097.13 DPWH
12.18.2017

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
OFFICE OF THE SECRETARY
MANILA

15 DEC 2017

DEPARTMENT ORDER)
)
No. 147)
Series of 2017 12.18.17)

SUBJECT : Amendments to DPWH Standard Specification for ITEM 706 – CONCRETE, CLAY, PLASTIC AND FIBER PIPE (Item 706.14.2 Structured Wall Pipe – High Density Polyethylene Pipe)

In order to ensure uniformity in the application/ adoption of the Pay Items of Work to be used/ adopted by those who are involved in the preparation of the Design Plans and Quantities, Program of Works (POW) and Approved Budget for the Contract (ABC) for Infrastructure Projects Nationwide, and to provide material requirements to the aforementioned expansion joints, the attached DPWH Standard Specifications for **Item 706.14.2 Structured Wall Pipe – High Density Polyethylene Pipe** are hereby prescribed, for the guidance and compliance of all concerned.

This Standard Specifications form part of the DPWH Standard Specifications for Highways, Bridges and Airports, Volume II and now included in the Project and Contract Management Application (PCMA).

This Order shall take effect immediately.

MARK A. VILLAR
Secretary

14.1.2 MLL/RGT

Department of Public Works and Highways
Office of the Secretary
WIN7U01550

DPWH Standard Specification for Item 706 - Concrete, Clay, Plastic and Fiber Pipe

706.1 Non-Reinforced Concrete Pipe

This pipe shall conform to the requirements of AASHTO M 86M (ASTM C 14M), Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe for the specified internal diameters, wall thickness, length, straightness and strength classes.

706.2 Reinforced Concrete Pipe

This pipe shall conform to the requirements of AASHTO M 170M (ASTM C 76), Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe or AASHTO M 242M (ASTM C 655), Standard Specification for Reinforced Concrete D-Load Culvert, Storm Drain, and Sewer Pipe for specified internal diameters, wall thickness, length, reinforcement and strength classes.

Reinforced elliptically shaped concrete pipe conforming to the requirements of AASHTO M 207M (ASTM C 507), Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe shall be furnished where specified. Unless otherwise specified, pipe wall design and use of elliptical reinforced concrete arch culvert pipe shall meet the requirements of AASHTO M 206M (ASTM C 506), Standard Specification for Concrete Arch Culvert, Storm Drain and Sewer Pipe

Precast reinforced concrete and sections shall conform to the requirements of the cited specifications to the extent which they apply.

706.3 Perforated Concrete Pipe

This pipe intended to be used for underdrainage shall conform to the requirements of AASHTO M 175M (ASTM C 444M), Standard Specification for Perforated Concrete Pipe for the specified types, internal diameters and slot length and spacing.

706.4 Concrete, Clay Drain and Perforated Clay Drain Tile

The concrete drain tile with internal diameter from 100 mm to 900 mm that are intended to be used for surface and subsurface drainage shall conform to the requirements of AASHTO M 178M (ASTM C 412), Standard Specification for Concrete Drain Tile for the specified internal diameter, wall thickness, length, shape, strength and absorption.

Clay drain and perforated clay drain tile shall conform to the requirements of ASTM C 4, Standard Specification for Clay Drain Tile and Perforated Clay Drain Tile for the specified sizes and strengths.

706.5 Porous Concrete Pipe

This non-reinforced concrete pipe for use in underdrains shall conform to the requirements of AASHTO M 176M (ASTM C 654), Standard Specification for Porous Concrete Pipe for the specified internal diameters, strength and porosity or rate of infiltration tests.

706.6 Vitrified Clay Lined Reinforced Concrete Pipe

Designs for fully lined or half lined pipes of the specified strength classes shall be submitted by the manufacturer for approval by the Engineer. The applicable requirements of AASHTO M 170M (ASTM C 76), Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe shall govern. Liner or liner elements, shall be clay of first class quality, sound, thoroughly and perfectly burned without warps, cracks or other imperfections and fully and smoothly salt glazed.

706.7 Perforated Vitrified Clay Pipe

This pipe intended to be used for underdrainage shall conform to the requirements of ASTM C 700, Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated for pipe with full circular cross-section, for the specified diameters and strength class.

706.8 Vitrified Clay Pipe

This pipe intended to be used for the conveyance of sewage and storm water shall conform to the requirements of ASTM C 700, Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated for pipe with full circular cross-section, for the specified diameters and strength class.

Pipe and fittings for sewers of 150 mm to 600 mm diameter shall be extra strength vitrified clay pipe conforming to the applicable requirements.

