CUSTOM DESIGN & ENGINEERING, INC.
MUKILTEO - SEATTLE
PHONE (425) 343-7517 - FAX (425) 492-8388

STRUCTURAL ANALYSIS COVER PAGE

Job Title: 8032 SE 57TH ST, MERCER ISLAND WA

Job Number: A4-3437

Jurisdiction: CITY OF MERCER ISLAND

LATERAL ENGINEERING DESIGN PARAMETERS

```
Wind Design Data
-----------------------------------------------------------
Wind Design Speed, Vu = 110 MPH, Vasd = 85 MPH
Wind Exposure = C
Wind Importance Factor, Iw = 1.0
Internal Pressure Coefficient = +/- 0.18
Ktz = 1.00
Kd = 0.85
Seismic Design Data
_____________________________________
Importance factor = 0.0
Ss = 0.00g, S1 = 0.00g
Site Class =
SDS = 0.00g, SD1 = 0.00g
SDC =
Seismic System =
Design Base Shear = 0.00 kips
Cs = 0.000
R = 0.0
Analysis procedure:  ASCE 11.4, 11.5 & 12.8
```

GRAVITY ENGINEERING DESIGN PARAMETERS

```
Snow load = 25 psf
Roof dead load = 15 psf
Live load = 40 psf
Dead load = 12 psf
Allowable bearing pressure = 1500 psf
```

Contents

1 Lateral Analysis

1.1 Wind Design

ASCE 7-22 Chapter 26 & 27 (Directional Procedure)

Given data

Wind speed 110, Exposure C
Given Roof angle = 2.39 (0.5:12 Pitch)
Building width = 19.0 ft
Building length = 42.0 ft

Total height = 19.4 ft
Height to average roof height = 19.00 ft + 0.40/3 = 19.13 ft
Bldg height = 19.00 ft
Roof height = = 0.40 ft

Velocity pressures, $q_z = 0.00256 K_z K_{zt} K_d K_e V^2 I_w$ Eq 26.10-1
Topography factor, $K_{zt} = 1.00$
Directionality factor, $K_d = 0.85$ (Table 26.6-1)
Ground Elevation Factor, $K_e = 1.00$ (Section 26.9)
Wind pressure, $p = q_h G C_p - q_i (G C_{pi})$
$q_z = 0.00256(1.00)(0.85)(110.00)^2\ 1.00 K_z = 26.33 K_z$

Height	ft	Kz	qz (psf)
Diaphragm	9.000	0.850	22.380
	15.000	0.850	22.380
Diaphragm	19.000	0.900	23.697
Mean Roof	19.198	0.900	23.697
Max Height	19.396	0.900	23.697

Gust effect factor $G = 0.85$, assume Rigid Structure (ASCE 7-10 Section 26.9.1)
Internal pressure coefficient ($G\ Cpi$) = +/- 0.18 (ASCE 7-10 Table 26.11-1)

External wall *Cp* from Figure 27.4-1

Windward wall, $Cp = 0.80$ for all L /B ratios
Side wall, $Cp = -0.70$ for all L /B ratios

Leeward wall pressure coefficient, *Cp* if a function of the L /B ratio
For load direction 1, *B* = 42.0 ft. and *L* = 19.0 ft.
L /B = 19.0 / 42.0 = 0.5, *Cp* = -0.50
For load direction 2, *B* = 19.0 ft. and *L* = 42.0 ft.
L /B = 42.0 / 19.0 = 2.2, *Cp* = -0.29

Surface	Wind Direction	L/B	Cp
Windward wall	All	All	0.80
Leeward wall	Direction 1	0.45	-0.50
Leeward wall	Direction 2	2.21	-0.29
Side wall	All	All	-0.70

External roof *Cp* - Load direction 1, from Figure 27.4-1

For Angle = 2.4 degrees

Windward roof : 0 to h/2, 0 to 19.2/2 = 9.6 ft, Cp = -1.30

Windward roof : h > h/2 = 9.6 ft, Cp -0.70

The above table reflects C_p values based on *h/L* 19.2/19.0 = 1.01

Internal pressure coefficient (G Cpi) - Load direction 1

G Cpi = +/- 0.18 acting at 19.2 ft.
Velocity pressure at $q_i = q_h$ = 23.70 psf (Load case 2-Occurs at roof mid height)

MWFRS Net pressures - Load direction 1

$p = q_h\ G\ C_p - q_i\ (G\ C_{pi})$
$p = q_h\ (0.85)C_p$ - 23.70(+/- 0.18), psf

MWFRS pressures: Direction 1

Surface	z ft	q psf	G	Cp	Net pressure psf with (+Gpi)	(-Gpi)
Windward wall	9.0	22.4	0.85	0.80	11.0	19.5
	15.0	22.4	0.85	0.80	11.0	19.5
	19.0	23.7	0.85	0.80	11.8	20.4
Leeward wall	All	23.7	0.85	-0.50	-14.3	-5.8

Side wall	All	23.7	0.85	-0.70	-18.4	-9.8
Windward roof	>0-h/2	23.7	0.85	-1.30	-30.5	-21.9
Windward roof	>h/2	23.7	0.85	-0.70	-18.4	-9.8
Leeward roof	N/A					

External roof C_p-Load direction 2 (L = 42.0 ft.), from Figure 6 - 6

For Angle = 0.0 degrees

Surface : Windward roof 0 to h/2, 0 to 19.2/2 = 9.6 ft, Cp = -0.90

Surface : Windward roof h/2 to h, 9.6 to 19.2 ft, Cp = -0.90

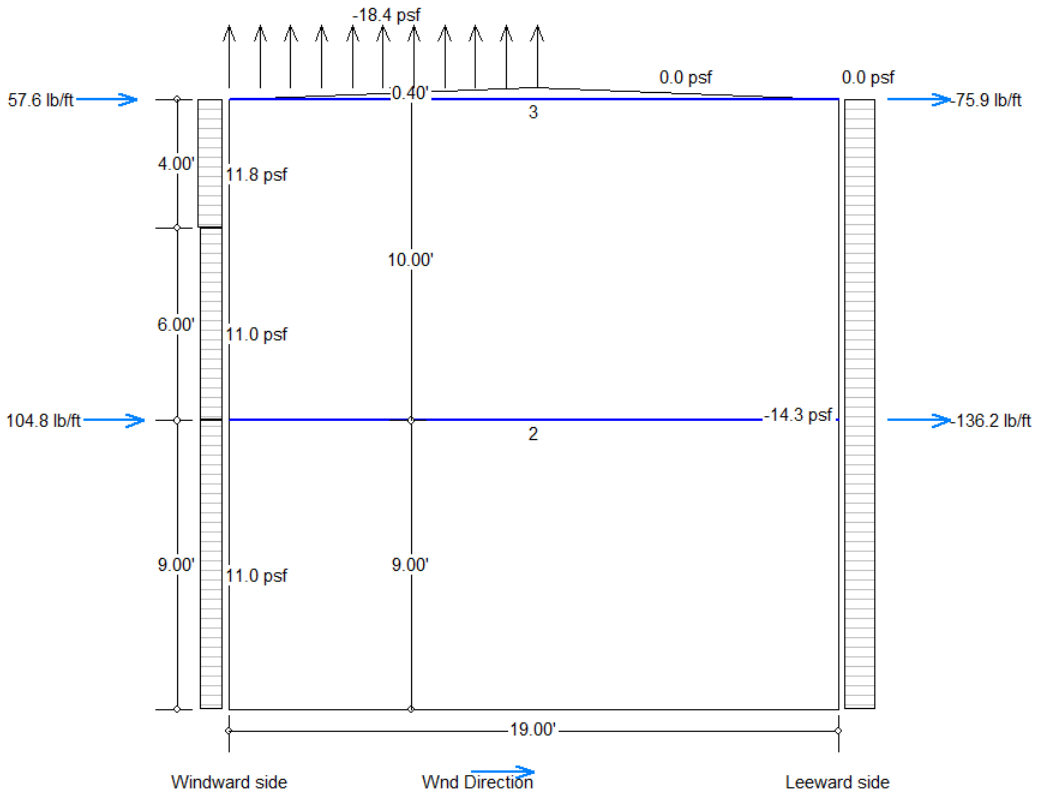
Surface : Windward roof h to 2h, 19.2 to 2(19.2) = 38.4 ft, Cp = -0.50

Surface : Windward roof h > 2h = 38.4 ft, Cp = -0.30

The above table reflects C_p values based on h / L of 19.2 / 42.0 = 0.5

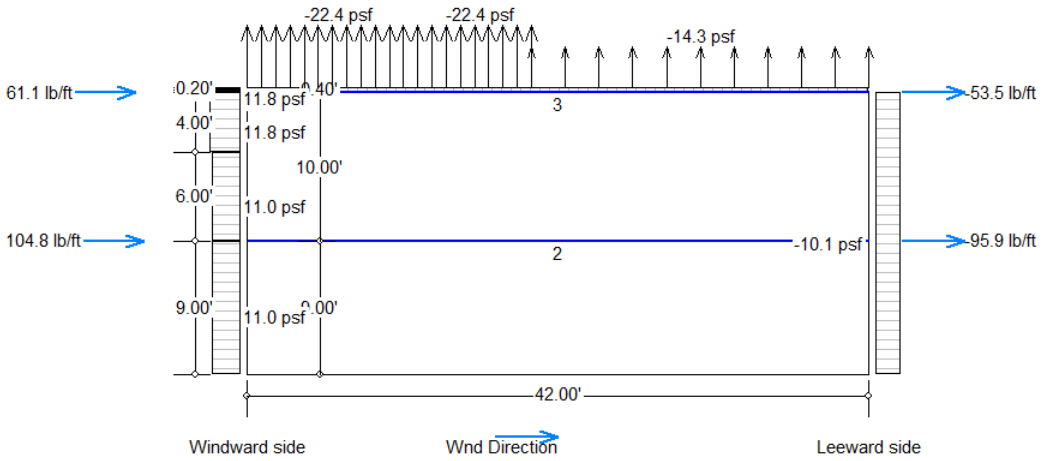
MWFRS pressures : Direction 2
\par \ul Leeward roof N/A \ulnone

Surface	z	q	G	Cp	Net pressure psf with	
	ft	psf			(+Gpi)	(-Gpi)
Windward wall	9.0	22.4	0.85	0.80	11.0	19.5
	15.0	22.4	0.85	0.80	11.0	19.5
	19.0	23.7	0.85	0.80	11.8	20.4
	19.2	23.7	0.85	0.80	11.8	20.4
	19.4	23.7	0.85	0.80	11.8	20.4
Leeward wall	All	23.7	0.85	-0.29	-10.1	-1.6
side wall	All	23.7	0.85	-0.70	-18.4	-9.8
Windward roof	0-h/2	23.7	0.85	-0.90	-22.4	-13.9
Windward roof	h/2-h	23.7	0.85	-0.90	-22.4	-13.9
Windward roof	h-2h	23.7	0.85	-0.50	-14.3	-5.8
Windward roof	>2h	23.7	0.85	-0.30	-10.3	-1.8
Leeward roof	>N/A					



Transverse Direction - with positive internal pressure

Diaphragm	Windward	Leeward	Total
1	57.6 lb/ft	-75.9 lb/ft	133.5 lb/ft
2	104.8 lb/ft	-136.2 lb/ft	241.0 lb/ft



Longitudinal Direction - with positive internal pressure

Diaphragm	Windward	Leeward	Total
1	61.1 lb/ft	-53.5 lb/ft	114.6 lb/ft
2	104.8 lb/ft	-95.9 lb/ft	200.7 lb/ft

Seismic Analysis - Equivalent Lateral Force Procedure per ASCE 12.8

Project Data

Latitude : 47.55

Longitude : -122.23

Risk Category : II

Site Class : D

Structural System : Wood/Steel structural panels rated for shear resistance

R = 6.5

Ω = 2.50

C_d = 4.00

I_E = 1.00

Risk-Targeted Maximum Considered Earthquake (MCER) Spectral Response Acceleration Parameters (per section 11.4.3) from the USGS Seismic Design Geodatabase.

SM_S = 1.73

SM_1 = 1.32

SD_S = 1.15

SD_1 = 0.88

SD_C = D

S_S = 1.63

S_1 = 0.64

T_S = 0.765

T_0 = 0.153

T_L = 6

Compute S_a (Seismic Acceleration) per section 11.4.5

$T_a = C_t h^x_n$ = 0.02 x 19.00 $^{0.75}$ = 0.182 sec, k = 0.75 for All Other Structure

For periods less than T_0:

$S_a = S_{DS}$ x (0.4 + 0.6 x T / T_0) = 1.15 x (0.4 + 0.6 x 0.182/0.153) = 1.281 (11.4-3)

For periods greater or equal to T_0 and less than equal to T_s:

$S_a = S_{DS}$ = 1.15

For periods greater than T_s and less than equal to T_L:

$S_a = S_{D1} / T_a$ = 0.88 / 0.182 = 4.835 (11.4-4)

For periods greater than T_L:

$S_a = S_{D1}\ T_L / Ta^2$ = 0.88 x 6.000 / 0.182 ^{2} = 159.38 (11.4-5)

S_a = 1.150 (Controls)

Seismic response coefficient C_s per section 12.8.1.1 Method 2

$C_s = S_{DS} / (R/I_e)$ = 1.15 / (6.5/1.0) = 0.177 (12.8-3)

for $T \leq T_L$

$C_s = S_{D1} / [\ T_a$ x $(R / I_e)\ ]$ = 0.88 / [0.182 x (6.5 / 1.0) = 0.744 (12.8-4)

for T □> T_L

$C_s = S_{D1}$ x $T_L / [\ T^2$ x $(R / I_e)\ ]$ = 0.88 x 6.000 / [0.182^2 x 6.5 / 1.0] = 24.521 (12.8-5)

Lower bounds for Cs for both methods:

$C_s = 0.044 S_{DS} I_e \geq 0.01 \rightarrow$□0.044 x 1.15 x 1.0 = 0.051 ≥ 0.01 (12.8-6)

For S1 ≥ 0.60:

$C_s = 0.5 S_1 / (R / I_e)\ ]$ = 0.5 x 0.64 x / (6.5 / 1.0) = 0.049 (12.8-7)

Therefore,**C_s = 0.177 (Controls)**

Building Element Weights

Level	Roof	Floor	Exterior Wall	Interior Wall
Roof	15 psf		12 psf	10 psf
1		12 psf	12 psf	10 psf

Building weights lumped on roof and floor diaphragms

Level	Area ft²	Weight psf	Area X Weight	Part x Weight (1)	Ext Wall x Perim x Weight (2)	Total Weight x Weight
Roof	763	15	11448	3816	7140	22404
1	1933	12	23196	19330	23142	65668

Notes:

(1) Partition weight = 1/2 upper mass of most upper level.

(2) Exterior wall weight = 1/2 upper & 1/2 lower mass of level above and below.

Total weight = 88072 lbs

Design Base Shear, $V = C_s \; x \; W$ = 0.177 x 88072 = 15582 lbs, lbs (12.8-1)

Vertical Distribution of Seismic Forces (Section 12.8.3)

$F_x = C_{vx} V$ (12.8-12)

$C_{vx} = w_x \, (h_x)^k \, / \, \sum \left[w_i \, (h_i)^k \right]$ (12.8-13)

Exponent *k* related to the structure period:

For T_a < 0.5s, *k* = 1 **Controls**

For T_a > 2.5s, *k* = 2

For T_a > 0.5s and T_a < 2.5, *k* shall be interpolated

Level x	h_x	h^k_x	w_x	$w_x \, x \, h^k_x$	C_{vx}	$F_x = C_{vx} \, V$	$S_a = F_x / w_x$

Roof	19.00	19.00	22.40	425.7	0.419	6.5	0.291
1	9.00	9.00	65.67	591.0	0.581	9.1	0.138

Compute Diaphragm shears per section 12.10.1.1

Fpx = $\Sigma[F_i]$ / $\Sigma[w_i]$ x w_{px} (12.10-1)

Min $F_{px} = 0.2 S_{DS} I_e w_{px}$ (12.10-2)

Max $F_{px} = 0.4 S_{DS} I_e w_{px}$ (12.10-3)

Level x	w_{px}	F_i	F_{px}	Min Fpx	Max Fpx	Design Fpx
Roof	22.4	6.5	6.5	5.2	10.3	6.5
1	65.7	9.1	9.1	15.1	30.2	15.1

1.2 Diaphragm design shears

The diaphragm design shears are calculated based on a unit width of diaphragm length including interior walls per the calculation:

Load between grid lines (lb/ft) = 1 ft diaphragm width x diaphragm length x (diaphragm weight + interior partition weight) + exterior wall weight x ave height above and below the diaphragm.

Analysis Direction 1

Current Level 3

Shear Forces Table

DIAPHRAGM SPAN	WIDTH ft	WIND LOAD lb/ft	SEISMIC LOAD lb/ft

C-D	19.0	114.6	268.9

Direct Shear Forces Table

DIAPHRAGM SPAN	GRID LINE	WIND lb	SEISMIC lb	GRID LINE	WIND lb	SEISMIC lb
C-D	C	1089	2555	D	1089	2555

Current Level 2

Shear Forces Table

DIAPHRAGM SPAN	WIDTH ft	WIND LOAD lb/ft	SEISMIC LOAD lb/ft
A-B	19.5	200.7	135.1
B-C	22.0	200.7	119.9
C-D	19.0	200.7	138.2

Direct Shear Forces Table

DIAPHRAGM SPAN	GRID LINE	WIND lb	SEISMIC lb	GRID LINE	WIND lb	SEISMIC lb
A-B	A	1957	1317	B	4166	2638
B-C	B	4166	2638	C	4116	2633
C-D	C	4116	2633	D	1907	1313

Analysis Direction 2

Current Level 3

Shear Forces Table

DIAPHRAGM SPAN	WIDTH ft	WIND LOAD lb/ft	SEISMIC LOAD lb/ft

1-3	40.2	133.5	145.6

Direct Shear Forces Table

DIAPHRAGM SPAN	GRID LINE	WIND lb	SEISMIC lb	GRID LINE	WIND lb	SEISMIC lb
1-3	1	2682	2925	3	2682	2925

Current Level 2

Shear Forces Table

DIAPHRAGM SPAN	WIDTH ft	WIND LOAD lb/ft	SEISMIC LOAD lb/ft
1-2	35.2	241.0	215.0

Direct Shear Forces Table

DIAPHRAGM SPAN	GRID LINE	WIND lb	SEISMIC lb	GRID LINE	WIND lb	SEISMIC lb
1-2	1	4239	3783	2	4239	3783

1.3 Compute Rho

```
Redundancy calculation rho, per ASCE 12.3.4.2 - Summary
-----------------------------------------------------
Level = 3
              Condition
Direction     A       B     Rho
------------------------------
   1        PASS    PASS   1.0
   2        FAIL    FAIL   1.3
------------------------------
Level = 2
              Condition
```

```
Direction     A       B    Rho
------------------------------
   1        PASS    PASS   1.0
   2        PASS    PASS   1.0
------------------------------
Design rho for Direction 1 = 1.0
Design rho for Direction 2 = 1.0
Analysis
Redundancy calculations
-------------------------------------------
*** D E S I G N  L E V E L  = 3 ***
-------------------------------------------
*** Direction 1 ***
--------------------
Check condition A
Grid Line C, Height = 9.00 ft
  #      Length    Height/Length
------------------------------
  1      20.67'       0.44
  2      15.50'       0.58
------------------------------
Grid Line D, Height = 9.00 ft
  #      Length    Height/Length
------------------------------
  1      33.33'       0.27
------------------------------
Total shear wall length = 69.5 ft
Check shear wall piers that have h/L > 1.0. Remove that pier and check the length of
removed pier ratio to total shear wall length is less than 0.33.
-------------------------------------------
Removed
Grid/Pier   Length    Length/Total Length
-------------------------------------------
-------------------------------------------
Condition A, PASSED
Check condition B
Grid Line    Length     Height    2L/H
-----------------------------------------------
  C          36.17'     9.00'     8.04
  D          33.33'     9.00'     7.41
-----------------------------------------------
Sum                              15.44
There are 15.44 bays > 4 req'd, therefore OK
Condition B, PASSED
*** Direction 2 ***
--------------------
Check condition A
Grid Line 1, Height = 9.00 ft
  #      Length    Height/Length
------------------------------
  1       5.08'       1.77
------------------------------
Grid Line 3, Height = 9.00 ft
```

```
  #      Length    Height/Length
------------------------------
  1       3.51'       2.57
------------------------------
Total shear wall length = 8.6 ft
Check shear wall piers that have h/L > 1.0. Remove that pier and check the length of
removed pier ratio to total shear wall length is less than 0.33.
---------------------------------------------
Removed
Grid/Pier   Length    Length/Total Length
---------------------------------------------
  1          5.08'          0.59 --> NG
  3          3.51'          0.41 --> NG
---------------------------------------------
Condition A, FAILED
Check condition B
Grid Line    Length     Height    2L/H
-------------------------------------------------
  1           5.08'     9.00'     1.13
  3           3.51'     9.00'     0.78
-------------------------------------------------
Sum                               1.91
There are 1.91 bays < 4 req'd, therefore NOT OK
Condition B, FAILED
---------------------------------------------
*** D E S I G N  L E V E L  = 2 ***
---------------------------------------------
*** Direction 1 ***
--------------------
Check condition A
Grid Line A, Height = 8.00 ft
  #      Length    Height/Length
------------------------------
  1      28.83'       0.28
------------------------------
Grid Line B, Height = 8.00 ft
  #      Length    Height/Length
------------------------------
  1      19.00'       0.42
------------------------------
Grid Line C, Height = 8.00 ft
  #      Length    Height/Length
------------------------------
  1       9.00'       0.89
------------------------------
Grid Line D, Height = 8.00 ft
  #      Length    Height/Length
------------------------------
  1      16.74'       0.48
  2      11.67'       0.69
------------------------------
Total shear wall length = 85.2 ft
```

Check shear wall piers that have h/L > 1.0. Remove that pier and check the length of removed pier ratio to total shear wall length is less than 0.33.

Removed Grid/Pier	Length	Length/Total Length

Condition A, PASSED
Check condition B

Grid Line	Length	Height	2L/H
A	28.83'	8.00'	7.21
B	19.00'	8.00'	4.75
C	9.00'	8.00'	2.25
D	28.40'	8.00'	7.10
Sum			21.31

There are 21.31 bays > 4 req'd, therefore OK
Condition B, PASSED
*** Direction 2 ***

Check condition A
Grid Line 1, Height = 8.00 ft

#	Length	Height/Length
1	2.00'	4.00
2	2.00'	4.00
3	3.50'	2.29
4	5.08'	1.57

Grid Line 2, Height = 8.00 ft

#	Length	Height/Length
1	4.65'	1.72
2	19.91'	0.40

Total shear wall length = 37.1 ft
Check shear wall piers that have h/L > 1.0. Remove that pier and check the length of removed pier ratio to total shear wall length is less than 0.33.

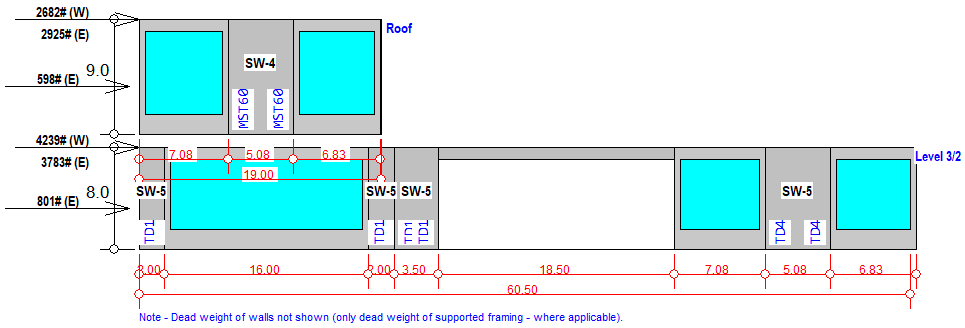
Removed Grid/Pier	Length	Length/Total Length
1	2.00'	0.05 --> OK
1	2.00'	0.05 --> OK
1	3.50'	0.09 --> OK
1	5.08'	0.14 --> OK
2	4.65'	0.13 --> OK

Condition A, PASSED
Check condition B

Grid Line	Length	Height	2L/H

```
  1          12.58'      8.00'      3.15
  2          24.56'      8.00'      6.14
-------------------------------------------------
Sum                                  9.28
There are 9.28 bays > 4 req'd, therefore OK
Condition B, PASSED
```

Shear Wall at Grid 1



NOTE: THE SW-5 PANEL IN THE GREAT ROOM HAS BEEN REPLACED BY (3) HSS 4 X 4 X 3/8 CANTILEVER COLUMN ELEMENTS.

Design Rho = 1.0

Table 1 - Shears

Level	Sum B ft	H ft	Max Aspect Ratio	E lb	Ew lb	E+Ew lb	W lb	vE plf	vW plf	Max plf	MARK
3	5.1	9.0	1.8	2925	342	3267	2682	450	226	450	SW-4
2	12.6	8.0	3.5**	6708	674	7382	6921	460*	261*	460	SW-4

Shear panel(s) in the braced wall line exceed aspect ratio as defined per SDPWS 4.3.4.

Reduction per SDPWS 4.3.4.2 is required. The capacity of the shear wall is reduced by

WSP = 1.25 - 0.125(h/bs) Aspect Ratio Factor. It is more convenient to increase

the demand load by the factor 1 / WSP and size the SW accordingly. Where WSP > 1.0.

Level	Max Aspect Ratio	WSP	1/WSP	Design Shear	Adjusted Shear	Revised SW MARK
2	3.50	0.81	1.23	460	567	SW-5

Notes

1. b = sum of all solid panels.
2. H / W = Maximum aspect ratio of all panels within a SW.
3. E - Unfactored seismic forces(Summed between levels) = rho x Qe.
4. Ew - Unfactored Wall inertia force (wall & window panels) includes rho.
5. E + Ew = Total unfactored seismic load.
6. W - Unfactored wind forces(Summed between levels).
7. vE = 0.7 x vE(ASD factored shear).
8. wW = 0.6 x vW / 1.4.
9. * = Shear values includes effects of vertical shears due hold-down reactions from upper levels (if applicable).

Table 2a - Vertical loads on panels

Level	Panel#/ Type	Length ft	x1 ft	x2 ft	Dead lb/ft	Snow lb/ft	Live lb/ft	Wind Uplift lb/ft

3	0/OPEN	7.08	0.00	7.08	0.0*	-	-	-
3	1/SW	5.08	0.00	5.08	108.0*	-	-	-
3	2/OPEN	6.83	0.00	6.83	0.0*	-	-	-
2	0/SW	2.00	0.00	2.00	84.0*	-	-	-
2	1/OPEN	16.00	0.00	16.00	0.0*	-	-	-
2	2/SW	2.00	0.00	2.00	84.0*	-	-	-
2	3/SW	3.50	0.00	3.50	96.0*	-	-	-
2	4/DRAG	18.50	0.00	18.50	0.0*	-	-	-
2	5/OPEN	7.08	0.00	7.08	0.0*	-	-	-
2	6/SW	5.08	0.00	5.08	96.0*	-	-	-
2	7/OPEN	6.83	0.00	6.83	0.0*	-	-	-

Notes:

1. A panel is considered an element within a braced wall line.
   such as shear wall, window, filler (non-shear load), drag element.
2. length = indivisual panel length (within a braced wall line).
3. x1 = the start dimension for the distributive load - measured from LHS end of panel.
4. x2 = the end dimension for the distributive load - measured from LHS end of panel.
5. Multiple distributive loads may be supported by a panel.
6. Multiple distributive loads shown are not sorted - along the span of the panel.
7. * = Wall Dead load (wall dead load does not apply to drag elements and window panels).
   Wall dead loads are summed up with framing dead loads where applicable
   (which includes beam drag elements and window hdrs). See Table 2b below.
8. OPEN = Window/Door, DRAG = Drag strut, NO-SW = filler panel (no shear capacity)
   SW = Shear panel.

