

Strain Pole Foundation Chart – Untethered Spans – Poles Not Connected to Tie-Off Spans ^A												
Span Length (ft)	Soil Type	Soil Condition		30 ft Pole Length				36 ft Pole Length		40 ft Pole Length		Casing Length
		S _u *	N ₆₀ *	Diameter (in)	Foundation Depth (ft) *	Diameter (in)	Foundation Depth (ft) *	Diameter (in)	Foundation Depth (ft) *	Diameter (in)	Foundation Depth (ft) *	
≤ 100	Low Sand	-	5 ≤ N ₆₀ < 10	42	13.5	48	13.0	48	14.0	48	14.5	As Shown on Plans
	Med Sand	-	10 ≤ N ₆₀ < 20	42	12.0	48	11.5	48	12.5	48	12.5	
	High Sand	-	N ₆₀ ≥ 20	42	11.5	48	11.0	48	11.5	48	12.0	
	Low Clay	500 ≤ S _u < 1000	-	42	16.5	48	16.5	48	17.5	48	18.0	
	Med Clay	1000 ≤ S _u < 2000	-	42	13.0	48	13.0	48	13.5	48	14.0	
	High Clay	S _u ≥ 2000	-	42	10.5	48	10.5	48	11.0	48	11.5	
101 to 120	Low Sand	-	5 ≤ N ₆₀ < 10	42	14.0	48	14.0	48	14.5	48	15.0	
	Med Sand	-	10 ≤ N ₆₀ < 20	42	12.5	48	12.0	48	12.5	48	13.0	
	High Sand	-	N ₆₀ ≥ 20	42	12.0	48	11.5	48	12.0	48	12.5	
	Low Clay	500 ≤ S _u < 1000	-	42	17.5	48	17.0	48	18.0	48	19.0	
	Med Clay	1000 ≤ S _u < 2000	-	42	13.5	48	13.0	48	14.0	48	14.5	
	High Clay	S _u ≥ 2000	-	42	11.0	48	11.0	48	11.5	48	12.0	
121 to 150	Low Sand	-	5 ≤ N ₆₀ < 10	42	14.0	48	14.0	48	14.5	48	15.0	
	Med Sand	-	10 ≤ N ₆₀ < 20	42	12.5	48	12.0	48	13.0	48	13.5	
	High Sand	-	N ₆₀ ≥ 20	42	12.0	48	11.5	48	12.5	48	12.5	
	Low Clay	500 ≤ S _u < 1000	-	42	18.0	48	17.5	48	18.5	48	19.5	
	Med Clay	1000 ≤ S _u < 2000	-	42	14.0	48	13.5	48	14.5	48	15.0	
	High Clay	S _u ≥ 2000	-	42	11.5	48	11.0	48	11.5	48	12.0	
151 to 176	Low Sand	-	5 ≤ N ₆₀ < 10	42	-	48	-	48	15.5	48	16.0	
	Med Sand	-	10 ≤ N ₆₀ < 20	42	-	48	-	48	13.5	48	14.0	
	High Sand	-	N ₆₀ ≥ 20	42	-	48	-	48	13.0	48	13.5	
	Low Clay	500 ≤ S _u < 1000	-	42	-	48	-	48	20.0	48	20.5	
	Med Clay	1000 ≤ S _u < 2000	-	42	-	48	-	48	15.5	48	16.0	
	High Clay	S _u ≥ 2000	-	42	-	48	-	48	12.5	48	13.0	
177 to 200	Low Sand	-	5 ≤ N ₆₀ < 10	42	-	48	-	48	15.5	48	16.0	
	Med Sand	-	10 ≤ N ₆₀ < 20	42	-	48	-	48	14.0	48	14.5	
	High Sand	-	N ₆₀ ≥ 20	42	-	48	-	48	13.0	48	13.5	
	Low Clay	500 ≤ S _u < 1000	-	42	-	48	-	48	20.0	48	21.0	
	Med Clay	1000 ≤ S _u < 2000	-	42	-	48	-	48	15.5	48	16.0	
	High Clay	S _u ≥ 2000	-	42	-	48	-	48	12.5	48	13.0	

* S_u = Undrained Shear Strength in Cohesive Soil (psf)

* N₆₀ = Standard Penetration Resistance (Blows/foot according to ASTM D-1586) Corrected to 60 % Hammer Efficiency Utilizing the Hammer's Calibrated Energy

* Foundation length measured from the top of the shaft, and assumes maximum 0.25 feet (3 inches) of stickup

NOTE: A Detailed Site Specific Design is Required for the Following Conditions

- 1) If N₆₀ < 5 bpf or S_u < 500 psf
- 2) If span lengths are greater than 200 feet
- 3) If ground water is less than 3 feet below the ground surface.
- 4) If a rock socket is required for the drilled shaft, if N₆₀ values greater than 50 blows per foot dominate the lower half of the drilled shaft length, or if drilling refusal or split-spoon refusal is encountered above design bottom of foundation elevation.

