DEI
DIBBLE ENGINEERS INC

STRUCTURAL CALCULATIONS
HARRIS RESIDENCE REMODEL

1640 72nd Ave SE

Mercer Island, WA 98040

Prepared for Gelotte Hommas Drivdahl Architecture

Project # 23-183

11/28/2023

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DIBBLE ENGINEERS INC

STRUCTURAL CALCULATIONS
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Harris Residence Remodel & DEI Job #23-183

The structural scope of work includes remodeling the existing main floor family room, adding an upper floor addition above the family room, and adding an upper floor deck above the existing exterior patio.

The roof framing consists of pre-manufactured wood trusses, and the floor framing consists of a combination of wood I-joists and engineered lumber framing. The lateral force resisting system at the addition consists of wood-framed shear walls. The existing concrete foundation below the family room and patio will be retrofit with pipe piles.

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DESIGN CRITERIA & LOADS

Harris Residence Remodel & DEI Job #23-183

Dibble Engineers Inc
1029 Market Street, Suite 200
Kirkland, WA 98033
(425) 828-4200

JOB TITLE Harris Residence Remodel

JOB NO. 23-183 **SHEET NO.**
CALCULATED BY LAP **DATE**
CHECKED BY **DATE**

Roof Design Loads

Items	Description	Multiple	psf (max)	psf (min)
Roofing	5 ply composite, no gravel		2.5	2.0
Decking	1/2" plywood/OSB		1.8	1.5
Framing	Wood 2x @24"		2.5	1.5
Insulation	R-40 Fiberglass insul.		1.3	1.2
Ceiling	5/8" gypsum		2.8	2.5
Mech & Elec	Mech. & Elec.		2.0	0.0
Misc.	Misc.		0.5	0.0
			0.0	0.0
		Actual Dead Load	○ 13.4	○ 8.7
	25 PSF FLAT ROOF SNOW LOAD	Use this DL instead	◉ 15.0	◉ 9.0
		Live Load	19.5	0.0
		Snow Load	~~16.8~~	0.0
		Ultimate Wind (zone 2 - 100sf)	~~16.0~~	~~28.6~~
ASD Loading		D + Lr	~~34.5~~	—
		D + 0.75(0.6*W + Lr)	~~36.8~~	—
		0.6*D + 0.6*W	—	~~11.8~~
LRFD Loading		1.2D + 1.6 Lr + 0.5W	~~57.2~~	—
		1.2D + 1.0W + 0.5Lr	~~43.8~~	—
		0.9D + 1.0W	—	~~20.5~~

ASD & LRFD LOADING CALCULATED LATER (SPREADSHEET VALUES NOT USED)

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Floor Design Loads

Items	Description	Multiple	psf (max)	psf (min)
Flooring	Carpet & pad		1.0	1.0
Topping	Concrete lightwt per 1"	x 1.5	15.0	12.8
Decking	3/4" plywood/OSB		2.7	2.3
Framing	TJI @ 24"	x 1.5	3.0	1.5
	None	x 1.5	0.0	0.0
Ceiling	5/8" gypsum		2.8	2.5
Mech & Elec	Mech. & Elec.		2.0	0.0
Misc.	Misc.		0.5	0.0
	None		0.0	0.0
		Actual Dead Load	○ 27.0	○ 20.1
		Use this DL instead	◉ 30.0	◉ 25.0
		Partitions	0.0	0.0
		Live Load	40.0	0.0
		Total Live Load	40.0	0.0
		Total Load	70.0	25.0

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Deck Design Loads

Items	Description	Multiple	psf (max)	psf (min)
	None		0.0	0.0
Topping	Deck Pavers	x 1.5	15.0	12.8
Decking	3/4" plywood/OSB	x 1.5	4.1	3.5
Framing	TJI @ 24"	x 1.5	3.0	1.5
Framing	Wood 2x @24"	x 1.5	3.8	2.3
Ceiling	5/8" gypsum		2.8	2.5
Insulation	R-30 Fiberglass insul.		0.9	0.9
	None		0.0	0.0
Misc.	Misc.		0.5	0.0
		Actual Dead Load	○ 30.0	○ 23.4
		Use this DL instead	◉ 30.0	◉ 25.0
		Partitions	0.0	0.0
		Live Load	40.0	0.0
		Total Live Load	40.0	0.0
		Total Load	70.0	25.0

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Wall Design Load #1 (EXTERIOR STUCCO WALL)

Items	Description	Multiple	psf (max)	psf (min)
Sheathing	1/2" plywood/OSB		1.8	1.5
Sheathing	5/8" gypsum		2.8	2.5
Framing	2x6 wood stud @ 16"		2.0	1.1
veneer	7/8" Stucco		10.0	10.0
			0.0	0.0
Insulation	R-11 Fiberglass insul.		0.4	0.4
Mech & Elec	Mech. & Elec.		1.0	0.0
Misc.	Misc.		0.5	0.0
		Actual Dead Load	○ 18.5	○ 15.5
		Use this DL instead	◉ 20.0	◉ 16.0

Wall Design Load #2 (STONE CLAD EXT WALL)

Items	Description	Multiple	psf (max)	psf (min)
Sheathing	1/2" plywood/OSB		1.8	1.5
Sheathing	5/8" gypsum		2.8	2.5
Framing	2x6 wood stud @ 16"		2.0	1.1
veneer	Stone	x 0.20	11.0	10.0
			0.0	0.0
Insulation	R-11 Fiberglass insul.		0.4	0.4
Mech & Elec	Mech. & Elec.		1.0	0.0
Misc.	Misc.		0.5	0.0
		Actual Dead Load	○ 19.5	○ 15.5
		Use this DL instead	◉ 20.0	◉ 16.0

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PROJECT NAME: Harris Res. | SHEET #:
PROJECT #: 23-183 | DATE: 10/2023
SUBJECT: | BY: LAP

SEISMIC WEIGHT:

UPPER FLOOR EXT WALLS

27.3 ft² + 30.7 ft² = 58 ft²
7 ft² + (26.3 ft² + 13.6 ft²) = 46.9 ft²
43 ft² + 37.3 ft² = 80.3 ft²

$\sum$ = 185.2 ft² area of solid ext wall

total ext wall area = 9'-5 1/2" x (50'-8" - 8'-3") = 401.2 ft²

% solid wall = 0.462 @ 20 psf stucco wall wt
% windows = 0.538 @ 10 psf glass wt
* 1/2 to roof & 1/2 to upper floor

PARTIAL HT WALLS @ UPR FLR DECK:

A_{STONE} = (8.2 ft² + 13.6 ft²) x 2 sides = 43.6 ft² @ 30 psf stone veneer

A_{WALL} = (124.5 ft² - 43 ft²) = 81.5 ft² @ 20 psf stucco wall

MAIN FLOOR WALLS, ETC.

total ext wall area = 11'-4 1/2" (50'-8" - 8'-3") = 482.5 ft²

89.5 ft² + (2'-2 1/2")(11'-4 1/2") + 50.2 ft² + 44.8 ft² = 209.6 ft² solid wall area

% solid wall = 0.434 @ 20 psf stucco wall
% windows = 0.566 @ 10 psf glass wt

+ STONE WRAPPED CORNER + STONE PATIO WALL

A_{STONE} = (31-9 1/2" x 2 + 2'-1" x 2) x 11'-4 1/2" + 67.6 ft²
= 133.66 ft² + 67.6 ft² = 201.26 ft² (shared btwn upper floor & main floor) @ 30 psf

+ STUCCO PATIO WALL

A = 64.6 ft² @ 20 psf

+ GUARDRAIL

L_{rail} = 26'-7"
W_{rail} = 15 plf ± (assumed)

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PROJECT	Harris Residence Remodel	SHEET No.	
PROJECT No	23-183	DATE	11/27/2023
SUBJECT	ADDITION SEISMIC BASE SHEAR	BY	LAP

SEISMIC BASE SHEAR CALCULATION

References: 2018 IBC (Ch16), ASCE 7-16 (Ch.11,12,& 22),

Method ASD

Lateral System A. BEARING WALL SYSTEM

[Tab. 12.2-1] 15. Light-framed (wood) walls sheathed with wood structural panels rated for shear resistance

Risk Category II [IBC Tab. 1604.5]

Site Class D Default [ASCE Ch.20]

Design Category D [IBC Sec.1613.2.5;Tab 1613.2.5]

Building Height Limit (ft) 65 [Tab. 12.2-1]

**Using Metric? Check Table 12.8-2

*ATC Hazards (Default Site Class if no Geotech)	S_s*	1.379	[ASCE Tab. 12.8-2]	C_t**	0.02	**Cs Limits** [ASCE 7-16]		
	S_1*	0.481	[ASCE Tab. 12.8-2]	x**	0.75	S_{DS} / (R/I)=	0.170	[Eqn.12.8-2]
[IBC Tab 1613.2.3(1)]	F_a	1.2	[ASCE 12.8.2.1]	h_n	27.5	S_{D1} / [T*(R/I)] =MAX	0.374	[Eqn.12.8-3]
[IBC Tab. 1613.2.3(2)]	F_v	1.819	[ASCE Eqn. 12.8-7]	T_a	0.240	(S_{D1}*T_L) /[T^2 *(R/I)] =MAX	9.33	[Eqn.12.8-4]
[IBC Eqn. 16-36]	S_{MS}	1.6548	[ASCE Tab. 12.8-1]	C_u	1.4	0.044*S_{DS}*I ≥ 0.01 =MIN	0.049	[Eqn.12.8-5]
[IBC Eqn. 16-37]	S_{M1}	0.87494	[ASCE 12.8.2]	T_{MODAL}		(0.5*S_1) / (R/I) =MIN	0.037	[Eqn.12.8-6]
[IBC Eqn. 16-38]	S_{DS}	1.103	[ASCE 12.8.2]	T	0.240	Absolute Cs MIN	0.037	
[IBC Eqn. 16-39]	S_{D1}	0.583	[ASCE Fig. 22-14 to 17]	T_L	6	Absolute Cs MAX	9.33	

[ASCE Tab. 1.5-2]	I	1
[ASCE Tab. 12.2-1]	R	6.5
[ASCE Tab. 12.2-1]	Ω_0	3
[ASCE Tab. 12.2-1]	C_d	4
[ASCE Sec.12.3.4]	ρ	1

Cs (Design) =	0.170	
W =	147.42 K	
V =	17.51 K	ASD

Vertical Distribution of Forces ASCE 7-16, Sec. 12.8.3

Expontent related to structural period

k = 1.0 [Sec. 12.8.3]

Level	Weight, w_x	Height, h_x	$w_x h_x^k$ [Eqn. 12.8-12]	C_{vx} [Eqn. 12.8-11]	$F_x = C_s * C_{vx} * \Sigma w * f$	V_x (Design) [Eqn. 12.8-13]
Roof	11.4 K	29 ft	333 k-ft	0.231	4.05 K	4.054 K
Upper	32.7 K	18 ft	590 k-ft	0.410	7.17 K	11.229 K
Main	103.4 K	5 ft	516.8 k-ft	0.359	6.29 K	17.515 K
-	0.0 K	0 ft	0.0 k-ft	0.000	0.00 K	0.00 K
-	0.0 K	0 ft	0.0 k-ft	0.000	0.00 K	0.00 K
Σ	147.42 K		1440 k-ft	1.000	17.51 K	

Diaphragm Design Forces ASCE 7-16 12.10.1.1

Precast Concrete Diaphragm? no See ASCE12.10.3

Level	w_x	F_x	F_{px} [Eqn. 12.10-1]	F_{px}, max Eqn.12.10-3	F_{px},min. [Eqn.12.10-2]	F_{px}, (Design) 12.10.1.1
Roof	11.4 K	4.05 K	4.05 K	3.51 K	1.76 K	3.514 K
Upper	32.7 K	7.17 K	8.33 K	10.10 K	5.05 K	8.330 K
Main	103.4 K	6.29 K	12.28 K	31.93 K	15.96 K	15.963 K
-	0.0 K	0.00 K	0.00 K	0.00 K	0.00 K	0.00 K
-	0.0 K	0.00 K	0.00 K	0.00 K	0.00 K	0.00 K
Σ	147.42 K	17.51 K	24.66 K	45.54 K	22.77 K	27.81 K

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Wind Loads : ASCE 7- 16

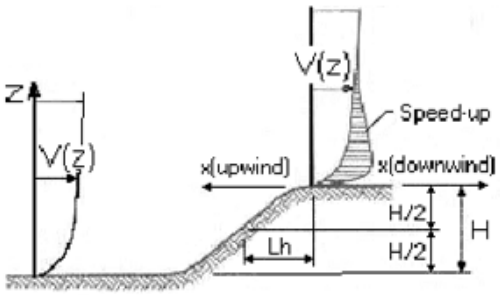
Ultimate Wind Speed	97 mph
Nominal Wind Speed	75.1 mph
Risk Category	II
Exposure Category	C
Enclosure Classif.	Enclosed Building
Internal pressure	+/-0.18
Directionality (Kd)	0.85
Kh case 1	1.014
Kh case 2	1.014
Type of roof	Monoslope

Topographic Factor (Kzt)

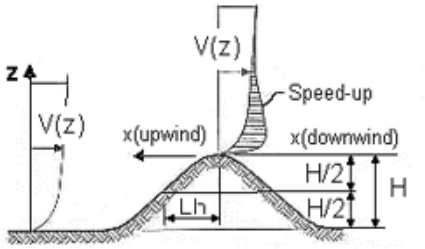
Topography		Flat
Hill Height	(H)	80.0 ft
Half Hill Length (Lh)		100.0 ft
Actual H/Lh	=	0.80
Use H/Lh	=	0.50
Modified Lh	=	160.0 ft
From top of crest: x =		50.0 ft
Bldg up/down wind?		downwind

H/Lh= 0.50 K_1 = 0.000
x/Lh = 0.31 K_2 = 0.792
z/Lh = 0.22 K_3 = 1.000

At Mean Roof Ht:
Kzt = $(1+K_1K_2K_3)^2$ = 1.00



ESCARPMENT



2D RIDGE or 3D AXISYMMETRICAL HILL

Gust Effect Factor

Flexible structure if natural frequency < 1 Hz (T > 1 second).
If building h/B>4 then may be flexible and should be investigated.

h =	34.8 ft
B =	66.3 ft
/z (0.6h) =	20.9 ft

h/B = 0.53 Rigid structure (low rise bldg)

G = 0.85 Using rigid structure default

Rigid Structure

ē =	0.20	
ℓ =	500 ft	
z_{min} =	15 ft	
c =	0.20	
g_Q, g_v =	3.4	
L_z =	456.3 ft	
Q =	0.90	
I_z =	0.22	
G =	0.87	use G = 0.85

Flexible or Dynamically Sensitive Structure

34 ncy (η_1) =	0.0 Hz			
Damping ratio (β) =	0			
/b =	0.65			
/α =	0.15			
Vz =	86.2			
N_1 =	0.00			
R_n =	0.000			
R_h =	28.282	η =	0.000	h = 34.8 ft
R_B =	28.282	η =	0.000	
R_L =	28.282	η =	0.000	
g_R =	0.000			
R =	0.000			
Gf =	0.000			

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Wind Loads - MWFRS all h (Except for Open Buildings)

Kh (case 2) =	1.01	h =	34.8 ft	GCpi =	+/-0.18
Base pressure (q_h) =	**20.8 psf**	ridge ht =	41.0 ft	G =	0.85
Roof Angle (θ) =	20.6 deg	Bldg length =	110.0 ft	qi = qh	
Roof tributary area - (h/2)*L:	1916 sf	width =	66.3 ft		
(h/2)*w:	1154 sf				

Ultimate Wind Surface Pressures (psf)

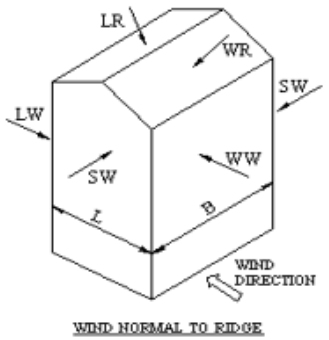
	Wind Normal to Ridge				Wind Parallel to Ridge				
	B/L = 0.60		h/L = 0.53			L/B = 1.66		h/L = 0.32	
Surface	Cp	q_hGC_p	w/+q_iGC_{pi}	w/-q_hGC_{pi}	Dist.*	Cp	q_hGC_p	w/ +q_iGC_{pi}	w/ -q_hGC_{pi}
Windward Wall (WW)	0.80	14.1	see table below			0.80	14.1	see table below	
Leeward Wall (LW)	-0.50	-8.8	-12.6	-5.1		-0.37	-6.5	-10.2	-2.8
Side Wall (SW)	-0.70	-12.3	-16.1	-8.6		-0.70	-12.3	-16.1	-8.6
Leeward Roof (LR)	-0.60	-10.6	-14.3	-6.8		Included in windward roof			
Neg Windward Roof pressure	-0.40	-7.1	-10.9	-3.4	0 to h/2*	-0.90	-15.9	-19.6	-12.1
Pos/min Windward Roof press.	0.01	0.2	-3.5	4.0	h/2 to h*	-0.90	-15.9	-19.6	-12.1
					h to 2h*	-0.50	-8.8	-12.6	-5.1
					> 2h*	-0.30	-5.3	-9.0	-1.6
					Min press.	-0.18	-3.2	-6.9	0.6

*Horizontal distance from windward edge

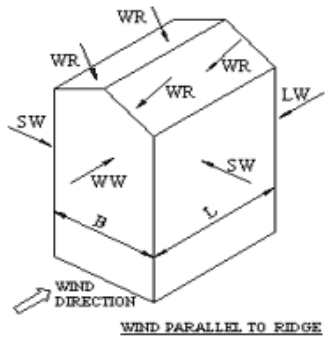
For monoslope roofs, entire roof surface is either windward or leeward surface.

Windward Wall Pressures at "z" (psf)

	z	Kz	Kzt	Windward Wall q_zGC_p	Windward Wall w/+q_iGC_{pi}	Windward Wall w/-q_hGC_{pi}	Combined WW + LW Normal to Ridge	Combined WW + LW Parallel to Ridge
	0 to 15'	0.85	1.00	11.8	8.1	15.6	20.6	18.3
	20.0 ft	0.90	1.00	12.6	8.8	16.3	21.4	19.0
	25.0 ft	0.95	1.00	13.2	9.4	16.9	22.0	19.7
	30.0 ft	0.98	1.00	13.7	9.9	17.4	22.5	20.2
h=	34.8 ft	1.01	1.00	14.1	10.4	17.8	22.9	20.6
ridge =	41.0 ft	1.05	1.00	14.6	10.9	18.3	23.4	21.1

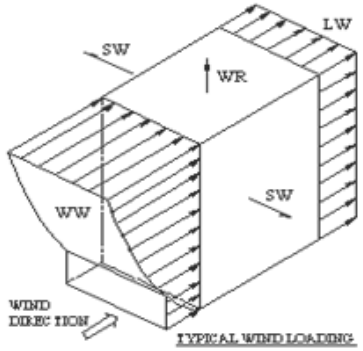


WIND NORMAL TO RIDGE



WIND PARALLEL TO RIDGE

NOTE:
See figure in ASCE7 for the application of full and partial loading of the above wind pressures. There are 4 different loading cases.



TYPICAL WIND LOADING

Parapet

z	Kz	Kzt	qp (psf)
0.0 ft	0.85	1.00	0.0

Windward parapet: 0.0 psf (GCpn = +1.5)
Leeward parapet: 0.0 psf (GCpn = -1.0)

Windward roof overhangs (add to windward roof pressure) : 14.1 psf (upward)

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Ultimate Wind Pressures

Wind Loads - Components & Cladding : h ≤ 60'

Kh (case 1) =	1.01	h =	34.8 ft
Base pressure (qh) =	**20.8 psf**	a =	6.6 ft
Minimum parapet ht =	0.0 ft	GCpi =	+/-0.18
Roof Angle (θ) =	20.6 deg	qi = qh =	20.8 psf
Type of roof =	Monoslope		

NOT APPLICABLE

Roof

	GCp +/- Gcpi				Surface Pressure (psf)				User input	
Area	10 sf	20 sf	50 sf	100 sf	10 sf	20 sf	50 sf	100 sf	25 sf	50 sf
Negative Zone 1	-1.48	-1.42	-1.34	-1.28	-30.7	-29.5	-27.8	-26.6	-28.1	-27.8
Negative Zone 2	-1.78	-1.66	-1.5	-1.38	-36.9	-34.4	-31.1	-28.6	-33.6	-31.1
Negative Zone 3	-3.08	-2.81	-2.45	-2.18	-63.9	-58.3	-50.9	-45.2	-56.5	-50.9
Positive All Zones	0.58	0.55	0.51	0.48	16.0	16.0	16.0	16.0	16.0	16.0

Parapet

qp = 0.0 psf

		Surface Pressure (psf)						User input
Solid Parapet Pressure		10 sf	20 sf	50 sf	100 sf	200 sf	500 sf	50 sf
CASE A:	Zone 2 :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zone 3 :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CASE B :	Interior zone :	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Corner zone :	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Walls

	GCp +/- GCpi				Surface Pressure at h				User input	
Area	10 sf	100 sf	200 sf	500 sf	10 sf	100 sf	200 sf	500 sf	50 sf	80 sf
Negative Zone 4	-1.28	-1.10	-1.05	-0.98	-26.6	-22.9	-21.8	-20.3	-24.0	-23.3
Negative Zone 5	-1.58	-1.23	-1.12	-0.98	-32.8	-25.5	-23.3	-20.3	-27.7	-26.2
Positive Zone 4 & 5	1.18	1.00	0.95	0.88	24.5	20.8	19.7	18.3	21.9	21.2

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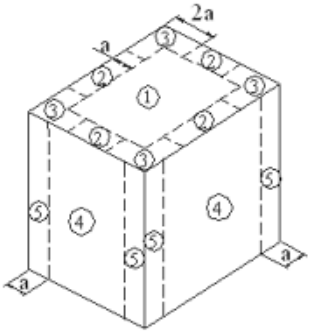
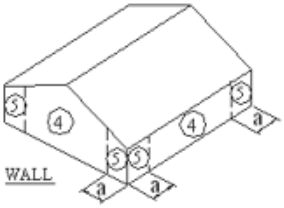
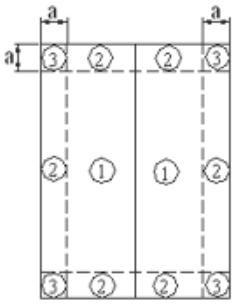
Location of C&C Wind Pressure Zones - ASCE 7-10 & earlier



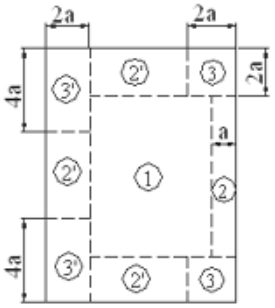
Roofs w/ θ ≤ 10°
and all walls
h > 60'



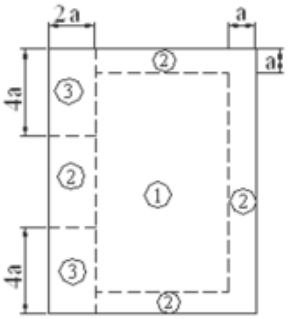
Walls h ≤ 60'
& alt design h<90'



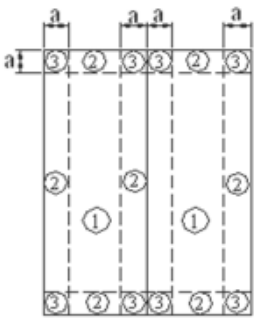
Gable, Sawtooth and
Multispan Gable θ ≤ 7 degrees &
Monoslope ≤ 3 degrees
h ≤ 60' & alt design h<90'



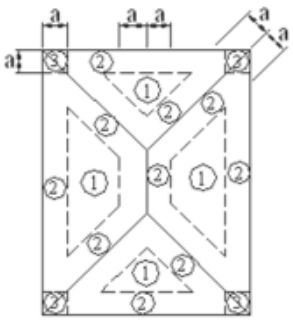
Monoslope roofs
3° < θ ≤ 10°
h ≤ 60' & alt design h<90'



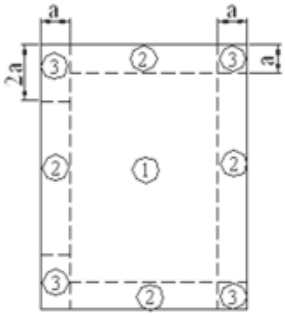
Monoslope roofs
10° < θ ≤ 30°
h ≤ 60' & alt design h<90'



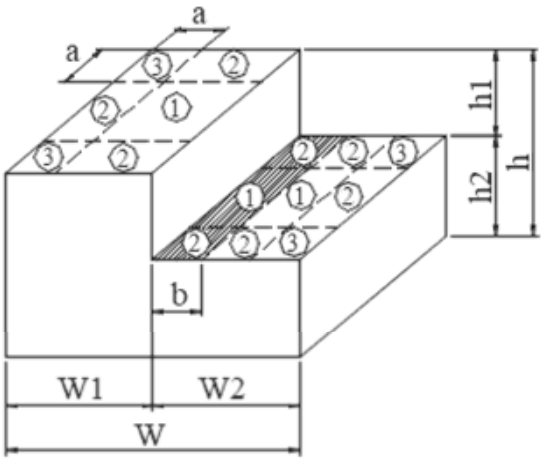
Multispan Gable &
Gable 7° < θ ≤ 45°

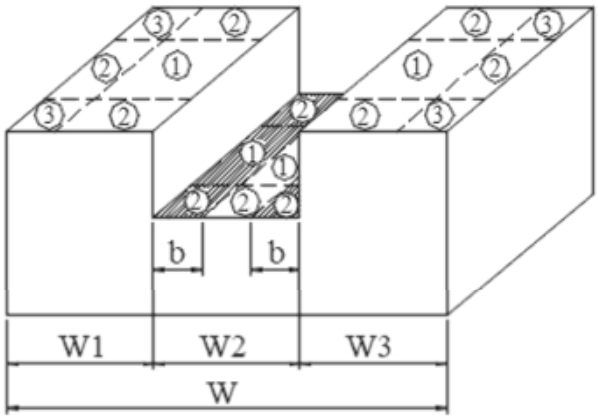


Hip 7° < θ ≤ 27°

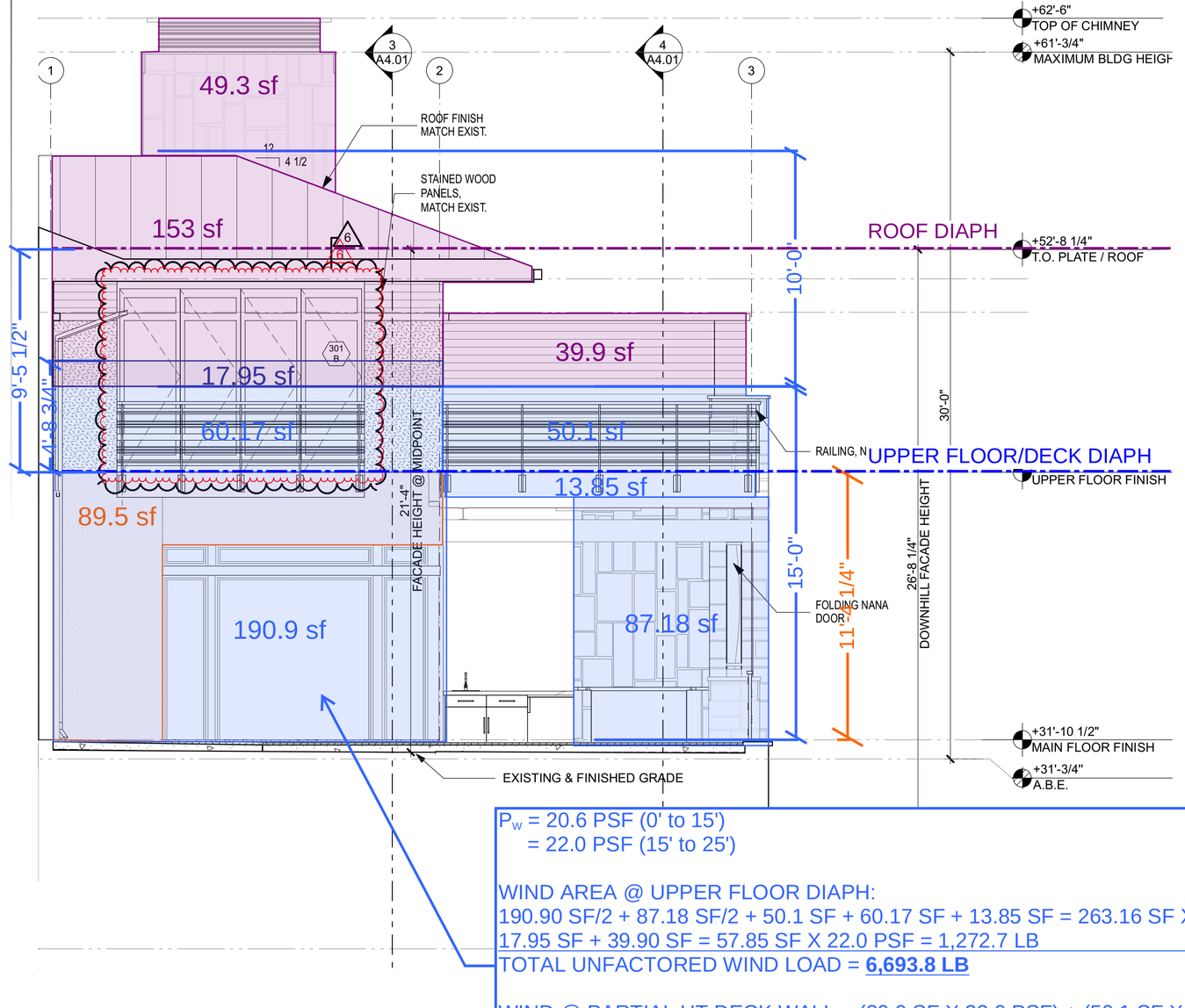


Sawtooth 10° < θ ≤ 45°
h ≤ 60' & alt design h<90'





Stepped roofs θ ≤ 3°
h ≤ 60' & alt design h<90'



P_w = 20.6 PSF (0' to 15')
= 22.0 PSF (15' to 25')

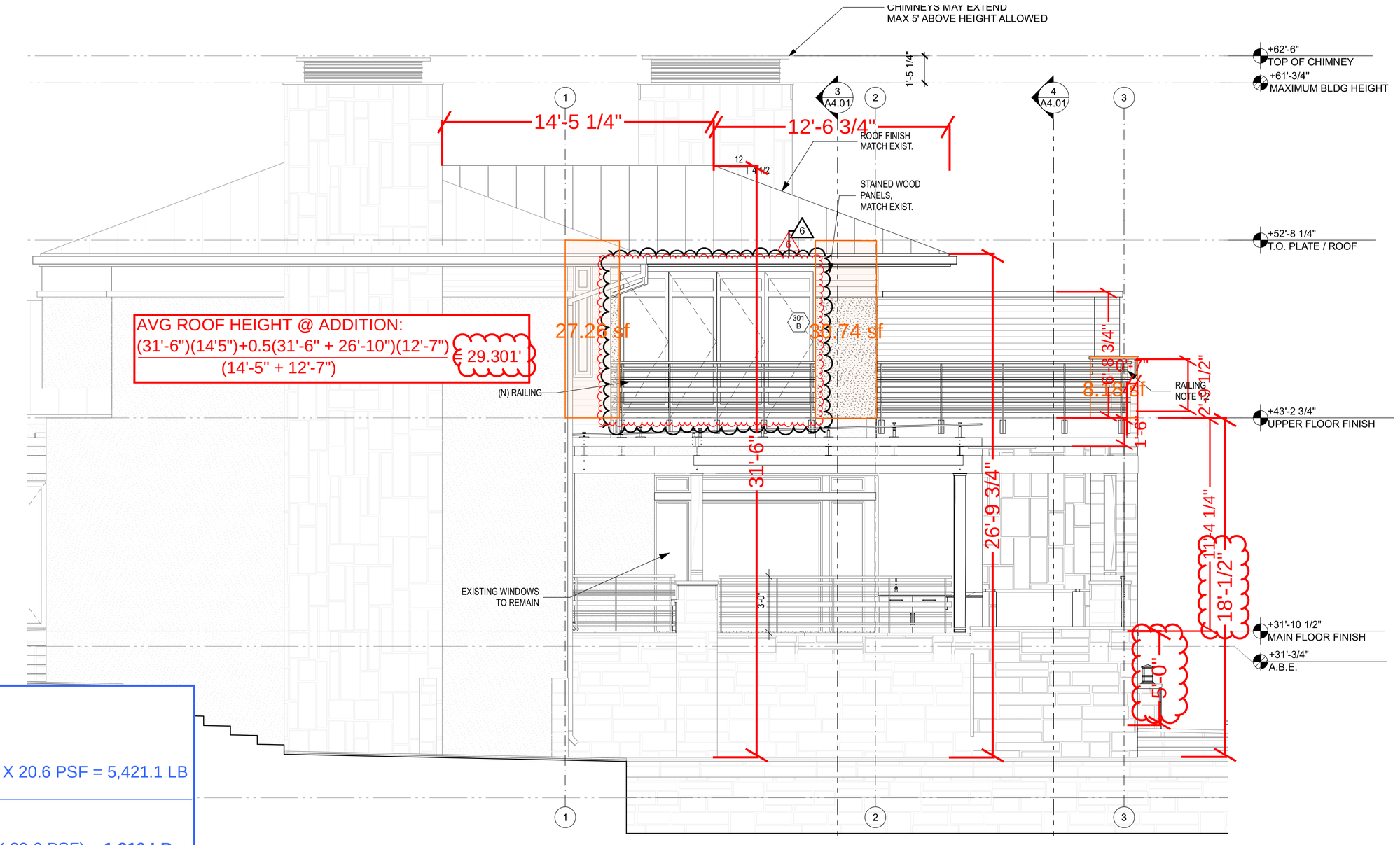
WIND AREA @ UPPER FLOOR DIAPH:
190.90 SF/2 + 87.18 SF/2 + 50.1 SF + 60.17 SF + 13.85 SF = 263.16 SF X 20.6 PSF = 5,421.1 LB
17.95 SF + 39.90 SF = 57.85 SF X 22.0 PSF = 1,272.7 LB
TOTAL UNFACTORED WIND LOAD = **6,693.8 LB**

WIND @ PARTIAL HT DECK WALL = (39.9 SF X 22.0 PSF) + (50.1 SF X 20.6 PSF) = **1,910 LB**

WIND AREA @ ROOF DIAPH:
(153.00 SF - 17.95 SF) + 49.3 SF = 184.35 SF X 22.0 PSF = **4,056 LB**

3 EAST ELEVATION PARTIA

SCALE: 1/4" = 1'-0"



2 EAST ELEVATION - PROPOSED

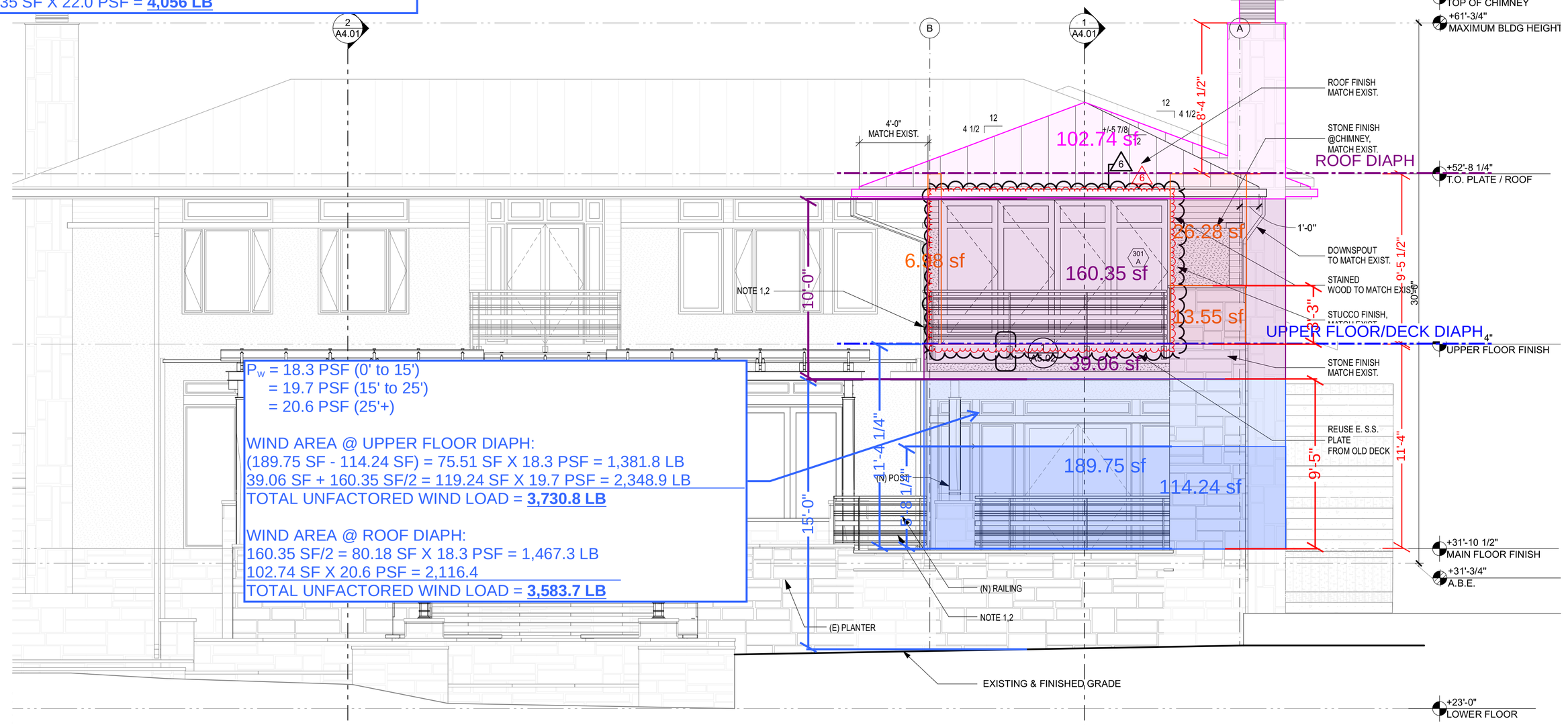
SCALE: 1/4" = 1'-0"

NOTES

1) HANDRAILS TO BE 34"-38" ABOVE TREAD NOSING, 1 1/2" FROM WALL, NOT LESS THAN 1 1/4" OR MORE THAN 2" IN DIAMETER PER IRC, SECTION R311& R312. HANDRAILS TO BE PROVIDED FOR A FLIGHT OF STAIRS WITH FOUR OR MORE RISERS PER IRCR311.7.8.

2) GUARD RAILS SHALL BE MIN 36" HIGH AND HAVE A MAXIMUM OPENING SUCH THAT A 4" SPHERE CANNOT PASS THROUGH PER IRC, SECTIONS R312.1.2 & R312.1.3

3) VERIFY CODE COMPLIANCE FOR EXISTING HANDRAILS AND GUARDRAILS THROUGHOUT.



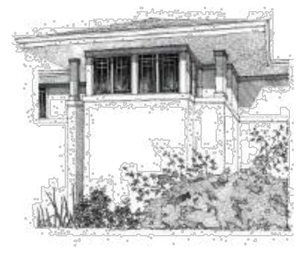
P_w = 18.3 PSF (0' to 15')
= 19.7 PSF (15' to 25')
= 20.6 PSF (25'+)

WIND AREA @ UPPER FLOOR DIAPH:
(189.75 SF - 114.24 SF) = 75.51 SF X 18.3 PSF = 1,381.8 LB
39.06 SF + 160.35 SF/2 = 119.24 SF X 19.7 PSF = 2,348.9 LB
TOTAL UNFACTORED WIND LOAD = **3,730.8 LB**

WIND AREA @ ROOF DIAPH:
160.35 SF/2 = 80.18 SF X 18.3 PSF = 1,467.3 LB
102.74 SF X 20.6 PSF = 2,116.4
TOTAL UNFACTORED WIND LOAD = **3,583.7 LB**

NORTH ELEVATION - PROPOSED

SCALE: 1/4" = 1'-0"



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HARRIS REMODEL

1640 72ND AVE SE
MERCER ISLAND, WA 98040

Job No.	2110
Project Manager:	TB
Issue Date:	10/9/23

NO.	DATE	REVISION
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EXTERIOR ELEVATIONS

A3.01

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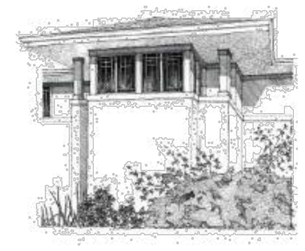

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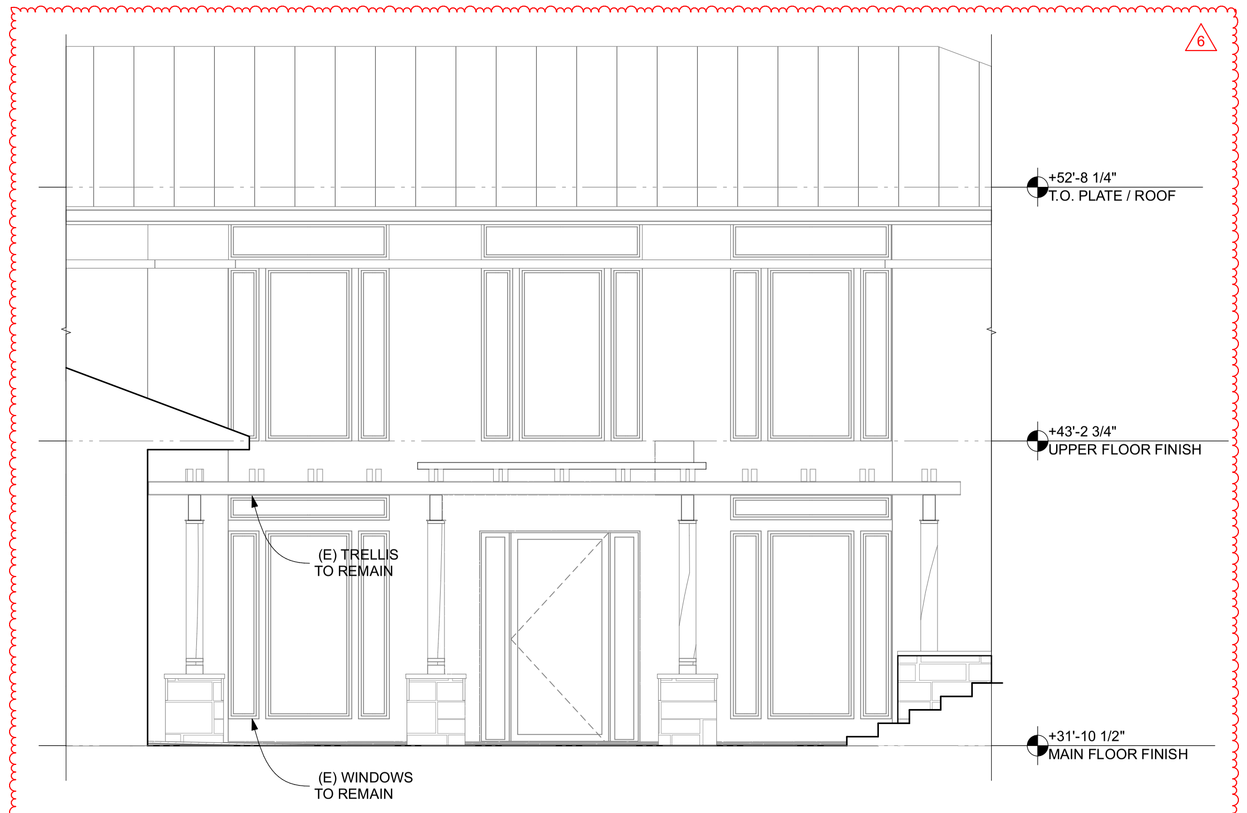
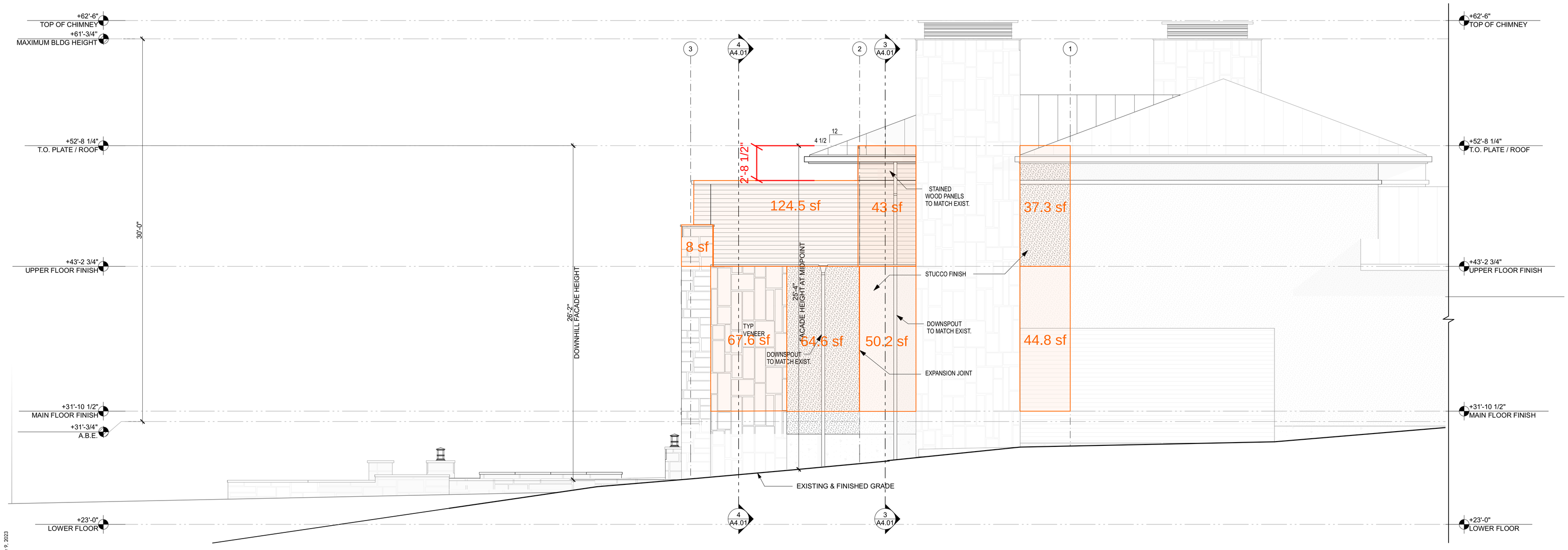


2 SOUTH ELEVATION



1 WEST ELEVATION - PROPOSED

SCALE: 1/4" = 1'-0"

HARRIS REMODEL

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EXTERIOR ELEVATIONS

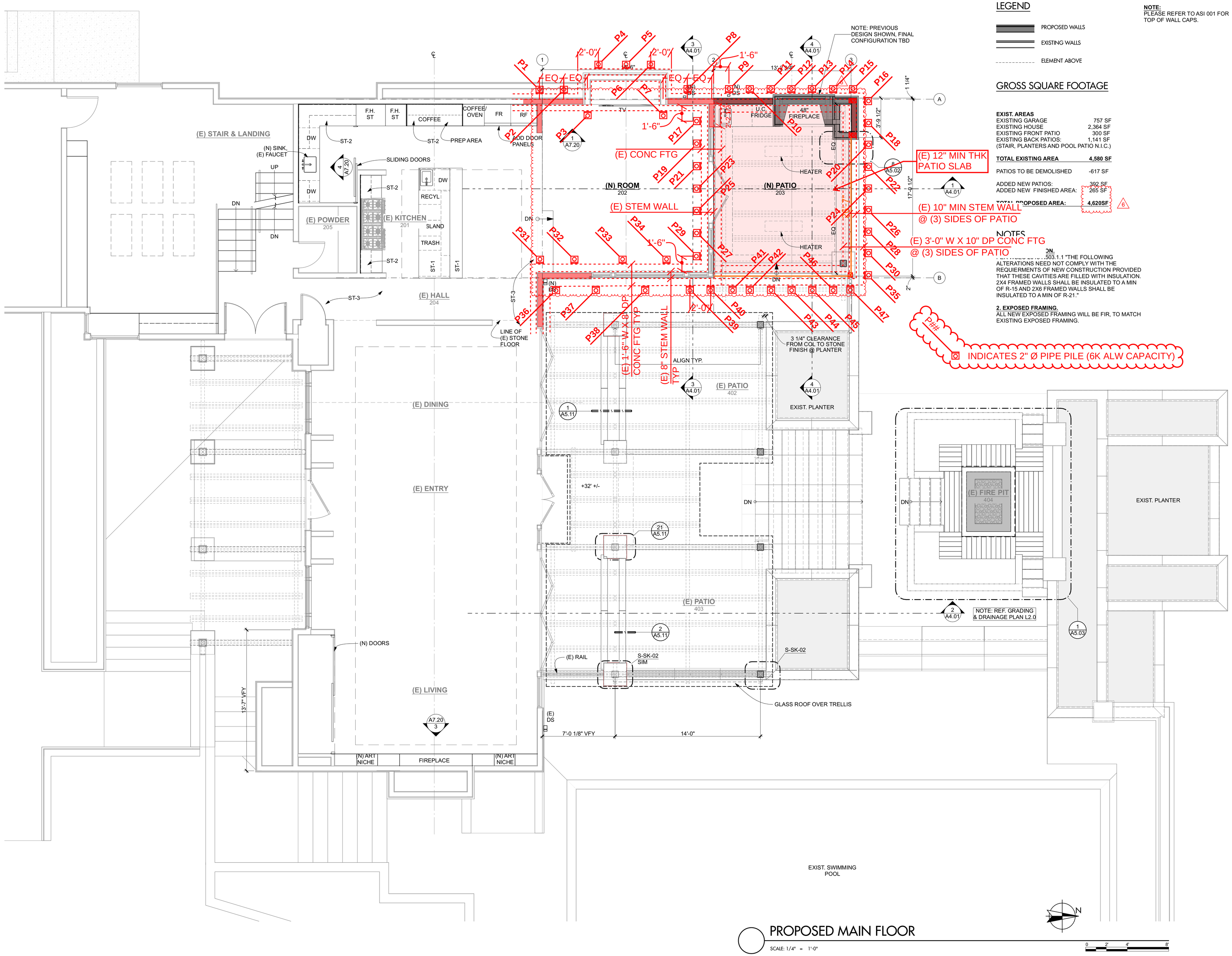
A3.02

FILE: 2110 Harris Remodel PRINTED: Monday, October 9, 2023

DEI
DIBBLE ENGINEERS INC

GRAVITY FRAMING & SHEAR WALL KEY PLAN

Harris Residence Remodel & DEI Job #23-183



LEGEND

PROPOSED WALLS

EXISTING WALLS

ELEMENT ABOVE

NOTE:
PLEASE REFER TO ASI 001 FOR TOP OF WALL CAPS.

GROSS SQUARE FOOTAGE

EXIST. AREAS	
EXISTING GARAGE	757 SF
EXISTING HOUSE	2,364 SF
EXISTING FRONT PATIO	300 SF
EXISTING BACK PATIOS: (STAIR, PLANTERS AND POOL PATIO N.I.C.)	1,141 SF
TOTAL EXISTING AREA	**4,580 SF**
PATIOS TO BE DEMOLISHED	-617 SF
ADDED NEW PATIOS:	392 SF
ADDED NEW FINISHED AREA:	265 SF
TOTAL PROPOSED AREA:	**4,620SF**

NOTES

1. EXISTING CONDITION.
EXISTING CONDITIONS PER IRC R503.1.1 "THE FOLLOWING ALTERATIONS NEED NOT COMPLY WITH THE REQUIERMENTS OF NEW CONSTRUCTION PROVIDED THAT THESE CAVITIES ARE FILLED WITH INSULATION. 2X4 FRAMED WALLS SHALL BE INSULATED TO A MIN OF R-15 AND 2X6 FRAMED WALLS SHALL BE INSULATED TO A MIN OF R-21."

2. EXPOSED FRAMING.
ALL NEW EXPOSED FRAMING WILL BE FIR, TO MATCH EXISTING EXPOSED FRAMING.

PROPOSED MAIN FLOOR

SCALE: 1/4" = 1'-0"

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MAIN FLOOR PLAN

A2.2

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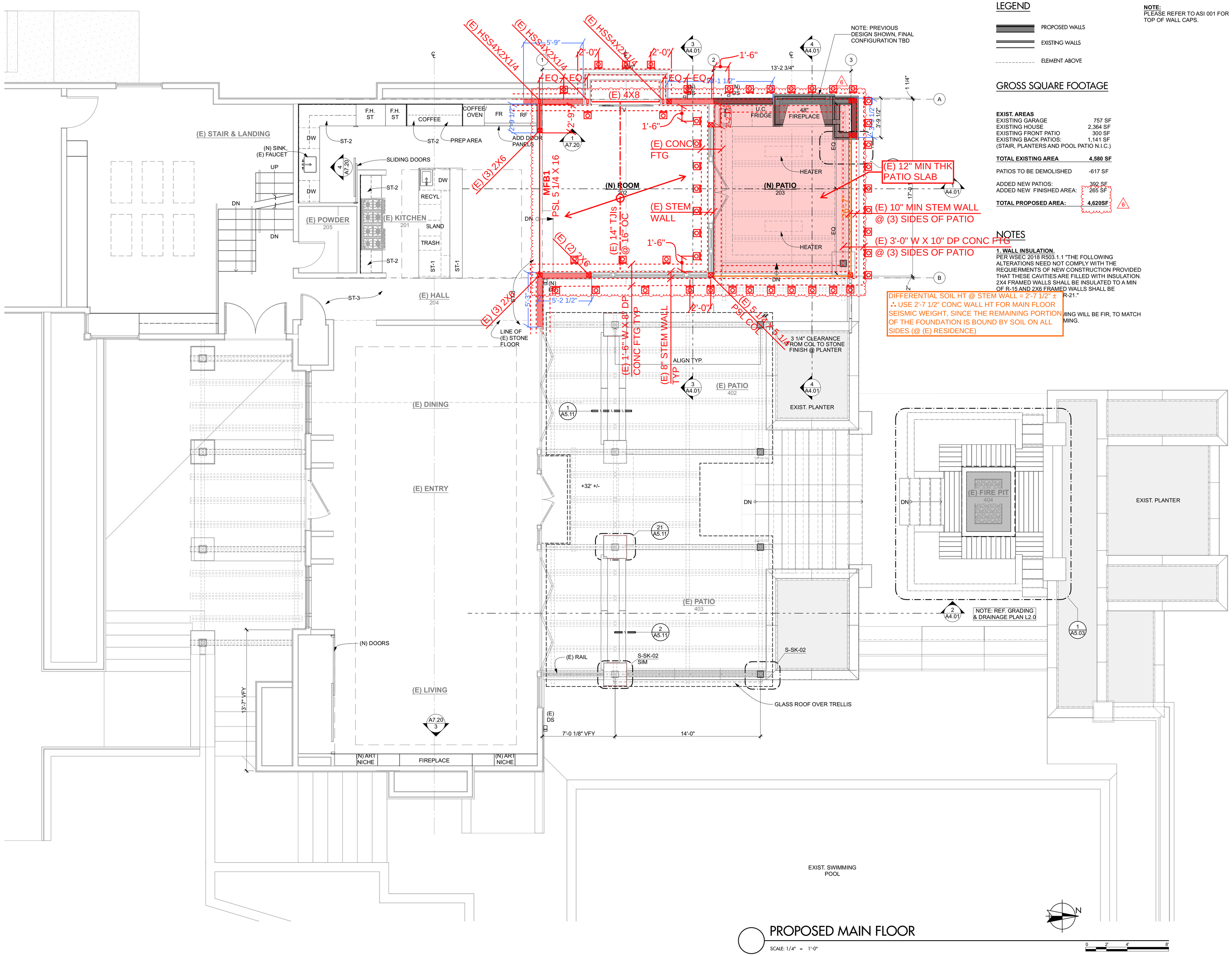

PROPOSED MAIN FLOOR

SCALE: 1/4" = 1'-0"

0 2' 4' 8'

LEGEND

- PROPOSED WALLS
- EXISTING WALLS
- ELEMENT ABOVE

NOTE:
PLEASE REFER TO ASI 001 FOR TOP OF WALL CAPS.

GROSS SQUARE FOOTAGE

EXIST. AREAS	
EXISTING GARAGE	757 SF
EXISTING HOUSE	2,364 SF
EXISTING FRONT PATIO	300 SF
EXISTING BACK PATIOS: (STAIR, PLANTERS AND POOL PATIO N.I.C.)	1,141 SF
TOTAL EXISTING AREA	**4,580 SF**
PATIOS TO BE DEMOLISHED	-617 SF
ADDED NEW PATIOS:	392 SF
ADDED NEW FINISHED AREA:	265 SF
TOTAL PROPOSED AREA:	**4,620SF** 6

NOTES

1. WALL INSULATION.
PER WSEC 2018 R503.1.1 "THE FOLLOWING ALTERATIONS NEED NOT COMPLY WITH THE REQUIERMENTS OF NEW CONSTRUCTION PROVIDED THAT THESE CAVITIES ARE FILLED WITH INSULATION. 2X4 FRAMED WALLS SHALL BE INSULATED TO A MIN OF R-15 AND 2X6 FRAMED WALLS SHALL BE R-21."

MING WILL BE FIR, TO MATCH MING.

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MAIN FLOOR PLAN

A2.2

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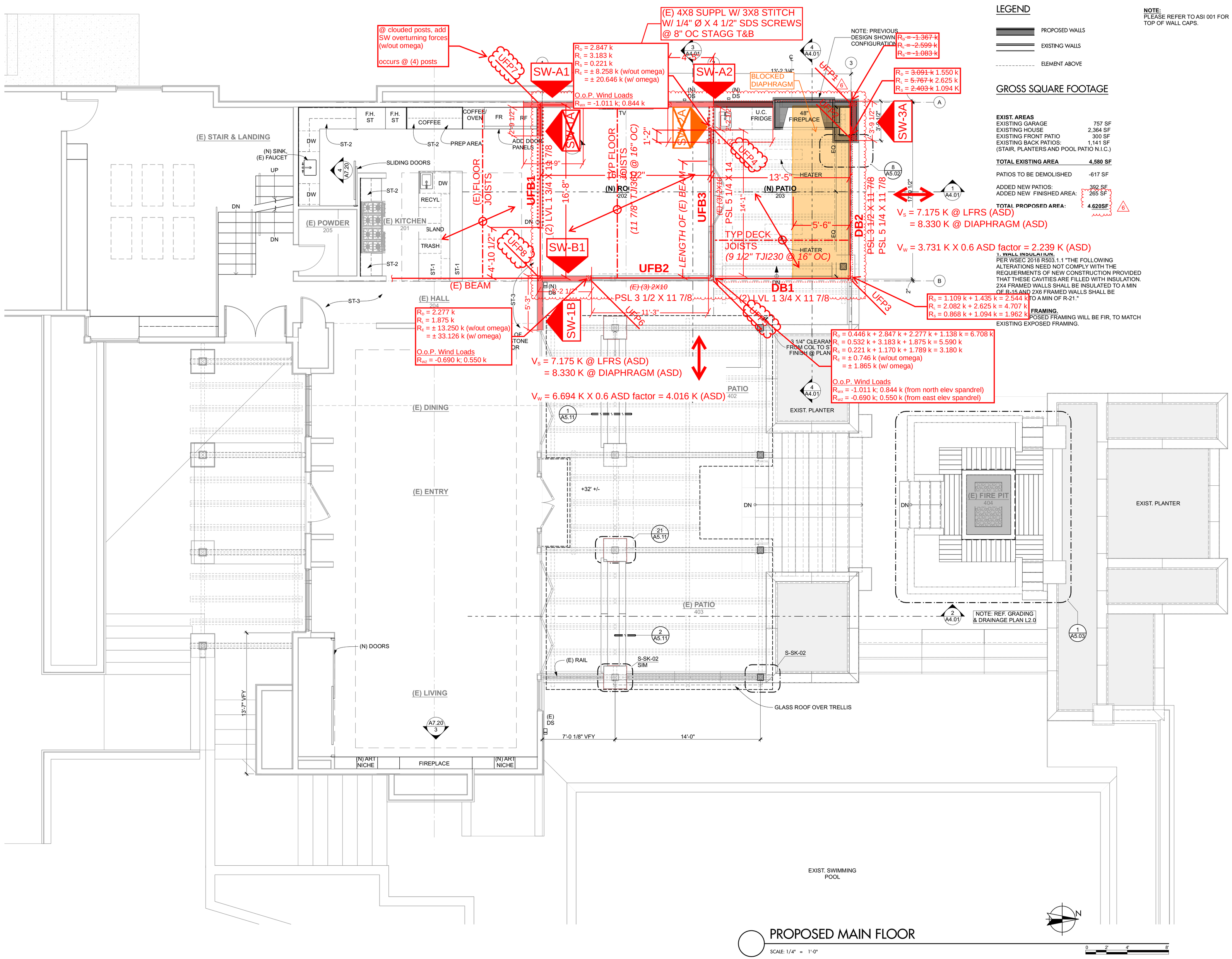

PROPOSED MAIN FLOOR

SCALE: 1/4" = 1'-0"

LEGEND

- PROPOSED WALLS
- EXISTING WALLS
- ELEMENT ABOVE

NOTE:
PLEASE REFER TO ASI 001 FOR TOP OF WALL CAPS.

GROSS SQUARE FOOTAGE

EXIST. AREAS	
EXISTING GARAGE	757 SF
EXISTING HOUSE	2,364 SF
EXISTING FRONT PATIO	300 SF
EXISTING BACK PATIOS:	1,141 SF
(STAIR, PLANTERS AND POOL PATIO N.I.C.)	
TOTAL EXISTING AREA	**4,580 SF**
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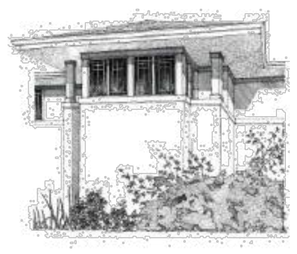
TOTAL PROPOSED AREA:	**4,620SF**

1. WALL INSULATION.
PER WSEC 2018 R503.1.1 "THE FOLLOWING ALTERATIONS NEED NOT COMPLY WITH THE REQUIERMENTS OF NEW CONSTRUCTION PROVIDED THAT THESE CAVITIES ARE FILLED WITH INSULATION. 2X4 FRAMED WALLS SHALL BE INSULATED TO A MIN OF R-15 AND 2X6 FRAMED WALLS SHALL BE INSULATED TO A MIN OF R-21."

FRAMING.
EXPOSED FRAMING WILL BE FIR, TO MATCH EXISTING EXPOSED FRAMING.



