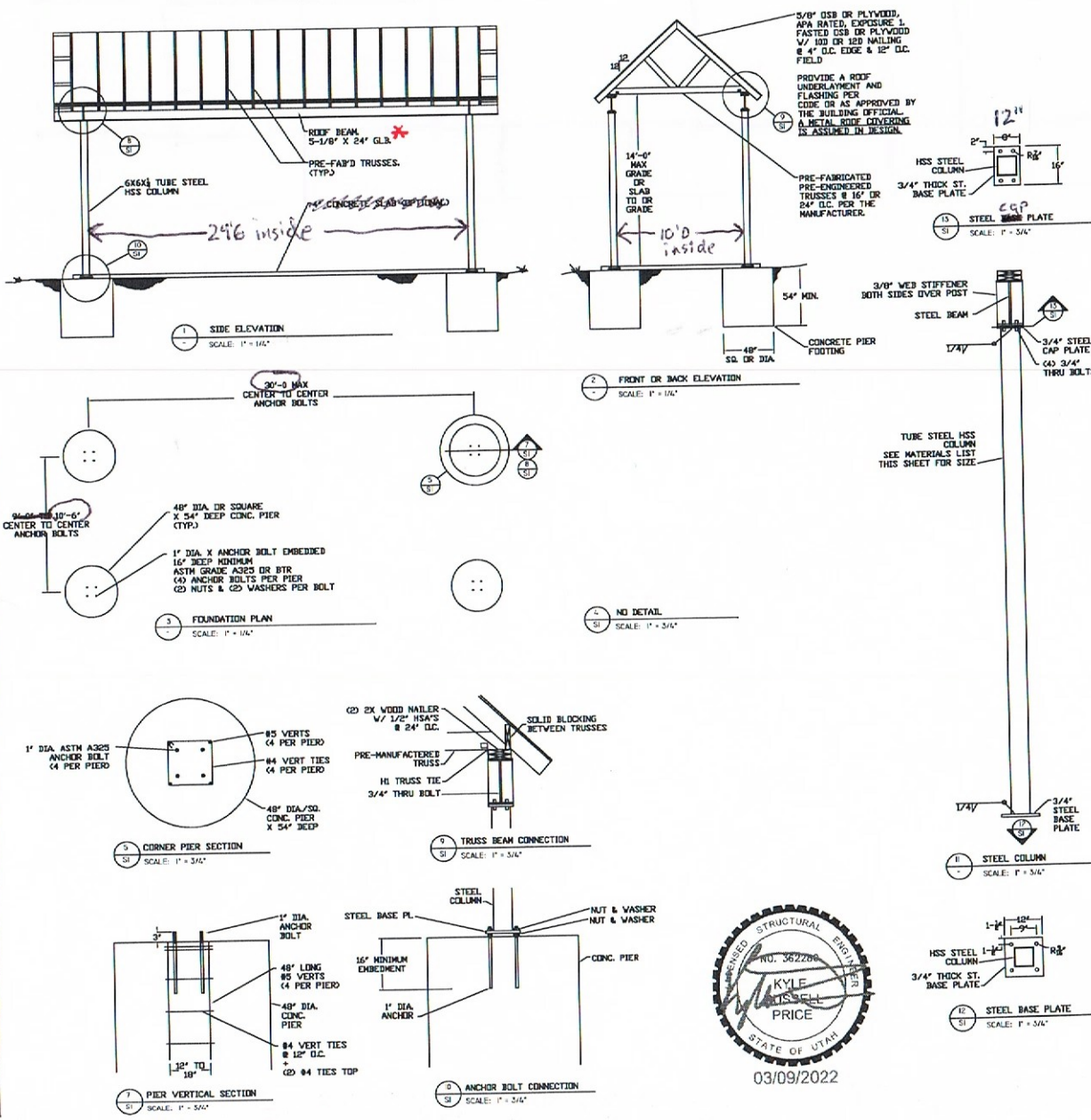


Randy Hunter, Sourdough Ranch, Segundo 5  
 801-735-7888



**FRAMING AND STEEL SPECIFICATIONS**

1. STEEL:  
 TUBE STEEL COLUMN WITH 3/4" BASE PLATE & CAP PLATE (SEE DETAIL). COLUMN SIZE:  
 6" X 6" X (16' OR 24') HSS TUBE STEEL UP TO 14'-0" HEIGHT TO ROOF TRUSS  
 COLUMN STEEL IS ASTM A441 OR BETTER. ALL OTHER STEEL ASTM GRADE A36 OR BETTER. ALL WELDING PROVIDE 70 KSI ELECTRODES.

2. REINFORCING STEEL, GRADE 60:  
 #5 LENGTHS (2) CONTINUOUS IN GRADE BEAMS W/ 24" MIN. OVERLAP. (4) #5 48" LONG VERTICALS W/ #4 TIES @ 12" O.C. (2) TIES TOP.

