe is to be plugged in accordance with Subsection S604-3.12 Abandon and Remove Existing Catch Basin, Field Inlet.

Connect existing or new lateral and underdrain pipes to structure. Where existing lateral pipe is to be reconnected, existing lateral pipe is to be thoroughly cleaned of all extraneous material before being reconnected. Connections are to be made flush with inside face of structure wall, and are to project outside of structure sufficient distance to allow for proper connection with adjoining lateral and underdrain pipe sections. Lateral and underdrain pipes are to fit neatly and tightly within structure wall, and connections thoroughly sealed with epoxy grout and mortar.

Apply two coats of damp proof material to exterior and interior surfaces of structure, making sure that all surfaces are thoroughly covered.

Unused openings in structure walls are to be blocked up with brick and mortar. Finish off with concrete, completely filling in all voids and thoroughly sealing up both exterior and interior sides of opening. Surfaces of blocked up openings are to be smooth, blend in with surrounding surface, without any excess projections, and damp proofed.

Where required, provide concrete collar in accordance with Subsection S604-3.03 Catch Basin/Manhole Installation with Concrete Collar.

S604-3.08 Clean Existing Catch Basin, Field Inlet and Lateral Pipe

Existing structure and lateral pipe are to be cleaned of all extraneous material and kept clean until final acceptance of work.

S604-3.09 Damp Proof Existing Catch Basin, Field Inlet

Thoroughly clean entire interior surface area of structure by sand blasting or water pressure, removing all existing damp proofing and other extraneous materials so as to be in condition suitable for proper application of new damp proof material.

Apply two coats of damp proof material to interior surfaces of structure, making sure that all surfaces are thoroughly covered.

Apply two coats of damp proof material to exterior surfaces of structure that are exposed, making sure that all surfaces are thoroughly covered.

S604-3.10 Temporary Adjustment of Catch Basin, Field Inlet Castings

Where required for an extended layover, or for winter shut down, temporary brick and mortar riser section is to be built on top of existing structure walls to temporarily set frame and grate to grade.

Fill existing keyway with sand, construct temporary riser section to proper height necessary to set castings to grade and on sound bearing.

Apply one coat of damp proof material to exterior and interior surfaces of temporary riser section.

Prior to final paving, remove temporary riser section and sand fill, and properly dispose of all materials.

After removal of temporary riser section, install castings, and construct permanent concrete riser section and concrete collar in accordance with Subsection S604-3.05 Adjust Existing Catch Basin, Field Inlet Castings.

S604-3.11 Catch Basin Wall, Field Inlet Repair

Dismantle and remove damaged area of existing structure wall to point where wall is structurally sound. Work to repair damaged area is to be consistent with original construction, or better.

Entire structure and lateral pipe are to be cleaned to main sewer of all construction and any other extraneous debris, and maintained clean for duration of project. All debris removed is to be promptly disposed of.

Apply two coats of damp proof material to interior surfaces of structure, making sure that all surfaces are thoroughly covered.

Apply two coats of damp proof material to exterior surfaces of structure that are exposed, making sure that all surfaces are thoroughly covered.

S604-3.12 Abandon and Remove Existing Catch Basin, Field Inlet

Existing castings are to be removed, cleaned of all extraneous material and returned to MCPW. Structurally damaged castings are to be properly disposed of.

Remove and dispose existing concrete collar where appropriate.

Existing lateral and underdrain pipes are to be disconnected, and existing structure completely removed and disposed of.

Where existing lateral pipe is to be abandoned in place, disconnected end is to be plugged. For lateral pipe 6 inch diameter and smaller, insert rubber gasketed mechanical type permanent plug into open end of lateral pipe. For lateral pipe over 6 inch diameter, fill open end of lateral pipe with brick until opening is plugged as much as possible. Completely fill and seal any remaining void with cement mortar.

Where existing lateral pipe is to remain active and extended to new structure, disconnected end is to be connected to new lateral pipe in accordance with Section S601 Sewer Lateral and Connection.

Where existing underdrain pipe is to remain, and separated pieces connected with new underdrain pipe.

S604-3.13 Adjust or Replace Existing Sewer Manhole Frame and Cover

Existing castings are to be removed and cleaned of all extraneous material. Existing castings that are to be replaced and are structurally sound, are to be cleaned and returned to MCPW. Structurally damaged castings are to be properly disposed of, and replaced with new castings.

Remove and dispose existing concrete collar where appropriate.

