SECTION S604 - CATCH BASIN AND SEWER MANHOLE

S604-1 DESCRIPTION

Work consists of construction of new catch basins and field inlets, or alteration of existing catch basins, field inlets and sewer manholes as required in Contract Documents, as required by Monroe County Pure Waters (MCPW) and Rochester Pure Waters District (RPWD), and as directed by Project Manager.

References to NYSDOT specifications are to be in accordance with *NYSDOT Standard Specifications (US Customary Units)* in effect at time of bid advertisement.

S604-2 MATERIALS

S604-2.01 General

Bar reinforcement is to be 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 NPII 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.

Asphalt pavement joint adhesive is to be in accordance with NYSDOT Section 418 Asphalt Pavement Joint Adhesive.

S604-2.02 Castings

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.

S604-2.03 Catch Basin and Field Inlet

A. General

Structures may be either precast or cast-in-place concrete units. Concrete is to have minimum 28 day compressive strength of 4000 psi in accordance with NYSDOT Sections 704-03 Precast Concrete – General and 706-04 Precast Concrete Drainage Units, reinforced with #4 rebar.

Precast structures are to have recessed type lifting devices designed for use in precast concrete, and have an adequate capacity to safely handle structure. Recess is to be filled with approved concrete repair material after structure is installed.

Castings are to be hot dip galvanized after fabrication, and are to be in accordance with ASTM A123, Section R655 Frame and Grate, and NYSDOT Section 655 Frames, Grates and Covers.

B. Type A/B Catch Basin Frame and Grate

Frame, grate and appurtenant parts are to be fabricated galvanized steel per Syracuse Castings Model NYSDOT #1 for Type A, and #3 for Type B, or approved equivalent.

C. Type C Catch Basin

Frame, grate and appurtenant parts are to be fabricated galvanized steel per Syracuse Castings Model NYSDOT #9, or approved equivalent.

Type C catch basin is to have trap and underdrain check valve(s).

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 Type B catch basin structure, with access frame and cover.

Access frame is to be welded steel; access cover 1/4 inch diamond plate hot rolled steel with 1/4 x 2 inch rib reinforcing @ 2-1/2 inch on center; in accordance with ASTM A36 and ASTM A48-83 Class 30B.

E. Field Inlet

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

Frame, grate and appurtenant parts are 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 Class D concrete, reinforced with synthetic micro-fibers and #3 rebar. Concrete is to be in accordance with NYSDOT Section 501 Portland Cement Concrete – General.

High early strength concrete may be used for placements required to satisfy open to traffic time requirements, as approved by Project Manager.

Synthetic micro-fiber reinforcement is to be in accordance with NYSDOT Section 501 Portland Cement Concrete - General, 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.

S604-2.04 Sewer Manhole

A. Sewer Manhole Frame and Cover

Frame, cover and appurtenant parts 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 or 35B, and NYSDOT Section 655 Frames, Grates and Covers.

Frame is to be 9 inches tall in accordance with EJ 1310Z1 frame (9 inch tall) as manufactured by EJ Group, Inc., or approved equivalent.

Cover is to be 24 inch diameter, 1-3/8 inch thick, with two pickholes in accordance with EJ 1310A2 cover as manufactured by EJ Group, Inc., or approved equivalent. Word “SEWER” and letters “MC-PW” at least 1-1/4 inches high are to be cast into cover and are to be plainly visible.

Watertight frame and cover are to be heavy-duty with inner cover bolt and lock bar as required by MCPW.

B. Adjustment Rings, Flat Top Slab and Risers

Adjustment rings are to be in accordance with NYSDOT Section 715-13 Prefabricated Adjustment Rings, Frames and Utility Valve Risers for Drainage Units, Manholes and Utilities.

Top slab and risers are to be prefabricated concrete with minimum 28 day compressive strength of 4000 psi in accordance with ASTM C478 and NYSDOT Sections 704-03 Precast Concrete – General and 706-04 Precast Concrete Drainage Units.

Where applicable, units are to have minimum of three lifting eyes or hooks designed for use in precast concrete, and have an adequate capacity to safely handle unit.

Top slab is to be minimum of 8 inches thick, with 24 inch diameter hole located as required. Top slab is to be designed for AASHTO H-20 highway loading. Underside is to be pre-coated by manufacturer with cutback bitumen RC-30.

Prior to ordering top slab, Contractor is to verify existing manhole size and proper location for hole in top slab.

C. Concrete Encasement and Collar

Concrete for encasement and collar is to be Class D concrete, reinforced with synthetic micro-fibers. Concrete is to be in accordance with NYSDOT Section 501 Portland Cement Concrete – General.

High early strength concrete may be used for placements required to satisfy open to traffic time requirements, as approved by Project Manager.

Synthetic micro-fiber reinforcement is to be in accordance with NYSDOT Section 501 Portland Cement Concrete - General, 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.

S604-2.05 Highway Joint Sealant

Highway joint sealant is to be in accordance with NYSDOT 705-02 Highway Joint Sealants.

Sealant is to be hot-applied product, such as Crafco Roadsaver 201, Crafco Roadsaver 203, or approved equivalent.

S604-3 CONSTRUCTION DETAILS

S604-3.01 General

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

Construct sewer appurtenances in accordance with these specifications and specifications of RPWD.

RPWD requires all other utilities to cross perpendicular to or as close as possible to perpendicular to RPWD sewer facilities.

Notify 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 sewer facilities at all times. If at any time RPWD cannot access its sewer facilities, it will be responsibility of Contractor to provide access. Contractor is to supply MCPW Dispatch Center with an emergency contact phone list, which will be instructed to contact Contractor in event such access is necessary.

