SECTION 334236 - STORMWATER TRENCH DRAINS

This Section specifies trench drains and accessories.

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes: Trench drains and accessories.
				2. Related Requirements:

List other Sections directly related to or affecting Work of this Section. Include Sections specifying information expected to be found in this Section as well as Sections required to describe complete system or assembly requirements.

Section 310000 - Earthwork: Excavating and backing for trench drain installation.

Section 310001 - Earthwork Materials: Material specifications for Earthwork items.

Section 334200 - Stormwater Conveyance: Connection to stormwater collection system.

* + - 1. REFERENCE STANDARDS

List reference standards included within text of this Section, with designations, numbers, and complete document titles.

* + - * 1. American Association of State and Highway Transportation Officials:

AASHTO HB-17 - Standard Specifications for Highway Bridges.

* + - 1. SUBMITTALS

Only request submittals needed to verify compliance with Project requirements.

* + - * 1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: Submit manufacturer information for trench drain materials and components.

USE PARAGRAPH BELOW WITH EPD REQUIREMENT WHEN PROJECT ESTIMATE IS $1M OR MORE.

* + - * 1. Submit an Environmental Product Declaration (EPD) from the manufacturer for concrete channel drains within this specification section, if available. A statement of the contractor’s good faith effort to obtain the EPD shall be provided if not available.

Manufacturer-provided EPDs must be Product Specific Type III (Third-Party Reviewed), in adherence with ISO 14025 *Environmental labels and declarations*, ISO 14044 *Environmental management – Life cycle assessment*, and ISO 21930 *Core rules for environmental product declarations of construction products and services.*

* + - * 1. Shop Drawings: Indicate critical dimensions, installation and anchoring requirements, and other details.
				2. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

Include separate Paragraphs for additional certifications.

* + - * 1. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.
				2. Source Quality-Control Submittals: Indicate results of [**shop**] [**factory**] tests and inspections.
				3. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
				4. Qualifications Statement:

Coordinate following Subparagraph with requirements specified in QUALIFICATIONS Article.

Submit qualifications for manufacturer.

* + - 1. CLOSEOUT SUBMITTALS
				1. Project Record Documents: Record actual locations of installed trench drains and accessories.
			2. QUALITY ASSURANCE

Include this Article to specify compliance with overall reference standards affecting products and installation included in this Section.

Include following Paragraph only when cost of acquiring specified standards is justified.

* + - * 1. Maintain <**\_\_\_\_\_\_\_\_**> [**copy**] [**copies**] of each standard affecting Work of this Section on Site.
			1. QUALIFICATIONS

Coordinate following Paragraph with requirements specified in SUBMITTALS Article.

* + - * 1. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years' [**documented**] experience.
			1. DELIVERY, STORAGE, AND HANDLING
				1. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
				2. Store products according to manufacturer instructions.
				3. Protection:

Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.

Provide additional protection according to manufacturer instructions.

* + - 1. EXISTING CONDITIONS
				1. Field Measurements:

Verify field measurements prior to fabrication.

Indicate field measurements on Shop Drawings.

1. PRODUCTS
	* + 1. TRENCH DRAINS
				1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=11937&mf=04&src=wd):

McNichols Co., (877) 879-0308, PO Box 30300, Tampa, FL 33630.

ACO, (440) 639- 7231, 9470 Pinecone Dr., Mentor, OH 44060.

Watts, (978) 688-1811, 815 Chestnut St., North Andover, MA 01845.

Approved equivalent.

Insert descriptive specifications below to identify Project requirements and to eliminate conflicts with products specified above.

* + - * 1. Performance and Design Criteria:

Loading:

H-20, according to AASHTO HB-17.

Impact Allowance: Additional [**30**] <**\_\_\_\_\_\_\_\_**> percent.

* + - * 1. Channel Drains:

Material: [**PE, with UV inhibitor**] [**Concrete**] <**\_\_\_\_\_\_\_\_**>.

Built-in Slope: [**0.7**] <**\_\_\_\_\_\_\_\_**> percent.

Width: [**6**] <\_\_\_\_\_\_\_\_> inches.

ID: [**4**] <\_\_\_\_\_\_\_\_> inches.