3. CONCRETE:  
 3000 PSI (MIN.) STRENGTH @ 28 DAYS. 4" SLUMP MAX.

4. STEEL BEAM, WOOD PRODUCTS & ROOF:  
 PRE-MANUFACTURED PRE-ENGINEERED TRUSSES W/ 12/12 PITCH. 2x6" X 2x12" PLYWOOD OR OSB ROOF PANELS, APA RATED (STAMPED), EXPOSURE 1, IMPERMEABLE CODE APPROVED ROOF COVERING & APPLICABLE FASCIA. SUPPLIER UNSTRUCTURED CODE APPROVED R10-D ROOF SURFACE.  
 TRUSS BEAM OPTIONS (SEE NOTE BELOW):  
 BEAM: MAX. SPAN, COLUMN TO COLUMN CENTER  
 W 14x45 OR W16x50 STEEL WIDE FLANGE 30 FT. + 2 FT. OVERHANG **34" total length**

NOTE:  
 BEAM SPEC ASTM A992. PROVIDE DOUBLE 2X TOP WOOD NAILER. SECTION WOULD NAILED TO BEAM WITH 12" DIAMETER & 5' LONG HEADED STUD ANCHORS W/ SHIR TO TOP OF W/ BEAM FLANGE. STUD ANCHOR SPACING: 24" ON CENTER.

5. HARDWARE:  
 1" DIA. ANCHOR BOLT, ASTM A325 GRADE OR BETTER W/ (2) NUTS & (2) WASHERS PER BOLT (4 BOLTS PER PIER). TRUSS HURRICANE FRAMING TIE, CIPPOSON BRAND 18", (2) PER TRUSS. 3/4" DIA. THRU BOLTS, CAP PLATE TO BEAM, ASTM A325 OR BETTER.  
 TEMPLATE FOR SETTING ANCHOR BOLTS IN CONCRETE (1 PER PIER). 304" TO 1/2" DIA. UNIFORM CRUSHED GRAVEL FOR FILL IF NEEDED. EXTERIOR PAINT FOR STEEL COLUMNS AND ANCHOR BOLTS AS NEEDED.

**CONSTRUCTION NOTES & DESIGN CRITERIA**

EXCAVATION:  
 PLACE ALL CONCRETE PIERS AND GRADE BEAMS ON UNIFORM CRUSHED GRAVEL FILL OR INDICATED EARTH STRIPPED FREE OF VEGETATION AND TOP SOILS. THE BOTTOM OF PIERS SHALL BE 40" MIN. BELOW FINISHED GRADE MEASURED IN ANY DIRECTION.

GENERAL DESIGN CRITERIA:  
 DESIGN CODE: 2018 IBC  
 SEISMIC LOAD: DESIGN SPECTRAL RESPONSE: 65% CATEGORY D SITE CLASS D (ASSUMED)  
 WIND LOAD: EXPOSURE C WIND SPEED 85 MPH (3 SEC 6147) ALLOWABLE DRIFT 1.0 IN.  
 SNOW LOAD: GROUND 207 PSF (7800 FT. ELEV) ROOF P/ 216 PSF ROOF P/ 108 PSF  
 DEAD LOADS: ROOF 8 PSF COLUMNS & BEAMS 15 PLF  
 SOILS: NO SOILS REPORT PROVIDED 1500 PSF ALLOWABLE BEARING (ASSUMED)



**PRICE ENGINEERING INC.**  
 KYLE (801) 701-6274  
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 KYLE@PRICE-ENGINEERING.COM  
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Date / Revision  
 Scale AS NOTED

RANDY HUNTER  
 801-735-7888

PROJECT: SOURDOUGH HUNTER SEGUNDO #5  
 801 LOT 5, SOURDOUGH WILDERNESS RANCH  
 WEBER COUNTY, UTAH

**S1**  
 SHEET 1 OF 1

# STRUCTURAL CALCULATIONS

for

*Sourdough Hunter Segundo 5  
Post Frame Canopy  
Sourdough Wilderness Ranch, Segundo Lot 5  
Weber County, Utah*

for

*Randy Hunter  
801-735-7888*

Date: 5/14/2021



Kyle: 801-791-6274 (Text or Call)  
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Travis: 435-720-2907 (Text or Call)  
[travis@price-engineering.com](mailto:travis@price-engineering.com)

3677 N. Hwy 126, Suite 4B  
Farr West, UT 84404



05/14/2021

Project: Southdough Hunter-Segundo 5  
Analysis: K. Price  
Date: 05/14/21



### DESIGN CRITERIA

Structure Type: Light Wood Framed, Concrete Footing

Design Codes: 2018 IBC, Risk Category I

City, County or Area: Huntsville

Live Loads: 20 psf for Roof  
N/A psf for Framed Storage / Floors

Snow Loads: Pg: 257 Ce: 1.0 Cc: 1.2 I: 1.0  
Cs: 0.50  
 $P_s \Rightarrow (P_g * C_s * C_e * C_t * I * 0.7)$   
 $P_s^* = 107.94 \text{ psf}$

