Development Services

Post-Tensioned Concrete Preconstruction Meeting Agenda

Project Name/Location_____

Meeting Date_____ First Pour Date_____

Project Team	Name/Company	Phone	Email
Building Official*			
Building Inspector*			
Structural Engineer*			
General Contractor*			
Special Inspector*			
PT Supplier			
Rebar Supplier			
Concrete Supplier			
PT Placer			
Rebar Placer			
Concrete Placer			
Concrete Finisher			

*Attendance is required

Submittals

The following submittals shall be reviewed, approved and available on site prior to placing concrete for post-tensioned beams and/or slabs:

- Concrete mix design
- PT shop drawings
- Rebar shop drawings
- Formwork shop drawings or system information
- Slab penetration and in-slab conduit layout
- Stressing pocket bonding agent and grout data
- Embedded items
- Deferred submittals (hold down anchors, in-slab duct systems, etc.)

General PT Items

Pour Statistics

- Expected number of pours _____
- Number of levels _____
- Typical slab thicknesses_____
- Largest pour _____C.Y._____S.F.
- Typical pour_____C.Y._____S.F.

Concrete Mix

The concrete mix shall be approved by the structural engineer (EOR), and shall be as follows:

- Mix design #_____ will be used.
- Mix is continuously approved ☐ Yes ☐ No
- The maximum aggregate size is_____ inches.
- The minimum clearance or spacing is_____ inches.
- The maximum allowed slump is_____ inches.
- The minimum slump for use with PT is 4 inches.
- Design concrete strength is_____ psi at_____ days.
- Strength for stressing is_____ psi at_____ days.

NOTE: The maximum slump for the mix may not be exceeded, even if the drawings or specifications allow a higher slump. Under no circumstances shall the maximum slump allowed be the average slump expected.

Concrete Sampling

Tests shall be taken at the point of placement whenever possible.

Rejection Procedures

Concrete not in conformance with the mix designs or other stated requirements shall be rejected. Rejection procedure shall be:

PT Samples

Sample pieces of PT cable approximately six feet long are to be delivered with every shipment of cable to the job site. Samples shall be from the same batch or heat as the strands with which they were sent. These samples are to be tagged and held in the testing laboratory along with the mill certifications.

Stressing Equipment

Well calibrated, properly maintained equipment is critical to reliably stressing PT cables.

- Will two sets of stressing equipment be kept on site? ☐ Yes ☐ No
- Will matching ram and gauge calibrations be supplied? ☐ Yes ☐ No

Structural Observation

Structural observation by a representative of the EOR is strongly encouraged. The planned structural observation schedule includes:

- Observation of PT with the inspector prior to the first pour ☐ Yes ☐ No
- Pre-pour observation of any subsequent placements with significant differences from the first ☐ Yes ☐ No
- Observation of PT for_____ total pours
- Observation report will be written and submitted to_____.

Mechanical, Electrical and Plumbing Coordination

The contractor shall ensure that placement of nonstructural systems is coordinated with the placement of reinforcement.

Unusual Conditions

Please note any conditions that make the PT for this project unusual or different from typical projects completed in this area:

- PT Beams or Walls _____
- Corrosion-Resistant Systems _____
- Large or Numerous Deck Openings _____
- Stressing Accessibility_____
- In-Slab Ducting System _____
- Other Conditions _____

Items Reviewed Prior to Each PT Deck Pour

Overpour

Check vertical element for overpours. Overpours are locations where vertical sections have been poured higher than per plans such that they extend vertically into the slabs or beams. Concrete walls and columns shall not extend more than ½-inch into the bottom of beams, slabs or drop caps. If slip joints are used at the top of a wall, no overpour is acceptable.

Formwork

Formwork shall be stable, cambered if required, clean and properly supported to carry the weight of all materials and construction loading.

Construction Joints

All construction joints shall be inspected for any required keyways and added rebar per the structural drawings.

Stud Rails

The size, length, spacing and number of studs and the thickness, length and width of the bottom plate shall be reviewed to verify compliance with the structural drawings. The number, placing and positioning of the stud rail shall also be reviewed to verify compliance with the structural drawings.

PT Support

All PT cables shall be supported by rebar, on chairs or on continuous slab bolsters at a maximum spacing of four feet on center. All cables shall be securely tied to these supports to ensure final position after concrete placement. Back-up bars are required at all anchor locations per the structural drawings and the PT shop drawings. Hairpins are required at locations where horizontal curvature of the cable is severe as defined in the structural drawings.

PT Placement

PT cables shall be installed and placed to the allowable tolerances as indicated on the structural drawings. Slab tendon tolerance shall be +/-_____inches for the vertical profile as shown on the PT shop drawings.

The special inspector shall review all cable counts, spacings, profiles and anchorages prior to placing concrete. All stressing end anchors and pocket formers shall be firmly connected to the edge form. Grommets shall be well greased.