OTHER NOTES:

A. This chart is for use with untethered spans not connected to tie-offs with signals that do not have backplates. See SIG-020 for details.
 The upper 5 feet of soil modeled as disturbed soil assuming ground is disturbed to locate utilities.
 Drilled shaft head deflection less than or equal to 1 inch.

Strain Pole Foundation Chart – Tethered Spans – Poles Not Connected to Tie-Off Spans ^A												
Span Length (ft)	Soil Type	Soil Condition		30 ft Pole Length				36 ft Pole Length		40 ft Pole Length		Casing Length
		S _u *	N ₆₀ *	Diameter (in)	Foundation Depth (ft) *	Diameter (in)	Foundation Depth (ft) *	Diameter (in)	Foundation Depth (ft) *	Diameter (in)	Foundation Depth (ft) *	
≤ 100	Low Sand	-	5 ≤ N ₆₀ < 10	42	19.0	48	17.5	48	19.5	48	20.5	As Shown on Plans
	Med Sand	-	10 ≤ N ₆₀ < 20	42	16.5	48	15.5	48	17.0	48	18.0	
	High Sand	-	N ₆₀ ≥ 20	42	15.5	48	15.0	48	16.0	48	17.0	
	Low Clay	500 ≤ S _u < 1000	-	42	26.0	48	23.5	48	26.0	48	28.0	
	Med Clay	1000 ≤ S _u < 2000	-	42	18.5	48	17.5	48	19.0	48	20.0	
	High Clay	S _u ≥ 2000	-	42	14.5	48	14.0	48	15.0	48	16.0	
101 to 120	Low Sand	-	5 ≤ N ₆₀ < 10	42	19.0	48	18.0	48	19.5	48	20.5	
	Med Sand	-	10 ≤ N ₆₀ < 20	42	17.0	48	16.0	48	17.5	48	18.0	
	High Sand	-	N ₆₀ ≥ 20	42	16.0	48	15.0	48	16.0	48	17.0	
	Low Clay	500 ≤ S _u < 1000	-	42	26.5	48	24.0	48	26.5	48	29.0	
	Med Clay	1000 ≤ S _u < 2000	-	42	19.0	48	18.0	48	19.5	48	20.5	
	High Clay	S _u ≥ 2000	-	42	15.0	48	14.0	48	15.5	48	16.0	
121 to 150	Low Sand	-	5 ≤ N ₆₀ < 10	42	19.5	48	18.0	48	20.5	48	21.0	
	Med Sand	-	10 ≤ N ₆₀ < 20	42	17.5	48	16.0	48	17.5	48	18.5	
	High Sand	-	N ₆₀ ≥ 20	42	16.0	48	15.0	48	16.5	48	17.5	
	Low Clay	500 ≤ S _u < 1000	-	42	27.5	48	24.5	48	27.5	48	29.5	
	Med Clay	1000 ≤ S _u < 2000	-	42	19.0	48	18.0	48	20.0	48	21.0	
	High Clay	S _u ≥ 2000	-	42	15.0	48	14.5	48	15.5	48	16.5	
151 to 176	Low Sand	-	5 ≤ N ₆₀ < 10	42	-	48	-	48	20.0	48	21.5	
	Med Sand	-	10 ≤ N ₆₀ < 20	42	-	48	-	48	17.5	48	18.5	
	High Sand	-	N ₆₀ ≥ 20	42	-	48	-	48	16.5	48	17.5	
	Low Clay	500 ≤ S _u < 1000	-	42	-	48	-	48	28.0	48	30.5	
	Med Clay	1000 ≤ S _u < 2000	-	42	-	48	-	48	20.0	48	21.0	
	High Clay	S _u ≥ 2000	-	42	-	48	-	48	15.5	48	16.5	
177 to 200	Low Sand	-	5 ≤ N ₆₀ < 10	42	-	48	-	48	20.5	48	21.5	
	Med Sand	-	10 ≤ N ₆₀ < 20	42	-	48	-	48	18.0	48	19.0	
	High Sand	-	N ₆₀ ≥ 20	42	-	48	-	48	16.5	48	17.5	
	Low Clay	500 ≤ S _u < 1000	-	42	-	48	-	48	28.0	48	30.5	
	Med Clay	1000 ≤ S _u < 2000	-	42	-	48	-	48	20.0	48	21.0	
	High Clay	S _u ≥ 2000	-	42	-	48	-	48	16.0	48	16.5	

