Florida Department of Transportation

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GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JOSÉ ABREU
SECRETARY

April 19, 2004

Mr. Donald Davis
Program Operations Engineer
Federal Highway Administration
545 John Knox Road
Tallahassee, Florida 32303

Re: Office of Design, Specifications
Section 410
Proposed Specification: 4100000.D01

Dear Mr. Davis:

We are resubmitting, for your approval, two copies of a proposed Supplemental Specification for Precast Concrete Box Culvert. This draft reflects the changes requested by your office per the memo dated April 12.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via Email to SP965DB or duane.brautigam@dot.state.fl.us.

If you have any questions relating to this specification change, please call Duane F. Brautigam, State Specifications Engineer at 414-4110.

Sincerely,

Signature on file

Duane F. Brautigam, P.E.
State Specifications Engineer

DFB/jf
Attachment
cc: General Counsel
Florida Transportation Builders' Assoc.
State Construction Engineer

PRECAST CONCRETE BOX CULVERT.
(REV 4-19-04)

SECTION 410 (Pages 369-371) is deleted and the following substituted:

SECTION 410
PRECAST CONCRETE BOX CULVERT

410-1 Description.

Before the manufacturing of the precast box culvert, submit details of the special units, modifications, and required devices for the Engineer's review and approval. Obtain the precast box culvert from a plant that is currently on the Department's list of qualified precast drainage structures plants and meet the requirements of Section 6.3 of the Materials Manual, which is available at the following URL: www.dot.state.fl.us/specificationsoffice/materialsmanual/section63.pdf .

Construct headwalls, wingwalls and other special features using cast-in-place concrete. Precast wingwalls, cut-off walls or headwalls are not allowed.

410-2 Materials.

Meet the requirements of AASHTO M 259 [AASHTO M 259M] for installations with ~~cover~~*fill height* greater than 2 feet [0.6 m] and AASHTO M 273 [AASHTO M 273M] for installations with less than 2 feet [0.6 m] of ~~cover~~*fill height*. The plans will note the appropriate table for the AASHTO specification to be used. Design the precast box culvert section for the same live load, hydraulic opening, fill height, and reinforcing steel cover as the plan details using the section dimensions shown in the appropriate tables in the AASHTO specifications. Alternatively, in lieu of a redesign, design the precast box culvert section identical to plan details including reinforcing steel quantity, grade and cover, concrete class, and slab and wall thicknesses. Ensure that a Specialty Engineer performs any redesign of the box culvert and signs and seals the plans. When used with headwalls, *wingwalls, cut-off walls* and other special features, provide special precast end sections having exposed reinforcement for tying headwall, *wingwall and cut-off wall* reinforcing steel. The Engineer will not allow field cutting of the sections for the purpose of exposing reinforcement.

410-3 Trench, Foundation, Laying, and Backfill.

For the methods of construction of trench and foundation, and for laying and backfilling, meet the requirements specified in Section 430, and the following:

Lay all precast box culvert sections on a dry, unyielding foundation. Provide dewatering devices capable of maintaining a stable as well as surface dry trench bottom. Provide bedding that consists of a minimum 6 inch [150 mm] depth of coarse concrete sand or other suitable granular material placed below the culvert to a minimum width of 12 inches [300 mm] outside the exterior walls of the culvert. Set grade forms 12 inches [300 mm] outside each exterior wall of the box culvert. Uniformly compact this material as required in 120-9.3, and then grade off using the forms. Set the grade forms approximately 1/8 to 1/4 inch [3 to 6 mm] above the theoretical grade line to allow for soil compression. Adjust this distance to yield the proper grade, but do not use in lieu of the proper compaction of the granular bedding material. Remove the forms after placing the precast box culvert section. When required by the plans, provide other special bedding. Obtain the Engineer's approval of the method of controlling line and grade during culvert installation. Use a method that allows rapid checking of the previously laid sections. Maintain line and grade on sections previously set. The Engineer will consider sections which do not retain the plan line (within 0.10 foot [30 mm]) or grade (within 0.10 foot [30 mm]) during laying of subsequent sections as not having been laid to line and grade. Take up and relay sections not to line and grade without additional compensation. Begin backfilling only after the Engineer determines that the culvert sections are to line and grade and will not be affected by subsequent laying procedures. Seal holes

provided for lifting or joint restraint by using an approved non-shrink mortar, applied in conjunction with an approved epoxy bonding compound, mixed, applied, and cured in accordance with the manufacturer's recommendation.

410-4 Joints.

Make field joints for precast concrete box culvert sections with a butyl rubber based preformed plastic gasket material or as detailed in the plans. For culverts to be laid with joints made from preformed plastic gasket material, meet the requirements outlined in 430-7.3, and the following:

Furnish to the Engineer a written recommendation of the size (cross-sectional area) of gasket material which will create a watertight seal. Ensure that this amount is the minimum quantity of gasket material used.

In addition, completely wrap the outside of each joint with either a woven or non-woven filter fabric. Use fabric having a minimum width of 2 feet [0.6 m] and secure the fabric tightly against the box culvert section with metal strapping. The Contractor may use other methods which, in the opinion of the Engineer, would hold the fabric securely against the wall of the culvert until the Contractor places and compacts the backfill. When specified in the plans, secure the joint by a suitable device capable of holding the sections to line and grade as well as fully home. Remove these devices after placing and compacting sufficient backfill to secure the sections.

Construct headwalls, *wingwalls, cut-off walls* and other special features in place, leaving a sufficient length of steel exposed for connection to endwalls or cast-in-place sections.

410-5 Method of Measurement.

The quantity to be paid for will be the length, in feet [meters], installed in place, completed and accepted, measured along the centerline of the structure, from end to end with proper deduction in length for cast-in-place headwalls, *wingwalls and cut-off walls* or other cast-in-place sections. As an exception to the deduction in length requirement, short cast-in-place sections which are used in lieu of standard field joints as specified in 410-4 will not be deducted. Measurement for multiple barrel precast box culvert installations will be the total of measurements along each barrel.

410-6 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section, including the cost of the special bedding material and its placement, graded forms, sealing hoses, preformed plastic gasket material, filter fabric material, attachment of the filter fabric, and restraining devices when required. The price will also include all excavation except the volume included in the items for the grading work specified for separate payment in Section 125.

Cast-in-place transitions, *wingwalls, cut-off walls* and headwalls will be paid for under the pay items for concrete (culverts) and reinforcing steel (roadway).

As an exception to the above, when precast construction of a concrete box culvert is substituted for cast-in-place construction, payment will be made for concrete and steel at the Contract unit prices. Prices and payments will be full compensation for all work specified herein. The quantities to be paid for will be those quantities which would be paid for if cast-in-place construction was utilized.

Payment will be made under:

Item No. 410- 70-	Precast Concrete Box Culvert - per foot.
Item No. 2410- 70-	Precast Concrete Box Culvert - per meter.

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