LEIGH & O'KANE L.L.C. – STRUCTURAL CALCULATIONS FOR

Lee's Summit Fire Station 5

801 MO Highway 150, Lee's Summit, MO 64062



Jordan Bennett, P.E.
10-26-2022

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Revision:	Date:	Sheet No. i
Project Name: FIRE STATION 5		

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GENERAL DESIGN CONSIDERATIONS

Design a category IV structure to resist the vertical and lateral loads set forth by the governing IBC and ASCE. The main supporting structure is steel frame with moment frames for lateral support. Structure is supported by shallow concrete foundations.

Storm Shelter: Design a storm shelter to resist the loading set forth in the Governing IBC/ICC-500 2020. Structure is to be considered completely independent from the main supporting structure. For this specific structure, we have load bearing & non load bearing masonry on top of the storm shelter. Calculations have been provided to prove that the masonry walls will fail and the cast in place connection will remain in the event of a severe storm.

Loading

Non Storm Shelter

Roof:

- Dead:30 PSF
- Live Roof: 20 PSF
- Snow: 24 PSF

Floor Loads:

- Dead: 55 PSF
- Live: 100 PSF

Storm Shelter

- Dead: Self
- Live Roof: 170 PSF (35 PSF for roof dead *2 for fall down/ debris loading.)
- Wind
    - V:250 MPH
    - GCPi: +/- 0.55

REFERENCED DESIGN STANDARDS

- Structure located in Lee's Summit, Missouri. Current Lee's Summit building code IBC 2018.
- ICC 500 2020
- ASCE 7-16 Minimum Design Loads Assocaited Criteria for Buildings and Other Structures
- AISC 360-16 Specification for Structural Steel Buidlings
- ACI 318-14 Building Code Requirements for Structural Concrete
- TMS 406-16 Building Code for Masonry Structures

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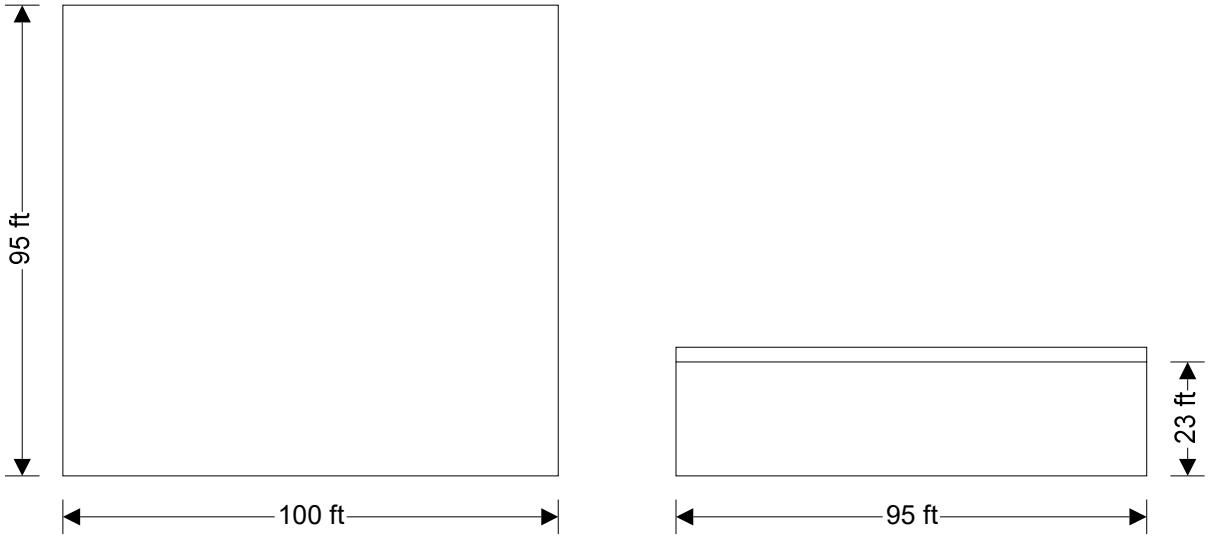
WIND LOADING (ASCE7)

WIND LOADING

In accordance with ASCE7-16

Using the directional design method

Tedds calculation version 2.1.10



Building data

Type of roof	Flat
Length of building	b = **100.00** ft
Width of building	d = **95.00** ft
Height to eaves	H = **23.00** ft
Height of parapet	h_p = **3.00** ft
Mean height	h = **23.00** ft

General wind load requirements

Basic wind speed	V = **122.0** mph
Risk category	IV
Velocity pressure exponent coef (Table 26.6-1)	K_d = **0.85**
Ground elevation above sea level	z_{gl} = **0** ft
Ground elevation factor	$K_e = \exp(-0.0000362 \times z_{gl}/1ft)$ = **1.00**
Exposure category (cl 26.7.3)	B
Enclosure classification (cl.26.12)	Enclosed buildings
Internal pressure coef +ve (Table 26.13-1)	GC_{pi_p} = **0.18**
Internal pressure coef –ve (Table 26.13-1)	GC_{pi_n} = **-0.18**
Gust effect factor	G_f = **0.85**
Minimum design wind loading (cl.27.4.7)	p_{min_r} = **8** lb/ft^2

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Topography

Topography factor not significant — $K_{zt} = 1.0$

Velocity pressure equation — $q = 0.00256 \times K_z \times K_{zt} \times K_d \times V^2 \times 1psf/mph^2$

Velocity pressures table

z (ft)	K_z (Table 26.10-1)	q_z (psf)
15.00	0.57	18.46
15.00	0.57	18.46
23.00	0.64	20.86
26.00	0.67	21.63

Peak velocity pressure for internal pressure

Peak velocity pressure – internal (as roof press.) — q_i = **20.86** psf

Parapet pressures and forces

Velocity pressure at top of parapet — q_p = **21.63** psf

Combined net pressure coefficient, leeward — GC_{pnl} = **-1.0**

Combined net parapet pressure, leeward — $p_{pl} = q_p \times GC_{pnl}$ = **-21.63** psf

Combined net pressure coefficient, windward — GC_{pnw} = **1.5**

Combined net parapet pressure, windward — $p_{pw} = q_p \times GC_{pnw}$ = **32.45** psf

Wind direction 0 deg:

Leeward parapet force — $F_{w,wpl\_0} = p_{pl} \times h_p \times b$ = **-6.5** kips

Windward parapet force — $F_{w,wpw\_0} = p_{pw} \times h_p \times b$ = **9.7** kips

Wind direction 90 deg:

Leeward parapet force — $F_{w,wpl\_90} = p_{pl} \times h_p \times d$ = **-6.2** kips

Windward parapet force — $F_{w,wpw\_90} = p_{pw} \times h_p \times d$ = **9.2** kips

Pressures and forces

Net pressure — $p = q \times G_f \times C_{pe} - q_i \times GC_{pi}$

Net force — $F_w = p \times A_{ref}$

Roof load case 1 - Wind 0, GC_{pi} 0.18, $-c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A (-ve)	23.00	-0.90	20.86	-19.71	1150.00	-22.67
B (-ve)	23.00	-0.90	20.86	-19.71	1150.00	-22.67
C (-ve)	23.00	-0.50	20.86	-12.62	2300.00	-29.02
D (-ve)	23.00	-0.30	20.86	-9.07	4900.00	-44.46

Total vertical net force — $F_{w,v}$ = **-118.82** kips

Total horizontal net force — $F_{w,h}$ = **0.00** kips

Walls load case 1 - Wind 0, GC_{pi} 0.18, $-c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A_1	15.00	0.80	18.46	8.80	1500.00	13.20

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Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A_2	15.00	0.80	18.46	8.80	0.00	0.00
A_3	23.00	0.80	20.86	10.43	800.00	8.34
B	23.00	-0.50	20.86	-12.62	2300.00	-29.02
C	23.00	-0.70	20.86	-16.16	2185.00	-35.32
D	23.00	-0.70	20.86	-16.16	2185.00	-35.32

Overall loading

Projected vertical plan area of wall $A_{vert\_w\_0} = b \times (H + h_p) =$ **2600.00** ft^2

Projected vertical area of roof $A_{vert\_r\_0} =$ **0.00** ft^2

Minimum overall horizontal loading $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_0} + p_{min\_r} \times A_{vert\_r\_0} =$ **41.60** kips

Leeward net force $F_l = F_{w,wB} + F_{w,wpl\_0} =$ **-35.5** kips

Windward net force $F_w = F_{w,wA\_1} + F_{w,wA\_2} + F_{w,wA\_3} + F_{w,wpw\_0} =$ **31.3** kips

Overall horizontal loading $F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total\_min}) =$ **66.8** kips

Roof load case 2 - Wind 0, GC_{pi} -0.18, -0c_{pe}

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A (+ve)	23.00	-0.18	20.86	0.56	1150.00	0.65
B (+ve)	23.00	-0.18	20.86	0.56	1150.00	0.65
C (+ve)	23.00	-0.18	20.86	0.56	2300.00	1.30
D (+ve)	23.00	-0.18	20.86	0.56	4900.00	2.76

Total vertical net force $F_{w,v} =$ **5.35** kips

Total horizontal net force $F_{w,h} =$ **0.00** kips

Walls load case 2 - Wind 0, GC_{pi} -0.18, -0c_{pe}

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A_1	15.00	0.80	18.46	16.31	1500.00	24.46
A_2	15.00	0.80	18.46	16.31	0.00	0.00
A_3	23.00	0.80	20.86	17.94	800.00	14.35
B	23.00	-0.50	20.86	-5.11	2300.00	-11.75
C	23.00	-0.70	20.86	-8.66	2185.00	-18.91
D	23.00	-0.70	20.86	-8.66	2185.00	-18.91

Overall loading

Projected vertical plan area of wall $A_{vert\_w\_0} = b \times (H + h_p) =$ **2600.00** ft^2

Projected vertical area of roof $A_{vert\_r\_0} =$ **0.00** ft^2

Minimum overall horizontal loading $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_0} + p_{min\_r} \times A_{vert\_r\_0} =$ **41.60** kips

Leeward net force $F_l = F_{w,wB} + F_{w,wpl\_0} =$ **-18.2** kips

Windward net force $F_w = F_{w,wA\_1} + F_{w,wA\_2} + F_{w,wA\_3} + F_{w,wpw\_0} =$ **48.5** kips

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Overall horizontal loading — $F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total\_min}) =$ **66.8** kips

Roof load case 3 - Wind 90, GC_{pi} 0.18, $-c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A (-ve)	23.00	-0.90	20.86	-19.71	1092.50	-21.53
B (-ve)	23.00	-0.90	20.86	-19.71	1092.50	-21.53
C (-ve)	23.00	-0.50	20.86	-12.62	2185.00	-27.57
D (-ve)	23.00	-0.30	20.86	-9.07	5130.00	-46.54

Total vertical net force — $F_{w,v} =$ **-117.18** kips

Total horizontal net force — $F_{w,h} =$ **0.00** kips

Walls load case 3 - Wind 90, GC_{pi} 0.18, $-c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A_1	15.00	0.80	18.46	8.80	1425.00	12.54
A_2	15.00	0.80	18.46	8.80	0.00	0.00
A_3	23.00	0.80	20.86	10.43	760.00	7.93
B	23.00	-0.49	20.86	-12.43	2185.00	-27.16
C	23.00	-0.70	20.86	-16.16	2300.00	-37.18
D	23.00	-0.70	20.86	-16.16	2300.00	-37.18

Overall loading

Projected vertical plan area of wall — $A_{vert\_w\_90} = d \times (H + h_p) =$ **2470.00** ft^2

Projected vertical area of roof — $A_{vert\_r\_90} =$ **0.00** ft^2

Minimum overall horizontal loading — $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_90} + p_{min\_r} \times A_{vert\_r\_90} =$ **39.52** kips

Leeward net force — $F_l = F_{w,wB} + F_{w,wpl\_90} =$ **-33.3** kips

Windward net force — $F_w = F_{w,wA\_1} + F_{w,wA\_2} + F_{w,wA\_3} + F_{w,wpw\_90} =$ **29.7** kips

Overall horizontal loading — $F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total\_min}) =$ **63.0** kips

Roof load case 4 - Wind 90, GC_{pi} -0.18, $+c_{pe}$

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A (+ve)	23.00	-0.18	20.86	0.56	1092.50	0.62
B (+ve)	23.00	-0.18	20.86	0.56	1092.50	0.62
C (+ve)	23.00	-0.18	20.86	0.56	2185.00	1.23
D (+ve)	23.00	-0.18	20.86	0.56	5130.00	2.89

Total vertical net force — $F_{w,v} =$ **5.35** kips

Total horizontal net force — $F_{w,h} =$ **0.00** kips

Walls load case 4 - Wind 90, GC_{pi} -0.18, $+c_{pe}$

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Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A_1	15.00	0.80	18.46	16.31	1425.00	23.24
A_2	15.00	0.80	18.46	16.31	0.00	0.00
A_3	23.00	0.80	20.86	17.94	760.00	13.63
B	23.00	-0.49	20.86	-4.92	2185.00	-10.76
C	23.00	-0.70	20.86	-8.66	2300.00	-19.91
D	23.00	-0.70	20.86	-8.66	2300.00	-19.91

Overall loading

Projected vertical plan area of wall — $A_{vert\_w\_90} = d \times (H + h_p) =$ **2470.00** ft^2

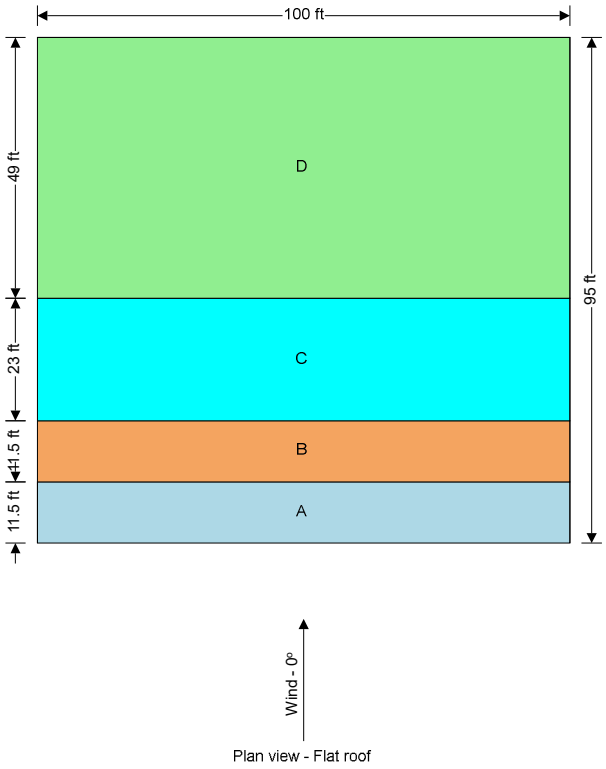
Projected vertical area of roof — $A_{vert\_r\_90} =$ **0.00** ft^2

Minimum overall horizontal loading — $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_90} + p_{min\_r} \times A_{vert\_r\_90} =$ **39.52** kips

Leeward net force — $F_l = F_{w,wB} + F_{w,wpl\_90} =$ **-16.9** kips

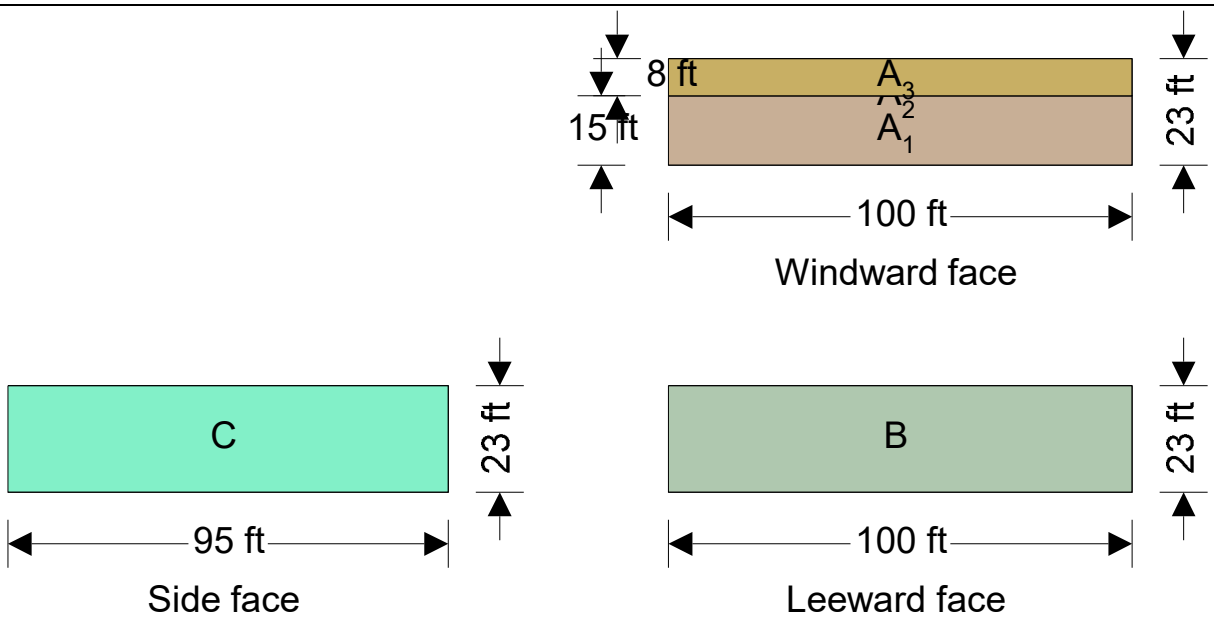
Windward net force — $F_w = F_{w,wA\_1} + F_{w,wA\_2} + F_{w,wA\_3} + F_{w,wpw\_90} =$ **46.1** kips

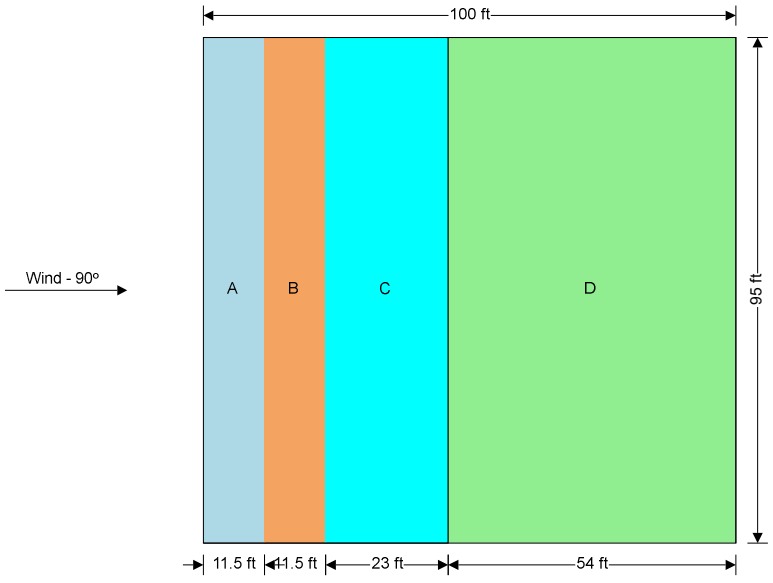
Overall horizontal loading — $F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total\_min}) =$ **63.0** kips



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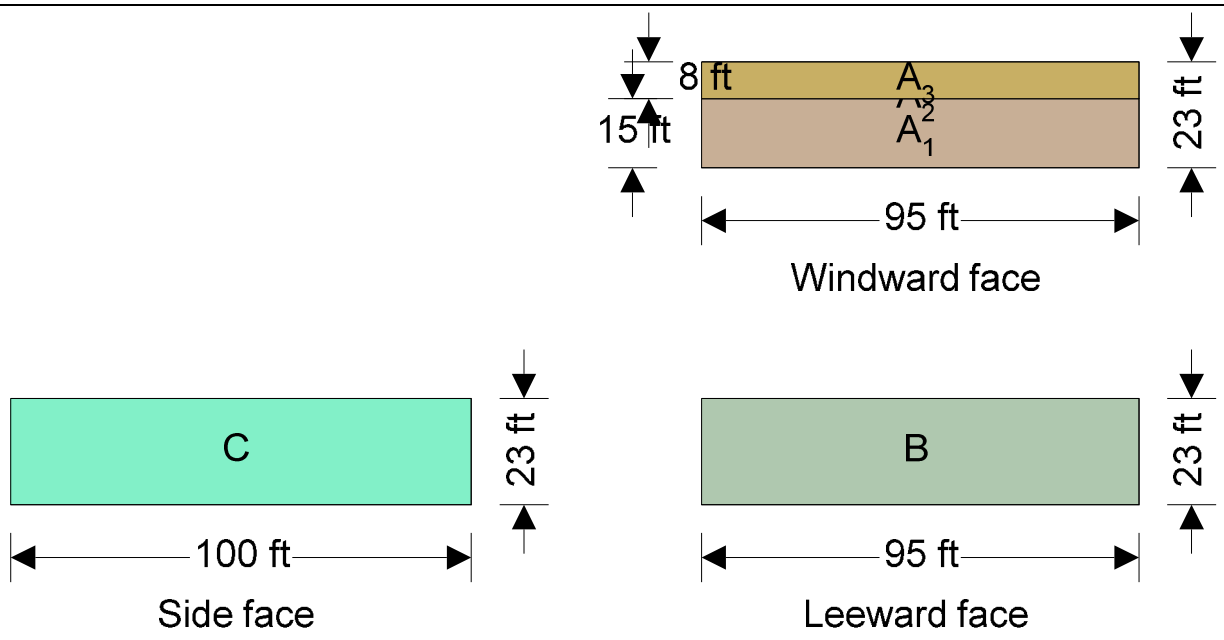




Plan view - Flat roof

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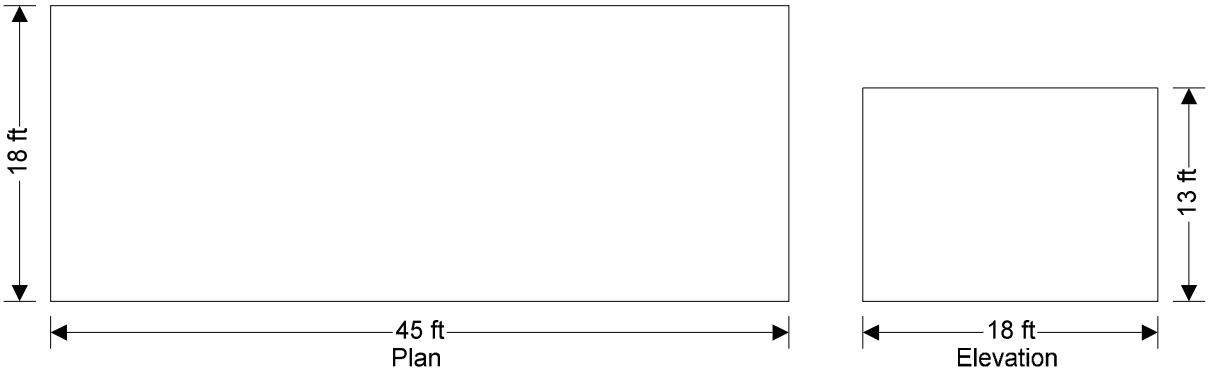
STORM SHELTER WIND

WIND LOADING

In accordance with ASCE7-16

Using the directional design method

Tedds calculation version 2.1.10



Building data

Type of roof	Flat
Length of building	b = **45.00** ft
Width of building	d = **18.00** ft
Height to eaves	H = **13.00** ft
Mean height	h = **13.00** ft

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General wind load requirements

Basic wind speed	V = **250.0** mph
Risk category	IV
Velocity pressure exponent coef (Table 26.6-1)	K_d = **0.85**
Ground elevation above sea level	z_{gl} = **0** ft
Ground elevation factor	$K_e = \exp(-0.0000362 \times z_{gl}/1ft)$ = **1.00**
Exposure category (cl 26.7.3)	C
Enclosure classification (cl.26.12)	Enclosed buildings
Internal pressure coef +ve (Table 26.13-1)	GC_{pi_p} = **0.18**
Internal pressure coef –ve (Table 26.13-1)	GC_{pi_n} = **-0.18**
Gust effect factor	G_f = **0.85**
Minimum design wind loading (cl.27.4.7)	p_{min_r} = **8** lb/ft^2

Topography

Topography factor not significant	K_{zt} = 1.0
Velocity pressure equation	$q = 0.00256 \times K_z \times K_{zt} \times K_d \times V^2 \times 1psf/mph^2$

Velocity pressures table

z (ft)	K_z (Table 26.10-1)	q_z (psf)
13.00	0.85	115.60

Peak velocity pressure for internal pressure

Peak velocity pressure – internal (as roof press.) q_i = **115.60** psf

Pressures and forces

Net pressure $p = q \times G_f \times C_{pe} - q_i \times GC_{pi}$

Net force $F_w = p \times A_{ref}$

Roof load case 1 - Wind 0, GC_{pi} 0.55, - c_{pe}

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A (-ve)	13.00	-1.02	115.60	-163.48	292.50	-47.82
B (-ve)	13.00	-0.81	115.60	-143.28	292.50	-41.91
C (-ve)	13.00	-0.59	115.60	-121.44	225.00	-27.32

Total vertical net force $F_{w,v}$ = **-117.05** kips

Total horizontal net force $F_{w,h}$ = **0.00** kips

Walls load case 1 - Wind 0, GC_{pi} 0.55, - c_{pe}

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A	13.00	0.80	115.60	15.03	585.00	8.79
B	13.00	-0.50	115.60	-112.71	585.00	-65.94
C	13.00	-0.70	115.60	-132.36	234.00	-30.97
D	13.00	-0.70	115.60	-132.36	234.00	-30.97

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Overall loading

Projected vertical plan area of wall $A_{vert\_w\_0} = b \times H =$ **585.00** ft^2

Projected vertical area of roof $A_{vert\_r\_0} =$ **0.00** ft^2

Minimum overall horizontal loading $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_0} + p_{min\_r} \times A_{vert\_r\_0} =$ **9.36** kips

Leeward net force $F_l = F_{w,wB} =$ **-65.9** kips

Windward net force $F_w = F_{w,wA} =$ **8.8** kips

Overall horizontal loading $F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total\_min}) =$ **74.7** kips

Roof load case 2 - Wind 0, GC_{pi} -0.55, + c_{pe}

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A (+ve)	13.00	-0.18	115.60	45.89	292.50	13.42
B (+ve)	13.00	-0.18	115.60	45.89	292.50	13.42
C (+ve)	13.00	-0.18	115.60	45.89	225.00	10.33

Total vertical net force $F_{w,v} =$ **37.17** kips

Total horizontal net force $F_{w,h} =$ **0.00** kips

Walls load case 2 - Wind 0, GC_{pi} -0.55, + c_{pe}

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A	13.00	0.80	115.60	142.19	585.00	83.18
B	13.00	-0.50	115.60	14.45	585.00	8.45
C	13.00	-0.70	115.60	-5.20	234.00	-1.22
D	13.00	-0.70	115.60	-5.20	234.00	-1.22

Overall loading

Projected vertical plan area of wall $A_{vert\_w\_0} = b \times H =$ **585.00** ft^2

Projected vertical area of roof $A_{vert\_r\_0} =$ **0.00** ft^2

Minimum overall horizontal loading $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_0} + p_{min\_r} \times A_{vert\_r\_0} =$ **9.36** kips

Leeward net force $F_l = F_{w,wB} =$ **8.5** kips

Windward net force $F_w = F_{w,wA} =$ **83.2** kips

Overall horizontal loading $F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total\_min}) =$ **74.7** kips

Roof load case 3 - Wind 90, GC_{pi} 0.55, - c_{pe}

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A (-ve)	13.00	-0.90	115.60	-152.01	117.00	-17.79
B (-ve)	13.00	-0.90	115.60	-152.01	117.00	-17.79
C (-ve)	13.00	-0.50	115.60	-112.71	234.00	-26.37
D (-ve)	13.00	-0.30	115.60	-93.06	342.00	-31.83

Total vertical net force $F_{w,v} =$ **-93.77** kips

Total horizontal net force $F_{w,h} =$ **0.00** kips

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Walls load case 3 - Wind 90, GC_{pi} 0.55, - c_{pe}

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A	13.00	0.80	115.60	15.03	234.00	3.52
B	13.00	-0.28	115.60	-90.60	234.00	-21.20
C	13.00	-0.70	115.60	-132.36	585.00	-77.43
D	13.00	-0.70	115.60	-132.36	585.00	-77.43

Overall loading

Projected vertical plan area of wall — $A_{vert\_w\_90} = d \times H =$ **234.00** ft^2

Projected vertical area of roof — $A_{vert\_r\_90} =$ **0.00** ft^2

Minimum overall horizontal loading — $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_90} + p_{min\_r} \times A_{vert\_r\_90} =$ **3.74** kips

Leeward net force — $F_l = F_{w,wB} =$ **-21.2** kips

Windward net force — $F_w = F_{w,wA} =$ **3.5** kips

Overall horizontal loading — $F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total\_min}) =$ **24.7** kips

Roof load case 4 - Wind 90, GC_{pi} -0.55, + c_{pe}

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A (+ve)	13.00	-0.18	115.60	45.89	117.00	5.37
B (+ve)	13.00	-0.18	115.60	45.89	117.00	5.37
C (+ve)	13.00	-0.18	115.60	45.89	234.00	10.74
D (+ve)	13.00	-0.18	115.60	45.89	342.00	15.70

Total vertical net force — $F_{w,v} =$ **37.17** kips

Total horizontal net force — $F_{w,h} =$ **0.00** kips

Walls load case 4 - Wind 90, GC_{pi} -0.55, + c_{pe}

Zone	Ref. height (ft)	Ext pressure coefficient c_{pe}	Peak velocity pressure q_p (psf)	Net pressure p (psf)	Area A_{ref} (ft^2)	Net force F_w (kips)
A	13.00	0.80	115.60	142.19	234.00	33.27
B	13.00	-0.28	115.60	36.56	234.00	8.55
C	13.00	-0.70	115.60	-5.20	585.00	-3.04
D	13.00	-0.70	115.60	-5.20	585.00	-3.04

Overall loading

Projected vertical plan area of wall — $A_{vert\_w\_90} = d \times H =$ **234.00** ft^2

Projected vertical area of roof — $A_{vert\_r\_90} =$ **0.00** ft^2

Minimum overall horizontal loading — $F_{w,total\_min} = p_{min\_w} \times A_{vert\_w\_90} + p_{min\_r} \times A_{vert\_r\_90} =$ **3.74** kips

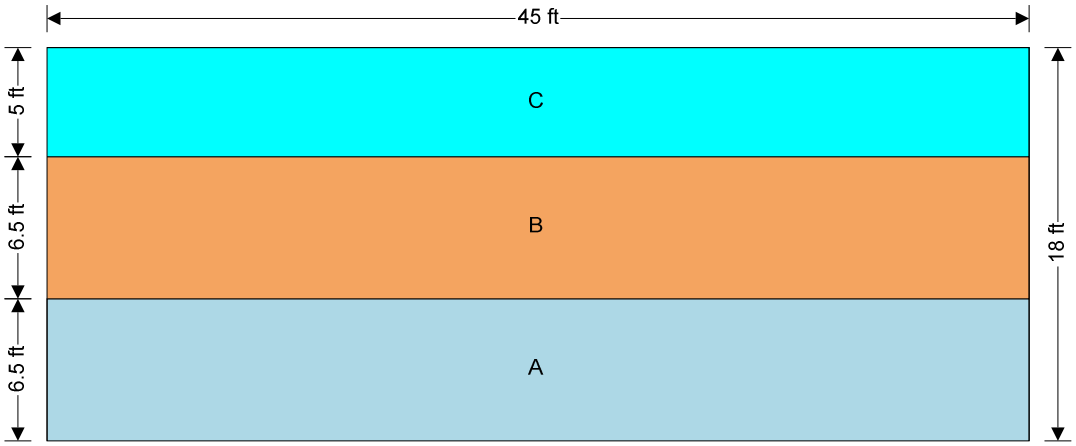
Leeward net force — $F_l = F_{w,wB} =$ **8.6** kips

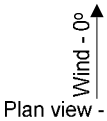
Windward net force — $F_w = F_{w,wA} =$ **33.3** kips

Overall horizontal loading — $F_{w,total} = \max(F_w - F_l + F_{w,h}, F_{w,total\_min}) =$ **24.7** kips

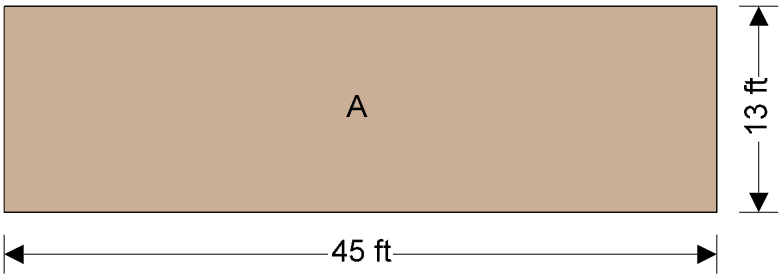
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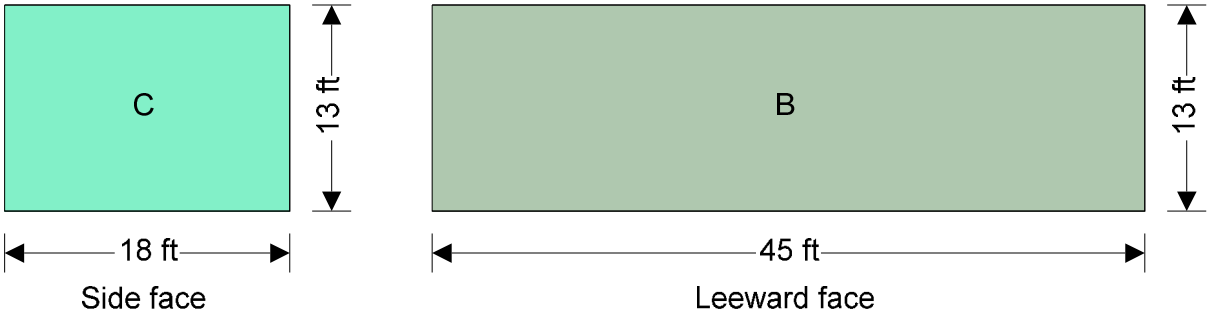




Plan view - Flat roof



Windward face

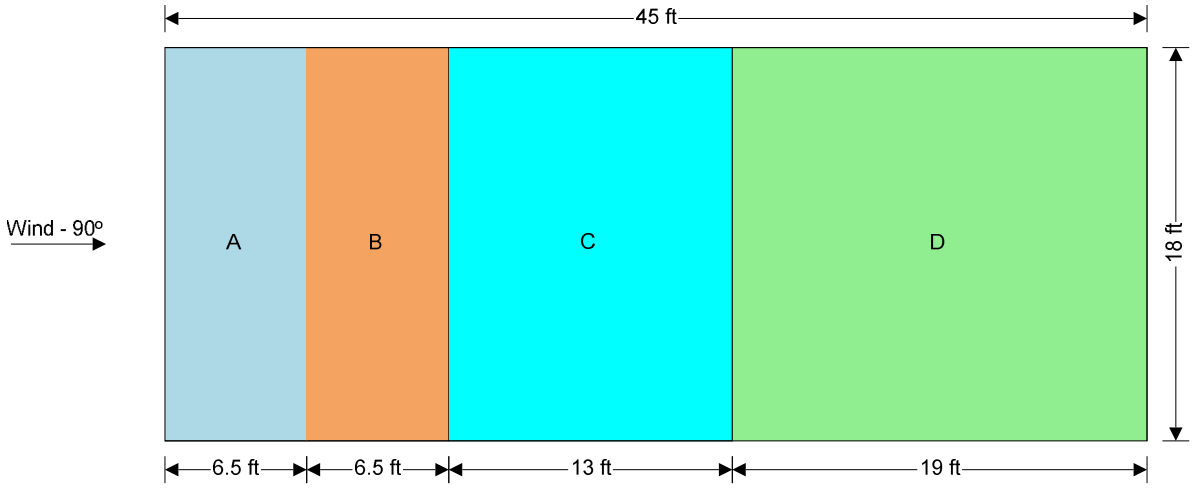


Side face

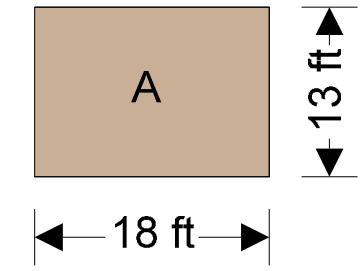
Leeward face

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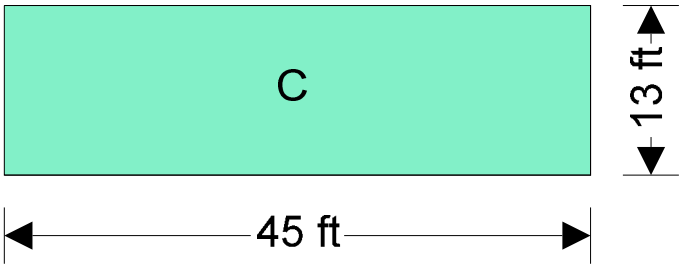
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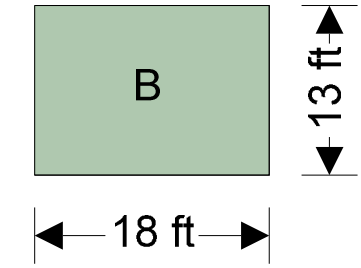
Plan view - Flat roof



Windward face



Side face



Leeward face

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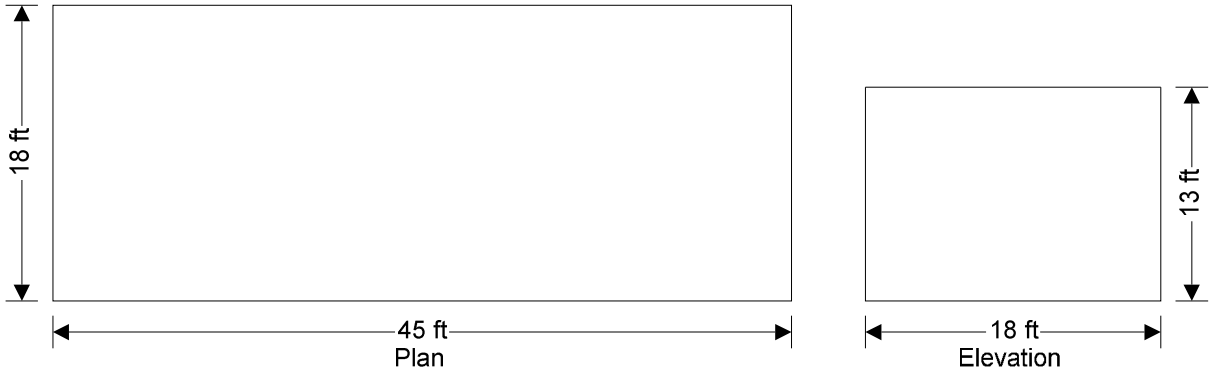
STORM SHELTER WIND COMPONENTS AND CLADDING

WIND LOADING

In accordance with ASCE7-16

Using the components and cladding design method

Tedds calculation version 2.1.10



Building data

Type of roof	Flat
Length of building	b = **45.00** ft
Width of building	d = **18.00** ft
Height to eaves	H = **13.00** ft
Mean height	h = **13.00** ft

General wind load requirements

Basic wind speed	V = **250.0** mph
Risk category	IV
Velocity pressure exponent coef (Table 26.6-1)	K_d = **1.00**
Ground elevation above sea level	z_{gl} = **0** ft
Ground elevation factor	$K_e = \exp(-0.0000362 \times z_{gl}/1ft)$ = **1.00**
Exposure category (cl 26.7.3)	C
Enclosure classification (cl.26.12)	Enclosed buildings
Internal pressure coef +ve (Table 26.13-1)	GC_{pi_p} = **0.18**
Internal pressure coef –ve (Table 26.13-1)	GC_{pi_n} = **-0.18**
Gust effect factor	G_f = **0.85**

Topography

Topography factor not significant	K_{zt} = 1.0

Velocity pressure

Velocity pressure coefficient (Table 26.10-1)	K_z = **0.85**
Velocity pressure	$q_h = 0.00256 \times K_z \times K_{zt} \times K_d \times K_e \times V^2 \times 1psf/mph^2$ = **136.0** psf

Peak velocity pressure for internal pressure

Peak velocity pressure – internal (as roof press.)	q_i = **136.00** psf

Equations used in tables

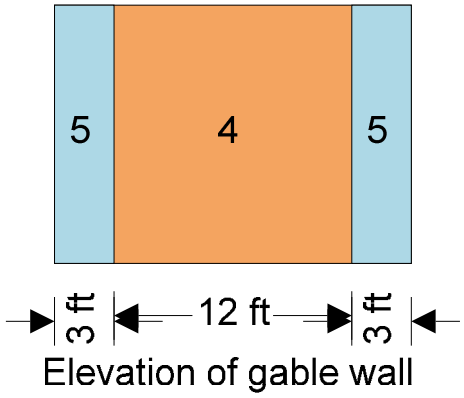
Net pressure	$p = q_h \times [GC_p - GC_{pi}]$

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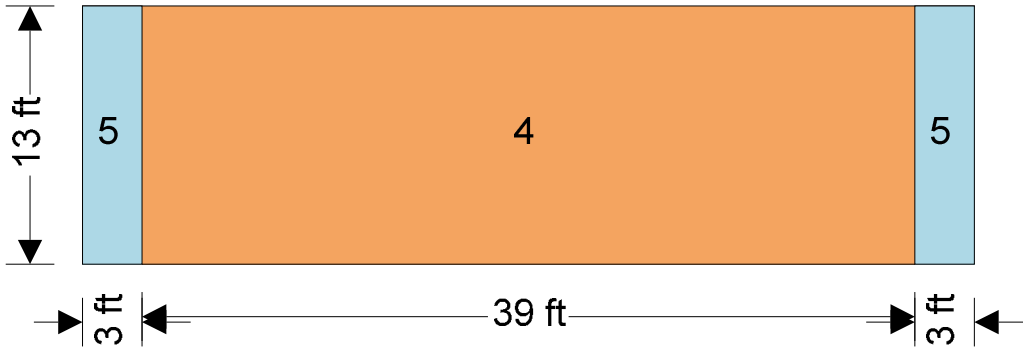
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Components and cladding pressures - Wall (Table 30.3-1)

Component	Zone	Length (ft)	Width (ft)	Eff. area (ft^2)	$+GC_p$	$-GC_p$	Pres (+ve) (psf)	Pres (-ve) (psf)
<=10 sf	4	-	-	10.0	0.90	-0.99	146.9	-159.1
50 sf	4	-	-	50.0	0.79	-0.88	131.8	-144.0
200 sf	4	-	-	200.0	0.69	-0.78	118.8	-131.0
>500 sf	4	-	-	500.1	0.63	-0.72	110.2	-122.4
<=10 sf	5	-	-	10.0	0.90	-1.26	146.9	-195.8
50 sf	5	-	-	50.0	0.79	-1.04	131.8	-165.6
200 sf	5	-	-	200.0	0.69	-0.85	118.8	-139.6
>500 sf	5	-	-	500.1	0.63	-0.72	110.2	-122.4



Elevation of gable wall



Elevation of side wall

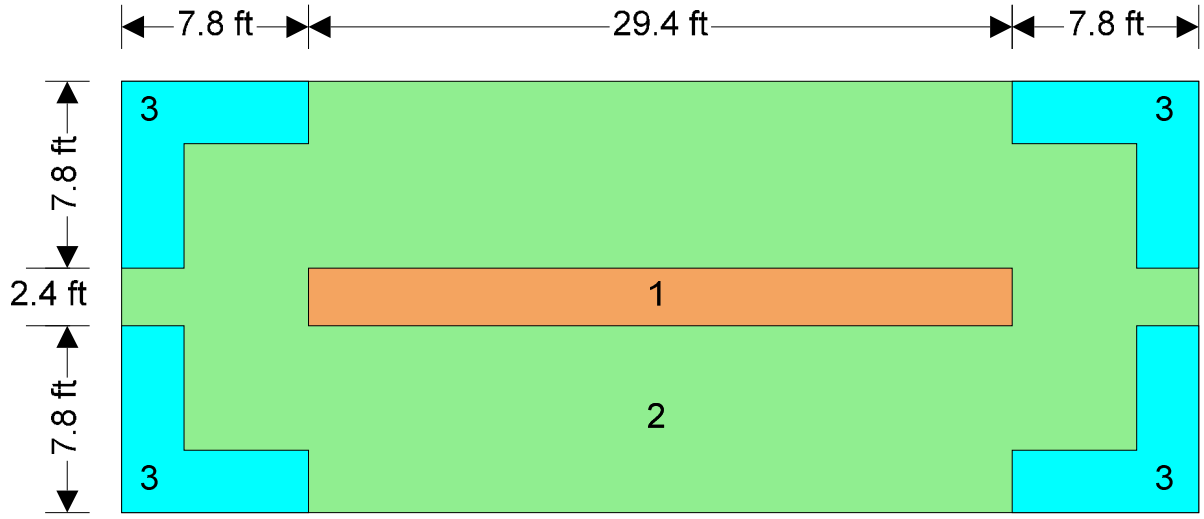
Components and cladding pressures - Roof (Figure 30.3-2A)

Component	Zone	Length (ft)	Width (ft)	Eff. area (ft^2)	$+GC_p$	$-GC_p$	Pres (+ve) (psf)	Pres (-ve) (psf)
<=10 sf	1	-	-	10.0	0.30	-1.70	65.3	-255.7
100 sf	1	-	-	100.0	0.20	-1.29	51.7	-199.6
200 sf	1	-	-	200.0	0.20	-1.16	51.7	-182.8
>500 sf	1	-	-	500.1	0.20	-1.00	51.7	-160.5

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Component	Zone	Length (ft)	Width (ft)	Eff. area (ft^2)	$+GC_p$	$-GC_p$	Pres (+ve) (psf)	Pres (-ve) (psf)
<=10 sf	2	-	-	10.0	0.30	-2.30	65.3	-337.3
100 sf	2	-	-	100.0	0.20	-1.77	51.7	-265.2
200 sf	2	-	-	200.0	0.20	-1.61	51.7	-243.5
>500 sf	2	-	-	500.1	0.20	-1.40	51.7	-214.9
<=10 sf	3	-	-	10.0	0.30	-3.20	65.3	-459.7
100 sf	3	-	-	100.0	0.20	-2.14	51.7	-315.6
200 sf	3	-	-	200.0	0.20	-1.82	51.7	-272.2
>500 sf	3	-	-	500.1	0.20	-1.40	51.7	-214.9



Plan on roof

STORM SHELTER WALL DESIGN

MASONRY WALL PANEL DESIGN (TMS 402/602-16)

In accordance with strength design method

Tedds calculation version 2.2.09

Masonry wall panel details

Reinforced single-wythe wall, the wall is pinned at the top and at the bottom for out of plane loads

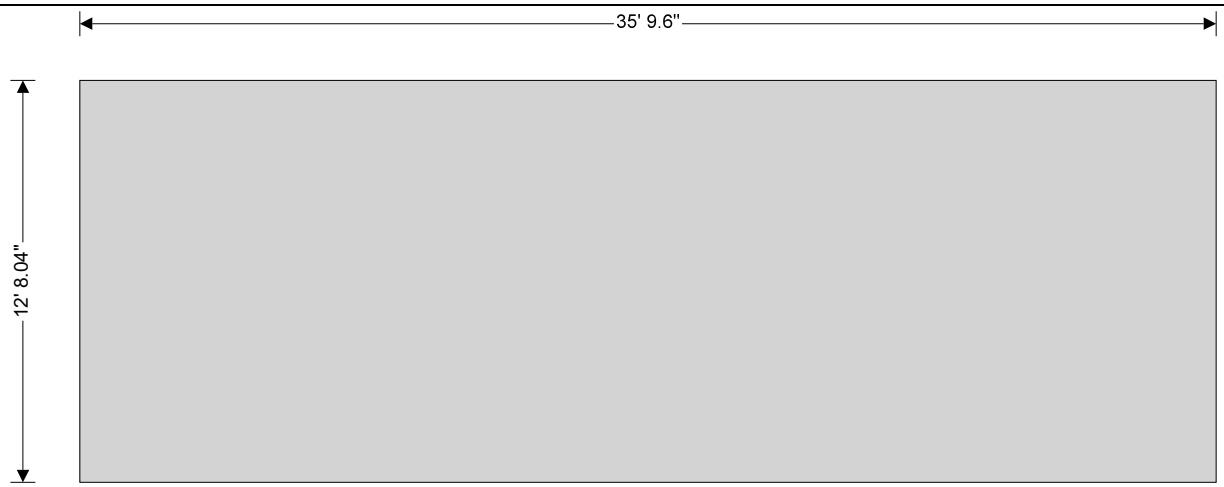
The wall is fixed at the bottom and free at the top for in plane loads

Panel length L = **35.8** ft

Panel height h = **12.67** ft

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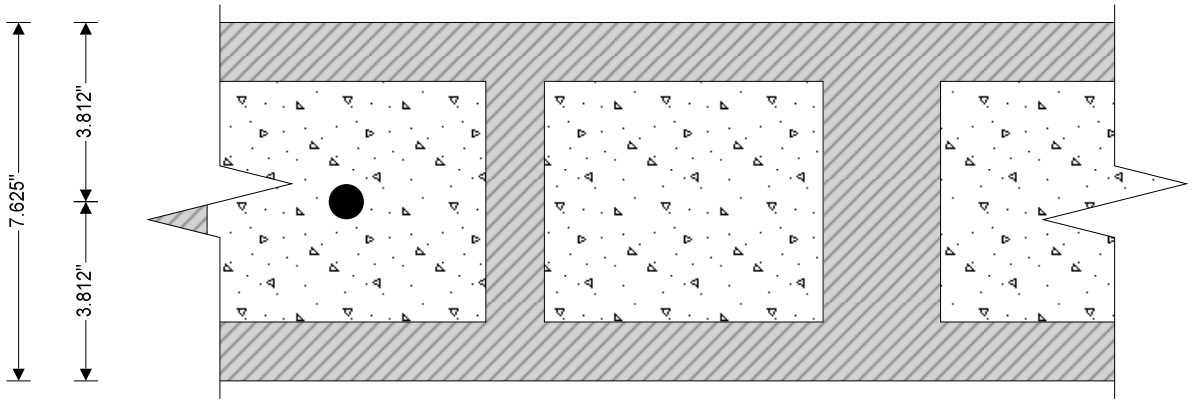


Seismic properties

Seismic design category	C
Seismic importance factor (ASCE7 Table 1.5-2)	I_e = **1.5**
Design spectral response acceleration parameter, short periods (IBC 1613.2.4 or ASCE7 11.4.5)	
	S_{DS} = **0.106**
Seismic wall classification	Nonparticipating
Redundancy factor, on out-of-plane load	ρ_E = **1.0**

Construction details

Wall thickness t = **7.625** in



Masonry details

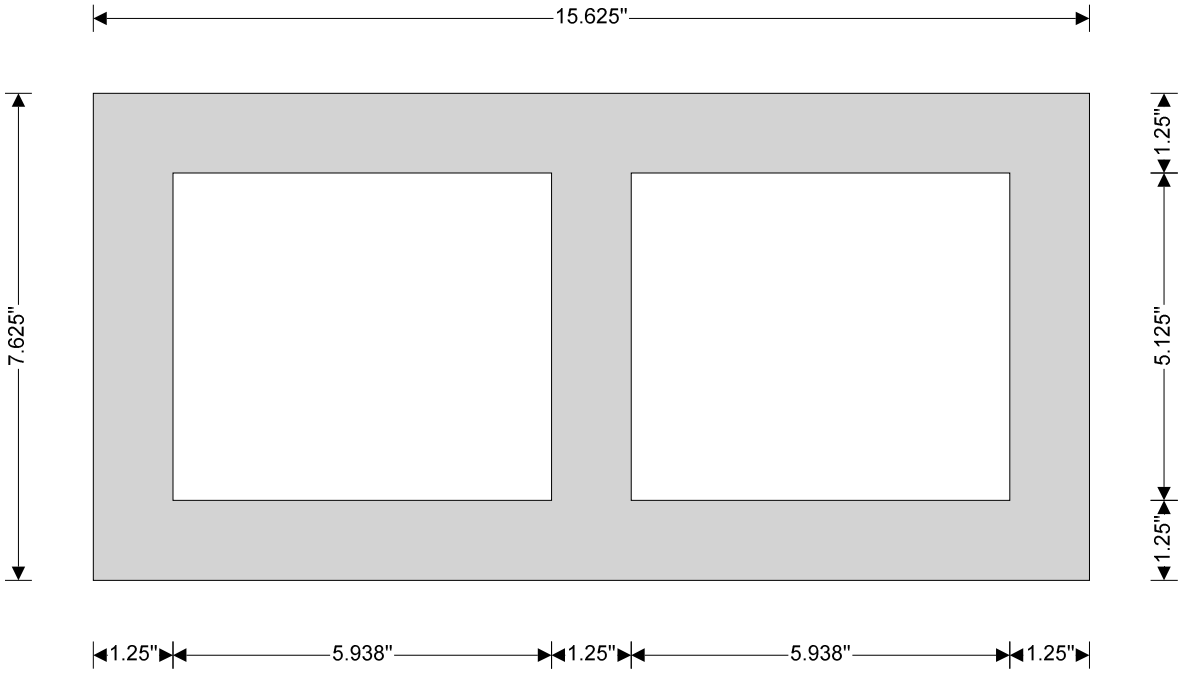
Hollow concrete units fully grouted in running bond fully bedded with PCL class M mortar

Compressive strength of unit	f'_{cu} = **1900** psi
Density of masonry units	γ_{block} = **135** lb/ft^3
Height of masonry units	h_b = **7.625** in
Length of masonry units	l_b = **15.625** in
Number of internal webs	N_{web} = **1**
Number of end webs	N_{end} = **2**
Internal web thickness	t_{bw} = **1.25** in

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Face shell thickness	t_{bf} = **1.25** in
End web thickness	t_{be} = **1.25** in
Area of block	$A_{block} = [t \times l_b - (l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})] / l_b$ = **44.76** in^2/ft
Area of grout	$A_{grout} = [(l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})] / l_b$ = **46.74** in^2/ft
Density of grout	γ_{grout} = **140** lb/ft^3
Self weight of wall	$w_{SW} = A_{block} \times \gamma_{block} + A_{grout} \times \gamma_{grout}$ = **87.4** psf



From TMS 602-16 Table 2 - Compressive strength of masonry

Net compressive strength of masonry	f'_m = **1900** psi
Modulus of elasticity for masonry	$E_m = 900 \times f'_m$ = **1710000** psi
Shear modulus of masonry	$G_v = 0.4 \times E_m$ = **684000** psi

From TMS 402 -16 Table 9.1.9.2 - Modulus of rupture

Modulus of rupture normal to bed	f_{r_norm} = **163** psi
Modulus of rupture parallel to bed	f_{r_para} = **267** psi

Reinforcement details

Yield strength of reinforcement	f_y = **60000** psi
Allowable tensile stress in reinforcement	F_s = **32000** psi
Modulus of elasticity for reinforcement	E_s = **29000000** psi
Vertical reinforcement provided	No.6 bars at 24 in centers
Area of vertical reinforcement	$A_s = \pi \times Dia^2 / (4 \times s)$ = **0.22** in^2/ft

Seismic reinforcement requirements

Minimum vertical reinf., seismic (Ch. 7)	No. 4 bars at 120 in

PASS - Vertical distributed reinforcement meets minimum seismic requirements

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Lateral out-of-plane loads

Wind load on panel	W = **128** psf
Wind load on parapet	W_p = **18** psf
Seismic load factor (ASCE7 12.11.1)	$F_p = 0.4 \times S_{DS} \times I_e$ = **0.064**
Seismic load from wall	$E_{wall} = \max(F_p, 0.1) \times w_{SW}$ = **8.7** psf
Additional seimic load	E_{add} = **0** psf
Seismic lateral load on panel	$E = E_{wall} + E_{add}$ = **8.7** psf

Lateral in-plane loads

Wind shear load on wall	V_W = **7700** lbs
Wind moment load on wall	M_W = **97559** lbs_ft

Vertical loading details

Dead load from above	DL_{above} = **900** lb/ft
Live load from above	LL_{above} = **1000** lb/ft
Live roof load at supported level	LL_r = **1000** lb/ft
Vertical seismic load factor applied to dead load	$F_{Ev} = 0.2 \times S_{DS}$ = **0.021**

From IBC 2018 cl.1605.2 - Basic load combinations (Utilization)

Load combination no.1	$1.4 \times DL$ (0.037)
Load combination no.2	$1.2 \times DL + 1.6 \times LL + 0.5 \times (LL_r$ or SL or RL) (0.060)
Load combination no.3	$1.2 \times DL + LL + 1.6 \times (LL_r$ or SL or RL) (0.066)
Load combination no.4	$1.2 \times DL + 1.6 \times (LL_r$ or SL or RL) $+ 0.5 \times W$ (0.305)
Load combination no.5	$1.2 \times DL + W + LL + 0.5 \times (LL_r$ or SL or RL) (0.641)
Load combination no.7	$0.9 \times DL + W$ (0.699)

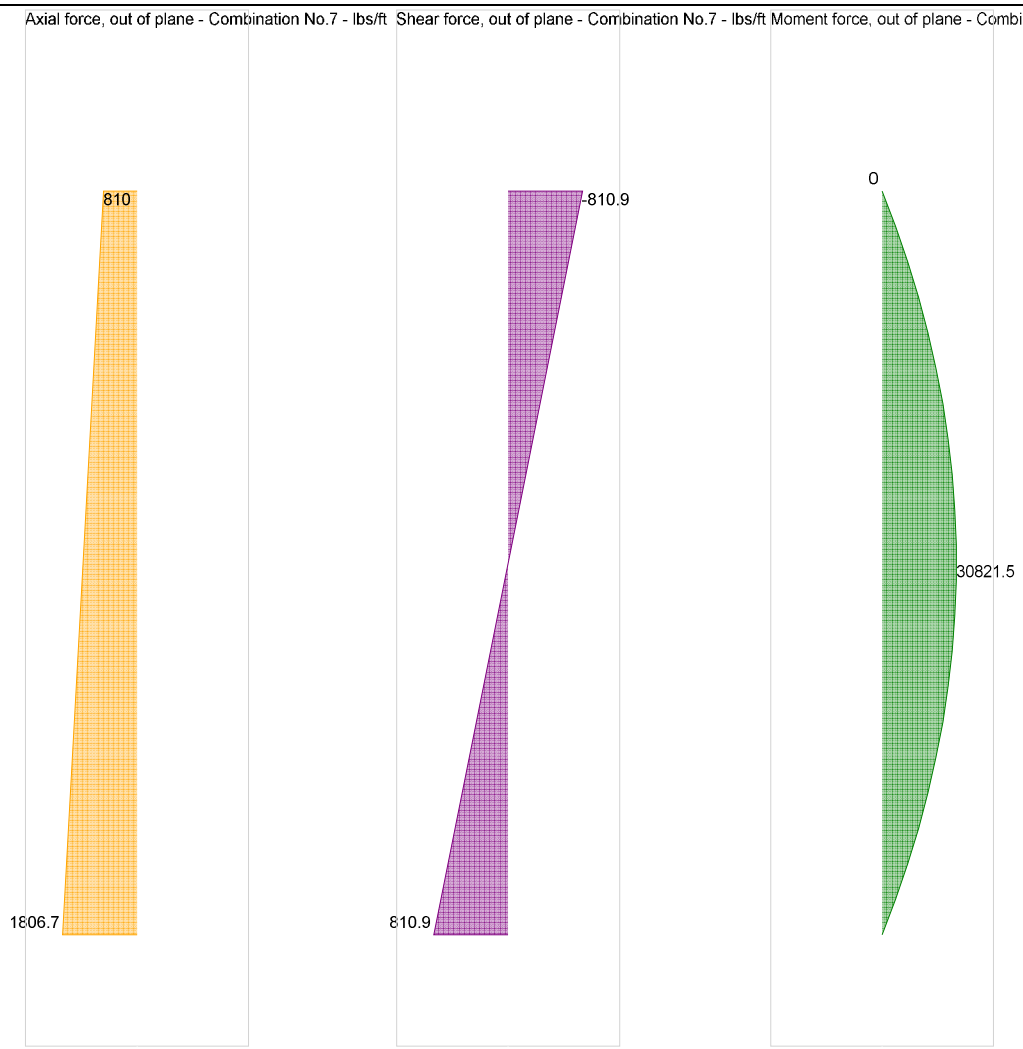
Properties of masonry section

Cross-sectional area	$A = t$ = **91.5** in^2/ft
Properties for walls loaded out-of-plane:	
Moment of inertia	$I = t^3 / 12$ = **443.3** in^4/ft
Section modulus	$S = I / c$ = **116.3** in^3/ft
Radius of gyration	$r = \sqrt{[I / A]}$ = **2.201** in
Effective height factor	K = **1**
Properties for walls loaded in-plane:	
Gross moment of inertia	$I_{x\_gross} = t \times L^3 / 12$ = **50379218** in^4
Gross section modulus	$S_{x\_gross} = I_{x\_gross} / (L / 2)$ = **234540** in^3

Consider wall at maximum moment location under load combination no.7

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Maximum moment location	6.34 ft
Axial load at mid-height of panel	P = **1308** lb/ft
Slenderness ratio	$(K \times h) / r$ = **69.073** < 99
Nominal axial strength	$P_n = 0.8 \times (0.8 \times f'_m \times (A - A_s) + A_s \times 0\ ksi) \times [1 - ((K \times h) / (140 \times r))^2]$ = **83977** lb/ft
Strength reduction factor	ϕ = **0.9**
Design axial strength	$\phi \times P_n$ = **75579** lb/ft
	$P / (\phi \times P_n)$ = **0.017**
	PASS - Nominal axial strength exceeds axial load
Factored axial stress	P / t = **14** psi
Factored axial stress limit	$0.2 \times f'_m$ = **380** psi
	PASS - Allowable stress under out of plane loads exceeds factored axial stress
Nominal cracking moment strength	$M_{cr} = S \times f_{r\_norm}$ = **18954** lb_in/ft
Modular ratio	$n = E_s / E_m$ = **16.959**
Distance to neutral axis	$c_{cr} = (A_s \times f_y + P) / (0.64 \times f'_m)$ = **0.998** in

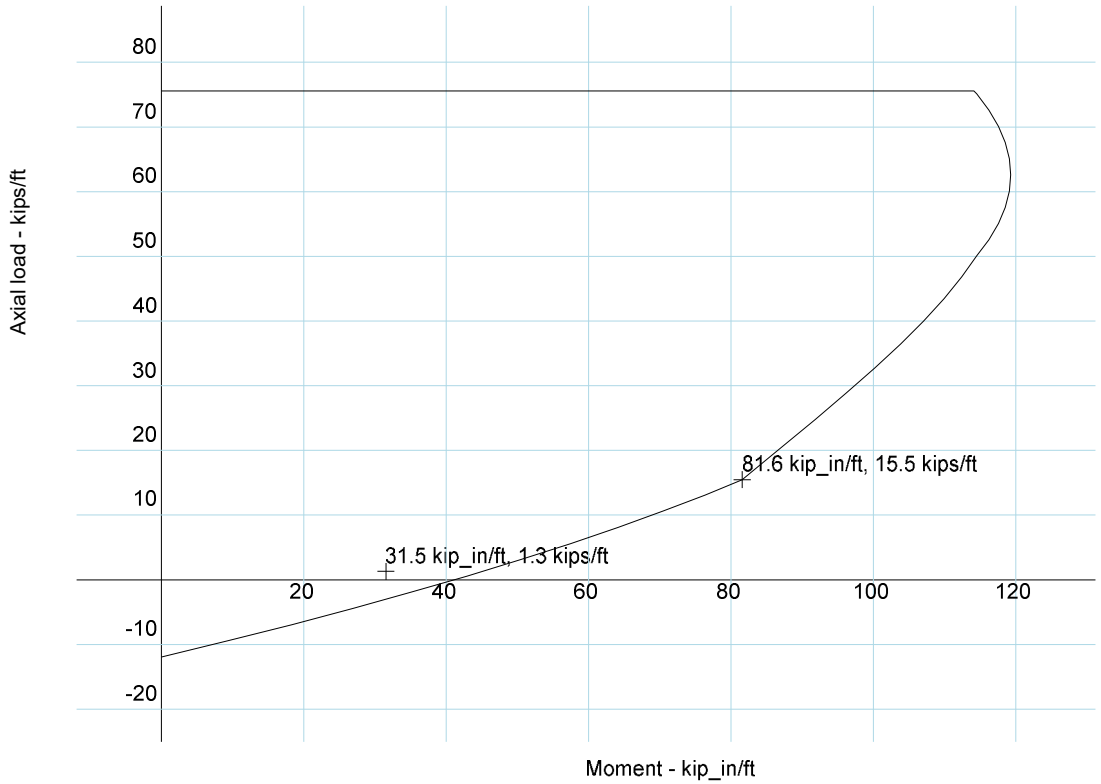
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Moment of inertia of cracked section	$I_{cr} = n \times (A_s + P \times t / (f_y \times 2 \times d)) \times (d - c_{cr})^2 + c_{cr}^3 / 3 =$ **36.6** in^4/ft
By iteration	$M_{u0} = M =$ **30822** lb_in/ft
	$\delta_{u0} = 5 \times M_{cr} \times h^2 / (48 \times E_m \times I) + 5 \times (M_{u0} - M_{cr}) \times h^2 / (48 \times E_m \times I_{cr}) =$ **0.517** in
	$M_{u2} = M_{u0} + P \times \delta_{u1} =$ **31532** lb_in/ft
	$\delta_{u2} = 5 \times M_{cr} \times h^2 / (48 \times E_m \times I) + 5 \times (M_{u2} - M_{cr}) \times h^2 / (48 \times E_m \times I_{cr}) =$ **0.544** in
Bending moment at mid-height of panel	$M = M_{u0} + P \times \delta_{u2} =$ **31534** lb_in/ft
Depth of reinforcement	$d =$ **3.813** in
Effective width per bar	$b_{eff} = \min(s, 6 \times t_{nom}, 72 \text{ in}) =$ **24** in
Strength reduction factor	$\phi =$ **0.9**
Tensile strain in reinforcement	$\varepsilon_s = f_y / E_s =$ **0.0021**
Maximum usable compressive strain of masonry	$\varepsilon_{mu} =$ **0.0025**
Fiber of max.compressive strain to neutral axis	$c_{bal} = \varepsilon_{mu} \times d / (\varepsilon_{mu} + \varepsilon_s) =$ **2.086** in
Tensile force at balance point	$T_{bal} = A_s \times f_y =$ **13254** lb/ft
	$\beta_1 =$ **0.8**
Compressive force at balance point	$C_{bal} = 0.8 \times f'_m \times \beta_1 \times c_{bal} =$ **30440** lb/ft
Design axial force at balance point	$P_{bal} = \phi \times (C_{bal} - T_{bal}) =$ **15468** lb/ft
Design moment at balance point	$M_{bal} = \phi \times [T_{bal} \times (d - t / 2) + C_{bal} \times (t / 2 - \beta_1 \times c_{bal} / 2)] =$ **81588** lb_in/ft
Maximum design moment from interaction diagram	$M_c =$ **45089** lb_in/ft
	$M / M_c =$ **0.699**
	PASS - Combination of applied axial load and flexure is acceptable
Maximum area of tensile reinforcement (9.3.3.2)	$A_{s\_max} = 0.64 \times f'_m \times [\varepsilon_{mu} / (\varepsilon_{mu} + 1.5 \times \varepsilon_s)] \times d / f_y =$ **0.414** in^2/ft
	PASS - Area of reinforcement provided is less than maximum allowable

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Strength interaction diagram

Consider wall at top under load combination no.7

Shear force	V = **811** lb/ft
Compressive force	N_u = **810** lb/ft
Net shear area	A_{nv} = d = **45.750** in^2/ft
Nominal shear strength	$V_n = \min([4 - 1.75 \times \min(M / (V \times d), 1)] \times A_{nv} \times \sqrt{(f'_m \times 1\ psi)} + 0.25 \times N_u, 6 \times A_{nv} \times \sqrt{(f'_m \times 1\ psi)})$ = **8179** lb/ft
Strength reduction factor	ϕ_v = **0.8**
Design shear strength	$\phi_v \times V_n$ = **6543** lb/ft
	$V / (\phi_v \times V_n)$ = **0.124**

PASS - Design shear strength exceeds applied shear strength

SNOW LOADING (ASCE7)

SNOW LOADING

In accordance with ASCE7-16

Tedds calculation version 1.0.10

Building details

Roof type	Flat
Width of roof	b = **100.00** ft

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Ground snow load

Ground snow load (Figure 7.2-1)	p_g = **20.00** lb/ft^2
Density of snow	$\gamma = \min(0.13 \times p_g / 1ft + 14lb/ft^3, 30lb/ft^3)$ = **16.60** lb/ft^3
Terrain typeSect. 26.7	C
Exposure condition (Table 7.3-1)	Fully exposed
Exposure factor (Table 7.3-1)	C_e = **0.90**
Thermal condition (Table 7.3-2)	Structures kept just above freezing
Thermal factor (Table 7.3-2)	C_t = **1.10**
Importance category (Table 1.5-1)	IV
Importance factor (Table 1.5-2)	I_s = **1.20**
Min snow load for low slope roofs (Sect 7.3.4)	$p_{f\_min} = I_s \times p_g$ = **24.00** lb/ft^2
Flat roof snow load (Sect 7.3)	$p_f = 0.7 \times C_e \times C_t \times I_s \times p_g$ = **16.63** lb/ft^2

Left parapet

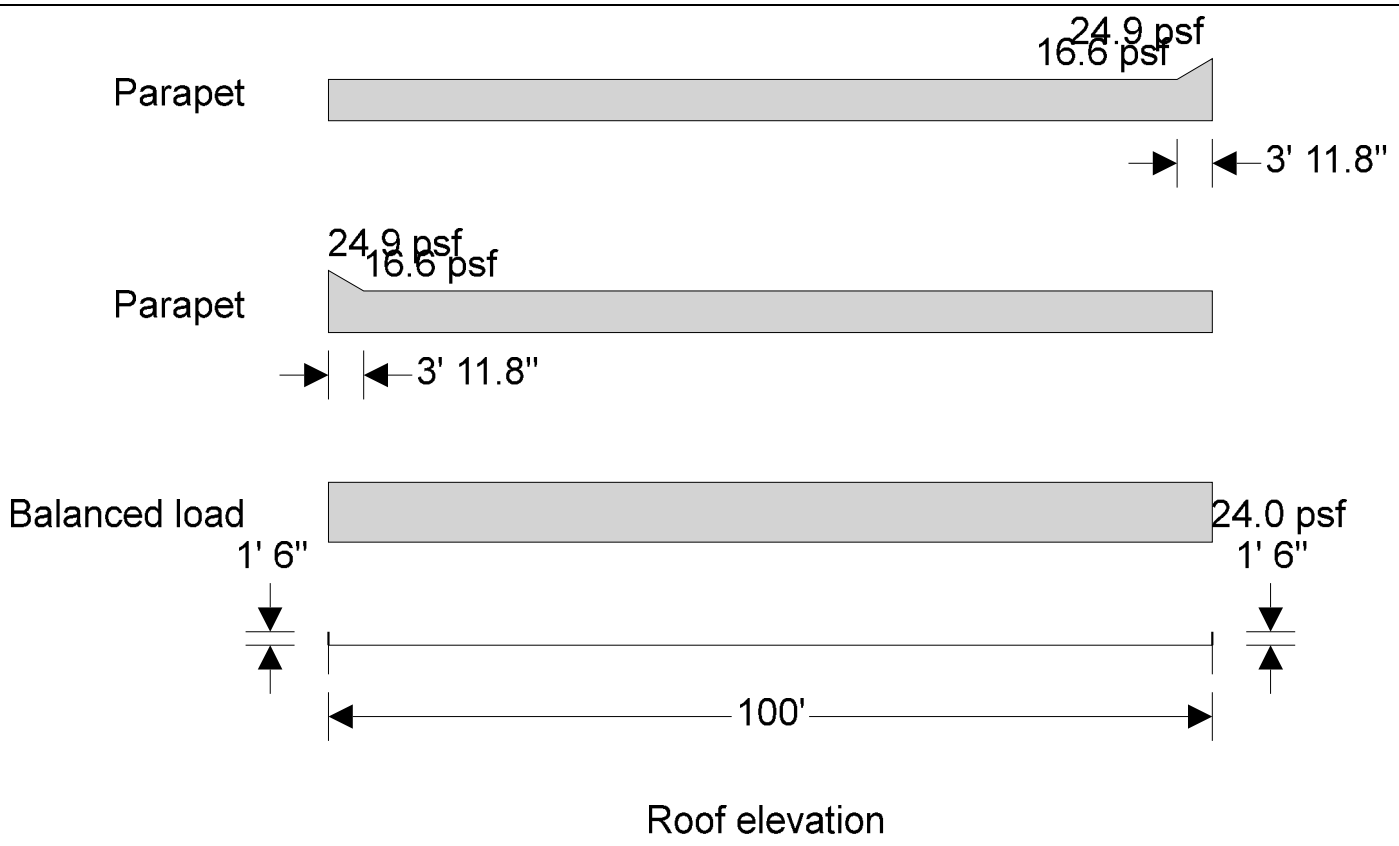
Balanced snow load height	$h_b = p_f / \gamma$ = **1.00** ft
Height of left parapet	h_{pptL} = **1.50** ft
Height from balance load to top of left parapet	$h_{c\_pptL} = h_{pptL} - h_b$ = **0.50** ft
Length of roof - left parapet	$l_{u\_pptL} = b$ = **100.00** ft
Drift height windward drift - left parpet	$h_{d\_l\_pptL} = \sqrt{(I_s)} \times 0.75 \times (0.43 \times (\max(20\ ft, l_{u\_pptL}) \times 1ft^2)^{1/3} \times (p_g / 1lb/ft^2 + 10)^{1/4} - 1.5ft)$ = **2.61** ft
Drift height - left parapet	$h_{d\_pptL} = \min(h_{d\_l\_pptL}, h_{pptL} - h_b)$ = **0.50** ft
Drift width	$W_{d\_pptL} = \min(4 \times h_{d\_l\_pptL}^2 / h_{c\_pptL}, 8 \times (h_{pptL} - h_b), b)$ = **3.98** ft
Drift surcharge load - left parapet	$p_{d\_pptL} = h_{d\_pptL} \times \gamma$ = **8.27** lb/ft^2

Right parapet

Height of right parapet	h_{pptR} = **1.50** ft
Height from balance load to top of right parapet	$h_{c\_pptR} = h_{pptR} - h_b$ = **0.50** ft
Length of roof - right parapet	$l_{u\_pptR} = b$ = **100.00** ft
Drift height windward drift - right parpet	$h_{d\_l\_pptR} = \sqrt{(I_s)} \times 0.75 \times (0.43 \times (\max(20\ ft, l_{u\_pptR}) \times 1ft^2)^{1/3} \times (p_g / 1lb/ft^2 + 10)^{1/4} - 1.5ft)$ = **2.61** ft
Drift height - right parapet	$h_{d\_pptR} = \min(h_{d\_l\_pptR}, h_{pptR} - h_b)$ = **0.50** ft
Drift width	$W_{d\_pptR} = \min(4 \times h_{d\_l\_pptR}^2 / h_{c\_pptR}, 8 \times (h_{pptR} - h_b), b)$ = **3.98** ft
Drift surcharge load - right parapet	$p_{d\_pptR} = h_{d\_pptR} \times \gamma$ = **8.27** lb/ft^2

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APP BAY SLAB WITH TRUCK LOAD

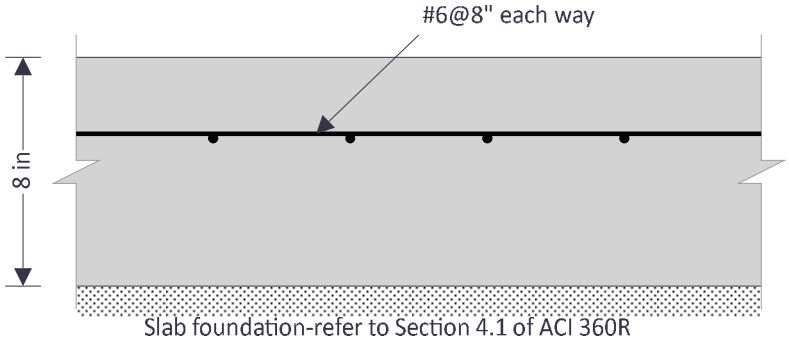
SLAB ON GROUND (ACI 360R)

In accordance with Guide to Design of Slab-on-Ground per ACI 360R-10

Tedds calculation version 1.0.03

Design summary

Description	Unit	Provided	Required	Utilization	Result
Slab thickness	in	8	7.54	0.942	PASS
Reinforcement	in^2 / ft	0.66	0.48	0.724	PASS



Design method

Design method publisher — **Portland Cement Association**

Materials and site properties

Slab thickness — h = **8** in

Specified compressive strength of concrete — f'_c = **4000** psi

Subgrade modulus — k = **150** lb/in^3

Wheel specifications

Axle type — **Single-axle**

Number of wheels at end of each axle — **Dual wheels**

Inner wheel center to center spacing — S = **98** in

Dual wheels spacing — S_d = **16** in

Loading details

Load location — **Interior**

Axle load — P_a = **31** kips

Safety factor — FS = **2**

Load contact area per wheel — A_c = **62** in^2

By iteration assumend trial thickness — h_{trial} = **8** in

The following output is based on the use of this trial thickness in the design charts in Appendix A of ACI 360R

Effective contact area per wheel (Fig. A1.2) — A_{c_eff} = **61.8** in^2

Equivalent load factor (Fig. A1.3) — F_l = **0.77**

Corrected axle load — $P_{a\_corrected} = P_a \times F_l$ = **23.74** kips

Slab thickness design

Modulus of rupture of concrete — $f_r = 9 \times \sqrt{(f'_c \times 1\ psi)}$ = **569.2** psi

Concrete working stress — $f_{t\_allow} = f_r / FS$ = **284.6** psi

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Slab stress / 1000 lb axle load	$f_t = f_{t\_allow} / (P_{a\_corrected} / 1\ kips)$ = **12** psi
Required slab thickness (Fig. A1.1)	h_{min} = **7.54** in
	h_{min} / h = **0.942**
	PASS - Slab thickness is adequate to avoid live load-induced cracks

Crack control options

Reinforcement type	**Bar reinforcement**
Reinforcement provided	**#6@8" each way**
Area of reinf. provided	A_{s_prov} = **0.66** in²/ft
Minimum area of reinf. required	A_{s_req} = 0.005 × h = **0.48** in²/ft
	A_{s_req} / A_{s_prov} = **0.724**

PASS - Area of reinforcement exceeds minimum required area

Note - Min. steel is calculated based on 0.5% (PCA 2001) of slab cross section area for crack-width control (8.3)

APP BAY ROOF OVER HANGS

STEEL MEMBER ANALYSIS & DESIGN (AISC 360)

In accordance with AISC360 15th Edition published 2016 using the ASD method

Tedds calculation version 4.4.08

ANALYSIS

Tedds calculation version 1.0.37

Geometry

Geometry (ft) - Steel (AISC) - HSS 5x5x3/8

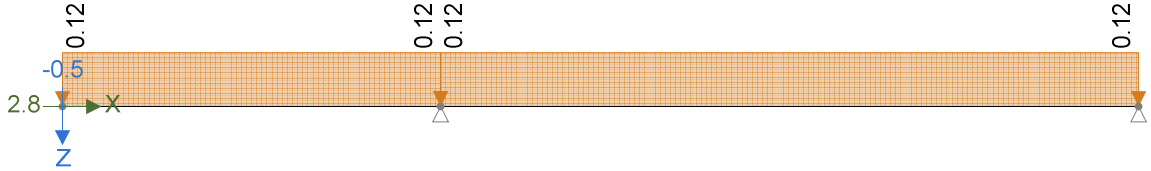


Span	Length (ft)	Section	Start Support	End Support
1	4.33	HSS 5x5x3/8	Free	Pinned
2	8	HSS 5x5x3/8	Pinned	Pinned
HSS 5x5x3/8: Area 6 in², Inertia Major 22 in⁴, Inertia Minor 22 in⁴, Shear area parallel to Minor 3 in², Shear area parallel to Major 3 in²				
Steel (AISC): Density 490 lbm/ft³, Youngs 29000 ksi, Shear 11200 ksi, Thermal 0.000012 °C⁻¹				

Loading

Self weight included

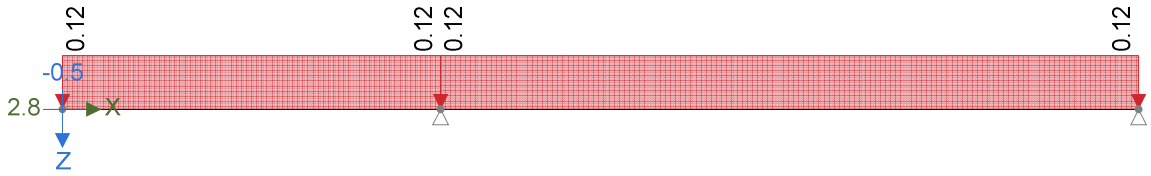
Dead - Loading (kips/ft)



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Snow - Loading (kips/ft)



Load combination factors

Load combination	Self Weight	Dead	Snow	Wind
1.0D (Strength)	***1.00***	***1.00***		
1.0D + 1.0S (Strength)	***1.00***	***1.00***	***1.00***	
1.0D + 0.6W (Strength)	***1.00***	***1.00***		***0.60***
1.0D + 0.75L + 0.75S + 0.45W (Strength)	***1.00***	***1.00***	***0.75***	***0.45***
0.6D + 0.6W (Strength)	***0.60***	***0.60***		***0.60***

Member Loads

Member	Load case	Load Type	Orientation	Description
Member1	Dead	UDL	GlobalZ	0.12 kips/ft
Member1	Snow	UDL	GlobalZ	0.12 kips/ft

Results

Total deflection

Member results

Load combination: 1.0D (Strength)

Member	Position (ft)	Deflection (in)		Axial deflection (in)	
Member1	0	0.024 (max)		0 (min)	
	4.33	0		0 (min)	
	4.72	0 (min)		0 (min)	

Member results

Load combination: 1.0D + 1.0S (Strength)

Member	Position (ft)	Deflection (in)		Axial deflection (in)	
Member1	0	0.044 (max)		0 (min)	
	4.33	0		0 (min)	
	4.72	0 (min)		0 (min)	

Member results

Load combination: 1.0D + 0.6W (Strength)

Member	Position (ft)	Deflection (in)		Axial deflection (in)	
Member1	0	0.024 (max)		0 (min)	

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Member	Position (ft)	Deflection (in)		Axial deflection (in)	
	4.33	0		0 (min)	
	4.72	0 (min)		0 (min)	

Member results

Load combination: 1.0D + 0.75L + 0.75S + 0.45W (Strength)

Member	Position (ft)	Deflection (in)		Axial deflection (in)	
Member1	0	0.039 (max)		0 (min)	
	4.33	0		0 (min)	
	4.72	0 (min)		0 (min)	

Member results

Load combination: 0.6D + 0.6W (Strength)

Member	Position (ft)	Deflection (in)		Axial deflection (in)	
Member1	0	0.014 (max)		0 (min)	
	4.33	0		0 (min)	
	4.72	0 (min)		0 (min)	

Reactions

Load case: Self Weight

Node	Force Fx (kips)	Fz (kips)	Moment My (kip_ft)
2	0	0.2	0
3	0	0.059	0

Load case: Dead

Node	Force Fx (kips)	Fz (kips)	Moment My (kip_ft)
2	0	1.141	0
3	0	0.339	0

Load case: Snow

Node	Force Fx (kips)	Fz (kips)	Moment My (kip_ft)
2	0	1.141	0
3	0	0.339	0

Load case: Wind

Node	Force Fx (kips)	Fz (kips)	Moment My (kip_ft)
2	0	0	0
3	0	0	0

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Load combination: 1.0D (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
2	0	1.341	0
3	0	0.399	0

Load combination: 1.0D + 1.0S (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
2	0	2.482	0
3	0	0.738	0

Load combination: 1.0D + 0.6W (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
2	0	1.341	0
3	0	0.399	0

Load combination: 1.0D + 0.75L + 0.75S + 0.45W (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
2	0	2.197	0
3	0	0.653	0

Load combination: 0.6D + 0.6W (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
2	0	0.804	0
3	0	0.239	0

Forces

Member results

Envelope - Strength combinations

Member	Position (ft)	Shear force (kips)		Moment (kip_ft)	
Member1	4.33	-0.367	-1.131	-0.795	-2.451 (min)
	9.51	0		1.042 (max)	0.338

Envelope - Strength combinations

Member	Position (ft)	Deflection (in)	
Member1	0	0.044 (max)	0.014
	4.72	0	0 (min)

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Member results

Load combination: 1.0D (Strength)

Member	Position (ft)	Deflection (in)	
Member1	0	0.024 (max)	
	4.72	0 (min)	

Member results

Load combination: 1.0D + 1.0S (Strength)

Member	Position (ft)	Deflection (in)	
Member1	0	0.044 (max)	
	4.72	0 (min)	

Member results

Load combination: 1.0D + 0.6W (Strength)

Member	Position (ft)	Deflection (in)	
Member1	0	0.024 (max)	
	4.72	0 (min)	

Member results

Load combination: 1.0D + 0.75L + 0.75S + 0.45W (Strength)

Member	Position (ft)	Deflection (in)	
Member1	0	0.039 (max)	
	4.72	0 (min)	

Member results

Load combination: 0.6D + 0.6W (Strength)

Member	Position (ft)	Deflection (in)	
Member1	0	0.014 (max)	
	4.72	0 (min)	

Safety factors

Shear	Ω_v = **1.67**
Flexure	Ω_b = **1.67**
Tensile yielding	$\Omega_{t,y}$ = **1.67**
Tensile rupture	$\Omega_{t,r}$ = **2.00**
Compression	Ω_c = **1.67**

Member1 - Span 1 design

Section details

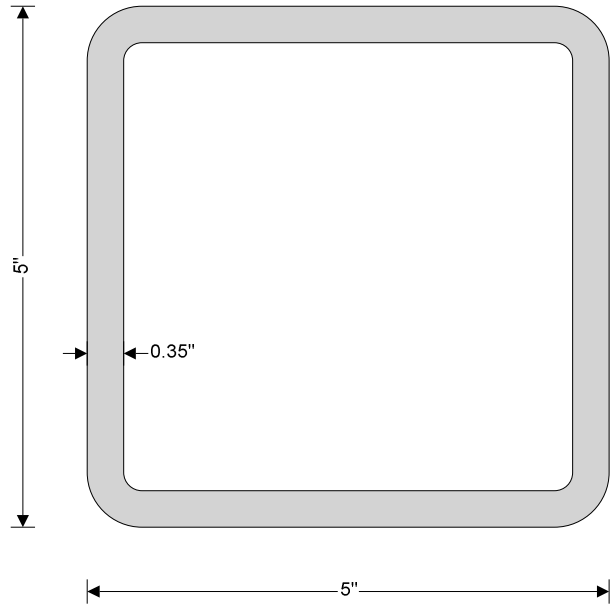
Section type	HSS 5x5x3/8 (AISC 15th Edn (v15.0))
ASTM steel designation	A500 Gr.B
Steel yield stress	F_y = **46** ksi

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Steel tensile stress F_u = **58** ksi

Modulus of elasticity E = **29000** ksi



HSS 5x5x3/8 (AISC 15th Edn (v15.0))
Section depth, d, 5 in
Section breadth, b_f, 5 in
Weight of section, Weight, 22.4 lbf/ft
Section thickness, t, 0.349 in
Area of section, A, 6.2 in^2
Radius of gyration about x-axis, r_x, 1.87 in
Radius of gyration about y-axis, r_y, 1.87 in
Elastic section modulus about x-axis, S_x, 8.68 in^3
Elastic section modulus about y-axis, S_y, 8.68 in^3
Plastic section modulus about x-axis, Z_x, 10.6 in^3
Plastic section modulus about y-axis, Z_y, 10.6 in^3
Second moment of area about x-axis, I_x, 21.7 in^4
Second moment of area about y-axis, I_y, 21.7 in^4

Lateral restraint

Upper flange has full lateral restraint

Lower flange has lateral restraint at supports only

Classification of sections for local buckling - Section B4

Classification of flanges in flexure - Table B4.1b (case 17)

Width to thickness ratio $(b_f - 3 \times t) / t$ = **11.33**

Limiting ratio for compact section $\lambda_{pff} = 1.12 \times \sqrt{[E / F_y]}$ = **28.12**

Limiting ratio for non-compact section $\lambda_{rff} = 1.40 \times \sqrt{[E / F_y]}$ = **35.15** Compact

Classification of web in flexure - Table B4.1b (case 19)

Width to thickness ratio $(d - 3 \times t) / t$ = **11.33**

Limiting ratio for compact section $\lambda_{pwf} = 2.42 \times \sqrt{[E / F_y]}$ = **60.76**

Limiting ratio for non-compact section $\lambda_{rwf} = 5.70 \times \sqrt{[E / F_y]}$ = **143.12** Compact

Section is compact in flexure

Check design at end of span

Design of members for tension - Chapter D

Required tensile strength P_r = **0** kips

Slenderness limitations - Section D1

Slenderness ratio $\lambda = L_{b,x} / r_x$ = **27.81**

Tension member slenderness ratio does not exceed recommended limit of 300

Allowable tensile strength - D2

Nominal tensile yielding strength $P_{n,yld} = F_y \times A$ = **284.28** kips

Nominal tensile rupture strength $P_{n,r} = F_u \times A_e$ = **358.44** kips

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Allowable tensile strength	$P_c = \min(P_{n,yld} / \Omega_{t,y}, P_{n,r} / \Omega_{t,r})$ = **170.228** kips
	P_r / P_c = **0**
	PASS - Nominal tensile strength exceeds required tensile strength

Design of members for shear - Chapter G

Required shear strength	$V_{r,x}$ = **1.1** kips
Web area	$A_w = 2 \times (d - 3 \times t) \times t$ = **2.759** in^2
Web plate buckling coefficient	k_v = **5**
	$(d - 3 \times t) / t <= 1.10 \times \sqrt{(k_v \times E / F_y)}$
Web shear coefficient - eq G2-9	C_{v2} = **1.000**
Nominal shear strength - eq G4-1	$V_{n,x} = 0.6 \times F_y \times A_w \times C_{v2}$ = **76.2** kips
Safety factor	Ω_v = 1.67
Allowable shear strength	$V_{c,x} = V_{n,x} / \Omega_v$ = **45.6** kips
	$V_{r,x} / V_{c,x}$ = **0.025**
	PASS - Allowable shear strength exceeds required shear strength

Design of members for flexure - Chapter F

Required flexural strength	$M_{r,x}$ = **2.5** kips_ft

Yielding - Section F7.1

Nominal flexural strength for yielding - eq F7-1	$M_{n,yld,x} = M_{p,x} = F_y \times Z_x$ = **40.6** kips_ft

Allowable flexural strength - F1

Nominal flexural strength	$M_{n,x} = M_{n,yld,x}$ = **40.6** kips_ft
Allowable flexural strength	$M_{c,x} = M_{n,x} / \Omega_b$ = **24.3** kips_ft
	$M_{r,x} / M_{c,x}$ = **0.103**
	PASS - Allowable flexural strength exceeds required flexural strength

Design of members for combined forces - Chapter H

Combined flexure and axial force - eq H1-1b	$P_r / (2 \times P_c) + M_{r,x} / M_{c,x}$ = **0.103**
	PASS - Combined flexure and axial force is within acceptable limits

Check design at start of span

Design of members for x-x axis deflection

Maximum deflection	δ_x = **0.044** in
Allowable deflection	$\delta_{x,Allowable} = L_{m1\_s1} / 120$ = **0.433** in
	$\delta_x / \delta_{x,Allowable}$ = **0.103**
	PASS - Allowable deflection exceeds design deflection

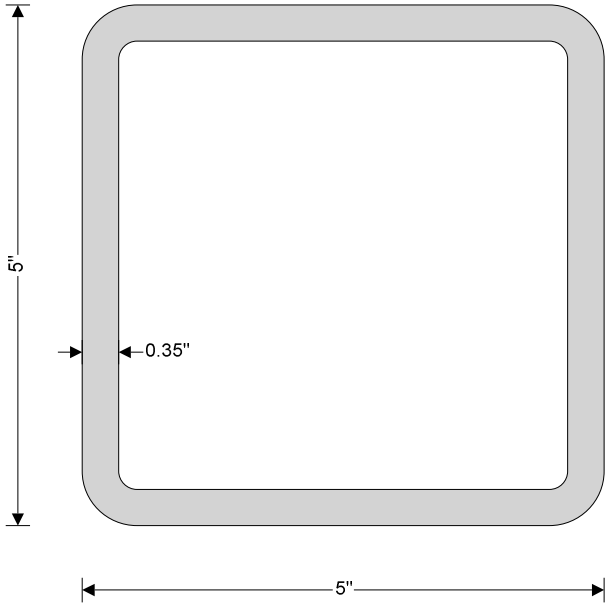
Member1 - Span 2 design

Section details

Section type	HSS 5x5x3/8 (AISC 15th Edn (v15.0))
ASTM steel designation	A500 Gr.B
Steel yield stress	F_y = **46** ksi
Steel tensile stress	F_u = **58** ksi
Modulus of elasticity	E = **29000** ksi

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HSS 5x5x3/8 (AISC 15th Edn (v15.0))
Section depth, d, 5 in
Section breadth, b_f, 5 in
Weight of section, Weight, 22.4 lbf/ft
Section thickness, t, 0.349 in
Area of section, A, 6.2 in^2
Radius of gyration about x-axis, r_x, 1.87 in
Radius of gyration about y-axis, r_y, 1.87 in
Elastic section modulus about x-axis, S_x, 8.68 in^3
Elastic section modulus about y-axis, S_y, 8.68 in^3
Plastic section modulus about x-axis, Z_x, 10.6 in^3
Plastic section modulus about y-axis, Z_y, 10.6 in^3
Second moment of area about x-axis, I_x, 21.7 in^4
Second moment of area about y-axis, I_y, 21.7 in^4

Lateral restraint

Upper flange has full lateral restraint
Lower flange has lateral restraint at supports only

Classification of sections for local buckling - Section B4

Classification of flanges in flexure - Table B4.1b (case 17)

Width to thickness ratio	$(b_f - 3 \times t) / t =$ **11.33**	
Limiting ratio for compact section	$\lambda_{pff} = 1.12 \times \sqrt{[E / F_y]} =$ **28.12**	
Limiting ratio for non-compact section	$\lambda_{rff} = 1.40 \times \sqrt{[E / F_y]} =$ **35.15**	Compact

Classification of web in flexure - Table B4.1b (case 19)

Width to thickness ratio	$(d - 3 \times t) / t =$ **11.33**	
Limiting ratio for compact section	$\lambda_{pwf} = 2.42 \times \sqrt{[E / F_y]} =$ **60.76**	
Limiting ratio for non-compact section	$\lambda_{rwf} = 5.70 \times \sqrt{[E / F_y]} =$ **143.12**	Compact

Section is compact in flexure

<u>Check design at start of span</u>

Design of members for shear - Chapter G

Required shear strength	$V_{r,x} =$ **1.4** kips
Web area	$A_w = 2 \times (d - 3 \times t) \times t =$ **2.759** in^2
Web plate buckling coefficient	$k_v =$ **5**
	$(d - 3 \times t) / t <= 1.10 \times \sqrt{(k_v \times E / F_y)}$
Web shear coefficient - eq G2-9	$C_{v2} =$ **1.000**
Nominal shear strength - eq G4-1	$V_{n,x} = 0.6 \times F_y \times A_w \times C_{v2} =$ **76.2** kips
Safety factor	$\Omega_v = 1.67$
Allowable shear strength	$V_{c,x} = V_{n,x} / \Omega_v =$ **45.6** kips
	$V_{r,x} / V_{c,x} =$ **0.03**

PASS - Allowable shear strength exceeds required shear strength

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Design of members for flexure - Chapter F

Required flexural strength — $M_{r,x}$ = **2.5** kips_ft

Yielding - Section F7.1

Nominal flexural strength for yielding - eq F7-1 — $M_{n,yld,x} = M_{p,x} = F_y \times Z_x$ = **40.6** kips_ft

Allowable flexural strength - F1

Nominal flexural strength — $M_{n,x} = M_{n,yld,x}$ = **40.6** kips_ft

Allowable flexural strength — $M_{c,x} = M_{n,x} / \Omega_b$ = **24.3** kips_ft

$M_{r,x} / M_{c,x}$ = **0.103**

PASS - Allowable flexural strength exceeds required flexural strength

Check design 5ft 2.086in along span

Design of members for flexure - Chapter F

Required flexural strength — $M_{r,x}$ = **1** kips_ft

Yielding - Section F7.1

Nominal flexural strength for yielding - eq F7-1 — $M_{n,yld,x} = M_{p,x} = F_y \times Z_x$ = **40.6** kips_ft

Allowable flexural strength - F1

Nominal flexural strength — $M_{n,x} = M_{n,yld,x}$ = **40.6** kips_ft

Allowable flexural strength — $M_{c,x} = M_{n,x} / \Omega_b$ = **24.3** kips_ft

$M_{r,x} / M_{c,x}$ = **0.041**

PASS - Allowable flexural strength exceeds required flexural strength

Check design 4ft 9.881in along span

Design of members for x-x axis deflection

Maximum deflection — δ_x = **0.013** in

Allowable deflection — $\delta_{x,Allowable} = L_{m1\_s2} / 240$ = **0.4** in

$\delta_x / \delta_{x,Allowable}$ = **0.032**

PASS - Allowable deflection exceeds design deflection

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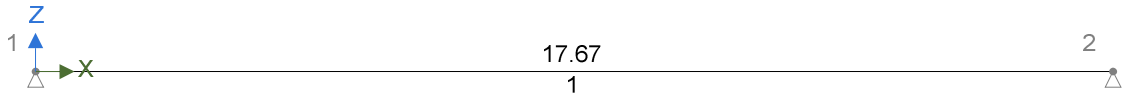
STORM SHELTER ANALYSIS DOWN

ANALYSIS

Tedds calculation version 1.0.37

Geometry

Geometry (ft) - Concrete (ACI normal) - R 12x12



Span	Length (ft)	Section	Start Support	End Support
1	17.67	R 12x12	Pinned	Pinned
R 12x12: Area 144 in^2, Inertia Major 1728 in^4, Inertia Minor 1728 in^4, Shear area parallel to Minor 120 in^2, Shear area parallel to Major 120 in^2				
Concrete (ACI normal): Density 150 lbm/ft^3, Youngs 4200 ksi, Shear 1750 ksi, Thermal 0.00001 $°C^{-1}$				

Loading

Self weight included

Load combination factors

Load combination	Self Weight	Dead	Live	Wind	Roof Live
1.4D (Strength)	***1.40***	***1.40***			
1.2D + 1.6L (Strength)	***1.20***	***1.20***	***1.60***		
1.0D + 1.0L (Service)	***1.00***	***1.00***	***1.00***		
1.2D + 1.6L + 0.5Lr (Strength)	***1.20***	***1.20***	***1.60***		***0.50***
1.0D + 0.75L + 0.75Lr (Service)	***1.00***	***1.00***	***0.75***		***0.75***
1.2D + 1.0L + 1.6Lr (Strength)	***1.20***	***1.20***	***1.00***		***1.60***
1.0D + 0.0L + 1.0Lr (Service)	***1.00***	***1.00***	***0.00***		***1.00***
1.2D + 1.6Lr + 0.5W (Strength)	***1.20***	***1.20***		***0.50***	***1.60***
1.0D + 1.0Lr + 0.5W (Service)	***1.00***	***1.00***		***0.50***	***1.00***
1.2D + 1.6S + 0.5W (Strength)	***1.20***	***1.20***		***0.50***	
1.0D + 1.0S + 0.5W (Service)	***1.00***	***1.00***		***0.50***	
1.2D + 1.0L + 0.5Lr + 1.0W (Strength)	***1.20***	***1.20***	***1.00***	***1.00***	***0.50***
1.0D + 0.5L + 0.5Lr + 0.7W (Service)	***1.00***	***1.00***	***0.50***	***0.70***	***0.50***
1.2D + 1.0L + 0.5S + 1.0W (Strength)	***1.20***	***1.20***	***1.00***	***1.00***	
1.0D + 0.5L + 0.5S + 0.7W (Service)	***1.00***	***1.00***	***0.50***	***0.70***	
0.9D + 1.0W (Strength)	***0.90***	***0.90***		***1.00***	

Member Loads

Member	Load case	Load Type	Orientation	Description
Member1	Dead	UDL	GlobalZ	0.03 kips/ft
Member1	Live	UDL	GlobalZ	0.1 kips/ft
Member1	Wind	UDL	GlobalZ	0.05 kips/ft
Member1	Roof Live	UDL	GlobalZ	0.1 kips/ft

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Results

Total deflection

Member results

Load case: Self Weight

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.046 (max)		0	
	17.67	0		0	

Member results

Load case: Dead

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.008 (max)		0	
	17.67	0		0	

Member results

Load case: Live

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.03 (max)		0	
	17.67	0		0	

Member results

Load case: Wind

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.014 (max)		0	
	17.67	0		0	

Member results

Load case: Roof Live

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.03 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.4D (Strength)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	

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Element	Position (ft)	Deflection (in)		Axial deflection (in)	
	8.84	0.075 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.2D + 1.6L (Strength)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.113 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.0D + 1.0L (Service)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.084 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.2D + 1.6L + 0.5Lr (Strength)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.128 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.0D + 0.75L + 0.75Lr (Service)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.099 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.2D + 1.0L + 1.6Lr (Strength)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.143 (max)		0	
	17.67	0		0	

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Member results

Load combination: 1.0D + 0.0L + 1.0Lr (Service)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.084 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.2D + 1.6Lr + 0.5W (Strength)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.12 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.0D + 1.0Lr + 0.5W (Service)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.091 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.2D + 1.6S + 0.5W (Strength)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.071 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.0D + 1.0S + 0.5W (Service)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.06 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.2D + 1.0L + 0.5Lr + 1.0W (Strength)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.123 (max)		0	
	17.67	0		0	

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Member results

Load combination: 1.0D + 0.5L + 0.5Lr + 0.7W (Service)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.093 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.2D + 1.0L + 0.5S + 1.0W (Strength)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.108 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.0D + 0.5L + 0.5S + 0.7W (Service)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.078 (max)		0	
	17.67	0		0	

Member results

Load combination: 0.9D + 1.0W (Strength)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.062 (max)		0	
	17.67	0		0	

Reactions

Load case: Self Weight

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	1.325	0
2	0	1.325	0

Load case: Dead

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	0.221	0
2	0	0.221	0

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Load case: Live

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	0.884	0
2	0	0.884	0

Load case: Wind

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	0.398	0
2	0	0.398	0

Load case: Roof Live

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	0.884	0
2	0	0.884	0

Load combination: 1.4D (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	2.165	0
2	0	2.165	0

Load combination: 1.2D + 1.6L (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	3.269	0
2	0	3.269	0

Load combination: 1.0D + 1.0L (Service)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	2.43	0
2	0	2.43	0

Load combination: 1.2D + 1.6L + 0.5Lr (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	3.711	0
2	0	3.711	0

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Load combination: 1.0D + 0.75L + 0.75Lr (Service)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	2.871	0
2	0	2.871	0

Load combination: 1.2D + 1.0L + 1.6Lr (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	4.152	0
2	0	4.152	0

Load combination: 1.0D + 0.0L + 1.0Lr (Service)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	2.43	0
2	0	2.43	0

Load combination: 1.2D + 1.6Lr + 0.5W (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	3.468	0
2	0	3.468	0

Load combination: 1.0D + 1.0Lr + 0.5W (Service)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	2.628	0
2	0	2.628	0

Load combination: 1.2D + 1.6S + 0.5W (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	2.054	0
2	0	2.054	0

Load combination: 1.0D + 1.0S + 0.5W (Service)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	1.745	0
2	0	1.745	0

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Load combination: 1.2D + 1.0L + 0.5Lr + 1.0W (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	3.578	0
2	0	3.578	0

Load combination: 1.0D + 0.5L + 0.5Lr + 0.7W (Service)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	2.708	0
2	0	2.708	0

Load combination: 1.2D + 1.0L + 0.5S + 1.0W (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	3.136	0
2	0	3.136	0

Load combination: 1.0D + 0.5L + 0.5S + 0.7W (Service)

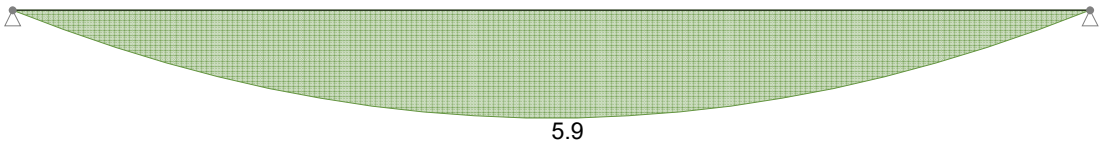
Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	2.266	0
2	0	2.266	0

Load combination: 0.9D + 1.0W (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	1.789	0
2	0	1.789	0

Forces

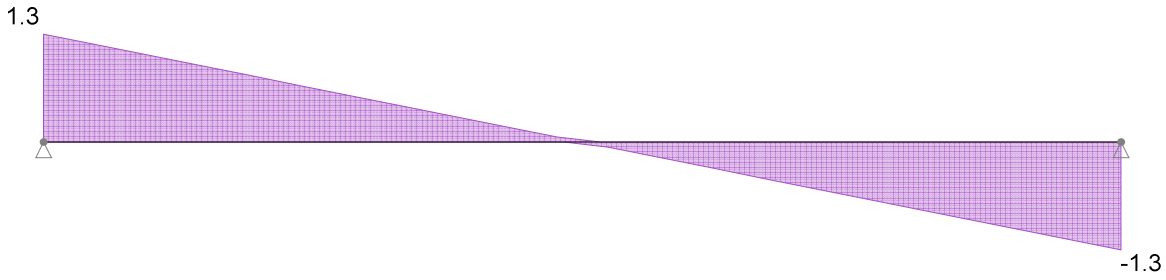
All load cases - Moment envelope (kip_ft)



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All load cases - Shear envelope (kips)



Element results

Envelope - All load cases

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	1.325 (max abs)	0.221	0 (min)	
	8.84	0		5.854 (max)	0.976
	17.67	-0.221	-1.325	0 (min)	

Element results

Load case: Self Weight

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	1.325 (max abs)		0	
	8.84	0		5.854 (max)	
	17.67	-1.325		0	

Load case: Self Weight

Element	Position (ft)	Deflection (in)	
1	8.84	0.046 (max)	
	17.67	0	

Element results

Load case: Dead

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	0.221 (max abs)		0 (min)	
	8.84	0		0.976 (max)	
	17.67	-0.221		0 (min)	

Load case: Dead

Element	Position (ft)	Deflection (in)	
1	8.84	0.008 (max)	
	17.67	0	

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Element results

Load case: Live

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	0.884 (max abs)		0 (min)	
	8.84	0		3.903 (max)	
	17.67	-0.883		0 (min)	

Load case: Live

Element	Position (ft)	Deflection (in)	
1	8.84	0.03 (max)	
	17.67	0	

Element results

Load case: Wind

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	0.398		0 (min)	
	8.84	0		1.756 (max)	
	17.67	-0.398 (max abs)		0 (min)	

Load case: Wind

Element	Position (ft)	Deflection (in)	
1	8.84	0.014 (max)	
	17.67	0	

Element results

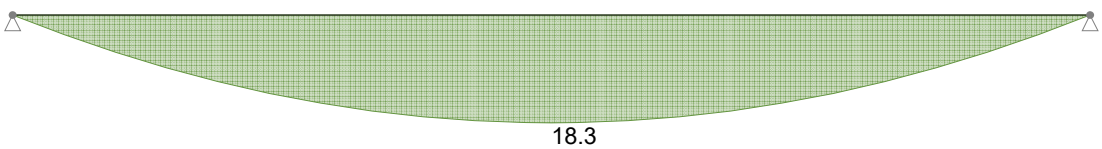
Load case: Roof Live

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	0.884 (max abs)		0 (min)	
	8.84	0		3.903 (max)	
	17.67	-0.883		0 (min)	

Load case: Roof Live

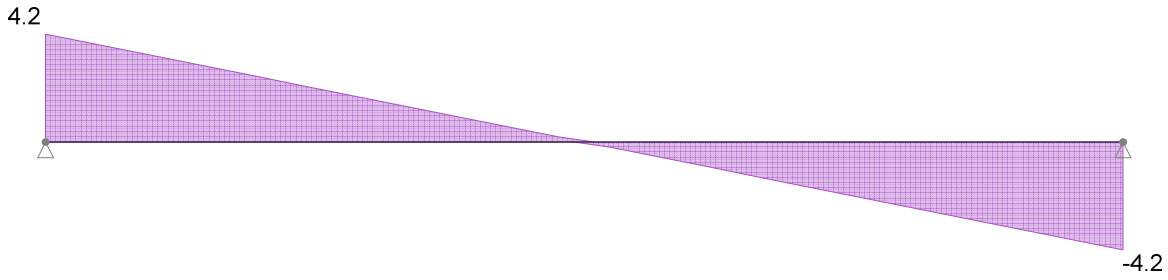
Element	Position (ft)	Deflection (in)	
1	8.84	0.03 (max)	
	17.67	0	

Strength combinations - Moment envelope (kip_ft)



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Strength combinations - Shear envelope (kips)



Element results

Envelope - Strength combinations

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	4.152	1.789	0 (min)	
	8.84	0		18.343 (max)	7.903
	17.67	-1.789	-4.152 (max abs)	0 (min)	

Element results

Load combination: 1.4D (Strength)

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	2.165 (max abs)		0 (min)	
	8.84	0		9.562 (max)	
	17.67	-2.165		0 (min)	

Element results

Load combination: 1.2D + 1.6L (Strength)

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	3.269		0 (min)	
	8.84	0		14.441 (max)	
	17.67	-3.269 (max abs)		0 (min)	

Element results

Load combination: 1.0D + 1.0L (Service)

Element	Position (ft)	Deflection (in)	
1	8.84	0.084 (max)	
	17.67	0	

Element results

Load combination: 1.2D + 1.6L + 0.5Lr (Strength)

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	3.711		0 (min)	
	8.84	0		16.392 (max)	

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Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
	17.67	-3.711 (max abs)		0 (min)	

Element results

Load combination: 1.0D + 0.75L + 0.75Lr (Service)

Element	Position (ft)	Deflection (in)	
1	8.84	0.099 (max)	
	17.67	0	

Element results

Load combination: 1.2D + 1.0L + 1.6Lr (Strength)

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	4.152		0 (min)	
	8.84	0		18.343 (max)	
	17.67	-4.152 (max abs)		0 (min)	

Element results

Load combination: 1.0D + 0.0L + 1.0Lr (Service)

Element	Position (ft)	Deflection (in)	
1	8.84	0.084 (max)	
	17.67	0	

Element results

Load combination: 1.2D + 1.6Lr + 0.5W (Strength)

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	3.468		0 (min)	
	8.84	0		15.319 (max)	
	17.67	-3.468 (max abs)		0 (min)	

Element results

Load combination: 1.0D + 1.0Lr + 0.5W (Service)

Element	Position (ft)	Deflection (in)	
1	8.84	0.091 (max)	
	17.67	0	

Element results

Load combination: 1.2D + 1.6S + 0.5W (Strength)

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	2.054		0 (min)	
	8.84	0		9.074 (max)	
	17.67	-2.054 (max abs)		0 (min)	

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Element results

Load combination: 1.0D + 1.0S + 0.5W (Service)

Element	Position (ft)	Deflection (in)	
1	8.84	0.06 (max)	
	17.67	0	

Element results

Load combination: 1.2D + 1.0L + 0.5Lr + 1.0W (Strength)

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	3.578		0 (min)	
	8.84	0		15.807 (max)	
	17.67	-3.578 (max abs)		0 (min)	

Element results

Load combination: 1.0D + 0.5L + 0.5Lr + 0.7W (Service)

Element	Position (ft)	Deflection (in)	
1	8.84	0.093 (max)	
	17.67	0	

Element results

Load combination: 1.2D + 1.0L + 0.5S + 1.0W (Strength)

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	3.136		0 (min)	
	8.84	0		13.855 (max)	
	17.67	-3.136 (max abs)		0 (min)	

Element results

Load combination: 1.0D + 0.5L + 0.5S + 0.7W (Service)

Element	Position (ft)	Deflection (in)	
1	8.84	0.078 (max)	
	17.67	0	

Element results

Load combination: 0.9D + 1.0W (Strength)

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	1.789		0 (min)	
	8.84	0		7.903 (max)	
	17.67	-1.789 (max abs)		0 (min)	

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RC ONE WAY SLAB DESIGN (ACI318)

RC ONE-WAY SLAB DESIGN (ACI 318)

In accordance with ACI318-14

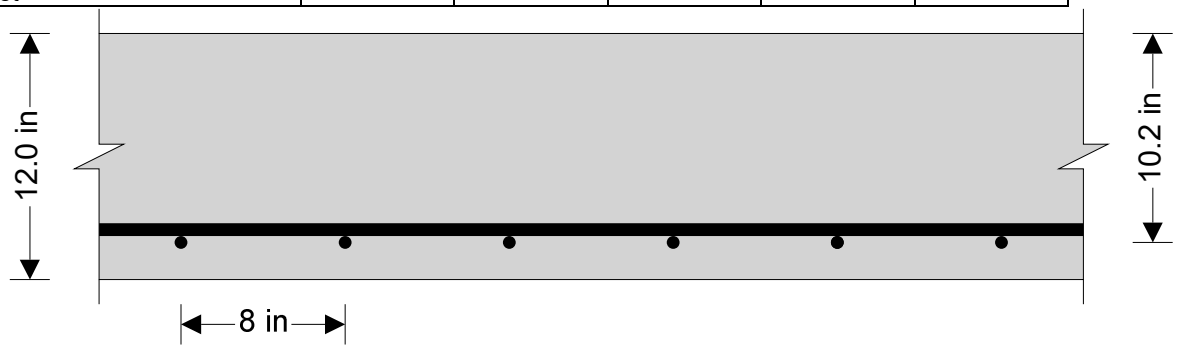
Tedds calculation version 1.2.03

Design summary

Overall design status PASS

Overall design utilization 0.588

Description	Unit	Capacity	Maximum	Utilization	Result
Moment	kip_ft/ft	20.396	12.000	0.588	PASS
Shear	kips/ft	11.598	4.500	0.388	PASS
Minimum thickness requirements are met					PASS



Slab definition

Slab type **One-way simply supported**

Overall thickness of slab h = **12.000** in

Span of slab l_n = **17.67** ft

Clear cover to tension reinforcement c_c = **1.50** in

Materials

Specified compressive strength of concrete f'_c = **4000** psi

Specified yield strength of reinforcement f_y = **60000** psi

Modulus of elasticity E_{SACI} = **29000000** psi

Compression-controlled strain limit - 21.2.2.1 ε_{ty} = **0.002**

Minimum tensile strain - 7.3.3.1 ε_{min} = **0.004**

Concrete modification factor λ = **1.00**

Maximum design moment and shear in span(per 12 in width of slab)

Maximum ultimate positive moment M_{us} = **12.000** kip_ft/ft

Maximum ultimate shear force V_u = **4.500** kips/ft

Reinforcement calculation - positive moments

Tension steel provided **No. 5 @ 8 in o.c.**

Depth to tension steel d = (h – c_c – D / 2) = **10.19** in

β_1 = if(f'_c <= 4 ksi, 0.85, max(0.65, 0.85 - 0.05 × (f'_c - 4 ksi) / 1 ksi)) = **0.85**

Stress block depth factor β_1 = 0.85

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Reinforcement ratio at strain of ε_{min}	$\rho_b = 0.85 \times \beta_1 \times f'_c / f_y \times (0.003 / (0.003 + \varepsilon_{min}))$ = **0.021**
Maximum reinforcement ratio	$\rho_{max} = \rho_b$ = **0.021**
Maximum area of tension steel	$A_{s\_max} = \rho_{max} \times d$ = **2.524** in^2/ft
Min ratio of transverse reinforcement – cl. 7.6.1.1	ρ_t =**0.0018**
Min area tension steel req'd – cl. 7.6.1.1	$A_{s\_min} = \rho_t \times h$ = **0.259** in^2/ft
Area required for bending	A_{s_req} = **0.267** in^2/ft
Area of tension steel provided	A_{s_prov} = **0.460** in^2/ft
	PASS - Area of steel provided - OK
Steel stress – cl. 24.3.2.1	$f_s = 2/3 \times f_y$ = **40000** psi
Max allowable spacing – cl. 7.7.2.3 & cl. 24.3.2	s_{max} = min(3×h, 18in, 15in×(40000 psi/f_s) – 2.5×c_c, 12in×(40000 psi/f_s))
	s_{max} = **11.250** in
Actual tensile bar spacing provided	s = **8.000** in
	PASS - Spacing of bars (+ve moment steel) less than maximum allowable
	Library item: Steel Calcs - SAGGING

Check for section - positive moments

Depth of equivalent rectangular stress block	$a = (A_{s\_prov} \times f_y) / (0.85 \times f'_c)$ = **0.68** in
Depth of neutral axis	$c = a / \beta_1$ = **0.796** in
Net tensile strain in long. steel at nominal strength	$\varepsilon_t = 0.003 \times [(d - c) / c]$ = **0.0354**
	Tensile strain exceeds minimum required, design OK
Required nominal flexural strength	M_{us} = **12.000** kip_ft/ft
Strength reduction factor	ϕ =**0.9**
Nominal flexural strength	$M_{ns\_prov} = A_{s\_prov} \times f_y \times (d - a / 2)$ = **22.663** kip_ft/ft
Design flexural strength	$\phi M_{ns\_prov} = \phi \times M_{ns\_prov}$ = **20.396** kip_ft/ft
	PASS - Design flexural strength exceeds required flexural strength

Transverse reinforcement - (for shrinkage and temperature)

Transverse reinforcement provided	**No. 5 @ 8 in o.c.**
Area of reinforcement provided	A_{t_prov} = **0.460** in^2/ft
Min ratio of transverse reinforcement – cl. 7.6.1.1	ρ_t =**0.0018**
Minimum area of transverse reinforcement required	$A_{t\_req} = \rho_t \times h$ = **0.259** in^2/ft
	PASS - Area of transverse steel provided OK
Maximum allowable spacing of bars	s_{max_t} = min (5 × h, 18 in) = **18.000** in
Actual transverse bar spacing provided	s_t = **8.000** in
	PASS - Spacing of transverse bars is less than allowable
	Library item: Transverse steel calcs

Check for shear

Required shear strength	V_u = **4.500** kips/ft
Shear strength provided by concrete	$V_c = 2 \times \lambda \times \sqrt{(f'_c \times 1 \text{ psi})} \times d$ = **15.464** kips/ft
Shear strength provided by shear steel (assumed)	V_s = 0 kips/ft
Shear capacity of section	$V = V_c + V_s$ = **15.464** kips/ft
Design shear capacity of section	$\phi V = 0.75 \times V$= **11.598** kips/ft
	PASS - One-way shear capacity

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Check of clear cover – cl. 20.6.1.1

Permissible min nominal cover to all reinforcement c_{min} = 0.75 in

Clear cover to tension reinforcement (+ve mnt) $c_c = h - d - D/2$ = **1.500** in

PASS - Cover to steel resisting positive moment exceeds allowable minimum cover

Deflection

Support condition **Simply supported**

Basic span-to-thickness ratio - Table 7.3.1.1 $ratio_{basic}$ = **20**

Type of concrete **Normal weight**

Concrete density factor - Table 7.3.1.1 $f_{density}$ = **1.00**

Allowable span-to-thickness ratio $ratio_{allow} = ratio_{basic} / (f_{density} \times (0.4 + f_y / 100000\ psi))$ = **20.000**

Actual span-to-thickness ratio $ratio_{actual} = l_n / h$ = **17.670**

PASS - The slab thickness is adequate to control deflection

Design summary

Slab is 12.0 in thick in 4000 psi concrete

Tension steel provided - positive moment, No. 5 @ 8 in o.c. in 60000 psi steel

Transverse steel provided , No. 5 @ 8 in o.c. in 60000 psi steel

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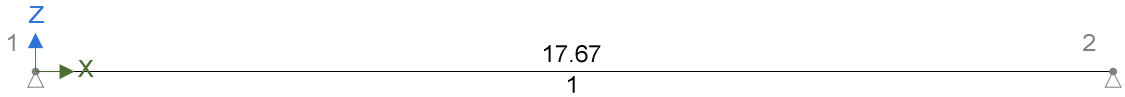
STORM SHELTER ANALYSIS UPLIFT

ANALYSIS

Tedds calculation version 1.0.37

Geometry

Geometry (ft) - Concrete (ACI normal) - R 12x12



Span	Length (ft)	Section	Start Support	End Support
1	17.67	R 12x12	Pinned	Pinned
R 12x12: Area 144 in^2, Inertia Major 1728 in^4, Inertia Minor 1728 in^4, Shear area parallel to Minor 120 in^2, Shear area parallel to Major 120 in^2				
Concrete (ACI normal): Density 150 lbm/ft^3, Youngs 4200 ksi, Shear 1750 ksi, Thermal 0.00001 $°C^{-1}$				

Loading

Self weight included

Load combination factors

Load combination	Self Weight	Dead	Live	Wind	Roof Live
1.4D (Strength)	***1.40***	***1.40***			
1.2D + 1.6L (Strength)	***1.20***	***1.20***	***1.60***		
1.0D + 1.0L (Service)	***1.00***	***1.00***	***1.00***		
1.2D + 1.6L + 0.5Lr (Strength)	***1.20***	***1.20***	***1.60***		***0.50***
1.0D + 0.75L + 0.75Lr (Service)	***1.00***	***1.00***	***0.75***		***0.75***
1.2D + 1.0L + 1.6Lr (Strength)	***1.20***	***1.20***	***1.00***		***1.60***
1.0D + 0.0L + 1.0Lr (Service)	***1.00***	***1.00***	***0.00***		***1.00***
1.2D + 1.6Lr + 0.5W (Strength)	***1.20***	***1.20***		***0.50***	***1.60***
1.0D + 1.0Lr + 0.5W (Service)	***1.00***	***1.00***		***0.50***	***1.00***
1.2D + 1.0L + 0.5Lr + 1.0W (Strength)	***1.20***	***1.20***	***1.00***	***1.00***	***0.50***
1.0D + 0.5L + 0.5Lr + 0.7W (Service)	***1.00***	***1.00***	***0.50***	***0.70***	***0.50***
0.9D + 1.0W (Strength)	***0.90***	***0.90***		***1.00***	

Member Loads

Member	Load case	Load Type	Orientation	Description
Member1	Dead	UDL	GlobalZ	0.02 kips/ft
Member1	Wind	UDL	GlobalZ	-0.16 kips/ft
Member1	Roof Live	UDL	GlobalZ	0.1 kips/ft

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Results

Total deflection

Member results

Load case: Self Weight

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.046 (max)		0	
	17.67	0		0	

Member results

Load case: Dead

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.005 (max)		0	
	17.67	0		0	

Member results

Load case: Live

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	17.67	0		0	

Member results

Load case: Wind

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.83	-0.05 (min)		0	
	17.67	0		0	

Member results

Load case: Roof Live

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.03 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.4D (Strength)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.07 (max)		0	

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Element	Position (ft)	Deflection (in)		Axial deflection (in)	
	17.67	0		0	

Member results

Load combination: 1.2D + 1.6L (Strength)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.06 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.0D + 1.0L (Service)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.05 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.2D + 1.6L + 0.5Lr (Strength)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.076 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.0D + 0.75L + 0.75Lr (Service)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.073 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.2D + 1.0L + 1.6Lr (Strength)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.109 (max)		0	
	17.67	0		0	

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Member results

Load combination: 1.0D + 0.0L + 1.0Lr (Service)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.081 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.2D + 1.6Lr + 0.5W (Strength)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.084 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.0D + 1.0Lr + 0.5W (Service)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.056 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.2D + 1.0L + 0.5Lr + 1.0W (Strength)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.026 (max)		0	
	17.67	0		0	

Member results

Load combination: 1.0D + 0.5L + 0.5Lr + 0.7W (Service)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.84	0.031 (max)		0	
	17.67	0		0	

Member results

Load combination: 0.9D + 1.0W (Strength)

Element	Position (ft)	Deflection (in)		Axial deflection (in)	
1	0	0		0	
	8.83	-0.004 (min)		0	
	17.67	0		0	

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Reactions

Load case: Self Weight

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	1.325	0
2	0	1.325	0

Load case: Dead

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	0.133	0
2	0	0.133	0

Load case: Live

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	0	0
2	0	0	0

Load case: Wind

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	-1.44	0
2	0	-1.44	0

Load case: Roof Live

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	0.884	0
2	0	0.884	0

Load combination: 1.4D (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	2.041	0
2	0	2.041	0

Load combination: 1.2D + 1.6L (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	1.749	0
2	0	1.749	0

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Load combination: 1.0D + 1.0L (Service)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	1.458	0
2	0	1.458	0

Load combination: 1.2D + 1.6L + 0.5Lr (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	2.191	0
2	0	2.191	0

Load combination: 1.0D + 0.75L + 0.75Lr (Service)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	2.12	0
2	0	2.12	0

Load combination: 1.2D + 1.0L + 1.6Lr (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	3.163	0
2	0	3.163	0

Load combination: 1.0D + 0.0L + 1.0Lr (Service)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	2.341	0
2	0	2.341	0

Load combination: 1.2D + 1.6Lr + 0.5W (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	2.443	0
2	0	2.443	0

Load combination: 1.0D + 1.0Lr + 0.5W (Service)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	1.621	0
2	0	1.621	0

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Load combination: 1.2D + 1.0L + 0.5Lr + 1.0W (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	0.751	0
2	0	0.751	0

Load combination: 1.0D + 0.5L + 0.5Lr + 0.7W (Service)

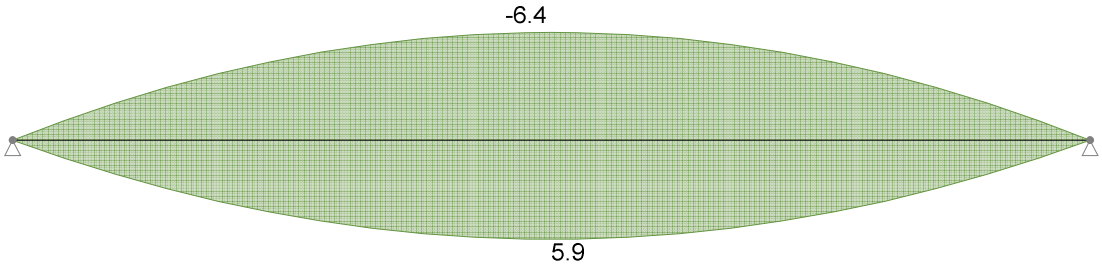
Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	0.891	0
2	0	0.891	0

Load combination: 0.9D + 1.0W (Strength)

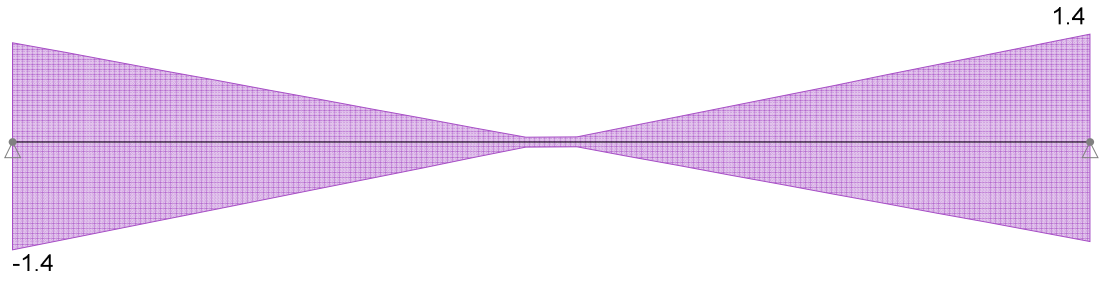
Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
1	0	-0.128	0
2	0	-0.128	0

Forces

All load cases - Moment envelope (kip_ft)



All load cases - Shear envelope (kips)



Element results

Envelope - All load cases

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	1.325	-1.44 (max abs)	0	

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Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
	8.84	0		5.854 (max)	-6.362 (min)
	8.84	0		5.854 (max)	-6.362 (min)
	17.67	1.44	-1.325	0	

Element results

Load case: Self Weight

Element	Position (ft)	Deflection (in)	
1	8.84	0.046 (max)	
	17.67	0	

Element results

Load case: Dead

Element	Position (ft)	Deflection (in)	
1	8.84	0.005 (max)	
	17.67	0	

Element results

Load case: Live

Element	Position (ft)	Deflection (in)	
1	0	0	
	17.67	0	

Element results

Load case: Wind

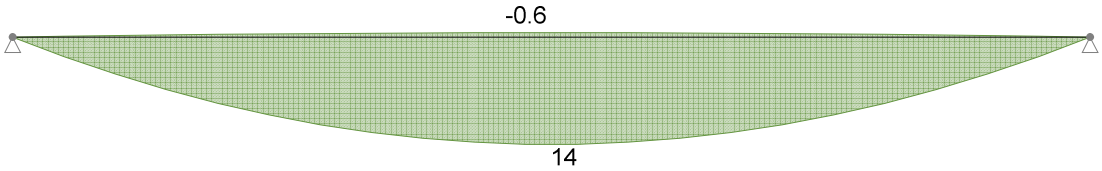
Element	Position (ft)	Deflection (in)	
1	8.83	-0.05 (min)	
	17.67	0	

Element results

Load case: Roof Live

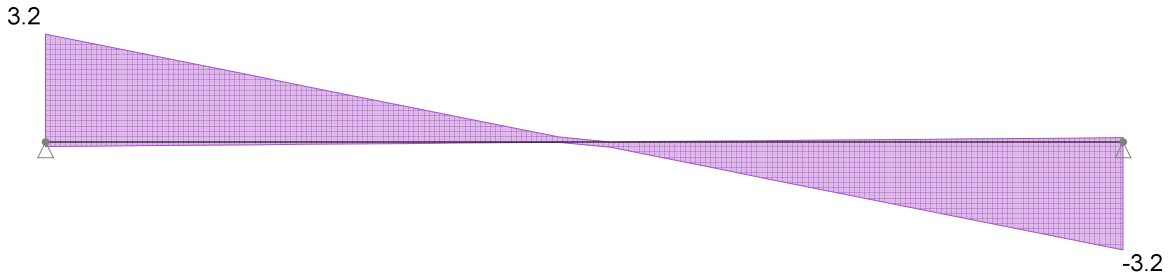
Element	Position (ft)	Deflection (in)	
1	8.84	0.03 (max)	
	17.67	0	

Strength combinations - Moment envelope (kip_ft)



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Strength combinations - Shear envelope (kips)



Element results

Envelope - Strength combinations

Element	Position (ft)	Shear force (kips)		Moment (kip_ft)	
1	0	3.163 (max abs)	-0.128	0	
	8.84	0		13.972 (max)	-0.566 (min)
	8.84	0		13.972 (max)	-0.566 (min)
	17.67	0.128	-3.163	0	

Element results

Load combination: 1.0D + 1.0L (Service)

Element	Position (ft)	Deflection (in)	
1	8.84	0.05 (max)	
	17.67	0	

Element results

Load combination: 1.0D + 0.75L + 0.75Lr (Service)

Element	Position (ft)	Deflection (in)	
1	8.84	0.073 (max)	
	17.67	0	

Element results

Load combination: 1.0D + 0.0L + 1.0Lr (Service)

Element	Position (ft)	Deflection (in)	
1	8.84	0.081 (max)	
	17.67	0	

Element results

Load combination: 1.0D + 1.0Lr + 0.5W (Service)

Element	Position (ft)	Deflection (in)	
1	8.84	0.056 (max)	
	17.67	0	

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Element results

Load combination: 1.0D + 0.5L + 0.5Lr + 0.7W (Service)

Element	Position (ft)	Deflection (in)	
1	8.84	0.031 (max)	
	17.67	0	

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MASONRY WALL FAILURE ANALYSIS

MASONRY WALL PANEL DESIGN (TMS 402/602-16)

In accordance with strength design method

Tedds calculation version 2.2.09

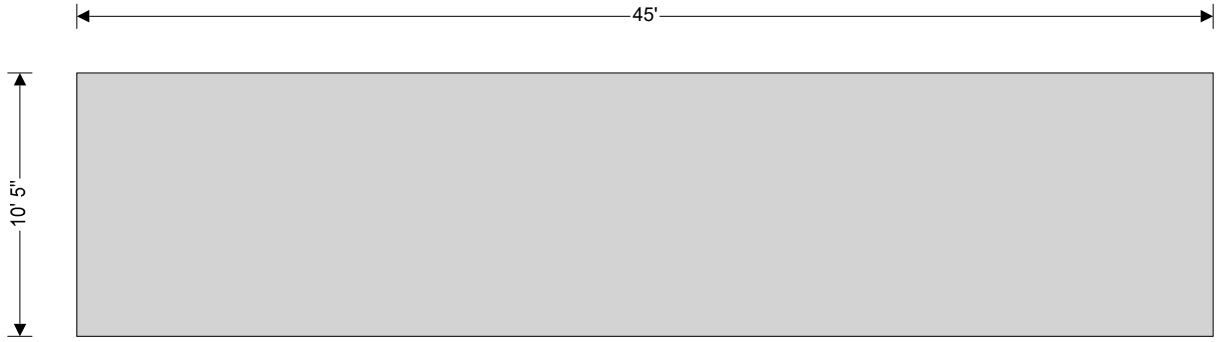
Masonry wall panel details

Reinforced single-wythe wall, the wall is free at the top and fixed at the bottom for out of plane loads

The wall is fixed at the bottom and free at the top for in plane loads

Panel length L = **45** ft

Panel height h = **10.417** ft



Seismic properties

Seismic design category A

Seismic importance factor (ASCE7 Table 1.5-2) I_e = **1**

Design spectral response acceleration parameter, short periods (IBC 1613.2.4 or ASCE7 11.4.5)

S_{DS} = **1**

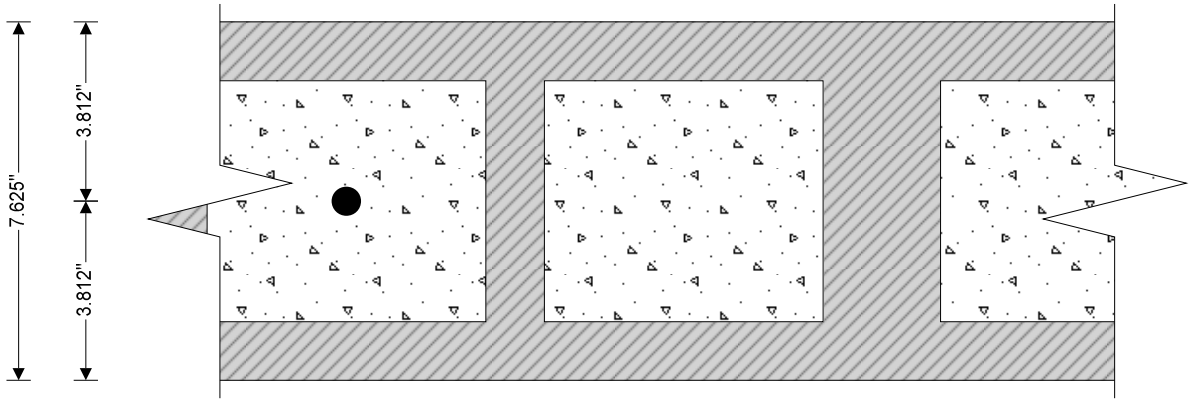
Seismic wall classification Nonparticipating

No prescriptive minimum seismic reinforcement

Redundancy factor, on out-of-plane load ρ_E = **1.0**

Construction details

Wall thickness t = **7.625** in



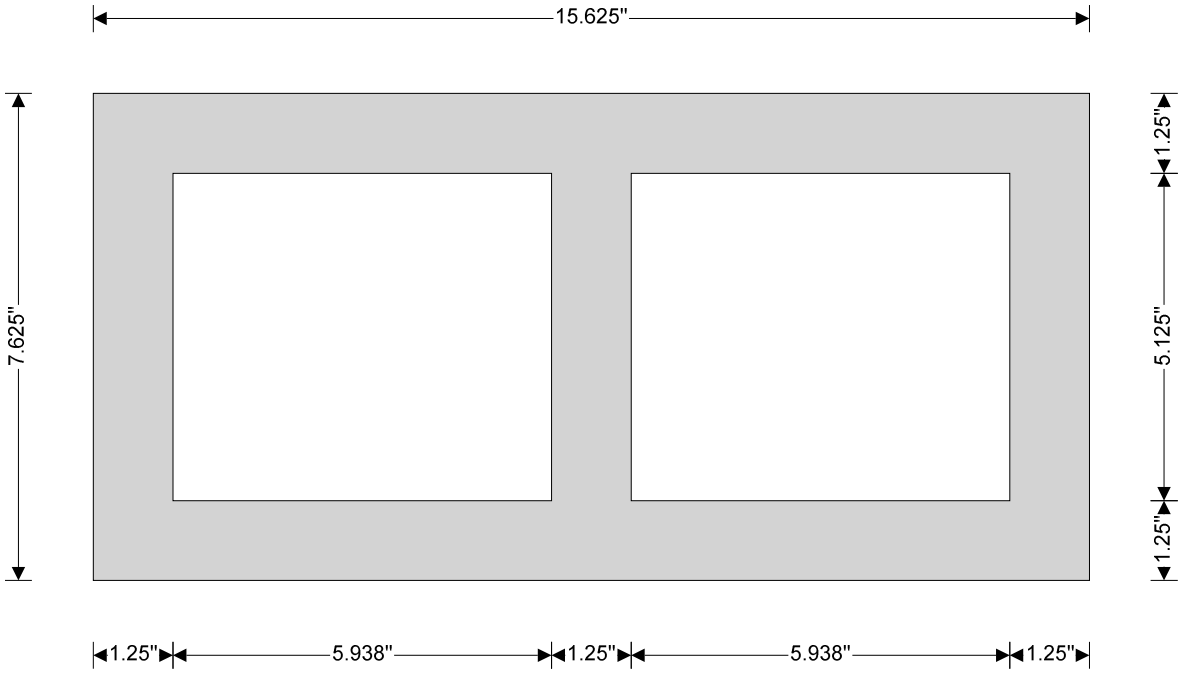
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Masonry details

Hollow concrete units fully grouted in running bond fully bedded with PCL class M mortar

Compressive strength of unit	f'_{cu} = **2000** psi
Density of masonry units	γ_{block} = **135** lb/ft^3
Height of masonry units	h_b = **7.625** in
Length of masonry units	l_b = **15.625** in
Number of internal webs	N_{web} = **1**
Number of end webs	N_{end} = **2**
Internal web thickness	t_{bw} = **1.25** in
Face shell thickness	t_{bf} = **1.25** in
End web thickness	t_{be} = **1.25** in
Area of block	$A_{block} = [t \times l_b - (l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})] / l_b$ = **44.76** in^2/ft
Area of grout	$A_{grout} = [(l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})] / l_b$ = **46.74** in^2/ft
Density of grout	γ_{grout} = **140** lb/ft^3
Self weight of wall	$w_{SW} = A_{block} \times \gamma_{block} + A_{grout} \times \gamma_{grout}$ = **87.4** psf



From TMS 602-16 Table 2 - Compressive strength of masonry

Net compressive strength of masonry	f'_m = **2000** psi
Modulus of elasticity for masonry	$E_m = 900 \times f'_m$ = **1800000** psi
Shear modulus of masonry	$G_v = 0.4 \times E_m$ = **720000** psi

From TMS 402 -16 Table 9.1.9.2 - Modulus of rupture

Modulus of rupture normal to bed	f_{r_norm} = **163** psi
Modulus of rupture parallel to bed	f_{r_para} = **267** psi

Reinforcement details

Yield strength of reinforcement	f_y = **60000** psi

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Allowable tensile stress in reinforcement	F_s = **32000** psi
Modulus of elasticity for reinforcement	E_s = **29000000** psi
Vertical reinforcement provided	No.5 bars at 32 in centers
Area of vertical reinforcement	$A_s = \pi \times Dia^2 / (4 \times s)$ = **0.12** in^2/ft

Lateral out-of-plane loads

Wind load on panel	W = **157** psf
Wind load on parapet	W_p = **18** psf
Seismic load factor (ASCE7 12.11.1)	$F_p = 0.4 \times S_{DS} \times I_e$ = **0.4**
Seismic load from wall	$E_{wall} = \max(F_p, 0.1) \times w_{SW}$ = **35** psf
Additional seimic load	E_{add} = **0** psf
Seismic lateral load on panel	$E = E_{wall} + E_{add}$ = **35** psf

Lateral in-plane loads

Vertical loading details

Vertical seismic load factor applied to dead load	$F_{Ev} = 0.2 \times S_{DS}$ = **0.2**

From IBC 2018 cl.1605.2 - Basic load combinations (Utilization)

Load combination no.1	$1.4 \times DL$ (0.014)
Load combination no.4	$1.2 \times DL + 1.6 \times (LL_r$ or SL or RL) $+ 0.5 \times W$ (2.085)
Load combination no.7	$0.9 \times DL + W$ (4.310)

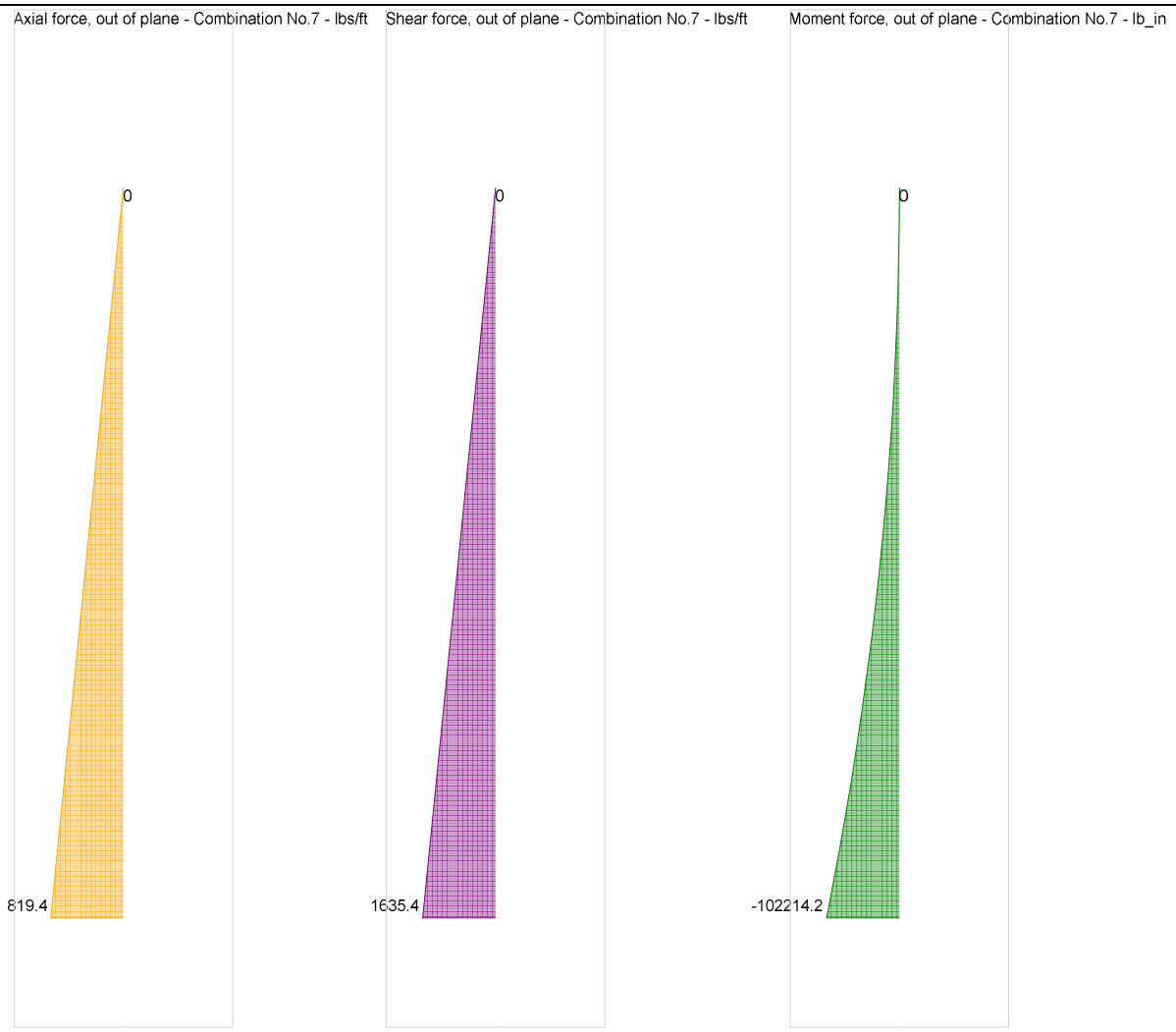
Properties of masonry section

Cross-sectional area	$A = t$ = **91.5** in^2/ft
Properties for walls loaded out-of-plane:	
Moment of inertia	$I = t^3 / 12$ = **443.3** in^4/ft
Section modulus	$S = I / c$ = **116.3** in^3/ft
Radius of gyration	$r = \sqrt{[I / A]}$ = **2.201** in
Effective height factor	K = **1**

Consider wall at bottom under load combination no.7

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Axial load at bottom of panel	P = **819** lb/ft
Slenderness ratio	$(K \times h) / r$ = **56.789** < 99
Nominal axial strength	$P_n = 0.8 \times (0.8 \times f'_m \times (A - A_s) + A_s \times 0$ ksi$) \times [1 - ((K \times h) / (140 \times r))^2]$ = **97726** lb/ft
Strength reduction factor	ϕ = **0.9**
Design axial strength	$\phi \times P_n$ = **87954** lb/ft
	$P / (\phi \times P_n)$ = **0.009**
	PASS - Nominal axial strength exceeds axial load
Factored axial stress	P / t = **9** psi
Factored axial stress limit	$0.2 \times f'_m$ = **400** psi
	PASS - Allowable stress under out of plane loads exceeds factored axial stress
Nominal cracking moment strength	$M_{cr} = S \times f_{r\_norm}$ = **18954** lb_in/ft
Modular ratio	$n = E_s / E_m$ = **16.111**
Distance to neutral axis	$c_{cr} = (A_s \times f_y + P) / (0.64 \times f'_m)$ = **0.503** in
Moment of inertia of cracked section	$I_{cr} = n \times (A_s + P \times t / (f_y \times 2 \times d)) \times (d - c_{cr})^2 + c_{cr}^3 / 3$ = **23.2** in^4/ft

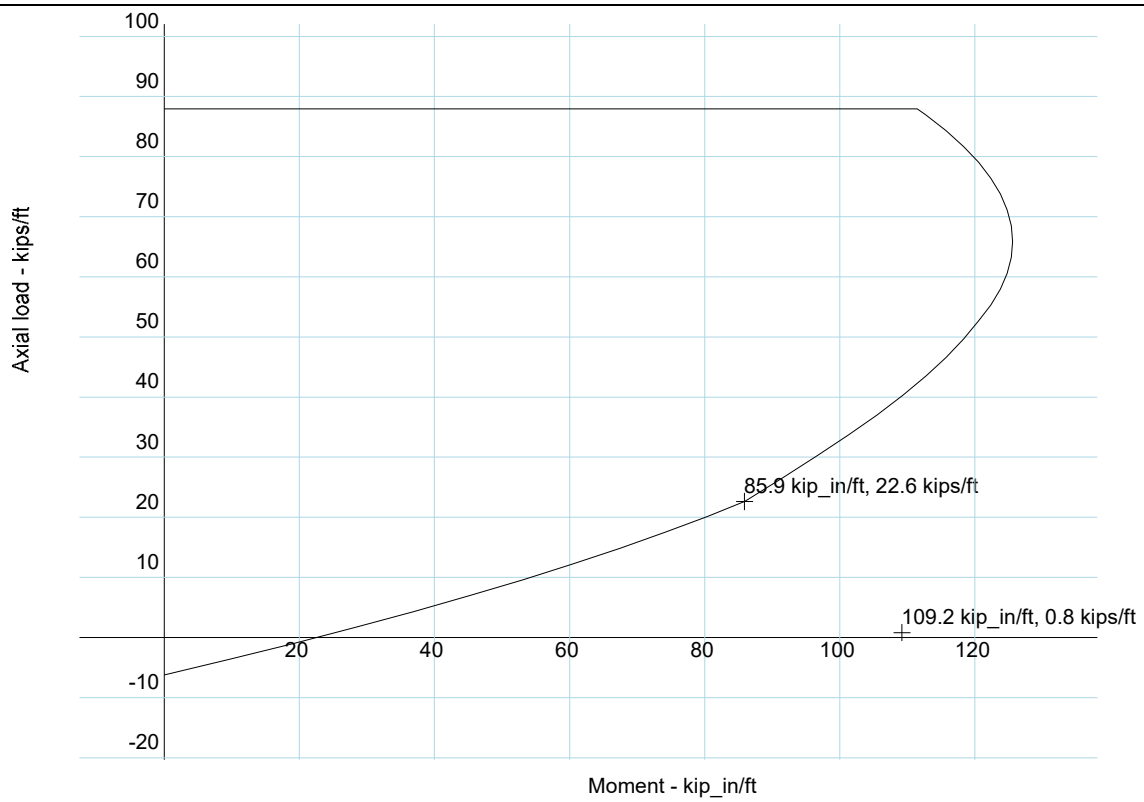
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By iteration	$M_{u0} = M =$ **102214** lb_in/ft
	$\delta_{u0} = M_{cr} \times h^2 / (4 \times E_m \times I) + (M_{u0} - M_{cr}) \times h^2 / (4 \times E_m \times I_{cr}) =$ **7.873** in
	$M_{u1} = M_{u0} + P \times \delta_{u0} =$ **108666** lb_in/ft
	$\delta_{u1} = M_{cr} \times h^2 / (4 \times E_m \times I) + (M_{u1} - M_{cr}) \times h^2 / (4 \times E_m \times I_{cr}) =$ **8.476** in
	$M_{u2} = M_{u0} + P \times \delta_{u1} =$ **109160** lb_in/ft
	$\delta_{u2} = M_{cr} \times h^2 / (4 \times E_m \times I) + (M_{u2} - M_{cr}) \times h^2 / (4 \times E_m \times I_{cr}) =$ **8.522** in
Bending moment at bottom of panel	$M = M_{u0} + P \times \delta_{u2} =$ **109198** lb_in/ft
Depth of reinforcement	$d =$ **3.813** in
Effective width per bar	$b_{eff} = \min(s, 6 \times t_{nom}, 72 \text{ in}) =$ **32** in
Strength reduction factor	$\phi =$ **0.9**
Tensile strain in reinforcement	$\varepsilon_s = f_y / E_s =$ **0.0021**
Maximum usable compressive strain of masonry	$\varepsilon_{mu} =$ **0.0025**
Fiber of max.compressive strain to neutral axis	$c_{bal} = \varepsilon_{mu} \times d / (\varepsilon_{mu} + \varepsilon_s) =$ **2.086** in
Tensile force at balance point	$T_{bal} = A_s \times f_y =$ **6903** lb/ft
	$\beta_1 =$ **0.8**
Compressive force at balance point	$C_{bal} = 0.8 \times f'_m \times \beta_1 \times c_{bal} =$ **32042** lb/ft
Design axial force at balance point	$P_{bal} = \phi \times (C_{bal} - T_{bal}) =$ **22625** lb/ft
Design moment at balance point	$M_{bal} = \phi \times [T_{bal} \times (d - t / 2) + C_{bal} \times (t / 2 - \beta_1 \times c_{bal} / 2)] =$ **85882** lb_in/ft
Maximum design moment from interaction diagram	$M_c =$ **25334** lb_in/ft
	$M / M_c =$ **4.310**
	FAIL - Combination of applied axial load and flexure is unacceptable
Maximum area of tensile reinforcement (9.3.3.2)	$A_{s\_max} = 0.64 \times f'_m \times [\varepsilon_{mu} / (\varepsilon_{mu} + 1.5 \times \varepsilon_s)] \times d / f_y =$ **0.435** in^2/ft
	PASS - Area of reinforcement provided is less than maximum allowable

