STRUCTURAL CALCULATIONS

(A 65 Unit Residential Development)

The Colony 65

Plan 1, 2 and 3

Lancaster, County of Los Angeles, CA

Gouvis Job No.: 64797

4/23/2018

Developer:

Imagine Development

Architect:

KPI

949.752.1612

15 Studebaker

Irvine, CA

92618

Mike Houshmand, Vice President

C42283 Exp. Date 3/31/2020

The attached calculations are valid only when bearing original or electronic signature of Mike Houshmand, Hereon.

GOUVISengineering
consulting group, inc.

STRUCTURAL CALCULATIONS

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PAGE:
JOB NO.: 64797
DATE: 3/19/2018
CLIENT:

SHEAR WALL SCHEDULE

2016 CALIFORNIA BUILDING CODE (1), (3)

SHEAR PANEL TYPE	SHEATHING (8)	EDGE NAILING (COMMON)	FIELD NAILING (COMMON) (9)	ALLOWABLE SHEAR (PLF)	SILL PLATE CONNECTION			FRAMING CLIPS A35's, LS50's OR LTP4's (5), (6)
					16d's SINKER	1/4"Øx6" SDS SCREWS LSL & DF RIM BOARD	1/4"Øx6" SDS SCREWS LVL RIM BOARD	
1	3/8" APA rated	8 d's @ 6" O.C.	8 d's @ 12" O.C.	260 / (7) 220	@ 6" O.C.	@ 16" O.C.	@ 14" O.C.	@ 16" O.C.
2 (4) (2)	3/8" APA rated	8 d's @ 4" O.C.	8 d's @ 12" O.C.	380 / (7) 320	@ 4" O.C.	@ 12" O.C.	@ 10" O.C.	@ 12" O.C.
3 (4) (2)	3/8" APA rated	8 d's @ 3" O.C.	8 d's @ 12" O.C.	490 / (7) 410	(10) @ 3" O.C.	(10) @ 8" O.C.	(10) @ 7" O.C.	(10) @ 8" O.C.
4 (4) (2)	3/8" APA rated	8 d's @ 2" O.C.	8 d's @ 12" O.C.	640 / (7) 530	(10) @ 2" O.C.	(10) @ 6" O.C.	(10) @ 5" O.C.	(10) @ 8" O.C.
5 (4) (2)	15/32" APA rated Structural I	10 d's @ 2" O.C.	10 d's @ 12" O.C.	870	(10) 2 ROWS STAGG. @ 3" O.C.	(10) @ 5" O.C.	(10) @ 4" O.C.	(10) @ 6" O.C.

(1) SHEATHING PANEL JOINT AND SILL PLATE NAILING SHALL BE STAGGERED IN ALL CASES.
(2) PROVIDE 3" NOMINAL OR WIDER FRAMING AT ADJOINING PANEL EDGES WITH NAILS STAGGERED.
(3) STUDS ARE SPACED @ 16" O.C. MAX. UNLESS NOTED OTHERWISE ON PLAN.
(4) PERIODIC SPECIAL INSPECTION IS REQUIRED.
(5) USE CLIPS @ 6" O.C. ON SIMPSON STRONG WALL & HARDY FRAME (U.N.O.).
(6) USE SPACING PER SCHEDULE IF NUMBER OF FRAMING CLIPS ARE NOT SPECIFIED ON FRAMING PLANS.
(7) ALLOWABLE SHEAR ARE FOR STUDS SPACED @ 24" O.C. MAX.
(8) SHEATHING CONFORMS TO EITHER DOC PS 1 OR PS 2 STANDARDS.
(9) NAILING @ 6" O.C. WHEN STUDS ARE SPACED @ 24" O.C.
(10) FOR DOUBLE SIDED SHEAR PANELS:
a. USE HALF THE SPACING OF SILL PLATE FASTENERS STAGGERED FOR TYPE 3 .
b. USE ONLY 1/4"Øx6" SDS SCREWS IN SCHEDULE AND WITH HALF THE SPACING, FOR TYPES 4 & 5 .
c. SEE SHEAR TRANSFER DETAIL ON PLAN FOR FRAMING CLIP TYPES AND SPACING, FOR TYPES 3 , 4 & 5 .

REV. 12/19/2016

DESIGN CRITERIA:

A. Code: 2016 CBC
Wind Exposure: C, Speed = 110mph
Seismic Design Category : D, S_s= 1.50, S_1= 0.63, S_{DS}=1.000, S_{D1}=0.634, R_X =6.5, R_Y =6.5

B. Maximum 19% moisture content
prior to Installation of Finish Material
4X Members: No. 2 or Better
6X, 8X Beams and Headers: No.1 or Better
2X Joists and Rafters: No. 2 or Better
Plates and Blocking: Standard Grade or Better
Studs: Stud Grade or Better
Mud Sills: Pressure Treated Utility Grade or Better
Parallam PSL Beams and Headers: Grade 2.0E DF, F_b= 2900 psi(MIN), F_V= 290 psi(MIN)
Versa-Lam LVL Beams and Headers: Grade 2.0E, F_b= 2900 psi(MIN), F_V= 285 psi(MIN)
TimberStrand LSL Beams and Headers: Grade 1.55E, F_b= 2325 psi(MIN), F_V= 425 psi(MIN)
TimberStrand LSL Rim Board and Headers: Grade 1.3E, F_b= 1700 psi(MIN), F_V= 425 psi(MIN)
Glu-Lam Beams and Headers: 24F-V4, DF/DF, 1.8E, F_b= 2400(T)/1850(B) psi (MIN), F_V= 265 psi(MIN)

C. N/A

EXTERIOR WALL (WALL_E): DL = 15
INTERIOR WALL (WALL_I): DL = 10

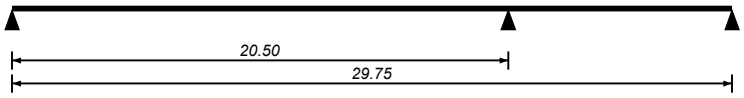
PRIMARY ROOF (ROOF_P)

Pitch:		5
K = Increase for pitch:		1.08/12
Typ. Truss @ 24" O/C	x K	2.60
Plywood(1/2")	x K	1.68
1/2" Gyp. Board		2.20
Conc. Tile	x K	10.83
sprinkler:		1.00
Misc:		1.69
Snow Load:		20.00
Dead Load:		20.00
Live Load:		20.00

BEAM GT#1 : GT @ OVER GARAGE @ 1st Floor

Loads (Downward +)

SELF_WEIGHT *40 plf from 0.00ft to 29.75ft*
ROOF_P *200 PLF = 10.00' x (20.00+20.00)/2 from 0.00' to 20.50'*
ROOF_P *160 PLF = 8.00' x (20.00+20.00)/2 from 20.50' to 29.75'*



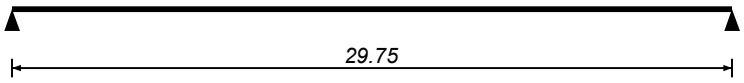
DOWN (D+Lr+L/Max. Comb.)	1962/2004	4752/4852	0/0
UP (D+Lr+L/Max. Comb.)	0/0	0/0	-84/-86

***** TRUSS DESIGN BY OTHER *****

BEAM GT#2 : GT @ OVER BED #3 @ 1st Floor

Loads (Downward +)

SELF_WEIGHT *40 plf from 0.00ft to 29.75ft*
ROOF_P *180 PLF = 9.00' x (20.00+20.00)/2 from 0.00' to 29.75'*



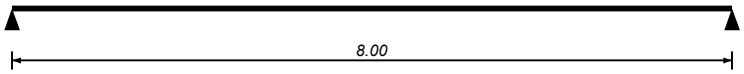
DOWN (D+Lr+L/Max. Comb.)	3206/3272	3206/3272
UP (D+Lr+L/Max. Comb.)	0/0	0/0

***** TRUSS DESIGN BY OTHER *****

BEAM GT#3 : GT @ OVER KITCHEN - PLB @ 1st Floor

Loads (Downward +)

SELF_WEIGHT *20 plf from 0.00ft to 8.00ft*
ROOF_P *580 PLF = 29.00' x (20.00+20.00)/2 from 0.00' to 8.00'*



DOWN (D+Lr+L/Max. Comb.)	2342/2400	2342/2400
UP (D+Lr+L/Max. Comb.)	0/0	0/0

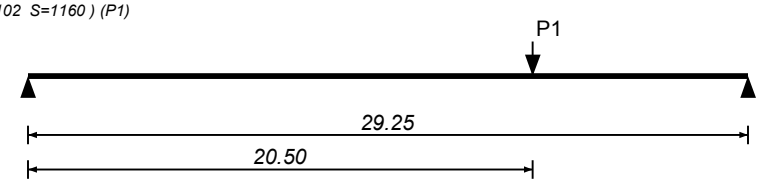
***** TRUSS DESIGN BY OTHER *****

BEAM GT#4 : GT @ OVER KITCHEN - PL B @ 1st Floor

Loads (Downward +)

SELF_WEIGHT *40 plf from 0.00ft to 29.25ft*
ROOF_P *80 PLF = 4.00' x (20.00+20.00)/2 from 0.00' to 20.50'*
ROOF_P *160 PLF = 8.00' x (20.00+20.00)/2 from 20.50' to 29.25'*
Point from Support 2 of Beam GT#3 @ 20.5ft, (D=1240 Lr=1102 S=1160) (P1)

:Point load Location



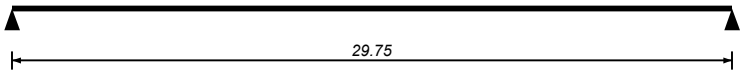
DOWN (D+Lr+L/Max. Comb.)	2528/2578	3948/4032
UP (D+Lr+L/Max. Comb.)	0/0	0/0

***** TRUSS DESIGN BY OTHER *****

BEAM GT#5 : GT @ OVER GARAGE - PL C @ 1st Floor

Loads (Downward +)

SELF_WEIGHT *40 plf from 0.00ft to 29.75ft*
ROOF_P *170 PLF = 8.50' x (20.00+20.00)/2 from 0.00' to 29.75'*



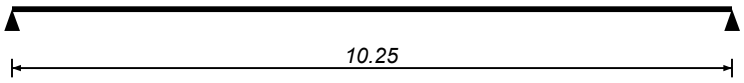
DOWN (D+Lr+L/Max. Comb.)	3061/3124	3061/3124
UP (D+Lr+L/Max. Comb.)	0/0	0/0

***** TRUSS DESIGN BY OTHER *****

BEAM GT#6 : GT @ OVER BED#3 - PL C @ 1st Floor

Loads (Downward +)

SELF_WEIGHT *20 plf from 0.00ft to 10.25ft*
ROOF_P *200 PLF = 10.00' x (20.00+20.00)/2 from 0.00' to 10.25'*



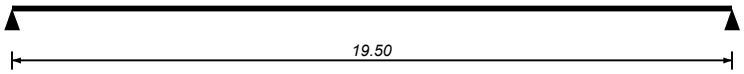
DOWN (D+Lr+L/Max. Comb.)	1102/1128	1102/1128
UP (D+Lr+L/Max. Comb.)	0/0	0/0

***** TRUSS DESIGN BY OTHER *****

BEAM GT#7 : GT @ OVER PORCH3 - PL C @ 1st Floor

Loads (Downward +)

SELF_WEIGHT *30 plf from 0.00ft to 19.50ft*
ROOF_P *110 PLF = 5.50' x (20.00+20.00)/2 from 0.00' to 19.50'*



DOWN (D+Lr+L/Max. Comb.)	1338/1365	1338/1365
UP (D+Lr+L/Max. Comb.)	0/0	0/0

***** TRUSS DESIGN BY OTHER *****

BEAM 1 (DROP): HDR @ FRONT OF GARAGE @ 1st Floor

Loads (Downward +)

SELF_WEIGHT *16 plf from 0.00ft to 16.25ft*
ROOF_P *200 PLF = 10.00' x (20.00+20.00)/2 from 0.00' to 16.25'*
WALL_E *30 PLF = 2.00' x 15.00 from 0.00' to 16.25'*

Reactions (D+Lr+L/Max. Load comb.)

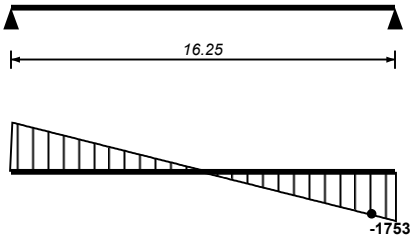
Down	1999/1999	1999/1999
Up	0/0	0/0

USE TIMBERSTRAND 3 1/2"x11 7/8" 1.55E (F_b = 2325, F_v = 310)

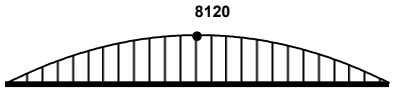
Critical Shear =-1753 LB @ 15.25' 1.5xV/(F'$_v$x A)=0.177
F'$_v$= 357, A = 41.56

Critical Moment =8120 LB-FT @ 8.08' M/(F'$_b$x S)=0.53
F'$_b$= 2218, S = 82.26

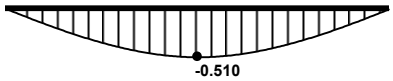
Critical Deflection for TL = -0.510 INCH @ 8.17' L/240 = 0.813"
Critical Deflection for LL = -0.207 INCH @ 8.17' L/480 = 0.406"



Shear Diagragm:D + S



Moment Diagragm:D + S



Deflection Diagram:D + S

BEAM 2 (DROP): HDR @ RIGHT OF PATIO @ 1st Floor

Loads (Downward +)

SELF_WEIGHT *7 plf from 0.00ft to 6.25ft*
ROOF_P *160 PLF = 8.00' x (20.00+20.00)/2 from 0.00' to 4.50'*
ROOF_P *640 PLF = 32.00' x (20.00+20.00)/2 from 4.50' to 6.25'*
WALL_E *30 PLF = 2.00' x 15.00 from 0.00' to 6.25'*
Point from Support 3 of Beam GT#1 @ 4.5ft, () (P1)
:Point load Location

Reactions (D+Lr+L/Max. Load comb.)

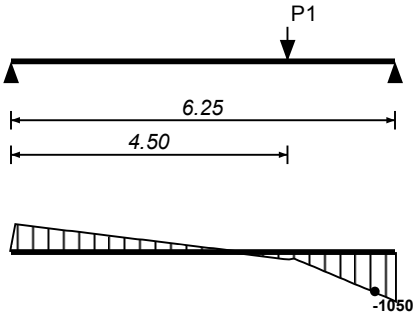
Down	709/709	1276/1276
Up	0/0	0/0

USE DFL NO2 4 x 8 (F_b = 900, F_v = 180)

Critical Shear =-1050 LB @ 5.92' 1.5xV/(F'$_v$x A)=0.300
F'$_v$= 207, A = 25.38

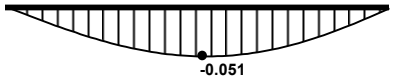
Critical Moment =1276 LB-FT @ 3.58' M/(F'$_b$x S)=0.37
F'$_b$= 1333, S = 30.66

Critical Deflection for TL = -0.051 INCH @ 3.25' L/240 = 0.313"
Critical Deflection for LL = -0.022 INCH @ 3.25' L/480 = 0.156"



Shear Diagragm:D + S

Moment Diagragm:D + S



Deflection Diagram:D + S

BEAM 3 (DROP): HDR @ FRONT OF GARAGE - PL.B @ 1st Floor

Loads (Downward +)

SELF_WEIGHT 9 plf from 0.00ft to 16.25ft
ROOF_P 80 PLF = 4.00' x (20.00+20.00)/2 from 0.00' to 16.25'
WALL_E 30 PLF = 2.00' x 15.00 from 0.00' to 16.25'

Reactions (D+Lr+L/Max. Load comb.)

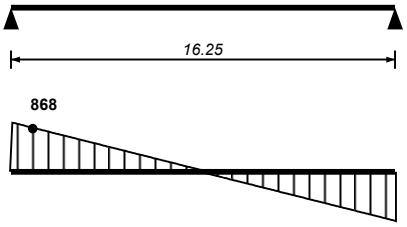
Down	967/967	967/967
Up	0/0	0/0

USE DFL NO2 4 x 10 (F_b = 900, F_v = 180)

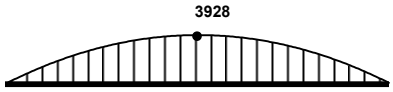
Critical Shear =868 LB @ 0.83' 1.5xV/(F'_vx A)=0.194
F'_v= 207, A = 32.38

Critical Moment =3928 LB-FT @ 8.08' M/(F'_bx S)=0.79
F'_b= 1194, S = 49.91

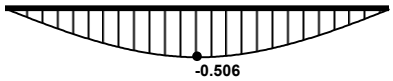
Critical Deflection for TL = -0.505 INCH @ 8.17' L/240 = 0.813"
Critical Deflection for LL = -0.170 INCH @ 8.17' L/480 = 0.406"



Shear Diagragm:D + S



Moment Diagragm:D + S



Deflection Diagram:D + S

BEAM 4 (DROP): HDR @ RIGHT OF PATIO - PL.C @ 1st Floor

Loads (Downward +)

SELF_WEIGHT 11 plf from 0.00ft to 7.25ft
ROOF_P 80 PLF = 4.00' x (20.00+20.00)/2 from 0.00' to 5.00'
ROOF_P 640 PLF = 32.00' x (20.00+20.00)/2 from 5.00' to 7.25'
WALL_E 30 PLF = 2.00' x 15.00 from 0.00' to 7.25'
Point from Support 2 of Beam GT#5 @ 5ft, (D=1859 Lr=1201 S=1264) (P1)
:Point load Location

Reactions (D+Lr+L/Max. Load comb.)

Down	1604/1604	3657/3657
Up	0/0	0/0

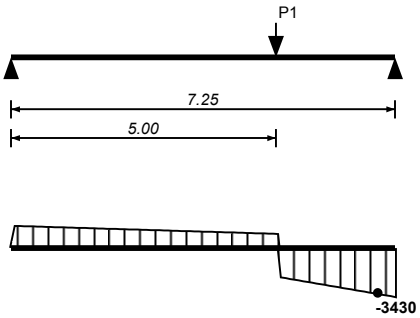
w/ 2-2X4 trim at support 2 (at 7'-3")(1)

USE DFL NO2 4 x 12 (F_b = 900, F_v = 180)

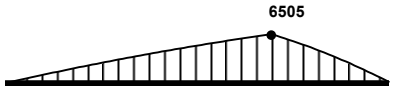
Critical Shear =-3430 LB @ 6.92' 1.5xV/(F'_vx A)=0.631
F'_v= 207, A = 39.38

Critical Moment =6505 LB-FT @ 5.00' M/(F'_bx S)=0.94
F'_b= 1119, S = 73.83

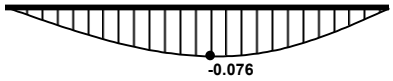
Critical Deflection for TL = -0.076 INCH @ 3.92' L/240 = 0.363"
Critical Deflection for LL = -0.031 INCH @ 3.92' L/480 = 0.181"



Shear Diagragm:D + S



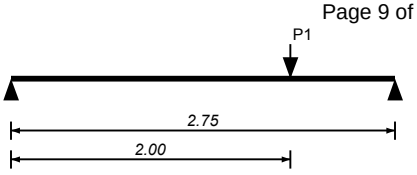
Moment Diagragm:D + S



Deflection Diagram:D + S

(1) selected post do not consider combined axial and out-of-plane bending

BEAM 5 (DROP): HDR @ RIGHT OF BED #3 - PL.C @ 1st Floor



Loads (Downward +)

SELF_WEIGHT 6 plf from 0.00ft to 2.75ft
ROOF_P 580 PLF = 29.00' x (20.00+20.00)/2 from 0.00' to 2.00'
ROOF_P 380 PLF = 19.00' x (20.00+20.00)/2 from 2.00' to 2.75'
Point from Support 2 of Beam GT#6 @ 2ft, (D=615 Lr=487 S=513) (P1)
:Point load Location

Reactions (D+Lr+L/Max. Load comb.)

Down	1093/1093	1496/1496
Up	0/0	0/0

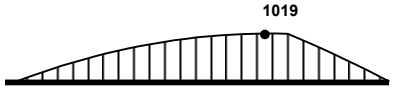
Shear Diagragm:D + S

USE DFL NO2 4 x 6 (F_b = 900, F_v = 180)

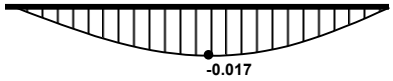
Critical Shear =-1368 LB @ 2.42' 1.5xV/(F'$_v$x A)=0.515
F'$_v$= 207, A = 19.25

Critical Moment =1019 LB-FT @ 1.83' M/(F'$_b$x S)=0.52
F'$_b$= 1341, S = 17.65

Critical Deflection for TL = -0.017 INCH @ 1.42' L/240 = 0.138"
Critical Deflection for LL = -0.008 INCH @ 1.42' L/480 = 0.069"

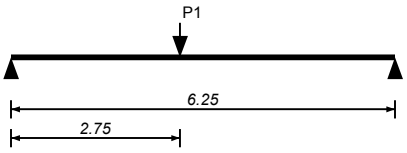


Moment Diagragm:D + S



Deflection Diagram:D + S

BEAM 6 (DROP): HDR @ RIGHT OF PORCH - PL.C @ 1st Floor

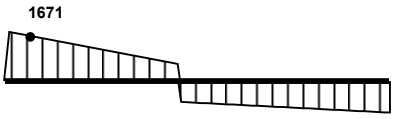


Loads (Downward +)

SELF_WEIGHT 7 plf from 0.00ft to 6.25ft
ROOF_P 400 PLF = 20.00' x (20.00+20.00)/2 from 0.00' to 2.75'
ROOF_P 80 PLF = 4.00' x (20.00+20.00)/2 from 2.75' to 6.25'
WALL_E 30 PLF = 2.00' x 15.00 from 0.00' to 6.25'
Point from Support 2 of Beam GT#7 @ 2.75ft, (D=829 Lr=509 S=536) (P1)
:Point load Location

Reactions (D+Lr+L/Max. Load comb.)

Down	1816/1816	1160/1160
Up	0/0	0/0



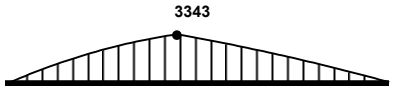
Shear Diagragm:D + S

USE DFL NO2 4 x 8 (F_b = 900, F_v = 180)

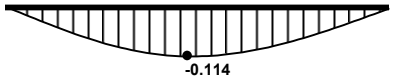
Critical Shear =1671 LB @ 0.33' 1.5xV/(F'$_v$x A)=0.477
F'$_v$= 207, A = 25.38

Critical Moment =3343 LB-FT @ 2.75' M/(F'$_b$x S)=0.98
F'$_b$= 1333, S = 30.66

Critical Deflection for TL = -0.114 INCH @ 3.00' L/240 = 0.313"
Critical Deflection for LL = -0.046 INCH @ 3.00' L/480 = 0.156"



Moment Diagragm:D + S



Deflection Diagram:D + S

GOUVISengineering
consulting group, inc.

