

STRUCTURAL CALCULATIONS

Project:

FALCONE RESIDENCE

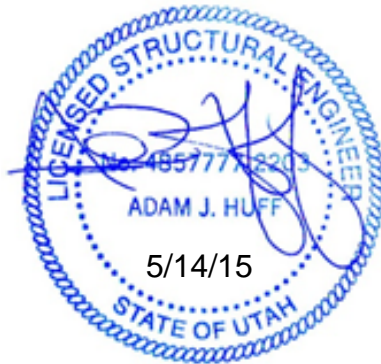
7947 E HEARTHWOOD DR
WEBER COUNTY, UT

Epic Project Number:

14SM2068

Prepared For:

AMD ARCHITECTURE



Date:

MARCH 2015

Prepared By:

PLW

Reviewed By:

AJH



epic
ENGINEERING

Epic Engineering

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HEBER CITY, UT 84032
1-435-654-6600



50 East 100 South
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Snow Load Formula (Based on Section 1608.1.1)

Vlookup Factors		
Po	S	Ao
43	63	4.5

$P_g = (P_o^2 + S^2(A - A_o)^2)^{.5}$ 277 psf

Flat Roof Factor : 0.7

Thermal Factor : 1

Exposure Factor : 0.9

Importance Factor : 1

Roof Snow Load : **175 psf**

County **WEBER**
 Elevation Above Sea Level **8850 ft**

SLOPED ROOF SNOW LOAD

Type of Roof **1**

1. Slippery Surface (Metal, Slate, Glass, Bitumious Ruber or Plastic Membrane)
2. Non Slip Surface (Asphalt Shingles, Wood Shingles, Shake)

Roof Slope

Rise: 0 Angle = 0.00

Run: 12

Slope Factor, C_s : 1.00 (ASCE 7-10 Fig. 7-2)

$P_s = 175$ psf



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PROJECT INFORMATION

Client: **AMD ARCHITECTURE**
 Project Address: **7947 E HEARTHWOOD DR**
 Project Location: **WEBER COUNTY, UT**
 Zip Code:

--

 Latitude:

41.3788

 North APPROX
 Longitude:

-111.7807

 West APPROX
 Elevation:

8850

 ft WORST CASE

PROJECT DESCRIPTION

GENERAL DESIGN CRITERIA

Structure Type: Wood / Concrete
Building Category: V-B

Design Codes: 2012 IBC & 2012 IRC

Live Loads:

Snow Load:	175	psf
Roof Load:	0	psf
Floor Load:	40	psf
Deck Load:	40	psf

Dead Loads:

Roof Structure:	65	psf
Floor Structure:	12	psf
Exterior Siding/Stucco:	15	psf
Cultured Stone:	NA	psf
Brick/Stone Veneer:	NA	psf
Deck Structure:	12	psf

Wind Criteria:

Wind Speed:	115	mph
Exposure:	C	

Seismic Criteria:

Ss:	0.825	g
S1:	0.274	g

Deflection Criteria:

		Total Load	Live Load
Roof:	L /	180	240
Floor:	L /	240	480



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SOIL / FOUNDATION CRITERIA & SPECIFICATIONS

Soils Report:

By: Not available
Date: Not available

Soil Profile:

Bearing Pressure:

1500

 psf (Assumed Values)
Passive Pressure:

300

 pcf
Active Pressure:

45

 pcf
Coefficient of Friction:

0.4

 alone

0.3

 w/ passive

Footing / Foundation Type: Concrete Spread Footings
Req. Footing Depth: Per Local Building Codes

CONCRETE & REINFORCING STEEL SPECIFICATIONS

Concrete Strengths:

Footings:

3000

 psi
Grade Beams:

3000

 psi
Slab on Grade:

4000

 psi
Walls:

3000

 psi

Reinforcing Steel:

ASTM A615 Grade 60
ASTM A706 Grade 60 Weldable Rebar

Design calculations based on 2,500 psi, special inspections are not required.

STRUCTURAL STEEL SPECIFICATIONS

Structural Steel:

W Beams: ASTM A992, Grade 50
Channel ASTM A36
Tubing: ASTM A500, Grade B, Fy = 46 ksi
Pipe: ASTM A53, Grade B, Fy = 35 ksi
Machine Bolts: ASTM A307
High-Strength Bolts: ASTM A325 and/or A490

Welds:

E70XX Electrodes

WOOD FRAMING SPECIFICATIONS

Sawn Lumber:

Species: Douglas Fir-Larch
Grade: No. 2
Studs, Posts, Joists, Beams,
Headers, Purlins, Girts, Bracing

Glue Laminated Beams:

Species: Douglas Fir-Larch
Simple Spans: 24F-V4
Continuous Spans: 24F-V8

Sheathing:

APA Rated OSB

Framing Hardware: Simpson Strong-Tie Connectors

Structural Nails: Common Wire Type (Unless noted otherwise)

Bolts in Wood: ASTM A307



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ASCE 7-10 Wind Load Calculations

Basic Parameters

Risk Category	II	Table 1.5-1
Basic Wind Speed, V	115 mph	Figure 26.5-1A
Wind Directionality Factor, K _d	0.85	Table 26.6-1
Exposure Category	C	Section 26.7
Topographic Factor, K _{zt}	1.00	Section 26.8
Gust Effect Factor, G or G _f	0.850	Section 26.9
Enclosure Classification	Enclosed	Section 26.10
Internal Pressure Coefficient, GC _{pi}	+/- 0.18	Table 26.11-1
Terrain Exposure Constant, a	9.5	Table 26.9-1
Terrain Exposure Constant, z _g	900 ft	Table 26.9-1

Wall Pressure Coefficients

Windward Wall Width, B	65.50 ft	
Side Wall Width, L	22.50 ft	
L/B Ratio	0.34	
Windward Wall Coefficient, C _p	0.80	Figure 27.4-1
Leeward Wall Coefficient, C _p	-0.50	Figure 27.4-1
Side Wall Coefficient, C _p	-0.70	Figure 27.4-1

Roof Pressure Coefficients

Roof Slope, q	0.0°	
Median Roof Height, h	22.0 ft	
Velocity Pressure Exposure Coef., K _h	0.92	Table 27.3-1
Velocity Pressure, q _h	26.5 psf	Equation 27.3-1
h/L Ratio	0.98	
Windward Roof Area	0 ft ²	
Roof Area Within 11 ft of WW Edge	0 ft ²	

Location	Min/Max	Horiz Distance From Windward Edge			
		0 ft	11 ft	22 ft	44 ft
Windward Roof Coefficient Normal to Ridge, C _p	Min	-1.28	-1.28	-0.69	-0.68
	Max	-0.18	-0.18	-0.18	-0.18
Leeward Roof Coefficient Normal to Ridge, C _p	Min	-1.28	-1.28	-0.69	-0.68
	Max	-0.18	-0.18	-0.18	-0.18
Roof Coefficient Parallel to Ridge, C _p	Min	-1.28	-1.28	-0.69	-0.68
	Max	-0.18	-0.18	-0.18	-0.18

Figure 27.4-1

Structure Pressure Summary (Add Internal Pressure q,GC_{pi} or q,GC_{pi} as Necessary)

Height, z	K _z	q _z	Roof						Internal	
			Walls			Normal to Ridge		Parallel to Ridge	Positive	Negative
			WW	LW	Side	WW	LW			
0 ft	0.85	24.4 psf	16.6 psf		27.9 psf				4.8 psf	
2 ft	0.85	24.4 psf	16.6 psf		27.9 psf		Min:	Min:	Min:	4.8 psf
4 ft	0.85	24.4 psf	16.6 psf		27.9 psf		-28.9 psf	-28.9 psf	-28.9 psf	4.8 psf
7 ft	0.85	24.4 psf	16.6 psf		27.9 psf					4.8 psf
9 ft	0.85	24.4 psf	16.6 psf		27.9 psf					4.8 psf
11 ft	0.85	24.4 psf	16.6 psf	-11.3 psf	27.9 psf	-15.8 psf				4.8 psf
13 ft	0.85	24.4 psf	16.6 psf		27.9 psf					4.8 psf
15 ft	0.85	24.6 psf	16.7 psf		28.0 psf		Max:	Max:	Max:	4.8 psf
18 ft	0.88	25.3 psf	17.2 psf		28.4 psf		-4.1 psf	-4.1 psf	-4.1 psf	4.8 psf
20 ft	0.90	25.9 psf	17.6 psf		28.9 psf					4.8 psf
22 ft	0.92	26.5 psf	18.0 psf		29.3 psf					4.8 psf

Wind Force on Projected Surfaces of Structure:

Location	Wind Pres.	Front	Side
Upper	29.3 psf	10	10
Main	27.9 psf	11.5	11.5

psf ft ft

Wind Diaphragm Forces:

Location	Front	Side
Upper	147	147
Main	453	453

plf plf

Building Dimensions:

Location	Front	Side
Upper	65.50 ft	22.50 ft
Main	65.50 ft	22.50 ft

ft ft

Base Shear Forces:

Location	Front	Side
Upper	9596	3296
Main	29699	10202

lbs lbs

ASCE 7-10 27.1.5 Minimum design wind loads

The wind load to be used in the design of the MWFRS for an enclosed or partially enclosed building shall not be less than 16 psf multiplied by the wall area of the building and 8 psf multiplied by the roof area of the building projected onto a vertical plane normal to the assumed wind direction. Wall and roof loads shall be applied simultaneously. The design wind force for open buildings shall be not less than 16 psf multiplied by the area Af.



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ASCE7-10 SEISMIC FORCE CALCULATIONS

SECTION 11.4.1 MAPPED ACCELERATION PARAMETERS

$$\begin{aligned} S_s &= \boxed{0.83} \text{ g} && \text{(Site accel. obtained from the Earthquake} \\ S_1 &= \boxed{0.27} \text{ g} && \text{Spectral Response Acceleration Maps)} \end{aligned}$$

SECTION 11.4.2 SITE CLASS

$$\text{Site Class} = \boxed{B} \quad \text{Table 20.3-1 (assumed)}$$

SECTION 11.4.3 SITE COEFFICIENT AND ADJUSTMENT MAXIMUM CONSIDERED EARTHQUAKE (MCE) SPECTRAL RESPONSE ACCELERATION PARAMETERS.

$$\begin{aligned} F_a &= \boxed{1.00} && \text{Table 11.4-1} \\ F_v &= \boxed{1.00} && \text{Table 11.4-2} \\ S_{MS} = F_a * S_s &= \boxed{0.83} \text{ g} && \text{Equation 11.4-1} \\ S_{M1} = F_v * S_1 &= \boxed{0.27} \text{ g} && \text{Equation 11.4-2} \end{aligned}$$

SECTION 11.6 SEISMIC DESIGN CATEGORY

$$\begin{aligned} \text{Risk Category} &= \boxed{II} && \text{Table 1.5-1} \\ \text{Importance Factor} &= \boxed{1.00} && \text{Table 1.5-2} \\ S_1 < 0.75g &= \boxed{\text{Yes}} \\ \text{Value of } S_{DS} &= \text{Greater than } 0.50g \\ \text{Value of } S_{D1} &= \text{Greater than } 0.20g \\ \text{Based on } S_{DS} &: \boxed{D} && \text{Table 11.6-1} \\ \text{Based on } S_{D1} &: \boxed{D} && \text{Table 11.6-2} \end{aligned}$$

SECTION 11.4.4 DESIGN SPECTRAL ACCELERATION PARAMETERS

$$\begin{aligned} S_{DS} = 2/3 * S_{MS} &= \boxed{0.55} \text{ g} && \text{Equation 11.4-3} \\ S_{D1} = 2/3 * S_{M1} &= \boxed{0.18} \text{ g} && \text{Equation 11.4-4} \end{aligned}$$



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ASCE7-10 SEISMIC FORCE CALCULATIONS (continued)

SECTION 12.8 EQUIVALENT LATERAL FORCE DESIGN PROCEDURE

Force Resist. Sys. =

R = *Table 12.14-1*

Importance Factor = *Table 1.5-2*

S_{DS} = g *Equation 11.4-3*

C_s = **Governs** *Equation 12.8-2*

Cs Need Not Exceed

$$C_s = \frac{S_{DS}}{T^R / I_e} \quad \text{For } T \leq T_L$$

$$C_s = \frac{S_{D1} T_L}{T^2 (R/I_e)} \quad \text{For } T > T_L$$

T = s *Equation 12.8-7 & Table 12.8.2*

Building Height = ft

T_L = s *Section 11.4.5*

C_s = *Section 12.8.1.1*

Cs Shall Not Be Less Than

$$C_s = 0.044 S_{DS} I_e \geq 0.01$$

C_s =

SEISMIC BASE SHEAR

$$V = \text{} \times W \quad \text{Equation 12.8-1}$$

STRUCTURAL COMPONENT WEIGHTS

Calculate Snow Load Dead Weigh

Area SL = psf

Elevation = 1000 ft

$C_s = 0.20 + (0.025 * (E-5))$ Utah Snow Load Study

C_s =

App. SL = psf

Roof	DL (psf)	Area (sf)	W (lbs)
Upper	117	1360	159120

Floor	DL (psf)	Area (sf)	W (lbs)
Upper	15	1360	20400
Main	15	1360	20400



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Wall	DL (psf)	Ht. (ft)	Length (ft)	W (lbs)
Upper	8	11.5	176	16192
Main	8	11.5	176	16192

Base Shear Forces:

Location	
Upper	20561 lbs
Main	25061 lbs

Building Dimensions:

Location	Front	Side	
Upper	65.5	23.5	ft
Main	65.5	23.5	ft

Seismic Diaphragm Forces:

Location	Front	Side	
Upper	314	875	plf
Main	383	1066	plf



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ASCE7-10 SEISMIC FORCE CALCULATIONS

SECTION 11.4.1 MAPPED ACCELERATION PARAMETERS

$$S_s = \boxed{0.83} \text{ g} \quad (\text{Site accel. obtained from the Earthquake Spectral Response Acceleration Maps})$$
$$S_1 = \boxed{0.27} \text{ g}$$

SECTION 11.4.2 SITE CLASS

$$\text{Site Class} = \boxed{B} \quad \text{Table 20.3-1 (assumed)}$$

SECTION 11.4.3 SITE COEFFICIENT AND ADJUSTMENT MAXIMUM CONSIDERED EARTHQUAKE (MCE) SPECTRAL RESPONSE ACCELERATION PARAMETERS.

$$F_a = \boxed{1.00} \quad \text{Table 11.4-1}$$
$$F_v = \boxed{1.00} \quad \text{Table 11.4-2}$$
$$S_{MS} = F_a * S_s = \boxed{0.83} \text{ g} \quad \text{Equation 11.4-1}$$
$$S_{M1} = F_v * S_1 = \boxed{0.27} \text{ g} \quad \text{Equation 11.4-2}$$

SECTION 11.6 SEISMIC DESIGN CATEGORY

$$\text{Risk Category} = \boxed{II} \quad \text{Table 1.5-1}$$
$$\text{Importance Factor} = \boxed{1.00} \quad \text{Table 1.5-2}$$
$$S_1 < 0.75g = \boxed{\text{Yes}}$$

Value of S_{DS} = Greater than 0.50g
Value of S_{D1} = Greater than 0.20g

$$\text{Based on } S_{DS} : \boxed{D} \quad \text{Table 11.6-1}$$
$$\text{Based on } S_{D1} : \boxed{D} \quad \text{Table 11.6-2}$$

SECTION 11.4.4 DESIGN SPECTRAL ACCELERATION PARAMETERS

$$S_{DS} = 2/3 * S_{MS} = \boxed{0.55} \text{ g} \quad \text{Equation 11.4-3}$$
$$S_{D1} = 2/3 * S_{M1} = \boxed{0.18} \text{ g} \quad \text{Equation 11.4-4}$$



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ASCE7-10 SEISMIC FORCE CALCULATIONS (continued)

SECTION 12.8 EQUIVALENT LATERAL FORCE DESIGN PROCEDURE

Force Resist. Sys. = WOOD SHEAR WALLS

R = 6.5 *Table 12.14-1*
 Importance Factor = 1.00 *Table 1.5-2*
 $S_{DS} = 0.55$ g *Equation 11.4-3*
 $C_s = 0.09$ **Governs** *Equation 12.8-2*

Cs Need Not Exceed

$$C_s = \frac{S_{DS}}{T^R / I_e} \quad \text{For } T \leq T_L$$

$$C_s = \frac{S_{D1} T_L}{T^2 (R / I_e)} \quad \text{For } T > T_L$$

T = 0.21 s *Equation 12.8-7 & Table 12.8.2*
 Building Height = 23.00 ft
 $T_L = 8.00$ s *Section 11.4.5*
 $C_s = 0.41$ *Section 12.8.1.1*

Cs Shall Not Be Less Than

$$C_s = 0.044 S_{DS} I_e \geq 0.01$$

$C_s = 0.02$

SEISMIC BASE SHEAR

$$V = 0.085 \times W \quad \text{Equation 12.8-1}$$

STRUCTURAL COMPONENT WEIGHTS

Calculate Snow Load Dead Weigh

Area SL = 175 psf
 Elevation = 9 1000 ft
 $C_s = 0.20 + (0.025 * (E - 5))$ Utah Snow Load Study
 $C_s = 0.30$
 App. SL = 51.84 psf

Roof	DL (psf)	Area (sf)	W (lbs)
Upper	117	1360	159120
Main	0	0	0

Floor	DL (psf)	Area (sf)	W (lbs)
Upper	15	1360	20400
Main	15	1360	20400



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Wall	DL (psf)	Ht. (ft)	Length (ft)	W (lbs)
Upper	8	11.5	174	16008
Main	8	11.5	174	16008

Base Shear Forces:

Location		
Upper	14227	lbs
Main	17326	lbs

Building Dimensions:

Location	Front	Side	
Upper	65.5	23.5	ft
Main	65.5	23.5	ft

Seismic Diaphragm Forces:

Location	Front	Side	
Upper	217	605	plf
Main	265	737	plf



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CONTROLLING LATERAL FORCES

Force Type: **Wind**

Force Type: **Seismic**

Base Shear Forces:

Base Shear Forces:

Location	Front	Side	
Upper	9596	3296	lbs
Main	29699	10202	lbs

Location	Front	Side	
Upper	14227	20561	lbs
Main	17326	25061	lbs

Diaphragm Forces:

Diaphragm Forces:

Location	Front	Side	
Upper	147	147	plf
Main	453	453	plf

Location	Front	Side	
Upper	217	875	plf
Main	265	1066	plf



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SHEARWALL SCHEDULE

Mark	Nailing Requirements		Notes	V _{allow} Seismic (plf)	V _{allow (6)} Wind (plf)	Sole Plate Nailing
	Edge	Field				
SW1	6"	12"	1,2,3,4,5	255	357	16d common @ 6" o.c.
SW2	4"	12"	1,2,3,4,5	395	552	16d common @ 4" o.c.
SW3	3"	12"	1,2,3,4,5	505	707	16d common @ 4" o.c.
SW4	2"	12"	1,2,3,4,5	670	937	16d common @ 3" o.c.

*values per AWC SDPWS-2008 Table 4.3A

- Notes:
- 16" o.c. max stud spacing (AWC SDPWS-2008 Note 2)
 - 7/16" APA rated OSB panel .
 - 8d common or galvanized box nailing. Provide hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper nails at perservative-treated and fire-retardant-treated wood locations.
 - Block all edges.
 - 3" nominal framing at abutting panel edges (IBC Notes d & g)
- *IBC notes above refer to "Notes to Table 2306.3" in 2012 IBC

STAPLE EQUIVALENCY CHART

Common Nails		Equivalent Staple Spacing (in.)
		16 Ga.
8d @	< 3"	Not allowed
	3"	Not allowed
	4"	2
	6"	4

- Notes:
- Minimum staple penetration into main member is 1".
 - Place staples parallel to panel edge.
 - Provide 3/8" distance from panel edge to staple.
 - Table valid for shearwalls only.
 - Provide hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper staples at perservative-treated and fire-retardant-treated wood locations.



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WOOD SHEAR WALLS FOR SEISMIC VALUES:

LEFT SIDE OF BUILDING

UPPER LEFT

SHEAR 7114 MAXIMUM HEIGHT / WIDTH RATIO 2 : 1

WALL ID	NUMBER OF WALLS	WALL LENGTH ft.	TYPE SEISMIC		UNIFORM DL plf	WALL SHEAR plf	HEIGHT/ WIDTH RATIO	RED. FACTOR 2w/h	MOMENT OT ft-lbs	MOMENT RES ft-lbs	HOLDDOWN FORCE lbs	SHEAR WALL REQ'D	HOLD-DOWN REQ'D
			TOTAL LENGTH ft.	WALL HEIGHT ft.									
1	1	17.68	17.7	9	715	277	OK	-	44080	67077	0	SW-2	NO
2	1	8.00	8.0	9	715	277	OK	-	19941	13728	777	SW-2	NO
			25.7										

UPPER RIGHT

SHEAR 7114 MAXIMUM HEIGHT / WIDTH RATIO 2 : 1

WALL ID	NUMBER OF WALLS	WALL LENGTH ft.	TYPE SEISMIC		UNIFORM DL plf	WALL SHEAR plf	HEIGHT/ WIDTH RATIO	RED. FACTOR 2w/h	MOMENT OT ft-lbs	MOMENT RES ft-lbs	HOLDDOWN FORCE lbs	SHEAR WALL REQ'D	HOLD-DOWN REQ'D
			TOTAL LENGTH ft.	WALL HEIGHT ft.									
1	1	15.5	15.5	9	715	200	OK	-	27953	51534	0	SW1	NO
2	1	20.00	20.0	9	715	200	OK	-	36068	85800	0	SW1	NO
			35.5										

MAIN RIGHT

SHEAR 8663 MAXIMUM HEIGHT / WIDTH RATIO 2 : 1

WALL ID	NUMBER OF WALLS	WALL LENGTH ft.	TYPE SEISMIC		UNIFORM DL plf	WALL SHEAR plf	HEIGHT/ WIDTH RATIO	RED. FACTOR 2w/h	MOMENT OT ft-lbs	MOMENT RES ft-lbs	HOLDDOWN FORCE lbs	SHEAR WALL REQ'D	HOLD-DOWN REQ'D
			TOTAL LENGTH ft.	WALL HEIGHT ft.									
1	1	13.4	13.4	10	715	337	OK	-	45190	38591	492	SW2	NO
2	1	7.5	7.5	10	715	337	OK	-	25268	12066	1760	SW2	YES
3	1	4.8	4.8	10	715	337	REDUCE CAP	0.96	16172	4942	2339	SW2	YES
			25.7										

MAIN LEFT

SHEAR 8663 MAXIMUM HEIGHT / WIDTH RATIO 2 : 1

WALL ID	NUMBER OF WALLS	WALL LENGTH ft.	TYPE SEISMIC		UNIFORM DL plf	WALL SHEAR plf	HEIGHT/ WIDTH RATIO	RED. FACTOR 2w/h	MOMENT OT ft-lbs	MOMENT RES ft-lbs	HOLDDOWN FORCE lbs	SHEAR WALL REQ'D	HOLD-DOWN REQ'D
			TOTAL LENGTH ft.	WALL HEIGHT ft.									
1	1	13.8	13.8	10	715	301	OK	-	41510	40849	48	SW2	NO
2	1	15.0	15.0	10	715	301	OK	-	45120	48263	0	SW2	NO
			28.8										

RIGHT SIDE OF BUILDING

UPPER LEFT

SHEAR 7114 MAXIMUM HEIGHT / WIDTH RATIO 2 : 1

WALL ID	NUMBER OF WALLS	WALL LENGTH ft.	TYPE SEISMIC		UNIFORM DL plf	WALL SHEAR plf	HEIGHT/ WIDTH RATIO	RED. FACTOR 2w/h	MOMENT OT ft-lbs	MOMENT RES ft-lbs	HOLDDOWN FORCE lbs	SHEAR WALL REQ'D	HOLD-DOWN REQ'D
			TOTAL LENGTH ft.	WALL HEIGHT ft.									
1	1	14.5	14.5	9	715	222	OK	-	29010	45099	0	SW1	NO
1	1	9.5	9.5	9	715	222	OK	-	19006	19359	0	SW1	NO
1	1	8.0	8.0	9	715	222	OK	-	16005	13728	285	SW1	NO
			32.0										

UPPER RIGHT

SHEAR 7114 MAXIMUM HEIGHT / WIDTH RATIO 2 : 1

WALL ID	NUMBER OF WALLS	WALL LENGTH ft.	TYPE SEISMIC		UNIFORM DL plf	WALL SHEAR plf	HEIGHT/ WIDTH RATIO	RED. FACTOR 2w/h	MOMENT OT ft-lbs	MOMENT RES ft-lbs	HOLDDOWN FORCE lbs	SHEAR WALL REQ'D	HOLD-DOWN REQ'D
			TOTAL LENGTH ft.	WALL HEIGHT ft.									
1	1	22.4	22.4	9	715	201	OK	-	40517	107724	0	SW1	NO
1	1	13.0	13.0	9	715	201	OK	-	23504	36251	0	SW1	NO
			35.4										

MAIN LEFTSHEAR 8663
TYPE SEISMIC

MAXIMUM HEIGHT / WIDTH RATIO 2 : 1

WALL ID	NUMBER OF WALLS	WALL LENGTH ft.	TOTAL LENGTH ft.	WALL HEIGHT ft.	UNIFORM DL plf	WALL SHEAR plf	HEIGHT/ WIDTH RATIO	RED. FACTOR 2w/h	MOMENT OT ft-lbs	MOMENT RES ft-lbs	HOLDDOWN FORCE lbs	SHEAR WALL REQ'D	HOLD-DOWN REQ'D
1	1	9.0	9.0	10	715	248	OK	-	22276	17375	545	SW1	NO
2	1	11.0	11.0	10	715	248	OK	-	27227	25955	116	SW1	NO
1	1	15.0	15.0	10	715	248	OK	-	37127	48263	0	SW1	NO
			35.0										

MAIN RIGHTSHEAR 8663
TYPE SEISMIC

MAXIMUM HEIGHT / WIDTH RATIO 2 : 1

WALL ID	NUMBER OF WALLS	WALL LENGTH ft.	TOTAL LENGTH ft.	WALL HEIGHT ft.	UNIFORM DL plf	WALL SHEAR plf	HEIGHT/ WIDTH RATIO	RED. FACTOR 2w/h	MOMENT OT ft-lbs	MOMENT RES ft-lbs	HOLDDOWN FORCE lbs	SHEAR WALL REQ'D	HOLD-DOWN REQ'D
1	1	6.0	6.0	10	715	394	OK	-	23642	7722	2653	SW2	YES
2	1	7.0	7.0	10	715	394	OK	-	27582	10511	2439	SW2	YES
1	1	9.0	9.0	10	715	394	OK	-	35406	17319	2013	SW2	YES
			22.0										



Project: FALCONE RESIDENCE
 By: PLW
 Date: MARCH 2015

Project No: 0
 Reviewed By: AJH
 Sheet: 11

PERFORATED SHEARWALL CALCULATION

Location = UPPER LEFT

Total Length (b) =	20.0	ft
Opening Length (bo) =	2.5	ft
Total Height (h) =	9.0	ft
Opening Height (ho) =	2.5	ft
bfh = b-bo =	17.5	ft
bfh/b =	0.88	
ho/h =	0.28	
Co =	1.01	
Equiv. SW Length =	17.68	ft

Vwall =	7114	lbs
T = Vwall*h/(Co*bfh) =	3620	lbs

Location = MAIN RIGHT

Total Length (b) =	19.5	ft
Opening Length (bo) =	6.0	ft
Total Height (h) =	10.0	ft
Opening Height (ho) =	3.0	ft
bfh = b-bo =	13.5	ft
bfh/b =	0.69	
ho/h =	0.30	
Co =	0.99	
Equiv. SW Length =	13.41	ft

Vwall =	1648	lbs
T = Vwall*h/(Co*bfh) =	1229	lbs

Location = UPPER RIGHT

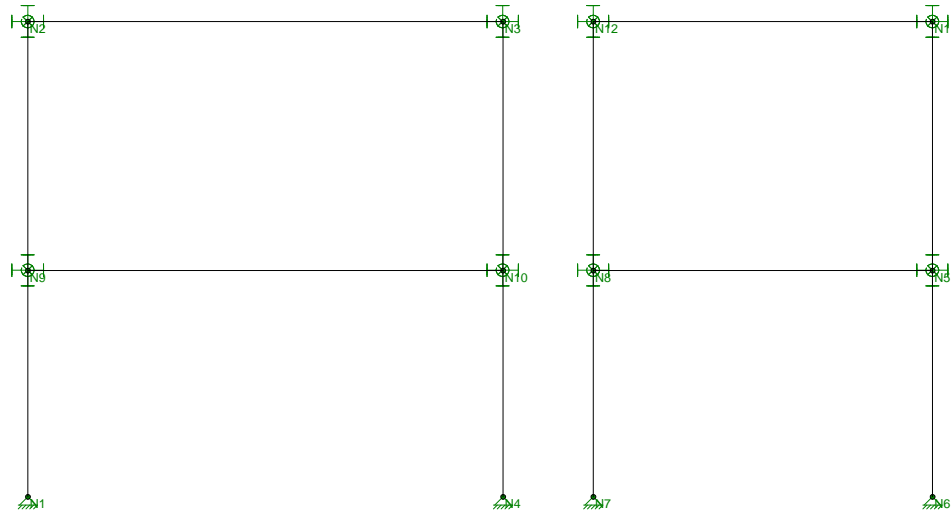
Total Length (b) =	25.0	ft
Opening Length (bo) =	2.5	ft
Total Height (h) =	9.0	ft
Opening Height (ho) =	3.0	ft
bfh = b-bo =	22.5	ft
bfh/b =	0.90	
ho/h =	0.33	
Co =	1.00	
Equiv. SW Length =	22.41	ft

Vwall =	7114	lbs
T = Vwall*h/(Co*bfh) =	2857	lbs

Location = MAIN RIGHT

Total Length (b) =	12.0	ft
Opening Length (bo) =	3.0	ft
Total Height (h) =	10.0	ft
Opening Height (ho) =	3.0	ft
bfh = b-bo =	9	ft
bfh/b =	0.75	
ho/h =	0.30	
Co =	1.00	
Equiv. SW Length =	8.99	ft

Vwall =	8663	lbs
T = Vwall*h/(Co*bfh) =	9641	lbs



EPIC ENGINEERING

PLW

MOMENT FRAME

SK - 1

May 14, 2015 at 3:04 PM

MOMENT FRAME 2.r3d

Envelope AISC 13th(360-05): ASD Steel Code Checks

Member	Shape	Code C...	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	Pnc/om [k]	Pnt/om [k]	Mnyy/om ...	Mnzz/om ...	Cb	Eqn	
1	M2	W8X40	.032	0	8	.007	0	y	1	116.215	350.299	46.158	99.301	2...	H1-1b
2	M4	W8X40	.911	9.97	8	.152	0	y	8	116.215	350.299	46.158	99.301	2...	H1-1b
3	M5	W8X40	.020	15	8	.005	15	y	8	199.194	350.299	46.158	99.301	2...	H1-1b
4	M6	W8X40	.909	11.03	8	.152	11.03	y	8	116.215	350.299	46.158	99.301	2...	H1-1b
5	M6A	W8X40	.962	11.03	8	.152	11.03	y	8	265.65	350.299	46.158	93.92	1	H1-1b
6	M7A	W8X40	.959	11.03	8	.152	11.03	y	8	265.65	350.299	46.158	93.92	1	H1-1b
7	M7	W8X40	.036	0	8	.007	0	y	1	116.215	350.299	46.158	99.301	2...	H1-1b
8	M9	W8X40	.018	0	8	.005	0	y	1	199.194	350.299	46.158	99.301	2...	H1-1b

Hot Rolled Steel Properties

Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt	
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
3	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.4	58	1.3
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.4	58	1.3

Load Combinations

Description	Solve	PDelta	SR...	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	BLC Factor	
1	IBC 16-8 (a)	Yes	Y	DL	1								
2	IBC 16-9 (a)	Yes	Y	DL	1	LL	1	LLS	1				
3	IBC 16-10 (...)	Yes	Y	DL	1	RLL	1						
4	IBC 16-10 (...)	Yes	Y	DL	1	SL	1						
5	IBC 16-10 (...)	Yes	Y	DL	1								
6	IBC 16-11 (...)	Yes	Y	DL	1	LL	.75	LLS	.75	RLL	.75		
7	IBC 16-11 (...)	Yes	Y	DL	1	LL	.75	LLS	.75	SL	.75		
8	IBC 16-12 (...)	Yes	Y	DL	1	EL	.7						
9	IBC 16-13 (...)	Yes	Y	DL	1	EL	.525	LL	.75	LLS	.75	RLL	.75
10	IBC 16-13 (...)	Yes	Y	DL	1	EL	.525	LL	.75	LLS	.75	SL	.75
11	IBC 16-13 (f)	Yes	Y	DL	1	EL	.525	LL	.75	LLS	.75		
12	IBC 16-15	Yes	Y	DL	.6	EL	.7						

Hot Rolled Steel Design Parameters

Label	Shape	Length...	Lbyy[ft]	Lbzz[ft]	Lcomp to...	Lcomp bo...	Kyy	Kzz	Cm-yy	Cm-zz	Cb	y sway	z sway	Function
1	M2	MOMEN...	21											Lateral
2	M4	MOMEN...	21											Lateral
3	M5	MOMEN...	15											Lateral
4	M6	MOMEN...	21											Lateral
5	M6A	MOMEN...	21	10.5	10.5									Lateral
6	M7A	MOMEN...	21	10.5	10.5									Lateral
7	M7	MOMEN...	21											Lateral
8	M9	MOMEN...	15											Lateral

Hot Rolled Steel Section Sets

Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]	
1	MOMENT F...	W8X40	Beam	Wide Flange	A572 Gr.50	Typical	11.7	49.1	146	1.12

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	N1	Reaction	Reaction	Reaction				
2	N4	Reaction	Reaction	Reaction				
3	N2			Fixed	Reaction	Reaction	Reaction	
4	N3			Fixed	Reaction	Reaction	Reaction	
5	N6	Reaction	Reaction	Reaction				
6	N5			Fixed	Reaction	Reaction	Reaction	
7	N7	Reaction	Reaction	Reaction				
8	N8			Fixed	Reaction	Reaction	Reaction	
9	N9			Fixed	Reaction	Reaction	Reaction	
10	N10			Fixed	Reaction	Reaction	Reaction	
11	N12			Fixed	Reaction	Reaction	Reaction	
12	N11			Fixed	Reaction	Reaction	Reaction	

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	21	0	0	
3	N3	21	21	0	0	
4	N4	21	0	0	0	
5	N5	40	10	0	0	
6	N6	40	0	0	0	
7	N7	25	0	0	0	
8	N8	25	10	0	0	
9	N9	0	10	0	0	
10	N10	21	10	0	0	
11	N11	40	21	0	0	
12	N12	25	21	0	0	

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M2	N2	N3			MOMENT FR...	Beam	Wide Flange	A572 Gr.50	Typical
2	M4	N7	N12			MOMENT FR...	Beam	Wide Flange	A572 Gr.50	Typical
3	M5	N8	N5			MOMENT FR...	Beam	Wide Flange	A572 Gr.50	Typical
4	M6	N11	N6			MOMENT FR...	Beam	Wide Flange	A572 Gr.50	Typical
5	M6A	N2	N1			MOMENT FR...	Beam	Wide Flange	A572 Gr.50	Typical
6	M7A	N3	N4			MOMENT FR...	Beam	Wide Flange	A572 Gr.50	Typical
7	M7	N9	N10			MOMENT FR...	Beam	Wide Flange	A572 Gr.50	Typical
8	M9	N12	N11			MOMENT FR...	Beam	Wide Flange	A572 Gr.50	Typical

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	0	1	1.672	1	0	1	0	1	0	1	0	1
2		min	-9.005	12	1.003	12	0	1	0	1	0	1	0	1
3	N4	max	0	1	1.672	8	0	1	0	1	0	1	0	1
4		min	-8.985	8	1.003	12	0	1	0	1	0	1	0	1
5	N2	max	0	1	0	1	NC	NC	0	1	0	1	23.775	8
6		min	0	1	0	1	NC	NC	0	1	0	1	1.463	1
7	N3	max	0	1	0	1	NC	NC	0	1	0	1	21.487	12
8		min	0	1	0	1	NC	NC	0	1	0	1	-1.463	1
9	N6	max	0	1	1.433	8	0	1	0	1	0	1	0	1
10		min	-8.988	8	.86	12	0	1	0	1	0	1	0	1
11	N5	max	0	1	0	1	NC	NC	0	1	0	1	111.938	12

MOMENT FRAME

Envelope Joint Reactions (Continued)

Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC	
12		min	0	1	0	1	NC	NC	0	1	0	1	-.746	1
13	N7	max	0	1	1.433	1	0	1	0	1	0	1	0	1
14		min	-9.002	12	.86	12	0	1	0	1	0	1	0	1
15	N8	max	0	1	0	1	NC	NC	0	1	0	1	113.348	8
16		min	0	1	0	1	NC	NC	0	1	0	1	.746	1
17	N9	max	0	1	0	1	NC	NC	0	1	0	1	114.138	8
18		min	0	1	0	1	NC	NC	0	1	0	1	1.463	1
19	N10	max	0	1	0	1	NC	NC	0	1	0	1	111.517	12
20		min	0	1	0	1	NC	NC	0	1	0	1	-1.463	1
21	N12	max	0	1	0	1	NC	NC	0	1	0	1	23.065	8
22		min	0	1	0	1	NC	NC	0	1	0	1	.746	1
23	N11	max	0	1	0	1	NC	NC	0	1	0	1	21.908	12
24		min	0	1	0	1	NC	NC	0	1	0	1	-.746	1
25	Totals:	max	0	1	6.211	9	0	1						
26		min	-35.98	8	3.726	12	0	1						

Envelope Member Section Deflections

Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [rad]	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC	
1	M2	1	max	1.824	8	0	12	0	1	0	1	NC	12	NC	1
2			min	0	1	0	1	0	1	0	1	NC	1	NC	1
3		2	max	1.821	8	0	12	0	1	0	1	NC	12	NC	1
4			min	0	1	0	8	0	1	0	1	NC	8	NC	1
5	M4	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
6			min	0	1	0	1	0	1	0	1	NC	1	NC	1
7		2	max	0	12	0	1	0	1	0	1	NC	1	NC	1
8			min	0	1	-1.823	8	0	1	0	1	NC	8	NC	1
9	M5	1	max	1.574	8	0	12	0	1	0	1	NC	12	NC	1
10			min	0	1	0	1	0	1	0	1	NC	1	NC	1
11		2	max	1.571	8	0	12	0	1	0	1	NC	12	NC	1
12			min	0	1	0	8	0	1	0	1	NC	8	NC	1
13	M6	1	max	0	8	0	1	0	1	0	1	NC	1	NC	1
14			min	0	12	-1.821	8	0	1	0	1	NC	8	NC	1
15		2	max	0	1	0	1	0	1	0	1	NC	1	NC	1
16			min	0	1	0	1	0	1	0	1	NC	1	NC	1
17	M6A	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
18			min	0	12	-1.824	8	0	1	0	1	NC	8	NC	1
19		2	max	0	1	0	1	0	1	0	1	NC	1	NC	1
20			min	0	1	0	1	0	1	0	1	NC	1	NC	1
21	M7A	1	max	0	8	0	1	0	1	0	1	NC	1	NC	1
22			min	0	12	-1.821	8	0	1	0	1	NC	8	NC	1
23		2	max	0	1	0	1	0	1	0	1	NC	1	NC	1
24			min	0	1	0	1	0	1	0	1	NC	1	NC	1
25	M7	1	max	1.575	8	0	12	0	1	0	1	NC	12	NC	1
26			min	0	1	0	1	0	1	0	1	NC	1	NC	1
27		2	max	1.572	8	0	12	0	1	0	1	NC	12	NC	1
28			min	0	1	0	8	0	1	0	1	NC	8	NC	1
29	M9	1	max	1.823	8	0	12	0	1	0	1	NC	12	NC	1
30			min	0	1	0	1	0	1	0	1	NC	1	NC	1
31		2	max	1.821	8	0	12	0	1	0	1	NC	12	NC	1
32			min	0	1	0	8	0	1	0	1	NC	8	NC	1

Envelope Member Section Stresses

Member	Sec		Axial[ksi]	LC	y Shear[...]	LC	z Shear[...]	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC	
1	M2	1	max	.347	12	.141	1	0	1	-.298	12	.496	1	0	1	0	1
2			min	0	1	.084	12	0	1	-.496	1	.298	12	0	1	0	1

Envelope Member Section Stresses (Continued)

Member	Sec		Axial[ksj]	LC	y Shear[...LC	z Shear[...LC	y-Top[ksj]	LC	y-Bot[ksj]	LC	z-Top[ksj]	LC	z-Bot[ksj]	LC									
3	2	max	.347	12	-.084	12	0	1	-.298	12	.496	8	0	1	0	1							
4		min	0	1	-.141	8	0	1	-.496	8	.298	12	0	1	0	1							
5	M4	1	max	.123	1	3.04	8	0	1	0	1	0	1	0	1	0	1						
6		min	.073	12	0	1	0	1	0	1	0	1	0	1	0	1	0	1					
7	2	max	.026	1	1.366	8	0	1	7.567	8	0	1	0	1	0	1	0	1					
8		min	.015	12	0	1	0	1	0	1	-7.567	8	0	1	0	1	0	1					
9	M5	1	max	.421	8	.101	1	0	1	-.152	12	.253	1	0	1	0	1	0	1				
10		min	0	1	.06	12	0	1	-.253	1	.152	12	0	1	0	1	0	1					
11	2	max	.421	8	-.06	12	0	1	-.152	12	.253	8	0	1	0	1	0	1					
12		min	0	1	-.101	8	0	1	-.253	8	.152	12	0	1	0	1	0	1					
13	M6	1	max	.026	8	0	1	0	1	7.581	8	0	1	0	1	0	1	0	1				
14		min	.015	12	-1.369	8	0	1	0	1	-7.581	8	0	1	0	1	0	1					
15	2	max	.123	8	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1			
16		min	.074	12	-3.035	8	0	1	0	1	0	1	0	1	0	1	0	1	0	1			
17	M6A	1	max	.036	1	0	1	0	1	7.565	8	0	1	0	1	0	1	0	1	0	1		
18		min	.021	12	-1.366	8	0	1	0	1	-7.565	8	0	1	0	1	0	1	0	1	0	1	
19	2	max	.143	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	
20		min	.086	12	-3.043	8	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	
21	M7A	1	max	.036	9	0	1	0	1	7.584	8	0	1	0	1	0	1	0	1	0	1	0	1
22		min	.021	12	-1.369	8	0	1	0	1	-7.584	8	0	1	0	1	0	1	0	1	0	1	
23	2	max	.143	8	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	
24		min	.086	12	-3.035	8	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	
25	M7	1	max	.42	8	.141	1	0	1	-.298	12	.496	1	0	1	0	1	0	1	0	1	0	1
26		min	0	1	.084	12	0	1	-.496	1	.298	12	0	1	0	1	0	1	0	1	0	1	
27	2	max	.42	8	-.084	12	0	1	-.298	12	.496	8	0	1	0	1	0	1	0	1	0	1	
28		min	0	1	-.141	8	0	1	-.496	8	.298	12	0	1	0	1	0	1	0	1	0	1	
29	M9	1	max	.347	12	.101	1	0	1	-.152	12	.253	1	0	1	0	1	0	1	0	1	0	1
30		min	0	1	.06	12	0	1	-.253	1	.152	12	0	1	0	1	0	1	0	1	0	1	
31	2	max	.347	12	-.06	12	0	1	-.152	12	.253	8	0	1	0	1	0	1	0	1	0	1	
32		min	0	1	-.101	8	0	1	-.253	8	.152	12	0	1	0	1	0	1	0	1	0	1	

Envelope Member Section Forces

Member	Sec		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k... LC	y-y Mom...	LC	z-z Moment[k... LC	LC		
1	M2	1	max	4.065	12	.418	1	0	1	0	1	0	1	1.463	1
2		min	0	1	.251	12	0	1	0	1	0	1	.878	12	
3	2	max	4.065	12	-.251	12	0	1	0	1	0	1	1.463	8	
4		min	0	1	-.418	8	0	1	0	1	0	1	.878	12	
5	M4	1	max	1.433	1	9.028	8	0	1	0	1	0	1	0	1
6		min	.86	12	0	1	0	1	0	1	0	1	0	1	
7	2	max	.299	1	4.058	8	0	1	0	1	0	1	0	1	
8		min	.179	12	0	1	0	1	0	1	0	1	-22.318	8	
9	M5	1	max	4.924	8	.299	1	0	1	0	1	0	1	.746	1
10		min	0	1	.179	12	0	1	0	1	0	1	.448	12	
11	2	max	4.924	8	-.179	12	0	1	0	1	0	1	.746	8	
12		min	0	1	-.299	8	0	1	0	1	0	1	.448	12	
13	M6	1	max	.299	8	0	1	0	1	0	1	0	1	0	1
14		min	.179	12	-4.065	8	0	1	0	1	0	1	-22.359	8	
15	2	max	1.433	8	0	1	0	1	0	1	0	1	0	1	
16		min	.86	12	-9.013	8	0	1	0	1	0	1	0	1	
17	M6A	1	max	.418	1	0	1	0	1	0	1	0	1	0	1
18		min	.251	12	-4.057	8	0	1	0	1	0	1	-22.312	8	
19	2	max	1.672	1	0	1	0	1	0	1	0	1	0	1	
20		min	1.003	12	-9.036	8	0	1	0	1	0	1	0	1	
21	M7A	1	max	.418	9	0	1	0	1	0	1	0	1	0	1
22		min	.251	12	-4.067	8	0	1	0	1	0	1	-22.369	8	
23	2	max	1.672	8	0	1	0	1	0	1	0	1	0	1	

Envelope Member Section Forces (Continued)

Member	Sec		Axial[k]	LC	v Shear[k]	LC	z Shear[k]	LC	Torque[k...]	LC	v-v Mom...	LC	z-z Moment[k...]	LC
24		min	1.003	12	-9.015	8	0	1	0	1	0	1	0	1
25	M7	1	max	4.919	8	.418	1	0	1	0	1	0	1.463	1
26		min	0	1	.251	12	0	1	0	1	0	1	.878	12
27		2	max	4.919	8	-.251	12	0	1	0	1	0	1.463	8
28		min	0	1	-.418	8	0	1	0	1	0	1	.878	12
29	M9	1	max	4.064	12	.299	1	0	1	0	1	0	.746	1
30		min	0	1	.179	12	0	1	0	1	0	1	.448	12
31		2	max	4.064	12	-.179	12	0	1	0	1	0	.746	8
32		min	0	1	-.299	8	0	1	0	1	0	1	.448	12



Steel Column

Lic. # : KW-06007744

Description : SC-1

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : IBC 2012

General Information

Steel Section Name :	W18x35	Overall Column Height	11.0 ft
Analysis Method :	Allowable Strength	Top & Bottom Fixity	Top & Bottom Pinned
Steel Stress Grade		Brace condition for deflection (buckling) along columns :	
Fy : Steel Yield	36.0 ksi	X-X (width) axis :	
E : Elastic Bending Modulus	29,000.0 ksi	Unbraced Length for X-X Axis buckling =	11.0 ft, K = 1.20
Load Combination :	IBC 2012	Y-Y (depth) axis :	Fully braced against buckling along Y-Y Axis