Bottom Radius: [**2**] <\_\_\_\_\_\_\_\_> inches.

Channel Section Length: [**4**] <\_\_\_\_\_\_\_\_> feet.

End Connections: Tongue and groove.

Bottom Outlet: Molded.

* + - * 1. Channel Grates:

Material: [**Polyolefin, with UV inhibitor**] [**Cast iron**] [**Ductile iron**] [**Galvanized steel**] <**\_\_\_\_\_\_\_\_**>.

Grate Openings: <\_\_\_\_\_\_\_\_> by <\_\_\_\_\_\_\_\_> inches.

Open Surface Area: <\_\_\_\_\_\_\_\_> sq. in./ft..

Inlet Capacity: <\_\_\_\_\_\_\_\_> gpm/ft..

Color: [**White**] [**Gray**] [**Black**] <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Accessories:

Grate lock.

End cap and screws.

End outlet.

Bottom outlet adapter.

* + - 1. MATERIALS

Select bedding and backfill material type for Project conditions. If more than one type is required, edit following Paragraph accordingly.

Verify bedding and backfill requirements with trench drain manufacturer.

* + - * 1. Bedding and Backfill:

Bedding: As specified in Section [**310001 – Earthwork Materials**] <**\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_**>.

Backfill: As specified in Section [**310001 – Earthwork Materials**] <**\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_**>.

Subsoil: No rocks more than 6 inches in diameter, frozen earth, or foreign matter.

* + - 1. SOURCE QUALITY CONTROL
				1. Provide shop inspection and testing of completed assembly.

Include one or both of following Paragraphs to require Director’s Representative inspection or witnessing of test at factory.

* + - * 1. Director’s Representative’s Inspection:

Make completed <**product name**> available for inspection at manufacturer's factory prior to packaging for shipment.

Notify Director’s Representative at least [**seven**] <**\_\_\_\_\_\_\_\_**> days before inspection is allowed.

* + - * 1. Director’s Representative’s Witnessing:

Allow witnessing of factory inspections and tests at manufacturer's test facility.

Notify Director’s Representative at least [**seven**] <**\_\_\_\_\_\_\_\_**> days before inspections and tests are scheduled.

Include following Paragraph if reliance on manufacturer's approved quality-control program is sufficient for Project requirements.

* + - * 1. Certificate of Compliance:

If manufacturer is approved by authorities having jurisdiction, submit certificate of compliance indicating Work performed at manufacturer's facility conforms to Contract Documents.

Specified shop tests are not required for Work performed by approved manufacturer.

1. EXECUTION
	* + 1. EXAMINATION
				1. Verify that excavation is ready to receive trench drains.
			2. PREPARATION
				1. Do not install trench drains if Site conditions induce loads exceeding structural capacity of trench drains.
				2. Inspection:

Inspect trench drains immediately prior to placement in excavation to verify that trench drains are internally clean and free from damage.

Remove and replace damaged sections.

* + - 1. INSTALLATION
				1. Excavation:

As specified in Section 310000 – Earthwork, excavate at location and to depth as indicated on Drawings.

Provide clearance around sidewalls of structure for construction operations.

If groundwater is encountered, prevent accumulation of water in excavations; place trench drains in dry trench.

* + - * 1. Place trench drain sections plumb and level, to elevations as indicated on Drawings, and according to manufacturer instructions.
				2. Backfilling: As specified in Section [**310000 - Earthwork**].
				3. Cut and fit for [**pipe**] [**conduit**] <**\_\_\_\_\_\_\_\_**>.
			1. FIELD QUALITY CONTROL
				1. Inspection:

Verify alignment of gate and components.

Verify that gate operates smoothly and does not bind or scrape.

* + - * 1. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than <**\_\_\_\_\_\_\_\_**> [**days**] [**hours**] on Site for installation, inspection, startup, field testing, and instructing Facility personnel in operation and maintenance of equipment.
				2. Equipment Acceptance:

Adjust, repair, modify, or replace components failing to perform as specified and rerun tests.

Make final adjustments to equipment under direction of manufacturer's representative.

* + - 1. DEMONSTRATION
				1. Demonstrate routine maintenance and emergency repair procedures to Facility personnel.

END OF SECTION 334236