SHEET:	LL	Page 10 of 67
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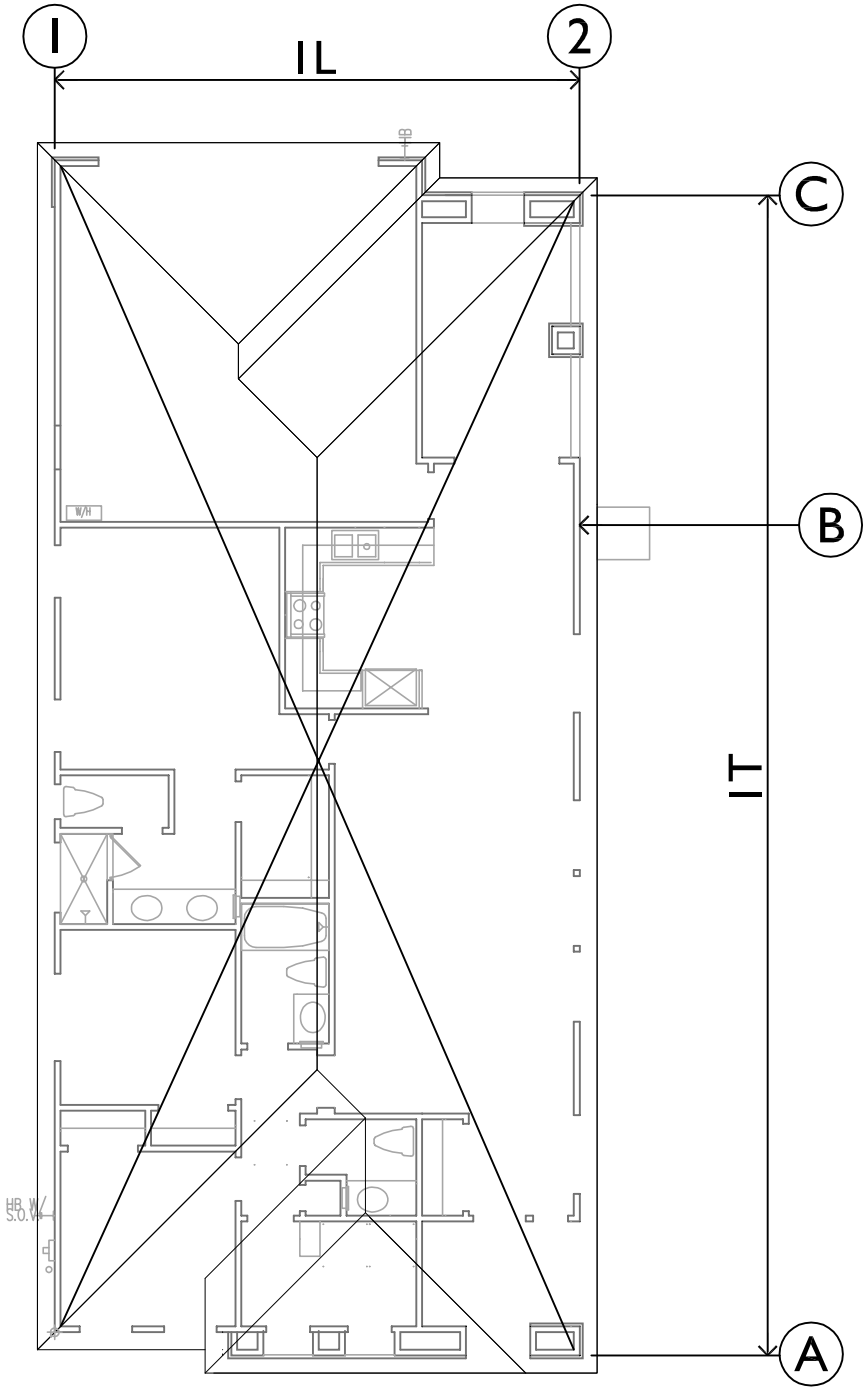
DATE:	3/19/2018	
CLIENT:	-	



SHEAR WALL LAYOUT

PLAN 1

SECTION 1 - DIRECTION L

BLDG DIMENSION (FT): BASE HT = 0.5 HEIGHT = 14.0 B = 30.0 L = 67.0
SECTION DIMENSION (FT): BASE HT = 0.5 HEIGHT = 16.0 WIDTH = 30.0 DEPTH = 67.0
PLATE HT.: 1-FLR = 10.0'
ASCE 7-10 DIRECTIONAL PROCEDURE
WIND PARAMETERS: WIND SPEED = 110MPH WIND EXPOSURE = C
COEFFICENTS: K_d=0.85, K_{zt}= 1.00, G = 0.85, G_{Cpi}= ±0.18, ω = 1.00, q_h = 22.35PSF
INTERPOLATION: L/B => YES, h/L => YES, θ => YES

WIND HEIGHT (FT):	15	20	25	30	40	50
WALL PRESSURE ωP (PSF):	20.68	21.63	22.4	23.06	24.16	25.06
ROOF ELEMENT	WDIR+	WDIR-	OWDIR+	OWDIR-	UDIR+	UDIR-
Hip Roof W=30' L=33.5' Windward	4.25	48.5	84.82	40.57	8771	684
Hip Roof W=30' L=33.5' LeeWard	84.82	40.57	4.25	48.5	8771	684
Over Hang W=30' L=2'	0	0	0	0	912	912

WIND LOAD: ROOF = 115.47 = 0.6 x 192.45 PLF (MAX.) UPLIFT AVE. = 5.51 PSF
MAX TOTAL = 115.47 PLF

SEISMIC PARAMETERS: S_s= 1.50 S_1= 0.63 F_a= 1.00 F_v= 1.50
R_y=6.50 SITE CLASS:D S_{DS}=2F_a S_s/3 =1.000 S_{D1}=2F_v S_1 /3 =0.634 S_{DC}=D I_e=1.00 k =1.00
V= S_{DS}x I x W / 1.4 x R= 0.1099W

ROOF:	DL ROOF =	20.00 x 2220.00 / 30.00 =	1480.00 PLF
	DL EXT WALL =	15.00 x 60.00 x 5.00 / 30.00 =	150.00 PLF
	DL INT WALL =	10.00 x 30.00 x 5.00 / 30.00 =	50.00 PLF
	SHEAR =	0.1099 x (1480.00 + 150.00 + 50.00) =	184.63 PLF

SHEAR ROOF= 184.63 x 1680.00 x 10.0 / 16800 = 184.63 PLF (240.00 PLF[1])
ROOF: 184.63 PLF SEISMIC GOVERN
ROOF DIAPHRAGM: V = 240.00 PLF ALIGN
MAX SHEAR= 240.00 x 30.00 / (2 x 67.00) = 53.73 PLF
USE: 15/32" CDX RATED UNBLOCKED 32/16 w/8d COMMON NAILS AT 6", 6", 12" O.C.
CHORD FORCE= 240.00 x 30.00 ² / (8 x 67.00) = 402.99 LBS
SPLICE W/ MIN. (5) 16d SINKER NAILS EACH SIDE OF SPLICE AT 8" O.C. (STANDARD CONSTRUCTION)

SECTION 1 - DIRECTION T

BLDG DIMENSION (FT): BASE HT = 0.5 HEIGHT = 14.0 B = 30.0 L = 67.0
SECTION DIMENSION (FT): BASE HT = 0.5 HEIGHT = 16.0 WIDTH = 67.0 DEPTH = 30.0
PLATE HT.: 1-FLR = 10.0'
ASCE 7-10 DIRECTIONAL PROCEDURE
WIND PARAMETERS: WIND SPEED = 110MPH WIND EXPOSURE = C
COEFFICENTS: K_d=0.85, K_{zt}= 1.00, G = 0.85, G_{Cpi}= ±0.18, ω = 1.00, q_h = 22.35PSF
INTERPOLATION: L/B => YES, h/L => YES, θ => YES

WIND HEIGHT (FT):	15	20	25	30	40	50
WALL PRESSURE ωP (PSF):	24.7	25.65	26.42	27.09	28.18	29.08
ROOF ELEMENT	WDIR+	WDIR-	OWDIR+	OWDIR-	UDIR+	UDIR-
Hip Roof W=67' L=15' Windward	-10.15	34.11	84.82	40.57	10553	2466
Hip Roof W=67' L=15' LeeWard	84.82	40.57	-10.15	34.11	10553	2466
Over Hang W=67' L=2'	0	0	0	0	2037	2037

WIND LOAD: ROOF = 118.90 = 0.6 x 198.16 PLF (MAX.) UPLIFT AVE. = 6.91 PSF
MAX TOTAL = 118.90 PLF

SEISMIC PARAMETERS: S_s= 1.50 S_1= 0.63 F_a= 1.00 F_v= 1.50
R_x=6.50 SITE CLASS:D S_{DS}=2F_a S_s/3 =1.000 S_{D1}=2F_v S_1 /3 =0.634 S_{DC}=D I_e=1.00 k =1.00
V= S_{DS}x I x W / 1.4 x R= 0.1099W

ROOF:	DL ROOF =	20.00 x 2220.00 / 67.00 =	662.69 PLF
	DL EXT WALL =	15.00 x 134.00 x 5.00 / 67.00 =	150.00 PLF
	DL INT WALL =	10.00 x 67.00 x 5.00 / 67.00 =	50.00 PLF
	SHEAR =	0.1099 x (662.69 + 150.00 + 50.00) =	94.81 PLF

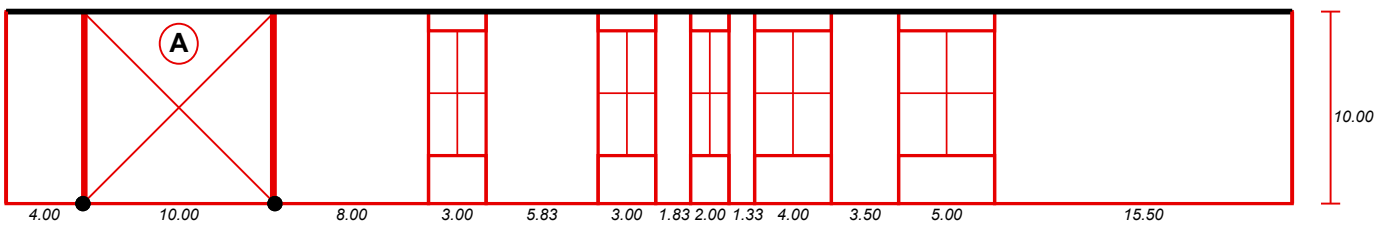
SHEAR ROOF= 94.81 x 862.69 x 10.0 / 8627 = 94.81 PLF (123.24 PLF[1])
ROOF: 118.90 PLF WIND GOVERN
ROOF DIAPHRAGM: V = 123.24 PLF ALIGN
MAX SHEAR= 123.24 x 46.00 / (2 x 30.00) = 94.48 PLF
USE: 15/32" CDX RATED UNBLOCKED 32/16 w/8d COMMON NAILS AT 6", 6", 12" O.C.
CHORD FORCE= 123.24 x 46.00 ² / (8 x 30.00) = 1086.57 LBS
SPLICE W/ MIN. (5) 16d SINKER NAILS EACH SIDE OF SPLICE AT 8" O.C. (STANDARD CONSTRUCTION)

(1) Load from Diaphragm Only

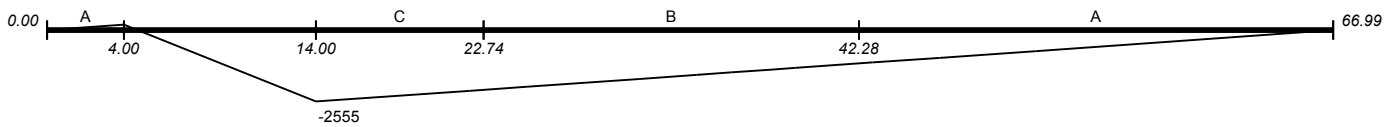
1L_ROOF
30.00ft

Wind: 1732
Seismic: 2769

Wind: 1732(LB)
Seismic: 3231(LB) = 2769 + 461



● Strap (E)



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice
B: Simpson ST6224 (2134LB) ALT (16) #16 sinker per top plate splice
C: Simpson ST6236 (3230LB) ALT (22) #16 sinker per top plate splice

Design Analysis

WALL 1 1st Floor @ GRID 1
Exterior Direction: L Location:(0.00,67.00) **(ρ = 1.0)**
Total Length = 66.99 ft Total panel Length = 10.00ft (Net Length= 10.00ft)
Shear Diaphragm = 3231 / 66.99 = 48 plf
Use (8 A35) or (6 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule
Design Wall Shears = 3231 / 10.00 = 323 plf (Flexible) Max. Drag = 2555 lbs
Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 1.730" ≤ 0.020 x 120.00 = 2.400 "

Use TYPE 2
Design Report:
Loads:
Wall 150.00 plf = 15 x 10.00'

Overturn Analysis Uplift(T) Down(C)
Panel A b = 10.00 h = 10.00

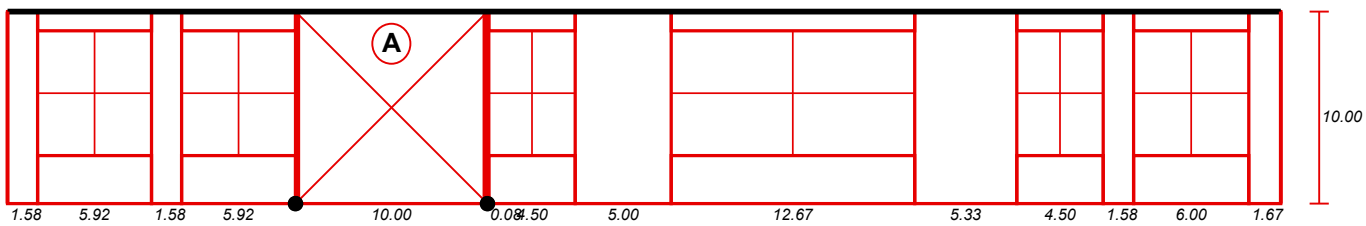
Left Side:	T = 2930 LB	C = 3431 LB	STHD10/4x4
Right Side:	T = 2930 LB	C = 3431 LB	STHD10/4x4

Use STHD10/4x4 on both ends
w/ (3) 5/8" x 12" Anchor Bolt (@ 48" O.C. max)

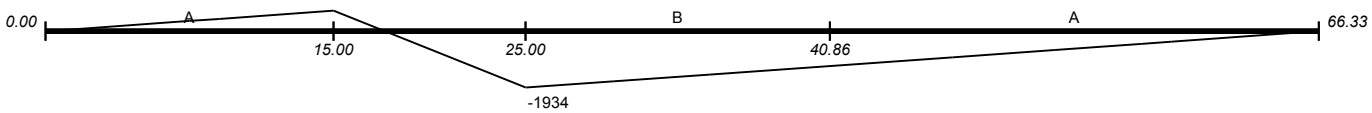
1L_ROOF
30.00ft

Wind: 1732
Seismic: 2769

Wind: 1732(LB)
Seismic: 3104(LB) = 2769 + 335



● Strap (E)



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice
B: Simpson ST6224 (2134LB) ALT (16) #16 sinker per top plate splice

Design Analysis

WALL 2 1st Floor @ GRID 2
Exterior Direction: L Location:(30.00,65.00) **(ρ = 1.0)**
Total Length = 66.33 ft Total panel Length = 10.00ft (Net Length= 10.00ft)
Shear Diaphragm = 3104 / 66.33 = 47 plf
Use (8 A35) or (6 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule
Design Wall Shears = 3104 / 10.00 = 310 plf (Flexible) Max. Drag = 1935 lbs
Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 1.658" ≤ 0.020 x 120.00 = 2.400 "

Use TYPE 2
Design Report:
Loads:
Wall 150.00 plf = 15 x 10.00'

Overturn Analysis Uplift(T) Down(C)
Panel A b = 10.00 h = 10.00

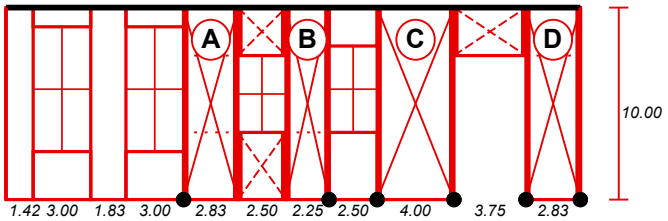
Left Side:	T = 2803 LB	C = 3301 LB	STHD10/4x4
Right Side:	T = 2803 LB	C = 3301 LB	STHD10/4x4

Use STHD10/4x4 on both ends
w/ (3) 5/8" x 12" Anchor Bolt (@ 48" O.C. max)

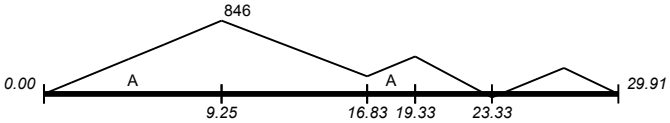
1T_ROOF
46.00ft

Wind: 2735
Seismic: 2181

Wind: 2735(LB)
Seismic: 2354(LB) = 2181 + 174



- Strap (E) Blocked panel use TYPE 4



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice

Design Analysis

WALL A 1st Floor @ GRID A

Exterior Direction: T Location:(0.00,0.00) **(ρ = 1.0)**

Total Length = 29.91 ft Total panel Length = 11.91ft (Net Length= 10.42ft)

Shear Diaphragm = 2735 / 29.91 = 91 plf

Use (8 A35) or (7 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule

Design Wall Shears = 317 plf (At blocked opening A & B) Max. Drag = 846 lbs

Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 1.406" ≤ 0.020 x 120.00 = 2.400 "

Use TYPE 4 *

Design Report:

Loads:

Wall 150.00 plf = 15 x 10.00'

Overturn Analysis Uplift(T) Down(C)

Panel A b = 2.83 h = 10.00

Left Side:	T =	1464 LB	C =	1760 LB	STHD10/4x4
Right Side:	T =	0 LB	C =	0 LB	NO_UPLIFT

Use STHD10/4x4 @ L.

w/ (2) 5/8" x 12" Anchor Bolt (@ 16" O.C. max)

Blocked! Force at Edge of opening is 396 LB

Use at least two anchor bolts inside opening

Panel B b = 2.25 h = 10.00

Left Side:	T =	0 LB	C =	0 LB	NO_UPLIFT
Right Side:	T =	1464 LB	C =	1760 LB	STHD10/4x4

Use STHD10/4x4 @ R.

w/ (2) 5/8" x 12" Anchor Bolt (@ 12" O.C. max)

Panel C b = 4.00 h = 10.00

Left Side:	T =	1993 LB	C =	2374 LB	STHD10/4x4
Right Side:	T =	1993 LB	C =	2374 LB	STHD10/4x4

Use STHD10/4x4 on both ends

w/ (2) 5/8" x 12" Anchor Bolt (@ 32" O.C. max)

* User refered
Reduce shear capacity per Section SDPWS 4.3.4.2

WALL A 1st Floor @ GRID A

Overturn Analysis Uplift(T) Down(C)

Panel D b = 2.83 h = 10.00

Left Side:	T =	1955	LB	C =	2321 LB	STHD10/4x4
Right Side:	T =	1955	LB	C =	2321 LB	STHD10/4x4

Blocked with Header

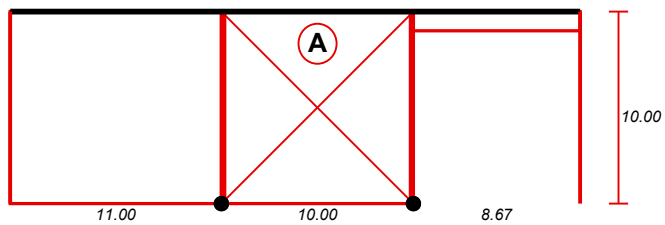
Use STHD10/4x4 on both ends

w/ (2) 5/8" x 12" Anchor Bolt (@ 16" O.C. max)

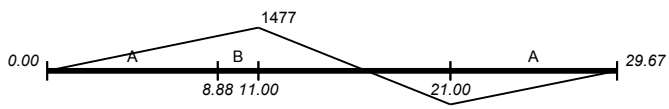
1T_ROOF
67.00ft

Wind: 3983
Seismic: 3176

Wind: 3983(LB)
Seismic: 3356(LB) = 3176 + 180



- Strap (E)



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice
B: Simpson ST6224 (2134LB) ALT (16) #16 sinker per top plate splice

Design Analysis

WALL B 1st Floor @ GRID B
Exterior Direction: T Location:(0.33,46.33) **(ρ = 1.0)**
Total Length = 29.67 ft Total panel Length = 10.00ft (Net Length= 10.00ft)
Shear Diaphragm = 3983 / 29.67 = 134 plf
Use (10 A35) or (7 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule
Design Wall Shears = 3983 / 10.00 = 398 plf (Flexible) Max. Drag = 1477 lbs
Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 1.562" ≤ 0.020 x 120.00 = 2.400 "

Use TYPE 3
Design Report:
Loads:
Wall 150.00 plf = 15 x 10.00'

Overturn Analysis Uplift(T) Down(C)
Panel A b = 10.00 h = 10.00

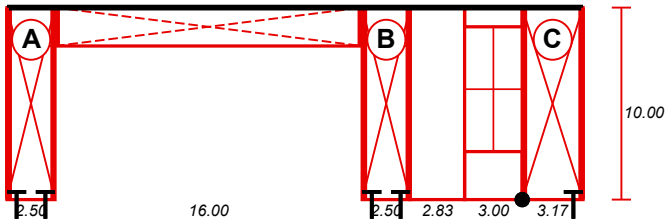
Left Side:	T = 3585 LB	C = 4206 LB	STHD14/4x4
Right Side:	T = 3585 LB	C = 4206 LB	STHD14/4x4

Use STHD14/4x4 on both ends
w/ (3) 5/8" x 12" Anchor Bolt (@ 48" O.C. max)

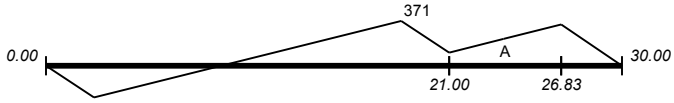
1T_ROOF
20.00ft

Wind: 1189
Seismic: 948

Wind: 1189(LB)
Seismic: 1074(LB) = 948 + 126



● Strap (E) T Hold down Blocked panel use TYPE 3



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice

Design Analysis

WALL C 1st Floor @ GRID C

Exterior Direction: T Location:(0.00,67.00) **(ρ = 1.0)**

Total Length = 30.00 ft Total panel Length = 8.17ft (Net Length= 5.13ft)

Shear Diaphragm = 1189 / 30.00 = 40 plf

Use (6 A35) or (6 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule

Design Wall Shears = 1189 / 5.13 = 232 plf (Flexible) Max. Drag = 403 lbs

Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 1.361" ≤ 0.020 x 120.00 = 2.400 "

Use TYPE 3 *

Design Report:

Loads:

Wall 150.00 plf = 15 x 10.00'

Overturn Analysis Uplift(T) Down(C)

Panel A b = 2.50 h = 10.00

Left Side:	T = 1590 LB	C = 1752 LB	HTT5/4x4 (*) (I) w/ DBL BLK'G	
Right Side:	T = 1590 LB	C = 1752 LB	HTT5/4x4 (*) (I) w/ DBL BLK'G	

Blocked with Header

Use HTT5/4x4 (I) on both ends

w/ (2) 5/8" x 12" Anchor Bolt (@ 16" O.C. max)

Panel B b = 2.50 h = 10.00

Left Side:	T = 1590 LB	C = 1752 LB	HTT5/4x4 (*) (I) w/ DBL BLK'G
Right Side:	T = 1590 LB	C = 1752 LB	HTT5/4x4 (*) (I) w/ DBL BLK'G

Blocked with Header

Use HTT5/4x4 (I) on both ends

w/ (2) 5/8" x 12" Anchor Bolt (@ 16" O.C. max)

Panel C b = 3.17 h = 10.00

Left Side:	T = 1389 LB	C = 1727 LB	STHD10/4x4
Right Side:	T = 1517 LB	C = 1727 LB	HTT5/4x4 (*) (I) w/ DBL BLK'G

Use STHD10/4x4 @ L. and Use HTT5/4x4 (I) @ R.

w/ (2) 5/8" x 12" Anchor Bolt (@ 24" O.C. max)

* User refered
(I) Hold down Inside of panel
(O) Hold down Outside of panel
Reduce shear capacity per Section SDPWS 4.3.4.2

Footing/Pad: F1 TYP. CONT. FOOTING
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of footing 225 PLF = 150 x 1.00' x 1.50'
ROOF_P 600 PLF = 30.00' x (20.00+20.00)/2 from 0.00' to 1.00'
WALL_E 135 PLF = 9.00' x 15.00 from 0.00' to 1.00'

Total Weight(W_{total}) = 1260 PLF
Footing Width(B_f) Required: 10.08" = (W_{total} / SB) = 1260/1500 x 12

USE 12" Wide x 12" Deep Continuous Footing #4 Cont. @ T & B (U.N.O.)

Footing/Pad: F2 CENTER OF GT#1
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of footing 225 PLF = 150 x 1.00' x 1.50'
Weight of Pad 938 LB = 150 x 2.50' x 2.50' x 1.00'
WALL_E 135 PLF = 9.00' x 15.00 from 0.00' to 1.00'
Point from Support 2 of Beam GT#1 (6757 LB)

Total Weight(W_{total}) = 360 PLF Total Point Load(P_{Total}) = 7694 LB
Footing Width(B_f) Required: 2.88" = (W_{total} / SB) = 360/1500 x 12

USE 12" Wide x 12" Deep Continuous Footing #4 Cont. @ T & B (U.N.O.)
S = 3.50" + 2 x 18" = 39.50" Width 12"
Capacity of Point Load on Footing(P_{cap}) = (SB x S x Width)/144 = 4938 LB
Allowable Point Load on Footing(P_{Allow}) = P_{cap} - (W_{total} x S)/12 = 3753 LB
Required Pad Area = P_{total} /SB = 7694 / 1500 = 5.13'
USE 2'-6" SQ x 12" DEEP PAD (4)#4 @ Botom E.W.

Footing/Pad: F3 RIGHT OF GT#4
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of footing 225 PLF = 150 x 1.00' x 1.50'
Weight of Pad 938 LB = 150 x 2.50' x 2.50' x 1.00'
WALL_E 135 PLF = 9.00' x 15.00 from 0.00' to 1.00'
Point from Support 2 of Beam GT#4 (5643 LB)

Total Weight(W_{total}) = 360 PLF Total Point Load(P_{Total}) = 6581 LB
Footing Width(B_f) Required: 2.88" = (W_{total} / SB) = 360/1500 x 12

USE 12" Wide x 12" Deep Continuous Footing #4 Cont. @ T & B (U.N.O.)
S = 3.50" + 2 x 18" = 39.50" Width 12"
Capacity of Point Load on Footing(P_{cap}) = (SB x S x Width)/144 = 4938 LB
Allowable Point Load on Footing(P_{Allow}) = P_{cap} - (W_{total} x S)/12 = 3753 LB
Required Pad Area = P_{total} /SB = 6581 / 1500 = 4.39'
USE 2'-6" SQ x 12" DEEP PAD (4)#4 @ Botom E.W.