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 385.673 lbs * Dead Load Factor
AXIAL LOADS . . .
 Axial Load at 11.0 ft, D = 0.830, S = 12.140 k
BENDING LOADS . . .
 Moment acting about X-X axis, S = 91.0 k-ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	0.8327 : 1	Maximum SERVICE Load Reactions . .	
Load Combination	+D+S+H	Top along X-X	0.0 k
Location of max.above base	11.0 ft	Bottom along X-X	0.0 k
At maximum location values are . . .		Top along Y-Y	8.273 k
Pa : Axial	12.970 k	Bottom along Y-Y	8.273 k
Pn / Omega : Allowable	91.413 k	Maximum SERVICE Load Deflections . . .	
Ma-x : Applied	91.0 k-ft	Along Y-Y 0.08325 in at	6.423 ft above base
Mn-x / Omega : Allowable	119.461 k-ft	for load combination : +D+S+H	
Ma-y : Applied	0.0 k-ft	Along X-X 0.0 in at	0.0 ft above base
Mn-y / Omega : Allowable	14.479 k-ft	for load combination :	
 PASS Maximum Shear Stress Ratio =	 0.1082 : 1		
Load Combination	+D+S+H		
Location of max.above base	0.0 ft		
At maximum location values are . . .			
Va : Applied	8.273 k		
Vn / Omega : Allowable	76.464 k		

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
	Stress Ratio	Status	Location	Stress Ratio	Status	Location
+D+H	0.013	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+L+H	0.013	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+Lr+H	0.013	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+S+H	0.833	PASS	11.00 ft	0.108	PASS	0.00 ft
+D+0.750Lr+0.750L+H	0.013	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.750L+0.750S+H	0.626	PASS	11.00 ft	0.081	PASS	0.00 ft
+D+0.60W+H	0.013	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.70E+H	0.013	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.750Lr+0.750L+0.450W+H	0.013	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.750L+0.750S+0.450W+H	0.626	PASS	11.00 ft	0.081	PASS	0.00 ft
+D+0.750L+0.750S+0.5250E+H	0.626	PASS	11.00 ft	0.081	PASS	0.00 ft
+0.60D+0.60W+0.60H	0.008	PASS	0.00 ft	0.000	PASS	0.00 ft
+0.60D+0.70E+0.60H	0.008	PASS	0.00 ft	0.000	PASS	0.00 ft



Steel Column

Lic. # : KW-06007744

Description : SC-1

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		Y-Y Axis Reaction		Axial Reaction
	@ Base	@ Top	@ Base	@ Top	@ Base
+D+H		k		k	1.216 k
+D+L+H		k		k	1.216 k
+D+Lr+H		k		k	1.216 k
+D+S+H		k	-8.273	-8.273 k	13.356 k
+D+0.750Lr+0.750L+H		k		k	1.216 k
+D+0.750L+0.750S+H		k	-6.205	-6.205 k	10.321 k
+D+0.60W+H		k		k	1.216 k
+D+0.70E+H		k		k	1.216 k
+D+0.750Lr+0.750L+0.450W+H		k		k	1.216 k
+D+0.750L+0.750S+0.450W+H		k	-6.205	-6.205 k	10.321 k
+D+0.750L+0.750S+0.5250E+H		k	-6.205	-6.205 k	10.321 k
+0.60D+0.60W+0.60H		k		k	0.729 k
+0.60D+0.70E+0.60H		k		k	0.729 k
D Only		k		k	1.216 k
Lr Only		k		k	k
L Only		k		k	k
S Only		k	-8.273	-8.273 k	12.140 k
W Only		k		k	k
E Only		k		k	k
H Only		k		k	k

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Max. Y-Y Deflection	
	Distance		Distance	
+D+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+L+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+Lr+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+S+H	0.0000 in	0.000 ft	0.083 in	6.423 ft
+D+0.750Lr+0.750L+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750L+0.750S+H	0.0000 in	0.000 ft	0.062 in	6.423 ft
+D+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.70E+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750Lr+0.750L+0.450W+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750L+0.750S+0.450W+H	0.0000 in	0.000 ft	0.062 in	6.423 ft
+D+0.750L+0.750S+0.5250E+H	0.0000 in	0.000 ft	0.062 in	6.423 ft
+0.60D+0.60W+0.60H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+0.60D+0.70E+0.60H	0.0000 in	0.000 ft	0.000 in	0.000 ft
D Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
Lr Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
L Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
S Only	0.0000 in	0.000 ft	0.083 in	6.423 ft
W Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
E Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
H Only	0.0000 in	0.000 ft	0.000 in	0.000 ft

Steel Section Properties : W18x35



Steel Column

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ENERCALC, INC. 1983-2015, Build:6.15.1.19, Ver:6.15.1.19

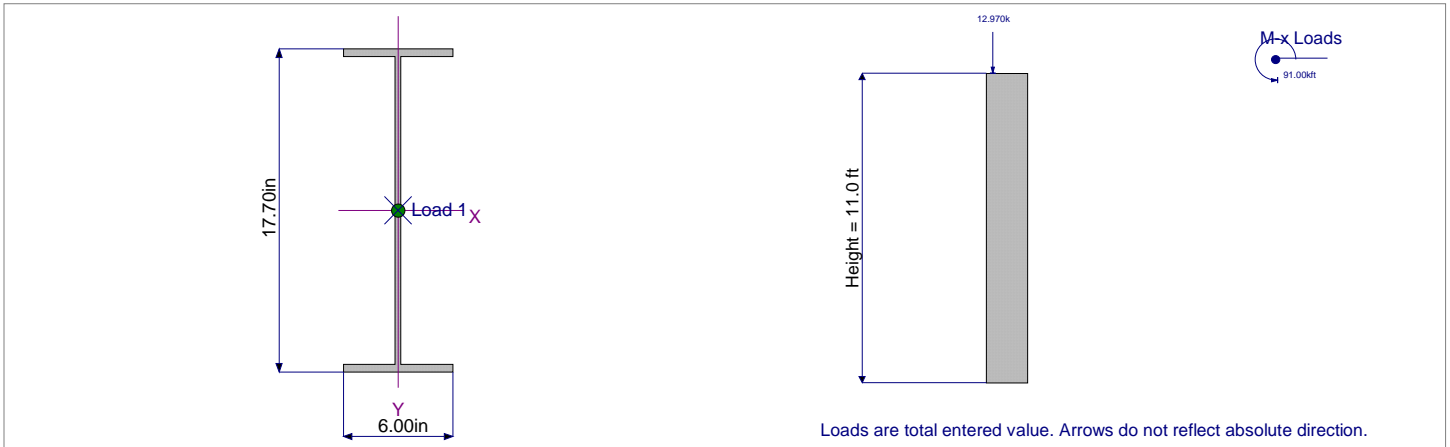
Lic. # : KW-06007744

Licensee : EPIC ENGINEERING, PC

Description : SC-1

Steel Section Properties : W18x35

Depth	=	17.700 in	I xx	=	510.00 in ⁴	J	=	0.506 in ⁴
Web Thick	=	0.300 in	S xx	=	57.60 in ³	Cw	=	1,140.00 in ⁶
Flange Width	=	6.000 in	R xx	=	7.040 in			
Flange Thick	=	0.425 in	Zx	=	66.500 in ³			
Area	=	10.300 in ²	I yy	=	15.300 in ⁴			
Weight	=	35.061 plf	S yy	=	5.120 in ³	Wno	=	25.900 in ²
Kdesign	=	0.827 in	R yy	=	1.220 in	Sw	=	16.500 in ⁴
K1	=	0.750 in	Zy	=	8.060 in ³	Qf	=	10.500 in ³
rts	=	1.520 in	rT	=	1.490 in	Qw	=	32.700 in ³
Ycg	=	0.000 in						



Steel Column

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 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. # : KW-06007744

Description : SC-1 AT GRID A-8.5

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
 Load Combinations Used : IBC 2012

General Information

Steel Section Name :	W12x22	Overall Column Height	11.0 ft
Analysis Method :	Allowable Strength	Top & Bottom Fixity	Top & Bottom Pinned
Steel Stress Grade		Brace condition for deflection (buckling) along columns :	
Fy : Steel Yield	36.0 ksi	X-X (width) axis :	
E : Elastic Bending Modulus	29,000.0 ksi	Unbraced Length for X-X Axis buckling =	11.0 ft, K = 1.20
Load Combination :	IBC 2012	Y-Y (depth) axis :	
		Fully braced against buckling along Y-Y Axis	

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 242.637 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 11.0 ft, D = 0.410, S = 6.080 k

BENDING LOADS . . .

Moment acting about X-X axis, S = 23.0 k-ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	0.0 : 1	Maximum SERVICE Load Reactions . .	
Load Combination	0.0	Top along X-X	0.0 k
Location of max.above base	0.0 ft	Bottom along X-X	0.0 k
At maximum location values are . . .		Top along Y-Y	0.0 k
Pa : Axial	0.0 k	Bottom along Y-Y	0.0 k
Pn / Omega : Allowable	0.0 k	Maximum SERVICE Load Deflections . . .	
Ma-x : Applied	0.0 k-ft	Along Y-Y	0.0 in at 0.0ft above base
Mn-x / Omega : Allowable	0.0 k-ft	for load combination :	
Ma-y : Applied	0.0 k-ft	Along X-X	0.0 in at 0.0ft above base
Mn-y / Omega : Allowable	0.0 k-ft	for load combination :	
PASS Maximum Shear Stress Ratio =	0.0 : 1		
Load Combination	0.0		
Location of max.above base	0.0 ft		
At maximum location values are . . .			
Va : Applied	0.0 k		
Vn / Omega : Allowable	0.0 k		

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
	Stress Ratio	Status	Location	Stress Ratio	Status	Location
	0.000	PASS	0.00 ft	0.000	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		Y-Y Axis Reaction		Axial Reaction
	@ Base	@ Top	@ Base	@ Top	@ Base

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance

Steel Section Properties : **W12x22**

Steel Column

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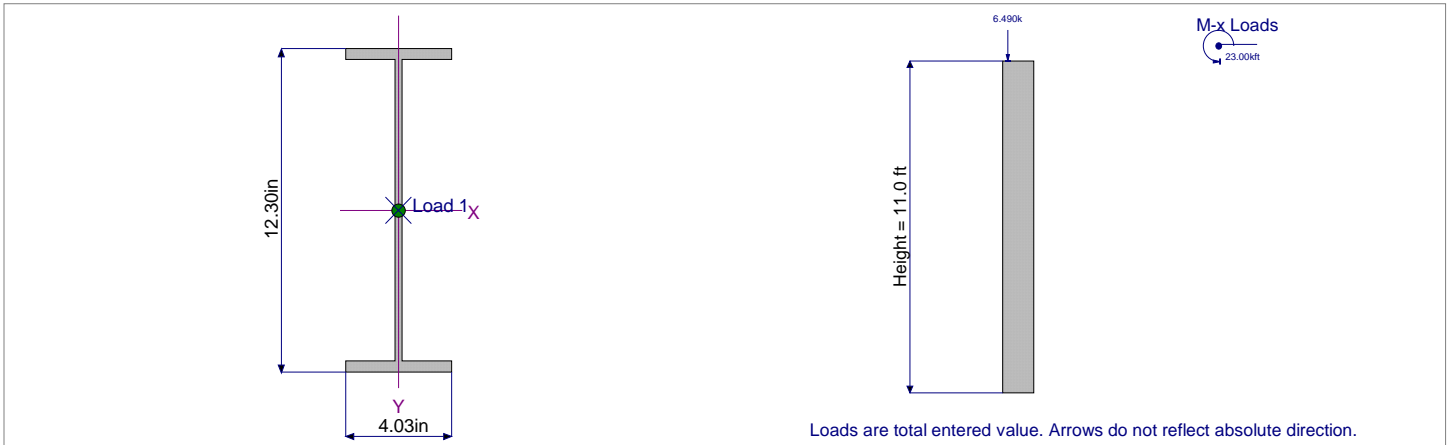
Lic. # : KW-06007744

Licensee : EPIC ENGINEERING, PC

Description : SC-1 AT GRID A-8.5

Steel Section Properties : W12x22

Depth	=	12.300 in	I _{xx}	=	156.00 in ⁴	J	=	0.293 in ⁴
Web Thick	=	0.260 in	S _{xx}	=	25.40 in ³	C _w	=	164.00 in ⁶
Flange Width	=	4.030 in	R _{xx}	=	4.910 in			
Flange Thick	=	0.425 in	Z _x	=	29.300 in ³			
Area	=	6.480 in ²	I _{yy}	=	4.660 in ⁴			
Weight	=	22.058 plf	S _{yy}	=	2.310 in ³	W _{ho}	=	12.000 in ²
Kdesign	=	0.725 in	R _{yy}	=	0.848 in	S _w	=	5.120 in ⁴
K1	=	0.625 in	Z _y	=	3.660 in ³	Q _f	=	4.760 in ³
r _{ts}	=	1.040 in	r _T	=	1.020 in	Q _w	=	14.400 in ³
Y _{cg}	=	0.000 in						





Steel Beam

Lic. # : KW-06007744

Licensee : EPIC ENGINEERING, PC

Description : RB-1

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
Dsgn. L = 22.00 ft		1	0.091	0.025	6.66		6.66	122.08	73.10	1.00	1.00	1.57	95.94	63.96
+0.60D+0.70E+0.60H														
Dsgn. L = 22.00 ft		1	0.091	0.025	6.66		6.66	122.08	73.10	1.00	1.00	1.57	95.94	63.96

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S+H	1	0.8799	10.670		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	10.963	5.482
Overall MINimum	1.573	0.787
+D+H	2.622	1.311
+D+L+H	2.622	1.311
+D+Lr+H	2.622	1.311
+D+S+H	10.963	5.482
+D+0.750Lr+0.750L+H	2.622	1.311
+D+0.750L+0.750S+H	8.878	4.439
+D+0.60W+H	2.622	1.311
+D+0.70E+H	2.622	1.311
+D+0.750Lr+0.750L+0.450W+H	2.622	1.311
+D+0.750L+0.750S+0.450W+H	8.878	4.439
+D+0.750L+0.750S+0.5250E+H	8.878	4.439
+0.60D+0.60W+0.60H	1.573	0.787
+0.60D+0.70E+0.60H	1.573	0.787
D Only	2.622	1.311
Lr Only		
L Only		
S Only	8.342	4.171
W Only		
E Only		
H Only		

Steel Beam

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 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11

Lic. #: KW-06007744

Licensee: EPIC ENGINEERING, PC

Description: RB-1A

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
Dsgn. L = 21.50 ft		1	0.040	0.011	2.94		2.94	122.08	73.10	1.00	1.00	0.71	95.94	63.96
+0.60D+0.70E+0.60H														
Dsgn. L = 21.50 ft		1	0.040	0.011	2.94		2.94	122.08	73.10	1.00	1.00	0.71	95.94	63.96

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S+H	1	0.3704	10.428		0.0000	0.000

Vertical Reactions

Load Combination	Support 1	Support 2
Overall MAXimum	4.945	2.473
Overall MINimum	0.710	0.355
+D+H	1.183	0.591
+D+L+H	1.183	0.591
+D+Lr+H	1.183	0.591
+D+S+H	4.945	2.473
+D+0.750Lr+0.750L+H	1.183	0.591
+D+0.750L+0.750S+H	4.004	2.002
+D+0.60W+H	1.183	0.591
+D+0.70E+H	1.183	0.591
+D+0.750Lr+0.750L+0.450W+H	1.183	0.591
+D+0.750L+0.750S+0.450W+H	4.004	2.002
+D+0.750L+0.750S+0.5250E+H	4.004	2.002
+0.60D+0.60W+0.60H	0.710	0.355
+0.60D+0.70E+0.60H	0.710	0.355
D Only	1.183	0.591
Lr Only		
L Only		
S Only	3.763	1.881
W Only		
E Only		
H Only		

Support notation : Far left is #1

Values in KIPS

Steel Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. # : KW-06007744

Description : RB-1B

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
Dsgn. L = 22.67 ft		1	0.074	0.019	5.44		5.44	122.08	73.10	1.00	1.00	1.25	95.94	63.96
+0.60D+0.70E+0.60H														
Dsgn. L = 22.67 ft		1	0.074	0.019	5.44		5.44	122.08	73.10	1.00	1.00	1.25	95.94	63.96

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S+H	1	0.7632	10.995		0.0000	0.000

Vertical Reactions

Load Combination	Support 1	Support 2
Overall MAXimum	8.690	4.345
Overall MINimum	1.247	0.623
+D+H	2.078	1.039
+D+L+H	2.078	1.039
+D+Lr+H	2.078	1.039
+D+S+H	8.690	4.345
+D+0.750Lr+0.750L+H	2.078	1.039
+D+0.750L+0.750S+H	7.037	3.519
+D+0.60W+H	2.078	1.039
+D+0.70E+H	2.078	1.039
+D+0.750Lr+0.750L+0.450W+H	2.078	1.039
+D+0.750L+0.750S+0.450W+H	7.037	3.519
+D+0.750L+0.750S+0.5250E+H	7.037	3.519
+0.60D+0.60W+0.60H	1.247	0.623
+0.60D+0.70E+0.60H	1.247	0.623
D Only	2.078	1.039
Lr Only		
L Only		
S Only	6.612	3.306
W Only		
E Only		
H Only		

Support notation : Far left is #1

Values in KIPS

Steel Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11

Lic. # : KW-06007744

Licensee : EPIC ENGINEERING, PC

Description : RB-2 SHORTER CONDITION

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
Dsgn. L = 5.00 ft		1	0.037	0.012		-4.10	4.10	184.17	110.28	1.00	1.00	0.86	117.75	70.51
+0.60D+0.70E+0.60H														
Dsgn. L = 5.00 ft		1	0.037	0.012		-4.10	4.10	184.17	110.28	1.00	1.00	0.86	117.75	70.51

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S+H	1	0.0456	5.000		0.0000	0.000

Vertical Reactions

Load Combination	Support 1	Support 2
Overall MAXimum	5.631	
Overall MINimum	0.858	
+D+H	1.431	
+D+L+H	1.431	
+D+Lr+H	1.431	
+D+S+H	5.631	
+D+0.750Lr+0.750L+H	1.431	
+D+0.750L+0.750S+H	4.581	
+D+0.60W+H	1.431	
+D+0.70E+H	1.431	
+D+0.750Lr+0.750L+0.450W+H	1.431	
+D+0.750L+0.750S+0.450W+H	4.581	
+D+0.750L+0.750S+0.5250E+H	4.581	
+0.60D+0.60W+0.60H	0.858	
+0.60D+0.70E+0.60H	0.858	
D Only	1.431	
Lr Only		
L Only		
S Only	4.200	
W Only		
E Only		
H Only		

Support notation : Far left is #1

Values in KIPS

Steel Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-V\LWNXFI-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11

Lic. # : KW-06007744

Licensee : EPIC ENGINEERING, PC

Description : RB-2

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
Dsgn. L = 10.00 ft		1	0.141	0.022		-15.60	15.60	184.17	110.28	1.00	1.00	1.56	117.75	70.51
+0.60D+0.70E+0.60H														
Dsgn. L = 10.00 ft		1	0.141	0.022		-15.60	15.60	184.17	110.28	1.00	1.00	1.56	117.75	70.51

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S+H	1	0.7192	10.000		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	10.940	
Overall MINimum	1.560	
+D+H	2.600	
+D+L+H	2.600	
+D+Lr+H	2.600	
+D+S+H	10.940	
+D+0.750Lr+0.750L+H	2.600	
+D+0.750L+0.750S+H	8.855	
+D+0.60W+H	2.600	
+D+0.70E+H	2.600	
+D+0.750Lr+0.750L+0.450W+H	2.600	
+D+0.750L+0.750S+0.450W+H	8.855	
+D+0.750L+0.750S+0.5250E+H	8.855	
+0.60D+0.60W+0.60H	1.560	
+0.60D+0.70E+0.60H	1.560	
D Only	2.600	
Lr Only		
L Only		
S Only	8.340	
W Only		
E Only		
H Only		

Wood Beam

Lic. # : KW-06007744

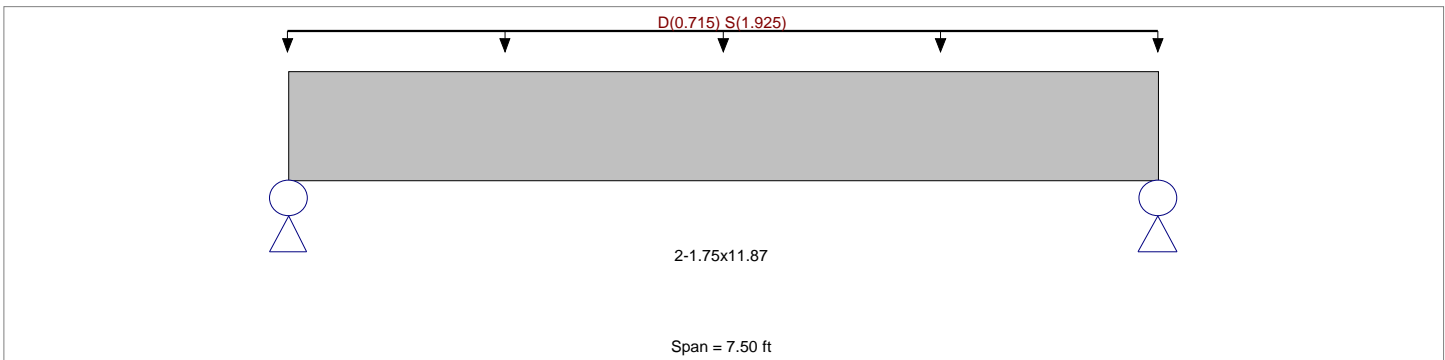
Description : HDR-1

CODE REFERENCES

Calculations per NDS 2012, IBC 2012, CBC 2013, ASCE 7-10
 Load Combination Set : IBC 2012

Material Properties

Analysis Method : Allowable Stress Design	Fb - Tension	2600 psi	E : Modulus of Elasticity	
Load Combination IBC 2012	Fb - Compr	2600 psi	Ebend- xx	1900 ksi
Wood Species : Truss Joist	Fc - Prll	2510 psi	Eminbend - xx	965.71 ksi
Wood Grade : MicroLam LVL 1.9 E	Fc - Perp	750 psi	Density	32.21 pcf
Beam Bracing : Beam is Fully Braced against lateral-torsion buckling	Fv	285 psi		
	Ft	1555 psi		



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Uniform Load : D = 0.0650, S = 0.1750 ksf, Tributary Width = 11.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.906 : 1	Maximum Shear Stress Ratio =	0.804 : 1
Section used for this span	2-1.75x11.87	Section used for this span	2-1.75x11.87
fb : Actual =	2,707.91 psi	fv : Actual =	263.41 psi
FB : Allowable =	2,990.00 psi	Fv : Allowable =	327.75 psi
Load Combination	+D+S+H	Load Combination	+D+S+H
Location of maximum on span	3.750 ft	Location of maximum on span	6.515 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.149 in	Ratio =	605
Max Upward Transient Deflection	0.000 in	Ratio =	0 < 360
Max Downward Total Deflection	0.204 in	Ratio =	441
Max Upward Total Deflection	0.000 in	Ratio =	0 < 180

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values								
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v						
+D+H	Length = 7.50 ft	1	0.313	0.278	0.90	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.03	733.39	2340.00	0.00	0.00	0.00	1.98	71.34	256.50
+D+L+H	Length = 7.50 ft	1	0.282	0.250	1.00	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.03	733.39	2600.00	0.00	0.00	0.00	1.98	71.34	285.00
+D+Lr+H	Length = 7.50 ft	1	0.226	0.200	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.03	733.39	3250.00	0.00	0.00	0.00	1.98	71.34	356.25
+D+S+H	Length = 7.50 ft	1	0.906	0.804	1.15	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	18.56	2,707.91	2990.00	0.00	0.00	0.00	7.30	263.41	327.75
+D+0.750Lr+0.750L+H	Length = 7.50 ft	1	0.226	0.200	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.03	733.39	3250.00	0.00	0.00	0.00	1.98	71.34	356.25
+D+0.750L+0.750S+H	Length = 7.50 ft	1	0.741	0.657	1.15	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	15.18	2,214.28	2990.00	0.00	0.00	0.00	5.97	215.39	327.75

Wood Beam

Lic. # : KW-06007744

Description : HDR-1

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values						
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F ^b	V	fv	F ^v			
+D+0.60W+H	Length = 7.50 ft	1	0.176	0.156	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.03	733.39	4160.00	0.00	0.00	0.00
+D+0.70E+H	Length = 7.50 ft	1	0.176	0.156	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.03	733.39	4160.00	0.00	0.00	0.00
+D+0.750Lr+0.750L+0.450W+H	Length = 7.50 ft	1	0.176	0.156	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.03	733.39	4160.00	1.98	71.34	456.00
+D+0.750L+0.750S+0.450W+H	Length = 7.50 ft	1	0.176	0.156	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	5.03	733.39	4160.00	1.98	71.34	456.00
+D+0.750L+0.750S+0.5250E+H	Length = 7.50 ft	1	0.532	0.472	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	15.18	2,214.28	4160.00	0.00	0.00	0.00	
+D+0.750L+0.750S+0.5250E+H	Length = 7.50 ft	1	0.532	0.472	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	15.18	2,214.28	4160.00	5.97	215.39	456.00	
+0.60D+0.60W+0.60H	Length = 7.50 ft	1	0.106	0.094	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.02	440.03	4160.00	0.00	0.00	0.00	
+0.60D+0.70E+0.60H	Length = 7.50 ft	1	0.106	0.094	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.02	440.03	4160.00	0.00	0.00	0.00	
+0.60D+0.70E+0.60H	Length = 7.50 ft	1	0.106	0.094	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.02	440.03	4160.00	1.19	42.80	456.00	

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S+H	1	0.2037	3.777		0.0000	0.000

Vertical Reactions

Load Combination	Support 1	Support 2
Overall MAXimum	9.900	9.900
Overall MINimum	1.609	1.609
+D+H	2.681	2.681
+D+L+H	2.681	2.681
+D+Lr+H	2.681	2.681
+D+S+H	9.900	9.900
+D+0.750Lr+0.750L+H	2.681	2.681
+D+0.750L+0.750S+H	8.095	8.095
+D+0.60W+H	2.681	2.681
+D+0.70E+H	2.681	2.681
+D+0.750Lr+0.750L+0.450W+H	2.681	2.681
+D+0.750L+0.750S+0.450W+H	8.095	8.095
+D+0.750L+0.750S+0.5250E+H	8.095	8.095
+0.60D+0.60W+0.60H	1.609	1.609
+0.60D+0.70E+0.60H	1.609	1.609
D Only	2.681	2.681
Lr Only		
L Only		
S Only	7.219	7.219
W Only		
E Only		
H Only		

Support notation : Far left is #1

Values in KIPS

Wood Beam

Lic. # : KW-06007744

Description : HDR-2

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values		
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	f _b	F ['] _b	V	f _v
Length = 4.0 ft	1	0.348	0.380	1.15	1.000	1.00	1.00	1.00	1.00	1.00	4.33	1,041.52	2990.00	2.69	124.53	327.75
+D+0.60W+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1	0.083	0.091	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.44	347.29	4160.00	0.90	41.52	456.00
+D+0.70E+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1	0.083	0.091	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.44	347.29	4160.00	0.90	41.52	456.00
+D+0.750Lr+0.750L+0.450W+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1	0.250	0.273	1.60	1.000	1.00	1.00	1.00	1.00	1.00	4.33	1,041.52	4160.00	2.69	124.53	456.00
+D+0.750L+0.750S+0.450W+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1	0.250	0.273	1.60	1.000	1.00	1.00	1.00	1.00	1.00	4.33	1,041.52	4160.00	2.69	124.53	456.00
+D+0.750L+0.750S+0.5250E+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1	0.250	0.273	1.60	1.000	1.00	1.00	1.00	1.00	1.00	4.33	1,041.52	4160.00	2.69	124.53	456.00
+0.60D+0.60W+0.60H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1	0.050	0.055	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.87	208.37	4160.00	0.54	24.91	456.00
+0.60D+0.70E+0.60H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 4.0 ft	1	0.050	0.055	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.87	208.37	4160.00	0.54	24.91	456.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.0350	2.015		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	5.294	5.294
Overall MINimum	0.867	0.867
+D+H	1.444	1.444
+D+L+H	5.294	5.294
+D+Lr+H	1.444	1.444
+D+S+H	1.444	1.444
+D+0.750Lr+0.750L+H	4.332	4.332
+D+0.750L+0.750S+H	4.332	4.332
+D+0.60W+H	1.444	1.444
+D+0.70E+H	1.444	1.444
+D+0.750Lr+0.750L+0.450W+H	4.332	4.332
+D+0.750L+0.750S+0.450W+H	4.332	4.332
+D+0.750L+0.750S+0.5250E+H	4.332	4.332
+0.60D+0.60W+0.60H	0.867	0.867
+0.60D+0.70E+0.60H	0.867	0.867
D Only	1.444	1.444
Lr Only		
L Only	3.850	3.850
S Only		
W Only		
E Only		
H Only		

Wood Beam

Lic. # : KW-06007744

Description : HDR-3

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values		
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv
Length = 3.0 ft	1	0.600	0.415	1.15	1.100	1.00	1.00	1.00	1.00	1.00	2.44	683.17	1138.50	1.59	85.85	207.00
+D+0.60W+H					1.100	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.144	0.099	1.60	1.100	1.00	1.00	1.00	1.00	1.00	0.81	227.58	1584.00	0.53	28.60	288.00
+D+0.70E+H					1.100	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.144	0.099	1.60	1.100	1.00	1.00	1.00	1.00	1.00	0.81	227.58	1584.00	0.53	28.60	288.00
+D+0.750Lr+0.750L+0.450W+H					1.100	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.431	0.298	1.60	1.100	1.00	1.00	1.00	1.00	1.00	2.44	683.17	1584.00	1.59	85.85	288.00
+D+0.750L+0.750S+0.450W+H					1.100	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.431	0.298	1.60	1.100	1.00	1.00	1.00	1.00	1.00	2.44	683.17	1584.00	1.59	85.85	288.00
+D+0.750L+0.750S+0.5250E+H					1.100	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.431	0.298	1.60	1.100	1.00	1.00	1.00	1.00	1.00	2.44	683.17	1584.00	1.59	85.85	288.00
+0.60D+0.60W+0.60H					1.100	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.086	0.060	1.60	1.100	1.00	1.00	1.00	1.00	1.00	0.49	136.55	1584.00	0.32	17.16	288.00
+0.60D+0.70E+0.60H					1.100	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 3.0 ft	1	0.086	0.060	1.60	1.100	1.00	1.00	1.00	1.00	1.00	0.49	136.55	1584.00	0.32	17.16	288.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.0153	1.511		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	3.969	3.969
Overall MINimum	0.649	0.649
+D+H	1.082	1.082
+D+L+H	3.969	3.969
+D+Lr+H	1.082	1.082
+D+S+H	1.082	1.082
+D+0.750Lr+0.750L+H	3.247	3.247
+D+0.750L+0.750S+H	3.247	3.247
+D+0.60W+H	1.082	1.082
+D+0.70E+H	1.082	1.082
+D+0.750Lr+0.750L+0.450W+H	3.247	3.247
+D+0.750L+0.750S+0.450W+H	3.247	3.247
+D+0.750L+0.750S+0.5250E+H	3.247	3.247
+0.60D+0.60W+0.60H	0.649	0.649
+0.60D+0.70E+0.60H	0.649	0.649
D Only	1.082	1.082
Lr Only		
L Only	2.888	2.888
S Only		
W Only		
E Only		
H Only		

Wood Column

Lic. # : KW-06007744

Description : C-3

Code References

Calculations per 2012 NDS, IBC 2012, CBC 2013, ASCE 7-10
 Load Combinations Used : IBC2012

General Information

Analysis Method :	Allowable Stress Design			Wood Section Name	2-2x6
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber
Overall Column Height	10.0 ft			Wood Member Type	Sawn
<i>(Used for non-slender calculations)</i>					
Wood Species	Douglas Fir - Larch			Exact Width	3.0 in
Wood Grade	No.2			Exact Depth	5.50 in
Fb - Tension	900 psi	Fv	180 psi	Area	16.50 in ²
Fb - Compr	900 psi	Ft	575 psi	Ix	41.594 in ⁴
Fc - Prll	1350 psi	Density	32.21 pcf	Iy	12.375 in ⁴
Fc - Perp	625 psi				
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial	Allow Stress Modification Factors	
Basic	1600	1600	1600 ksi	Cf or Cv for Bending	1.30
Minimum	580	580		Cf or Cv for Compression	1.10
				Cf or Cv for Tension	1.30
				Cm : Wet Use Factor	1.0
				Ct : Temperature Factor	1.0
				Cfu : Flat Use Factor	1.0
				Kf : Built-up columns	1.0 <small>NDS 15.3.2</small>
				Use Cr : Repetitive ?	No <small>(non-glb only)</small>
Brace condition for deflection (buckling) along columns :					
X-X (width) axis : Fully braced against buckling along X-X Axis					
Y-Y (depth) axis : Unbraced Length for X-X Axis buckling = 5 ft, K = 1.0					

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 36.907 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 10.0 ft, D = 2.30, S = 6.90 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	0.4152 : 1	Maximum SERVICE Lateral Load Reactions . .	
Load Combination	+D+S	Top along Y-Y	0.0 k
Governing NDS Formula	Comp Only, fc/Fc'	Top along X-X	0.0 k
Location of max.above base	0.0 ft	Bottom along Y-Y	0.0 k
At maximum location values are . . .		Bottom along X-X	0.0 k
Applied Axial	9.237 k	Maximum SERVICE Load Lateral Deflections . . .	
Applied Mx	0.0 k-ft	Along Y-Y	0.0 in at 0.0 ft above base
Applied My	0.0 k-ft	for load combination :	n/a
Fc : Allowable	1,348.22 psi	Along X-X	0.0 in at 0.0 ft above base
		for load combination :	n/a
PASS Maximum Shear Stress Ratio =	0.0 : 1	Other Factors used to calculate allowable stresses . . .	
Load Combination	+0.60D+0.70E	Bending	Compression
Location of max.above base	10.0 ft	Cf or Cv : Size based factors	1.300 1.100
Applied Design Shear	0.0 psi		
Allowable Shear	180.0 psi		

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	1.000	0.908	0.1051	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+L	1.000	0.908	0.1051	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+Lr	1.000	0.908	0.1051	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+S	1.000	0.908	0.4152	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750Lr+0.750L	1.000	0.908	0.1051	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750L+0.750S	1.000	0.908	0.3377	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.60W	1.000	0.908	0.1051	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.70E	1.000	0.908	0.1051	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750Lr+0.750L+0.450W	1.000	0.908	0.1051	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750L+0.750S+0.450W	1.000	0.908	0.3377	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750L+0.750S+0.5250E	1.000	0.908	0.3377	PASS	0.0 ft	0.0	PASS	10.0 ft
+0.60D+0.60W	1.000	0.908	0.06303	PASS	0.0 ft	0.0	PASS	10.0 ft

Title Block Line 6

Wood Column

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-V\LWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2014, Build:6.14.11.18, Ver:6.14.11.18

Lic. #: KW-06007744

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Description: C-3

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
+0.60D+0.70E	1.000	0.908	0.06303	PASS	0.0 ft	0.0	PASS	10.0 ft

Maximum Reactions

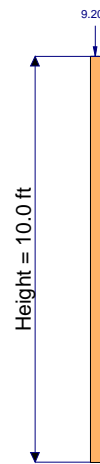
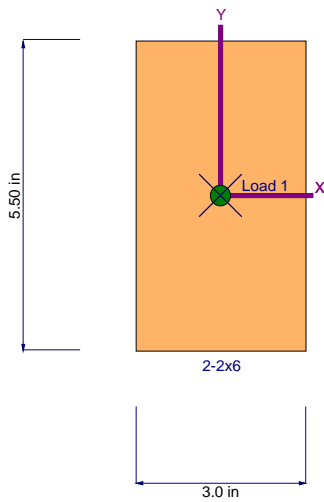
Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		Y-Y Axis Reaction		Axial Reaction
	@ Base	@ Top	@ Base	@ Top	@ Base

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance

Sketches



Loads are total entered value. Arrows do not reflect absolute direction.

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
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Lic. # : KW-06007744

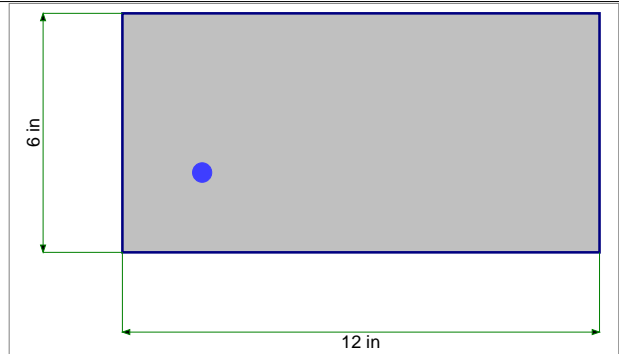
Description : LOWER ROOF CONCRETE SLAB

CODE REFERENCES

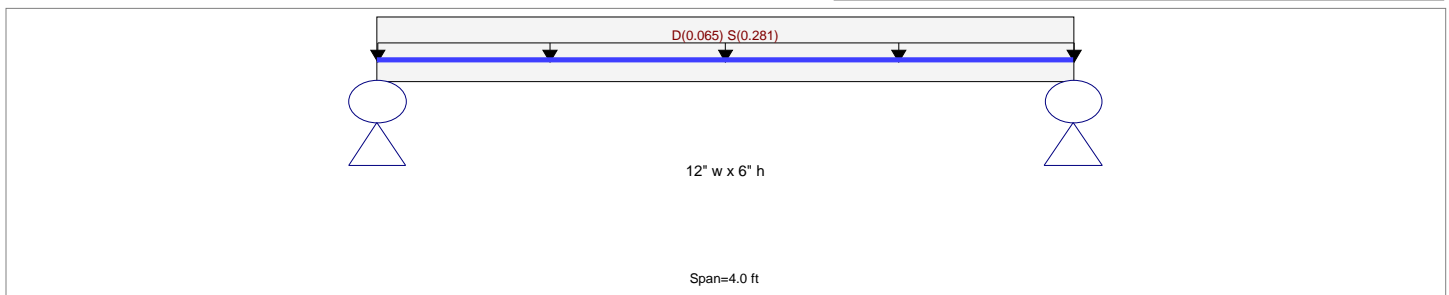
Calculations per ACI 318-11, IBC 2012, ASCE 7-10
 Load Combination Set : IBC 2012

Material Properties

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = f'_c^{1/2} * 7.50$	=	410.792 psi		Shear :	0.750
Ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	Fy - Stirrups	=	40.0 ksi
fy - Main Rebar	=	60.0 ksi	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	# 3
			Number of Resisting Legs Per Stirrup	=	2



Load Combination IBC 2012



Cross Section & Reinforcing Details

Rectangular Section, Width = 12.0 in, Height = 6.0 in
 Span #1 Reinforcing....
 1-#4 at 2.0 in from Bottom, from 0.0 to 4.0 ft in this span

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Load for Span Number 1
 Uniform Load : D = 0.0650, S = 0.2810 k/ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.308 : 1	Maximum Deflection	
Section used for this span	Typical Section	Max Downward Transient Deflection	0.002 in Ratio = 20017
Mu : Applied	1.055 k-ft	Max Upward Transient Deflection	0.000 in Ratio = 0 < 360
Mn * Phi : Allowable	3.423 k-ft	Max Downward Total Deflection	0.003 in Ratio = 16257
Load Combination	+1.20D+0.50L+1.60S+1.60H	Max Upward Total Deflection	0.000 in Ratio = 999 < 180
Location of maximum on span	2.000ft		
Span # where maximum occurs	Span # 1		

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2
Overall MAXimum	0.692	0.692
Overall MINimum	0.078	0.078
+D+H	0.130	0.130
+D+L+H	0.130	0.130
+D+Lr+H	0.130	0.130
+D+S+H	0.692	0.692
+D+0.750Lr+0.750L+H	0.130	0.130
+D+0.750L+0.750S+H	0.551	0.551
+D+0.60W+H	0.130	0.130
+D+0.70E+H	0.130	0.130
+D+0.750Lr+0.750L+0.450W+H	0.130	0.130
+D+0.750L+0.750S+0.450W+H	0.551	0.551
+D+0.750L+0.750S+0.5250E+H	0.551	0.551
+0.60D+0.60W+0.60H	0.078	0.078
+0.60D+0.70E+0.60H	0.078	0.078

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11

Lic. #: KW-06007744

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Description: LOWER ROOF CONCRETE SLAB

Vertical Reactions

Support notation: Far left is #1

Load Combination	Support 1	Support 2
D Only	0.130	0.130
Lr Only		
L Only		
S Only	0.562	0.562
W Only		
E Only		
H Only		

Shear Stirrup Requirements

Entire Beam Span Length: $\Phi V_c/2 < V_u \leq \Phi V_c$, Req'd Vs = $H_t \leq 10"$, Not Req'd, use stirrups spaced at 0.000 in

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Location (ft) in Span	Bending Stress Results (k-ft)		
				Mu: Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope						
Span # 1		1	4.000	1.06	3.42	0.31
+1.40D+1.60H						
Span # 1		1	4.000	0.18	3.42	0.05
+1.20D+0.50Lr+1.60L+1.60H						
Span # 1		1	4.000	0.16	3.42	0.05
+1.20D+1.60L+0.50S+1.60H						
Span # 1		1	4.000	0.44	3.42	0.13
+1.20D+1.60Lr+0.50L+1.60H						
Span # 1		1	4.000	0.16	3.42	0.05
+1.20D+1.60Lr+0.50W+1.60H						
Span # 1		1	4.000	0.16	3.42	0.05
+1.20D+0.50L+1.60S+1.60H						
Span # 1		1	4.000	1.06	3.42	0.31
+1.20D+1.60S+0.50W+1.60H						
Span # 1		1	4.000	1.06	3.42	0.31
+1.20D+0.50Lr+0.50L+W+1.60H						
Span # 1		1	4.000	0.16	3.42	0.05
+1.20D+0.50L+0.50S+W+1.60H						
Span # 1		1	4.000	0.44	3.42	0.13
+1.20D+0.50L+0.70S+E+1.60H						
Span # 1		1	4.000	0.55	3.42	0.16
+0.90D+W+0.90H						
Span # 1		1	4.000	0.12	3.42	0.03
+0.90D+E+0.90H						
Span # 1		1	4.000	0.12	3.42	0.03

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S+H	1	0.0030	2.040		0.0000	0.000

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.20D+1.60S+0.50W+1.60H	1	0.00	2.00	1.06	1.06	0.00	1.00	1.87	PhiVc/2 < Vu <=	Ht<=10", N	1.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.01	4.00	1.05	1.05	0.01	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.02	4.00	1.05	1.05	0.02	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.03	4.00	1.04	1.04	0.03	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.04	4.00	1.04	1.04	0.04	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.04	4.00	1.03	1.03	0.05	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.05	4.00	1.03	1.03	0.06	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.06	4.00	1.02	1.02	0.06	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.07	4.00	1.02	1.02	0.07	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.08	4.00	1.01	1.01	0.08	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.09	4.00	1.01	1.01	0.09	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.10	4.00	1.00	1.00	0.10	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.11	4.00	1.00	1.00	0.11	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.12	4.00	0.99	0.99	0.12	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.12	4.00	0.99	0.99	0.13	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.13	4.00	0.98	0.98	0.14	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11

Lic. #: KW-06007744

Licensee: EPIC ENGINEERING, PC

Description: LOWER ROOF CONCRETE SLAB

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.20D+1.60S+0.50W+1.60H	1	0.14	4.00	0.98	0.98	0.14	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.15	4.00	0.98	0.98	0.15	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.16	4.00	0.97	0.97	0.16	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.17	4.00	0.97	0.97	0.17	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.18	4.00	0.96	0.96	0.18	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.19	4.00	0.96	0.96	0.19	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.20	4.00	0.95	0.95	0.20	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.20	4.00	0.95	0.95	0.20	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.21	4.00	0.94	0.94	0.21	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.22	4.00	0.94	0.94	0.22	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.23	4.00	0.93	0.93	0.23	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.24	4.00	0.93	0.93	0.24	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.25	4.00	0.92	0.92	0.25	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.26	4.00	0.92	0.92	0.25	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.27	4.00	0.91	0.91	0.26	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.28	4.00	0.91	0.91	0.27	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.28	4.00	0.91	0.91	0.28	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.29	4.00	0.90	0.90	0.29	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.30	4.00	0.90	0.90	0.29	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.31	4.00	0.89	0.89	0.30	0.98	4.11	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.32	4.00	0.89	0.89	0.31	0.95	4.10	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.33	4.00	0.88	0.88	0.32	0.92	4.09	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.34	4.00	0.88	0.88	0.33	0.90	4.08	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.35	4.00	0.87	0.87	0.33	0.87	4.07	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.36	4.00	0.87	0.87	0.34	0.85	4.06	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.36	4.00	0.86	0.86	0.35	0.82	4.06	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.37	4.00	0.86	0.86	0.36	0.80	4.05	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.38	4.00	0.85	0.85	0.36	0.78	4.04	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.39	4.00	0.85	0.85	0.37	0.76	4.03	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.40	4.00	0.84	0.84	0.38	0.74	4.02	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.41	4.00	0.84	0.84	0.39	0.72	4.02	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.42	4.00	0.83	0.83	0.39	0.70	4.01	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.43	4.00	0.83	0.83	0.40	0.69	4.00	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.44	4.00	0.83	0.83	0.41	0.67	4.00	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.44	4.00	0.82	0.82	0.42	0.66	3.99	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.45	4.00	0.82	0.82	0.42	0.64	3.99	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.46	4.00	0.81	0.81	0.43	0.63	3.98	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.47	4.00	0.81	0.81	0.44	0.61	3.98	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.48	4.00	0.80	0.80	0.45	0.60	3.97	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.49	4.00	0.80	0.80	0.45	0.59	3.97	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.50	4.00	0.79	0.79	0.46	0.57	3.96	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.51	4.00	0.79	0.79	0.47	0.56	3.96	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.52	4.00	0.78	0.78	0.47	0.55	3.95	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.52	4.00	0.78	0.78	0.48	0.54	3.95	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.53	4.00	0.77	0.77	0.49	0.53	3.94	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.54	4.00	0.77	0.77	0.49	0.52	3.94	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.55	4.00	0.76	0.76	0.50	0.51	3.94	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.56	4.00	0.76	0.76	0.51	0.50	3.93	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.57	4.00	0.76	0.76	0.51	0.49	3.93	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.58	4.00	0.75	0.75	0.52	0.48	3.93	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.59	4.00	0.75	0.75	0.53	0.47	3.92	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.60	4.00	0.74	0.74	0.53	0.46	3.92	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.60	4.00	0.74	0.74	0.54	0.45	3.92	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.61	4.00	0.73	0.73	0.55	0.45	3.91	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0