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Strength interaction diagram

Consider wall at bottom under load combination no.7

Shear force	V = **1635** lb/ft
Compressive force	N_u = **819** lb/ft
Net shear area	A_{nv} = d = **45.750** in^2/ft
Nominal shear strength	$V_n = \min([4 - 1.75 \times \min(M / (V \times d), 1)] \times A_{nv} \times \sqrt{(f'_m \times 1\ psi)} + 0.25 \times N_u, 4 \times A_{nv} \times \sqrt{(f'_m \times 1\ psi)})$ = **4808** lb/ft
Strength reduction factor	ϕ_v = **0.8**
Design shear strength	$\phi_v \times V_n$ = **3847** lb/ft
	$V / (\phi_v \times V_n)$ = **0.425**

PASS - Design shear strength exceeds applied shear strength

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MASONRY WALL FAILURE ANALYSIS

MASONRY WALL PANEL DESIGN (TMS 402/602-16)

In accordance with strength design method

Tedds calculation version 2.2.09

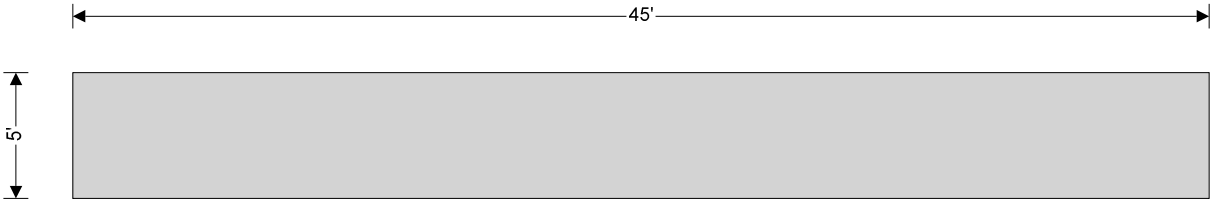
Masonry wall panel details

Reinforced single-wythe wall, the wall is free at the top and fixed at the bottom for out of plane loads

The wall is fixed at the bottom and free at the top for in plane loads

Panel length L = **45** ft

Panel height h = **5** ft



Seismic properties

Seismic design category A

Seismic importance factor (ASCE7 Table 1.5-2) I_e = **1**

Design spectral response acceleration parameter, short periods (IBC 1613.2.4 or ASCE7 11.4.5)

S_{DS} = **1**

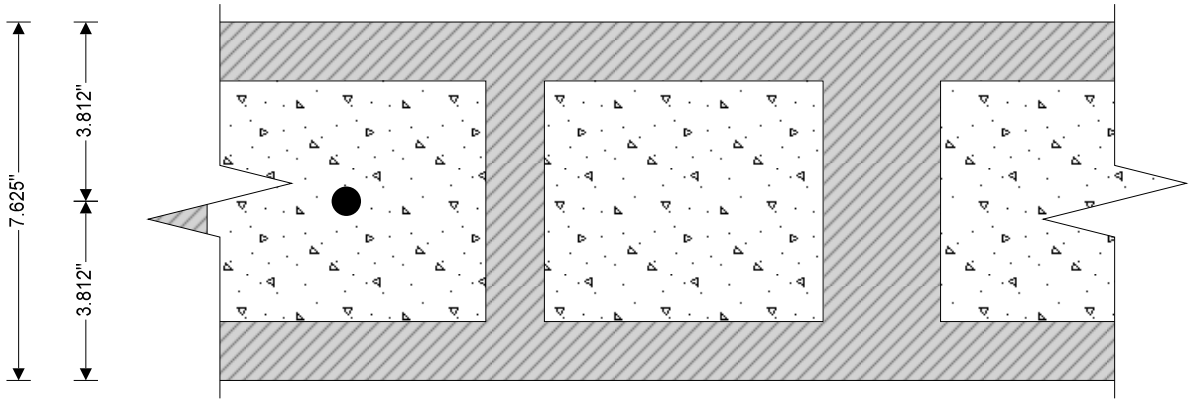
Seismic wall classification Nonparticipating

No prescriptive minimum seismic reinforcement

Redundancy factor, on out-of-plane load ρ_E = **1.0**

Construction details

Wall thickness t = **7.625** in



Masonry details

Hollow concrete units fully grouted in running bond fully bedded with PCL class M mortar

Compressive strength of unit f'_{cu} = **2000** psi

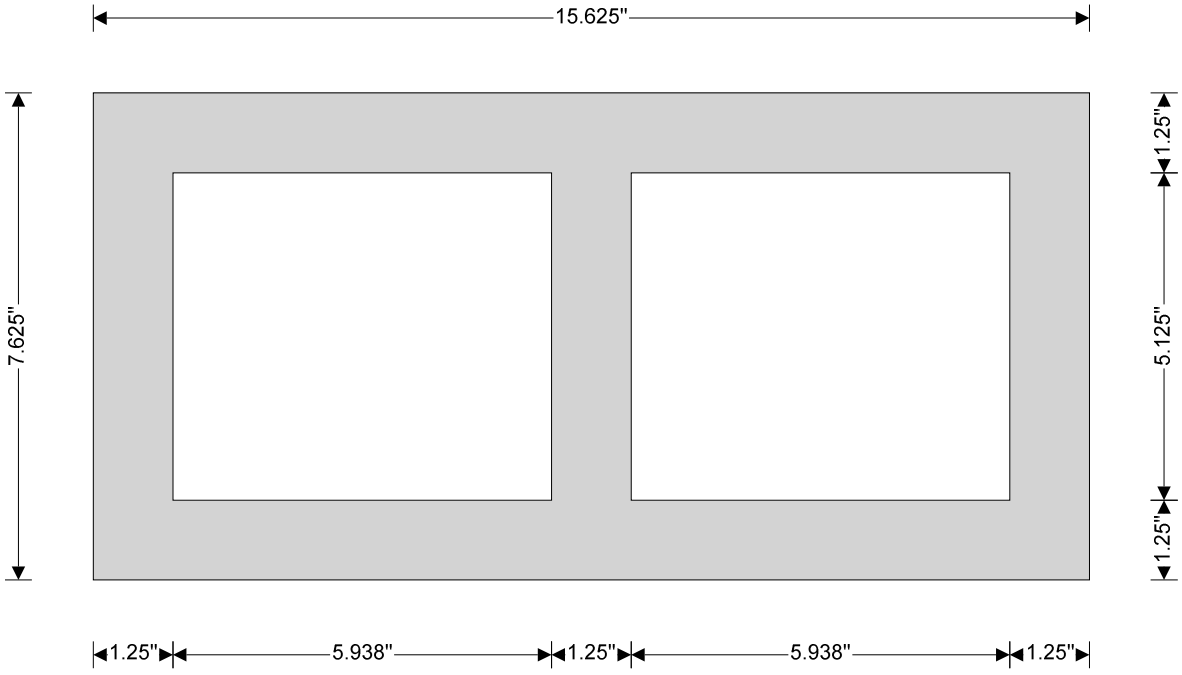
Density of masonry units γ_{block} = **135** lb/ft^3

Height of masonry units h_b = **7.625** in

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Length of masonry units	l_b = **15.625** in
Number of internal webs	N_{web} = **1**
Number of end webs	N_{end} = **2**
Internal web thickness	t_{bw} = **1.25** in
Face shell thickness	t_{bf} = **1.25** in
End web thickness	t_{be} = **1.25** in
Area of block	$A_{block} = [t \times l_b - (l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})] / l_b$ = **44.76** in^2/ft
Area of grout	$A_{grout} = [(l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})] / l_b$ = **46.74** in^2/ft
Density of grout	γ_{grout} = **140** lb/ft^3
Self weight of wall	$w_{SW} = A_{block} \times \gamma_{block} + A_{grout} \times \gamma_{grout}$ = **87.4** psf



From TMS 602-16 Table 2 - Compressive strength of masonry

Net compressive strength of masonry	f'_m = **2000** psi
Modulus of elasticity for masonry	$E_m = 900 \times f'_m$ = **1800000** psi
Shear modulus of masonry	$G_v = 0.4 \times E_m$ = **720000** psi

From TMS 402 -16 Table 9.1.9.2 - Modulus of rupture

Modulus of rupture normal to bed	f_{r_norm} = **163** psi
Modulus of rupture parallel to bed	f_{r_para} = **267** psi

Reinforcement details

Yield strength of reinforcement	f_y = **60000** psi
Allowable tensile stress in reinforcement	F_s = **32000** psi
Modulus of elasticity for reinforcement	E_s = **29000000** psi
Vertical reinforcement provided	No.5 bars at 32 in centers
Area of vertical reinforcement	$A_s = \pi \times Dia^2 / (4 \times s)$ = **0.12** in^2/ft

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Lateral out-of-plane loads

Wind load on panel	W = **157** psf
Wind load on parapet	W_p = **18** psf
Seismic load factor (ASCE7 12.11.1)	$F_p = 0.4 \times S_{DS} \times I_e$ = **0.4**
Seismic load from wall	$E_{wall} = \max(F_p, 0.1) \times w_{SW}$ = **35** psf
Additional seimic load	E_{add} = **0** psf
Seismic lateral load on panel	$E = E_{wall} + E_{add}$ = **35** psf

Lateral in-plane loads

Vertical loading details

Vertical seismic load factor applied to dead load	$F_{Ev} = 0.2 \times S_{DS}$ = **0.2**

From IBC 2018 cl.1605.2 - Basic load combinations (Utilization)

Load combination no.1	$1.4 \times DL$ (0.006)
Load combination no.4	$1.2 \times DL + 1.6 \times (LL_r$ or SL or RL) $+ 0.5 \times W$ (0.484)
Load combination no.7	$0.9 \times DL + W$ (0.989)

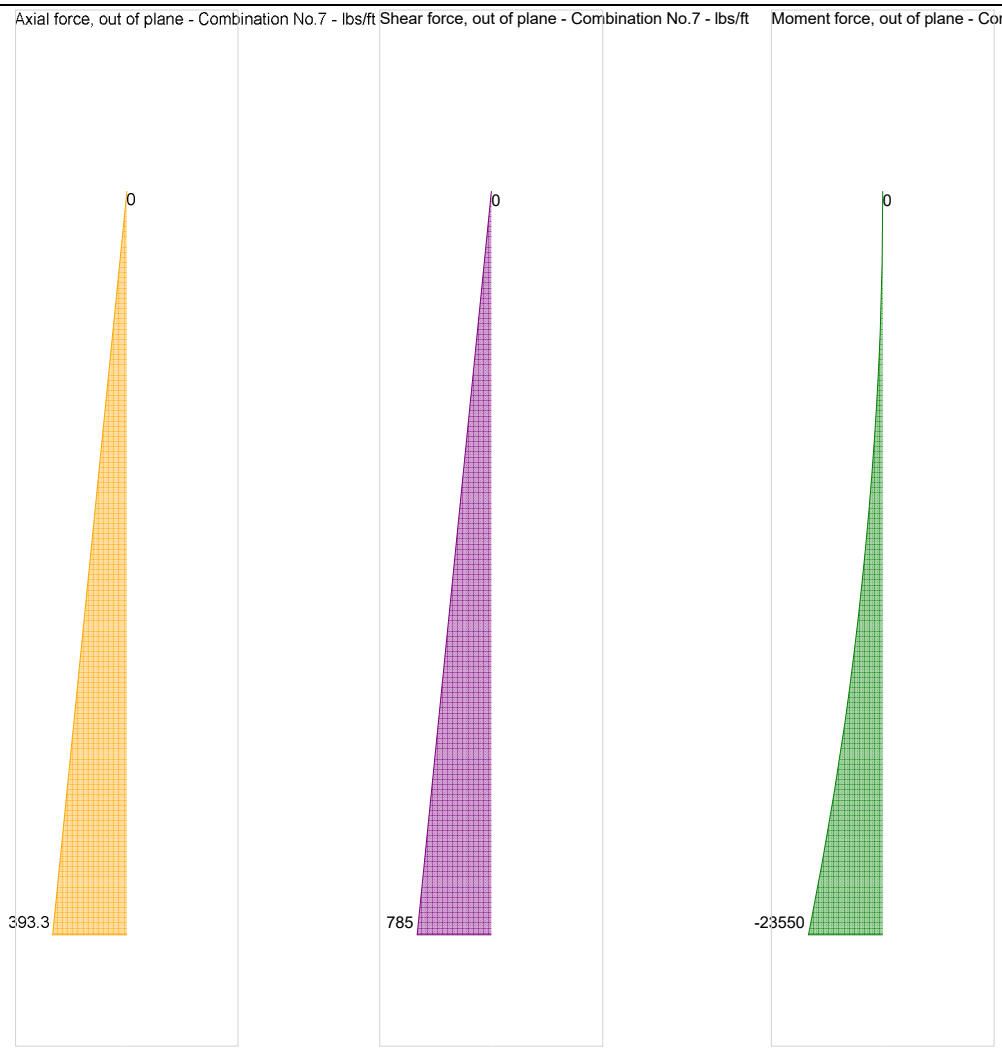
Properties of masonry section

Cross-sectional area	$A = t$ = **91.5** in^2/ft
Properties for walls loaded out-of-plane:	
Moment of inertia	$I = t^3 / 12$ = **443.3** in^4/ft
Section modulus	$S = I / c$ = **116.3** in^3/ft
Radius of gyration	$r = \sqrt{[I / A]}$ = **2.201** in
Effective height factor	K = **1**

Consider wall at bottom under load combination no.7

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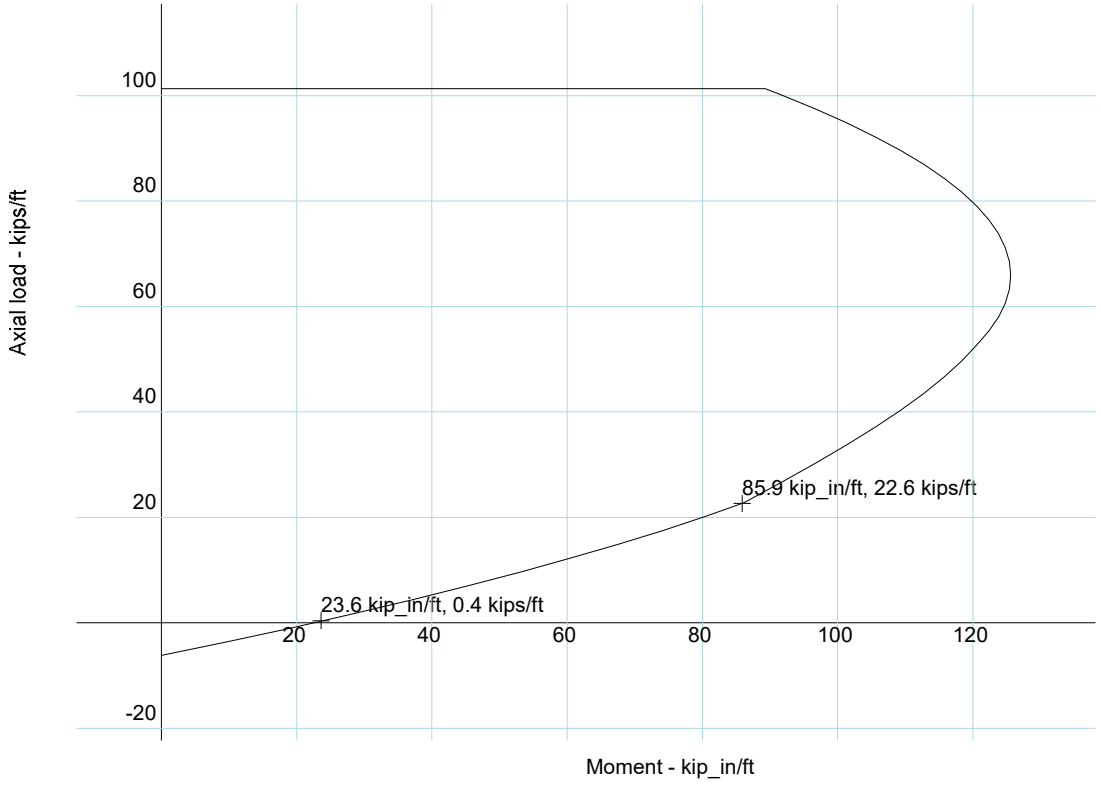


Axial load at bottom of panel	P = **393** lb/ft
Slenderness ratio	$(K \times h) / r$ = **27.259** < 99
Nominal axial strength	$P_n = 0.8 \times (0.8 \times f'_m \times (A - A_s) + A_s \times 0\ ksi) \times [1 - ((K \times h) / (140 \times r))^2]$ = **112538** lb/ft
Strength reduction factor	ϕ = **0.9**
Design axial strength	$\phi \times P_n$ = **101285** lb/ft
	$P / (\phi \times P_n)$ = **0.004**
	PASS - Nominal axial strength exceeds axial load
Factored axial stress	P / t = **4** psi
Factored axial stress limit	$0.2 \times f'_m$ = **400** psi
	PASS - Allowable stress under out of plane loads exceeds factored axial stress
Nominal cracking moment strength	$M_{cr} = S \times f_{r\_norm}$ = **18954** lb_in/ft
Modular ratio	$n = E_s / E_m$ = **16.111**
Distance to neutral axis	$c_{cr} = (A_s \times f_y + P) / (0.64 \times f'_m)$ = **0.475** in
Moment of inertia of cracked section	$I_{cr} = n \times (A_s + P \times t / (f_y \times 2 \times d)) \times (d - c_{cr})^2 + c_{cr}^3 / 3$ = **22.3** in^4/ft

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By iteration	$M_{u0} = M =$ **23550** lb_in/ft
	$\delta_{u0} = M_{cr} \times h^2 / (4 \times E_m \times I) + (M_{u0} - M_{cr}) \times h^2 / (4 \times E_m \times I_{cr}) =$ **0.125** in
	$M_{u1} = M_{u0} + P \times \delta_{u0} =$ **23599** lb_in/ft
	$\delta_{u1} = M_{cr} \times h^2 / (4 \times E_m \times I) + (M_{u1} - M_{cr}) \times h^2 / (4 \times E_m \times I_{cr}) =$ **0.126** in
Bending moment at bottom of panel	$M = M_{u0} + P \times \delta_{u1} =$ **23599** lb_in/ft
Depth of reinforcement	$d =$ **3.813** in
Effective width per bar	$b_{eff} = \min(s, 6 \times t_{nom}, 72 \text{ in}) =$ **32** in
Strength reduction factor	$\phi =$ **0.9**
Tensile strain in reinforcement	$\varepsilon_s = f_y / E_s =$ **0.0021**
Maximum usable compressive strain of masonry	$\varepsilon_{mu} =$ **0.0025**
Fiber of max.compressive strain to neutral axis	$c_{bal} = \varepsilon_{mu} \times d / (\varepsilon_{mu} + \varepsilon_s) =$ **2.086** in
Tensile force at balance point	$T_{bal} = A_s \times f_y =$ **6903** lb/ft
	$\beta_1 =$ **0.8**
Compressive force at balance point	$C_{bal} = 0.8 \times f'_m \times \beta_1 \times c_{bal} =$ **32042** lb/ft
Design axial force at balance point	$P_{bal} = \phi \times (C_{bal} - T_{bal}) =$ **22625** lb/ft
Design moment at balance point	$M_{bal} = \phi \times [T_{bal} \times (d - t / 2) + C_{bal} \times (t / 2 - \beta_1 \times c_{bal} / 2)] =$ **85882** lb_in/ft
Maximum design moment from interaction diagram	$M_c =$ **23872** lb_in/ft
	$M / M_c =$ **0.989**
	PASS - Combination of applied axial load and flexure is acceptable
Maximum area of tensile reinforcement (9.3.3.2)	$A_{s\_max} = 0.64 \times f'_m \times [\varepsilon_{mu} / (\varepsilon_{mu} + 1.5 \times \varepsilon_s)] \times d / f_y =$ **0.435** in^2/ft
	PASS - Area of reinforcement provided is less than maximum allowable



Strength interaction diagram

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Consider wall at bottom under load combination no.7

Shear force	V = **785** lb/ft
Compressive force	N_u = **393** lb/ft
Net shear area	$A_{nv} = d$ = **45.750** in^2/ft
Nominal shear strength	$V_n = \min([4 - 1.75 \times \min(M / (V \times d), 1)] \times A_{nv} \times \sqrt{(f'_m \times 1\ psi)} + 0.25 \times N_u, 4 \times A_{nv} \times \sqrt{(f'_m \times 1\ psi)})$ = **4702** lb/ft
Strength reduction factor	ϕ_v = **0.8**
Design shear strength	$\phi_v \times V_n$ = **3761** lb/ft
	$V / (\phi_v \times V_n)$ = **0.209**
	PASS - Design shear strength exceeds applied shear strength

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Company:		Page:	1
Address:		Specifier:	
Phone I Fax:	|	E-Mail:	
Design:	STORM SHELTER LID EMBED BREAKOUT STREN	Date:	1/31/2022
Fastening point:			

Specifier's comments:

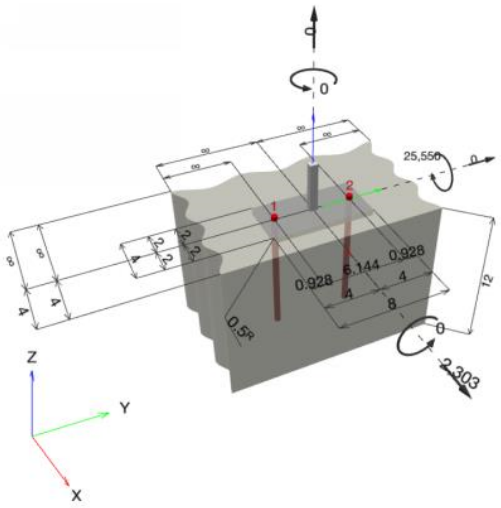
1 Input data



Anchor type and diameter:	**AWS D1.1 GR. B 1/2**
Item number:	not available
Effective embedment depth:	h_{ef} = 10.000 in.
Material:	
Evaluation Service Report:	Hilti Technical Data
Issued I Valid:	- | -
Proof:	Design Method ACI 318-08 / CIP
Stand-off installation:	e_b = 0.000 in. (no stand-off); t = 0.500 in.
Anchor plate[R]:	l_x x l_y x t = 4.000 in. x 8.000 in. x 0.500 in.; (Recommended plate thickness: not calculated)
Profile:	Rectangular plates and bars (AISC), 1/2 - 5/8; (L x W x T) = 0.500 in. x 0.625 in.
Base material:	cracked concrete, 4000, f_c' = 4,000 psi; h = 12.000 in.
Reinforcement:	tension: condition B, shear: condition B; edge reinforcement: none or < No. 4 bar
Seismic loads (cat. C, D, E, or F)	no

[R] - The anchor calculation is based on a rigid anchor plate assumption.

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



Input data and results must be checked for conformity with the existing conditions and for plausibility!
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Design:	STORM SHELTER LID EMBED BREAKOUT STREN	Date:	1/31/2022
Fastening point:			

1.1 Design results

Case	Description	Forces [lb] / Moments [in.lb]	Seismic	Max. Util. Anchor [%]
1	Combination 1	N = 0; V_x = 2,303; V_y = 0; M_x = 0; M_y = 25,550; M_z = 0;	no	98

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2 Proof I Utilization (Governing Cases)

		Design values [lb]		Utilization	
Loading	**Proof**	**Load**	**Capacity**	**β_N / β_V [%]**	**Status**
Tension	Steel Strength	7,459	9,555	79 / -	OK
Shear	Concrete edge failure in direction x+	2,303	4,592	- / 51	OK

Loading	**β_N**	**β_V**	**ζ**	**Utilization $\beta_{N,V}$ [%]**	**Status**
Combined tension and shear loads	0.781	0.502	5/3	98	OK

3 Warnings

- Please consider all details and hints/warnings given in the detailed report!

Fastening meets the design criteria!

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ROOF FIXED BASE COLUMNS

STEEL MEMBER ANALYSIS & DESIGN (AISC 360)

In accordance with AISC360 15th Edition published 2016 using the ASD method

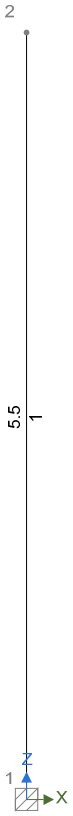
Tedds calculation version 4.4.08

ANALYSIS

Tedds calculation version 1.0.37

Geometry

Geometry (ft) - Steel (AISC) - HSS 4x4x3/8



Span	Length (ft)	Section	Start Support	End Support
1	5.5	HSS 4x4x3/8	Fixed	Free
HSS 4x4x3/8: Area 5 in^2, Inertia Major 10 in^4, Inertia Minor 10 in^4, Shear area parallel to Minor 2 in^2, Shear area parallel to Major 2 in^2				
Steel (AISC): Density 490 lbm/ft^3, Youngs 29000 ksi, Shear 11200 ksi, Thermal 0.000012 $°C^{-1}$				

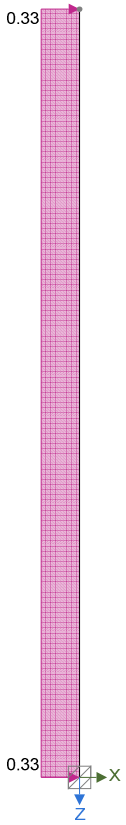
Loading

Self weight included

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Wind - Loading (kips/ft)



Load combination factors

Load combination	Self Weight	Dead	Live	Wind
1.0D + 1.0L (Strength)	1.00	1.00	1.00	
1.0D + 0.75L + 0.75S + 0.45W (Strength)	1.00	1.00	0.75	0.45
0.6D + 0.6W (Strength)	0.60	0.60		0.60

Member Loads

Member	Load case	Load Type	Orientation	Description
Member1	Wind	UDL	GlobalX	0.33 kips/ft

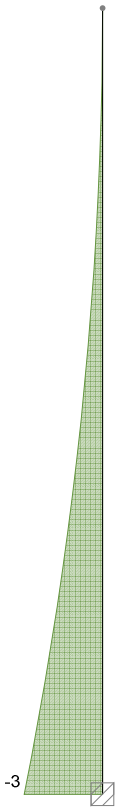
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Results

Forces

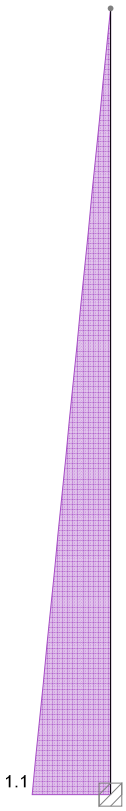
Strength combinations - Moment envelope (kip_ft)



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Strength combinations - Shear envelope (kips)



Safety factors

Shear	Ω_v = **1.67**
Flexure	Ω_b = **1.67**
Tensile yielding	$\Omega_{t,y}$ = **1.67**
Tensile rupture	$\Omega_{t,r}$ = **2.00**
Compression	Ω_c = **1.67**

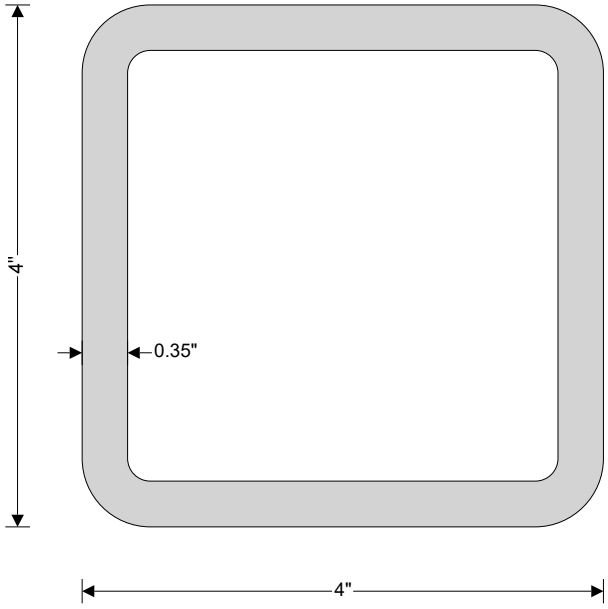
Member1 design

Section details

Section type	HSS 4x4x3/8 (AISC 15th Edn (v15.0))
ASTM steel designation	A500 Gr.B
Steel yield stress	F_y = **46** ksi
Steel tensile stress	F_u = **58** ksi
Modulus of elasticity	E = **29000** ksi

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HSS 4x4x3/8 (AISC 15th Edn (v15.0))
Section depth, d, 4 in
Section breadth, b_f, 4 in
Weight of section, Weight, 17.3 lbf/ft
Section thickness, t, 0.349 in
Area of section, A, 4.8 in^2
Radius of gyration about x-axis, r_x, 1.47 in
Radius of gyration about y-axis, r_y, 1.47 in
Elastic section modulus about x-axis, S_x, 5.13 in^3
Elastic section modulus about y-axis, S_y, 5.13 in^3
Plastic section modulus about x-axis, Z_x, 6.39 in^3
Plastic section modulus about y-axis, Z_y, 6.39 in^3
Second moment of area about x-axis, I_x, 10.3 in^4
Second moment of area about y-axis, I_y, 10.3 in^4

Lateral restraint

Both flanges have lateral restraint at supports only

Consider Combination 3 - 0.6D + 0.6W (Strength)

Classification of sections for local buckling - Section B4

Classification of flanges in flexure - Table B4.1b (case 17)

Width to thickness ratio	$(b_f - 3 \times t) / t$ = **8.46**	
Limiting ratio for compact section	$\lambda_{pff} = 1.12 \times \sqrt{[E / F_y]}$ = **28.12**	
Limiting ratio for non-compact section	$\lambda_{rff} = 1.40 \times \sqrt{[E / F_y]}$ = **35.15**	Compact

Classification of web in flexure - Table B4.1b (case 19)

Width to thickness ratio	$(d - 3 \times t) / t$ = **8.46**	
Limiting ratio for compact section	$\lambda_{pwf} = 2.42 \times \sqrt{[E / F_y]}$ = **60.76**	
Limiting ratio for non-compact section	$\lambda_{rwf} = 5.70 \times \sqrt{[E / F_y]}$ = **143.12**	Compact

Section is compact in flexure

Classification of flanges in uniform compression - Table B4.1a (case 6)

Width to thickness ratio	$(b_f - 3 \times t) / t$ = **8.46**	
Limiting ratio for non-compact section	$\lambda_{rfc} = 1.40 \times \sqrt{[E / F_y]}$ = **35.15**	Nonslender

Classification of web in uniform compression - Table B4.1a (case 6)

Width to thickness ratio	$(d - 3 \times t) / t$ = **8.46**	
Limiting ratio for non-compact section	$\lambda_{rwc} = 1.40 \times \sqrt{[E / F_y]}$ = **35.15**	Nonslender

Section is nonslender in compression

Check design at start of span

Design of members for compression - Chapter E

Required compressive strength P_r = **0.1** kips

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Slenderness limitations and effective length - Section E2

Unbraced length	$L_{b,x} = L_{m1\_s1}$ = **5.5** ft
Effective length factor	K_x = **1.00**
Effective length	$L_{cb,x} = K_x \times L_{b,x}$ = **5.5** ft
Column slenderness	$\lambda_x = L_{cb,x} / r_x$ = **44.898**

Major axis column slenderness ratio does not exceed recommended limit of 200

Slenderness limitations and effective length - Section E2

Unbraced length	$L_{b,y} = L_{m1\_s1\_seg1}$ = **5.5** ft
Effective length factor	K_y = **1.00**
Effective length	$L_{cb,y} = K_y \times L_{b,y}$ = **5.5** ft
Column slenderness	$\lambda_y = L_{cb,y} / r_y$ = **44.898**

Minor axis column slenderness ratio does not exceed recommended limit of 200

Flexural buckling of members without slender elements - Section E3

Elastic critical buckling stress - eq E3-4	$F_{e,x} = \pi^2 \times E / (L_{cb,x} / r_x)^2$ = **142** ksi
Flexural buckling stress - eq E3-2	$F_{cr,x} = [0.658^{F_y / F_{e,x}}] \times F_y$ = **40.2** ksi
Nominal compressive strength for flexural buckling - eq E3-1	
	$P_{n,fb,x} = F_{cr,x} \times A$ = **192** kips
Elastic critical buckling stress - eq E3-4	$F_{e,y} = \pi^2 \times E / (L_{cb,y} / r_y)^2$ = **142** ksi
Flexural buckling stress - eq E3-2	$F_{cr,y} = [0.658^{F_y / F_{e,y}}] \times F_y$ = **40.2** ksi
Nominal compressive strength for flexural buckling - eq E3-1	
	$P_{n,fb,y} = F_{cr,y} \times A$ = **192** kips

Allowable compressive strength - E1

Nominal compressive strength	$P_n = \min(P_{n,fb,x}, P_{n,fb,y})$ = **192** kips
Allowable compressive strength	$P_c = P_n / \Omega_c$ = **115** kips
	P_r / P_c = **0.000**

PASS - Nominal compressive strength exceeds required compressive strength

Design of members for shear - Chapter G

Required shear strength	$V_{r,x}$ = **1.1** kips
Web area	$A_w = 2 \times (d - 3 \times t) \times t$ = **2.061** in^2
Web plate buckling coefficient	k_v = **5**
	$(d - 3 \times t) / t <= 1.10 \times \sqrt{(k_v \times E / F_y)}$
Web shear coefficient - eq G2-9	C_{v2} = **1.000**
Nominal shear strength - eq G4-1	$V_{n,x} = 0.6 \times F_y \times A_w \times C_{v2}$ = **56.9** kips
Safety factor	Ω_v = 1.67
Allowable shear strength	$V_{c,x} = V_{n,x} / \Omega_v$ = **34.1** kips
	$V_{r,x} / V_{c,x}$ = **0.032**

PASS - Allowable shear strength exceeds required shear strength

Design of members for flexure - Chapter F

Required flexural strength	$M_{r,x}$ = **3** kips_ft

Yielding - Section F7.1

Nominal flexural strength for yielding - eq F7-1	$M_{n,yld,x} = M_{p,x} = F_y \times Z_x$ = **24.5** kips_ft

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Allowable flexural strength - F1

Nominal flexural strength — $M_{n,x} = M_{n,yld,x} =$ **24.5** kips_ft

Allowable flexural strength — $M_{c,x} = M_{n,x} / \Omega_b =$ **14.7** kips_ft

$M_{r,x} / M_{c,x} =$ **0.205**

PASS - Allowable flexural strength exceeds required flexural strength

Design of members for combined forces - Chapter H

Combined flexure and axial force - eq H1-1b — $P_r / (2 \times P_c) + M_{r,x} / M_{c,x} =$ **0.205**

PASS - Combined flexure and axial force is within acceptable limits

Check design at end of span

Design of members for x-x axis deflection

Maximum deflection — $\delta_x =$ **0.132** in

Allowable deflection — $\delta_{x,Allowable} = L_{m1\_s1} / 180 =$ **0.367** in

$\delta_x / \delta_{x,Allowable} =$ **0.359**

PASS - Allowable deflection exceeds design deflection

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HIGH ROOF WEAK AXIS BEAMS

STEEL MEMBER ANALYSIS & DESIGN (AISC 360)

In accordance with AISC360 15th Edition published 2016 using the ASD method

Tedds calculation version 4.4.08

ANALYSIS

Tedds calculation version 1.0.37

Geometry

Geometry (ft) - Steel (AISC) - W 14x22

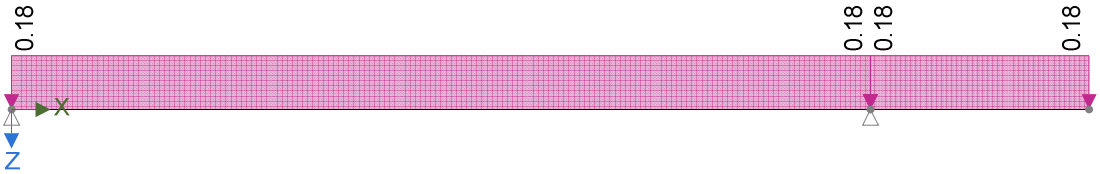


Span	Length (ft)	Section	Start Support	End Support
1	17.67	W 14x22	Pinned	Pinned
2	4.5	W 14x22	Pinned	Free
W 14x22: Area 6 in^2, Inertia Major 199 in^4, Inertia Minor 7 in^4, Shear area parallel to Minor 3 in^2, Shear area parallel to Major 3 in^2				
Steel (AISC): Density 490 lbm/ft^3, Youngs 29000 ksi, Shear 11200 ksi, Thermal 0.000012 $°C^{-1}$				

Loading

Self weight included

Wind - Loading (kips/ft)



Load combination factors

Load combination	Self Weight	Dead	Live	Wind
1.0D + 1.0L (Strength)	1.00	1.00	1.00	
1.0D + 0.6W (Strength)	1.00	1.00		0.60
0.6D + 0.6W (Strength)	0.60	0.60		0.60

Member Loads

Member	Load case	Load Type	Orientation	Description
Member1	Wind	UDL	GlobalZ	0.18 kips/ft

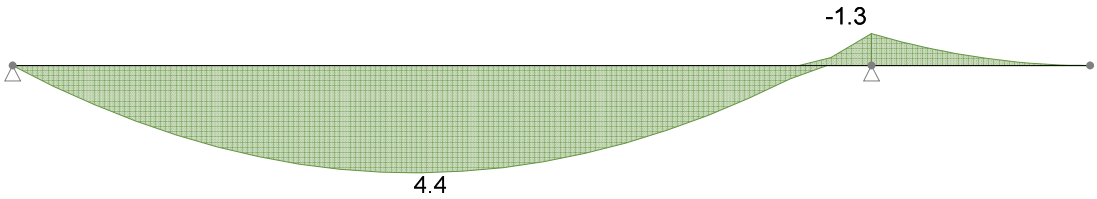
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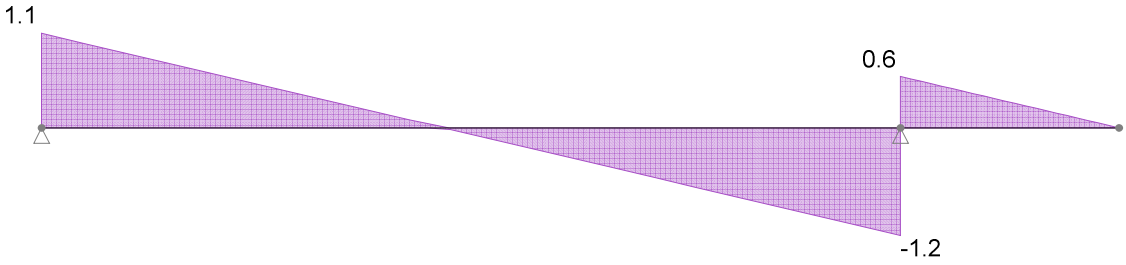
Results

Forces

Strength combinations - Moment envelope (kip_ft)



Strength combinations - Shear envelope (kips)



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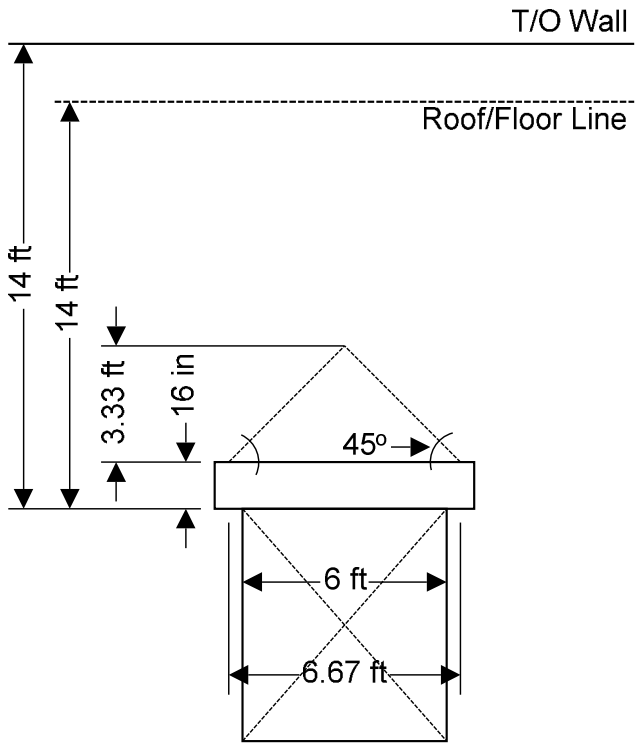
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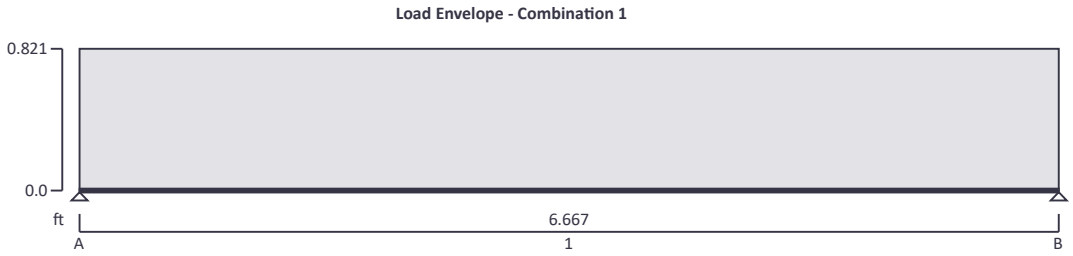
6" MASONRY LINTEL

MASONRY LINTEL ANALYSIS AND DESIGN TO TMS/MSJC 2011

Using the allowable stress design method

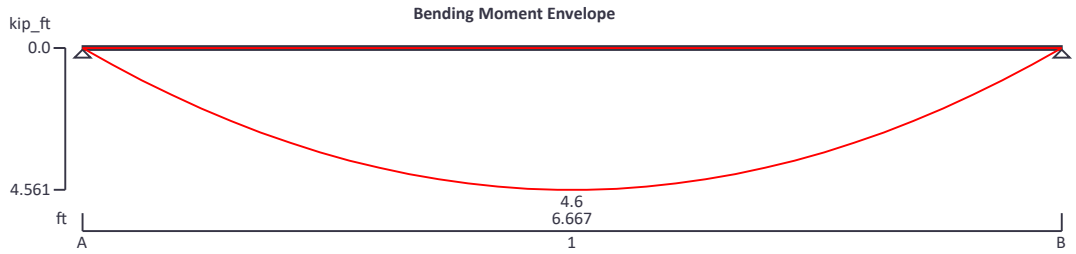
Tedds calculation version 1.2.02

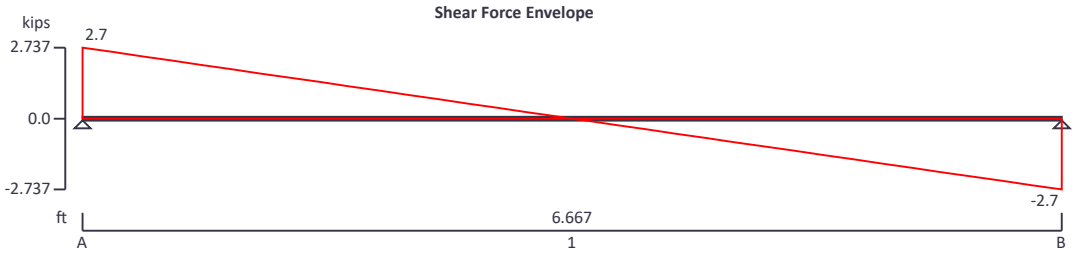




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Support conditions

Support A	Vertically restrained
	Rotationally free
Support B	Vertically restrained
	Rotationally free

Applied loading

Beam loads	Self - Dead self weight of beam × 1
	Wall - Dead full UDL 735 lb/ft

Load combinations

Load combination 1	Support A	Dead × 1.00
		Live × 1.00
		Dead × 1.00
		Live × 1.00
	Support B	Dead × 1.00
		Live × 1.00

Analysis results

Maximum moment	M_{max} = **4.561** kip_ft	M_{min} = **0** kip_ft
Maximum shear	V_{max} = **2.74** kips	V_{min} = **-2.74** kips
Maximum reaction at support A	R_{A_max} = **2.7** kips	R_{A_min} = **2.7** kips
Unfactored dead load reaction at support A	R_{A_Dead} = **2.7** kips	
Maximum reaction at support B	R_{B_max} = **2.7** kips	R_{B_min} = **2.7** kips
Unfactored dead load reaction at support B	R_{B_Dead} = **2.7** kips	

Masonry details

Masonry type	Concrete

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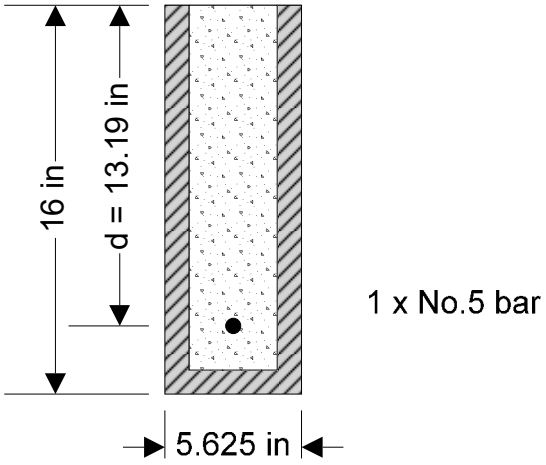
Density of masonry unit	$\gamma = 135$ lb/ft^3
Pattern bond	Running
Mortar type	PCL Type M
Compressive strength of masonry unit	$f'_{cu} = 1900$ psi
Net compressive strength of masonry (Table 2)	$f'_m = 1500$ psi
Modulus of elasticity (1.8.2.2.1)	$E_m = 900 \times f'_m =$ **1350000** psi
Allowable flexural tensile stress (Table 2.2.3.2)	$F_t = 106$ psi

Reinforcement details

Allowable tensile stress	$F_s = 32000$ psi
Modulus of elasticity of steel	$E_s = 29000000$ psi

Cover to reinforcement

Bottom cover to reinforcement	$c_{nom\_b} = 1.5$ in
Side cover to reinforcement	$c_{nom\_s} = 1.5$ in



Section properties

Modular ratio	$n = E_s / E_m =$ **21.48**
Section width	$b =$ **5.625** in
Section depth	$h =$ **16** in
Net shear area	$A_{nv} = b \times d =$ **74.19** in^2
Section modulus	$S = b \times h^2 / 6 =$ **240** in^3
Depth to tension reinforcement	$d =$ **13.19** in
Moment of inertia of net section	$I_n = b \times h^3 / 12 =$ **1920** in^4
Cracked moment of inertia	$I_{cr} = b \times (k \times d)^3 / 3 + n \times A_s \times (d - k \times d)^2 =$ **673.7** in^4

Flexure design (Chapter 2)

Tension reinforcement	1 x No. 5 bar
Area of tension reinforcement	$A_s = N_{bot} \times BarArea_{bot} =$ **0.31** in^2
Reinforcement ratio	$\rho_{ratio} = A_s / (b \times d) =$ **0.00418**
Neutral axis factor	$k = \sqrt{(2 \times \rho_{ratio} \times n + (\rho_{ratio} \times n)^2)} - \rho_{ratio} \times n =$ **0.343**

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Lever arm factor	$j = 1 - k / 3 =$ **0.886**
Cracking moment	$M_{cr} = 2.5 \times F_t \times S =$ **5.3** kip_ft
Design bending moment	M = **4.56** kip_ft
Tensile stress in reinforcement	$f_s = M / (A_s \times j \times d) =$ **15116** psi
Allowable tensile stress in reinf. (2.3.3.1)	$F_s =$ **32000** psi
Reinforcement stress ratio	$f_s / F_s =$ **0.472**
	PASS - Allowable tensile stress exceeds tensile stress due to flexure
Compressive stress in masonry	$f_b = 2 \times M / (j \times k \times b \times d^2) =$ **367.9** psi
Allowable stress in masonry (2.3.4.2.2)	$F_b = 0.45 \times f'_m =$ **675.0** psi
Masonry stress ratio	$f_b / F_b =$ **0.545**
	PASS - Allowable compressive stress exceeds compressive stress due to flexure

Shear design (Chapter 2)

Location of shear force	Face of support
Design shear force	V = **2.46** kips
Depth of shear area	d = **13.19** in
Moment shear relationship, M/Vd	Assume $M\_Vd_{ratio} = 1$
Shear stress (2-24)	$f_v = V / A_{nv} =$ **33.2** psi
Allowable masonry shear stress (2-28)	$F_v = 1/2 \times (4.0 - 1.75 \times M\_Vd_{ratio}) \times \sqrt{(f'_m \times 1psi)}$
	$F_v =$ **43.6** psi
Masonry shear stress ratio	$f_v / F_v =$ **0.762**
	PASS - Allowable shear stress exceeds shear stress in masonry

Deflection (1.13.1.4)

Deflection load combination	Dead
Moment at midspan under deflection loads	$M_a =$ **4.561** kip_ft
Effective moment of inertia (1-1)	$I_{eff} = \min(I_n \times (M_{cr} / M_a)^3 + I_{cr} \times (1 - (M_{cr} / M_a)^3), I_n) =$ **1920** in^4
Maximum instantaneous deflection	$\delta_{inst} =$ **0.01** in or span / 5683
Deflection limit	δ_{limit} =span / 600
	PASS - Deflection limit exceeds deflection of lintel

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MASONRY WALL ON GRID A

MASONRY WALL PANEL DESIGN (TMS 402/602-16)

In accordance with strength design method

Tedds calculation version 2.2.09

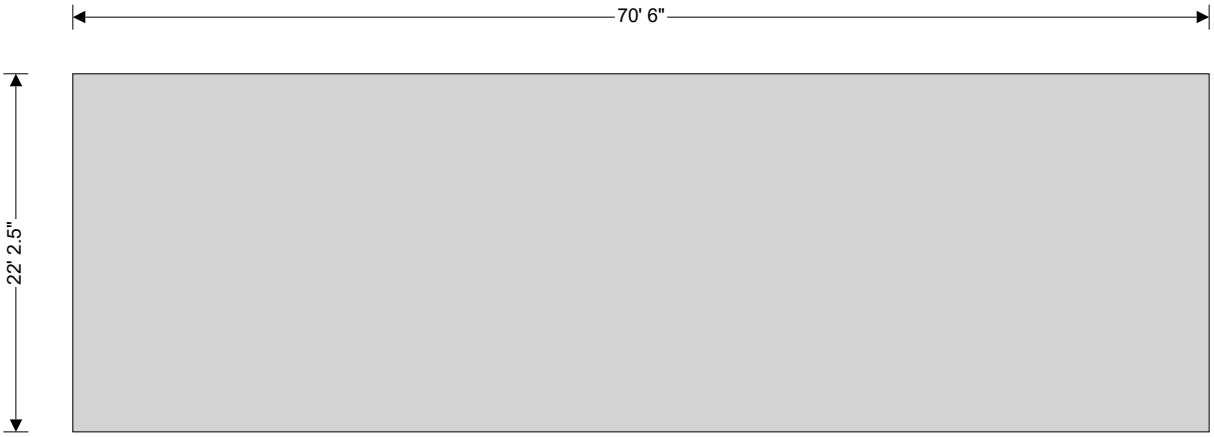
Masonry wall panel details

Reinforced single-wythe wall, the wall is pinned at the top and at the bottom for out of plane loads

The wall is fixed at the bottom and free at the top for in plane loads

Panel length L = **70.5** ft

Panel height h = **22.208** ft



Seismic properties

Seismic design category A

Seismic importance factor (ASCE7 Table 1.5-2) I_e = **1**

Design spectral response acceleration parameter, short periods (IBC 1613.2.4 or ASCE7 11.4.5)

S_{DS} = **1**

Seismic wall classification Nonparticipating

No prescriptive minimum seismic reinforcement

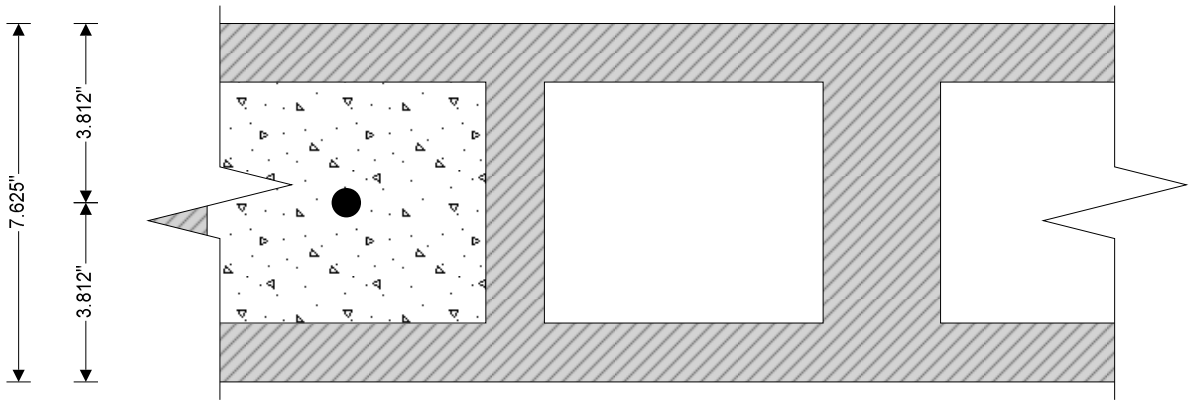
Redundancy factor, on out-of-plane load ρ_E = **1.0**

Construction details

Wall thickness t = **7.625** in

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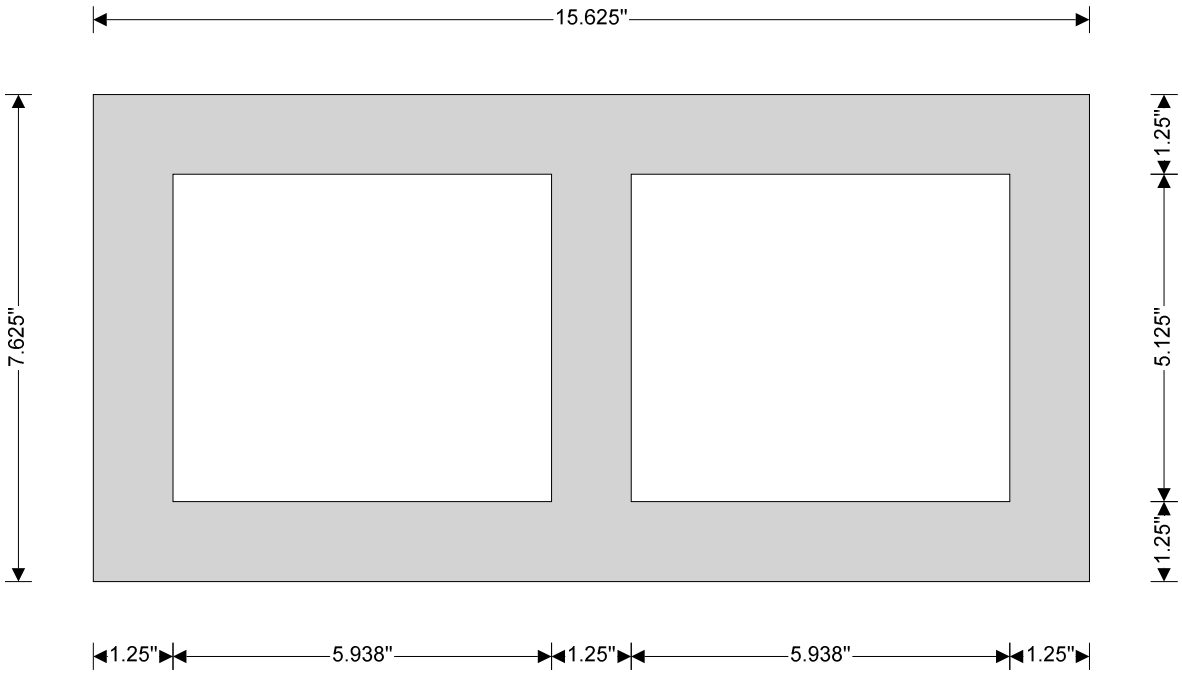
Masonry details

Hollow concrete units grouted at 24 in on center in running bond fully bedded with PCL class M mortar

Compressive strength of unit	f'_{cu} = **1900** psi
Density of masonry units	γ_{block} = **135** lb/ft^3
Height of masonry units	h_b = **7.625** in
Length of masonry units	l_b = **15.625** in
Number of internal webs	N_{web} = **1**
Number of end webs	N_{end} = **2**
Internal web thickness	t_{bw} = **1.25** in
Face shell thickness	t_{bf} = **1.25** in
End web thickness	t_{be} = **1.25** in
Area of block	$A_{block} = [t \times l_b - (l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})] / l_b$ = **44.76** in^2/ft
Area of grout	$A_{grout} = [0.33 \times (l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})] / l_b$ = **15.42** in^2/ft
Density of grout	γ_{grout} = **140** lb/ft^3
Self weight of wall	$w_{SW} = A_{block} \times \gamma_{block} + A_{grout} \times \gamma_{grout}$ = **56.96** psf

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From TMS 602-16 Table 2 - Compressive strength of masonry

Net compressive strength of masonry	f'_m = **1900** psi
Modulus of elasticity for masonry	$E_m = 900 \times f'_m$ = **1710000** psi
Shear modulus of masonry	$G_v = 0.4 \times E_m$ = **684000** psi

From TMS 402 -16 Table 9.1.9.2 - Modulus of rupture

Modulus of rupture normal to bed	f_{r_norm} = **110** psi
Modulus of rupture parallel to bed	f_{r_para} = **167** psi

Reinforcement details

Yield strength of reinforcement	f_y = **60000** psi
Allowable tensile stress in reinforcement	F_s = **32000** psi
Modulus of elasticity for reinforcement	E_s = **29000000** psi
Vertical reinforcement provided	No.5 bars at 24 in centers
Area of vertical reinforcement	$A_s = \pi \times Dia^2 / (4 \times s)$ = **0.15** in^2/ft

Lateral out-of-plane loads

Wind load on panel	W = **22** psf
Wind load on parapet	W_p = **18** psf
Seismic load factor (ASCE7 12.11.1)	$F_p = 0.4 \times S_{DS} \times I_e$ = **0.4**
Seismic load from wall	$E_{wall} = \max(F_p, 0.1) \times w_{SW}$ = **22.8** psf
Additional seimic load	E_{add} = **0** psf
Seismic lateral load on panel	$E = E_{wall} + E_{add}$ = **22.8** psf

Lateral in-plane loads

Wind shear load on wall	V_W = **8140** lbs
Wind moment load on wall	M_W = **171160** lbs_ft

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Vertical loading details

Dead load from above	DL_{above} = **750** lb/ft
Dead load at supported level	DL = **400** lb/ft at an eccentricity of 3 in
Snow load from above	SL_{above} = **750** lb/ft
Snow load at supported level	SL = **200** lb/ft
Vertical seismic load factor applied to dead load	$F_{Ev} = 0.2 \times S_{DS}$ = **0.2**

From IBC 2018 cl.1605.2 - Basic load combinations (Utilization)

Load combination no.1	$1.4 \times DL$ (0.120)
Load combination no.2	$1.2 \times DL + 1.6 \times LL + 0.5 \times (LL_r$ or SL or RL) (0.119)
Load combination no.4	$1.2 \times DL + 1.6 \times (LL_r$ or SL or RL) $+ 0.5 \times W$ (0.188)
Load combination no.5	$1.2 \times DL + W + LL + 0.5 \times (LL_r$ or SL or RL) (0.491)
Load combination no.7	$0.9 \times DL + W$ (0.502)

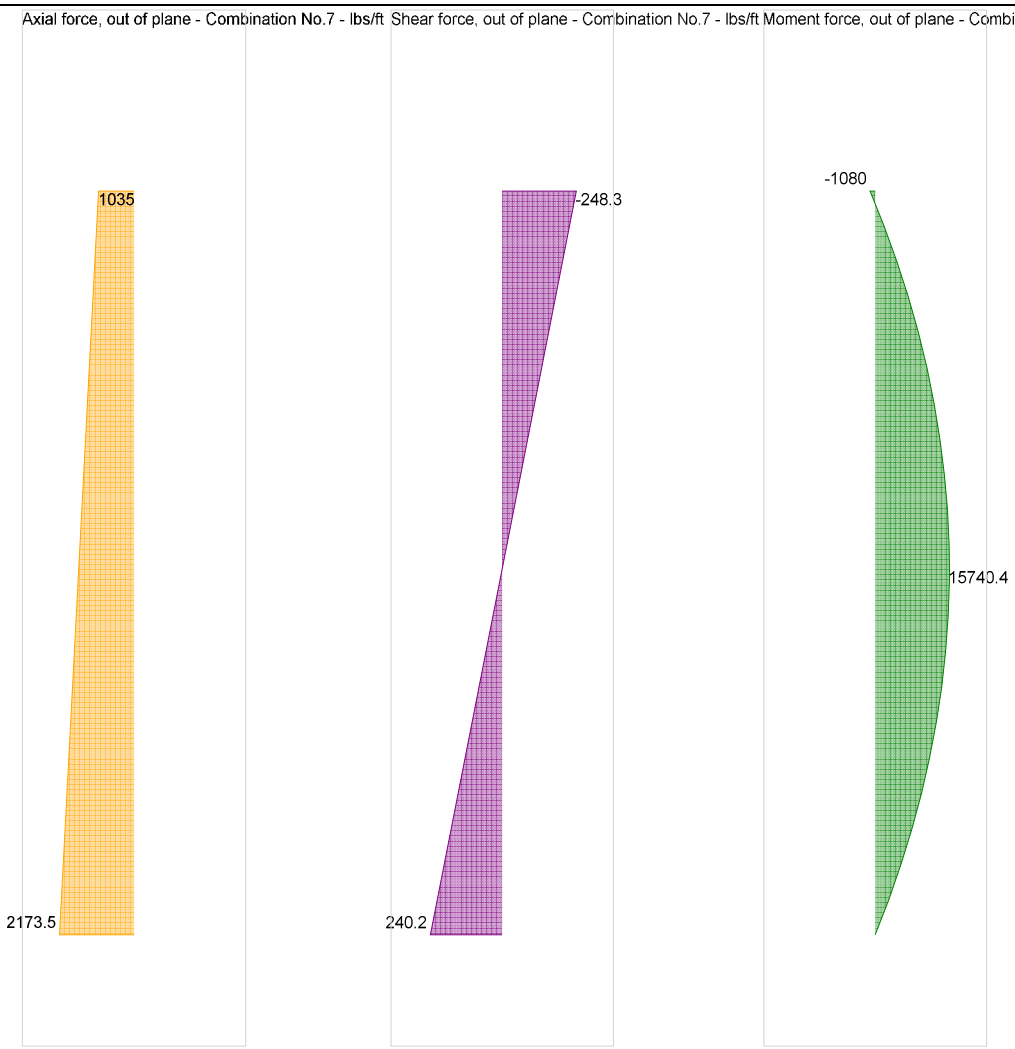
Properties of masonry section

Cross-sectional area	$A = [t \times l_b - 0.67 \times (l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})] / l_b$ = **60.2** in^2/ft
Properties for walls loaded out-of-plane:	
Moment of inertia	$I = t^3 / 12 - 0.67 \times (l_b - N_{web} \times t_{bw} - N_{end} \times t_{be}) \times (t - 2 \times t_{bf})^3 / (12 \times l_b)$ = **374.8** in^4/ft
Section modulus	$S = I / c$ = **98.3** in^3/ft
Radius of gyration	$r = \sqrt{[I / A]}$ = **2.495** in
Effective height factor	K = **1**
Properties for walls loaded in-plane:	
Net moment of inertia	$I_{x\_net} = t \times L^3 / 12 - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell1}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell2}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell4}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell5}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell7}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell8}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell10}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell11}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell13}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell14}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell16}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell17}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell19}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell20}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell22}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell23}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell25}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell26}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell28}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell29}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell31}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell32}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell34}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell35}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell37}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell38}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell40}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell41}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell43}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell44}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell46}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell47}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell49}^2) - 2 \times (I_{x\_cell} + A_{cell} \times x_{cell50}^2)$ = **269985408** in^4
Net section modulus	$S_{x\_net} = I_{x\_net} / (L / 2)$ = **638263** in^3

Consider wall at maximum moment location under load combination no.7

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Maximum moment location	10.92 ft
Axial load at mid-height of panel	P = **1614** lb/ft
Slenderness ratio	$(K \times h) / r$ = **106.795** > 99
Nominal axial strength	$P_n = 0.8 \times (0.8 \times f'_m \times (A - A_s) + A_s \times 0\ ksi) \times (70 \times r / (K \times h))^2$ = **31362** lb/ft
Strength reduction factor	ϕ = **0.9**
Design axial strength	$\phi \times P_n$ = **28226** lb/ft
	$P / (\phi \times P_n)$ = **0.057**
	PASS - Nominal axial strength exceeds axial load
Factored axial stress	P / t = **18** psi
Factored axial stress limit	$0.05 \times f'_m$ = **95** psi
	PASS - Allowable stress under out of plane loads exceeds factored axial stress
Nominal cracking moment strength	$M_{cr} = S \times f_{r\_norm}$ = **10846** lb_in/ft
Modular ratio	$n = E_s / E_m$ = **16.959**
Distance to neutral axis	$c_{cr} = (A_s \times f_y + P) / (0.64 \times f'_m)$ = **0.741** in
Moment of inertia of cracked section	$I_{cr} = n \times (A_s + P \times t / (f_y \times 2 \times d)) \times (d - c_{cr})^2 + c_{cr}^3 / 3$ = **30.5** in^4/ft

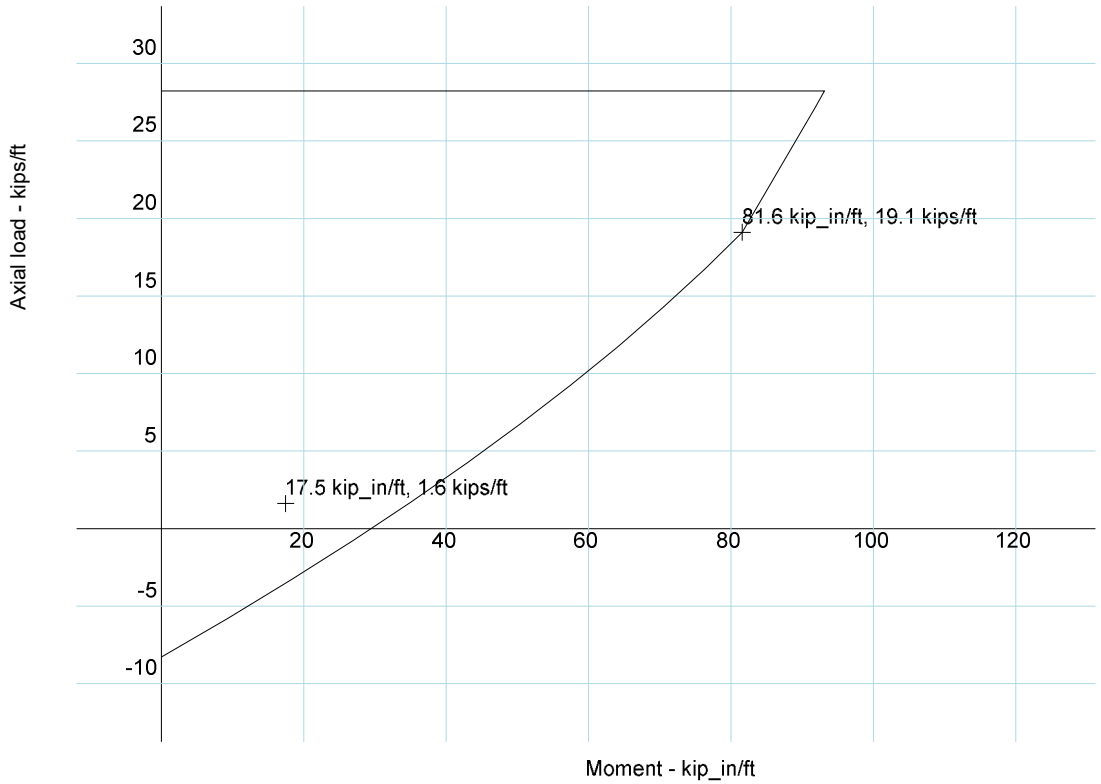
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By iteration	$M_{u0} = M =$ **15740** lb_in/ft
	$\delta_{u0} = 5 \times M_{cr} \times h^2 / (48 \times E_m \times I) + 5 \times (M_{u0} - M_{cr}) \times h^2 / (48 \times E_m \times I_{cr}) =$ **0.820** in
	$M_{u4} = M_{u0} + P \times \delta_{u3} =$ **17453** lb_in/ft
	$\delta_{u4} = 5 \times M_{cr} \times h^2 / (48 \times E_m \times I) + 5 \times (M_{u4} - M_{cr}) \times h^2 / (48 \times E_m \times I_{cr}) =$ **1.063** in
Bending moment at mid-height of panel	$M = M_{u0} + P \times \delta_{u4} =$ **17456** lb_in/ft
Depth of reinforcement	$d =$ **3.813** in
Effective width per bar	$b_{eff} = \min(s, 6 \times t_{nom}, 72 \text{ in}) =$ **24** in
Strength reduction factor	$\phi =$ **0.9**
Tensile strain in reinforcement	$\varepsilon_s = f_y / E_s =$ **0.0021**
Maximum usable compressive strain of masonry	$\varepsilon_{mu} =$ **0.0025**
Fiber of max.compressive strain to neutral axis	$c_{bal} = \varepsilon_{mu} \times d / (\varepsilon_{mu} + \varepsilon_s) =$ **2.086** in
Tensile force at balance point	$T_{bal} = A_s \times f_y =$ **9204** lb/ft
	$\beta_1 =$ **0.8**
Compressive force at balance point	$C_{bal} = 0.8 \times f'_m \times \beta_1 \times c_{bal} =$ **30440** lb/ft
Design axial force at balance point	$P_{bal} = \phi \times (C_{bal} - T_{bal}) =$ **19113** lb/ft
Design moment at balance point	$M_{bal} = \phi \times [T_{bal} \times (d - t / 2) + C_{bal} \times (t / 2 - \beta_1 \times c_{bal} / 2)] =$ **81588** lb_in/ft
Maximum design moment from interaction diagram	$M_c =$ **34741** lb_in/ft
	$M / M_c =$ **0.502**
	PASS - Combination of applied axial load and flexure is acceptable
Maximum area of tensile reinforcement (9.3.3.2)	$A_{s\_max} = 0.64 \times f'_m \times [\varepsilon_{mu} / (\varepsilon_{mu} + 1.5 \times \varepsilon_s)] \times d / f_y =$ **0.414** in^2/ft
	PASS - Area of reinforcement provided is less than maximum allowable

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Strength interaction diagram

Consider wall at top under load combination no.7

Shear force	V = **248** lb/ft
Compressive force	N_u = **1035** lb/ft
Net shear area	$A_{nv} = d \times l_b / ((N_{web} + 1) \times s_{grout})$ = **14.893** in^2/ft
Nominal shear strength	$V_n = \min([4 - 1.75 \times \min(M / (V \times d), 1)] \times A_{nv} \times \sqrt{(f'_m \times 1\ psi)} + 0.25 \times N_u, 4 \times A_{nv} \times \sqrt{(f'_m \times 1\ psi)})$ = **1719** lb/ft
Strength reduction factor	ϕ_v = **0.8**
Design shear strength	$\phi_v \times V_n$ = **1375** lb/ft
	$V / (\phi_v \times V_n)$ = **0.181**

PASS - Design shear strength exceeds applied shear strength

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MASONRY LINTEL AT GRID A

MASONRY LINTEL DESIGN TO TMS/MSJC 2013

Using the allowable stress design method

Tedds calculation version 1.2.02

Masonry details

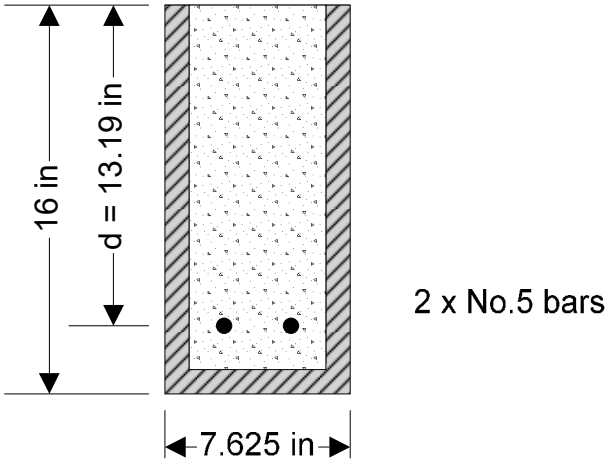
Masonry type	Concrete
Density of masonry unit	$\gamma = 135$ lb/ft^3
Pattern bond	Running
Mortar type	PCL Type M
Compressive strength of masonry unit	$f'_{cu} = 1900$ psi
Net compressive strength of masonry (Table 2)	$f'_m = 1900$ psi
Modulus of elasticity (4.2.2)	$E_m = 900 \times f'_m =$ **1710000** psi
Allowable flexural tensile stress (8.2.4.2)	$F_t = 106$ psi

Reinforcement details

Allowable tensile stress	$F_s = 32000$ psi
Modulus of elasticity of steel	$E_s = 29000000$ psi

Cover to reinforcement

Bottom cover to reinforcement	$c_{nom\_b} = 1.5$ in
Side cover to reinforcement	$c_{nom\_s} = 1.5$ in



Section properties

Modular ratio	$n = E_s / E_m =$ **16.96**
Section width	$b =$ **7.625** in
Section depth	$h =$ **16** in
Net shear area	$A_{nv} = b \times h =$ **122** in^2
Section modulus	$S = b \times h^2 / 6 =$ **325.33** in^3
Depth to tension reinforcement	$d =$ **13.19** in

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Flexure design (Chapter 8)

Tension reinforcement	2 x No. 5 bars
Area of tension reinforcement	$A_s = N_{bot} \times BarArea_{bot}$ = **0.62** in^2
Reinforcement ratio	$\rho_{ratio} = A_s / (b \times d)$ = **0.00616**
Neutral axis factor	$k = \sqrt{(2 \times \rho_{ratio} \times n + (\rho_{ratio} \times n)^2)} - \rho_{ratio} \times n$ = **0.365**
Lever arm factor	$j = 1 - k / 3$ = **0.878**
Cracking moment	$M_{cr} = 2.5 \times F_t \times S$ = **7.2** kip_ft
Design bending moment	M = **4.20** kip_ft
Tensile stress in reinforcement	$f_s = M / (A_s \times j \times d)$ = **7015** psi
Allowable tensile stress in reinf. (8.3.3.1)	F_s = **32000** psi
Reinforcement stress ratio	f_s / F_s = **0.219**
	PASS - Allowable tensile stress exceeds tensile stress due to flexure
Compressive stress in masonry	$f_b = 2 \times M / (j \times k \times b \times d^2)$ = **237.3** psi
Allowable stress in masonry (8.3.4.2.2)	$F_b = 0.45 \times f'_m$ = **855.0** psi
Masonry stress ratio	f_b / F_b = **0.278**
	PASS - Allowable compressive stress exceeds compressive stress due to flexure

Shear design (Chapter 8)

Design shear force	V = **5.00** kips
Depth of shear area	d_v = **16.00** in
Moment shear relationship, M/Vd	Assume $M\_Vd_{ratio} = 1$
Shear stress (8-24)	$f_v = V / A_{nv}$ = **41.0** psi
Allowable masonry shear stress (8-29)	$F_v = 1/2 \times (4.0 - 1.75 \times M\_Vd_{ratio}) \times \sqrt{(f'_m \times 1psi)}$
	F_v = **49.0** psi
Masonry shear stress ratio	f_v / F_v = **0.836**
	PASS - Allowable shear stress exceeds shear stress in masonry

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APP BAY OUTLOOKER

STEEL MEMBER ANALYSIS & DESIGN (AISC 360)

In accordance with AISC360 15th Edition published 2016 using the ASD method

Tedds calculation version 4.4.08

ANALYSIS

Tedds calculation version 1.0.37

Geometry

Geometry (ft) - Steel (AISC) - HSS 5x5x3/8

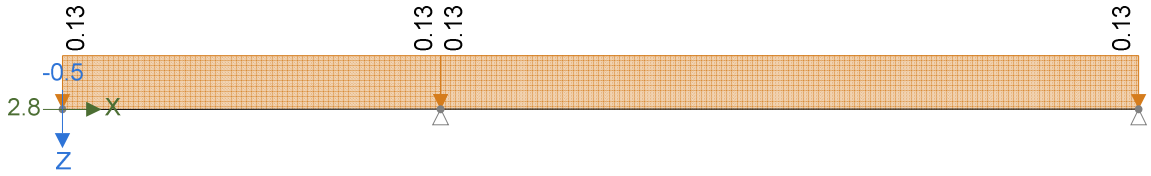


Span	Length (ft)	Section	Start Support	End Support
1	4.33	HSS 5x5x3/8	Free	Pinned
2	8	HSS 5x5x3/8	Pinned	Pinned
HSS 5x5x3/8: Area 6 in^2, Inertia Major 22 in^4, Inertia Minor 22 in^4, Shear area parallel to Minor 3 in^2, Shear area parallel to Major 3 in^2				
Steel (AISC): Density 490 lbm/ft^3, Youngs 29000 ksi, Shear 11200 ksi, Thermal 0.000012 $°C^{-1}$				

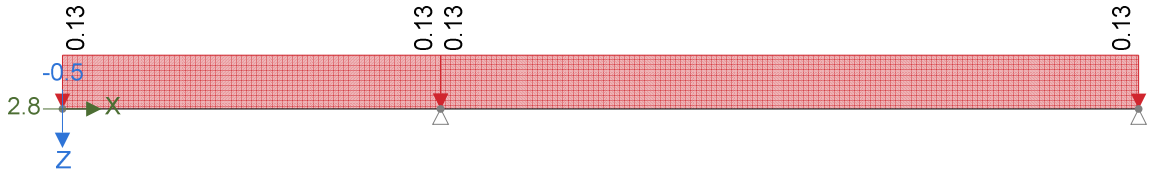
Loading

Self weight included

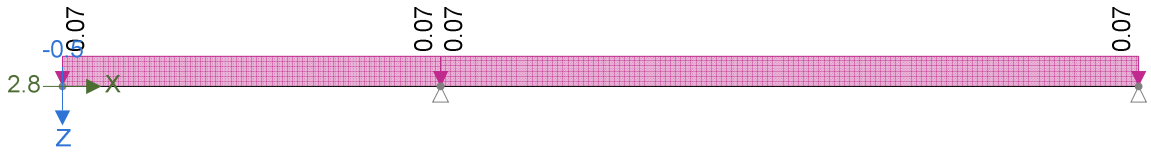
Dead - Loading (kips/ft)



Snow - Loading (kips/ft)



Wind - Loading (kips/ft)



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Load combination factors

Load combination	Self Weight	Dead	Snow	Wind
1.0D (Strength)	*1.00*	*1.00*		
1.0D + 1.0S (Strength)	*1.00*	*1.00*	*1.00*	
1.0D + 0.6W (Strength)	*1.00*	*1.00*		*0.60*
1.0D + 0.75L + 0.75S + 0.45W (Strength)	*1.00*	*1.00*	*0.75*	*0.45*
0.6D + 0.6W (Strength)	*0.60*	*0.60*		*0.60*

Member Loads

Member	Load case	Load Type	Orientation	Description
Member1	Dead	UDL	GlobalZ	0.13 kips/ft
Member1	Snow	UDL	GlobalZ	0.13 kips/ft
Member1	Wind	UDL	GlobalZ	0.07 kips/ft

Results

Total deflection

Member results

Load combination: 1.0D (Strength)

Member	Position (ft)	Deflection (in)		Axial deflection (in)	
Member1	0	0.025 (max)		0 (min)	
	4.33	0		0 (min)	
	4.72	0 (min)		0 (min)	

Member results

Load combination: 1.0D + 1.0S (Strength)

Member	Position (ft)	Deflection (in)		Axial deflection (in)	
Member1	0	0.046 (max)		0 (min)	
	4.33	0		0 (min)	
	4.72	0 (min)		0 (min)	

Member results

Load combination: 1.0D + 0.6W (Strength)

Member	Position (ft)	Deflection (in)		Axial deflection (in)	
Member1	0	0.032 (max)		0 (min)	
	4.33	0		0 (min)	
	4.72	0 (min)		0 (min)	

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Member results

Load combination: 1.0D + 0.75L + 0.75S + 0.45W (Strength)

Member	Position (ft)	Deflection (in)		Axial deflection (in)	
Member1	0	0.046 (max)		0 (min)	
	4.33	0		0 (min)	
	4.72	0 (min)		0 (min)	

Member results

Load combination: 0.6D + 0.6W (Strength)

Member	Position (ft)	Deflection (in)		Axial deflection (in)	
Member1	0	0.022 (max)		0 (min)	
	4.33	0		0 (min)	
	4.72	0 (min)		0 (min)	

Reactions

Load case: Self Weight

Node	Force Fx (kips)	Force Fz (kips)	Moment My (kip_ft)
2	0	0.2	0
3	0	0.059	0

Load case: Dead

Node	Force Fx (kips)	Force Fz (kips)	Moment My (kip_ft)
2	0	1.188	0
3	0	0.353	0

Load case: Snow

Node	Force Fx (kips)	Force Fz (kips)	Moment My (kip_ft)
2	0	1.188	0
3	0	0.353	0

Load case: Wind

Node	Force Fx (kips)	Force Fz (kips)	Moment My (kip_ft)
2	0	0.666	0
3	0	0.198	0

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Load combination: 1.0D (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
2	0	1.388	0
3	0	0.413	0

Load combination: 1.0D + 1.0S (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
2	0	2.577	0
3	0	0.766	0

Load combination: 1.0D + 0.6W (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
2	0	1.788	0
3	0	0.531	0

Load combination: 1.0D + 0.75L + 0.75S + 0.45W (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
2	0	2.579	0
3	0	0.767	0

Load combination: 0.6D + 0.6W (Strength)

Node	Force		Moment
	Fx (kips)	Fz (kips)	My (kip_ft)
2	0	1.232	0
3	0	0.366	0

Forces

Member results

Envelope - Strength combinations

Member	Position (ft)	Shear force (kips)		Moment (kip_ft)	
Member1	4.33	-0.562	-1.176	-1.217	-2.547 (min)
	9.51	0		1.083 (max)	0.518

Envelope - Strength combinations

Member	Position (ft)	Deflection (in)	
Member1	0	0.046 (max)	0.022
	4.72	0	0 (min)

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Member results

Load combination: 1.0D (Strength)

Member	Position (ft)	Deflection (in)	
Member1	0	0.025 (max)	
	4.72	0 (min)	

Member results

Load combination: 1.0D + 1.0S (Strength)

Member	Position (ft)	Deflection (in)	
Member1	0	0.046 (max)	
	4.72	0 (min)	

Member results

Load combination: 1.0D + 0.6W (Strength)

Member	Position (ft)	Deflection (in)	
Member1	0	0.032 (max)	
	4.72	0 (min)	

Member results

Load combination: 1.0D + 0.75L + 0.75S + 0.45W (Strength)

Member	Position (ft)	Deflection (in)	
Member1	0	0.046 (max)	
	4.72	0 (min)	

Member results

Load combination: 0.6D + 0.6W (Strength)

Member	Position (ft)	Deflection (in)	
Member1	0	0.022 (max)	
	4.72	0 (min)	

Safety factors

Shear	Ω_v = **1.67**
Flexure	Ω_b = **1.67**
Tensile yielding	$\Omega_{t,y}$ = **1.67**
Tensile rupture	$\Omega_{t,r}$ = **2.00**
Compression	Ω_c = **1.67**

Member1 - Span 1 design

Section details

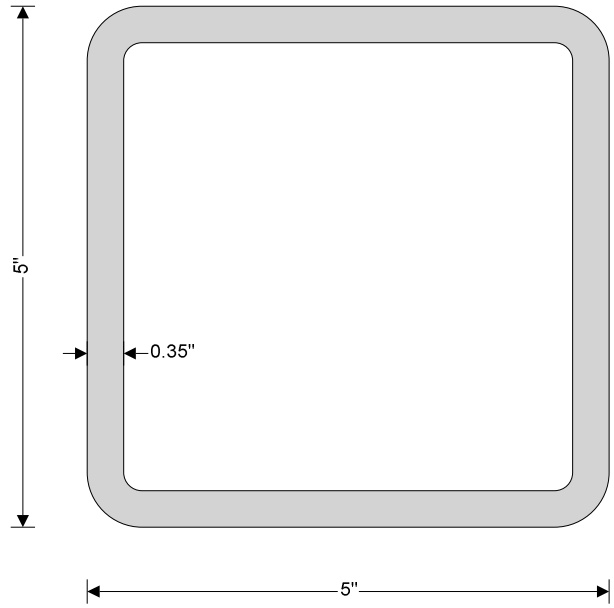
Section type	HSS 5x5x3/8 (AISC 15th Edn (v15.0))
ASTM steel designation	A500 Gr.B
Steel yield stress	F_y = **46** ksi

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Steel tensile stress F_u = **58** ksi

Modulus of elasticity E = **29000** ksi



HSS 5x5x3/8 (AISC 15th Edn (v15.0))
Section depth, d, 5 in
Section breadth, b_f, 5 in
Weight of section, Weight, 22.4 lbf/ft
Section thickness, t, 0.349 in
Area of section, A, 6.2 in^2
Radius of gyration about x-axis, r_x, 1.87 in
Radius of gyration about y-axis, r_y, 1.87 in
Elastic section modulus about x-axis, S_x, 8.68 in^3
Elastic section modulus about y-axis, S_y, 8.68 in^3
Plastic section modulus about x-axis, Z_x, 10.6 in^3
Plastic section modulus about y-axis, Z_y, 10.6 in^3
Second moment of area about x-axis, I_x, 21.7 in^4
Second moment of area about y-axis, I_y, 21.7 in^4

Lateral restraint

Upper flange has full lateral restraint

Lower flange has lateral restraint at supports only

Classification of sections for local buckling - Section B4

Classification of flanges in flexure - Table B4.1b (case 17)

Width to thickness ratio $(b_f - 3 \times t) / t$ = **11.33**

Limiting ratio for compact section $\lambda_{pff} = 1.12 \times \sqrt{[E / F_y]}$ = **28.12**

Limiting ratio for non-compact section $\lambda_{rff} = 1.40 \times \sqrt{[E / F_y]}$ = **35.15** Compact

Classification of web in flexure - Table B4.1b (case 19)

Width to thickness ratio $(d - 3 \times t) / t$ = **11.33**

Limiting ratio for compact section $\lambda_{pwf} = 2.42 \times \sqrt{[E / F_y]}$ = **60.76**

Limiting ratio for non-compact section $\lambda_{rwf} = 5.70 \times \sqrt{[E / F_y]}$ = **143.12** Compact

Section is compact in flexure

Check design at end of span

Design of members for tension - Chapter D

Required tensile strength P_r = **0** kips

Slenderness limitations - Section D1

Slenderness ratio $\lambda = L_{b,x} / r_x$ = **27.81**

Tension member slenderness ratio does not exceed recommended limit of 300

Allowable tensile strength - D2

Nominal tensile yielding strength $P_{n,yld} = F_y \times A$ = **284.28** kips

Nominal tensile rupture strength $P_{n,r} = F_u \times A_e$ = **358.44** kips

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Allowable tensile strength	$P_c = \min(P_{n,yld} / \Omega_{t,y}, P_{n,r} / \Omega_{t,r})$ = **170.228** kips
	P_r / P_c = **0**
	PASS - Nominal tensile strength exceeds required tensile strength

Design of members for shear - Chapter G

Required shear strength	$V_{r,x}$ = **1.2** kips
Web area	$A_w = 2 \times (d - 3 \times t) \times t$ = **2.759** in^2
Web plate buckling coefficient	k_v = **5**
	$(d - 3 \times t) / t <= 1.10 \times \sqrt{(k_v \times E / F_y)}$
Web shear coefficient - eq G2-9	C_{v2} = **1.000**
Nominal shear strength - eq G4-1	$V_{n,x} = 0.6 \times F_y \times A_w \times C_{v2}$ = **76.2** kips
Safety factor	Ω_v = 1.67
Allowable shear strength	$V_{c,x} = V_{n,x} / \Omega_v$ = **45.6** kips
	$V_{r,x} / V_{c,x}$ = **0.026**
	PASS - Allowable shear strength exceeds required shear strength

Design of members for flexure - Chapter F

Required flexural strength	$M_{r,x}$ = **2.5** kips_ft

Yielding - Section F7.1

Nominal flexural strength for yielding - eq F7-1	$M_{n,yld,x} = M_{p,x} = F_y \times Z_x$ = **40.6** kips_ft

Allowable flexural strength - F1

Nominal flexural strength	$M_{n,x} = M_{n,yld,x}$ = **40.6** kips_ft
Allowable flexural strength	$M_{c,x} = M_{n,x} / \Omega_b$ = **24.3** kips_ft
	$M_{r,x} / M_{c,x}$ = **0.103**
	PASS - Allowable flexural strength exceeds required flexural strength

Design of members for combined forces - Chapter H

Combined flexure and axial force - eq H1-1b	$P_r / (2 \times P_c) + M_{r,x} / M_{c,x}$ = **0.103**
	PASS - Combined flexure and axial force is within acceptable limits

Check design at start of span

Design of members for x-x axis deflection

Maximum deflection	δ_x = **0.046** in
Allowable deflection	$\delta_{x,Allowable} = L_{m1\_s1} / 120$ = **0.433** in
	$\delta_x / \delta_{x,Allowable}$ = **0.107**
	PASS - Allowable deflection exceeds design deflection

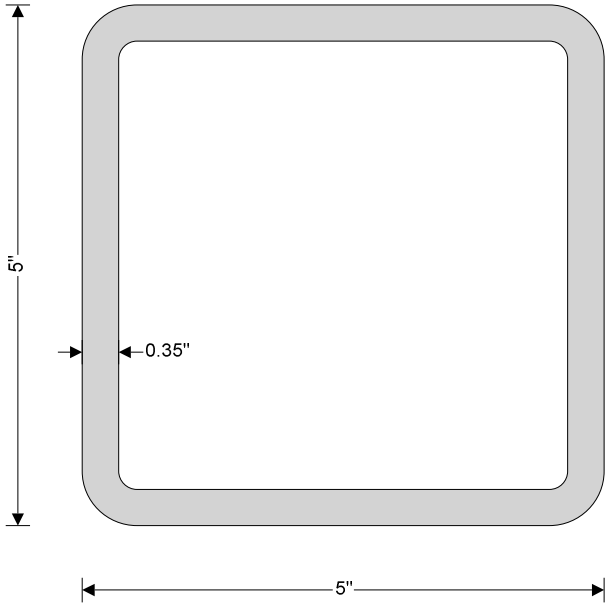
Member1 - Span 2 design

Section details

Section type	HSS 5x5x3/8 (AISC 15th Edn (v15.0))
ASTM steel designation	A500 Gr.B
Steel yield stress	F_y = **46** ksi
Steel tensile stress	F_u = **58** ksi
Modulus of elasticity	E = **29000** ksi

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HSS 5x5x3/8 (AISC 15th Edn (v15.0))
Section depth, d, 5 in
Section breadth, b_f, 5 in
Weight of section, Weight, 22.4 lbf/ft
Section thickness, t, 0.349 in
Area of section, A, 6.2 in^2
Radius of gyration about x-axis, r_x, 1.87 in
Radius of gyration about y-axis, r_y, 1.87 in
Elastic section modulus about x-axis, S_x, 8.68 in^3
Elastic section modulus about y-axis, S_y, 8.68 in^3
Plastic section modulus about x-axis, Z_x, 10.6 in^3
Plastic section modulus about y-axis, Z_y, 10.6 in^3
Second moment of area about x-axis, I_x, 21.7 in^4
Second moment of area about y-axis, I_y, 21.7 in^4

Lateral restraint

Both flanges have lateral restraint at supports only

Classification of sections for local buckling - Section B4

Classification of flanges in flexure - Table B4.1b (case 17)

Width to thickness ratio	$(b_f - 3 \times t) / t$ = **11.33**	
Limiting ratio for compact section	$\lambda_{pff} = 1.12 \times \sqrt{[E / F_y]}$ = **28.12**	
Limiting ratio for non-compact section	$\lambda_{rff} = 1.40 \times \sqrt{[E / F_y]}$ = **35.15**	Compact

Classification of web in flexure - Table B4.1b (case 19)

Width to thickness ratio	$(d - 3 \times t) / t$ = **11.33**	
Limiting ratio for compact section	$\lambda_{pwf} = 2.42 \times \sqrt{[E / F_y]}$ = **60.76**	
Limiting ratio for non-compact section	$\lambda_{rwf} = 5.70 \times \sqrt{[E / F_y]}$ = **143.12**	Compact

Section is compact in flexure

<u>Check design at start of span</u>

Design of members for shear - Chapter G

Required shear strength	$V_{r,x}$ = **1.4** kips
Web area	$A_w = 2 \times (d - 3 \times t) \times t$ = **2.759** in^2
Web plate buckling coefficient	k_v = **5**
	$(d - 3 \times t) / t <= 1.10 \times \sqrt{(k_v \times E / F_y)}$
Web shear coefficient - eq G2-9	C_{v2} = **1.000**
Nominal shear strength - eq G4-1	$V_{n,x} = 0.6 \times F_y \times A_w \times C_{v2}$ = **76.2** kips
Safety factor	Ω_v = 1.67
Allowable shear strength	$V_{c,x} = V_{n,x} / \Omega_v$ = **45.6** kips
	$V_{r,x} / V_{c,x}$ = **0.031**

PASS - Allowable shear strength exceeds required shear strength

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Design of members for flexure - Chapter F

Required flexural strength — $M_{r,x}$ = **2.5** kips_ft

Yielding - Section F7.1

Nominal flexural strength for yielding - eq F7-1 — $M_{n,yld,x} = M_{p,x} = F_y \times Z_x$ = **40.6** kips_ft

Allowable flexural strength - F1

Nominal flexural strength — $M_{n,x} = M_{n,yld,x}$ = **40.6** kips_ft

Allowable flexural strength — $M_{c,x} = M_{n,x} / \Omega_b$ = **24.3** kips_ft

$M_{r,x} / M_{c,x}$ = **0.103**

PASS - Allowable flexural strength exceeds required flexural strength

Check design 5ft 2.086in along span

Design of members for flexure - Chapter F

Required flexural strength — $M_{r,x}$ = **1.1** kips_ft

Yielding - Section F7.1

Nominal flexural strength for yielding - eq F7-1 — $M_{n,yld,x} = M_{p,x} = F_y \times Z_x$ = **40.6** kips_ft

Allowable flexural strength - F1

Nominal flexural strength — $M_{n,x} = M_{n,yld,x}$ = **40.6** kips_ft

Allowable flexural strength — $M_{c,x} = M_{n,x} / \Omega_b$ = **24.3** kips_ft

$M_{r,x} / M_{c,x}$ = **0.045**

PASS - Allowable flexural strength exceeds required flexural strength

Check design 4ft 9.881in along span

Design of members for x-x axis deflection

Maximum deflection — δ_x = **0.013** in

Allowable deflection — $\delta_{x,Allowable} = L_{m1\_s2} / 240$ = **0.4** in

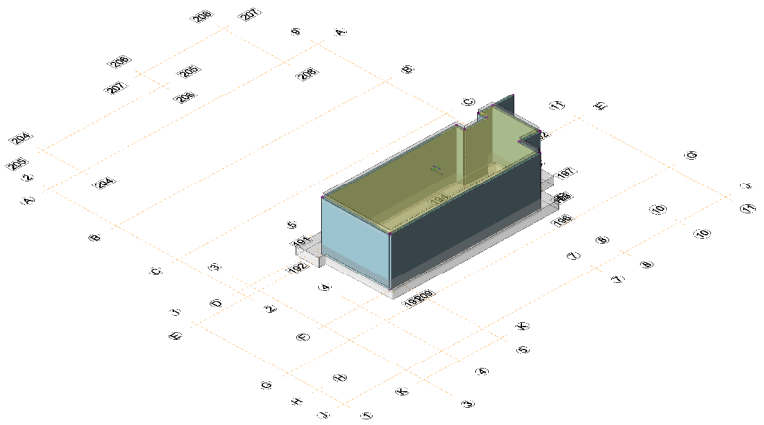
$\delta_x / \delta_{x,Allowable}$ = **0.034**

PASS - Allowable deflection exceeds design deflection

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STORM SHELTER CONCRETE OUTPUT



Structure

Structure

Wind Data

General

Method
ASCE/SEI 7-16 : Directional Procedure Part 1

Site Details

Site Ground Level	0"	ft, in
Orientation of Principal Axes relative to Global axes	0.0000	°
Mean Roof Height, h	12' 8"	ft, in
Level of Highest Opening in Building (Use Mean Roof Height)	12' 8"	ft, in
Overall Building X' Dimension	50' 3/16"	ft, in
Overall Building Y' Dimension	17' 7 127/256"	ft, in
Torsion Design Pressure Factor	75.00	%
Torsion Eccentricity	15.00	%
Basic Wind Speed, V	250.00	mph
Directionality Factor, K_d	1.000	
Ground Elevation above Sea Level, z_g	0	ft
Ground Elevation Factor, K_e	1.000	
Enclosure Classification	Enclosed	
Gust Effect factor, G	0.850	
Principal Axis	+X'	
Exposure Category	C	
Topographic Feature	None	
Principal Axis	+Y'	
Exposure Category	C	
Topographic Feature	None	

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Principal Axis	-X'
Exposure Category	C
Topographic Feature	None
Principal Axis	-Y'
Exposure Category	C
Topographic Feature	None

Intermediate Factors

+X'

Height above ground, z	12' 8"	ft, in
Exposure Coefficient, K_z	0.849	
Topographic Factor, K_{zt}	1.000	

+Y'

Height above ground, z	12' 8"	ft, in
Exposure Coefficient, K_z	0.849	
Topographic Factor, K_{zt}	1.000	

-X'

Height above ground, z	12' 8"	ft, in
Exposure Coefficient, K_z	0.849	
Topographic Factor, K_{zt}	1.000	

-Y'

Height above ground, z	12' 8"	ft, in
Exposure Coefficient, K_z	0.849	
Topographic Factor, K_{zt}	1.000	

Velocity Pressures

+X'

Height above ground, z	12' 8"	ft, in
Velocity Pressure, q_z	135.7	psf

+Y'

Height above ground, z	12' 8"	ft, in
Velocity Pressure, q_z	135.7	psf

-X'

Height above ground, z	12' 8"	ft, in
Velocity Pressure, q_z	135.7	psf

-Y'

Height above ground, z	12' 8"	ft, in
Velocity Pressure, q_z	135.7	psf

Generated Loadcases

137 Wind +X'-Y',GCpi 0.55,+MT

Wall Zone Loads

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	LY	-74.4	500	-37.2
WI 50	Zero	0.0	12	0.0
	WX13	9.9	223	2.2
WI 49	Zero	0.0	23	0.0
	WY13	9.9	446	4.4
WI 48	Zero	0.0	1	0.0
	WX13	9.9	27	0.3
WI 47	Zero	0.0	1	0.0
	LX	-58.7	27	-1.6
WI 46	Zero	0.0	4	0.0
	WY13	9.9	73	0.7
WI 45	Zero	0.0	6	0.0
	WY13	9.9	114	1.1
WI 44	Zero	0.0	3	0.0
	LY	-74.4	66	-5.0
WI 43	Zero	0.0	4	0.0
	LX	-58.7	68	-4.0
WI 42	Zero	0.0	8	0.0
	LX	-58.7	156	-9.1

Average Wall Loads

Wind	9
Leew	-
Left	0
Right	0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	8.0	-22.4	663' 11 11/64"	-235' 5 187/256"
St. L2 (LEVEL 2)	9.2	-26.0	663' 11 11/64"	-235' 5 187/256"
Total	**17.2**	**-48.4**	-	-

Total Loads

1
-
0

136 Wind +X'-Y',GCpi 0.55,-MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	LY	-74.4	500	-37.2
WI 50	Zero	0.0	12	0.0
	WX13	9.9	223	2.2
WI 49	Zero	0.0	23	0.0
	WY13	9.9	446	4.4
WI 48	Zero	0.0	1	0.0

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
	WX13	9.9	27	0.3
WI 47	Zero	0.0	1	0.0
	LX	-58.7	27	-1.6
WI 46	Zero	0.0	4	0.0
	WY13	9.9	73	0.7
WI 45	Zero	0.0	6	0.0
	WY13	9.9	114	1.1
WI 44	Zero	0.0	3	0.0
	LY	-74.4	66	-5.0
WI 43	Zero	0.0	4	0.0
	LX	-58.7	68	-4.0
WI 42	Zero	0.0	8	0.0
	LX	-58.7	156	-9.1

Average Wall Loads

Wind	9
Leew	-
Left	0
Right	0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	8.0	-22.4	663' 11 11/64"	-235' 5 187/256"
St. L2 (LEVEL 2)	9.2	-26.0	663' 11 11/64"	-235' 5 187/256"
Total	**17.2**	**-48.4**	-	-

Total Loads

1
-
0

135 Wind +X'-Y',GCpi 0.55,+Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	LY	-99.3	500	-49.6
WI 50	Zero	0.0	12	0.0
	WX13	13.2	223	3.0
WI 49	Zero	0.0	23	0.0
	WY13	13.2	446	5.9
WI 48	Zero	0.0	1	0.0
	WX13	13.2	27	0.4
WI 47	Zero	0.0	1	0.0
	LX	-78.3	27	-2.1
WI 46	Zero	0.0	4	0.0
	WY13	13.2	73	1.0
WI 45	Zero	0.0	6	0.0
	WY13	13.2	114	1.5

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 44	Zero	0.0	3	0.0
	LY	-99.3	66	-6.6
WI 43	Zero	0.0	4	0.0
	LX	-78.3	68	-5.3
WI 42	Zero	0.0	8	0.0
	LX	-78.3	156	-12.2

Average Wall Loads

Wind	1
Leew	-
Left	0
Right	0

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	Zero	0.0	747	0.0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	10.6	-29.9	663' 11 11/64"	-235' 5 187/256"
St. L2 (LEVEL 2)	12.3	-34.7	663' 11 11/64"	-235' 5 187/256"
Total	**22.9**	**-64.6**	-	-

Total Loads

2
-
0

134 Wind +X'-Y',GCpi 0.55,-Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	LY	-99.3	500	-49.6
WI 50	Zero	0.0	12	0.0
	WX13	13.2	223	3.0
WI 49	Zero	0.0	23	0.0
	WY13	13.2	446	5.9
WI 48	Zero	0.0	1	0.0
	WX13	13.2	27	0.4
WI 47	Zero	0.0	1	0.0
	LX	-78.3	27	-2.1
WI 46	Zero	0.0	4	0.0
	WY13	13.2	73	1.0
WI 45	Zero	0.0	6	0.0
	WY13	13.2	114	1.5
WI 44	Zero	0.0	3	0.0
	LY	-99.3	66	-6.6

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 43	Zero	0.0	4	0.0
	LX	-78.3	68	-5.3
WI 42	Zero	0.0	8	0.0
	LX	-78.3	156	-12.2

Average Wall Loads

Wind	1
Leew	-
Left	0
Right	0

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	Zero	0.0	747	0.0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	10.6	-29.9	663' 11 11/64"	-235' 5 187/256"
St. L2 (LEVEL 2)	12.3	-34.7	663' 11 11/64"	-235' 5 187/256"
Total	**22.9**	**-64.6**	-	-

Total Loads

2
-
0

133 Wind +X'-Y',GCpi -0.55,+MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	LY	9.5	500	4.8
WI 50	Zero	0.0	12	0.0
	WX13	93.9	223	21.0
WI 49	Zero	0.0	23	0.0
	WY13	93.9	446	41.9
WI 48	Zero	0.0	1	0.0
	WX13	93.9	27	2.5
WI 47	Zero	0.0	1	0.0
	LX	25.2	27	0.7
WI 46	Zero	0.0	4	0.0
	WY13	93.9	73	6.9
WI 45	Zero	0.0	6	0.0
	WY13	93.9	114	10.7
WI 44	Zero	0.0	3	0.0
	LY	9.5	66	0.6
WI 43	Zero	0.0	4	0.0
	LX	25.2	68	1.7

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 42	Zero	0.0	8	0.0
	LX	25.2	156	3.9

Average Wall Loads

Wind	8
Leew	1
Left	0
Right	0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	8.0	-25.1	638' 3 139/256"	-202' 8 33/64"
St. L2 (LEVEL 2)	9.2	-29.0	638' 3 139/256"	-202' 8 33/64"
Total	**17.2**	**-54.1**	-	-

Total Loads

1
-
0

132 Wind +X'-Y',GCpi -0.55,-MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	LY	9.5	500	4.8
WI 50	Zero	0.0	12	0.0
	WX13	93.9	223	21.0
WI 49	Zero	0.0	23	0.0
	WY13	93.9	446	41.9
WI 48	Zero	0.0	1	0.0
	WX13	93.9	27	2.5
WI 47	Zero	0.0	1	0.0
	LX	25.2	27	0.7
WI 46	Zero	0.0	4	0.0
	WY13	93.9	73	6.9
WI 45	Zero	0.0	6	0.0
	WY13	93.9	114	10.7
WI 44	Zero	0.0	3	0.0
	LY	9.5	66	0.6
WI 43	Zero	0.0	4	0.0
	LX	25.2	68	1.7
WI 42	Zero	0.0	8	0.0
	LX	25.2	156	3.9

Average Wall Loads

Wind	8
Leew	1
Left	0

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Right 0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	8.0	-25.1	638' 3 139/256"	-202' 8 33/64"
St. L2 (LEVEL 2)	9.2	-29.0	638' 3 139/256"	-202' 8 33/64"
Total	**17.2**	**-54.1**	-	-

Total Loads

1
-
0

131 Wind +X'-Y',GCpi -0.55,+Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	LY	12.7	500	6.4
WI 50	Zero	0.0	12	0.0
	WX13	125.2	223	28.0
WI 49	Zero	0.0	23	0.0
	WY13	125.2	446	55.8
WI 48	Zero	0.0	1	0.0
	WX13	125.2	27	3.4
WI 47	Zero	0.0	1	0.0
	LX	33.7	27	0.9
WI 46	Zero	0.0	4	0.0
	WY13	125.2	73	9.2
WI 45	Zero	0.0	6	0.0
	WY13	125.2	114	14.3
WI 44	Zero	0.0	3	0.0
	LY	12.7	66	0.8
WI 43	Zero	0.0	4	0.0
	LX	33.7	68	2.3
WI 42	Zero	0.0	8	0.0
	LX	33.7	156	5.2

Average Wall Loads

Wind 1
Leew 1
Left 0.
Right 0.

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	Zero	0.0	747	0.0

Lateral Loads by Level

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Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	10.6	-33.4	638' 3 139/256"	-202' 8 33/64"
St. L2 (LEVEL 2)	12.3	-38.7	638' 3 139/256"	-202' 8 33/64"
Total	**22.9**	**-72.1**	-	-

Total Loads

2
-
0

130 Wind +X'-Y',GCpi -0.55,-Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	LY	12.7	500	6.4
WI 50	Zero	0.0	12	0.0
	WX13	125.2	223	28.0
WI 49	Zero	0.0	23	0.0
	WY13	125.2	446	55.8
WI 48	Zero	0.0	1	0.0
	WX13	125.2	27	3.4
WI 47	Zero	0.0	1	0.0
	LX	33.7	27	0.9
WI 46	Zero	0.0	4	0.0
	WY13	125.2	73	9.2
WI 45	Zero	0.0	6	0.0
	WY13	125.2	114	14.3
WI 44	Zero	0.0	3	0.0
	LY	12.7	66	0.8
WI 43	Zero	0.0	4	0.0
	LX	33.7	68	2.3
WI 42	Zero	0.0	8	0.0
	LX	33.7	156	5.2

Average Wall Loads

Wind	1
Leew	1
Left	0.
Right	0.

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	Zero	0.0	747	0.0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	10.6	-33.4	638' 3 139/256"	-202' 8 33/64"
St. L2 (LEVEL 2)	12.3	-38.7	638' 3 139/256"	-202' 8 33/64"

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Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
Total	**22.9**	**-72.1**	-	-

Total Loads

2
-
0

129 Wind -Y',GCpi 0.55,+MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	L	-99.3	500	-49.6
WI 50	Zero	0.0	12	0.0
	S	-116.6	223	-26.0
WI 49	Zero	0.0	23	0.0
	W13	13.2	446	5.9
WI 48	Zero	0.0	1	0.0
	S	-116.6	27	-3.1
WI 47	Zero	0.0	1	0.0
	S	-116.6	27	-3.1
WI 46	Zero	0.0	4	0.0
	W13	13.2	73	1.0
WI 45	Zero	0.0	6	0.0
	W13	13.2	114	1.5
WI 44	Zero	0.0	3	0.0
	L	-99.3	66	-6.6
WI 43	Zero	0.0	4	0.0
	S	-116.6	68	-7.9
WI 42	Zero	0.0	8	0.0
	S	-116.6	156	-18.1

Average Wall Loads

Wind	12
Leew	-
Left	-
Right	-

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	0.0	-29.9	294' 7 163/256"	0"
St. L2 (LEVEL 2)	0.0	-34.7	294' 7 163/256"	0"
Total	**0.0**	**-64.6**	-	-

Total Loads

0
-
0

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128 Wind -Y',GCpi 0.55,-MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	L	-99.3	500	-49.6
WI 50	Zero	0.0	12	0.0
	S	-116.6	223	-26.0
WI 49	Zero	0.0	23	0.0
	W13	13.2	446	5.9
WI 48	Zero	0.0	1	0.0
	S	-116.6	27	-3.1
WI 47	Zero	0.0	1	0.0
	S	-116.6	27	-3.1
WI 46	Zero	0.0	4	0.0
	W13	13.2	73	1.0
WI 45	Zero	0.0	6	0.0
	W13	13.2	114	1.5
WI 44	Zero	0.0	3	0.0
	L	-99.3	66	-6.6
WI 43	Zero	0.0	4	0.0
	S	-116.6	68	-7.9
WI 42	Zero	0.0	8	0.0
	S	-116.6	156	-18.1

Average Wall Loads

Wind	12
Leew	-
Left	-
Right	-

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	0.0	-29.9	294' 7 163/256"	0"
St. L2 (LEVEL 2)	0.0	-34.7	294' 7 163/256"	0"
Total	**0.0**	**-64.6**	-	-

Total Loads

0
-
0

127 Wind -Y',GCpi 0.55,+Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	L	-132.4	500	-66.1
WI 50	Zero	0.0	12	0.0
	S	-155.4	223	-34.7
WI 49	Zero	0.0	23	0.0

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
	W13	17.6	446	7.9
WI 48	Zero	0.0	1	0.0
	S	-155.4	27	-4.2
WI 47	Zero	0.0	1	0.0
	S	-155.4	27	-4.2
WI 46	Zero	0.0	4	0.0
	W13	17.6	73	1.3
WI 45	Zero	0.0	6	0.0
	W13	17.6	114	2.0
WI 44	Zero	0.0	3	0.0
	L	-132.4	66	-8.8
WI 43	Zero	0.0	4	0.0
	S	-155.4	68	-10.5
WI 42	Zero	0.0	8	0.0
	S	-155.4	156	-24.2

Average Wall Loads

Wind	16
Leew	-
Left	-
Right	-

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	1	-95.4	223	-21.3
	2	-95.4	223	-21.3
	3	-95.4	175	-16.7
	1	-95.4	37	-3.5
	2	-95.4	33	-3.1
	3	-95.4	12	-1.1
	1	-95.4	23	-2.2
	2	-95.4	22	-2.1

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	0.0	-39.9	294' 7 163/256"	0"
St. L2 (LEVEL 2)	0.0	-46.2	294' 7 163/256"	0"
Total	**0.0**	**-86.1**	-	-

Total Loads

0	
-	
-	

126 Wind -Y',GCpi 0.55,-Cp

Wall Zone Loads

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	L	-132.4	500	-66.1
WI 50	Zero	0.0	12	0.0
	S	-155.4	223	-34.7
WI 49	Zero	0.0	23	0.0
	W13	17.6	446	7.9
WI 48	Zero	0.0	1	0.0
	S	-155.4	27	-4.2
WI 47	Zero	0.0	1	0.0
	S	-155.4	27	-4.2
WI 46	Zero	0.0	4	0.0
	W13	17.6	73	1.3
WI 45	Zero	0.0	6	0.0
	W13	17.6	114	2.0
WI 44	Zero	0.0	3	0.0
	L	-132.4	66	-8.8
WI 43	Zero	0.0	4	0.0
	S	-155.4	68	-10.5
WI 42	Zero	0.0	8	0.0
	S	-155.4	156	-24.2

Average Wall Loads

Wind	16
Leew	-
Left	-
Right	-

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	1	-193.3	223	-43.1
	2	-168.4	223	-37.5
	3	-142.4	175	-24.9
	1	-198.7	37	-7.3
	2	-168.4	33	-5.5
	3	-142.4	12	-1.7
	1	-198.7	23	-4.7
	2	-168.4	22	-3.7

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	0.0	-39.9	294' 7 163/256"	0"
St. L2 (LEVEL 2)	0.0	-46.2	294' 7 163/256"	0"
Total	**0.0**	**-86.1**	-	-

Total Loads

0.	
-	
-	

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125 Wind -Y',GCpi -0.55,+MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	L	12.7	500	6.4
WI 50	Zero	0.0	12	0.0
	S	-4.6	223	-1.0
WI 49	Zero	0.0	23	0.0
	W13	125.2	446	55.8
WI 48	Zero	0.0	1	0.0
	S	-4.6	27	-0.1
WI 47	Zero	0.0	1	0.0
	S	-4.6	27	-0.1
WI 46	Zero	0.0	4	0.0
	W13	125.2	73	9.2
WI 45	Zero	0.0	6	0.0
	W13	125.2	114	14.3
WI 44	Zero	0.0	3	0.0
	L	12.7	66	0.8
WI 43	Zero	0.0	4	0.0
	S	-4.6	68	-0.3
WI 42	Zero	0.0	8	0.0
	S	-4.6	156	-0.7

Average Wall Loads

Wind	1
Leew	1
Left	-
Right	-

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	0.0	-33.4	297' 2 75/128"	0"
St. L2 (LEVEL 2)	0.0	-38.7	297' 2 75/128"	0"
Total	**0.0**	**-72.1**	-	-

Total Loads

0
-
0

124 Wind -Y',GCpi -0.55,-MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	L	12.7	500	6.4
WI 50	Zero	0.0	12	0.0
	S	-4.6	223	-1.0

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 49	Zero	0.0	23	0.0
	W13	125.2	446	55.8
WI 48	Zero	0.0	1	0.0
	S	-4.6	27	-0.1
WI 47	Zero	0.0	1	0.0
	S	-4.6	27	-0.1
WI 46	Zero	0.0	4	0.0
	W13	125.2	73	9.2
WI 45	Zero	0.0	6	0.0
	W13	125.2	114	14.3
WI 44	Zero	0.0	3	0.0
	L	12.7	66	0.8
WI 43	Zero	0.0	4	0.0
	S	-4.6	68	-0.3
WI 42	Zero	0.0	8	0.0
	S	-4.6	156	-0.7

Average Wall Loads

Wind	1
Leew	1
Left	-
Right	-

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	0.0	-33.4	297' 2 75/128"	0"
St. L2 (LEVEL 2)	0.0	-38.7	297' 2 75/128"	0"
Total	**0.0**	**-72.1**	-	-

Total Loads

0
-
0

123 Wind -Y',GCpi -0.55,+Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	L	17.0	500	8.5
WI 50	Zero	0.0	12	0.0
	S	-6.1	223	-1.4
WI 49	Zero	0.0	23	0.0
	W13	167.0	446	74.4
WI 48	Zero	0.0	1	0.0
	S	-6.1	27	-0.2
WI 47	Zero	0.0	1	0.0
	S	-6.1	27	-0.2
WI 46	Zero	0.0	4	0.0

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
	W13	167.0	73	12.3
WI 45	Zero	0.0	6	0.0
	W13	167.0	114	19.1
WI 44	Zero	0.0	3	0.0
	L	17.0	66	1.1
WI 43	Zero	0.0	4	0.0
	S	-6.1	68	-0.4
WI 42	Zero	0.0	8	0.0
	S	-6.1	156	-1.0

Average Wall Loads

Wind	1
Leew	1
Left	-
Right	-

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	1	53.9	223	12.0
	2	53.9	223	12.0
	3	53.9	175	9.4
	1	53.9	37	2.0
	2	53.9	33	1.8
	3	53.9	12	0.6
	1	53.9	23	1.3
	2	53.9	22	1.2

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	0.0	-44.6	297' 2 75/128"	0"
St. L2 (LEVEL 2)	0.0	-51.6	297' 2 75/128"	0"
Total	**0.0**	**-96.2**	-	-

Total Loads

0
-
4

122 Wind -Y',GCpi -0.55,-Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	L	17.0	500	8.5
WI 50	Zero	0.0	12	0.0
	S	-6.1	223	-1.4
WI 49	Zero	0.0	23	0.0
	W13	167.0	446	74.4

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 48	Zero	0.0	1	0.0
	S	-6.1	27	-0.2
WI 47	Zero	0.0	1	0.0
	S	-6.1	27	-0.2
WI 46	Zero	0.0	4	0.0
	W13	167.0	73	12.3
WI 45	Zero	0.0	6	0.0
	W13	167.0	114	19.1
WI 44	Zero	0.0	3	0.0
	L	17.0	66	1.1
WI 43	Zero	0.0	4	0.0
	S	-6.1	68	-0.4
WI 42	Zero	0.0	8	0.0
	S	-6.1	156	-1.0

Average Wall Loads

Wind	1
Leew	1
Left	-
Right	-

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	1	-44.0	223	-9.8
	2	-19.1	223	-4.3
	3	6.9	175	1.2
	1	-49.4	37	-1.8
	2	-19.1	33	-0.6
	3	6.9	12	0.1
	1	-49.4	23	-1.2
	2	-19.1	22	-0.4

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	0.0	-44.6	297' 2 75/128"	0"
St. L2 (LEVEL 2)	0.0	-51.6	297' 2 75/128"	0"
Total	**0.0**	**-96.2**	-	-

Total Loads

0	
-	
-	

121 Wind -X'-Y',GCpi 0.55,+MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
	LY	-74.4	500	-37.2
WI 50	Zero	0.0	12	0.0
	LX	-58.7	223	-13.1
WI 49	Zero	0.0	23	0.0
	WY13	9.9	446	4.4
WI 48	Zero	0.0	1	0.0
	LX	-58.7	27	-1.6
WI 47	Zero	0.0	1	0.0
	WX13	9.9	27	0.3
WI 46	Zero	0.0	4	0.0
	WY13	9.9	73	0.7
WI 45	Zero	0.0	6	0.0
	WY13	9.9	114	1.1
WI 44	Zero	0.0	3	0.0
	LY	-74.4	66	-5.0
WI 43	Zero	0.0	4	0.0
	WX13	9.9	68	0.7
WI 42	Zero	0.0	8	0.0
	WX13	9.9	156	1.5

Average Wall Loads

Wind	9
Leew	-
Left	0
Right	0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-8.0	-22.4	-140' 6 5/256"	-49' 9 63/64"
St. L2 (LEVEL 2)	-9.2	-26.0	-140' 6 5/256"	-49' 9 63/64"
Total	**-17.2**	**-48.4**	-	-

Total Loads

-
-
0

120 Wind -X'-Y',GCpi 0.55,-MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	LY	-74.4	500	-37.2
WI 50	Zero	0.0	12	0.0
	LX	-58.7	223	-13.1
WI 49	Zero	0.0	23	0.0
	WY13	9.9	446	4.4
WI 48	Zero	0.0	1	0.0
	LX	-58.7	27	-1.6

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 47	Zero	0.0	1	0.0
	WX13	9.9	27	0.3
WI 46	Zero	0.0	4	0.0
	WY13	9.9	73	0.7
WI 45	Zero	0.0	6	0.0
	WY13	9.9	114	1.1
WI 44	Zero	0.0	3	0.0
	LY	-74.4	66	-5.0
WI 43	Zero	0.0	4	0.0
	WX13	9.9	68	0.7
WI 42	Zero	0.0	8	0.0
	WX13	9.9	156	1.5

Average Wall Loads

Wind	9
Leew	-
Left	0
Right	0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-8.0	-22.4	-140′ 6 5/256″	-49′ 9 63/64″
St. L2 (LEVEL 2)	-9.2	-26.0	-140′ 6 5/256″	-49′ 9 63/64″
Total	**-17.2**	**-48.4**	-	-

Total Loads

-
-
0

119 Wind -X'-Y',GCpi 0.55,+Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	LY	-99.3	500	-49.6
WI 50	Zero	0.0	12	0.0
	LX	-78.3	223	-17.5
WI 49	Zero	0.0	23	0.0
	WY13	13.2	446	5.9
WI 48	Zero	0.0	1	0.0
	LX	-78.3	27	-2.1
WI 47	Zero	0.0	1	0.0
	WX13	13.2	27	0.4
WI 46	Zero	0.0	4	0.0
	WY13	13.2	73	1.0
WI 45	Zero	0.0	6	0.0
	WY13	13.2	114	1.5
WI 44	Zero	0.0	3	0.0
	LY	-99.3	66	-6.6

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 43	Zero	0.0	4	0.0
	WX13	13.2	68	0.9
WI 42	Zero	0.0	8	0.0
	WX13	13.2	156	2.1

Average Wall Loads

Wind	1
Leew	-
Left	0
Right	0

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	Zero	0.0	747	0.0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-10.6	-29.9	-140′ 6 5/256″	-49′ 9 63/64″
St. L2 (LEVEL 2)	-12.3	-34.7	-140′ 6 5/256″	-49′ 9 63/64″
Total	**-22.9**	**-64.6**	-	-

Total Loads

-
-
0

118 Wind -X'-Y',GCpi 0.55,-Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	LY	-99.3	500	-49.6
WI 50	Zero	0.0	12	0.0
	LX	-78.3	223	-17.5
WI 49	Zero	0.0	23	0.0
	WY13	13.2	446	5.9
WI 48	Zero	0.0	1	0.0
	LX	-78.3	27	-2.1
WI 47	Zero	0.0	1	0.0
	WX13	13.2	27	0.4
WI 46	Zero	0.0	4	0.0
	WY13	13.2	73	1.0
WI 45	Zero	0.0	6	0.0
	WY13	13.2	114	1.5
WI 44	Zero	0.0	3	0.0
	LY	-99.3	66	-6.6
WI 43	Zero	0.0	4	0.0
	WX13	13.2	68	0.9

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 42	Zero	0.0	8	0.0
	WX13	13.2	156	2.1

Average Wall Loads

Wind	1
Leew	-
Left	0
Right	0

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	Zero	0.0	747	0.0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-10.6	-29.9	-140′ 6 5/256″	-49′ 9 63/64″
St. L2 (LEVEL 2)	-12.3	-34.7	-140′ 6 5/256″	-49′ 9 63/64″
Total	**-22.9**	**-64.6**	-	-

Total Loads

-
-
0

117 Wind -X'-Y',GCpi -0.55,+MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	LY	9.5	500	4.8
WI 50	Zero	0.0	12	0.0
	LX	25.2	223	5.6
WI 49	Zero	0.0	23	0.0
	WY13	93.9	446	41.9
WI 48	Zero	0.0	1	0.0
	LX	25.2	27	0.7
WI 47	Zero	0.0	1	0.0
	WX13	93.9	27	2.5
WI 46	Zero	0.0	4	0.0
	WY13	93.9	73	6.9
WI 45	Zero	0.0	6	0.0
	WY13	93.9	114	10.7
WI 44	Zero	0.0	3	0.0
	LY	9.5	66	0.6
WI 43	Zero	0.0	4	0.0
	WX13	93.9	68	6.3
WI 42	Zero	0.0	8	0.0
	WX13	93.9	156	14.6

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Average Wall Loads

Wind	8
Leew	1
Left	0
Right	0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-8.0	-25.1	-98' 3 113/128"	-31' 2 181/256"
St. L2 (LEVEL 2)	-9.2	-29.0	-98' 3 113/128"	-31' 2 181/256"
Total	**-17.2**	**-54.1**	-	-

Total Loads

-
-
0

116 Wind -X'-Y',GCpi -0.55,-MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	LY	9.5	500	4.8
WI 50	Zero	0.0	12	0.0
	LX	25.2	223	5.6
WI 49	Zero	0.0	23	0.0
	WY13	93.9	446	41.9
WI 48	Zero	0.0	1	0.0
	LX	25.2	27	0.7
WI 47	Zero	0.0	1	0.0
	WX13	93.9	27	2.5
WI 46	Zero	0.0	4	0.0
	WY13	93.9	73	6.9
WI 45	Zero	0.0	6	0.0
	WY13	93.9	114	10.7
WI 44	Zero	0.0	3	0.0
	LY	9.5	66	0.6
WI 43	Zero	0.0	4	0.0
	WX13	93.9	68	6.3
WI 42	Zero	0.0	8	0.0
	WX13	93.9	156	14.6

Average Wall Loads

Wind	8
Leew	1
Left	0
Right	0

Lateral Loads by Level

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Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-8.0	-25.1	-98′ 3 113/128″	-31′ 2 181/256″
St. L2 (LEVEL 2)	-9.2	-29.0	-98′ 3 113/128″	-31′ 2 181/256″
Total	**-17.2**	**-54.1**	-	-

Total Loads

-
-
0

115 Wind -X'-Y',GCpi -0.55,+Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	LY	12.7	500	6.4
WI 50	Zero	0.0	12	0.0
	LX	33.7	223	7.5
WI 49	Zero	0.0	23	0.0
	WY13	125.2	446	55.8
WI 48	Zero	0.0	1	0.0
	LX	33.7	27	0.9
WI 47	Zero	0.0	1	0.0
	WX13	125.2	27	3.4
WI 46	Zero	0.0	4	0.0
	WY13	125.2	73	9.2
WI 45	Zero	0.0	6	0.0
	WY13	125.2	114	14.3
WI 44	Zero	0.0	3	0.0
	LY	12.7	66	0.8
WI 43	Zero	0.0	4	0.0
	WX13	125.2	68	8.5
WI 42	Zero	0.0	8	0.0
	WX13	125.2	156	19.5

Average Wall Loads

Wind	1
Leew	1
Left	0.
Right	0.

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	Zero	0.0	747	0.0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-10.6	-33.4	-98′ 3 113/128″	-31′ 2 181/256″
St. L2 (LEVEL 2)	-12.3	-38.7	-98′ 3 113/128″	-31′ 2 181/256″

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Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
Total	**-22.9**	**-72.1**	-	-

Total Loads

-
-
0

114 Wind -X'-Y',GCpi -0.55,-Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	LY	12.7	500	6.4
WI 50	Zero	0.0	12	0.0
	LX	33.7	223	7.5
WI 49	Zero	0.0	23	0.0
	WY13	125.2	446	55.8
WI 48	Zero	0.0	1	0.0
	LX	33.7	27	0.9
WI 47	Zero	0.0	1	0.0
	WX13	125.2	27	3.4
WI 46	Zero	0.0	4	0.0
	WY13	125.2	73	9.2
WI 45	Zero	0.0	6	0.0
	WY13	125.2	114	14.3
WI 44	Zero	0.0	3	0.0
	LY	12.7	66	0.8
WI 43	Zero	0.0	4	0.0
	WX13	125.2	68	8.5
WI 42	Zero	0.0	8	0.0
	WX13	125.2	156	19.5

Average Wall Loads

Wind	1
Leew	1
Left	0.
Right	0.

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	Zero	0.0	747	0.0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-10.6	-33.4	-98′ 3 113/128″	-31′ 2 181/256″
St. L2 (LEVEL 2)	-12.3	-38.7	-98′ 3 113/128″	-31′ 2 181/256″
Total	**-22.9**	**-72.1**	-	-

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Total Loads

-
-
0

113 Wind -X',GCpi 0.55,+MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	S	-116.6	500	-58.2
WI 50	Zero	0.0	12	0.0
	L	-78.3	223	-17.5
WI 49	Zero	0.0	23	0.0
	S	-116.6	446	-52.0
WI 48	Zero	0.0	1	0.0
	L	-78.3	27	-2.1
WI 47	Zero	0.0	1	0.0
	W13	13.2	27	0.4
WI 46	Zero	0.0	4	0.0
	S	-116.6	73	-8.6
WI 45	Zero	0.0	6	0.0
	S	-116.6	114	-13.3
WI 44	Zero	0.0	3	0.0
	S	-116.6	66	-7.8
WI 43	Zero	0.0	4	0.0
	W13	13.2	68	0.9
WI 42	Zero	0.0	8	0.0
	W13	13.2	156	2.1

Average Wall Loads

Wind	12
Leew	-
Left	-
Right	-

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-10.6	3.6	425' 2 69/256"	-1240' 4 117/128"
St. L2 (LEVEL 2)	-12.3	4.2	425' 2 69/256"	-1240' 4 117/128"
Total	**-22.9**	**7.9**	-	-

Total Loads

-
7
0

112 Wind -X',GCpi 0.55,-MT

Wall Zone Loads

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	S	-116.6	500	-58.2
WI 50	Zero	0.0	12	0.0
	L	-78.3	223	-17.5
WI 49	Zero	0.0	23	0.0
	S	-116.6	446	-52.0
WI 48	Zero	0.0	1	0.0
	L	-78.3	27	-2.1
WI 47	Zero	0.0	1	0.0
	W13	13.2	27	0.4
WI 46	Zero	0.0	4	0.0
	S	-116.6	73	-8.6
WI 45	Zero	0.0	6	0.0
	S	-116.6	114	-13.3
WI 44	Zero	0.0	3	0.0
	S	-116.6	66	-7.8
WI 43	Zero	0.0	4	0.0
	W13	13.2	68	0.9
WI 42	Zero	0.0	8	0.0
	W13	13.2	156	2.1

Average Wall Loads

Wind	12
Leew	-
Left	-
Right	-

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-10.6	3.6	425' 2 69/256"	-1240' 4 117/128"
St. L2 (LEVEL 2)	-12.3	4.2	425' 2 69/256"	-1240' 4 117/128"
Total	**-22.9**	**7.9**	-	-

Total Loads

-
7
0

111 Wind -X',GCpi 0.55,+Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	S	-155.4	500	-77.7
WI 50	Zero	0.0	12	0.0
	L	-104.4	223	-23.3
WI 49	Zero	0.0	23	0.0
	S	-155.4	446	-69.3
WI 48	Zero	0.0	1	0.0

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
	L	-104.4	27	-2.8
WI 47	Zero	0.0	1	0.0
	W13	17.6	27	0.5
WI 46	Zero	0.0	4	0.0
	S	-155.4	73	-11.4
WI 45	Zero	0.0	6	0.0
	S	-155.4	114	-17.7
WI 44	Zero	0.0	3	0.0
	S	-155.4	66	-10.3
WI 43	Zero	0.0	4	0.0
	W13	17.6	68	1.2
WI 42	Zero	0.0	8	0.0
	W13	17.6	156	2.7

Average Wall Loads

Wind	16
Leew	-
Left	-
Right	-

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	1	-95.4	13	-1.3
	2	-95.4	13	-1.3
	3	-95.4	27	-2.6
	4	-95.4	21	-2.0
	1	-95.4	72	-6.9
	2	-95.4	64	-6.1
	3	-95.4	129	-12.3
	4	-95.4	197	-18.8
	1	-95.4	34	-3.2
	2	-95.4	34	-3.2
	3	-95.4	68	-6.4
	4	-95.4	75	-7.2

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-14.2	4.9	425' 2 69/256"	-1240' 4 117/128"
St. L2 (LEVEL 2)	-16.4	5.6	425' 2 69/256"	-1240' 4 117/128"
Total	**-30.5**	**10.5**	-	-

Total Loads

-
1
-

110 Wind -X',GCpi 0.55,-Cp

Wall Zone Loads

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	S	-155.4	500	-77.7
WI 50	Zero	0.0	12	0.0
	L	-104.4	223	-23.3
WI 49	Zero	0.0	23	0.0
	S	-155.4	446	-69.3
WI 48	Zero	0.0	1	0.0
	L	-104.4	27	-2.8
WI 47	Zero	0.0	1	0.0
	W13	17.6	27	0.5
WI 46	Zero	0.0	4	0.0
	S	-155.4	73	-11.4
WI 45	Zero	0.0	6	0.0
	S	-155.4	114	-17.7
WI 44	Zero	0.0	3	0.0
	S	-155.4	66	-10.3
WI 43	Zero	0.0	4	0.0
	W13	17.6	68	1.2
WI 42	Zero	0.0	8	0.0
	W13	17.6	156	2.7

Average Wall Loads

Wind	16
Leew	-
Left	-
Right	-

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	1	-178.5	13	-2.4
	2	-178.5	13	-2.4
	3	-132.4	27	-3.6
	4	-109.3	21	-2.3
	1	-178.5	72	-12.9
	2	-178.5	64	-11.5
	3	-132.4	129	-17.0
	4	-109.3	197	-21.5
	1	-178.5	34	-6.0
	2	-178.5	34	-6.0
	3	-132.4	68	-8.9
	4	-109.3	75	-8.2

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-14.2	4.9	425' 2 69/256"	-1240' 4 117/128"
St. L2 (LEVEL 2)	-16.4	5.6	425' 2 69/256"	-1240' 4 117/128"
Total	**-30.5**	**10.5**	-	-

Total Loads

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-
10
-

109 Wind -X',GCpi -0.55,+MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	S	-4.6	500	-2.3
WI 50	Zero	0.0	12	0.0
	L	33.7	223	7.5
WI 49	Zero	0.0	23	0.0
	S	-4.6	446	-2.0
WI 48	Zero	0.0	1	0.0
	L	33.7	27	0.9
WI 47	Zero	0.0	1	0.0
	W13	125.2	27	3.4
WI 46	Zero	0.0	4	0.0
	S	-4.6	73	-0.3
WI 45	Zero	0.0	6	0.0
	S	-4.6	114	-0.5
WI 44	Zero	0.0	3	0.0
	S	-4.6	66	-0.3
WI 43	Zero	0.0	4	0.0
	W13	125.2	68	8.5
WI 42	Zero	0.0	8	0.0
	W13	125.2	156	19.5

Average Wall Loads

Wind	1
Leew	3
Left	-
Right	-

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-10.6	0.1	17' 3 13/256"	-1280' 9 79/256"
St. L2 (LEVEL 2)	-12.3	0.2	17' 3 13/256"	-1280' 9 79/256"
Total	**-22.9**	**0.3**	-	-

Total Loads

-
0
0

108 Wind -X',GCpi -0.55,-MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
	S	-4.6	500	-2.3
WI 50	Zero	0.0	12	0.0
	L	33.7	223	7.5
WI 49	Zero	0.0	23	0.0
	S	-4.6	446	-2.0
WI 48	Zero	0.0	1	0.0
	L	33.7	27	0.9
WI 47	Zero	0.0	1	0.0
	W13	125.2	27	3.4
WI 46	Zero	0.0	4	0.0
	S	-4.6	73	-0.3
WI 45	Zero	0.0	6	0.0
	S	-4.6	114	-0.5
WI 44	Zero	0.0	3	0.0
	S	-4.6	66	-0.3
WI 43	Zero	0.0	4	0.0
	W13	125.2	68	8.5
WI 42	Zero	0.0	8	0.0
	W13	125.2	156	19.5

Average Wall Loads

Wind	1
Leew	3
Left	-
Right	-

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-10.6	0.1	17' 3 13/256"	-1280' 9 79/256"
St. L2 (LEVEL 2)	-12.3	0.2	17' 3 13/256"	-1280' 9 79/256"
Total	**-22.9**	**0.3**	-	-

Total Loads

-
0
0

107 Wind -X',GCpi -0.55,+Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	S	-6.1	500	-3.1
WI 50	Zero	0.0	12	0.0
	L	44.9	223	10.0
WI 49	Zero	0.0	23	0.0
	S	-6.1	446	-2.7
WI 48	Zero	0.0	1	0.0
	L	44.9	27	1.2

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 47	Zero	0.0	1	0.0
	W13	167.0	27	4.5
WI 46	Zero	0.0	4	0.0
	S	-6.1	73	-0.4
WI 45	Zero	0.0	6	0.0
	S	-6.1	114	-0.7
WI 44	Zero	0.0	3	0.0
	S	-6.1	66	-0.4
WI 43	Zero	0.0	4	0.0
	W13	167.0	68	11.3
WI 42	Zero	0.0	8	0.0
	W13	167.0	156	26.0

Average Wall Loads

Wind	1
Leew	4
Left	-
Right	-

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	1	53.9	13	0.7
	2	53.9	13	0.7
	3	53.9	27	1.5
	4	53.9	21	1.1
	1	53.9	72	3.9
	2	53.9	64	3.5
	3	53.9	129	6.9
	4	53.9	197	10.6
	1	53.9	34	1.8
	2	53.9	34	1.8
	3	53.9	68	3.6
	4	53.9	75	4.1

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-14.2	0.2	17' 3 13/256"	-1280' 9 79/256"
St. L2 (LEVEL 2)	-16.4	0.2	17' 3 13/256"	-1280' 9 79/256"
Total	**-30.5**	**0.4**	-	-

Total Loads

-
0
4

106 Wind -X',GCpi -0.55,-Cp

Wall Zone Loads

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	S	-6.1	500	-3.1
WI 50	Zero	0.0	12	0.0
	L	44.9	223	10.0
WI 49	Zero	0.0	23	0.0
	S	-6.1	446	-2.7
WI 48	Zero	0.0	1	0.0
	L	44.9	27	1.2
WI 47	Zero	0.0	1	0.0
	W13	167.0	27	4.5
WI 46	Zero	0.0	4	0.0
	S	-6.1	73	-0.4
WI 45	Zero	0.0	6	0.0
	S	-6.1	114	-0.7
WI 44	Zero	0.0	3	0.0
	S	-6.1	66	-0.4
WI 43	Zero	0.0	4	0.0
	W13	167.0	68	11.3
WI 42	Zero	0.0	8	0.0
	W13	167.0	156	26.0

Average Wall Loads

Wind	1
Leew	4
Left	-
Right	-

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	1	-29.2	13	-0.4
	2	-29.2	13	-0.4
	3	17.0	27	0.5
	4	40.0	21	0.8
	1	-29.2	72	-2.1
	2	-29.2	64	-1.9
	3	17.0	129	2.2
	4	40.0	197	7.9
	1	-29.2	34	-1.0
	2	-29.2	34	-1.0
	3	17.0	68	1.1
	4	40.0	75	3.0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-14.2	0.2	17′ 3 13/256″	-1280′ 9 79/256″
St. L2 (LEVEL 2)	-16.4	0.2	17′ 3 13/256″	-1280′ 9 79/256″
Total	**-30.5**	**0.4**	-	-

Total Loads

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-
0
8

105 Wind -X'+Y',GCpi 0.55,+MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	WY13	9.9	500	5.0
WI 50	Zero	0.0	12	0.0
	LX	-58.7	223	-13.1
WI 49	Zero	0.0	23	0.0
	LY	-74.4	446	-33.2
WI 48	Zero	0.0	1	0.0
	LX	-58.7	27	-1.6
WI 47	Zero	0.0	1	0.0
	WX13	9.9	27	0.3
WI 46	Zero	0.0	4	0.0
	LY	-74.4	73	-5.5
WI 45	Zero	0.0	6	0.0
	LY	-74.4	114	-8.5
WI 44	Zero	0.0	3	0.0
	WY13	9.9	66	0.7
WI 43	Zero	0.0	4	0.0
	WX13	9.9	68	0.7
WI 42	Zero	0.0	8	0.0
	WX13	9.9	156	1.5

Average Wall Loads

Wind	9
Leew	-
Left	0
Right	0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-8.0	24.5	643' 11 97/128"	-209' 7 5/32"
St. L2 (LEVEL 2)	-9.2	28.3	643' 11 97/128"	-209' 7 5/32"
Total	**-17.2**	**52.8**	-	-

Total Loads

-
5
0

104 Wind -X'+Y',GCpi 0.55,-MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
	WY13	9.9	500	5.0
WI 50	Zero	0.0	12	0.0
	LX	-58.7	223	-13.1
WI 49	Zero	0.0	23	0.0
	LY	-74.4	446	-33.2
WI 48	Zero	0.0	1	0.0
	LX	-58.7	27	-1.6
WI 47	Zero	0.0	1	0.0
	WX13	9.9	27	0.3
WI 46	Zero	0.0	4	0.0
	LY	-74.4	73	-5.5
WI 45	Zero	0.0	6	0.0
	LY	-74.4	114	-8.5
WI 44	Zero	0.0	3	0.0
	WY13	9.9	66	0.7
WI 43	Zero	0.0	4	0.0
	WX13	9.9	68	0.7
WI 42	Zero	0.0	8	0.0
	WX13	9.9	156	1.5

Average Wall Loads

Wind	9
Leew	-
Left	0
Right	0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-8.0	24.5	643' 11 97/128"	-209' 7 5/32"
St. L2 (LEVEL 2)	-9.2	28.3	643' 11 97/128"	-209' 7 5/32"
Total	**-17.2**	**52.8**	-	-

Total Loads

-
5
0

103 Wind -X'+Y',GCpi 0.55,+Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	WY13	13.2	500	6.6
WI 50	Zero	0.0	12	0.0
	LX	-78.3	223	-17.5
WI 49	Zero	0.0	23	0.0
	LY	-99.3	446	-44.3
WI 48	Zero	0.0	1	0.0
	LX	-78.3	27	-2.1

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 47	Zero	0.0	1	0.0
	WX13	13.2	27	0.4
WI 46	Zero	0.0	4	0.0
	LY	-99.3	73	-7.3
WI 45	Zero	0.0	6	0.0
	LY	-99.3	114	-11.3
WI 44	Zero	0.0	3	0.0
	WY13	13.2	66	0.9
WI 43	Zero	0.0	4	0.0
	WX13	13.2	68	0.9
WI 42	Zero	0.0	8	0.0
	WX13	13.2	156	2.1

Average Wall Loads

Wind	1
Leew	-
Left	0
Right	0

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	Zero	0.0	747	0.0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-10.6	32.6	643' 11 97/128"	-209' 7 5/32"
St. L2 (LEVEL 2)	-12.3	37.8	643' 11 97/128"	-209' 7 5/32"
Total	**-22.9**	**70.4**	-	-

Total Loads

-
7
0

102 Wind -X'+Y',GCpi 0.55,-Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	WY13	13.2	500	6.6
WI 50	Zero	0.0	12	0.0
	LX	-78.3	223	-17.5
WI 49	Zero	0.0	23	0.0
	LY	-99.3	446	-44.3
WI 48	Zero	0.0	1	0.0
	LX	-78.3	27	-2.1
WI 47	Zero	0.0	1	0.0
	WX13	13.2	27	0.4

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 46	Zero	0.0	4	0.0
	LY	-99.3	73	-7.3
WI 45	Zero	0.0	6	0.0
	LY	-99.3	114	-11.3
WI 44	Zero	0.0	3	0.0
	WY13	13.2	66	0.9
WI 43	Zero	0.0	4	0.0
	WX13	13.2	68	0.9
WI 42	Zero	0.0	8	0.0
	WX13	13.2	156	2.1

Average Wall Loads

Wind	1
Leew	-
Left	0
Right	0

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	Zero	0.0	747	0.0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-10.6	32.6	643' 11 97/128"	-209' 7 5/32"
St. L2 (LEVEL 2)	-12.3	37.8	643' 11 97/128"	-209' 7 5/32"
Total	**-22.9**	**70.4**	-	-

Total Loads

-
7
0

101 Wind -X'+Y',GCpi -0.55,+MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	WY13	93.9	500	46.9
WI 50	Zero	0.0	12	0.0
	LX	25.2	223	5.6
WI 49	Zero	0.0	23	0.0
	LY	9.5	446	4.3
WI 48	Zero	0.0	1	0.0
	LX	25.2	27	0.7
WI 47	Zero	0.0	1	0.0
	WX13	93.9	27	2.5
WI 46	Zero	0.0	4	0.0
	LY	9.5	73	0.7

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 45	Zero	0.0	6	0.0
	LY	9.5	114	1.1
WI 44	Zero	0.0	3	0.0
	WY13	93.9	66	6.2
WI 43	Zero	0.0	4	0.0
	WX13	93.9	68	6.3
WI 42	Zero	0.0	8	0.0
	WX13	93.9	156	14.6

Average Wall Loads

Wind	8
Leew	1
Left	0
Right	0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-8.0	21.8	670' 3 117/256"	-244' 4 23/128"
St. L2 (LEVEL 2)	-9.2	25.3	670' 3 117/256"	-244' 4 23/128"
Total	**-17.2**	**47.1**	-	-

Total Loads

-
4
0

100 Wind -X'+Y',GCpi -0.55,-MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	WY13	93.9	500	46.9
WI 50	Zero	0.0	12	0.0
	LX	25.2	223	5.6
WI 49	Zero	0.0	23	0.0
	LY	9.5	446	4.3
WI 48	Zero	0.0	1	0.0
	LX	25.2	27	0.7
WI 47	Zero	0.0	1	0.0
	WX13	93.9	27	2.5
WI 46	Zero	0.0	4	0.0
	LY	9.5	73	0.7
WI 45	Zero	0.0	6	0.0
	LY	9.5	114	1.1
WI 44	Zero	0.0	3	0.0
	WY13	93.9	66	6.2
WI 43	Zero	0.0	4	0.0
	WX13	93.9	68	6.3
WI 42	Zero	0.0	8	0.0

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
	WX13	93.9	156	14.6

Average Wall Loads

Wind	8
Leew	1
Left	0
Right	0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-8.0	21.8	670' 3 117/256"	-244' 4 23/128"
St. L2 (LEVEL 2)	-9.2	25.3	670' 3 117/256"	-244' 4 23/128"
Total	**-17.2**	**47.1**	-	-

Total Loads

-
4
0

99 Wind -X'+Y',GCpi -0.55,+Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	WY13	125.2	500	62.6
WI 50	Zero	0.0	12	0.0
	LX	33.7	223	7.5
WI 49	Zero	0.0	23	0.0
	LY	12.7	446	5.7
WI 48	Zero	0.0	1	0.0
	LX	33.7	27	0.9
WI 47	Zero	0.0	1	0.0
	WX13	125.2	27	3.4
WI 46	Zero	0.0	4	0.0
	LY	12.7	73	0.9
WI 45	Zero	0.0	6	0.0
	LY	12.7	114	1.5
WI 44	Zero	0.0	3	0.0
	WY13	125.2	66	8.3
WI 43	Zero	0.0	4	0.0
	WX13	125.2	68	8.5
WI 42	Zero	0.0	8	0.0
	WX13	125.2	156	19.5

Average Wall Loads

Wind	1
Leew	1
Left	0.
Right	0.

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Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	Zero	0.0	747	0.0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-10.6	29.1	670′ 3 117/256″	-244′ 4 23/128″
St. L2 (LEVEL 2)	-12.3	33.7	670′ 3 117/256″	-244′ 4 23/128″
Total	**-22.9**	**62.8**	-	-

Total Loads

-
6
0

98 Wind -X'+Y',GCpi -0.55,-Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	WY13	125.2	500	62.6
WI 50	Zero	0.0	12	0.0
	LX	33.7	223	7.5
WI 49	Zero	0.0	23	0.0
	LY	12.7	446	5.7
WI 48	Zero	0.0	1	0.0
	LX	33.7	27	0.9
WI 47	Zero	0.0	1	0.0
	WX13	125.2	27	3.4
WI 46	Zero	0.0	4	0.0
	LY	12.7	73	0.9
WI 45	Zero	0.0	6	0.0
	LY	12.7	114	1.5
WI 44	Zero	0.0	3	0.0
	WY13	125.2	66	8.3
WI 43	Zero	0.0	4	0.0
	WX13	125.2	68	8.5
WI 42	Zero	0.0	8	0.0
	WX13	125.2	156	19.5

Average Wall Loads

Wind	1
Leew	1
Left	0.
Right	0.

