

9480000 MISCELLANEOUS TYPES OF PIPE  
COMMENTS FROM INTERNAL/INDUSTRY REVIEW

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Rudy Powell  
414-4280

Comments: (11-17-11)

1. Why is this required for all pipes 12-36" because won't some of these be buried?

**948-1.7 Polyvinyl Chloride (PVC) Pipe (12 to 36 Inches):** ~~PVC~~ Polyvinyl Chloride (PVC) pipe for side drain, cross drain, storm drain and other specified applications shall conform to AASHTO M-278 for smooth wall PVC pipe or ASTM F-949 for PVC ribbed pipe. **Resin shall contain a minimum of 1.5% titanium dioxide for UV-protection.** Mitered end sections are not to be constructed of polyvinyl chloride. Use only concrete or metal mitered end sections as indicated in the Design Standards.

All pipe produced and shipped to the job site shall meet the requirements of 105-3.2.

Response: The pipe sits in the producer's yard and the project site for up to 3 years. UV protection is required so that the UV doesn't affect the polymer.

2. Table I, Oxidation Resistance of Pipes, Liner and/or Crown, Test Method (Incubation Test) Test Conditions: What is the reason for changing 195 days to 265 days?

Response: These are mistakes that were not corrected until now. Industry has carried out the additional testing and will not be affected.

3. What is the reason for these changes?

(8) The incubation temperature and duration can also be ~~136-196~~ days at 185°F.

(9) ~~Within each replicate set of tests, the discrepancy range shall be within 6%. If an out-of-range discrepancy occurs, repeat the three OIT tests.~~

(10) The tests for incubated and "as-manufactured" pipe samples shall be performed by the same lab, same operator, the same testing device, and in the same day.

(11) ~~Within each replicate set of tests, the discrepancy range shall be within 9%. If an out-of-range discrepancy occurs, repeat the two MI tests on the same pipe sample. If insufficient material is available, a repeat of one test is acceptable.~~

(12) The MI retained value is determined using the average MI value of incubated sample divided by the average MI value of as-manufactured pipe sample.

Response: Test method already has the bias and precision statement that covers this.

4. Change green highlighted text to meet formatting and be consistent with the next sentence.

**948-3.1 For Bridge Drains:** *Fiberglass pipe shall conform to the requirements of ASTM D-2996 or ASTM D-2310, for Type I, Grade 2, Class E, pipe using polyvinyl ester as the only resin. The minimum designation ~~should~~ shall be RTRP-11EA. The resin ~~should~~ shall contain UV- inhibitors and absorbers and/or a two-part premium grade 100% solids polyurethane coating. ~~For the portion of bridge drains not encased in concrete that are exposed to direct sunlight for any duration in a 24-hour period, the pipe~~*

~~should be shielded from exposure.~~ Where specified in the Plans, provide a two-part 100% solids polyurethane coating. Unless otherwise stated in the Plans, use Federal Color Standard No. 595c, Color No. 36622.

Response: Sentence clarified as shown below. Change made prior to Industry Review.

.....The minimum designation ~~should~~ shall be RTRP-11EA. The resin ~~should~~ shall contain UV- ~~inhibitors and absorbers and~~ stabilizers ~~or a two-part premium grade-100% solids polyurethane coating.~~

5. 948-7 Profile Wall Polypropylene (PP) Pipe. (second paragraph)

a. Suggest adding the specific materials manual.

*All pipe produced and shipped to the job site shall meet the requirements of 105-3.2. For initial product approval, the manufacturer shall demonstrate adequate oxidation resistance for the application.*

Response: How do we make this a requirement of the contractor if we only included the reference of the MM? This is the same for HDPE, PVC, metal, etc. If it needs to change, I suggest discussing in the next round of changes once construction and drainage have a chance to weight in. I am not opposed to changing the language. No change made at this time.

b. What is the requirement? How is “adequate” defined?

*All pipe produced and shipped to the job site shall meet the requirements of 105-3.2. For initial product approval, the manufacturer shall demonstrate adequate oxidation resistance for the application.*

Response: Language will be changed as follows:

*All pipe produced and shipped to the job site shall meet the requirements of 105-3.2. ~~For initial product approval, the manufacturer shall demonstrate adequate oxidation resistance for the application~~ will last using accelerated aging by use of incubation tests in accordance with FM 5-574. Tests shall demonstrate that stabilization package is present and that no degradation has occurred.*

Change made.

