700 MATERIAL DETAILS

700 Minimum Requirements for Sampling Materials

Replace applicable sections with:

Specification Number	Material	Material Only Inspection or Sampling Requirements	Post Inspection Instructions
305, 451, 452, 499	Concrete cylinders – pavement or base	Make 4 cylinders each day, each 100 CY (m^3) or fraction thereof.	
511, 499	Concrete for Structures	Make 4 cylinders each day, each class, each 100 CY (m^3) or fraction thereof, each span.	

703 Aggregate

703.01 General.

D. Method of Test. Replace: "Clay Lumps" test (S1017) with AASHTO T112.

703.05 Aggregate for Asphalt Concrete. (Intermediate and Surface Courses), Prime Coat (408), Chip Coat (422), and Microsurfacing (421).

B. Coarse Aggregate. Delete Section 1 and substitute:

1. Provide 100 percent crushed carbonate stone, 100 percent crushed air-cooled slag, or 100 percent crushed washed gravel.

Add:

703.20 Bank Run Gravel. Provide sound durable materials containing not more than five percent clay or silt by weight and free from an excessive amount of deleterious material. Meet the following grading requirements:

100 percent passing a three-inch sieve (75 mm);
at least 90 percent passing a one-inch (25 mm) sieve;
not more than 25 percent passing a 1/4-inch (6mm) sieve;
and not more than 5 percent passing a No. 50 sieve.

704 Masonry Units

Add:

704.04 Pre-Cast Manufactured Clay/Ceramic Paving Brick. Furnish pre-cast manufactured clay/ceramic paving bricks/pavers for use in Detectable Warning Strips conforming to ASTM C902, Class SX, Type I Specification for Pedestrian and Light Traffic Paving Brick. Furnish solid pavers without core holes or other perforations meeting the following requirements:

Physical Dimensions ..... 4" x 8" x 2-1/4" (101.6 x 202.2 x 57.15 mm)
Minimum Average Compressive Strength..... 8,000 psi (60 Mpa)
Average cold water absorbtion ..... > 6% with no individual unit >7%
Freeze/Thaw Resistance ..... > 50 cycles (ASTM C67)
Dimension Tolerances ..... Meet PX standard
Dimension Tolerances around mean ..... 1/16" (2 mm)

Acceptable units:

Manufacturer	**Address/Phone**	**Color**
Whitacre-Greer	1400 S. Mahoning Avenue Alliance, Ohio 44601 330-823-1610	Clear Red (Rustic) #30
Endicott Clay Products	P.O. Box 17 Fairbury, Nebraska 68352 402-729-3315	Red Blend
Pine Hall Brick	P.O. Box 11044 2701 Shorefair Drive Winston-Salem, North Carolina 27116-1044 800-334-8689	Pathway Red

Or approved equal.

Test sampling of 24 pavers for every 50,000 pavers manufactured to determine compliance with dimensional and water absorption characteristics.

Provide pavers with truncated domes with the following characteristics:

Base Diameter ..... 0.9" to 1.4" (23 mm to 36 mm)
Top Diameter..... 50% of Base Diameter (minimum)
..... 65% of Base Diameter (maximum)
Height..... 0.2" (5 mm)
Center-to-center spacing..... 1.6" (41 mm) minimum
..... 2.4" (61 mm) maximum
Base-to-base spacing..... 0.65" (16 mm) minimum*

* measured between most adjacent domes on a square grid.

706 Concrete and Clay Pipe

706.02 Reinforced Concrete Circular Pipe. Modify ASTM C 76 accordingly:

2.1 Applicable Documents. Replace ASTM C 497 Testing Concrete Pipe or Tile with AASHTO T 33.

Modify Table 5 to include the following additional sizes:

Table 5 (Modification)

Internal Diameter of Pipe (inches)	Wall Thickness (inches)	Circular Reinforcement Inner Cage	Deformed Square Inches Outer Cage
6	1-3/4	0.07	—
8	1-3/4	0.07	—
10	1-3/4	0.07	—

11.4.1 Concrete Test Requirements. Add:

Provide cores drilled from the wall of the pipe satisfying the minimum specified concrete strength requirements as outlined in the compression tests. Ensure that the diameter of the core has a capped height to diameter or L/D ratio between one and two. Secure and prepare the cores for testing as prescribed in the appropriate sections of AASHTO T 33. Ensure that the compressive strength of each core tested is equal to or greater than the design strength of the concrete. If a core does not meet the required strength, another core from the same pipe may be tested. Reject any pipe if this core does not meet the required strength. Provide additional tests on other pipe to determine the acceptability of the lot. When the cores cut from a section of pipe successfully meet the strength test requirement, plug and seal in a manner such that the pipe section will meet all of the test requirements of these specifications.