Table 2b - Unfactored Reaction forces at panels

Reaction	Location from end (ft)	D lb	S lb	L lb	W Uplift lb	DIRECTION 1 E lb	DIRECTION 1 W lb	DIRECTION 2 E lb	DIRECTION 2 W lb
3-0	41.50	0	0	0	0	0	0	0	0
3-1	48.58	274	0	0	0	-5784	-4749	5784	4749
3-2	53.67	274	0	0	0	5784	4749	-5784	-4749
3-3	60.50	0	0	0	0	0	0	0	0
2-0	0.00	84	0	0	0	-4106	-3850	4106	3850
2-1	2.00	84	0	0	0	4106	3850	-4106	-3850
2-2	18.00	84	0	0	0	-4106	-3850	4106	3850
2-3	20.00	252	0	0	0	-587	-550	587	550
2-4	23.50	168	0	0	0	4693	4400	-4693	-4400
2-5	41.50	0	0	0	0	0	0	0	0
2-6	42.00	0	0	0	0	-409	-336	409	336
2-7	48.58	274	0	0	0	0	0	0	0
2-8	49.08	244	0	0	0	-9498	-8346	9498	8346
2-9	53.67	274	0	0	0	0	0	0	0
2-10	54.17	244	0	0	0	9907	8681	-9907	-8681
2-11	60.50	0	0	0	0	0	0	0	0
2-12	61.00	0	0	0	0	0	0	0	0

Notes:

1. Reaction X-Y, X = level, Y = panel sequence id

2. D = DEAD LOAD, L = LIVE LOAD, W-UPLIFT = WIND UPLIFT LOAD

   W = WIND LOAD, E = SEISMIC LOAD

3. D = (Panel Height x Panel Width x Panel weight = 0.0 psf) / 2

   Dead load vectors are summed at abutting panels

4. DIRECTION 1 = LOAD DIRECTION LEFT TO RIGHT

5. DIRECTION 2 = LOAD DIRECTION RIGHT TO LEFT

6. NEGATIVE VALUES = UPLIFT OR TENSION

Table 3 - Factored Reaction forces at panels

Reaction Location		DIRECTION 1						DIRECTION 2						MIN MAX
	from end	LC1	LC2	LC3	LC4	LC5	LC6	LC1	LC2	LC3	LC4	LC5	LC6	LOAD LOAD
	(ft)	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb lb
3-0	41.5	0	0	0	0	0	0	0	0	0	0	0	0	0 0
3-1	48.6	-2575	-3774	-1863	-2762	-2685	-3922	3124	4323	2412	3311	3014	4176	-3922 4323
3-2	53.7	3124	4323	2412	3311	3014	4176	-2575	-3774	-1863	-2762	-2685	-3922	-3922 4323
3-3	60.5	0	0	0	0	0	0	0	0	0	0	0	0	0 0
2-0	0.0	-2226	-2790	-1649	-2072	-2260	-2835	2394	2958	1817	2240	2361	2913	-2835 2958
2-1	2.0	2394	2958	1817	2240	2361	2913	-2226	-2790	-1649	-2072	-2260	-2835	-2835 2958

2-2	18.0	-2226	-2790	-1649	-2072	-2260	-2835	2394	2958	1817	2240	2361	2913	-2835	2958
2-3	20.0	-78	-159	4	-56	-179	-294	582	663	500	560	481	528	-294	663
2-4	23.5	2808	3453	2148	2632	2741	3363	-2472	-3117	-1812	-2296	-2539	-3207	-3207	3453
2-5	41.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-6	42.0	-201	-286	-151	-215	-201	-286	201	286	151	215	201	286	-286	286
2-7	48.6	274	274	274	274	165	127	274	274	274	274	165	127	127	274
2-8	49.1	-4763	-6405	-3512	-4743	-4861	-6536	5251	6893	4000	5231	5154	6762	-6536	6893
2-9	53.7	274	274	274	274	165	127	274	274	274	274	165	127	127	274
2-10	54.2	5453	7179	4151	5445	5355	7048	-4965	-6691	-3663	-4957	-5062	-6822	-6822	7179
2-11	60.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2-12	61.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Notes

1. LC = Load combination
2. LC1 = D + 0.6W ASCE 2.4.1 - 5a
3. LC2 = D + 0.7E ASCE 2.4.1 - 5b
4. LC3 = D + 0.75L + 0.75(0.6W) + 0.75S ASCE 2.4.1 - 6a
5. LC4 = D + 0.75L + 0.75(0.7E) + 0.75S ASCE 2.4.1 - 6b
6. LC5 = 0.6D + 0.6W ASCE 2.4.1 - 7
7. LC6 = (0.6 - 0.14SDS)D + 0.7E ASCE 2.4.1 - 8, SDS = 0.970
8. MIN LOAD = Maximum negative tension force
9. MAX LOAD = Maximum positive compression force
10. W = W uplift + W shear overturning

Table 4 - Tie down schedule

Reaction Location from end (ft)	MIN LOAD lb	MAX LOAD lb	HOLD-DOWN MARK
3-0 41.5	0	0	
3-1 48.6	-3922	3014	MST60
3-2 53.7	-3922	3014	MST60
3-3 60.5	0	0	
2-0 0.0	-2835	2240	TD1
2-1 2.0	-2835	2240	TD1
2-2 18.0	-2835	2240	TD1
2-3 20.0	-294	500	TD1
2-4 23.5	-3207	2632	TD1
2-5 41.5	0	0	TD1
2-6 42.0	-286	201	TD1
2-7 48.6	127	274	TD4
2-8 49.1	-6536	5154	TD4
2-9 53.7	127	274	TD4
2-10 54.2	-6822	5355	TD4
2-11 60.5	0	0	TD1
2-12 61.0	0	0	TD1

Notes

1. N/R = Not required - compression controls.

2. NONE = Uplift exceeded specified hold-down.

3. Due to the applied dead loads, some hold-downs may differ within a shear panel. The highest capacity hold-down will be used at both ends.

Table 5 - Drag forces (Unfactored loads)

Level = 3

LOAD	q lb/ft	v lb/ft	dq lb/ft
WIND	141.17	527.65	-386.49
SEISMIC	171.94	642.69	-470.75

PANEL ID	TYPE	PANEL END#1 WIND LB	PANEL END#1 SEISMIC LB	PANEL END #2 WIND LB	PANEL END #2 SEISMIC LB
1	WINDOW/DOOR	0	0	1000	1218
2	SHEAR WALL	1000	1218	-965	-1175

3	WINDOW/DOOR	-965	-1175	-0	-0

Level = 2

	q	v	dq
LOAD	lb/ft	lb/ft	lb/ft
WIND	70.07	608.51	47.69
SEISMIC	68.01	657.84	124.08

		PANEL END#1		PANEL END #2	
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC
		LB	LB	LB	LB
1	SHEAR WALL	0	0	95	248
2	WINDOW/DOOR	95	248	1216	1336
3	SHEAR WALL	1216	1336	1312	1584
4	SHEAR WALL	1312	1584	1479	2019
5	DRAG-STRUT	1479	2019	2775	3277
6	WINDOW/DOOR	2775	3277	3271	3759
7	SHEAR WALL	3271	3759	3514	4389
8	WINDOW/DOOR	3514	4389	3992	4854

Notes:

q = Diaphragm shear.

v = Shear wall shear.

dq = q - v (this level) + v (upper level)

Table 6 - Drag forces (Factored loads)

Level = 3

		PANEL END #1		PANEL END #2		
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC	
		LB	LB	LB	LB	
1	WINDOW/DOOR	0	0	600	2131	MST27
2	SHEAR WALL	600	2131	-579	-2056	MST27
3	WINDOW/DOOR	-579	-2056	-0	-0	

Level = 2

		PANEL END #1		PANEL END #2		
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC	
		LB	LB	LB	LB	
1	SHEAR WALL	0	0	57	434	
2	WINDOW/DOOR	57	434	730	2339	MST27
3	SHEAR WALL	730	2339	787	2773	MST27

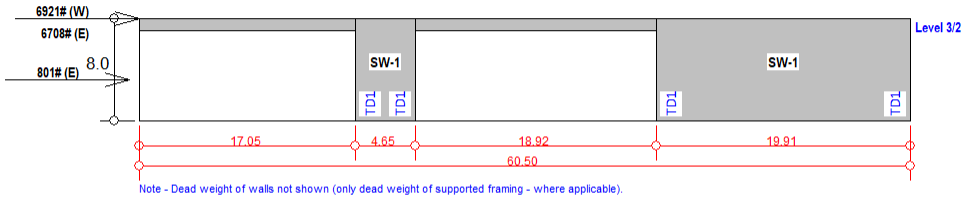
4	SHEAR WALL	787	2773	887	3533	MST37
5	DRAG-STRUT	887	3533	1665	5735	MST48
6	WINDOW/DOOR	1665	5735	1963	6578	(2) MST37
7	SHEAR WALL	1963	6578	2108	7682	(2) MST37
8	WINDOW/DOOR	2108	7682	2395	8495	(2) MST37

Notes

1. Wind load, W = 0.6 x Load

2. Seismic load, E = 0.7 x 1.25 x Load. Apply requirements of ASCE 7-10 (SEC 12.3.3.4)

Shear Wall at Grid 2



Design Rho = 1.0

Table 1 - Shears

Level	Sum B	H	Max Aspect	E	Ew	E+Ew	W	vE	vW	Max	MARK
	ft	ft	Ratio	lb	lb	lb	lb	plf	plf	plf	
2	24.6	8.0	1.7	6708	325	7033	6921	200	121	200	SW-1

Notes

1. b = sum of all solid panels.

2. H / W = Maximum aspect ratio of all panels within a SW.

3. E - Unfactored seismic forces(Summed between levels) = rho x Qe.

4. Ew - Unfactored Wall inertia force (wall & window panels) includes rho.

5. E + Ew = Total unfactored seismic load.

6. W - Unfactored wind forces(Summed between levels).

7. vE = 0.7 x vE(ASD factored shear).

8. wW = 0.6 x vW / 1.4.

9. * = Shear values includes effects of vertical shears due hold-down reactions

   from upper levels (if applicable).

Table 2a - Vertical loads on panels

Level	Panel#/ Type	Length ft	x1 ft	x2 ft	Dead lb/ft	Snow lb/ft	Live lb/ft	Wind Uplift lb/ft
2	0/DRAG	17.05	0.00	17.05	0.0*	-	-	-
2	1/SW	4.65	0.00	4.65	96.0*	-	-	-
2	2/DRAG	18.92	0.00	18.92	0.0*	-	-	-
2	3/SW	19.91	0.00	19.91	96.0*	-	-	-

Notes:

1. A panel is considered an element within a braced wall line.

   such as shear wall, window, filler (non-shear load), drag element.

2. length = indivisual panel length (within a braced wall line).

3. x1 = the start dimension for the distributive load - measured from LHS end of panel.

4. x2 = the end dimension for the distributive load - measured from LHS end of panel.

5. Multiple distributive loads may be supported by a panel.

6. Multiple distributive loads shown are not sorted - along the span of the panel.

7. * = Wall Dead load (wall dead load does not apply to drag elements and window panels).

   Wall dead loads are summed up with framing dead loads where applicable

   (which includes beam drag elements and window hdrs). See Table 2b below.

8. OPEN = Window/Door, DRAG = Drag strut, NO-SW = filler panel (no shear capacity)

   SW = Shear panel.

Table 2b - Unfactored Reaction forces at panels

							DIRECTION 1		DIRECTION 2	
Reaction	Location from end (ft)	D lb	S lb	L lb	W Uplift lb		E lb	W lb	E lb	W lb
2-0	0.00	0	0	0	0		0	0	0	0
2-1	17.05	223	0	0	0		-2291	-2255	2291	2255
2-2	21.70	223	0	0	0		2291	2255	-2291	-2255
2-3	40.61	956	0	0	0		-2291	-2255	2291	2255
2-4	60.52	956	0	0	0		2291	2255	-2291	-2255

Notes:

1. Reaction X-Y, X = level, Y = panel sequence id

2. D = DEAD LOAD, L = LIVE LOAD, W-UPLIFT = WIND UPLIFT LOAD

   W = WIND LOAD, E = SEISMIC LOAD

3. D = (Panel Height x Panel Width x Panel weight = 0.0 psf) / 2

   Dead load vectors are summed at abutting panels

4. DIRECTION 1 = LOAD DIRECTION LEFT TO RIGHT

5. DIRECTION 2 = LOAD DIRECTION RIGHT TO LEFT

6. NEGATIVE VALUES = UPLIFT OR TENSION

Table 3 - Factored Reaction forces at panels

Reaction Location		DIRECTION 1						DIRECTION 2						MIN MAX
	from end	LC1	LC2	LC3	LC4	LC5	LC6	LC1	LC2	LC3	LC4	LC5	LC6	LOAD
	(ft)	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb lb
2-0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0 0
2-1	17.0	-1130	-1381	-792	-980	-1219	-1500	1576	1827	1238	1426	1487	1707	-1500 1827
2-2	21.7	1576	1827	1238	1426	1487	1707	-1130	-1381	-792	-980	-1219	-1500	-1500 1827
2-3	40.6	-397	-648	-59	-247	-779	-1160	2309	2560	1970	2159	1926	2048	-1160 2560
2-4	60.5	2309	2560	1970	2159	1926	2048	-397	-648	-59	-247	-779	-1160	-1160 2560

Notes

1. LC = Load combination

2. LC1 = D + 0.6W ASCE 2.4.1 - 5a

3. LC2 = D + 0.7E ASCE 2.4.1 - 5b

4. LC3 = D + 0.75L + 0.75(0.6W) + 0.75S ASCE 2.4.1 - 6a

5. LC4 = D + 0.75L + 0.75(0.7E) + 0.75S ASCE 2.4.1 - 6b

6. LC5 = 0.6D + 0.6W ASCE 2.4.1 - 7

7. LC6 = (0.6 - 0.14SDS)D + 0.7E ASCE 2.4.1 - 8, SDS = 0.970

8. MIN LOAD = Maximum negative tension force

9. MAX LOAD = Maximum positive compression force

10. W = W uplift + W shear overturning

Table 4 - Tie down schedule

Reaction Location from end (ft)	MIN LOAD lb	MAX LOAD lb	HOLD-DOWN MARK
2-0 0.0	0	0	TD1
2-1 17.0	-1500	1426	TD1
2-2 21.7	-1500	1426	TD1
2-3 40.6	-1160	1970	TD1
2-4 60.5	-1160	1970	TD1

Notes

1. N/R = Not required - compression controls.

2. NONE = Uplift exceeded specified hold-down.

3. Due to the applied dead loads, some hold-downs may differ within a shear panel. The highest capacity hold-down will be used at both ends.

Table 5 - Drag forces (Unfactored loads)

Level = 2

	q	v	dq
LOAD	lb/ft	lb/ft	lb/ft
WIND	114.40	281.84	-167.45
SEISMIC	116.25	286.41	-170.16

		PANEL END#1		PANEL END #2	
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC
		LB	LB	LB	LB
1	DRAG-STRUT	0	0	1950	1982
2	SHEAR WALL	1950	1982	1172	1191
3	DRAG-STRUT	1172	1191	3336	3390
4	SHEAR WALL	3336	3390	2	3

Notes:

q = Diaphragm shear.

v = Shear wall shear.

dq = q - v (this level) + v (upper level)

Table 6 - Drag forces (Factored loads)

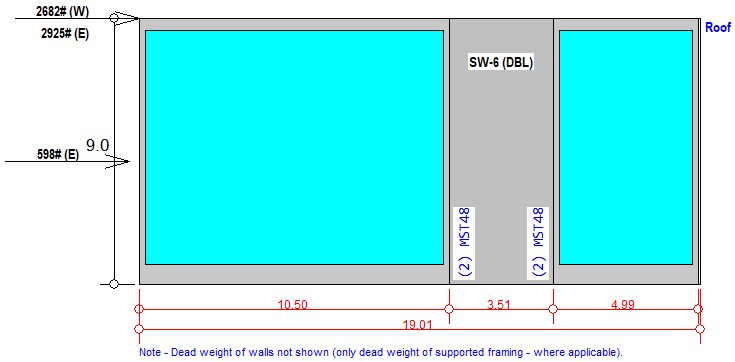
Level = 2

		PANEL END #1		PANEL END #2		
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC	
		LB	LB	LB	LB	
1	DRAG-STRUT	0	0	1170	3468	MST37
2	SHEAR WALL	1170	3468	703	2085	MST37
3	DRAG-STRUT	703	2085	2002	5933	MST60
4	SHEAR WALL	2002	5933	1	4	MST60

Notes

1. Wind load, W = 0.6 x Load
2. Seismic load, E = 0.7 x 1.25 x Load. Apply requirements of ASCE 7-10 (SEC 12.3.3.4)

Shear Wall at Grid 3



Note - Dead weight of walls not shown (only dead weight of supported framing - where applicable).

Design Rho = 1.0

Table 1 - Shears

Level	Sum B	H	Max Aspect	E	Ew	E+Ew	W	vE	vW	Max	MARK
	ft	ft	Ratio	lb	lb	lb	lb	plf	plf	plf	
3	3.5	9.0	2.6**	2925	313	3238	2682	647	328	647	SW-6 (DBL)

Shear panel(s) in the braced wall line exceed aspect ratio as defined per SDPWS 4.3.4.

Reduction per SDPWS 4.3.4.2 is required. The capacity of the shear wall is reduced by

WSP = 1.25 - 0.125(h/bs) Aspect Ratio Factor. It is more convenient to increase

the demand load by the factor 1 / WSP and size the SW accordingly. Where WSP > 1.0.

Level	Max Aspect Ratio	WSP	1/WSP	Design Shear	Adjusted Shear	Revised SW MARK
3	2.57	0.93	1.08	647	696	SW-6 (DBL)

Notes

1. b = sum of all solid panels.
2. H / W = Maximum aspect ratio of all panels within a SW.
3. E - Unfactored seismic forces(Summed between levels) = rho x Qe.
4. Ew - Unfactored Wall inertia force (wall & window panels) includes rho.
5. E + Ew = Total unfactored seismic load.
6. W - Unfactored wind forces(Summed between levels).
7. vE = 0.7 x vE(ASD factored shear).
8. wW = 0.6 x vW / 1.4.
9. * = Shear values includes effects of vertical shears due hold-down reactions from upper levels (if applicable).

Table 2a - Vertical loads on panels

Level	Panel#/ Type	Length ft	x1 ft	x2 ft	Dead lb/ft	Snow lb/ft	Live lb/ft	Wind Uplift lb/ft
3	0/OPEN	10.50	0.00	10.50	0.0*	-	-	-

3	1/SW	3.51	0.00	3.51	108.0*	-	-	-
3	2/OPEN	4.99	0.00	4.99	0.0*	-	-	-

Notes:

1. A panel is considered an element within a braced wall line.
   such as shear wall, window, filler (non-shear load), drag element.
2. length = indivisual panel length (within a braced wall line).
3. x1 = the start dimension for the distributive load - measured from LHS end of panel.
4. x2 = the end dimension for the distributive load - measured from LHS end of panel.
5. Multiple distributive loads may be supported by a panel.
6. Multiple distributive loads shown are not sorted - along the span of the panel.
7. * = Wall Dead load (wall dead load does not apply to drag elements and window panels).
   Wall dead loads are summed up with framing dead loads where applicable
   (which includes beam drag elements and window hdrs). See Table 2b below.
8. OPEN = Window/Door, DRAG = Drag strut, NO-SW = filler panel (no shear capacity)
   SW = Shear panel.

Table 2b - Unfactored Reaction forces at panels

						DIRECTION 1		DIRECTION 2	
Reaction	Location from end (ft)	D lb	S lb	L lb	W Uplift lb	E lb	W lb	E lb	W lb
3-0	0.00	0	0	0	0	0	0	0	0
3-1	10.50	189	0	0	0	-8313	-6886	8313	6886
3-2	14.01	189	0	0	0	8313	6886	-8313	-6886

3-3	18.99	0	0	0	0	0	0	0	0	0	0	0	0	0

Notes:

1. Reaction X-Y, X = level, Y = panel sequence id
2. D = DEAD LOAD, L = LIVE LOAD, W-UPLIFT = WIND UPLIFT LOAD
   W = WIND LOAD, E = SEISMIC LOAD
3. D = (Panel Height x Panel Width x Panel weight = 0.0 psf) / 2
   Dead load vectors are summed at abutting panels
4. DIRECTION 1 = LOAD DIRECTION LEFT TO RIGHT
5. DIRECTION 2 = LOAD DIRECTION RIGHT TO LEFT
6. NEGATIVE VALUES = UPLIFT OR TENSION

Table 3 - Factored Reaction forces at panels

Reaction Location	DIRECTION 1						DIRECTION 2						MIN MAX
from end	LC1	LC2	LC3	LC4	LC5	LC6	LC1	LC2	LC3	LC4	LC5	LC6	LOAD LOAD
(ft)	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb lb
3-0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0 0
3-1	10.5	-3942	-5630	-2909	-4175	-4018	-5731	4321	6008	3288	4554	4245	5907	-5731 6008
3-2	14.0	4321	6008	3288	4554	4245	5907	-3942	-5630	-2909	-4175	-4018	-5731	-5731 6008
3-3	19.0	0	0	0	0	0	0	0	0	0	0	0	0	0 0

Notes

1. LC = Load combination

2. LC1 = D + 0.6W ASCE 2.4.1 - 5a

3. LC2 = D + 0.7E ASCE 2.4.1 - 5b

4. LC3 = D + 0.75L + 0.75(0.6W) + 0.75S ASCE 2.4.1 - 6a

5. LC4 = D + 0.75L + 0.75(0.7E) + 0.75S ASCE 2.4.1 - 6b

6. LC5 = 0.6D + 0.6W ASCE 2.4.1 - 7

7. LC6 = (0.6 - 0.14SDS)D + 0.7E ASCE 2.4.1 - 8, SDS = 0.970

8. MIN LOAD = Maximum negative tension force

9. MAX LOAD = Maximum positive compression force

10. W = W uplift + W shear overturning

Table 4 - Tie down schedule

Reaction Location from end (ft)	MIN LOAD lb	MAX LOAD lb	HOLD-DOWN MARK
3-0 0.0	0	0	
3-1 10.5	-5731	4245	(2) MST48
3-2 14.0	-5731	4245	(2) MST48
3-3 19.0	0	0	

Notes

1. N/R = Not required - compression controls.

2. NONE = Uplift exceeded specified hold-down.

3. Due to the applied dead loads, some hold-downs may differ within a shear panel. The highest capacity hold-down will be used at

both ends.

Table 5 - Drag forces (Unfactored loads)

Level = 3

	q	v	dq
LOAD	lb/ft	lb/ft	lb/ft
WIND	141.13	765.13	-624.00
SEISMIC	170.37	923.65	-753.28

		PANEL END#1		PANEL END #2	
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC
		LB	LB	LB	LB
1	WINDOW/DOOR	0	0	1482	1789
2	SHEAR WALL	1482	1789	-706	-852
3	WINDOW/DOOR	-706	-852	-2	-2

Notes:

q = Diaphragm shear.

v = Shear wall shear.

dq = q - v (this level) + v (upper level)

Table 6 - Drag forces (Factored loads)

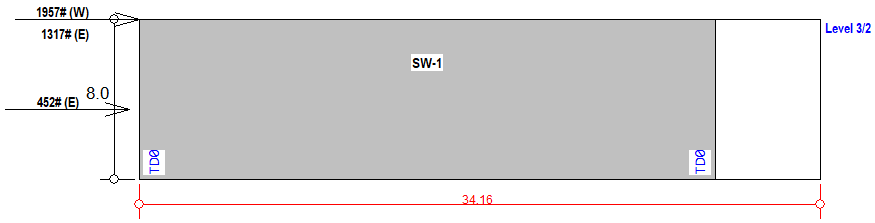
Level = 3

		PANEL END #1		PANEL END #2		
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC	
		LB	LB	LB	LB	
1	WINDOW/DOOR	0	0	889	3131	MST27
2	SHEAR WALL	889	3131	-423	-1491	MST27
3	WINDOW/DOOR	-423	-1491	-1	-4	

Notes

1. Wind load, W = 0.6 x Load
2. Seismic load, E = 0.7 x 1.25 x Load. Apply requirements of ASCE 7-10 (SEC 12.3.3.4)

Shear Wall at Grid A



Note - Dead weight of walls not shown (only dead weight of supported framing - where applicable).

Design Rho = 1.0

Table 1 - Shears

Level	Sum B	H	Max Aspect	E	Ew	E+Ew	W	vE	vW	Max	MARK
	ft	ft	Ratio	lb	lb	lb	lb	plf	plf	plf	
2	28.8	8.0	0.3	1317	382	1699	1957	41	29	41	SW-1

Notes

1. b = sum of all solid panels.
2. H / W = Maximum aspect ratio of all panels within a SW.
3. E - Unfactored seismic forces(Summed between levels) = rho x Qe.
4. Ew - Unfactored Wall inertia force (wall & window panels) includes rho.
5. E + Ew = Total unfactored seismic load.
6. W - Unfactored wind forces(Summed between levels).
7. vE = 0.7 x vE(ASD factored shear).

8. wW = 0.6 x vW / 1.4.

9. * = Shear values includes effects of vertical shears due hold-down reactions

from upper levels (if applicable).

Table 2a - Vertical loads on panels

Level	Panel#/ Type	Length ft	x1 ft	x2 ft	Dead lb/ft	Snow lb/ft	Live lb/ft	Wind Uplift lb/ft
2	0/SW	28.83	0.00	28.83	96.0*	-	-	-

Notes:

1. A panel is considered an element within a braced wall line.

such as shear wall, window, filler (non-shear load), drag element.

2. length = indivisual panel length (within a braced wall line).

3. x1 = the start dimension for the distributive load - measured from LHS end of panel.

4. x2 = the end dimension for the distributive load - measured from LHS end of panel.

5. Multiple distributive loads may be supported by a panel.

6. Multiple distributive loads shown are not sorted - along the span of the panel.

7. * = Wall Dead load (wall dead load does not apply to drag elements and window panels).

Wall dead loads are summed up with framing dead loads where applicable

(which includes beam drag elements and window hdrs). See Table 2b below.

8. OPEN = Window/Door, DRAG = Drag strut, NO-SW = filler panel (no shear capacity)

SW = Shear panel.

Table 2b - Unfactored Reaction forces at panels

						DIRECTION 1		DIRECTION 2	
Reaction Location	D	S	L	W		E	W	E	W
from end				Uplift					
(ft)	lb	lb	lb	lb		lb	lb	lb	lb
2-0	0.00	1384	0	0	0	-471	-543	471	543
2-1	28.83	1384	0	0	0	471	543	-471	-543

Notes:

1. Reaction X-Y, X = level, Y = panel sequence id
2. D = DEAD LOAD, L = LIVE LOAD, W-UPLIFT = WIND UPLIFT LOAD
   W = WIND LOAD, E = SEISMIC LOAD
3. D = (Panel Height x Panel Width x Panel weight = 0.0 psf) / 2
   Dead load vectors are summed at abutting panels
4. DIRECTION 1 = LOAD DIRECTION LEFT TO RIGHT
5. DIRECTION 2 = LOAD DIRECTION RIGHT TO LEFT
6. NEGATIVE VALUES = UPLIFT OR TENSION

Table 3 - Factored Reaction forces at panels

Reaction Location	DIRECTION 1						DIRECTION 2						MIN	MAX
from end	LC1	LC2	LC3	LC4	LC5	LC6	LC1	LC2	LC3	LC4	LC5	LC6	LOAD	LOAD
(ft)	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb
2-0 0.0	1058	1054	1140	1137	505	312	1710	1714	1628	1631	1156	972	312	1714
2-1 28.8	1710	1714	1628	1631	1156	972	1058	1054	1140	1137	505	312	312	1714

Notes

1. LC = Load combination
2. LC1 = D + 0.6W ASCE 2.4.1 - 5a
3. LC2 = D + 0.7E ASCE 2.4.1 - 5b
4. LC3 = D + 0.75L + 0.75(0.6W) + 0.75S ASCE 2.4.1 - 6a
5. LC4 = D + 0.75L + 0.75(0.7E) + 0.75S ASCE 2.4.1 - 6b
6. LC5 = 0.6D + 0.6W ASCE 2.4.1 - 7
7. LC6 = (0.6 - 0.14SDS)D + 0.7E ASCE 2.4.1 - 8, SDS = 0.970
8. MIN LOAD = Maximum negative tension force
9. MAX LOAD = Maximum positive compression force
10. W = W uplift + W shear overturning

Table 4 - Tie down schedule

Reaction Location from end (ft)	MIN LOAD lb	MAX LOAD lb	HOLD-DOWN MARK
2-0 0.0	312	1156	TD0
2-1 28.8	312	1156	TD0

Notes

1. N/R = Not required - compression controls.
2. NONE = Uplift exceeded specified hold-down.
3. Due to the applied dead loads, some hold-downs may differ within

a shear panel. The highest capacity hold-down will be used at both ends.

