



CASCADE DESIGN

PROFESSIONALS

A Division of Cooper Zietz Engineers, Inc.

COMPUTATION SHEET

Revised 9-15-14

Project: TriMet/Center St.

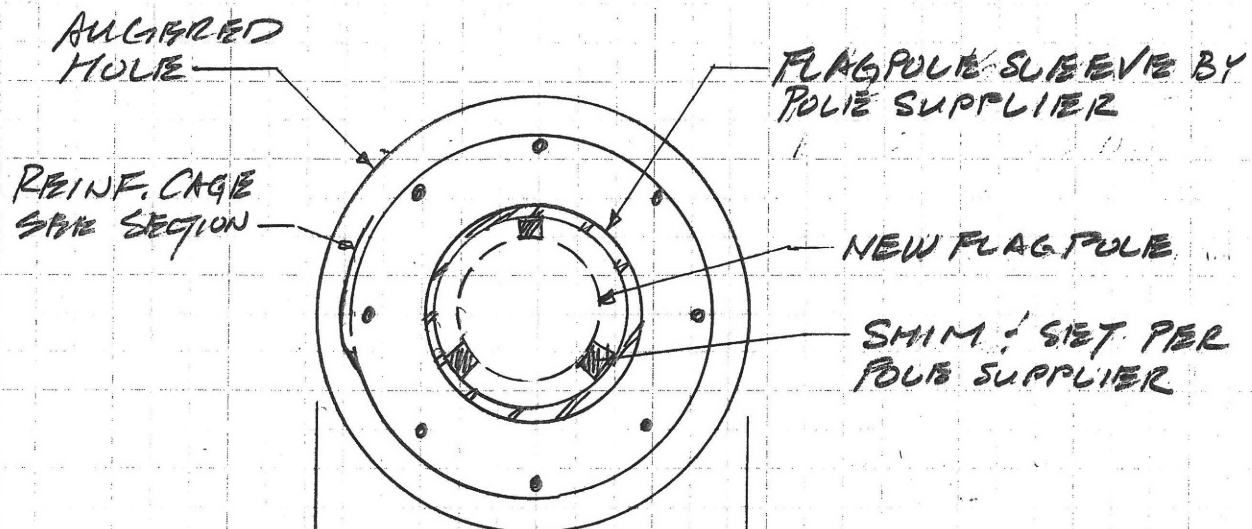
No: _____

Date: 4-9-14

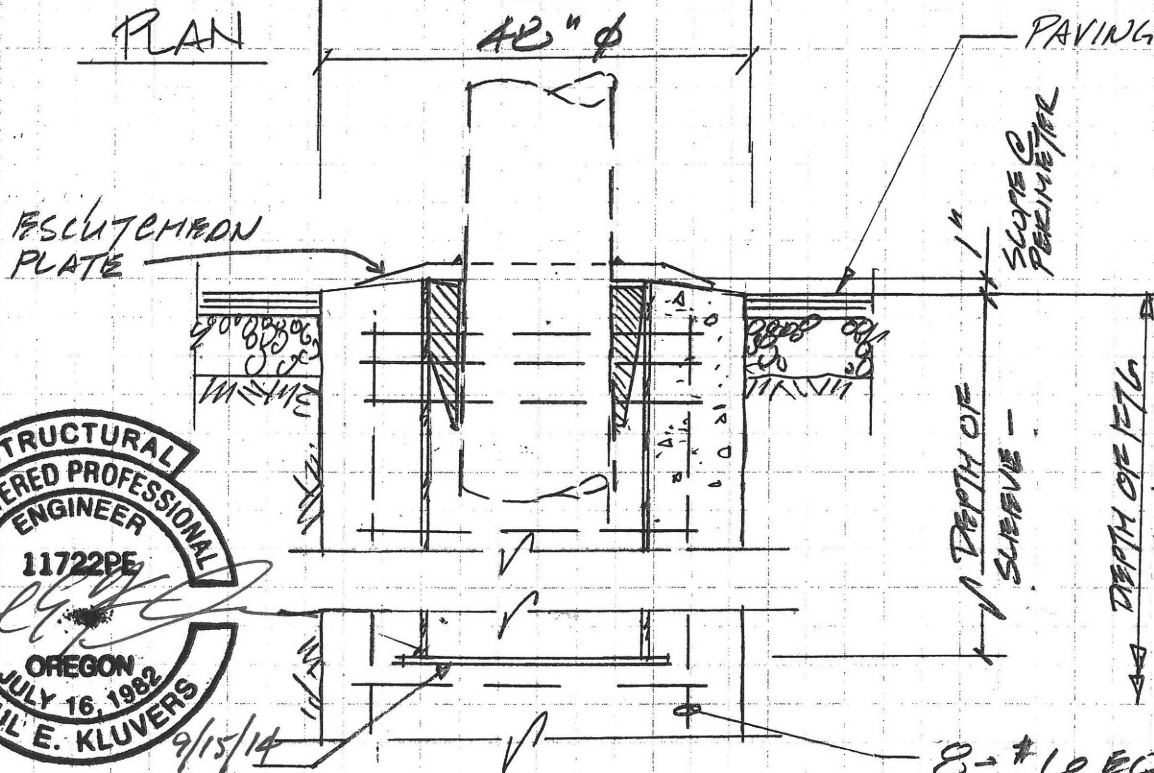
Subject: Flagpole Base

By: TFK

Sheet: SIC-1



PLAN



EXPIRATION DATE: 06-30-15

City of Portland
REVIEWED FOR CODE
COMPLIANCE

SEP 17 2014

Permit Number

SECTION

02-1-177-666151-41



Project: _____ No: _____ Date: _____

Subject: Flagpole Base By: _____ Sheet: _____

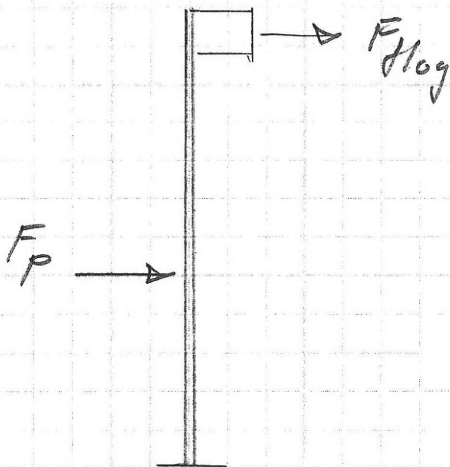
Pole Hgt = 50' - Revise to 40'

Base diameter (assumed) = 12" -

Tip " " " = 6" -

Wind Load (assumed) = 30 psf

$$\begin{aligned} \text{Total surface area} &= (1' + 0.5')(50')(\frac{1}{2}) \\ &= 38 \text{ SF} \end{aligned}$$



$$\begin{aligned} F_p &= 38 \text{ SF} \times 30 \text{ psf} \\ &= 1140 \text{ lbs} \\ &\text{ @ } \frac{1}{2} \text{ hgt} \end{aligned}$$

$$F_{\text{flag}} = 300 \text{ lbs}$$

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Total M @ base:

$$\begin{aligned} M &= (1140 \text{ lbs})(50'/2) + (300 \text{ lbs})(50') \\ &= 28,500 \text{ lb}' + 15,000 \text{ lb}' \\ &= 43,500 \text{ lb}' \end{aligned}$$

This is equiv. to $P = 1740$ @ 25' → change to 20'

