Trygstad ENGINEERING

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#24307
REVISED Structural Calculations For:

TAM- SIBAY Residence Addition & Alteration

4215 Holly Ln
Mercer Island, WA 98040

Designer: TAM Design

Design Criteria: IBC 2021 as adopted by the city of Mercer Island
Wind: Wind Speed = 100 mph, Exposure 'C', Kzt = 1.00
Seismic: Site Class D [Default], SDC = D, R = 6.5, I=1.0
Roof Rain-on-Snow Load = 25 psf
Roof Future PV Load = 5psf
Deck Live Load = 60psf
Residential Floor Live Load = 40psf

Summary:
The following changes are proposed to the previously submitted plan set:

1. A basement post at grid C.5 and 6.5 is proposed to be removed
2. The existing floor joists over the garage are proposed without reinforcing by reducing the span (adding dropped beam on Grid B).
3. Shallower Grid 4 window headers in bonus room provided
4. From the previous field revision (plans dated 10/02/25), a few refinements have been made:
    a. Garage Header on grid 1 (S2.3) and supporting footings (S2.1).
    b. Footing detail 14/S6.1 at grid 1 and B corner specified on S2.1.
    c. Drag strapping at top of grid A wall added to detail 18/S9.4.

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CALCULATION

SECTION 2.0:

ROOF FRAMING

BEAM ID'S NOT USED

RB10 RB08

RB12

RB13

RR05

RB15

POST OOP WIND LOAD:
P=0.6*28PSF
(ZONE 5, 100MPH, EXP. C, Kzt=1.0, h=32FT)
P=16.8psf (ASD)
w=17.3'2*16.8psf=141plf

AXIAL:
3.1K RB18 + 1.7K RB17 + 4.5K GT =9.3K

10 9 8 7 6 5 4 3 2 1

A B C D E F G H

(E) GUTTER, TYP

(E) GUTTER, TYP

(E) GUTTER, TYP

(E) GUTTER, TYP

(E) GUTTER, TYP

REFERENCE ONLY (NO WORK TO BE PERFORMED IN HATCHED AREA)

LOADING & LABELING KEY

TYPE: B=BEAM R=RAFTER J=JOIST

BM. CALC SEQ. NO.

BEAM LABEL: 2FB08

FLOOR OR ROOF LEVEL: 2=2ND,ETC. L=LOW

LEVEL R=ROOF F=FLOOR

LINE LOADING [PLF]

BEAM TRANSFER	WALL TRANSFER	*AT DECKS, LL=60 PSF
		"RED" = ROOF ONLY [25 S+15D+5PV]
		"YELLOW" = TOP FLR [40L*+15D]
		"ORANGE" = ROOF + FLR
		"BLUE" = LOWER FLOOR ONLY [40L*+15D]
		"GREEN" = MULTIPLE FLOORS

POINT LOADING [K]

- BM. LOAD (THIS LVL.)TO TRANSFER BM
- COL. LOAD TO LVL. BELOW
- COL. LOAD FROM ABV. TO TRANSFER BM
- KING POST W/IN LVL TO TRANSFER BM

RR04 ON WALL

RR03 (2)2x6x10FT STRUC FASCIA

RR02

RR01

RB07 6x8 HR

RB09 7x14 PSL HR OVER WSWH WALLS

RB18 SLOPED GLB HR

RB17 BM. (18/S9.4) CARRYING KING POST (BELOW UPPER WDW)

RB14 (2)2x12 VALLEY FB

RB11

RB06 6x10 HR

RB05 (3)2x6 HR

RB04 5.25x9.5 PSL HR

WSWH18

16 S9.4

19 S9.2

16 S9.1

17 S9.1

18 S9.1

GRID A:C9-C.G. TRANSITION

GRID C:C-RAKE WALL TO B/TRUSS

RAKE WALL TO B/TRUSS

6x8 DF#1 TRIMMER, EA. END OF WB

KING POST ON STL. BM: (2)KING STUDS BETWEEN (2)TRIMMERS

DBL. STRUC FASCIA

UPSIDE DOWN LUS HGR. TO STRUC FASCIA

TRUSS ENGR: 600 LB SL 500 LB DL

TRUSS ENGR: 1200 LB SL 1000 LB DL

TRUSS ENGR: T/CHD: 155PLF S, 125PLF D LOWER ROOF PLANE: 70PLF S, 55PLF D

DRAG T/CHD-B/CHD: 260PLF ASD E

GRID A:D LOW SM. DORMER 2x6 O.R. @ 24" O.C.

LUS HGR. TO T/CHD. @ O.R. BKSPAN

TRUSS TO T/PL: DSC5

HIGH ROOF: 2x6 O.R. @ 16" O.C.

CABLE-END G.T. @ O.R. BKSPAN

DROPPED T/CHD ON EAST END

SUN ROOM

KITCHEN

SEATING AREA

MUD ROOM

PANTRY

LIVING

BEDROOM

BATH

SCISSOR PMT @ 24" O.C.

TRUNCATED SCISSOR PMT @ 24" O.C.

RIDGE @ MAX. BLDG. HT (RE: ARCH)

INTERIOR SFT: DBL. PURLINS

G.T. W/2x6 MIN. T/CHD.

TRUSS ENGR: T/CHD: 2.5" RR TRIB. B/CHD: 2.5" CJ TRIB. [REF. RC KEYPLAN]

TRUSS ENGR: T/CHD: 2' RR TRIB. B/CHD: 2' CJ TRIB. [REF. RC KEYPLAN]

DROPPED T/CHD. TRUSS @ EAVE SCAB @ W END

ABV. SW: 12" FULL-HT. LSL BLKG. TO ROOF (ROOF P.E.N.)

LUS HGR. TO TRUSS T/CHD. @ O.R. BACKSPAN

TRUSS @ O.R. BKSPAN

CONT. HDR O/MID-SUPPORT TRIMMERS

GRID F.9:C.9 CJ TO G.T. B/CHD

4'-11 1/2"

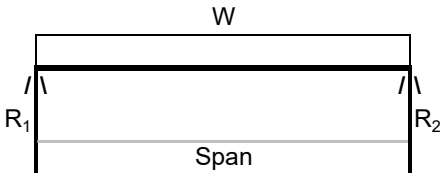
4'-8 1/2"

PROJECT NORTH (REFERENCE ONLY)

RB04) GRID 4 GARAGE WDW HEADER

1/13/2026

SIMPLE SPAN - UNIFORM LOAD



Span = 7.25 ft

Uniform Load (full span), W = 742.5 lb/ft

Reactions

V_{max} = 2692 lb — R_1 = 2692 lb

M_{max} = 4878 lb-ft — R_2 = 2692 lb

Nominal Beam Size: b = 5.25 in. d= 6.25 in. Number of Sections = 1

b_{act} = 5.25 in. d_{act} = 6.25 in.