Concrete Beam

File = S:\PROJ\SHKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11

Lic. #: KW-06007744

Licensee: EPIC ENGINEERING, PC

Description: LOWER ROOF CONCRETE SLAB

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.20D+1.60S+0.50W+1.60H	1	0.62	4.00	0.73	0.73	0.55	0.44	3.91	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.63	4.00	0.72	0.72	0.56	0.43	3.91	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.64	4.00	0.72	0.72	0.57	0.42	3.90	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.65	4.00	0.71	0.71	0.57	0.41	3.90	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.66	4.00	0.71	0.71	0.58	0.41	3.90	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.67	4.00	0.70	0.70	0.59	0.40	3.90	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.68	4.00	0.70	0.70	0.59	0.39	3.89	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.68	4.00	0.69	0.69	0.60	0.39	3.89	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.69	4.00	0.69	0.69	0.60	0.38	3.89	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.70	4.00	0.68	0.68	0.61	0.37	3.89	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.71	4.00	0.68	0.68	0.62	0.37	3.88	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.72	4.00	0.68	0.68	0.62	0.36	3.88	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.73	4.00	0.67	0.67	0.63	0.36	3.88	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.74	4.00	0.67	0.67	0.63	0.35	3.88	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.75	4.00	0.66	0.66	0.64	0.34	3.88	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.76	4.00	0.66	0.66	0.65	0.34	3.87	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.76	4.00	0.65	0.65	0.65	0.33	3.87	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.77	4.00	0.65	0.65	0.66	0.33	3.87	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.78	4.00	0.64	0.64	0.66	0.32	3.87	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.79	4.00	0.64	0.64	0.67	0.32	3.87	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.80	4.00	0.63	0.63	0.68	0.31	3.86	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.81	4.00	0.63	0.63	0.68	0.31	3.86	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.82	4.00	0.62	0.62	0.69	0.30	3.86	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.83	4.00	0.62	0.62	0.69	0.30	3.86	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.84	4.00	0.61	0.61	0.70	0.29	3.86	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.84	4.00	0.61	0.61	0.70	0.29	3.85	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.85	4.00	0.60	0.60	0.71	0.28	3.85	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.86	4.00	0.60	0.60	0.71	0.28	3.85	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.87	4.00	0.60	0.60	0.72	0.28	3.85	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.88	4.00	0.59	0.59	0.72	0.27	3.85	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.89	4.00	0.59	0.59	0.73	0.27	3.85	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.90	4.00	0.58	0.58	0.73	0.26	3.85	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.91	4.00	0.58	0.58	0.74	0.26	3.84	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.92	4.00	0.57	0.57	0.74	0.26	3.84	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.92	4.00	0.57	0.57	0.75	0.25	3.84	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.93	4.00	0.56	0.56	0.76	0.25	3.84	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.94	4.00	0.56	0.56	0.76	0.24	3.84	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.95	4.00	0.55	0.55	0.76	0.24	3.84	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.96	4.00	0.55	0.55	0.77	0.24	3.84	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.97	4.00	0.54	0.54	0.77	0.23	3.83	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.98	4.00	0.54	0.54	0.78	0.23	3.83	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	0.99	4.00	0.53	0.53	0.78	0.23	3.83	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.00	4.00	0.53	0.53	0.79	0.22	3.83	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.00	4.00	0.53	0.53	0.79	0.22	3.83	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.01	4.00	0.52	0.52	0.80	0.22	3.83	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.02	4.00	0.52	0.52	0.80	0.21	3.83	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.03	4.00	0.51	0.51	0.81	0.21	3.83	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.04	4.00	0.51	0.51	0.81	0.21	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.05	4.00	0.50	0.50	0.82	0.20	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.06	4.00	0.50	0.50	0.82	0.20	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.07	4.00	0.49	0.49	0.83	0.20	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.08	4.00	0.49	0.49	0.83	0.20	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.08	4.00	0.48	0.48	0.83	0.19	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.09	4.00	0.48	0.48	0.84	0.19	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. # : KW-06007744

Description : LOWER ROOF CONCRETE SLAB

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.20D+1.60S+0.50W+1.60H	1	1.10	4.00	0.47	0.47	0.84	0.19	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.11	4.00	0.47	0.47	0.85	0.18	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.12	4.00	0.46	0.46	0.85	0.18	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.13	4.00	0.46	0.46	0.86	0.18	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.14	4.00	0.45	0.45	0.86	0.18	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.15	4.00	0.45	0.45	0.86	0.17	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.16	4.00	0.45	0.45	0.87	0.17	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.16	4.00	0.44	0.44	0.87	0.17	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.17	4.00	0.44	0.44	0.87	0.17	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.18	4.00	0.43	0.43	0.88	0.16	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.19	4.00	0.43	0.43	0.88	0.16	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.20	4.00	0.42	0.42	0.89	0.16	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.21	4.00	0.42	0.42	0.89	0.16	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.22	4.00	0.41	0.41	0.89	0.15	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.23	4.00	0.41	0.41	0.90	0.15	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.24	4.00	0.40	0.40	0.90	0.15	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.24	4.00	0.40	0.40	0.90	0.15	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.25	4.00	0.39	0.39	0.91	0.14	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.26	4.00	0.39	0.39	0.91	0.14	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.27	4.00	0.38	0.38	0.92	0.14	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.28	4.00	0.38	0.38	0.92	0.14	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.29	4.00	0.38	0.38	0.92	0.14	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.30	4.00	0.37	0.37	0.93	0.13	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.31	4.00	0.37	0.37	0.93	0.13	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.32	4.00	0.36	0.36	0.93	0.13	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.32	4.00	0.36	0.36	0.93	0.13	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.33	4.00	0.35	0.35	0.94	0.12	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.34	4.00	0.35	0.35	0.94	0.12	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.35	4.00	0.34	0.34	0.94	0.12	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.36	4.00	0.34	0.34	0.95	0.12	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.37	4.00	0.33	0.33	0.95	0.12	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.38	4.00	0.33	0.33	0.95	0.11	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.39	4.00	0.32	0.32	0.96	0.11	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.40	4.00	0.32	0.32	0.96	0.11	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.40	4.00	0.31	0.31	0.96	0.11	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.41	4.00	0.31	0.31	0.96	0.11	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.42	4.00	0.30	0.30	0.97	0.11	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.43	4.00	0.30	0.30	0.97	0.10	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.44	4.00	0.30	0.30	0.97	0.10	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.45	4.00	0.29	0.29	0.98	0.10	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.46	4.00	0.29	0.29	0.98	0.10	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.47	4.00	0.28	0.28	0.98	0.10	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.48	4.00	0.28	0.28	0.98	0.09	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.48	4.00	0.27	0.27	0.99	0.09	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.49	4.00	0.27	0.27	0.99	0.09	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.50	4.00	0.26	0.26	0.99	0.09	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.51	4.00	0.26	0.26	0.99	0.09	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.52	4.00	0.25	0.25	0.99	0.08	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.53	4.00	0.25	0.25	1.00	0.08	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.54	4.00	0.24	0.24	1.00	0.08	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.55	4.00	0.24	0.24	1.00	0.08	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.56	4.00	0.23	0.23	1.00	0.08	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.56	4.00	0.23	0.23	1.01	0.08	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.57	4.00	0.23	0.23	1.01	0.07	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11

Lic. #: KW-06007744

Licensee: EPIC ENGINEERING, PC

Description: LOWER ROOF CONCRETE SLAB

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.20D+1.60S+0.50W+1.60H	1	1.58	4.00	0.22	0.22	1.01	0.07	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.59	4.00	0.22	0.22	1.01	0.07	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.60	4.00	0.21	0.21	1.01	0.07	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.61	4.00	0.21	0.21	1.01	0.07	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.62	4.00	0.20	0.20	1.02	0.07	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.63	4.00	0.20	0.20	1.02	0.06	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.64	4.00	0.19	0.19	1.02	0.06	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.64	4.00	0.19	0.19	1.02	0.06	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.65	4.00	0.18	0.18	1.02	0.06	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.66	4.00	0.18	0.18	1.03	0.06	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.67	4.00	0.17	0.17	1.03	0.06	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.68	4.00	0.17	0.17	1.03	0.05	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.69	4.00	0.16	0.16	1.03	0.05	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.70	4.00	0.16	0.16	1.03	0.05	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.71	4.00	0.15	0.15	1.03	0.05	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.72	4.00	0.15	0.15	1.03	0.05	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.72	4.00	0.15	0.15	1.04	0.05	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.73	4.00	0.14	0.14	1.04	0.05	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.74	4.00	0.14	0.14	1.04	0.04	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.75	4.00	0.13	0.13	1.04	0.04	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.76	4.00	0.13	0.13	1.04	0.04	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.77	4.00	0.12	0.12	1.04	0.04	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.78	4.00	0.12	0.12	1.04	0.04	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.79	4.00	0.11	0.11	1.04	0.04	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.80	4.00	0.11	0.11	1.04	0.03	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.80	4.00	0.10	0.10	1.05	0.03	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.81	4.00	0.10	0.10	1.05	0.03	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.82	4.00	0.09	0.09	1.05	0.03	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.83	4.00	0.09	0.09	1.05	0.03	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.84	4.00	0.08	0.08	1.05	0.03	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.85	4.00	0.08	0.08	1.05	0.03	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.86	4.00	0.08	0.08	1.05	0.02	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.87	4.00	0.07	0.07	1.05	0.02	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.88	4.00	0.07	0.07	1.05	0.02	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.88	4.00	0.06	0.06	1.05	0.02	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.89	4.00	0.06	0.06	1.05	0.02	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.90	4.00	0.05	0.05	1.05	0.02	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.91	4.00	0.05	0.05	1.05	0.01	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.92	4.00	0.04	0.04	1.05	0.01	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.93	4.00	0.04	0.04	1.05	0.01	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.94	4.00	0.03	0.03	1.05	0.01	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.95	4.00	0.03	0.03	1.05	0.01	3.75	Vu < PhiVc/2	Not Req'd	3.7	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.96	4.00	0.02	0.02	1.05	0.01	3.75	Vu < PhiVc/2	Not Req'd	3.7	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.96	4.00	0.02	0.02	1.05	0.01	3.75	Vu < PhiVc/2	Not Req'd	3.7	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.97	4.00	0.01	0.01	1.06	0.00	3.75	Vu < PhiVc/2	Not Req'd	3.7	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.98	4.00	0.01	0.01	1.06	0.00	3.75	Vu < PhiVc/2	Not Req'd	3.7	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	1.99	4.00	0.00	0.00	1.06	0.00	3.75	Vu < PhiVc/2	Not Req'd	3.7	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.00	4.00	0.00	0.00	1.06	0.00	3.75	Vu < PhiVc/2	Not Req'd	3.7	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.01	4.00	-0.00	0.00	1.06	0.00	3.75	Vu < PhiVc/2	Not Req'd	3.7	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.02	4.00	-0.01	0.01	1.06	0.00	3.75	Vu < PhiVc/2	Not Req'd	3.7	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.03	4.00	-0.01	0.01	1.06	0.00	3.75	Vu < PhiVc/2	Not Req'd	3.7	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.04	4.00	-0.02	0.02	1.05	0.01	3.75	Vu < PhiVc/2	Not Req'd	3.7	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.04	4.00	-0.02	0.02	1.05	0.01	3.75	Vu < PhiVc/2	Not Req'd	3.7	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.05	4.00	-0.03	0.03	1.05	0.01	3.75	Vu < PhiVc/2	Not Req'd	3.7	0.0	0.0

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. #: KW-06007744

Description: LOWER ROOF CONCRETE SLAB

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.20D+1.60S+0.50W+1.60H	1	2.06	4.00	-0.03	0.03	1.05	0.01	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.07	4.00	-0.04	0.04	1.05	0.01	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.08	4.00	-0.04	0.04	1.05	0.01	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.09	4.00	-0.05	0.05	1.05	0.01	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.10	4.00	-0.05	0.05	1.05	0.02	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.11	4.00	-0.06	0.06	1.05	0.02	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.12	4.00	-0.06	0.06	1.05	0.02	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.12	4.00	-0.07	0.07	1.05	0.02	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.13	4.00	-0.07	0.07	1.05	0.02	3.75	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.14	4.00	-0.08	0.08	1.05	0.02	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.15	4.00	-0.08	0.08	1.05	0.03	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.16	4.00	-0.08	0.08	1.05	0.03	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.17	4.00	-0.09	0.09	1.05	0.03	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.18	4.00	-0.09	0.09	1.05	0.03	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.19	4.00	-0.10	0.10	1.05	0.03	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.20	4.00	-0.10	0.10	1.05	0.03	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.20	4.00	-0.11	0.11	1.04	0.03	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.21	4.00	-0.11	0.11	1.04	0.04	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.22	4.00	-0.12	0.12	1.04	0.04	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.23	4.00	-0.12	0.12	1.04	0.04	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.24	4.00	-0.13	0.13	1.04	0.04	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.25	4.00	-0.13	0.13	1.04	0.04	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.26	4.00	-0.14	0.14	1.04	0.04	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.27	4.00	-0.14	0.14	1.04	0.05	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.28	4.00	-0.15	0.15	1.04	0.05	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.28	4.00	-0.15	0.15	1.03	0.05	3.76	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.29	4.00	-0.15	0.15	1.03	0.05	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.30	4.00	-0.16	0.16	1.03	0.05	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.31	4.00	-0.16	0.16	1.03	0.05	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.32	4.00	-0.17	0.17	1.03	0.05	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.33	4.00	-0.17	0.17	1.03	0.06	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.34	4.00	-0.18	0.18	1.03	0.06	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.35	4.00	-0.18	0.18	1.02	0.06	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.36	4.00	-0.19	0.19	1.02	0.06	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.36	4.00	-0.19	0.19	1.02	0.06	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.37	4.00	-0.20	0.20	1.02	0.06	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.38	4.00	-0.20	0.20	1.02	0.07	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.39	4.00	-0.21	0.21	1.01	0.07	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.40	4.00	-0.21	0.21	1.01	0.07	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.41	4.00	-0.22	0.22	1.01	0.07	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.42	4.00	-0.22	0.22	1.01	0.07	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.43	4.00	-0.23	0.23	1.01	0.07	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.44	4.00	-0.23	0.23	1.01	0.08	3.77	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.44	4.00	-0.23	0.23	1.00	0.08	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.45	4.00	-0.24	0.24	1.00	0.08	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.46	4.00	-0.24	0.24	1.00	0.08	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.47	4.00	-0.25	0.25	1.00	0.08	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.48	4.00	-0.25	0.25	0.99	0.08	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.49	4.00	-0.26	0.26	0.99	0.09	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.50	4.00	-0.26	0.26	0.99	0.09	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.51	4.00	-0.27	0.27	0.99	0.09	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.52	4.00	-0.27	0.27	0.99	0.09	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.52	4.00	-0.28	0.28	0.98	0.09	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.53	4.00	-0.28	0.28	0.98	0.10	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11

Lic. #: KW-06007744

Licensee: EPIC ENGINEERING, PC

Description: LOWER ROOF CONCRETE SLAB

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.20D+1.60S+0.50W+1.60H	1	2.54	4.00	-0.29	0.29	0.98	0.10	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.55	4.00	-0.29	0.29	0.98	0.10	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.56	4.00	-0.30	0.30	0.97	0.10	3.78	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.57	4.00	-0.30	0.30	0.97	0.10	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.58	4.00	-0.30	0.30	0.97	0.11	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.59	4.00	-0.31	0.31	0.96	0.11	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.60	4.00	-0.31	0.31	0.96	0.11	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.60	4.00	-0.32	0.32	0.96	0.11	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.61	4.00	-0.32	0.32	0.96	0.11	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.62	4.00	-0.33	0.33	0.95	0.11	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.63	4.00	-0.33	0.33	0.95	0.12	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.64	4.00	-0.34	0.34	0.95	0.12	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.65	4.00	-0.34	0.34	0.94	0.12	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.66	4.00	-0.35	0.35	0.94	0.12	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.67	4.00	-0.35	0.35	0.94	0.12	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.68	4.00	-0.36	0.36	0.93	0.13	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.68	4.00	-0.36	0.36	0.93	0.13	3.79	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.69	4.00	-0.37	0.37	0.93	0.13	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.70	4.00	-0.37	0.37	0.93	0.13	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.71	4.00	-0.38	0.38	0.92	0.14	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.72	4.00	-0.38	0.38	0.92	0.14	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.73	4.00	-0.38	0.38	0.92	0.14	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.74	4.00	-0.39	0.39	0.91	0.14	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.75	4.00	-0.39	0.39	0.91	0.14	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.76	4.00	-0.40	0.40	0.90	0.15	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.76	4.00	-0.40	0.40	0.90	0.15	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.77	4.00	-0.41	0.41	0.90	0.15	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.78	4.00	-0.41	0.41	0.89	0.15	3.80	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.79	4.00	-0.42	0.42	0.89	0.16	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.80	4.00	-0.42	0.42	0.89	0.16	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.81	4.00	-0.43	0.43	0.88	0.16	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.82	4.00	-0.43	0.43	0.88	0.16	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.83	4.00	-0.44	0.44	0.87	0.17	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.84	4.00	-0.44	0.44	0.87	0.17	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.84	4.00	-0.45	0.45	0.87	0.17	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.85	4.00	-0.45	0.45	0.86	0.17	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.86	4.00	-0.45	0.45	0.86	0.18	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.87	4.00	-0.46	0.46	0.86	0.18	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.88	4.00	-0.46	0.46	0.85	0.18	3.81	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.89	4.00	-0.47	0.47	0.85	0.18	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.90	4.00	-0.47	0.47	0.84	0.19	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.91	4.00	-0.48	0.48	0.84	0.19	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.92	4.00	-0.48	0.48	0.83	0.19	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.92	4.00	-0.49	0.49	0.83	0.20	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.93	4.00	-0.49	0.49	0.83	0.20	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.94	4.00	-0.50	0.50	0.82	0.20	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.95	4.00	-0.50	0.50	0.82	0.20	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.96	4.00	-0.51	0.51	0.81	0.21	3.82	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.97	4.00	-0.51	0.51	0.81	0.21	3.83	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.98	4.00	-0.52	0.52	0.80	0.21	3.83	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	2.99	4.00	-0.52	0.52	0.80	0.22	3.83	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.00	4.00	-0.53	0.53	0.79	0.22	3.83	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.00	4.00	-0.53	0.53	0.79	0.22	3.83	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.01	4.00	-0.53	0.53	0.78	0.23	3.83	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0

Concrete Beam

File = S:\PROJ\SHKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11

Lic. #: KW-06007744

Licensee: EPIC ENGINEERING, PC

Description: LOWER ROOF CONCRETE SLAB

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.20D+1.60S+0.50W+1.60H	1	3.02	4.00	-0.54	0.54	0.78	0.23	3.83	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.03	4.00	-0.54	0.54	0.77	0.23	3.83	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.04	4.00	-0.55	0.55	0.77	0.24	3.84	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.05	4.00	-0.55	0.55	0.76	0.24	3.84	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.06	4.00	-0.56	0.56	0.76	0.24	3.84	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.07	4.00	-0.56	0.56	0.76	0.25	3.84	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.08	4.00	-0.57	0.57	0.75	0.25	3.84	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.08	4.00	-0.57	0.57	0.74	0.26	3.84	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.09	4.00	-0.58	0.58	0.74	0.26	3.84	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.10	4.00	-0.58	0.58	0.73	0.26	3.85	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.11	4.00	-0.59	0.59	0.73	0.27	3.85	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.12	4.00	-0.59	0.59	0.72	0.27	3.85	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.13	4.00	-0.60	0.60	0.72	0.28	3.85	Vu < PhiVc/2	Not Req'd	3.8	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.14	4.00	-0.60	0.60	0.71	0.28	3.85	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.15	4.00	-0.60	0.60	0.71	0.28	3.85	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.16	4.00	-0.61	0.61	0.70	0.29	3.85	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.16	4.00	-0.61	0.61	0.70	0.29	3.86	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.17	4.00	-0.62	0.62	0.69	0.30	3.86	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.18	4.00	-0.62	0.62	0.69	0.30	3.86	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.19	4.00	-0.63	0.63	0.68	0.31	3.86	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.20	4.00	-0.63	0.63	0.68	0.31	3.86	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.21	4.00	-0.64	0.64	0.67	0.32	3.87	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.22	4.00	-0.64	0.64	0.66	0.32	3.87	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.23	4.00	-0.65	0.65	0.66	0.33	3.87	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.24	4.00	-0.65	0.65	0.65	0.33	3.87	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.24	4.00	-0.66	0.66	0.65	0.34	3.87	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.25	4.00	-0.66	0.66	0.64	0.34	3.88	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.26	4.00	-0.67	0.67	0.63	0.35	3.88	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.27	4.00	-0.67	0.67	0.63	0.36	3.88	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.28	4.00	-0.68	0.68	0.62	0.36	3.88	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.29	4.00	-0.68	0.68	0.62	0.37	3.88	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.30	4.00	-0.68	0.68	0.61	0.37	3.89	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.31	4.00	-0.69	0.69	0.60	0.38	3.89	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.32	4.00	-0.69	0.69	0.60	0.39	3.89	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.32	4.00	-0.70	0.70	0.59	0.39	3.89	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.33	4.00	-0.70	0.70	0.59	0.40	3.90	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.34	4.00	-0.71	0.71	0.58	0.41	3.90	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.35	4.00	-0.71	0.71	0.57	0.41	3.90	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.36	4.00	-0.72	0.72	0.57	0.42	3.90	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.37	4.00	-0.72	0.72	0.56	0.43	3.91	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.38	4.00	-0.73	0.73	0.55	0.44	3.91	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.39	4.00	-0.73	0.73	0.55	0.45	3.91	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.40	4.00	-0.74	0.74	0.54	0.45	3.92	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.40	4.00	-0.74	0.74	0.53	0.46	3.92	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.41	4.00	-0.75	0.75	0.53	0.47	3.92	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.42	4.00	-0.75	0.75	0.52	0.48	3.93	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.43	4.00	-0.76	0.76	0.51	0.49	3.93	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.44	4.00	-0.76	0.76	0.51	0.50	3.93	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.45	4.00	-0.76	0.76	0.50	0.51	3.94	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.46	4.00	-0.77	0.77	0.49	0.52	3.94	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.47	4.00	-0.77	0.77	0.49	0.53	3.94	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.48	4.00	-0.78	0.78	0.48	0.54	3.95	Vu < PhiVc/2	Not Req'd	3.9	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.48	4.00	-0.78	0.78	0.47	0.55	3.95	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.49	4.00	-0.79	0.79	0.47	0.56	3.96	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. #: KW-06007744

Description: LOWER ROOF CONCRETE SLAB

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.20D+1.60S+0.50W+1.60H	1	3.50	4.00	-0.79	0.79	0.46	0.57	3.96	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.51	4.00	-0.80	0.80	0.45	0.59	3.97	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.52	4.00	-0.80	0.80	0.45	0.60	3.97	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.53	4.00	-0.81	0.81	0.44	0.61	3.98	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.54	4.00	-0.81	0.81	0.43	0.63	3.98	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.55	4.00	-0.82	0.82	0.42	0.64	3.99	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.56	4.00	-0.82	0.82	0.42	0.66	3.99	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.56	4.00	-0.83	0.83	0.41	0.67	4.00	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.57	4.00	-0.83	0.83	0.40	0.69	4.00	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.58	4.00	-0.83	0.83	0.39	0.70	4.01	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.59	4.00	-0.84	0.84	0.39	0.72	4.02	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.60	4.00	-0.84	0.84	0.38	0.74	4.02	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.61	4.00	-0.85	0.85	0.37	0.76	4.03	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.62	4.00	-0.85	0.85	0.36	0.78	4.04	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.63	4.00	-0.86	0.86	0.36	0.80	4.05	Vu < PhiVc/2	Not Req'd	4.0	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.64	4.00	-0.86	0.86	0.35	0.82	4.06	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.64	4.00	-0.87	0.87	0.34	0.85	4.06	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.65	4.00	-0.87	0.87	0.33	0.87	4.07	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.66	4.00	-0.88	0.88	0.33	0.90	4.08	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.67	4.00	-0.88	0.88	0.32	0.92	4.09	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.68	4.00	-0.89	0.89	0.31	0.95	4.10	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.69	4.00	-0.89	0.89	0.30	0.98	4.11	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.70	4.00	-0.90	0.90	0.29	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.71	4.00	-0.90	0.90	0.29	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.72	4.00	-0.91	0.91	0.28	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.72	4.00	-0.91	0.91	0.27	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.73	4.00	-0.91	0.91	0.26	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.74	4.00	-0.92	0.92	0.25	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.75	4.00	-0.92	0.92	0.25	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.76	4.00	-0.93	0.93	0.24	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.77	4.00	-0.93	0.93	0.23	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.78	4.00	-0.94	0.94	0.22	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.79	4.00	-0.94	0.94	0.21	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.80	4.00	-0.95	0.95	0.20	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.80	4.00	-0.95	0.95	0.20	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.81	4.00	-0.96	0.96	0.19	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.82	4.00	-0.96	0.96	0.18	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.83	4.00	-0.97	0.97	0.17	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.84	4.00	-0.97	0.97	0.16	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.85	4.00	-0.98	0.98	0.15	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.86	4.00	-0.98	0.98	0.14	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.87	4.00	-0.98	0.98	0.14	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.88	4.00	-0.99	0.99	0.13	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.88	4.00	-0.99	0.99	0.12	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.89	4.00	-1.00	1.00	0.11	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.90	4.00	-1.00	1.00	0.10	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.91	4.00	-1.01	1.01	0.09	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.92	4.00	-1.01	1.01	0.08	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.93	4.00	-1.02	1.02	0.07	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.94	4.00	-1.02	1.02	0.06	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.95	4.00	-1.03	1.03	0.06	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.96	4.00	-1.03	1.03	0.05	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.96	4.00	-1.04	1.04	0.04	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.97	4.00	-1.04	1.04	0.03	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-V\LWNXF1-XIC7A4YC-FL2FOR8-B.EC6

ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11

Lic. # : KW-06007744

Licensee : EPIC ENGINEERING, PC

Description : LOWER ROOF CONCRETE SLAB

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.20D+1.60S+0.50W+1.60H	1	3.98	4.00	-1.05	1.05	0.02	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	3.99	4.00	-1.05	1.05	0.01	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0
+1.20D+1.60S+0.50W+1.60H	1	4.00	4.00	-1.06	1.06	0.00	1.00	4.12	Vu < PhiVc/2	Not Req'd	4.1	0.0	0.0

Wall Footing

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
ENERCALC, INC. 1983-2015, Build:6.15.1.19, Ver:6.15.1.19

Lic. #: KW-06007744

Licensee: EPIC ENGINEERING, PC

Description: F-1

Code References

Calculations per ACI 318-11, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used: IBC 2012

General Information

Material Properties

f_c : Concrete 28 day strength	=	3.0 ksi
f_y : Rebar Yield	=	60.0 ksi
E_c : 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
AutoCalc Footing Weight as DL	:	Yes

Soil Design Values

Allowable Soil Bearing	=	5.0 ksf
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

Reference Depth below Surface	=	ft
Allow. Pressure Increase per foot of depth when base footing is below	=	ksf ft

Increases based on footing Width

Allow. Pressure Increase per foot of width when footing is wider than	=	ksf ft
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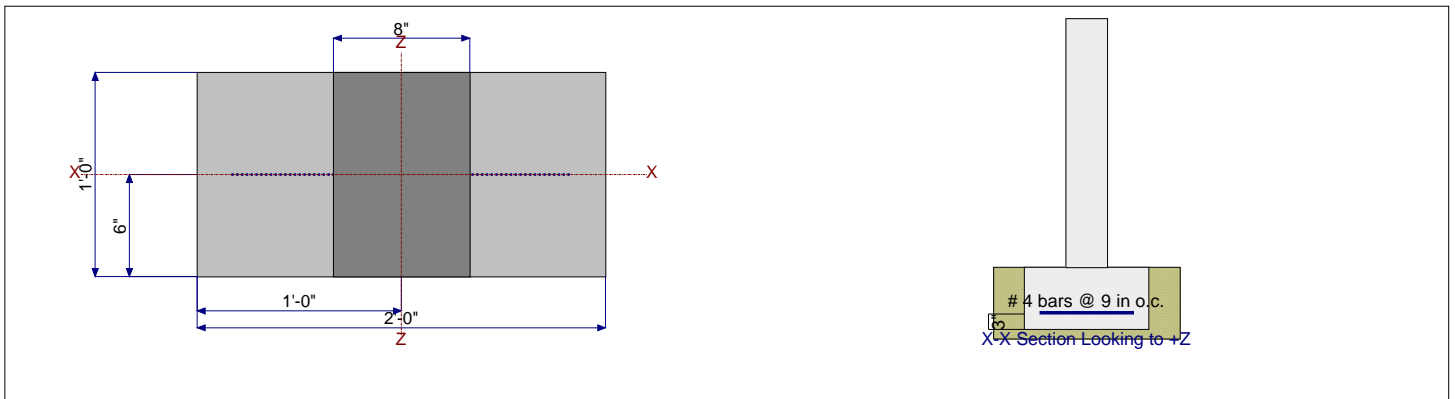
Dimensions

Footing Width	=	2.0 ft
Wall Thickness	=	8.0 in
Wall center offset from center of footing	=	0 in

Footing Thickness	=	12.0 in
Rebar Centerline to Edge of Concrete.. at Bottom of footing	=	3.0 in

Reinforcing

Bars along X-X Axis	=	
Bar spacing	=	9.00
Reinforcing Bar Size	=	# 4



Applied Loads

	D	Lr	L	S	W	E	H
P: Column Load	=	2.10		0.880	4.60		
OB: Overburden	=						k ksf
V-x	=						k
M-zz	=						k-ft
Vx applied	=						in above top of footing

DESIGN SUMMARY

Design OK

	Min. Ratio	Item	Applied	Capacity	Governing Load Combination
PASS	0.6990	Soil Bearing	3.495 ksf	5.0 ksf	+D+S+H
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	Uplift	0.0 k	0.0 k	No Uplift
PASS	0.1130	Z Flexure (+X)	1.185 k-ft	10.486 k-ft	+1.20D+0.50L+1.60S+1
PASS	0.02279	Z Flexure (-X)	0.2390 k-ft	10.486 k-ft	+0.90D+E+0.90H
PASS	n/a	1-way Shear (+X)	0.0 psi	82.158 psi	n/a
PASS	0.0	1-way Shear (-X)	0.0 psi	0.0 psi	n/a



Wall Footing

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
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Lic. # : KW-06007744

Description : F-1

Detailed Results

Soil Bearing

Rotation Axis & Load Combination...	Gross Allowable	Xeccc	Zeccc	Actual Soil Bearing Stress				Actual / Allowable Ratio
				+Z	+Z	-X	-X	
, +D+H	5.0 ksf	0.0 in			1.195 ksf	1.195 ksf	0.239	
, +D+L+H	5.0 ksf	0.0 in			1.635 ksf	1.635 ksf	0.327	
, +D+Lr+H	5.0 ksf	0.0 in			1.195 ksf	1.195 ksf	0.239	
, +D+S+H	5.0 ksf	0.0 in			3.495 ksf	3.495 ksf	0.699	
, +D+0.750Lr+0.750L+H	5.0 ksf	0.0 in			1.525 ksf	1.525 ksf	0.305	
, +D+0.750L+0.750S+H	5.0 ksf	0.0 in			3.250 ksf	3.250 ksf	0.650	
, +D+0.60W+H	5.0 ksf	0.0 in			1.195 ksf	1.195 ksf	0.239	
, +D+0.70E+H	5.0 ksf	0.0 in			1.195 ksf	1.195 ksf	0.239	
, +D+0.750Lr+0.750L+0.450W+H	5.0 ksf	0.0 in			1.525 ksf	1.525 ksf	0.305	
, +D+0.750L+0.750S+0.450W+H	5.0 ksf	0.0 in			3.250 ksf	3.250 ksf	0.650	
, +D+0.750L+0.750S+0.5250E+H	5.0 ksf	0.0 in			3.250 ksf	3.250 ksf	0.650	
, +0.60D+0.60W+0.60H	5.0 ksf	0.0 in			0.7170 ksf	0.7170 ksf	0.143	
, +0.60D+0.70E+0.60H	5.0 ksf	0.0 in			0.7170 ksf	0.7170 ksf	0.143	

Units : k-ft

Overturning Stability

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

Sliding Stability

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

Footing Flexure

Flexure Axis & Load Combination	Mu k-ft	Which Side ?	Tension @ Bot. or Top ?	As Req'd in^2	Gvrn. As in^2	Actual As in^2	Phi*Mn k-ft	Status
, +1.40D+1.60H	0.3718	-X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.40D+1.60H	0.3718	+X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+0.50Lr+1.60L+1.60H	0.4751	-X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+0.50Lr+1.60L+1.60H	0.4751	+X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+1.60L+0.50S+1.60H	0.7307	-X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+1.60L+0.50S+1.60H	0.7307	+X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+1.60Lr+0.50L+1.60H	0.3676	-X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+1.60Lr+0.50L+1.60H	0.3676	+X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+1.60Lr+0.50W+1.60H	0.3187	-X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+1.60Lr+0.50W+1.60H	0.3187	+X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+0.50L+1.60S+1.60H	1.185	-X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+0.50L+1.60S+1.60H	1.185	+X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+1.60S+0.50W+1.60H	1.136	-X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+1.60S+0.50W+1.60H	1.136	+X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+0.50Lr+0.50L+W+1.60H	0.3676	-X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+0.50Lr+0.50L+W+1.60H	0.3676	+X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+0.50L+0.50S+W+1.60H	0.6231	-X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+0.50L+0.50S+W+1.60H	0.6231	+X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+0.50L+0.70S+E+1.60H	0.7253	-X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +1.20D+0.50L+0.70S+E+1.60H	0.7253	+X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +0.90D+W+0.90H	0.239	-X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +0.90D+W+0.90H	0.239	+X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +0.90D+E+0.90H	0.239	-X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK
, +0.90D+E+0.90H	0.239	+X	Bottom	0.2592	Min Temp %	0.2667	10.486	OK

Units : k

One Way Shear

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+1.40D+1.60H	0 psi	0 psi	0 psi	82.158 psi	0	OK
+1.20D+0.50Lr+1.60L+1.60H	0 psi	0 psi	0 psi	82.158 psi	0	OK
+1.20D+1.60L+0.50S+1.60H	0 psi	0 psi	0 psi	82.158 psi	0	OK
+1.20D+1.60Lr+0.50L+1.60H	0 psi	0 psi	0 psi	82.158 psi	0	OK
+1.20D+1.60Lr+0.50W+1.60H	0 psi	0 psi	0 psi	82.158 psi	0	OK
+1.20D+0.50L+1.60S+1.60H	0 psi	0 psi	0 psi	82.158 psi	0	OK
+1.20D+1.60S+0.50W+1.60H	0 psi	0 psi	0 psi	82.158 psi	0	OK



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Title Block Line 6

Wall Footing

File = S:\PROJ\SHSKCD-4\21YFRF-IVANCBNR-VLWNXFI-XIC7A4YC-FL2FOR8-B.EC6
ENERCALC, INC. 1983-2015, Build:6.15.1.19, Ver:6.15.1.19

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Description : F-1

+1.20D+0.50Lr+0.50L+W+1.60H	0 psi	0 psi	0 psi	82.158 psi	0	OK
+1.20D+0.50L+0.50S+W+1.60H	0 psi	0 psi	0 psi	82.158 psi	0	OK
+1.20D+0.50L+0.70S+E+1.60H	0 psi	0 psi	0 psi	82.158 psi	0	OK



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Title Block Line 6

Wall Footing

File = S:\PROJ\SHSKCD-4\21YFRF-IVANCBNR-VLWNXFI-XIC7A4YC-FL2FOR8-B.EC6
ENERCALC, INC. 1983-2015, Build:6.15.1.19, Ver:6.15.1.19

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Description : F-1

One Way Shear

Units : k

Load Combination...	Vu @ -X	Vu @ +X	Vu:Max	Phi Vn	Vu / Phi*Vn	Status
+0.90D+W+0.90H	0 psi	0 psi	0 psi	82.158 psi	0	OK
+0.90D+E+0.90H	0 psi	0 psi	0 psi	82.158 psi	0	OK

Concrete Column

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
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Lic. # : KW-06007744

Licensee : EPIC ENGINEERING, PC

Description : P-1

Code References

Calculations per ACI 318-11, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : IBC2012

General Information

f_c : Concrete 28 day strength = 3.0 ksi
 E = 3,122.0 ksi
 Density = 145.0 pcf
 β = 0.850
 f_y - Main Rebar = 60.0 ksi
 E - Main Rebar = 29,000.0 ksi
 Allow. Reinforcing Limits *ASTM A615 Bars Used*
 Min. Reinf. = 1.0 %
 Max. Reinf. = 8.0 %

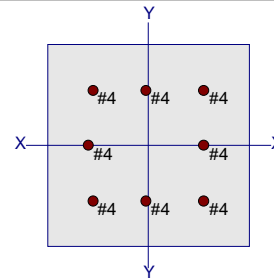
Load Combination : IBC2012

Overall Column Height = 8.0 ft
 End Fixity **Top & Bottom Pinned**
 Brace condition for deflection (buckling) along columns :
 X-X (width) axis :
 Unbraced Length for X-X Axis buckling = 2 ft, $K = 1.0$
 Y-Y (depth) axis :
 Unbraced Length for X-X Axis buckling = 2 ft, $K = 1.0$

Column Cross Section

Column Dimensions : 10.0in Square Column, Column Edge to Rebar
Edge Cover = 2.0in

Column Reinforcing : 4 - #4 bars @ corners,, 1 - #4 bars top & bottom
between corner bars, 1 - #4 bars left & right
between corner bars



Applied Loads

Entered loads are factored per load combinations specified by user.

Column self weight included : 805.56 lbs * Dead Load Factor

AXIAL LOADS . . .

POINTLOADFROMDECKBEAM: Axial Load at 8.0 ft above base, D = 8.60 k

BENDING LOADS . . .

Lat. Point Load at 8.0 ft creating M_x -x, $E = 9.0$ k

DESIGN SUMMARY

Load Combination	+1.40D+1.60H	Maximum SERVICE Load Reactions . .		
Location of max. above base	7.946 ft	Top along Y-Y	0.0 k	Bottom along Y-Y 0.0 k
Maximum Stress Ratio	0.073 : 1	Top along X-X	0.0 k	Bottom along X-X 0.0 k
Ratio = $(P_u^2 + M_u^2)^{.5} / (\Phi P_n^2 + \Phi M_n^2)^{.5}$				
P_u =	13.168 k	$\Phi * P_n$ =	180.398 k	
M_u -x =	0.0 k-ft	$\Phi * M_n$ -x =	0.0 k-ft	
M_u -y =	0.0 k-ft	$\Phi * M_n$ -y =	0.0 k-ft	
M_u Angle =	0.0 deg			
M_u at Angle =	0.0 k-ft	ΦM_n at Angle =	0.0 k-ft	
<i>P_n & M_n values located at P_u-M_u vector intersection with capacity curve</i>				
Column Capacities . . .		Maximum SERVICE Load Deflections . . .		
P_{nmax} : Nominal Max. Compressive Axial Capacity	346.920 k	Along Y-Y	0.0 in at	0.0 ft above base
P_{nmin} : Nominal Min. Tension Axial Capacity	-96.0 k	for load combination :		
ΦP_n , max : Usable Compressive Axial Capacity	180.398 k	Along X-X	0.0 in at	0.0 ft above base
ΦP_n , min : Usable Tension Axial Capacity	-62.40 k	for load combination :		
		General Section Information . $\rho = 0.650$ $\beta = 0.850$ $\theta = 0.80$		
		ρ : % Reinforcing	1.60 %	Rebar % Ok
		Reinforcing Area	1.60 in ²	
		Concrete Area	100.0 in ²	

Concrete Column

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-V\LWNXF1-XIC7A4YC-FL2FOR8-B.EC6
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Lic. # : KW-06007744

Description : P-1

Governing Load Combination Results

Governing Factored Load Combination	Moment Source		Dist. from base ft	Axial Load k			Bending Analysis					k-ft δ Mu	Utilization Ratio
	X-X	Y-Y		Pu	ϕ	* Pn	δx	$\delta x * Mu_x$	δy	$\delta y * Mu_y$	Alpha (deg)		
+1.40D+1.60H			7.95	13.17		180.40					0.000		0.073
+1.20D+0.50Lr+1.60L+1.60H			7.95	11.29		180.40					0.000		0.063
+1.20D+1.60L+0.50S+1.60H			7.95	11.29		180.40					0.000		0.063
+1.20D+1.60Lr+0.50L+1.60H			7.95	11.29		180.40					0.000		0.063
+1.20D+1.60Lr+0.50W+1.60H			7.95	11.29		180.40					0.000		0.063
+1.20D+0.50L+1.60S+1.60H			7.95	11.29		180.40					0.000		0.063
+1.20D+1.60S+0.50W+1.60H			7.95	11.29		180.40					0.000		0.063
+1.20D+0.50Lr+0.50L+W+1.60H			7.95	11.29		180.40					0.000		0.063
+1.20D+0.50L+0.50S+W+1.60H			7.95	11.29		180.40					0.000		0.063
+1.20D+0.50L+0.70S+E+1.60H			7.95	11.29		180.40					0.000		0.063
+0.90D+W+0.90H			7.95	8.47		180.40					0.000		0.047
+0.90D+E+0.90H			7.95	8.47		180.40					0.000		0.047

Note: Only non-zero reactions are listed.