PT Clearance

A minimum clearance of _____ inches (3 inches is typical) shall be verified from PT cables to the edges of openings or sleeves. Sleeves may not be used near anchors.

PT Encapsulation

For encapsulated systems as shown on the structural drawings, all PT system components shall be enclosed in a watertight assembly. Because PT cables under stress corrode much faster than typical steel, this assembly is critical to providing a high level of durability. All components of the systems shall be firmly attached to the anchors. Translucent sleeves shall be completely filled with grease. Cuts or tears in the cable sheathing shall be taped with a spiral wrap. No bare cable may be exposed. The inspector shall issue a report verifying that these conditions have been satisfied for each pour.

Rebar

All rebar shall be installed and placed within allowable tolerances as indicated in the structural drawings and per ACI 318. The special inspector shall review all rebar sizes, spacings, clearances, and laps prior to pouring. No wet setting of rebar is permitted.

Unexpected Pour Interruptions

The contractor shall have a contingency plan for the creation of construction joints to allow for the unexpected interruption of a pour due to pump failure, concrete supply interruption, heavy rains, etc. This plan should be discussed with the EOR in advance, and materials for additional keyways and reinforcing should be available on site.

Four Hour Waiting Period

A four-hour minimum time between the special inspector's approval of reinforcement and placing of the concrete shall be observed. The purpose of the waiting period is to ensure that work is complete, inspected and approved prior to the start of the pour. *Exception: The city inspector may make an exception to the four-hour minimum rule for a minor item provided the concrete is never placed at any point on the deck until the inspector has completed the final inspection and has approved all mild steel and PT cable placement in writing*. No other workers may be on the deck during this final inspection. Violations may result in a stop-work order posted by the city. (There is usually a three-day minimum to have a stop-work order removed).

Items Reviewed During Each PT Deck Pour

Special Inspection During the Pour

Special inspection shall be provided continuously throughout the pour. At a minimum, one special inspector shall observe the placement of concrete on the deck and one inspector shall meet the concrete trucks to verify batch tickets and take test cylinders at the point of delivery.

Pour Watch

The contractor shall designate an individual to be on pour watch and accompany the special inspector to correct any PT or other reinforcement that is displaced during the pour. This individual may not have other duties that will conflict with the pour watch.

Test Cylinders

The city requires a minimum of three laboratory cured cylinders for every 150 cubic yards of concrete placed. Of those, one is to be tested at seven days and two at 28 days. In total, the special inspector shall take _____ total test cylinders for verifying the concrete strength. These shall be as follows:

- at 3 days (for stressing – must be field cured)
- at 7 days
- at 28 days
- at 56 days
- at 90 days

It may be helpful to take one additional cylinder to hold in case of problems with other cylinders. Other testing issues to consider:

- Will maturity testing be used? ☐ Yes ☐ No
- Are 4 x 8 cylinders acceptable? ☐ Yes ☐ No
- May all the cylinders be field-cured? ☐ Yes ☐ No

Field cured cylinders must be placed on the deck or in a thermocouple box connected to the deck and protected in such a way as to assure that they benefit from the deck's heat of hydration. Under no circumstances may lab cured cylinders be used in place of field cured cylinders for determining the strength of the deck for stressing purposes.

Air Entrainment and Slump

Air content as specified in the drawings is air content at the point of placement. Target slump as specified in the mix design shall be the slump allowed at the point of placement. If the concrete is pumped, the concrete supplier shall coordinate with the contractor to provide the proper allowance for air loss and slump changes due to pumping to ensure that air content and slump will be as specified. Concrete with excessive slumps will not be placed.

Adding Water

No water shall be added to the concrete at the site unless the supplier has withheld an equal or greater amount from the total water shown on the approved mix design. Each batch ticket shall clearly show how much water, if any, may be added. The person responsible for ordering the concrete and requesting that permissible amounts of added water be listed on the batch ticket is _____. The ticket shall be provided to the inspector who will observe the addition of any water and log it in the inspection report.

Superplasticizer

A superplasticizer may be added at the site after the concrete has been successfully tested for slump. A quality-control representative of the concrete supplier should be on site to establish the dosage for the initial loads. Superplasticizer shall not be used in conjunction with air entrainment unless the potential air loss has been accounted for by the supplier.

Concrete Placement

Place concrete per the requirements of ACI 301, taking any necessary precautions for hot or cold weather conditions if required. Do not dislocate rebar, post-tensioning cables or other reinforcement while placing concrete. Special precautions may be necessary if concrete is being placed with a bucket due to the surge at the discharge point, or if hoses are being dragged across the deck.

