General Notes:
1. The details shown on Indices No. 21801, 21802, and 21803 depict the final condition of the post-tensioning system. The standards assume certain methods to obtain the required final condition. The Contractor may elect to modify these methods with the approval of the Engineer of Record provided the post-tensioning system is protected from contamination during all intermediate steps and the final condition conforms with the requirements of the Contract Documents.

2. See Specifications for grouting procedures, and post-tensioning systems.


4. See Specifications for surface preparation and other details of the elastomeric coating (Elastomeric Coating System).

5. See Specifications for surface preparation and other details of the Magnesium Ammonium Phosphate Concrete (Magnesium Ammonium Phosphate Concrete) (MAPC).

6. If deviations from these standard methods are proposed, the Contractor shall demonstrate through a mock-up or other methods that his proposed grouting plan adequately fulfills the requirement of fully grouted tendons.

7. The Contractor shall attach pressure gauges to all grout inlets during the grouting operation. Locations of all pressure gauges shall be noted on the grouting operations plan.

8. The grout outlets shown shall be adjusted to accommodate the true high point of the tendon in the completed structure.

9. All grout inlets / outlets are to be sealed using threaded plugs with the exception of inlets / outlets exiting to a vertical face or exiting from the bottom of the bottom soffit.

10. All grout inlets / outlets exiting on vertical surfaces shall be directed toward the inside face of exterior girders or toward the interior of cellular boxes.

11. See Index No. 21802 for "POST-TENSIONING ANCHORAGE PROTECTION".

12. See Index No. 21803 for "POST-TENSIONING ANCHORAGE AND GROUTING DETAILS".

Legend:
- Strand Tendon
- End Anchor with Grout Outlet
- Optional Grout Outlet
- Drain / Grout Outlet
- Grout Outlet
- Direction of Grout Flow
- Inspection Location

Profile 1
Profile 2
Profile 3
Profile 4
Profile 5
Profile 6
Profile 7
Profile 8
Profile 9
Profile 10
Profile 11
Profile 12

POST-TENSIONING VERTICAL PROFILES

FDOT 2014
DESIGN STANDARDS

INDEX NO.
21801

SHEET NO.
1 of 2
NOTES: Grouting Procedures

1. Take into account longitudinal grade, if any, and establish direction of grouting.
2. Orient end anchors so that grout outlet is at the top.
3. Provide grout outlets at all anchors.
4. Provide grout inlet at low point of all tendon profiles.
5. For tendons longer than 150 feet, additional grout outlets are required.
6. Incorporate the information on these drawings into the grouting operations plan.
   a. Direction of grouting
   b. Locations of grout inlets & outlets
   c. Staged grouting operations
   d. Sequence of opening & closing vents
   e. Procedures for time delayed grout phasing of the tendons.
7. In the grouting plan, show
   a. Direction of grouting
   b. Locations of grout inlets & outlets
   c. Staged grouting operations
   d. Sequence of opening & closing vents
   e. Procedures for time delayed grout phasing of the tendons.
8. After grouting, inspect all anchors and high points for voids.
9. Vacuum grout voids and seal post-tensioning system in accordance with the specifications.

Legend:
- Strand Tendon
- End Anchor with Grout Outlet
- Drain / Optional Grout Inlet
- Grout Inlet
- Grout Outlet
- Direction of Grout Flow
- Inspection Location
ANCHOR PROTECTION FOR PT TENDONS

TYPE 1
- Epoxy Grout Pour-back
- Permanent Grout Cap
- Elastomeric Coating Extend 12" beyond edge of anchor
- Concrete Surface

TYPE 2
- Epoxy Grout Pour-back
- Permanent Grout Cap
- Transverse Tendon
- Slope (0.02 Min.)

TYPE 3
- Epoxy Grout Pour-back
- Permanent Grout Cap
- Pocket Former
- Concrete Surface

TYPE 4
- Epoxy Grout Pour-back
- Permanent Grout Cap
- Reinforced Concrete or MAPC Pour-back
- Elastomeric Coating Extend 6" beyond edge of anchor

TYPE 5
- Permanent Grout Cap
- Elastomeric Coating Extend 6" beyond edge of anchor

TYPE 6
- Permanent Grout Cap
- Reinforced Concrete or MAPC Pour-back with High Molecular Weight Methacrylate

ANCHOR PROTECTION FOR PT BARS

TYPE 7
- Type 7 Notes:
  1. Traffic or Pedestrian/Bicycle Railing not shown for clarity.
  2. Where Pour-back is not protected by Traffic or Pedestrian/Bicycle Railing, pour Pour-back with High Molecular Weight Methacrylate.

TYPE 8
- Elastomeric Coating Extend 12" beyond edge of anchor Pour-back

TYPE 9
- Epoxy Grout Pour-back
- Permanent Grout Cap
- Block-Out

TYPE 10
- Epoxy Grout Pour-back
- Permanent Grout Cap
- Concrete Plug

TYPE 11
- Epoxy Grout Pour-back
- Permanent Grout Cap
- Steel Cap or Cover

TYPE 12
- Concrete Secondary Cover
- Pour-back Reinforcing (No. 4 Bar or Equal @ 1'-0" O.C. or as Shown on Plans (Min.))