Add/remove additional courses brick/block as necessary as/if required to retrofit castings to finished grade, on sound bearing, and true to line and grade. For adjustment use either new concrete adjustment ring or bricks/concrete blocks set in mortar leveling course. Mortar head and bed joints are to be maximum 1/2 inch thick.

Where necessary, install new concrete top slab in accordance with Subsection S604-3.16 Sewer Manhole Flat Top Slab.

Apply two coats of damp proof material to interior surfaces of new riser section, making sure that entire surface area is thoroughly covered.

Where required, provide concrete collar in accordance with Subsection S604-3.03 Catch Basin/Manhole Installation with Concrete Collar.

S604-3.14 Temporary Adjustment of Sewer Manhole Frame and Cover

Where required for an extended layover, or for winter shut down, temporary brick and mortar riser section is to be built on top of existing structure walls to temporarily set castings to grade.

Remove portion of existing riser section as necessary and to sound construction to retrofit castings true to line and grade. Construct temporary riser to proper height necessary to set castings to grade and on sound bearing.

Where necessary, install new concrete top slab in accordance with Subsection S604-3.16 Sewer Manhole Concrete Flat Top Slab.

After setting frame, encase frame and rebuilt riser section all around with 12 inches of concrete. Top of concrete encasement is to be at least 3-1/2 inches below grade in pavement area, 5 inches below grade outside of pavement area.

Apply one coat of damp proof material to interior surface of temporary riser section.

Prior to final paving, remove temporary riser section and concrete encasement, and properly dispose of all materials.

After removal of temporary riser section, install castings, and construct permanent riser section and concrete collar in accordance with Subsection S604-3.13 Adjust or Replace Existing Sewer Manhole Frame and Cover.

S604-3.15 Abandon and Remove Existing Sewer Manhole

Existing casting are to be removed, cleaned of all extraneous material and returned to MCPW. Structurally damaged castings are to be properly disposed of.

Remove and dispose existing concrete collar where appropriate.

Existing sewer pipe(s) is to be disconnected, and existing structure completely removed and disposed of.

Where existing sewer pipe(s) is to be abandoned in place, open end(s) is to be plugged. For existing sewer pipe 6 inch diameter and smaller, insert rubber gasketed mechanical type permanent plug into open end(s) of sewer pipe. For existing sewer pipe over 6 inch diameter, fill open end(s) with brick until opening(s) is plugged as much as possible. Completely fill and seal any remaining void with regular cement mortar Type II cement.

Where inline manhole structure has been removed and existing sewer pipe is to remain active, open ends are to be interconnected with new sewer pipe.

S604-3.16 Sewer Manhole Precast Concrete Flat Top Slab

Remove portion of existing riser section as necessary to retrofit new flat top slab on sound bearing. Install new precast concrete flat top slab in mortar leveling course onto existing manhole structure.

Apply two coats of damp proof material to exterior and interior surfaces of structure, making sure that all surfaces are thoroughly covered.

S604-3.17 Sewer Manhole Precast Concrete Riser

Remove existing riser section as necessary to retrofit new riser on sound bearing. Install new riser complete with new manhole steps. Use rubber ring gaskets with flexible joint sealer on outside of joints.

Apply two coats of damp proof material to exterior and interior surfaces of structure, making sure that all surfaces are thoroughly covered.

S604-4 METHOD OF MEASUREMENT

S604-4.01 Catch Basin, Field Inlet

Quantity to be measured for payment will be number of new structures constructed; or existing structures modified, relocated, cleaned, or abandoned.

Type D catch basin, measurement will be made with frame and grate, including access frame and cover, counted as one complete unit.

Under this pay unit, maximum invert depth for new structure construction will be up to 4 feet 6 inches (4.50'), as measured between elevation of top of grate and elevation of interior floor of new structure.

S604-4.02 Additional Depth of New Catch Basin, Field Inlet

Quantity to be measured for payment will be number of linear feet of additional depth for new structure construction, where maximum invert depth exceeds 4 feet 6 inches (4.50') as specified in Subsection S604-4.01 Catch basin, Field Inlet, as measured to nearest tenth of foot (0.10').

S604-4.03 Adjust Existing Catch Basin, Field Inlet Frame and Grate, Access Castings

Quantity to be measured for payment will be number of existing structure frame and grate units, including type D catch basin access frame and cover, adjusted. For type D catch basin, measurement will be made with frame and grate, including access frame and cover, counted as one complete unit.

