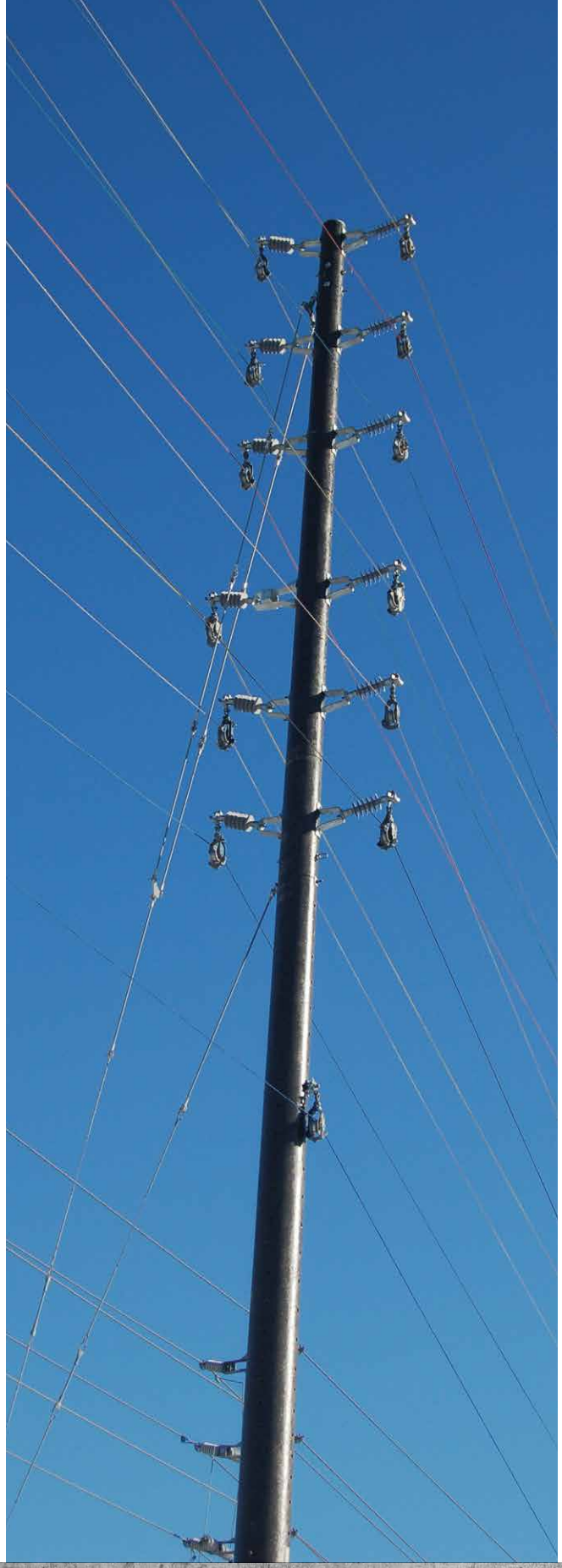
StressCrete

SPUN CONCRETE UTILITY POLES



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THE STRESSCRETE GROUP

StressCrete Ltd., a division of The StressCrete Group, was established in 1953 and is the longest-operating, most experienced manufacturer of centrifugally cast, prestressed reinforced concrete poles in North America. With plants in Alabama, Kansas and Ontario, we provide a vast range of spun concrete poles to the distribution, transmission and substation market segments.

We are a family business that operates by the core values of honesty, integrity, compassion and respect to better the lives of our employees, their families, our customers and the communities we represent.

Our innovation driven culture continuously develops new and better products and processes to satisfy the needs of our customers.

We provide every customer with the highest quality innovative products and work as a team to create and maintain life-long customers through world class service.

SPUN CONCRETE POLES

Concrete and steel are the principal materials for building city infrastructure. Due to concrete's inherent strength and durability, with proper design, engineering, and construction, concrete plays a significant role in building a lasting urban infrastructure. Concrete works very well for certain applications in transportation, building and pavement. In utility transmission and distribution, concrete is mainly used in above ground utility structures in the form of poles.

Spun concrete poles are designed to provide reliable strength, unsurpassed durability and a long service life. Each pole is made to order; customized by length, strength and customer specifications including all mounting holes, apertures, grounding etc. To assist in the coordination of each project, delivery options such as drop shipments/pole spotting, delivery to exact installation location or leaving poles on a trailer overnight are available.