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

RPWD will not mark private service laterals. If available, record maps indicating lateral wye locations of recorded wyes/taps may be obtained by contacting Dig Safely NY by calling 811, or online at *digsafelynewyork.com*, and requesting a design ticket.

Contractor will be responsible for repair of any lateral pipe damaged during construction activities. RPWD must be notified immediately in event of any damage to 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.

In event sewer main or lateral pipes are damaged during construction activities, any and all repairs must be extended linearly, introducing new bends in pipe will not be permitted. All 5 inch inside diameter lateral pipe must be repaired using 5 inch service weight cast iron pipe and Fernco couplers. All other pipes are to be repaired with PVC SDR-21 pipe and Fernco couplers. Contractor may be permitted to use oakum and epoxy mortar to connect new PVC pipe to an existing bell that is in good condition.

Stone bedding material used for sewer main and lateral pipe repairs is to be Class B consisting of #1 and #2 washed stone at minimum of 6 inch depth.

In event that an existing catch basin is damaged during Contractor's 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 PVC SDR-21 pipe and Fernco pipe couplers
- damaged poured concrete riser section is to be completely removed and replaced with new poured concrete riser
- damaged precast concrete catch basin structure is to be completely removed and replaced with new precast concrete catch basin structure

Existing castings are property of RPWD. All castings that are to be replaced, or are no longer needed, (regardless of condition), are to be cleaned of all extraneous materials and returned to MCPW Fleet Center, 145 Paul Road, Rochester, New York 14624, Monday through Friday, between hours of 8:00AM and 3:00PM. Coordinate drop-off by calling MCPW dispatcher at 585-753-7600, option 1.

All existing capstones that are removed, are to be properly disposed of. Do not return capstones to MCPW.

As-built drawings are to be furnished to RPWD, when applicable. In addition to paper hard copies, as-built drawings are also to be submitted electronically as georeferenced CAD drawings. As-built drawings are to indicate exact location of all sewers, wye branches, laterals, clean-outs and manholes.

S604-3.02 Casting Installation and Tolerance

A. Installation - General

Grade level castings are to be installed in same horizontal plane as surrounding elevation, true to line and grade and cross-slope of surrounding pavement, and on sound bearing. Top of cover/grate is to be level with top of corresponding frame.

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

Castings that are buried are to be uncovered, cleaned of all extraneous material, and set to grade, and surrounding area properly restored.

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

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 planar, true to line and grade, and cross-slope of surrounding pavement.

Top of cover/grate must be level with top of corresponding frame.

Wherever above conditions for basis of acceptance are not met, castings, including cover/grate, must be reset to acceptable installation.

S604-3.03 Catch Basin and Sewer Manhole - with Concrete Collar

A. General

Concrete collar is required for grade level catch basin and sewer manhole castings that are located within asphalt, concrete, brick or other stone paver type pavement areas.

Concrete collar will not be required where castings are located within concrete gutter section, lawn or landscaped area.

Grade level castings and concrete collar are to be installed in same horizontal plane as surrounding elevation, true to line and grade and cross-slope of surrounding pavement, and on sound bearing.

In lieu of 4000 psi or Class D concrete, high early strength concrete may be used for placements required to satisfy open to traffic time requirements, as approved by Project Manager.

1. *Vibration*. During and immediately after deposition of concrete, perform moderate vibration and compaction to expel large bubbles and excess of entrapped air from freshly placed using mechanical vibrating equipment in accordance with NYSDOT Section 555-3.04 Handling and Placing Concrete.

Vibrators must be adequately powered, capable of transmitting vibration to concrete in frequencies of not less than 5,000 vibrations per minute while inserted in concrete, and are to produce a vibration of sufficient intensity to consolidate concrete into place without separation of ingredients.

Vibrating element is to be vertically inserted in concrete mass at depth sufficient to vibrate bottom of each layer effectively inserting vibrator into any underlying lift.

Time of vibration is to be of sufficient duration to accomplish thorough consolidation, complete embedment of any reinforcement, produce dense smooth surfaces free from aggregate pockets, honeycombing, and air bubbles, and to work concrete into all angles and corners, however over-vibration is to be avoided.

Vibration is to be supplemented by working or spading by hand in corners and angles while concrete is plastic. Vibrators shall not be used to push or distribute concrete laterally.

In asphalt pavement areas, final setting of castings and construction of concrete collar is to be done after final paving of top course has been completed, unless field conditions require otherwise, or as recommended by Contractor and as approved by Project Manager. In concrete, brick or other stone paver type pavement, final setting of casting and method of construction of concrete collar will be as approved by Project Manager.

Care is to be taken not to damage any portion of adjacent pavement section. Any damage to adjacent pavement section caused by Contractor's operations, is to be repaired by Contractor to pre-existing or better condition at Contractor's expense.

For non-round shaped concrete collar, saw cut pavement full depth along neat lines around outer extents of concrete collar with power saw with diamond or abrasive blade designed for such work - do not overcut corners. Only remove pavement section to depth sufficient to construct concrete collar – do not over excavate.

For round shaped concrete collar, cut pavement full depth along neat lines around outer extents of concrete collar with power hole cutter system that has 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. Do not over cut or over excavate pavement section.

After concrete has completely set, thoroughly seal all edges and joints, including around castings, with hot-applied highway joint sealant.

Where Contractor elects to cut pavement area for concrete collar installation and leave core in place for removal at later time, void must be filled-in by end of that day. Voids are not to be left unfilled overnight. Use asphalt cold patch, millings or other asphalt material to fill-in void, with material brought up to grade and flush with surrounding surface, and with top being level and smooth.