S604-4.04 Damp Proof Existing Catch Basin, Field Inlet

Quantity to be measured for payment will be number of existing structures where exterior and/or interior portion is required to be completely damp proofed. Measurement will be made separately for both interior and exterior damp proofing, they will not be counted as one complete unit.

Separate payment for damp proofing will be limited only to those existing structures that are not already damp proofed, or where existing damp proofing needs to be completely replaced.

No separate payment will be made for damp proofing of new structure construction.

S604-4.05 Temporary Adjustment of Catch Basin, Field Inlet Castings

Quantity to be measured for payment will be number of structures topped with temporary brick riser section.

S604-4.06 Catch Basin Wall, Field Inlet Repair

Quantity to be measured for payment will be number of square feet of structure wall repaired as measured to nearest tenth of foot (0.10').

S604-4.07 Sewer Manhole

Quantity to be measured for payment will be number of existing sewer manholes abandoned; or sewer manhole frames and covers adjusted, replaced, or temporarily adjusted.

S604-4.08 Sewer Manhole Precast Concrete Flat Top Slab and Riser

Quantity to be measured for payment will be number of units installed.

S604-5 BASIS OF PAYMENT

S604-5.01 General All Items

Unit price bid includes cost of: sheeting; shoring; verifying existing and proposed top and invert elevations; cleaning out structure; cleaning out lateral pipe; disposing structurally damaged castings; disposing all extraneous material; and furnishing all labor, material and equipment necessary to complete work.

Existing structures that are being replaced and structure falls within general trench excavation limits for new structure and/or lateral pipe, removal of existing structure is considered to be part of general trench excavation for new structure and/or lateral pipe.

Existing structures that are being replaced and structure falls outside of general trench excavation limits for new structure and/or lateral pipe, removal of existing structure will not be considered to be part of general trench excavation for new structure and/or lateral pipe, and will be paid for separately under Section R206 Trench and Culvert Excavation.

Replaced and removed castings and capstones are property of RPWD, and structurally sound castings are to be returned to MCPW Fleet Center. No separate payment will be made for return of castings and capstones, cost is to be included in respective work item. Structurally damaged castings are to be properly disposed of.

S604-5.02 Catch Basin/Manhole Installation with Concrete Collar

Bid items that include concrete collar, unit price bid also includes cost of: full depth pavement cutting and removal; repair and compaction pavement subbase; furnishing and installing concrete collar; fiber reinforcement and/or rebar; dowels; grout; drilling holes; highway joint sealant; asphalt joint adhesive; scored and tooled joints; and setting castings.

S604-5.03 Catch Basin, Field Inlet

Unit price bid also includes cost of: furnishing and installing precast or cast-in-place structure; frame and grate; riser section; concrete; forms; key way; rebar; mortar; epoxy grout; damp proofing; field repair of improperly fitting frame and grate; providing openings for connection of lateral and underdrain pipe; connecting and sealing lateral and underdrain pipes to structure; stone bedding leveling course.

Catch Basin – Installed items, unit price bid also includes cost of excavation; furnishing and installing backfill, select granular backfill (sewer), pavement base or full pavement restoration.

Additional Depth of Catch Basin and Field Inlet, unit price bid also includes cost of furnishing and constructing additional cast-in-place portion that exceeds maximum invert depth of 4 feet 6 inches (4.50').

Type C Catch Basin, unit price bid also includes cost of furnishing and installing hooded trap and underdrain check valve.

Type D Catch Basin, unit price bid also includes cost of furnishing and installing access frame and cover; field repair of improperly fitting access frame and cover.

S604-5.04 Adjust Existing Catch Basin, Field Inlet Castings

Unit price bid also includes cost of: removing, cleaning and resetting or disposing existing castings; removing and disposing concrete collar; repairing existing structure walls; scarifying and/or removal top of existing walls; removal temporary brick riser; furnishing and installing epoxy polysulfide grout; dowels; grout; drilling holes.

Furnishing and installing new castings will be paid for under separate bid items.

S604-5.05 Modify Existing Capstone Catch Basin

Unit price bid includes cost of: removing, cleaning, returning to MCPW Fleet Center or disposing existing capstone; removing and disposing concrete collar; removing, cleaning, resetting or disposing existing castings; repairing existing capstone catch basin walls; hand dismantling or otherwise preparing top portion existing capstone catch basin walls; furnishing and installing concrete lintel; brick and mortar or concrete cap; masonry; forms; epoxy polysulfide grout; rebar; grout; damp proofing.