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MAIN FLOOR PLAN

A2.2

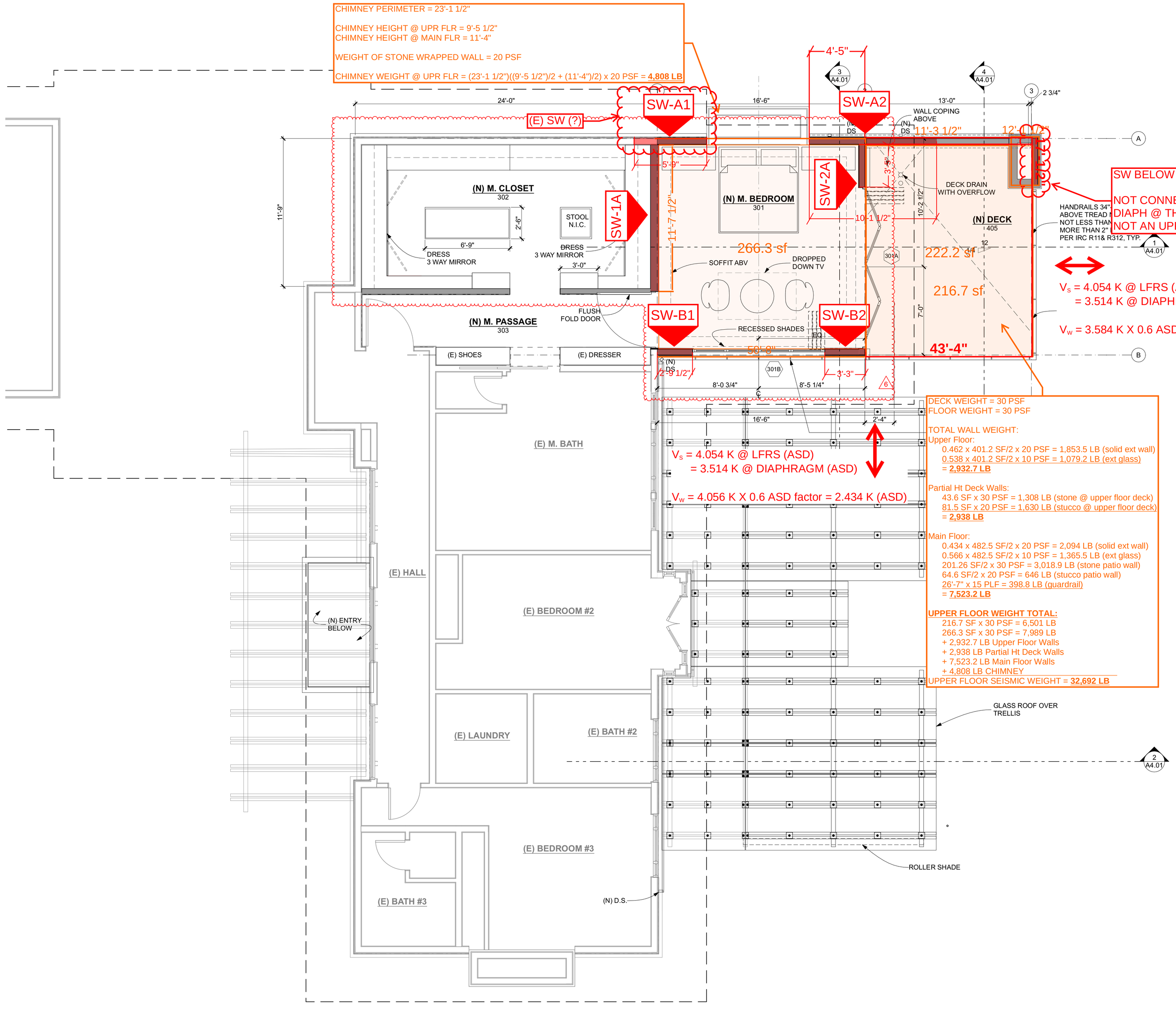
FILE: 2110 Harris Remodel PRINTED: Monday, October 9, 2023

CHIMNEY PERIMETER = 23'-1 1/2"

CHIMNEY HEIGHT @ UPR FLR = 9'-5 1/2"
CHIMNEY HEIGHT @ MAIN FLR = 11'-4"

WEIGHT OF STONE WRAPPED WALL = 20 PSF

CHIMNEY WEIGHT @ UPR FLR = (23'-1 1/2")((9'-5 1/2")/2 + (11'-4")/2) x 20 PSF = **4,808 LB**



V_s = 4.054 K @ LFRS (ASD)
= 3.514 K @ DIAPHRAGM (ASD)

V_w = 3.584 K X 0.6 ASD factor = 2.150 K (ASD)

V_s = 4.054 K @ LFRS (ASD)
= 3.514 K @ DIAPHRAGM (ASD)

V_w = 4.056 K X 0.6 ASD factor = 2.434 K (ASD)

SW BELOW

NOT CONNECTED TO ROOF DIAPH @ THIS LEVEL, SO NOT AN UPPER FLOOR SW

DECK WEIGHT = 30 PSF
FLOOR WEIGHT = 30 PSF

TOTAL WALL WEIGHT:
Upper Floor:
0.462 x 401.2 SF/2 x 20 PSF = 1,853.5 LB (solid ext wall)
0.538 x 401.2 SF/2 x 10 PSF = 1,079.2 LB (ext glass)
= **2,932.7 LB**

Partial Ht Deck Walls:
43.6 SF x 30 PSF = 1,308 LB (stone @ upper floor deck)
81.5 SF x 20 PSF = 1,630 LB (stucco @ upper floor deck)
= **2,938 LB**

Main Floor:
0.434 x 482.5 SF/2 x 20 PSF = 2,094 LB (solid ext wall)
0.566 x 482.5 SF/2 x 10 PSF = 1,365.5 LB (ext glass)
201.26 SF/2 x 30 PSF = 3,018.9 LB (stone patio wall)
64.6 SF/2 x 20 PSF = 646 LB (stucco patio wall)
26'-7" x 15 PLF = 398.8 LB (guardrail)
= **7,523.2 LB**

UPPER FLOOR WEIGHT TOTAL:
216.7 SF x 30 PSF = 6,501 LB
266.3 SF x 30 PSF = 7,989 LB
+ 2,932.7 LB Upper Floor Walls
+ 2,938 LB Partial Ht Deck Walls
+ 7,523.2 LB Main Floor Walls
+ 4,808 LB CHIMNEY
UPPER FLOOR SEISMIC WEIGHT = **32,692 LB**

LEGEND

- PROPOSED WALLS
- EXISTING WALLS
- ELEMENT ABOVE

GROSS SQUARE FOOTAGE

	2,333 SF
	283 SF
AREA	**2,616 SF**
OLISHED	-283 SF
ROJECT FINISHED AREA:	302 SF
NEW DECK:	206 SF
TOTAL PROPOSED AREA:	**2,841 SF**

DORS

WINDOWS AND DOORS THAT WILL BE RE-USED TO BE VERIFIED TO MEET U=0.30 AND SAFETY GLAZING WHERE REQUIRED. WHEN MORE THAN ONE REPLACEMENT FENESTRATION UNIT IS BEING INSTALLEDD, AN AREA- WEIGHTED AVERAGE OF THE U-FACTOR SAHLL BE PERMITTED TO BE USED TO DEMONSTRATE COMPLIANCE. WSEC R503.1.1.1 AND WSEC TABLE R402.1.1.

UPPER FLOOR

SCALE: 1/4" = 1'-0"

N

0 2' 4' 8'

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UPPER FLOOR PLAN

A2.3

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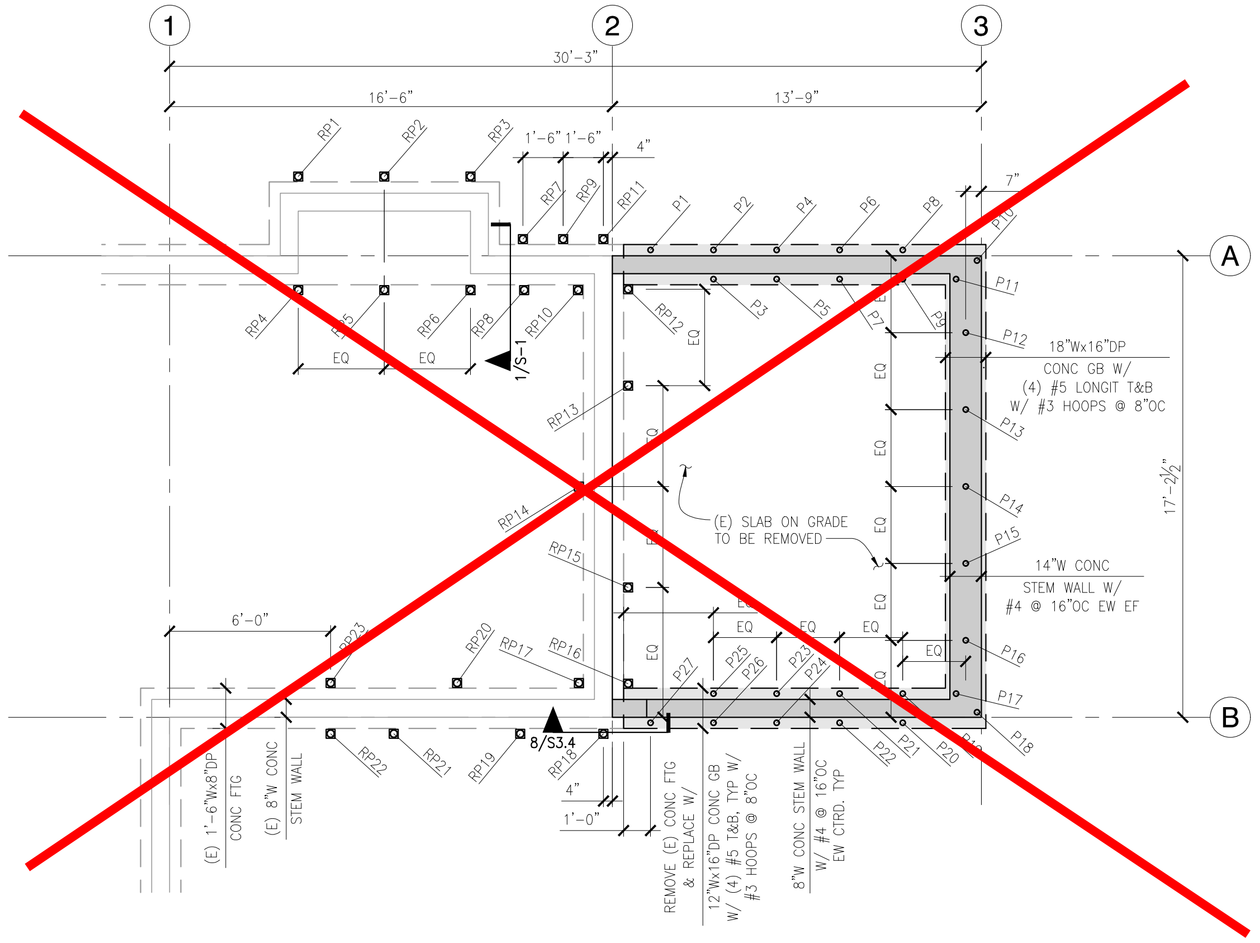
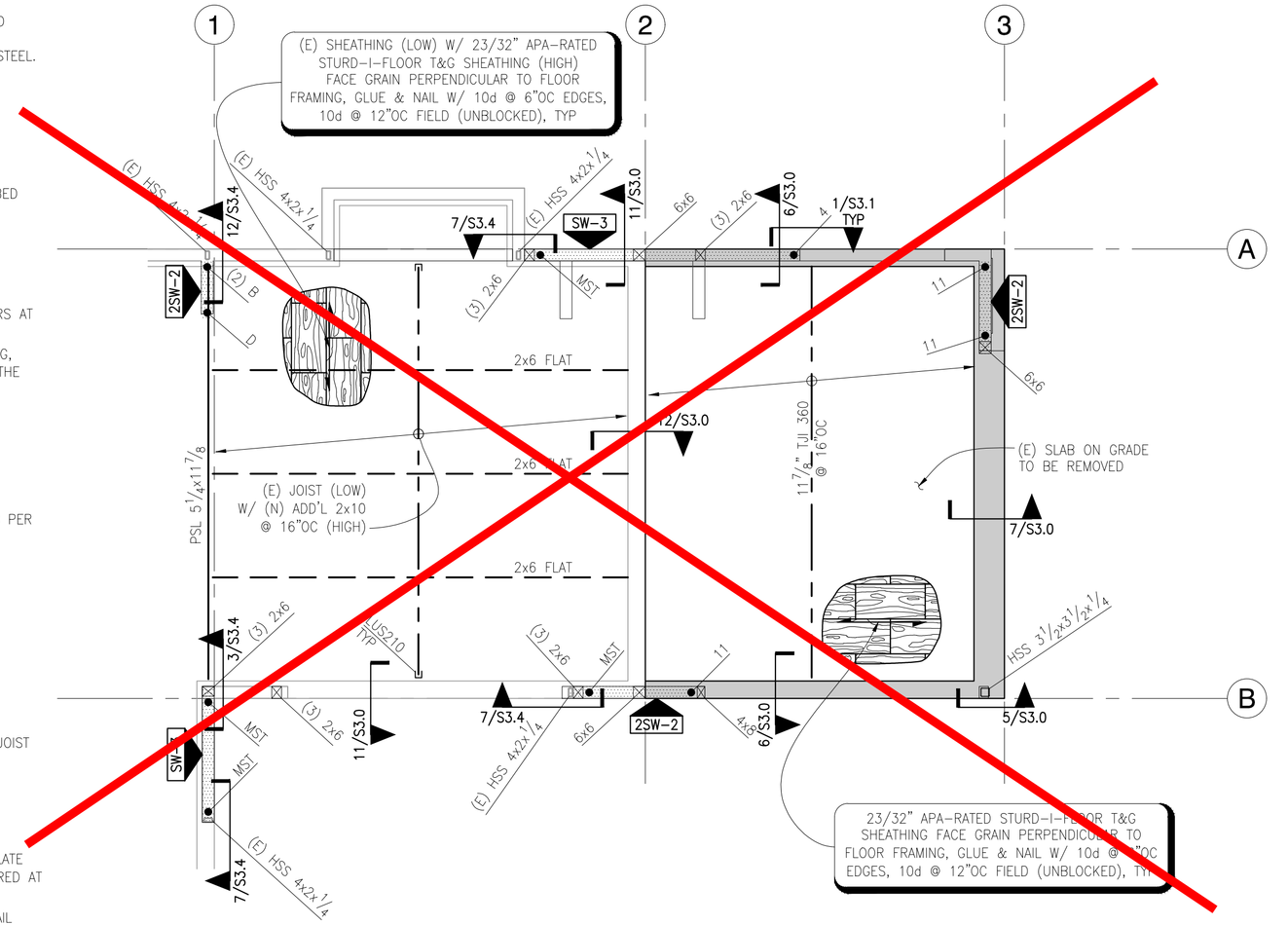


PARTIAL
FOUNDATION PLAN

SCALE: ¼" = 1'-0"

(PROJECT)



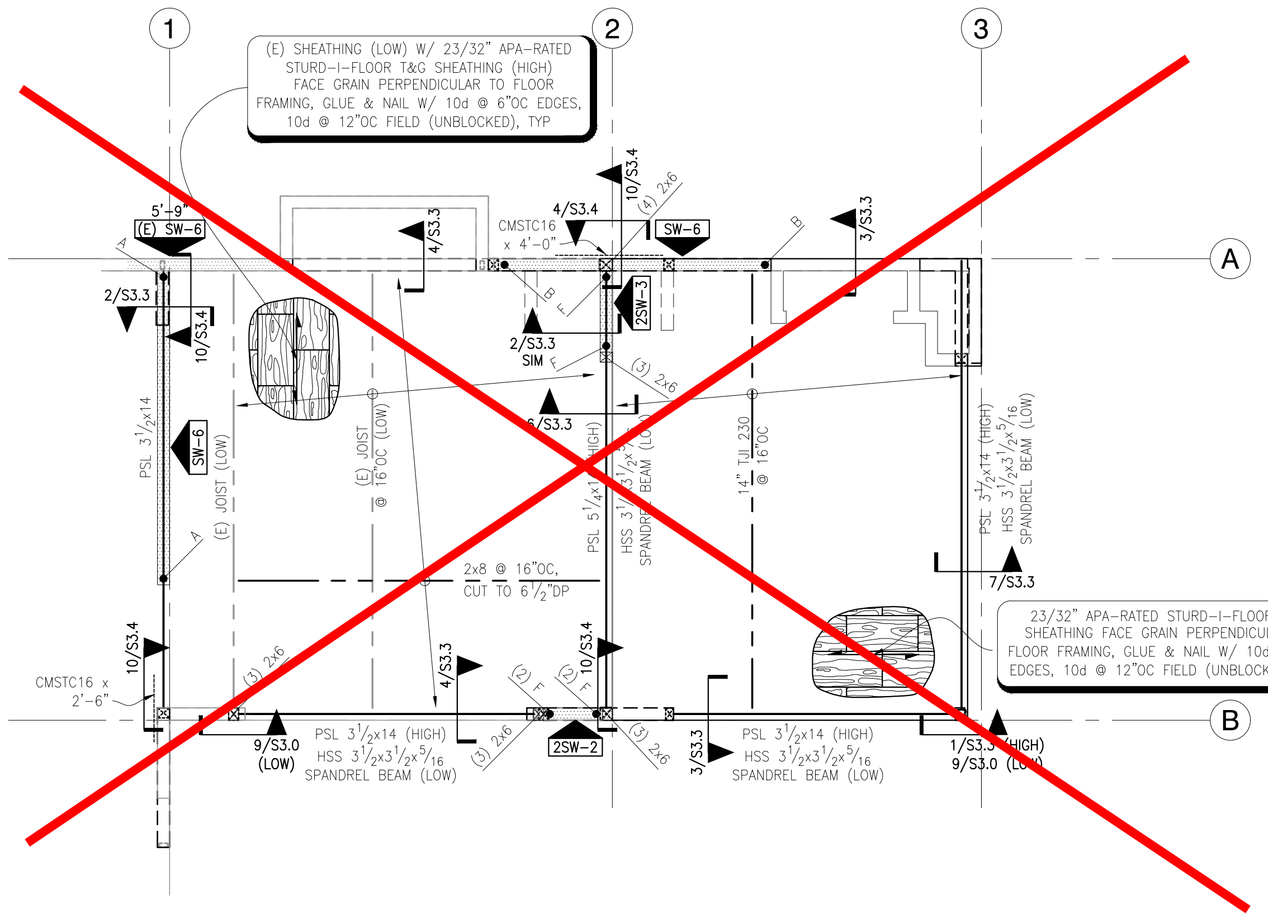
PARTIAL
MAIN FLOOR FRAMING PLAN

SCALE: ¼" = 1'-0"

(PROJECT)

PLAN NOTES

1. REFERENCE S1.0 FOR STRUCTURAL GENERAL NOTES, DRAWING LIST, & ABBREVIATIONS..
2. DIMENSIONS: VERIFY ALL DIMENSIONS AND ELEVATIONS WITH THE ARCHITECTURAL DRAWINGS. COLUMNS AND FOOTINGS ARE CENTERED ON GRID, TYPICAL. ALL EXISTING DIMENSIONS SHALL BE FIELD VERIFIED. ALL DIMENSIONS ARE TO INSIDE FACE OF CONCRETE, OUTSIDE FACE OF CONCRETE OR CENTERLINE OF GRID/STEEL. CONTINUOUS FOOTINGS ARE CENTERED UNDER WALLS/STRUCTURAL PANELS. POSTS, BUNDLED STUDS OR COLUMNS ARE TO BE CENTERED ON FOOTING OR WALL PIER, UNO.
3. MOISTURE PROOF ALL WALLS BELOW GRADE PER ARCHITECT.
4. ALL RIMS SHALL BE LSL 1¾ x FULL-DEPTH TYP, UNO ON PLAN.
5. PROVIDE PANEL EDGE NAILING AT ALL HOLDOWNS, POSTS/BUNDLED STUDS.
6. THE BOTTOM OF ALL FOOTINGS SHALL BE 18" MINIMUM BELOW GRADE AND BEAR UPON FIRM, UNDISTURBED SOIL OR ENGINEERED COMPACTED BACK-FILL.
7. FULLY BLOCK FLOOR CAVITY AT ALL POINT LOADS. POINT LOADS SHALL BE SUPPORTED CONTINUOUSLY THROUGH FLOORS TO THE FOUNDATION.
8. ALL WOOD IN CONTACT WITH WEATHER-EXPOSED CONCRETE OR WITHIN 8" OF FINISHED GRADE SHALL BE PRESSURE-TREATED.
9. USE HOT DIPPED GALVANIZED FASTENERS AND EITHER HOT DIPPED GALVANIZED OR ZMAX COATED HANGERS AT CONNECTORS TO PRESSURE TREATED LUMBER.
10. ALL DUCTS, CHASES AND PIPE/CONDUIT OPENINGS SHALL BE PER ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL AND SPRINKLER DRAWINGS. CONTACT EOR FOR APPROVAL OF ANY OPENING NOT SHOWN ON THE STRUCTURAL DRAWINGS. FOR STAIR DETAILS AND GUARDRAILS, REFERENCE ARCHITECTURAL DRAWINGS.
11. CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY SHORING.
12. ALL BEAMS ARE FLUSH WITH JOISTS UNO AS "DROP" INDICATING A DROPPED BEAM.
13. PROVIDE FULL HEIGHT SOLID BLOCKING OR DOUBLE JOISTS OVER SHEAR WALLS AND BEARING WALLS AT REPETITIVE FRAMING MEMBERS. AT SHEAR WALLS AND BEARING WALLS PARALLEL TO FRAMING, ALIGN (1) JOIST/BEAM OVER WALL (ADDITIONAL JOISTS MAY BE REQUIRED).
14. ALL WOOD EXPOSED TO WEATHER OR IN DIRECT CONTACT WITH CONCRETE SHALL BE PRESSURE-TREATED PER STRUCTURAL GENERAL NOTES.
15. PROVIDE DOUBLE JOISTS AROUND ALL ROOF OPENINGS GREATER THAN 24"OC ONE SIDE.
16. =⊃HDR⊂= INDICATES (2) 2x8 TYPICAL HEADER. 4'-0" MAXIMUM HEADER SPAN.
17. PROVIDE SW-6 SHEATHING/NAILING ON EXTERIOR BUILDING, TYPICAL.
18. MATCH BUNDLED STUDS FROM ABOVE & EXTEND TO FOUNDATION.
19. HANGERS: ALL 2x HANGERS TO BE SIMPSON LUS SERIES. ALL I-JOIST HANGERS TO BE ITS SERIES.
20. JOIST BRIDGING PER JOIST MANUFACTURER, TYP.
21. ALL BEAMS ARE FLUSH WITH JOISTS UNO AS "DROP" INDICATING A DROPPED BEAM.
22. PROVIDE FULL HEIGHT SOLID BLOCKING OR DOUBLE JOISTS OVER SHEAR WALLS AND BEARING WALLS AT REPETITIVE FRAMING MEMBERS. AT SHEAR WALLS AND BEARING WALLS PARALLEL TO FRAMING, ALIGN (1) JOIST OVER WALL (ADDITIONAL JOISTS MAY BE REQUIRED).
23. PROVIDE SW-6 SHEATHING/NAILING ON EXTERIOR BUILDING, TYPICAL.
24. PROVIDE DOUBLE JOISTS AROUND ALL ROOF OPENINGS GREATER THAN 24"OC ONE SIDE.
25. ALL WOOD EXPOSED TO WEATHER SHALL BE PRESSURE-TREATED PER STRUCTURAL GENERAL NOTES.
26. HORIZONTL STRAP TIES INDICATED ON THE SHEAR WALL PLANS ARE TO BE CENTERED OVER WALL TOP PLATE AND/OR HEADER, BLOCKING OR BEAM. CONTRACTOR SHALL COORDINATE ADDTIONAL WALL FURRING REQUIRED AT BEAMS AND POSTS WITH CONNECTIONS OR HOLDOWNS THAT EXCEED THE NOMINAL WALL THICKNESS.
27. TYPICAL TOP PLATE SPLICE: PROVIDE A MINIMUM 48" LAP W/ 16d @ 6"OC STAGGERED. REFERENCE DETAIL 9/S3.2.
28. TRUSS BRACING PER TRUSS MANUFACTURER, TYP.
29. ROOF TRUSSES SHALL BE DESIGNED FOR THE FOLLOWING CRITERIA:
    - REFER TO THE STRUCTURAL GENERAL NOTES FOR STANDARD DEAD AND LIVE LOADS AND SUBMITTAL INFORMATION.
    - TRUSS LAYOUT SHOWN IS APPROXIMATE. TRUSS SUPPLIER IS RESPONSIBLE FOR FINAL TRUSS LAYOUT AND CONFIGURATION. NOTIFY ENGINEER OF REVISIONS TO PLAN.
    - SHADED REGION INDICATES APPROXIMATE AREA OF OVER FRAMING. TRUSS MANUFACTURER IS RESPONSIBLE FOR DESIGNING THE OVER FRAMING REQUIRED. TRUSSES SHALL BE DESIGNED TO SUPPORT OVER FRAMING IN ADDITION TO THE STANDARD DESIGN LOADS.
    - ALL GIRDER TRUSSES SHALL BE SUPPORTED BY A MINIMUM OF (3) STUDS. TRUSS MANUFACTURER TO SUBMIT TO ENGINEER ALL LOCATIONS WHERE REACTIONS FROM GIRDER TRUSSES EXCEED 6,000 LBS. FOR REVIEW OF COLUMN SUPPORT CAPACITY.
    - PROVIDE SIMPSON H2.5A HURRICANE TIES AT ALL ROOF TRUSSES AND ROOF JOISTS, TYP.
    - ALL MULTIPLE STUDS UNDER HIP MASTER AND GIRDER TRUSS ENDS TO CONTINUE TO FOUNDATION.



PARTIAL
UPPER FLOOR FRAMING PLAN

SCALE: ¼" = 1'-0"

(PROJECT)

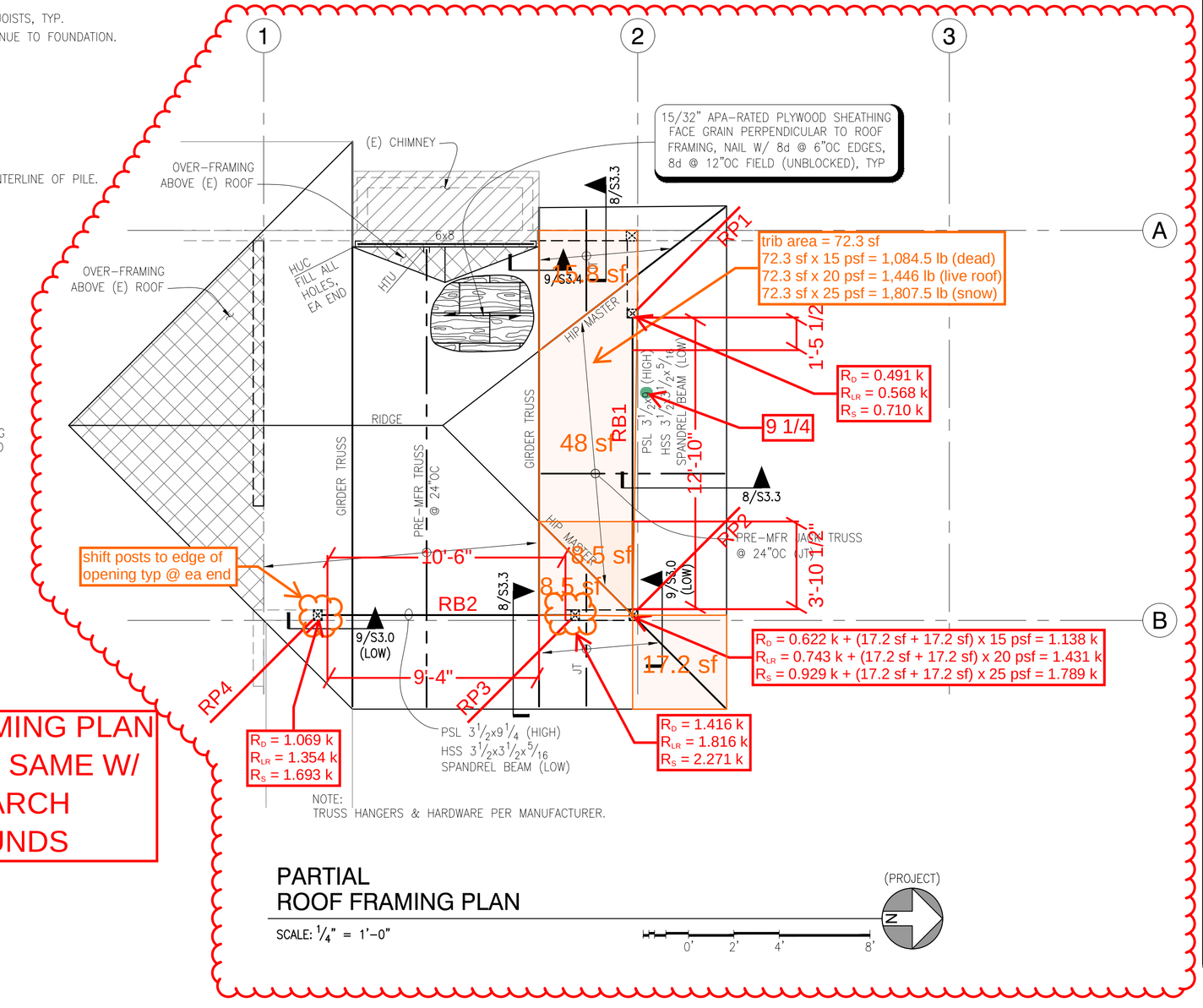
PILE PLAN NOTES

1. VERIFY ALL GRID DIMENSIONS WITH ARCHITECTURAL DRAWINGS. ALL DIMENSIONS ARE TO CENTERLINE OF PILE.
2. RP# INDICATES RETROFIT 2"ø PIPE PILE (3K ALLOWABLE).
3. P# INDICATES 2"ø PIPE PILE (3K ALLOWABLE).

SHEAR WALL KEY PLAN NOTES

1. VERIFY ALL DIMENSIONS AND ELEVATIONS WITH THE ARCHITECTURAL DRAWINGS.
2. SW-# INDICATES SHEAR WALL TYPE PER 12/S3.1. (MINIMUM LENGTH WHERE NOTED)
3. INDICATES TYPICAL HOLDOWN PER 6/S3.1 OR TIEDOWN PER 5/S3.1.
4. CONTRACTOR TO COORDINATE HOLDOWN ANCHOR BOLTS WITH STEEL POST BASE PLATES.
5. PROVIDE FULL HEIGHT SOLID BLOCKING OR DOUBLE JOISTS OVER SHEARWALLS AND BEARING WALLS AT REPETITIVE FRAMING MEMBERS. AT SHEARWALLS AND BEARING WALLS PARALLEL TO FRAMING, ALIGN (1) JOIST OVER WALL (ADDITIONAL JOISTS MAY BE REQUIRED).

ROOF FRAMING PLAN
STAYS THE SAME W/
UPDATED ARCH
BACKGROUNDS



PARTIAL
ROOF FRAMING PLAN

SCALE: ¼" = 1'-0"

(PROJECT)

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SEAL:

PRELIMINARY -
NOT FOR
CONSTRUCTION

HARRIS RESIDENCE
REMODEL
1640 72ND AVE SE
MERCER ISLAND, WA 98040

PROJECT #:	23-183
DRAWN BY:	TLT
DESIGNED BY:	RAD
DATE:	DESCRIPTION
09.14.2023	PROGRESS

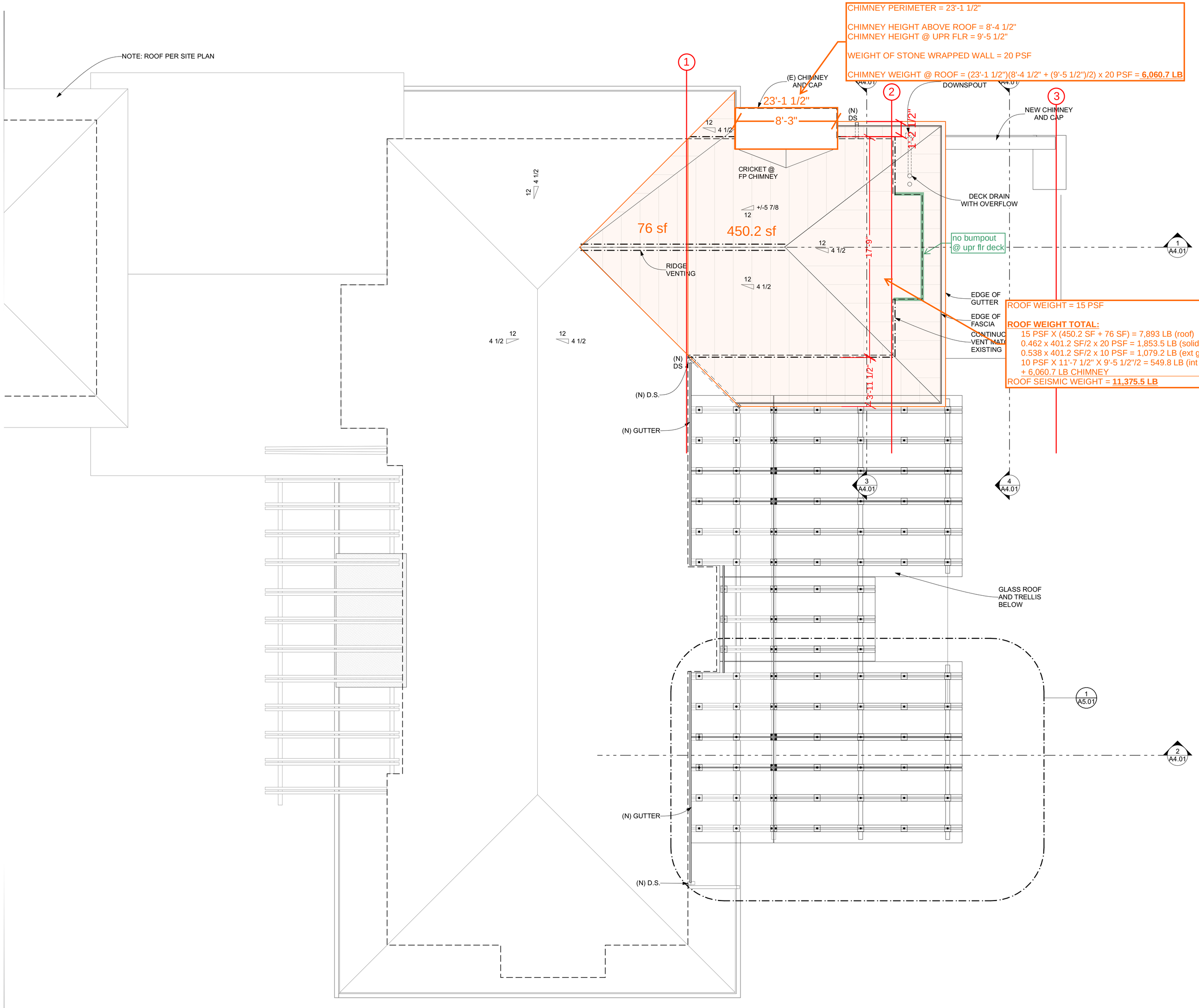
JURISDICTIONAL STAMP:

SHEET TITLE:

STRUCTURAL
FOUNDATION &
FRAMING PLANS

SHEET NUMBER:

S 2.0



ROOF VENTING CALCS

EAVE VENTING
AT ROOF:
VENTING PRODUCT: COR-A-VENT S-400 @ LOWER EAVES
10 SQ IN NFVA/LINEAL FOOT (10/144+0.0694 SQ FT/LINEAL FOOT)

RIDGE VENTING
VENTING PRODUCT COR-A-VENT V300=13.5 SQ IN NFVA/LINEAL FOOT (13.5 SQ IN /144=0.93 SQ FT)

ROOF AREA= 576 SF

REQUIRED VENTING AREA: 1/300X576= 1.92 SF
TOTAL VENTING PROVIDED: 3.85 SF

EAVE VENTING= 34.25' LINEAL FEET
34.25'X0.0694'= 2.37 SF (0.96 SF REQUIRED)

RIDGE VENTING= 16' LINEAL FEET
16'X0.093'= 1.48 SF (0.96 SF REQUIRED)

ROOF PLAN

SCALE: 1/4" = 1'-0"

0 2' 4' 8'

N

GELOTTE HOMMAS DRIVDAHL
ARCHITECTURE
2340 130th Ave. NE, Suite 100, Bellevue, WA 98005
425.828.3081
THEARTOFARCHITECTURE.COM

HARRIS REMODEL

1640 72ND AVE SE
MERCER ISLAND, WA 98040

Job No.	2110
Project Manager:	TB
Issue Date:	10/9/23

NO.	DATE	REVISION
1	06/29/2022	PERMIT REVISION - 1
2	9/10/2022	CONSTRUCTION SET
3	09/16/2022	PERMIT REVISION
4	12/09/2022	CONSTRUCTION SET
5	02/03/2023	CONSTRUCTION SET

ROOF PLAN

A2.4

FILE: 2110 Harris Remodel PRINTED: Monday, October 9, 2023

DEI
DIBBLE ENGINEERS INC

GRAVITY

Harris Residence Remodel & DEI Job #23-183

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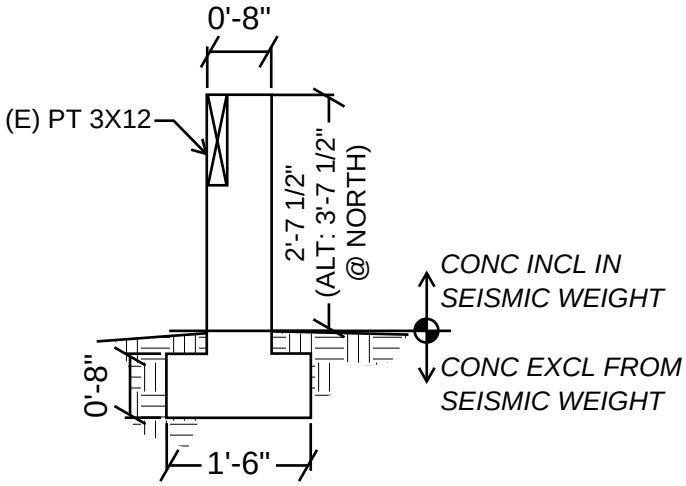
PROJECT NAME	Harris Residence Remodel	SHEET #	1
PROJECT #	23-183	DATE	10/2023
SUBJECT	Total Addition Weight/Seismic Weight	BY	LAP



SECTION: (E) RESIDENCE STEM WALL

STEM WALL HT @ (E) RESIDENCE:
Overall H = 3'-9"

For seismic weight calcs,
h = 2'-7 1/2" @ E&W
h = 3'-7 1/2" @ NORTH
stem wall @ south excluded*
**(in line w/ longer (E) stem wall along north elev)*

FOUNDATION WALL HT @ (E) PATIO:
h = 5'-0" typ @ E, W, & N elevations (full height)
h = 5'-0" + 3'-0" = 8'-0" @ 17'-0" length @ NW corner

(E) RESIDENCE CONC WEIGHT:

TOTAL:
(3'-9" - 11 1/4")(8") + (11 1/4")(8" - 2 1/2") = 1.875 ft^3/ft + 0.430 ft^3/ft = 2.305 ft^3/ft
1'-6" (8") = 1.00 ft^3/ft
Conc Area = 3.305 ft^3/ft
Length = 2 (16'-6")+ 17'-3" = 50'-3"
Weight = 3.305 ft^3/ft x 150 pcf = 495.75 plf
= **24,911.4 lb**

MAIN FLOOR SEISMIC WEIGHT:
(2'-7 1/2"-11 1/4")(8") + (11 1/4")(8" - 2 1/2") = 162 in^2+ 61.875 in^2 = 1.555 ft^3/ft
Length = 2(16'-6") = 33'-0"
Weight = 1.555 ft^3/ft x 150 pcf = 233.20 plf
= 7,695.7 lb

(3'-7 1/2" - 11 1/4")(8") + (11 1/4")(8" - 2 1/2") = 258 in^2 + 61.875 in^2 = 2.221 ft3/ft
Length = 17'-3"
Weight = 2.221 ft^3/ft x 150 pcf = 333.20 plf
= 5,747.8 lb
Total Conc Seismic Weight @ (E) Residence = 7,695.7 lb + 5,747.8 lb = **13,443.5 lb**

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PROJECT NAME	Harris Residence Remodel	SHEET #	2
PROJECT #	23-183	DATE	10/2023
SUBJECT	Total Addition Weight/Seismic Weight C	BY	LAP

(E) PATIO FOUNDATION CONC WEIGHT:

TOTAL:

Slab Area = 222.2 ft^2

Slab Weight = (150 pcf)(12" x ft/12") x 222.2 ft^2 = 33,330 lb

Typical Patio Wall Weight:

(5'-0")(12") = 5.00 ft^3/ft

(3'-0")(10") = 2.50 ft^3/ft

Conc Area = 7.50 ft^3/ft

Length = (43'-4" - 17'-0") = 26'-4"

Weight = 7.50 ft^3/ft x 150 pcf = 1,125 plf

= 29,625 lb

Extended Patio Wall Weight:

(5'-0" - 8" -3'-0")(12") = 7.333 ft^3/ft

(3'-0")(10") = 2.50 ft^3/ft

Conc Area = 9.833 ft^3/ft

Length = 17'-0"

Weight = 9.833 ft^3/ft x 150 pcf = 1,475 plf

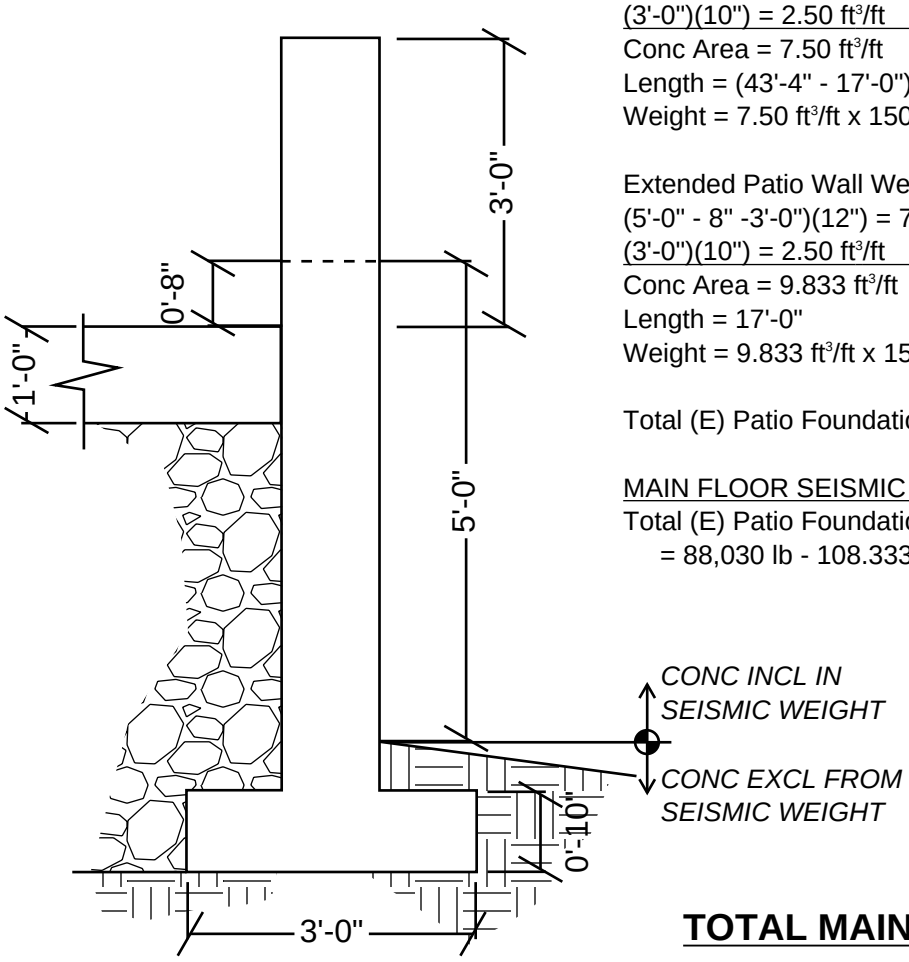
= 25,075 lb

Total (E) Patio Foundation Weight = **88,030 lb**

MAIN FLOOR SEISMIC WEIGHT:

Total (E) Patio Foundation Weight - (3'-0")(10")(43'-4") x 150 pcf

= 88,030 lb - 108.333 ft^3/ft x 150 pcf = 88,030 lb - 16,250 lb = **71,780 lb**



SECTION: (E) PATIO FOUNDATION

TOTAL MAIN FLOOR SEISMIC WEIGHT:

(E) RESIDENCE FOUNDATION WEIGHT = 13,443.5 lb

(E) PATIO FOUNDATION WEIGHT (INCL. SLAB) = 71,780 lb

(E) CHIMNEY = (23'-1 1/2")(11'-4"/2) x 20 psf = 2,620.8 lb

(E) EXT WALLS = 7,523.2 lb *(same as Upper Floor Seismic Weight)*

(E) MAIN FLOOR = 266.3 sf x 30 psf = 7,989 lb

TOTAL = **103,356.5 lb**

TOTAL ADDITION WEIGHT:

(E) ROOF W/ ADDITION = **11,375.5 lb**

(E) UPPER FLOOR W/ ADDITION = **32,692 lb**

(E) MAIN FLOOR = 103,356.5 + (88,030 lb - 71,780 lb) + (24,911.4 lb - 13,443.5 lb)

= **131,074.4 lb**

TOTAL = 175,141.9 lb = **175,142 lb**

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PROJECT NAME	Harris Residence Remodel	SHEET #	3
PROJECT #	23-183	DATE	10/2023
SUBJECT	Approx Pile Takeoff based on Weight	BY	LAP

CALC APPROX. PILE QUANTITY:

2 x 13,332 lb + 2 x 10,652 lb LIVE

D + L = 175.142 k DEAD + (222.2 sf x 60 psf x 2 floor + 266.3 sf x 40 psf x 2 floors)
= 175.142 k DEAD + 47.968 k LIVE
= 223.110 k (ASD) ⟵ governs

11,255 lb SNOW

D + 0.75L + 0.75S = 175.142 k DEAD + 0.75 (47.968 k LIVE) + 0.75 (450.2 sf x 25 psf SNOW)
= 219.559 k (ASD)

2" Ø PILE CAP = 3 tons = 6 k alw
(223.110 k X 1.25) / (6 k/pile) = 46.48 = **(47) 2" Ø piles (approx.)**

3" Ø PILE CAP = 6 tons = 12 k alw
(223.110 k X 1.25) / (12 k/pile) = 23.241 = **(24) 3" Ø piles (approx.)**

CALC APPROX. MAX PILE SPACING:

(E) RESIDENCE:

West Elevation:

DEAD LOAD (West Elev @ Chimney, governs):
495.75 plf conc foundation
6,060.7 lb + 4,808 lb + 2,620.8 lb = 13,489.5 lb chimney/7'-10" = 1,722.07 plf chimney
17'-9"/2 = 8.875' x 15 psf = 133.13 plf roof
17'-3"/2 = 8.625' x 30 psf x 2 floors = 517.5 plf floors
= **2,868.45 plf DEAD**

LIVE LOAD (West Elev @ Chimney, governs):
17'-3"/2 = 8.625' x 40 psf x 2 floors = **690 plf LIVE**

SNOW LOAD (West Elev @ Chimney, governs):
17'-9"/2 = 8.875' x 25 psf = **221.88 plf SNOW**

Calculate Min No. Piles @ West Chimney:
3,558.45 plf x 7'-10"
= 27,874.5 lb total @ west elevation chimney

27,874.5 lb / 6,000 lb = 4.646 piles min = (5) 2" Ø piles

w = 2,868.45 plf + 690 plf = **3,558.45 plf** ⟵ governs
= 2,868.45 plf + 0.75(690 plf + 221.88 plf) = 3,552.35 plf

6,000 lb alw pile cap / (3,558.45 plf x 1.25) = 1.349' max pile spacing (w/ 80% efficiency)
= 1.686' max pile spacing (w/ 100% efficiency)

DEAD LOAD (West Elev w/out Chimney)
495.75 plf conc foundation
(9'-5 1/2"+11'-4") x 20 psf = 415.83 plf ext wall
17'-9"/2 + 4' cant = 12.875' x 15 psf = 193.13 plf roof
17'-3"/2 = 8.625' x 40 psf x 2 floors = 517.5 plf floors
= **1,622.21 plf DEAD**

LIVE LOAD (West Elev w/out Chimney) = **690 plf LIVE**
SNOW LOAD (West Elev w/out Chimney)
17'-9"/2 + 4' cant = 12.875' x 25 psf = **321.88 plf SNOW**

w = 1,622.21 plf + 690 plf = 2,312.21 plf
= 1,622.21 plf + 0.75(690+321.88 plf) = **2,381.11 plf** ⟵ governs

6,000 lb alw pile cap / (2,381.11 plf x 1.25) = 2.016' max pile spacing (w/ 80% efficiency)
= 2.520' max pile spacing (w/ 100% efficiency)

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PROJECT NAME: Harris Residence Remodel | SHEET #: 3
PROJECT #: 23-183 | DATE: 10/2023
SUBJECT: Approx Pile Takeoff based on Weight | BY: LAP

CONTINUED CALC APPROX. MAX PILE SPACING:

(E) RESIDENCE:

East Elevation: same as West Elevation w/out Chimney
w = 1,622.21 plf + 690 plf = 2,312.21 plf
= 1,622.21 plf + 0.75(690+321.88 plf) = **2,381.11 plf** ⟵ governs

6,000 lb alw pile cap / (2,381.11 plf x 1.25) = 2.016' max pile spacing (w/ 80% efficiency)
= 2.520' max pile spacing (w/ 100% efficiency)

North Elevation:
DEAD LOAD
495.75 plf conc foundation
4'/2 + 4' cant = 6' x 15 psf = 90 plf roof
(13'-3")/2 = 6.625' x 30 psf = 198.75 plf deck
16" (ft/12") = 1.333 ft x 30 psf x 2 floors = 80 plf floors
33,330 lb slab weight / (2 x 17' + 2 x 13'-3") = 550.91 plf conc slab
(9'-5 1/2"+11'-4") x 15 psf = 311.875 plf ext wall
= **1,727.29 plf DEAD**

LIVE LOAD
(13'-3")/2 = 6.625' x 60 psf = 397.5 plf deck
16" (ft/12") = 1.333' x 40 psf x 2 floors = 106.67 plf floors
= **504.17 plf LIVE**

SNOW LOAD
4"/2 + 4' cant = 6' x 25 psf = 150 plf roof
(13'-3")/2 = 6.625' x 25 psf = 165.63 plf deck
= **315.63 plf SNOW**

w = 1,727.29 plf + 504.17 plf = 2,231.46 plf
= 1,727.29 plf + 0.75(504.17+315.63 plf) = **2,342.14 plf**

6,000 lb alw pile cap / (2,342.14 plf x 1.25) = 2.049' max pile spacing (w/ 80% efficiency)
= 2.562' max pile spacing (w/ 100% efficiency)

Calculate Min No. Piles @ East:
2,381.11 plf x 16'-6" = 39,288.32 lb total @ east elevation

39,288.32 lb / 6,000 lb = 6.548 piles min = (7) 2" Ø piles

Calculate Min No. Piles @ North:
2,342.14 plf x 17'-3" = 40,401.92 lb total @ east elevation

40,401.92 lb / 6,000 lb = 6.734 piles min = (7) 2" Ø piles

(E) PATIO FOUNDATION:
**not at column point loads*
DEAD LOAD (NW Corner Governs):
1,475 plf conc foundation
33,330 lb slab weight / (2 x 17' + 2 x 13'-3") = 550.91 plf conc slab
(11'-4" + 6'-9") = 18.083' x 20 psf = 361.67 plf ext walls
= **2,387.58 plf DEAD**

LIVE LOAD:
222.2 sf / (2 x 17' + 2 x 13'-3") = 3.673' x 60 psf = **220.36 plf LIVE**

w = 2,387.58 plf + 220.36 plf = **2,607.94 plf**

6,000 lb alw pile cap / (2,607.94 plf x 1.25) = 1.841' max pile spacing (w/ 80% efficiency)
= 2.301' max pile spacing (w/ 100% efficiency)
12,000 lb alw pile cap / (2,246.36 plf x 1.25) = 4.274' max pile spacing (w/ 80% efficiency)
= 5.342' max pile spacing (w/ 100% efficiency)

Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: RB1 - North Elev

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

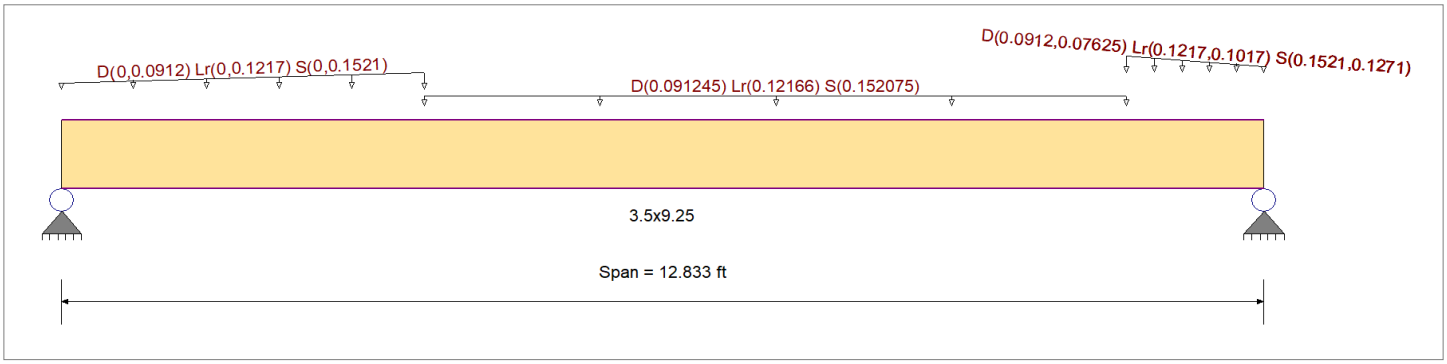
Wood Species : Trus Joist
Wood Grade : Parallam PSL 2.0E

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

Fb +	2,900.0 psi
Fb -	2,900.0 psi
Fc - Prll	2,900.0 psi
Fc - Perp	625.0 psi
Fv	290.0 psi
Ft	2,025.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,016.54 ksi
Density	45.070 pcf



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
Uniform Load : D = 0.0150, Lr = 0.020, S = 0.0250 ksf, Extent = 3.875 -->> 11.375 ft, Tributary Width = 6.083 ft
Varying Uniform Load : D= 0.0->0.09120, Lr= 0.0->0.1217, S= 0.0->0.1521 k/ft, Extent = 0.0 -->> 3.875 ft, Trib Width = 1.0 ft

Varying Uniform Load : D= 0.09120->0.07625, Lr= 0.1217->0.1017, S= 0.1521->0.1271 k/ft, Extent = 11.375 -->> 12.833 ft, Trib Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.344 : 1	Maximum Shear Stress Ratio	=	0.192 : 1
Section used for this span		3.5x9.25	Section used for this span		3.5x9.25
fb: Actual	=	1,180.59 psi	fv: Actual	=	64.08 psi
F'b	=	3,432.76 psi	F'v	=	333.50 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	6.604 ft	Location of maximum on span	=	12.084 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.188 in	Ratio =	820	>=360	Span: 1 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0	<360	n/a
Max Downward Total Deflection	0.314 in	Ratio =	490	>=240	Span: 1 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0	<240	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 12.833 ft	1	0.176	0.098	0.90	1.00	1.00	1.00	1.029	1.00	1.00	1.00	1.97	474.0	2,686.5	0.55	25.7	261.0
+D+Lr					1.00	1.00	1.00	1.029	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 12.833 ft	1	0.279	0.156	1.25	1.00	1.00	1.00	1.029	1.00	1.00	1.00	4.32	1,039.3	3,731.3	1.22	56.4	362.5
+D+S					1.00	1.00	1.00	1.029	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 12.833 ft	1	0.344	0.192	1.15	1.00	1.00	1.00	1.029	1.00	1.00	1.00	4.91	1,180.6	3,432.8	1.38	64.1	333.5

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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: RB1 - North Elev

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+D+0.750Lr					1.00	1.00	1.00	1.029	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 12.833 ft	1	0.241	0.134	1.25	1.00	1.00	1.00	1.029	1.00	1.00	1.00	3.73	898.0	3,731.3	1.05	48.7	362.5
+D+0.750S					1.00	1.00	1.00	1.029	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 12.833 ft	1	0.292	0.163	1.15	1.00	1.00	1.00	1.029	1.00	1.00	1.00	4.18	1,003.9	3,432.8	1.18	54.5	333.5
+0.60D					1.00	1.00	1.00	1.029	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 12.833 ft	1	0.060	0.033	1.60	1.00	1.00	1.00	1.029	1.00	1.00	1.00	1.18	284.4	4,776.0	0.33	15.4	464.0

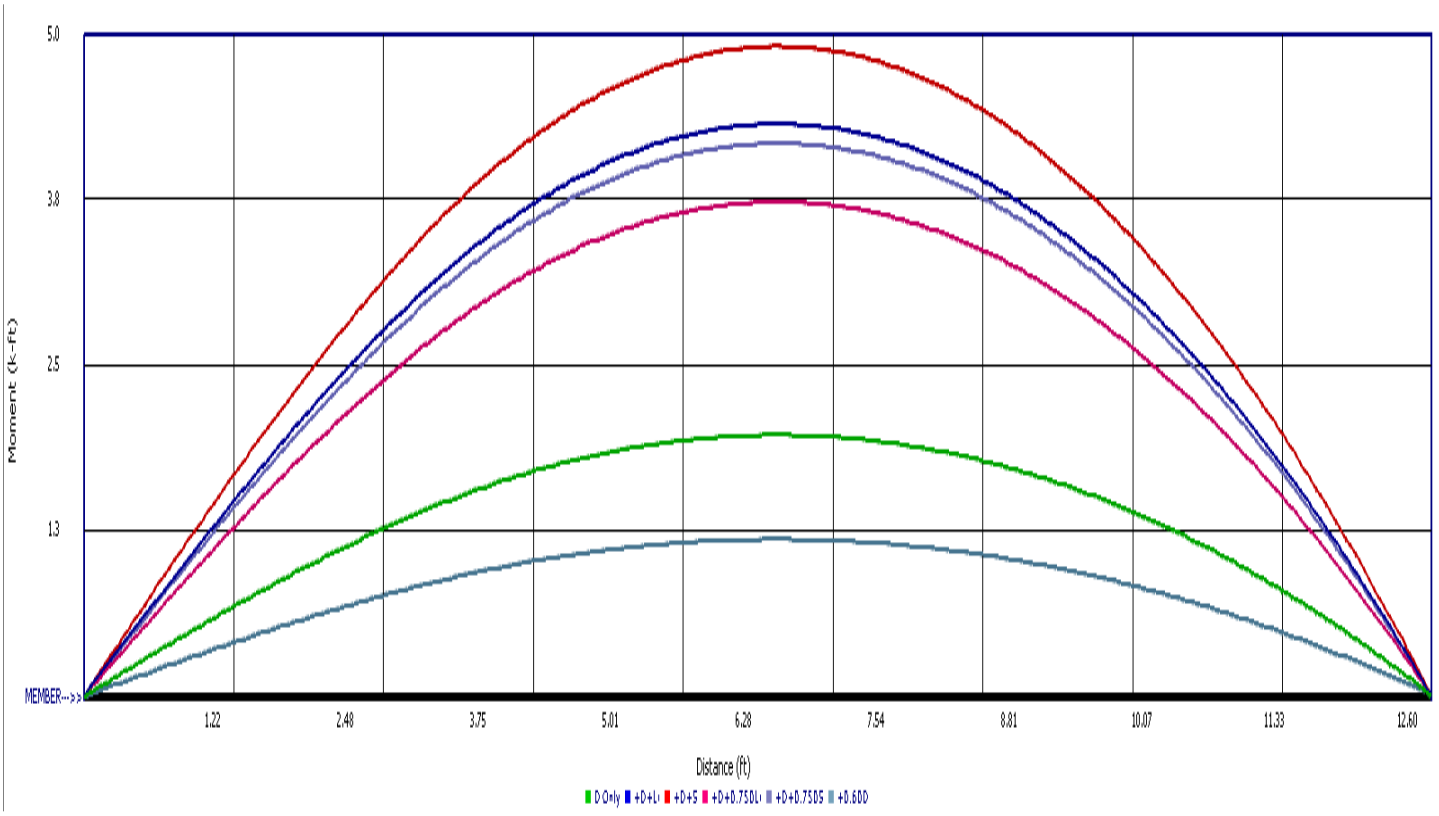
Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.3137	6.510		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	1.201	1.551
Max Upward from Load Combinations	1.201	1.551
Max Upward from Load Cases	0.710	0.929
D Only	0.491	0.622
+D+Lr	1.059	1.365
+D+S	1.201	1.551
+D+0.750Lr	0.917	1.179
+D+0.750S	1.024	1.319
+0.60D	0.295	0.373
Lr Only	0.568	0.743
S Only	0.710	0.929



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(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: RB2 - East Elev

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

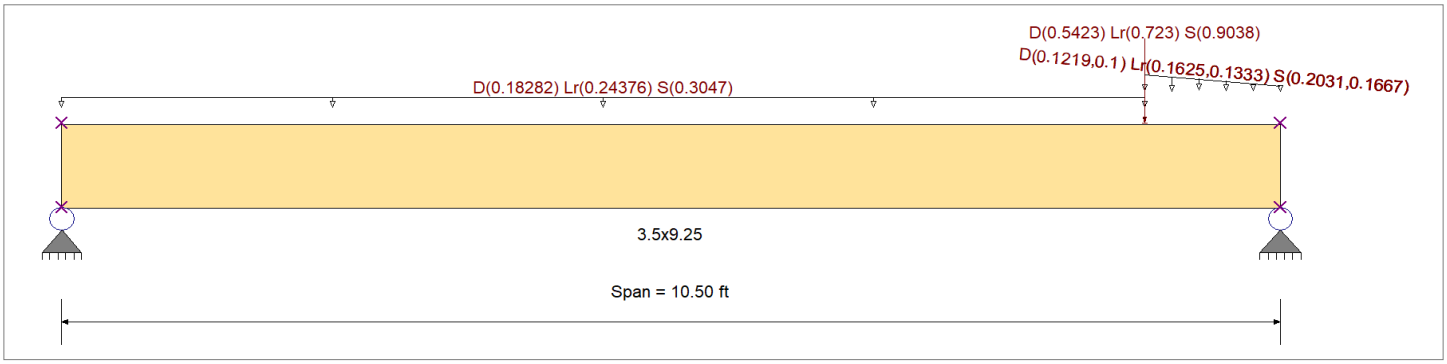
Material Properties

Analysis Method :	Allowable Stress Design
Load Combination :	IBC 2021
Wood Species :	Trus Joist
Wood Grade :	Parallam PSL 2.0E
Beam Bracing :	Completely Unbraced