SPUN CONCRETE POLES

Poles are manufactured with prestressed 7-wire strands, deformed reinforcing bars, galvanized helical reinforcing wire and high-strength concrete. During manufacturing, the pole undergoes a centrifugal spinning process that results in high-density concrete and a hollow raceway inside the pole thereby reducing weight and providing a smooth conduit for electrical and communication cables.

APPLICATION TYPES

Our spun concrete poles are used for both Transmission and Distribution, and in many types of applications. Each product is designed and made to order to the customer's specifications.

ANGLE

TANGENT

DEAD END/RISER

H STRUCTURE

ROAD CROSSING

JOINT USE

QUALITY PEOPLE - QUALITY PRODUCTS

Strength

Prestressed reinforcement coupled with the centrifugal casting process, produces poles that have high-strength and high-density concrete which doesn't lose strength over time. Poles are available in many classes and manufactured to guaranteed minimum strengths.

Durability

- Minimal vibration, deflection and distortion including twisting
- No fatigue joints
- Withstands high ice loading with no rusting or deterioration from the elements
- Resistant to fire, woodpeckers, termites, insects and rot
- Highly resistant to road and de-icing salts, airborne acidities and acidic soils

Maintenance Free and Environmentally Friendly

Our product is maintenance free, produced from inert materials, recyclable, safe for direct burial, and chemical free.

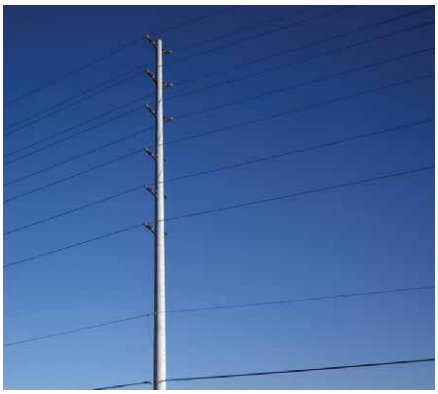
QUALITY PEOPLE - QUALITY PRODUCTS

Lifetime Warranty

Our products are guaranteed to be free of defects in materials and workmanship for the lifetime of the product's intended use. Since 1953 we've developed life-long customers based on our high-quality products and through world class service.

Cost Effective

Due to our lifetime warranty and because the product is maintenance free, our spun concrete poles have low lifetime costs to provide a high return on your investment.



Engineered to Specifications

Our company is certified by CSA and our products are designed and manufactured in accordance to CSA, ANSI and ASTM standards. All products are engineered and manufactured to customer's specifications and delivery requirements.

Engineering Support

The StressCrete Group has high standards for excellent customer service and a desire to exceed the needs of our customers. Our engineers provide design and in-field support before, during and after project completion. Each customer's needs and projects are unique and we pride ourselves in working as a team with our customers to provide excellent customer service, resulting in life-long relationships.

RELIABLE - SET IT AND FORGET IT!

System Hardening with Spun Concrete Poles

Extreme weather events are becoming an increasing threat to utility companies, and many are choosing to use concrete poles for transmission and distribution lines to improve the reliability and performance of their system. Utilities rely on spun concrete poles for fire protection and to withstand massive storms providing quicker restoration times for their customers.

Utilize Spun Concrete Poles for:

- Faster power restoration time;
- Minimal maintenance costs;
- Fire resistance;
- Higher tolerance to severe wind gusts;
- Fewer replacement poles after an extreme weather event.

The reliability of concrete poles can have a significant financial impact following wildfires, extreme weather events and ice storms, resulting in fewer replacement poles and impressive power restoration times.

RELIABLE - SET IT AND FORGET IT!

Hurricane Protection

Fast power restoration times can be achieved when distribution lines are supported by concrete poles. When the powerful Hurricane Irma approached landfall in Florida as a Category 4 storm, not one concrete pole went down due to wind. And, when Hurricane Ivan, a Category 5 storm hit the Cayman Islands, the Caribbean Utility Company, Ltd. only had to replace six concrete poles resulting in quick power restoration times.

Concrete poles after Hurricane Ivan

Fire Protection

The installation of concrete poles is one contributing factor to improving the preparation of utilities for wildfires. Concrete poles are strong, durable and resistant to fire which aid in the response time to recover from wildfire damage.