Lumber Species/Type:---------- PSL REPETITIVE MEMBER?---------- N

Post?: YES

Design Stresses and Factors:

C_L= 1.00 Moisture > 19%? N

Fv =	290 psi	LDF =	1.00	$C_{M(v)}$ =	1.00
Fb =	2,900 psi	Cr =	1.00	$C_{M(b)}$ =	1.00
Fc|| =	2,900 psi	Cv =	1.00	$C_{M(c\|\|)}$ =	1.00
Fc⊥ =	750 psi	$CF_{(B)}$ =	1.00	$C_{M(c\perp)}$ =	1.00
E =	2.0E+06 psi	δ_{TOTAL}=L/	360	$C_{M(E)}$ =	1.00
Emin =	.00E+00 psi			Incise Ci=	1.00

Stresses and Deflections		
	Actual	Allowable
Fv (psi)	105.4	**290**
Fb (psi)	1713	**2900**
Delta (in.)	0.22	**0.24**

Section Properties		
	Required	Provided
A (in2)	**11.92**	32.8
Sx (in3)	**20.19**	34.18
I (in4)	**95.50**	106.8

0 INCH ϕ HOLE SEC. REDUC.
0.0 in3
0.0 in4

REQ'D END BEARING = 0.68 inches

NOTCH DEPTH = 0 inches

$f_{V,NOTCH}$ (Tension Face) = < Fv' = 290 psi

USE: (1) 5.25 x 6.25 PSL

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CALCULATION

SECTION 3.0:

L2 FLOOR FRAMING

BEAM ID'S NOT USED

2FB04	2FB13	2FB21
2FB05	2FB14	2FB22
2FB06	2FB15	2FB20
2FB07	2FB16	
2FB08	2FB17	
2FB09	2FB18	

BM O.T. RXN:
2*(3.2K/4)*15' TALL/23' BM
=1.1K E ASD UPLIFT
OMEGA * 1.1K =2.6K...B4 DL REDUC
...HSS NOT NEEDED FOR UPLIFT

BM O.T. RXN:
2*(3.2K/4)*15' TALL/11' BM
=2.2K E ASD RXN
OMEGA * 2.2K =5.5K

FULL L +S+ D= 5.8K

~GOV BLC: 0.85 *5.8K + 0.75*5.5K

=9.1K DN

OR

0.6*(5.8K*30%) - 5.5K = -4.5K UP

LOADING & LABELING KEY

TYPE: B=BEAM R=RAFTER J=JOIST

BM. CALC SEQ. NO.

BEAM LABEL: 2FB08

FLOOR OR ROOF LEVEL: 2=2ND,ETC. L=LOW

LEVEL: R=ROOF F=FLOOR

LINE LOADING [PLF]

BEAM TRANSFER	WALL TRANSFER	
		"RED" = ROOF ONLY [25 S+15D+5PV]
		"YELLOW" = FLR [40L*+15D], R/DK:60+27
		"ORANGE" = ROOF + FLR
		"BLUE" = LOWER FLOOR ONLY [40L*+15D]
		"GREEN" = MULTIPLE FLOORS

*AT DECKS, LL=60 PSF

POINT LOADING [K]

- BM. LOAD (THIS LVL.)TO TRANSFER BM
- COL. LOAD TO LVL. BELOW
- COL. LOAD FROM ABV. TO TRANSFER BM
- KING POST W/IN LVL TO TRANSFER BM

10 9 8 7 6 5 4 3 2 1

(E) DECK

(E) PRIMARY BEDROOM

(E) PRIMARY BATH

ENTRY

(E) BATH

(E) BEDROOM

BATH

PRIMARY BEDROOM

BATH

W.I.C.

MECHANICAL ROOM

MUD ROOM

(E) GYM

(N) 2ND FLR. ~18'-8½"

BONUS T/SUBFLR ~26'-5¾"

FLOOR G.T.

FLR. TRUSSES

20" FLOOR TRUSSES @ 16" O.C. MAX.

UPPER FLOOR: 20PSF DL, 40PSF LL

REPLACE (E)2X4 GARAGE EXTERIOR WALLS WITH 2X6@16" O.C. FRAMING

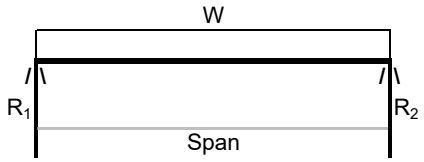
[IF USING EXIST. BEAM, VERIFY MANUF. STAMP FOR 24F-V4 DF-DF GLULAM]

PROJECT NORTH (REFERENCE ONLY)

2FB29) GRID B BEAM

12/1/2025

SIMPLE SPAN - UNIFORM LOAD



Span = 12.3 ft

Uniform Load (full span), W = 789 lb/ft

Reactions

V_{max} = 4852 lb — R_1 = 4852 lb

M_{max} = 14921 lb-ft — R_2 = 4852 lb

Nominal Beam Size: b = 5.5 in. d= 12 in. Number of Sections = 1

b_{act} = 5.50 in. d_{act} = 12.00 in.

Lumber Species/Type:---------- GLB REPETITIVE MEMBER?---------- N

Post?: NO

Design Stresses and Factors:

C_L= 0.99 Moisture > 19%? N

Fv =	240 psi	LDF =	1.00	$C_{M(v)}$ =	1.00
Fb =	2,400 psi	Cr =	1.00	$C_{M(b)}$ =	1.00
Fc|| =	1,650 psi	Cv =	1.00	$C_{M(c\|\|)}$ =	1.00
Fc⊥ =	650 psi	$CF_{(B)}$ =	1.00	$C_{M(c\perp)}$ =	1.00
E =	1.8E+06 psi	δ_{TOTAL}=L/	480	$C_{M(E)}$ =	1.00
Emin =	.93E+06 psi			Incise Ci=	1.00

Stresses and Deflections		
	Actual	Allowable
Fv (psi)	92.3	**240**
Fb (psi)	1356	**2364**
Delta (in.)	0.29	**0.31**

Section Properties		
	Required	Provided
A (in2)	**25.40**	66.0
Sx (in3)	**75.73**	132.00
I (in4)	**734.11**	792.0

0 INCH ϕ HOLE SEC. REDUC.
0.0 in3
0.0 in4

REQ'D END BEARING = 1.36 inches

NOTCH DEPTH = 0 inches

$f_{V,NOTCH}$ (Tension Face) = < Fv' = 240 psi

USE: 5.5 x 12 IN. 24F-V4 GLB

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CALCULATION

SECTION 4.0:

L1 FLOOR FRAMING

BEAM ID'S NOT USED

1FB03

1FB08

10 9 8 7 6 5 4 3 2 1

A B C D E F G H

EX. FLR. WITH ADJUSTMENTS
GC TO VERIFY (E)BM & JST. LOC. & DIR. AS SHOWN

NEW FLOOR ADDITION

L1 EXIST. DECK

(N)2x10 DECK TOTAL 6.8K O.C.
SISTERED TO BUILT-OUT TJI'S

(2)2x6 KING STUDS+ 16.1k total
2x6 TRIMMER EA. SIDE
[2X4 NOT ALLOWED]

(2)MST60
[L1 'A' SW]

5.3K TOTAL

NO WDW

~6'-8"
P4

(2)2x8 HR

1FB05

2x6 TRIM+
(2)2X6 KING

NO ADDED NEW LOAD

EXIST. FRAMED 1ST FLOOR OVER EXIST. BASEMENT

(E)2X10 FJ @ 16" O.C.

(E)1ST FLR
~9'-0"

V.I.F. POST IN WALL ABV. IS SUPPORTED ON FLR. BM OR POST

TRIM TO CLG.

(E) KITCHEN

(E)4X4 POST

NO LOAD CHANGE

1FB01

(N)7x14 PSL FB(O)

COL ABV.

4.6K 1FB01 [8/7/25]
HB7.12: 5.6K CAP
HHUS7.25/14: 13.8K

LIVING

CS14x96" W/24" DIA.

HHUS7.25/14 HGR.

