

POST TENSIONED CONCRETE COURT SPECIFICATIONS

SCOPE

The work contained in this section shall cover the building of new post tensioned concrete courts. To ensure that these courts are built to the highest industry standards and meet USTA and American Sports Builders guidelines for tennis court construction, only a professional license court builder shall build the PT slabs, install the fencing, install the surfacing, and furnish and install the accessories required for the courts. The court builder must have a minimum of 5 years of experience building post-tension concrete courts. The court builder must provide references for 5 similar post tensioned concrete court facilities it has built. Court builder must be a member in good standing with the American Sports Builders Association.

SUBMITTALS AND QUALIFICATIONS

Court contractor shall furnish an Engineered Shop Drawing for the Post tensioned slab, from a licensed Engineer, licensed in the state that work is to be done in. Slab shall be engineered to meet 125 PSI residual compressive strength and shall follow the recommendations provided in the Geo-technical report.

Court contractor must provide proof that it carries the correct license for building sports courts. Court contractor must provide proof of its membership in good standing with the ASBA. Court contractor must provide a list of 5 similar court projects including PT slabs, court fencing, court lighting, court surfacing and court accessories that it has installed.

PURPOSE

The work contained in this section consists of the furnishing and placing of Portland cement concrete for specified structures in complete accordance with these specifications and the applicable drawings. The preferred method of concrete court construction is the post-tensioned concrete slab. This system allows for a much larger single monolithic pour, eliminates the need for expansion joints and minimizes reflective and surface cracking.

CONCRETE QUALITY AND STRENGTH

Concrete shall have a minimum compressive strength of 3,500 psi at 28 days. Minimum cement content shall be 5.5 sacks per cubic yard. No Fly-Ash or Slag is allowed in the concrete. Fly-Ash prevents the adhesion of the court surfacing materials.

COURT ORIENTATION, SLOPE AND ELEVATION REQUIREMENTS

All courts should be oriented North to South. All excavating, filling, grading and compacting work of the sub-base should be performed so that the finished sub-grade is 4"-6" above the surrounding ground. The grade around the court should slope away from the court. No water shall be allowed to drain across or back up onto the court. The slope of the court shall not be less than 0.83% (1:120). Each court must slope in a true plane, preferably from side to side (but from end to end is also acceptable), or in the shortest direction for good drainage and water runoff. The court should never be sloped from the net line to the baseline, from the baseline to the net-line, from the sides to the centerline or from the centerline to the sides.

BASE PREPARATION

Refer to Geo-technical report for base preparation.

MOISTURE/VAPOR BARRIER

A vapor barrier consisting of (2) layers of 6 mil. polyethylene shall be installed in prior to installation of any steel and/or cables. Overlap polyethylene sheets at least 12" and tape joints. Once in place no vehicular traffic should be allowed on the moisture/vapor barrier nor any other object which could puncture the barrier or otherwise compromise the integrity of the surface. All concrete shall be placed using a concrete pump-truck.

CONCRETE THICKNESS

Concrete work shall be 5" thick.

POST TENSIONING

Slab shall be engineered to meet 125 psi residual compressive strength. Post-tensioning material should consist of seven wire stress-relieved strands, conforming to ASTM A 416, with an ultimate strength of 270 KSI. Strands should be coated with a permanent rust preventative lubricant and wrapped with plastic sheathing. If strand sheathing is damaged or removed, it is to be repaired by taping. A maximum of 6" exposed strand is permitted at the anchor. End anchorage devices will conform to Post-Tensioning Institute (PTI) specifications. All dead-end anchorages must be power seated. All strands are to be supported on chairs and tied at all intersections or securely supported in beams to prevent vertical and horizontal movement during concrete placement. Cables should be laid out in grids no greater than 3.5' on center. The Court builders must provide a stamped engineered shop drawing for the PT slab for submittal. Slab shall be engineered to meet 125 psi residual compressive strength. Concrete must be well consolidated, especially in the vicinity of strand anchorages. Strands should be anchored at 28.9 KIPS but may be initially stressed at 33 KIPS. A 9" diameter centered on the strand axis by a 36" length should be allowed for stressing equipment clearance. The stressing process generates tremendous pressures and extreme care should be taken to prevent injury from operator error or failure of equipment or materials. All structural materials shall be designed using acceptable engineering practices in accordance with the geotechnical and structural engineers recommendations.

FORMS

Forms should be set accurately to the lines and grades indicated on drawings and secured to prevent settlement or movement during placing of concrete. Forms should remain in place until concrete has taken its final set.

CONCRETE PROPORTIONING AND MIXING

The concrete should have a compressive strength of not less than 3,500 psi at 28th day after casting. Ready-mixed concrete should be mixed and delivered in accordance with ASTM C 94, Specification for Ready-Mixed Concrete with a 4" maximum slump. Midrange water reducer shall be used to chemically increase the slump $\pm 1.5" - 2"$ without the need for adding additional water on site.

PLACING AND FINISHING

Concrete shall be placed by pumping method. One full court should be placed in one continuous operation without intervening joints of any kind. Concrete shall be spread, consolidated, screeded, bull-floated and finished in accordance with Section 7.2 of ACI (American Concrete Institute) Standard 302, Recommended Practice for Concrete Floor and Slab Construction. When concrete is sufficiently set to withstand foot pressure with only about 1/4" indentation and the water sheen has left the surface, the slab should be uniformly finished by power floating and troweling. The final finish texture should be a light broom finish unless otherwise specified by the surface manufacturer. No curing compounds should be used at any time.

SURFACE TOLERANCES

The finished surface of the court should not vary more than 1/8" in 10' when measured in any direction.

CURING

Immediately after finishing, the concrete should be kept continuously moist for 7 days by covering with polyethylene film or waterproof curing paper, or by sprinkling or ponding or other acceptable coverings. No curing compounds should be used at any time. Curing time should be in accordance with surfacing system manufacturer's recommendations. Timing is critical on all of the above due to the possibility of disturbing the finished surface.



There is also a particular concrete mix design and finish required for our surface system to optimally adhere

NOTE:

Regarding the court slab concrete mix design, we would recommend a 3,500 PSI concrete mix design. Straight Cement, no Fly-ash, and include a Mid-Range Water reducer. Fly-ash prohibits the paint from sticking, MRWR increases the slump of the concrete chemically without altering the cement water ratio. This helps pump-ability and place-ability. This mix design should realize PSI break strengths that are above 4,000 in less than 28 days. No curing compounds can be used. Apply a medium broom finish.

This is the best concrete mix design, and curing method for tennis courts.

As for thickness, we would recommend at min. a 4 inch Post Tensioned concrete slab. This is better for sports play because it eliminates expansion joints, and reduces the negative effects of cracking.

Court Slope requirements - The Maximum slope allowed is 1" per every 10ft (0.83% slope).

Courts should slope in a true plane (preferably East / West,).

NOTE: QCI assumes no responsibility for slope, drainage, flatness, structural integrity, cracking, or performance of any slab constructed by others, and any surface issues resulting therefrom are excluded from QCI's scope and warranty. Slabs must meet applicable industry standards, including current ASBA slope and drainage requirements. QCI shall not be required to patch, level, overlay, or otherwise remediate slabs lacking proper or sufficient slope, as athletic surfacing systems cannot create or correct structural pitch where none exists, and any corrective work shall be the responsibility of Owner or General Contractor. (For surfacing proposals)