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Charles Boyd  
414-4275

Comments: (11-18-11)

1. Delete the highlighted text. No construction specs have been developed yet to address applications of these coatings. Also, the need for these coatings to meet the design life of the drainage system has not yet been confirmed. cost comparison has not been conducted to evaluate whether it is more economical to coat the pipes during construction and then maintain

the coatings over the years versus simply replacing the pipes as required should they fail due to UV attack (or other reasons) over the service life of the bridge.

**948-1.1 For Bridge Drains:** ~~PVC~~ polyvinyl chloride pipe, for use in bridge drains which will be exposed shall conform to the requirements of ASTM D-1785, for Type II, Grade 1, Schedule 40-80 PVC pipe *with a minimum polymer cell classification of 12454 per ASTM D 1784 and a minimum of 1.5% titanium dioxide for UV- protection.* ~~For the portion of bridge drains not encased in concrete that are exposed to direct sunlight for any duration in a 24 hour period, the pipe may should be as specified in 948-1.4 shielded from exposure~~ *Where specified in the Plans, provide a water-based, 100% acrylic paint coating. Unless otherwise stated in the Plans, use Federal Color Standard No. 595c, Color No. 36622.*

**948-3.1 For Bridge Drains:** Fiberglass pipe shall conform to the requirements of ASTM D-2996 or ASTM D-2310, for Type I, Grade 2, Class E, ~~pipe~~ using polyvinyl ester as the only resin. The minimum designation ~~should~~ shall be RTRP-11EA. The resin ~~should~~ shall contain UV- inhibitors and absorbers and/or a two-part ~~premium grade~~ 100% solids polyurethane coating. ~~For the portion of bridge drains not encased in concrete that are exposed to direct sunlight for any duration in a 24 hour period, the pipe should be shielded from exposure.~~ *Where specified in the Plans, provide a two-part 100% solids polyurethane coating. Unless otherwise stated in the Plans, use Federal Color Standard No. 595c, Color No. 36622.*

**948-6.1 For Bridge Drains:** Flexible transition couplers and pipe shall conform to the requirements of ASTM C-1173. *Where specified in the Plans, provide a water-based latex or acrylic paint coating appropriate for the elastomer used in the coupler. Unless otherwise stated in the Plans, use Federal Color Standard No. 595c, Color No. 36622.*

Response: Text will be deleted. Change made prior to Industry Review.

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Comments: (11-22-11)

Are revisions being made to the Design Standards, Drainage Manual, Culvert Service Life Estimator Program, and Basis of Estimates Manual which might address usage, selection, service life and payment when these materials are used. Section 506 of the Standard Specifications addresses application and payment for Bridge Drainage System but what about in other applications?

Note specifically: in the proposed revision polypropylene is allowed for side drain, storm drain and cross drain. Could it be used as a slip lining material? Are there restrictions on where it can be used, such as with HDPE? What is the service life, load carry ability and n-value? How is it to be identified in the plans? **Would it not be better to introduce this type of change in conjunction with other changes?**

Response: The Drainage Manual and CSLE are being changed to include 50-year PP pipe as an allowable option. PP pipe is included in the new LRFD pipe clearances and is being given an n-value of 0.012 just like HDPE. It will be paid for as optional pipe and listed, when appropriate, on the optional pipe summary sheet. Given its stiffness, it could be used anywhere PVC is used.

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Barry Smith  
414-4776

Comments: (11-29-11)

See highlighted text – should a volume of weight be indicated for the new TiO<sub>2</sub> requirements? If so, what?

**948-1.1 For Bridge Drains:** ~~PVC polyvinyl chloride pipe, for use in bridge drains which will be exposed~~ shall conform to the requirements of ASTM D-1785, for Type II, Grade 1, Schedule ~~40-80~~ PVC pipe *with a minimum polymer cell classification of 12454 per ASTM D 1784 and a minimum of 1.5% titanium dioxide for UV- protection. For the portion of bridge drains not encased in concrete that are exposed to direct sunlight for any duration in a 24 hour period, the pipe may should be as specified in 948-1.4 shielded from exposure Where specified in the Plans, provide a water-based, 100% acrylic paint coating. Unless otherwise stated in the Plans, use Federal Color Standard No. 595e, Color No. 36622.*

Response: The 1.5% is by mass. Language will be changed to “.....minimum of 1.5% **by weight of** titanium dioxide for UV protection.” for clarification.  
Change made.

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