Table 5 - Drag forces (Unfactored loads)

Level = 2

	q	v	dq
LOAD	lb/ft	lb/ft	lb/ft
WIND	57.27	67.86	-10.58
SEISMIC	49.74	58.93	-9.19

		PANEL END#1		PANEL END #2	
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC
		LB	LB	LB	LB
1	SHEAR WALL	0	0	-305	-265

Notes:

q = Diaphragm shear.

v = Shear wall shear.

dq = q - v (this level) + v (upper level)

Table 6 - Drag forces (Factored loads)

Level = 2

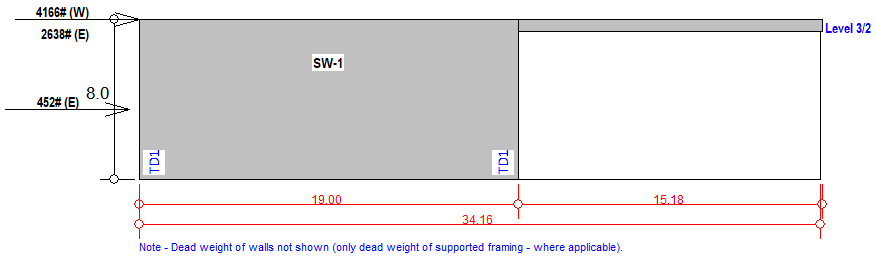
PANEL ID	TYPE	PANEL END #1 WIND	PANEL END #1 SEISMIC	PANEL END #2 WIND	PANEL END #2 SEISMIC
		LB	LB	LB	LB
1	SHEAR WALL	0	0	-183	-464

Notes

1. Wind load, W = 0.6 x Load

2. Seismic load, E = 0.7 x 1.25 x Load. Apply requirements of ASCE 7-10 (SEC 12.3.3.4)

Shear Wall at Grid B



Design Rho = 1.0

Table 1 - Shears

Level	Sum B	H	Max Aspect	E	Ew	E+Ew	W	vE	vW	Max	MARK
	ft	ft	Ratio	lb	lb	lb	lb	plf	plf	plf	
2	19.0	8.0	0.4	2638	252	2889	4166	106	94	106	SW-1

Notes

1. b = sum of all solid panels.
2. H / W = Maximum aspect ratio of all panels within a SW.
3. E - Unfactored seismic forces(Summed between levels) = rho x Qe.
4. Ew - Unfactored Wall inertia force (wall & window panels) includes rho.
5. E + Ew = Total unfactored seismic load.
6. W - Unfactored wind forces(Summed between levels).
7. vE = 0.7 x vE(ASD factored shear).
8. wW = 0.6 x vW / 1.4.
9. * = Shear values includes effects of vertical shears due hold-down reactions from upper levels (if applicable).

Table 2a - Vertical loads on panels

Level	Panel#/ Type	Length ft	x1 ft	x2 ft	Dead lb/ft	Snow lb/ft	Live lb/ft	Wind Uplift lb/ft
2	0/SW	19.00	0.00	19.00	96.0*	-	-	-

2	1/DRAG	15.18	0.00	15.18	0.0*	-	-	-

Notes:

1. A panel is considered an element within a braced wall line.
   such as shear wall, window, filler (non-shear load), drag element.
2. length = indivisual panel length (within a braced wall line).
3. x1 = the start dimension for the distributive load - measured from LHS end of panel.
4. x2 = the end dimension for the distributive load - measured from LHS end of panel.
5. Multiple distributive loads may be supported by a panel.
6. Multiple distributive loads shown are not sorted - along the span of the panel.
7. * = Wall Dead load (wall dead load does not apply to drag elements and window panels).
   Wall dead loads are summed up with framing dead loads where applicable
   (which includes beam drag elements and window hdrs). See Table 2b below.
8. OPEN = Window/Door, DRAG = Drag strut, NO-SW = filler panel (no shear capacity)
   SW = Shear panel.

Table 2b - Unfactored Reaction forces at panels

						DIRECTION 1		DIRECTION 2	
Reaction	Location from end (ft)	D lb	S lb	L lb	W Uplift lb	E lb	W lb	E lb	W lb
2-0	0.00	912	0	0	0	-1217	-1754	1217	1754
2-1	19.00	912	0	0	0	1217	1754	-1217	-1754
2-2	34.18	0	0	0	0	0	0	0	0

Notes:

1. Reaction X-Y, X = level, Y = panel sequence id

2. D = DEAD LOAD, L = LIVE LOAD, W-UPLIFT = WIND UPLIFT LOAD

   W = WIND LOAD, E = SEISMIC LOAD

3. D = (Panel Height x Panel Width x Panel weight = 0.0 psf) / 2

   Dead load vectors are summed at abutting panels

4. DIRECTION 1 = LOAD DIRECTION LEFT TO RIGHT

5. DIRECTION 2 = LOAD DIRECTION RIGHT TO LEFT

6. NEGATIVE VALUES = UPLIFT OR TENSION

Table 3 - Factored Reaction forces at panels

Reaction Location	DIRECTION 1						DIRECTION 2						MIN MAX
from end	LC1	LC2	LC3	LC4	LC5	LC6	LC1	LC2	LC3	LC4	LC5	LC6	LOAD LOAD
(ft)	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb lb
2-0 0.0	-140	60	123	273	-505	-428	1964	1764	1701	1551	1600	1275	-505 1964
2-1 19.0	1964	1764	1701	1551	1600	1275	-140	60	123	273	-505	-428	-505 1964
2-2 34.2	0	0	0	0	0	0	0	0	0	0	0	0	0 0

Notes

1. LC = Load combination

2. LC1 = D + 0.6W ASCE 2.4.1 - 5a

3. LC2 = D + 0.7E ASCE 2.4.1 - 5b

4. LC3 = D + 0.75L + 0.75(0.6W) + 0.75S ASCE 2.4.1 - 6a

5. LC4 = D + 0.75L + 0.75(0.7E) + 0.75S ASCE 2.4.1 - 6b

6. LC5 = 0.6D + 0.6W ASCE 2.4.1 - 7

7. LC6 = (0.6 - 0.14SDS)D + 0.7E ASCE 2.4.1 - 8, SDS = 0.970

8. MIN LOAD = Maximum negative tension force

9. MAX LOAD = Maximum positive compression force

10. W = W uplift + W shear overturning

Table 4 - Tie down schedule

Reaction Location from end (ft)	MIN LOAD lb	MAX LOAD lb	HOLD-DOWN MARK
2-0 0.0	-505	1551	TD1
2-1 19.0	-505	1551	TD1
2-2 34.2	0	0	TD1

Notes

1. N/R = Not required - compression controls.

2. NONE = Uplift exceeded specified hold-down.

3. Due to the applied dead loads, some hold-downs may differ within a shear panel. The highest capacity hold-down will be used at both ends.

Table 5 - Drag forces (Unfactored loads)

Level = 2

	q	v	dq
LOAD	lb/ft	lb/ft	lb/ft
WIND	121.95	219.26	-97.31
SEISMIC	84.58	152.07	-67.49

		PANEL END#1		PANEL END #2	
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC
		LB	LB	LB	LB
1	SHEAR WALL	0	0	-1849	-1282
2	DRAG-STRUT	-1849	-1282	2	1

Notes:

q = Diaphragm shear.

v = Shear wall shear.

dq = q - v (this level) + v (upper level)

Table 6 - Drag forces (Factored loads)

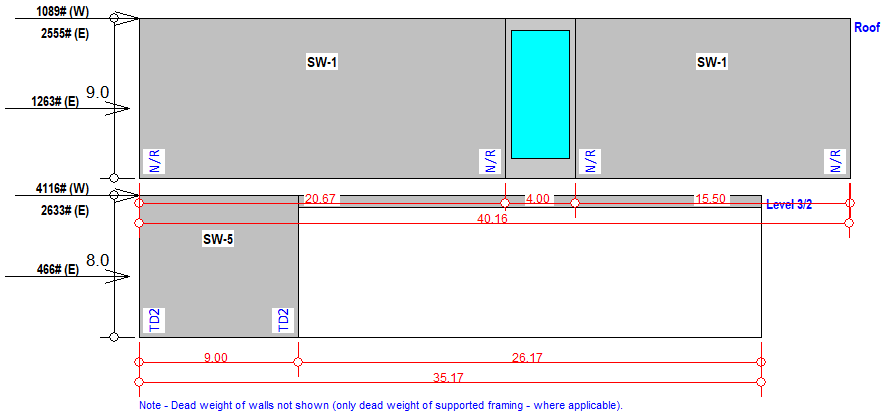
Level = 2

		PANEL END #1		PANEL END #2	
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC
		LB	LB	LB	LB
1	SHEAR WALL	0	0	-1109	-2244
2	DRAG-STRUT	-1109	-2244	1	3

Notes

1. Wind load, W = 0.6 x Load
2. Seismic load, E = 0.7 x 1.25 x Load. Apply requirements of ASCE 7-10 (SEC 12.3.3.4)

Shear Wall at Grid C



Design Rho = 1.0

Table 1 - Shears

Level	Sum B	H	Max Aspect	E	Ew	E+Ew	W	vE	vW	Max	MARK
	ft	ft	Ratio	lb	lb	lb	lb	plf	plf	plf	
3	36.2	9.0	0.6	2555	1190	3745	1089	72	13	72	SW-1
2	9.0	8.0	0.9	5189	1309	6498	5205	505	248	505	SW-5

Notes

1. b = sum of all solid panels.

2. H / W = Maximum aspect ratio of all panels within a SW.

3. E - Unfactored seismic forces(Summed between levels) = rho x Qe.

4. Ew - Unfactored Wall inertia force (wall & window panels) includes rho.

5. E + Ew = Total unfactored seismic load.

6. W - Unfactored wind forces(Summed between levels).

7. vE = 0.7 x vE(ASD factored shear).

8. wW = 0.6 x vW / 1.4.

9. * = Shear values includes effects of vertical shears due hold-down reactions
   from upper levels (if applicable).

Table 2a - Vertical loads on panels

Level	Panel#/ Type	Length ft	x1 ft	x2 ft	Dead lb/ft	Snow lb/ft	Live lb/ft	Wind Uplift lb/ft
3	0/SW	20.67	0.00	20.67	108.0*	-	-	-
3	1/OPEN	4.00	0.00	4.00	0.0*	-	-	-
3	2/SW	15.50	0.00	15.50	108.0*	-	-	-
2	0/SW	9.00	0.00	9.00	96.0*	-	-	-
2	1/DRAG	26.17	0.00	26.17	0.0*	-	-	-

Notes:

1. A panel is considered an element within a braced wall line.
   such as shear wall, window, filler (non-shear load), drag element.

2. length = indivisual panel length (within a braced wall line).

3. x1 = the start dimension for the distributive load - measured from LHS end of panel.

4. x2 = the end dimension for the distributive load - measured from LHS end of panel.

5. Multiple distributive loads may be supported by a panel.

6. Multiple distributive loads shown are not sorted - along the span of the panel.

7. * = Wall Dead load (wall dead load does not apply to drag elements and window panels).

   Wall dead loads are summed up with framing dead loads where applicable

   (which includes beam drag elements and window hdrs). See Table 2b below.

8. OPEN = Window/Door, DRAG = Drag strut, NO-SW = filler panel (no shear capacity)

   SW = Shear panel.

Table 2b - Unfactored Reaction forces at panels

							DIRECTION 1		DIRECTION 2	
Reaction	Location from end (ft)	D lb	S lb	L lb	W Uplift lb		E lb	W lb	E lb	W lb
3-0	0.00	1116	0	0	0		-932	-271	932	271
3-1	20.67	1116	0	0	0		932	271	-932	-271
3-2	24.67	837	0	0	0		-932	-271	932	271
3-3	40.17	837	0	0	0		932	271	-932	-271
2-0	0.10	1548	0	0	0		-6708	-4898	6708	4898
2-1	9.10	432	0	0	0		5918	4668	-5918	-4668
2-2	20.67	1116	0	0	0		0	0	0	0
2-3	24.67	837	0	0	0		0	0	0	0
2-4	35.27	0	0	0	0		-142	-41	142	41

Notes:

1. Reaction X-Y, X = level, Y = panel sequence id

2. D = DEAD LOAD, L = LIVE LOAD, W-UPLIFT = WIND UPLIFT LOAD

   W = WIND LOAD, E = SEISMIC LOAD

3. D = (Panel Height x Panel Width x Panel weight = 0.0 psf) / 2

   Dead load vectors are summed at abutting panels

4. DIRECTION 1 = LOAD DIRECTION LEFT TO RIGHT

5. DIRECTION 2 = LOAD DIRECTION RIGHT TO LEFT

6. NEGATIVE VALUES = UPLIFT OR TENSION

Table 3 - Factored Reaction forces at panels

Reaction Location		DIRECTION 1						DIRECTION 2						MIN	MAX
	from end	LC1	LC2	LC3	LC4	LC5	LC6	LC1	LC2	LC3	LC4	LC5	LC6	LOAD	LOAD
	(ft)	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb
3-0	0.0	953	464	994	627	507	-134	1279	1768	1238	1605	832	1170	-134	1768
3-1	20.7	1279	1768	1238	1605	832	1170	953	464	994	627	507	-134	-134	1768
3-2	24.7	674	185	715	348	340	-264	1000	1489	959	1326	665	1041	-264	1489
3-3	40.2	1000	1489	959	1326	665	1041	674	185	715	348	340	-264	-264	1489
2-0	0.1	-1391	-3147	-656	-1973	-2010	-3977	4487	6243	3752	5069	3867	5414	-3977	6243
2-1	9.1	3233	4575	2533	3539	3060	4343	-2369	-3711	-1669	-2675	-2542	-3942	-3942	4575

2-2	20.7	1116	1116	1116	1116	670	518	1116	1116	1116	1116	670	518	518	1116
2-3	24.7	837	837	837	837	502	389	837	837	837	837	502	389	389	837
2-4	35.3	-25	-100	-19	-75	-25	-100	25	100	19	75	25	100	-100	100

Notes

1. LC = Load combination
2. LC1 = D + 0.6W ASCE 2.4.1 - 5a
3. LC2 = D + 0.7E ASCE 2.4.1 - 5b
4. LC3 = D + 0.75L + 0.75(0.6W) + 0.75S ASCE 2.4.1 - 6a
5. LC4 = D + 0.75L + 0.75(0.7E) + 0.75S ASCE 2.4.1 - 6b
6. LC5 = 0.6D + 0.6W ASCE 2.4.1 - 7
7. LC6 = (0.6 - 0.14SDS)D + 0.7E ASCE 2.4.1 - 8, SDS = 0.970
8. MIN LOAD = Maximum negative tension force
9. MAX LOAD = Maximum positive compression force
10. W = W uplift + W shear overturning

Table 4 - Tie down schedule

Reaction	Location from end (ft)	MIN LOAD lb	MAX LOAD lb	HOLD-DOWN MARK
3-0	0.0	-134	1170	N/R
3-1	20.7	-134	1170	N/R
3-2	24.7	-264	959	N/R

3-3	40.2		-264	959	N/R
2-0	0.1		-3977	3867	TD2
2-1	9.1		-3942	3060	TD2
2-2	20.7		518	1116	TD1
2-3	24.7		389	837	TD1
2-4	35.3		-100	25	TD1

Notes

1. N/R = Not required - compression controls.
2. NONE = Uplift exceeded specified hold-down.
3. Due to the applied dead loads, some hold-downs may differ within a shear panel. The highest capacity hold-down will be used at both ends.

Table 5 - Drag forces (Unfactored loads)

Level = 3

LOAD	q lb/ft	v lb/ft	dq lb/ft
WIND	27.11	30.11	-3.00
SEISMIC	93.24	103.55	-10.31

		PANEL END#1		PANEL END #2	
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC
		LB	LB	LB	LB
1	SHEAR WALL	0	0	-62	-213
2	WINDOW/DOOR	-62	-213	47	160
3	SHEAR WALL	47	160	0	0

Level = 2

	q	v	dq
LOAD	lb/ft	lb/ft	lb/ft
WIND	117.03	578.34	-431.20
SEISMIC	78.26	721.96	-540.15

		PANEL END#1		PANEL END #2	
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC
		LB	LB	LB	LB
1	SHEAR WALL	0	0	-3881	-4861
2	DRAG-STRUT	-3881	-4861	-818	-2813

Notes:

q = Diaphragm shear.

v = Shear wall shear.

dq = q - v (this level) + v (upper level)

Table 6 - Drag forces (Factored loads)

Level = 3

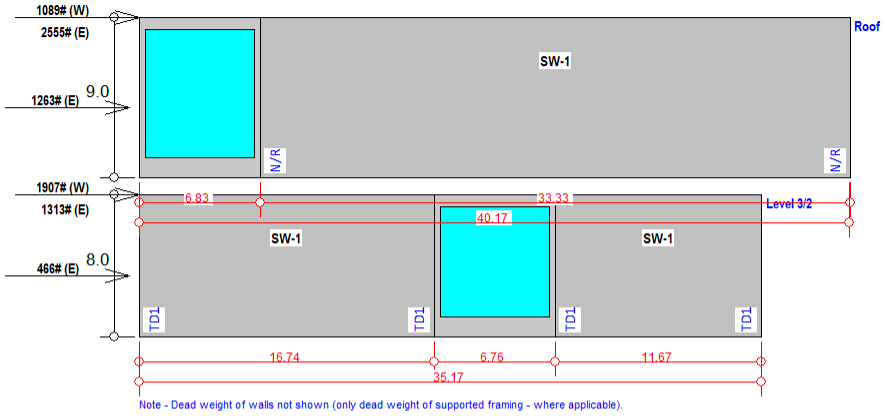
		PANEL END #1		PANEL END #2	
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC
		LB	LB	LB	LB
1	SHEAR WALL	0	0	-37	-373
2	WINDOW/DOOR	-37	-373	28	280
3	SHEAR WALL	28	280	0	0

Level = 2

		PANEL END #1		PANEL END #2	
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC
		LB	LB	LB	LB
1	SHEAR WALL	0	0	-2328	-8507

```
    2       DRAG-STRUT       -2328       -8507        -491       -4923

-------------------------------------------------------------------------------

Notes

 1. Wind load, W = 0.6 x Load

 2. Seismic load, E = 0.7 x 1.25 x Load. Apply requirements of ASCE 7-10 (SEC 12.3.3.4)
```

Shear Wall at Grid D




```
Design Rho = 1.0

Table 1 - Shears

 Level    Sum B      H    Max Aspect    E        Ew       E+Ew      W        vE        vW       Max     MARK

            ft       ft      Ratio      lb       lb        lb       lb       plf       plf      plf
```

3	33.3	9.0	0.3	2555	1138	3693	1089	78	14	78	SW-1
2	28.4	8.0	0.7	3868	1551	5419	2996	169*	52*	169	SW-1

Notes

1. b = sum of all solid panels.
2. H / W = Maximum aspect ratio of all panels within a SW.
3. E - Unfactored seismic forces(Summed between levels) = rho x Qe.
4. Ew - Unfactored Wall inertia force (wall & window panels) includes rho.
5. E + Ew = Total unfactored seismic load.
6. W - Unfactored wind forces(Summed between levels).
7. vE = 0.7 x vE(ASD factored shear).
8. wW = 0.6 x vW / 1.4.
9. * = Shear values includes effects of vertical shears due hold-down reactions from upper levels (if applicable).

Table 2a - Vertical loads on panels

Level	Panel#/ Type	Length ft	x1 ft	x2 ft	Dead lb/ft	Snow lb/ft	Live lb/ft	Wind Uplift lb/ft
3	0/OPEN	6.83	0.00	6.83	0.0*	-	-	-
3	1/SW	33.33	0.00	33.33	108.0*	-	-	-
2	0/SW	16.74	0.00	16.74	96.0*	-	-	-
2	1/OPEN	6.76	0.00	6.76	0.0*	-	-	-
2	2/SW	11.67	0.00	11.67	96.0*	-	-	-

Notes:

1. A panel is considered an element within a braced wall line.
   such as shear wall, window, filler (non-shear load), drag element.
2. length = indivisual panel length (within a braced wall line).
3. x1 = the start dimension for the distributive load - measured from LHS end of panel.
4. x2 = the end dimension for the distributive load - measured from LHS end of panel.
5. Multiple distributive loads may be supported by a panel.
6. Multiple distributive loads shown are not sorted - along the span of the panel.
7. * = Wall Dead load (wall dead load does not apply to drag elements and window panels).
   Wall dead loads are summed up with framing dead loads where applicable
   (which includes beam drag elements and window hdrs). See Table 2b below.
8. OPEN = Window/Door, DRAG = Drag strut, NO-SW = filler panel (no shear capacity)
   SW = Shear panel.

Table 2b - Unfactored Reaction forces at panels

							DIRECTION 1		DIRECTION 2	
Reaction	Location from end (ft)	D lb	S lb	L lb	W Uplift lb		E lb	W lb	E lb	W lb
3-0	0.00	0	0	0	0		0	0	0	0
3-1	6.83	1800	0	0	0		-997	-294	997	294
3-2	40.17	1800	0	0	0		997	294	-997	-294
2-0	0.00	803	0	0	0		-2116	-1018	2116	1018

2-1	6.83	1800	0	0	0	0	0	0	0	0
2-2	16.74	803	0	0	0	1119	724	-1119	-724	
2-3	23.50	560	0	0	0	-1526	-844	1526	844	
2-4	35.17	560	0	0	0	1526	844	-1526	-844	

Notes:

1. Reaction X-Y, X = level, Y = panel sequence id
2. D = DEAD LOAD, L = LIVE LOAD, W-UPLIFT = WIND UPLIFT LOAD
   W = WIND LOAD, E = SEISMIC LOAD
3. D = (Panel Height x Panel Width x Panel weight = 0.0 psf) / 2
   Dead load vectors are summed at abutting panels
4. DIRECTION 1 = LOAD DIRECTION LEFT TO RIGHT
5. DIRECTION 2 = LOAD DIRECTION RIGHT TO LEFT
6. NEGATIVE VALUES = UPLIFT OR TENSION

Table 3 - Factored Reaction forces at panels

Reaction Location	DIRECTION 1						DIRECTION 2						MIN	MAX
from end	LC1	LC2	LC3	LC4	LC5	LC6	LC1	LC2	LC3	LC4	LC5	LC6	LOAD	LOAD
(ft)	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb	lb
3-0	0.0	0	0	0	0	0	0	0	0	0	0	0	0	0
3-1	6.8	1624	1102	1668	1277	904	138	1976	2498	1932	2323	1256	1534	138	2498
3-2	40.2	1976	2498	1932	2323	1256	1534	1624	1102	1668	1277	904	138	138	2498

2-0	0.0	193	-678	345	-308	-129	-1109	1414	2285	1261	1915	1093	1854	-1109	2285
2-1	6.8	1800	1800	1800	1800	1080	836	1800	1800	1800	1800	1080	836	836	1800
2-2	16.7	1238	1587	1129	1391	916	1156	369	20	478	216	48	-411	-411	1587
2-3	23.5	54	-508	180	-241	-170	-809	1066	1628	940	1361	842	1328	-809	1628
2-4	35.2	1066	1628	940	1361	842	1328	54	-508	180	-241	-170	-809	-809	1628

Notes

1. LC = Load combination
2. LC1 = D + 0.6W ASCE 2.4.1 - 5a
3. LC2 = D + 0.7E ASCE 2.4.1 - 5b
4. LC3 = D + 0.75L + 0.75(0.6W) + 0.75S ASCE 2.4.1 - 6a
5. LC4 = D + 0.75L + 0.75(0.7E) + 0.75S ASCE 2.4.1 - 6b
6. LC5 = 0.6D + 0.6W ASCE 2.4.1 - 7
7. LC6 = (0.6 - 0.14SDS)D + 0.7E ASCE 2.4.1 - 8, SDS = 0.970
8. MIN LOAD = Maximum negative tension force
9. MAX LOAD = Maximum positive compression force
10. W = W uplift + W shear overturning

Table 4 - Tie down schedule

Reaction Location from end (ft)	MIN LOAD lb	MAX LOAD lb	HOLD-DOWN MARK

3-0	0.0		0	0	
3-1	6.8		138	1668	N/R
3-2	40.2		138	1668	N/R
2-0	0.0		-1109	1261	TD1
2-1	6.8		836	1800	TD1
2-2	16.7		-411	1129	TD1
2-3	23.5		-809	940	TD1
2-4	35.2		-809	940	TD1

Notes

1. N/R = Not required - compression controls.
2. NONE = Uplift exceeded specified hold-down.
3. Due to the applied dead loads, some hold-downs may differ within a shear panel. The highest capacity hold-down will be used at both ends.

