SECTION 334000

STORM DRAINAGE UTILITIES

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***NOTE TO SPECIFIER***

*Use this Specification Section for Mail Processing Facilities.*

***This is a Type 1 Specification with completely editable text; therefore, any portion of the text can be modified by the A/E preparing the Solicitation Package to suit the project.***

*For Design/Build projects, do not delete the Notes to Specifier in this Section so that they may be available to Design/Build entity when preparing the Construction Documents.*

*For the Design/Build entity, this specification is intended as a guide for the Architect/Engineer preparing the Construction Documents.*

*The MPF specifications may also be used for Design/Bid/Build projects. In either case, it is the responsibility of the design professional to edit the Specifications Sections as appropriate for the project.*

*Text shown in brackets must be modified as needed for project specific requirements.* *See the “Using the USPS Guide Specifications” document in Folder C for more information.*

*The last date that USPS revised this standard specification section occurs in two places, at the end of this section and in the Table of Contents. If the date in this section matches the date in the Table of Contents, then you are using the latest version. Do not delete or revise the “last revised” date at the end of the section during the development of the Project Manual.*

*The footer in this section should be edited to replace the text, “USPS MPF SPECIFICATION” with the project name, and the blank date in the center should be replaced with the submission date, for interim design reviews, or the issue date of the completed Project Manual.*

***Use this section where Storm Drainage is part of the Work. Before editing this Section, obtain the "Report of Subsurface Investigation" prepared by the Geotechnical Engineer. Read the report and incorporate the recommendations included in the report into this Section.***

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1. GENERAL
	1. SUMMARY
		1. Section Includes:
			1. Site storm sewer drainage piping, fittings and accessories, and bedding.
			2. Connection of storm sewer system to municipal storm sewer system.
			3. Catch basins, paved area drainage, site surface drainage, and storm water detention facilities.
		2. Related Documents: The Contract Documents, as defined in the General Conditions, apply to the Work of this Section. Additional requirements and information necessary to complete the Work of this Section may be found in other Documents.
		3. Related Sections:
			1. Section 312300 ‑ Excavation and Fill: Earthwork for utilities.
			2. Section 334913‑ Storm Drainage Manholes, Frames, and Covers: Manholes, manhole lids, frames, and accessories.
			3. Section 333000 ‑ Sanitary Sewerage Utilities: Site sanitary sewer system.
			4. Section 033000 - Cast-In-Place Concrete: Concrete for catch basins, inlets, and junction boxes.
	2. REFERENCES
		1. American Society for Testing and Materials (ASTM):
			1. ASTM A 760 - Standard Specification for Corrugated Steel Pipe, Metallic Coated for Sewers and Drains.
			2. ASTM C 12 ‑ Practice for Installing Vitrified Clay Pipe Lines.
			3. ASTM C 76 ‑ Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
			4. ASTM C 443 ‑ Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.
			5. ASTM D 2321 - Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
			6. ASTM D 3034 ‑ Specification for Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings.
			7. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
	3. DEFINITIONS
		1. Bedding: Fill placed under, beside and directly over pipe, prior to start of backfill operations.
	4. SUBMITTALS
		1. Section 017704 - Closeout Procedures and Training: Procedures for closeout submittals.
			1. Project Record Documents: Accurately record the following.
				1. Actual locations of pipe runs, connections, manholes, catch basins, cleanouts, and invert elevations.
				2. Identify and describe unexpected variations to subsoil conditions and location of uncharted utilities.
	5. QUALITY ASSURANCE
		1. Regulatory Requirements: Conform to local Public Works Standard Specifications for materials and installation of the work of this Section.
2. PRODUCTS

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**NOTE TO SPECIFIER**

Edit PIPE MATERIALS paragraph below for type of pipe used for this Project.