NO ADDED NEW LOAD

(N)7x14 PSL w/ 12"x14" LVL FB(D)

1FB02

DEMO (E)POST

(N)7x11⅞ PSL FB

1FB04

DEMO (E)WALL

DEMO (E)BRIDGE

BEDROOM

UP

DEMO (E)WALL& STAIRS

BATH

(E) CLOSET

BA3.56 HGR.

3x9½ PSL FB

1FB06

DEMO BRG. WALL

BRG. WALL

(E) GYM

(E)GYM FLR.
~5'-5"

(2)CS14
[L1 '5' SW]

1FB07

STAIRS

CS14
[L2 '5' SW]

9½" TJI/210 FJ @ 16" O.C.

2X10 FB (DRAG)

(E)2x10 FJ

(E) CLOSET

(E) CLOSET

(E) CLOSET

(E) CLOSET

(E) PANTRY

(E) BATH

10
S9.4

20
S1.3

P6

P4

P7

LOADING & LABELING KEY

TYPE:
B=BEAM
R=RAFTER
J=JOIST

BM. CALC SEQ. NO.

BEAM LABEL: 2FB08

FLOOR OR ROOF LEVEL: 2=2ND.ETC. L=LOW

LEVEL: R=ROOF F=FLOOR

LINE LOADING [PLF]

BEAM TRANSFER	WALL TRANSFER	
		"RED" = ROOF ONLY [25 S+15D+5PV]
		"YELLOW" = TOP FLR [40L*+15D]
		"ORANGE" = ROOF + FLR
		"BLUE" = LOWER FLOOR ONLY [40L*+15D]
		"GREEN" = MULTIPLE FLOORS

*AT DECKS, LL=60 PSF

POINT LOADING [K]

- BM. LOAD (THIS LVL.)TO TRANSFER BM
- COL. LOAD TO LVL. BELOW
- COL. LOAD FROM ABV. TO TRANSFER BM
- KING POST W/IN LVL TO TRANSFER BM

(E) GARAGE S.O.G.
~13'-5⅝"

1447 plf SURCHARGE
400plf Fndn

1847/ 2500psf *12

5.6k RB01
12.4K RB02

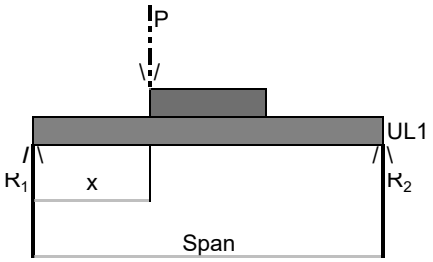
18.0k TOTAL

PROJECT NORTH
(REFERENCE ONLY)

1FB02) GRID C.5 BTWN. GRIDS 5:6.5

1/12/2026

SIMPLE SPAN - UNIFORM LOAD/PARTIAL LOAD/CONC. LD.



Span = 15.8 ft

	Load			
Uniform Load 1 (full span) =	650 lb/ft			
Uniform Load 2 (lbs/ft) =	133	from x =	10.5	15.8 feet
Sum UL1 + UL2 = 650				
Concentrated Load (lbs) =	6500	@ x =	10.5 feet	

		Reactions	
V_{max} =	10041 lb	R_1 =	7434 lb
M_{max} =	42025 lb-ft	R_2 =	10041 lb

Nominal Beam Size: b = 8.75 in. d= 14 in. Number of Sections = 1

b_{act} = 8.75 in. d_{act} = 14.00 in.

Lumber Species/Type:---------- LVL REPETITIVE MEMBER?---------- N

POST?: NO

Design Stresses and Factors:

		C_L=	0.99	Moisture > 19%?	N
Fv =	285 psi	LDF =	1.00	$C_{M(v)}$ =	1.00
Fb =	2,600 psi	Cr =	1.00	$C_{M(b)}$ =	1.00
Fc|| =	2,310 psi	Cv =	1.00	$C_{M(c\|\|)}$ =	1.00
Fc⊥=	750 psi	$CF_{(B)}$ =	1.00	$C_{M(c\perp)}$ =	1.00
E =	1.9E+06 psi	Delta = L/	435.3743883	$C_{M(E)}$ =	1.00
Emin =	.97E+06 psi			Incise Ci=	1.00

Stresses and Deflections		
	Actual	Allowable
Fv (psi)	113.67	**285**
Fb (psi)	1764	**2579**
Delta (in.)	0.41	**0.44**

Section Properties		
	Required	Provided
A (in2)	**48.9**	122.5
Sx (in3)	**195.6**	285.8
I (in4)	**1895.5**	2000.8

0 INCH ϕ HOLE SEC. REDUC.
0.0 in3
0.0 in4

REQ'D END BEARING = 1.53 inches

NOTCH DEPTH = 0 inches

$f_{V,NOTCH}$ (Tension Face) = N/A < Fv' = 285 psi

USE:

[7x14 PSL + 1.75x14 LVL]

1FB03) REMOVED

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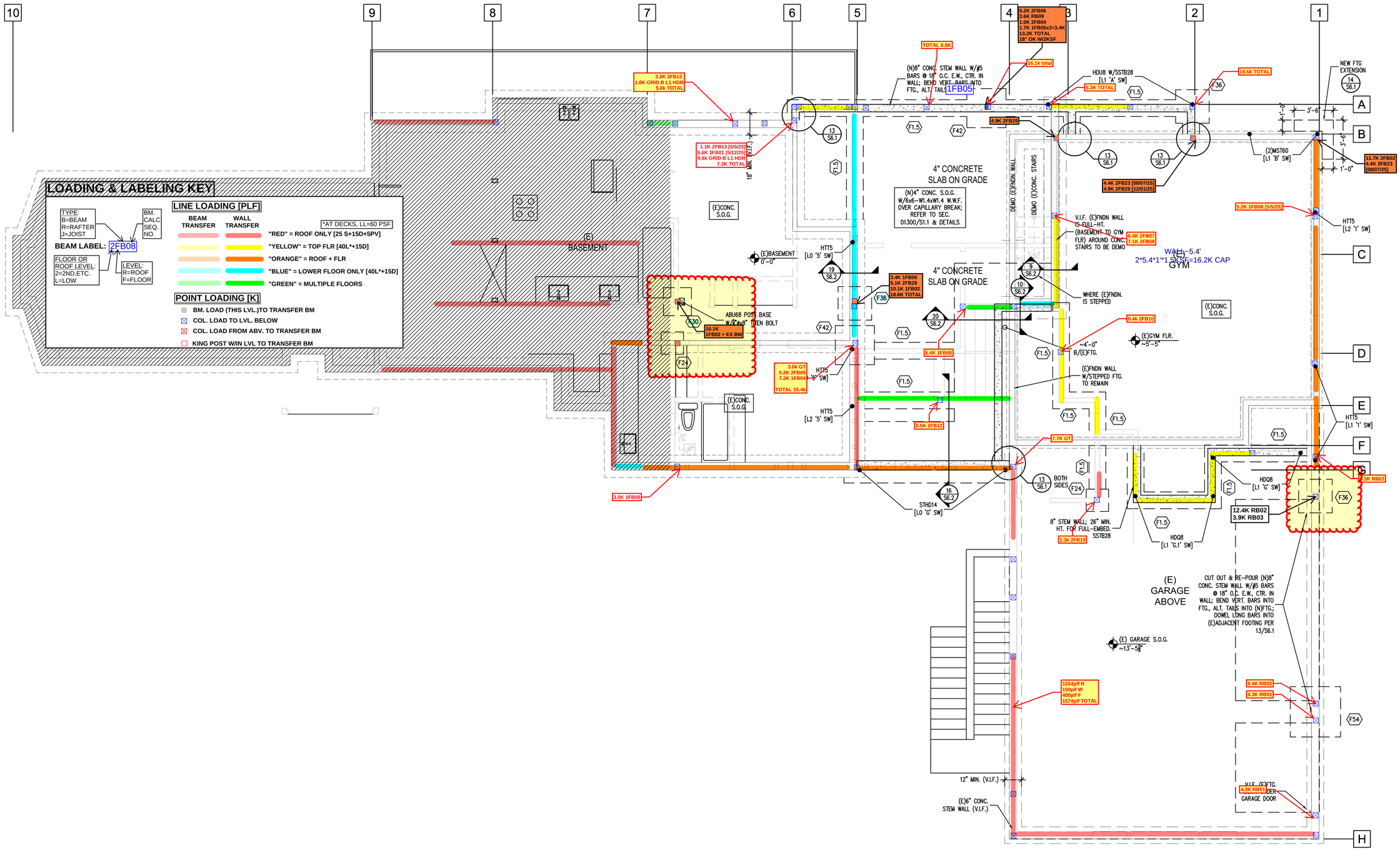
CALCULATION
SECTION 8.0:
FOUNDATION ENGINEERING


