

State of Ohio
Department of Transportation
Supplemental Specification 802
Post Construction Inspection of Storm Sewers and Drainage Structures
April 15, 2005

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802.01 General. The Contractor may elect to install all or part of the storm sewer runs per SS 802 instead of specification 603. For those storm sewer runs on which the Contractor elects to implement SS 802 an installation plan will be provided to the project engineer. Furnish the installation plan in writing 30 days in advance of any work on those storm sewer runs. All work under SS 802 is included in the appropriate 603 items as full compensation.

The Contractor may also elect to install all or part of the Item 604 drainage structures per SS 802 instead of specification. For those drainage structures on which the Contractor elects to implement SS 802 an installation plan will be provided to the project engineer. Furnish the installation plan in writing 30 days in advance of any work on those drainage structures. All work under SS 802 is included in the appropriate 604 items as full compensation.

The bedding depth, backfill height, trench width, and compaction requirements along with all the materials used for the bedding and backfill are the choice of the Contractor and may be the same as 603 and 604. The installation method for the storm sewers and the drainage structures is the choice of the Contractor and may be the same as 603 and 604. After completion of the installations post construction inspection will take place. Any required corrections including any settlement problems will be corrected before acceptance.

802.02 Definitions.

- A. Storm Sewers.** Defined as type B and C conduits in 603.
- B. Drainage Structures.** Defined as catch basins, manholes, and inlets in 604. The construction of precast structures and cast in place structures is covered by this

specification. Reconstruction and adjustment construction is not covered by this specification.

- C. **Lay Length.** Defined as the length of a standard stick or section of storm sewer as normally supplied by the manufacture.
- D. **Run of Pipe.** The pipe placed between drainage structures or between a drainage structure and an out fall.
- E. **Infiltration.** Defined as backfill material in the storm sewer or drainage structure due to improper joint construction or storm sewer connections with the drainage structures.
- F. **Inspection Team.** The Project Engineer, a Representative from the Contractor and a Department Technical person.
- G. **Installation Plan.** A plan submitted to the project as outlined in section 802.04.
- H. **Installation Report.** A report on how the installation plan was met as outlined in section 802.05.
- I. **Slip-line and re-line.** This repair is described in SS 837.
- J. **Fold and Form.** This repair is described in ASTM F 1533-94 and F1606-95 with installation per the material manufacturer.
- K. **Pressure Grout.** Is per the pressure grout equipment manufacturer.
- L. **Epoxy Injection.** Is per the epoxy injection equipment manufacturer.
- M. **Re-rounding.** Is per the re-rounding equipment furnished by the storm sewers' manufacture.
- N. **Internal Sleeve.** This joint repair uses either an internal coupling or an internal band.
- J. **Concerns.** Examples are spalls, cracks, tears, buckles, and deflections.
- K. **Deviations.** Examples are bath tubs, horizontal bends, or kinks.

802.03 Description. This work consists of furnishing an installation plan for the storm sewers and drainage structures, video or visual inspection of the storm sewers and drainage structures, and furnishing an installation report on the storm sewers and drainage structures by means of the following:

- A. Furnish an Installation Plan.
- B. Furnish an Installation Report.
- C. Furnish a video inspection of the storm sewers that are less than or equal to 48 inches (1200 mm) for review by the inspection team.
- D. Furnish a visual inspection of the storm sewers that are greater than 48 inches (1200 mm) for review by the inspection team. Include a written and photographic or videotape record. The inspection team maybe part of the visual inspection.
- E. Furnish a visual inspection of the drainage structures for review by the inspection team. Include a written and photographic or videotape record. The inspection team may be part of the visual inspection.

Upon completion of the installation plan and installation report and any corrections, the storm sewers or drainage structures are deemed completed. Furnish the Engineer with a copy of any corrections.