DESIGN CRITERIA:

A. Code: 2016 CBC
Wind Exposure: C, Speed = 110mph
Seismic Design Category : D, S_s= 1.50, S_1= 0.63, S_{DS}=1.000, S_{D1}=0.634, R_X =6.5, R_Y =6.5

B. Maximum 19% moisture content
prior to Installation of Finish Material
4X Members: No. 2 or Better
6X, 8X Beams and Headers: No.1 or Better
2X Joists and Rafters: No. 2 or Better
Plates and Blocking: Standard Grade or Better
Studs: Stud Grade or Better
Mud Sills: Pressure Treated Utility Grade or Better
Parallam PSL Beams and Headers: Grade 2.0E DF, F_b= 2900 psi(MIN), F_V= 290 psi(MIN)
Versa-Lam LVL Beams and Headers: Grade 2.0E, F_b= 2900 psi(MIN), F_V= 285 psi(MIN)
TimberStrand LSL Beams and Headers: Grade 1.55E, F_b= 2325 psi(MIN), F_V= 425 psi(MIN)
TimberStrand LSL Rim Board and Headers: Grade 1.3E, F_b= 1700 psi(MIN), F_V= 425 psi(MIN)
Glu-Lam Beams and Headers: 24F-V4, DF/DF, 1.8E, F_b= 2400(T)/1850(B) psi (MIN), F_V= 265 psi(MIN)

C. N/A

EXTERIOR WALL (WALL_E): DL = 15
INTERIOR WALL (WALL_I): DL = 10

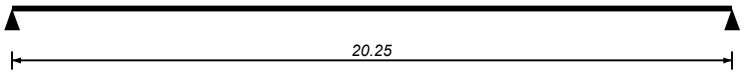
PRIMARY ROOF (ROOF_P)

Pitch:		5
K = Increase for pitch:		1.08/12
Typ. Truss @ 24" O/C	x K	2.60
Plywood(1/2")	x K	1.68
1/2" Gyp. Board		2.20
Conc. Tile	x K	10.83
sprinkler:		1.00
Misc:		1.69
Snow Load:		20.00
Dead Load:		20.00
Live Load:		20.00

BEAM GT#1 : GT @ OVER GARAGE @ 1st Floor

Loads (Downward +)

SELF_WEIGHT *40 plf from 0.00ft to 20.25ft*
ROOF_P *200 PLF = 10.00' x (20.00+20.00)/2 from 0.00' to 20.25'*



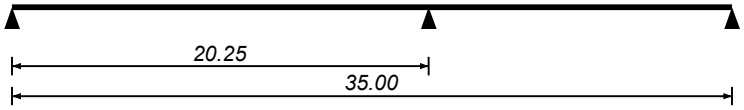
DOWN (D+Lr+L/Max. Comb.)	2379/2430	2379/2430
UP (D+Lr+L/Max. Comb.)	0/0	0/0

***** TRUSS DESIGN BY OTHER *****

BEAM GT#2 : GT @ OVER GARAGE @ 1st Floor

Loads (Downward +)

SELF_WEIGHT *40 plf from 0.00ft to 35.00ft*
ROOF_P *80 PLF = 4.00' x (20.00+20.00)/2 from 0.00' to 20.25'*
ROOF_P *200 PLF = 10.00' x (20.00+20.00)/2 from 20.25' to 35.00'*



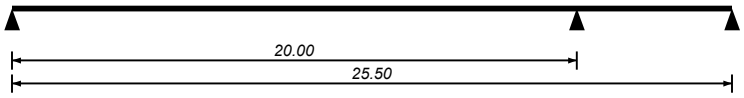
DOWN (D+Lr+L/Max. Comb.)	889/903	3654/3724	1313/1342
UP (D+Lr+L/Max. Comb.)	0/0	0/0	0/0

***** TRUSS DESIGN BY OTHER *****

BEAM GT#3 : GT @ OVER MASTER BED ROOM "@ PL 2C, 2D" @ 1st Floor

Loads (Downward +)

SELF_WEIGHT *30 plf from 0.00ft to 25.50ft*
ROOF_P *200 PLF = 10.00' x (20.00+20.00)/2 from 0.00' to 20.00'*
ROOF_P *160 PLF = 8.00' x (20.00+20.00)/2 from 20.00' to 25.50'*



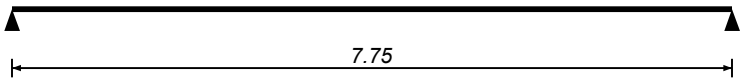
DOWN (D+Lr+L/Max. Comb.)	1801/1841	4842/4949	0/0
UP (D+Lr+L/Max. Comb.)	0/0	0/0	-1120/-1146

***** TRUSS DESIGN BY OTHER *****

BEAM GT#4 : GT @ OVER ENTRY @ 1st Floor

Loads (Downward +)

SELF_WEIGHT *20 plf from 0.00ft to 7.75ft*
ROOF_P *160 PLF = 8.00' x (20.00+20.00)/2 from 0.00' to 7.75'*



DOWN (D+Lr+L/Max. Comb.)	682/698	682/698
UP (D+Lr+L/Max. Comb.)	0/0	0/0

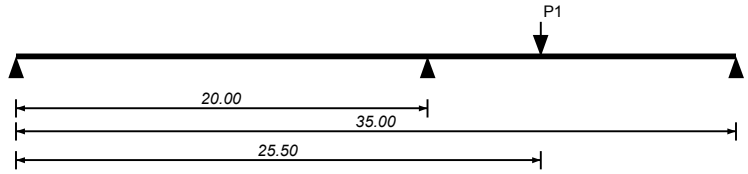
***** TRUSS DESIGN BY OTHER *****

BEAM GT#5 : GT @ OVER BED #4 @ 1st Floor

Loads (Downward +)

SELF_WEIGHT 30 plf from 0.00ft to 35.00ft
ROOF_P 80 PLF = 4.00' x (20.00+20.00)/2 from 0.00' to 25.50'
ROOF_P 200 PLF = 10.00' x (20.00+20.00)/2 from 25.50' to 35.00'
Point from Support 1 of Beam GT#4 @ 25.5ft, (D=388 Lr=295 S=310) (P1)

:Point load Location



DOWN (D+Lr+L/Max. Comb.)	774/788	3388/3457	1411/1443
UP (D+Lr+L/Max. Comb.)	0/0	0/0	0/0

***** TRUSS DESIGN BY OTHER *****

BEAM 1 (DROP): CONT. HDR @ FRONT OF GARAGE @ 1st Floor

Loads (Downward +)

SELF_WEIGHT *16 plf from 0.00ft to 16.25ft*
ROOF_P *200 PLF = 10.00' x (20.00+20.00)/2 from 0.00' to 16.25'*
WALL_E *30 PLF = 2.00' x 15.00 from 0.00' to 16.25'*

Reactions (D+Lr+L/Max. Load comb.)

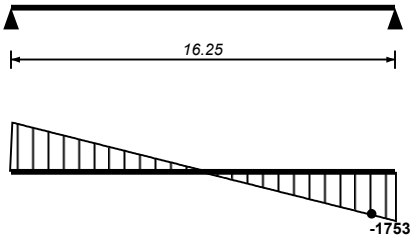
Down	1999/1999	1999/1999
Up	0/0	0/0

USE TIMBERSTRAND 3 1/2"x11 7/8" 1.55E (F_b = 2325, F_v = 310)

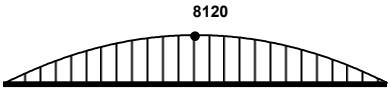
Critical Shear =-1753 LB @ 15.25' 1.5xV/(F'$_v$x A)=0.177
F'$_v$= 357, A = 41.56

Critical Moment =8120 LB-FT @ 8.08' M/(F'$_b$x S)=0.53
F'$_b$= 2218, S = 82.26

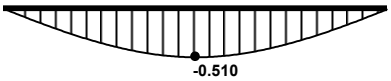
Critical Deflection for TL = -0.510 INCH @ 8.17' L/240 = 0.813"
Critical Deflection for LL = -0.207 INCH @ 8.17' L/480 = 0.406"



Shear Diagragm:D + S



Moment Diagragm:D + S



Deflection Diagram:D + S

BEAM 2 (DROP): HDR @ FRONT OF MASTER BED ROOM @ 1st Floor

Loads (Downward +)

SELF_WEIGHT *7 plf from 0.00ft to 8.25ft*
ROOF_P *200 PLF = 10.00' x (20.00+20.00)/2 from 0.00' to 8.25'*
WALL_E *30 PLF = 2.00' x 15.00 from 0.00' to 8.25'*

Reactions (D+Lr+L/Max. Load comb.)

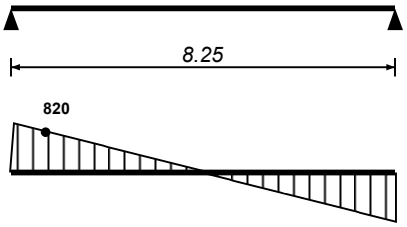
Down	978/978	978/978
Up	0/0	0/0

USE DFL NO2 4 x 8 (F_b = 900, F_v = 180)

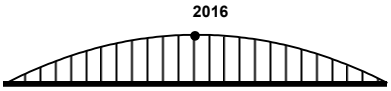
Critical Shear =820 LB @ 0.67' 1.5xV/(F'$_v$x A)=0.234
F'$_v$= 207, A = 25.38

Critical Moment =2016 LB-FT @ 4.17' M/(F'$_b$x S)=0.59
F'$_b$= 1328, S = 30.66

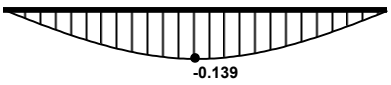
Critical Deflection for TL = -0.139 INCH @ 4.08' L/240 = 0.413"
Critical Deflection for LL = -0.059 INCH @ 4.08' L/480 = 0.206"



Shear Diagragm:D + S

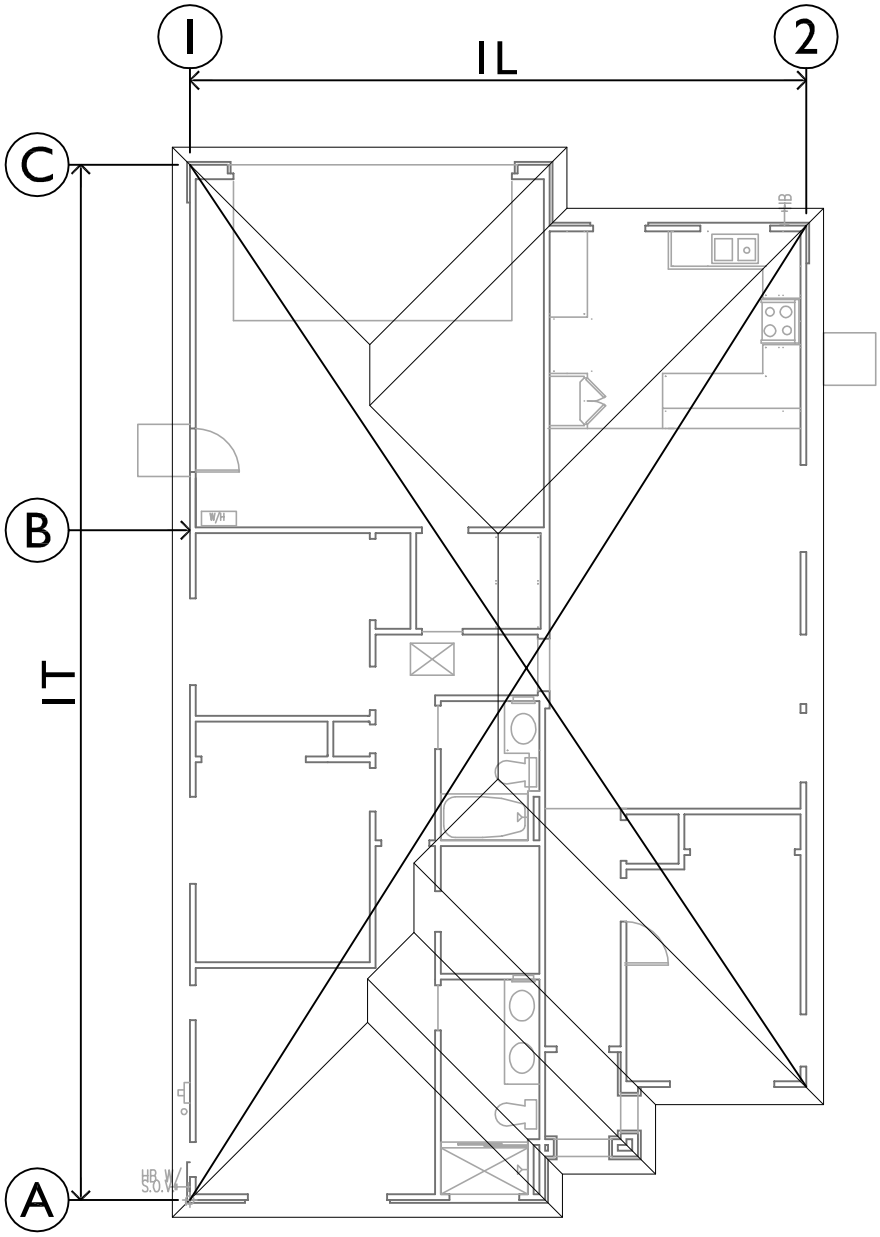


Moment Diagragm:D + S



Deflection Diagram:D + S

GOUVISengineering
consulting group, inc.



SHEAR WALL LAYOUT

PLAN 2

SECTION 1 - DIRECTION L

BLDG DIMENSION (FT): BASE HT = 0.5 HEIGHT = 14.0 B = 35.5 L = 56.0
SECTION DIMENSION (FT): BASE HT = 0.5 HEIGHT = 16.0 WIDTH = 35.0 DEPTH = 56.0
PLATE HT.: 1-FLR = 10.0'
ASCE 7-10 DIRECTIONAL PROCEDURE
WIND PARAMETERS: WIND SPEED = 110MPH WIND EXPOSURE = C
COEFFICENTS: K_d=0.85, K_{zt}= 1.00, G = 0.85, G_{Cpi}= ±0.18, ω = 1.00, q_h = 22.35PSF
INTERPOLATION: L/B => YES, h/L => YES, θ => YES

WIND HEIGHT (FT):	15	20	25	30	40	50
WALL PRESSURE ωP (PSF):	22.5	23.45	24.23	24.89	25.99	26.89
ROOF ELEMENT	WDIR+	WDIR-	OWDIR+	OWDIR-	UDIR+	UDIR-
Gable W=35' L=28' Windward	61.46	105.72	62.3	18.05	16975	9090
Gable W=35' L=28' LeeWard	62.3	18.05	61.46	105.72	16975	9090
Over Hang W=35.5' L=2'	0	0	0	0	1079	1079

WIND LOAD: ROOF = 141.77 = 0.6 x 236.29 PLF (MAX.) UPLIFT AVE. = 10.72 PSF
MAX TOTAL = 141.77 PLF

SEISMIC PARAMETERS: S_s= 1.50 S_1= 0.63 F_a= 1.00 F_v= 1.50
R_y=6.50 SITE CLASS:D S_{DS}=2F_a S_s/3 =1.000 S_{D1}=2F_v S_1 /3 =0.634 S_{DC}=D I_e=1.00 k =1.00
V= S_{DS}x I x W / 1.4 x R= 0.1099W

ROOF:	DL ROOF =	20.00 x 2170.00 / 35.00 =	1240.00 PLF
	DL EXT WALL =	15.00 x 70.00 x 5.00 / 35.00 =	150.00 PLF
	DL INT WALL =	10.00 x 70.00 x 5.00 / 35.00 =	100.00 PLF
	SHEAR =	0.1099 x (1240.00 + 150.00 + 100.00) =	163.75 PLF

SHEAR ROOF= 163.75 x 1490.00 x 10.0 / 14900 = 163.75 PLF (212.86 PLF(1))
ROOF: 163.75 PLF SEISMIC GOVERN
ROOF DIAPHRAGM: V = 212.86 PLF ALIGN
MAX SHEAR= 212.86 x 35.00 / (2 x 56.00) = 66.52 PLF
USE: 15/32" CDX RATED UNBLOCKED 32/16 w/8d COMMON NAILS AT 6", 6", 12" O.C.
CHORD FORCE= 212.86 x 35.00 ² / (8 x 56.00) = 582.03 LBS
SPLICE W/ MIN. (5) 16d SINKER NAILS EACH SIDE OF SPLICE AT 8" O.C. (STANDARD CONSTRUCTION)

SECTION 1 - DIRECTION T

BLDG DIMENSION (FT): BASE HT = 0.5 HEIGHT = 14.0 B = 35.5 L = 56.0
SECTION DIMENSION (FT): BASE HT = 0.5 HEIGHT = 17.5 WIDTH = 56.0 DEPTH = 35.0
PLATE HT.: 1-FLR = 10.0'
ASCE 7-10 DIRECTIONAL PROCEDURE
WIND PARAMETERS: WIND SPEED = 110MPH WIND EXPOSURE = C
COEFFICENTS: K_d=0.85, K_{zt}= 1.00, G = 0.85, G_{Cpi}= ±0.18, ω = 1.00, q_h = 22.35PSF
INTERPOLATION: L/B => YES, h/L => YES, θ => YES

WIND HEIGHT (FT):	15	20	25	30	40	50
WALL PRESSURE ωP (PSF):	24.7	25.65	26.42	27.09	28.18	29.08
ROOF ELEMENT	WDIR+	WDIR-	OWDIR+	OWDIR-	UDIR+	UDIR-
Hip Roof W=56' L=17.5' Windward	-7.04	49.29	107.95	51.63	9733	1847
Hip Roof W=56' L=17.5' LeeWard	107.95	51.63	-7.04	49.29	9733	1847
Over Hang W=56' L=2'	0	0	0	0	1702	1702

WIND LOAD: ROOF = 134.64 = 0.6 x 224.40 PLF (MAX.) UPLIFT AVE. = 6.48 PSF
MAX TOTAL = 134.64 PLF

SEISMIC PARAMETERS: S_s= 1.50 S_1= 0.63 F_a= 1.00 F_v= 1.50
R_x=6.50 SITE CLASS:D S_{DS}=2F_a S_s/3 =1.000 S_{D1}=2F_v S_1 /3 =0.634 S_{DC}=D I_e=1.00 k =1.00
V= S_{DS}x I x W / 1.4 x R= 0.1099W

ROOF:	DL ROOF =	20.00 x 2170.00 / 56.00 =	775.00 PLF
	DL EXT WALL =	15.00 x 112.00 x 5.00 / 56.00 =	150.00 PLF
	DL INT WALL =	10.00 x 56.00 x 5.00 / 56.00 =	50.00 PLF
	SHEAR =	0.1099 x (775.00 + 150.00 + 50.00) =	107.15 PLF

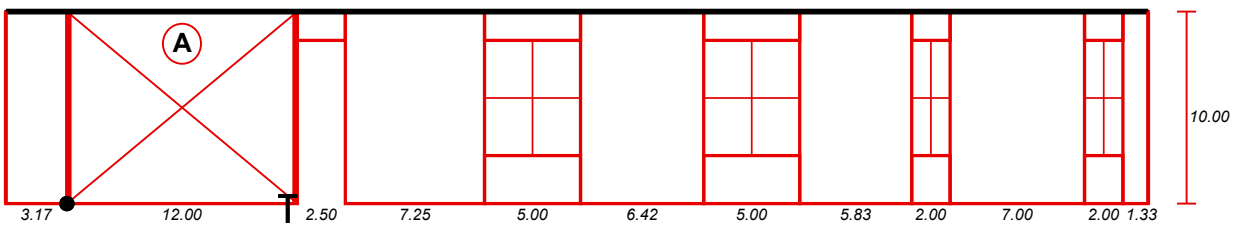
SHEAR ROOF= 107.15 x 975.00 x 10.0 / 9750 = 107.15 PLF (139.29 PLF(1))
ROOF: 134.64 PLF WIND GOVERN
ROOF DIAPHRAGM: V = 139.29 PLF ALIGN
MAX SHEAR= 139.29 x 32.00 / (2 x 35.00) = 63.67 PLF
USE: 15/32" CDX RATED UNBLOCKED 32/16 w/8d COMMON NAILS AT 6", 6", 12" O.C.
CHORD FORCE= 139.29 x 32.00 ² / (8 x 35.00) = 509.39 LBS
SPLICE W/ MIN. (5) 16d SINKER NAILS EACH SIDE OF SPLICE AT 8" O.C. (STANDARD CONSTRUCTION)

(1) Load from Diaphragm Only

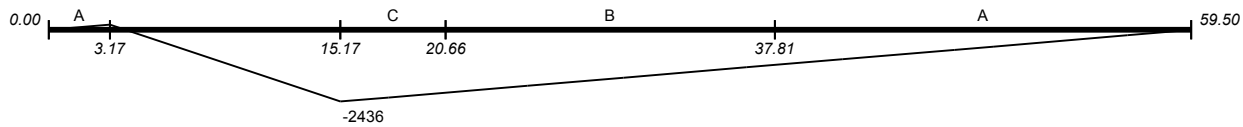
1L_ROOF
35.00ft

Wind: 2481
Seismic: 2866

Wind: 2481(LB)
Seismic: 3269(LB) = 2866 + 404



● Strap (E) T Hold down



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice
B: Simpson ST6224 (2134LB) ALT (16) #16 sinker per top plate splice
C: Simpson ST6236 (3230LB) ALT (22) #16 sinker per top plate splice

Design Analysis

WALL 1 1st Floor @ ON GRID 1
Exterior Direction: L Location:(0.00,59.50) **(ρ = 1.0)**
Total Length = 59.50 ft Total panel Length = 12.00ft (Net Length= 12.00ft)
Shear Diaphragm = 3269 / 59.50 = 55 plf
Use (8 A35) or (6 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule
Design Wall Shears = 3269 / 12.00 = 272 plf (Flexible) Max. Drag = 2436 lbs
Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 1.322" ≤ 0.020 x 120.00 = 2.400 "

Use TYPE 2
Design Report:
Loads:
Wall 150.00 plf = 15 x 10.00'

Overturn Analysis Uplift(T) Down(C)
Panel A b = 12.00 h = 10.00

Left Side:	T = 2341 LB	C = 2895 LB	STHD10/4x4
Right Side:	T = 2393 LB	C = 2895 LB	HTT5/4x4 (*) (I) w/ DBL BLK'G

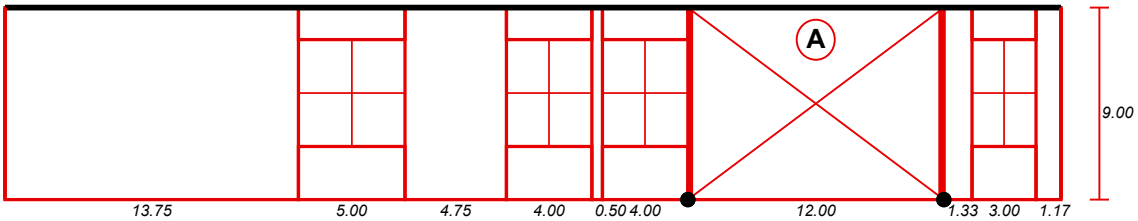
Use STHD10/4x4 @ L. and Use HTT5/4x4 (I) @ R.
w/ (3) 5/8" x 12" Anchor Bolt (@ 64" O.C. max)

* User refered
(I) Hold down Inside of panel
(O) Hold down Outside of panel

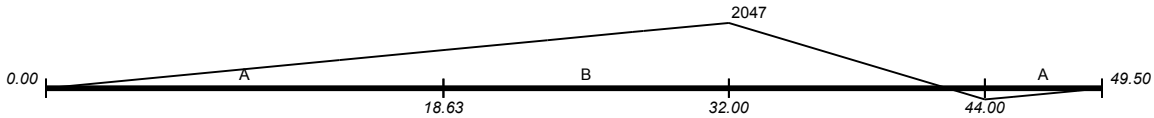
1L_ROOF
35.00ft

Wind: 2481
Seismic: 2866

Wind: 2481(LB)
Seismic: 3167(LB) = 2866 + 301



- Strap (E)



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice
B: Simpson ST6224 (2134LB) ALT (16) #16 sinker per top plate splice

Design Analysis

WALL 2 1st Floor @ ON GRID 2
Exterior Direction: L Location:(35.42,56.00) **(ρ = 1.0)**
Total Length = 49.50 ft Total panel Length = 12.00ft (Net Length= 12.00ft)
Shear Diaphragm = 3167 / 49.50 = 64 plf
Use (8 A35) or (6 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule
Design Wall Shears = 3167 / 12.00 = 264 plf (Flexible) Max. Drag = 2047 lbs
Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 1.103" ≤ 0.020 x 108.00 = 2.160 "

Use TYPE 2
Design Report:
Loads:
Wall 135.00 plf = 15 x 9.00'

Overturn Analysis Uplift(T) Down(C)
Panel A b = 12.00 h = 9.00

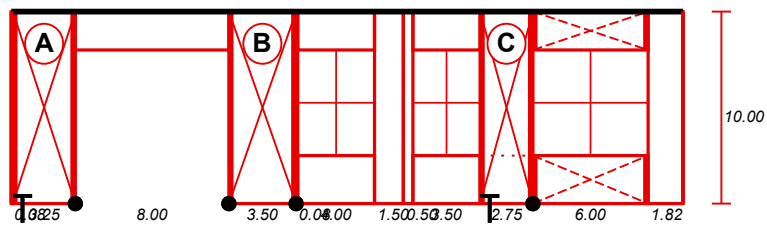
Left Side:	T = 2030 LB	C = 2527 LB	STHD10/4x4
Right Side:	T = 2030 LB	C = 2527 LB	STHD10/4x4

Use STHD10/4x4 on both ends
w/ (3) 5/8" x 12" Anchor Bolt (@ 64" O.C. max)

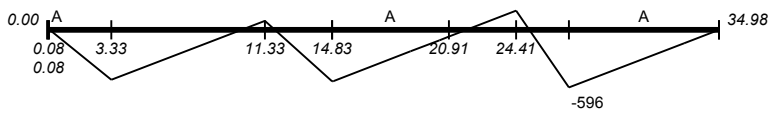
1T_ROOF
35.00ft

Wind: 2356
Seismic: 1875

Wind: 2356(LB)
*Seismic: 2664(LB) = 1.3 * (1875 + 174)*



● Strap (E) T Hold down Blocked panel use TYPE 3



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice

Design Analysis

WALL A 1st Floor @ ON GRID A

Exterior Direction: T Location:(0.00,0.00) **(ρ = 1.3)**

Total Length = 34.98 ft Total panel Length = 9.50ft (Net Length= 7.31ft)

Shear Diaphragm = 2664 / 34.98 = 76 plf

Use (8 A35) or (6 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule

Design Wall Shears = 2664 / 7.31 = 364 plf (Flexible) Max. Drag = 596 lbs

Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 1.887" ≤ 0.020 x 120.00 = 2.400 "

Use TYPE 3 *

Design Report:

Loads:

Wall 150.00 plf = 15 x 10.00'

Overturn Analysis Uplift(T) Down(C)

Panel A b = 3.25 h = 10.00

Left Side:	T = 2575 LB	C = 2712 LB	HTT5/4x4 (*) (I) w/ DBL BLK'G
Right Side:	T = 2363 LB	C = 2712 LB	STHD10/4x4

Use HTT5/4x4 (I) @ L. and Use STHD10/4x4 @ R.

w/ (2) 5/8" x 12" Anchor Bolt (@ 24" O.C. max)

Panel B b = 3.50 h = 10.00

Left Side:	T = 2536 LB	C = 2891 LB	STHD10/4x4
Right Side:	T = 2536 LB	C = 2891 LB	STHD10/4x4

Use STHD10/4x4 on both ends

w/ (2) 5/8" x 12" Anchor Bolt (@ 24" O.C. max)

Panel C b = 2.75 h = 10.00

Left Side:	T = 4155 LB	C = 4188 LB	HTT5/4x4 (*) (I) w/ DBL BLK'G
Right Side:	T = 3748 LB	C = 4188 LB	STHD14/4x4

Blocked with Header

Use HTT5/4x4 (I) @ L. and Use STHD14/4x4 @ R.

