

FINAL VERSION

POST TENSIONED BRIDGES WALK THROUGH INSPECTIONS

Structures requiring walk through inspections.

All districts should complete the walk through inspections and submit a Summary Report to the State Maintenance Office by December 15, 2000.

The following structure types require a walk through inspection:

- All segmentally constructed concrete boxes.
- All segmentally constructed substructures.
- Post Tensioned bulb tees with anchorage pocket in the deck slab.

At the next District Structures and Facilities Engineer's statewide meeting in January a more detailed, phase II inspection will be established and recommendations for the need, frequency and depth of additional inspections will be determined.

Walk Through Inspection Requirements

The inspectors should conduct a walk through inspection observing the following items and note any deficiencies found. If possible this inspection should be conducted during or shortly after a heavy rain. This may help find possible access paths for moisture.

Ducts (this only applies to external post tensioning):

- Check for cracks in duct. A mirror should be used to assist in inspecting the complete circumference of the duct. Any cracks found should be marked at each end to monitor crack growth and date of inspection noted. Cracked ducts provide a path for moisture to attack the post tensioning.
- Check for kinks or bulges in the duct. Kinking in a duct may be the result of the installed duct being too long and not the result of distress in the post tensioning, however the inspector should note any kinking or bulging of the duct.
- If the duct is cracked try to obtain a sample of the grout for submission to Gainesville. Check with the State Materials Office on methodology for obtaining grout samples. Do not destroy the duct to obtain samples. Note the location of the grout sample.
- If the grout is visible in any locations, note the locations and the condition of the grout.
- Identify any areas of grout spillage.
- Note any grout color differences in the grout. This indicates different types of grout used and may be an indication that the quality of the initial grouting was poor.
- Identify duct type material (may need to review construction records).

- Shrink wrap all cracked ducts full length between boots as soon as possible, unless a more detailed inspection of the tendon is anticipated. Check with District 3 or 6 on the methodology for wrapping the ducts.

Anchorage and Deviation Blocks (when visible):

- Note any moved boots and deviation pipes. This could be a sign of strand or tendon failure.
- Look for and note chalky material at anchorages. This may indicate poor quality in the grout or in the pour back which could allow moisture to enter the duct and cause corrosion to the tendon.
- Look for and note sweating or signs of corrosion to the anchorages and strands.
- Look for and note cracks and/or spalls around the deviation blocks and pipes.

Post Tensioning Block outs:

- Check for cracking and spalling and signs of corrosion.
- For bulb tees, check for crack opening around anchorage pocket pour backs in the deck slab.

General Structure:

- Note any light coming between segments. This could be a sign of poor matching of segments or more significantly a sign of loss of stress in the post tensioning. If the inspector believes this to be because of loss of stress in the post tensioning the inspectors should immediately contact the District Structures and Facilities Engineer for an immediate evaluation of the situation. The District Structure and Facility Engineer should contact the State Structures Design Engineer and the State Maintenance Office if needed.
- Look for and note signs of water leaking, efflorescence and or rust staining, especially at joints between segments.
- Look for cracks near anchorages that are leaking.
- Look for porous or cracked anchorage pourbacks where water may enter and recharge the tendon voids.
- Look for and note signs of poor drainage. This may include the identification of areas where water ponds after periods of heavy rains.
- Look for and note signs of leaking expansion joints.
- Identify types of expansion joints.
- Note any cracks that are discovered in the outside of the box. Especially note cracks in tension areas.
- Look for any signs of misalignment of the box or girder. If this is found the inspectors should immediately contact the District Structures and Facilities Engineer for an immediate evaluation of the situation. The District Structure and Facility Engineer should contact the State Structures Design Engineer and the State Maintenance Office if needed.

- Listen for any unusual sounds while inside the box. Depending on the traffic level on the structure this may not be possible. Popping or cracking sounds may be an indication of post tensioning wires breaking or cracking of the ducts.
- Mark and date any unusual cracks on walls.

Report Format (Due December 15, 2000)

The report shall contain the following sections:

- Description – This should be a general description of the structure, the post tensioning type(s) used and the square foot area of the various post tensioning type used. Example: The Seminole Gator Bridge is a 15 span bridge with Spans 1-5 being post tensioned bulb tees having 30,000 sq ft deck area, Spans 6-10 being externally post tensioned segmental box construction having 50,000 sq ft deck area, Spans 11-15 being internally post tensioned segmental box construction having 45,000 sq ft deck area. In addition Piers 4, 5 and 6 are segmentally constructed. The areas of most concern based on the walk through inspection are the externally post tensioned box section and Pier 5.
- Findings – Discuss significant deficiencies found including location and orientation. If there is a deficiency that is found repetitively throughout the bridge give the number of locations where this is found and the total number of the locations where it is possible for this deficiency to be found, example: 9 of 56 anchor blocks have severe rust staining around the pour back. Include photographs and sketches of typical deficiencies. Photographs should be digital.
- General Comments – Provide general related comments about the structure.
- Recommendations – Include preliminary recommendations. This might include more frequent inspections, phase 2 inspections (boroscopes, soundings, vibration testing, magnetic flux, etc.), possible repairs.