Project: Plan 2800

Location: Garage Roof Girder Truss Footing
Footing
[2015 International Building Code(2012 NDS)]
Footing Size: 3.0 FT x 3.0 FT x 10.00 IN
Reinforcement: #4 Bars @ 9.00 IN. O.C. E/W / (4) min.
Section Footing Design Adequate

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FOOTING PROPERTIES

Allowable Soil Bearing Pressure:	$Q_s =$	1500 psf
Concrete Compressive Strength:	$F'c =$	2500 psi
Reinforcing Steel Yield Strength:	$F_y =$	60000 psi
Concrete Reinforcement Cover:	$c =$	3 in

FOOTING SIZE

Width:	$W =$	3 ft
Length:	$L =$	3 ft
Depth:	Depth =	10 in
Effective Depth to Top Layer of Steel:	$d =$	6.25 in

COLUMN AND BASEPLATE SIZE

Column Type:	Wood	
Column Width:	$m =$	6 in
Column Depth:	$n =$	6 in

FOOTING CALCULATIONS

Bearing Calculations:

Ultimate Bearing Pressure:	$Q_u =$	1111 psf
Effective Allowable Soil Bearing Pressure:	$Q_e =$	1375 psf
Required Footing Area:	$A_{req} =$	7.27 sf
Area Provided:	$A =$	9.00 sf

Baseplate Bearing:

Bearing Required:	Bear =	14800 lb
Allowable Bearing:	Bear-A =	99450 lb

Beam Shear Calculations (One Way Shear):

Beam Shear:	$V_{u1} =$	4831 lb
Allowable Beam Shear:	$V_{c1} =$	16875 lb

Punching Shear Calculations (Two Way Shear):

Critical Perimeter:	$B_o =$	49 in
Punching Shear:	$V_{u2} =$	13086 lb
Allowable Punching Shear (ACI 11-35):	$vc2\text{-}a =$	68906 lb
Allowable Punching Shear (ACI 11-36):	$vc2\text{-}b =$	81563 lb
Allowable Punching Shear (ACI 11-37):	$vc2\text{-}c =$	45938 lb
Controlling Allowable Punching Shear:	$vc2 =$	45938 lb

Bending Calculations:

Factored Moment:	$M_u =$	66600 in-lb
Nominal Moment Strength:	$M_n =$	251888 in-lb

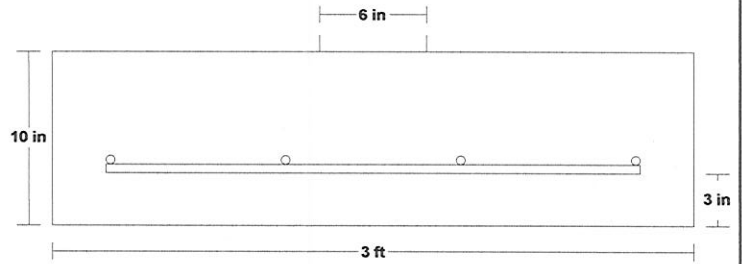**Reinforcement Calculations:**

Concrete Compressive Block Depth:	$a =$	0.62 in
Steel Required Based on Moment:	$A_s(1) =$	0.20 in2
Min. Code Req'd Reinf. Shrink./Temp. (ACI-10.5.4):	$A_s(2) =$	0.65 in2
Controlling Reinforcing Steel:	$A_s\text{-reqd} =$	0.65 in2
Selected Reinforcement:	#4's @ 9.0 in. o.c. e/w (4) Min.	
Reinforcement Area Provided:	$A_s =$	0.79 in2

Development Length Calculations:

Development Length Required:	$L_d =$	15 in
Development Length Supplied:	$L_d\text{-sup} =$	15 in

LOADING DIAGRAM

FOOTING LOADING

Live Load:	$PL =$	7000 lb
Dead Load:	$PD =$	3000 lb
Total Load:	$PT =$	10000 lb
Ultimate Factored Load:	$P_u =$	14800 lb
Weight to resist uplift w/ 1.5 F.S.:	U.R. =	725 lb

