Florida Department of Transportation

JEB BUSH
GOVERNOR

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Tallahassee, FL 32399-0450

DENVER J. STUTLER, JR.
SECRETARY

March 24, 2006

Mr. Donald Davis
Program Operations Engineer
Federal Highway Administration
545 John Knox Road, Suite 200
Tallahassee, Florida 32303

Re: Office of Design, Specifications
Section 425
Proposed Specification: 4250000 – Inlets, Manholes, and Junction Boxes

Dear Mr. Davis:

We are submitting, for your approval, two copies of a proposed Supplemental Specification for Inlets, Manholes, and Junction Boxes.

This change was proposed by Linda Seigle of the State Drainage Office to resolve conflict between Department documents and for clarification.

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

INLETS, MANHOLES, AND JUNCTION BOXES
(REV 12-6-05)

Section 425 (pages 386 – 390) is deleted and the following substituted:

SECTION 425
INLETS, MANHOLES, AND JUNCTION BOXES

425-1 Description.

Construct ~~drop~~ inlets, manholes, *and* junction boxes~~, shoulder gutter inlets, and yard drains~~ from reinforced concrete *as shown ~~on~~ in the Design Standards and the plans*. Brick masonry may be used if the structure is circular and constructed in place. Furnish and install the necessary metal frames and gratings. *Construct yard drains from non-structural concrete as ~~shown on Design Standard~~ per~~,~~ Index 282.* ~~Also, A~~adjust ~~those~~ structures shown in the plans to be adjusted or ~~which are~~ requir*inged* ~~to be~~ adjust*mented* for the satisfactory completion of the work.

425-2 Composition and Proportioning.

425-2.1 Concrete: *For inlets, manholes, and junction boxes, ~~U~~u*se Class ~~I~~*III or IV* concrete, as *designated in the plans and Design Standards and as* specified in Section~~s~~ 346~~ and 347~~. *For yard drains use concrete as specified in Section 347.*

425-2.2 Mortar: For brick masonry, make the mortar by mixing one part portland cement to three parts sand. Miami Oolitic rock screenings may be substituted for the sand, provided the screenings meet the requirements of 902-5.2.3 except for gradation requirements. Use materials passing the No. 8 [2.36 mm] sieve that are uniformly graded from coarse to fine.

Masonry cement may be used in lieu of the above-specified mortar provided it is delivered in packages properly identified by brand name of manufacturer, net weight of package, and whether it is Type 1 or Type 2, and further provided that it has not been in storage for a period greater than six months.

425-3 Materials.

425-3.1 General: Meet the following requirements:

Sand (for mortar)	902-3.2
Portland Cement	Section 921
Water	Section 923
Reinforcing Steel	931-1.1 and 415-3
~~Inlet and Outlet Pipe~~	~~Sections 449, 943, 945 and 946~~
Brick and Concrete Masonry Units	Section 949
Castings for Frames and Gratings	962~~-8~~

425-3.2 Gratings: Use gratings and frames fabricated from structural steel *or cast iron as designated in the appropriate Design Standard. When "Alt. G" grates are specified in the plans, provide structural steel grates that are* galvanized in accordance with the requirements of ASTM A 123~~, or painted, meeting the requirements of 971-8. Use the Qualified Products List to determine the number of dip coats to apply and the thickness of each coat. Apply a black finish coat (Color No. 17038, Federal~~

~~Standard 595A). Prior to painting, clean the steel in accordance with the Steel Structures Painting Council Surface Preparation Specifications, SSPC-SP2 or SSPC-SP7. All paint may be applied in the shop, by dipping, provided that the first coat application is thoroughly dry before applying the second coat. Do not follow the requirements of this Subarticle when using ASTM A 588 steel~~.

425-4 Forms.

Design and construct wood or metal forms so that they may be removed without ~~injuring~~ *damaging* the concrete. Build forms true to line and grade and brace them in a substantial and unyielding manner. Obtain the Engineer's approval before filling them with concrete.

425-5 Precast Inlets, Manholes, and Junction Boxes.

Precast inlets, manholes and junction boxes, designed and fabricated in accordance with the plans*, the Design Standards and Section 449*, may be substituted for cast-in-place units.