706.9 Cradle Invert Clay Pipe

This pipe shall conform to the applicable requirements of ASTM C 700, Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated and ASTM C 1208M, Standard Specification for Vitrified Clay Pipe and Joints for Use in Microtunneling, Sliplining, Pipe Bursting, and Tunnels.

706.10 Reinforced Concrete Arch Culvert, Storm Drain and Sewer Pipe

This pipe shall conform to the requirements of AASHTO M 206M (ASTM C 506), Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe.

706.11 Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe

This pipe shall conform to the requirements of AASHTO M 207M (ASTM C 507), Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain, and Sewer Pipe

706.12 Reinforced Concrete D-load Culvert, Storm Drain and Sewer Pipe

This pipe shall conform to the requirements of AASHTO M 242M (ASTM C 655), Standard Specification for Reinforced Concrete D-Load Culvert, Storm Drain, and Sewer Pipe.

706.13 Plastic and Polyethylene Corrugated Drainage Pipe or Tubing

This pipe shall conform to the requirements of AASHTO M 252, Standard Specification for Corrugated Polyethylene Drainage Pipe.

706.14 High Density Polyethylene Pipe

706.14.1 Solid Wall Pressure Pipes

This pipe shall conform to the requirements of ASTM F 714, Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter and shall be based upon the DIPS, outside diameter sizing system. The dimension ratio (DR) of pipe to be installed shall also be either shown on the drawings or as directed by the Engineer.

706.14.2 Structured Wall Pipe

Thermoplastic pipes and fittings with a structured wall and smooth inside surface, including different jointing systems for gravity and low pressure applications, such as storm drain, sewer, and sea outfall, with a large diameter of DN/ID 250 to DN/ID 4000 mm, inside diameter based polyethylene (PE) pipe shall conform to the requirements of ASTM F 894, Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe.

706.15 Precast Reinforced Concrete Box Sections for Culverts, Storm Drains and Sewers

These sections shall conform to the requirements of AASHTO M 259M, Standard Specification for Precast Reinforced Concrete Box Section for Culverts, Storm Drains, and Sewers and ASTM C 1433, Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers.

706.16 Acrylonibile-Butadiene-Styrene (ABS) Composite Sewer Pipe

This pipe shall conform to the requirements of AASHTO M 264 (ASTM D 2680), Standard Specification for Acrylonitrile – Butadiene – Styrene (ABS) and Polyvinyl Chloride (PVC) Composite Sewer Piping.

706.17 Polyvinyl Chloride (PVC) Sewer Pipe and Drain Pipe

This pipe shall conform to the applicable requirements of AASHTO M 278, Standard Specification for Class PS46 Polyvinyl Chloride (PVC) Pipe or AASHTO M 304, Standard Specification for Polyvinyl Chloride (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter, ASTM D 2729, Standard Specification for Polyvinyl Chloride (PVC) Sewer Pipe and Fittings and ASTM F 679, Standard Specification for Polyvinyl Chloride (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.

706.17.1 General Requirements

A. Pipes

1. Pipe sizes shall be as shown on the drawings, unless otherwise approved by the Engineer.

    a. The designated sizes on the drawings refer to outside diameters.

a.1. For sanitary uPVC pipes and fittings sizes 57 mm up to 160 mm shall conform to AASHTO M 278 or AASHTO M 304 or ASTM D 2729.

a.2. For uPVC sizes 160 mm and up shall conform to ASTM F 679, Standard Specification for Polyvinyl Chloride (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.

B. Joints

1. All joints shall be elastomeric ring and should be machine installed fixed seal made of Ethylene Propylene Diene Monomer (EPDM) rubber bonded with stiff polypropylene ring unless approved otherwise by the Engineer.

2. Double sockets or slip on sockets may be used adjacent structures or special fittings.

3. Solvent welded joints may be used for buried fittings if assembled in the manufacturer's workshop under the Engineer's supervision. Solvent shall be as per the pipe manufacturer's recommendation.

4. Solvent or welded fittings may be used for exposed piping, if approved by the Engineer. Solvent cemented joints shall be allowed provided that the designed strength can be attained for at least 24 hours and shall be subjected to internal pressure of 0.17 MPa using water as the test medium within one (1) hour. Examine the joint for leakage.

References:

1. *ASTM F 894, Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe.*
2. *ASTM F 679, Standard Specification for Polyvinyl Chloride (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.*
3. *DENR Administrative Order No. 2000 – 02 January 06, 2000 (Chemical Control Order for Asbestos.)*
4. *DIN 16961 – Thermoplastics Pipes and Fittings with Profiled Wall and Smooth Pipe Inside.*