Furnishing and installing new frame and grate will be paid for under separate bid items.

S604-5.06 Relocate Existing Catch Basin, Field Inlet

Unit price bid includes cost of: removing, moving, resetting and cleaning existing structure; removing and disposing concrete collar; removing, cleaning, resetting or disposing existing castings; repairing existing structure walls; disconnecting existing pipes; plugging existing pipes to be abandoned in place; furnishing and installing permanent mechanical plug; brick; cement mortar; furnishing and installing brick and mortar or concrete cap; concrete; forms; epoxy polysulfide grout; rebar; grout; drilling holes; blocking up and sealing excess openings; damp proofing.

Furnishing and installing new castings, lateral pipe and underdrain pipe will be paid for under separate bid items.

S604-5.07 Clean Existing Catch Basin, Field Inlet and Lateral Pipe

Unit price bid includes cost of: cleaning out structure and lateral pipe; disposing all extraneous material.

S604-5.08 Damp Proof Existing Catch Basin, Field Inlet

Unit price bid includes cost of: furnishing and applying damp proof material; cleaning existing structure surfaces by sand blasting, water pressure, or any other acceptable method.

S604-5.09 Temporary Adjustment of Catch Basin, Field Inlet Castings

Unit price bid includes cost of: furnishing, installing, removing and disposing temporary brick and mortar riser section; sand fill; setting, removing, maintaining and installing structure frame and grate; access frame and cover; damp proofing; removing existing concrete collar.

Final adjustment or replacement of castings will be paid for under separate bid items.

S604-5.10 Catch Basin, Field Inlet Wall Repair

Unit price bid includes cost of: dismantling and repairing damaged structure walls; furnishing and applying damp proofing.

S604-5.11 Abandon and Remove Existing Catch Basin, Field Inlet

Unit price bid includes cost of: cleaning and returning to MCPW Fleet Center or disposing existing castings; removing and disposing existing inlet structure and concrete collar; disconnecting, abandoning and plugging existing pipes; furnishing and installing permanent mechanical plug; brick; regular cement mortar Type II cement; filling and sealing void at plugged end.

Furnishing and installing new pipe(s) to reconnect open ends of existing pipe(s) will be paid for under separate bid item.

S604-5.12 Adjust Existing Sewer Manhole Castings

Unit price bid includes cost of: removing, cleaning and resetting existing castings; removing and disposing concrete collar; field repair of improperly fitting manhole frame and cover; preparing existing sewer manhole riser including removal of portion of existing sewer manhole structure as necessary; furnishing and installing either concrete adjustment ring or bricks/concrete blocks; mortar leveling course; concrete encasement; damp proofing.

Furnishing and installing new precast concrete top slab and/or riser will be paid for under separate bid items.

S604-5.13 Replace Existing Sewer Manhole Castings

Unit price bid includes cost of: removing, cleaning, returning to MCPW Fleet Center, or disposing, existing castings; removing and disposing concrete collar; furnishing and installing new manhole frame and cover; field repair of improperly fitting manhole frame and cover; preparing existing sewer manhole riser including removal of portion of existing sewer manhole structure as necessary; furnishing and installing either concrete adjustment ring or bricks/concrete blocks; mortar leveling course; concrete encasement; damp proofing.

Furnishing and installing new precast concrete top slab and/or riser will be paid for under separate bid items.

S604-5.14 Temporary Adjustment of Sewer Manhole Frame and Cover

Unit price bid includes cost of: removing, cleaning and resetting existing sewer manhole frame and cover; removing and disposing concrete collar; preparing existing sewer manhole riser including removal of portion of existing sewer manhole structure as necessary; furnishing, installing and removing temporary brick riser section; mortar leveling course and concrete encasement; damp proofing.

Final adjustment or replacement of sewer manhole frame and cover will be paid for under separate bid item.

Furnishing and installing new castings, precast concrete top slab and/or riser will be paid for under separate bid items.

S604-5.15 Clean Existing Sewer Manhole

Unit price bid includes cost of: cleaning out structure; disposing all extraneous material.

S604-5.16 Abandon and Remove Existing Sewer Manhole

Unit price bid includes cost of: removing, cleaning, returning to MCPW Fleet Center, or disposing, existing castings; removing and disposing existing sewer manhole structure and concrete collar; disconnecting, abandoning and plugging existing sewer pipe(s); furnishing and installing permanent mechanical plug; brick; regular cement mortar Type II cement; filling and sealing void at plugged end(s); disposing all extraneous material; and furnishing all labor, material and equipment necessary to complete work.