LOADING & LABELING KEY
TYPE: B=BEAM R=RAFTER J=JOIST
BM. CALC SEQ. NO.
BEAM LABEL: 2FB08
FLOOR OR ROOF LEVEL: 2=2ND,ETC. L=LOW
LEVEL: R=ROOF F=FLOOR
LINE LOADING [PLF]
BEAM TRANSFER
WALL TRANSFER
*AT DECKS, LL=60 PSF
"RED" = ROOF ONLY [25 S+15D+5PV]
"YELLOW" = TOP FLR [40L*+15D]
"ORANGE" = ROOF + FLR
"BLUE" = LOWER FLOOR ONLY [40L*+15D]
"GREEN" = MULTIPLE FLOORS
POINT LOADING [K]
BM. LOAD (THIS LVL.)TO TRANSFER BM
COL. LOAD TO LVL. BELOW
COL. LOAD FROM ABV. TO TRANSFER BM
KING POST W/IN LVL TO TRANSFER BM
10
9
8
7
6
5
4
3
2
1
A
B
C
D
E
F
G
H
3.2K 2FB13
1.8K GRID B L1 HDR
5.0k TOTAL
1.1K 2FB13 [5/5/25]
5.6K 1FB01 [5/12/25]
0.6k GRID B L1 HDR
7.3K TOTAL
MIN (V.I.F.)
18"
(E) BASEMENT
(E)CONC. S.O.G.
(E)BASEMENT 0'-0"
HTT5 [L0 '5' SW]
ABU68 POST BASE W/ 5"x8" TITEN BOLT
10.1K
1FB02 + EX BM
3.0K 1FB08
TOTAL 6.8K
(N)8" CONC. STEM WALL W/#5 BARS @ 18" O.C. E.W., CTR. IN WALL; BEND VERT. BARS INTO FTG., ALT. TAILS
1FB05
16.1k total
5.2K 2FB06
3.6K RB09
1.0K 2FB04
1.7K 1FB05x2=3.4K
13.2K TOTAL
18" OK W/2KSF
HDU8 W/SSTB28 [L1 'A' SW]
5.3K TOTAL
16.6k TOTAL
NEW FTG EXTENSION
4.9K 2FB29
4" CONCRETE SLAB ON GRADE
(N)4" CONC. S.O.G. W/6x6-W1.4xW1.4 W.W.F. OVER CAPILLARY BREAK; REFER TO SEC. 01300/S1.1 & DETAILS
DEMO (E)FNDN. WALL
DEMO (E)CONC. STAIRS
(2)MST60 [L1 'B' SW]
11.7K 2FB02
4.4K 2FB23
[08/07/25]
4.4K 2FB23 [08/07/25]
4.9K 2FB29 [12/01/25]
5.2K 2FB08 [5/5/25]
HTT5 [L2 'I' SW]
V.I.F. (E)FNDN WALL TO FULL-HT. (BASEMENT TO GYM FLR) AROUND CONC. STAIRS TO BE DEMO
6.4K 2FB07
7.1K 2FB08
WALL=5.4'
2*5.4*1'*1.5KSF=16.2K CAP
GYM
3.4K 1FB05
5.1K 2FB23
10.1K 1FB02
18.6K TOTAL
WHERE (E)FNDN. IS STEPPED
(E)CONC. S.O.G.
0.4k 2FB10
(E)GYM FLR. ~5'-5"
~4'-0" B/(E)FTG.
6.4K 1FB06
3.0k GT
5.2K 2FB09
7.2K 1FB04
TOTAL 15.4k
HTT5 [L2 '5' SW]
(E)FNDN WALL W/STEPPED FTG. TO REMAIN
0.5K 2FB12
7.7K GT
HDQ8 [L1 'G' SW]
12.4K RB02
3.9K RB03
13.3K RB03
BOTH SIDES
8" STEM WALL; 26" MIN. HT. FOR FULL-EMBED. SSTB28
1.3k 2FB19
HDQ8 [L1 'G.1' SW]
STHD14 [L0 'G' SW]
(E) GARAGE ABOVE
CUT OUT & RE-POUR (N)8" CONC. STEM WALL W/#5 BARS @ 18" O.C. E.W., CTR. IN WALL; BEND VERT. BARS INTO FTG., ALT. TAILS INTO (N)FTG.; DOWEL LONG BARS INTO (E)ADJACENT FOOTING PER 13/S6.1
(E) GARAGE S.O.G. ~13'-5"
1024plf R
150plf W
400plf F
1574plf TOTAL
9.4K RB02
4.3K RB01
12" MIN. (V.I.F.)
(E)6" CONC. STEM WALL (V.I.F.)
V.I.F. (E)FTG. UNDER GARAGE DOOR
PROJECT NORTH (REFERENCE ONLY)

Trygstad Engineering
nels@trygstadeng.com

Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: nels std calc catalog.ec6

DESCRIPTION: Modified F30: 2'-6"x2'-6" Footing 2500psf ASBP (14.8K)

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2012

General Information

Material Properties

f'c : Concrete 28 day strength	=	2.50	ksi
fy : Rebar Yield	=	60.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.0	ksi
Concrete Density	=	150.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	No
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	2.50	ksf
Soil Density	=		pcf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=	ksf
when max. length or width is greater than	=	ft

Dimensions

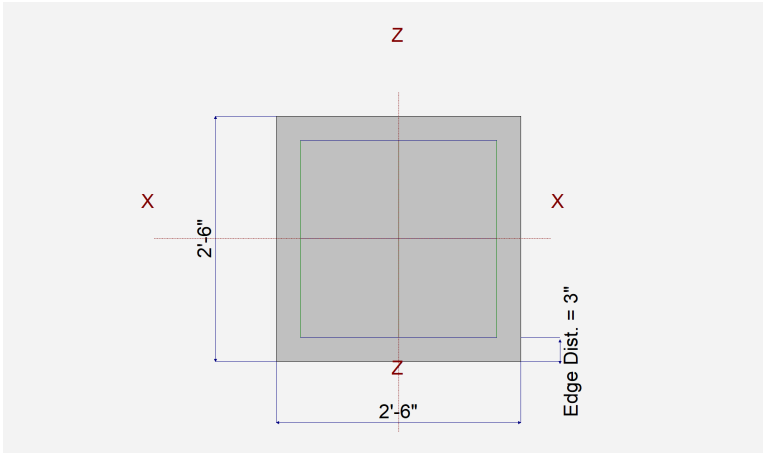
Width parallel to X-X Axis	=	2.50 ft
Length parallel to Z-Z Axis	=	2.50 ft
Footing Thickness	=	10.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	in
pz : parallel to Z-Z Axis	=	in
Height	=	in