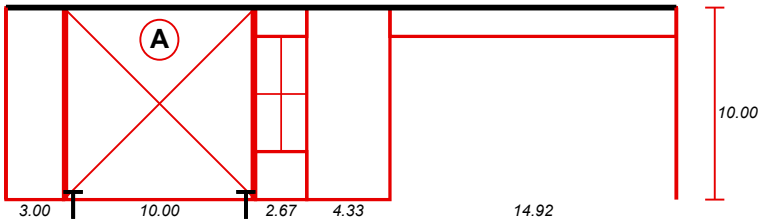
w/ (2) 5/8" x 12" Anchor Bolt (@ 16" O.C. max)

* User refered
(I) Hold down Inside of panel
(O) Hold down Outside of panel
Reduce shear capacity per Section SDPWS 4.3.4.2

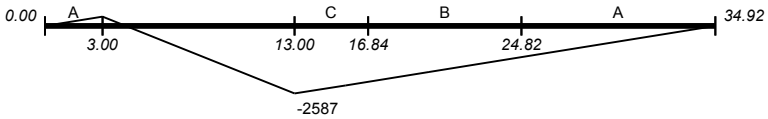
1T_ROOF
56.00ft

Wind: 3770
Seismic: 3000

Wind: 3770(LB)
*Seismic: 4121(LB) = 1.3 * (3000 + 170)*



T Hold down



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice
B: Simpson ST6224 (2134LB) ALT (16) #16 sinker per top plate splice
C: Simpson ST6236 (3230LB) ALT (22) #16 sinker per top plate splice

Design Analysis

WALL B 1st Floor @ ON GRID B
Exterior Direction: T Location:(0.33,38.67) **(ρ = 1.3)**
Total Length = 34.92 ft Total panel Length = 10.00ft (Net Length= 10.00ft)
Shear Diaphragm = 4121 / 34.92 = 118 plf
Use (10 A35) or (7 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule
Design Wall Shears = 4121 / 10.00 = 412 plf (Flexible) Max. Drag = 2587 lbs
Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 1.193" ≤ 0.020 x 120.00 = 2.400 "

Use TYPE 3 *
Design Report:
Loads:
Wall 150.00 plf = 15 x 10.00'

Overturn Analysis Uplift(T) Down(C)
Panel A b = 10.00 h = 10.00

Left Side:	T = 3936 LB	C = 4348 LB	HTT5/4x4(I) w/ DBL BLK'G
Right Side:	T = 3936 LB	C = 4348 LB	HTT5/4x4(I) w/ DBL BLK'G

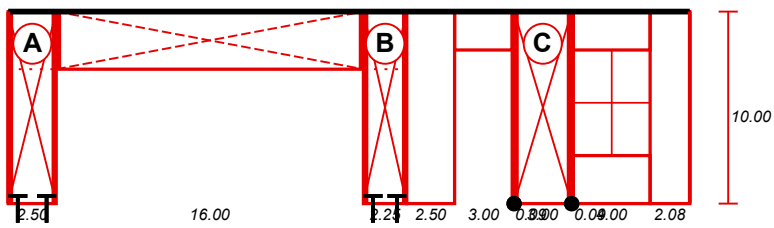
Use HTT5/4x4 (I) on both ends
w/ (4) 5/8" x 12" Anchor Bolt (@ 32" O.C. max)

* User refered
(I) Hold down Inside of panel
(O) Hold down Outside of panel

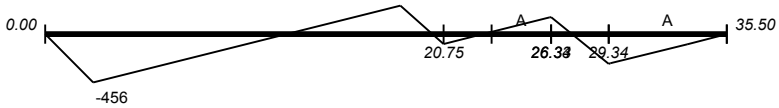
1T_ROOF
20.00ft

Wind: 1346
Seismic: 1072

Wind: 1346(LB)
*Seismic: 1604(LB) = 1.3 * (1072 + 162)*



● Strap (E) T Hold down ⊠ Blocked panel use TYPE 3



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice

Design Analysis

WALL C 1st Floor @ ON GRID C

Exterior Direction: T Location:(0.33,58.67) **(ρ = 1.3)**

Total Length = 35.50 ft Total panel Length = 7.75ft (Net Length= 5.03ft)

Shear Diaphragm = 1604 / 35.50 = 45 plf

Use (6 A35) or (6 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule

Design Wall Shears = 1604 / 5.03 = 319 plf (Flexible) Max. Drag = 582 lbs

Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 1.596" ≤ 0.020 x 120.00 = 2.400 "

Use TYPE 3 *

Design Report:

Loads:

Wall 150.00 plf = 15 x 10.00'

Overturn Analysis Uplift(T) Down(C)

Panel A b = 2.50 h = 10.00

Left Side:	T = 2610 LB	C = 2691 LB	HTT5/4x4 (*) (I) w/ DBL BLK'G	
Right Side:	T = 2610 LB	C = 2691 LB	HTT5/4x4 (*) (I) w/ DBL BLK'G	

Blocked with Header

Use HTT5/4x4 (I) on both ends

w/ (2) 5/8" x 12" Anchor Bolt (@ 16" O.C. max)

Panel B b = 2.25 h = 10.00

Left Side:	T = 2400 LB	C = 2469 LB	HTT5/4x4 (*) (I) w/ DBL BLK'G
Right Side:	T = 2400 LB	C = 2469 LB	HTT5/4x4 (*) (I) w/ DBL BLK'G

Blocked with Header

Use HTT5/4x4 (I) on both ends

w/ (2) 5/8" x 12" Anchor Bolt (@ 12" O.C. max)

Panel C b = 3.00 h = 10.00

Left Side:	T = 1902 LB	C = 2229 LB	STHD10/4x4
Right Side:	T = 1902 LB	C = 2229 LB	STHD10/4x4

Use STHD10/4x4 on both ends

w/ (2) 5/8" x 12" Anchor Bolt (@ 24" O.C. max)

* User refered
(I) Hold down Inside of panel
(O) Hold down Outside of panel
Reduce shear capacity per Section SDPWS 4.3.4.2

Footing/Pad: F1 TYP. CONT. FOOTING
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of footing 225 PLF = 150 x 1.00' x 1.50'
ROOF_P 740 PLF = 37.00' x (20.00+20.00)/2 from 0.00' to 1.00'
WALL_E 135 PLF = 9.00' x 15.00 from 0.00' to 1.00'

Total Weight(W_{total}) = 1470 PLF
Footing Width(B_f) Required: 11.76" = (W_{total} / SB) = 1470/1500 x 12

USE 12" Wide x 12" Deep Continuous Footing #4 Cont. @ T & B (U.N.O.)

Footing/Pad: F2 CENTER OF GT#2
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of footing 225 PLF = 150 x 1.00' x 1.50'
Weight of Pad 600 LB = 150 x 2.00' x 2.00' x 1.00'
WALL_I 90 PLF = 9.00' x 10.00 from 0.00' to 1.00'
Point from Support 2 of Beam GT#2 (5069 LB)

Total Weight(W_{total}) = 315 PLF Total Point Load(P_{Total}) = 5669 LB
Footing Width(B_f) Required: 2.52" = (W_{total} / SB) = 315/1500 x 12

USE 12" Wide x 12" Deep Continuous Footing #4 Cont. @ T & B (U.N.O.)
S = 3.50" + 2 x 18" = 39.50" Width 12"
Capacity of Point Load on Footing(P_{cap}) = (SB x S x Width)/144 = 4938 LB
Allowable Point Load on Footing(P_{Allow}) = P_{cap} - (W_{total} x S)/12 = 3901 LB
Required Pad Area = P_{total} /SB = 5669 / 1500 = 3.78'
USE 2'-0" SQ x 12" DEEP PAD (3)#4 @ Botom E.W.

Footing/Pad: F3 CENTER OF GT#5
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of footing 225 PLF = 150 x 1.00' x 1.50'
Weight of Pad 600 LB = 150 x 2.00' x 2.00' x 1.00'
WALL_I 90 PLF = 9.00' x 10.00 from 0.00' to 1.00'
Point from Support 2 of Beam GT#5 (4753 LB)

Total Weight(W_{total}) = 315 PLF Total Point Load(P_{Total}) = 5353 LB
Footing Width(B_f) Required: 2.52" = (W_{total} / SB) = 315/1500 x 12

USE 12" Wide x 12" Deep Continuous Footing #4 Cont. @ T & B (U.N.O.)
S = 3.50" + 2 x 18" = 39.50" Width 12"
Capacity of Point Load on Footing(P_{cap}) = (SB x S x Width)/144 = 4938 LB
Allowable Point Load on Footing(P_{Allow}) = P_{cap} - (W_{total} x S)/12 = 3901 LB
Required Pad Area = P_{total} /SB = 5353 / 1500 = 3.57'
USE 2'-0" SQ x 12" DEEP PAD (3)#4 @ Botom E.W.

DESIGN CRITERIA:

A. Code: 2016 CBC
Wind Exposure: C, Speed = 110mph
Seismic Design Category : D, S_s= 1.50, S_1= 0.63, S_{DS}=1.000, S_{D1}=0.634, R_X =6.5, R_Y =6.5

B. Maximum 19% moisture content
prior to Installation of Finish Material
4X Members: No. 2 or Better
6X, 8X Beams and Headers: No.1 or Better
2X Joists and Rafters: No. 2 or Better
Plates and Blocking: Standard Grade or Better
Studs: Stud Grade or Better
Mud Sills: Pressure Treated Utility Grade or Better
Parallam PSL Beams and Headers: Grade 2.0E DF, F_b= 2900 psi(MIN), F_V= 290 psi(MIN)
Versa-Lam LVL Beams and Headers: Grade 2.0E, F_b= 2900 psi(MIN), F_V= 285 psi(MIN)
TimberStrand LSL Beams and Headers: Grade 1.55E, F_b= 2325 psi(MIN), F_V= 425 psi(MIN)
TimberStrand LSL Rim Board and Headers: Grade 1.3E, F_b= 1700 psi(MIN), F_V= 425 psi(MIN)
Glu-Lam Beams and Headers: 24F-V4, DF/DF, 1.8E, F_b= 2400(T)/1850(B) psi (MIN), F_V= 265 psi(MIN)

C. N/A

EXTERIOR WALL (WALL_E): DL = 15
INTERIOR WALL (WALL_I): DL = 10

PRIMARY ROOF (ROOF_P)

Pitch:		4
K = Increase for pitch:		1.05/12
Typ. Truss @ 24" O/C	x K	2.53
Plywood(1/2")	x K	1.63
1/2" Gyp. Board		2.20
Conc. Tile	x K	10.54
sprinkler:		1.00
Misc:		2.10
Snow Load:		20.00
Dead Load:		20.00
Live Load:		20.00

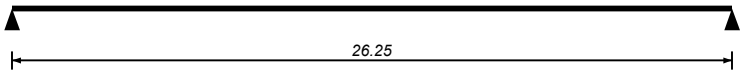
PRIMARY FLOOR (FLOOR_P)

14" TJI/210 @ 19.2" O/C	1.94
Plywood(3/4")	2.25
5/8" Gyp. Board	3.00
Carpet	1.00
None Covering	0.00
sprinkler:	1.00
Misc:	5.81
Dead Load:	15.00
Live Load:	40.00

BEAM GT#1 : GT @ OVER BED #3 @ 2nd Floor

Loads (Downward +)

SELF_WEIGHT *40 plf from 0.00ft to 26.25ft*
ROOF_P *200 PLF = 10.00' x (20.00+20.00)/2 from 0.00' to 26.25'*



DOWN (D+Lr+L/Max. Comb.)	3150/3150	3150/3150
UP (D+Lr+L/Max. Comb.)	0/0	0/0

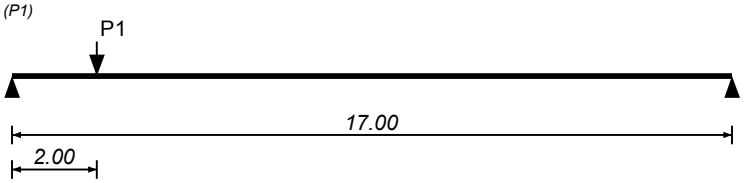
***** TRUSS DESIGN BY OTHER *****

BEAM GT#2 : GT @ OVER LAUNDRY @ 2nd Floor

Loads (Downward +)

SELF_WEIGHT *30 plf from 0.00ft to 17.00ft*
ROOF_P *80 PLF = 4.00' x (20.00+20.00)/2 from 0.00' to 2.00'*
ROOF_P *200 PLF = 10.00' x (20.00+20.00)/2 from 2.00' to 17.00'*
Point from Support 1 of Beam 1 @ 2ft, (D=438 Lr=339 S=339) (P1)

:Point load Location



DOWN (D+Lr+L/Max. Comb.)	2415/2415	2032/2032
UP (D+Lr+L/Max. Comb.)	0/0	0/0

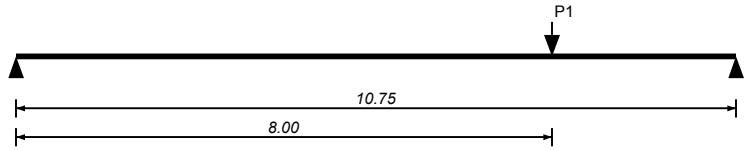
***** TRUSS DESIGN BY OTHER *****

BEAM GT#3 : GT @ OVER BED #3 @ 2nd Floor

Loads (Downward +)

SELF_WEIGHT 20 plf from 0.00ft to 10.75ft
ROOF_P 80 PLF = 4.00' x (20.00+20.00)/2 from 0.00' to 8.00'
ROOF_P 560 PLF = 28.00' x (20.00+20.00)/2 from 8.00' to 10.75'
Point from Support 2 of Beam GT#1 @ 8ft, (D=1838 Lr=1313 S=1313) (P1)

:Point load Location



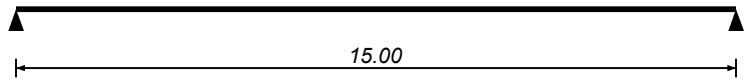
DOWN (D+Lr+L/Max. Comb.)	1512/1512	4033/4033
UP (D+Lr+L/Max. Comb.)	0/0	0/0

***** TRUSS DESIGN BY OTHER *****

BEAM GT#4 : GT @ OVER MASTER BED ROOM @ 2nd Floor

Loads (Downward +)

SELF_WEIGHT 30 plf from 0.00ft to 15.00ft
ROOF_P 200 PLF = 10.00' x (20.00+20.00)/2 from 0.00' to 15.00'



DOWN (D+Lr+L/Max. Comb.)	1725/1725	1725/1725
UP (D+Lr+L/Max. Comb.)	0/0	0/0

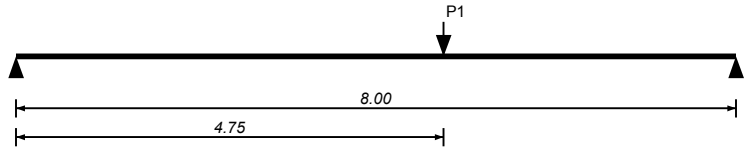
***** TRUSS DESIGN BY OTHER *****

BEAM GT#5 : GT @ LEFT OF MASTER BED ROOM @ 2nd Floor

Loads (Downward +)

SELF_WEIGHT 20 plf from 0.00ft to 8.00ft
ROOF_P 340 PLF = 17.00' x (20.00+20.00)/2 from 0.00' to 4.75'
ROOF_P 80 PLF = 4.00' x (20.00+20.00)/2 from 4.75' to 8.00'
Point from Support 1 of Beam GT#4 @ 4.75ft, (D=975 Lr=750 S=750) (P1)

:Point load Location



DOWN (D+Lr+L/Max. Comb.)	1969/1969	1791/1791
UP (D+Lr+L/Max. Comb.)	0/0	0/0

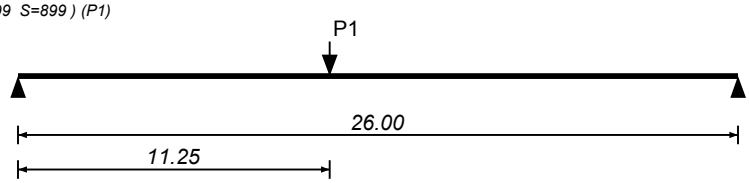
***** TRUSS DESIGN BY OTHER *****

BEAM GT#6 : GT @ OVER MASTER BATH ROOM @ 2nd Floor

Loads (Downward +)

SELF_WEIGHT 40 plf from 0.00ft to 26.00ft
ROOF_P 200 PLF = 10.00' x (20.00+20.00)/2 from 0.00' to 11.25'
ROOF_P 80 PLF = 4.00' x (20.00+20.00)/2 from 11.25' to 26.00'
Point from Support 1 of Beam GT#5 @ 11.25ft, (D=1070 Lr=899 S=899) (P1)

:Point load Location



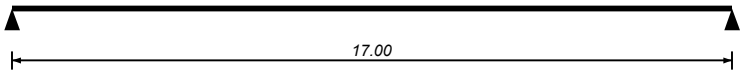
DOWN (D+Lr+L/Max. Comb.)	3735/3735	2704/2704
UP (D+Lr+L/Max. Comb.)	0/0	0/0

***** TRUSS DESIGN BY OTHER *****

BEAM GT#7 : GT @ OVER BED #2 @ PLAN B @ 2nd Floor

Loads (Downward +)

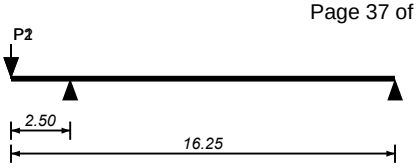
SELF_WEIGHT *30 plf from 0.00ft to 17.00ft*
ROOF_P *200 PLF = 10.00' x (20.00+20.00)/2 from 0.00' to 17.00'*



DOWN (D+Lr+L/Max. Comb.)	1955/1955	1955/1955
UP (D+Lr+L/Max. Comb.)	0/0	0/0

***** TRUSS DESIGN BY OTHER *****

BEAM F1 (J/R): CANT. JOIST @ OVER BED #5 @ 1st Floor



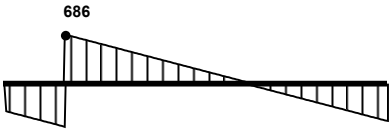
Loads (Downward +)

ROOF_P @ 0.00' (DL= 160, Lr= 160, LL= 0, SN= 160) (P1)
WALL_E @ 0.00' (DL= 216, Lr= 0, LL= 0, SN= 0) (P2)
FLOOR_P 88 PLF = 3.20' x (15.00+40.00)/2 from 0.00' to 16.25'

:Point load Location

Reactions (D+Lr+L/Max. Load comb.)

Down	1478/1289	488/517
Up	0/0	0/0

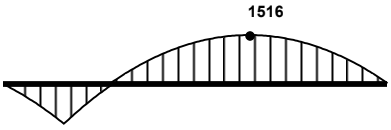


Shear Diagragm:D + L

USE 14" TJI 210 @ 19.2" O.C.

or 14" LPI 32 PLUS
or 14" BCI 6000-1.8
or 14" RFPI-400

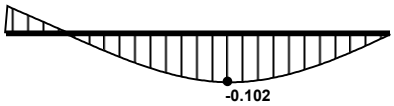
Critical Shear =686 LB @ 2.58' V/(F'$_v$x A)=0.408
F'$_v$= 58, A = 28.88



Moment Diagragm:D + L

Critical Moment =1516 LB-FT @ 10.42' M/(F'$_b$x S)=0.34
F'$_b$= 800, S = 67.39

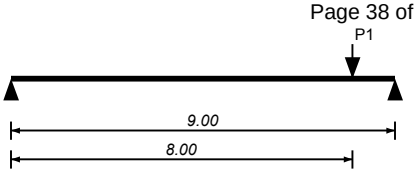
Critical Deflection for TL = -0.100 INCH @ 9.75' L/360 = 0.458"
Critical Deflection for LL = -0.103 INCH @ 9.42' L/540 = 0.306"



Deflection Diagram:L

Critical Reaction = 1289 LB @ 2.50 ft
Reaction Ratio = 0.601

BEAM 1 (DROP): CL'G BM @ OVER BATH #2 @ 2nd Floor



Loads (Downward +)

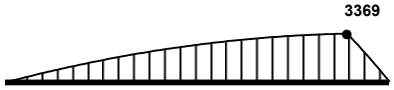
SELF_WEIGHT 9 plf from 0.00ft to 9.00ft
ROOF_P 80 PLF = 4.00' x (20.00+20.00)/2 from 0.00' to 8.00'
ROOF_P 560 PLF = 28.00' x (20.00+20.00)/2 from 8.00' to 9.00'
Point from Support 1 of Beam GT#1 @ 8ft, (D=1838 Lr=1313 S=1313) (P1)
:Point load Location

Reactions (D+Lr+L/Max. Load comb.)

Down	777/777	3654/3654
Up	0/0	0/0

Shear Diagragm:D + Lr

w/ HUS48 at support 1 (at 0'-0")
w/ 2-2X4 trim at support 2 (at 9'-0")(1)



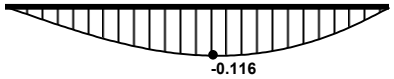
USE DFL NO2 4 x 10 (F_b = 900, F_v = 180)

Critical Shear =-3464 LB @ 8.67' 1.5xV/(F'$_v$x A)=0.713
F'$_v$= 225, A = 32.38

Moment Diagragm:D + Lr

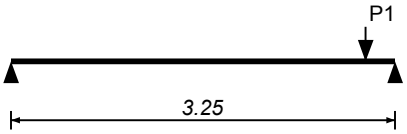
Critical Moment =3369 LB-FT @ 8.00' M/(F'$_b$x S)=0.61
F'$_b$= 1323, S = 49.91

Critical Deflection for TL = -0.116 INCH @ 4.92' L/240 = 0.450"
Critical Deflection for LL = -0.050 INCH @ 4.92' L/480 = 0.225"



Deflection Diagram:D + Lr

BEAM 2 (DROP): HDR @ RIGHT OF MASTER BED ROOM @ 2nd Floor



Loads (Downward +)

SELF_WEIGHT 6 plf from 0.00ft to 3.25ft
ROOF_P 340 PLF = 17.00' x (20.00+20.00)/2 from 0.00' to 3.00'
ROOF_P 80 PLF = 4.00' x (20.00+20.00)/2 from 3.00' to 3.25'
WALL_E 30 PLF = 2.00' x 15.00 from 0.00' to 3.25'
Point from Support 2 of Beam GT#4 @ 3ft, (D=975 Lr=750 S=750) (P1)
:Point load Location

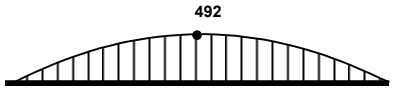
Reactions (D+Lr+L/Max. Load comb.)

