

SPECIFICATIONS

P R E S T R E S S E D S P U N C O N C R E T E P O L E S

StressCrete[®] GROUP

These specifications apply to the manufacturing of centrifugally cast, prestressed reinforced concrete poles ("spun concrete poles"). All spun concrete pole designs and wind loading calculations are prepared by an experienced licensed engineer. The manufacturer shall have a minimum of 70 years' experience in the design and production of spun concrete poles.

CERTIFICATION, DESIGN AND MANUFACTURING SPECIFICATIONS

The design and manufacturing of spun concrete poles shall meet the following standards and specifications:

- The manufacturing company shall be certified by Canadian Standards Association (CSA) to CSA-A14 (latest revision);
- Poles shall be designed to AASHTO-LTS (latest revision) to withstand a 3 second gust wind speed that is determined by geographical area utilizing the AASHTO wind map;
- Poles shall be designed/manufactured in accordance to:
 - CSA-A14: Concrete Poles (latest revision);
 - ANSI-C136.46: Roadway and Area Lighting Equipment - Concrete Lighting Poles (latest revision);
 - ASTM-C1089: Standard Specification for Spun Cast Prestressed Concrete Poles (latest revision);
 - The Guide Specification for Prestressed Concrete Poles, issue of the Journal of the Prestressed Concrete Institute.

CONCRETE MATERIALS

Coarse Aggregate

Shall be clean washed limestone or granite with a maximum size of ½", graded as to achieve optimum quality in the finished product.

Fine Aggregate

Shall be clean washed concrete grade sand, free of clay and other deleterious matter.

Cementitious Materials

Shall conform to ASTM C150 I/II, C595 IL, Type I/II and CSA Type 10 or Type 30.

Chemical Admixtures

Water reducers, retarders, or accelerating admixtures shall conform to ASTM-C494. Air entrainment and efflorescence control shall also be used.

Water

Shall be free of acids, alkalis, and organic materials.

Color Pigments

Where used shall be non-fade iron or chromium oxides.

STEEL REINFORCEMENT MATERIALS

- Prestressing reinforcement shall be uncoated 7-wire strand and shall conform to ASTM A416 and CSA G279.
- Non-prestressed reinforcing bars shall conform to ASTM A615, and CSA G30.12.
- Spiral reinforcement shall conform to ASTM A82, and when applicable, have a hot dipped galvanized coating as per ASTM A641, Class 3.

MANUFACTURING

Steel Reinforcing Cage

- The start of every prestressed spun concrete pole begins with the construction of a 'cage-skeleton' which provides support for longitudinal steel reinforcement during manufacturing. This cage-skeleton is constructed of ring wire, welded every two feet, at a constant taper, along a ¼" pencil-rod.
- The longitudinal reinforcing steel consists of prestressing steel strands and/or rebar. The required prestressing strands or rebar are symmetrically placed around the cage-skeleton and secured with tie-wire creating the steel reinforcing cage. Size and quantity of strands and will vary based upon pole length and class.
- Noncorrosive wheel-spacers are placed every 6' along the longitudinal steel to ensure a minimum concrete cover of ¾" on the steel reinforcing cage.
- The steel reinforcing cage shall be wrapped in both directions with steel spiral reinforcement. The pitch shall not be greater than 4" or the radius of the pole, whichever is less. The diameter of helical reinforcement is determined by pole class.
- Ornamental poles shall have additional reinforcing rings at large bell locations for added durability.

Mold Set-Up

The mold is set up to include all through holes, hand hole boxes, apertures, etc. per customer specifications. The steel reinforcing cage is placed into the mold and centered with precision drilled end plates and spools. To further center the cage within the mold, the bottom strand is pre-tensioned to remove any slack in the cable.

Concrete

- A fully automated batching system is to be used for all concrete mix designs. These batches are to be recorded and kept for a minimum of 7 years.
- Concrete is sampled and tested daily. Acceptance tests include compressive strength testing, slump, unit weight, air content, and temperature.
- The concrete is proportioned so that the 28-day compressive tests exceed the minimum design compressive strength of 8,000 psi (55 Mpa).
- Air entrainment admixture shall be used to produce 5-8% air content.

Stressing

- Prestressing steel reinforcement shall be stressed to a maximum of 70% of their ultimate capacity.
- Elongation is to be measured on all strands.

Spinning

Molds are to be spun at 300 – 350 rpm for a duration of 6-15 minutes, depending on pole length and class.

Curing

- Steam is not to be introduced until concrete reaches initial set.
- Concrete temperature not to exceed 140 degrees Fahrenheit (60 degrees Celsius).

Demolding

Prestressing strand shall not be released until a minimum concrete compressive strength of 3,500 psi (25 Mpa) is achieved.