*S_u = Undrained Shear Strength in Cohesive Soil (psf)

* N₆₀ = Standard Penetration Resistance (Blows/foot according to ASTM D-1586) Corrected to 60 % Hammer Efficiency Utilizing the Hammer's Calibrated Energy

*Foundation length from the top of the shaft, and assumes maximum 0.25 feet (3 inches) of stickup

NOTE: A Detailed Site Specific Design is Required for the Following Conditions

- 1) If N₆₀ < 5 bpf or S_u < 500 psf
- 2) If span lengths are greater than 200 feet
- 3) If ground water is less than 3 feet below the ground surface.
- 4) If a rock socket is required for the drilled shaft, if N₆₀ values greater than 50 blows per foot dominate the lower half of the drilled shaft length, or if drilling refusal or split-spoon refusal is encountered above design bottom of foundation elevation.

OTHER NOTES:

A. This chart is for use with tethered spans not connected to tie-offs with signals that have backplates. See SIG-020 for details.
 The upper 5 feet of soil modeled as disturbed soil assuming ground is disturbed to locate utilities.
 Drilled shaft head deflection less than or equal to 1 inch.

Strain Pole Foundation Chart - Untethered Spans - Poles Connected to Tie-Off Spans ^A								
Span Length (ft)	Soil Type	Soil Condition		36 ft Pole Length		40 ft Pole Length		Casing Length
		S _u *	N ₆₀ *	Diameter (in)	Foundation Depth (ft) *	Diameter (in)	Foundation Depth (ft) *	
≤ 100	Low Sand	-	5 ≤ N ₆₀ < 10	48	15.5	48	16.0	As Shown on Plans
	Med Sand	-	10 ≤ N ₆₀ < 20	48	13.5	48	14.0	
	High Sand	-	N ₆₀ ≥ 20	48	13.0	48	13.5	
	Low Clay	500 ≤ S _u < 1000	-	48	19.5	48	20.5	
	Med Clay	1000 ≤ S _u < 2000	-	48	15.0	48	16.0	
	High Clay	S _u ≥ 2000	-	48	12.5	48	12.5	
101 to 120	Low Sand	-	5 ≤ N ₆₀ < 10	48	16.0	48	16.5	
	Med Sand	-	10 ≤ N ₆₀ < 20	48	14.5	48	14.5	
	High Sand	-	N ₆₀ ≥ 20	48	13.5	48	14.0	
	Low Clay	500 ≤ S _u < 1000	-	48	21.0	48	21.5	
	Med Clay	1000 ≤ S _u < 2000	-	48	16.0	48	16.5	
	High Clay	S _u ≥ 2000	-	48	12.5	48	13.5	
121 to 150	Low Sand	-	5 ≤ N ₆₀ < 10	48	16.5	48	17.0	
	Med Sand	-	10 ≤ N ₆₀ < 20	48	14.5	48	15.0	
	High Sand	-	N ₆₀ ≥ 20	48	13.5	48	14.0	
	Low Clay	500 ≤ S _u < 1000	-	48	21.0	48	22.0	
	Med Clay	1000 ≤ S _u < 2000	-	48	16.5	48	17.0	
	High Clay	S _u ≥ 2000	-	48	13.0	48	13.5	
151 to 176	Low Sand	-	5 ≤ N ₆₀ < 10	48	17.5	48	18.0	
	Med Sand	-	10 ≤ N ₆₀ < 20	48	15.5	48	16.0	
	High Sand	-	N ₆₀ ≥ 20	48	14.5	48	15.0	
	Low Clay	500 ≤ S _u < 1000	-	48	23.0	48	24.0	
	Med Clay	1000 ≤ S _u < 2000	-	48	17.5	48	18.0	
	High Clay	S _u ≥ 2000	-	48	14.0	48	14.5	
177 to 200	Low Sand	-	5 ≤ N ₆₀ < 10	48	18.0	48	18.5	
	Med Sand	-	10 ≤ N ₆₀ < 20	48	16.0	48	16.5	
	High Sand	-	N ₆₀ ≥ 20	48	15.0	48	15.5	
	Low Clay	500 ≤ S _u < 1000	-	48	23.5	48	24.5	
	Med Clay	1000 ≤ S _u < 2000	-	48	18.0	48	18.5	
	High Clay	S _u ≥ 2000	-	48	14.0	48	14.5	