Table 5 - Drag forces (Unfactored loads)

Level = 3

LOAD	q lb/ft	v lb/ft	dq lb/ft

	q	v	dq
LOAD	lb/ft	lb/ft	lb/ft
WIND	27.11	32.67	-5.56
SEISMIC	91.94	110.79	-18.85

		PANEL END#1		PANEL END #2	
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC
		LB	LB	LB	LB
1	WINDOW/DOOR	0	0	185	628
2	SHEAR WALL	185	628	0	0

Level = 2

	q	v	dq
LOAD	lb/ft	lb/ft	lb/ft
WIND	54.22	120.47	-18.58
SEISMIC	49.09	241.68	-30.92

		PANEL END#1		PANEL END #2	
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC

		LB	LB	LB	LB
1	SHEAR WALL	0	0	-311	-518
2	WINDOW/DOOR	-311	-518	56	-186
3	SHEAR WALL	56	-186	-161	-546

Notes:

q = Diaphragm shear.

v = Shear wall shear.

dq = q - v (this level) + v (upper level)

Table 6 - Drag forces (Factored loads)

Level = 3

		PANEL END #1		PANEL END #2	
PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC
		LB	LB	LB	LB
1	WINDOW/DOOR	0	0	111	1099
2	SHEAR WALL	111	1099	0	0

Level = 2

		PANEL END #1		PANEL END #2	

PANEL ID	TYPE	WIND	SEISMIC	WIND	SEISMIC
		LB	LB	LB	LB
1	SHEAR WALL	0	0	-187	-906
2	WINDOW/DOOR	-187	-906	33	-325
3	SHEAR WALL	33	-325	-97	-956

Notes

1. Wind load, W = 0.6 x Load

2. Seismic load, E = 0.7 x 1.25 x Load. Apply requirements of ASCE 7-10 (SEC 12.3.3.4)

2 GRAVITY DESIGN

Beam Framing Analysis

2.1 Analysis of Bm 6 - 1.750 x 11.875 LVL 2.0E

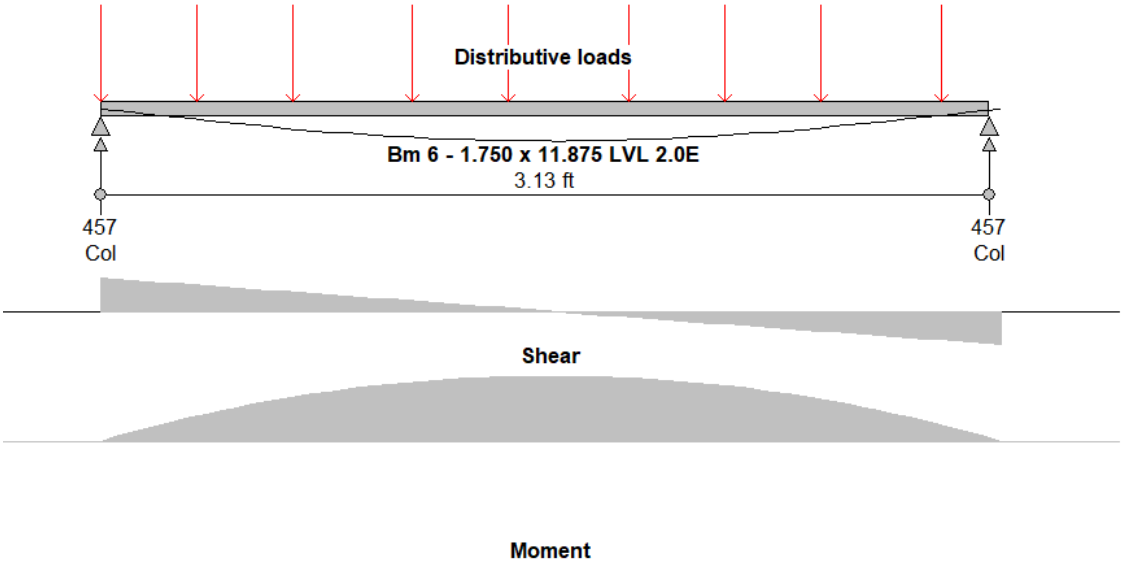


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

No Applied point loads

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA ID	WALL HEIGHT	D	S	L
0	Floor/Roof	1	-	12.0	0.0	40.0
1	Floor/Roof	1	-	12.0	0.0	40.0

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
0	Floor/Roof	11.3 |	3.3	3.1 |	67.5	0.0	225.0
1	Floor/Roof	11.3 |	3.1	0.0 |	67.5	0.0	225.0

(1) From loc and to loc are load segments starting and ending
measured from the left of the beam

->Computed moments and shears (Factored) :

Max shear = 457 lbs D + L (2.4-2)

Min shear = -457 lbs D + L (2.4-2)

Max moment = 357 ft-lbs D + L (2.4-2)

Min moment = -0 ft-lbs D + L (2.4-2)

->Beam properties (2D xy axis) :

```
        Span  = 3.12 ft

        Area  = 20.78 sq.in

        Sx    = 41.13 sq.in

        Ixx   = 244.21 sq.in

->Check shear :

        fv = 1.5 x V / Area  = 457 / 20.78 = 32.99 psi

        F'v = 285 x 1.00 =  285.00 psi

          Fv = 285 psi, CD = 1.00

->Check moment :

        fb = M x 12 / Sx  = 4283 / 41.13 = 104.14 psi

          Fb = 2600 psi, CD = 1.00, Cf = 1.00, Cl = 1.00.

          Fb' x CD x CF x CL = 2603 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 1

        Deflection span 0, Length = 3.12 ft Combined deflection = -0.001 [D + L (2.4-2)]

                Allowed = 3.12 x 12 / 360.0 = 0.104 in.

                Allowed (Seismic controled) = 3.12 x 12 / 180.0 = 0.208 in.
```

2.2 Analysis of Bm 7 - 5.250 x 11.875 PSL 2.2E

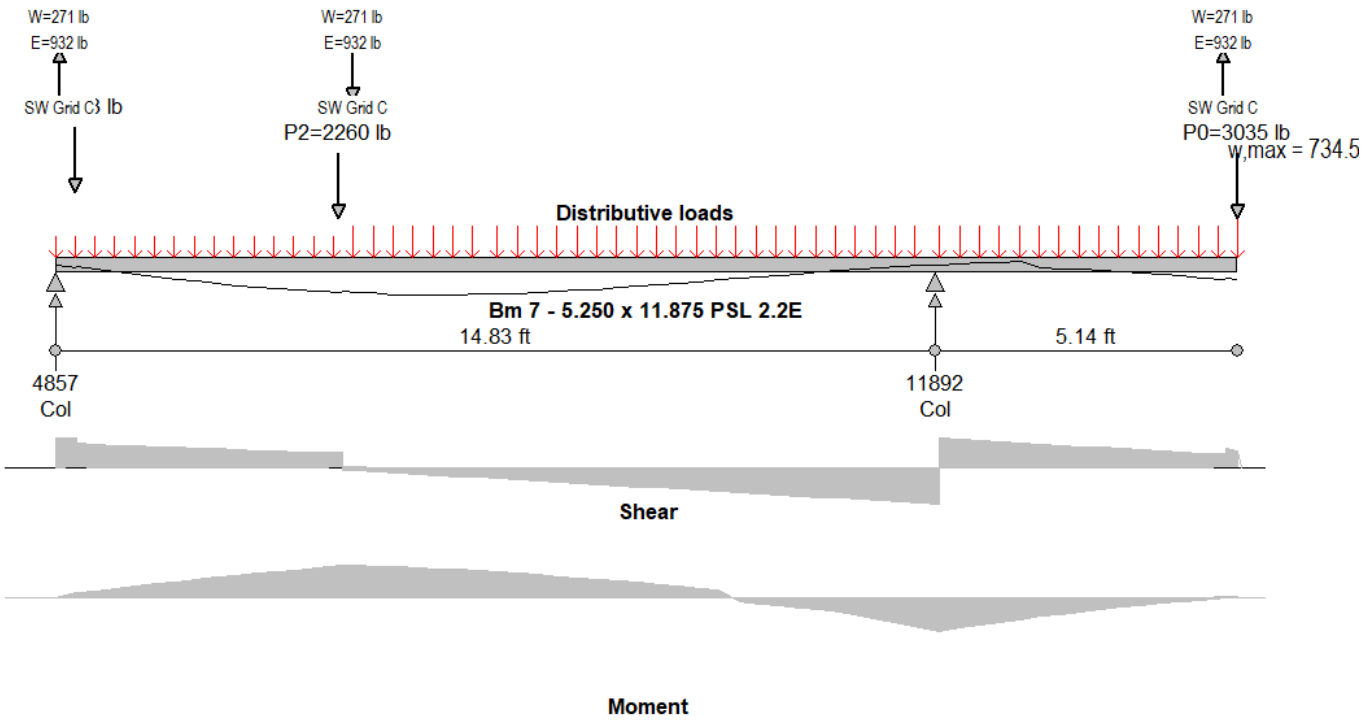


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES
0	965	1057	0	576	2432	0.02	From BM 9 from Level 2
1	357	596	0	0	0	0.08	From BM 18 from Level 3
2	848	1413	0	0	0	0.08	From BM 18 from Level 3
9	0	0	0	271	932	0.08	From SW supt from Level 2
10	0	0	0	271	932	0.08	From SW supt from Level 2
11	0	0	0	271	932	0.08	From SW supt from Level 2

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 2 - Seismic load table

LOAD	E	E X OMEGA	NOTES
0	2432	2432	Transfered load which includes overstrength factor
9	932	2796	Overstrength factor = 3.0 applied
10	932	2796	Overstrength factor = 3.0 applied
11	932	2796	Overstrength factor = 3.0 applied

(1) Un-factored loads with overstrength factor applied as applicable, in lbs.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA ID	WALL HEIGHT	D	S	L
3	Wall	-	9.0	12.0		
4	Floor/Roof	0	-	12.0	0.0	40.0
5	Floor/Roof	0	-	12.0	0.0	40.0
6	Floor/Roof	2	-	15.0	25.0	0.0
7	Floor/Roof	2	-	15.0	25.0	0.0
8	Floor/Roof	13	-	15.0	25.0	0.0

(1) Wall height in feet.

(2) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
3	Wall		4.8	19.8	108.0		
4	Floor/Roof	18.6	19.7	19.8	111.5	0.0	371.7
5	Floor/Roof	18.6	19.9	0.0	111.5	0.0	371.7
6	Floor/Roof	7.2	19.7	19.8	53.7	89.6	0.0
7	Floor/Roof	7.2	19.9	4.8	53.7	89.6	0.0
8	Floor/Roof	18.5	0.4	0.0	138.8	231.3	0.0

(1) From loc and to loc are load segments starting and ending
measured from the left of the beam

(2) Wall weight, lb/ft = height x weight in psf

->Computed moments and shears (Factored) :

Max shear = 6659 lbs D + (0.75)0.7E + 0.75S + 0.75L (2.4-6c)

Min shear = -7288 lbs D - (0.75)0.7E + 0.75S + 0.75L (2.4-6c)

Max moment = 17396 ft-lbs D + (0.75)0.7E + 0.75S + 0.75L (2.4-6c)

Min moment = -20079 ft-lbs D - (0.75)0.7E + 0.75S + 0.75L (2.4-6c)

->Beam properties (2D xy axis) :

Span = 19.89 ft

Area = 62.34 sq.in

Sx = 123.39 sq.in

```
        Ixx   = 732.62 sq.in

->Check shear :

        fv = 1.5 x V / Area  = 7288 / 62.34 = 175.36 psi

        F'v = 290 x 1.60 =  464.00 psi

          Fv = 290 psi, CD = 1.00

->Check moment :

        fb = M x 12 / Sx  = 240951 / 123.39 = 1952.78 psi

          Fb = 2900 psi, CD = 1.60, Cf = 1.00, Cl = 0.99.

          Fb' x CD x CF x CL = 4594 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 2

        Deflection span 0, Length = 14.83 ft Combined deflection = -0.273 [D + L (2.4-2)]

                Allowed = 14.83 x 12 / 360.0 = 0.494 in.

                Allowed (Seismic controled) = 14.83 x 12 / 180.0 = 0.989 in.

Cantilever Deflection span 1, Length = 5.06 ft Combined deflection = -0.158 [D + S
(2.4-3)]
                Allowed = 5.06 x 12 / 240.0 = 0.253 in.
```

2.3 Analysis of Bm 8 - 5.250 x 14.000 PSL 2.2E

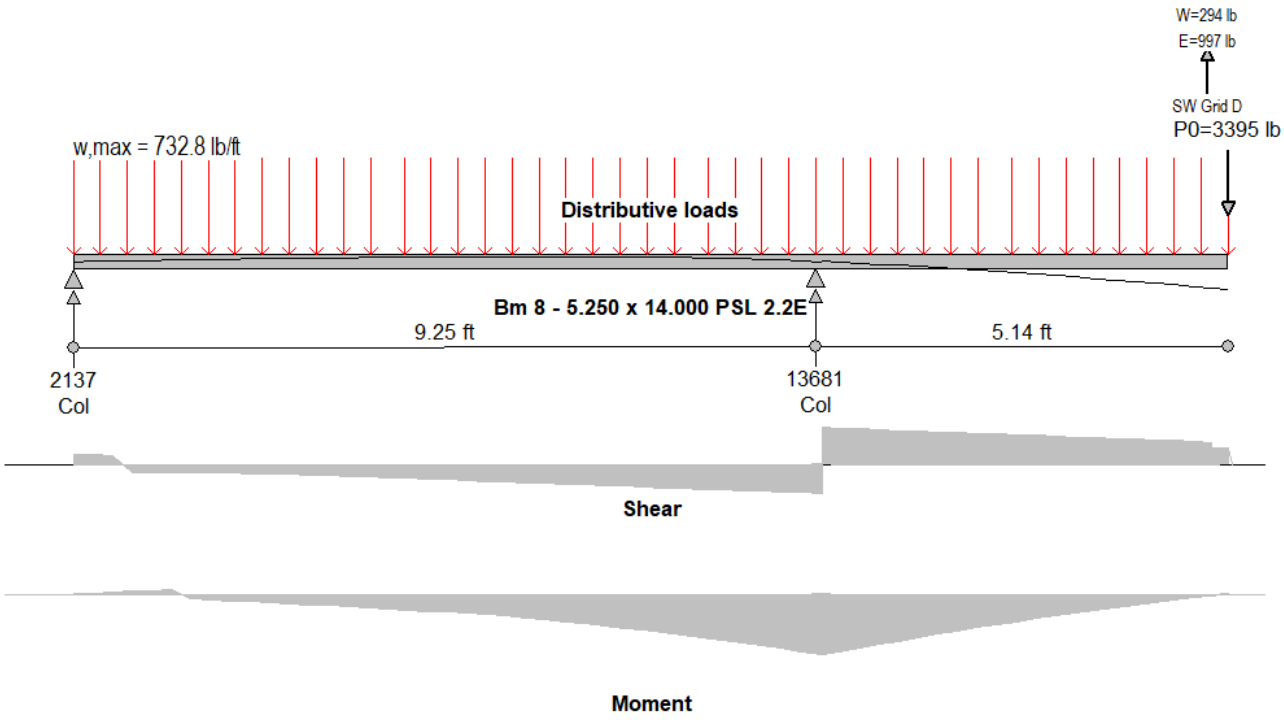


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES
0	1316	1070	0	576	2432	0.02	From BM 9 from Level 2
6	0	0	0	294	997	0.00	From SW supt from Level 2

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 2 - Seismic load table

LOAD	E	E X OMEGA	NOTES
0	2432	2432	Transfered load which includes overstrength factor
6	997	2991	Overstrength factor = 3.0 applied

(1) Un-factored loads with overstrength factor applied as applicable, in lbs.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA ID	WALL HEIGHT	D	S	L
1	Wall	-	9.0	12.0		
2	Floor/Roof	0	-	12.0	0.0	40.0
3	Floor/Roof	0	-	12.0	0.0	40.0
4	Floor/Roof	4	-	15.0	25.0	0.0
5	Floor/Roof	4	-	15.0	25.0	0.0

(1) Wall height in feet.

(2) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
1	Wall		0.0	14.2	108.0		
2	Floor/Roof	18.6	0.0	14.1	111.5	0.0	371.7

```
 3  Floor/Roof             18.6 |   14.1   14.3 |   111.5     0.0   371.7

 4  Floor/Roof              7.1 |    0.0   14.1 |    53.1    88.5     0.0

 5  Floor/Roof              7.1 |   14.1   14.2 |    53.1    88.5     0.0

------------------------------------------------------------------------

(1) From loc and to loc are load segments starting and ending

    measured from the left of the beam

(2) Wall weight, lb/ft = height x weight in psf

->Computed moments and shears (Factored) :

        Max shear  =       7583 lbs    D - (0.75)0.7E + 0.75S + 0.75L (2.4-6c)

        Min shear  =      -7043 lbs    D + (0.75)0.7E + 0.75S + 0.75L (2.4-6c)

        Max moment =      15597 ft-lbs    D + 0.7E (2.4-5c)

        Min moment =     -29972 ft-lbs D - (0.75)0.7E + 0.75S + 0.75L (2.4-6c)

->Beam properties (2D xy axis) :

        Span  = 14.31 ft

        Area  = 73.50 sq.in

        Sx    = 171.50 sq.in

        Ixx   = 1200.50 sq.in

->Check shear :

        fv = 1.5 x V / Area  = 7583 / 73.50 = 154.76 psi

        F'v = 290 x 1.60 =  464.00 psi

          Fv = 290 psi, CD = 1.00

->Check moment :

        fb = M x 12 / Sx  = 359665 / 171.50 = 2097.17 psi

          Fb = 2900 psi, CD = 1.60, Cf = 0.98, Cl = 0.99.
```

```
          Fb' x CD x CF x CL = 4499 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 2

        Deflection span 0, Length = 9.25 ft Combined deflection = 0.038 [D + S (2.4-3)]

                Allowed = 9.25 x 12 / 300.0 = 0.370 in.

                Allowed (Seismic controled) = 9.25 x 12 / 180.0 = 0.617 in.

Cantilever Deflection span 1, Length = 5.06 ft Combined deflection = -0.210 [D + S
(2.4-3)]
                Allowed = 5.06 x 12 / 120.0 = 0.506 in.
```

2.4 Analysis of Bm 9 - 5.250 x 11.875 PSL 2.2E

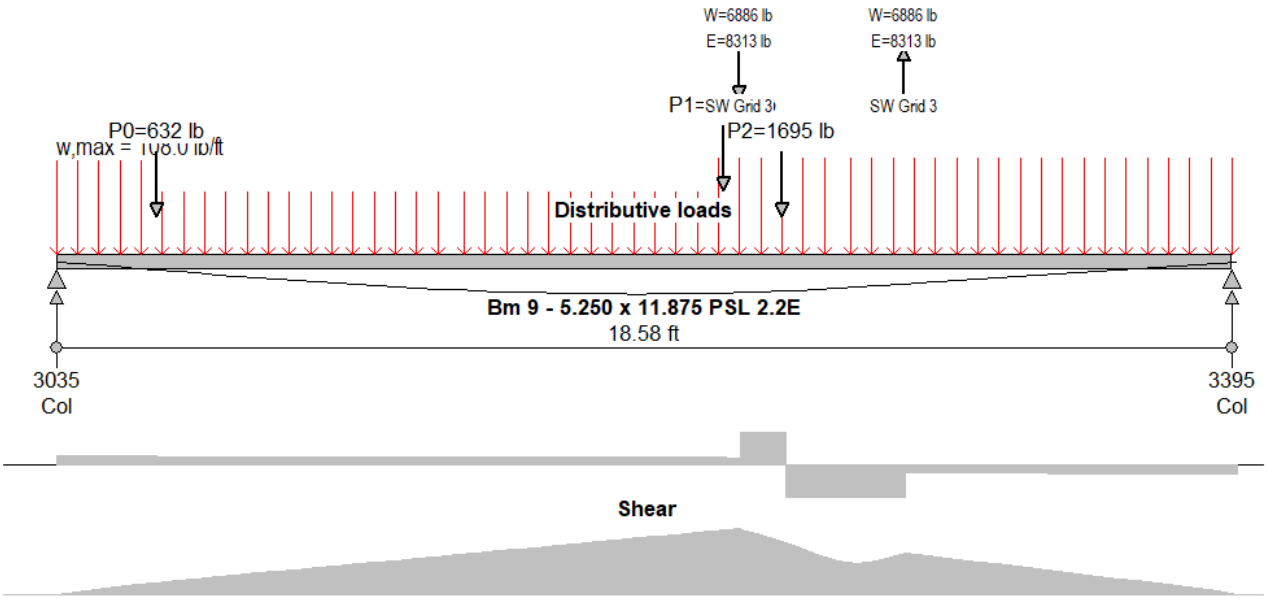


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES
0	237	395	0	0	0	1.58	From BM 13 from Level 3
1	404	673	0	0	0	10.54	From BM 13 from Level 3
2	636	1060	0	0	0	11.48	From BM 14 from Level 3
6	0	0	0	6886	8313	10.77	From SW supt from Level 2
7	0	0	0	6886	8313	13.36	From SW supt from Level 2

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 2 - Seismic load table

LOAD	E	E X OMEGA	NOTES
6	8313	24939	Overstrength factor = 3.0 applied
7	8313	24939	Overstrength factor = 3.0 applied

(1) Un-factored loads with overstrength factor applied as applicable, in lbs.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA ID	WALL HEIGHT	D	S	L
3	Wall	-	9.0	12.0		
4	Wall	-	9.0	12.0		
5	Wall	-	9.0	12.0		

(1) Wall height in feet.

(2) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
3	Wall		0.0	1.6	108.0		

```
 4  Wall                          |   10.5   13.8 |   108.0

 5  Wall                          |   13.8   18.6 |   108.0

-------------------------------------------------------------------------

(1) From loc and to loc are load segments starting and ending

    measured from the left of the beam

(2) Wall weight, lb/ft = height x weight in psf

->Computed moments and shears (Factored) :

        Max shear  =      11097 lbs    0.6D - 0.7E (2.4-8b)

        Min shear  =     -11833 lbs       D + 0.7E (2.4-5c)

        Max moment =      26121 ft-lbs D + (0.75)0.7E + 0.75S + 0.75L (2.4-6c)

        Min moment =     -18339 ft-lbs 0.6D - 0.7E (2.4-8b)

->Beam properties (2D xy axis) :

        Span  = 18.58 ft

        Area  = 62.34 sq.in

        Sx    = 123.39 sq.in

        Ixx   = 732.62 sq.in

->Check shear :

        fv = 1.5 x V / Area  = 11833 / 62.34 = 284.71 psi

        F'v = 290 x 1.60 =  464.00 psi

          Fv = 290 psi, CD = 1.00

->Check moment :

        fb = M x 12 / Sx  = 313456 / 123.39 = 2540.40 psi

          Fb = 2900 psi, CD = 1.60, Cf = 1.00, Cl = 1.00.

          Fb' x CD x CF x CL = 4645 psi
```

```
->Check bearing :

->Check deflections :

        Number of deflection spans = 1

        Deflection span 0, Length = 18.58 ft Combined deflection = -0.594 [D + 0.7E (2.4-
5c)]

                Allowed = 18.58 x 12 / 360.0 = 0.619 in.

                Allowed (Seismic controled) = 18.58 x 12 / 180.0 = 1.239 in.
```

2.5 Analysis of Bm 10 - (2) 2 x 8 DF #2

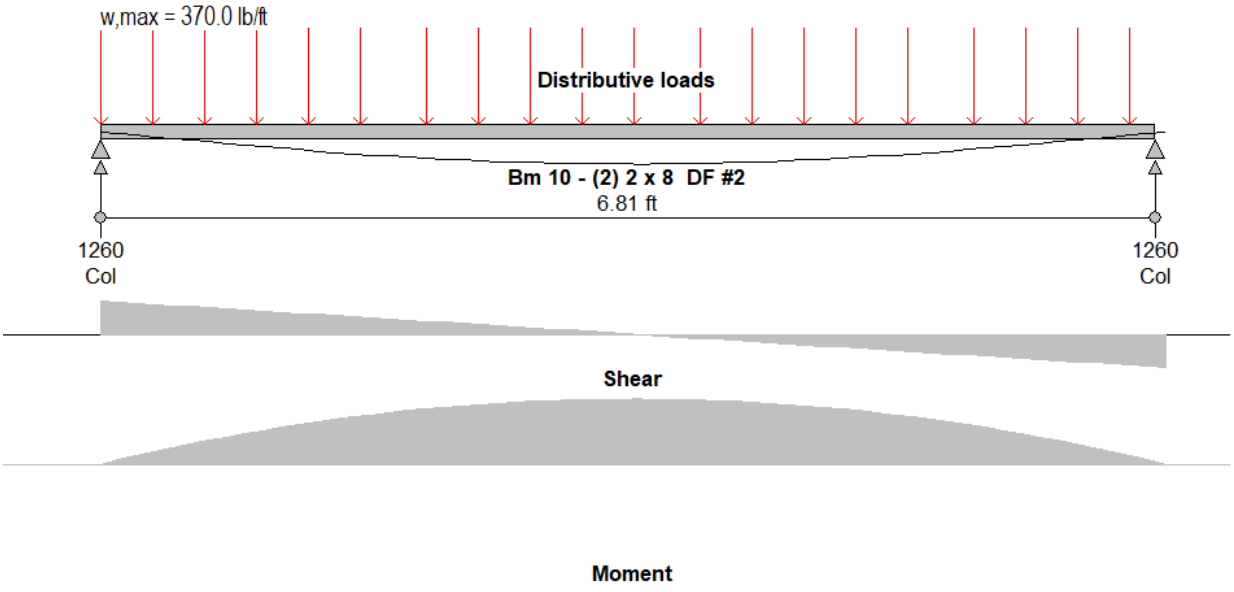


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

No Applied point loads

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA ID	WALL HEIGHT	D	S	L
0	Floor/Roof	13	-	15.0	25.0	0.0

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
0	Floor/Roof	18.5 |	-0.0	6.8 |	138.8	231.3	0.0

(1) From loc and to loc are load segments starting and ending
measured from the left of the beam

->Computed moments and shears (Factored) :

```
        Max shear  =       1260 lbs           D + S (2.4-3)

        Min shear  =      -1260 lbs           D + S (2.4-3)

        Max moment =       2146 ft-lbs        D + S (2.4-3)

        Min moment =         -0 ft-lbs        D + S (2.4-3)

->Beam properties (2D xy axis) :

        Span  = 6.81 ft

        Area  = 21.75 sq.in

        Sx    = 26.28 sq.in

        Ixx   = 95.27 sq.in

->Check shear :

        fv = 1.5 x V / Area  = 1260 / 21.75 = 86.92 psi

        F'v = 180.00 x 1.15 x 1.00 x 1.00 x 1.00 =  207.00 psi

          Fv = 180 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check bending :

        fb-top = M x 12 / Sx  = 25750 / 26.28 = 979.79 psi

        fb-btm = M x 12 / Sx  = 0 / 26.28 = 0.00 psi

          Fb = 900 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

         Cf = 1.20, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

          Fb'x CD x CM x CT x CL x CFx CFU x CI x CR = 1242 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 1

        Deflection span 0, Length = 6.81 ft Combined deflection = -0.118 [D + S (2.4-3)]

                Allowed = 6.81 x 12 / 360.0 = 0.227 in.
```

Allowed (Seismic controled) = 6.81 x 12 / 180.0 = 0.454 in.

2.6 Analysis of Bm 12 - 5.125 x 12.000 GLB 24F-V4

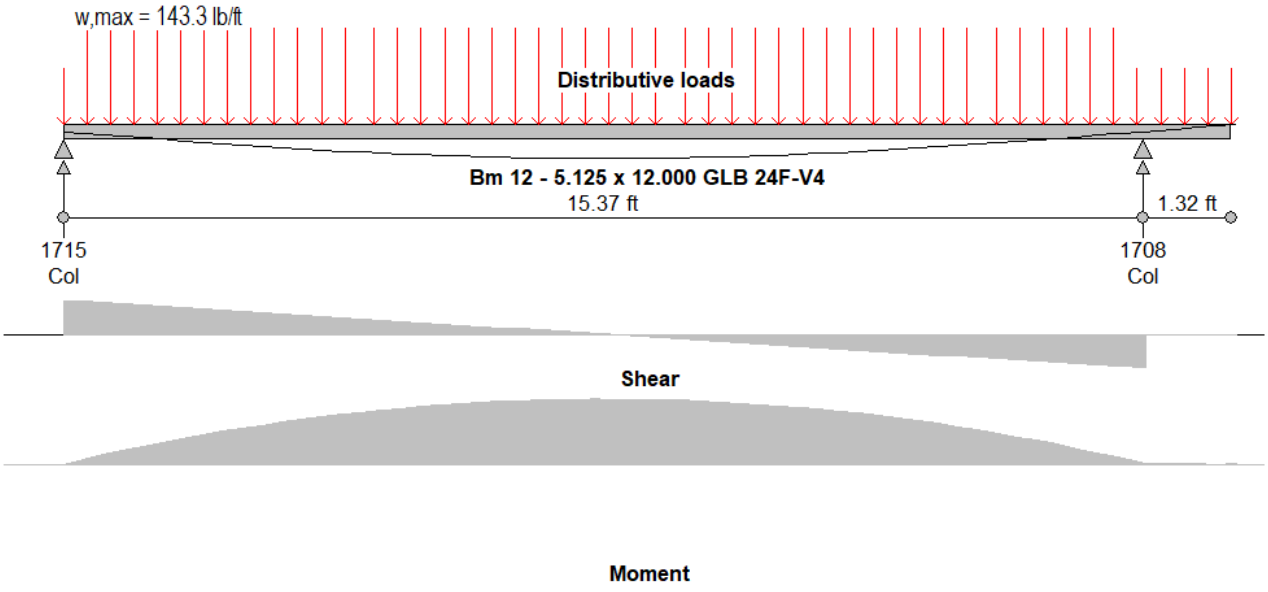


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

No Applied point loads

---

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA ID	WALL HEIGHT	D	S	L
0	Floor/Roof	2	-	15.0	25.0	0.0
1	Floor/Roof	3	-	15.0	25.0	0.0

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
0	Floor/Roof	7.2	0.2	15.2	53.7	89.6	0.0
1	Floor/Roof	4.3	15.3	0.0	31.9	53.1	0.0

(1) From loc and to loc are load segments starting and ending
measured from the left of the beam

->Computed moments and shears (Factored) :

Max shear = 1715 lbs D + S (2.4-3)

Min shear = -1660 lbs D + S (2.4-3)

Max moment = 6740 ft-lbs D + S (2.4-3)

```
        Min moment =          -0 ft-lbs        D + S (2.4-3)

->Beam properties (2D xy axis) :

        Span  = 16.65 ft

        Area  = 61.50 sq.in

        Sx    = 123.00 sq.in

        Ixx   = 738.00 sq.in

->Check shear :

        fv = 1.5 * V / Area  = 1715 / 61.50 = 41.82 psi

        F'v = 190.00 x 1.15 x 1.00 x 1.00 x 1.00 =  218.50 psi

          Fv = 190 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check moment :

        fb-top = M x 12 / Sx  = -0 / 123.00 = 0.00 psi

        fb-btm = M x 12 / Sx  = 80884 / 123.00 = 657.59 psi

          Fb = 2400 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

          Cv = 0.80, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

        Cv controls

          Fb'top x CD x CM x CT x CV x CFU x CI x CR = 1102 psi

          Fb'btm x CD x CM x CT x CV x CFU x CI x CR = 2203 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 2

        Deflection span 0, Length = 15.37 ft Combined deflection = -0.216 [D + S (2.4-3)]

                Allowed = 15.37 x 12 / 360.0 = 0.512 in.

                Allowed (Seismic controled) = 15.37 x 12 / 180.0 = 1.025 in.
```

Cantilever Deflection span 1, Length = 1.28 ft Combined deflection = 0.057 [D + S (2.4-3)]

Allowed = 1.28 x 12 / 240.0 = 0.064 in.