Down	608/608	2274/2274
Up	0/0	0/0

Shear Diagragm:D + Lr

USE DFL NO2 4 x 6 (F_b = 900, F_v = 180)

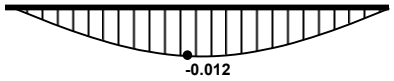
Critical Shear =-488 LB @ 2.92' 1.5xV/(F'$_v$x A)=0.169
F'$_v$= 225, A = 19.25



Critical Moment =492 LB-FT @ 1.58' M/(F'$_b$x S)=0.23
F'$_b$= 1457, S = 17.65

Moment Diagragm:D + Lr

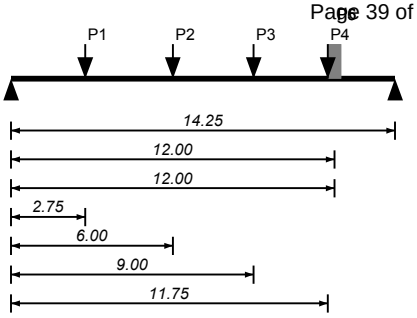
Critical Deflection for TL = -0.012 INCH @ 1.58' L/240 = 0.163"
Critical Deflection for LL = -0.005 INCH @ 1.58' L/480 = 0.081"



Deflection Diagram:D + Lr

(1) selected post do not consider combined axial and out-of-plane bending

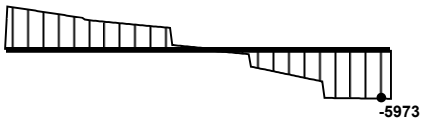
BEAM 3 : FL BM @ OVER GARAGE @ PLAN B @ 1st Floor



Loads (Downward +)

SELF_WEIGHT 28 plf from 0.00ft to 14.25ft
ROOF_P 200 PLF = 10.00' x (20.00+20.00)/2 from 0.00' to 3.00'
ROOF_P 380 PLF = 19.00' x (20.00+20.00)/2 from 9.00' to 11.75'
WALL_E 135 PLF = 9.00' x 15.00 from 0.00' to 11.75'
FLOOR_P 44 PLF = 1.60' x (15.00+40.00)/2 from 0.00' to 14.25'
ROOF_P 140 PLF = 7.00' x (20.00+20.00)/2 from 0.00' to 11.75'
Point from Support 1 of Beam 14 @ 2.75ft, (D=98 Lr=67 S=67) (P1)
Point from Support 2 of Beam 14 @ 6ft, (D=1203 Lr=910 S=910) (P2)
Point from Support 3 of Beam 14 @ 9ft, (D=841 Lr=661 S=661) (P3)
Point from Support 2 of Beam GT#2 @ 11.75ft, (D=1149 Lr=883 S=883) (P4)
SHEARLINE W= 434 E=256 H= 9.00' @ 12 L= 2.67' 2 Right (B) (P5)
SHEARLINE W= 1495 E=1482 H= 9.00' @ 12 L= 5.00' C Left (A) (P6)

:Point load Location
:Shear wall post from above



Shear Diagragm:D + S

Reactions (D+Lr+L/Max. Load comb.)

Down	5500/5272	6215/6458
Up	0/0	0/0

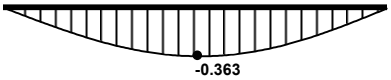
w/ 2-2X6 at support 1 (at 0'-0")(1)
w/ 2-2X6 at support 2 (at 14'-3")(1)

USE PARALLAM 5 1/4" x 14" 2.0E (F_b = 2800, F_v = 285)

Moment Diagragm:D + S

Critical Shear =-5973 LB @ 13.92' 1.5xV/(F'$_v$x A)=0.372
F'$_v$= 328, A = 73.50

Critical Moment =23123 LB-FT @ 7.58' M/(F'$_b$x S)=0.51
F'$_b$= 3165, S = 171.50



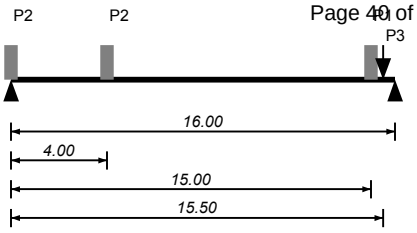
Deflection Diagram:D + S + L

Critical Deflection for TL = -0.363 INCH @ 7.25' L/280 = 0.611"
Critical Deflection for LL = -0.143 INCH @ 7.25' L/480 = 0.356"

** Omega Strength factor Ω = 2.5 is considered but may not a controlling case*

(1) selected post do not consider combined axial and out-of-plane bending

BEAM 4 (DROP): HDR @ REAR OF GARAGE @ 1st Floor



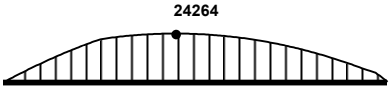
Loads (Downward +)

SELF_WEIGHT 24 plf from 0.00ft to 16.00ft
ROOF_P 80 PLF = 4.00' x (20.00+20.00)/2 from 0.00' to 16.00'
WALL_E 135 PLF = 9.00' x 15.00 from 0.00' to 15.50'
FLOOR_P 385 PLF = 14.00' x (15.00+40.00)/2 from 0.00' to 15.50'
WALL_E 30 PLF = 2.00' x 15.00 from 15.50' to 16.00'
SHEARLINE W= 434 E=256 H= 9.00' @ 15 L= 2.67' 2 Left (A) (P1)
SHEARLINE W= 612 E=568 H= 9.00' @ 0 L= 4.00' D Both (A) (P2)
Point from Support 1 of Beam 3 @ 15.5ft, (D=3398 Lr=1866 S=1873 L=228 W=178 E=218) (P3)
:Point load Location
:Shear wall post from above

Shear Diagragm:D + L

Reactions (D+Lr+L/Max. Load comb.)

Down	5160/5468	10079/9306
Up	0/0	0/0



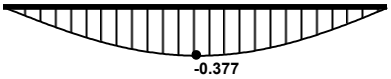
w/ 2-2X4 trim at support 1 (at 0'-0")(1)
w/ 4X8 trim at support 2 (at 16'-0")(1)

USE TIMBERSTRAND 3 1/2"x18" 1.55E (F_b = 2325, F_v = 310)

Moment Diagragm:(1.0 + 0.105xSds)D + 0.75x0.7xΩxE + 0.75(L + S)

Critical Shear =-7913 LB @ 15.67' 1.5xV/(F'$_v$x A)=0.608
F'$_v$= 310, A = 63.00

Critical Moment =24264 LB-FT @ 7.17' M/(F'$_b$x S)=0.91
F'$_b$= 1701, S = 189.00

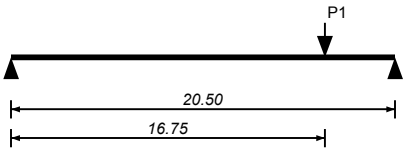


Critical Deflection for TL = -0.377 INCH @ 8.08' L/280 = 0.686"
Critical Deflection for LL = -0.190 INCH @ 8.08' L/480 = 0.400"

Deflection Diagram:D + S + L

** Omega Strength factor Ω = 2.5 is considered but may not a controlling case*

BEAM 5 (DROP): DROP BM @ OVER GARAGE @ 1st Floor



Loads (Downward +)

SELF_WEIGHT 30 plf from 0.00ft to 20.50ft
FLOOR_P 564 PLF = 20.50' x (15.00+40.00)/2 from 0.00' to 16.75'
from Support 1 of F1 From 16.75ft to 20.5ft (P1)
Point from Support 2 of Beam 3 @ 16.75ft, (D=3695 Lr=2286 S=2292 L=228 W=947 E=1165) (P2)
:Point load Location

Shear Diagragm:D + L

Reactions (D+Lr+L/Max. Load comb.)

Down	7257/6798	12330/11415
Up	0/0	0/0

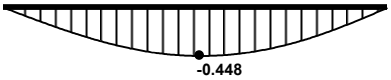
w/ 4X8 trim at support 1 (at 0'-0")(1)
w/ 4X8 trim at support 2 (at 20'-6")(1)

USE GLB 24F-V4 6 3/4" x 16 1/2" (F_b = 2400/1850, F_v = 265)

Critical Shear =-9776 LB @ 20.17' 1.5xV/(F'$_v$x A)=0.497
F'$_v$= 265, A = 111.38

Critical Moment =39508 LB-FT @ 11.58' M/(F'$_b$x S)=0.68
F'$_b$= 2267, S = 306.28

Moment Diagragm:D + L



Critical Deflection for TL = -0.760 INCH @ 10.67' L/280 = 0.879"
Critical Deflection for LL = -0.448 INCH @ 10.50' L/480 = 0.513"

Deflection Diagram:S + L

(1) selected post do not consider combined axial and out-of-plane bending

BEAM 6 : FL BM @ REAR OF BATH #3 @ 1st Floor

Loads (Downward +)

SELF_WEIGHT 10 plf from 0.00ft to 9.00ft
FLOOR_P 88 PLF = 3.20' x (15.00+40.00)/2 from 0.00' to 9.00'

Reactions (D+Lr+L/Max. Load comb.)

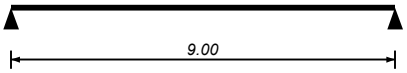
Down	441/441	441/441
Up	0/0	0/0

USE TIMBERSTRAND 1 3/4"x14" 1.55E (F_b = 2325, F_v = 310)

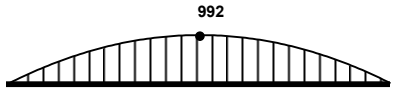
Critical Shear =327 LB @ 1.17' 1.5xV/(F'_vx A)=0.065
F'_v= 310, A = 24.50

Critical Moment =992 LB-FT @ 4.50' M/(F'_bx S)=0.09
F'_b= 2292, S = 57.17

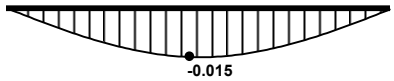
Critical Deflection for TL = -0.023 INCH @ 4.50' L/280 = 0.386"
Critical Deflection for LL = -0.015 INCH @ 4.50' L/480 = 0.225"



Shear Diagragm:D + L



Moment Diagragm:D + L



Deflection Diagram:L

BEAM 7 : CONT. FL BM @ OVER BED #5 @ 1st Floor

Loads (Downward +)

SELF_WEIGHT 19 plf from 0.00ft to 23.50ft
ROOF_P 560 PLF = 28.00' x (20.00+20.00)/2 from 10.75' to 23.50'
WALL_E 135 PLF = 9.00' x 15.00 from 10.75' to 23.50'
FLOOR_P 88 PLF = 3.20' x (15.00+40.00)/2 from 0.00' to 23.50'
Point from Support 2 of Beam GT#3 @ 10.75ft, (D=2266 Lr=1767 S=1767) (P1)
SHEARLINE W= 1900 E=2230 H= 9.00' @ 19.25 L= 8.00' 3 Left (A) (P2)

:Point load Location
:Shear wall post from above

Reactions (D+Lr+L/Max. Load comb.)

Down	1653/1505	12724/12529	1032/1663
Up	0/0	0/0	0/-594

w/ 4X8 at support 2 (at 15'-9")(1)

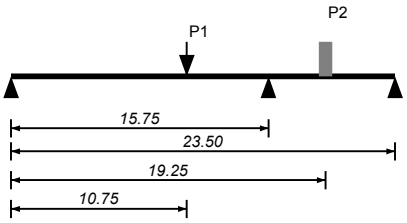
USE TIMBERSTRAND 3 1/2"x14" 1.55E (F_b = 2325, F_v = 310)

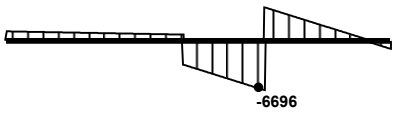
Critical Shear =-6696 LB @ 15.42' 1.5xV/(F'_vx A)=0.575
F'_v= 357, A = 49.00

Critical Moment =-14602 LB-FT @ 15.75' M/(F'_bx S)=0.57
F'_b= 2636, S = 114.33

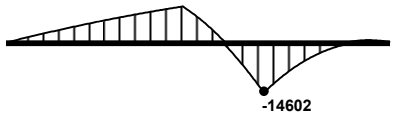
Critical Deflection for TL = -0.324 INCH @ 8.08' L/280 = 0.675"
Critical Deflection for LL = -0.151 INCH @ 8.00' L/480 = 0.394"

** Omega Strength factor Ω = 2.5 is considered but may not a controlling case*

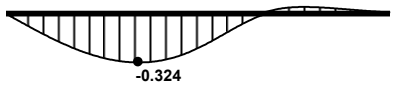




Shear Diagragm:D + S



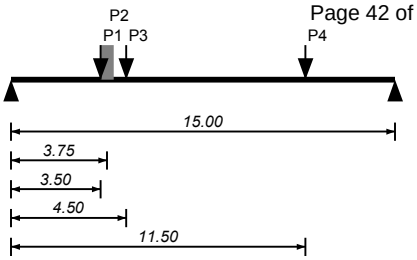
Moment Diagragm:D + S



Deflection Diagram:D + S + L

(1) selected post do not consider combined axial and out-of-plane bending

BEAM 8 : FL BM @ OVER GREAT ROOM @ PLAN D @ 1st Floor



Loads (Downward +)

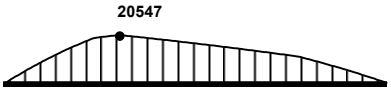
SELF_WEIGHT 28 plf from 0.00ft to 15.00ft
ROOF_P 560 PLF = 28.00' x (20.00+20.00)/2 from 0.00' to 3.50'
ROOF_P 340 PLF = 17.00' x (20.00+20.00)/2 from 3.50' to 4.50'
ROOF_P 80 PLF = 4.00' x (20.00+20.00)/2 from 11.50' to 15.00'
WALL_E 135 PLF = 9.00' x 15.00 from 0.00' to 4.50'
WALL_E 135 PLF = 9.00' x 15.00 from 11.50' to 15.00'
FLOOR_P 88 PLF = 3.20' x (15.00+40.00)/2 from 0.00' to 15.00'
Point from Support 2 of Beam GT#6 @ 3.5ft, (D=1649 Lr=1055 S=1055) (P1)
SHEARLINE W= 1522 E=1660 H= 9.00' @ 3.75 L= 8.00' A Right (B) (P2)
Point from Support 1 of Beam 13 @ 4.5ft, (D=1193 Lr=912 S=912) (P3)
Point from Support 2 of Beam 13 @ 11.5ft, (D=764 Lr=528 S=528) (P4)

:Point load Location
:Shear wall post from above

Shear Diagragm:D + Lr

Reactions (D+Lr+L/Max. Load comb.)

Down	7303/7589	4198/4127
Up	0/0	0/0



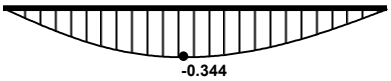
Moment Diagragm:D + Lr

w/ 2-2X6 at support 2 (at 15'-0")(1)

USE PARALLAM 5 1/4" x 14" 2.0E (F_b = 2800, F_v = 285)

Critical Shear =6574 LB @ 0.33' 1.5xV/(F'$_v$x A)=0.377
F'$_v$= 356, A = 73.50

Critical Moment =20547 LB-FT @ 4.50' M/(F'$_b$x S)=0.42
F'$_b$= 3441, S = 171.50

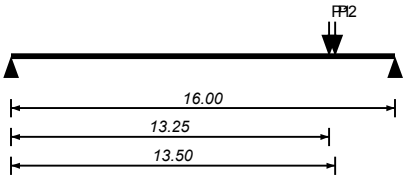


Deflection Diagram:D + Lr + L

Critical Deflection for TL = -0.344 INCH @ 7.08' L/280 = 0.643"
Critical Deflection for LL = -0.145 INCH @ 7.08' L/480 = 0.375"

** Omega Strength factor Ω = 2.5 is considered but may not a controlling case*

BEAM 9 : FL BM @ OVER GREAT ROOM @ 1st Floor



Loads (Downward +)

SELF_WEIGHT 28 plf from 0.00ft to 16.00ft
FLOOR_P 591 PLF = 21.50' x (15.00+40.00)/2 from 0.00' to 16.00'
Point from Support 3 of Beam 7 @ 13.25ft, (D=633 Lr=290 S=343 L=56 W=830 E=974) (P1)
Point from Support 1 of Beam 8 @ 13.5ft, (D=4246 Lr=2577 S=2577 L=480 W=1284 E=1401) (P2)

:Point load Location

Shear Diagragm:D + L

Reactions (D+Lr+L/Max. Load comb.)

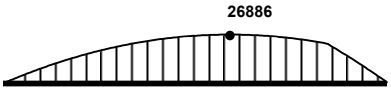
Down	6175/5713	11873/11869
Up	0/0	0/0

w/ 2-2X6 at support 1 (at 0'-0")(1)
w/ 4X6 at support 2 (at 16'-0")(1)

USE PARALLAM 5 1/4" x 14" 2.0E (F_b = 2800, F_v = 285)

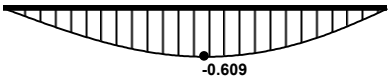
Critical Shear =-9213 LB @ 15.67' 1.5xV/(F'$_v$x A)=0.660
F'$_v$= 285, A = 73.50

Critical Moment =26886 LB-FT @ 9.42' M/(F'$_b$x S)=0.68
F'$_b$= 2752, S = 171.50



Moment Diagragm:D + L

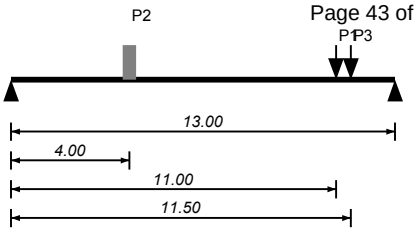
Critical Deflection for TL = -0.609 INCH @ 8.42' L/280 = 0.686"
Critical Deflection for LL = -0.354 INCH @ 8.25' L/480 = 0.400"



Deflection Diagram:D + S + L

(1) selected post do not consider combined axial and out-of-plane bending

BEAM 10 : FL BM @ OVER DINNING ROOM @ 1st Floor



Loads (Downward +)

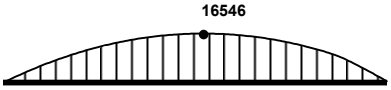
SELF_WEIGHT 19 plf from 0.00ft to 13.00ft
ROOF_P 200 PLF = 10.00' x (20.00+20.00)/2 from 0.00' to 11.50'
WALL_E 135 PLF = 9.00' x 15.00 from 0.00' to 11.50'
FLOOR_P 440 PLF = 16.00' x (15.00+40.00)/2 from 0.00' to 13.00'
ROOF_P 70 PLF = 3.50' x (20.00+20.00)/2 from 0.00' to 11.25'
FLOOR_P 96 PLF = 3.50' x (15.00+40.00)/2 from 11.25' to 13.00'
POINTLOAD @ 11.00' (D=459 Lr=190) (P1)
SHEARLINE W= 676 E=738 H= 9.00' @ 4 L= 4.00' A Right (A) (P2)
Point from Support 2 of Beam GT#5 @ 11.5ft, (D=1002 Lr=789 S=789) (P3)

:Point load Location
:Shear wall post from above

Shear Diagragm:D + L

Reactions (D+Lr+L/Max. Load comb.)

Down	5897/5990	7319/6769
Up	0/0	0/0



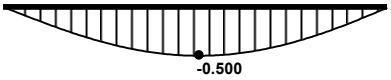
w/ 4X4 at support 1 (at 0'-0")(1)
w/ 3-2X4 at support 2 (at 13'-0")(1)

USE TIMBERSTRAND 3 1/2"x14" 1.55E (F_b = 2325, F_v = 310)

Moment Diagragm:D + L

Critical Shear =-5596 LB @ 12.67' 1.5xV/(F'$_v$x A)=0.553
F'$_v$= 310, A = 49.00

Critical Moment =16546 LB-FT @ 6.75' M/(F'$_b$x S)=0.76
F'$_b$= 2292, S = 114.33

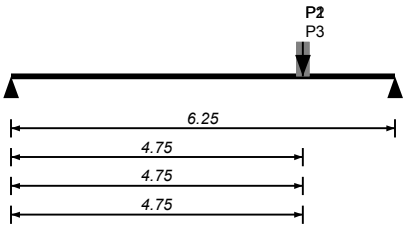


Critical Deflection for TL = -0.500 INCH @ 6.58' L/280 = 0.557"
Critical Deflection for LL = -0.257 INCH @ 6.58' L/480 = 0.325"

Deflection Diagram:D + Lr + L

** Omega Strength factor Ω = 2.5 is considered but may not a controlling case*

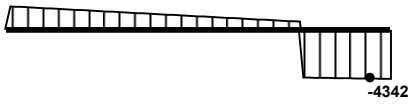
BEAM 11 (DROP): HDR @ LEFT OF DINNING ROOM @ 1st Floor



Loads (Downward +)

SELF_WEIGHT 13 plf from 0.00ft to 6.25ft
ROOF_P 200 PLF = 10.00' x (20.00+20.00)/2 from 0.00' to 4.75'
WALL_E 135 PLF = 9.00' x 15.00 from 0.00' to 4.75'
ROOF_P 80 PLF = 4.00' x (20.00+20.00)/2 from 4.75' to 6.25'
WALL_E 30 PLF = 2.00' x 15.00 from 4.75' to 6.25'
FLOOR_P 44 PLF = 1.60' x (15.00+40.00)/2 from 0.00' to 4.75'
SHEARLINE W= 1315 E=1900 H= 9.00' @ 4.75 L= 8.00' 1 Right (B) (P1)
SHEARLINE W= 676 E=738 H= 9.00' @ 4.75 L= 4.00' A Left (A) (P2)
Point from Support 1 of Beam 10 @ 4.75ft, (D=2823 Lr=985 S=956 L=2088 W=1053 E=1149) (P3)

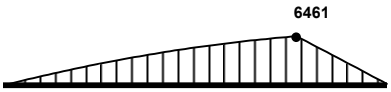
:Point load Location
:Shear wall post from above



Shear Diagragm:D + L

Reactions (D+Lr+L/Max. Load comb.)

Down	2592/2490	5351/5271
Up	0/0	0/0



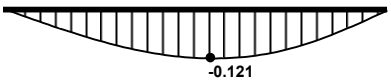
w/ 2-2X4 trim at support 1 (at 0'-0")(1)
w/ 4X4 trim at support 2 (at 6'-3")(1)

USE TIMBERSTRAND 3 1/2"x 9 1/2" 1.55E (F_b = 2325, F_v = 310)

Moment Diagragm:D + L

Critical Shear =-4342 LB @ 5.92' 1.5xV/(F'$_v$x A)=0.632
F'$_v$= 310, A = 33.25

Critical Moment =6461 LB-FT @ 4.75' M/(F'$_b$x S)=0.63
F'$_b$= 2330, S = 52.65



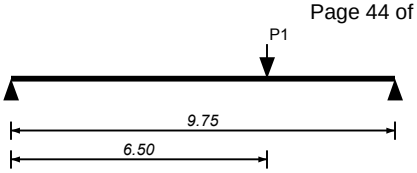
Critical Deflection for TL = -0.121 INCH @ 3.42' L/280 = 0.268"
Critical Deflection for LL = -0.058 INCH @ 3.42' L/480 = 0.156"

Deflection Diagram:D + Lr + L

** Omega Strength factor Ω = 2.5 is considered but may not a controlling case*

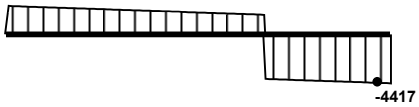
(1) selected post do not consider combined axial and out-of-plane bending

BEAM 12 (DROP): HDR @ RIGHT OF DINNING ROOM @ 1st Floor



Loads (Downward +)

SELF_WEIGHT 16 plf from 0.00ft to 9.75ft
FLOOR_P 88 PLF = 3.20' x (15.00+40.00)/2 from 0.00' to 9.75'
WALL_I 20 PLF = 2.00' x 10.00 from 0.00' to 9.75'
Point from Support 2 of Beam 10 @ 6.5ft, (D=3587 Lr=1537 S=1377 L=2194 W=468 E=511) (P1)
:Point load Location

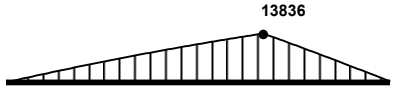


Shear Diagragm:D + L

Reactions (D+Lr+L/Max. Load comb.)

