Post-tension Field Inspection of Unbonded Tendons for Parking and Flat Slab Structures

April 5, 2013

1. The contract drawings show the location of tendons as the distance from the bottom of the slab to the center of tendons at mid-span and over the columns. Make sure that the tendons are properly secured at the high and low point to the support bars and the chair heights. Slight variation of tendons drape can severely reduce the design capacity.

2. Generally, the effective force in the tendons for the floor slab and beams depend on the longest span with maximum drape of the tendons. For smaller spans, the drape of tendons is less. This is accomplished by raising the tendons at mid span. Make sure to check the drapes of the tendons, especially for smaller spans.

3. Do not crowd the dead end anchors near the stairs, elevators or other big openings. Spread the anchors to avoid stress concentration.

4. Provide minimum two tendons over the columns.

5. Minimum mild negative reinforcement is required as per American Concrete Institute Code over the columns, however, minimum reinforcement at mid span is only required for one-way slab spanning between the beams, unless otherwise required by design.

6. In the outermost and innermost layers, the tendons should take precedent over the mild reinforcement. Most of the negative mild reinforcement should be located over the columns width plus 1-1/2 the slab depth on either side of the column face.

7. Before pouring the concrete, all damaged sheathing and the exposed tendons near the dead and live end anchorage must be properly wrapped with sheathing material. Tendons should be protected from exposure to cement mortar.

8. Pulling of the tendons should commence, at minimum three days after the pour, or when the concrete has attained strength up to 70% of the 28 days concrete strength.

9. Keep proper logs of all elongations and compare them with the elongations shown on the shop drawings. If some tendons do not achieve the required elongations, DO NOT re-stress them, as there is a greater chance you may break that tendon. Total elongations of tendons per bay can be within +4% of the required elongations. All broken tendons must be brought to the attention of the structural design engineer. After the tendons are fully stressed and the elongations are certified by the structural engineer, cut the tendons at the live end and properly grout the anchorage area. The delay in cutting and patching can cause rust to the tendons exposed to moisture.

10. If the slab pour is more than 120 feet long, pull tendons from both ends. For post-tension deep beams, the one side pull length may be increased to 150 feet.

For more information, contact the Consulting Support Service (003C5), Asok Ghosh at 202-632-5028.