11.9 Absorption. Delete this section and substitute:

Ensure that the absorption of a sample from the wall of the pipe as determined in AASHTO T 33 does not exceed nine percent of the dry weight. When the initial absorption specimen from a pipe fails to conform to these requirements, perform another absorption test on another specimen from the same pipe and substitute the results of the retest for the original test results. Permit a retest on two additional pipe for each pipe that failed when the replacement specimen fail to conform to the specified requirements. Accept the pipe only when all retest specimens conform to the specified requirement. Obtain retest specimens from broken or unbroken pipe.

11.10 Retests of Pipe. Delete this section:

11.11 Test Equipment. Delete this section and substitute:

Furnish all facilities and personnel necessary to carry out the specified tests as described in AASHTO T 33.

16. Marking. Add:

Mark on each section of pipe: (a) the pipe class, (b) type of wall to be designated as A, B, or C, mark wall thicknesses between standard ASTM wall thicknesses with the letters of both the thinner and thicker walls, i.e. A/B for wall thicknesses between A wall and B wall, (c) the date of manufacture, (d) the name or trade-mark of the manufacturer including plant location, (e) mark the center line of the crown and invert inside or outside the pipe with elliptical steel reinforcement and quadrant steel reinforcement at both ends, except where cast lift holes are centered over the crown. Mark the center line of the crown of the pipe without lift holes on the inside and outside of the pipe with TB, (f) mark the pipe with quadrant steel with the letter "Q" (g) mark pipe with elliptical reinforcement with the letter E and (h) mark pipe with deformed reinforcement conforming to modified Tables 2 and 3 with the letters DF. Provide legible and indented marking on the pipe section or paint with waterproof paint.

706.04 Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe. Modify ASTM C 507 as follows:

2.1 Applicable Documents. Replace ASTM C 497 Testing of Concrete Pipe or Tile with AASHTO T 33.

11.5. Concrete Test Requirements. Add:

Provide cores drilled from the wall of the pipe satisfying the minimum specified concrete strength requirements as outlined in the compression tests. Ensure that the diameter of the core has a capped height to diameter or L/D ratio between one and two. Secure and prepare the cores for testing as prescribed in the appropriate sections of AASHTO T 33. Ensure that the compressive strength of each core tested is equal to or greater than the design strength of the concrete. If a core does not meet the required strength, test another core from the same pipe Reject any pipe if this core does not meet the required strength. Provide additional tests on other pipe to determine the acceptability of the lot. When the cores cut from a section of pipe successfully meet the strength test requirement, plug and seal in a manner such that the pipe section will meet all of the test requirements of these specifications.

11.9 Absorption Test Requirements of Concrete. Delete this section and substitute:

Ensure that the absorption of a sample from the wall of the pipe as determined in AASHTO T 33 does not exceed nine percent of the dry weight. When the initial absorption specimen from a pipe fails to conform to these requirements, make another absorption test on another specimen from the same pipe and substitute the results of the retest for the original test results. Permit a retest on two additional pipe for each pipe that failed when the replacement specimen fail to conform to the specified requirements. Accept the pipe only when all retest specimens conform to the specified requirement. Obtain retest specimens from broken or unbroken pipe.

11.11 Test Equipment. Delete this section and substitute:

Furnish all facilities and personnel necessary to carry out the specified tests as described in AASHTO T 33.

706.05 Precast Reinforced Concrete Box Sections. Add:

Submit shop drawings in accordance with 501.04.

706.051 Precast Reinforced Concrete Three-Sided Flat Topped Culverts. In the fourth paragraph, delete the third sentence and replace with:

Submit shop drawings in accordance with 501.04.

706.052 Precast Reinforced Concrete Arch Sections. In the fourth paragraph, delete the third sentence and replace with:

Submit shop drawings in accordance with 501.04.

706.13 Precast Reinforced Concrete Manhole Riser Sections, Flat Slab Tops, Catch Basins and Inlet Tops, and Portable Barriers. Add:

Submit shop drawings for all precast structures in accordance with 501.04.