Rebar Centerline to Edge of Concrete...

at Bottom of footing	=	3.0 in

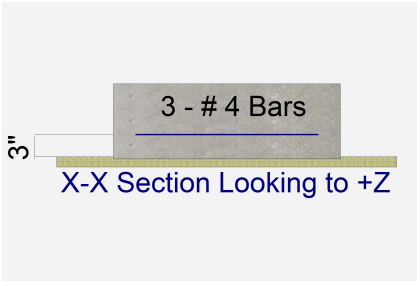


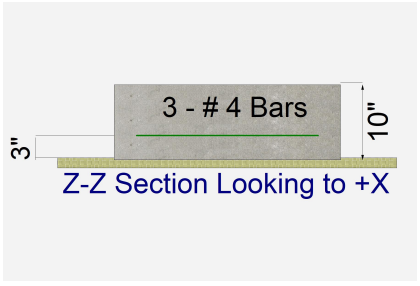
Reinforcing

Bars parallel to X-X Axis			
Number of Bars	=		3.0
Reinforcing Bar Size	=	#	4
Bars parallel to Z-Z Axis			
Number of Bars	=		3.0
Reinforcing Bar Size	=	#	4

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=			14.80					k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

Trygstad Engineering
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Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: nels std calc catalog.ec6

DESCRIPTION: Modified F30: 2'-6"x2'-6" Footing 2500psf ASBP (14.8K)

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.9972	Soil Bearing	2.493 ksf	2.50 ksf	+D+L+H about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.4080	Z Flexure (+X)	2.960 k-ft/ft	7.255 k-ft/ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4080	Z Flexure (-X)	2.960 k-ft/ft	7.255 k-ft/ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4080	X Flexure (+Z)	2.960 k-ft/ft	7.255 k-ft/ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4080	X Flexure (-Z)	2.960 k-ft/ft	7.255 k-ft/ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4059	1-way Shear (+X)	30.446 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4059	1-way Shear (-X)	30.446 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4059	1-way Shear (+Z)	30.446 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4059	1-way Shear (-Z)	30.446 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.7590	2-way Punching	113.857 psi	150.0 psi	+1.20D+0.50Lr+1.60L+1.60H

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, +D+H	2.50	n/a	0.0	0.1250	0.1250	n/a	n/a	0.050
X-X, +D+L+H	2.50	n/a	0.0	2.493	2.493	n/a	n/a	0.997
X-X, +D+Lr+H	2.50	n/a	0.0	0.1250	0.1250	n/a	n/a	0.050
X-X, +D+S+H	2.50	n/a	0.0	0.1250	0.1250	n/a	n/a	0.050
X-X, +D+0.750Lr+0.750L+H	2.50	n/a	0.0	1.901	1.901	n/a	n/a	0.760
X-X, +D+0.750L+0.750S+H	2.50	n/a	0.0	1.901	1.901	n/a	n/a	0.760
X-X, +D+0.60W+H	2.50	n/a	0.0	0.1250	0.1250	n/a	n/a	0.050
X-X, +D+0.70E+H	2.50	n/a	0.0	0.1250	0.1250	n/a	n/a	0.050
X-X, +D+0.750Lr+0.750L+0.450W+H	2.50	n/a	0.0	1.901	1.901	n/a	n/a	0.760
X-X, +D+0.750L+0.750S+0.450W+H	2.50	n/a	0.0	1.901	1.901	n/a	n/a	0.760
X-X, +D+0.750L+0.750S+0.5250E+H	2.50	n/a	0.0	1.901	1.901	n/a	n/a	0.760
X-X, +0.60D+0.60W+0.60H	2.50	n/a	0.0	0.0750	0.0750	n/a	n/a	0.030
X-X, +0.60D+0.70E+0.60H	2.50	n/a	0.0	0.0750	0.0750	n/a	n/a	0.030
Z-Z, +D+H	2.50	0.0	n/a	n/a	n/a	0.1250	0.1250	0.050
Z-Z, +D+L+H	2.50	0.0	n/a	n/a	n/a	2.493	2.493	0.997
Z-Z, +D+Lr+H	2.50	0.0	n/a	n/a	n/a	0.1250	0.1250	0.050
Z-Z, +D+S+H	2.50	0.0	n/a	n/a	n/a	0.1250	0.1250	0.050
Z-Z, +D+0.750Lr+0.750L+H	2.50	0.0	n/a	n/a	n/a	1.901	1.901	0.760
Z-Z, +D+0.750L+0.750S+H	2.50	0.0	n/a	n/a	n/a	1.901	1.901	0.760
Z-Z, +D+0.60W+H	2.50	0.0	n/a	n/a	n/a	0.1250	0.1250	0.050
Z-Z, +D+0.70E+H	2.50	0.0	n/a	n/a	n/a	0.1250	0.1250	0.050
Z-Z, +D+0.750Lr+0.750L+0.450W+H	2.50	0.0	n/a	n/a	n/a	1.901	1.901	0.760
Z-Z, +D+0.750L+0.750S+0.450W+H	2.50	0.0	n/a	n/a	n/a	1.901	1.901	0.760
Z-Z, +D+0.750L+0.750S+0.5250E+H	2.50	0.0	n/a	n/a	n/a	1.901	1.901	0.760
Z-Z, +0.60D+0.60W+0.60H	2.50	0.0	n/a	n/a	n/a	0.0750	0.0750	0.030
Z-Z, +0.60D+0.70E+0.60H	2.50	0.0	n/a	n/a	n/a	0.0750	0.0750	0.030

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

Trygstad Engineering
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Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: nels std calc catalog.ec6

DESCRIPTION: Modified F30: 2'-6"x2'-6" Footing 2500psf ASBP (14.8K)