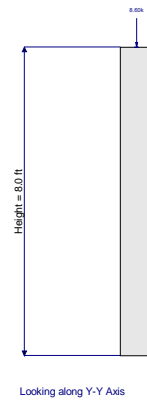
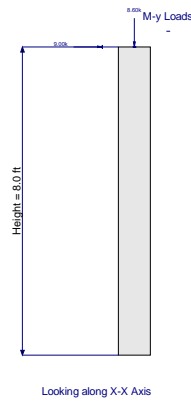
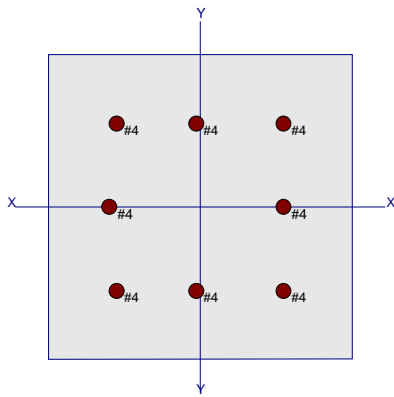
Maximum Reactions

Load Combination	Reaction along X-X Axis		Reaction along Y-Y Axis		Axial Reaction @ Base
	@ Base	@ Top	@ Base	@ Top	

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance

Sketches



Interaction Diagrams



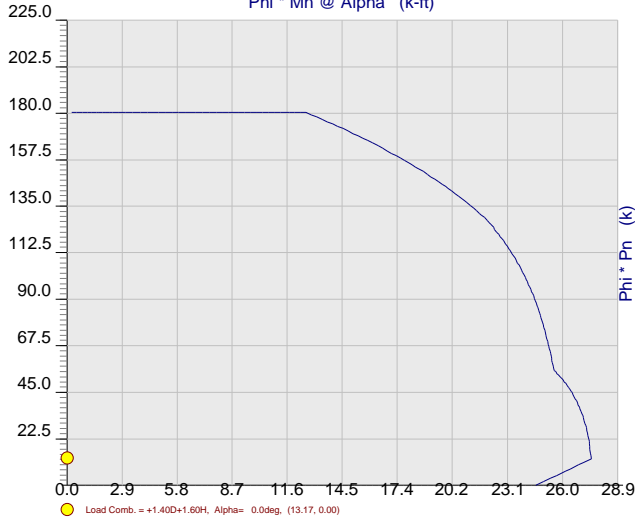
Concrete Column

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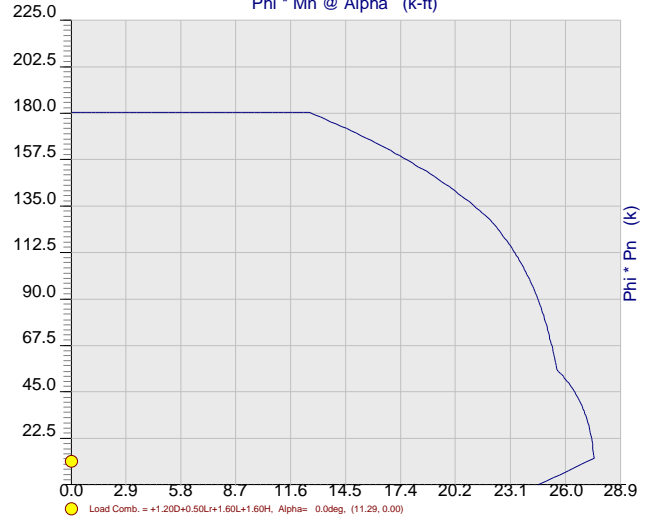
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Description : P-1

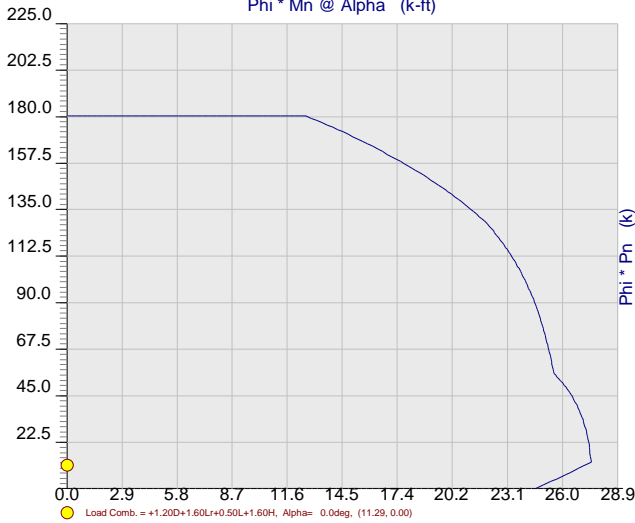
Concrete Column P-M Interaction Diagram
Phi * Mn @ Alpha (k-ft)



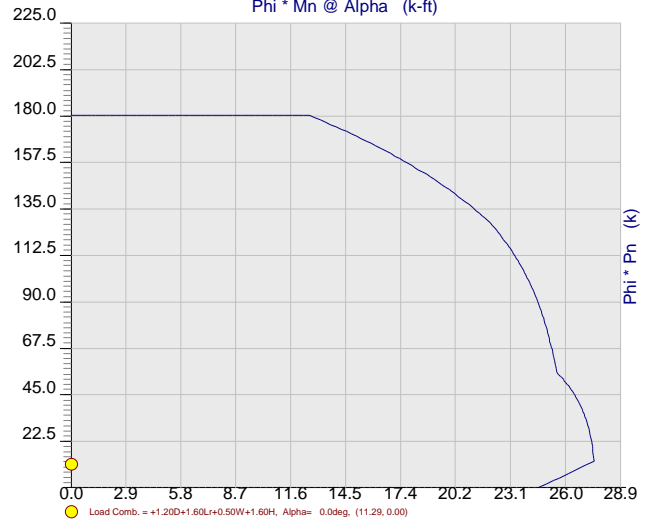
Concrete Column P-M Interaction Diagram
Phi * Mn @ Alpha (k-ft)



Concrete Column P-M Interaction Diagram
Phi * Mn @ Alpha (k-ft)



Concrete Column P-M Interaction Diagram
Phi * Mn @ Alpha (k-ft)



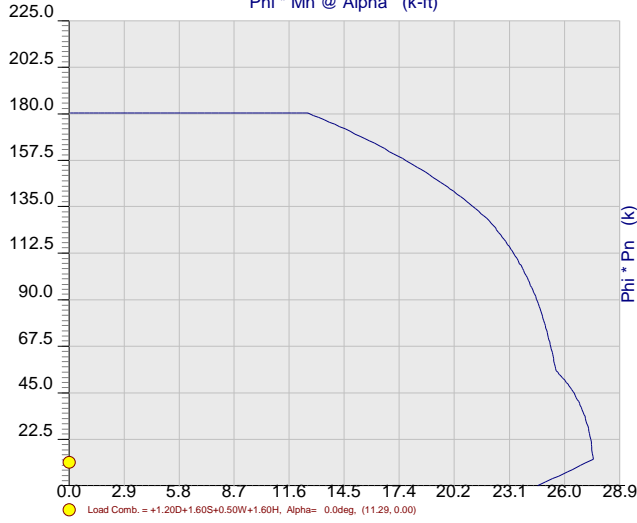


Concrete Column

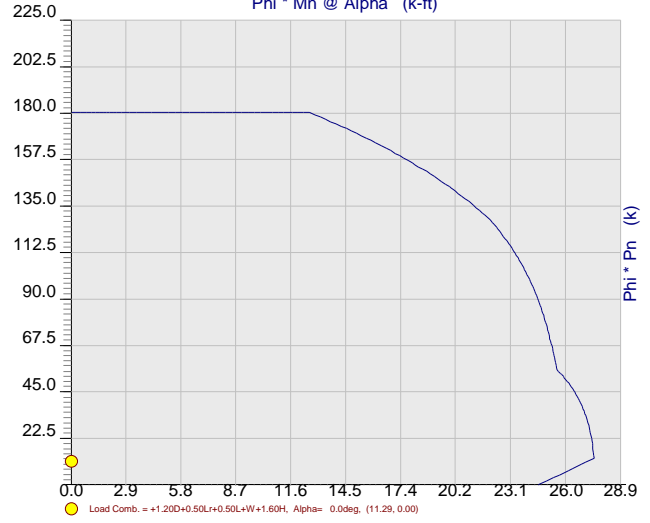
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Description : P-1

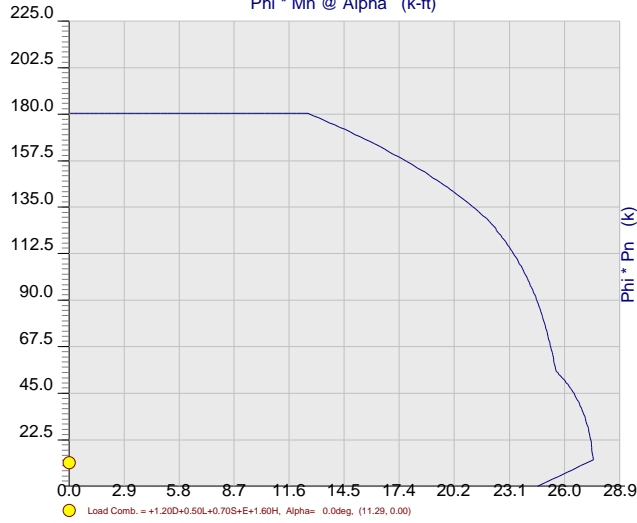
Concrete Column P-M Interaction Diagram
Phi * Mn @ Alpha (k-ft)



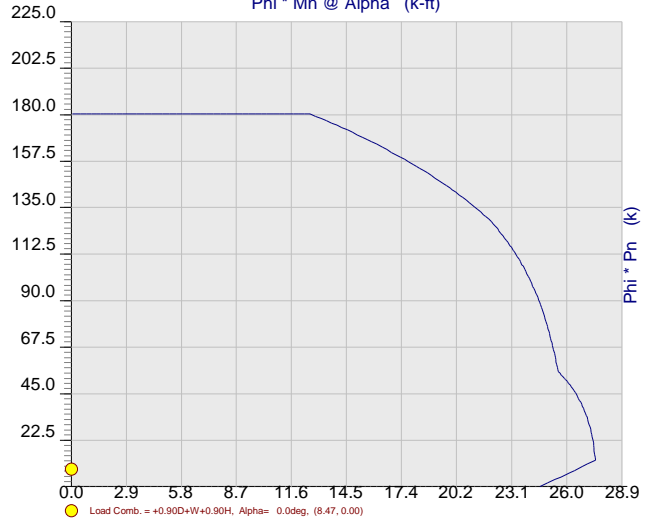
Concrete Column P-M Interaction Diagram
Phi * Mn @ Alpha (k-ft)



Concrete Column P-M Interaction Diagram
Phi * Mn @ Alpha (k-ft)



Concrete Column P-M Interaction Diagram
Phi * Mn @ Alpha (k-ft)





Steel Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
ENERCALC, INC. 1983-2015, Build:6.15.1.19, Ver:6.15.1.19
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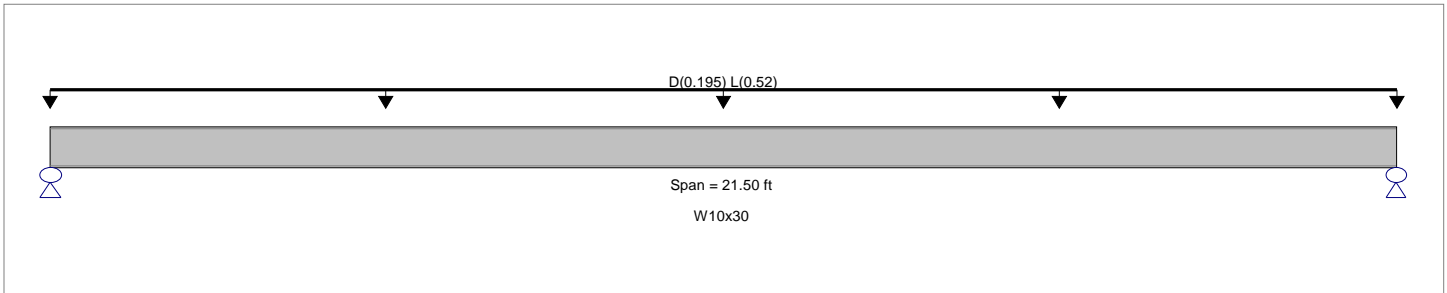
Description : FB-1

CODE REFERENCES

Calculations per AISC 360-10, IBC 2012, ASCE 7-10
Load Combination Set : IBC2012

Material Properties

Analysis Method : Allowable Strength Design
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling
Bending Axis : Major Axis Bending
Load Combination IBC2012
Fy : Steel Yield : 50.0 ksi
E : Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
Uniform Load : D = 0.0150, L = 0.040 ksf, Tributary Width = 13.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.471 : 1	Maximum Shear Stress Ratio =	0.127 : 1
Section used for this span	W10x30	Section used for this span	W10x30
Ma : Applied	43.052 k-ft	Va : Applied	8.010 k
Mn / Omega : Allowable	91.317 k-ft	Vn/Omega : Allowable	63.0 k
Load Combination	+D+L	Load Combination	+D+L
Location of maximum on span	10.750ft	Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.511 in	Ratio =	504
Max Upward Transient Deflection	0.000 in	Ratio =	0 <480
Max Downward Total Deflection	0.732 in	Ratio =	352
Max Upward Total Deflection	0.000 in	Ratio =	0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values					Summary of Shear Values					
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega	
D Only															
Dsgn. L = 21.50 ft		1	0.142	0.038	13.01		13.01	152.50	91.32	1.00	1.00	2.42	94.50	63.00	
+D+L															
Dsgn. L = 21.50 ft		1	0.471	0.127	43.05		43.05	152.50	91.32	1.00	1.00	8.01	94.50	63.00	
+D+Lr															
Dsgn. L = 21.50 ft		1	0.142	0.038	13.01		13.01	152.50	91.32	1.00	1.00	2.42	94.50	63.00	
+D+S															
Dsgn. L = 21.50 ft		1	0.142	0.038	13.01		13.01	152.50	91.32	1.00	1.00	2.42	94.50	63.00	
+D+0.750Lr+0.750L															
Dsgn. L = 21.50 ft		1	0.389	0.105	35.54		35.54	152.50	91.32	1.00	1.00	6.61	94.50	63.00	
+D+0.750L+0.750S															
Dsgn. L = 21.50 ft		1	0.389	0.105	35.54		35.54	152.50	91.32	1.00	1.00	6.61	94.50	63.00	
+D+0.60W															
Dsgn. L = 21.50 ft		1	0.142	0.038	13.01		13.01	152.50	91.32	1.00	1.00	2.42	94.50	63.00	
+D+0.70E															
Dsgn. L = 21.50 ft		1	0.142	0.038	13.01		13.01	152.50	91.32	1.00	1.00	2.42	94.50	63.00	
+D+0.750Lr+0.750L+0.450W															
Dsgn. L = 21.50 ft		1	0.389	0.105	35.54		35.54	152.50	91.32	1.00	1.00	6.61	94.50	63.00	
+D+0.750L+0.750S+0.450W															
Dsgn. L = 21.50 ft		1	0.389	0.105	35.54		35.54	152.50	91.32	1.00	1.00	6.61	94.50	63.00	
+D+0.750L+0.750S+0.5250E															
Dsgn. L = 21.50 ft		1	0.389	0.105	35.54		35.54	152.50	91.32	1.00	1.00	6.61	94.50	63.00	
+0.60D+0.60W															
Dsgn. L = 21.50 ft		1	0.085	0.023	7.80		7.80	152.50	91.32	1.00	1.00	1.45	94.50	63.00	



Steel Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-V\LWNXF1-XIC7A4YC-FL2FOR8-B.EC6
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Description : FB-1

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
+0.60D+0.70E	Dsgn. L = 21.50 ft	1	0.085	0.023	7.80		7.80	152.50	91.32	1.00	1.00	1.45	94.50	63.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.7324	10.858		0.0000	0.000

Vertical Reactions

Load Combination	Support 1	Support 2
Overall MAXimum	8.010	8.010
Overall MINimum	1.452	1.452
D Only	2.420	2.420
+D+L	8.010	8.010
+D+Lr	2.420	2.420
+D+S	2.420	2.420
+D+0.750Lr+0.750L	6.612	6.612
+D+0.750L+0.750S	6.612	6.612
+D+0.60W	2.420	2.420
+D+0.70E	2.420	2.420
+D+0.750Lr+0.750L+0.450W	6.612	6.612
+D+0.750L+0.750S+0.450W	6.612	6.612
+D+0.750L+0.750S+0.5250E	6.612	6.612
+0.60D+0.60W	1.452	1.452
+0.60D+0.70E	1.452	1.452
D Only	2.420	2.420
Lr Only		
L Only	5.590	5.590
S Only		
W Only		
E Only		
H Only		

Support notation : Far left is #1

Values in KIPS

Wood Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. # : KW-06007744

Description : FB-2

CODE REFERENCES

Calculations per NDS 2012, IBC 2012, CBC 2013, ASCE 7-10

Load Combination Set : IBC 2012

Material Properties

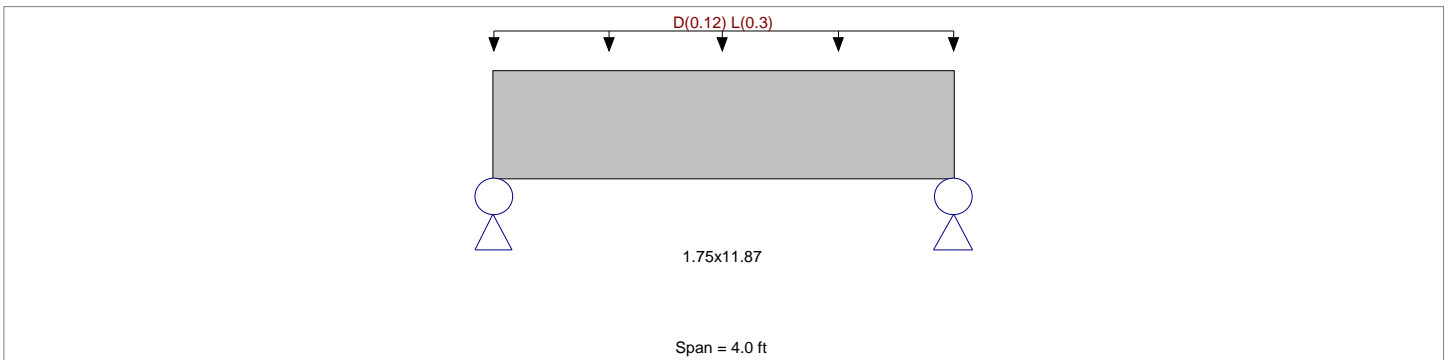
Analysis Method : Allowable Stress Design
 Load Combination IBC 2012

Wood Species : iLevel Truss Joist
 Wood Grade : MicroLam LVL 1.9 E

Beam Bracing : Beam is Fully Braced against lateral-torsion buckling

Fb - Tension 2600 psi
 Fb - Compr 2600 psi
 Fc - Prll 2510 psi
 Fc - Perp 750 psi
 Fv 285 psi
 Ft 1555 psi

E : Modulus of Elasticity
 Ebend- xx 1900 ksi
 Eminbend - xx 965.71 ksi
 Density 42pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Uniform Load : D = 0.0160, L = 0.040 ksf, Tributary Width = 7.50 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.094 : 1	Maximum Shear Stress Ratio	=	0.109 : 1
Section used for this span	=	1.75x11.87	Section used for this span	=	1.75x11.87
fb : Actual	=	245.08 psi	fv : Actual	=	30.98 psi
FB : Allowable	=	2,600.00 psi	Fv : Allowable	=	285.00 psi
Load Combination	=	+D+L+H	Load Combination	=	+D+L+H
Location of maximum on span	=	2.000ft	Location of maximum on span	=	3.022 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection	=	0.004 in	Ratio =	=	12813
Max Upward Transient Deflection	=	0.000 in	Ratio =	=	0 < 480
Max Downward Total Deflection	=	0.005 in	Ratio =	=	9152
Max Upward Total Deflection	=	0.000 in	Ratio =	=	0 < 240

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values								
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v						
+D+H	Length = 4.0 ft	1	0.030	0.035	0.90	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.24	70.02	2340.00	0.00	0.00	0.00	0.12	8.85	256.50	
+D+L+H	Length = 4.0 ft	1	0.094	0.109	1.00	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.84	245.08	2600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
+D+Lr+H	Length = 4.0 ft	1	0.022	0.025	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.24	70.02	3250.00	0.00	0.00	0.00	0.12	8.85	356.25	
+D+S+H	Length = 4.0 ft	1	0.023	0.027	1.15	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.24	70.02	2990.00	0.00	0.00	0.00	0.12	8.85	327.75	
+D+0.750Lr+0.750L+H	Length = 4.0 ft	1	0.062	0.071	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.69	201.32	3250.00	0.00	0.00	0.00	0.35	25.45	356.25	
+D+0.750L+0.750S+H	Length = 4.0 ft	1	0.067	0.078	1.15	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.69	201.32	2990.00	0.00	0.00	0.00	0.35	25.45	327.75	

Wood Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
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Description : FB-2

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values					
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F ^b	V	f _v	F ^v		
+D+0.60W+H	Length = 4.0 ft	1	0.017	0.019	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.24	70.02	4160.00	0.00	0.00	0.00
+D+0.70E+H	Length = 4.0 ft	1	0.017	0.019	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.24	70.02	4160.00	0.00	0.00	0.00	
+D+0.750Lr+0.750L+0.450W+H	Length = 4.0 ft	1	0.048	0.056	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.69	201.32	4160.00	0.00	0.00	0.00	
+D+0.750L+0.750S+0.450W+H	Length = 4.0 ft	1	0.048	0.056	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.69	201.32	4160.00	0.00	0.00	0.00	
+D+0.750L+0.750S+0.5250E+H	Length = 4.0 ft	1	0.048	0.056	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.69	201.32	4160.00	0.00	0.00	0.00	
+0.60D+0.60W+0.60H	Length = 4.0 ft	1	0.010	0.012	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.14	42.01	4160.00	0.00	0.00	0.00	
+0.60D+0.70E+0.60H	Length = 4.0 ft	1	0.010	0.012	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.14	42.01	4160.00	0.00	0.00	0.00	

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.0052	2.015		0.0000	0.000

Vertical Reactions

Load Combination	Support 1	Support 2
Overall MAXimum	0.840	0.840
Overall MINimum	0.144	0.144
+D+H	0.240	0.240
+D+L+H	0.840	0.840
+D+Lr+H	0.240	0.240
+D+S+H	0.240	0.240
+D+0.750Lr+0.750L+H	0.690	0.690
+D+0.750L+0.750S+H	0.690	0.690
+D+0.60W+H	0.240	0.240
+D+0.70E+H	0.240	0.240
+D+0.750Lr+0.750L+0.450W+H	0.690	0.690
+D+0.750L+0.750S+0.450W+H	0.690	0.690
+D+0.750L+0.750S+0.5250E+H	0.690	0.690
+0.60D+0.60W+0.60H	0.144	0.144
+0.60D+0.70E+0.60H	0.144	0.144
D Only	0.240	0.240
Lr Only		
L Only	0.600	0.600
S Only		
W Only		
E Only		
H Only		

Support notation : Far left is #1

Values in KIPS

Wood Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
ENERCALC, INC. 1983-2015, Build:6.15.1.19, Ver:6.15.1.19
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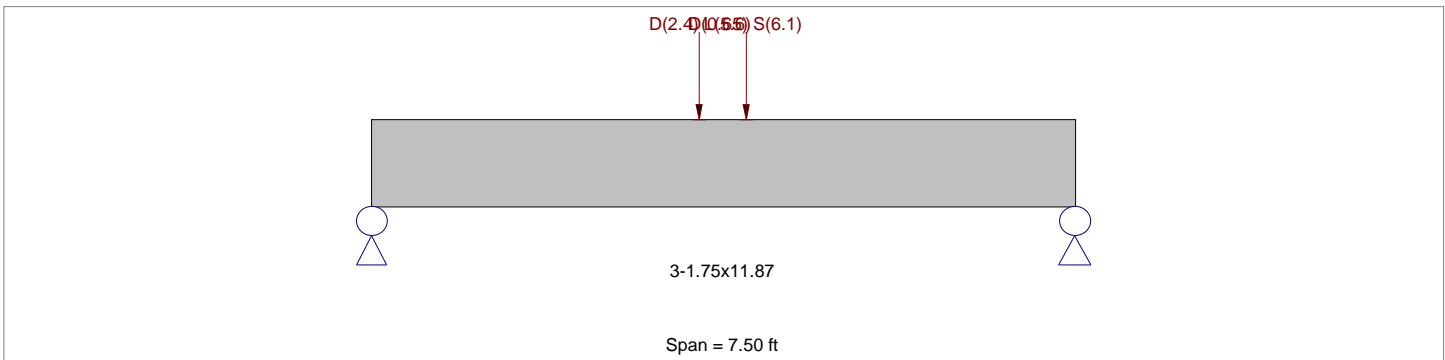
Lic. # : KW-06007744
Description : HDR-4

CODE REFERENCES

Calculations per NDS 2012, IBC 2012, CBC 2013, ASCE 7-10
Load Combination Set : IBC2012

Material Properties

Analysis Method : Allowable Stress Design	Fb - Tension	2600 psi	E : Modulus of Elasticity
Load Combination IBC2012	Fb - Compr	2600 psi	Ebend- xx
Wood Species : Truss Joist	Fc - Prll	2510 psi	Eminbend - xx
Wood Grade : MicroLam LVL 1.9 E	Fc - Perp	750 psi	Density
Beam Bracing : Beam is Fully Braced against lateral-torsion buckling	Fv	285 psi	
	Ft	1555 psi	
			32.21 pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loads
Point Load : D = 2.40, L = 5.60 k @ 3.50 ft, (FB-1)
Point Load : D = 0.650, S = 6.10 k @ 4.0 ft, (SC-2)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.681 : 1	Maximum Shear Stress Ratio	=	0.440 : 1
Section used for this span		3-1.75x11.87	Section used for this span		3-1.75x11.87
fb : Actual	=	2,037.41 psi	fv : Actual	=	144.29 psi
FB : Allowable	=	2,990.00 psi	Fv : Allowable	=	327.75 psi
Load Combination		+D+0.750L+0.750S	Load Combination		+D+0.750L+0.750S
Location of maximum on span	=	3.504ft	Location of maximum on span	=	0.000ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection		0.067 in	Ratio =		1353
Max Upward Transient Deflection		0.000 in	Ratio =		0 < 480
Max Downward Total Deflection		0.130 in	Ratio =		694
Max Upward Total Deflection		0.000 in	Ratio =		0 < 240

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values						
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v			
D Only	Length = 7.50 ft	1	0.234	0.152	0.90	1.000	1.00	1.00	1.00	1.00	1.00	5.64	548.15	2340.00	0.00	0.00	0.00	1.62	39.02	256.50
+D+L	Length = 7.50 ft	1	0.601	0.389	1.00	1.000	1.00	1.00	1.00	1.00	1.00	16.08	1,563.85	2600.00	0.00	0.00	0.00	4.61	110.88	285.00
+D+Lr	Length = 7.50 ft	1	0.169	0.110	1.25	1.000	1.00	1.00	1.00	1.00	1.00	5.64	548.15	3250.00	0.00	0.00	0.00	1.62	39.02	356.25
+D+S	Length = 7.50 ft	1	0.540	0.349	1.15	1.000	1.00	1.00	1.00	1.00	1.00	16.61	1,615.40	2990.00	0.00	0.00	0.00	4.76	114.49	327.75
+D+0.750Lr+0.750L	Length = 7.50 ft	1	0.403	0.261	1.25	1.000	1.00	1.00	1.00	1.00	1.00	13.47	1,309.93	3250.00	0.00	0.00	0.00	3.86	92.92	356.25



Wood Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
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Lic. # : KW-06007744

Description : HDR-4

Load Combination Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values		
		M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F ^b	V	f _v	F ^v
+D+0.750L+0.750S Length = 7.50 ft	1	0.681	0.440	1.15	1.000	1.00	1.00	1.00	1.00	1.00	20.95	2,037.41	2990.00	6.00	144.29	327.75
+D+0.60W Length = 7.50 ft	1	0.132	0.086	1.60	1.000	1.00	1.00	1.00	1.00	1.00	5.64	548.15	4160.00	1.62	39.02	456.00
+D+0.70E Length = 7.50 ft	1	0.132	0.086	1.60	1.000	1.00	1.00	1.00	1.00	1.00	5.64	548.15	4160.00	1.62	39.02	456.00
+D+0.750Lr+0.750L+0.450W Length = 7.50 ft	1	0.315	0.204	1.60	1.000	1.00	1.00	1.00	1.00	1.00	13.47	1,309.93	4160.00	3.86	92.92	456.00
+D+0.750L+0.750S+0.450W Length = 7.50 ft	1	0.490	0.316	1.60	1.000	1.00	1.00	1.00	1.00	1.00	20.95	2,037.41	4160.00	6.00	144.29	456.00
+D+0.750L+0.750S+0.5250E Length = 7.50 ft	1	0.490	0.316	1.60	1.000	1.00	1.00	1.00	1.00	1.00	20.95	2,037.41	4160.00	6.00	144.29	456.00
+0.60D+0.60W Length = 7.50 ft	1	0.079	0.051	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.38	328.89	4160.00	0.97	23.41	456.00
+0.60D+0.70E Length = 7.50 ft	1	0.079	0.051	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.38	328.89	4160.00	0.97	23.41	456.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750L+0.750S+0.5250E	1	0.1296	3.750		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	6.011	5.919
Overall MINimum	0.981	0.911
D Only	1.636	1.519
+D+L	4.622	4.132
+D+Lr	1.636	1.519
+D+S	4.482	4.772
+D+0.750Lr+0.750L	3.876	3.479
+D+0.750L+0.750S	6.011	5.919
+D+0.60W	1.636	1.519
+D+0.70E	1.636	1.519
+D+0.750Lr+0.750L+0.450W	3.876	3.479
+D+0.750L+0.750S+0.450W	6.011	5.919
+D+0.750L+0.750S+0.5250E	6.011	5.919
+0.60D+0.60W	0.981	0.911
+0.60D+0.70E	0.981	0.911
D Only	1.636	1.519
Lr Only		
L Only	2.987	2.613
S Only	2.847	3.253
W Only		
E Only		
H Only		

Steel Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-V\LWNXF1-XIC7A4YC-FL2FOR8-B.EC6
ENERCALC, INC. 1983-2015, Build:6.15.1.19, Ver:6.15.1.19
Licensee : EPIC ENGINEERING, PC

Lic. # : KW-06007744

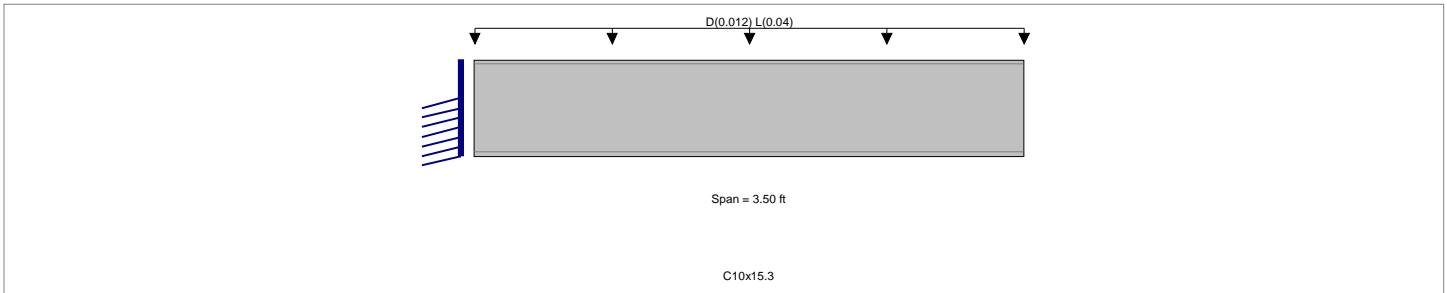
Description : STAIR TREAD

CODE REFERENCES

Calculations per AISC 360-10, IBC 2012, ASCE 7-10
Load Combination Set : IBC2012

Material Properties

Analysis Method : Allowable Strength Design
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling
Bending Axis : Minor Axis Bending
Load Combination IBC2012
Fy : Steel Yield : 36.0 ksi
E : Modulus : 29,000.0 ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight NOT internally calculated and added
Uniform Load : D = 0.0120, L = 0.040 ksf, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.096 : 1	Maximum Shear Stress Ratio =	0.012 : 1
Section used for this span	C10x15.3	Section used for this span	C10x15.3
Ma : Applied	0.319 k-ft	Va : Applied	0.1820 k
Mn / Omega : Allowable	3.305 k-ft	Vn/Omega : Allowable	14.662 k
Load Combination	+D+L+H	Load Combination	+D+L+H
Location of maximum on span	0.000ft	Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.020 in	Ratio =	4,279
Max Upward Transient Deflection	0.000 in	Ratio =	0 <480
Max Downward Total Deflection	0.026 in	Ratio =	3292
Max Upward Total Deflection	0.000 in	Ratio =	0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values					Summary of Shear Values				
			M	V	Mmax +	Mmax -	Ma - Max	Mny	Mny/Omega	Cb	Rm	Va Max	Vny	Vny/Omega
+D+H	Dsgn. L = 3.50 ft	1	0.022	0.003		-0.07	0.07	5.52	3.31	1.00	1.00	0.04	24.49	14.66
+D+L+H	Dsgn. L = 3.50 ft	1	0.096	0.012		-0.32	0.32	5.52	3.31	1.00	1.00	0.18	24.49	14.66
+D+Lr+H	Dsgn. L = 3.50 ft	1	0.022	0.003		-0.07	0.07	5.52	3.31	1.00	1.00	0.04	24.49	14.66
+D+S+H	Dsgn. L = 3.50 ft	1	0.022	0.003		-0.07	0.07	5.52	3.31	1.00	1.00	0.04	24.49	14.66
+D+0.750Lr+0.750L+H	Dsgn. L = 3.50 ft	1	0.078	0.010		-0.26	0.26	5.52	3.31	1.00	1.00	0.15	24.49	14.66
+D+0.750L+0.750S+H	Dsgn. L = 3.50 ft	1	0.078	0.010		-0.26	0.26	5.52	3.31	1.00	1.00	0.15	24.49	14.66
+D+0.60W+H	Dsgn. L = 3.50 ft	1	0.022	0.003		-0.07	0.07	5.52	3.31	1.00	1.00	0.04	24.49	14.66
+D+0.70E+H	Dsgn. L = 3.50 ft	1	0.022	0.003		-0.07	0.07	5.52	3.31	1.00	1.00	0.04	24.49	14.66
+D+0.750Lr+0.750L+0.450W+H	Dsgn. L = 3.50 ft	1	0.078	0.010		-0.26	0.26	5.52	3.31	1.00	1.00	0.15	24.49	14.66
+D+0.750L+0.750S+0.450W+H	Dsgn. L = 3.50 ft	1	0.078	0.010		-0.26	0.26	5.52	3.31	1.00	1.00	0.15	24.49	14.66
+D+0.750L+0.750S+0.5250E+H	Dsgn. L = 3.50 ft	1	0.078	0.010		-0.26	0.26	5.52	3.31	1.00	1.00	0.15	24.49	14.66
+0.60D+0.60W+0.60H	Dsgn. L = 3.50 ft	1	0.013	0.002		-0.04	0.04	5.52	3.31	1.00	1.00	0.03	24.49	14.66



Steel Beam

File = S:\PROJ\SHSKCD-4\21YFRF-IVANCBNR-VLWNXFI-XIC7A4YC-FL2FOR8-B.EC6
ENERCALC, INC. 1983-2015, Build:6.15.1.19, Ver:6.15.1.19

Lic. # : KW-06007744

Licensee : EPIC ENGINEERING, PC

Description : STAIR TREAD

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
+0.60D+0.70E+0.60H	Dsgn. L = 3.50 ft	1	0.013	0.002		-0.04	0.04	5.52	3.31	1.00	1.00	0.03	24.49	14.66

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.0255	3.500		0.0000	0.000

Vertical Reactions

Load Combination	Support 1	Support 2
Overall MAXimum	0.182	
Overall MINimum	0.025	
+D+H	0.042	
+D+L+H	0.182	
+D+Lr+H	0.042	
+D+S+H	0.042	
+D+0.750Lr+0.750L+H	0.147	
+D+0.750L+0.750S+H	0.147	
+D+0.60W+H	0.042	
+D+0.70E+H	0.042	
+D+0.750Lr+0.750L+0.450W+H	0.147	
+D+0.750L+0.750S+0.450W+H	0.147	
+D+0.750L+0.750S+0.5250E+H	0.147	
+0.60D+0.60W+0.60H	0.025	
+0.60D+0.70E+0.60H	0.025	
D Only	0.042	
Lr Only		
L Only	0.140	
S Only		
W Only		
E Only		
H Only		

Support notation : Far left is #1

Values in KIPS



Steel Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-V\LWNXFI-XIC7A4YC-FL2FOR8-B.EC6
ENERCALC, INC. 1983-2015, Build:6.15.1.19, Ver:6.15.1.19

Lic. # : KW-06007744

Licensee : EPIC ENGINEERING, PC

Description : STAIR STRINGER

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
Dsgn. L = 7.50 ft		1	0.004	0.002	0.20		0.20	76.80	45.99	1.00	1.00	0.10	73.09	43.77
+0.60D+0.70E+0.60H														
Dsgn. L = 7.50 ft		1	0.004	0.002	0.20		0.20	76.80	45.99	1.00	1.00	0.10	73.09	43.77

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.0034	3.900		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	0.640	0.725
Overall MINimum	0.087	0.103
+D+H	0.144	0.171
+D+L+H	0.640	0.725
+D+Lr+H	0.144	0.171
+D+S+H	0.144	0.171
+D+0.750Lr+0.750L+H	0.516	0.586
+D+0.750L+0.750S+H	0.516	0.586
+D+0.60W+H	0.144	0.171
+D+0.70E+H	0.144	0.171
+D+0.750Lr+0.750L+0.450W+H	0.516	0.586
+D+0.750L+0.750S+0.450W+H	0.516	0.586
+D+0.750L+0.750S+0.5250E+H	0.516	0.586
+0.60D+0.60W+0.60H	0.087	0.103
+0.60D+0.70E+0.60H	0.087	0.103
D Only	0.144	0.171
Lr Only		
L Only	0.496	0.554
S Only		
W Only		
E Only		
H Only		

Wood Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-V\LWNXFI-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. #: KW-06007744

Description : SHOWER FLOOR JOISTS

Load Combination Segment Length	Span #	Max Stress Ratios		Moment Values							Shear Values					
		M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v
+D+0.60W+H Length = 8.0 ft	1	0.118	0.052	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.26	233.78	1987.20	0.11	15.08	288.00
+D+0.70E+H Length = 8.0 ft	1	0.118	0.052	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.26	233.78	1987.20	0.11	15.08	288.00
+D+0.750Lr+0.750L+0.450W+H Length = 8.0 ft	1	0.338	0.151	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.74	672.11	1987.20	0.31	43.35	288.00
+D+0.750L+0.750S+0.450W+H Length = 8.0 ft	1	0.338	0.151	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.74	672.11	1987.20	0.31	43.35	288.00
+D+0.750L+0.750S+0.5250E+H Length = 8.0 ft	1	0.338	0.151	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.74	672.11	1987.20	0.31	43.35	288.00
+0.60D+0.60W+0.60H Length = 8.0 ft	1	0.071	0.031	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.15	140.27	1987.20	0.07	9.05	288.00
+0.60D+0.70E+0.60H Length = 8.0 ft	1	0.071	0.031	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.15	140.27	1987.20	0.07	9.05	288.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.1362	4.029		0.0000	0.000

Vertical Reactions

Load Combination	Support 1	Support 2
Overall MAXimum	0.448	0.448
Overall MINimum	0.077	0.077
+D+H	0.128	0.128
+D+L+H	0.448	0.448
+D+Lr+H	0.128	0.128
+D+S+H	0.128	0.128
+D+0.750Lr+0.750L+H	0.368	0.368
+D+0.750L+0.750S+H	0.368	0.368
+D+0.60W+H	0.128	0.128
+D+0.70E+H	0.128	0.128
+D+0.750Lr+0.750L+0.450W+H	0.368	0.368
+D+0.750L+0.750S+0.450W+H	0.368	0.368
+D+0.750L+0.750S+0.5250E+H	0.368	0.368
+0.60D+0.60W+0.60H	0.077	0.077
+0.60D+0.70E+0.60H	0.077	0.077
D Only	0.128	0.128
Lr Only		
L Only	0.320	0.320
S Only		
W Only		
E Only		
H Only		

Support notation : Far left is #1

Values in KIPS

Wood Beam

File = S:\PROJ\SHKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
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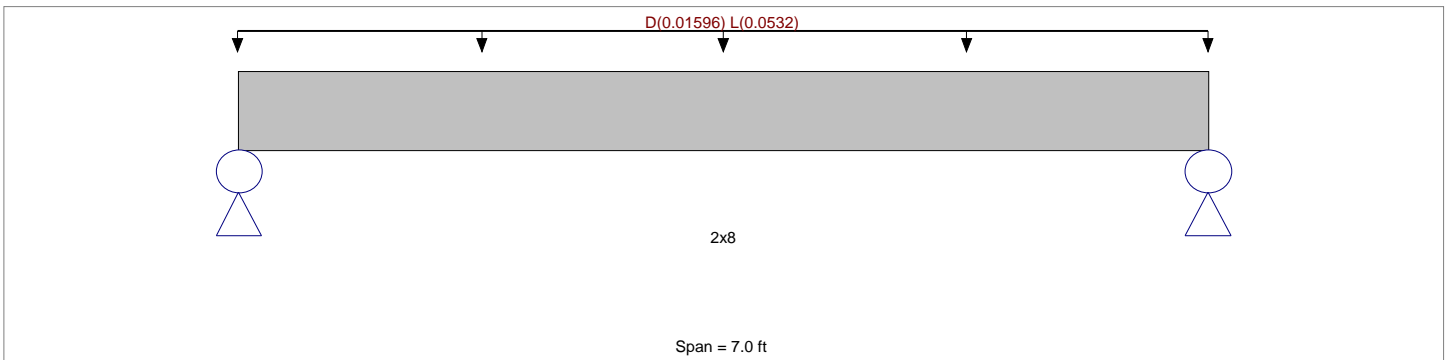
Description : BASEMENT FLOOR JOISTS

CODE REFERENCES

Calculations per NDS 2012, IBC 2012, CBC 2013, ASCE 7-10
 Load Combination Set : IBC 2012

Material Properties

Analysis Method : Allowable Stress Design	Fb - Tension	900.0 psi	E : Modulus of Elasticity
Load Combination IBC 2012	Fb - Compr	900.0 psi	Ebend- xx
Wood Species : Douglas Fir - Larch	Fc - Prll	1,350.0 psi	Eminbend - xx
Wood Grade : No.2	Fc - Perp	625.0 psi	
Beam Bracing : Beam is Fully Braced against lateral-torsion buckling	Fv	180.0 psi	Density
	Ft	575.0 psi	Repetitive Member Stress Increase
			31.20pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Uniform Load : D = 0.0120, L = 0.040 ksf, Tributary Width = 1.330 ft

DESIGN SUMMARY

Design OK

<p>Maximum Bending Stress Ratio = 0.311 : 1</p> <p>Section used for this span = 2x8</p> <p>fb : Actual = 386.84 psi</p> <p>FB : Allowable = 1,242.00 psi</p> <p>Load Combination = +D+L+H</p> <p>Location of maximum on span = 3.500ft</p> <p>Span # where maximum occurs = Span # 1</p> <p>Maximum Deflection</p> <p>Max Downward Transient Deflection = 0.038 in Ratio = 2214</p> <p>Max Upward Transient Deflection = 0.000 in Ratio = 0 < 480</p> <p>Max Downward Total Deflection = 0.049 in Ratio = 1703</p> <p>Max Upward Total Deflection = 0.000 in Ratio = 0 < 240</p>	<p>Maximum Shear Stress Ratio = 0.154 : 1</p> <p>Section used for this span = 2x8</p> <p>fv : Actual = 27.78 psi</p> <p>Fv : Allowable = 180.00 psi</p> <p>Load Combination = +D+L+H</p> <p>Location of maximum on span = 6.412 ft</p> <p>Span # where maximum occurs = Span # 1</p>
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Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values			
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v	
+D+H	Length = 7.0 ft	1	0.080	0.040	0.90	1.200	1.00	1.15	1.00	1.00	1.00	0.10	89.27	1117.80	0.00	0.05	6.41	162.00
+D+L+H	Length = 7.0 ft	1	0.311	0.154	1.00	1.200	1.00	1.15	1.00	1.00	1.00	0.42	386.84	1242.00	0.00	0.00	0.00	0.00
+D+Lr+H	Length = 7.0 ft	1	0.058	0.028	1.25	1.200	1.00	1.15	1.00	1.00	1.00	0.10	89.27	1552.50	0.00	0.05	6.41	225.00
+D+S+H	Length = 7.0 ft	1	0.063	0.031	1.15	1.200	1.00	1.15	1.00	1.00	1.00	0.10	89.27	1428.30	0.00	0.05	6.41	207.00
+D+0.750Lr+0.750L+H	Length = 7.0 ft	1	0.201	0.100	1.25	1.200	1.00	1.15	1.00	1.00	1.00	0.34	312.44	1552.50	0.00	0.16	22.44	225.00
+D+0.750L+0.750S+H	Length = 7.0 ft	1	0.219	0.108	1.15	1.200	1.00	1.15	1.00	1.00	1.00	0.34	312.44	1428.30	0.00	0.16	22.44	207.00

Wood Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-V\LWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11

Lic. #: KW-06007744

Licensee: EPIC ENGINEERING, PC

Description: BASEMANT FLOOR JOISTS

Load Combination	Segment Length	Span #	Max Stress Ratios		Moment Values							Shear Values					
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v
+D+0.60W+H	Length = 7.0 ft	1	0.045	0.022	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.10	89.27	1987.20	0.00	0.00	0.00
+D+0.70E+H	Length = 7.0 ft	1	0.045	0.022	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.10	89.27	1987.20	0.00	0.00	0.00
+D+0.750Lr+0.750L+0.450W+H	Length = 7.0 ft	1	0.157	0.078	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.34	312.44	1987.20	0.00	0.00	0.00
+D+0.750L+0.750S+0.450W+H	Length = 7.0 ft	1	0.157	0.078	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.34	312.44	1987.20	0.00	0.00	0.00
+D+0.750L+0.750S+0.5250E+H	Length = 7.0 ft	1	0.157	0.078	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.34	312.44	1987.20	0.00	0.00	0.00
+0.60D+0.60W+0.60H	Length = 7.0 ft	1	0.027	0.013	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.06	53.56	1987.20	0.00	0.00	0.00
+0.60D+0.70E+0.60H	Length = 7.0 ft	1	0.027	0.013	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.06	53.56	1987.20	0.00	0.00	0.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.0493	3.526		0.0000	0.000

Vertical Reactions

Load Combination	Support 1	Support 2
Overall MAXimum	0.242	0.242
Overall MINimum	0.034	0.034
+D+H	0.056	0.056
+D+L+H	0.242	0.242
+D+Lr+H	0.056	0.056
+D+S+H	0.056	0.056
+D+0.750Lr+0.750L+H	0.196	0.196
+D+0.750L+0.750S+H	0.196	0.196
+D+0.60W+H	0.056	0.056
+D+0.70E+H	0.056	0.056
+D+0.750Lr+0.750L+0.450W+H	0.196	0.196
+D+0.750L+0.750S+0.450W+H	0.196	0.196
+D+0.750L+0.750S+0.5250E+H	0.196	0.196
+0.60D+0.60W+0.60H	0.034	0.034
+0.60D+0.70E+0.60H	0.034	0.034
D Only	0.056	0.056
Lr Only		
L Only	0.186	0.186
S Only		
W Only		
E Only		
H Only		

Support notation: Far left is #1

Values in KIPS

Wood Beam

Lic. # : KW-06007744

Description : DJ-1

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values		
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv
Length = 8.0 ft	1	0.473	0.210	1.15	1.200	1.00	1.15	1.00	1.00	1.00	0.74	675.27	1428.30	0.32	43.55	207.00
+D+0.60W+H					1.200	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.119	0.053	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.26	236.94	1987.20	0.11	15.28	288.00
+D+0.70E+H					1.200	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.119	0.053	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.26	236.94	1987.20	0.11	15.28	288.00
+D+0.750Lr+0.750L+0.450W+H					1.200	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.340	0.151	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.74	675.27	1987.20	0.32	43.55	288.00
+D+0.750L+0.750S+0.450W+H					1.200	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.340	0.151	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.74	675.27	1987.20	0.32	43.55	288.00
+D+0.750L+0.750S+0.5250E+H					1.200	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.340	0.151	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.74	675.27	1987.20	0.32	43.55	288.00
+0.60D+0.60W+0.60H					1.200	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.072	0.032	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.16	142.16	1987.20	0.07	9.17	288.00
+0.60D+0.70E+0.60H					1.200	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 8.0 ft	1	0.072	0.032	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.16	142.16	1987.20	0.07	9.17	288.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.1367	4.029		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	0.450	0.450
Overall MINimum	0.078	0.078
+D+H	0.130	0.130
+D+L+H	0.450	0.450
+D+Lr+H	0.130	0.130
+D+S+H	0.130	0.130
+D+0.750Lr+0.750L+H	0.370	0.370
+D+0.750L+0.750S+H	0.370	0.370
+D+0.60W+H	0.130	0.130
+D+0.70E+H	0.130	0.130
+D+0.750Lr+0.750L+0.450W+H	0.370	0.370
+D+0.750L+0.750S+0.450W+H	0.370	0.370
+D+0.750L+0.750S+0.5250E+H	0.370	0.370
+0.60D+0.60W+0.60H	0.078	0.078
+0.60D+0.70E+0.60H	0.078	0.078
D Only	0.130	0.130
Lr Only		
L Only	0.320	0.320
S Only		
W Only		
E Only		
H Only		

Wood Beam

Lic. # : KW-06007744

Description : DJ-1

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values		
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv
Length = 11.50 ft	1	0.644	0.210	1.15	1.200	1.00	1.15	1.00	1.00	1.00	1.01	919.86	1428.30	0.31	43.39	207.00
+D+0.60W+H					1.200	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.50 ft	1	0.167	0.054	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.36	331.10	1987.20	0.11	15.62	288.00
+D+0.70E+H					1.200	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.50 ft	1	0.167	0.054	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.36	331.10	1987.20	0.11	15.62	288.00
+D+0.750Lr+0.750L+0.450W+H					1.200	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.50 ft	1	0.463	0.151	1.60	1.200	1.00	1.15	1.00	1.00	1.00	1.01	919.86	1987.20	0.31	43.39	288.00
+D+0.750L+0.750S+0.450W+H					1.200	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.50 ft	1	0.463	0.151	1.60	1.200	1.00	1.15	1.00	1.00	1.00	1.01	919.86	1987.20	0.31	43.39	288.00
+D+0.750L+0.750S+0.5250E+H					1.200	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.50 ft	1	0.463	0.151	1.60	1.200	1.00	1.15	1.00	1.00	1.00	1.01	919.86	1987.20	0.31	43.39	288.00
+0.60D+0.60W+0.60H					1.200	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.50 ft	1	0.100	0.033	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.22	198.66	1987.20	0.07	9.37	288.00
+0.60D+0.70E+0.60H					1.200	1.00	1.15	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 11.50 ft	1	0.100	0.033	1.60	1.200	1.00	1.15	1.00	1.00	1.00	0.22	198.66	1987.20	0.07	9.37	288.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.3840	5.792		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	0.425	0.425
Overall MINimum	0.076	0.076
+D+H	0.126	0.126
+D+L+H	0.425	0.425
+D+Lr+H	0.126	0.126
+D+S+H	0.126	0.126
+D+0.750Lr+0.750L+H	0.350	0.350
+D+0.750L+0.750S+H	0.350	0.350
+D+0.60W+H	0.126	0.126
+D+0.70E+H	0.126	0.126
+D+0.750Lr+0.750L+0.450W+H	0.350	0.350
+D+0.750L+0.750S+0.450W+H	0.350	0.350
+D+0.750L+0.750S+0.5250E+H	0.350	0.350
+0.60D+0.60W+0.60H	0.076	0.076
+0.60D+0.70E+0.60H	0.076	0.076
D Only	0.126	0.126
Lr Only		
L Only	0.299	0.299
S Only		
W Only		
E Only		
H Only		

Steel Beam

Lic. #: KW-06007744

Licensee : EPIC ENGINEERING, PC

Description : DB-1

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
Dsgn. L = 22.50 ft		1	0.053	0.009	1.64		1.64	52.12	31.21	1.00	1.00	0.33	56.26	37.51
+0.60D+0.70E+0.60H														
Dsgn. L = 22.50 ft		1	0.053	0.009	1.64		1.64	52.12	31.21	1.00	1.00	0.33	56.26	37.51

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.5892	11.475		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	1.547	2.011
Overall MINimum	0.253	0.329
+D+H	0.422	0.548
+D+L+H	1.547	2.011
+D+Lr+H	0.422	0.548
+D+S+H	0.422	0.548
+D+0.750Lr+0.750L+H	1.266	1.645
+D+0.750L+0.750S+H	1.266	1.645
+D+0.60W+H	0.422	0.548
+D+0.70E+H	0.422	0.548
+D+0.750Lr+0.750L+0.450W+H	1.266	1.645
+D+0.750L+0.750S+0.450W+H	1.266	1.645
+D+0.750L+0.750S+0.5250E+H	1.266	1.645
+0.60D+0.60W+0.60H	0.253	0.329
+0.60D+0.70E+0.60H	0.253	0.329
D Only	0.422	0.548
Lr Only		
L Only	1.125	1.463
S Only		
W Only		
E Only		
H Only		