Roof Zone Loads

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	Zero	0.0	747	0.0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	-10.6	29.1	670' 3 117/256"	-244' 4 23/128"
St. L2 (LEVEL 2)	-12.3	33.7	670' 3 117/256"	-244' 4 23/128"
Total	**-22.9**	**62.8**	-	-

Total Loads

-
6
0

97 Wind +Y',GCpi 0.55,+MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	W13	13.2	500	6.6
WI 50	Zero	0.0	12	0.0
	S	-116.6	223	-26.0
WI 49	Zero	0.0	23	0.0
	L	-99.3	446	-44.3
WI 48	Zero	0.0	1	0.0
	S	-116.6	27	-3.1
WI 47	Zero	0.0	1	0.0
	S	-116.6	27	-3.1
WI 46	Zero	0.0	4	0.0
	L	-99.3	73	-7.3
WI 45	Zero	0.0	6	0.0
	L	-99.3	114	-11.3
WI 44	Zero	0.0	3	0.0
	W13	13.2	66	0.9
WI 43	Zero	0.0	4	0.0
	S	-116.6	68	-7.9
WI 42	Zero	0.0	8	0.0
	S	-116.6	156	-18.1

Average Wall Loads

Wind	12
Leew	-
Left	-
Right	-

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	0.0	32.6	296' 8 1/256"	0"
St. L2 (LEVEL 2)	0.0	37.8	296' 8 1/256"	0"

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Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
Total	**0.0**	**70.4**	-	-

Total Loads

0
7
0

96 Wind +Y',GCpi 0.55,-MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	W13	13.2	500	6.6
WI 50	Zero	0.0	12	0.0
	S	-116.6	223	-26.0
WI 49	Zero	0.0	23	0.0
	L	-99.3	446	-44.3
WI 48	Zero	0.0	1	0.0
	S	-116.6	27	-3.1
WI 47	Zero	0.0	1	0.0
	S	-116.6	27	-3.1
WI 46	Zero	0.0	4	0.0
	L	-99.3	73	-7.3
WI 45	Zero	0.0	6	0.0
	L	-99.3	114	-11.3
WI 44	Zero	0.0	3	0.0
	W13	13.2	66	0.9
WI 43	Zero	0.0	4	0.0
	S	-116.6	68	-7.9
WI 42	Zero	0.0	8	0.0
	S	-116.6	156	-18.1

Average Wall Loads

Wind	12
Leew	-
Left	-
Right	-

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	0.0	32.6	296' 8 1/256"	0"
St. L2 (LEVEL 2)	0.0	37.8	296' 8 1/256"	0"
Total	**0.0**	**70.4**	-	-

Total Loads

0
7
0

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95 Wind +Y',GCpi 0.55,+Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	W13	17.6	500	8.8
WI 50	Zero	0.0	12	0.0
	S	-155.4	223	-34.7
WI 49	Zero	0.0	23	0.0
	L	-132.4	446	-59.0
WI 48	Zero	0.0	1	0.0
	S	-155.4	27	-4.2
WI 47	Zero	0.0	1	0.0
	S	-155.4	27	-4.2
WI 46	Zero	0.0	4	0.0
	L	-132.4	73	-9.7
WI 45	Zero	0.0	6	0.0
	L	-132.4	114	-15.1
WI 44	Zero	0.0	3	0.0
	W13	17.6	66	1.2
WI 43	Zero	0.0	4	0.0
	S	-155.4	68	-10.5
WI 42	Zero	0.0	8	0.0
	S	-155.4	156	-24.2

Average Wall Loads

Wind	16
Leew	-
Left	-
Right	-

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	1	-95.4	33	-3.2
	2	-95.4	28	-2.7
	1	-95.4	250	-23.8
	2	-95.4	250	-23.8
	3	-95.4	187	-17.8

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	0.0	43.5	296' 8 1/256"	0"
St. L2 (LEVEL 2)	0.0	50.4	296' 8 1/256"	0"
Total	**0.0**	**93.8**	-	-

Total Loads

0
9
-

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94 Wind +Y',GCpi 0.55,-Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	W13	17.6	500	8.8
WI 50	Zero	0.0	12	0.0
	S	-155.4	223	-34.7
WI 49	Zero	0.0	23	0.0
	L	-132.4	446	-59.0
WI 48	Zero	0.0	1	0.0
	S	-155.4	27	-4.2
WI 47	Zero	0.0	1	0.0
	S	-155.4	27	-4.2
WI 46	Zero	0.0	4	0.0
	L	-132.4	73	-9.7
WI 45	Zero	0.0	6	0.0
	L	-132.4	114	-15.1
WI 44	Zero	0.0	3	0.0
	W13	17.6	66	1.2
WI 43	Zero	0.0	4	0.0
	S	-155.4	68	-10.5
WI 42	Zero	0.0	8	0.0
	S	-155.4	156	-24.2

Average Wall Loads

Wind	16
Leew	-
Left	-
Right	-

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	1	-198.7	33	-6.6
	2	-168.4	28	-4.7
	1	-192.1	250	-48.0
	2	-168.4	250	-42.1
	3	-142.4	187	-26.6

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	0.0	43.5	296' 8 1/256"	0"
St. L2 (LEVEL 2)	0.0	50.4	296' 8 1/256"	0"
Total	**0.0**	**93.8**	-	-

Total Loads

0.
93
-

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93 Wind +Y',GCpi -0.55,+MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	W13	125.2	500	62.6
WI 50	Zero	0.0	12	0.0
	S	-4.6	223	-1.0
WI 49	Zero	0.0	23	0.0
	L	12.7	446	5.7
WI 48	Zero	0.0	1	0.0
	S	-4.6	27	-0.1
WI 47	Zero	0.0	1	0.0
	S	-4.6	27	-0.1
WI 46	Zero	0.0	4	0.0
	L	12.7	73	0.9
WI 45	Zero	0.0	6	0.0
	L	12.7	114	1.5
WI 44	Zero	0.0	3	0.0
	W13	125.2	66	8.3
WI 43	Zero	0.0	4	0.0
	S	-4.6	68	-0.3
WI 42	Zero	0.0	8	0.0
	S	-4.6	156	-0.7

Average Wall Loads

Wind	1
Leew	1
Left	-
Right	-

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	0.0	29.1	293' 11 103/256"	0"
St. L2 (LEVEL 2)	0.0	33.7	293' 11 103/256"	0"
Total	**0.0**	**62.8**	-	-

Total Loads

0
6
0

92 Wind +Y',GCpi -0.55,-MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	W13	125.2	500	62.6
WI 50	Zero	0.0	12	0.0
	S	-4.6	223	-1.0
WI 49	Zero	0.0	23	0.0

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
	L	12.7	446	5.7
WI 48	Zero	0.0	1	0.0
	S	-4.6	27	-0.1
WI 47	Zero	0.0	1	0.0
	S	-4.6	27	-0.1
WI 46	Zero	0.0	4	0.0
	L	12.7	73	0.9
WI 45	Zero	0.0	6	0.0
	L	12.7	114	1.5
WI 44	Zero	0.0	3	0.0
	W13	125.2	66	8.3
WI 43	Zero	0.0	4	0.0
	S	-4.6	68	-0.3
WI 42	Zero	0.0	8	0.0
	S	-4.6	156	-0.7

Average Wall Loads

Wind	1
Leew	1
Left	-
Right	-

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	0.0	29.1	293' 11 103/256"	0"
St. L2 (LEVEL 2)	0.0	33.7	293' 11 103/256"	0"
Total	**0.0**	**62.8**	-	-

Total Loads

0
6
0

91 Wind +Y',GCpi -0.55,+Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	W13	167.0	500	83.4
WI 50	Zero	0.0	12	0.0
	S	-6.1	223	-1.4
WI 49	Zero	0.0	23	0.0
	L	17.0	446	7.6
WI 48	Zero	0.0	1	0.0
	S	-6.1	27	-0.2
WI 47	Zero	0.0	1	0.0
	S	-6.1	27	-0.2
WI 46	Zero	0.0	4	0.0
	L	17.0	73	1.2

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 45	Zero	0.0	6	0.0
	L	17.0	114	1.9
WI 44	Zero	0.0	3	0.0
	W13	167.0	66	11.1
WI 43	Zero	0.0	4	0.0
	S	-6.1	68	-0.4
WI 42	Zero	0.0	8	0.0
	S	-6.1	156	-1.0

Average Wall Loads

Wind	1
Leew	1
Left	-
Right	-

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	1	53.9	33	1.8
	2	53.9	28	1.5
	1	53.9	250	13.5
	2	53.9	250	13.5
	3	53.9	187	10.1

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	0.0	38.8	293' 11 103/256"	0"
St. L2 (LEVEL 2)	0.0	45.0	293' 11 103/256"	0"
Total	**0.0**	**83.8**	-	-

Total Loads

0
8
4

90 Wind +Y',GCpi -0.55,-Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	W13	167.0	500	83.4
WI 50	Zero	0.0	12	0.0
	S	-6.1	223	-1.4
WI 49	Zero	0.0	23	0.0
	L	17.0	446	7.6
WI 48	Zero	0.0	1	0.0
	S	-6.1	27	-0.2
WI 47	Zero	0.0	1	0.0
	S	-6.1	27	-0.2

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 46	Zero	0.0	4	0.0
	L	17.0	73	1.2
WI 45	Zero	0.0	6	0.0
	L	17.0	114	1.9
WI 44	Zero	0.0	3	0.0
	W13	167.0	66	11.1
WI 43	Zero	0.0	4	0.0
	S	-6.1	68	-0.4
WI 42	Zero	0.0	8	0.0
	S	-6.1	156	-1.0

Average Wall Loads

Wind	1
Leew	1
Left	-
Right	-

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	1	-49.4	33	-1.6
	2	-19.1	28	-0.5
	1	-42.8	250	-10.7
	2	-19.1	250	-4.8
	3	6.9	187	1.3

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	0.0	38.8	293' 11 103/256"	0"
St. L2 (LEVEL 2)	0.0	45.0	293' 11 103/256"	0"
Total	**0.0**	**83.8**	-	-

Total Loads

0
8
-

89 Wind +X'+Y',GCpi 0.55,+MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	WY13	9.9	500	5.0
WI 50	Zero	0.0	12	0.0
	WX13	9.9	223	2.2
WI 49	Zero	0.0	23	0.0
	LY	-74.4	446	-33.2
WI 48	Zero	0.0	1	0.0
	WX13	9.9	27	0.3

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 47	Zero	0.0	1	0.0
	LX	-58.7	27	-1.6
WI 46	Zero	0.0	4	0.0
	LY	-74.4	73	-5.5
WI 45	Zero	0.0	6	0.0
	LY	-74.4	114	-8.5
WI 44	Zero	0.0	3	0.0
	WY13	9.9	66	0.7
WI 43	Zero	0.0	4	0.0
	LX	-58.7	68	-4.0
WI 42	Zero	0.0	8	0.0
	LX	-58.7	156	-9.1

Average Wall Loads

Wind	9
Leew	-
Left	0
Right	0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	8.0	24.5	-107' 5 47/64"	-34' 11 197/256"
St. L2 (LEVEL 2)	9.2	28.3	-107' 5 47/64"	-34' 11 197/256"
Total	**17.2**	**52.8**	-	-

Total Loads

1
5
0

88 Wind +X'+Y',GCpi 0.55,-MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	WY13	9.9	500	5.0
WI 50	Zero	0.0	12	0.0
	WX13	9.9	223	2.2
WI 49	Zero	0.0	23	0.0
	LY	-74.4	446	-33.2
WI 48	Zero	0.0	1	0.0
	WX13	9.9	27	0.3
WI 47	Zero	0.0	1	0.0
	LX	-58.7	27	-1.6
WI 46	Zero	0.0	4	0.0
	LY	-74.4	73	-5.5
WI 45	Zero	0.0	6	0.0
	LY	-74.4	114	-8.5
WI 44	Zero	0.0	3	0.0
	WY13	9.9	66	0.7

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 43	Zero	0.0	4	0.0
	LX	-58.7	68	-4.0
WI 42	Zero	0.0	8	0.0
	LX	-58.7	156	-9.1

Average Wall Loads

Wind	9
Leew	-
Left	0
Right	0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	8.0	24.5	-107' 5 47/64"	-34' 11 197/256"
St. L2 (LEVEL 2)	9.2	28.3	-107' 5 47/64"	-34' 11 197/256"
Total	**17.2**	**52.8**	-	-

Total Loads

1	
5	
0	

87 Wind +X'+Y',GCpi 0.55,+Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	WY13	13.2	500	6.6
WI 50	Zero	0.0	12	0.0
	WX13	13.2	223	3.0
WI 49	Zero	0.0	23	0.0
	LY	-99.3	446	-44.3
WI 48	Zero	0.0	1	0.0
	WX13	13.2	27	0.4
WI 47	Zero	0.0	1	0.0
	LX	-78.3	27	-2.1
WI 46	Zero	0.0	4	0.0
	LY	-99.3	73	-7.3
WI 45	Zero	0.0	6	0.0
	LY	-99.3	114	-11.3
WI 44	Zero	0.0	3	0.0
	WY13	13.2	66	0.9
WI 43	Zero	0.0	4	0.0
	LX	-78.3	68	-5.3
WI 42	Zero	0.0	8	0.0
	LX	-78.3	156	-12.2

Average Wall Loads

Wind	1

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Leew -
Left 0
Right 0

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	Zero	0.0	747	0.0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	10.6	32.6	-107' 5 47/64"	-34' 11 197/256"
St. L2 (LEVEL 2)	12.3	37.8	-107' 5 47/64"	-34' 11 197/256"
Total	**22.9**	**70.4**	-	-

Total Loads

2
7
0

86 Wind +X'+Y',GCpi 0.55,-Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	WY13	13.2	500	6.6
WI 50	Zero	0.0	12	0.0
	WX13	13.2	223	3.0
WI 49	Zero	0.0	23	0.0
	LY	-99.3	446	-44.3
WI 48	Zero	0.0	1	0.0
	WX13	13.2	27	0.4
WI 47	Zero	0.0	1	0.0
	LX	-78.3	27	-2.1
WI 46	Zero	0.0	4	0.0
	LY	-99.3	73	-7.3
WI 45	Zero	0.0	6	0.0
	LY	-99.3	114	-11.3
WI 44	Zero	0.0	3	0.0
	WY13	13.2	66	0.9
WI 43	Zero	0.0	4	0.0
	LX	-78.3	68	-5.3
WI 42	Zero	0.0	8	0.0
	LX	-78.3	156	-12.2

Average Wall Loads

Wind 1
Leew -
Left 0
Right 0

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Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	Zero	0.0	747	0.0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	10.6	32.6	-107' 5 47/64"	-34' 11 197/256"
St. L2 (LEVEL 2)	12.3	37.8	-107' 5 47/64"	-34' 11 197/256"
Total	**22.9**	**70.4**	-	-

Total Loads

2
7
0

85 Wind +X'+Y',GCpi -0.55,+MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	WY13	93.9	500	46.9
WI 50	Zero	0.0	12	0.0
	WX13	93.9	223	21.0
WI 49	Zero	0.0	23	0.0
	LY	9.5	446	4.3
WI 48	Zero	0.0	1	0.0
	WX13	93.9	27	2.5
WI 47	Zero	0.0	1	0.0
	LX	25.2	27	0.7
WI 46	Zero	0.0	4	0.0
	LY	9.5	73	0.7
WI 45	Zero	0.0	6	0.0
	LY	9.5	114	1.1
WI 44	Zero	0.0	3	0.0
	WY13	93.9	66	6.2
WI 43	Zero	0.0	4	0.0
	LX	25.2	68	1.7
WI 42	Zero	0.0	8	0.0
	LX	25.2	156	3.9

Average Wall Loads

Wind	8
Leew	1
Left	0
Right	0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	8.0	21.8	-151' 4 13/64"	-55' 2 21/256"

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Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. L2 (LEVEL 2)	9.2	25.3	-151' 4 13/64"	-55' 2 21/256"
Total	**17.2**	**47.1**	-	-

Total Loads

1
4
0

84 Wind +X'+Y',GCpi -0.55,-MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	WY13	93.9	500	46.9
WI 50	Zero	0.0	12	0.0
	WX13	93.9	223	21.0
WI 49	Zero	0.0	23	0.0
	LY	9.5	446	4.3
WI 48	Zero	0.0	1	0.0
	WX13	93.9	27	2.5
WI 47	Zero	0.0	1	0.0
	LX	25.2	27	0.7
WI 46	Zero	0.0	4	0.0
	LY	9.5	73	0.7
WI 45	Zero	0.0	6	0.0
	LY	9.5	114	1.1
WI 44	Zero	0.0	3	0.0
	WY13	93.9	66	6.2
WI 43	Zero	0.0	4	0.0
	LX	25.2	68	1.7
WI 42	Zero	0.0	8	0.0
	LX	25.2	156	3.9

Average Wall Loads

Wind	8
Leew	1
Left	0
Right	0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	8.0	21.8	-151' 4 13/64"	-55' 2 21/256"
St. L2 (LEVEL 2)	9.2	25.3	-151' 4 13/64"	-55' 2 21/256"
Total	**17.2**	**47.1**	-	-

Total Loads

1
4
0

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83 Wind +X'+Y',GCpi -0.55,+Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	WY13	125.2	500	62.6
WI 50	Zero	0.0	12	0.0
	WX13	125.2	223	28.0
WI 49	Zero	0.0	23	0.0
	LY	12.7	446	5.7
WI 48	Zero	0.0	1	0.0
	WX13	125.2	27	3.4
WI 47	Zero	0.0	1	0.0
	LX	33.7	27	0.9
WI 46	Zero	0.0	4	0.0
	LY	12.7	73	0.9
WI 45	Zero	0.0	6	0.0
	LY	12.7	114	1.5
WI 44	Zero	0.0	3	0.0
	WY13	125.2	66	8.3
WI 43	Zero	0.0	4	0.0
	LX	33.7	68	2.3
WI 42	Zero	0.0	8	0.0
	LX	33.7	156	5.2

Average Wall Loads

Wind	1
Leew	1
Left	0.
Right	0.

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	Zero	0.0	747	0.0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	10.6	29.1	-151' 4 13/64"	-55' 2 21/256"
St. L2 (LEVEL 2)	12.3	33.7	-151' 4 13/64"	-55' 2 21/256"
Total	**22.9**	**62.8**	-	-

Total Loads

2	
6	
0	

82 Wind +X'+Y',GCpi -0.55,-Cp

Wall Zone Loads

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	WY13	125.2	500	62.6
WI 50	Zero	0.0	12	0.0
	WX13	125.2	223	28.0
WI 49	Zero	0.0	23	0.0
	LY	12.7	446	5.7
WI 48	Zero	0.0	1	0.0
	WX13	125.2	27	3.4
WI 47	Zero	0.0	1	0.0
	LX	33.7	27	0.9
WI 46	Zero	0.0	4	0.0
	LY	12.7	73	0.9
WI 45	Zero	0.0	6	0.0
	LY	12.7	114	1.5
WI 44	Zero	0.0	3	0.0
	WY13	125.2	66	8.3
WI 43	Zero	0.0	4	0.0
	LX	33.7	68	2.3
WI 42	Zero	0.0	8	0.0
	LX	33.7	156	5.2

Average Wall Loads

Wind	1
Leew	1
Left	0.
Right	0.

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	Zero	0.0	747	0.0

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	10.6	29.1	-151' 4 13/64"	-55' 2 21/256"
St. L2 (LEVEL 2)	12.3	33.7	-151' 4 13/64"	-55' 2 21/256"
Total	**22.9**	**62.8**	-	-

Total Loads

2
6
0

81 Wind +X',GCpi 0.55,+MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	S	-116.6	500	-58.2

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 50	Zero	0.0	12	0.0
	W13	13.2	223	3.0
WI 49	Zero	0.0	23	0.0
	S	-116.6	446	-52.0
WI 48	Zero	0.0	1	0.0
	W13	13.2	27	0.4
WI 47	Zero	0.0	1	0.0
	L	-78.3	27	-2.1
WI 46	Zero	0.0	4	0.0
	S	-116.6	73	-8.6
WI 45	Zero	0.0	6	0.0
	S	-116.6	114	-13.3
WI 44	Zero	0.0	3	0.0
	S	-116.6	66	-7.8
WI 43	Zero	0.0	4	0.0
	L	-78.3	68	-5.3
WI 42	Zero	0.0	8	0.0
	L	-78.3	156	-12.2

Average Wall Loads

Wind	12
Leew	-
Left	-
Right	-

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	10.6	3.6	-358' 135/256"	-1044' 6 5/16"
St. L2 (LEVEL 2)	12.3	4.2	-358' 135/256"	-1044' 6 5/16"
Total	**22.9**	**7.9**	-	-

Total Loads

2
7
0

80 Wind +X',GCpi 0.55,-MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	S	-116.6	500	-58.2
WI 50	Zero	0.0	12	0.0
	W13	13.2	223	3.0
WI 49	Zero	0.0	23	0.0
	S	-116.6	446	-52.0
WI 48	Zero	0.0	1	0.0
	W13	13.2	27	0.4
WI 47	Zero	0.0	1	0.0

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
	L	-78.3	27	-2.1
WI 46	Zero	0.0	4	0.0
	S	-116.6	73	-8.6
WI 45	Zero	0.0	6	0.0
	S	-116.6	114	-13.3
WI 44	Zero	0.0	3	0.0
	S	-116.6	66	-7.8
WI 43	Zero	0.0	4	0.0
	L	-78.3	68	-5.3
WI 42	Zero	0.0	8	0.0
	L	-78.3	156	-12.2

Average Wall Loads

Wind	12
Leew	-
Left	-
Right	-

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	10.6	3.6	-358' 135/256"	-1044' 6 5/16"
St. L2 (LEVEL 2)	12.3	4.2	-358' 135/256"	-1044' 6 5/16"
Total	**22.9**	**7.9**	-	-

Total Loads

2
7
0

79 Wind +X',GCpi 0.55,+Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	S	-155.4	500	-77.7
WI 50	Zero	0.0	12	0.0
	W13	17.6	223	3.9
WI 49	Zero	0.0	23	0.0
	S	-155.4	446	-69.3
WI 48	Zero	0.0	1	0.0
	W13	17.6	27	0.5
WI 47	Zero	0.0	1	0.0
	L	-104.4	27	-2.8
WI 46	Zero	0.0	4	0.0
	S	-155.4	73	-11.4
WI 45	Zero	0.0	6	0.0
	S	-155.4	114	-17.7
WI 44	Zero	0.0	3	0.0
	S	-155.4	66	-10.3

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 43	Zero	0.0	4	0.0
	L	-104.4	68	-7.1
WI 42	Zero	0.0	8	0.0
	L	-104.4	156	-16.3

Average Wall Loads

Wind	16
Leew	-
Left	-
Right	-

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	1	-95.4	112	-10.7
	2	-95.4	112	-10.7
	3	-95.4	223	-21.3
	4	-95.4	293	-28.0
	1	-95.4	8	-0.7

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	14.2	4.9	-358' 135/256"	-1044' 6 5/16"
St. L2 (LEVEL 2)	16.4	5.6	-358' 135/256"	-1044' 6 5/16"
Total	**30.5**	**10.5**	-	-

Total Loads

3
1
-

78 Wind +X',GCpi 0.55,-Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	S	-155.4	500	-77.7
WI 50	Zero	0.0	12	0.0
	W13	17.6	223	3.9
WI 49	Zero	0.0	23	0.0
	S	-155.4	446	-69.3
WI 48	Zero	0.0	1	0.0
	W13	17.6	27	0.5
WI 47	Zero	0.0	1	0.0
	L	-104.4	27	-2.8
WI 46	Zero	0.0	4	0.0
	S	-155.4	73	-11.4
WI 45	Zero	0.0	6	0.0
	S	-155.4	114	-17.7

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 44	Zero	0.0	3	0.0
	S	-155.4	66	-10.3
WI 43	Zero	0.0	4	0.0
	L	-104.4	68	-7.1
WI 42	Zero	0.0	8	0.0
	L	-104.4	156	-16.3

Average Wall Loads

Wind	16
Leew	-
Left	-
Right	-

Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	1	-178.5	112	-19.9
	2	-178.5	112	-19.9
	3	-132.4	223	-29.5
	4	-109.3	293	-32.0
	1	-178.5	8	-1.4

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	14.2	4.9	-358' 135/256"	-1044' 6 5/16"
St. L2 (LEVEL 2)	16.4	5.6	-358' 135/256"	-1044' 6 5/16"
Total	**30.5**	**10.5**	-	-

Total Loads

30	
10	
-	

77 Wind +X',GCpi 0.55,+MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	S	-116.6	500	-58.2
WI 50	Zero	0.0	12	0.0
	W13	13.2	223	3.0
WI 49	Zero	0.0	23	0.0
	S	-116.6	446	-52.0
WI 48	Zero	0.0	1	0.0
	W13	13.2	27	0.4
WI 47	Zero	0.0	1	0.0
	L	-78.3	27	-2.1
WI 46	Zero	0.0	4	0.0
	S	-116.6	73	-8.6

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 45	Zero	0.0	6	0.0
	S	-116.6	114	-13.3
WI 44	Zero	0.0	3	0.0
	S	-116.6	66	-7.8
WI 43	Zero	0.0	4	0.0
	L	-78.3	68	-5.3
WI 42	Zero	0.0	8	0.0
	L	-78.3	156	-12.2

Average Wall Loads

Wind	12
Leew	-
Left	-
Right	-

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	10.6	3.6	-358' 135/256"	-1044' 6 5/16"
St. L2 (LEVEL 2)	12.3	4.2	-358' 135/256"	-1044' 6 5/16"
Total	**22.9**	**7.9**	-	-

Total Loads

2
7
0

76 Wind +X',GCpi -0.55,-MT

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	S	-4.6	500	-2.3
WI 50	Zero	0.0	12	0.0
	W13	125.2	223	28.0
WI 49	Zero	0.0	23	0.0
	S	-4.6	446	-2.0
WI 48	Zero	0.0	1	0.0
	W13	125.2	27	3.4
WI 47	Zero	0.0	1	0.0
	L	33.7	27	0.9
WI 46	Zero	0.0	4	0.0
	S	-4.6	73	-0.3
WI 45	Zero	0.0	6	0.0
	S	-4.6	114	-0.5
WI 44	Zero	0.0	3	0.0
	S	-4.6	66	-0.3
WI 43	Zero	0.0	4	0.0
	L	33.7	68	2.3
WI 42	Zero	0.0	8	0.0

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Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
	L	33.7	156	5.2

Average Wall Loads

Wind	1
Leew	3
Left	-
Right	-

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	10.6	0.1	-17' 1 169/256"	-1272' 2 23/256"
St. L2 (LEVEL 2)	12.3	0.2	-17' 1 169/256"	-1272' 2 23/256"
Total	**22.9**	**0.3**	-	-

Total Loads

2
0
0

75 Wind +X',GCpi -0.55,+Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	S	-6.1	500	-3.1
WI 50	Zero	0.0	12	0.0
	W13	167.0	223	37.3
WI 49	Zero	0.0	23	0.0
	S	-6.1	446	-2.7
WI 48	Zero	0.0	1	0.0
	W13	167.0	27	4.5
WI 47	Zero	0.0	1	0.0
	L	44.9	27	1.2
WI 46	Zero	0.0	4	0.0
	S	-6.1	73	-0.4
WI 45	Zero	0.0	6	0.0
	S	-6.1	114	-0.7
WI 44	Zero	0.0	3	0.0
	S	-6.1	66	-0.4
WI 43	Zero	0.0	4	0.0
	L	44.9	68	3.0
WI 42	Zero	0.0	8	0.0
	L	44.9	156	7.0

Average Wall Loads

Wind	1
Leew	4
Left	-
Right	-

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Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	1	53.9	112	6.0
	2	53.9	112	6.0
	3	53.9	223	12.0
	4	53.9	293	15.8
	1	53.9	8	0.4

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	14.2	0.2	-17' 1 169/256"	-1272' 2 23/256"
St. L2 (LEVEL 2)	16.4	0.2	-17' 1 169/256"	-1272' 2 23/256"
Total	**30.5**	**0.4**	-	-

Total Loads

3
0
4

74 Wind +X',GCpi -0.55,-Cp

Wall Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
WI 52	Zero	0.0	26	0.0
	S	-6.1	500	-3.1
WI 50	Zero	0.0	12	0.0
	W13	167.0	223	37.3
WI 49	Zero	0.0	23	0.0
	S	-6.1	446	-2.7
WI 48	Zero	0.0	1	0.0
	W13	167.0	27	4.5
WI 47	Zero	0.0	1	0.0
	L	44.9	27	1.2
WI 46	Zero	0.0	4	0.0
	S	-6.1	73	-0.4
WI 45	Zero	0.0	6	0.0
	S	-6.1	114	-0.7
WI 44	Zero	0.0	3	0.0
	S	-6.1	66	-0.4
WI 43	Zero	0.0	4	0.0
	L	44.9	68	3.0
WI 42	Zero	0.0	8	0.0
	L	44.9	156	7.0

Average Wall Loads

Wind	1
Leew	4
Left	-
Right	-

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Roof Zone Loads

Reference	Zone	Design Pressure [psf]	Area [ft²]	Applied Load [kip]
RI 9	1	-29.2	112	-3.3
	2	-29.2	112	-3.3
	3	17.0	223	3.8
	4	40.0	293	11.7
	1	-29.2	8	-0.2

Lateral Loads by Level

Level	Total [kip]		Center [ft, in]	
	X	Y	X	Y
St. TOF AB (TOF AB)	14.2	0.2	-17′ 1 169/256″	-1272′ 2 23/256″
St. L2 (LEVEL 2)	16.4	0.2	-17′ 1 169/256″	-1272′ 2 23/256″
Total	**30.5**	**0.4**	-	-

Total Loads

3
0
8

Concrete

Slab/Mat Panels

Mat: MF 1, Panel: SI 2

Static & RSA

Reinforcement Design Summary

Reinforcement Layer	Reinforcement Provided	Area Provided [in²/ft]	Area Required [in²/ft]	Utilization
Bottom-X	#6-8″-B2	0.66	0.07	0.099
Bottom-Y	#6-8″-B1	0.66	0.06	0.087
Top-X	#6-8″-T2	0.66	0.02	0.035
Top-Y	#6-8″-T1	0.66	0.01	0.020

Bearing Pressure Summary

Bearing pressure checks	Max. value [ksf]	Limit [ksf]	Status	Utilization
Pressure	0.94	2.00	✔ Pass	0.472

Static & RSA

Reinforcement Design Details

Bottom-X

Summary

Utilization ratio $A_{s,reqd}$ / $A_{s,prov}$ = **0.099**

Analysis method First-order linear

Critical combination 48 (Final) $LRFD_{7.18}$-1.2D+1.6Lr+0.5W

✔ Pass

Moment Capacity Check

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$A_{s,prov\ X\ Bottom}$	0.66	in^2/ft
$M_{dX\ Bottom}$	-7.0	kip-ft/ft
$A_{s,req\ X\ Bottom}$	0.07	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.099**	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bottom-Y

Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.087**
Analysis method	First-order linear
Critical combination	48 (Final) $LRFD_{7.18}$-1.2D+1.6Lr+0.5W

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Bottom}$	0.66	in^2/ft
$M_{dY\ Bottom}$	-6.3	kip-ft/ft
$A_{s,req\ Y\ Bottom}$	0.06	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.087**	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-X

Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.035**
Analysis method	First-order linear
Critical combination	80 (Final) $LRFD_{7.50}$-1.2D+1.6Lr+0.5W

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Top}$	0.66	in^2/ft
$M_{dX\ Top}$	2.5	kip-ft/ft
$A_{s,req\ X\ Top}$	0.02	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.035**	

✔ Pass

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Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-Y

Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.020**
Analysis method	First-order linear
Critical combination	80 (Final) $LRFD_{7.50}$-1.2D+1.6Lr+0.5W

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Top}$	0.66	in^2/ft
$M_{dY\ Top}$	1.4	kip-ft/ft
$A_{s,req\ Y\ Top}$	0.01	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.020**	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bearing Capacity

First-order linear

Max base pressure, q_{max}	0.94	ksf
Critical combination	48 (Final) $LRFD_{7.18}$-1.2D+1.6Lr+0.5W	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.472	
Pressure status	✔ Pass	

Grillage chase-down

Max base pressure, q_{max}	0.88	ksf
Critical combination	21 (Final) $LRFD_5$-1.2D+L+1.6Lr	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.440	
Pressure status	✔ Pass	

FE chase-down

Max base pressure, q_{max}	0.88	ksf
Critical combination	21 (Final) $LRFD_5$-1.2D+L+1.6Lr	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.440	

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Pressure status ✔ Pass

Tension Check

First-order linear

Min base pressure, q_{min}	0.21	ksf
Critical combination	339 (Final) $LRFD_{12.53}$-0.9D+W	
Tension status	✔ Pass	

Grillage chase-down

Min base pressure, q_{min}	0.68	ksf
Critical combination	26 (Final) $LRFD_{6.1}$-1.2D+L+1.6S	
Tension status	✔ Pass	

FE chase-down

Min base pressure, q_{min}	0.68	ksf
Critical combination	26 (Final) $LRFD_{6.1}$-1.2D+L+1.6S	
Tension status	✔ Pass	

Mat: MF 1, Panel: SI 3

Static & RSA

Reinforcement Design Summary

Reinforcement Layer	Reinforcement Provided	Area Provided [in²/ft]	Area Required [in²/ft]	Utilization
Bottom-X	#6-8″-B2	0.66	0.06	0.086
Bottom-Y	#6-8″-B1	0.66	0.03	0.050
Top-X	#6-8″-T2	0.66	0.02	0.033
Top-Y	#6-8″-T1	0.66	0.03	0.038

Bearing Pressure Summary

Bearing pressure checks	Max. value [ksf]	Limit [ksf]	Status	Utilization
Pressure	1.00	2.00	✔ Pass	0.499

Static & RSA

Reinforcement Design Details

Bottom-X

Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.086**
Analysis method	First-order linear
Critical combination	48 (Final) $LRFD_{7.18}$-1.2D+1.6Lr+0.5W

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Bottom}$	0.66	in²/ft
$M_{dX\ Bottom}$	-6.1	kip-ft/ft
$A_{s,req\ X\ Bottom}$	0.06	in²/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.086**	

✔ Pass

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Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bottom-Y

Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.050**
Analysis method	First-order linear
Critical combination	48 (Final) $LRFD_{7.18}$-1.2D+1.6Lr+0.5W

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Bottom}$	0.66	in^2/ft
$M_{dY\ Bottom}$	-3.6	kip-ft/ft
$A_{s,req\ Y\ Bottom}$	0.03	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.050**	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-X

Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.033**
Analysis method	First-order linear
Critical combination	64 (Final) $LRFD_{7.34}$-1.2D+1.6Lr+0.5W

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Top}$	0.66	in^2/ft
$M_{dX\ Top}$	2.3	kip-ft/ft
$A_{s,req\ X\ Top}$	0.02	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.033**	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1

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Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-Y

Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.038**
Analysis method	First-order linear
Critical combination	48 (Final) $LRFD_{7.18}$-1.2D+1.6Lr+0.5W

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Top}$	0.66	in^2/ft
$M_{dY\ Top}$	2.8	kip-ft/ft
$A_{s,req\ Y\ Top}$	0.03	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.038**	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bearing Capacity

First-order linear

Max base pressure, q_{max}	1.00	ksf
Critical combination	80 (Final) $LRFD_{7.50}$-1.2D+1.6Lr+0.5W	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.499	
Pressure status	✔ Pass	

Grillage chase-down

Max base pressure, q_{max}	0.93	ksf
Critical combination	21 (Final) $LRFD_5$-1.2D+L+1.6Lr	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.465	
Pressure status	✔ Pass	

FE chase-down

Max base pressure, q_{max}	0.93	ksf
Critical combination	21 (Final) $LRFD_5$-1.2D+L+1.6Lr	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.464	
Pressure status	✔ Pass	

Tension Check

First-order linear

Min base pressure, q_{min}	0.26	ksf
Critical combination	339 (Final) $LRFD_{12.53}$-0.9D+W	

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Tension status ✔ Pass

Grillage chase-down

Min base pressure, q_{min} 0.70 ksf
Critical combination 26 (Final) $LRFD_{6.1}$-1.2D+L+1.6S
Tension status ✔ Pass

FE chase-down

Min base pressure, q_{min} 0.70 ksf
Critical combination 26 (Final) $LRFD_{6.1}$-1.2D+L+1.6S
Tension status ✔ Pass

Mat: MF 1, Panel: SI 4

Static & RSA

Reinforcement Design Summary

Reinforcement Layer	Reinforcement Provided	Area Provided [in²/ft]	Area Required [in²/ft]	Utilization
Bottom-X	#6-8″-B2	0.66	0.04	0.055
Bottom-Y	#6-8″-B1	0.66	0.05	0.073
Top-X	#6-8″-T2	0.66	0.02	0.034
Top-Y	#6-8″-T1	0.66	0.01	0.019

Bearing Pressure Summary

Bearing pressure checks	Max. value [ksf]	Limit [ksf]	Status	Utilization
Pressure	1.08	2.00	✔ Pass	0.540

Static & RSA

Reinforcement Design Details

Bottom-X

Summary

Utilization ratio **$A_{s,reqd}$ / $A_{s,prov}$ = 0.055**
Analysis method First-order linear
Critical combination 80 (Final) $LRFD_{7.50}$-1.2D+1.6Lr+0.5W

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Bottom}$ 0.66 in²/ft
$M_{dX\ Bottom}$ -4.3 kip-ft/ft
$A_{s,req\ X\ Bottom}$ 0.04 in²/ft
Utilization ratio **$A_{s,reqd}$ / $A_{s,prov}$ = 0.055**

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter Pass
Check Maximum Diameter Pass
Check Minimum Bar Distance Pass ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars Pass ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement Pass ACI 318-14 Section 8.6.1.1

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Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bottom-Y

Summary

Utilization ratio	$A_{s,reqd}$ / $A_{s,prov}$ = 0.073
Analysis method	First-order linear
Critical combination	80 (Final) LRFD$_{7.50}$-1.2D+1.6Lr+0.5W

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Bottom}$	0.66	in^2/ft
$M_{dY\ Bottom}$	-5.8	kip-ft/ft
$A_{s,req\ Y\ Bottom}$	0.05	in^2/ft
Utilization ratio	$A_{s,reqd}$ / $A_{s,prov}$ = 0.073	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-X

Summary

Utilization ratio	$A_{s,reqd}$ / $A_{s,prov}$ = 0.034
Analysis method	First-order linear
Critical combination	48 (Final) LRFD$_{7.18}$-1.2D+1.6Lr+0.5W

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Top}$	0.66	in^2/ft
$M_{dX\ Top}$	2.7	kip-ft/ft
$A_{s,req\ X\ Top}$	0.02	in^2/ft
Utilization ratio	$A_{s,reqd}$ / $A_{s,prov}$ = 0.034	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-Y

Summary

Utilization ratio	$A_{s,reqd}$ / $A_{s,prov}$ = 0.019
Analysis method	First-order linear

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Critical combination 48 (Final) LRFD$_{7.18}$-1.2D+1.6Lr+0.5W

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Top}$	0.66	in^2/ft
$M_{dY\ Top}$	1.5	kip-ft/ft
$A_{s,req\ Y\ Top}$	0.01	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.019**	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bearing Capacity

First-order linear

Max base pressure, q_{max}	1.08	ksf
Critical combination	80 (Final) LRFD$_{7.50}$-1.2D+1.6Lr+0.5W	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.540	
Pressure status	✔ Pass	

Grillage chase-down

Max base pressure, q_{max}	0.96	ksf
Critical combination	21 (Final) LRFD$_5$-1.2D+L+1.6Lr	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.478	
Pressure status	✔ Pass	

FE chase-down

Max base pressure, q_{max}	0.95	ksf
Critical combination	21 (Final) LRFD$_5$-1.2D+L+1.6Lr	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.477	
Pressure status	✔ Pass	

Tension Check

First-order linear

Min base pressure, q_{min}	0.22	ksf
Critical combination	307 (Final) LRFD$_{12.21}$-0.9D+W	
Tension status	✔ Pass	

Grillage chase-down

Min base pressure, q_{min}	0.73	ksf
Critical combination	26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S	

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Tension status ✔ Pass

FE chase-down

Min base pressure, q_{min} 0.73 ksf

Critical combination 26 (Final) $LRFD_{6.1}$-1.2D+L+1.6S

Tension status ✔ Pass

Mat: MF 1, Panel: SI 5

Static & RSA

Reinforcement Design Summary

Reinforcement Layer	Reinforcement Provided	Area Provided [in²/ft]	Area Required [in²/ft]	Utilization
Bottom-X	#6-8"-B2	0.66	0.02	0.025
Bottom-Y	#6-8"-B1	0.66	0.02	0.025
Top-X	#6-8"-T2	0.66	0.01	0.011
Top-Y	#6-8"-T1	0.66	0.00	0.006

Bearing Pressure Summary

Bearing pressure checks	Max. value [ksf]	Limit [ksf]	Status	Utilization
Pressure	1.01	2.00	✔ Pass	0.506

Static & RSA

Reinforcement Design Details

Bottom-X

Summary

Utilization ratio $\mathbf{A_{s,reqd} / A_{s,prov} = 0.025}$

Analysis method First-order linear

Critical combination 80 (Final) $LRFD_{7.50}$-1.2D+1.6Lr+0.5W

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Bottom}$	0.66	in²/ft
$M_{dX\ Bottom}$	-2.0	kip-ft/ft
$A_{s,req\ X\ Bottom}$	0.02	in²/ft

Utilization ratio $\mathbf{A_{s,reqd} / A_{s,prov} = 0.025}$

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bottom-Y

Summary

Utilization ratio $\mathbf{A_{s,reqd} / A_{s,prov} = 0.025}$

Analysis method First-order linear

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Critical combination 80 (Final) LRFD$_{7.50}$-1.2D+1.6Lr+0.5W

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Bottom}$	0.66	in^2/ft
$M_{dY\ Bottom}$	-2.0	kip-ft/ft
$A_{s,req\ Y\ Bottom}$	0.02	in^2/ft

Utilization ratio **$A_{s,reqd}$ / $A_{s,prov}$ = 0.025**

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-X

Summary

Utilization ratio **$A_{s,reqd}$ / $A_{s,prov}$ = 0.011**

Analysis method FE chase-down

Critical combination 21 (Final) LRFD$_5$-1.2D+L+1.6Lr

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Top}$	0.66	in^2/ft
$M_{dX\ Top}$	0.9	kip-ft/ft
$A_{s,req\ X\ Top}$	0.01	in^2/ft

Utilization ratio **$A_{s,reqd}$ / $A_{s,prov}$ = 0.011**

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-Y

Summary

Utilization ratio **$A_{s,reqd}$ / $A_{s,prov}$ = 0.006**

Analysis method FE chase-down

Critical combination 21 (Final) LRFD$_5$-1.2D+L+1.6Lr

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Top}$	0.66	in^2/ft
$M_{dY\ Top}$	0.5	kip-ft/ft

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$A_{s,req\ Y\ Top}$ 0.00 in^2/ft

Utilization ratio **$A_{s,reqd}$ / $A_{s,prov}$ = 0.006**

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bearing Capacity

First-order linear

Max base pressure, q_{max}	1.01	ksf
Critical combination	80 (Final) $LRFD_{7.50}$-1.2D+1.6Lr+0.5W	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.506	
Pressure status	✔ Pass	

Grillage chase-down

Max base pressure, q_{max}	0.93	ksf
Critical combination	21 (Final) $LRFD_5$-1.2D+L+1.6Lr	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.465	
Pressure status	✔ Pass	

FE chase-down

Max base pressure, q_{max}	0.93	ksf
Critical combination	21 (Final) $LRFD_5$-1.2D+L+1.6Lr	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.465	
Pressure status	✔ Pass	

Tension Check

First-order linear

Min base pressure, q_{min}	0.28	ksf
Critical combination	307 (Final) $LRFD_{12.21}$-0.9D+W	
Tension status	✔ Pass	

Grillage chase-down

Min base pressure, q_{min}	0.74	ksf
Critical combination	26 (Final) $LRFD_{6.1}$-1.2D+L+1.6S	
Tension status	✔ Pass	

FE chase-down

Min base pressure, q_{min}	0.74	ksf
Critical combination	26 (Final) $LRFD_{6.1}$-1.2D+L+1.6S	
Tension status	✔ Pass	

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Mat: MF 1, Panel: SI 6

Static & RSA

Reinforcement Design Summary

Reinforcement Layer	Reinforcement Provided	Area Provided [in²/ft]	Area Required [in²/ft]	Utilization
Bottom-X	#6-8"-B2	0.66	0.02	0.033
Bottom-Y	#6-8"-B1	0.66	0.02	0.029
Top-X	#6-8"-T2	0.66	0.01	0.011
Top-Y	#6-8"-T1	0.66	0.01	0.012

Bearing Pressure Summary

Bearing pressure checks	Max. value [ksf]	Limit [ksf]	Status	Utilization
Pressure	1.01	2.00	✔ Pass	0.504

Static & RSA

Reinforcement Design Details

Bottom-X

Summary

Utilization ratio $\mathbf{A_{s,reqd} / A_{s,prov} = 0.033}$

Analysis method First-order linear

Critical combination 80 (Final) $LRFD_{7.50}$-1.2D+1.6Lr+0.5W

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Bottom}$	0.66	in²/ft
$M_{dX\ Bottom}$	-2.6	kip-ft/ft
$A_{s,req\ X\ Bottom}$	0.02	in²/ft

Utilization ratio $\mathbf{A_{s,reqd} / A_{s,prov} = 0.033}$

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bottom-Y

Summary

Utilization ratio $\mathbf{A_{s,reqd} / A_{s,prov} = 0.029}$

Analysis method First-order linear

Critical combination 80 (Final) $LRFD_{7.50}$-1.2D+1.6Lr+0.5W

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Bottom}$	0.66	in²/ft

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$M_{dY\ Bottom}$	-2.3	kip-ft/ft
$A_{s,req\ Y\ Bottom}$	0.02	in²/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.029**	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-X

Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.011**
Analysis method	FE chase-down
Critical combination	21 (Final) LRFD$_5$-1.2D+L+1.6Lr

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Top}$	0.66	in²/ft
$M_{dX\ Top}$	0.8	kip-ft/ft
$A_{s,req\ X\ Top}$	0.01	in²/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.011**	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-Y

Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.012**
Analysis method	FE chase-down
Critical combination	21 (Final) LRFD$_5$-1.2D+L+1.6Lr

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Top}$	0.66	in²/ft
$M_{dY\ Top}$	1.0	kip-ft/ft
$A_{s,req\ Y\ Top}$	0.01	in²/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.012**	

✔ Pass

Limiting Reinforcement Parameters Checks

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Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bearing Capacity

First-order linear

Max base pressure, q_{max}	1.01	ksf
Critical combination	80 (Final) $LRFD_{7.50}$-1.2D+1.6Lr+0.5W	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.504	
Pressure status	✔ Pass	

Grillage chase-down

Max base pressure, q_{max}	0.93	ksf
Critical combination	21 (Final) $LRFD_{5}$-1.2D+L+1.6Lr	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.464	
Pressure status	✔ Pass	

FE chase-down

Max base pressure, q_{max}	0.93	ksf
Critical combination	21 (Final) $LRFD_{5}$-1.2D+L+1.6Lr	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.464	
Pressure status	✔ Pass	

Tension Check

First-order linear

Min base pressure, q_{min}	0.28	ksf
Critical combination	307 (Final) $LRFD_{12.21}$-0.9D+W	
Tension status	✔ Pass	

Grillage chase-down

Min base pressure, q_{min}	0.73	ksf
Critical combination	26 (Final) $LRFD_{6.1}$-1.2D+L+1.6S	
Tension status	✔ Pass	

FE chase-down

Min base pressure, q_{min}	0.73	ksf
Critical combination	26 (Final) $LRFD_{6.1}$-1.2D+L+1.6S	
Tension status	✔ Pass	

Slab: S 2, Panel: SI 7

Static & RSA

Reinforcement Design Summary

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Reinforcement Layer	Reinforcement Provided	Area Provided [in²/ft]	Area Required [in²/ft]	Utilization
Bottom-X	#5-8″-B2	0.47	0.34	0.732
Bottom-Y	#5-8″-B1	0.47	0.15	0.332
Top-X	#5-8″-T2	0.47	0.45	0.976
Top-Y	#5-8″-T1	0.47	0.44	0.951

Static & RSA

Reinforcement Design Details

Bottom-X

Summary

Utilization ratio $\mathbf{A_{s,reqd} / A_{s,prov} = 0.732}$

Analysis method FE chase-down

Critical combination 21 (Final) $LRFD_5$-1.2D+L+1.6Lr

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Bottom}$	0.47	in²/ft
$M_{dX\ Bottom}$	-14.3	kip-ft/ft
$A_{s,req\ X\ Bottom}$	0.34	in²/ft

Utilization ratio $\mathbf{A_{s,reqd} / A_{s,prov} = 0.732}$

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bottom-Y

Summary

Utilization ratio $\mathbf{A_{s,reqd} / A_{s,prov} = 0.332}$

Analysis method FE chase-down

Critical combination 21 (Final) $LRFD_5$-1.2D+L+1.6Lr

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Bottom}$	0.47	in²/ft
$M_{dY\ Bottom}$	-7.0	kip-ft/ft
$A_{s,req\ Y\ Bottom}$	0.15	in²/ft

Utilization ratio $\mathbf{A_{s,reqd} / A_{s,prov} = 0.332}$

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3

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Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-X

Summary

Utilization ratio	$\mathbf{A_{s,reqd} / A_{s,prov} = 0.976}$
Analysis method	FE chase-down
Critical combination	21 (Final) LRFD$_5$-1.2D+L+1.6Lr

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Top}$	0.47	in^2/ft
$M_{dX\ Top}$	18.9	kip-ft/ft
$A_{s,req\ X\ Top}$	0.45	in^2/ft
Utilization ratio	$\mathbf{A_{s,reqd} / A_{s,prov} = 0.976}$	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-Y

Summary

Utilization ratio	$\mathbf{A_{s,reqd} / A_{s,prov} = 0.951}$
Analysis method	FE chase-down
Critical combination	21 (Final) LRFD$_5$-1.2D+L+1.6Lr

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Top}$	0.47	in^2/ft
$M_{dY\ Top}$	19.6	kip-ft/ft
$A_{s,req\ Y\ Top}$	0.44	in^2/ft
Utilization ratio	$\mathbf{A_{s,reqd} / A_{s,prov} = 0.951}$	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

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CONNECTION DESIGN OUTPUT

Bentley

Current Date: 10/17/2022 9:14 AM
Units system: English
File name: \\nas01\leok\Production\Current Projects\21-18 LS FS 4 and 5\Engineering\Calculations\Connections.rcnx

Steel connections

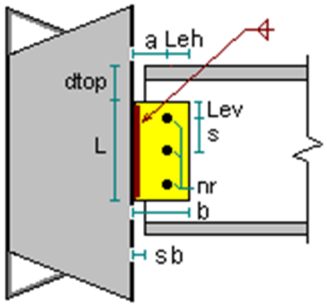
Detailed report

Connection name : **SP BCF**
Connection ID : **1V**

Family: Beam - Column flange (BCF)
Type: Single plate
Description: 1

GENERAL INFORMATION

Connector



MEMBERS

Beam

General

Beam section	:	W 14X22
Beam material	:	A992 Gr50
sb: Beam setback	:	0.5 in
Horizontal angle (deg)	:	0
Vertical angle (deg)	:	0
Horizontal eccentricity	:	0 in

Coped

dct: Top cope depth	:	0 in
ct: Top cope length	:	0 in
dcb: Bottom cope depth	:	0 in
cb: Bottom cope length	:	0 in

Column

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General

Support section	:	HSS_SQR 6X6X3_8
Support material	:	A500 GrB rectangular

SINGLE PLATE

Connector

Section	:	PL 3/8x3.5x9
b: Width	:	3.5 in
L: Length	:	9 in
tp: Plate thickness	:	0.375 in
Material	:	A36
Plate position on beam	:	Center
Bolts	:	3/4" A325 N
nr: Rows of Bolts	:	3
nc: Bolt columns	:	1
s: Pitch - longitudinal center-to-center spacing	:	3 in
Lev: Vertical edge distance	:	1.5 in
Leh: Horizontal edge distance	:	1.5 in
a: Distance between weld and bolts	:	2 in
Hole type on plate	:	Short Slotted (SSL)
Slot direction on plate	:	Horizontal
Hole type on beam	:	Standard (STD)
Welding electrode to support	:	E70XX
D: Weld size to support (1/16 in)	:	4
Wo: Obtuse side weld size (AWS) (1/16 in)	:	4
Wa: Acute side weld size (AWS) (1/16 in)	:	4
Wo: Obtuse side weld size (AISC) (1/16 in)	:	4
Wa: Acute side weld size (AISC) (1/16 in)	:	4

Design code: AISC 360-16 LRFD

DEMANDS

	Beam	Column				
Description	**Ru**	**Pu**	**Pu**	**Mu22**	**Mu33**	**Load type**
	[Kip]	[Kip]	[Kip]	[Kip*ft]	[Kip*ft]	
DL1	20.00	0.00	0.00	0.00	0.00	Design
DL2	20.00	0.00	0.00	0.00	0.00	Design

GEOMETRIC CONSIDERATIONS

	Dimensions References	**Unit**	**Value**	**Min. value**	**Max. value**	**Sta.**
Shear plate						
Number of bolts			3	2	12	✔ p 10-102
Distance from the bolt line to the weld line		[in]	2.00	--	3.50	✔ p 10-102
Length		[in]	9.00	6.12	12.23	✔ p. 10-104
Thickness, precludes a punching failure of the HSS...		[in]	0.38	--	--	✔

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Vertical edge distance	[in]	1.50	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.50	1.50	--	✔	p. 10-103
Vertical center-to-center spacing (pitch)	[in]	3.00	2.00	5.52	✔	Sec. J3.3, Sec. J3.5
Beam						
Vertical edge distance	[in]	3.85	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.50	1.00	--	✔	Tables J3.4, J3.5
Support						
Maximum value of the specified yield stress	[Kip/in2]	46.00	--	--	✔	
Yield stress to tensile stress ratio		0.79	--	0.80	✔	Table K2.1A, Table K2.1
Weld size	[1/16in]	4	4	--	✔	p. 10-87
Weld length	[in]	9.00	1.00	--	✔	Sec. J2.2b
Thickness	[in]	0.35	0.14	--	✔	Sec. B4.2, p. 10-153, p. 10-154

DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Shear plate						
Bolts shear		[Kip]	48.60	20.00	DL1	0.41	Tables (7-1..14)
Bolt bearing under shear load		[Kip]	72.52	20.00	DL1	0.28	p. 7-18, Sec. J3.10
Shear yielding		[Kip]	72.90	20.00	DL1	0.27	Eq. J4-3
Shear rupture		[Kip]	62.40	20.00	DL1	0.32	Eq. J4-4
Block shear		[Kip]	61.37	20.00	DL1	0.33	Eq. J4-5
Plate (support side)						
Weld capacity		[Kip]	100.23	20.00	DL1	0.20	Tables 8-4 .. 8-11
Beam						
Bolt bearing under shear load		[Kip]	54.79	20.00	DL1	0.37	p. 7-18, Sec. J3.10
Shear yielding		[Kip]	94.53	20.00	DL1	0.21	Eq. J4-3
Support						
Welds rupture		[Kip/ft]	145.74	17.78	DL1	0.12	p. 9-5
Chord wall plastification		[Kip]	41.08	0.00	DL1	0.00	Eq. J4-5
Punching shear (shear rupture)		[Kip]	122.97	20.00	DL1	0.16	p. 10-153

Global critical strength ratio 0.41

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Project Name: FIRE STATION 5		

NOTES

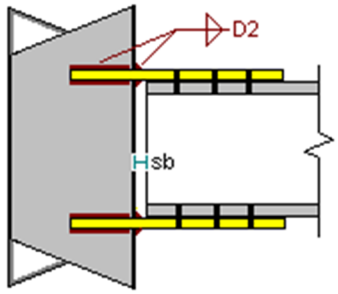
The plate is designed with the conventional configuration criteria.

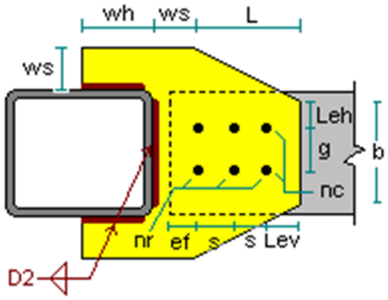
Connection name : FP BCF Bolted
Connection ID : 1M

Family: Beam - Column flange (BCF)
Type: Flange-plated
Description: 1

GENERAL INFORMATION

Connector





MEMBERS

Beam

General

Beam section	:	W 14X22
Beam material	:	A992 Gr50
sb: Beam setback	:	0.5 in

Column

General

Support section	:	HSS_SQR 6X6X3_8
Support material	:	A500 GrB rectangular

FLANGE PLATE

Connector

L: Top plate length	:	8.5 in
b: Top plate width	:	6 in
tp: Top plate thickness	:	0.625 in
Lb: Bottom plate length	:	8.5 in
Lb: Bottom plate length	:	8.5 in
bb: Bottom plate width	:	6 in
tpb: Bottom plate thickness	:	0.625 in
ws: Additional plate width	:	1.5 in
wh: Additional plate length	:	2.5 in
Plate material	:	A36

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Beam side

Connection type	:	Bolted
Bolts	:	3/4" A325 SC (class A)
nc: Bolt columns	:	2
nr: Rows of Bolts	:	3
g: Gage - transverse center-to-center spacing	:	3 in
s: Pitch - longitudinal center-to-center spacing	:	3 in
Lev: Longitudinal distance to top plate edge	:	1.5 in
Leh: Transverse distance to top plate edge	:	1.5 in
ef: Longitudinal distance to beam edge (top plate)	:	2 in
Levb: Longitudinal distance to bottom plate edge	:	1.5 in
Lehb: Transverse distance to bottom plate edge	:	1.5 in
efb: Longitudinal distance to beam edge (bottom ...	:	2 in
Hole type on beam	:	Standard (STD)
Hole type on top plate	:	Short Slotted (SSL)
Slot direction on top plate	:	Horizontal
Hole type on bottom plate	:	Short Slotted (SSL)
Slot direction on bottom plate	:	Horizontal

Support side

Welding electrode to support	:	E70XX
D1: Top weld size to support (1/16 in)	:	5
Welding electrode to support	:	E70XX
D2: Bottom weld size to support (1/16 in)	:	5

Design code: AISC 360-16 LRFD

DEMANDS

	Beam		Right beam		Left beam		Column	Panel		
Description	**Ru**	**Pu**	**Mu**	**PufTop**	**PufBot**	**PufTop**	**PufBot**	**Pu**	**Vu**	**Load type**
	[Kip]	[Kip]	[Kip*ft]	[Kip]	[Kip]	[Kip]	[Kip]	[Kip]	[Kip]	
DL1	0.00	0.00	-55.00	49.38	-49.38	0.00	0.00	0.00	49.38	Design
DL2	0.00	0.00	-55.00	49.38	-49.38	0.00	0.00	0.00	49.38	Design

GEOMETRIC CONSIDERATIONS

	Dimensions References	Unit	Value	Min. value	Max. value	Sta.
Plate (beam side)						
Vertical center-to-center spacing (pitch)	[in]		3.00	2.00	8.04 ✔	Sec. J3.3, Sec. J3.5
Horizontal center-to-center spacing (gage)	[in]		3.00	2.00	8.04 ✔	Sec. J3.3, Sec. J3.5
Top flange plate data						
Vertical edge distance	[in]		1.50	1.00	-- ✔	Tables J3.4, J3.5
Horizontal edge distance	[in]		1.50	1.13	-- ✔	Tables J3.4,

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						J3.5
Bottom flange plate data						
Vertical edge distance	[in]	1.50	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.50	1.13	--	✔	Tables J3.4, J3.5
Plate (support side)						
Top plate weld size - column flange	[1/16in]	5	3	--	✔	table J2.4
Bottom plate weld size - column flange	[1/16in]	5	3	--	✔	table J2.4
Beam						
Vertical edge distance	[in]	2.00	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.00	1.00	--	✔	Tables J3.4, J3.5

DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Top plate (beam side)						
Compression		[Kip]	175.10	0.00	DL1	0.00 Sec. J4.4
Tension yielding		[Kip]	175.10	46.07	DL1	0.26 Eq. J4-1
Bolts shear		[Kip]	56.95	48.18	DL1	0.85 Tables (7-1..14)
Bolt bearing (Top plate)		[Kip]	267.12	48.18	DL1	0.18 Eq. J3-6
Block shear		[Kip]	204.55	46.07	DL1	0.23 Eq. J4-5
Tension rupture		[Kip]	177.32	46.07	DL1	0.26 Eq. J4-2
Bottom plate (beam side)						
Tension yielding		[Kip]	175.10	0.00	DL1	0.00 Eq. J4-1
Compression		[Kip]	175.10	46.07	DL1	0.26 Sec. J4.4
Bolts shear		[Kip]	56.95	48.18	DL1	0.85 Tables (7-1..14)
Tension rupture		[Kip]	177.32	0.00	DL1	0.00 Eq. J4-2
Block shear		[Kip]	204.55	0.00	DL1	0.00 Eq. J4-5
Bolt bearing (Bottom plate)		[Kip]	267.12	48.18	DL1	0.18 Eq. J3-6
Top plate (support side)						
Weld to column		[Kip]	55.03	49.38	DL1	0.90 Eq. J2-4
Shear yielding due to welds		[Kip]	53.37	46.07	DL1	0.86 [3]
Tension rupture on extension (ws)		[Kip]	81.56	46.07	DL1	0.56 Eq. J4-2
Bottom plate (support side)						
Weld to column		[Kip]	55.03	49.38	DL1	0.90 Eq. J2-4
Shear yielding due to welds		[Kip]	53.37	46.07	DL1	0.86 [3]
Compression on extension (ws)		[Kip]	60.75	46.07	DL1	0.76 Sec. J4.4
Beam						
Top flange bending		[Kip*ft]	91.89	55.00	DL1	0.60 Eq. F13-1
Top flange bolt bearing under shear load		[Kip]	176.38	49.38	DL1	0.28 Eq. J3-6
Top flange block shear		[Kip]	132.28	49.38	DL1	0.37 Eq. J4-5
Bottom flange bending		[Kip*ft]	91.89	55.00	DL1	0.60 Eq. F13-1

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Bottom flange bolt bearing under shear load	[Kip]	176.38	49.38	DL1	0.28	Eq. J3-6
Bottom flange block shear	[Kip]	132.28	49.38	DL1	0.37	Eq. J4-5
Support						
Shear yielding due to welds (wh)	[Kip]	76.15	46.07	DL1	0.61	[3]

Global critical strength ratio 0.90

REFERENCES

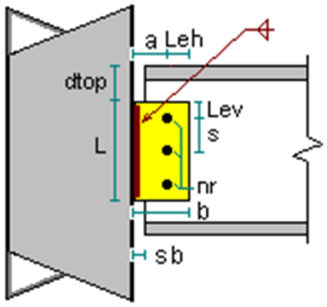
[3] Dowswell, B., 2003, Connection Design For Steel Structures, Structural Design Solutions, LLC.

Connection name : SP BCF
Connection ID : 2V

Family: Beam - Column flange (BCF)
Type: Single plate
Description: 2

GENERAL INFORMATION

Connector



MEMBERS

Beam

General

Beam section	:	W 21X50
Beam material	:	A992 Gr50
sb: Beam setback	:	0.5 in
Horizontal angle (deg)	:	0
Vertical angle (deg)	:	0
Horizontal eccentricity	:	0 in

Coped

dct: Top cope depth	:	0 in
ct: Top cope length	:	0 in
dcb: Bottom cope depth	:	0 in
cb: Bottom cope length	:	0 in

Column

General

Support section	:	HSS_SQR 6X6X3_8

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Support material	:	A500 GrB rectangular

SINGLE PLATE

Connector

Section	:	PL 3/8x3.5x18
b: Width	:	3.5 in
L: Length	:	18 in
tp: Plate thickness	:	0.375 in
Material	:	A36
Plate position on beam	:	Center
Bolts	:	3/4" A325 N
nr: Rows of Bolts	:	6
nc: Bolt columns	:	1
s: Pitch - longitudinal center-to-center spacing	:	3 in
Lev: Vertical edge distance	:	1.5 in
Leh: Horizontal edge distance	:	1.5 in
a: Distance between weld and bolts	:	2 in
Hole type on plate	:	Short Slotted (SSL)
Slot direction on plate	:	Horizontal
Hole type on beam	:	Standard (STD)
Welding electrode to support	:	E70XX
D: Weld size to support (1/16 in)	:	4
Wo: Obtuse side weld size (AWS) (1/16 in)	:	4
Wa: Acute side weld size (AWS) (1/16 in)	:	4
Wo: Obtuse side weld size (AISC) (1/16 in)	:	4
Wa: Acute side weld size (AISC) (1/16 in)	:	4

Design code: AISC 360-16 LRFD

DEMANDS

	Beam	Column				
Description	**Ru**	**Pu**	**Pu**	**Mu22**	**Mu33**	**Load type**
	[Kip]	[Kip]	[Kip]	[Kip*ft]	[Kip*ft]	
DL1	40.00	0.00	0.00	0.00	0.00	Design
DL2	40.00	0.00	0.00	0.00	0.00	Design

GEOMETRIC CONSIDERATIONS

	Dimensions References	**Unit**	**Value**	**Min. value**	**Max. value**	**Sta.**
Shear plate						
Number of bolts			6	2	12	p 10-102
Distance from the bolt line to the weld line		[in]	2.00	--	3.50	p 10-102
Minimum plate or beam web thickness		[in]	0.38	--	0.44	Table 10-9
Length		[in]	18.00	9.36	18.72	p. 10-104
Thickness, precludes a punching failure of the HSS...		[in]	0.38	--	--	

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Vertical edge distance	[in]	1.50	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.50	1.50	--	✔	p. 10-103
Vertical center-to-center spacing (pitch)	[in]	3.00	2.00	9.00	✔	Sec. J3.3, Sec. J3.5
Beam						
Vertical edge distance	[in]	2.90	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.50	1.00	--	✔	Tables J3.4, J3.5
Support						
Maximum value of the specified yield stress	[Kip/in2]	46.00	--	--	✔	
Yield stress to tensile stress ratio		0.79	--	0.80	✔	Table K2.1A, Table K2.1
Weld size	[1/16in]	4	4	--	✔	p. 10-87
Weld length	[in]	18.00	1.00	--	✔	Sec. J2.2b
Thickness	[in]	0.35	0.14	--	✔	Sec. B4.2, p. 10-153, p. 10-154

DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Shear plate						
Bolts shear		[Kip]	103.31	40.00	DL1	0.39	Tables (7-1..14)
Bolt bearing under shear load		[Kip]	161.80	40.00	DL1	0.25	p. 7-18, Sec. J3.10
Shear yielding		[Kip]	145.80	40.00	DL1	0.27	Eq. J4-3
Shear rupture		[Kip]	124.79	40.00	DL1	0.32	Eq. J4-4
Block shear		[Kip]	116.04	40.00	DL1	0.34	Eq. J4-5
Plate (support side)						
Weld capacity		[Kip]	200.46	40.00	DL1	0.20	Tables 8-4 .. 8-11
Beam						
Bolt bearing under shear load		[Kip]	192.44	40.00	DL1	0.21	p. 7-18, Sec. J3.10
Shear yielding		[Kip]	237.12	40.00	DL1	0.17	Eq. J4-3
Support						
Welds rupture		[Kip/ft]	145.74	17.78	DL1	0.12	p. 9-5
Chord wall plastification		[Kip]	59.00	0.00	DL1	0.00	Eq. J4-5
Punching shear (shear rupture)		[Kip]	491.88	40.00	DL1	0.08	p. 10-153

Global critical strength ratio 0.39

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Made by: JMB	Date: 10/17/2022	Job No. 21-18
Revision:	Date:	Sheet No. 195
Project Name: FIRE STATION 5		

NOTES

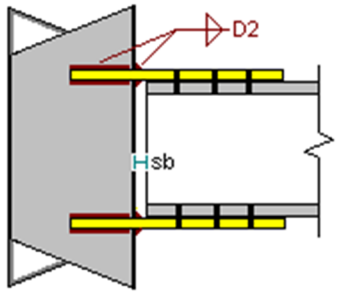
The plate is designed with the conventional configuration criteria.

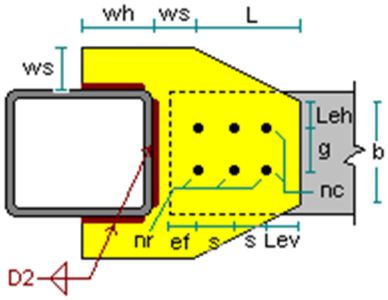
Connection name : FP BCF Bolted
Connection ID : 2M

Family: Beam - Column flange (BCF)
Type: Flange-plated
Description: 2

GENERAL INFORMATION

Connector





MEMBERS

Beam

General

Beam section	:	W 21X50
Beam material	:	A992 Gr50
sb: Beam setback	:	0.5 in

Column

General

Support section	:	HSS_SQR 6X6X3_8
Support material	:	A500 GrB rectangular

FLANGE PLATE

Connector

L: Top plate length	:	8.5 in
b: Top plate width	:	6 in
tp: Top plate thickness	:	0.5 in
Lb: Bottom plate length	:	8.5 in
Lb: Bottom plate length	:	8.5 in
bb: Bottom plate width	:	6 in
tpb: Bottom plate thickness	:	0.5 in
ws: Additional plate width	:	1.5 in
wh: Additional plate length	:	2.5 in
Plate material	:	A36

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Beam side

Connection type	:	Bolted
Bolts	:	3/4" A325 SC (class A)
nc: Bolt columns	:	2
nr: Rows of Bolts	:	3
g: Gage - transverse center-to-center spacing	:	3 in
s: Pitch - longitudinal center-to-center spacing	:	3 in
Lev: Longitudinal distance to top plate edge	:	1.5 in
Leh: Transverse distance to top plate edge	:	1.5 in
ef: Longitudinal distance to beam edge (top plate)	:	2 in
Levb: Longitudinal distance to bottom plate edge	:	1.5 in
Lehb: Transverse distance to bottom plate edge	:	1.5 in
efb: Longitudinal distance to beam edge (bottom ...	:	2 in
Hole type on beam	:	Standard (STD)
Hole type on top plate	:	Short Slotted (SSL)
Slot direction on top plate	:	Horizontal
Hole type on bottom plate	:	Short Slotted (SSL)
Slot direction on bottom plate	:	Horizontal

Support side

Welding electrode to support	:	E70XX
D1: Top weld size to support (1/16 in)	:	4
Welding electrode to support	:	E70XX
D2: Bottom weld size to support (1/16 in)	:	4

Design code: AISC 360-16 LRFD

DEMANDS

	Beam		Right beam		Left beam		Column	Panel		
Description	**Ru** [Kip]	**Pu** [Kip]	**Mu** [Kip*ft]	**PufTop** [Kip]	**PufBot** [Kip]	**PufTop** [Kip]	**PufBot** [Kip]	**Pu** [Kip]	**Vu** [Kip]	**Load type**
DL1	0.00	0.00	-65.00	38.49	-38.49	0.00	0.00	0.00	38.49	Design
DL2	0.00	0.00	-65.00	38.49	-38.49	0.00	0.00	0.00	38.49	Design

GEOMETRIC CONSIDERATIONS

	Dimensions References	**Unit**	**Value**	**Min. value**	**Max. value**	**Sta.**
Plate (beam side)						
Vertical center-to-center spacing (pitch)	[in]	3.00	2.00	12.00	✔	Sec. J3.3, Sec. J3.5
Horizontal center-to-center spacing (gage)	[in]	3.00	2.00	12.00	✔	Sec. J3.3, Sec. J3.5
Top flange plate data						
Vertical edge distance	[in]	1.50	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.50	1.13	--	✔	Tables J3.4,

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Project Name: FIRE STATION 5		

						J3.5
Bottom flange plate data						
Vertical edge distance	[in]	1.50	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.50	1.13	--	✔	Tables J3.4, J3.5
Plate (support side)						
Top plate weld size - column flange	[1/16in]	4	3	--	✔	table J2.4
Bottom plate weld size - column flange	[1/16in]	4	3	--	✔	table J2.4
Beam						
Vertical edge distance	[in]	2.00	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.77	1.00	--	✔	Tables J3.4, J3.5

DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Top plate (beam side)						
Compression		[Kip]	140.08	0.00	DL1	0.00 Sec. J4.4
Tension yielding		[Kip]	140.08	36.62	DL1	0.26 Eq. J4-1
Bolts shear		[Kip]	56.95	37.50	DL1	0.66 Tables (7-1..14)
Bolt bearing (Top plate)		[Kip]	213.69	37.50	DL1	0.18 Eq. J3-6
Block shear		[Kip]	163.64	36.62	DL1	0.22 Eq. J4-5
Tension rupture		[Kip]	141.85	36.62	DL1	0.26 Eq. J4-2
Bottom plate (beam side)						
Tension yielding		[Kip]	140.08	0.00	DL1	0.00 Eq. J4-1
Compression		[Kip]	140.08	36.62	DL1	0.26 Sec. J4.4
Bolts shear		[Kip]	56.95	37.50	DL1	0.66 Tables (7-1..14)
Tension rupture		[Kip]	141.85	0.00	DL1	0.00 Eq. J4-2
Block shear		[Kip]	163.64	0.00	DL1	0.00 Eq. J4-5
Bolt bearing (Bottom plate)		[Kip]	213.69	37.50	DL1	0.18 Eq. J3-6
Top plate (support side)						
Weld to column		[Kip]	44.02	38.49	DL1	0.87 Eq. J2-4
Shear yielding due to welds		[Kip]	42.69	36.62	DL1	0.86 [3]
Tension rupture on extension (ws)		[Kip]	65.25	36.62	DL1	0.56 Eq. J4-2
Bottom plate (support side)						
Weld to column		[Kip]	44.02	38.49	DL1	0.87 Eq. J2-4
Shear yielding due to welds		[Kip]	42.69	36.62	DL1	0.86 [3]
Compression on extension (ws)		[Kip]	48.60	36.62	DL1	0.75 Sec. J4.4
Beam						
Top flange bending		[Kip*ft]	337.23	65.00	DL1	0.19 Eq. F13-1
Top flange bolt bearing under shear load		[Kip]	281.68	38.49	DL1	0.14 Eq. J3-6
Top flange block shear		[Kip]	251.16	38.49	DL1	0.15 Eq. J4-5
Bottom flange bending		[Kip*ft]	337.23	65.00	DL1	0.19 Eq. F13-1

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Bottom flange bolt bearing under shear load	[Kip]	281.68	38.49	DL1	0.14	Eq. J3-6
Bottom flange block shear	[Kip]	251.16	38.49	DL1	0.15	Eq. J4-5
Support						
Shear yielding due to welds (wh)	[Kip]	76.15	36.62	DL1	0.48	[3]

Global critical strength ratio 0.87

REFERENCES

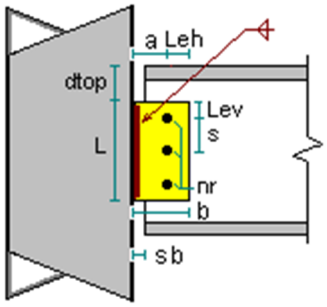
[3] Dowswell, B., 2003, Connection Design For Steel Structures, Structural Design Solutions, LLC.

Connection name : SP_BCF_1/4PL_3B3/4
Connection ID : 3V

Family: Beam - Column flange (BCF)
Type: Single plate
Description: 3

GENERAL INFORMATION

Connector



MEMBERS

Beam

General

Beam section	:	W 16X36
Beam material	:	A992 Gr50
sb: Beam setback	:	0.5 in
Horizontal angle (deg)	:	0
Vertical angle (deg)	:	0
Horizontal eccentricity	:	0 in

Coped

dct: Top cope depth	:	0 in
ct: Top cope length	:	0 in
dcb: Bottom cope depth	:	0 in
cb: Bottom cope length	:	0 in

Column

General

Support section	:	HSS_SQR 6X6X3_8

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Support material : A500 GrB rectangular

SINGLE PLATE

Connector

Section	:	PL 3/8x4x12
b: Width	:	4 in
L: Length	:	12 in
tp: Plate thickness	:	0.375 in
Material	:	A36
Plate position on beam	:	Center
Bolts	:	3/4" A325 N
nr: Rows of Bolts	:	4
nc: Bolt columns	:	1
s: Pitch - longitudinal center-to-center spacing	:	3 in
Lev: Vertical edge distance	:	1.5 in
Leh: Horizontal edge distance	:	1.5 in
a: Distance between weld and bolts	:	2.5 in
Hole type on plate	:	Short Slotted (SSL)
Slot direction on plate	:	Horizontal
Hole type on beam	:	Standard (STD)
Welding electrode to support	:	E70XX
D: Weld size to support (1/16 in)	:	4
Wo: Obtuse side weld size (AWS) (1/16 in)	:	4
Wa: Acute side weld size (AWS) (1/16 in)	:	4
Wo: Obtuse side weld size (AISC) (1/16 in)	:	4
Wa: Acute side weld size (AISC) (1/16 in)	:	4

Design code: AISC 360-16 LRFD

DEMANDS

	Beam	Column				
Description	**Ru**	**Pu**	**Pu**	**Mu22**	**Mu33**	**Load type**
	[Kip]	[Kip]	[Kip]	[Kip*ft]	[Kip*ft]	
DL1	17.00	0.00	0.00	0.00	0.00	Design
DL2	17.00	0.00	0.00	0.00	0.00	Design

GEOMETRIC CONSIDERATIONS

	Dimensions References	Unit	Value	Min. value	Max. value	Sta.
Shear plate						
Number of bolts			4	2	12	✔ p 10-102
Distance from the bolt line to the weld line		[in]	2.50	--	3.50	✔ p 10-102
Length		[in]	12.00	7.12	14.24	✔ p. 10-104
Thickness, precludes a punching failure of the HSS...		[in]	0.38	--	--	✔
Vertical edge distance		[in]	1.50	1.00	--	✔ Tables J3.4,

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						J3.5
Horizontal edge distance	[in]	1.50	1.50	--	✔	p. 10-103
Vertical center-to-center spacing (pitch)	[in]	3.00	2.00	7.08	✔	Sec. J3.3, Sec. J3.5
Beam						
Vertical edge distance	[in]	3.45	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	2.00	1.00	--	✔	Tables J3.4, J3.5
Support						
Maximum value of the specified yield stress	[Kip/in2]	46.00	--	--	✔	
Yield stress to tensile stress ratio		0.79	--	0.80	✔	Table K2.1A, Table K2.1
Weld size	[1/16in]	4	4	--	✔	p. 10-87
Weld length	[in]	12.00	1.00	--	✔	Sec. J2.2b
Thickness	[in]	0.35	0.14	--	✔	Sec. B4.2, p. 10-153, p. 10-154

DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Shear plate						
Bolts shear		[Kip]	65.53	17.00	DL1	0.26 Tables (7-1..14)
Bolt bearing under shear load		[Kip]	100.21	17.00	DL1	0.17 p. 7-18, Sec. J3.10
Shear yielding		[Kip]	97.20	17.00	DL1	0.17 Eq. J4-3
Shear rupture		[Kip]	83.19	17.00	DL1	0.20 Eq. J4-4
Block shear		[Kip]	79.59	17.00	DL1	0.21 Eq. J4-5
Plate (support side)						
Weld capacity		[Kip]	133.64	17.00	DL1	0.13 Tables 8-4 .. 8-11
Beam						
Bolt bearing under shear load		[Kip]	94.76	17.00	DL1	0.18 p. 7-18, Sec. J3.10
Shear yielding		[Kip]	140.72	17.00	DL1	0.12 Eq. J4-3
Support						
Welds rupture		[Kip/ft]	145.74	11.33	DL1	0.08 p. 9-5
Chord wall plastification		[Kip]	47.05	0.00	DL1	0.00 Eq. J4-5
Punching shear (shear rupture)		[Kip]	174.89	17.00	DL1	0.10 p. 10-153

Global critical strength ratio 0.26

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Project Name: FIRE STATION 5		

NOTES

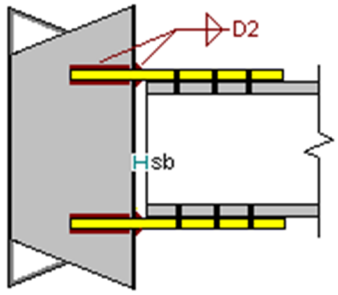
The plate is designed with the conventional configuration criteria.

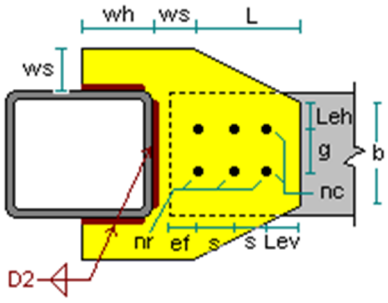
Connection name : FP BCF Bolted
Connection ID : 3M

Family: Beam - Column flange (BCF)
Type: Flange-plated
Description: 3

GENERAL INFORMATION

Connector





MEMBERS

Beam

General

Beam section	:	W 16X36
Beam material	:	A992 Gr50
sb: Beam setback	:	0.5 in

Column

General

Support section	:	HSS_SQR 6X6X3_8
Support material	:	A500 GrB rectangular

FLANGE PLATE

Connector

L: Top plate length	:	8.5 in
b: Top plate width	:	6 in
tp: Top plate thickness	:	0.5 in
Lb: Bottom plate length	:	8.5 in
Lb: Bottom plate length	:	8.5 in
bb: Bottom plate width	:	6 in
tpb: Bottom plate thickness	:	0.5 in
ws: Additional plate width	:	1.5 in
wh: Additional plate length	:	2.5 in
Plate material	:	A36

Beam side

Connection type	:	Bolted
Bolts	:	3/4" A325 SC (class A)

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nc: Bolt columns	:	2
nr: Rows of Bolts	:	3
g: Gage - transverse center-to-center spacing	:	3 in
s: Pitch - longitudinal center-to-center spacing	:	3 in
Lev: Longitudinal distance to top plate edge	:	1.5 in
Leh: Transverse distance to top plate edge	:	1.5 in
ef: Longitudinal distance to beam edge (top plate)	:	2 in
Levb: Longitudinal distance to bottom plate edge	:	1.5 in
Lehb: Transverse distance to bottom plate edge	:	1.5 in
efb: Longitudinal distance to beam edge (bottom ...	:	2 in
Hole type on beam	:	Standard (STD)
Hole type on top plate	:	Short Slotted (SSL)
Slot direction on top plate	:	Horizontal
Hole type on bottom plate	:	Short Slotted (SSL)
Slot direction on bottom plate	:	Horizontal
Support side		
Welding electrode to support	:	E70XX
D1: Top weld size to support (1/16 in)	:	4
Welding electrode to support	:	E70XX
D2: Bottom weld size to support (1/16 in)	:	4

Design code: AISC 360-16 LRFD

DEMANDS

	Beam		Right beam		Left beam		Column	Panel		
Description	**Ru**	**Pu**	**Mu**	**PufTop**	**PufBot**	**PufTop**	**PufBot**	**Pu**	**Vu**	**Load type**
	[Kip]	[Kip]	[Kip*ft]	[Kip]	[Kip]	[Kip]	[Kip]	[Kip]	[Kip]	
DL1	0.00	0.00	-48.00	37.23	-37.23	0.00	0.00	0.00	37.23	Design
DL2	0.00	0.00	-48.00	37.23	-37.23	0.00	0.00	0.00	37.23	Design

GEOMETRIC CONSIDERATIONS

	Dimensions References	**Unit**	**Value**	**Min. value**	**Max. value**	**Sta.**
Plate (beam side)						
Vertical center-to-center spacing (pitch)	[in]		3.00	2.00	10.32 ✔	Sec. J3.3, Sec. J3.5
Horizontal center-to-center spacing (gage)	[in]		3.00	2.00	10.32 ✔	Sec. J3.3, Sec. J3.5
Top flange plate data						
Vertical edge distance	[in]		1.50	1.00	-- ✔	Tables J3.4, J3.5
Horizontal edge distance	[in]		1.50	1.13	-- ✔	Tables J3.4, J3.5
Bottom flange plate data						

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Vertical edge distance	[in]	1.50	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.50	1.13	--	✔	Tables J3.4, J3.5
Plate (support side)						
Top plate weld size - column flange	[1/16in]	4	3	--	✔	table J2.4
Bottom plate weld size - column flange	[1/16in]	4	3	--	✔	table J2.4
Beam						
Vertical edge distance	[in]	2.00	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	2.00	1.00	--	✔	Tables J3.4, J3.5

DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Top plate (beam side)						
Compression		[Kip]	140.08	0.00	DL1	0.00 Sec. J4.4
Tension yielding		[Kip]	140.08	35.12	DL1	0.25 Eq. J4-1
Bolts shear		[Kip]	56.95	36.23	DL1	0.64 Tables (7-1..14)
Bolt bearing (Top plate)		[Kip]	213.69	36.23	DL1	0.17 Eq. J3-6
Block shear		[Kip]	163.64	35.12	DL1	0.21 Eq. J4-5
Tension rupture		[Kip]	141.85	35.12	DL1	0.25 Eq. J4-2
Bottom plate (beam side)						
Tension yielding		[Kip]	140.08	0.00	DL1	0.00 Eq. J4-1
Compression		[Kip]	140.08	35.12	DL1	0.25 Sec. J4.4
Bolts shear		[Kip]	56.95	36.23	DL1	0.64 Tables (7-1..14)
Tension rupture		[Kip]	141.85	0.00	DL1	0.00 Eq. J4-2
Block shear		[Kip]	163.64	0.00	DL1	0.00 Eq. J4-5
Bolt bearing (Bottom plate)		[Kip]	213.69	36.23	DL1	0.17 Eq. J3-6
Top plate (support side)						
Weld to column		[Kip]	44.02	37.23	DL1	0.85 Eq. J2-4
Shear yielding due to welds		[Kip]	42.69	35.12	DL1	0.82 [3]
Tension rupture on extension (ws)		[Kip]	65.25	35.12	DL1	0.54 Eq. J4-2
Bottom plate (support side)						
Weld to column		[Kip]	44.02	37.23	DL1	0.85 Eq. J2-4
Shear yielding due to welds		[Kip]	42.69	35.12	DL1	0.82 [3]
Compression on extension (ws)		[Kip]	48.60	35.12	DL1	0.72 Sec. J4.4
Beam						
Top flange bending		[Kip*ft]	206.48	48.00	DL1	0.23 Eq. F13-1
Top flange bolt bearing under shear load		[Kip]	226.39	37.23	DL1	0.16 Eq. J3-6
Top flange block shear		[Kip]	211.51	37.23	DL1	0.18 Eq. J4-5
Bottom flange bending		[Kip*ft]	206.48	48.00	DL1	0.23 Eq. F13-1
Bottom flange bolt bearing under shear load		[Kip]	226.39	37.23	DL1	0.16 Eq. J3-6
Bottom flange block shear		[Kip]	211.51	37.23	DL1	0.18 Eq. J4-5

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Support

Shear yielding due to welds (wh)	[Kip]	76.15	35.12	DL1	0.46	[3]

Global critical strength ratio 0.85

REFERENCES

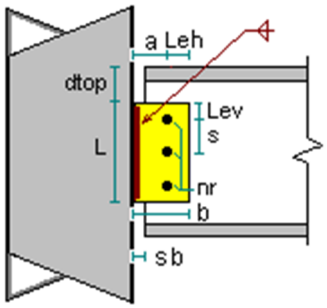
[3] Dowswell, B., 2003, Connection Design For Steel Structures, Structural Design Solutions, LLC.

Connection name : SP BCF
Connection ID : 4V

Family: Beam - Column flange (BCF)
Type: Single plate
Description: 4

GENERAL INFORMATION

Connector



MEMBERS

Beam

General

Beam section	:	W 12X26
Beam material	:	A992 Gr50
sb: Beam setback	:	0.5 in
Horizontal angle (deg)	:	0
Vertical angle (deg)	:	0
Horizontal eccentricity	:	0 in

Coped

dct: Top cope depth	:	0 in
ct: Top cope length	:	0 in
dcb: Bottom cope depth	:	0 in
cb: Bottom cope length	:	0 in

Column

General

Support section	:	HSS_SQR 6X6X5_8
Support material	:	A500 GrB rectangular

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SINGLE PLATE

Connector

Section	:	PL 3/8x3.5x9
b: Width	:	3.5 in
L: Length	:	9 in
tp: Plate thickness	:	0.375 in
Material	:	A36
Plate position on beam	:	Center
Bolts	:	3/4" A325 N
nr: Rows of Bolts	:	3
nc: Bolt columns	:	1
s: Pitch - longitudinal center-to-center spacing	:	3 in
Lev: Vertical edge distance	:	1.5 in
Leh: Horizontal edge distance	:	1.5 in
a: Distance between weld and bolts	:	2 in
Hole type on plate	:	Short Slotted (SSL)
Slot direction on plate	:	Horizontal
Hole type on beam	:	Standard (STD)
Welding electrode to support	:	E70XX
D: Weld size to support (1/16 in)	:	4
Wo: Obtuse side weld size (AWS) (1/16 in)	:	4
Wa: Acute side weld size (AWS) (1/16 in)	:	4
Wo: Obtuse side weld size (AISC) (1/16 in)	:	4
Wa: Acute side weld size (AISC) (1/16 in)	:	4

Design code: AISC 360-16 LRFD

DEMANDS

	Beam	Column				
Description	**Ru** [Kip]	**Pu** [Kip]	**Pu** [Kip]	**Mu22** [Kip*ft]	**Mu33** [Kip*ft]	**Load type**
DL1	15.00	0.00	0.00	0.00	0.00	Design
DL2	15.00	0.00	0.00	0.00	0.00	Design

GEOMETRIC CONSIDERATIONS

	Dimensions References	**Unit**	**Value**	**Min. value**	**Max. value**	**Sta.**
Shear plate						
Number of bolts		3	2	12	✔	p 10-102
Distance from the bolt line to the weld line	[in]	2.00	--	3.50	✔	p 10-102
Length	[in]	9.00	5.42	10.84	✔	p. 10-104
Thickness, precludes a punching failure of the HSS...	[in]	0.38	--	--	✔	
Vertical edge distance	[in]	1.50	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.50	1.50	--	✔	p. 10-103

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Vertical center-to-center spacing (pitch)	[in]	3.00	2.00	5.52	✔	Sec. J3.3, Sec. J3.5
Beam						
Vertical edge distance	[in]	3.10	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.50	1.00	--	✔	Tables J3.4, J3.5
Support						
Maximum value of the specified yield stress	[Kip/in2]	46.00	--	--	✔	
Yield stress to tensile stress ratio		0.79	--	0.80	✔	Table K2.1A, Table K2.1
Weld size	[1/16in]	4	4	--	✔	p. 10-87
Weld length	[in]	9.00	1.00	--	✔	Sec. J2.2b
Thickness	[in]	0.58	0.12	--	✔	Sec. B4.2, p. 10-153, p. 10-154

DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Shear plate						
Bolts shear		[Kip]	48.60	15.00	DL1	0.31	Tables (7-1..14)
Bolt bearing under shear load		[Kip]	72.52	15.00	DL1	0.21	p. 7-18, Sec. J3.10
Shear yielding		[Kip]	72.90	15.00	DL1	0.21	Eq. J4-3
Shear rupture		[Kip]	62.40	15.00	DL1	0.24	Eq. J4-4
Block shear		[Kip]	61.37	15.00	DL1	0.24	Eq. J4-5
Plate (support side)						
Weld capacity		[Kip]	100.23	15.00	DL1	0.15	Tables 8-4 .. 8-11
Beam						
Bolt bearing under shear load		[Kip]	54.79	15.00	DL1	0.27	p. 7-18, Sec. J3.10
Shear yielding		[Kip]	84.18	15.00	DL1	0.18	Eq. J4-3
Support						
Welds rupture		[Kip/ft]	242.63	13.33	DL1	0.05	p. 9-5
Chord wall plastification		[Kip]	113.84	0.00	DL1	0.00	Eq. J4-5
Punching shear (shear rupture)		[Kip]	204.72	15.00	DL1	0.07	p. 10-153

Global critical strength ratio 0.31

NOTES

The plate is designed with the conventional configuration criteria.

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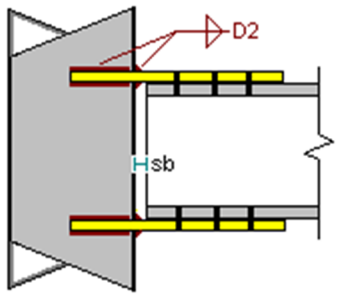
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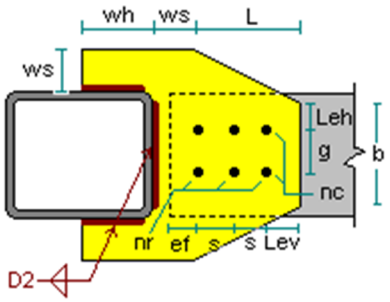
Connection name : FP BCF Bolted
Connection ID : 4M

Family: Beam - Column flange (BCF)
Type: Flange-plated
Description: 4

GENERAL INFORMATION

Connector





MEMBERS

Beam

General

Beam section	:	W 12X26
Beam material	:	A992 Gr50
sb: Beam setback	:	0.5 in

Column

General

Support section	:	HSS_SQR 6X6X5_8
Support material	:	A500 GrB rectangular

FLANGE PLATE

Connector

L: Top plate length	:	8.5 in
b: Top plate width	:	6 in
tp: Top plate thickness	:	0.625 in
Lb: Bottom plate length	:	8.5 in
Lb: Bottom plate length	:	8.5 in
bb: Bottom plate width	:	6 in
tpb: Bottom plate thickness	:	0.625 in
ws: Additional plate width	:	1.5 in
wh: Additional plate length	:	3 in
Plate material	:	A36

Beam side

Connection type	:	Bolted
Bolts	:	3/4" A325 SC (class A)
nc: Bolt columns	:	2
nr: Rows of Bolts	:	3

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g: Gage - transverse center-to-center spacing	:	3 in
s: Pitch - longitudinal center-to-center spacing	:	3 in
Lev: Longitudinal distance to top plate edge	:	1.5 in
Leh: Transverse distance to top plate edge	:	1.5 in
ef: Longitudinal distance to beam edge (top plate)	:	2 in
Levb: Longitudinal distance to bottom plate edge	:	1.5 in
Lehb: Transverse distance to bottom plate edge	:	1.5 in
efb: Longitudinal distance to beam edge (bottom ...	:	2 in
Hole type on beam	:	Standard (STD)
Hole type on top plate	:	Short Slotted (SSL)
Slot direction on top plate	:	Horizontal
Hole type on bottom plate	:	Short Slotted (SSL)
Slot direction on bottom plate	:	Horizontal
Support side		
Welding electrode to support	:	E70XX
D1: Top weld size to support (1/16 in)	:	5
Welding electrode to support	:	E70XX
D2: Bottom weld size to support (1/16 in)	:	5

Design code: AISC 360-16 LRFD

DEMANDS

	Beam		Right beam		Left beam		Column	Panel		
Description	**Ru** [Kip]	**Pu** [Kip]	**Mu** [Kip*ft]	**PufTop** [Kip]	**PufBot** [Kip]	**PufTop** [Kip]	**PufBot** [Kip]	**Pu** [Kip]	**Vu** [Kip]	**Load type**
DL1	0.00	0.00	-57.00	57.87	-57.87	0.00	0.00	0.00	57.87	Design
DL2	0.00	0.00	-57.00	57.87	-57.87	0.00	0.00	0.00	57.87	Design

GEOMETRIC CONSIDERATIONS

	Dimensions References	**Unit**	**Value**	**Min. value**	**Max. value**		**Sta.**
Plate (beam side)							
Vertical center-to-center spacing (pitch)		[in]	3.00	2.00	9.12	✔	Sec. J3.3, Sec. J3.5
Horizontal center-to-center spacing (gage)		[in]	3.00	2.00	9.12	✔	Sec. J3.3, Sec. J3.5
Top flange plate data							
Vertical edge distance		[in]	1.50	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance		[in]	1.50	1.13	--	✔	Tables J3.4, J3.5
Bottom flange plate data							
Vertical edge distance		[in]	1.50	1.00	--	✔	Tables J3.4, J3.5

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Horizontal edge distance	[in]	1.50	1.13	--	✔	Tables J3.4, J3.5
Plate (support side)						
Top plate weld size - column flange	[1/16in]	5	4	--	✔	table J2.4
Bottom plate weld size - column flange	[1/16in]	5	4	--	✔	table J2.4
Beam						
Vertical edge distance	[in]	2.00	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.74	1.00	--	✔	Tables J3.4, J3.5

DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Top plate (beam side)						
Compression		[Kip]	175.10	0.00	DL1	0.00	Sec. J4.4
Tension yielding		[Kip]	175.10	53.33	DL1	0.30	Eq. J4-1
Bolts shear		[Kip]	56.95	56.07	DL1	0.98	Tables (7-1..14)
Bolt bearing (Top plate)		[Kip]	267.12	56.07	DL1	0.21	Eq. J3-6
Block shear		[Kip]	204.55	53.33	DL1	0.26	Eq. J4-5
Tension rupture		[Kip]	177.32	53.33	DL1	0.30	Eq. J4-2
Bottom plate (beam side)						
Tension yielding		[Kip]	175.10	0.00	DL1	0.00	Eq. J4-1
Compression		[Kip]	175.10	53.33	DL1	0.30	Sec. J4.4
Bolts shear		[Kip]	56.95	56.07	DL1	0.98	Tables (7-1..14)
Tension rupture		[Kip]	177.32	0.00	DL1	0.00	Eq. J4-2
Block shear		[Kip]	204.55	0.00	DL1	0.00	Eq. J4-5
Bolt bearing (Bottom plate)		[Kip]	267.12	56.07	DL1	0.21	Eq. J3-6
Top plate (support side)						
Weld to column		[Kip]	59.26	57.87	DL1	0.98	Eq. J2-4
Shear yielding due to welds		[Kip]	57.47	53.33	DL1	0.93	[3]
Tension rupture on extension (ws)		[Kip]	81.56	53.33	DL1	0.65	Eq. J4-2
Bottom plate (support side)						
Weld to column		[Kip]	59.26	57.87	DL1	0.98	Eq. J2-4
Shear yielding due to welds		[Kip]	57.47	53.33	DL1	0.93	[3]
Compression on extension (ws)		[Kip]	60.75	53.33	DL1	0.88	Sec. J4.4
Beam						
Top flange bending		[Kip*ft]	118.92	57.00	DL1	0.48	Eq. F13-1
Top flange bolt bearing under shear load		[Kip]	200.07	57.87	DL1	0.29	Eq. J3-6
Top flange block shear		[Kip]	177.65	57.87	DL1	0.33	Eq. J4-5
Bottom flange bending		[Kip*ft]	118.92	57.00	DL1	0.48	Eq. F13-1
Bottom flange bolt bearing under shear load		[Kip]	200.07	57.87	DL1	0.29	Eq. J3-6
Bottom flange block shear		[Kip]	177.65	57.87	DL1	0.33	Eq. J4-5
Support						
Shear yielding due to welds (wh)		[Kip]	136.53	53.33	DL1	0.39	[3]

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Global critical strength ratio 0.98

REFERENCES

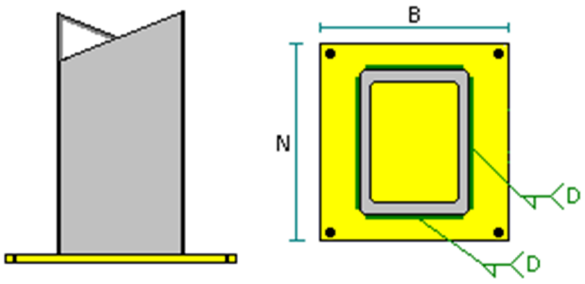
[3] Dowswell, B., 2003, Connection Design For Steel Structures, Structural Design Solutions, LLC.

Connection name : Fixed biaxial BP
Connection ID : 5

Family: Column - Base (CB)
Type: Base plate
Description: 5

GENERAL INFORMATION

Connector



MEMBERS

Column

Column type	:	Prismatic member
Section	:	HSS_SQR 4X4X3_8
Material	:	A500 GrB rectangular
Longitudinal offset	:	0 in
Transversal offset	:	0 in

CONNECTOR

Base plate

Connection type	:	Unstiffened
Position on the support	:	Center
N: Longitudinal dimension	:	5 in
B: Transversal dimension	:	10 in
Thickness	:	1 in
Material	:	A36
Column weld	:	E70XX
D: Column weld size (1/16 in)	:	4
Override A2/A1 ratio	:	No

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Include shear lug	:	No
Support		
With pedestal	:	No
Longitudinal dimension	:	8 ft
Transversal dimension	:	8 ft
Thickness	:	24 in
Material	:	C 4-60
Include grouting	:	No
Anchor		
Anchor position	:	Longitudinal position
Rows number per side	:	1
Anchors per row	:	2
Longitudinal edge distance on the plate	:	1 in
Transverse edge distance on the plate	:	1.5 in
Anchor type	:	Headed
Head type	:	Hexagonal
Include lock nut	:	No
Anchor	:	3/4"
Effective embedment depth	:	12 in
Total length	:	13.99 in
Material	:	F1554 Gr36
Fy	:	36 kip/in2
Fu	:	58 kip/in2
Cracked concrete	:	No
Brittle steel	:	No
Anchors welded to base plate	:	No
Anchor reinforcement		
Type of reinforcement	:	Primary
Tension reinforcement	:	No
Shear reinforcement	:	No

Design code: AISC 360-16 LRFD, ACI 318-11

DEMANDS

Description	Pu [Kip]	Mu22 [Kip*ft]	Mu33 [Kip*ft]	Vu2 [Kip]	Vu3 [Kip]	Load type
DL1	-2.00	0.00	5.00	1.80	0.00	Design
DL2	-2.00	5.00	0.00	0.00	1.80	Design

Design for major axis

Base plate (AISC 360-16 LRFD)

GEOMETRIC CONSIDERATIONS

	Dimensions References	Unit	Value	Min. value	Max. value	Sta.
Base plate						
Distance from anchor to edge		[in]	0.62	0.25	--	✔

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Weld size	[1/16in]	4	3	--	✔	table J2.4

DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Concrete base						
Axial bearing	[Kip/in2]	4.42	1.34	DL1	0.30	DG1 3.1.1;
Base plate						
Flexural yielding (bearing interface)	[Kip*ft/ft]	8.10	6.45	DL1	0.80	DG1 Eq. 3.3.13, DG1 Sec 3.1.2
Flexural yielding (tension interface)	[Kip*ft/ft]	8.10	2.75	DL1	0.34	DG1 Eq. 3.3.13
Column						
Weld capacity	[Kip/ft]	100.23	34.34	DL1	0.34	p. 8-9, Sec. J2.5, Sec. J2.4, HSS Manual p. 7-10
Elastic method weld shear and axial capacity	[Kip/ft]	100.23	49.69	DL1	0.50	p. 8-9, Sec. J2.5, Sec. J2.4

Ratio 0.80

Design for minor axis
Base plate (AISC 360-16 LRFD)

GEOMETRIC CONSIDERATIONS

	Dimensions References	Unit	Value	Min. value	Max. value	Sta.
Base plate						
Distance from anchor to edge	[in]	0.62	0.25	--	✔	
Weld size	[1/16in]	4	3	--	✔	table J2.4

DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Concrete base						
Axial bearing	[Kip/in2]	4.42	1.34	DL1	0.30	DG1 3.1.1;
Base plate						
Flexural yielding (bearing interface)	[Kip*ft/ft]	8.10	2.98	DL2	0.37	DG1 Eq. 3.3.13, DG1 Sec 3.1.2
Flexural yielding (tension interface)	[Kip*ft/ft]	8.10	2.75	DL1	0.34	DG1 Eq. 3.3.13

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Column						
Weld capacity	[Kip/ft]	100.23	34.34	DL1	0.34	p. 8-9, Sec. J2.5, Sec. J2.4, HSS Manual p. 7-10
Elastic method weld shear and axial capacity	[Kip/ft]	100.23	49.69	DL2	0.50	p. 8-9, Sec. J2.5, Sec. J2.4
	Ratio	**0.50**				

Major axis
Anchors

GEOMETRIC CONSIDERATIONS

Dimensions References	Unit	Value	Min. value	Max. value	Sta.
Anchors					
Anchor spacing	[in]	3.00	3.00	--	✔ Sec. D.8.1
Concrete cover	[in]	44.12	3.00	--	✔ Sec. 7.7.1
Effective length	[in]	12.49	--	23.51	✔

DESIGN CHECK

Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Anchor tension Eq. D-2	[Kip]	14.55	8.59	DL1	0.59
Breakout of anchor in tension 0.15 Eq. D-3, Sec. D.3.3.4.4	[Kip]	55.69	8.59	DL1	
Breakout of group of anchors in tension DL1 0.26 Eq. D-4, Sec. D.3.3.4.4	[Kip]	66.52			17.17
Pullout of anchor in tension 0.42 Sec. D.3.3.4.4	[Kip]	20.51	8.59	DL1	
Anchor shear Eq. D-29	[Kip]	7.57	0.45	DL1	0.06
Breakout of anchor in shear 0.01 Table D.4.1.1, Sec. D.4.3	[Kip]	68.49	0.45	DL1	

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Breakout of group of anchors in shear[Kip]			71.40	1.80	
DL1	0.03	Table D.4.1.1,			
Sec. D.4.3					
Pryout of anchor in shear	[Kip]	111.38	0.45	DL1	
0.00	Eq. D-3,				
Table D.4.1.1,					
Sec. D.4.3					
Pryout of group of anchors in shear[Kip]		133.04	0.90	DL1	
0.01	Eq. D-4,				
Table D.4.1.1,					
Sec. D.4.3					
Interaction of tensile and shear forces[Kip]			1.20	0.00	
DL1	0.00	Eq. D-2,			
Eq. D-3,					
Sec. D.3.3.4.4,					
Eq. D-4,					
Eq. D-29,					
Table D.4.1.1,					
Sec. D.4.3,					
Sec. D.7					

Ratio 0.59

Minor axis
Anchors

GEOMETRIC CONSIDERATIONS

Dimensions	Unit	Value	Min. value	Max. value	Sta.	References
Anchors						
Anchor spacing	[in]	3.00	3.00	--	✓	Sec. D.8.1
Concrete cover	[in]	44.12	3.00	--	✓	Sec. 7.7.1
Effective length	[in]	12.49	--	23.51	✓	

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DESIGN CHECK

Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Anchor tension Eq. D-2	[Kip]	14.55	8.59	DL1	0.59
Breakout of anchor in tension 0.15 Eq. D-3, Sec. D.3.3.4.4	[Kip]	55.69	8.59	DL1	
Breakout of group of anchors in tension DL1 0.26 Eq. D-4, Sec. D.3.3.4.4	[Kip]		66.52		17.17
Pullout of anchor in tension 0.42 Sec. D.3.3.4.4	[Kip]	20.51	8.59	DL1	
Anchor shear Eq. D-29	[Kip]	7.57	0.45	DL2	0.06
Breakout of anchor in shear 0.01 Table D.4.1.1, Sec. D.4.3	[Kip]	70.10	0.45	DL2	
Breakout of group of anchors in shear DL2 0.03 Table D.4.1.1, Sec. D.4.3	[Kip]		71.40		1.80
Pryout of anchor in shear 0.00 Eq. D-3, Table D.4.1.1, Sec. D.4.3	[Kip]	111.38	0.45	DL2	
Pryout of group of anchors in shear 0.01 Eq. D-4, Table D.4.1.1, Sec. D.4.3	[Kip]	120.67	0.90	DL2	
Interaction of tensile and shear forces DL2 0.00 Eq. D-2, Eq. D-3, Sec. D.3.3.4.4, Eq. D-4, Eq. D-29, Table D.4.1.1,	[Kip]		1.20		0.00

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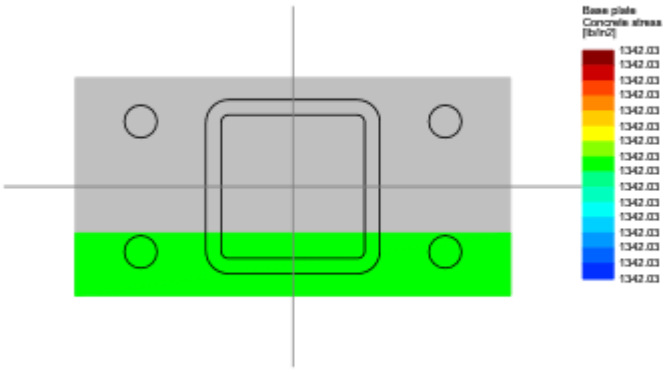
Sec. D.4.3,

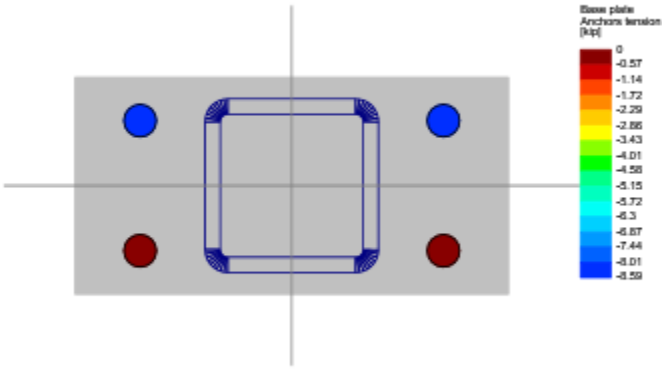
Sec. D.7

Ratio 0.59

Global critical strength ratio 0.80

Biaxial
Maximum compression and tension (DL1)





Maximum bearing pressure	1342.03	[psi]
Minimum bearing pressure	1342.03	[psi]

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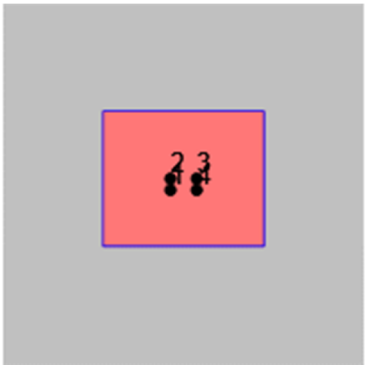
Maximum anchor tension	8.59	[Kip]
Minimum anchor tension	0.00	[Kip]
Neutral axis angle	0.00	
Bearing length	1.43	[in]

Anchors tensions

Anchor	Transverse [in]	Longitudinal [in]	Shear [Kip]	Tension [Kip]
1	-3.50	-1.50	0.45	0.00
2	-3.50	1.50	0.45	8.59
3	3.50	1.50	0.45	8.59
4	3.50	-1.50	0.45	0.00

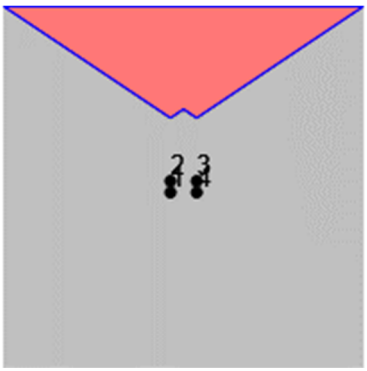
Major axis

Results for tensile breakout (DL1)



Group	Area [in2]	Tension [Kip]	Anchors
1	1548.00	17.17	2, 3

Results for shear breakout (DL1)



Group	Area [in2]	Shear [Kip]	Anchors

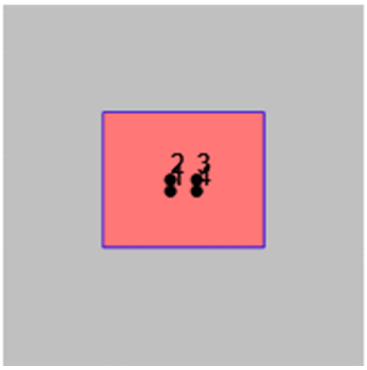
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1	2304.00	1.80	1, 2, 3, 4
2	2304.00	0.90	2, 3

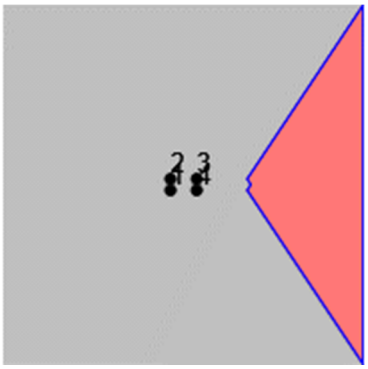
Minor axis

Results for tensile breakout (DL1)



Group	Area [in2]	Tension [Kip]	Anchors
1	1548.00	17.17	2, 3

Results for shear breakout (DL2)



Group	Area [in2]	Shear [Kip]	Anchors
1	2304.00	1.80	1, 2, 3, 4
2	2304.00	0.90	3, 4

Connection name : Fixed biaxial BP
Connection ID : 6

Family: Column - Base (CB)
Type: Base plate

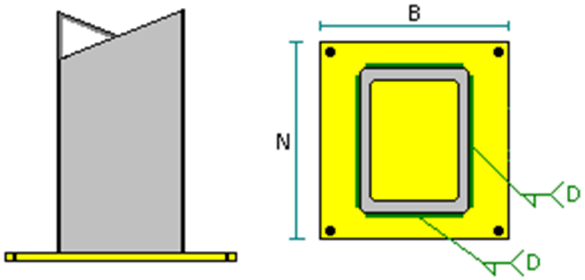
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Description: 6

GENERAL INFORMATION

Connector



MEMBERS

Column

Column type	:	Prismatic member
Section	:	HSS_SQR 6X6X1_2
Material	:	A500 GrB rectangular
Longitudinal offset	:	0 in
Transversal offset	:	0 in

CONNECTOR

Base plate

Connection type	:	Unstiffened
Position on the support	:	Center
N: Longitudinal dimension	:	6.5 in
B: Transversal dimension	:	12 in
Thickness	:	1.5 in
Material	:	A36
Column weld	:	E70XX
D: Column weld size (1/16 in)	:	5
Override A2/A1 ratio	:	No
Include shear lug	:	No

Support

With pedestal	:	No
Longitudinal dimension	:	8 ft
Transversal dimension	:	8 ft
Thickness	:	24 in
Material	:	C 4-60
Include grouting	:	No

Anchor

Anchor position	:	Longitudinal position
Rows number per side	:	1
Anchors per row	:	2
Longitudinal edge distance on the plate	:	1.5 in
Transverse edge distance on the plate	:	1.5 in
Anchor type	:	Headed
Head type	:	Hexagonal
Include lock nut	:	No

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Project Name: FIRE STATION 5		

Anchor	:	3/4"
Effective embedment depth	:	12 in
Total length	:	14.49 in
Material	:	F1554 Gr36
Fy	:	36 kip/in2
Fu	:	58 kip/in2
Cracked concrete	:	No
Brittle steel	:	No
Anchors welded to base plate	:	No
Anchor reinforcement		
Type of reinforcement	:	Primary
Tension reinforcement	:	No
Shear reinforcement	:	No

Design code: AISC 360-16 ASD

DEMANDS

Description	Pu [Kip]	Mu22 [Kip*ft]	Mu33 [Kip*ft]	Vu2 [Kip]	Vu3 [Kip]	Load type
DL1	2.00	0.00	10.00	10.00	0.00	Design
DL2	2.00	10.00	0.00	0.00	10.00	Design

Design for major axis
Base plate (AISC 360-16 ASD)

GEOMETRIC CONSIDERATIONS

	Dimensions References	Unit	Value	Min. value	Max. value	Sta.
Base plate						
Distance from anchor to edge	[in]	1.12	0.25	--	✔	
Weld size	[1/16in]	5	3	--	✔	table J2.4

DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Concrete base						
Axial bearing	[Kip/in2]	2.94	1.62	DL1	0.55	DG1 3.1.1;
Base plate						
Flexural yielding (bearing interface)	[Kip*ft/ft]	12.13	8.05	DL1	0.66	DG1 Eq. 3.3.13, DG1 Sec 3.1.2
Flexural yielding (tension interface)	[Kip*ft/ft]	12.13	7.61	DL1	0.63	DG1 Eq. 3.3.13
Column						
Weld capacity	[Kip/ft]	83.53	58.09	DL1	0.70	p. 8-9, Sec. J2.5,

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Project Name: FIRE STATION 5		

Elastic method weld shear and axial capacity	[Kip/ft]	83.53	46.72	DL1	0.56	Sec. J2.4, HSS Manual p. 7-10 p. 8-9, Sec. J2.5, Sec. J2.4
	Ratio	**0.70**				

Design for minor axis
Base plate (AISC 360-16 ASD)

GEOMETRIC CONSIDERATIONS

	Dimensions References	**Unit**	**Value**	**Min. value**	**Max. value**	**Sta.**
Base plate						
Distance from anchor to edge	[in]	1.12	0.25	--	✔	
Weld size	[1/16in]	5	3	--	✔	table J2.4

DESIGN CHECK

	Verification References	**Unit**	**Capacity**	**Demand**	**Ctrl EQ**	**Ratio**
Concrete base						
Axial bearing	[Kip/in2]	2.94	1.62	DL1	0.55	DG1 3.1.1;
Base plate						
Flexural yielding (bearing interface)	[Kip*ft/ft]	12.13	3.59	DL2	0.30	DG1 Eq. 3.3.13, DG1 Sec 3.1.2
Flexural yielding (tension interface)	[Kip*ft/ft]	12.13	7.61	DL1	0.63	DG1 Eq. 3.3.13
Column						
Weld capacity	[Kip/ft]	83.53	58.09	DL1	0.70	p. 8-9, Sec. J2.5, Sec. J2.4, HSS Manual p. 7-10
Elastic method weld shear and axial capacity	[Kip/ft]	83.53	46.72	DL2	0.56	p. 8-9, Sec. J2.5, Sec. J2.4
	Ratio	**0.70**				

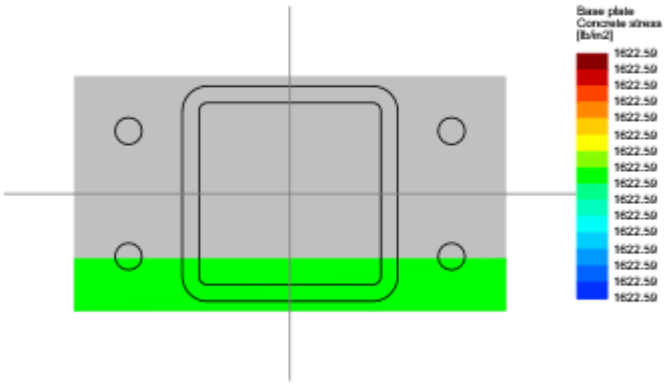
Global critical strength ratio 0.70

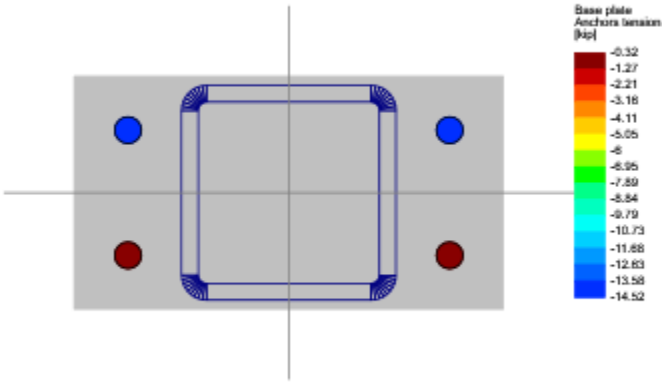
Biaxial

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Project Name: FIRE STATION 5		

Maximum compression and tension (DL1)





Maximum bearing pressure	1622.59	[psi]
Minimum bearing pressure	1622.59	[psi]
Maximum anchor tension	14.52	[Kip]
Minimum anchor tension	0.32	[Kip]
Neutral axis angle	0.00	
Bearing length	1.42	[in]

Anchors tensions

Anchor	Transverse [in]	Longitudinal [in]	Shear [Kip]	Tension [Kip]
1	-4.50	-1.75	2.50	0.32
2	-4.50	1.75	2.50	14.52
3	4.50	1.75	2.50	14.52

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Project Name: FIRE STATION 5		

4	4.50	-1.75	2.50	0.32

NOTES

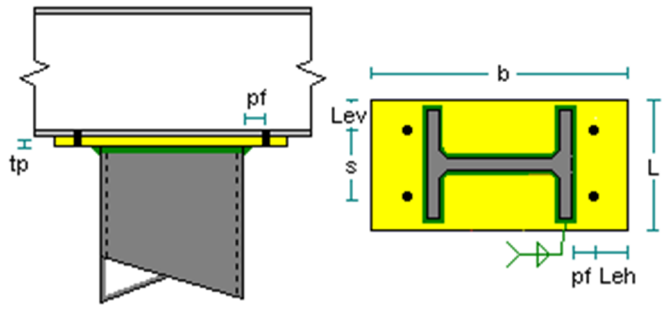
Anchors only designed for LRFD code

Connection name : CP_1PL_2B1
Connection ID : 7

Family: Column cap (CC)
Type: Cap Plate
Description: 7

GENERAL INFORMATION

Connector



MEMBERS

Beam

General

Beam section	:	W 18X35
Beam material	:	A992 Gr50
Built-up	:	No

Column

General

Support section	:	HSS_SQR 6X6X1_2
Support material	:	A500 GrB rectangular
Column orientation	:	Longitudinal

CAP PLATE

Connector

tp: Plate thickness	:	1.5 in
Plate material	:	A36
Bolts	:	3/4" A325 N
Lev: Transverse distance to edge	:	1.5 in
Leh: Longitudinal distance to edge	:	1.5 in
pf: distance bolt centerline-tension flange	:	1.5 in
s: Transverse bolt spacing	:	3.5 in

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Project Name: FIRE STATION 5		

Hole type on plate : Standard (STD)

Beam side

Hole type on beam : Standard (STD)

Column side

Weld to support : E70XX

D1: Weld size to support (1/16in) : 4

Stiffeners

Ns: Transverse stiffeners : None

Design code: AISC 360-16 LRFD

DEMANDS

Description	Ru [Kip]	Pu [Kip]	Mu [Kip*ft]	PufTop [Kip]	PufBot [Kip]	Load type
DL1	0.00	0.00	10.00	-INF	INF	Design
DL2	0.00	0.00	10.00	-INF	INF	Design

GEOMETRIC CONSIDERATIONS

	Dimensions References	Unit	Value	Min. value	Max. value	Sta.
Cap Plate						
Bolt diameter		[in]	0.75	--	1.50	✔ DG4 Sec. 1.1
Transverse center-to-center spacing (gage)		[in]	3.50	2.00	12.00	✔ Sec. J3.3, Sec. J3.5
Transverse edge distance		[in]	1.50	1.00	--	✔ Tables J3.4, J3.5
Longitudinal edge distance		[in]	1.50	1.00	--	✔ Tables J3.4, J3.5
Beam						
Transverse edge distance		[in]	1.25	1.00	--	✔ Tables J3.4, J3.5
Plate (support side)						
Distance from centerline of bolt to nearer surface o...		[in]	1.50	1.25	--	✔ DG4 Sec. 2.1
Weld size		[1/16in]	4	3	--	✔ table J2.4

DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Cap Plate						
Resulting tension capacity due prying action		[Kip]	59.67	20.00	DL1	0.34 p. 9-10
Beam						

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Bending	[Kip*ft]	198.90	10.00	DL1	0.05	Eq. F13-1
Resulting tension capacity due prying action	[Kip]	24.10	20.00	DL1	0.83	p. 9-11, p. 9-10
Local web yielding	[Kip]	133.91	20.00	DL1	0.15	DG4 eq. 3.24
Web crippling	[Kip]	84.90	20.00	DL1	0.24	Eq. J10-4
Compression buckling of the web	[Kip]	43.77	20.00	DL1	0.46	Eq. J10-8
Support						
Weld capacity	[Kip]	33.41	20.00	DL1	0.60	Eq. J2-3
Side wall local crippling	[Kip]	785.89	20.00	DL1	0.03	Eq. J10-4
Side wall local yielding	[Kip]	128.34	20.00	DL1	0.16	Eq. J4-1

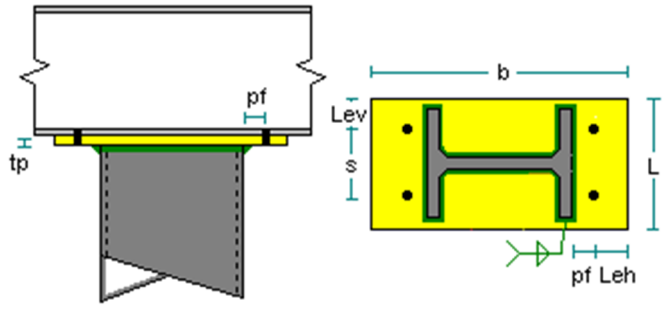
Global critical strength ratio 0.83

Connection name : CP_1PL_2B1
Connection ID : 8

Family: Column cap (CC)
Type: Cap Plate
Description: 8

GENERAL INFORMATION

Connector



MEMBERS

Beam

General

Beam section	:	W 14X22
Beam material	:	A992 Gr50
Built-up	:	No

Column

General

Support section	:	HSS_SQR 4X4X3_8
Support material	:	A500 GrB rectangular
Column orientation	:	Longitudinal

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CAP PLATE

Connector

tp: Plate thickness	:	1 in
Plate material	:	A36
Bolts	:	3/4" A325 N
Lev: Transverse distance to edge	:	1 in
Leh: Longitudinal distance to edge	:	1.5 in
pf: distance bolt centerline-tension flange	:	1.5 in
s: Transverse bolt spacing	:	3 in
Hole type on plate	:	Standard (STD)

Beam side

Hole type on beam	:	Standard (STD)

Column side

Weld to support	:	E70XX
D1: Weld size to support (1/16in)	:	4

Stiffeners

Ns: Transverse stiffeners	:	None

Design code: AISC 360-16 LRFD

DEMANDS

Description	Ru [Kip]	Pu [Kip]	Mu [Kip*ft]	PufTop [Kip]	PufBot [Kip]	Load type
DL1	0.00	-2.00	5.00	-INF	INF	Design
DL2	0.00	-2.00	5.00	-INF	INF	Design

GEOMETRIC CONSIDERATIONS

	Dimensions References	Unit	Value	Min. value	Max. value	Sta.
Cap Plate						
Bolt diameter		[in]	0.75	--	1.50 ✔	DG4 Sec. 1.1
Transverse center-to-center spacing (gage)		[in]	3.00	2.00	12.00 ✔	Sec. J3.3, Sec. J3.5
Transverse edge distance		[in]	1.00	1.00	-- ✔	Tables J3.4, J3.5
Longitudinal edge distance		[in]	1.50	1.00	-- ✔	Tables J3.4, J3.5
Beam						
Transverse edge distance		[in]	1.00	1.00	-- ✔	Tables J3.4, J3.5
Plate (support side)						
Distance from centerline of bolt to nearer surface o...		[in]	1.50	1.25	-- ✔	DG4 Sec. 2.1
Weld size		[1/16in]	4	3	-- ✔	table J2.4

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DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Cap Plate						
Resulting tension capacity due prying action	[Kip]	59.04	14.00	DL1	0.24	p. 9-10
Beam						
Bending	[Kip*ft]	91.89	5.00	DL1	0.05	Eq. F13-1
Resulting tension capacity due prying action	[Kip]	15.36	14.00	DL1	0.91	p. 9-11, p. 9-10
Local web yielding	[Kip]	83.48	16.00	DL1	0.19	DG4 eq. 3.24
Web crippling	[Kip]	51.00	16.00	DL1	0.31	Eq. J10-4
Compression buckling of the web	[Kip]	25.88	16.00	DL1	0.62	Eq. J10-8
Support						
Weld capacity	[Kip]	22.27	14.00	DL1	0.63	Eq. J2-3
Side wall local crippling	[Kip]	504.11	16.00	DL1	0.03	Eq. J10-4
Side wall local yielding	[Kip]	64.22	16.00	DL1	0.25	Eq. J4-1

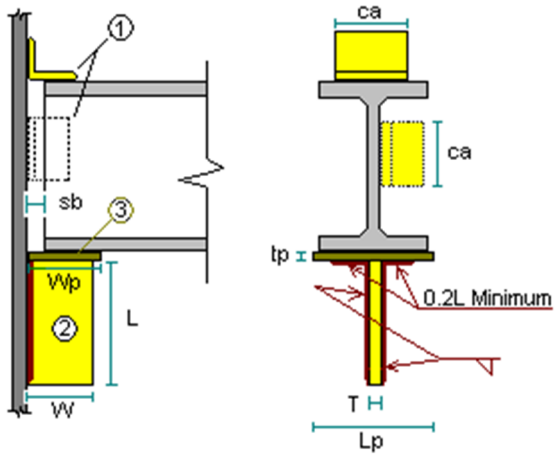
Global critical strength ratio 0.91

Connection name : SST BCF Welded
Connection ID : 9V

Family: Beam - Column flange (BCF)
Type: Stiffened Seated
Description: 9

GENERAL INFORMATION

Connector



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Beam

General

Beam section	:	W 14X22
Beam material	:	A992 Gr50
Horizontal eccentricity	:	0 in
sb: Beam setback	:	0.5 in

Column

General

Support section	:	W 24X192
Support material	:	A992 Gr50

STIFFENED SEATED

Stiffening element

General

Stiffener element	:	Plate
T: Stiffener thickness	:	0.5 in
L: Stiffener depth	:	4 in
W: Stiffener width	:	4 in
Material	:	A36
Lp: Seat plate length	:	5 in
Wp: Seat plate width	:	6.5 in
tp: Seat plate thickness	:	0.5 in

Support side

Section	:	PL 1/2x4x4
Welding electrode to support	:	E70XX
D1: Weld size to column flanges (1/16 in)	:	4

Top angle

General

Top angle location	:	At top
Top angle section	:	L 4X4X1_2
Top angle material	:	A36
Angle short leg on beam	:	Yes

Support side

Connection type	:	Welded
Welding electrode to support	:	E70XX
D2: Weld size to support (1/16 in)	:	4

Beam side

Connection type	:	Bolted
Bolts	:	3/4" A325 N
nr: Rows of Bolts	:	1
nc: Bolt columns	:	2
g: Gage - transverse center-to-center spacing	:	3 in
Leh: Horizontal edge distance	:	1.5 in
Lev: Transverse distance to edge	:	1.5 in

Design code: AISC 360-16 ASD

DEMANDS

Description	Ru [Kip]	Pu [Kip]	Load type

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DL1	4.00	0.00	Design
DL2	4.00	0.00	Design

GEOMETRIC CONSIDERATIONS

	Dimensions References	Unit	Value	Min. value	Max. value	Sta.
Stiffener						
Seat plate thickness	[in]	0.50	0.38	--	✔	[7]
Weld size	[1/16in]	4	3	--	✔	table J2.4
Thickness	[in]	0.50	0.32	--	✔	
Top angle (support side)						
Top angle thickness	[in]	0.50	0.25	--	✔	p. 10-92
Top angle vertical leg	[in]	4.00	4.00	--	✔	p. 10-92

DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Stiffener (support side)						
Stiffener top side bearing	[Kip]	52.65	4.00	DL1	0.08	Eq. J7-1
Weld capacity	[Kip]	10.63	4.00	DL1	0.38	Eq. J2-4, [7]
Shear yielding	[Kip]	28.80	4.00	DL1	0.14	Eq. J4-3
Beam						
Local web yielding	[Kip]	39.00	4.00	DL1	0.10	Eq. J10-3
Web crippling	[Kip]	21.93	4.00	DL1	0.18	Eq. J10-5b

Global critical strength ratio 0.38

REFERENCES

[7] Ellifritt, D.S., and T. Sputo, 1999, Design Criteria for Stiffened Seated Connections to Column Webs, Engineering Journal, Vol. 36, No. 4, (4th Qtr.), pp. 160-167, AISC, Chicago, IL.

Connection name : Pinned BP - HSS Member
Connection ID : 10

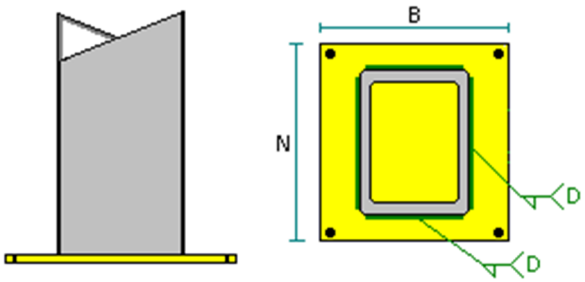
Family: Column - Base (CB)
Type: Base plate
Description: 10

GENERAL INFORMATION

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Project Name: FIRE STATION 5		

Connector



MEMBERS

Column

Column type	:	Prismatic member
Section	:	HSS_SQR 6X6X3_8
Material	:	A500 GrB rectangular
Longitudinal offset	:	0 in

CONNECTOR

Base plate

Connection type	:	Unstiffened
Position on the support	:	Center
N: Longitudinal dimension	:	6.5 in
B: Transversal dimension	:	12 in
Thickness	:	0.75 in
Material	:	A36
Column weld	:	E70XX
D: Column weld size (1/16 in)	:	5
Override A2/A1 ratio	:	No
Include shear lug	:	No

Support

With pedestal	:	No
Longitudinal dimension	:	36 in
Transversal dimension	:	36 in
Thickness	:	24 in
Material	:	C 4-60
Include grouting	:	No

Anchor

Anchor position	:	Longitudinal position
Rows number per side	:	1
Anchors per row	:	2
Longitudinal edge distance on the plate	:	1.5 in
Transverse edge distance on the plate	:	1.5 in
Anchor type	:	Headed
Head type	:	Hexagonal
Include lock nut	:	No
Anchor	:	3/4"
Effective embedment depth	:	12 in
Total length	:	13.74 in

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Material	:	F1554 Gr36
Fy	:	36 kip/in2
Fu	:	58 kip/in2
Cracked concrete	:	Yes
Brittle steel	:	No
Anchors welded to base plate	:	No
Anchor reinforcement		
Type of reinforcement	:	Primary
Tension reinforcement	:	No
Shear reinforcement	:	No

Design code: AISC 360-16 LRFD, ACI 318-08

DEMANDS

Description	Pu [Kip]	Mu22 [Kip*ft]	Mu33 [Kip*ft]	Vu2 [Kip]	Vu3 [Kip]	Load type
DL1	-35.00	0.00	0.00	10.00	0.00	Design
DL2	-35.00	0.00	0.00	-10.00	0.00	Design

Design for major axis
Base plate (AISC 360-16 LRFD)

GEOMETRIC CONSIDERATIONS

	Dimensions References	Unit	Value	Min. value	Max. value	Sta.
Base plate						
Distance from anchor to edge	[in]	1.12	0.25	--	✔	
Weld size	[1/16in]	5	3	--	✔	table J2.4

DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Concrete base						
Axial bearing	[Kip/in2]	4.42	0.45	DL1	0.10	DG1 3.1.1;
Base plate						
Flexural yielding (bearing interface)	[Kip*ft/ft]	4.56	2.23	DL1	0.49	DG1 Sec 3.1.2
Flexural yielding (tension interface)	[Kip*ft/ft]	4.56	0.00	DL1	0.00	DG1 Eq. 3.3.13
Column						
Weld capacity	[Kip/ft]	125.29	0.00	DL1	0.00	p. 8-9, Sec. J2.5, Sec. J2.4
Elastic method weld shear and axial capacity	[Kip/ft]	125.29	12.11	DL1	0.10	p. 8-9, Sec. J2.5, Sec. J2.4

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Ratio **0.49**

Major axis
Anchors

GEOMETRIC CONSIDERATIONS

Dimensions References	Unit	Value	Min. value	Max. value	Sta.
Anchors					
Anchor spacing	[in]	3.50	3.00	--	✔ Sec. D.8.1
Concrete cover	[in]	13.12	3.00	--	✔ Sec. 7.7.1
Effective length	[in]	12.49	--	23.51	✔

DESIGN CHECK

Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Anchor tension Eq. D-3	[Kip]	14.55	0.00	DL1	0.00
Breakout of anchor in tension 0.00 Eq. D-4, Sec. D.4.1.1	[Kip]	34.31	0.00	DL1	
Pullout of anchor in tension 0.00 Sec. D.4.1.1	[Kip]	14.65	0.00	DL1	
Anchor shear Eq. D-20	[Kip]	7.57	2.50	DL1	0.33
Breakout of anchor in shear 0.15 Sec. D.4.1.1	[Kip]	16.96	2.50	DL1	
Breakout of group of anchors in shear DL1 0.59 Sec. D.4.1.1	[Kip]		16.96	10.00	
Pryout of anchor in shear 0.04 Eq. D-4, Sec. D.4.1.1	[Kip]	68.62	2.50	DL1	

Ratio **0.59**

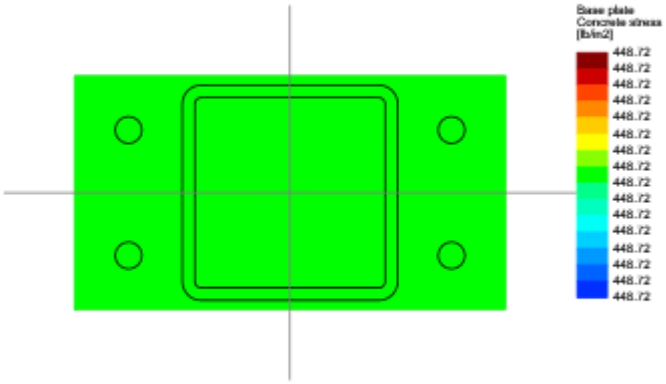
Global critical strength ratio **0.59**

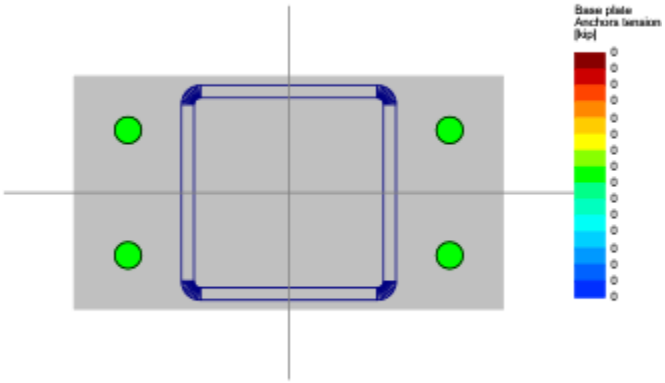
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Major axis

Maximum compression and tension (DL1)





Maximum bearing pressure	448.72	[psi]
Minimum bearing pressure	448.72	[psi]
Maximum anchor tension	0.00 [Kip]	
Minimum anchor tension	0.00 [Kip]	
Neutral axis angle	0.00	
Bearing length	1.2E31	[in]

Anchors tensions

Anchor	Transverse [in]	Longitudinal [in]	Shear [Kip]	Tension [Kip]
1	-4.50	-1.75	2.50	0.00
2	-4.50	1.75	2.50	0.00

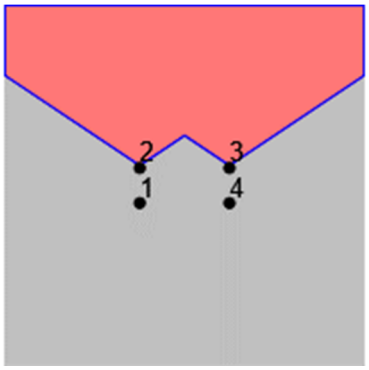
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3	4.50	1.75	2.50	0.00
4	4.50	-1.75	2.50	0.00

Major axis

Results for shear breakout (DL1)



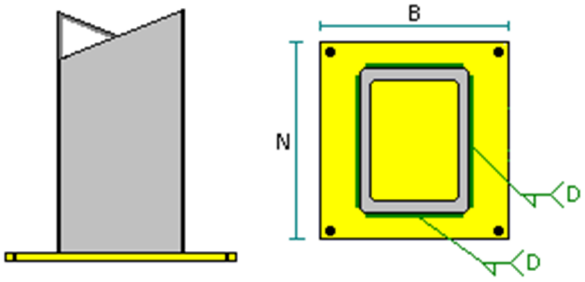
Group	Area [in2]	Shear [Kip]	Anchors
1	864.00	10.00	1, 2, 3, 4
2	864.00	5.00	2, 3

Connection name : Pinned BP - HSS Member
Connection ID : 11

Family: Column - Base (CB)
Type: Base plate
Description: 10

GENERAL INFORMATION

Connector



MEMBERS

Column

Column type : Prismatic member

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Section	:	HSS_SQR 6X6X3_8
Material	:	A992 Gr50
Longitudinal offset	:	0 in

CONNECTOR

Base plate

Connection type	:	Unstiffened
Position on the support	:	Center
N: Longitudinal dimension	:	6.5 in
B: Transversal dimension	:	12 in
Thickness	:	0.75 in
Material	:	A36
Column weld	:	E70XX
D: Column weld size (1/16 in)	:	4
Override A2/A1 ratio	:	No
Include shear lug	:	No

Support

With pedestal	:	No
Longitudinal dimension	:	36 in
Transversal dimension	:	36 in
Thickness	:	24 in
Material	:	C 4-60
Include grouting	:	No

Anchor

Anchor position	:	Longitudinal position
Rows number per side	:	1
Anchors per row	:	2
Longitudinal edge distance on the plate	:	1.5 in
Transverse edge distance on the plate	:	1.5 in
Anchor type	:	Headed
Head type	:	Hexagonal
Include lock nut	:	No
Anchor	:	3/4"
Effective embedment depth	:	12 in
Total length	:	13.74 in
Material	:	F1554 Gr36
Fy	:	36 kip/in2
Fu	:	58 kip/in2
Cracked concrete	:	Yes
Brittle steel	:	No
Anchors welded to base plate	:	No

Anchor reinforcement

Type of reinforcement	:	Primary
Tension reinforcement	:	No
Shear reinforcement	:	No

Design code: AISC 360-16 ASD

DEMANDS

Description	Pu [Kip]	Mu22 [Kip*ft]	Mu33 [Kip*ft]	Vu2 [Kip]	Vu3 [Kip]	Load type

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DL1	-35.00	0.00	0.00	10.00	0.00	Design
DL2	-35.00	0.00	0.00	-10.00	0.00	Design

Design for major axis
Base plate (AISC 360-16 ASD)

GEOMETRIC CONSIDERATIONS

	Dimensions References	Unit	Value	Min. value	Max. value	Sta.
Base plate						
Distance from anchor to edge	[in]	1.12	0.25	--	✔	
Weld size	[1/16in]	4	3	--	✔	table J2.4

DESIGN CHECK

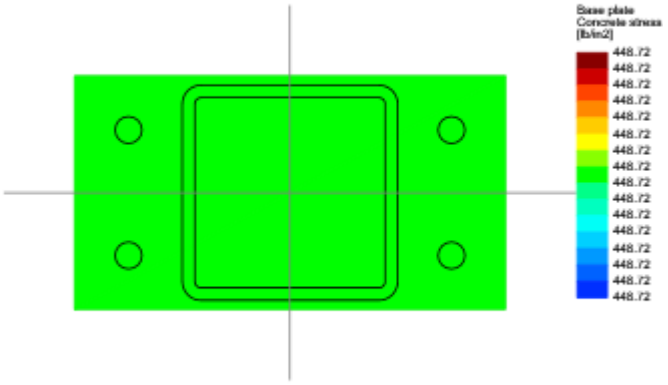
	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Concrete base						
Axial bearing	[Kip/in2]	2.94	0.45	DL1	0.15	DG1 3.1.1;
Base plate						
Flexural yielding (bearing interface)	[Kip*ft/ft]	3.03	2.23	DL1	0.73	DG1 Sec 3.1.2
Flexural yielding (tension interface)	[Kip*ft/ft]	3.03	0.00	DL1	0.00	DG1 Eq. 3.3.13
Column						
Weld capacity	[Kip/ft]	66.82	0.00	DL1	0.00	p. 8-9, Sec. J2.5, Sec. J2.4
Elastic method weld shear and axial capacity	[Kip/ft]	66.82	12.11	DL1	0.18	p. 8-9, Sec. J2.5, Sec. J2.4
	Ratio	**0.73**				

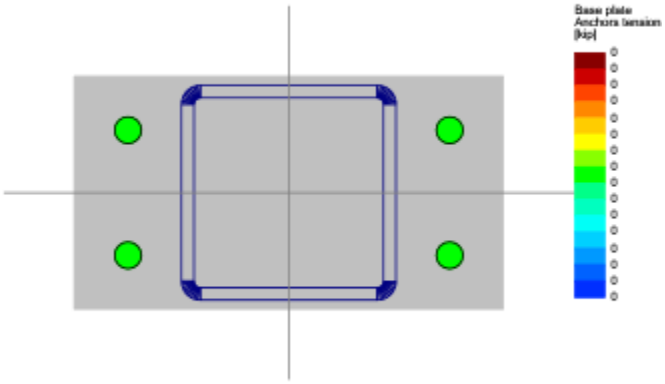
Global critical strength ratio 0.73

Major axis
Maximum compression and tension (DL1)

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Project Name: FIRE STATION 5		





Maximum bearing pressure	448.72	[psi]
Minimum bearing pressure	448.72	[psi]
Maximum anchor tension	0.00 [Kip]	
Minimum anchor tension	0.00 [Kip]	
Neutral axis angle	0.00	
Bearing length	1.2E31	[in]

Anchors tensions

Anchor	Transverse [in]	Longitudinal [in]	Shear [Kip]	Tension [Kip]
1	-4.50	-1.75	2.50	0.00
2	-4.50	1.75	2.50	0.00
3	4.50	1.75	2.50	0.00
4	4.50	-1.75	2.50	0.00

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Project Name: FIRE STATION 5		

NOTES

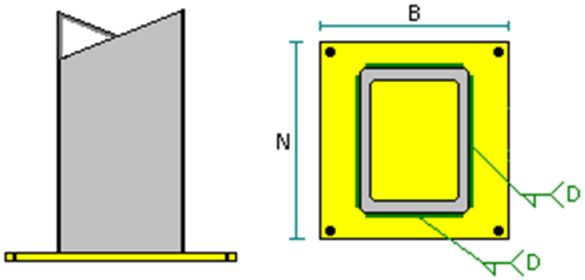
Anchors only designed for LRFD code

Connection name : Pinned BP - HSS Member
Connection ID : 12

Family: Column - Base (CB)
Type: Base plate
Description: 10

GENERAL INFORMATION

Connector



MEMBERS

Column

Column type	:	Prismatic member
Section	:	HSS_SQR 4X4X3_8
Material	:	A500 GrB rectangular
Longitudinal offset	:	0 in

CONNECTOR

Base plate

Connection type	:	Unstiffened
Position on the support	:	Center
N: Longitudinal dimension	:	10 in
B: Transversal dimension	:	10 in
Thickness	:	0.75 in
Material	:	A36
Column weld	:	E70XX
D: Column weld size (1/16 in)	:	4
Override A2/A1 ratio	:	No
Include shear lug	:	No

Support

With pedestal	:	No
Longitudinal dimension	:	36 in

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Transversal dimension	:	36 in
Thickness	:	24 in
Material	:	C 4-60
Include grouting	:	No

Anchor

Anchor position	:	Longitudinal position
Rows number per side	:	1
Anchors per row	:	2
Longitudinal edge distance on the plate	:	1.5 in
Transverse edge distance on the plate	:	1.5 in
Anchor type	:	Headed
Head type	:	Hexagonal
Include lock nut	:	No
Anchor	:	3/4"
Effective embedment depth	:	12 in
Total length	:	13.74 in
Material	:	F1554 Gr36
Fy	:	36 kip/in2
Fu	:	58 kip/in2
Cracked concrete	:	Yes
Brittle steel	:	No
Anchors welded to base plate	:	No

Anchor reinforcement

Type of reinforcement	:	Primary
Tension reinforcement	:	No
Shear reinforcement	:	No

Design code: AISC 360-16 ASD

DEMANDS

Description	Pu [Kip]	Mu22 [Kip*ft]	Mu33 [Kip*ft]	Vu2 [Kip]	Vu3 [Kip]	Load type
DL1	-35.00	0.00	0.00	10.00	0.00	Design
DL2	-35.00	0.00	0.00	-10.00	0.00	Design

Design for major axis
Base plate (AISC 360-16 ASD)

GEOMETRIC CONSIDERATIONS

	Dimensions References	Unit	Value	Min. value	Max. value	Sta.
Base plate						
Distance from anchor to edge	[in]	1.12	0.25	--	✔	
Weld size	[1/16in]	4	3	--	✔	table J2.4

DESIGN CHECK

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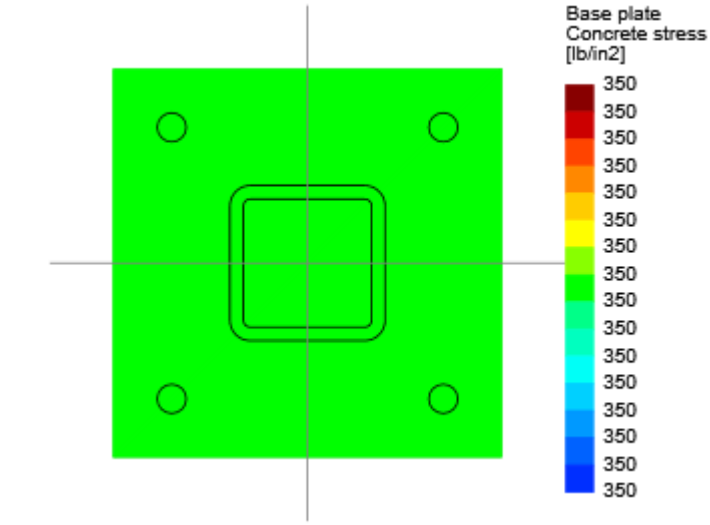
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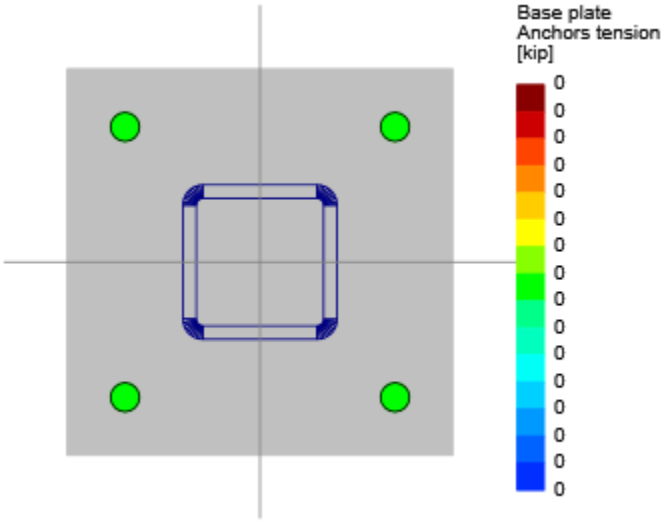
	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Concrete base						
Axial bearing	[Kip/in2]	2.94	0.35	DL1	0.12	DG1 3.1.1;
Base plate						
Flexural yielding (bearing interface)	[Kip*ft/ft]	3.03	1.68	DL1	0.55	DG1 Sec 3.1.2
Flexural yielding (tension interface)	[Kip*ft/ft]	3.03	0.00	DL1	0.00	DG1 Eq. 3.3.13
Column						
Weld capacity	[Kip/ft]	66.82	0.00	DL1	0.00	p. 8-9, Sec. J2.5, Sec. J2.4
Elastic method weld shear and axial capacity	[Kip/ft]	66.82	20.32	DL1	0.30	p. 8-9, Sec. J2.5, Sec. J2.4
	Ratio	**0.55**				
	Global critical strength ratio				**0.55**	

Major axis
Maximum compression and tension (DL1)

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Maximum bearing pressure	350.00	[psi]
Minimum bearing pressure	350.00	[psi]
Maximum anchor tension	0.00 [Kip]	
Minimum anchor tension	0.00 [Kip]	
Neutral axis angle	0.00	
Bearing length	1.2E31	[in]

Anchors tensions

Anchor	Transverse [in]	Longitudinal [in]	Shear [Kip]	Tension [Kip]
1	-3.50	-3.50	2.50	0.00
2	-3.50	3.50	2.50	0.00
3	3.50	3.50	2.50	0.00
4	3.50	-3.50	2.50	0.00

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NOTES

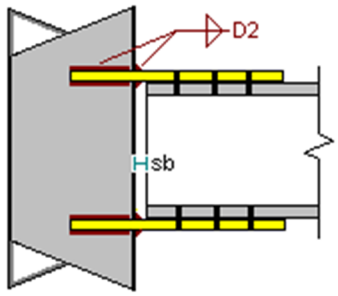
Anchors only designed for LRFD code

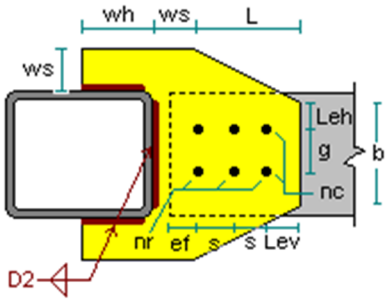
Connection name : FP BCF Bolted
Connection ID : 13M

Family: Beam - Column flange (BCF)
Type: Flange-plated
Description: 1

GENERAL INFORMATION

Connector





MEMBERS

Beam

General

Beam section	:	W 14X22
Beam material	:	A992 Gr50
sb: Beam setback	:	0.5 in

Column

General

Support section	:	HSS_SQR 6X6X3_8
Support material	:	A500 GrB rectangular

FLANGE PLATE

Connector

L: Top plate length	:	5.5 in
b: Top plate width	:	6 in
tp: Top plate thickness	:	0.5 in
Lb: Bottom plate length	:	5.5 in
Lb: Bottom plate length	:	5.5 in
bb: Bottom plate width	:	6 in
tpb: Bottom plate thickness	:	0.5 in
ws: Additional plate width	:	1 in
wh: Additional plate length	:	3 in
Plate material	:	A36

Beam side

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Connection type	:	Bolted
Bolts	:	3/4" A325 SC (class A)
nc: Bolt columns	:	2
nr: Rows of Bolts	:	2
g: Gage - transverse center-to-center spacing	:	3 in
s: Pitch - longitudinal center-to-center spacing	:	3 in
Lev: Longitudinal distance to top plate edge	:	1.5 in
Leh: Transverse distance to top plate edge	:	1.5 in
ef: Longitudinal distance to beam edge (top plate)	:	1.5 in
Levb: Longitudinal distance to bottom plate edge	:	1.5 in
Lehb: Transverse distance to bottom plate edge	:	1.5 in
efb: Longitudinal distance to beam edge (bottom ...	:	1.5 in
Hole type on beam	:	Standard (STD)
Hole type on top plate	:	Short Slotted (SSL)
Slot direction on top plate	:	Horizontal
Hole type on bottom plate	:	Short Slotted (SSL)
Slot direction on bottom plate	:	Horizontal
Support side		
Welding electrode to support	:	E70XX
D1: Top weld size to support (1/16 in)	:	4
Welding electrode to support	:	E70XX
D2: Bottom weld size to support (1/16 in)	:	4

Design code: AISC 360-16 ASD

DEMANDS

	Beam		Right beam		Left beam		Column	Panel		
Description	**Ru** [Kip]	**Pu** [Kip]	**Mu** [Kip*ft]	**PufTop** [Kip]	**PufBot** [Kip]	**PufTop** [Kip]	**PufBot** [Kip]	**Pu** [Kip]	**Vu** [Kip]	**Load type**
DL1	0.00	0.00	-13.00	11.67	-11.67	0.00	0.00	0.00	11.67	Design
DL2	0.00	0.00	13.00	-11.67	11.67	0.00	0.00	0.00	11.67	Design

GEOMETRIC CONSIDERATIONS

	Dimensions References	**Unit**	**Value**	**Min. value**	**Max. value**		**Sta.**
Plate (beam side)							
Vertical center-to-center spacing (pitch)		[in]	3.00	2.00	8.04	✔	Sec. J3.3, Sec. J3.5
Horizontal center-to-center spacing (gage)		[in]	3.00	2.00	8.04	✔	Sec. J3.3, Sec. J3.5
Top flange plate data							
Vertical edge distance		[in]	1.50	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance		[in]	1.50	1.13	--	✔	Tables J3.4, J3.5

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Bottom flange plate data						
Vertical edge distance	[in]	1.50	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.50	1.13	--	✔	Tables J3.4, J3.5
Plate (support side)						
Top plate weld size - column flange	[1/16in]	4	3	--	✔	table J2.4
Bottom plate weld size - column flange	[1/16in]	4	3	--	✔	table J2.4
Beam						
Vertical edge distance	[in]	1.50	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.00	1.00	--	✔	Tables J3.4, J3.5

DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Top plate (beam side)						
Compression		[Kip]	69.67	10.99	DL2	0.16 Sec. J4.4
Tension yielding		[Kip]	69.67	10.99	DL1	0.16 Eq. J4-1
Bolts shear		[Kip]	25.31	11.39	DL1	0.45 Tables (7-1..14)
Bolt bearing (Top plate)		[Kip]	90.26	11.39	DL1	0.13 Eq. J3-6
Block shear		[Kip]	76.69	10.99	DL1	0.14 Eq. J4-5
Tension rupture		[Kip]	79.91	10.99	DL1	0.14 Eq. J4-2
Bottom plate (beam side)						
Tension yielding		[Kip]	69.67	10.99	DL2	0.16 Eq. J4-1
Compression		[Kip]	69.67	10.99	DL1	0.16 Sec. J4.4
Bolts shear		[Kip]	25.31	11.39	DL1	0.45 Tables (7-1..14)
Tension rupture		[Kip]	79.91	10.99	DL2	0.14 Eq. J4-2
Block shear		[Kip]	76.69	10.99	DL2	0.14 Eq. J4-5
Bolt bearing (Bottom plate)		[Kip]	90.26	11.39	DL1	0.13 Eq. J3-6
Top plate (support side)						
Weld to column		[Kip]	36.77	11.67	DL1	0.32 Eq. J2-4
Shear yielding due to welds		[Kip]	35.66	10.99	DL1	0.31 [3]
Compression on extension (ws)		[Kip]	21.56	10.99	DL2	0.51 Sec. J4.4
Tension rupture on extension (ws)		[Kip]	29.00	10.99	DL1	0.38 Eq. J4-2
Bottom plate (support side)						
Weld to column		[Kip]	36.77	11.67	DL1	0.32 Eq. J2-4
Shear yielding due to welds		[Kip]	35.66	10.99	DL1	0.31 [3]
Compression on extension (ws)		[Kip]	21.56	10.99	DL1	0.51 Sec. J4.4
Tension rupture on extension (ws)		[Kip]	29.00	10.99	DL2	0.38 Eq. J4-2
Beam						
Top flange bending		[Kip*ft]	61.14	13.00	DL1	0.21 Eq. F13-1
Top flange bolt bearing under shear load		[Kip]	67.77	11.67	DL1	0.17 Eq. J3-6
Top flange block shear		[Kip]	53.89	11.67	DL1	0.22 Eq. J4-5

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Bottom flange bending	[Kip*ft]	61.14	13.00	DL1	0.21	Eq. F13-1
Bottom flange bolt bearing under shear load	[Kip]	67.77	11.67	DL1	0.17	Eq. J3-6
Bottom flange block shear	[Kip]	53.89	11.67	DL1	0.22	Eq. J4-5
Support						
Shear yielding due to welds (wh)	[Kip]	63.61	10.99	DL1	0.17	[3]

Global critical strength ratio 0.51

REFERENCES

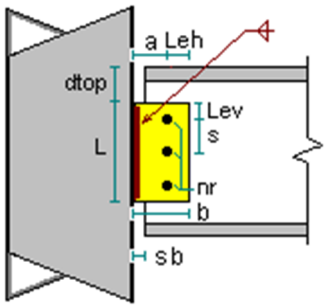
[3] Dowswell, B., 2003, Connection Design For Steel Structures, Structural Design Solutions, LLC.