802.04 Installation Plan. Submit an installation plan for each size and material type of storm sewer and each drainage structure type that will be constructed under SS 802. The installation plan will furnish the kind of bedding and backfill material to be used, the compaction density that the bedding and backfill material will achieve, the trench geometry, and the equipment that will be furnished to achieve that compaction density.

802.05 Installation Report Storm Sewers. Submit an installation report to the project engineer on how the installation plan was met, for storm sewers with or without inspection by the Department or a third party. Submit the installation report within 10 days after the final fill has been placed.

The installation report will be completed as a series of checks. Start making checks at the beginning of each run, every 250 ft. (75m), at each change in storm sewer material or size, and at all drainage structures. Make a minimum of 2 checks per run of pipe.

Checks for the Storm Sewers include:

- A. Project Number
- B. Co.-Rt.-Sec.
- C. Location
- D. Reference Number
- E. Type of Storm Sewer (B or C)
- F. Storm Sewer Material and Strength Classifications
- G. Field Measured Outside Diameter of Flexible Pipe Storm Sewer before Installation, OD
- H. Field Measured Inside Diameter of Flexible Pipe Storm Sewer before Installation, ID
- I. Measured Width of Trench at Top of the Storm Sewer, W
- J. Measured Thickness of Bedding, B
- K. Measured Distance from Storm Sewer OD to Trench Wall, T
- L. Measured Height of Embankment Backfill, H
- M. Type of Bedding Material
- N. Type of Backfill Material
- O. Diagrams of Installation including a Trench Cross Section
- P. Compaction Test Method
- Q. Compaction Method for Bedding Material
- R. Compaction Method for Backfill Material
- S. Any problems encountered and how they were resolved in the form of a report
- T. Signatures of who did the Installation Report

The installation report will be legible and in water proof blue or black ink on standard letter head paper. A typed installation report is preferred.

802.06 Installation Report Drainage Structures. Submit the installation report to the project engineer on how the installation plan was met for the drainage structures, with or without inspection by the Department or a third party. Submit the installation report within 10 days after the final fill has been placed.

The installation report will be completed for each drainage structure.

Checks for Drainage Structures include:

- A. Project Number
- B. Co.-Rt.-Sec.
- C. Location
- D. Reference Number
- E. Type of Structure
- F. A Measured Distance from the Drainage Structure to the Excavation for the Drainage Structure at the top of the Excavation
- G. Material Type of Bedding
- H. Thickness of Bedding
- I. Compaction Test Method
- J. Bedding Materials Compaction Method
- K. Compaction Method for Backfill Material
- L. Diagrams of Installation including a Cross Section of the Excavation for the Drainage Structure
- M. Any problems encountered and how they were resolved
- N. Signatures of who did the Installation Report

The installation report will be legible and in water proof blue or black ink on standard letter head paper. A typed installation report is preferred.

802.07 Equipment. Furnish a new color video recording for the Department. Furnish video equipment such that during color filming the identification, location, and description of all concerns, and infiltrations can be made as required by means of audio. Furnish a camera that has sufficient light such that all concerns and infiltrations are readily seen. Furnish a crawler that is able to navigate without difficulty the run of storm sewers being filmed. Furnish all required equipment needed to determine the degree of any concerns, and infiltration at no additional cost to the Department. Furnish all required equipment to make corrections at no additional cost to the Department. Furnish all necessary equipment required to ensure safety meeting all State and Federal regulations at no additional cost to the Department.

802.08 Inspection. After the completion of the final fill and before the project final inspection, inspect the storm sewers and the drainage structures. Video the storm sewers that have a rise equal to or less than 48 inches (1200mm). Visually inspect the storm sewers that have a rise greater than 48 inches (1200mm). Visually inspect the drainage structures. Furnish the video inspection for review to the inspection team. Furnish the visual inspection for review to the inspection team. The inspection team can be part of any visual inspections.

If deemed necessary by the inspection team furnish additional inspection to determine the degree of any concerns. Complete this work at no additional cost to the Department.