Wind Loads: Exposure: C Risk 1.0  
Design Speed: 115 mph (3 Second Gust)

Seismic Loads: Sms: 0.98 SDC: D Site Class: D  
Sm1: 0.58 R: 1.5 (Cant'd Posts) I: 1.00  
Sds: 0.65 R: 2.5 (Shear Walls, N/A)

Dead Loads: 8 psf for Roof Structure (Rafters, Corr Metal Panels)  
3 psf for Walls (2x Girts, Corr Metal Panels)  
0 psf for Framed Floors (as applicable)

Project: Sourdough Hunter Segundo 5  
Analysis: K. Price  
Date: 05/14/21



Deflection Criteria:

	Total Load	Live Load	
L/	120	120	for: Roof Structure
L/	120	120	for: Floor Structure (Minimum)
Exterior Walls Considered Flexible			

**SOIL DESIGN PROPERTIES**

\*Geotechnical Study  
Of Investigation by: N/A

Date of Report: N/A

Proj No. of Report: N/A

Foundation Type: Concrete Pier Footing

\*Bearing Pressure (Qa): 1500 psf

\*\*Allow. Lateral Pressure: 533 psf/sf

\*Coeff. of Friction: 0.35 alone

\*Design Values are assumed if no Geotechnical Study or Investigation is provided or does not provide values.  
\*Price Engineering assumes stable soil characteristics.  
\*All design is based on stable soil characteristics meeting the unified soil classification types GW, GP, SW, SP  
\*Soils found on site while excavation occurs which differ from those stated above should be brought to the attention of Price Engineering before and foundation or footing systems are installed.  
\*\*Soils assumed to be GW or GP, with a 33% increase for short term lateral loads and multiplied by 2 per IBC 1806.3.4.



Project: Sourdough Hunter Sogundo S  
Analysis: K. Price  
Date: 05/14/21



## MATERIAL SPECIFICATIONS

**Reinforcing Steel:** ASTM A615, Grade 60, ASTM A706, Grade 60 Weldable Rebar  
**Structural Steel:** ASTM A500 Gr B (HSS), ASTM A36 (Plate)  
**Welded Wire Fabric:** ASTM A185  
**Anchor Bolts:** ASTM A325 or better, Zinc Coated  
**Wood Bolts:** ASTM A307 or better, Zinc Coated

**Concrete Strengths:** (*F<sub>c</sub> Design @ 28 Days*) (*F<sub>c</sub> Recommended @ 28 Days*)

Footings:	2500	psi	3000	psi
Walls:	2500	psi	3000	psi
Piers:	2500	psi	3500	psi
Slabs on Grade:	3500	psi	3500	psi

## Concrete Masonry:

Units: ASTM C90 Medium Weight, Grade N-1

Mortar: Type "S" conforming to IBC Table 2103.7

Grout: Compress. Strength @ 28 days: 1800 psi

## Sawn Lumber:

Use Stamped Grade, Spec, or Value (Minimum)

Wall Studs: Stud

Posts: Grade #1

Joists & Rafter's & Purlins: Grade #2

Other: Grade #2

Preservative Treated: For Concrete Contact, 0.2 Spec, Ground Contact, 0.4 Spec (See Lumber tag)

## Engineered and Manufactured Lumber Products:

Product Stamped Grade, Spec, or Value

Glulam Beam: 24F-V4, 24F-V8

LVL: 1.9E, Fb 2600

LSL: 1.3E, Fb 1900

PSL: 1.8E, Fb 2400

## Sheathing & Panels:

All Panels & Sheathing shall be APA Rated & Stamped

All Roof, Floor, and Wall Panels are OSB structural with Exposure 1 treated

## Structural Nails:

Hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze, or copper  
Common wire or other galvanized acceptable for preservative treated wood.

Project: Sourdough Hunter Segundo 5  
 Analysis: K. Price  
 Date: 05/14/21

**Diaphragm Description Main 12 X 34 Building Roof**

**Wind Loading Calculations**

Wind Speed 115 mph, 3 sec. gust  
 Exposure C  
 Risk 1.00  
 Kz 0.90  
 Topo Factor (Kzt) 1.00

Traverse Dimension (w)	12	ft
Long. dimension (L)	34	ft
Ridge Height	6.0	ft
Eave Height	0.0	ft
Roof Rise	12	ft
Roof Run	12	ft
Roof Slope	45.0	degrees

	Gable	Long.	Base Ea Wall
sum Ps=	1,243	305	
sum Ps=	1,243	152	Top Ea Wall
	Uplift	34	plf

Basic Load Combinations  
 (Engineer may compare w/ NDS factors)

Roof DL	8	psf
Col Trib (Spacing)	30	ft
Col Trib Roof	180	sq ft
Roof Snow	107.94	psf

	Axial	Moment
D+S	20869.2	0
D+0.6*W	1440	8701
D+(0.6*W).75W+.75S	16011.9	3915

Project: Sourdough Hunter Segundo S  
 Analysis: K. Price  
 Date: 05/14/21

**Wind Cantilever System**

No. Columns	4	ft (Eave Ht. - 1 ft.)
Col Ht	14.0	in
Col Depth	9.25	in
Col Width	9.25	in
Col Area	85.5625	sq
Col Fyb	1248	psi
Col'E	1040000	psi
Col F'c	782	psi

Mom Ea Col Trav 4205 lb\*<sup>2</sup>ft wind only  
 Mom Ea Col Long #REF! lb\*<sup>2</sup>ft wind only

Col Sxly Trav 132  
 Req'd Sxly Trav #VALUE!  
 Col Sxly Long 132  
 Req'd Sxly Long #REF!