Connection name : SP BCF
Connection ID : 13V

Family: Beam - Column flange (BCF)
Type: Single plate
Description: 1

GENERAL INFORMATION

Connector



MEMBERS

Beam

General

Beam section	:	W 14X22
Beam material	:	A992 Gr50
sb: Beam setback	:	0.5 in
Horizontal angle (deg)	:	0
Vertical angle (deg)	:	0
Horizontal eccentricity	:	0 in

Coped

dct: Top cope depth	:	0 in
ct: Top cope length	:	0 in
dcb: Bottom cope depth	:	0 in
cb: Bottom cope length	:	0 in

Column

General

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Support section	:	HSS_SQR 6X6X3_8
Support material	:	A500 GrB rectangular

SINGLE PLATE

Connector

Section	:	PL 1/4x4x9
b: Width	:	4 in
L: Length	:	9 in
tp: Plate thickness	:	0.25 in
Material	:	A36
Plate position on beam	:	Center
Bolts	:	3/4" A325 N
nr: Rows of Bolts	:	3
nc: Bolt columns	:	1
s: Pitch - longitudinal center-to-center spacing	:	3 in
Lev: Vertical edge distance	:	1.5 in
Leh: Horizontal edge distance	:	1.5 in
a: Distance between weld and bolts	:	2.5 in
Hole type on plate	:	Standard (STD)
Hole type on beam	:	Standard (STD)
Welding electrode to support	:	E70XX
D: Weld size to support (1/16 in)	:	3
Wo: Obtuse side weld size (AWS) (1/16 in)	:	3
Wa: Acute side weld size (AWS) (1/16 in)	:	3
Wo: Obtuse side weld size (AISC) (1/16 in)	:	3
Wa: Acute side weld size (AISC) (1/16 in)	:	3

Design code: AISC 360-16 ASD

DEMANDS

	Beam	Column				
Description	**Ru**	**Pu**	**Pu**	**Mu22**	**Mu33**	**Load type**
	[Kip]	[Kip]	[Kip]	[Kip*ft]	[Kip*ft]	
DL1	7.00	0.00	0.00	0.00	0.00	Design
DL2	7.00	0.00	0.00	0.00	0.00	Design

GEOMETRIC CONSIDERATIONS

	Dimensions References	**Unit**	**Value**	**Min. value**	**Max. value**	**Sta.**
Shear plate						
Number of bolts			3	2	12	✔ p 10-102
Distance from the bolt line to the weld line		[in]	2.50	--	3.50	✔ p 10-102
Minimum plate or beam web thickness		[in]	0.23	--	0.44	✔ Table 10-9
Length		[in]	9.00	6.12	12.23	✔ p. 10-104
Thickness, precludes a punching failure of the HSS...		[in]	0.25	--	--	✔

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Vertical edge distance	[in]	1.50	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	1.50	1.50	--	✔	p. 10-103
Vertical center-to-center spacing (pitch)	[in]	3.00	2.00	5.52	✔	Sec. J3.3, Sec. J3.5
Beam						
Vertical edge distance	[in]	3.85	1.00	--	✔	Tables J3.4, J3.5
Horizontal edge distance	[in]	2.00	1.00	--	✔	Tables J3.4, J3.5
Support						
Maximum value of the specified yield stress	[Kip/in2]	46.00	--	--	✔	
Yield stress to tensile stress ratio		0.79	--	0.80	✔	Table K2.1A, Table K2.1
Weld size	[1/16in]	3	3	--	✔	p. 10-87
Weld length	[in]	9.00	0.75	--	✔	Sec. J2.2b
Thickness	[in]	0.35	0.14	--	✔	Sec. B4.2, p. 10-153, p. 10-154

DESIGN CHECK

	Verification References	Unit	Capacity	Demand	Ctrl EQ	Ratio
Shear plate						
Bolts shear		[Kip]	31.07	7.00	DL1	0.23 Tables (7-1..14)
Bolt bearing under shear load		[Kip]	30.91	7.00	DL1	0.23 p. 7-18, Sec. J3.10
Shear yielding		[Kip]	32.40	7.00	DL1	0.22 Eq. J4-3
Shear rupture		[Kip]	27.73	7.00	DL1	0.25 Eq. J4-4
Block shear		[Kip]	27.95	7.00	DL1	0.25 Eq. J4-5
Plate (support side)						
Weld capacity		[Kip]	50.12	7.00	DL1	0.14 Tables 8-4 .. 8-11
Beam						
Bolt bearing under shear load		[Kip]	35.03	7.00	DL1	0.20 p. 7-18, Sec. J3.10
Shear yielding		[Kip]	63.02	7.00	DL1	0.11 Eq. J4-3
Support						
Welds rupture		[Kip/ft]	145.74	9.33	DL1	0.06 p. 9-5
Chord wall plastification		[Kip]	26.96	0.00	DL1	0.00 Eq. J4-5
Punching shear (shear rupture)		[Kip]	65.58	7.00	DL1	0.11 p. 10-153

Global critical strength ratio 0.25

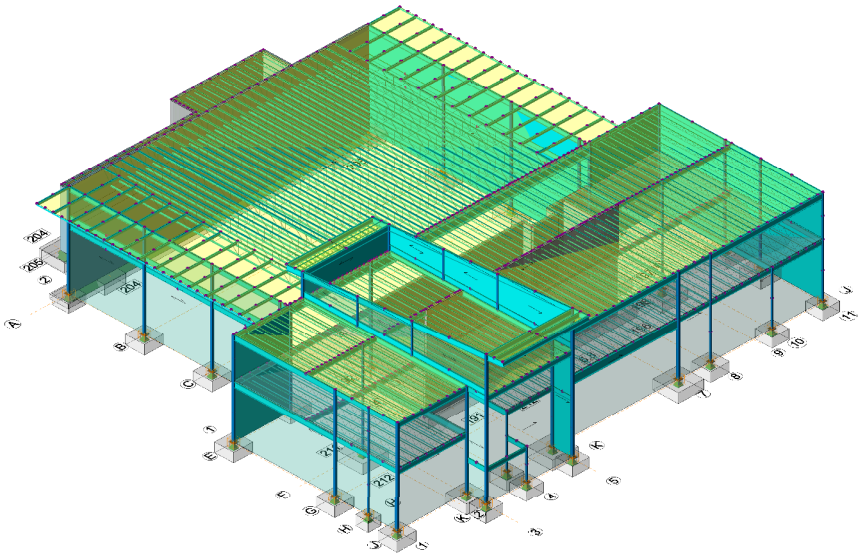
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NOTES

The plate is designed with the conventional configuration criteria.

BUILDING DESIGN OUTPUT



Structure

Steel

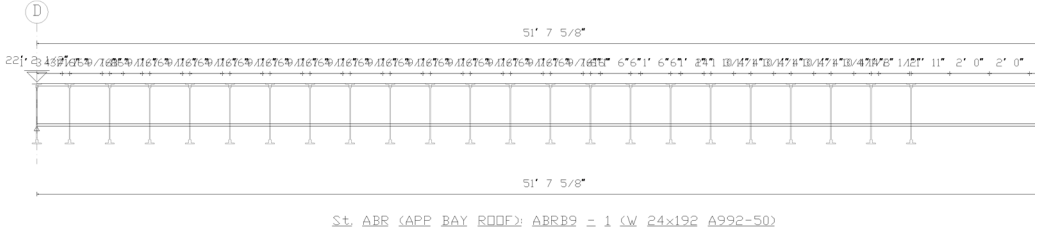
Beam Design

Beams

Non-Composite

Rolled

ABRB9



Static

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Summary W 24x192

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	110	96.7	619.7	kip	0.156	✔ Pass
Shear Minor	260	9.1	1024.9	kip	0.009	✔ Pass
Flexure Major	96	1159.6	2096.2	kip ft	0.553	✔ Pass
Flexure Minor	228	33.4	472.5	kip ft	0.071	✔ Pass
Axial Tension	118	-27.3	2542.5	kip	0.011	✔ Pass
Axial Compression	128	43.9	1782.3	kip	0.025	✔ Pass
Combined Forces	96	-	-	-	0.603	✔ Pass
Torsion	96	-	-	-	0.733	✔ Pass
Deflection Self weight	1	0.597	-	in	-	-
Deflection Slab	1	0.003	2.582	in	0.001	✔ Pass
Deflection Dead	1	0.766	1.721	in	0.445	✔ Pass
Deflection Live	21	0.583	2.582	in	0.226	✔ Pass
Deflection Wind	323	-0.350	3.098	in	0.113	✔ Pass
Deflection Total	96	2.294	2.582	in	0.889	✔ Pass
Torsion	Design Check Applied Forces Only					-

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 24x192 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=26.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Non-slender	AISC 360 Table B4.1a

Shear Major

110 (Final) LRFD$_{8.16}$-1.2D+1.6S+0.5W - Critical

Span 1 W 24x192 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=96.7 kip	
Design shear strength	=619.7 kip	AISC 360 G2
Ratio	**=0.156**	

✔ Pass

Shear Minor

260 (Final) LRFD$_{10.38}$-1.2D+L+0.5S+W - Critical

Span 1 W 24x192 A992-50 - Critical

Position 3' 7 5/8" - Critical

Position of V_{rx}	=3' 7 5/8" ft, in	
Required minor axis shear strength, V_{rx}	=9.1 kip	
Design shear strength	=1024.9 kip	AISC 360 G6
Ratio	**=0.009**	

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✔ Pass

Flexure Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 24x192 A992-50 - Critical

Yielding: 25′ 7 5/8″ - Critical

Dist of M_{rx} along member	=25′ 7 5/8″ ft, in	
Required flexural strength, M_{rx1}	=1159.6 kip ft	
Design flexural strength	=2096.2 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.553**	

✔ Pass

Flexure Minor

228 (Final) LRFD$_{10.6}$-1.2D+L+0.5S+W - Critical

Span 1 W 24x192 A992-50 - Critical

Yielding: 4′ 3 5/8″ - Critical

Dist of M_{ry} along member	=4′ 3 5/8″ ft, in	
Required flexural strength, M_{ry1}	=33.4 kip ft	
Design flexural strength	=472.5 kip ft	AISC 360 F6
Ratio	**=0.071**	

✔ Pass

Axial Tension

118 (Final) LRFD$_{8.24}$-1.2D+1.6S+0.5W - Critical

Span 1 W 24x192 A992-50 - Critical

Yielding: Position 27′ 3 3/16″ - Critical

Distance of P_r along member	=27′ 3 3/16″ ft, in	
Required tensile strength, P_r	=-27.3 kip	
Design yield strength	=2542.5 kip	AISC 360 D2
Ratio	**=0.011**	

✔ Pass

Axial Compression

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 24x192 A992-50 - Critical

Flexural torsional: 0″ - 51′ 7 5/8″ - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 51′ 7 5/8″	Flexural torsional	51′ 7 5/8″	43.9	1782.3	kip	0.025	✔ Pass

Combined Forces

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 24x192 A992-50 - Critical

Flange Btm LTB 0″ - 51′ 7 5/8″ - Critical

Axial Comp: I.P. 0″ - 1′ 3 3/16″ , O.o.P.0″ - 1′ 7 5/8″ , Tors. 0″ - 51′ 7 5/8″ - Critical

Mode	Ratio	Status
Combined buckling	0.603	✔ Pass

Torsion

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

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Torsion Combined Forces - Critical

Span 1 W 24x192 A992-50 - Critical

Compression Critical length $F_{cr,a}$ 0" - 51' 7 5/8"; Critical length $F_{cr,b}$ Yielding - Critical

Critical stress position in flange

$\sigma_a / 0.85 F_{cra}$	**=0.025**
$\sigma_{bx} / \phi_b F_{cr,bx}$	**=0.630**
$\sigma_{by} / 0.9 F_y$	**=0.059**
$\sigma_w / 0.9 F_y$	**=0.019**
$\sigma_a / 0.85 F_{cra} + \sigma_{bx} / \phi_b F_{cr,bx} + \sigma_{by} / 0.9 F_y + \sigma_w / 0.9 F_y$	DG9 Eq. 4.16a
Ratio	**=0.733**

✔ Pass

Deflection

96 (Final) $LRFD_{8.2}$-1.2D+1.6S+0.5W - Critical

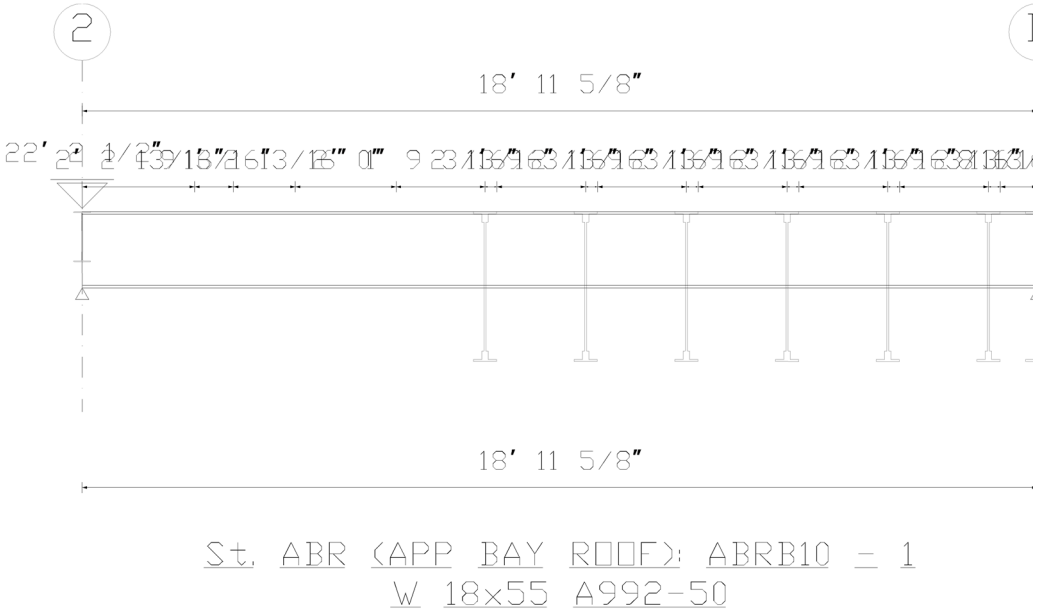
Span 1 W 24x192 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=25' 7 5/8" ft, in
Max. Total load deflection	=2.294 in
Span over limit	=2.582 in
Design limit	=2.582 in
Utilization Ratio	**=0.889**

✔ Pass

ABRB10



Static

Summary W 18x55

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	27	-31.8	211.8	kip	0.150	✔ Pass

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Minor	191	12.4	256.2	kip	0.049	✔ Pass
Flexure Major	128	134.5	420.0	kip ft	0.320	✔ Pass
Flexure Minor	191	31.6	69.4	kip ft	0.456	✔ Pass
Axial Tension	7	-7.3	729.0	kip	0.010	✔ Pass
Axial Compression	27	30.3	432.2	kip	0.070	✔ Pass
Combined Forces	256	-	-	-	0.702	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.053	-	in	-	-
Deflection Dead	1	0.101	0.632	in	0.159	✔ Pass
Deflection Live	21	0.063	0.948	in	0.066	✔ Pass
Deflection Wind	291	-0.047	1.138	in	0.041	✔ Pass
Deflection Total	121	0.260	0.632	in	0.411	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 18x55 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.4 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

27 (Final) LRFD$_{6.2}$-1.2D+L+1.6S+NL$_{Dir1+}$ - Critical

Span 1 W 18x55 A992-50 - Critical

Position 18' 11 5/8" - Critical

Position of V_{ry}	=18' 11 5/8" ft, in	
Required major axis shear strength, V_{ry}	=-31.8 kip	
Design shear strength	=211.8 kip	AISC 360 G2
Ratio	**=0.150**	

✔ Pass

Shear Minor

191 (Final) LRFD$_{9.33}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 18x55 A992-50 - Critical

Position 2' 2 13/16" - Critical

Position of V_{rx}	=2' 2 13/16" ft, in	
Required minor axis shear strength, V_{rx}	=12.4 kip	
Design shear strength	=256.2 kip	AISC 360 G6
Ratio	**=0.049**	

✔ Pass

Flexure Major

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 18x55 A992-50 - Critical

Yielding: 10' 2 13/16" - Critical

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Dist of M_{rx} along member =10' 2 13/16" ft, in
Required flexural strength, M_{rx1} =134.5 kip ft
Design flexural strength =420.0 kip ft AISC 360 F1, F2 and F3
Ratio **=0.320**

✔ Pass

Flexure Minor

191 (Final) $LRFD_{9.33}$-1.2D+L+0.5Lr+W - Critical
Span 1 W 18x55 A992-50 - Critical
Yielding: 3' 0" - Critical
Dist of M_{ry} along member =3' 0" ft, in
Required flexural strength, M_{ry1} =31.6 kip ft
Design flexural strength =69.4 kip ft AISC 360 F6
Ratio **=0.456**

✔ Pass

Axial Tension

7 (Final) $LRFD_{2.1}$-1.2D+1.6L+NL_{Dir1+} - Critical
Span 1 W 18x55 A992-50 - Critical
Yielding: Position 0" - Critical
Distance of P_r along member =0" ft, in
Required tensile strength, P_r =-7.3 kip
Design yield strength =729.0 kip AISC 360 D2
Ratio **=0.010**

✔ Pass

Axial Compression

27 (Final) $LRFD_{6.2}$-1.2D+L+1.6S+NL_{Dir1+} - Critical
Span 1 W 18x55 A992-50 - Critical
Flexural torsional: 0" - 18' 11 5/8" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 18' 11 5/8"	Flexural torsional	18' 11 5/8"	30.3	432.2	kip	0.070	✔ Pass

Combined Forces

256 (Final) $LRFD_{10.34}$-1.2D+L+0.5S+W - Critical
Span 1 W 18x55 A992-50 - Critical
Flange Btm LTB 0" - 18' 11 5/8" - Critical
Axial Comp: I.P. 0" - 2' 2 13/16" , O.o.P.0" - 8' 0" , Tors. 0" - 18' 11 5/8" - Critical

Mode	Ratio	Status
Combined buckling	0.702	✔ Pass

Deflection

121 (Final) $LRFD_{8.27}$-1.2D+1.6S+0.5W - Critical
Span 1 W 18x55 A992-50 - Critical
Deflection Total - Critical
Position Total load deflection =9' 8 113/256" ft, in
Max. Total load deflection =0.260 in
Span over limit =0.632 in
Design limit =0.632 in

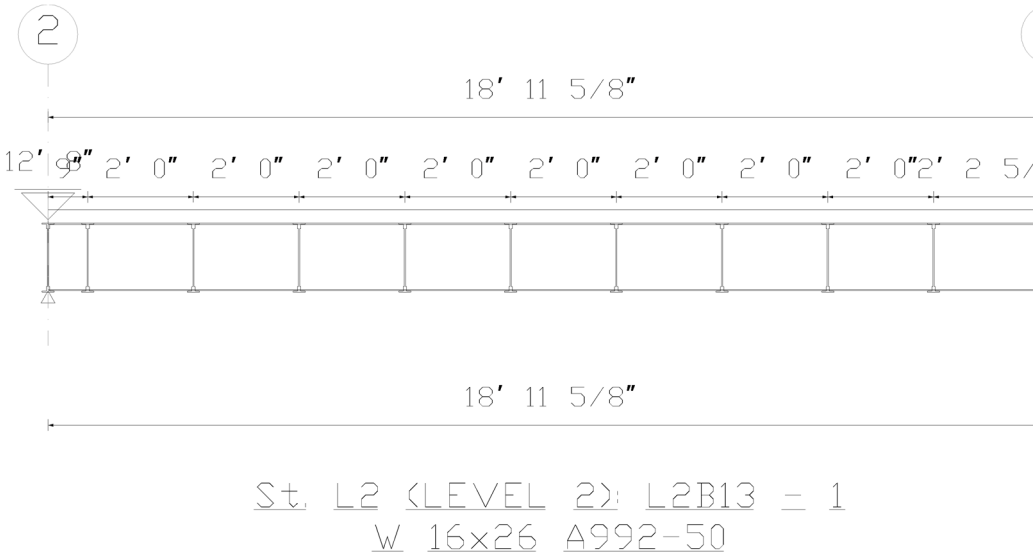
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Utilization Ratio **=0.411**

Pass

L2B13



Static

Summary W 16x26

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	9	19.0	106.0	kip	0.179	Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	20	92.7	165.7	kip ft	0.559	Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.019	-	in	-	-
Deflection Slab	1	0.110	0.948	in	0.116	Pass
Deflection Dead	1	0.073	0.632	in	0.116	Pass
Deflection Live	6	0.293	0.948	in	0.309	Pass
Deflection Total	6	0.495	0.632	in	0.784	Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 16x26 A992-50 - Critical

Flexural: Position 9" - Critical

Moment, M_x =5.7 kip ft

Elastic modulus of steel, E =29000 ksi

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Minimum yield stress, F_y =50.00 ksi
Flexural section class Compact AISC 360 Table B4.1b

Shear Major
9 (Final) LRFD$_{2.3}$-1.2D+1.6L+NL$_{Dir2+}$ - Critical
Span 1 W 16x26 A992-50 - Critical
Position 0" - Critical
Position of V_{ry} =0" ft, in
Required major axis shear strength, V_{ry} =19.0 kip
Design shear strength =106.0 kip AISC 360 G2
Ratio **=0.179**
✔ Pass

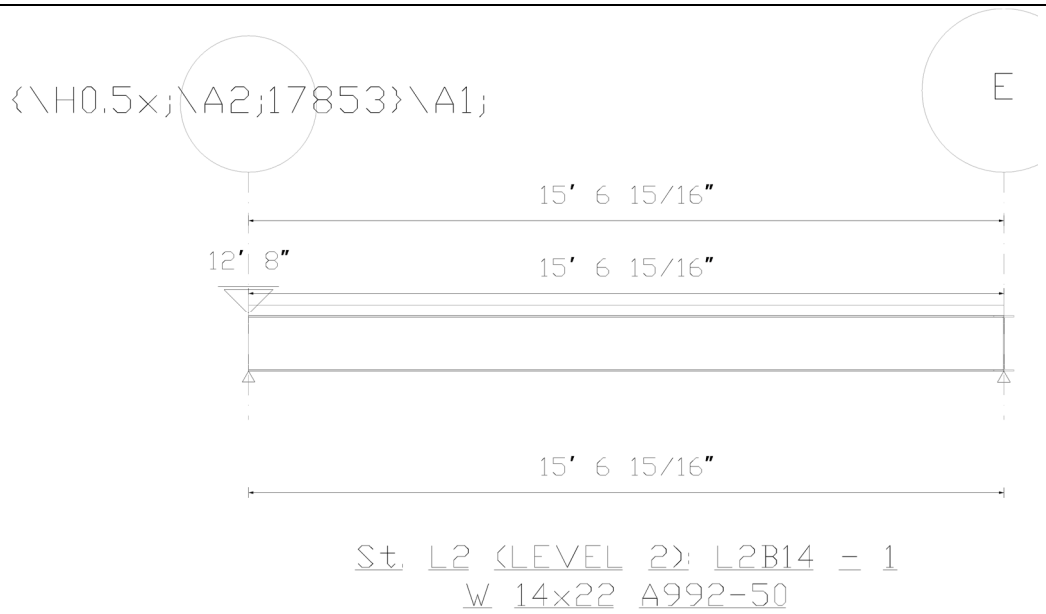
Flexure Major
20 (Final) LRFD$_{4.5}$-1.2D+1.6L+0.5S+NL$_{Dir2-}$ - Critical
Span 1 W 16x26 A992-50 - Critical
Yielding: 8' 9" - Critical
Dist of M_{rx} along member =8' 9" ft, in
Required flexural strength, M_{rx1} =92.7 kip ft
Design flexural strength =165.7 kip ft AISC 360 F1, F2 and F3
Ratio **=0.559**
✔ Pass

Deflection
6 (Final) LRFD$_2$-1.2D+1.6L - Critical
Span 1 W 16x26 A992-50 - Critical
Deflection Total - Critical
Position Total load deflection =9' 5 181/256" ft, in
Max. Total load deflection =0.495 in
Span over limit =0.632 in
Design limit =0.632 in
Utilization Ratio **=0.784**
✔ Pass

L2B14

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Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	170	-1.5	94.5	kip	0.016	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	170	-6.0	77.9	kip ft	0.077	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.003	-	in	-	-
Deflection Slab	1	0.003	0.779	in	0.004	✔ Pass
Deflection Dead	1	0.001	0.519	in	0.003	✔ Pass
Deflection Live	6	0.008	0.779	in	0.010	✔ Pass
Deflection Wind	298	0.003	0.935	in	0.004	✔ Pass
Deflection Total	6	0.015	0.519	in	0.029	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x	=-1.1 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

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Shear Major

170 (Final) LRFD$_{9.12}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 14x22 A992-50 - Critical

Position 15' 6 15/16" - Critical

Position of V_{ry}	=15' 6 15/16" ft, in	
Required major axis shear strength, V_{ry}	=-1.5 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.016**	

✔ Pass

Flexure Major

170 (Final) LRFD$_{9.12}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 14x22 A992-50 - Critical

LTB Flange Btm: 0" - 15' 6 15/16" - Critical

Dist of M_{rx1} along member	=15' 6 15/16" ft, in	
Required flexural strength, M_{rx1}	=-6.0 kip ft	
Design flexural strength	=77.9 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.077**	

✔ Pass

Deflection

6 (Final) LRFD$_{2}$-1.2D+1.6L - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

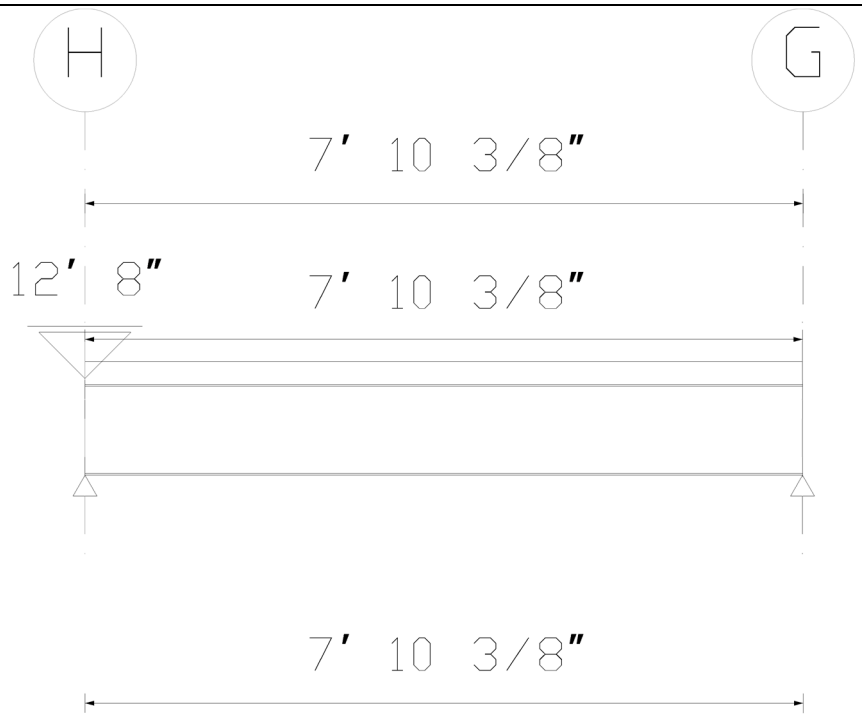
Position Total load deflection	=7' 8 13/128" ft, in
Max. Total load deflection	=0.015 in
Span over limit	=0.519 in
Design limit	=0.519 in
Utilization Ratio	**=0.029**

✔ Pass

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Project Name: FIRE STATION 5		



St. L2 (LEVEL 2): L2B970 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	6	-0.4	64.3	kip	0.006	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	17	0.8	42.5	kip ft	0.018	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.001	-	in	-	-
Deflection Slab	1	0.000	0.393	in	0.001	✔ Pass
Deflection Live	6	0.001	0.393	in	0.003	✔ Pass
Deflection Total	6	0.003	0.262	in	0.010	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

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Classification
1 (Final) LRFD$_1$-1.4D - Critical
Span 1 W 12x14 A992-50 - Critical
Flexural: Position 1' 3 187/256" - Critical

Moment, M_x	=0.2 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major
6 (Final) LRFD$_2$-1.2D+1.6L - Critical
Span 1 W 12x14 A992-50 - Critical
Position 7' 10 3/8" - Critical

Position of V_{ry}	=7' 10 3/8" ft, in	
Required major axis shear strength, V_{ry}	=-0.4 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.006**	

✔ Pass

Flexure Major
17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$ - Critical
Span 1 W 12x14 A992-50 - Critical
LTB Flange Top: 0" - 7' 10 3/8" - Critical

Dist of M_{rx1} along member	=3' 11 9/128" ft, in	
Required flexural strength, M_{rx1}	=0.8 kip ft	
Design flexural strength	=42.5 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.018**	

✔ Pass

Deflection
6 (Final) LRFD$_2$-1.2D+1.6L - Critical
Span 1 W 12x14 A992-50 - Critical
Deflection Total - Critical

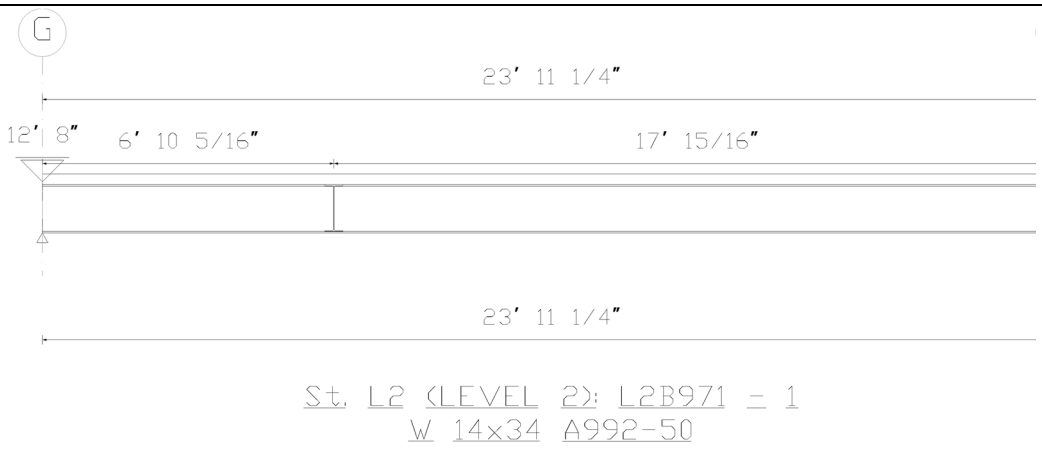
Position Total load deflection	=3' 11 21/128" ft, in
Max. Total load deflection	=0.003 in
Span over limit	=0.262 in
Design limit	=0.262 in
Utilization Ratio	**=0.010**

✔ Pass

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Project Name: FIRE STATION 5		



Static

Summary W 14x34

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	20	22.8	119.7	kip	0.190	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	9	110.9	204.7	kip ft	0.541	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.028	-	in	-	-
Deflection Slab	1	0.127	1.197	in	0.106	✔ Pass
Deflection Dead	1	0.071	0.798	in	0.090	✔ Pass
Deflection Live	6	0.340	1.197	in	0.284	✔ Pass
Deflection Wind	339	0.010	1.436	in	0.007	✔ Pass
Deflection Total	6	0.567	0.798	in	0.711	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x34 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x	=-19.1 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

20 (Final) LRFD$_{4.5}$-1.2D+1.6L+0.5S+NL$_{Dir2-}$ - Critical

Span 1 W 14x34 A992-50 - Critical

Position 0" - Critical

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Position of V_{ry} =0" ft, in
Required major axis shear strength, V_{ry} =22.8 kip
Design shear strength =119.7 kip AISC 360 G2
Ratio **=0.190**

✔ Pass

Flexure Major
9 (Final) LRFD$_{2.3}$-1.2D+1.6L+NL$_{Dir2+}$ - Critical
Span 1 W 14x34 A992-50 - Critical
Yielding: 6' 10 5/16" - Critical
Dist of M_{rx} along member =6' 10 5/16" ft, in
Required flexural strength, M_{rx1} =110.9 kip ft
Design flexural strength =204.7 kip ft AISC 360 F1, F2 and F3
Ratio **=0.541**

✔ Pass

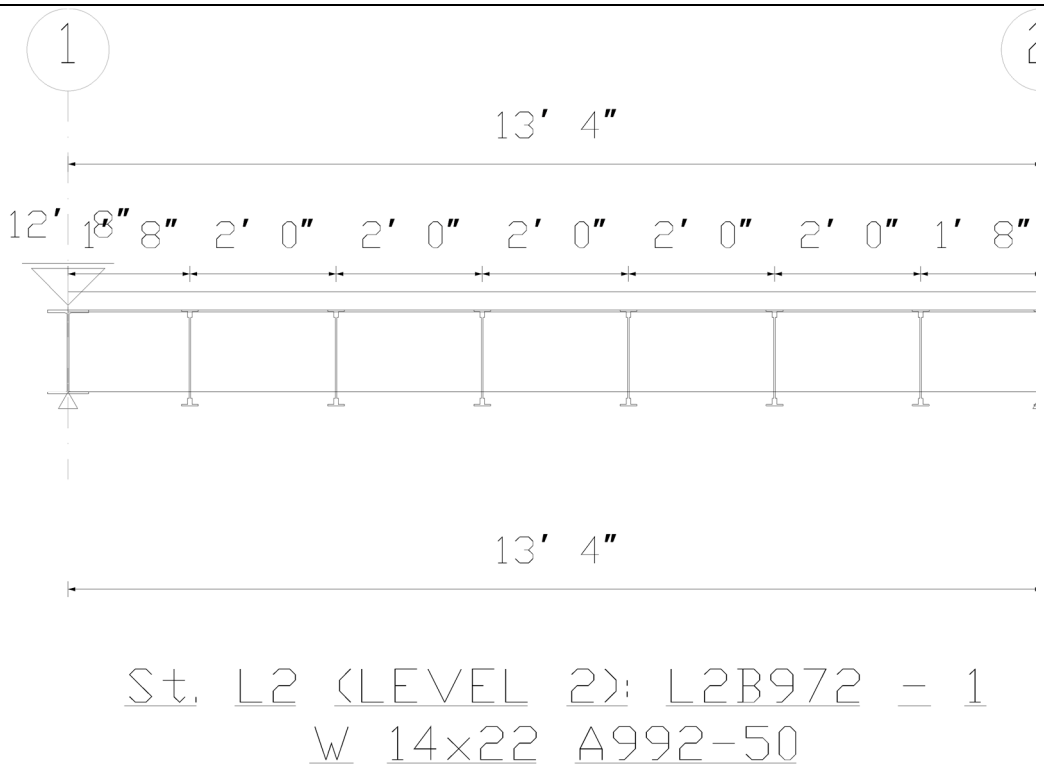
Deflection
6 (Final) LRFD$_2$-1.2D+1.6L - Critical
Span 1 W 14x34 A992-50 - Critical
Deflection Total - Critical
Position Total load deflection =10' 3 125/128" ft, in
Max. Total load deflection =0.567 in
Span over limit =0.798 in
Design limit =0.798 in
Utilization Ratio **=0.711**

✔ Pass

L2B972

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Project Name: FIRE STATION 5		



Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	18	17.0	94.5	kip	0.180	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	18	-48.4	89.3	kip ft	0.542	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.005	-	in	-	-
Deflection Slab	1	0.026	0.667	in	0.039	✔ Pass
Deflection Dead	1	0.016	0.444	in	0.036	✔ Pass
Deflection Live	6	0.070	0.667	in	0.105	✔ Pass
Deflection Wind	291	0.007	0.800	in	0.008	✔ Pass
Deflection Total	6	0.115	0.444	in	0.259	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

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Flexural: Position 0" - Critical

Moment, M_x	=-30.3 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

18 (Final) LRFD$_{4.3}$-1.2D+1.6L+0.5S+NL$_{Dir1-}$ - Critical

Span 1 W 14x22 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=17.0 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.180**	

✔ Pass

Flexure Major

18 (Final) LRFD$_{4.3}$-1.2D+1.6L+0.5S+NL$_{Dir1-}$ - Critical

Span 1 W 14x22 A992-50 - Critical

LTB Flange Btm: 0" - 13' 4" - Critical

Dist of M_{rx1} along member	=0" ft, in	
Required flexural strength, M_{rx1}	=-48.4 kip ft	
Design flexural strength	=89.3 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.542**	

✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

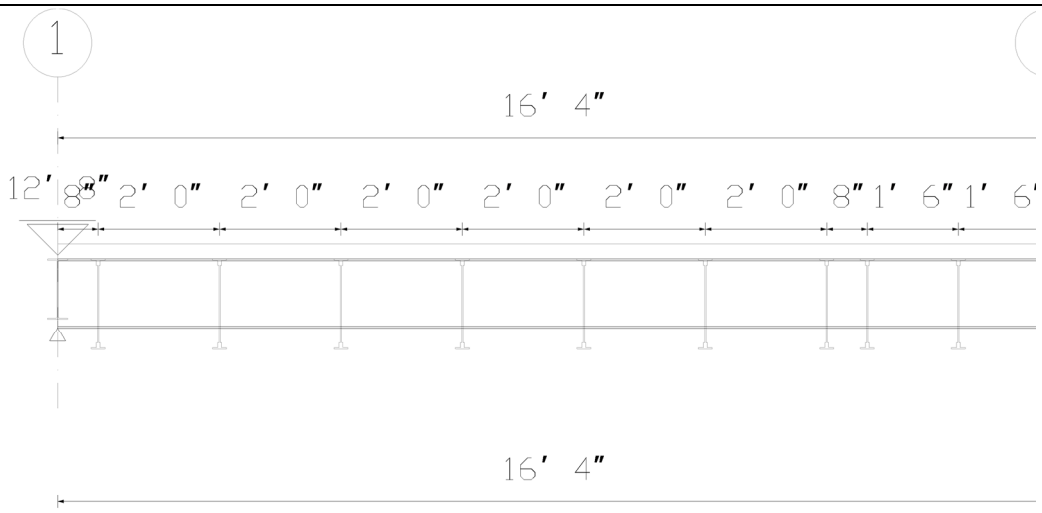
Position Total load deflection	=7' 8" ft, in
Max. Total load deflection	=0.115 in
Span over limit	=0.444 in
Design limit	=0.444 in
Utilization Ratio	**=0.259**

✔ Pass

L2B973

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St. L2 (LEVEL 2): L2B973 - 1
W 14x22 A992-50

Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	18	20.1	94.5	kip	0.213	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	17	-33.7	45.8	kip ft	0.736	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.010	-	in	-	-
Deflection Slab	1	0.070	0.817	in	0.086	✔ Pass
Deflection Dead	1	0.040	0.544	in	0.073	✔ Pass
Deflection Live	6	0.188	0.817	in	0.230	✔ Pass
Deflection Wind	323	0.007	0.980	in	0.008	✔ Pass
Deflection Total	6	0.309	0.544	in	0.567	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x =-11.7 kip ft

Elastic modulus of steel, E =29000 ksi

Minimum yield stress, F_y =50.00 ksi

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Flexural section class Compact AISC 360 Table B4.1b

Shear Major

18 (Final) LRFD$_{4.3}$-1.2D+1.6L+0.5S+NL$_{Dir1-}$ - Critical

Span 1 W 14x22 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=20.1 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.213**	

✔ Pass

Flexure Major

17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$ - Critical

Span 1 W 14x22 A992-50 - Critical

LTB Flange Btm: 0" - 16' 4" - Critical

Dist of M_{rx1} along member	=16' 4" ft, in	
Required flexural strength, M_{rx1}	=-33.7 kip ft	
Design flexural strength	=45.8 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.736**	

✔ Pass

Deflection

6 (Final) LRFD$_{2}$-1.2D+1.6L - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

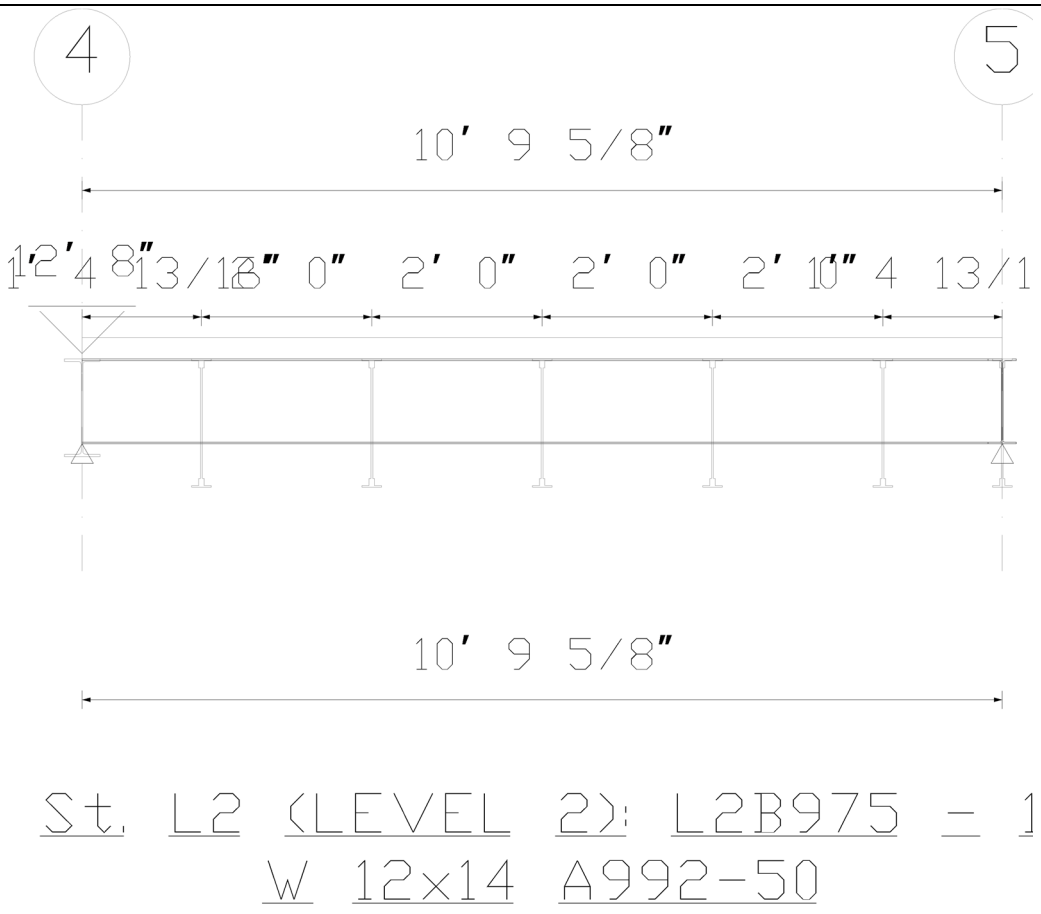
Position Total load deflection	=8' 1 153/256" ft, in
Max. Total load deflection	=0.309 in
Span over limit	=0.544 in
Design limit	=0.544 in
Utilization Ratio	**=0.567**

✔ Pass

L2B975

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Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	12	-12.3	64.3	kip	0.191	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	18	37.8	65.2	kip ft	0.580	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.007	-	in	-	-
Deflection Slab	1	0.050	0.540	in	0.092	✔ Pass
Deflection Dead	1	0.033	0.360	in	0.092	✔ Pass
Deflection Live	6	0.132	0.540	in	0.245	✔ Pass
Deflection Total	6	0.222	0.360	in	0.615	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

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Project Name: FIRE STATION 5		

Classification
1 (Final) LRFD$_1$-1.4D - Critical
Span 1 W 12x14 A992-50 - Critical
Flexural: Position 1' 4 13/16" - Critical

Moment, M_x	=6.7 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major
12 (Final) LRFD$_{3.1}$-1.2D+1.6L+0.5Lr+NL$_{Dir1+}$ - Critical
Span 1 W 12x14 A992-50 - Critical
Position 10' 9 5/8" - Critical

Position of V_{ry}	=10' 9 5/8" ft, in	
Required major axis shear strength, V_{ry}	=-12.3 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.191**	

✔ Pass

Flexure Major
18 (Final) LRFD$_{4.3}$-1.2D+1.6L+0.5S+NL$_{Dir1-}$ - Critical
Span 1 W 12x14 A992-50 - Critical
Yielding: 5' 4 13/16" - Critical

Dist of M_{rx} along member	=5' 4 13/16" ft, in	
Required flexural strength, M_{rx1}	=37.8 kip ft	
Design flexural strength	=65.2 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.580**	

✔ Pass

Deflection
6 (Final) LRFD$_2$-1.2D+1.6L - Critical
Span 1 W 12x14 A992-50 - Critical
Deflection Total - Critical

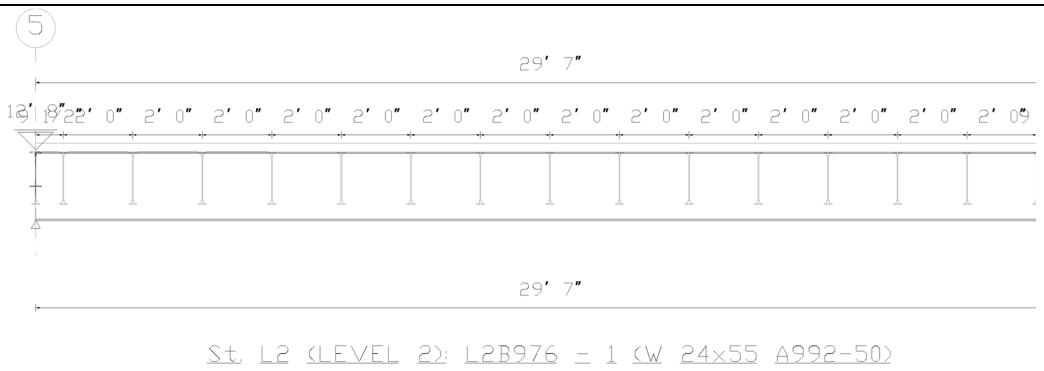
Position Total load deflection	=5' 4 13/16" ft, in
Max. Total load deflection	=0.222 in
Span over limit	=0.360 in
Design limit	=0.360 in
Utilization Ratio	**=0.615**

✔ Pass

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St. L2 (LEVEL 2): L2B976 - 1 (W 24x55 A992-50)

Static

Summary W 24x55

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	17	-38.3	251.7	kip	0.152	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	17	-53.6	106.0	kip ft	0.506	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.032	-	in	-	-
Deflection Slab	1	0.149	1.479	in	0.101	✔ Pass
Deflection Dead	1	0.083	0.986	in	0.084	✔ Pass
Deflection Live	6	0.398	1.479	in	0.269	✔ Pass
Deflection Wind	307	0.007	1.775	in	0.004	✔ Pass
Deflection Total	6	0.662	0.986	in	0.671	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 24x55 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x	=-23.4 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$ - Critical

Span 1 W 24x55 A992-50 - Critical

Position 29' 7" - Critical

Position of V_{ry}	=29' 7" ft, in
Required major axis shear strength, V_{ry}	=-38.3 kip

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Design shear strength =251.7 kip AISC 360 G2
Ratio **=0.152**

✔ Pass

Flexure Major
17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$ - Critical
Span 1 W 24x55 A992-50 - Critical
LTB Flange Btm: 0" - 29' 7" - Critical
Dist of M_{rx1} along member =29' 7" ft, in
Required flexural strength, M_{rx1} =-53.6 kip ft
Design flexural strength =106.0 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.506**

✔ Pass

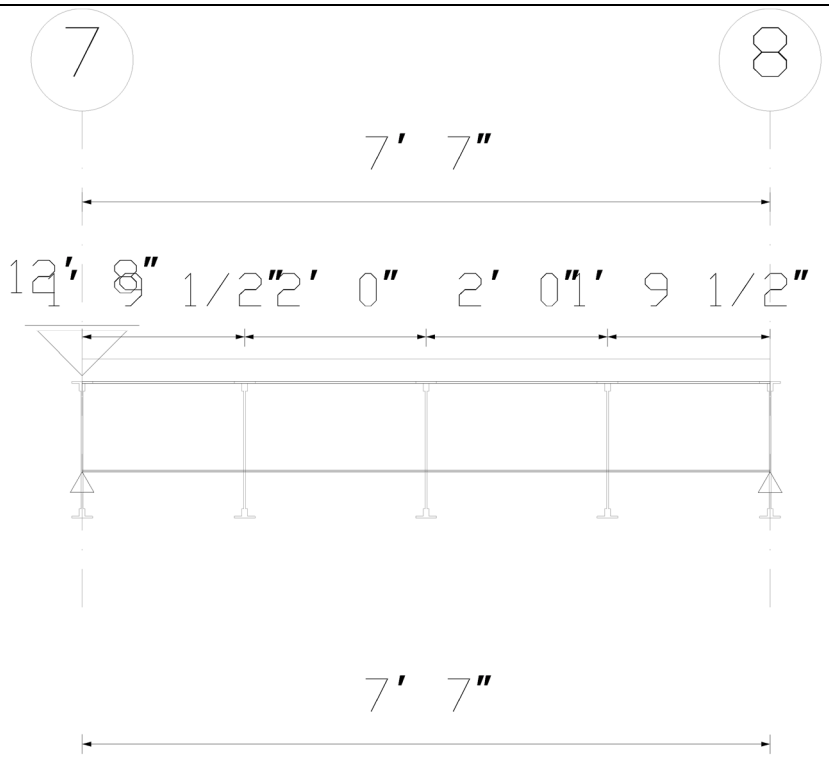
Deflection
6 (Final) LRFD$_2$-1.2D+1.6L - Critical
Span 1 W 24x55 A992-50 - Critical
Deflection Total - Critical
Position Total load deflection =14' 9 1/2" ft, in
Max. Total load deflection =0.662 in
Span over limit =0.986 in
Design limit =0.986 in
Utilization Ratio **=0.671**

✔ Pass

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St. L2 (LEVEL 2): L2B977 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	7	-7.7	64.3	kip	0.120	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	18	18.7	65.2	kip ft	0.286	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.002	-	in	-	-
Deflection Slab	1	0.012	0.379	in	0.033	✔ Pass
Deflection Dead	1	0.008	0.253	in	0.033	✔ Pass
Deflection Live	6	0.033	0.379	in	0.088	✔ Pass
Deflection Total	6	0.056	0.253	in	0.220	✔ Pass

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Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 10 3/4" - Critical

Moment, M_x	=2.7 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

7 (Final) LRFD$_{2.1}$-1.2D+1.6L+NL$_{Dir1+}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Position 7' 7" - Critical

Position of V_{ry}	=7' 7" ft, in	
Required major axis shear strength, V_{ry}	=-7.7 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.120**	

✔ Pass

Flexure Major

18 (Final) LRFD$_{4.3}$-1.2D+1.6L+0.5S+NL$_{Dir1-}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: 3' 9 1/2" - Critical

Dist of M_{rx} along member	=3' 9 1/2" ft, in	
Required flexural strength, M_{rx1}	=18.7 kip ft	
Design flexural strength	=65.2 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.286**	

✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

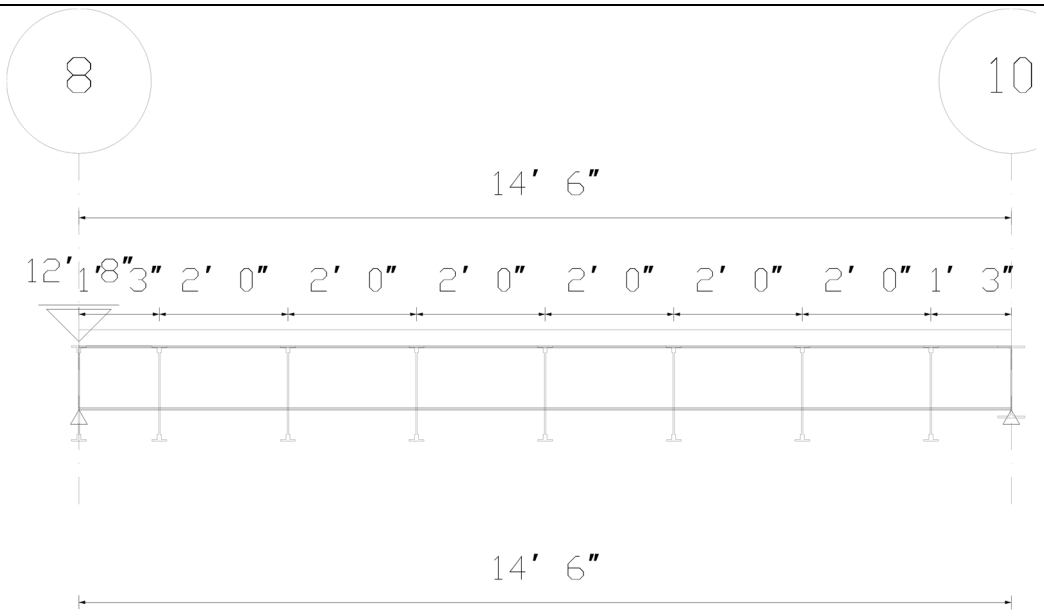
Position Total load deflection	=3' 9 1/2" ft, in
Max. Total load deflection	=0.056 in
Span over limit	=0.253 in
Design limit	=0.253 in
Utilization Ratio	**=0.220**

✔ Pass

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St. L2 (LEVEL 2): L2B978 - 1
W 12x19 A992-50

Static

Summary W 12x19

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	9	-17.3	86.0	kip	0.201	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	19	68.3	92.6	kip ft	0.737	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.016	-	in	-	-
Deflection Slab	1	0.109	0.725	in	0.150	✔ Pass
Deflection Dead	1	0.073	0.483	in	0.150	✔ Pass
Deflection Live	6	0.291	0.725	in	0.401	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 12x19 A992-50 - Critical

Flexural: Position 1' 3" - Critical

Moment, M_x =8.5 kip ft

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Elastic modulus of steel, E =29000 ksi
Minimum yield stress, F_y =50.00 ksi
Flexural section class Compact AISC 360 Table B4.1b

Shear Major
9 (Final) LRFD$_{2.3}$-1.2D+1.6L+NL$_{Dir2+}$ - Critical
Span 1 W 12x19 A992-50 - Critical
Position 14' 6" - Critical
Position of V_{ry} =14' 6" ft, in
Required major axis shear strength, V_{ry} =-17.3 kip
Design shear strength =86.0 kip AISC 360 G2
Ratio **=0.201**
✔ Pass

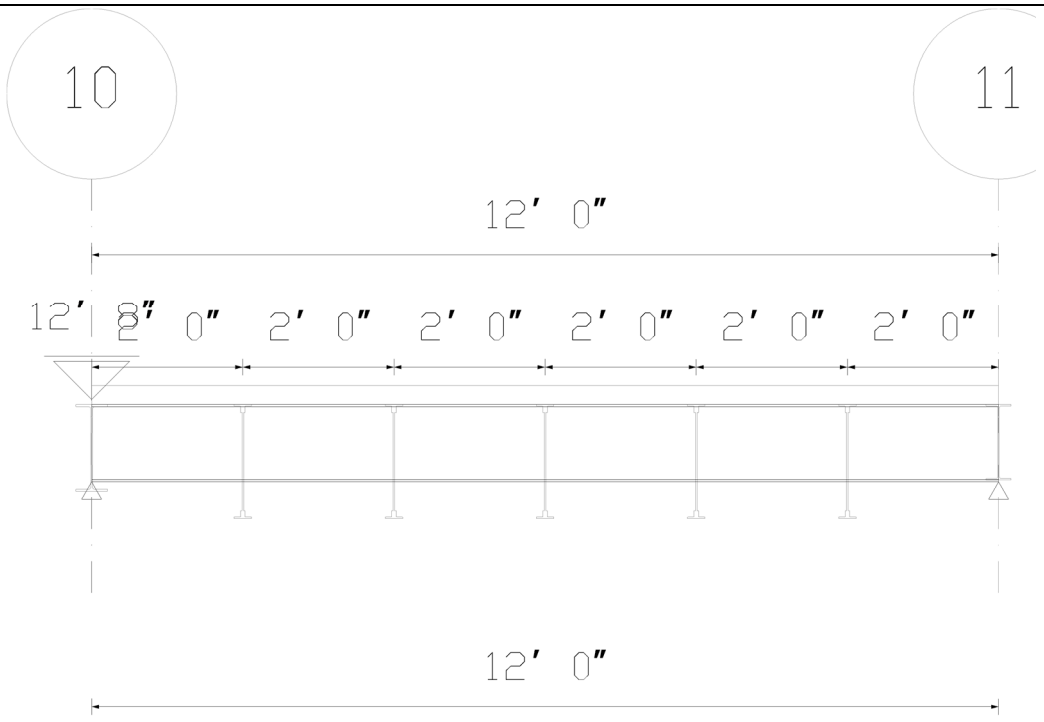
Flexure Major
19 (Final) LRFD$_{4.4}$-1.2D+1.6L+0.5S+NL$_{Dir2+}$ - Critical
Span 1 W 12x19 A992-50 - Critical
Yielding: 7' 3" - Critical
Dist of M_{rx} along member =7' 3" ft, in
Required flexural strength, M_{rx1} =68.3 kip ft
Design flexural strength =92.6 kip ft AISC 360 F1, F2 and F3
Ratio **=0.737**
✔ Pass

Deflection
6 (Final) LRFD$_2$-1.2D+1.6L - Critical
Span 1 W 12x19 A992-50 - Critical
Deflection Live - Critical
Position Live load deflection =7' 3" ft, in
Max. Live load deflection =0.291 in
Span over limit =0.725 in
Design limit =0.725 in
Utilization Ratio **=0.401**
✔ Pass

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St. L2 (LEVEL 2): L2B979 - 1
W 12x19 A992-50

Static

Summary W 12x19

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	16	13.2	86.0	kip	0.153	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	19	46.8	92.6	kip ft	0.505	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.007	-	in	-	-
Deflection Slab	1	0.052	0.600	in	0.086	✔ Pass
Deflection Dead	1	0.034	0.400	in	0.086	✔ Pass
Deflection Live	6	0.138	0.600	in	0.229	✔ Pass
Deflection Total	6	0.231	0.400	in	0.578	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

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1 (Final) LRFD$_1$-1.4D - Critical
Span 1 W 12x19 A992-50 - Critical
Flexural: Position 1' 0" - Critical

Moment, M_x	=5.2 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major
16 (Final) LRFD$_{4.1}$-1.2D+1.6L+0.5S - Critical
Span 1 W 12x19 A992-50 - Critical
Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=13.2 kip	
Design shear strength	=86.0 kip	AISC 360 G2
Ratio	**=0.153**	

✔ Pass

Flexure Major
19 (Final) LRFD$_{4.4}$-1.2D+1.6L+0.5S+NL$_{Dir2+}$ - Critical
Span 1 W 12x19 A992-50 - Critical
Yielding: 6' 0" - Critical

Dist of M_{rx} along member	=6' 0" ft, in	
Required flexural strength, M_{rx1}	=46.8 kip ft	
Design flexural strength	=92.6 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.505**	

✔ Pass

Deflection
6 (Final) LRFD$_2$-1.2D+1.6L - Critical
Span 1 W 12x19 A992-50 - Critical
Deflection Total - Critical

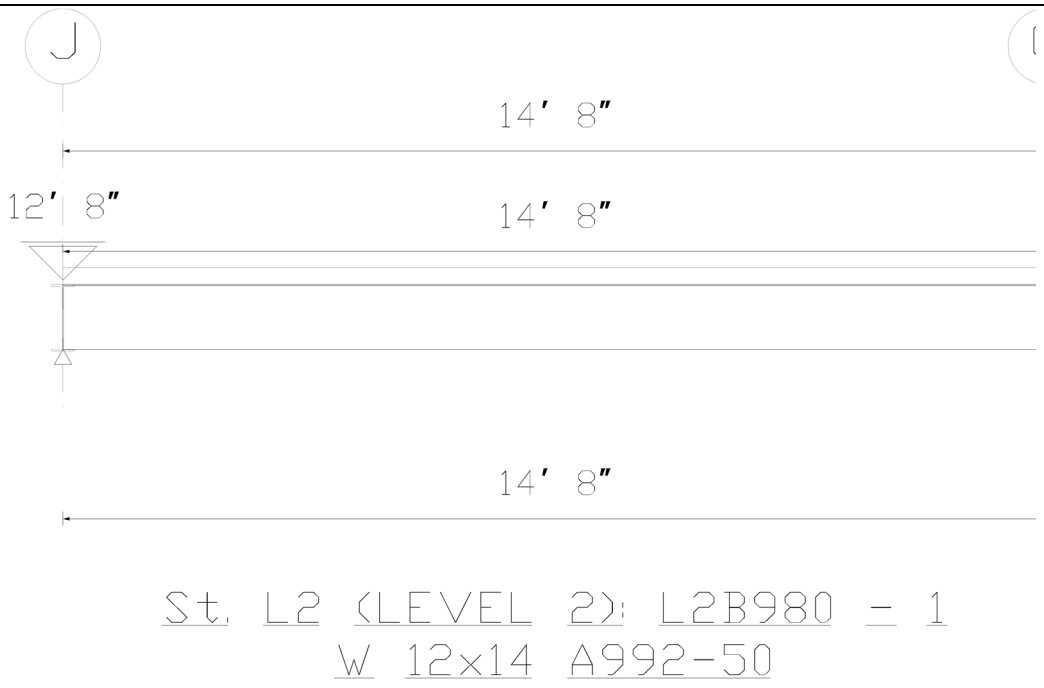
Position Total load deflection	=6' 0" ft, in
Max. Total load deflection	=0.231 in
Span over limit	=0.400 in
Design limit	=0.400 in
Utilization Ratio	**=0.578**

✔ Pass

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Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	6	-1.9	64.3	kip	0.029	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	6	6.9	15.6	kip ft	0.439	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.006	-	in	-	-
Deflection Slab	1	0.016	0.733	in	0.022	✔ Pass
Deflection Dead	1	0.011	0.489	in	0.022	✔ Pass
Deflection Live	6	0.042	0.733	in	0.057	✔ Pass
Deflection Total	6	0.074	0.489	in	0.152	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 11 47/64" - Critical

Moment, M_x	=0.7 kip ft
Elastic modulus of steel, E	=29000 ksi
Minimum yield stress, F_y	=50.00 ksi

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Flexural section class Compact AISC 360 Table B4.1b

Shear Major
6 (Final) LRFD$_2$-1.2D+1.6L - Critical
Span 1 W 12x14 A992-50 - Critical
Position 14' 8" - Critical
Position of V_{ry} =14' 8" ft, in
Required major axis shear strength, V_{ry} =-1.9 kip
Design shear strength =64.3 kip AISC 360 G2
Ratio **=0.029**
✔ Pass

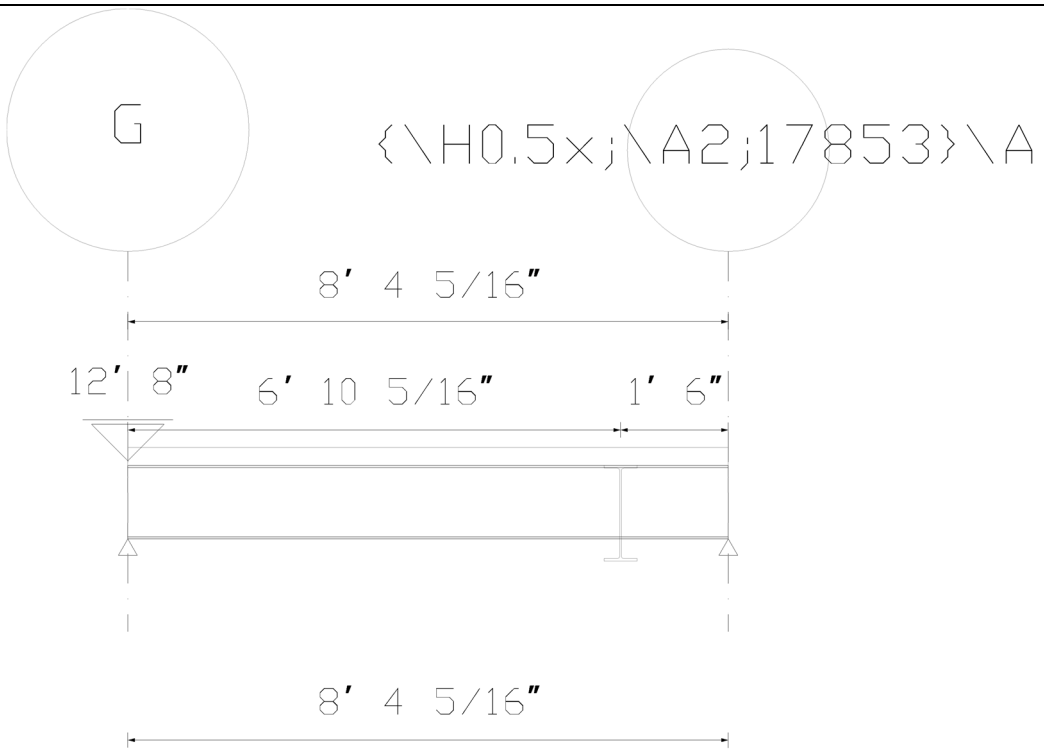
Flexure Major
6 (Final) LRFD$_2$-1.2D+1.6L - Critical
Span 1 W 12x14 A992-50 - Critical
LTB Flange Top: 0" - 14' 8" - Critical
Dist of M_{rx1} along member =7' 4 85/128" ft, in
Required flexural strength, M_{rx1} =6.9 kip ft
Design flexural strength =15.6 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.439**
✔ Pass

Deflection
6 (Final) LRFD$_2$-1.2D+1.6L - Critical
Span 1 W 12x14 A992-50 - Critical
Deflection Total - Critical
Position Total load deflection =7' 4 27/256" ft, in
Max. Total load deflection =0.074 in
Span over limit =0.489 in
Design limit =0.489 in
Utilization Ratio **=0.152**
✔ Pass

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St. L2 (LEVEL 2): L2B981 - 1
W 12x19 A992-50

Static

Summary W 12x19

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	6	-29.3	86.0	kip	0.340	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	9	43.8	92.6	kip ft	0.473	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.003	-	in	-	-
Deflection Slab	1	0.019	0.418	in	0.044	✔ Pass
Deflection Dead	1	0.012	0.279	in	0.044	✔ Pass
Deflection Live	6	0.050	0.418	in	0.118	✔ Pass
Deflection Total	6	0.084	0.279	in	0.301	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

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Classification
1 (Final) LRFD$_1$-1.4D - Critical
Span 1 W 12x19 A992-50 - Critical
Flexural: Position 1' 1 23/32" - Critical

Moment, M_x	=3.3 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major
6 (Final) LRFD$_2$-1.2D+1.6L - Critical
Span 1 W 12x19 A992-50 - Critical
Position 8' 4 5/16" - Critical

Position of V_{ry}	=8' 4 5/16" ft, in	
Required major axis shear strength, V_{ry}	=-29.3 kip	
Design shear strength	=86.0 kip	AISC 360 G2
Ratio	**=0.340**	

✔ Pass

Flexure Major
9 (Final) LRFD$_{2.3}$-1.2D+1.6L+NL$_{Dir2+}$ - Critical
Span 1 W 12x19 A992-50 - Critical
Yielding: 6' 10 5/16" - Critical

Dist of M_{rx} along member	=6' 10 5/16" ft, in	
Required flexural strength, M_{rx1}	=43.8 kip ft	
Design flexural strength	=92.6 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.473**	

✔ Pass

Deflection
6 (Final) LRFD$_2$-1.2D+1.6L - Critical
Span 1 W 12x19 A992-50 - Critical
Deflection Total - Critical

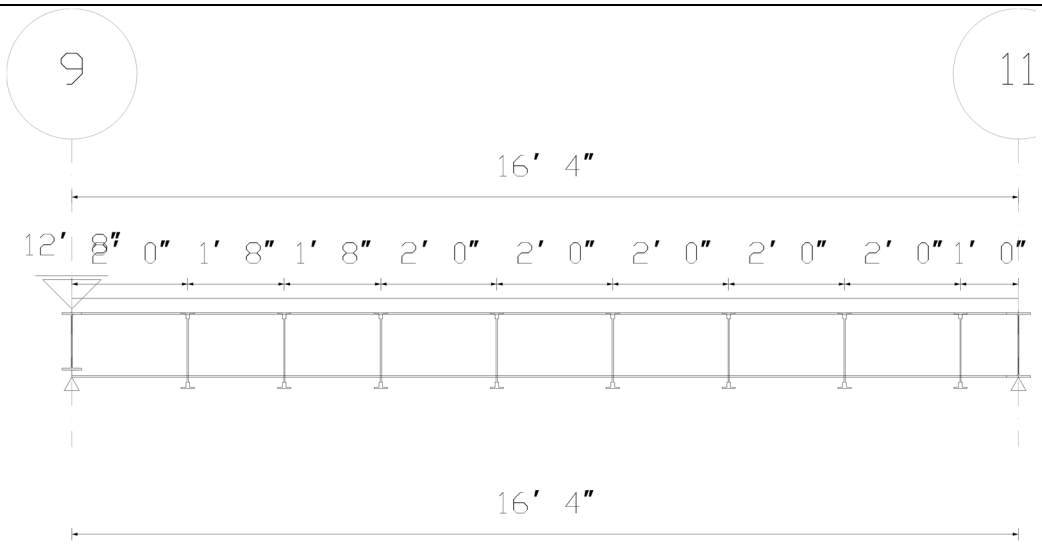
Position Total load deflection	=4' 10 87/256" ft, in
Max. Total load deflection	=0.084 in
Span over limit	=0.279 in
Design limit	=0.279 in
Utilization Ratio	**=0.301**

✔ Pass

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St. L2 (LEVEL 2): L2B982 - 1
W 14x22 A992-50

Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	17	-17.8	94.5	kip	0.188	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	17	-38.1	46.5	kip ft	0.819	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.014	-	in	-	-
Deflection Slab	1	0.058	0.817	in	0.071	✔ Pass
Deflection Dead	1	0.036	0.544	in	0.066	✔ Pass
Deflection Live	6	0.151	0.817	in	0.184	✔ Pass
Deflection Wind	323	0.006	0.980	in	0.006	✔ Pass
Deflection Total	6	0.256	0.544	in	0.469	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x =6.0 kip ft

Elastic modulus of steel, E =29000 ksi

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Minimum yield stress, F_y =50.00 ksi
Flexural section class Compact AISC 360 Table B4.1b

Shear Major
17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$ - Critical
Span 1 W 14x22 A992-50 - Critical
Position 16′ 4″ - Critical
Position of V_{ry} =16′ 4″ ft, in
Required major axis shear strength, V_{ry} =-17.8 kip
Design shear strength =94.5 kip AISC 360 G2
Ratio **=0.188**
✔ Pass

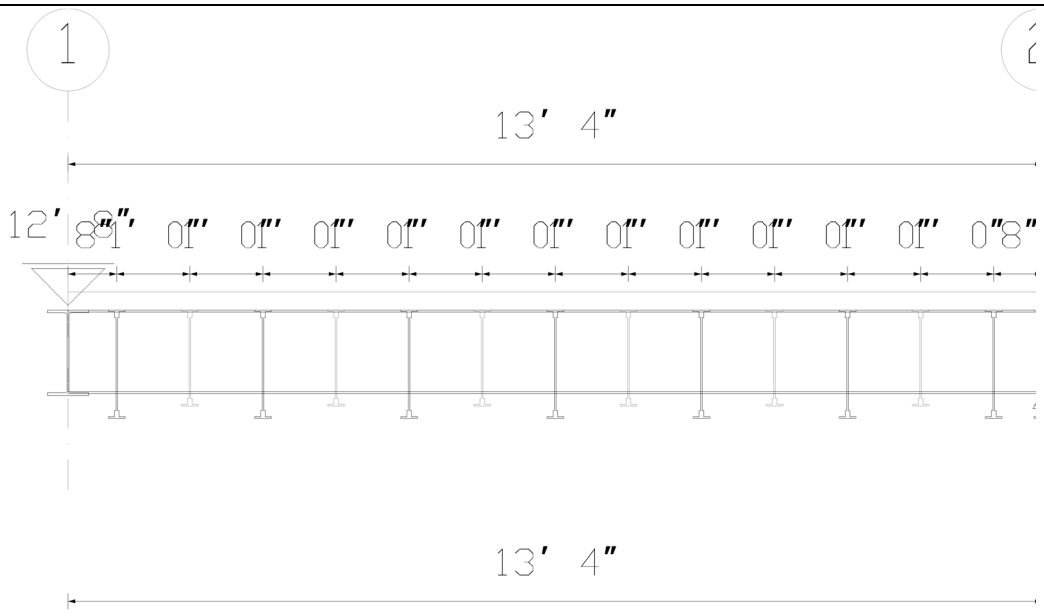
Flexure Major
17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$ - Critical
Span 1 W 14x22 A992-50 - Critical
LTB Flange Btm: 0″ - 16′ 4″ - Critical
Dist of M_{rx1} along member =16′ 4″ ft, in
Required flexural strength, M_{rx1} =-38.1 kip ft
Design flexural strength =46.5 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.819**
✔ Pass

Deflection
6 (Final) LRFD$_2$-1.2D+1.6L - Critical
Span 1 W 14x22 A992-50 - Critical
Deflection Total - Critical
Position Total load deflection =7′ 8 3/16″ ft, in
Max. Total load deflection =0.256 in
Span over limit =0.544 in
Design limit =0.544 in
Utilization Ratio **=0.469**
✔ Pass

L2B983

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St. L2 (LEVEL 2): L2B983 - 1
W 14x22 A992-50

Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	16	-28.6	94.5	kip	0.302	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	7	102.2	124.5	kip ft	0.821	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.012	-	in	-	-
Deflection Slab	1	0.093	0.667	in	0.140	✔ Pass
Deflection Dead	1	0.062	0.444	in	0.140	✔ Pass
Deflection Live	6	0.248	0.667	in	0.372	✔ Pass
Deflection Total	6	0.415	0.444	in	0.934	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural: Position 8" - Critical

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Moment, M_x	=7.4 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

16 (Final) LRFD$_{4.1}$-1.2D+1.6L+0.5S - Critical

Span 1 W 14x22 A992-50 - Critical

Position 13' 4" - Critical

Position of V_{ry}	=13' 4" ft, in	
Required major axis shear strength, V_{ry}	=-28.6 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.302**	

✔ Pass

Flexure Major

7 (Final) LRFD$_{2.1}$-1.2D+1.6L+NL$_{Dir1+}$ - Critical

Span 1 W 14x22 A992-50 - Critical

Yielding: 6' 8" - Critical

Dist of M_{rx} along member	=6' 8" ft, in	
Required flexural strength, M_{rx1}	=102.2 kip ft	
Design flexural strength	=124.5 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.821**	

✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

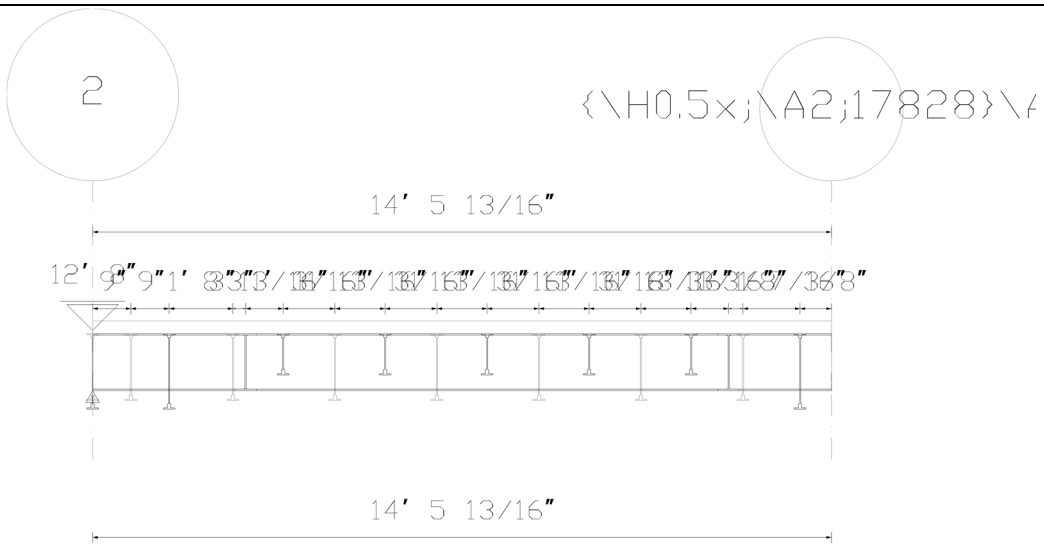
Position Total load deflection	=6' 8" ft, in
Max. Total load deflection	=0.415 in
Span over limit	=0.444 in
Design limit	=0.444 in
Utilization Ratio	**=0.934**

✔ Pass

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Project Name: FIRE STATION 5		



St. L2 (LEVEL 2): L2B984 - 1
W 14x22 A992-50

Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	9	-30.6	94.5	kip	0.324	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	17	102.8	124.5	kip ft	0.826	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.018	-	in	-	-
Deflection Slab	1	0.111	0.724	in	0.154	✔ Pass
Deflection Dead	1	0.074	0.483	in	0.154	✔ Pass
Deflection Live	6	0.297	0.724	in	0.409	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural: Position 9" - Critical

Moment, M_x	=8.7 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

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Shear Major
9 (Final) LRFD$_{2.3}$-1.2D+1.6L+NL$_{Dir2+}$ - Critical
Span 1 W 14x22 A992-50 - Critical
Position 14' 5 13/16" - Critical

Position of V_{ry}	=14' 5 13/16" ft, in	
Required major axis shear strength, V_{ry}	=-30.6 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.324**	

✔ Pass

Flexure Major
17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$ - Critical
Span 1 W 14x22 A992-50 - Critical
Yielding: 6' 9" - Critical

Dist of M_{rx} along member	=6' 9" ft, in	
Required flexural strength, M_{rx1}	=102.8 kip ft	
Design flexural strength	=124.5 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.826**	

✔ Pass

Deflection
6 (Final) LRFD$_{2}$-1.2D+1.6L - Critical
Span 1 W 14x22 A992-50 - Critical
Deflection Live - Critical

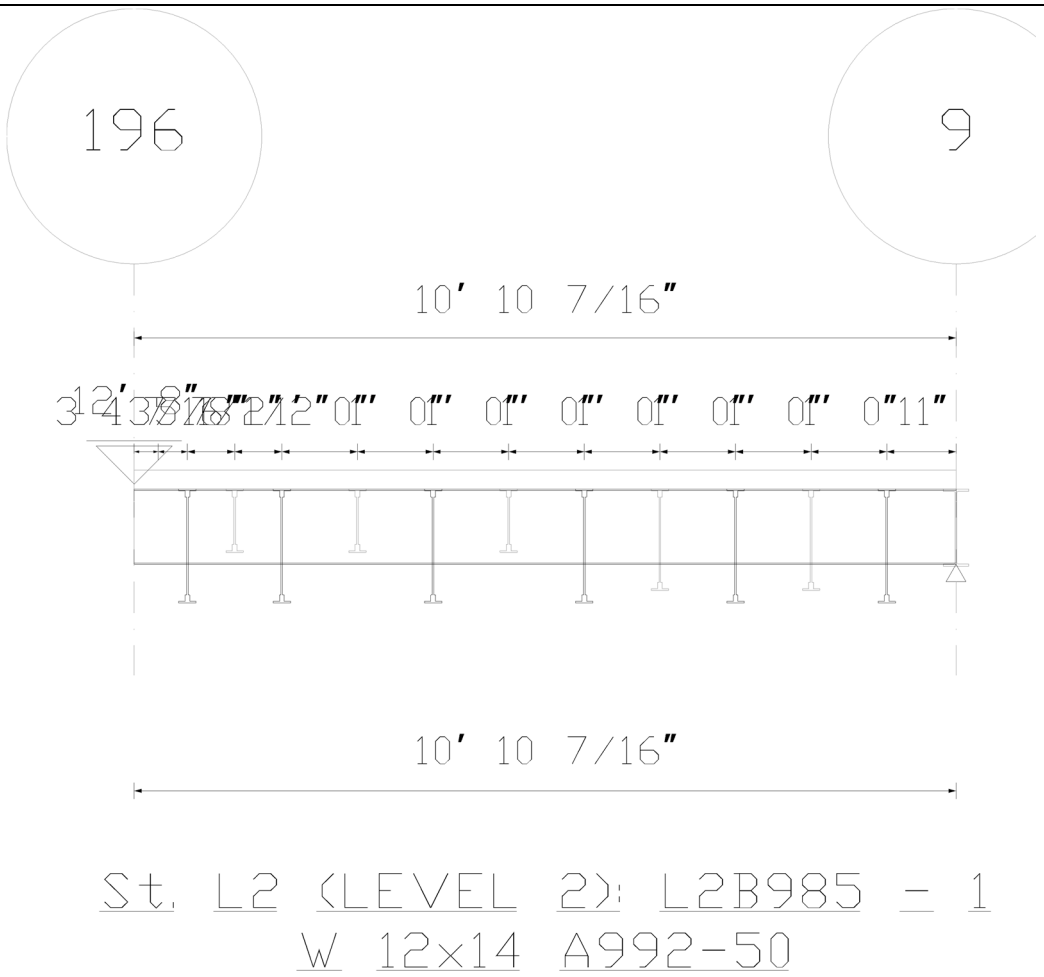
Position Live load deflection	=7' 2 151/256" ft, in
Max. Live load deflection	=0.297 in
Span over limit	=0.724 in
Design limit	=0.724 in
Utilization Ratio	**=0.409**

✔ Pass

L2B985

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St. L2 (LEVEL 2): L2B985 - 1
W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	28	27.8	64.3	kip	0.432	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	20	58.3	65.2	kip ft	0.893	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.012	-	in	-	-
Deflection Slab	1	0.077	0.543	in	0.141	✔ Pass
Deflection Dead	1	0.057	0.362	in	0.158	✔ Pass
Deflection Live	6	0.204	0.543	in	0.376	✔ Pass
Deflection Wind	323	-0.003	0.652	in	0.004	✔ Pass
Deflection Total	6	0.351	0.362	in	0.967	✔ Pass

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Project Name: FIRE STATION 5		

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 3 13/16" - Critical

Moment, M_x	=4.7 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=27.8 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.432**	

✔ Pass

Flexure Major

20 (Final) LRFD$_{4.5}$-1.2D+1.6L+0.5S+NL$_{Dir2-}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: 5' 11 7/16" - Critical

Dist of M_{rx} along member	=5' 11 7/16" ft, in	
Required flexural strength, M_{rx1}	=58.3 kip ft	
Design flexural strength	=65.2 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.893**	

✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

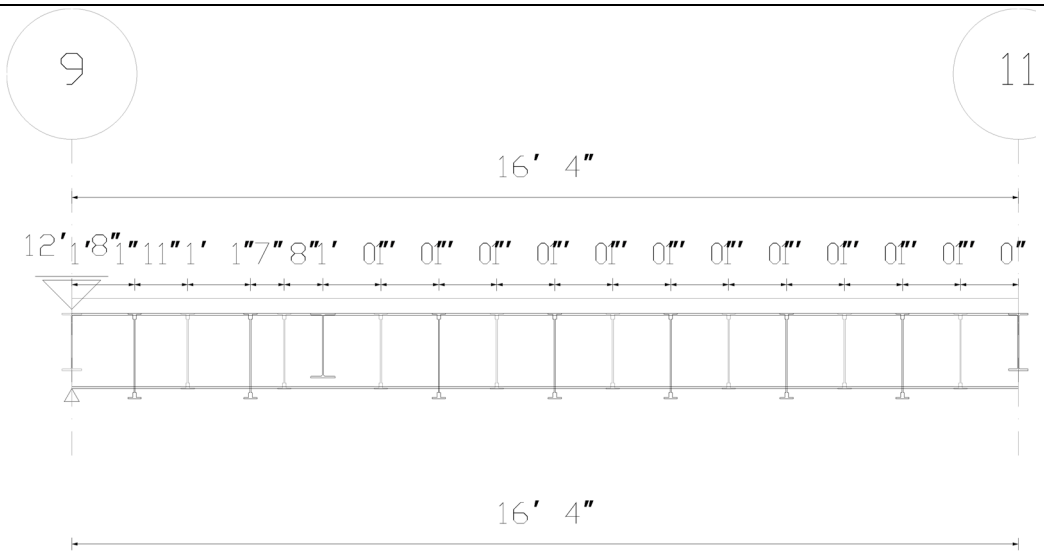
Position Total load deflection	=5' 6 71/256" ft, in
Max. Total load deflection	=0.351 in
Span over limit	=0.362 in
Design limit	=0.362 in
Utilization Ratio	**=0.967**

✔ Pass

L2B986

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St. L2 (LEVEL 2): L2B986 - 1
W 16x31 A992-50

Static

Summary W 16x31

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	17	36.0	131.2	kip	0.274	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	8	155.2	202.5	kip ft	0.767	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.018	-	in	-	-
Deflection Slab	1	0.112	0.817	in	0.137	✔ Pass
Deflection Dead	1	0.074	0.544	in	0.137	✔ Pass
Deflection Live	6	0.298	0.817	in	0.365	✔ Pass
Deflection Total	6	0.502	0.544	in	0.922	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 16x31 A992-50 - Critical

Flexural: Position 1' 1" - Critical

Moment, M_x =15.4 kip ft

Elastic modulus of steel, E =29000 ksi

Minimum yield stress, F_y =50.00 ksi

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Flexural section class Compact AISC 360 Table B4.1b

Shear Major

17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$ - Critical

Span 1 W 16x31 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in
Required major axis shear strength, V_{ry}	=36.0 kip
Design shear strength	=131.2 kip AISC 360 G2
Ratio	**=0.274**

✔ Pass

Flexure Major

8 (Final) LRFD$_{2.2}$-1.2D+1.6L+NL$_{Dir1-}$ - Critical

Span 1 W 16x31 A992-50 - Critical

Yielding: 8' 4" - Critical

Dist of M_{rx} along member	=8' 4" ft, in
Required flexural strength, M_{rx1}	=155.2 kip ft
Design flexural strength	=202.5 kip ft AISC 360 F1, F2 and F3
Ratio	**=0.767**

✔ Pass

Deflection

6 (Final) LRFD$_{2}$-1.2D+1.6L - Critical

Span 1 W 16x31 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=8' 2 17/256" ft, in
Max. Total load deflection	=0.502 in
Span over limit	=0.544 in
Design limit	=0.544 in
Utilization Ratio	**=0.922**

✔ Pass

L2B987



St. L2 (LEVEL 2): L2B987 - 1
W 14x22 A992-50

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Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	6	-4.2	94.5	kip	0.045	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	6	23.4	28.3	kip ft	0.828	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.019	-	in	-	-
Deflection Slab	1	0.052	1.076	in	0.048	✔ Pass
Deflection Dead	1	0.034	0.718	in	0.048	✔ Pass
Deflection Live	6	0.138	1.076	in	0.128	✔ Pass
Deflection Total	6	0.243	0.718	in	0.339	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural: Position 1' 117/128" - Critical

Moment, M_x	=1.9 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 14x22 A992-50 - Critical

Position 21' 6 5/16" - Critical

Position of V_{ry}	=21' 6 5/16" ft, in	
Required major axis shear strength, V_{ry}	=-4.2 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.045**	

✔ Pass

Flexure Major

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 14x22 A992-50 - Critical

LTB Flange Top: 0" - 21' 6 5/16" - Critical

Dist of M_{rx1} along member	=10' 8 235/256" ft, in	
Required flexural strength, M_{rx1}	=23.4 kip ft	
Design flexural strength	=28.3 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.828**	

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✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=10' 9 19/256" ft, in
Max. Total load deflection	=0.243 in
Span over limit	=0.718 in
Design limit	=0.718 in
Utilization Ratio	**=0.339**

✔ Pass

L2B988



Static

Summary W 12x19

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	6	-4.0	86.0	kip	0.046	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	12	17.8	23.3	kip ft	0.765	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.010	-	in	-	-
Deflection Slab	1	0.039	0.854	in	0.045	✔ Pass
Deflection Dead	1	0.026	0.569	in	0.045	✔ Pass

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Deflection Live	6	0.103	0.854	in	0.121	✔ Pass
Deflection Total	6	0.177	0.569	in	0.311	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x19 A992-50 - Critical

Flexural: Position 1' 1 85/128" - Critical

Moment, M_x	=1.8 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 12x19 A992-50 - Critical

Position 17' 15/16" - Critical

Position of V_{ry}	=17' 15/16" ft, in	
Required major axis shear strength, V_{ry}	=-4.0 kip	
Design shear strength	=86.0 kip	AISC 360 G2
Ratio	**=0.046**	

✔ Pass

Flexure Major

12 (Final) LRFD$_{3.1}$-1.2D+1.6L+0.5Lr+NL$_{Dir1+}$ - Critical

Span 1 W 12x19 A992-50 - Critical

LTB Flange Top: 0" - 17' 15/16" - Critical

Dist of M_{rx1} along member	=8' 6 85/256" ft, in	
Required flexural strength, M_{rx1}	=17.8 kip ft	
Design flexural strength	=23.3 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.765**	

✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 12x19 A992-50 - Critical

Deflection Total - Critical

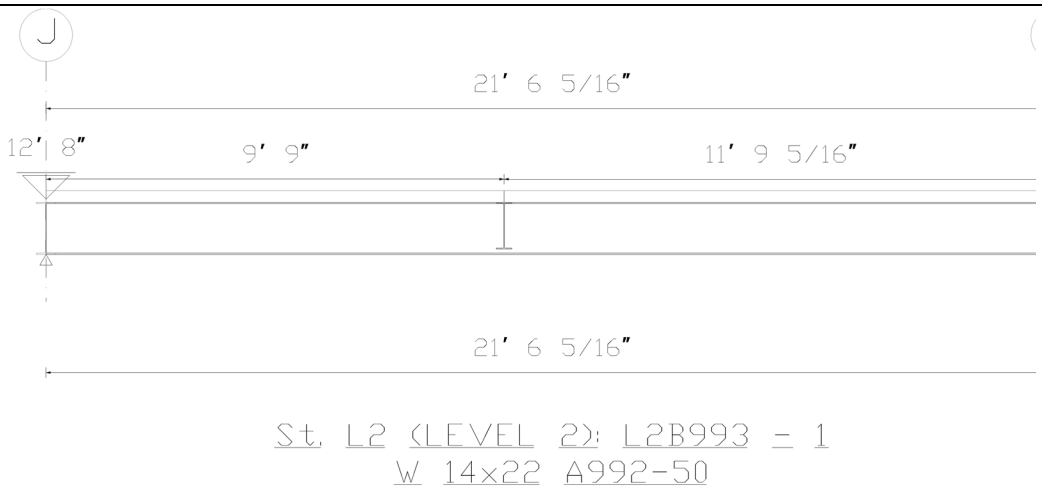
Position Total load deflection	=8' 6 15/32" ft, in
Max. Total load deflection	=0.177 in
Span over limit	=0.569 in
Design limit	=0.569 in
Utilization Ratio	**=0.311**

✔ Pass

L2B993

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Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	6	5.9	94.5	kip	0.062	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	9	47.9	92.4	kip ft	0.519	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.028	-	in	-	-
Deflection Slab	1	0.093	1.076	in	0.086	✔ Pass
Deflection Dead	1	0.062	0.718	in	0.086	✔ Pass
Deflection Live	6	0.247	1.076	in	0.230	✔ Pass
Deflection Total	6	0.429	0.718	in	0.599	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural: Position 1' 1" - Critical

Moment, M_x	=2.6 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 14x22 A992-50 - Critical

Position 0" - Critical

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Position of V_{ry} =0" ft, in
Required major axis shear strength, V_{ry} =5.9 kip
Design shear strength =94.5 kip AISC 360 G2
Ratio **=0.062**

✔ Pass

Flexure Major

9 (Final) LRFD$_{2.3}$-1.2D+1.6L+NL$_{Dir2+}$ - Critical

Span 1 W 14x22 A992-50 - Critical

LTB Flange Top: 9' 9" - 21' 6 5/16" - Critical

Dist of M_{rx1} along member =9' 9" ft, in
Required flexural strength, M_{rx1} =47.9 kip ft
Design flexural strength =92.4 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.519**

✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

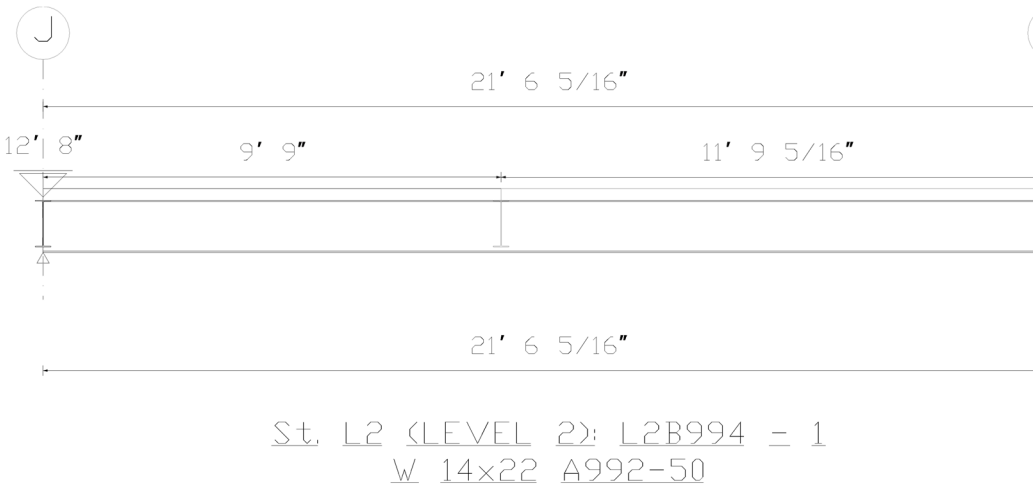
Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =10' 6 51/128" ft, in
Max. Total load deflection =0.429 in
Span over limit =0.718 in
Design limit =0.718 in
Utilization Ratio **=0.599**

✔ Pass

L2B994



Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	16	5.7	94.5	kip	0.060	✔ Pass

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	20	46.9	92.9	kip ft	0.505	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.028	-	in	-	-
Deflection Slab	1	0.090	1.076	in	0.084	✔ Pass
Deflection Dead	1	0.060	0.718	in	0.084	✔ Pass
Deflection Live	6	0.240	1.076	in	0.223	✔ Pass
Deflection Total	6	0.419	0.718	in	0.584	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural: Position 1' 1" - Critical

Moment, M_x	=2.6 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

16 (Final) LRFD$_{4.1}$-1.2D+1.6L+0.5S - Critical

Span 1 W 14x22 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=5.7 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.060**	

✔ Pass

Flexure Major

20 (Final) LRFD$_{4.5}$-1.2D+1.6L+0.5S+NL$_{Dir2-}$ - Critical

Span 1 W 14x22 A992-50 - Critical

LTB Flange Top: 9' 9" - 21' 6 5/16" - Critical

Dist of M_{rx1} along member	=9' 9" ft, in	
Required flexural strength, M_{rx1}	=46.9 kip ft	
Design flexural strength	=92.9 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.505**	

✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =10' 6 9/32" ft, in

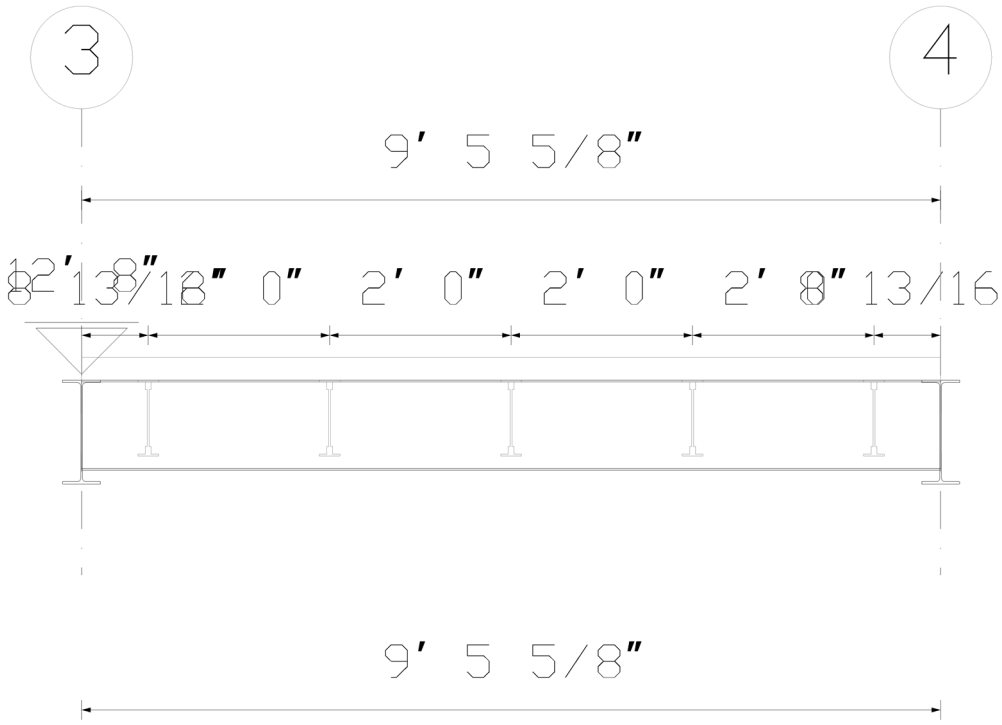
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Max. Total load deflection	=0.419 in
Span over limit	=0.718 in
Design limit	=0.718 in
Utilization Ratio	**=0.584**

✔ Pass

L2B995



St. L2 (LEVEL 2): L2B995 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	18	-6.4	64.3	kip	0.099	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	20	16.0	65.2	kip ft	0.245	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.002	-	in	-	-

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Deflection Slab	1	0.016	0.473	in	0.034	✔ Pass
Deflection Dead	1	0.011	0.316	in	0.034	✔ Pass
Deflection Live	6	0.043	0.473	in	0.092	✔ Pass
Deflection Total	6	0.073	0.316	in	0.230	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 8 13/16" - Critical

Moment, M_x	=1.8 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

18 (Final) LRFD$_{4.3}$-1.2D+1.6L+0.5S+NL$_{Dir1-}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Position 9' 5 5/8" - Critical

Position of V_{ry}	=9' 5 5/8" ft, in	
Required major axis shear strength, V_{ry}	=-6.4 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.099**	

✔ Pass

Flexure Major

20 (Final) LRFD$_{4.5}$-1.2D+1.6L+0.5S+NL$_{Dir2-}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: 4' 8 13/16" - Critical

Dist of M_{rx} along member	=4' 8 13/16" ft, in	
Required flexural strength, M_{rx1}	=16.0 kip ft	
Design flexural strength	=65.2 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.245**	

✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

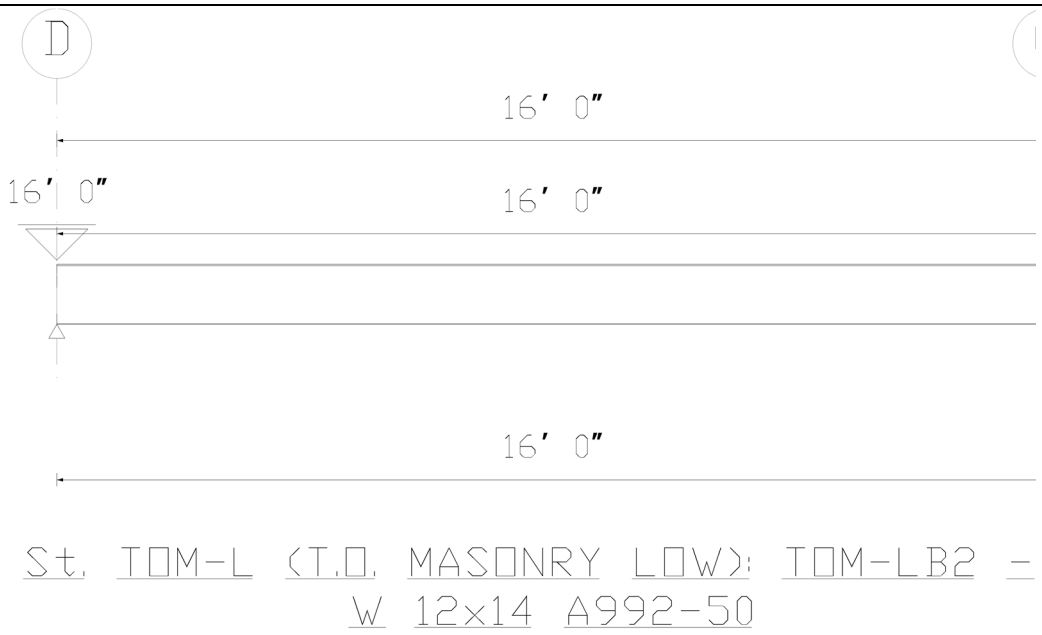
Position Total load deflection	=4' 8 13/16" ft, in
Max. Total load deflection	=0.073 in
Span over limit	=0.316 in
Design limit	=0.316 in
Utilization Ratio	**=0.230**

✔ Pass

TOM-LB2

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Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	103	-1.8	64.3	kip	0.027	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	103	-14.2	27.8	kip ft	0.511	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	141	-3.1	187.2	kip	0.017	✔ Pass
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	231	-	-	-	0.484	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Slab	1	-0.012	0.800	in	0.015	✔ Pass
Deflection Dead	1	-0.005	0.533	in	0.010	✔ Pass
Deflection Live	21	-0.004	0.533	in	0.008	✔ Pass
Deflection Wind	323	0.006	0.960	in	0.007	✔ Pass
Deflection Total	103	-0.037	0.800	in	0.047	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x	=10.3 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

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Shear Major

103 (Final) LRFD$_{8.9}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 16′ 0″ - Critical

Position of V_{ry}	=16′ 0″ ft, in	
Required major axis shear strength, V_{ry}	=-1.8 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.027**	

✔ Pass

Flexure Major

103 (Final) LRFD$_{8.9}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Btm: 0″ - 16′ 0″ - Critical

Dist of M_{rx1} along member	=16′ 0″ ft, in	
Required flexural strength, M_{rx1}	=-14.2 kip ft	
Design flexural strength	=27.8 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.511**	

✔ Pass

Axial Tension

141 (Final) LRFD$_{8.47}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 0″ - Critical

Distance of P_r along member	=0″ ft, in	
Required tensile strength, P_r	=-3.1 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.017**	

✔ Pass

Combined Forces

231 (Final) LRFD$_{10.9}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Btm LTB 0″ - 16′ 0″ - Critical

Axial Tension: 0″ - 16′ 0″ - Critical

Mode	Ratio	Status
Combined buckling	0.484	✔ Pass

Deflection

103 (Final) LRFD$_{8.9}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=12′ 3 19/64″ ft, in
Max. Total load deflection	=-0.037 in
Span over limit	=0.800 in
Design limit	=0.800 in
Utilization Ratio	**=0.047**

✔ Pass

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Project Name: FIRE STATION 5		

TOM-LB1002



St. TOM-L (T.O. MASONRY LOW): TOM-LB1002 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	29	-2.5	64.3	kip	0.039	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	29	-20.1	27.6	kip ft	0.729	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	158	-2.7	187.2	kip	0.014	✔ Pass
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	29	-	-	-	0.693	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Slab	1	-0.014	0.800	in	0.017	✔ Pass
Deflection Dead	1	-0.013	0.533	in	0.023	✔ Pass
Deflection Live	11	-0.012	0.533	in	0.023	✔ Pass
Deflection Wind	291	0.007	0.960	in	0.008	✔ Pass
Deflection Total	240	-0.049	0.800	in	0.062	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x =12.1 kip ft

Elastic modulus of steel, E =29000 ksi

Minimum yield stress, F_y =50.00 ksi

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Flexural section class Compact AISC 360 Table B4.1b

Shear Major

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Position 16′ 0″ - Critical

Position of V_{ry} =16′ 0″ ft, in

Required major axis shear strength, V_{ry} =-2.5 kip

Design shear strength =64.3 kip AISC 360 G2

Ratio **=0.039**

✔ Pass

Flexure Major

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$ - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Btm: 0″ - 16′ 0″ - Critical

Dist of M_{rx1} along member =16′ 0″ ft, in

Required flexural strength, M_{rx1} =-20.1 kip ft

Design flexural strength =27.6 kip ft AISC 360 F1, F2, F3 and F4

Ratio **=0.729**

✔ Pass

Axial Tension

158 (Final) LRFD$_{8.64}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 0″ - Critical

Distance of P_r along member =0″ ft, in

Required tensile strength, P_r =-2.7 kip

Design yield strength =187.2 kip AISC 360 D2

Ratio **=0.014**

✔ Pass

Combined Forces

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Btm LTB 0″ - 16′ 0″ - Critical

Axial Tension: 0″ - 16′ 0″ - Critical

Mode	Ratio	Status
Combined buckling	0.693	✔ Pass

Deflection

240 (Final) LRFD$_{10.18}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =12′ 4 13/128″ ft, in

Max. Total load deflection =-0.049 in

Span over limit =0.800 in

Design limit =0.800 in

Utilization Ratio **=0.062**

✔ Pass

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Project Name: FIRE STATION 5		

TOM-LB1003



St. TOM-L (T.O. MASONRY LOW): TOM-LB1003 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	283	1.2	64.3	kip	0.018	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	283	-9.1	28.1	kip ft	0.323	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	102	-3.1	187.2	kip	0.016	✔ Pass
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	283	-	-	-	0.310	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.002	-	in	-	-
Deflection Slab	1	-0.008	0.800	in	0.010	✔ Pass
Deflection Dead	1	-0.004	0.533	in	0.008	✔ Pass
Deflection Live	11	-0.005	0.533	in	0.010	✔ Pass
Deflection Wind	303	0.005	0.960	in	0.005	✔ Pass
Deflection Total	283	-0.023	0.800	in	0.028	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x =-5.8 kip ft

Elastic modulus of steel, E =29000 ksi

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Minimum yield stress, F_y =50.00 ksi
Flexural section class Compact AISC 360 Table B4.1b

Shear Major
283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Position 0" - Critical
Position of V_{ry} =0" ft, in
Required major axis shear strength, V_{ry} =1.2 kip
Design shear strength =64.3 kip AISC 360 G2
Ratio **=0.018**
✔ Pass

Flexure Major
283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
LTB Flange Btm: 0" - 16' 0" - Critical
Dist of M_{rx1} along member =0" ft, in
Required flexural strength, M_{rx1} =-9.1 kip ft
Design flexural strength =28.1 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.323**
✔ Pass

Axial Tension
102 (Final) LRFD$_{8.8}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
Yielding: Position 0" - Critical
Distance of P_r along member =0" ft, in
Required tensile strength, P_r =-3.1 kip
Design yield strength =187.2 kip AISC 360 D2
Ratio **=0.016**
✔ Pass

Combined Forces
283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Flange Btm LTB 0" - 16' 0" - Critical
Axial Tension: 0" - 16' 0" - Critical

Mode	Ratio	Status
Combined buckling	0.310	✔ Pass

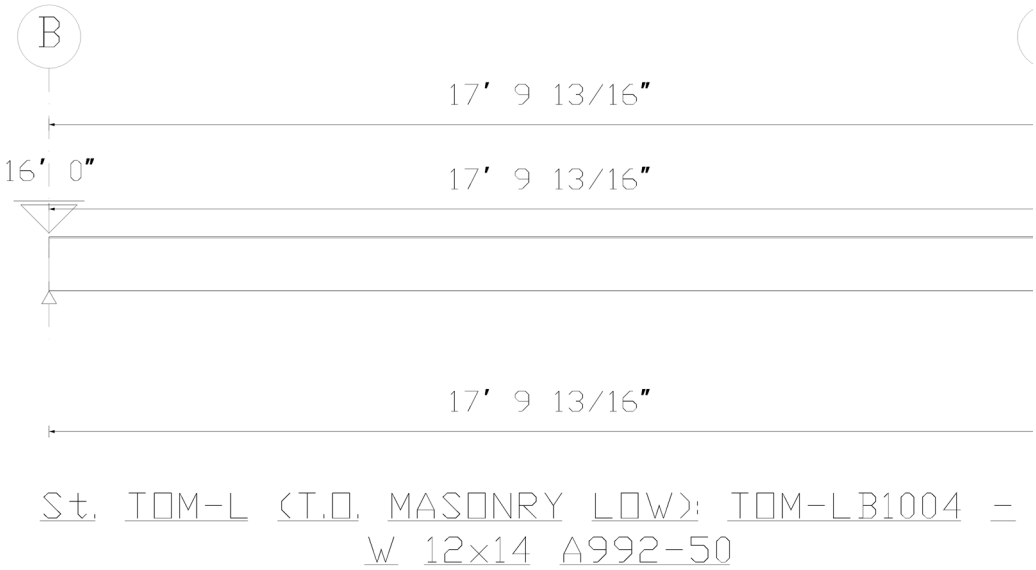
Deflection
283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Deflection Total - Critical
Position Total load deflection =3' 9 63/128" ft, in
Max. Total load deflection =-0.023 in
Span over limit =0.800 in
Design limit =0.800 in
Utilization Ratio **=0.028**

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Project Name: FIRE STATION 5		

✔ Pass

TOM-LB1004



Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	335	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	283	0.8	64.3	kip	0.013	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	283	-6.6	23.7	kip ft	0.278	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	134	-3.6	187.2	kip	0.019	✔ Pass
Axial Compression	335	0.3	11.7	kip	0.028	✔ Pass
Combined Forces	283	-	-	-	0.268	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.003	-	in	-	-
Deflection Slab	1	0.004	0.891	in	0.004	✔ Pass
Deflection Dead	1	-0.004	0.594	in	0.006	✔ Pass
Deflection Live	11	-0.003	0.594	in	0.006	✔ Pass
Deflection Wind	303	-0.008	1.069	in	0.008	✔ Pass
Deflection Total	211	0.014	0.891	in	0.016	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

335 (Final) $LRFD_{12.49}$-0.9D+W - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P =0.3 kip

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Elastic modulus of steel, E =29000 ksi
Minimum yield stress, F_y =50.00 ksi
Axial section class Slender AISC 360 Table B4.1a

Shear Major
283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Position 0" - Critical
Position of V_{ry} =0" ft, in
Required major axis shear strength, V_{ry} =0.8 kip
Design shear strength =64.3 kip AISC 360 G2
Ratio **=0.013**
✔ Pass

Flexure Major
283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
LTB Flange Btm: 0" - 17' 9 13/16" - Critical
Dist of M_{rx1} along member =0" ft, in
Required flexural strength, M_{rx1} =-6.6 kip ft
Design flexural strength =23.7 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.278**
✔ Pass

Axial Tension
134 (Final) LRFD$_{8.40}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
Yielding: Position 0" - Critical
Distance of P_r along member =0" ft, in
Required tensile strength, P_r =-3.6 kip
Design yield strength =187.2 kip AISC 360 D2
Ratio **=0.019**
✔ Pass

Axial Compression
335 (Final) LRFD$_{12.49}$-0.9D+W - Critical
Span 1 W 12x14 A992-50 - Critical
Flexural - out-of-plane: 0" - 17' 9 13/16" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 17' 9 13/16"	Flexural - out-of-plane	17' 9 13/16"	0.3	11.7	kip	0.028	✔ Pass

Combined Forces
283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Flange Btm LTB 0" - 17' 9 13/16" - Critical
Axial Tension: 0" - 17' 9 13/16" - Critical

Mode	Ratio	Status
Combined buckling	0.268	✔ Pass

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Project Name: FIRE STATION 5		

Deflection

211 (Final) LRFD$_{9.53}$-1.2D+L+0.5Lr+W - Critical

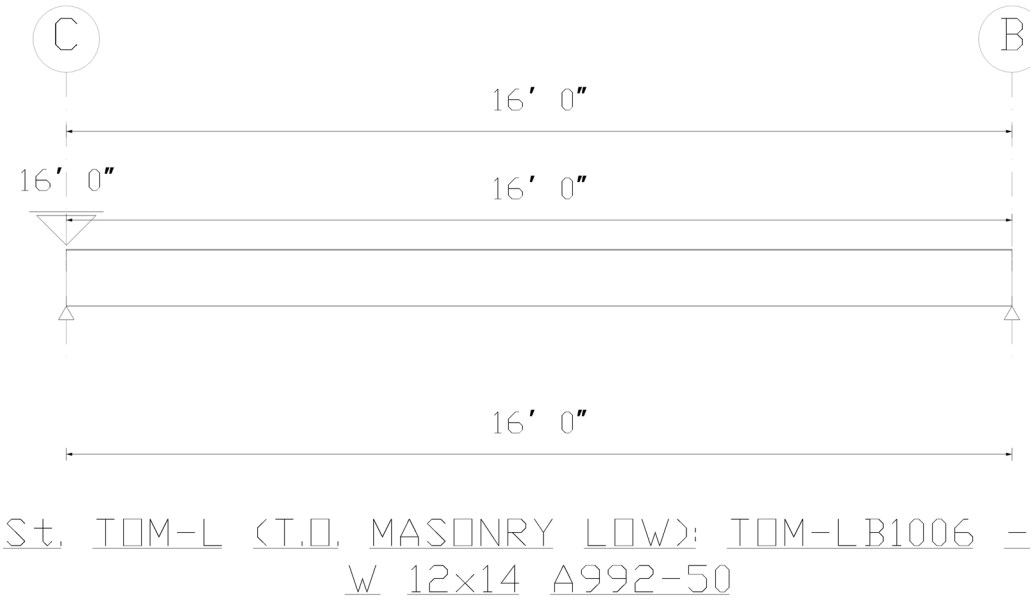
Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=13' 9 139/256" ft, in
Max. Total load deflection	=0.014 in
Span over limit	=0.891 in
Design limit	=0.891 in
Utilization Ratio	**=0.016**

✔ Pass

TOM-LB1006



St. TOM-L (T.O. MASONRY LOW): TOM-LB1006 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	267	1.0	64.3	kip	0.015	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	267	-7.4	28.4	kip ft	0.261	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	141	-2.7	187.2	kip	0.015	✔ Pass
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	267	-	-	-	0.252	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Slab	1	-0.007	0.800	in	0.009	✔ Pass
Deflection Dead	1	0.002	0.533	in	0.003	✔ Pass
Deflection Live	11	0.002	0.533	in	0.003	✔ Pass
Deflection Wind	295	-0.004	0.960	in	0.004	✔ Pass
Deflection Total	267	-0.018	0.800	in	0.022	✔ Pass

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Project Name: FIRE STATION 5		

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_{1}$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x	=-5.8 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=1.0 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.015**	

✔ Pass

Flexure Major

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Btm: 0" - 16' 0" - Critical

Dist of M_{rx1} along member	=0" ft, in	
Required flexural strength, M_{rx1}	=-7.4 kip ft	
Design flexural strength	=28.4 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.261**	

✔ Pass

Axial Tension

141 (Final) LRFD$_{8.47}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-2.7 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.015**	

✔ Pass

Combined Forces

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Btm LTB 0" - 16' 0" - Critical

Axial Tension: 0" - 16' 0" - Critical

Mode	Ratio	Status
Combined buckling	0.252	✔ Pass

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Deflection

267 (Final) $LRFD_{10.45}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=3' 7 95/128" ft, in
Max. Total load deflection	=-0.018 in
Span over limit	=0.800 in
Design limit	=0.800 in
Utilization Ratio	**=0.022**

✔ Pass

TOM-LB1007



Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	267	0.7	64.3	kip	0.011	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	267	-5.6	24.0	kip ft	0.233	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	133	-3.2	187.2	kip	0.017	✔ Pass
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	267	-	-	-	0.224	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.004	-	in	-	-
Deflection Slab	1	0.004	0.891	in	0.004	✔ Pass
Deflection Dead	1	-0.003	0.594	in	0.005	✔ Pass
Deflection Live	21	-0.002	0.594	in	0.004	✔ Pass
Deflection Wind	295	-0.006	1.069	in	0.006	✔ Pass

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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Deflection Total	139	-0.013	0.891	in	0.014	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x	=-3.6 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=0.7 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.011**	

✔ Pass

Flexure Major

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Btm: 0" - 17' 9 13/16" - Critical

Dist of M_{rx1} along member	=0" ft, in	
Required flexural strength, M_{rx1}	=-5.6 kip ft	
Design flexural strength	=24.0 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.233**	

✔ Pass

Axial Tension

133 (Final) LRFD$_{8.39}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-3.2 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.017**	

✔ Pass

Combined Forces

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Btm LTB 0" - 17' 9 13/16" - Critical

Axial Tension: 0" - 17' 9 13/16" - Critical

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Mode	Ratio	Status
Combined buckling	0.224	✔ Pass

Deflection

139 (Final) LRFD$_{8.45}$-1.2D+1.6S+0.5W - Critical

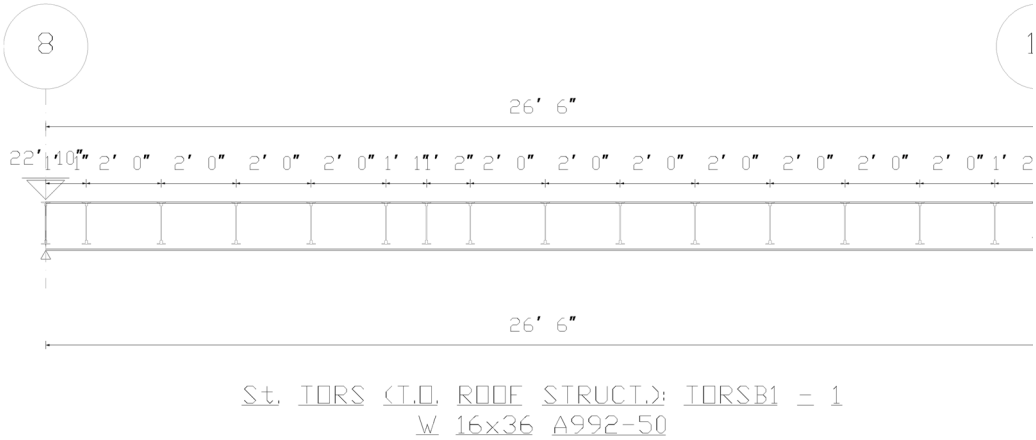
Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=3' 9 11/32" ft, in
Max. Total load deflection	=-0.013 in
Span over limit	=0.891 in
Design limit	=0.891 in
Utilization Ratio	**=0.014**

✔ Pass

TORSB1



Static

Summary W 16x36

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	55	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	13.7	140.7	kip	0.097	✔ Pass
Shear Minor	163	-0.3	162.3	kip	0.002	✔ Pass
Flexure Major	112	94.2	240.0	kip ft	0.393	✔ Pass
Flexure Minor	227	-0.5	40.5	kip ft	0.013	✔ Pass
Axial Tension	276	-1.4	477.0	kip	0.003	✔ Pass
Axial Compression	255	0.6	180.8	kip	0.003	✔ Pass
Combined Forces	112	-	-	-	0.398	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.058	-	in	-	-
Deflection Dead	1	0.281	0.883	in	0.318	✔ Pass
Deflection Live	21	0.187	1.325	in	0.141	✔ Pass
Deflection Wind	323	-0.123	1.590	in	0.077	✔ Pass
Deflection Total	112	0.670	0.883	in	0.759	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

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Project Name: FIRE STATION 5		

Static

Classification

55 (Final) LRFD$_{7.25}$-1.2D+1.6Lr+0.5W - Critical

Span 1 W 16x36 A992-50 - Critical

Axial: Position 21' 4" - Critical

Axial Force, P	=0.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 16x36 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=13.7 kip	
Design shear strength	=140.7 kip	AISC 360 G2
Ratio	**=0.097**	

✔ Pass

Shear Minor

163 (Final) LRFD$_{9.5}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 16x36 A992-50 - Critical

Position 0" - Critical

Position of V_{rx}	=0" ft, in	
Required minor axis shear strength, V_{rx}	=-0.3 kip	
Design shear strength	=162.3 kip	AISC 360 G6
Ratio	**=0.002**	

✔ Pass

Flexure Major

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical

Span 1 W 16x36 A992-50 - Critical

Yielding: 13' 4" - Critical

Dist of M_{rx} along member	=13' 4" ft, in	
Required flexural strength, M_{rx1}	=94.2 kip ft	
Design flexural strength	=240.0 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.393**	

✔ Pass

Flexure Minor

227 (Final) LRFD$_{10.5}$-1.2D+L+0.5S+W - Critical

Span 1 W 16x36 A992-50 - Critical

Yielding: 10' 2" - Critical

Dist of M_{ry} along member	=10' 2" ft, in	
Required flexural strength, M_{ry1}	=-0.5 kip ft	
Design flexural strength	=40.5 kip ft	AISC 360 F6
Ratio	**=0.013**	

✔ Pass

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Axial Tension

276 (Final) LRFD$_{10.54}$-1.2D+L+0.5S+W - Critical

Span 1 W 16x36 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-1.4 kip	
Design yield strength	=477.0 kip	AISC 360 D2
Ratio	**=0.003**	

✔ Pass

Axial Compression

255 (Final) LRFD$_{10.33}$-1.2D+L+0.5S+W - Critical

Span 1 W 16x36 A992-50 - Critical

Flexural torsional: 0" - 26' 6" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 26' 6"	Flexural torsional	26' 6"	0.6	180.8	kip	0.003	✔ Pass

Combined Forces

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical

Span 1 W 16x36 A992-50 - Critical

Flange Btm LTB 0" - 26' 6" - Critical

Axial Tension: 0" - 26' 6" - Critical

Mode	Ratio	Status
Combined buckling	0.398	✔ Pass

Deflection

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical

Span 1 W 16x36 A992-50 - Critical

Deflection Total - Critical

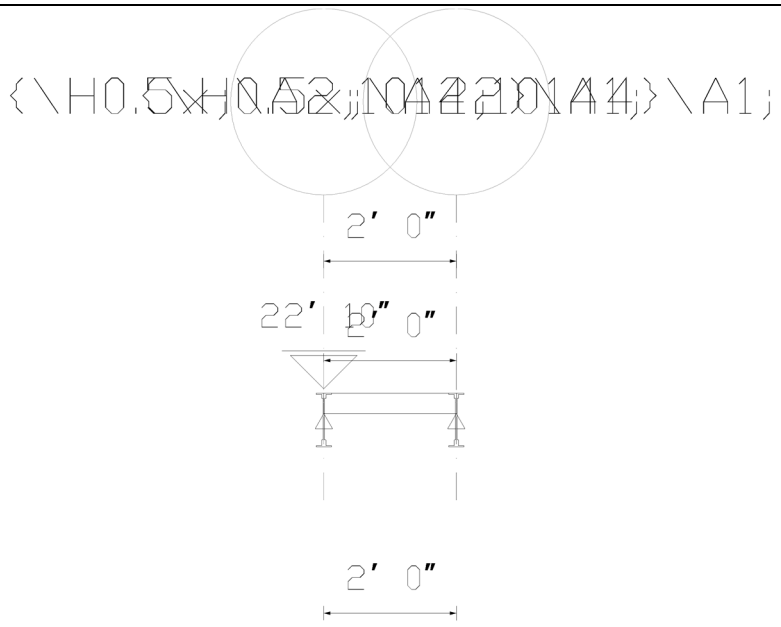
Position Total load deflection	=13' 3 41/256" ft, in
Max. Total load deflection	=0.670 in
Span over limit	=0.883 in
Design limit	=0.883 in
Utilization Ratio	**=0.759**

✔ Pass

TORSB7

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Project Name: FIRE STATION 5		



St. TORS (T.O. ROOF STRUCT.): TORSB7 - L 4x4x3/8 A992-50

Static

Summary L 4x4x3/8

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	159	Compact	-	-	-	✔ Pass
Shear Major	No Significant Forces			kip	-	Not required
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	No Significant Forces			kip ft	-	Not required
Flexure Minor	249	0.1	8.4	kip ft	0.015	✔ Pass
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	17	10.6	120.1	kip	0.088	✔ Pass
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=5.7 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Non-slender	AISC 360 Table B4.1a

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Project Name: FIRE STATION 5		

Flexure Minor

249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Yielding: 1′ 0″ - Critical

Dist of M_{ry} along member	=1′ 0″ ft, in	
Required flexural strength, M_{ry1}	=0.1 kip ft	
Design flexural strength	=8.4 kip ft	AISC 360 F1 and F10
Ratio	**=0.015**	

✔ Pass

Axial Compression

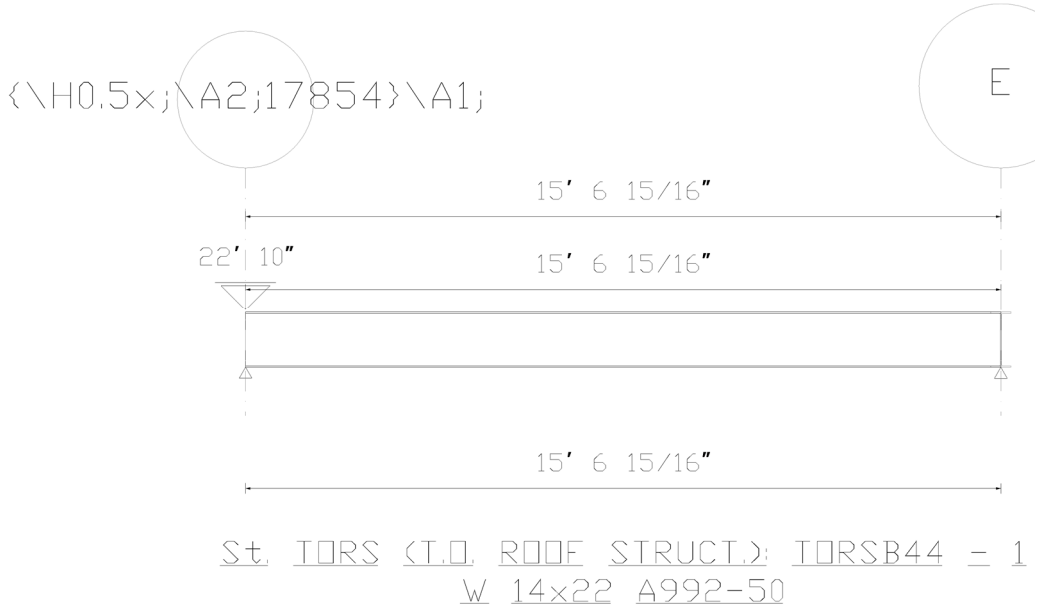
17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$ - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Flexural - out-of-plane principal: 0″ - 2′ 0″ - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 2′ 0″	Flexural - out-of-plane principal	2′ 0″	10.6	120.1	kip	0.088	✔ Pass

TORSB44



Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	234	-1.5	94.5	kip	0.016	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	234	-7.1	81.1	kip ft	0.088	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	324	-1.0	292.1	kip	0.003	✔ Pass
Axial Compression	231	0.8	45.4	kip	0.017	✔ Pass
Combined Forces	235	-	-	-	0.080	✔ Pass

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Revision:	Date:	Sheet No. 315
Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.003	-	in	-	-
Deflection Slab	1	0.000	0.779	in	0.001	✔ Pass
Deflection Dead	1	0.005	0.519	in	0.010	✔ Pass
Deflection Live	21	0.004	0.779	in	0.005	✔ Pass
Deflection Wind	307	-0.004	0.935	in	0.004	✔ Pass
Deflection Total	106	0.016	0.519	in	0.031	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_{1}$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Axial: Position 15' 6 15/16" - Critical

Axial Force, P	=0.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Position 15' 6 15/16" - Critical

Position of V_{ry}	=15' 6 15/16" ft, in	
Required major axis shear strength, V_{ry}	=-1.5 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.016**	

✔ Pass

Flexure Major

234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

LTB Flange Btm: 0" - 15' 6 15/16" - Critical

Dist of M_{rx1} along member	=15' 6 15/16" ft, in	
Required flexural strength, M_{rx1}	=-7.1 kip ft	
Design flexural strength	=81.1 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.088**	

✔ Pass

Axial Tension

324 (Final) LRFD$_{12.38}$-0.9D+W - Critical

Span 1 W 14x22 A992-50 - Critical

Yielding: Position 15' 6 15/16" - Critical

Distance of P_r along member	=15' 6 15/16" ft, in	
Required tensile strength, P_r	=-1.0 kip	
Design yield strength	=292.1 kip	AISC 360 D2
Ratio	**=0.003**	

✔ Pass

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Axial Compression

231 (Final) LRFD$_{10.9}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural - out-of-plane: 0" - 15' 6 15/16" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 15' 6 15/16"	Flexural - out-of-plane	15' 6 15/16"	0.8	45.4	kip	0.017	✔ Pass

Combined Forces

235 (Final) LRFD$_{10.13}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Flange Btm LTB 0" - 15' 6 15/16" - Critical

Axial Tension: 0" - 15' 6 15/16" - Critical

Mode	Ratio	Status
Combined buckling	0.080	✔ Pass

Deflection

106 (Final) LRFD$_{8.12}$-1.2D+1.6S+0.5W - Critical

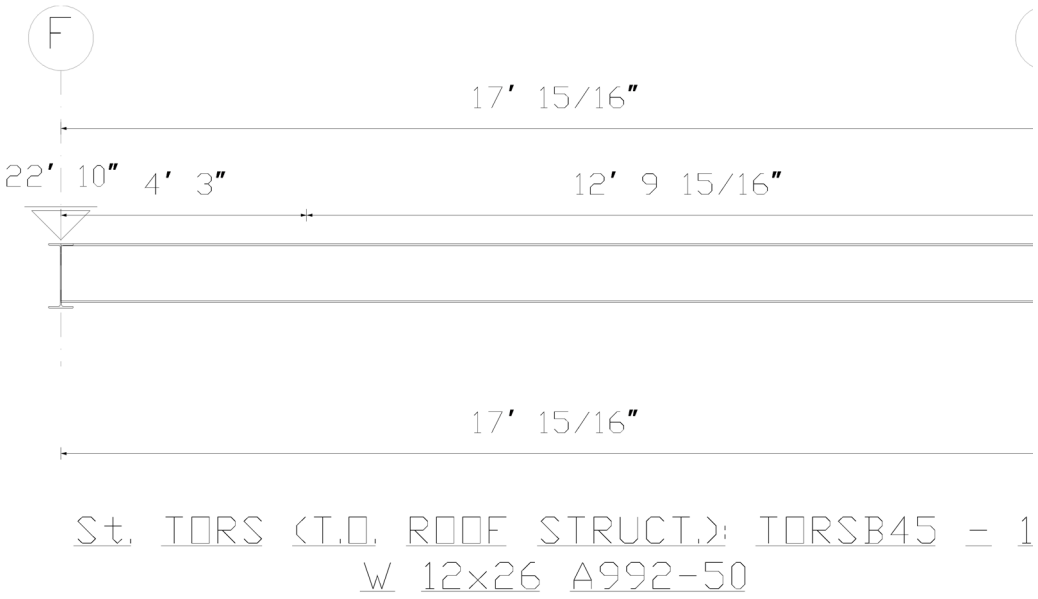
Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=6' 4 3/128" ft, in
Max. Total load deflection	=0.016 in
Span over limit	=0.519 in
Design limit	=0.519 in
Utilization Ratio	**=0.031**

✔ Pass

TORSB45



Static

Summary W 12x26

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	26	1.9	84.2	kip	0.022	✔ Pass
Flexure Major	26	6.9	132.5	kip ft	0.052	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.020	-	in	-	-
Deflection Slab	1	-0.002	0.854	in	0.003	✔ Pass
Deflection Live	21	0.004	0.854	in	0.004	✔ Pass
Deflection Total	26	0.030	0.569	in	0.053	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x26 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=2.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical

Span 1 W 12x26 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=1.9 kip	
Design shear strength	=84.2 kip	AISC 360 G2
Ratio	**=0.022**	

✔ Pass

Flexure Major

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical

Span 1 W 12x26 A992-50 - Critical

LTB Flange Top: 0" - 17' 15/16" - Critical

Dist of M_{rx1} along member	=4' 3" ft, in	
Required flexural strength, M_{rx1}	=6.9 kip ft	
Design flexural strength	=132.5 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.052**	

✔ Pass

Deflection

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical

Span 1 W 12x26 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=8' 2 47/64" ft, in
Max. Total load deflection	=0.030 in
Span over limit	=0.569 in

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Design limit =0.569 in
Utilization Ratio **=0.053**

✔ Pass

Forces Ignored

1 (Final) LRFD$_1$-1.4D
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -0.9 kip

2 (Final) LRFD$_{1.1}$-1.4D+NL$_{Dir1+}$
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -0.9 kip

3 (Final) LRFD$_{1.2}$-1.4D+NL$_{Dir1-}$
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -0.8 kip

4 (Final) LRFD$_{1.3}$-1.4D+NL$_{Dir2+}$
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip
Axial Force, P -0.7 kip

5 (Final) LRFD$_{1.4}$-1.4D+NL$_{Dir2-}$
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -1.0 kip

6 (Final) LRFD$_2$-1.2D+1.6L
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -0.9 kip

7 (Final) LRFD$_{2.1}$-1.2D+1.6L+NL$_{Dir1+}$
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -1.0 kip

8 (Final) LRFD$_{2.2}$-1.2D+1.6L+NL$_{Dir1-}$
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip
Axial Force, P -0.9 kip

9 (Final) LRFD$_{2.3}$-1.2D+1.6L+NL$_{Dir2+}$
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -0.8 kip

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10 (Final) LRFD$_{2.4}$-1.2D+1.6L+NL$_{Dir2-}$
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip
Axial Force, P -1.1 kip

11 (Final) LRFD$_{3}$-1.2D+1.6L+0.5Lr
Span 1 W 12x26 A992-50
Axial Force, P 2.6 kip
Axial Force, P -1.0 kip

12 (Final) LRFD$_{3.1}$-1.2D+1.6L+0.5Lr+NL$_{Dir1+}$
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -1.0 kip

13 (Final) LRFD$_{3.2}$-1.2D+1.6L+0.5Lr+NL$_{Dir1-}$
Span 1 W 12x26 A992-50
Axial Force, P 2.6 kip
Axial Force, P -1.0 kip

14 (Final) LRFD$_{3.3}$-1.2D+1.6L+0.5Lr+NL$_{Dir2+}$
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -0.8 kip

15 (Final) LRFD$_{3.4}$-1.2D+1.6L+0.5Lr+NL$_{Dir2-}$
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -1.1 kip

16 (Final) LRFD$_{4.1}$-1.2D+1.6L+0.5S
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -1.0 kip

17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -1.0 kip

18 (Final) LRFD$_{4.3}$-1.2D+1.6L+0.5S+NL$_{Dir1-}$
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -1.0 kip

19 (Final) LRFD$_{4.4}$-1.2D+1.6L+0.5S+NL$_{Dir2+}$
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip

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Axial Force, P -0.8 kip

20 (Final) LRFD$_{4.5}$-1.2D+1.6L+0.5S+NL$_{Dir2-}$
Span 1 W 12x26 A992-50
Axial Force, P 2.6 kip
Axial Force, P -1.2 kip

21 (Final) LRFD$_{5}$-1.2D+L+1.6Lr
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -0.9 kip

22 (Final) LRFD$_{5.1}$-1.2D+L+1.6Lr+NL$_{Dir1+}$
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip
Axial Force, P -1.0 kip

23 (Final) LRFD$_{5.2}$-1.2D+L+1.6Lr+NL$_{Dir1-}$
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -0.9 kip

24 (Final) LRFD$_{5.3}$-1.2D+L+1.6Lr+NL$_{Dir2+}$
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip
Axial Force, P -0.7 kip

25 (Final) LRFD$_{5.4}$-1.2D+L+1.6Lr+NL$_{Dir2-}$
Span 1 W 12x26 A992-50
Axial Force, P 2.6 kip
Axial Force, P -1.2 kip

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip
Axial Force, P -1.0 kip

27 (Final) LRFD$_{6.2}$-1.2D+L+1.6S+NL$_{Dir1+}$
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip
Axial Force, P -1.1 kip

28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip
Axial Force, P -1.0 kip

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$
Span 1 W 12x26 A992-50

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Axial Force, P 3.0 kip
Axial Force, P -0.8 kip

30 (Final) LRFD$_{6.5}$-1.2D+L+1.6S+NL$_{Dir2-}$
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip
Axial Force, P -1.3 kip

31 (Final) LRFD$_{7.1}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip
Axial Force, P -2.6 kip

32 (Final) LRFD$_{7.2}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip
Axial Force, P -2.7 kip

33 (Final) LRFD$_{7.3}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -1.3 kip

34 (Final) LRFD$_{7.4}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -3.1 kip

35 (Final) LRFD$_{7.5}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.7 kip
Axial Force, P -3.1 kip

36 (Final) LRFD$_{7.6}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -3.2 kip

37 (Final) LRFD$_{7.7}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip
Axial Force, P -1.7 kip

38 (Final) LRFD$_{7.8}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.7 kip
Axial Force, P -3.6 kip

39 (Final) LRFD$_{7.9}$-1.2D+1.6Lr+0.5W

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Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip

40 (Final) LRFD$_{7.10}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip

41 (Final) LRFD$_{7.11}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.7 kip

42 (Final) LRFD$_{7.12}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip
Axial Force, P -1.7 kip

43 (Final) LRFD$_{7.13}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip
Axial Force, P -0.3 kip

44 (Final) LRFD$_{7.14}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip
Axial Force, P -0.3 kip

45 (Final) LRFD$_{7.15}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip

46 (Final) LRFD$_{7.16}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -2.0 kip

47 (Final) LRFD$_{7.17}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

48 (Final) LRFD$_{7.18}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

49 (Final) LRFD$_{7.19}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

50 (Final) LRFD$_{7.20}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50

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Axial Force, P 3.0 kip
Axial Force, P -0.1 kip

51 (Final) LRFD$_{7.21}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip

52 (Final) LRFD$_{7.22}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip

53 (Final) LRFD$_{7.23}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip

54 (Final) LRFD$_{7.24}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -0.5 kip

55 (Final) LRFD$_{7.25}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip

56 (Final) LRFD$_{7.26}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip

57 (Final) LRFD$_{7.27}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip

58 (Final) LRFD$_{7.28}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -0.2 kip

59 (Final) LRFD$_{7.29}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

60 (Final) LRFD$_{7.30}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

61 (Final) LRFD$_{7.31}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip

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62 (Final) LRFD$_{7.32}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip
Axial Force, P -0.4 kip

63 (Final) LRFD$_{7.33}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip

64 (Final) LRFD$_{7.34}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip

65 (Final) LRFD$_{7.35}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip

66 (Final) LRFD$_{7.36}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip
Axial Force, P -1.1 kip

67 (Final) LRFD$_{7.37}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -0.3 kip

68 (Final) LRFD$_{7.38}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.0 kip
Axial Force, P -0.3 kip

69 (Final) LRFD$_{7.39}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip

70 (Final) LRFD$_{7.40}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -1.4 kip

71 (Final) LRFD$_{7.41}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.7 kip
Axial Force, P -0.9 kip

72 (Final) LRFD$_{7.42}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.7 kip

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Axial Force, P -0.9 kip

73 (Final) LRFD$_{7.43}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip

74 (Final) LRFD$_{7.44}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -2.4 kip

75 (Final) LRFD$_{7.45}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -1.3 kip

76 (Final) LRFD$_{7.46}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -1.3 kip

77 (Final) LRFD$_{7.47}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip

78 (Final) LRFD$_{7.48}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -2.7 kip

79 (Final) LRFD$_{7.49}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip
Axial Force, P -2.5 kip

80 (Final) LRFD$_{7.50}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip
Axial Force, P -2.5 kip

81 (Final) LRFD$_{7.51}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -1.0 kip

82 (Final) LRFD$_{7.52}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -3.1 kip

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83 (Final) LRFD$_{7.53}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -2.9 kip

84 (Final) LRFD$_{7.54}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -3.0 kip

85 (Final) LRFD$_{7.55}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -1.4 kip

86 (Final) LRFD$_{7.56}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip
Axial Force, P -3.5 kip

87 (Final) LRFD$_{7.57}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip
Axial Force, P -3.1 kip

88 (Final) LRFD$_{7.58}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip
Axial Force, P -3.1 kip

89 (Final) LRFD$_{7.59}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.6 kip
Axial Force, P -1.0 kip

90 (Final) LRFD$_{7.60}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip
Axial Force, P -4.0 kip

91 (Final) LRFD$_{7.61}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -3.5 kip

92 (Final) LRFD$_{7.62}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip

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Axial Force, P -3.5 kip

93 (Final) LRFD$_{7.63}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip
Axial Force, P -1.3 kip

94 (Final) LRFD$_{7.64}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -4.3 kip

95 (Final) LRFD$_{8.1}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip
Axial Force, P -2.7 kip

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip
Axial Force, P -2.8 kip

97 (Final) LRFD$_{8.3}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -1.4 kip

98 (Final) LRFD$_{8.4}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip
Axial Force, P -3.2 kip

99 (Final) LRFD$_{8.5}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip
Axial Force, P -3.2 kip

100 (Final) LRFD$_{8.6}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -3.3 kip

101 (Final) LRFD$_{8.7}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip
Axial Force, P -1.8 kip

102 (Final) LRFD$_{8.8}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50

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Axial Force, P 1.9 kip
Axial Force, P -3.7 kip

103 (Final) LRFD$_{8.9}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

104 (Final) LRFD$_{8.10}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

105 (Final) LRFD$_{8.11}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.8 kip

106 (Final) LRFD$_{8.12}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip
Axial Force, P -1.8 kip

107 (Final) LRFD$_{8.13}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip
Axial Force, P -0.4 kip

108 (Final) LRFD$_{8.14}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip
Axial Force, P -0.4 kip