B. Concrete Collar for New Catch Basin

Concrete collar is to be parallel with outer edge of frame, and from minimum 8 inches to maximum 12 inches wide, as measured from outer edge of frame. Use same dimension for width of concrete collar on all sides of catch basin.

Depth of concrete collar is to be minimum of 12 inches as measured from top of pavement down to top of structure, and tie into keyway. Exact depth will be based on actual field conditions, as recommended by Contractor and as approved by Project Manager.

At minimum, provide scored and tooled joints from corners of frame out to corners of concrete collar.

C. Concrete Collar for Existing Catch Basin

Concrete collar is to be parallel with outer edge of frame, and from minimum 8 inches to maximum 12 inches wide, as measured from outer edge of frame. Use same dimension for width of concrete collar on all sides of catch basin.

Depth of concrete collar is to be minimum of 12 inches as measured from top of pavement down to top of 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.

Scarify and/or remove top of existing walls to sufficient depth to accommodate concrete. Coat top surface of wall with NYSDOT 721-03 Epoxy Polysulfide Grout prior to pouring concrete. Concrete is to be tied into existing catch basin walls with minimum of six #5 dowels drilled and grouted into existing structure walls to form tight fit.

At minimum, provide scored and tooled joints from corners of frame out to corners of concrete collar.

D. Concrete Collar for Existing Capstone Catch Basin

Concrete collar is to be parallel with outer edge of frame, and 12 inches wide as measured from outer edge of frame. Use same dimension for width of concrete collar on all sides of catch basin.

Depth of concrete collar is to be minimum of 12 inches as measured from top of pavement down to top of 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.

Remove/add courses of brick, mortar or concrete to adjust top of existing walls to set castings to required finished grade, and on sound bearing.

At minimum, provide scored and tooled joints from corners of frame out to corners of concrete collar.

E. Sewer Manhole – Round Concrete Collar

Concrete collar is to be round, completely encompassing castings. Concrete collar is to be 12 inches wide as measured from outer edge of frame. Depth of concrete collar is to minimum of 12 inches as measured from top of pavement down to either top of structure, 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.

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

F. Sewer Manhole – Other Shaped Concrete Collar

Where existing physical conditions impede ability to construct round concrete collar, other shaped concrete collar may be allowed, but only at sole discretion of City Engineer.

Concrete collar is to completely encompass castings. Concrete collar is to be 12 inches wide as measured from outer edge of frame along coordinate axes. Depth of concrete collar is to minimum of 12 inches as measured from top of pavement down to either top of structure, 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 edge of concrete collar is to be parallel with and perpendicular to pavement edge.

At minimum, provide scored and tooled joints from frame ribs out to outer edge of concrete collar.

S604-3.04 New Catch Basin and Field Inlet

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

Before installation and backfilling of excavation, exterior surface of structure is to be thoroughly damp proofed with two coats of an approved bituminous coating material.

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.

Castings are to be set in accordance with Subsection S604-3.02 Casting Installation and Tolerance.

Set back edge of frame parallel with and 1-1/2 inches from face of cub. Where catch basin is in radius area, mid-point of back edge of frame is to be set radial with radius curb, and 1-1/2 inches from face of curb.

Fill gap between frame and curb down to top of concrete with 1:2 mortar.

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 any other type of load. After tightening, bolts are to be unable to be loosened by hand.

Lateral pipe that is to be connected to structure is to be thoroughly cleaned of all extraneous material before and after making connection. New lateral pipe must be PVC SDR-21 in accordance with ASTM D-2241. Joints on horizontal pipe and bends are to be made with push-on neoprene gaskets. Glued or chemically welded joints are not acceptable.

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. Connections are to be thoroughly sealed with 100 percent solids epoxy mortar, such as Sikadur 33 by Sika Corp., Flexolith Gel by Euclid Chemical, or approved equivalent.

Upon completion of work structure is to be cleaned of all extraneous material, and interior surface of structure thoroughly damp proofed with two coats of an approved epoxy material. Structure is to be kept clean until final acceptance of work.

Where required, construct concrete collar in accordance with Subsection S604-3.03 Catch Basin and Sewer Manhole - with Concrete Collar.

S604-3.05 Alter Existing Catch Basin and Field Inlet

Existing castings are to be removed, and replaced with new frame and grate. Existing castings (regardless of condition) are to be cleaned of all extraneous materials, and returned to MCPW.

Existing concrete collar/riser is to be removed. All removed materials are to be properly disposed of.

Portions of existing structure walls that are damaged are to be repaired consistent with original construction.

Scarify and/or remove top portion of existing structure walls to sufficient depth to accommodate new concrete collar/riser. Coat top surface of wall with NYSDOT 721-03 Epoxy Polysulfide Grout material prior to pouring new concrete. If required, new concrete is to be tied into existing catch basin walls with minimum of six #5 vertical dowels drilled and grouted into existing catch basin walls to form tight fit. Precast structures with keyway do not require vertical dowels.

Where necessary, new riser section may corbelled with maximum shift of 7 inches. If corbel will exceed maximum shift of 7 inches, existing catch basin is to be completely removed and new catch basin structure installed in appropriate location, and existing lateral pipe extended and connected to new structure.

Castings are to be set in accordance with Subsections S604-3.02 Casting Installation and Tolerance, and S604-3.04 New Catch Basin and Field Inlet.

Exposed exterior surface of new concrete is to be thoroughly damp proofed with two coats of an approved bituminous coating material.