Concrete poles after fire broke at Vandenberg Air Force Base, California

Ice Protection

Ice storms caused by extensive periods of freezing rain can cause trees, power lines, roads and walkways to be covered with ice. Covered power lines that are not built to withstand a heavy ice loading are susceptible to damage, lost power and long restoration times.

Utility crew restoring power following ice storms across the central United States

ACCESSORIES AND INSTALLATION

Value-Added Features and Accessories

- Poles are easy to drill in the field
- Select colors with etched, acrylic and anti-graffiti finishes available
- Designed to your needs for items such as copper ground wire, rugged high density cast zinc box type hand holes with cover plate, wiring apertures, through holes, and threaded inserts
- Accessories such as cable entrance covers, pole steps and safety cables, ladder clips, hand holes or split bolt connector for grounding are also available

Easy to Drill in the Field

Colored Concrete Available

Accessories such as Cable Entrance Covers Available

Easy Installation

Installation of poles occurs in four easy steps:

1. Install external equipment, ground wire etc.
2. Auger the setting hole
3. Choke the pole, lift and insert
4. Add backfill

SPECIFYING A SPUN CONCRETE POLE

A spun concrete pole like any pole supporting conductors, has various loads applied by line tension, changes of line direction, wind, and ice loadings if applicable, on both the conductors and the pole itself. Because of their durability and reliability, spun concrete poles have a favorable load factor specified in ANSI transmission and distribution line requirements. When specifying poles for distribution and transmission use, it is common to select a pole based on tip load requirements or by design.

TIP LOAD

Concrete poles are grouped in alphabetically labelled classes which have a bending capacity appropriate to the design requirements. The class is defined in terms of a guaranteed minimum ultimate transverse load applied 2 feet down from the tip of the pole.

The ground line moment capacity depends on the length of the pole since that moment is the product of the class minimum ultimate transverse load and the distance between the point of application (2 feet from the tip) and the ground line.

Note, the wood classification system is based on an average strength while the concrete pole class is based on minimum strength, so the two classification systems cannot be directly compared.

Concrete Pole Class	Minimum Ultimate Transverse Load (lbs)
C	1200
D	1500
E	1900
F	2400
G	3000
H	3700
J	4500
K	5400
L	6400
M	7500
N	8700
O	10000

Example Calculations:

Determine the Ultimate Ground Line Moment (GLM) for a desired Pole Length of 70 ft with a Concrete Pole Class of K

Burial depth is determined as 10% of the pole length plus 2 feet: (70 ft x 0.1) + 2 ft = 9 ft

Above grade height is determined by subtracting the burial depth: 70 ft – 9 ft = 61 ft

Minimum ultimate transverse load at 2 ft from tip load for the pole class K is 5,400 lbs as defined by CSA/ANSI

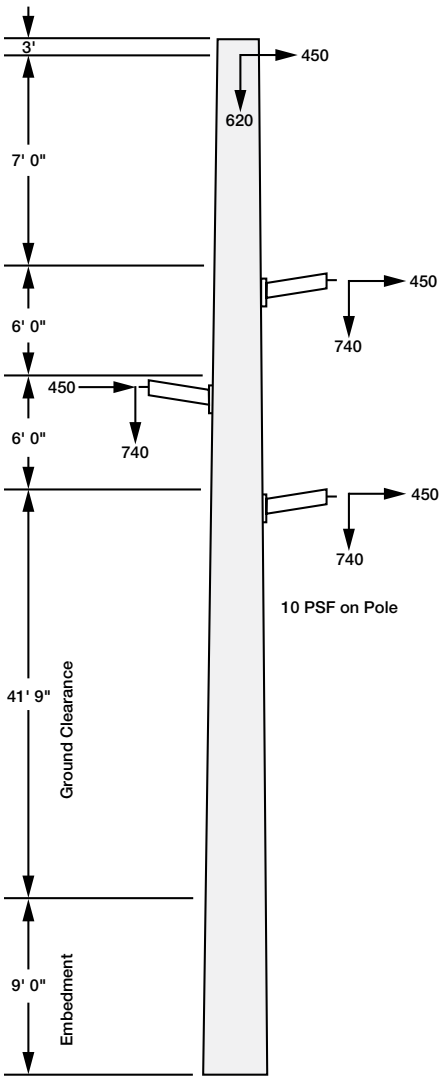
Ultimate GLM is the product of the class minimum ultimate transverse load at 2 ft from tip load and the distance between the point of application and the ground line = 5,400 lbs x (61 ft – 2 ft) = 318,600 ft.lbs

Determine a Concrete Pole Class for an Ultimate GLM of 252,000 ft.lbs and 70 ft Above Grade Height

Minimum ultimate transverse load at 2 ft from tip load is determined by dividing the ultimate GLM by the height at 2 ft from tip load = 252,000 ft.lbs ÷ (70 ft – 2 ft) = 3,706 lbs

The concrete pole class to withstand the minimum ultimate transverse load of 3,706 lbs is Class J as the minimum ultimate transverse load for this class is greater than the requirement needed in this application.