109 (Final) LRFD$_{8.15}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

110 (Final) LRFD$_{8.16}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip
Axial Force, P -2.1 kip

111 (Final) LRFD$_{8.17}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.5 kip

113 (Final) LRFD$_{8.19}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50

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Axial Force, P 3.8 kip

114 (Final) LRFD$_{8.20}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip
Axial Force, P -0.2 kip

115 (Final) LRFD$_{8.21}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip

116 (Final) LRFD$_{8.22}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip

117 (Final) LRFD$_{8.23}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip

118 (Final) LRFD$_{8.24}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip
Axial Force, P -0.6 kip

119 (Final) LRFD$_{8.25}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip

120 (Final) LRFD$_{8.26}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip

121 (Final) LRFD$_{8.27}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip

122 (Final) LRFD$_{8.28}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.6 kip
Axial Force, P -0.3 kip

123 (Final) LRFD$_{8.29}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip

124 (Final) LRFD$_{8.30}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip

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125 (Final) LRFD$_{8.31}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip

126 (Final) LRFD$_{8.32}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip
Axial Force, P -0.5 kip

127 (Final) LRFD$_{8.33}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip

129 (Final) LRFD$_{8.35}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip

130 (Final) LRFD$_{8.36}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -1.2 kip

131 (Final) LRFD$_{8.37}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -0.4 kip

132 (Final) LRFD$_{8.38}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -0.4 kip

133 (Final) LRFD$_{8.39}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.7 kip

134 (Final) LRFD$_{8.40}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip
Axial Force, P -1.5 kip

135 (Final) LRFD$_{8.41}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip
Axial Force, P -1.0 kip

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136 (Final) $LRFD_{8.42}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip
Axial Force, P -1.0 kip

137 (Final) $LRFD_{8.43}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip

138 (Final) $LRFD_{8.44}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -2.5 kip

139 (Final) $LRFD_{8.45}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -1.4 kip

140 (Final) $LRFD_{8.46}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -1.4 kip

141 (Final) $LRFD_{8.47}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip

142 (Final) $LRFD_{8.48}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -2.8 kip

143 (Final) $LRFD_{8.49}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -2.6 kip

144 (Final) $LRFD_{8.50}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -2.6 kip

145 (Final) $LRFD_{8.51}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip
Axial Force, P -1.1 kip

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146 (Final) LRFD$_{8.52}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -3.2 kip

147 (Final) LRFD$_{8.53}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -3.0 kip

148 (Final) LRFD$_{8.54}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -3.1 kip

149 (Final) LRFD$_{8.55}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -1.5 kip

150 (Final) LRFD$_{8.56}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip
Axial Force, P -3.6 kip

151 (Final) LRFD$_{8.57}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -3.2 kip

152 (Final) LRFD$_{8.58}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -3.2 kip

153 (Final) LRFD$_{8.59}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -1.1 kip

154 (Final) LRFD$_{8.60}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -4.0 kip

155 (Final) LRFD$_{8.61}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip
Axial Force, P -3.6 kip

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156 (Final) LRFD$_{8.62}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip
Axial Force, P -3.6 kip

157 (Final) LRFD$_{8.63}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -1.3 kip

158 (Final) LRFD$_{8.64}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -4.4 kip

159 (Final) LRFD$_{9.1}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -4.5 kip

160 (Final) LRFD$_{9.2}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip
Axial Force, P -4.7 kip

161 (Final) LRFD$_{9.3}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -1.9 kip

162 (Final) LRFD$_{9.4}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip
Axial Force, P -5.6 kip

163 (Final) LRFD$_{9.5}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -5.5 kip

164 (Final) LRFD$_{9.6}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -5.7 kip

165 (Final) LRFD$_{9.7}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip

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Axial Force, P -2.6 kip

166 (Final) LRFD$_{9.8}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip
Axial Force, P -6.4 kip

167 (Final) LRFD$_{9.9}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 4.5 kip

168 (Final) LRFD$_{9.10}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 4.5 kip

169 (Final) LRFD$_{9.11}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 5.1 kip

170 (Final) LRFD$_{9.12}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip
Axial Force, P -2.7 kip

171 (Final) LRFD$_{9.13}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

172 (Final) LRFD$_{9.14}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

173 (Final) LRFD$_{9.15}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 4.6 kip

174 (Final) LRFD$_{9.16}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip
Axial Force, P -3.3 kip

175 (Final) LRFD$_{9.17}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

176 (Final) LRFD$_{9.18}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 4.4 kip

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177 (Final) LRFD$_{9.19}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 5.3 kip

178 (Final) LRFD$_{9.20}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.8 kip

179 (Final) LRFD$_{9.21}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip

180 (Final) LRFD$_{9.22}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.5 kip

181 (Final) LRFD$_{9.23}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 4.5 kip

182 (Final) LRFD$_{9.24}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip
Axial Force, P -0.2 kip

183 (Final) LRFD$_{9.25}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 5.1 kip

184 (Final) LRFD$_{9.26}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 5.1 kip

185 (Final) LRFD$_{9.27}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 7.0 kip

186 (Final) LRFD$_{9.28}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip

187 (Final) LRFD$_{9.29}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 4.4 kip

188 (Final) LRFD$_{9.30}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 4.4 kip

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189 (Final) LRFD$_{9.31}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 6.3 kip

190 (Final) LRFD$_{9.32}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip

191 (Final) LRFD$_{9.33}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip

192 (Final) LRFD$_{9.34}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.0 kip

193 (Final) LRFD$_{9.35}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

194 (Final) LRFD$_{9.36}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -1.4 kip

195 (Final) LRFD$_{9.37}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -0.4 kip

196 (Final) LRFD$_{9.38}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -0.2 kip

197 (Final) LRFD$_{9.39}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip

198 (Final) LRFD$_{9.40}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -2.1 kip

199 (Final) LRFD$_{9.41}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -1.1 kip

200 (Final) LRFD$_{9.42}$-1.2D+L+0.5Lr+W

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Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -1.1 kip

201 (Final) LRFD$_{9.43}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip

202 (Final) LRFD$_{9.44}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -4.0 kip

203 (Final) LRFD$_{9.45}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -1.9 kip

204 (Final) LRFD$_{9.46}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -1.9 kip

205 (Final) LRFD$_{9.47}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip

206 (Final) LRFD$_{9.48}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.1 kip
Axial Force, P -4.6 kip

207 (Final) LRFD$_{9.49}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip
Axial Force, P -4.2 kip

208 (Final) LRFD$_{9.50}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip
Axial Force, P -4.3 kip

209 (Final) LRFD$_{9.51}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -1.3 kip

210 (Final) LRFD$_{9.52}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50

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Axial Force, P 1.0 kip
Axial Force, P -5.5 kip

211 (Final) LRFD$_{9.53}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -5.1 kip

212 (Final) LRFD$_{9.54}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -5.3 kip

213 (Final) LRFD$_{9.55}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -2.0 kip

214 (Final) LRFD$_{9.56}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -6.3 kip

215 (Final) LRFD$_{9.57}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip
Axial Force, P -5.4 kip

216 (Final) LRFD$_{9.58}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip
Axial Force, P -5.4 kip

217 (Final) LRFD$_{9.59}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip
Axial Force, P -1.3 kip

218 (Final) LRFD$_{9.60}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip
Axial Force, P -7.2 kip

219 (Final) LRFD$_{9.61}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -6.2 kip

220 (Final) LRFD$_{9.62}$-1.2D+L+0.5Lr+W

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Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -6.2 kip

221 (Final) $LRFD_{9.63}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -1.8 kip

222 (Final) $LRFD_{9.64}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.0 kip
Axial Force, P -7.9 kip

223 (Final) $LRFD_{10.1}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip
Axial Force, P -4.6 kip

224 (Final) $LRFD_{10.2}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip
Axial Force, P -4.7 kip

225 (Final) $LRFD_{10.3}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip
Axial Force, P -2.0 kip

226 (Final) $LRFD_{10.4}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip
Axial Force, P -5.6 kip

227 (Final) $LRFD_{10.5}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -5.5 kip

228 (Final) $LRFD_{10.6}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -5.7 kip

229 (Final) $LRFD_{10.7}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip
Axial Force, P -2.7 kip

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230 (Final) LRFD$_{10.8}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip
Axial Force, P -6.4 kip

231 (Final) LRFD$_{10.9}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 4.6 kip

232 (Final) LRFD$_{10.10}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 4.6 kip

233 (Final) LRFD$_{10.11}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 5.2 kip

234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.7 kip
Axial Force, P -2.7 kip

235 (Final) LRFD$_{10.13}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 4.0 kip

236 (Final) LRFD$_{10.14}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 4.0 kip

237 (Final) LRFD$_{10.15}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 4.7 kip

238 (Final) LRFD$_{10.16}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip
Axial Force, P -3.3 kip

239 (Final) LRFD$_{10.17}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 4.4 kip

240 (Final) LRFD$_{10.18}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 4.5 kip

241 (Final) LRFD$_{10.19}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50

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Axial Force, P 5.3 kip

242 (Final) $LRFD_{10.20}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.8 kip

243 (Final) $LRFD_{10.21}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip

244 (Final) $LRFD_{10.22}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.5 kip

245 (Final) $LRFD_{10.23}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 4.4 kip

246 (Final) $LRFD_{10.24}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip
Axial Force, P -0.3 kip

247 (Final) $LRFD_{10.25}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 5.1 kip

248 (Final) $LRFD_{10.26}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 5.1 kip

249 (Final) $LRFD_{10.27}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 6.9 kip

250 (Final) $LRFD_{10.28}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip

251 (Final) $LRFD_{10.29}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

252 (Final) $LRFD_{10.30}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

253 (Final) $LRFD_{10.31}$-1.2D+L+0.5S+W

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Span 1 W 12x26 A992-50
Axial Force, P 6.2 kip

254 (Final) $LRFD_{10.32}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip

255 (Final) $LRFD_{10.33}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip

256 (Final) $LRFD_{10.34}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.0 kip

257 (Final) $LRFD_{10.35}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

258 (Final) $LRFD_{10.36}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -1.4 kip

259 (Final) $LRFD_{10.37}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.1 kip
Axial Force, P -0.4 kip

260 (Final) $LRFD_{10.38}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -0.2 kip

261 (Final) $LRFD_{10.39}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip

262 (Final) $LRFD_{10.40}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.1 kip
Axial Force, P -2.1 kip

263 (Final) $LRFD_{10.41}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip
Axial Force, P -1.2 kip

264 (Final) $LRFD_{10.42}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50

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Axial Force, P 1.3 kip
Axial Force, P -1.2 kip

265 (Final) LRFD$_{10.43}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip

266 (Final) LRFD$_{10.44}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -4.1 kip

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -2.0 kip

268 (Final) LRFD$_{10.46}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -2.0 kip

269 (Final) LRFD$_{10.47}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip

270 (Final) LRFD$_{10.48}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -4.7 kip

271 (Final) LRFD$_{10.49}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -4.2 kip

272 (Final) LRFD$_{10.50}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -4.4 kip

273 (Final) LRFD$_{10.51}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -1.3 kip

274 (Final) LRFD$_{10.52}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip

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Axial Force, P -5.5 kip

275 (Final) LRFD$_{10.53}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -5.2 kip

276 (Final) LRFD$_{10.54}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -5.3 kip

277 (Final) LRFD$_{10.55}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip
Axial Force, P -2.0 kip

278 (Final) LRFD$_{10.56}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -6.4 kip

279 (Final) LRFD$_{10.57}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip
Axial Force, P -5.5 kip

280 (Final) LRFD$_{10.58}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip
Axial Force, P -5.5 kip

281 (Final) LRFD$_{10.59}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip
Axial Force, P -1.3 kip

282 (Final) LRFD$_{10.60}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -7.2 kip

283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -6.2 kip

284 (Final) LRFD$_{10.62}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50

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Axial Force, P 1.8 kip
Axial Force, P -6.2 kip

285 (Final) LRFD$_{10.63}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -1.8 kip

286 (Final) LRFD$_{10.64}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -7.9 kip

287 (Final) LRFD$_{12.1}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -4.2 kip

288 (Final) LRFD$_{12.2}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip
Axial Force, P -4.4 kip

289 (Final) LRFD$_{12.3}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.7 kip
Axial Force, P -1.6 kip

290 (Final) LRFD$_{12.4}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -5.2 kip

291 (Final) LRFD$_{12.5}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.1 kip
Axial Force, P -5.2 kip

292 (Final) LRFD$_{12.6}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.3 kip
Axial Force, P -5.3 kip

293 (Final) LRFD$_{12.7}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -2.3 kip

294 (Final) LRFD$_{12.8}$-0.9D+W

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Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -6.1 kip

295 (Final) $LRFD_{12.9}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.5 kip

296 (Final) $LRFD_{12.10}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.5 kip

297 (Final) $LRFD_{12.11}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 4.1 kip

298 (Final) $LRFD_{12.12}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.6 kip
Axial Force, P -2.4 kip

299 (Final) $LRFD_{12.13}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip

300 (Final) $LRFD_{12.14}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip

301 (Final) $LRFD_{12.15}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

302 (Final) $LRFD_{12.16}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -2.9 kip

303 (Final) $LRFD_{12.17}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 4.5 kip

304 (Final) $LRFD_{12.18}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 4.4 kip

305 (Final) $LRFD_{12.19}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 5.7 kip

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306 (Final) $LRFD_{12.20}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip

307 (Final) $LRFD_{12.21}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.5 kip

308 (Final) $LRFD_{12.22}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip

309 (Final) $LRFD_{12.23}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 4.8 kip

310 (Final) $LRFD_{12.24}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip

311 (Final) $LRFD_{12.25}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 5.5 kip

312 (Final) $LRFD_{12.26}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 5.5 kip

313 (Final) $LRFD_{12.27}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 7.3 kip

314 (Final) $LRFD_{12.28}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.7 kip

315 (Final) $LRFD_{12.29}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 4.7 kip

316 (Final) $LRFD_{12.30}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 4.7 kip

317 (Final) $LRFD_{12.31}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 6.6 kip

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318 (Final) LRFD$_{12.32}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip

319 (Final) LRFD$_{12.33}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip
Axial Force, P -0.5 kip

320 (Final) LRFD$_{12.34}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip
Axial Force, P -0.3 kip

321 (Final) LRFD$_{12.35}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip

322 (Final) LRFD$_{12.36}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -1.1 kip

323 (Final) LRFD$_{12.37}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.5 kip
Axial Force, P -1.5 kip

324 (Final) LRFD$_{12.38}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -1.3 kip

325 (Final) LRFD$_{12.39}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -0.1 kip

326 (Final) LRFD$_{12.40}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -1.8 kip

327 (Final) LRFD$_{12.41}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -0.8 kip

328 (Final) LRFD$_{12.42}$-0.9D+W
Span 1 W 12x26 A992-50

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Axial Force, P 0.2 kip
Axial Force, P -0.8 kip

329 (Final) $LRFD_{12.43}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip

330 (Final) $LRFD_{12.44}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -3.7 kip

331 (Final) $LRFD_{12.45}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -1.6 kip

332 (Final) $LRFD_{12.46}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -1.6 kip

333 (Final) $LRFD_{12.47}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip

334 (Final) $LRFD_{12.48}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -4.3 kip

335 (Final) $LRFD_{12.49}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.5 kip
Axial Force, P -3.8 kip

336 (Final) $LRFD_{12.50}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.5 kip
Axial Force, P -4.0 kip

337 (Final) $LRFD_{12.51}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -0.9 kip

338 (Final) $LRFD_{12.52}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -5.1 kip

339 (Final) $LRFD_{12.53}$-0.9D+W
Span 1 W 12x26 A992-50

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Axial Force, P -4.8 kip

340 (Final) $LRFD_{12.54}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -5.0 kip

341 (Final) $LRFD_{12.55}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -1.6 kip

342 (Final) $LRFD_{12.56}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -6.0 kip

343 (Final) $LRFD_{12.57}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -5.1 kip

344 (Final) $LRFD_{12.58}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -5.1 kip

345 (Final) $LRFD_{12.59}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -1.0 kip

346 (Final) $LRFD_{12.60}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.5 kip
Axial Force, P -6.8 kip

347 (Final) $LRFD_{12.61}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -5.9 kip

348 (Final) $LRFD_{12.62}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -5.9 kip

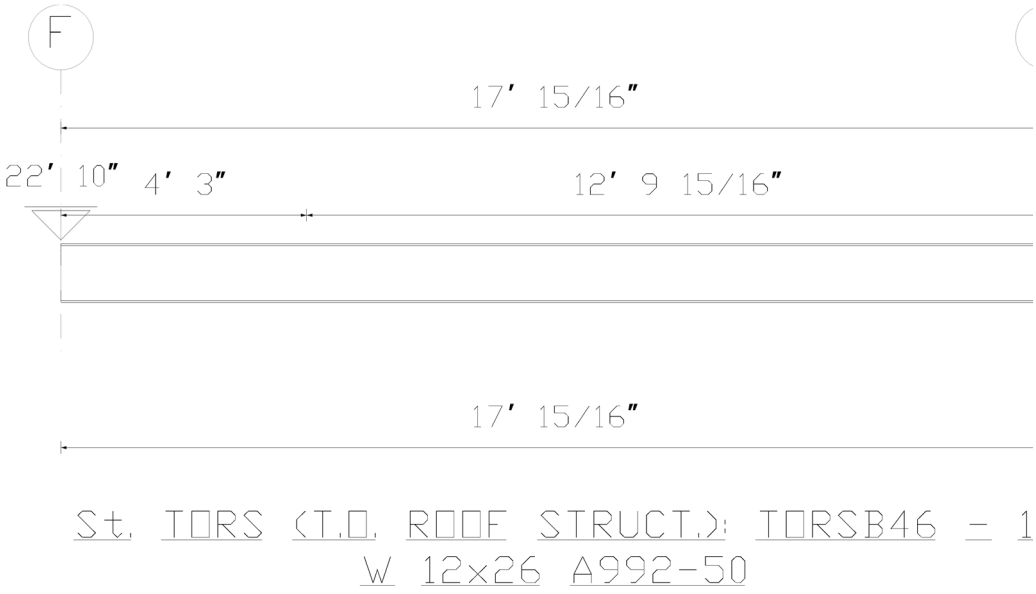
349 (Final) $LRFD_{12.63}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -1.4 kip

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350 (Final) $LRFD_{12.64}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -7.5 kip

TORSB46



Static
Summary W 12x26

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	26	2.1	84.2	kip	0.024	✔ Pass
Flexure Major	26	7.6	139.5	kip ft	0.055	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.019	-	in	-	-
Deflection Slab	1	0.003	0.854	in	0.004	✔ Pass
Deflection Live	6	0.003	0.854	in	0.004	✔ Pass
Deflection Total	16	0.027	0.569	in	0.048	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static
Classification
1 (Final) $LRFD_1$-1.4D - Critical
Span 1 W 12x26 A992-50 - Critical
Axial: Position 0" - Critical

Axial Force, P	=0.3 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

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Shear Major
26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical
Span 1 W 12x26 A992-50 - Critical
Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=2.1 kip	
Design shear strength	=84.2 kip	AISC 360 G2
Ratio	**=0.024**	

✔ Pass

Flexure Major
26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical
Span 1 W 12x26 A992-50 - Critical
Yielding: 4' 3" - Critical

Dist of M_{rx} along member	=4' 3" ft, in	
Required flexural strength, M_{rx1}	=7.6 kip ft	
Design flexural strength	=139.5 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.055**	

✔ Pass

Deflection
16 (Final) LRFD$_{4.1}$-1.2D+1.6L+0.5S - Critical
Span 1 W 12x26 A992-50 - Critical
Deflection Total - Critical

Position Total load deflection	=8' 1 77/128" ft, in
Max. Total load deflection	=0.027 in
Span over limit	=0.569 in
Design limit	=0.569 in
Utilization Ratio	**=0.048**

✔ Pass

Forces Ignored
1 (Final) LRFD$_{1}$-1.4D
Span 1 W 12x26 A992-50
Axial Force, P 0.3 kip
Axial Force, P -2.6 kip

2 (Final) LRFD$_{1.1}$-1.4D+NL$_{Dir1+}$
Span 1 W 12x26 A992-50
Axial Force, P 0.3 kip
Axial Force, P -2.6 kip

3 (Final) LRFD$_{1.2}$-1.4D+NL$_{Dir1-}$
Span 1 W 12x26 A992-50
Axial Force, P 0.3 kip
Axial Force, P -2.7 kip

4 (Final) LRFD$_{1.3}$-1.4D+NL$_{Dir2+}$
Span 1 W 12x26 A992-50

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Axial Force, P 0.4 kip
Axial Force, P -2.4 kip

5 (Final) $LRFD_{1.4}$-1.4D+NL_{Dir2-}
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -2.9 kip

6 (Final) $LRFD_{2}$-1.2D+1.6L
Span 1 W 12x26 A992-50
Axial Force, P -2.4 kip

7 (Final) $LRFD_{2.1}$-1.2D+1.6L+NL_{Dir1+}
Span 1 W 12x26 A992-50
Axial Force, P -2.3 kip

8 (Final) $LRFD_{2.2}$-1.2D+1.6L+NL_{Dir1-}
Span 1 W 12x26 A992-50
Axial Force, P -2.4 kip

9 (Final) $LRFD_{2.3}$-1.2D+1.6L+NL_{Dir2+}
Span 1 W 12x26 A992-50
Axial Force, P -2.2 kip

10 (Final) $LRFD_{2.4}$-1.2D+1.6L+NL_{Dir2-}
Span 1 W 12x26 A992-50
Axial Force, P -2.5 kip

11 (Final) $LRFD_{3}$-1.2D+1.6L+0.5Lr
Span 1 W 12x26 A992-50
Axial Force, P -2.6 kip

12 (Final) $LRFD_{3.1}$-1.2D+1.6L+0.5Lr+NL_{Dir1+}
Span 1 W 12x26 A992-50
Axial Force, P -2.6 kip

13 (Final) $LRFD_{3.2}$-1.2D+1.6L+0.5Lr+NL_{Dir1-}
Span 1 W 12x26 A992-50
Axial Force, P -2.7 kip

14 (Final) $LRFD_{3.3}$-1.2D+1.6L+0.5Lr+NL_{Dir2+}
Span 1 W 12x26 A992-50
Axial Force, P -2.4 kip

15 (Final) $LRFD_{3.4}$-1.2D+1.6L+0.5Lr+NL_{Dir2-}
Span 1 W 12x26 A992-50
Axial Force, P -2.8 kip

16 (Final) $LRFD_{4.1}$-1.2D+1.6L+0.5S

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Span 1 W 12x26 A992-50
Axial Force, P -2.8 kip

17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$
Span 1 W 12x26 A992-50
Axial Force, P -2.7 kip

18 (Final) LRFD$_{4.3}$-1.2D+1.6L+0.5S+NL$_{Dir1-}$
Span 1 W 12x26 A992-50
Axial Force, P -2.9 kip

19 (Final) LRFD$_{4.4}$-1.2D+1.6L+0.5S+NL$_{Dir2+}$
Span 1 W 12x26 A992-50
Axial Force, P -2.6 kip

20 (Final) LRFD$_{4.5}$-1.2D+1.6L+0.5S+NL$_{Dir2-}$
Span 1 W 12x26 A992-50
Axial Force, P -3.0 kip

21 (Final) LRFD$_{5}$-1.2D+L+1.6Lr
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -3.2 kip

22 (Final) LRFD$_{5.1}$-1.2D+L+1.6Lr+NL$_{Dir1+}$
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -3.1 kip

23 (Final) LRFD$_{5.2}$-1.2D+L+1.6Lr+NL$_{Dir1-}$
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -3.2 kip

24 (Final) LRFD$_{5.3}$-1.2D+L+1.6Lr+NL$_{Dir2+}$
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -2.9 kip

25 (Final) LRFD$_{5.4}$-1.2D+L+1.6Lr+NL$_{Dir2-}$
Span 1 W 12x26 A992-50
Axial Force, P 0.8 kip
Axial Force, P -3.4 kip

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -3.6 kip

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27 (Final) LRFD$_{6.2}$-1.2D+L+1.6S+NL$_{Dir1+}$
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip
Axial Force, P -3.6 kip

28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -3.7 kip

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -3.3 kip

30 (Final) LRFD$_{6.5}$-1.2D+L+1.6S+NL$_{Dir2-}$
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -4.0 kip

31 (Final) LRFD$_{7.1}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip

32 (Final) LRFD$_{7.2}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -0.3 kip

33 (Final) LRFD$_{7.3}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip
Axial Force, P -1.8 kip

34 (Final) LRFD$_{7.4}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -0.2 kip

35 (Final) LRFD$_{7.5}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -0.4 kip

36 (Final) LRFD$_{7.6}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -0.6 kip

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37 (Final) LRFD$_{7.7}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip
Axial Force, P -2.1 kip

38 (Final) LRFD$_{7.8}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip
Axial Force, P -0.5 kip

39 (Final) LRFD$_{7.9}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

40 (Final) LRFD$_{7.10}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

41 (Final) LRFD$_{7.11}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip
Axial Force, P -0.7 kip

42 (Final) LRFD$_{7.12}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.8 kip

43 (Final) LRFD$_{7.13}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

44 (Final) LRFD$_{7.14}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

45 (Final) LRFD$_{7.15}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip
Axial Force, P -1.0 kip

46 (Final) LRFD$_{7.16}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

47 (Final) LRFD$_{7.17}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

48 (Final) LRFD$_{7.18}$-1.2D+1.6Lr+0.5W

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Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

49 (Final) LRFD$_{7.19}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip
Axial Force, P -1.7 kip

50 (Final) LRFD$_{7.20}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.5 kip

51 (Final) LRFD$_{7.21}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.6 kip

52 (Final) LRFD$_{7.22}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.9 kip

53 (Final) LRFD$_{7.23}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip
Axial Force, P -2.0 kip

54 (Final) LRFD$_{7.24}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip

55 (Final) LRFD$_{7.25}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -3.2 kip

56 (Final) LRFD$_{7.26}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -3.2 kip

57 (Final) LRFD$_{7.27}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip
Axial Force, P -4.6 kip

58 (Final) LRFD$_{7.28}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip

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Axial Force, P -1.7 kip

59 (Final) LRFD$_{7.29}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -3.6 kip

60 (Final) LRFD$_{7.30}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -3.6 kip

61 (Final) LRFD$_{7.31}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -4.8 kip

62 (Final) LRFD$_{7.32}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -2.0 kip

63 (Final) LRFD$_{7.33}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.3 kip
Axial Force, P -6.9 kip

64 (Final) LRFD$_{7.34}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -7.1 kip

65 (Final) LRFD$_{7.35}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.8 kip
Axial Force, P -6.9 kip

66 (Final) LRFD$_{7.36}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -5.2 kip

67 (Final) LRFD$_{7.37}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P -7.2 kip

68 (Final) LRFD$_{7.38}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P -7.4 kip

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69 (Final) LRFD$_{7.39}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.5 kip
Axial Force, P -7.2 kip

70 (Final) LRFD$_{7.40}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.8 kip
Axial Force, P -5.6 kip

71 (Final) LRFD$_{7.41}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -7.4 kip

72 (Final) LRFD$_{7.42}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -7.4 kip

73 (Final) LRFD$_{7.43}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -7.7 kip

74 (Final) LRFD$_{7.44}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -4.9 kip

75 (Final) LRFD$_{7.45}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -7.7 kip

76 (Final) LRFD$_{7.46}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -7.7 kip

77 (Final) LRFD$_{7.47}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.5 kip
Axial Force, P -7.9 kip

78 (Final) LRFD$_{7.48}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip

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Axial Force, P -5.2 kip

79 (Final) LRFD$_{7.49}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -5.1 kip

80 (Final) LRFD$_{7.50}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -5.3 kip

81 (Final) LRFD$_{7.51}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -5.7 kip

82 (Final) LRFD$_{7.52}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -3.8 kip

83 (Final) LRFD$_{7.53}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.3 kip
Axial Force, P -5.4 kip

84 (Final) LRFD$_{7.54}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.5 kip
Axial Force, P -5.6 kip

85 (Final) LRFD$_{7.55}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.8 kip
Axial Force, P -6.0 kip

86 (Final) LRFD$_{7.56}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -4.1 kip

87 (Final) LRFD$_{7.57}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -2.3 kip

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88 (Final) LRFD$_{7.58}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -2.3 kip

89 (Final) LRFD$_{7.59}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -3.8 kip

90 (Final) LRFD$_{7.60}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip
Axial Force, P -1.1 kip

91 (Final) LRFD$_{7.61}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -2.6 kip

92 (Final) LRFD$_{7.62}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -2.6 kip

93 (Final) LRFD$_{7.63}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip
Axial Force, P -4.0 kip

94 (Final) LRFD$_{7.64}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -1.3 kip

95 (Final) LRFD$_{8.1}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip
Axial Force, P -0.6 kip

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip
Axial Force, P -0.8 kip

97 (Final) LRFD$_{8.3}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip
Axial Force, P -2.3 kip

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98 (Final) LRFD$_{8.4}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip
Axial Force, P -0.7 kip

99 (Final) LRFD$_{8.5}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.5 kip
Axial Force, P -0.9 kip

100 (Final) LRFD$_{8.6}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.7 kip
Axial Force, P -1.1 kip

101 (Final) LRFD$_{8.7}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip
Axial Force, P -2.6 kip

102 (Final) LRFD$_{8.8}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip
Axial Force, P -0.9 kip

103 (Final) LRFD$_{8.9}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.8 kip

104 (Final) LRFD$_{8.10}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.8 kip

105 (Final) LRFD$_{8.11}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.2 kip
Axial Force, P -1.2 kip

106 (Final) LRFD$_{8.12}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.7 kip

107 (Final) LRFD$_{8.13}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.5 kip

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108 (Final) LRFD$_{8.14}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.5 kip

109 (Final) LRFD$_{8.15}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.0 kip
Axial Force, P -1.5 kip

110 (Final) LRFD$_{8.16}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.5 kip

111 (Final) LRFD$_{8.17}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.2 kip

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.5 kip
Axial Force, P -0.3 kip

113 (Final) LRFD$_{8.19}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.1 kip
Axial Force, P -2.2 kip

114 (Final) LRFD$_{8.20}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.4 kip

115 (Final) LRFD$_{8.21}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.5 kip
Axial Force, P -0.4 kip

116 (Final) LRFD$_{8.22}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.8 kip
Axial Force, P -0.6 kip

117 (Final) LRFD$_{8.23}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.7 kip
Axial Force, P -2.5 kip

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118 (Final) LRFD$_{8.24}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 4.1 kip
Axial Force, P -0.3 kip

119 (Final) LRFD$_{8.25}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip
Axial Force, P -3.7 kip

120 (Final) LRFD$_{8.26}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip
Axial Force, P -3.7 kip

121 (Final) LRFD$_{8.27}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip
Axial Force, P -5.1 kip

122 (Final) LRFD$_{8.28}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.7 kip
Axial Force, P -2.2 kip

123 (Final) LRFD$_{8.29}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip
Axial Force, P -4.1 kip

124 (Final) LRFD$_{8.30}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip
Axial Force, P -4.1 kip

125 (Final) LRFD$_{8.31}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip
Axial Force, P -5.3 kip

126 (Final) LRFD$_{8.32}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip
Axial Force, P -2.5 kip

127 (Final) LRFD$_{8.33}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip

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Axial Force, P -7.4 kip

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip
Axial Force, P -7.6 kip

129 (Final) LRFD$_{8.35}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.7 kip
Axial Force, P -7.4 kip

130 (Final) LRFD$_{8.36}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -5.7 kip

131 (Final) LRFD$_{8.37}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -7.7 kip

132 (Final) LRFD$_{8.38}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -7.9 kip

133 (Final) LRFD$_{8.39}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -7.7 kip

134 (Final) LRFD$_{8.40}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.7 kip
Axial Force, P -6.1 kip

135 (Final) LRFD$_{8.41}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -7.9 kip

136 (Final) LRFD$_{8.42}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -7.9 kip

137 (Final) LRFD$_{8.43}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50

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Axial Force, P 1.6 kip
Axial Force, P -8.1 kip

138 (Final) LRFD$_{8.44}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -5.4 kip

139 (Final) LRFD$_{8.45}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip
Axial Force, P -8.2 kip

140 (Final) LRFD$_{8.46}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip
Axial Force, P -8.2 kip

141 (Final) LRFD$_{8.47}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -8.4 kip

142 (Final) LRFD$_{8.48}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -5.7 kip

143 (Final) LRFD$_{8.49}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip
Axial Force, P -5.6 kip

144 (Final) LRFD$_{8.50}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -5.8 kip

145 (Final) LRFD$_{8.51}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -6.2 kip

146 (Final) LRFD$_{8.52}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip
Axial Force, P -4.3 kip

147 (Final) LRFD$_{8.53}$-1.2D+1.6S+0.5W

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Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.2 kip
Axial Force, P -5.9 kip

148 (Final) LRFD$_{8.54}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.4 kip
Axial Force, P -6.1 kip

149 (Final) LRFD$_{8.55}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.7 kip
Axial Force, P -6.5 kip

150 (Final) LRFD$_{8.56}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.0 kip
Axial Force, P -4.6 kip

151 (Final) LRFD$_{8.57}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip
Axial Force, P -2.8 kip

152 (Final) LRFD$_{8.58}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip
Axial Force, P -2.8 kip

153 (Final) LRFD$_{8.59}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -4.3 kip

154 (Final) LRFD$_{8.60}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip
Axial Force, P -1.6 kip

155 (Final) LRFD$_{8.61}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -3.1 kip

156 (Final) LRFD$_{8.62}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50

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Axial Force, P 2.7 kip
Axial Force, P -3.1 kip

157 (Final) LRFD$_{8.63}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip
Axial Force, P -4.5 kip

158 (Final) LRFD$_{8.64}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip
Axial Force, P -1.8 kip

159 (Final) LRFD$_{9.1}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip

160 (Final) LRFD$_{9.2}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip

161 (Final) LRFD$_{9.3}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip

162 (Final) LRFD$_{9.4}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

163 (Final) LRFD$_{9.5}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.8 kip
Axial Force, P -1.1 kip

164 (Final) LRFD$_{9.6}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.5 kip
Axial Force, P -0.6 kip

165 (Final) LRFD$_{9.7}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -0.7 kip

166 (Final) LRFD$_{9.8}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft

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Axial Force, P 2.7 kip

167 (Final) LRFD$_{9.9}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 7.3 kip

168 (Final) LRFD$_{9.10}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 7.3 kip

169 (Final) LRFD$_{9.11}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip

170 (Final) LRFD$_{9.12}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 7.7 kip

171 (Final) LRFD$_{9.13}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 6.7 kip

172 (Final) LRFD$_{9.14}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 6.7 kip

173 (Final) LRFD$_{9.15}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip

174 (Final) LRFD$_{9.16}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 7.3 kip

175 (Final) LRFD$_{9.17}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 4.4 kip

176 (Final) LRFD$_{9.18}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 4.0 kip

177 (Final) LRFD$_{9.19}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip

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178 (Final) LRFD$_{9.20}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 4.5 kip

179 (Final) LRFD$_{9.21}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.8 kip

180 (Final) LRFD$_{9.22}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 3.4 kip

181 (Final) LRFD$_{9.23}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.4 kip
Axial Force, P -0.4 kip

182 (Final) LRFD$_{9.24}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.9 kip

183 (Final) LRFD$_{9.25}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -2.9 kip

184 (Final) LRFD$_{9.26}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -2.9 kip

185 (Final) LRFD$_{9.27}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -5.7 kip

186 (Final) LRFD$_{9.28}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip

187 (Final) LRFD$_{9.29}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -3.5 kip

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188 (Final) LRFD$_{9.30}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -3.5 kip

189 (Final) LRFD$_{9.31}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -6.1 kip

190 (Final) LRFD$_{9.32}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -0.4 kip

191 (Final) LRFD$_{9.33}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P -10.2 kip

192 (Final) LRFD$_{9.34}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P -10.6 kip

193 (Final) LRFD$_{9.35}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -10.3 kip

194 (Final) LRFD$_{9.36}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -6.8 kip

195 (Final) LRFD$_{9.37}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -10.8 kip

196 (Final) LRFD$_{9.38}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -11.2 kip

197 (Final) LRFD$_{9.39}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -10.9 kip

198 (Final) LRFD$_{9.40}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -7.6 kip

199 (Final) LRFD$_{9.41}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50

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Axial Force, P -11.2 kip

200 (Final) LRFD$_{9.42}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -11.2 kip

201 (Final) LRFD$_{9.43}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -11.7 kip

202 (Final) LRFD$_{9.44}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -6.2 kip

203 (Final) LRFD$_{9.45}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -11.9 kip

204 (Final) LRFD$_{9.46}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -11.9 kip

205 (Final) LRFD$_{9.47}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -12.1 kip

206 (Final) LRFD$_{9.48}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -6.8 kip

207 (Final) LRFD$_{9.49}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -6.7 kip

208 (Final) LRFD$_{9.50}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -7.1 kip

209 (Final) LRFD$_{9.51}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -7.8 kip

210 (Final) LRFD$_{9.52}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -3.9 kip

211 (Final) LRFD$_{9.53}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50

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Moment, M_y -0.1 kip ft
Axial Force, P -7.3 kip

212 (Final) LRFD$_{9.54}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -7.7 kip

213 (Final) LRFD$_{9.55}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -8.4 kip

214 (Final) LRFD$_{9.56}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -4.6 kip

215 (Final) LRFD$_{9.57}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -1.0 kip

216 (Final) LRFD$_{9.58}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -1.0 kip

217 (Final) LRFD$_{9.59}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -3.9 kip

218 (Final) LRFD$_{9.60}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip

219 (Final) LRFD$_{9.61}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -1.6 kip

220 (Final) LRFD$_{9.62}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -1.6 kip

221 (Final) LRFD$_{9.63}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -4.5 kip

222 (Final) LRFD$_{9.64}$-1.2D+L+0.5Lr+W

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Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -0.3 kip

223 (Final) LRFD$_{10.1}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

224 (Final) LRFD$_{10.2}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip

225 (Final) LRFD$_{10.3}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -0.1 kip

226 (Final) LRFD$_{10.4}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip

227 (Final) LRFD$_{10.5}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.7 kip
Axial Force, P -0.8 kip

228 (Final) LRFD$_{10.6}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.3 kip
Axial Force, P -0.3 kip

229 (Final) LRFD$_{10.7}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -0.8 kip

230 (Final) LRFD$_{10.8}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.5 kip

231 (Final) LRFD$_{10.9}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 7.2 kip

232 (Final) LRFD$_{10.10}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50

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Axial Force, P 7.2 kip

233 (Final) $LRFD_{10.11}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.6 kip

234 (Final) $LRFD_{10.12}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 7.6 kip

235 (Final) $LRFD_{10.13}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 6.5 kip

236 (Final) $LRFD_{10.14}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 6.5 kip

237 (Final) $LRFD_{10.15}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip

238 (Final) $LRFD_{10.16}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 7.1 kip

239 (Final) $LRFD_{10.17}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 4.2 kip

240 (Final) $LRFD_{10.18}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.8 kip

241 (Final) $LRFD_{10.19}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip

242 (Final) $LRFD_{10.20}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 4.4 kip

243 (Final) $LRFD_{10.21}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft

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Axial Force, P 3.7 kip

244 (Final) LRFD$_{10.22}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 3.2 kip

245 (Final) LRFD$_{10.23}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.7 kip
Axial Force, P -0.5 kip

246 (Final) LRFD$_{10.24}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.7 kip

247 (Final) LRFD$_{10.25}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -3.0 kip

248 (Final) LRFD$_{10.26}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -3.0 kip

249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.5 kip
Axial Force, P -5.8 kip

250 (Final) LRFD$_{10.28}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip

251 (Final) LRFD$_{10.29}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.3 kip
Axial Force, P -3.7 kip

252 (Final) LRFD$_{10.30}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.3 kip
Axial Force, P -3.7 kip

253 (Final) LRFD$_{10.31}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50

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Axial Force, P -6.3 kip

254 (Final) LRFD$_{10.32}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.0 kip
Axial Force, P -0.6 kip

255 (Final) LRFD$_{10.33}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P -10.4 kip

256 (Final) LRFD$_{10.34}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -10.8 kip

257 (Final) LRFD$_{10.35}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -10.5 kip

258 (Final) LRFD$_{10.36}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -7.0 kip

259 (Final) LRFD$_{10.37}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -10.9 kip

260 (Final) LRFD$_{10.38}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -11.3 kip

261 (Final) LRFD$_{10.39}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -11.0 kip

262 (Final) LRFD$_{10.40}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -7.7 kip

263 (Final) LRFD$_{10.41}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -11.4 kip

264 (Final) LRFD$_{10.42}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -11.4 kip

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265 (Final) LRFD$_{10.43}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -11.9 kip

266 (Final) LRFD$_{10.44}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -6.4 kip

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -12.0 kip

268 (Final) LRFD$_{10.46}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -12.0 kip

269 (Final) LRFD$_{10.47}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -12.3 kip

270 (Final) LRFD$_{10.48}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -6.9 kip

271 (Final) LRFD$_{10.49}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -6.9 kip

272 (Final) LRFD$_{10.50}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -7.3 kip

273 (Final) LRFD$_{10.51}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -7.9 kip

274 (Final) LRFD$_{10.52}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -4.1 kip

275 (Final) LRFD$_{10.53}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -7.4 kip

276 (Final) LRFD$_{10.54}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50

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Moment, M_y -0.2 kip ft
Axial Force, P -7.8 kip

277 (Final) $LRFD_{10.55}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -8.6 kip

278 (Final) $LRFD_{10.56}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -4.7 kip

279 (Final) $LRFD_{10.57}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -1.1 kip

280 (Final) $LRFD_{10.58}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -1.1 kip

281 (Final) $LRFD_{10.59}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -4.1 kip

282 (Final) $LRFD_{10.60}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip

283 (Final) $LRFD_{10.61}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -1.8 kip

284 (Final) $LRFD_{10.62}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -1.8 kip

285 (Final) $LRFD_{10.63}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -4.6 kip

286 (Final) $LRFD_{10.64}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.8 kip

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287 (Final) LRFD$_{12.1}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

288 (Final) LRFD$_{12.2}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

289 (Final) LRFD$_{12.3}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip

290 (Final) LRFD$_{12.4}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 4.1 kip

291 (Final) LRFD$_{12.5}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.7 kip
Axial Force, P -0.6 kip

292 (Final) LRFD$_{12.6}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.4 kip
Axial Force, P -0.1 kip

293 (Final) LRFD$_{12.7}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip

294 (Final) LRFD$_{12.8}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

295 (Final) LRFD$_{12.9}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 8.2 kip

296 (Final) LRFD$_{12.10}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 8.2 kip

297 (Final) LRFD$_{12.11}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip

298 (Final) LRFD$_{12.12}$-0.9D+W

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Span 1 W 12x26 A992-50
Axial Force, P 8.6 kip

299 (Final) $LRFD_{12.13}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 7.6 kip

300 (Final) $LRFD_{12.14}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 7.6 kip

301 (Final) $LRFD_{12.15}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

302 (Final) $LRFD_{12.16}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 8.2 kip

303 (Final) $LRFD_{12.17}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 5.3 kip

304 (Final) $LRFD_{12.18}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 4.9 kip

305 (Final) $LRFD_{12.19}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

306 (Final) $LRFD_{12.20}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 5.4 kip

307 (Final) $LRFD_{12.21}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 4.7 kip

308 (Final) $LRFD_{12.22}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 4.3 kip

309 (Final) $LRFD_{12.23}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft

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Axial Force, P 1.9 kip

310 (Final) LRFD$_{12.24}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 4.8 kip

311 (Final) LRFD$_{12.25}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -2.0 kip

312 (Final) LRFD$_{12.26}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -2.0 kip

313 (Final) LRFD$_{12.27}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -4.8 kip

314 (Final) LRFD$_{12.28}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.7 kip

315 (Final) LRFD$_{12.29}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.5 kip
Axial Force, P -2.7 kip

316 (Final) LRFD$_{12.30}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.5 kip
Axial Force, P -2.7 kip

317 (Final) LRFD$_{12.31}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -5.2 kip

318 (Final) LRFD$_{12.32}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip

319 (Final) LRFD$_{12.33}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P -9.3 kip

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320 (Final) $LRFD_{12.34}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P -9.7 kip

321 (Final) $LRFD_{12.35}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -9.4 kip

322 (Final) $LRFD_{12.36}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -6.0 kip

323 (Final) $LRFD_{12.37}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -9.9 kip

324 (Final) $LRFD_{12.38}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -10.3 kip

325 (Final) $LRFD_{12.39}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -10.0 kip

326 (Final) $LRFD_{12.40}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -6.7 kip

327 (Final) $LRFD_{12.41}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -10.3 kip

328 (Final) $LRFD_{12.42}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -10.3 kip

329 (Final) $LRFD_{12.43}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -10.8 kip

330 (Final) $LRFD_{12.44}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -5.3 kip

331 (Final) $LRFD_{12.45}$-0.9D+W
Span 1 W 12x26 A992-50

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Axial Force, P -11.0 kip

332 (Final) LRFD$_{12.46}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -11.0 kip

333 (Final) LRFD$_{12.47}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -11.3 kip

334 (Final) LRFD$_{12.48}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -5.9 kip

335 (Final) LRFD$_{12.49}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -5.8 kip

336 (Final) LRFD$_{12.50}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -6.2 kip

337 (Final) LRFD$_{12.51}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -6.9 kip

338 (Final) LRFD$_{12.52}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -3.0 kip

339 (Final) LRFD$_{12.53}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -6.4 kip

340 (Final) LRFD$_{12.54}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -6.8 kip

341 (Final) LRFD$_{12.55}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -7.5 kip

342 (Final) LRFD$_{12.56}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft

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Axial Force, P -3.7 kip

343 (Final) $LRFD_{12.57}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip

344 (Final) $LRFD_{12.58}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip

345 (Final) $LRFD_{12.59}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -3.1 kip

346 (Final) $LRFD_{12.60}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip

347 (Final) $LRFD_{12.61}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -0.7 kip

348 (Final) $LRFD_{12.62}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -0.7 kip

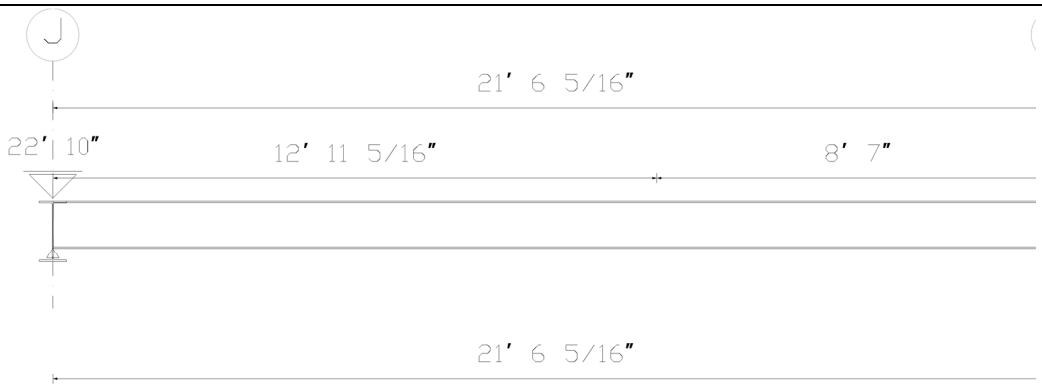
349 (Final) $LRFD_{12.63}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -3.6 kip

350 (Final) $LRFD_{12.64}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip

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Static

Summary W 12x26

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	26	-3.0	84.2	kip	0.036	✔ Pass
Flexure Major	26	17.8	62.3	kip ft	0.285	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.068	-	in	-	-
Deflection Slab	1	0.007	1.076	in	0.007	✔ Pass
Deflection Live	21	0.029	1.076	in	0.027	✔ Pass
Deflection Total	26	0.172	0.718	in	0.239	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x26 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=1.3 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical

Span 1 W 12x26 A992-50 - Critical

Position 21' 6 5/16" - Critical

Position of V_{ry}	=21' 6 5/16" ft, in	
Required major axis shear strength, V_{ry}	=-3.0 kip	
Design shear strength	=84.2 kip	AISC 360 G2
Ratio	**=0.036**	

✔ Pass

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Flexure Major

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical

Span 1 W 12x26 A992-50 - Critical

LTB Flange Top: 0" - 21' 6 5/16" - Critical

Dist of M_{rx1} along member	=12' 11 5/16" ft, in	
Required flexural strength, M_{rx1}	=17.8 kip ft	
Design flexural strength	=62.3 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.285**	

✔ Pass

Deflection

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical

Span 1 W 12x26 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=11' 1 173/256" ft, in
Max. Total load deflection	=0.172 in
Span over limit	=0.718 in
Design limit	=0.718 in
Utilization Ratio	**=0.239**

✔ Pass

Forces Ignored

1 (Final) LRFD$_{1}$-1.4D

Span 1 W 12x26 A992-50

Axial Force, P 1.3 kip

2 (Final) LRFD$_{1.1}$-1.4D+NL$_{Dir1+}$

Span 1 W 12x26 A992-50

Axial Force, P 1.3 kip

3 (Final) LRFD$_{1.2}$-1.4D+NL$_{Dir1-}$

Span 1 W 12x26 A992-50

Axial Force, P 1.3 kip

4 (Final) LRFD$_{1.3}$-1.4D+NL$_{Dir2+}$

Span 1 W 12x26 A992-50

Axial Force, P 1.2 kip

5 (Final) LRFD$_{1.4}$-1.4D+NL$_{Dir2-}$

Span 1 W 12x26 A992-50

Axial Force, P 1.3 kip

6 (Final) LRFD$_{2}$-1.2D+1.6L

Span 1 W 12x26 A992-50

Axial Force, P 0.4 kip

Axial Force, P -1.4 kip

7 (Final) LRFD$_{2.1}$-1.2D+1.6L+NL$_{Dir1+}$

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Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -1.3 kip

8 (Final) $LRFD_{2.2}$-1.2D+1.6L+NL_{Dir1-}
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -1.4 kip

9 (Final) $LRFD_{2.3}$-1.2D+1.6L+NL_{Dir2+}
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -1.3 kip

10 (Final) $LRFD_{2.4}$-1.2D+1.6L+NL_{Dir2-}
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -1.5 kip

11 (Final) $LRFD_{3}$-1.2D+1.6L+0.5Lr
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -0.7 kip

12 (Final) $LRFD_{3.1}$-1.2D+1.6L+0.5Lr+NL_{Dir1+}
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -0.7 kip

13 (Final) $LRFD_{3.2}$-1.2D+1.6L+0.5Lr+NL_{Dir1-}
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -0.8 kip

14 (Final) $LRFD_{3.3}$-1.2D+1.6L+0.5Lr+NL_{Dir2+}
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -0.6 kip

15 (Final) $LRFD_{3.4}$-1.2D+1.6L+0.5Lr+NL_{Dir2-}
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -0.9 kip

16 (Final) $LRFD_{4.1}$-1.2D+1.6L+0.5S
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -0.4 kip

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17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -0.4 kip

18 (Final) LRFD$_{4.3}$-1.2D+1.6L+0.5S+NL$_{Dir1-}$
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -0.5 kip

19 (Final) LRFD$_{4.4}$-1.2D+1.6L+0.5S+NL$_{Dir2+}$
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -0.3 kip

20 (Final) LRFD$_{4.5}$-1.2D+1.6L+0.5S+NL$_{Dir2-}$
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -0.5 kip

21 (Final) LRFD$_{5}$-1.2D+L+1.6Lr
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip

22 (Final) LRFD$_{5.1}$-1.2D+L+1.6Lr+NL$_{Dir1+}$
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip

23 (Final) LRFD$_{5.2}$-1.2D+L+1.6Lr+NL$_{Dir1-}$
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip

24 (Final) LRFD$_{5.3}$-1.2D+L+1.6Lr+NL$_{Dir2+}$
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip

25 (Final) LRFD$_{5.4}$-1.2D+L+1.6Lr+NL$_{Dir2-}$
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

27 (Final) LRFD$_{6.2}$-1.2D+L+1.6S+NL$_{Dir1+}$
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$

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Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

30 (Final) LRFD$_{6.5}$-1.2D+L+1.6S+NL$_{Dir2-}$
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip

31 (Final) LRFD$_{7.1}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.0 kip

32 (Final) LRFD$_{7.2}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.2 kip

33 (Final) LRFD$_{7.3}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

34 (Final) LRFD$_{7.4}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

35 (Final) LRFD$_{7.5}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

36 (Final) LRFD$_{7.6}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.5 kip

37 (Final) LRFD$_{7.7}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip

38 (Final) LRFD$_{7.8}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.0 kip

39 (Final) LRFD$_{7.9}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.9 kip

40 (Final) LRFD$_{7.10}$-1.2D+1.6Lr+0.5W

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Span 1 W 12x26 A992-50
Axial Force, P 5.9 kip

41 (Final) LRFD$_{7.11}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.2 kip

42 (Final) LRFD$_{7.12}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 6.1 kip

43 (Final) LRFD$_{7.13}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.5 kip

44 (Final) LRFD$_{7.14}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.5 kip

45 (Final) LRFD$_{7.15}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

46 (Final) LRFD$_{7.16}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.8 kip

47 (Final) LRFD$_{7.17}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.4 kip

48 (Final) LRFD$_{7.18}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.7 kip

49 (Final) LRFD$_{7.19}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

50 (Final) LRFD$_{7.20}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.0 kip

51 (Final) LRFD$_{7.21}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.7 kip

52 (Final) LRFD$_{7.22}$-1.2D+1.6Lr+0.5W

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Span 1 W 12x26 A992-50
Axial Force, P 4.0 kip

53 (Final) LRFD$_{7.23}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

54 (Final) LRFD$_{7.24}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.7 kip

55 (Final) LRFD$_{7.25}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

56 (Final) LRFD$_{7.26}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

57 (Final) LRFD$_{7.27}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.7 kip

58 (Final) LRFD$_{7.28}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

59 (Final) LRFD$_{7.29}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip

60 (Final) LRFD$_{7.30}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip

61 (Final) LRFD$_{7.31}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip

62 (Final) LRFD$_{7.32}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

63 (Final) LRFD$_{7.33}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.3 kip
Axial Force, P -0.6 kip

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64 (Final) LRFD$_{7.34}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.4 kip
Axial Force, P -0.2 kip

65 (Final) LRFD$_{7.35}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.5 kip
Axial Force, P -0.1 kip

66 (Final) LRFD$_{7.36}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.0 kip

67 (Final) LRFD$_{7.37}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P -1.3 kip

68 (Final) LRFD$_{7.38}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P -1.0 kip

69 (Final) LRFD$_{7.39}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -0.5 kip

70 (Final) LRFD$_{7.40}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip

71 (Final) LRFD$_{7.41}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.2 kip
Axial Force, P -0.1 kip

72 (Final) LRFD$_{7.42}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.2 kip
Axial Force, P -0.1 kip

73 (Final) LRFD$_{7.43}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50

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Axial Force, P 0.8 kip
Axial Force, P -0.4 kip

74 (Final) LRFD$_{7.44}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip

75 (Final) LRFD$_{7.45}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -0.5 kip

76 (Final) LRFD$_{7.46}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -0.5 kip

77 (Final) LRFD$_{7.47}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -0.6 kip

78 (Final) LRFD$_{7.48}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip

79 (Final) LRFD$_{7.49}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip

80 (Final) LRFD$_{7.50}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip

81 (Final) LRFD$_{7.51}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip

82 (Final) LRFD$_{7.52}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip

83 (Final) LRFD$_{7.53}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip

84 (Final) LRFD$_{7.54}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip

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85 (Final) LRFD$_{7.55}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.0 kip

86 (Final) LRFD$_{7.56}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip

87 (Final) LRFD$_{7.57}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

88 (Final) LRFD$_{7.58}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

89 (Final) LRFD$_{7.59}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip

90 (Final) LRFD$_{7.60}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

91 (Final) LRFD$_{7.61}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip

92 (Final) LRFD$_{7.62}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip

93 (Final) LRFD$_{7.63}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip

94 (Final) LRFD$_{7.64}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.7 kip

95 (Final) LRFD$_{8.1}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.0 kip

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.3 kip

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97 (Final) $LRFD_{8.3}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

98 (Final) $LRFD_{8.4}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.4 kip

99 (Final) $LRFD_{8.5}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

100 (Final) $LRFD_{8.6}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.6 kip

101 (Final) $LRFD_{8.7}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

102 (Final) $LRFD_{8.8}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.0 kip

103 (Final) $LRFD_{8.9}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 6.9 kip

104 (Final) $LRFD_{8.10}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 6.9 kip

105 (Final) $LRFD_{8.11}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.3 kip

106 (Final) $LRFD_{8.12}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 7.1 kip

107 (Final) $LRFD_{8.13}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 6.5 kip

108 (Final) $LRFD_{8.14}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 6.5 kip

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109 (Final) $LRFD_{8.15}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.0 kip

110 (Final) $LRFD_{8.16}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 6.8 kip

111 (Final) $LRFD_{8.17}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.4 kip

112 (Final) $LRFD_{8.18}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.8 kip

113 (Final) $LRFD_{8.19}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.7 kip

114 (Final) $LRFD_{8.20}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 6.1 kip

115 (Final) $LRFD_{8.21}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.7 kip

116 (Final) $LRFD_{8.22}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.0 kip

117 (Final) $LRFD_{8.23}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

118 (Final) $LRFD_{8.24}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.7 kip

119 (Final) $LRFD_{8.25}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.5 kip

120 (Final) $LRFD_{8.26}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50

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Moment, M_y -0.1 kip ft
Axial Force, P 3.5 kip

121 (Final) LRFD$_{8.27}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip

122 (Final) LRFD$_{8.28}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.6 kip

123 (Final) LRFD$_{8.29}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip

124 (Final) LRFD$_{8.30}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip

125 (Final) LRFD$_{8.31}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

126 (Final) LRFD$_{8.32}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

127 (Final) LRFD$_{8.33}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.5 kip

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.8 kip

129 (Final) LRFD$_{8.35}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.9 kip

130 (Final) LRFD$_{8.36}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.0 kip

131 (Final) LRFD$_{8.37}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50

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Axial Force, P -0.3 kip

133 (Final) LRFD$_{8.39}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip

134 (Final) LRFD$_{8.40}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip

135 (Final) LRFD$_{8.41}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.4 kip

136 (Final) LRFD$_{8.42}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.4 kip

137 (Final) LRFD$_{8.43}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.0 kip

138 (Final) LRFD$_{8.44}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

139 (Final) LRFD$_{8.45}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip

140 (Final) LRFD$_{8.46}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip

141 (Final) LRFD$_{8.47}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.8 kip

142 (Final) LRFD$_{8.48}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip

143 (Final) LRFD$_{8.49}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip

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144 (Final) LRFD$_{8.50}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip

145 (Final) LRFD$_{8.51}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip

146 (Final) LRFD$_{8.52}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip

147 (Final) LRFD$_{8.53}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip

148 (Final) LRFD$_{8.54}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip

149 (Final) LRFD$_{8.55}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip

150 (Final) LRFD$_{8.56}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip

151 (Final) LRFD$_{8.57}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

152 (Final) LRFD$_{8.58}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

153 (Final) LRFD$_{8.59}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip

154 (Final) LRFD$_{8.60}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.9 kip

155 (Final) LRFD$_{8.61}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

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156 (Final) LRFD$_{8.62}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

157 (Final) LRFD$_{8.63}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip

158 (Final) LRFD$_{8.64}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.7 kip

159 (Final) LRFD$_{9.1}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip

160 (Final) LRFD$_{9.2}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip

161 (Final) LRFD$_{9.3}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip

162 (Final) LRFD$_{9.4}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.5 kip

163 (Final) LRFD$_{9.5}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 1.4 kip

164 (Final) LRFD$_{9.6}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 1.9 kip

165 (Final) LRFD$_{9.7}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 0.7 kip

166 (Final) LRFD$_{9.8}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 2.9 kip

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167 (Final) LRFD$_{9.9}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 6.6 kip

168 (Final) LRFD$_{9.10}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 6.6 kip

169 (Final) LRFD$_{9.11}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

170 (Final) LRFD$_{9.12}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 7.0 kip

171 (Final) LRFD$_{9.13}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 5.9 kip

172 (Final) LRFD$_{9.14}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 5.9 kip

173 (Final) LRFD$_{9.15}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip

174 (Final) LRFD$_{9.16}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 6.5 kip

175 (Final) LRFD$_{9.17}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 3.7 kip

176 (Final) LRFD$_{9.18}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 4.4 kip

177 (Final) LRFD$_{9.19}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip

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178 (Final) LRFD$_{9.20}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 5.0 kip

179 (Final) LRFD$_{9.21}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 2.3 kip

180 (Final) LRFD$_{9.22}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 2.9 kip

181 (Final) LRFD$_{9.23}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.4 kip

182 (Final) LRFD$_{9.24}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 4.2 kip

183 (Final) LRFD$_{9.25}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.2 kip
Axial Force, P -0.2 kip

184 (Final) LRFD$_{9.26}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.2 kip
Axial Force, P -0.2 kip

185 (Final) LRFD$_{9.27}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.4 kip
Axial Force, P -1.8 kip

186 (Final) LRFD$_{9.28}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.0 kip

187 (Final) LRFD$_{9.29}$-1.2D+L+0.5Lr+W

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Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -0.9 kip

188 (Final) LRFD$_{9.30}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -0.9 kip

189 (Final) LRFD$_{9.31}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -2.3 kip

190 (Final) LRFD$_{9.32}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip

191 (Final) LRFD$_{9.33}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.3 kip ft
Axial Force, P -6.3 kip

192 (Final) LRFD$_{9.34}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.3 kip ft
Axial Force, P -5.6 kip

193 (Final) LRFD$_{9.35}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.4 kip

194 (Final) LRFD$_{9.36}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -3.1 kip

195 (Final) LRFD$_{9.37}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -7.7 kip

196 (Final) LRFD$_{9.38}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -7.1 kip

197 (Final) LRFD$_{9.39}$-1.2D+L+0.5Lr+W

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Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -6.0 kip

198 (Final) LRFD$_{9.40}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -3.9 kip

199 (Final) LRFD$_{9.41}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.3 kip

200 (Final) LRFD$_{9.42}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.3 kip

201 (Final) LRFD$_{9.43}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.9 kip

202 (Final) LRFD$_{9.44}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.3 kip
Axial Force, P -2.3 kip

203 (Final) LRFD$_{9.45}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -6.1 kip

204 (Final) LRFD$_{9.46}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -6.1 kip

205 (Final) LRFD$_{9.47}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -6.4 kip

206 (Final) LRFD$_{9.48}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -2.9 kip

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207 (Final) LRFD$_{9.49}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -3.1 kip

208 (Final) LRFD$_{9.50}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -2.5 kip

209 (Final) LRFD$_{9.51}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -3.3 kip

210 (Final) LRFD$_{9.52}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.0 kip
Axial Force, P -0.8 kip

211 (Final) LRFD$_{9.53}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Moment, M_y -0.1 kip ft
Axial Force, P 0.1 kip
Axial Force, P -4.5 kip

212 (Final) LRFD$_{9.54}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Moment, M_y -0.1 kip ft
Axial Force, P 0.2 kip
Axial Force, P -4.0 kip

213 (Final) LRFD$_{9.55}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Moment, M_y -0.1 kip ft
Axial Force, P -4.1 kip

214 (Final) LRFD$_{9.56}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 0.3 kip
Axial Force, P -1.5 kip

215 (Final) LRFD$_{9.57}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50

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Axial Force, P 2.4 kip

216 (Final) LRFD$_{9.58}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

217 (Final) LRFD$_{9.59}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -0.8 kip

218 (Final) LRFD$_{9.60}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip

219 (Final) LRFD$_{9.61}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.8 kip

220 (Final) LRFD$_{9.62}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.8 kip

221 (Final) LRFD$_{9.63}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -1.4 kip

222 (Final) LRFD$_{9.64}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip

223 (Final) LRFD$_{10.1}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip

224 (Final) LRFD$_{10.2}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.7 kip

225 (Final) LRFD$_{10.3}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip

226 (Final) LRFD$_{10.4}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

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227 (Final) $LRFD_{10.5}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 1.7 kip

228 (Final) $LRFD_{10.6}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 2.3 kip

229 (Final) $LRFD_{10.7}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.0 kip

230 (Final) $LRFD_{10.8}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 3.2 kip

231 (Final) $LRFD_{10.9}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 6.9 kip

232 (Final) $LRFD_{10.10}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 6.9 kip

233 (Final) $LRFD_{10.11}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

234 (Final) $LRFD_{10.12}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 7.3 kip

235 (Final) $LRFD_{10.13}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 6.2 kip

236 (Final) $LRFD_{10.14}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 6.2 kip

237 (Final) $LRFD_{10.15}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50

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Axial Force, P 3.1 kip

238 (Final) $LRFD_{10.16}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 6.8 kip

239 (Final) $LRFD_{10.17}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 4.0 kip

240 (Final) $LRFD_{10.18}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 4.7 kip

241 (Final) $LRFD_{10.19}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

242 (Final) $LRFD_{10.20}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 5.3 kip

243 (Final) $LRFD_{10.21}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 2.6 kip

244 (Final) $LRFD_{10.22}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 3.2 kip

245 (Final) $LRFD_{10.23}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.8 kip

246 (Final) $LRFD_{10.24}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 4.6 kip

247 (Final) $LRFD_{10.25}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.3 kip

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248 (Final) LRFD$_{10.26}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.3 kip

249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.5 kip
Axial Force, P -1.5 kip

250 (Final) LRFD$_{10.28}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.3 kip

251 (Final) LRFD$_{10.29}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -0.6 kip

252 (Final) LRFD$_{10.30}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -0.6 kip

253 (Final) LRFD$_{10.31}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -2.0 kip

254 (Final) LRFD$_{10.32}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip

255 (Final) LRFD$_{10.33}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.3 kip ft
Axial Force, P -6.0 kip

256 (Final) LRFD$_{10.34}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.3 kip ft
Axial Force, P -5.3 kip

257 (Final) LRFD$_{10.35}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft

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Axial Force, P -5.1 kip

258 (Final) LRFD$_{10.36}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -2.8 kip

259 (Final) LRFD$_{10.37}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -7.4 kip

260 (Final) LRFD$_{10.38}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -6.7 kip

261 (Final) LRFD$_{10.39}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -5.7 kip

262 (Final) LRFD$_{10.40}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -3.6 kip

263 (Final) LRFD$_{10.41}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.0 kip

264 (Final) LRFD$_{10.42}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.0 kip

265 (Final) LRFD$_{10.43}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.6 kip

266 (Final) LRFD$_{10.44}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.4 kip
Axial Force, P -2.0 kip

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W

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Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.7 kip

268 (Final) $LRFD_{10.46}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.7 kip

269 (Final) $LRFD_{10.47}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -6.1 kip

270 (Final) $LRFD_{10.48}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -2.6 kip

271 (Final) $LRFD_{10.49}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -2.7 kip

272 (Final) $LRFD_{10.50}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip
Axial Force, P -2.2 kip

273 (Final) $LRFD_{10.51}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.3 kip
Axial Force, P -3.0 kip

274 (Final) $LRFD_{10.52}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.0 kip
Axial Force, P -0.5 kip

275 (Final) $LRFD_{10.53}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Moment, M_y -0.1 kip ft
Axial Force, P 0.2 kip
Axial Force, P -4.2 kip

276 (Final) $LRFD_{10.54}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft

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Moment, M_y -0.1 kip ft
Axial Force, P 0.3 kip
Axial Force, P -3.7 kip

277 (Final) $LRFD_{10.55}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -3.7 kip

278 (Final) $LRFD_{10.56}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 0.4 kip
Axial Force, P -1.2 kip

279 (Final) $LRFD_{10.57}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

280 (Final) $LRFD_{10.58}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

281 (Final) $LRFD_{10.59}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -0.5 kip

282 (Final) $LRFD_{10.60}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip

283 (Final) $LRFD_{10.61}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.8 kip

284 (Final) $LRFD_{10.62}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.8 kip

285 (Final) $LRFD_{10.63}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -1.0 kip

286 (Final) $LRFD_{10.64}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50

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Axial Force, P 2.5 kip

287 (Final) LRFD$_{12.1}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 3.3 kip

288 (Final) LRFD$_{12.2}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.8 kip

289 (Final) LRFD$_{12.3}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip

290 (Final) LRFD$_{12.4}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 4.0 kip

291 (Final) LRFD$_{12.5}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 1.9 kip

292 (Final) LRFD$_{12.6}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 2.4 kip

293 (Final) LRFD$_{12.7}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.1 kip

294 (Final) LRFD$_{12.8}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 3.3 kip

295 (Final) LRFD$_{12.9}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 7.0 kip

296 (Final) LRFD$_{12.10}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 7.0 kip

297 (Final) LRFD$_{12.11}$-0.9D+W
Span 1 W 12x26 A992-50

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Axial Force, P 3.8 kip

298 (Final) $LRFD_{12.12}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 7.5 kip

299 (Final) $LRFD_{12.13}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 6.3 kip

300 (Final) $LRFD_{12.14}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 6.3 kip

301 (Final) $LRFD_{12.15}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip

302 (Final) $LRFD_{12.16}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 6.9 kip

303 (Final) $LRFD_{12.17}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 4.1 kip

304 (Final) $LRFD_{12.18}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 4.8 kip

305 (Final) $LRFD_{12.19}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.6 kip

306 (Final) $LRFD_{12.20}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 5.4 kip

307 (Final) $LRFD_{12.21}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 2.7 kip

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308 (Final) LRFD$_{12.22}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 3.4 kip

309 (Final) LRFD$_{12.23}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.9 kip

310 (Final) LRFD$_{12.24}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 4.7 kip

311 (Final) LRFD$_{12.25}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.3 kip

312 (Final) LRFD$_{12.26}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.3 kip

313 (Final) LRFD$_{12.27}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.4 kip
Axial Force, P -1.3 kip

314 (Final) LRFD$_{12.28}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.5 kip

315 (Final) LRFD$_{12.29}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -0.4 kip

316 (Final) LRFD$_{12.30}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -0.4 kip

317 (Final) LRFD$_{12.31}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft

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Axial Force, P -1.8 kip

318 (Final) $LRFD_{12.32}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip

319 (Final) $LRFD_{12.33}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.3 kip ft
Axial Force, P -5.8 kip

320 (Final) $LRFD_{12.34}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.3 kip ft
Axial Force, P -5.2 kip

321 (Final) $LRFD_{12.35}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -4.9 kip

322 (Final) $LRFD_{12.36}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -2.7 kip

323 (Final) $LRFD_{12.37}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -7.3 kip

324 (Final) $LRFD_{12.38}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -6.6 kip

325 (Final) $LRFD_{12.39}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -5.6 kip

326 (Final) $LRFD_{12.40}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -3.4 kip

327 (Final) $LRFD_{12.41}$-0.9D+W
Span 1 W 12x26 A992-50

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Moment, M_y -0.2 kip ft
Axial Force, P -4.9 kip

328 (Final) $LRFD_{12.42}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -4.9 kip

329 (Final) $LRFD_{12.43}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.5 kip

330 (Final) $LRFD_{12.44}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.3 kip
Axial Force, P -1.9 kip

331 (Final) $LRFD_{12.45}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -5.6 kip

332 (Final) $LRFD_{12.46}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -5.6 kip

333 (Final) $LRFD_{12.47}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -6.0 kip

334 (Final) $LRFD_{12.48}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -2.4 kip

335 (Final) $LRFD_{12.49}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -2.6 kip

336 (Final) $LRFD_{12.50}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -2.1 kip

337 (Final) $LRFD_{12.51}$-0.9D+W

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Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -2.9 kip

338 (Final) LRFD$_{12.52}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -0.4 kip

339 (Final) LRFD$_{12.53}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Moment, M_y -0.1 kip ft
Axial Force, P -4.1 kip

340 (Final) LRFD$_{12.54}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Moment, M_y -0.1 kip ft
Axial Force, P 0.2 kip
Axial Force, P -3.5 kip

341 (Final) LRFD$_{12.55}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P -3.6 kip

342 (Final) LRFD$_{12.56}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 0.3 kip
Axial Force, P -1.1 kip

343 (Final) LRFD$_{12.57}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

344 (Final) LRFD$_{12.58}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

345 (Final) LRFD$_{12.59}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.0 kip
Axial Force, P -0.3 kip

346 (Final) LRFD$_{12.60}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip

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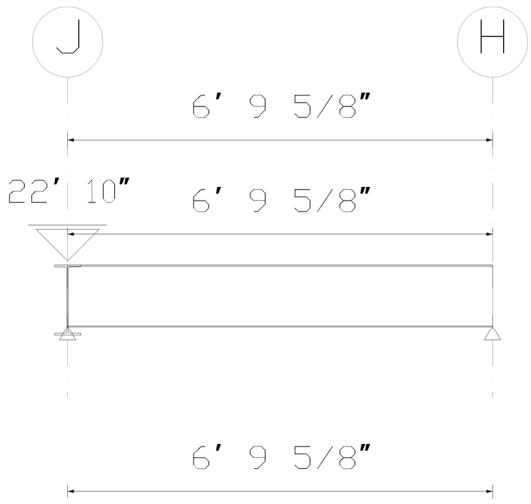
347 (Final) LRFD$_{12.61}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.7 kip

348 (Final) LRFD$_{12.62}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.7 kip

349 (Final) LRFD$_{12.63}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.5 kip
Axial Force, P -0.9 kip

350 (Final) LRFD$_{12.64}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 2.6 kip

TORSB1014



St. TORS (T.O. ROOF STRUCT.): TORSB1014 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	39	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	0.3	64.3	kip	0.005	✔ Pass

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	112	0.5	49.9	kip ft	0.011	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	260	-1.0	187.2	kip	0.005	✔ Pass
Axial Compression	304	0.6	79.2	kip	0.008	✔ Pass
Combined Forces	148	-	-	-	0.015	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Dead	1	0.001	0.227	in	0.002	✔ Pass
Deflection Total	112	0.001	0.227	in	0.006	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

39 (Final) LRFD$_{7.9}$-1.2D+1.6Lr+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.2 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=0.3 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.005**	

✔ Pass

Flexure Major

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Top: 0" - 6' 9 5/8" - Critical

Dist of M_{rx1} along member	=3' 4 13/16" ft, in	
Required flexural strength, M_{rx1}	=0.5 kip ft	
Design flexural strength	=49.9 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.011**	

✔ Pass

Axial Tension

260 (Final) LRFD$_{10.38}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 6' 9 5/8" - Critical

Distance of P_r along member	=6' 9 5/8" ft, in	
Required tensile strength, P_r	=-1.0 kip	
Design yield strength	=187.2 kip	AISC 360 D2

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Ratio =0.005

✔ Pass

Axial Compression

304 (Final) LRFD$_{12.18}$-0.9D+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural - out-of-plane: 0" - 6' 9 5/8" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 6' 9 5/8"	Flexural - out-of-plane	6' 9 5/8"	0.6	79.2	kip	0.008	✔ Pass

Combined Forces

148 (Final) LRFD$_{8.54}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Top LTB 0" - 6' 9 5/8" - Critical

Axial Tension: 0" - 6' 9 5/8" - Critical

Mode	Ratio	Status
Combined buckling	0.015	✔ Pass

Deflection

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =3' 4 13/16" ft, in

Max. Total load deflection =0.001 in

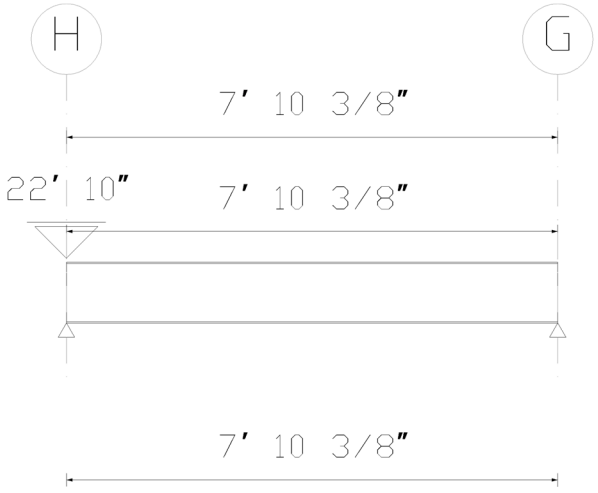
Span over limit =0.227 in

Design limit =0.227 in

Utilization Ratio **=0.006**

✔ Pass

TORSB1015



St. TORS (T.O. ROOF STRUCT.): TORSB1015 - W 12x14 A992-50

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Project Name: FIRE STATION 5		

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	167	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	0.4	64.3	kip	0.006	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	112	0.7	43.1	kip ft	0.017	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	276	-1.5	187.2	kip	0.008	✔ Pass
Axial Compression	297	0.7	59.8	kip	0.011	✔ Pass
Combined Forces	276	-	-	-	0.025	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.001	-	in	-	-
Deflection Dead	1	0.001	0.262	in	0.004	✔ Pass
Deflection Live	21	0.001	0.393	in	0.002	✔ Pass
Deflection Wind	339	0.000	0.472	in	0.001	✔ Pass
Deflection Total	112	0.003	0.262	in	0.010	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

167 (Final) LRFD$_{9.9}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.4 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=0.4 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.006**	

✔ Pass

Flexure Major

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Top: 0" - 7' 10 3/8" - Critical

Dist of M_{rx1} along member	=3' 11 3/16" ft, in	
Required flexural strength, M_{rx1}	=0.7 kip ft	
Design flexural strength	=43.1 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.017**	

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✔ Pass

Axial Tension

276 (Final) LRFD$_{10.54}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 7′ 10 3/8″ - Critical

Distance of P_r along member	=7′ 10 3/8″ ft, in	
Required tensile strength, P_r	=-1.5 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.008**	

✔ Pass

Axial Compression

297 (Final) LRFD$_{12.11}$-0.9D+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural - out-of-plane: 0″ - 7′ 10 3/8″ - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 7′ 10 3/8″	Flexural - out-of-plane	7′ 10 3/8″	0.7	59.8	kip	0.011	✔ Pass

Combined Forces

276 (Final) LRFD$_{10.54}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Top LTB 0″ - 7′ 10 3/8″ - Critical

Axial Tension: 0″ - 7′ 10 3/8″ - Critical

Mode	Ratio	Status
Combined buckling	0.025	✔ Pass

Deflection

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

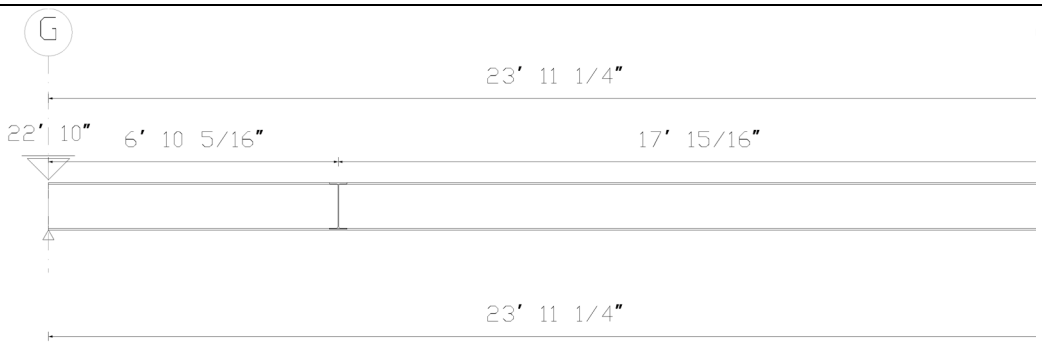
Position Total load deflection	=3′ 11 3/16″ ft, in
Max. Total load deflection	=0.003 in
Span over limit	=0.262 in
Design limit	=0.262 in
Utilization Ratio	**=0.010**

✔ Pass

TORSB1016

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Project Name: FIRE STATION 5		



St. TORS (T.O. ROOF STRUCT.): TORSB1016 - 1
W 14x26 A992-50

Static

Summary W 14x26

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	158	9.6	106.3	kip	0.090	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	158	-21.8	45.5	kip ft	0.479	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	19	3.3	48.2	kip	0.069	✔ Pass
Combined Forces	154	-	-	-	0.499	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.031	-	in	-	-
Deflection Slab	1	-0.018	1.197	in	0.015	✔ Pass
Deflection Dead	1	0.127	0.798	in	0.159	✔ Pass
Deflection Live	21	0.092	1.197	in	0.077	✔ Pass
Deflection Wind	291	-0.061	1.436	in	0.042	✔ Pass
Deflection Total	144	0.303	0.798	in	0.380	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 14x26 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=1.8 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

158 (Final) $LRFD_{8.64}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x26 A992-50 - Critical

Position 0" - Critical

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Position of V_{ry} =0" ft, in
Required major axis shear strength, V_{ry} =9.6 kip
Design shear strength =106.3 kip AISC 360 G2
Ratio **=0.090**

✔ Pass

Flexure Major

158 (Final) LRFD$_{8.64}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x26 A992-50 - Critical

LTB Flange Btm: 0" - 23' 11 1/4" - Critical

Dist of M_{rx1} along member =0" ft, in
Required flexural strength, M_{rx1} =-21.8 kip ft
Design flexural strength =45.5 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.479**

✔ Pass

Axial Compression

19 (Final) LRFD$_{4.4}$-1.2D+1.6L+0.5S+NL$_{Dir2+}$ - Critical

Span 1 W 14x26 A992-50 - Critical

Flexural - out-of-plane: 6' 10 5/16" - 23' 11 1/4" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
6' 10 5/16" - 23' 11 1/4"	Flexural - out-of-plane	17' 15/16"	3.3	48.2	kip	0.069	✔ Pass

Combined Forces

154 (Final) LRFD$_{8.60}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x26 A992-50 - Critical

Flange Btm LTB 0" - 23' 11 1/4" - Critical

Axial Comp: I.P. 0" - 23' 11 1/4" , O.o.P.6' 10 5/16" - 23' 11 1/4" , Tors. 0" - 23' 11 1/4" - Critical

Mode	Ratio	Status
Combined buckling	0.499	✔ Pass

Deflection

144 (Final) LRFD$_{8.50}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x26 A992-50 - Critical

Deflection Total - Critical

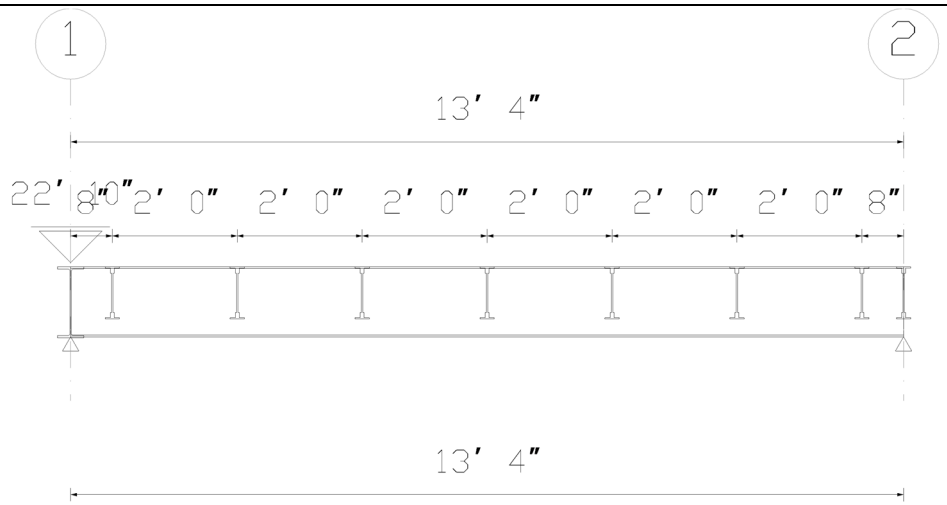
Position Total load deflection =10' 6 3/8" ft, in
Max. Total load deflection =0.303 in
Span over limit =0.798 in
Design limit =0.798 in
Utilization Ratio **=0.380**

✔ Pass

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Project Name: FIRE STATION 5		



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Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	28	9.4	94.5	kip	0.100	Pass
Shear Minor	249	1.6	90.5	kip	0.018	Pass
Flexure Major	28	-33.3	98.5	kip ft	0.338	Pass
Flexure Minor	249	-1.1	16.5	kip ft	0.065	Pass
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	28	6.5	138.3	kip	0.047	Pass
Combined Forces	28	-	-	-	0.399	Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.003	-	in	-	-
Deflection Slab	1	-0.006	0.667	in	0.009	Pass
Deflection Dead	1	0.023	0.444	in	0.052	Pass
Deflection Live	21	0.016	0.667	in	0.024	Pass
Deflection Wind	291	-0.010	0.800	in	0.013	Pass
Deflection Total	158	0.055	0.444	in	0.124	Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P =4.1 kip

Elastic modulus of steel, E =29000 ksi

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Minimum yield stress, F_y =50.00 ksi
Axial section class Slender AISC 360 Table B4.1a

Shear Major
28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$ - Critical
Span 1 W 14x22 A992-50 - Critical
Position 0" - Critical
Position of V_{ry} =0" ft, in
Required major axis shear strength, V_{ry} =9.4 kip
Design shear strength =94.5 kip AISC 360 G2
Ratio **=0.100**
✔ Pass

Shear Minor
249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W - Critical
Span 1 W 14x22 A992-50 - Critical
Position 12' 8" - Critical
Position of V_{rx} =12' 8" ft, in
Required minor axis shear strength, V_{rx} =1.6 kip
Design shear strength =90.5 kip AISC 360 G6
Ratio **=0.018**
✔ Pass

Flexure Major
28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$ - Critical
Span 1 W 14x22 A992-50 - Critical
LTB Flange Btm: 0" - 13' 4" - Critical
Dist of M_{rx1} along member =0" ft, in
Required flexural strength, M_{rx1} =-33.3 kip ft
Design flexural strength =98.5 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.338**
✔ Pass

Flexure Minor
249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W - Critical
Span 1 W 14x22 A992-50 - Critical
Yielding: 12' 8" - Critical
Dist of M_{ry} along member =12' 8" ft, in
Required flexural strength, M_{ry1} =-1.1 kip ft
Design flexural strength =16.5 kip ft AISC 360 F6
Ratio **=0.065**
✔ Pass

Axial Compression
28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$ - Critical
Span 1 W 14x22 A992-50 - Critical
Flexural torsional: 0" - 13' 4" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 13' 4"	Flexural torsional	13' 4"	6.5	138.3	kip	0.047	✔ Pass

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Combined Forces

28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$ - Critical

Span 1 W 14x22 A992-50 - Critical

Flange Btm LTB 0" - 13' 4" - Critical

Axial Comp: I.P. 0" - 13' 4" , O.o.P.0" - 8" , Tors. 0" - 13' 4" - Critical

Mode	Ratio	Status
Combined buckling	0.399	✔ Pass

Deflection

158 (Final) LRFD$_{8.64}$-1.2D+1.6S+0.5W - Critical

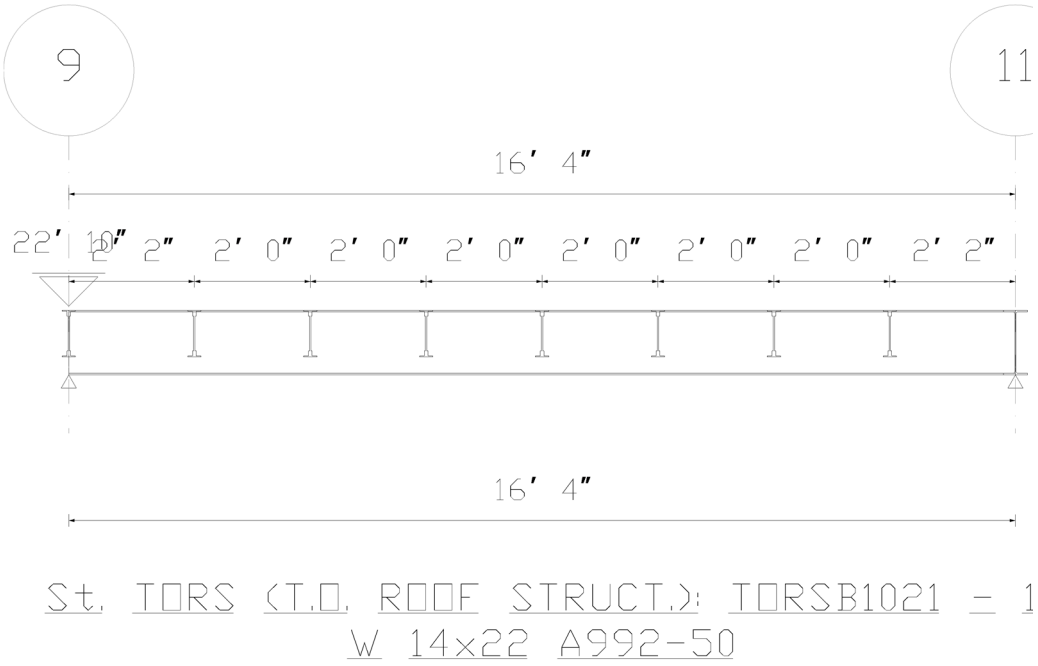
Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=8' 1 25/64" ft, in
Max. Total load deflection	=0.055 in
Span over limit	=0.444 in
Design limit	=0.444 in
Utilization Ratio	**=0.124**

✔ Pass

TORSB1021



Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	-6.9	94.5	kip	0.073	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required

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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexure Major	96	-21.3	66.0	kip ft	0.323	✔ Pass
Flexure Minor	227	0.3	16.5	kip ft	0.020	✔ Pass
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	27	4.5	115.7	kip	0.039	✔ Pass
Combined Forces	96	-	-	-	0.346	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Slab	1	-0.008	0.817	in	0.009	✔ Pass
Deflection Dead	1	0.032	0.544	in	0.059	✔ Pass
Deflection Live	21	0.023	0.817	in	0.028	✔ Pass
Deflection Wind	339	-0.016	0.980	in	0.017	✔ Pass
Deflection Total	128	0.072	0.544	in	0.132	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_{1}$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=2.7 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Position 16' 4" - Critical

Position of V_{ry}	=16' 4" ft, in	
Required major axis shear strength, V_{ry}	=-6.9 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.073**	

✔ Pass

Flexure Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

LTB Flange Btm: 0" - 16' 4" - Critical

Dist of M_{rx1} along member	=16' 4" ft, in	
Required flexural strength, M_{rx1}	=-21.3 kip ft	
Design flexural strength	=66.0 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.323**	

✔ Pass

Flexure Minor

227 (Final) LRFD$_{10.5}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Yielding: 2' 2" - Critical

Dist of M_{ry} along member	=2' 2" ft, in	

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Required flexural strength, M_{ry1} =0.3 kip ft
Design flexural strength =16.5 kip ft AISC 360 F6
Ratio **=0.020**

✔ Pass

Axial Compression

27 (Final) LRFD$_{6.2}$-1.2D+L+1.6S+NL$_{Dir1+}$ - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural torsional: 0" - 16' 4" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 16' 4"	Flexural torsional	16' 4"	4.5	115.7	kip	0.039	✔ Pass

Combined Forces

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Flange Btm LTB 0" - 16' 4" - Critical

Axial Comp: I.P. 0" - 16' 4" , O.o.P.0" - 2' 2" , Tors. 0" - 16' 4" - Critical

Mode	Ratio	Status
Combined buckling	0.346	✔ Pass

Deflection

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =7' 11 115/128" ft, in
Max. Total load deflection =0.072 in
Span over limit =0.544 in
Design limit =0.544 in
Utilization Ratio **=0.132**

✔ Pass

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Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	-8.3	94.5	kip	0.088	✔ Pass
Shear Minor	249	0.4	90.5	kip	0.004	✔ Pass
Flexure Major	96	-16.2	45.8	kip ft	0.353	✔ Pass
Flexure Minor	249	0.7	16.5	kip ft	0.045	✔ Pass
Axial Tension	291	-0.4	292.1	kip	0.001	✔ Pass
Axial Compression	256	3.3	115.7	kip	0.029	✔ Pass
Combined Forces	27	-	-	-	0.379	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.009	-	in	-	-
Deflection Slab	1	-0.009	0.817	in	0.011	✔ Pass
Deflection Dead	1	0.059	0.544	in	0.108	✔ Pass
Deflection Live	21	0.043	0.817	in	0.053	✔ Pass
Deflection Wind	291	-0.031	0.980	in	0.032	✔ Pass
Deflection Total	128	0.137	0.544	in	0.251	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=1.3 kip
Elastic modulus of steel, E	=29000 ksi
Minimum yield stress, F_y	=50.00 ksi

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Axial section class Slender AISC 360 Table B4.1a

Shear Major
96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical
Span 1 W 14x22 A992-50 - Critical
Position 16' 4" - Critical
Position of V_{ry} =16' 4" ft, in
Required major axis shear strength, V_{ry} =-8.3 kip
Design shear strength =94.5 kip AISC 360 G2
Ratio **=0.088**
✔ Pass

Shear Minor
249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W - Critical
Span 1 W 14x22 A992-50 - Critical
Position 11' 8" - Critical
Position of V_{rx} =11' 8" ft, in
Required minor axis shear strength, V_{rx} =0.4 kip
Design shear strength =90.5 kip AISC 360 G6
Ratio **=0.004**
✔ Pass

Flexure Major
96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical
Span 1 W 14x22 A992-50 - Critical
LTB Flange Btm: 0" - 16' 4" - Critical
Dist of M_{rx1} along member =16' 4" ft, in
Required flexural strength, M_{rx1} =-16.2 kip ft
Design flexural strength =45.8 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.353**
✔ Pass

Flexure Minor
249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W - Critical
Span 1 W 14x22 A992-50 - Critical
Yielding: 13' 4" - Critical
Dist of M_{ry} along member =13' 4" ft, in
Required flexural strength, M_{ry1} =0.7 kip ft
Design flexural strength =16.5 kip ft AISC 360 F6
Ratio **=0.045**
✔ Pass

Axial Tension
291 (Final) LRFD$_{12.5}$-0.9D+W - Critical
Span 1 W 14x22 A992-50 - Critical
Yielding: Position 0" - Critical
Distance of P_r along member =0" ft, in
Required tensile strength, P_r =-0.4 kip
Design yield strength =292.1 kip AISC 360 D2

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Ratio =**0.001**

✔ Pass

Axial Compression

256 (Final) LRFD$_{10.34}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural torsional: 0" - 16' 4" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 16' 4"	Flexural torsional	16' 4"	3.3	115.7	kip	0.029	✔ Pass

Combined Forces

27 (Final) LRFD$_{6.2}$-1.2D+L+1.6S+NL$_{Dir1+}$ - Critical

Span 1 W 14x22 A992-50 - Critical

Flange Btm LTB 0" - 16' 4" - Critical

Axial Comp: I.P. 0" - 16' 4" , O.o.P.0" - 1' 8" , Tors. 0" - 16' 4" - Critical

Mode	Ratio	Status
Combined buckling	0.379	✔ Pass

Deflection

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =8' 4 39/256" ft, in

Max. Total load deflection =0.137 in

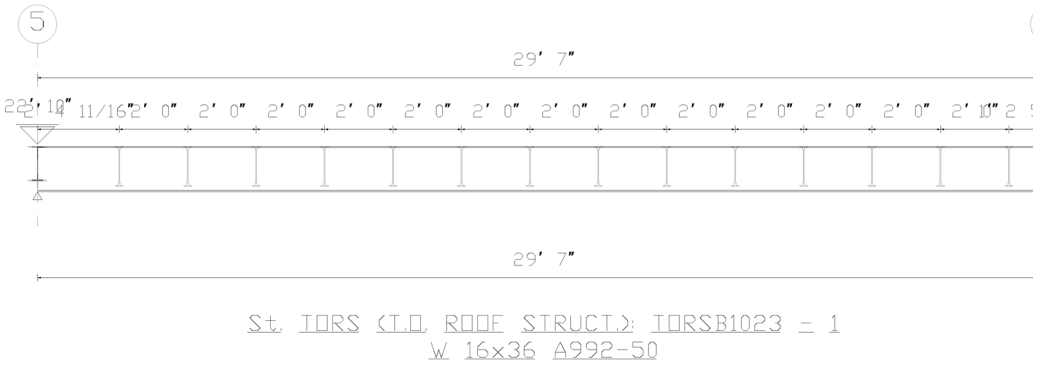
Span over limit =0.544 in

Design limit =0.544 in

Utilization Ratio **=0.251**

✔ Pass

TORSB1023



Static

Summary W 16x36

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	-15.6	140.7	kip	0.111	✔ Pass
Shear Minor	163	0.4	162.3	kip	0.002	✔ Pass

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexure Major	27	-38.6	65.8	kip ft	0.586	✔ Pass
Flexure Minor	234	0.5	40.5	kip ft	0.012	✔ Pass
Axial Tension	323	-0.2	477.0	kip	0.000	✔ Pass
Axial Compression	28	6.1	166.4	kip	0.037	✔ Pass
Combined Forces	27	-	-	-	0.607	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.056	-	in	-	-
Deflection Slab	1	-0.020	1.479	in	0.014	✔ Pass
Deflection Dead	1	0.294	0.986	in	0.298	✔ Pass
Deflection Live	21	0.205	1.479	in	0.139	✔ Pass
Deflection Wind	307	-0.134	1.775	in	0.076	✔ Pass
Deflection Total	96	0.693	0.986	in	0.702	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_{1}$-1.4D - Critical

Span 1 W 16x36 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=3.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 16x36 A992-50 - Critical

Position 29' 7" - Critical

Position of V_{ry}	=29' 7" ft, in	
Required major axis shear strength, V_{ry}	=-15.6 kip	
Design shear strength	=140.7 kip	AISC 360 G2
Ratio	**=0.111**	

✔ Pass

Shear Minor

163 (Final) LRFD$_{9.5}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 16x36 A992-50 - Critical

Position 28' 4 11/16" - Critical

Position of V_{rx}	=28' 4 11/16" ft, in	
Required minor axis shear strength, V_{rx}	=0.4 kip	
Design shear strength	=162.3 kip	AISC 360 G6
Ratio	**=0.002**	

✔ Pass

Flexure Major

27 (Final) LRFD$_{6.2}$-1.2D+L+1.6S+NL$_{Dir1+}$ - Critical

Span 1 W 16x36 A992-50 - Critical

LTB Flange Btm: 0" - 29' 7" - Critical

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Dist of M_{rx1} along member =29' 7" ft, in
Required flexural strength, M_{rx1} =-38.6 kip ft
Design flexural strength =65.8 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.586**

✔ Pass

Flexure Minor

234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W - Critical
Span 1 W 16x36 A992-50 - Critical
Yielding: 2' 4 11/16" - Critical
Dist of M_{ry} along member =2' 4 11/16" ft, in
Required flexural strength, M_{ry1} =0.5 kip ft
Design flexural strength =40.5 kip ft AISC 360 F6
Ratio **=0.012**

✔ Pass

Axial Tension

323 (Final) LRFD$_{12.37}$-0.9D+W - Critical
Span 1 W 16x36 A992-50 - Critical
Yielding: Position 29' 7" - Critical
Distance of P_r along member =29' 7" ft, in
Required tensile strength, P_r =-0.2 kip
Design yield strength =477.0 kip AISC 360 D2
Ratio **=0.000**

✔ Pass

Axial Compression

28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$ - Critical
Span 1 W 16x36 A992-50 - Critical
Flexural torsional: 0" - 29' 7" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 29' 7"	Flexural torsional	29' 7"	6.1	166.4	kip	0.037	✔ Pass

Combined Forces

27 (Final) LRFD$_{6.2}$-1.2D+L+1.6S+NL$_{Dir1+}$ - Critical
Span 1 W 16x36 A992-50 - Critical
Flange Btm LTB 0" - 29' 7" - Critical
Axial Comp: I.P. 0" - 29' 7" , O.o.P.0" - 2' 4 11/16" , Tors. 0" - 29' 7" - Critical

Mode	Ratio	Status
Combined buckling	0.607	✔ Pass

Deflection

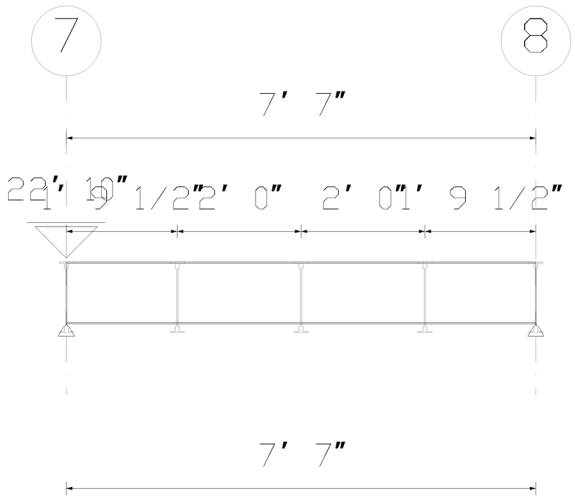
96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical
Span 1 W 16x36 A992-50 - Critical
Deflection Total - Critical
Position Total load deflection =14' 6 115/128" ft, in
Max. Total load deflection =0.693 in
Span over limit =0.986 in
Design limit =0.986 in
Utilization Ratio **=0.702**

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✔ Pass

TORSB1024



St. TORS (T.O. ROOF STRUCT.): TORSB1024 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	183	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	128	3.0	64.3	kip	0.047	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	128	7.5	65.2	kip ft	0.115	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	276	-1.8	187.2	kip	0.010	✔ Pass
Axial Compression	311	0.7	103.9	kip	0.006	✔ Pass
Combined Forces	112	-	-	-	0.123	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.001	-	in	-	-
Deflection Dead	1	0.010	0.253	in	0.039	✔ Pass
Deflection Live	21	0.007	0.379	in	0.017	✔ Pass
Deflection Wind	307	-0.004	0.455	in	0.009	✔ Pass
Deflection Total	144	0.023	0.253	in	0.091	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

183 (Final) $LRFD_{9.25}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

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Axial Force, P =0.4 kip
Elastic modulus of steel, E =29000 ksi
Minimum yield stress, F_y =50.00 ksi
Axial section class Slender AISC 360 Table B4.1a

Shear Major
128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
Position 0" - Critical
Position of V_{ry} =0" ft, in
Required major axis shear strength, V_{ry} =3.0 kip
Design shear strength =64.3 kip AISC 360 G2
Ratio **=0.047**
✔ Pass

Flexure Major
128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
Yielding: 3' 9 1/2" - Critical
Dist of M_{rx} along member =3' 9 1/2" ft, in
Required flexural strength, M_{rx1} =7.5 kip ft
Design flexural strength =65.2 kip ft AISC 360 F1, F2 and F3
Ratio **=0.115**
✔ Pass

Axial Tension
276 (Final) LRFD$_{10.54}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Yielding: Position 0" - Critical
Distance of P_r along member =0" ft, in
Required tensile strength, P_r =-1.8 kip
Design yield strength =187.2 kip AISC 360 D2
Ratio **=0.010**
✔ Pass

Axial Compression
311 (Final) LRFD$_{12.25}$-0.9D+W - Critical
Span 1 W 12x14 A992-50 - Critical
Flexural torsional: 0" - 7' 7" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 7' 7"	Flexural torsional	7' 7"	0.7	103.9	kip	0.006	✔ Pass

Combined Forces
112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
Flange Btm LTB 0" - 7' 7" - Critical
Axial Tension: 0" - 7' 7" - Critical

Mode	Ratio	Status
Combined buckling	0.123	✔ Pass

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Deflection

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=3' 9 1/2" ft, in
Max. Total load deflection	=0.023 in
Span over limit	=0.253 in
Design limit	=0.253 in
Utilization Ratio	**=0.091**

✔ Pass

TORSB1026



Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	9	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	0.5	64.3	kip	0.008	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	96	1.9	15.6	kip ft	0.122	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	324	-1.1	187.2	kip	0.006	✔ Pass
Axial Compression	175	1.1	17.2	kip	0.063	✔ Pass
Combined Forces	128	-	-	-	0.123	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.006	-	in	-	-
Deflection Dead	1	0.007	0.489	in	0.015	✔ Pass
Deflection Live	21	0.005	0.733	in	0.007	✔ Pass

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Deflection Wind	323	-0.003	0.880	in	0.004	✔ Pass
Deflection Total	96	0.022	0.489	in	0.045	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

9 (Final) $LRFD_{2.3}$-1.2D+1.6L+NL_{Dir2+} - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 7′ 4″ - Critical

Axial Force, P	=0.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

96 (Final) $LRFD_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0″ - Critical

Position of V_{ry}	=0″ ft, in	
Required major axis shear strength, V_{ry}	=0.5 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.008**	

✔ Pass

Flexure Major

96 (Final) $LRFD_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Top: 0″ - 14′ 8″ - Critical

Dist of M_{rx1} along member	=7′ 4″ ft, in	
Required flexural strength, M_{rx1}	=1.9 kip ft	
Design flexural strength	=15.6 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.122**	

✔ Pass

Axial Tension

324 (Final) $LRFD_{12.38}$-0.9D+W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 14′ 8″ - Critical

Distance of P_r along member	=14′ 8″ ft, in	
Required tensile strength, P_r	=-1.1 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.006**	

✔ Pass

Axial Compression

175 (Final) $LRFD_{9.17}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural - out-of-plane: 0″ - 14′ 8″ - Critical

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Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 14′ 8″	Flexural - out-of-plane	14′ 8″	1.1	17.2	kip	0.063	✔ Pass

Combined Forces

128 (Final) $LRFD_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Top LTB 0″ - 14′ 8″ - Critical

Axial Tension: 0″ - 14′ 8″ - Critical

Mode	Ratio	Status
Combined buckling	0.123	✔ Pass

Deflection

96 (Final) $LRFD_{8.2}$-1.2D+1.6S+0.5W - Critical

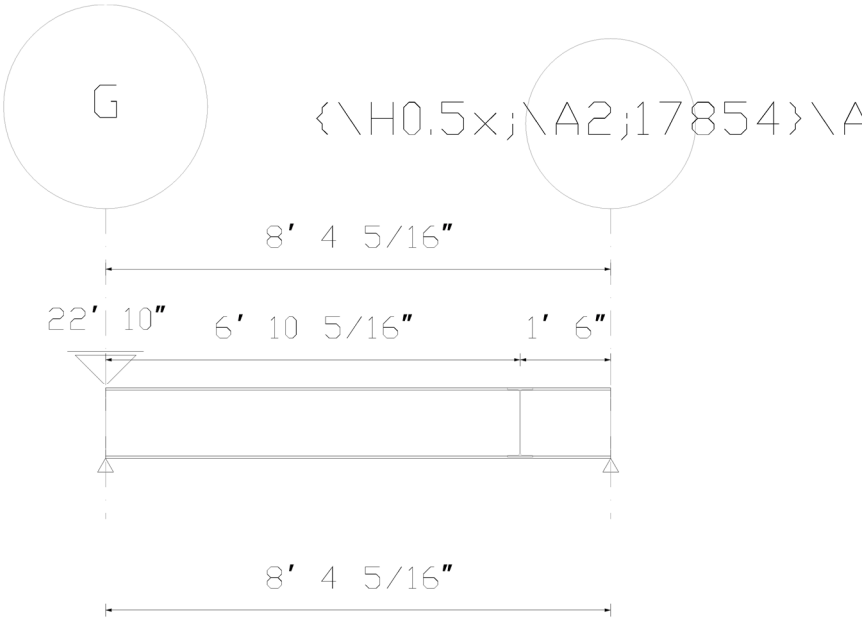
Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=7′ 4″ ft, in
Max. Total load deflection	=0.022 in
Span over limit	=0.489 in
Design limit	=0.489 in
Utilization Ratio	**=0.045**

✔ Pass

TORSB1027



St. TORS (T.O. ROOF STRUCT.): TORSB1027 - W 14x26 A992-50

Static

Summary W 14x26

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	47	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	112	-11.7	106.3	kip	0.110	✔ Pass
Shear Minor	307	0.3	114.1	kip	0.003	✔ Pass
Flexure Major	144	17.4	150.7	kip ft	0.116	✔ Pass
Flexure Minor	307	-0.5	20.8	kip ft	0.022	✔ Pass
Axial Tension	324	-1.3	346.1	kip	0.004	✔ Pass
Axial Compression	175	0.9	237.3	kip	0.004	✔ Pass
Combined Forces	128	-	-	-	0.130	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.001	-	in	-	-
Deflection Dead	1	0.008	0.279	in	0.029	✔ Pass
Deflection Live	21	0.005	0.418	in	0.013	✔ Pass
Deflection Wind	323	-0.004	0.502	in	0.007	✔ Pass
Deflection Total	144	0.019	0.279	in	0.068	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

47 (Final) LRFD$_{7.17}$-1.2D+1.6Lr+0.5W - Critical

Span 1 W 14x26 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x26 A992-50 - Critical

Position 8' 4 5/16" - Critical

Position of V_{ry}	=8' 4 5/16" ft, in	
Required major axis shear strength, V_{ry}	=-11.7 kip	
Design shear strength	=106.3 kip	AISC 360 G2
Ratio	**=0.110**	

✔ Pass

Shear Minor

307 (Final) LRFD$_{12.21}$-0.9D+W - Critical

Span 1 W 14x26 A992-50 - Critical

Position 6' 10 5/16" - Critical

Position of V_{rx}	=6' 10 5/16" ft, in	
Required minor axis shear strength, V_{rx}	=0.3 kip	
Design shear strength	=114.1 kip	AISC 360 G6
Ratio	**=0.003**	

✔ Pass

Flexure Major

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144 (Final) LRFD$_{8.50}$-1.2D+1.6S+0.5W - Critical
Span 1 W 14x26 A992-50 - Critical
Yielding: 6′ 10 5/16″ - Critical

Dist of M_{rx} along member	=6′ 10 5/16″ ft, in	
Required flexural strength, M_{rx1}	=17.4 kip ft	
Design flexural strength	=150.7 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.116**	

✔ Pass

Flexure Minor
307 (Final) LRFD$_{12.21}$-0.9D+W - Critical
Span 1 W 14x26 A992-50 - Critical
Yielding: 6′ 10 5/16″ - Critical

Dist of M_{ry} along member	=6′ 10 5/16″ ft, in	
Required flexural strength, M_{ry1}	=-0.5 kip ft	
Design flexural strength	=20.8 kip ft	AISC 360 F6
Ratio	**=0.022**	

✔ Pass

Axial Tension
324 (Final) LRFD$_{12.38}$-0.9D+W - Critical
Span 1 W 14x26 A992-50 - Critical
Yielding: Position 8′ 4 5/16″ - Critical

Distance of P_r along member	=8′ 4 5/16″ ft, in	
Required tensile strength, P_r	=-1.3 kip	
Design yield strength	=346.1 kip	AISC 360 D2
Ratio	**=0.004**	

✔ Pass

Axial Compression
175 (Final) LRFD$_{9.17}$-1.2D+L+0.5Lr+W - Critical
Span 1 W 14x26 A992-50 - Critical
Flexural torsional: 0″ - 8′ 4 5/16″ - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 8′ 4 5/16″	Flexural torsional	8′ 4 5/16″	0.9	237.3	kip	0.004	✔ Pass

Combined Forces
128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical
Span 1 W 14x26 A992-50 - Critical
Flange Top LTB 6′ 10 5/16″ - 8′ 4 5/16″ - Critical
Axial Tension: 6′ 10 5/16″ - 8′ 4 5/16″ - Critical

Mode	Ratio	Status
Combined buckling	0.130	✔ Pass

Deflection
128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical
Span 1 W 14x26 A992-50 - Critical
Deflection Total - Critical

Position Total load deflection	=4′ 11 97/256″ ft, in	

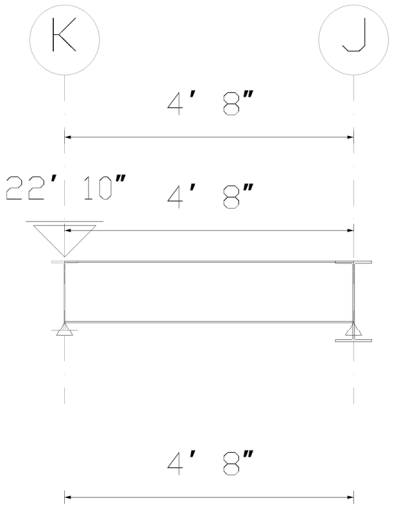
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Max. Total load deflection =0.019 in
Span over limit =0.279 in
Design limit =0.279 in
Utilization Ratio **=0.068**

✔ Pass

TORSB1029



St. TORS (T.O. ROOF STRUCT.): TORSB1029 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	0.2	64.3	kip	0.003	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	96	0.2	62.4	kip ft	0.004	✔ Pass
Flexure Minor	269	-0.2	7.1	kip ft	0.026	✔ Pass
Axial Tension	323	-2.2	187.2	kip	0.012	✔ Pass
Axial Compression	234	4.0	115.5	kip	0.035	✔ Pass
Combined Forces	234	-	-	-	0.041	✔ Pass
Torsion	No Significant Forces			-	-	Not required

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0″ - Critical

Axial Force, P =1.7 kip

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Elastic modulus of steel, E =29000 ksi
Minimum yield stress, F_y =50.00 ksi
Axial section class Slender AISC 360 Table B4.1a

Shear Major
96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
Position 0" - Critical
Position of V_{ry} =0" ft, in
Required major axis shear strength, V_{ry} =0.2 kip
Design shear strength =64.3 kip AISC 360 G2
Ratio **=0.003**
✔ Pass

Flexure Major
96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
LTB Flange Top: 0" - 4' 8" - Critical
Dist of M_{rx1} along member =2' 4" ft, in
Required flexural strength, M_{rx1} =0.2 kip ft
Design flexural strength =62.4 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.004**
✔ Pass

Flexure Minor
269 (Final) LRFD$_{10.47}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Yielding: 2' 4" - Critical
Dist of M_{ry} along member =2' 4" ft, in
Required flexural strength, M_{ry1} =-0.2 kip ft
Design flexural strength =7.1 kip ft AISC 360 F6
Ratio **=0.026**
✔ Pass

Axial Tension
323 (Final) LRFD$_{12.37}$-0.9D+W - Critical
Span 1 W 12x14 A992-50 - Critical
Yielding: Position 4' 8" - Critical
Distance of P_r along member =4' 8" ft, in
Required tensile strength, P_r =-2.2 kip
Design yield strength =187.2 kip AISC 360 D2
Ratio **=0.012**
✔ Pass

Axial Compression
234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Flexural - out-of-plane: 0" - 4' 8" - Critical

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Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 4′ 8″	Flexural - out-of-plane	4′ 8″	4.0	115.5	kip	0.035	✔ Pass

Combined Forces

234 (Final) $LRFD_{10.12}$-1.2D+L+0.5S+W - Critical

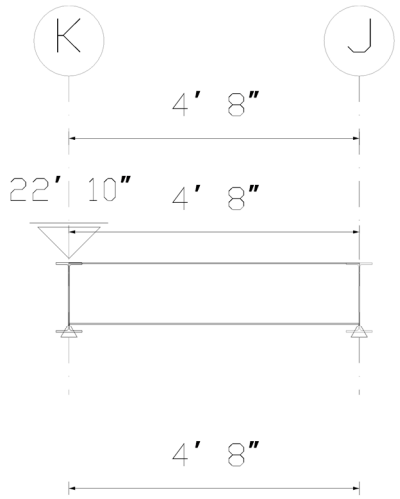
Span 1 W 12x14 A992-50 - Critical

Flange Top LTB 0″ - 4′ 8″ - Critical

Axial Comp: I.P. 0″ - 4′ 8″ , O.o.P.0″ - 4′ 8″ , Tors. 0″ - 4′ 8″ - Critical

Mode	Ratio	Status
Combined buckling	0.041	✔ Pass

TORSB1030



St. TORS (T.O. ROOF STRUCT.): TORSB1030 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	128	0.3	64.3	kip	0.004	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	128	0.3	62.4	kip ft	0.005	✔ Pass
Flexure Minor	286	0.2	7.1	kip ft	0.031	✔ Pass
Axial Tension	291	-2.5	187.2	kip	0.014	✔ Pass
Axial Compression	185	3.2	115.5	kip	0.028	✔ Pass
Combined Forces	286	-	-	-	0.039	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Total	128	0.000	0.156	in	0.003	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

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Project Name: FIRE STATION 5		

Static

Classification

1 (Final) LRFD$_{1}$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.5 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=0.3 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.004**	

✔ Pass

Flexure Major

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Top: 0" - 4' 8" - Critical

Dist of M_{rx1} along member	=2' 4" ft, in	
Required flexural strength, M_{rx1}	=0.3 kip ft	
Design flexural strength	=62.4 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.005**	

✔ Pass

Flexure Minor

286 (Final) LRFD$_{10.64}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: 2' 4" - Critical

Dist of M_{ry} along member	=2' 4" ft, in	
Required flexural strength, M_{ry1}	=0.2 kip ft	
Design flexural strength	=7.1 kip ft	AISC 360 F6
Ratio	**=0.031**	

✔ Pass

Axial Tension

291 (Final) LRFD$_{12.5}$-0.9D+W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 4' 8" - Critical

Distance of P_r along member	=4' 8" ft, in	
Required tensile strength, P_r	=-2.5 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.014**	

✔ Pass

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Project Name: FIRE STATION 5		

Axial Compression

185 (Final) LRFD$_{9.27}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural - out-of-plane: 0" - 4' 8" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 4' 8"	Flexural - out-of-plane	4' 8"	3.2	115.5	kip	0.028	✔ Pass

Combined Forces

286 (Final) LRFD$_{10.64}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Top LTB 0" - 4' 8" - Critical

Axial Tension: 0" - 4' 8" - Critical

Mode	Ratio	Status
Combined buckling	0.039	✔ Pass

Deflection

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

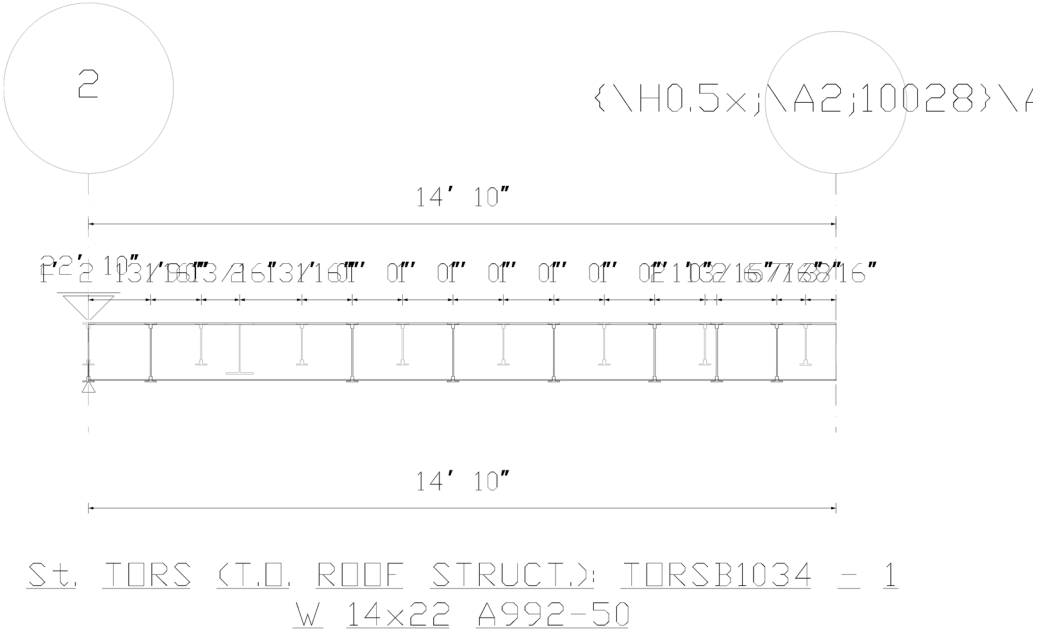
Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=2' 4" ft, in
Max. Total load deflection	=0.000 in
Span over limit	=0.156 in
Design limit	=0.156 in
Utilization Ratio	**=0.003**

✔ Pass

TORSB1034



Static

Summary W 14x22

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	-18.9	94.5	kip	0.200	✔ Pass
Shear Minor	249	-1.6	90.5	kip	0.017	✔ Pass
Flexure Major	158	69.0	124.5	kip ft	0.554	✔ Pass
Flexure Minor	249	-1.5	16.5	kip ft	0.091	✔ Pass
Axial Tension	339	-1.4	292.1	kip	0.005	✔ Pass
Axial Compression	224	2.4	126.5	kip	0.019	✔ Pass
Combined Forces	158	-	-	-	0.591	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.035	-	in	-	-
Deflection Slab	1	0.002	0.742	in	0.002	✔ Pass
Deflection Dead	1	0.175	0.494	in	0.354	✔ Pass
Deflection Live	21	0.084	0.742	in	0.113	✔ Pass
Deflection Wind	307	-0.055	0.890	in	0.061	✔ Pass
Deflection Total	158	0.368	0.494	in	0.744	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.4 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

96 (Final) $LRFD_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Position 14' 10" - Critical

Position of V_{ry}	=14' 10" ft, in	
Required major axis shear strength, V_{ry}	=-18.9 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.200**	

✔ Pass

Shear Minor

249 (Final) $LRFD_{10.27}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Position 2' 2 13/16" - Critical

Position of V_{rx}	=2' 2 13/16" ft, in	
Required minor axis shear strength, V_{rx}	=-1.6 kip	
Design shear strength	=90.5 kip	AISC 360 G6
Ratio	**=0.017**	

✔ Pass

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Flexure Major

158 (Final) LRFD$_{8.64}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Yielding: 7′ 2 13/16″ - Critical

Dist of M_{rx} along member	=7′ 2 13/16″ ft, in	
Required flexural strength, M_{rx1}	=69.0 kip ft	
Design flexural strength	=124.5 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.554**	

✔ Pass

Flexure Minor

249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Yielding: 3′ 0″ - Critical

Dist of M_{ry} along member	=3′ 0″ ft, in	
Required flexural strength, M_{ry1}	=-1.5 kip ft	
Design flexural strength	=16.5 kip ft	AISC 360 F6
Ratio	**=0.091**	

✔ Pass

Axial Tension

339 (Final) LRFD$_{12.53}$-0.9D+W - Critical

Span 1 W 14x22 A992-50 - Critical

Yielding: Position 14′ 10″ - Critical

Distance of P_r along member	=14′ 10″ ft, in	
Required tensile strength, P_r	=-1.4 kip	
Design yield strength	=292.1 kip	AISC 360 D2
Ratio	**=0.005**	

✔ Pass

Axial Compression

224 (Final) LRFD$_{10.2}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural torsional: 0″ - 14′ 10″ - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 14′ 10″	Flexural torsional	14′ 10″	2.4	126.5	kip	0.019	✔ Pass

Combined Forces

158 (Final) LRFD$_{8.64}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Flange Btm LTB 0″ - 14′ 10″ - Critical

Axial Comp: I.P. 0″ - 14′ 10″ , O.o.P.0″ - 1′ 2 13/16″ , Tors. 0″ - 14′ 10″ - Critical

Mode	Ratio	Status
Combined buckling	0.591	✔ Pass

Deflection

158 (Final) LRFD$_{8.64}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

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Position Total load deflection	=7' 5 9/128" ft, in
Max. Total load deflection	=0.368 in
Span over limit	=0.494 in
Design limit	=0.494 in
Utilization Ratio	**=0.744**

✔ Pass

TORS-LB996



St. TORS-L (T.O. ROOF STRUCT LOW): TORS-LB996 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	103	-1.7	64.3	kip	0.027	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	103	-13.4	27.9	kip ft	0.481	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	106	3.4	14.5	kip	0.235	✔ Pass
Combined Forces	106	-	-	-	0.554	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Slab	1	-0.012	0.800	in	0.015	✔ Pass
Deflection Dead	1	-0.004	0.533	in	0.007	✔ Pass
Deflection Live	21	-0.003	0.533	in	0.006	✔ Pass
Deflection Wind	295	0.005	0.960	in	0.005	✔ Pass
Deflection Total	103	-0.033	0.800	in	0.041	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

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Axial Force, P =2.8 kip
Elastic modulus of steel, E =29000 ksi
Minimum yield stress, F_y =50.00 ksi
Axial section class Slender AISC 360 Table B4.1a

Shear Major
103 (Final) LRFD$_{8.9}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
Position 16′ 0″ - Critical
Position of V_{ry} =16′ 0″ ft, in
Required major axis shear strength, V_{ry} =-1.7 kip
Design shear strength =64.3 kip AISC 360 G2
Ratio **=0.027**
✔ Pass

Flexure Major
103 (Final) LRFD$_{8.9}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
LTB Flange Btm: 0″ - 16′ 0″ - Critical
Dist of M_{rx1} along member =16′ 0″ ft, in
Required flexural strength, M_{rx1} =-13.4 kip ft
Design flexural strength =27.9 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.481**
✔ Pass

Axial Compression
106 (Final) LRFD$_{8.12}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
Flexural - out-of-plane: 0″ - 16′ 0″ - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 16′ 0″	Flexural - out-of-plane	16′ 0″	3.4	14.5	kip	0.235	✔ Pass

Combined Forces
106 (Final) LRFD$_{8.12}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
Flange Btm LTB 0″ - 16′ 0″ - Critical
Axial Comp: I.P. 0″ - 16′ 0″ , O.o.P.0″ - 16′ 0″ , Tors. 0″ - 16′ 0″ - Critical

Mode	Ratio	Status
In-plane instability	0.217	✔ Pass
Out-of-plane instability	0.554	✔ Pass

Deflection
103 (Final) LRFD$_{8.9}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
Deflection Total - Critical
Position Total load deflection =12′ 5 29/128″ ft, in
Max. Total load deflection =-0.033 in
Span over limit =0.800 in
Design limit =0.800 in
Utilization Ratio **=0.041**

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✔ Pass

TORS-LB997



St. TORS-L (T.O. ROOF STRUCT LOW): TORS-LB997 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	267	0.8	64.3	kip	0.012	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	267	-6.5	28.1	kip ft	0.231	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	234	5.4	14.5	kip	0.375	✔ Pass
Combined Forces	106	-	-	-	0.528	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Slab	1	-0.009	0.800	in	0.011	✔ Pass
Deflection Dead	1	-0.003	0.533	in	0.006	✔ Pass
Deflection Live	11	-0.003	0.533	in	0.005	✔ Pass
Deflection Wind	307	0.003	0.960	in	0.003	✔ Pass
Deflection Total	144	-0.024	0.800	in	0.030	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=4.5 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

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Shear Major

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=0.8 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.012**	

✔ Pass

Flexure Major

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Btm: 0" - 16' 0" - Critical

Dist of M_{rx1} along member	=0" ft, in	
Required flexural strength, M_{rx1}	=-6.5 kip ft	
Design flexural strength	=28.1 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.231**	

✔ Pass

Axial Compression

234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural - out-of-plane: 0" - 16' 0" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 16' 0"	Flexural - out-of-plane	16' 0"	5.4	14.5	kip	0.375	✔ Pass

Combined Forces

106 (Final) LRFD$_{8.12}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Btm LTB 0" - 16' 0" - Critical

Axial Comp: I.P. 0" - 16' 0" , O.o.P.0" - 16' 0" , Tors. 0" - 16' 0" - Critical

Mode	Ratio	Status
In-plane instability	0.100	✔ Pass
Out-of-plane instability	0.528	✔ Pass

Deflection

144 (Final) LRFD$_{8.50}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

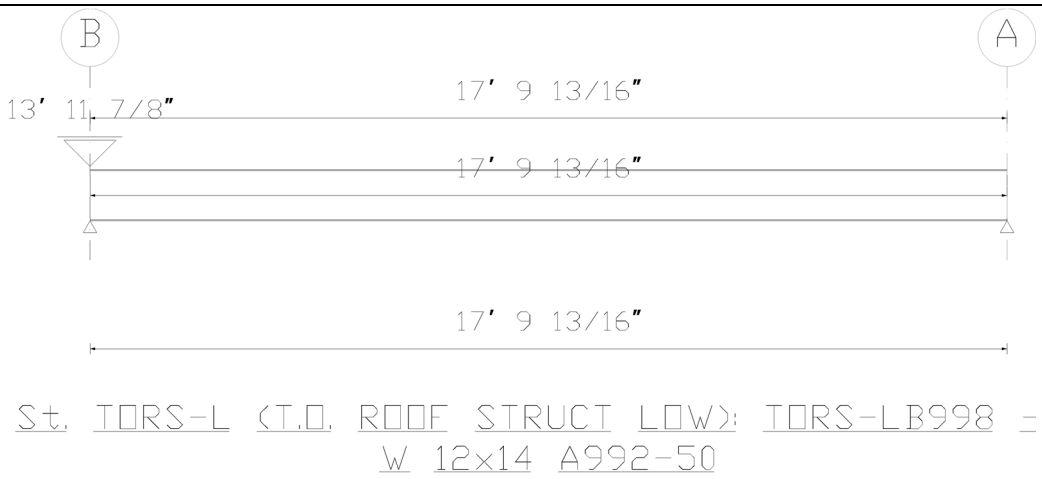
Position Total load deflection	=4' 7 11/128" ft, in	
Max. Total load deflection	=-0.024 in	
Span over limit	=0.800 in	
Design limit	=0.800 in	
Utilization Ratio	**=0.030**	

✔ Pass

TORS-LB998

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Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	203	0.5	64.3	kip	0.008	Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	203	-3.5	21.2	kip ft	0.166	Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	333	-1.3	187.2	kip	0.007	Pass
Axial Compression	234	4.1	11.7	kip	0.351	Pass
Combined Forces	298	-	-	-	0.444	Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.004	-	in	-	-
Deflection Slab	1	0.002	0.891	in	0.002	Pass
Deflection Live	6	0.002	0.594	in	0.003	Pass
Deflection Wind	298	-0.008	1.069	in	0.007	Pass
Deflection Total	205	0.012	0.891	in	0.014	Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=1.9 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

203 (Final) $LRFD_{9.45}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

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Position of V_{ry} =0" ft, in
Required major axis shear strength, V_{ry} =0.5 kip
Design shear strength =64.3 kip AISC 360 G2
Ratio **=0.008**

✔ Pass

Flexure Major

203 (Final) LRFD$_{9.45}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Btm: 0" - 17' 9 13/16" - Critical

Dist of M_{rx1} along member =0" ft, in
Required flexural strength, M_{rx1} =-3.5 kip ft
Design flexural strength =21.2 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.166**

✔ Pass

Axial Tension

333 (Final) LRFD$_{12.47}$-0.9D+W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member =0" ft, in
Required tensile strength, P_r =-1.3 kip
Design yield strength =187.2 kip AISC 360 D2
Ratio **=0.007**

✔ Pass

Axial Compression

234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural - out-of-plane: 0" - 17' 9 13/16" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 17' 9 13/16"	Flexural - out-of-plane	17' 9 13/16"	4.1	11.7	kip	0.351	✔ Pass

Combined Forces

298 (Final) LRFD$_{12.12}$-0.9D+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Btm LTB 0" - 17' 9 13/16" - Critical

Axial Comp: I.P. 0" - 17' 9 13/16" , O.o.P.0" - 17' 9 13/16" , Tors. 0" - 17' 9 13/16" - Critical

Mode	Ratio	Status
In-plane instability	0.042	✔ Pass
Out-of-plane instability	0.444	✔ Pass

Deflection

205 (Final) LRFD$_{9.47}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =12' 8 101/128" ft, in
Max. Total load deflection =0.012 in
Span over limit =0.891 in

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Design limit =0.891 in
Utilization Ratio **=0.014**

✔ Pass

TORS-LB999



St. TORS-L (T.O. ROOF STRUCT LOW): TORS-LB999 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	29	-2.5	64.3	kip	0.039	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	29	-19.7	27.7	kip ft	0.709	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	137	3.0	14.5	kip	0.205	✔ Pass
Combined Forces	29	-	-	-	0.780	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.006	-	in	-	-
Deflection Slab	1	-0.013	0.800	in	0.017	✔ Pass
Deflection Dead	1	-0.010	0.533	in	0.018	✔ Pass
Deflection Live	11	0.011	0.533	in	0.020	✔ Pass
Deflection Wind	339	-0.007	0.960	in	0.008	✔ Pass
Deflection Total	240	0.041	0.800	in	0.052	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P =2.2 kip
Elastic modulus of steel, E =29000 ksi

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Minimum yield stress, F_y =50.00 ksi
Axial section class Slender AISC 360 Table B4.1a

Shear Major
29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$ - Critical
Span 1 W 12x14 A992-50 - Critical
Position 16′ 0″ - Critical
Position of V_{ry} =16′ 0″ ft, in
Required major axis shear strength, V_{ry} =-2.5 kip
Design shear strength =64.3 kip AISC 360 G2
Ratio **=0.039**
✔ Pass

Flexure Major
29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$ - Critical
Span 1 W 12x14 A992-50 - Critical
LTB Flange Btm: 0″ - 16′ 0″ - Critical
Dist of M_{rx1} along member =16′ 0″ ft, in
Required flexural strength, M_{rx1} =-19.7 kip ft
Design flexural strength =27.7 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.709**
✔ Pass

Axial Compression
137 (Final) LRFD$_{8.43}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
Flexural - out-of-plane: 0″ - 16′ 0″ - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 16′ 0″	Flexural - out-of-plane	16′ 0″	3.0	14.5	kip	0.205	✔ Pass

Combined Forces
29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$ - Critical
Span 1 W 12x14 A992-50 - Critical
Flange Btm LTB 0″ - 16′ 0″ - Critical
Axial Comp: I.P. 0″ - 16′ 0″ , O.o.P.0″ - 16′ 0″ , Tors. 0″ - 16′ 0″ - Critical

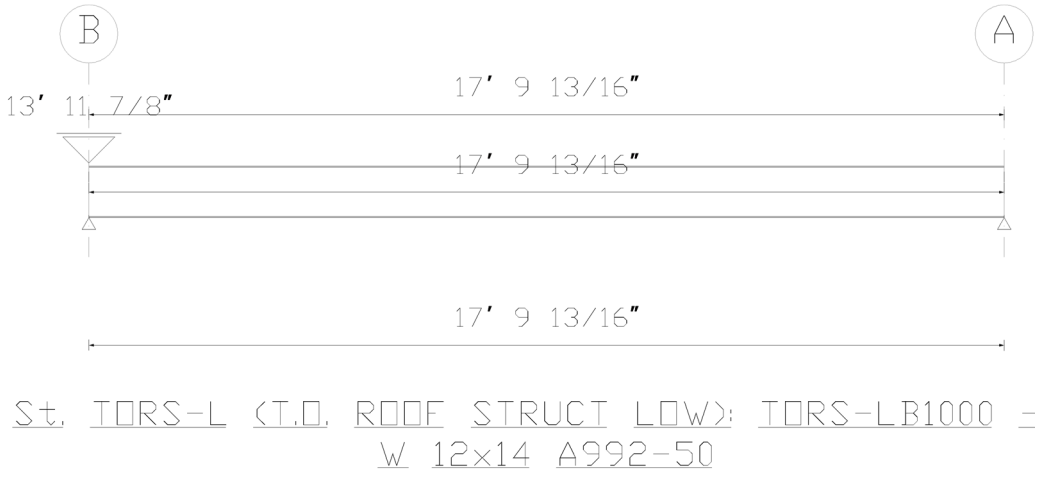
Mode	Ratio	Status
In-plane instability	0.311	✔ Pass
Out-of-plane instability	0.780	✔ Pass

Deflection
240 (Final) LRFD$_{10.18}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Deflection Total - Critical
Position Total load deflection =3′ 5 23/256″ ft, in
Max. Total load deflection =0.041 in
Span over limit =0.800 in
Design limit =0.800 in
Utilization Ratio **=0.052**
✔ Pass

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TORS-LB1000



Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	211	0.6	64.3	kip	0.010	✓ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	211	4.4	21.1	kip ft	0.210	✓ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	339	-1.8	187.2	kip	0.009	✓ Pass
Axial Compression	249	5.1	11.7	kip	0.441	✓ Pass
Combined Forces	240	-	-	-	0.570	✓ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.004	-	in	-	-
Deflection Slab	1	0.002	0.891	in	0.003	✓ Pass
Deflection Dead	1	-0.001	0.594	in	0.001	✓ Pass
Deflection Live	6	0.003	0.594	in	0.005	✓ Pass
Deflection Wind	335	0.011	1.069	in	0.010	✓ Pass
Deflection Total	207	0.015	0.891	in	0.017	✓ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=2.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

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211 (Final) LRFD$_{9.53}$-1.2D+L+0.5Lr+W - Critical
Span 1 W 12x14 A992-50 - Critical
Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=0.6 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.010**	

✔ Pass

Flexure Major
211 (Final) LRFD$_{9.53}$-1.2D+L+0.5Lr+W - Critical
Span 1 W 12x14 A992-50 - Critical
LTB Flange Top: 0" - 17' 9 13/16" - Critical

Dist of M_{rx1} along member	=17' 9 13/16" ft, in	
Required flexural strength, M_{rx1}	=4.4 kip ft	
Design flexural strength	=21.1 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.210**	

✔ Pass

Axial Tension
339 (Final) LRFD$_{12.53}$-0.9D+W - Critical
Span 1 W 12x14 A992-50 - Critical
Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-1.8 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.009**	

✔ Pass

Axial Compression
249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Flexural - out-of-plane: 0" - 17' 9 13/16" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 17' 9 13/16"	Flexural - out-of-plane	17' 9 13/16"	5.1	11.7	kip	0.441	✔ Pass

Combined Forces
240 (Final) LRFD$_{10.18}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Flange Btm LTB 0" - 17' 9 13/16" - Critical
Axial Comp: I.P. 0" - 17' 9 13/16" , O.o.P.0" - 17' 9 13/16" , Tors. 0" - 17' 9 13/16" - Critical

Mode	Ratio	Status
In-plane instability	0.052	✔ Pass
Out-of-plane instability	0.570	✔ Pass

Deflection
207 (Final) LRFD$_{9.49}$-1.2D+L+0.5Lr+W - Critical
Span 1 W 12x14 A992-50 - Critical
Deflection Total - Critical

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Position Total load deflection	=12' 9 15/128" ft, in
Max. Total load deflection	=0.015 in
Span over limit	=0.891 in
Design limit	=0.891 in
Utilization Ratio	**=0.017**

✔ Pass

Beam Design Summary

Static

Member Reference	Group Ref.	Span	Section	Grade	Length [ft, in]	No. Connectors	Camber	Utilization	Status
TORSB108	SBR80	1	W 12x26	A992-50	21' 6 5/16"		0.00	0.285	⚠ Warning
TORSB7	SBR97	1	L 4x4x3/8	A992-50	2' 0"		0.00	0.088	✔ Pass
TORSB46	SBR78	1	W 12x26	A992-50	17' 15/16"		0.00	0.055	⚠ Warning
TORSB1034	SBR70	1	W 14x22	A992-50	14' 10"		0.00	0.744	✔ Pass
TORSB1030	SBR124	1	W 12x14	A992-50	4' 8"		0.00	0.039	✔ Pass
TORSB1029	SBR125	1	W 12x14	A992-50	4' 8"		0.00	0.041	✔ Pass
TORSB1027	SBR72	1	W 14x26	A992-50	8' 4 5/16"		0.00	0.130	✔ Pass
TORSB1026	SBR15	1	W 12x14	A992-50	14' 8"		0.00	0.123	✔ Pass
TORSB1	SBR18	1	W 16x36	A992-50	26' 6"		0.00	0.759	✔ Pass
TORSB1024	SBR73	1	W 12x14	A992-50	7' 7"		0.00	0.123	✔ Pass
TORSB1023	SBR74	1	W 16x36	A992-50	29' 7"		0.00	0.702	✔ Pass
TORSB1022	SBR113	1	W 14x22	A992-50	16' 4"		0.00	0.379	✔ Pass
TORSB1021	SBR121	1	W 14x22	A992-50	16' 4"		0.00	0.346	✔ Pass
ABRB9	SBR20	1	W 24x192	A992-50	51' 7 5/8"		0.00	0.889	✔ Pass
ABRB10	SBR93	1	W 18x55	A992-50	18' 11 5/8"		0.00	0.702	✔ Pass
TORSB1017	SBR114	1	W 14x22	A992-50	13' 4"		0.00	0.399	✔ Pass
TORSB1016	SBR110	1	W 14x26	A992-50	23' 11 1/4"		0.00	0.499	✔ Pass
TORSB1015	SBR76	1	W 12x14	A992-50	7' 10 3/8"		0.00	0.025	✔ Pass
TORSB1014	SBR77	1	W 12x14	A992-50	6' 9 5/8"		0.00	0.015	✔ Pass
TOM-LB1007	SBR139	1	W 12x14	A992-50	17' 9 13/16"		0.00	0.233	✔ Pass
TOM-LB1006	SBR129	1	W 12x14	A992-50	16' 0"		0.00	0.261	✔ Pass
TOM-LB1004	SBR137	1	W 12x14	A992-50	17' 9 13/16"		0.00	0.278	✔ Pass
TOM-LB1003	SBR135	1	W 12x14	A992-50	16' 0"		0.00	0.323	✔ Pass
TOM-LB1002	SBR136	1	W 12x14	A992-50	16' 0"		0.00	0.729	✔ Pass

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Project Name: FIRE STATION 5		

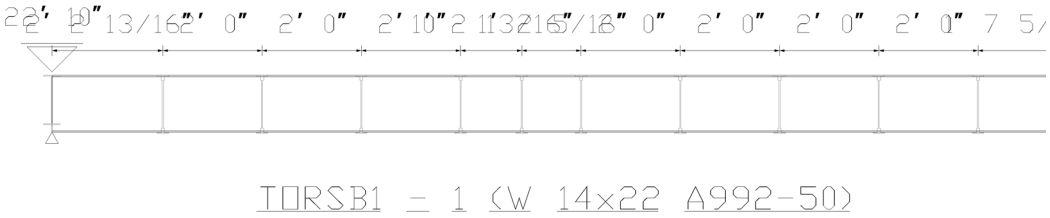
Member Reference	Group Ref.	Span	Section	Grade	Length [ft, in]	No. Connectors	Camber	Utilization	Status
TORSB45	SBR78	1	W 12x26	A992-50	17' 15/16"		0.00	0.053	Warning
TORS-LB1000	SBR140	1	W 12x14	A992-50	17' 9 13/16"		0.00	0.570	Pass
TORS-LB999	SBR142	1	W 12x14	A992-50	16' 0"		0.00	0.780	Pass
TORS-LB998	SBR144	1	W 12x14	A992-50	17' 9 13/16"		0.00	0.444	Pass
TORS-LB997	SBR79	1	W 12x14	A992-50	16' 0"		0.00	0.528	Pass
TORS-LB996	SBR143	1	W 12x14	A992-50	16' 0"		0.00	0.554	Pass
L2B995	SBR71	1	W 12x14	A992-50	9' 5 5/8"		0.00	0.245	Pass
L2B994	SBR80	1	W 14x22	A992-50	21' 6 5/16"		0.00	0.584	Pass
L2B993	SBR80	1	W 14x22	A992-50	21' 6 5/16"		0.00	0.599	Pass
L2B988	SBR82	1	W 12x19	A992-50	17' 15/16"		0.00	0.765	Pass
L2B987	SBR80	1	W 14x22	A992-50	21' 6 5/16"		0.00	0.828	Pass
L2B986	SBR69	1	W 16x31	A992-50	16' 4"		0.00	0.922	Pass
L2B985	SBR23	1	W 12x14	A992-50	10' 10 7/16"		0.00	0.967	Pass
L2B984	SBR70	1	W 14x22	A992-50	14' 5 13/16"		0.00	0.826	Pass
L2B983	SBR21	1	W 14x22	A992-50	13' 4"		0.00	0.934	Pass
L2B982	SBR120	1	W 14x22	A992-50	16' 4"		0.00	0.819	Pass
L2B981	SBR122	1	W 12x19	A992-50	8' 4 5/16"		0.00	0.473	Pass
L2B980	SBR15	1	W 12x14	A992-50	14' 8"		0.00	0.439	Pass
L2B979	SBR83	1	W 12x19	A992-50	12' 0"		0.00	0.578	Pass
L2B978	SBR70	1	W 12x19	A992-50	14' 6"		0.00	0.737	Pass
L2B977	SBR73	1	W 12x14	A992-50	7' 7"		0.00	0.286	Pass
L2B976	SBR123	1	W 24x55	A992-50	29' 7"		0.00	0.671	Pass
L2B975	SBR23	1	W 12x14	A992-50	10' 9 5/8"		0.00	0.615	Pass
L2B973	SBR112	1	W 14x22	A992-50	16' 4"		0.00	0.736	Pass
L2B972	SBR115	1	W 14x22	A992-50	13' 4"		0.00	0.542	Pass
L2B971	SBR111	1	W 14x34	A992-50	23' 11 1/4"		0.00	0.711	Pass
L2B970	SBR76	1	W 12x14	A992-50	7' 10 3/8"		0.00	0.018	Pass
L2B14	SBR129	1	W 14x22	A992-50	15' 6 15/16"		0.00	0.077	Pass
TORSB44	SBR130	1	W 14x22	A992-50	15' 6 15/16"		0.00	0.088	Pass

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Member Reference	Group Ref.	Span	Section	Grade	Length [ft, in]	No. Connectors	Camber	Utilization	Status
TOM-LB2	SBR138	1	W 12x14	A992-50	16′ 0″		0.00	0.511	✔ Pass
L2B13	SBR81	1	W 16x26	A992-50	18′ 11 5/8″		0.00	0.784	✔ Pass

TORSB1



Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	287	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	128	14.0	94.5	kip	0.148	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	128	-28.6	33.8	kip ft	0.845	✔ Pass
Flexure Minor	106	0.2	16.5	kip ft	0.010	✔ Pass
Axial Tension	118	-3.5	292.1	kip	0.012	✔ Pass
Axial Compression	319	0.4	95.5	kip	0.004	✔ Pass
Combined Forces	128	-	-	-	0.818	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.023	-	in	-	-
Deflection Dead	1	0.252	0.676	in	0.372	✔ Pass
Deflection Live	21	0.106	1.014	in	0.104	✔ Pass
Deflection Wind	307	-0.066	1.216	in	0.054	✔ Pass
Deflection Total	158	0.464	0.676	in	0.687	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

287 (Final) $LRFD_{12.1}$-0.9D+W - Critical

Span 1 W 14x22 A992-50 - Critical

Axial: Position 0″ - Critical

Axial Force, P	=0.4 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

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Shear Major

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=14.0 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.148**	

✔ Pass

Flexure Major

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

LTB Flange Btm: 0" - 20' 3 1/4" - Critical

Dist of M_{rx1} along member	=0" ft, in	
Required flexural strength, M_{rx1}	=-28.6 kip ft	
Design flexural strength	=33.8 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.845**	

✔ Pass

Flexure Minor

106 (Final) LRFD$_{8.12}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Yielding: 18' 7 15/16" - Critical

Dist of M_{ry} along member	=18' 7 15/16" ft, in	
Required flexural strength, M_{ry1}	=0.2 kip ft	
Design flexural strength	=16.5 kip ft	AISC 360 F6
Ratio	**=0.010**	

✔ Pass

Axial Tension

118 (Final) LRFD$_{8.24}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Yielding: Position 16' 7 15/16" - Critical

Distance of P_r along member	=16' 7 15/16" ft, in	
Required tensile strength, P_r	=-3.5 kip	
Design yield strength	=292.1 kip	AISC 360 D2
Ratio	**=0.012**	

✔ Pass

Axial Compression

319 (Final) LRFD$_{12.33}$-0.9D+W - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural torsional: 0" - 20' 3 1/4" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 20' 3 1/4"	Flexural torsional	20' 3 1/4"	0.4	95.5	kip	0.004	✔ Pass

Combined Forces

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

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Span 1 W 14x22 A992-50 - Critical
Flange Btm LTB 0" - 20' 3 1/4" - Critical
Axial Tension: 0" - 20' 3 1/4" - Critical

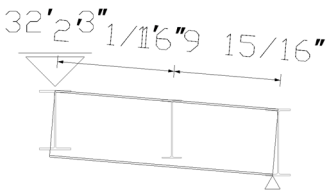
Mode	Ratio	Status
Combined buckling	0.818	✔ Pass

Deflection
158 (Final) $LRFD_{8.64}$-1.2D+1.6S+0.5W - Critical
Span 1 W 14x22 A992-50 - Critical
Deflection Total - Critical

Position Total load deflection	=9' 11 191/256" ft, in
Max. Total load deflection	=0.464 in
Span over limit	=0.676 in
Design limit	=0.676 in
Utilization Ratio	**=0.687**

✔ Pass

UPPER SLOPED ROOFB2



UPPER SLOPED ROOF: UPPER SLOPED ROOFB2 - W 14x22 A992-50

Static
Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	-3.3	94.5	kip	0.035	✔ Pass
Shear Minor	230	-0.2	90.5	kip	0.002	✔ Pass
Flexure Major	96	-8.6	123.3	kip ft	0.070	✔ Pass
Flexure Minor	191	0.5	16.5	kip ft	0.028	✔ Pass
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	117	0.3	238.7	kip	0.001	✔ Pass
Combined Forces	102	-	-	-	0.087	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.002	-	in	-	-
Deflection Dead	1	0.003	0.256	in	0.013	✔ Pass
Deflection Live	21	0.002	0.256	in	0.009	✔ Pass
Deflection Wind	323	-0.002	0.256	in	0.006	✔ Pass
Deflection Total	96	0.010	0.384	in	0.026	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

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Static

Classification

1 (Final) LRFD$_{1}$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Axial: Position 2' 21/256" - Critical

Axial Force, P	=0.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Position 3' 10 1/32" - Critical

Position of V_{ry}	=3' 10 1/32" ft, in	
Required major axis shear strength, V_{ry}	=-3.3 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.035**	

✔ Pass

Shear Minor

230 (Final) LRFD$_{10.8}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Position 2' 21/256" - Critical

Position of V_{rx}	=2' 21/256" ft, in	
Required minor axis shear strength, V_{rx}	=-0.2 kip	
Design shear strength	=90.5 kip	AISC 360 G6
Ratio	**=0.002**	

✔ Pass

Flexure Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

LTB Flange Btm: 0" - 3' 10 1/32" - Critical

Dist of M_{rx1} along member	=3' 10 1/32" ft, in	
Required flexural strength, M_{rx1}	=-8.6 kip ft	
Design flexural strength	=123.3 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.070**	