Steel Beam

Lic. # : KW-06007744

Description : DB-2

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
Dsgn. L = 6.00 ft	6.00 ft	1	0.095	0.031		-12.18	12.18	213.33	127.74	1.00	1.00	2.35	112.50	75.00
Dsgn. L = 13.50 ft	13.50 ft	2	0.095	0.031		-12.18	12.18	213.33	127.74	1.00	1.00	2.35	112.50	75.00
+D+0.750Lr+0.750L+0.450W														
Dsgn. L = 6.00 ft	6.00 ft	1	0.315	0.092		-40.30	40.30	213.33	127.74	1.00	1.00	6.93	112.50	75.00
Dsgn. L = 13.50 ft	13.50 ft	2	0.315	0.092		-40.30	40.30	213.33	127.74	1.00	1.00	6.93	112.50	75.00
+D+0.750L+0.750S+0.450W														
Dsgn. L = 6.00 ft	6.00 ft	1	0.315	0.092		-40.30	40.30	213.33	127.74	1.00	1.00	6.93	112.50	75.00
Dsgn. L = 13.50 ft	13.50 ft	2	0.315	0.092		-40.30	40.30	213.33	127.74	1.00	1.00	6.93	112.50	75.00
+D+0.750L+0.750S+0.5250E														
Dsgn. L = 6.00 ft	6.00 ft	1	0.315	0.092		-40.30	40.30	213.33	127.74	1.00	1.00	6.93	112.50	75.00
Dsgn. L = 13.50 ft	13.50 ft	2	0.315	0.092		-40.30	40.30	213.33	127.74	1.00	1.00	6.93	112.50	75.00
+0.60D+0.60W														
Dsgn. L = 6.00 ft	6.00 ft	1	0.057	0.019		-7.31	7.31	213.33	127.74	1.00	1.00	1.41	112.50	75.00
Dsgn. L = 13.50 ft	13.50 ft	2	0.057	0.019		-7.31	7.31	213.33	127.74	1.00	1.00	1.41	112.50	75.00
+0.60D+0.70E														
Dsgn. L = 6.00 ft	6.00 ft	1	0.057	0.019		-7.31	7.31	213.33	127.74	1.00	1.00	1.41	112.50	75.00
Dsgn. L = 13.50 ft	13.50 ft	2	0.057	0.019		-7.31	7.31	213.33	127.74	1.00	1.00	1.41	112.50	75.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000			
+D+L	2	0.7962	13.500	+D+L	-0.0242	3.508
					0.0000	3.508

Vertical Reactions

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	-8.279	16.729	
Overall MINimum	-1.218	2.628	
D Only	-2.029	4.379	
+D+L	-8.279	16.729	
+D+Lr	-2.029	4.379	
+D+S	-2.029	4.379	
+D+0.750Lr+0.750L	-6.717	13.642	
+D+0.750L+0.750S	-6.717	13.642	
+D+0.60W	-2.029	4.379	
+D+0.70E	-2.029	4.379	
+D+0.750Lr+0.750L+0.450W	-6.717	13.642	
+D+0.750L+0.750S+0.450W	-6.717	13.642	
+D+0.750L+0.750S+0.5250E	-6.717	13.642	
+0.60D+0.60W	-1.218	2.628	
+0.60D+0.70E	-1.218	2.628	
D Only	-2.029	4.379	
Lr Only			
L Only	-6.250	12.350	
S Only			
W Only			
E Only			
H Only			

Support notation : Far left is #1

Values in KIPS

Steel Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-V\LWNXFI-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11

Lic. # : KW-06007744

Licensee : EPIC ENGINEERING, PC

Description : DB-4

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
Dsgn. L = 4.50 ft		1	0.090	0.017		-1.56	1.56	28.89	17.30	1.00	1.00	0.39	38.02	22.76
+0.60D+0.70E														
Dsgn. L = 4.50 ft		1	0.090	0.017		-1.56	1.56	28.89	17.30	1.00	1.00	0.39	38.02	22.76

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.1319	4.500		0.0000	0.000

Vertical Reactions

Load Combination	Support 1	Support 2
Overall MAXimum	2.850	
Overall MINimum	0.390	
D Only	0.650	
+D+L	2.850	
+D+Lr	0.650	
+D+S	0.650	
+D+0.750Lr+0.750L	2.300	
+D+0.750L+0.750S	2.300	
+D+0.60W	0.650	
+D+0.70E	0.650	
+D+0.750Lr+0.750L+0.450W	2.300	
+D+0.750L+0.750S+0.450W	2.300	
+D+0.750L+0.750S+0.5250E	2.300	
+0.60D+0.60W	0.390	
+0.60D+0.70E	0.390	
D Only	0.650	
Lr Only		
L Only	2.200	
S Only		
W Only		
E Only		
H Only		

Support notation : Far left is #1

Values in KIPS



Steel Beam

Lic. # : KW-06007744

Description : DB-3

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
Dsgn. L = 6.50 ft		1	0.142	0.049										
Dsgn. L = 8.00 ft		2	0.142	0.049		-7.24	7.24	85.00	50.90	1.00	1.00	2.03	62.10	41.40
+D+0.750Lr+0.750L+0.450W														
Dsgn. L = 6.50 ft		1	0.340	0.127		-17.29	17.29	85.00	50.90	1.00	1.00	5.26	62.10	41.40
Dsgn. L = 8.00 ft		2	0.340	0.127		-17.29	17.29	85.00	50.90	1.00	1.00	5.26	62.10	41.40
+D+0.750L+0.750S+0.450W														
Dsgn. L = 6.50 ft		1	0.340	0.127		-17.29	17.29	85.00	50.90	1.00	1.00	5.26	62.10	41.40
Dsgn. L = 8.00 ft		2	0.340	0.127		-17.29	17.29	85.00	50.90	1.00	1.00	5.26	62.10	41.40
+D+0.750L+0.750S+0.5250E														
Dsgn. L = 6.50 ft		1	0.340	0.127		-17.29	17.29	85.00	50.90	1.00	1.00	5.26	62.10	41.40
Dsgn. L = 8.00 ft		2	0.340	0.127		-17.29	17.29	85.00	50.90	1.00	1.00	5.26	62.10	41.40
+0.60D+0.60W														
Dsgn. L = 6.50 ft		1	0.085	0.029		-4.34	4.34	85.00	50.90	1.00	1.00	1.22	62.10	41.40
Dsgn. L = 8.00 ft		2	0.085	0.029		-4.34	4.34	85.00	50.90	1.00	1.00	1.22	62.10	41.40
+0.60D+0.70E														
Dsgn. L = 6.50 ft		1	0.085	0.029		-4.34	4.34	85.00	50.90	1.00	1.00	1.22	62.10	41.40
Dsgn. L = 8.00 ft		2	0.085	0.029		-4.34	4.34	85.00	50.90	1.00	1.00	1.22	62.10	41.40

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000			
+D+L	2	0.5195	8.000	+D+L	-0.0447	3.800
					0.0000	3.800

Vertical Reactions

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	-3.175	9.505	
Overall MINimum	-0.668	1.886	
D Only	-1.114	3.144	
+D+L	-3.175	9.505	
+D+Lr	-1.114	3.144	
+D+S	-1.114	3.144	
+D+0.750Lr+0.750L	-2.660	7.915	
+D+0.750L+0.750S	-2.660	7.915	
+D+0.60W	-1.114	3.144	
+D+0.70E	-1.114	3.144	
+D+0.750Lr+0.750L+0.450W	-2.660	7.915	
+D+0.750L+0.750S+0.450W	-2.660	7.915	
+D+0.750L+0.750S+0.5250E	-2.660	7.915	
+0.60D+0.60W	-0.668	1.886	
+0.60D+0.70E	-0.668	1.886	
D Only	-1.114	3.144	
Lr Only			
L Only	-2.062	6.362	
S Only			
W Only			
E Only			
H Only			

Support notation : Far left is #1

Values in KIPS

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. # : KW-06007744

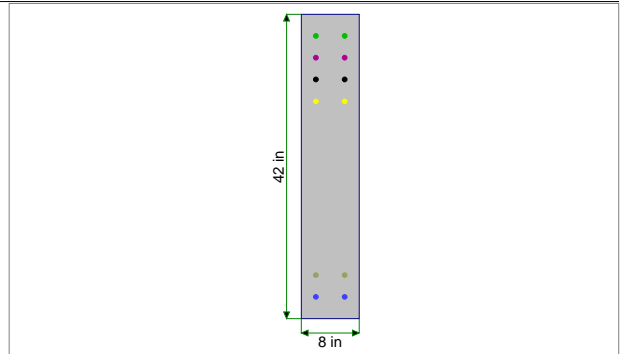
Description : Concrete pool wall

CODE REFERENCES

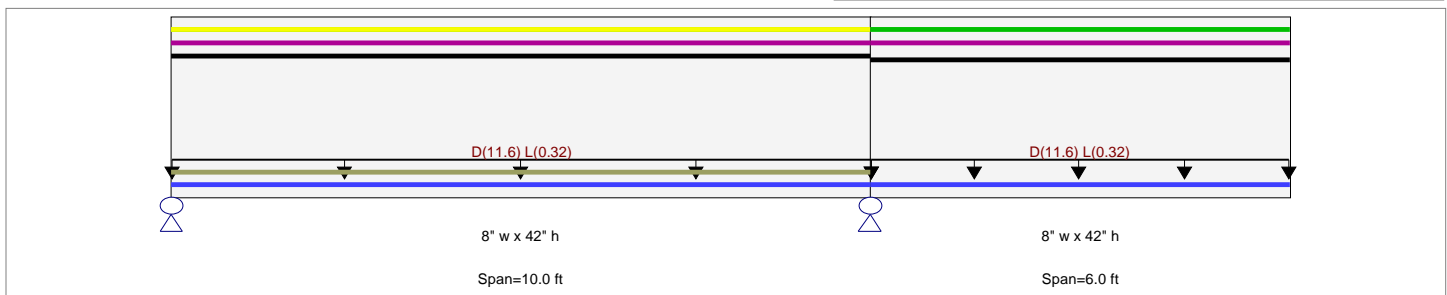
Calculations per ACI 318-11, IBC 2012, ASCE 7-10
 Load Combination Set : ASCE 7-10

Material Properties

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure :	0.90
$f_r = f'_c^{1/2} * 7.50$	=	410.792 psi		Shear :	0.750
Ψ Density	=	145.0 pcf	β_1	=	0.850
λ LtWt Factor	=	1.0	F_y - Stirrups	=	40.0 ksi
Elastic Modulus	=	3,122.0 ksi	E - Stirrups	=	29,000.0 ksi
f_y - Main Rebar	=	60.0 ksi	Stirrup Bar Size #	=	# 3
E - Main Rebar	=	29,000.0 ksi	Number of Resisting Legs Per Stirrup	=	2



Load Combination ASCE 7-10



Cross Section & Reinforcing Details

Rectangular Section, Width = 8.0 in, Height = 42.0 in

Span #1 Reinforcing....

- 2-#5 at 3.0 in from Bottom, from 0.0 to 10.0 ft in this span
- 2-#5 at 6.0 in from Top, from 0.0 to 10.0 ft in this span
- 2-#5 at 12.0 in from Top, from 0.0 to 10.0 ft in this span

- 2-#5 at 3.0 in from Top, from 0.0 to 10.0 ft in this span
- 2-#5 at 9.0 in from Top, from 0.0 to 10.0 ft in this span
- 2-#5 at 6.0 in from Bottom, from 0.0 to 10.0 ft in this span

Span #2 Reinforcing....

- 2-#6 at 3.0 in from Bottom, from 0.0 to 6.0 ft in this span
- 2-#6 at 6.0 in from Top, from 0.0 to 6.0 ft in this span

- 2-#6 at 3.0 in from Top, from 0.0 to 6.0 ft in this span
- 2-#6 at 10.0 in from Top, from 0.0 to 6.0 ft in this span

Applied Loads

Beam self weight calculated and added to loads

Load for Span Number 1

Uniform Load : D = 1.450, L = 0.040 ksf, Tributary Width = 8.0 ft

Load for Span Number 2

Uniform Load : D = 1.450, L = 0.040 ksf, Tributary Width = 8.0 ft

Service loads entered. Load Factors will be applied for calculations.

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.840 : 1
Section used for this span	Typical Section
Mu : Applied	-295.453 k-ft
Mn * Phi : Allowable	351.880 k-ft
Load Combination	+1.40D+1.60H
Location of maximum on span	9.952ft
Span # where maximum occurs	Span # 1

Maximum Deflection	
Max Downward Transient Deflection	0.000 in Ratio = 0 <360
Max Upward Transient Deflection	0.000 in Ratio = 0 <360
Max Downward Total Deflection	0.086 in Ratio = 1670
Max Upward Total Deflection	-0.004 in Ratio = 30380

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	39.227	156.907	
Overall MINimum	1.024	4.096	
+D+H	38.203	152.811	
+D+L+H	39.227	156.907	
+D+Lr+H	38.203	152.811	
+D+S+H	38.203	152.811	

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. # : KW-06007744

Description : Concrete pool wall

Vertical Reactions

Support notation : Far left is #1

Load Combination	Support 1	Support 2	Support 3
+D+0.750Lr+0.750L+H	38.971	155.883	
+D+0.750L+0.750S+H	38.971	155.883	
+D+0.60W+H	38.203	152.811	
+D+0.70E+H	38.203	152.811	
+D+0.750Lr+0.750L+0.450W+H	38.971	155.883	
+D+0.750L+0.750S+0.450W+H	38.971	155.883	
+D+0.750L+0.750S+0.5250E+H	38.971	155.883	
+0.60D+0.60W+0.60H	22.922	91.686	
+0.60D+0.70E+0.60H	22.922	91.686	
D Only	38.203	152.811	
Lr Only			
L Only	1.024	4.096	
S Only			
W Only			
E Only			
H Only			

Shear Stirrup Requirements

Between 0.00 to 1.57 ft, $\Phi V_c < V_u$, Req'd $V_s = 0.5427$, use stirrups spaced at 9.000 in
 Between 1.62 to 2.43 ft, $\Phi V_c/2 < V_u \leq \Phi V_c$, Req'd $V_s = \text{Min } 11.4.6.1$, use stirrups spaced at 19.000 in
 Between 2.48 to 3.95 ft, $V_u < \Phi V_c/2$, Req'd $V_s = \text{Not Req'd } 11.4.6.1$, use stirrups spaced at 0.000 in
 Between 4.00 to 4.76 ft, $\Phi V_c/2 < V_u \leq \Phi V_c$, Req'd $V_s = \text{Min } 11.4.6.1$, use stirrups spaced at 19.000 in
 Between 4.81 to 8.00 ft, $\Phi V_c < V_u$, Req'd $V_s = 51.224$, use stirrups spaced at 5.000 in
 Between 8.05 to 11.17 ft, $V_s > (4bd'fc^{.5}) \text{ ACI } 11.4.5.3$, Req'd $V_s = 51.401$, use stirrups spaced at 3.000 in
 Between 11.20 to 14.23 ft, $\Phi V_c < V_u$, Req'd $V_s = 0.3053$, use stirrups spaced at 5.000 in
 Between 14.26 to 15.11 ft, $\Phi V_c/2 < V_u \leq \Phi V_c$, Req'd $V_s = \text{Min } 11.4.6.1$, use stirrups spaced at 19.000 in
 Between 15.14 to 15.97 ft, $V_u < \Phi V_c/2$, Req'd $V_s = \text{Not Req'd } 11.4.6.1$, use stirrups spaced at 0.000 in

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Location (ft) in Span	Bending Stress Results (k-ft)		
				Mu : Max	Phi*Mnx	Stress Ratio
MAXimum BENDING Envelope						
Span # 1		1	10.000	-295.45	351.88	0.84
Span # 2		2	6.000	-300.85	389.13	0.77
+1.40D+1.60H						
Span # 1		1	10.000	-295.45	351.88	0.84
Span # 2		2	6.000	-300.85	389.13	0.77
+1.20D+0.50Lr+1.60L+1.60H						
Span # 1		1	10.000	-262.30	351.88	0.75
Span # 2		2	6.000	-267.08	389.13	0.69
+1.20D+1.60L+0.50S+1.60H						
Span # 1		1	10.000	-262.30	351.88	0.75
Span # 2		2	6.000	-267.08	389.13	0.69
+1.20D+1.60Lr+0.50L+1.60H						
Span # 1		1	10.000	-256.07	351.88	0.73
Span # 2		2	6.000	-260.75	389.13	0.67
+1.20D+1.60Lr+0.50W+1.60H						
Span # 1		1	10.000	-253.25	351.88	0.72
Span # 2		2	6.000	-257.87	389.13	0.66
+1.20D+0.50L+1.60S+1.60H						
Span # 1		1	10.000	-256.07	351.88	0.73
Span # 2		2	6.000	-260.75	389.13	0.67
+1.20D+1.60S+0.50W+1.60H						
Span # 1		1	10.000	-253.25	351.88	0.72
Span # 2		2	6.000	-257.87	389.13	0.66
+1.20D+0.50Lr+0.50L+W+1.60H						
Span # 1		1	10.000	-256.07	351.88	0.73
Span # 2		2	6.000	-260.75	389.13	0.67
+1.20D+0.50L+0.50S+W+1.60H						
Span # 1		1	10.000	-256.07	351.88	0.73
Span # 2		2	6.000	-260.75	389.13	0.67
+1.20D+0.50L+0.20S+E+1.60H						
Span # 1		1	10.000	-256.07	351.88	0.73
Span # 2		2	6.000	-260.75	389.13	0.67
+0.90D+W+0.90H						
Span # 1		1	10.000	-189.93	351.88	0.54
Span # 2		2	6.000	-193.40	389.13	0.50
+0.90D+E+0.90H						

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. # : KW-06007744

Description : Concrete pool wall

Load Combination	Segment Length	Span #	Location (ft) in Span	Bending Stress Results (k-ft)		
				Mu : Max	Phi*Mnx	Stress Ratio
Span # 1		1	10.000	-189.93	351.88	0.54
Span # 2		2	6.000	-193.40	389.13	0.50

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.0024	2.833	+D+L+H	-0.0039	8.500
+D+L+H	2	0.0862	6.000		0.0000	8.500

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.40D+1.60H	1	0.00	39.00	53.48	53.48	0.00	1.00	26.68	PhiVc < Vu	26.807	55.3	9.6	9.0
+1.40D+1.60H	1	0.05	39.00	52.69	52.69	2.53	1.00	26.68	PhiVc < Vu	26.011	55.3	9.9	9.0
+1.40D+1.60H	1	0.10	39.00	51.89	51.89	5.02	1.00	26.68	PhiVc < Vu	25.215	55.3	10.2	9.0
+1.40D+1.60H	1	0.14	39.00	51.10	51.10	7.47	1.00	26.68	PhiVc < Vu	24.419	55.3	10.5	9.0
+1.40D+1.60H	1	0.19	39.00	50.30	50.30	9.88	1.00	26.68	PhiVc < Vu	23.623	55.3	10.9	9.0
+1.40D+1.60H	1	0.24	39.00	49.50	49.50	12.26	1.00	26.68	PhiVc < Vu	22.828	55.3	11.3	9.0
+1.40D+1.60H	1	0.29	39.00	48.71	48.71	14.60	1.00	26.68	PhiVc < Vu	22.032	55.3	11.7	9.0
+1.40D+1.60H	1	0.33	39.00	47.91	47.91	16.90	1.00	26.68	PhiVc < Vu	21.236	55.3	12.1	9.0
+1.40D+1.60H	1	0.38	39.00	47.12	47.12	19.16	1.00	26.68	PhiVc < Vu	20.440	55.3	12.6	9.0
+1.40D+1.60H	1	0.43	39.00	46.32	46.32	21.39	1.00	26.68	PhiVc < Vu	19.644	55.3	13.1	9.0
+1.40D+1.60H	1	0.48	39.00	45.52	45.52	23.57	1.00	26.68	PhiVc < Vu	18.848	55.3	13.7	9.0
+1.40D+1.60H	1	0.52	39.00	44.73	44.73	25.72	1.00	26.68	PhiVc < Vu	18.052	55.3	14.3	9.0
+1.40D+1.60H	1	0.57	39.00	43.93	43.93	27.83	1.00	26.68	PhiVc < Vu	17.256	55.3	14.9	9.0
+1.40D+1.60H	1	0.62	39.00	43.14	43.14	29.91	1.00	26.68	PhiVc < Vu	16.460	55.3	15.6	9.0
+1.40D+1.60H	1	0.67	39.00	42.34	42.34	31.94	1.00	26.68	PhiVc < Vu	15.665	55.3	16.4	9.0
+1.40D+1.60H	1	0.71	39.00	41.55	41.55	33.94	1.00	26.68	PhiVc < Vu	14.869	55.3	17.3	9.0
+1.40D+1.60H	1	0.76	39.00	40.75	40.75	35.90	1.00	26.68	PhiVc < Vu	14.073	55.3	18.3	9.0
+1.40D+1.60H	1	0.81	39.00	39.95	39.95	37.82	1.00	26.68	PhiVc < Vu	13.277	55.3	19.4	9.0
+1.40D+1.60H	1	0.86	39.00	39.16	39.16	39.70	1.00	26.68	PhiVc < Vu	12.481	55.3	19.5	9.0
+1.40D+1.60H	1	0.90	39.00	38.36	38.36	41.55	1.00	26.68	PhiVc < Vu	11.685	55.3	19.5	9.0
+1.40D+1.60H	1	0.95	39.00	37.57	37.57	43.36	1.00	26.68	PhiVc < Vu	10.889	55.3	19.5	9.0
+1.40D+1.60H	1	1.00	39.00	36.77	36.77	45.13	1.00	26.68	PhiVc < Vu	10.093	55.3	19.5	9.0
+1.40D+1.60H	1	1.05	39.00	35.97	35.97	46.86	1.00	26.68	PhiVc < Vu	9.297	55.3	19.5	9.0
+1.40D+1.60H	1	1.10	39.00	35.18	35.18	48.55	1.00	26.68	PhiVc < Vu	8.502	55.3	19.5	9.0
+1.40D+1.60H	1	1.14	39.00	34.38	34.38	50.21	1.00	26.68	PhiVc < Vu	7.706	55.3	19.5	9.0
+1.40D+1.60H	1	1.19	39.00	33.59	33.59	51.83	1.00	26.68	PhiVc < Vu	6.910	55.3	19.5	9.0
+1.40D+1.60H	1	1.24	39.00	32.79	32.79	53.41	1.00	26.68	PhiVc < Vu	6.114	55.3	19.5	9.0
+1.40D+1.60H	1	1.29	39.00	31.99	31.99	54.95	1.00	26.68	PhiVc < Vu	5.318	55.3	19.5	9.0
+1.40D+1.60H	1	1.33	39.00	31.20	31.20	56.46	1.00	26.68	PhiVc < Vu	4.522	55.3	19.5	9.0
+1.40D+1.60H	1	1.38	39.00	30.40	30.40	57.92	1.00	26.68	PhiVc < Vu	3.726	55.3	19.5	9.0
+1.40D+1.60H	1	1.43	39.00	29.61	29.61	59.35	1.00	26.68	PhiVc < Vu	2.930	55.3	19.5	9.0
+1.40D+1.60H	1	1.48	39.00	28.81	28.81	60.74	1.00	26.68	PhiVc < Vu	2.134	55.3	19.5	9.0
+1.40D+1.60H	1	1.52	39.00	28.02	28.02	62.09	1.00	26.68	PhiVc < Vu	1.339	55.3	19.5	9.0
+1.40D+1.60H	1	1.57	39.00	27.22	27.22	63.41	1.00	26.68	PhiVc < Vu	0.5427	55.3	19.5	9.0
+1.40D+1.60H	1	1.62	39.00	26.42	26.42	64.69	1.00	26.68	PhiVc/2 < Vu <=	Min 11.4.6	40.2	19.5	19.0
+1.40D+1.60H	1	1.67	39.00	25.63	25.63	65.93	1.00	26.68	PhiVc/2 < Vu <=	Min 11.4.6	40.2	19.5	19.0
+1.40D+1.60H	1	1.71	39.00	24.83	24.83	67.13	1.00	26.68	PhiVc/2 < Vu <=	Min 11.4.6	40.2	19.5	19.0
+1.40D+1.60H	1	1.76	39.00	24.04	24.04	68.29	1.00	26.68	PhiVc/2 < Vu <=	Min 11.4.6	40.2	19.5	19.0
+1.40D+1.60H	1	1.81	39.00	23.24	23.24	69.42	1.00	26.68	PhiVc/2 < Vu <=	Min 11.4.6	40.2	19.5	19.0
+1.40D+1.60H	1	1.86	39.00	22.44	22.44	70.50	1.00	26.68	PhiVc/2 < Vu <=	Min 11.4.6	40.2	19.5	19.0
+1.40D+1.60H	1	1.90	39.00	21.65	21.65	71.55	0.98	26.64	PhiVc/2 < Vu <=	Min 11.4.6	40.2	19.5	19.0
+1.40D+1.60H	1	1.95	39.00	20.85	20.85	72.57	0.93	26.52	PhiVc/2 < Vu <=	Min 11.4.6	40.1	19.5	19.0
+1.40D+1.60H	1	2.00	39.00	20.06	20.06	73.54	0.89	26.41	PhiVc/2 < Vu <=	Min 11.4.6	40.0	19.5	19.0
+1.40D+1.60H	1	2.05	39.00	19.26	19.26	74.48	0.84	26.31	PhiVc/2 < Vu <=	Min 11.4.6	39.9	19.5	19.0
+1.40D+1.60H	1	2.10	39.00	18.46	18.46	75.37	0.80	26.20	PhiVc/2 < Vu <=	Min 11.4.6	39.8	19.5	19.0
+1.40D+1.60H	1	2.14	39.00	17.67	17.67	76.23	0.75	26.10	PhiVc/2 < Vu <=	Min 11.4.6	39.7	19.5	19.0

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. #: KW-06007744

Description : Concrete pool wall

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.40D+1.60H	1	2.19	39.00	16.87	16.87	77.06	0.71	26.01	PhiVc/2 < Vu <=	Min 11.4.6	39.6	19.5	19.0
+1.40D+1.60H	1	2.24	39.00	16.08	16.08	77.84	0.67	25.91	PhiVc/2 < Vu <=	Min 11.4.6	39.5	19.5	19.0
+1.40D+1.60H	1	2.29	39.00	15.28	15.28	78.59	0.63	25.82	PhiVc/2 < Vu <=	Min 11.4.6	39.4	19.5	19.0
+1.40D+1.60H	1	2.33	39.00	14.49	14.49	79.30	0.59	25.73	PhiVc/2 < Vu <=	Min 11.4.6	39.3	19.5	19.0
+1.40D+1.60H	1	2.38	39.00	13.69	13.69	79.97	0.56	25.65	PhiVc/2 < Vu <=	Min 11.4.6	39.2	19.5	19.0
+1.40D+1.60H	1	2.43	39.00	12.89	12.89	80.60	0.52	25.56	PhiVc/2 < Vu <=	Min 11.4.6	39.1	19.5	19.0
+1.40D+1.60H	1	2.48	39.00	12.10	12.10	81.20	0.48	25.48	Vu < PhiVc/2	Not Req'd	25.5	0.0	0.0
+1.40D+1.60H	1	2.52	39.00	11.30	11.30	81.75	0.45	25.40	Vu < PhiVc/2	Not Req'd	25.4	0.0	0.0
+1.40D+1.60H	1	2.57	39.00	10.51	10.51	82.27	0.42	25.32	Vu < PhiVc/2	Not Req'd	25.3	0.0	0.0
+1.40D+1.60H	1	2.62	39.00	9.71	9.71	82.75	0.38	25.24	Vu < PhiVc/2	Not Req'd	25.2	0.0	0.0
+1.40D+1.60H	1	2.67	39.00	8.91	8.91	83.20	0.35	25.16	Vu < PhiVc/2	Not Req'd	25.2	0.0	0.0
+1.40D+1.60H	1	2.71	39.00	8.12	8.12	83.60	0.32	25.09	Vu < PhiVc/2	Not Req'd	25.1	0.0	0.0
+1.40D+1.60H	1	2.76	39.00	7.32	7.32	83.97	0.28	25.01	Vu < PhiVc/2	Not Req'd	25.0	0.0	0.0
+1.40D+1.60H	1	2.81	39.00	6.53	6.53	84.30	0.25	24.94	Vu < PhiVc/2	Not Req'd	24.9	0.0	0.0
+1.40D+1.60H	1	2.86	39.00	5.73	5.73	84.59	0.22	24.86	Vu < PhiVc/2	Not Req'd	24.9	0.0	0.0
+1.40D+1.60H	1	2.90	39.00	4.93	4.93	84.85	0.19	24.79	Vu < PhiVc/2	Not Req'd	24.8	0.0	0.0
+1.40D+1.60H	1	2.95	39.00	4.14	4.14	85.06	0.16	24.72	Vu < PhiVc/2	Not Req'd	24.7	0.0	0.0
+1.40D+1.60H	1	3.00	39.00	3.34	3.34	85.24	0.13	24.65	Vu < PhiVc/2	Not Req'd	24.6	0.0	0.0
+1.40D+1.60H	1	3.05	39.00	2.55	2.55	85.38	0.10	24.58	Vu < PhiVc/2	Not Req'd	24.6	0.0	0.0
+1.40D+1.60H	1	3.10	39.00	1.75	1.75	85.48	0.07	24.51	Vu < PhiVc/2	Not Req'd	24.5	0.0	0.0
+1.40D+1.60H	1	3.14	39.00	0.96	0.96	85.55	0.04	24.44	Vu < PhiVc/2	Not Req'd	24.4	0.0	0.0
+1.40D+1.60H	1	3.19	39.00	0.16	0.16	85.57	0.01	24.37	Vu < PhiVc/2	Not Req'd	24.4	0.0	0.0
+1.40D+1.60H	1	3.24	39.00	-0.64	0.64	85.56	0.02	24.41	Vu < PhiVc/2	Not Req'd	24.4	0.0	0.0
+1.40D+1.60H	1	3.29	39.00	-1.43	1.43	85.51	0.05	24.48	Vu < PhiVc/2	Not Req'd	24.5	0.0	0.0
+1.40D+1.60H	1	3.33	39.00	-2.23	2.23	85.43	0.08	24.55	Vu < PhiVc/2	Not Req'd	24.5	0.0	0.0
+1.40D+1.60H	1	3.38	39.00	-3.02	3.02	85.30	0.12	24.62	Vu < PhiVc/2	Not Req'd	24.6	0.0	0.0
+1.40D+1.60H	1	3.43	39.00	-3.82	3.82	85.14	0.15	24.69	Vu < PhiVc/2	Not Req'd	24.7	0.0	0.0
+1.40D+1.60H	1	3.48	39.00	-4.62	4.62	84.94	0.18	24.76	Vu < PhiVc/2	Not Req'd	24.8	0.0	0.0
+1.40D+1.60H	1	3.52	39.00	-5.41	5.41	84.70	0.21	24.83	Vu < PhiVc/2	Not Req'd	24.8	0.0	0.0
+1.40D+1.60H	1	3.57	39.00	-6.21	6.21	84.42	0.24	24.91	Vu < PhiVc/2	Not Req'd	24.9	0.0	0.0
+1.40D+1.60H	1	3.62	39.00	-7.00	7.00	84.11	0.27	24.98	Vu < PhiVc/2	Not Req'd	25.0	0.0	0.0
+1.40D+1.60H	1	3.67	39.00	-7.80	7.80	83.75	0.30	25.06	Vu < PhiVc/2	Not Req'd	25.1	0.0	0.0
+1.40D+1.60H	1	3.71	39.00	-8.60	8.60	83.36	0.34	25.13	Vu < PhiVc/2	Not Req'd	25.1	0.0	0.0
+1.40D+1.60H	1	3.76	39.00	-9.39	9.39	82.94	0.37	25.21	Vu < PhiVc/2	Not Req'd	25.2	0.0	0.0
+1.40D+1.60H	1	3.81	39.00	-10.19	10.19	82.47	0.40	25.29	Vu < PhiVc/2	Not Req'd	25.3	0.0	0.0
+1.40D+1.60H	1	3.86	39.00	-10.98	10.98	81.97	0.44	25.36	Vu < PhiVc/2	Not Req'd	25.4	0.0	0.0
+1.40D+1.60H	1	3.90	39.00	-11.78	11.78	81.42	0.47	25.44	Vu < PhiVc/2	Not Req'd	25.4	0.0	0.0
+1.40D+1.60H	1	3.95	39.00	-12.58	12.58	80.84	0.51	25.53	Vu < PhiVc/2	Not Req'd	25.5	0.0	0.0
+1.40D+1.60H	1	4.00	39.00	-13.37	13.37	80.23	0.54	25.61	PhiVc/2 < Vu <=	Min 11.4.6	39.2	19.5	19.0
+1.40D+1.60H	1	4.05	39.00	-14.17	14.17	79.57	0.58	25.70	PhiVc/2 < Vu <=	Min 11.4.6	39.2	19.5	19.0
+1.40D+1.60H	1	4.10	39.00	-14.96	14.96	78.88	0.62	25.79	PhiVc/2 < Vu <=	Min 11.4.6	39.3	19.5	19.0
+1.40D+1.60H	1	4.14	39.00	-15.76	15.76	78.14	0.66	25.88	PhiVc/2 < Vu <=	Min 11.4.6	39.4	19.5	19.0
+1.40D+1.60H	1	4.19	39.00	-16.55	16.55	77.38	0.70	25.97	PhiVc/2 < Vu <=	Min 11.4.6	39.5	19.5	19.0
+1.40D+1.60H	1	4.24	39.00	-17.35	17.35	76.57	0.74	26.06	PhiVc/2 < Vu <=	Min 11.4.6	39.6	19.5	19.0
+1.40D+1.60H	1	4.29	39.00	-18.15	18.15	75.72	0.78	26.16	PhiVc/2 < Vu <=	Min 11.4.6	39.7	19.5	19.0
+1.40D+1.60H	1	4.33	39.00	-18.94	18.94	74.84	0.82	26.26	PhiVc/2 < Vu <=	Min 11.4.6	39.8	19.5	19.0
+1.40D+1.60H	1	4.38	39.00	-19.74	19.74	73.92	0.87	26.37	PhiVc/2 < Vu <=	Min 11.4.6	39.9	19.5	19.0
+1.40D+1.60H	1	4.43	39.00	-20.53	20.53	72.96	0.91	26.48	PhiVc/2 < Vu <=	Min 11.4.6	40.0	19.5	19.0
+1.40D+1.60H	1	4.48	39.00	-21.33	21.33	71.96	0.96	26.59	PhiVc/2 < Vu <=	Min 11.4.6	40.1	19.5	19.0
+1.40D+1.60H	1	4.52	39.00	-22.13	22.13	70.93	1.00	26.68	PhiVc/2 < Vu <=	Min 11.4.6	40.2	19.5	19.0
+1.40D+1.60H	1	4.57	39.00	-22.92	22.92	69.86	1.00	26.68	PhiVc/2 < Vu <=	Min 11.4.6	40.2	19.5	19.0
+1.40D+1.60H	1	4.62	39.00	-23.72	23.72	68.75	1.00	26.68	PhiVc/2 < Vu <=	Min 11.4.6	40.2	19.5	19.0
+1.40D+1.60H	1	4.67	39.00	-24.51	24.51	67.60	1.00	26.68	PhiVc/2 < Vu <=	Min 11.4.6	40.2	19.5	19.0
+1.40D+1.60H	1	4.71	39.00	-25.31	25.31	66.41	1.00	26.68	PhiVc/2 < Vu <=	Min 11.4.6	40.2	19.5	19.0

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. #: KW-06007744

Description: Concrete pool wall

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.40D+1.60H	1	4.76	39.00	-26.11	26.11	65.19	1.00	26.68	PhiVc/2 < Vu <=	Min 11.4.6	40.2	19.5	19.0
+1.40D+1.60H	1	4.81	39.00	-26.90	26.90	63.93	1.00	26.68	PhiVc < Vu	0.2243	78.2	19.5	5.0
+1.40D+1.60H	1	4.86	39.00	-27.70	27.70	62.63	1.00	26.68	PhiVc < Vu	1.020	78.2	19.5	5.0
+1.40D+1.60H	1	4.90	39.00	-28.49	28.49	61.29	1.00	26.68	PhiVc < Vu	1.816	78.2	19.5	5.0
+1.40D+1.60H	1	4.95	39.00	-29.29	29.29	59.91	1.00	26.68	PhiVc < Vu	2.612	78.2	19.5	5.0
+1.40D+1.60H	1	5.00	39.00	-30.08	30.08	58.50	1.00	26.68	PhiVc < Vu	3.408	78.2	19.5	5.0
+1.40D+1.60H	1	5.05	39.00	-30.88	30.88	57.05	1.00	26.68	PhiVc < Vu	4.204	78.2	19.5	5.0
+1.40D+1.60H	1	5.10	39.00	-31.68	31.68	55.56	1.00	26.68	PhiVc < Vu	5.0	78.2	19.5	5.0
+1.40D+1.60H	1	5.14	39.00	-32.47	32.47	54.03	1.00	26.68	PhiVc < Vu	5.796	78.2	19.5	5.0
+1.40D+1.60H	1	5.19	39.00	-33.27	33.27	52.46	1.00	26.68	PhiVc < Vu	6.591	78.2	19.5	5.0
+1.40D+1.60H	1	5.24	39.00	-34.06	34.06	50.86	1.00	26.68	PhiVc < Vu	7.387	78.2	19.5	5.0
+1.40D+1.60H	1	5.29	39.00	-34.86	34.86	49.22	1.00	26.68	PhiVc < Vu	8.183	78.2	19.5	5.0
+1.40D+1.60H	1	5.33	39.00	-35.66	35.66	47.54	1.00	26.68	PhiVc < Vu	8.979	78.2	19.5	5.0
+1.40D+1.60H	1	5.38	39.00	-36.45	36.45	45.82	1.00	26.68	PhiVc < Vu	9.775	78.2	19.5	5.0
+1.40D+1.60H	1	5.43	39.00	-37.25	37.25	44.07	1.00	26.68	PhiVc < Vu	10.571	78.2	19.5	5.0
+1.40D+1.60H	1	5.48	39.00	-38.04	38.04	42.28	1.00	26.68	PhiVc < Vu	11.367	78.2	19.5	5.0
+1.40D+1.60H	1	5.52	39.00	-38.84	38.84	40.45	1.00	26.68	PhiVc < Vu	12.163	78.2	19.5	5.0
+1.40D+1.60H	1	5.57	39.00	-39.64	39.64	38.58	1.00	26.68	PhiVc < Vu	12.959	78.2	19.5	5.0
+1.40D+1.60H	1	5.62	39.00	-40.43	40.43	36.67	1.00	26.68	PhiVc < Vu	13.754	78.2	18.7	5.0
+1.40D+1.60H	1	5.67	39.00	-41.23	41.23	34.73	1.00	26.68	PhiVc < Vu	14.550	78.2	17.7	5.0
+1.40D+1.60H	1	5.71	39.00	-42.02	42.02	32.75	1.00	26.68	PhiVc < Vu	15.346	78.2	16.8	5.0
+1.40D+1.60H	1	5.76	39.00	-42.82	42.82	30.73	1.00	26.68	PhiVc < Vu	16.142	78.2	15.9	5.0
+1.40D+1.60H	1	5.81	39.00	-43.61	43.61	28.67	1.00	26.68	PhiVc < Vu	16.938	78.2	15.2	5.0
+1.40D+1.60H	1	5.86	39.00	-44.41	44.41	26.57	1.00	26.68	PhiVc < Vu	17.734	78.2	14.5	5.0
+1.40D+1.60H	1	5.90	39.00	-45.21	45.21	24.44	1.00	26.68	PhiVc < Vu	18.530	78.2	13.9	5.0
+1.40D+1.60H	1	5.95	39.00	-46.00	46.00	22.27	1.00	26.68	PhiVc < Vu	19.326	78.2	13.3	5.0
+1.40D+1.60H	1	6.00	39.00	-46.80	46.80	20.06	1.00	26.68	PhiVc < Vu	20.122	78.2	12.8	5.0
+1.40D+1.60H	1	6.05	39.00	-47.59	47.59	17.81	1.00	26.68	PhiVc < Vu	20.917	78.2	12.3	5.0
+1.40D+1.60H	1	6.10	39.00	-48.39	48.39	15.52	1.00	26.68	PhiVc < Vu	21.713	78.2	11.9	5.0
+1.40D+1.60H	1	6.14	39.00	-49.19	49.19	13.20	1.00	26.68	PhiVc < Vu	22.509	78.2	11.4	5.0
+1.40D+1.60H	1	6.19	39.00	-49.98	49.98	10.84	1.00	26.68	PhiVc < Vu	23.305	78.2	11.0	5.0
+1.40D+1.60H	1	6.24	39.00	-50.78	50.78	8.44	1.00	26.68	PhiVc < Vu	24.101	78.2	10.7	5.0
+1.40D+1.60H	1	6.29	39.00	-51.57	51.57	6.00	1.00	26.68	PhiVc < Vu	24.897	78.2	10.3	5.0
+1.40D+1.60H	1	6.33	39.00	-52.37	52.37	3.53	1.00	26.68	PhiVc < Vu	25.693	78.2	10.0	5.0
+1.40D+1.60H	1	6.38	39.00	-53.17	53.17	1.02	1.00	26.68	PhiVc < Vu	26.489	78.2	9.7	5.0
+1.40D+1.60H	1	6.43	39.00	-53.96	53.96	1.53	1.00	29.00	PhiVc < Vu	24.960	80.5	10.3	5.0
+1.40D+1.60H	1	6.48	39.00	-54.76	54.76	4.12	1.00	29.00	PhiVc < Vu	25.755	80.5	10.0	5.0
+1.40D+1.60H	1	6.52	39.00	-55.55	55.55	6.75	1.00	29.00	PhiVc < Vu	26.551	80.5	9.7	5.0
+1.40D+1.60H	1	6.57	39.00	-56.35	56.35	9.41	1.00	29.00	PhiVc < Vu	27.347	80.5	9.4	5.0
+1.40D+1.60H	1	6.62	39.00	-57.14	57.14	12.12	1.00	29.00	PhiVc < Vu	28.143	80.5	9.1	5.0
+1.40D+1.60H	1	6.67	39.00	-57.94	57.94	14.86	1.00	29.00	PhiVc < Vu	28.939	80.5	8.9	5.0
+1.40D+1.60H	1	6.71	39.00	-58.74	58.74	17.63	1.00	29.00	PhiVc < Vu	29.735	80.5	8.7	5.0
+1.40D+1.60H	1	6.76	39.00	-59.53	59.53	20.45	1.00	29.00	PhiVc < Vu	30.531	80.5	8.4	5.0
+1.40D+1.60H	1	6.81	39.00	-60.33	60.33	23.30	1.00	29.00	PhiVc < Vu	31.327	80.5	8.2	5.0
+1.40D+1.60H	1	6.86	39.00	-61.12	61.12	26.20	1.00	29.00	PhiVc < Vu	32.123	80.5	8.0	5.0
+1.40D+1.60H	1	6.90	39.00	-61.92	61.92	29.13	1.00	29.00	PhiVc < Vu	32.918	80.5	7.8	5.0
+1.40D+1.60H	1	6.95	39.00	-62.72	62.72	32.09	1.00	29.00	PhiVc < Vu	33.714	80.5	7.6	5.0
+1.40D+1.60H	1	7.00	39.00	-63.51	63.51	35.10	1.00	29.00	PhiVc < Vu	34.510	80.5	7.5	5.0
+1.40D+1.60H	1	7.05	39.00	-64.31	64.31	38.14	1.00	29.00	PhiVc < Vu	35.306	80.5	7.3	5.0
+1.40D+1.60H	1	7.10	39.00	-65.10	65.10	41.22	1.00	29.00	PhiVc < Vu	36.102	80.5	7.1	5.0
+1.40D+1.60H	1	7.14	39.00	-65.90	65.90	44.34	1.00	29.00	PhiVc < Vu	36.898	80.5	7.0	5.0
+1.40D+1.60H	1	7.19	39.00	-66.70	66.70	47.50	1.00	29.00	PhiVc < Vu	37.694	80.5	6.8	5.0
+1.40D+1.60H	1	7.24	39.00	-67.49	67.49	50.69	1.00	29.00	PhiVc < Vu	38.490	80.5	6.7	5.0
+1.40D+1.60H	1	7.29	39.00	-68.29	68.29	53.93	1.00	29.00	PhiVc < Vu	39.286	80.5	6.6	5.0

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-I\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. # : KW-06007744