SPECIFYING A SPUN CONCRETE POLE



DESIGN BASED

The strength of a concrete pole is defined as a minimum strength which does not vary over time. Poles are designed and manufactured so that all poles will exceed the specified minimum strength which will be present for the life of each pole. In contrast, because wood is a naturally grown product with natural defects such as splits and knots, strength is defined as the average strength of all poles of that species and dimension at the time of installation. Since some poles in a batch will have strengths less than the average and because there is further deterioration with time, a strength factor is utilized.

The NESC has determined the strength factor for concrete as 1.0 compared to 0.65 and 0.85 for wood in Grade B and Grade C construction, respectively. This strength factor is especially important when converting wood poles to spun concrete poles so that the wood pole is replaced with a concrete pole that is designed to the appropriate strength.

For higher voltage lines with large conductor spacings and multiple circuits, there may be major reactions distributed over a substantial length of the pole. There may also be many different load combinations along a line, depending on pole spacing and line angles.

For these types of applications, it is typical to specify poles with a load tree for each pole loading variation along the line. This can be specified by the customer or determined by StressCrete using multiple elevations at which loads can be applied so that the required capacity of the pole can be accurately computed along its entire length.

EXAMPLE ABOVE

Note:

- All loads shown in pounds
- All loads include appropriate load factors
- 'Wind on pole' load shall be applied uniformly along the pole shaft at the most critical horizontal direction

Legend:

↓ Vertical Load

→ Horizontal load along the x-axis, parallel to the centre line of insulator

POLE SPECIFICATIONS

SPUN CONCRETE POLES									WOOD POLES	
Catalog Code	Pole Length (ft.)	Above Grade Height (ft.)	Burial Depth (ft.)*	Tip Diameter (in.)**	Butt Diameter (in.)	Nominal Weight (lbs)	Concrete Pole Class	Concrete Pole Min. Ultimate Transverse Load (lbs)	Approx. Wood Pole Class	Approx. Wood Pole Equivalent Min. Ultimate Transverse Load (lbs)***
E300-CPR-G	30’	25’	5’	6.5”	11.9”	2040	C	1200	5	1235
E300-DPR-G	30’	25’	5’	6.5”	11.9”	2040	D	1500	4	1560
E300-EPR-G	30’	25’	5’	6.5”	11.9”	2040	E	1900	3	1950
E300-FPR-G	30’	25’	5’	6.5”	11.9”	2075	F	2400	2	2405
E350-CPR-G	35’	29’ 6”	5’ 6”	6.5”	12.8”	2545	C	1200	5	1235
E350-DPR-G	35’	29’ 6”	5’ 6”	6.5”	12.8”	2545	D	1500	4	1560
E350-EPR-G	35’	29’ 6”	5’ 6”	6.5”	12.8”	2545	E	1900	3	1950
E350-FPR-G	35’	29’ 6”	5’ 6”	6.5”	12.8”	2590	F	2400	2	2405
E400-CPR-G	40’	34’	6’	6.5”	13.7”	3095	C	1200	5	1235
E400-DPR-G	40’	34’	6’	6.5”	13.7”	3095	D	1500	4	1560
E400-EPR-G	40’	34’	6’	6.5”	13.7”	3095	E	1900	3	1950
E400-FPR-G	40’	34’	6’	6.5”	13.7”	3150	F	2400	2	2405
E450-DPR-G	45’	38’ 6”	6’ 6”	6.5”	14.6”	3695	D	1500	4	1560
E450-EPR-G	45’	38’ 6”	6’ 6”	6.5”	14.6”	3695	E	1900	3	1950
E450-FPR-G	45’	38’ 6”	6’ 6”	6.5”	14.6”	3760	F	2400	2	2405
E450-GPR-G	45’	38’ 6”	6’ 6”	8.25”	16.35”	4820	G	3000	1	2925
E500-DPR-G	50’	43’	7’	6.5”	15.5”	4340	D	1500	4	1560
E500-EPR-G	50’	43’	7’	6.5”	15.5”	4380	E	1900	3	1950
E500-FPR-G	50’	43’	7’	6.5”	15.5”	4455	F	2400	2	2405
E500-GPR-G	50’	43’	7’	8.25”	17.25”	5610	G	3000	1	2925
E500-HPR-G	50’	43’	7’	8.25”	17.25”	5650	H	3700	H1	3510
E550-DPR-G	55’	47’ 6”	7’ 6”	6.5”	16.4”	5030	D	1500	4	1560
E550-EPR-G	55’	47’ 6”	7’ 6”	6.5”	16.4”	5080	E	1900	3	1950
E550-FPR-G	55’	47’ 6”	7’ 6”	6.5”	16.4”	5175	F	2400	2	2405
E550-GPR-G	55’	47’ 6”	7’ 6”	8.25”	18.15”	6450	G	3000	1	2925
E550-HPR-G	55’	47’ 6”	7’ 6”	8.25”	18.15”	6500	H	3700	H1	3510
E600-FPR-G	60’	52’	8’	6.5”	17.3”	5935	F	2400	2	2405
E600-GPR-G	60’	52’	8’	8.25”	19.05”	7340	G	3000	1	2925
E600-HPR-G	60’	52’	8’	8.25”	19.05”	7405	H	3700	H1	3510
E650-FPR-G	65’	56’ 6”	8’ 6”	6.5”	18.2”	6740	F	2400	2	2405
E650-GPR-G	65’	56’ 6”	8’ 6”	8.25”	19.95”	8285	G	3000	1	2925
E650-HPR-G	65’	56’ 6”	8’ 6”	8.25”	19.95”	8360	H	3700	H1	3510
E700-FPR-G	70’	61’	9’	6.5”	19.1”	7595	F	2400	2	2405
E700-GPR-G	70’	61’	9’	8.25”	20.85”	9275	G	3000	1	2925
E700-HPR-G	70’	61’	9’	8.25”	20.85”	9365	H	3700	H1	3510