Upon completion of work structure is to be cleaned of all extraneous material, and interior surface of structure thoroughly damp proofed with two coats of an approved epoxy material. Structure is to be kept clean until final acceptance of work.

Where required, construct concrete collar in accordance with Subsection S604-3.03 Catch Basin and Sewer Manhole - with Concrete Collar.

S604-3.06 Alter Existing Capstone Catch Basin

Existing structure walls are generally constructed of brick and mortar, with portion of structure located under and behind curb line, and with or without an at-grade capstone.

Existing capstones are to be removed and properly disposed of. Do not return capstones to MCPW.

Existing castings are to be removed, and are to be either reset or replaced with new frame and grate. If existing castings will not be reused, clean of all extraneous materials and return to MCPW (regardless of condition).

Existing cast iron castings that are to be reset, long tines on back of frame are to be carefully removed so as not to damage remainder of frame.

Existing concrete collar is to be removed. All removed materials are to be properly disposed of.

Castings are to be set in accordance with Subsection S604-3.02 Casting Installation and Tolerance.

Set back edge of frame parallel with and against face of curb.

Portions of existing structure walls that are damaged are to be repaired consistent with original construction.

Remove/add courses of brick, mortar or concrete to adjust top of existing walls to set castings to finished grade, and on sound bearing.

Mortar head and bed joints are to be maximum 1/2 inch thick.

Portion of existing structure walls under and behind curb are to be dismantled by hand to depth sufficient to accommodate new concrete lintel on sound bearing. Coat top surface of wall with NYSDOT 721-03 Epoxy Polysulfide Grout prior to pouring concrete.

Exposed exterior surface of new concrete is to be thoroughly damp proofed with two coats of an approved bituminous coating material.

Where necessary, new riser section may corbelled with maximum shift of 7 inches. If corbel will exceed maximum shift of 7 inches, existing catch basin is to be completely removed and new catch basin structure installed in appropriate location, and existing lateral pipe extended and connected to new structure.

Upon completion of work structure is to be cleaned of all extraneous material, and interior surface of structure thoroughly damp proofed with two coats of an approved epoxy material. Structure is to be kept clean until final acceptance of work.

Construct concrete collar in accordance with Subsection S604-3.03 Catch Basin and Sewer Manhole - with Concrete Collar.

S604-3.07 Relocate Existing Catch Basin and Field Inlet

Only precast structures are acceptable for relocation. Cast-in-place structures are not acceptable for relocation and must be completely removed and properly disposed of.

Existing castings are to be removed, and replaced with new frame and grate. Existing castings (regardless of condition) are to be cleaned of all extraneous materials, and returned to MCPW.

Existing concrete collar/riser is to be removed. All removed materials are to be properly disposed of.

Portions of existing structure walls that are damaged are to be repaired consistent with original construction.

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 otherwise determined to be unacceptable for re-use by Project Manager is to be properly disposed of.

Existing lateral and underdrain pipes are to be abandoned or reconnected in accordance with Subsection S604-3.11 Abandon and Remove Existing Catch Basin and Field Inlet.

Install relocated structure and connect new/existing lateral and underdrain pipes in accordance with Subsection S604-3.04 New Catch Basin and Field Inlet.

If necessary, scarify and/or remove top portion of existing catch basin walls to sufficient depth to accommodate new concrete collar/riser. Coat top surface of wall with NYSDOT 721-03 Epoxy Polysulfide Grout material prior to pouring new concrete. If required, new concrete is to be tied into existing catch basin walls with minimum of six #5 vertical dowels drilled and grouted into existing catch basin walls to form tight fit. Precast structures with keyway do not require vertical dowels.

Unused openings in structure walls are to be blocked up with brick and mortar. Completely fill in all voids with 100 percent solids epoxy mortar, such as Sikadur 33 by Sika Corp., Flexolith Gel by Euclid Chemical, or approved equivalent. Finish off thoroughly sealing up both exterior and interior sides of opening with concrete. Surfaces of blocked up openings are to be smooth, blend in with surrounding surface, without any excess projections.

Before backfilling excavation, exterior surface of new concrete is to be thoroughly damp proofed with two coats of an approved bituminous coating material.

Upon completion of work structure is to be cleaned of all extraneous material, and interior surface of structure thoroughly damp proofed with two coats of an approved epoxy material. Structure is to be kept clean until final acceptance of work.

Where required, construct concrete collar in accordance with Subsection S604-3.03 Catch Basin and Sewer Manhole - with Concrete Collar.

S604-3.08 Temporary Setting Catch Basin and Field Inlet Castings

Use and separate payment of this item will only be made at locations where Project Manager has pre-authorized such work.

Temporarily fill existing keyway with sand, construct temporary riser section to proper height necessary to set castings to grade and on sound bearing. Mortar head and bed joints are to be maximum 1/2 inch thick.

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, construct permanent concrete collar/riser and set castings in accordance with Subsection S604-3.05 Alter Existing Catch Basin and Field Inlet.

S604-3.09 Damp Proof Existing Catch Basin and 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.

Upon completion of work structure is to be cleaned of all extraneous material, and interior surface of structure thoroughly damp proofed with two coats of an approved epoxy material. Structure is to be kept clean until final acceptance of work.

S604-3.10 Existing Catch Basin and Field Inlet Wall 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.

All removed materials are to be properly disposed of.

Upon completion of work structure is to be cleaned of all extraneous material, and interior surface of structure thoroughly damp proofed with two coats of an approved epoxy material. Structure is to be kept clean until final acceptance of work.

S604-3.11 Abandon and Remove Existing Catch Basin and Field Inlet

Existing castings are to be removed, cleaned of all extraneous materials, and returned to MCPW (regardless of condition).