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D+1.60H	0.0	+Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.40D+1.60H	0.0	-Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+0.50Lr+1.60L+1.60H	2.960	+Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+0.50Lr+1.60L+1.60H	2.960	-Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+1.60L+0.50S+1.60H	2.960	+Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+1.60L+0.50S+1.60H	2.960	-Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+1.60Lr+0.50L+1.60H	0.9250	+Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+1.60Lr+0.50L+1.60H	0.9250	-Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+1.60Lr+0.50W+1.60H	0.0	+Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+1.60Lr+0.50W+1.60H	0.0	-Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+0.50L+1.60S+1.60H	0.9250	+Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+0.50L+1.60S+1.60H	0.9250	-Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+1.60S+0.50W+1.60H	0.0	+Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+1.60S+0.50W+1.60H	0.0	-Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+0.50Lr+0.50L+W+1.60H	0.9250	+Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+0.50Lr+0.50L+W+1.60H	0.9250	-Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+0.50L+0.50S+W+1.60H	0.9250	+Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+0.50L+0.50S+W+1.60H	0.9250	-Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+0.50L+0.70S+E+1.60H	0.9250	+Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +1.20D+0.50L+0.70S+E+1.60H	0.9250	-Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +0.90D+W+0.90H	0.0	+Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +0.90D+W+0.90H	0.0	-Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +0.90D+E+0.90H	0.0	+Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
X-X, +0.90D+E+0.90H	0.0	-Z	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.40D+1.60H	0.0	-X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.40D+1.60H	0.0	+X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+0.50Lr+1.60L+1.60H	2.960	-X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+0.50Lr+1.60L+1.60H	2.960	+X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+1.60L+0.50S+1.60H	2.960	-X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+1.60L+0.50S+1.60H	2.960	+X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+1.60Lr+0.50L+1.60H	0.9250	-X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+1.60Lr+0.50L+1.60H	0.9250	+X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+1.60Lr+0.50W+1.60H	0.0	-X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+1.60Lr+0.50W+1.60H	0.0	+X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+0.50L+1.60S+1.60H	0.9250	-X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+0.50L+1.60S+1.60H	0.9250	+X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+1.60S+0.50W+1.60H	0.0	-X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+1.60S+0.50W+1.60H	0.0	+X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+0.50Lr+0.50L+W+1.60H	0.9250	-X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+0.50Lr+0.50L+W+1.60H	0.9250	+X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+0.50L+0.50S+W+1.60H	0.9250	-X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+0.50L+0.50S+W+1.60H	0.9250	+X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+0.50L+0.70S+E+1.60H	0.9250	-X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +1.20D+0.50L+0.70S+E+1.60H	0.9250	+X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +0.90D+W+0.90H	0.0	-X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +0.90D+W+0.90H	0.0	+X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +0.90D+E+0.90H	0.0	-X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK
Z-Z, +0.90D+E+0.90H	0.0	+X	Bottom	0.2160	ACI 7.6.1.1	0.240	7.255	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50Lr+1.60L+1.60H	30.45 psi	30.45 psi	30.45 psi	75.00 psi	0.41	OK
+1.20D+1.60L+0.50S+1.60H	30.45 psi	30.45 psi	30.45 psi	75.00 psi	0.41	OK
+1.20D+1.60Lr+0.50L+1.60H	9.51 psi	9.51 psi	9.51 psi	75.00 psi	0.13	OK
+1.20D+1.60Lr+0.50W+1.60H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50L+1.60S+1.60H	9.51 psi	9.51 psi	9.51 psi	75.00 psi	0.13	OK
+1.20D+1.60S+0.50W+1.60H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50Lr+0.50L+W+1.60H	9.51 psi	9.51 psi	9.51 psi	75.00 psi	0.13	OK
+1.20D+0.50L+0.50S+W+1.60H	9.51 psi	9.51 psi	9.51 psi	75.00 psi	0.13	OK
+1.20D+0.50L+0.70S+E+1.60H	9.51 psi	9.51 psi	9.51 psi	75.00 psi	0.13	OK
+0.90D+W+0.90H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK

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Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: nels std calc catalog.ec6

DESCRIPTION: Modified F30: 2'-6"x2'-6" Footing 2500psf ASBP (14.8K)

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+0.90D+E+0.90H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50Lr+1.60L+1.60H	30.45 psi	30.45 psi	30.45 psi	75.00 psi	0.41	OK
+1.20D+1.60L+0.50S+1.60H	30.45 psi	30.45 psi	30.45 psi	75.00 psi	0.41	OK
+1.20D+1.60Lr+0.50L+1.60H	9.51 psi	9.51 psi	9.51 psi	75.00 psi	0.13	OK
+1.20D+1.60Lr+0.50W+1.60H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50L+1.60S+1.60H	9.51 psi	9.51 psi	9.51 psi	75.00 psi	0.13	OK
+1.20D+1.60S+0.50W+1.60H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50Lr+0.50L+W+1.60H	9.51 psi	9.51 psi	9.51 psi	75.00 psi	0.13	OK
+1.20D+0.50L+0.50S+W+1.60H	9.51 psi	9.51 psi	9.51 psi	75.00 psi	0.13	OK
+1.20D+0.50L+0.70S+E+1.60H	9.51 psi	9.51 psi	9.51 psi	75.00 psi	0.13	OK
+0.90D+W+0.90H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+0.90D+E+0.90H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	0.00 psi	150.00 psi	0	OK
+1.20D+0.50Lr+1.60L+1.60H	113.86 psi	150.00 psi	0.759	OK
+1.20D+1.60L+0.50S+1.60H	113.86 psi	150.00 psi	0.759	OK
+1.20D+1.60Lr+0.50L+1.60H	35.58 psi	150.00 psi	0.2372	OK
+1.20D+1.60Lr+0.50W+1.60H	0.00 psi	150.00 psi	0	OK
+1.20D+0.50L+1.60S+1.60H	35.58 psi	150.00 psi	0.2372	OK
+1.20D+1.60S+0.50W+1.60H	0.00 psi	150.00 psi	0	OK
+1.20D+0.50Lr+0.50L+W+1.60H	35.58 psi	150.00 psi	0.2372	OK
+1.20D+0.50L+0.50S+W+1.60H	35.58 psi	150.00 psi	0.2372	OK
+1.20D+0.50L+0.70S+E+1.60H	35.58 psi	150.00 psi	0.2372	OK
+0.90D+W+0.90H	0.00 psi	150.00 psi	0	OK
+0.90D+E+0.90H	0.00 psi	150.00 psi	0	OK

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Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

LIC# : KW-06020766, Build:20.24.07.08 TRYGSTAD ENGINEERING

DESCRIPTION: Modified F36: 3'-0"x3'-0" Footing 2500psf ASBP (21.2K CAP)

Code References

Calculations per ACI 318-14, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2012

General Information

Material Properties

f'c : Concrete 28 day strength	=	2.50	ksi
fy : Rebar Yield	=	60.0	ksi
Ec : Concrete Elastic Modulus	=	3,122.0	ksi
Concrete Density	=	145.0	pcf
φ Values Flexure	=	0.90	
Shear	=	0.750	

Analysis Settings

Min Steel % Bending Reinf.	=	
Min Allow % Temp Reinf.	=	0.00180
Min. Overturning Safety Factor	=	1.0 : 1
Min. Sliding Safety Factor	=	1.0 : 1
Add Ftg Wt for Soil Pressure	:	Yes
Use ftg wt for stability, moments & shears	:	No
Add Pedestal Wt for Soil Pressure	:	No
Use Pedestal wt for stability, mom & shear	:	No

Soil Design Values

Allowable Soil Bearing	=	2.50	ksf
Soil Density	=		pcf
Increase Bearing By Footing Weight	=	No	
Soil Passive Resistance (for Sliding)	=	250.0	pcf
Soil/Concrete Friction Coeff.	=	0.30	

Increases based on footing Depth

Footing base depth below soil surface	=	ft
Allow press. increase per foot of depth	=	ksf
when footing base is below	=	ft

Increases based on footing plan dimension

Allowable pressure increase per foot of depth	=	ksf
when max. length or width is greater than	=	ft