NOTES

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Permit Number: 20-01955

Project: Plan 2800

Location: Garage Floor Support om Stem Wall
Footing
[2015 International Building Code(2012 NDS)]
Footing Size: 16.0 IN Wide x 6.0 IN Deep Continuous Footing With 6.0 IN Thick x 24.0 IN Tall Stemwall
LongitudinalReinforcement: (2) Continuous #4 Bars
TransverseReinforcement: #4 Bars @ 18.00 IN. O.C. (unnecessary)
Section Footing Design Adequate

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FOOTING PROPERTIES
Allowable Soil Bearing Pressure:	Q_s =	1500	psf
Concrete Compressive Strength:	$F'c$ =	2500	psi
Reinforcing Steel Yield Strength:	F_y =	60000	psi
Concrete Reinforcement Cover:	c =	3	in

FOOTING SIZE
Width:	W =	16	in
Depth:	Depth =	6	in
Effective Depth to Top Layer of Steel:	d =	2.25	in

STEMWALL SIZE
Stemwall Width: 6 in
Stemwall Height: 24 in
Stemwall Weight: 150 pcf

FOOTING CALCULATIONS

Bearing Calculations:
Ultimate Bearing Pressure:	Q_u =	563	psf
Effective Allowable Soil Bearing Pressure:	Q_e =	1425	psf
Width Required:	W_{req} =	0.53	in2
Beam Shear Calculations (One Way Shear):			
Beam Shear:	V_{u1} =	182	lb
Allowable Beam Shear:	V_{c1} =	2025	lb

Transverse Direction:
Bending Calculations:
Factored Moment:	M_u =	828	in-lb
Nominal Moment Strength:	M_n =	0	in-lb
Reinforcement Calculations:			
Concrete Compressive Block Depth:	a =	0.30	in
Steel Required Based on Moment:	$A_s(1)$ =	0.01	in2
Min. Code Req'd Reinf. Shrink./Temp. (ACI-10.5.4):	$A_s(2)$ =	0.13	in2
Controlling Reinforcing Steel:	As-reqd =	0.13	in2
Selected Reinforcement:	Trans: #4's @ 18.0 in. o.c.		
Reinforcement Area Provided:	A_s =	0.13	in2

Development Length Calculations:
Development Length Required:	L_d =	15	in
Development Length Supplied:	Ld-sup =	2	in

Note: Plain concrete adequate for bending,
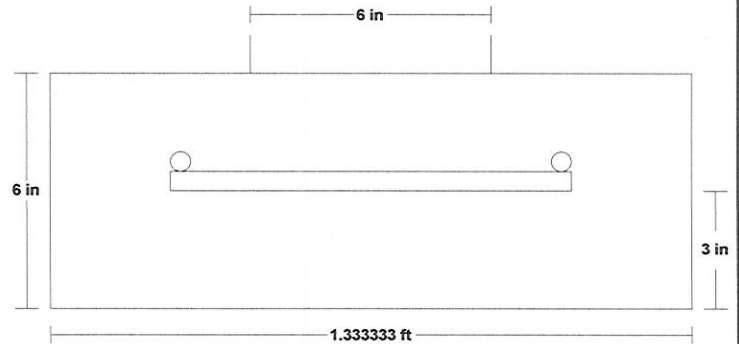therefore adequate development length not required.

Longitudinal Direction:
Reinforcement Calculations:
Min. Code Req'd Reinf. Shrink./Temp. (ACI-10.5.4):	$A_s(2)$ =	0.17	in2
Controlling Reinforcing Steel:	As-reqd =	0.17	in2
Selected Reinforcement:	Longitudinal: (2) Cont. #4 Bars		
Reinforcement Area Provided:	A_s =	0.39	in2

LOADING DIAGRAM

6 in
6 in
3 in
1.333333 ft

FOOTING LOADING
Live Load:	PL =	400	lb
Dead Load:	PD =	200	lb
Total Load:	PT =	750	lb
Ultimate Factored Load:	P_u =	1060	lb

NOTES

Permit Number: 20-01955