Existing capstones are to be removed and properly disposed of. Do not return capstones to MCPW.

Existing lateral and underdrain pipes are to be disconnected, and entire structure and concrete collar are to be completely removed and properly disposed of.

Where existing lateral and underdrain pipes are to be abandoned in place, disconnected end is to be thoroughly plugged and sealed.

For lateral pipe 6 inch diameter and smaller insert rubber gasketed mechanical type permanent plug into open end of lateral pipe, completely filling and sealing end of lateral pipe with regular cement mortar, Type II Cement.

For lateral pipe over 6 inch diameter fill open end of lateral pipe with sewer brick until opening is plugged as much as possible, completely filling and sealing end of lateral pipe with regular cement mortar, Type II Cement.

Where existing lateral pipe is to remain active and reconnected, new lateral pipe is to be connected to open end of existing lateral pipe in accordance with Section S601 Sewer Lateral and Connection.

Where existing underdrain pipe is to remain active, new underdrain pipe is to be installed to reconnect open ends in accordance with Section S605 Underdrain.

S604-3.12 Alter Existing Sewer Manhole

A. General

Existing castings are to be removed, and are to be either reset (if approved by MCPW), or replaced with new castings frame and cover. All castings being replaced are to be cleaned of all extraneous materials and returned to MCPW (regardless of condition).

New frame and cover may be standard frame and cover, or watertight frame and cover, as required by RPWD.

Existing concrete collar/encasement is to be removed. All removed materials are to be properly disposed of.

Castings are to be set in accordance with Subsection S604-3.02 Casting Installation and Tolerance.

New concrete top slab is to be in accordance with Subsection S604-3.15 New Sewer Manhole Precast Concrete Flat Top Slab.

Surface of hole in concrete top slab is to be thoroughly damp proofed with two coats of an approved epoxy material.

Exposed exterior surface of new concrete is to be thoroughly damp proofed with two coats of an approved bituminous coating material.

Upon completion of work structure is to be cleaned of all extraneous material, and interior surface of structure thoroughly damp proofed with two coats of an approved epoxy material. Structure is to be kept clean until final acceptance of work.

Where required, construct concrete collar/encasement in accordance with Subsection S604-3.03 Catch Basin and Sewer Manhole - with Concrete Collar.

B. Existing Brick/Stone Sewer Manhole Structure

Remove/add additional courses brick/block, or install concrete adjustment ring as necessary as/if required to retrofit castings to finished grade, on sound bearing, and true to line and grade. For adjustment use either concrete adjustment ring or bricks/concrete blocks set in mortar leveling course. Concrete collar/encasement is to be at, or below, lowest portion of leveling course.

Mortar head and bed joints are to be maximum 1/2 inch thick.

Where new concrete top slab is required to be installed, remove additional courses brick/block to set top slab on sound bearing, and with bottom surface of top slab being minimum of 24 inches below grade. Top slab is to be set on mortar leveling course and is to overhang structure by minimum of 2 inches all around. Install either concrete adjustment ring or minimum two courses bricks/concrete blocks set in mortar leveling course as necessary to retrofit castings to finished grade, and true to line and grade. Concrete encasement for top slab is to be minimum 6 inches wide, extending down minimum of 6 inches below bottom of top slab.

C. Existing Precast Concrete Sewer Manhole Structure

Remove/add additional courses brick, or install concrete adjustment ring as necessary as/if required to retrofit castings to finished grade, on sound bearing, and true to line and grade. For adjustment use either concrete adjustment ring or minimum two courses bricks/concrete blocks set in mortar leveling course. Concrete collar/encasement is to extend down to top of existing precast structure.

Mortar head and bed joints are to be maximum 1/2 inch thick.

Where new concrete top slab is required to be installed, remove existing manhole top slab and saw cut top of riser section down minimum of 24 inches below finished grade. Saw cutting is to be done for full width of structure wall, and along neat, straight lines. Extreme irregularities of saw cut surface are to be milled or ground finished to relatively smooth level surface. Top slab is to be set on mortar leveling course, and is to be tied into existing structure walls with eight #5 vertical dowels drilled and grouted into existing structure walls to form tight fit. Install either concrete adjustment ring or minimum two courses bricks/concrete blocks set in mortar leveling course as necessary to retrofit castings to finished grade, and true to line and grade. Concrete collar/encasement is to extend down to top of concrete top slab.

S604-3.13 Temporary Setting Sewer Manhole Castings

Use and separate payment of this item will only be made at locations where Project Manager has pre-authorized such work.

Construct permanent alterations, including where necessary installation of concrete top slab, to within 12 inches of finished grade in accordance with Subsection S604-3.12 Altering Existing Sewer Manhole.

Construct temporary riser section to proper height necessary to set castings to grade and on sound bearing. Mortar head and bed joints are to be maximum 1/2 inch thick.

After setting frame, encase frame and temporary riser section all around with 12 inches of concrete. Top of concrete encasement is to be at least 2 inches below grade in paved areas and extend down to bottom of temporary riser section. Outside of paved areas, top of concrete encasement is to be 5 inches below grade and extend down to bottom of temporary riser section.

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 concrete encasement, and properly dispose of all materials.

After removal of temporary riser section, construct permanent concrete collar/encasement and set castings in accordance with Subsection S604-3.12 Alter Existing Sewer Manhole.

S604-3.14 Abandon and Remove Existing Sewer Manhole

Existing castings are to be removed, and cleaned of all extraneous materials and returned to MCPW (regardless of condition).