✔ Pass

Flexure Minor

191 (Final) LRFD$_{9.33}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 14x22 A992-50 - Critical

Yielding: 3' 10 1/32" - Critical

Dist of M_{ry} along member	=3' 10 1/32" ft, in	
Required flexural strength, M_{ry1}	=0.5 kip ft	
Design flexural strength	=16.5 kip ft	AISC 360 F6
Ratio	**=0.028**	

✔ Pass

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Axial Compression

117 (Final) LRFD$_{8.23}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural torsional: 0" - 3' 10 1/32" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 3' 10 1/32"	Flexural torsional	3' 10 1/32"	0.3	238.7	kip	0.001	✔ Pass

Combined Forces

102 (Final) LRFD$_{8.8}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Flange Btm LTB 0" - 3' 10 1/32" - Critical

Axial Comp: I.P. 0" - 3' 10 1/32" , O.o.P.0" - 2' 21/256" , Tors. 0" - 3' 10 1/32" - Critical

Mode	Ratio	Status
Combined buckling	0.087	✔ Pass

Deflection

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =0" ft, in

Max. Total load deflection =0.010 in

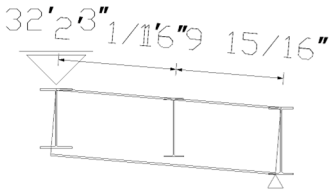
Span over limit =0.384 in

Design limit =0.384 in

Utilization Ratio **=0.026**

✔ Pass

UPPER SLOPED ROOFB1



UPPER SLOPED ROOF: UPPER SLOPED ROOFB1 - W 14x22 A992-50

Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	-3.3	94.5	kip	0.035	✔ Pass
Shear Minor	259	0.2	90.5	kip	0.002	✔ Pass
Flexure Major	128	-8.6	123.3	kip ft	0.070	✔ Pass
Flexure Minor	288	-0.4	16.5	kip ft	0.026	✔ Pass
Axial Tension	No Significant Forces			kip	-	Not required

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Compression	118	0.3	238.7	kip	0.001	✔ Pass
Combined Forces	96	-	-	-	0.087	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.002	-	in	-	-
Deflection Dead	1	0.003	0.256	in	0.013	✔ Pass
Deflection Live	21	0.002	0.256	in	0.009	✔ Pass
Deflection Wind	291	-0.002	0.256	in	0.006	✔ Pass
Deflection Total	128	0.010	0.384	in	0.026	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_{1}$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Axial: Position 2' 21/256" - Critical

Axial Force, P	=0.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Position 3' 10 1/32" - Critical

Position of V_{ry}	=3' 10 1/32" ft, in	
Required major axis shear strength, V_{ry}	=-3.3 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.035**	

✔ Pass

Shear Minor

259 (Final) LRFD$_{10.37}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Position 2' 21/256" - Critical

Position of V_{rx}	=2' 21/256" ft, in	
Required minor axis shear strength, V_{rx}	=0.2 kip	
Design shear strength	=90.5 kip	AISC 360 G6
Ratio	**=0.002**	

✔ Pass

Flexure Major

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

LTB Flange Btm: 0" - 3' 10 1/32" - Critical

Dist of M_{rx1} along member	=3' 10 1/32" ft, in	
Required flexural strength, M_{rx1}	=-8.6 kip ft	
Design flexural strength	=123.3 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.070**	

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✔ Pass

Flexure Minor

288 (Final) LRFD$_{12.2}$-0.9D+W - Critical

Span 1 W 14x22 A992-50 - Critical

Yielding: 3′ 10 1/32″ - Critical

Dist of M_{ry} along member	=3′ 10 1/32″ ft, in	
Required flexural strength, M_{ry1}	=-0.4 kip ft	
Design flexural strength	=16.5 kip ft	AISC 360 F6
Ratio	**=0.026**	

✔ Pass

Axial Compression

118 (Final) LRFD$_{8.24}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural torsional: 0″ - 3′ 10 1/32″ - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 3′ 10 1/32″	Flexural torsional	3′ 10 1/32″	0.3	238.7	kip	0.001	✔ Pass

Combined Forces

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Flange Btm LTB 0″ - 3′ 10 1/32″ - Critical

Axial Comp: I.P. 0″ - 3′ 10 1/32″ , O.o.P.0″ - 2′ 21/256″ , Tors. 0″ - 3′ 10 1/32″ - Critical

Mode	Ratio	Status
Combined buckling	0.087	✔ Pass

Deflection

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

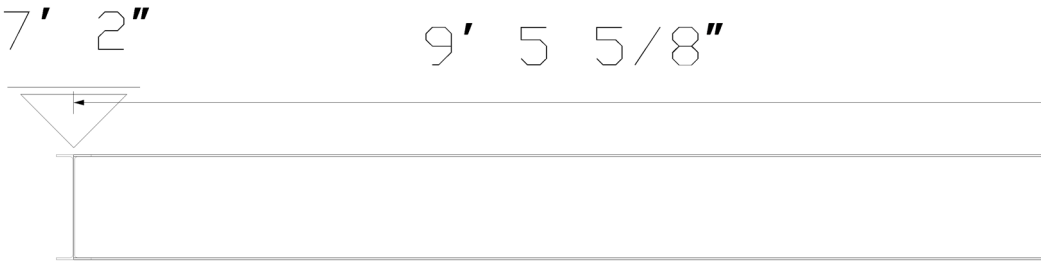
Position Total load deflection	=0″ ft, in
Max. Total load deflection	=0.010 in
Span over limit	=0.384 in
Design limit	=0.384 in
Utilization Ratio	**=0.026**

✔ Pass

B13

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B13 – 1
W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	No Significant Forces			kip	-	Not required
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	1	0.2	31.2	kip ft	0.007	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.001	-	in	-	-
Deflection Total	1	0.001	0.316	in	0.003	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 4' 8 13/16" - Critical

Moment, M_x	=0.2 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Flexure Major

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Top: 0" - 9' 5 5/8" - Critical

Dist of M_{rx1} along member =4' 8 13/16" ft, in

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Required flexural strength, M_{rx1} =0.2 kip ft
Design flexural strength =31.2 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.007**

✔ Pass

Deflection

1 (Final) $LRFD_1$-1.4D - Critical

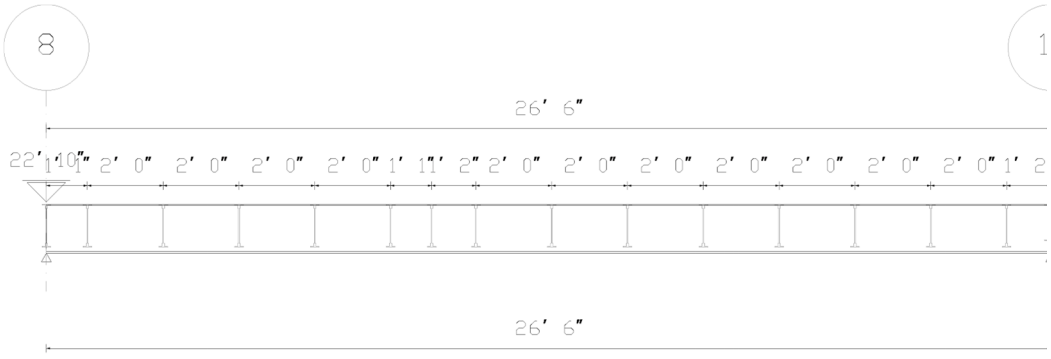
Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =4' 8 13/16" ft, in
Max. Total load deflection =0.001 in
Span over limit =0.316 in
Design limit =0.316 in
Utilization Ratio **=0.003**

✔ Pass

TORSB1



St, TORS (T.O. ROOF STRUCT.): TORSB1 - 1
W 16x36 A992-50

Static

Summary W 16x36

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	55	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	13.7	140.7	kip	0.097	✔ Pass
Shear Minor	163	-0.3	162.3	kip	0.002	✔ Pass
Flexure Major	112	94.2	240.0	kip ft	0.393	✔ Pass
Flexure Minor	227	-0.5	40.5	kip ft	0.013	✔ Pass
Axial Tension	276	-1.4	477.0	kip	0.003	✔ Pass
Axial Compression	255	0.6	180.8	kip	0.003	✔ Pass
Combined Forces	112	-	-	-	0.398	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.058	-	in	-	-
Deflection Dead	1	0.281	0.883	in	0.318	✔ Pass
Deflection Live	21	0.187	1.325	in	0.141	✔ Pass
Deflection Wind	323	-0.123	1.590	in	0.077	✔ Pass
Deflection Total	112	0.670	0.883	in	0.759	✔ Pass

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Revision:	Date:	Sheet No. 472
Project Name: FIRE STATION 5		

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

55 (Final) LRFD$_{7.25}$-1.2D+1.6Lr+0.5W - Critical

Span 1 W 16x36 A992-50 - Critical

Axial: Position 21' 4" - Critical

Axial Force, P	=0.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 16x36 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=13.7 kip	
Design shear strength	=140.7 kip	AISC 360 G2
Ratio	**=0.097**	

✔ Pass

Shear Minor

163 (Final) LRFD$_{9.5}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 16x36 A992-50 - Critical

Position 0" - Critical

Position of V_{rx}	=0" ft, in	
Required minor axis shear strength, V_{rx}	=-0.3 kip	
Design shear strength	=162.3 kip	AISC 360 G6
Ratio	**=0.002**	

✔ Pass

Flexure Major

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical

Span 1 W 16x36 A992-50 - Critical

Yielding: 13' 4" - Critical

Dist of M_{rx} along member	=13' 4" ft, in	
Required flexural strength, M_{rx1}	=94.2 kip ft	
Design flexural strength	=240.0 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.393**	

✔ Pass

Flexure Minor

227 (Final) LRFD$_{10.5}$-1.2D+L+0.5S+W - Critical

Span 1 W 16x36 A992-50 - Critical

Yielding: 10' 2" - Critical

Dist of M_{ry} along member	=10' 2" ft, in	
Required flexural strength, M_{ry1}	=-0.5 kip ft	
Design flexural strength	=40.5 kip ft	AISC 360 F6

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Ratio **=0.013**

✔ Pass

Axial Tension

276 (Final) LRFD$_{10.54}$-1.2D+L+0.5S+W - Critical

Span 1 W 16x36 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member =0" ft, in

Required tensile strength, P_r =-1.4 kip

Design yield strength =477.0 kip AISC 360 D2

Ratio **=0.003**

✔ Pass

Axial Compression

255 (Final) LRFD$_{10.33}$-1.2D+L+0.5S+W - Critical

Span 1 W 16x36 A992-50 - Critical

Flexural torsional: 0" - 26' 6" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 26' 6"	Flexural torsional	26' 6"	0.6	180.8	kip	0.003	✔ Pass

Combined Forces

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical

Span 1 W 16x36 A992-50 - Critical

Flange Btm LTB 0" - 26' 6" - Critical

Axial Tension: 0" - 26' 6" - Critical

Mode	Ratio	Status
Combined buckling	0.398	✔ Pass

Deflection

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical

Span 1 W 16x36 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =13' 3 41/256" ft, in

Max. Total load deflection =0.670 in

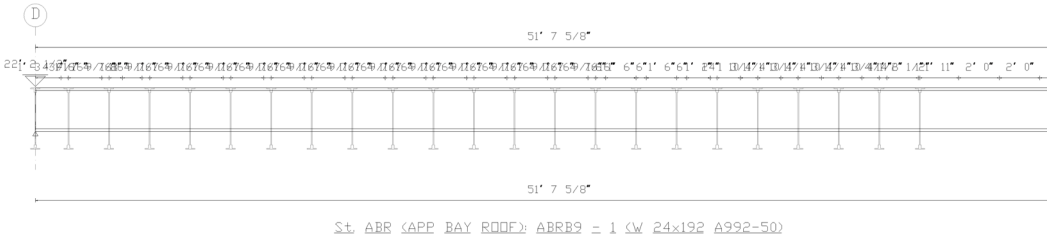
Span over limit =0.883 in

Design limit =0.883 in

Utilization Ratio **=0.759**

✔ Pass

ABRB9



Static

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Revision:	Date:	Sheet No. 474
Project Name: FIRE STATION 5		

Summary W 24x192

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	110	96.7	619.7	kip	0.156	✔ Pass
Shear Minor	260	9.1	1024.9	kip	0.009	✔ Pass
Flexure Major	96	1159.6	2096.2	kip ft	0.553	✔ Pass
Flexure Minor	228	33.4	472.5	kip ft	0.071	✔ Pass
Axial Tension	118	-27.3	2542.5	kip	0.011	✔ Pass
Axial Compression	128	43.9	1782.3	kip	0.025	✔ Pass
Combined Forces	96	-	-	-	0.603	✔ Pass
Torsion	96	-	-	-	0.733	✔ Pass
Deflection Self weight	1	0.597	-	in	-	-
Deflection Slab	1	0.003	2.582	in	0.001	✔ Pass
Deflection Dead	1	0.766	1.721	in	0.445	✔ Pass
Deflection Live	21	0.583	2.582	in	0.226	✔ Pass
Deflection Wind	323	-0.350	3.098	in	0.113	✔ Pass
Deflection Total	96	2.294	2.582	in	0.889	✔ Pass
Torsion	Design Check Applied Forces Only					-

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 24x192 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=26.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Non-slender	AISC 360 Table B4.1a

Shear Major

110 (Final) LRFD$_{8.16}$-1.2D+1.6S+0.5W - Critical

Span 1 W 24x192 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=96.7 kip	
Design shear strength	=619.7 kip	AISC 360 G2
Ratio	**=0.156**	

✔ Pass

Shear Minor

260 (Final) LRFD$_{10.38}$-1.2D+L+0.5S+W - Critical

Span 1 W 24x192 A992-50 - Critical

Position 3' 7 5/8" - Critical

Position of V_{rx}	=3' 7 5/8" ft, in	
Required minor axis shear strength, V_{rx}	=9.1 kip	
Design shear strength	=1024.9 kip	AISC 360 G6
Ratio	**=0.009**	

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✔ Pass

Flexure Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 24x192 A992-50 - Critical

Yielding: 25' 7 5/8" - Critical

Dist of M_{rx} along member	=25' 7 5/8" ft, in	
Required flexural strength, M_{rx1}	=1159.6 kip ft	
Design flexural strength	=2096.2 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.553**	

✔ Pass

Flexure Minor

228 (Final) LRFD$_{10.6}$-1.2D+L+0.5S+W - Critical

Span 1 W 24x192 A992-50 - Critical

Yielding: 4' 3 5/8" - Critical

Dist of M_{ry} along member	=4' 3 5/8" ft, in	
Required flexural strength, M_{ry1}	=33.4 kip ft	
Design flexural strength	=472.5 kip ft	AISC 360 F6
Ratio	**=0.071**	

✔ Pass

Axial Tension

118 (Final) LRFD$_{8.24}$-1.2D+1.6S+0.5W - Critical

Span 1 W 24x192 A992-50 - Critical

Yielding: Position 27' 3 3/16" - Critical

Distance of P_r along member	=27' 3 3/16" ft, in	
Required tensile strength, P_r	=-27.3 kip	
Design yield strength	=2542.5 kip	AISC 360 D2
Ratio	**=0.011**	

✔ Pass

Axial Compression

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 24x192 A992-50 - Critical

Flexural torsional: 0" - 51' 7 5/8" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 51' 7 5/8"	Flexural torsional	51' 7 5/8"	43.9	1782.3	kip	0.025	✔ Pass

Combined Forces

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 24x192 A992-50 - Critical

Flange Btm LTB 0" - 51' 7 5/8" - Critical

Axial Comp: I.P. 0" - 1' 3 3/16" , O.o.P.0" - 1' 7 5/8" , Tors. 0" - 51' 7 5/8" - Critical

Mode	Ratio	Status
Combined buckling	0.603	✔ Pass

Torsion

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

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Torsion Combined Forces - Critical

Span 1 W 24x192 A992-50 - Critical

Compression Critical length $F_{cr,a}$ 0" - 51' 7 5/8"; Critical length $F_{cr,b}$ Yielding - Critical

Critical stress position in flange

σ_a / 0.85 F_{cra}	**=0.025**	
σ_{bx} / ϕ_b $F_{cr,bx}$	**=0.630**	
σ_{by} / 0.9 F_y	**=0.059**	
σ_w / 0.9 F_y	**=0.019**	
σ_a / 0.85 F_{cra} + σ_{bx} / ϕ_b $F_{cr,bx}$ + σ_{by} / 0.9 F_y + σ_w / 0.9 F_y		DG9 Eq. 4.16a
Ratio	**=0.733**	

✔ Pass

Deflection

96 (Final) $LRFD_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 24x192 A992-50 - Critical

Deflection Total - Critical

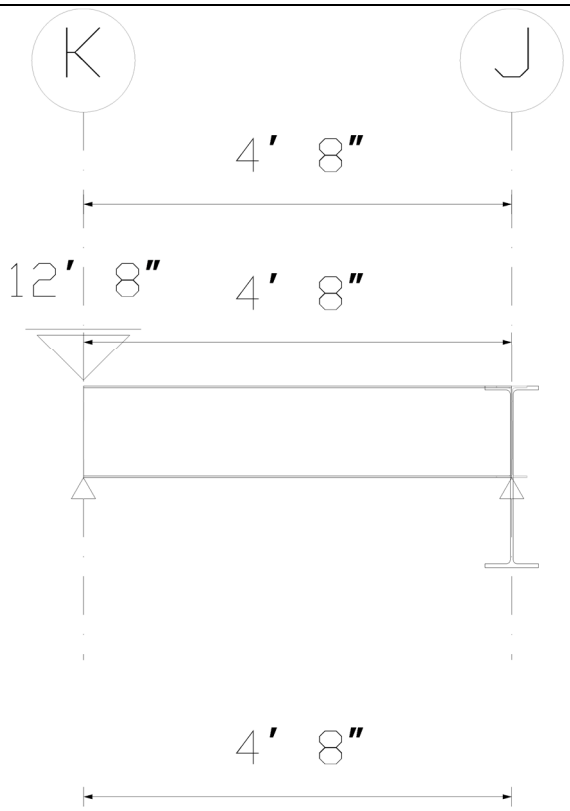
Position Total load deflection	=25' 7 5/8" ft, in
Max. Total load deflection	=2.294 in
Span over limit	=2.582 in
Design limit	=2.582 in
Utilization Ratio	**=0.889**

✔ Pass

L2B989

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Revision:	Date:	Sheet No. 477
Project Name: FIRE STATION 5		



St. L2 (LEVEL 2): L2B989 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	47	Slender	-	-	-	✔ Pass
Flexural Classification		Unknown	-	-	-	Not required
Shear Major	No Significant Forces			kip	-	Not required
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	No Significant Forces			kip ft	-	Not required
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	228	-2.6	187.2	kip	0.014	✔ Pass
Axial Compression	303	1.9	115.5	kip	0.016	✔ Pass
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

47 (Final) $LRFD_{7.17}$-1.2D+1.6Lr+0.5W - Critical

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Project Name: FIRE STATION 5		

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.3 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Axial Tension

228 (Final) $LRFD_{10.6}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-2.6 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.014**	

✔ Pass

Axial Compression

303 (Final) $LRFD_{12.17}$-0.9D+W - Critical

Span 1 W 12x14 A992-50 - Critical

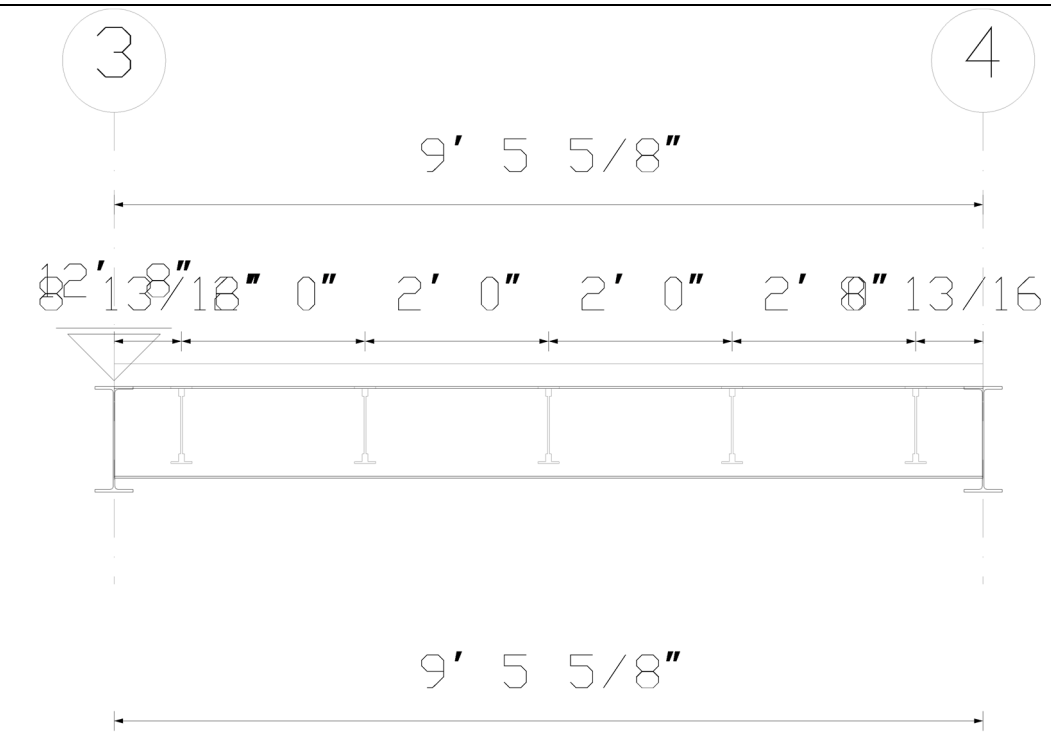
Flexural - out-of-plane: 0" - 4' 8" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 4' 8"	Flexural - out-of-plane	4' 8"	1.9	115.5	kip	0.016	✔ Pass

L2B995

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Revision:	Date:	Sheet No. 479
Project Name: FIRE STATION 5		



St. L2 (LEVEL 2): L2B995 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	18	-6.4	64.3	kip	0.099	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	20	16.0	65.2	kip ft	0.245	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.002	-	in	-	-
Deflection Slab	1	0.016	0.473	in	0.034	✔ Pass
Deflection Dead	1	0.011	0.316	in	0.034	✔ Pass
Deflection Live	6	0.043	0.473	in	0.092	✔ Pass
Deflection Total	6	0.073	0.316	in	0.230	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

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Project Name: FIRE STATION 5		

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 8 13/16" - Critical

Moment, M_x	=1.8 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

18 (Final) LRFD$_{4.3}$-1.2D+1.6L+0.5S+NL$_{Dir1-}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Position 9' 5 5/8" - Critical

Position of V_{ry}	=9' 5 5/8" ft, in	
Required major axis shear strength, V_{ry}	=-6.4 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.099**	

✔ Pass

Flexure Major

20 (Final) LRFD$_{4.5}$-1.2D+1.6L+0.5S+NL$_{Dir2-}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: 4' 8 13/16" - Critical

Dist of M_{rx} along member	=4' 8 13/16" ft, in	
Required flexural strength, M_{rx1}	=16.0 kip ft	
Design flexural strength	=65.2 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.245**	

✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

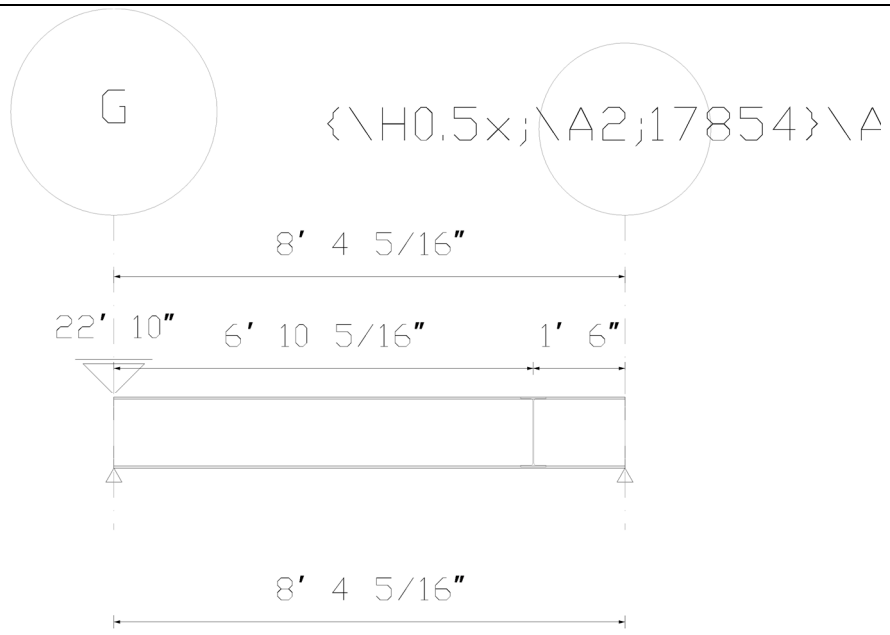
Position Total load deflection	=4' 8 13/16" ft, in
Max. Total load deflection	=0.073 in
Span over limit	=0.316 in
Design limit	=0.316 in
Utilization Ratio	**=0.230**

✔ Pass

TORSB1027

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Project Name: FIRE STATION 5		



St. TORS (T.O. ROOF STRUCT.): TORSB1027 - W 14x26 A992-50

Static

Summary W 14x26

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	47	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	112	-11.7	106.3	kip	0.110	✔ Pass
Shear Minor	307	0.3	114.1	kip	0.003	✔ Pass
Flexure Major	144	17.4	150.7	kip ft	0.116	✔ Pass
Flexure Minor	307	-0.5	20.8	kip ft	0.022	✔ Pass
Axial Tension	324	-1.3	346.1	kip	0.004	✔ Pass
Axial Compression	175	0.9	237.3	kip	0.004	✔ Pass
Combined Forces	128	-	-	-	0.130	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.001	-	in	-	-
Deflection Dead	1	0.008	0.279	in	0.029	✔ Pass
Deflection Live	21	0.005	0.418	in	0.013	✔ Pass
Deflection Wind	323	-0.004	0.502	in	0.007	✔ Pass
Deflection Total	144	0.019	0.279	in	0.068	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

47 (Final) LRFD$_{7.17}$-1.2D+1.6Lr+0.5W - Critical

Span 1 W 14x26 A992-50 - Critical

Axial: Position 0" - Critical

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Axial Force, P	=0.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x26 A992-50 - Critical

Position 8' 4 5/16" - Critical

Position of V_{ry}	=8' 4 5/16" ft, in	
Required major axis shear strength, V_{ry}	=-11.7 kip	
Design shear strength	=106.3 kip	AISC 360 G2
Ratio	**=0.110**	

✔ Pass

Shear Minor

307 (Final) LRFD$_{12.21}$-0.9D+W - Critical

Span 1 W 14x26 A992-50 - Critical

Position 6' 10 5/16" - Critical

Position of V_{rx}	=6' 10 5/16" ft, in	
Required minor axis shear strength, V_{rx}	=0.3 kip	
Design shear strength	=114.1 kip	AISC 360 G6
Ratio	**=0.003**	

✔ Pass

Flexure Major

144 (Final) LRFD$_{8.50}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x26 A992-50 - Critical

Yielding: 6' 10 5/16" - Critical

Dist of M_{rx} along member	=6' 10 5/16" ft, in	
Required flexural strength, M_{rx1}	=17.4 kip ft	
Design flexural strength	=150.7 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.116**	

✔ Pass

Flexure Minor

307 (Final) LRFD$_{12.21}$-0.9D+W - Critical

Span 1 W 14x26 A992-50 - Critical

Yielding: 6' 10 5/16" - Critical

Dist of M_{ry} along member	=6' 10 5/16" ft, in	
Required flexural strength, M_{ry1}	=-0.5 kip ft	
Design flexural strength	=20.8 kip ft	AISC 360 F6
Ratio	**=0.022**	

✔ Pass

Axial Tension

324 (Final) LRFD$_{12.38}$-0.9D+W - Critical

Span 1 W 14x26 A992-50 - Critical

Yielding: Position 8' 4 5/16" - Critical

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Project Name: FIRE STATION 5		

Distance of P_r along member =8′ 4 5/16″ ft, in
Required tensile strength, P_r =-1.3 kip
Design yield strength =346.1 kip AISC 360 D2
Ratio **=0.004**

✔ Pass

Axial Compression

175 (Final) LRFD$_{9.17}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 14x26 A992-50 - Critical

Flexural torsional: 0″ - 8′ 4 5/16″ - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 8′ 4 5/16″	Flexural torsional	8′ 4 5/16″	0.9	237.3	kip	0.004	✔ Pass

Combined Forces

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x26 A992-50 - Critical

Flange Top LTB 6′ 10 5/16″ - 8′ 4 5/16″ - Critical

Axial Tension: 6′ 10 5/16″ - 8′ 4 5/16″ - Critical

Mode	Ratio	Status
Combined buckling	0.130	✔ Pass

Deflection

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

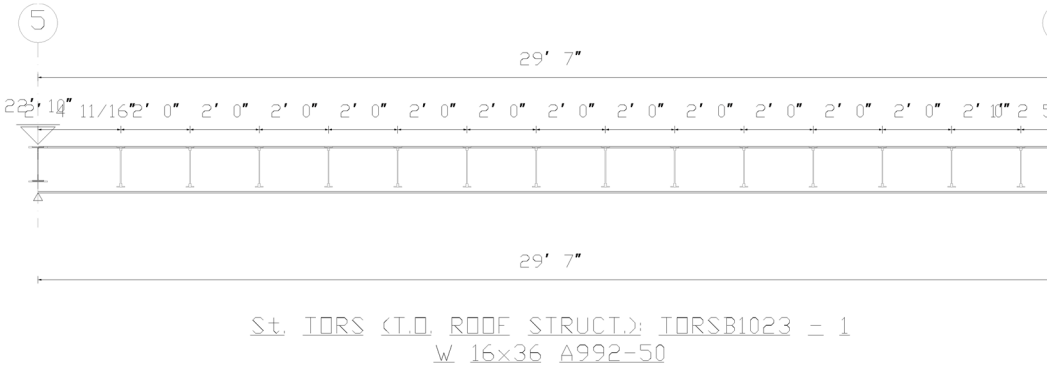
Span 1 W 14x26 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =4′ 11 97/256″ ft, in
Max. Total load deflection =0.019 in
Span over limit =0.279 in
Design limit =0.279 in
Utilization Ratio **=0.068**

✔ Pass

TORSB1023



Static

Summary W 16x36

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	-15.6	140.7	kip	0.111	✔ Pass
Shear Minor	163	0.4	162.3	kip	0.002	✔ Pass
Flexure Major	27	-38.6	65.8	kip ft	0.586	✔ Pass
Flexure Minor	234	0.5	40.5	kip ft	0.012	✔ Pass
Axial Tension	323	-0.2	477.0	kip	0.000	✔ Pass
Axial Compression	28	6.1	166.4	kip	0.037	✔ Pass
Combined Forces	27	-	-	-	0.607	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.056	-	in	-	-
Deflection Slab	1	-0.020	1.479	in	0.014	✔ Pass
Deflection Dead	1	0.294	0.986	in	0.298	✔ Pass
Deflection Live	21	0.205	1.479	in	0.139	✔ Pass
Deflection Wind	307	-0.134	1.775	in	0.076	✔ Pass
Deflection Total	96	0.693	0.986	in	0.702	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 16x36 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=3.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 16x36 A992-50 - Critical

Position 29' 7" - Critical

Position of V_{ry}	=29' 7" ft, in	
Required major axis shear strength, V_{ry}	=-15.6 kip	
Design shear strength	=140.7 kip	AISC 360 G2
Ratio	**=0.111**	

✔ Pass

Shear Minor

163 (Final) LRFD$_{9.5}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 16x36 A992-50 - Critical

Position 28' 4 11/16" - Critical

Position of V_{rx}	=28' 4 11/16" ft, in	
Required minor axis shear strength, V_{rx}	=0.4 kip	
Design shear strength	=162.3 kip	AISC 360 G6
Ratio	**=0.002**	

✔ Pass

Flexure Major

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27 (Final) LRFD$_{6.2}$-1.2D+L+1.6S+NL$_{Dir1+}$ - Critical
Span 1 W 16x36 A992-50 - Critical
LTB Flange Btm: 0" - 29' 7" - Critical
Dist of M_{rx1} along member =29' 7" ft, in
Required flexural strength, M_{rx1} =-38.6 kip ft
Design flexural strength =65.8 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.586**
✔ Pass

Flexure Minor
234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W - Critical
Span 1 W 16x36 A992-50 - Critical
Yielding: 2' 4 11/16" - Critical
Dist of M_{ry} along member =2' 4 11/16" ft, in
Required flexural strength, M_{ry1} =0.5 kip ft
Design flexural strength =40.5 kip ft AISC 360 F6
Ratio **=0.012**
✔ Pass

Axial Tension
323 (Final) LRFD$_{12.37}$-0.9D+W - Critical
Span 1 W 16x36 A992-50 - Critical
Yielding: Position 29' 7" - Critical
Distance of P_r along member =29' 7" ft, in
Required tensile strength, P_r =-0.2 kip
Design yield strength =477.0 kip AISC 360 D2
Ratio **=0.000**
✔ Pass

Axial Compression
28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$ - Critical
Span 1 W 16x36 A992-50 - Critical
Flexural torsional: 0" - 29' 7" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 29' 7"	Flexural torsional	29' 7"	6.1	166.4	kip	0.037	✔ Pass

Combined Forces
27 (Final) LRFD$_{6.2}$-1.2D+L+1.6S+NL$_{Dir1+}$ - Critical
Span 1 W 16x36 A992-50 - Critical
Flange Btm LTB 0" - 29' 7" - Critical
Axial Comp: I.P. 0" - 29' 7" , O.o.P.0" - 2' 4 11/16" , Tors. 0" - 29' 7" - Critical

Mode	Ratio	Status
Combined buckling	0.607	✔ Pass

Deflection
96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical
Span 1 W 16x36 A992-50 - Critical
Deflection Total - Critical
Position Total load deflection =14' 6 115/128" ft, in

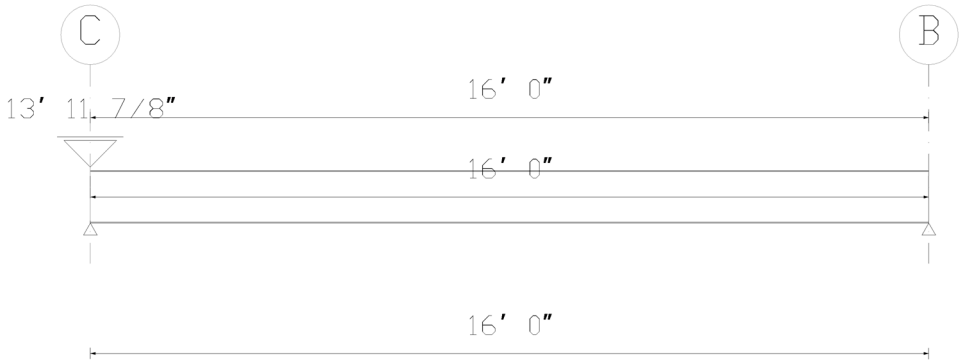
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Max. Total load deflection =0.693 in
Span over limit =0.986 in
Design limit =0.986 in
Utilization Ratio **=0.702**

✔ Pass

TORS-LB997



St. TORS-L (T.O. ROOF STRUCT LOW): TORS-LB997 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	267	0.8	64.3	kip	0.012	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	267	-6.5	28.1	kip ft	0.231	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	234	5.4	14.5	kip	0.375	✔ Pass
Combined Forces	106	-	-	-	0.528	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Slab	1	-0.009	0.800	in	0.011	✔ Pass
Deflection Dead	1	-0.003	0.533	in	0.006	✔ Pass
Deflection Live	11	-0.003	0.533	in	0.005	✔ Pass
Deflection Wind	307	0.003	0.960	in	0.003	✔ Pass
Deflection Total	144	-0.024	0.800	in	0.030	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P =4.5 kip

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Elastic modulus of steel, E =29000 ksi
Minimum yield stress, F_y =50.00 ksi
Axial section class Slender AISC 360 Table B4.1a

Shear Major
267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Position 0" - Critical
Position of V_{ry} =0" ft, in
Required major axis shear strength, V_{ry} =0.8 kip
Design shear strength =64.3 kip AISC 360 G2
Ratio **=0.012**
✔ Pass

Flexure Major
267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
LTB Flange Btm: 0" - 16' 0" - Critical
Dist of M_{rx1} along member =0" ft, in
Required flexural strength, M_{rx1} =-6.5 kip ft
Design flexural strength =28.1 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.231**
✔ Pass

Axial Compression
234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Flexural - out-of-plane: 0" - 16' 0" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 16' 0"	Flexural - out-of-plane	16' 0"	5.4	14.5	kip	0.375	✔ Pass

Combined Forces
106 (Final) LRFD$_{8.12}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
Flange Btm LTB 0" - 16' 0" - Critical
Axial Comp: I.P. 0" - 16' 0" , O.o.P.0" - 16' 0" , Tors. 0" - 16' 0" - Critical

Mode	Ratio	Status
In-plane instability	0.100	✔ Pass
Out-of-plane instability	0.528	✔ Pass

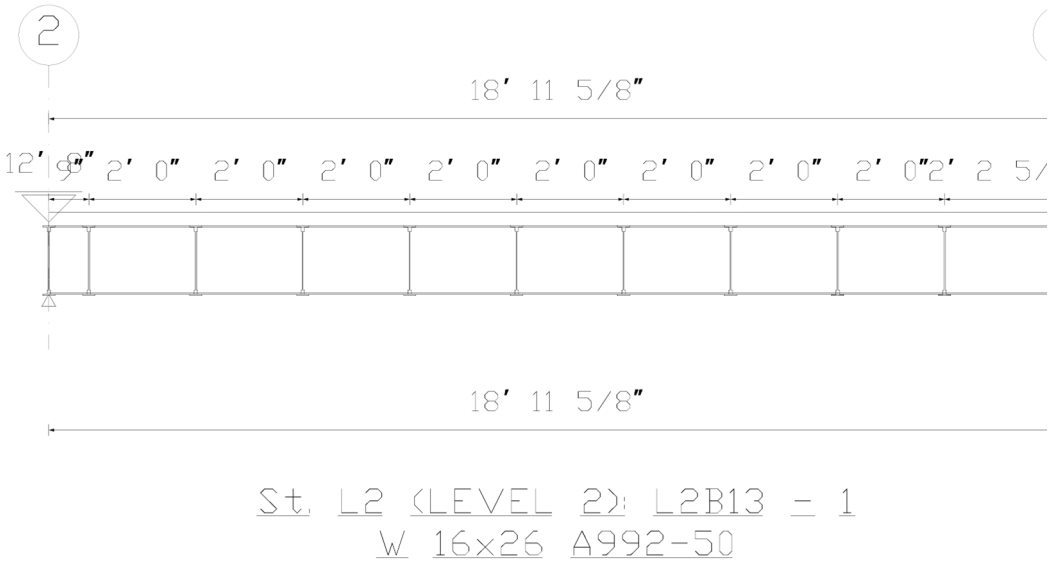
Deflection
144 (Final) LRFD$_{8.50}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
Deflection Total - Critical
Position Total load deflection =4' 7 11/128" ft, in
Max. Total load deflection =-0.024 in
Span over limit =0.800 in
Design limit =0.800 in
Utilization Ratio **=0.030**

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✔ Pass

L2B13



Static

Summary W 16x26

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	9	19.0	106.0	kip	0.179	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	20	92.7	165.7	kip ft	0.559	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.019	-	in	-	-
Deflection Slab	1	0.110	0.948	in	0.116	✔ Pass
Deflection Dead	1	0.073	0.632	in	0.116	✔ Pass
Deflection Live	6	0.293	0.948	in	0.309	✔ Pass
Deflection Total	6	0.495	0.632	in	0.784	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 16x26 A992-50 - Critical

Flexural: Position 9" - Critical

Moment, M_x =5.7 kip ft

Elastic modulus of steel, E =29000 ksi

Minimum yield stress, F_y =50.00 ksi

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Flexural section class Compact AISC 360 Table B4.1b

Shear Major

9 (Final) LRFD$_{2.3}$-1.2D+1.6L+NL$_{Dir2+}$ - Critical

Span 1 W 16x26 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=19.0 kip	
Design shear strength	=106.0 kip	AISC 360 G2
Ratio	**=0.179**	

✔ Pass

Flexure Major

20 (Final) LRFD$_{4.5}$-1.2D+1.6L+0.5S+NL$_{Dir2-}$ - Critical

Span 1 W 16x26 A992-50 - Critical

Yielding: 8' 9" - Critical

Dist of M_{rx} along member	=8' 9" ft, in	
Required flexural strength, M_{rx1}	=92.7 kip ft	
Design flexural strength	=165.7 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.559**	

✔ Pass

Deflection

6 (Final) LRFD$_{2}$-1.2D+1.6L - Critical

Span 1 W 16x26 A992-50 - Critical

Deflection Total - Critical

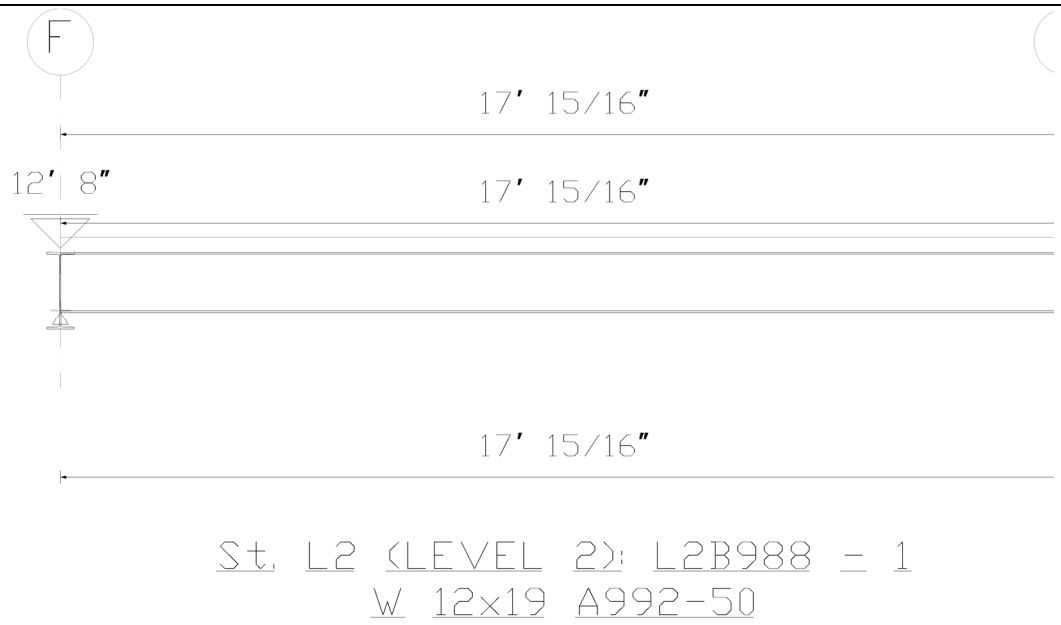
Position Total load deflection	=9' 5 181/256" ft, in
Max. Total load deflection	=0.495 in
Span over limit	=0.632 in
Design limit	=0.632 in
Utilization Ratio	**=0.784**

✔ Pass

L2B988

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Static

Summary W 12x19

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	6	-4.0	86.0	kip	0.046	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	12	17.8	23.3	kip ft	0.765	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.010	-	in	-	-
Deflection Slab	1	0.039	0.854	in	0.045	✔ Pass
Deflection Dead	1	0.026	0.569	in	0.045	✔ Pass
Deflection Live	6	0.103	0.854	in	0.121	✔ Pass
Deflection Total	6	0.177	0.569	in	0.311	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x19 A992-50 - Critical

Flexural: Position 1' 1 85/128" - Critical

Moment, M_x	=1.8 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

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Shear Major

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 12x19 A992-50 - Critical

Position 17' 15/16" - Critical

Position of V_{ry}	=17' 15/16" ft, in	
Required major axis shear strength, V_{ry}	=-4.0 kip	
Design shear strength	=86.0 kip	AISC 360 G2
Ratio	**=0.046**	

✔ Pass

Flexure Major

12 (Final) LRFD$_{3.1}$-1.2D+1.6L+0.5Lr+NL$_{Dir1+}$ - Critical

Span 1 W 12x19 A992-50 - Critical

LTB Flange Top: 0" - 17' 15/16" - Critical

Dist of M_{rx1} along member	=8' 6 85/256" ft, in	
Required flexural strength, M_{rx1}	=17.8 kip ft	
Design flexural strength	=23.3 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.765**	

✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 12x19 A992-50 - Critical

Deflection Total - Critical

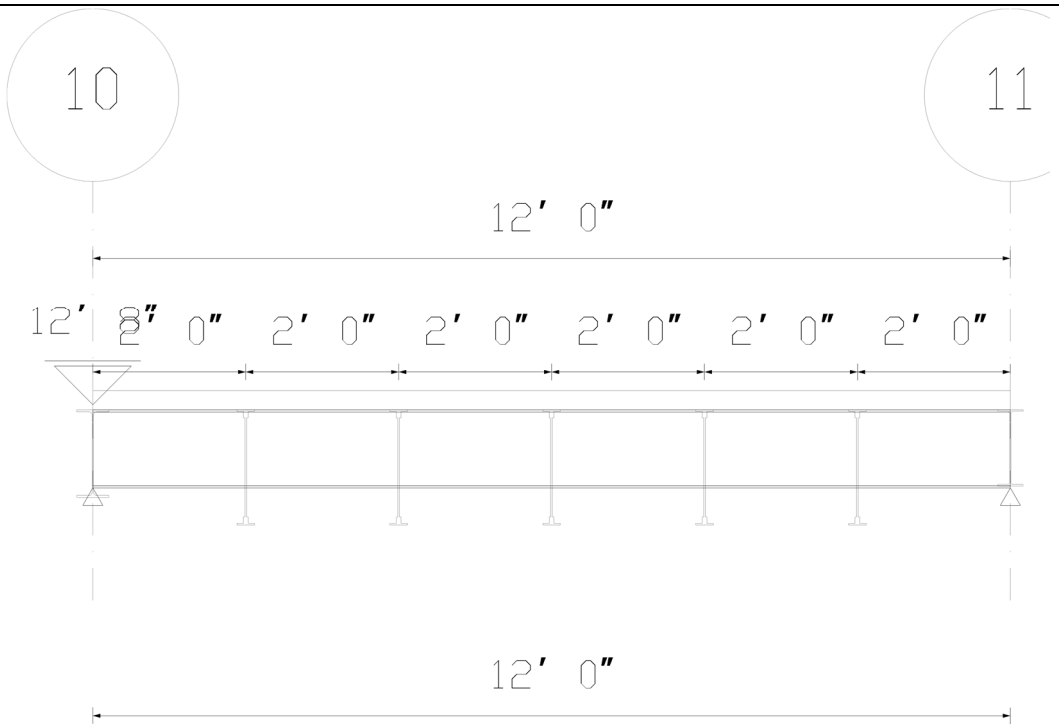
Position Total load deflection	=8' 6 15/32" ft, in
Max. Total load deflection	=0.177 in
Span over limit	=0.569 in
Design limit	=0.569 in
Utilization Ratio	**=0.311**

✔ Pass

L2B979

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St. L2 (LEVEL 2): L2B979 - 1
W 12x19 A992-50

Static

Summary W 12x19

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	16	13.2	86.0	kip	0.153	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	19	46.8	92.6	kip ft	0.505	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.007	-	in	-	-
Deflection Slab	1	0.052	0.600	in	0.086	✔ Pass
Deflection Dead	1	0.034	0.400	in	0.086	✔ Pass
Deflection Live	6	0.138	0.600	in	0.229	✔ Pass
Deflection Total	6	0.231	0.400	in	0.578	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

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Classification
1 (Final) LRFD$_{1}$-1.4D - Critical
Span 1 W 12x19 A992-50 - Critical
Flexural: Position 1' 0" - Critical

Moment, M_x	=5.2 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major
16 (Final) LRFD$_{4.1}$-1.2D+1.6L+0.5S - Critical
Span 1 W 12x19 A992-50 - Critical
Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=13.2 kip	
Design shear strength	=86.0 kip	AISC 360 G2
Ratio	**=0.153**	

✔ Pass

Flexure Major
19 (Final) LRFD$_{4.4}$-1.2D+1.6L+0.5S+NL$_{Dir2+}$ - Critical
Span 1 W 12x19 A992-50 - Critical
Yielding: 6' 0" - Critical

Dist of M_{rx} along member	=6' 0" ft, in	
Required flexural strength, M_{rx1}	=46.8 kip ft	
Design flexural strength	=92.6 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.505**	

✔ Pass

Deflection
6 (Final) LRFD$_{2}$-1.2D+1.6L - Critical
Span 1 W 12x19 A992-50 - Critical
Deflection Total - Critical

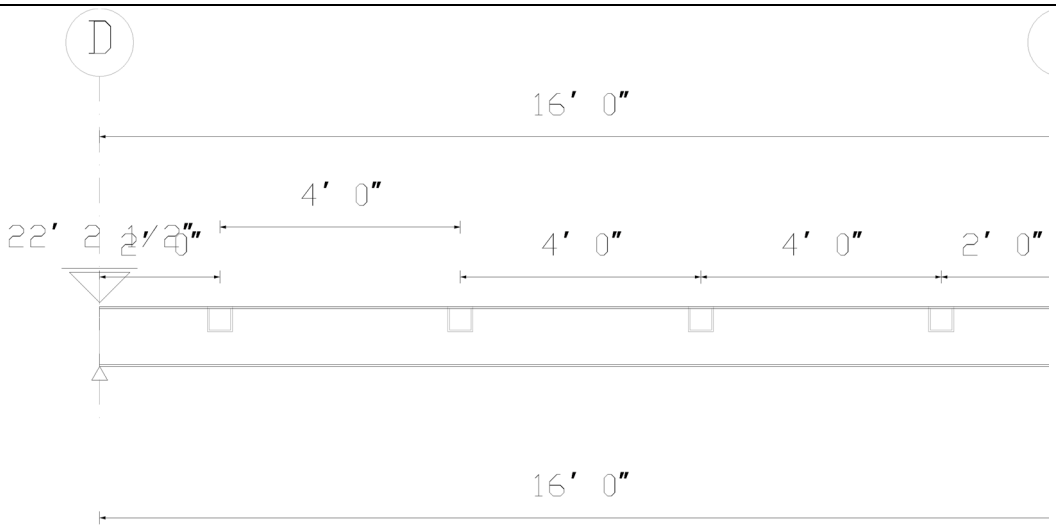
Position Total load deflection	=6' 0" ft, in
Max. Total load deflection	=0.231 in
Span over limit	=0.400 in
Design limit	=0.400 in
Utilization Ratio	**=0.578**

✔ Pass

ABRB6

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St. ABR (APP BAY ROOF): ABRB6 - 1
W 12x26 A500B-46

Static

Summary W 12x26

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	42	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	112	-14.3	77.4	kip	0.185	✔ Pass
Shear Minor	307	0.7	122.5	kip	0.006	✔ Pass
Flexure Major	112	-54.2	128.3	kip ft	0.423	✔ Pass
Flexure Minor	307	-1.5	28.2	kip ft	0.052	✔ Pass
Axial Tension	163	-4.6	316.7	kip	0.014	✔ Pass
Axial Compression	314	1.4	186.6	kip	0.008	✔ Pass
Combined Forces	118	-	-	-	0.437	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.008	-	in	-	-
Deflection Slab	1	-0.013	0.800	in	0.017	✔ Pass
Deflection Dead	1	0.039	0.533	in	0.074	✔ Pass
Deflection Live	21	0.032	0.533	in	0.059	✔ Pass
Deflection Wind	291	-0.021	0.960	in	0.022	✔ Pass
Deflection Total	112	0.088	0.800	in	0.110	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

42 (Final) $LRFD_{7.12}$-1.2D+1.6Lr+0.5W - Critical

Span 1 W 12x26 A500B-46 - Critical

Axial: Position 14′ 0″ - Critical

Axial Force, P =0.1 kip

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Elastic modulus of steel, E =29000 ksi
Minimum yield stress, F_y =46.00 ksi
Axial section class Slender AISC 360 Table B4.1a

Shear Major
112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x26 A500B-46 - Critical
Position 16' 0" - Critical
Position of V_{ry} =16' 0" ft, in
Required major axis shear strength, V_{ry} =-14.3 kip
Design shear strength =77.4 kip AISC 360 G2
Ratio **=0.185**
✔ Pass

Shear Minor
307 (Final) LRFD$_{12.21}$-0.9D+W - Critical
Span 1 W 12x26 A500B-46 - Critical
Position 14' 0" - Critical
Position of V_{rx} =14' 0" ft, in
Required minor axis shear strength, V_{rx} =0.7 kip
Design shear strength =122.5 kip AISC 360 G6
Ratio **=0.006**
✔ Pass

Flexure Major
112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x26 A500B-46 - Critical
Yielding: 16' 0" - Critical
Dist of M_{rx} along member =16' 0" ft, in
Required flexural strength, M_{rx1} =-54.2 kip ft
Design flexural strength =128.3 kip ft AISC 360 F1, F2 and F3
Ratio **=0.423**
✔ Pass

Flexure Minor
307 (Final) LRFD$_{12.21}$-0.9D+W - Critical
Span 1 W 12x26 A500B-46 - Critical
Yielding: 14' 0" - Critical
Dist of M_{ry} along member =14' 0" ft, in
Required flexural strength, M_{ry1} =-1.5 kip ft
Design flexural strength =28.2 kip ft AISC 360 F6
Ratio **=0.052**
✔ Pass

Axial Tension
163 (Final) LRFD$_{9.5}$-1.2D+L+0.5Lr+W - Critical
Span 1 W 12x26 A500B-46 - Critical
Yielding: Position 0" - Critical
Distance of P_r along member =0" ft, in

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Required tensile strength, P_r =-4.6 kip
Design yield strength =316.7 kip AISC 360 D2
Ratio **=0.014**

✔ Pass

Axial Compression

314 (Final) $LRFD_{12.28}$-0.9D+W - Critical

Span 1 W 12x26 A500B-46 - Critical

Flexural torsional: 0" - 16' 0" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 16' 0"	Flexural torsional	16' 0"	1.4	186.6	kip	0.008	✔ Pass

Combined Forces

118 (Final) $LRFD_{8.24}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x26 A500B-46 - Critical

Flange Top LTB 14' 0" - 16' 0" - Critical

Axial Comp: I.P. 0" - 16' 0" , O.o.P.14' 0" - 16' 0" , Tors. 0" - 16' 0" - Critical

Mode	Ratio	Status
Combined buckling	0.437	✔ Pass

Deflection

112 (Final) $LRFD_{8.18}$-1.2D+1.6S+0.5W - Critical

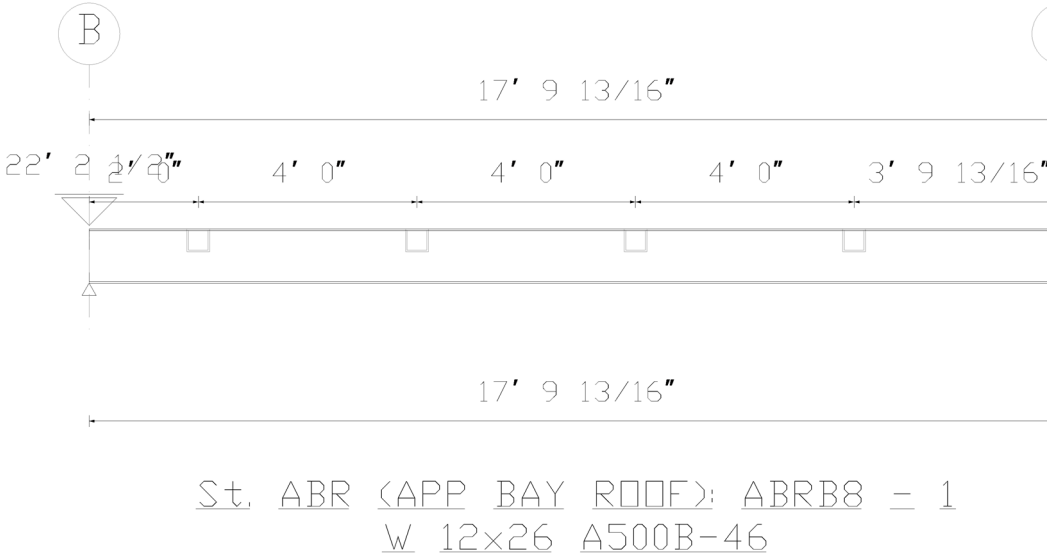
Span 1 W 12x26 A500B-46 - Critical

Deflection Total - Critical

Position Total load deflection =6' 0" ft, in
Max. Total load deflection =0.088 in
Span over limit =0.800 in
Design limit =0.800 in
Utilization Ratio **=0.110**

✔ Pass

ABRB8



St. ABR (APP BAY ROOF): ABRB8 - 1
W 12x26 A500B-46

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Project Name: FIRE STATION 5		

Static

Summary W 12x26

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	11	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	144	13.4	77.4	kip	0.174	✔ Pass
Shear Minor	276	-0.7	122.5	kip	0.006	✔ Pass
Flexure Major	139	-39.2	123.0	kip ft	0.319	✔ Pass
Flexure Minor	276	-1.4	28.2	kip ft	0.051	✔ Pass
Axial Tension	291	-1.8	316.7	kip	0.006	✔ Pass
Axial Compression	153	1.7	174.4	kip	0.010	✔ Pass
Combined Forces	128	-	-	-	0.345	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.021	-	in	-	-
Deflection Slab	1	0.005	0.891	in	0.006	✔ Pass
Deflection Dead	1	0.054	0.594	in	0.090	✔ Pass
Deflection Live	21	0.043	0.594	in	0.072	✔ Pass
Deflection Wind	291	-0.028	1.069	in	0.026	✔ Pass
Deflection Total	139	0.148	0.891	in	0.166	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

11 (Final) LRFD$_3$-1.2D+1.6L+0.5Lr - Critical

Span 1 W 12x26 A500B-46 - Critical

Axial: Position 10′ 0″ - Critical

Axial Force, P	=0.2 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=46.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

144 (Final) LRFD$_{8.50}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x26 A500B-46 - Critical

Position 0″ - Critical

Position of V_{ry}	=0″ ft, in	
Required major axis shear strength, V_{ry}	=13.4 kip	
Design shear strength	=77.4 kip	AISC 360 G2
Ratio	**=0.174**	

✔ Pass

Shear Minor

276 (Final) LRFD$_{10.54}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x26 A500B-46 - Critical

Position 0″ - Critical

Position of V_{rx}	=0″ ft, in
Required minor axis shear strength, V_{rx}	=-0.7 kip

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Design shear strength =122.5 kip AISC 360 G6
Ratio **=0.006**

✔ Pass

Flexure Major

139 (Final) LRFD$_{8.45}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x26 A500B-46 - Critical
LTB Flange Btm: 0" - 17' 9 13/16" - Critical
Dist of M_{rx1} along member =0" ft, in
Required flexural strength, M_{rx1} =-39.2 kip ft
Design flexural strength =123.0 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.319**

✔ Pass

Flexure Minor

276 (Final) LRFD$_{10.54}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x26 A500B-46 - Critical
Yielding: 2' 0" - Critical
Dist of M_{ry} along member =2' 0" ft, in
Required flexural strength, M_{ry1} =-1.4 kip ft
Design flexural strength =28.2 kip ft AISC 360 F6
Ratio **=0.051**

✔ Pass

Axial Tension

291 (Final) LRFD$_{12.5}$-0.9D+W - Critical
Span 1 W 12x26 A500B-46 - Critical
Yielding: Position 0" - Critical
Distance of P_r along member =0" ft, in
Required tensile strength, P_r =-1.8 kip
Design yield strength =316.7 kip AISC 360 D2
Ratio **=0.006**

✔ Pass

Axial Compression

153 (Final) LRFD$_{8.59}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x26 A500B-46 - Critical
Flexural torsional: 0" - 17' 9 13/16" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 17' 9 13/16"	Flexural torsional	17' 9 13/16"	1.7	174.4	kip	0.010	✔ Pass

Combined Forces

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x26 A500B-46 - Critical
Flange Btm LTB 0" - 17' 9 13/16" - Critical
Axial Comp: I.P. 0" - 17' 9 13/16" , O.o.P.0" - 2' 0" , Tors. 0" - 17' 9 13/16" - Critical

Mode	Ratio	Status
Combined buckling	0.345	✔ Pass

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Project Name: FIRE STATION 5		

Deflection

139 (Final) $LRFD_{8.45}$-1.2D+1.6S+0.5W - Critical

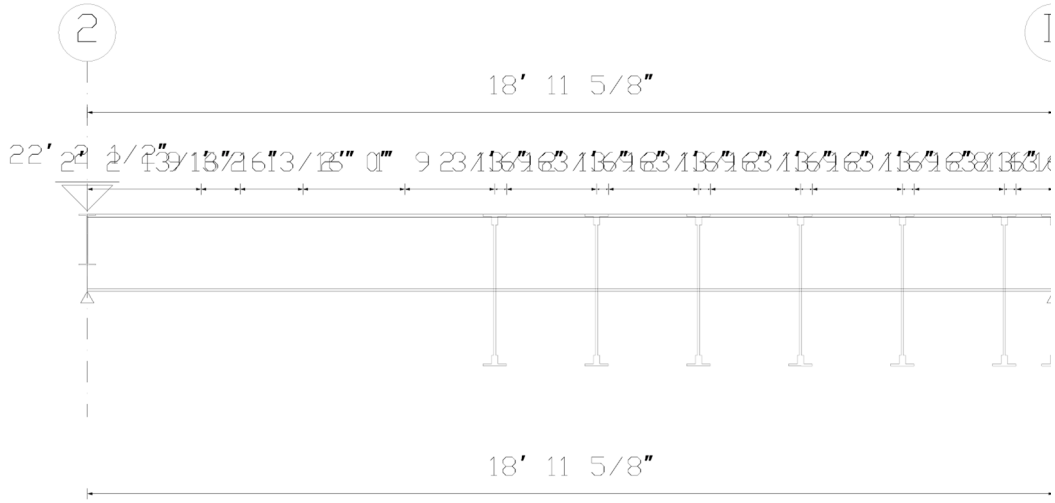
Span 1 W 12x26 A500B-46 - Critical

Deflection Total - Critical

Position Total load deflection	=9' 8 29/256" ft, in
Max. Total load deflection	=0.148 in
Span over limit	=0.891 in
Design limit	=0.891 in
Utilization Ratio	**=0.166**

✔ Pass

ABRB10



St. ABR (APP BAY ROOF): ABRB10 - 1
W 18x55 A992-50

Static

Summary W 18x55

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	27	-31.8	211.8	kip	0.150	✔ Pass
Shear Minor	191	12.4	256.2	kip	0.049	✔ Pass
Flexure Major	128	134.5	420.0	kip ft	0.320	✔ Pass
Flexure Minor	191	31.6	69.4	kip ft	0.456	✔ Pass
Axial Tension	7	-7.3	729.0	kip	0.010	✔ Pass
Axial Compression	27	30.3	432.2	kip	0.070	✔ Pass
Combined Forces	256	-	-	-	0.702	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.053	-	in	-	-
Deflection Dead	1	0.101	0.632	in	0.159	✔ Pass
Deflection Live	21	0.063	0.948	in	0.066	✔ Pass
Deflection Wind	291	-0.047	1.138	in	0.041	✔ Pass
Deflection Total	121	0.260	0.632	in	0.411	✔ Pass

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Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_{1}$-1.4D - Critical

Span 1 W 18x55 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.4 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

27 (Final) LRFD$_{6.2}$-1.2D+L+1.6S+NL$_{Dir1+}$ - Critical

Span 1 W 18x55 A992-50 - Critical

Position 18' 11 5/8" - Critical

Position of V_{ry}	=18' 11 5/8" ft, in	
Required major axis shear strength, V_{ry}	=-31.8 kip	
Design shear strength	=211.8 kip	AISC 360 G2
Ratio	**=0.150**	

✔ Pass

Shear Minor

191 (Final) LRFD$_{9.33}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 18x55 A992-50 - Critical

Position 2' 2 13/16" - Critical

Position of V_{rx}	=2' 2 13/16" ft, in	
Required minor axis shear strength, V_{rx}	=12.4 kip	
Design shear strength	=256.2 kip	AISC 360 G6
Ratio	**=0.049**	

✔ Pass

Flexure Major

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 18x55 A992-50 - Critical

Yielding: 10' 2 13/16" - Critical

Dist of M_{rx} along member	=10' 2 13/16" ft, in	
Required flexural strength, M_{rx1}	=134.5 kip ft	
Design flexural strength	=420.0 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.320**	

✔ Pass

Flexure Minor

191 (Final) LRFD$_{9.33}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 18x55 A992-50 - Critical

Yielding: 3' 0" - Critical

Dist of M_{ry} along member	=3' 0" ft, in	
Required flexural strength, M_{ry1}	=31.6 kip ft	
Design flexural strength	=69.4 kip ft	AISC 360 F6

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Ratio **=0.456**

✔ Pass

Axial Tension

7 (Final) LRFD$_{2.1}$-1.2D+1.6L+NL$_{Dir1+}$ - Critical

Span 1 W 18x55 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member =0" ft, in

Required tensile strength, P_r =-7.3 kip

Design yield strength =729.0 kip AISC 360 D2

Ratio **=0.010**

✔ Pass

Axial Compression

27 (Final) LRFD$_{6.2}$-1.2D+L+1.6S+NL$_{Dir1+}$ - Critical

Span 1 W 18x55 A992-50 - Critical

Flexural torsional: 0" - 18' 11 5/8" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 18' 11 5/8"	Flexural torsional	18' 11 5/8"	30.3	432.2	kip	0.070	✔ Pass

Combined Forces

256 (Final) LRFD$_{10.34}$-1.2D+L+0.5S+W - Critical

Span 1 W 18x55 A992-50 - Critical

Flange Btm LTB 0" - 18' 11 5/8" - Critical

Axial Comp: I.P. 0" - 2' 2 13/16" , O.o.P.0" - 8' 0" , Tors. 0" - 18' 11 5/8" - Critical

Mode	Ratio	Status
Combined buckling	0.702	✔ Pass

Deflection

121 (Final) LRFD$_{8.27}$-1.2D+1.6S+0.5W - Critical

Span 1 W 18x55 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =9' 8 113/256" ft, in

Max. Total load deflection =0.260 in

Span over limit =0.632 in

Design limit =0.632 in

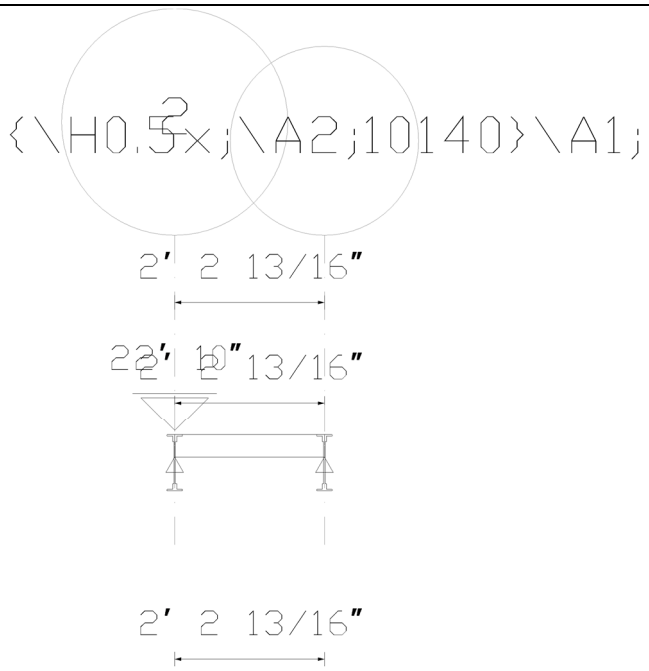
Utilization Ratio **=0.411**

✔ Pass

TORSB4

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St. TORS (T.O. ROOF STRUCT.): TORSB4 - L 4x4x3/8 A992-50

Static

Summary L 4x4x3/8

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	2	Compact	-	-	-	✔ Pass
Shear Major	No Significant Forces			kip	-	Not required
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	No Significant Forces			kip ft	-	Not required
Flexure Minor	119	-0.2	8.4	kip ft	0.023	✔ Pass
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	7	14.0	118.0	kip	0.119	✔ Pass
Combined Forces	199	-	-	-	0.117	✔ Pass
Torsion	No Significant Forces			-	-	Not required

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=5.5 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Non-slender	AISC 360 Table B4.1a

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Flexure Minor

119 (Final) LRFD$_{8.25}$-1.2D+1.6S+0.5W - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Yielding: 1′ 1 13/32″ - Critical

Dist of M_{ry} along member	=1′ 1 13/32″ ft, in	
Required flexural strength, M_{ry1}	=-0.2 kip ft	
Design flexural strength	=8.4 kip ft	AISC 360 F1 and F10
Ratio	**=0.023**	

✔ Pass

Axial Compression

7 (Final) LRFD$_{2.1}$-1.2D+1.6L+NL$_{Dir1+}$ - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Flexural - out-of-plane principal: 0″ - 2′ 2 13/16″ - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 2′ 2 13/16″	Flexural - out-of-plane principal	2′ 2 13/16″	14.0	118.0	kip	0.119	✔ Pass

Combined Forces

199 (Final) LRFD$_{9.41}$-1.2D+L+0.5Lr+W - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

LTB 0″ - 2′ 2 13/16″ - Critical

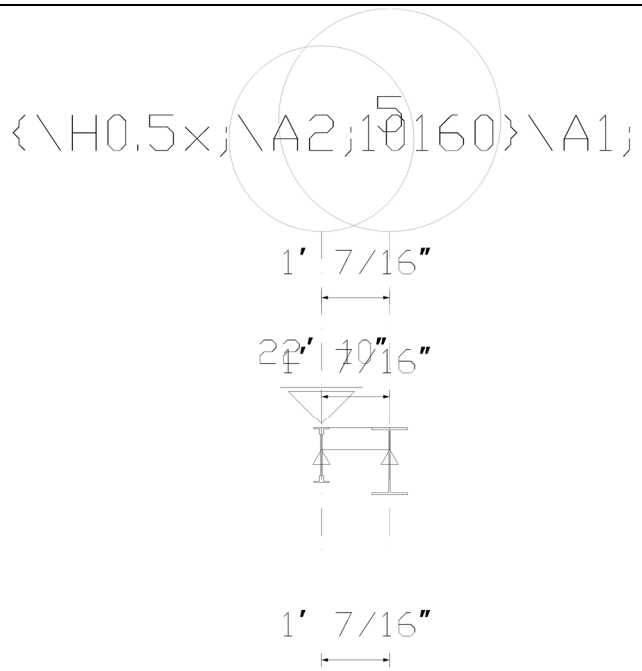
Axial Comp: I.P. 0″ - 2′ 2 13/16″ , O.o.P.0″ - 2′ 2 13/16″ , Tors. 0″ - 2′ 2 13/16″

Mode	Ratio	Status
Combined buckling	0.117	✔ Pass

TORSB17

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Project Name: FIRE STATION 5		



St. TORS (T.O. ROOF STRUCT.): TORSB17 - L 4x4x3/8 A992-50

Static

Summary L 4x4x3/8

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification		Unknown	-	-	-	Not required
Shear Major	No Significant Forces			kip	-	Not required
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	No Significant Forces			kip ft	-	Not required
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	133	-14.4	128.7	kip	0.112	✔ Pass
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Axial Tension

133 (Final) $LRFD_{8.39}$-1.2D+1.6S+0.5W - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Yielding: Position 1' 7/16" - Critical

Distance of P_r along member =1' 7/16" ft, in

Required tensile strength, P_r =-14.4 kip

Design yield strength =128.7 kip AISC 360 D2

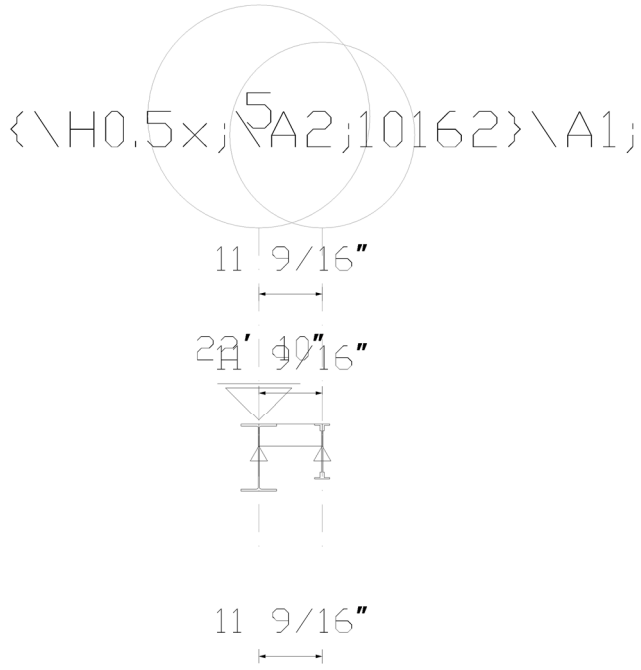
Ratio **=0.112**

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Project Name: FIRE STATION 5		

✔ Pass

TORSB18



St. TORS (T.O. ROOF STRUCT.): TORSB18 - L 4x4x3/8 A992-50

Static

Summary L 4x4x3/8

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification		Unknown	-	-	-	Not required
Shear Major	No Significant Forces			kip	-	Not required
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	No Significant Forces			kip ft	-	Not required
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	128	-15.2	128.7	kip	0.118	✔ Pass
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Axial Tension

128 (Final) $LRFD_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Yielding: Position 11 9/16" - Critical

Distance of P_r along member =11 9/16" ft, in

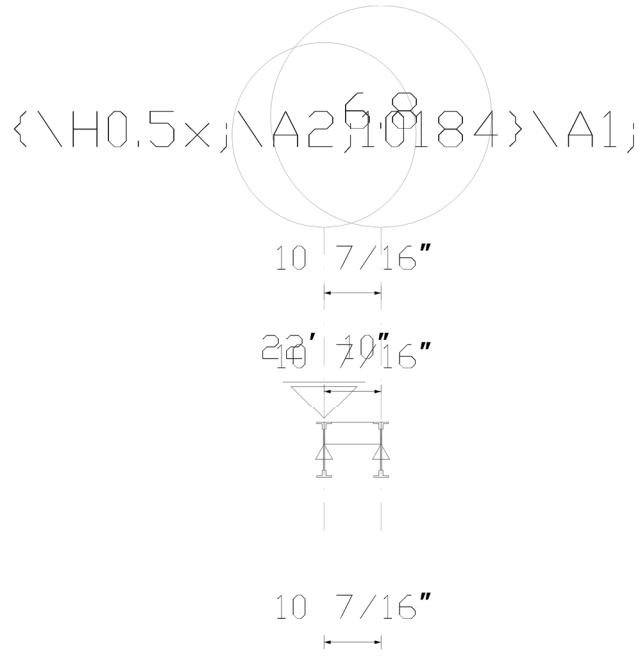
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Project Name: FIRE STATION 5		

Required tensile strength, P_r =-15.2 kip
Design yield strength =128.7 kip AISC 360 D2
Ratio **=0.118**

✔ Pass

TORSB30



St. TORS (T.O. ROOF STRUCT.): TORSB30 - L 4x4x3/8 A992-50

Static

Summary L 4x4x3/8

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification		Unknown	-	-	-	Not required
Shear Major	No Significant Forces			kip	-	Not required
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	No Significant Forces			kip ft	-	Not required
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	96	27.7	127.0	kip	0.218	✔ Pass
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

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Project Name: FIRE STATION 5		

Span 1 L 4x4x3/8 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=17.4 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Non-slender	AISC 360 Table B4.1a

Axial Compression

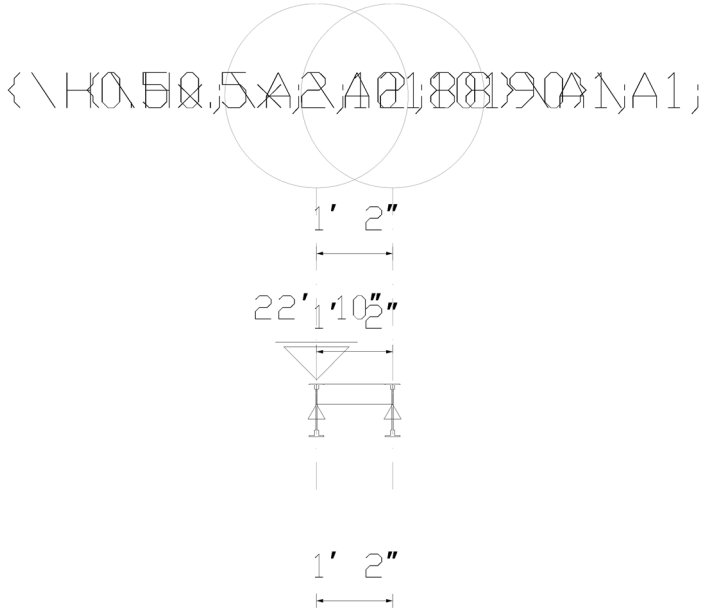
96 (Final) $LRFD_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Flexural - out-of-plane principal: 0" - 10 7/16" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 10 7/16"	Flexural - out-of-plane principal	10 7/16"	27.7	127.0	kip	0.218	✔ Pass

TORSB33



Static

Summary L 4x4x3/8

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification		Unknown	-	-	-	Not required
Shear Major	No Significant Forces			kip	-	Not required
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	No Significant Forces			kip ft	-	Not required
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	30	23.7	125.7	kip	0.189	✔ Pass

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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=15.1 kip
Elastic modulus of steel, E	=29000 ksi
Minimum yield stress, F_y	=50.00 ksi
Axial section class	Non-slender AISC 360 Table B4.1a

Axial Compression

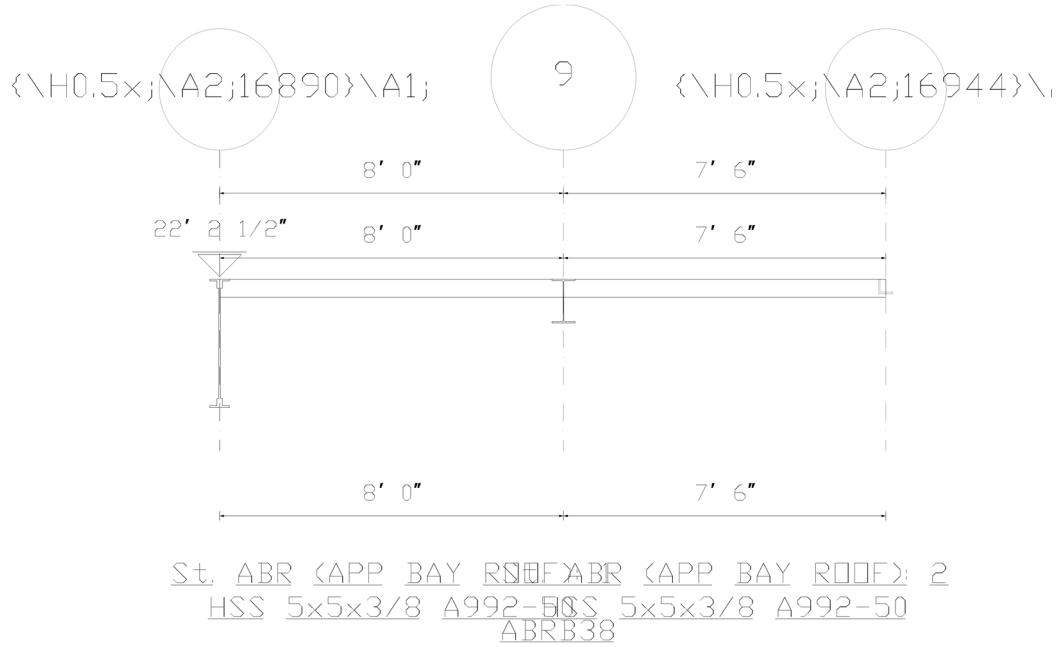
30 (Final) $LRFD_{6.5}$-1.2D+L+1.6S+NL_{Dir2} - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Flexural - out-of-plane principal: 0" - 1' 2" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 1' 2"	Flexural - out-of-plane principal	1' 2"	23.7	125.7	kip	0.189	✔ Pass

ABRB38



Static

Summary HSS 5x5x3/8

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	183	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Major	96	2.5	74.5	kip	0.034	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	112	-9.6	39.7	kip ft	0.243	✔ Pass
Flexure Minor	229	0.5	39.7	kip ft	0.013	✔ Pass
Axial Tension	276	-0.2	278.1	kip	0.001	✔ Pass
Axial Compression	319	0.2	229.3	kip	0.001	✔ Pass
Combined Forces	101	-	-	-	0.249	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.077	-	in	-	-
Deflection Dead	1	0.215	0.500	in	0.430	✔ Pass
Deflection Live	21	0.172	0.500	in	0.344	✔ Pass
Deflection Wind	339	-0.113	0.500	in	0.225	✔ Pass
Deflection Total	112	0.552	0.750	in	0.736	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_{1}$-1.4D - Critical

Span 1 HSS 5x5x3/8 A992-50 - Critical

Flexural: Position 4' 0" - Critical

Moment, M_x	=-1.2 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 2 HSS 5x5x3/8 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=2.5 kip	
Design shear strength	=74.5 kip	AISC 360 G4
Ratio	**=0.034**	

✔ Pass

Flexure Major

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical

Span 2 HSS 5x5x3/8 A992-50 - Critical

Yielding: 0" - Critical

Dist of M_{rx} along member	=0" ft, in	
Required flexural strength, M_{rx1}	=-9.6 kip ft	
Design flexural strength	=39.7 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.243**	

✔ Pass

Flexure Minor

229 (Final) LRFD$_{10.7}$-1.2D+L+0.5S+W - Critical

Span 1 HSS 5x5x3/8 A992-50 - Critical

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Yielding: 8′ 0″ - Critical

Dist of M_{ry} along member	=8′ 0″ ft, in	
Required flexural strength, M_{ry1}	=0.5 kip ft	
Design flexural strength	=39.7 kip ft	AISC 360 F7
Ratio	**=0.013**	

✔ Pass

Axial Tension

276 (Final) $LRFD_{10.54}$-1.2D+L+0.5S+W - Critical

Span 1 HSS 5x5x3/8 A992-50 - Critical

Yielding: Position 0″ - Critical

Distance of P_r along member	=0″ ft, in	
Required tensile strength, P_r	=-0.2 kip	
Design yield strength	=278.1 kip	AISC 360 D2
Ratio	**=0.001**	

✔ Pass

Axial Compression

319 (Final) $LRFD_{12.33}$-0.9D+W - Critical

Span 1 HSS 5x5x3/8 A992-50 - Critical

Flexural - in-plane: 0″ - 8′ 0″ - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 8′ 0″	Flexural - in-plane	8′ 0″	0.2	229.3	kip	0.001	✔ Pass

Combined Forces

101 (Final) $LRFD_{8.7}$-1.2D+1.6S+0.5W - Critical

Span 1 HSS 5x5x3/8 A992-50 - Critical

Flange Top LTB 0″ - 8′ 0″ - Critical

Axial Tension: 0″ - 8′ 0″ - Critical

Mode	Ratio	Status
Combined buckling	0.249	✔ Pass

Deflection

112 (Final) $LRFD_{8.18}$-1.2D+1.6S+0.5W - Critical

Span 2 HSS 5x5x3/8 A992-50 - Critical

Deflection Total - Critical

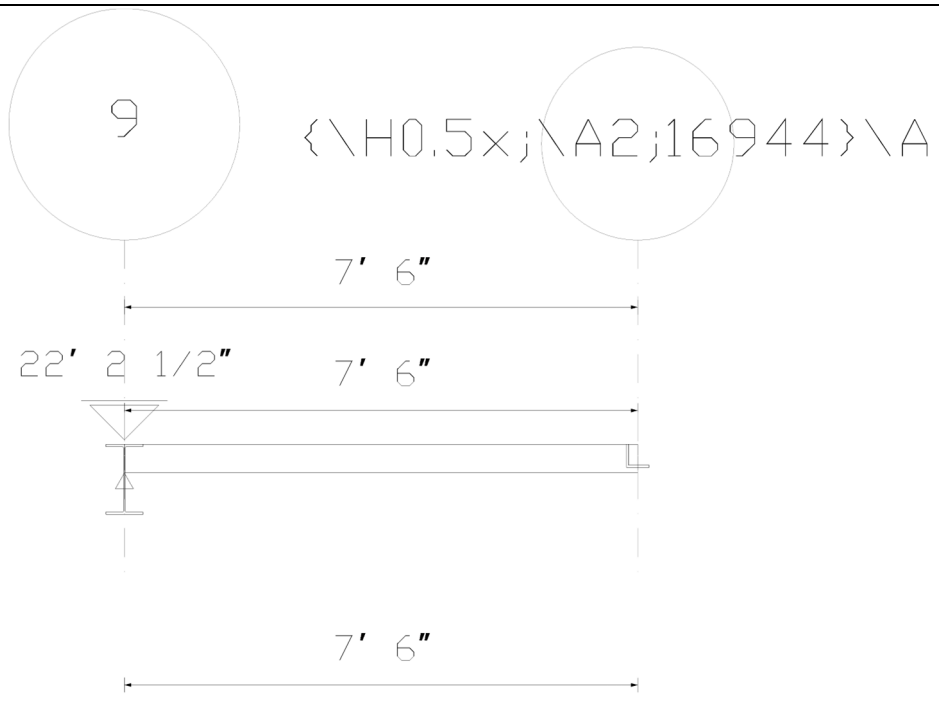
Position Total load deflection	=7′ 6″ ft, in
Max. Total load deflection	=0.552 in
Span over limit	=0.750 in
Design limit	=0.750 in
Utilization Ratio	**=0.736**

✔ Pass

ABRB26

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Project Name: FIRE STATION 5		



St. ABR (APP BAY ROOF): ABRB26 - 1
HSS 5x5x3/8 A992-50

Static

Summary HSS 5x5x3/8

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	55	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	1.3	74.5	kip	0.018	✔ Pass
Shear Minor	211	-0.2	74.5	kip	0.003	✔ Pass
Flexure Major	128	-5.1	39.7	kip ft	0.128	✔ Pass
Flexure Minor	211	0.8	39.7	kip ft	0.021	✔ Pass
Axial Tension	163	-0.5	278.1	kip	0.002	✔ Pass
Axial Compression	320	0.4	234.7	kip	0.002	✔ Pass
Combined Forces	106	-	-	-	0.144	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.030	-	in	-	-
Deflection Dead	1	0.053	0.500	in	0.105	✔ Pass
Deflection Live	21	0.042	0.500	in	0.084	✔ Pass
Deflection Wind	291	-0.028	0.500	in	0.055	✔ Pass
Deflection Total	128	0.147	0.750	in	0.196	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

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Project Name: FIRE STATION 5		

1 (Final) LRFD$_1$-1.4D - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Flexural: Position 0" - Critical

Moment, M_x	=-2.9 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major
96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=1.3 kip	
Design shear strength	=74.5 kip	AISC 360 G4
Ratio	**=0.018**	

✔ Pass

Shear Minor
211 (Final) LRFD$_{9.53}$-1.2D+L+0.5Lr+W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Position 0" - Critical

Position of V_{rx}	=0" ft, in	
Required minor axis shear strength, V_{rx}	=-0.2 kip	
Design shear strength	=74.5 kip	AISC 360 G4
Ratio	**=0.003**	

✔ Pass

Flexure Major
128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Yielding: 0" - Critical

Dist of M_{rx} along member	=0" ft, in	
Required flexural strength, M_{rx1}	=-5.1 kip ft	
Design flexural strength	=39.7 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.128**	

✔ Pass

Flexure Minor
211 (Final) LRFD$_{9.53}$-1.2D+L+0.5Lr+W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Yielding: 0" - Critical

Dist of M_{ry} along member	=0" ft, in	
Required flexural strength, M_{ry1}	=0.8 kip ft	
Design flexural strength	=39.7 kip ft	AISC 360 F7
Ratio	**=0.021**	

✔ Pass

Axial Tension

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Project Name: FIRE STATION 5		

163 (Final) LRFD$_{9.5}$-1.2D+L+0.5Lr+W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-0.5 kip	
Design yield strength	=278.1 kip	AISC 360 D2
Ratio	**=0.002**	

✔ Pass

Axial Compression
320 (Final) LRFD$_{12.34}$-0.9D+W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Flexural - in-plane: 0" - 7' 6" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 7' 6"	Flexural - in-plane	7' 6"	0.4	234.7	kip	0.002	✔ Pass

Combined Forces
106 (Final) LRFD$_{8.12}$-1.2D+1.6S+0.5W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Flange Top LTB 0" - 7' 6" - Critical
Axial Tension: 0" - 7' 6" - Critical

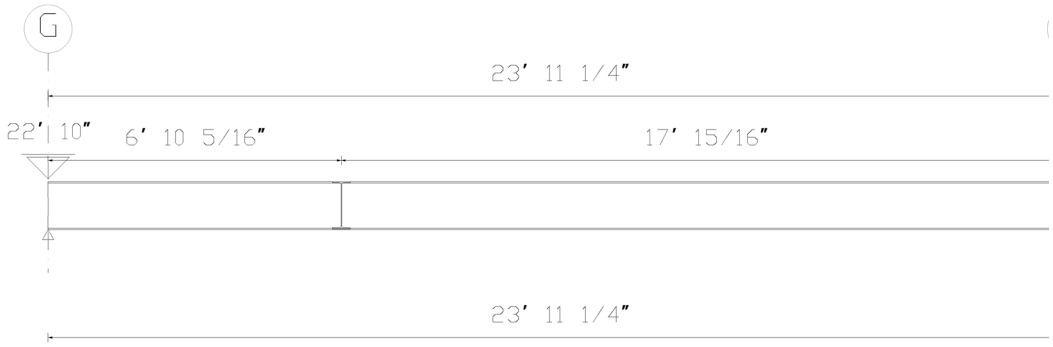
Mode	Ratio	Status
Combined buckling	0.144	✔ Pass

Deflection
128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Deflection Total - Critical

Position Total load deflection	=7' 6" ft, in	
Max. Total load deflection	=0.147 in	
Span over limit	=0.750 in	
Design limit	=0.750 in	
Utilization Ratio	**=0.196**	

✔ Pass

TORSB1016



St. TORS (T.O. ROOF STRUCT.): TORSB1016 - 1
W 14x26 A992-50

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Project Name: FIRE STATION 5		

Static

Summary W 14x26

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	158	9.6	106.3	kip	0.090	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	158	-21.8	45.5	kip ft	0.479	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	19	3.3	48.2	kip	0.069	✔ Pass
Combined Forces	154	-	-	-	0.499	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.031	-	in	-	-
Deflection Slab	1	-0.018	1.197	in	0.015	✔ Pass
Deflection Dead	1	0.127	0.798	in	0.159	✔ Pass
Deflection Live	21	0.092	1.197	in	0.077	✔ Pass
Deflection Wind	291	-0.061	1.436	in	0.042	✔ Pass
Deflection Total	144	0.303	0.798	in	0.380	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x26 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=1.8 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

158 (Final) LRFD$_{8.64}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x26 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=9.6 kip	
Design shear strength	=106.3 kip	AISC 360 G2
Ratio	**=0.090**	

✔ Pass

Flexure Major

158 (Final) LRFD$_{8.64}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x26 A992-50 - Critical

LTB Flange Btm: 0" - 23' 11 1/4" - Critical

Dist of M_{rx1} along member	=0" ft, in	
Required flexural strength, M_{rx1}	=-21.8 kip ft	
Design flexural strength	=45.5 kip ft	AISC 360 F1, F2, F3 and F4

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Ratio =0.479

Pass

Axial Compression

19 (Final) LRFD$_{4.4}$-1.2D+1.6L+0.5S+NL$_{Dir2+}$ - Critical

Span 1 W 14x26 A992-50 - Critical

Flexural - out-of-plane: 6' 10 5/16" - 23' 11 1/4" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
6' 10 5/16" - 23' 11 1/4"	Flexural - out-of-plane	17' 15/16"	3.3	48.2	kip	0.069	Pass

Combined Forces

154 (Final) LRFD$_{8.60}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x26 A992-50 - Critical

Flange Btm LTB 0" - 23' 11 1/4" - Critical

Axial Comp: I.P. 0" - 23' 11 1/4" , O.o.P.6' 10 5/16" - 23' 11 1/4" , Tors. 0" - 23' 11 1/4" - Critical

Mode	Ratio	Status
Combined buckling	0.499	Pass

Deflection

144 (Final) LRFD$_{8.50}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x26 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =10' 6 3/8" ft, in

Max. Total load deflection =0.303 in

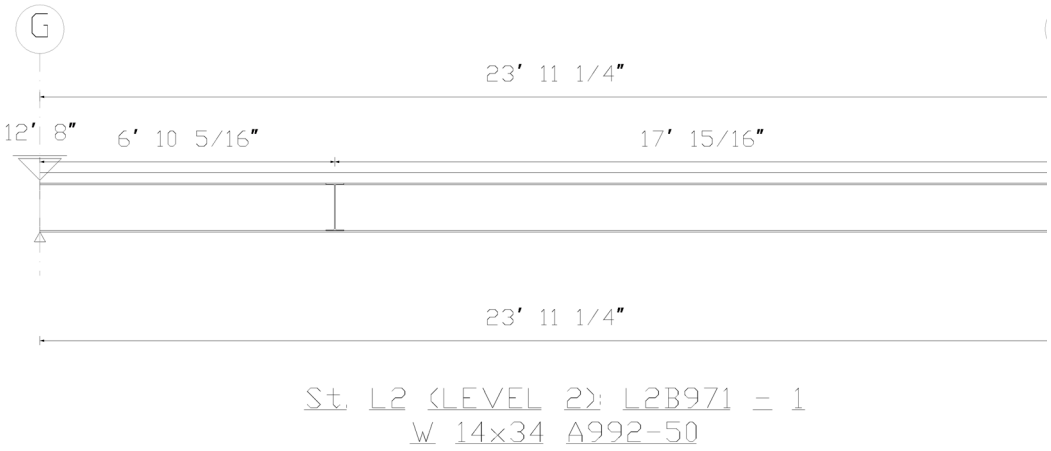
Span over limit =0.798 in

Design limit =0.798 in

Utilization Ratio **=0.380**

Pass

L2B971



Static

Summary W 14x34

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required

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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	20	22.8	119.7	kip	0.190	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	9	110.9	204.7	kip ft	0.541	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.028	-	in	-	-
Deflection Slab	1	0.127	1.197	in	0.106	✔ Pass
Deflection Dead	1	0.071	0.798	in	0.090	✔ Pass
Deflection Live	6	0.340	1.197	in	0.284	✔ Pass
Deflection Wind	339	0.010	1.436	in	0.007	✔ Pass
Deflection Total	6	0.567	0.798	in	0.711	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x34 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x	=-19.1 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

20 (Final) LRFD$_{4.5}$-1.2D+1.6L+0.5S+NL$_{Dir2-}$ - Critical

Span 1 W 14x34 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=22.8 kip	
Design shear strength	=119.7 kip	AISC 360 G2
Ratio	**=0.190**	

✔ Pass

Flexure Major

9 (Final) LRFD$_{2.3}$-1.2D+1.6L+NL$_{Dir2+}$ - Critical

Span 1 W 14x34 A992-50 - Critical

Yielding: 6' 10 5/16" - Critical

Dist of M_{rx} along member	=6' 10 5/16" ft, in	
Required flexural strength, M_{rx1}	=110.9 kip ft	
Design flexural strength	=204.7 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.541**	

✔ Pass

Deflection

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Project Name: FIRE STATION 5		

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

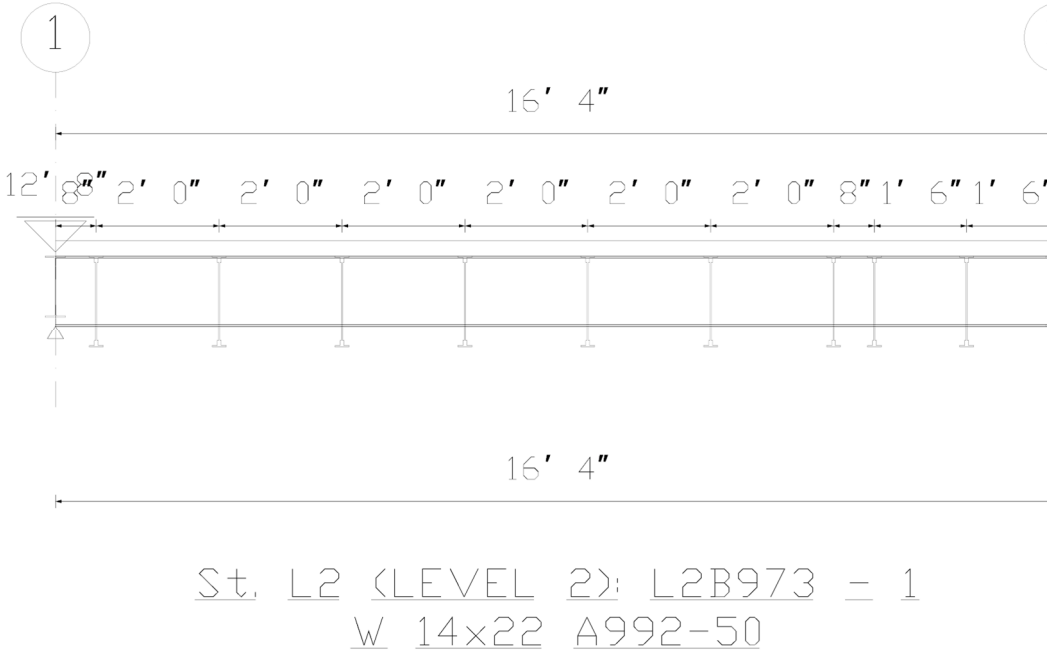
Span 1 W 14x34 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=10' 3 125/128" ft, in
Max. Total load deflection	=0.567 in
Span over limit	=0.798 in
Design limit	=0.798 in
Utilization Ratio	**=0.711**

✔ Pass

L2B973



Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	18	20.1	94.5	kip	0.213	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	17	-33.7	45.8	kip ft	0.736	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.010	-	in	-	-
Deflection Slab	1	0.070	0.817	in	0.086	✔ Pass
Deflection Dead	1	0.040	0.544	in	0.073	✔ Pass
Deflection Live	6	0.188	0.817	in	0.230	✔ Pass
Deflection Wind	323	0.007	0.980	in	0.008	✔ Pass

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Deflection Total	6	0.309	0.544	in	0.567	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x	=-11.7 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

18 (Final) LRFD$_{4.3}$-1.2D+1.6L+0.5S+NL$_{Dir1-}$ - Critical

Span 1 W 14x22 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=20.1 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.213**	

✔ Pass

Flexure Major

17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$ - Critical

Span 1 W 14x22 A992-50 - Critical

LTB Flange Btm: 0" - 16' 4" - Critical

Dist of M_{rx1} along member	=16' 4" ft, in	
Required flexural strength, M_{rx1}	=-33.7 kip ft	
Design flexural strength	=45.8 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.736**	

✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

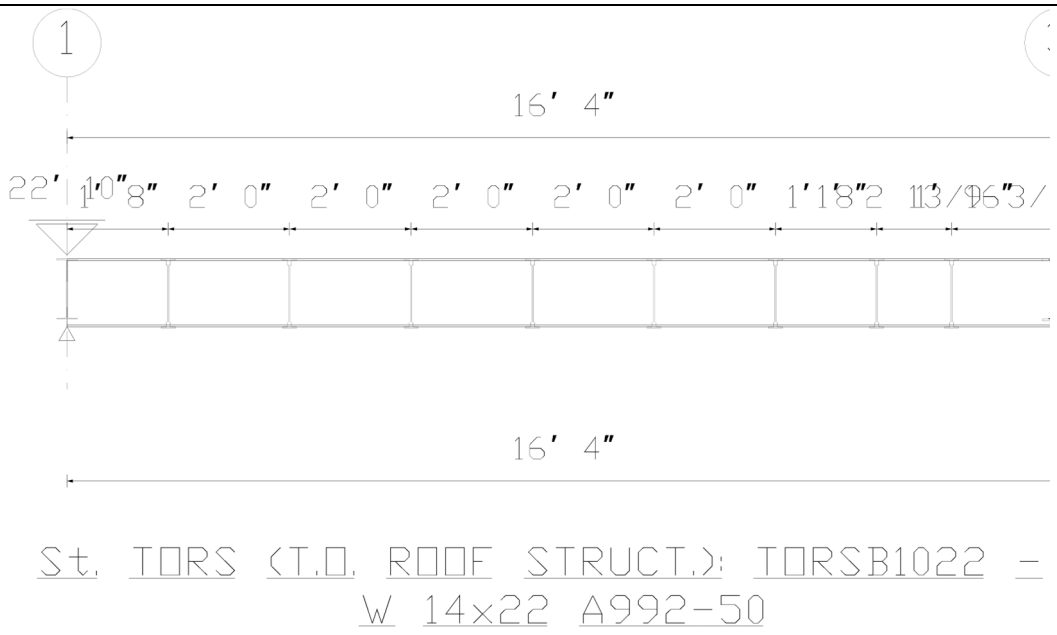
Position Total load deflection	=8' 1 153/256" ft, in
Max. Total load deflection	=0.309 in
Span over limit	=0.544 in
Design limit	=0.544 in
Utilization Ratio	**=0.567**

✔ Pass

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Project Name: FIRE STATION 5		



Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	-8.3	94.5	kip	0.088	✔ Pass
Shear Minor	249	0.4	90.5	kip	0.004	✔ Pass
Flexure Major	96	-16.2	45.8	kip ft	0.353	✔ Pass
Flexure Minor	249	0.7	16.5	kip ft	0.045	✔ Pass
Axial Tension	291	-0.4	292.1	kip	0.001	✔ Pass
Axial Compression	256	3.3	115.7	kip	0.029	✔ Pass
Combined Forces	27	-	-	-	0.379	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.009	-	in	-	-
Deflection Slab	1	-0.009	0.817	in	0.011	✔ Pass
Deflection Dead	1	0.059	0.544	in	0.108	✔ Pass
Deflection Live	21	0.043	0.817	in	0.053	✔ Pass
Deflection Wind	291	-0.031	0.980	in	0.032	✔ Pass
Deflection Total	128	0.137	0.544	in	0.251	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P =1.3 kip

Elastic modulus of steel, E =29000 ksi

Minimum yield stress, F_y =50.00 ksi

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Project Name: FIRE STATION 5		

Axial section class Slender AISC 360 Table B4.1a

Shear Major
96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical
Span 1 W 14x22 A992-50 - Critical
Position 16' 4" - Critical
Position of V_{ry} =16' 4" ft, in
Required major axis shear strength, V_{ry} =-8.3 kip
Design shear strength =94.5 kip AISC 360 G2
Ratio **=0.088**
✔ Pass

Shear Minor
249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W - Critical
Span 1 W 14x22 A992-50 - Critical
Position 11' 8" - Critical
Position of V_{rx} =11' 8" ft, in
Required minor axis shear strength, V_{rx} =0.4 kip
Design shear strength =90.5 kip AISC 360 G6
Ratio **=0.004**
✔ Pass

Flexure Major
96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical
Span 1 W 14x22 A992-50 - Critical
LTB Flange Btm: 0" - 16' 4" - Critical
Dist of M_{rx1} along member =16' 4" ft, in
Required flexural strength, M_{rx1} =-16.2 kip ft
Design flexural strength =45.8 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.353**
✔ Pass

Flexure Minor
249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W - Critical
Span 1 W 14x22 A992-50 - Critical
Yielding: 13' 4" - Critical
Dist of M_{ry} along member =13' 4" ft, in
Required flexural strength, M_{ry1} =0.7 kip ft
Design flexural strength =16.5 kip ft AISC 360 F6
Ratio **=0.045**
✔ Pass

Axial Tension
291 (Final) LRFD$_{12.5}$-0.9D+W - Critical
Span 1 W 14x22 A992-50 - Critical
Yielding: Position 0" - Critical
Distance of P_r along member =0" ft, in
Required tensile strength, P_r =-0.4 kip
Design yield strength =292.1 kip AISC 360 D2

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Ratio **=0.001**

✔ Pass

Axial Compression

256 (Final) LRFD$_{10.34}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural torsional: 0" - 16' 4" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 16' 4"	Flexural torsional	16' 4"	3.3	115.7	kip	0.029	✔ Pass

Combined Forces

27 (Final) LRFD$_{6.2}$-1.2D+L+1.6S+NL$_{Dir1+}$ - Critical

Span 1 W 14x22 A992-50 - Critical

Flange Btm LTB 0" - 16' 4" - Critical

Axial Comp: I.P. 0" - 16' 4" , O.o.P.0" - 1' 8" , Tors. 0" - 16' 4" - Critical

Mode	Ratio	Status
Combined buckling	0.379	✔ Pass

Deflection

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =8' 4 39/256" ft, in

Max. Total load deflection =0.137 in

Span over limit =0.544 in

Design limit =0.544 in

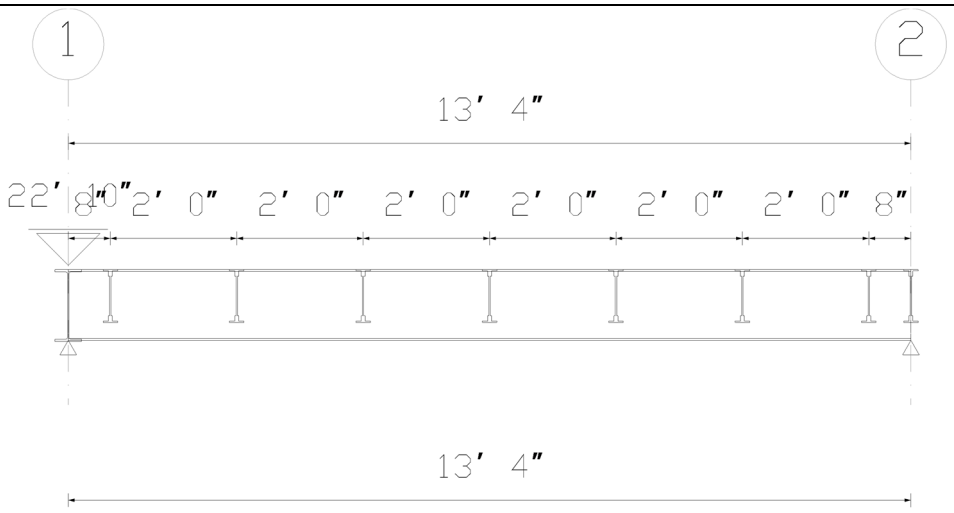
Utilization Ratio **=0.251**

✔ Pass

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Revision:	Date:	Sheet No. 522
Project Name: FIRE STATION 5		



St. TORS (T.O. ROOF STRUCT.): TORSB1017 - W 14x22 A992-50

Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	28	9.4	94.5	kip	0.100	✔ Pass
Shear Minor	249	1.6	90.5	kip	0.018	✔ Pass
Flexure Major	28	-33.3	98.5	kip ft	0.338	✔ Pass
Flexure Minor	249	-1.1	16.5	kip ft	0.065	✔ Pass
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	28	6.5	138.3	kip	0.047	✔ Pass
Combined Forces	28	-	-	-	0.399	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.003	-	in	-	-
Deflection Slab	1	-0.006	0.667	in	0.009	✔ Pass
Deflection Dead	1	0.023	0.444	in	0.052	✔ Pass
Deflection Live	21	0.016	0.667	in	0.024	✔ Pass
Deflection Wind	291	-0.010	0.800	in	0.013	✔ Pass
Deflection Total	158	0.055	0.444	in	0.124	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P =4.1 kip

Elastic modulus of steel, E =29000 ksi

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Project Name: FIRE STATION 5		

Minimum yield stress, F_y =50.00 ksi
Axial section class Slender AISC 360 Table B4.1a

Shear Major
28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$ - Critical
Span 1 W 14x22 A992-50 - Critical
Position 0" - Critical
Position of V_{ry} =0" ft, in
Required major axis shear strength, V_{ry} =9.4 kip
Design shear strength =94.5 kip AISC 360 G2
Ratio **=0.100**
✔ Pass

Shear Minor
249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W - Critical
Span 1 W 14x22 A992-50 - Critical
Position 12' 8" - Critical
Position of V_{rx} =12' 8" ft, in
Required minor axis shear strength, V_{rx} =1.6 kip
Design shear strength =90.5 kip AISC 360 G6
Ratio **=0.018**
✔ Pass

Flexure Major
28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$ - Critical
Span 1 W 14x22 A992-50 - Critical
LTB Flange Btm: 0" - 13' 4" - Critical
Dist of M_{rx1} along member =0" ft, in
Required flexural strength, M_{rx1} =-33.3 kip ft
Design flexural strength =98.5 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.338**
✔ Pass

Flexure Minor
249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W - Critical
Span 1 W 14x22 A992-50 - Critical
Yielding: 12' 8" - Critical
Dist of M_{ry} along member =12' 8" ft, in
Required flexural strength, M_{ry1} =-1.1 kip ft
Design flexural strength =16.5 kip ft AISC 360 F6
Ratio **=0.065**
✔ Pass

Axial Compression
28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$ - Critical
Span 1 W 14x22 A992-50 - Critical
Flexural torsional: 0" - 13' 4" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 13' 4"	Flexural torsional	13' 4"	6.5	138.3	kip	0.047	✔ Pass

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Combined Forces

28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$ - Critical

Span 1 W 14x22 A992-50 - Critical

Flange Btm LTB 0" - 13' 4" - Critical

Axial Comp: I.P. 0" - 13' 4" , O.o.P.0" - 8" , Tors. 0" - 13' 4" - Critical

Mode	Ratio	Status
Combined buckling	0.399	✔ Pass

Deflection

158 (Final) LRFD$_{8.64}$-1.2D+1.6S+0.5W - Critical

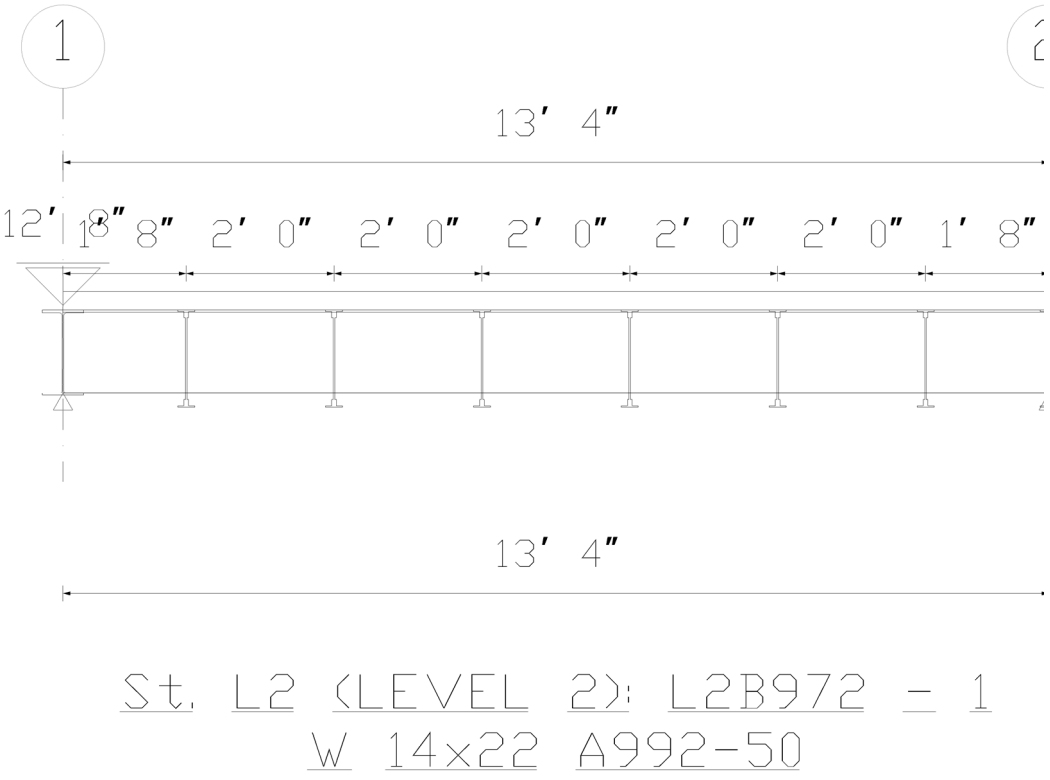
Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=8' 1 25/64" ft, in
Max. Total load deflection	=0.055 in
Span over limit	=0.444 in
Design limit	=0.444 in
Utilization Ratio	**=0.124**

✔ Pass

L2B972



Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required

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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	18	17.0	94.5	kip	0.180	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	18	-48.4	89.3	kip ft	0.542	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.005	-	in	-	-
Deflection Slab	1	0.026	0.667	in	0.039	✔ Pass
Deflection Dead	1	0.016	0.444	in	0.036	✔ Pass
Deflection Live	6	0.070	0.667	in	0.105	✔ Pass
Deflection Wind	291	0.007	0.800	in	0.008	✔ Pass
Deflection Total	6	0.115	0.444	in	0.259	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x	=-30.3 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

18 (Final) LRFD$_{4.3}$-1.2D+1.6L+0.5S+NL$_{Dir1-}$ - Critical

Span 1 W 14x22 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=17.0 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.180**	

✔ Pass

Flexure Major

18 (Final) LRFD$_{4.3}$-1.2D+1.6L+0.5S+NL$_{Dir1-}$ - Critical

Span 1 W 14x22 A992-50 - Critical

LTB Flange Btm: 0" - 13' 4" - Critical

Dist of M_{rx1} along member	=0" ft, in	
Required flexural strength, M_{rx1}	=-48.4 kip ft	
Design flexural strength	=89.3 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.542**	

✔ Pass

Deflection

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Project Name: FIRE STATION 5		

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

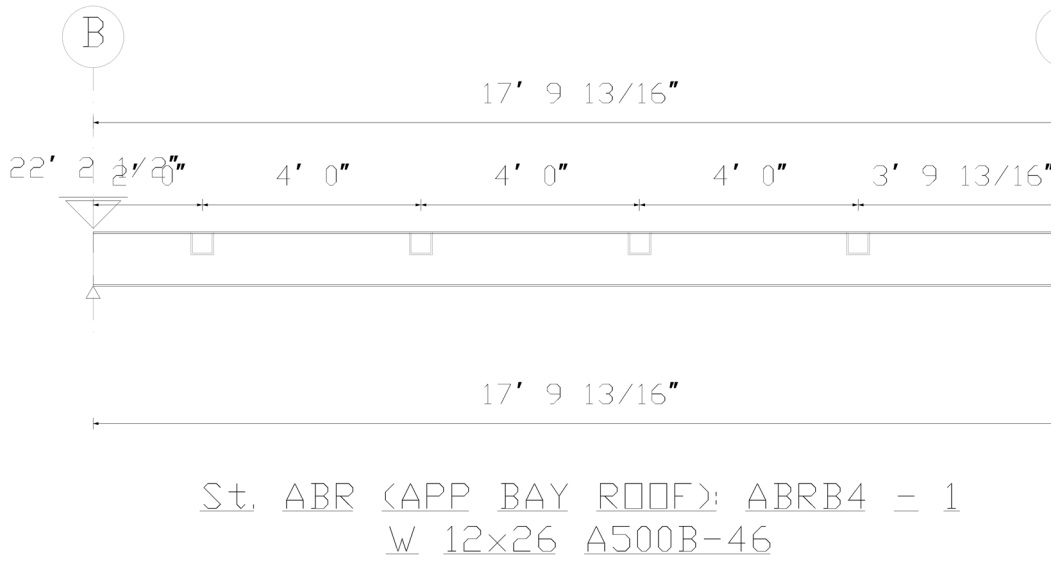
Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=7′ 8″ ft, in
Max. Total load deflection	=0.115 in
Span over limit	=0.444 in
Design limit	=0.444 in
Utilization Ratio	**=0.259**

✔ Pass

ABRB4



Static

Summary W 12x26

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	155	13.3	77.4	kip	0.171	✔ Pass
Shear Minor	224	-0.9	122.5	kip	0.008	✔ Pass
Flexure Major	155	-38.9	122.2	kip ft	0.318	✔ Pass
Flexure Minor	224	-1.9	28.2	kip ft	0.066	✔ Pass
Axial Tension	323	-3.5	316.7	kip	0.011	✔ Pass
Axial Compression	151	2.7	174.4	kip	0.016	✔ Pass
Combined Forces	96	-	-	-	0.356	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.019	-	in	-	-
Deflection Slab	1	0.006	0.891	in	0.007	✔ Pass
Deflection Dead	1	0.055	0.594	in	0.092	✔ Pass
Deflection Live	21	0.043	0.594	in	0.072	✔ Pass
Deflection Wind	323	-0.027	1.069	in	0.025	✔ Pass
Deflection Total	155	0.149	0.891	in	0.167	✔ Pass

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Project Name: FIRE STATION 5		

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x26 A500B-46 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.4 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=46.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

155 (Final) LRFD$_{8.61}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x26 A500B-46 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=13.3 kip	
Design shear strength	=77.4 kip	AISC 360 G2
Ratio	**=0.171**	

✔ Pass

Shear Minor

224 (Final) LRFD$_{10.2}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x26 A500B-46 - Critical

Position 0" - Critical

Position of V_{rx}	=0" ft, in	
Required minor axis shear strength, V_{rx}	=-0.9 kip	
Design shear strength	=122.5 kip	AISC 360 G6
Ratio	**=0.008**	

✔ Pass

Flexure Major

155 (Final) LRFD$_{8.61}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x26 A500B-46 - Critical

LTB Flange Btm: 0" - 17' 9 13/16" - Critical

Dist of M_{rx1} along member	=0" ft, in	
Required flexural strength, M_{rx1}	=-38.9 kip ft	
Design flexural strength	=122.2 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.318**	

✔ Pass

Flexure Minor

224 (Final) LRFD$_{10.2}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x26 A500B-46 - Critical

Yielding: 2' 0" - Critical

Dist of M_{ry} along member	=2' 0" ft, in	
Required flexural strength, M_{ry1}	=-1.9 kip ft	
Design flexural strength	=28.2 kip ft	AISC 360 F6
Ratio	**=0.066**	

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Project Name: FIRE STATION 5		

✔ Pass

Axial Tension

323 (Final) LRFD$_{12.37}$-0.9D+W - Critical

Span 1 W 12x26 A500B-46 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-3.5 kip	
Design yield strength	=316.7 kip	AISC 360 D2
Ratio	**=0.011**	

✔ Pass

Axial Compression

151 (Final) LRFD$_{8.57}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x26 A500B-46 - Critical

Flexural torsional: 0" - 17' 9 13/16" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 17' 9 13/16"	Flexural torsional	17' 9 13/16"	2.7	174.4	kip	0.016	✔ Pass

Combined Forces

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x26 A500B-46 - Critical

Flange Btm LTB 0" - 17' 9 13/16" - Critical

Axial Comp: I.P. 0" - 17' 9 13/16" , O.o.P.0" - 2' 0" , Tors. 0" - 17' 9 13/16" - Critical

Mode	Ratio	Status
Combined buckling	0.356	✔ Pass

Deflection

155 (Final) LRFD$_{8.61}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x26 A500B-46 - Critical

Deflection Total - Critical

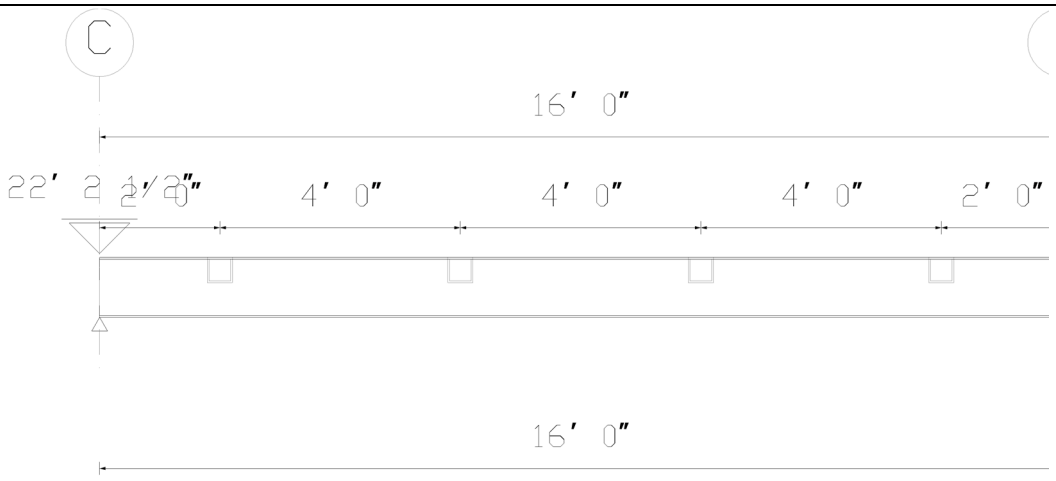
Position Total load deflection	=9' 8 1/32" ft, in
Max. Total load deflection	=0.149 in
Span over limit	=0.891 in
Design limit	=0.891 in
Utilization Ratio	**=0.167**

✔ Pass

ABRB3

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Project Name: FIRE STATION 5		



St. ABR (APP BAY ROOF): ABRB3 - 1
W 12x26 A500B-46

Static

Summary W 12x26

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	39	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	30	12.4	77.4	kip	0.160	✔ Pass
Shear Minor	224	-0.8	122.5	kip	0.006	✔ Pass
Flexure Major	30	-50.7	128.3	kip ft	0.395	✔ Pass
Flexure Minor	224	-1.5	28.2	kip ft	0.054	✔ Pass
Axial Tension	195	-6.8	316.7	kip	0.021	✔ Pass
Axial Compression	297	2.3	186.6	kip	0.012	✔ Pass
Combined Forces	96	-	-	-	0.406	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Slab	1	-0.014	0.800	in	0.017	✔ Pass
Deflection Dead	1	0.007	0.533	in	0.014	✔ Pass
Deflection Live	6	-0.009	0.533	in	0.017	✔ Pass
Deflection Wind	339	-0.009	0.960	in	0.009	✔ Pass
Deflection Total	275	-0.025	0.800	in	0.032	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

39 (Final) LRFD$_{7.9}$-1.2D+1.6Lr+0.5W - Critical

Span 1 W 12x26 A500B-46 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.6 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=46.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

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Shear Major
30 (Final) LRFD$_{6.5}$-1.2D+L+1.6S+NL$_{Dir2-}$ - Critical
Span 1 W 12x26 A500B-46 - Critical
Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=12.4 kip	
Design shear strength	=77.4 kip	AISC 360 G2
Ratio	**=0.160**	

✔ Pass

Shear Minor
224 (Final) LRFD$_{10.2}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x26 A500B-46 - Critical
Position 0" - Critical

Position of V_{rx}	=0" ft, in	
Required minor axis shear strength, V_{rx}	=-0.8 kip	
Design shear strength	=122.5 kip	AISC 360 G6
Ratio	**=0.006**	

✔ Pass

Flexure Major
30 (Final) LRFD$_{6.5}$-1.2D+L+1.6S+NL$_{Dir2-}$ - Critical
Span 1 W 12x26 A500B-46 - Critical
Yielding: 0" - Critical

Dist of M_{rx} along member	=0" ft, in	
Required flexural strength, M_{rx1}	=-50.7 kip ft	
Design flexural strength	=128.3 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.395**	

✔ Pass

Flexure Minor
224 (Final) LRFD$_{10.2}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x26 A500B-46 - Critical
Yielding: 2' 0" - Critical

Dist of M_{ry} along member	=2' 0" ft, in	
Required flexural strength, M_{ry1}	=-1.5 kip ft	
Design flexural strength	=28.2 kip ft	AISC 360 F6
Ratio	**=0.054**	

✔ Pass

Axial Tension
195 (Final) LRFD$_{9.37}$-1.2D+L+0.5Lr+W - Critical
Span 1 W 12x26 A500B-46 - Critical
Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-6.8 kip	
Design yield strength	=316.7 kip	AISC 360 D2
Ratio	**=0.021**	

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✔ Pass

Axial Compression

297 (Final) $LRFD_{12.11}$-0.9D+W - Critical

Span 1 W 12x26 A500B-46 - Critical

Flexural torsional: 0" - 16' 0" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 16' 0"	Flexural torsional	16' 0"	2.3	186.6	kip	0.012	✔ Pass

Combined Forces

96 (Final) $LRFD_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x26 A500B-46 - Critical

Flange Btm LTB 0" - 16' 0" - Critical

Axial Tension: 0" - 16' 0" - Critical

Mode	Ratio	Status
Combined buckling	0.406	✔ Pass

Deflection

275 (Final) $LRFD_{10.53}$-1.2D+L+0.5S+W - Critical

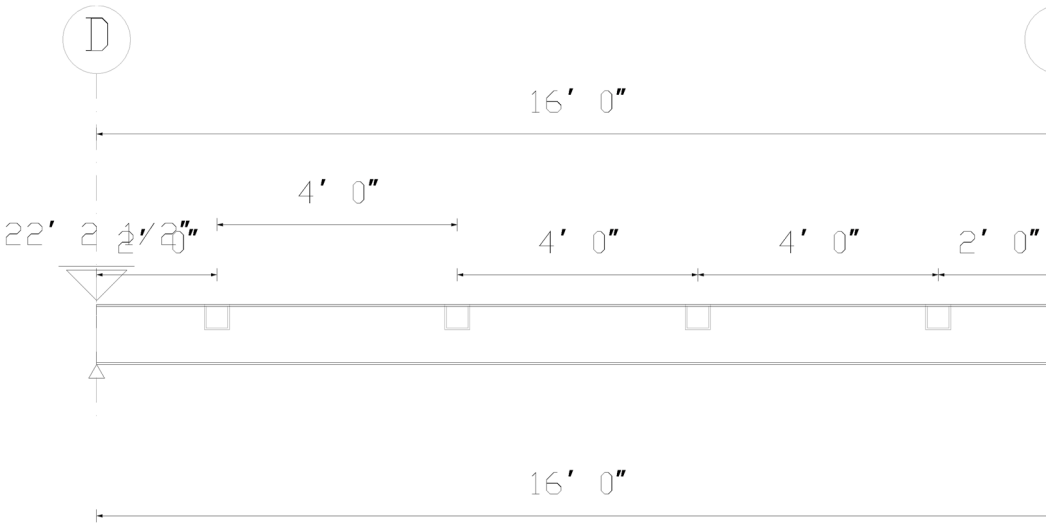
Span 1 W 12x26 A500B-46 - Critical

Deflection Total - Critical

Position Total load deflection	=3' 3 249/256" ft, in
Max. Total load deflection	=-0.025 in
Span over limit	=0.800 in
Design limit	=0.800 in
Utilization Ratio	**=0.032**

✔ Pass

ABRB2



St. ABR (APP BAY ROOF): ABRB2 - 1
W 12x26 A500B-46

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Revision:	Date:	Sheet No. 532
Project Name: FIRE STATION 5		

Static

Summary W 12x26

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	29	-15.3	77.4	kip	0.198	✔ Pass
Shear Minor	244	-0.8	122.5	kip	0.006	✔ Pass
Flexure Major	29	-62.5	128.3	kip ft	0.487	✔ Pass
Flexure Minor	244	1.5	28.2	kip ft	0.055	✔ Pass
Axial Tension	323	-7.7	316.7	kip	0.024	✔ Pass
Axial Compression	233	6.7	186.6	kip	0.036	✔ Pass
Combined Forces	29	-	-	-	0.495	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.011	-	in	-	-
Deflection Slab	1	-0.015	0.800	in	0.018	✔ Pass
Deflection Dead	1	0.036	0.533	in	0.067	✔ Pass
Deflection Live	21	0.030	0.533	in	0.056	✔ Pass
Deflection Wind	323	-0.021	0.960	in	0.022	✔ Pass
Deflection Total	112	0.086	0.800	in	0.108	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_{1}$-1.4D - Critical

Span 1 W 12x26 A500B-46 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.6 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=46.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

29 (Final) $LRFD_{6.4}$-1.2D+L+1.6S+NL_{Dir2+} - Critical

Span 1 W 12x26 A500B-46 - Critical

Position 16' 0" - Critical

Position of V_{ry}	=16' 0" ft, in	
Required major axis shear strength, V_{ry}	=-15.3 kip	
Design shear strength	=77.4 kip	AISC 360 G2
Ratio	**=0.198**	

✔ Pass

Shear Minor

244 (Final) $LRFD_{10.22}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x26 A500B-46 - Critical

Position 14' 0" - Critical

Position of V_{rx}	=14' 0" ft, in
Required minor axis shear strength, V_{rx}	=-0.8 kip

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Design shear strength =122.5 kip AISC 360 G6
Ratio **=0.006**

✔ Pass

Flexure Major

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$ - Critical

Span 1 W 12x26 A500B-46 - Critical

Yielding: 16' 0" - Critical

Dist of M_{rx} along member =16' 0" ft, in
Required flexural strength, M_{rx1} =-62.5 kip ft
Design flexural strength =128.3 kip ft AISC 360 F1, F2 and F3
Ratio **=0.487**

✔ Pass

Flexure Minor

244 (Final) LRFD$_{10.22}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x26 A500B-46 - Critical

Yielding: 14' 0" - Critical

Dist of M_{ry} along member =14' 0" ft, in
Required flexural strength, M_{ry1} =1.5 kip ft
Design flexural strength =28.2 kip ft AISC 360 F6
Ratio **=0.055**

✔ Pass

Axial Tension

323 (Final) LRFD$_{12.37}$-0.9D+W - Critical

Span 1 W 12x26 A500B-46 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member =0" ft, in
Required tensile strength, P_r =-7.7 kip
Design yield strength =316.7 kip AISC 360 D2
Ratio **=0.024**

✔ Pass

Axial Compression

233 (Final) LRFD$_{10.11}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x26 A500B-46 - Critical

Flexural torsional: 0" - 16' 0" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 16' 0"	Flexural torsional	16' 0"	6.7	186.6	kip	0.036	✔ Pass

Combined Forces

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$ - Critical

Span 1 W 12x26 A500B-46 - Critical

Flange Btm LTB 0" - 16' 0" - Critical

Axial Comp: I.P. 0" - 16' 0" , O.o.P.0" - 2' 0" , Tors. 0" - 16' 0" - Critical

Mode	Ratio	Status
Combined buckling	0.495	✔ Pass

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Deflection

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical

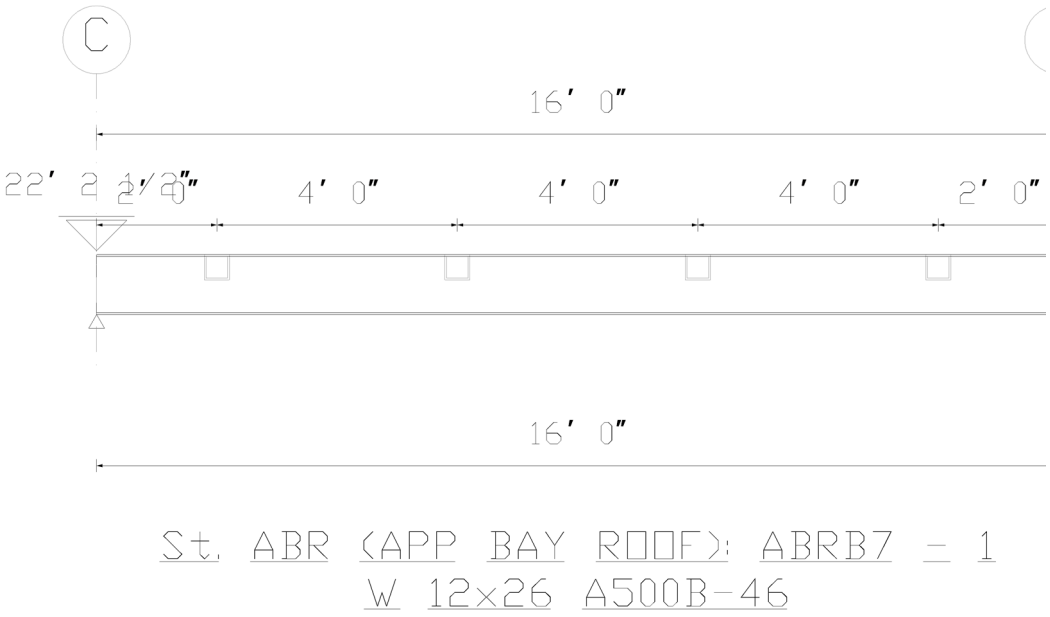
Span 1 W 12x26 A500B-46 - Critical

Deflection Total - Critical

Position Total load deflection	=6' 0" ft, in
Max. Total load deflection	=0.086 in
Span over limit	=0.800 in
Design limit	=0.800 in
Utilization Ratio	**=0.108**

✔ Pass

ABRB7



Static

Summary W 12x26

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	144	12.1	77.4	kip	0.156	✔ Pass
Shear Minor	276	-0.7	122.5	kip	0.006	✔ Pass
Flexure Major	30	-45.3	128.3	kip ft	0.353	✔ Pass
Flexure Minor	276	-1.4	28.2	kip ft	0.049	✔ Pass
Axial Tension	163	-4.4	316.7	kip	0.014	✔ Pass
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	128	-	-	-	0.376	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Slab	1	-0.012	0.800	in	0.015	✔ Pass
Deflection Dead	1	0.012	0.533	in	0.023	✔ Pass
Deflection Live	21	0.010	0.533	in	0.019	✔ Pass
Deflection Wind	307	-0.009	0.960	in	0.010	✔ Pass
Deflection Total	211	-0.017	0.800	in	0.021	✔ Pass

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Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x26 A500B-46 - Critical

Flexural: Position 0" - Critical

Moment, M_x	=-29.2 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=46.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

144 (Final) LRFD$_{8.50}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x26 A500B-46 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=12.1 kip	
Design shear strength	=77.4 kip	AISC 360 G2
Ratio	**=0.156**	

✔ Pass

Shear Minor

276 (Final) LRFD$_{10.54}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x26 A500B-46 - Critical

Position 0" - Critical

Position of V_{rx}	=0" ft, in	
Required minor axis shear strength, V_{rx}	=-0.7 kip	
Design shear strength	=122.5 kip	AISC 360 G6
Ratio	**=0.006**	

✔ Pass

Flexure Major

30 (Final) LRFD$_{6.5}$-1.2D+L+1.6S+NL$_{Dir2-}$ - Critical

Span 1 W 12x26 A500B-46 - Critical

Yielding: 0" - Critical

Dist of M_{rx} along member	=0" ft, in	
Required flexural strength, M_{rx1}	=-45.3 kip ft	
Design flexural strength	=128.3 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.353**	

✔ Pass

Flexure Minor

276 (Final) LRFD$_{10.54}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x26 A500B-46 - Critical

Yielding: 2' 0" - Critical

Dist of M_{ry} along member	=2' 0" ft, in	
Required flexural strength, M_{ry1}	=-1.4 kip ft	
Design flexural strength	=28.2 kip ft	AISC 360 F6

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Ratio **=0.049**

✔ Pass

Axial Tension

163 (Final) LRFD$_{9.5}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x26 A500B-46 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-4.4 kip	
Design yield strength	=316.7 kip	AISC 360 D2
Ratio	**=0.014**	

✔ Pass

Combined Forces

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x26 A500B-46 - Critical

Flange Btm LTB 0" - 16' 0" - Critical

Axial Tension: 0" - 16' 0" - Critical

Mode	Ratio	Status
Combined buckling	0.376	✔ Pass

Deflection

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x26 A500B-46 - Critical

Deflection Dead - Critical

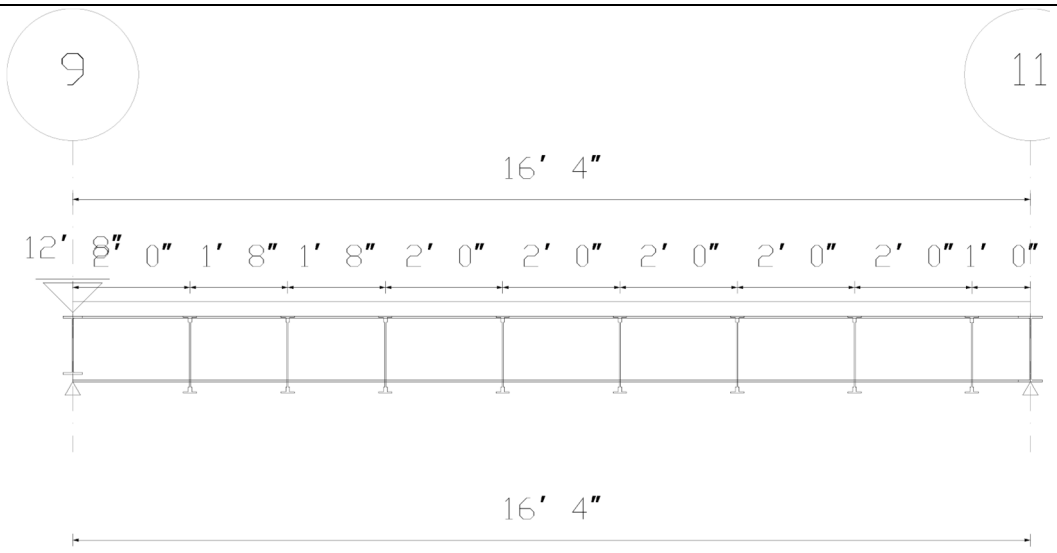
Position Dead load deflection	=8' 5 57/256" ft, in
Max. Dead load deflection	=0.012 in
Span over limit	=0.533 in
Design limit	=0.533 in
Utilization Ratio	**=0.023**

✔ Pass

L2B982

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St. L2 (LEVEL 2): L2B982 - 1
W 14x22 A992-50

Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	17	-17.8	94.5	kip	0.188	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	17	-38.1	46.5	kip ft	0.819	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.014	-	in	-	-
Deflection Slab	1	0.058	0.817	in	0.071	✔ Pass
Deflection Dead	1	0.036	0.544	in	0.066	✔ Pass
Deflection Live	6	0.151	0.817	in	0.184	✔ Pass
Deflection Wind	323	0.006	0.980	in	0.006	✔ Pass
Deflection Total	6	0.256	0.544	in	0.469	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x =6.0 kip ft

Elastic modulus of steel, E =29000 ksi

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Minimum yield stress, F_y =50.00 ksi
Flexural section class Compact AISC 360 Table B4.1b

Shear Major
17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$ - Critical
Span 1 W 14x22 A992-50 - Critical
Position 16' 4" - Critical
Position of V_{ry} =16' 4" ft, in
Required major axis shear strength, V_{ry} =-17.8 kip
Design shear strength =94.5 kip AISC 360 G2
Ratio **=0.188**
✔ Pass

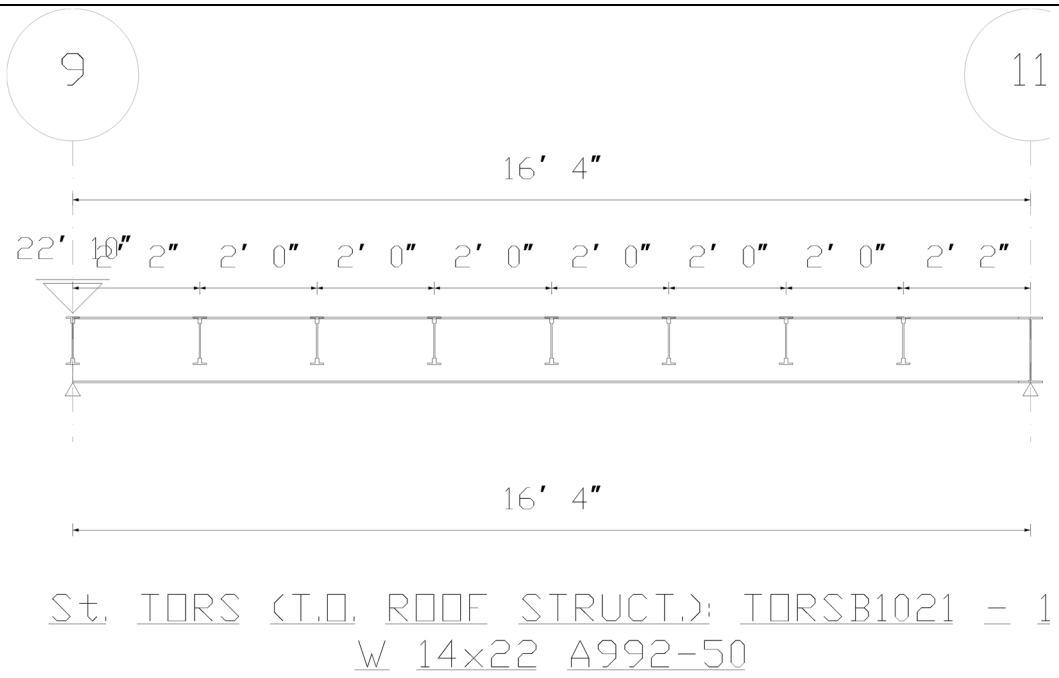
Flexure Major
17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$ - Critical
Span 1 W 14x22 A992-50 - Critical
LTB Flange Btm: 0" - 16' 4" - Critical
Dist of M_{rx1} along member =16' 4" ft, in
Required flexural strength, M_{rx1} =-38.1 kip ft
Design flexural strength =46.5 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.819**
✔ Pass

Deflection
6 (Final) LRFD$_2$-1.2D+1.6L - Critical
Span 1 W 14x22 A992-50 - Critical
Deflection Total - Critical
Position Total load deflection =7' 8 3/16" ft, in
Max. Total load deflection =0.256 in
Span over limit =0.544 in
Design limit =0.544 in
Utilization Ratio **=0.469**
✔ Pass

TORSB1021

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Project Name: FIRE STATION 5		



Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	-6.9	94.5	kip	0.073	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	96	-21.3	66.0	kip ft	0.323	✔ Pass
Flexure Minor	227	0.3	16.5	kip ft	0.020	✔ Pass
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	27	4.5	115.7	kip	0.039	✔ Pass
Combined Forces	96	-	-	-	0.346	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Slab	1	-0.008	0.817	in	0.009	✔ Pass
Deflection Dead	1	0.032	0.544	in	0.059	✔ Pass
Deflection Live	21	0.023	0.817	in	0.028	✔ Pass
Deflection Wind	339	-0.016	0.980	in	0.017	✔ Pass
Deflection Total	128	0.072	0.544	in	0.132	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P =2.7 kip

Elastic modulus of steel, E =29000 ksi

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Minimum yield stress, F_y =50.00 ksi
Axial section class Slender AISC 360 Table B4.1a

Shear Major
96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical
Span 1 W 14x22 A992-50 - Critical
Position 16′ 4″ - Critical
Position of V_{ry} =16′ 4″ ft, in
Required major axis shear strength, V_{ry} =-6.9 kip
Design shear strength =94.5 kip AISC 360 G2
Ratio **=0.073**
✔ Pass

Flexure Major
96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical
Span 1 W 14x22 A992-50 - Critical
LTB Flange Btm: 0″ - 16′ 4″ - Critical
Dist of M_{rx1} along member =16′ 4″ ft, in
Required flexural strength, M_{rx1} =-21.3 kip ft
Design flexural strength =66.0 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.323**
✔ Pass

Flexure Minor
227 (Final) LRFD$_{10.5}$-1.2D+L+0.5S+W - Critical
Span 1 W 14x22 A992-50 - Critical
Yielding: 2′ 2″ - Critical
Dist of M_{ry} along member =2′ 2″ ft, in
Required flexural strength, M_{ry1} =0.3 kip ft
Design flexural strength =16.5 kip ft AISC 360 F6
Ratio **=0.020**
✔ Pass

Axial Compression
27 (Final) LRFD$_{6.2}$-1.2D+L+1.6S+NL$_{Dir1+}$ - Critical
Span 1 W 14x22 A992-50 - Critical
Flexural torsional: 0″ - 16′ 4″ - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 16′ 4″	Flexural torsional	16′ 4″	4.5	115.7	kip	0.039	✔ Pass

Combined Forces
96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical
Span 1 W 14x22 A992-50 - Critical
Flange Btm LTB 0″ - 16′ 4″ - Critical
Axial Comp: I.P. 0″ - 16′ 4″ , O.o.P.0″ - 2′ 2″ , Tors. 0″ - 16′ 4″ - Critical

Mode	Ratio	Status
Combined buckling	0.346	✔ Pass

Deflection

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128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

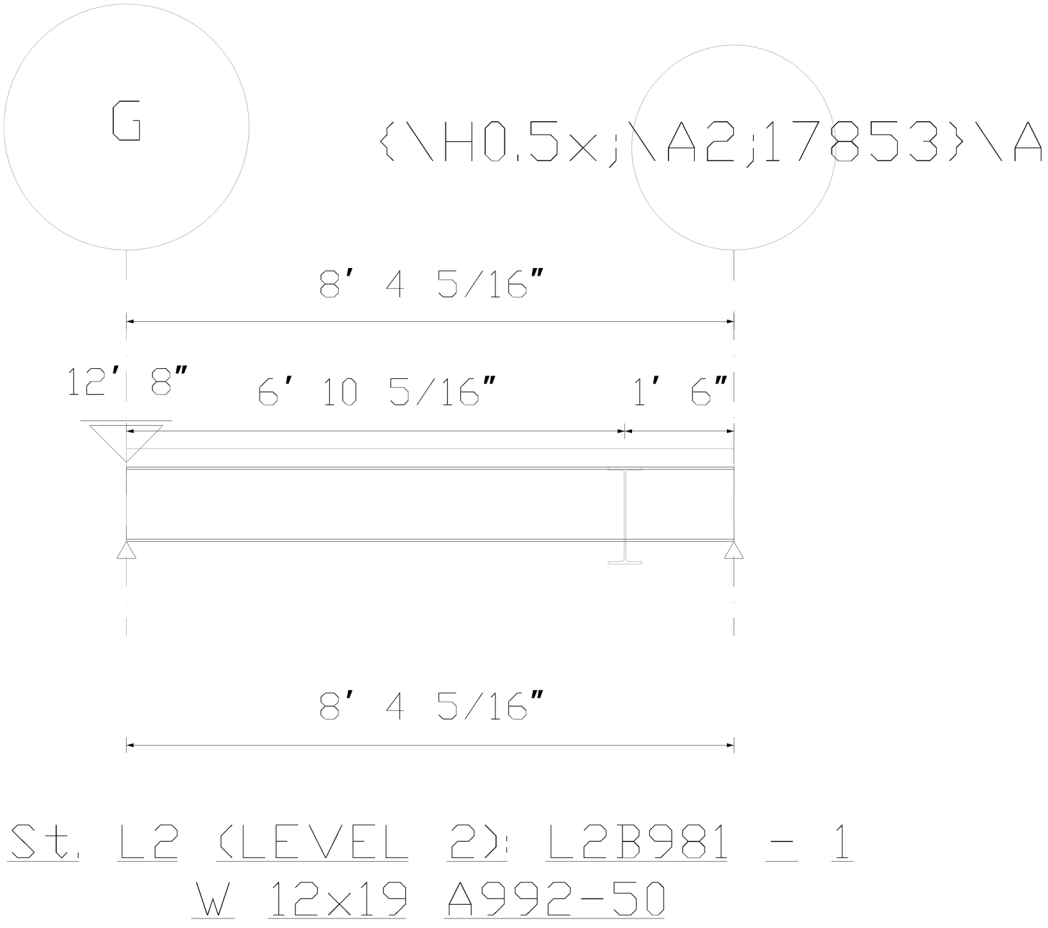
Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=7' 11 115/128" ft, in
Max. Total load deflection	=0.072 in
Span over limit	=0.544 in
Design limit	=0.544 in
Utilization Ratio	**=0.132**

✔ Pass

L2B981



Static

Summary W 12x19

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	6	-29.3	86.0	kip	0.340	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	9	43.8	92.6	kip ft	0.473	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.003	-	in	-	-
Deflection Slab	1	0.019	0.418	in	0.044	✔ Pass
Deflection Dead	1	0.012	0.279	in	0.044	✔ Pass
Deflection Live	6	0.050	0.418	in	0.118	✔ Pass
Deflection Total	6	0.084	0.279	in	0.301	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x19 A992-50 - Critical

Flexural: Position 1' 1 23/32" - Critical

Moment, M_x	=3.3 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 12x19 A992-50 - Critical

Position 8' 4 5/16" - Critical

Position of V_{ry}	=8' 4 5/16" ft, in	
Required major axis shear strength, V_{ry}	=-29.3 kip	
Design shear strength	=86.0 kip	AISC 360 G2
Ratio	**=0.340**	

✔ Pass

Flexure Major

9 (Final) LRFD$_{2.3}$-1.2D+1.6L+NL$_{Dir2+}$ - Critical

Span 1 W 12x19 A992-50 - Critical

Yielding: 6' 10 5/16" - Critical

Dist of M_{rx} along member	=6' 10 5/16" ft, in	
Required flexural strength, M_{rx1}	=43.8 kip ft	
Design flexural strength	=92.6 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.473**	

✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 12x19 A992-50 - Critical

Deflection Total - Critical

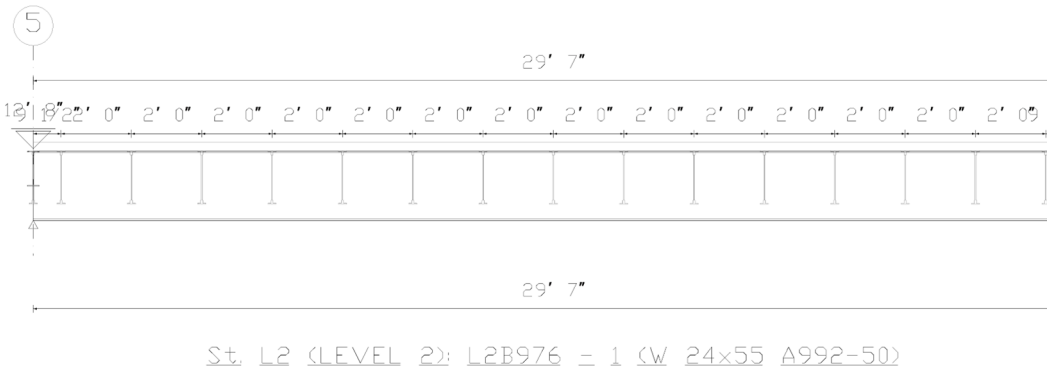
Position Total load deflection	=4' 10 87/256" ft, in
Max. Total load deflection	=0.084 in
Span over limit	=0.279 in
Design limit	=0.279 in
Utilization Ratio	**=0.301**