Down	3044/2772	5484/5018
Up	0/0	0/0

w/ 2-2X4 trim at support 1 (at 0'-0")(1)
w/ 4X4 trim at support 2 (at 9'-9")(1)



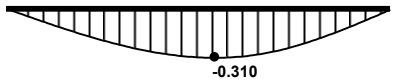
USE TIMBERSTRAND 3 1/2"x11 7/8" 1.55E (F_b = 2325, F_v = 310)

Critical Shear =-4417 LB @ 9.42' 1.5xV/(F'$_v$x A)=0.514
F'$_v$= 310, A = 41.56

Moment Diagragm:D + L

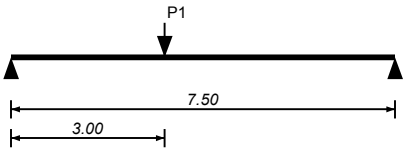
Critical Moment =13836 LB-FT @ 6.50' M/(F'$_b$x S)=0.91
F'$_b$= 2209, S = 82.26

Critical Deflection for TL = -0.310 INCH @ 5.25' L/280 = 0.418"
Critical Deflection for LL = -0.159 INCH @ 5.25' L/480 = 0.244"



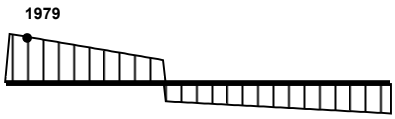
Deflection Diagram:D + Lr + L

BEAM 13 (DROP): HDR @ RIGHT OF MASTER BED ROOM @ PLAN D @ 2nd Floor



Loads (Downward +)

SELF_WEIGHT 9 plf from 0.00ft to 7.50ft
ROOF_P 340 PLF = 17.00' x (20.00+20.00)/2 from 0.00' to 3.00'
ROOF_P 80 PLF = 4.00' x (20.00+20.00)/2 from 3.00' to 7.50'
WALL_E 30 PLF = 2.00' x 15.00 from 0.00' to 7.50'
Point from Support 2 of Beam GT#4 @ 3ft, (D=975 Lr=750 S=750) (P1)
:Point load Location



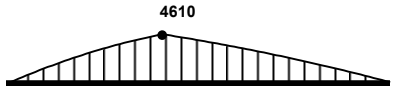
Shear Diagragm:D + Lr

Reactions (D+Lr+L/Max. Load comb.)

Down	2105/2105	1292/1292
Up	0/0	0/0

USE DFL NO2 4 x 10 (F_b = 900, F_v = 180)

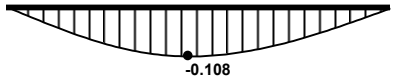
Critical Shear =1979 LB @ 0.33' 1.5xV/(F'$_v$x A)=0.407
F'$_v$= 225, A = 32.38



Critical Moment =4610 LB-FT @ 3.00' M/(F'$_b$x S)=0.83
F'$_b$= 1328, S = 49.91

Moment Diagragm:D + Lr

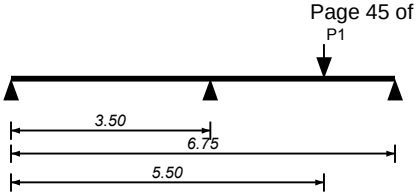
Critical Deflection for TL = -0.107 INCH @ 3.58' L/240 = 0.375"
Critical Deflection for LL = -0.046 INCH @ 3.50' L/480 = 0.188"



Deflection Diagram:D + Lr

(1) selected post do not consider combined axial and out-of-plane bending

BEAM 14 (DROP): CONT. HDR @ RIGHT OF BED #2 @ PLAN B @ 2nd Floor

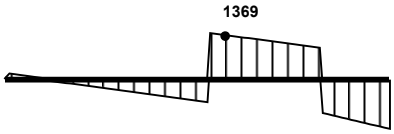


Loads (Downward +)

SELF_WEIGHT 7 plf from 0.00ft to 6.75ft
ROOF_P 200 PLF = 10.00' x (20.00+20.00)/2 from 0.00' to 5.50'
ROOF_P 380 PLF = 19.00' x (20.00+20.00)/2 from 5.50' to 6.75'
WALL_E 30 PLF = 2.00' x 15.00 from 0.00' to 6.75'
Point from Support 2 of Beam GT#7 @ 5.5ft, (D=1105 Lr=850 S=850) (P1)
:Point load Location

Reactions (D+Lr+L/Max. Load comb.)

Down	166/166	2112/2112	1502/1502
Up	0/0	0/0	0/0



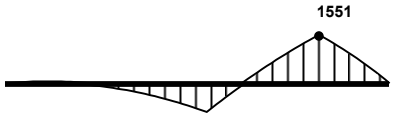
Shear Diagragm:D + Lr

USE DFL NO2 4 x 8 (F_b = 900, F_v = 180)

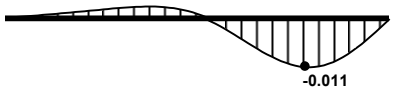
Critical Shear =1369 LB @ 3.83' 1.5xV/(F'$_v$x A)=0.360
F'$_v$= 225, A = 25.38

Critical Moment =1551 LB-FT @ 5.50' M/(F'$_b$x S)=0.42
F'$_b$= 1454, S = 30.66

Critical Deflection for TL = -0.011 INCH @ 5.33' L/240 = 0.163"
Critical Deflection for LL = -0.005 INCH @ 5.33' L/480 = 0.081"

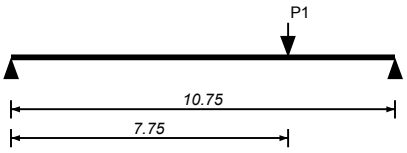


Moment Diagragm:D + Lr



Deflection Diagram:D + Lr

BEAM 15 (DROP): CL'G BM @ RIGHT OF BED #3 @ PLAN B @ 2nd Floor

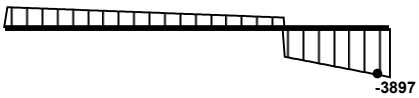


Loads (Downward +)

SELF_WEIGHT 13 plf from 0.00ft to 10.75ft
ROOF_P 100 PLF = 5.00' x (20.00+20.00)/2 from 0.00' to 7.75'
ROOF_P 570 PLF = 28.50' x (20.00+20.00)/2 from 7.75' to 10.75'
Point from Support 2 of Beam GT#1 @ 7.75ft, (D=1838 Lr=1313 S=1313) (P1)
:Point load Location

Reactions (D+Lr+L/Max. Load comb.)

Down	1683/1683	4092/4092
Up	0/0	0/0



Shear Diagragm:D + Lr

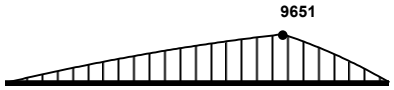
w/ 2-2X4 trim at support 2 (at 10'-9")(1)

USE TIMBERSTRAND 3 1/2"x 9 1/2" 1.55E (F_b = 2325, F_v = 310)

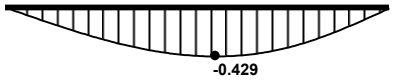
Critical Shear =-3897 LB @ 10.42' 1.5xV/(F'$_v$x A)=0.454
F'$_v$= 388, A = 33.25

Critical Moment =9651 LB-FT @ 7.75' M/(F'$_b$x S)=0.78
F'$_b$= 2806, S = 52.65

Critical Deflection for TL = -0.429 INCH @ 5.83' L/240 = 0.538"
Critical Deflection for LL = -0.186 INCH @ 5.83' L/480 = 0.269"



Moment Diagragm:D + Lr



Deflection Diagram:D + Lr

(1) selected post do not consider combined axial and out-of-plane bending

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consulting group, inc.

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DATE:	3/19/2018	
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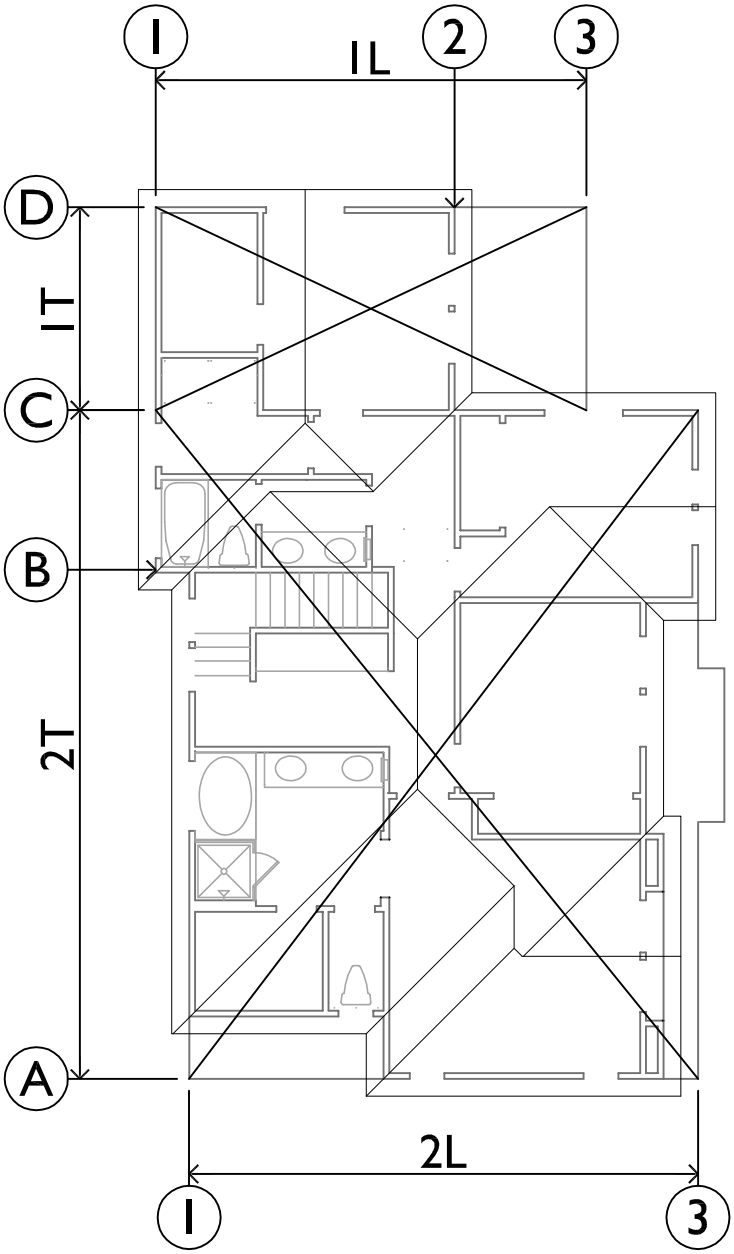

SHEAR WALL LAYOUT
PLAN 3

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DATE:	3/19/2018	
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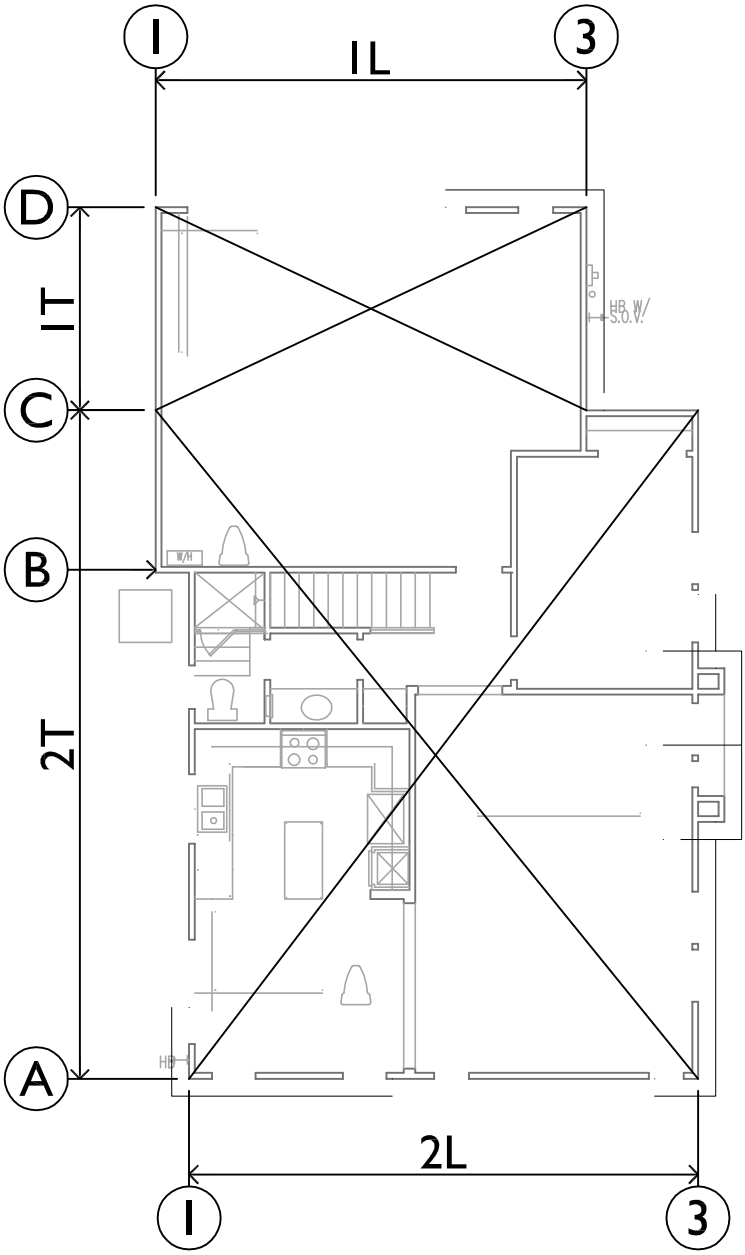


SHEAR WALL LAYOUT

PLAN 3

SECTION 1 - DIRECTION L

BLDG DIMENSION (FT): BASE HT = 0.5 HEIGHT = 22.5 B = 31.0 L = 50.0
SECTION DIMENSION (FT): BASE HT = 0.5 HEIGHT = 25.0 WIDTH = 27.5 DEPTH = 38.5
PLATE HT.: 1-FLR = 9.0' 2-FLR = 9.0' FLR. DEPTH = 14"
ASCE 7-10 DIRECTIONAL PROCEDURE
WIND PARAMETERS: WIND SPEED = 110MPH WIND EXPOSURE = C
COEFFICENTS: K_d =0.85, K_{zt}= 1.00, G = 0.85, G_{Cpi}= ±0.18, ω = 1.00, q_h = 24.34PSF
INTERPOLATION: L/B => YES, h/L => YES, θ => YES

WIND HEIGHT (FT):	15	20	25	30	40	50
WALL PRESSURE ωP (PSF):	23.01	23.96	24.73	25.4	26.49	27.39
ROOF ELEMENT	WDIR+	WDIR-	OWDIR+	OWDIR-	UDIR+	UDIR-
Gable W=27.5' L=19' Windward	64.91	111.65	65.02	18.28	9857	5278
Gable W=27.5' L=19' LeeWard	65.02	18.28	64.91	111.65	9857	5278
Over Hang W=27.5' L=2'	0	0	0	0	910	910

WIND LOAD: ROOF = 146.16 = 0.6 x 243.61 PLF (MAX.) UPLIFT AVE. = 11.69 PSF
1-FLR = 132.96 = 0.6 x 221.61 PLF
MAX TOTAL = 279.13 PLF

SEISMIC PARAMETERS: S_s= 1.50 S_1= 0.63 F_a= 1.00 F_v= 1.50
R_y=6.50 SITE CLASS:D S_{DS}=2$F_a S_s$/3 =1.000 S_{D1}=2$F_v S_1$/3 =0.634 S_{DC}=D I_e=1.00 k =1.00
V= S_{DS}x I x W / 1.4 x R= 0.1099W

ROOF:	DL ROOF =	20.00 x 1179.00 / 27.50 =	857.45 PLF	
	DL EXT WALL =	15.00 x 55.00 x 4.50 / 27.50 =	135.00 PLF	
	DL INT WALL =	10.00 x 27.50 x 4.50 / 27.50 =	45.00 PLF	
	SHEAR =	0.1099 x (857.45 + 135.00 + 45.00) =		114.02 PLF
1-FLR:	DL ROOF =	20.00 x 182.00 / 27.50 =	132.36 PLF	
	DL FLOOR =	15.00 x 1020.00 / 27.50 =	556.36 PLF	
	DL EXT WALL =	135.00 + 15.00 x 55.00 x 4.50 / 27.50 =	270.00 PLF	
	DL INT WALL =	45.00 + 10.00 x 27.50 x 4.50 / 27.50 =	90.00 PLF	
	SHEAR =	0.1099 x (132.36 + 556.36 + 270.00 + 90.00) =		115.26 PLF
TOTAL SEISMIC LOAD =		114.02 + 115.26 =		229.27 PLF

REDISTRIB.: 1037.5 x 19.2 + 1048.7 x 9.0 = 29358 PLFxFT
SHEAR ROOF= 229.27 x 1037.45 x 19.2 / 29358 = 155.56 PLF (155.56 PLF(1))
SHEAR 1-FLR= 229.27 x 1048.73 x 9.0 / 29358 = 73.71 PLF (149.82 PLF(1))
ROOF: 155.56 PLF SEISMIC GOVERN
1-FLR: 279.13 PLF WIND GOVERN
ROOF DIAPHRAGM: V = 155.56 PLF ALIGN
MAX SHEAR= 155.56 x 27.50 / (2 x 38.50) = 55.56 PLF
USE: 15/32" CDX RATED UNBLOCKED 32/16 w/8d COMMON NAILS AT 6", 6", 12" O.C.
CHORD FORCE= 155.56 x 27.50 ² / (8 x 38.50) = 381.96 LBS
SPLICE W/ MIN. (5) 16d SINKER NAILS EACH SIDE OF SPLICE AT 8" O.C. (STANDARD CONSTRUCTION)
1-FLR DIAPHRAGM: V = 149.82 PLF ALIGN
MAX SHEAR= 149.82 x 27.50 / (2 x 38.50) = 53.51 PLF
USE: 23/32" CDX RATED UNBLOCKED w/10d COMMON NAILS AT 6", 6", 12" O.C.
CHORD FORCE= 149.82 x 27.50 ² / (8 x 38.50) = 367.86 LBS
SPLICE W/ MIN. (5) 16d SINKER NAILS EACH SIDE OF SPLICE AT 8" O.C. (STANDARD CONSTRUCTION)

(1) Load from Diaphragm Only

SECTION 1 - DIRECTION T

BLDG DIMENSION (FT): BASE HT = 0.5 HEIGHT = 22.5 B = 31.0 L = 50.0
SECTION DIMENSION (FT): BASE HT = 0.5 HEIGHT = 25.0 WIDTH = 38.5 DEPTH = 27.5
PLATE HT.: 1-FLR = 9.0' 2-FLR = 9.0' FLR. DEPTH = 14"
ASCE 7-10 DIRECTIONAL PROCEDURE
WIND PARAMETERS: WIND SPEED = 110MPH WIND EXPOSURE = C
COEFFICENTS: K_d =0.85, K_{zt}= 1.00, G = 0.85, G_{Cpi}= ±0.18, ω = 1.00, q_h = 24.34PSF
INTERPOLATION: L/B => YES, h/L => YES, θ => YES

WIND HEIGHT (FT):	15	20	25	30	40	50
WALL PRESSURE ωP (PSF):	25.54	26.49	27.27	27.93	29.03	29.93
ROOF ELEMENT	WDIR+	WDIR-	OWDIR+	OWDIR-	UDIR+	UDIR-
Hip Roof W=38.5' L=13.5' Windward	-17.4	29.34	89.58	42.84	7304	2749
Hip Roof W=38.5' L=13.5' LeeWard	89.58	42.84	-17.4	29.34	7304	2749
Over Hang W=38.5' L=2'	0	0	0	0	1275	1275

WIND LOAD: ROOF = 118.81 = 0.6 x 198.02 PLF (MAX.) UPLIFT AVE. = 9.00 PSF
1-FLR = 147.55 = 0.6 x 245.92 PLF
MAX TOTAL = 266.36 PLF

SEISMIC PARAMETERS: S_s= 1.50 S_1= 0.63 F_a= 1.00 F_v= 1.50
R_x=6.50 SITE CLASS:D S_{DS}=2$F_a S_s$/3 =1.000 S_{D1}=2$F_v S_1$/3 =0.634 S_{DC}=D I_e=1.00 k =1.00
V= S_{DS}x I x W / 1.4 x R= 0.1099W

ROOF:	DL ROOF =	20.00 x 1179.00 / 38.50 =	612.47 PLF	
	DL EXT WALL =	15.00 x 77.00 x 4.50 / 38.50 =	135.00 PLF	
	DL INT WALL =	10.00 x 38.50 x 4.50 / 38.50 =	45.00 PLF	
	SHEAR =	0.1099 x (612.47 + 135.00 + 45.00) =		87.09 PLF
1-FLR:	DL ROOF =	20.00 x 182.00 / 38.50 =	94.55 PLF	
	DL FLOOR =	15.00 x 1020.00 / 38.50 =	397.40 PLF	
	DL EXT WALL =	135.00 + 15.00 x 77.00 x 4.50 / 38.50 =	270.00 PLF	
	DL INT WALL =	45.00 + 10.00 x 38.50 x 4.50 / 38.50 =	90.00 PLF	
	SHEAR =	0.1099 x (94.55 + 397.40 + 270.00 + 90.00) =		93.63 PLF
TOTAL SEISMIC LOAD =		87.09 + 93.63 =		180.72 PLF

REDISTRIB.: 792.5 x 19.2 + 851.9 x 9.0 = 22883 PLFxFT
SHEAR ROOF= 180.72 x 792.47 x 19.2 / 22883 = 120.17 PLF (120.17 PLF(1))
SHEAR 1-FLR= 180.72 x 851.95 x 9.0 / 22883 = 60.56 PLF (121.71 PLF(1))
ROOF: 120.17 PLF SEISMIC GOVERN
1-FLR: 266.36 PLF WIND GOVERN
ROOF DIAPHRAGM: V = 120.17 PLF ALIGN
MAX SHEAR= 120.17 x 35.00 / (2 x 27.50) = 76.47 PLF
USE: 15/32" CDX RATED UNBLOCKED 32/16 w/8d COMMON NAILS AT 6", 6", 12" O.C.
CHORD FORCE= 120.17 x 35.00 ² / (8 x 27.50) = 669.10 LBS
SPLICE W/ MIN. (5) 16d SINKER NAILS EACH SIDE OF SPLICE AT 8" O.C. (STANDARD CONSTRUCTION)
1-FLR DIAPHRAGM: V = 147.55 PLF ALIGN
MAX SHEAR= 147.55 x 29.50 / (2 x 27.50) = 79.14 PLF
USE: 23/32" CDX RATED UNBLOCKED w/10d COMMON NAILS AT 6", 6", 12" O.C.
CHORD FORCE= 147.55 x 29.50 ² / (8 x 27.50) = 583.67 LBS
SPLICE W/ MIN. (5) 16d SINKER NAILS EACH SIDE OF SPLICE AT 8" O.C. (STANDARD CONSTRUCTION)

(1) Load from Diaphragm Only

SECTION 2 - DIRECTION L

BLDG DIMENSION (FT): BASE HT = 0.5 HEIGHT = 22.5 B = 31.0 L = 50.0
SECTION DIMENSION (FT): BASE HT = 0.0 HEIGHT = 21.5 WIDTH = 17.0 DEPTH = 12.0
PLATE HT.: 1-FLR = 9.0' 2-FLR = 9.0' FLR. DEPTH = 14"
ASCE 7-10 DIRECTIONAL PROCEDURE
WIND PARAMETERS: WIND SPEED = 110MPH WIND EXPOSURE = C
COEFFICENTS: K_d =0.85, K_{zt}= 1.00, G = 0.85, G_{Cpi}= ±0.18, ω = 1.00, q_h = 24.34PSF
INTERPOLATION: L/B => YES, h/L => YES, θ => YES

WIND HEIGHT (FT):	15	20	25	30	40	50
WALL PRESSURE ωP (PSF):	23.01	23.96	24.73	25.4	26.49	27.39
ROOF ELEMENT	WDIR+	WDIR-	OWDIR+	OWDIR-	UDIR+	UDIR-
Gable W=17' L=6' Windward	28.4	48.85	28.45	8	1924	1030
Gable W=17' L=6' LeeWard	28.45	8	28.4	48.85	1924	1030
Over Hang W=17' L=2'	0	0	0	0	563	563

WIND LOAD: ROOF = 102.16 = 0.6 x 170.26 PLF (MAX.) UPLIFT AVE. = 12.97 PSF
1-FLR = 132.83 = 0.6 x 221.39 PLF
MAX TOTAL = 234.99 PLF

SEISMIC PARAMETERS: S_s= 1.50 S_1 = 0.63 F_a = 1.00 F_v= 1.50
R_y=6.50 SITE CLASS:D S_{DS}=2F_a S_s/3 =1.000 S_{D1}=2F_v S_1 /3 =0.634 S_{DC}=D I_e=1.00 k =1.00
V= S_{DS}x I x W / 1.4 x R= 0.1099W

ROOF:	DL ROOF =	20.00 x 224.00 / 17.00 =	263.53 PLF	
	DL EXT WALL =	15.00 x 17.00 x 4.50 / 17.00 =	67.50 PLF	
	SHEAR =	0.1099 x (263.53 + 67.50) =		36.38 PLF
1-FLR:	DL ROOF =	20.00 x 109.00 / 17.00 =	128.24 PLF	
	DL FLOOR =	15.00 x 200.00 / 17.00 =	176.47 PLF	
	DL EXT WALL =	67.50 + 15.00 x 25.00 x 4.50 / 17.00 =	166.76 PLF	
	SHEAR =	0.1099 x (128.24 + 176.47 + 166.76) =		51.81 PLF
TOTAL SEISMIC LOAD =		36.38 + 51.81 =		88.19 PLF