Embedded Pole Footing [per 2009 IBC/2010 OSSC Section 1807.3]

(Notes: Applied P is based on maximum moment capacity of selected post)

A. Nonconstrained Footing:

XXX = Resulting values
XXX = Input values

Depth, $d = 0.5A \{1 + [1 + (4.36h/A)]^{1/2}\} =$ **9.29 feet** [Eq. 18-1]

$A = 2.34P/S_1$ $b =$ **2.776091**

$b =$ Pole diameter = **4** feet

$d =$ Embedment = **5.5** feet (trial depth of embedment)

$h =$ Distance to load, $P =$ **20** feet

$P =$ Applied Lat. Force = **1740** lbs

$S_1 =$ Allow. Lat. Soil Pres. **366.67** psf (See below)

Compute S_1 and S_3 :

Material	Allow Fdn Pressure (psf)	Lateral Bearing* (psf)
Crystalline Bedrock	12,000	1,200
Sed/Foliated Rock	4,000	400
Sandy Gravel/Gravel	3,000	200
Sand, Silty/Clay Snd	2,000	150
Clay, Sandy Clay..	1,500	100
* psf/foot below natural grade		
Selected Values:		200
$S_1 =$	366.67 psf	
$S_3 =$	1100 psf	

B. Constrained Footing: (Constraint provided by rigid floor or pavement)

Depth, $d = [4.25(Ph/S_3b)]^{1/2} =$ **5.80 feet**

Compare with trial depth above, = **5.5** feet

Trial and Error Output Recap:

Trial Depth	Type A Footing Depth	Type B Footing Depth
4		
5		
6		
7		



Project: _____ No: _____ Date: _____

Subject: _____ By: _____ Sheet: _____

from worksheet -

Assume 'constrained' (area improved)

use 4' ϕ x 6.0' deep.