~~Smooth welded wire fabric may be substituted for deformed re-bar or welded deformed wire reinforcement in non-circular precast drainage structures provided the following requirements are met:~~

~~1. The smooth welded wire fabric complies with ASTM A 185.~~

~~2. Substitution of equal areas of smooth wire fabric for the reinforcing steel and provided the width and length of the unit is four times the width of the spacing of the cross wires.~~

~~3. Wire is continuous around the box and spliced at a quarter point of one side with an overlap of not less than the spacing of the cross wires plus 2 inches [50 mm].~~

425-6 Construction Methods.

425-6.1 Excavation: Excavate as specified in Section 125.
Where unsuitable material for foundations is encountered, excavate the unsuitable material and backfill with suitable material prior to constructing or setting inlets, manholes and junction boxes.

As an option to the above and with the Engineer's approval, the Contractor may carry the walls down to a depth required for a satisfactory foundation, backfill to 8 inches [200 mm] below the flowline with clean sand and cast a non-reinforced 8 inch [200 mm] floor.

425-6.2 Placing and Curing Concrete: Place the concrete in the forms, to the depth shown in the plans, and thoroughly vibrate it. After the concrete has hardened sufficiently, cover it with suitable material and keep it moist for a period of three days. Finish the traffic surface in accordance with 522-7.2, or with a simulated broom finish approved by the Engineer.

425-6.3 Setting Manhole Castings: After curing the concrete as specified above, set the frame of the casting in a full mortar bed composed of one part portland cement to two parts of fine aggregate.

425-6.4 Reinforcing Steel: Follow the construction methods for the steel reinforcement as specified in Section 415.

425-6.5 Laying Brick: Saturate all brick with water before laying. Bond the brick thoroughly into the mortar using the shovejoint method to lay the brick. Arrange headers

and stretchers so as to bond the mass thoroughly. Finish the joints properly as the work progresses and ensure that they are not less than 1/4 inch [6 mm] or more than 3/4 inch [19 mm] in thickness. Do not use spalls or bats except for shaping around irregular openings or when unavoidable at corners.

~~**425-6.6 Placing Pipe:** Construct inlet and outlet pipes of the same size and kind as the connecting pipe shown in the plans. Extend the pipes through the walls for a distance beyond the outside surface sufficient for the intended connections, and construct the concrete around them neatly to prevent leakage along their outer surface. Keep the inlet and outlet pipes flush with the inside of the wall. Resilient connectors as specified in 942-3 may be used in lieu of a masonry seal.~~

425-6.~~7~~*6* Backfilling: Backfill as specified in Section 125, meeting the specific requirements for backfilling and compaction around inlets, manholes, and junction boxes detailed in 125-8.1 and 125-8.2. However, for outfall lines beyond the sidewalk or future sidewalk area, where no vehicular traffic will pass over the pipe, inlets, manholes, and junction boxes, compact backfill as required in ~~125-8.3~~*125-9.2.2*.

425-6.~~8~~*7* Adjusting Existing Structures: Cut down or extend existing manholes, catch basins, inlets, valve boxes, ~~monument boxes,~~ etc., within the limits of the proposed work, to meet the finished grade of the proposed pavement, or if outside of the proposed pavement area, to the finished grade designated on the plans for such structures. Use materials and construction methods which meet the requirements specified above to cut down or extend the existing structures.

The Contractor may extend manholes needing to be raised using adjustable extension rings of the type which do not require the removal of the existing manhole frame. Use an extension device that provides positive locking action and permits adjustment in height as well as diameter and meets the approval of the Engineer.

425-7 Method of Measurement.

The quantities to be paid for will be (1) the number of inlets, manholes, junction boxes, and yard drains, completed and accepted; and (2) the number of structures of these types (including also valve boxes ~~and monument boxes~~) satisfactorily adjusted.

425-8 Basis of Payment.

425-8.1 New Structures: Price and payment will be full compensation for furnishing all materials and completing all work described herein or shown in the plans, including all clearing and grubbing outside the limits of clearing and grubbing as shown in the plans, all excavation except the volume included in the measurement designated to be paid for under the items for the grading work on the project, all backfilling around the structures, the disposal of surplus material, and the furnishing and placing of all gratings, frames, covers, and any other necessary fittings.