REDISTRIB.: 331.0 x 19.2 + 471.5 x 9.0 = 10599 PLFxFT
SHEAR ROOF= 88.19 x 331.03 x 19.2 / 10599 = 52.89 PLF (52.89 PLF(1))
SHEAR 1-FLR= 88.19 x 471.47 x 9.0 / 10599 = 35.31 PLF (67.35 PLF(1))
ROOF: 102.16 PLF WIND GOVERN
1-FLR: 234.99 PLF WIND GOVERN
ROOF DIAPHRAGM: V = 102.16 PLF ALIGN
MAX SHEAR= 102.16 x 17.00 / (2 x 12.00) = 72.36 PLF
USE: 15/32" CDX RATED UNBLOCKED 32/16 w/8d COMMON NAILS AT 6", 6", 12" O.C.
CHORD FORCE= 102.16 x 17.00 ² / (8 x 12.00) = 307.54 LBS
SPLICE W/ MIN. (5) 16d SINKER NAILS EACH SIDE OF SPLICE AT 8" O.C. (STANDARD CONSTRUCTION)
1-FLR DIAPHRAGM: V = 132.83 PLF ALIGN
MAX SHEAR= 132.83 x 25.00 / (2 x 12.00) = 138.37 PLF
USE: 23/32" CDX RATED UNBLOCKED w/10d COMMON NAILS AT 6", 6", 12" O.C.
CHORD FORCE= 132.83 x 25.00 ² / (8 x 12.00) = 864.80 LBS
SPLICE W/ MIN. (5) 16d SINKER NAILS EACH SIDE OF SPLICE AT 8" O.C. (STANDARD CONSTRUCTION)

(1) Load from Diaphragm Only

SECTION 2 - DIRECTION T

BLDG DIMENSION (FT): BASE HT = 0.5 HEIGHT = 22.5 B = 31.0 L = 50.0
SECTION DIMENSION (FT): BASE HT = 0.0 HEIGHT = 23.0 WIDTH = 12.0 DEPTH = 17.0
PLATE HT.: 1-FLR = 9.0' 2-FLR = 9.0' FLR. DEPTH = 14"
ASCE 7-10 DIRECTIONAL PROCEDURE
WIND PARAMETERS: WIND SPEED = 110MPH WIND EXPOSURE = C
COEFFICENTS: K_d=0.85, K_{zt}= 1.00, G = 0.85, G_{Cpi}= ±0.18, ω = 1.00, q_h = 24.34PSF
INTERPOLATION: L/B => YES, h/L => YES, θ => YES

WIND HEIGHT (FT):	15	20	25	30	40	50
WALL PRESSURE ωP (PSF):	25.54	26.49	27.27	27.93	29.03	29.93
ROOF ELEMENT	WDIR+	WDIR-	OWDIR+	OWDIR-	UDIR+	UDIR-
Hip Roof W=12' L=8.5' Windward	-12.51	21.09	64.39	30.79	1433	540
Hip Roof W=12' L=8.5' LeeWard	64.39	30.79	-12.51	21.09	1433	540
Over Hang W=12' L=2'	0	0	0	0	397	397

WIND LOAD: ROOF = 106.48 = 0.6 x 177.46 PLF (MAX.) UPLIFT AVE. = 9.60 PSF
1-FLR = 147.42 = 0.6 x 245.70 PLF
MAX TOTAL = 253.90 PLF

SEISMIC PARAMETERS: S_s= 1.50 S_1= 0.63 F_a= 1.00 F_v= 1.50
R_x=6.50 SITE CLASS:D S_{DS}=2$F_a S_s$/3 =1.000 S_{D1}=2$F_v S_1$/3 =0.634 S_{DC}=D I_e=1.00 k =1.00
V= S_{DS}x I x W / 1.4 x R= 0.1099W

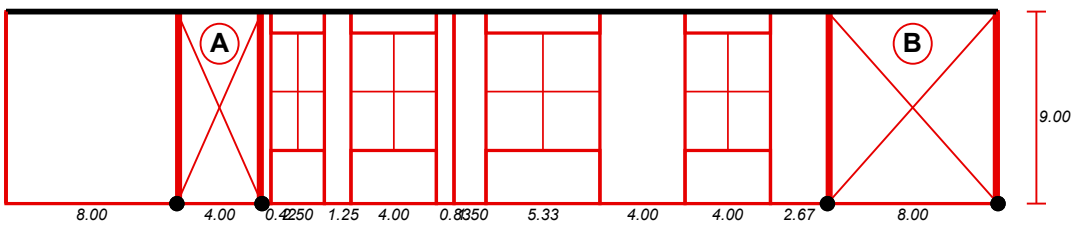
ROOF:	DL ROOF =	20.00 x 224.00 / 12.00 =	373.33 PLF	
	DL EXT WALL =	15.00 x 24.00 x 4.50 / 12.00 =	135.00 PLF	
	SHEAR =	0.1099 x (373.33 + 135.00) =		55.87 PLF
1-FLR:	DL ROOF =	20.00 x 109.00 / 12.00 =	181.67 PLF	
	DL FLOOR =	15.00 x 200.00 / 12.00 =	250.00 PLF	
	DL EXT WALL =	135.00 + 15.00 x 24.00 x 4.50 / 12.00 =	270.00 PLF	
	SHEAR =	0.1099 x (181.67 + 250.00 + 270.00) =		77.11 PLF
TOTAL SEISMIC LOAD =		55.87 + 77.11 =		132.98 PLF

REDISTRIB.: 508.3 x 19.2 + 701.7 x 9.0 = 16075 PLFxFT
SHEAR ROOF= 132.98 x 508.33 x 19.2 / 16075 = 80.74 PLF (80.74 PLF(1))
SHEAR 1-FLR= 132.98 x 701.67 x 9.0 / 16075 = 52.24 PLF (100.24 PLF(1))
ROOF: 106.48 PLF WIND GOVERN
1-FLR: 253.90 PLF WIND GOVERN
ROOF DIAPHRAGM: V = 106.48 PLF ALIGN
MAX SHEAR= 106.48 x 12.00 / (2 x 17.00) = 37.58 PLF
USE: 15/32" CDX RATED UNBLOCKED 32/16 w/8d COMMON NAILS AT 6", 6", 12" O.C.
CHORD FORCE= 106.48 x 12.00 ² / (8 x 17.00) = 112.74 LBS
SPLICE W/ MIN. (5) 16d SINKER NAILS EACH SIDE OF SPLICE AT 8" O.C. (STANDARD CONSTRUCTION)
1-FLR DIAPHRAGM: V = 147.42 PLF ALIGN
MAX SHEAR= 147.42 x 12.00 / (2 x 17.00) = 52.03 PLF
USE: 23/32" CDX RATED UNBLOCKED w/10d COMMON NAILS AT 6", 6", 12" O.C.
CHORD FORCE= 147.42 x 12.00 ² / (8 x 17.00) = 156.09 LBS
SPLICE W/ MIN. (5) 16d SINKER NAILS EACH SIDE OF SPLICE AT 8" O.C. (STANDARD CONSTRUCTION)

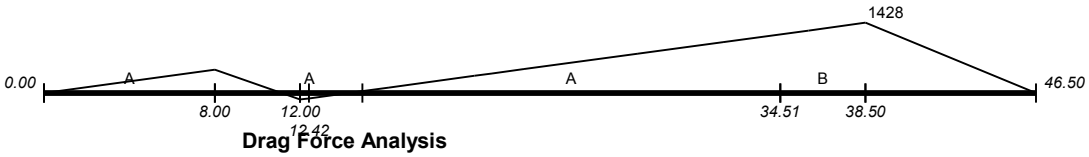
(1) Load from Diaphragm Only

1L_ROOF	Wind: 1900	2L_ROOF	Wind: 0
26.00ft	Seismic: 2022	17.00ft	Seismic: 450

Wind: 1900(LB)
Seismic: 2745(LB) = 2472 + 273



- Strap (E)



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice
B: Simpson ST6224 (2134LB) ALT (16) #16 sinker per top plate splice

Design Analysis

WALL 1 2nd Floor @ GRID 1
Exterior Direction: L Location:(-1.92,50.08) **(ρ = 1.0)**
Total Length = 46.50 ft Total panel Length = 12.00ft (Net Length= 11.56ft)
Shear Diaphragm = 2745 / 46.50 = 59 plf
Use (7 A35) or (6 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule
Design Wall Shears = 2745 / 11.56 = 238 plf (Flexible) Max. Drag = 1428 lbs
Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 0.857" ≤ 0.020 x 108.00 = 2.160 "

Use TYPE 2 *
Design Report:
Loads:
Wall *135.00 plf = 15 x 9.00'*

Overturn Analysis Uplift(T) Down(C)
Panel A b = 4.00 h = 9.00

Left Side:	T = 1834 LB	C = 2123 LB	(2)CS16/(2)2x4
Right Side:	T = 1834 LB	C = 2123 LB	(2)CS16/(2)2x4

Use (2)CS16/(2)2x4 on both ends

Panel B b = 8.00 h = 9.00

Left Side:	T = 1921 LB	C = 2300 LB	(2)CS16/(2)2x4
Right Side:	T = 1921 LB	C = 2300 LB	(2)CS16/(2)2x4

Use (2)CS16/(2)2x4 on both ends

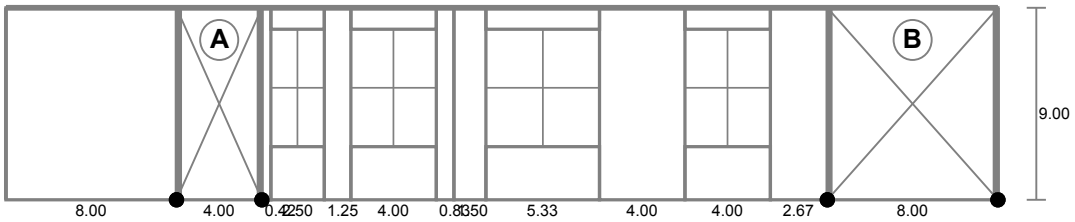
* User refered
Plywood shear wall to be nailed to all studs receiving holdowns
Reduce shear capacity per Section SDPWS 4.3.4.2

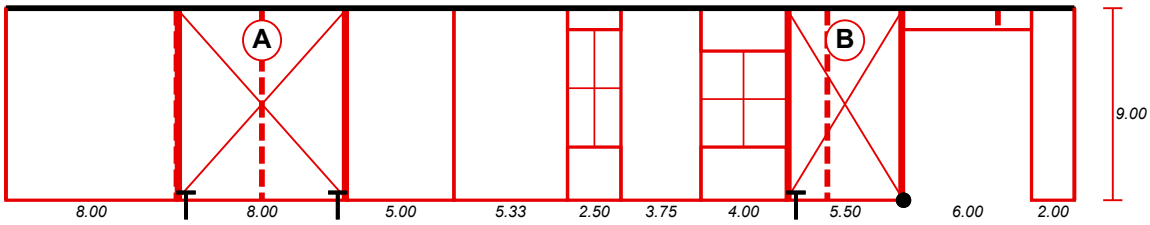
1L_1_FL 26.00ft — Wind: 1728 Seismic: 958

2L_1_FL 24.50ft — Wind: 0 Seismic: 433

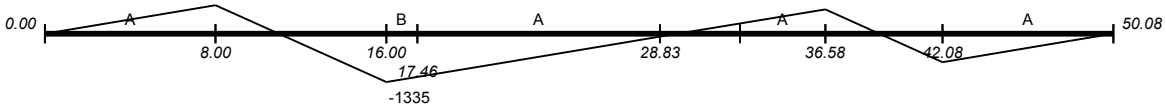
from SW 1 (W=1900LB, E=2745LB) from 0.00ft to 46.50ft (100%)
30% lateral Load from SW 2 (W=868LB, E=513LB)

Wind: 3889(LB) = 1728 + 2161
Seismic: 4887(LB) = 1391 + 306 + 3191





● Strap (E) T Hold down ⋮ Post/stud required to transfer load from ABV.



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice
B: Simpson ST6224 (2134LB) ALT (16) #16 sinker per top plate splice

Design Analysis

WALL 1 1st Floor @ GRID 1
Exterior Direction: L Location:(-1.92,50.08) **(ρ = 1.0)**
Total Length = 50.08 ft Total panel Length = 13.50ft (Net Length= 13.50ft)
Shear Diaphragm = 4887 / 50.08 = 98 plf
Use (12 A35) or (9 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule
Design Wall Shears = 4887 / 13.50 = 362 plf (Flexible) Max. Drag = 1335 lbs
Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 2.150" ≤ 0.020 x 108.00 = 2.160 "

Use TYPE 2
Design Report:
Loads:
Wall 135.00 plf = 15 x 9.00'

Overturn Analysis Uplift(T) Down(C)
Panel A b = 8.00 h = 9.00

Left Side: T = 3976 LB C = 4461 LB HTT5/4x4(I) w/ DBL BLK'G
Right Side: T = 4106 LB C = 4461 LB HTT5/4x4(I) w/ DBL BLK'G

Use HTT5/4x4 (I) on both ends
w/ (3) 5/8" x 12" Anchor Bolt (@ 40" O.C. max)

Panel B b = 5.50 h = 9.00

Left Side: T = 4659 LB C = 5160 LB HTT5/4x4(I) w/ DBL BLK'G
Right Side: T = 2896 LB C = 3446 LB STHD10/4x8

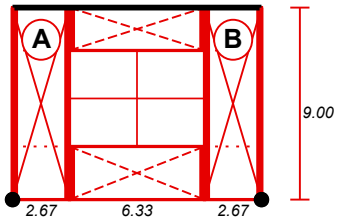
Use HTT5/4x4 (I) @ L. and Use STHD10/4x8 @ R.
w/ (2) 5/8" x 12" Anchor Bolt (@ 48" O.C. max)

(I) Hold down Inside of panel
(O) Hold down Outside of panel

2L_ROOF
17.00ft

Wind: 868
Seismic: 450

Wind: 868(LB)
Seismic: 513(LB) = 450 + 63



● Strap (E) Blocked panel use TYPE 2

Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice

Design Analysis

WALL 2 2nd Floor @ GRID 2

Exterior Direction: L Location:(15.25,50.08) **(ρ = 1.0)**

Total Length = 11.67 ft Total panel Length = 5.34ft (Net Length= 5.34ft)

Shear Diaphragm = 868 / 11.67 = 74 plf

Use (3 A35) or (2 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule

Design Wall Shears = 163 plf (At blocked opening A & B) Max. Drag = 236 lbs

Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 0.213" ≤ 0.020 x 108.00 = 2.160 " (At Opening)

Use TYPE 2 *

Design Report:

Loads:

Wall *135.00 plf = 15 x 9.00'*

Overturn Analysis Uplift(T) Down(C)

Panel A b = 2.67 h = 9.00

Left Side:	T =	325 LB	C =	670 LB	(2)CS16/(2)2x4 (*)
Right Side:	T =	0 LB	C =	0 LB	NO_UPLIFT

Use (2)CS16/(2)2x4 @ L.

Blocked! Force at Edge of opening is 500 LB

Panel B b = 2.67 h = 9.00

Left Side:	T =	0 LB	C =	0 LB	NO_UPLIFT
Right Side:	T =	325 LB	C =	670 LB	CS16/2x4

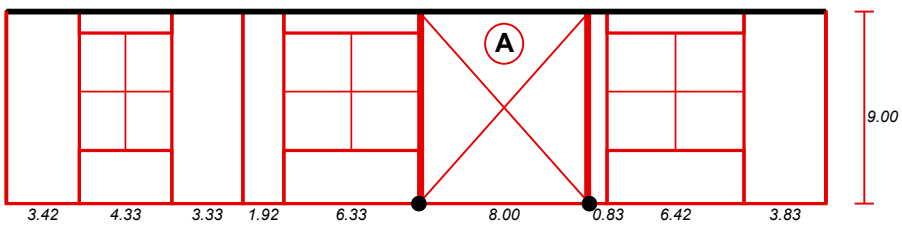
Use CS16/2x4 @ R.

* User refered
Plywood shear wall to be nailed to all studs receiving holdowns

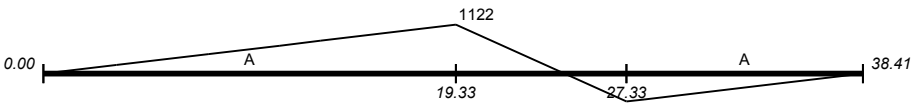
1L_ROOF
26.00ft

Wind: 1900
Seismic: 2022

Wind: 1900(LB)
Seismic: 2230(LB) = 2022 + 208



- Strap (E)



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice

Design Analysis

WALL 3 2nd Floor @ GRID 3

Exterior Direction: L Location:(29.25,38.42) **(ρ = 1.0)**

Total Length = 38.41 ft Total panel Length = 8.00ft (Net Length= 8.00ft)

Shear Diaphragm = 2230 / 38.41 = 58 plf

Use (6 A35) or (4 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule

Design Wall Shears = 2230 / 8.00 = 279 plf (Flexible) Max. Drag = 1122 lbs

Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 0.930" ≤ 0.020 x 108.00 = 2.160 "

Use TYPE 2

Design Report:

Loads:

Wall 135.00 plf = 15 x 9.00'

Overturn Analysis Uplift(T) Down(C)

Panel A b = 8.00 h = 9.00

Left Side:	T = 2298 LB	C = 2682 LB	(2)CS16/(2)2x4
Right Side:	T = 2298 LB	C = 2682 LB	(2)CS16/(2)2x4

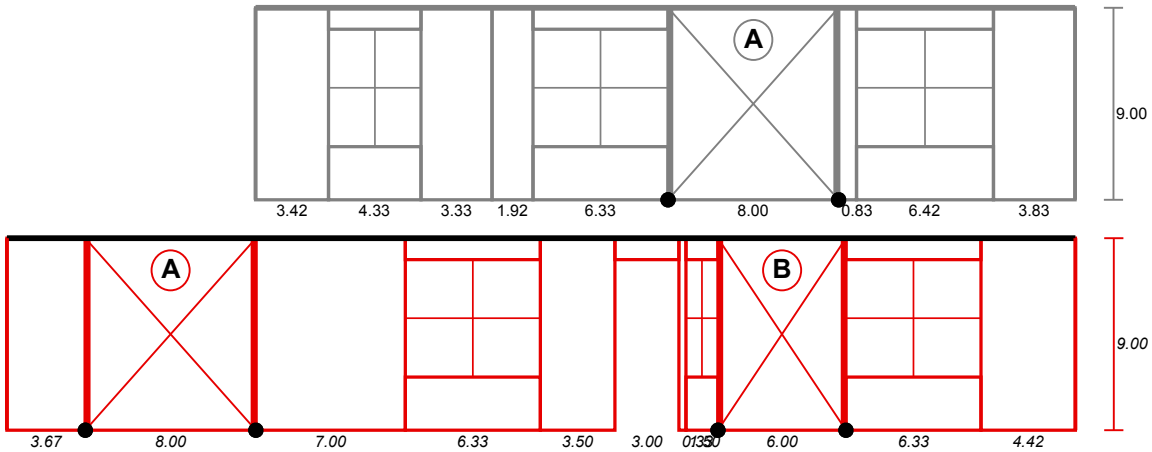
Use (2)CS16/(2)2x4 on both ends

1L_1_FL 29.00ft — Wind: 1928 Seismic: 1069

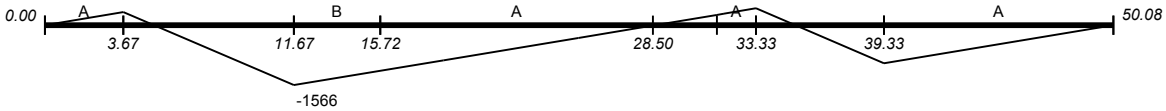
2L_1_FL 24.50ft — Wind: 0 Seismic: 433

from SW 3 (W=1900LB, E=2230LB) from 11.66ft to 50.07ft (100%)
70% lateral Load from SW 2 (W=868LB, E=513LB)

Wind: 4436(LB) = 1928 + 2508
Seismic: 4629(LB) = 1501 + 288 + 2840



● Strap (E) ┆ Post/stud required to transfer load from ABV.



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice
B: Simpson ST6224 (2134LB) ALT (16) #16 sinker per top plate splice

Design Analysis

WALL 3 1st Floor @ GRID 3
Exterior Direction: L Location:(22.83,50.08) **(ρ = 1.0)**
Total Length = 50.08 ft Total panel Length = 14.00ft (Net Length= 14.00ft)
Shear Diaphragm = 4629 / 50.08 = 92 plf
Use (12 A35) or (9 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule
Design Wall Shears = 4629 / 14.00 = 331 plf (Flexible) Max. Drag = 1566 lbs
Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 1.999" ≤ 0.020 x 108.00 = 2.160 "

Use TYPE 2
Design Report:
Loads:
Wall 135.00 plf = 15 x 9.00'

Overturn Analysis Uplift(T) Down(C)
Panel A b = 8.00 h = 9.00

Left Side: T = 2780 LB C = 3182 LB STHD10/4x4
Right Side: T = 2780 LB C = 3182 LB STHD10/4x4
Use STHD10/4x4 on both ends
w/ (3) 5/8" x 12" Anchor Bolt (@ 40" O.C. max)

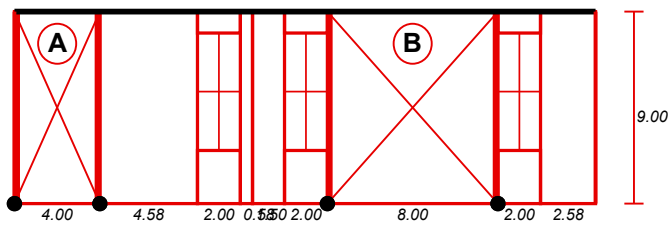
Panel B b = 6.00 h = 9.00

Left Side: T = 2860 LB C = 3223 LB STHD10/4x4
Right Side: T = 2860 LB C = 3223 LB STHD10/4x4
Use STHD10/4x4 on both ends
w/ (2) 5/8" x 12" Anchor Bolt (@ 56" O.C. max)

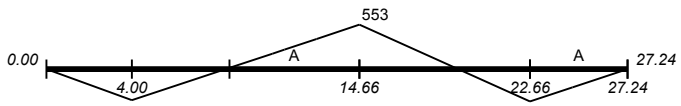
1T_ROOF
37.00ft

Wind: 2198
Seismic: 2223

Wind: 2198(LB)
Seismic: 2398(LB) = 2223 + 175



- Strap (E)



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice

Design Analysis

WALL A **2nd Floor** **@ GRID A**

Exterior Direction: T Location:(0.00,3.58) **(ρ = 1.0)**

Total Length = 27.24 ft Total panel Length = 12.00ft (Net Length= 11.56ft)

Shear Diaphragm = 2398 / 27.24 = 88 plf

Use (6 A35) or (5 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule

Design Wall Shears = 2398 / 11.56 = 208 plf (Flexible) Max. Drag = 553 lbs

Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 1.221" ≤ 0.020 x 108.00 = 2.160 "

Use TYPE 1

Design Report:

Loads:

Wall *135.00 plf = 15 x 9.00'*

Overturn Analysis **Uplift(T)** **Down(C)**

Panel A b = 4.00 h = 9.00

Left Side:	T = 1561 LB	C = 1807 LB	CS16/2x4
Right Side:	T = 1561 LB	C = 1807 LB	CS16/2x4

Use CS16/2x4 on both ends

Panel B b = 8.00 h = 9.00

Left Side:	T = 1634 LB	C = 1989 LB	CS16/2x4
Right Side:	T = 1634 LB	C = 1989 LB	CS16/2x4

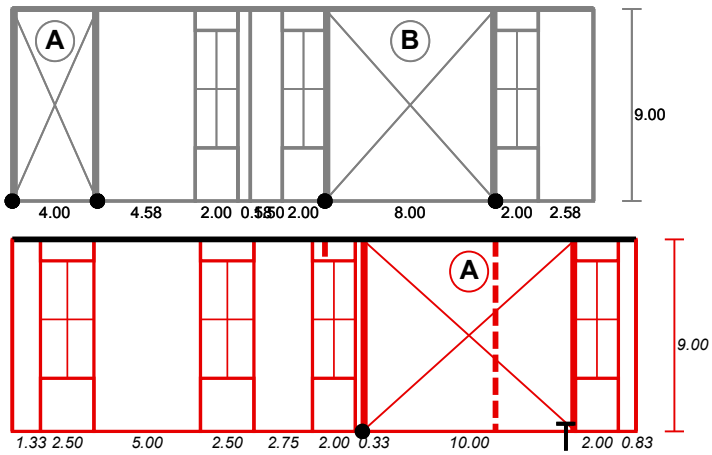
Use CS16/2x4 on both ends

1T_1_FL
29.50ft

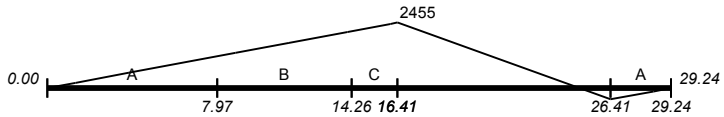
Wind: 2176
Seismic: 893

from SW A (W=2198LB, E=2398LB) from 0.00ft to 27.24ft (100%)

Wind: 4374(LB) = 2176 + 2198
Seismic: 3642(LB) = 893 + 176 + 2573



● Strap (E) T Hold down ⋮ Post/stud required to transfer load from ABV.