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✔ Pass

L2B976



Static

Summary W 24x55

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	17	-38.3	251.7	kip	0.152	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	17	-53.6	106.0	kip ft	0.506	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.032	-	in	-	-
Deflection Slab	1	0.149	1.479	in	0.101	✔ Pass
Deflection Dead	1	0.083	0.986	in	0.084	✔ Pass
Deflection Live	6	0.398	1.479	in	0.269	✔ Pass
Deflection Wind	307	0.007	1.775	in	0.004	✔ Pass
Deflection Total	6	0.662	0.986	in	0.671	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 24x55 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x	=-23.4 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

17 (Final) $LRFD_{4.2}$-1.2D+1.6L+0.5S+NL_{Dir1+} - Critical

Span 1 W 24x55 A992-50 - Critical

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Position 29' 7" - Critical

Position of V_{ry}	=29' 7" ft, in	
Required major axis shear strength, V_{ry}	=-38.3 kip	
Design shear strength	=251.7 kip	AISC 360 G2
Ratio	**=0.152**	

✔ Pass

Flexure Major

17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$ - Critical

Span 1 W 24x55 A992-50 - Critical

LTB Flange Btm: 0" - 29' 7" - Critical

Dist of M_{rx1} along member	=29' 7" ft, in	
Required flexural strength, M_{rx1}	=-53.6 kip ft	
Design flexural strength	=106.0 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.506**	

✔ Pass

Deflection

6 (Final) LRFD$_{2}$-1.2D+1.6L - Critical

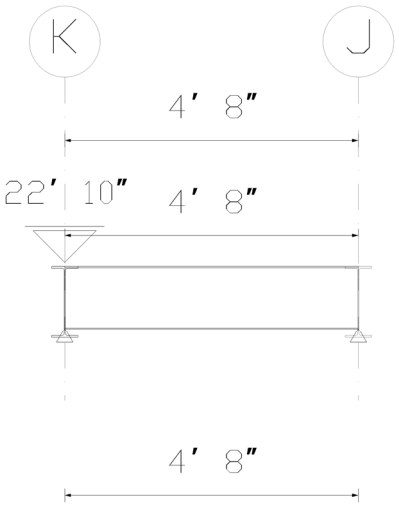
Span 1 W 24x55 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=14' 9 1/2" ft, in
Max. Total load deflection	=0.662 in
Span over limit	=0.986 in
Design limit	=0.986 in
Utilization Ratio	**=0.671**

✔ Pass

TORSB1030



St. TORS (T.O. ROOF STRUCT.): TORSB1030 - W 12x14 A992-50

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Project Name: FIRE STATION 5		

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	128	0.3	64.3	kip	0.004	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	128	0.3	62.4	kip ft	0.005	✔ Pass
Flexure Minor	286	0.2	7.1	kip ft	0.031	✔ Pass
Axial Tension	291	-2.5	187.2	kip	0.014	✔ Pass
Axial Compression	185	3.2	115.5	kip	0.028	✔ Pass
Combined Forces	286	-	-	-	0.039	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Total	128	0.000	0.156	in	0.003	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_{1}$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.5 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=0.3 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.004**	

✔ Pass

Flexure Major

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Top: 0" - 4' 8" - Critical

Dist of M_{rx1} along member	=2' 4" ft, in	
Required flexural strength, M_{rx1}	=0.3 kip ft	
Design flexural strength	=62.4 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.005**	

✔ Pass

Flexure Minor

286 (Final) LRFD$_{10.64}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

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Yielding: 2′ 4″ - Critical

Dist of M_{ry} along member	=2′ 4″ ft, in	
Required flexural strength, M_{ry1}	=0.2 kip ft	
Design flexural strength	=7.1 kip ft	AISC 360 F6
Ratio	**=0.031**	

✔ Pass

Axial Tension

291 (Final) LRFD$_{12.5}$-0.9D+W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 4′ 8″ - Critical

Distance of P_r along member	=4′ 8″ ft, in	
Required tensile strength, P_r	=-2.5 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.014**	

✔ Pass

Axial Compression

185 (Final) LRFD$_{9.27}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural - out-of-plane: 0″ - 4′ 8″ - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 4′ 8″	Flexural - out-of-plane	4′ 8″	3.2	115.5	kip	0.028	✔ Pass

Combined Forces

286 (Final) LRFD$_{10.64}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Top LTB 0″ - 4′ 8″ - Critical

Axial Tension: 0″ - 4′ 8″ - Critical

Mode	Ratio	Status
Combined buckling	0.039	✔ Pass

Deflection

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

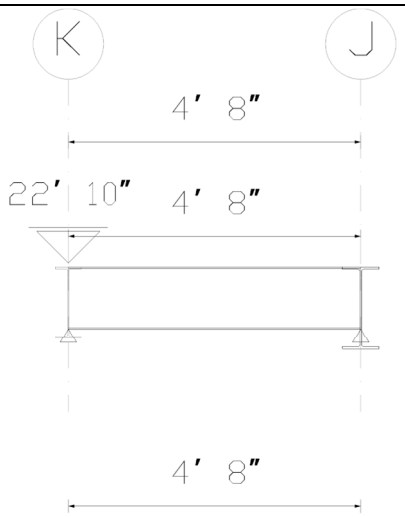
Position Total load deflection	=2′ 4″ ft, in
Max. Total load deflection	=0.000 in
Span over limit	=0.156 in
Design limit	=0.156 in
Utilization Ratio	**=0.003**

✔ Pass

TORSB1029

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Project Name: FIRE STATION 5		



St. TORS (T.O. ROOF STRUCT.): TORSB1029 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	0.2	64.3	kip	0.003	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	96	0.2	62.4	kip ft	0.004	✔ Pass
Flexure Minor	269	-0.2	7.1	kip ft	0.026	✔ Pass
Axial Tension	323	-2.2	187.2	kip	0.012	✔ Pass
Axial Compression	234	4.0	115.5	kip	0.035	✔ Pass
Combined Forces	234	-	-	-	0.041	✔ Pass
Torsion	No Significant Forces			-	-	Not required

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=1.7 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

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Position 0" - Critical

Position of V_{ry} =0" ft, in

Required major axis shear strength, V_{ry} =0.2 kip

Design shear strength =64.3 kip AISC 360 G2

Ratio **=0.003**

✔ Pass

Flexure Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Top: 0" - 4' 8" - Critical

Dist of M_{rx1} along member =2' 4" ft, in

Required flexural strength, M_{rx1} =0.2 kip ft

Design flexural strength =62.4 kip ft AISC 360 F1, F2, F3 and F4

Ratio **=0.004**

✔ Pass

Flexure Minor

269 (Final) LRFD$_{10.47}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: 2' 4" - Critical

Dist of M_{ry} along member =2' 4" ft, in

Required flexural strength, M_{ry1} =-0.2 kip ft

Design flexural strength =7.1 kip ft AISC 360 F6

Ratio **=0.026**

✔ Pass

Axial Tension

323 (Final) LRFD$_{12.37}$-0.9D+W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 4' 8" - Critical

Distance of P_r along member =4' 8" ft, in

Required tensile strength, P_r =-2.2 kip

Design yield strength =187.2 kip AISC 360 D2

Ratio **=0.012**

✔ Pass

Axial Compression

234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural - out-of-plane: 0" - 4' 8" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 4' 8"	Flexural - out-of-plane	4' 8"	4.0	115.5	kip	0.035	✔ Pass

Combined Forces

234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Top LTB 0" - 4' 8" - Critical

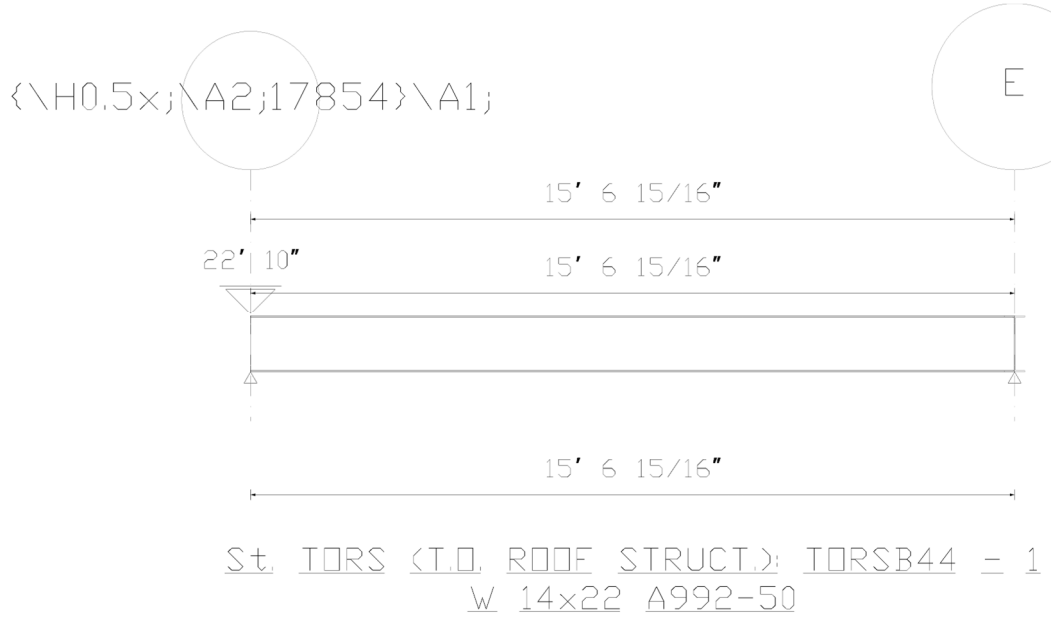
Axial Comp: I.P. 0" - 4' 8" , O.o.P.0" - 4' 8" , Tors. 0" - 4' 8" - Critical

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Mode	Ratio	Status
Combined buckling	0.041	✔ Pass

TORSB44



Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	234	-1.5	94.5	kip	0.016	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	234	-7.1	81.1	kip ft	0.088	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	324	-1.0	292.1	kip	0.003	✔ Pass
Axial Compression	231	0.8	45.4	kip	0.017	✔ Pass
Combined Forces	235	-	-	-	0.080	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.003	-	in	-	-
Deflection Slab	1	0.000	0.779	in	0.001	✔ Pass
Deflection Dead	1	0.005	0.519	in	0.010	✔ Pass
Deflection Live	21	0.004	0.779	in	0.005	✔ Pass
Deflection Wind	307	-0.004	0.935	in	0.004	✔ Pass
Deflection Total	106	0.016	0.519	in	0.031	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

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Axial: Position 15' 6 15/16" - Critical

Axial Force, P	=0.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Position 15' 6 15/16" - Critical

Position of V_{ry}	=15' 6 15/16" ft, in	
Required major axis shear strength, V_{ry}	=-1.5 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.016**	

✔ Pass

Flexure Major

234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

LTB Flange Btm: 0" - 15' 6 15/16" - Critical

Dist of M_{rx1} along member	=15' 6 15/16" ft, in	
Required flexural strength, M_{rx1}	=-7.1 kip ft	
Design flexural strength	=81.1 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.088**	

✔ Pass

Axial Tension

324 (Final) LRFD$_{12.38}$-0.9D+W - Critical

Span 1 W 14x22 A992-50 - Critical

Yielding: Position 15' 6 15/16" - Critical

Distance of P_r along member	=15' 6 15/16" ft, in	
Required tensile strength, P_r	=-1.0 kip	
Design yield strength	=292.1 kip	AISC 360 D2
Ratio	**=0.003**	

✔ Pass

Axial Compression

231 (Final) LRFD$_{10.9}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural - out-of-plane: 0" - 15' 6 15/16" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 15' 6 15/16"	Flexural - out-of-plane	15' 6 15/16"	0.8	45.4	kip	0.017	✔ Pass

Combined Forces

235 (Final) LRFD$_{10.13}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Flange Btm LTB 0" - 15' 6 15/16" - Critical

Axial Tension: 0" - 15' 6 15/16" - Critical

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Mode	Ratio	Status
Combined buckling	0.080	✔ Pass

Deflection

106 (Final) $LRFD_{8.12}$-1.2D+1.6S+0.5W - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=6' 4 3/128" ft, in
Max. Total load deflection	=0.016 in
Span over limit	=0.519 in
Design limit	=0.519 in
Utilization Ratio	**=0.031**

✔ Pass

TOM-LB1003



St. TOM-L (T.O. MASONRY LOW): TOM-LB1003 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	283	1.2	64.3	kip	0.018	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	283	-9.1	28.1	kip ft	0.323	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	102	-3.1	187.2	kip	0.016	✔ Pass
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	283	-	-	-	0.310	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.002	-	in	-	-

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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Deflection Slab	1	-0.008	0.800	in	0.010	✔ Pass
Deflection Dead	1	-0.004	0.533	in	0.008	✔ Pass
Deflection Live	11	-0.005	0.533	in	0.010	✔ Pass
Deflection Wind	303	0.005	0.960	in	0.005	✔ Pass
Deflection Total	283	-0.023	0.800	in	0.028	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x	=-5.8 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=1.2 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.018**	

✔ Pass

Flexure Major

283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Btm: 0" - 16' 0" - Critical

Dist of M_{rx1} along member	=0" ft, in	
Required flexural strength, M_{rx1}	=-9.1 kip ft	
Design flexural strength	=28.1 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.323**	

✔ Pass

Axial Tension

102 (Final) LRFD$_{8.8}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-3.1 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.016**	

✔ Pass

Combined Forces

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283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Flange Btm LTB 0" - 16' 0" - Critical
Axial Tension: 0" - 16' 0" - Critical

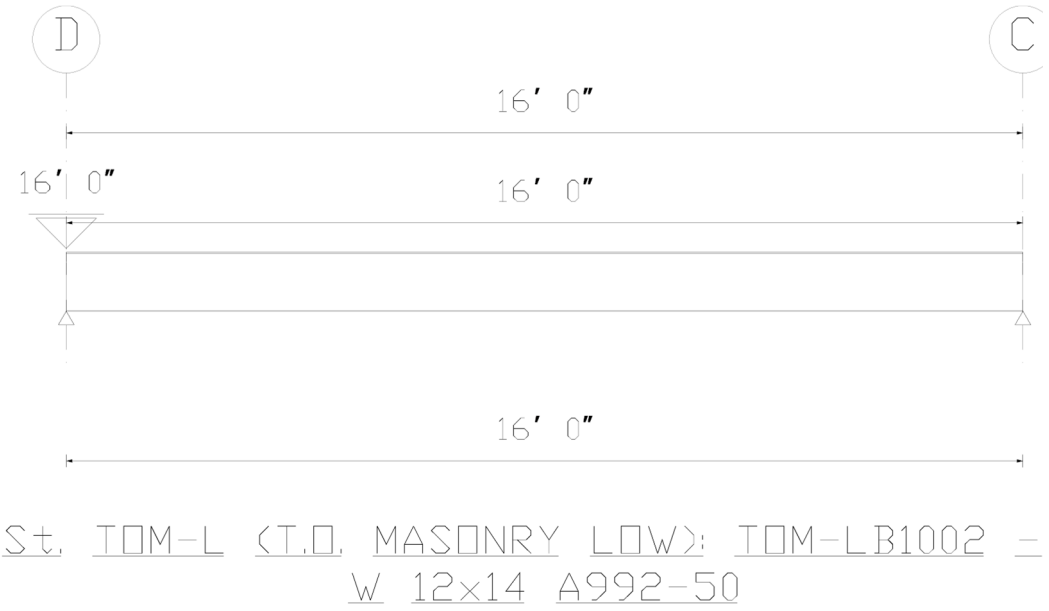
Mode	Ratio	Status
Combined buckling	0.310	✔ Pass

Deflection
283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Deflection Total - Critical

Position Total load deflection	=3' 9 63/128" ft, in
Max. Total load deflection	=-0.023 in
Span over limit	=0.800 in
Design limit	=0.800 in
Utilization Ratio	**=0.028**

✔ Pass

TOM-LB1002



Static
Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	29	-2.5	64.3	kip	0.039	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	29	-20.1	27.6	kip ft	0.729	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	158	-2.7	187.2	kip	0.014	✔ Pass
Axial Compression	No Significant Forces			kip	-	Not required

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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Combined Forces	29	-	-	-	0.693	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Slab	1	-0.014	0.800	in	0.017	✔ Pass
Deflection Dead	1	-0.013	0.533	in	0.023	✔ Pass
Deflection Live	11	-0.012	0.533	in	0.023	✔ Pass
Deflection Wind	291	0.007	0.960	in	0.008	✔ Pass
Deflection Total	240	-0.049	0.800	in	0.062	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x	=12.1 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Position 16' 0" - Critical

Position of V_{ry}	=16' 0" ft, in	
Required major axis shear strength, V_{ry}	=-2.5 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.039**	

✔ Pass

Flexure Major

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$ - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Btm: 0" - 16' 0" - Critical

Dist of M_{rx1} along member	=16' 0" ft, in	
Required flexural strength, M_{rx1}	=-20.1 kip ft	
Design flexural strength	=27.6 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.729**	

✔ Pass

Axial Tension

158 (Final) LRFD$_{8.64}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-2.7 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.014**	

✔ Pass

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Combined Forces

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Btm LTB 0" - 16' 0" - Critical

Axial Tension: 0" - 16' 0" - Critical

Mode	Ratio	Status
Combined buckling	0.693	✔ Pass

Deflection

240 (Final) LRFD$_{10.18}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=12' 4 13/128" ft, in
Max. Total load deflection	=-0.049 in
Span over limit	=0.800 in
Design limit	=0.800 in
Utilization Ratio	**=0.062**

✔ Pass

TOM-LB1004



Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	335	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	283	0.8	64.3	kip	0.013	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	283	-6.6	23.7	kip ft	0.278	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	134	-3.6	187.2	kip	0.019	✔ Pass

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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Compression	335	0.3	11.7	kip	0.028	✔ Pass
Combined Forces	283	-	-	-	0.268	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.003	-	in	-	-
Deflection Slab	1	0.004	0.891	in	0.004	✔ Pass
Deflection Dead	1	-0.004	0.594	in	0.006	✔ Pass
Deflection Live	11	-0.003	0.594	in	0.006	✔ Pass
Deflection Wind	303	-0.008	1.069	in	0.008	✔ Pass
Deflection Total	211	0.014	0.891	in	0.016	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

335 (Final) LRFD$_{12.49}$-0.9D+W - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.3 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=0.8 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.013**	

✔ Pass

Flexure Major

283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Btm: 0" - 17' 9 13/16" - Critical

Dist of M_{rx1} along member	=0" ft, in	
Required flexural strength, M_{rx1}	=-6.6 kip ft	
Design flexural strength	=23.7 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.278**	

✔ Pass

Axial Tension

134 (Final) LRFD$_{8.40}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-3.6 kip	
Design yield strength	=187.2 kip	AISC 360 D2

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Project Name: FIRE STATION 5		

Ratio **=0.019**

✔ Pass

Axial Compression

335 (Final) LRFD$_{12.49}$-0.9D+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural - out-of-plane: 0" - 17' 9 13/16" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 17' 9 13/16"	Flexural - out-of-plane	17' 9 13/16"	0.3	11.7	kip	0.028	✔ Pass

Combined Forces

283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Btm LTB 0" - 17' 9 13/16" - Critical

Axial Tension: 0" - 17' 9 13/16" - Critical

Mode	Ratio	Status
Combined buckling	0.268	✔ Pass

Deflection

211 (Final) LRFD$_{9.53}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =13' 9 139/256" ft, in

Max. Total load deflection =0.014 in

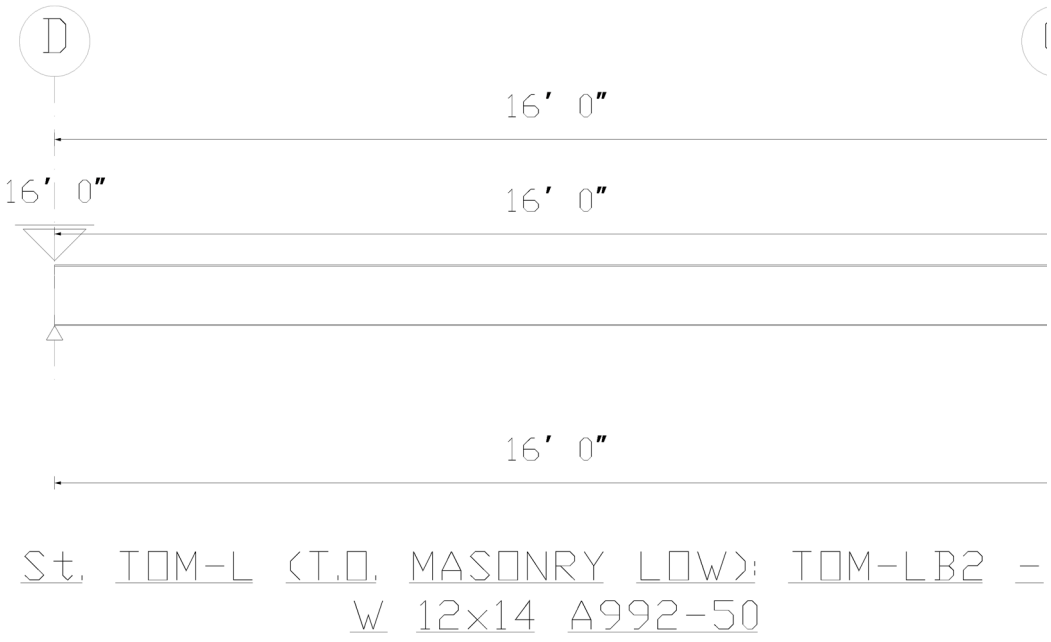
Span over limit =0.891 in

Design limit =0.891 in

Utilization Ratio **=0.016**

✔ Pass

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Revision:	Date:	Sheet No. 558
Project Name: FIRE STATION 5		

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	103	-1.8	64.3	kip	0.027	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	103	-14.2	27.8	kip ft	0.511	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	141	-3.1	187.2	kip	0.017	✔ Pass
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	231	-	-	-	0.484	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Slab	1	-0.012	0.800	in	0.015	✔ Pass
Deflection Dead	1	-0.005	0.533	in	0.010	✔ Pass
Deflection Live	21	-0.004	0.533	in	0.008	✔ Pass
Deflection Wind	323	0.006	0.960	in	0.007	✔ Pass
Deflection Total	103	-0.037	0.800	in	0.047	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x	=10.3 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

103 (Final) LRFD$_{8.9}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 16' 0" - Critical

Position of V_{ry}	=16' 0" ft, in	
Required major axis shear strength, V_{ry}	=-1.8 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.027**	

✔ Pass

Flexure Major

103 (Final) LRFD$_{8.9}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Btm: 0" - 16' 0" - Critical

Dist of M_{rx1} along member	=16' 0" ft, in	
Required flexural strength, M_{rx1}	=-14.2 kip ft	
Design flexural strength	=27.8 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.511**	

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✔ Pass

Axial Tension

141 (Final) LRFD$_{8.47}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-3.1 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.017**	

✔ Pass

Combined Forces

231 (Final) LRFD$_{10.9}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Btm LTB 0" - 16' 0" - Critical

Axial Tension: 0" - 16' 0" - Critical

Mode	Ratio	Status
Combined buckling	0.484	✔ Pass

Deflection

103 (Final) LRFD$_{8.9}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=12' 3 19/64" ft, in
Max. Total load deflection	=-0.037 in
Span over limit	=0.800 in
Design limit	=0.800 in
Utilization Ratio	**=0.047**

✔ Pass

TOM-LB1007



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Project Name: FIRE STATION 5		

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	267	0.7	64.3	kip	0.011	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	267	-5.6	24.0	kip ft	0.233	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	133	-3.2	187.2	kip	0.017	✔ Pass
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	267	-	-	-	0.224	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.004	-	in	-	-
Deflection Slab	1	0.004	0.891	in	0.004	✔ Pass
Deflection Dead	1	-0.003	0.594	in	0.005	✔ Pass
Deflection Live	21	-0.002	0.594	in	0.004	✔ Pass
Deflection Wind	295	-0.006	1.069	in	0.006	✔ Pass
Deflection Total	139	-0.013	0.891	in	0.014	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x	=-3.6 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=0.7 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.011**	

✔ Pass

Flexure Major

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Btm: 0" - 17' 9 13/16" - Critical

Dist of M_{rx1} along member	=0" ft, in	
Required flexural strength, M_{rx1}	=-5.6 kip ft	
Design flexural strength	=24.0 kip ft	AISC 360 F1, F2, F3 and F4

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Project Name: FIRE STATION 5		

Ratio **=0.233**

✔ Pass

Axial Tension

133 (Final) LRFD$_{8.39}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-3.2 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.017**	

✔ Pass

Combined Forces

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Btm LTB 0" - 17' 9 13/16" - Critical

Axial Tension: 0" - 17' 9 13/16" - Critical

Mode	Ratio	Status
Combined buckling	0.224	✔ Pass

Deflection

139 (Final) LRFD$_{8.45}$-1.2D+1.6S+0.5W - Critical

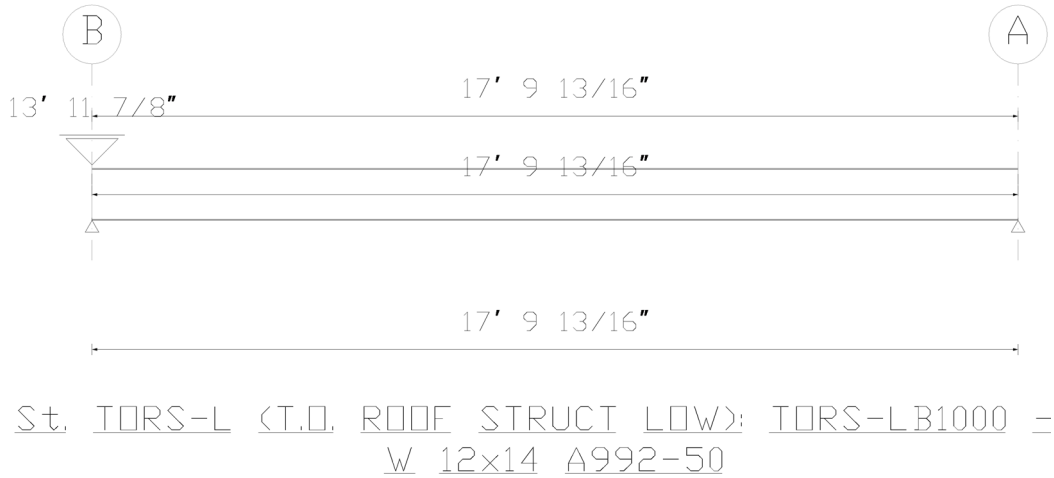
Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=3' 9 11/32" ft, in	
Max. Total load deflection	=-0.013 in	
Span over limit	=0.891 in	
Design limit	=0.891 in	
Utilization Ratio	**=0.014**	

✔ Pass

TORS-LB1000



Static

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Revision:	Date:	Sheet No. 562
Project Name: FIRE STATION 5		

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	211	0.6	64.3	kip	0.010	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	211	4.4	21.1	kip ft	0.210	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	339	-1.8	187.2	kip	0.009	✔ Pass
Axial Compression	249	5.1	11.7	kip	0.441	✔ Pass
Combined Forces	240	-	-	-	0.570	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.004	-	in	-	-
Deflection Slab	1	0.002	0.891	in	0.003	✔ Pass
Deflection Dead	1	-0.001	0.594	in	0.001	✔ Pass
Deflection Live	6	0.003	0.594	in	0.005	✔ Pass
Deflection Wind	335	0.011	1.069	in	0.010	✔ Pass
Deflection Total	207	0.015	0.891	in	0.017	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=2.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

211 (Final) LRFD$_{9.53}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=0.6 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.010**	

✔ Pass

Flexure Major

211 (Final) LRFD$_{9.53}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Top: 0" - 17' 9 13/16" - Critical

Dist of M_{rx1} along member	=17' 9 13/16" ft, in	
Required flexural strength, M_{rx1}	=4.4 kip ft	
Design flexural strength	=21.1 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.210**	

✔ Pass

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Axial Tension

339 (Final) LRFD$_{12.53}$-0.9D+W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-1.8 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.009**	

✔ Pass

Axial Compression

249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural - out-of-plane: 0" - 17' 9 13/16" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 17' 9 13/16"	Flexural - out-of-plane	17' 9 13/16"	5.1	11.7	kip	0.441	✔ Pass

Combined Forces

240 (Final) LRFD$_{10.18}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Btm LTB 0" - 17' 9 13/16" - Critical

Axial Comp: I.P. 0" - 17' 9 13/16" , O.o.P.0" - 17' 9 13/16" , Tors. 0" - 17' 9 13/16" - Critical

Mode	Ratio	Status
In-plane instability	0.052	✔ Pass
Out-of-plane instability	0.570	✔ Pass

Deflection

207 (Final) LRFD$_{9.49}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

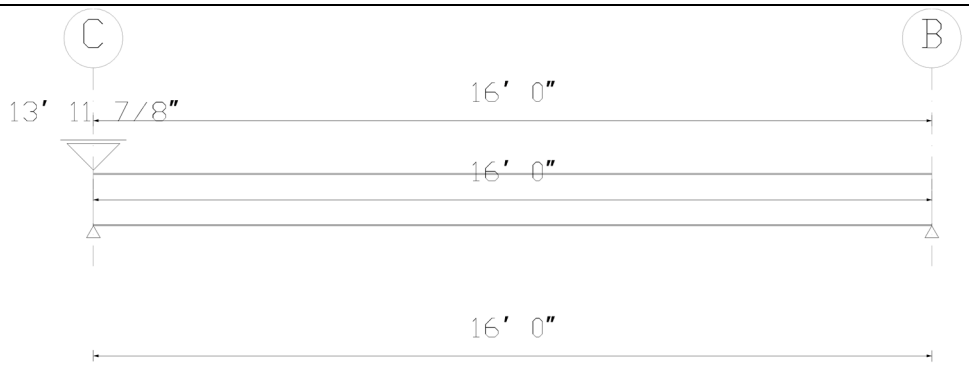
Position Total load deflection	=12' 9 15/128" ft, in
Max. Total load deflection	=0.015 in
Span over limit	=0.891 in
Design limit	=0.891 in
Utilization Ratio	**=0.017**

✔ Pass

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Revision:	Date:	Sheet No. 564
Project Name: FIRE STATION 5		



St. TORS-L (T.O. ROOF STRUCT LOW): TORS-LB1001 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	283	1.0	64.3	kip	0.016	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	283	-8.6	27.7	kip ft	0.310	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	249	6.6	14.5	kip	0.456	✔ Pass
Combined Forces	29	-	-	-	0.651	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Slab	1	-0.010	0.800	in	0.012	✔ Pass
Deflection Dead	1	-0.008	0.533	in	0.015	✔ Pass
Deflection Live	11	-0.008	0.533	in	0.015	✔ Pass
Deflection Wind	307	0.005	0.960	in	0.005	✔ Pass
Deflection Total	283	-0.032	0.800	in	0.040	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=4.6 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

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Project Name: FIRE STATION 5		

Position of V_{ry} =0" ft, in
Required major axis shear strength, V_{ry} =1.0 kip
Design shear strength =64.3 kip AISC 360 G2
Ratio **=0.016**

✔ Pass

Flexure Major

283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Btm: 0" - 16' 0" - Critical

Dist of M_{rx1} along member =0" ft, in
Required flexural strength, M_{rx1} =-8.6 kip ft
Design flexural strength =27.7 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.310**

✔ Pass

Axial Compression

249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural - out-of-plane: 0" - 16' 0" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 16' 0"	Flexural - out-of-plane	16' 0"	6.6	14.5	kip	0.456	✔ Pass

Combined Forces

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Btm LTB 0" - 16' 0" - Critical

Axial Comp: I.P. 0" - 16' 0" , O.o.P.0" - 16' 0" , Tors. 0" - 16' 0" - Critical

Mode	Ratio	Status
In-plane instability	0.142	✔ Pass
Out-of-plane instability	0.651	✔ Pass

Deflection

283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

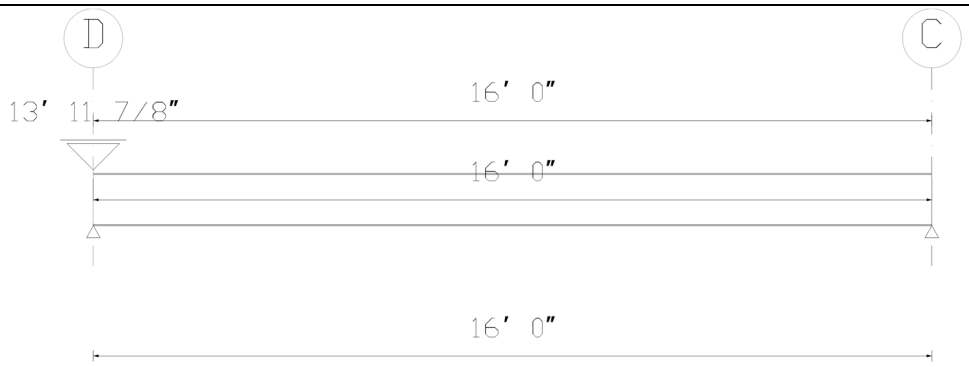
Position Total load deflection =4' 8 9/128" ft, in
Max. Total load deflection =-0.032 in
Span over limit =0.800 in
Design limit =0.800 in
Utilization Ratio **=0.040**

✔ Pass

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Revision:	Date:	Sheet No. 566
Project Name: FIRE STATION 5		



St TORS-L (T.O. ROOF STRUCT LOW): TORS-LB999 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	29	-2.5	64.3	kip	0.039	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	29	-19.7	27.7	kip ft	0.709	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	137	3.0	14.5	kip	0.205	✔ Pass
Combined Forces	29	-	-	-	0.780	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.006	-	in	-	-
Deflection Slab	1	-0.013	0.800	in	0.017	✔ Pass
Deflection Dead	1	-0.010	0.533	in	0.018	✔ Pass
Deflection Live	11	0.011	0.533	in	0.020	✔ Pass
Deflection Wind	339	-0.007	0.960	in	0.008	✔ Pass
Deflection Total	240	0.041	0.800	in	0.052	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_{1}$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=2.2 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$ - Critical

Span 1 W 12x14 A992-50 - Critical

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Project Name: FIRE STATION 5		

Position 16' 0" - Critical

Position of V_{ry}	=16' 0" ft, in	
Required major axis shear strength, V_{ry}	=-2.5 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.039**	

✔ Pass

Flexure Major

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$ - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Btm: 0" - 16' 0" - Critical

Dist of M_{rx1} along member	=16' 0" ft, in	
Required flexural strength, M_{rx1}	=-19.7 kip ft	
Design flexural strength	=27.7 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.709**	

✔ Pass

Axial Compression

137 (Final) LRFD$_{8.43}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural - out-of-plane: 0" - 16' 0" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 16' 0"	Flexural - out-of-plane	16' 0"	3.0	14.5	kip	0.205	✔ Pass

Combined Forces

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Btm LTB 0" - 16' 0" - Critical

Axial Comp: I.P. 0" - 16' 0" , O.o.P.0" - 16' 0" , Tors. 0" - 16' 0" - Critical

Mode	Ratio	Status
In-plane instability	0.311	✔ Pass
Out-of-plane instability	0.780	✔ Pass

Deflection

240 (Final) LRFD$_{10.18}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

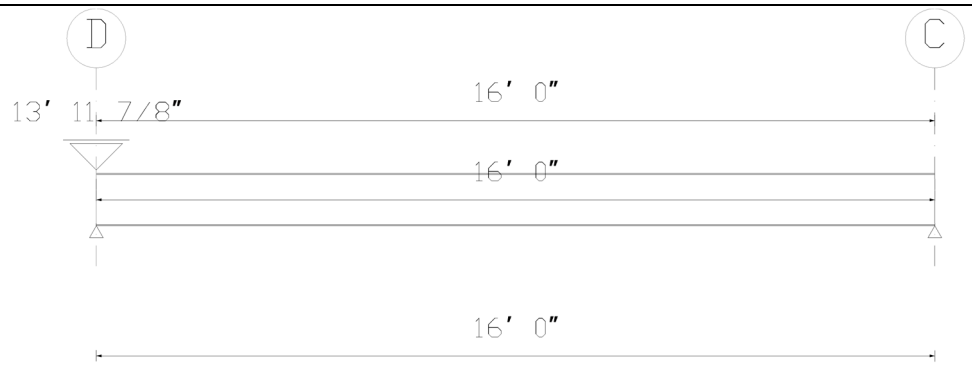
Position Total load deflection	=3' 5 23/256" ft, in
Max. Total load deflection	=0.041 in
Span over limit	=0.800 in
Design limit	=0.800 in
Utilization Ratio	**=0.052**

✔ Pass

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Revision:	Date:	Sheet No. 568
Project Name: FIRE STATION 5		



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Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	103	-1.7	64.3	kip	0.027	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	103	-13.4	27.9	kip ft	0.481	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	106	3.4	14.5	kip	0.235	✔ Pass
Combined Forces	106	-	-	-	0.554	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Slab	1	-0.012	0.800	in	0.015	✔ Pass
Deflection Dead	1	-0.004	0.533	in	0.007	✔ Pass
Deflection Live	21	-0.003	0.533	in	0.006	✔ Pass
Deflection Wind	295	0.005	0.960	in	0.005	✔ Pass
Deflection Total	103	-0.033	0.800	in	0.041	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=2.8 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

103 (Final) $LRFD_{8.9}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

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Project Name: FIRE STATION 5		

Position 16' 0" - Critical

Position of V_{ry}	=16' 0" ft, in	
Required major axis shear strength, V_{ry}	=-1.7 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.027**	

✔ Pass

Flexure Major

103 (Final) LRFD$_{8.9}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Btm: 0" - 16' 0" - Critical

Dist of M_{rx1} along member	=16' 0" ft, in	
Required flexural strength, M_{rx1}	=-13.4 kip ft	
Design flexural strength	=27.9 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.481**	

✔ Pass

Axial Compression

106 (Final) LRFD$_{8.12}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural - out-of-plane: 0" - 16' 0" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 16' 0"	Flexural - out-of-plane	16' 0"	3.4	14.5	kip	0.235	✔ Pass

Combined Forces

106 (Final) LRFD$_{8.12}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Btm LTB 0" - 16' 0" - Critical

Axial Comp: I.P. 0" - 16' 0" , O.o.P.0" - 16' 0" , Tors. 0" - 16' 0" - Critical

Mode	Ratio	Status
In-plane instability	0.217	✔ Pass
Out-of-plane instability	0.554	✔ Pass

Deflection

103 (Final) LRFD$_{8.9}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

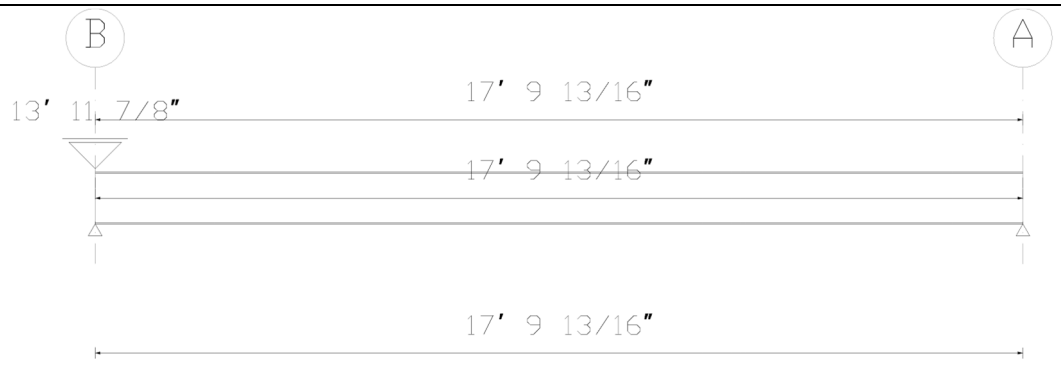
Position Total load deflection	=12' 5 29/128" ft, in
Max. Total load deflection	=-0.033 in
Span over limit	=0.800 in
Design limit	=0.800 in
Utilization Ratio	**=0.041**

✔ Pass

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Project Name: FIRE STATION 5		



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Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	203	0.5	64.3	kip	0.008	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	203	-3.5	21.2	kip ft	0.166	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	333	-1.3	187.2	kip	0.007	✔ Pass
Axial Compression	234	4.1	11.7	kip	0.351	✔ Pass
Combined Forces	298	-	-	-	0.444	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.004	-	in	-	-
Deflection Slab	1	0.002	0.891	in	0.002	✔ Pass
Deflection Live	6	0.002	0.594	in	0.003	✔ Pass
Deflection Wind	298	-0.008	1.069	in	0.007	✔ Pass
Deflection Total	205	0.012	0.891	in	0.014	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=1.9 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

203 (Final) LRFD$_{9.45}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

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Position 0" - Critical

Position of V_{ry} =0" ft, in

Required major axis shear strength, V_{ry} =0.5 kip

Design shear strength =64.3 kip AISC 360 G2

Ratio **=0.008**

✔ Pass

Flexure Major

203 (Final) LRFD$_{9.45}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Btm: 0" - 17' 9 13/16" - Critical

Dist of M_{rx1} along member =0" ft, in

Required flexural strength, M_{rx1} =-3.5 kip ft

Design flexural strength =21.2 kip ft AISC 360 F1, F2, F3 and F4

Ratio **=0.166**

✔ Pass

Axial Tension

333 (Final) LRFD$_{12.47}$-0.9D+W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member =0" ft, in

Required tensile strength, P_r =-1.3 kip

Design yield strength =187.2 kip AISC 360 D2

Ratio **=0.007**

✔ Pass

Axial Compression

234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural - out-of-plane: 0" - 17' 9 13/16" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 17' 9 13/16"	Flexural - out-of-plane	17' 9 13/16"	4.1	11.7	kip	0.351	✔ Pass

Combined Forces

298 (Final) LRFD$_{12.12}$-0.9D+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Btm LTB 0" - 17' 9 13/16" - Critical

Axial Comp: I.P. 0" - 17' 9 13/16" , O.o.P.0" - 17' 9 13/16" , Tors. 0" - 17' 9 13/16" - Critical

Mode	Ratio	Status
In-plane instability	0.042	✔ Pass
Out-of-plane instability	0.444	✔ Pass

Deflection

205 (Final) LRFD$_{9.47}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =12' 8 101/128" ft, in

Max. Total load deflection =0.012 in

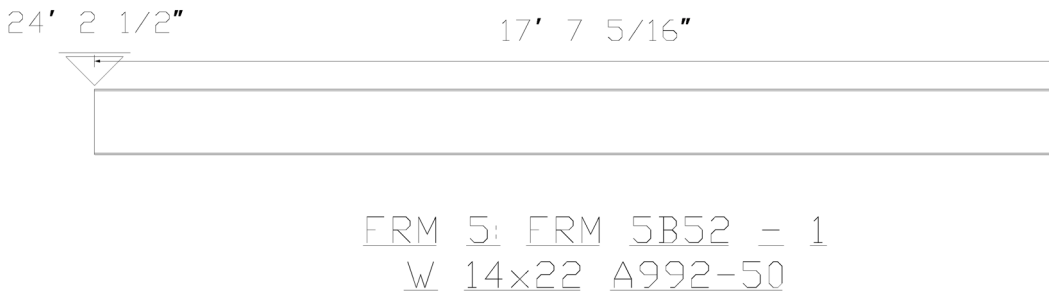
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Span over limit =0.891 in
Design limit =0.891 in
Utilization Ratio **=0.014**

✔ Pass

FRM 5B52



Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	8	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	1	0.3	94.5	kip	0.003	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	1	1.2	37.6	kip ft	0.032	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	347	-2.7	292.1	kip	0.009	✔ Pass
Axial Compression	247	3.1	35.5	kip	0.087	✔ Pass
Combined Forces	247	-	-	-	0.071	✔ Pass
Torsion	191	-	-	-	0.000	⚠ Warning
Deflection Self weight	1	0.009	-	in	-	-
Deflection Total	1	0.009	0.880	in	0.010	✔ Pass
Torsion	Design Check Applied Forces Only					-

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

8 (Final) LRFD$_{2.2}$-1.2D+1.6L+NL$_{Dir1-}$ - Critical

Span 1 W 14x22 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P =0.1 kip
Elastic modulus of steel, E =29000 ksi
Minimum yield stress, F_y =50.00 ksi
Axial section class Slender AISC 360 Table B4.1a

Shear Major

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Position 0" - Critical

Position of V_{ry} =0" ft, in

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Required major axis shear strength, V_{ry} =0.3 kip
Design shear strength =94.5 kip AISC 360 G2
Ratio **=0.003**

✔ Pass

Flexure Major

1 (Final) LRFD$_{1}$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

LTB Flange Top: 0" - 17' 7 5/16" - Critical

Dist of M_{rx1} along member =8' 9 21/32" ft, in
Required flexural strength, M_{rx1} =1.2 kip ft
Design flexural strength =37.6 kip ft AISC 360 F1, F2, F3 and F4
Ratio **=0.032**

✔ Pass

Axial Tension

347 (Final) LRFD$_{12.61}$-0.9D+W - Critical

Span 1 W 14x22 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member =0" ft, in
Required tensile strength, P_r =-2.7 kip
Design yield strength =292.1 kip AISC 360 D2
Ratio **=0.009**

✔ Pass

Axial Compression

247 (Final) LRFD$_{10.25}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural - out-of-plane: 0" - 17' 7 5/16" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 17' 7 5/16"	Flexural - out-of-plane	17' 7 5/16"	3.1	35.5	kip	0.087	✔ Pass

Combined Forces

247 (Final) LRFD$_{10.25}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Flange Top LTB 0" - 17' 7 5/16" - Critical

Axial Comp: I.P. 0" - 17' 7 5/16" , O.o.P.0" - 17' 7 5/16" , Tors. 0" - 17' 7 5/16" - Critical

Mode	Ratio	Status
Combined buckling	0.071	✔ Pass

Torsion

191 (Final) LRFD$_{9.33}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 14x22 A992-50

No significant torsion forces

Inherent torsion design for open sections is beyond the current scope of Tekla Structural Designer
Inherent Torsion Moment T_r =2.081 kip ft

⚠ Warning

Deflection

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1 (Final) LRFD$_1$-1.4D - Critical

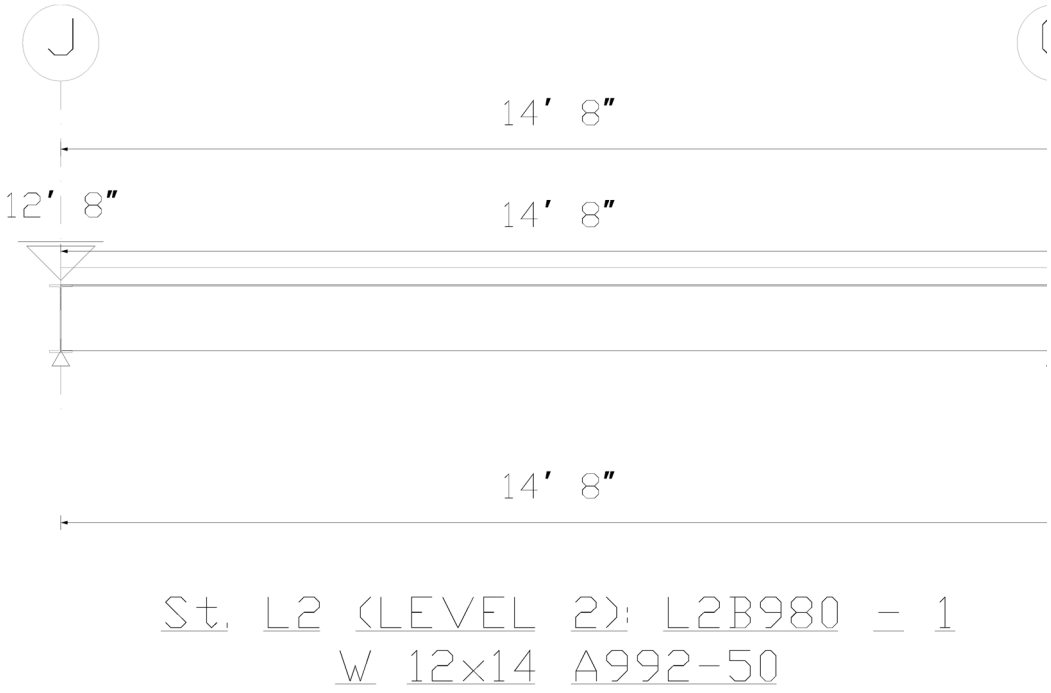
Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=8' 9 21/32" ft, in
Max. Total load deflection	=0.009 in
Span over limit	=0.880 in
Design limit	=0.880 in
Utilization Ratio	**=0.010**

✔ Pass

L2B980



St. L2 (LEVEL 2): L2B980 - 1
W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	6	-1.9	64.3	kip	0.029	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	6	6.9	15.6	kip ft	0.439	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.006	-	in	-	-
Deflection Slab	1	0.016	0.733	in	0.022	✔ Pass
Deflection Dead	1	0.011	0.489	in	0.022	✔ Pass
Deflection Live	6	0.042	0.733	in	0.057	✔ Pass

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Deflection Total	6	0.074	0.489	in	0.152	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 11 47/64" - Critical

Moment, M_x	=0.7 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 12x14 A992-50 - Critical

Position 14' 8" - Critical

Position of V_{ry}	=14' 8" ft, in	
Required major axis shear strength, V_{ry}	=-1.9 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.029**	

✔ Pass

Flexure Major

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Top: 0" - 14' 8" - Critical

Dist of M_{rx1} along member	=7' 4 85/128" ft, in	
Required flexural strength, M_{rx1}	=6.9 kip ft	
Design flexural strength	=15.6 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.439**	

✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

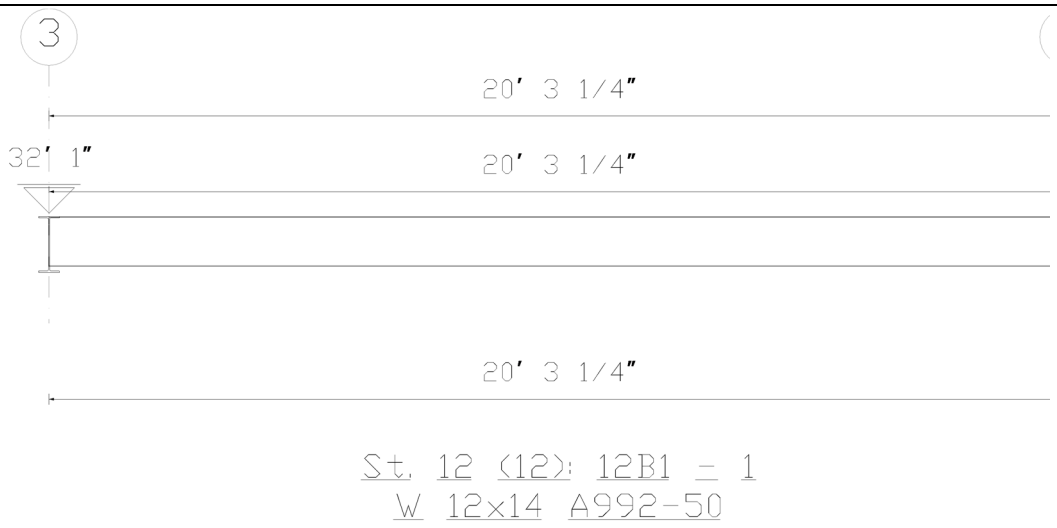
Position Total load deflection	=7' 4 27/256" ft, in
Max. Total load deflection	=0.074 in
Span over limit	=0.489 in
Design limit	=0.489 in
Utilization Ratio	**=0.152**

✔ Pass

12B1

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Project Name: FIRE STATION 5		



Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	26	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	26	2.0	64.3	kip	0.030	✔ Pass
Flexure Major	26	9.9	65.2	kip ft	0.152	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.021	-	in	-	-
Deflection Live	21	0.058	0.676	in	0.085	✔ Pass
Deflection Total	26	0.208	1.216	in	0.171	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.1 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=2.0 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.030**	

✔ Pass

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Flexure Major
26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical
Span 1 W 12x14 A992-50 - Critical
Yielding: 10' 1 143/256" - Critical

Dist of M_{rx} along member	=10' 1 143/256" ft, in	
Required flexural strength, M_{rx1}	=9.9 kip ft	
Design flexural strength	=65.2 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.152**	

✔ Pass

Deflection
26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical
Span 1 W 12x14 A992-50 - Critical
Deflection Total - Critical

Position Total load deflection	=10' 1 5/8" ft, in
Max. Total load deflection	=0.208 in
Span over limit	=1.216 in
Design limit	=1.216 in
Utilization Ratio	**=0.171**

✔ Pass

Forces Ignored
26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

27 (Final) LRFD$_{6.2}$-1.2D+L+1.6S+NL$_{Dir1+}$
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

30 (Final) LRFD$_{6.5}$-1.2D+L+1.6S+NL$_{Dir2-}$
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

31 (Final) LRFD$_{7.1}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

32 (Final) LRFD$_{7.2}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

33 (Final) LRFD$_{7.3}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

34 (Final) LRFD$_{7.4}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

35 (Final) LRFD$_{7.5}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

36 (Final) LRFD$_{7.6}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

37 (Final) LRFD$_{7.7}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

38 (Final) LRFD$_{7.8}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

39 (Final) LRFD$_{7.9}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

40 (Final) LRFD$_{7.10}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

42 (Final) LRFD$_{7.12}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

43 (Final) LRFD$_{7.13}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

44 (Final) LRFD$_{7.14}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

45 (Final) LRFD$_{7.15}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

46 (Final) LRFD$_{7.16}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

47 (Final) LRFD$_{7.17}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

48 (Final) LRFD$_{7.18}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

50 (Final) LRFD$_{7.20}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

51 (Final) LRFD$_{7.21}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

52 (Final) LRFD$_{7.22}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

53 (Final) LRFD$_{7.23}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

54 (Final) LRFD$_{7.24}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

57 (Final) LRFD$_{7.27}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

59 (Final) LRFD$_{7.29}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

60 (Final) LRFD$_{7.30}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

61 (Final) LRFD$_{7.31}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

64 (Final) LRFD$_{7.34}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

65 (Final) LRFD$_{7.35}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

67 (Final) LRFD$_{7.37}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

68 (Final) LRFD$_{7.38}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

69 (Final) LRFD$_{7.39}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

73 (Final) LRFD$_{7.43}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

75 (Final) LRFD$_{7.45}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

76 (Final) LRFD$_{7.46}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

77 (Final) LRFD$_{7.47}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

79 (Final) LRFD$_{7.49}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

80 (Final) LRFD$_{7.50}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

82 (Final) LRFD$_{7.52}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

83 (Final) LRFD$_{7.53}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

84 (Final) LRFD$_{7.54}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

85 (Final) LRFD$_{7.55}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

86 (Final) LRFD$_{7.56}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

87 (Final) LRFD$_{7.57}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

88 (Final) LRFD$_{7.58}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

90 (Final) LRFD$_{7.60}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

91 (Final) LRFD$_{7.61}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

92 (Final) LRFD$_{7.62}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

93 (Final) LRFD$_{7.63}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

94 (Final) LRFD$_{7.64}$-1.2D+1.6Lr+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

95 (Final) LRFD$_{8.1}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

97 (Final) LRFD$_{8.3}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

98 (Final) LRFD$_{8.4}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

99 (Final) LRFD$_{8.5}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

100 (Final) LRFD$_{8.6}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.2 kip

101 (Final) LRFD$_{8.7}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

102 (Final) LRFD$_{8.8}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.2 kip

103 (Final) LRFD$_{8.9}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

104 (Final) LRFD$_{8.10}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

105 (Final) LRFD$_{8.11}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

106 (Final) LRFD$_{8.12}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.2 kip

107 (Final) LRFD$_{8.13}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50

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Axial Force, P 0.2 kip

108 (Final) LRFD$_{8.14}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.2 kip

109 (Final) LRFD$_{8.15}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

110 (Final) LRFD$_{8.16}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.2 kip

111 (Final) LRFD$_{8.17}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

113 (Final) LRFD$_{8.19}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

114 (Final) LRFD$_{8.20}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

115 (Final) LRFD$_{8.21}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

116 (Final) LRFD$_{8.22}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

117 (Final) LRFD$_{8.23}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

118 (Final) LRFD$_{8.24}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.2 kip

119 (Final) LRFD$_{8.25}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

120 (Final) LRFD$_{8.26}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

121 (Final) LRFD$_{8.27}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

122 (Final) LRFD$_{8.28}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

123 (Final) LRFD$_{8.29}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

124 (Final) LRFD$_{8.30}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

125 (Final) LRFD$_{8.31}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

126 (Final) LRFD$_{8.32}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

127 (Final) LRFD$_{8.33}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

129 (Final) LRFD$_{8.35}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

130 (Final) LRFD$_{8.36}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

131 (Final) LRFD$_{8.37}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

132 (Final) LRFD$_{8.38}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

133 (Final) LRFD$_{8.39}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

134 (Final) LRFD$_{8.40}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

135 (Final) LRFD$_{8.41}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

136 (Final) LRFD$_{8.42}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

137 (Final) LRFD$_{8.43}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

138 (Final) LRFD$_{8.44}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

139 (Final) LRFD$_{8.45}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

140 (Final) LRFD$_{8.46}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

141 (Final) LRFD$_{8.47}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

142 (Final) LRFD$_{8.48}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

143 (Final) LRFD$_{8.49}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

144 (Final) LRFD$_{8.50}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

145 (Final) LRFD$_{8.51}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

146 (Final) LRFD$_{8.52}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

147 (Final) LRFD$_{8.53}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

148 (Final) LRFD$_{8.54}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

149 (Final) LRFD$_{8.55}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

150 (Final) LRFD$_{8.56}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

151 (Final) LRFD$_{8.57}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

152 (Final) LRFD$_{8.58}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

153 (Final) LRFD$_{8.59}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

154 (Final) LRFD$_{8.60}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.2 kip

155 (Final) LRFD$_{8.61}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50

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Axial Force, P 0.2 kip

156 (Final) LRFD$_{8.62}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.2 kip

157 (Final) LRFD$_{8.63}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

158 (Final) LRFD$_{8.64}$-1.2D+1.6S+0.5W
Span 1 W 12x14 A992-50
Axial Force, P 0.2 kip

159 (Final) LRFD$_{9.1}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

160 (Final) LRFD$_{9.2}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

162 (Final) LRFD$_{9.4}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

163 (Final) LRFD$_{9.5}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

164 (Final) LRFD$_{9.6}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

165 (Final) LRFD$_{9.7}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

166 (Final) LRFD$_{9.8}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

167 (Final) LRFD$_{9.9}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

168 (Final) LRFD$_{9.10}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

170 (Final) LRFD$_{9.12}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

171 (Final) LRFD$_{9.13}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

172 (Final) LRFD$_{9.14}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

174 (Final) LRFD$_{9.16}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

177 (Final) LRFD$_{9.19}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

178 (Final) LRFD$_{9.20}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

180 (Final) LRFD$_{9.22}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

181 (Final) LRFD$_{9.23}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

182 (Final) LRFD$_{9.24}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

183 (Final) LRFD$_{9.25}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

184 (Final) LRFD$_{9.26}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

185 (Final) LRFD$_{9.27}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

187 (Final) LRFD$_{9.29}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

188 (Final) LRFD$_{9.30}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

189 (Final) LRFD$_{9.31}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

191 (Final) LRFD$_{9.33}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

192 (Final) LRFD$_{9.34}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

193 (Final) LRFD$_{9.35}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

195 (Final) LRFD$_{9.37}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

196 (Final) LRFD$_{9.38}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

197 (Final) LRFD$_{9.39}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

198 (Final) LRFD$_{9.40}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

199 (Final) LRFD$_{9.41}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

200 (Final) LRFD$_{9.42}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

201 (Final) LRFD$_{9.43}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

203 (Final) LRFD$_{9.45}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

204 (Final) LRFD$_{9.46}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

205 (Final) LRFD$_{9.47}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

210 (Final) LRFD$_{9.52}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

212 (Final) LRFD$_{9.54}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

213 (Final) LRFD$_{9.55}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

214 (Final) LRFD$_{9.56}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

215 (Final) LRFD$_{9.57}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

216 (Final) LRFD$_{9.58}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

218 (Final) LRFD$_{9.60}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

219 (Final) LRFD$_{9.61}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

220 (Final) LRFD$_{9.62}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

222 (Final) LRFD$_{9.64}$-1.2D+L+0.5Lr+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

223 (Final) LRFD$_{10.1}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

224 (Final) LRFD$_{10.2}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

226 (Final) LRFD$_{10.4}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

227 (Final) LRFD$_{10.5}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

228 (Final) LRFD$_{10.6}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

229 (Final) LRFD$_{10.7}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

230 (Final) LRFD$_{10.8}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

231 (Final) LRFD$_{10.9}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

232 (Final) LRFD$_{10.10}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

235 (Final) LRFD$_{10.13}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

236 (Final) LRFD$_{10.14}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

238 (Final) LRFD$_{10.16}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

240 (Final) LRFD$_{10.18}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

241 (Final) LRFD$_{10.19}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

242 (Final) LRFD$_{10.20}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

244 (Final) LRFD$_{10.22}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

245 (Final) LRFD$_{10.23}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

246 (Final) LRFD$_{10.24}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

247 (Final) LRFD$_{10.25}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

248 (Final) LRFD$_{10.26}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

251 (Final) $LRFD_{10.29}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

252 (Final) $LRFD_{10.30}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

253 (Final) $LRFD_{10.31}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

255 (Final) $LRFD_{10.33}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

256 (Final) $LRFD_{10.34}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

257 (Final) $LRFD_{10.35}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

259 (Final) $LRFD_{10.37}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

260 (Final) $LRFD_{10.38}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

261 (Final) $LRFD_{10.39}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

262 (Final) $LRFD_{10.40}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

263 (Final) $LRFD_{10.41}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

264 (Final) $LRFD_{10.42}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

265 (Final) $LRFD_{10.43}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

267 (Final) $LRFD_{10.45}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

268 (Final) $LRFD_{10.46}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

269 (Final) $LRFD_{10.47}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

272 (Final) $LRFD_{10.50}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

273 (Final) $LRFD_{10.51}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

274 (Final) $LRFD_{10.52}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

275 (Final) $LRFD_{10.53}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

276 (Final) $LRFD_{10.54}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

277 (Final) $LRFD_{10.55}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

278 (Final) $LRFD_{10.56}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

279 (Final) $LRFD_{10.57}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

280 (Final) LRFD$_{10.58}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

282 (Final) LRFD$_{10.60}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

284 (Final) LRFD$_{10.62}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

286 (Final) LRFD$_{10.64}$-1.2D+L+0.5S+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

292 (Final) LRFD$_{12.6}$-0.9D+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

294 (Final) LRFD$_{12.8}$-0.9D+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

298 (Final) LRFD$_{12.12}$-0.9D+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

299 (Final) LRFD$_{12.13}$-0.9D+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

300 (Final) LRFD$_{12.14}$-0.9D+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

302 (Final) LRFD$_{12.16}$-0.9D+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

310 (Final) LRFD$_{12.24}$-0.9D+W
Span 1 W 12x14 A992-50

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Axial Force, P 0.1 kip

317 (Final) LRFD$_{12.31}$-0.9D+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

324 (Final) LRFD$_{12.38}$-0.9D+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

325 (Final) LRFD$_{12.39}$-0.9D+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

333 (Final) LRFD$_{12.47}$-0.9D+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

346 (Final) LRFD$_{12.60}$-0.9D+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

347 (Final) LRFD$_{12.61}$-0.9D+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

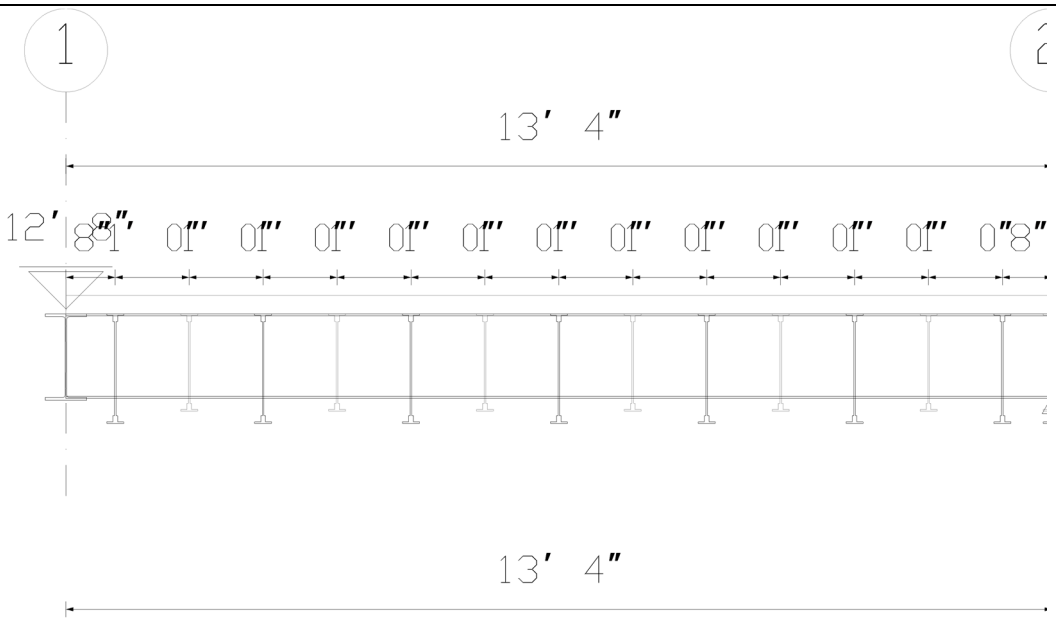
348 (Final) LRFD$_{12.62}$-0.9D+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

350 (Final) LRFD$_{12.64}$-0.9D+W
Span 1 W 12x14 A992-50
Axial Force, P 0.1 kip

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Project Name: FIRE STATION 5		



St. L2 (LEVEL 2): L2B983 - 1
W 14x22 A992-50

Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	16	-28.6	94.5	kip	0.302	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	7	102.2	124.5	kip ft	0.821	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.012	-	in	-	-
Deflection Slab	1	0.093	0.667	in	0.140	✔ Pass
Deflection Dead	1	0.062	0.444	in	0.140	✔ Pass
Deflection Live	6	0.248	0.667	in	0.372	✔ Pass
Deflection Total	6	0.415	0.444	in	0.934	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

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Project Name: FIRE STATION 5		

Flexural: Position 8" - Critical

Moment, M_x	=7.4 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

16 (Final) LRFD$_{4.1}$-1.2D+1.6L+0.5S - Critical

Span 1 W 14x22 A992-50 - Critical

Position 13' 4" - Critical

Position of V_{ry}	=13' 4" ft, in	
Required major axis shear strength, V_{ry}	=-28.6 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.302**	

✔ Pass

Flexure Major

7 (Final) LRFD$_{2.1}$-1.2D+1.6L+NL$_{Dir1+}$ - Critical

Span 1 W 14x22 A992-50 - Critical

Yielding: 6' 8" - Critical

Dist of M_{rx} along member	=6' 8" ft, in	
Required flexural strength, M_{rx1}	=102.2 kip ft	
Design flexural strength	=124.5 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.821**	

✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

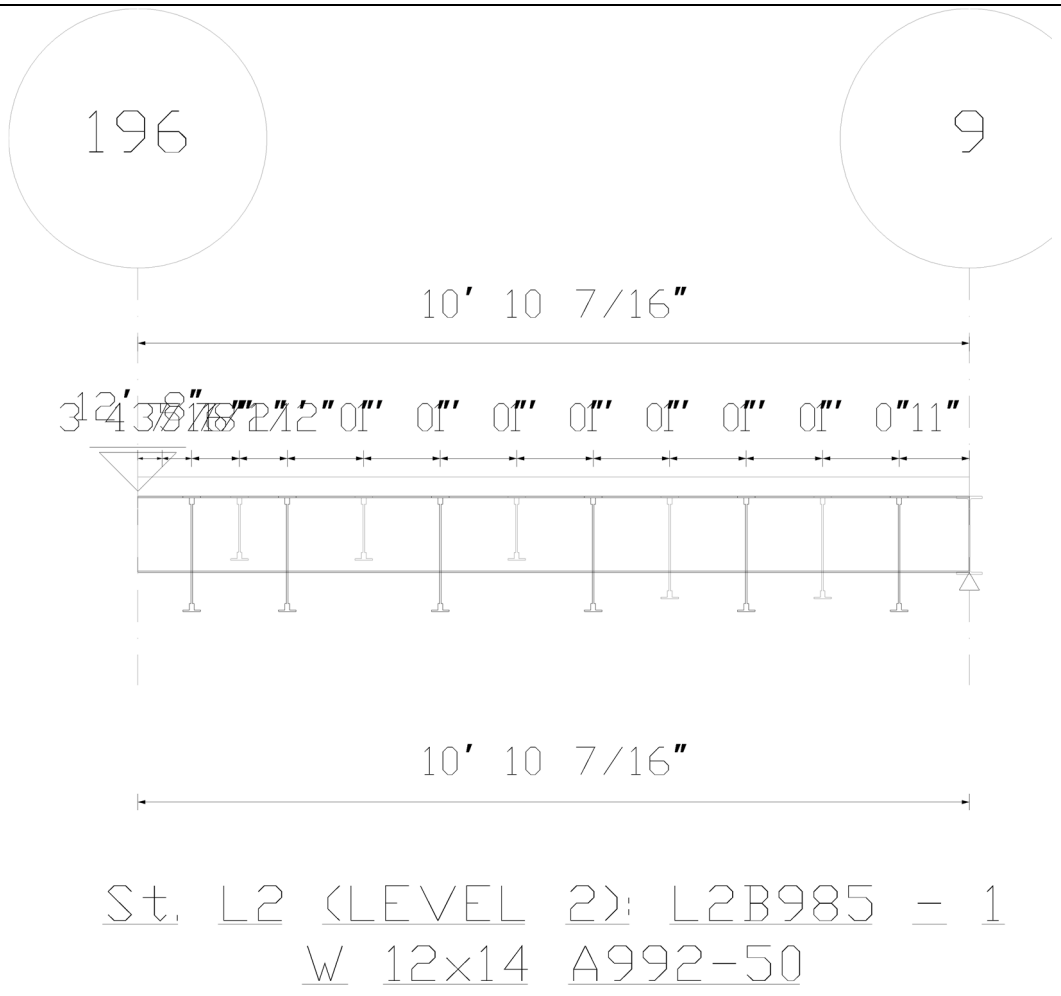
Position Total load deflection	=6' 8" ft, in
Max. Total load deflection	=0.415 in
Span over limit	=0.444 in
Design limit	=0.444 in
Utilization Ratio	**=0.934**

✔ Pass

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Revision:	Date:	Sheet No. 599
Project Name: FIRE STATION 5		



St. L2 (LEVEL 2): L2B985 - 1
W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	28	27.8	64.3	kip	0.432	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	20	58.3	65.2	kip ft	0.893	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.012	-	in	-	-
Deflection Slab	1	0.077	0.543	in	0.141	✔ Pass
Deflection Dead	1	0.057	0.362	in	0.158	✔ Pass
Deflection Live	6	0.204	0.543	in	0.376	✔ Pass
Deflection Wind	323	-0.003	0.652	in	0.004	✔ Pass
Deflection Total	6	0.351	0.362	in	0.967	✔ Pass

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Revision:	Date:	Sheet No. 600
Project Name: FIRE STATION 5		

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 3 13/16" - Critical

Moment, M_x	=4.7 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=27.8 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.432**	

✔ Pass

Flexure Major

20 (Final) LRFD$_{4.5}$-1.2D+1.6L+0.5S+NL$_{Dir2-}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: 5' 11 7/16" - Critical

Dist of M_{rx} along member	=5' 11 7/16" ft, in	
Required flexural strength, M_{rx1}	=58.3 kip ft	
Design flexural strength	=65.2 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.893**	

✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

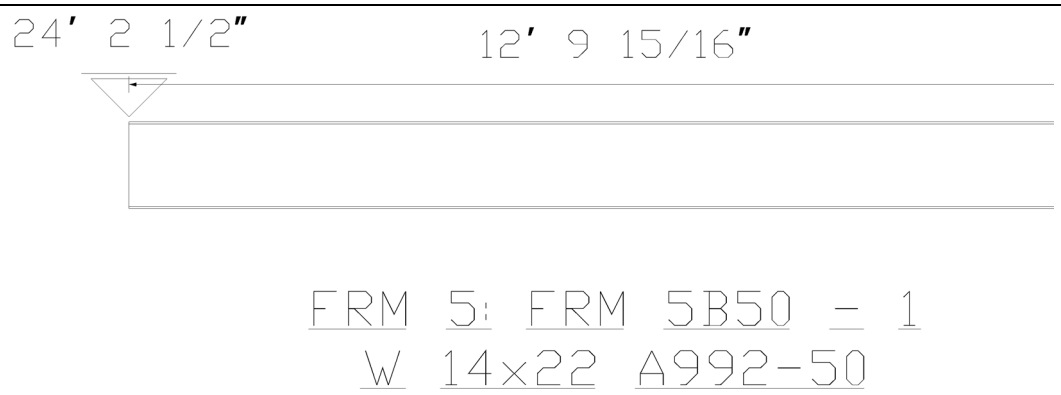
Position Total load deflection	=5' 6 71/256" ft, in
Max. Total load deflection	=0.351 in
Span over limit	=0.362 in
Design limit	=0.362 in
Utilization Ratio	**=0.967**

✔ Pass

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Revision:	Date:	Sheet No. 601
Project Name: FIRE STATION 5		



Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	1	0.2	94.5	kip	0.002	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	1	0.6	61.3	kip ft	0.010	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	302	-13.7	292.1	kip	0.047	✔ Pass
Axial Compression	265	17.8	66.9	kip	0.266	✔ Pass
Combined Forces	265	-	-	-	0.274	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.002	-	in	-	-
Deflection Total	1	0.002	0.641	in	0.004	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=2.7 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=0.2 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.002**	

✔ Pass

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Revision:	Date:	Sheet No. 602
Project Name: FIRE STATION 5		

Flexure Major

1 (Final) LRFD$_{1}$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

LTB Flange Top: 0" - 12' 9 15/16" - Critical

Dist of M_{rx1} along member	=6' 4 31/32" ft, in	
Required flexural strength, M_{rx1}	=0.6 kip ft	
Design flexural strength	=61.3 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.010**	

✔ Pass

Axial Tension

302 (Final) LRFD$_{12.16}$-0.9D+W - Critical

Span 1 W 14x22 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-13.7 kip	
Design yield strength	=292.1 kip	AISC 360 D2
Ratio	**=0.047**	

✔ Pass

Axial Compression

265 (Final) LRFD$_{10.43}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural - out-of-plane: 0" - 12' 9 15/16" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 12' 9 15/16"	Flexural - out-of-plane	12' 9 15/16"	17.8	66.9	kip	0.266	✔ Pass

Combined Forces

265 (Final) LRFD$_{10.43}$-1.2D+L+0.5S+W - Critical

Span 1 W 14x22 A992-50 - Critical

Flange Top LTB 0" - 12' 9 15/16" - Critical

Axial Comp: I.P. 0" - 12' 9 15/16" , O.o.P.0" - 12' 9 15/16" , Tors. 0" - 12' 9 15/16" - Critical

Mode	Ratio	Status
Combined buckling	0.274	✔ Pass

Deflection

1 (Final) LRFD$_{1}$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Total - Critical

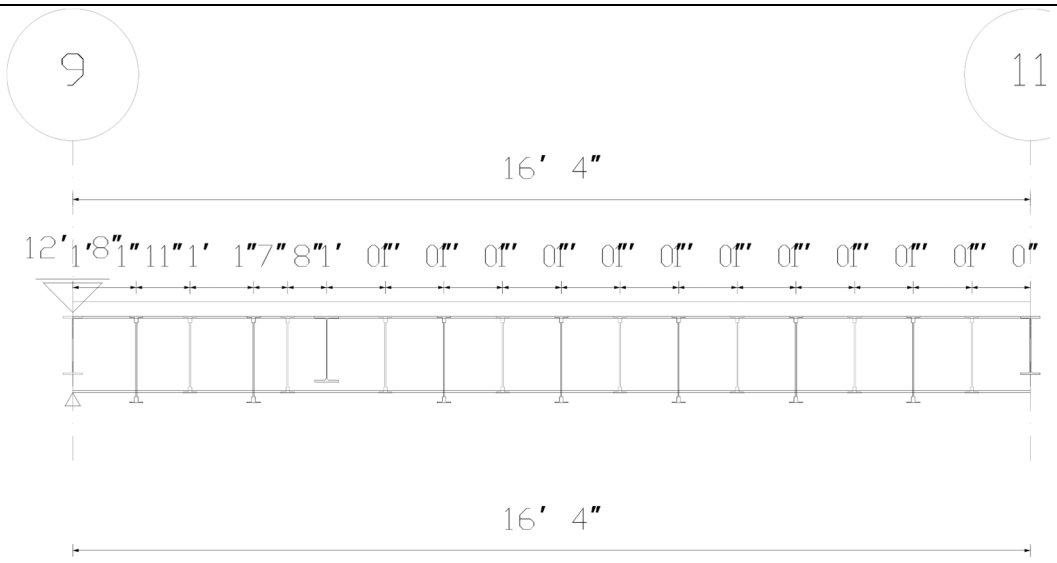
Position Total load deflection	=6' 4 31/32" ft, in
Max. Total load deflection	=0.002 in
Span over limit	=0.641 in
Design limit	=0.641 in
Utilization Ratio	**=0.004**

✔ Pass

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Revision:	Date:	Sheet No. 603
Project Name: FIRE STATION 5		



St. L2 (LEVEL 2): L2B986 - 1
W 16x31 A992-50

Static

Summary W 16x31

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	17	36.0	131.2	kip	0.274	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	8	155.2	202.5	kip ft	0.767	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.018	-	in	-	-
Deflection Slab	1	0.112	0.817	in	0.137	✔ Pass
Deflection Dead	1	0.074	0.544	in	0.137	✔ Pass
Deflection Live	6	0.298	0.817	in	0.365	✔ Pass
Deflection Total	6	0.502	0.544	in	0.922	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 16x31 A992-50 - Critical

Flexural: Position 1' 1" - Critical

Moment, M_x =15.4 kip ft

Elastic modulus of steel, E =29000 ksi

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Project Name: FIRE STATION 5		

Minimum yield stress, F_y =50.00 ksi
Flexural section class Compact AISC 360 Table B4.1b

Shear Major
17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$ - Critical
Span 1 W 16x31 A992-50 - Critical
Position 0" - Critical
Position of V_{ry} =0" ft, in
Required major axis shear strength, V_{ry} =36.0 kip
Design shear strength =131.2 kip AISC 360 G2
Ratio **=0.274**
✔ Pass

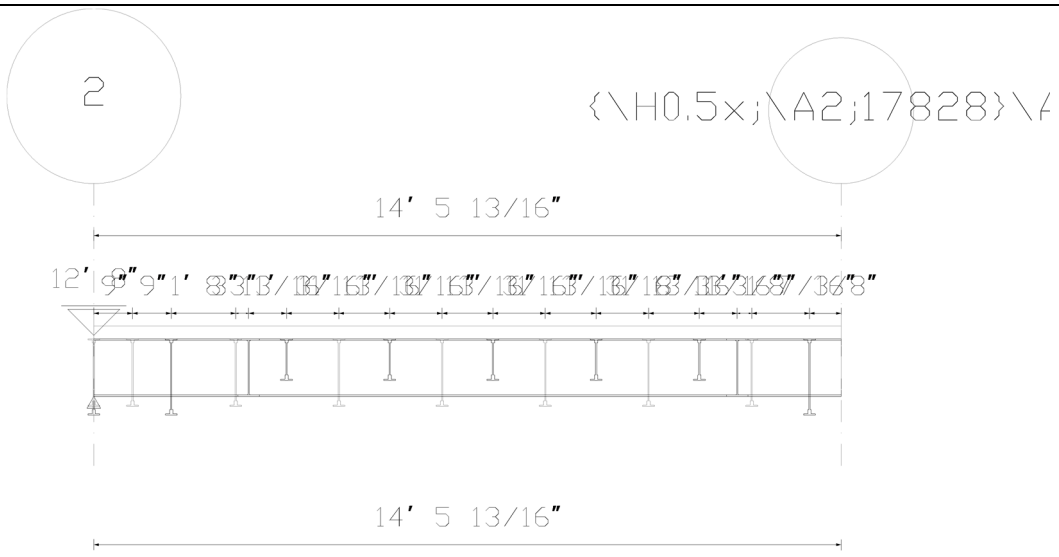
Flexure Major
8 (Final) LRFD$_{2.2}$-1.2D+1.6L+NL$_{Dir1-}$ - Critical
Span 1 W 16x31 A992-50 - Critical
Yielding: 8' 4" - Critical
Dist of M_{rx} along member =8' 4" ft, in
Required flexural strength, M_{rx1} =155.2 kip ft
Design flexural strength =202.5 kip ft AISC 360 F1, F2 and F3
Ratio **=0.767**
✔ Pass

Deflection
6 (Final) LRFD$_2$-1.2D+1.6L - Critical
Span 1 W 16x31 A992-50 - Critical
Deflection Total - Critical
Position Total load deflection =8' 2 17/256" ft, in
Max. Total load deflection =0.502 in
Span over limit =0.544 in
Design limit =0.544 in
Utilization Ratio **=0.922**
✔ Pass

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Project Name: FIRE STATION 5		



St. L2 (LEVEL 2): L2B984 - 1
W 14x22 A992-50

Static

Summary W 14x22

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	9	-30.6	94.5	kip	0.324	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	17	102.8	124.5	kip ft	0.826	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.018	-	in	-	-
Deflection Slab	1	0.111	0.724	in	0.154	✔ Pass
Deflection Dead	1	0.074	0.483	in	0.154	✔ Pass
Deflection Live	6	0.297	0.724	in	0.409	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 14x22 A992-50 - Critical

Flexural: Position 9" - Critical

Moment, M_x	=8.7 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

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Project Name: FIRE STATION 5		

Shear Major

9 (Final) LRFD$_{2.3}$-1.2D+1.6L+NL$_{Dir2+}$ - Critical

Span 1 W 14x22 A992-50 - Critical

Position 14' 5 13/16" - Critical

Position of V_{ry}	=14' 5 13/16" ft, in	
Required major axis shear strength, V_{ry}	=-30.6 kip	
Design shear strength	=94.5 kip	AISC 360 G2
Ratio	**=0.324**	

✔ Pass

Flexure Major

17 (Final) LRFD$_{4.2}$-1.2D+1.6L+0.5S+NL$_{Dir1+}$ - Critical

Span 1 W 14x22 A992-50 - Critical

Yielding: 6' 9" - Critical

Dist of M_{rx} along member	=6' 9" ft, in	
Required flexural strength, M_{rx1}	=102.8 kip ft	
Design flexural strength	=124.5 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.826**	

✔ Pass

Deflection

6 (Final) LRFD$_{2}$-1.2D+1.6L - Critical

Span 1 W 14x22 A992-50 - Critical

Deflection Live - Critical

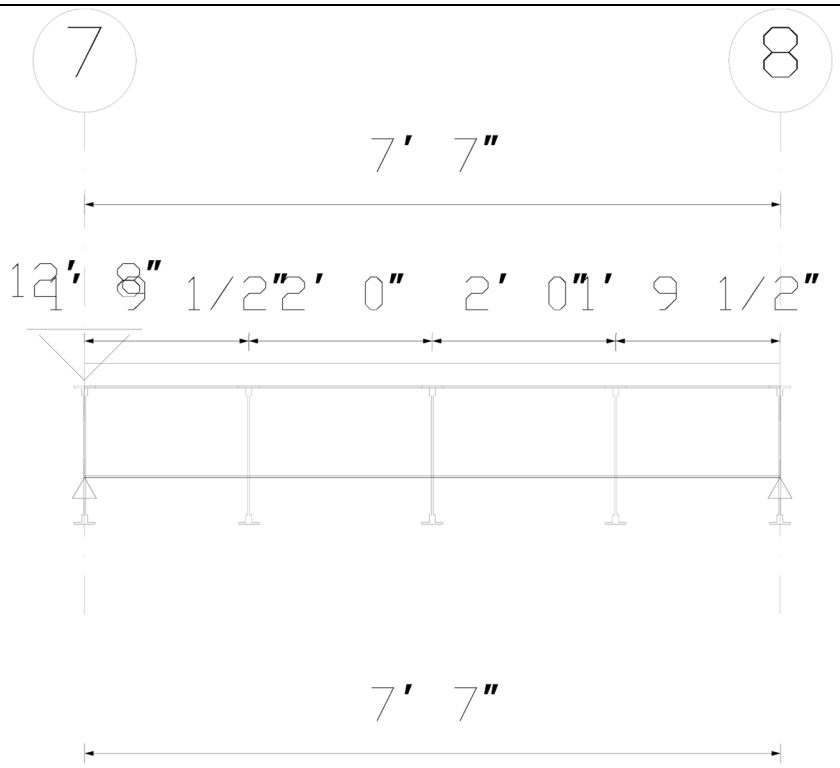
Position Live load deflection	=7' 2 151/256" ft, in
Max. Live load deflection	=0.297 in
Span over limit	=0.724 in
Design limit	=0.724 in
Utilization Ratio	**=0.409**

✔ Pass

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Project Name: FIRE STATION 5		



St. L2 (LEVEL 2): L2B977 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	7	-7.7	64.3	kip	0.120	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	18	18.7	65.2	kip ft	0.286	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.002	-	in	-	-
Deflection Slab	1	0.012	0.379	in	0.033	✔ Pass
Deflection Dead	1	0.008	0.253	in	0.033	✔ Pass
Deflection Live	6	0.033	0.379	in	0.088	✔ Pass
Deflection Total	6	0.056	0.253	in	0.220	✔ Pass

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Revision:	Date:	Sheet No. 608
Project Name: FIRE STATION 5		

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 10 3/4" - Critical

Moment, M_x	=2.7 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

7 (Final) LRFD$_{2.1}$-1.2D+1.6L+NL$_{Dir1+}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Position 7' 7" - Critical

Position of V_{ry}	=7' 7" ft, in	
Required major axis shear strength, V_{ry}	=-7.7 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.120**	

✔ Pass

Flexure Major

18 (Final) LRFD$_{4.3}$-1.2D+1.6L+0.5S+NL$_{Dir1-}$ - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: 3' 9 1/2" - Critical

Dist of M_{rx} along member	=3' 9 1/2" ft, in	
Required flexural strength, M_{rx1}	=18.7 kip ft	
Design flexural strength	=65.2 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.286**	

✔ Pass

Deflection

6 (Final) LRFD$_2$-1.2D+1.6L - Critical

Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

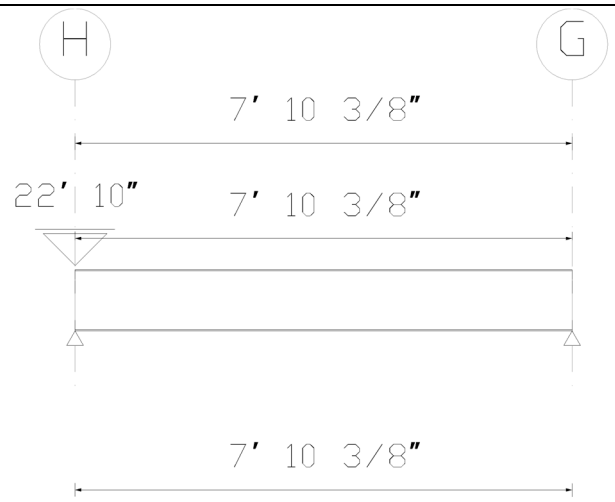
Position Total load deflection	=3' 9 1/2" ft, in
Max. Total load deflection	=0.056 in
Span over limit	=0.253 in
Design limit	=0.253 in
Utilization Ratio	**=0.220**

✔ Pass

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Project Name: FIRE STATION 5		



St. TORS (T.O. ROOF STRUCT.): TORSB1015 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	167	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	0.4	64.3	kip	0.006	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	112	0.7	43.1	kip ft	0.017	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	276	-1.5	187.2	kip	0.008	✔ Pass
Axial Compression	297	0.7	59.8	kip	0.011	✔ Pass
Combined Forces	276	-	-	-	0.025	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.001	-	in	-	-
Deflection Dead	1	0.001	0.262	in	0.004	✔ Pass
Deflection Live	21	0.001	0.393	in	0.002	✔ Pass
Deflection Wind	339	0.000	0.472	in	0.001	✔ Pass
Deflection Total	112	0.003	0.262	in	0.010	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

167 (Final) LRFD$_{9.9}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.4 kip
Elastic modulus of steel, E	=29000 ksi
Minimum yield stress, F_y	=50.00 ksi

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Axial section class Slender AISC 360 Table B4.1a

Shear Major

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

Position of V_{ry} =0" ft, in

Required major axis shear strength, V_{ry} =0.4 kip

Design shear strength =64.3 kip AISC 360 G2

Ratio **=0.006**

✔ Pass

Flexure Major

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Top: 0" - 7' 10 3/8" - Critical

Dist of M_{rx1} along member =3' 11 3/16" ft, in

Required flexural strength, M_{rx1} =0.7 kip ft

Design flexural strength =43.1 kip ft AISC 360 F1, F2, F3 and F4

Ratio **=0.017**

✔ Pass

Axial Tension

276 (Final) LRFD$_{10.54}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 7' 10 3/8" - Critical

Distance of P_r along member =7' 10 3/8" ft, in

Required tensile strength, P_r =-1.5 kip

Design yield strength =187.2 kip AISC 360 D2

Ratio **=0.008**

✔ Pass

Axial Compression

297 (Final) LRFD$_{12.11}$-0.9D+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural - out-of-plane: 0" - 7' 10 3/8" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 7' 10 3/8"	Flexural - out-of-plane	7' 10 3/8"	0.7	59.8	kip	0.011	✔ Pass

Combined Forces

276 (Final) LRFD$_{10.54}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Flange Top LTB 0" - 7' 10 3/8" - Critical

Axial Tension: 0" - 7' 10 3/8" - Critical

Mode	Ratio	Status
Combined buckling	0.025	✔ Pass

Deflection

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

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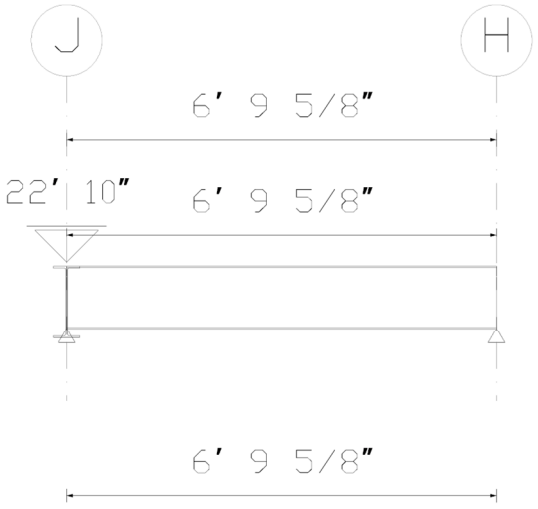
Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=3' 11 3/16" ft, in
Max. Total load deflection	=0.003 in
Span over limit	=0.262 in
Design limit	=0.262 in
Utilization Ratio	**=0.010**

✔ Pass

TORSB1014



St. TORS (T.O. ROOF STRUCT.): TORSB1014 - W 12x14 A992-50

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	39	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	0.3	64.3	kip	0.005	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	112	0.5	49.9	kip ft	0.011	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	260	-1.0	187.2	kip	0.005	✔ Pass
Axial Compression	304	0.6	79.2	kip	0.008	✔ Pass
Combined Forces	148	-	-	-	0.015	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Dead	1	0.001	0.227	in	0.002	✔ Pass
Deflection Total	112	0.001	0.227	in	0.006	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

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Classification
39 (Final) LRFD$_{7.9}$-1.2D+1.6Lr+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
Axial: Position 0" - Critical

Axial Force, P	=0.2 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major
96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=0.3 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.005**	

✔ Pass

Flexure Major
112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
LTB Flange Top: 0" - 6' 9 5/8" - Critical

Dist of M_{rx1} along member	=3' 4 13/16" ft, in	
Required flexural strength, M_{rx1}	=0.5 kip ft	
Design flexural strength	=49.9 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.011**	

✔ Pass

Axial Tension
260 (Final) LRFD$_{10.38}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Yielding: Position 6' 9 5/8" - Critical

Distance of P_r along member	=6' 9 5/8" ft, in	
Required tensile strength, P_r	=-1.0 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.005**	

✔ Pass

Axial Compression
304 (Final) LRFD$_{12.18}$-0.9D+W - Critical
Span 1 W 12x14 A992-50 - Critical
Flexural - out-of-plane: 0" - 6' 9 5/8" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 6' 9 5/8"	Flexural - out-of-plane	6' 9 5/8"	0.6	79.2	kip	0.008	✔ Pass

Combined Forces
148 (Final) LRFD$_{8.54}$-1.2D+1.6S+0.5W - Critical
Span 1 W 12x14 A992-50 - Critical
Flange Top LTB 0" - 6' 9 5/8" - Critical

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Axial Tension: 0" - 6' 9 5/8" - Critical

Mode	Ratio	Status
Combined buckling	0.015	✔ Pass

Deflection

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W - Critical

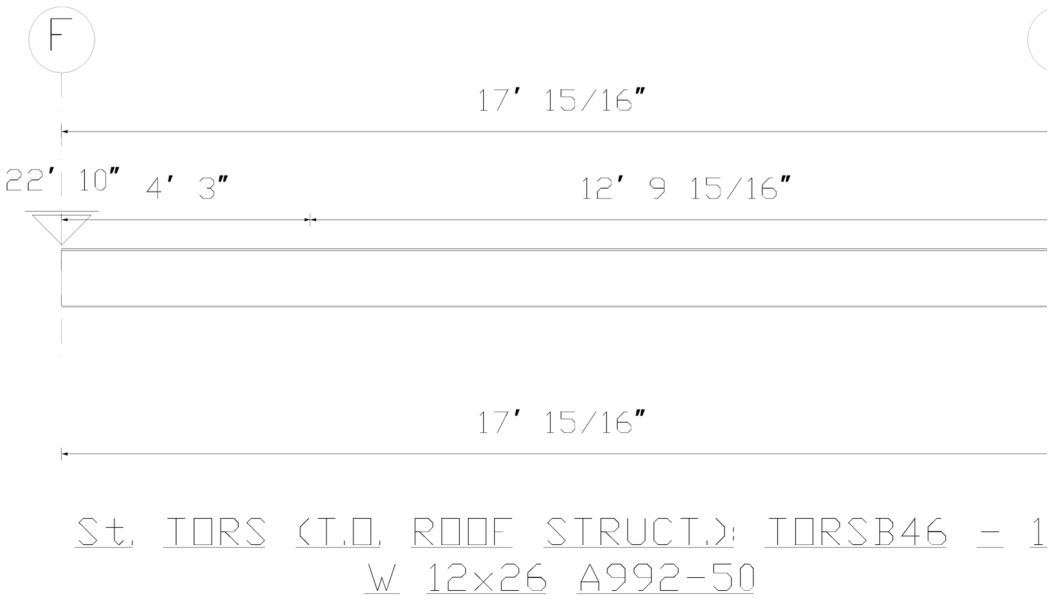
Span 1 W 12x14 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=3' 4 13/16" ft, in
Max. Total load deflection	=0.001 in
Span over limit	=0.227 in
Design limit	=0.227 in
Utilization Ratio	**=0.006**

✔ Pass

TORSB46



Static

Summary W 12x26

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	26	2.1	84.2	kip	0.024	✔ Pass
Flexure Major	26	7.6	139.5	kip ft	0.055	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.019	-	in	-	-
Deflection Slab	1	0.003	0.854	in	0.004	✔ Pass
Deflection Live	6	0.003	0.854	in	0.004	✔ Pass
Deflection Total	16	0.027	0.569	in	0.048	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

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Static

Classification

1 (Final) LRFD$_{1}$-1.4D - Critical

Span 1 W 12x26 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.3 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical

Span 1 W 12x26 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=2.1 kip	
Design shear strength	=84.2 kip	AISC 360 G2
Ratio	**=0.024**	

✔ Pass

Flexure Major

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical

Span 1 W 12x26 A992-50 - Critical

Yielding: 4' 3" - Critical

Dist of M_{rx} along member	=4' 3" ft, in	
Required flexural strength, M_{rx1}	=7.6 kip ft	
Design flexural strength	=139.5 kip ft	AISC 360 F1, F2 and F3
Ratio	**=0.055**	

✔ Pass

Deflection

16 (Final) LRFD$_{4.1}$-1.2D+1.6L+0.5S - Critical

Span 1 W 12x26 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=8' 1 77/128" ft, in
Max. Total load deflection	=0.027 in
Span over limit	=0.569 in
Design limit	=0.569 in
Utilization Ratio	**=0.048**

✔ Pass

Forces Ignored

1 (Final) LRFD$_{1}$-1.4D

Span 1 W 12x26 A992-50

Axial Force, P	0.3	kip
Axial Force, P	-2.6	kip

2 (Final) LRFD$_{1.1}$-1.4D+NL$_{Dir1+}$

Span 1 W 12x26 A992-50

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Axial Force, P 0.3 kip
Axial Force, P -2.6 kip

3 (Final) $LRFD_{1.2}$-1.4D+NL_{Dir1-}
Span 1 W 12x26 A992-50
Axial Force, P 0.3 kip
Axial Force, P -2.7 kip

4 (Final) $LRFD_{1.3}$-1.4D+NL_{Dir2+}
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -2.4 kip

5 (Final) $LRFD_{1.4}$-1.4D+NL_{Dir2-}
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -2.9 kip

6 (Final) $LRFD_{2}$-1.2D+1.6L
Span 1 W 12x26 A992-50
Axial Force, P -2.4 kip

7 (Final) $LRFD_{2.1}$-1.2D+1.6L+NL_{Dir1+}
Span 1 W 12x26 A992-50
Axial Force, P -2.3 kip

8 (Final) $LRFD_{2.2}$-1.2D+1.6L+NL_{Dir1-}
Span 1 W 12x26 A992-50
Axial Force, P -2.4 kip

9 (Final) $LRFD_{2.3}$-1.2D+1.6L+NL_{Dir2+}
Span 1 W 12x26 A992-50
Axial Force, P -2.2 kip

10 (Final) $LRFD_{2.4}$-1.2D+1.6L+NL_{Dir2-}
Span 1 W 12x26 A992-50
Axial Force, P -2.5 kip

11 (Final) $LRFD_{3}$-1.2D+1.6L+0.5Lr
Span 1 W 12x26 A992-50
Axial Force, P -2.6 kip

12 (Final) $LRFD_{3.1}$-1.2D+1.6L+0.5Lr+NL_{Dir1+}
Span 1 W 12x26 A992-50
Axial Force, P -2.6 kip

13 (Final) $LRFD_{3.2}$-1.2D+1.6L+0.5Lr+NL_{Dir1-}
Span 1 W 12x26 A992-50
Axial Force, P -2.7 kip

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14 (Final) $LRFD_{3.3}$-1.2D+1.6L+0.5Lr+NL_{Dir2+}
Span 1 W 12x26 A992-50
Axial Force, P -2.4 kip

15 (Final) $LRFD_{3.4}$-1.2D+1.6L+0.5Lr+NL_{Dir2-}
Span 1 W 12x26 A992-50
Axial Force, P -2.8 kip

16 (Final) $LRFD_{4.1}$-1.2D+1.6L+0.5S
Span 1 W 12x26 A992-50
Axial Force, P -2.8 kip

17 (Final) $LRFD_{4.2}$-1.2D+1.6L+0.5S+NL_{Dir1+}
Span 1 W 12x26 A992-50
Axial Force, P -2.7 kip

18 (Final) $LRFD_{4.3}$-1.2D+1.6L+0.5S+NL_{Dir1-}
Span 1 W 12x26 A992-50
Axial Force, P -2.9 kip

19 (Final) $LRFD_{4.4}$-1.2D+1.6L+0.5S+NL_{Dir2+}
Span 1 W 12x26 A992-50
Axial Force, P -2.6 kip

20 (Final) $LRFD_{4.5}$-1.2D+1.6L+0.5S+NL_{Dir2-}
Span 1 W 12x26 A992-50
Axial Force, P -3.0 kip

21 (Final) $LRFD_{5}$-1.2D+L+1.6Lr
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -3.2 kip

22 (Final) $LRFD_{5.1}$-1.2D+L+1.6Lr+NL_{Dir1+}
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -3.1 kip

23 (Final) $LRFD_{5.2}$-1.2D+L+1.6Lr+NL_{Dir1-}
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -3.2 kip

24 (Final) $LRFD_{5.3}$-1.2D+L+1.6Lr+NL_{Dir2+}
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -2.9 kip

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25 (Final) LRFD$_{5.4}$-1.2D+L+1.6Lr+NL$_{Dir2-}$
Span 1 W 12x26 A992-50
Axial Force, P 0.8 kip
Axial Force, P -3.4 kip

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -3.6 kip

27 (Final) LRFD$_{6.2}$-1.2D+L+1.6S+NL$_{Dir1+}$
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip
Axial Force, P -3.6 kip

28 (Final) LRFD$_{6.3}$-1.2D+L+1.6S+NL$_{Dir1-}$
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -3.7 kip

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -3.3 kip

30 (Final) LRFD$_{6.5}$-1.2D+L+1.6S+NL$_{Dir2-}$
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -4.0 kip

31 (Final) LRFD$_{7.1}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip

32 (Final) LRFD$_{7.2}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -0.3 kip

33 (Final) LRFD$_{7.3}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip
Axial Force, P -1.8 kip

34 (Final) LRFD$_{7.4}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -0.2 kip

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35 (Final) LRFD$_{7.5}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -0.4 kip

36 (Final) LRFD$_{7.6}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -0.6 kip

37 (Final) LRFD$_{7.7}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip
Axial Force, P -2.1 kip

38 (Final) LRFD$_{7.8}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip
Axial Force, P -0.5 kip

39 (Final) LRFD$_{7.9}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

40 (Final) LRFD$_{7.10}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

41 (Final) LRFD$_{7.11}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip
Axial Force, P -0.7 kip

42 (Final) LRFD$_{7.12}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.8 kip

43 (Final) LRFD$_{7.13}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

44 (Final) LRFD$_{7.14}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

45 (Final) LRFD$_{7.15}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip
Axial Force, P -1.0 kip

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46 (Final) LRFD$_{7.16}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

47 (Final) LRFD$_{7.17}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

48 (Final) LRFD$_{7.18}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

49 (Final) LRFD$_{7.19}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip
Axial Force, P -1.7 kip

50 (Final) LRFD$_{7.20}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.5 kip

51 (Final) LRFD$_{7.21}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.6 kip

52 (Final) LRFD$_{7.22}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.9 kip

53 (Final) LRFD$_{7.23}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip
Axial Force, P -2.0 kip

54 (Final) LRFD$_{7.24}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip

55 (Final) LRFD$_{7.25}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -3.2 kip

56 (Final) LRFD$_{7.26}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

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Axial Force, P -3.2 kip

57 (Final) LRFD$_{7.27}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip
Axial Force, P -4.6 kip

58 (Final) LRFD$_{7.28}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -1.7 kip

59 (Final) LRFD$_{7.29}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -3.6 kip

60 (Final) LRFD$_{7.30}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -3.6 kip

61 (Final) LRFD$_{7.31}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -4.8 kip

62 (Final) LRFD$_{7.32}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip
Axial Force, P -2.0 kip

63 (Final) LRFD$_{7.33}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.3 kip
Axial Force, P -6.9 kip

64 (Final) LRFD$_{7.34}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -7.1 kip

65 (Final) LRFD$_{7.35}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.8 kip
Axial Force, P -6.9 kip

66 (Final) LRFD$_{7.36}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50

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Axial Force, P 1.1 kip
Axial Force, P -5.2 kip

67 (Final) LRFD$_{7.37}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P -7.2 kip

68 (Final) LRFD$_{7.38}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P -7.4 kip

69 (Final) LRFD$_{7.39}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.5 kip
Axial Force, P -7.2 kip

70 (Final) LRFD$_{7.40}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.8 kip
Axial Force, P -5.6 kip

71 (Final) LRFD$_{7.41}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -7.4 kip

72 (Final) LRFD$_{7.42}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -7.4 kip

73 (Final) LRFD$_{7.43}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -7.7 kip

74 (Final) LRFD$_{7.44}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -4.9 kip

75 (Final) LRFD$_{7.45}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -7.7 kip

76 (Final) LRFD$_{7.46}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip

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Axial Force, P -7.7 kip

77 (Final) LRFD$_{7.47}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.5 kip
Axial Force, P -7.9 kip

78 (Final) LRFD$_{7.48}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -5.2 kip

79 (Final) LRFD$_{7.49}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -5.1 kip

80 (Final) LRFD$_{7.50}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -5.3 kip

81 (Final) LRFD$_{7.51}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -5.7 kip

82 (Final) LRFD$_{7.52}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -3.8 kip

83 (Final) LRFD$_{7.53}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.3 kip
Axial Force, P -5.4 kip

84 (Final) LRFD$_{7.54}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.5 kip
Axial Force, P -5.6 kip

85 (Final) LRFD$_{7.55}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.8 kip
Axial Force, P -6.0 kip

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86 (Final) LRFD$_{7.56}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -4.1 kip

87 (Final) LRFD$_{7.57}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -2.3 kip

88 (Final) LRFD$_{7.58}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -2.3 kip

89 (Final) LRFD$_{7.59}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -3.8 kip

90 (Final) LRFD$_{7.60}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip
Axial Force, P -1.1 kip

91 (Final) LRFD$_{7.61}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -2.6 kip

92 (Final) LRFD$_{7.62}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -2.6 kip

93 (Final) LRFD$_{7.63}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip
Axial Force, P -4.0 kip

94 (Final) LRFD$_{7.64}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -1.3 kip

95 (Final) LRFD$_{8.1}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip
Axial Force, P -0.6 kip

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96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip
Axial Force, P -0.8 kip

97 (Final) LRFD$_{8.3}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip
Axial Force, P -2.3 kip

98 (Final) LRFD$_{8.4}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip
Axial Force, P -0.7 kip

99 (Final) LRFD$_{8.5}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.5 kip
Axial Force, P -0.9 kip

100 (Final) LRFD$_{8.6}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.7 kip
Axial Force, P -1.1 kip

101 (Final) LRFD$_{8.7}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip
Axial Force, P -2.6 kip

102 (Final) LRFD$_{8.8}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip
Axial Force, P -0.9 kip

103 (Final) LRFD$_{8.9}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.8 kip

104 (Final) LRFD$_{8.10}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.8 kip

105 (Final) LRFD$_{8.11}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.2 kip

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Axial Force, P -1.2 kip

106 (Final) LRFD$_{8.12}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.7 kip

107 (Final) LRFD$_{8.13}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.5 kip

108 (Final) LRFD$_{8.14}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.5 kip

109 (Final) LRFD$_{8.15}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.0 kip
Axial Force, P -1.5 kip

110 (Final) LRFD$_{8.16}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.5 kip

111 (Final) LRFD$_{8.17}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.2 kip

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.5 kip
Axial Force, P -0.3 kip

113 (Final) LRFD$_{8.19}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.1 kip
Axial Force, P -2.2 kip

114 (Final) LRFD$_{8.20}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.4 kip

115 (Final) LRFD$_{8.21}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.5 kip
Axial Force, P -0.4 kip

116 (Final) LRFD$_{8.22}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50

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Moment, M_y -0.1 kip ft
Axial Force, P 3.8 kip
Axial Force, P -0.6 kip

117 (Final) LRFD$_{8.23}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.7 kip
Axial Force, P -2.5 kip

118 (Final) LRFD$_{8.24}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 4.1 kip
Axial Force, P -0.3 kip

119 (Final) LRFD$_{8.25}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip
Axial Force, P -3.7 kip

120 (Final) LRFD$_{8.26}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip
Axial Force, P -3.7 kip

121 (Final) LRFD$_{8.27}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip
Axial Force, P -5.1 kip

122 (Final) LRFD$_{8.28}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.7 kip
Axial Force, P -2.2 kip

123 (Final) LRFD$_{8.29}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip
Axial Force, P -4.1 kip

124 (Final) LRFD$_{8.30}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip
Axial Force, P -4.1 kip

125 (Final) LRFD$_{8.31}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip
Axial Force, P -5.3 kip

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126 (Final) LRFD$_{8.32}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip
Axial Force, P -2.5 kip

127 (Final) LRFD$_{8.33}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -7.4 kip

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip
Axial Force, P -7.6 kip

129 (Final) LRFD$_{8.35}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.7 kip
Axial Force, P -7.4 kip

130 (Final) LRFD$_{8.36}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip
Axial Force, P -5.7 kip

131 (Final) LRFD$_{8.37}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -7.7 kip

132 (Final) LRFD$_{8.38}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -7.9 kip

133 (Final) LRFD$_{8.39}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -7.7 kip

134 (Final) LRFD$_{8.40}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.7 kip
Axial Force, P -6.1 kip

135 (Final) LRFD$_{8.41}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip

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Axial Force, P -7.9 kip

136 (Final) LRFD$_{8.42}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -7.9 kip

137 (Final) LRFD$_{8.43}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip
Axial Force, P -8.1 kip

138 (Final) LRFD$_{8.44}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -5.4 kip

139 (Final) LRFD$_{8.45}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip
Axial Force, P -8.2 kip

140 (Final) LRFD$_{8.46}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip
Axial Force, P -8.2 kip

141 (Final) LRFD$_{8.47}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip
Axial Force, P -8.4 kip

142 (Final) LRFD$_{8.48}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip
Axial Force, P -5.7 kip

143 (Final) LRFD$_{8.49}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip
Axial Force, P -5.6 kip

144 (Final) LRFD$_{8.50}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip
Axial Force, P -5.8 kip

145 (Final) LRFD$_{8.51}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50

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Axial Force, P 2.0 kip
Axial Force, P -6.2 kip

146 (Final) LRFD$_{8.52}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip
Axial Force, P -4.3 kip

147 (Final) LRFD$_{8.53}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.2 kip
Axial Force, P -5.9 kip

148 (Final) LRFD$_{8.54}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.4 kip
Axial Force, P -6.1 kip

149 (Final) LRFD$_{8.55}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.7 kip
Axial Force, P -6.5 kip

150 (Final) LRFD$_{8.56}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.0 kip
Axial Force, P -4.6 kip

151 (Final) LRFD$_{8.57}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip
Axial Force, P -2.8 kip

152 (Final) LRFD$_{8.58}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip
Axial Force, P -2.8 kip

153 (Final) LRFD$_{8.59}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -4.3 kip

154 (Final) LRFD$_{8.60}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip

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Axial Force, P -1.6 kip

155 (Final) LRFD$_{8.61}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -3.1 kip

156 (Final) LRFD$_{8.62}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip
Axial Force, P -3.1 kip

157 (Final) LRFD$_{8.63}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip
Axial Force, P -4.5 kip

158 (Final) LRFD$_{8.64}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip
Axial Force, P -1.8 kip

159 (Final) LRFD$_{9.1}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip

160 (Final) LRFD$_{9.2}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip

161 (Final) LRFD$_{9.3}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip

162 (Final) LRFD$_{9.4}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

163 (Final) LRFD$_{9.5}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.8 kip
Axial Force, P -1.1 kip

164 (Final) LRFD$_{9.6}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.5 kip
Axial Force, P -0.6 kip

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165 (Final) LRFD$_{9.7}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -0.7 kip

166 (Final) LRFD$_{9.8}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.7 kip

167 (Final) LRFD$_{9.9}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 7.3 kip

168 (Final) LRFD$_{9.10}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 7.3 kip

169 (Final) LRFD$_{9.11}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip

170 (Final) LRFD$_{9.12}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 7.7 kip

171 (Final) LRFD$_{9.13}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 6.7 kip

172 (Final) LRFD$_{9.14}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 6.7 kip

173 (Final) LRFD$_{9.15}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip

174 (Final) LRFD$_{9.16}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 7.3 kip

175 (Final) LRFD$_{9.17}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 4.4 kip

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176 (Final) LRFD$_{9.18}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 4.0 kip

177 (Final) LRFD$_{9.19}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.0 kip

178 (Final) LRFD$_{9.20}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 4.5 kip

179 (Final) LRFD$_{9.21}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.8 kip

180 (Final) LRFD$_{9.22}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 3.4 kip

181 (Final) LRFD$_{9.23}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.4 kip
Axial Force, P -0.4 kip

182 (Final) LRFD$_{9.24}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.9 kip

183 (Final) LRFD$_{9.25}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -2.9 kip

184 (Final) LRFD$_{9.26}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -2.9 kip

185 (Final) LRFD$_{9.27}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -5.7 kip

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186 (Final) LRFD$_{9.28}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip

187 (Final) LRFD$_{9.29}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -3.5 kip

188 (Final) LRFD$_{9.30}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -3.5 kip

189 (Final) LRFD$_{9.31}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -6.1 kip

190 (Final) LRFD$_{9.32}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -0.4 kip

191 (Final) LRFD$_{9.33}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P -10.2 kip

192 (Final) LRFD$_{9.34}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P -10.6 kip

193 (Final) LRFD$_{9.35}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -10.3 kip

194 (Final) LRFD$_{9.36}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -6.8 kip

195 (Final) LRFD$_{9.37}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -10.8 kip

196 (Final) LRFD$_{9.38}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -11.2 kip

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197 (Final) LRFD$_{9.39}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -10.9 kip

198 (Final) LRFD$_{9.40}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -7.6 kip

199 (Final) LRFD$_{9.41}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -11.2 kip

200 (Final) LRFD$_{9.42}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -11.2 kip

201 (Final) LRFD$_{9.43}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -11.7 kip

202 (Final) LRFD$_{9.44}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -6.2 kip

203 (Final) LRFD$_{9.45}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -11.9 kip

204 (Final) LRFD$_{9.46}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -11.9 kip

205 (Final) LRFD$_{9.47}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -12.1 kip

206 (Final) LRFD$_{9.48}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -6.8 kip

207 (Final) LRFD$_{9.49}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -6.7 kip

208 (Final) LRFD$_{9.50}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -7.1 kip

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209 (Final) LRFD$_{9.51}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -7.8 kip

210 (Final) LRFD$_{9.52}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -3.9 kip

211 (Final) LRFD$_{9.53}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -7.3 kip

212 (Final) LRFD$_{9.54}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -7.7 kip

213 (Final) LRFD$_{9.55}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -8.4 kip

214 (Final) LRFD$_{9.56}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -4.6 kip

215 (Final) LRFD$_{9.57}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -1.0 kip

216 (Final) LRFD$_{9.58}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -1.0 kip

217 (Final) LRFD$_{9.59}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -3.9 kip

218 (Final) LRFD$_{9.60}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip

219 (Final) LRFD$_{9.61}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -1.6 kip

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220 (Final) LRFD$_{9.62}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -1.6 kip

221 (Final) LRFD$_{9.63}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P -4.5 kip

222 (Final) LRFD$_{9.64}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -0.3 kip

223 (Final) LRFD$_{10.1}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

224 (Final) LRFD$_{10.2}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip

225 (Final) LRFD$_{10.3}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -0.1 kip

226 (Final) LRFD$_{10.4}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip

227 (Final) LRFD$_{10.5}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.7 kip
Axial Force, P -0.8 kip

228 (Final) LRFD$_{10.6}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.3 kip
Axial Force, P -0.3 kip

229 (Final) LRFD$_{10.7}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -0.8 kip

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230 (Final) LRFD$_{10.8}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.5 kip

231 (Final) LRFD$_{10.9}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 7.2 kip

232 (Final) LRFD$_{10.10}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 7.2 kip

233 (Final) LRFD$_{10.11}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.6 kip

234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 7.6 kip

235 (Final) LRFD$_{10.13}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 6.5 kip

236 (Final) LRFD$_{10.14}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 6.5 kip

237 (Final) LRFD$_{10.15}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip

238 (Final) LRFD$_{10.16}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 7.1 kip

239 (Final) LRFD$_{10.17}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 4.2 kip

240 (Final) LRFD$_{10.18}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.8 kip

241 (Final) LRFD$_{10.19}$-1.2D+L+0.5S+W

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Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip

242 (Final) $LRFD_{10.20}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 4.4 kip

243 (Final) $LRFD_{10.21}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 3.7 kip

244 (Final) $LRFD_{10.22}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 3.2 kip

245 (Final) $LRFD_{10.23}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.7 kip
Axial Force, P -0.5 kip

246 (Final) $LRFD_{10.24}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.7 kip

247 (Final) $LRFD_{10.25}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -3.0 kip

248 (Final) $LRFD_{10.26}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -3.0 kip

249 (Final) $LRFD_{10.27}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.5 kip
Axial Force, P -5.8 kip

250 (Final) $LRFD_{10.28}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip

251 (Final) $LRFD_{10.29}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50

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Axial Force, P 0.3 kip
Axial Force, P -3.7 kip

252 (Final) LRFD$_{10.30}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.3 kip
Axial Force, P -3.7 kip

253 (Final) LRFD$_{10.31}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -6.3 kip

254 (Final) LRFD$_{10.32}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.0 kip
Axial Force, P -0.6 kip

255 (Final) LRFD$_{10.33}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P -10.4 kip

256 (Final) LRFD$_{10.34}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -10.8 kip

257 (Final) LRFD$_{10.35}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -10.5 kip

258 (Final) LRFD$_{10.36}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -7.0 kip

259 (Final) LRFD$_{10.37}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -10.9 kip

260 (Final) LRFD$_{10.38}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -11.3 kip

261 (Final) LRFD$_{10.39}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -11.0 kip

262 (Final) LRFD$_{10.40}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -7.7 kip

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263 (Final) $LRFD_{10.41}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -11.4 kip

264 (Final) $LRFD_{10.42}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -11.4 kip

265 (Final) $LRFD_{10.43}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -11.9 kip

266 (Final) $LRFD_{10.44}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -6.4 kip

267 (Final) $LRFD_{10.45}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -12.0 kip

268 (Final) $LRFD_{10.46}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -12.0 kip

269 (Final) $LRFD_{10.47}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -12.3 kip

270 (Final) $LRFD_{10.48}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -6.9 kip

271 (Final) $LRFD_{10.49}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -6.9 kip

272 (Final) $LRFD_{10.50}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -7.3 kip

273 (Final) $LRFD_{10.51}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -7.9 kip

274 (Final) $LRFD_{10.52}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50

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Axial Force, P -4.1 kip

275 (Final) LRFD$_{10.53}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -7.4 kip

276 (Final) LRFD$_{10.54}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -7.8 kip

277 (Final) LRFD$_{10.55}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -8.6 kip

278 (Final) LRFD$_{10.56}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -4.7 kip

279 (Final) LRFD$_{10.57}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -1.1 kip

280 (Final) LRFD$_{10.58}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -1.1 kip

281 (Final) LRFD$_{10.59}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -4.1 kip

282 (Final) LRFD$_{10.60}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip

283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -1.8 kip

284 (Final) LRFD$_{10.62}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -1.8 kip

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285 (Final) LRFD$_{10.63}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P -4.6 kip

286 (Final) LRFD$_{10.64}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.8 kip

287 (Final) LRFD$_{12.1}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

288 (Final) LRFD$_{12.2}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

289 (Final) LRFD$_{12.3}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip

290 (Final) LRFD$_{12.4}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 4.1 kip

291 (Final) LRFD$_{12.5}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.7 kip
Axial Force, P -0.6 kip

292 (Final) LRFD$_{12.6}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.4 kip
Axial Force, P -0.1 kip

293 (Final) LRFD$_{12.7}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip

294 (Final) LRFD$_{12.8}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

295 (Final) LRFD$_{12.9}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 8.2 kip

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296 (Final) LRFD$_{12.10}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 8.2 kip

297 (Final) LRFD$_{12.11}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip

298 (Final) LRFD$_{12.12}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 8.6 kip

299 (Final) LRFD$_{12.13}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 7.6 kip

300 (Final) LRFD$_{12.14}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 7.6 kip

301 (Final) LRFD$_{12.15}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

302 (Final) LRFD$_{12.16}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 8.2 kip

303 (Final) LRFD$_{12.17}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 5.3 kip

304 (Final) LRFD$_{12.18}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 4.9 kip

305 (Final) LRFD$_{12.19}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

306 (Final) LRFD$_{12.20}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 5.4 kip

307 (Final) LRFD$_{12.21}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft

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Axial Force, P 4.7 kip

308 (Final) LRFD$_{12.22}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 4.3 kip

309 (Final) LRFD$_{12.23}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.9 kip

310 (Final) LRFD$_{12.24}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 4.8 kip

311 (Final) LRFD$_{12.25}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -2.0 kip

312 (Final) LRFD$_{12.26}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -2.0 kip

313 (Final) LRFD$_{12.27}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -4.8 kip

314 (Final) LRFD$_{12.28}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.7 kip

315 (Final) LRFD$_{12.29}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.5 kip
Axial Force, P -2.7 kip

316 (Final) LRFD$_{12.30}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.5 kip
Axial Force, P -2.7 kip

317 (Final) LRFD$_{12.31}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip

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Axial Force, P -5.2 kip

318 (Final) LRFD$_{12.32}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip

319 (Final) LRFD$_{12.33}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P -9.3 kip

320 (Final) LRFD$_{12.34}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P -9.7 kip

321 (Final) LRFD$_{12.35}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -9.4 kip

322 (Final) LRFD$_{12.36}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -6.0 kip

323 (Final) LRFD$_{12.37}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -9.9 kip

324 (Final) LRFD$_{12.38}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -10.3 kip

325 (Final) LRFD$_{12.39}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -10.0 kip

326 (Final) LRFD$_{12.40}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -6.7 kip

327 (Final) LRFD$_{12.41}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -10.3 kip

328 (Final) LRFD$_{12.42}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -10.3 kip

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329 (Final) LRFD$_{12.43}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -10.8 kip

330 (Final) LRFD$_{12.44}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -5.3 kip

331 (Final) LRFD$_{12.45}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -11.0 kip

332 (Final) LRFD$_{12.46}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -11.0 kip

333 (Final) LRFD$_{12.47}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -11.3 kip

334 (Final) LRFD$_{12.48}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -5.9 kip

335 (Final) LRFD$_{12.49}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -5.8 kip

336 (Final) LRFD$_{12.50}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -6.2 kip

337 (Final) LRFD$_{12.51}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -6.9 kip

338 (Final) LRFD$_{12.52}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -3.0 kip

339 (Final) LRFD$_{12.53}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -6.4 kip

340 (Final) LRFD$_{12.54}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft

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Axial Force, P -6.8 kip

341 (Final) LRFD$_{12.55}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -7.5 kip

342 (Final) LRFD$_{12.56}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -3.7 kip

343 (Final) LRFD$_{12.57}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip

344 (Final) LRFD$_{12.58}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip

345 (Final) LRFD$_{12.59}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -3.1 kip

346 (Final) LRFD$_{12.60}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip

347 (Final) LRFD$_{12.61}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -0.7 kip

348 (Final) LRFD$_{12.62}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -0.7 kip

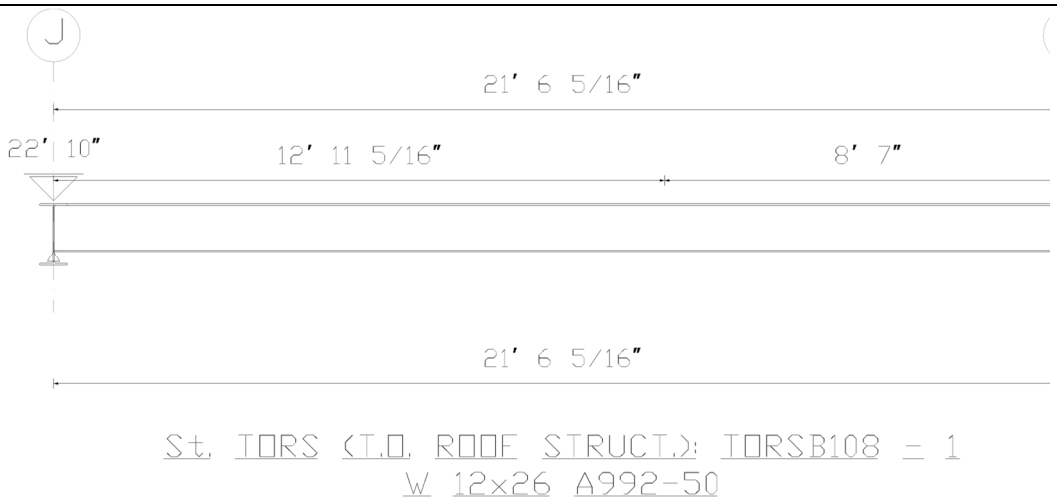
349 (Final) LRFD$_{12.63}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -3.6 kip

350 (Final) LRFD$_{12.64}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip

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Static

Summary W 12x26

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	26	-3.0	84.2	kip	0.036	✔ Pass
Flexure Major	26	17.8	62.3	kip ft	0.285	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.068	-	in	-	-
Deflection Slab	1	0.007	1.076	in	0.007	✔ Pass
Deflection Live	21	0.029	1.076	in	0.027	✔ Pass
Deflection Total	26	0.172	0.718	in	0.239	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x26 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=1.3 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Shear Major

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical

Span 1 W 12x26 A992-50 - Critical

Position 21' 6 5/16" - Critical

Position of V_{ry}	=21' 6 5/16" ft, in	
Required major axis shear strength, V_{ry}	=-3.0 kip	
Design shear strength	=84.2 kip	AISC 360 G2
Ratio	**=0.036**	

✔ Pass

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Flexure Major

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical

Span 1 W 12x26 A992-50 - Critical

LTB Flange Top: 0" - 21' 6 5/16" - Critical

Dist of M_{rx1} along member	=12' 11 5/16" ft, in	
Required flexural strength, M_{rx1}	=17.8 kip ft	
Design flexural strength	=62.3 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.285**	

✔ Pass

Deflection

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical

Span 1 W 12x26 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=11' 1 173/256" ft, in
Max. Total load deflection	=0.172 in
Span over limit	=0.718 in
Design limit	=0.718 in
Utilization Ratio	**=0.239**

✔ Pass

Forces Ignored

1 (Final) LRFD$_{1}$-1.4D

Span 1 W 12x26 A992-50

Axial Force, P 1.3 kip

2 (Final) LRFD$_{1.1}$-1.4D+NL$_{Dir1+}$

Span 1 W 12x26 A992-50

Axial Force, P 1.3 kip

3 (Final) LRFD$_{1.2}$-1.4D+NL$_{Dir1-}$

Span 1 W 12x26 A992-50

Axial Force, P 1.3 kip

4 (Final) LRFD$_{1.3}$-1.4D+NL$_{Dir2+}$

Span 1 W 12x26 A992-50

Axial Force, P 1.2 kip

5 (Final) LRFD$_{1.4}$-1.4D+NL$_{Dir2-}$

Span 1 W 12x26 A992-50

Axial Force, P 1.3 kip

6 (Final) LRFD$_{2}$-1.2D+1.6L

Span 1 W 12x26 A992-50

Axial Force, P 0.4 kip

Axial Force, P -1.4 kip

7 (Final) LRFD$_{2.1}$-1.2D+1.6L+NL$_{Dir1+}$

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Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -1.3 kip

8 (Final) $LRFD_{2.2}$-1.2D+1.6L+NL_{Dir1-}
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -1.4 kip

9 (Final) $LRFD_{2.3}$-1.2D+1.6L+NL_{Dir2+}
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -1.3 kip

10 (Final) $LRFD_{2.4}$-1.2D+1.6L+NL_{Dir2-}
Span 1 W 12x26 A992-50
Axial Force, P 0.4 kip
Axial Force, P -1.5 kip

11 (Final) $LRFD_{3}$-1.2D+1.6L+0.5Lr
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -0.7 kip

12 (Final) $LRFD_{3.1}$-1.2D+1.6L+0.5Lr+NL_{Dir1+}
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -0.7 kip

13 (Final) $LRFD_{3.2}$-1.2D+1.6L+0.5Lr+NL_{Dir1-}
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -0.8 kip

14 (Final) $LRFD_{3.3}$-1.2D+1.6L+0.5Lr+NL_{Dir2+}
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -0.6 kip

15 (Final) $LRFD_{3.4}$-1.2D+1.6L+0.5Lr+NL_{Dir2-}
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -0.9 kip

16 (Final) $LRFD_{4.1}$-1.2D+1.6L+0.5S
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -0.4 kip

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17 (Final) $LRFD_{4.2}$-1.2D+1.6L+0.5S+NL_{Dir1+}
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -0.4 kip

18 (Final) $LRFD_{4.3}$-1.2D+1.6L+0.5S+NL_{Dir1-}
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -0.5 kip

19 (Final) $LRFD_{4.4}$-1.2D+1.6L+0.5S+NL_{Dir2+}
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -0.3 kip

20 (Final) $LRFD_{4.5}$-1.2D+1.6L+0.5S+NL_{Dir2-}
Span 1 W 12x26 A992-50
Axial Force, P 0.7 kip
Axial Force, P -0.5 kip

21 (Final) $LRFD_{5}$-1.2D+L+1.6Lr
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip

22 (Final) $LRFD_{5.1}$-1.2D+L+1.6Lr+NL_{Dir1+}
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip

23 (Final) $LRFD_{5.2}$-1.2D+L+1.6Lr+NL_{Dir1-}
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip

24 (Final) $LRFD_{5.3}$-1.2D+L+1.6Lr+NL_{Dir2+}
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip

25 (Final) $LRFD_{5.4}$-1.2D+L+1.6Lr+NL_{Dir2-}
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip

26 (Final) $LRFD_{6.1}$-1.2D+L+1.6S
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

27 (Final) $LRFD_{6.2}$-1.2D+L+1.6S+NL_{Dir1+}
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

28 (Final) $LRFD_{6.3}$-1.2D+L+1.6S+NL_{Dir1-}

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Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip

29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

30 (Final) LRFD$_{6.5}$-1.2D+L+1.6S+NL$_{Dir2-}$
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip

31 (Final) LRFD$_{7.1}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.0 kip

32 (Final) LRFD$_{7.2}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.2 kip

33 (Final) LRFD$_{7.3}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

34 (Final) LRFD$_{7.4}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

35 (Final) LRFD$_{7.5}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

36 (Final) LRFD$_{7.6}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.5 kip

37 (Final) LRFD$_{7.7}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip

38 (Final) LRFD$_{7.8}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.0 kip

39 (Final) LRFD$_{7.9}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.9 kip

40 (Final) LRFD$_{7.10}$-1.2D+1.6Lr+0.5W

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Span 1 W 12x26 A992-50
Axial Force, P 5.9 kip

41 (Final) LRFD$_{7.11}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.2 kip

42 (Final) LRFD$_{7.12}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 6.1 kip

43 (Final) LRFD$_{7.13}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.5 kip

44 (Final) LRFD$_{7.14}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.5 kip

45 (Final) LRFD$_{7.15}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

46 (Final) LRFD$_{7.16}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.8 kip

47 (Final) LRFD$_{7.17}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.4 kip

48 (Final) LRFD$_{7.18}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.7 kip

49 (Final) LRFD$_{7.19}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

50 (Final) LRFD$_{7.20}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.0 kip

51 (Final) LRFD$_{7.21}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.7 kip

52 (Final) LRFD$_{7.22}$-1.2D+1.6Lr+0.5W

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Span 1 W 12x26 A992-50
Axial Force, P 4.0 kip

53 (Final) LRFD$_{7.23}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

54 (Final) LRFD$_{7.24}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.7 kip

55 (Final) LRFD$_{7.25}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

56 (Final) LRFD$_{7.26}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

57 (Final) LRFD$_{7.27}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.7 kip

58 (Final) LRFD$_{7.28}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

59 (Final) LRFD$_{7.29}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip

60 (Final) LRFD$_{7.30}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip

61 (Final) LRFD$_{7.31}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip

62 (Final) LRFD$_{7.32}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

63 (Final) LRFD$_{7.33}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.3 kip
Axial Force, P -0.6 kip

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64 (Final) LRFD$_{7.34}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.4 kip
Axial Force, P -0.2 kip

65 (Final) LRFD$_{7.35}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.5 kip
Axial Force, P -0.1 kip

66 (Final) LRFD$_{7.36}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.0 kip

67 (Final) LRFD$_{7.37}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P -1.3 kip

68 (Final) LRFD$_{7.38}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P -1.0 kip

69 (Final) LRFD$_{7.39}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -0.5 kip

70 (Final) LRFD$_{7.40}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip

71 (Final) LRFD$_{7.41}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.2 kip
Axial Force, P -0.1 kip

72 (Final) LRFD$_{7.42}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.2 kip
Axial Force, P -0.1 kip

73 (Final) LRFD$_{7.43}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50

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Axial Force, P 0.8 kip
Axial Force, P -0.4 kip

74 (Final) LRFD$_{7.44}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip

75 (Final) LRFD$_{7.45}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -0.5 kip

76 (Final) LRFD$_{7.46}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -0.5 kip

77 (Final) LRFD$_{7.47}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -0.6 kip

78 (Final) LRFD$_{7.48}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip

79 (Final) LRFD$_{7.49}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip

80 (Final) LRFD$_{7.50}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip

81 (Final) LRFD$_{7.51}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip

82 (Final) LRFD$_{7.52}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip

83 (Final) LRFD$_{7.53}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip

84 (Final) LRFD$_{7.54}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip

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85 (Final) LRFD$_{7.55}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.0 kip

86 (Final) LRFD$_{7.56}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip

87 (Final) LRFD$_{7.57}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

88 (Final) LRFD$_{7.58}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

89 (Final) LRFD$_{7.59}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip

90 (Final) LRFD$_{7.60}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

91 (Final) LRFD$_{7.61}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip

92 (Final) LRFD$_{7.62}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip

93 (Final) LRFD$_{7.63}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip

94 (Final) LRFD$_{7.64}$-1.2D+1.6Lr+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.7 kip

95 (Final) LRFD$_{8.1}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.0 kip

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.3 kip

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97 (Final) LRFD$_{8.3}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

98 (Final) LRFD$_{8.4}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.4 kip

99 (Final) LRFD$_{8.5}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

100 (Final) LRFD$_{8.6}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.6 kip

101 (Final) LRFD$_{8.7}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

102 (Final) LRFD$_{8.8}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.0 kip

103 (Final) LRFD$_{8.9}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 6.9 kip

104 (Final) LRFD$_{8.10}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 6.9 kip

105 (Final) LRFD$_{8.11}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.3 kip

106 (Final) LRFD$_{8.12}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 7.1 kip

107 (Final) LRFD$_{8.13}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 6.5 kip

108 (Final) LRFD$_{8.14}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 6.5 kip

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109 (Final) LRFD$_{8.15}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.0 kip

110 (Final) LRFD$_{8.16}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 6.8 kip

111 (Final) LRFD$_{8.17}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.4 kip

112 (Final) LRFD$_{8.18}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.8 kip

113 (Final) LRFD$_{8.19}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.7 kip

114 (Final) LRFD$_{8.20}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 6.1 kip

115 (Final) LRFD$_{8.21}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.7 kip

116 (Final) LRFD$_{8.22}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.0 kip

117 (Final) LRFD$_{8.23}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

118 (Final) LRFD$_{8.24}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 5.7 kip

119 (Final) LRFD$_{8.25}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 3.5 kip

120 (Final) LRFD$_{8.26}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50

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Moment, M_y -0.1 kip ft
Axial Force, P 3.5 kip

121 (Final) LRFD$_{8.27}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip

122 (Final) LRFD$_{8.28}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.6 kip

123 (Final) LRFD$_{8.29}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip

124 (Final) LRFD$_{8.30}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip

125 (Final) LRFD$_{8.31}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

126 (Final) LRFD$_{8.32}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

127 (Final) LRFD$_{8.33}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.5 kip

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.8 kip

129 (Final) LRFD$_{8.35}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.9 kip

130 (Final) LRFD$_{8.36}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.0 kip

131 (Final) LRFD$_{8.37}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50

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Axial Force, P -0.3 kip

133 (Final) LRFD$_{8.39}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip

134 (Final) LRFD$_{8.40}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip

135 (Final) LRFD$_{8.41}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.4 kip

136 (Final) LRFD$_{8.42}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 1.4 kip

137 (Final) LRFD$_{8.43}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.0 kip

138 (Final) LRFD$_{8.44}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

139 (Final) LRFD$_{8.45}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip

140 (Final) LRFD$_{8.46}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip

141 (Final) LRFD$_{8.47}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 0.8 kip

142 (Final) LRFD$_{8.48}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip

143 (Final) LRFD$_{8.49}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip

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144 (Final) LRFD$_{8.50}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.3 kip

145 (Final) LRFD$_{8.51}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip

146 (Final) LRFD$_{8.52}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip

147 (Final) LRFD$_{8.53}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.5 kip

148 (Final) LRFD$_{8.54}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip

149 (Final) LRFD$_{8.55}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 1.6 kip

150 (Final) LRFD$_{8.56}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip

151 (Final) LRFD$_{8.57}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

152 (Final) LRFD$_{8.58}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.3 kip

153 (Final) LRFD$_{8.59}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip

154 (Final) LRFD$_{8.60}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.9 kip

155 (Final) LRFD$_{8.61}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

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156 (Final) LRFD$_{8.62}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

157 (Final) LRFD$_{8.63}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip

158 (Final) LRFD$_{8.64}$-1.2D+1.6S+0.5W
Span 1 W 12x26 A992-50
Axial Force, P 4.7 kip

159 (Final) LRFD$_{9.1}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.9 kip

160 (Final) LRFD$_{9.2}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.4 kip

161 (Final) LRFD$_{9.3}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip

162 (Final) LRFD$_{9.4}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.5 kip

163 (Final) LRFD$_{9.5}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 1.4 kip

164 (Final) LRFD$_{9.6}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 1.9 kip

165 (Final) LRFD$_{9.7}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 0.7 kip

166 (Final) LRFD$_{9.8}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 2.9 kip

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167 (Final) LRFD$_{9.9}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 6.6 kip

168 (Final) LRFD$_{9.10}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 6.6 kip

169 (Final) LRFD$_{9.11}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 3.3 kip

170 (Final) LRFD$_{9.12}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 7.0 kip

171 (Final) LRFD$_{9.13}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 5.9 kip

172 (Final) LRFD$_{9.14}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 5.9 kip

173 (Final) LRFD$_{9.15}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.8 kip

174 (Final) LRFD$_{9.16}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 6.5 kip

175 (Final) LRFD$_{9.17}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 3.7 kip

176 (Final) LRFD$_{9.18}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 4.4 kip

177 (Final) LRFD$_{9.19}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.1 kip

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178 (Final) LRFD$_{9.20}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 5.0 kip

179 (Final) LRFD$_{9.21}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 2.3 kip

180 (Final) LRFD$_{9.22}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 2.9 kip

181 (Final) LRFD$_{9.23}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.4 kip

182 (Final) LRFD$_{9.24}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 4.2 kip

183 (Final) LRFD$_{9.25}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.2 kip
Axial Force, P -0.2 kip

184 (Final) LRFD$_{9.26}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.2 kip
Axial Force, P -0.2 kip

185 (Final) LRFD$_{9.27}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.4 kip
Axial Force, P -1.8 kip

186 (Final) LRFD$_{9.28}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.0 kip

187 (Final) LRFD$_{9.29}$-1.2D+L+0.5Lr+W

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Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -0.9 kip

188 (Final) LRFD$_{9.30}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -0.9 kip

189 (Final) LRFD$_{9.31}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -2.3 kip

190 (Final) LRFD$_{9.32}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.4 kip

191 (Final) LRFD$_{9.33}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.3 kip ft
Axial Force, P -6.3 kip

192 (Final) LRFD$_{9.34}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.3 kip ft
Axial Force, P -5.6 kip

193 (Final) LRFD$_{9.35}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.4 kip

194 (Final) LRFD$_{9.36}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -3.1 kip

195 (Final) LRFD$_{9.37}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -7.7 kip

196 (Final) LRFD$_{9.38}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -7.1 kip

197 (Final) LRFD$_{9.39}$-1.2D+L+0.5Lr+W

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Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -6.0 kip

198 (Final) LRFD$_{9.40}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -3.9 kip

199 (Final) LRFD$_{9.41}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.3 kip

200 (Final) LRFD$_{9.42}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.3 kip

201 (Final) LRFD$_{9.43}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.9 kip

202 (Final) LRFD$_{9.44}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.3 kip
Axial Force, P -2.3 kip

203 (Final) LRFD$_{9.45}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -6.1 kip

204 (Final) LRFD$_{9.46}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -6.1 kip

205 (Final) LRFD$_{9.47}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -6.4 kip

206 (Final) LRFD$_{9.48}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -2.9 kip

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207 (Final) LRFD$_{9.49}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -3.1 kip

208 (Final) LRFD$_{9.50}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -2.5 kip

209 (Final) LRFD$_{9.51}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -3.3 kip

210 (Final) LRFD$_{9.52}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.0 kip
Axial Force, P -0.8 kip

211 (Final) LRFD$_{9.53}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Moment, M_y -0.1 kip ft
Axial Force, P 0.1 kip
Axial Force, P -4.5 kip

212 (Final) LRFD$_{9.54}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Moment, M_y -0.1 kip ft
Axial Force, P 0.2 kip
Axial Force, P -4.0 kip

213 (Final) LRFD$_{9.55}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Moment, M_y -0.1 kip ft
Axial Force, P -4.1 kip

214 (Final) LRFD$_{9.56}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 0.3 kip
Axial Force, P -1.5 kip

215 (Final) LRFD$_{9.57}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50

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Axial Force, P 2.4 kip

216 (Final) LRFD$_{9.58}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

217 (Final) LRFD$_{9.59}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -0.8 kip

218 (Final) LRFD$_{9.60}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.7 kip

219 (Final) LRFD$_{9.61}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.8 kip

220 (Final) LRFD$_{9.62}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.8 kip

221 (Final) LRFD$_{9.63}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -1.4 kip

222 (Final) LRFD$_{9.64}$-1.2D+L+0.5Lr+W
Span 1 W 12x26 A992-50
Axial Force, P 2.2 kip

223 (Final) LRFD$_{10.1}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip

224 (Final) LRFD$_{10.2}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.7 kip

225 (Final) LRFD$_{10.3}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip

226 (Final) LRFD$_{10.4}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.9 kip

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227 (Final) LRFD$_{10.5}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 1.7 kip

228 (Final) LRFD$_{10.6}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 2.3 kip

229 (Final) LRFD$_{10.7}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.0 kip

230 (Final) LRFD$_{10.8}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 3.2 kip

231 (Final) LRFD$_{10.9}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 6.9 kip

232 (Final) LRFD$_{10.10}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 6.9 kip

233 (Final) LRFD$_{10.11}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.6 kip

234 (Final) LRFD$_{10.12}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 7.3 kip

235 (Final) LRFD$_{10.13}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 6.2 kip

236 (Final) LRFD$_{10.14}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 6.2 kip

237 (Final) LRFD$_{10.15}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50

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Axial Force, P 3.1 kip

238 (Final) LRFD$_{10.16}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 6.8 kip

239 (Final) LRFD$_{10.17}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 4.0 kip

240 (Final) LRFD$_{10.18}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 4.7 kip

241 (Final) LRFD$_{10.19}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

242 (Final) LRFD$_{10.20}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 5.3 kip

243 (Final) LRFD$_{10.21}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 2.6 kip

244 (Final) LRFD$_{10.22}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 3.2 kip

245 (Final) LRFD$_{10.23}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.8 kip

246 (Final) LRFD$_{10.24}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 4.6 kip

247 (Final) LRFD$_{10.25}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.3 kip

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248 (Final) LRFD$_{10.26}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.3 kip

249 (Final) LRFD$_{10.27}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.5 kip
Axial Force, P -1.5 kip

250 (Final) LRFD$_{10.28}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.3 kip

251 (Final) LRFD$_{10.29}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -0.6 kip

252 (Final) LRFD$_{10.30}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -0.6 kip

253 (Final) LRFD$_{10.31}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -2.0 kip

254 (Final) LRFD$_{10.32}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.8 kip

255 (Final) LRFD$_{10.33}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.3 kip ft
Axial Force, P -6.0 kip

256 (Final) LRFD$_{10.34}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.3 kip ft
Axial Force, P -5.3 kip

257 (Final) LRFD$_{10.35}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft

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Axial Force, P -5.1 kip

258 (Final) LRFD$_{10.36}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -2.8 kip

259 (Final) LRFD$_{10.37}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -7.4 kip

260 (Final) LRFD$_{10.38}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -6.7 kip

261 (Final) LRFD$_{10.39}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -5.7 kip

262 (Final) LRFD$_{10.40}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -3.6 kip

263 (Final) LRFD$_{10.41}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.0 kip

264 (Final) LRFD$_{10.42}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.0 kip

265 (Final) LRFD$_{10.43}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.6 kip

266 (Final) LRFD$_{10.44}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.4 kip
Axial Force, P -2.0 kip

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W

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Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.7 kip

268 (Final) $LRFD_{10.46}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.7 kip

269 (Final) $LRFD_{10.47}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -6.1 kip

270 (Final) $LRFD_{10.48}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -2.6 kip

271 (Final) $LRFD_{10.49}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -2.7 kip

272 (Final) $LRFD_{10.50}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.3 kip
Axial Force, P -2.2 kip

273 (Final) $LRFD_{10.51}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.3 kip
Axial Force, P -3.0 kip

274 (Final) $LRFD_{10.52}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.0 kip
Axial Force, P -0.5 kip

275 (Final) $LRFD_{10.53}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Moment, M_y -0.1 kip ft
Axial Force, P 0.2 kip
Axial Force, P -4.2 kip

276 (Final) $LRFD_{10.54}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft

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Moment, M_y -0.1 kip ft
Axial Force, P 0.3 kip
Axial Force, P -3.7 kip

277 (Final) LRFD$_{10.55}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -3.7 kip

278 (Final) LRFD$_{10.56}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 0.4 kip
Axial Force, P -1.2 kip

279 (Final) LRFD$_{10.57}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

280 (Final) LRFD$_{10.58}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 2.5 kip

281 (Final) LRFD$_{10.59}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -0.5 kip

282 (Final) LRFD$_{10.60}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 3.0 kip

283 (Final) LRFD$_{10.61}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.8 kip

284 (Final) LRFD$_{10.62}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.8 kip

285 (Final) LRFD$_{10.63}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50
Axial Force, P 0.6 kip
Axial Force, P -1.0 kip

286 (Final) LRFD$_{10.64}$-1.2D+L+0.5S+W
Span 1 W 12x26 A992-50

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Axial Force, P 2.5 kip

287 (Final) LRFD$_{12.1}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 3.3 kip

288 (Final) LRFD$_{12.2}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.8 kip

289 (Final) LRFD$_{12.3}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip

290 (Final) LRFD$_{12.4}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 4.0 kip

291 (Final) LRFD$_{12.5}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 1.9 kip

292 (Final) LRFD$_{12.6}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 2.4 kip

293 (Final) LRFD$_{12.7}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.1 kip

294 (Final) LRFD$_{12.8}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 3.3 kip

295 (Final) LRFD$_{12.9}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 7.0 kip

296 (Final) LRFD$_{12.10}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 7.0 kip

297 (Final) LRFD$_{12.11}$-0.9D+W
Span 1 W 12x26 A992-50

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Axial Force, P 3.8 kip

298 (Final) $LRFD_{12.12}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 7.5 kip

299 (Final) $LRFD_{12.13}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 6.3 kip

300 (Final) $LRFD_{12.14}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 6.3 kip

301 (Final) $LRFD_{12.15}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.2 kip

302 (Final) $LRFD_{12.16}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 6.9 kip

303 (Final) $LRFD_{12.17}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 4.1 kip

304 (Final) $LRFD_{12.18}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 4.8 kip

305 (Final) $LRFD_{12.19}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.6 kip

306 (Final) $LRFD_{12.20}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 5.4 kip

307 (Final) $LRFD_{12.21}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 2.7 kip

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308 (Final) LRFD$_{12.22}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 3.4 kip

309 (Final) LRFD$_{12.23}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.9 kip

310 (Final) LRFD$_{12.24}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Axial Force, P 4.7 kip

311 (Final) LRFD$_{12.25}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.3 kip

312 (Final) LRFD$_{12.26}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.3 kip

313 (Final) LRFD$_{12.27}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P 0.4 kip
Axial Force, P -1.3 kip

314 (Final) LRFD$_{12.28}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 2.5 kip

315 (Final) LRFD$_{12.29}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -0.4 kip

316 (Final) LRFD$_{12.30}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -0.4 kip

317 (Final) LRFD$_{12.31}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft

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Axial Force, P -1.8 kip

318 (Final) LRFD$_{12.32}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.9 kip

319 (Final) LRFD$_{12.33}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.3 kip ft
Axial Force, P -5.8 kip

320 (Final) LRFD$_{12.34}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.3 kip ft
Axial Force, P -5.2 kip

321 (Final) LRFD$_{12.35}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -4.9 kip

322 (Final) LRFD$_{12.36}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -2.7 kip

323 (Final) LRFD$_{12.37}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -7.3 kip

324 (Final) LRFD$_{12.38}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -6.6 kip

325 (Final) LRFD$_{12.39}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -5.6 kip

326 (Final) LRFD$_{12.40}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -3.4 kip

327 (Final) LRFD$_{12.41}$-0.9D+W
Span 1 W 12x26 A992-50

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Moment, M_y -0.2 kip ft
Axial Force, P -4.9 kip

328 (Final) $LRFD_{12.42}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -4.9 kip

329 (Final) $LRFD_{12.43}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.2 kip ft
Axial Force, P -5.5 kip

330 (Final) $LRFD_{12.44}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P 0.3 kip
Axial Force, P -1.9 kip

331 (Final) $LRFD_{12.45}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -5.6 kip

332 (Final) $LRFD_{12.46}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -5.6 kip

333 (Final) $LRFD_{12.47}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y -0.1 kip ft
Axial Force, P -6.0 kip

334 (Final) $LRFD_{12.48}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P -2.4 kip