Model EH408188

8" - 14 gauge spun aluminum ball
gold anodized

Single sheave truck, cast aluminum
revolving, non-fouling type

2 Bronze swivel snaps with covers
per halyard

1 Set of halyard: #10 poly

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Permit Number

1 - 9" Cast aluminum cleat

Aluminum flash collar

3000 PSI concrete

Hardwood wedges
(supplied by others)

Dry sand tightly tamped
after aligning pole

Foundation sleeve -16 ga
hot dip galvanized steel

Steel centering wedges

1/4" Steel base plate

1/4" Steel support plate
welded to grounding spike

Exposed height: 40'-0"

Tapered portion: 32'-2"

Overall length: 44'-0"

Cleat height: 5'-0"

Straight portion: 11'-10"

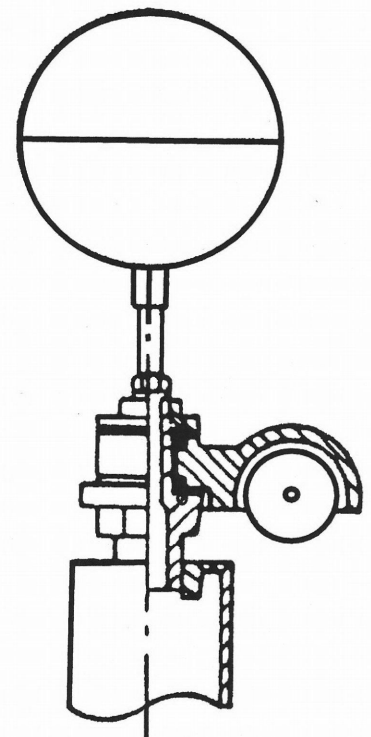
Foundation: 4'-6"

4'-0"

6"

12"

9"
18"
48"



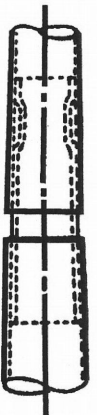
Truck Detail

Aluminum body
Stainless steel ball bearings
Aluminum sheave
Cast aluminum spindle

All shafts with overall
length of more than
38'-6" are shipped in
two sections.

Each section matched marked
for field assembly. Exposed
portion of jam sleeve must
be **well lubricated** prior to
assembly.

1-1/2" maximum shop
gap allowed for field fitting
(ram for tight joint)



The Flagpole Company
800.805.9728

Project:	Ground set tapered aluminum flagpole: ALLOY: 6063T6			Date:
Location:	Exposed height: 40'-0"	Overall height: 44'-0"		Revision:
Architect:	Ship in 2 sections	Butt diameter: 8"		
Contractor:	Top diameter: 3-1/2"	Wall thickness: .188"		
Customer:	Finish: 100 grit polish			Job:



City of Portland, Oregon - Bureau of Development Services

1900 SW Fourth Avenue • Portland, Oregon 97201 • 503-823-7300 • www.portlandoregon.gov/bds



Permit Revision Application and Submittal Requirements

A Permit Revision is required when there are proposed changes to the project after the permit has been issued. This may arise due to discrepancies between the city-approved permit drawings and actual field conditions, or the customer has changed their mind about an aspect of the project. In all cases, a revision to the existing permit must be submitted, reviewed and approved.

Applicants will provide:

☒ A copy of this application

☒ Three (3) sets of plans that clearly reflect the proposed change(s).

Drawings and calculations must be stamped and signed by the Architect and/or the Engineer of Record, if applicable.

☐ One (1) copy of the original city approved permit drawings. (NOTE: If your project has an assigned process manager please contact them regarding submittal of the revision).

☐ Two (2) sets of calculations, if applicable

☐ Inspector's correction notice, if revision is due to an inspection correction

☐ Revision fee (paid at time of submittal)

Contact Information:

Contact name Karen Karlsson - KLK Consulting

Address 906 NW 23rd Ave

City Portland

State Oregon

Zip Code 97210

Phone 503-515-6865

Email karen@klk-consulting.com

Value of proposed revision \$2,000

Issued permit # 14-157999-CO

Description of revision Enlarge size of foundation to match new pole.

Fees:

The Permit Revisions are subject to fees associated with plan review, processing and any increase in project value. Additional fees may apply if adding plumbing fixtures.

The Bureau of Development Services fee schedule is available under the fees tab on the BDS web site at: www.portlandoregon.gov/bds. Fees are updated annually on July 1st.

Helpful Information:

Bureau of Development Services
City of Portland, Oregon
1900 SW 4th Avenue, Portland, OR 97201
www.portlandoregon.gov/bds

Submit your plans in person to:

Development Services Center (DSC), First Floor,
Tuesday - Friday:
7:30 am - 12:00 pm
Closed Mondays

Important Telephone Numbers:

BDS main number503-823-7300
DSC automated information line503-823-7310
Building code information503-823-1456
BDS 24 hour inspection request line503-823-7000
Residential information for
one and two family dwelling503-823-7388
General Permit Processing and
Fee Estimate info503-823-7357
City of Portland TTY503-823-6868