SECTION (_____)

Steel Reinforced Polyethylene (SRPE)

Underground Detention and Infiltration Standard Specification

1.0 GENERAL

1.1 This item shall govern the furnishing and installation of Steel Reinforced Polyethylene (SRPE) underground detention and infiltration systems for nominal diameters 30" (750mm) through 120" (3000mm).

1.2 Contractor shall furnish all labor, materials, equipment and incidentals necessary to install the SRPE system, appurtenances and incidentals in accordance with the Drawings and as specified herein.

1.3 A stormwater treatment device upstream of the SRPE system is recommended as the appropriate means of pretreating for the purpose of extending the maintenance interval on the SRPE system and reducing the life cycle cost. Both engineered solutions shall be provided by a single supplier/manufacturer. Filtration by wrapping a system with geotextile is not an acceptable means of pretreatment.

1.4 Applicable provisions of any Division shall govern work in this section.

1.5 Related Standards

- 1.5.1 ASTM F2562 "Standard Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage"
- 1.5.2 AASHTO M 335 "Standard Specification for Steel-Reinforced Polyethylene (PE) Ribbed Pipe, 300- to 1500-mm (12- to 60-in.) Diameter"
- 1.5.3 AASHTO MP 40 "Standard Specification for Steel-Reinforced Polyethylene (PE) Ribbed Pipe, 1650- to 3000-mm (66- to 120-in.) Diameter"
- 1.5.4 ASTM D3350 "Standard Specification for Polyethylene Plastics Pipe and Fittings Materials"
- 1.5.5 ASTM D3212 "Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals"
- 1.5.6 ASTM D2321 "Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications"

1.6 Site layout drawings, product specifications, materials, hydraulic storage data and supporting calculations of proposed alternatives shall be submitted to the Engineer of Record (EOR) for review at a minimum of 10 working days prior to bid closing.

1.7 Shop drawings shall be annotated to indicate all materials to be furnished and installed under this section, and all applicable standards for materials, required tests of materials and design assumptions for structural analysis.

1.7.1 Before installation of the SRPE system, Contractor shall obtain written approval from the EOR for the stormwater system and the installation drawings.

1.8 All proposed alternatives to the SRPE system shall conform to applicable above referenced AASHTO and ASTM specifications.

2.0 MATERIALS

2.1 SRPE shall be manufactured in accordance with the applicable requirements of ASTM F2562 "Standard Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage".

2.2 Virgin high density polyethylene stress-rated resins are used to manufacture SRPE pipe and complimentary fabricated fittings. Resins shall conform to the minimum requirements of cell classification 345464C as defined and described in the latest version of ASTM D3350 "Standard Specification for Polyethylene Plastics Pipe and Fittings Materials".

2.3 Pipe lengths shall be joined on site using coupling bands, bell & spigots, or welded couplers especially designed for SRPE pipe. Joints shall meet one of the performance levels as required and specified:

2.3.1 Soil Tight Joints (30" – 120"") shall be plain ended SRPE pipe with Aluminized Type 2 (or optional Polymeric coated) CMP coupling bands and elastomeric gaskets.

2.3.2 QuikJoint® with UHP Technology (30" – 120") shall be gasketed, bell and spigot joints where both the bell and spigot are reinforced with steel that is fully encased in stress-rated high-density polyethylene. This joint may be subjected to a post installation, low pressure air test to confirm integrity.

2.3.3 Welded Coupler (WC) Joints (36" – 120") shall utilize plain ended SRPE pipe joined by welded couplers. The Contractor is responsible for sourcing plastic field welding services, unless otherwise stated in the quote, and providing a clean, dry surface for welding as described in the Contech Installation Guidelines for SRPE pipe.

2.4 The manufacturer of the SRPE system shall be one that has regularly been engaged in the engineering design and production of these systems for at least twelve (12) years, and which has a history of successful production, acceptable to the EOR. In accordance with the Drawings, the SRPE system shall be supplied by:

Contech Engineered Solutions
9100 Centre Pointe Drive, Suite 400
West Chester, OH, 45069
Tel: 1 800 338 1122

2.5 Sampling, testing, and inspection of PE resin, metal sheets and coils used for manufacturing the SRPE system shall be in accordance with the above applicable referenced specifications. All fabrication of the product shall occur within the United States.

3.0 PERFORMANCE

3.1 The SRPE system proposal shall be sized in accordance to the design provided and approved by the EOR. Any Contractor deviating from the design shown on the plans, to include: material, footprint, etc., shall provide to the EOR a summary report on stage-storage curves, design calculations, HydroCAD modeling and engineering drawings.