Fb +	2,900.0 psi
Fb -	2,900.0 psi
Fc - Prll	2,900.0 psi
Fc - Perp	625.0 psi
Fv	290.0 psi
Ft	2,025.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,016.54 ksi
Density	45.070 pcf



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
Uniform Load : D = 0.0150, Lr = 0.020, S = 0.0250 ksf, Extent = 0.0 -->> 9.333 ft, Tributary Width = 12.188 ft
Varying Uniform Load : D= 0.1219->0.10, Lr= 0.1625->0.1333, S= 0.2031->0.1667 k/ft, Extent = 9.333 -->> 10.50 ft, Trib Width = 1.0 ft
Point Load : D = 0.5423, Lr = 0.7230, S = 0.9038 k @ 9.333 ft, (GT End Rxn)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.561 : 1	Maximum Shear Stress Ratio	=	0.481 : 1
Section used for this span		3.5x9.25	Section used for this span		3.5x9.25
fb: Actual	=	1,842.18 psi	fv: Actual	=	160.28 psi
F'b	=	3,284.74 psi	F'v	=	333.50 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	5.557 ft	Location of maximum on span	=	9.734 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.207 in	Ratio =	610 >=360	Span: 1 : S Only
Max Upward Transient Deflection	0 in	Ratio =	0 <360	n/a
Max Downward Total Deflection	0.336 in	Ratio =	374 >=240	Span: 1 : +D+S
Max Upward Total Deflection	0 in	Ratio =	0 <240	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 10.50 ft	1	0.273	0.235	0.90	1.00	1.00	0.97	1.029	1.00	1.00	1.00	2.96	711.7	2,607.8	1.33	61.4	261.0
+D+Lr					1.00	1.00	0.97	1.029	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 10.50 ft	1	0.456	0.388	1.25	1.00	1.00	0.95	1.029	1.00	1.00	1.00	6.72	1,616.1	3,545.5	3.03	140.5	362.5
+D+S					1.00	1.00	0.95	1.029	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 10.50 ft	1	0.561	0.481	1.15	1.00	1.00	0.96	1.029	1.00	1.00	1.00	7.66	1,842.2	3,284.7	3.46	160.3	333.5
+D+0.750Lr					1.00	1.00	0.96	1.029	1.00	1.00	1.00			0.0	0.00	0.0	0.0

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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: RB2 - East Elev

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 10.50 ft	1	0.392	0.333	1.25	1.00	1.00	0.95	1.029	1.00	1.00	1.00	5.78	1,390.0	3,545.5	2.61	120.7	362.5
+D+0.750S					1.00	1.00	0.95	1.029	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 10.50 ft	1	0.475	0.406	1.15	1.00	1.00	0.96	1.029	1.00	1.00	1.00	6.49	1,559.6	3,284.7	2.93	135.6	333.5
+0.60D					1.00	1.00	0.96	1.029	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 10.50 ft	1	0.097	0.079	1.60	1.00	1.00	0.92	1.029	1.00	1.00	1.00	1.78	427.0	4,395.0	0.80	36.9	464.0

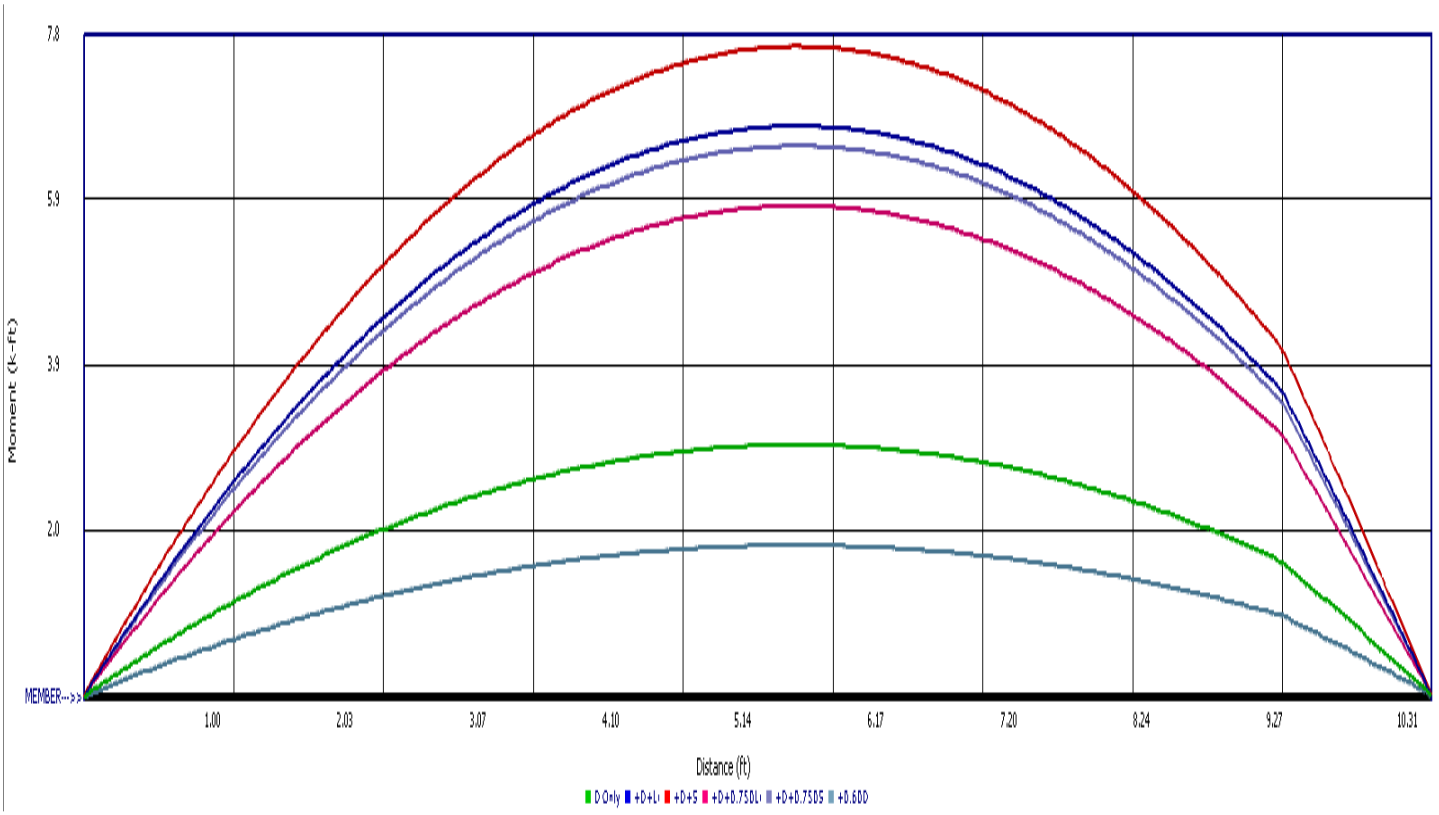
Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.3364	5.365		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	2.762	3.686
Max Upward from Load Combinations	2.762	3.686
Max Upward from Load Cases	1.693	2.271
D Only	1.069	1.416
+D+Lr	2.423	3.232
+D+S	2.762	3.686
+D+0.750Lr	2.084	2.778
+D+0.750S	2.338	3.119
+0.60D	0.641	0.849
Lr Only	1.354	1.816
S Only	1.693	2.271



Dibble Engineers, Inc.
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(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: harris res remodel_rev.ec6

DESCRIPTION: RP2 (east end of RB1 governs) (SW-B2, Upr Flr North Elev Spandrel)

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design		
End Fixities	Top & Bottom Pinned		
Overall Column Height	9.7916667 ft		
(Used for non-slender calculations)			
Wood Species	Hem Fir		
Wood Grade	No.2		
Fb +	850.0 psi	Fv	150.0 psi
Fb -	850.0 psi	Ft	525.0 psi
Fc - Prll	1,300.0 psi	Density	26.840 pcf
Fc - Perp	405.0 psi		

Wood Section Name	**3-2x6**	
Wood Grading/Manuf.	Graded Lumber	
Wood Member Type	Sawn	
Exact Width	**4.50** in	Allow Stress Modification Factors
Exact Depth	**5.50** in	
Area	24.750 in^2	Cf or Cv for Bending 1.30
Ix	62.391 in^4	Cf or Cv for Compressio 1.10
Iy	41.766 in^4	Cf or Cv for Tension 1.30
		Cm : Wet Use Factor 1.0
		Ct : Temperature Fact 1.0
		Cfu : Flat Use Factor 1.0
		Kf : Built-up columns 1.0
		Use Cr : Repetitive ? No

E : Modulus of Elasticity . . .

	x-x Bending	y-y Bending	Axial
Basic	1,300.0	1,300.0	1,300.0 ksi
Minimum	470.0	470.0	

Column Buckling Condition:
ABOUT X-X Axis: Lux = 9.7916667 ft, Kx = 1.0
ABOUT Y-Y Axis: Luy = 9.7916667 ft, Ky = 1.0

Applied Loads

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

Column self weight included : 45.170 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 9.792 ft, D = 1.138, Lr = 1.431, S = 1.789, E = 7.146 k
BENDING LOADS . . .
Lat. Point Load at 7.208 ft creating Mx-x, W = 0.8560 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.4748 : 1**

Load Combination	+D+0.750S+0.5250E
Governing NDS Forumla	Comp Only, fc/Fc'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	6.277 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	534.12 psi

PASS Maximum Shear Stress Ratio = **0.09548 : 1**

Load Combination	+D+0.60W
Location of max.above base	9.792 ft
Applied Design Shear	34.372 psi
Allowable Shear	240.0 psi

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y	0.6302 k	Bottom along Y-Y	0.2258 k
Top along X-X	0.0 k	Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .

Along Y-Y 0.2624 in at 5.454 ft above base
for load combination : W Only

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

Other Factors used to calculate allowable stresses . . .

	Bending	Compression	Tension

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.900	0.390	0.09517	PASS	0.0 ft	0.0	PASS	9.792 ft
+D+Lr	1.250	0.293	0.2018	PASS	0.0 ft	0.0	PASS	9.792 ft
+D+S	1.150	0.315	0.2315	PASS	0.0 ft	0.0	PASS	9.792 ft
+D+0.750Lr	1.250	0.293	0.1742	PASS	0.0 ft	0.0	PASS	9.792 ft
+D+0.750S	1.150	0.315	0.1966	PASS	0.0 ft	0.0	PASS	9.792 ft
+D+0.60W	1.600	0.233	0.3193	PASS	7.163 ft	0.09548	PASS	9.792 ft
+D+0.70E	1.600	0.233	0.4679	PASS	0.0 ft	0.0	PASS	9.792 ft
+D+0.750Lr+0.450W	1.600	0.233	0.2760	PASS	7.163 ft	0.07161	PASS	9.792 ft
+D+0.750S+0.450W	1.600	0.233	0.2869	PASS	7.163 ft	0.07161	PASS	9.792 ft

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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: harris res remodel_rev.ec6

DESCRIPTION: RP2 (east end of RB1 governs) (SW-B2, Upr Flr North Elev Spandrel)

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
+D+0.750S+0.5250E	1.600	0.233	0.4748	PASS	0.0 ft	0.0	PASS	9.792 ft
+0.60D+0.60W	1.600	0.233	0.3069	PASS	7.163 ft	0.09548	PASS	9.792 ft
+0.60D+0.70E	1.600	0.233	0.4321	PASS	0.0 ft	0.0	PASS	9.792 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction @ Base	@ Top	k	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base	My - End Moments k-ft @ Base	@ Top	Mx - End Moments @ Base	@ Top
D Only						1.183				
+D+Lr						2.614				
+D+S						2.972				
+D+0.750Lr						2.256				
+D+0.750S						2.525				
+D+0.60W				0.136	0.378	1.183				
+D+0.70E						6.185				
+D+0.750Lr+0.450W				0.102	0.284	2.256				
+D+0.750S+0.450W				0.102	0.284	2.525				
+D+0.750S+0.5250E						6.277				
+0.60D+0.60W				0.136	0.378	0.710				
+0.60D+0.70E						5.712				
Lr Only						1.431				
S Only						1.789				
W Only				0.226	0.630					
E Only						7.146				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+Lr	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+S	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.750Lr	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.750S	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.60W	0.0000 in	0.000ft	0.157 in	5.454 ft
+D+0.70E	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.750Lr+0.450W	0.0000 in	0.000ft	0.118 in	5.454 ft
+D+0.750S+0.450W	0.0000 in	0.000ft	0.118 in	5.454 ft
+D+0.750S+0.5250E	0.0000 in	0.000ft	0.000 in	0.000 ft
+0.60D+0.60W	0.0000 in	0.000ft	0.157 in	5.454 ft
+0.60D+0.70E	0.0000 in	0.000ft	0.000 in	0.000 ft
Lr Only	0.0000 in	0.000ft	0.000 in	0.000 ft
S Only	0.0000 in	0.000ft	0.000 in	0.000 ft
W Only	0.0000 in	0.000ft	0.262 in	5.454 ft
E Only	0.0000 in	0.000ft	0.000 in	0.000 ft

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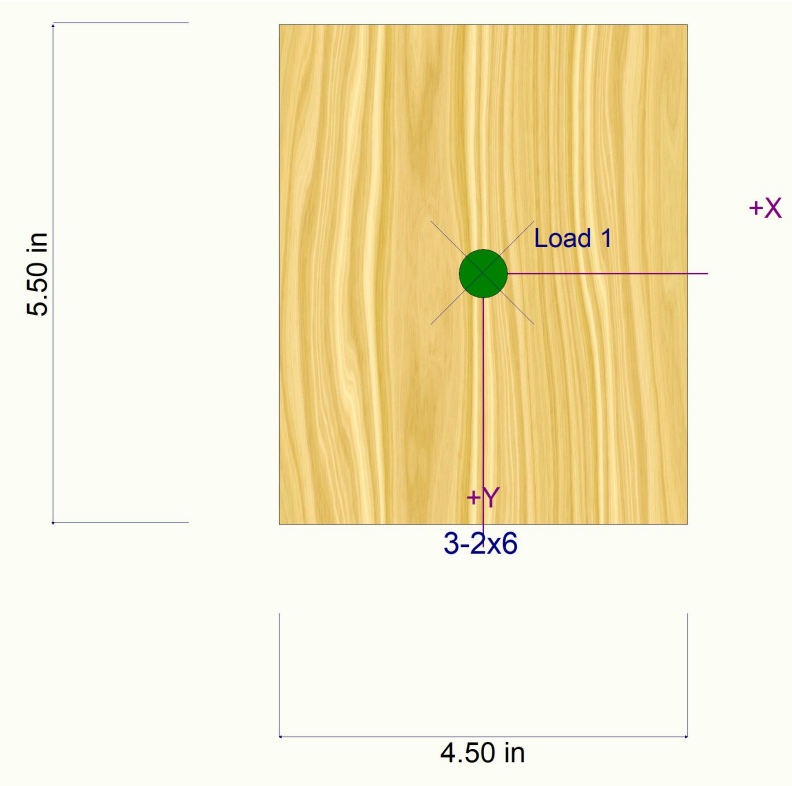
Project Title:
Engineer:
Project ID:
Project Descr:

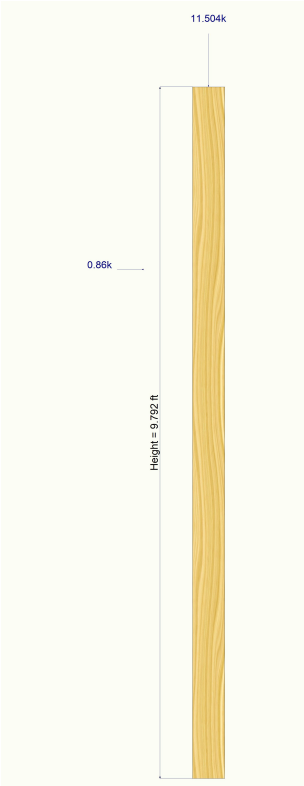
Wood Column

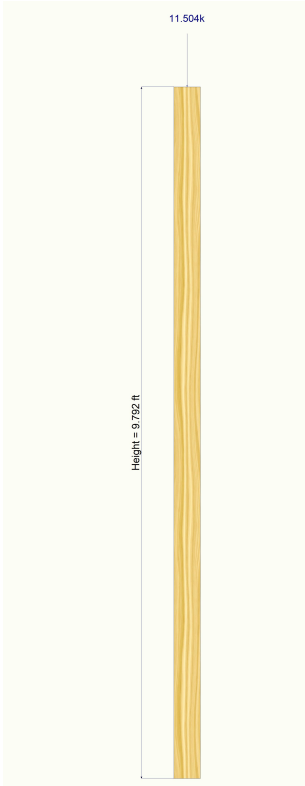
Project File: harris res remodel_rev.ec6

DESCRIPTION: RP2 (east end of RB1 governs) (SW-B2, Upr Flr North Elev Spandrel)

Sketches







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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: harris res remodel_rev.ec6

DESCRIPTION: RP4 (north end of RB2 governs) (SW-B1, Upr Flr East Spandrel)

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design	Wood Section Name	**3-2x6**
End Fixities	Top & Bottom Pinned	Wood Grading/Manuf.	Graded Lumber
Overall Column Height	9.7916667 ft	Wood Member Type	Sawn
(Used for non-slender calculations)			
Wood Species	Hem Fir	Exact Width	**4.50** in
Wood Grade	No.2	Exact Depth	**5.50** in
Fb +	850.0 psi	Fv	150.0 psi
Fb -	850.0 psi	Ft	525.0 psi
Fc - Prll	1,300.0 psi	Density	26.840 pcf
Fc - Perp	405.0 psi		

Area	24.750 in^2
Ix	62.391 in^4
Iy	41.766 in^4

Allow Stress Modification Factors

Cf or Cv for Bending	1.30
Cf or Cv for Compressio	1.10
Cf or Cv for Tension	1.30
Cm : Wet Use Factor	1.0
Ct : Temperature Fact	1.0
Cfu : Flat Use Factor	1.0
Kf : Built-up columns	1.0
Use Cr : Repetitive ?	No

E : Modulus of Elasticity . . .

	x-x Bending	y-y Bending	Axial
Basic	1,300.0	1,300.0	1,300.0 ksi
Minimum	470.0	470.0	

Column Buckling Condition:
ABOUT X-X Axis: Lux = 9.7916667 ft, Kx = 1.0
ABOUT Y-Y Axis: Luy = 9.7916667 ft, Ky = 1.0

Applied Loads

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

Column self weight included : 45.170 lbs * Dead Load Factor
AXIAL LOADS . . .
Axial Load at 9.792 ft, D = 1.416, Lr = 1.816, S = 2.271, E = 8.435 k
BENDING LOADS . . .
Lat. Point Load at 7.208 ft creating Mx-x, W = 0.7210 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.5744 : 1**

Load Combination	+D+0.750S+0.5250E
Governing NDS Forumla	Comp Only, fc/Fc'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	7.593 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	534.12 psi

PASS Maximum Shear Stress Ratio = **0.08042 : 1**

Load Combination	+D+0.60W
Location of max.above base	9.792 ft
Applied Design Shear	28.952 psi
Allowable Shear	240.0 psi

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y	0.5308 k	Bottom along Y-Y	0.1902 k
Top along X-X	0.0 k	Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .

Along Y-Y 0.2210 in at 5.454 ft above base
for load combination : W Only

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

Other Factors used to calculate allowable stresses . . .

	Bending	Compression	Tension

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.900	0.390	0.1175	PASS	0.0 ft	0.0	PASS	9.792 ft
+D+Lr	1.250	0.293	0.2530	PASS	0.0 ft	0.0	PASS	9.792 ft
+D+S	1.150	0.315	0.2906	PASS	0.0 ft	0.0	PASS	9.792 ft
+D+0.750Lr	1.250	0.293	0.2180	PASS	0.0 ft	0.0	PASS	9.792 ft
+D+0.750S	1.150	0.315	0.2464	PASS	0.0 ft	0.0	PASS	9.792 ft
+D+0.60W	1.600	0.233	0.2781	PASS	7.163 ft	0.08042	PASS	9.792 ft
+D+0.70E	1.600	0.233	0.5572	PASS	0.0 ft	0.0	PASS	9.792 ft
+D+0.750Lr+0.450W	1.600	0.233	0.260	PASS	7.163 ft	0.06032	PASS	9.792 ft
+D+0.750S+0.450W	1.600	0.233	0.2758	PASS	7.163 ft	0.06032	PASS	9.792 ft

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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: harris res remodel_rev.ec6

DESCRIPTION: RP4 (north end of RB2 governs) (SW-B1, Upr Flr East Spandrel)

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
+D+0.750S+0.5250E	1.600	0.233	0.5744	PASS	0.0 ft	0.0	PASS	9.792 ft
+0.60D+0.60W	1.600	0.233	0.2626	PASS	7.163 ft	0.08042	PASS	9.792 ft
+0.60D+0.70E	1.600	0.233	0.5130	PASS	0.0 ft	0.0	PASS	9.792 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction @ Base	@ Top	k	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base	My - End Moments k-ft @ Base	@ Top	Mx - End Moments @ Base	@ Top
D Only						1.461				
+D+Lr						3.277				
+D+S						3.732				
+D+0.750Lr						2.823				
+D+0.750S						3.164				
+D+0.60W				0.114	0.318	1.461				
+D+0.70E						7.366				
+D+0.750Lr+0.450W				0.086	0.239	2.823				
+D+0.750S+0.450W				0.086	0.239	3.164				
+D+0.750S+0.5250E						7.593				
+0.60D+0.60W				0.114	0.318	0.877				
+0.60D+0.70E						6.781				
Lr Only						1.816				
S Only						2.271				
W Only				0.190	0.531					
E Only						8.435				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+Lr	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+S	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.750Lr	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.750S	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.60W	0.0000 in	0.000ft	0.133 in	5.454 ft
+D+0.70E	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.750Lr+0.450W	0.0000 in	0.000ft	0.099 in	5.454 ft
+D+0.750S+0.450W	0.0000 in	0.000ft	0.099 in	5.454 ft
+D+0.750S+0.5250E	0.0000 in	0.000ft	0.000 in	0.000 ft
+0.60D+0.60W	0.0000 in	0.000ft	0.133 in	5.454 ft
+0.60D+0.70E	0.0000 in	0.000ft	0.000 in	0.000 ft
Lr Only	0.0000 in	0.000ft	0.000 in	0.000 ft
S Only	0.0000 in	0.000ft	0.000 in	0.000 ft
W Only	0.0000 in	0.000ft	0.221 in	5.454 ft
E Only	0.0000 in	0.000ft	0.000 in	0.000 ft

Dibble Engineers, Inc.
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(425) 828-4200

Project Title:
Engineer:
Project ID:
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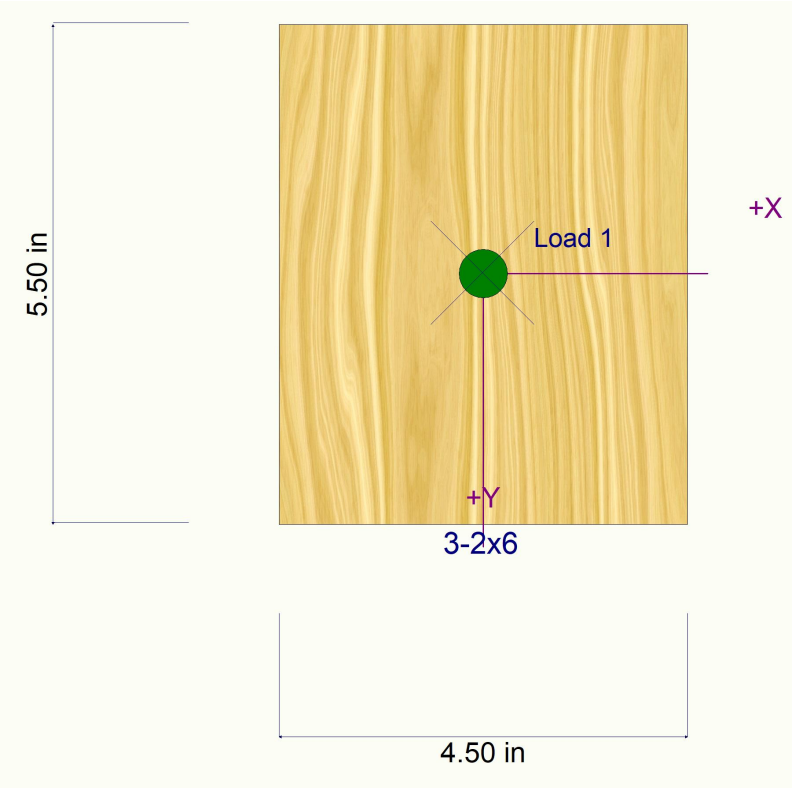
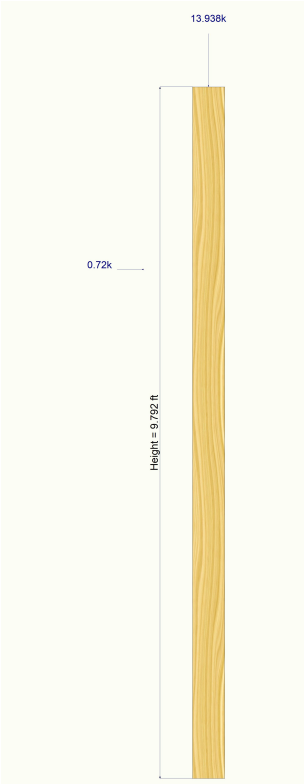
Wood Column

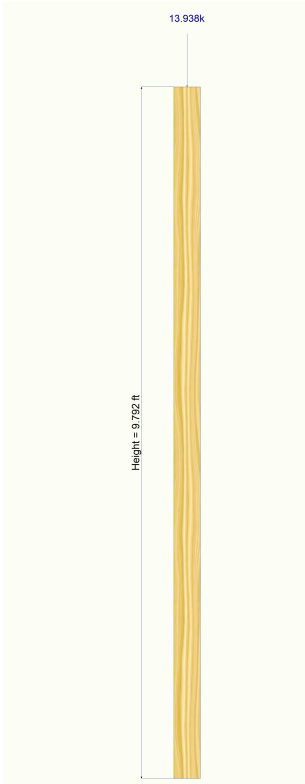
Project File: harris res remodel_rev.ec6

DESCRIPTION: RP4 (north end of RB2 governs) (SW-B1, Upr Flr East Spandrel)

Sketches







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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: DB1 - East Deck Edge (Joist Parallel)

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

Wood Species : Trus Joist
Wood Grade : MicroLam LVL 2.0 E

Beam Bracing : Beam bracing is defined as a set spacing over all spans

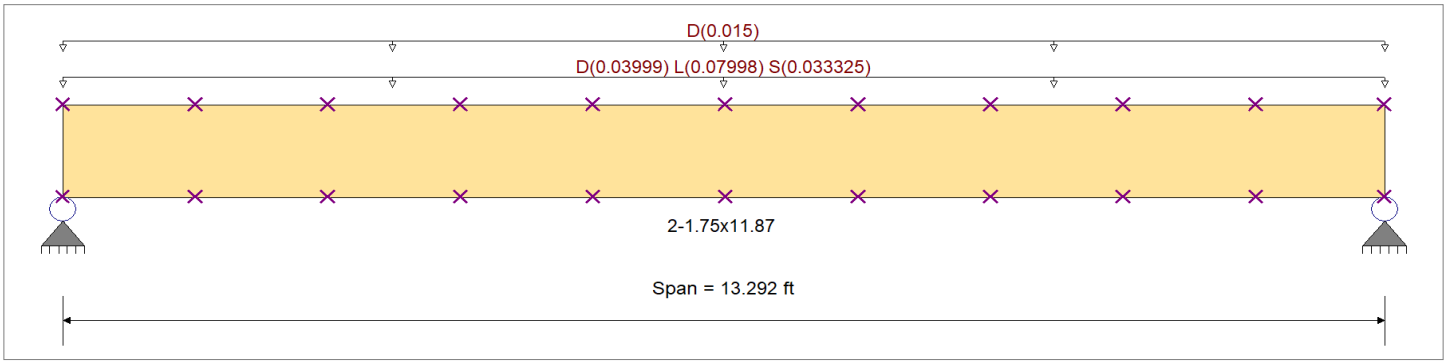
Fb +	2600 psi
Fb -	2600 psi
Fc - Prll	2510 psi
Fc - Perp	750 psi
Fv	285 psi
Ft	1555 psi

E : Modulus of Elasticity

Ebend- xx	2000 ksi
Eminbend - xx	1016.535 ksi
Density	42.01 pcf

Unbraced Lengths

First Brace starts at 1.333 ft from Left-Most support
Regular spacing of lateral supports on length of beam = 1.333 ft



Applied Loads

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

Beam self weight calculated and added to loading
Uniform Load : D = 0.030, L = 0.060, S = 0.0250 ksf, Tributary Width = 1.333 ft
Uniform Load : D = 0.0150 , Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.183 : 1	Maximum Shear Stress Ratio	=	0.106 : 1
Section used for this span		2-1.75x11.87	Section used for this span		2-1.75x11.87
fb: Actual	=	473.88 psi	fv: Actual	=	30.13 psi
F'b	=	2,594.06 psi	F'v	=	285.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	6.646 ft	Location of maximum on span	=	12.321 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.058 in	Ratio =	2757 >=600	Span: 1 : L Only
Max Upward Transient Deflection	0 in	Ratio =	0 <600	n/a
Max Downward Total Deflection	0.110 in	Ratio =	1450 >=480	Span: 1 : +D+0.750L+0.750S
Max Upward Total Deflection	0 in	Ratio =	0 <480	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 1.310 ft	1	0.033	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.53	76.8	2,335.9	0.38	13.7	256.5
Length = 1.310 ft	1	0.059	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.94	136.9	2,335.9	0.36	13.7	256.5
Length = 1.358 ft	1	0.078	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.24	181.4	2,335.6	0.27	13.7	256.5
Length = 1.310 ft	1	0.089	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.42	207.2	2,335.9	0.18	13.7	256.5
Length = 1.358 ft	1	0.093	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.48	216.2	2,335.6	0.09	13.7	256.5
Length = 1.310 ft	1	0.093	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.48	216.2	2,335.9	0.09	13.7	256.5

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Project Title:
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Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: DB1 - East Deck Edge (Joist Parallel)

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 1.358 ft	1	0.089	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.42	207.8	2,335.6	0.18	13.7	256.5
Length = 1.310 ft	1	0.078	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.24	181.4	2,335.9	0.27	13.7	256.5
Length = 1.358 ft	1	0.059	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.95	138.8	2,335.6	0.36	13.7	256.5
Length = 1.310 ft	1	0.033	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.53	76.8	2,335.9	0.38	13.7	256.5
+D+L					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.310 ft	1	0.065	0.106	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.15	168.4	2,594.4	0.83	30.1	285.0
Length = 1.310 ft	1	0.116	0.106	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.06	299.9	2,594.4	0.78	30.1	285.0
Length = 1.358 ft	1	0.153	0.106	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.72	397.5	2,594.1	0.59	30.1	285.0
Length = 1.310 ft	1	0.175	0.106	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.11	454.1	2,594.4	0.39	30.1	285.0
Length = 1.358 ft	1	0.183	0.106	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.25	473.9	2,594.1	0.20	30.1	285.0
Length = 1.310 ft	1	0.183	0.106	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.25	473.9	2,594.4	0.19	30.1	285.0
Length = 1.358 ft	1	0.176	0.106	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.12	455.5	2,594.1	0.39	30.1	285.0
Length = 1.310 ft	1	0.153	0.106	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.72	397.5	2,594.4	0.59	30.1	285.0
Length = 1.358 ft	1	0.117	0.106	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.08	304.1	2,594.1	0.78	30.1	285.0
Length = 1.310 ft	1	0.065	0.106	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.15	168.4	2,594.4	0.83	30.1	285.0
+D+S					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.310 ft	1	0.039	0.063	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.79	115.0	2,981.9	0.57	20.6	327.8
Length = 1.310 ft	1	0.069	0.063	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.40	204.8	2,981.9	0.54	20.6	327.8
Length = 1.358 ft	1	0.091	0.063	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.86	271.4	2,981.4	0.40	20.6	327.8
Length = 1.310 ft	1	0.104	0.063	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.13	310.1	2,981.9	0.27	20.6	327.8
Length = 1.358 ft	1	0.109	0.063	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.22	323.6	2,981.4	0.14	20.6	327.8
Length = 1.310 ft	1	0.109	0.063	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.22	323.6	2,981.9	0.13	20.6	327.8
Length = 1.358 ft	1	0.104	0.063	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.13	311.0	2,981.4	0.27	20.6	327.8
Length = 1.310 ft	1	0.091	0.063	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.86	271.4	2,981.9	0.40	20.6	327.8
Length = 1.358 ft	1	0.070	0.063	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.42	207.7	2,981.4	0.54	20.6	327.8
Length = 1.310 ft	1	0.039	0.063	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.79	115.0	2,981.9	0.57	20.6	327.8
+D+0.750L					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.310 ft	1	0.045	0.073	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.00	145.5	3,239.9	0.72	26.0	356.3
Length = 1.310 ft	1	0.080	0.073	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.78	259.2	3,239.9	0.68	26.0	356.3
Length = 1.358 ft	1	0.106	0.073	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.35	343.5	3,239.3	0.51	26.0	356.3
Length = 1.310 ft	1	0.121	0.073	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.69	392.4	3,239.9	0.34	26.0	356.3
Length = 1.358 ft	1	0.126	0.073	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.81	409.5	3,239.3	0.17	26.0	356.3
Length = 1.310 ft	1	0.126	0.073	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.81	409.5	3,239.9	0.17	26.0	356.3
Length = 1.358 ft	1	0.121	0.073	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.70	393.6	3,239.3	0.34	26.0	356.3
Length = 1.310 ft	1	0.106	0.073	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.35	343.5	3,239.9	0.51	26.0	356.3
Length = 1.358 ft	1	0.081	0.073	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.80	262.8	3,239.3	0.68	26.0	356.3
Length = 1.310 ft	1	0.045	0.073	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.00	145.5	3,239.9	0.72	26.0	356.3
+D+0.750L+0.750S					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.310 ft	1	0.058	0.095	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.19	174.1	2,981.9	0.86	31.2	327.8
Length = 1.310 ft	1	0.104	0.095	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.13	310.1	2,981.9	0.81	31.2	327.8
Length = 1.358 ft	1	0.138	0.095	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.82	411.0	2,981.4	0.61	31.2	327.8
Length = 1.310 ft	1	0.157	0.095	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.22	469.5	2,981.9	0.41	31.2	327.8
Length = 1.358 ft	1	0.164	0.095	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.36	490.0	2,981.4	0.21	31.2	327.8
Length = 1.310 ft	1	0.164	0.095	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.36	490.0	2,981.9	0.20	31.2	327.8
Length = 1.358 ft	1	0.158	0.095	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.23	470.9	2,981.4	0.41	31.2	327.8
Length = 1.310 ft	1	0.138	0.095	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.82	411.0	2,981.9	0.60	31.2	327.8
Length = 1.358 ft	1	0.105	0.095	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.16	314.4	2,981.4	0.81	31.2	327.8

Dibble Engineers, Inc.
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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: DB1 - East Deck Edge (Joist Parallel)

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
Length = 1.310 ft	1	0.058	0.095	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.19	174.1	2,981.9	0.86	31.2	327.8
+0.60D					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.310 ft	1	0.011	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.32	46.1	4,141.2	0.23	8.2	456.0
Length = 1.310 ft	1	0.020	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.56	82.1	4,141.2	0.21	8.2	456.0
Length = 1.358 ft	1	0.026	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.75	108.8	4,140.2	0.16	8.2	456.0
Length = 1.310 ft	1	0.030	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.85	124.3	4,141.2	0.11	8.2	456.0
Length = 1.358 ft	1	0.031	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.89	129.7	4,140.2	0.05	8.2	456.0
Length = 1.310 ft	1	0.031	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.89	129.7	4,141.2	0.05	8.2	456.0
Length = 1.358 ft	1	0.030	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.85	124.7	4,140.2	0.11	8.2	456.0
Length = 1.310 ft	1	0.026	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.75	108.8	4,141.2	0.16	8.2	456.0
Length = 1.358 ft	1	0.020	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.57	83.3	4,140.2	0.21	8.2	456.0
Length = 1.310 ft	1	0.011	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.32	46.1	4,141.2	0.23	8.2	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750L+0.750S	1	0.1100	6.694		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	1.011	1.011
Max Upward from Load Combinations	1.011	1.011
Max Upward from Load Cases	0.532	0.532
D Only	0.446	0.446
+D+L	0.978	0.978
+D+S	0.668	0.668
+D+0.750L	0.845	0.845
+D+0.750L+0.750S	1.011	1.011
+0.60D	0.268	0.268
L Only	0.532	0.532
S Only	0.221	0.221

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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: DB2 - North Deck Edge

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

Wood Species : Trus Joist
Wood Grade : Parallam PSL 2.0E

Beam Bracing : Beam bracing is defined as a set spacing over all spans

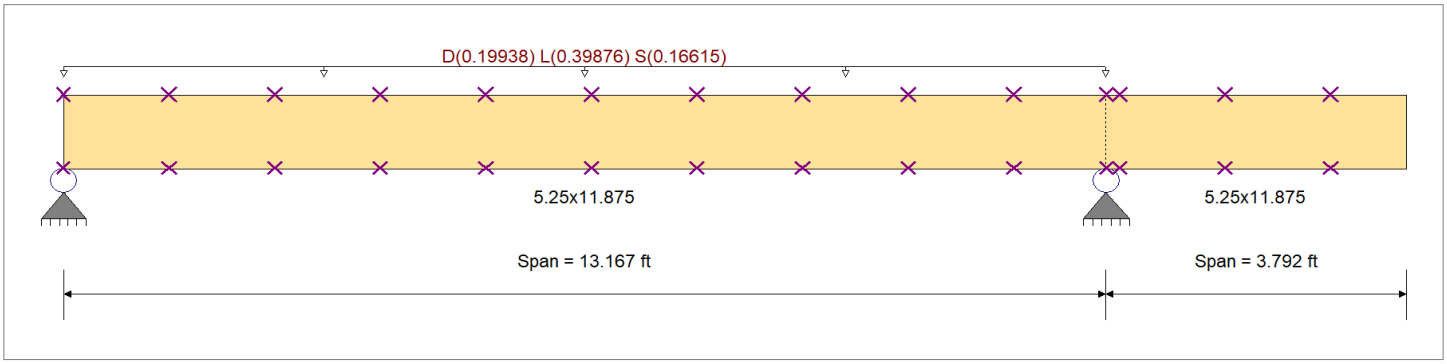
Fb +	2,900.0 psi
Fb -	2,900.0 psi
Fc - Prll	2,900.0 psi
Fc - Perp	625.0 psi
Fv	290.0 psi
Ft	2,025.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,016.54 ksi
Density	45.070 pcf

Unbraced Lengths

First Brace starts at 1.333 ft from Left-Most support
Regular spacing of lateral supports on length of beam = 1.333 ft



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
Uniform Load : D = 0.030, L = 0.060, S = 0.0250 ksf, Tributary Width = 6.646 ft

DESIGN SUMMARY

Design N.G.

Maximum Bending Stress Ratio	=	0.447 : 1	Maximum Shear Stress Ratio	=	0.289 : 1
Section used for this span		5.25x11.875	Section used for this span		5.25x11.875
fb: Actual	=	1,294.88 psi	fv: Actual	=	83.88 psi
F'b	=	2,898.35 psi	F'v	=	290.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	6.547 ft	Location of maximum on span		13.210 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs		Span # 1

deflection will be resisted by surrounding wall framing & plywood

upward deflection @ cant end ok!

Maximum Deflection

Max Downward Transient Deflection	0.186 in	Ratio =	850 >=600	Span: 1 : L Only
Max Upward Transient Deflection	-0.170 in	Ratio =	536 <600	Span: 2 : L Only
Max Downward Total Deflection	0.297 in	Ratio =	531 >=480	Span: 1 : +D+0.750L+0.750S
Max Upward Total Deflection	-0.270 in	Ratio =	336 <480	Span: 2 : +D+0.750L+0.750S

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 1.324 ft	1	0.063	0.113	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.70	165.5	2,609.0	1.22	29.4	261.0
Length = 1.324 ft	1	0.113	0.113	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.02	293.7	2,609.0	1.14	29.4	261.0
Length = 1.324 ft	1	0.147	0.113	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.95	384.6	2,609.0	0.85	29.4	261.0
Length = 1.324 ft	1	0.168	0.113	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	4.51	438.2	2,609.0	0.56	29.4	261.0
Length = 1.324 ft	1	0.174	0.113	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	4.67	454.5	2,609.0	0.27	29.4	261.0
Length = 1.324 ft	1	0.174	0.113	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	4.67	454.4	2,609.0	0.31	29.4	261.0

Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: DB2 - North Deck Edge

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 1.324 ft	1	0.166	0.113	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	4.46	433.4	2,609.0	0.60	29.4	261.0
Length = 1.324 ft	1	0.144	0.113	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.86	375.0	2,609.0	0.89	29.4	261.0
Length = 1.398 ft	1	0.107	0.113	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.87	279.3	2,608.7	1.19	29.4	261.0
Length = 1.177 ft	1	0.053	0.115	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.42	137.8	2,609.4	1.24	29.9	261.0
Length = 0.1483 ft	2	0.005	0.115	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.14	13.6	2,612.6	0.05	29.9	261.0
Length = 1.335 ft	2	0.005	0.115	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.13	12.6	2,608.9	0.05	29.9	261.0
Length = 1.335 ft	2	0.002	0.115	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.05	5.1	2,608.9	0.05	29.9	261.0
Length = 0.9744 ft	2	0.000	0.115	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.01	0.9	2,610.1	0.02	29.9	261.0
+D+L					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.324 ft	1	0.162	0.287	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	4.83	469.6	2,898.3	3.46	83.4	290.0
Length = 1.324 ft	1	0.288	0.287	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	8.57	833.8	2,898.3	3.24	83.4	290.0
Length = 1.324 ft	1	0.377	0.287	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	11.24	1,092.8	2,898.3	2.42	83.4	290.0
Length = 1.324 ft	1	0.430	0.287	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	12.82	1,246.4	2,898.3	1.60	83.4	290.0
Length = 1.324 ft	1	0.447	0.287	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	13.31	1,294.9	2,898.3	0.78	83.4	290.0
Length = 1.324 ft	1	0.447	0.287	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	13.31	1,294.8	2,898.3	0.85	83.4	290.0
Length = 1.324 ft	1	0.427	0.287	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	12.73	1,237.9	2,898.3	1.67	83.4	290.0
Length = 1.324 ft	1	0.371	0.287	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	11.06	1,075.6	2,898.3	2.49	83.4	290.0
Length = 1.398 ft	1	0.279	0.287	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	8.31	808.1	2,898.1	3.35	83.4	290.0
Length = 1.177 ft	1	0.142	0.289	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	4.23	411.4	2,898.9	3.49	83.9	290.0
Length = 0.1483 ft	2	0.005	0.289	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.14	13.6	2,902.8	0.05	83.9	290.0
Length = 1.335 ft	2	0.004	0.289	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.13	12.6	2,898.3	0.05	83.9	290.0
Length = 1.335 ft	2	0.002	0.289	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.05	5.1	2,898.3	0.05	83.9	290.0
Length = 0.9744 ft	2	0.000	0.289	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.01	0.9	2,899.7	0.02	83.9	290.0
+D+S					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.324 ft	1	0.088	0.156	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.00	292.2	3,332.2	2.16	51.9	333.5
Length = 1.324 ft	1	0.156	0.156	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	5.33	518.8	3,332.2	2.01	51.9	333.5
Length = 1.324 ft	1	0.204	0.156	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	6.99	679.7	3,332.2	1.50	51.9	333.5
Length = 1.324 ft	1	0.233	0.156	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	7.97	775.0	3,332.2	0.99	51.9	333.5
Length = 1.324 ft	1	0.241	0.156	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	8.27	804.7	3,332.2	0.48	51.9	333.5
Length = 1.324 ft	1	0.241	0.156	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	8.27	804.6	3,332.2	0.53	51.9	333.5
Length = 1.324 ft	1	0.231	0.156	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	7.90	768.6	3,332.2	1.04	51.9	333.5
Length = 1.324 ft	1	0.200	0.156	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	6.86	666.9	3,332.2	1.55	51.9	333.5
Length = 1.398 ft	1	0.150	0.156	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	5.14	499.6	3,331.8	2.09	51.9	333.5
Length = 1.177 ft	1	0.076	0.157	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.59	251.8	3,333.0	2.18	52.4	333.5
Length = 0.1483 ft	2	0.004	0.157	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.14	13.6	3,338.2	0.05	52.4	333.5
Length = 1.335 ft	2	0.004	0.157	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.13	12.6	3,332.1	0.05	52.4	333.5
Length = 1.335 ft	2	0.002	0.157	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.05	5.1	3,332.1	0.05	52.4	333.5
Length = 0.9744 ft	2	0.000	0.157	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.01	0.9	3,334.0	0.02	52.4	333.5
+D+0.750L					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.324 ft	1	0.109	0.193	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	4.05	393.6	3,621.3	2.90	69.9	362.5
Length = 1.324 ft	1	0.193	0.193	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	7.19	698.8	3,621.3	2.71	69.9	362.5
Length = 1.324 ft	1	0.253	0.193	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	9.42	915.7	3,621.3	2.03	69.9	362.5
Length = 1.324 ft	1	0.288	0.193	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	10.74	1,044.4	3,621.3	1.34	69.9	362.5
Length = 1.324 ft	1	0.300	0.193	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	11.15	1,084.8	3,621.3	0.66	69.9	362.5
Length = 1.324 ft	1	0.300	0.193	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	11.15	1,084.7	3,621.3	0.72	69.9	362.5
Length = 1.324 ft	1	0.286	0.193	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	10.66	1,036.7	3,621.3	1.40	69.9	362.5
Length = 1.324 ft	1	0.249	0.193	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	9.26	900.5	3,621.3	2.09	69.9	362.5

Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: DB2 - North Deck Edge

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 1.398 ft	1	0.187	0.193	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	6.95	675.9	3,620.8	2.81	69.9	362.5
Length = 1.177 ft	1	0.095	0.194	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.53	343.0	3,622.2	2.93	70.4	362.5
Length = 0.1483 ft	2	0.004	0.194	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.14	13.6	3,628.4	0.05	70.4	362.5
Length = 1.335 ft	2	0.003	0.194	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.13	12.6	3,621.2	0.05	70.4	362.5
Length = 1.335 ft	2	0.001	0.194	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.05	5.1	3,621.2	0.05	70.4	362.5
Length = 0.9744 ft	2	0.000	0.194	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.01	0.9	3,623.5	0.02	70.4	362.5
+D+0.750L+0.750S					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.324 ft	1	0.147	0.260	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	5.02	488.6	3,332.2	3.61	86.7	333.5
Length = 1.324 ft	1	0.260	0.260	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	8.92	867.6	3,332.2	3.37	86.7	333.5
Length = 1.324 ft	1	0.341	0.260	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	11.69	1,137.1	3,332.2	2.52	86.7	333.5
Length = 1.324 ft	1	0.389	0.260	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	13.34	1,297.0	3,332.2	1.67	86.7	333.5
Length = 1.324 ft	1	0.404	0.260	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	13.85	1,347.4	3,332.2	0.82	86.7	333.5
Length = 1.324 ft	1	0.404	0.260	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	13.85	1,347.3	3,332.2	0.89	86.7	333.5
Length = 1.324 ft	1	0.387	0.260	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	13.25	1,288.1	3,332.2	1.74	86.7	333.5
Length = 1.324 ft	1	0.336	0.260	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	11.51	1,119.4	3,332.2	2.59	86.7	333.5
Length = 1.398 ft	1	0.252	0.260	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	8.65	841.1	3,331.8	3.48	86.7	333.5
Length = 1.177 ft	1	0.129	0.262	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	4.41	428.5	3,333.0	3.63	87.3	333.5
Length = 0.1483 ft	2	0.004	0.262	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.14	13.6	3,338.2	0.05	87.3	333.5
Length = 1.335 ft	2	0.004	0.262	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.13	12.6	3,332.1	0.05	87.3	333.5
Length = 1.335 ft	2	0.002	0.262	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.05	5.1	3,332.1	0.05	87.3	333.5
Length = 0.9744 ft	2	0.000	0.262	1.15	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.01	0.9	3,334.0	0.02	87.3	333.5
+0.60D					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.324 ft	1	0.021	0.038	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.02	99.3	4,632.3	0.73	17.6	464.0
Length = 1.324 ft	1	0.038	0.038	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.81	176.2	4,632.3	0.68	17.6	464.0
Length = 1.324 ft	1	0.050	0.038	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.37	230.8	4,632.3	0.51	17.6	464.0
Length = 1.324 ft	1	0.057	0.038	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.70	262.9	4,632.3	0.34	17.6	464.0
Length = 1.324 ft	1	0.059	0.038	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.80	272.7	4,632.3	0.16	17.6	464.0
Length = 1.324 ft	1	0.059	0.038	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.80	272.7	4,632.3	0.19	17.6	464.0
Length = 1.324 ft	1	0.056	0.038	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.67	260.0	4,632.3	0.36	17.6	464.0
Length = 1.324 ft	1	0.049	0.038	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.31	225.0	4,632.3	0.53	17.6	464.0
Length = 1.398 ft	1	0.036	0.038	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.72	167.6	4,631.5	0.72	17.6	464.0
Length = 1.177 ft	1	0.018	0.039	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.85	82.7	4,633.8	0.75	17.9	464.0
Length = 0.1483 ft	2	0.002	0.039	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.08	8.2	4,644.0	0.03	17.9	464.0
Length = 1.335 ft	2	0.002	0.039	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.08	7.6	4,632.2	0.03	17.9	464.0
Length = 1.335 ft	2	0.001	0.039	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.03	3.0	4,632.2	0.03	17.9	464.0
Length = 0.9744 ft	2	0.000	0.039	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.01	0.5	4,635.9	0.01	17.9	464.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750L+0.750S	1	0.2974	6.620		0.0000	0.000
	2	0.0000	6.620	+D+0.750L+0.750S	-0.2699	3.792

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Max Upward from all Load Conditions	4.220	4.315	
Max Upward from Load Combinations	4.220	4.315	
Max Upward from Load Cases	2.625	2.625	
D Only	1.430	1.526	
+D+L	4.056	4.151	
+D+S	2.524	2.620	
+D+0.750L	3.399	3.495	

Dibble Engineers, Inc.
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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

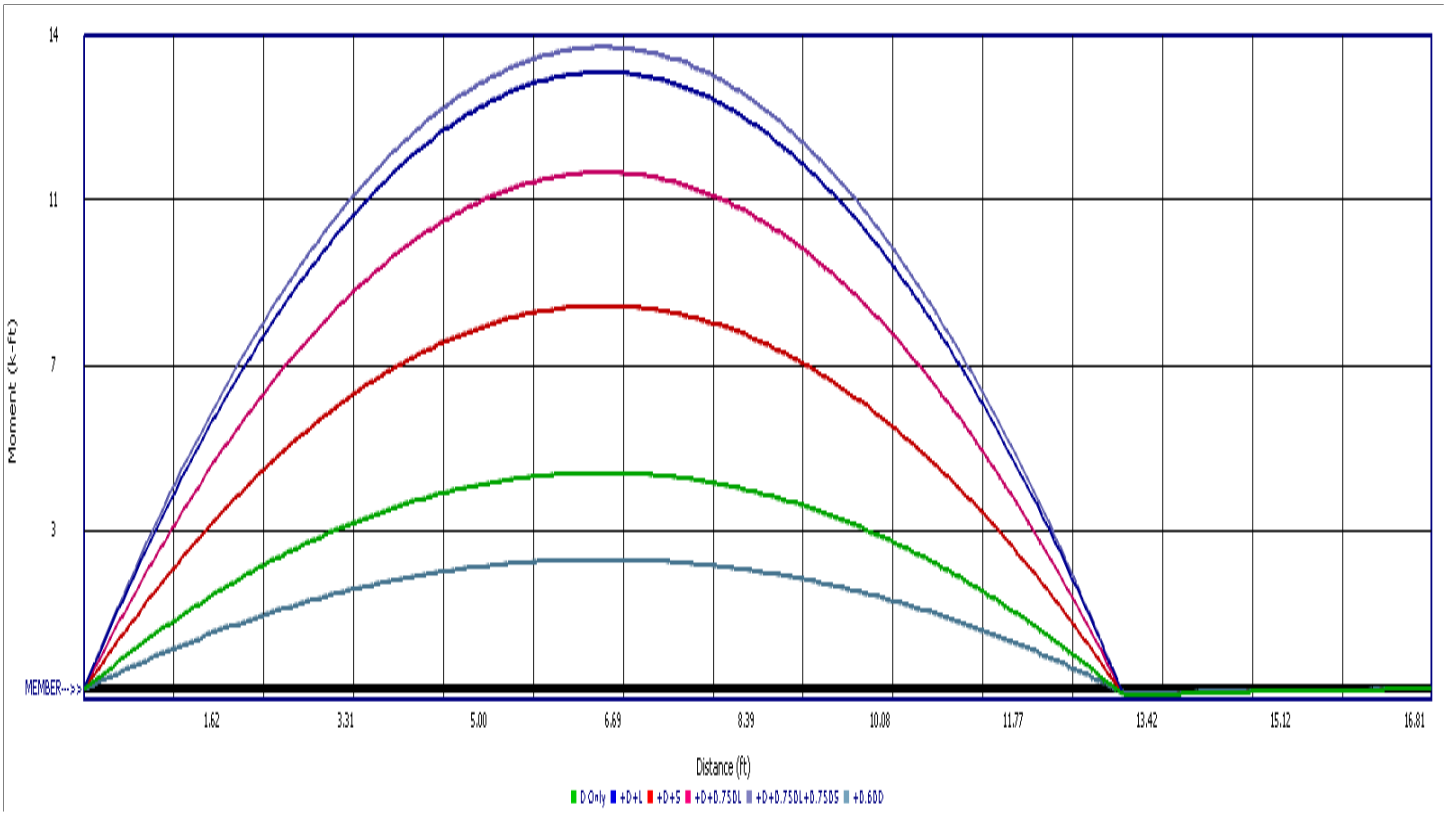
Project File: harris res remodel_rev.ec6

DESCRIPTION: DB2 - North Deck Edge

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
+D+0.750L+0.750S	4.220	4.315	
+0.60D	0.858	0.915	
L Only	2.625	2.625	
S Only	1.094	1.094	



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DESCRIPTION: UFB1 - Transition btwn (N) & (E), Loaded by SW-1A (C w/out Omega)

CODE REFERENCES

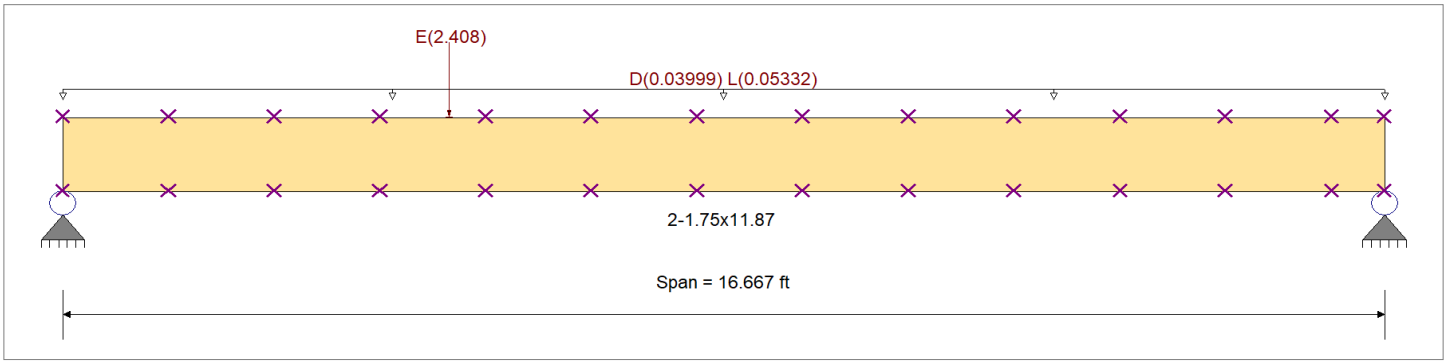
Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Stress Design	Fb +	2600 psi	*E : Modulus of Elasticity*	
Load Combination :	IBC 2021	Fb -	2600 psi	Ebend- xx	2000 ksi
		Fc - Prll	2510 psi	Eminbend - xx	1016.535 ksi
Wood Species :	Trus Joist	Fc - Perp	750 psi		
Wood Grade :	MicroLam LVL 2.0 E	Fv	285 psi		
		Ft	1555 psi	Density	42.01 pcf
Beam Bracing :	Beam bracing is defined as a set spacing over all spans				

Unbraced Lengths

First Brace starts at 1.333 ft from Left-Most support
Regular spacing of lateral supports on length of beam = 1.333 ft



Applied Loads

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

Beam self weight calculated and added to loading
Uniform Load : D = 0.030, L = 0.040 ksf, Tributary Width = 1.333 ft, (Deck)
Point Load : E = 2.408 k @ 4.875 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.257 : 1	Maximum Shear Stress Ratio	=	0.125 : 1
Section used for this span		2-1.75x11.87	Section used for this span		2-1.75x11.87
fb: Actual	=	1,064.86 psi	fv: Actual	=	56.88 psi
F'b	=	4,140.64 psi	F'v	=	456.00 psi
Load Combination		+D+0.70E	Load Combination		+D+0.70E
Location of maximum on span	=	4.866 ft	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	0.326 in	Ratio =	614	>=600	Span: 1 : E Only
Max Upward Transient Deflection	0 in	Ratio =	0	<600	n/a
Max Downward Total Deflection	0.335 in	Ratio =	597	>=480	Span: 1 : +D+0.750L+0.5250E
Max Upward Total Deflection	0 in	Ratio =	0	<480	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 1.277 ft	1	0.032	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.51	74.7	2,336.1	0.38	13.8	256.5
Length = 1.338 ft	1	0.060	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.96	139.7	2,335.7	0.37	13.8	256.5
Length = 1.338 ft	1	0.082	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.31	191.1	2,335.7	0.30	13.8	256.5
Length = 1.338 ft	1	0.098	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.57	228.8	2,335.7	0.23	13.8	256.5
Length = 1.338 ft	1	0.108	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.73	253.0	2,335.7	0.16	13.8	256.5
Length = 1.338 ft	1	0.113	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.81	263.5	2,335.7	0.09	13.8	256.5

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Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFB1 - Transition btwn (N) & (E), Loaded by SW-1A (C w/out Omega)

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 1.338 ft	1	0.113	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.81	264.0	2,335.7	0.05	13.8	256.5
Length = 1.338 ft	1	0.111	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.78	260.4	2,335.7	0.12	13.8	256.5
Length = 1.338 ft	1	0.104	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.67	243.7	2,335.7	0.19	13.8	256.5
Length = 1.338 ft	1	0.091	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.46	213.3	2,335.7	0.26	13.8	256.5
Length = 1.338 ft	1	0.073	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.16	169.4	2,335.7	0.33	13.8	256.5
Length = 1.277 ft	1	0.048	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.77	111.9	2,336.1	0.38	13.8	256.5
Length = 0.7299 ft	1	0.019	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.30	44.2	2,339.3	0.38	13.8	256.5
+D+L					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.277 ft	1	0.058	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.04	151.2	2,594.7	0.78	28.0	285.0
Length = 1.338 ft	1	0.109	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.94	282.6	2,594.2	0.74	28.0	285.0
Length = 1.338 ft	1	0.149	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.65	386.6	2,594.2	0.60	28.0	285.0
Length = 1.338 ft	1	0.178	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.17	462.9	2,594.2	0.46	28.0	285.0
Length = 1.338 ft	1	0.197	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.51	511.8	2,594.2	0.32	28.0	285.0
Length = 1.338 ft	1	0.205	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.65	533.0	2,594.2	0.18	28.0	285.0
Length = 1.338 ft	1	0.206	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.66	534.1	2,594.2	0.10	28.0	285.0
Length = 1.338 ft	1	0.203	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.61	526.8	2,594.2	0.24	28.0	285.0
Length = 1.338 ft	1	0.190	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.38	493.0	2,594.2	0.38	28.0	285.0
Length = 1.338 ft	1	0.166	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.96	431.6	2,594.2	0.53	28.0	285.0
Length = 1.338 ft	1	0.132	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.35	342.7	2,594.2	0.67	28.0	285.0
Length = 1.277 ft	1	0.087	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.55	226.3	2,594.7	0.78	28.0	285.0
Length = 0.7299 ft	1	0.034	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.61	89.5	2,598.7	0.78	28.0	285.0
+D+0.750L					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.277 ft	1	0.041	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.91	132.1	3,240.3	0.68	24.5	356.3
Length = 1.338 ft	1	0.076	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.69	246.9	3,239.6	0.65	24.5	356.3
Length = 1.338 ft	1	0.104	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.31	337.7	3,239.6	0.53	24.5	356.3
Length = 1.338 ft	1	0.125	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.77	404.4	3,239.6	0.40	24.5	356.3
Length = 1.338 ft	1	0.138	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.06	447.1	3,239.6	0.28	24.5	356.3
Length = 1.338 ft	1	0.144	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.19	465.6	3,239.6	0.16	24.5	356.3
Length = 1.338 ft	1	0.144	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.20	466.5	3,239.6	0.09	24.5	356.3
Length = 1.338 ft	1	0.142	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.15	460.2	3,239.6	0.21	24.5	356.3
Length = 1.338 ft	1	0.133	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.95	430.6	3,239.6	0.34	24.5	356.3
Length = 1.338 ft	1	0.116	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.58	377.1	3,239.6	0.46	24.5	356.3
Length = 1.338 ft	1	0.092	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.05	299.4	3,239.6	0.58	24.5	356.3
Length = 1.277 ft	1	0.061	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.36	197.7	3,240.3	0.68	24.5	356.3
Length = 0.7299 ft	1	0.024	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.54	78.2	3,246.7	0.68	24.5	356.3
+D+0.70E					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.277 ft	1	0.072	0.125	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	2.04	297.0	4,141.9	1.58	56.9	456.0
Length = 1.338 ft	1	0.144	0.125	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	4.08	594.7	4,140.6	1.56	56.9	456.0
Length = 1.338 ft	1	0.212	0.125	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	6.02	878.9	4,140.6	1.49	56.9	456.0
Length = 1.338 ft	1	0.257	0.125	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	7.30	1,064.9	4,140.6	1.42	56.9	456.0
Length = 1.338 ft	1	0.253	0.125	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	7.18	1,046.9	4,140.6	0.40	56.9	456.0
Length = 1.338 ft	1	0.235	0.125	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	6.68	974.8	4,140.6	0.47	56.9	456.0
Length = 1.338 ft	1	0.215	0.125	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	6.09	889.1	4,140.6	0.54	56.9	456.0
Length = 1.338 ft	1	0.191	0.125	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	5.41	789.8	4,140.6	0.61	56.9	456.0
Length = 1.338 ft	1	0.163	0.125	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	4.64	676.8	4,140.6	0.68	56.9	456.0
Length = 1.338 ft	1	0.133	0.125	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	3.77	550.2	4,140.6	0.75	56.9	456.0
Length = 1.338 ft	1	0.099	0.125	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	2.81	410.0	4,140.6	0.82	56.9	456.0