Axial Load 20869.2 lbs, Ea Column  
 Moment 8701 lb\*<sup>2</sup>ft Ea Column

fb 792 psi  
 fc 244 psi  
 c 0.8  
 Fce 2592 psi  
 Cp 0.928  
 F'c 726 psi  
 ratio 0.813  
 check OK  
 (See Steel Column Calcs)

Allowable Lat. Load 533 psf  
 A 1.091  
 P 621 lbs  
 Provide 2.5 ft Wide Pier  
 Provide 4.7 ft Deep Pier  
 Provide 56.0 in. Deep Pier

Allowable Lat. Load 533 psf  
 A 0.682  
 P 621 lbs  
 Provide 4.0 ft Wide Pier  
 Provide 3.6 ft Deep Pier  
 Provide 43.0 in. Deep Pier

**Wind Shear Wall System**

Shear Walls  
 Width Total 0 ft  
 Length Total 0.0 ft  
 Allowable Shear 116 plf  
 Wind Factor 1.4

Width Allow Total 0 lbs  
 Length Allowable Total 0 lbs

Check Width NG  
 Check Length NG  
 (See Wind Cant. System if NG)

**Column Uplift**

Column Ht 14 ft  
 Shear Wall Width 30.0 ft  
 Design Shear 1243 lbs.

Total Uplift #DIV/0!  
 Pier Diameter 2.5 ft

Req'd Pier Depth #DIV/0! in.  
 Pier Diameter 4.0 ft

Req'd Pier Depth #DIV/0! in.

Assumed Allow. Bearing Press 1500 psf  
 Depth 3 ft  
 Soil Density 120 pcf  
 Allow. End Bearing @ Depth 1860 psf  
 Controlling Axial Load 20,869 lbs  
 Bolts Req'd 8.7 Bolts  
 Pier Dia Req'd 3.8 ft

Project: Sourdough Hunter Segundo 5  
 Analysis: K. Price  
 Date: 05/14/21

**Tables & Load Sumations**

105	Design Wind Pressures							
	A	B	C	D	E	F	G	H
15	22	-7.3	14.6	-4.1	-21	-13.7	-14.6	-10.5
20	24.2	-6.4	16.1	-3.5	-21	-14.6	-14.6	-11.1
25	21.9	3.5	15.9	3.6	-9.7	-13.3	-7.1	-10.7
30	19.7	13.4	15.6	10.8	7.6	-11.9	6.6	-10.3

115	Design Wind Pressures							
	A	B	C	D	E	F	G	H
15	26.3	-8.7	17.5	-5	-25.2	-16.5	-17.5	-12.6
20	29	-7.7	19.4	-4.2	-25.2	-17.5	-17.5	-13.3
25	26.3	4.2	19.1	4.3	-11.7	-15.9	-8.5	-12.8
30	23.6	16.1	18.8	12.9	9.1	-14.3	7.9	-12.3

150	Design Wind Pressures							
	A	B	C	D	E	F	G	H
15	44.8	-14.9	29.8	-8.5	-42.9	-28	-29.8	-21.4
20	49.4	-13	32.9	-7.2	-42.9	-29.8	-29.8	-22.6
25	44.8	7.2	32.4	7.4	-19.9	-27.1	-14.4	-21.8
30	40.1	27.4	31.9	22	15.4	-24.4	13.4	-20.9

105	19.70	13.40	15.60	10.80	7.60	-11.90	6.60	-10.30
115	23.60	16.10	18.80	12.90	9.10	-14.30	7.90	-12.30
150	40.10	27.40	31.90	22.00	15.40	-24.40	13.40	-20.90

Applic. Press. For 115 mph gust

Ps' =	23.60	16.10	18.80	12.90	9.10	-14.30	7.90	-12.30
	21.24	14.49	16.92	11.61	8.19	-12.87	7.11	-11.07

Calcd Zone Areas (sf)		A	B	C	D	E	F	G	H
Transverse	0	41	0	163	41	41	163	163	163
Longitudinal	0	-	36	-	41	41	163	163	163

Calcd Zone Loads (lbs)		A	B	C	D	E	F	G	H
Transverse	0	591	0	1895	334	-525	1160	-1807	-1807
Longitudinal	0	-	609	-	334	-525	1160	-1807	-1807



Project: Sourdough Hunter Segundo 5  
 Analysis: K. Price  
 Date: 05/14/21

### Earthquake Loading Calculations

$V = (SDS)(Fa)(W)(2/3)/R$  Seismic Base Shear  
 $SDS = (2/3)SMS$  Design Spectral Response Acceleration  
 $SMS = Fa(SS)$  Max Considered Spectral Response Acceleration  
 $SS = 0.975$  Short Period Spectral Acceleration  
 $S1 = 0.58$  1 Second Period Spectral Acceleration  
 $Fa = 1.00$  Site Coefficient for Short Period Acceleration  
 D Site Class (Assumed if no Soils Report)  
 D Seismic Design Category  
 No Soils Investigation Required?