Existing sewer pipe(s) is to be disconnected, and entire sewer manhole structure and concrete collar are to be completely removed and properly 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 existing sewer pipe is to remain active and be reconnected, new sewer pipe is to be installed and connected to open ends of existing sewer pipe in accordance with requirements of RPWD.

S604-3.15 New Sewer Manhole Precast Concrete Flat Top Slab

Precast concrete flat top slab is to be installed in accordance with Subsection S604-3.12 Altering Existing Sewer Manhole.

S604-3.16 New Sewer Manhole Precast Concrete Riser

Manhole step(s) are to be provided with precast concrete riser. Use rubber ring gaskets with flexible joint sealer on outside of joints.

Exterior surface is to be thoroughly damp proofed with two coats of an approved bituminous coating material.

Interior surface is to be thoroughly damp proofed with two coats of an approved epoxy material.

S604-4 METHOD OF MEASUREMENT

S604-4.01 Concrete Collar

No separate measurement and payment will be made for concrete collars. Concrete collars will be included in respective bid item as indicated in item description.

S604-4.02 Catch Basin and Field Inlet

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

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.

S604-4.03 Additional Depth of New Catch Basin and 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 S604-4.02 Catch Basin and Field Inlet, as measured to nearest tenth of foot (0.10').

S604-4.04 Alter Existing Catch Basin, Field Inlet and Sewer Manhole Castings

Quantity to be measured for payment will be number of existing structures altered.

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

S604-4.05 Temporary Setting Catch Basin, Field Inlet and Sewer Manhole Castings

Payment under this item will only be made at locations where Project Manager has pre-authorized separate payment.

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

Separate measurement and payment for existing structures will be made once under alteration item, and once under temporary setting item.

S604-4.06 Damp Proof Existing Catch Basin and Field Inlet

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

Separate measurement and payment for damp proofing will be limited only to those existing structures where existing damp proofing needs to be completely replaced, and no other type of work is being performed.

No separate measurement and payment will be made under this item for damp proofing required in conjunction with new structure installation, and/or alteration or relocation of existing structures.

S604-4.07 Existing Catch Basin and Field Inlet Wall Repair

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

Separate measurement and payment for repairing existing structure walls will be limited only to those existing structures where no other type of work is being performed.

No separate measurement and payment will be made under this item for wall repair required in conjunction with alteration or relocation of existing structures.

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

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

S604-5 BASIS OF PAYMENT

S604-5.01 General All Items

Unit price bid includes cost of: providing access to RPWD to its sewer facilities at all times; taking appropriate measures to prevent dirt, debris and construction materials from entering sewer facilities during construction of project; removing and disposing any contaminant materials; cleaning contaminated sewer facilities; contacting Dig Safely NY and requesting a design ticket to obtain sewer record maps; locating and marking out recorded wyes/taps locations; and repairing any lateral pipe damaged during construction activities.

Unit price bid also includes cost of: sheeting; shoring; verifying existing and proposed top of catch basin grate, manhole cover, and invert elevations; setting casting in accordance with basis of acceptable tolerance requirements; field repair of improperly fitting castings; furnishing and applying interior and exterior damp proofing material; cleaning out structure and lateral pipe of all construction related debris; returning existing castings to MCPW; disposing all extraneous material; furnishing and applying highway joint sealant; 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, and no separate payment will be made.

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, or NYSDOT Section 203 Excavation and Embankment.

Replaced and removed castings are property of RPWD. All replaced and removed castings (regardless of condition) are to be salvaged, and returned to MCPW Fleet Center. No separate payment will be made for returning castings, cost is to be included in respective work item.

S604-5.02 Catch Basin and Sewer Manhole - with Concrete Collar

Furnishing and installing concrete collar will be included in unit price bid for item as indicated in item description.

Unit price bid also includes cost of: excavation; full depth pavement cutting and removal; repair and compaction pavement subbase; furnishing and installing concrete; fiber reinforcement; rebar; dowels; drilling holes; grout; scored and tooled joints; setting castings; and furnishing and applying highway joint sealant and asphalt pavement joint adhesive.

S604-5.03 New Catch Basin and 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; providing openings for connection of lateral and underdrain pipe; connecting and sealing lateral and underdrain pipes to structure; stone bedding leveling course.

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(s).

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

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.

S604-5.04 Alter Existing Catch Basin and Field Inlet

Unit price bid also includes cost of: excavation; backfill; removing cleaning and returning existing castings to MCPW (regardless of condition); removing and disposing concrete collar; repairing existing structure walls that are damaged; scarifying and/or removal top of existing walls; removal temporary brick riser; furnishing and installing new frame and grate; forms; concrete riser section; concrete riser section; epoxy polysulfide grout; dowels; grout; mortar; drilling holes.

Unit price bid also includes cost of: corbelling concrete riser section.

S604-5.05 Alter Existing Capstone Catch Basin

Unit price bid also includes cost of: excavation; backfill; resetting or replacing existing castings; modifying and resetting existing cast iron castings; or removing, cleaning and returning existing castings to MCPW (regardless of condition), and furnishing and installing new frame and grate; removing and disposing capstone; removing and disposing concrete collar; furnishing and installing concrete collar and lintel; repairing existing capstone catch basin walls; hand dismantling existing walls as necessary; removing/adding brick, mortar or concrete; furnishing and installing brick and mortar or concrete riser section; masonry; forms; epoxy polysulfide grout; rebar; grout.

Unit price bid also includes cost of: corbelling concrete riser section.