3.2 The SRPE system shall comprise of manhole access with minimum dimensions of 24-inch diameter to provide adequate inspection and maintenance entry into interior of the SRPE system. Manholes shall be provided to allow full entry into and visual inspection of the complete SRPE system, at a minimum as to allow full maintenance of the SRPE system. Cleanouts or inspection ports are not acceptable access points for maintenance and inspection, nor are any other alternatives which do not allow for full entry into the system.

3.3 Consult Contech Engineered Solutions, LLC, before altering row spacing and stone base thickness per project drawings

3.4 The SRPE system shall be designed for a minimum HS-20/HS-25 final live loading conditions with the minimum pipe stiffness as shown in Table 1. The SRPE system shall meet HS-20/HS-25 loading requirements with a minimum cover measured from Pipe Diameter (I.D.) to the bottom of flexible pavement as shown in Table 1.

Table 1: Pipe Dimensions and Cover Limits

Pipe Diameter (I.D.)	Outside Diameter	Unit Weight*	Minimum Cover**		Maximum Cover**	
inch	in. [mm]	lbs./ft	ft.	[m]	ft.	[m]
30	31.4 [798]	19.1	1	[.305]	50	[15.2]
36	37.7 [958]	24	1	[.305]	50	[15.2]
42	43.2 [1097]	27	1	[.305]	50	[15.2]
48	49.5 [1257]	30.8	1	[.305]	30	[9.1]
54	55.5 [1410]	36.1	1	[.305]	30	[9.1]
60	62.3 [1582]	43.6	1	[.305]	30	[9.1]
66	67.8 [1722]	56.9	1.5	[.457]	30	[9.1]

72	74.1[1882]	65.6	1.5	[.457]	30	[9.1]
78	81.2 [2063]	72.1	2	[.610]	30	[9.1]
84	85.9 [2182]	76.3	2	[.610]	30	[9.1]
96	97.8 [2484]	87	2	[.610]	30	[9.1]
108	111.3 [2827]	99.7	2.5	[.762]	25	[7.6]
120	121.9 [3096]	109	3	[.914]	25	[7.6]
* Approximate weights. Actual weight will vary with length and joint type.						
** Minimum and maximum cover limits are for H20/H25 loading.						

3.5 The SRPE system shall be designed so as the hydraulic grade line will increase evenly throughout whereas transverse movement from one storage compartment to another shall not be permitted. All storage compartments shall be connected via manifold (or connecting pipe) versus by transporting stormwater through stone.

3.6 A stormwater pretreatment device is recommended upstream of the SRPE system as follows:

3.6.1 Infiltration: Where feasible, the selected stormwater treatment device upstream of an infiltration system shall be a filter system and have General Use Level Designation (GULD) for Basic Treatment by the Washington State Department of Ecology or demonstrate equivalent performance in independently verified field testing following a peer reviewed testing protocol, and must be sized consistent with the system producing those results.

3.6.2 Detention: Where feasible, the selected Stormwater treatment device upstream of a detention system shall be a separator system and have GULD for Pretreatment by the WADOE or demonstrate equivalent performance in independently verified field testing following a peer reviewed testing protocol, and must be sized consistent with the system producing those results.

3.6.3 Selected pretreatment stormwater device shall incorporate a physical barrier capable of capturing and retaining trash and debris (i.e.: floatable and neutrally buoyant materials) for all flows up to the treatment capacity of the device.

3.6.4 The application of wrapping a system with geotextile of any branding or material type, that allows the passage of stormwater, shall not be regarded as an acceptable treatment or pretreatment device.

3.6.5 The manufacturer of the selected Stormwater treatment device shall have been regularly engaged in the engineering design and production of systems for the physical treatment of Stormwater runoff for 15 years.

4.0 EXECUTION

4.1 The SRPE system installation shall be in accordance with ASTM D2321 “Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications” along with Table 1 above and product-specific recommendations contained in Contech Installation Guidelines for SRPE pipe, available from local Contech representative or from www.conteches.com.

4.2 For SRPE system using a welded coupler (WC) joint, Contractor is responsible for providing a clean, dry surface for welding as described in the Contech Installation Guidelines for SRPE pipe

4.3 The contractor shall follow Occupational Safety and Health Association (OSHA) guidelines for safe practices in executing the installation process in accordance with the manufacturer/supplier installation recommendations.

4.4 Contractor is required to participate in an on-site preconstruction meeting with the supplier prior to the scheduled delivery date of the SRPE system.

END SECTION