



Centrecon and Victorian Series Specification Sheet

Scope	Ameron's Centrecon and Victorian Series standard specifications for the manufacture of machine-made, prestressed, spun-concrete poles of natural, colored or terrazzo concrete.
General	<p>Standards shall be a tapered concrete pole and consist of: (1) dense, centrifugally cast concrete, (2) high-tensile steel prestressing strand throughout the shaft tensioned at a predetermined stress, thus placing the shaft in compression, and (3) spirally wrapped wire at a controlled pitch.</p> <p>Acceptability of standards shall be based entirely upon conformance with these specifications. Plant tests of completed standards will not be required.</p> <p>To be acceptable, a bid must be based on standards which are manufactured in accordance with the engineering requirements set forth in these specifications.</p> <p>The manufacturer shall furnish standards in accordance with the terms and requirements of these specifications and shall guarantee the finished product to be free of defective material and workmanship for a period of ten years after the date of acceptance by the customer.</p>
Cement	Portland cement shall conform to the current specifications for "Portland Cement" (ASTM Designation C150). Cement shall be stored in a dry, well-ventilated location protected from weather.
Aggregates	Shall conform to ASTM C-33 and shall be uniformly graded from a maximum size of 1/2 inch to 5 percent passing #100 sieve.
Water	Water used in mixing concrete shall be clean and free from deleterious amounts of silt, oil, acids, alkalis or organic materials.
Admixtures	Admixtures shall conform to ASTM C-494.
Strength	<p>The design compressive strength of concrete at the time of prestressing shall be as shown on the contract drawings. Enough water to obtain a workable mix shall be used.</p> <p>During each working day, at least two companion test cylinders will be cast from a single batch of concrete. Test cylinders shall be centrifugally cast in 8-inch diameter by 12-inch long rigid molds and spun about their longitudinal axes at a speed which will produce a mix compaction similar to that of the pole. Cure of the test cylinders shall be equivalent to the cure of the pole.</p> <p>Strength test shall be made in accordance with "Method of Test Compressive Strength of Molded Concrete Cylinders" (ASTM Designation C39) using the net area of the hollow cylinder to determine the compressive strength. The test strength shall be the average strength of at least two companion cylinders cast from the same batch and tested at the same age.</p>
Steel	<ol style="list-style-type: none">1. Prestressing wire shall conform to ASTM A-421 except for strengths noted in "Manufacturing specifications," which follow.2. Mild reinforcing wire and spiral wire shall conform to ASTM A-82.3. Base Plates shall conform to ASTM A-36.4. Anchor bolts shall conform to ASTM specification designated on drawing.5. Top Mount coupling shall conform to ASTM specification designated on drawing.6. Mild deformed reinforcing bar shall conform to ASTM A-615 grades 40 and 60.
Steel Cage Wire	Wire for reinforcement shall conform to "Cold-Drawn Steel Wire for Concrete Reinforcement" (ASTM Designation A82).
Steel Plate	Plate steel shall conform to "Structural Steel" (ASTM Designation A36).
Steel Bar	Bar for reinforcement shall conform to "Deformed Billet Steel Bars for Concrete Reinforcement" (ASTM Designation A615).
Aluminum	All cast aluminum parts (handhole frames, cable exits, pole top collars, etc.) shall conform to ASTM B-26, alloy, SG70A, unless otherwise noted.
Manufacturing	The prestressing wire shall have the following specifications: minimum ultimate strength of 250,000 psi for 5mm, 235,000 psi for 7mm, 206,000 psi for 9mm. Maximum initial prestressing force shall be as designed for maximum ultimate strength at time of stress transfer.

The spiral reinforcement shall not be less than 13 gauge. Pitch shall be no more than 4 inches for the Centrecon Series "S" and "M" poles. For larger poles, 11 gauge spiral at 3-1/2 inch pitch shall be used. This reinforcement shall continue from the top of the pole over its entire length and be secured to the longitudinal reinforcement by an approved automatic caging method.