Dimensions

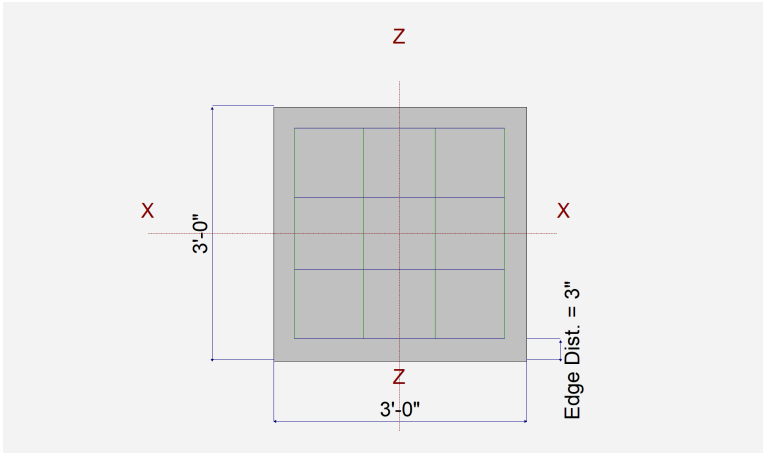
Width parallel to X-X Axis	=	3.0 ft
Length parallel to Z-Z Axis	=	3.0 ft
Footing Thickness	=	10.0 in

Pedestal dimensions...

px : parallel to X-X Axis	=	3.50 in
pz : parallel to Z-Z Axis	=	3.50 in
Height	=	in

Rebar Centerline to Edge of Concrete...

at Bottom of footing	=	3.0 in

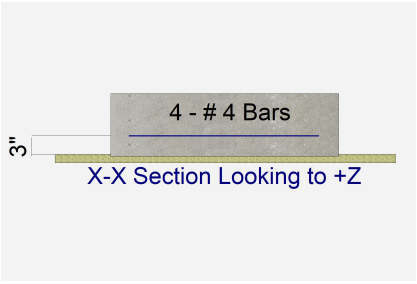


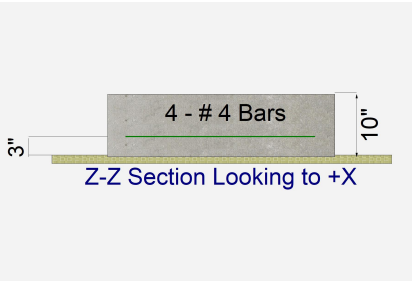
Reinforcing

Bars parallel to X-X Axis			
Number of Bars	=		4
Reinforcing Bar Size	=	#	4
Bars parallel to Z-Z Axis			
Number of Bars	=		4
Reinforcing Bar Size	=	#	4

Bandwidth Distribution Check (ACI 15.4.4.2)

Direction Requiring Closer Separation	n/a
# Bars required within zone	n/a
# Bars required on each side of zone	n/a





Applied Loads

		D	Lr	L	S	W	E	H	
P : Column Load	=			21.20					k
OB : Overburden	=								ksf
M-xx	=								k-ft
M-zz	=								k-ft
V-x	=								k
V-z	=								k

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General Footing

Project File: nels std calc catalog.ec6

DESCRIPTION: Modified F36: 3'-0"x3'-0" Footing 2500psf ASBP (21.2K CAP)

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.9904	Soil Bearing	2.476 ksf	2.50 ksf	+D+L+H about Z-Z axis
PASS	n/a	Overturning - X-X	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Overturning - Z-Z	0.0 k-ft	0.0 k-ft	No Overturning
PASS	n/a	Sliding - X-X	0.0 k	0.0 k	No Sliding
PASS	n/a	Sliding - Z-Z	0.0 k	0.0 k	No Sliding
PASS	n/a	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.4307	Z Flexure (+X)	3.456 k-ft/ft	8.024 k-ft/ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4307	Z Flexure (-X)	3.456 k-ft/ft	8.024 k-ft/ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4307	X Flexure (+Z)	3.456 k-ft/ft	8.024 k-ft/ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4307	X Flexure (-Z)	3.456 k-ft/ft	8.024 k-ft/ft	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4666	1-way Shear (+X)	34.997 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4666	1-way Shear (-X)	34.997 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4666	1-way Shear (+Z)	34.997 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.4666	1-way Shear (-Z)	34.997 psi	75.0 psi	+1.20D+0.50Lr+1.60L+1.60H
PASS	0.6999	2-way Punching	104.990 psi	150.0 psi	+1.20D+0.50Lr+1.60L+1.60H

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xecc (in)	Zecc (in)	Actual Soil Bearing Stress @ Location Bottom, -Z	Top, +Z	Left, -X	Right, +X	Actual / Allow Ratio
X-X, +D+H	2.50	n/a	0.0	0.1208	0.1208	n/a	n/a	0.048
X-X, +D+L+H	2.50	n/a	0.0	2.476	2.476	n/a	n/a	0.990
X-X, +D+Lr+H	2.50	n/a	0.0	0.1208	0.1208	n/a	n/a	0.048
X-X, +D+S+H	2.50	n/a	0.0	0.1208	0.1208	n/a	n/a	0.048
X-X, +D+0.750Lr+0.750L+H	2.50	n/a	0.0	1.888	1.888	n/a	n/a	0.755
X-X, +D+0.750L+0.750S+H	2.50	n/a	0.0	1.888	1.888	n/a	n/a	0.755
X-X, +D+0.60W+H	2.50	n/a	0.0	0.1208	0.1208	n/a	n/a	0.048
X-X, +D+0.70E+H	2.50	n/a	0.0	0.1208	0.1208	n/a	n/a	0.048
X-X, +D+0.750Lr+0.750L+0.450W+H	2.50	n/a	0.0	1.888	1.888	n/a	n/a	0.755
X-X, +D+0.750L+0.750S+0.450W+H	2.50	n/a	0.0	1.888	1.888	n/a	n/a	0.755
X-X, +D+0.750L+0.750S+0.5250E+H	2.50	n/a	0.0	1.888	1.888	n/a	n/a	0.755
X-X, +0.60D+0.60W+0.60H	2.50	n/a	0.0	0.07250	0.07250	n/a	n/a	0.029
X-X, +0.60D+0.70E+0.60H	2.50	n/a	0.0	0.07250	0.07250	n/a	n/a	0.029
Z-Z, +D+H	2.50	0.0	n/a	n/a	n/a	0.1208	0.1208	0.048
Z-Z, +D+L+H	2.50	0.0	n/a	n/a	n/a	2.476	2.476	0.990
Z-Z, +D+Lr+H	2.50	0.0	n/a	n/a	n/a	0.1208	0.1208	0.048
Z-Z, +D+S+H	2.50	0.0	n/a	n/a	n/a	0.1208	0.1208	0.048
Z-Z, +D+0.750Lr+0.750L+H	2.50	0.0	n/a	n/a	n/a	1.888	1.888	0.755
Z-Z, +D+0.750L+0.750S+H	2.50	0.0	n/a	n/a	n/a	1.888	1.888	0.755
Z-Z, +D+0.60W+H	2.50	0.0	n/a	n/a	n/a	0.1208	0.1208	0.048
Z-Z, +D+0.70E+H	2.50	0.0	n/a	n/a	n/a	0.1208	0.1208	0.048
Z-Z, +D+0.750Lr+0.750L+0.450W+H	2.50	0.0	n/a	n/a	n/a	1.888	1.888	0.755
Z-Z, +D+0.750L+0.750S+0.450W+H	2.50	0.0	n/a	n/a	n/a	1.888	1.888	0.755
Z-Z, +D+0.750L+0.750S+0.5250E+H	2.50	0.0	n/a	n/a	n/a	1.888	1.888	0.755
Z-Z, +0.60D+0.60W+0.60H	2.50	0.0	n/a	n/a	n/a	0.07250	0.07250	0.029
Z-Z, +0.60D+0.70E+0.60H	2.50	0.0	n/a	n/a	n/a	0.07250	0.07250	0.029