* S_u = Undrained Shear Strength in Cohesive Soil (psf)

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* Foundation length measured from the top of the shaft, and assumes maximum 0.25 feet (3 inches) of stickup

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 The upper 5 feet of soil modeled as disturbed soil assuming ground is disturbed to locate utilities.
 Drilled shaft head deflection less than or equal to 1 inch.

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NO.	DATE	AUTH	DESCRIPTION	NO.	DATE	AUTH	DESCRIPTION			DESIGN UNIT: SIGNALS	JN:STATEWIDE	FOUNDATION DESIGN TABLE		SECT
										FILE: sig-design-153-A	TSC:STATEWIDE	SIG-DESIGN-153-A		3 of 4

Strain Pole Foundation Chart - Tethered Spans - Poles Connected to Tie-Off Spans ^A								
Span Length (ft)	Soil Type	Soil Condition		36 ft Pole Length		40 ft Pole Length		Casing Length
		S _u *	N ₆₀ *	Diameter (in)	Foundation Depth (ft) *	Diameter (in)	Foundation Depth (ft) *	
≤ 100	Low Sand	-	5 ≤ N ₆₀ < 10	48	20.0	48	21.5	As Shown on Plans
	Med Sand	-	10 ≤ N ₆₀ < 20	48	17.5	48	18.5	
	High Sand	-	N ₆₀ ≥ 20	48	16.5	48	17.5	
	Low Clay	500 ≤ S _u < 1000	-	48	27.5	48	30.0	
	Med Clay	1000 ≤ S _u < 2000	-	48	20.0	48	21.0	
	High Clay	S _u ≥ 2000	-	48	15.5	48	16.5	
101 to 120	Low Sand	-	5 ≤ N ₆₀ < 10	48	20.5	48	21.5	
	Med Sand	-	10 ≤ N ₆₀ < 20	48	18.0	48	19.0	
	High Sand	-	N ₆₀ ≥ 20	48	16.5	48	17.5	
	Low Clay	500 ≤ S _u < 1000	-	48	28.0	48	30.5	
	Med Clay	1000 ≤ S _u < 2000	-	48	20.0	48	21.0	
	High Clay	S _u ≥ 2000	-	48	16.0	48	16.5	
121 to 150	Low Sand	-	5 ≤ N ₆₀ < 10	48	21.0	48	22.5	
	Med Sand	-	10 ≤ N ₆₀ < 20	48	18.5	48	19.5	
	High Sand	-	N ₆₀ ≥ 20	48	17.5	48	18.0	
	Low Clay	500 ≤ S _u < 1000	-	48	30.0	48	33.5	
	Med Clay	1000 ≤ S _u < 2000	-	48	21.0	48	22.0	
	High Clay	S _u ≥ 2000	-	48	16.5	48	17.0	
151 to 176	Low Sand	-	5 ≤ N ₆₀ < 10	48	21.5	48	23.0	
	Med Sand	-	10 ≤ N ₆₀ < 20	48	19.0	48	20.0	
	High Sand	-	N ₆₀ ≥ 20	48	17.5	48	18.5	
	Low Clay	500 ≤ S _u < 1000	-	48	31.5	48	37.5	
	Med Clay	1000 ≤ S _u < 2000	-	48	21.5	48	22.5	
	High Clay	S _u ≥ 2000	-	48	16.5	48	17.5	
177 to 200	Low Sand	-	5 ≤ N ₆₀ < 10	48	22.0	48	23.5	
	Med Sand	-	10 ≤ N ₆₀ < 20	48	19.0	48	20.0	
	High Sand	-	N ₆₀ ≥ 20	48	18.0	48	18.5	
	Low Clay	500 ≤ S _u < 1000	-	48	32.0	48	38.0	
	Med Clay	1000 ≤ S _u < 2000	-	48	21.5	48	23.5	
	High Clay	S _u ≥ 2000	-	48	16.5	48	17.5	

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										FILE: sig-design-153-A	TSC:STATEWIDE	SIG-DESIGN-153-A		4 of 4