948 MISCELLANEOUS TYPE OF PIPE–CORRUGATED POLYETHYLENE PIPE. (REV 2-8-05) (FA 3-3-05) (7-05)

ARTICLE 948-2 (Page 859) is deleted and the following substituted:

948-2 Corrugated Polyethylene Tubing and Pipe.

948-2.1 General: For underdrain, Corrugated Polyethylene Tubing and fittings shall meet the requirements of AASHTO M 252. For edgedrain, Corrugated Polyethylene Tubing and fittings shall meet the requirements of AASHTO M 252, except as modified in 948-2.2. For storm drain side drain, french drain and cross drain corrugated Polyethylene Pipe shall meet the requirements of AASHTO M 294 and 948-2.3.2.

The tubing or pipe shall not be left exposed to sunlight for periods exceeding the manufacturer's recommendation.

948-2.2 Edgedrain (4 to 10 inches [100 to 250 mm]): The requirements for Edgedrain as specified in AASHTO M 252 are modified as follows:

(a) Coiling of tubing 6 inches [150 mm] in diameter or greater is not permitted. Tubing shall have a minimum pipe stiffness of 46 psi [275 kPa] at 5% deflection.

948-2.3 Corrugated Polyethylene Pipe (12 to 60 inches [300 to 1,500 mm]):

948-2.3.1 General: Class I corrugated Polyethylene Pipe used for side drain, cross drain, storm drain or french drain shall meet the requirements of AASHTO M 294. Class II Corrugated Pipe shall meet the requirements of AASHTO M 294 and 948-2.3.1. Corrugations may only be annular; pipe conforming to the minimum cell classification 335400E may be used if the combination of color and UV stabilizer provides the same or better UV protection as 335400C. Mitered end sections are not to be constructed of polyethylene. Use only concrete or metal mitered end sections as indicated in the Design Standards.

When rubber gaskets are to be installed in the pipe joint, the gasket shall be the sole element relied on to maintain a tight joint. Test pipe joints at the plant hydrostatically using test methods in ASTM D 3212 [ASTM D 3212M]. Soil tight joints must be watertight to 2 psi [13.8 kPa]. Watertight joints must be watertight to 5 psi [34.5 kPa] unless a higher pressure rating is required in the plans.

Provide certification of the actual mean diameter of pipe shipped to the project. Include in the certification the minimum and maximum diameters used to certify the actual mean diameter. The certification shall be attested to by a person having legal authority to bind the manufacturing company.

Obtain pipe products from producers listed on the Department's List of Qualified Flexible Pipe Manufacturing Plants, which may be viewed at the following: http://www.dot.state.fl.us/statematerialsoffice/quality/programs/qualitycontrol/materialslistings/sources/drainagesource.pdf .

Ensure that each shipment of products to the job site includes a list of products and each product has an affixed legible stamp mark of the plant, indicating its compliance with the requirements of the plant's Department approved Quality Control Plan and Contract Documents.

Accept responsibility of either obtaining products from another approved plant, or await re-approval of the plant, when the plant is removed from the Department's list of Flexible Pipe Manufacturing Plants.

The Engineer will not allow changes in Contract Time or completion dates as a result of the plant's loss of qualification. Accept responsibility for all delay costs or other costs associated with the loss of plant's qualification.

948-2.3.2 Additional Requirements for Class II Polyethylene Pipe: Meet the following requirements:

Table 1

Stress Crack Resistance of Pipes			
Pipe Location	Test Method	Test Conditions	Requirement
Pipe Liner	FM 5-572, Procedure A	10% Igepal solution at 50°C and 600 psi applied stress 5 replicates	Average failure time of the pipe liner shall be ≥17 hours, no single value shall be less than 12 hours..
Pipe Corrugation (molded plaque)	ASTM F 2136	10% Igepal solution at 50°C 600 psi applied stress	Average failure time shall be ≥24 hours, no single value shall be less than 17 hours.
Junction*	FM 5-572, Procedure B and FM 5-573 ASTM D 2837	Test temperature 80°C and applied stresses of 650 and 450 psi. Test temperature 70°C and applied stress of 650 psi; 5 replicates at each stress level	Calculate three constants Failure time at 500 psi at 23°C ≥ 100 years (95% statistical confidence)
		Single Test: Test temperature 80°C and applied stress of 650 psi.; 5 replicates	The failure time must be equal or greater than the calculated value using the three constants from the three points test
Longitudinal Profile*	FM 5-572, Procedure C, and FM 5-573 ASTM 2837	Test temperature 80°C and applied stresses of 650 and 450 psi. Test temperature 70°C at applied stress of 650 psi; 5 replicates at each stress level	Calculate three constants Failure time at 500 psi at 23°C ≥ 100 years (95% statistical confidence)
		Single Test: Test temperature 80°C and applied stress of 650 psi.; 5 replicates	The failure time must be equal or greater than the calculated value using the three constants from the three points test
Oxidation Resistance of Pipes			
Pipe Location	Test Method	Test Conditions	Requirement
Liner and/or Crown	OIT Test (ASTM D 3895)	2 replicates (to determine initial OIT value)	25 minutes, minimum
Liner and/or Crown	Incubation test FM 5-574 and OIT test ASTM D 3895	Three samples for incubation of 195 days at 80° C and applied stress of 250 psi. One OIT test per each sample.	Average of 3 ± 1 minutes (no value shall be less than 2 minutes)
Note: FM= Florida Method of Test. * Required only when corrugation resin is different than liner resin. * A higher test temperature (90°C) may be used if supporting test data acceptable to the State Materials Engineer is submitted and approved in writing.			

948-2.3.3 Certification: Furnish to the Engineer certification from the manufacturer for each pipe diameter to be incorporated into the project that the pipe meets the requirements of these Specifications.

Manufacturers seeking evaluation of a product in accordance with Departmental procedures must submit test reports conducted by a laboratory deemed to be appropriately qualified by the Plastics Pipe Institute and acceptable to the State Materials Engineer. Submit this information to the Director, State Materials Office.

SUBARTICLE 948-4.4 (Page 861) is expanded by the following:

948-4.4.1 Machine Spiral Wound Pipe Liner: Machine spiral wound pipe liner shall consist of a continuous one piece profile strip wound directly into the deteriorated pipelines. The liner can be installed in close fit to the host pipe, or alternatively installed at a fixed diameter. Where the liner is installed at a fixed diameter, the annular space between the spiral wound liner pipe and the existing pipe is grouted.

(1) Polyvinyl Chloride: Polyvinyl chloride machine spiral wound pipe liner shall meet the requirements of ASTM F 1697 and shall have a minimum cell classification of 13354.