* Burial depths are assumed at 10% of pole length plus 2 feet
** Tip diameter may vary by design
*** Wood pole equivalents are based upon NESC Grade B District Loading (0.65 Strength Factor). If other design criteria is required, please contact StressCrete to determine the required class. Min. Ultimate Transverse Load calculated at 2 feet from pole tip.
† Extrapolated

POLE SPECIFICATIONS

SPUN CONCRETE POLES									WOOD POLES	
Catalog Code	Pole Length (ft.)	Above Grade Height (ft.)	Burial Depth (ft.)*	Tip Diameter (in.)**	Butt Diameter (in.)	Nominal Weight (lbs)	Concrete Pole Class	Concrete Pole Min. Ultimate Transverse Load (lbs)	Approx. Wood Pole Class	Approx. Wood Pole Equivalent Min. Ultimate Transverse Load (lbs)***
E750-GPR-G	75’	65’ 6”	9’ 6”	8.25”	21.75”	10320	G	3000	1	2925
E750-HPR-G	75’	65’ 6”	9’ 6”	8.25”	21.75”	10420	H	3700	H1	3510
E750-JPR-G	75’	65’ 6”	9’ 6”	8.25”	21.75”	10565	J	4500	H2	4160
E750-KPR-G	75’	65’ 6”	9’ 6”	9.5”	23”	11865	K	5400	H3	4875
E750-LPR-G	75’	65’ 6”	9’ 6”	9.5”	23”	12100	L	6400	H4	5655
E800-GPR-G	80’	70’	10’	8.25”	22.65”	11415	G	3000	1	2925
E800-HPR-G	80’	70’	10’	8.25”	22.65”	11530	H	3700	H1	3510
E800-JPR-G	80’	70’	10’	8.25”	22.65”	11680	J	4500	H2	4160
E800-KPR-G	80’	70’	10’	9.5”	23.9”	13080	K	5400	H3	4875
E800-LPR-G	80’	70’	10’	9.5”	23.9”	13340	L	6400	H4	5655
E850-GPR-G	85’	74’ 6”	10’ 6”	8.25”	23.55”	12555	G	3000	1	2925
E850-HPR-G	85’	74’ 6”	10’ 6”	8.25”	23.55”	12685	H	3700	H1	3510
E850-JPR-G	85’	74’ 6”	10’ 6”	8.25”	23.55”	12855	J	4500	H2	4160
E850-KPR-G	85’	74’ 6”	10’ 6”	9.5”	24.8”	14345	K	5400	H3	4875
E850-LPR-G	85’	74’ 6”	10’ 6”	9.5”	24.8”	14630	L	6400	H4	5655
E850-MPR-G	85’	74’ 6”	10’ 6”	11.25”	24.8”	16260	M	7500	H5	6500
E850-NPR-G	85’	74’ 6”	10’ 6”	13.0”	27.3”	16605	N	8700	H6	7410
E900-GPR-G	90’	79’	11’	8.25”	24.45”	13755	G	3000	1	2925
E900-HPR-G	90’	79’	11’	8.25”	24.45”	13890	H	3700	H1	3510
E900-JPR-G	90’	79’	11’	8.25”	24.45”	14070	J	4500	H2	4160
E900-KPR-G	90’	79’	11’	9.5”	25.7”	15660	K	5400	H3	4875