Description : Concrete pool wall

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.40D+1.60H	1	7.33	39.00	-69.08	69.08	57.20	1.00	29.00	PhiVc < Vu	40.081	80.5	6.4	5.0
+1.40D+1.60H	1	7.38	39.00	-69.88	69.88	60.51	1.00	29.00	PhiVc < Vu	40.877	80.5	6.3	5.0
+1.40D+1.60H	1	7.43	39.00	-70.67	70.67	63.85	1.00	29.00	PhiVc < Vu	41.673	80.5	6.2	5.0
+1.40D+1.60H	1	7.48	39.00	-71.47	71.47	67.24	1.00	29.00	PhiVc < Vu	42.469	80.5	6.1	5.0
+1.40D+1.60H	1	7.52	39.00	-72.27	72.27	70.66	1.00	29.00	PhiVc < Vu	43.265	80.5	5.9	5.0
+1.40D+1.60H	1	7.57	39.00	-73.06	73.06	74.12	1.00	29.00	PhiVc < Vu	44.061	80.5	5.8	5.0
+1.40D+1.60H	1	7.62	39.00	-73.86	73.86	77.62	1.00	29.00	PhiVc < Vu	44.857	80.5	5.7	5.0
+1.40D+1.60H	1	7.67	39.00	-74.65	74.65	81.15	1.00	29.00	PhiVc < Vu	45.653	80.5	5.6	5.0
+1.40D+1.60H	1	7.71	39.00	-75.45	75.45	84.73	1.00	29.00	PhiVc < Vu	46.449	80.5	5.5	5.0
+1.40D+1.60H	1	7.76	39.00	-76.25	76.25	88.34	1.00	29.00	PhiVc < Vu	47.244	80.5	5.4	5.0
+1.40D+1.60H	1	7.81	39.00	-77.04	77.04	91.99	1.00	29.00	PhiVc < Vu	48.040	80.5	5.4	5.0
+1.40D+1.60H	1	7.86	39.00	-77.84	77.84	95.68	1.00	29.00	PhiVc < Vu	48.836	80.5	5.3	5.0
+1.40D+1.60H	1	7.90	39.00	-78.63	78.63	99.40	1.00	29.00	PhiVc < Vu	49.632	80.5	5.2	5.0
+1.40D+1.60H	1	7.95	39.00	-79.43	79.43	103.17	1.00	29.00	PhiVc < Vu	50.428	80.5	5.1	5.0
+1.40D+1.60H	1	8.00	39.00	-80.23	80.23	106.97	1.00	29.00	PhiVc < Vu	51.224	80.5	5.0	5.0
+1.40D+1.60H	1	8.05	39.00	-81.02	81.02	110.81	1.00	29.00	Vs>(4bdfc^5)	52.020	114.8	4.9	3.0
+1.40D+1.60H	1	8.10	39.00	-81.82	81.82	114.68	1.00	29.00	Vs>(4bdfc^5)	52.816	114.8	4.9	3.0
+1.40D+1.60H	1	8.14	39.00	-82.61	82.61	118.60	1.00	29.00	Vs>(4bdfc^5)	53.612	114.8	4.8	3.0
+1.40D+1.60H	1	8.19	39.00	-83.41	83.41	122.55	1.00	29.00	Vs>(4bdfc^5)	54.407	114.8	4.7	3.0
+1.40D+1.60H	1	8.24	39.00	-84.21	84.21	126.54	1.00	29.00	Vs>(4bdfc^5)	55.203	114.8	4.7	3.0
+1.40D+1.60H	1	8.29	39.00	-85.00	85.00	130.57	1.00	29.00	Vs>(4bdfc^5)	55.999	114.8	4.6	3.0
+1.40D+1.60H	1	8.33	39.00	-85.80	85.80	134.64	1.00	29.00	Vs>(4bdfc^5)	56.795	114.8	4.5	3.0
+1.40D+1.60H	1	8.38	39.00	-86.59	86.59	138.74	1.00	29.00	Vs>(4bdfc^5)	57.591	114.8	4.5	3.0
+1.40D+1.60H	1	8.43	39.00	-87.39	87.39	142.88	1.00	29.00	Vs>(4bdfc^5)	58.387	114.8	4.4	3.0
+1.40D+1.60H	1	8.48	39.00	-88.18	88.18	147.07	1.00	29.00	Vs>(4bdfc^5)	59.183	114.8	4.3	3.0
+1.40D+1.60H	1	8.52	39.00	-88.98	88.98	151.28	1.00	29.00	Vs>(4bdfc^5)	59.979	114.8	4.3	3.0
+1.40D+1.60H	1	8.57	39.00	-89.78	89.78	155.54	1.00	29.00	Vs>(4bdfc^5)	60.775	114.8	4.2	3.0
+1.40D+1.60H	1	8.62	39.00	-90.57	90.57	159.83	1.00	29.00	Vs>(4bdfc^5)	61.570	114.8	4.2	3.0
+1.40D+1.60H	1	8.67	39.00	-91.37	91.37	164.17	1.00	29.00	Vs>(4bdfc^5)	62.366	114.8	4.1	3.0
+1.40D+1.60H	1	8.71	39.00	-92.16	92.16	168.54	1.00	29.00	Vs>(4bdfc^5)	63.162	114.8	4.1	3.0
+1.40D+1.60H	1	8.76	39.00	-92.96	92.96	172.94	1.00	29.00	Vs>(4bdfc^5)	63.958	114.8	4.0	3.0
+1.40D+1.60H	1	8.81	39.00	-93.76	93.76	177.39	1.00	29.00	Vs>(4bdfc^5)	64.754	114.8	4.0	3.0
+1.40D+1.60H	1	8.86	39.00	-94.55	94.55	181.87	1.00	29.00	Vs>(4bdfc^5)	65.550	114.8	3.9	3.0
+1.40D+1.60H	1	8.90	39.00	-95.35	95.35	186.39	1.00	29.00	Vs>(4bdfc^5)	66.346	114.8	3.9	3.0
+1.40D+1.60H	1	8.95	39.00	-96.14	96.14	190.95	1.00	29.00	Vs>(4bdfc^5)	67.142	114.8	3.8	3.0
+1.40D+1.60H	1	9.00	39.00	-96.94	96.94	195.55	1.00	29.00	Vs>(4bdfc^5)	67.938	114.8	3.8	3.0
+1.40D+1.60H	1	9.05	39.00	-97.74	97.74	200.19	1.00	29.00	Vs>(4bdfc^5)	68.733	114.8	3.7	3.0
+1.40D+1.60H	1	9.10	39.00	-98.53	98.53	204.86	1.00	29.00	Vs>(4bdfc^5)	69.529	114.8	3.7	3.0
+1.40D+1.60H	1	9.14	39.00	-99.33	99.33	209.57	1.00	29.00	Vs>(4bdfc^5)	70.325	114.8	3.7	3.0
+1.40D+1.60H	1	9.19	39.00	-100.12	100.12	214.32	1.00	29.00	Vs>(4bdfc^5)	71.121	114.8	3.6	3.0
+1.40D+1.60H	1	9.24	39.00	-100.92	100.92	219.10	1.00	29.00	Vs>(4bdfc^5)	71.917	114.8	3.6	3.0
+1.40D+1.60H	1	9.29	39.00	-101.71	101.71	223.93	1.00	29.00	Vs>(4bdfc^5)	72.713	114.8	3.5	3.0
+1.40D+1.60H	1	9.33	39.00	-102.51	102.51	228.79	1.00	29.00	Vs>(4bdfc^5)	73.509	114.8	3.5	3.0
+1.40D+1.60H	1	9.38	39.00	-103.31	103.31	233.69	1.00	29.00	Vs>(4bdfc^5)	74.305	114.8	3.5	3.0
+1.40D+1.60H	1	9.43	39.00	-104.10	104.10	238.63	1.00	29.00	Vs>(4bdfc^5)	75.101	114.8	3.4	3.0
+1.40D+1.60H	1	9.48	39.00	-104.90	104.90	243.61	1.00	29.00	Vs>(4bdfc^5)	75.896	114.8	3.4	3.0
+1.40D+1.60H	1	9.52	39.00	-105.69	105.69	248.62	1.00	29.00	Vs>(4bdfc^5)	76.692	114.8	3.4	3.0
+1.40D+1.60H	1	9.57	39.00	-106.49	106.49	253.67	1.00	29.00	Vs>(4bdfc^5)	77.488	114.8	3.3	3.0
+1.40D+1.60H	1	9.62	39.00	-107.29	107.29	258.76	1.00	29.00	Vs>(4bdfc^5)	78.284	114.8	3.3	3.0
+1.40D+1.60H	1	9.67	39.00	-108.08	108.08	263.89	1.00	29.00	Vs>(4bdfc^5)	79.080	114.8	3.3	3.0
+1.40D+1.60H	1	9.71	39.00	-108.88	108.88	269.06	1.00	29.00	Vs>(4bdfc^5)	79.876	114.8	3.2	3.0
+1.40D+1.60H	1	9.76	39.00	-109.67	109.67	274.26	1.00	29.00	Vs>(4bdfc^5)	80.672	114.8	3.2	3.0
+1.40D+1.60H	1	9.81	39.00	-110.47	110.47	279.50	1.00	29.00	Vs>(4bdfc^5)	81.468	114.8	3.2	3.0
+1.40D+1.60H	1	9.86	39.00	-111.27	111.27	284.78	1.00	29.00	Vs>(4bdfc^5)	82.264	114.8	3.1	3.0

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. #: KW-06007744

Description: Concrete pool wall

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.40D+1.60H	1	9.90	39.00	-112.06	112.06	290.10	1.00	29.00	Vs>(4bdfc^5)	83.059	114.8	3.1	3.0
+1.40D+1.60H	1	9.95	39.00	-112.86	112.86	295.45	1.00	29.00	Vs>(4bdfc^5)	83.855	114.8	3.1	3.0
+1.40D+1.60H	2	10.00	39.00	100.28	100.28	300.85	1.00	29.30	Vs>(4bdfc^5)	70.980	115.1	3.6	3.0
+1.40D+1.60H	2	10.03	39.00	99.80	99.80	297.99	1.00	29.30	Vs>(4bdfc^5)	70.503	115.1	3.7	3.0
+1.40D+1.60H	2	10.06	39.00	99.33	99.33	295.14	1.00	29.30	Vs>(4bdfc^5)	70.025	115.1	3.7	3.0
+1.40D+1.60H	2	10.09	39.00	98.85	98.85	292.31	1.00	29.30	Vs>(4bdfc^5)	69.548	115.1	3.7	3.0
+1.40D+1.60H	2	10.11	39.00	98.37	98.37	289.49	1.00	29.30	Vs>(4bdfc^5)	69.070	115.1	3.7	3.0
+1.40D+1.60H	2	10.14	39.00	97.89	97.89	286.69	1.00	29.30	Vs>(4bdfc^5)	68.593	115.1	3.8	3.0
+1.40D+1.60H	2	10.17	39.00	97.42	97.42	283.90	1.00	29.30	Vs>(4bdfc^5)	68.115	115.1	3.8	3.0
+1.40D+1.60H	2	10.20	39.00	96.94	96.94	281.12	1.00	29.30	Vs>(4bdfc^5)	67.638	115.1	3.8	3.0
+1.40D+1.60H	2	10.23	39.00	96.46	96.46	278.36	1.00	29.30	Vs>(4bdfc^5)	67.160	115.1	3.8	3.0
+1.40D+1.60H	2	10.26	39.00	95.98	95.98	275.61	1.00	29.30	Vs>(4bdfc^5)	66.682	115.1	3.9	3.0
+1.40D+1.60H	2	10.29	39.00	95.51	95.51	272.88	1.00	29.30	Vs>(4bdfc^5)	66.205	115.1	3.9	3.0
+1.40D+1.60H	2	10.31	39.00	95.03	95.03	270.15	1.00	29.30	Vs>(4bdfc^5)	65.727	115.1	3.9	3.0
+1.40D+1.60H	2	10.34	39.00	94.55	94.55	267.45	1.00	29.30	Vs>(4bdfc^5)	65.250	115.1	3.9	3.0
+1.40D+1.60H	2	10.37	39.00	94.07	94.07	264.75	1.00	29.30	Vs>(4bdfc^5)	64.772	115.1	4.0	3.0
+1.40D+1.60H	2	10.40	39.00	93.60	93.60	262.07	1.00	29.30	Vs>(4bdfc^5)	64.295	115.1	4.0	3.0
+1.40D+1.60H	2	10.43	39.00	93.12	93.12	259.40	1.00	29.30	Vs>(4bdfc^5)	63.817	115.1	4.0	3.0
+1.40D+1.60H	2	10.46	39.00	92.64	92.64	256.75	1.00	29.30	Vs>(4bdfc^5)	63.340	115.1	4.1	3.0
+1.40D+1.60H	2	10.49	39.00	92.16	92.16	254.11	1.00	29.30	Vs>(4bdfc^5)	62.862	115.1	4.1	3.0
+1.40D+1.60H	2	10.51	39.00	91.69	91.69	251.48	1.00	29.30	Vs>(4bdfc^5)	62.385	115.1	4.1	3.0
+1.40D+1.60H	2	10.54	39.00	91.21	91.21	248.87	1.00	29.30	Vs>(4bdfc^5)	61.907	115.1	4.2	3.0
+1.40D+1.60H	2	10.57	39.00	90.73	90.73	246.27	1.00	29.30	Vs>(4bdfc^5)	61.430	115.1	4.2	3.0
+1.40D+1.60H	2	10.60	39.00	90.25	90.25	243.69	1.00	29.30	Vs>(4bdfc^5)	60.952	115.1	4.2	3.0
+1.40D+1.60H	2	10.63	39.00	89.78	89.78	241.11	1.00	29.30	Vs>(4bdfc^5)	60.475	115.1	4.3	3.0
+1.40D+1.60H	2	10.66	39.00	89.30	89.30	238.56	1.00	29.30	Vs>(4bdfc^5)	59.997	115.1	4.3	3.0
+1.40D+1.60H	2	10.69	39.00	88.82	88.82	236.01	1.00	29.30	Vs>(4bdfc^5)	59.519	115.1	4.3	3.0
+1.40D+1.60H	2	10.71	39.00	88.34	88.34	233.48	1.00	29.30	Vs>(4bdfc^5)	59.042	115.1	4.4	3.0
+1.40D+1.60H	2	10.74	39.00	87.87	87.87	230.96	1.00	29.30	Vs>(4bdfc^5)	58.564	115.1	4.4	3.0
+1.40D+1.60H	2	10.77	39.00	87.39	87.39	228.46	1.00	29.30	Vs>(4bdfc^5)	58.087	115.1	4.4	3.0
+1.40D+1.60H	2	10.80	39.00	86.91	86.91	225.97	1.00	29.30	Vs>(4bdfc^5)	57.609	115.1	4.5	3.0
+1.40D+1.60H	2	10.83	39.00	86.43	86.43	223.49	1.00	29.30	Vs>(4bdfc^5)	57.132	115.1	4.5	3.0
+1.40D+1.60H	2	10.86	39.00	85.96	85.96	221.03	1.00	29.30	Vs>(4bdfc^5)	56.654	115.1	4.5	3.0
+1.40D+1.60H	2	10.89	39.00	85.48	85.48	218.58	1.00	29.30	Vs>(4bdfc^5)	56.177	115.1	4.6	3.0
+1.40D+1.60H	2	10.91	39.00	85.00	85.00	216.15	1.00	29.30	Vs>(4bdfc^5)	55.699	115.1	4.6	3.0
+1.40D+1.60H	2	10.94	39.00	84.52	84.52	213.72	1.00	29.30	Vs>(4bdfc^5)	55.222	115.1	4.7	3.0
+1.40D+1.60H	2	10.97	39.00	84.05	84.05	211.32	1.00	29.30	Vs>(4bdfc^5)	54.744	115.1	4.7	3.0
+1.40D+1.60H	2	11.00	39.00	83.57	83.57	208.92	1.00	29.30	Vs>(4bdfc^5)	54.267	115.1	4.7	3.0
+1.40D+1.60H	2	11.03	39.00	83.09	83.09	206.54	1.00	29.30	Vs>(4bdfc^5)	53.789	115.1	4.8	3.0
+1.40D+1.60H	2	11.06	39.00	82.61	82.61	204.17	1.00	29.30	Vs>(4bdfc^5)	53.312	115.1	4.8	3.0
+1.40D+1.60H	2	11.09	39.00	82.14	82.14	201.82	1.00	29.30	Vs>(4bdfc^5)	52.834	115.1	4.9	3.0
+1.40D+1.60H	2	11.11	39.00	81.66	81.66	199.48	1.00	29.30	Vs>(4bdfc^5)	52.356	115.1	4.9	3.0
+1.40D+1.60H	2	11.14	39.00	81.18	81.18	197.15	1.00	29.30	Vs>(4bdfc^5)	51.879	115.1	5.0	3.0
+1.40D+1.60H	2	11.17	39.00	80.70	80.70	194.84	1.00	29.30	Vs>(4bdfc^5)	51.401	115.1	5.0	3.0
+1.40D+1.60H	2	11.20	39.00	80.23	80.23	192.54	1.00	29.30	PhiVc < Vu	50.924	80.8	5.1	5.0
+1.40D+1.60H	2	11.23	39.00	79.75	79.75	190.26	1.00	29.30	PhiVc < Vu	50.446	80.8	5.1	5.0
+1.40D+1.60H	2	11.26	39.00	79.27	79.27	187.98	1.00	29.30	PhiVc < Vu	49.969	80.8	5.2	5.0
+1.40D+1.60H	2	11.29	39.00	78.79	78.79	185.73	1.00	29.30	PhiVc < Vu	49.491	80.8	5.2	5.0
+1.40D+1.60H	2	11.31	39.00	78.32	78.32	183.48	1.00	29.30	PhiVc < Vu	49.014	80.8	5.3	5.0
+1.40D+1.60H	2	11.34	39.00	77.84	77.84	181.25	1.00	29.30	PhiVc < Vu	48.536	80.8	5.3	5.0
+1.40D+1.60H	2	11.37	39.00	77.36	77.36	179.03	1.00	29.30	PhiVc < Vu	48.059	80.8	5.4	5.0
+1.40D+1.60H	2	11.40	39.00	76.88	76.88	176.83	1.00	29.30	PhiVc < Vu	47.581	80.8	5.4	5.0
+1.40D+1.60H	2	11.43	39.00	76.41	76.41	174.64	1.00	29.30	PhiVc < Vu	47.104	80.8	5.5	5.0
+1.40D+1.60H	2	11.46	39.00	75.93	75.93	172.46	1.00	29.30	PhiVc < Vu	46.626	80.8	5.5	5.0

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11

Lic. #: KW-06007744

Licensee: EPIC ENGINEERING, PC

Description: Concrete pool wall

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.40D+1.60H	2	11.49	39.00	75.45	75.45	170.30	1.00	29.30	PhiVc < Vu	46.149	80.8	5.6	5.0
+1.40D+1.60H	2	11.51	39.00	74.97	74.97	168.15	1.00	29.30	PhiVc < Vu	45.671	80.8	5.6	5.0
+1.40D+1.60H	2	11.54	39.00	74.50	74.50	166.02	1.00	29.30	PhiVc < Vu	45.193	80.8	5.7	5.0
+1.40D+1.60H	2	11.57	39.00	74.02	74.02	163.90	1.00	29.30	PhiVc < Vu	44.716	80.8	5.8	5.0
+1.40D+1.60H	2	11.60	39.00	73.54	73.54	161.79	1.00	29.30	PhiVc < Vu	44.238	80.8	5.8	5.0
+1.40D+1.60H	2	11.63	39.00	73.06	73.06	159.69	1.00	29.30	PhiVc < Vu	43.761	80.8	5.9	5.0
+1.40D+1.60H	2	11.66	39.00	72.59	72.59	157.61	1.00	29.30	PhiVc < Vu	43.283	80.8	5.9	5.0
+1.40D+1.60H	2	11.69	39.00	72.11	72.11	155.55	1.00	29.30	PhiVc < Vu	42.806	80.8	6.0	5.0
+1.40D+1.60H	2	11.71	39.00	71.63	71.63	153.49	1.00	29.30	PhiVc < Vu	42.328	80.8	6.1	5.0
+1.40D+1.60H	2	11.74	39.00	71.15	71.15	151.45	1.00	29.30	PhiVc < Vu	41.851	80.8	6.2	5.0
+1.40D+1.60H	2	11.77	39.00	70.67	70.67	149.43	1.00	29.30	PhiVc < Vu	41.373	80.8	6.2	5.0
+1.40D+1.60H	2	11.80	39.00	70.20	70.20	147.41	1.00	29.30	PhiVc < Vu	40.896	80.8	6.3	5.0
+1.40D+1.60H	2	11.83	39.00	69.72	69.72	145.42	1.00	29.30	PhiVc < Vu	40.418	80.8	6.4	5.0
+1.40D+1.60H	2	11.86	39.00	69.24	69.24	143.43	1.00	29.30	PhiVc < Vu	39.941	80.8	6.4	5.0
+1.40D+1.60H	2	11.89	39.00	68.76	68.76	141.46	1.00	29.30	PhiVc < Vu	39.463	80.8	6.5	5.0
+1.40D+1.60H	2	11.91	39.00	68.29	68.29	139.50	1.00	29.30	PhiVc < Vu	38.986	80.8	6.6	5.0
+1.40D+1.60H	2	11.94	39.00	67.81	67.81	137.56	1.00	29.30	PhiVc < Vu	38.508	80.8	6.7	5.0
+1.40D+1.60H	2	11.97	39.00	67.33	67.33	135.63	1.00	29.30	PhiVc < Vu	38.030	80.8	6.8	5.0
+1.40D+1.60H	2	12.00	39.00	66.85	66.85	133.71	1.00	29.30	PhiVc < Vu	37.553	80.8	6.9	5.0
+1.40D+1.60H	2	12.03	39.00	66.38	66.38	131.81	1.00	29.30	PhiVc < Vu	37.075	80.8	6.9	5.0
+1.40D+1.60H	2	12.06	39.00	65.90	65.90	129.92	1.00	29.30	PhiVc < Vu	36.598	80.8	7.0	5.0
+1.40D+1.60H	2	12.09	39.00	65.42	65.42	128.04	1.00	29.30	PhiVc < Vu	36.120	80.8	7.1	5.0
+1.40D+1.60H	2	12.11	39.00	64.94	64.94	126.18	1.00	29.30	PhiVc < Vu	35.643	80.8	7.2	5.0
+1.40D+1.60H	2	12.14	39.00	64.47	64.47	124.33	1.00	29.30	PhiVc < Vu	35.165	80.8	7.3	5.0
+1.40D+1.60H	2	12.17	39.00	63.99	63.99	122.49	1.00	29.30	PhiVc < Vu	34.688	80.8	7.4	5.0
+1.40D+1.60H	2	12.20	39.00	63.51	63.51	120.67	1.00	29.30	PhiVc < Vu	34.210	80.8	7.5	5.0
+1.40D+1.60H	2	12.23	39.00	63.03	63.03	118.86	1.00	29.30	PhiVc < Vu	33.733	80.8	7.6	5.0
+1.40D+1.60H	2	12.26	39.00	62.56	62.56	117.07	1.00	29.30	PhiVc < Vu	33.255	80.8	7.7	5.0
+1.40D+1.60H	2	12.29	39.00	62.08	62.08	115.29	1.00	29.30	PhiVc < Vu	32.778	80.8	7.9	5.0
+1.40D+1.60H	2	12.31	39.00	61.60	61.60	113.52	1.00	29.30	PhiVc < Vu	32.300	80.8	8.0	5.0
+1.40D+1.60H	2	12.34	39.00	61.12	61.12	111.77	1.00	29.30	PhiVc < Vu	31.823	80.8	8.1	5.0
+1.40D+1.60H	2	12.37	39.00	60.65	60.65	110.03	1.00	29.30	PhiVc < Vu	31.345	80.8	8.2	5.0
+1.40D+1.60H	2	12.40	39.00	60.17	60.17	108.30	1.00	29.30	PhiVc < Vu	30.867	80.8	8.3	5.0
+1.40D+1.60H	2	12.43	39.00	59.69	59.69	106.59	1.00	29.30	PhiVc < Vu	30.390	80.8	8.5	5.0
+1.40D+1.60H	2	12.46	39.00	59.21	59.21	104.89	1.00	29.30	PhiVc < Vu	29.912	80.8	8.6	5.0
+1.40D+1.60H	2	12.49	39.00	58.74	58.74	103.21	1.00	29.30	PhiVc < Vu	29.435	80.8	8.7	5.0
+1.40D+1.60H	2	12.51	39.00	58.26	58.26	101.54	1.00	29.30	PhiVc < Vu	28.957	80.8	8.9	5.0
+1.40D+1.60H	2	12.54	39.00	57.78	57.78	99.88	1.00	29.30	PhiVc < Vu	28.480	80.8	9.0	5.0
+1.40D+1.60H	2	12.57	39.00	57.30	57.30	98.24	1.00	29.30	PhiVc < Vu	28.002	80.8	9.2	5.0
+1.40D+1.60H	2	12.60	39.00	56.83	56.83	96.60	1.00	29.30	PhiVc < Vu	27.525	80.8	9.4	5.0
+1.40D+1.60H	2	12.63	39.00	56.35	56.35	94.99	1.00	29.30	PhiVc < Vu	27.047	80.8	9.5	5.0
+1.40D+1.60H	2	12.66	39.00	55.87	55.87	93.39	1.00	29.30	PhiVc < Vu	26.570	80.8	9.7	5.0
+1.40D+1.60H	2	12.69	39.00	55.39	55.39	91.80	1.00	29.30	PhiVc < Vu	26.092	80.8	9.9	5.0
+1.40D+1.60H	2	12.71	39.00	54.92	54.92	90.22	1.00	29.30	PhiVc < Vu	25.615	80.8	10.0	5.0
+1.40D+1.60H	2	12.74	39.00	54.44	54.44	88.66	1.00	29.30	PhiVc < Vu	25.137	80.8	10.2	5.0
+1.40D+1.60H	2	12.77	39.00	53.96	53.96	87.11	1.00	29.30	PhiVc < Vu	24.660	80.8	10.4	5.0
+1.40D+1.60H	2	12.80	39.00	53.48	53.48	85.57	1.00	29.30	PhiVc < Vu	24.182	80.8	10.6	5.0
+1.40D+1.60H	2	12.83	39.00	53.01	53.01	84.05	1.00	29.30	PhiVc < Vu	23.704	80.8	10.9	5.0
+1.40D+1.60H	2	12.86	39.00	52.53	52.53	82.55	1.00	29.30	PhiVc < Vu	23.227	80.8	11.1	5.0
+1.40D+1.60H	2	12.89	39.00	52.05	52.05	81.05	1.00	29.30	PhiVc < Vu	22.749	80.8	11.3	5.0
+1.40D+1.60H	2	12.91	39.00	51.57	51.57	79.57	1.00	29.30	PhiVc < Vu	22.272	80.8	11.6	5.0
+1.40D+1.60H	2	12.94	39.00	51.10	51.10	78.10	1.00	29.30	PhiVc < Vu	21.794	80.8	11.8	5.0
+1.40D+1.60H	2	12.97	39.00	50.62	50.62	76.65	1.00	29.30	PhiVc < Vu	21.317	80.8	12.1	5.0
+1.40D+1.60H	2	13.00	39.00	50.14	50.14	75.21	1.00	29.30	PhiVc < Vu	20.839	80.8	12.4	5.0

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. #: KW-06007744

Description: Concrete pool wall

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.40D+1.60H	2	13.03	39.00	49.66	49.66	73.79	1.00	29.30	PhiVc < Vu	20.362	80.8	12.6	5.0
+1.40D+1.60H	2	13.06	39.00	49.19	49.19	72.37	1.00	29.30	PhiVc < Vu	19.884	80.8	12.9	5.0
+1.40D+1.60H	2	13.09	39.00	48.71	48.71	70.98	1.00	29.30	PhiVc < Vu	19.407	80.8	13.3	5.0
+1.40D+1.60H	2	13.11	39.00	48.23	48.23	69.59	1.00	29.30	PhiVc < Vu	18.929	80.8	13.6	5.0
+1.40D+1.60H	2	13.14	39.00	47.75	47.75	68.22	1.00	29.30	PhiVc < Vu	18.452	80.8	14.0	5.0
+1.40D+1.60H	2	13.17	39.00	47.28	47.28	66.86	1.00	29.30	PhiVc < Vu	17.974	80.8	14.3	5.0
+1.40D+1.60H	2	13.20	39.00	46.80	46.80	65.52	1.00	29.30	PhiVc < Vu	17.497	80.8	14.7	5.0
+1.40D+1.60H	2	13.23	39.00	46.32	46.32	64.19	1.00	29.30	PhiVc < Vu	17.019	80.8	15.1	5.0
+1.40D+1.60H	2	13.26	39.00	45.84	45.84	62.87	1.00	29.30	PhiVc < Vu	16.541	80.8	15.6	5.0
+1.40D+1.60H	2	13.29	39.00	45.37	45.37	61.57	1.00	29.30	PhiVc < Vu	16.064	80.8	16.0	5.0
+1.40D+1.60H	2	13.31	39.00	44.89	44.89	60.28	1.00	29.30	PhiVc < Vu	15.586	80.8	16.5	5.0
+1.40D+1.60H	2	13.34	39.00	44.41	44.41	59.00	1.00	29.30	PhiVc < Vu	15.109	80.8	17.0	5.0
+1.40D+1.60H	2	13.37	39.00	43.93	43.93	57.74	1.00	29.30	PhiVc < Vu	14.631	80.8	17.6	5.0
+1.40D+1.60H	2	13.40	39.00	43.46	43.46	56.49	1.00	29.30	PhiVc < Vu	14.154	80.8	18.2	5.0
+1.40D+1.60H	2	13.43	39.00	42.98	42.98	55.26	1.00	29.30	PhiVc < Vu	13.676	80.8	18.8	5.0
+1.40D+1.60H	2	13.46	39.00	42.50	42.50	54.04	1.00	29.30	PhiVc < Vu	13.199	80.8	19.5	5.0
+1.40D+1.60H	2	13.49	39.00	42.02	42.02	52.83	1.00	29.30	PhiVc < Vu	12.721	80.8	19.5	5.0
+1.40D+1.60H	2	13.51	39.00	41.55	41.55	51.63	1.00	29.30	PhiVc < Vu	12.244	80.8	19.5	5.0
+1.40D+1.60H	2	13.54	39.00	41.07	41.07	50.45	1.00	29.30	PhiVc < Vu	11.766	80.8	19.5	5.0
+1.40D+1.60H	2	13.57	39.00	40.59	40.59	49.29	1.00	29.30	PhiVc < Vu	11.289	80.8	19.5	5.0
+1.40D+1.60H	2	13.60	39.00	40.11	40.11	48.14	1.00	29.30	PhiVc < Vu	10.811	80.8	19.5	5.0
+1.40D+1.60H	2	13.63	39.00	39.64	39.64	47.00	1.00	29.30	PhiVc < Vu	10.334	80.8	19.5	5.0
+1.40D+1.60H	2	13.66	39.00	39.16	39.16	45.87	1.00	29.30	PhiVc < Vu	9.856	80.8	19.5	5.0
+1.40D+1.60H	2	13.69	39.00	38.68	38.68	44.76	1.00	29.30	PhiVc < Vu	9.378	80.8	19.5	5.0
+1.40D+1.60H	2	13.71	39.00	38.20	38.20	43.66	1.00	29.30	PhiVc < Vu	8.901	80.8	19.5	5.0
+1.40D+1.60H	2	13.74	39.00	37.73	37.73	42.58	1.00	29.30	PhiVc < Vu	8.423	80.8	19.5	5.0
+1.40D+1.60H	2	13.77	39.00	37.25	37.25	41.50	1.00	29.30	PhiVc < Vu	7.946	80.8	19.5	5.0
+1.40D+1.60H	2	13.80	39.00	36.77	36.77	40.45	1.00	29.30	PhiVc < Vu	7.468	80.8	19.5	5.0
+1.40D+1.60H	2	13.83	39.00	36.29	36.29	39.40	1.00	29.30	PhiVc < Vu	6.991	80.8	19.5	5.0
+1.40D+1.60H	2	13.86	39.00	35.81	35.81	38.37	1.00	29.30	PhiVc < Vu	6.513	80.8	19.5	5.0
+1.40D+1.60H	2	13.89	39.00	35.34	35.34	37.36	1.00	29.30	PhiVc < Vu	6.036	80.8	19.5	5.0
+1.40D+1.60H	2	13.91	39.00	34.86	34.86	36.35	1.00	29.30	PhiVc < Vu	5.558	80.8	19.5	5.0
+1.40D+1.60H	2	13.94	39.00	34.38	34.38	35.36	1.00	29.30	PhiVc < Vu	5.081	80.8	19.5	5.0
+1.40D+1.60H	2	13.97	39.00	33.90	33.90	34.39	1.00	29.30	PhiVc < Vu	4.603	80.8	19.5	5.0
+1.40D+1.60H	2	14.00	39.00	33.43	33.43	33.43	1.00	29.30	PhiVc < Vu	4.126	80.8	19.5	5.0
+1.40D+1.60H	2	14.03	39.00	32.95	32.95	32.48	1.00	29.30	PhiVc < Vu	3.648	80.8	19.5	5.0
+1.40D+1.60H	2	14.06	39.00	32.47	32.47	31.54	1.00	29.30	PhiVc < Vu	3.171	80.8	19.5	5.0
+1.40D+1.60H	2	14.09	39.00	31.99	31.99	30.62	1.00	29.30	PhiVc < Vu	2.693	80.8	19.5	5.0
+1.40D+1.60H	2	14.11	39.00	31.52	31.52	29.72	1.00	29.30	PhiVc < Vu	2.215	80.8	19.5	5.0
+1.40D+1.60H	2	14.14	39.00	31.04	31.04	28.82	1.00	29.30	PhiVc < Vu	1.738	80.8	19.5	5.0
+1.40D+1.60H	2	14.17	39.00	30.56	30.56	27.94	1.00	29.30	PhiVc < Vu	1.260	80.8	19.5	5.0
+1.40D+1.60H	2	14.20	39.00	30.08	30.08	27.08	1.00	29.30	PhiVc < Vu	0.7829	80.8	19.5	5.0
+1.40D+1.60H	2	14.23	39.00	29.61	29.61	26.22	1.00	29.30	PhiVc < Vu	0.3053	80.8	19.5	5.0
+1.40D+1.60H	2	14.26	39.00	29.13	29.13	25.38	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.29	39.00	28.65	28.65	24.56	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.31	39.00	28.17	28.17	23.75	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.34	39.00	27.70	27.70	22.95	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.37	39.00	27.22	27.22	22.16	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.40	39.00	26.74	26.74	21.39	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.43	39.00	26.26	26.26	20.64	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.46	39.00	25.79	25.79	19.89	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.49	39.00	25.31	25.31	19.16	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.51	39.00	24.83	24.83	18.45	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.54	39.00	24.35	24.35	17.74	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0

Concrete Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. #: KW-06007744

Description: Concrete pool wall

Detailed Shear Information

Load Combination	Span Number	Distance (ft)	'd' (in)	Vu (k)		Mu (k-ft)	d*Vu/Mu	Phi*Vc (k)	Comment	Phi*Vs (k)	Phi*Vn (k)	Spacing (in)	
				Actual	Design							Req'd	Suggest
+1.40D+1.60H	2	14.57	39.00	23.88	23.88	17.05	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.60	39.00	23.40	23.40	16.38	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.63	39.00	22.92	22.92	15.72	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.66	39.00	22.44	22.44	15.07	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.69	39.00	21.97	21.97	14.44	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.71	39.00	21.49	21.49	13.81	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.74	39.00	21.01	21.01	13.21	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.77	39.00	20.53	20.53	12.61	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.80	39.00	20.06	20.06	12.03	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.83	39.00	19.58	19.58	11.47	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.86	39.00	19.10	19.10	10.92	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.89	39.00	18.62	18.62	10.38	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.91	39.00	18.15	18.15	9.85	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.94	39.00	17.67	17.67	9.34	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	14.97	39.00	17.19	17.19	8.84	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	15.00	39.00	16.71	16.71	8.36	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	15.03	39.00	16.24	16.24	7.89	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	15.06	39.00	15.76	15.76	7.43	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	15.09	39.00	15.28	15.28	6.99	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	15.11	39.00	14.80	14.80	6.56	1.00	29.30	PhiVc/2 < Vu <=	Min 11.4.6	42.8	19.5	19.0
+1.40D+1.60H	2	15.14	39.00	14.33	14.33	6.14	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.17	39.00	13.85	13.85	5.74	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.20	39.00	13.37	13.37	5.35	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.23	39.00	12.89	12.89	4.97	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.26	39.00	12.42	12.42	4.61	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.29	39.00	11.94	11.94	4.26	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.31	39.00	11.46	11.46	3.93	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.34	39.00	10.98	10.98	3.61	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.37	39.00	10.51	10.51	3.30	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.40	39.00	10.03	10.03	3.01	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.43	39.00	9.55	9.55	2.73	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.46	39.00	9.07	9.07	2.46	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.49	39.00	8.60	8.60	2.21	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.51	39.00	8.12	8.12	1.97	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.54	39.00	7.64	7.64	1.75	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.57	39.00	7.16	7.16	1.53	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.60	39.00	6.69	6.69	1.34	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.63	39.00	6.21	6.21	1.15	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.66	39.00	5.73	5.73	0.98	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.69	39.00	5.25	5.25	0.83	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.71	39.00	4.78	4.78	0.68	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.74	39.00	4.30	4.30	0.55	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.77	39.00	3.82	3.82	0.44	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.80	39.00	3.34	3.34	0.33	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.83	39.00	2.87	2.87	0.25	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.86	39.00	2.39	2.39	0.17	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.89	39.00	1.91	1.91	0.11	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.91	39.00	1.43	1.43	0.06	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.94	39.00	0.96	0.96	0.03	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.40D+1.60H	2	15.97	39.00	0.48	0.48	0.01	1.00	29.30	Vu < PhiVc/2	Not Req'd	29.3	0.0	0.0
+1.20D+1.60L+0.50S+1.60H	2	16.00	39.00	0.00	0.00	0.00	1.00	26.00	Vu < PhiVc/2	Not Req'd	26.0	0.0	0.0

Steel Beam

Lic. # : KW-06007744

Licensee : EPIC ENGINEERING, PC

Description : DB-3

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
Dsgn. L = 22.50 ft		1	0.039	0.009	2.00		2.00	85.00	50.90	1.00	1.00	0.39	62.10	41.40
+0.60D+0.70E+0.60H														
Dsgn. L = 22.50 ft		1	0.039	0.009	2.00		2.00	85.00	50.90	1.00	1.00	0.39	62.10	41.40

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.6056	11.475		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	2.291	2.828
Overall MINimum	0.317	0.392
+D+H	0.529	0.653
+D+L+H	2.291	2.828
+D+Lr+H	0.529	0.653
+D+S+H	0.529	0.653
+D+0.750Lr+0.750L+H	1.851	2.284
+D+0.750L+0.750S+H	1.851	2.284
+D+0.60W+H	0.529	0.653
+D+0.70E+H	0.529	0.653
+D+0.750Lr+0.750L+0.450W+H	1.851	2.284
+D+0.750L+0.750S+0.450W+H	1.851	2.284
+D+0.750L+0.750S+0.5250E+H	1.851	2.284
+0.60D+0.60W+0.60H	0.317	0.392
+0.60D+0.70E+0.60H	0.317	0.392
D Only	0.529	0.653
Lr Only		
L Only	1.763	2.175
S Only		
W Only		
E Only		
H Only		



Wood Column

File = S:\PROJ\SHKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
ENERCALC, INC. 1983-2015, Build:6.15.1.19, Ver:6.15.1.19
Licensee : EPIC ENGINEERING, PC

Lic. # : KW-06007744

Description : C-3

Code References

Calculations per 2012 NDS, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : IBC2012

General Information

Analysis Method :	Allowable Stress Design			Wood Section Name	2-2x6	
End Fixities	Top & Bottom Pinned			Wood Grading/Manuf.	Graded Lumber	
Overall Column Height	10.0 ft			Wood Member Type	Sawn	
<i>(Used for non-slender calculations)</i>						
Wood Species	Douglas Fir - Larch			Exact Width	3.0 in	
Wood Grade	No.2			Exact Depth	5.50 in	
Fb - Tension	900.0 psi	Fv	180.0 psi	Area	16.50 in ²	
Fb - Compr	900.0 psi	Ft	575.0 psi	Ix	41.594 in ⁴	
Fc - Prll	1,350.0 psi	Density	32.210 pcf	Iy	12.375 in ⁴	
Fc - Perp	625.0 psi					
E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial	Allow Stress Modification Factors		
	Basic	1,600.0	1,600.0	1,600.0 ksi	Cf or Cv for Bending	1.30
	Minimum	580.0	580.0		Cf or Cv for Compression	1.10
					Cf or Cv for Tension	1.30
					Cm : Wet Use Factor	1.0
					Ct : Temperature Factor	1.0
					Cfu : Flat Use Factor	1.0
					Kf : Built-up columns	1.0 <small>NDS 15.3.2</small>
					Use Cr : Repetitive ?	No <small>(non-glb only)</small>
Brace condition for deflection (buckling) along columns :						
X-X (width) axis : Unbraced Length for X-X Axis buckling = 3 ft, K = 1.0						
Y-Y (depth) axis : Unbraced Length for X-X Axis buckling = 3 ft, K = 1.0						

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 36.907 lbs * Dead Load Factor

AXIAL LOADS . . .

Axial Load at 10.0 ft, D = 2.150, L = 2.90, S = 3.20 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.3122 : 1**

Load Combination **+D+0.750L+0.750S**

Governing NDS Formula **Comp Only, fc/Fc'**

Location of max.above base **0.0 ft**

At maximum location values are . . .

Applied Axial **6.762 k**

Applied Mx **0.0 k-ft**

Applied My **0.0 k-ft**

Fc : Allowable **1,312.57 psi**

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y	0.0 k	Bottom along Y-Y	0.0 k
Top along X-X	0.0 k	Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .

Along Y-Y	0.0 in	at	0.0 ft	above base
for load combination : n/a				
Along X-X	0.0 in	at	0.0 ft	above base
for load combination : n/a				

PASS Maximum Shear Stress Ratio = **0.0 : 1**

Load Combination **+0.60D+0.70E**

Location of max.above base **10.0 ft**

Applied Design Shear **0.0 psi**

Allowable Shear **180.0 psi**

Other Factors used to calculate allowable stresses . . .

	<u>Bending</u>	<u>Compression</u>	<u>Tension</u>
Cf or Cv : Size based factors	1.300	1.100	

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
D Only	1.000	0.884	0.1010	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+L	1.000	0.884	0.2349	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+Lr	1.000	0.884	0.1010	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+S	1.000	0.884	0.2487	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750Lr+0.750L	1.000	0.884	0.2014	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750L+0.750S	1.000	0.884	0.3122	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.60W	1.000	0.884	0.1010	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.70E	1.000	0.884	0.1010	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750Lr+0.750L+0.450W	1.000	0.884	0.2014	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750L+0.750S+0.450W	1.000	0.884	0.3122	PASS	0.0 ft	0.0	PASS	10.0 ft
+D+0.750L+0.750S+0.5250E	1.000	0.884	0.3122	PASS	0.0 ft	0.0	PASS	10.0 ft
+0.60D+0.60W	1.000	0.884	0.06059	PASS	0.0 ft	0.0	PASS	10.0 ft



Wood Column

Lic. # : KW-06007744

Description : C-3

Load Combination Results

Load Combination	C _D	C _P	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
			Stress Ratio	Status	Location	Stress Ratio	Status	Location
+0.60D+0.70E	1.000	0.884	0.06059	PASS	0.0 ft	0.0	PASS	10.0 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		Y-Y Axis Reaction		Axial Reaction
	@ Base	@ Top	@ Base	@ Top	@ Base
D Only		k		k	2.187 k
+D+L		k		k	5.087 k
+D+Lr		k		k	2.187 k
+D+S		k		k	5.387 k
+D+0.750Lr+0.750L		k		k	4.362 k
+D+0.750L+0.750S		k		k	6.762 k
+D+0.60W		k		k	2.187 k
+D+0.70E		k		k	2.187 k
+D+0.750Lr+0.750L+0.450W		k		k	4.362 k
+D+0.750L+0.750S+0.450W		k		k	6.762 k
+D+0.750L+0.750S+0.5250E		k		k	6.762 k
+0.60D+0.60W		k		k	1.312 k
+0.60D+0.70E		k		k	1.312 k
D Only		k		k	2.187 k
Lr Only		k		k	k
L Only		k		k	2.900 k
S Only		k		k	3.200 k
W Only		k		k	k
E Only		k		k	k
H Only		k		k	k

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+L	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+Lr	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+S	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750Lr+0.750L	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750L+0.750S	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.60W	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.70E	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750Lr+0.750L+0.450W	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750L+0.750S+0.450W	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750L+0.750S+0.5250E	0.0000 in	0.000 ft	0.000 in	0.000 ft
+0.60D+0.60W	0.0000 in	0.000 ft	0.000 in	0.000 ft
+0.60D+0.70E	0.0000 in	0.000 ft	0.000 in	0.000 ft
D Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
Lr Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
L Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
S Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
W Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
E Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
H Only	0.0000 in	0.000 ft	0.000 in	0.000 ft



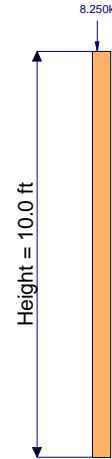
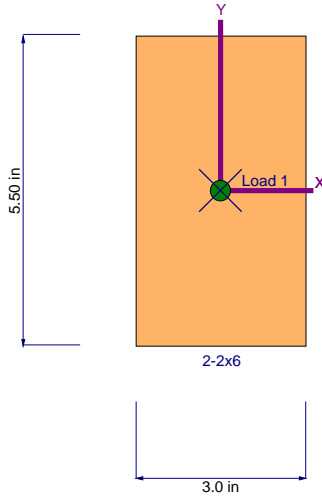
Wood Column

Lic. # : KW-06007744

Licensee : EPIC ENGINEERING, PC

Description : C-3

Sketches



Loads are total entered value. Arrows do not reflect absolute direction.