POST-TENSIONING ANCHORAGE PROTECTION

FDOT 2014 DESIGN STANDARDS

INDEX NO. 21802

Sheet No. 1 of 1
**POST-TENSIONING ANCHORAGE AND GROUTING DETAILS**

**INSTALLATION, GROUTING, INSPECTION & PROTECTION**

1. INSTALLATION & SHIPPING

   1. Remove Rigid Grout Pipe.
   2. Inspect Tendon for Voids as Necessary.
   4. Clean Threads and Rethread as Required.
   5. Install Threaded Plug into Outlet to Form a Tight Fit.
   6. Over-Ream Hole (1/8" Over-Ream) Clean and Roughen Sides.
   7. FillPocket with Epoxy Grout.

2. GROUTING

   - Inspect Anchor for Voids through Grout Inlet/Outlet (See Grout Outlet Detail at Horizontal Surfaces for Procedures).
   - Install Threaded Plug after Inspection of Voids.
   - Pour Epoxy Grout into Pipe Recesses.
   - Grout Pour-back (Epoxy Grout Optional)
   - Install Permanent Grout Cap after Stressing Tendons.
   - Thread Grout Pipe with Grout Valve through Oversize Pipe and into Grout Cap.
   - Pressure Gauge.

3. INSPECTION

   - Inspection of Grout Cap not Required.
   - Install Permanent Threaded Plug after Inspection of Voids.
   - Pressure Gauge.

4. PROTECTION

   - Protection (Align with Temporary Cap if Necessary).
   - Oversize Rigid Pipe Protection (Align with Opening in Grout Cap).
   - Threaded Rigid Pipe with Temporary Cap Protection.

**NOTES:**

1. Holes used for the Inspection and Grout Inlets/Outlets may be Formed using Tapered Pipes or Mandrels.
2. Round Pocket Former - Gravity Fed Placement of Grout Acceptable
4. Square Pocket Former - Vacuum Grouting Required
GROUT OUTLET CONNECTION TO TENDON

1. Grout outlet connection to tendon.

2. FILLING POCKET

PROCEDURE:
1. Remove rigid grout pipe, or drill grout in flexible pipe.
2. Inspect tendon for voids as necessary.
3. Vacuum grout as required and allow grout to cure for 24 hr. (MINs.)
4. Remove pipe used for vacuum grouting.
5. Plug recess with threaded cap.

NOTE:
- Grout outlet connection to tendon filling pocket.
- Duct coupler.
- Modified inlet / outlet coupler (see groat outlet detail at vertical surfaces).
- Modified inlet / outlet coupler (See.

INLET END

OUTLET END

GROUT INLET AND OUTLET DETAILS FOR PT BARS

GROUT INLET AND OUTLET DETAILS FOR I-GIRDERS/BULB-T'S

GROUT OUTLET DETAIL AT VERTICAL SURFACES

TENDONS AT 3' TO 6' FROM HIGH POINTS (GROUT OUTLET)

TENDONS AT LOW POINTS (GROUT INLET / DRAIN)

GROUT INLET AND OUTLET DETAILS FOR C-I-P BOXES

Details for C-I-P Boxes with internal tendons similar. Web reinforcing not shown for clarity.

POST-TENSIONING ANCHORAGE AND GROUTING DETAILS
**NOTES:**
Place Tapered Blocks Under Each Tendon to be Grouted to Raise Duct off Tendon Strands. Center Strands within Duct before Grouting. Blocks Shall be Removed after Grout has Set. Blocks Shall not Damage or Permanently Deform Duct.

**ELEVATION OF GROUT INLET**

**SECTION**

**GROUTING FOR SPAN BY SPAN CONSTRUCTION**

**TEMPORARY ACCESS HOLES**

Notes: Temporary Access Holes
1. Temporary access holes to facilitate access for erection, jacking and grouting operations inside the box during construction are allowed. The access holes shall be limited to a maximum size of 12" wide x 30" long and shall be limited to one per span.
2. Slab block-outs for temporary / permanent longitudinal post-tensioning bars are not allowed. Temporary/ permanent PT bars in the top slab shall be placed in oversized ducts in the slab to accommodate both the bar and coupler.
3. In lieu of 1 ~ 42" x 30" temporary access hole, a maximum of 2 top slab block-outs (12" x 12" (Max.)) between the webs is allowed for construction per span. Block-outs shall be a minimum of 12" from the nearest duct or anchor and shall be located as to prevent direct drip onto bottom slab anchors.

Notes: Repair of Temporary Access Holes, Block-outs, and Lifting Holes
1. Form all large block-outs with tapered sides.
2. Immediately before casting the concrete, mechanically clean the mating concrete surfaces to remove any latex and to expose small aggregate.
3. Repair all holes and block-outs with Magnesium Ammonium Phosphate Concrete within 24 hours of cleaning concrete.
4. After completion of the deck grooving, coat the repaired and surrounding concrete surfaces with High Molecular Weight Methacrylate.
5. Alternately, epoxy grout may be used to repair holes. High Molecular Weight Methacrylate is not required with epoxy grout.

**DETAIL OF DRIP LEDGE AT ABUTMENTS AND EXPANSION JOINTS FOR SEGMENTAL AND CAST-IN-PLACE BOX CONSTRUCTION**

**DUCT COUPLER DETAIL**