425-8.2 Adjusted Structures: When an item of payment for adjusting manholes, valve boxes, *or* inlets~~, or monument boxes~~ is provided in the proposal, price and payment will be full compensation for the number of such structures designated to be paid for under such separate items, and which are satisfactorily adjusted, at the Contract unit prices each for Adjusting Inlets, Adjusting Manholes, *and* Adjusting Valve Boxes ~~and Adjusting Monument Boxes~~.

For any of such types of these structures required to be adjusted but for which no separate item of payment is shown in the proposal for the specific type, payment will be made under the item of Adjusting Miscellaneous Structures.

425-8.3 Payment Items: Payment will be made under:

Item No. 425- 1- Inlets - each.
Item No. 2425- 1- Inlets - each.
Item No. 425- 2- Manholes - each.
Item No. 2425- 2- Manholes - each.
Item No. 425- 3- Junction Boxes - each.
Item No. 2425- 3- Junction Boxes - each.
Item No. 425- 4- Adjusting Inlets - each.
Item No. 2425- 4- Adjusting Inlets - each.
Item No. 425- 5- Adjusting Manholes - each.
Item No. 2425- 5- Adjusting Manholes - each.
Item No. 425- 6- Adjusting Valve Boxes - each.
Item No. 2425- 6- Adjusting Valve Boxes - each.
~~Item No. 425- 7- Adjusting Monument Boxes - each.~~
~~Item No. 2425- 7- Adjusting Monument Boxes - each.~~
Item No. 425- 8- Adjusting Miscellaneous Structures - each.
Item No. 2425- 8- Adjusting Miscellaneous Structures - each.
~~Item No. 425- 9- Shoulder Gutter Inlets - each.~~
~~Item No. 2425- 9- Shoulder Gutter Inlets - each.~~
Item No. 425- 10- Yard Drains - each.
Item No. 2425- 10- Yard Drains - each.

INLETS, MANHOLES, AND JUNCTION BOXES
(REV 12-6-05)

Section 425 (pages 386 – 390) is deleted and the following substituted:

SECTION 425
INLETS, MANHOLES, AND JUNCTION BOXES

425-1 Description.

Construct inlets, manholes, and junction boxes from reinforced concrete as shown in the Design Standards and the plans. Brick masonry may be used if the structure is circular and constructed in place. Furnish and install the necessary metal frames and gratings. Construct yard drains from non-structural concrete as per Index 282. Adjust structures shown in the plans to be adjusted or requiring adjustment for the satisfactory completion of the work.

425-2 Composition and Proportioning.

425-2.1 Concrete: For inlets, manholes, and junction boxes, use Class II or IV concrete, as designated in the plans and Design Standards and as specified in Section 346. For yard drains use concrete as specified in Section 347.

425-2.2 Mortar: For brick masonry, make the mortar by mixing one part portland cement to three parts sand. Miami Oolitic rock screenings may be substituted for the sand, provided the screenings meet the requirements of 902-5.2.3 except for gradation requirements. Use materials passing the No. 8 [2.36 mm] sieve that are uniformly graded from coarse to fine.

Masonry cement may be used in lieu of the above-specified mortar provided it is delivered in packages properly identified by brand name of manufacturer, net weight of package, and whether it is Type 1 or Type 2, and further provided that it has not been in storage for a period greater than six months.

425-3 Materials.

425-3.1 General: Meet the following requirements:

Sand (for mortar)..... 902-3.2
Portland Cement.....Section 921
Water.....Section 923
Reinforcing Steel ..... 931-1.1 and 415-3
Brick and Concrete Masonry Units.....Section 949
Castings for Frames and Gratings.....962

425-3.2 Gratings: Use gratings and frames fabricated from structural steel or cast iron as designated in the appropriate Design Standard. When “Alt. G” grates are specified in the plans, provide structural steel grates that are galvanized in accordance with the requirements of ASTM A 123.

425-4 Forms.

Design and construct wood or metal forms so that they may be removed without damaging the concrete. Build forms true to line and grade and brace them in a substantial and unyielding manner. Obtain the Engineer's approval before filling them with concrete.

425-5 Precast Inlets, Manholes, and Junction Boxes.

Precast inlets, manholes and junction boxes, designed and fabricated in accordance with the plans, the Design Standards and Section 449, may be substituted for cast-in-place units.