Steel Column

File = S:\PROJ\SHSKCD-4\21YFRF-IVANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
ENERCALC, INC. 1983-2015, Build:6.15.1.19, Ver:6.15.1.19
Licensee : EPIC ENGINEERING, PC

Lic. # : KW-06007744

Description : C-4

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : IBC2012

General Information

Steel Section Name :	HSS4x4x1/4	Overall Column Height	12.0 ft
Analysis Method :	Allowable Strength	Top & Bottom Fixity	Top Free, Bottom Fixed
Steel Stress Grade		Brace condition for deflection (buckling) along columns :	
Fy : Steel Yield	36.0 ksi	X-X (width) axis :	
E : Elastic Bending Modulus	29,000.0 ksi	Unbraced Length for X-X Axis buckling = 10 ft, K = 1.0	
Load Combination :	IBC2012	Y-Y (depth) axis :	
		Unbraced Length for Y-Y Axis buckling = 10 ft, K = 1.0	

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 146.170 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 12.0 ft, D = 3.80, L = 8.30, S = 12.10 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	0.3678 : 1	Maximum SERVICE Load Reactions . .	
Load Combination	+D+0.750L+0.750S+H	Top along X-X	0.0 k
Location of max.above base	0.0 ft	Bottom along X-X	0.0 k
At maximum location values are . . .		Top along Y-Y	0.0 k
Pa : Axial	19.246 k	Bottom along Y-Y	0.0 k
Pn / Omega : Allowable	52.326 k	Maximum SERVICE Load Deflections . . .	
Ma-x : Applied	0.0 k-ft	Along Y-Y	0.0 in at 0.0ft above base
Mn-x / Omega : Allowable	8.425 k-ft	for load combination :	
Ma-y : Applied	0.0 k-ft	Along X-X	0.0 in at 0.0ft above base
Mn-y / Omega : Allowable	8.425 k-ft	for load combination :	
PASS Maximum Shear Stress Ratio =	0.0 : 1		
Load Combination			
Location of max.above base	0.0 ft		
At maximum location values are . . .			
Va : Applied	0.0 k		
Vn / Omega : Allowable	0.0 k		

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
	Stress Ratio	Status	Location	Stress Ratio	Status	Location
+D+H	0.075	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+L+H	0.234	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+Lr+H	0.075	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+S+H	0.307	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.750Lr+0.750L+H	0.194	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.750L+0.750S+H	0.368	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.60W+H	0.075	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.70E+H	0.075	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.750Lr+0.750L+0.450W+H	0.194	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.750L+0.750S+0.450W+H	0.368	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.750L+0.750S+0.5250E+H	0.368	PASS	0.00 ft	0.000	PASS	0.00 ft
+0.60D+0.60W+0.60H	0.045	PASS	0.00 ft	0.000	PASS	0.00 ft
+0.60D+0.70E+0.60H	0.045	PASS	0.00 ft	0.000	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		Y-Y Axis Reaction		Axial Reaction
	@ Base	@ Top	@ Base	@ Top	@ Base
+D+H					3.946 k



Steel Column

Lic. # : KW-06007744

Description : C-4

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		Y-Y Axis Reaction		Axial Reaction
	@ Base	@ Top	@ Base	@ Top	@ Base
+D+L+H		k		k	12.246 k
+D+Lr+H		k		k	3.946 k
+D+S+H		k		k	16.046 k
+D+0.750Lr+0.750L+H		k		k	10.171 k
+D+0.750L+0.750S+H		k		k	19.246 k
+D+0.60W+H		k		k	3.946 k
+D+0.70E+H		k		k	3.946 k
+D+0.750Lr+0.750L+0.450W+H		k		k	10.171 k
+D+0.750L+0.750S+0.450W+H		k		k	19.246 k
+D+0.750L+0.750S+0.5250E+H		k		k	19.246 k
+0.60D+0.60W+0.60H		k		k	2.368 k
+0.60D+0.70E+0.60H		k		k	2.368 k
D Only		k		k	3.946 k
Lr Only		k		k	k
L Only		k		k	8.300 k
S Only		k		k	12.100 k
W Only		k		k	k
E Only		k		k	k
H Only		k		k	k

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Max. Y-Y Deflection	
	Distance		Distance	
+D+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+L+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+Lr+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+S+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750Lr+0.750L+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750L+0.750S+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.60W+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.70E+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750Lr+0.750L+0.450W+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750L+0.750S+0.450W+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750L+0.750S+0.5250E+H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+0.60D+0.60W+0.60H	0.0000 in	0.000 ft	0.000 in	0.000 ft
+0.60D+0.70E+0.60H	0.0000 in	0.000 ft	0.000 in	0.000 ft
D Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
Lr Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
L Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
S Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
W Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
E Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
H Only	0.0000 in	0.000 ft	0.000 in	0.000 ft



Steel Column

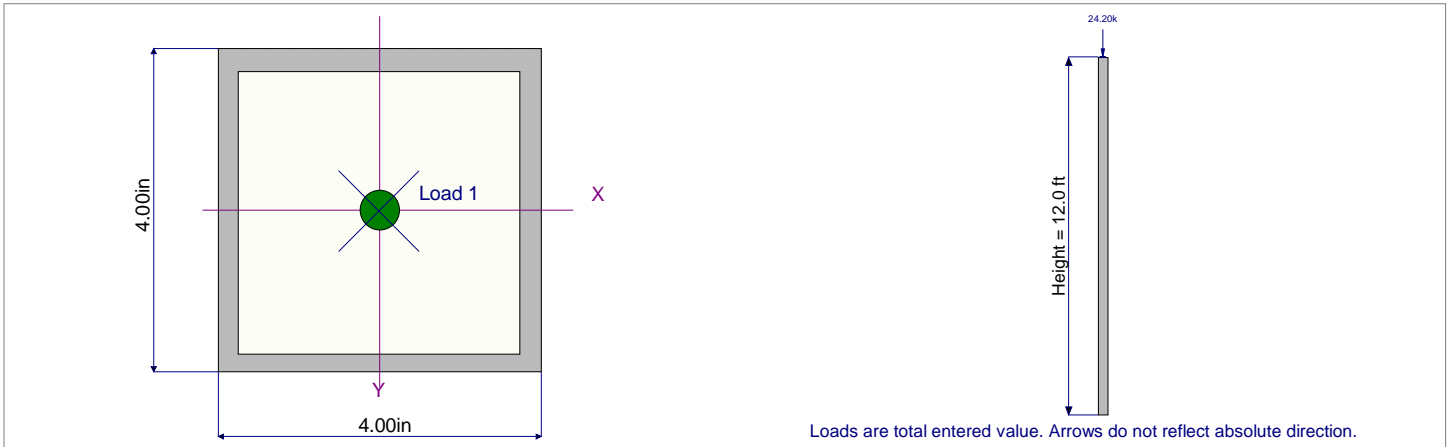
Lic. # : KW-06007744

Licensee : EPIC ENGINEERING, PC

Description : C-4

Steel Section Properties : HSS4x4x1/4

Depth	=	4.000 in	I _{xx}	=	7.80 in ⁴	J	=	12.800 in ⁴
			S _{xx}	=	3.90 in ³			
Width	=	4.000 in	R _{xx}	=	1.520 in			
Wall Thick	=	0.250 in	Z _x	=	4.690 in ³			
Area	=	3.370 in ²	I _{yy}	=	7.800 in ⁴	C	=	6.560 in ³
Weight	=	12.181 plf	S _{yy}	=	3.900 in ³			
			R _{yy}	=	1.520 in			
Ycg	=	0.000 in						





Steel Column

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
ENERCALC, INC. 1983-2015, Build:6.15.1.19, Ver:6.15.1.19
Licensee : EPIC ENGINEERING, PC

Lic. # : KW-06007744

Description : C-4

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10
Load Combinations Used : IBC2012

General Information

Steel Section Name :	HSS4x4x1/4	Overall Column Height	12.0 ft
Analysis Method :	Allowable Strength	Top & Bottom Fixity	Top Free, Bottom Fixed
Steel Stress Grade		Brace condition for deflection (buckling) along columns :	
Fy : Steel Yield	36.0 ksi	X-X (width) axis :	
E : Elastic Bending Modulus	29,000.0 ksi	Unbraced Length for X-X Axis buckling = 10 ft, K = 1.0	
Load Combination :	IBC2012	Y-Y (depth) axis :	
		Unbraced Length for Y-Y Axis buckling = 10 ft, K = 1.0	

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 146.170 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 12.0 ft, D = 1.70, L = 0.740, S = 25.30 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio =	0.5188 : 1	Maximum SERVICE Load Reactions . .	
Load Combination	+D+S+H	Top along X-X	0.0 k
Location of max.above base	0.0 ft	Bottom along X-X	0.0 k
At maximum location values are . . .		Top along Y-Y	0.0 k
Pa : Axial	27.146 k	Bottom along Y-Y	0.0 k
Pn / Omega : Allowable	52.326 k	Maximum SERVICE Load Deflections . .	
Ma-x : Applied	0.0 k-ft	Along Y-Y	0.0 in at 0.0ft above base
Mn-x / Omega : Allowable	8.425 k-ft	for load combination :	
Ma-y : Applied	0.0 k-ft	Along X-X	0.0 in at 0.0ft above base
Mn-y / Omega : Allowable	8.425 k-ft	for load combination :	
PASS Maximum Shear Stress Ratio =	0.0 : 1		
Load Combination			
Location of max.above base	0.0 ft		
At maximum location values are . . .			
Va : Applied	0.0 k		
Vn / Omega : Allowable	0.0 k		

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
	Stress Ratio	Status	Location	Stress Ratio	Status	Location
+D+H	0.035	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+L+H	0.049	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+Lr+H	0.035	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+S+H	0.519	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.750Lr+0.750L+H	0.046	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.750L+0.750S+H	0.409	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.60W+H	0.035	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.70E+H	0.035	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.750Lr+0.750L+0.450W+H	0.046	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.750L+0.750S+0.450W+H	0.409	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.750L+0.750S+0.5250E+H	0.409	PASS	0.00 ft	0.000	PASS	0.00 ft
+0.60D+0.60W+0.60H	0.021	PASS	0.00 ft	0.000	PASS	0.00 ft
+0.60D+0.70E+0.60H	0.021	PASS	0.00 ft	0.000	PASS	0.00 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		Y-Y Axis Reaction		Axial Reaction
	@ Base	@ Top	@ Base	@ Top	@ Base
+D+H		k		k	1.846 k



Steel Column

Lic. # : KW-06007744

Description : C-4

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		Y-Y Axis Reaction		Axial Reaction
	@ Base	@ Top	@ Base	@ Top	@ Base
+D+L+H		k		k	2.586 k
+D+Lr+H		k		k	1.846 k
+D+S+H		k		k	27.146 k
+D+0.750Lr+0.750L+H		k		k	2.401 k
+D+0.750L+0.750S+H		k		k	21.376 k
+D+0.60W+H		k		k	1.846 k
+D+0.70E+H		k		k	1.846 k
+D+0.750Lr+0.750L+0.450W+H		k		k	2.401 k
+D+0.750L+0.750S+0.450W+H		k		k	21.376 k
+D+0.750L+0.750S+0.5250E+H		k		k	21.376 k
+0.60D+0.60W+0.60H		k		k	1.108 k
+0.60D+0.70E+0.60H		k		k	1.108 k
D Only		k		k	1.846 k
Lr Only		k		k	k
L Only		k		k	0.740 k
S Only		k		k	25.300 k
W Only		k		k	k
E Only		k		k	k
H Only		k		k	k

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Distance		Max. Y-Y Deflection		Distance	
	Value	Unit	Value	Unit	Value	Unit	Value	Unit
+D+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+L+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+Lr+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+S+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.750Lr+0.750L+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.750L+0.750S+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.60W+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.70E+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.750Lr+0.750L+0.450W+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.750L+0.750S+0.450W+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+D+0.750L+0.750S+0.5250E+H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+0.60D+0.60W+0.60H	0.0000	in	0.000	ft	0.000	in	0.000	ft
+0.60D+0.70E+0.60H	0.0000	in	0.000	ft	0.000	in	0.000	ft
D Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
Lr Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
L Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
S Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
W Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
E Only	0.0000	in	0.000	ft	0.000	in	0.000	ft
H Only	0.0000	in	0.000	ft	0.000	in	0.000	ft



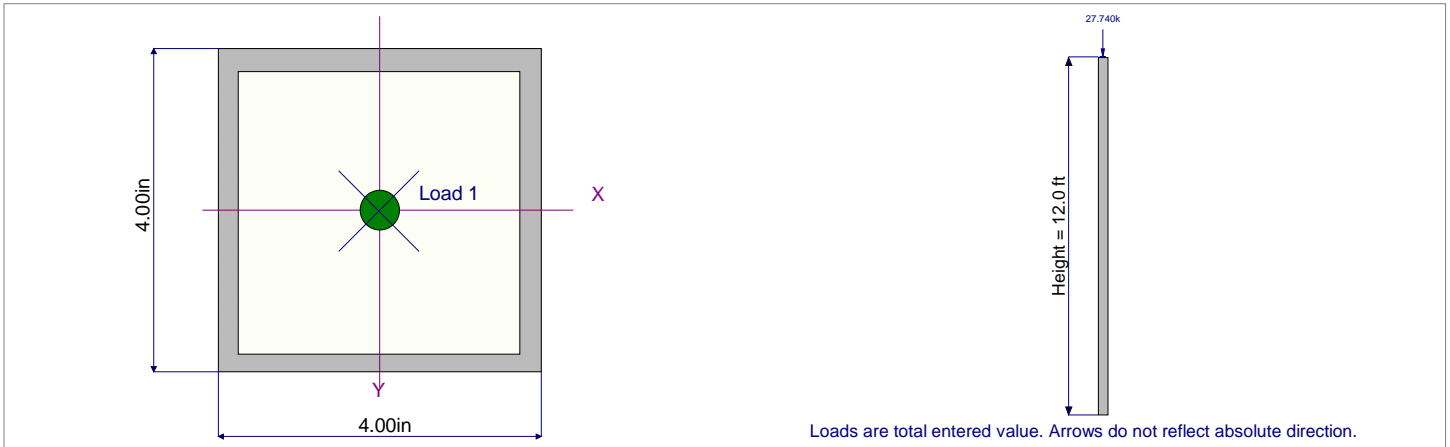
Steel Column

Lic. # : KW-06007744

Description : C-4

Steel Section Properties : HSS4x4x1/4

Depth	=	4.000 in	I xx	=	7.80 in ⁴	J	=	12.800 in ⁴
			S xx	=	3.90 in ³			
Width	=	4.000 in	R xx	=	1.520 in			
Wall Thick	=	0.250 in	Zx	=	4.690 in ³			
Area	=	3.370 in ²	I yy	=	7.800 in ⁴	C	=	6.560 in ³
Weight	=	12.181 plf	S yy	=	3.900 in ³			
			R yy	=	1.520 in			
Ycg	=	0.000 in						



Steel Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
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Lic. # : KW-06007744

Description : RB-4

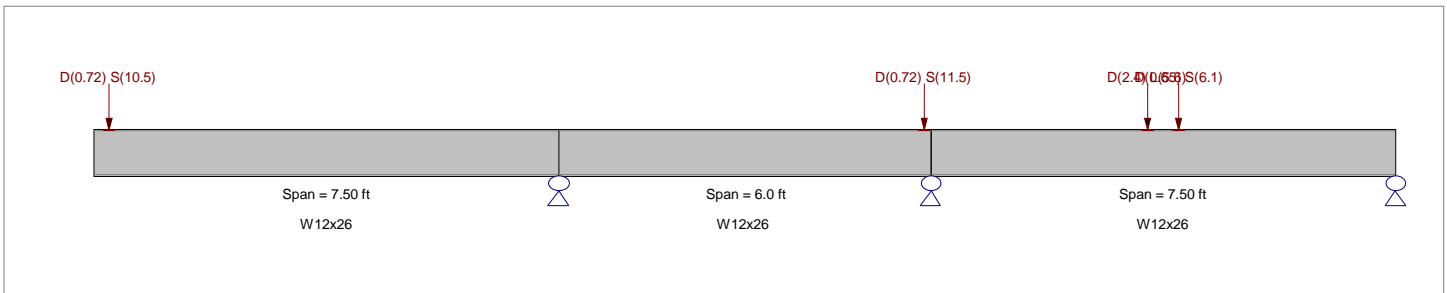
CODE REFERENCES

Calculations per AISC 360-10, IBC 2012, ASCE 7-10
 Load Combination Set : IBC2012

Material Properties

Analysis Method : **Allowable Strength Design**
 Beam Bracing : **Beam is Fully Braced against lateral-torsional buckling**
 Bending Axis : **Major Axis Bending**
 Load Combination **IBC2012**

Fy : Steel Yield : **50.0 ksi**
 E: Modulus : **29,000.0 ksi**



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
 Load(s) for Span Number 1
 Point Load : D = 0.720, S = 10.50 k @ 0.250 ft
 Load(s) for Span Number 2
 Point Load : D = 0.720, S = 11.50 k @ 5.90 ft, (RB-5)
 Load(s) for Span Number 3
 Point Load : D = 2.40, L = 5.60 k @ 3.50 ft, (FB-1)
 Point Load : D = 0.650, S = 6.10 k @ 4.0 ft, (SC-2)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.884 : 1	Maximum Shear Stress Ratio =	0.280 : 1
Section used for this span	W12x26	Section used for this span	W12x26
Ma : Applied	82.077 k-ft	Va : Applied	15.714 k
Mn / Omega : Allowable	92.814 k-ft	Vn/Omega : Allowable	56.120 k
Load Combination	+D+S	Load Combination	+D+S
Location of maximum on span	7.500ft	Location of maximum on span	7.500 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.719 in	Ratio =	250
Max Upward Transient Deflection	-0.045 in	Ratio =	1,593
Max Downward Total Deflection	0.778 in	Ratio =	231
Max Upward Total Deflection	-0.050 in	Ratio =	1443

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
D Only														
Dsgn. L =	7.50 ft	1	0.064	0.016		-5.95	5.95	155.00	92.81	1.00	1.00	0.92	84.18	56.12
Dsgn. L =	6.00 ft	2	0.064	0.033	-0.00	-5.95	5.95	155.00	92.81	1.00	1.00	1.85	84.18	56.12
Dsgn. L =	7.50 ft	3	0.054	0.033	5.04	-1.26	5.04	155.00	92.81	1.00	1.00	1.85	84.18	56.12
+D+L														
Dsgn. L =	7.50 ft	1	0.064	0.016		-5.95	5.95	155.00	92.81	1.00	1.00	0.92	84.18	56.12
Dsgn. L =	6.00 ft	2	0.064	0.097	-0.00	-5.95	5.95	155.00	92.81	1.00	1.00	5.43	84.18	56.12
Dsgn. L =	7.50 ft	3	0.141	0.097	13.09	-5.72	13.09	155.00	92.81	1.00	1.00	5.43	84.18	56.12
+D+Lr														
Dsgn. L =	7.50 ft	1	0.064	0.016		-5.95	5.95	155.00	92.81	1.00	1.00	0.92	84.18	56.12
Dsgn. L =	6.00 ft	2	0.064	0.033	-0.00	-5.95	5.95	155.00	92.81	1.00	1.00	1.85	84.18	56.12
Dsgn. L =	7.50 ft	3	0.054	0.033	5.04	-1.26	5.04	155.00	92.81	1.00	1.00	1.85	84.18	56.12
+D+S														
Dsgn. L =	7.50 ft	1	0.884	0.280		-82.08	82.08	155.00	92.81	1.00	1.00	15.71	84.18	56.12
Dsgn. L =	6.00 ft	2	0.884	0.280	10.51	-82.08	82.08	155.00	92.81	1.00	1.00	15.71	84.18	56.12
Dsgn. L =	7.50 ft	3	0.233	0.111	21.60		21.60	155.00	92.81	1.00	1.00	6.22	84.18	56.12
+D+0.750Lr+0.750L														
Dsgn. L =	7.50 ft	1	0.064	0.016		-5.95	5.95	155.00	92.81	1.00	1.00	0.92	84.18	56.12

Steel Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. #: KW-06007744

Description : RB-4

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
Dsgn. L = 6.00 ft		2	0.064	0.081	-0.00	-5.95	5.95	155.00	92.81	1.00	1.00	4.53	84.18	56.12
Dsgn. L = 7.50 ft		3	0.119	0.081	11.08	-4.60	11.08	155.00	92.81	1.00	1.00	4.53	84.18	56.12
+D+0.750L+0.750S														
Dsgn. L = 7.50 ft		1	0.679	0.204		-63.05	63.05	155.00	92.81	1.00	1.00	11.45	84.18	56.12
Dsgn. L = 6.00 ft		2	0.679	0.204	4.23	-63.05	63.05	155.00	92.81	1.00	1.00	11.45	84.18	56.12
Dsgn. L = 7.50 ft		3	0.251	0.116	23.28		23.28	155.00	92.81	1.00	1.00	6.53	84.18	56.12
+D+0.60W														
Dsgn. L = 7.50 ft		1	0.064	0.016		-5.95	5.95	155.00	92.81	1.00	1.00	0.92	84.18	56.12
Dsgn. L = 6.00 ft		2	0.064	0.033	-0.00	-5.95	5.95	155.00	92.81	1.00	1.00	1.85	84.18	56.12
Dsgn. L = 7.50 ft		3	0.054	0.033	5.04	-1.26	5.04	155.00	92.81	1.00	1.00	1.85	84.18	56.12
+D+0.70E														
Dsgn. L = 7.50 ft		1	0.064	0.016		-5.95	5.95	155.00	92.81	1.00	1.00	0.92	84.18	56.12
Dsgn. L = 6.00 ft		2	0.064	0.033	-0.00	-5.95	5.95	155.00	92.81	1.00	1.00	1.85	84.18	56.12
Dsgn. L = 7.50 ft		3	0.054	0.033	5.04	-1.26	5.04	155.00	92.81	1.00	1.00	1.85	84.18	56.12
+D+0.750Lr+0.750L+0.450W														
Dsgn. L = 7.50 ft		1	0.064	0.016		-5.95	5.95	155.00	92.81	1.00	1.00	0.92	84.18	56.12
Dsgn. L = 6.00 ft		2	0.064	0.081	-0.00	-5.95	5.95	155.00	92.81	1.00	1.00	4.53	84.18	56.12
Dsgn. L = 7.50 ft		3	0.119	0.081	11.08	-4.60	11.08	155.00	92.81	1.00	1.00	4.53	84.18	56.12
+D+0.750L+0.750S+0.450W														
Dsgn. L = 7.50 ft		1	0.679	0.204		-63.05	63.05	155.00	92.81	1.00	1.00	11.45	84.18	56.12
Dsgn. L = 6.00 ft		2	0.679	0.204	4.23	-63.05	63.05	155.00	92.81	1.00	1.00	11.45	84.18	56.12
Dsgn. L = 7.50 ft		3	0.251	0.116	23.28		23.28	155.00	92.81	1.00	1.00	6.53	84.18	56.12
+D+0.750L+0.750S+0.5250E														
Dsgn. L = 7.50 ft		1	0.679	0.204		-63.05	63.05	155.00	92.81	1.00	1.00	11.45	84.18	56.12
Dsgn. L = 6.00 ft		2	0.679	0.204	4.23	-63.05	63.05	155.00	92.81	1.00	1.00	11.45	84.18	56.12
Dsgn. L = 7.50 ft		3	0.251	0.116	23.28		23.28	155.00	92.81	1.00	1.00	6.53	84.18	56.12
+0.60D+0.60W														
Dsgn. L = 7.50 ft		1	0.038	0.010		-3.57	3.57	155.00	92.81	1.00	1.00	0.55	84.18	56.12
Dsgn. L = 6.00 ft		2	0.038	0.020	-0.00	-3.57	3.57	155.00	92.81	1.00	1.00	1.11	84.18	56.12
Dsgn. L = 7.50 ft		3	0.033	0.020	3.02	-0.76	3.02	155.00	92.81	1.00	1.00	1.11	84.18	56.12
+0.60D+0.70E														
Dsgn. L = 7.50 ft		1	0.038	0.010		-3.57	3.57	155.00	92.81	1.00	1.00	0.55	84.18	56.12
Dsgn. L = 6.00 ft		2	0.038	0.020	-0.00	-3.57	3.57	155.00	92.81	1.00	1.00	1.11	84.18	56.12
Dsgn. L = 7.50 ft		3	0.033	0.020	3.02	-0.76	3.02	155.00	92.81	1.00	1.00	1.11	84.18	56.12

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.7783	0.000		0.0000	0.000
	2	0.0000	0.000	+D+S	-0.0499	2.430
+D+0.750L+0.750S+0.5250E	3	0.0356	3.703		0.0000	2.430

Vertical Reactions

Load Combination	Support notation : Far left is #1				Values in KIPS
	Support 1	Support 2	Support 3	Support 4	
Overall MAXimum		27.129	6.177	6.528	
Overall MINimum		-0.742	-0.212	0.837	
D Only		1.787	1.854	1.396	
+D+L		1.045	6.177	3.415	
+D+Lr		1.787	1.854	1.396	
+D+S		27.129	-0.212	6.220	
+D+0.750Lr+0.750L		1.230	5.096	2.910	
+D+0.750L+0.750S		20.237	3.547	6.528	
+D+0.60W		1.787	1.854	1.396	
+D+0.70E		1.787	1.854	1.396	
+D+0.750Lr+0.750L+0.450W		1.230	5.096	2.910	
+D+0.750L+0.750S+0.450W		20.237	3.547	6.528	
+D+0.750L+0.750S+0.5250E		20.237	3.547	6.528	
+0.60D+0.60W		1.072	1.113	0.837	
+0.60D+0.70E		1.072	1.113	0.837	
D Only		1.787	1.854	1.396	
Lr Only					
L Only		-0.742	4.322	2.020	
S Only		25.342	-2.066	4.824	
W Only					
E Only					
H Only					

Steel Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-VLWNXF1-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. # : KW-06007744

Description : RB-3

CODE REFERENCES

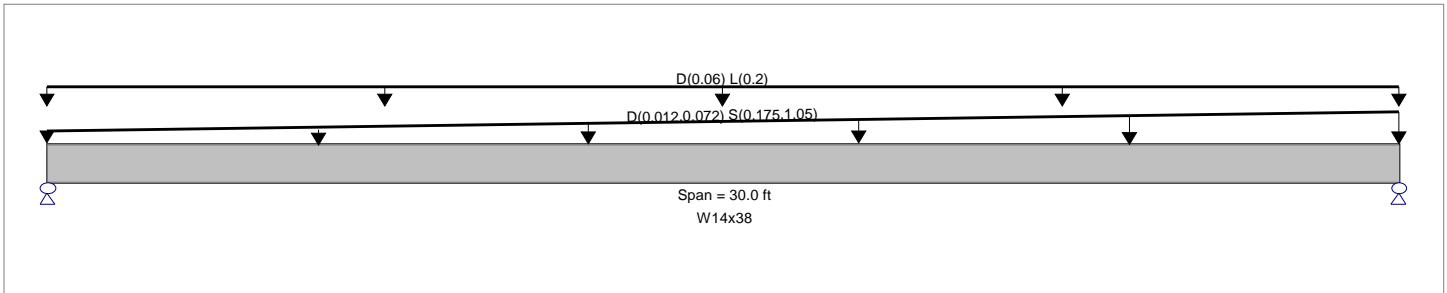
Calculations per AISC 360-10, IBC 2012, ASCE 7-10

Load Combination Set : IBC2012

Material Properties

Analysis Method : **Allowable Strength Design**
 Beam Bracing : **Beam is Fully Braced against lateral-torsional buckling**
 Bending Axis : **Major Axis Bending**
 Load Combination **IBC2012**

Fy : Steel Yield : **50.0** ksi
 E : Modulus : **29,000.0** ksi



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading
 Load for Span Number 1

Varying Uniform Load : D(S,E) = 0.0120->0.0120, S(S,E) = 0.1750->0.1750 ksf, Extent = 0.0 -->> 30.0 ft, Trib Width = 1.0->6.0 ft

Uniform Load : D = 0.0120, L = 0.040 ksf, Tributary Width = 5.0 ft, (DECK)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.558 : 1	Maximum Shear Stress Ratio =	0.156 : 1
Section used for this span	W14x38	Section used for this span	W14x38
Ma : Applied	85.559 k-ft	Va : Applied	13.627 k
Mn / Omega : Allowable	153.443 k-ft	Vn/Omega : Allowable	87.420 k
Load Combination	+D+S+H	Load Combination	+D+S+H
Location of maximum on span	16.500ft	Location of maximum on span	30.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	1.006 in Ratio = 357		
Max Upward Transient Deflection	0.000 in Ratio = 0 <240		
Max Downward Total Deflection	1.239 in Ratio = 291		
Max Upward Total Deflection	0.000 in Ratio = 0 <180		

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values				
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega	
+D+H															
Dsgn. L = 30.00 ft		1	0.103	0.026	15.78		15.78	256.25	153.44	1.00	1.00	2.25	131.13	87.42	
+D+L+H															
Dsgn. L = 30.00 ft		1	0.249	0.060	38.27		38.27	256.25	153.44	1.00	1.00	5.25	131.13	87.42	
+D+Lr+H															
Dsgn. L = 30.00 ft		1	0.103	0.026	15.78		15.78	256.25	153.44	1.00	1.00	2.25	131.13	87.42	
+D+S+H															
Dsgn. L = 30.00 ft		1	0.558	0.156	85.56		85.56	256.25	153.44	1.00	1.00	13.63	131.13	87.42	
+D+0.750Lr+0.750L+H															
Dsgn. L = 30.00 ft		1	0.213	0.051	32.65		32.65	256.25	153.44	1.00	1.00	4.50	131.13	87.42	
+D+0.750L+0.750S+H															
Dsgn. L = 30.00 ft		1	0.553	0.149	84.85		84.85	256.25	153.44	1.00	1.00	13.03	131.13	87.42	
+D+0.60W+H															
Dsgn. L = 30.00 ft		1	0.103	0.026	15.78		15.78	256.25	153.44	1.00	1.00	2.25	131.13	87.42	
+D+0.70E+H															
Dsgn. L = 30.00 ft		1	0.103	0.026	15.78		15.78	256.25	153.44	1.00	1.00	2.25	131.13	87.42	
+D+0.750Lr+0.750L+0.450W+H															
Dsgn. L = 30.00 ft		1	0.213	0.051	32.65		32.65	256.25	153.44	1.00	1.00	4.50	131.13	87.42	
+D+0.750L+0.750S+0.450W+H															
Dsgn. L = 30.00 ft		1	0.553	0.149	84.85		84.85	256.25	153.44	1.00	1.00	13.03	131.13	87.42	
+D+0.750L+0.750S+0.5250E+H															
Dsgn. L = 30.00 ft		1	0.553	0.149	84.85		84.85	256.25	153.44	1.00	1.00	13.03	131.13	87.42	

Steel Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-V\LWNXFI-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11

Lic. #: KW-06007744

Licensee: EPIC ENGINEERING, PC

Description: RB-3

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma - Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
+0.60D+0.60W+0.60H														
Dsgn. L = 30.00 ft		1	0.062	0.015	9.47		9.47	256.25	153.44	1.00	1.00	1.35	131.13	87.42
+0.60D+0.70E+0.60H														
Dsgn. L = 30.00 ft		1	0.062	0.015	9.47		9.47	256.25	153.44	1.00	1.00	1.35	131.13	87.42

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S+H	1	1.2388	15.450		0.0000	0.000

Vertical Reactions

Load Combination	Support notation : Far left is #1		Values in KIPS
	Support 1	Support 2	
Overall MAXimum	9.452	13.627	
Overall MINimum	1.171	1.351	
+D+H	1.952	2.252	
+D+L+H	4.952	5.252	
+D+Lr+H	1.952	2.252	
+D+S+H	8.952	13.627	
+D+0.750Lr+0.750L+H	4.202	4.502	
+D+0.750L+0.750S+H	9.452	13.033	
+D+0.60W+H	1.952	2.252	
+D+0.70E+H	1.952	2.252	
+D+0.750Lr+0.750L+0.450W+H	4.202	4.502	
+D+0.750L+0.750S+0.450W+H	9.452	13.033	
+D+0.750L+0.750S+0.5250E+H	9.452	13.033	
+0.60D+0.60W+0.60H	1.171	1.351	
+0.60D+0.70E+0.60H	1.171	1.351	
D Only	1.952	2.252	
Lr Only			
L Only	3.000	3.000	
S Only	7.000	11.375	
W Only			
E Only			
H Only			

Wood Beam

File = S:\PROJ\SHSKCD-4\21YFRF-1\ANCBNR-V\LWNXFI-XIC7A4YC-FL2FOR8-B.EC6
 ENERCALC, INC. 1983-2015, Build:6.15.4.11, Ver:6.15.4.11
 Licensee : EPIC ENGINEERING, PC

Lic. # : KW-06007744

Description : RB-5

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values		
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	f _b	F ['] _b	V	f _v
Length = 22.0 ft	1	0.169	0.063	1.15	1.000	1.00	1.00	1.00	1.00	1.00	3.47	505.69	2990.00	0.58	20.75	327.75
+D+0.60W+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 22.0 ft	1	0.122	0.046	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.47	505.69	4160.00	0.58	20.75	456.00
+D+0.70E+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 22.0 ft	1	0.122	0.046	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.47	505.69	4160.00	0.58	20.75	456.00
+D+0.750Lr+0.750L+0.450W+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 22.0 ft	1	0.122	0.046	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.47	505.69	4160.00	0.58	20.75	456.00
+D+0.750L+0.750S+0.450W+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 22.0 ft	1	0.122	0.046	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.47	505.69	4160.00	0.58	20.75	456.00
+D+0.750L+0.750S+0.5250E+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 22.0 ft	1	0.122	0.046	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.47	505.69	4160.00	0.58	20.75	456.00
+0.60D+0.60W+0.60H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 22.0 ft	1	0.073	0.027	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.08	303.41	4160.00	0.35	12.45	456.00
+0.60D+0.70E+0.60H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 22.0 ft	1	0.073	0.027	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.08	303.41	4160.00	0.35	12.45	456.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
D Only	1	0.3273	11.080		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

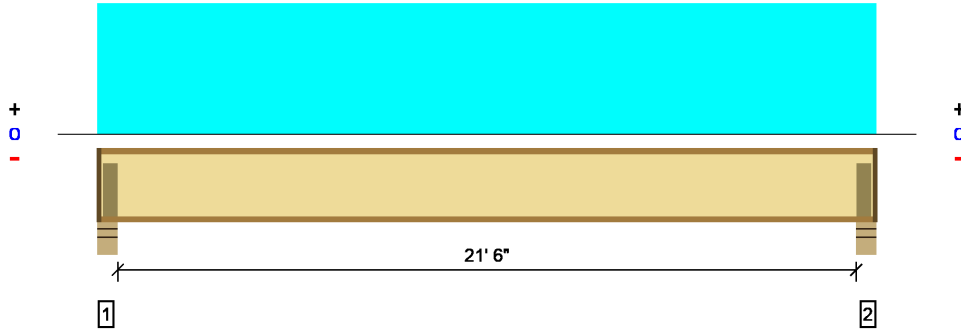
Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	0.630	0.630
Overall MINimum	0.378	0.378
+D+H	0.630	0.630
+D+L+H	0.630	0.630
+D+Lr+H	0.630	0.630
+D+S+H	0.630	0.630
+D+0.750Lr+0.750L+H	0.630	0.630
+D+0.750L+0.750S+H	0.630	0.630
+D+0.60W+H	0.630	0.630
+D+0.70E+H	0.630	0.630
+D+0.750Lr+0.750L+0.450W+H	0.630	0.630
+D+0.750L+0.750S+0.450W+H	0.630	0.630
+D+0.750L+0.750S+0.5250E+H	0.630	0.630
+0.60D+0.60W+0.60H	0.378	0.378
+0.60D+0.70E+0.60H	0.378	0.378
D Only	0.630	0.630
Lr Only		
L Only		
S Only		
W Only		
E Only		
H Only		

01: ROOF			
Member Name	Results	Current Solution	Comments
ROOF JOISTS	Passed	2 Piece(s) 16" TJI® 560 @ 19.2" OC	
Roof Joist 2	Passed	1 Piece(s) 16" TJI® 110 @ 24" OC	Reinforcement accessories required
LOWER ROOF JOIST	Passed	1 Piece(s) 11 7/8" TJI® 360 @ 16" OC	Reinforcement accessories required
ROOF JOIST 3	Passed	1 Piece(s) 16" TJI® 360 @ 16" OC	
02: UPPER FLOOR			
Member Name	Results	Current Solution	Comments
upper FLOOR JOISTS	Passed	1 Piece(s) 11 7/8" TJI® 210 @ 16" OC	
SHOWER BEAM	Passed	2 Piece(s) 11 7/8" TJI® 210	
03: MAIN FLOOR			
Member Name	Results	Current Solution	Comments
MAIN FLOOR JOISTS	Passed	1 Piece(s) 11 7/8" TJI® 210 @ 16" OC	

Forte Software Operator	Job Notes
Patrick Wilson Epic Engineering (435) 654-6600 pwilson@epiceng.net	

Overall Length: 22' 5"



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	4264 @ 4 1/2"	5060 (3.50")	Passed (84%)	1.15	1.0 D + 1.0 S (All Spans)
Shear (lbs)	4128 @ 5 1/2"	6233	Passed (66%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	22533 @ 11' 2 1/2"	29728	Passed (76%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.648 @ 11' 2 1/2"	0.722	Passed (L/401)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.889 @ 11' 2 1/2"	1.083	Passed (L/292)	--	1.0 D + 1.0 S (All Spans)

System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Bracing (Lu): All compression edges (top and bottom) must be braced at 5' 4 7/8" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Stud wall - DF	5.50"	4.25"	2.19"	1166	3138	4304	Web Stiffeners, 1 1/4" Rim Board
2 - Stud wall - DF	5.50"	4.25"	2.19"	1166	3138	4304	Web Stiffeners, 1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

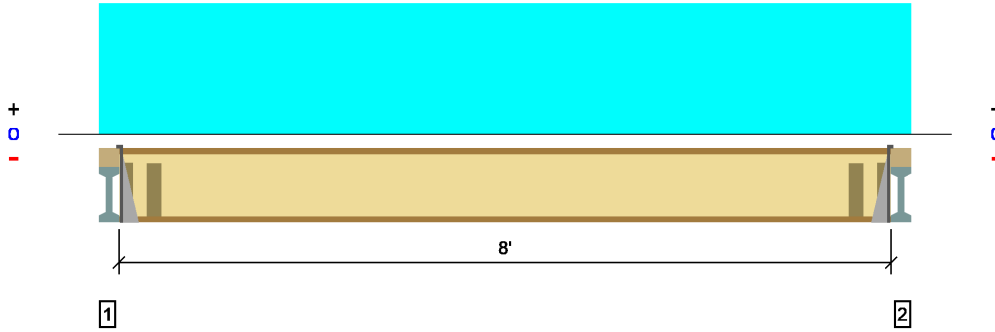
Loads	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 22' 5"	19.2"	65.0	175.0	Roof

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Forte Software Operator	Job Notes
Patrick Wilson Epic Engineering (435) 654-6600 pwilson@epiceng.net	

Overall Length: 8' 11"



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1920 @ 5 1/2"	1920 (3.26")	Passed (100%)	1.15	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1920 @ 5 1/2"	2467	Passed (78%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	3840 @ 4' 5 1/2"	4922	Passed (78%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.098 @ 4' 5 1/2"	0.267	Passed (L/983)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.134 @ 4' 5 1/2"	0.400	Passed (L/717)	--	1.0 D + 1.0 S (All Spans)

System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Bracing (Lu): All compression edges (top and bottom) must be braced at 2' 11 9/16" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Hanger on Single 2X DF plate	5.50"	Hanger ¹	3.26"	580	1560	2140	Web Stiffeners, See note ¹
2 - Hanger on Single 2X DF plate	5.50"	Hanger ¹	3.26"	580	1560	2140	Web Stiffeners, See note ¹

- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

Connector: Simpson Strong-Tie Connectors						
Support	Model	Seat Length	Top Nails	Face Nails	Member Nails	Accessories
1 - Top Mount Hanger	WP16	3.50"	2-10d x 1-1/2	N/A	2-10d x 1-1/2	Web Stiffeners
2 - Top Mount Hanger	WP16	3.50"	2-10d x 1-1/2	N/A	2-10d x 1-1/2	Web Stiffeners

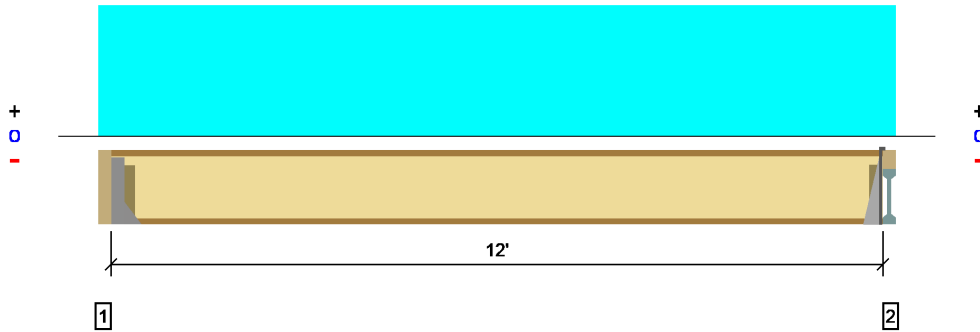
Loads	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 8' 11"	24"	65.0	175.0	Roof

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Forte Software Operator	Job Notes
Patrick Wilson Epic Engineering (435) 654-6600 pwilson@epiceng.net	

Overall Length: 12' 7"



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1640 @ 3 1/2"	1640 (3.17")	Passed (100%)	1.15	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1640 @ 3 1/2"	1961	Passed (84%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	4920 @ 6' 3 1/2"	7107	Passed (69%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.335 @ 6' 3 1/2"	0.400	Passed (L/430)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.393 @ 6' 3 1/2"	0.600	Passed (L/367)	--	1.0 D + 1.0 S (All Spans)

System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Bracing (Lu): All compression edges (top and bottom) must be braced at 3' 8 5/16" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Hanger on 11 7/8" DF beam	3.50"	Hanger ¹	3.17"	252	1468	1720	See note ¹
2 - Hanger on Single 2X DF plate	3.50"	Hanger ¹	3.17"	252	1468	1720	See note ¹

- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

Connector: Simpson Strong-Tie Connectors						
Support	Model	Seat Length	Top Nails	Face Nails	Member Nails	Accessories
1 - Face Mount Hanger	U3510/14	2.00"	N/A	14-10d common	6-10d x 1-1/2	Web Stiffeners
2 - Top Mount Hanger	LBV2.37/11.88	2.50"	6-10d x 1-1/2	4-10d x 1-1/2	2-10d x 1-1/2	Web Stiffeners

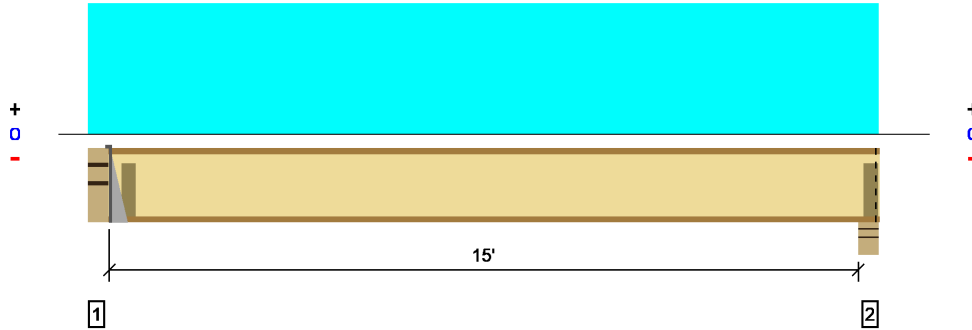
Loads	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 12' 7"	16"	30.0	175.0	Roof

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Forte Software Operator	Job Notes
Patrick Wilson Epic Engineering (435) 654-6600 pwilson@epiceng.net	

Overall Length: 15' 11"



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1911 @ 5 1/2"	1911 (2.67")	Passed (100%)	1.15	1.0 D + 1.0 S (All Spans)
Shear (lbs)	1911 @ 5 1/2"	2519	Passed (76%)	1.15	1.0 D + 1.0 S (All Spans)
Moment (Ft-lbs)	7204 @ 8'	9666	Passed (75%)	1.15	1.0 D + 1.0 S (All Spans)
Live Load Defl. (in)	0.416 @ 8'	0.503	Passed (L/435)	--	1.0 D + 1.0 S (All Spans)
Total Load Defl. (in)	0.452 @ 8'	0.754	Passed (L/401)	--	1.0 D + 1.0 S (All Spans)

System : Roof
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC
 Design Methodology : ASD
 Member Pitch : 0/12

- Deflection criteria: LL (L/360) and TL (L/240).
- Bracing (Lu): All compression edges (top and bottom) must be braced at 3' 7 1/4" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Snow	Total	
1 - Hanger on DF stud wall	5.50"	Hanger ¹	2.67"	160	1867	2027	Web Stiffeners, See note ¹
2 - Stud wall - DF	5.50"	5.50"	3.00"	158	1847	2005	Web Stiffeners, Blocking

- Blocking Panels are assumed to carry no loads applied directly above them and the full load is applied to the member being designed.
- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

Connector: Simpson Strong-Tie Connectors						
Support	Model	Seat Length	Top Nails	Face Nails	Member Nails	Accessories
1 - Top Mount Hanger	Connector not found	N/A	N/A	N/A	N/A	

Loads	Location	Spacing	Dead (0.90)	Snow (1.15)	Comments
1 - Uniform (PSF)	0 to 15' 11"	16"	15.0	175.0	Roof

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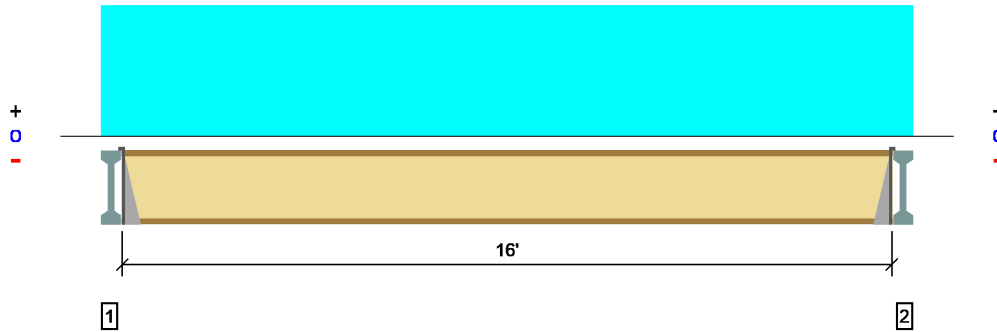
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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator



Forte Software Operator	Job Notes
Patrick Wilson Epic Engineering (435) 654-6600 pwilson@epiceng.net	

Overall Length: 16' 11"



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	555 @ 5 1/2"	1005 (1.75")	Passed (55%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	555 @ 5 1/2"	1655	Passed (34%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	2219 @ 8' 5 1/2"	3795	Passed (58%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.234 @ 8' 5 1/2"	0.400	Passed (L/821)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.304 @ 8' 5 1/2"	0.800	Passed (L/632)	--	1.0 D + 1.0 L (All Spans)
TJ-Pro™ Rating	42	40	Passed	--	--

System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Bracing (Lu): All compression edges (top and bottom) must be braced at 4' 3 3/8" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Hanger on steel	5.50"	Hanger ¹	1.75"	135	451	586	See note ¹
2 - Hanger on steel	5.50"	Hanger ¹	1.75"	135	451	586	See note ¹

- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

Connector: Simpson Strong-Tie Connectors						
Support	Model	Seat Length	Top Nails	Face Nails	Member Nails	Accessories
1 - Top Mount Hanger	LBV2.1/11.88	2.50"	N/A	N/A	2-10d x 1-1/2	
2 - Top Mount Hanger	LBV2.1/11.88	2.50"	N/A	N/A	2-10d x 1-1/2	

Loads	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 16' 11"	16"	12.0	40.0	Residential - Living Areas

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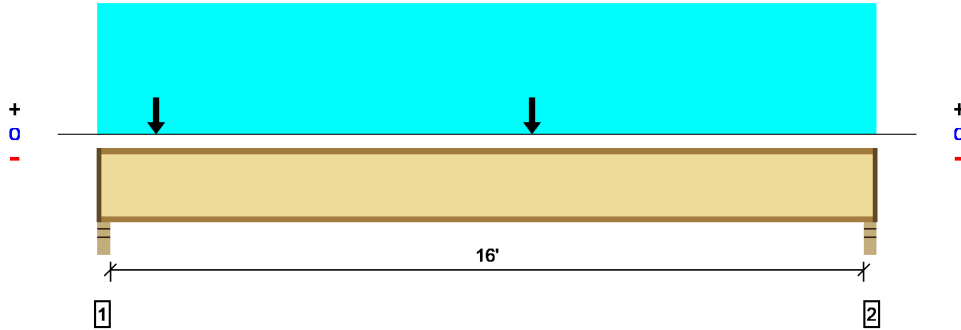
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Forte Software Operator	Job Notes
Patrick Wilson Epic Engineering (435) 654-6600 pwilson@epiceng.net	

Overall Length: 16' 7"



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	1626 @ 2"	2267 (2.25")	Passed (72%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	1615 @ 3 1/2"	3310	Passed (49%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	5641 @ 9' 3"	7590	Passed (74%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.307 @ 8' 3 15/16"	0.406	Passed (L/635)	--	1.0 D + 1.0 L (All Spans)
Total Load Defl. (in)	0.435 @ 8' 3 15/16"	0.813	Passed (L/449)	--	1.0 D + 1.0 L (All Spans)

System : Floor
 Member Type : Flush Beam
 Building Use : Residential
 Building Code : IBC
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Bracing (Lu): All compression edges (top and bottom) must be braced at 3' 9 9/16" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Stud wall - DF	3.50"	2.25"	1.75"	475	1156	1631	1 1/4" Rim Board
2 - Stud wall - DF	3.50"	2.25"	1.75"	296	707	1003	1 1/4" Rim Board

- Rim Board is assumed to carry all loads applied directly above it, bypassing the member being designed.

Loads	Location	Tributary Width	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 16' 7"	1'	12.0	40.0	Residential - Living Areas
2 - Point (lb)	1' 3"	N/A	240	600	
3 - Point (lb)	9' 3"	N/A	240	600	

Weyerhaeuser Notes

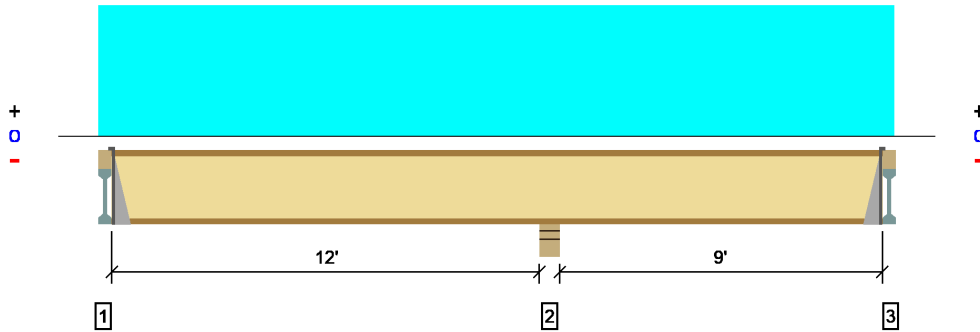
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The product application, input design loads, dimensions and support information have been provided by Forte Software Operator



Forte Software Operator	Job Notes
Patrick Wilson Epic Engineering (435) 654-6600 pwilson@epiceng.net	

Overall Length: 22' 1/2"



All locations are measured from the outside face of left support (or left cantilever end). All dimensions are horizontal.;Drawing is Conceptual

Design Results	Actual @ Location	Allowed	Result	LDF	Load: Combination (Pattern)
Member Reaction (lbs)	945 @ 12' 6 1/4"	2565 (5.25")	Passed (37%)	1.00	1.0 D + 1.0 L (All Spans)
Shear (lbs)	474 @ 12' 3 1/2"	1821	Passed (26%)	1.00	1.0 D + 1.0 L (All Spans)
Moment (Ft-lbs)	-1056 @ 12' 6 1/4"	3795	Passed (28%)	1.00	1.0 D + 1.0 L (All Spans)
Live Load Defl. (in)	0.064 @ 6' 1/4"	0.306	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
Total Load Defl. (in)	0.080 @ 5' 11 9/16"	0.611	Passed (L/999+)	--	1.0 D + 1.0 L (Alt Spans)
TJ-Pro™ Rating	56	40	Passed	--	--

System : Floor
 Member Type : Joist
 Building Use : Residential
 Building Code : IBC
 Design Methodology : ASD

- Deflection criteria: LL (L/480) and TL (L/240).
- Bracing (Lu): All compression edges (top and bottom) must be braced at 6' 2 7/16" o/c unless detailed otherwise. Proper attachment and positioning of lateral bracing is required to achieve member stability.
- A structural analysis of the deck has not been performed.
- Deflection analysis is based on composite action with a single layer of 23/32" Weyerhaeuser Edge™ Panel (24" Span Rating) that is glued and nailed down.
- Additional considerations for the TJ-Pro™ Rating include: None

Supports	Bearing			Loads to Supports (lbs)			Accessories
	Total	Available	Required	Dead	Floor Live	Total	
1 - Hanger on Single 2X DF plate	3.50"	Hanger ¹	1.75"	83	295/-4	378/-4	See note ¹
2 - Stud wall - DF	5.50"	5.50"	3.50"	218	727	945	None
3 - Hanger on Single 2X DF plate	3.50"	Hanger ¹	1.75"	52	235/-46	287/-46	See note ¹

- At hanger supports, the Total Bearing dimension is equal to the width of the material that is supporting the hanger
- ¹ See Connector grid below for additional information and/or requirements.