#### Diaphragm Description: Main 12 X 34 Building Roof

Wall DL	3	psf
Floor DL	0	psf
Roof DL	8	psf
Roof SL	0	psf

(Applicable Portion)

#### Cantilever System

Traverse Dimension (W)	12	ft
Long. dimension (L)	34	ft
Eave Height	0.0	ft

$R = 1.5$  RMC  
 $V = 0.4333$  (W)  
 $E*0.7 = 0.303$  (W)

$V = 990$  lbs. @ base Total  
 $V = 990$  lbs. @ top Total

#### Shear Wall System

Traverse Dimension (W)	12	ft
Long. dimension (L)	34	ft
Eave Height	0.0	ft

$R = 2.5$  RMC  
 $V = 0.2600$  (W)  
 $E*0.7 = 0.182$  (W)

$V = 297$  lbs. @ base  
 $V = 297$  lbs. @ top

#### Basic Load Combinations

(Engineer may compare w/ NDS factors)

Ea.Col  
 Col Trib  ft  
 Col Trip Roof  sq ft  
 Roof Snow  psf

	Axial	Moment
D+S	20869.2	0
D+7E	540	3465
D+.75(.7E)+.75S	16011.9	2599

Project: Sourdough Hunter Segundo 5  
 Analysis: K. Price  
 Date: 05/14/21

**Seismic Cantilever System**

No. Columns	4	ft (Eave Ht. - 1 ft)
Col Ht	14.0	in
Col Depth	9.25	in
Col. Width	9.25	in
Col Area	85.5625	si
Col. F <sub>b</sub>	1248	psi
Col E	1040000	psi
Col F <sub>c</sub>	782	psi
Col Sx	132	

Mom Ea Col  lb\*ft  
 Axial Load  lbs, Ea Column

f <sub>b</sub>	315	psi
f <sub>c</sub>	6	psi
c	0.8	
F <sub>ce</sub>	2592	psi
C <sub>p</sub>	0.928	
F <sub>1c</sub>	726	psi

ratio  See Shear Wall  
 Check OK (See Steel Column Calcs)

Allowable Lat. Load  psf

A	<input type="text" value="0.435"/>	lbs
P	<input type="text" value="248"/>	ft Wide Pier
Provide	<input type="text" value="2.5"/>	ft Deep Pier
Provide	<input type="text" value="2.8"/>	in. Deep Pier

Allowable Lat. Load  psf

A	<input type="text" value="0.272"/>	lbs
P	<input type="text" value="248"/>	ft Wide Pier
Provide	<input type="text" value="4"/>	ft Deep Pier
Provide	<input type="text" value="2.2"/>	in. Deep Pier
Provide	<input type="text" value="26.1"/>	in. Deep Pier

**Seismic Shear Wall System**

Width Total	<input type="text" value="0"/>	ft
Length Total	<input type="text" value="0.0"/>	ft
Allowable Shear	<input type="text" value="116"/>	plf
(See Seismic Cantilever System if NG)		
Width Allow Total	<input type="text" value="0"/>	lbs
Length Allowable Total	<input type="text" value="0"/>	lbs

Check Width NG  
 Check Length NG

**Column Uplift**

Column Ht	<input type="text" value="14"/>	ft
Shear Wall Width	<input type="text" value="30.0"/>	ft
Design Shear	<input type="text" value="297"/>	lbs.

Total Uplift  lbs  
 Pier Diameter  ft

Requ'd Pier Depth  in.

Pier Diameter  ft

Requ'd Pier Depth  in.

## Steel Beam

File #: **KW-06009007**

Description : Soudough Canopy Beam

Licensee: Price Engineering

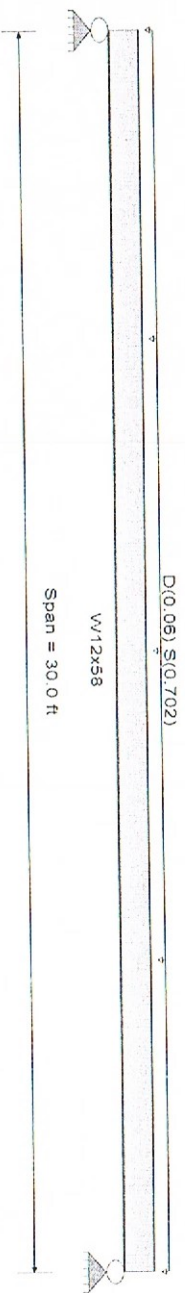
### CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16  
Load Combination Set : IBC 2015