2.7 Analysis of Bm 13 - 6 x 8 DF #2

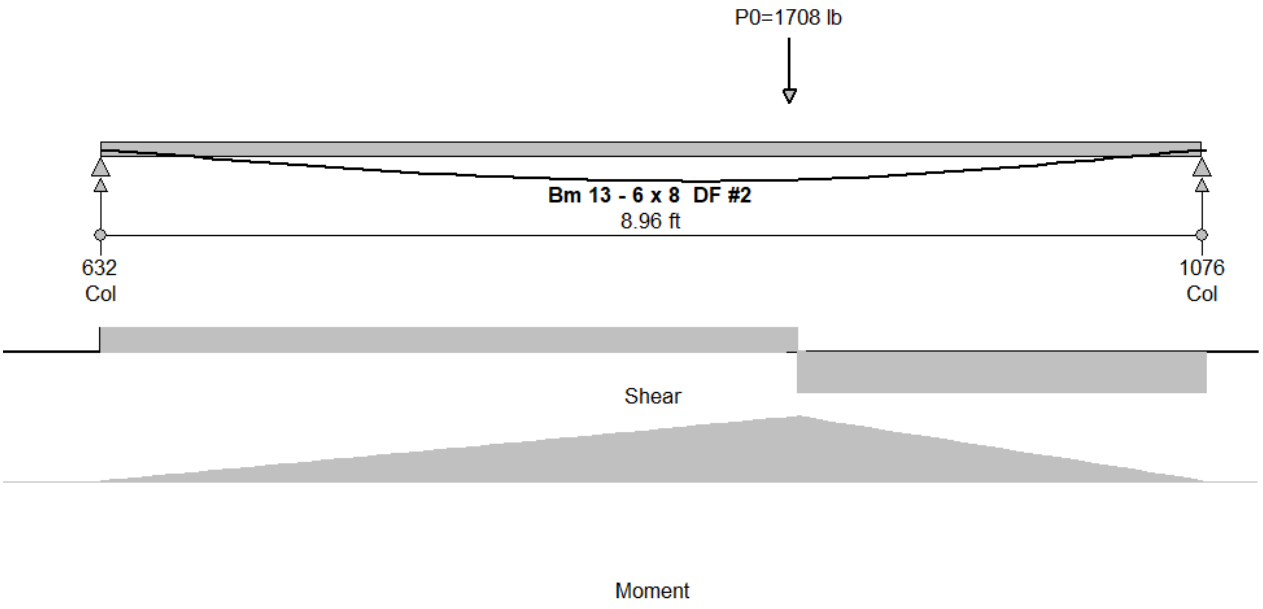


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

```
 0     640    1067       0       0       0 |    5.65    | From BM 12 from Level 3

-------------------------------------------------------------------------------

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD  ELEMENT     AREA   WALL     D        S      L

                   ID   HEIGHT

-----------------------------------------------------------

No distributive loads

.-----------------------------------------------------------

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD  ELEMENT              TRIB     from    to       D         S      L

                           WIDTH     loc    loc

-----------------------------------------------------------------------

No distributive loads

.-----------------------------------------------------------------------

(1) From loc and to loc are load segments starting and ending

    measured from the left of the beam

->Computed moments and shears (Factored) :

        Max shear  =        632 lbs           D + S (2.4-3)

        Min shear  =      -1076 lbs           D + S (2.4-3)

        Max moment =       3566 ft-lbs        D + S (2.4-3)

        Min moment =         -0 ft-lbs        D + S (2.4-3)
```

```
->Beam properties (2D xy axis) :

        Span  = 8.96 ft

        Area  = 39.88 sq.in

        Sx    = 48.18 sq.in

        Ixx   = 174.66 sq.in

->Check shear :

        fv = 1.5 x V / Area  = 1076 / 39.88 = 40.49 psi

        F'v = 180.00 x 1.15 x 1.00 x 1.00 x 1.00 =  207.00 psi

          Fv = 180 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check bending :

        fb-top = M x 12 / Sx  = 42786 / 48.18 = 888.01 psi

        fb-btm = M x 12 / Sx  = 0 / 48.18 = 0.00 psi

          Fb = 900 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

         Cf = 1.05, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

          Fb'x CD x CM x CT x CL x CFx CFU x CI x CR = 1083 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 1

        Deflection span 0, Length = 8.96 ft Combined deflection = -0.144 [D + S (2.4-3)]

                Allowed = 8.96 x 12 / 360.0 = 0.299 in.

                Allowed (Seismic controled) = 8.96 x 12 / 180.0 = 0.597 in.
```

2.8 Analysis of Bm 14 - 5.125 x 12.000 GLB 24F-V4

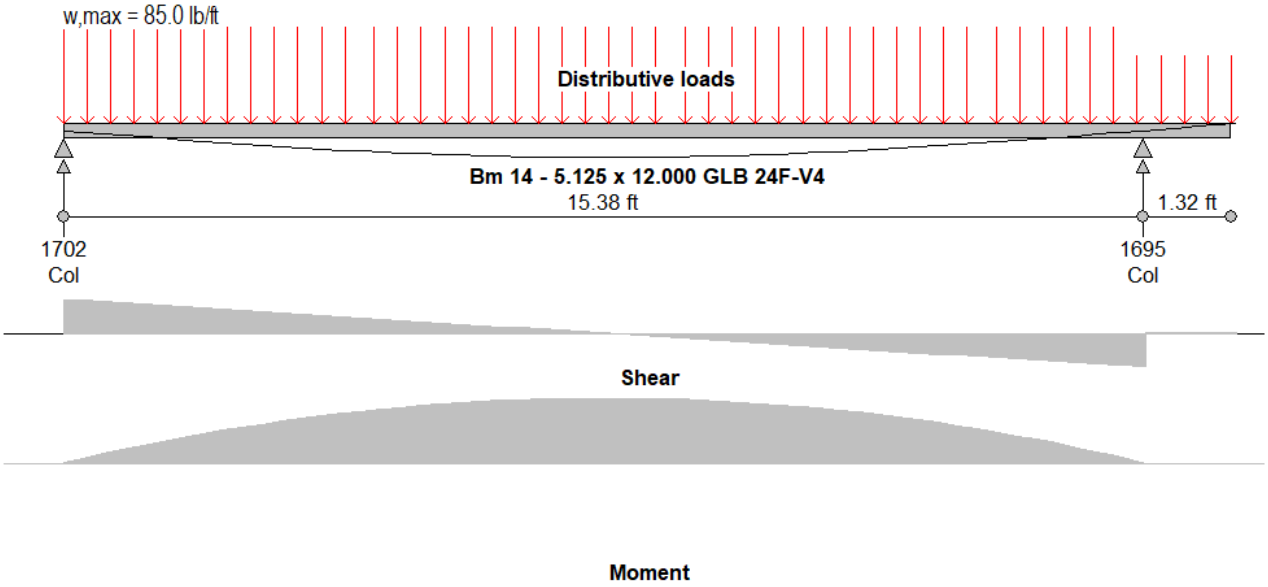


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

No Applied point loads

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA ID	WALL HEIGHT	D	S	L
0	Floor/Roof	3	-	15.0	25.0	0.0
1	Floor/Roof	4	-	15.0	25.0	0.0

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
0	Floor/Roof	4.3	0.0	15.3	31.9	53.1	0.0
1	Floor/Roof	7.1	15.2	0.2	53.1	88.5	0.0

(1) From loc and to loc are load segments starting and ending
measured from the left of the beam

->Computed moments and shears (Factored) :

Max shear = 1702 lbs D + S (2.4-3)

Min shear = -1648 lbs D + S (2.4-3)

Max moment = 6691 ft-lbs D + S (2.4-3)

Min moment = -0 ft-lbs D + S (2.4-3)

->Beam properties (2D xy axis) :

Span = 16.65 ft

```
        Area  = 61.50 sq.in

        Sx    = 123.00 sq.in

        Ixx   = 738.00 sq.in

->Check shear :

        fv = 1.5 * V / Area  = 1702 / 61.50 = 41.52 psi

        F'v = 190.00 x 1.15 x 1.00 x 1.00 x 1.00 =  218.50 psi

          Fv = 190 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check moment :

        fb-top = M x 12 / Sx  = -0 / 123.00 = 0.00 psi

        fb-btm = M x 12 / Sx  = 80294 / 123.00 = 652.80 psi

          Fb = 2400 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

          Cv = 0.80, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

        Cv controls

          Fb'top x CD x CM x CT x CV x CFU x CI x CR = 1102 psi

          Fb'btm x CD x CM x CT x CV x CFU x CI x CR = 2203 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 2

        Deflection span 0, Length = 15.38 ft Combined deflection = -0.214 [D + S (2.4-3)]

                Allowed = 15.38 x 12 / 360.0 = 0.513 in.

                Allowed (Seismic controled) = 15.38 x 12 / 180.0 = 1.025 in.

Cantilever Deflection span 1, Length = 1.28 ft Combined deflection = 0.057 [D + S
(2.4-3)]

                Allowed = 1.28 x 12 / 240.0 = 0.064 in.
```

2.9 Analysis of Bm 17 - 5.125 x 12.000 GLB 24F-V4

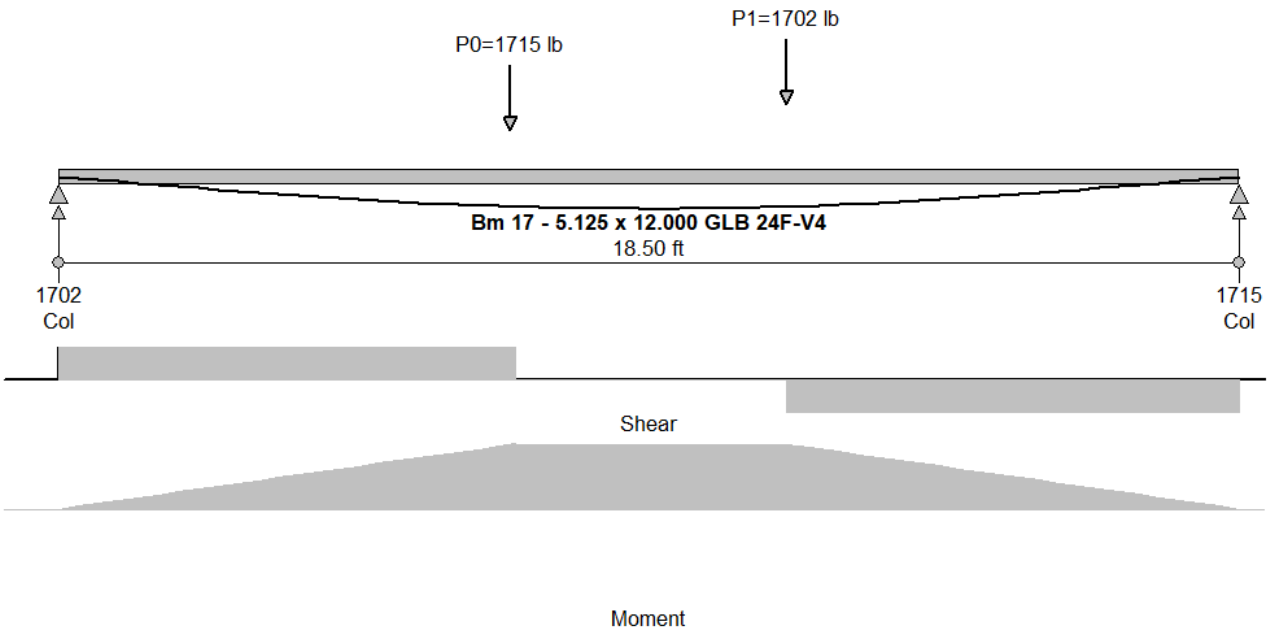


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES
0	643	1072	0	0	0	7.17	From BM 12 from Level 3
1	638	1064	0	0	0	11.42	From BM 14 from Level 3

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA	WALL	D	S	L
		ID	HEIGHT			

No distributive loads

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB	from	to	D	S	L
		WIDTH	loc	loc			

No distributive loads

(1) From loc and to loc are load segments starting and ending
measured from the left of the beam

->Computed moments and shears (Factored) :

Max shear =	1702 lbs	D + S (2.4-3)
Min shear =	-1715 lbs	D + S (2.4-3)
Max moment =	12200 ft-lbs	D + S (2.4-3)
Min moment =	-0 ft-lbs	D + S (2.4-3)

->Beam properties (2D xy axis) :

Span = 18.50 ft

```
        Area  = 61.50 sq.in

        Sx    = 123.00 sq.in

        Ixx   = 738.00 sq.in

->Check shear :

        fv = 1.5 * V / Area  = 1715 / 61.50 = 41.83 psi

        F'v = 190.00 x 1.15 x 1.00 x 1.00 x 1.00 =  218.50 psi

          Fv = 190 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check moment :

        fb-top = M x 12 / Sx  = -0 / 123.00 = 0.00 psi

        fb-btm = M x 12 / Sx  = 146402 / 123.00 = 1190.26 psi

          Fb = 2400 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

          Cv = 0.79, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

        Cv controls

          Fb'top x CD x CM x CT x CV x CFU x CI x CR = 1090 psi

          Fb'btm x CD x CM x CT x CV x CFU x CI x CR = 2180 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 1

        Deflection span 0, Length = 18.50 ft Combined deflection = -0.543 [D + S (2.4-3)]

                Allowed = 18.50 x 12 / 360.0 = 0.617 in.

                Allowed (Seismic controled) = 18.50 x 12 / 180.0 = 1.233 in.
```

2.10 Analysis of Bm 18 - (2) 2 x 6 DF #2

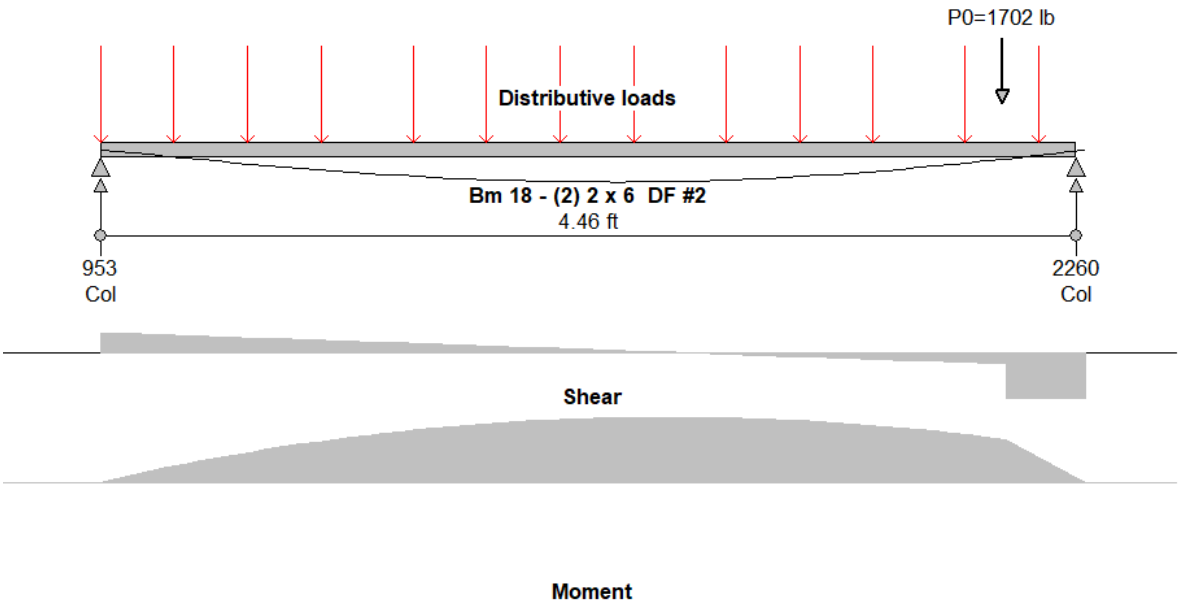


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES
0	638	1064	0	0	0	0.00	From BM 17 from Level 3

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA ID	WALL HEIGHT	D	S	L
1	Floor/Roof	2	-	15.0	25.0	0.0
2	Floor/Roof	13	-	15.0	25.0	0.0

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
1	Floor/Roof	7.2	4.5	4.4	53.7	89.6	0.0
2	Floor/Roof	18.5	4.1	0.0	138.8	231.3	0.0

(1) From loc and to loc are load segments starting and ending
measured from the left of the beam

->Computed moments and shears (Factored) :

Max shear = 953 lbs D + S (2.4-3)

Min shear = -2260 lbs D + S (2.4-3)

Max moment = 1228 ft-lbs D + S (2.4-3)

Min moment = -0 ft-lbs D + S (2.4-3)

->Beam properties (2D xy axis) :

Span = 4.46 ft

```
        Area  = 16.50 sq.in

        Sx    = 15.12 sq.in

        Ixx   = 41.59 sq.in

->Check shear :

        fv = 1.5 x V / Area  = 2260 / 16.50 = 205.46 psi

        F'v = 180.00 x 1.15 x 1.00 x 1.00 x 1.00 =  207.00 psi

          Fv = 180 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check bending :

        fb-top = M x 12 / Sx  = 14737 / 15.12 = 974.37 psi

        fb-btm = M x 12 / Sx  = 0 / 15.12 = 0.00 psi

          Fb = 900 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

         Cf = 1.30, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

          Fb'x CD x CM x CT x CL x CFx CFU x CI x CR = 1346 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 1

        Deflection span 0, Length = 4.46 ft Combined deflection = -0.068 [D + S (2.4-3)]

                Allowed = 4.46 x 12 / 360.0 = 0.149 in.

                Allowed (Seismic controled) = 4.46 x 12 / 180.0 = 0.297 in.
```

2.11 Analysis of Bm 22 - 5.125 x 12.000 GLB 24F-V4

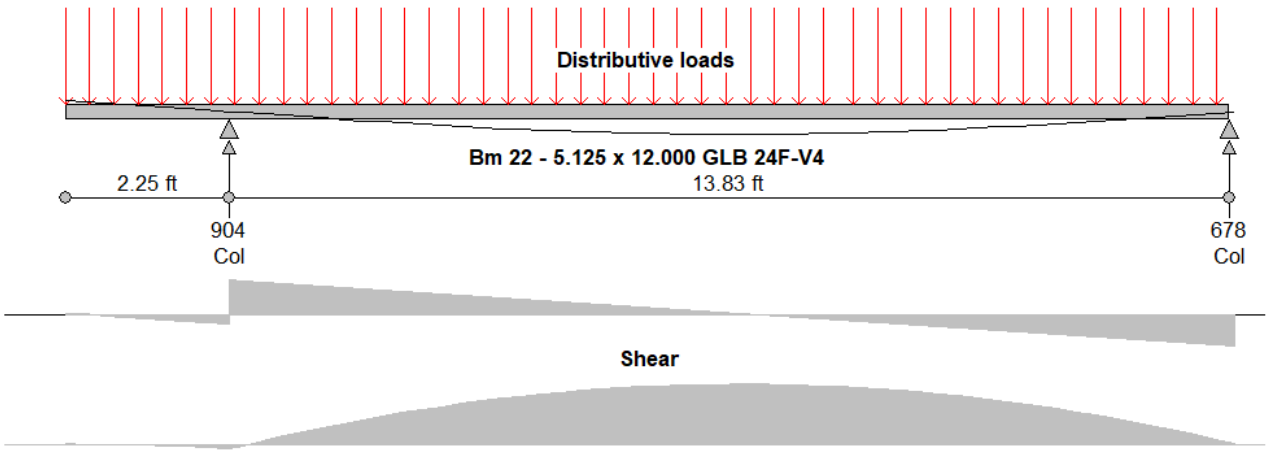


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

No Applied point loads

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA	WALL	D	S	L

		ID	HEIGHT			
0	Floor/Roof	5	-	15.0	25.0	0.0

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
0	Floor/Roof	5.0 |	16.1	0.2 |	37.5	62.5	0.0

(1) From loc and to loc are load segments starting and ending
measured from the left of the beam

->Computed moments and shears (Factored) :

Max shear = 706 lbs D + S (2.4-3)

Min shear = -678 lbs D + S (2.4-3)

Max moment = 2295 ft-lbs D + S (2.4-3)

Min moment = -196 ft-lbs D + S (2.4-3)

->Beam properties (2D xy axis) :

Span = 16.08 ft

Area = 61.50 sq.in

Sx = 123.00 sq.in

Ixx = 738.00 sq.in

->Check shear :

```
        fv = 1.5 * V / Area  = 706 / 61.50 = 17.21 psi

        F'v = 190.00 x 1.15 x 1.00 x 1.00 x 1.00 =  218.50 psi

          Fv = 190 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check moment :

        fb-top = M x 12 / Sx  = -2346 / 123.00 = 19.07 psi

        fb-btm = M x 12 / Sx  = 27542 / 123.00 = 223.92 psi

          Fb = 2400 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

          Cv = 0.80, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

        Cv controls

          Fb'top x CD x CM x CT x CV x CFU x CI x CR = 1105 psi

          Fb'btm x CD x CM x CT x CV x CFU x CI x CR = 2211 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 2

        Deflection span 0, Length = 13.83 ft Combined deflection = -0.059 [D + S (2.4-3)]

                Allowed = 13.83 x 12 / 360.0 = 0.461 in.

                Allowed (Seismic controled) = 13.83 x 12 / 180.0 = 0.922 in.

Cantilever Deflection span 1, Length = 2.25 ft Combined deflection = 0.029 [D + S
(2.4-3)]
                Allowed = 2.25 x 12 / 240.0 = 0.113 in.
```

2.12 Analysis of Bm 23 - 5.125 x 12.000 GLB 24F-V4

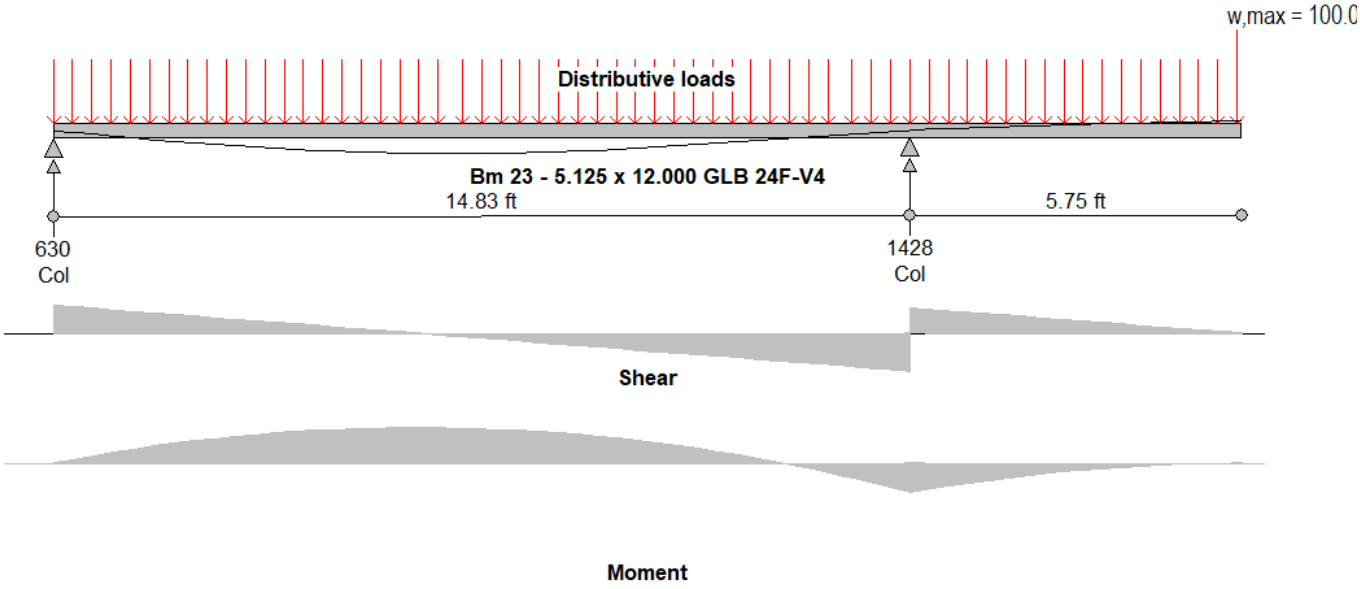


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

No Applied point loads

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA	WALL	D	S	L

		ID		HEIGHT		
0	Floor/Roof	5	-	15.0	25.0	0.0
1	Floor/Roof	5	-	15.0	25.0	0.0
2	Floor/Roof	5	-	15.0	25.0	0.0

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
0	Floor/Roof	5.0	20.4	20.6	37.5	62.5	0.0
1	Floor/Roof	5.0	20.6	14.8	37.5	62.5	0.0
2	Floor/Roof	5.0	14.8	0.0	37.5	62.5	0.0

(1) From loc and to loc are load segments starting and ending measured from the left of the beam

->Computed moments and shears (Factored) :

Max shear = 630 lbs D + S (2.4-3)

Min shear = -835 lbs D + S (2.4-3)

Max moment = 1986 ft-lbs D + S (2.4-3)

Min moment = -1653 ft-lbs D + S (2.4-3)

->Beam properties (2D xy axis) :

Span = 20.58 ft

```
        Area  = 61.50 sq.in

        Sx    = 123.00 sq.in

        Ixx   = 738.00 sq.in

->Check shear :

        fv = 1.5 * V / Area  = 835 / 61.50 = 20.37 psi

        F'v = 190.00 x 1.15 x 1.00 x 1.00 x 1.00 =  218.50 psi

          Fv = 190 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check moment :

        fb-top = M x 12 / Sx  = -19837 / 123.00 = 161.28 psi

        fb-btm = M x 12 / Sx  = 23830 / 123.00 = 193.74 psi

          Fb = 2400 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

          Cv = 0.78, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

        Cv controls

          Fb'top x CD x CM x CT x CV x CFU x CI x CR = 1079 psi

          Fb'btm x CD x CM x CT x CV x CFU x CI x CR = 2157 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 2

        Deflection span 0, Length = 14.83 ft Combined deflection = -0.053 [D + S (2.4-3)]

                Allowed = 14.83 x 12 / 360.0 = 0.494 in.

                Allowed (Seismic controled) = 14.83 x 12 / 180.0 = 0.989 in.

Cantilever Deflection span 1, Length = 5.75 ft Combined deflection = 0.023 [D + S
(2.4-3)]

                Allowed = 5.75 x 12 / 240.0 = 0.287 in.
```

2.13 Analysis of Bm 24 - 5.125 x 12.000 GLB 24F-V4

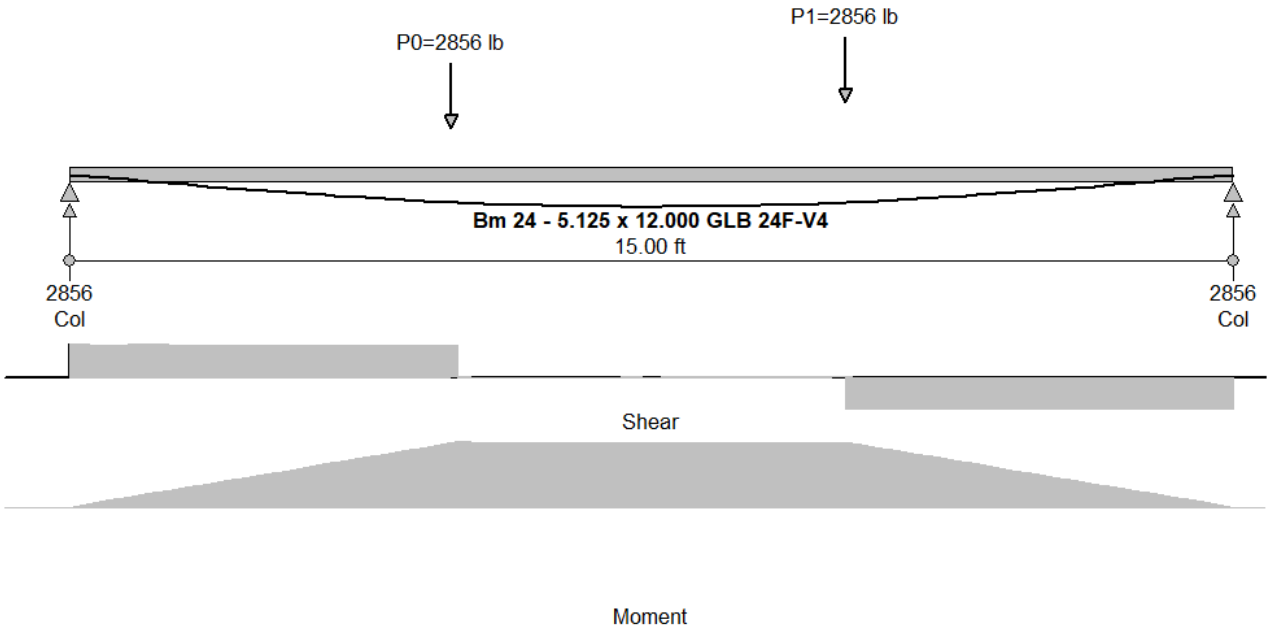


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES
0	1071	1785	0	0	0	5.00	From BM 23 from Level 2
1	1071	1785	0	0	0	10.00	From BM 24 from Level 2