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Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFB1 - Transition btwn (N) & (E), Loaded by SW-1A (C w/out Omega)

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 1.277 ft	1	0.062	0.125	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	1.76	256.2	4,141.9	0.88	56.9	456.0
Length = 0.7299 ft	1	0.023	0.125	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.66	96.7	4,152.8	0.88	56.9	456.0
+D+0.750L+0.5250E					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.277 ft	1	0.072	0.124	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	2.05	298.7	4,141.9	1.57	56.7	456.0
Length = 1.338 ft	1	0.142	0.124	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	4.03	588.2	4,140.6	1.54	56.7	456.0
Length = 1.338 ft	1	0.206	0.124	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	5.85	853.6	4,140.6	1.42	56.7	456.0
Length = 1.338 ft	1	0.247	0.124	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	7.00	1,021.9	4,140.6	1.30	56.7	456.0
Length = 1.338 ft	1	0.246	0.124	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	6.98	1,018.0	4,140.6	0.21	56.7	456.0
Length = 1.338 ft	1	0.239	0.124	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	6.78	988.5	4,140.6	0.34	56.7	456.0
Length = 1.338 ft	1	0.226	0.124	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	6.41	934.9	4,140.6	0.46	56.7	456.0
Length = 1.338 ft	1	0.207	0.124	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	5.88	857.2	4,140.6	0.58	56.7	456.0
Length = 1.338 ft	1	0.182	0.124	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	5.18	755.5	4,140.6	0.71	56.7	456.0
Length = 1.338 ft	1	0.152	0.124	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	4.32	629.7	4,140.6	0.83	56.7	456.0
Length = 1.338 ft	1	0.116	0.124	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	3.29	479.9	4,140.6	0.95	56.7	456.0
Length = 1.277 ft	1	0.074	0.124	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	2.10	306.0	4,141.9	1.05	56.7	456.0
Length = 0.7299 ft	1	0.028	0.124	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.81	117.5	4,152.8	1.05	56.7	456.0
+0.60D					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.277 ft	1	0.011	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.31	44.8	4,141.9	0.23	8.3	456.0
Length = 1.338 ft	1	0.020	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.57	83.8	4,140.6	0.22	8.3	456.0
Length = 1.338 ft	1	0.028	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.79	114.6	4,140.6	0.18	8.3	456.0
Length = 1.338 ft	1	0.033	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.94	137.3	4,140.6	0.14	8.3	456.0
Length = 1.338 ft	1	0.037	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	1.04	151.8	4,140.6	0.10	8.3	456.0
Length = 1.338 ft	1	0.038	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	1.08	158.1	4,140.6	0.05	8.3	456.0
Length = 1.338 ft	1	0.038	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	1.09	158.4	4,140.6	0.03	8.3	456.0
Length = 1.338 ft	1	0.038	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	1.07	156.2	4,140.6	0.07	8.3	456.0
Length = 1.338 ft	1	0.035	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	1.00	146.2	4,140.6	0.11	8.3	456.0
Length = 1.338 ft	1	0.031	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.88	128.0	4,140.6	0.16	8.3	456.0
Length = 1.338 ft	1	0.025	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.70	101.6	4,140.6	0.20	8.3	456.0
Length = 1.277 ft	1	0.016	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.46	67.1	4,141.9	0.23	8.3	456.0
Length = 0.7299 ft	1	0.006	0.018	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.18	26.5	4,152.8	0.23	8.3	456.0
+0.60D+0.70E					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.277 ft	1	0.064	0.113	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	1.83	267.1	4,141.9	1.42	51.3	456.0
Length = 1.338 ft	1	0.130	0.113	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	3.69	538.9	4,140.6	1.41	51.3	456.0
Length = 1.338 ft	1	0.194	0.113	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	5.50	802.5	4,140.6	1.37	51.3	456.0
Length = 1.338 ft	1	0.236	0.113	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	6.70	977.5	4,140.6	1.33	51.3	456.0
Length = 1.338 ft	1	0.231	0.113	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	6.55	955.4	4,140.6	0.44	51.3	456.0
Length = 1.338 ft	1	0.211	0.113	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	5.99	873.6	4,140.6	0.48	51.3	456.0
Length = 1.338 ft	1	0.189	0.113	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	5.37	783.7	4,140.6	0.52	51.3	456.0
Length = 1.338 ft	1	0.166	0.113	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	4.70	685.6	4,140.6	0.57	51.3	456.0
Length = 1.338 ft	1	0.140	0.113	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	3.97	579.3	4,140.6	0.61	51.3	456.0
Length = 1.338 ft	1	0.112	0.113	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	3.19	464.9	4,140.6	0.65	51.3	456.0
Length = 1.338 ft	1	0.083	0.113	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	2.35	342.3	4,140.6	0.69	51.3	456.0
Length = 1.277 ft	1	0.051	0.113	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	1.45	211.5	4,141.9	0.72	51.3	456.0
Length = 0.7299 ft	1	0.019	0.113	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.54	79.0	4,152.8	0.72	51.3	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750L+0.5250E	1	0.3346	7.908		0.0000	0.000

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Wood Beam

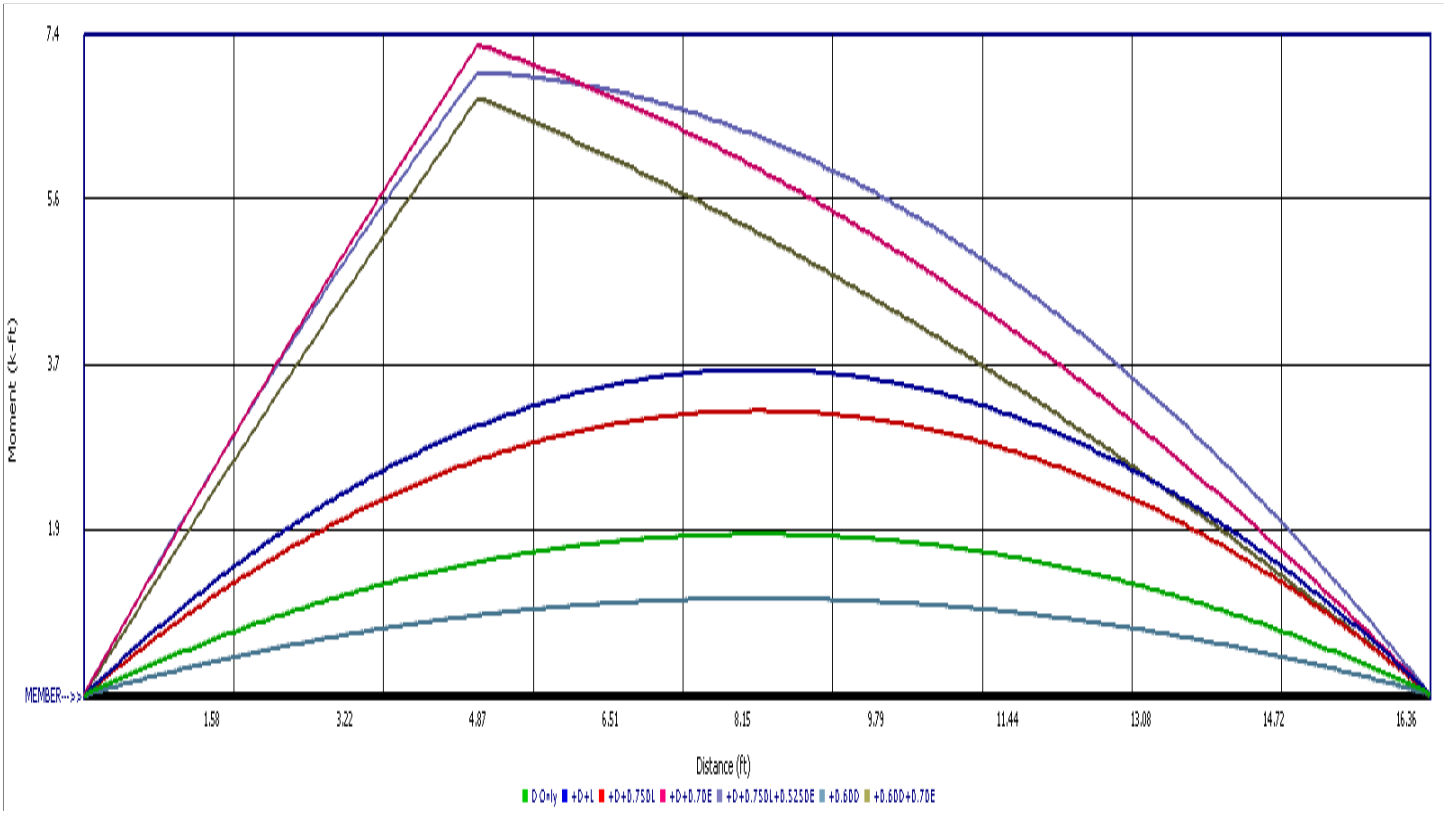
Project File: harris res remodel_rev.ec6

DESCRIPTION: UFB1 - Transition btwn (N) & (E), Loaded by SW-1A (C w/out Omega)

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	1.704	1.137
Max Upward from Load Combinations	1.662	1.137
Max Upward from Load Cases	1.704	0.704
D Only	0.434	0.434
+D+L	0.879	0.879
+D+0.750L	0.768	0.768
+D+0.70E	1.627	0.927
+D+0.750L+0.5250E	1.662	1.137
+0.60D	0.261	0.261
+0.60D+0.70E	1.453	0.754
L Only	0.444	0.444
E Only	1.704	0.704



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CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

Wood Species : Trus Joist
Wood Grade : MicroLam LVL 2.0 E

Beam Bracing : Beam bracing is defined as a set spacing over all spans

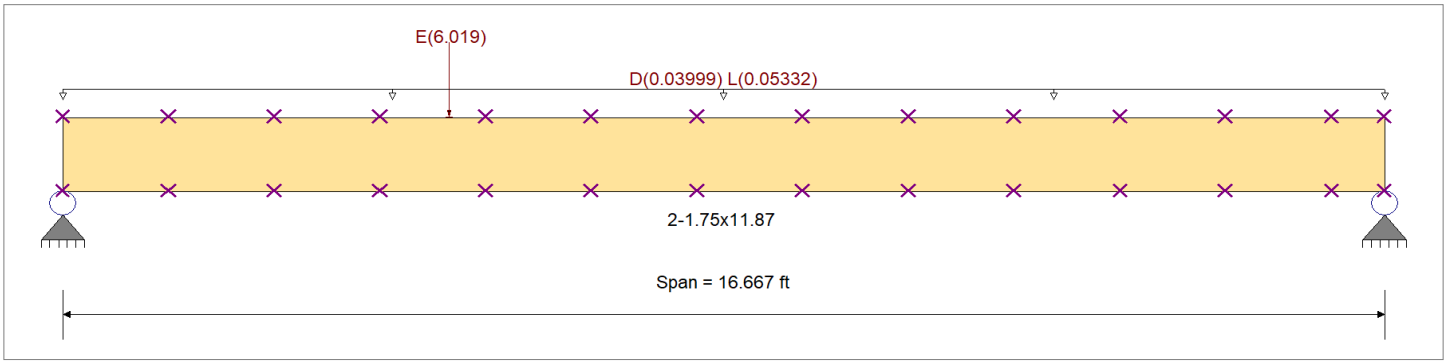
Fb +	2600 psi
Fb -	2600 psi
Fc - Prll	2510 psi
Fc - Perp	750 psi
Fv	285 psi
Ft	1555 psi

E : Modulus of Elasticity

Ebend- xx	2000 ksi
Eminbend - xx	1016.535 ksi
Density	42.01 pcf

Unbraced Lengths

First Brace starts at 1.333 ft from Left-Most support
Regular spacing of lateral supports on length of beam = 1.333 ft



Applied Loads

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

Beam self weight calculated and added to loading
Uniform Load : D = 0.030, L = 0.040 ksf, Tributary Width = 1.333 ft, (Deck)
Point Load : E = 6.019 k @ 4.875 ft

DESIGN SUMMARY

Design N.G.

Maximum Bending Stress Ratio	=	0.564 : 1	Maximum Shear Stress Ratio	=	0.266 : 1
Section used for this span		2-1.75x11.87	Section used for this span		2-1.75x11.87
fb: Actual	=	2,334.38 psi	fv: Actual	=	121.43 psi
F'b	=	4,140.64 psi	F'v	=	456.00 psi
Load Combination		+D+0.70E	Load Combination		+D+0.70E
Location of maximum on span	=	4.866 ft	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	0.814 in	Ratio =	245 <600	Span: 1 : E Only
Max Upward Transient Deflection	0 in	Ratio =	0 <600	n/a
Max Downward Total Deflection	0.662 in	Ratio =	302 <480	Span: 1 : +D+0.70E
Max Upward Total Deflection	0 in	Ratio =	0 <480	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 1.277 ft	1	0.032	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.51	74.7	2,336.1	0.38	13.8	256.5
Length = 1.338 ft	1	0.060	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.96	139.7	2,335.7	0.37	13.8	256.5
Length = 1.338 ft	1	0.082	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.31	191.1	2,335.7	0.30	13.8	256.5
Length = 1.338 ft	1	0.098	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.57	228.8	2,335.7	0.23	13.8	256.5
Length = 1.338 ft	1	0.108	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.73	253.0	2,335.7	0.16	13.8	256.5
Length = 1.338 ft	1	0.113	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.81	263.5	2,335.7	0.09	13.8	256.5

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DESCRIPTION: UFB1 - Transition btwn (N) & (E), Loaded by SW-1A (C w/ Omega)

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 1.338 ft	1	0.113	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.81	264.0	2,335.7	0.05	13.8	256.5
Length = 1.338 ft	1	0.111	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.78	260.4	2,335.7	0.12	13.8	256.5
Length = 1.338 ft	1	0.104	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.67	243.7	2,335.7	0.19	13.8	256.5
Length = 1.338 ft	1	0.091	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.46	213.3	2,335.7	0.26	13.8	256.5
Length = 1.338 ft	1	0.073	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.16	169.4	2,335.7	0.33	13.8	256.5
Length = 1.277 ft	1	0.048	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.77	111.9	2,336.1	0.38	13.8	256.5
Length = 0.7299 ft	1	0.019	0.054	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.30	44.2	2,339.3	0.38	13.8	256.5
+D+L					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.277 ft	1	0.058	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.04	151.2	2,594.7	0.78	28.0	285.0
Length = 1.338 ft	1	0.109	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.94	282.6	2,594.2	0.74	28.0	285.0
Length = 1.338 ft	1	0.149	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.65	386.6	2,594.2	0.60	28.0	285.0
Length = 1.338 ft	1	0.178	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.17	462.9	2,594.2	0.46	28.0	285.0
Length = 1.338 ft	1	0.197	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.51	511.8	2,594.2	0.32	28.0	285.0
Length = 1.338 ft	1	0.205	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.65	533.0	2,594.2	0.18	28.0	285.0
Length = 1.338 ft	1	0.206	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.66	534.1	2,594.2	0.10	28.0	285.0
Length = 1.338 ft	1	0.203	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.61	526.8	2,594.2	0.24	28.0	285.0
Length = 1.338 ft	1	0.190	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.38	493.0	2,594.2	0.38	28.0	285.0
Length = 1.338 ft	1	0.166	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.96	431.6	2,594.2	0.53	28.0	285.0
Length = 1.338 ft	1	0.132	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.35	342.7	2,594.2	0.67	28.0	285.0
Length = 1.277 ft	1	0.087	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.55	226.3	2,594.7	0.78	28.0	285.0
Length = 0.7299 ft	1	0.034	0.098	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.61	89.5	2,598.7	0.78	28.0	285.0
+D+0.750L					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.277 ft	1	0.041	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.91	132.1	3,240.3	0.68	24.5	356.3
Length = 1.338 ft	1	0.076	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.69	246.9	3,239.6	0.65	24.5	356.3
Length = 1.338 ft	1	0.104	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.31	337.7	3,239.6	0.53	24.5	356.3
Length = 1.338 ft	1	0.125	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.77	404.4	3,239.6	0.40	24.5	356.3
Length = 1.338 ft	1	0.138	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.06	447.1	3,239.6	0.28	24.5	356.3
Length = 1.338 ft	1	0.144	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.19	465.6	3,239.6	0.16	24.5	356.3
Length = 1.338 ft	1	0.144	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.20	466.5	3,239.6	0.09	24.5	356.3
Length = 1.338 ft	1	0.142	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.15	460.2	3,239.6	0.21	24.5	356.3
Length = 1.338 ft	1	0.133	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.95	430.6	3,239.6	0.34	24.5	356.3
Length = 1.338 ft	1	0.116	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.58	377.1	3,239.6	0.46	24.5	356.3
Length = 1.338 ft	1	0.092	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.05	299.4	3,239.6	0.58	24.5	356.3
Length = 1.277 ft	1	0.061	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.36	197.7	3,240.3	0.68	24.5	356.3
Length = 0.7299 ft	1	0.024	0.069	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.54	78.2	3,246.7	0.68	24.5	356.3
+D+0.70E					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.277 ft	1	0.152	0.266	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	4.32	630.2	4,141.9	3.36	121.4	456.0
Length = 1.338 ft	1	0.308	0.266	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	8.75	1,277.1	4,140.6	3.35	121.4	456.0
Length = 1.338 ft	1	0.461	0.266	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	13.10	1,910.4	4,140.6	3.28	121.4	456.0
Length = 1.338 ft	1	0.564	0.266	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	16.00	2,334.4	4,140.6	3.21	121.4	456.0
Length = 1.338 ft	1	0.549	0.266	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	15.59	2,273.8	4,140.6	1.14	121.4	456.0
Length = 1.338 ft	1	0.497	0.266	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	14.10	2,057.3	4,140.6	1.21	121.4	456.0
Length = 1.338 ft	1	0.441	0.266	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	12.53	1,827.3	4,140.6	1.28	121.4	456.0
Length = 1.338 ft	1	0.382	0.266	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	10.86	1,583.6	4,140.6	1.35	121.4	456.0
Length = 1.338 ft	1	0.320	0.266	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	9.09	1,326.3	4,140.6	1.42	121.4	456.0
Length = 1.338 ft	1	0.255	0.266	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	7.23	1,055.4	4,140.6	1.49	121.4	456.0
Length = 1.338 ft	1	0.186	0.266	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	5.28	770.9	4,140.6	1.56	121.4	456.0

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Wood Beam

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DESCRIPTION: UFB1 - Transition btwn (N) & (E), Loaded by SW-1A (C w/ Omega)

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 1.277 ft	1	0.114	0.266	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	3.24	472.7	4,141.9	1.62	121.4	456.0
Length = 0.7299 ft	1	0.042	0.266	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.20	175.4	4,152.8	1.62	121.4	456.0
+D+0.750L+0.5250E					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.277 ft	1	0.132	0.231	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	3.76	548.7	4,141.9	2.91	105.2	456.0
Length = 1.338 ft	1	0.266	0.231	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	7.54	1,100.0	4,140.6	2.89	105.2	456.0
Length = 1.338 ft	1	0.393	0.231	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	11.15	1,627.2	4,140.6	2.76	105.2	456.0
Length = 1.338 ft	1	0.476	0.231	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	13.52	1,972.9	4,140.6	2.64	105.2	456.0
Length = 1.338 ft	1	0.468	0.231	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	13.29	1,938.1	4,140.6	0.77	105.2	456.0
Length = 1.338 ft	1	0.435	0.231	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	12.34	1,800.3	4,140.6	0.89	105.2	456.0
Length = 1.338 ft	1	0.396	0.231	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	11.23	1,638.5	4,140.6	1.01	105.2	456.0
Length = 1.338 ft	1	0.351	0.231	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	9.96	1,452.6	4,140.6	1.14	105.2	456.0
Length = 1.338 ft	1	0.300	0.231	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	8.52	1,242.6	4,140.6	1.26	105.2	456.0
Length = 1.338 ft	1	0.244	0.231	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	6.91	1,008.6	4,140.6	1.38	105.2	456.0
Length = 1.338 ft	1	0.181	0.231	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	5.14	750.5	4,140.6	1.51	105.2	456.0
Length = 1.277 ft	1	0.113	0.231	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	3.21	468.3	4,141.9	1.60	105.2	456.0
Length = 0.7299 ft	1	0.043	0.231	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.21	176.6	4,152.8	1.60	105.2	456.0
+0.60D					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.277 ft	1	0.011	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.31	44.8	4,141.9	0.23	8.3	456.0
Length = 1.338 ft	1	0.020	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.57	83.8	4,140.6	0.22	8.3	456.0
Length = 1.338 ft	1	0.028	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.79	114.6	4,140.6	0.18	8.3	456.0
Length = 1.338 ft	1	0.033	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.94	137.3	4,140.6	0.14	8.3	456.0
Length = 1.338 ft	1	0.037	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	1.04	151.8	4,140.6	0.10	8.3	456.0
Length = 1.338 ft	1	0.038	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	1.08	158.1	4,140.6	0.05	8.3	456.0
Length = 1.338 ft	1	0.038	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	1.09	158.4	4,140.6	0.03	8.3	456.0
Length = 1.338 ft	1	0.038	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	1.07	156.2	4,140.6	0.07	8.3	456.0
Length = 1.338 ft	1	0.035	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	1.00	146.2	4,140.6	0.11	8.3	456.0
Length = 1.338 ft	1	0.031	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.88	128.0	4,140.6	0.16	8.3	456.0
Length = 1.338 ft	1	0.025	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.70	101.6	4,140.6	0.20	8.3	456.0
Length = 1.277 ft	1	0.016	0.018	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	0.46	67.1	4,141.9	0.23	8.3	456.0
Length = 0.7299 ft	1	0.006	0.018	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.18	26.5	4,152.8	0.23	8.3	456.0
+0.60D+0.70E					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.277 ft	1	0.145	0.254	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	4.12	600.3	4,141.9	3.21	115.9	456.0
Length = 1.338 ft	1	0.295	0.254	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	8.37	1,221.2	4,140.6	3.20	115.9	456.0
Length = 1.338 ft	1	0.443	0.254	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	12.57	1,834.0	4,140.6	3.16	115.9	456.0
Length = 1.338 ft	1	0.543	0.254	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	15.40	2,247.1	4,140.6	3.12	115.9	456.0
Length = 1.338 ft	1	0.527	0.254	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	14.96	2,182.3	4,140.6	1.18	115.9	456.0
Length = 1.338 ft	1	0.472	0.254	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	13.41	1,956.2	4,140.6	1.22	115.9	456.0
Length = 1.338 ft	1	0.416	0.254	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	11.80	1,721.9	4,140.6	1.26	115.9	456.0
Length = 1.338 ft	1	0.357	0.254	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	10.14	1,479.4	4,140.6	1.30	115.9	456.0
Length = 1.338 ft	1	0.297	0.254	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	8.42	1,228.8	4,140.6	1.35	115.9	456.0
Length = 1.338 ft	1	0.234	0.254	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	6.65	970.1	4,140.6	1.39	115.9	456.0
Length = 1.338 ft	1	0.170	0.254	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	4.82	703.1	4,140.6	1.43	115.9	456.0
Length = 1.277 ft	1	0.103	0.254	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	2.93	428.0	4,141.9	1.46	115.9	456.0
Length = 0.7299 ft	1	0.038	0.254	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.08	157.8	4,152.8	1.46	115.9	456.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
E Only	1	0.8141	7.482		0.0000	0.000

Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

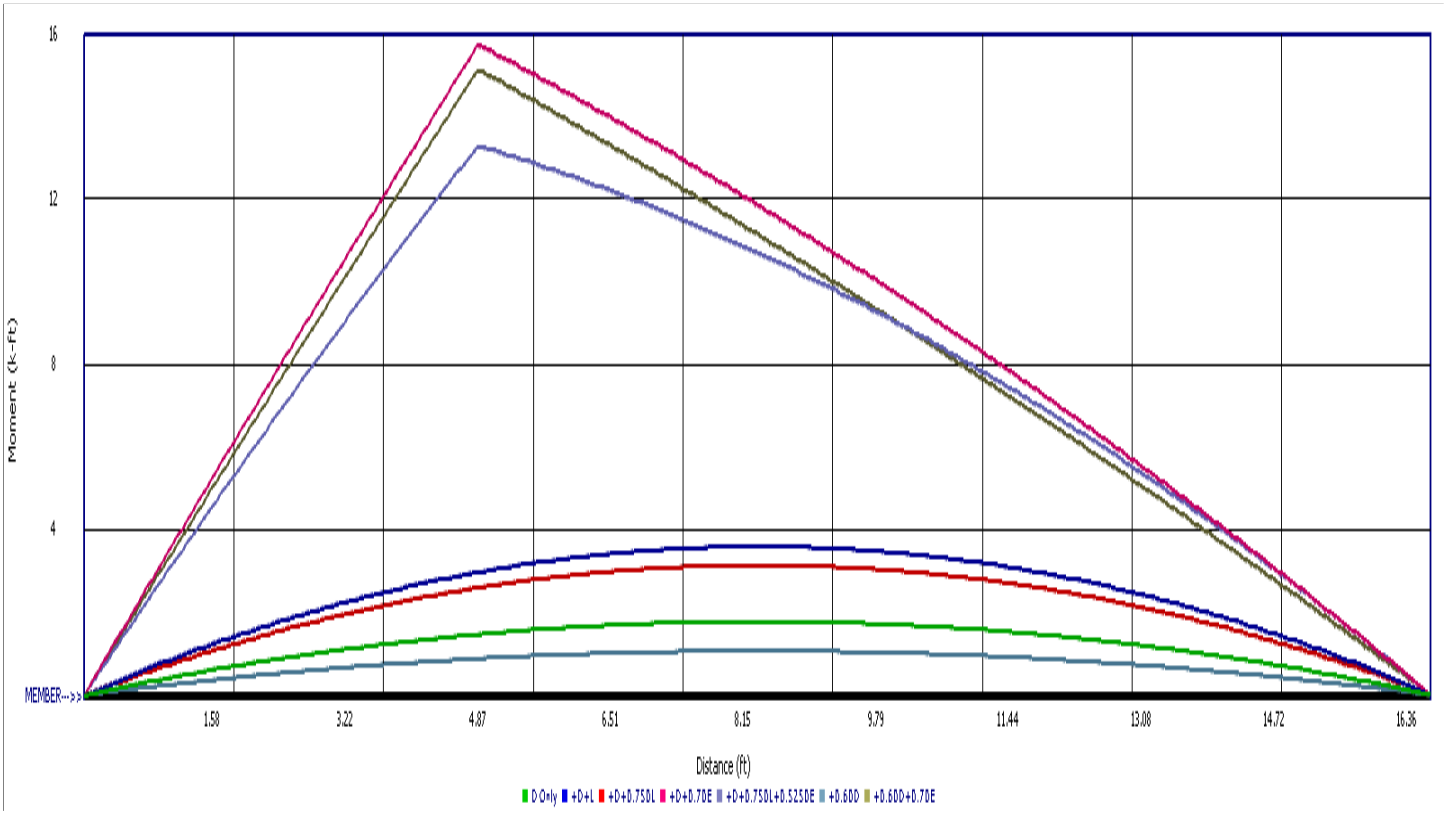
Project File: harris res remodel_rev.ec6

DESCRIPTION: UFB1 - Transition btwn (N) & (E), Loaded by SW-1A (C w/ Omega)

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	4.258	1.761
Max Upward from Load Combinations	3.415	1.692
Max Upward from Load Cases	4.258	1.761
D Only	0.434	0.434
+D+L	0.879	0.879
+D+0.750L	0.768	0.768
+D+0.70E	3.415	1.667
+D+0.750L+0.5250E	3.003	1.692
+0.60D	0.261	0.261
+0.60D+0.70E	3.241	1.493
L Only	0.444	0.444
E Only	4.258	1.761



Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFB2 - East Elev Family Room

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

Wood Species : Trus Joist
Wood Grade : Parallam PSL 2.0E

Beam Bracing : Beam bracing is defined as a set spacing over all spans

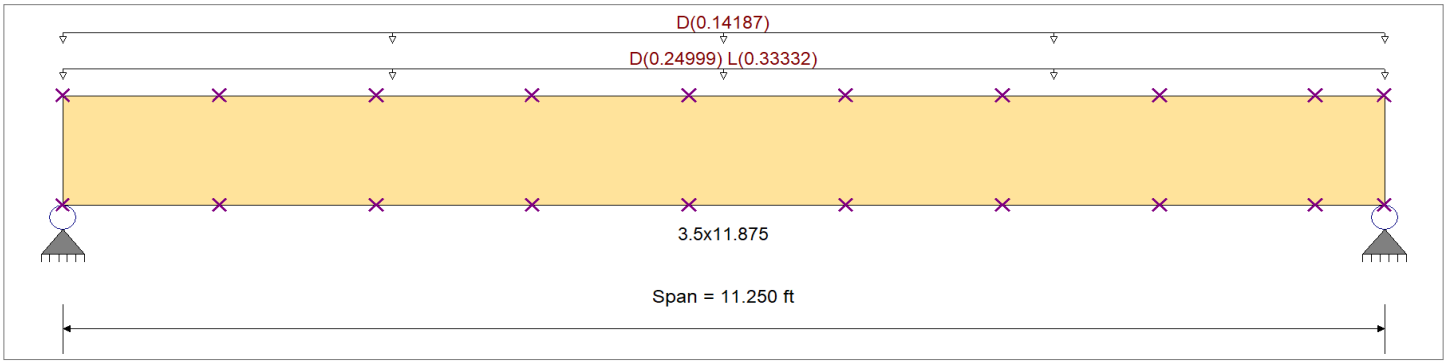
Fb +	2,900.0 psi
Fb -	2,900.0 psi
Fc - Prll	2,900.0 psi
Fc - Perp	625.0 psi
Fv	290.0 psi
Ft	2,025.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,016.54 ksi
Density	45.070 pcf

Unbraced Lengths

First Brace starts at 1.333 ft from Left-Most support
Regular spacing of lateral supports on length of beam = 1.333 ft



Applied Loads

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

Beam self weight calculated and added to loading
Uniform Load : D = 0.030, L = 0.040 ksf, Tributary Width = 8.333 ft, (Deck)
Uniform Load : D = 0.0150 ksf, Tributary Width = 9.458 ft, (Ext Wall (Mostly Glass))

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.589 : 1	Maximum Shear Stress Ratio	=	0.426 : 1
Section used for this span		3.5x11.875	Section used for this span		3.5x11.875
fb: Actual	=	1,703.65 psi	fv: Actual	=	123.61 psi
F'b	=	2,891.32 psi	F'v	=	290.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	5.625 ft	Location of maximum on span	=	10.265 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.124 in	Ratio =	1091 >=600	Span: 1 : L Only
Max Upward Transient Deflection	0 in	Ratio =	0 <600	n/a
Max Downward Total Deflection	0.274 in	Ratio =	492 >=480	Span: 1 : +D+L
Max Upward Total Deflection	0 in	Ratio =	0 <480	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 1.314 ft	1	0.148	0.260	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.64	385.5	2,603.7	1.88	67.8	261.0
Length = 1.314 ft	1	0.257	0.260	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	4.59	669.1	2,603.7	1.75	67.8	261.0
Length = 1.355 ft	1	0.328	0.260	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	5.86	854.7	2,603.3	1.21	67.8	261.0
Length = 1.314 ft	1	0.358	0.260	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	6.38	931.2	2,603.7	0.66	67.8	261.0
Length = 1.355 ft	1	0.359	0.260	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	6.41	934.4	2,603.3	0.42	67.8	261.0
Length = 1.314 ft	1	0.347	0.260	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	6.19	903.3	2,603.7	0.95	67.8	261.0

Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFB2 - East Elev Family Room

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 1.355 ft	1	0.297	0.260	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	5.30	772.6	2,603.3	1.50	67.8	261.0
Length = 1.314 ft	1	0.204	0.260	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	3.64	531.1	2,603.7	1.88	67.8	261.0
Length = 0.6159 ft	1	0.074	0.260	0.90	1.00	1.00	1.00	1.001	1.00	1.00	1.00	1.33	193.4	2,608.8	1.88	67.8	261.0
+D+L					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.314 ft	1	0.243	0.426	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	4.82	702.9	2,891.7	3.42	123.6	290.0
Length = 1.314 ft	1	0.422	0.426	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	8.36	1,219.9	2,891.7	3.18	123.6	290.0
Length = 1.355 ft	1	0.539	0.426	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	10.68	1,558.4	2,891.3	2.21	123.6	290.0
Length = 1.314 ft	1	0.587	0.426	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	11.64	1,697.8	2,891.7	1.21	123.6	290.0
Length = 1.355 ft	1	0.589	0.426	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	11.68	1,703.6	2,891.3	0.76	123.6	290.0
Length = 1.314 ft	1	0.570	0.426	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	11.29	1,646.9	2,891.7	1.73	123.6	290.0
Length = 1.355 ft	1	0.487	0.426	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	9.66	1,408.7	2,891.3	2.73	123.6	290.0
Length = 1.314 ft	1	0.335	0.426	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	6.64	968.4	2,891.7	3.42	123.6	290.0
Length = 0.6159 ft	1	0.122	0.426	1.00	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.42	352.6	2,898.1	3.42	123.6	290.0
+D+0.750L					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.314 ft	1	0.173	0.302	1.25	1.00	1.00	0.99	1.001	1.00	1.00	1.00	4.27	623.6	3,610.7	3.04	109.7	362.5
Length = 1.314 ft	1	0.300	0.302	1.25	1.00	1.00	0.99	1.001	1.00	1.00	1.00	7.42	1,082.2	3,610.7	2.82	109.7	362.5
Length = 1.355 ft	1	0.383	0.302	1.25	1.00	1.00	0.99	1.001	1.00	1.00	1.00	9.48	1,382.5	3,610.0	1.96	109.7	362.5
Length = 1.314 ft	1	0.417	0.302	1.25	1.00	1.00	0.99	1.001	1.00	1.00	1.00	10.32	1,506.2	3,610.7	1.08	109.7	362.5
Length = 1.355 ft	1	0.419	0.302	1.25	1.00	1.00	0.99	1.001	1.00	1.00	1.00	10.36	1,511.3	3,610.0	0.67	109.7	362.5
Length = 1.314 ft	1	0.405	0.302	1.25	1.00	1.00	0.99	1.001	1.00	1.00	1.00	10.02	1,461.0	3,610.7	1.53	109.7	362.5
Length = 1.355 ft	1	0.346	0.302	1.25	1.00	1.00	0.99	1.001	1.00	1.00	1.00	8.57	1,249.7	3,610.0	2.42	109.7	362.5
Length = 1.314 ft	1	0.238	0.302	1.25	1.00	1.00	0.99	1.001	1.00	1.00	1.00	5.89	859.1	3,610.7	3.04	109.7	362.5
Length = 0.6159 ft	1	0.086	0.302	1.25	1.00	1.00	1.00	1.001	1.00	1.00	1.00	2.14	312.8	3,620.9	3.04	109.7	362.5
+0.60D					1.00	1.00	1.00	1.001	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.314 ft	1	0.050	0.088	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	1.59	231.3	4,614.2	1.13	40.7	464.0
Length = 1.314 ft	1	0.087	0.088	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	2.75	401.5	4,614.2	1.05	40.7	464.0
Length = 1.355 ft	1	0.111	0.088	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	3.52	512.8	4,613.1	0.73	40.7	464.0
Length = 1.314 ft	1	0.121	0.088	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	3.83	558.7	4,614.2	0.40	40.7	464.0
Length = 1.355 ft	1	0.122	0.088	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	3.84	560.6	4,613.1	0.25	40.7	464.0
Length = 1.314 ft	1	0.117	0.088	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	3.72	542.0	4,614.2	0.57	40.7	464.0
Length = 1.355 ft	1	0.100	0.088	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	3.18	463.6	4,613.1	0.90	40.7	464.0
Length = 1.314 ft	1	0.069	0.088	1.60	1.00	1.00	0.99	1.001	1.00	1.00	1.00	2.18	318.7	4,614.2	1.13	40.7	464.0
Length = 0.6159 ft	1	0.025	0.088	1.60	1.00	1.00	1.00	1.001	1.00	1.00	1.00	0.80	116.0	4,631.6	1.13	40.7	464.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.2740	5.666		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	4.152	4.152
Max Upward from Load Combinations	4.152	4.152
Max Upward from Load Cases	2.277	2.277
D Only	2.277	2.277
+D+L	4.152	4.152
+D+0.750L	3.684	3.684
+0.60D	1.366	1.366
L Only	1.875	1.875

Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFB3 - Deck to Wall (North Elev) (SW-2A, C x Omega)

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

Wood Species : Trus Joist
Wood Grade : Parallam PSL 2.0E

Beam Bracing : Beam bracing is defined as a set spacing over all spans

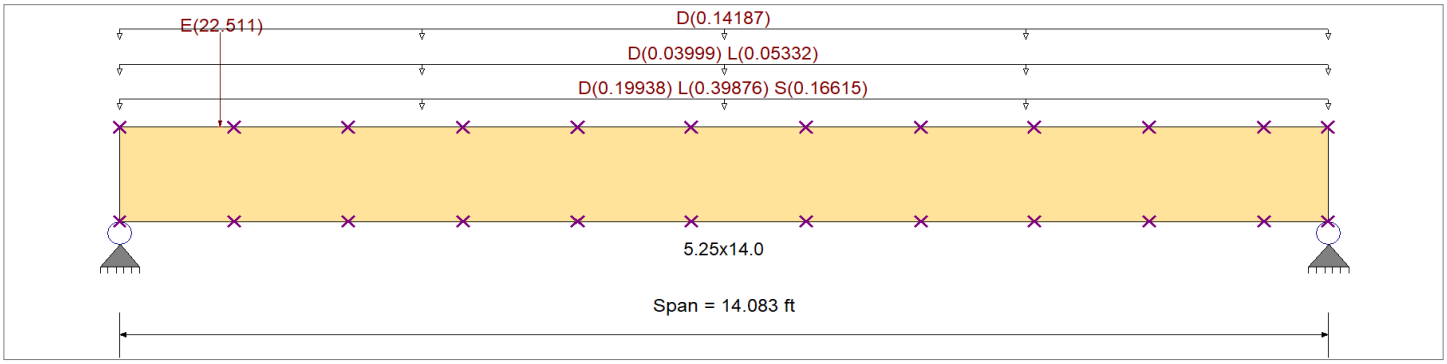
Fb +	2,900.0 psi
Fb -	2,900.0 psi
Fc - Prll	2,900.0 psi
Fc - Perp	625.0 psi
Fv	290.0 psi
Ft	2,025.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,016.54 ksi
Density	45.070 pcf

Unbraced Lengths

First Brace starts at 1.333 ft from Left-Most support
Regular spacing of lateral supports on length of beam = 1.333 ft



Applied Loads

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

Beam self weight calculated and added to loading
Uniform Load : D = 0.030, L = 0.060, S = 0.0250 ksf, Tributary Width = 6.646 ft
Uniform Load : D = 0.030, L = 0.040 ksf, Tributary Width = 1.333 ft, (Deck)
Uniform Load : D = 0.0150 ksf, Tributary Width = 9.458 ft, (Ext Wall (Mostly Glass))
Point Load : E = 22.511 k @ 1.167 ft, (SW-2A OTM w/ Omega (Compression))

DESIGN SUMMARY

Design N.G.

Maximum Bending Stress Ratio	=	0.522 : 1	Maximum Shear Stress Ratio	=	0.741 : 1
Section used for this span		5.25x14.0	Section used for this span		5.25x14.0
fb: Actual	=	1,485.51 psi	fv: Actual	=	343.71 psi
F'b	=	2,845.01 psi	F'v	=	464.00 psi
Load Combination		+D+L	Load Combination		+D+0.70E
Location of maximum on span	=	7.042 ft	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	0.240 in	Ratio =	704 >=600	Span: 1 : E Only
Max Upward Transient Deflection	0 in	Ratio =	0 <600	n/a
Max Downward Total Deflection	0.446 in	Ratio =	379 <480	Span: 1 : +D+0.750L+0.750S+0.5250E
Max Upward Total Deflection	0 in	Ratio =	0 <480	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.091	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	3.32	232.6	2,561.2	2.39	48.8	261.0
Length = 1.336 ft	1	0.166	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	6.07	424.9	2,561.0	2.33	48.8	261.0
Length = 1.336 ft	1	0.221	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	8.10	566.8	2,561.0	1.79	48.8	261.0
Length = 1.336 ft	1	0.257	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	9.40	658.1	2,561.0	1.25	48.8	261.0

Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFB3 - Deck to Wall (North Elev) (SW-2A, C x Omega)

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 1.336 ft	1	0.273	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	9.99	698.9	2,561.0	0.71	48.8	261.0
Length = 1.336 ft	1	0.274	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	10.02	701.3	2,561.0	0.37	48.8	261.0
Length = 1.336 ft	1	0.269	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	9.85	689.2	2,561.0	0.91	48.8	261.0
Length = 1.336 ft	1	0.246	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	8.99	628.9	2,561.0	1.45	48.8	261.0
Length = 1.336 ft	1	0.202	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	7.41	518.2	2,561.0	1.99	48.8	261.0
Length = 1.336 ft	1	0.139	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	5.10	356.9	2,561.0	2.39	48.8	261.0
Length = 0.7710 ft	1	0.057	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	2.07	145.2	2,563.1	2.39	48.8	261.0
+D+L					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.173	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	7.04	492.7	2,845.2	5.06	103.3	290.0
Length = 1.336 ft	1	0.316	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	12.86	900.1	2,845.0	4.93	103.3	290.0
Length = 1.336 ft	1	0.422	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	17.16	1,200.6	2,845.0	3.79	103.3	290.0
Length = 1.336 ft	1	0.490	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	19.92	1,394.0	2,845.0	2.64	103.3	290.0
Length = 1.336 ft	1	0.520	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	21.16	1,480.4	2,845.0	1.50	103.3	290.0
Length = 1.336 ft	1	0.522	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	21.23	1,485.5	2,845.0	0.79	103.3	290.0
Length = 1.336 ft	1	0.513	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	20.86	1,459.9	2,845.0	1.94	103.3	290.0
Length = 1.336 ft	1	0.468	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	19.04	1,332.3	2,845.0	3.08	103.3	290.0
Length = 1.336 ft	1	0.386	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	15.69	1,097.7	2,845.0	4.23	103.3	290.0
Length = 1.336 ft	1	0.266	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	10.81	756.1	2,845.0	5.06	103.3	290.0
Length = 0.7710 ft	1	0.108	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	4.39	307.5	2,847.5	5.06	103.3	290.0
+D+S					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.100	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	4.69	328.2	3,271.0	3.37	68.8	333.5
Length = 1.336 ft	1	0.183	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	8.57	599.6	3,270.7	3.28	68.8	333.5
Length = 1.336 ft	1	0.245	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	11.43	799.7	3,270.7	2.52	68.8	333.5
Length = 1.336 ft	1	0.284	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	13.27	928.6	3,270.7	1.76	68.8	333.5
Length = 1.336 ft	1	0.301	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	14.09	986.1	3,270.7	1.00	68.8	333.5
Length = 1.336 ft	1	0.303	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	14.14	989.5	3,270.7	0.53	68.8	333.5
Length = 1.336 ft	1	0.297	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	13.90	972.4	3,270.7	1.29	68.8	333.5
Length = 1.336 ft	1	0.271	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	12.68	887.4	3,270.7	2.05	68.8	333.5
Length = 1.336 ft	1	0.224	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	10.45	731.2	3,270.7	2.81	68.8	333.5
Length = 1.336 ft	1	0.154	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	7.20	503.6	3,270.7	3.37	68.8	333.5
Length = 0.7710 ft	1	0.063	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	2.93	204.8	3,274.1	3.37	68.8	333.5
+D+0.750L					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.120	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	6.11	427.7	3,554.7	4.39	89.7	362.5
Length = 1.336 ft	1	0.220	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	11.17	781.3	3,554.4	4.28	89.7	362.5
Length = 1.336 ft	1	0.293	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	14.89	1,042.1	3,554.4	3.29	89.7	362.5
Length = 1.336 ft	1	0.340	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	17.29	1,210.0	3,554.4	2.29	89.7	362.5
Length = 1.336 ft	1	0.362	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	18.37	1,285.1	3,554.4	1.30	89.7	362.5
Length = 1.336 ft	1	0.363	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	18.43	1,289.5	3,554.4	0.69	89.7	362.5
Length = 1.336 ft	1	0.357	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	18.11	1,267.2	3,554.4	1.68	89.7	362.5
Length = 1.336 ft	1	0.325	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	16.53	1,156.4	3,554.4	2.67	89.7	362.5
Length = 1.336 ft	1	0.268	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	13.62	952.8	3,554.4	3.67	89.7	362.5
Length = 1.336 ft	1	0.185	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	9.38	656.3	3,554.4	4.39	89.7	362.5
Length = 0.7710 ft	1	0.075	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	3.81	266.9	3,558.3	4.39	89.7	362.5
+D+0.750L+0.750S					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.153	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	7.14	499.4	3,271.0	5.13	104.7	333.5
Length = 1.336 ft	1	0.279	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	13.04	912.3	3,270.7	5.00	104.7	333.5
Length = 1.336 ft	1	0.372	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	17.39	1,216.8	3,270.7	3.84	104.7	333.5

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Project Title:
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Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFB3 - Deck to Wall (North Elev) (SW-2A, C x Omega)

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 1.336 ft	1	0.432	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	20.19	1,412.9	3,270.7	2.68	104.7	333.5
Length = 1.336 ft	1	0.459	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	21.44	1,500.5	3,270.7	1.52	104.7	333.5
Length = 1.336 ft	1	0.460	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	21.52	1,505.6	3,270.7	0.80	104.7	333.5
Length = 1.336 ft	1	0.452	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	21.15	1,479.6	3,270.7	1.96	104.7	333.5
Length = 1.336 ft	1	0.413	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	19.30	1,350.3	3,270.7	3.12	104.7	333.5
Length = 1.336 ft	1	0.340	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	15.90	1,112.6	3,270.7	4.28	104.7	333.5
Length = 1.336 ft	1	0.234	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	10.95	766.3	3,270.7	5.13	104.7	333.5
Length = 0.7710 ft	1	0.095	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	4.45	311.6	3,274.1	5.13	104.7	333.5
+D+0.70E					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.308	0.741	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	20.03	1,401.6	4,546.7	16.84	343.7	464.0
Length = 1.336 ft	1	0.324	0.741	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	21.04	1,471.8	4,546.1	1.02	343.7	464.0
Length = 1.336 ft	1	0.328	0.741	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	21.32	1,491.9	4,546.1	0.48	343.7	464.0
Length = 1.336 ft	1	0.328	0.741	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	21.32	1,491.6	4,546.1	0.60	343.7	464.0
Length = 1.336 ft	1	0.321	0.741	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	20.88	1,460.9	4,546.1	1.14	343.7	464.0
Length = 1.336 ft	1	0.303	0.741	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	19.72	1,379.6	4,546.1	1.68	343.7	464.0
Length = 1.336 ft	1	0.274	0.741	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	17.83	1,247.8	4,546.1	2.22	343.7	464.0
Length = 1.336 ft	1	0.234	0.741	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	15.23	1,065.5	4,546.1	2.76	343.7	464.0
Length = 1.336 ft	1	0.183	0.741	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	11.90	832.7	4,546.1	3.30	343.7	464.0
Length = 1.336 ft	1	0.121	0.741	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	7.85	549.4	4,546.1	3.69	343.7	464.0
Length = 0.7710 ft	1	0.047	0.741	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	3.08	215.6	4,552.7	3.69	343.7	464.0
+D+0.750L+0.750S+0.5250E					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.303	0.702	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	19.67	1,376.1	4,546.7	15.97	325.9	464.0
Length = 1.336 ft	1	0.373	0.702	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	24.26	1,697.5	4,546.1	4.02	325.9	464.0
Length = 1.336 ft	1	0.420	0.702	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	27.30	1,910.5	4,546.1	2.86	325.9	464.0
Length = 1.336 ft	1	0.443	0.702	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	28.80	2,015.0	4,546.1	1.70	325.9	464.0
Length = 1.336 ft	1	0.446	0.702	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	28.96	2,026.6	4,546.1	0.62	325.9	464.0
Length = 1.336 ft	1	0.442	0.702	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	28.74	2,011.0	4,546.1	1.78	325.9	464.0
Length = 1.336 ft	1	0.418	0.702	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	27.13	1,898.6	4,546.1	2.94	325.9	464.0
Length = 1.336 ft	1	0.369	0.702	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	23.98	1,677.8	4,546.1	4.10	325.9	464.0
Length = 1.336 ft	1	0.297	0.702	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	19.27	1,348.5	4,546.1	5.26	325.9	464.0
Length = 1.336 ft	1	0.200	0.702	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	13.02	910.7	4,546.1	6.11	325.9	464.0
Length = 0.7710 ft	1	0.080	0.702	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	5.21	364.5	4,552.7	6.11	325.9	464.0
+0.60D					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.031	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	1.99	139.6	4,546.7	1.43	29.3	464.0
Length = 1.336 ft	1	0.056	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	3.64	255.0	4,546.1	1.40	29.3	464.0
Length = 1.336 ft	1	0.075	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	4.86	340.1	4,546.1	1.07	29.3	464.0
Length = 1.336 ft	1	0.087	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	5.64	394.8	4,546.1	0.75	29.3	464.0
Length = 1.336 ft	1	0.092	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	5.99	419.3	4,546.1	0.42	29.3	464.0
Length = 1.336 ft	1	0.093	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	6.01	420.8	4,546.1	0.22	29.3	464.0
Length = 1.336 ft	1	0.091	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	5.91	413.5	4,546.1	0.55	29.3	464.0
Length = 1.336 ft	1	0.083	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	5.39	377.4	4,546.1	0.87	29.3	464.0
Length = 1.336 ft	1	0.068	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	4.44	310.9	4,546.1	1.20	29.3	464.0
Length = 1.336 ft	1	0.047	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	3.06	214.2	4,546.1	1.43	29.3	464.0
Length = 0.7710 ft	1	0.019	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	1.24	87.1	4,552.7	1.43	29.3	464.0
+0.60D+0.70E					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.288	0.699	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	18.70	1,308.5	4,546.7	15.89	324.2	464.0
Length = 1.336 ft	1	0.288	0.699	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	18.72	1,309.7	4,546.1	0.23	324.2	464.0

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DESCRIPTION: UFB3 - Deck to Wall (North Elev) (SW-2A, C x Omega)

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
Length = 1.336 ft	1	0.286	0.699	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	18.61	1,301.9	4,546.1	0.56	324.2	464.0
Length = 1.336 ft	1	0.278	0.699	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	18.08	1,264.9	4,546.1	0.88	324.2	464.0
Length = 1.336 ft	1	0.263	0.699	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	17.12	1,197.6	4,546.1	1.21	324.2	464.0
Length = 1.336 ft	1	0.242	0.699	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	15.72	1,100.1	4,546.1	1.53	324.2	464.0
Length = 1.336 ft	1	0.214	0.699	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	13.89	972.2	4,546.1	1.85	324.2	464.0
Length = 1.336 ft	1	0.179	0.699	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	11.63	814.0	4,546.1	2.18	324.2	464.0
Length = 1.336 ft	1	0.138	0.699	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	8.94	625.5	4,546.1	2.50	324.2	464.0
Length = 1.336 ft	1	0.089	0.699	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	5.81	406.6	4,546.1	2.74	324.2	464.0
Length = 0.7710 ft	1	0.035	0.699	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	2.25	157.5	4,552.7	2.74	324.2	464.0

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	0.4456	6.785		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	20.646	7.091
Max Upward from Load Combinations	17.299	7.091
Max Upward from Load Cases	20.646	3.183
D Only	2.847	2.847
+D+L	6.030	6.030
+D+S	4.017	4.017
+D+0.750L	5.234	5.234
+D+0.750L+0.750S	6.112	6.112
+D+0.70E	17.299	4.152
+D+0.750L+0.750S+0.5250E	16.951	7.091
+0.60D	1.708	1.708
+0.60D+0.70E	16.160	3.013
L Only	3.183	3.183
S Only	1.170	1.170
E Only	20.646	1.865

Dibble Engineers, Inc.
1029 Market Street
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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFB3 - Deck to Wall (North Elev) (SW-2A, C w/out Omega)

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

Wood Species : Trus Joist
Wood Grade : Parallam PSL 2.0E

Beam Bracing : Beam bracing is defined as a set spacing over all spans

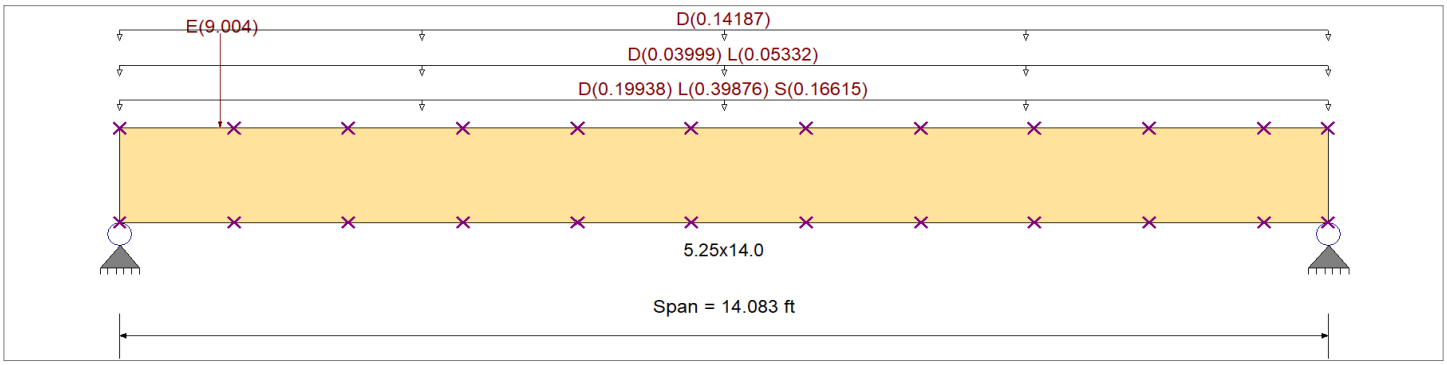
Fb +	2,900.0 psi
Fb -	2,900.0 psi
Fc - Prll	2,900.0 psi
Fc - Perp	625.0 psi
Fv	290.0 psi
Ft	2,025.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,016.54 ksi
Density	45.070 pcf

Unbraced Lengths

First Brace starts at 1.333 ft from Left-Most support
Regular spacing of lateral supports on length of beam = 1.333 ft



Applied Loads

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

Beam self weight calculated and added to loading
Uniform Load : D = 0.030, L = 0.060, S = 0.0250 ksf, Tributary Width = 6.646 ft
Uniform Load : D = 0.030, L = 0.040 ksf, Tributary Width = 1.333 ft, (Deck)
Uniform Load : D = 0.0150 ksf, Tributary Width = 9.458 ft, (Ext Wall (Mostly Glass))
Point Load : E = 9.004 k @ 1.167 ft, (SW-2A OTM w/ Omega (Compression))

DESIGN SUMMARY

Design N.G.