Connector: Simpson Strong-Tie Connectors

Support	Model	Seat Length	Top Nails	Face Nails	Member Nails	Accessories
1 - Top Mount Hanger	ITS2.06/11.88	2.00"	4-10d x 1-1/2	2-10d x 1-1/2	N/A	
3 - Top Mount Hanger	ITS2.06/11.88	2.00"	4-10d x 1-1/2	2-10d x 1-1/2	N/A	

Loads	Location	Spacing	Dead (0.90)	Floor Live (1.00)	Comments
1 - Uniform (PSF)	0 to 22' 1/2"	16"	12.0	40.0	Residential - Living Areas

Weyerhaeuser Notes

Weyerhaeuser warrants that the sizing of its products will be in accordance with Weyerhaeuser product design criteria and published design values. Weyerhaeuser expressly disclaims any other warranties related to the software. Refer to current Weyerhaeuser literature for installation details. (www.woodbywy.com) Accessories (Rim Board, Blocking Panels and Squash Blocks) are not designed by this software. Use of this software is not intended to circumvent the need for a design professional as determined by the authority having jurisdiction. The designer of record, builder or framer is responsible to assure that this calculation is compatible with the overall project. Products manufactured at Weyerhaeuser facilities are third-party certified to sustainable forestry standards.

The product application, input design loads, dimensions and support information have been provided by Forte Software Operator



Forte Software Operator	Job Notes
Patrick Wilson Epic Engineering (435) 654-6600 pwilson@epiceng.net	

Bolting Calculation for Steel Beam Connections W12X35

Type of Connector	Ft (ksi)	Fv (ksi)	
		Slip Critical	Bearing
A502 hot-driven rivets			
Grade 1	23		17.5
Grade 2	29		22
A307 Common Bolts	20		10
A325 High-Strength Bolts			
<i>No threads in Shear Plane</i>	44	17	30
<i>Threads in Shear Plane</i>	44	17	21
A490 High Strength Bolts			
<i>No threads in Shear Plane</i>	54	21	40
<i>Threads in Shear Plane</i>	54	21	28

Enter Reaction 16.8 kips

Enter Bolt Diameter 0.625 in

Av= 0.306641

Enter Bolt Grade from Table 2

Bolt Type Selected A325

Enter 1 if *Slip Critical*, 2 if *Bearing* 2

Allowable Shear Stress 30 ksi

Include Threads in Shear Plane YES

Reduced Shear Stress 21 ksi

Beam Characteristics

Plate Thickness (Web Thickness) 0.285 in

Beam Height 8 in

Minimum distance between holes 1.666667 in

Minimum Longitudinal spacing 0.88 in

Minimum first row spacing from edge 0.68 in

Net Area in Tension 1.69 in²

Allowable Tensile Stress 29.00 ksi

Bolting Requirements

Number of Bolts Required Due to Shear Stress Criteria 3.0

Number of Bolts Required Due to Bearing Stress 2

Maximum Load Based on Net effective Section 49.1 kips

Maximum Load Based on Gross effective Section 49.248 kips

Bolting Calculation for Steel Beam Connections W10X30/W8X21

Type of Connector	Ft (ksi)	Slip	Fv (ksi) Critical Bearing
A502 hot-driven rivets			
Grade 1	23		17.5
Grade 2	29		22
A307 Common Bolts	20		10
A325 High-Strength Bolts			
<i>No threads in Shear Plane</i>	44	17	30
<i>Threads in Shear Plane</i>	44	17	21
A490 High Strength Bolts			
<i>No threads in Shear Plane</i>	54	21	40
<i>Threads in Shear Plane</i>	54	21	28

Enter Reaction 9.5 kips

Enter Bolt Diameter 0.625 in

Av= 0.306641

Enter Bolt Grade from Table 2

Bolt Type Selected A325

Enter 1 if *Slip Critical* , 2 if *Bearing* 2

Allowable Shear Stress 30 ksi

Include Threads in Shear Plane YES

Reduced Shear Stress 21 ksi

Beam Characteristics

Plate Thickness (Web Thickness) 0.285 in

Beam Height 8 in

Minimum distance between holes 1.666667 in

Minimum Longitudinal spacing 0.79 in

Minimum first row spacing from edge 0.57 in

Net Area in Tension 1.89 in²

Allowable Tensile Stress 29.00 ksi

Bolting Requirements

Number of Bolts Required Due to Shear Stress Criteria 2.0

Number of Bolts Required Due to Bearing Stress 1

Maximum Load Based on Net effective Section 54.8 kips

Maximum Load Based on Gross effective Section 49.248 kips

Bolting Calculation for Steel Beam Connections W12x22

Type of Connector	Ft (ksi)	Fv (ksi)	
		Slip	Critical Bearing
A502 hot-driven rivets			
Grade 1	23		17.5
Grade 2	29		22
A307 Common Bolts	20		10
A325 High-Strength Bolts			
<i>No threads in Shear Plane</i>	44	17	30
<i>Threads in Shear Plane</i>	44	17	21
A490 High Strength Bolts			
<i>No threads in Shear Plane</i>	54	21	40
<i>Threads in Shear Plane</i>	54	21	28

Enter Reaction 10.9 kips

Enter Bolt Diameter 0.625 in

Av= 0.306641

Enter Bolt Grade from Table 2

Bolt Type Selected A325

Enter 1 if *Slip Critical* , 2 if *Bearing* 2

Allowable Shear Stress 30 ksi

Include Threads in Shear Plane YES

Reduced Shear Stress 21 ksi

Beam Characteristics

Plate Thickness (Web Thickness) 0.285 in

Beam Height 8 in

Minimum distance between holes 1.666667 in

Minimum Longitudinal spacing 0.86 in

Minimum first row spacing from edge 0.66 in

Net Area in Tension 1.89 in²

Allowable Tensile Stress 29.00 ksi

Bolting Requirements

Number of Bolts Required Due to Shear Stress Criteria 2.0

Number of Bolts Required Due to Bearing Stress 1

Maximum Load Based on Net effective Section 54.8 kips

Maximum Load Based on Gross effective Section 49.248 kips

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Restrained Retaining Wall Design

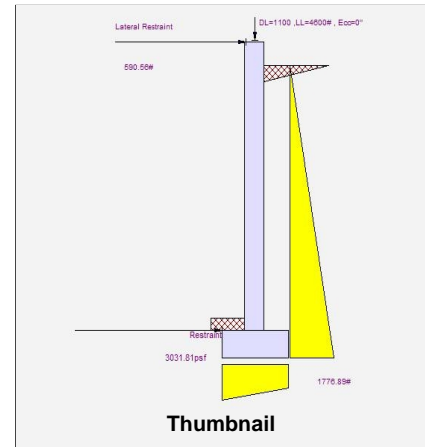
Code: IBC 2012,ACI 318-11,ACI 530-11

Criteria

Retained Height	=	11.00 ft
Wall height above soil	=	1.00 ft
Total Wall Height	=	12.00 ft
Top Support Height	=	12.00 ft
Slope Behind Wall	=	0.00 : 1
Height of Soil over Toe	=	6.00 in

Soil Data

Allow Soil Bearing	=	5,000.0 psf
Equivalent Fluid Pressure Method		
Heel Active Pressure	=	32.0 psf/ft
	=	
Passive Pressure	=	250.0 psf/ft
Soil Density	=	110.00 pcf
Footing Soil Frictior	=	0.400
Soil height to ignore for passive pressure	=	12.00 in



Surcharge Loads

Surcharge Over Heel	=	0.0 psf
>>>Used To Resist Sliding & Overturning		
Surcharge Over Toe	=	0.0 psf
Used for Sliding & Overturning		

Axial Load Applied to Stem

Axial Dead Load	=	1,100.0 lbs
Axial Live Load	=	4,600.0 lbs
Axial Load Eccentricity	=	0.0 in

Earth Pressure Seismic Load

Stem Weight Seismic Load

Uniform Lateral Load Applied to Stem

Lateral Load	=	0.0 #/ft
...Height to Top	=	0.00 ft
...Height to Bottom	=	0.00 ft
The above lateral load has been increased by a factor of	=	1.00

Wind on Exposed Stem = 0.0 psf

K_h Soil Density Multiplier = 0.200 g Added seismic per unit area = 0.0 psf

F_p / W_p Weight Multiplier = 0.000 g Added seismic per unit area = 0.0 psf

Adjacent Footing Load

Adjacent Footing Load	=	0.0 lbs
Footing Width	=	0.00 ft
Eccentricity	=	0.00 in
Wall to Ftg CL Dist	=	0.00 ft
Footing Type	=	Line Load
Base Above/Below Soil at Back of Wall	=	0.0 ft
Poisson's Ratio	=	0.300

Design Summary

Total Bearing Load	=	9,095 lbs
...resultant ecc.	=	1.58 in
Soil Pressure @ Toe	=	3,032 psf OK
Soil Pressure @ Heel	=	3,032 psf OK
Allowable	=	5,000 psf
Soil Pressure Less Than Allowable		
ACI Factored @ Toe	=	3,130 psf
ACI Factored @ Heel	=	5,373 psf
Footing Shear @ Toe	=	4.8 psi OK
Footing Shear @ Heel	=	26.0 psi OK
Allowable	=	75.0 psi
Reaction at Top	=	590.6 lbs
Reaction at Bottom	=	1,776.9 lbs

Sliding Calcs Slab Resists All Sliding !
Lateral Sliding Force = 1,776.9 lbs

Concrete Stem Construction

Thickness	=	10.00 in	F_y	=	60,000 psi
Wall Weight	=	125.0 psf	f'_c	=	3,000 psi
Stem is FREE to rotate at top of footing					

	@ Top Support	Mmax Between Top & Base	@ Base of Wall
Design Height Above Ftg	Stem OK = 12.00 ft	Stem OK = 4.96 ft	Stem OK = 0.00 ft
Rebar Size	# 5	# 5	# 5
Rebar Spacing	= 16.00 in	= 16.00 in	= 16.00 in
Rebar Placed at	= Center	= Center	= Center
Rebar Depth 'd'	= 5.00 in	= 5.00 in	= 5.00 in

Design Data

fb/FB + fa/Fa	=	0.000	0.958	0.000
Mu....Actual	=	0.0 ft-#	4,783.3 ft-#	0.0 ft-#
Mn * Phi....Allowable	=	4,992.1 ft-#	4,992.1 ft-#	4,992.1 ft-#
Shear Force @ this height	=	946.5 lbs		2,151.1 lbs
Shear.....Actual	=	15.77 psi		35.85 psi
Shear.....Allowable	=	82.16 psi		82.16 psi

Load Factors

Building Code	IBC 2012,ACI
Dead Load	1.200
Live Load	1.600
Earth, H	1.600
Wind, W	1.000
Seismic, E	1.000

Other Acceptable Sizes & Spacings:

Toe: None Spec'd	-or-	Not req'd: $M_u < \phi * 5 * \lambda * \sqrt{f'_c} * S_m$
Heel: None Spec'd	-or-	Not req'd: $M_u < \phi * 5 * \lambda * \sqrt{f'_c} * S_m$
Key: No key defined	-or-	No key defined

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Restrained Retaining Wall Design

Code: IBC 2012,ACI 318-11,ACI 530-11

Footing Strengths & Dimensions

Toe Width	=	1.08 ft
Heel Width	=	1.92
Total Footing Width	=	3.00
Footing Thickness	=	14.00 in
Key Width	=	0.00 in
Key Depth	=	0.00 in
Key Distance from Toe	=	0.00 ft
f'c =	2,500 psi	Fy = 60,000 psi
Footing Concrete Density	=	150.00 pcf
Min. As %	=	0.0018
Cover @ Top	=	2.00 in @ Btm.= 3.00 in

Footing Design Results

		Toe	Heel
Factored Pressure	=	3,130	5,373 psf
Mu' : Upward	=	1,995	2,994 ft-#
Mu' : Downward	=	162	975 ft-#
Mu: Design	=	1,833	-2,019 ft-#
Actual 1-Way Shear	=	4.85	25.95 psi
Allow 1-Way Shear	=	75.00	75.00 psi

Summary of Forces on Footing : Slab RESISTS sliding, stem is PINNED at footing

Forces acting on footing soil pressure

(taking moments about front of footing to find eccentricity)

Surcharge Over Heel	=	lbs	ft	ft-#
Axial Dead Load on Stem	=	5,700.0lbs	1.50 ft	8,550.0ft-#
Soil Over Toe	=	59.6lbs	0.54 ft	32.3ft-#
Adjacent Footing Load	=	lbs	ft	ft-#
Surcharge Over Toe	=	lbs	ft	ft-#
Stem Weight	=	1,500.0lbs	1.50 ft	2,250.0ft-#
Soil Over Heel	=	1,310.8lbs	2.46 ft	3,222.5ft-#
Footing Weight	=	525.0lbs	1.50 ft	787.5ft-#
Total Vertical Force	=	9,095.4lbs	Moment =	14,842.2ft-#

Net Mom. at Stem/Ftg Interface = -1,199.1 ft-#

Allow. Mom. @ Stem/Ftg Interface = 3,120.0 ft-#

Allow. Mom. Exceeds Applied Mom.? Yes

Therefore Uniform Soil Pressure = 3,031.8 psf

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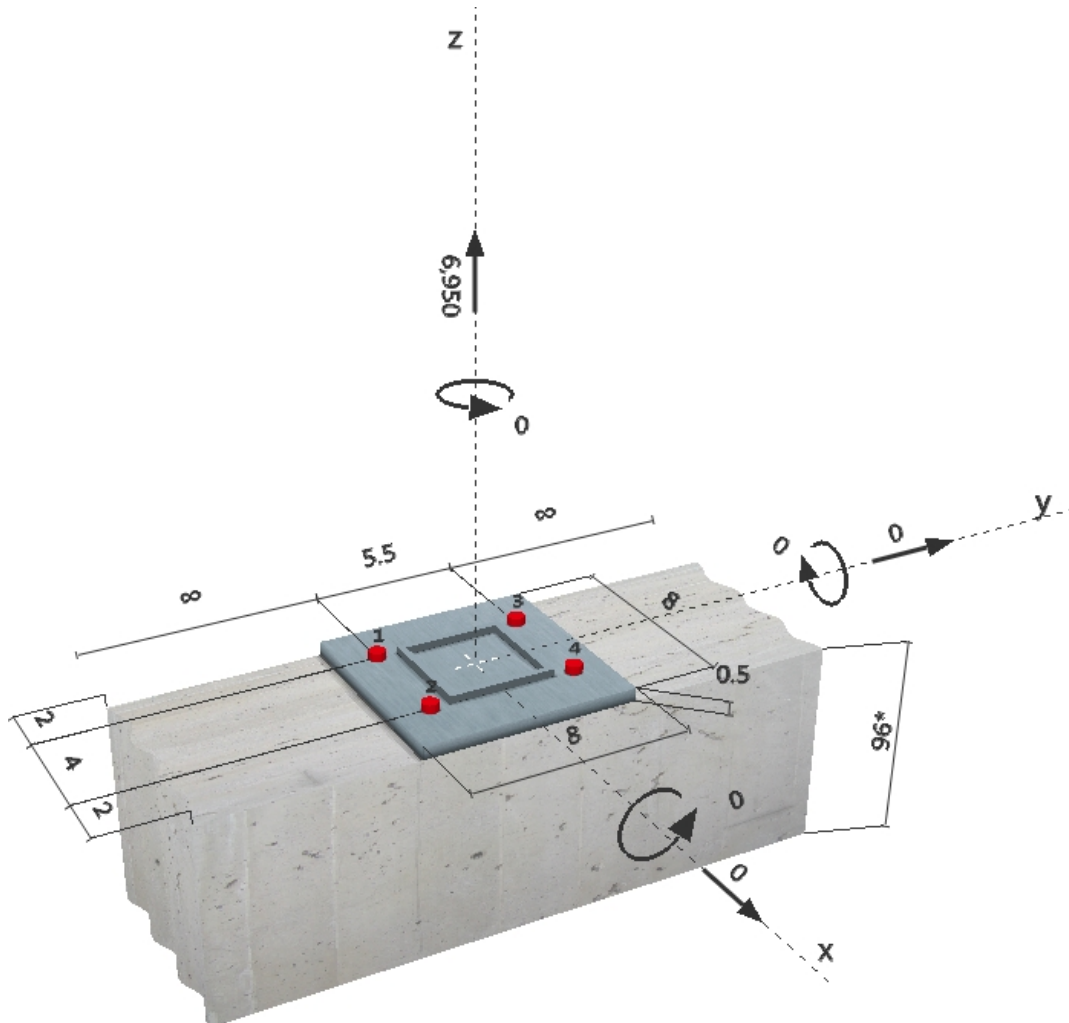
Specifier's comments:

1 Input data



Anchor type and diameter:	Hex Head ASTM F 1554 GR. 36 5/8
Effective embedment depth:	$h_{ef} = 7.000$ in.
Material:	ASTM F 1554
Proof:	Design method ACI 318-08 / CIP
Stand-off installation:	$e_b = 0.000$ in. (no stand-off); $t = 0.500$ in.
Anchor plate:	$l_x \times l_y \times t = 8.000$ in. \times 8.000 in. \times 0.500 in.; (Recommended plate thickness: not calculated)
Profile:	Square HSS (AISC); $(L \times W \times T) = 4.000$ in. \times 4.000 in. \times 0.250 in.
Base material:	cracked concrete, 2500, $f'_c = 2500$ psi; $h = 96.000$ in.
Reinforcement:	tension: condition A, shear: condition A; anchor reinforcement: tension, shear edge reinforcement: none or $<$ No. 4 bar
Seismic loads (cat. C, D, E, or F)	no

Geometry [in.] & Loading [lb, in.lb]



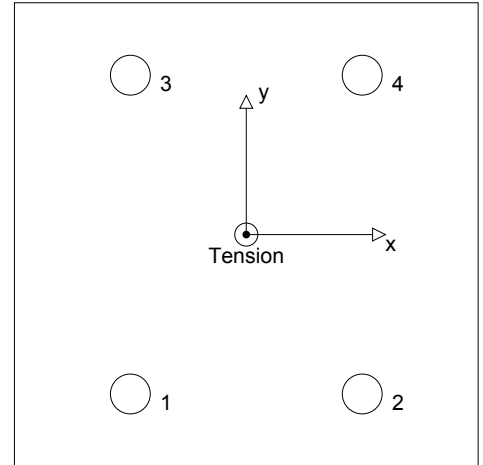
2 Load case/Resulting anchor forces

Load case: Design loads

Anchor reactions [lb]

Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	1738	0	0	0
2	1738	0	0	0
3	1738	0	0	0
4	1738	0	0	0

max. concrete compressive strain: - [%]
max. concrete compressive stress: - [psi]
resulting tension force in (x/y)=(0.000/0.000): 6950 [lb]
resulting compression force in (x/y)=(0.000/0.000): 0 [lb]


3 Tension load

	Load N_{ua} [lb]	Capacity ϕN_n [lb]	Utilization $\beta_N = N_{ua} / \phi N_n$	Status
Steel Strength*	1738	9831	18	OK
Pullout Strength*	1738	6356	28	OK
Concrete Breakout Strength** ¹	N/A	N/A	N/A	N/A
Concrete Side-Face Blowout, direction x+**	3475	11791	30	OK

* anchor having the highest loading **anchor group (anchors in tension)

¹ Tension Anchor Reinforcement has been selected!

3.1 Steel Strength

$$N_{sa} = n A_{se,N} f_{uta} \quad \text{ACI 318-08 Eq. (D-3)}$$

$$\phi N_{steel} \geq N_{ua} \quad \text{ACI 318-08 Eq. (D-1)}$$

Variables

n	$A_{se,N}$ [in. ²]	f_{uta} [psi]
1	0.23	58000

Calculations

$$N_{sa} \text{ [lb]}$$

$$13108$$

Results

N_{sa} [lb]	ϕ_{steel}	ϕN_{sa} [lb]	N_{ua} [lb]
13108	0.750	9831	1738

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3.2 Pullout Strength

$$N_{pN} = \psi_{c,p} N_p \quad \text{ACI 318-08 Eq. (D-14)}$$

$$N_p = 8 A_{brg} f'_c \quad \text{ACI 318-08 Eq. (D-15)}$$

$$\phi N_{pN} \geq N_{ua} \quad \text{ACI 318-08 Eq. (D-1)}$$

Variables

$\psi_{c,p}$	A_{brg} [in. ²]	f'_c [psi]
1.000	0.45	2500

Calculations

N_p [lb]
9080

Results

N_{pN} [lb]	$\phi_{concrete}$	ϕN_{pN} [lb]	N_{ua} [lb]
9080	0.700	6356	1738

3.3 Concrete Side-Face Blowout, direction x+

$$N_{sb} = 160 c_{a1} \sqrt{A_{brg}} \lambda \sqrt{f'_c} \quad \text{ACI 318-08 Eq. (D-17)}$$

$$N_{sbg} = \alpha_{group} N_{sb} \quad \text{ACI 318-08 Eq. (D-18)}$$

$$\phi N_{sbg} \geq N_{ua} \quad \text{ACI 318-08 Eq. (D-1)}$$

$$\alpha_{group} = \left(1 + \frac{s}{6 c_{a1}} \right) \quad \text{see ACI 318-08, Part D.5.4.2 Eq. (D-18)}$$

Variables

c_{a1} [in.]	c_{a2} [in.]	A_{brg} [in. ²]	λ	f'_c [psi]	s [in.]
2.000	-	0.45	1.000	2500	5.500

Calculations

α_{group}	N_{sb} [lb]
1.458	10781

Results

N_{sbg} [lb]	$\phi_{concrete}$	ϕN_{sbg} [lb]	$N_{ua,edge}$ [lb]
15722	0.750	11791	3475

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4 Shear load

	Load V_{ua} [lb]	Capacity ϕV_n [lb]	Utilization $\beta_V = V_{ua}/\phi V_n$	Status
Steel Strength*	N/A	N/A	N/A	N/A
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength*	N/A	N/A	N/A	N/A
Concrete edge failure in direction ** ¹	N/A	N/A	N/A	N/A

* anchor having the highest loading **anchor group (relevant anchors)

¹ Shear Anchor Reinforcement has been selected!

5 Warnings

- Load re-distributions on the anchors due to elastic deformations of the anchor plate are not considered. The anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the loading! Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies when supplementary reinforcement is used. The Φ factor is increased for non-steel Design Strengths except Pullout Strength and Pryout strength. Condition B applies when supplementary reinforcement is not used and for Pullout Strength and Pryout Strength. Refer to your local standard.
- Checking the transfer of loads into the base material and the shear resistance are required in accordance with ACI 318 or the relevant standard!
- The design of Anchor Reinforcement is beyond the scope of PROFIS Anchor. Refer to ACI 318-08, Part D.5.2.9 for information about Anchor Reinforcement.
- The design of Anchor Reinforcement is beyond the scope of PROFIS Anchor. Refer to ACI 318-08, Part D.6.2.9 for information about Anchor Reinforcement.
- Anchor Reinforcement has been selected as a design option, calculations should be compared with PROFIS Anchor calculations.

Fastening meets the design criteria!

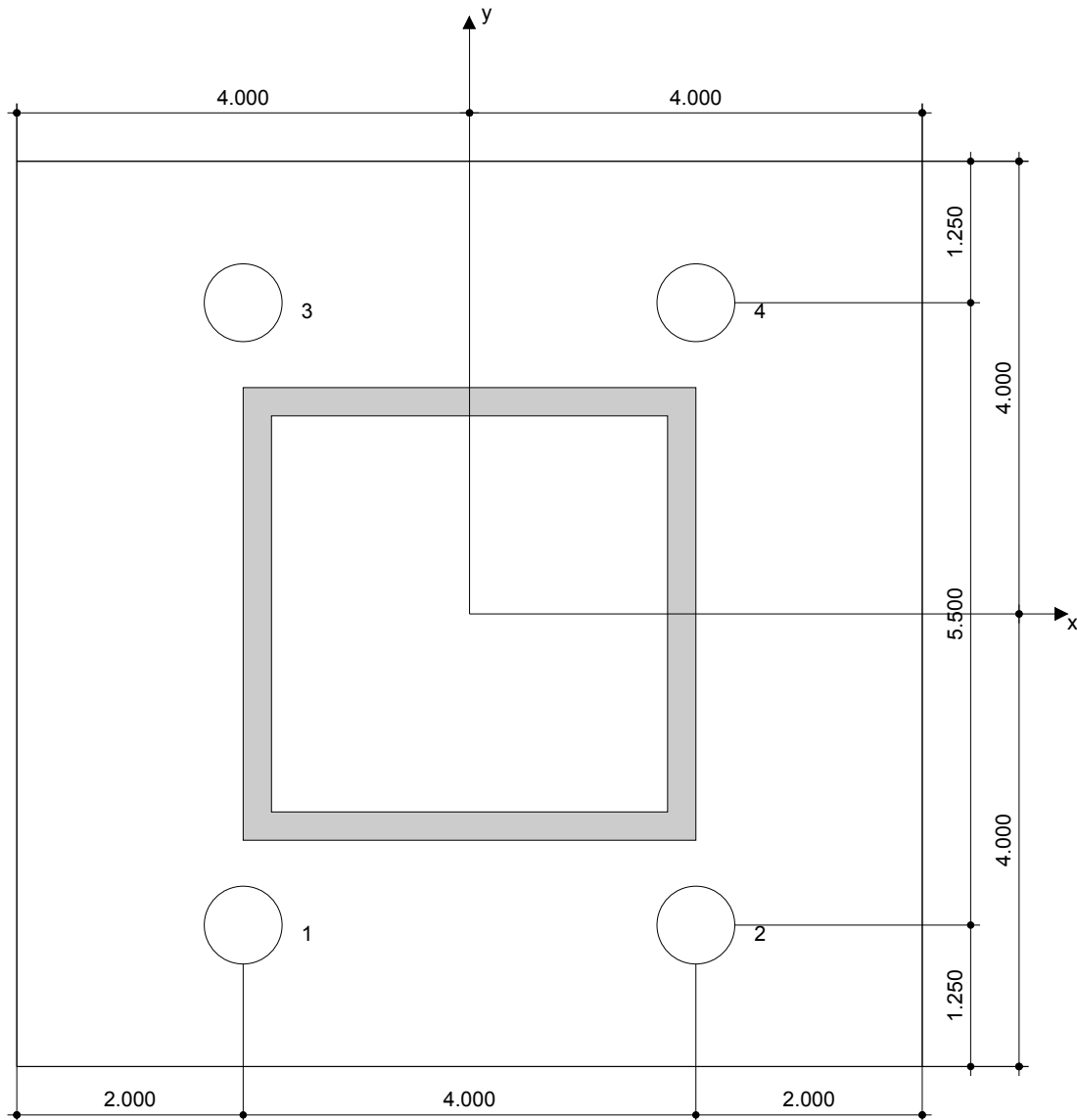
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6 Installation data

Anchor plate, steel: -
 Profile: Square HSS (AISC); 4.000 x 4.000 x 0.250 in.
 Hole diameter in the fixture: $d_f = 0.688$ in.
 Plate thickness (input): 0.500 in.
 Recommended plate thickness: not calculated
 Cleaning: No cleaning of the drilled hole is required

Anchor type and diameter: Hex Head ASTM F 1554 GR. 36 5/8
 Installation torque: -0.009 in.lb
 Hole diameter in the base material: - in.
 Hole depth in the base material: 7.000 in.
 Minimum thickness of the base material: 8.922 in.



Coordinates Anchor in.

Anchor	x	y	C _{-x}	C _{+x}	C _{-y}	C _{+y}
1	-2.000	-2.750	2.000	6.000	-	-
2	2.000	-2.750	6.000	2.000	-	-
3	-2.000	2.750	2.000	6.000	-	-
4	2.000	2.750	6.000	2.000	-	-

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7 Remarks; Your Cooperation Duties

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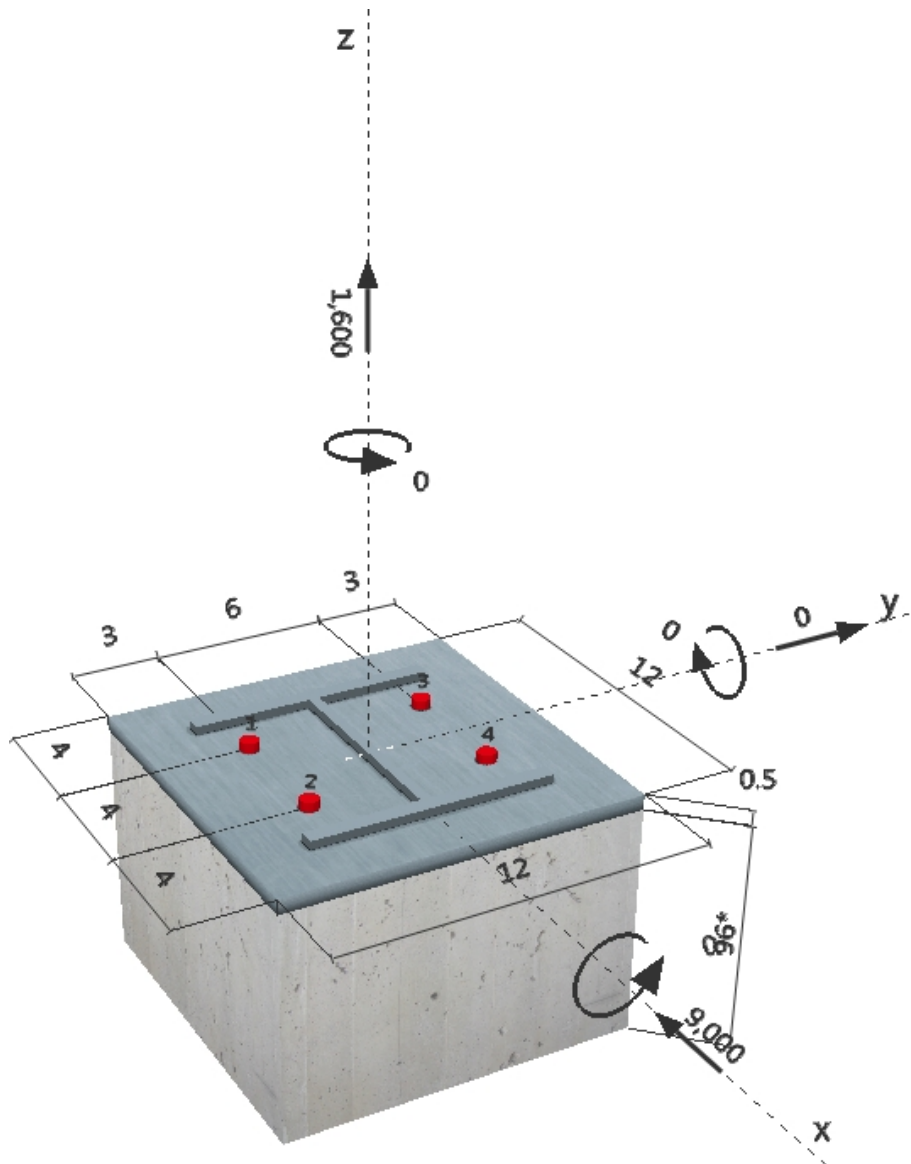
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 FALCONE
 MOMENT FRAME
 5/14/2015

Specifier's comments: ANCHOR BOLT CALCS

1 Input data

Anchor type and diameter:	Hex Head ASTM F 1554 GR. 105 5/8	
Effective embedment depth:	$h_{ef} = 12.000$ in.	
Material:	ASTM F 1554	
Proof:	Design method ACI 318-08 / CIP	
Stand-off installation:	$e_b = 0.000$ in. (no stand-off); $t = 0.500$ in.	
Anchor plate:	$l_x \times l_y \times t = 12.000$ in. \times 12.000 in. \times 0.500 in.; (Recommended plate thickness: not calculated)	
Profile:	W shape (AISC); (L \times W \times T \times FT) = 8.250 in. \times 8.070 in. \times 0.360 in. \times 0.560 in.	
Base material:	cracked concrete, 2500, $f'_c = 2500$ psi; $h = 96.000$ in.	
Reinforcement:	tension: condition A, shear: condition A; anchor reinforcement: shear edge reinforcement: none or $<$ No. 4 bar	
Seismic loads (cat. C, D, E, or F)	no	

Geometry [in.] & Loading [lb, in.lb]



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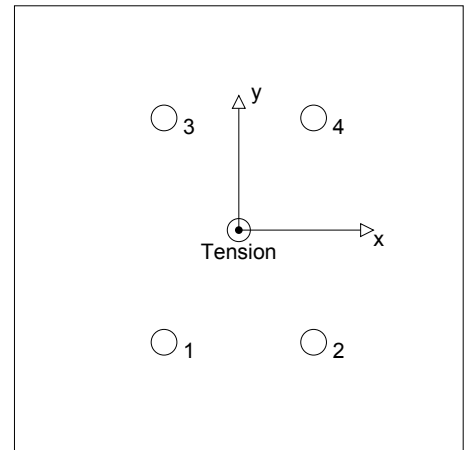
2 Load case/Resulting anchor forces

Load case: Design loads

Anchor reactions [lb]

Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	400	2250	-2250	0
2	400	2250	-2250	0
3	400	2250	-2250	0
4	400	2250	-2250	0

 max. concrete compressive strain: - [%]
 max. concrete compressive stress: - [psi]
 resulting tension force in (x/y)=(0.000/0.000): 1600 [lb]
 resulting compression force in (x/y)=(0.000/0.000): 0 [lb]


3 Tension load

	Load N_{ua} [lb]	Capacity ϕN_n [lb]	Utilization $\beta_N = N_{ua} / \phi N_n$	Status
Steel Strength*	400	21187	2	OK
Pullout Strength*	400	6356	7	OK
Concrete Breakout Strength**	1600	8157	20	OK
Concrete Side-Face Blowout, direction y-**	800	14823	6	OK

* anchor having the highest loading **anchor group (anchors in tension)

3.1 Steel Strength

$$N_{sa} = n A_{se,N} f_{uta} \quad \text{ACI 318-08 Eq. (D-3)}$$

$$\phi N_{steel} \geq N_{ua} \quad \text{ACI 318-08 Eq. (D-1)}$$

Variables

n	$A_{se,N}$ [in. ²]	f_{uta} [psi]
1	0.23	125001

Calculations

$$\frac{N_{sa} \text{ [lb]}}{28250}$$

Results

N_{sa} [lb]	ϕ_{steel}	ϕN_{sa} [lb]	N_{ua} [lb]
28250	0.750	21187	400

3.2 Pullout Strength

$$N_{pN} = \psi_{c,p} N_p \quad \text{ACI 318-08 Eq. (D-14)}$$

$$N_p = 8 A_{brg} f_c \quad \text{ACI 318-08 Eq. (D-15)}$$

$$\phi N_{pN} \geq N_{ua} \quad \text{ACI 318-08 Eq. (D-1)}$$

Variables

$\psi_{c,p}$	A_{brg} [in. ²]	f_c [psi]
1.000	0.45	2500

Calculations

$$\frac{N_p \text{ [lb]}}{9080}$$

Results

N_{pN} [lb]	$\phi_{concrete}$	ϕN_{pN} [lb]	N_{ua} [lb]
9080	0.700	6356	400

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3.3 Concrete Breakout Strength

$$N_{cbg} = \left(\frac{A_{Nc}}{A_{Nc0}} \right) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b \quad \text{ACI 318-08 Eq. (D-5)}$$

$$\phi N_{cbg} \geq N_{ua} \quad \text{ACI 318-08 Eq. (D-1)}$$

 A_{Nc} see ACI 318-08, Part D.5.2.1, Fig. RD.5.2.1(b)

$$A_{Nc0} = 9 h_{ef}^2 \quad \text{ACI 318-08 Eq. (D-6)}$$

$$\Psi_{ec,N} = \left(\frac{1}{1 + \frac{2 e_N}{3 h_{ef}}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-9)}$$

$$\Psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-11)}$$

$$\Psi_{cp,N} = \text{MAX} \left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-13)}$$

$$N_b = k_c \lambda \sqrt{f'_c} h_{ef}^{1.5} \quad \text{ACI 318-08 Eq. (D-7)}$$

Variables

h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]	$\Psi_{c,N}$
2.667	0.000	0.000	3.000	1.000
c_{ac} [in.]	k_c	λ	f'_c [psi]	
0.000	24	1	2500	

Calculations

A_{Nc} [in. ²]	A_{Nc0} [in. ²]	$\Psi_{ec1,N}$	$\Psi_{ec2,N}$	$\Psi_{ed,N}$	$\Psi_{cp,N}$	N_b [lb]
144.00	64.00	1.000	1.000	0.925	1.000	5226

Results

N_{cbg} [lb]	$\phi_{concrete}$	ϕN_{cbg} [lb]	N_{ua} [lb]
10876	0.750	8157	1600

3.4 Concrete Side-Face Blowout, direction y-

$$N_{sb} = 160 c_{a1} \sqrt{A_{brg}} \lambda \sqrt{f'_c} \quad \text{ACI 318-08 Eq. (D-17)}$$

$$N_{sbg} = \alpha_{group} N_{sb} \quad \text{ACI 318-08 Eq. (D-18)}$$

$$\phi N_{sbg} \geq N_{ua} \quad \text{ACI 318-08 Eq. (D-1)}$$

$$\alpha_{group} = \left(1 + \frac{s}{6 c_{a1}} \right) \quad \text{see ACI 318-08, Part D.5.4.2 Eq. (D-18)}$$

Variables

c_{a1} [in.]	c_{a2} [in.]	A_{brg} [in. ²]	λ	f'_c [psi]	s [in.]
3.000	4.000	0.45	1.000	2500	4.000

Calculations

α_{group}	N_{sb} [lb]
1.222	16171

Results

N_{sbg} [lb]	$\phi_{concrete}$	ϕN_{sbg} [lb]	$N_{ua,edge}$ [lb]
19765	0.750	14823	800

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4 Shear load

	Load V_{ua} [lb]	Capacity ϕV_n [lb]	Utilization $\beta_v = V_{ua}/\phi V_n$	Status
Steel Strength*	2250	11017	21	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength**	9000	15226	60	OK
Concrete edge failure in direction **1	N/A	N/A	N/A	N/A

* anchor having the highest loading **anchor group (relevant anchors)

1 Shear Anchor Reinforcement has been selected!

4.1 Steel Strength

$$V_{sa} = n \cdot 0.6 \cdot A_{se,v} \cdot f_{uta} \quad \text{ACI 318-08 Eq. (D-20)}$$

$$\phi V_{steel} \geq V_{ua} \quad \text{ACI 318-08 Eq. (D-2)}$$

Variables

n	$A_{se,v}$ [in. ²]	f_{uta} [psi]
1	0.23	125001

Calculations

$$\frac{V_{sa} \text{ [lb]}}{16950}$$

Results

V_{sa} [lb]	ϕ_{steel}	ϕV_{sa} [lb]	V_{ua} [lb]
16950	0.650	11017	2250

4.2 Pryout Strength

$$V_{cpg} = k_{cp} \left[\left(\frac{A_{Nc}}{A_{Nc0}} \right) \psi_{ec,N} \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b \right] \quad \text{ACI 318-08 Eq. (D-31)}$$

$$\phi V_{cpg} \geq V_{ua} \quad \text{ACI 318-08 Eq. (D-2)}$$

 A_{Nc} see ACI 318-08, Part D.5.2.1, Fig. RD.5.2.1(b)

$$A_{Nc0} = 9 h_{ef}^2 \quad \text{ACI 318-08 Eq. (D-6)}$$

$$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2 e_N}{3 h_{ef}}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-9)}$$

$$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-11)}$$

$$\psi_{cp,N} = \text{MAX} \left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}} \right) \leq 1.0 \quad \text{ACI 318-08 Eq. (D-13)}$$

$$N_b = k_c \lambda \sqrt{f_c} h_{ef}^{1.5} \quad \text{ACI 318-08 Eq. (D-7)}$$

Variables

k_{cp}	h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]
2	2.667	0.000	0.000	3.000

$\psi_{c,N}$	c_{ac} [in.]	k_c	λ	f_c [psi]
1.000	-	24	1	2500

Calculations

A_{Nc} [in. ²]	A_{Nc0} [in. ²]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
144.00	64.00	1.000	1.000	0.925	1.000	5226

Results

V_{cpg} [lb]	$\phi_{concrete}$	ϕV_{cpg} [lb]	V_{ua} [lb]
21751	0.700	15226	9000

5 Combined tension and shear loads

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.196	0.591	5/3	49	OK

$$\beta_{NV} = \beta_N + \beta_V \leq 1$$

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6 Warnings

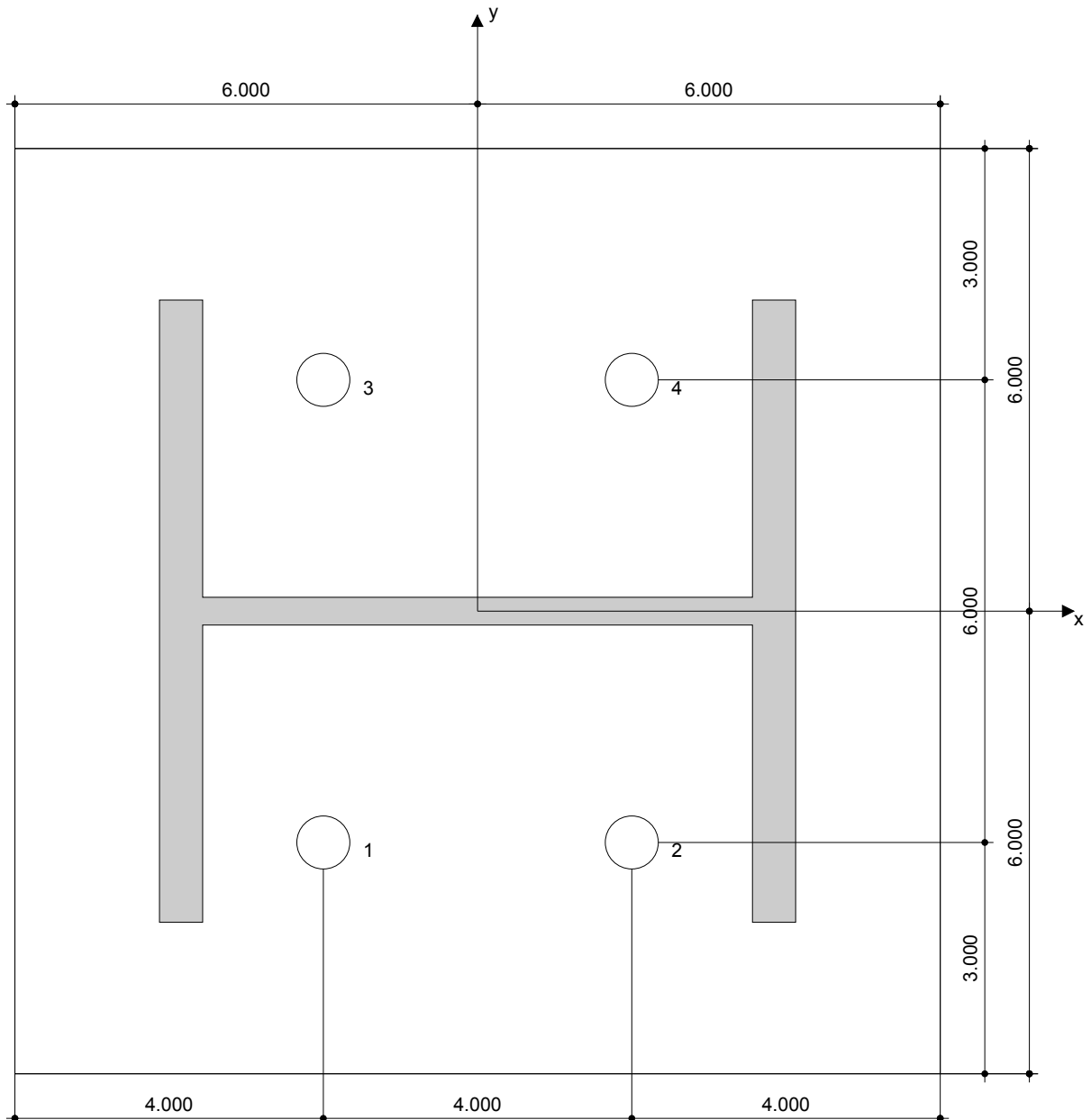
- Load re-distributions on the anchors due to elastic deformations of the anchor plate are not considered. The anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the loading! Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies when supplementary reinforcement is used. The Φ factor is increased for non-steel Design Strengths except Pullout Strength and Pryout strength. Condition B applies when supplementary reinforcement is not used and for Pullout Strength and Pryout Strength. Refer to your local standard.
- Checking the transfer of loads into the base material and the shear resistance are required in accordance with ACI 318 or the relevant standard!
- The design of Anchor Reinforcement is beyond the scope of PROFIS Anchor. Refer to ACI 318-08, Part D.6.2.9 for information about Anchor Reinforcement.
- Anchor Reinforcement has been selected as a design option, calculations should be compared with PROFIS Anchor calculations.

Fastening meets the design criteria!

7 Installation data

Anchor plate, steel: -
 Profile: W shape (AISC); 8.250 x 8.070 x 0.360 x 0.560 in.
 Hole diameter in the fixture: $d_f = 0.688$ in.
 Plate thickness (input): 0.500 in.
 Recommended plate thickness: not calculated
 Cleaning: No cleaning of the drilled hole is required

Anchor type and diameter: Hex Head ASTM F 1554 GR. 105 5/8
 Installation torque: -0.009 in.lb
 Hole diameter in the base material: - in.
 Hole depth in the base material: 12.000 in.
 Minimum thickness of the base material: 13.922 in.



Coordinates Anchor in.

Anchor	x	y	C-x	C+x	C-y	C+y
1	-2.000	-3.000	4.000	8.000	3.000	9.000
2	2.000	-3.000	8.000	4.000	3.000	9.000
3	-2.000	3.000	4.000	8.000	9.000	3.000
4	2.000	3.000	8.000	4.000	9.000	3.000

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8 Remarks; Your Cooperation Duties

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