### Material Properties

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

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



### Applied Loads

Beam self weight calculated and added to loading  
Uniform Load : D = 0.060, S = 0.7020 K/ft, Tributary Width = 1.0 ft, (Roof)

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

### DESIGN SUMMARY

Maximum Bending Stress Ratio =  
Section used for this span

Ma : Applied  
Mn / Omega : Allowable

Maximum Shear Stress Ratio =  
Section used for this span

W12x58  
92.250 K-ft  
215.569 K-ft

Va : Applied

Vn/Omega : Allowable

Load Combination  
Location of maximum on span  
Span # where maximum occurs

+D+S+H  
15.000 ft  
Span # 1

Load Combination  
Location of maximum on span  
Span # where maximum occurs

+D+S+H  
0.000 ft  
Span # 1

Maximum Deflection  
Max Downward Transient Deflection  
Max Upward Transient Deflection  
Max Downward Total Deflection  
Max Upward Total Deflection

0.933 in  
0.000 in  
1.090 in  
0.000 in  
Ratio =  
Ratio =  
Ratio =  
Ratio =

385 >= 240  
0 < 240  
330 >= 240  
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
+D+H		1	0.062	0.020		13.28		360.00	215.57	1.00	1.00	1.77	131.76	87.84
+D+L+H		1	0.062	0.020		13.28		360.00	215.57	1.00	1.00	1.77	131.76	87.84
-D+L+H		1	0.062	0.020		13.28		360.00	215.57	1.00	1.00	1.77	131.76	87.84
+D+S+H		1	0.428	0.140		92.25		360.00	215.57	1.00	1.00	12.30	131.76	87.84
+D+0.750L+0.750L+H		1	0.062	0.020		13.28		360.00	215.57	1.00	1.00	1.77	131.76	87.84
+D+0.750L+0.750S+H		1	0.336	0.110		72.51		360.00	215.57	1.00	1.00	9.67	131.76	87.84
+D+0.60W+H		1	0.062	0.020		13.28		360.00	215.57	1.00	1.00	1.77	131.76	87.84
+D+0.70E+H		1	0.062	0.020		13.28		360.00	215.57	1.00	1.00	1.77	131.76	87.84
+D+0.750L+0.750L+0.450W+H		1	0.062	0.020		13.28		360.00	215.57	1.00	1.00	1.77	131.76	87.84
+D+0.750L+0.750S+0.450W+H		1	0.336	0.110		72.51		360.00	215.57	1.00	1.00	9.67	131.76	87.84
+D+0.750L+0.750S+0.5250E+H		1	0.336	0.110		72.51		360.00	215.57	1.00	1.00	9.67	131.76	87.84
+0.60D+0.60W+0.60H		1	0.037	0.012		7.97		360.00	215.57	1.00	1.00	1.06	131.76	87.84





# PRICE

## ENGINEERING Inc.

STRUCTURAL • CIVIL

Project Title:  
Engineer:  
Project ID:  
Project Descr:

File = C:\Users\PRICE-1\ONEEDR-1\CURRENT-1\SOUGHD-1\SOUGHD-2\Steel Beam.ec5  
Software copyright ENERCALC, INC. 1983-2018. Build:10.18.12.13.

Printed: 14 MAY 2024, 11:10AM

Licensee: Price Engineering

### Steel Beam

License #: KW-06009007

Description: Soudough Canopy Beam

Load Combination      Segment Length      Span #      Max Stress Ratios      M      V      Mmax +      Mmax -      Ma Max      Mnx      Mnx/Omega      Cb      Rm      Va Max      Vnx      Vnx/Omega

+0.60D+0.70E+0.60H      1      0.037      0.012      7.97      7.97      360.00      215.57      1.00      1.00      1.06      131.76      87.84

Dsgn. L = 30.00 ft

### Overall Maximum Deflections

Load Combination	Span	Max "+" Defl	Location in Span	Load Combination	Max "-" Defl	Location in Span
+D+S+H	1	1.0899	15.086		0.0000	0.000

Support notation : Far left is #1      Values in KIPS

### Vertical Reactions

Load Combination	Support 1	Support 2
Overall Maximum	12.300	12.300
Overall Minimum	1.062	1.062
+D+H	1.770	1.770
+D+L+H	1.770	1.770
+D+L+H	1.770	1.770
+D+S+H	12.300	12.300
+D+0.750L+0.750L+H	1.770	1.770
+D+0.750L+0.750S+H	9.668	9.668
+D+0.60W+H	1.770	1.770
+D+0.70E+H	1.770	1.770
+D+0.750L+0.750L+0.450W+H	1.770	1.770
+D+0.750L+0.750S+0.450W+H	9.668	9.668
+D+0.750L+0.750S+0.5250E+H	9.668	9.668
+0.60D+0.60W+0.60H	1.062	1.062
+0.60D+0.70E+0.60H	1.062	1.062
D Only	1.770	1.770
L+ Only		
L Only	10.530	10.530
S Only		
W Only		
E Only		
H Only		





# PRICE

## ENGINEERING Inc.

STRUCTURAL • CIVIL

Project Title:  
Engineer:  
Project ID:  
Project Descr:

File = C:\Users\PRICE~1\DOCUMENT~1\ENRCOA-1\Seardough Canopy 30L 14H 4P.ees  
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### Steel Column

File #: KW-06009007  
Description: Steel Posts.