Furnishing and installing new sewer pipe to reconnect open ends of existing pipe(s) will be paid for under separate bid item.

S604-5.17 Sewer Manhole Precast Concrete Flat Top Slab

Unit price bid includes cost of: removing portion of existing sewer manhole structure as necessary; furnishing and installing precast concrete flat top slab, mortar leveling course; damp proofing; concrete encasement.

S604-5.18 Sewer Manhole Precast Concrete Riser

Unit price bid includes cost of: removing portion of existing sewer manhole structure as necessary; furnishing and installing precast concrete riser, manhole steps; rubber ring gaskets; flexible joint sealer; damp proofing.

S604-5.19 Excavation, Backfill, Pavement Base Restoration and Pavement Restoration

Excavation including hand and tunnel excavation, and furnishing and placing of select granular backfill (sewer) will be paid for under separate bid items or included in unit price bid for item as indicated in item description.

Pavement base or full pavement restoration, will be paid for under separate bid items or included in unit price bid for item as indicated in item description.

No separate payment will be made for placement of select backfill material excavated from trench.

Excavation that is included in bid item does not include rock excavation. Rock excavation will be paid for under separate bid item.

Bid items that include cost of pavement base restoration, pavement base may consist of either concrete base or asphalt base course, as required in Contract Documents. Unit price bid will be same regardless of which type of pavement base is used, and bid items will include cost of: subbase courses type 1 and type 2; either Class C concrete foundation or asphalt base course; asphalt binder course; and asphalt tack coat.

Bid items that include cost of pavement restoration, pavement base may consist of either concrete base or asphalt base course, as required in Contract Documents. Unit price bid will be same regardless of which type of pavement base is used, and bid items will include cost of: subbase courses type 1 and type 2; either Class C concrete foundation or asphalt base course; asphalt binder course; asphalt top course; and asphalt tack coat.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S604.30	Type A Catch Basin	Each
S604.3002	Type A Catch Basin (Including Concrete Collar)	Each
S604.3003	Type A Catch Basin (Including Rectangular Concrete Collar)	Each
S604.31	Type B Catch Basin	Each
S604.3102	Type B Catch Basin (Including Concrete Collar)	Each
S604.3103	Type B Catch Basin (Including Rectangular Concrete Collar)	Each
S604.32	Type C Catch Basin	Each

ITEM NO.	ITEM	PAY UNIT
S604.3202	Type C Catch Basin (Including Square Concrete Collar)	Each
S604.33	Type D Catch Basin	Each
S604.34	Field Inlet	Each
S604.3701	Type B Catch Basin - Installed (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.3702	Type B Catch Basin - Installed (Including Excavation, Backfill and Pavement Restoration)	Each
S604.3703	Type D Catch Basin - Installed (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.3704	Type D Catch Basin - Installed (Including Excavation, Backfill and Pavement Restoration)	Each
S604.3705	Type B Catch Basin - Installed (Including Concrete Collar) (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.3706	Type B Catch Basin - Installed (Including Concrete Collar) (Including Excavation, Backfill and Pavement Restoration)	Each
S604.3707	Type B Catch Basin - Installed (Including Rectangular Concrete Collar) (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.3708	Type B Catch Basin - Installed (Including Rectangular Concrete Collar) (Including Excavation, Backfill and Pavement Restoration)	Each
S604.40	Additional Depth Type A Catch Basin	Linear Foot
S604.4002	Additional Depth Type A Catch Basin (Including Excavation and Backfill)	Linear Foot
S604.41	Additional Depth Type B Catch Basin	Linear Foot
S604.4102	Additional Depth Type B Catch Basin (Including Excavation and Backfill)	Linear Foot
S604.42	Additional Depth Type C Catch Basin	Linear Foot
S604.4202	Additional Depth Type C Catch Basin (Including Excavation and Backfill)	Linear Foot
S604.43	Additional Depth Type D Catch Basin	Linear Foot
S604.4302	Additional Depth Type D Catch Basin (Including Excavation and Backfill)	Linear Foot
S604.44	Additional Depth Field Inlet	Linear Foot
S604.4402	Additional Depth Field Inlet (Including Excavation and Backfill)	Linear Foot
S604.5006	Adjust Existing Type A/B Catch Basin Frame and Grate	Each
S604.5007	Adjust Existing Type A/B Catch Basin Frame and Grate (Including Excavation and Backfill)	Each
S604.5008	Adjust Existing Type A/B Catch Basin Frame and Grate (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.5009	Adjust Existing Type A/B Catch Basin Frame and Grate (Including Excavation, Backfill and Pavement Restoration)	Each
S604.5010	Adjust Existing Type A/B Catch Basin Frame and Grate (Including Concrete Collar)	Each
S604.5011	Adjust Existing Type A/B Catch Basin Frame and Grate (Including Concrete Collar) (Including Excavation and Backfill)	Each
S604.5012	Adjust Existing Type A/B Catch Basin Frame and Grate (Including Concrete Collar) (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.5013	Adjust Existing Type A/B Catch Basin Frame and Grate (Including Concrete Collar) (Including Excavation, Backfill and Pavement Restoration)	Each
S604.5014	Adjust Existing Type A/B Catch Basin Frame and Grate (Including Rectangular Concrete Collar)	Each
S604.5015	Adjust Existing Type A/B Catch Basin Frame and Grate (Including Rectangular Concrete Collar) (Including Excavation and Backfill)	Each
S604.5016	Adjust Existing Type A/B Catch Basin Frame and Grate (Including Rectangular Concrete Collar) (Including Excavation, Backfill and Pavement Base Restoration)	Each