Maximum Bending Stress Ratio	=	0.522 : 1	Maximum Shear Stress Ratio	=	0.416 : 1
Section used for this span		5.25x14.0	Section used for this span		5.25x14.0
fb: Actual	=	1,485.51 psi	fv: Actual	=	193.18 psi
F'b	=	2,845.01 psi	F'v	=	464.00 psi
Load Combination		+D+L	Load Combination		+D+0.750L+0.750S+0.5250E
Location of maximum on span	=	7.042 ft	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	0.168 in	Ratio =	1008	>=600	Span: 1 : L Only
Max Upward Transient Deflection	0 in	Ratio =	0	<600	n/a
Max Downward Total Deflection	0.371 in	Ratio =	455	<480	Span: 1 : +D+0.750L+0.750S+0.5250E
Max Upward Total Deflection	0 in	Ratio =	0	<480	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.091	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	3.32	232.6	2,561.2	2.39	48.8	261.0
Length = 1.336 ft	1	0.166	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	6.07	424.9	2,561.0	2.33	48.8	261.0
Length = 1.336 ft	1	0.221	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	8.10	566.8	2,561.0	1.79	48.8	261.0
Length = 1.336 ft	1	0.257	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	9.40	658.1	2,561.0	1.25	48.8	261.0

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Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFB3 - Deck to Wall (North Elev) (SW-2A, C w/out Omega)

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 1.336 ft	1	0.273	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	9.99	698.9	2,561.0	0.71	48.8	261.0
Length = 1.336 ft	1	0.274	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	10.02	701.3	2,561.0	0.37	48.8	261.0
Length = 1.336 ft	1	0.269	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	9.85	689.2	2,561.0	0.91	48.8	261.0
Length = 1.336 ft	1	0.246	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	8.99	628.9	2,561.0	1.45	48.8	261.0
Length = 1.336 ft	1	0.202	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	7.41	518.2	2,561.0	1.99	48.8	261.0
Length = 1.336 ft	1	0.139	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	5.10	356.9	2,561.0	2.39	48.8	261.0
Length = 0.7710 ft	1	0.057	0.187	0.90	1.00	1.00	1.00	0.983	1.00	1.00	1.00	2.07	145.2	2,563.1	2.39	48.8	261.0
+D+L					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.173	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	7.04	492.7	2,845.2	5.06	103.3	290.0
Length = 1.336 ft	1	0.316	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	12.86	900.1	2,845.0	4.93	103.3	290.0
Length = 1.336 ft	1	0.422	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	17.16	1,200.6	2,845.0	3.79	103.3	290.0
Length = 1.336 ft	1	0.490	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	19.92	1,394.0	2,845.0	2.64	103.3	290.0
Length = 1.336 ft	1	0.520	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	21.16	1,480.4	2,845.0	1.50	103.3	290.0
Length = 1.336 ft	1	0.522	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	21.23	1,485.5	2,845.0	0.79	103.3	290.0
Length = 1.336 ft	1	0.513	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	20.86	1,459.9	2,845.0	1.94	103.3	290.0
Length = 1.336 ft	1	0.468	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	19.04	1,332.3	2,845.0	3.08	103.3	290.0
Length = 1.336 ft	1	0.386	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	15.69	1,097.7	2,845.0	4.23	103.3	290.0
Length = 1.336 ft	1	0.266	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	10.81	756.1	2,845.0	5.06	103.3	290.0
Length = 0.7710 ft	1	0.108	0.356	1.00	1.00	1.00	1.00	0.983	1.00	1.00	1.00	4.39	307.5	2,847.5	5.06	103.3	290.0
+D+S					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.100	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	4.69	328.2	3,271.0	3.37	68.8	333.5
Length = 1.336 ft	1	0.183	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	8.57	599.6	3,270.7	3.28	68.8	333.5
Length = 1.336 ft	1	0.245	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	11.43	799.7	3,270.7	2.52	68.8	333.5
Length = 1.336 ft	1	0.284	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	13.27	928.6	3,270.7	1.76	68.8	333.5
Length = 1.336 ft	1	0.301	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	14.09	986.1	3,270.7	1.00	68.8	333.5
Length = 1.336 ft	1	0.303	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	14.14	989.5	3,270.7	0.53	68.8	333.5
Length = 1.336 ft	1	0.297	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	13.90	972.4	3,270.7	1.29	68.8	333.5
Length = 1.336 ft	1	0.271	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	12.68	887.4	3,270.7	2.05	68.8	333.5
Length = 1.336 ft	1	0.224	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	10.45	731.2	3,270.7	2.81	68.8	333.5
Length = 1.336 ft	1	0.154	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	7.20	503.6	3,270.7	3.37	68.8	333.5
Length = 0.7710 ft	1	0.063	0.206	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	2.93	204.8	3,274.1	3.37	68.8	333.5
+D+0.750L					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.120	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	6.11	427.7	3,554.7	4.39	89.7	362.5
Length = 1.336 ft	1	0.220	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	11.17	781.3	3,554.4	4.28	89.7	362.5
Length = 1.336 ft	1	0.293	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	14.89	1,042.1	3,554.4	3.29	89.7	362.5
Length = 1.336 ft	1	0.340	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	17.29	1,210.0	3,554.4	2.29	89.7	362.5
Length = 1.336 ft	1	0.362	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	18.37	1,285.1	3,554.4	1.30	89.7	362.5
Length = 1.336 ft	1	0.363	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	18.43	1,289.5	3,554.4	0.69	89.7	362.5
Length = 1.336 ft	1	0.357	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	18.11	1,267.2	3,554.4	1.68	89.7	362.5
Length = 1.336 ft	1	0.325	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	16.53	1,156.4	3,554.4	2.67	89.7	362.5
Length = 1.336 ft	1	0.268	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	13.62	952.8	3,554.4	3.67	89.7	362.5
Length = 1.336 ft	1	0.185	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	9.38	656.3	3,554.4	4.39	89.7	362.5
Length = 0.7710 ft	1	0.075	0.247	1.25	1.00	1.00	1.00	0.983	1.00	1.00	1.00	3.81	266.9	3,558.3	4.39	89.7	362.5
+D+0.750L+0.750S					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.153	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	7.14	499.4	3,271.0	5.13	104.7	333.5
Length = 1.336 ft	1	0.279	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	13.04	912.3	3,270.7	5.00	104.7	333.5
Length = 1.336 ft	1	0.372	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	17.39	1,216.8	3,270.7	3.84	104.7	333.5

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DESCRIPTION: UFB3 - Deck to Wall (North Elev) (SW-2A, C w/out Omega)

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
Length = 1.336 ft	1	0.432	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	20.19	1,412.9	3,270.7	2.68	104.7	333.5
Length = 1.336 ft	1	0.459	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	21.44	1,500.5	3,270.7	1.52	104.7	333.5
Length = 1.336 ft	1	0.460	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	21.52	1,505.6	3,270.7	0.80	104.7	333.5
Length = 1.336 ft	1	0.452	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	21.15	1,479.6	3,270.7	1.96	104.7	333.5
Length = 1.336 ft	1	0.413	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	19.30	1,350.3	3,270.7	3.12	104.7	333.5
Length = 1.336 ft	1	0.340	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	15.90	1,112.6	3,270.7	4.28	104.7	333.5
Length = 1.336 ft	1	0.234	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	10.95	766.3	3,270.7	5.13	104.7	333.5
Length = 0.7710 ft	1	0.095	0.314	1.15	1.00	1.00	1.00	0.983	1.00	1.00	1.00	4.45	311.6	3,274.1	5.13	104.7	333.5
+D+0.70E					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.154	0.359	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	10.01	700.2	4,546.7	8.17	166.7	464.0
Length = 1.336 ft	1	0.186	0.359	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	12.06	843.7	4,546.1	1.80	166.7	464.0
Length = 1.336 ft	1	0.206	0.359	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	13.39	936.7	4,546.1	1.26	166.7	464.0
Length = 1.336 ft	1	0.215	0.359	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	13.99	979.2	4,546.1	0.72	166.7	464.0
Length = 1.336 ft	1	0.216	0.359	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	14.04	982.1	4,546.1	0.36	166.7	464.0
Length = 1.336 ft	1	0.214	0.359	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	13.88	971.2	4,546.1	0.90	166.7	464.0
Length = 1.336 ft	1	0.201	0.359	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	13.04	912.6	4,546.1	1.44	166.7	464.0
Length = 1.336 ft	1	0.177	0.359	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	11.48	803.6	4,546.1	1.98	166.7	464.0
Length = 1.336 ft	1	0.142	0.359	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	9.20	644.0	4,546.1	2.52	166.7	464.0
Length = 1.336 ft	1	0.095	0.359	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	6.20	433.9	4,546.1	2.91	166.7	464.0
Length = 0.7710 ft	1	0.038	0.359	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	2.48	173.3	4,552.7	2.91	166.7	464.0
+D+0.750L+0.750S+0.5250E					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.187	0.416	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	12.15	850.0	4,546.7	9.47	193.2	464.0
Length = 1.336 ft	1	0.270	0.416	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	17.53	1,226.4	4,546.1	4.60	193.2	464.0
Length = 1.336 ft	1	0.329	0.416	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	21.36	1,494.3	4,546.1	3.44	193.2	464.0
Length = 1.336 ft	1	0.364	0.416	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	23.63	1,653.7	4,546.1	2.29	193.2	464.0
Length = 1.336 ft	1	0.375	0.416	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	24.36	1,704.7	4,546.1	1.13	193.2	464.0
Length = 1.336 ft	1	0.375	0.416	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	24.36	1,704.7	4,546.1	1.19	193.2	464.0
Length = 1.336 ft	1	0.362	0.416	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	23.54	1,647.2	4,546.1	2.35	193.2	464.0
Length = 1.336 ft	1	0.326	0.416	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	21.17	1,481.3	4,546.1	3.51	193.2	464.0
Length = 1.336 ft	1	0.265	0.416	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	17.25	1,206.9	4,546.1	4.67	193.2	464.0
Length = 1.336 ft	1	0.181	0.416	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	11.78	824.1	4,546.1	5.52	193.2	464.0
Length = 0.7710 ft	1	0.073	0.416	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	4.76	332.8	4,552.7	5.52	193.2	464.0
+0.60D					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.031	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	1.99	139.6	4,546.7	1.43	29.3	464.0
Length = 1.336 ft	1	0.056	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	3.64	255.0	4,546.1	1.40	29.3	464.0
Length = 1.336 ft	1	0.075	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	4.86	340.1	4,546.1	1.07	29.3	464.0
Length = 1.336 ft	1	0.087	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	5.64	394.8	4,546.1	0.75	29.3	464.0
Length = 1.336 ft	1	0.092	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	5.99	419.3	4,546.1	0.42	29.3	464.0
Length = 1.336 ft	1	0.093	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	6.01	420.8	4,546.1	0.22	29.3	464.0
Length = 1.336 ft	1	0.091	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	5.91	413.5	4,546.1	0.55	29.3	464.0
Length = 1.336 ft	1	0.083	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	5.39	377.4	4,546.1	0.87	29.3	464.0
Length = 1.336 ft	1	0.068	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	4.44	310.9	4,546.1	1.20	29.3	464.0
Length = 1.336 ft	1	0.047	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	3.06	214.2	4,546.1	1.43	29.3	464.0
Length = 0.7710 ft	1	0.019	0.063	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	1.24	87.1	4,552.7	1.43	29.3	464.0
+0.60D+0.70E					1.00	1.00	1.00	0.983	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 1.285 ft	1	0.134	0.317	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	8.68	607.1	4,546.7	7.21	147.2	464.0
Length = 1.336 ft	1	0.148	0.317	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	9.63	673.7	4,546.1	0.87	147.2	464.0

Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFB3 - Deck to Wall (North Elev) (SW-2A, C w/out Omega)

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
Length = 1.336 ft	1	0.156	0.317	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	10.15	710.0	4,546.1	0.55	147.2	464.0
Length = 1.336 ft	1	0.158	0.317	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	10.25	717.3	4,546.1	0.23	147.2	464.0
Length = 1.336 ft	1	0.157	0.317	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	10.23	715.9	4,546.1	0.42	147.2	464.0
Length = 1.336 ft	1	0.152	0.317	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	9.88	691.6	4,546.1	0.75	147.2	464.0
Length = 1.336 ft	1	0.140	0.317	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	9.10	637.0	4,546.1	1.07	147.2	464.0
Length = 1.336 ft	1	0.121	0.317	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	7.89	552.0	4,546.1	1.39	147.2	464.0
Length = 1.336 ft	1	0.096	0.317	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	6.24	436.7	4,546.1	1.72	147.2	464.0
Length = 1.336 ft	1	0.064	0.317	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	4.16	291.1	4,546.1	1.96	147.2	464.0
Length = 0.7710 ft	1	0.025	0.317	1.60	1.00	1.00	1.00	0.983	1.00	1.00	1.00	1.65	115.3	4,552.7	1.96	147.2	464.0

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	0.3712	6.939		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	10.447	6.503
Max Upward from Load Combinations	10.447	6.503
Max Upward from Load Cases	8.258	3.183
D Only	2.847	2.847
+D+L	6.030	6.030
+D+S	4.017	4.017
+D+0.750L	5.234	5.234
+D+0.750L+0.750S	6.112	6.112
+D+0.70E	8.627	3.369
+D+0.750L+0.750S+0.5250E	10.447	6.503
+0.60D	1.708	1.708
+0.60D+0.70E	7.489	2.230
L Only	3.183	3.183
S Only	1.170	1.170
E Only	8.258	0.746

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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFP3 (loaded by DB1 & DB2)

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design		
End Fixities	Top & Bottom Pinned		
Overall Column Height	10.333333 ft		
(Used for non-slender calculations)			
Wood Species	Douglas Fir - Larch		
Wood Grade	No.1		
Fb +	1200 psi	Fv	170 psi
Fb -	1200 psi	Ft	825 psi
Fc - Prll	1000 psi	Density	31.21 pcf
Fc - Perp	625 psi		

E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial
Basic	1600	1600	1600 ksi
Minimum	580	580	

Wood Section Name	**6x6**		
Wood Grading/Manuf.	Graded Lumber		
Wood Member Type	Sawn		
Exact Width	**5.50** in	Allow Stress Modification Factors	
Exact Depth	**5.50** in	Cf or Cv for Bending	1.0
Area	30.250 in^2	Cf or Cv for Compressio	1.0
Ix	76.255 in^4	Cf or Cv for Tension	1.0
Iy	76.255 in^4	Cm : Wet Use Factor	1.0
Incising Factors :		Ct : Temperature Fact	1.0
for Bending	0.80	Cfu : Flat Use Factor	1.0
for Elastic Modulus	0.95	Kf : Built-up columns	1.0
		Use Cr : Repetitive ?	No

Column Buckling Condition:
ABOUT X-X Axis: Lux = 10.333333 ft, Kx = 1.0
ABOUT Y-Y Axis: Luy = 10.333333 ft, Ky = 1.0

Applied Loads

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

Column self weight included : 67.748 lbs * Dead Load Factor
AXIAL LOADS . . .
Deck Floor Loads: Axial Load at 10.333 ft, D = 1.555, L = 2.614, S = 1.089 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.2619 : 1**

Load Combination	+D+L
Governing NDS Forumla	Comp Only, fc/Fc'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	4.237 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	534.75 psi

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

Load Combination	+0.60D
Location of max.above base	10.333 ft
Applied Design Shear	0.0 psi
Allowable Shear	217.60 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

Other Factors used to calculate allowable stresses . . .

	Bending	Compression	Tension

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.900	0.705	0.1057	PASS	0.0 ft	0.0	PASS	10.333 ft
+D+L	1.000	0.668	0.2619	PASS	0.0 ft	0.0	PASS	10.333 ft
+D+S	1.150	0.617	0.1579	PASS	0.0 ft	0.0	PASS	10.333 ft
+D+0.750L	1.250	0.585	0.2024	PASS	0.0 ft	0.0	PASS	10.333 ft
+D+0.750L+0.750S	1.150	0.617	0.2563	PASS	0.0 ft	0.0	PASS	10.333 ft
+0.60D	1.600	0.491	0.05118	PASS	0.0 ft	0.0	PASS	10.333 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction k @ Base	@ Top	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base	My - End Moments k-ft @ Base	@ Top	Mx - End Moments @ Base	@ Top
D Only					1.623				

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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFP3 (loaded by DB1 & DB2)

Maximum Reactions

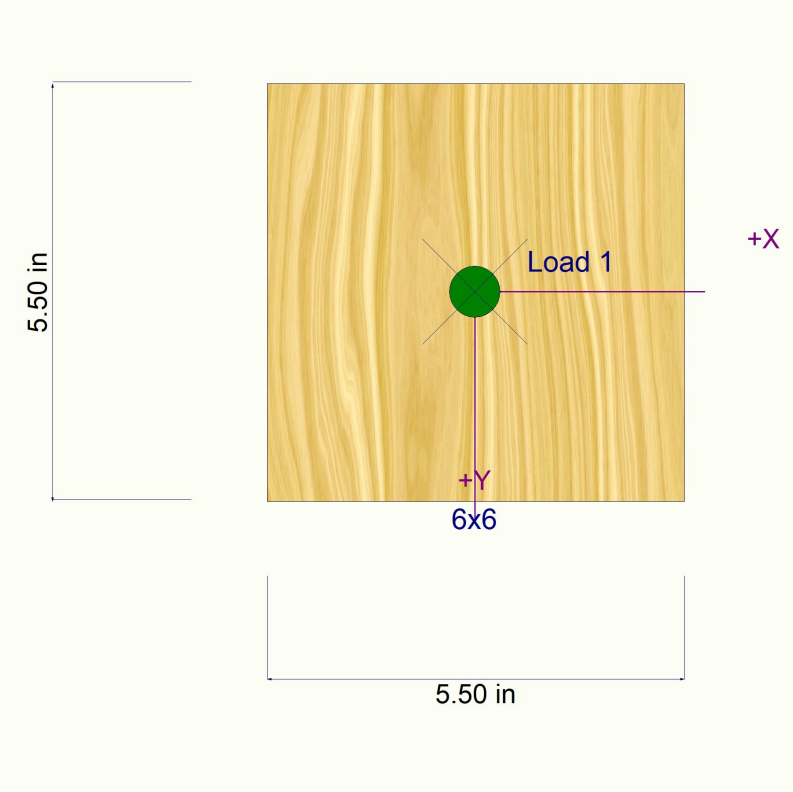
Note: Only non-zero reactions are listed.

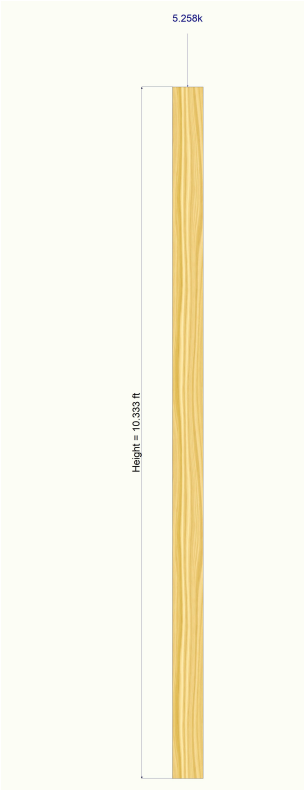
Load Combination	X-X Axis Reaction @ Base	@ Top	k	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base	My - End Moments @ Base	@ Top	k-ft	Mx - End Moments @ Base	@ Top
+D+L						4.237					
+D+S						2.712					
+D+0.750L						3.583					
+D+0.750L+0.750S						4.400					
+0.60D						0.974					
L Only						2.614					
S Only						1.089					

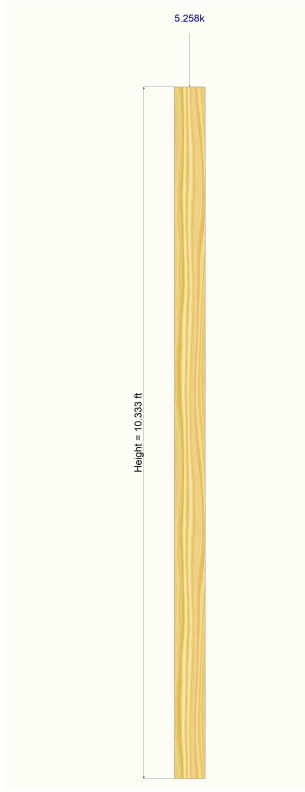
Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+L	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+S	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.750L	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.750L+0.750S	0.0000 in	0.000ft	0.000 in	0.000 ft
+0.60D	0.0000 in	0.000ft	0.000 in	0.000 ft
L Only	0.0000 in	0.000ft	0.000 in	0.000 ft
S Only	0.0000 in	0.000ft	0.000 in	0.000 ft

Sketches







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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFP4 (loaded by UFB3 & stacks w/ RP1)

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design		
End Fixities	Top & Bottom Pinned		
Overall Column Height	10.33333 ft		
(Used for non-slender calculations)			
Wood Species	Hem Fir		
Wood Grade	No.2		
Fb +	850.0 psi	Fv	150.0 psi
Fb -	850.0 psi	Ft	525.0 psi
Fc - Prll	1,300.0 psi	Density	26.840 pcf
Fc - Perp	405.0 psi		

E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial
Basic	1,300.0	1,300.0	1,300.0 ksi
Minimum	470.0	470.0	

Wood Section Name	**3-2x6**		
Wood Grading/Manuf.	Graded Lumber		
Wood Member Type	Sawn		
Exact Width	**4.50** in	Allow Stress Modification Factors	
Exact Depth	**5.50** in	Cf or Cv for Bending	1.30
Area	24.750 in^2	Cf or Cv for Compressio	1.10
Ix	62.391 in^4	Cf or Cv for Tension	1.30
Iy	41.766 in^4	Cm : Wet Use Factor	1.0
		Ct : Temperature Fact	1.0
		Cfu : Flat Use Factor	1.0
		Kf : Built-up columns	1.0
		Use Cr : Repetitive ?	No

Column Buckling Condition:
ABOUT X-X Axis: Lux = 10.33333 ft, Kx = 1.0
ABOUT Y-Y Axis: Luy = 10.33333 ft, Ky = 1.0

Applied Loads

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

Column self weight included : 47.669 lbs * Dead Load Factor
AXIAL LOADS . . .
Upper Floor Loads: Axial Load at 10.333 ft, D = 2.847, L = 3.183, S = 0.2210, E = 8.258 k
RP1: Axial Load at 10.333 ft, D = 0.4910, Lr = 0.5680, S = 0.710 k
BENDING LOADS . . .
Lat. Point Load at 6.333 ft creating Mx-x, W = 1.011 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.9041 : 1**

Load Combination	+D+0.750L+0.750S+0.5250E
Governing NDS Forumla	Comp Only, fc/Fc'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	10.807 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	482.961 psi

PASS Maximum Shear Stress Ratio = **0.09389 : 1**

Load Combination	+D+0.60W
Location of max.above base	10.333 ft
Applied Design Shear	33.799 psi
Allowable Shear	240.0 psi

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y	0.6196 k	Bottom along Y-Y	0.3914 k
Top along X-X	0.0 k	Bottom along X-X	0.0 k

Maximum SERVICE Load Lateral Deflections . . .

Along Y-Y 0.4670 in at 5.548 ft above base
for load combination : W Only

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

Other Factors used to calculate allowable stresses . . .

	Bending	Compression	Tension

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.900	0.356	0.2986	PASS	0.0 ft	0.0	PASS	10.333 ft
+D+L	1.000	0.325	0.5718	PASS	0.0 ft	0.0	PASS	10.333 ft
+D+Lr	1.250	0.265	0.3367	PASS	0.0 ft	0.0	PASS	10.333 ft
+D+S	1.150	0.286	0.3703	PASS	0.0 ft	0.0	PASS	10.333 ft
+D+0.750Lr+0.750L	1.250	0.265	0.5278	PASS	0.0 ft	0.0	PASS	10.333 ft
+D+0.750L+0.750S	1.150	0.286	0.5551	PASS	0.0 ft	0.0	PASS	10.333 ft
+D+0.60W	1.600	0.211	0.6270	PASS	6.311 ft	0.09389	PASS	10.333 ft
+D+0.70E	1.600	0.211	0.7668	PASS	0.0 ft	0.0	PASS	10.333 ft

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Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFP4 (loaded by UFB3 & stacks w/ RP1)

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+0.750Lr+0.750L+0.450W	1.600	0.211	0.7705	PASS	6.311 ft	0.07041	PASS	10.333 ft
+D+0.750L+0.750S+0.450W	1.600	0.211	0.8057	PASS	6.311 ft	0.07041	PASS	10.333 ft
+D+0.750L+0.750S+0.5250E	1.600	0.211	0.9041	PASS	0.0 ft	0.0	PASS	10.333 ft
+0.60D+0.60W	1.600	0.211	0.5316	PASS	6.311 ft	0.09389	PASS	10.333 ft
+0.60D+0.70E	1.600	0.211	0.6535	PASS	0.0 ft	0.0	PASS	10.333 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction k		Y-Y Axis Reaction		Axial Reaction	My - End Moments k-ft		Mx - End Moments	
	@ Base	@ Top	@ Base	@ Top	@ Base	@ Base	@ Top	@ Base	@ Top
D Only					3.386				
+D+L					6.569				
+D+Lr					3.954				
+D+S					4.317				
+D+0.750Lr+0.750L					6.199				
+D+0.750L+0.750S					6.471				
+D+0.60W			0.235	0.372	3.386				
+D+0.70E					9.166				
+D+0.750Lr+0.750L+0.450W			0.176	0.279	6.199				
+D+0.750L+0.750S+0.450W			0.176	0.279	6.471				
+D+0.750L+0.750S+0.5250E					10.807				
+0.60D+0.60W			0.235	0.372	2.031				
+0.60D+0.70E					7.812				
Lr Only					0.568				
L Only					3.183				
S Only					0.931				
W Only			0.391	0.620					
E Only					8.258				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+L	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+Lr	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+S	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.750Lr+0.750L	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.750L+0.750S	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.60W	0.0000 in	0.000ft	0.280 in	5.548 ft
+D+0.70E	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.750Lr+0.750L+0.450W	0.0000 in	0.000ft	0.210 in	5.548 ft
+D+0.750L+0.750S+0.450W	0.0000 in	0.000ft	0.210 in	5.548 ft
+D+0.750L+0.750S+0.5250E	0.0000 in	0.000ft	0.000 in	0.000 ft
+0.60D+0.60W	0.0000 in	0.000ft	0.280 in	5.548 ft
+0.60D+0.70E	0.0000 in	0.000ft	0.000 in	0.000 ft
Lr Only	0.0000 in	0.000ft	0.000 in	0.000 ft
L Only	0.0000 in	0.000ft	0.000 in	0.000 ft
S Only	0.0000 in	0.000ft	0.000 in	0.000 ft
W Only	0.0000 in	0.000ft	0.467 in	5.548 ft
E Only	0.0000 in	0.000ft	0.000 in	0.000 ft

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1029 Market Street
Kirkland, WA 98033
(425) 828-4200

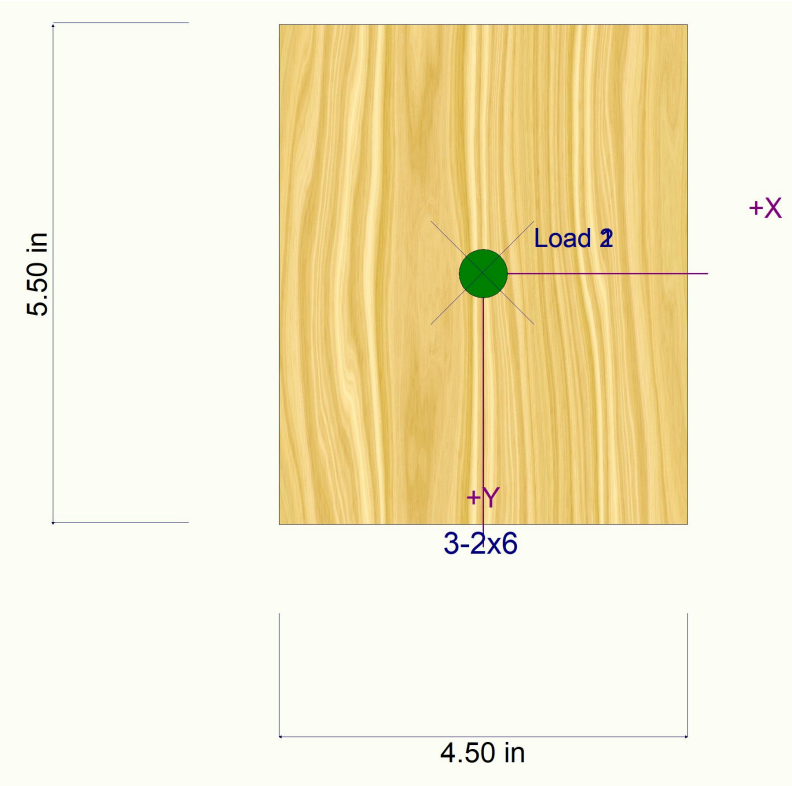
Project Title:
Engineer:
Project ID:
Project Descr:

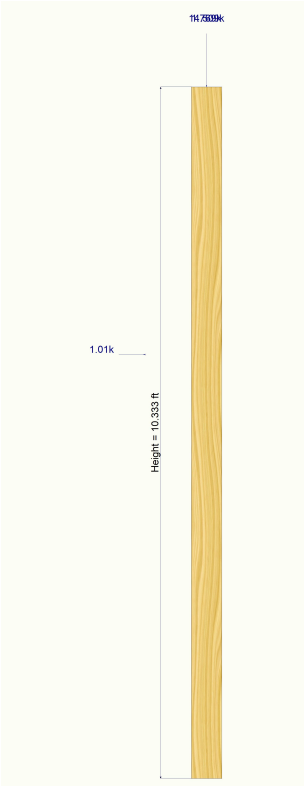
Wood Column

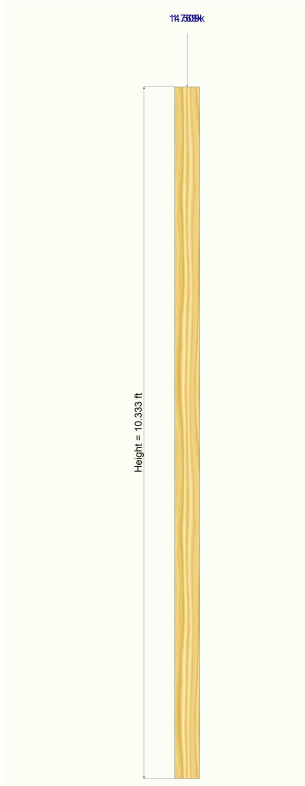
Project File: harris res remodel_rev.ec6

DESCRIPTION: UFP4 (loaded by UFB3 & stacks w/ RP1)

Sketches







Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFP5 (loaded by DB1, UFB3, UFB2, & stacks w/ RP2) [(E) 5 1/4 SQ PSL]

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design	Wood Section Name	**5.25x5.25**
End Fixities	Top & Bottom Pinned	Wood Grading/Manuf.	Trus-Joist
Overall Column Height	10.33333 ft	Wood Member Type	Parallam PSL
(Used for non-slender calculations)			
Wood Species	Trus Joist	Exact Width	**5.250** in
Wood Grade	Parallam PSL 2.0E	Exact Depth	**5.250** in
Fb +	2,900.0 psi	Fv	290.0 psi
Fb -	2,900.0 psi	Ft	2,025.0 psi
Fc - Prll	2,900.0 psi	Density	45.070 pcf
Fc - Perp	625.0 psi		

Area	27.563	in^2
Ix	63.308	in^4
Iy	63.308	in^4

Allow Stress Modification Factors

Cf or Cv for Bending	1.096
Cf or Cv for Compressio	1.0
Cf or Cv for Tension	1.0
Cm : Wet Use Factor	1.0
Ct : Temperature Fact	1.0
Cfu : Flat Use Factor	1.0
Kf : Built-up columns	1.0
Use Cr : Repetitive ?	No

E : Modulus of Elasticity . . .

	x-x Bending	y-y Bending	Axial
Basic	2,000.0	2,000.0	2,000.0 ksi
Minimum	1,016.54	1,016.54	

Column Buckling Condition:
ABOUT X-X Axis: Lux = 10.33333 ft, Kx = 1.0
ABOUT Y-Y Axis: Luy = 10.33333 ft, Ky = 1.0

Applied Loads

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

Column self weight included : 89.144 lbs * Dead Load Factor
AXIAL LOADS . . .
UFB3: Axial Load at 10.333 ft, D = 2.847, L = 3.183, S = 1.170, E = 0.7460 k
RP2: Axial Load at 10.333 ft, D = 1.138, Lr = 1.431, S = 1.789 k
UFB2: Axial Load at 10.333 ft, Xecc = 2.0 in, D = 2.277, L = 1.875 k
DB1: Axial Load at 10.333 ft, Xecc = -2.0 in, D = 0.4460, L = 0.5320, S = 0.2210 k
BENDING LOADS . . .
Lat. Point Load at 6.333 ft creating Mx-x, W = 1.011 k
Lat. Point Load at 6.333 ft creating My-y, W = 0.690 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.3484 : 1**

Load Combination	+D+0.750L+0.750S+0.5250E
Governing NDS Forumla	Comp Only, fc/Fc'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	13.766 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	1,433.75 psi

PASS Maximum Shear Stress Ratio = **0.04361 : 1**

Load Combination	+D+0.60W
Location of max.above base	10.333 ft
Applied Design Shear	30.350 psi
Allowable Shear	464.0 psi

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y	0.6196 k	Bottom along Y-Y	0.3914 k
Top along X-X	0.4229 k	Bottom along X-X	0.2671 k

Maximum SERVICE Load Lateral Deflections . . .

Along Y-Y 0.2991 in at 5.548 ft above base
for load combination : W Only

Along X-X 0.2042 in at 5.548 ft above base
for load combination : W Only

Other Factors used to calculate allowable stresses . . .

	Bending	Compression	Tension

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.900	0.518	0.1823	PASS	0.0 ft	0.006158	PASS	10.333 ft
+D+L	1.000	0.474	0.3271	PASS	0.0 ft	0.009607	PASS	10.333 ft
+D+Lr	1.250	0.389	0.2120	PASS	0.0 ft	0.004434	PASS	10.333 ft
+D+S	1.150	0.419	0.2591	PASS	0.0 ft	0.004238	PASS	10.333 ft
+D+0.750Lr+0.750L	1.250	0.389	0.3108	PASS	0.0 ft	0.006873	PASS	10.333 ft

Dibble Engineers, Inc.
1029 Market Street
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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFP5 (loaded by DB1, UFB3, UFB2, & stacks w/ RP2) [(E) 5 1/4 SQ PSL]

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+0.750L+0.750S	1.150	0.419	0.3473	PASS	0.0 ft	0.007034	PASS	10.333 ft
+D+0.60W	1.600	0.309	0.2838	PASS	6.311 ft	0.04361	PASS	10.333 ft
+D+0.70E	1.600	0.309	0.1852	PASS	0.0 ft	0.003464	PASS	10.333 ft
+D+0.750Lr+0.750L+0.450W	1.600	0.309	0.3053	PASS	0.0 ft	0.03271	PASS	10.333 ft
+D+0.750L+0.750S+0.450W	1.600	0.309	0.3384	PASS	0.0 ft	0.03271	PASS	10.333 ft
+D+0.750L+0.750S+0.5250E	1.600	0.309	0.3484	PASS	0.0 ft	0.005056	PASS	10.333 ft
+0.60D+0.60W	1.600	0.309	0.2595	PASS	6.311 ft	0.04361	PASS	10.333 ft
+0.60D+0.70E	1.600	0.309	0.1164	PASS	0.0 ft	0.002078	PASS	10.333 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction		k	Y-Y Axis Reaction		Axial Reaction	My - End Moments		k-ft	Mx - End Moments	
	@ Base	@ Top		@ Base	@ Top	@ Base	@ Base	@ Top		@ Base	@ Top
D Only	-0.030	0.030				6.797					
+D+L	-0.051	0.051				12.387					
+D+Lr	-0.030	0.030				8.228					
+D+S	-0.026	0.026				9.977					
+D+0.750Lr+0.750L	-0.046	0.046				12.063					
+D+0.750L+0.750S	-0.043	0.043				13.375					
+D+0.60W	0.131	0.283		0.235	0.372	6.797					
+D+0.70E	-0.030	0.030				7.319					
+D+0.750Lr+0.750L+0.450W	0.074	0.236		0.176	0.279	12.063					
+D+0.750L+0.750S+0.450W	0.077	0.233		0.176	0.279	13.375					
+D+0.750L+0.750S+0.5250E	-0.043	0.043				13.766					
+0.60D+0.60W	0.143	0.271		0.235	0.372	4.078					
+0.60D+0.70E	-0.018	0.018				4.600					
Lr Only						1.431					
L Only	-0.022	0.022				5.590					
S Only	0.004	-0.004				3.180					
W Only	0.267	0.423		0.391	0.620						
E Only						0.746					

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	-0.0288 in	6.034ft	0.000 in	0.000 ft
+D+L	-0.0499 in	6.034ft	0.000 in	0.000 ft
+D+Lr	-0.0288 in	6.034ft	0.000 in	0.000 ft
+D+S	-0.0253 in	6.034ft	0.000 in	0.000 ft
+D+0.750Lr+0.750L	-0.0446 in	6.034ft	0.000 in	0.000 ft
+D+0.750L+0.750S	-0.0420 in	6.034ft	0.000 in	0.000 ft
+D+0.60W	0.0940 in	5.409ft	0.179 in	5.548 ft
+D+0.70E	-0.0288 in	6.034ft	0.000 in	0.000 ft
+D+0.750Lr+0.750L+0.450W	0.0479 in	5.201ft	0.135 in	5.548 ft
+D+0.750L+0.750S+0.450W	0.0505 in	5.271ft	0.135 in	5.548 ft
+D+0.750L+0.750S+0.5250E	-0.0420 in	6.034ft	0.000 in	0.000 ft
+0.60D+0.60W	0.1054 in	5.479ft	0.179 in	5.548 ft
+0.60D+0.70E	-0.0173 in	6.034ft	0.000 in	0.000 ft
Lr Only	0.0000 in	0.000ft	0.000 in	0.000 ft
L Only	-0.0211 in	6.034ft	0.000 in	0.000 ft
S Only	0.0035 in	6.034ft	0.000 in	0.000 ft
W Only	0.2042 in	5.548ft	0.299 in	5.548 ft
E Only	0.0000 in	0.000ft	0.000 in	0.000 ft

Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

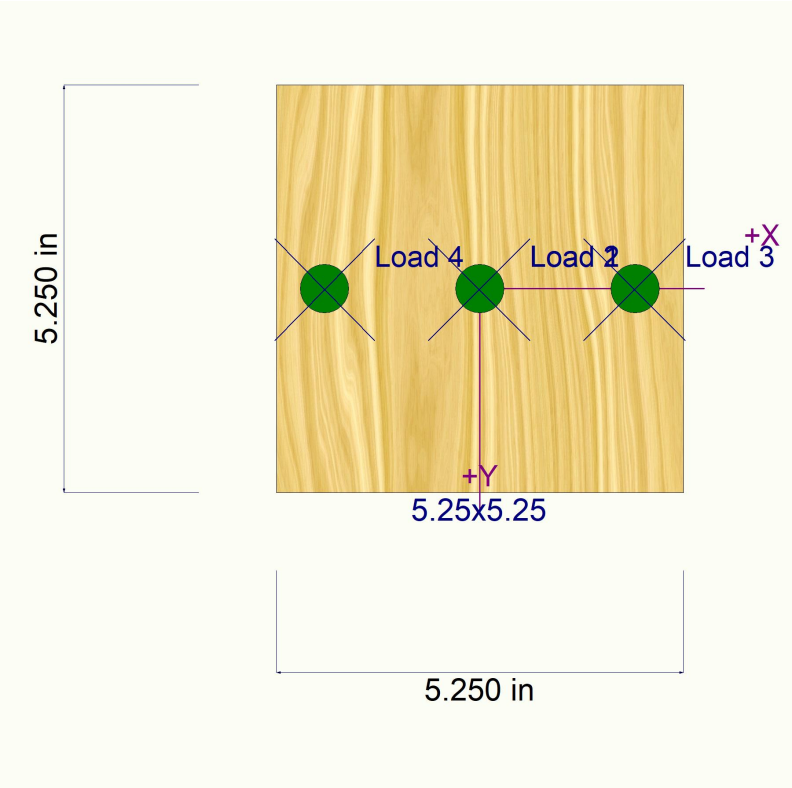
Project Title:
Engineer:
Project ID:
Project Descr:

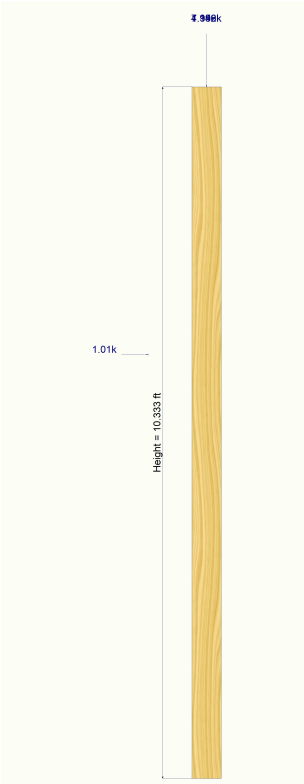
Wood Column

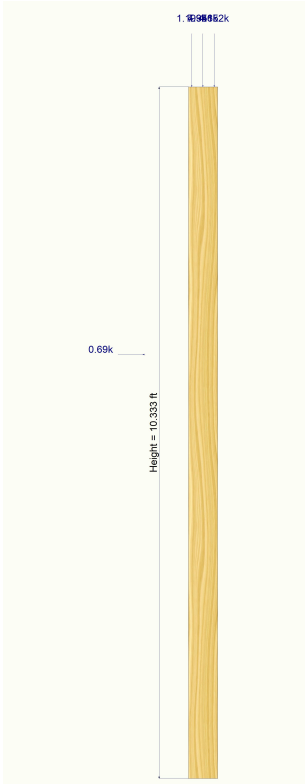
Project File: harris res remodel_rev.ec6

DESCRIPTION: UFP5 (loaded by DB1, UFB3, UFB2, & stacks w/ RP2) [(E) 5 1/4 SQ PSL]

Sketches







Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFP6 (loaded by UFB2, & stacks w/ RP4, SW-B1, Main Flr East Spandrel)

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design		
End Fixities	Top & Bottom Pinned		
Overall Column Height	10.33333 ft		
(Used for non-slender calculations)			
Wood Species	Douglas Fir - Larch		
Wood Grade	No.1		
Fb +	1200 psi	Fv	170 psi
Fb -	1200 psi	Ft	825 psi
Fc - Prll	1000 psi	Density	31.21 pcf
Fc - Perp	625 psi		

E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial
Basic	1600	1600	1600 ksi
Minimum	580	580	

Wood Section Name	**6x6**		
Wood Grading/Manuf.	Graded Lumber		
Wood Member Type	Sawn		
Exact Width	**5.50** in	Allow Stress Modification Factors	
Exact Depth	**5.50** in	Cf or Cv for Bending	1.0
Area	30.250 in^2	Cf or Cv for Compressio	1.0
Ix	76.255 in^4	Cf or Cv for Tension	1.0
Iy	76.255 in^4	Cm : Wet Use Factor	1.0
		Ct : Temperature Fact	1.0
		Cfu : Flat Use Factor	1.0
		Kf : Built-up columns	1.0
		Use Cr : Repetitive ?	No

Column Buckling Condition:
ABOUT X-X Axis: Lux = 10.33333 ft, Kx = 1.0
ABOUT Y-Y Axis: Luy = 10.33333 ft, Ky = 1.0

Applied Loads

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

Column self weight included : 67.748 lbs * Dead Load Factor
AXIAL LOADS . . .
RP4: Axial Load at 10.333 ft, D = 1.069, Lr = 1.354, S = 1.693 k
UFB2 & SW-B1: Axial Load at 10.333 ft, D = 2.277, L = 1.875, E = 13.250 k
BENDING LOADS . . .
Lat. Point Load at 6.333 ft creating My-y, W = 0.690 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.5486 : 1**

Load Combination	+D+0.750L+0.750S+0.5250E
Governing NDS Forumla	Comp Only, fc/Fc'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	13.046 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	786.10 psi

PASS Maximum Shear Stress Ratio = **0.04626 : 1**

Load Combination	+D+0.60W
Location of max.above base	10.333 ft
Applied Design Shear	18.873 psi
Allowable Shear	272.0 psi

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y	0.0 k	Bottom along Y-Y	0.0 k
Top along X-X	0.4229 k	Bottom along X-X	0.2671 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 0.2119 in at 5.548 ft above base
for load combination : W Only

Other Factors used to calculate allowable stresses . . .

	Bending	Compression	Tension

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.900	0.705	0.1778	PASS	0.0 ft	0.0	PASS	10.333 ft
+D+L	1.000	0.668	0.2616	PASS	0.0 ft	0.0	PASS	10.333 ft
+D+Lr	1.250	0.585	0.2155	PASS	0.0 ft	0.0	PASS	10.333 ft
+D+S	1.150	0.617	0.2380	PASS	0.0 ft	0.0	PASS	10.333 ft
+D+0.750Lr+0.750L	1.250	0.585	0.2637	PASS	0.0 ft	0.0	PASS	10.333 ft
+D+0.750L+0.750S	1.150	0.617	0.2838	PASS	0.0 ft	0.0	PASS	10.333 ft
+D+0.60W	1.600	0.491	0.2797	PASS	6.311 ft	0.04626	PASS	10.333 ft
+D+0.70E	1.600	0.491	0.5336	PASS	0.0 ft	0.0	PASS	10.333 ft

Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: harris res remodel_rev.ec6

DESCRIPTION: UFP6 (loaded by UFB2, & stacks w/ RP4, SW-B1, Main Flr East Spandrel)

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
+D+0.750Lr+0.750L+0.450W	1.600	0.491	0.2755	PASS	6.311 ft	0.03469	PASS	10.333 ft
+D+0.750L+0.750S+0.450W	1.600	0.491	0.2833	PASS	6.311 ft	0.03469	PASS	10.333 ft
+D+0.750L+0.750S+0.5250E	1.600	0.491	0.5486	PASS	0.0 ft	0.0	PASS	10.333 ft
+0.60D+0.60W	1.600	0.491	0.2531	PASS	6.311 ft	0.04626	PASS	10.333 ft
+0.60D+0.70E	1.600	0.491	0.4762	PASS	0.0 ft	0.0	PASS	10.333 ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	X-X Axis Reaction k @ Base	@ Top	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base	My - End Moments k-ft @ Base	@ Top	Mx - End Moments @ Base	@ Top
D Only					3.414				
+D+L					5.289				
+D+Lr					4.768				
+D+S					5.107				
+D+0.750Lr+0.750L					5.835				
+D+0.750L+0.750S					6.090				
+D+0.60W	0.160	0.254			3.414				
+D+0.70E					12.689				
+D+0.750Lr+0.750L+0.450W	0.120	0.190			5.835				
+D+0.750L+0.750S+0.450W	0.120	0.190			6.090				
+D+0.750L+0.750S+0.5250E					13.046				
+0.60D+0.60W	0.160	0.254			2.048				
+0.60D+0.70E					11.323				
Lr Only					1.354				
L Only					1.875				
S Only					1.693				
W Only	0.267	0.423							
E Only					13.250				

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+L	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+Lr	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+S	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.750Lr+0.750L	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.750L+0.750S	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.60W	0.1271 in	5.548ft	0.000 in	0.000 ft
+D+0.70E	0.0000 in	0.000ft	0.000 in	0.000 ft
+D+0.750Lr+0.750L+0.450W	0.0953 in	5.548ft	0.000 in	0.000 ft
+D+0.750L+0.750S+0.450W	0.0953 in	5.548ft	0.000 in	0.000 ft
+D+0.750L+0.750S+0.5250E	0.0000 in	0.000ft	0.000 in	0.000 ft
+0.60D+0.60W	0.1271 in	5.548ft	0.000 in	0.000 ft
+0.60D+0.70E	0.0000 in	0.000ft	0.000 in	0.000 ft
Lr Only	0.0000 in	0.000ft	0.000 in	0.000 ft
L Only	0.0000 in	0.000ft	0.000 in	0.000 ft
S Only	0.0000 in	0.000ft	0.000 in	0.000 ft
W Only	0.2119 in	5.548ft	0.000 in	0.000 ft
E Only	0.0000 in	0.000ft	0.000 in	0.000 ft

Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

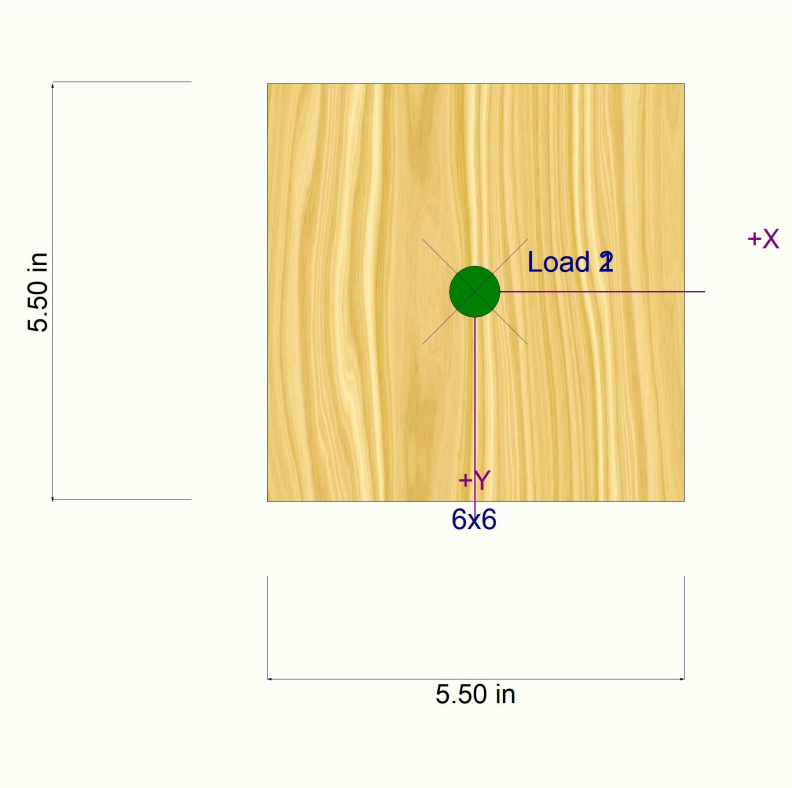
Project Title:
Engineer:
Project ID:
Project Descr:

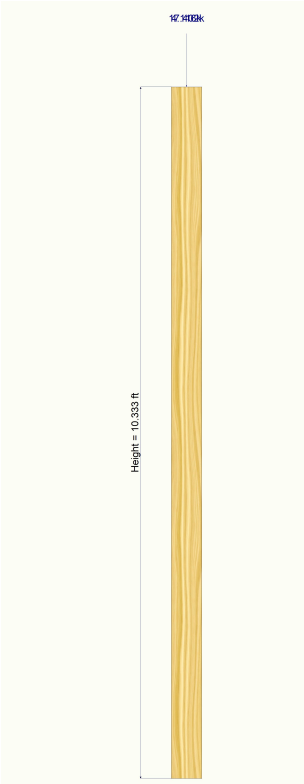
Wood Column

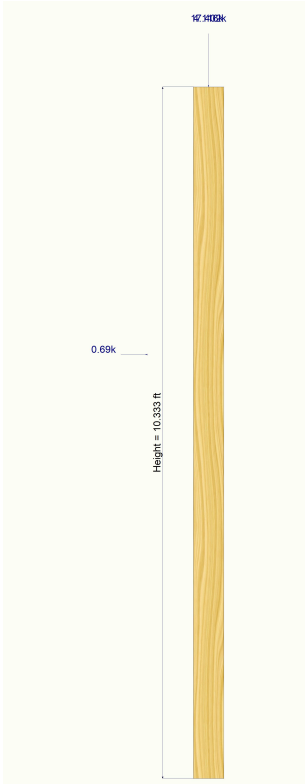
Project File: harris res remodel_rev.ec6

DESCRIPTION: UFP6 (loaded by UFB2, & stacks w/ RP4, SW-B1, Main Flr East Spandrel)

Sketches







Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: harris res remodel_rev.ec6

DESCRIPTION: REV - UFP2 (loaded by DB2 & SW-3A)

Code References

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : IBC 2021

General Information

Analysis Method	Allowable Stress Design		
End Fixities	Top & Bottom Pinned		
Overall Column Height	10.333333 ft		
(Used for non-slender calculations)			
Wood Species	Douglas Fir - Larch		
Wood Grade	No.1		
Fb +	1,200.0 psi	Fv	170.0 psi
Fb -	1,200.0 psi	Ft	825.0 psi
Fc - Prll	1,000.0 psi	Density	31.210 pcf
Fc - Perp	625.0 psi		

E : Modulus of Elasticity . . .	x-x Bending	y-y Bending	Axial
Basic	1,600.0	1,600.0	1,600.0 ksi
Minimum	580.0	580.0	

Wood Section Name	**4x6 + 6x6**		
Wood Grading/Manuf.	Graded Lumber		
Wood Member Type	Sawn		
Exact Width	**9.0** in	Allow Stress Modification Factors	
Exact Depth	**5.50** in	Cf or Cv for Bending	1.30
Area	49.50 in^2	Cf or Cv for Compressio	1.10
Ix	124.781 in^4	Cf or Cv for Tension	1.30
Iy	334.125 in^4	Cm : Wet Use Factor	1.0
Incising Factors :		Ct : Temperature Fact	1.0
for Bending	0.80	Cfu : Flat Use Factor	1.0
for Elastic Modulus	0.95	Kf : Built-up columns	1.0
		Use Cr : Repetitive ?	No

Column Buckling Condition:
ABOUT X-X Axis: Lux = 10.333333 ft, Kx = 1.0
ABOUT Y-Y Axis: Luy = 10.333333 ft, Ky = 1.0

Applied Loads

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

Column self weight included : 110.861 lbs * Dead Load Factor
AXIAL LOADS . . .
Deck Loads: Axial Load at 10.333 ft, Xecc = 2.750 in, D = 1.441, L = 2.625, S = 1.094 k
SW-3A: Axial Load at 10.333 ft, Xecc = -1.750 in, E = 9.766 k

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.2977 : 1**

Load Combination	+D+0.750L+0.750S+0.5250E
Governing NDS Forumla	Comp Only, fc/Fc'
Location of max.above base	0.0 ft
At maximum location values are .	
Applied Axial	9.468 k
Applied Mx	0.0 k-ft
Applied My	0.0 k-ft
Fc : Allowable	642.51 psi

PASS Maximum Shear Stress Ratio = **0.02009 : 1**

Load Combination	+D+L
Location of max.above base	10.333 ft
Applied Design Shear	4.099 psi
Allowable Shear	136.0 psi

Maximum SERVICE Lateral Load Reactions . .

Top along Y-Y	0.0 k	Bottom along Y-Y	0.0 k
Top along X-X	0.1378 k	Bottom along X-X	0.1378 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 0.03348 in at 6.034 ft above base
for load combination : E Only

Other Factors used to calculate allowable stresses . . .

	Bending	Compression	Tension

Load Combination Results

Load Combination	C_D	C_P	Maximum Axial + Bending Stress Ratios: Stress Ratio	Status	Location	Maximum Shear Ratios: Stress Ratio	Status	Location
D Only	0.900	0.672	0.05890	PASS	0.0 ft	0.007912	PASS	10.333 ft
+D+L	1.000	0.634	0.1513	PASS	0.0 ft	0.02009	PASS	10.333 ft
+D+S	1.150	0.581	0.09096	PASS	0.0 ft	0.01089	PASS	10.333 ft
+D+0.750L	1.250	0.549	0.1178	PASS	0.0 ft	0.01348	PASS	10.333 ft
+D+0.750L+0.750S	1.150	0.581	0.1492	PASS	0.0 ft	0.01818	PASS	10.333 ft
+D+0.70E	1.600	0.456	0.2637	PASS	0.0 ft	0.008985	PASS	10.333 ft
+D+0.750L+0.750S+0.5250E	1.600	0.456	0.2977	PASS	0.0 ft	0.002988	PASS	10.333 ft
+0.60D	1.600	0.456	0.02928	PASS	0.0 ft	0.002670	PASS	10.333 ft
+0.60D+0.70E	1.600	0.456	0.2442	PASS	0.0 ft	0.01077	PASS	10.333 ft

Dibble Engineers, Inc.
1029 Market Street
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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Column

Project File: harris res remodel_rev.ec6

DESCRIPTION: REV - UFP2 (loaded by DB2 & SW-3A)

Maximum Reactions

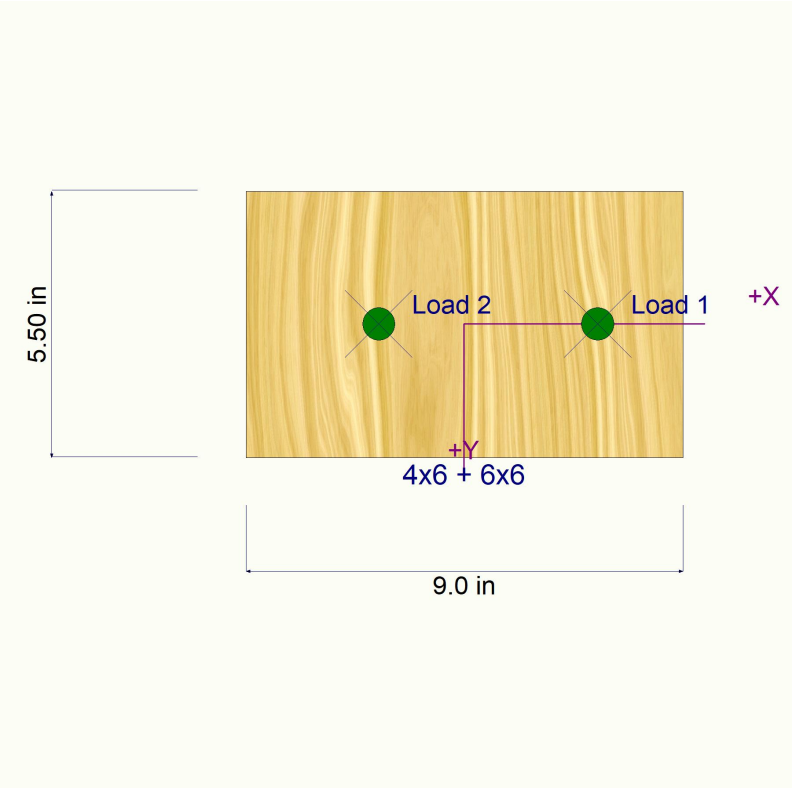
Note: Only non-zero reactions are listed.

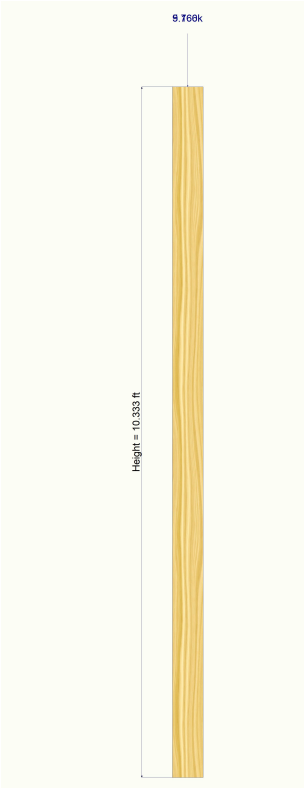
Load Combination	X-X Axis Reaction @ Base	@ Top	k	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base	My - End Moments @ Base	@ Top	k-ft	Mx - End Moments @ Base	@ Top
D Only	-0.032	0.032				1.552					
+D+L	-0.090	0.090				4.177					
+D+S	-0.056	0.056				2.646					
+D+0.750L	-0.076	0.076				3.521					
+D+0.750L+0.750S	-0.094	0.094				4.341					
+D+0.70E	0.065	-0.065				8.388					
+D+0.750L+0.750S+0.5250E	-0.021	0.021				9.468					
+0.60D	-0.019	0.019				0.931					
+0.60D+0.70E	0.077	-0.077				7.767					
L Only	-0.058	0.058				2.625					
S Only	-0.024	0.024				1.094					
E Only	0.138	-0.138				9.766					

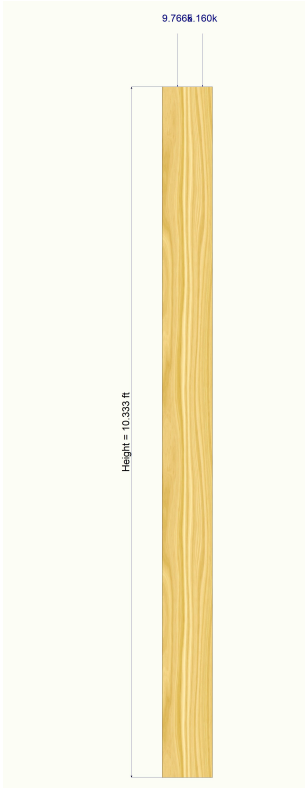
Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection	Distance	Max. Y-Y Deflection	Distance
D Only	-0.0078 in	6.034ft	0.000 in	0.000 ft
+D+L	-0.0219 in	6.034ft	0.000 in	0.000 ft
+D+S	-0.0137 in	6.034ft	0.000 in	0.000 ft
+D+0.750L	-0.0184 in	6.034ft	0.000 in	0.000 ft
+D+0.750L+0.750S	-0.0228 in	6.034ft	0.000 in	0.000 ft
+D+0.70E	0.0157 in	6.034ft	0.000 in	0.000 ft
+D+0.750L+0.750S+0.5250E	-0.0052 in	6.034ft	0.000 in	0.000 ft
+0.60D	-0.0047 in	6.034ft	0.000 in	0.000 ft
+0.60D+0.70E	0.0188 in	6.034ft	0.000 in	0.000 ft
L Only	-0.0141 in	6.034ft	0.000 in	0.000 ft
S Only	-0.0059 in	6.034ft	0.000 in	0.000 ft
E Only	0.0335 in	6.034ft	0.000 in	0.000 ft

Sketches







Dibble Engineers, Inc.
1029 Market Street
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(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

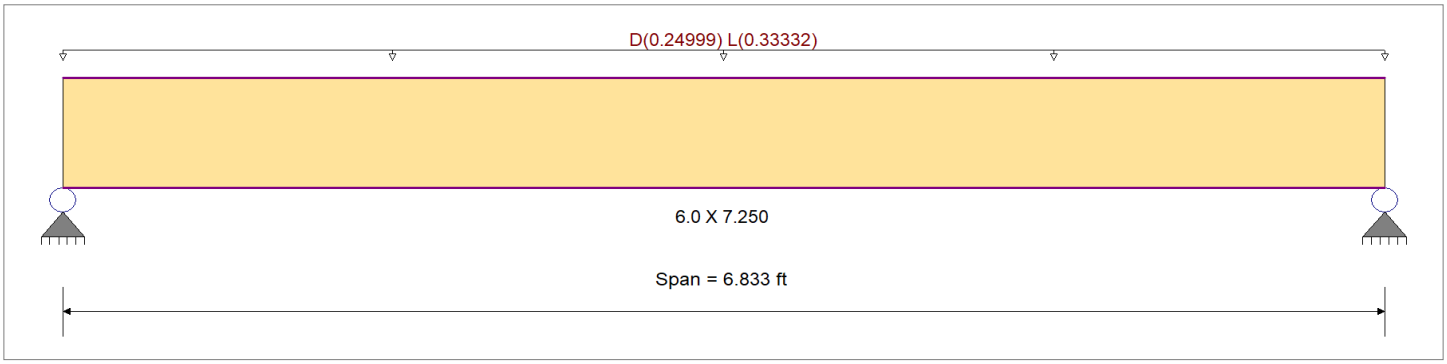
DESCRIPTION: (E) Hdr @ Chimney

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Stress Design	Fb +	850 psi	*E : Modulus of Elasticity*	
Load Combination :	IBC 2021	Fb -	850 psi	Ebend- xx	1300 ksi
		Fc - Prll	1300 psi	Eminbend - xx	470 ksi
Wood Species :	Hem Fir	Fc - Perp	405 psi		
Wood Grade :	No.2	Fv	150 psi		
		Ft	525 psi	Density	26.84 pcf
Beam Bracing :	Beam is Fully Braced against lateral-torsional buckling				



Applied Loads

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

Beam self weight calculated and added to loading
Uniform Load : D = 0.030, L = 0.040 ksf, Tributary Width = 8.333 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.713 : 1	Maximum Shear Stress Ratio	=	0.383 : 1
Section used for this span		6.0 X 7.250	Section used for this span		6.0 X 7.250
fb: Actual	=	788.09 psi	fv: Actual	=	57.47 psi
F'b	=	1,105.00 psi	F'v	=	150.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	3.417 ft	Location of maximum on span	=	6.235 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.066 in	Ratio =	1234 >=480	Span: 1 : L Only
Max Upward Transient Deflection	0 in	Ratio =	0 <480	n/a
Max Downward Total Deflection	0.118 in	Ratio =	695 >=600	Span: 1 : +D+L
Max Upward Total Deflection	0 in	Ratio =	0 <600	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination		Max Stress Ratios										Moment Values			Shear Values		
Segment Length	Span #	M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	M	fb	F'b	V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 6.833 ft	1	0.346	0.186	0.90	1.00	1.00	1.00	1.300	1.00	1.00	1.00	1.51	343.9	994.5	0.73	25.1	135.0
+D+L					1.00	1.00	1.00	1.300	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.833 ft	1	0.713	0.383	1.00	1.00	1.00	1.00	1.300	1.00	1.00	1.00	3.45	788.1	1,105.0	1.67	57.5	150.0
+D+0.750L					1.00	1.00	1.00	1.300	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.833 ft	1	0.490	0.263	1.25	1.00	1.00	1.00	1.300	1.00	1.00	1.00	2.97	677.0	1,381.3	1.43	49.4	187.5
+0.60D					1.00	1.00	1.00	1.300	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 6.833 ft	1	0.117	0.063	1.60	1.00	1.00	1.00	1.300	1.00	1.00	1.00	0.90	206.4	1,768.0	0.44	15.0	240.0

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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: (E) Hdr @ Chimney

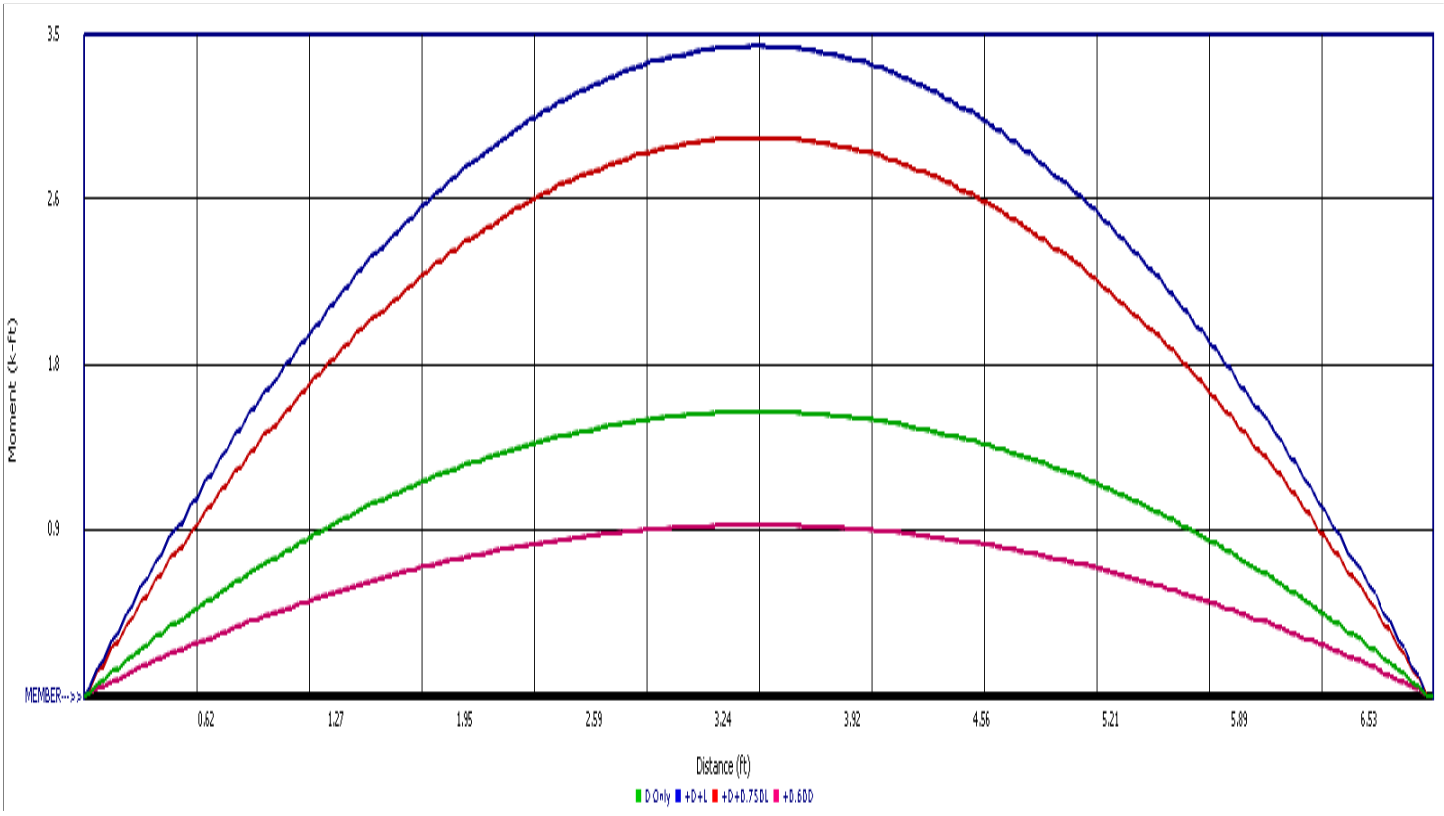
Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.1178	3.442		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	2.021	2.021
Max Upward from Load Combinations	2.021	2.021
Max Upward from Load Cases	1.139	1.139
D Only	0.882	0.882
+D+L	2.021	2.021
+D+0.750L	1.736	1.736
+0.60D	0.529	0.529
L Only	1.139	1.139