Overturning Stability

Rotation Axis & Load Combination...	Overturning Moment	Resisting Moment	Stability Ratio	Status
Footing Has NO Overturning				

All units k

Sliding Stability

Force Application Axis Load Combination...	Sliding Force	Resisting Force	Stability Ratio	Status
Footing Has NO Sliding				

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Project Title:
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General Footing

Project File: nels std calc catalog.ec6

DESCRIPTION: Modified F36: 3'-0"x3'-0" Footing 2500psf ASBP (21.2K CAP)

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Side	Tension Surface	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
X-X, +1.40D+1.60H	0.0	+Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.40D+1.60H	0.0	-Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+0.50Lr+1.60L+1.60H	3.456	+Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+0.50Lr+1.60L+1.60H	3.456	-Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+1.60L+0.50S+1.60H	3.456	+Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+1.60L+0.50S+1.60H	3.456	-Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+1.60Lr+0.50L+1.60H	1.080	+Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+1.60Lr+0.50L+1.60H	1.080	-Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+1.60Lr+0.50W+1.60H	0.0	+Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+1.60Lr+0.50W+1.60H	0.0	-Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+0.50L+1.60S+1.60H	1.080	+Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+0.50L+1.60S+1.60H	1.080	-Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+1.60S+0.50W+1.60H	0.0	+Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+1.60S+0.50W+1.60H	0.0	-Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+0.50Lr+0.50L+W+1.60H	1.080	+Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+0.50Lr+0.50L+W+1.60H	1.080	-Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+0.50L+0.50S+W+1.60H	1.080	+Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+0.50L+0.50S+W+1.60H	1.080	-Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+0.50L+0.70S+E+1.60H	1.080	+Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +1.20D+0.50L+0.70S+E+1.60H	1.080	-Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +0.90D+W+0.90H	0.0	+Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +0.90D+W+0.90H	0.0	-Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +0.90D+E+0.90H	0.0	+Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
X-X, +0.90D+E+0.90H	0.0	-Z	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.40D+1.60H	0.0	-X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.40D+1.60H	0.0	+X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+0.50Lr+1.60L+1.60H	3.456	-X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+0.50Lr+1.60L+1.60H	3.456	+X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+1.60L+0.50S+1.60H	3.456	-X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+1.60L+0.50S+1.60H	3.456	+X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+1.60Lr+0.50L+1.60H	1.080	-X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+1.60Lr+0.50L+1.60H	1.080	+X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+1.60Lr+0.50W+1.60H	0.0	-X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+1.60Lr+0.50W+1.60H	0.0	+X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+0.50L+1.60S+1.60H	1.080	-X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+0.50L+1.60S+1.60H	1.080	+X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+1.60S+0.50W+1.60H	0.0	-X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+1.60S+0.50W+1.60H	0.0	+X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+0.50Lr+0.50L+W+1.60H	1.080	-X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+0.50Lr+0.50L+W+1.60H	1.080	+X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+0.50L+0.50S+W+1.60H	1.080	-X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+0.50L+0.50S+W+1.60H	1.080	+X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+0.50L+0.70S+E+1.60H	1.080	-X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +1.20D+0.50L+0.70S+E+1.60H	1.080	+X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +0.90D+W+0.90H	0.0	-X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +0.90D+W+0.90H	0.0	+X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +0.90D+E+0.90H	0.0	-X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK
Z-Z, +0.90D+E+0.90H	0.0	+X	Bottom	0.2160	ACI 7.6.1.1	0.2667	8.024	OK

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50Lr+1.60L+1.60H	35.00 psi	35.00 psi	35.00 psi	75.00 psi	0.47	OK
+1.20D+1.60L+0.50S+1.60H	35.00 psi	35.00 psi	35.00 psi	75.00 psi	0.47	OK
+1.20D+1.60Lr+0.50L+1.60H	10.94 psi	10.94 psi	10.94 psi	75.00 psi	0.15	OK
+1.20D+1.60Lr+0.50W+1.60H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50L+1.60S+1.60H	10.94 psi	10.94 psi	10.94 psi	75.00 psi	0.15	OK
+1.20D+1.60S+0.50W+1.60H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50Lr+0.50L+W+1.60H	10.94 psi	10.94 psi	10.94 psi	75.00 psi	0.15	OK
+1.20D+0.50L+0.50S+W+1.60H	10.94 psi	10.94 psi	10.94 psi	75.00 psi	0.15	OK
+1.20D+0.50L+0.70S+E+1.60H	10.94 psi	10.94 psi	10.94 psi	75.00 psi	0.15	OK
+0.90D+W+0.90H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK

Trygstad Engineering
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Project Title:
Engineer:
Project ID:
Project Descr:

General Footing

Project File: nels std calc catalog.ec6

DESCRIPTION: Modified F36: 3'-0"x3'-0" Footing 2500psf ASBP (21.2K CAP)

One Way Shear X

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+0.90D+E+0.90H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK

One Way Shear Z

Load Combination...	Vu @ -Z	Vu @ +Z	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50Lr+1.60L+1.60H	35.00 psi	35.00 psi	35.00 psi	75.00 psi	0.47	OK
+1.20D+1.60L+0.50S+1.60H	35.00 psi	35.00 psi	35.00 psi	75.00 psi	0.47	OK
+1.20D+1.60Lr+0.50L+1.60H	10.94 psi	10.94 psi	10.94 psi	75.00 psi	0.15	OK
+1.20D+1.60Lr+0.50W+1.60H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50L+1.60S+1.60H	10.94 psi	10.94 psi	10.94 psi	75.00 psi	0.15	OK
+1.20D+1.60S+0.50W+1.60H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+1.20D+0.50Lr+0.50L+W+1.60H	10.94 psi	10.94 psi	10.94 psi	75.00 psi	0.15	OK
+1.20D+0.50L+0.50S+W+1.60H	10.94 psi	10.94 psi	10.94 psi	75.00 psi	0.15	OK
+1.20D+0.50L+0.70S+E+1.60H	10.94 psi	10.94 psi	10.94 psi	75.00 psi	0.15	OK
+0.90D+W+0.90H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK
+0.90D+E+0.90H	0.00 psi	0.00 psi	0.00 psi	75.00 psi	0.00	OK

Two-Way "Punching" Shear

All units k

Load Combination...	Vu	Phi*Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	0.00 psi	150.00 psi	0	OK
+1.20D+0.50Lr+1.60L+1.60H	104.99 psi	150.00 psi	0.6999	OK
+1.20D+1.60L+0.50S+1.60H	104.99 psi	150.00 psi	0.6999	OK
+1.20D+1.60Lr+0.50L+1.60H	32.81 psi	150.00 psi	0.2187	OK
+1.20D+1.60Lr+0.50W+1.60H	0.00 psi	150.00 psi	0	OK
+1.20D+0.50L+1.60S+1.60H	32.81 psi	150.00 psi	0.2187	OK
+1.20D+1.60S+0.50W+1.60H	0.00 psi	150.00 psi	0	OK
+1.20D+0.50Lr+0.50L+W+1.60H	32.81 psi	150.00 psi	0.2187	OK
+1.20D+0.50L+0.50S+W+1.60H	32.81 psi	150.00 psi	0.2187	OK
+1.20D+0.50L+0.70S+E+1.60H	32.81 psi	150.00 psi	0.2187	OK
+0.90D+W+0.90H	0.00 psi	150.00 psi	0	OK
+0.90D+E+0.90H	0.00 psi	150.00 psi	0	OK