### Code References

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-10  
Load Combinations Used : IBC 2015

### General Information

Steel Section Name :	HSS6x6x1/4	Overall Column Height	14 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 :	Fully braced against buckling about X-X Axis
E : Elastic Bending Modulus	29,000.0 ksi	Y-Y (depth) axis :	Fully braced against buckling about Y-Y Axis

### Applied Loads

Column self weight included : 266.280 lbs \* Dead Load Factor  
AXIAL LOADS ...  
Roof: Axial Load at 14.0 ft, D = 1.496, S = 18.887 k  
BENDING LOADS ...  
Wind: Lat. Point Load at 14.0 ft creating Mx-x, W = 0.4705 k

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

### DESIGN SUMMARY

#### Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = 0.2178 : 1  
 Location of max. above base 0.0 ft  
 At maximum location values are ...  
 Pa : Axial 15.928 k  
 Pr / Omega : Allowable 112.958 k  
 Me-x : Applied -2.964 k-ft  
 Mn-x / Omega : Allowable 20.120 k-ft  
 Ma-y : Applied 0.0 k-ft  
 Mn-y / Omega : Allowable 20.120 k-ft  
 Maximum Load Reactions ...  
 Top along X-X 0.0 k  
 Bottom along X-X 0.0 k  
 Top along Y-Y 0.0 k  
 Bottom along Y-Y 0.4705 k  
 Maximum Load Deflections ...  
 Along Y-Y 0.8921 in at 14.0 ft above base  
 for load combination : W Only  
 Along X-X 0.0 in at 0.0 ft above base  
 for load combination :

PASS Maximum Shear Stress Ratio = 0.008335 : 1  
 Location of max. above base +D+0.60W+H  
 At maximum location values are ...  
 Va : Applied 0.2823 k  
 Vn / Omega : Allowable 31.951 k

### Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios					
	Stress Ratio	Status	Location	Cbx	Cby	KxLx/Rx KyLy/Ry	Stress Ratio	Status	Location
+D+H	0.016	PASS	0.00 ft	1.00	1.00	0.00	0.000	PASS	0.00 ft
+D+L+H	0.016	PASS	0.00 ft	1.00	1.00	0.00	0.000	PASS	0.00 ft
+D+L+H	0.016	PASS	0.00 ft	1.00	1.00	0.00	0.000	PASS	0.00 ft
+D+S+H	0.183	PASS	0.00 ft	1.00	1.00	0.00	0.000	PASS	0.00 ft
+D+0.750L+0.750L+H	0.016	PASS	0.00 ft	1.00	1.00	0.00	0.000	PASS	0.00 ft
+D+0.750L+0.750S+H	0.141	PASS	0.00 ft	1.00	1.00	0.00	0.009	PASS	0.00 ft
+D+0.60W+H	0.204	PASS	0.00 ft	1.00	1.00	0.00	0.000	PASS	0.00 ft
+D+0.70E+H	0.016	PASS	0.00 ft	1.00	1.00	0.00	0.007	PASS	0.00 ft
+D+0.750L+0.750L+0.450W+H	0.155	PASS	0.00 ft	1.00	1.00	0.00	0.007	PASS	0.00 ft
+D+0.750L+0.750S+0.450W+H	0.218	PASS	0.00 ft	1.00	1.00	0.00	0.000	PASS	0.00 ft
+D+0.750L+0.750S+0.5250E+H	0.141	PASS	0.00 ft	1.00	1.00	0.00	0.009	PASS	0.00 ft
+0.60D+0.60W+0.60H	0.201	PASS	0.00 ft	1.00	1.00	0.00	0.000	PASS	0.00 ft
+0.60D+0.70E+0.60H	0.009	PASS	0.00 ft	1.00	1.00	0.00	0.000	PASS	0.00 ft



**Steel Column**

Lic. #: KY-06009307

Licensee: Price Engineering

Description: Steel Posts

Note: Only non-zero reactions are listed.