425-6 Construction Methods.

425-6.1 Excavation: Excavate as specified in Section 125.
Where unsuitable material for foundations is encountered, excavate the unsuitable material and backfill with suitable material prior to constructing or setting inlets, manholes and junction boxes.

As an option to the above and with the Engineer's approval, the Contractor may carry the walls down to a depth required for a satisfactory foundation, backfill to 8 inches [200 mm] below the flowline with clean sand and cast a non-reinforced 8 inch [200 mm] floor.

425-6.2 Placing and Curing Concrete: Place the concrete in the forms, to the depth shown in the plans, and thoroughly vibrate it. After the concrete has hardened sufficiently, cover it with suitable material and keep it moist for a period of three days. Finish the traffic surface in accordance with 522-7.2, or with a simulated broom finish approved by the Engineer.

425-6.3 Setting Manhole Castings: After curing the concrete as specified above, set the frame of the casting in a full mortar bed composed of one part portland cement to two parts of fine aggregate.

425-6.4 Reinforcing Steel: Follow the construction methods for the steel reinforcement as specified in Section 415.

425-6.5 Laying Brick: Saturate all brick with water before laying. Bond the brick thoroughly into the mortar using the shovejoint method to lay the brick. Arrange headers and stretchers so as to bond the mass thoroughly. Finish the joints properly as the work progresses and ensure that they are not less than 1/4 inch [6 mm] or more than 3/4 inch [19 mm] in thickness. Do not use spalls or bats except for shaping around irregular openings or when unavoidable at corners.

425-6.6 Backfilling: Backfill as specified in Section 125, meeting the specific requirements for backfilling and compaction around inlets, manholes, and junction boxes detailed in 125-8.1 and 125-8.2. However, for outfall lines beyond the sidewalk or future sidewalk area, where no vehicular traffic will pass over the pipe, inlets, manholes, and junction boxes, compact backfill as required in125-9.2.2.

425-6.7 Adjusting Existing Structures: Cut down or extend existing manholes, catch basins, inlets, valve boxes, etc., within the limits of the proposed work, to meet the finished grade of the proposed pavement, or if outside of the proposed pavement area, to the finished grade designated on the plans for such structures. Use materials and construction methods which meet the requirements specified above to cut down or extend the existing structures.

The Contractor may extend manholes needing to be raised using adjustable extension rings of the type which do not require the removal of the existing manhole frame. Use an extension device that provides positive locking action and permits adjustment in height as well as diameter and meets the approval of the Engineer.

425-7 Method of Measurement.

The quantities to be paid for will be (1) the number of inlets, manholes, junction boxes, and yard drains, completed and accepted; and (2) the number of structures of these types (including also valve boxes) satisfactorily adjusted.

425-8 Basis of Payment.

425-8.1 New Structures: Price and payment will be full compensation for furnishing all materials and completing all work described herein or shown in the plans, including all clearing and grubbing outside the limits of clearing and grubbing as shown in the plans, all excavation except the volume included in the measurement designated to be paid for under the items for the grading work on the project, all backfilling around the structures, the disposal of surplus material, and the furnishing and placing of all gratings, frames, covers, and any other necessary fittings.

425-8.2 Adjusted Structures: When an item of payment for adjusting manholes, valve boxes, or inlets is provided in the proposal, price and payment will be full compensation for the number of such structures designated to be paid for under such separate items, and which are satisfactorily adjusted, at the Contract unit prices each for Adjusting Inlets, Adjusting Manholes, and Adjusting Valve Boxes.

For any of such types of these structures required to be adjusted but for which no separate item of payment is shown in the proposal for the specific type, payment will be made under the item of Adjusting Miscellaneous Structures.

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Item No. 2425- 4-	Adjusting Inlets - each.
Item No. 425- 5-	Adjusting Manholes - each.
Item No. 2425- 5-	Adjusting Manholes - each.
Item No. 425- 6-	Adjusting Valve Boxes - each.
Item No. 2425- 6-	Adjusting Valve Boxes - each.
Item No. 425- 8-	Adjusting Miscellaneous Structures - each.
Item No. 2425- 8-	Adjusting Miscellaneous Structures - each.
Item No. 425- 10-	Yard Drains - each.
Item No. 2425- 10-	Yard Drains - each.