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* 1. PIPE MATERIALS
		1. Reinforced Concrete Pipe:
			1. Pipe: ASTM C 76, Class III unless indicated otherwise on Drawings.
			2. Gaskets: ASTM C 443; rubber compression gaskets installed in accordance with manufacturer's published instructions.
		2. Corrugated Steel Pipe:
			1. Pipe: ASTM A 760; galvanized, aluminized or bituminous coated round pipe, arch pipe, or slotted drain pipe as indicated on Drawings., 16 gage unless otherwise indicated.
				1. Provide slotted drain pipe with 1.75 inch wide drain guide waterway openings and 6 inch minimum height drain guide.
			2. Fittings:
				1. Matching band connectors.
				2. Sleeve gaskets in accordance with manufacturer's recommendations.
		3. Spiral Rib Metal Pipe:
			1. Pipe: ASTM A 760, Type 1R; Galvanized, aluminized or bituminous coated as indicated on Drawings.
			2. Fittings: Provide re‑ corrugated pipe ends with semi‑corrugated Hugger‑type bands and "O" ring gaskets in accordance with manufacturers recommendations.
		4. Polyvinyl Chloride (PVC) Pipe:
			1. Pipe: ASTM D 3034, SDR 35 Rated.
				1. Continuously mark pipe with manufacturer's name, pipe size, cell classification, SDR rating, and ASTM D 3034 classification.
			2. Joints: ASTM D 3034, Table 2; integrally molded bell ends with factory supplied elastomeric gaskets and lubricant.
		5. High-Density Polyethylene (HDPE) Pipe:
			1. Pipe: AASHTO M252, M294 & MP7-97 Type “S” (Corrugated Polyethylene Pipe).
				1. Pipe shall have a smooth interior and a corrugated annular exterior.
				2. Continuously mark pipe with manufacturer's name, pipe size and AASHTO classification.
				3. Pipe shall be installed per manufacturer’s recommendations.
				4. Subject to compliance with project requirements, manufacturers offering Products which may be incorporated in the Work include the following:

Hancor, Findlay, OH (888) 367-7473: Sure-Lok F477.

Section 016000 - Product Requirements: Product options and substitutions. Substitutions: permitted.

* + - 1. Joints: Pipe shall be joined with a bell and spigot joint incorporating ASTM F477 gasket material insuring a leak resistant performance.
	1. INLETS, CATCH BASINS AND JUNCTION BOXES
		1. Lid and Frame: Cast iron as indicated on Drawings.
		2. Structure: As indicated on Drawings.
		3. Concrete: Specified in Section 033000.

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**NOTE TO SPECIFIER**

The following paragraph may be included when fuel tanks and on-site fueling is to occur at the facility.

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* + 1. Oil/Sediment Separator
			1. Separator shall remove oil and sediment from storm water during frequent wet weather events. Separator shall treat a minimum of 75 to 90 percent of the annual runoff volume and be capable of removing 50 to 80 percent of the total suspended sediment load and greater than 90 percent of the floatable free oil. Separator must be capable of trapping silt and clay size particles in addition to large particles. Separator shall be installed underground as part of the storm sewer system and be structurally designed for (HS-20 min.) traffic loading at the surface. Storage in the separator shall be vertically oriented. Separator shall be maintainable from the surface via one access point.
			2. Separator shall be equipped with an internal high flow bypass that regulates the flow rate into the treatment chamber and conveys high flows directly to the outlet such that scour and/or re-suspension of material previously collected in the separator does not occur. External bypasses are not acceptable. Bypass area shall be physically separated from the separation area to prevent mixing. Separator shall be circular, and constructed from either fiberglass or precast concrete risers. Concrete separator shall be designed and manufactured in accordance with ASTM C-478. Concrete joints shall be oil resistance, water tight and meet the design criteria according to ASTM C-443. In the concrete separator, a fiberglass insert, bolted and sealed watertight to the inside of the bypass chamber, shall divert low to normal stormwater flows into the treatment chamber. A minimum of 12 inches of oil storage shall be lined with fiberglass to provide secondary containment of any hydrocarbon materials.
			3. Difference between the inlet pipe elevation to the separator and the outlet pipe elevation from the separator shall be 1 inch. For a multiple inlet pipe or inlet design there shall be a 3 inch difference between horizontal inlet pipe inverts and the outlet pipe invert. Separator shall be able to be used as a bend structure in the storm sewer system. Access cover for all non-inlet type separators shall clearly indicate that it is an oil/sediment separator.
			4. Separator shall be capable of containing spills of floatable substances such as free oil and not be compromised by temporary backwater conditions (i.e., trapped pollutants should not be re-suspended and scoured from the separator during backwater conditions).
			5. Capabilities of the selected separator must be documented with scientific studies and reports. Preference will be given to devices that have been verified by a state or federal stormwater verification program.
			6. Subject to compliance with project requirements, manufacturers offering Products which may be incorporated in the Work include the following:
				1. Stormceptor manufactured by Carder Concrete Products, Littleton, CO (888) 220-9190.
				2. Stormceptor manufactured by Rinker Stormceptor, Kansas City, MO (800) 909-7763.
				3. Baysaver manufactured by Baysaver Technologies, Mount Airy, MD (800) 229-7283.
1. EXECUTION
	1. EXAMINATION
		1. Section 017300 - Execution: Verification of existing conditions before starting work.
		2. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive Work.
			1. Verify that survey benchmark and intended elevations for the Work are as indicated on Drawings.
			2. Verify that trench cut and excavation is ready to receive Work and excavations, dimensions, and elevations are as indicated on Drawings.
		3. Report in writing to Contracting Officer prevailing conditions that will adversely affect satisfactory execution of the Work of this Section. Do not proceed with Work until unsatisfactory conditions have been corrected.
		4. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to the United States Postal Service.
	2. PREPARATION
		1. Hand trim excavations to required elevations. Correct over excavation with fine aggregate.
		2. Remove large stones or other hard matter which could damage piping or impede consistent backfilling or compaction.
	3. BEDDING

