ORIGINATION FORM

Date: **March 20th, 2014**
Originator: **Chase C. Knight**
Contact Information: **State Materials Office, 352-955-6642, chase.knight@dot.state.fl.us**

Specification Title: **Aluminum Pipe, Including Underdrain, Pipe Arch and Structural Plate Pipe and Pipe Arch**
Specification Section, Article, or Sub-article Number: **945**

Why does the existing language need to be changed? **Title change needed for more clarity as well as to be consistent with the wording of the titles of 943 and 944. Change needed to section for clarification to project personnel and is consistent with other structure requirements referred to in Section 105. Liner Repair Systems added for repair options to existing structures.**

Summary of the changes: **Title changed to *Aluminum Pipe and Pipe Arch (Including Underdrain) and Structural Plate Aluminum Pipe and Pipe Arch*. Additional verbiage added to section to clarify selecting and obtaining a pipe producer. The processes for joint and gasket testing and approval has been described. 945-3 added to specify rehabilitation options with reference to Section 948.**

Are these changes applicable to all Department jobs? **Yes**
If not, what are the restrictions?

Will these changes result in an increase or decrease in project costs? **No**
If yes, what is the estimated change in costs?

With who have you discussed these changes? **Mario Paredes, Greg Weich**

What other offices will be impacted by these changes? **Construction, Drainage**

Are changes needed to the PPM, Design Standards, SDG, CPAM or other manual? **No**

Are all references to external publications current? **Yes**
If not, what references need to be updated (please include changes in the redline)?

Is a Design Bulletin, Construction Memo, or Estimates Bulletin needed? **No**

Contact the State Specifications Office for assistance in completing this form.
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ANANTH PRASAD, P.E.
SECRETARY

M E M O R A N D U M

DATE: May 30, 2014

TO: Specification Review Distribution List

FROM: Daniel Scheer, P.E., State Specifications Engineer

SUBJECT: Proposed Specification: **9450000 Aluminum Pipe, Including Underdrain, Pipe Arch and Structural Plate Pipe and Pipe Arch.**

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change.

This change was proposed by Chase Knight of the Department's State Materials Office (SMO) to add the method for the testing of pipe joints and gaskets, and for formatting.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via e-mail at SP965DS, or daniel.scheer@dot.state.fl.us. Comments received after **June 27, 2014,** may not be considered. Your input is encouraged.

DS/dt
Attachment

ALUMINUM PIPE, INCLUDING UNDERDRAIN, PIPE ARCH AND STRUCTURAL PLATE PIPE AND PIPE ARCH.

(REV ~~4-13-14~~ ~~5-13-14~~ 5-19-14)

SECTION 945 is deleted and the following substituted:

SECTION 945
ALUMINUM PIPE, INCLUDING UNDERDRAIN, PIPE ARCH AND STRUCTURAL PLATE PIPE AND PIPE ARCH

943-1 General Requirements.

Aluminum-alloy culvert pipe and underdrains shall meet the requirements of AASHTO M196 and the additional provisions contained herein. Except for underdrain, corrugated aluminum pipe including pipe arch shall be fabricated with helical corrugations with a minimum of two annular corrugations formed into each end of each pipe to accommodate a coupling band. Annular fabrication is not permitted unless specifically called for in the Plans or specifications. Provide *notarized* certification of the actual mean *inside* diameter *and lengths* of pipe shipped to the project. Include in the certification the minimum and maximum *inside* diameters used to certify the actual mean *inside* diameter.

Test the pipe joints hydrostatically at the specified pressure using test methods in ASTM D3212 with the exceptions of Sections 7.3 and 7.4. In lieu of Section 7.4, deflect one side of the pipe to a 5% reduction in internal diameter using the parallel plate testing methodology of ASTM D2412. Load the deflected pipe to within 1/2 the actual pipe diameter from the centerline of the gasket or just beyond the end of the hugger band, whichever is greater. Ensure that the loading mechanism does not contact the hugger band or associated hardware. Testing of pipe joints shall be witnessed by the Engineer.

Test gaskets in accordance with ASTM D3212. Testing of gaskets shall be witnessed by the Engineer.

For sidedrains, unless shown otherwise in the Plans the minimum thickness of the metal shall be as specified below.

NON SI UNITS		
TABLE I THICKNESS OF METAL FOR SIDEDRAIN PIPE		
Nominal Diameter or Equivalent (inches)	Sheet Gauge No.	Mean Thickness of Metal (inches)
6	18	0.048
8	16	0.060
10	16	0.060
12	16	0.060
15	16	0.060
18	16	0.060
21	16	0.060
24	16	0.060
30	14	0.075

36	14	0.075
42	12	0.105
48	12	0.105
54	12	0.105
60	10	0.135
66	10	0.135
72 and over	8	0.164

Where bituminous coated aluminum pipe is specified the bituminous coating shall meet the requirements as specified for corrugated steel pipe in 943-5. Bituminous coated and paved aluminum pipe shall meet the additional requirements specified in 943-6 and 943-7, as applicable.

Class IV pipe shall not be used.

945-2 Aluminum Alloy Structural Plate Pipe, Pipe Arch and Arches.

945-2.1 General Requirements: Aluminum alloy structural plate pipe, pipe arch, and arches shall conform to AASHTO M219, with the exceptions and additions specified herein. The nominal thickness of the plate shall be as shown in the Plans.

945-2.2 Bolts and Nuts: In lieu of shaped bolts and nuts, standard type bolts and nuts, with special shaped washers, may be used. For aluminum bolts and nuts the material shall conform to the chemical requirements shown in Table I of ASTM B211, for Alloy 6061. Nuts shall be lubricated at the factory, with a suitable wax compound. The bolts may be sampled and tested before erection or may be accepted on the basis of the manufacturer's certification.

For steel bolts and nuts, the material shall meet the requirements of either ASTM A307 or ASTM A325, as appropriate, and shall be hot double-dipped galvanized. Aluminized steel bolts, or other equally suitable devices for connecting the plates, may be used if approved by the Engineer.

945-2.3 Certification of Tests: For all aluminum materials, test certifications as specified in 965-2, shall be furnished.

945-2.4 Direct Purchases by the Department: The provisions of 944-9~~, for the conditions of direct purchase of structural plate steel pipe and pipe arches,~~ shall also apply to Departmental purchases of aluminum alloy structural plate pipe, pipe arches and arches.

945-2.5 Pipe Markings: In lieu of the coined markings required by AASHTO M196, Section 14, information may be ink stamped on the pipe at the time of manufacture. *A QC label with* ~~T~~*t*he pipe fabricator's identity, *the* date of corrugating or forming into pipe*, and the date of final QC inspection*~~may be stamped onto the pipe using indelible ink and a suitably fashioned stamping device.~~ *shall be applied to the inside walls of pipe using indelible ink.* The pipe markings must be clearly legible upon arrival at the jobsite and at the time of installation. Pipe with illegible or incomplete markings may be rejected.