S604-5.06 Relocate Existing Catch Basin and Field Inlet

Unit price bid also includes cost of: removing, moving, resetting and cleaning existing precast structure; removing, cleaning and returning existing castings to MCPW (regardless of condition); removing and disposing concrete collar; repairing existing structure walls that are damaged; 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; furnishing and installing new frame and grate; forms; concrete riser section; epoxy polysulfide grout; rebar, grout; drilling holes; blocking up and sealing excess openings; damp proofing.

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

S604-5.07 Temporary Setting Catch Basin and Field Inlet Castings

Use of this item will only be at locations where approved for temporary adjustment by Project Manager.

Unit price bid also includes cost of: excavation; backfill; furnishing, installing, removing and disposing temporary brick and mortar riser section; sand fill; temporary setting of castings.

Final alteration of existing catch basin will be paid for under separate bid item.

Separate measurement and payment for existing structures will be made once under alteration item, and once under temporary setting item.

S604-5.08 Damp Proof Existing Catch Basin and Field Inlet

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

Separate payment under this bid item will only be made where no other work is being performed on existing structure.

S604-5.09 Existing Catch Basin and Field Inlet Wall Repair

Unit price bid also includes cost of: dismantling and repairing damaged structure walls; furnishing and installing repair materials.

Separate payment under this bid item will only be made where no other work is being performed on existing structure.

S604-5.10 Abandon and Remove Existing Catch Basin, Field Inlet

Unit price bid also includes cost of: removing, cleaning and returning existing castings to MCPW (regardless of condition); removing and disposing capstone; 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 lateral pipe and underdrain pipe will be paid for under separate bid items.

S604-5.11 Alter Existing Sewer Manhole

A. General All Items

Unit price bid also includes cost of: excavation; backfill; resetting or replacing existing castings; or removing, cleaning and resetting existing castings; or removing, cleaning and returning existing castings to MCPW (regardless of condition) and furnishing and installing new frame and cover; removing and disposing concrete collar and extraneous material.

Furnishing and installing new precast concrete top slab will be included in unit price bid for item or paid for separately as indicated in item description.

Furnishing and installing new precast concrete riser with appurtenances will be paid for separately.

B. Existing Brick/Stone Sewer Manhole Structure

Unit price bid also includes cost of: removing/adding additional courses brick/concrete block, or furnishing and installing concrete adjustment ring; mortar levelling course.

Bid item with installation of new concrete top slab, unit price bid also includes cost of: removing additional courses brick/concrete block; furnishing and installing precast concrete top slab; mortar leveling course; concrete encasement.

C. Existing Precast Concrete Sewer Manhole Structure

Unit price bid also includes cost of: removing/adding additional courses brick/concrete block, or furnishing and installing concrete adjustment ring; mortar levelling course.

Bid item with installation of new concrete top slab, unit price bid also includes cost of: removing and disposing existing manhole top slab; saw cutting, removing and disposing portion of top of existing riser section; finishing cut section by milling or grinding; furnishing and installing precast concrete top slab; mortar leveling course; vertical dowels; drilling; grout.

S604-5.12 Temporary Setting Sewer Manhole Castings

Use of this item will only be at locations where approved for temporary adjustment by Project Manager.

Unit price bid also includes cost of: excavation; backfill; furnishing, installing, removing and disposing temporary brick and mortar riser section; temporary setting of castings.

Final alteration of existing sewer manhole will be paid for under separate bid item.

Separate measurement and payment for existing structures will be made once under alteration item, and once under temporary setting item.

S604-5.13 Abandon and Remove Existing Sewer Manhole

Unit price bid also includes cost of: removing, cleaning and returning existing castings to MCPW (regardless of condition); 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).

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

S604-5.14 New Sewer Manhole Precast Concrete Flat Top Slab

Unit price bid includes cost of: furnishing and installing precast concrete flat top slab.

S604-5.15 New Sewer Manhole Precast Concrete Riser

Unit price bid includes cost of: furnishing and installing precast concrete riser; manhole steps; rubber ring gaskets; flexible joint sealer.

S604-5.16 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 where indicated under Basis of Payment, or in item description.

Bid items that include concrete collar as indicated in item description, will always include excavation and backfill.

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.

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 full 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; asphalt joint adhesive; and asphalt tack coat.

Payment will be made under:

ITEM NO.	ITEM	PAY UNIT
S604.30	New Type A Catch Basin	Each
S604.3002	New Type A Catch Basin (Including Concrete Collar)	Each
S604.31	New Type B Catch Basin	Each
S604.3102	New Type B Catch Basin (Including Concrete Collar)	Each
S604.32	New Type C Catch Basin	Each
S604.3202	New Type C Catch Basin (Including Concrete Collar)	Each
S604.33	New Type D Catch Basin (Including Concrete Collar)	Each
S604.34	New Field Inlet	Each
S604.3701	New Type B Catch Basin - Installed (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.3702	New Type B Catch Basin - Installed (Including Excavation, Backfill and Full Pavement Restoration)	Each
S604.3703	New Type D Catch Basin – Installed (Including Concrete Collar) (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.3704	New Type D Catch Basin - Installed (Including Concrete Collar) (Including Excavation, Backfill and Full Pavement Restoration)	Each
S604.3705	New Type B Catch Basin - Installed (Including Concrete Collar) (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.3706	New Type B Catch Basin - Installed (Including Concrete Collar) (Including Excavation, Backfill and Full Pavement Restoration)	Each
S604.40	Additional Depth New Type A Catch Basin	Linear Foot
S604.4002	Additional Depth New Type A Catch Basin (Including Excavation and Backfill)	Linear Foot
S604.41	Additional Depth New Type B Catch Basin	Linear Foot
S604.4102	Additional Depth New Type B Catch Basin (Including Excavation and Backfill)	Linear Foot
S604.42	Additional Depth New Type C Catch Basin	Linear Foot
S604.4202	Additional Depth New Type C Catch Basin (Including Excavation and Backfill)	Linear Foot
S604.43	Additional Depth New Type D Catch Basin	Linear Foot
S604.4302	Additional Depth New Type D Catch Basin (Including Excavation and Backfill)	Linear Foot
S604.44	Additional Depth New Field Inlet	Linear Foot
S604.4402	Additional Depth New Field Inlet (Including Excavation and Backfill)	Linear Foot
S604.5007	Alter Existing Type A/B Catch Basin	Each
S604.5008	Alter Existing Type A/B Catch Basin (Including Concrete Collar) (Including Pavement Base Restoration)	Each
S604.5009	Alter Existing Type A/B Catch Basin (Including Concrete Collar) (Including Full Pavement Restoration)	Each
S604.5010	Alter Existing Type A/B Catch Basin (Including Concrete Collar)	Each
S604.5019	Alter Existing Type C Catch Basin	Each
S604.5020	Alter Existing Type C Catch Basin (Including Concrete Collar) (Including Pavement Base Restoration)	Each
S604.5021	Alter Existing Type C Catch Basin (Including Concrete Collar) (Including Full Pavement Restoration)	Each
S604.5022	Alter Existing Type C Catch Basin (Including Concrete Collar)	Each
S604.5026	Alter Existing Type D Catch Basin (Including Concrete Collar)	Each
S604.5031	Alter Existing Field Inlet	Each
S604.5105	Alter Existing Capstone Catch Basin (Including Concrete Collar)	Each
S604.5105	Alter Existing Capstone Catch Basin (Including Concrete Collar) (Including Pavement Base Restoration)	Each
S604.5105	Alter Existing Capstone Catch Basin (Including Concrete Collar)	Each

	(Including Full Pavement Restoration)	
S604.5202	Relocate Existing Type A/B Catch Basin	Each
S604.5203	Relocate Existing Type A/B Catch Basin (Including Concrete Collar)	Each
S604.5205	Relocate Existing Type C Catch Basin	Each
S604.5206	Relocate Existing Type C Catch Basin (Including Concrete Collar)	Each
S604.5207	Relocate Existing Type D Catch Basin (Including Concrete Collar)	Each
S604.5208	Relocate Existing Field Inlet	Each
S604.54	Damp Proof Existing Catch Basin	Each
S604.5402	Damp Proof Existing Field Inlet	Each
S604.550301	Temporary Setting Catch Basin Castings	Each
S604.5509	Temporary Setting Field Inlet Castings	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 Full 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	Existing Catch Basin Wall Repair	Square Foot
S604.5901	Existing Field Inlet Wall Repair	Square Foot
S604.6020	Alter Existing Brick/Stone Sewer Manhole – Existing Castings at/or Below Finished Grade	Each
S604.6021	Alter Existing Brick/Stone Sewer Manhole – Existing Castings at/or Below Finished Grade (Including New Precast Flat Top Slab)	Each
S604.6022	Alter Existing Brick/Stone Sewer Manhole – Existing Castings Above Finished Grade	Each
S604.6023	Alter Existing Brick/Stone Sewer Manhole – Existing Castings Above Finished Grade (Including New Precast Flat Top Slab)	Each
S604.6024	Alter Existing Brick/Stone Sewer Manhole – Existing Castings at/or Below Finished Grade (Including Concrete Collar)	Each
S604.6025	Alter Existing Brick/Stone Sewer Manhole – Existing Castings at/or Below Finished Grade (Including Concrete Collar) (Including New Precast Flat Top Slab)	Each
S604.6026	Alter Existing Brick/Stone Sewer Manhole – Existing Castings Above Finished Grade (Including Concrete Collar)	Each
S604.6027	Alter Existing Brick/Stone Sewer Manhole – Existing Castings Above Finished Grade (Including Concrete Collar) (Including New Precast Flat Top Slab)	Each
S604.6028	Alter Existing Precast Sewer Manhole – Existing Castings at/or Below Finished Grade	Each
S604.6029	Alter Existing Precast Sewer Manhole - Existing Castings at/or Below Finished Grade (Including New Precast Flat Top Slab)	Each
S604.6030	Alter Existing Precast Sewer Manhole - Existing Castings Above Finished Grade	Each
S604.6031	Alter Existing Precast Sewer Manhole - Existing Castings Above Finished Grade (Including New Precast Flat Top Slab)	Each
S604.6032	Alter Existing Precast Sewer Manhole – Existing Castings at/or Below Finished Grade (Including Concrete Collar)	Each
S604.6033	Alter Existing Precast Sewer Manhole - Existing Castings at/or Below Finished Grade (Including Concrete Collar) (Including New Precast Flat Top Slab)	Each
S604.6034	Alter Existing Precast Sewer Manhole - Existing Castings Above Finished Grade (Including Concrete Collar)	Each
S604.6035	Alter Existing Precast Sewer Manhole - Existing Castings Above Finished Grade (Including Concrete Collar) (Including New Precast Flat Top Slab)	Each
S604.6202	Temporary Setting Sewer Manhole Castings	Each
S604.6601	Abandon and Remove Existing Sewer Manhole	Each

S604.6602	Abandon and Remove Existing Sewer Manhole (Including Excavation and Backfill)	Each
S604.6603	Abandon and Remove Existing Sewer Manhole (Including Excavation, Backfill and Pavement Base Restoration)	Each
S604.6604	Abandon and Remove Existing Sewer Manhole (Including Excavation, Backfill and Full 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