* + 1. Excavate pipe trench as specified in Section 312300. Hand trim excavation for accurate placement of pipe to elevations indicated.
		2. Place bedding material at trench bottom, level materials in continuous layers not exceeding 6 inches compacted depth, each layer. Place compacted bedding material to elevation of paving subgrade as indicated on Drawings.
		3. Maintain optimum moisture content of bedding material to attain required compaction density.
		4. Remove excess backfill and excavated material from site.
	1. INSTALLATION ‑ PIPE
		1. Install pipe, fittings, and accessories in accordance with ASTM C 12, ASTM D 2321 or manufacturer's published instructions, and state or local requirements. Seal joints watertight.
		2. Install pipe on minimum 4 inch bedding as specified in Section 312300.
		3. Lay pipe to slope gradients indicated on Drawings.
		4. Install aggregate at sides and over top of pipe. Provide top cover to minimum compacted thickness equal to paving subgrade indicated on Drawings.
		5. Refer to Section 312300 for trenching requirements. Do not displace or damage pipe when compacting.
		6. Refer to Section 334913 for manhole requirements.
		7. Connect to municipal storm sewer systems, manholes, and inlets as indicated on Drawings.
	2. INSTALLATION ‑ CATCH BASINS, INLETS, AND JUNCTION BOXES
		1. Form bottom of excavation clean and smooth to elevation indicated on Drawings.
		2. Form and place cast‑in‑place concrete base pad, with provision for storm sewer pipe to be placed at required elevations.
		3. Form and place cast-in-place concrete walls, sleeved at required elevation, to receive storm sewer pipe as indicated on Drawings.
		4. Form and place cast-in-place top of structure as indicated on Drawings.
		5. Mount grate and frame level, in grout, secured to top section at elevation indicated.
	3. CONSTRUCTION
		1. Interface with Other work: Coordinate the Work with termination of storm sewer connection outside building including connection to municipal storm sewer system.
	4. FIELD QUALITY CONTROL
		1. Section 014000 - Quality Requirements: Field inspection and testing.
		2. Site Tests:
			1. Perform inspections prior to and immediately after placing bedding.
			2. Compaction: Specified in Section 312300.
				1. If tests indicate Work does not meet specified requirements, remove Work, replace and retest.
				2. Frequency of Tests: One test for each 50 lineal feet of trench.
			3. Perform the following tests in accordance with applicable local Public Works Department Standard Specifications and requirements.
				1. Pressure Test.
				2. Infiltration Test.
				3. Deflection Test.

END OF SECTION

USPS MPF Specification Last Revised: 10/1/2022