ITEM NO.	ITEM	PAY UNIT
S604.5017	Adjust Existing Type A/B Catch Basin Frame and Grate (Including Rectangular Concrete Collar) (Including Excavation, Backfill and Pavement Restoration)	Each
S604.5018	Adjust Existing Type C Catch Basin Frame and Grate	Each
S604.5019	Adjust Existing Type C Catch Basin Frame and Grate (Including Excavation and Backfill)	Each
S604.5020	Adjust Existing Type C Catch Basin Frame and Grate (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.5021	Adjust Existing Type C Catch Basin Frame and Grate (Including Excavation, Backfill and Pavement Restoration)	Each
S604.5022	Adjust Existing Type C Catch Basin Frame and Grate (Including Square Concrete Collar)	Each
S604.5023	Adjust Existing Type C Catch Basin Frame and Grate (Including Square Concrete Collar) (Including Excavation and Backfill)	Each
S604.5024	Adjust Existing Type C Catch Basin Frame and Grate (Including Square Concrete Collar) (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.5025	Adjust Existing Type C Catch Basin Frame and Grate (Including Square Concrete Collar) (Including Excavation, Backfill and Pavement Restoration)	Each
S604.5026	Adjust Existing Type D Catch Basin Frame, Grate and Access Cover	Each
S604.5027	Adjust Existing Type D Catch Basin Frame, Grate and Access Cover (Including Excavation and Backfill)	Each
S604.5028	Adjust Existing Type D Catch Basin Frame, Grate and Access Cover (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.5029	Adjust Existing Type D Catch Basin Frame, Grate and Access Cover (Including Excavation, Backfill and Pavement Restoration)	Each
S604.5030	Adjust Existing Field Inlet Frame and Grate	Each
S604.5031	Adjust Existing Field Inlet Frame and Grate (Including Excavation and Backfill)	Each
S604.5101	Modify Existing Capstone Catch Basin	Each
S604.5102	Modify Existing Capstone Catch Basin (Including Excavation and Backfill)	Each
S604.5103	Modify Existing Capstone Catch Basin (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.5104	Modify Existing Capstone Catch Basin (Including Excavation, Backfill and Pavement Restoration)	Each
S604.5105	Modify Existing Capstone Catch Basin (Including Concrete Collar)	Each
S604.5106	Modify Existing Capstone Catch Basin (Including Concrete Collar) (Including Excavation and Backfill)	Each
S604.5107	Modify Existing Capstone Catch Basin (Including Concrete Collar) (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.5108	Modify Existing Capstone Catch Basin (Including Concrete Collar) (Including Excavation, Backfill and Pavement Restoration)	Each
S604.5202	Relocate Existing Type A/B Catch Basin	Each
S604.5203	Relocate Existing Type A/B Catch Basin (Including Concrete Collar)	Each
S604.5204	Relocate Existing Type A/B Catch Basin (Including Rectangular Concrete Collar)	Each
S604.5205	Relocate Existing Type C Catch Basin	Each
S604.5206	Relocate Existing Type C Catch Basin (Including Square Concrete Collar)	Each
S604.5207	Relocate Existing Type D Catch Basin	Each
S604.5208	Relocate Existing Field Inlet	Each
S604.53	Clean Existing Catch Basin and Lateral Pipe	Each
S604.5302	Clean Existing Field Inlet and Lateral Pipe	Each
S604.54	Damp proof Existing Catch Basin	Each