**Maximum Reactions**

Load Combination	Axial Reaction @ Base		X-X Axis Reaction @ Base @ Top		k @ Base @ Top	Y-Y Axis Reaction @ Base @ Top		Mx - End Moments @ Base @ Top	k-ft @ Base @ Top	My - End Moments @ Base @ Top
	Value	Unit	Value	Unit		Value	Unit			
+D+H	1.762	in								
+D+L+H	1.762	in								
+D+Lr+H	1.762	in								
+D+S+H	20.649	in								
+D+0.750Lr+0.750L+H	1.762	in								
+D+0.750L+0.750S+H	15.928	in								
+D+0.60W+H	1.762	in				0.282			-3.952	
+D+0.70E+H	1.762	in				0.212			-2.964	
+D+0.750Lr+0.750L+0.450W+H	1.762	in				0.212			-2.964	
+D+0.750L-0.750S+0.450W+H	15.928	in								
+D+0.750L-0.750S+0.5250E+H	15.928	in				0.282			-3.952	
+D+0.60D+0.60W+0.60H	1.057	in								
+D+0.60D+0.70E+0.60H	1.057	in								
D Only	1.762	in								
Lr Only										
L Only										
S Only	18.887	in				0.471			-6.587	
W Only										
E Only										
H Only										

**Extreme Reactions**

Item	Axial @ Base	Extreme Value		Axial Reaction @ Base		X-X Axis Reaction @ Base @ Top		k @ Base @ Top	Y-Y Axis Reaction @ Base @ Top		Mx - End Moments @ Base @ Top		k-ft @ Base @ Top		My - End Moments @ Base @ Top	
		Maximum	Minimum	Value	Unit	Value	Unit		Value	Unit	Value	Unit	Value	Unit	Value	Unit
Axial @ Base	20.649															
Reaction, X-X Axis Base	1.762	Maximum														
"	1.762	Minimum														
Reaction, Y-Y Axis Base	1.762	Maximum							0.471					-6.587		
"	1.762	Minimum														
Reaction, X-X Axis Top	1.762	Maximum														
"	1.762	Minimum														
Reaction, Y-Y Axis Top	1.762	Maximum														
"	1.762	Minimum														
Moment, X-X Axis Base	1.762	Maximum							0.471					-6.587		
"	1.762	Minimum														
Moment, Y-Y Axis Base	1.762	Maximum														
"	1.762	Minimum														
Moment, X-X Axis Top	1.762	Maximum														
"	1.762	Minimum														
Moment, Y-Y Axis Top	1.762	Maximum														
"	1.762	Minimum														

**Maximum Deflections for Load Combinations**

Load Combination	Max. X-X Deflection		Distance	Max. Y-Y Deflection		Distance
	Value	Unit		Value	Unit	
+D+H	0.0000	in	0.000	ft	0.000	in
+D+L+H	0.0000	in	0.000	ft	0.000	in
+D+Lr+H	0.0000	in	0.000	ft	0.000	in
+D+S+H	0.0000	in	0.000	ft	0.000	in
+D+0.750Lr+0.750L+H	0.0000	in	0.000	ft	0.000	in
+D+0.750L+0.750S+H	0.0000	in	0.000	ft	0.000	in
+D+0.60W+H	0.0000	in	0.000	ft	0.535	in
+D+0.70E+H	0.0000	in	0.000	ft	0.000	in
+D+0.750Lr+0.750L+0.450W+H	0.0000	in	0.000	ft	0.401	in
+D+0.750L+0.750S+0.450W+H	0.0000	in	0.000	ft	0.401	in
+D+0.750L-0.750S+0.450W+H	0.0000	in	0.000	ft	0.000	in
+D+0.750L-0.750S+0.5250E+H	0.0000	in	0.000	ft	0.335	in
+D+0.60D+0.60W+0.60H	0.0000	in	0.000	ft	0.000	in
+D+0.60D+0.70E+0.60H	0.0000	in	0.000	ft	0.000	in
D Only	0.0000	in	0.000	ft	0.000	in





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**Steel Column**

Loc #: KW-06009007

Licensee: Price Engineering

Description: Steel Posts

**Maximum Deflections for Load Combinations**

Load Combination	Max. X-X Deflection		Max. Y-Y Deflection	
	Distance	ft	Distance	ft
L-Only	0.0000	in	0.000	ft
L Only	0.0000	in	0.000	ft
S Only	0.0000	in	0.000	ft
S Only	0.0000	in	0.000	ft
W Only	0.0000	in	0.892	ft
W Only	0.0000	in	14.000	ft
E Only	0.0000	in	0.000	ft
H Only	0.0000	in	0.000	ft

**Steel Section Properties :** HSS6x6x1/4

Depth	=	6.000 in	I <sub>xx</sub>	=	28.60 in <sup>4</sup>	J	=	45.600 in <sup>4</sup>
Design Thick	=	0.233 in	S <sub>xx</sub>	=	9.54 in <sup>3</sup>			
Width	=	6.000 in	R <sub>xx</sub>	=	2.340 in			
Wall Thick	=	0.250 in	Z <sub>x</sub>	=	11.200 in <sup>3</sup>			
Area	=	5.240 in <sup>2</sup>	I <sub>yy</sub>	=	28.600 in <sup>4</sup>	C	=	15.400 in <sup>3</sup>
Weight	=	19.020 plf	S <sub>yy</sub>	=	9.540 in <sup>3</sup>			
			R <sub>yy</sub>	=	2.340 in			
Ycg	=	0.000 in						

**Sketches**

