7/28/13
Robin R. Schuckman
18139 NW Skyline Blvd
Portland, Oregon 97231

File: 13-034-02

Re: Structural Checksheet Response
       Permit No. 13-142959-000-00-RS

Dear Robin:

The following memorandum has been generated for the Structural Checksheet prepared by the City of Portland for permit No. 13-142959-000-00-RS for the project located at 18139 NW Skyline Blvd. Per the checksheet the Description of work is to convert existing agricultural building to unheated shop with heated office space for home occupation.

The following is a copy of the structural checksheet comments and how each has been addressed; responses are in blue for clarity:

1. Please provide an enlarged detail for all truss gussets. Calc shows ¾" plywood with numerous nails. Not to split the wood truss members, the nail spacing suppose to be 3" o.c. or more (Heel join connection could be an issue)

   Response: Details for the truss gusset connections have been added to a structural sheet for clarity. Note the NDS does not require a minimum spacing for nailing, per 11.5.1 the geometry factor for fasteners less than ¼" diameter is 1.0. However, to mitigate splitting potential the nailing has been specified with two rows of staggered nails have been detailed.

2. Corbel connection. Please see calc sheet 9. Please provide a detail in scale and with sufficient clarity. Structural detail not a sketch.

   Response: Details for the corbel connection have been added to a structural sheet for clarity, See detail 1/S1.

3. Please provide complete architectural drawings, with dimension lines for the levations. Show how tall is the building, each corner, each ridge. Wind load calculation could be effected. NOT TO SCALE.

   Response: The drawings with requested dimensions have been updated accordingly and the scales have been corrected.

4. Please provide complete <u>structural</u> drawings. Included but not limited to girts, siding attachment, etc. – for the entire building.
   Response: The additional information requested has been added to the drawings and the previous structural mark-ups have been added to the drawings to match the structural calculations.

5. Pleas provide very specific foundation drawings, including pole embedment concrete around post at underground. Provide foundation info for the office foundation also.

   Response: The foundation elements have been clarified on the drawings.

6. Post embedment design. Please provide a sketch, show all loads on the post. Calc page 17/31 shows: Lateral load 0.822kj, post is 14fet. Moment suppose to be 14'x0.882k=12.34 kipsft, calc shows only 6.174k-ft. In general, a pole foundation for a barn needs 5 feet minimum embedment, with concrete diameter 16" at least.

   Response: A sketch showing the loads on the posts is shown in the original calculations on sheet 16 of 31. (The loads are also shown on sheet 12 of 31 for the posts) Note the loads to the post are shown for both wind and seismic conditions (as well as snow and gravity). Note that the seismic load is applied to the top of the post via the diaphragm (since the seismic mass is largely from the roof so it was conservatively considered to apply at the top of the post), however, the wind load is applied as a distributed load to the posts as the wind load is generated from the wind loads applied to the wall girts between posts. Therefore, the wind load is applied as a distributed load to the posts.

   Sheet of 17 & 18 (of 31) have been revised (see attached) to show the correct seismic loading as well as the revised footing size in the updated drawings (24" diameter). Note, the Enercalc calculation checks all ASCE7 combinations. The replaced sheet showed the Dead + Wind load combination for the pole embedment design, which were the values shown at the Controlling values at the top of the sheet. Since the wind load is a distributed load the wind load is 63 plf * 14' = 0.882 kips. And the associated moment at the base is (63 plf)*14'^2/2 = 6.174 ft-kips as shown. Load combination results for all other load combinations are shown at the bottom of the sheet.

Please call if you have any questions.

Sincerely,

Travis McFeron, P.E.,S.E.
Peterson Structural Engineers, Inc.

Submitted via Email –
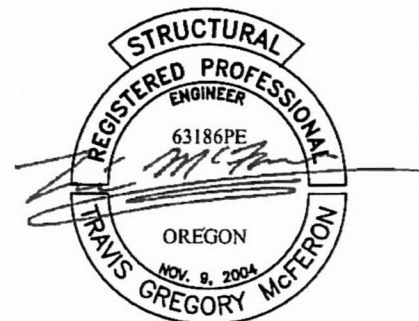
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PSE
Peterson Structural Engineers, Inc.