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice
B: Simpson ST6224 (2134LB) ALT (16) #16 sinker per top plate splice
C: Simpson ST6236 (3230LB) ALT (22) #16 sinker per top plate splice

Design Analysis

WALL A 1st Floor @ GRID A
Exterior Direction: T Location:(0.00,0.00) **(ρ = 1.0)**
Total Length = 29.24 ft Total panel Length = 10.00ft (Net Length= 10.00ft)
Shear Diaphragm = 4374 / 29.24 = 150 plf
Use (11 A35) or (8 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule
Design Wall Shears = 4374 / 10.00 = 437 plf (Flexible) Max. Drag = 2455 lbs
Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 1.316" ≤ 0.020 x 108.00 = 2.160 "

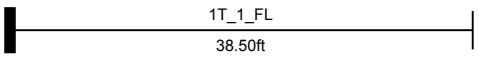
Use TYPE 3
Design Report:
Loads:
Wall 135.00 plf = 15 x 9.00'

Overturn Analysis Uplift(T) Down(C)
Panel A b = 10.00 h = 9.00

Left Side:	T = 2809 LB	C = 3487 LB	STHD10/4x4
Right Side:	T = 4583 LB	C = 5250 LB	HTT5/4x4(I) w/ DBL BLK'G

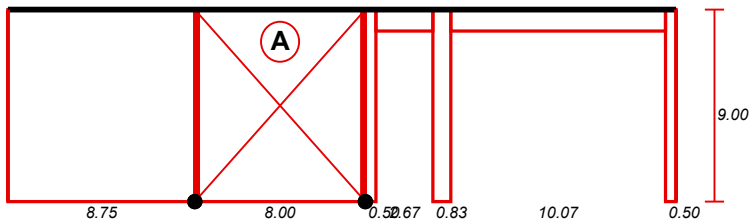
Use STHD10/4x4 @ L. and Use HTT5/4x4 (I) @ R.
w/ (3) 5/8" x 12" Anchor Bolt (@ 48" O.C. max)

(I) Hold down Inside of panel
(O) Hold down Outside of panel

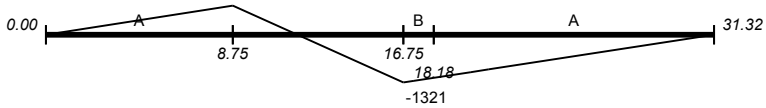


Wind: 2840
Seismic: 1802

Wind: 2840(LB)
Seismic: 1951(LB) = 1802 + 148



- Strap (E)



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice
B: Simpson ST6224 (2134LB) ALT (16) #16 sinker per top plate splice

Design Analysis

WALL B 1st Floor @ GRID B
Exterior Direction: T Location:(-1.92,29.42) **(ρ = 1.0)**
Total Length = 31.32 ft Total panel Length = 8.00ft (Net Length= 8.00ft)
Shear Diaphragm = 2840 / 31.32 = 91 plf
Use (7 A35) or (5 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule
Design Wall Shears = 2840 / 8.00 = 355 plf (Flexible) Max. Drag = 1321 lbs
Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 1.081" ≤ 0.020 x 108.00 = 2.160 "

Use TYPE 3 *
Design Report:
Loads:
Wall 135.00 plf = 15 x 9.00'

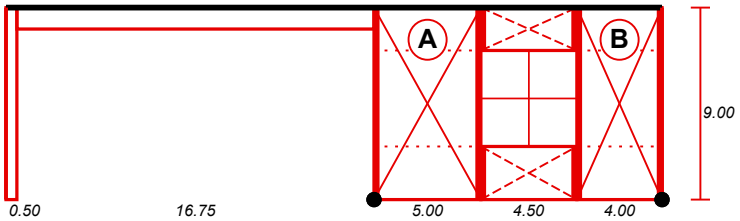
Overturn Analysis Uplift(T) Down(C)
Panel A b = 8.00 h = 9.00

Left Side:	T = 2925 LB	C = 3410 LB	STHD10/4x4
Right Side:	T = 2925 LB	C = 3410 LB	STHD10/4x4

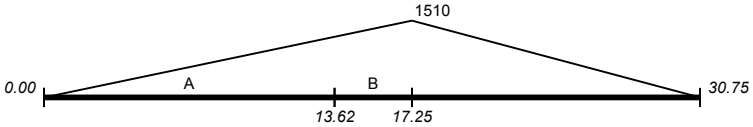
Use STHD10/4x4 on both ends
w/ (3) 5/8" x 12" Anchor Bolt (@ 40" O.C. max)

1T_ROOF	Wind: 2079	2T_ROOF	Wind: 612
35.00ft	Seismic: 2103	11.50ft	Seismic: 464

Wind: 2691(LB)
Seismic: 2668(LB) = 2567 + 101



● Strap (E) Blocked panel use TYPE 3



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice
B: Simpson ST6224 (2134LB) ALT (16) #16 sinker per top plate splice

Design Analysis

WALL C **2nd Floor** **@ GRID C**
Exterior Direction: T Location:(-1.92,38.35) **(ρ = 1.0)**
Total Length = 30.75 ft Total panel Length = 9.00ft (Net Length= 9.00ft)
Shear Diaphragm = 2691 / 30.75 = 88 plf
Use (7 A35) or (5 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule
Design Wall Shears = 424 plf (At blocked opening A & B) Max. Drag = 1510 lbs
Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 0.644" ≤ 0.020 x 108.00 = 2.160 " (At Opening)

Use TYPE 3
Design Report:
Loads:
Wall *135.00 plf = 15 x 9.00'*

Overturn Analysis **Uplift(T)** **Down(C)**
Panel A b = 5.00 h = 9.00

Left Side:	T = 1432 LB	C = 1794 LB	CS16/2x4
Right Side:	T = 0 LB	C = 0 LB	NO_UPLIFT

Use CS16/2x4 @ L.

Blocked! Force at Edge of opening is 953 LB

Panel B b = 4.00 h = 9.00

Left Side:	T = 0 LB	C = 0 LB	NO_UPLIFT
Right Side:	T = 1432 LB	C = 1794 LB	(2)CS16/(2)2x4 (*)

Use (2)CS16/(2)2x4 @ R.

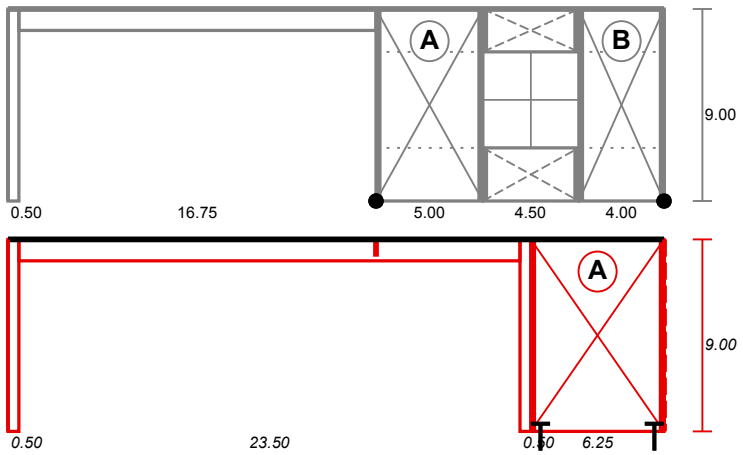
* User refered
Plywood shear wall to be nailed to all studs receiving holdowns

1T_1_FL 9.00ft — Wind: 664 Seismic: 273

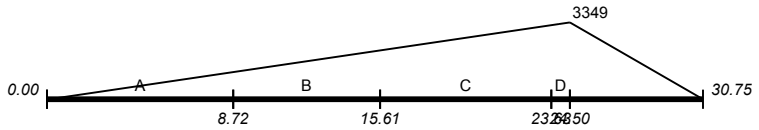
2T_1_FL 11.50ft — Wind: 848 Seismic: 300

from SW C (W=2691LB, E=2668LB) from 0.00ft to 30.75ft (100%)

Wind: 4203(LB) = 1512 + 2691
Seismic: 3415(LB) = 573 + 73 + 2769



T Hold down ⋮ Post/stud required to transfer load from ABV.



Drag Force Analysis

A: Simpson ST22 (1192LB)	ALT (10) #16 sinker per top plate splice
B: Simpson ST6224 (2134LB)	ALT (16) #16 sinker per top plate splice
C: Simpson ST6236 (3230LB)	ALT (22) #16 sinker per top plate splice
D: Simpson MST37 (4267LB)	ALT (24) #16 sinker per top plate splice

Design Analysis

WALL C 1st Floor @ GRID C

Exterior Direction: T Location:(-1.92,38.47) **(ρ = 1.0)**

Total Length = 30.75 ft Total panel Length = 6.25ft (Net Length= 6.25ft)

Shear Diaphragm = 4203 / 30.75 = 137 plf

Use (10 A35) or (8 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule

Design Wall Shears = 4203 / 6.25 = 672 plf (Flexible) Max. Drag = 3349 lbs

Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 1.366" ≤ 0.020 x 108.00 = 2.160 "

Use TYPE 5

Design Report:

Loads:

Wall 135.00 plf = 15 x 9.00'

Overturn Analysis Uplift(T) Down(C)

Panel A b = 6.25 h = 9.00

Left Side:	T = 6202 LB	C = 6488 LB	HDU8/4x4(I) w/ DBL BLK'G
Right Side:	T = 7731 LB	C = 8384 LB	HDQ8/(3)2x4(I) w/ DBL BLK'G

Use HDU8/4x4 (I) @ L. and Use HDQ8/(3)2x4 (I) @ R.

w/ (3) 5/8" x 12" Anchor Bolt (@ 24" O.C. max)

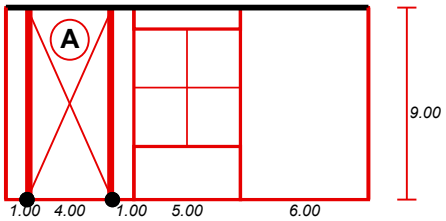
For Grade Beam, Add (1)#4 Top & Bottom, 4' Past Panel Each End

(I) Hold down Inside of panel
(O) Hold down Outside of panel

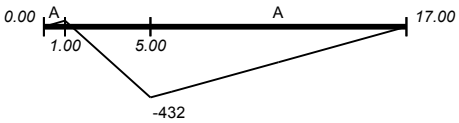
2T_ROOF
11.50ft

Wind: 612
Seismic: 464

Wind: 612(LB)
Seismic: 568(LB) = 464 + 103



- Strap (E)



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice

Design Analysis

WALL D **2nd Floor** **@ GRID D**
Exterior Direction: T Location:(-1.92,50.08) **(ρ = 1.0)**
Total Length = 17.00 ft Total panel Length = 4.00ft (Net Length= 4.00ft)
Shear Diaphragm = 612 / 17.00 = 36 plf
Use (2 A35) or (2 LS50) Along Line of Shear Panel or for Framing Clips Spacing See S.W. Schedule
Design Wall Shears = 612 / 4.00 = 153 plf (Flexible) Max. Drag = 432 lbs
Max panel deflection: ΔM = (4.0/1.00) x Δs x 1.4 = 0.762" ≤ 0.020 x 108.00 = 2.160 "

Use TYPE 2 *
(shear capacity reduced by Aspect Ratio = 0.97)*

Design Report:
Loads:
Wall *135.00 plf = 15 x 9.00'*

Overturn Analysis **Uplift(T)** **Down(C)**
Panel A b = 4.00 h = 9.00

Left Side:	T =	1235 LB	C =	1515 LB	CS16/2x4
Right Side:	T =	1235 LB	C =	1515 LB	CS16/2x4

Use CS16/2x4 on both ends

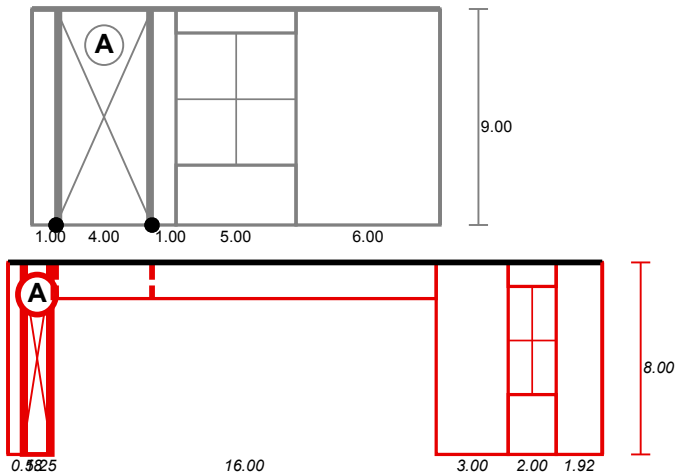
* User refered
Plywood shear wall to be nailed to all studs receiving holdowns
Use Exceptions 1 Per Section SDPWS 4.3.3.4.1

2T_ROOF
11.50ft

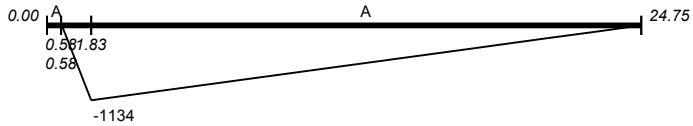
Wind: 612
Seismic: 464

from SW D (W=612LB, E=568LB) from 1.00ft to 18.00ft (100%)

Wind: 1225(LB) = 612 + 612
Seismic: 1205(LB) = 464 + 70 + 671



Post/stud required to transfer load from ABV.



Drag Force Analysis

A: Simpson ST22 (1192LB) ALT (10) #16 sinker per top plate splice

Design Analysis

WALL D 1st Floor @ GRID D
Exterior Direction: T Location:(-1.92,50.08) **(ρ = 1.0)**
Total Length = 24.75 ft Total panel Length = 1.25ft (Net Length= 1.25ft)
Shear Diaphragm = 1225 / 24.75 = 49 plf
Design Wall Shears = 1225 / 1.25 = 980 plf (Flexible) Max. Drag = 1134 lbs

Use (1) SIMPSON STEEL STRONG WALL (SSW15x8 - 1" DIA.)
For Grade Beam of Each Panel, Add (2)#5 Top & Bottom, 4' past Panel Each End.

Footing/Pad: F1 TYP. CONT. FOOTING
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of footing 375 PLF = 150 x 1.25' x 2.00'
ROOF_P 160 PLF = 8.00' x (20.00+20.00)/2 from 0.00' to 1.00'
FLOOR_P 385 PLF = 14.00' x (15.00+40.00)/2 from 0.00' to 1.00'
WALL_E 270 PLF = 18.00' x 15.00 from 0.00' to 1.00'

Total Weight(W_{total}) = 1270 PLF
Footing Width(B_f) Required: 10.16" = (W_{total} / SB) = 1270/1500 x 12

USE 15" Wide x 18" Deep Continuous Footing #4 Cont. @ T & B (U.N.O.)

Footing/Pad: F2 LEFT OF GT#6
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of footing 375 PLF = 150 x 1.25' x 2.00'
Weight of Pad 1406 LB = 150 x 2.50' x 2.50' x 1.50'
WALL_E 270 PLF = 18.00' x 15.00 from 0.00' to 1.00'
Point from Support 1 of Beam GT#6 (5294 LB)

Total Weight(W_{total}) = 645 PLF Total Point Load(P_{Total}) = 6700 LB
Footing Width(B_f) Required: 5.16" = (W_{total} / SB) = 645/1500 x 12

USE 15" Wide x 18" Deep Continuous Footing #4 Cont. @ T & B (U.N.O.)
S = 3.50" + 2 x 24" = 51.50" Width 15"
Capacity of Point Load on Footing(P_{cap}) = (SB x S x Width)/144 = 8047 LB
Allowable Point Load on Footing(P_{Allow}) = P_{cap} - (W_{total} x S)/12 = 5279 LB
Required Pad Area = P_{total} /SB = 6700 / 1500 = 4.47'
USE 2'-6" SQ x 18" DEEP PAD (5)#4 @ Botom E.W.

Footing/Pad: F3 RIGHT OF BEAM 4
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of footing 375 PLF = 150 x 1.25' x 2.00'
Weight of Pad 1406 LB = 150 x 2.50' x 2.50' x 1.50'
WALL_E 270 PLF = 18.00' x 15.00 from 0.00' to 1.00'
Point from Support 1 of Beam 4 (5538 LB)

Total Weight(W_{total}) = 645 PLF Total Point Load(P_{Total}) = 6945 LB
Footing Width(B_f) Required: 5.16" = (W_{total} / SB) = 645/1500 x 12

USE 15" Wide x 18" Deep Continuous Footing #4 Cont. @ T & B (U.N.O.)
S = 3.50" + 2 x 24" = 51.50" Width 15"
Capacity of Point Load on Footing(P_{cap}) = (SB x S x Width)/144 = 8047 LB
Allowable Point Load on Footing(P_{Allow}) = P_{cap} - (W_{total} x S)/12 = 5279 LB
Required Pad Area = P_{total} /SB = 6945 / 1500 = 4.63'
USE 2'-6" SQ x 18" DEEP PAD (5)#4 @ Botom E.W.

Footing/Pad: F4 LEFT OF BEAM 5
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of footing 375 PLF = 150 x 1.25' x 2.00'
Weight of Pad 1406 LB = 150 x 2.50' x 2.50' x 1.50'
WALL_E 270 PLF = 18.00' x 15.00 from 0.00' to 1.00'
Point from Support 1 of Beam 5 (7716 LB)

Total Weight(W_{total}) = 645 PLF Total Point Load(P_{Total}) = 9122 LB
Footing Width(B_f) Required: 5.16" = (W_{total} / SB) = 645/1500 x 12

USE 15" Wide x 18" Deep Continuous Footing #4 Cont. @ T & B (U.N.O.)
S = 3.50" + 2 x 24" = 51.50" Width 15"
Capacity of Point Load on Footing(P_{cap}) = (SB x S x Width)/144 = 8047 LB
Allowable Point Load on Footing(P_{Allow}) = P_{cap} - (W_{total} x S)/12 = 5279 LB
Required Pad Area = P_{total} /SB = 9122 / 1500 = 6.08'
USE 2'-6" SQ x 18" DEEP PAD (5)#4 @ Botom E.W.

Footing/Pad: F5 RIGHT OF BEAM 5
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of footing 375 PLF = 150 x 1.25' x 2.00'
Weight of Pad 2756 LB = 150 x 3.50' x 3.50' x 1.50'
WALL_E 270 PLF = 18.00' x 15.00 from 0.00' to 1.00'
Point from Support 2 of Beam 5 (14600 LB)

Total Weight(W_{total}) = 645 PLF Total Point Load(P_{Total}) = 17357 LB
Footing Width(B_f) Required: 5.16" = (W_{total} / SB) = 645/1500 x 12

USE 15" Wide x 18" Deep Continuous Footing #4 Cont. @ T & B (U.N.O.)
S = 3.50" + 2 x 24" = 51.50" Width 15"
Capacity of Point Load on Footing(P_{cap}) = (SB x S x Width)/144 = 8047 LB
Allowable Point Load on Footing(P_{Allow}) = P_{cap} - (W_{total} x S)/12 = 5279 LB
Required Pad Area = P_{total} /SB = 17357 / 1500 = 11.57'
USE 3'-6" SQ x 18" DEEP PAD (7)#4 @ Botom E.W.

Footing/Pad: F6 CENTER OF BEAM 7
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of footing 375 PLF = 150 x 1.25' x 2.00'
Weight of Pad 3600 LB = 150 x 4.00' x 4.00' x 1.50'
WALL_E 270 PLF = 18.00' x 15.00 from 0.00' to 1.00'
Point from Support 2 of Beam 7 (17119 LB)

Total Weight(W_{total}) = 645 PLF Total Point Load(P_{Total}) = 20719 LB
Footing Width(B_f) Required: 5.16" = (W_{total} / SB) = 645/1500 x 12

USE 15" Wide x 18" Deep Continuous Footing #4 Cont. @ T & B (U.N.O.)
S = 3.50" + 2 x 24" = 51.50" Width 15"
Capacity of Point Load on Footing(P_{cap}) = (SB x S x Width)/144 = 8047 LB
Allowable Point Load on Footing(P_{Allow}) = P_{cap} - (W_{total} x S)/12 = 5279 LB
Required Pad Area = P_{total} /SB = 20719 / 1500 = 13.81'
USE 4'-0" SQ x 18" DEEP PAD (8)#4 @ Botom E.W.

Footing/Pad: F7 RIGHT OF BEAM 8
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of footing 375 PLF = 150 x 1.25' x 2.00'
Weight of Pad 1406 LB = 150 x 2.50' x 2.50' x 1.50'
WALL_E 270 PLF = 18.00' x 15.00 from 0.00' to 1.00'
Point from Support 2 of Beam 8 (5406 LB)

Total Weight(W_{total}) = 645 PLF Total Point Load(P_{Total}) = 6813 LB
Footing Width(B_f) Required: 5.16" = (W_{total} / SB) = 645/1500 x 12

USE 15" Wide x 18" Deep Continuous Footing #4 Cont. @ T & B (U.N.O.)
S = 3.50" + 2 x 24" = 51.50" Width 15"
Capacity of Point Load on Footing(P_{cap}) = (SB x S x Width)/144 = 8047 LB
Allowable Point Load on Footing(P_{Allow}) = P_{cap} - (W_{total} x S)/12 = 5279 LB
Required Pad Area = P_{total} /SB = 6813 / 1500 = 4.54'
USE 2'-6" SQ x 18" DEEP PAD (5)#4 @ Botom E.W.

Footing/Pad: F8 LEFT OF BEAM 8
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of Pad 1406 LB = 150 x 2.50' x 2.50' x 1.50'
Point from Support 1 of Beam 9 (6628 LB)

Total Point Load(P_{Total}) = 8034 LB
Required Pad Area = P_{total} /SB = 8034 / 1500 = 5.36'
USE 2'-6" SQ x 18" DEEP PAD (5)#4 @ Botom E.W.

Footing/Pad: F9 RIGHT OF BEAM 8
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of footing 375 PLF = 150 x 1.25' x 2.00'
Weight of Pad 2756 LB = 150 x 3.50' x 3.50' x 1.50'
WALL_E 270 PLF = 18.00' x 15.00 from 0.00' to 1.00'
Point from Support 2 of Beam 9 (14288 LB)

Total Weight(W_{total}) = 645 PLF Total Point Load(P_{Total}) = 17044 LB
Footing Width(B_f) Required: 5.16" = (W_{total} / SB) = 645/1500 x 12

USE 15" Wide x 18" Deep Continuous Footing #4 Cont. @ T & B (U.N.O.)
S = 3.50" + 2 x 24" = 51.50" Width 15"
Capacity of Point Load on Footing(P_{cap}) = (SB x S x Width)/144 = 8047 LB
Allowable Point Load on Footing(P_{Allow}) = P_{cap} - (W_{total} x S)/12 = 5279 LB
Required Pad Area = P_{total} /SB = 17044 / 1500 = 11.36'
USE 3'-6" SQ x 18" DEEP PAD (7)#4 @ Botom E.W.

Footing/Pad: F10 RIGHT OF BEAM 11
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of footing 375 PLF = 150 x 1.25' x 2.00'
Weight of Pad 1406 LB = 150 x 2.50' x 2.50' x 1.50'
WALL_E 270 PLF = 18.00' x 15.00 from 0.00' to 1.00'
Point from Support 2 of Beam 11 (6311 LB)

Total Weight(W_{total}) = 645 PLF Total Point Load(P_{Total}) = 7717 LB
Footing Width(B_f) Required: 5.16" = (W_{total} / SB) = 645/1500 x 12

USE 15" Wide x 18" Deep Continuous Footing #4 Cont. @ T & B (U.N.O.)
S = 3.50" + 2 x 24" = 51.50" Width 15"
Capacity of Point Load on Footing(P_{cap}) = (SB x S x Width)/144 = 8047 LB
Allowable Point Load on Footing(P_{Allow}) = P_{cap} - (W_{total} x S)/12 = 5279 LB
Required Pad Area = P_{total} /SB = 7717 / 1500 = 5.14'
USE 2'-6" SQ x 18" DEEP PAD (5)#4 @ Botom E.W.

Footing/Pad: F11 LEFT OF BEAM 12
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of Pad 900 LB = 150 x 2.00' x 2.00' x 1.50'
Point from Support 1 of Beam 12 (3503 LB)

Total Point Load(P_{Total}) = 4403 LB
Required Pad Area = P_{total} /SB = 4403 / 1500 = 2.94'
USE 2'-0" SQ x 18" DEEP PAD (4)#4 @ Botom E.W.

Footing/Pad: F12 RIGHT OF BEAM 12
Soil Bearing(SB) = 1500 PSF post width parallel to footing(Bp) = 3.50"

Loads:
Weight of footing 375 PLF = 150 x 1.25' x 2.00'
Weight of Pad 1406 LB = 150 x 2.50' x 2.50' x 1.50'
WALL_E 270 PLF = 18.00' x 15.00 from 0.00' to 1.00'
Point from Support 2 of Beam 12 (6401 LB)

Total Weight(W_{total}) = 645 PLF Total Point Load(P_{Total}) = 7808 LB
Footing Width(B_f) Required: 5.16" = (W_{total} / SB) = 645/1500 x 12

USE 15" Wide x 18" Deep Continuous Footing #4 Cont. @ T & B (U.N.O.)
S = 3.50" + 2 x 24" = 51.50" Width 15"
Capacity of Point Load on Footing(P_{cap}) = (SB x S x Width)/144 = 8047 LB
Allowable Point Load on Footing(P_{Allow}) = P_{cap} - (W_{total} x S)/12 = 5279 LB
Required Pad Area = P_{total} /SB = 7808 / 1500 = 5.21'
USE 2'-6" SQ x 18" DEEP PAD (5)#4 @ Botom E.W.