ITEM NO.	ITEM	PAY UNIT
S604.5402	Damp proof Existing Field Inlet	Each
S604.5502	Temporary Adjustment Type A/B Catch Basin Frame and Grate	Each
S604.5503	Temporary Adjustment Type A/B Catch Basin Frame and Grate (Including Excavation and Backfill)	Each
S604.5504	Temporary Adjustment Type C Catch Basin Frame and Grate	Each
S604.5505	Temporary Adjustment Type C Catch Basin Frame and Grate (Including Excavation and Backfill)	Each
S604.5506	Temporary Adjustment Type D Catch Basin Frame, Grate and Access Cover	Each
S604.5507	Temporary Adjustment Type D Catch Basin Frame, Grate and Access Cover (Including Excavation and Backfill)	Each
S604.5508	Temporary Adjustment Field Inlet Frame and Grate	Each
S604.5509	Temporary Adjustment Field Inlet Frame and Grate (Including Excavation and Backfill)	Each
S604.560101	Abandon and Remove Existing Catch Basin	Each
S604.560201	Abandon and Remove Existing Catch Basin (Including Excavation and Backfill)	Each
S604.560301	Abandon and Remove Existing Catch Basin (Including Excavation Backfill and Pavement Base Restoration)	Each
S604.560401	Abandon and Remove Existing Catch Basin (Including Excavation Backfill and Pavement Restoration)	Each
S604.560501	Abandon and Remove Existing Catch Basin and Concrete Collar	Each
S604.560601	Abandon and Remove Existing Catch Basin and Concrete Collar (Including Excavation and Backfill)	Each
S604.560701	Abandon and Remove Existing Catch Basin and Concrete Collar (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.560801	Abandon and Remove Existing Catch Basin and Concrete Collar (Including Excavation, Backfill and Pavement Restoration)	Each
S604.570101	Abandon and Remove Existing Field Inlet	Each
S604.570201	Abandon and Remove Existing Field Inlet (Including Excavation and Backfill)	Each
S604.5801	Catch Basin Wall Repair	Square Foot
S604.5901	Field Inlet Wall Repair	Square Foot
S604.6001	Adjust Existing Sewer Manhole Frame and Cover	Each
S604.6002	Adjust Existing Sewer Manhole Frame and Cover (Including Excavation and Backfill)	Each
S604.6003	Adjust Existing Sewer Manhole Frame and Cover (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.6004	Adjust Existing Sewer Manhole Frame and Cover (Including Excavation, Backfill and Pavement Restoration)	Each
S604.6005	Adjust Existing Sewer Manhole Frame and Cover (Including Round Concrete Collar)	Each
S604.6006	Adjust Existing Sewer Manhole Frame and Cover (Including Round Concrete Collar) (Including Excavation and Backfill)	Each
S604.6007	Adjust Existing Sewer Manhole Frame and Cover (Including Round Concrete Collar) (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.6008	Adjust Existing Sewer Manhole Frame and Cover (Including Round Concrete Collar) (Including Excavation, Backfill and Pavement Restoration)	Each
S604.6009	Adjust Existing Sewer Manhole Frame and Cover (Including Other Shaped Concrete Collar)	Each
S604.6010	Adjust Existing Sewer Manhole Frame and Cover (Including Other Shaped Concrete Collar) (Including Excavation and Backfill)	Each
S604.6011	Adjust Existing Sewer Manhole Frame and Cover (Including Other Shaped Concrete Collar) (Including Excavation, Backfill and Pavement Base Restoration)	Each