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA	WALL	D	S	L
		ID	HEIGHT			

No distributive loads

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB	from	to	D	S	L
		WIDTH	loc	loc			

No distributive loads

(1) From loc and to loc are load segments starting and ending
measured from the left of the beam

->Computed moments and shears (Factored) :

Max shear =	2856 lbs	D + S (2.4-3)
Min shear =	-2856 lbs	D + S (2.4-3)
Max moment =	14281 ft-lbs	D + S (2.4-3)
Min moment =	-0 ft-lbs	D + S (2.4-3)

->Beam properties (2D xy axis) :

Span = 15.00 ft

```
        Area  = 61.50 sq.in

        Sx    = 123.00 sq.in

        Ixx   = 738.00 sq.in

->Check shear :

        fv = 1.5 * V / Area  = 2856 / 61.50 = 69.66 psi

        F'v = 190.00 x 1.15 x 1.00 x 1.00 x 1.00 =  218.50 psi

          Fv = 190 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check moment :

        fb-top = M x 12 / Sx  = -0 / 123.00 = 0.00 psi

        fb-btm = M x 12 / Sx  = 171374 / 123.00 = 1393.28 psi

          Fb = 2400 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

          Cv = 0.81, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

        Cv controls

          Fb'top x CD x CM x CT x CV x CFU x CI x CR = 1113 psi

          Fb'btm x CD x CM x CT x CV x CFU x CI x CR = 2226 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 1

        Deflection span 0, Length = 15.00 ft Combined deflection = -0.445 [D + S (2.4-3)]

                Allowed = 15.00 x 12 / 360.0 = 0.500 in.

                Allowed (Seismic controled) = 15.00 x 12 / 180.0 = 1.000 in.
```

2.14 Analysis of Bm 20 - 5.125 x 12.000 GLB 24F-V4

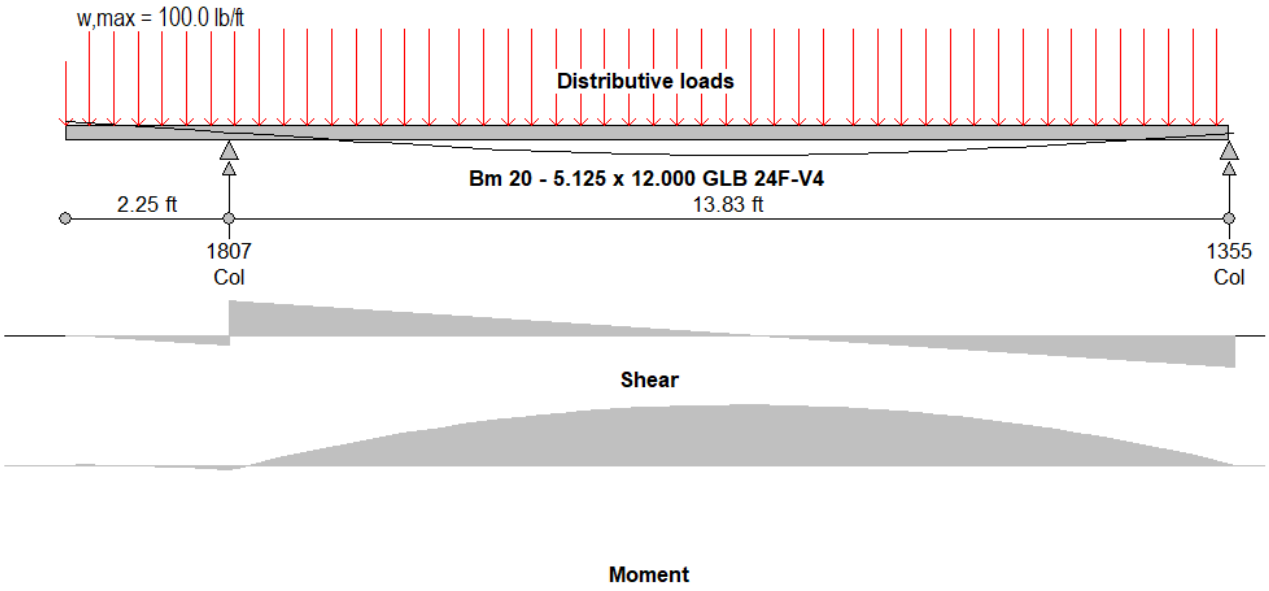


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

No Applied point loads

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA ID	WALL HEIGHT	D	S	L
0	Floor/Roof	5	-	15.0	25.0	0.0
1	Floor/Roof	6	-	15.0	25.0	0.0

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
0	Floor/Roof	5.0	0.2	16.1	37.5	62.5	0.0
1	Floor/Roof	5.0	16.1	0.2	37.5	62.5	0.0

(1) From loc and to loc are load segments starting and ending
measured from the left of the beam

->Computed moments and shears (Factored) :

Max shear = 1412 lbs D + S (2.4-3)

Min shear = -1355 lbs D + S (2.4-3)

Max moment = 4590 ft-lbs D + S (2.4-3)

Min moment = -391 ft-lbs D + S (2.4-3)

->Beam properties (2D xy axis) :

Span = 16.08 ft

```
        Area  = 61.50 sq.in

        Sx    = 123.00 sq.in

        Ixx   = 738.00 sq.in

->Check shear :

        fv = 1.5 * V / Area  = 1412 / 61.50 = 34.43 psi

        F'v = 190.00 x 1.15 x 1.00 x 1.00 x 1.00 =  218.50 psi

          Fv = 190 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check moment :

        fb-top = M x 12 / Sx  = -4692 / 123.00 = 38.15 psi

        fb-btm = M x 12 / Sx  = 55084 / 123.00 = 447.84 psi

          Fb = 2400 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

          Cv = 0.80, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

        Cv controls

          Fb'top x CD x CM x CT x CV x CFU x CI x CR = 1105 psi

          Fb'btm x CD x CM x CT x CV x CFU x CI x CR = 2211 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 2

        Deflection span 0, Length = 13.83 ft Combined deflection = -0.118 [D + S (2.4-3)]

                Allowed = 13.83 x 12 / 360.0 = 0.461 in.

                Allowed (Seismic controled) = 13.83 x 12 / 180.0 = 0.922 in.

Cantilever Deflection span 1, Length = 2.25 ft Combined deflection = 0.059 [D + S
(2.4-3)]

                Allowed = 2.25 x 12 / 240.0 = 0.113 in.
```

2.15 Analysis of Bm 21 - 5.125 x 12.000 GLB 24F-V4

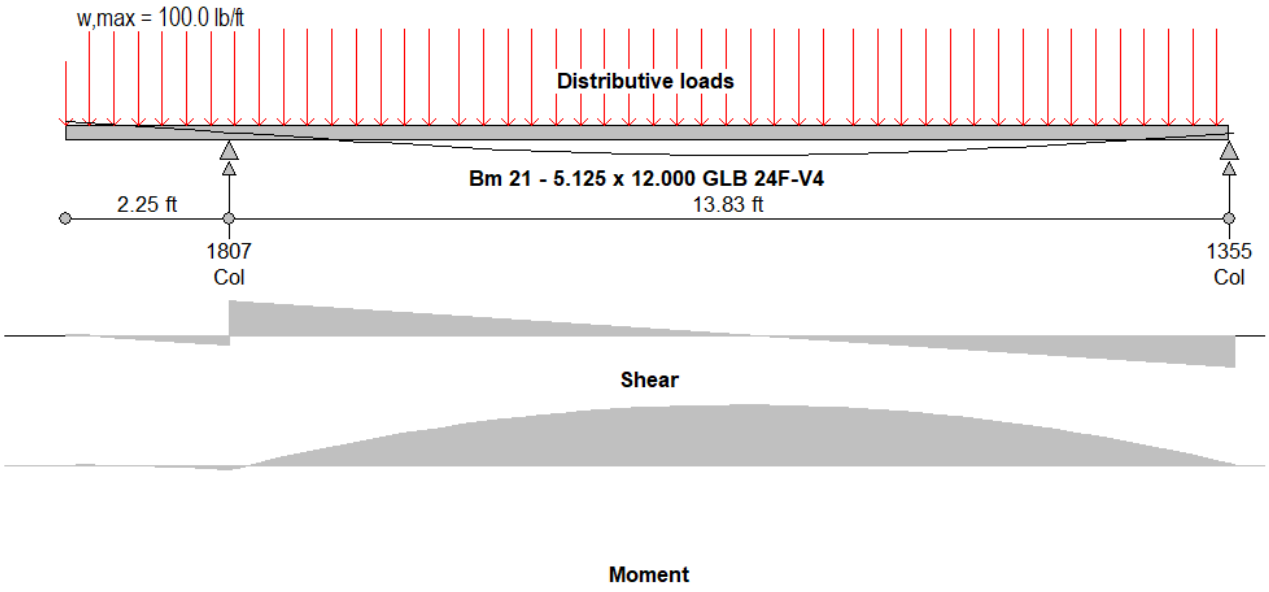


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

No Applied point loads

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA ID	WALL HEIGHT	D	S	L
0	Floor/Roof	6	-	15.0	25.0	0.0
1	Floor/Roof	7	-	15.0	25.0	0.0

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
0	Floor/Roof	5.0 |	0.2	16.1 |	37.5	62.5	0.0
1	Floor/Roof	5.0 |	16.1	0.2 |	37.5	62.5	0.0

(1) From loc and to loc are load segments starting and ending
measured from the left of the beam

->Computed moments and shears (Factored) :

Max shear = 1412 lbs D + S (2.4-3)

Min shear = -1355 lbs D + S (2.4-3)

Max moment = 4590 ft-lbs D + S (2.4-3)

Min moment = -391 ft-lbs D + S (2.4-3)

->Beam properties (2D xy axis) :

```
        Span  = 16.08 ft

        Area  = 61.50 sq.in

        Sx    = 123.00 sq.in

        Ixx   = 738.00 sq.in

->Check shear :

        fv = 1.5 * V / Area  = 1412 / 61.50 = 34.43 psi

        F'v = 190.00 x 1.15 x 1.00 x 1.00 x 1.00 =  218.50 psi

          Fv = 190 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check moment :

        fb-top = M x 12 / Sx  = -4692 / 123.00 = 38.15 psi

        fb-btm = M x 12 / Sx  = 55084 / 123.00 = 447.84 psi

          Fb = 2400 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

          Cv = 0.80, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

        Cv controls

          Fb'top x CD x CM x CT x CV x CFU x CI x CR = 1105 psi

          Fb'btm x CD x CM x CT x CV x CFU x CI x CR = 2211 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 2

        Deflection span 0, Length = 13.83 ft Combined deflection = -0.118 [D + S (2.4-3)]

                Allowed = 13.83 x 12 / 360.0 = 0.461 in.

                Allowed (Seismic controled) = 13.83 x 12 / 180.0 = 0.922 in.

Cantilever Deflection span 1, Length = 2.25 ft Combined deflection = 0.059 [D + S
(2.4-3)]

                Allowed = 2.25 x 12 / 240.0 = 0.113 in.
```

2.16 Analysis of Bm 22 - 5.125 x 12.000 GLB 24F-V4

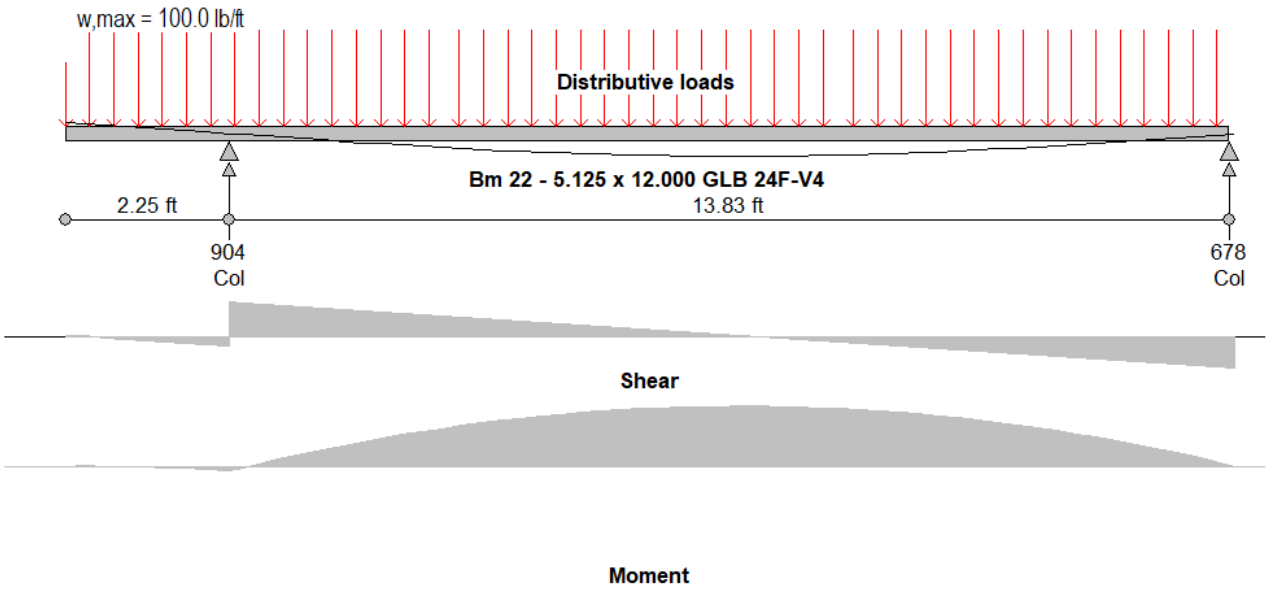


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

No Applied point loads

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA ID	WALL HEIGHT	D	S	L
0	Floor/Roof	7	-	15.0	25.0	0.0

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
0	Floor/Roof	5.0 |	0.2	16.1 |	37.5	62.5	0.0

(1) From loc and to loc are load segments starting and ending
measured from the left of the beam

->Computed moments and shears (Factored) :

Max shear = 706 lbs D + S (2.4-3)

Min shear = -678 lbs D + S (2.4-3)

Max moment = 2295 ft-lbs D + S (2.4-3)

Min moment = -196 ft-lbs D + S (2.4-3)

->Beam properties (2D xy axis) :

Span = 16.08 ft

```
        Area  = 61.50 sq.in

        Sx    = 123.00 sq.in

        Ixx   = 738.00 sq.in

->Check shear :

        fv = 1.5 * V / Area  = 706 / 61.50 = 17.21 psi

        F'v = 190.00 x 1.15 x 1.00 x 1.00 x 1.00 =  218.50 psi

          Fv = 190 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check moment :

        fb-top = M x 12 / Sx  = -2346 / 123.00 = 19.07 psi

        fb-btm = M x 12 / Sx  = 27542 / 123.00 = 223.92 psi

          Fb = 2400 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

          Cv = 0.80, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

        Cv controls

          Fb'top x CD x CM x CT x CV x CFU x CI x CR = 1105 psi

          Fb'btm x CD x CM x CT x CV x CFU x CI x CR = 2211 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 2

        Deflection span 0, Length = 13.83 ft Combined deflection = -0.059 [D + S (2.4-3)]

                Allowed = 13.83 x 12 / 360.0 = 0.461 in.

                Allowed (Seismic controled) = 13.83 x 12 / 180.0 = 0.922 in.

Cantilever Deflection span 1, Length = 2.25 ft Combined deflection = 0.029 [D + S
(2.4-3)]
                Allowed = 2.25 x 12 / 240.0 = 0.113 in.
```

2.17 Analysis of Bm 23 - 5.125 x 12.000 GLB 24F-V4

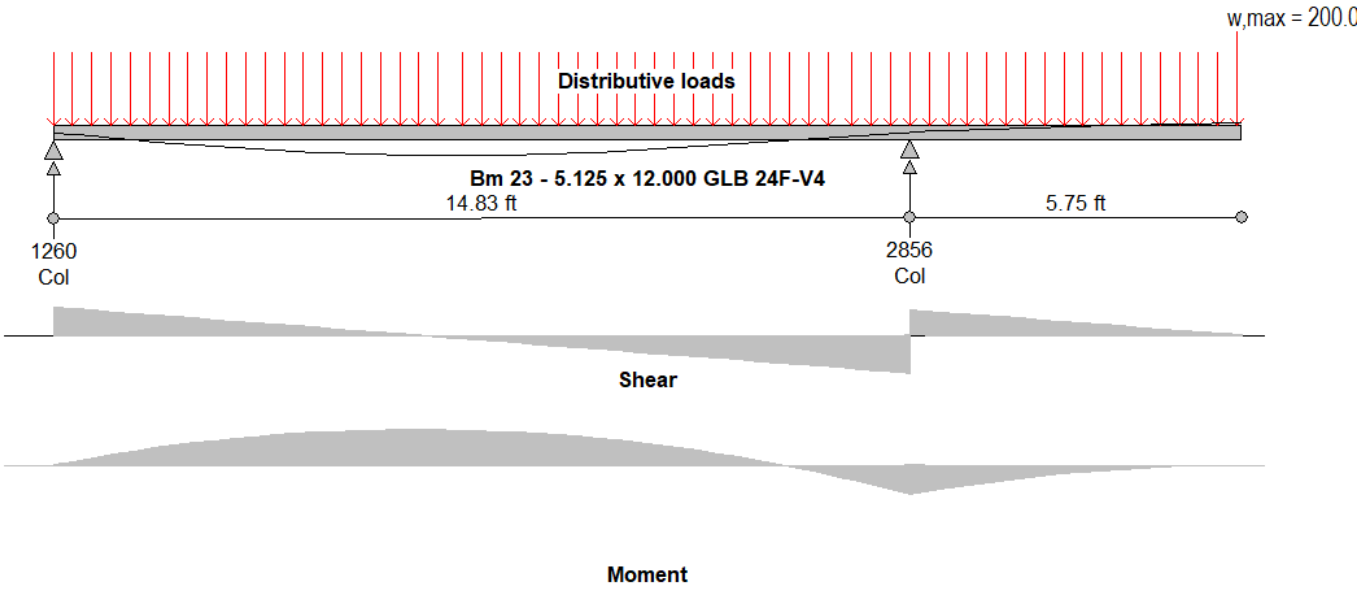


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

No Applied point loads

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA ID	WALL HEIGHT	D	S	L
0	Floor/Roof	5	-	15.0	25.0	0.0
1	Floor/Roof	5	-	15.0	25.0	0.0
2	Floor/Roof	6	-	15.0	25.0	0.0
3	Floor/Roof	6	-	15.0	25.0	0.0

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
0	Floor/Roof	5.0	0.0	20.4	37.5	62.5	0.0
1	Floor/Roof	5.0	20.4	20.6	37.5	62.5	0.0
2	Floor/Roof	5.0	20.4	20.6	37.5	62.5	0.0
3	Floor/Roof	5.0	20.6	0.0	37.5	62.5	0.0

(1) From loc and to loc are load segments starting and ending measured from the left of the beam

->Computed moments and shears (Factored) :

Max shear = 1260 lbs D + S (2.4-3)

```
        Min shear  =      -1670 lbs           D + S (2.4-3)

        Max moment =       3972 ft-lbs        D + S (2.4-3)

        Min moment =      -3306 ft-lbs        D + S (2.4-3)

->Beam properties (2D xy axis) :

        Span  = 20.58 ft

        Area  = 61.50 sq.in

        Sx    = 123.00 sq.in

        Ixx   = 738.00 sq.in

->Check shear :

        fv = 1.5 * V / Area  = 1670 / 61.50 = 40.73 psi

        F'v = 190.00 x 1.15 x 1.00 x 1.00 x 1.00 =  218.50 psi

          Fv = 190 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check moment :

        fb-top = M x 12 / Sx  = -39675 / 123.00 = 322.56 psi

        fb-btm = M x 12 / Sx  = 47661 / 123.00 = 387.49 psi

          Fb = 2400 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

          Cv = 0.78, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

        Cv controls

          Fb'top x CD x CM x CT x CV x CFU x CI x CR = 1079 psi

          Fb'btm x CD x CM x CT x CV x CFU x CI x CR = 2157 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 2

        Deflection span 0, Length = 14.83 ft Combined deflection = -0.106 [D + S (2.4-3)]
```

Allowed = 14.83 x 12 / 360.0 = 0.494 in.

Allowed (Seismic controled) = 14.83 x 12 / 180.0 = 0.989 in.

Cantilever Deflection span 1, Length = 5.75 ft Combined deflection = 0.046 [D + S (2.4-3)]

Allowed = 5.75 x 12 / 240.0 = 0.287 in.

2.18 Analysis of Bm 24 - 5.125 x 12.000 GLB 24F-V4

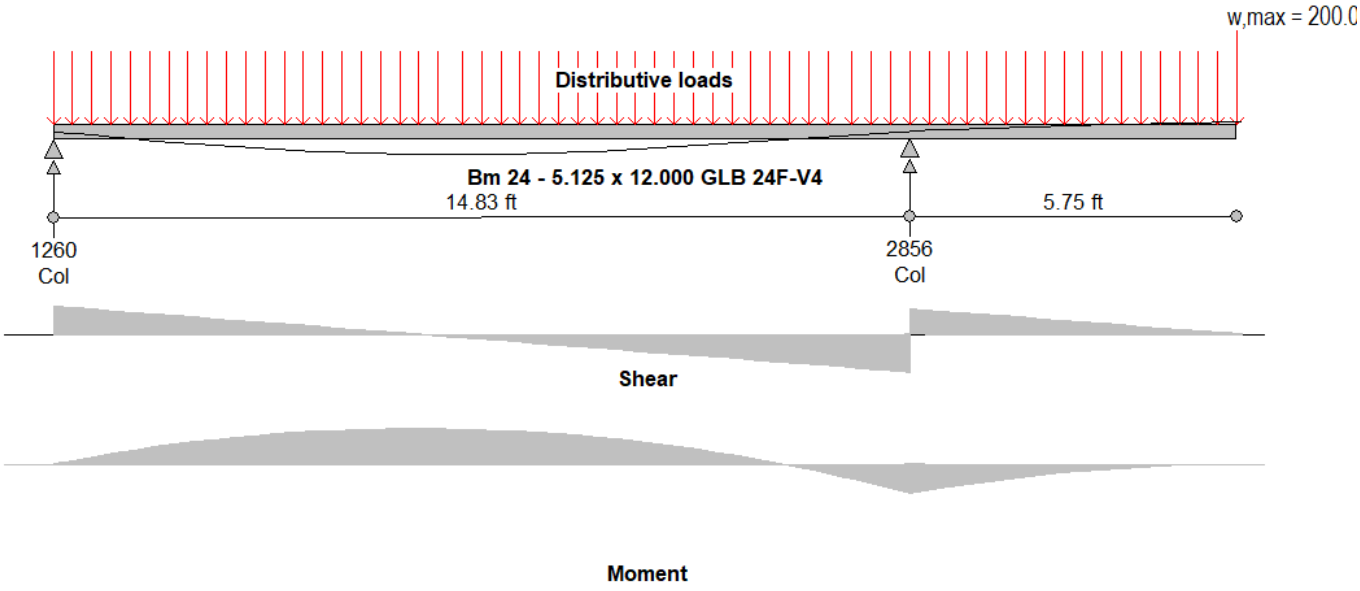


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

No Applied point loads

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA ID	WALL HEIGHT	D	S	L
0	Floor/Roof	6	-	15.0	25.0	0.0
1	Floor/Roof	6	-	15.0	25.0	0.0
2	Floor/Roof	7	-	15.0	25.0	0.0
3	Floor/Roof	7	-	15.0	25.0	0.0

(1) loads in psf.