802.09 Construction Inspection Requirements.

A. Storm Sewer Video Inspection - This work includes but not limit to:

1. For each inspection record the Project Number, County-Route-Section, date, time of filming, type and size of storm sewer, station with offset, and viewing direction on the tape.
2. Code each change in storm sewer size, material type or at each drainage structure as a new inspection.

B. Storm Sewer Visual Inspection – This work includes but not limited to:

1. For each inspection record the Project Number, County-Route-Section, date, time of inspection, type and size of storm sewer, station with offset.
2. Each change in storm sewers size, material type or at each drainage structure warrant's a new inspection.
3. Furnish a written and photographic or video record of any concerns.

C. Drainage Structure Visual Inspection - This work is for each drainage structure and includes but not be limited to:

1. For each inspection verify the plan elevation at the invert and the grate using survey.
2. For each inspection verify the structure matches their corresponding standard drawing details or plan details.
3. For each inspection verify the grates fit properly and are placed on the required slope.
4. For each inspection verify the station and offset for plan correctness using survey.
5. For each inspection verify that a flat slab top is furnished on all manholes unless the plans specify an eccentric cone top.
6. Furnish a written and photographic or video record of any concerns.

802.10 Repairs Storm Sewers. All storm sewers that show no concerns are deemed acceptable. Below is a list of concerns with corrections. All corrections listed per method may not work for all pipe types. The correction for concerns not listed below is replacement. Any deviations found correct by either re-lay, replace, or as determined by the Department or by a method approved by the Department. Additional inspections may be required by the project engineer 30 days after the correction has been made with no additional cost to the Department.

A. Storm Sewer Rigid. Rigid storm sewer corrections for longitudinal cracks (cracks along the length of the barrel) is per table 802.10.A. The width and number of cracks govern this correction.

1. METHOD 1

- a. Pressure grout

- b. Epoxy injection
- c. Fold and form
- d. Slip-line
- e. Approved re-line method
- f. Replace
- g. Or as determined by the Department or by a method approved by the Department

2. METHOD 2

- a. Fold and form
- b. Slip-line
- c. Approved re-line method
- d. Replace
- e. Or as determined by the Department or by a method approved by the Department

TABLE 802.10.A

NUMBER OF CRACKS	WIDTH	LENGTH	REQUIRED REPAIR
1 OR MORE	LESS THAN .075 IN (1.8 mm)	ANY	DO NOTHING
1 OR MORE	0.075 IN (1.8mm) UP TO 0.15 IN (3.8 mm)	ANY	METHOD 1 ALL CRACKS
1 OR MORE	GREATER THAN 0.15 IN (3.8 mm)	ANY	METHOD 2 ALL CRACKS

B. Storm Sewers Flexible. Flexible storm sewers with deflection in any plane (i.e., horizontal plane) measured perpendicular divided by the measured ID. The deflection will govern this correction. Flexible storm sewer corrections for deflections are per table 802.10.B.

1. METHOD 1

- a. Re-round
- b. Re-lay
- c. Replace
- d. Or as determined by the Department or by a method approved by the Department.

2. METHOD 2

- a. Re-lay
- b. Replace
- c. Or as determined by the Department or by a method approved by the Department

TABLE 802.10.B

DEFLECTION	REQUIRED REPAIR
LESS THAN OR EQUAL TO 5%	Do Nothing
GREATER THAN 5% AND LESS THAN 10%	Method 1
EQUAL TO 10% OR GREATER	Method 2

C. Joints. Rigid storm sewer, and flexible storm sewer joints that are non-rubber gasket (mastic, mortar, collars, wraps) the joint gap correction is per table 802.10.C. Rubber gasket joints to be installed and inspected per the manufacturer's recommendations.