No Wet Setting

All rebar and post-tensioned placement should be completed within the area of the pour before the pour begins. No placing of rebar, post-tensioning, inserts, sleeves, conduit, dowels, anchor bolts, etc., shall be allowed after the inspector has given the final approval to pour.

Consolidation

Consolidation, particularly around the PT anchors, is critical. It is difficult to segregate PT concrete mixes with a vibrator, so additional vibration should be done if there are any doubts about adequate consolidation. Concrete has failed at anchors due to inadequate consolidation. Besides requiring repair, these failures involve high forces and flying concrete and can be extremely

dangerous. Disturbing the concrete around the PT anchors after it has been placed and consolidated is prohibited.

Evaporative Retarder

Evaporative retarder as specified in the structural drawings or specifications shall be applied. Plastic shrinkage cracks are created by excessive evaporation from the top of the slab, and may begin to form immediately. To prevent this, the top of the slab must be sealed as soon as possible with an evaporative retarder. An evaporative retarder is sprayed on the slab immediately after placing and reduces evaporation until the top of the slab is finished. Ensure that this product is compatible with the curing compound.

Curing

Follow curing procedures as specified in the structural drawings or specifications. Good curing is one of the most important strategies in creating quality concrete. If curing with a spray-applied curing compound, apply the product immediately after slab finishing. On slabs with a broom finish or other roughened finish, apply two coats in opposite directions. See the drawings or specifications for additional curing information.

Items Reviewed After Each PT Deck Pour

Stressing Preparation

Clean out any slurry or concrete from the anchors to allow proper seating of the wedges. Clean the tendon tails of grease with a cloth or other means in order to accept the paint that the inspector will use for measuring the elongation.

Concrete Stressing Strength

Concrete strength shall be a minimum of_____ psi for stressing.

Stressing

The contractor shall follow the stressing procedures given on the structural drawings and the PT shop drawings. Stressing involves extremely high forces and failure to follow proper procedures may cause serious injury. Stressing shall consist of stressing one cable, then stopping while the stressing foreman and the special inspector both independently measure the elongation. If the elongation as determined by the special inspector is within tolerance, they may repeat this procedure for a second cable. If the second cable is also within tolerance, they may repeat the procedure for a third cable. If the third cable is also within tolerance, it is acceptable for the stressing crew to proceed slightly ahead of the special inspector. This procedure shall be repeated as often as is deemed necessary by the special inspector. The special inspector shall observe all

stressing operations and record all final measurements. Where multiple stressing crews work simultaneously, multiple special inspectors are required. Measured elongation tolerances shall be:

- Seven percent of the calculated value unless noted _____.
- For short pulls, are tolerances of ¼ inch acceptable? ☐ Yes ☐ No

In cases where the actual elongation falls outside of this range, do not proceed. Contact the EOR and the PT supplier to determine the problem before continuing. Stressing shall not continue until the EOR approves the resumption of stressing. Note that special inspector measures elongations and gauge readings, but does not operate the stressing equipment.

Elongation Reports

Once stressing is completed, the inspector shall fax (or email) the final stressing report to the EOR for review and approval as soon as possible. The tendon tails may not be cut off until approval is received.

Cutting and Capping Tendon Tails

Cutting and finishing of the tendon tails shall be witnessed by the special inspector. The watertight cap shall be applied immediately to the anchor to ensure that the cable, which was dried during the cutting process, remains dry. Finishing of the stressing end shall be verified by the inspector.

Stressing Blockouts

Stressing blockouts shall be patched within one week of receiving approval to cut the tendon tails. Before patching, the concrete in the blockouts shall be kept clean and free of rust inhibitors or other materials which may interfere with the bond of the grout patch.

Stripping Forms

Unless noted otherwise on the structural drawings, slab and beam formwork may be stripped after the stressing report has been approved. Verify the reshoring schedule with the formwork supplier before loading the newly poured deck with formwork.

Soffit Curing

When required by the structural drawings or specifications, apply a spray-applied curing compound to the bottom of the slab and beams after removal of the forms. This limits drying on the underside of the structure after the concrete is exposed and improves the quality of curing.

Repairs and Nonconformance Issues

Where repairs are needed or when major nonconformance issues arise, repair procedures proposed and approved by the EOR will need to be reviewed and approved by the City of Bellevue prior to commencing the repair.

Closure Strips

Closure strips may require that forms remain in place on each side of the closure until the strip has been poured and the concrete in it has reached 75 percent of its design strength. Closure strips for this project shall be poured no sooner than ___ days after the slab on both sides has been poured and stressed.

Cutting, Coring and Drilling

The contractor shall take precautions when cutting, coring, drilling or shooting into PT slabs and beams to avoid damage to the reinforcing. Cables and rebar shall be located and the information submitted to the EOR for review. Work may not begin until the EOR has approved the specific location where work is to be done.

Additional PT Deck Issues

Other issues specific to this project to be considered