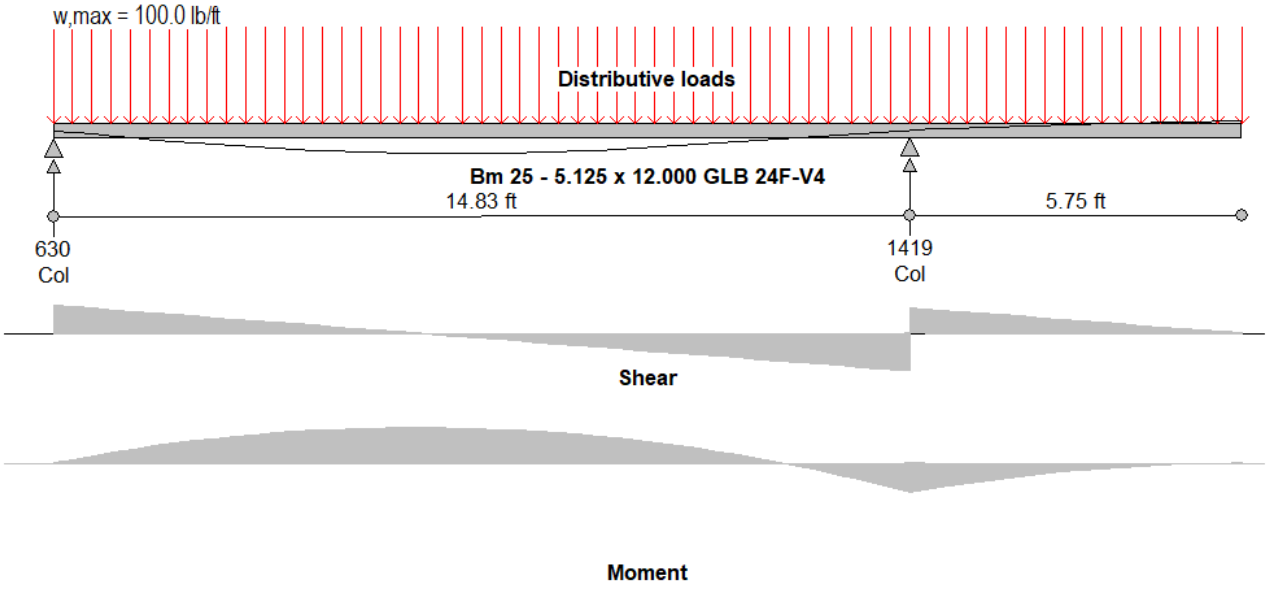
Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc		to loc		D	S	L
0	Floor/Roof	5.0	0.0	|	20.4	|	37.5	62.5	0.0
1	Floor/Roof	5.0	20.4	|	20.6	|	37.5	62.5	0.0
2	Floor/Roof	5.0	20.4	|	20.6	|	37.5	62.5	0.0
3	Floor/Roof	5.0	20.6	|	0.0	|	37.5	62.5	0.0

```
---------------------------------------------------------------------------

(1) From loc and to loc are load segments starting and ending

    measured from the left of the beam

->Computed moments and shears (Factored) :

        Max shear  =       1260 lbs           D + S (2.4-3)

        Min shear  =      -1670 lbs           D + S (2.4-3)

        Max moment =       3972 ft-lbs        D + S (2.4-3)

        Min moment =      -3306 ft-lbs        D + S (2.4-3)

->Beam properties (2D xy axis) :

        Span  = 20.58 ft

        Area  = 61.50 sq.in

        Sx    = 123.00 sq.in

        Ixx   = 738.00 sq.in

->Check shear :

        fv = 1.5 * V / Area  = 1670 / 61.50 = 40.73 psi

        F'v = 190.00 x 1.15 x 1.00 x 1.00 x 1.00 =  218.50 psi

          Fv = 190 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check moment :

        fb-top = M x 12 / Sx  = -39675 / 123.00 = 322.56 psi

        fb-btm = M x 12 / Sx  = 47661 / 123.00 = 387.49 psi

          Fb = 2400 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

          Cv = 0.78, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

        Cv controls

          Fb'top x CD x CM x CT x CV x CFU x CI x CR = 1079 psi
```

```
        Fb'btm x CD x CM x CT x CV x CFU x CI x CR = 2157 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 2

        Deflection span 0, Length = 14.83 ft Combined deflection = -0.106 [D + S (2.4-3)]

                Allowed = 14.83 x 12 / 360.0 = 0.494 in.

                Allowed (Seismic controled) = 14.83 x 12 / 180.0 = 0.989 in.

Cantilever Deflection span 1, Length = 5.75 ft Combined deflection = 0.046 [D + S (2.4-3)]

                Allowed = 5.75 x 12 / 240.0 = 0.287 in.
```

2.19 Analysis of Bm 25 - 5.125 x 12.000 GLB 24F-V4



Shear

Moment

Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

No Applied point loads

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA	WALL	D	S	L

		ID		HEIGHT		
0	Floor/Roof	7	-	15.0	25.0	0.0
1	Floor/Roof	7	-	15.0	25.0	0.0
2	Floor/Roof	7	-	15.0	25.0	0.0

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
0	Floor/Roof	5.0	0.0	14.8	37.5	62.5	0.0
1	Floor/Roof	5.0	14.8	20.4	37.5	62.5	0.0
2	Floor/Roof	5.0	20.4	20.6	37.5	62.5	0.0

(1) From loc and to loc are load segments starting and ending measured from the left of the beam

->Computed moments and shears (Factored) :

Max shear =	630 lbs	D + S (2.4-3)
Min shear =	-835 lbs	D + S (2.4-3)
Max moment =	1986 ft-lbs	D + S (2.4-3)
Min moment =	-1653 ft-lbs	D + S (2.4-3)

->Beam properties (2D xy axis) :

Span = 20.58 ft

```
        Area  = 61.50 sq.in

        Sx    = 123.00 sq.in

        Ixx   = 738.00 sq.in

->Check shear :

        fv = 1.5 * V / Area  = 835 / 61.50 = 20.37 psi

        F'v = 190.00 x 1.15 x 1.00 x 1.00 x 1.00 =  218.50 psi

          Fv = 190 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check moment :

        fb-top = M x 12 / Sx  = -19838 / 123.00 = 161.28 psi

        fb-btm = M x 12 / Sx  = 23828 / 123.00 = 193.72 psi

          Fb = 2400 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

          Cv = 0.78, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

        Cv controls

          Fb'top x CD x CM x CT x CV x CFU x CI x CR = 1079 psi

          Fb'btm x CD x CM x CT x CV x CFU x CI x CR = 2157 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 2

        Deflection span 0, Length = 14.83 ft Combined deflection = -0.053 [D + S (2.4-3)]

                Allowed = 14.83 x 12 / 360.0 = 0.494 in.

                Allowed (Seismic controled) = 14.83 x 12 / 180.0 = 0.989 in.

Cantilever Deflection span 1, Length = 5.75 ft Combined deflection = 0.023 [D + S
(2.4-3)]
                Allowed = 5.75 x 12 / 240.0 = 0.287 in.
```

2.20 Analysis of Bm 26 - 4 x 10 DF #2

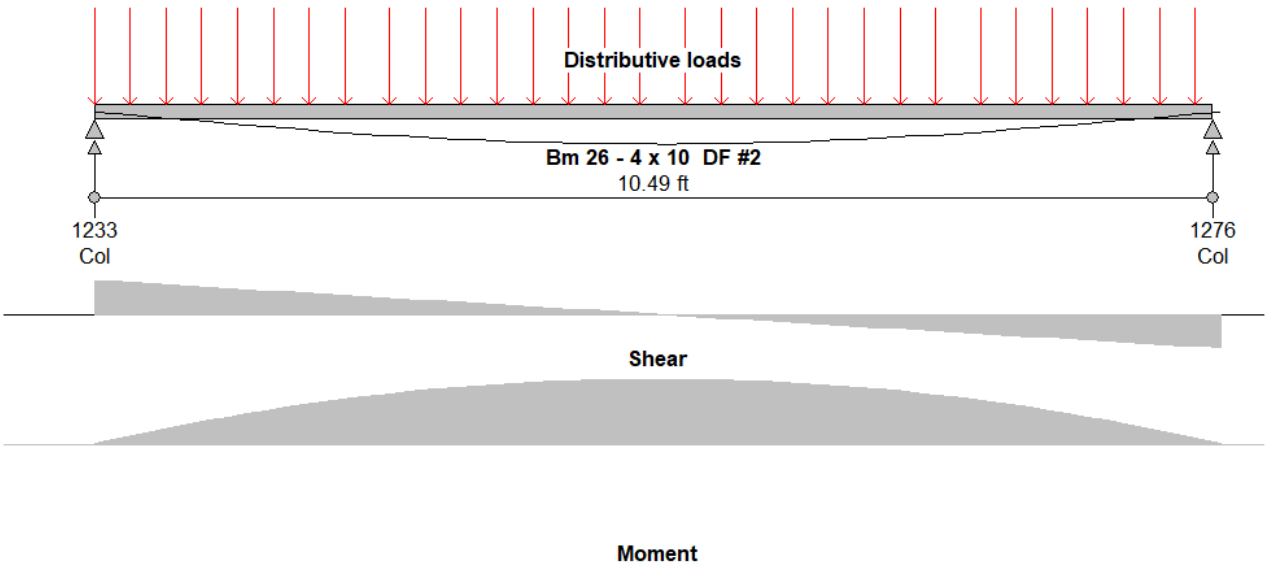


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

No Applied point loads

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA ID	WALL HEIGHT	D	S	L
0	Floor/Roof	9	-	15.0	25.0	0.0

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
0	Floor/Roof	12.2 |	10.5	0.2 |	91.3	152.1	0.0

(1) From loc and to loc are load segments starting and ending
measured from the left of the beam

->Computed moments and shears (Factored) :

Max shear = 1233 lbs D + S (2.4-3)

Min shear = -1276 lbs D + S (2.4-3)

Max moment = 3343 ft-lbs D + S (2.4-3)

Min moment = 0 ft-lbs D + S (2.4-3)

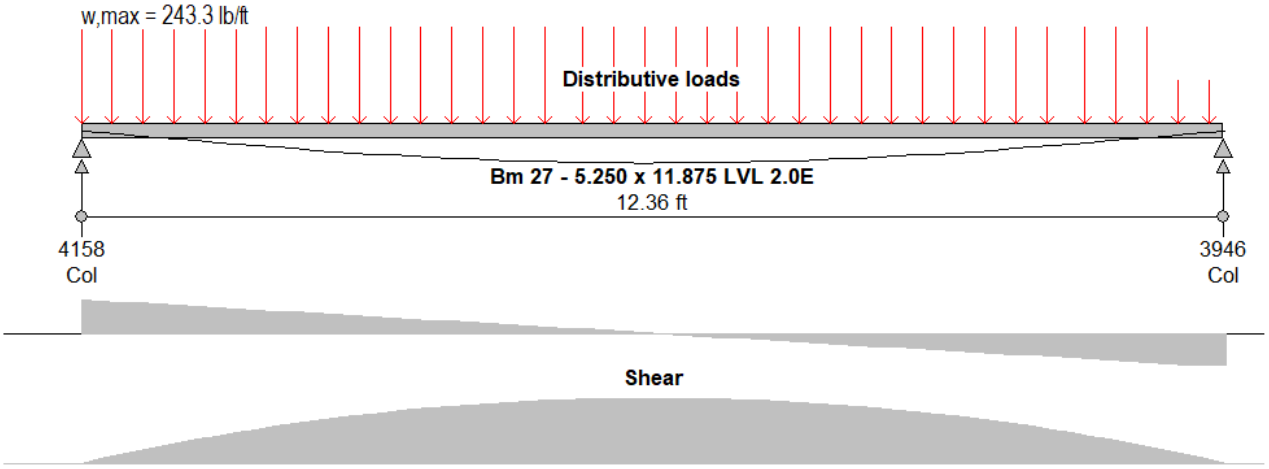
->Beam properties (2D xy axis) :

Span = 10.49 ft

Area = 32.38 sq.in

```
        Sx    = 49.91 sq.in

        Ixx   = 230.84 sq.in

->Check shear :

        fv = 1.5 x V / Area  = 1276 / 32.38 = 59.10 psi

        F'v = 180.00 x 1.15 x 1.00 x 1.00 x 1.00 =  207.00 psi

          Fv = 180 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check bending :

        fb-top = M x 12 / Sx  = 40112 / 49.91 = 803.67 psi

        fb-btm = M x 12 / Sx  = 0 / 49.91 = 0.00 psi

          Fb = 900 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

         Cf = 1.10, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

          Fb'x CD x CM x CT x CL x CFx CFU x CI x CR = 1138 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 1

        Deflection span 0, Length = 10.49 ft Combined deflection = -0.179 [D + S (2.4-3)]

                Allowed = 10.49 x 12 / 360.0 = 0.350 in.

                Allowed (Seismic controled) = 10.49 x 12 / 180.0 = 0.699 in.
```

2.21 Analysis of Bm 27 - 5.250 x 11.875 LVL 2.0E



Shear

Moment

Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

No Applied point loads

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA	WALL	D	S	L

		ID		HEIGHT		
0	Floor/Roof	8	-	15.0	25.0	0.0
1	Floor/Roof	9	-	15.0	25.0	0.0

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
0	Floor/Roof	21.5	12.1	0.0	161.2	268.7	0.0
1	Floor/Roof	12.2	0.0	11.9	91.3	152.1	0.0

(1) From loc and to loc are load segments starting and ending
measured from the left of the beam

->Computed moments and shears (Factored) :

Max shear = 4158 lbs D + S (2.4-3)

Min shear = -3946 lbs D + S (2.4-3)

Max moment = 12834 ft-lbs D + S (2.4-3)

Min moment = -0 ft-lbs D + S (2.4-3)

->Beam properties (2D xy axis) :

Span = 12.36 ft

Area = 62.34 sq.in

Sx = 123.39 sq.in

```
        Ixx   = 732.62 sq.in

->Check shear :

        fv = 1.5 x V / Area  = 4158 / 62.34 = 100.04 psi

        F'v = 285 x 1.15 =  327.75 psi

          Fv = 285 psi, CD = 1.00

->Check moment :

        fb = M x 12 / Sx  = 154005 / 123.39 = 1248.13 psi

          Fb = 2600 psi, CD = 1.15, Cf = 1.00, Cl = 1.00.

          Fb' x CD x CF x CL = 2993 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 1

        Deflection span 0, Length = 12.36 ft Combined deflection = -0.241 [D + S (2.4-3)]

                Allowed = 12.36 x 12 / 360.0 = 0.412 in.

                Allowed (Seismic controled) = 12.36 x 12 / 180.0 = 0.824 in.
```

2.22 Analysis of Bm 28 - 5.250 x 14.000 PSL 2.2E

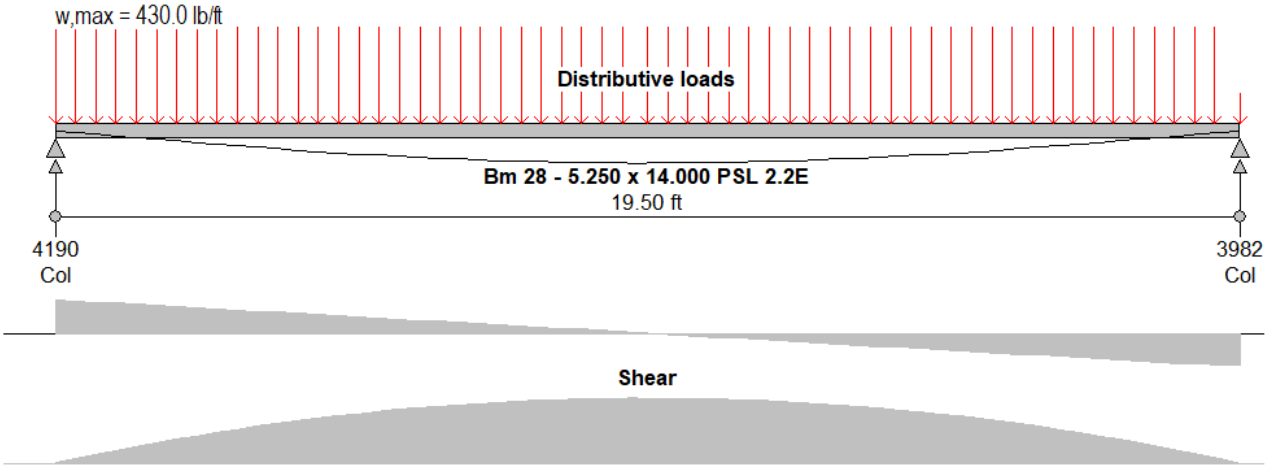


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

No Applied point loads

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA	WALL	D	S	L

```
                  ID   HEIGHT

-------------------------------------------------------

 0  Floor/Roof      8     -      15.0    25.0     0.0

-------------------------------------------------------

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD  ELEMENT              TRIB     from    to       D         S      L

                           WIDTH     loc    loc

-------------------------------------------------------------------------

 0  Floor/Roof             21.5 |    0.0   19.3 |   161.3   268.8     0.0

-------------------------------------------------------------------------

(1) From loc and to loc are load segments starting and ending

    measured from the left of the beam

->Computed moments and shears (Factored) :

        Max shear  =       4190 lbs           D + S (2.4-3)

        Min shear  =      -3982 lbs           D + S (2.4-3)

        Max moment =      20406 ft-lbs        D + S (2.4-3)

        Min moment =         -0 ft-lbs        D + S (2.4-3)

->Beam properties (2D xy axis) :

        Span  = 19.50 ft

        Area  = 73.50 sq.in

        Sx    = 171.50 sq.in

        Ixx   = 1200.50 sq.in

->Check shear :
```

```
        fv = 1.5 x V / Area  = 4190 / 73.50 = 85.50 psi

        F'v = 290 x 1.15 =  333.50 psi

          Fv = 290 psi, CD = 1.00

->Check moment :

        fb = M x 12 / Sx  = 244868 / 171.50 = 1427.80 psi

          Fb = 2900 psi, CD = 1.15, Cf = 0.98, Cl = 1.00.

          Fb' x CD x CF x CL = 3278 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 1

        Deflection span 0, Length = 19.50 ft Combined deflection = -0.529 [D + S (2.4-3)]

                Allowed = 19.50 x 12 / 360.0 = 0.650 in.

                Allowed (Seismic controled) = 19.50 x 12 / 180.0 = 1.300 in.
```

2.23 Analysis of Bm 29 - 5.125 x 16.500 GLB 24F-V4

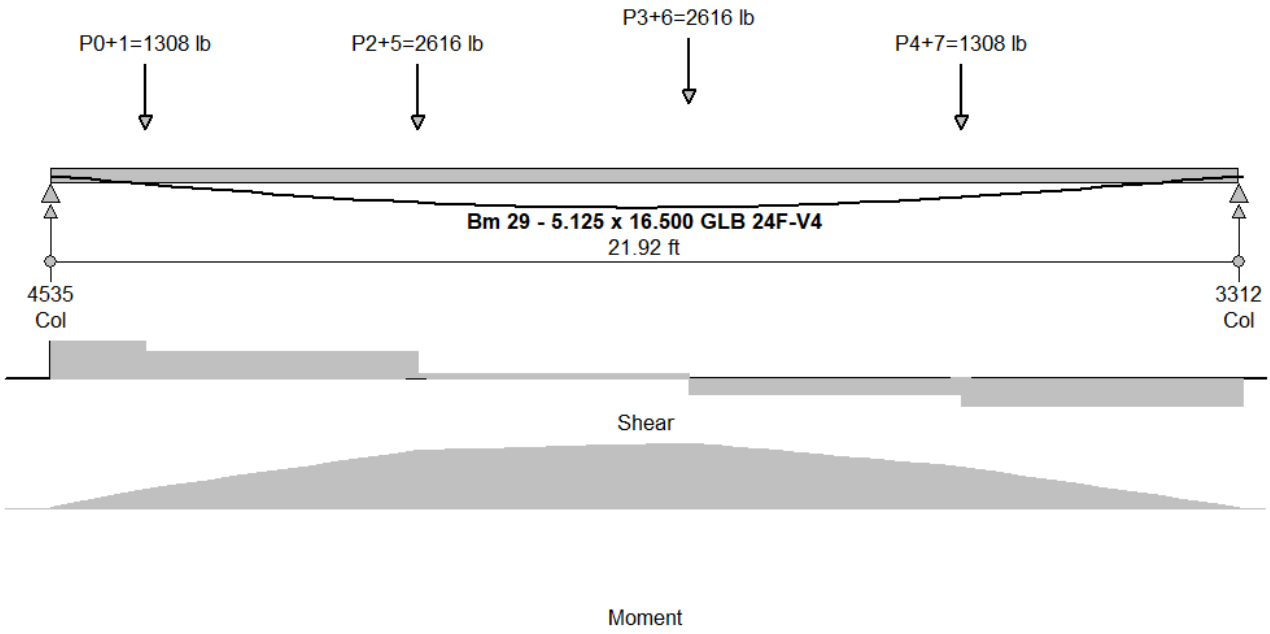


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES
0	254	423	0	0	0	1.75	From BM 22 from Level 2
1	236	394	0	0	0	1.75	From BM 23 from Level 2
2	508	847	0	0	0	6.75	From BM 20 from Level 2
3	508	847	0	0	0	11.75	From BM 21 from Level 2
4	254	423	0	0	0	16.75	From BM 22 from Level 2
5	473	788	0	0	0	6.75	From BM 23 from Level 2

6	473	788	0	0	0	11.75	From BM 24 from Level 2
7	236	394	0	0	0	16.75	From BM 25 from Level 2

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT ID	AREA	WALL HEIGHT	D	S	L

No distributive loads

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L

No distributive loads

(1) From loc and to loc are load segments starting and ending
measured from the left of the beam

->Computed moments and shears (Factored) :

Max shear =	4535 lbs	D + S (2.4-3)
Min shear =	-3312 lbs	D + S (2.4-3)
Max moment =	27130 ft-lbs	D + S (2.4-3)

```
        Min moment =          0 ft-lbs  D - (0.6)W (2.4-5b)

->Beam properties (2D xy axis) :

        Span  = 21.92 ft

        Area  = 84.56 sq.in

        Sx    = 232.55 sq.in

        Ixx   = 1918.51 sq.in

->Check shear :

        fv = 1.5 * V / Area  = 4535 / 84.56 = 80.44 psi

        F'v = 190.00 x 1.15 x 1.00 x 1.00 x 1.00 =  218.50 psi

          Fv = 190 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check moment :

        fb-top = M x 12 / Sx  = 0 / 232.55 = 0.00 psi

        fb-btm = M x 12 / Sx  = 325555 / 232.55 = 1399.95 psi

          Fb = 2400 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

          Cv = 0.75, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

        Cv controls

          Fb'top x CD x CM x CT x CV x CFU x CI x CR = 1038 psi

          Fb'btm x CD x CM x CT x CV x CFU x CI x CR = 2076 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 1

        Deflection span 0, Length = 21.92 ft Combined deflection = -0.645 [D + S (2.4-3)]

                Allowed = 21.92 x 12 / 360.0 = 0.731 in.

                Allowed (Seismic controled) = 21.92 x 12 / 180.0 = 1.461 in.
```

2.24 Analysis of Bm 30 - 4 x 8 DF #2

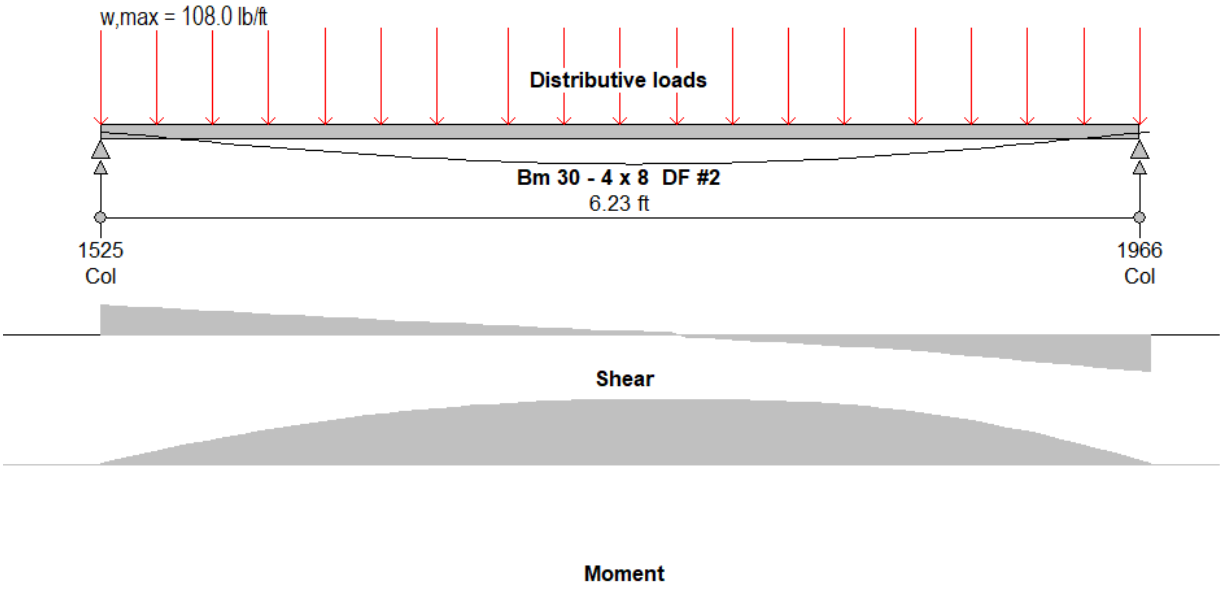


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES

No Applied point loads

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA ID	WALL HEIGHT	D	S	L
0	Wall	-	9.0	12.0		
1	Floor/Roof	0	-	12.0	0.0	40.0
2	Floor/Roof	13	-	15.0	25.0	0.0

(1) Wall height in feet.

(2) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
0	Wall		0.0	6.2	108.0		
1	Floor/Roof	18.6	6.2	4.2	111.5	0.0	371.7
2	Floor/Roof	18.5	6.2	0.0	138.8	231.3	0.0

(1) From loc and to loc are load segments starting and ending
measured from the left of the beam

(2) Wall weight, lb/ft = height x weight in psf

->Computed moments and shears (Factored) :

```
        Max shear  =       1525 lbs           D + S (2.4-3)

        Min shear  =      -1966 lbs    D + 0.75S + 0.75L (2.4-4)

        Max moment =       2547 ft-lbs D + 0.75S + 0.75L (2.4-4)

        Min moment =          0 ft-lbs        D + S (2.4-3)

->Beam properties (2D xy axis) :

        Span  = 6.23 ft

        Area  = 25.38 sq.in

        Sx    = 30.66 sq.in

        Ixx   = 111.15 sq.in

->Check shear :

        fv = 1.5 x V / Area  = 1966 / 25.38 = 116.19 psi

        F'v = 180.00 x 1.15 x 1.00 x 1.00 x 1.00 =  207.00 psi

          Fv = 180 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check bending :

        fb-top = M x 12 / Sx  = 30568 / 30.66 = 996.96 psi

        fb-btm = M x 12 / Sx  = 0 / 30.66 = 0.00 psi

          Fb = 900 psi, CD = 1.15, Cm = 1.00, Ct = 1.00, Cl = 1.00,

         Cf = 1.20, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

          Fb'x CD x CM x CT x CL x CFx CFU x CI x CR = 1242 psi

->Check bearing :

->Check deflections :

        Number of deflection spans = 1

        Deflection span 0, Length = 6.23 ft Combined deflection = -0.097 [D + 0.75S +
0.75L (2.4-4)]

                Allowed = 6.23 x 12 / 360.0 = 0.208 in.
```

Allowed (Seismic controled) = 6.23 x 12 / 180.0 = 0.415 in.

2.25 Analysis of Bm 31 - 4 x 8 DF #2

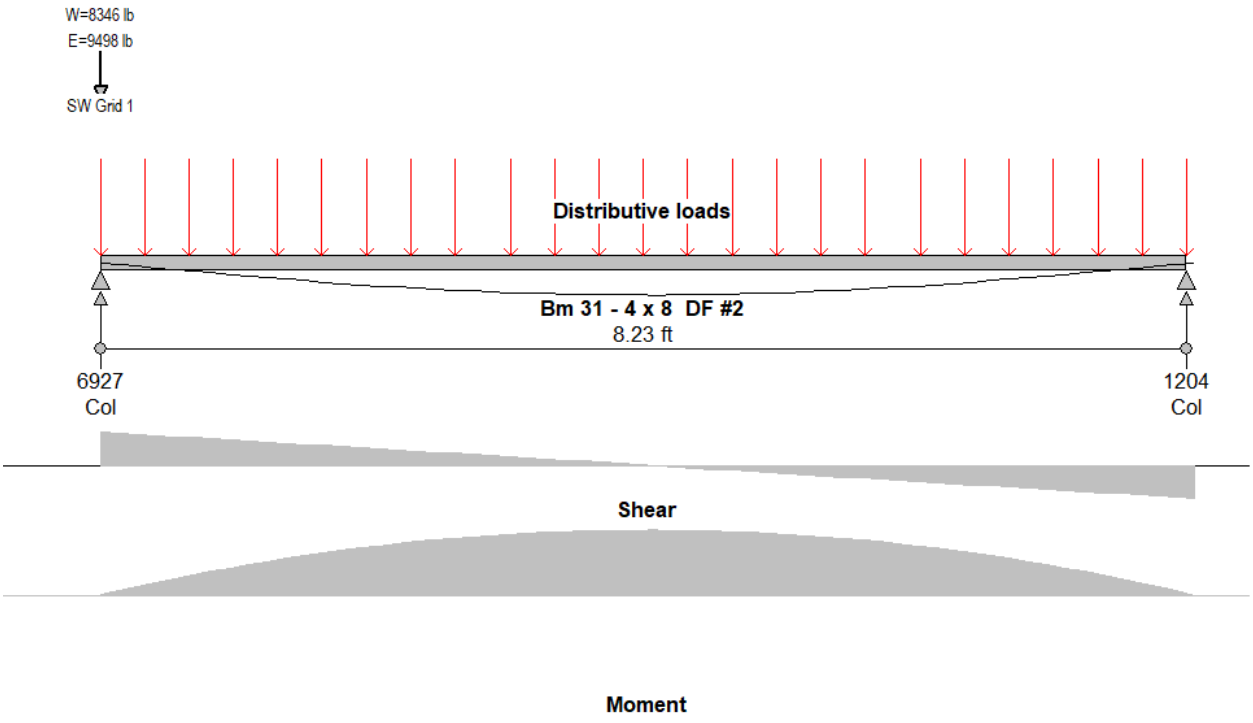


Table 1 - Point load table

LOAD	D	S	L	W+/-	E+/-	LOC	NOTES
2	0	0	0	8346	9498	0.04	From SW supt from Level 1

(1) Un-factored loads in lbs.

(2) Load location measured from left end of beam.

Table 2 - Seismic load table

LOAD	E	E X OMEGA	NOTES
2	9498	28495	Overstrength factor = 3.0 applied

(1) Un-factored loads with overstrength factor applied as applicable, in lbs.

Table 3 - Distributive load table (pressures)

LOAD	ELEMENT	AREA ID	WALL HEIGHT	D	S	L
0	Floor/Roof	1	-	12.0	0.0	40.0
1	Floor/Roof	1	-	12.0	0.0	40.0

(1) loads in psf.