1. METHOD 1

- a. Pressure grout
- b. Epoxy injection
- c. Internal sleeve
- d. Re-lay
- e. Replace
- f. Or as determined by the Department or by a method approved by the Department

2. METHOD 2

- a. Fold and form
- b. Slip-line
- c. Internal sleeve
- d. Approved re-line method
- e. Re-lay
- f. Replace
- g. Or as determined by the Department or by a method approved by the Department

3. METHOD 3

- a. Re-lay
- b. Replace
- c. Or as determined by the Department or by a method approved by the Department

TABLE 802.10.C

JOINT GAP *	REQUIRED REPAIR
LESS THAN 1 INCH (25 mm)	DO NOTHING
1 INCH (25 mm) TO LESS THAN 2 INCH (50 mm)	METHOD 1
2 INCH (50 mm) TO LESS THAN 3 INCH (75 mm)	METHOD 2
3 INCH (75 mm) OR MORE	METHOD 3

* Allowed gaps for joints using external couplers is two times those indicated in table 802.10 C.

D. Infiltration. Storm sewer to drainage structure connections such that there is free flowing water or infiltration use correction method 1.

1. METHOD 1

- a. Pressure grout
- b. Replace
- c. Or as determined by the Department or by a method approved by the Department.

802.11 Repairs Drainage Structures. All drainage structures that show no concerns are deemed acceptable. Below is a list of concerns with corrections. The correction for concerns not listed below is replacement. Any deviations found correct by either re-lay, replace, or as determined by the Department or by a method approved by the Department.

Additional inspections may be required by the project engineer 30 days after the correction has been made with no additional cost to the Department.

A. Drainage structures that are precast

1. Grate

- a. The slope and elevation of the grate or cover shall be within plus or minus 1 inch (25mm), or the grate shall be adjusted to conform to the plans.
- b. Broken or cracked grates shall be replaced.
- c. Manholes shall be provided with a flat slab top centered on supporting walls with the grate center located per the plan station and offset not the slab base center.
- d. Mortar between the frame and grate shall be cause for rejection.

2. Sump

- a. The elevation shall be within plus or minus 1 inch (25mm), or be reset.
- b. The inside finish shall be per the standard drawings with any areas of repair patched with trowelable mortar.

3. Storm Sewers Block Out For Pipe Which Are Perpendicular To The Structure

- a. The storm sewer block outs shall be within plus or minus 1 inch (25mm), of the elevation required by the plans, and shall be finished as detailed in the standard drawings and the opening shall not be greater than 2 inches (50mm) of the supplied pipe OD or a new structure sump shall be provided.

B. Drainage structures that are cast in place

1. Grate

- a. The slope and elevation of the grate or cover shall be within plus or minus 1 inch (25mm), or the grate shall be adjusted to conform to the plans.
- b. Broken or cracked grates shall be replaced.
- c. Manholes shall have the grate center located per the plan station and offset not the slab base center.

2. Sump

- a. The elevation shall be within plus or minus 1 in. (25mm) or be reset.
- b. The inside finish shall be per the standard drawings with any areas of repair patched with trowelable mortar.

802.12 Settlements. Correct any settlements that occur do to the method or material used in placing the storm sewers or drainage structures. These corrections will include all material and equipment required for the corrections. These corrections will be at no additional cost to the Department.

802.13 Method of Measurement. The storm sewers to be paid for are measured per Item 603.

All drainage structures to be paid for are measured per Item 604.

Any additional testing, i.e., deflection testing, the installation plan, and the installation report the inspections either video or visual shall be at no additional cost to the Department.

802.14 Basis of Payment. Correct all damage caused by the pipe installation at no cost to the Department. The accepted quantities of SS-802 for storm sewers is per the contract unit price per foot (meter) for the corresponding 603 Item. The accepted quantities of SS-802 for drainage structures is per the contract unit price each for the corresponding 604 Item.

Designers note:

Add to all jobs that have any 603 Type B or C Storm Sewers or any 604 catch basins or manholes.

No other changes are required.