Dibble Engineers, Inc.
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Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: MFB1 - Transition from (N) to (E), SW-1A (T/C, w/out Omega)

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

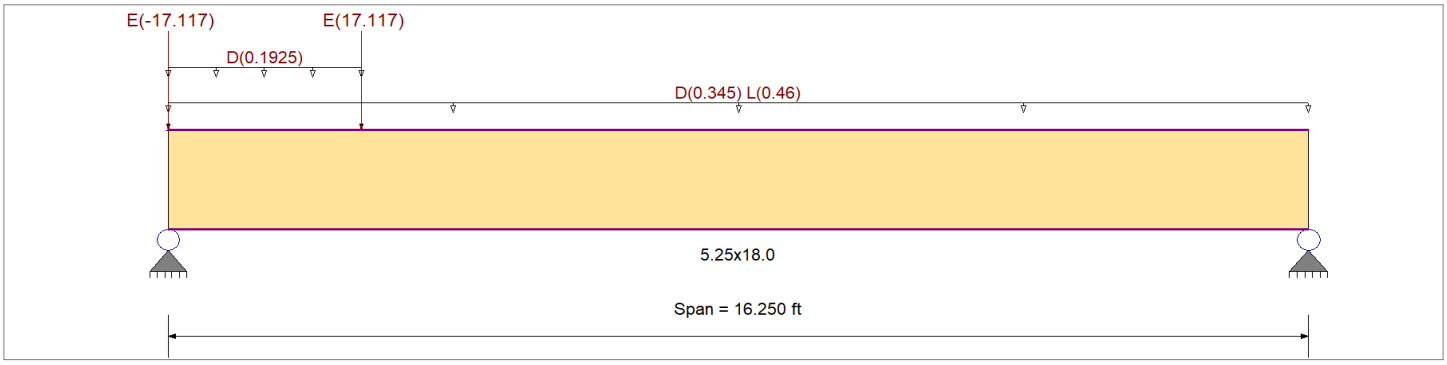
Wood Species : Trus Joist
Wood Grade : Parallam PSL 2.0E

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

Fb +	2,900.0 psi
Fb -	2,900.0 psi
Fc - Prll	2,900.0 psi
Fc - Perp	625.0 psi
Fv	290.0 psi
Ft	2,025.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,016.54 ksi
Density	45.070 pcf



Applied Loads

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

Beam self weight calculated and added to loading
Uniform Load : D = 0.030, L = 0.040 ksf, Tributary Width = 11.50 ft, ((E) Floor (south of addition))
Uniform Load : D = 0.010 ksf, Extent = 0.0 -->> 2.750 ft, Tributary Width = 19.250 ft, (Int Wall Weight)
Point Load : E = -17.117 k @ 0.0 ft, (SW-1A (Tension, w/out Omega))
Point Load : E = 17.117 k @ 2.750 ft, (SW-1A (Compression, w/out Omega))

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.426 : 1	Maximum Shear Stress Ratio	=	0.432 : 1
Section used for this span		5.25x18.0	Section used for this span		5.25x18.0
fb: Actual	=	1,181.49 psi	fv: Actual	=	200.66 psi
F'b	=	2,772.37 psi	F'v	=	464.00 psi
Load Combination		+D+L	Load Combination		+D+0.70E
Location of maximum on span	=	8.066 ft	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	0.260 in	Ratio =	748 >=600	Span: 1 : E Only
Max Upward Transient Deflection	0 in	Ratio =	0 <600	n/a
Max Downward Total Deflection	0.361 in	Ratio =	539 >=480	Span: 1 : +D+0.750L+0.5250E
Max Upward Total Deflection	0 in	Ratio =	0 <480	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 16.250 ft	1	0.216	0.163	0.90	1.00	1.00	1.00	0.956	1.00	1.00	1.00	12.73	538.9	2,495.1	2.69	42.7	261.0
+D+L					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.250 ft	1	0.426	0.314	1.00	1.00	1.00	1.00	0.956	1.00	1.00	1.00	27.91	1,181.5	2,772.4	5.74	91.2	290.0
+D+0.750L					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.250 ft	1	0.295	0.218	1.25	1.00	1.00	1.00	0.956	1.00	1.00	1.00	24.12	1,020.8	3,465.5	4.98	79.0	362.5
+D+0.70E					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.250 ft	1	0.333	0.432	1.60	1.00	1.00	1.00	0.956	1.00	1.00	1.00	34.93	1,478.5	4,435.8	12.64	200.7	464.0

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Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: MFB1 - Transition from (N) to (E), SW-1A (T/C, w/out Omega)

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+D+0.750L+0.5250E					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.250 ft	**1**	0.364	0.426	1.60	1.00	1.00	1.00	0.956	1.00	1.00	1.00	38.17	1,615.9	4,435.8	12.44	197.5	464.0
+0.60D					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.250 ft	**1**	0.073	0.055	1.60	1.00	1.00	1.00	0.956	1.00	1.00	1.00	7.64	323.3	4,435.8	1.61	25.6	464.0
+0.60D+0.70E					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.250 ft	**1**	0.304	0.396	1.60	1.00	1.00	1.00	0.956	1.00	1.00	1.00	31.88	1,349.3	4,435.8	11.57	183.6	464.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+0.750L+0.5250E	1	0.3615	7.710		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	7.266	7.412
Max Upward from Load Combinations	7.266	7.412
Max Upward from Load Cases	3.738	3.738
Max Downward from all Load Conditio	-2.897	
Max Downward from Load Cases (Resis	-2.897	
D Only	3.528	3.088
+D+L	7.266	6.826
+D+0.750L	6.331	5.891
+D+0.70E	1.500	5.116
+D+0.750L+0.5250E	4.810	7.412
+0.60D	2.117	1.853
+0.60D+0.70E	0.089	3.881
L Only	3.738	3.738
E Only	-2.897	2.897

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1029 Market Street
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(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: MFB1 - Transition from (N) to (E), without SW-1A loads

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

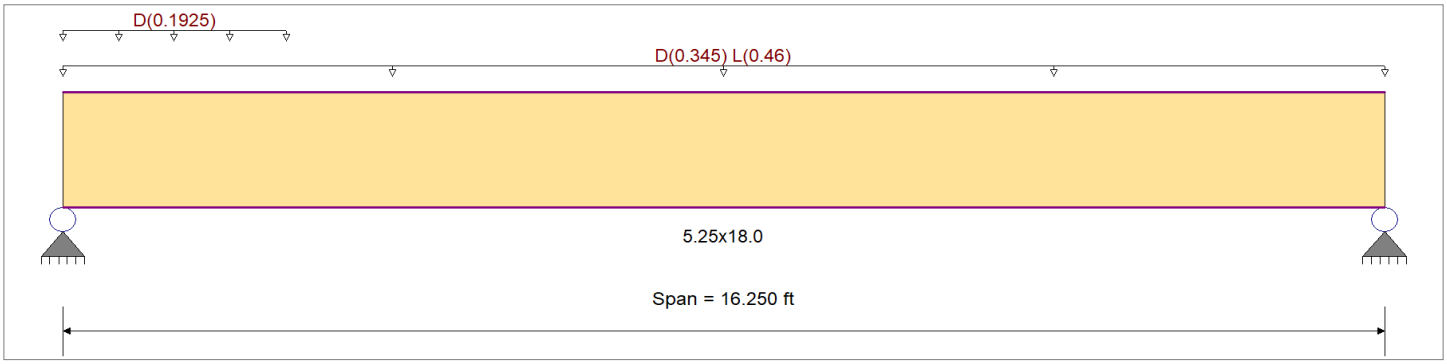
Wood Species : Trus Joist
Wood Grade : Parallam PSL 2.0E

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

Fb +	2,900.0 psi
Fb -	2,900.0 psi
Fc - Prll	2,900.0 psi
Fc - Perp	625.0 psi
Fv	290.0 psi
Ft	2,025.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,016.54 ksi
Density	45.070 pcf



Applied Loads

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

Beam self weight calculated and added to loading
Uniform Load : D = 0.030, L = 0.040 ksf, Tributary Width = 11.50 ft, ((E) Floor (south of addition))
Uniform Load : D = 0.010 ksf, Extent = 0.0 -->> 2.750 ft, Tributary Width = 19.250 ft, (Int Wall Weight)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.426 : 1	Maximum Shear Stress Ratio	=	0.314 : 1
Section used for this span		5.25x18.0	Section used for this span		5.25x18.0
fb: Actual	=	1,181.49 psi	fv: Actual	=	91.15 psi
F'b	=	2,772.37 psi	F'v	=	290.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	8.066 ft	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	0.142 in	Ratio =	1370 >=600	Span: 1 : L Only
Max Upward Transient Deflection	0 in	Ratio =	0 <600	n/a
Max Downward Total Deflection	0.262 in	Ratio =	743 >=480	Span: 1 : +D+L
Max Upward Total Deflection	0 in	Ratio =	0 <480	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 16.250 ft	1	0.216	0.163	0.90	1.00	1.00	1.00	0.956	1.00	1.00	1.00	12.73	538.9	2,495.1	2.69	42.7	261.0
+D+L					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.250 ft	1	0.426	0.314	1.00	1.00	1.00	1.00	0.956	1.00	1.00	1.00	27.91	1,181.5	2,772.4	5.74	91.2	290.0
+D+0.750L					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.250 ft	1	0.295	0.218	1.25	1.00	1.00	1.00	0.956	1.00	1.00	1.00	24.12	1,020.8	3,465.5	4.98	79.0	362.5
+0.60D					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.250 ft	1	0.073	0.055	1.60	1.00	1.00	1.00	0.956	1.00	1.00	1.00	7.64	323.3	4,435.8	1.61	25.6	464.0

Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: MFB1 - Transition from (N) to (E), without SW-1A loads

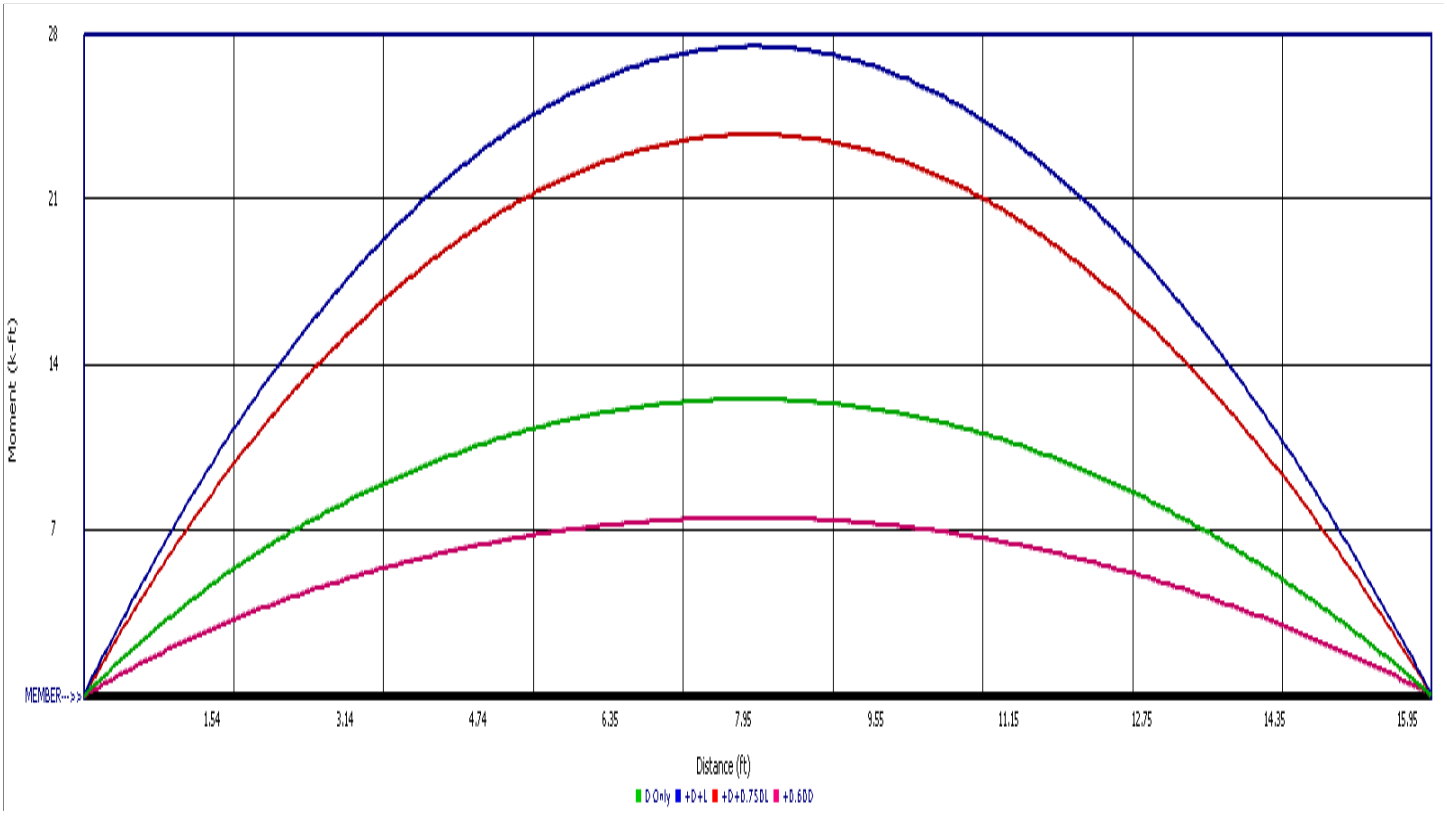
Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L	1	0.2621	8.125		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	7.266	6.826
Max Upward from Load Combinations	7.266	6.826
Max Upward from Load Cases	3.738	3.738
D Only	3.528	3.088
+D+L	7.266	6.826
+D+0.750L	6.331	5.891
+0.60D	2.117	1.853
L Only	3.738	3.738



Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: MFB1 - Transition from (N) to (E), SW-1A (T/C, w/ Omega)

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2021

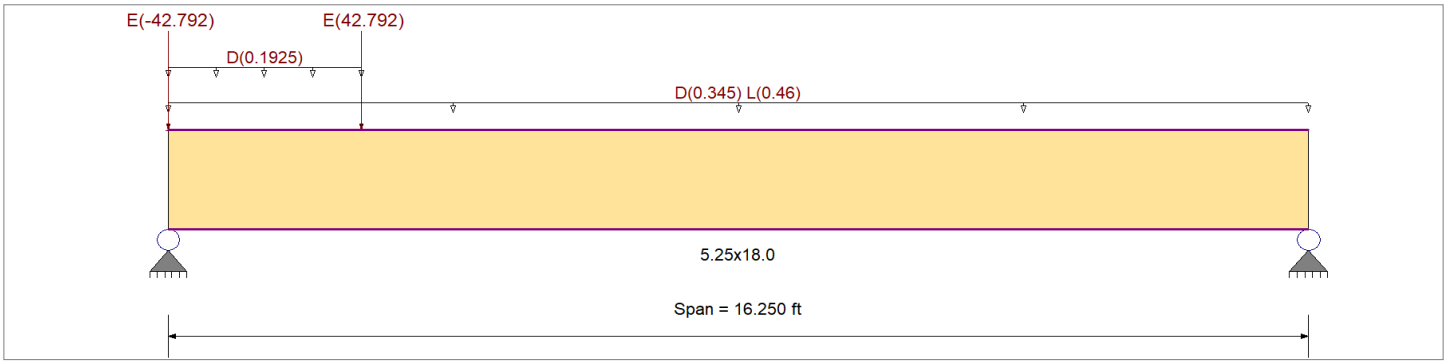
Wood Species : Trus Joist
Wood Grade : Parallam PSL 2.0E

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

Fb +	2,900.0 psi
Fb -	2,900.0 psi
Fc - Prll	2,900.0 psi
Fc - Perp	625.0 psi
Fv	290.0 psi
Ft	2,025.0 psi

E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,016.54 ksi
Density	45.070 pcf



Applied Loads

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

Beam self weight calculated and added to loading
Uniform Load : D = 0.030, L = 0.040 ksf, Tributary Width = 11.50 ft, ((E) Floor (south of addition))
Uniform Load : D = 0.010 ksf, Extent = 0.0 -->> 2.750 ft, Tributary Width = 19.250 ft, (Int Wall Weight)
Point Load : E = -42.792 k @ 0.0 ft, (SW-1A (Tension, w/ Omega))
Point Load : E = 42.792 k @ 2.750 ft, (SW-1A (Compression, w/ Omega))

DESIGN SUMMARY

Design N.G.

Maximum Bending Stress Ratio	=	0.724 : 1	Maximum Shear Stress Ratio	=	0.943 : 1
Section used for this span		5.25x18.0	Section used for this span		5.25x18.0
fb: Actual	=	3,211.68 psi	fv: Actual	=	437.66 psi
F'b	=	4,435.80 psi	F'v	=	464.00 psi
Load Combination		+D+0.70E	Load Combination		+D+0.70E
Location of maximum on span	=	2.787 ft	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	0.651 in	Ratio =	299 <600	Span: 1 : E Only
Max Upward Transient Deflection	0 in	Ratio =	0 <600	n/a
Max Downward Total Deflection	0.574 in	Ratio =	339 <480	Span: 1 : +D+0.70E
Max Upward Total Deflection	0 in	Ratio =	0 <480	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
D Only														0.0	0.00	0.0	0.0
Length = 16.250 ft	1	0.216	0.163	0.90	1.00	1.00	1.00	0.956	1.00	1.00	1.00	12.73	538.9	2,495.1	2.69	42.7	261.0
+D+L					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.250 ft	1	0.426	0.314	1.00	1.00	1.00	1.00	0.956	1.00	1.00	1.00	27.91	1,181.5	2,772.4	5.74	91.2	290.0
+D+0.750L					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.250 ft	1	0.295	0.218	1.25	1.00	1.00	1.00	0.956	1.00	1.00	1.00	24.12	1,020.8	3,465.5	4.98	79.0	362.5
+D+0.70E					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.250 ft	1	0.724	0.943	1.60	1.00	1.00	1.00	0.956	1.00	1.00	1.00	75.88	3,211.7	4,435.8	27.57	437.7	464.0

Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Wood Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: MFB1 - Transition from (N) to (E), SW-1A (T/C, w/ Omega)

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	V	CD	CM	C_t	CLx	C_F	Cfu	C_i	C_r	Moment Values M	fb	F'b	Shear Values V	fv	F'v
+D+0.750L+0.5250E					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.250 ft	**1**	0.623	0.809	1.60	1.00	1.00	1.00	0.956	1.00	1.00	1.00	65.29	2,763.5	4,435.8	23.64	375.3	464.0
+0.60D					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.250 ft	**1**	0.073	0.055	1.60	1.00	1.00	1.00	0.956	1.00	1.00	1.00	7.64	323.3	4,435.8	1.61	25.6	464.0
+0.60D+0.70E					1.00	1.00	1.00	0.956	1.00	1.00	1.00			0.0	0.00	0.0	0.0
Length = 16.250 ft	**1**	0.695	0.906	1.60	1.00	1.00	1.00	0.956	1.00	1.00	1.00	72.82	3,082.5	4,435.8	26.50	420.6	464.0

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
E Only	1	0.6511	7.057		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	7.266	9.693
Max Upward from Load Combinations	7.266	9.693
Max Upward from Load Cases	3.738	7.242
Max Downward from all Load Conditio	-7.242	
Max Downward from Load Combinations	-2.952	
Max Downward from Load Cases (Resis	-7.242	
D Only	3.528	3.088
+D+L	7.266	6.826
+D+0.750L	6.331	5.891
+D+0.70E	-1.541	8.157
+D+0.750L+0.5250E	2.529	9.693
+0.60D	2.117	1.853
+0.60D+0.70E	-2.952	6.922
L Only	3.738	3.738
E Only	-7.242	7.242

DEI
DIBBLE ENGINEERS INC

LATERAL

Harris Residence Remodel & DEI Job #23-183

Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Beam

Project File: harris res remodel_rev.ec6

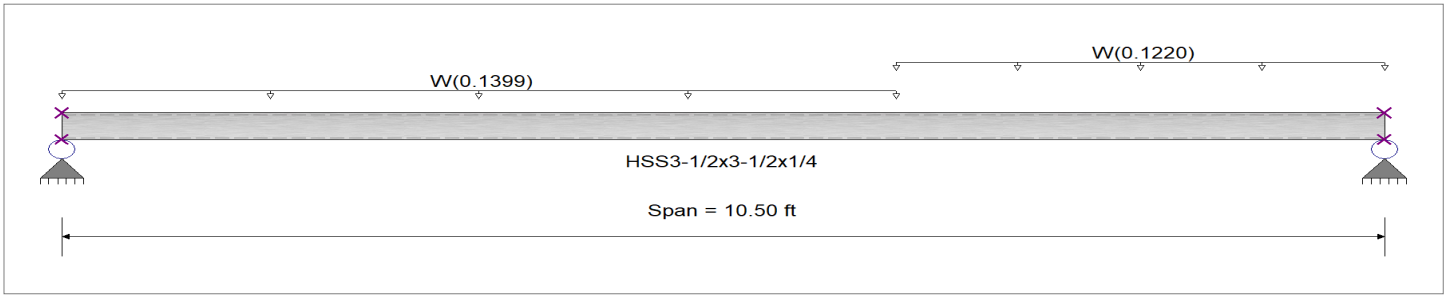
DESCRIPTION: OoP Wind - Upr Flr East Elev

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	46.0 ksi
Beam Bracing :	Completely Unbraced	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

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

Beam self weight NOT internally calculated and added
Load for Span Number 1
Uniform Load : W = 0.02740 ksf, Extent = 0.0 -->> 6.625 ft, Tributary Width = 5.104 ft, (C&C Wind (Zone 5))

Uniform Load : W = 0.02390 ksf, Extent = 6.625 -->> 10.50 ft, Tributary Width = 5.104 ft, (C&C Wind (Zone 5))

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.139 : 1	Maximum Shear Stress Ratio =	0.020 : 1
Section used for this span	HSS3-1/2x3-1/2x1/4	Section used for this span	HSS3-1/2x3-1/2x1/4
Ma : Applied	1.116 k-ft	Va : Applied	0.4329 k
Mn / Omega : Allowable	8.034 k-ft	Vn/Omega : Allowable	21.572 k
Load Combination	+0.60W	Load Combination	+0.60W
		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	0.253 in	Ratio =	498	>=360	Span: 1 : W Only
Max Upward Transient Deflection	0 in	Ratio =	0	<360	n/a
Max Downward Total Deflection	0.152 in	Ratio =	830	>=180	Span: 1 : +0.60W
Max Upward Total Deflection	0 in	Ratio =	0	<180	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
Dsgn. L = 10.50 ft	1		0.000				13.42	8.03	1.00	1.00	-0.00	36.03 21.57
+0.60W												
Dsgn. L = 10.50 ft	1	0.139	0.020	1.12		1.12	13.42	8.03	1.14	1.00	0.43	36.03 21.57
+0.450W												
Dsgn. L = 10.50 ft	1	0.104	0.015	0.84		0.84	13.42	8.03	1.14	1.00	0.32	36.03 21.57

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
W Only	1	0.2529	5.250		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.721	0.678
Max Upward from Load Combinations	0.433	0.407
Max Upward from Load Cases	0.721	0.678
+0.60W	0.433	0.407
+0.450W	0.325	0.305
W Only	0.721	0.678

Dibble Engineers, Inc.
1029 Market Street
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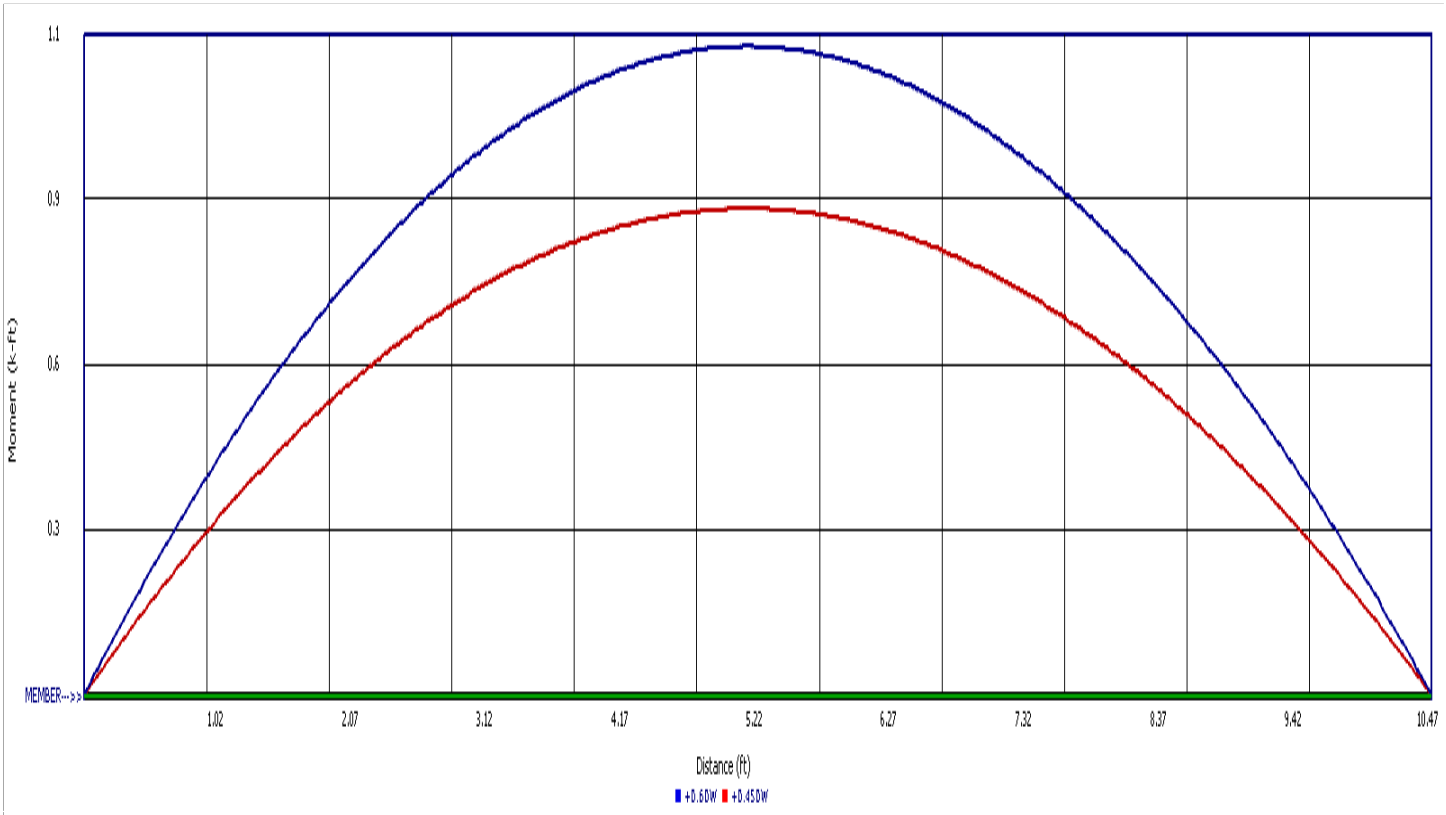
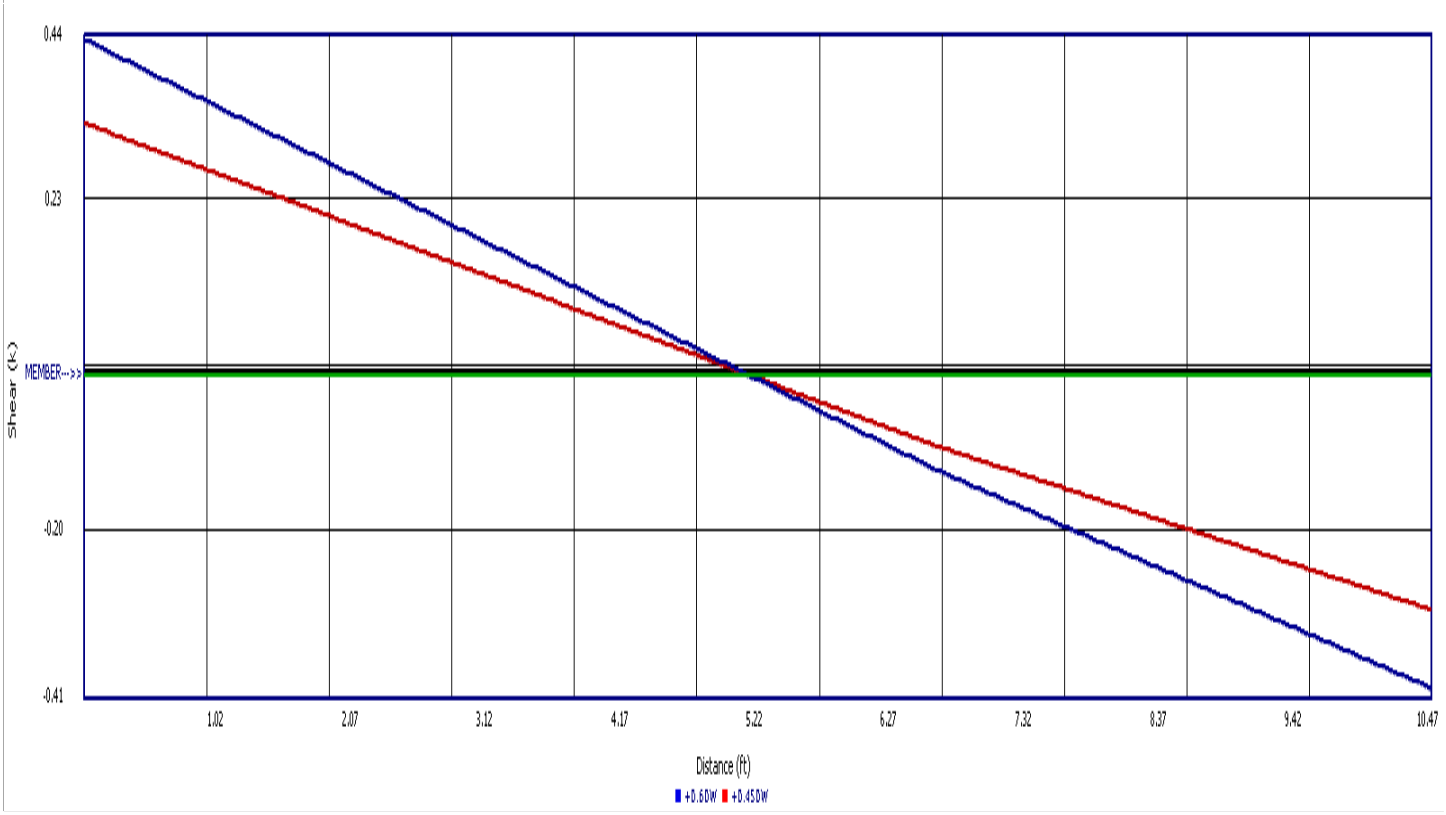
Project Title:
Engineer:
Project ID:
Project Descr:

Steel Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: OoP Wind - Upr Flr East Elev





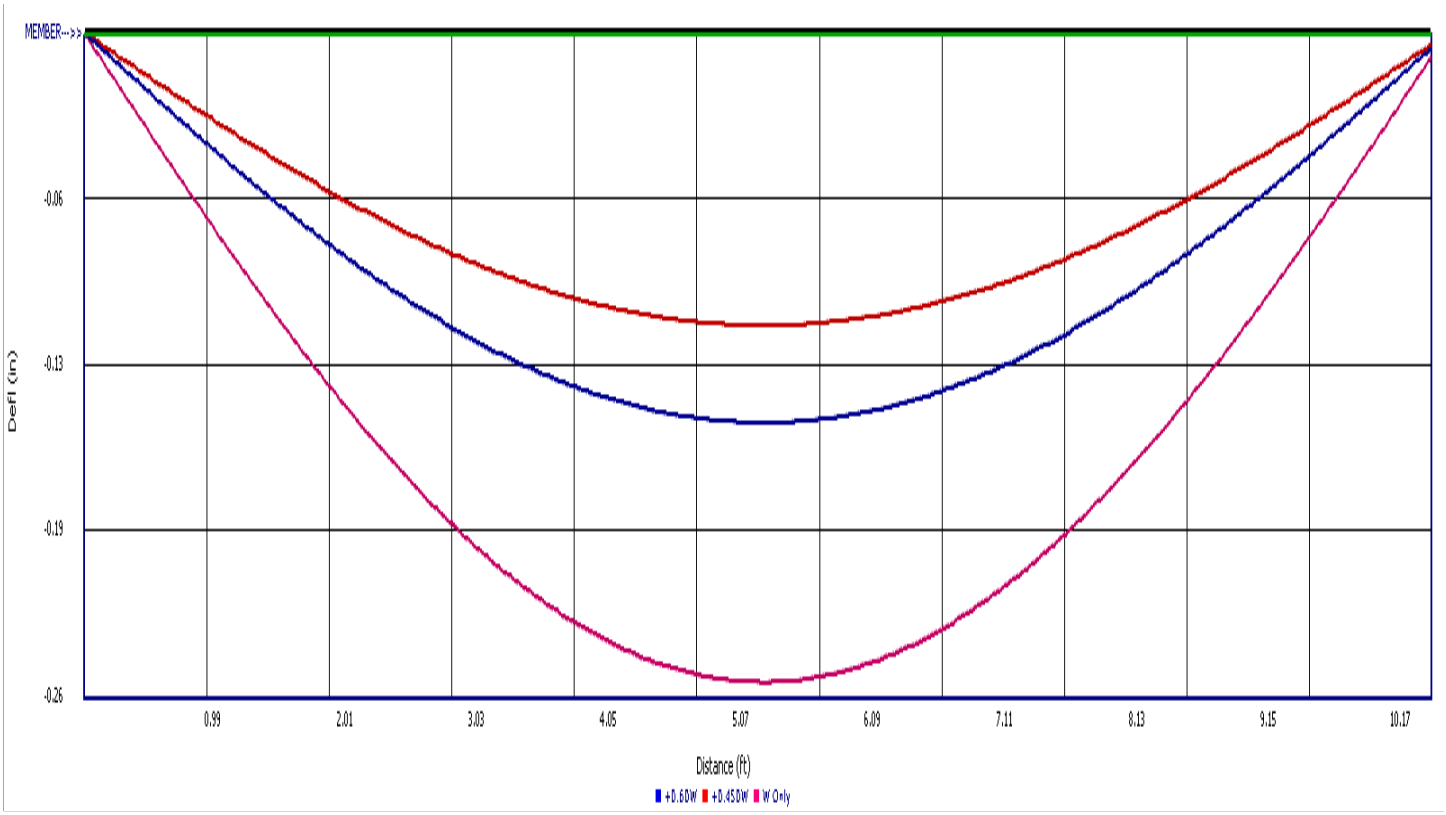
Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: OoP Wind - Upr Flr East Elev



Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: OoP Wind - Upr Flr North Elev

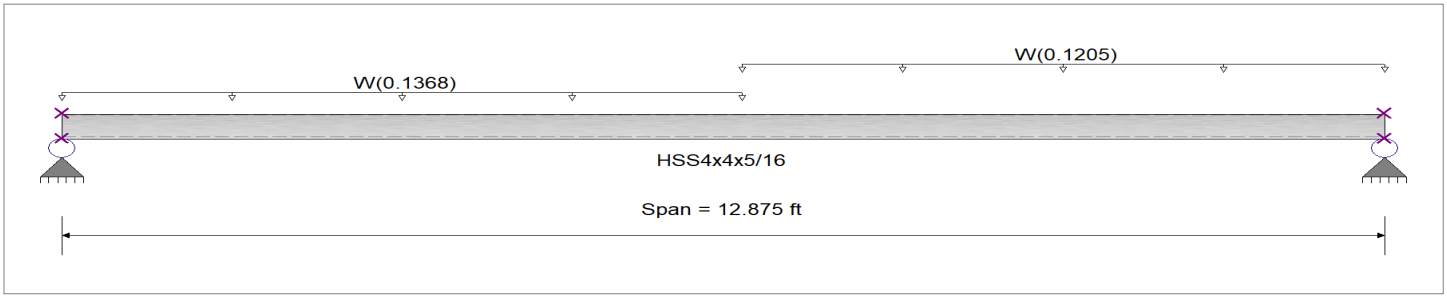
CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method : Allowable Strength Design
Beam Bracing : Completely Unbraced
Bending Axis : Major Axis Bending

Fy : Steel Yield : 46.0 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
Load for Span Number 1
Uniform Load : W = 0.02680 ksf, Extent = 0.0 -->> 6.625 ft, Tributary Width = 5.104 ft, (C&C Wind (Zone 5))

Uniform Load : W = 0.02360 ksf, Extent = 6.625 -->> 12.875 ft, Tributary Width = 5.104 ft, (C&C Wind (Zone 5))

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.125 : 1	Maximum Shear Stress Ratio =	0.017 : 1
Section used for this span	HSS4x4x5/16	Section used for this span	HSS4x4x5/16
Ma : Applied	1.606 k-ft	Va : Applied	0.5135 k
Mn / Omega : Allowable	12.831 k-ft	Vn/Omega : Allowable	30.078 k
Load Combination	+0.60W	Load Combination	+0.60W
		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	0.302 in	Ratio =	511	>=360	Span: 1 : W Only
Max Upward Transient Deflection	0 in	Ratio =	0	<360	n/a
Max Downward Total Deflection	0.181 in	Ratio =	852	>=240.	Span: 1 : +0.60W
Max Upward Total Deflection	0 in	Ratio =	0	<240.0	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
Dsgn. L = 12.88 ft	1		0.000				21.43	12.83	1.00	1.00	-0.00	50.23 30.08
+0.60W												
Dsgn. L = 12.88 ft	1	0.125	0.017	1.61		1.61	21.43	12.83	1.14	1.00	0.51	50.23 30.08
+0.450W												
Dsgn. L = 12.88 ft	1	0.094	0.013	1.20		1.20	21.43	12.83	1.14	1.00	0.39	50.23 30.08

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
W Only	1	0.3023	6.438		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.856	0.803
Max Upward from Load Combinations	0.513	0.482
Max Upward from Load Cases	0.856	0.803
+0.60W	0.513	0.482
+0.450W	0.385	0.361
W Only	0.856	0.803

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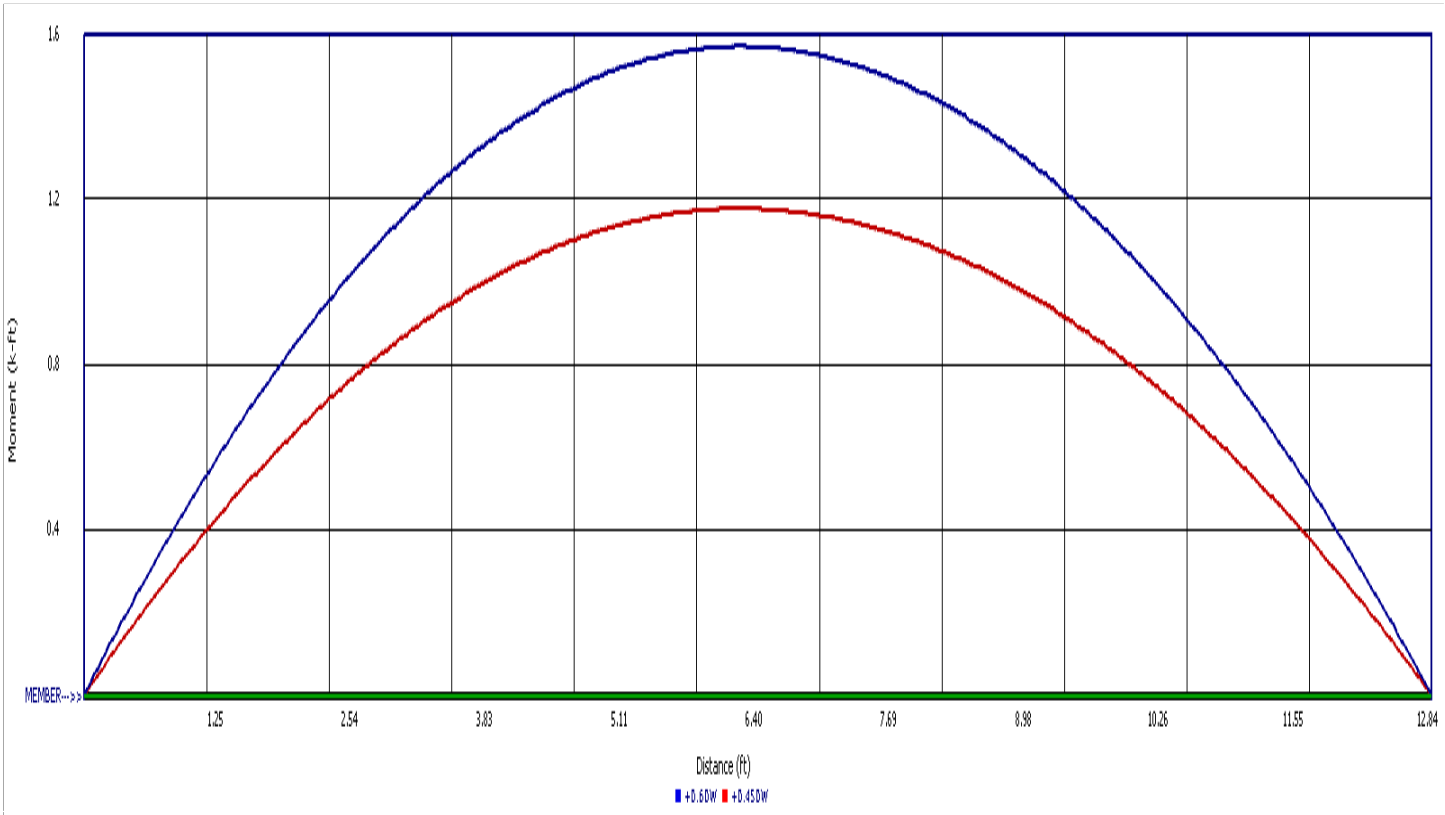
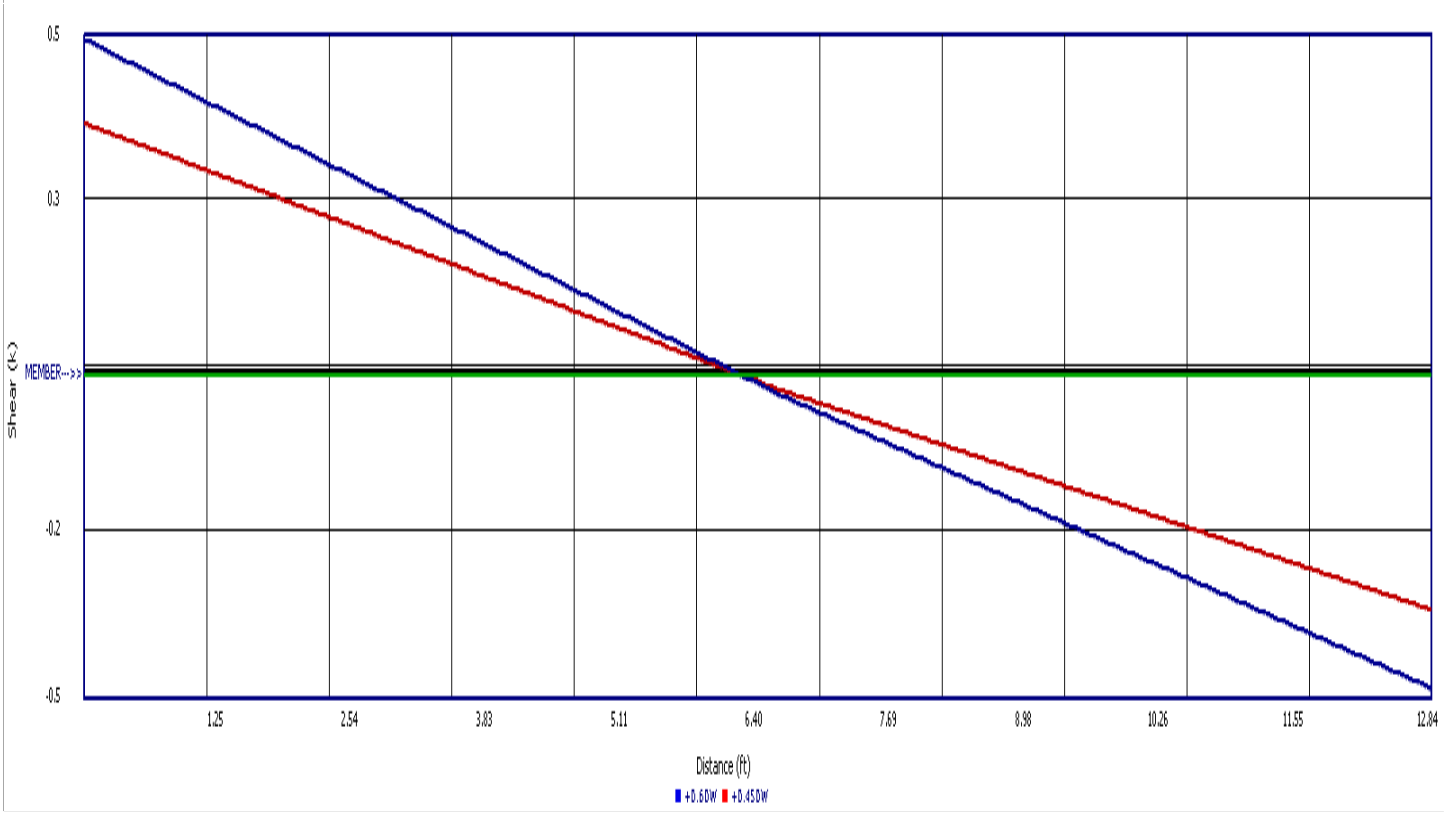
Project Title:
Engineer:
Project ID:
Project Descr:

Steel Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: OoP Wind - Upr Flr North Elev





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Project Title:
Engineer:
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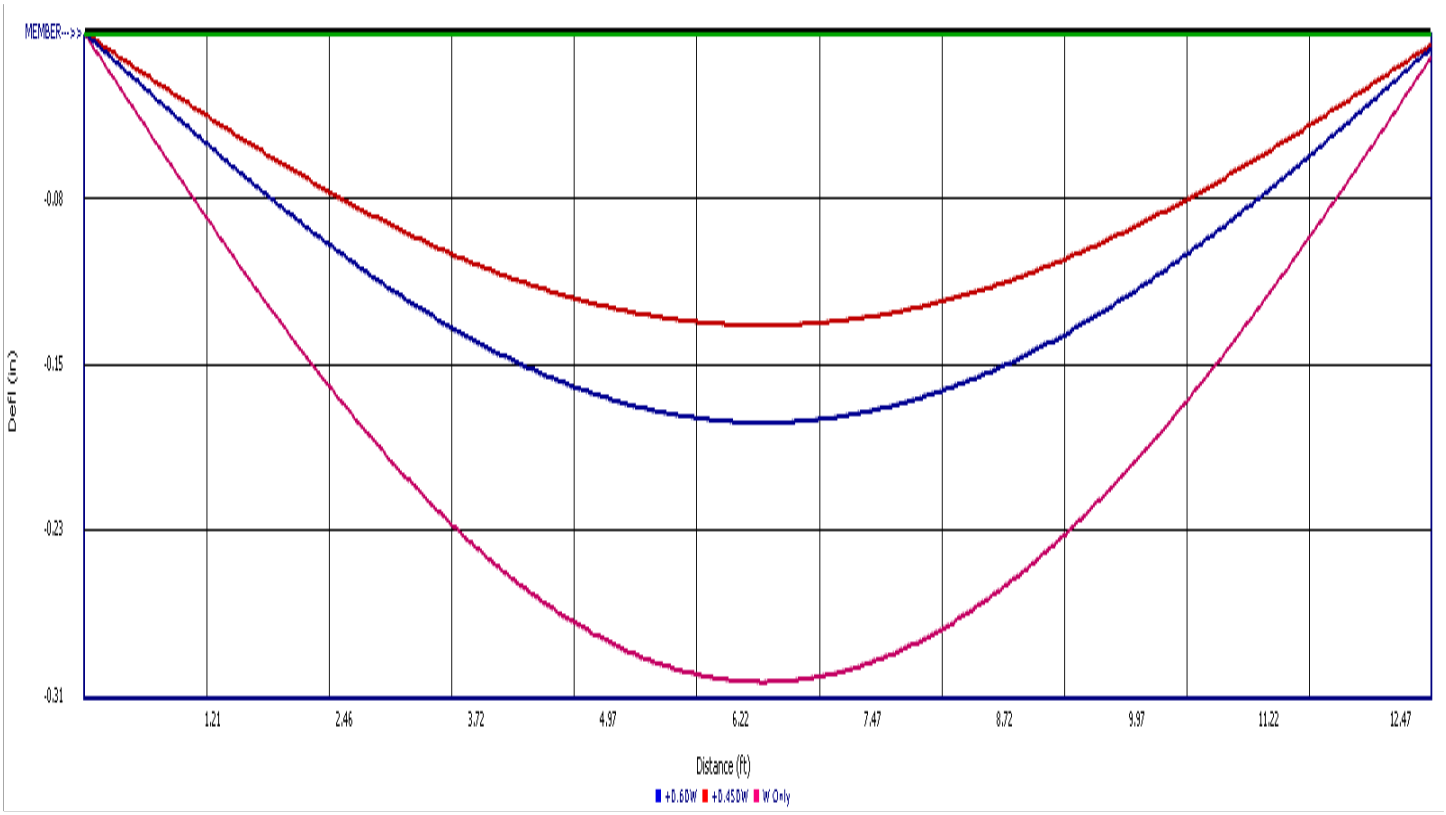
Steel Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: OoP Wind - Upr Flr North Elev



Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Beam

Project File: harris res remodel_rev.ec6

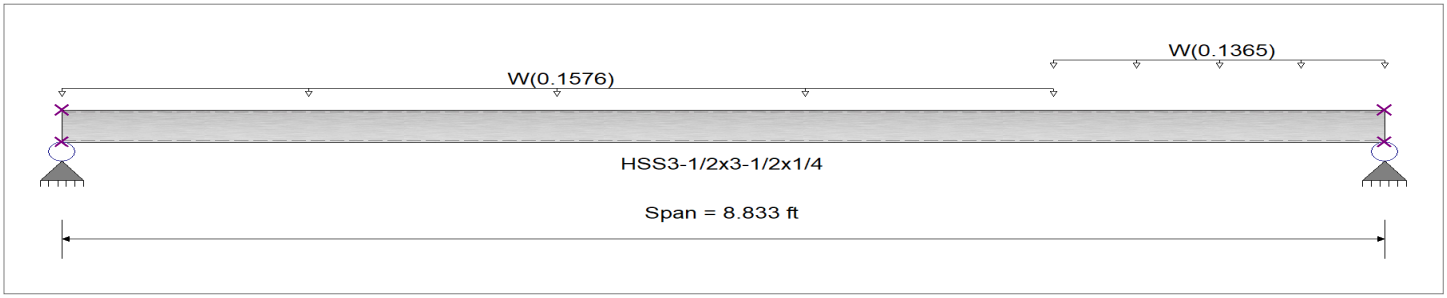
DESCRIPTION: OoP Wind - Main Flr East Elev

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	46.0 ksi
Beam Bracing :	Completely Unbraced	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

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

Beam self weight NOT internally calculated and added
Load for Span Number 1
Uniform Load : W = 0.02770 ksf, Extent = 0.0 -->> 6.625 ft, Tributary Width = 5.688 ft, (C&C Wind (Zone 5))

Uniform Load : W = 0.0240 ksf, Extent = 6.625 -->> 8.833 ft, Tributary Width = 5.688 ft, (C&C Wind (Zone 5))

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.113 : 1	Maximum Shear Stress Ratio =	0.019 : 1
Section used for this span	HSS3-1/2x3-1/2x1/4	Section used for this span	HSS3-1/2x3-1/2x1/4
Ma : Applied	0.907 k-ft	Va : Applied	0.4140 k
Mn / Omega : Allowable	8.034 k-ft	Vn/Omega : Allowable	21.572 k
Load Combination	+0.60W	Load Combination	+0.60W
		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	0.145 in	Ratio =	728	>=360	Span: 1 : W Only
Max Upward Transient Deflection	0 in	Ratio =	0	<360	n/a
Max Downward Total Deflection	0.087 in	Ratio =	1214	>=240.	Span: 1 : +0.60W
Max Upward Total Deflection	0 in	Ratio =	0	<240.0	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega
Dsgn. L = 8.83 ft	1		0.000				13.42	8.03	1.00	1.00	-0.00	36.03 21.57
+0.60W												
Dsgn. L = 8.83 ft	1	0.113	0.019	0.91		0.91	13.42	8.03	1.14	1.00	0.41	36.03 21.57
+0.450W												
Dsgn. L = 8.83 ft	1	0.085	0.014	0.68		0.68	13.42	8.03	1.14	1.00	0.31	36.03 21.57

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
W Only	1	0.1455	4.417		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	0.690	0.655
Max Upward from Load Combinations	0.414	0.393
Max Upward from Load Cases	0.690	0.655
+0.60W	0.414	0.393
+0.450W	0.311	0.295
W Only	0.690	0.655

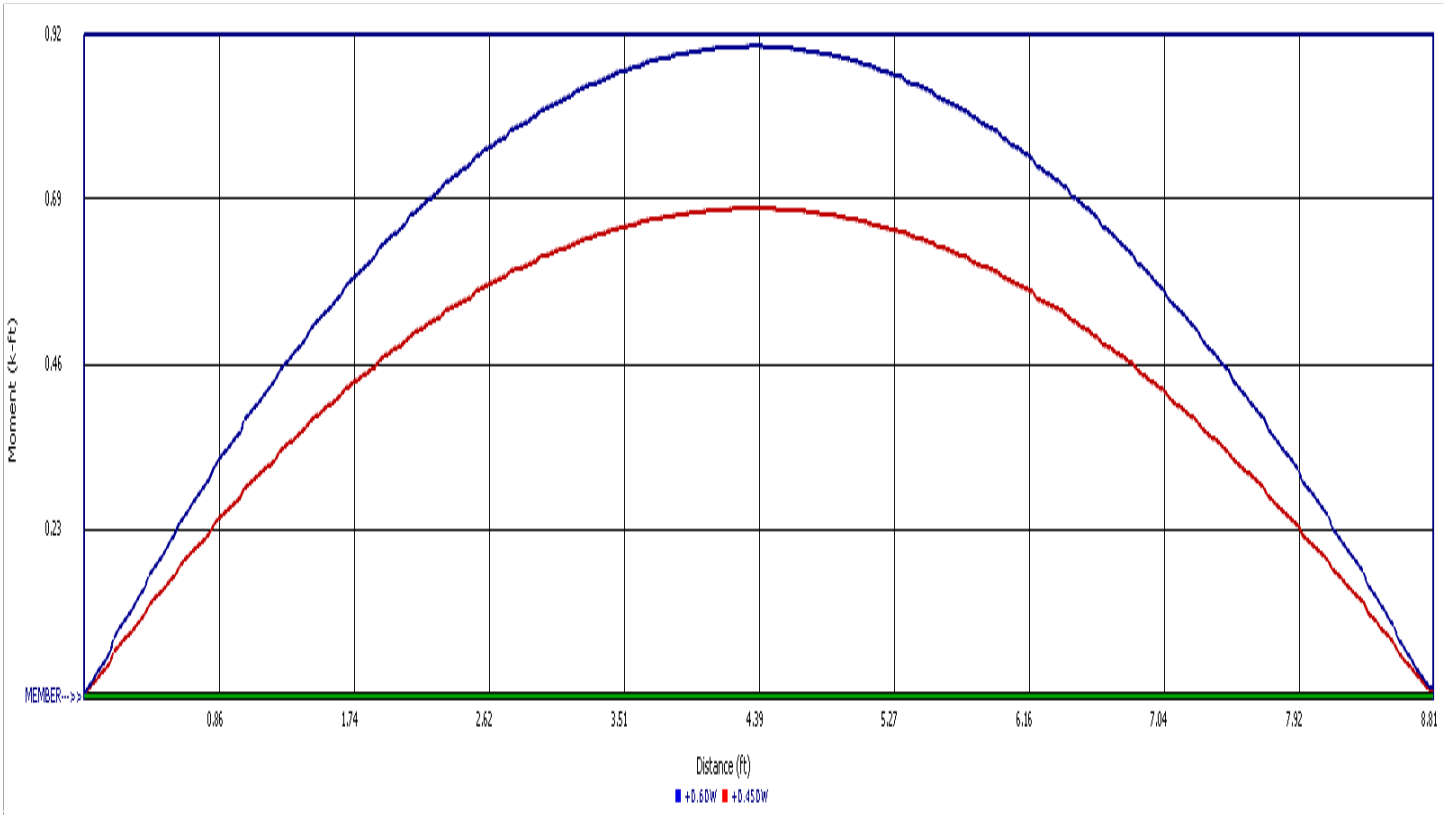
Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

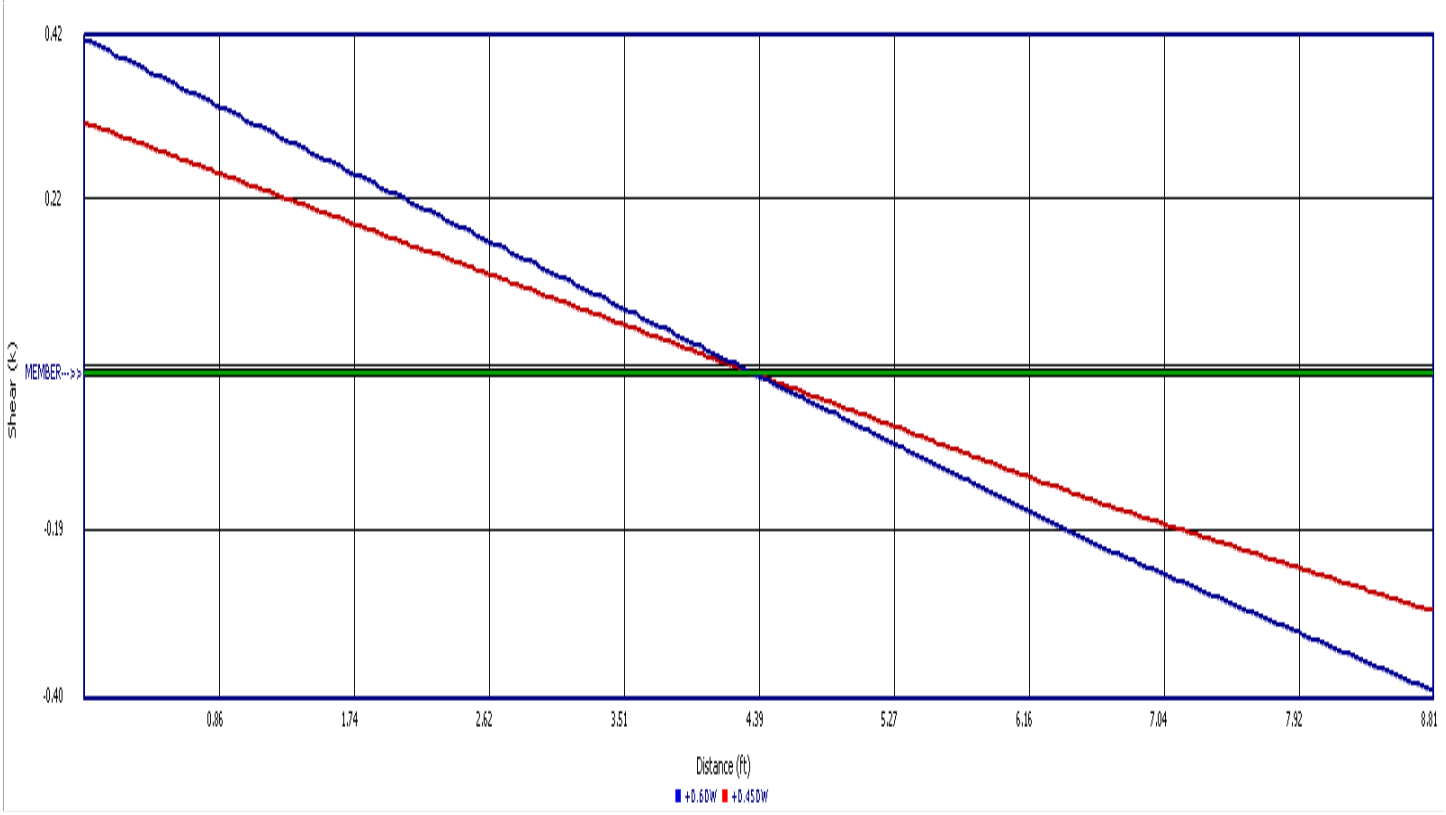
Project Title:
Engineer:
Project ID:
Project Descr:

Steel Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: OoP Wind - Main Flr East Elev





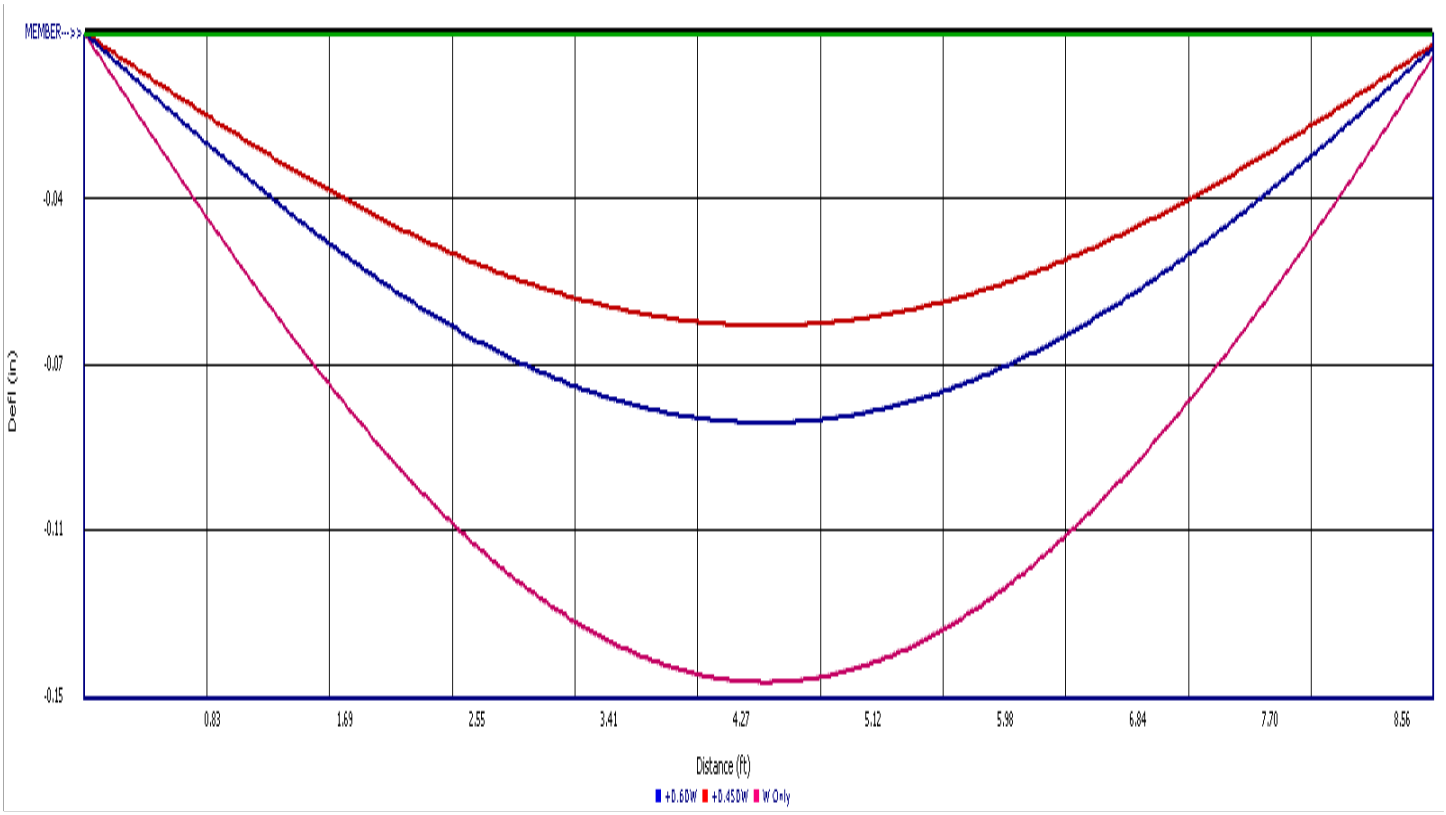
Dibble Engineers, Inc.
1029 Market Street
Kirkland, WA 98033
(425) 828-4200