Poles shall be prestressed concrete of the design and dimensions shown in the catalog and machine-made in steel molds by the centrifugal process to ensure maximum density and a smooth finish. Reinforcing shall be placed according to plans and specifications to assure that no cracking shall occur during normal handling. Series "S" poles shall have a minimum opening of the raceway of 1-3/8 inches and the concrete cover over the prestressing wire shall not be less than 3/8 inch. Series "M" shall have a minimum opening for the raceway of 2 inches and the concrete cover over prestressing wire shall not be less than 1/2 inch.

The proportions of water to cement shall produce a concrete, after curing, having a minimum compressive strength of 3500 psi before transfer of prestressing force. A minimum 28-day compressive strength of 7000 psi after atmospheric curing shall be required for concrete with natural aggregate. For concrete with terrazzo aggregate of color admixture, the minimum 28-day compressive strength shall be 6000 psi using spun cylinder test method.

- Design** Standards shall be designed for dead loads and wind loads which produce bending and torsion in the shaft induced by the fixtures and attachments. Design stresses due to loading and prestressing shall conform to "Building Code Requirements for Reinforced Concrete" (ACI 318, AASHTO, and IBC). Manufacturing shall conform to PCI and ACI requirements. Detailed design methods are available on request.
- Dimensions & Tolerances** The number of spirals of cold-drawn circumferential wire along any 3 feet of length shall not be less than required by design.
- The nominal concrete cover over the high-tensile prestressing strand shall be 3/4 inch while the nominal concrete cover over other steel shall be 1/2 inch except at openings and holes for attachments. Normal manufacturing tolerances will apply to the nominal covers.
- Hole patterns for wait-walk signals, auxiliary signals and push buttons shall be located within 1 inch of the location specified on the drawings.
- Centrifugal Concrete** Aggregate and cement for concrete shall be batched by weighing. Water used in the mix shall be metered or weighed. Concrete shall be mixed a sufficient time to obtain uniform consistency. There shall be no addition of water once the concrete has been discharged from the mixer.
- Concrete shall be placed in molds as rapidly as possible after mixing by a method known to produce uniform distribution. Compaction to dense durable concrete shall be by horizontal centrifugation. Water and laitance forced to the center of the standard shall be drained.
- Cure** The primary cure shall be of length so that sufficient compression strength of concrete (as stated on the contract drawings) is attained to prevent slippage of the prestressing cables. The cure method shall prevent loss of moisture in the standard. The standards shall receive an air cure of 15 days before delivery for installation.
- Prestressing** After concrete has attained the required compressive strength, the high-tensile prestressing strand shall be released so that its tension is at the maximum as designed for its ultimate strength at time of stress transfer.
- Bonding** Reinforcing steel, strand, wire, stud bolts, anchor lugs or plates shall be electrically bonded. Most arms shall be bonded to stud bolts or cables.
- Surface Treatment** Two surface treatments are available at the option of the purchaser: (1) exposed, and (2) surface impacted by the mold. The surface may be exposed after sufficient concrete cure and the resulting surface shall be uniform in lines and surface texture. Seam marks in either treatment shall be removed.
- Marking** Each standard shall be plainly marked inside the base showing the design classification and the date of removal from molds.
- Handling & Shipment** Standards shall be handled carefully. Blocking and hold-downs shall be used during shipment to prevent movement or shifting. Standards shall be handled using methods that assure structural integrity and uniform surface appearance.
- AASHTO Requirements**
1. Dead load deflections shall be equal to, or less than, one percent of the length of the prestressed shaft.
 2. Manufacturing tolerances,

Length of Pole (L) (ft)	Max. Allowable Deviation from Stringline (in)
$L \leq 21$	1/2
$21 < L \leq 26$	3/4
$26 < L \leq 35$	1
$35 < L < 40$	1-1/4