707 Steel, Aluminum and Plastic Pipe

707.15 Corrugated Steel Box Culverts. In the third paragraph, delete the second sentence and replace with:

Submit shop drawings for all structures in accordance with 501.04.

Add:

707.18 Cast Iron Pipe.

Provide cast iron pipe, fittings and joints for sewers conforming to AWWA Specifications C-102, C-106, C-108, C-110 and C-111.

Add:

707.20 Ductile Iron Pipe.

Provide ductile iron pipe, fittings and joints for sewers conforming to AWWA Specification C-151.

Modify:

707.25 Corrugated Aluminum Box Culverts. In the third paragraph, delete the second sentence and replace with:

Submit shop drawings for all structures in accordance with 501.04.

707.41 Polyvinyl Chloride Plastic Pipe. Add:

Provide ASTM D-3212 joints flexible elastomeric seals, or solvent welded joints using ASTM D-2855 for PVC specified pipe.

Can only be used if cover is 35 feet (10.7 m) or less.

Type PSM Poly Vinyl Chloride (PVC) sewer pipe and fittings; ASTM D-3034 latest edition.

As a minimum, provide a Standard Dimension Ratio (SDR) of 35 for PVC.

707.52 ABS Sewer Pipe. Add:

Can only be used if cover is 35 feet (10.7 m) or less.

As a minimum, provide a Standard Dimension Ratio (SDR) of 35 for ABS.

708 Paint

708.02.D.1.f Urethane Finish Coat – Colors. Delete this section and replace with:

Unless otherwise noted on the plans, the finish coat color will be determined by the Architect/Engineer. Provide color selection charts, samples, etc., as required by the Architect/Engineer to assist with the selection.

Add:

708.05 Paint for Tree Grates. Provide metal primer – Rust-T-Bond Composite type 9804 as manufactured by Foy-Johnson Paint Company or approved equal. Provide exterior enamel top coat of Beige – 29804 or Char Brown – 39842 as manufactured by Foy-Johnson Paint Company as directed by the Engineer, or approved equal.

Add:

708.06 Polyester TGIC Powder Coat Finish System. Provide powder coated finish specified to have TGIC or Type "T" finish.

A. Cleaning and Pretreatment of Hot-Dipped Galvanized Items: Clean, rinse, pretreat, dry, and handle hot-dipped galvanized items as required per polyester powder coat primer coat and finish topcoat Manufacturer's published specifications.

B. Primer Coat: Provide electrostatic application of primer consisting of thermosetting epoxy powder coat:

1. Primer Design Standard: Corvel Zinc Gray 13-7004 (or approved equal).

2. Average Coating Thickness: 2 mils (allowable range = 1.8 mils to 2.2 mils)

Cure primer properly in a convection oven with proper time/temperature ratios for approximately 6 minutes at 250° F (120° C).

C. Polyester TGIC Powder Coat Finish/Top Coat: Provide electrostatic application of polyester TGIC (Triglycidyl Isocyanurate) Powder Coat Finish/Topcoat:

1. Color: Federal Color No. 27038 – Black – Semi-Gloss unless noted otherwise.

2. Average Coating Thickness: 3 mils (allowable range = 2 to 4 mils)

3. Sheen/Gloss Level: 30%

Cure finished topcoat properly in a convection oven with proper time/temperature ratios for approximately 20 minutes at 250° F (120° C).

D. Testing Parameters for Polyester TGIC Powder Coating:

1. Hardness: Minimum hardness of the cured film will withstand a 2H pencil across the coated surface at a 45 degree angle.

2. Humidity Resistance: Evaluated in accordance with ASTM D 2247 with humidity levels maintained between 95% and 100%.

3. Impact: Tested in accordance with ASTM D 2794 using 20 inch-pounds, minimum.

4. Salt Spray Resistance: Cured film shall exhibit the following performance as evaluated in accordance with ASTM B 117 for an exposure of 1,000 hours:

Property	Aluminum	Steel
Average Paint Thickness	3 mils (2 mils to 4 mils)	3 mils (2 mils to 4 mils)
Creep (12" average scribe)	0	0.20 inch (maximum)
Thru-Film Corrosion of Blistering	0	0.1% (maximum)

5. Crosshatch: In accordance with ASTM D 3359B, crosshatch at 95% or better at 1/16 inch spacing.

6. Conical Mandrel: In accordance with ASTM D 522, with a conical mandrel, no cracking at ¼" end.

7. Weather Resistance: Use a Type B Weatherometer in order to evaluate weather resistance in accordance with ASTM G 26. An exposure of 1,000 hours shall not reveal a change in gloss of more than 10%, or a Q.U.V. test chamber shall also be used in accordance with ASTM G 53 with no change in gloss more than 15% after an exposure of 100 hours.