ITEM NO.	ITEM	PAY UNIT
S604.6012	Adjust Existing Sewer Manhole Frame and Cover (Including Other Shaped Concrete Collar) (Including Excavation, Backfill and Pavement Restoration)	Each
S604.6201	Temporary Adjustment Sewer Manhole Frame and Cover	Each
S604.6202	Temporary Adjustment Sewer Manhole Frame and Cover (Including Excavation and Backfill)	Each
S604.6203	Temporary Adjustment Sewer Manhole Frame and Cover (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.6204	Temporary Adjustment Sewer Manhole Frame and Cover (Including Excavation, Backfill and Pavement Restoration)	Each
S604.6301	Replace Existing Sewer Manhole Frame and Cover	Each
S604.6302	Replace Existing Sewer Manhole Frame and Cover (Including Excavation and Backfill)	Each
S604.6303	Replace Existing Sewer Manhole Frame and Cover (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.6304	Replace Existing Sewer Manhole Frame and Cover (Including Excavation, Backfill and Pavement Restoration)	Each
S604.6305	Replace Existing Sewer Manhole Frame and Cover (Including Round Concrete Collar)	Each
S604.6306	Replace Existing Sewer Manhole Frame and Cover (Including Round Concrete Collar) (Including Excavation and Backfill)	Each
S604.6307	Replace Existing Sewer Manhole Frame and Cover (Including Round Concrete Collar) (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.6308	Replace Existing Sewer Manhole Frame and Cover (Including Round Concrete Collar) (Including Excavation, Backfill and Pavement Restoration)	Each
S604.6309	Replace Existing Sewer Manhole Frame and Cover (Including Other Shaped Concrete Collar)	Each
S604.6310	Replace Existing Sewer Manhole Frame and Cover (Including Other Shaped Concrete Collar) (Including Excavation and Backfill)	Each
S604.6311	Replace Existing Sewer Manhole Frame and Cover (Including Other Shaped Concrete Collar) (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.6312	Replace Existing Sewer Manhole Frame and Cover (Including Other Shaped Concrete Collar) (Including Excavation, Backfill and Pavement Restoration)	Each
S604.6401	Install New Watertight Sewer Manhole Frame and Cover	Each
S604.6402	Install New Watertight Sewer Manhole Frame and Cover (Including Excavation and Backfill)	Each
S604.6403	Install New Watertight Sewer Manhole Frame and Cover (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.6404	Install New Watertight Sewer Manhole Frame and Cover (Including Excavation, Backfill and Pavement Restoration)	Each
S604.6405	Install New Watertight Sewer Manhole Frame and Cover (Including Round Concrete Collar)	Each
S604.6406	Install New Watertight Sewer Manhole Frame and Cover (Including Round Concrete Collar) (Including Excavation and Backfill)	Each
S604.6407	Install New Watertight Sewer Manhole Frame and Cover (Including Round Concrete Collar) (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.6408	Install New Watertight Sewer Manhole Frame and Cover (Including Round Concrete Collar) (Including Excavation, Backfill and Pavement Restoration)	Each
S604.6409	Install New Watertight Sewer Manhole Frame and Cover (Including Other Shaped Concrete Collar)	Each

ITEM NO.	ITEM	PAY UNIT
S604.6410	Install New Watertight Sewer Manhole Frame and Cover (Including Other Shaped Concrete Collar) (Including Excavation and Backfill)	Each
S604.6411	Install New Watertight Sewer Manhole Frame and Cover (Including Other Shaped Concrete Collar) (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.6412	Install New Watertight Sewer Manhole Frame and Cover (Including Other Shaped Concrete Collar) (Including Excavation, Backfill and Pavement Restoration)	Each
S604.65	Clean Existing Sewer Manhole	Each
S604.6601	Abandon and Remove Existing Sewer Manhole	Each
S604.6701	Abandon and Remove Existing Sewer Manhole (Including Excavation and Backfill)	Each
S604.6801	Abandon and Remove Existing Sewer Manhole (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.6901	Abandon and Remove Existing Sewer Manhole (Including Excavation, Backfill and Pavement Restoration)	Each
S604.6602	Abandon and Remove Existing Sewer Manhole and Concrete Collar	Each
S604.6702	Abandon and Remove Existing Sewer Manhole and Concrete Collar (Including Excavation and Backfill)	Each
S604.6802	Abandon and Remove Existing Sewer Manhole and Concrete Collar (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.6902	Abandon and Remove Existing Sewer Manhole and Concrete Collar (Including Excavation, Backfill and Pavement Restoration)	Each
S604.7048	Sewer Manhole Precast Concrete Flat Top Slab – 48" Diameter	Each
S604.7160	Sewer Manhole Precast Concrete Flat Top Slab – 60" Diameter	Each
S604.724812	Sewer Manhole Precast Concrete Riser – 48" Diameter – 12" Thick	Each
S604.724824	Sewer Manhole Precast Concrete Riser – 48" Diameter – 24" Thick	Each
S604.736012	Sewer Manhole Precast Concrete Riser – 60" Diameter – 12" Thick	Each
S604.736024	Sewer Manhole Precast Concrete Riser – 60" Diameter – 24" Thick	Each

REVISED March 21, 2019