Project Title:
Engineer:
Project ID:
Project Descr:

Steel Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: OoP Wind - Main Flr East Elev



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(425) 828-4200

Project Title:
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Project Descr:

Steel Beam

Project File: harris res remodel_rev.ec6

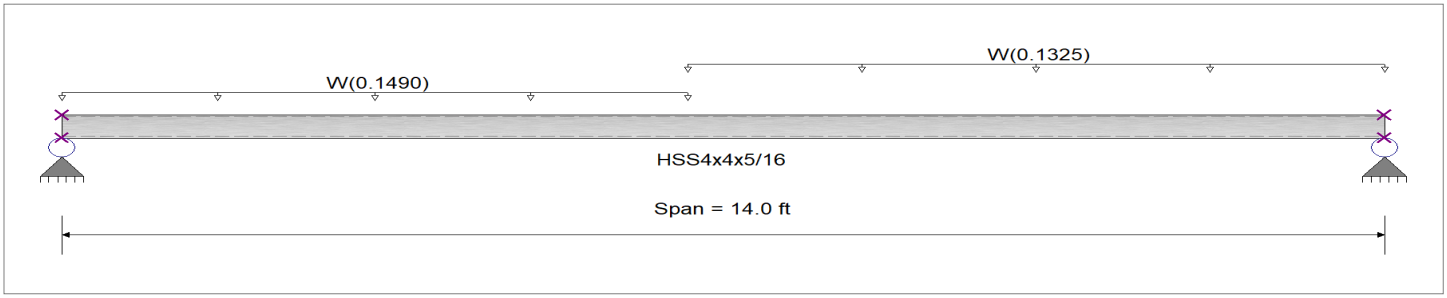
DESCRIPTION: OoP Wind - Main Flr North Elev

CODE REFERENCES

Calculations per AISC 360-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combination Set : IBC 2021

Material Properties

Analysis Method :	Allowable Strength Design	Fy : Steel Yield :	46.0 ksi
Beam Bracing :	Completely Unbraced	E: Modulus :	29,000.0 ksi
Bending Axis :	Major Axis Bending		



Applied Loads

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

Beam self weight NOT internally calculated and added
Load for Span Number 1
Uniform Load : W = 0.02620 ksf, Extent = 0.0 -->> 6.625 ft, Tributary Width = 5.688 ft, (C&C Wind (Zone 5))

Uniform Load : W = 0.02330 ksf, Extent = 6.625 -->> 14.0 ft, Tributary Width = 5.688 ft, (C&C Wind (Zone 5))

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.160 : 1	Maximum Shear Stress Ratio =	0.020 : 1
Section used for this span	HSS4x4x5/16	Section used for this span	HSS4x4x5/16
Ma : Applied	2.058 k-ft	Va : Applied	0.6067 k
Mn / Omega : Allowable	12.831 k-ft	Vn/Omega : Allowable	30.078 k
Load Combination	+0.60W	Load Combination	+0.60W
		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	0.458 in	Ratio =	366	>=360	Span: 1 : W Only
Max Upward Transient Deflection	0 in	Ratio =	0	<360	n/a
Max Downward Total Deflection	0.275 in	Ratio =	610	>=240.	Span: 1 : +0.60W
Max Upward Total Deflection	0 in	Ratio =	0	<240.0	n/a

Maximum Forces & Stresses for Load Combinations

Load Combination / Segment Length	Span #	Max Stress Ratios M	Max Stress Ratios V	Summary of Moment Values Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Summary of Shear Values Va Max	VnxVnx/Omega	
Dsgn. L = 14.00 ft +0.60W	1		0.000				21.43	12.83	1.00	1.00	-0.00	50.23	30.08
Dsgn. L = 14.00 ft +0.450W	1	0.160	0.020	2.06		2.06	21.43	12.83	1.14	1.00	0.61	50.23	30.08
Dsgn. L = 14.00 ft	1	0.120	0.015	1.54		1.54	21.43	12.83	1.14	1.00	0.46	50.23	30.08

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
W Only	1	0.4589	7.000		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2
Max Upward from all Load Conditions	1.011	0.954
Max Upward from Load Combinations	0.607	0.572
Max Upward from Load Cases	1.011	0.954
+0.60W	0.607	0.572
+0.450W	0.455	0.429
W Only	1.011	0.954

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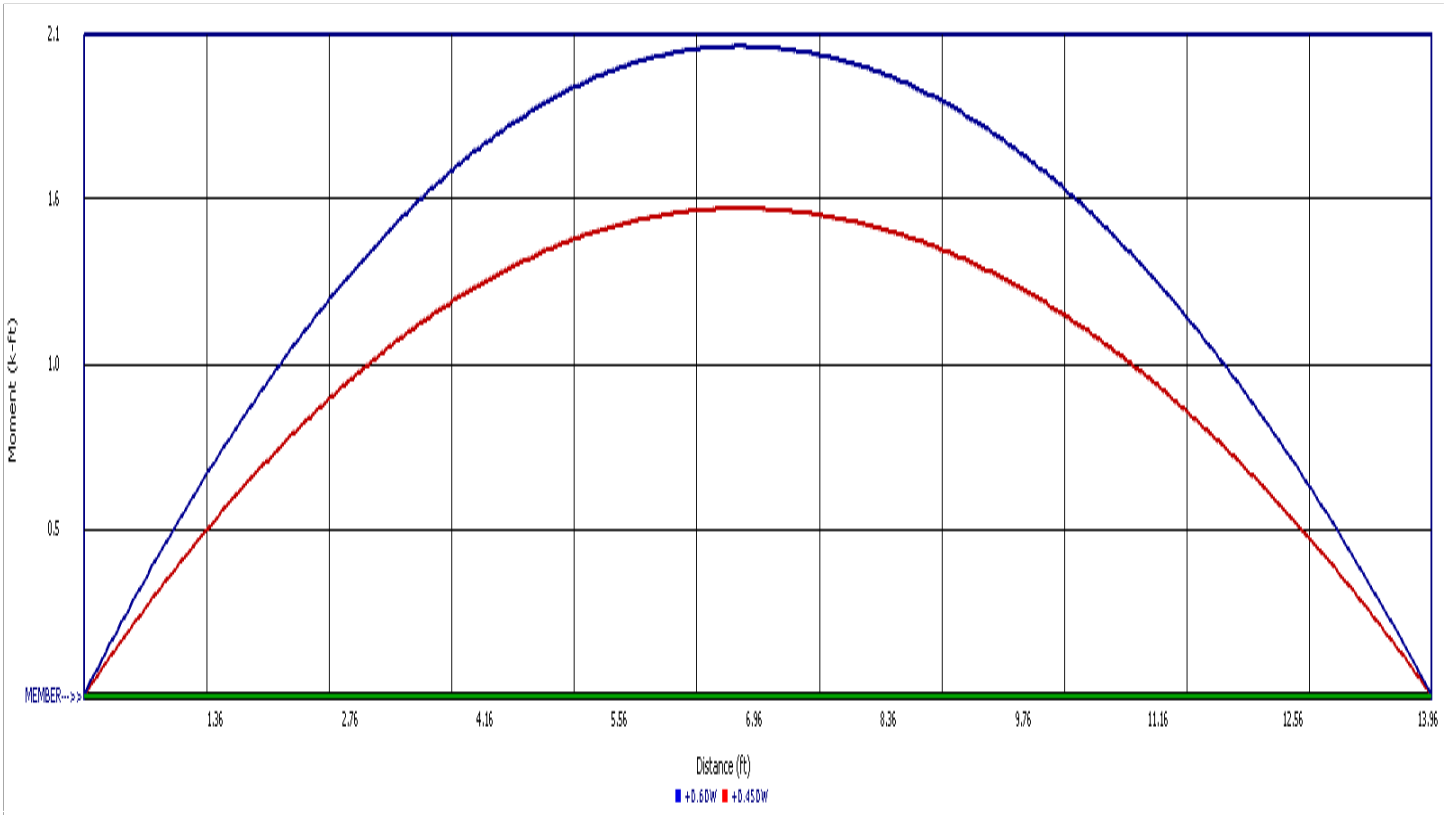
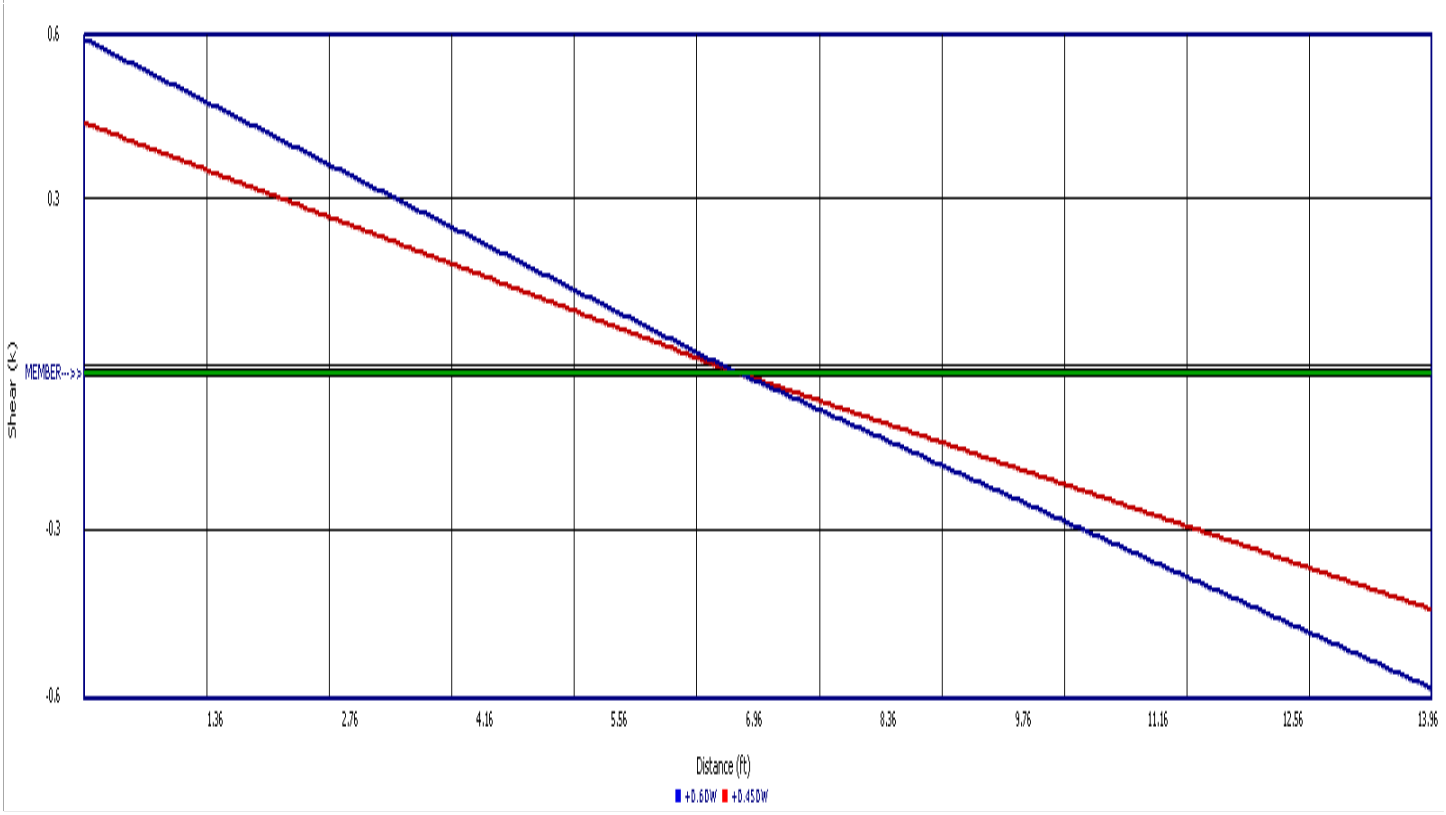
Steel Beam

Project File: harris res remodel_rev.ec6

DESCRIPTION: OoP Wind - Main Flr North Elev





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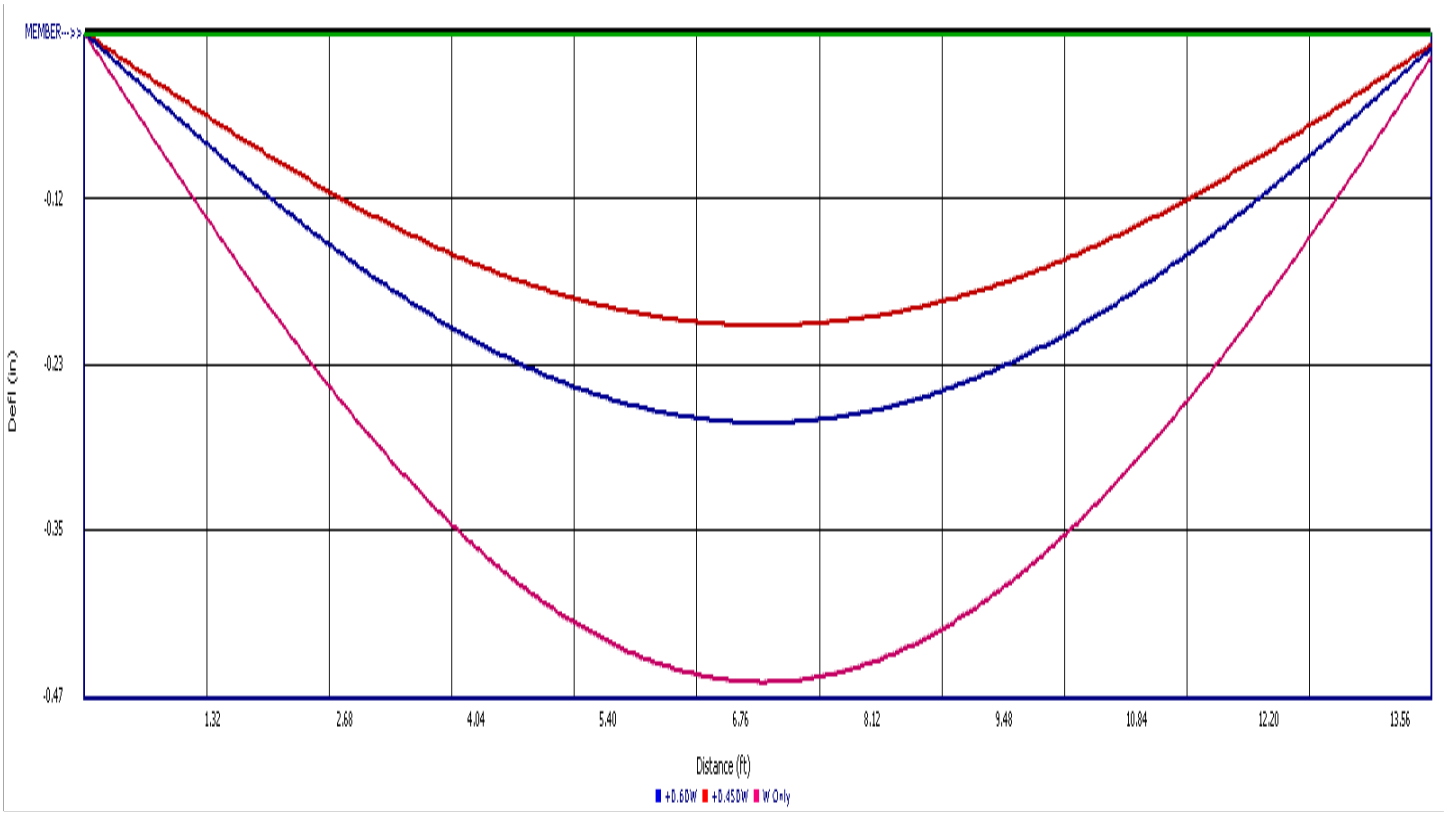


DIBBLE ENGINEERS, INC.

Project No:	Sheet No:
23-183	L-1

Project	Harris Res Remodel	*Date* 6/14/2023
Subject	Lateral Force Resisting System - Upper Floor Shear Walls	*By* LAP

Seismic Design Parameters

Wood-Framed Shear Walls

	Sds	1.103	
Uplift Factors	0.6 - 0.14 Sds	0.446	ASD
	0.9 - 0.2 Sds	0.679	LRFD
Compression Factors	1.0 + 0.14 Sds	1.154	ASD
	1.2 + 0.2 Sds	1.221	LRFD
	Ω_0	2.5	
(2) 2X	d (OTM dist.)	0.250	
(3) 2X	d (OTM dist.)	0.375	

N-S Direction

V_{ASD} =

2.434 K	**WIND (ASD)**
4.054 K	**SEISMIC (ASD)**

						WIND			SEISMIC										
Wall	Length (ft)	H/L Ratio	SW Cap. Coeff.	Co Eff V, Cap Ratio	Dist. Factor	V (lb)	v (plf)	v' (plf)	ρ	V w/out ρ (lb)	V (lb)	v (plf)	v' (plf)	W or E?	Story Height (ft)	OTM (lb-ft)	DL on Wall (lb)	Uplift (lb)	Compression (lb)
SW-A1	5.75	1.64	1.00	1	0.181	441	76.66	76.66	1.00	734	734	127.69	127.69	Seismic	9.46	6944.2	1850	851	2330
SW-A2	10.13	0.93	1.00	1	0.319	776	76.66	76.66	1.00	1293	1293	127.69	127.69	Seismic	9.46	12227.8	3440	472	3224
SW-B1	2.79	3.39	0.59	1	0.231	562	201.43	341.24	1.00	937	937	335.50	568.35	Seismic	9.46	15007.1	1065	5667	6519
SW-B2	3.25	2.91	0.69	1	0.269	655	201.43	293.11	1.00	1090	1090	335.50	488.20	Seismic	9.46	15007.1	1240	4726	5718

	Unfactored Overturning Loads		
SW-ID	T/C (lb)	T/C x Ω (lb)	Dead (lb)
SW-B1	8435	21087	1720
SW-B2	7146	17866	533

E-W Direction

V_{ASD} =

2.150 K	**WIND (ASD)**
4.054 K	**SEISMIC (ASD)**

						WIND			SEISMIC										
Wall	Length	H/L Ratio	SW Cap. Coeff.	Co Eff V, Cap Ratio	Dist. Factor	V (lb)	v (plf)	v' (plf)	ρ	V w/out ρ (lb)	V (lb)	v (plf)	v' (plf)	W or E?	Story Height (ft)	OTM (lb-ft)	DL on Wall (lb)	Uplift (lb)	Compression (lb)
SW-1A	11.63	0.81	1.00	1	0.500	1075	92.47	92.473	1.000	2027	2027.00	174.366	174.37	Seismic	9.46	19172.0	3163	981	3511
SW-2A	3.42	2.77	0.72	1	0.500	1075	314.63	435.500	1.000	2027	2027.00	593.268	821.17	Seismic	9.46	19172.0	954	5842	6605

	Unfactored Overturning Loads		
SW-ID	T/C (lb)	T/C x Ω (lb)	Dead (lb)
SW-1A	2408	6019	1581
SW-2A	9004	22511	477

N-S Direction

Wall	SW	SW DCR	Strap/HD	HD DCR
SW-A1	SW-6	44.3%	A	54.2%
SW-A2	SW-4	29.9%	A	30.1%
SW-B1	SW-2	79.4%	E	87.5%
SW-B2	SW-2	68.2%	E	73.0%

	Seismic Forces w/ Overstrength (LRFD)			Seismic OTM Forces (Unfactored)	
Wall	OTM (lb-ft)	Tension (lb)	Compression (lb)	OTM (lb-ft)	Tension/Compression (lb)
SW-A2	6944.2	3880.9	5638.0	9920	3052.4
SW-B2	12227.8	3253.7	6522.0	17468	1768.9
SW-B2	8858.8	12086.0	13098.2	12655	5236.7
SW-B1	10313.2	11856.3	13034.7	14733	4533.3

E-W Direction

Wall	SW	SW DCR	Strap/HD	HD DCR
SW-1A	SW-6	60.5%	A	62.5%
SW-2A	2SW-3	73.6%	E	90.2%

	Seismic Forces w/ Overstrength (LRFD)			Seismic OTM Forces (Unfactored)	
Wall	OTM (lb-ft)	Tension (lb)	Compression (lb)	OTM (lb-ft)	Tension/Compression (lb)
SW-1B	19172.0	4945.0	7949.8	27389	2434.5
SW-2A	19172.0	21298.6	22204.7	27389	9004.5

DIBBLE ENGINEERS, INC.

Project No:	Sheet No:
23-183	L-1

Project	Harris Res Remodel	Date 6/14/2023
Subject	Lateral Force Resisting System - Main Floor Shear Walls	By LAP

N-S Direction

V_{ASD} =

2.239 K	**WIND (ASD)**
7.175 K	**SEISMIC (ASD)**

						WIND			SEISMIC									
Wall	Length (ft)	H/L Ratio	SW Cap. Coeff.	Co Eff V, Cap Ratio	Dist. Factor	V (lb)	v (plf)	v' (plf)	ρ	V w/out ρ (lb)	V (lb)	v (plf)	v' (plf)	W or E?	Story Height (ft)	OTM (lb-ft)	DL on Wall (lb)	Uplift (lb)	Compression (lb)
SW-A1	5.75	1.71	1.00	1	0.181	846	147.18	147.18	1.00	2034	2034	353.67	353.67	Seismic	9.83	19997.0	4413	2653	6183
SW-A2	10.13	0.97	1.00	1	0.319	1155	114.06	114.06	1.00	3022	3022	298.50	298.50	Seismic	9.83	29719.0	5668	1747	6281
SW-B1	5.21	1.89	1.00	1	0.500	1896	363.97	363.97	1.30	4880	6344	1218.13	1218.13	Seismic	9.83	62386.4	5716	11977	15882

	T/C (Seismic)	
SW ID	w/out Overstrength	w/ Overstrength
SW-A2	3087.7	7719.2
SW-B1	13250.2	33125.5

E-W Direction

V_{ASD} =

4.016 K	**WIND (ASD)**
7.175 K	**SEISMIC (ASD)**

						WIND			SEISMIC									
Wall	Length	H/L Ratio	SW Cap. Coeff.	Co Eff V, Cap Ratio	Dist. Factor	V (lb)	v (plf)	v' (plf)	ρ	V w/out ρ (lb)	V (lb)	v (plf)	v' (plf)	W or E?	Story Height (ft)	OTM (lb-ft)	DL on Wall (lb)	Uplift (lb)	Compression (lb)
~~SW-1A~~	~~2.00~~	~~4.92~~	~~1.00~~	~~1~~	~~0.148~~	~~1056~~	~~528.25~~	~~528.25~~	~~1.000~~	~~1933~~	~~1933.22~~	~~966.611~~	~~966.61~~	~~Seismic~~	~~9.83~~	~~19009.4~~	~~986~~	~~10643~~	~~11432~~
~~(E) SW-1B~~	~~4.75~~	~~2.07~~	~~0.97~~	~~1~~	~~0.352~~	~~2509~~	~~528.25~~	~~546.76~~	~~1.000~~	~~4591~~	~~4591.40~~	~~966.611~~	~~1000.49~~	~~Seismic~~	~~9.83~~	~~45147.2~~	~~4082~~	~~9123~~	~~12389~~
~~SW-2A~~	~~2.21~~	~~4.45~~	~~0.45~~	~~1~~	~~0.500~~	~~2008~~	~~909.28~~	~~2024.43~~	~~1.000~~	~~3588~~	~~3587.50~~	~~1624.528~~	~~3616.86~~	~~Seismic~~	~~9.83~~	~~35277.0~~	~~887~~	~~17816~~	~~18526~~
SW-3A	3.69	1.85	1.00	1	0.500	2600	705.14	705.14	1.000	4704	4704.17	1275.708	1275.71	Seismic	6.83	32145.2	-	-	-

*includes (E) 3' Conc Wall **SEE ATTACHED HAND CALCS*

Calculate SW-1B Deflection

v (plf)	966.61
h (ft)	10.00
E (psi)	1300000
A (in^2)	24.75
b (ft)	4.75
G_a (k/in)	28.00
Δ_a (in)	0.137
Δ'_a (in)	0.131

2SW-2 w/ HF w/ 10d nails & ply shtg
HDU11 @ allowable tension load
HDU11 @ applied tension load

Δ_2 (in)	0.672

iterations using shear wall deflection (inversely proportional to stiffness) to distribute the lateral force w/ Simpson Strong-Wall

	Unfactored Seismic Overturning Loads		
SW-ID	T/C (lb)	T/C x Ω (lb)	Dead (lb)
SW-1A	12673	31682	493
SW-3A	10085	25212	-

LRFD Wind Overturning Loads		
SW-ID	T (lb)	C (lb)
SW-1A	10320	11257

Unfactored Wind Overturning Loads		
SW-ID	T/C (lb)	Dead
SW-1A	6393	493

ITERATION #1

~~SW-1A~~	~~2.00~~	~~4.92~~	~~1.00~~	~~1~~	~~0.373~~	~~2660~~	~~1330.00~~	~~1330.00~~	~~1.000~~	~~4867~~	~~4867.37~~	~~2433.684~~	~~2433.68~~	~~Seismic~~	~~9.83~~	~~47860.8~~	~~797~~	~~27172~~	~~27809~~
(E) SW-1B	4.75	2.07	0.97	1	0.500	3566	750.67	776.98	1.000	6525	6524.62	1373.605	1421.75	Seismic	9.83	64156.6	4082	14186	16613

N-S Direction

Wall	SW	SW DCR	Strap/HD	HD DCR
SW-A1	SW-4	83%	M1	94.7%
SW-A2	SW-4	70%	M1	62.4%
SW-B1	2SW-2	85%	HDU14	82.9%

E-W Direction

Wall	SW	SW DCR	Strap/HD	HD DCR
~~SW-1A~~	~~WSWH24x10~~	~~24.1%~~	~~(2) D~~	~~93.5%~~
~~(E) SW-1B~~	~~2SW-2~~	~~70%~~		~~248.3%~~
~~SW-2A~~	~~2SW-2~~	~~253%~~	-	~~186.9%~~
SW-3A	2SW-2	89%	(2) M2	-

Simpson Strong-Wall is too stiff & thus overloaded, therefore drag all lateral force to (E) SW-1B

ITERATION #1

~~SW-1A~~	~~WSWH24x10~~	~~121.4%~~	~~(2) D~~	~~238.8%~~
(E) SW-1B	2SW-2	99%	HDU14	98.2%

Additional Dead Load @ West End of SW-1B

Wall Dead Load (lb)	2041
(E) Upr Flr Bm Reaction (lb)	1953
(E) Roof Bm Reaction (lb)	1038
Total Dead Load	5033

Resulting Uplift (ASD, lb)	12707
Resulting Uplift (LRFD, lb)	17937

Subtract (E) HSS Col Cap. (LRFD, lb)	5168	*see attached Simpson Anchor Designer*
Remaining Uplift Demand (LRFD, lb)	12769	
% Uplift Force Reduced	71.2%	
Remaining Uplift Demand (ASD, lb)	9046	
HDU11 Capacity	9610 @ 94% capacity	

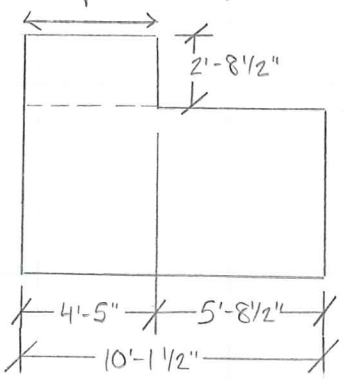
Remaining Uplift along Wall Ht	919.92 plf
TB Screw Capacity	335 lb
Max. TB Screw Spacing	4.370 in.
10d nail Capacity	163 lb
Max. 10d Nail Spacing	2.13 in.

DEI
DIBBLE ENGINEERS INC

PROJECT NAME: Harris Res Remodel | SHEET # 1/9
PROJECT #: 23-183 | DATE: 10/2023
SUBJECT: SW STEP & COLLECTOR TO SW-3A | BY: CAP

CHECK STEP @ SW-A2:

V = 1,293 lb / 4'-5" = 292.75 plf (seismic, ASD)



SW ELEVATION

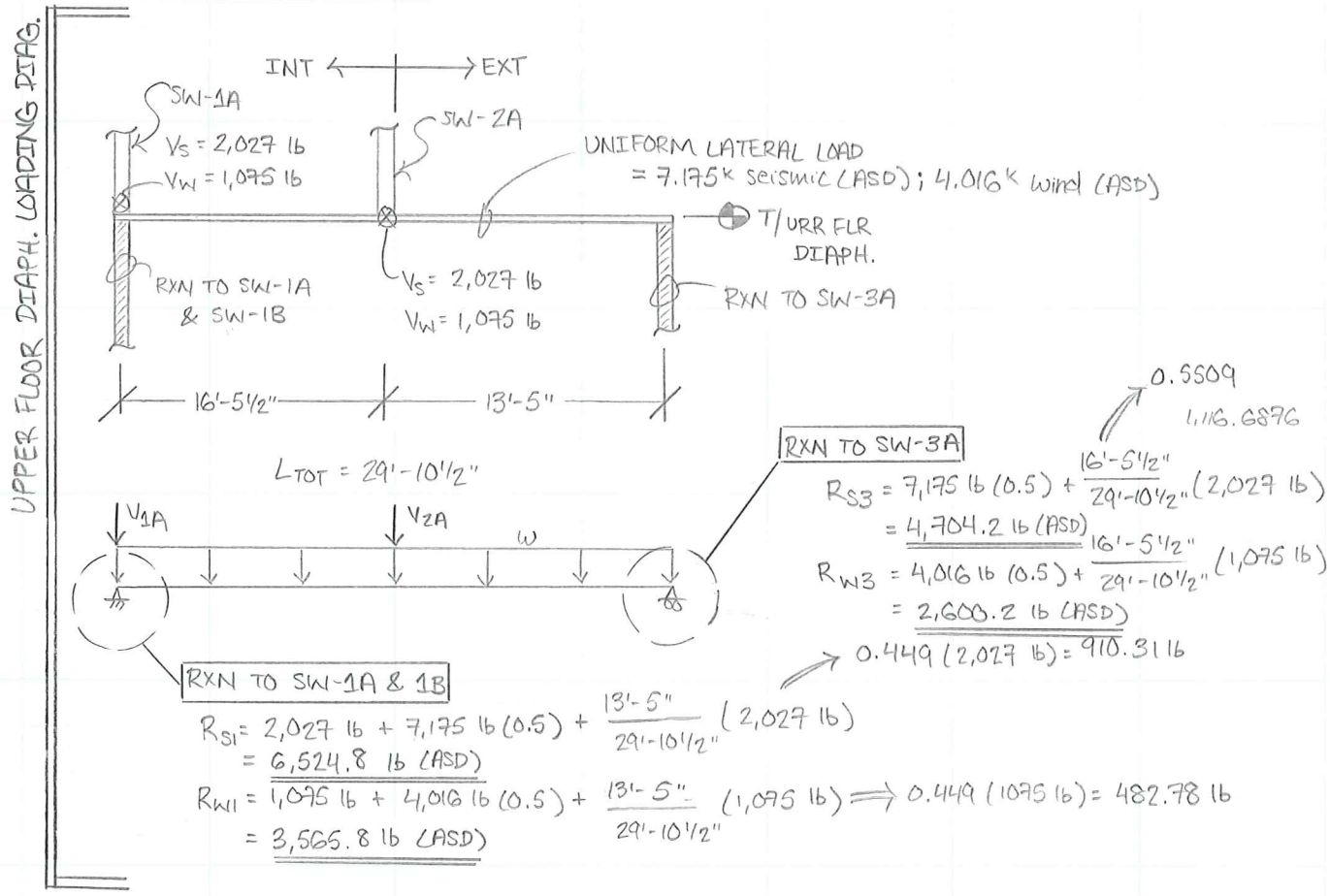
∴ UPSIZE TO SW-4 CAP. = 427 plf > 292.75 plf @ 68.6% DCR

ASPECT RATIO = 2'-8 1/2" / 4'-5" = 0.613 ∴ no SW cap reduction

transfer force across step = 129.69 plf (5'-8 1/2")
= 728.90 lb
× Ω0
1,822.25 lb (ASD w/ Ω0)

TRY CMSTC16 STRAP
CAP. = 4,690 lb (24/25) = 4,502.4 lb > 1,822.25 lb
↑ adjust for 2' strap length
∴ OK! @ 40.5% DCR

CHECK COLLECTOR (DB2) TO SW-3A:



0.5509
1,116.6876

$R_{S3} = 7{,}175\text{ lb}(0.5) + \frac{16'-5\frac{1}{2}"}{29'-10\frac{1}{2}"}(2{,}027\text{ lb})$
$= 4{,}704.2\text{ lb (ASD)}$

$R_{W3} = 4{,}016\text{ lb}(0.5) + \frac{16'-5\frac{1}{2}"}{29'-10\frac{1}{2}"}(1{,}075\text{ lb})$
$= 2{,}600.2\text{ lb (ASD)}$

0.449 (2,027 lb) = 910.31 lb

$R_{S1} = 2{,}027\text{ lb} + 7{,}175\text{ lb}(0.5) + \frac{13'-5"}{29'-10\frac{1}{2}"}(2{,}027\text{ lb})$
$= 6{,}524.8\text{ lb (ASD)}$

$R_{W1} = 1{,}075\text{ lb} + 4{,}016\text{ lb}(0.5) + \frac{13'-5"}{29'-10\frac{1}{2}"}(1{,}075\text{ lb})$ ⟹ 0.449 (1075 lb) = 482.78 lb
$= 3{,}565.8\text{ lb (ASD)}$

COLLECTOR FORCE = 4,704.2 lb (ASD) × 2.50 = 11,760.5 lb (ASD w/ Ω0)
↑ Ω0

CONT...

DEI
DIBBLE ENGINEERS INC

PROJECT NAME: Harris Res. Remodel | SHEET #: 2/9
PROJECT #: 23-183 | DATE: 10/2023
SUBJECT: COLLECTOR & PARTIAL HT STUDS | BY: CAP

CONT COLLECTOR TO SW-3A...

$\frac{11{,}760.5\text{ lb}}{3'\text{-}9\frac{1}{2}"} = 3{,}101.67$ plf (ASD w/ Ω_0) × 16" (ft/12") = 4,135.6 lb (stud (unattainable w/ screws) ∴ ADD BLKG

↑ SW LENGTH

TRY SDWS SCREWS

$Z' = 310\,(1.60) = 496$ lb/screw

↑ HF w/ 4" SIDE MEMBER

$\frac{496\text{ lb/screw}}{3{,}101.67\text{ plf}} = 0.1599'$
$= 1.919"$ max spa.

w/ (3) screws, max spa. = 5.75"

CHECK w/ DF BLKG:

$Z' = 1.60\,(395\text{ lb}) = 632$ lb

↑ DF w/ 4" SIDE MEMBER & 8" screw

$\frac{(3)(632\text{ lb})}{3{,}101.67\text{ plf}} = 0.6113' = 7.34"$ max spa.

→ CANNOT USE SDWS SCREWS @ THIS TIGHT OF SPA.

TRY 5/8"Ø LAG SCREW

$Z' = 977$ lb $\quad \frac{(3)977\text{ lb}}{3{,}101.67\text{ plf}} = 0.945' = 11.33"$ MAX

MIN END DIST. = 7D = 7(5/8") = 4 3/8"
SPACING BTWN ROWS = 1.5 D = 0.9375"
SPACING BTWN BOLTS IN A ROW = 4D = 2 1/2"
EDGE DIST. = 1.5 D = 0.9375"

↳ TRY 1/4"Ø SDS SCREWS W/ 14 GA ANGLE & DF BLKG

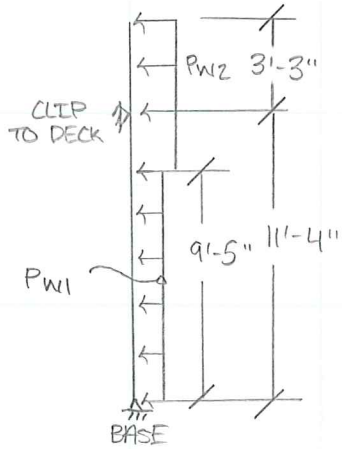
$Z' = 1.60\,(420\text{ lb}) = 672$ lb/screw

$\frac{672\text{ lb}}{3{,}101.67\text{ plf}} = 0.217' = 2.6"$ MAX
$= 5.2"$ MAX for pairs of screws

$\frac{(5)977\text{ lb}}{16"\,(\text{ft}/12")} = 3{,}663.75$ plf > 3,101.67 plf @ 84.7% DCR

∴ USE (5) 5/8"Ø x 8" LAG SCREWS @ 16" OC

CHECK STUDS @ NW CORNER OF DECK:



RXN TO CLIP = (11'-4"/2 + 3'-3")(PW)

P_{W1} = 18.3 psf for MWFRS; -26.6 psf or 21.4 psf for C&C

P_{W2} = 19.7 psf for MWFRS; -26.6 psf or 21.4 psf for C&C

$\frac{\ell}{3} = \frac{11'\text{-}4" + 31\text{-}3"}{3} = \frac{14'\text{-}7"}{3} = 4.861' \times h = 70.89$ sf

∴ P_W @ Neg. Zone 4 = -23.4 psf
@ Neg. Zone 5 = -26.6 psf
@ Pos. Zone = 21.4 psf

a = 3' min
↳ only 31-9 1/2" W wall ∴ use zone 5 pressures everywhere

CONTINUED

DEI
DIBBLE ENGINEERS INC

PROJECT NAME: Harris Res Remodel | SHEET #: 3/9
PROJECT #: 23-183 | DATE: 10/2023
SUBJECT: UPPER FLOOR DIAPH | BY: LAP

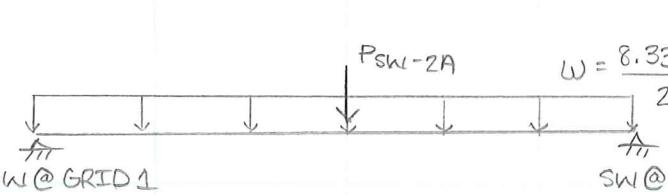
CONT STUDS @ NW CORNER WALL...

RXN TO CLIP @ DECK = (11'-4"/2 + 3'-3")(-26.6 psf) = -237.18 plf x 16"(ft/12") = -316.2 lb/stud
" (21.4 psf) = 190.82 plf x 16"(ft/12") = 254.4 lb/stud ← unf. wind

∴ R_W = -189.74 lb = 152.64 lb

∴ USE H2.5A CAP. = 615 lb > 189.7 lb
∴ ok! @ 31% DCR

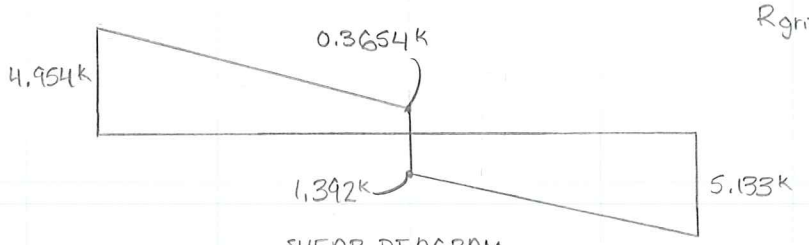
CHECK UPPER FLOOR DIAPH.



$P_{SW-2A} = 0.50(3.514^k) = 1.757^k$ (ASD)
← diaph. force @ main floor

$R_{grid\,1} = \frac{1}{2}(278.8\text{ plf})(29.875') + \frac{13'-5"}{29.875'}(1.757^k)$
$= 4.165^k + 0.789^k$
$= 4.954^k$ (ASD)

$R_{grid\,3} = \frac{1}{2}(278.8\text{ plf})(29.875') + \frac{16'-5\frac{1}{2}"}{29.875'}(1.757^k)$
$= 4.165^k + 0.968^k$
$= 5.133^k$ (ASD)



SHEAR DIAGRAM

$v_{diaph} = \frac{510\text{ plf}}{2.0} = 255$ plf cap. @ south ∴ ok!

$= \frac{430\text{ plf}}{2.0} = 215$ plf cap. @ north ∴ NG!
← 19/32" shtg, case 3

$v = \frac{5.133^k \times 1000\text{ lb/k}}{17'\text{ diaph. width}} = 301.9$ plf (ASD) @ North case 3

$v = \frac{4.166^k \times 1000\text{ lb/k}}{17'\text{ diaph. width}} = 245$ plf (ASD) @ South case 1

TRY BLOCKED DIAPH @ NORTH END:

19/32" SHTG W/ 10d NAILS W/ 6" OC EDGE NAILING

$v_{diaph} = \frac{640\text{ plf}}{2.0} = 320$ plf > 301.9 plf ∴ ok! @ 94.3% DCR

CALC. MIN WIDTH OF BLOCKED DIAPH.

$\frac{5.133^k}{17'} = 301.9$ plf

$\frac{1.392^k}{17'} = 81.88$ plf

$\frac{.2788\text{ k/f}}{17'} = 16.4$ plf/ft

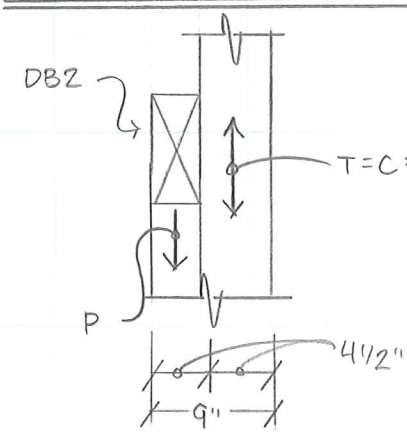
301.9 plf − 16.4 plf/ft (x) ≤ 215 plf

∴ $x_{min} = 5.299' \cong 5.5'$ wide blocked diaph.

DEI
DIBBLE ENGINEERS INC

PROJECT NAME: Harris Res Remodel | SHEET # 4/9
PROJECT #: 23-183 | DATE 10/2023
SUBJECT: POSTS @ ENDS OF SW-3A | BY LAP

CHECK POSTS @ ENDS OF SW-3A:



P_{WEST} = -1.367^k D ; -2.599^k L ; -1.083^k S @ UFP1
P_{EAST} = 3.091^k D ; 5.767^k L ; 2.403^k S @ UFP2
} REVISED PER ENERCALC

e_x @ P = 3 1/2"/2 + 1" = 2 3/4"
e_x @ SW = 5 1/2"/2 - 1" = 1 3/4"

CHECK UFP2: MAX. COMPRESSION

R_D = 3.091^k
R_L = 5.767^k
R_S = 2.403^k
R_E = 9.766^k

$M_x = P \times 2\,3/4" - R_E(1\,3/4")$

∴ 4x6 w/ 6x6 OK! [SEE ATTA

MAX UPLIFT

$(0.9 - 0.2S_{DS})D + E$
↳ = 0.6794

0.6794 (1.441^k) - 9.766^k
0.979^k - 9.766^k = -8.787^k (w/out Ω0)
= -23.436^k (w/ Ω0)

$= (0.6 - 0.14S_{DS})D + 0.7E$
$= 0.446D + 0.7E$ = -6.193^k ASD

CALC. MAX TENSION @ UFP1:

S_{DS} = 1.103

ASD FOR WOOD POST:

$(1.0 + 0.14S_{DS})D + 0.7E$ = -1.578^k - 6.836^k = -8.414^k
↳ 1.154

$(1.0 + 0.15S_{DS})D + 0.525E + 0.95L + 0.75S$ = -1.593^k + -5.127^k + -1.949^k + -0.812^k
↳ 1.165 = -9.481^k

F'_t = 1.60(825 psi) = 1,320 psi x (9" x 5 1/2") = 65.340^k CAP. ≫ 9.481^k ∴ OK! @ 15% DCR

LRFD FOR HOLDOWN ANCHOR:

1.2 D + 1.6L + 0.5S = 1.2(-1.367^k) + 1.6(-2.599^k) + 0.5(-1.083^k) = -6.340^k

$(1.2 + 0.2S_{DS})D + E + L + 0.2S$ = -1.942^k - 9.766^k - 2.599^k -0.2166^k
↳ 1.421 = -14.524^k (w/out Ω0)
= -29.173^k (w/ Ω0)

DEI
DIBBLE ENGINEERS INC

PROJECT NAME: Harris Res Remodel
SHEET #: 5/9
PROJECT #: 21-183
DATE: 10/2023
SUBJECT: UPLIFT @ ENDS OF SW-3A
BY: LAP

CALCULATE UPLIFT @ ENDS OF SW-3A:

T = C = 9,766 lb (UNIF SEISMIC)

EAST END:

$R_D = 1,550^k$
$R_L = 2,625^k$
$R_S = 1,094^k$
$R_E = \pm 9,766^k$

$R_a = (0.6 - 0.14 S_{DS}) D + 0.7E$ ($0.14 S_{DS} = 0.446$)
$= 0.691^k - 0.7(9.766^k) = -6.145^k$ (ASD w/out Ω_0)

∴ USE (2) MST STRAPS W/ (4) 1/2"Ø x TITEN HD

CAP. = 3,675 lb to DF x 2 = 7,350 lb > 6,145 lb ∴OK! @ 84% DCR

$\frac{3,695\ lb}{0.7} = 5,250$ lb (LRFD FOR ANCHOR DESIGNER)

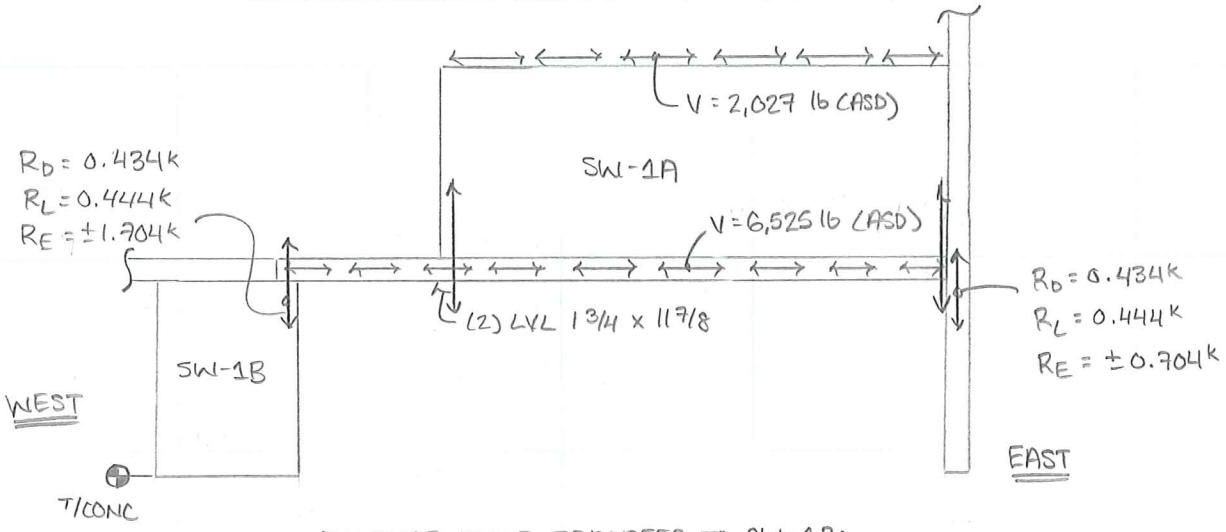
WEST END:

$R_E = \pm 9.766^k \times \Omega_0 = \pm 24.415^k$ (UNIF. W/ Ω_0)

↳ supported by cont PSL edge beam (LOAD ADDED TO END OF DB2)

DEI
DIBBLE ENGINEERS INC

PROJECT NAME: Harris Res Remodel
SHEET # 6/9
PROJECT #: 23-183
DATE: 11/2023
SUBJECT: GRID 1 SHEAR WALLS - LATERAL DISTRIBUTION
BY: CAP



COLLECTOR FORCE TRANSFER TO SW-1B:

V = 6,525 lb x 2.50 = 16,312.5 lb (ASD w/ Ω0)

(2) CMST12 → CAP. = 9,215 lb x (36"/38") x 2
= 17,460 lb > 16,312.5 lb ∴ OK! @ 93.4% DCR

∴ USE (2) CMST12 x 6'-0" L @ NEW to EXISTING SPLICE

COLLECTOR BEAM END CONNECTION:

EAST END:

$(0.6 - 0.14 S_{DS}) = 0.6 - 0.14(1.103) = 0.446$

R_a @ EAST = -0.299k (ASD) max. uplift

∴ USE MTSIG STRAP CAP. = 850 lb > 299 lb
∴ OK! @ 35% DCR

WEST END:

R_a @ WEST = -0.999k (ASD) max. uplift

∴ USE HTS STRAP
CAP. = 1,215 lb > 999 lb
∴ OK! @ 82.2% DCR

SW-1A TO BEAM:

$v = \frac{2,027\ lb}{111'-7\frac{1}{2}"} = 174.4$ plf (ASD)

∴ USE 1/4"Ø x 6" SDS SCREWS @ 16" OC
(@ 59.3% DCR)

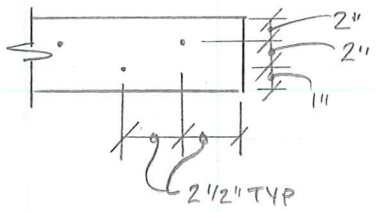
Z' = 1.6(245 lb) = 392 lb/screw

$\frac{392\ lb}{174.4\ plf} = 2.248'$

DEI
DIBBLE ENGINEERS INC

PROJECT NAME: Harris Residence
SHEET #: 7/9
PROJECT #: 23-183
DATE: 10/2023
SUBJECT: MISC - collector to SW-3A, ledger, (3) BM
BY: UAP

CHECK TENSION @ COLLECTOR ANGLE: to SW-3A



$A_{net} = (5" - 2(1/4" + 1/8")(0.078125")$ ← 14GA
$= 4.25"(0.078125") = 0.332\ in^2$

$\phi T_n = 0.9(0.332\ in^2)(65\ ksi) = 19.422^k > 11,760.5\ lb$

$F_y = 50\ ksi$
$F_u = 65\ ksi$

∴ OK! @ 61% DCR

CHECK LEDGER TO BEAM @ GRID 1 (MAIN FLOOR):

$trib = \frac{16"}{2} \times \frac{ft}{12"} = 0.667'$

$W_D = 0.667'(30\ psf) = 20\ plf$ DEAD
$W_L = 0.667'(40\ psf) = 26.67\ plf$ LIVE
$46.67\ plf$ (ASD)

$Z' = 102\ lb$ (10d common)

$\frac{102\ lb/nail}{46.67\ plf} = 2.19'/nail \cong 24"$ MAX. SPA. for gravity

↳ 10d @ 6" OC for lateral

∴ USE 10d @ 6" OC min

CHECK (3) BEAM TO POST CONN.:

UFB3 RXN:
$R_D = 2.847^k$
$R_L = 3.183^k$
$R_S = 1.170^k$
$R_E = \pm 0.746^k$ (w/out Ω_0)

$R_a = 6.508^k$

$0.05(2.847^k + 3.183^k) = 301.5\ lb$

CHECK MIN BRG AREA

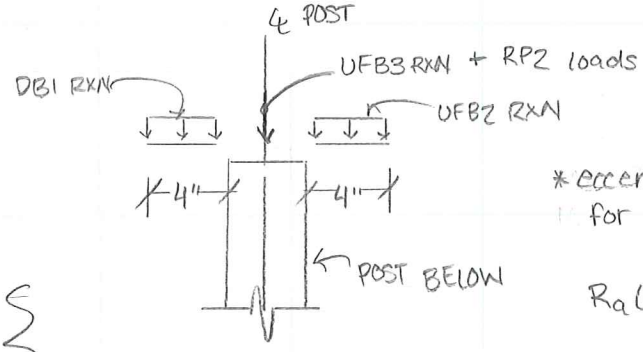
$F'_{c\perp} = 625\ psi\left(\frac{l_b + 0.375}{l_b}\right) \geq \frac{6,503\ lb}{5\ 1/4" \times l_b}$

$625\ psi(l_b + 0.375) \geq \frac{6,503\ lb}{5\ 1/4"}$

$l_b = 1.61"$ min

UFB2 RXN:
$R_D = 2.277^k$
$R_L = 1.875^k$

DB1 RXN:
$R_D = 0.446^k$
$R_L = 0.532^k$
$R_S = 0.221^k$



RP2 LOADS:
$R_D = 1.138^k$
$R_S = 1.989^k$

* eccentricity accounted for in enercalc check for UFP5

R_a (TOTAL) $= 13.286^k$
$(R_D + 0.75R_L + 0.75R_S)$
$0.05(13,286\ lb) = 664.3\ lb$

↳ CONTINUED

(3) beam to post conn. cont...

positive connection requirement = 0.05(13,286 lb) = 664.3 lb (ASD)

∴ (4) 1/4" Ø x 3" SDS SCREWS MIN PER BEAM

Z' = 1.6(300 lb) = 480 lb x 4 screws = 1,920 lb > 664.3 lb (ASD)
∴ OK! @ 34.6% DCR

CHECK WELDS:

$R_u = 1.2(R_D) + 1.6(R_L) = 5.732^k$

↑ @ UFBZ (max)

$\phi r_n = 1.392\ k/in\ (4)(\ell_{min}) \geq 5.732^k$

$\ell_{min} = 1.029"$ min. weld length

CHECK SPANDREL BEAM FOR O.O.P. WIND LOADS:

UPPER FLOOR:

EAST ELEV.:

span = 10'-6"

trib = (2'-10 1/2" + 7'-4")/2 = 5.104'

trib. area = 53.592 sf

P_W = -23.9 psf @ zone 4
= -27.4 psf @ zone 5
= 21.80 psf

a = 0.4h = 0.4(34.833') = 13.933'
= 0.10b = 0.10(66.25') = 6.625' ← governs!
= 0.4b = 0.04(66.25') = 2.65'
= 3 ft

NORTH ELEV.:

span = 12'-10 1/2"

trib = 5.104' (same as east elev.)

trib area = 65.714 sf

P_W = -23.6 psf @ zone 4
= -26.8 psf @ zone 5
= 21.5 psf

∴ USE HSS4x4x5/16 x 11' +
& USE HSS 3 1/2 x 3 1/2 x 1/4 x 11' MAX
(DEFLECTION CONTROLLED, LIMIT TO 1/2" MAX)

MAX END RXN

$R_{W,x} = 1.011^k;\ 0.844^k$

$R_{d,y}$ = 14.830 plf x 14 1/2 = 0.104k

MAIN FLOOR:

EAST ELEV.:

span = 8'-10"

trib = (4' + 7'-4 1/2")/2 = 5.6875'

trib. area = 50.240 sf

P_W = -24.0 psf @ zone 4
= -27.7 psf @ zone 5
= 21.9 psf

CONTINUED

NORTH ELEV.:

span = 14'-0"

trib = 5.6875'

trib area =

P_W = -23.8 psf @ zone 4
= -26.2 psf @ zone 5
= 21.2 psf

*governs end rxn

spandrel beam end reactions cont...

R_x (ASD) = 0.6 (1.011k) = 0.6066k
R_y (ASD) = 0.6 (0.104k) = 0.0624k

R_y (ASD) = 0.104k (no wind)

vector add $R_x + R_y$:

$R' = \sqrt{R_x^2 + R_y^2}$ = 0.610k (ASD)

$Z' = 1.6(900\,lb)(0.75''/1'')$ ← C_a

= 360 lb/screw for 1/4"Ø SDS SCREWS

∴ (2) screws min, @ 42.4% DCR w/ (4) SDS SCREWS

→ ADD O.O.P. WIND LOADS TO GRAVITY COLUMNS

MAIN TO UPR FLR POST
- UFP4 (MF NORTH) ✓
- UFP5 (MF NORTH & EAST) ✓
- UFP6 (SW1-B1 + MF EAST) ✓

UPR FLR TO ROOF POST
- RP1 (SW-2A + UF NORTH) → RP2 governs!
- RP2 (SW-B2 + UF NORTH ELEV SPANDREL) → $R_{w,x}$ = 0.856k ; 0.706k (UNF.) ✓, $R_{E,y}$ = 7.146k (UNF.)
- RP3 (SW-B2 + UF EAST ELEV SPANDREL) → RP4 governs!
- RP4 (SW-B1 + UF EAST ELEV SPANDREL) → $R_{w,x}$ = 0.721k ; 0.584k (UNF.) ✓, $R_{E,y}$ = 8.436k (UNF.)