8. Pinholes: Visual evaluation of the cured film shall not reveal the presence of pinholes on exposed surfaces.

9. Corrosion Testing: In accordance with ASTM B 117, the average scribe creep over a 12-inch scribe shall equal less than 1/8 inch at 1,000 hours. For marine test, the average scribe creep over a 12-inch scribe shall equal less than 1/8 inch in one year in 800 DOT exposure area.

E. Verification – Polyester TGIC Powder Coat Finish. Verify polyester powder coat paint application by submitting paint shop invoices. Submit paint shop documentation to verify conformance with Design Standard for Polyester Powder Coat Finish.

711 Structural Steel and Structure Incidentals

Add:

711.121 Cast Iron Tree Gratings. Furnish cast iron tree gratings according to ASTM A-48-83 Class 35 or better as manufactured by Neenah Foundry Company or approved equal.

712 Miscellaneous

Add:

712.12 Surface Applied Polymer Domes for Detectable Warning Strips. Provide surface applied Polymer Domes for Detectable Warning Strips as manufactured by:

Manufacturer	Product	Address/Phone	Color
COTE-L Industries, Inc.	Safti-Trax	1542 Jefferson Street Teaneck, NJ 07666 201-836-0733	Red
TILCO/Vanguard	Detectable Warning (Truncated Domes)	206 Broadway Avenue Snohomish, WA 98296 425-483-5700	Red (no mats)
Strongwall Industries, Inc.	Strongwarn, SWADA 2000	107 Chesnut Street Ridgewood, NJ 07450 800-535-0668	Charcoal Grey

Or approved equal.

Add:

712.13 Flat Plate Detectable Warning Strips. Provide Detectable Warning Strips as manufactured by:

Manufacturer	Product	Address/Phone	Color
Engineered Plastics - Armor Tile Tactile Systems	24" x 48" Cast-in Place Tactile/Detectable Warning Surface Paver System	300 International Drive, Suite 100, Willliamsville, NY 14221 1-800-372-0519	Brick Red

ADA Solutions Inc	24" x 48" Cast-in-Place Tactile/Detectable Warning Surface Paver System	One Survey Circle – 2nd Floor, North Billerica, MA 01862 1-800-372-0519	Brick Red, Gray
Neenah Foundry Company	24" x 24" Cast-in-Place Tactile Detectable Warning Plate	2121 Brooks Avenue, Box 729, Neenah Wisconsin 54956 1-800-558-5075	Unfinished
East Jordan Iron Works	24" x 24" Series 7005 Detectable Warning Plates	P.O. Box 439 East Jordan, MI 49727 1-800-874-4100	Unfinished

Or approved equal.
Add:

713 Sealant Materials

713.01 Paving Joint Sealants. Furnish a Paving Joint Sealant that is a multi-component polyurethane based sealant, gun grade in horizontal position, non-sag in vertical position, Sonolastic NP-2 joint sealant as made by Sonneborn Building Products Division of Degussa, THC-901 or Vulkem 227 from Tremco, DynaTrol II from Pecora Corporation, or an approved equal. Clearly indicate batch control numbers on all containers for base and accelerator components of multi-part sealants. Use identical control numbers for mixed components.

713.02 Paving Joints Primer Material. Furnish a primer recommended by the Manufacturer on all substrates, unless the Manufacturer's published literature states that the conditions of the performance guarantee can be met without the use of the primers.

713.03 Paving Joints Backer Material. Furnish a closed cell neoprene sponge rod conforming to ASTM C-509 for backup material for polyurethane sealants. Install rod under compression and at least 1/8 inch wider than the joint width. Furnish back-up material with depth as shown in the Manufacturer's literature. Furnish preformed, compressible, resilient, non-waxing, non-extruding closed cell polyethylene foam joint fillers, non-gassing and of size, shape, and density to control sealant depth.