Pole Footing Embedded in Soil

Description :   Embedded Pole

Code References

Calculations per IBC 2006 1805.7.2, CBC 2007, ASCE 7-05
Load Combinations Used : ASCE 7-05

General Information

Pole Footing Shape	Circular
Footing Diameter	24.0 in
Calculate Min. Depth for Allowable Pressures	
Lateral Restraint at Ground Surface	
Allow Passive	250.0 pcf
Max Passive	1,500.0 psf

$E = (0.7)(0.7786^k) = 0.545^k$; seismic LOAD

Controlling Values

Governing Load Combination : +D+0.70E+H

Lateral Load	0.5450 k
Moment	7.630 k-ft

Restraint @ Ground Surface

Pressure at Depth

Actual	1,153.02 psf
Allowable	1,249.69 psf
Surface Retraint Force	4,868.85 lbs
Minimum Required Depth	**3.750 ft**

$W_{WIND} = 63 plf$

Footing Base Area	3.142 ft^2
Maximum Soil Pressure	0.0 ksf

Footing Diameter = 2'-0"
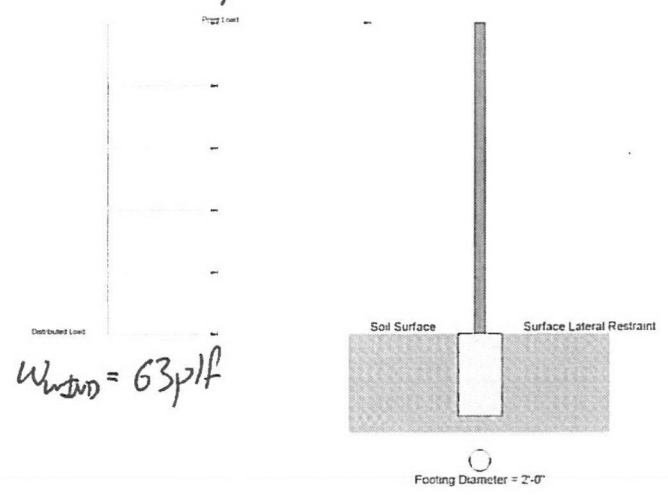
Applied Loads

Lateral Concentrated Load		Lateral Distributed Load	Applied Moment	Vertical Load
D : Dead Load	k	k/ft	k-ft	k
Lr : Roof Live	k	k/ft	k-ft	k
L : Live	k	k/ft	k-ft	k
S : Snow	k	k/ft	k-ft	k
W : Wind	k	0.0630 k/ft	k-ft	k
E : Earthquake	0.7786 k	k/ft	k-ft	k
H : Lateral Earth	k	k/ft	k-ft	k
Load distance above		TOP of Load above ground surface		
ground surface	14.0 ft	14.0 ft		
		BOTTOM of Load above ground surface		
		ft		

Load Combination Results

Load Combination	Forces @ Ground Surface		Required	Pressure at Depth		Soil Increase
	Loads - (k)	Moments - (ft-k)	Depth - (ft)	Actual - (psf)	Allow - (psf)	Factor
D Only	0.000	0.000	0.13	0.0	31.3	1.000
+D+L+H	0.000	0.000	0.13	0.0	31.3	1.000
+D+Lr+H	0.000	0.000	0.13	0.0	31.3	1.000
+D+S+H	0.000	0.000	0.13	0.0	31.3	1.000
+D+0.750Lr+0.750L+H	0.000	0.000	0.13	0.0	31.3	1.000
+D+0.750L+0.750S+H	0.000	0.000	0.13	0.0	31.3	1.000
+D+W+H	0.882	6.174	3.50	1,071.0	1,166.4	1.333
+D+0.70E+H	0.545	7.630	3.75	1,153.0	1,249.7	1.333
+D+0.750Lr+0.750L+0.750W+H	0.662	4.631	3.13	1,007.6	1,041.4	1.333

⚠ : 07.28.13
WHOLE SHEET

17/31

Project Title:
Engineer:
Project Descr:

Project ID:

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Pole Footing Embedded in Soil

Description :   Embedded Pole

+D+0.750L+0.750S+0.750W+H	0.662	4.631	3.13	1,007.6	1,041.4	1.333
+D+0.750Lr+0.750L+0.5250E+H	0.409	5.723	3.38	1,067.6	1,124.7	1.333
+D+0.750L+0.750S+0.5250E+H	0.409	5.723	3.38	1,067.6	1,124.7	1.333
+0.60D+W+H	0.882	6.174	3.50	1,071.0	1,166.4	1.333
+0.60D+0.70E+H	0.545	7.630	3.75	1,153.0	1,249.7	1.333

$\underline{\bigwedge} : 07.28.13$
WHOLE SHEET

18/31