E900-LPR-G	90’	79’	11’	9.5”	25.7”	15970	L	6400	H4	5655
E900-MPR-G	90’	79’	11’	11.25”	25.7”	17700	M	7500	H5	6500
E900-NPR-G	90’	79’	11’	13.0”	28.2”	18135	N	8700	H6	7410
E900-OPR-G	90’	79’	11’	14.75”	28.2”	19870	O	10000	H7†	8385
E950-LPR-G	95’	83’ 6”	11’ 6”	9.5”	26.6”	17360	L	6400	H4	5655
E950-MPR-G	95’	83’ 6”	11’ 6”	11.25”	26.6”	19190	M	7500	H5	6500
E950-NPR-G	95’	83’ 6”	11’ 6”	13.0”	29.1”	19665	N	8700	H6	7410
E950-OPR-G	95’	83’ 6”	11’ 6”	14.75”	29.1”	21495	O	10000	H7†	8385
E1000-KPR-G	100’	88’	12’	9.5”	27.5”	18450	K	5400	H3	4875
E1000-LPR-G	100’	88’	12’	9.5”	27.5”	18805	L	6400	H4	5655
E1000-MPR-G	100’	88’	12’	11.25”	27.5”	20810	M	7500	H5	6500
E1050-KPR-G	105’	92’ 6”	12’ 6”	9.5”	28.4”	19920	K	5400	H3	4875
E1050-LPR-G	105’	92’ 6”	12’ 6”	9.5”	28.4”	20300	L	6400	H4	5655
E1050-MPR-G	105’	92’ 6”	12’ 6”	11.25”	28.4”	22425	M	7500	H5	6500
E1100-KPR-G	110’	97’	13’	9.5”	29.3”	21445	K	5400	H3	4875
E1100-LPR-G	110’	97’	13’	9.5”	29.3”	21850	L	6400	H4	5655
E1100-MPR-G	110’	97’	13’	11.25”	29.3”	24085	M	7500	H5	6500

Pole lengths greater than 110 ft. are also available. Contact StressCrete for additional information.

* Burial depths are assumed at 10% of pole length plus 2 feet
** Tip diameter may vary by design
*** Wood pole equivalents are based upon NESC Grade B District Loading (0.65 Strength Factor). If other design criteria is required, please contact StressCrete to determine the required class. Min. Ultimate Transverse Load calculated at 2 feet from pole tip.
† Extrapolated

COMPANY HISTORY

1953

StressCrete Ltd., a utility pole manufacturer, is founded. The company manufactures static cast tapered square poles that are considered upgrades from standard wood.

1958

StressCrete Ltd. invests in spinning technology, which not only enables them to produce a round cross section, but also vastly improves the strength and durability of the product.

1995

StressCrete Inc.'s concrete pole manufacturing facility in Northport, Alabama begins operations.