Table 4 - Distributive load table (line loads)

LOAD	ELEMENT	TRIB WIDTH	from loc	to loc	D	S	L
0	Floor/Roof	11.3	8.2	0.2	67.5	0.0	225.0
1	Floor/Roof	11.3	0.2	0.0	67.5	0.0	225.0

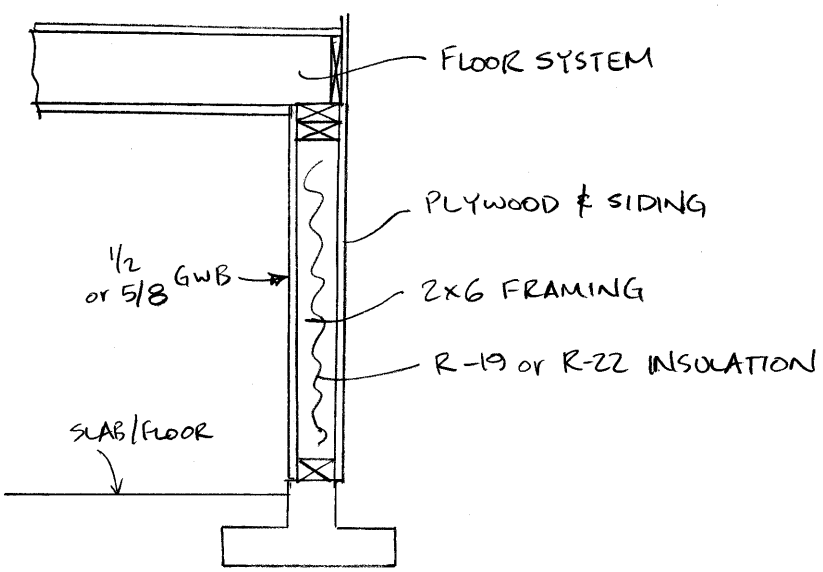
```
(1) From loc and to loc are load segments starting and ending

    measured from the left of the beam

->Computed moments and shears (Factored) :

        Max shear  =       1204 lbs           D + L (2.4-2)

        Min shear  =      -1204 lbs           D + L (2.4-2)

        Max moment =       2475 ft-lbs        D + L (2.4-2)

        Min moment =         -0 ft-lbs        D + L (2.4-2)

->Beam properties (2D xy axis) :

        Span  = 8.23 ft

        Area  = 25.38 sq.in

        Sx    = 30.66 sq.in

        Ixx   = 111.15 sq.in

->Check shear :

        fv = 1.5 x V / Area  = 1204 / 25.38 = 71.14 psi

        F'v = 180.00 x 1.00 x 1.00 x 1.00 x 1.00 =  180.00 psi

          Fv = 180 psi, CD = 1.00, Cm = 1.00, Ct = 1.00, Ci = 1.00.

->Check bending :

        fb-top = M x 12 / Sx  = 29703 / 30.66 = 968.75 psi

        fb-btm = M x 12 / Sx  = 0 / 30.66 = 0.00 psi

          Fb = 900 psi, CD = 1.00, Cm = 1.00, Ct = 1.00, Cl = 1.00,

         Cf = 1.20, Cfu = 1.00, Ci = 1.00, Cr = 1.00.

          Fb'x CD x CM x CT x CL x CFx CFU x CI x CR = 1080 psi

->Check bearing :

->Check deflections :
```

```
Number of deflection spans = 1

Deflection span 0, Length = 8.23 ft Combined deflection = -0.170 [D + L (2.4-2)]

        Allowed = 8.23 x 12 / 360.0 = 0.274 in.

        Allowed (Seismic controled) = 8.23 x 12 / 180.0 = 0.549 in.
```

APPENDIX A – TYPICAL DEAD WEIGHTS OF LIGHT WEIGHT STRUCTURES

Typical dead weights of light wood framed structures

Typical exterior wall



Weight of wall:

1 × 6 Cedar siding1.5 psf × .75 thick	= 1.13 psf
15# paper	= 1.00 psf
½ CDX plywood 3.0 psf /inch	= 1.5 psf
R-22 Insulation	= 1.0 psf
2 × 6 Studs (16" o.c. – 2.0 lb/ft)	= 1.50 psf
Sub Total	= 6.13 psf
With 5/8" GWB (5 psf/inch)	= 3.10 psf
Total with 5/8 GWB	= 9.23 psf (Use 10 psf)
With ½" GWB	= 2.5 psf
Total with ½ GWB	**= 8.63 psf (Use 10 psf)**

With 2-1/12 Face brick (25 psf) & ½ GWB = **32.5 psf**

Typical light floor system with 2 × 10 floor joists 16" O.C.

¾ T & G Sub floor (3.0 psf/inch)	= 2.25 psf
2 × 10 Joists (16" o.c – 3.37 lb/ft)	= 2.53 psf

Carpeting = 2.0 psf
5/8 GWB = 3.1 psf
or ½ GWB = 2.0 psf

Total with 5/8 GWB = 10 psf (Use 12 psf min)

Total with ½ GWB = 9.23psf (Use 10 psf min)

Typical heavy floor system with TJI floor joists 16" O.C. & 1-1/2" of Gyp-crete 2000.

¾ T & G Sub floor (3.0 psf/inch)	2.3
TJI 150 PRO 2.3 lb/ft @ 16 o.c.	1.7
Carpeting	2.0
5/8 GWB	3.1
1.5" Gyp-crete @ 115 pcf	14.4
Mech ceiling load	3.0
Total	26.5 psf

Typical interior 2 × 4 wall with 16" o.c. studs

½ GWB (both sides) = 5.0 psf
2 × 4 studs (16" o.c. – 1.28 lb/ft) = 0.96 psf
Insulation (optional) = 1.0 psf

Total = 7.00 psf

Truss roof system – with light roofing ≤ 6 psf

Max truss weight = 3.5 psf
½ GWB = 2.5 psf
R-38 insulation = 1.5 psf
Roof covering (includes paper) = 6.0 psf
½ CDX Sheathing = 1.50 psf

Total = 15 psf

Stick Frame roof system – with light roofing ≤ 6 psf

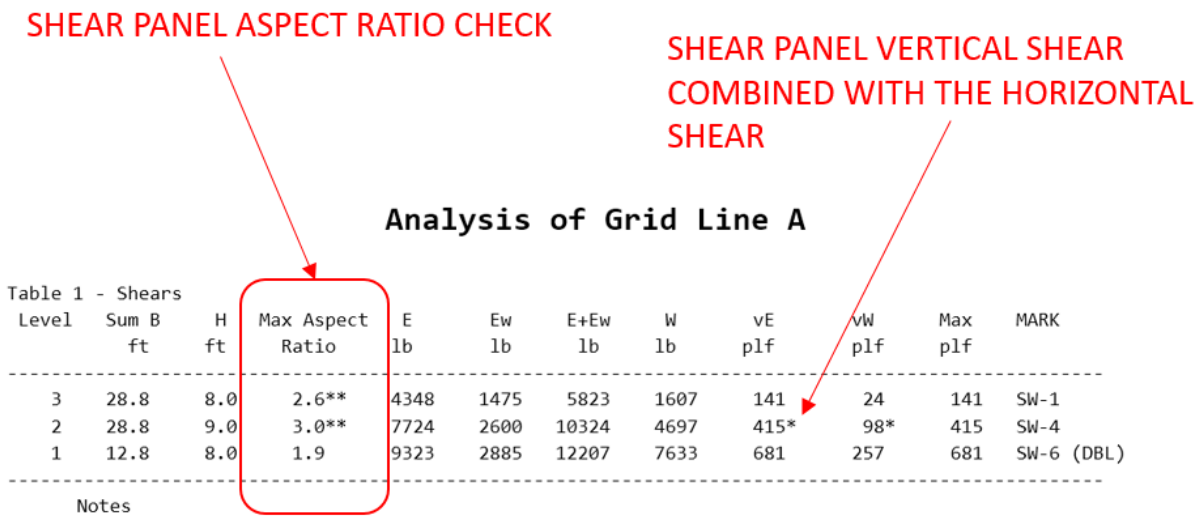
½ GWB = 2.5 psf
R-38 Insulation = 1.5 psf
Roof covering (includes paper) = 6.0 psf
½ CDX Sheathing = 1.5 psf

Subtotal = 11.5 psf
with
2 × 8 - 2' o.c. (1.32 psf) = 12.82 psf

2 × 8 – 16″ o.c. (1.92 psf) = 13.42 psf
2 × 10 - 2′ o.c. (1.69 psf) = 13.19 psf
2 × 10 – 16″ o.c. (2.53 psf) = 14.03 psf

APPENDIX B – WOOD SHEAR WALL DESIGN

The shear wall design consists of a static analysis by applying lateral and gravity loads. The following describes the tables per a typical analysis.



Analysis of Grid Line A

Table 1 - Shears

Level	Sum B ft	H ft	Max Aspect Ratio	E lb	Ew lb	E+Ew lb	W lb	vE plf	vW plf	Max plf	MARK
3	28.8	8.0	2.6**	4348	1475	5823	1607	141	24	141	SW-1
2	28.8	9.0	3.0**	7724	2600	10324	4697	415*	98*	415	SW-4
1	12.8	8.0	1.9	9323	2885	12207	7633	681	257	681	SW-6 (DBL)

Notes
1. b = sum of all solid panels.
2. H / W = Maximum aspect ratio of all panels within a SW.
3. E - Unfactored seismic forces(Summed between levels).
4. Ew - Unfactored Wall inertia force (wall & window panels).
5. E + Ew = Total unfactored seismic load.
6. W - Unfactored wind forces(Summed between levels).
7. vE = 0.7 x vE(ASD factored shear).
8. wW = 0.6 x vW / 1.4.
9. * = Shear values includes effects of vertical shears due hold-down reactions from upper levels (if applicable).
10. ** = Design shear has been factored up by the maximum h/2w (Section 2305.3.4) for SW with h / w > 2.0. H = to the story height, however some shear panels may have reduced heights by utilizing a continuous header beam per plan.

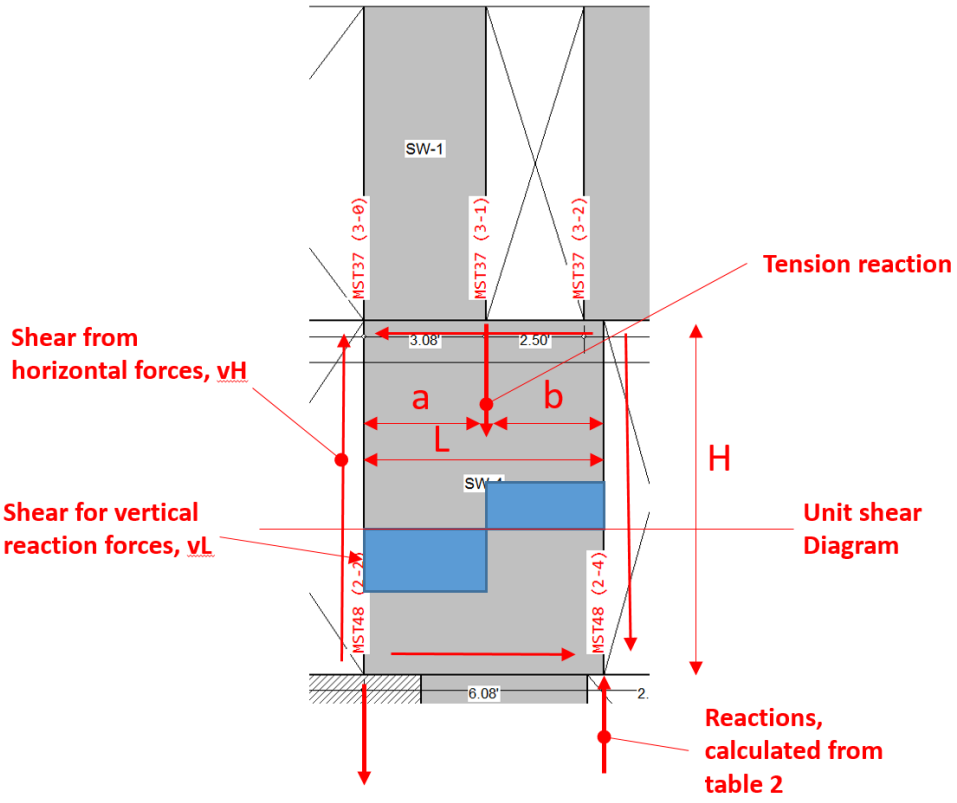
Table 1

This table shows the total shear at a shear wall. The lateral forces are summed from top to bottom for the seismic and wind lateral forces. The lengths of the shear panel per level is the “Sum B”.

Note 10 - Aspect ratio check – Per NDS Table 4.3.4, the shear panel unit shears must be reduced by the $2b_s$ / h if the h/b_s ratio exceeds 2:1. The Max aspect ratio check on Table 1, increases the applied load by a factor

of h/2w, w = b_s. The table above denotes when the requirement is exceeded, by the ** footnote and note 10. If all the panels meet the aspect ratio, this note will be shown on the table.

Note 9 – Combined horizontal and vertical unit shears – In order to reduce the number of hold-downs and the uplift can be resisted by the shear wall panel, then the vertical shear from the tension force(s) acting in beam action will be added to the horizontal shear. The applied forces are shown below



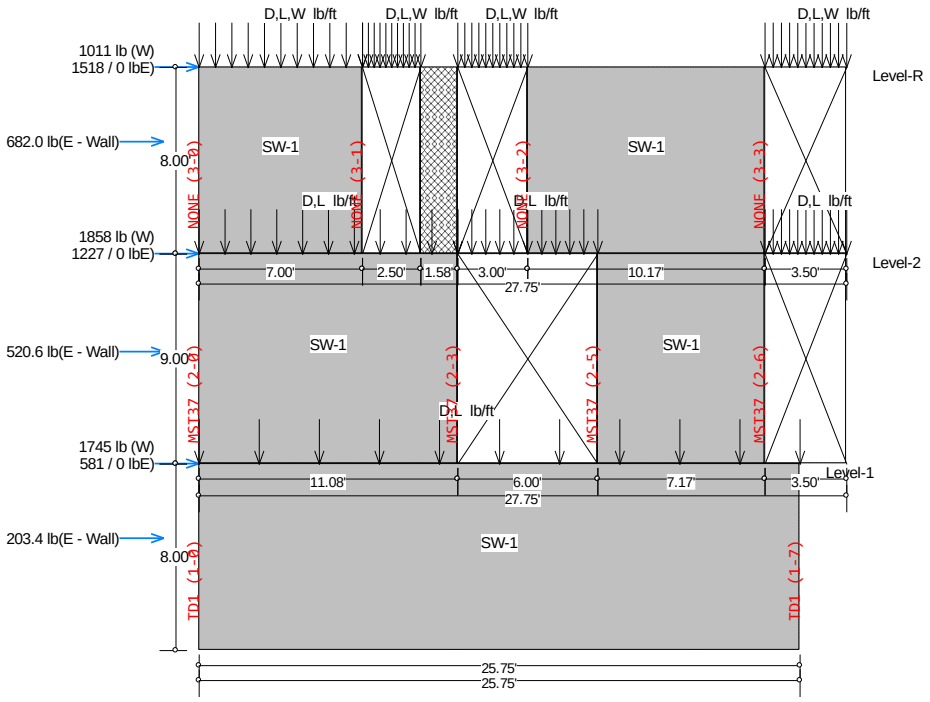
Free body diagram of a typical shear panel

To compute vL,

vL(LHS) = (Tension reaction x b / L) / H

Total shear = Max LHS or RHS reactions + vH.

Table 2a & 2b



Typical shear panel with all the forces acting

Table 2a - Vertical loads on panels

Level	Panel	Length ft	Dead lb/ft	Snow lb/ft	Live lb/ft	Wind Uplift lb/ft
3	1	7.00	147	0	392	-245
3	2	2.50	147	0	392	-245
3	3	1.58	0	0	0	0
3	4	3.00	121	0	323	-202
3	5	10.17	0	0	0	0
3	6	3.50	147	0	392	-245
2	1	11.08	147	0	392	0
2	2	6.00	121	0	323	0
2	3	7.17	0	0	0	0
2	4	3.50	147	0	392	0
1	1	25.75	78	0	209	0

The dead load, D is calculated from weight of the shear panel, wall with windows and walls not considered shear panels, and the weight on the framing (if any) that is supported by the three elements noted above. Snow and live loads are shown, but they do not control to the hold-down design (uplift). The snow load and the live load play a significant role when designing support beams for discontinuous elements. This analysis is performed in the beam design stage, where the shear wall overturning forces are combined with the vertical forces on the beam. This will be shown later. The wind uplift is additive to the hold-down reaction forces.

Typical dead weight component acting where the hold-down occurs is:

D = weight of wall x width x height / 2, where the weight of the wall = 12 psf for example. The dead weights are cumulative from top to bottom.

Snow, Live and Wind uplift load = load, lb/ft x L /2

Table 2b - Unfactored Reaction forces at panels

Reaction	Location from end (ft)	D lb	S lb	L lb	W Uplift lb	DIRECTION 1 E lb	DIRECTION 1 W lb	DIRECTION 2 E lb	DIRECTION 2 W lb
3-0	0.0	850	0	1371	-857	-1025	-471	1025	471
3-1	7.0	1154	0	1860	-1163	1025	471	-1025	-471
3-2	14.1	813	0	484	-302	-1025	-471	1025	471
3-3	24.3	913	0	685	-428	1025	471	-1025	-471
3-4	9.5	380	0	490	-306	0	0	0	0
3-5	11.1	401	0	484	-302	0	0	0	0
3-6	27.8	425	0	685	-428	0	0	0	0
2-0	0.0	2262	0	3541	-857	-2594	-1712	2594	1712
2-1	7.0	1154	0	1860	-1163	0	0	0	0
2-2	9.5	380	0	979	-612	0	0	0	0
2-3	11.1	3309	0	4105	-605	2081	1476	-2081	-1476
2-4	14.1	0	0	484	-302	0	0	0	0
2-5	17.1	1481	0	968	0	-2459	-1650	2459	1650
2-6	24.3	2659	0	2056	-857	2972	1885	-2972	-1885
2-7	27.8	871	0	1371	-428	0	0	0	0
1-0	0.0	4508	0	6234	-857	-3533	-2750	3533	2750
1-1	7.0	1154	0	1860	-1163	0	0	0	0
1-2	9.5	380	0	1469	-918	0	0	0	0
1-3	11.1	3309	0	4105	-605	0	0	0	0
1-4	14.1	0	0	484	-302	0	0	0	0
1-5	17.1	1481	0	968	0	0	0	0	0
1-6	24.3	2659	0	2056	-857	0	0	0	0
1-7	25.8	2246	0	2693	0	3533	2750	-3533	-2750

Notes
1. Reaction X-Y, X = level, Y = panel sequence id
2. D = DEAD LOAD, L = LIVE LOAD, W-UPLIFT = WIND UPLIFT LOAD
   W = WIND LOAD, E = SEISMIC LOAD
3. D = (Panel Height x Panel Width x Panel weight = 12.0 psf + Roof or Dead load)/ 2
   Dead load vectors are summed at abutting panels
4. DIRECTION 1 = LOAD DIRECTION LEFT TO RIGHT
5. DIRECTION 2 = LOAD DIRECTION RIGHT TO LEFT
6. NEGATIVE VALUES = UPLIFT OR TENSION

The table above shows the point loads applied at each panel (solid, open, etc).

The Reaction location 3-0, denotes 3rd level, 1st panel located 0 ft from the left,

The Reaction location 2-4, denotes 2nd level, 5th panel located 14.1 ft from the left.

Overturning forces for wind and seismic are calculated for both directions (alternating directions). All these forces must add to zero, since they are pure rotation reactions. The wind uplift is combined with the wind overturning as per Table 3 below.

Table 3 combination of loads

Table 3 - Factored Reaction forces at panels

Reaction	Location from end (ft)	DIRECTION 1 LC1 lb	LC2 lb	LC3 lb	LC4 lb	LC5 lb	LC6 lb	DIRECTION 2 LC1 lb	LC2 lb	LC3 lb	LC4 lb	LC5 lb	LC6 lb	MIN LOAD lb	MAX LOAD lb
3-0	0.0	567	132	1281	1340	227	-323	1133	1568	1705	2416	793	1112	-323	1281
3-1	7.0	1436	1871	2238	3087	975	1253	871	436	1814	2011	410	-182	-182	1814
3-2	14.1	531	96	828	638	205	-340	1096	1531	1252	1714	771	1095	-340	1095
3-3	24.3	1196	1631	1446	1965	830	1141	630	195	1022	889	265	-294	-294	1141
3-4	9.5	380	380	609	747	228	176	380	380	609	747	228	176	176	380
3-5	11.1	401	401	628	764	241	186	401	401	628	764	241	186	186	401
3-6	27.8	425	425	746	939	255	197	425	425	746	939	255	197	197	425
2-0	0.0	1235	447	3763	3557	330	-766	3290	4078	5303	6280	2385	2866	-766	3557
2-1	7.0	1154	1154	2026	2549	692	536	1154	1154	2026	2549	692	536	536	1154
2-2	9.5	380	380	839	1114	228	176	380	380	976	1114	228	176	176	380
2-3	11.1	4195	4766	6780	7481	2871	2993	2423	1852	5451	5295	1099	79	79	4766
2-4	14.1	0	0	227	363	0	0	0	0	227	363	0	0	0	0
2-5	17.1	491	-241	1464	915	-102	-1034	2471	3202	2949	3497	1878	2409	-1034	2409
2-6	24.3	3790	4739	4664	5761	2727	3315	1528	579	2967	2641	464	-846	-846	3315
2-7	27.8	871	871	1706	1899	523	404	871	871	1706	1899	523	404	404	871
1-0	0.0	2858	2035	7561	7329	1055	-380	6158	6982	10036	11039	4355	4566	-380	6982
1-1	7.0	1154	1154	2026	2549	692	536	1154	1154	2026	2549	692	536	536	1154
1-2	9.5	380	380	1068	1481	228	176	380	380	1343	1481	228	176	176	380
1-3	11.1	3309	3309	6116	6388	1985	1536	3309	3309	6116	6388	1985	1536	1536	3309
1-4	14.1	0	0	227	363	0	0	0	0	227	363	0	0	0	0
1-5	17.1	1481	1481	2206	2206	888	687	1481	1481	2206	2206	888	687	687	1481
1-6	24.3	2659	2659	3816	4201	1595	1234	2659	2659	3816	4201	1595	1234	1234	2659
1-7	25.8	3896	4719	5503	6121	2997	3516	596	-227	3028	2411	-302	-1431	-1431	3516

Notes

1. LC = Load combination
2. LC1 = D + 0.6W ASCE 2.4.1 - 5a
3. LC2 = D + 0.7E ASCE 2.4.1 - 5b
4. LC3 = D + 0.75L + 0.75(0.6W) + 0.75S ASCE 2.4.1 - 6a
5. LC4 = D + 0.75L + 0.75(0.7E) + 0.75S ASCE 2.4.1 - 6b
6. LC5 = 0.6D + 0.6W ASCE 2.4.1 - 7
7. LC6 = (0.6 - 0.14SDS)D + 0.7E ASCE 2.4.1 - 8, SDS = 0.970
8. MIN LOAD = Maximum negative tension force
9. MAX LOAD = Maximum positive compression force
10. W = W uplift + W shear overturning

All the forces shown on Table 2b are combined here. Load cases 6 & 7 size the hold-downs, since they produce the highest negative numbers. Any uplift force < 500 lb is considered small and therefore no hold-down is assigned to it.

The next page shows the application of the overturning forces on beams supporting discontinuous shear walls

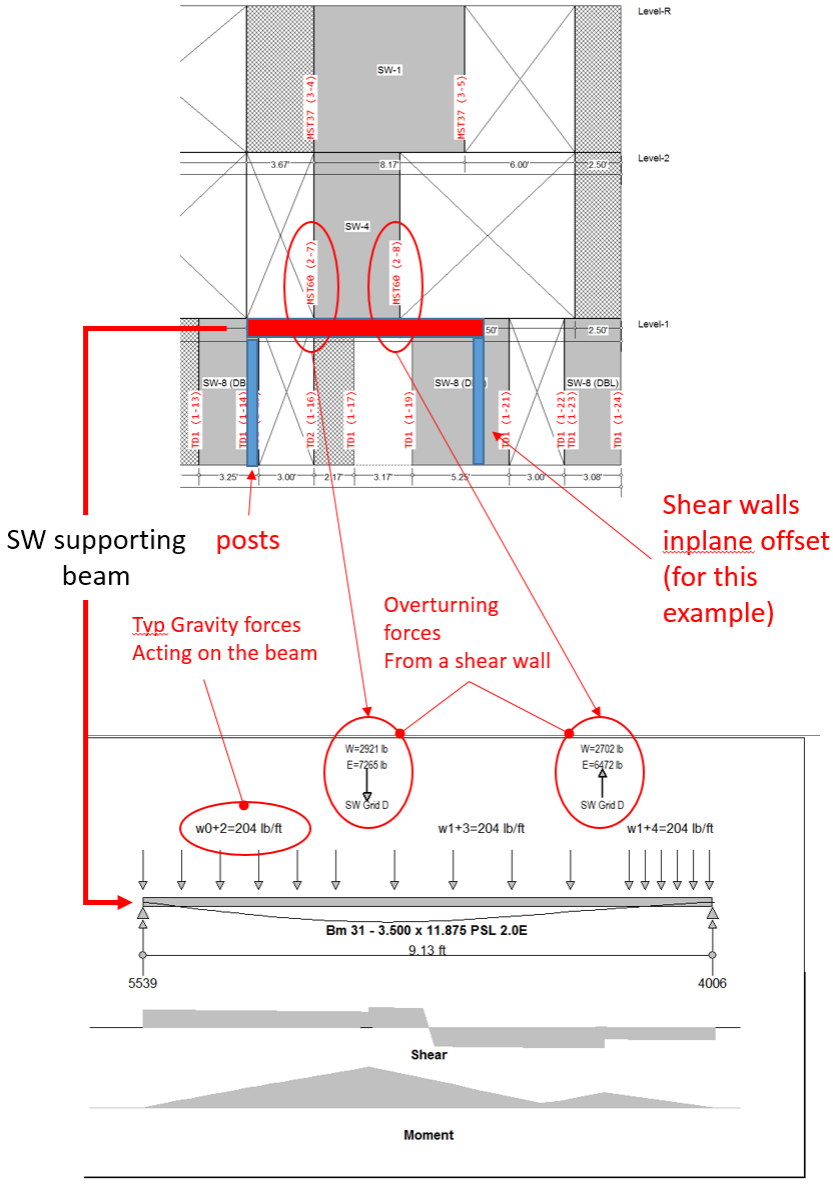


Illustration how shear wall forces are applied to the supporting beam

(See next page for typical calcs)

Excerpt from the beam analysis where the overturning forces are applied w/ the omega-not factored

```
->From location 7.81 ft to 9.13 ft

->Distributed load from wall cladding loads, w = 108.0 lb/ft

->      Weight of wall = 12.00 psf x Height = 9.00 ft = 108.00 lb/ft

      Point load 5 from shear wall overturning

            P-WIND_POS = 2920.5 lb @ loc = 3.60 ft

            P-SEISMIC_POS = 7264.6 lb @ loc = 3.60 ft

                  E (SEISMIC) = OMEGA X QE ***  = 0.7 x 3.00 X 7265 lb = 15256 lb

            P-WIND_NEG = -2920.5 lb @ loc = 3.60 ft

            P-SEISMIC_NEG = -7264.6 lb @ loc = 3.60 ft

                  E (SEISMIC) = OMEGA X QE ***  = 0.7 x 3.00 X -7265 lb = -15256 lb

      Point load 6 from shear wall overturning

            P-WIND_POS = -2701.9 lb @ loc = 7.35 ft

            P-SEISMIC_POS = -6472.5 lb @ loc = 7.35 ft

                  E (SEISMIC) = OMEGA X QE ***  = 0.7 x 3.00 X -6472 lb = -13592 lb

            P-WIND_NEG = 2701.9 lb @ loc = 7.35 ft

            P-SEISMIC_NEG = 6472.5 lb @ loc = 7.35 ft

                  E (SEISMIC) = OMEGA X QE ***  = 0.7 x 3.00 X 6472 lb = 13592 lb
->Computed moments and shears (Factored) :

      Max shear  =       6619 lbs    0.6D - 0.7E (2.4-8b)

      Min shear  =      -6991 lbs       D + 0.7E (2.4-5c)

      Max moment =      18738 ft-lbs    D + 0.7E (2.4-5c)

      Min moment =     -16632 ft-lbs 0.6D - 0.7E (2.4-8b)
```

Controlling factored loads. In this example only cladding and wall dead loads are acting on this beam.