[SEE ATTACHED ENERCALC]

MST Strap to Patio Foundation (SW-3A)

SIMPSON Strong-Tie®

Anchor Designer™ Software
Version 3.0.7947.1

Company:		Date:	10/31/2023
Engineer:		Page:	1/5
Project:			
Address:			
Phone:			
E-mail:			

1.Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Concrete screw
Material: Carbon Steel
Diameter (inch): 0.500
Nominal Embedment depth (inch): 4.000
Effective Embedment depth, h_{ef} (inch): 2.990
Code report: ICC-ES ESR-2713
Anchor category: 1
Anchor ductility: No
h_{min} (inch): 6.25
c_{ac} (inch): 4.50
C_{min} (inch): 1.75
S_{min} (inch): 3.00

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 10.00
State: Cracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: B tension, B shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Ignore 6do requirement: Not applicable
Build-up grout pad: No

Base Plate
Length x Width x Thickness (inch): 3.00 x 20.00 x 0.25

Recommended Anchor
Anchor Name: Titen HD® - 1/2"Ø Titen HD, hnom:4" (102mm)
Code Report: ICC-ES ESR-2713

MST Strap to Patio Foundation (SW-3A)

SIMPSON Strong-Tie® Anchor Designer™ Software
Version 3.0.7947.1

Company:		Date:	10/31/2023
Engineer:		Page:	2/5
Project:			
Address:			
Phone:			
E-mail:			

Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: No
Anchors subjected to sustained tension: Not applic
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: N

Strength level loads:

N_{ua} [lb]: 0
V_{uax} [lb]: 0
V_{uay} [lb]: 5250
M_{ux} [ft-lb]: 0
M_{uy} [ft-lb]: 0
M_{uz} [ft-lb]: 0

<Figure 1>

M1 INSTALLED INTO HF 2X BUNDLED STUDS

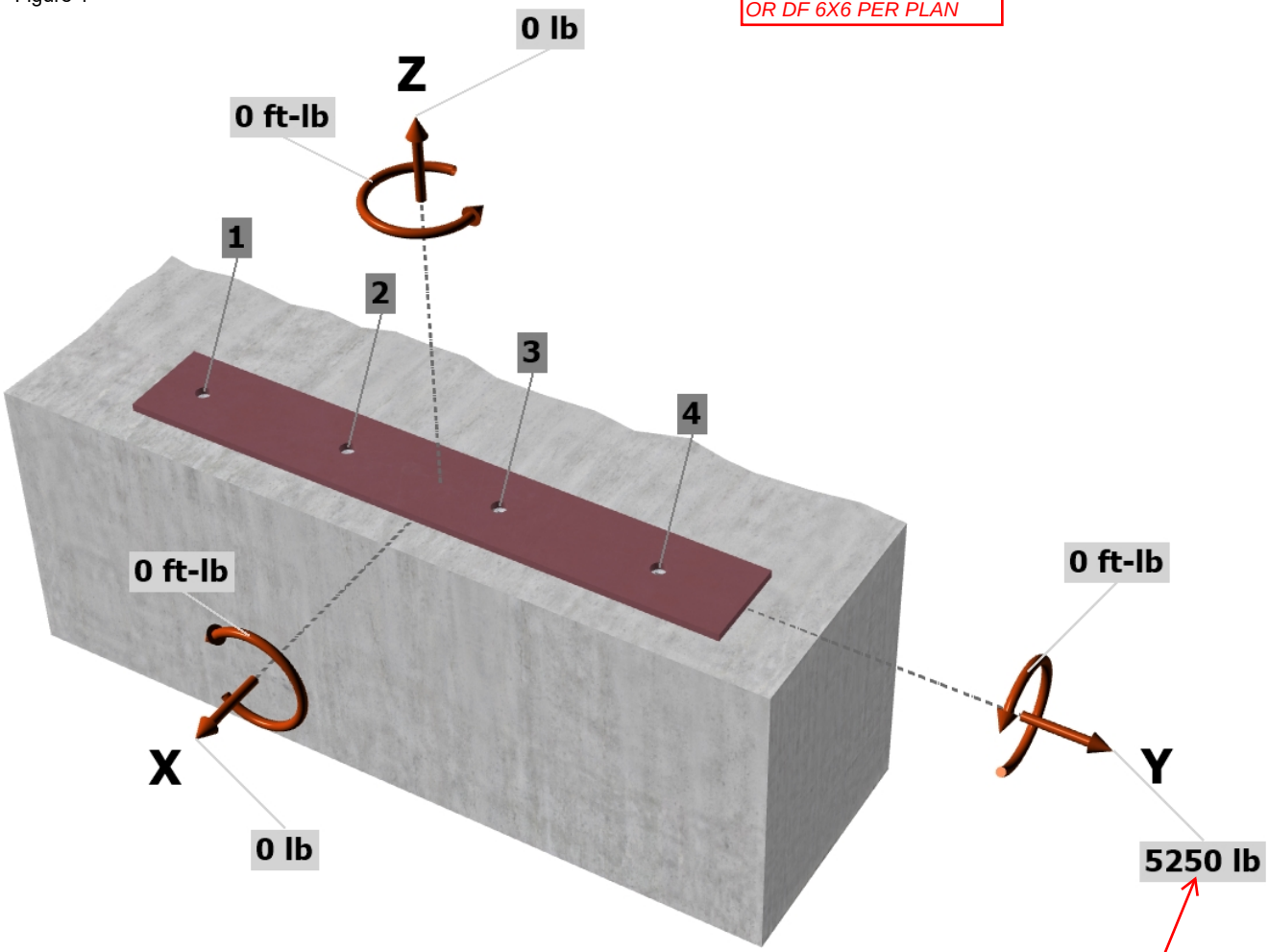
SIMPSON STRONG TIE TABLE FOR MST STRAP W/ BOLTS

Model No.	Ga.	Dimensions (in.) W	Dimensions (in.) L	Fasteners (Total) Nails (in.)	Fasteners (Total) Bolts Qty.	Fasteners (Total) Bolts Dia.	Allowable Tension Loads (DF/SP) Nails (160)	Allowable Tension Loads (DF/SP) Bolts (160)	Allowable Tension Loads (SPF/HF) Nails (160)	Allowable Tension Loads (SPF/HF) Bolts (160)
MST27		2 1/16	27	(30) 0.162 x 2 1/2	4	1/2	3,700	2,165	3,210	2,000
MST37	12	2 1/16	37 1/2	(42) 0.162 x 2 1/2	6	1/2	5,070	3,030	4,495	2,800
MST48		2 1/16	48	(50) 0.162 x 2 1/2	8	1/2	5,310	3,675	5,190	3,395
MST60	10	2 1/16	60	(68) 0.162 x 2 1/2	10	1/2	6,730	4,490	6,475	4,150
MST72		2 1/16	72	(68) 0.162 x 2 1/2	10	1/2	6,730	4,490	6,475	4,150

STRAP CALLED OUT PER HD SCHED (USED FOR LONGER STRAP END LENGTH TO BUNDLED WOOD STUD)

M2 (@ SW-3A)

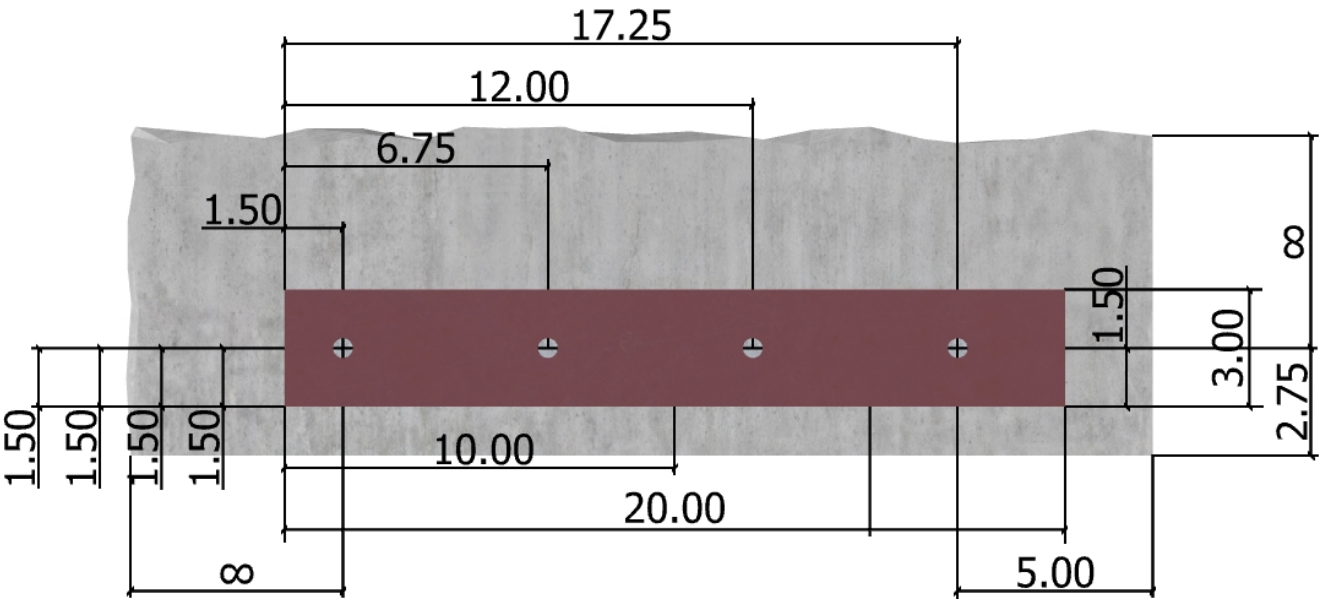
INSTALLLED INTO DF 4X6 OR DF 6X6 PER PLAN



M2 (@ SW-3A)

3,675/0.7 = 5,250 LB (ULT)

<Figure 2>



MST Strap to Patio Foundation (SW-3A)

SIMPSON Strong-Tie® Anchor Designer™ Software
Version 3.0.7947.1

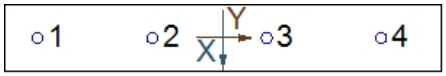
Company:		Date:	10/31/2023
Engineer:		Page:	4/5
Project:			
Address:			
Phone:			
E-mail:			

3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	0.0	0.0	1312.5	1312.5
2	0.0	0.0	1312.5	1312.5
3	0.0	0.0	1312.5	1312.5
4	0.0	0.0	1312.5	1312.5
Sum	0.0	0.0	5250.0	5250.0

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 0
Resultant compression force (lb): 0
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00
Eccentricity of resultant shear forces in x-axis, e'_{Vx} (inch): 0.00
Eccentricity of resultant shear forces in y-axis, e'_{Vy} (inch): 0.00

<Figure 3>



8. Steel Strength of Anchor in Shear (Sec. 17.5.1)

V_{sa} (lb)	ϕ_{grout}	ϕ	$\phi_{grout}\phi V_{sa}$ (lb)
7455	1.0	0.60	4473

9. Concrete Breakout Strength of Anchor in Shear (Sec. 17.5.2)

Shear perpendicular to edge in y-direction:

$V_{by} = \min|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{by} (lb)
2.99	0.500	1.00	2500	20.75	33452

$\phi V_{cby} = \phi\,(A_{Vc} / A_{Vco})\,\Psi_{ed,V}\,\Psi_{c,V}\,\Psi_{h,V}V_{by}$ (Sec. 17.3.1 & Eq. 17.5.2.1a)

A_{Vc} (in^2)	A_{Vco} (in^2)	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{by} (lb)	ϕ	ϕV_{cby} (lb)
338.75	1937.53	0.727	1.000	1.764	33452	0.70	5247

Shear parallel to edge in x-direction:

$V_{by} = \min|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{by} (lb)
2.99	0.500	1.00	2500	2.75	1614

$\phi V_{cbgx} = \phi\ (2)(A_{Vc} / A_{Vco})\,\Psi_{ec,V}\,\Psi_{ed,V}\,\Psi_{c,V}\,\Psi_{h,V}V_{by}$ (Sec. 17.3.1, 17.5.2.1(c) & Eq. 17.5.2.1b)

A_{Vc} (in^2)	A_{Vco} (in^2)	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{by} (lb)	ϕ	ϕV_{cbgx} (lb)
99.00	34.03	1.000	1.000	1.000	1.000	1614	0.70	6573

10. Concrete Pryout Strength of Anchor in Shear (Sec. 17.5.3)

$\phi V_{cpg} = \phi k_{cp} N_{cbg} = \phi k_{cp} (A_{Nc} / A_{Nco}) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$ (Sec. 17.3.1 & Eq. 17.5.3.1b)

k_{cp}	A_{Nc} (in^2)	A_{Nco} (in^2)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕV_{cpg} (lb)
2.0	178.85	80.46	1.000	0.884	1.000	1.000	4395	0.70	12089

11. Results

11. Interaction of Tensile and Shear Forces (Sec. D.7)?

Shear	Factored Load, V_{ua} (lb)	Design Strength, øV_n (lb)	Ratio	Status
Steel	1313	4473	0.29	Pass
T Concrete breakout y+	**5250**	**5247**	**1.00**	**Pass (Governs)**
|| Concrete breakout x+	**5250**	**6573**	**0.80**	**Pass (Governs)**
Pryout	5250	12089	0.43	Pass

1/2"Ø Titen HD, hnom:4" (102mm) meets the selected design criteria.

12. Warnings

- Designer must exercise own judgement to determine if this design is suitable.

- Refer to manufacturer's product literature for hole cleaning and installation instructions.

MST Strap to Typ Residence Foundation

SIMPSON Strong-Tie®

Anchor Designer™ Software
Version 3.0.7947.1

Company:		Date:	10/31/2023
Engineer:		Page:	1/5
Project:			
Address:			
Phone:			
E-mail:			

1.Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Concrete screw
Material: Carbon Steel
Diameter (inch): 0.500
Nominal Embedment depth (inch): 4.000
Effective Embedment depth, h_{ef} (inch): 2.990
Code report: ICC-ES ESR-2713
Anchor category: 1
Anchor ductility: No
h_{min} (inch): 6.25
c_{ac} (inch): 4.50
C_{min} (inch): 1.75
S_{min} (inch): 3.00

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 8.00
State: Cracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: B tension, B shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Ignore 6do requirement: Not applicable
Build-up grout pad: No

Base Plate
Length x Width x Thickness (inch): 3.00 x 16.00 x 0.25

Recommended Anchor
Anchor Name: Titen HD® - 1/2"Ø Titen HD, hnom:4" (102mm)
Code Report: ICC-ES ESR-2713

MST Strap to Typ Residence Foundation

SIMPSON Strong-Tie®

Anchor Designer™ Software
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Company:		Date:	10/31/2023
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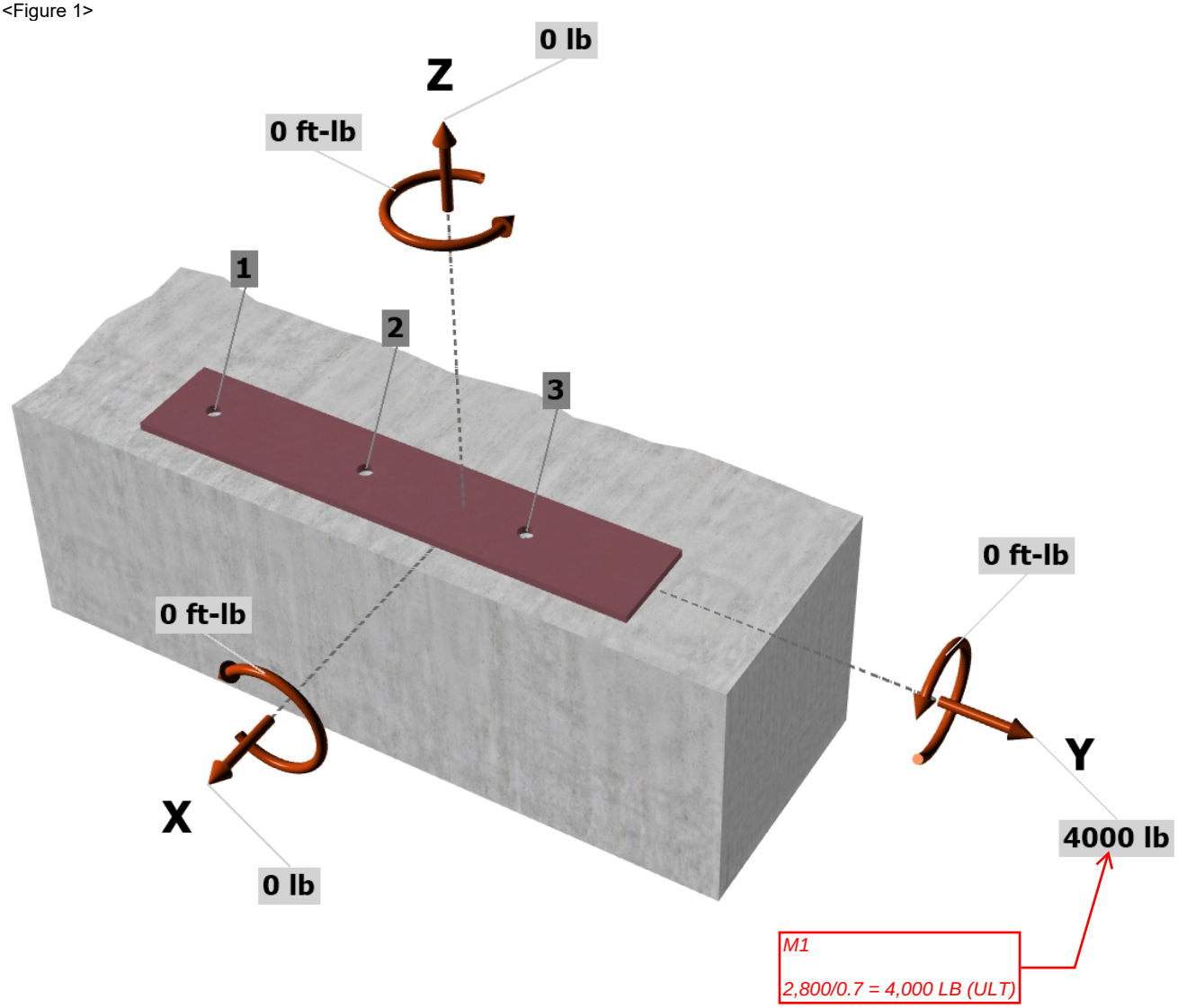
Project:			
Address:			
Phone:			
E-mail:			

Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: No
Anchors subjected to sustained tension: Not applicable
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: No

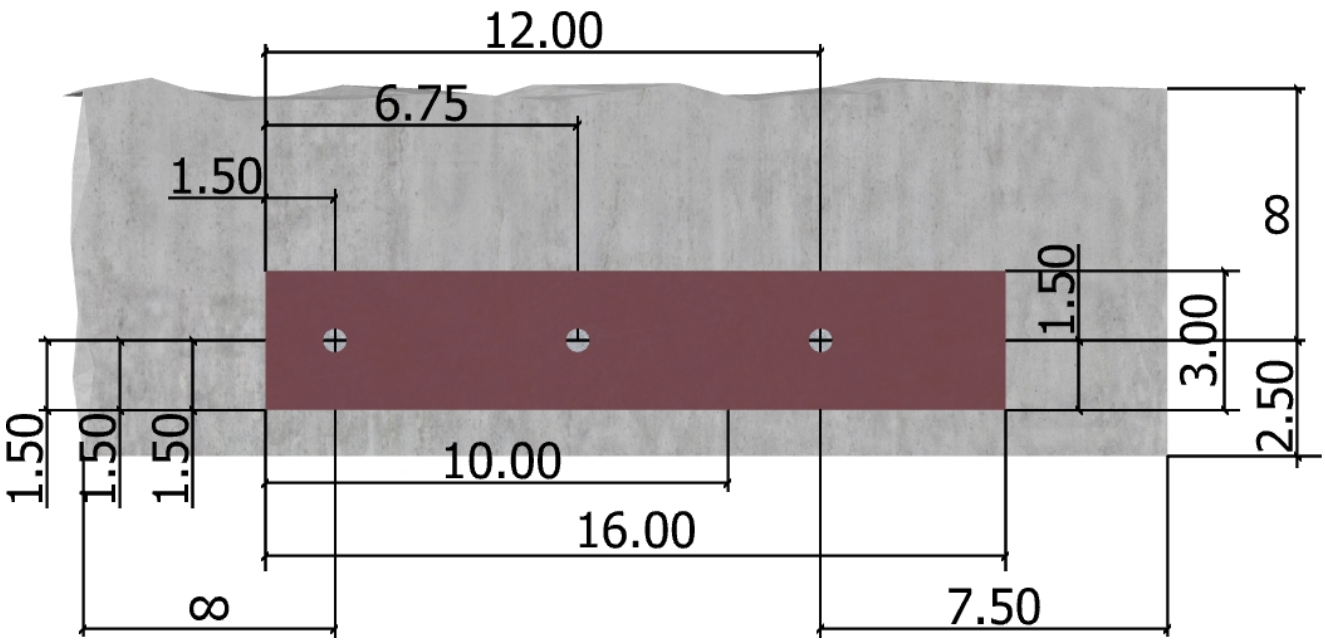
Strength level loads:

N_{ua} [lb]: 0
V_{uax} [lb]: 0
V_{uay} [lb]: 4000
M_{ux} [ft-lb]: 0
M_{uy} [ft-lb]: 0
M_{uz} [ft-lb]: 0

<Figure 1>



<Figure 2>



MST Strap to Typ Residence Foundation

SIMPSON Strong-Tie®

Anchor Designer™ Software
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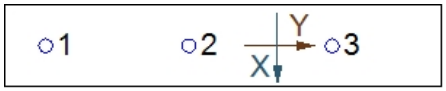
3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	0.0	0.0	1333.3	1333.3
2	0.0	0.0	1333.3	1333.3
3	0.0	0.0	1333.3	1333.3
Sum	0.0	0.0	4000.0	4000.0

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 0
Resultant compression force (lb): 0
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00
Eccentricity of resultant shear forces in x-axis, e'_{Vx} (inch): 0.00
Eccentricity of resultant shear forces in y-axis, e'_{Vy} (inch): 0.00

<Figure 3>



8. Steel Strength of Anchor in Shear (Sec. 17.5.1)

V_{sa} (lb)	ϕ_{grout}	ϕ	$\phi_{grout}\phi V_{sa}$ (lb)
7455	1.0	0.60	4473

9. Concrete Breakout Strength of Anchor in Shear (Sec. 17.5.2)

Shear perpendicular to edge in y-direction:

$V_{by} = \min|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{by} (lb)
2.99	0.500	1.00	2500	18.00	27027

$\phi V_{cby} = \phi\,(A_{Vc} / A_{Vco})\,\Psi_{ed,V}\,\Psi_{c,V}\,\Psi_{h,V}V_{by}$ (Sec. 17.3.1 & Eq. 17.5.2.1a)

A_{Vc} (in²)	A_{Vco} (in²)	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{by} (lb)	ϕ	ϕV_{cby} (lb)
236.00	1458.00	0.728	1.000	1.837	27027	0.70	4094

Shear parallel to edge in x-direction:

$V_{by} = \min|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{by} (lb)
2.99	0.500	1.00	2500	2.50	1399

$\phi V_{cbgx} = \phi\,(2)(A_{Vc} / A_{Vco})\,\Psi_{ec,V}\,\Psi_{ed,V}\,\Psi_{c,V}\,\Psi_{h,V}V_{by}$ (Sec. 17.3.1, 17.5.2.1(c) & Eq. 17.5.2.1b)

A_{Vc} (in²)	A_{Vco} (in²)	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{by} (lb)	ϕ	ϕV_{cbgx} (lb)
67.50	28.13	1.000	1.000	1.000	1.000	1399	0.70	4700

10. Concrete Pryout Strength of Anchor in Shear (Sec. 17.5.3)

$\phi V_{cpg} = \phi k_{cp} N_{cbg} = \phi k_{cp} (A_{Nc} / A_{Nco}) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$ (Sec. 17.3.1 & Eq. 17.5.3.1b)

k_{cp}	A_{Nc} (in^2)	A_{Nco} (in^2)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕV_{cpg} (lb)
2.0	136.00	80.46	1.000	0.867	1.000	1.000	4395	0.70	9018

11. Results

11. Interaction of Tensile and Shear Forces (Sec. D.7)?

Shear	Factored Load, V_{ua} (lb)	Design Strength, øV_n (lb)	Ratio	Status
Steel	1333	4473	0.30	Pass
T Concrete breakout y+	**4000**	**4094**	**0.98**	**Pass (Governs)**
|| Concrete breakout x+	**4000**	**4700**	**0.85**	**Pass (Governs)**
Pryout	4000	9018	0.44	Pass

1/2"Ø Titen HD, hnom:4" (102mm) meets the selected design criteria.

12. Warnings

- Designer must exercise own judgement to determine if this design is suitable.

- Refer to manufacturer's product literature for hole cleaning and installation instructions.

Double MST Strap to Patio Foundation (SW-3A)

SIMPSON Strong-Tie®

Anchor Designer™ Software
Version 3.0.7947.1

Company:		Date:	10/31/2023
Engineer:		Page:	1/5
Project:			
Address:			
Phone:			
E-mail:			

1.Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Concrete screw
Material: Carbon Steel
Diameter (inch): 0.500
Nominal Embedment depth (inch): 4.000
Effective Embedment depth, h_{ef} (inch): 2.990
Code report: ICC-ES ESR-2713
Anchor category: 1
Anchor ductility: No
h_{min} (inch): 6.25
c_{ac} (inch): 4.50
C_{min} (inch): 1.75
S_{min} (inch): 3.00

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 10.00
State: Cracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: B tension, B shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Ignore 6do requirement: Not applicable
Build-up grout pad: No

Base Plate
Length x Width x Thickness (inch): 7.50 x 20.00 x 0.25

Recommended Anchor
Anchor Name: Titen HD® - 1/2"Ø Titen HD, hnom:4" (102mm)
Code Report: ICC-ES ESR-2713

Double MST Strap to Patio Foundation (SW-3A)

SIMPSON Strong-Tie®

Anchor Designer™ Software
Version 3.0.7947.1

Company:		Date:	10/31/2023
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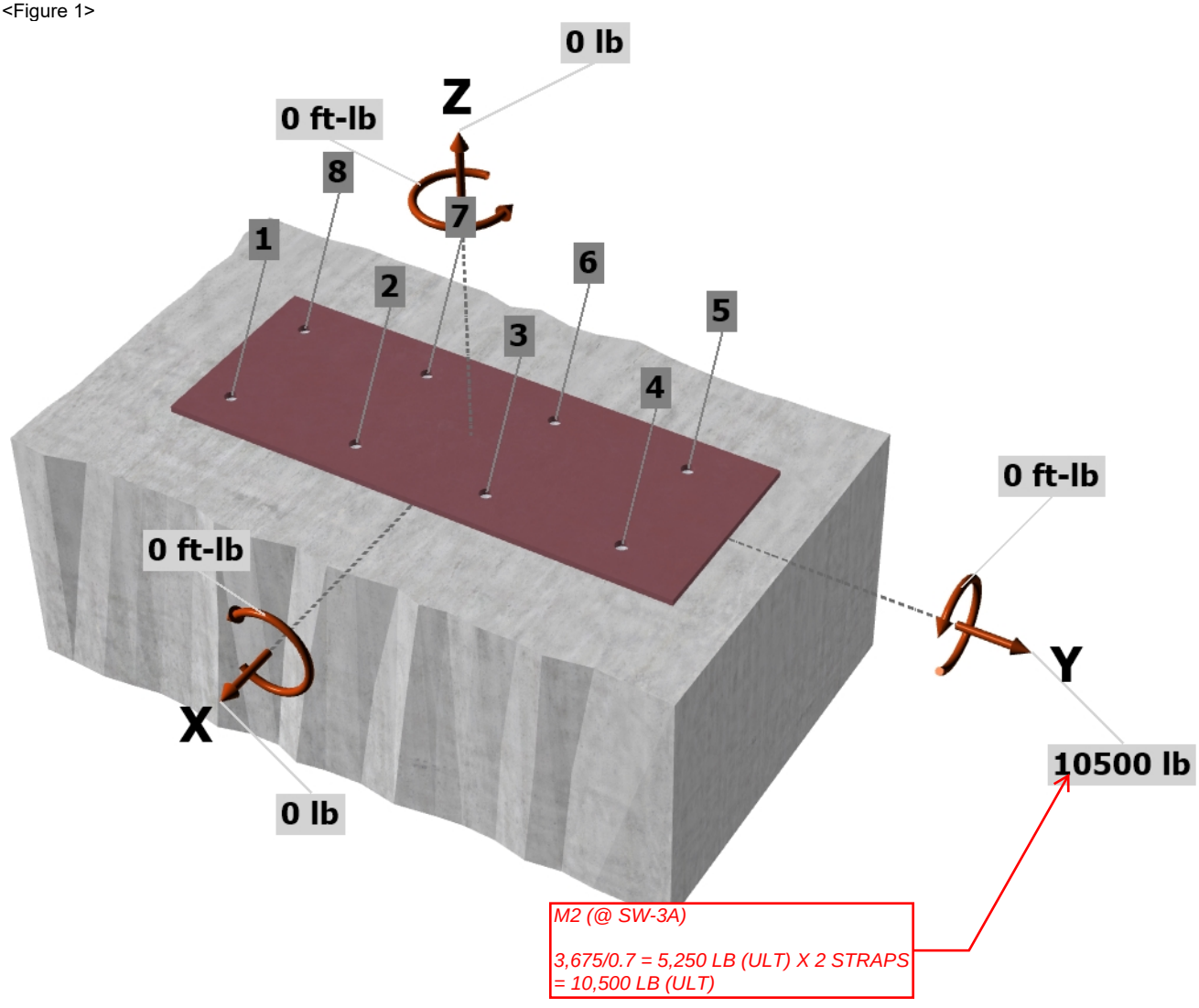
Project:			
Address:			
Phone:			
E-mail:			

Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: No
Anchors subjected to sustained tension: Not applicable
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: No

Strength level loads:

N_{ua} [lb]: 0
V_{uax} [lb]: 0
V_{uay} [lb]: 10500
M_{ux} [ft-lb]: 0
M_{uy} [ft-lb]: 0
M_{uz} [ft-lb]: 0

<Figure 1>



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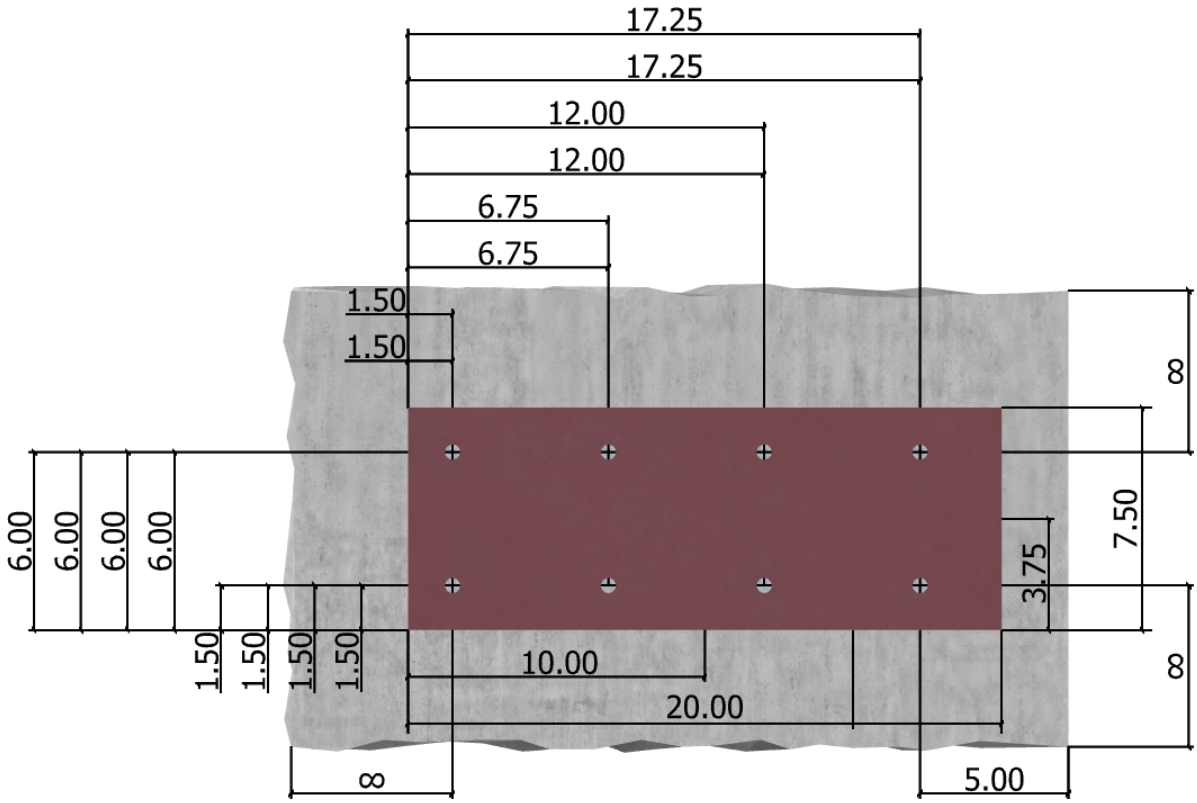
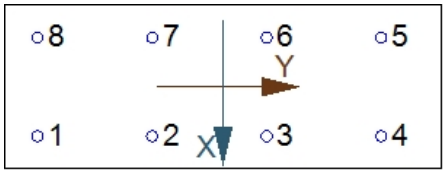

17.25
17.25
12.00
12.00
6.75
6.75
1.50
1.50
8
6.00
6.00
6.00
6.00
7.50
3.75
1.50
1.50
1.50
1.50
10.00
20.00
8
5.00

3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	0.0	0.0	1312.5	1312.5
2	0.0	0.0	1312.5	1312.5
3	0.0	0.0	1312.5	1312.5
4	0.0	0.0	1312.5	1312.5
5	0.0	0.0	1312.5	1312.5
6	0.0	0.0	1312.5	1312.5
7	0.0	0.0	1312.5	1312.5
8	0.0	0.0	1312.5	1312.5
Sum	0.0	0.0	10500.0	10500.0

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 0
Resultant compression force (lb): 0
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00
Eccentricity of resultant shear forces in x-axis, e'_{Vx} (inch): 0.00
Eccentricity of resultant shear forces in y-axis, e'_{Vy} (inch): 0.00

<Figure 3>



8. Steel Strength of Anchor in Shear (Sec. 17.5.1)

V_{sa} (lb)	ϕ_{grout}	ϕ	$\phi_{grout}\phi V_{sa}$ (lb)
7455	1.0	0.60	4473

9. Concrete Breakout Strength of Anchor in Shear (Sec. 17.5.2)

Shear perpendicular to edge in y-direction:

$V_{by} = \min|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{by} (lb)
2.99	0.500	1.00	2500	20.75	33452

$\phi V_{cbgy} = \phi\,(A_{Vc} / A_{Vco})\,\Psi_{ec,V}\,\Psi_{ed,V}\,\Psi_{c,V}\,\Psi_{h,V}\,V_{by}$ (Sec. 17.3.1 & Eq. 17.5.2.1b)

A_{Vc} (in^2)	A_{Vco} (in^2)	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{by} (lb)	ϕ	ϕV_{cbgy} (lb)
667.50	1937.53	1.000	1.000	1.000	1.764	33452	0.70	14232

10. Concrete Pryout Strength of Anchor in Shear (Sec. 17.5.3)

$\phi V_{cpg} = \phi k_{cp} N_{cbg} = \phi k_{cp}(A_{Nc} / A_{Nco})\,\Psi_{ec,N}\,\Psi_{ed,N}\,\Psi_{c,N}\,\Psi_{cp,N} N_b$ (Sec. 17.3.1 & Eq. 17.5.3.1b)

k_{cp}	A_{Nc} (in^2)	A_{Nco} (in^2)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕV_{cpg} (lb)
2.0	332.98	80.46	1.000	1.000	1.000	1.000	4395	0.70	25462

11. Results

11. Interaction of Tensile and Shear Forces (Sec. D.7)?

Shear	Factored Load, V_{ua} (lb)	Design Strength, øV_n (lb)	Ratio	Status
Steel	1313	4473	0.29	Pass
T Concrete breakout y+	**10500**	**14232**	**0.74**	**Pass (Governs)**
Pryout	10500	25462	0.41	Pass

1/2"Ø Titen HD, hnom:4" (102mm) meets the selected design criteria.

12. Warnings

- Designer must exercise own judgement to determine if this design is suitable.

- Refer to manufacturer's product literature for hole cleaning and installation instructions.

2SW-2 Retrofit Sill Pl Anchor to Patio Foundation

SIMPSON Strong-Tie®

Anchor Designer™ Software
Version 3.0.7947.1

Company:		Date:	10/31/2023
Engineer:		Page:	1/5
Project:			
Address:			
Phone:			
E-mail:			

1.Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Concrete screw
Material: Carbon Steel
Diameter (inch): 0.625
Nominal Embedment depth (inch): 4.500
Effective Embedment depth, h_{ef} (inch): 3.390
Code report: ICC-ES ESR-2713
Anchor category: 1
Anchor ductility: No
h_{min} (inch): 6.83
c_{ac} (inch): 5.13
C_{min} (inch): 1.75
S_{min} (inch): 3.00

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 16.00
State: Cracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: B tension, B shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Ignore 6do requirement: Not applicable
Build-up grout pad: No

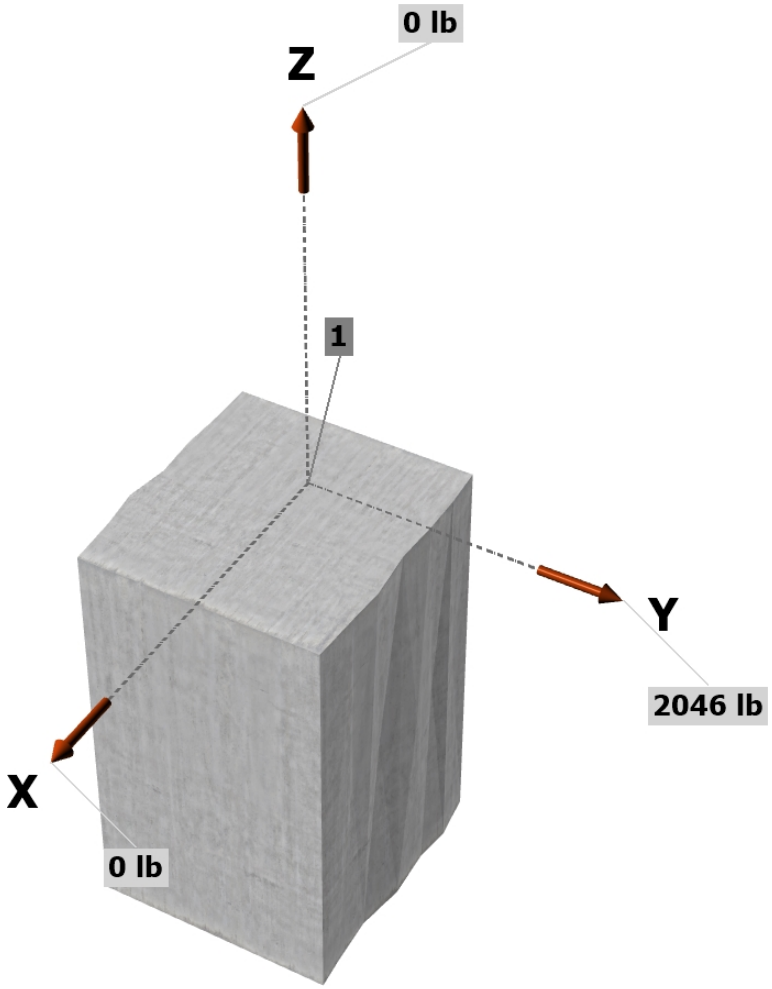
Recommended Anchor
Anchor Name: Titen HD® - 5/8"Ø Titen HD, hnom:4.5" (114mm)
Code Report: ICC-ES ESR-2713

Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: No
Anchors subjected to sustained tension: Not applicable
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: No

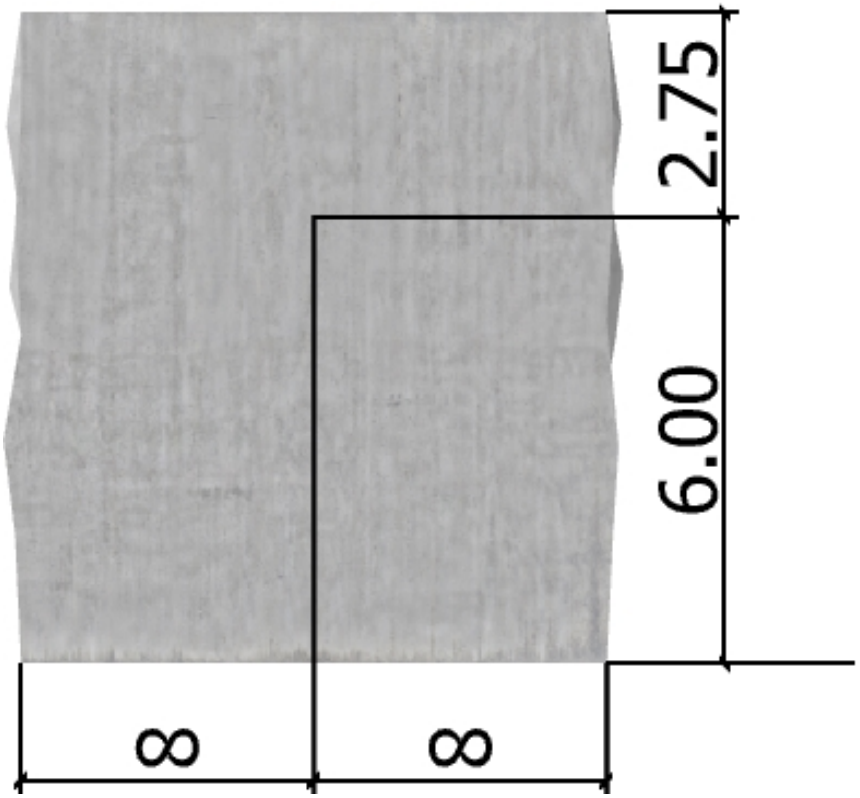
Strength level loads:

N_{ua} [lb]: 0
V_{uax} [lb]: 0
V_{uay} [lb]: 2046

<Figure 1>



<Figure 2>



2SW-2 Retrofit Sill Pl Anchor to Patio Foundation

SIMPSON Strong-Tie® Anchor Designer™ Software
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E-mail:			

3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	0.0	0.0	2046.0	2046.0
Sum	0.0	0.0	2046.0	2046.0

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 0
Resultant compression force (lb): 0
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00
Eccentricity of resultant shear forces in x-axis, e'_{Vx} (inch): 0.00
Eccentricity of resultant shear forces in y-axis, e'_{Vy} (inch): 0.00

8. Steel Strength of Anchor in Shear (Sec. 17.5.1)

V_{sa} (lb)	ϕ_{grout}	ϕ	$\phi_{grout}\phi V_{sa}$ (lb)
10000	1.0	0.60	6000

9. Concrete Breakout Strength of Anchor in Shear (Sec. 17.5.2)

Shear parallel to edge in x-direction:

$V_{by} = \min|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{by} (lb)
3.39	0.625	1.00	2500	2.75	1770

$\phi V_{cbx} = \phi\ (2)(A_{Vc} / A_{Vco})\,\Psi_{ed,V}\,\Psi_{c,V}\,\Psi_{h,V}\,V_{by}$ (Sec. 17.3.1, 17.5.2.1(c) & Eq. 17.5.2.1a)

A_{Vc} (in^2)	A_{Vco} (in^2)	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{by} (lb)	ϕ	ϕV_{cbx} (lb)
34.03	34.03	1.000	1.000	1.000	1770	0.70	2477

10. Concrete Pryout Strength of Anchor in Shear (Sec. 17.5.3)

$\phi V_{cp} = \phi k_{cp} N_{cb} = \phi k_{cp}(A_{Nc} / A_{Nco})\,\Psi_{ed,N}\,\Psi_{c,N}\,\Psi_{cp,N} N_b$ (Sec. 17.3.1 & Eq. 17.5.3.1a)

k_{cp}	A_{Nc} (in^2)	A_{Nco} (in^2)	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕV_{cp} (lb)
2.0	79.68	103.43	0.862	1.000	1.000	5305	0.70	4934

11. Results

11. Interaction of Tensile and Shear Forces (Sec. D.7)?

Shear	Factored Load, V_{ua} (lb)	Design Strength, ϕV_n (lb)	Ratio	Status

Steel	2046	6000	0.34	Pass
|| Concrete breakout x-	**2046**	**2477**	**0.83**	**Pass (Governs)**
Pryout	2046	4934	0.41	Pass

5/8"Ø Titen HD, hnom:4.5" (114mm) meets the selected design criteria.

12. Warnings

- Designer must exercise own judgement to determine if this design is suitable.

- Refer to manufacturer's product literature for hole cleaning and installation instructions.

2SW-2 Retrofit Sill Pl Anchor to Typ Residence Foundation

SIMPSON Strong-Tie®

Anchor Designer™ Software
Version 3.0.7947.1

Company:		Date:	10/31/2023
Engineer:		Page:	1/5
Project:			
Address:			
Phone:			
E-mail:			

1.Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Concrete screw
Material: Carbon Steel
Diameter (inch): 0.625
Nominal Embedment depth (inch): 4.500
Effective Embedment depth, h_{ef} (inch): 3.390
Code report: ICC-ES ESR-2713
Anchor category: 1
Anchor ductility: No
h_{min} (inch): 6.83
c_{ac} (inch): 5.13
C_{min} (inch): 1.75
S_{min} (inch): 3.00

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 16.00
State: Cracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: B tension, B shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Ignore 6do requirement: Not applicable
Build-up grout pad: No

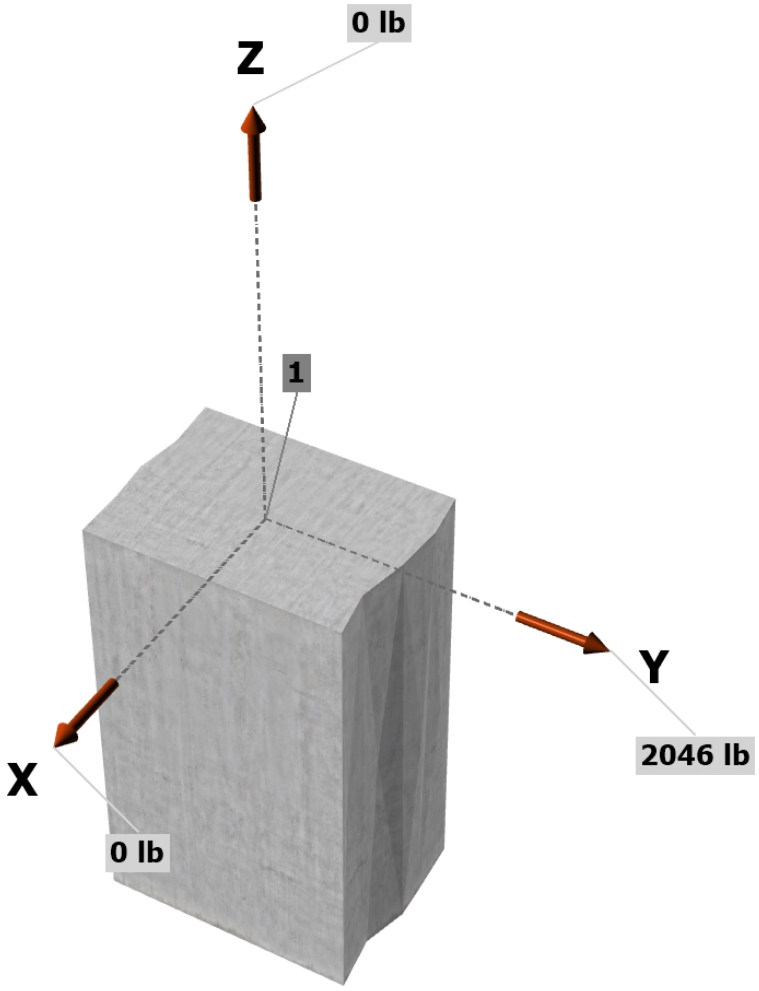
Recommended Anchor
Anchor Name: Titen HD® - 5/8"Ø Titen HD, hnom:4.5" (114mm)
Code Report: ICC-ES ESR-2713

Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: No
Anchors subjected to sustained tension: Not applicable
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: No

Strength level loads:

N_{ua} [lb]: 0
V_{uax} [lb]: 0
V_{uay} [lb]: 2046

<Figure 1>



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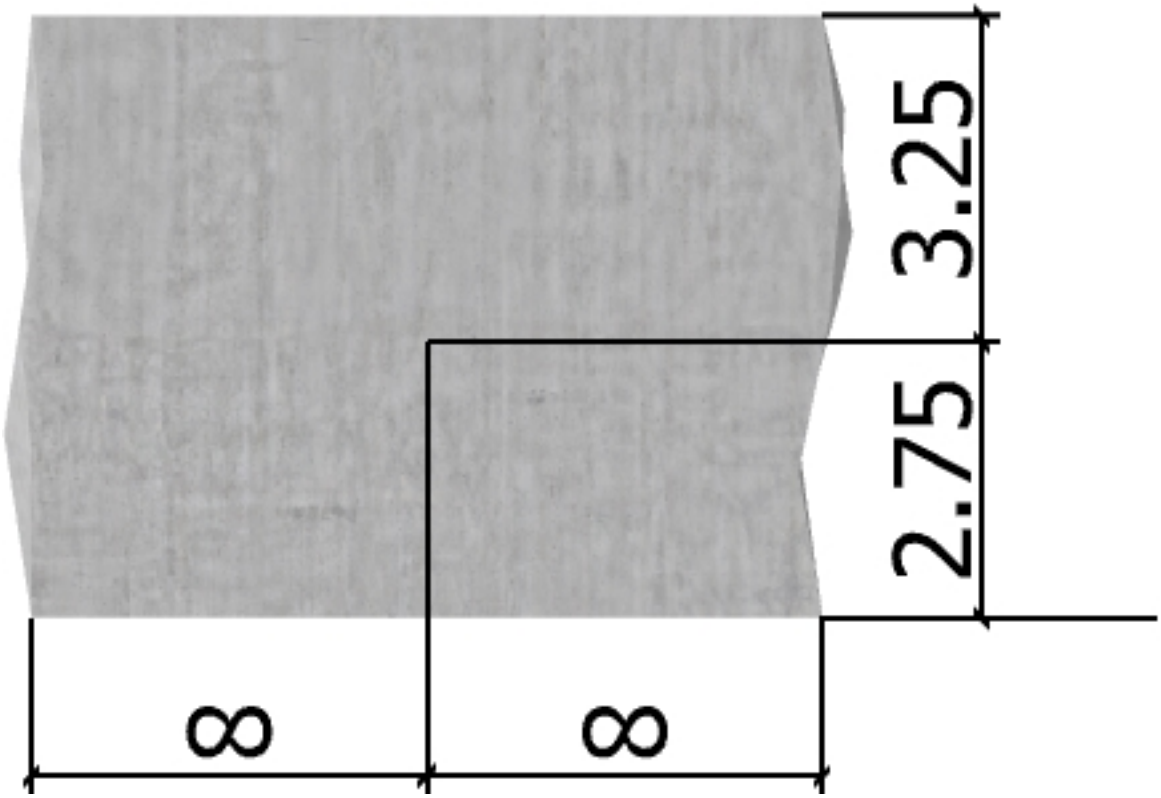

2SW-2 Retrofit Sill Pl Anchor to Typ Residence Foundation

SIMPSON Strong-Tie® Anchor Designer™ Software
Version 3.0.7947.1

Company:		Date:	10/31/2023
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3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	0.0	0.0	2046.0	2046.0
Sum	0.0	0.0	2046.0	2046.0

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 0
Resultant compression force (lb): 0
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00
Eccentricity of resultant shear forces in x-axis, e'_{Vx} (inch): 0.00
Eccentricity of resultant shear forces in y-axis, e'_{Vy} (inch): 0.00

8. Steel Strength of Anchor in Shear (Sec. 17.5.1)

V_{sa} (lb)	ϕ_{grout}	ϕ	$\phi_{grout}\phi V_{sa}$ (lb)
10000	1.0	0.60	6000

9. Concrete Breakout Strength of Anchor in Shear (Sec. 17.5.2)

Shear parallel to edge in x-direction:

$V_{by} = \min|7(l_e / d_a)^{0.2}\sqrt{d_a}\lambda_a\sqrt{f'_c}c_{a1}^{1.5};\ 9\lambda_a\sqrt{f'_c}c_{a1}^{1.5}|$ (Eq. 17.5.2.2a & Eq. 17.5.2.2b)

l_e (in)	d_a (in)	λ_a	f'_c (psi)	c_{a1} (in)	V_{by} (lb)
3.39	0.625	1.00	2500	2.75	1770

$\phi V_{cbx} = \phi\ (2)(A_{Vc} / A_{Vco})\,\Psi_{ed,V}\,\Psi_{c,V}\,\Psi_{h,V}\,V_{by}$ (Sec. 17.3.1, 17.5.2.1(c) & Eq. 17.5.2.1a)

A_{Vc} (in^2)	A_{Vco} (in^2)	$\Psi_{ed,V}$	$\Psi_{c,V}$	$\Psi_{h,V}$	V_{by} (lb)	ϕ	ϕV_{cbx} (lb)
34.03	34.03	1.000	1.000	1.000	1770	0.70	2477

10. Concrete Pryout Strength of Anchor in Shear (Sec. 17.5.3)

$\phi V_{cp} = \phi k_{cp} N_{cb} = \phi k_{cp}(A_{Nc} / A_{Nco})\,\Psi_{ed,N}\,\Psi_{c,N}\,\Psi_{cp,N} N_b$ (Sec. 17.3.1 & Eq. 17.5.3.1a)

k_{cp}	A_{Nc} (in^2)	A_{Nco} (in^2)	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕV_{cp} (lb)
2.0	61.02	103.43	0.862	1.000	1.000	5305	0.70	3778

11. Results

11. Interaction of Tensile and Shear Forces (Sec. D.7)?

Shear	Factored Load, V_{ua} (lb)	Design Strength, øV_n (lb)	Ratio	Status

Steel	2046	6000	0.34	Pass
|| Concrete breakout x+	**2046**	**2477**	**0.83**	**Pass (Governs)**
Pryout	2046	3778	0.54	Pass

5/8"Ø Titen HD, hnom:4.5" (114mm) meets the selected design criteria.

12. Warnings

- Designer must exercise own judgement to determine if this design is suitable.

- Refer to manufacturer's product literature for hole cleaning and installation instructions.

(E) HSS Column - Max Uplift Capacity Check

SIMPSON Strong-Tie®

Anchor Designer™ Software
Version 3.0.7947.1

Company:		Date:	6/20/2023
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Address:			
Phone:			
E-mail:			

1.Project information

Customer company:
Customer contact name:
Customer e-mail:
Comment:

Project description:
Location:
Fastening description:

2. Input Data & Anchor Parameters

General
Design method:ACI 318-14
Units: Imperial units

Anchor Information:
Anchor type: Cast-in-place
Material: F1554 Grade 36
Diameter (inch): 0.625
Effective Embedment depth, h_{ef} (inch): 6.000
Anchor category: -
Anchor ductility: Yes
h_{min} (inch): 7.38
C_{min} (inch): 3.75
S_{min} (inch): 3.75

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 24.00
State: Uncracked
Compressive strength, f'_c (psi): 2500
$\Psi_{c,V}$: 1.0
Reinforcement condition: B tension, B shear
Supplemental reinforcement: No
Reinforcement provided at corners: No
Ignore concrete breakout in tension: No
Ignore concrete breakout in shear: No
Ignore 6do requirement: No
Build-up grout pad: No

Base Plate
Length x Width x Thickness (inch): 5.00 x 8.00 x 0.25
Yield stress: 36000 psi

Profile type/size: HSS4X2X1/4

Recommended Anchor
Anchor Name: J- or L-Bolt - 5/8"Ø J- or L-Bolt, F1554 Gr. 36

(E) HSS Column - Max Uplift Capacity Check

SIMPSON Strong-Tie®

Anchor Designer™ Software
Version 3.0.7947.1

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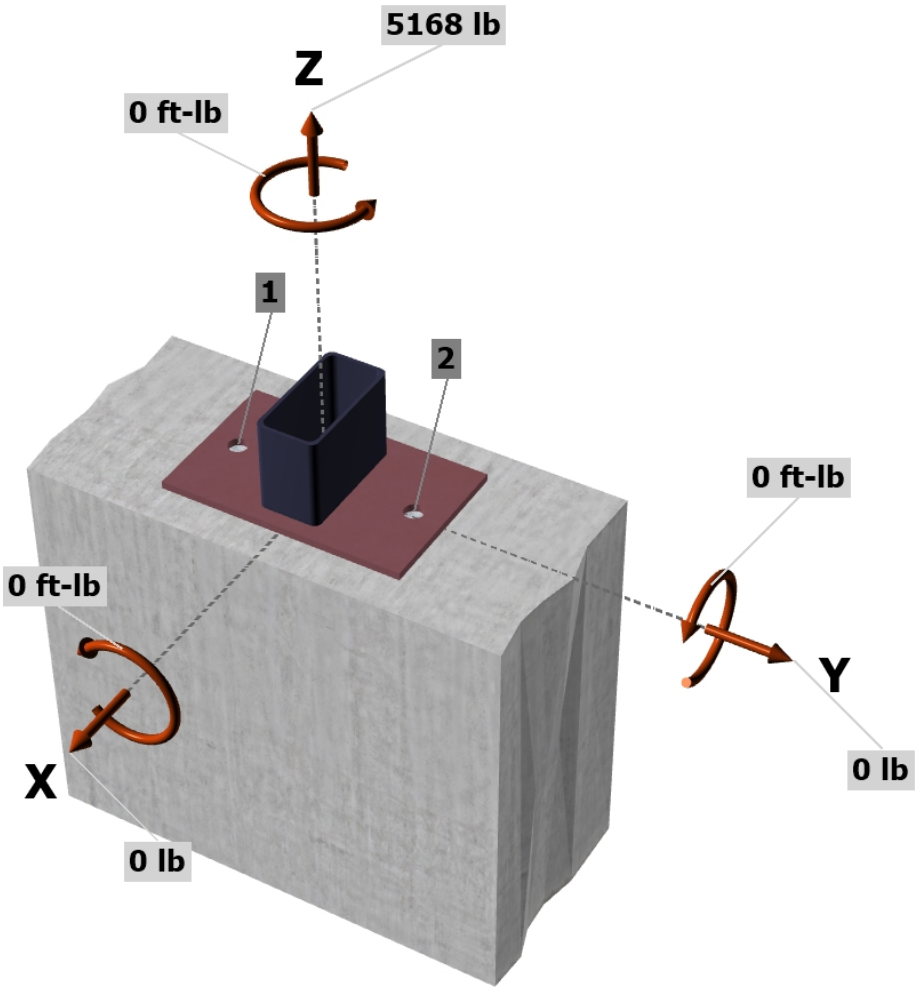
Address:			
Phone:			
E-mail:			

Load and Geometry
Load factor source: ACI 318 Section 5.3
Load combination: not set
Seismic design: No
Anchors subjected to sustained tension: Not applicable
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: No

Strength level loads:

N_{ua} [lb]: 5168
V_{uax} [lb]: 0
V_{uay} [lb]: 0
M_{ux} [ft-lb]: 0
M_{uy} [ft-lb]: 0
M_{uz} [ft-lb]: 0

<Figure 1>



(E) HSS Column - Max Uplift Capacity Check

SIMPSON Strong-Tie®

Anchor Designer™ Software
Version 3.0.7947.1

Company:		Date:	6/20/2023
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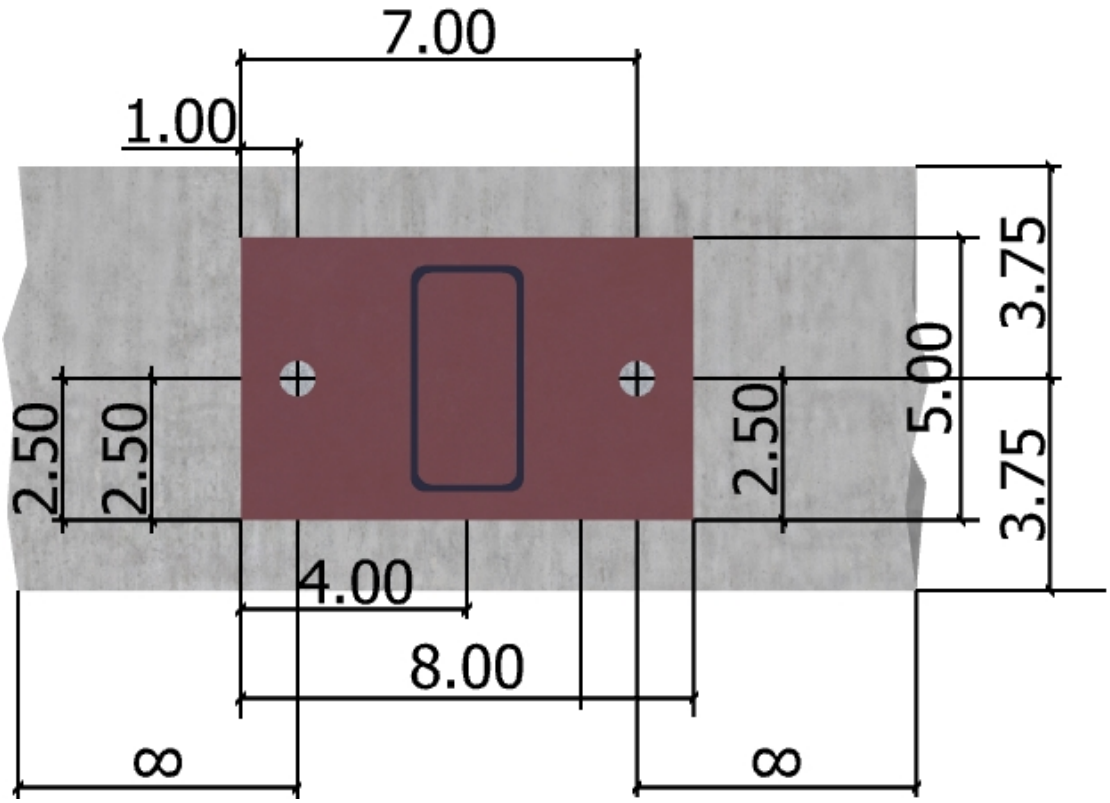
<Figure 2>



(E) HSS Column - Max Uplift Capacity Check

SIMPSON Strong-Tie®

Anchor Designer™ Software
Version 3.0.7947.1

Company:		Date:	6/20/2023
Engineer:		Page:	4/5
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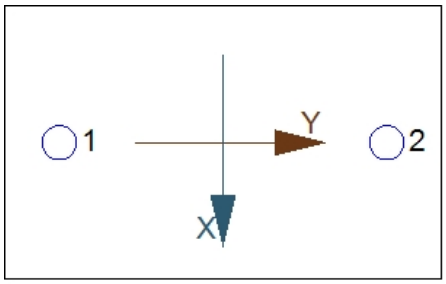
Address:			
Phone:			
E-mail:			

3. Resulting Anchor Forces

Anchor	Tension load, N_{ua} (lb)	Shear load x, V_{uax} (lb)	Shear load y, V_{uay} (lb)	Shear load combined, $\sqrt{(V_{uax})^2+(V_{uay})^2}$ (lb)
1	2584.0	0.0	0.0	0.0
2	2584.0	0.0	0.0	0.0
Sum	5168.0	0.0	0.0	0.0

Maximum concrete compression strain (‰): 0.00
Maximum concrete compression stress (psi): 0
Resultant tension force (lb): 5168
Resultant compression force (lb): 0
Eccentricity of resultant tension forces in x-axis, e'_{Nx} (inch): 0.00
Eccentricity of resultant tension forces in y-axis, e'_{Ny} (inch): 0.00

<Figure 3>



4. Steel Strength of Anchor in Tension (Sec. 17.4.1)

N_{sa} (lb)	ϕ	ϕN_{sa} (lb)
13100	0.75	9825

5. Concrete Breakout Strength of Anchor in Tension (Sec. 17.4.2)

$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5}$ (Eq. 17.4.2.2a)

k_c	λ_a	f'_c (psi)	h_{ef} (in)	N_b (lb)
24.0	1.00	2500	6.000	17636

$\phi N_{cbg} = \phi (A_{Nc} / A_{Nco}) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$ (Sec. 17.3.1 & Eq. 17.4.2.1b)

A_{Nc} (in²)	A_{Nco} (in²)	$c_{a,min}$ (in)	$\Psi_{ec,N}$	$\Psi_{ed,N}$	$\Psi_{c,N}$	$\Psi_{cp,N}$	N_b (lb)	ϕ	ϕN_{cbg} (lb)
180.00	324.00	3.75	1.000	0.825	1.25	1.000	17636	0.70	7073

6. Pullout Strength of Anchor in Tension (Sec. 17.4.3)

$fN_{pn} = fY_{c,P}N_p = fY_{c,P}0.9f'_c e_h d_a$ (Sec. 17.3.1, Eq. 17.4.3.1 & 17.4.3.5)

$\Psi_{c,P}$	f'_c (psi)	d_a (in)	$e_h=3d_a$ (in)	ϕ	ϕN_{pn} (lb)
1.4	2500	0.63	1.88	0.70	2584

11. Results

11. Interaction of Tensile and Shear Forces (Sec. D.7)?

Tension	Factored Load, N_{ua} (lb)	Design Strength, ϕN_n (lb)	Ratio	Status
Steel	2584	9825	0.26	Pass
Concrete breakout	5168	7073	0.73	Pass
Pullout	**2584**	**2584**	**1.00**	**Pass (Governs)**

5/8"Ø J- or L-Bolt, F1554 Gr. 36 with hef = 6.000 inch meets the selected design criteria.

12. Warnings

- Designer must exercise own judgement to determine if this design is suitable.

DEI
DIBBLE ENGINEERS INC

PROJECT NAME: Harris Res
PROJECT #: 23-183
SUBJECT:
SHEET #:
DATE: 10/2023
BY: LAP

GUARDRAIL CALCS:

P = 200 LB

h = 36" + 5" (curb, furring, etc. to T/BEAM)
= 41"

M = 200 LB × 41" = 8,200 lb·in

d = 6" − 1" = 5" T = C = $\frac{8,200 \text{ lb·in}}{5"}$ = 1,640 lb / 2 screws = 820 lb

Z' = 1,113 lb for 3/8"Ø LAG SCREW > 820 lb

∴OK! @ 74% DCR

guardrail fasteners

Design Method	Allowable Stress Design (ASD)
Connection Type	Withdrawal loading
Fastener Type	Lag Screw
Loading Scenario	N/A

Main Member Type	Douglas Fir-Larch
Main Member Thickness	3.5 in.
Side Member Type	Steel
Side Member Thickness	1/4 in.
Washer Thickness	1/8 in.
Nominal Diameter	3/8 in.
Length	4 in.
Load Duration Factor	C_D = 1.6
Wet Service Factor	C_M = 1.0
End Grain Factor	C_eg = 1.0
Temperature Factor	C_t = 1.0

Adjusted ASD Capacity	**1113 lbs.**
Fastener length exceeds total connection thickness	

3" min thread pen called out on detail 12/S3.3 (total fastener length will not exceed total connection thickness)

- The Adjusted ASD Capacity only applies to wit
  main member. It does not address head pull-thr
  side member.

While every effort has been made to insure the accuracy of the information presented, and special effort has been made to assure that the information reflects the state-of-the-art, neither the American Wood Council nor its members assume any responsibility for any particular design prepared from this on-line Connection Calculator. Those using this on-line Connection Calculator assume all liability from its use.

The Connection Calculator was designed and created by Cameron Knudson, Michael Dodson and David Pollock at Washington State University. Support for development of the Connection Calculator was provided by American Wood Council.