2008

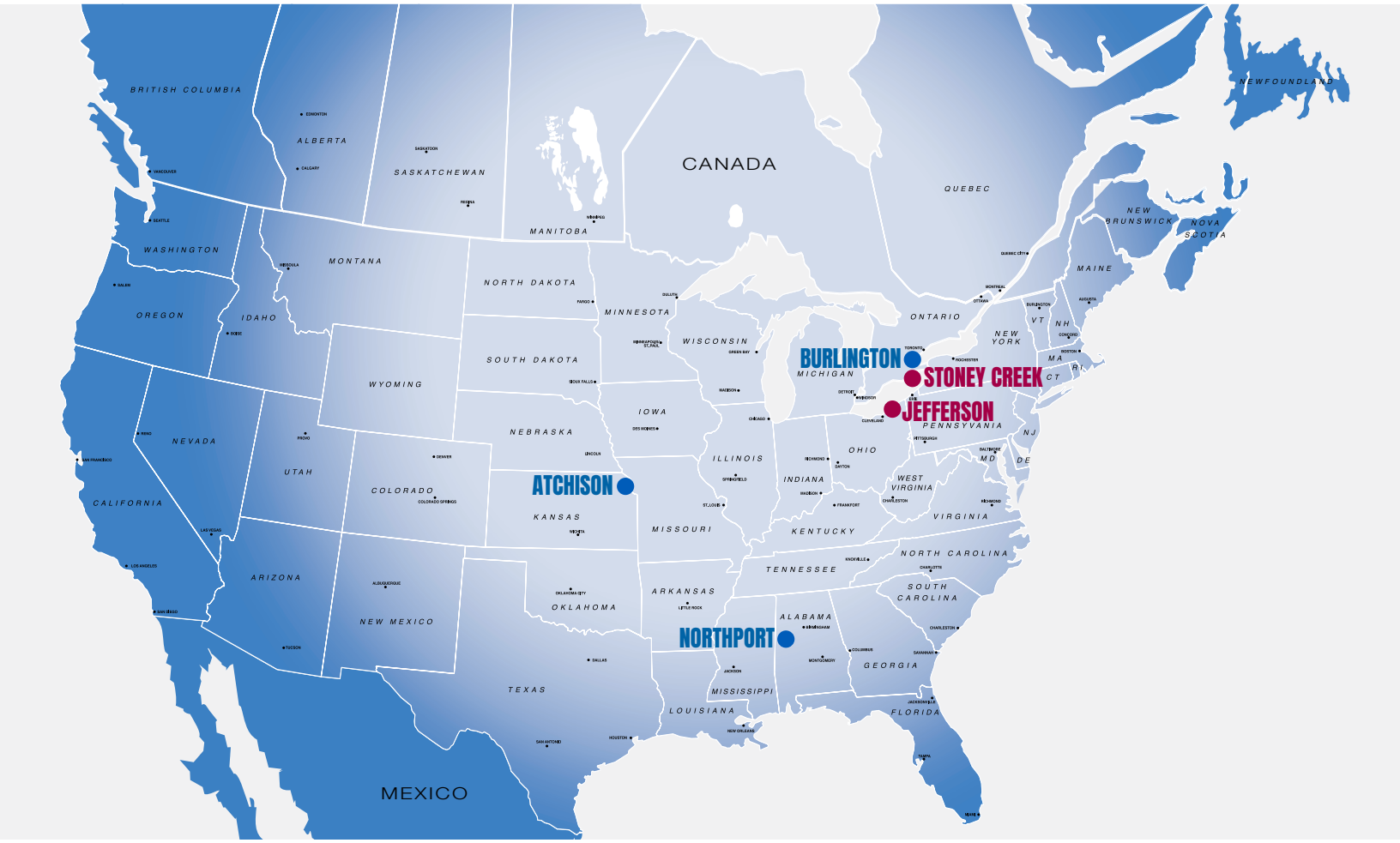
StressCrete Inc.'s concrete pole manufacturing facility in Atchison, Kansas begins operations.

2013

The StressCrete Group celebrates its 60th anniversary.

StressCrete Ltd.'s concrete pole manufacturing facility in Burlington, Ontario shown in photo.

StressCrete GROUP



STRESSCRETE ALABAMA	STRESSCRETE KANSAS	STRESSCRETE ONTARIO	KING LUMINAIRE ONTARIO	KING LUMINAIRE OHIO
9200 Energy Lane Northport, AL 35476	14503 Wallick Road Atchison, KS 66002	840 Walkers Line Burlington, ON L7R 3X9	695 Arvin Ave. Stoney Creek, ON L8E 5R2	1153 State Route 46N Jefferson, OH 44047
(800) 435-6563	(800) 837-1024	(800) 268-7809	(800) 268-7809	(800) 268-7809

www.StressCreteGroup.com/UtilityPoles