File: PRCOM20152958

LUTJEN

January 6, 2016

Jason Abplanalp
Premier Carports
233 SW Greenwich Drive #141
Lee's Summit, Missouri 64082
(816) 522-2006
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Email: jason@premiercarports.com

RE: JOHN KNOX VILLAGE CARPORTS **JOB #15200-01**
400 MURRAY RD.
LEE'S SUMMIT, MISSOURI 64081

SUBJECT: BELL PIER FOUNDATIONS

Mr. Abplanalp,

This letter is in regards to a change in the footing requirements for the above referenced project. It my understanding through conversations with you that the site and soil conditions have made it difficult to reach the specified bell pier diameter of 36 inches as indicated on sheet S2.0 of the design drawings.

Therefore, in order to shorten the diameter of the bell pier to 28 inches, the pier will be required to be 9" deeper to insure enough soil weight will counteract the uplift resistance needed during a code prescribed wind event. Finally, to summarize, the final bell pier requirements are outlined in the attached calculations.

Should you have any questions or concerns, please don't hesitate to contact me.

Best Regards,

Michael J. Valentine, P.E.

STATE OF MISSOURI
MICHAEL JOEL VALENTINE
NUMBER PE-2011015400
PROFESSIONAL ENGINEER

1/6/16

cc: Mr. John Borns
City of Lee's Summit, MO
220 SE Green St.
Lee's Summit, Missouri 64063
john.borns@cityofls.net

mv

LUTJEN	Project	John Knox Village	Footing Design-Vertical Loads		
	Location	Lee's Summit, MO	Made by	Date	Job No
	Client	Premier Carports	MJV		
	Description	Footing Design for Vertical Loads	Checked	Revision	Page No

Inputs

Loads		
Max Vertical Reaction	8.00	kips
Max Uplift	2.33	kips
Allowable Soil Bearing	2	ksf

Drilled Pier

Size Footing Diameter

Areq'd = Max Vertical Reaction / Allowable Soil Bearing

Areq'd = 4 ft2

Dreq'd = Sqrt(4 * Areq'd/π)

Dreq'd = 28 in ==> use 30 in dia

Size Footing Depth

Depth is based on weight needed to resist uplift

Vreq'd = Max Uplift / (0.6 * 0.15 kcf)

Vreq'd= 25.89 ft3

Use 30 in dia x 5.5 ft drilled pier.

Lreq'd = Vreq'd / Areq'd

Lreq'd = 5.5 ft

Belled Drilled Pier

Size Footing Diameter

Shaft Dia= 18 in

Areq'd = Max Vertical Reaction / Allowable Soil Bearing

Areq'd = 4 ft2

Bell Dreq'd = Sqrt(4 * Areq'd/π)

Bell Dreq'd = 28 in ==> use 28 in dia

Size Footing Depth

Depth is based on weight and soil capacity needed to resist uplift

Wsoil = Anet * Depth * Soil Density

Wconc = Conc Density * Volume

Trial Depth = 4.75 ft

Soil Density= 110 pcf

Wsoil = 10368 lb

Wconc = 1305 lb

Wtotal= 11673 lbs

Use 18 in dia shaft with 28 in dia bell x 4.75 ft drilled pier.

Wreq'd =Max Uplift/0.6= 3883 kips