335 (Final) $LRFD_{12.49}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.1 kip
Axial Force, P -2.6 kip

336 (Final) $LRFD_{12.50}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.2 kip
Axial Force, P -2.1 kip

337 (Final) $LRFD_{12.51}$-0.9D+W

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Span 1 W 12x26 A992-50
Axial Force, P 0.2 kip
Axial Force, P -2.9 kip

338 (Final) LRFD$_{12.52}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.9 kip
Axial Force, P -0.4 kip

339 (Final) LRFD$_{12.53}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Moment, M_y -0.1 kip ft
Axial Force, P -4.1 kip

340 (Final) LRFD$_{12.54}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.2 kip ft
Moment, M_y -0.1 kip ft
Axial Force, P 0.2 kip
Axial Force, P -3.5 kip

341 (Final) LRFD$_{12.55}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P -3.6 kip

342 (Final) LRFD$_{12.56}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 0.3 kip
Axial Force, P -1.1 kip

343 (Final) LRFD$_{12.57}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

344 (Final) LRFD$_{12.58}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 2.4 kip

345 (Final) LRFD$_{12.59}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 1.0 kip
Axial Force, P -0.3 kip

346 (Final) LRFD$_{12.60}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 3.1 kip

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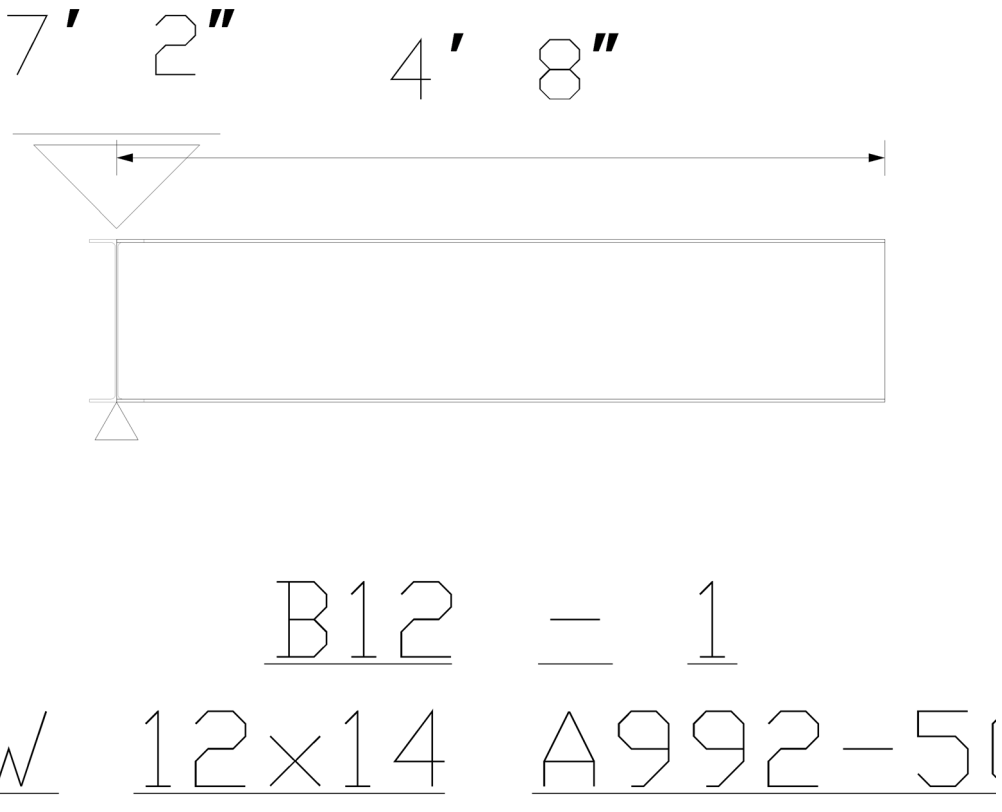
347 (Final) LRFD$_{12.61}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.7 kip

348 (Final) LRFD$_{12.62}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 1.7 kip

349 (Final) LRFD$_{12.63}$-0.9D+W
Span 1 W 12x26 A992-50
Axial Force, P 0.5 kip
Axial Force, P -0.9 kip

350 (Final) LRFD$_{12.64}$-0.9D+W
Span 1 W 12x26 A992-50
Moment, M_y 0.1 kip ft
Axial Force, P 2.6 kip

B12



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Project Name: FIRE STATION 5		

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	39	Slender	-	-	-	✔ Pass
Flexural Classification		Unknown	-	-	-	Not required
Shear Major	No Significant Forces			kip	-	Not required
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	No Significant Forces			kip ft	-	Not required
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	260	-0.7	187.2	kip	0.004	✔ Pass
Axial Compression	175	0.7	115.5	kip	0.006	✔ Pass
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

39 (Final) LRFD$_{7.9}$-1.2D+1.6Lr+0.5W - Critical

Span 1 W 12x14 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=0.2 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Axial section class	Slender	AISC 360 Table B4.1a

Axial Tension

260 (Final) LRFD$_{10.38}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-0.7 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.004**	

✔ Pass

Axial Compression

175 (Final) LRFD$_{9.17}$-1.2D+L+0.5Lr+W - Critical

Span 1 W 12x14 A992-50 - Critical

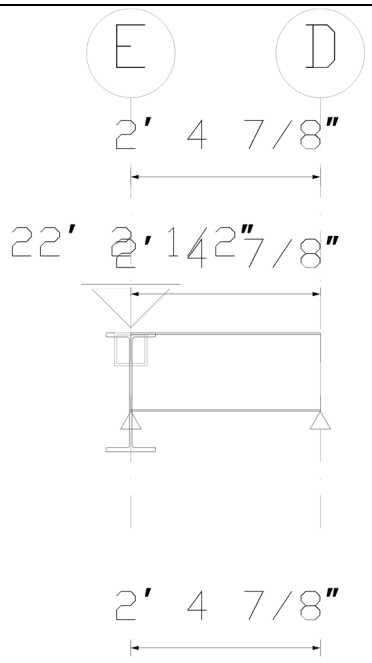
Flexural - out-of-plane: 0" - 4' 8" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 4' 8"	Flexural - out-of-plane	4' 8"	0.7	115.5	kip	0.006	✔ Pass

ABRB1

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Project Name: FIRE STATION 5		



St. ABR (APP BAY ROOF): ABRB1 - W 12x14 A500B-46

Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Slender	-	-	-	✔ Pass
Flexural Classification		Unknown	-	-	-	Not required
Shear Major	No Significant Forces			kip	-	Not required
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	No Significant Forces			kip ft	-	Not required
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	323	-6.5	172.2	kip	0.038	✔ Pass
Axial Compression	233	9.6	138.5	kip	0.069	✔ Pass
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A500B-46 - Critical

Axial: Position 0" - Critical

Axial Force, P =2.8 kip

Elastic modulus of steel, E =29000 ksi

Minimum yield stress, F_y =46.00 ksi

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Axial section class Slender AISC 360 Table B4.1a

Axial Tension

323 (Final) $LRFD_{12.37}$-0.9D+W - Critical

Span 1 W 12x14 A500B-46 - Critical

Yielding: Position 2′ 4 7/8″ - Critical

Distance of P_r along member =2′ 4 7/8″ ft, in

Required tensile strength, P_r =-6.5 kip

Design yield strength =172.2 kip AISC 360 D2

Ratio **=0.038**

✔ Pass

Axial Compression

233 (Final) $LRFD_{10.11}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A500B-46 - Critical

Flexural - out-of-plane: 0″ - 2′ 4 7/8″ - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 2′ 4 7/8″	Flexural - out-of-plane	2′ 4 7/8″	9.6	138.5	kip	0.069	✔ Pass

TORSB14



St. TORS (T.O. ROOF STRUCT.): TORSB14 - L 4x4x3/8 A992-50

Static

Summary L 4x4x3/8

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required

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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexural Classification		Unknown	-	-	-	Not required
Shear Major	No Significant Forces			kip	-	Not required
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	No Significant Forces			kip ft	-	Not required
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	96	-23.0	128.7	kip	0.178	✔ Pass
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Axial Tension

96 (Final) $LRFD_{8.2}$-1.2D+1.6S+0.5W - Critical

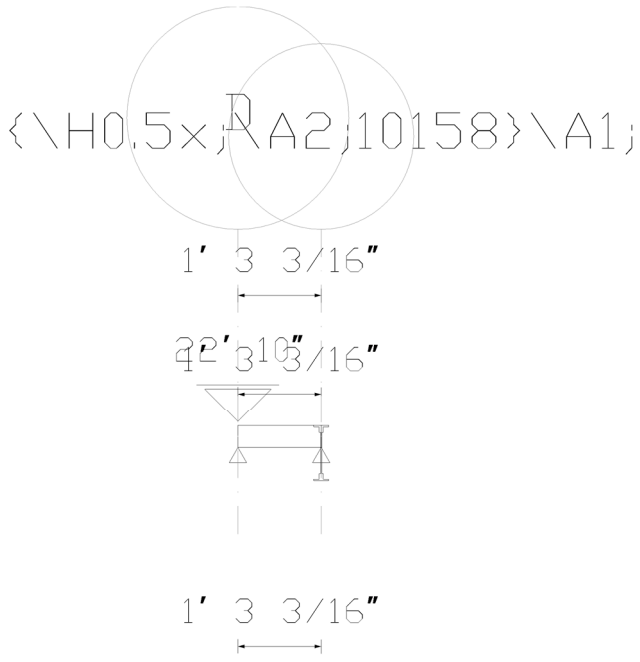
Span 1 L 4x4x3/8 A992-50 - Critical

Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-23.0 kip	
Design yield strength	=128.7 kip	AISC 360 D2
Ratio	**=0.178**	

✔ Pass

TORSB15



St. TORS (T.O. ROOF STRUCT.): TORSB15 - L 4x4x3/8 A992-50

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Static

Summary L 4x4x3/8

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	55	Compact	-	-	-	✔ Pass
Shear Major	No Significant Forces			kip	-	Not required
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	No Significant Forces			kip ft	-	Not required
Flexure Minor	247	-0.1	8.4	kip ft	0.014	✔ Pass
Axial Tension	128	-35.1	128.7	kip	0.273	✔ Pass
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

55 (Final) LRFD$_{7.25}$-1.2D+1.6Lr+0.5W - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Flexural: Position 7 35/64" - Critical

Moment, M_y =-0.1 kip ft

Elastic modulus of steel, E =29000 ksi

Minimum yield stress, F_y =50.00 ksi

Flexural section class Compact AISC 360 Table B4.1b

Flexure Minor

247 (Final) LRFD$_{10.25}$-1.2D+L+0.5S+W - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Yielding: 7 19/32" - Critical

Dist of M_{ry} along member =7 19/32" ft, in

Required flexural strength, M_{ry1} =-0.1 kip ft

Design flexural strength =8.4 kip ft AISC 360 F1 and F10

Ratio **=0.014**

✔ Pass

Axial Tension

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Yielding: Position 1' 3 3/16" - Critical

Distance of P_r along member =1' 3 3/16" ft, in

Required tensile strength, P_r =-35.1 kip

Design yield strength =128.7 kip AISC 360 D2

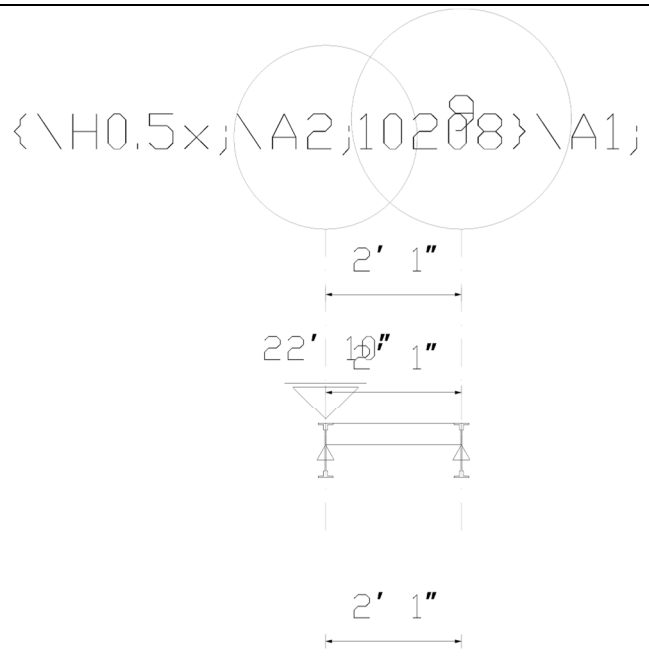
Ratio **=0.273**

✔ Pass

TORSB43

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St. TORS (T.O. ROOF STRUCT.): TORSB43 - L 4x4x3/8 A992-50

Static

Summary L 4x4x3/8

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required
Flexural Classification	163	Compact	-	-	-	✔ Pass
Shear Major	No Significant Forces			kip	-	Not required
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	No Significant Forces			kip ft	-	Not required
Flexure Minor	163	0.1	8.4	kip ft	0.013	✔ Pass
Axial Tension	96	-36.0	128.7	kip	0.280	✔ Pass
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

163 (Final) $LRFD_{9.5}$-1.2D+L+0.5Lr+W - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Flexural: Position 1' 121/256" - Critical

Moment, M_y	=0.1 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

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Flexure Minor

163 (Final) LRFD$_{9.5}$-1.2D+L+0.5Lr+W - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Yielding: 1′ 1/2″ - Critical

Dist of M_{ry} along member	=1′ 1/2″ ft, in	
Required flexural strength, M_{ry1}	=0.1 kip ft	
Design flexural strength	=8.4 kip ft	AISC 360 F1 and F10
Ratio	**=0.013**	

✔ Pass

Axial Tension

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

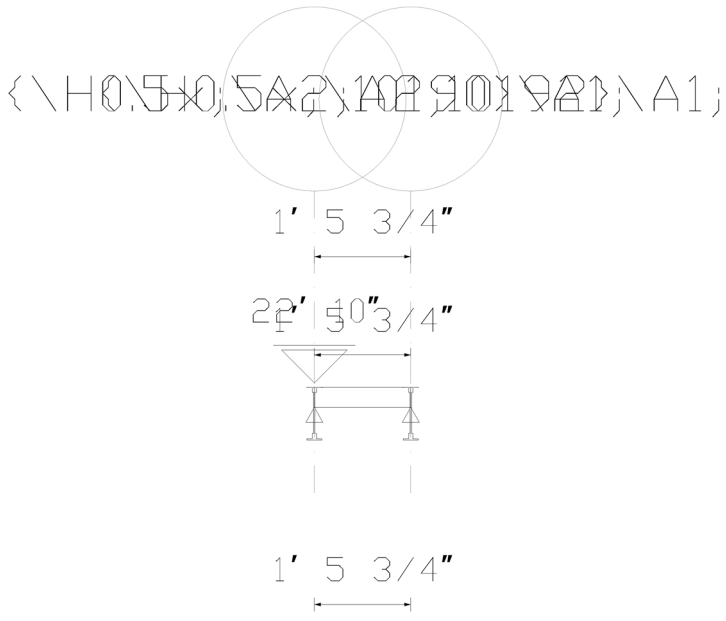
Span 1 L 4x4x3/8 A992-50 - Critical

Yielding: Position 2′ 1″ - Critical

Distance of P_r along member	=2′ 1″ ft, in	
Required tensile strength, P_r	=-36.0 kip	
Design yield strength	=128.7 kip	AISC 360 D2
Ratio	**=0.280**	

✔ Pass

TORSB34



Static

Summary L 4x4x3/8

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification		Unknown	-	-	-	Not required
Shear Major	No Significant Forces			kip	-	Not required
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	No Significant Forces			kip ft	-	Not required
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	No Significant Forces			kip	-	Not required
Axial Compression	30	21.4	123.9	kip	0.172	✔ Pass
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) $LRFD_1$-1.4D - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

Axial: Position 0" - Critical

Axial Force, P	=13.7 kip
Elastic modulus of steel, E	=29000 ksi
Minimum yield stress, F_y	=50.00 ksi
Axial section class	Non-slender AISC 360 Table B4.1a

Axial Compression

30 (Final) $LRFD_{6.5}$-1.2D+L+1.6S+NL_{Dir2} - Critical

Span 1 L 4x4x3/8 A992-50 - Critical

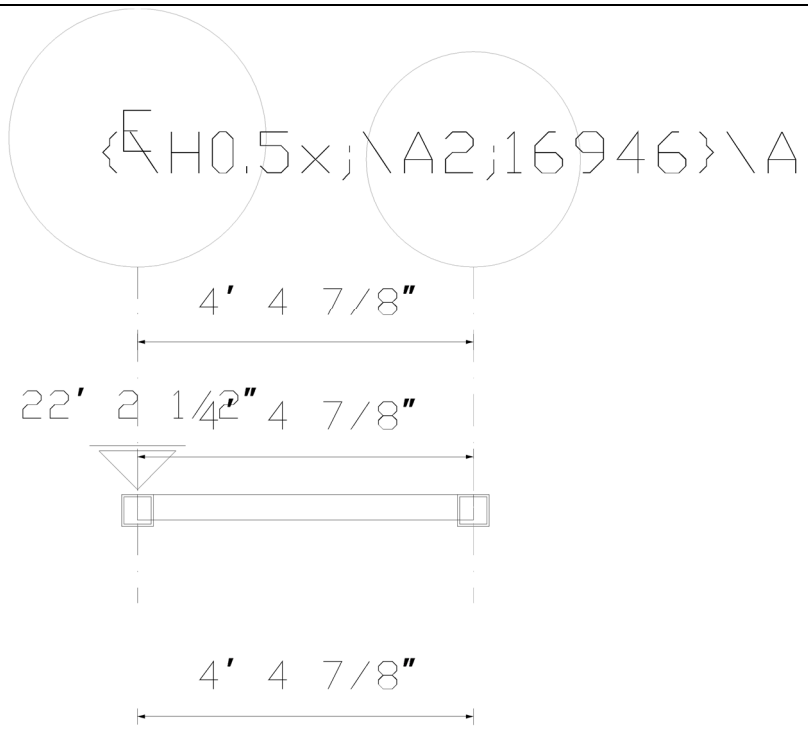
Flexural - out-of-plane principal: 0" - 1' 5 3/4" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 1' 5 3/4"	Flexural - out-of-plane principal	1' 5 3/4"	21.4	123.9	kip	0.172	✔ Pass

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Project Name: FIRE STATION 5		



St. ABR (APP BAY ROOF): ABRB41 - L 4x4x3/8 A36-36

Static

Summary L 4x4x3/8

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	31	Non-slender	-	-	-	✔ Pass
Flexural Classification		Unknown	-	-	-	Not required
Shear Major	No Significant Forces			kip	-	Not required
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	No Significant Forces			kip ft	-	Not required
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	259	-0.3	92.7	kip	0.004	✔ Pass
Axial Compression	288	0.3	72.7	kip	0.005	✔ Pass
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.001	-	in	-	-
Deflection Total	185	0.001	0.220	in	0.003	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

31 (Final) $LRFD_{7.1}$-1.2D+1.6Lr+0.5W - Critical

Span 1 L 4x4x3/8 A36-36 - Critical

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Axial: Position 2′ 2 7/16″ - Critical

Axial Force, P	=0.2 kip	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=36.00 ksi	
Axial section class	Non-slender	AISC 360 Table B4.1a

Axial Tension

259 (Final) LRFD$_{10.37}$-1.2D+L+0.5S+W - Critical

Span 1 L 4x4x3/8 A36-36 - Critical

Yielding: Position 4′ 4 7/8″ - Critical

Distance of P_r along member	=4′ 4 7/8″ ft, in	
Required tensile strength, P_r	=-0.3 kip	
Design yield strength	=92.7 kip	AISC 360 D2
Ratio	**=0.004**	

✔ Pass

Axial Compression

288 (Final) LRFD$_{12.2}$-0.9D+W - Critical

Span 1 L 4x4x3/8 A36-36 - Critical

Flexural - out-of-plane principal: 0″ - 4′ 4 7/8″ - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 4′ 4 7/8″	Flexural - out-of-plane principal	4′ 4 7/8″	0.3	72.7	kip	0.005	✔ Pass

Deflection

183 (Final) LRFD$_{9.25}$-1.2D+L+0.5Lr+W - Critical

Span 1 L 4x4x3/8 A36-36 - Critical

Deflection Total - Critical

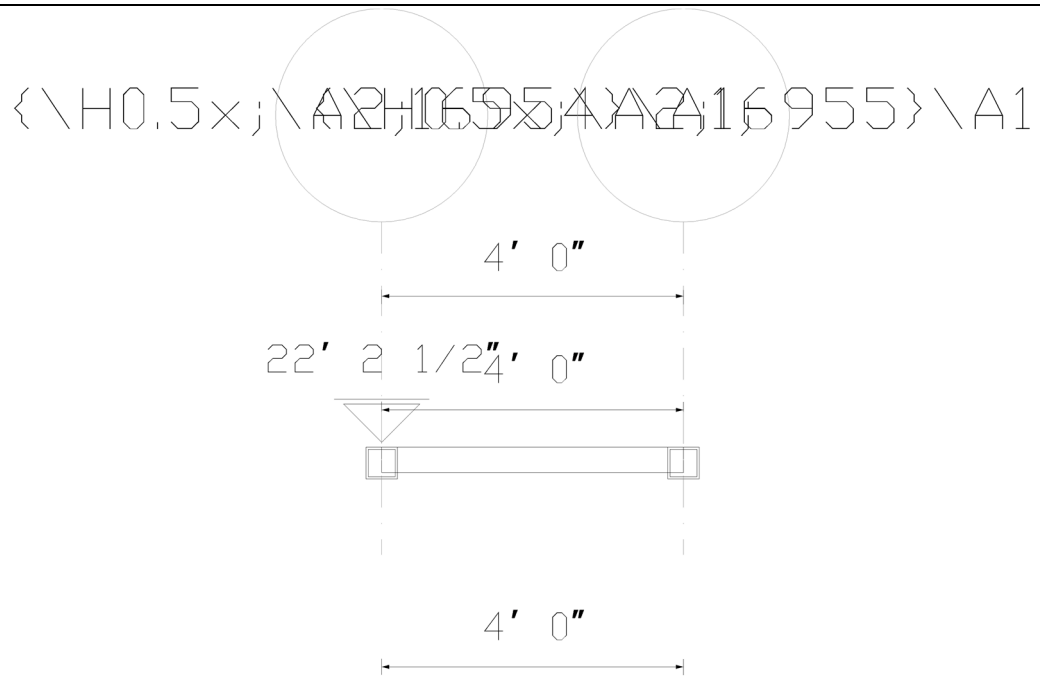
Position Total load deflection	=2′ 2 7/16″ ft, in
Max. Total load deflection	=0.001 in
Span over limit	=0.220 in
Design limit	=0.220 in
Utilization Ratio	**=0.003**

✔ Pass

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St. ABR (APP BAY ROOF): ABRB48 - L 4x4x3/8 A36-36

Static

Summary L 4x4x3/8

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	31	Non-slender	-	-	-	✔ Pass
Flexural Classification		Unknown	-	-	-	Not required
Shear Major	No Significant Forces			kip	-	Not required
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	No Significant Forces			kip ft	-	Not required
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	195	-1.7	92.7	kip	0.018	✔ Pass
Axial Compression	288	1.5	75.9	kip	0.020	✔ Pass
Combined Forces	No Significant Forces			-	-	Not required
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.000	-	in	-	-
Deflection Total	163	0.000	0.200	in	0.002	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

31 (Final) $LRFD_{7.1}$-1.2D+1.6Lr+0.5W - Critical

Span 1 L 4x4x3/8 A36-36 - Critical

Axial: Position 0" - Critical

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Axial Force, P =0.7 kip
Elastic modulus of steel, E =29000 ksi
Minimum yield stress, F_y =36.00 ksi
Axial section class Non-slender AISC 360 Table B4.1a

Axial Tension

195 (Final) LRFD$_{9.37}$-1.2D+L+0.5Lr+W - Critical

Span 1 L 4x4x3/8 A36-36 - Critical

Yielding: Position 4′ 0″ - Critical

Distance of P_r along member =4′ 0″ ft, in
Required tensile strength, P_r =-1.7 kip
Design yield strength =92.7 kip AISC 360 D2
Ratio **=0.018**

✔ Pass

Axial Compression

288 (Final) LRFD$_{12.2}$-0.9D+W - Critical

Span 1 L 4x4x3/8 A36-36 - Critical

Flexural - out-of-plane principal: 0″ - 4′ 0″ - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0″ - 4′ 0″	Flexural - out-of-plane principal	4′ 0″	1.5	75.9	kip	0.020	✔ Pass

Deflection

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 L 4x4x3/8 A36-36 - Critical

Deflection Total - Critical

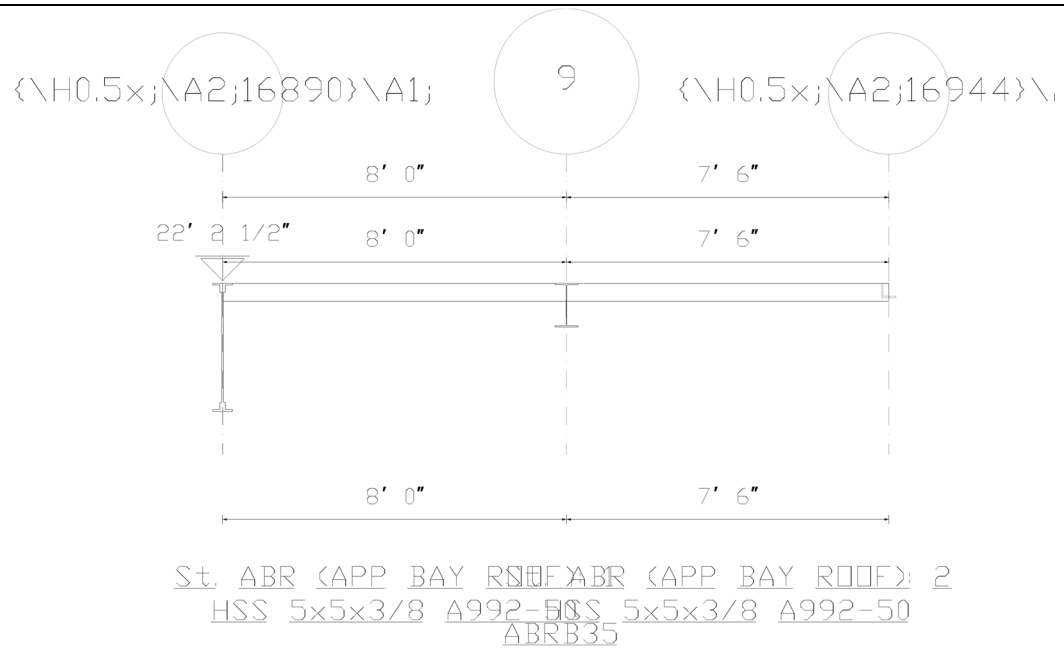
Position Total load deflection =2′ 1/256″ ft, in
Max. Total load deflection =0.000 in
Span over limit =0.200 in
Design limit =0.200 in
Utilization Ratio **=0.002**

✔ Pass

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Project Name: FIRE STATION 5		



Static

Summary HSS 5x5x3/8

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	55	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	128	-2.6	74.5	kip	0.035	Pass
Shear Minor	319	-0.2	74.5	kip	0.003	Pass
Flexure Major	128	-10.0	39.7	kip ft	0.252	Pass
Flexure Minor	319	-0.8	39.7	kip ft	0.021	Pass
Axial Tension	276	-1.0	278.1	kip	0.004	Pass
Axial Compression	319	1.0	229.3	kip	0.004	Pass
Combined Forces	128	-	-	-	0.262	Pass
Torsion	-	-	-	-	-	Beyond Scope
Deflection Self weight	1	0.079	-	in	-	-
Deflection Dead	1	0.222	0.500	in	0.444	Pass
Deflection Live	21	0.177	0.500	in	0.355	Pass
Deflection Wind	339	-0.121	0.500	in	0.242	Pass
Deflection Total	128	0.574	0.750	in	0.766	Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 HSS 5x5x3/8 A992-50 - Critical

Flexural: Position 4' 0" - Critical

Moment, M_x =-1.3 kip ft

Elastic modulus of steel, E =29000 ksi

Minimum yield stress, F_y =50.00 ksi

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Flexural section class Compact AISC 360 Table B4.1b

Shear Major
128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Position 8′ 0″ - Critical
Position of V_{ry} =8′ 0″ ft, in
Required major axis shear strength, V_{ry} =-2.6 kip
Design shear strength =74.5 kip AISC 360 G4
Ratio **=0.035**
✔ Pass

Shear Minor
319 (Final) LRFD$_{12.33}$-0.9D+W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Position 4′ 0″ - Critical
Position of V_{rx} =4′ 0″ ft, in
Required minor axis shear strength, V_{rx} =-0.2 kip
Design shear strength =74.5 kip AISC 360 G4
Ratio **=0.003**
✔ Pass

Flexure Major
128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Yielding: 8′ 0″ - Critical
Dist of M_{rx} along member =8′ 0″ ft, in
Required flexural strength, M_{rx1} =-10.0 kip ft
Design flexural strength =39.7 kip ft AISC 360 F1, F2 and F3
Ratio **=0.252**
✔ Pass

Flexure Minor
319 (Final) LRFD$_{12.33}$-0.9D+W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Yielding: 8′ 0″ - Critical
Dist of M_{ry} along member =8′ 0″ ft, in
Required flexural strength, M_{ry1} =-0.8 kip ft
Design flexural strength =39.7 kip ft AISC 360 F7
Ratio **=0.021**
✔ Pass

Axial Tension
276 (Final) LRFD$_{10.54}$-1.2D+L+0.5S+W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Yielding: Position 8′ 0″ - Critical
Distance of P_r along member =8′ 0″ ft, in
Required tensile strength, P_r =-1.0 kip
Design yield strength =278.1 kip AISC 360 D2

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Ratio **=0.004**

Pass

Axial Compression

319 (Final) LRFD$_{12.33}$-0.9D+W - Critical

Span 1 HSS 5x5x3/8 A992-50 - Critical

Flexural - in-plane: 0" - 8' 0" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 8' 0"	Flexural - in-plane	8' 0"	1.0	229.3	kip	0.004	Pass

Combined Forces

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 1 HSS 5x5x3/8 A992-50 - Critical

Flange Top LTB 0" - 8' 0" - Critical

Axial Comp: I.P. 0" - 8' 0" , O.o.P.0" - 8' 0" , Tors. 0" - 8' 0" - Critical

Mode	Ratio	Status
Combined buckling	0.262	Pass

Torsion

26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S - Critical

Span 2 HSS 5x5x3/8 A992-50 - Critical

Beyond Scope - Critical

Member not pinned at both ends

Beyond Scope

Deflection

128 (Final) LRFD$_{8.34}$-1.2D+1.6S+0.5W - Critical

Span 2 HSS 5x5x3/8 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection =7' 6" ft, in

Max. Total load deflection =0.574 in

Span over limit =0.750 in

Design limit =0.750 in

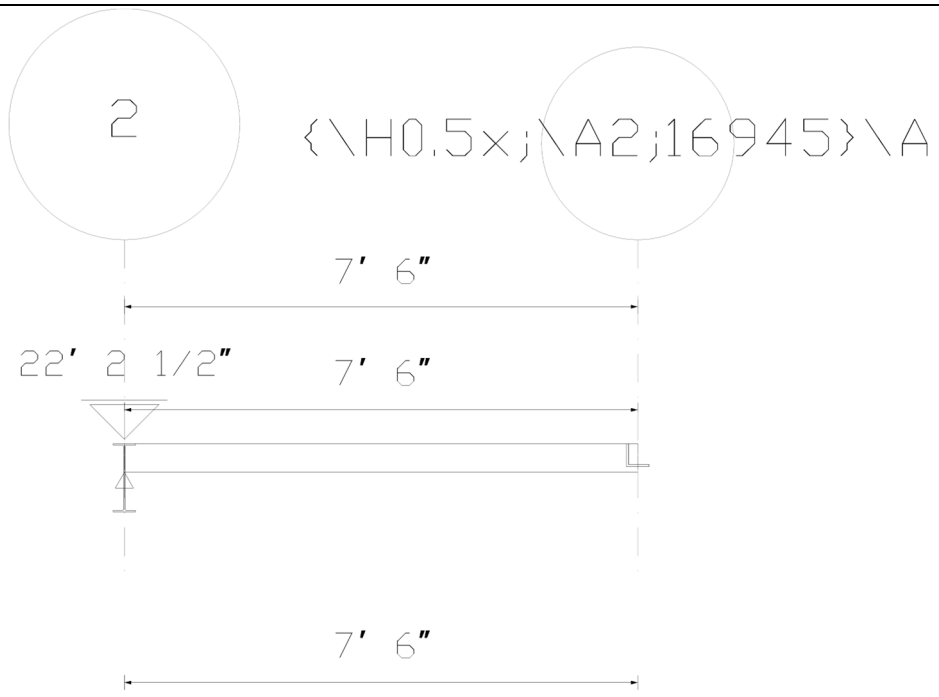
Utilization Ratio **=0.766**

Pass

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Project Name: FIRE STATION 5		



St. ABR (APP BAY ROOF): ABRB39 - 1
HSS 5x5x3/8 A992-50

Static

Summary HSS 5x5x3/8

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	31	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	96	1.5	74.5	kip	0.020	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	96	-5.8	39.7	kip ft	0.145	✔ Pass
Flexure Minor	224	0.2	39.7	kip ft	0.005	✔ Pass
Axial Tension	259	-0.7	278.1	kip	0.002	✔ Pass
Axial Compression	288	0.7	234.7	kip	0.003	✔ Pass
Combined Forces	96	-	-	-	0.149	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Self weight	1	0.031	-	in	-	-
Deflection Dead	1	0.061	0.500	in	0.121	✔ Pass
Deflection Live	21	0.048	0.375	in	0.129	✔ Pass
Deflection Wind	323	-0.032	0.500	in	0.064	✔ Pass
Deflection Total	96	0.166	0.250	in	0.662	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

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Project Name: FIRE STATION 5		

1 (Final) LRFD$_{1}$-1.4D - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Flexural: Position 0" - Critical
Moment, M_x =-3.2 kip ft
Elastic modulus of steel, E =29000 ksi
Minimum yield stress, F_y =50.00 ksi
Flexural section class Compact AISC 360 Table B4.1b

Shear Major
96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Position 0" - Critical
Position of V_{ry} =0" ft, in
Required major axis shear strength, V_{ry} =1.5 kip
Design shear strength =74.5 kip AISC 360 G4
Ratio **=0.020**
✔ Pass

Flexure Major
96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Yielding: 0" - Critical
Dist of M_{rx} along member =0" ft, in
Required flexural strength, M_{rx1} =-5.8 kip ft
Design flexural strength =39.7 kip ft AISC 360 F1, F2 and F3
Ratio **=0.145**
✔ Pass

Flexure Minor
224 (Final) LRFD$_{10.2}$-1.2D+L+0.5S+W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Yielding: 0" - Critical
Dist of M_{ry} along member =0" ft, in
Required flexural strength, M_{ry1} =0.2 kip ft
Design flexural strength =39.7 kip ft AISC 360 F7
Ratio **=0.005**
✔ Pass

Axial Tension
259 (Final) LRFD$_{10.37}$-1.2D+L+0.5S+W - Critical
Span 1 HSS 5x5x3/8 A992-50 - Critical
Yielding: Position 0" - Critical
Distance of P_r along member =0" ft, in
Required tensile strength, P_r =-0.7 kip
Design yield strength =278.1 kip AISC 360 D2
Ratio **=0.002**
✔ Pass

Axial Compression

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288 (Final) LRFD$_{12.2}$-0.9D+W - Critical

Span 1 HSS 5x5x3/8 A992-50 - Critical

Flexural - in-plane: 0" - 7' 6" - Critical

Start - End	Mode	Length	Value	Limit	Units	Ratio	Status
0" - 7' 6"	Flexural - in-plane	7' 6"	0.7	234.7	kip	0.003	✔ Pass

Combined Forces

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

Span 1 HSS 5x5x3/8 A992-50 - Critical

Flange Top LTB 0" - 7' 6" - Critical

Axial Comp: I.P. 0" - 7' 6" , O.o.P.0" - 7' 6" , Tors. 0" - 7' 6" - Critical

Mode	Ratio	Status
Combined buckling	0.149	✔ Pass

Deflection

96 (Final) LRFD$_{8.2}$-1.2D+1.6S+0.5W - Critical

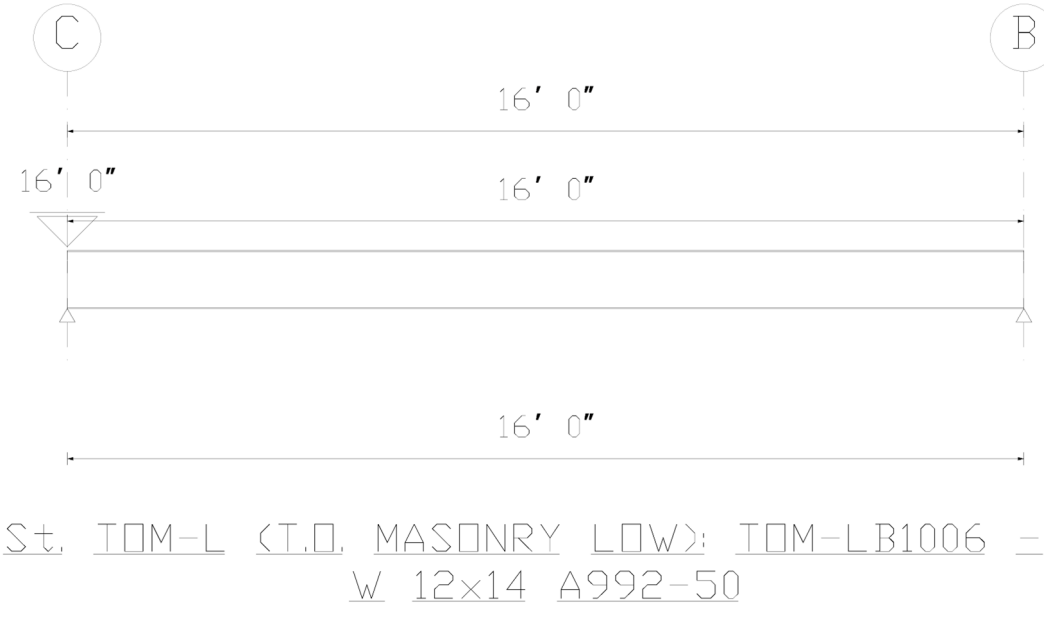
Span 1 HSS 5x5x3/8 A992-50 - Critical

Deflection Total - Critical

Position Total load deflection	=7' 6" ft, in
Max. Total load deflection	=0.166 in
Span over limit	=0.250 in
Design limit	=0.250 in
Utilization Ratio	**=0.662**

✔ Pass

TOM-LB1006



Static

Summary W 12x14

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification		Unknown	-	-	-	Not required

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	267	1.0	64.3	kip	0.015	✔ Pass
Shear Minor	No Significant Forces			kip	-	Not required
Flexure Major	267	-7.4	28.4	kip ft	0.261	✔ Pass
Flexure Minor	No Significant Forces			kip ft	-	Not required
Axial Tension	141	-2.7	187.2	kip	0.015	✔ Pass
Axial Compression	No Significant Forces			kip	-	Not required
Combined Forces	267	-	-	-	0.252	✔ Pass
Torsion	No Significant Forces			-	-	Not required
Deflection Slab	1	-0.007	0.800	in	0.009	✔ Pass
Deflection Dead	1	0.002	0.533	in	0.003	✔ Pass
Deflection Live	11	0.002	0.533	in	0.003	✔ Pass
Deflection Wind	295	-0.004	0.960	in	0.004	✔ Pass
Deflection Total	267	-0.018	0.800	in	0.022	✔ Pass

Head code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

Static

Classification

1 (Final) LRFD$_1$-1.4D - Critical

Span 1 W 12x14 A992-50 - Critical

Flexural: Position 0" - Critical

Moment, M_x	=-5.8 kip ft	
Elastic modulus of steel, E	=29000 ksi	
Minimum yield stress, F_y	=50.00 ksi	
Flexural section class	Compact	AISC 360 Table B4.1b

Shear Major

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

Position 0" - Critical

Position of V_{ry}	=0" ft, in	
Required major axis shear strength, V_{ry}	=1.0 kip	
Design shear strength	=64.3 kip	AISC 360 G2
Ratio	**=0.015**	

✔ Pass

Flexure Major

267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical

Span 1 W 12x14 A992-50 - Critical

LTB Flange Btm: 0" - 16' 0" - Critical

Dist of M_{rx1} along member	=0" ft, in	
Required flexural strength, M_{rx1}	=-7.4 kip ft	
Design flexural strength	=28.4 kip ft	AISC 360 F1, F2, F3 and F4
Ratio	**=0.261**	

✔ Pass

Axial Tension

141 (Final) LRFD$_{8.47}$-1.2D+1.6S+0.5W - Critical

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Span 1 W 12x14 A992-50 - Critical
Yielding: Position 0" - Critical

Distance of P_r along member	=0" ft, in	
Required tensile strength, P_r	=-2.7 kip	
Design yield strength	=187.2 kip	AISC 360 D2
Ratio	**=0.015**	

✔ Pass

Combined Forces
267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Flange Btm LTB 0" - 16' 0" - Critical
Axial Tension: 0" - 16' 0" - Critical

Mode	Ratio	Status
Combined buckling	0.252	✔ Pass

Deflection
267 (Final) LRFD$_{10.45}$-1.2D+L+0.5S+W - Critical
Span 1 W 12x14 A992-50 - Critical
Deflection Total - Critical

Position Total load deflection	=3' 7 95/128" ft, in
Max. Total load deflection	=-0.018 in
Span over limit	=0.800 in
Design limit	=0.800 in
Utilization Ratio	**=0.022**

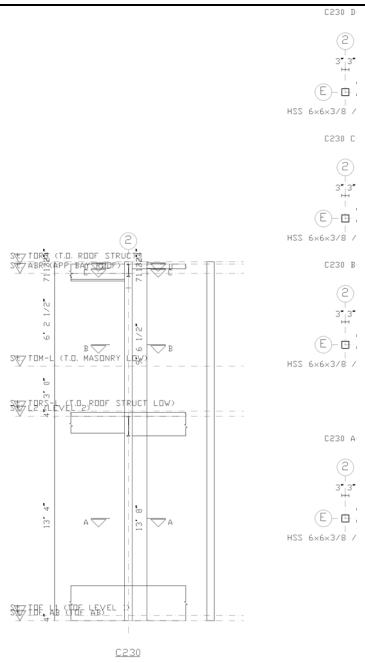
✔ Pass

Column Design

Columns
Rolled
C230

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Revision:	Date:	Sheet No. 703
Project Name: FIRE STATION 5		



Static

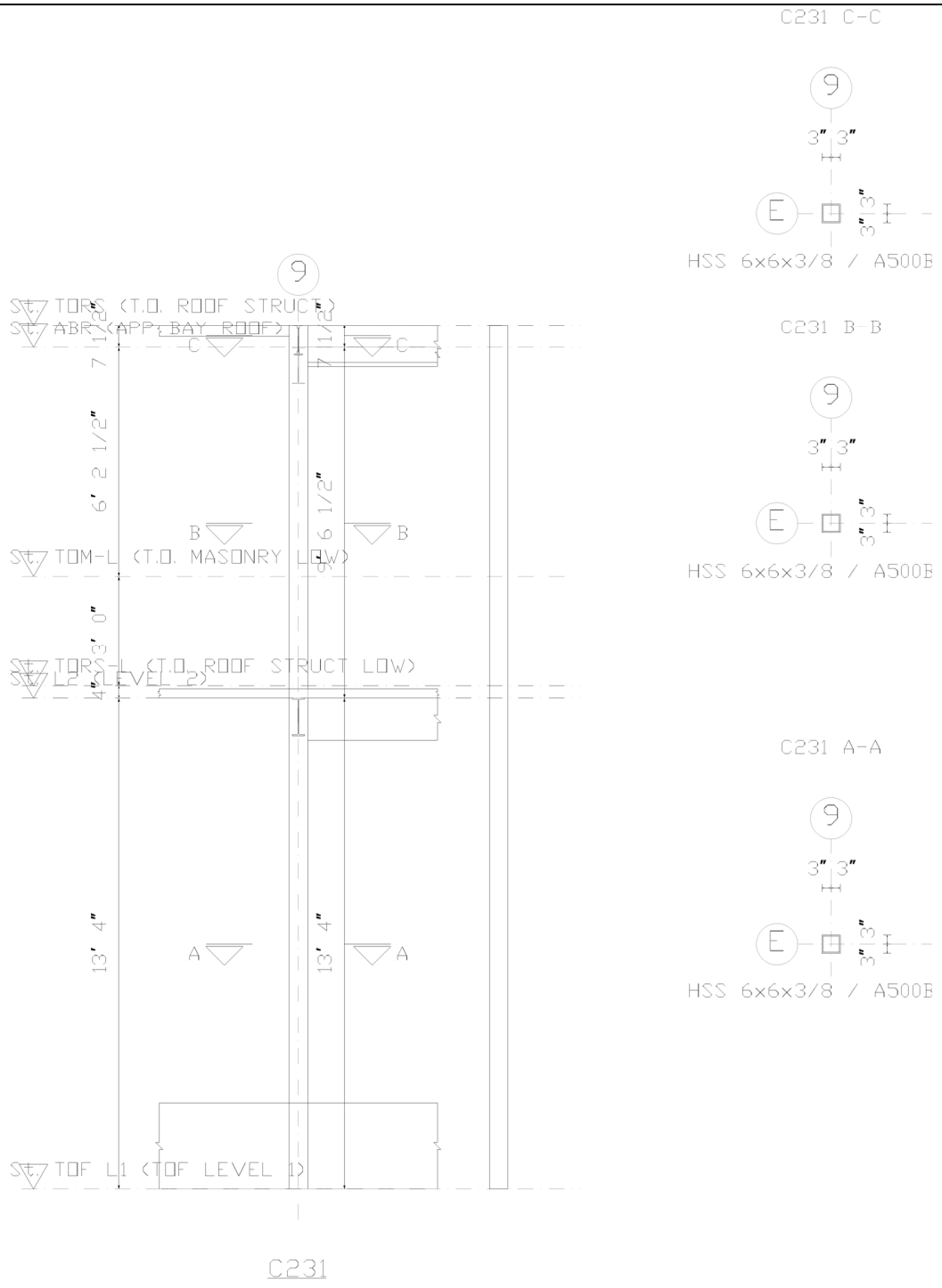
Summary HSS 6x6x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	249	7.0	85.9	kip	0.081	Pass
Shear Minor	7	-9.3	85.9	kip	0.108	Pass
Flexure Major	27	-13.0	54.5	kip ft	0.238	Pass
Flexure Minor	256	-22.8	54.5	kip ft	0.418	Pass
Axial Tension	196	-1.0	313.8	kip	0.003	Pass
Axial Compression	27	47.2	221.5	kip	0.213	Pass
Combined Forces	27	-	-	-	0.585	Pass
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

C231

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Made by: JMB	Date: 10/17/2022	Job No. 21-18
Revision:	Date:	Sheet No. 704
Project Name: FIRE STATION 5		



Static

Summary HSS 6x6x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass

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Revision:	Date:	Sheet No. 705
Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Major	227	-3.0	85.9	kip	0.034	✔ Pass
Shear Minor	96	-39.9	85.9	kip	0.465	✔ Pass
Flexure Major	163	-4.1	54.5	kip ft	0.075	✔ Pass
Flexure Minor	128	-20.4	54.5	kip ft	0.374	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	28	98.5	225.2	kip	0.437	✔ Pass
Combined Forces	96	-	-	-	0.577	✔ Pass

C243



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Revision:	Date:	Sheet No. 706
Project Name: FIRE STATION 5		

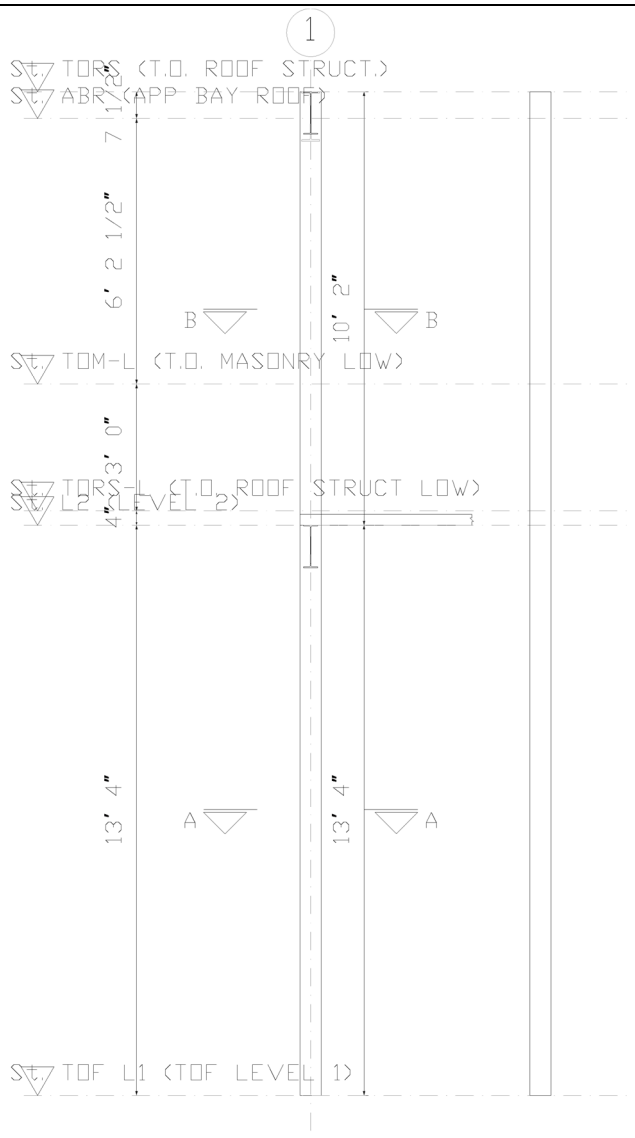
Summary HSS 4x4x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	2	Compact	-	-	-	Pass
Shear Major	No	Significant	Forces	kip	-	Not required
Shear Minor	No	Significant	Forces	kip	-	Not required
Flexure Major	179	-0.6	22.0	kip ft	0.026	Pass
Flexure Minor	224	-0.6	22.0	kip ft	0.029	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	26	1.7	89.1	kip	0.019	Pass
Combined Forces	195	-	-	-	0.051	Pass
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

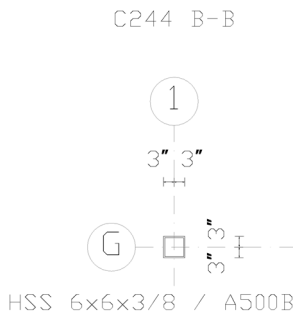
C244

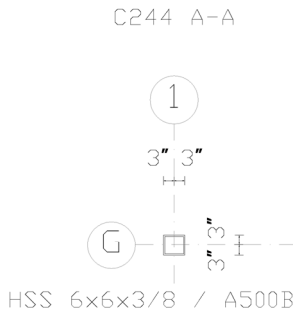
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Project Name: FIRE STATION 5		



C244





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Summary HSS 6x6x3/8 (A500B-46)

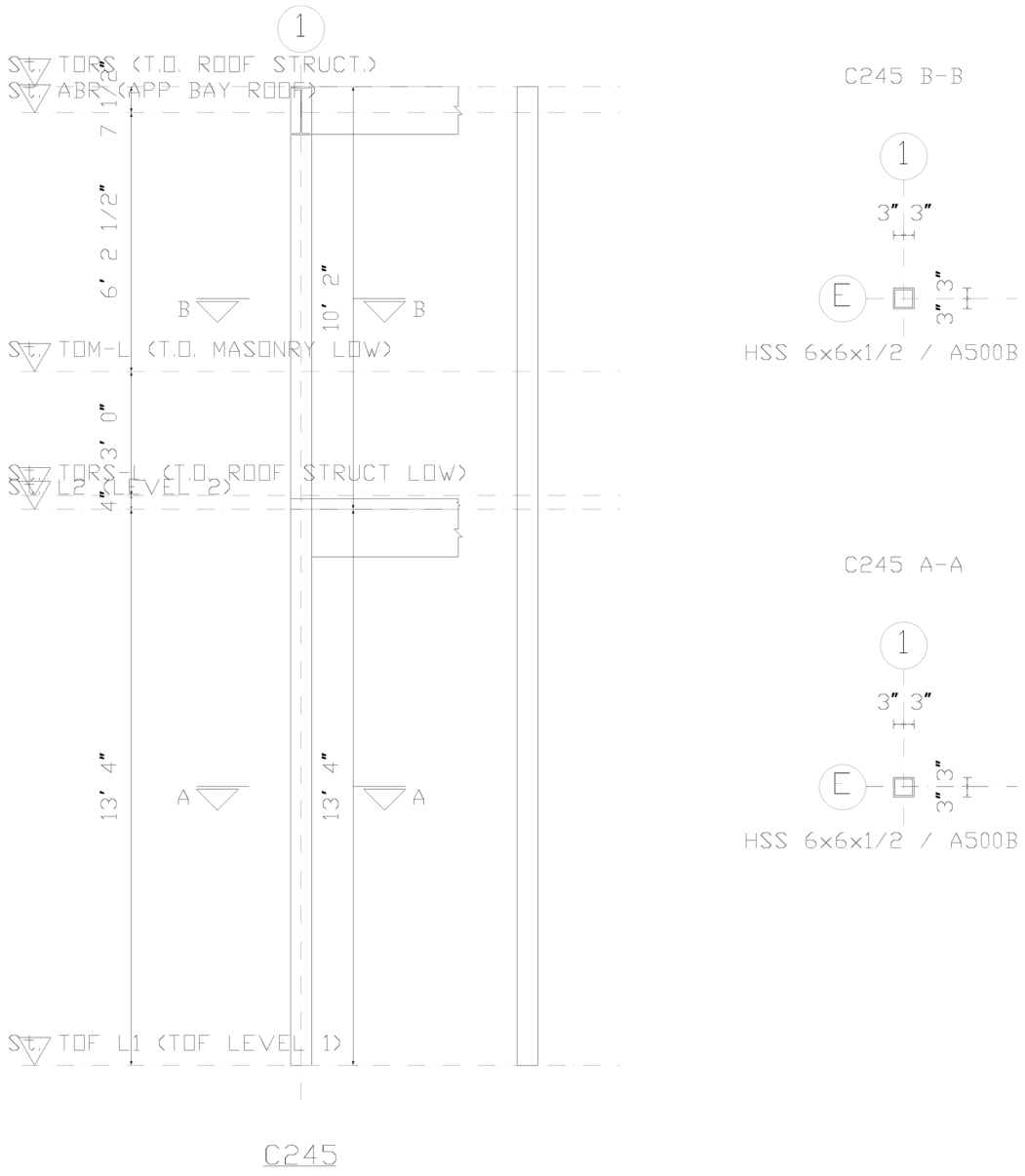
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	286	-4.7	85.9	kip	0.054	✔ Pass
Shear Minor	224	0.2	85.9	kip	0.003	✔ Pass
Flexure Major	286	27.3	54.5	kip ft	0.501	✔ Pass
Flexure Minor	224	-2.4	54.5	kip ft	0.044	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	20	29.8	225.2	kip	0.132	✔ Pass
Combined Forces	282	-	-	-	0.554	✔ Pass

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

C245



C245

Static

Summary HSS 6x6x1/2 (A500B-46)

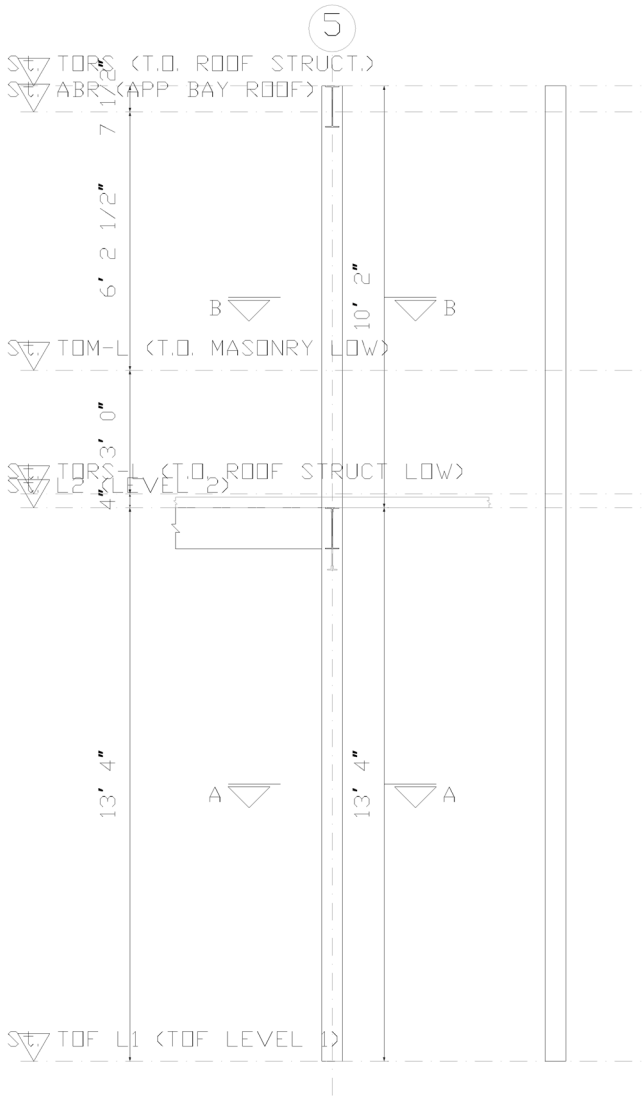
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	249	4.3	106.4	kip	0.041	Pass
Shear Minor	256	-6.6	106.4	kip	0.062	Pass

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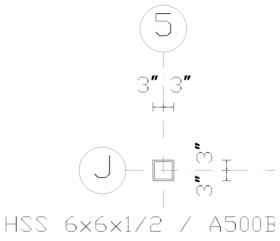
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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexure Major	253	-25.3	68.3	kip ft	0.370	Pass
Flexure Minor	256	34.3	68.3	kip ft	0.502	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	18	38.0	285.1	kip	0.133	Pass
Combined Forces	253	-	-	-	0.868	Pass

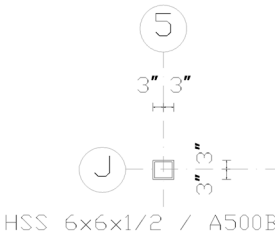
C246



C246 B-B



C246 A-A



C246

Static

Summary HSS 6x6x1/2 (A500B-46)

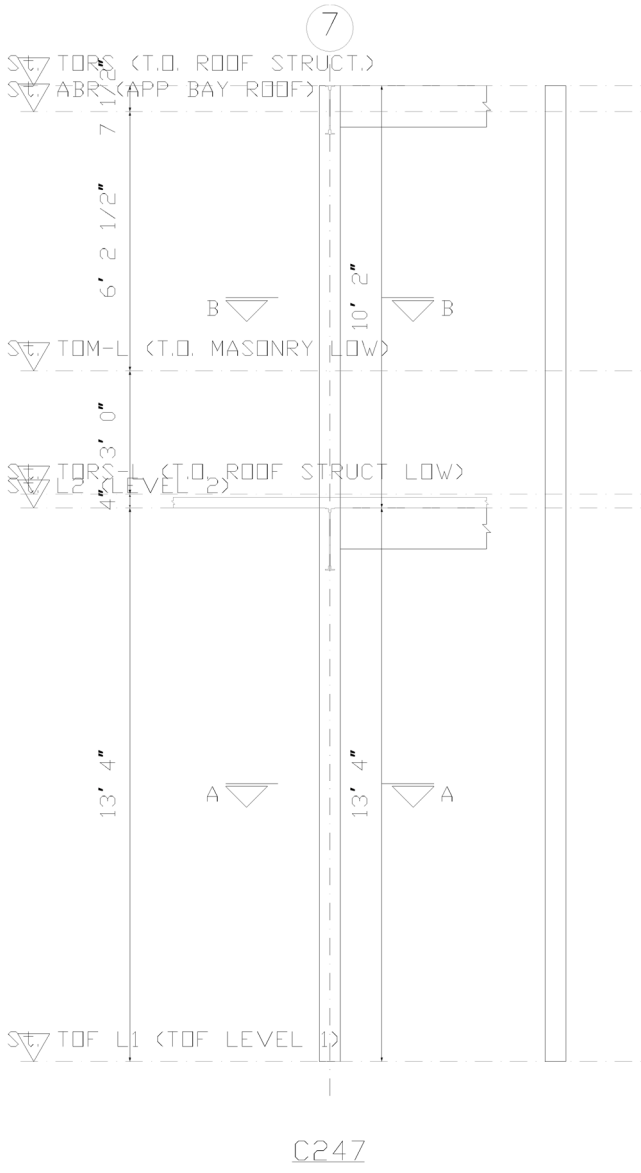
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass

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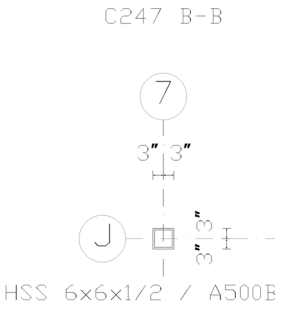
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Project Name: FIRE STATION 5		

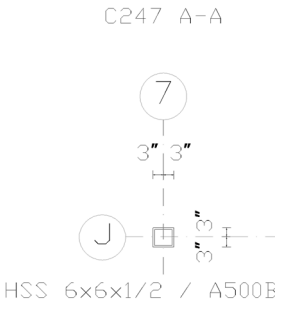
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Major	179	0.3	106.4	kip	0.003	✔ Pass
Shear Minor	256	-6.8	106.4	kip	0.063	✔ Pass
Flexure Major	179	-3.3	68.3	kip ft	0.048	✔ Pass
Flexure Minor	256	36.4	68.3	kip ft	0.533	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	18	65.0	285.1	kip	0.228	✔ Pass
Combined Forces	256	-	-	-	0.565	✔ Pass

C247



C247





Static

Summary HSS 6x6x1/2 (A500B-46)

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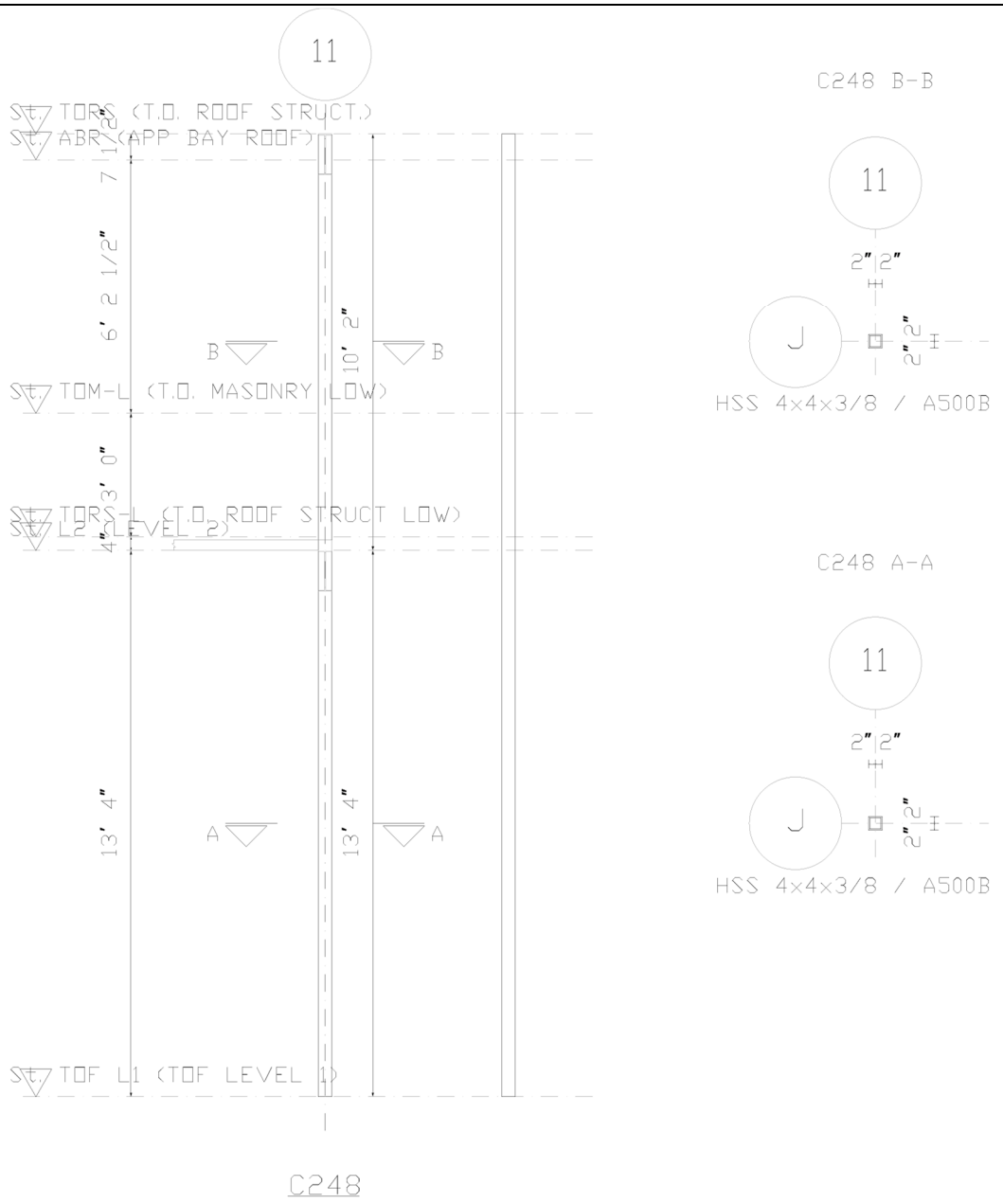
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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✓ Pass
Flexural Classification	1	Compact	-	-	-	✓ Pass
Shear Major	179	0.3	106.4	kip	0.002	✓ Pass
Shear Minor	27	7.3	106.4	kip	0.069	✓ Pass
Flexure Major	179	-3.1	68.3	kip ft	0.046	✓ Pass
Flexure Minor	27	38.6	68.3	kip ft	0.565	✓ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	17	62.3	285.1	kip	0.218	✓ Pass
Combined Forces	224	-	-	-	0.608	✓ Pass

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Project Name: FIRE STATION 5		



Static

Summary HSS 4x4x3/8 (A500B-46)

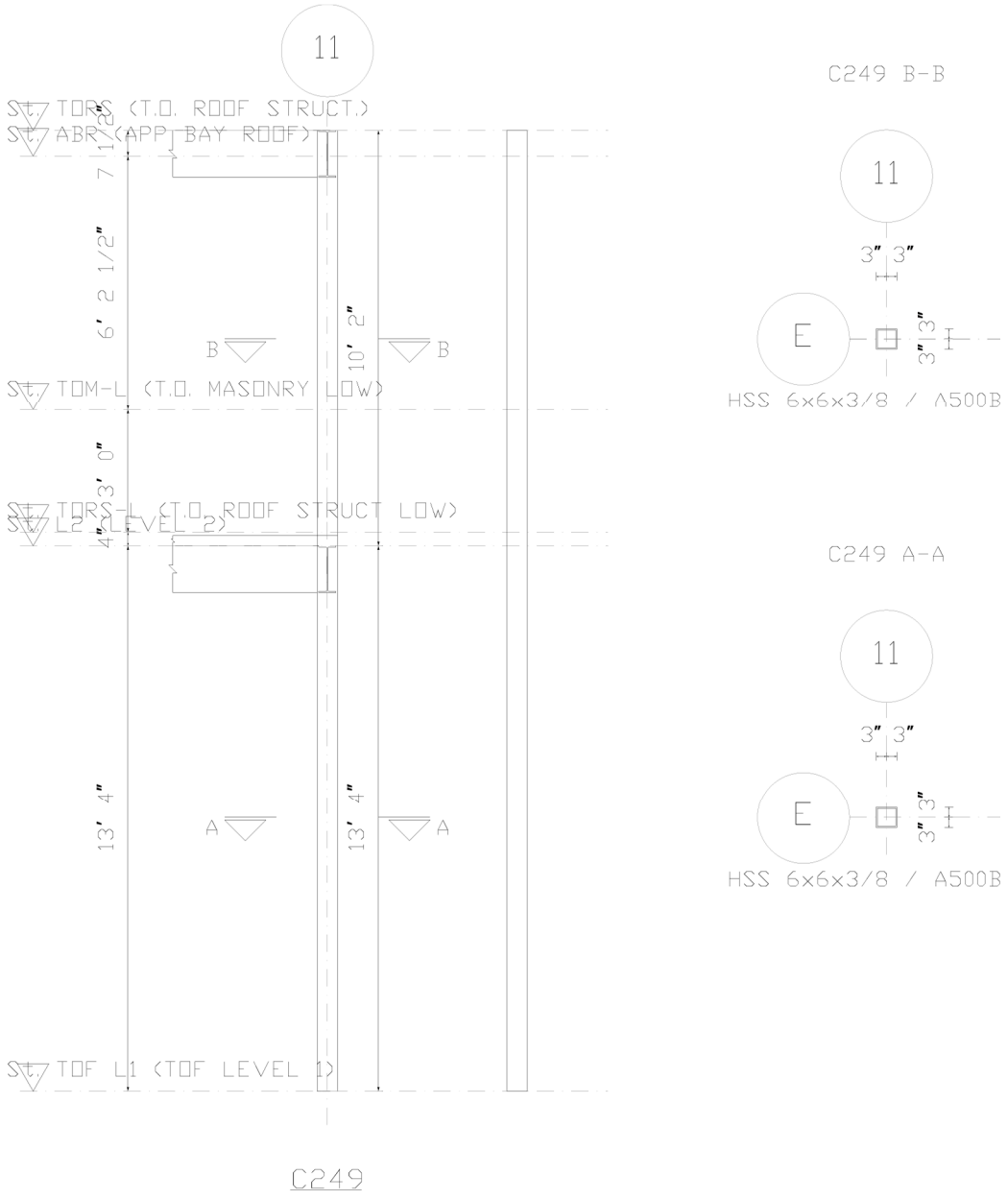
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	No	Significant	Forces	kip	-	Not required
Shear Minor	No	Significant	Forces	kip	-	Not required
Flexure Major	170	-0.9	22.0	kip ft	0.039	✔ Pass
Flexure Minor	96	5.1	22.0	kip ft	0.232	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Compression	27	25.7	89.1	kip	0.289	Pass
Combined Forces	18	-	-	-	0.378	Pass

C249



Static

Summary HSS 6x6x3/8 (A500B-46)

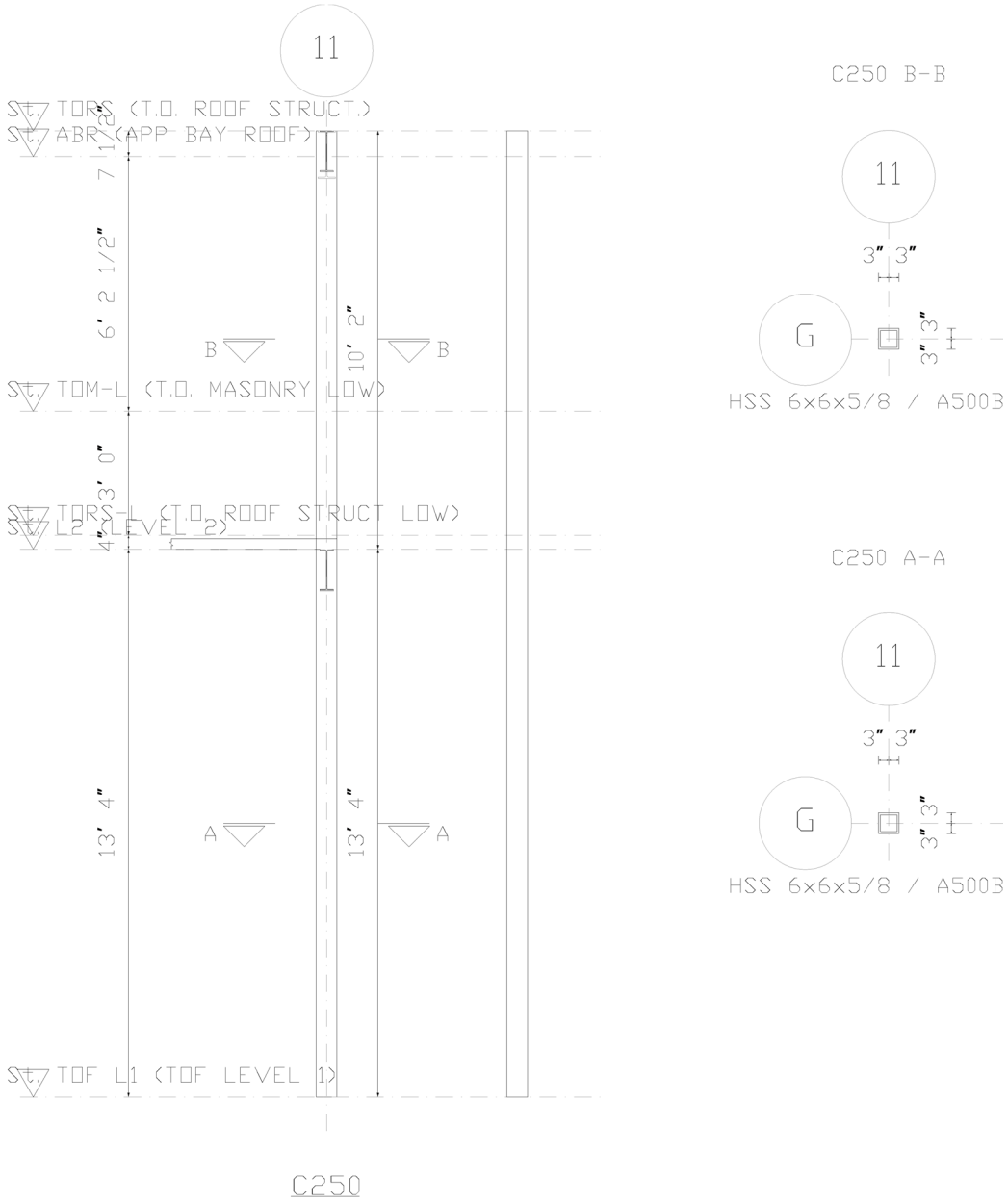
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass

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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Major	234	1.4	85.9	kip	0.017	✔ Pass
Shear Minor	224	4.9	85.9	kip	0.057	✔ Pass
Flexure Major	234	-7.3	54.5	kip ft	0.135	✔ Pass
Flexure Minor	224	-27.0	54.5	kip ft	0.496	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	17	25.3	225.2	kip	0.112	✔ Pass
Combined Forces	234	-	-	-	0.617	✔ Pass

C250



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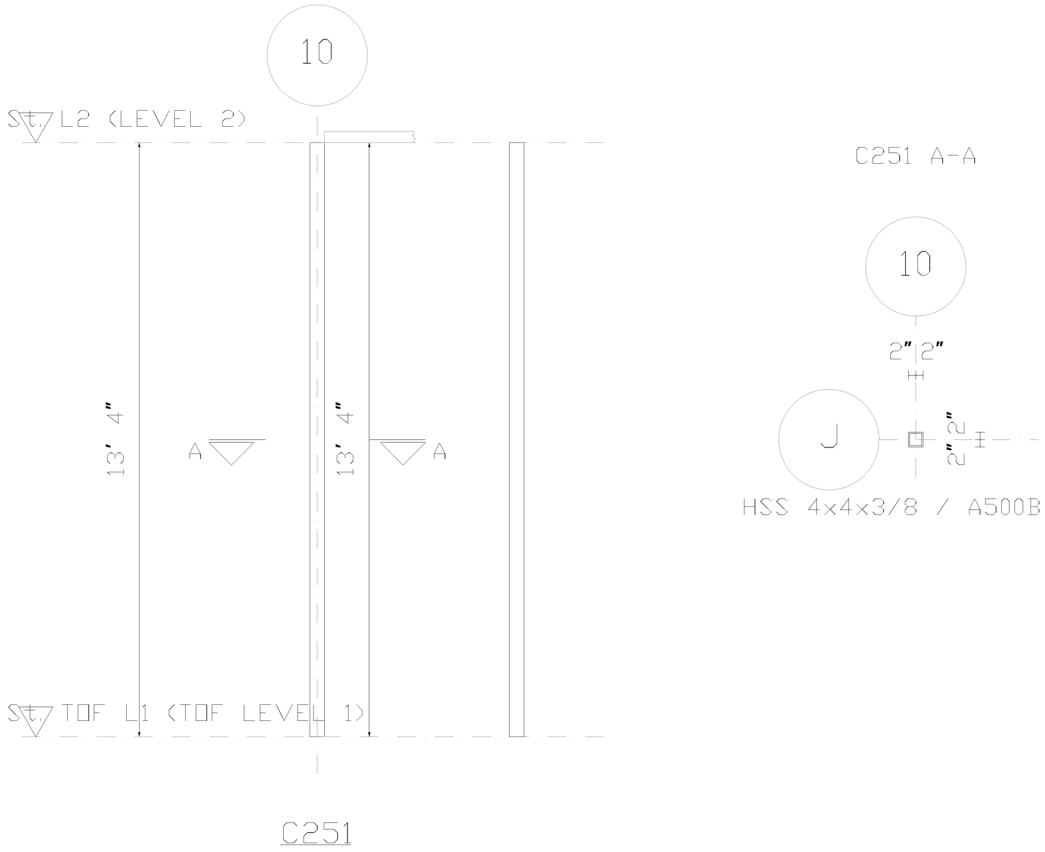
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Project Name: FIRE STATION 5		

Static

Summary HSS 6x6x5/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	170	0.3	122.9	kip	0.003	Pass
Shear Minor	228	0.3	122.9	kip	0.002	Pass
Flexure Major	170	-4.2	80.0	kip ft	0.053	Pass
Flexure Minor	228	-3.1	80.0	kip ft	0.038	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	20	12.3	335.9	kip	0.037	Pass
Combined Forces	238	-	-	-	0.099	Pass
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

C251



Static

Summary HSS 4x4x3/8 (A500B-46)

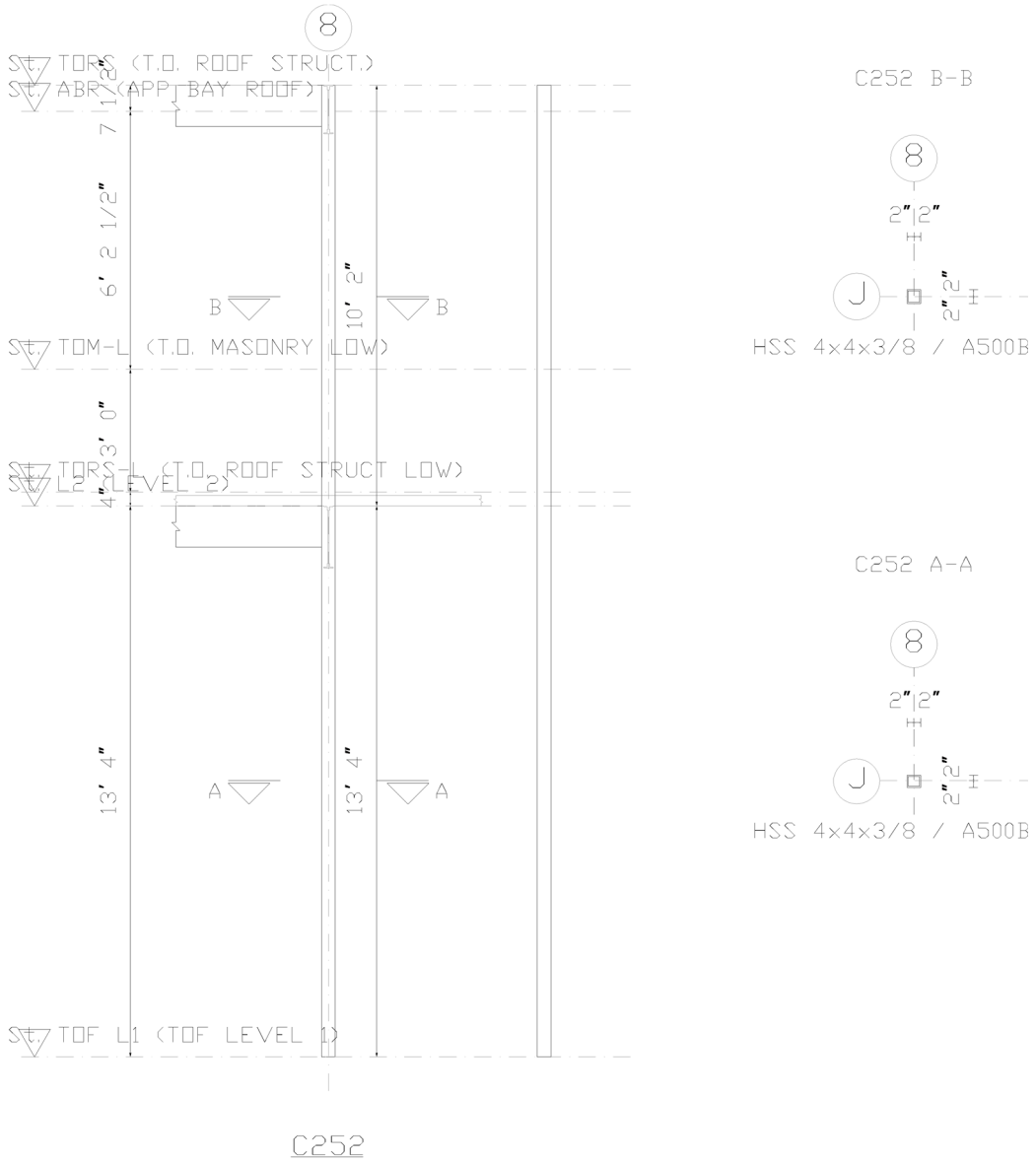
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	No	Significant	Forces	kip	-	Not required

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Minor	No	Significant	Forces	kip	-	Not required
Flexure Major	9	-1.6	22.0	kip ft	0.071	✔ Pass
Flexure Minor	7	1.5	22.0	kip ft	0.070	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	9	34.9	89.1	kip	0.392	✔ Pass
Combined Forces	9	-	-	-	0.518	✔ Pass

C252



C252

Static

Summary HSS 4x4x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass

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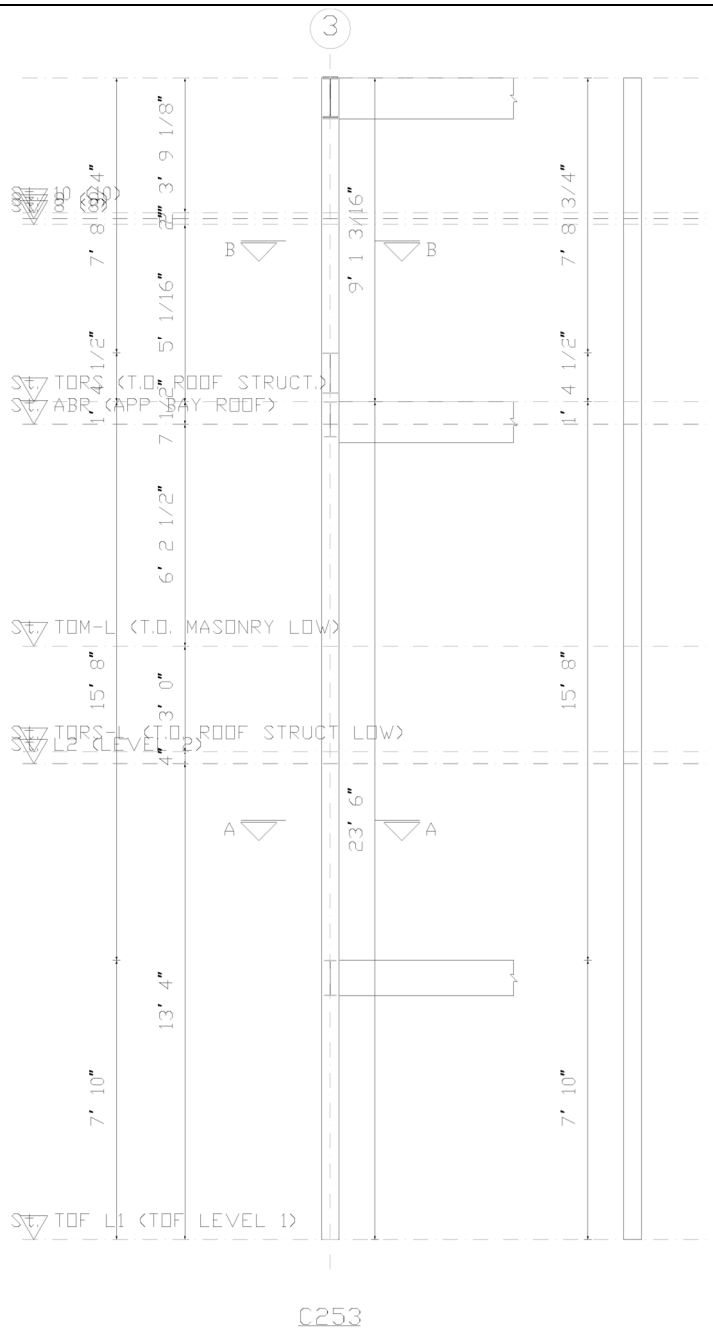
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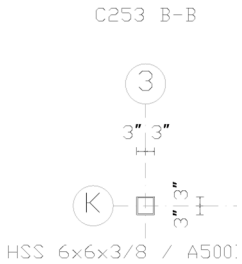
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	No	Significant	Forces	kip	-	Not required
Shear Minor	No	Significant	Forces	kip	-	Not required
Flexure Major	9	-1.0	22.0	kip ft	0.047	✔ Pass
Flexure Minor	128	-4.0	22.0	kip ft	0.181	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	20	40.3	89.1	kip	0.452	✔ Pass
Combined Forces	17	-	-	-	0.564	✔ Pass

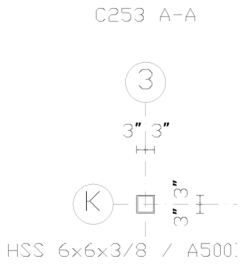
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Summary HSS 6x6x3/8 (A500B-46)

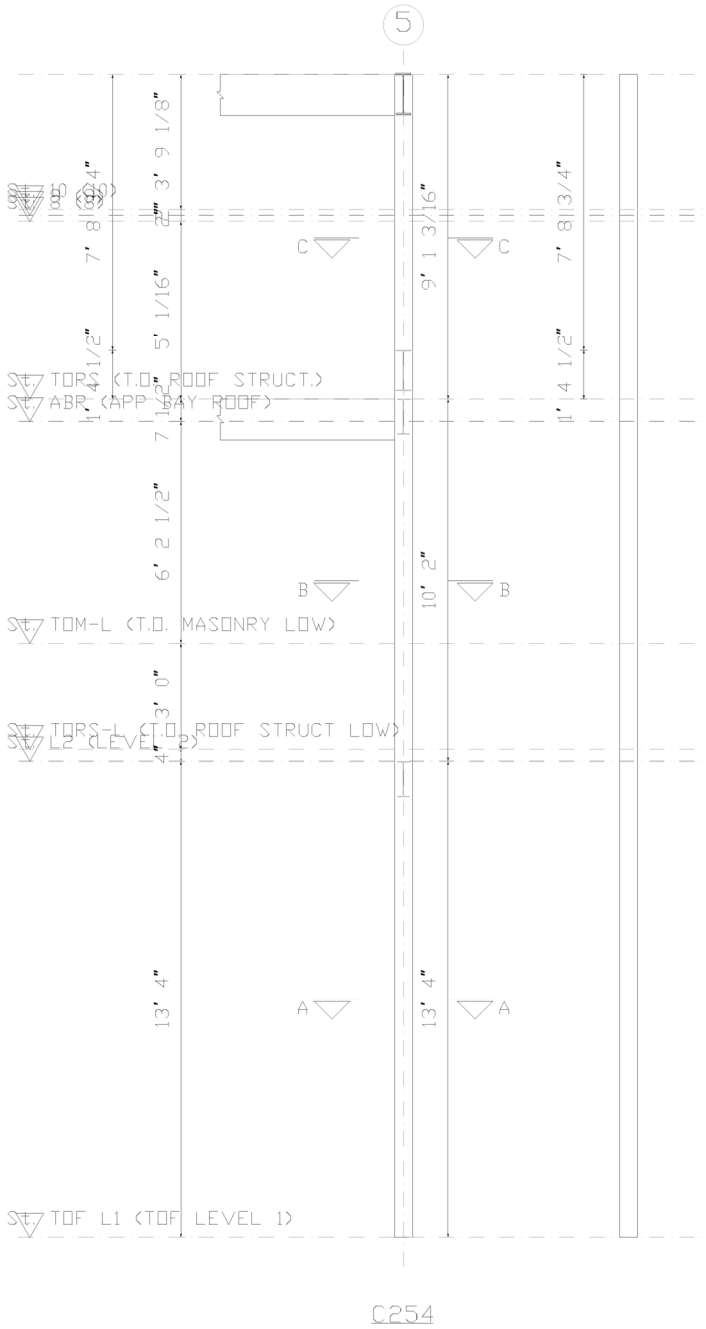
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	240	2.5	85.9	kip	0.029	✔ Pass
Shear Minor	128	-3.2	85.9	kip	0.038	✔ Pass
Flexure Major	128	8.6	54.5	kip ft	0.157	✔ Pass

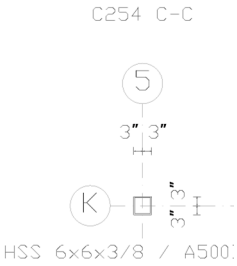
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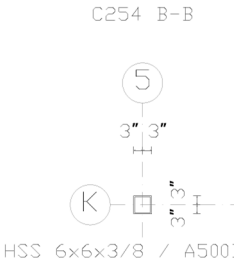
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Project Name: FIRE STATION 5		

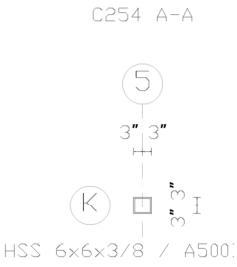
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexure Minor	128	21.5	54.5	kip ft	0.395	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	128	20.3	198.5	kip	0.102	✔ Pass
Combined Forces	128	-	-	-	0.562	✔ Pass

C254









Static

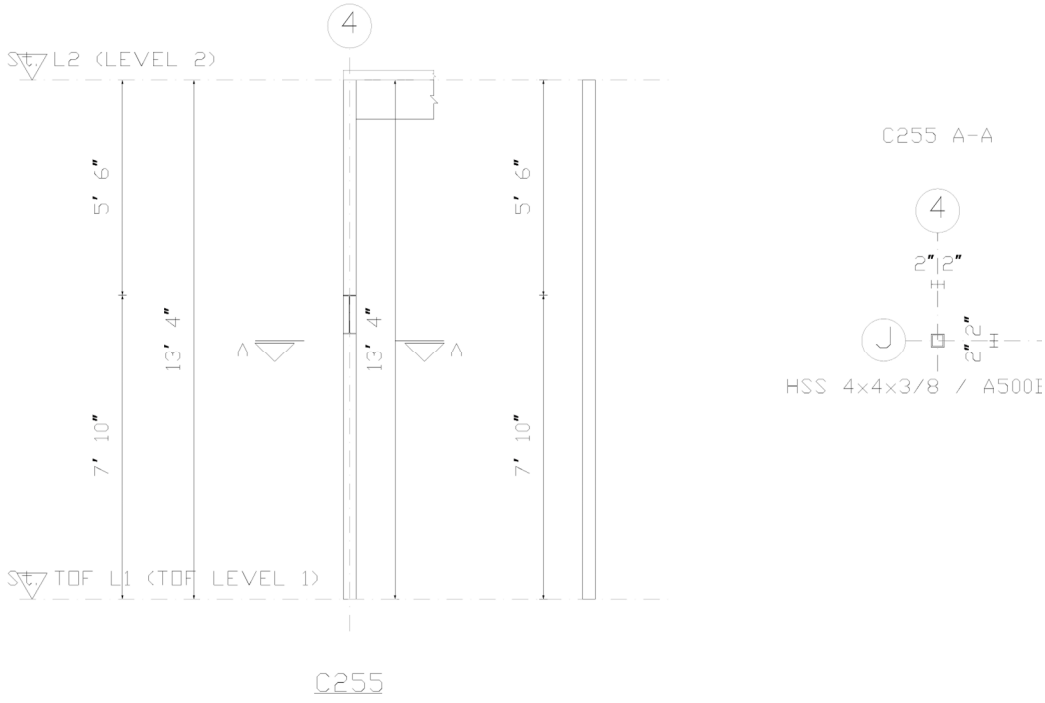
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Project Name: FIRE STATION 5		

Summary HSS 6x6x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	286	3.1	85.9	kip	0.036	Pass
Shear Minor	96	3.2	85.9	kip	0.038	Pass
Flexure Major	158	-9.0	54.5	kip ft	0.165	Pass
Flexure Minor	96	-21.4	54.5	kip ft	0.393	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	96	20.1	111.9	kip	0.180	Pass
Combined Forces	158	-	-	-	0.641	Pass

C255



Static

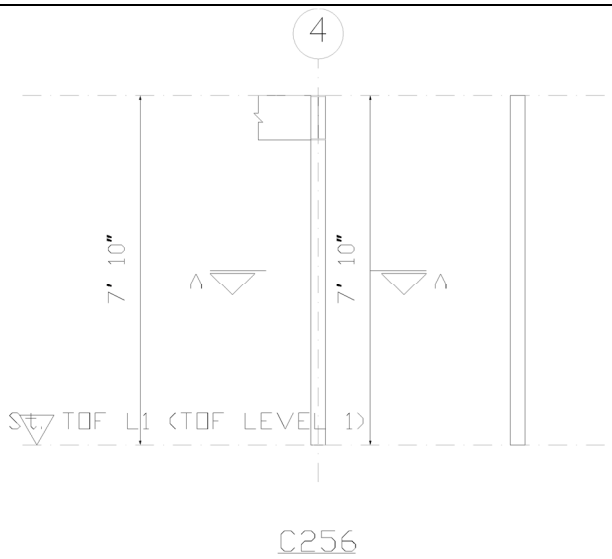
Summary HSS 4x4x3/8 (A500B-46)

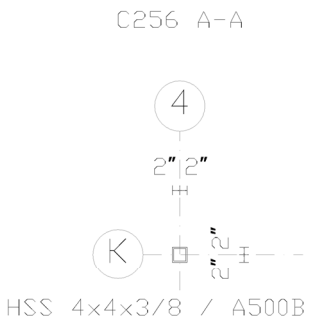
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	324	0.4	51.2	kip	0.008	Pass
Shear Minor	No	Significant	Forces	kip	-	Not required
Flexure Major	163	-2.3	22.0	kip ft	0.103	Pass
Flexure Minor	18	-4.6	22.0	kip ft	0.209	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	18	18.3	89.1	kip	0.205	Pass
Combined Forces	18	-	-	-	0.476	Pass

C256

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Project Name: FIRE STATION 5		





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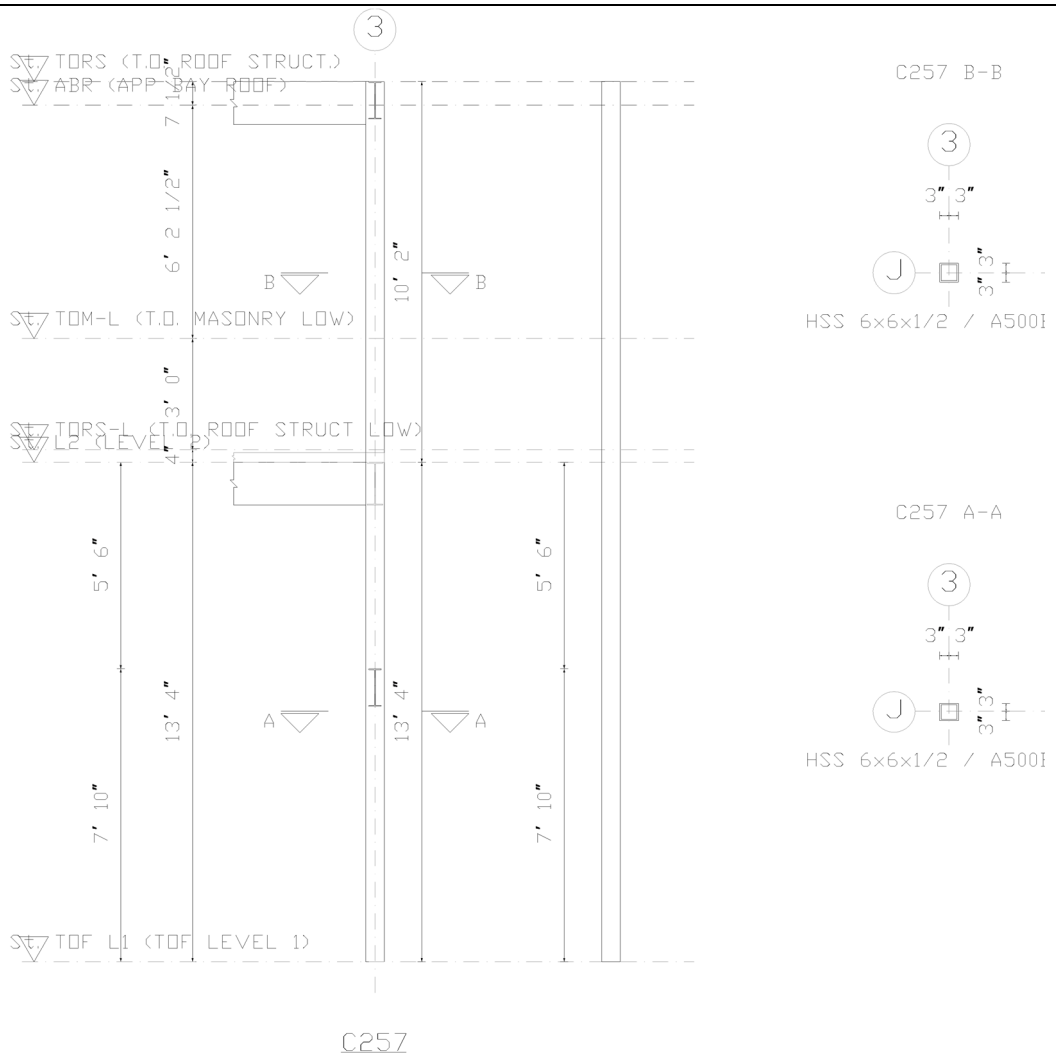
Summary HSS 4x4x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification		Unknown	-	-	-	Not required
Shear Major	No	Significant	Forces	kip	-	Not required
Shear Minor	No	Significant	Forces	kip	-	Not required
Flexure Major	No	Significant	Forces	kip ft	-	Not required
Flexure Minor	No	Significant	Forces	kip ft	-	Not required
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	1	0.3	150.3	kip	0.002	✔ Pass
Combined Forces	-	No	Significant	Forces	-	Not required

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C257

Static

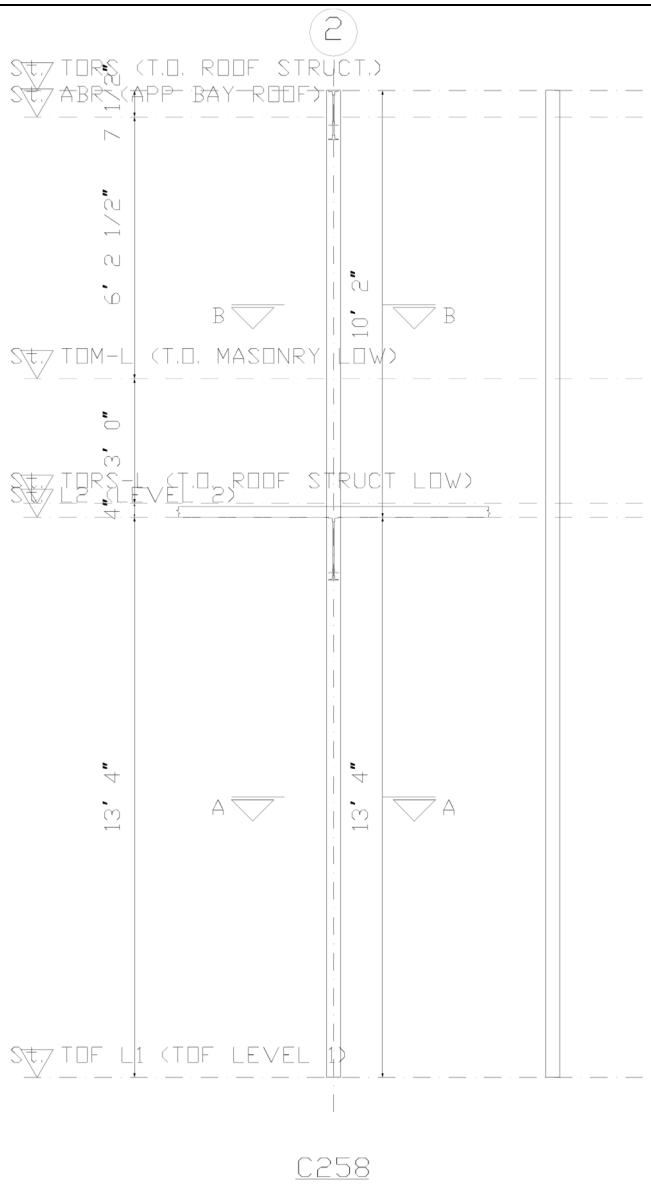
Summary HSS 6x6x1/2 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	144	0.6	106.4	kip	0.006	✔ Pass
Shear Minor	224	4.3	106.4	kip	0.040	✔ Pass
Flexure Major	179	-3.9	68.3	kip ft	0.057	✔ Pass
Flexure Minor	224	-24.8	68.3	kip ft	0.364	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	17	33.5	285.1	kip	0.118	✔ Pass
Combined Forces	282	-	-	-	0.411	✔ Pass

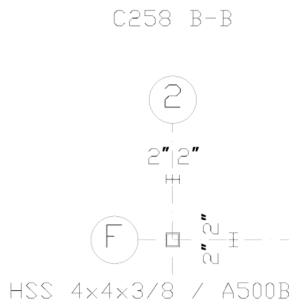
C258

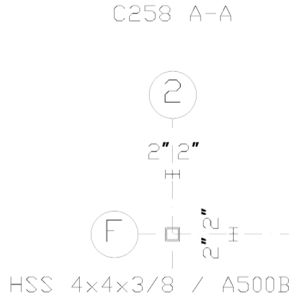
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C258





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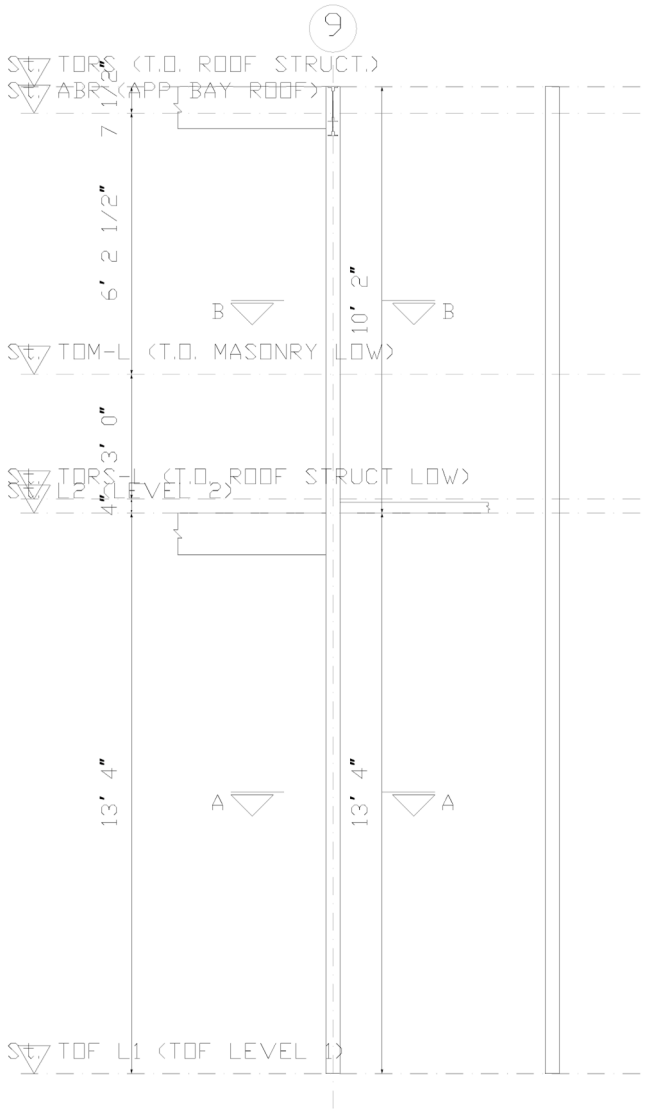
Summary HSS 4x4x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	No	Significant	Forces	kip	-	Not required
Shear Minor	No	Significant	Forces	kip	-	Not required
Flexure Major	179	-0.6	22.0	kip ft	0.029	✔ Pass
Flexure Minor	158	-2.0	22.0	kip ft	0.090	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	17	82.5	89.1	kip	0.926	✔ Pass
Combined Forces	17	-	-	-	0.946	✔ Pass

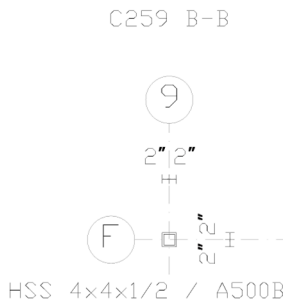
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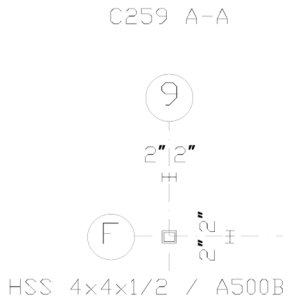
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C259



C259





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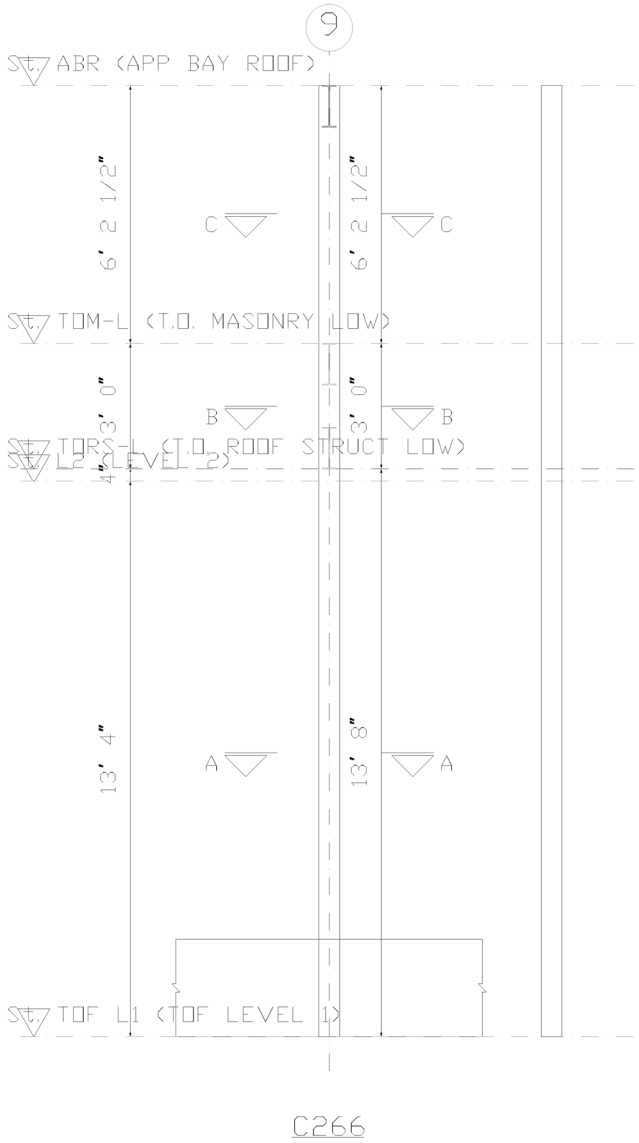
Summary HSS 4x4x1/2 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	No	Significant	Forces	kip	-	Not required
Shear Minor	No	Significant	Forces	kip	-	Not required
Flexure Major	9	-1.2	26.6	kip ft	0.044	✔ Pass
Flexure Minor	8	2.9	26.6	kip ft	0.110	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	17	77.2	104.7	kip	0.737	✔ Pass
Combined Forces	17	-	-	-	0.861	✔ Pass

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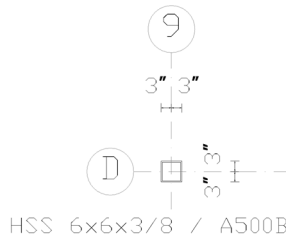
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Project Name: FIRE STATION 5		

C266

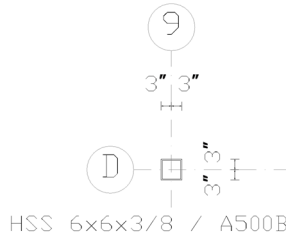


C266

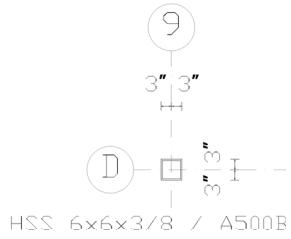
C266 C-C



C266 B-B



C266 A-A



Static

Summary HSS 6x6x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	103	4.1	85.9	kip	0.048	✔ Pass

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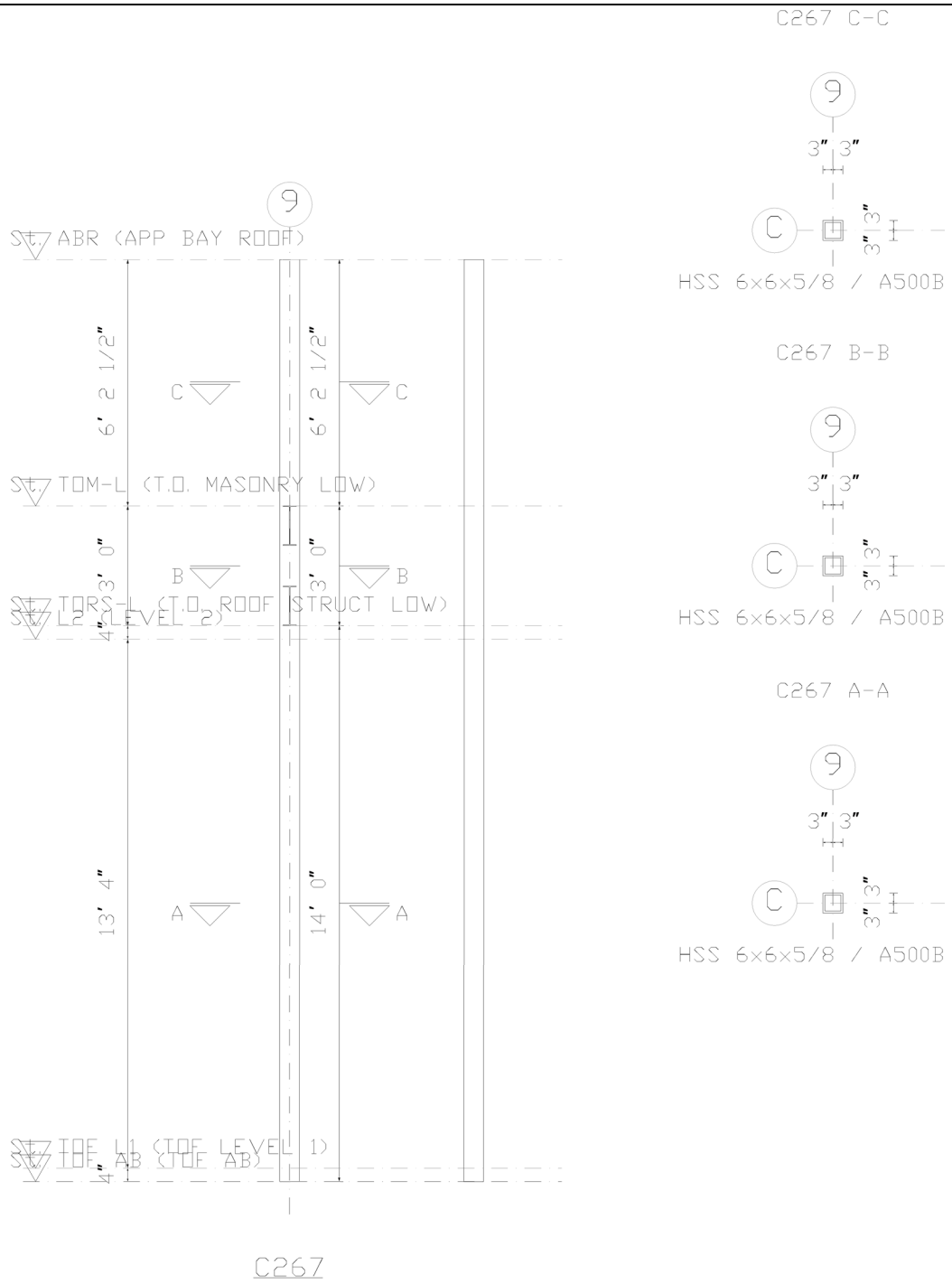
Made by: JMB	Date: 10/17/2022	Job No. 21-18
Revision:	Date:	Sheet No. 726
Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Minor	212	2.3	85.9	kip	0.026	Pass
Flexure Major	179	7.5	54.5	kip ft	0.137	Pass
Flexure Minor	211	-10.9	54.5	kip ft	0.200	Pass
Axial Tension	307	-2.1	313.8	kip	0.007	Pass
Axial Compression	139	7.7	118.1	kip	0.065	Pass
Combined Forces	179	-	-	-	0.340	Pass
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

C267

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Project Name: FIRE STATION 5		



Static

Summary HSS 6x6x5/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	231	2.8	122.9	kip	0.022	✔ Pass

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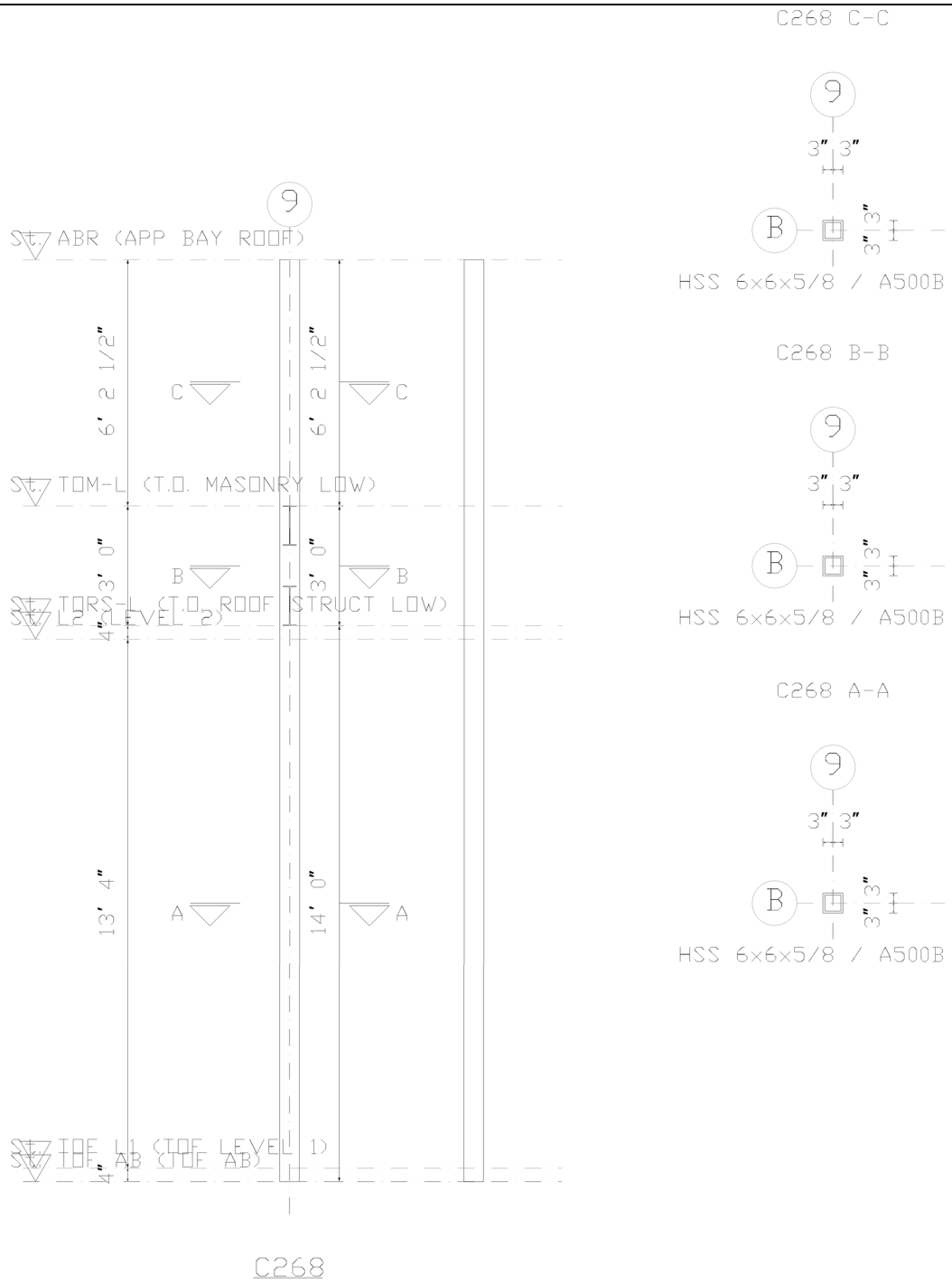
Made by: JMB	Date: 10/17/2022	Job No. 21-18
Revision:	Date:	Sheet No. 728
Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Minor	339	-3.3	122.9	kip	0.027	Pass
Flexure Major	103	10.1	80.0	kip ft	0.126	Pass
Flexure Minor	244	19.2	80.0	kip ft	0.239	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	112	32.1	160.5	kip	0.200	Pass
Combined Forces	244	-	-	-	0.411	Pass
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

C268

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Revision:	Date:	Sheet No. 729
Project Name: FIRE STATION 5		



Static

Summary HSS 6x6x5/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass

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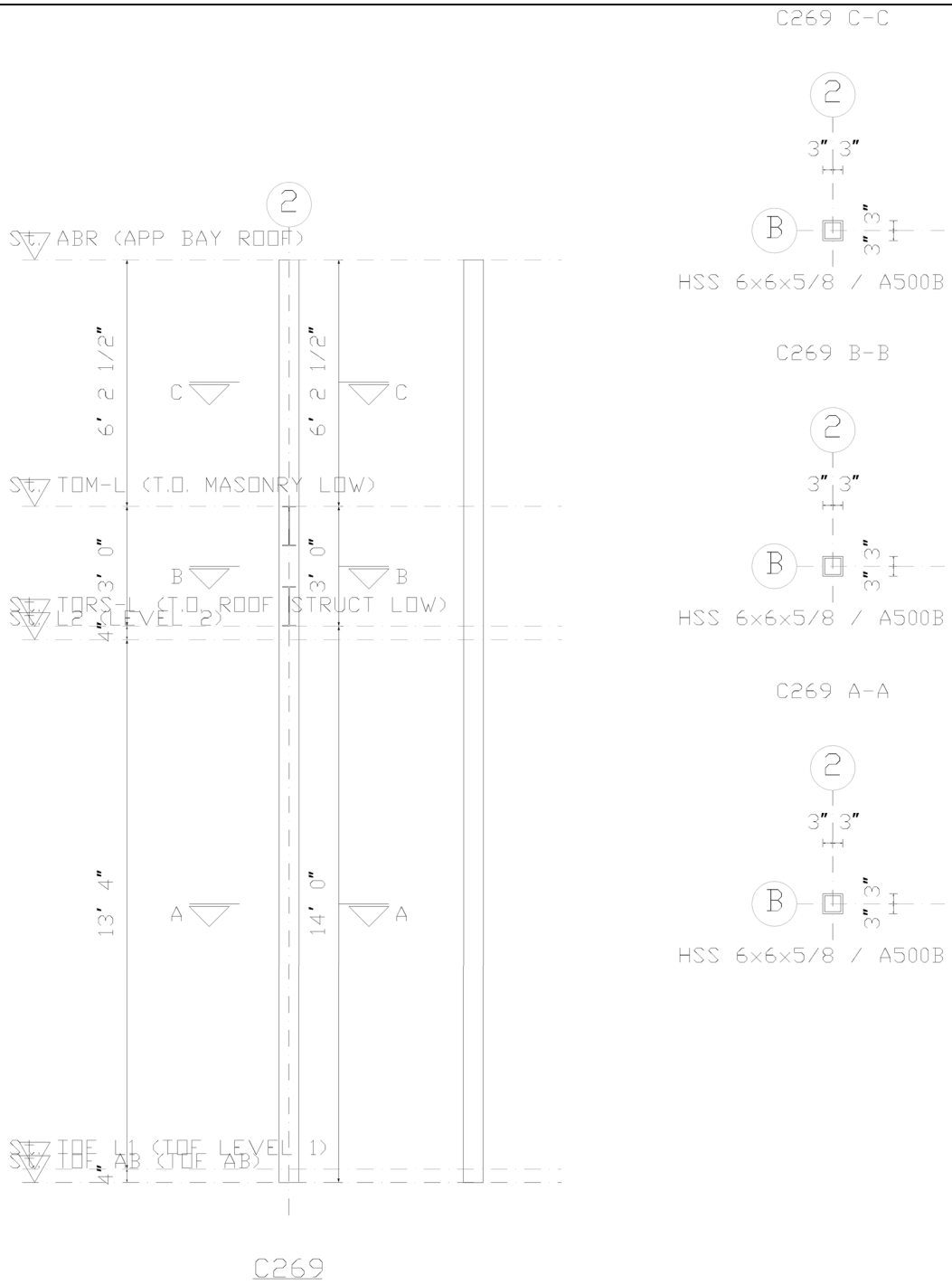
Made by: JMB	Date: 10/17/2022	Job No. 21-18
Revision:	Date:	Sheet No. 730
Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Major	267	-3.5	122.9	kip	0.029	Pass
Shear Minor	307	-3.5	122.9	kip	0.029	Pass
Flexure Major	139	-12.8	80.0	kip ft	0.160	Pass
Flexure Minor	244	20.2	80.0	kip ft	0.252	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	128	23.5	160.5	kip	0.147	Pass
Combined Forces	276	-	-	-	0.439	Pass
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

C269

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Static

Summary HSS 6x6x5/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass

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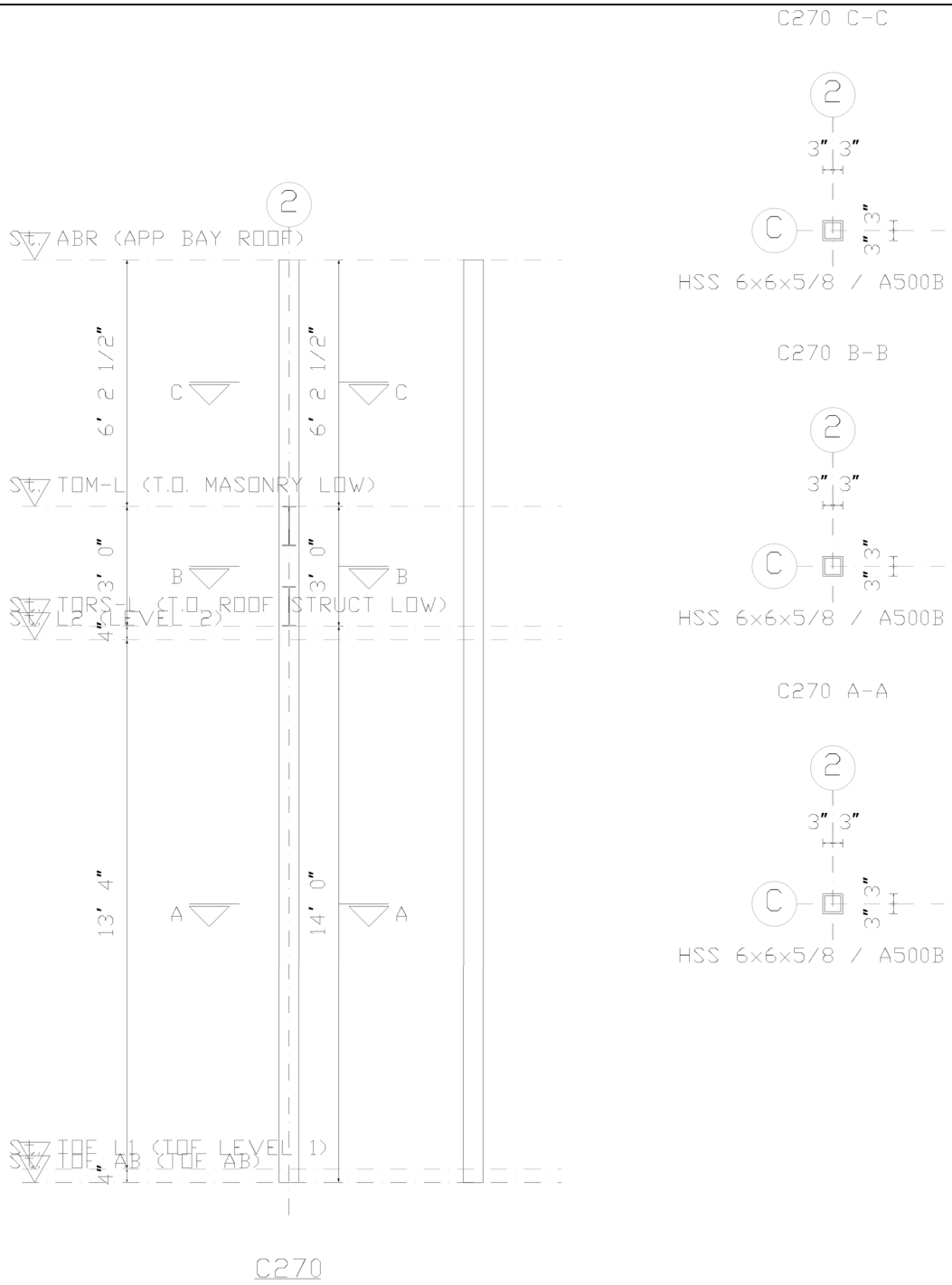
Made by: JMB	Date: 10/17/2022	Job No. 21-18
Revision:	Date:	Sheet No. 732
Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Major	283	-4.5	122.9	kip	0.037	Pass
Shear Minor	307	3.5	122.9	kip	0.029	Pass
Flexure Major	283	-14.4	80.0	kip ft	0.180	Pass
Flexure Minor	244	-20.2	80.0	kip ft	0.252	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	144	23.1	160.5	kip	0.144	Pass
Combined Forces	276	-	-	-	0.462	Pass
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

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Project Name: FIRE STATION 5		



Static

Summary HSS 6x6x5/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass

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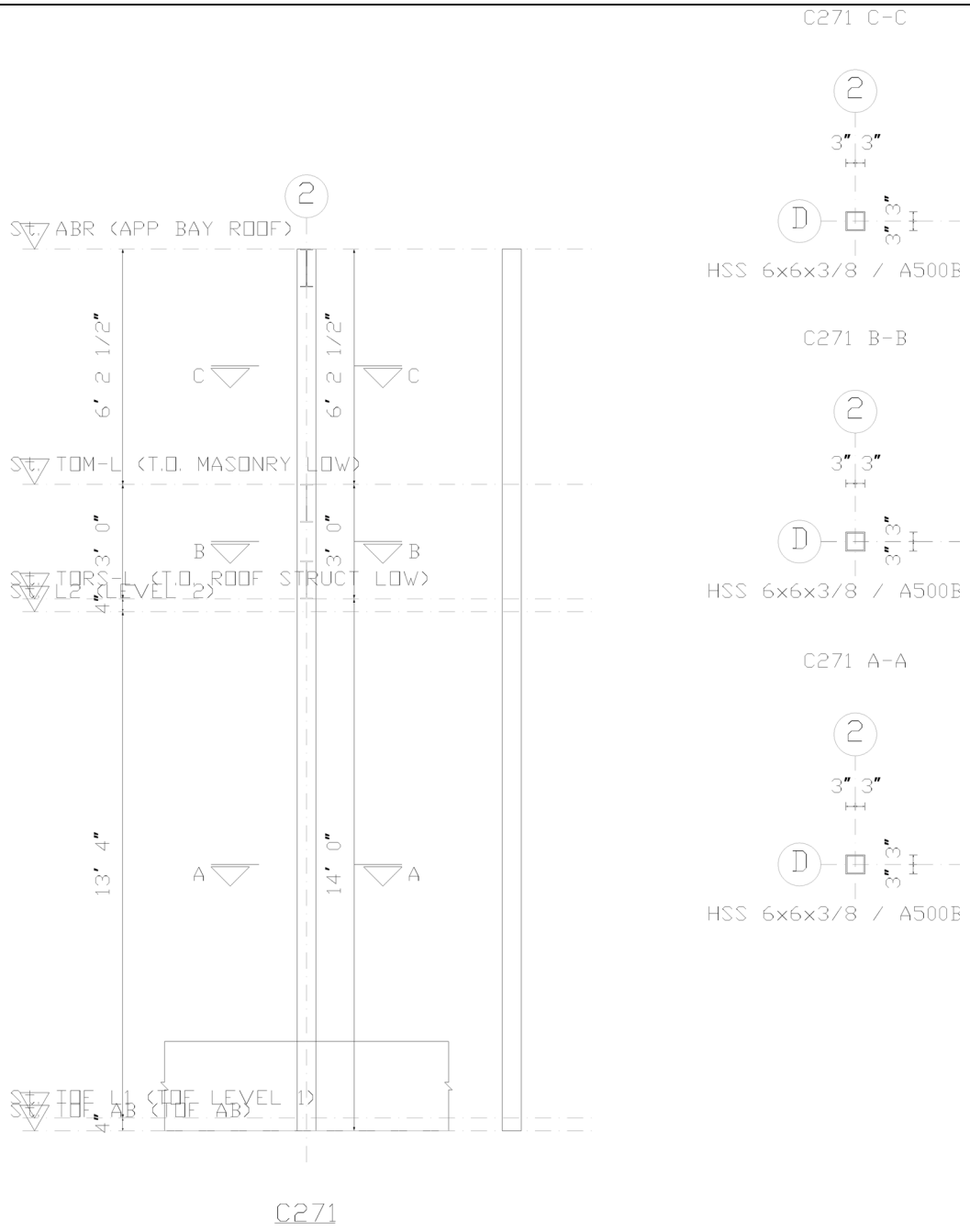
Made by: JMB	Date: 10/17/2022	Job No. 21-18
Revision:	Date:	Sheet No. 734
Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Major	240	4.6	122.9	kip	0.038	Pass
Shear Minor	339	3.3	122.9	kip	0.027	Pass
Flexure Major	240	13.4	80.0	kip ft	0.167	Pass
Flexure Minor	244	-19.1	80.0	kip ft	0.239	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	27	35.6	160.5	kip	0.222	Pass
Combined Forces	244	-	-	-	0.455	Pass
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

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Project Name: FIRE STATION 5		



Static

Summary HSS 6x6x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	29	5.0	85.9	kip	0.058	✔ Pass
Shear Minor	307	-2.0	85.9	kip	0.023	✔ Pass
Flexure Major	19	-17.7	54.5	kip ft	0.324	✔ Pass

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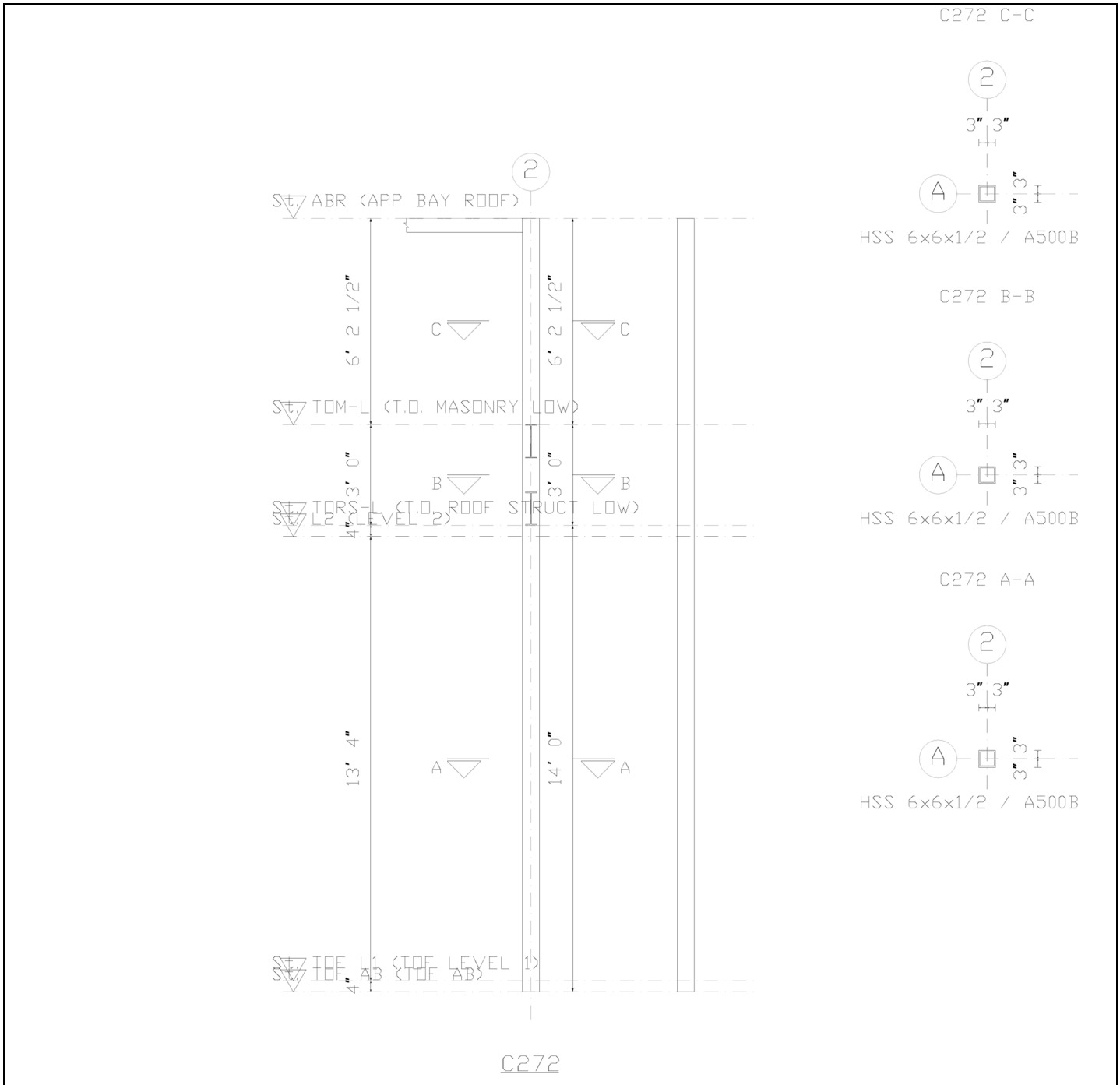
Made by: JMB	Date: 10/17/2022	Job No. 21-18
Revision:	Date:	Sheet No. 736
Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexure Minor	224	-9.2	54.5	kip ft	0.168	Pass
Axial Tension	179	-2.7	313.8	kip	0.009	Pass
Axial Compression	155	6.9	114.8	kip	0.060	Pass
Combined Forces	244	-	-	-	0.459	Pass
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

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Project Name: FIRE STATION 5		



Static

Summary HSS 6x6x1/2 (A500B-46)

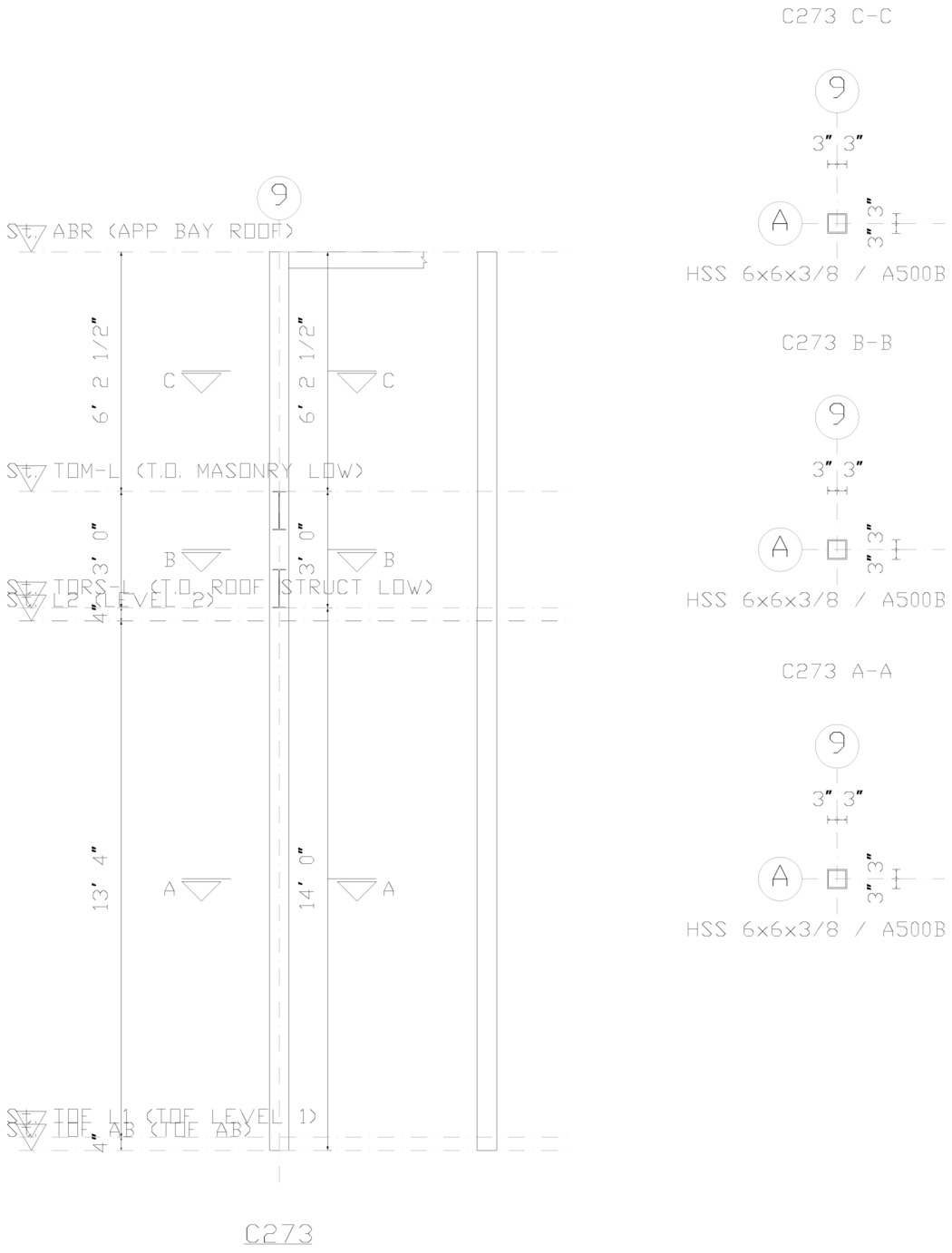
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	119	1.8	106.4	kip	0.017	Pass
Shear Minor	224	-0.4	106.4	kip	0.004	Pass

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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexure Major	119	7.7	68.3	kip ft	0.113	✔ Pass
Flexure Minor	224	-0.3	68.3	kip ft	0.005	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	139	6.2	275.2	kip	0.023	✔ Pass
Combined Forces	112	-	-	-	0.127	✔ Pass

C273



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Revision:	Date:	Sheet No. 739
Project Name: FIRE STATION 5		

Static

Summary HSS 6x6x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	103	1.6	85.9	kip	0.018	✔ Pass
Shear Minor	256	0.4	85.9	kip	0.004	✔ Pass
Flexure Major	103	6.5	54.5	kip ft	0.119	✔ Pass
Flexure Minor	256	0.3	54.5	kip ft	0.006	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	122	7.8	292.0	kip	0.027	✔ Pass
Combined Forces	112	-	-	-	0.136	✔ Pass

Column Design Summary

Static

Member Reference	Group Ref.	Stack	Section	Grade	Length [ft, in]	Utilization	Status
C259	SCR25	1	HSS 4x4x1/2	A500B-46	13′ 4″	0.861	✔ Pass
C259	SCR25	2	HSS 4x4x1/2	A500B-46	10′ 2″	0.179	✔ Pass
C258	SCR26	1	HSS 4x4x3/8	A500B-46	13′ 4″	0.946	✔ Pass
C258	SCR26	2	HSS 4x4x3/8	A500B-46	10′ 2″	0.344	✔ Pass
C257	SCR67	1	HSS 6x6x1/2	A500B-46	13′ 4″	0.258	✔ Pass
C257	SCR67	2	HSS 6x6x1/2	A500B-46	10′ 2″	0.411	✔ Pass
C256	SCR28	1	HSS 4x4x3/8	A500B-46	7′ 10″	0.002	✔ Pass
C255	SCR33	1	HSS 4x4x3/8	A500B-46	13′ 4″	0.476	✔ Pass
C254	SCR30	1	HSS 6x6x3/8	A500B-46	13′ 4″	0.641	✔ Pass
C254	SCR30	2	HSS 6x6x3/8	A500B-46	10′ 2″	0.365	✔ Pass
C254	SCR30	3	HSS 6x6x3/8	A500B-46	9′ 1 13/64″	0.562	✔ Pass
C253	SCR31	1	HSS 6x6x3/8	A500B-46	23′ 6″	0.268	✔ Pass
C253	SCR31	2	HSS 6x6x3/8	A500B-46	9′ 1 13/64″	0.562	✔ Pass
C252	SCR32	1	HSS 4x4x3/8	A500B-46	13′ 4″	0.564	✔ Pass
C252	SCR32	2	HSS 4x4x3/8	A500B-46	10′ 2″	0.280	✔ Pass
C251	SCR33	1	HSS 4x4x3/8	A500B-46	13′ 4″	0.518	✔ Pass
C231	SCR68	1	HSS 6x6x3/8	A500B-46	13′ 4″	0.507	✔ Pass
C231	SCR68	2	HSS 6x6x3/8	A500B-46	9′ 6 1/2″	0.577	✔ Pass
C231	SCR68	3	HSS 6x6x3/8	A500B-46	7 1/2″	0.465	✔ Pass
C230	SCR69	1	HSS 6x6x3/8	A500B-46	13′ 8″	0.585	✔ Pass
C230	SCR69	2	HSS 6x6x3/8	A500B-46	9′ 6 1/2″	0.471	✔ Pass
C230	SCR69	3	HSS 6x6x3/8	A500B-46	7 1/2″	0.476	✔ Pass
C230	SCR69	4	HSS 6x6x3/8	A500B-46	1 25/32″	0.008	✔ Pass
C250	SCR82	1	HSS 6x6x5/8	A500B-46	13′ 4″	0.099	✔ Pass
C250	SCR82	2	HSS 6x6x5/8	A500B-46	10′ 2″	0.077	✔ Pass
C249	SCR78	1	HSS 6x6x3/8	A500B-46	13′ 4″	0.301	✔ Pass
C249	SCR78	2	HSS 6x6x3/8	A500B-46	10′ 2″	0.617	✔ Pass
C248	SCR29	1	HSS 4x4x3/8	A500B-46	13′ 4″	0.378	✔ Pass
C248	SCR29	2	HSS 4x4x3/8	A500B-46	10′ 2″	0.303	✔ Pass
C247	SCR79	1	HSS 6x6x1/2	A500B-46	13′ 4″	0.458	✔ Pass

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Member Reference	Group Ref.	Stack	Section	Grade	Length [ft, in]	Utilization	Status
C247	SCR79	2	HSS 6x6x1/2	A500B-46	10′ 2″	0.608	Pass
C246	SCR80	1	HSS 6x6x1/2	A500B-46	13′ 4″	0.481	Pass
C246	SCR80	2	HSS 6x6x1/2	A500B-46	10′ 2″	0.565	Pass
C245	SCR71	1	HSS 6x6x1/2	A500B-46	13′ 4″	0.452	Pass
C245	SCR71	2	HSS 6x6x1/2	A500B-46	10′ 2″	0.868	Pass
C244	SCR73	1	HSS 6x6x3/8	A500B-46	13′ 4″	0.384	Pass
C244	SCR73	2	HSS 6x6x3/8	A500B-46	10′ 2″	0.554	Pass
C243	SCR37	1	HSS 4x4x3/8	A500B-46	13′ 4″	0.051	Pass
C243	SCR37	2	HSS 4x4x3/8	A500B-46	10′ 2″	0.045	Pass
C266	SCR74	1	HSS 6x6x3/8	A500B-46	13′ 8″	0.340	Pass
C266	SCR74	2	HSS 6x6x3/8	A500B-46	3′ 0″	0.340	Pass
C266	SCR74	3	HSS 6x6x3/8	A500B-46	6′ 2 1/2″	0.340	Pass
C270	SCR75	1	HSS 6x6x5/8	A500B-46	14′ 0″	0.455	Pass
C270	SCR75	2	HSS 6x6x5/8	A500B-46	3′ 0″	0.455	Pass
C270	SCR75	3	HSS 6x6x5/8	A500B-46	6′ 2 1/2″	0.455	Pass
C269	SCR75	1	HSS 6x6x5/8	A500B-46	14′ 0″	0.462	Pass
C269	SCR75	2	HSS 6x6x5/8	A500B-46	3′ 0″	0.462	Pass
C269	SCR75	3	HSS 6x6x5/8	A500B-46	6′ 2 1/2″	0.462	Pass
C268	SCR76	1	HSS 6x6x5/8	A500B-46	14′ 0″	0.439	Pass
C268	SCR76	2	HSS 6x6x5/8	A500B-46	3′ 0″	0.439	Pass
C268	SCR76	3	HSS 6x6x5/8	A500B-46	6′ 2 1/2″	0.439	Pass
C273	SCR77	1	HSS 6x6x3/8	A500B-46	14′ 0″	0.051	Pass
C273	SCR77	2	HSS 6x6x3/8	A500B-46	3′ 0″	0.038	Pass
C273	SCR77	3	HSS 6x6x3/8	A500B-46	6′ 2 1/2″	0.136	Pass
C271	SCR48	1	HSS 6x6x3/8	A500B-46	14′ 0″	0.459	Pass
C271	SCR48	2	HSS 6x6x3/8	A500B-46	3′ 0″	0.459	Pass
C271	SCR48	3	HSS 6x6x3/8	A500B-46	6′ 2 1/2″	0.459	Pass
C267	SCR75	1	HSS 6x6x5/8	A500B-46	14′ 0″	0.411	Pass
C267	SCR75	2	HSS 6x6x5/8	A500B-46	3′ 0″	0.411	Pass
C267	SCR75	3	HSS 6x6x5/8	A500B-46	6′ 2 1/2″	0.411	Pass
C272	SCR81	1	HSS 6x6x1/2	A500B-46	14′ 0″	0.059	Pass
C272	SCR81	2	HSS 6x6x1/2	A500B-46	3′ 0″	0.043	Pass
C272	SCR81	3	HSS 6x6x1/2	A500B-46	6′ 2 1/2″	0.127	Pass

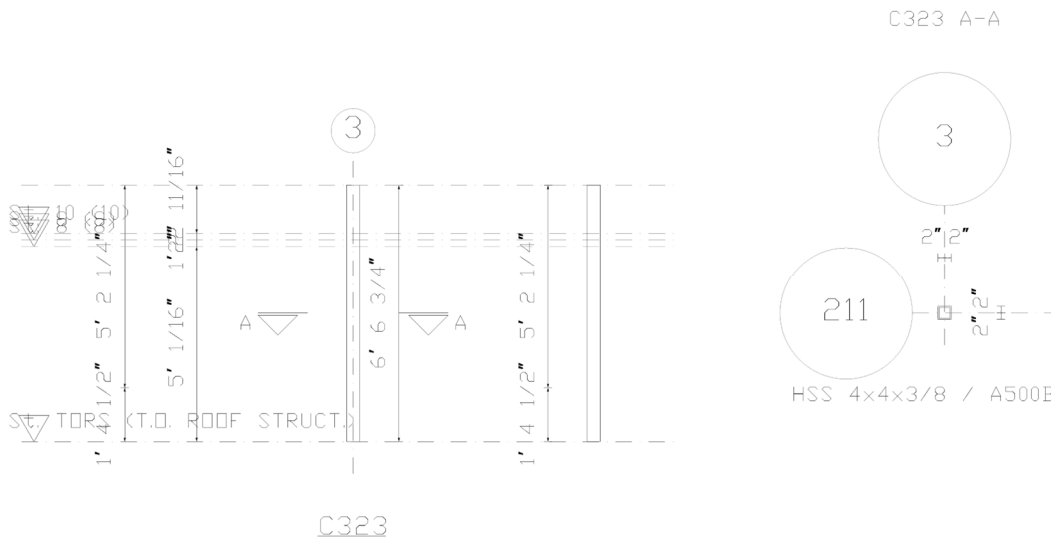
Reference	Stacks	Critical Stack	Section	Grade	Max. UR	Status
C259	2	1	HSS 4x4x1/2	A500B-46	0.861	Pass
C258	2	1	HSS 4x4x3/8	A500B-46	0.946	Pass
C248	2	1	HSS 4x4x3/8	A500B-46	0.378	Pass
C254	3	1	HSS 6x6x3/8	A500B-46	0.641	Pass
C253	2	2	HSS 6x6x3/8	A500B-46	0.562	Pass
C252	2	1	HSS 4x4x3/8	A500B-46	0.564	Pass
C243	2	1	HSS 4x4x3/8	A500B-46	0.051	Pass
C271	3	1	HSS 6x6x3/8	A500B-46	0.459	Pass
C277	1	1	HSS 2x2x1/4	A500B-46	0.311	Warning
C274	3	1	HSS 6x6x3/8	A500B-46	0.740	Pass
C257	2	2	HSS 6x6x1/2	A500B-46	0.411	Pass

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Reference	Stacks	Critical Stack	Section	Grade	Max. UR	Status
C231	3	2	HSS 6x6x3/8	A500B-46	0.577	Pass
C230	4	1	HSS 6x6x3/8	A500B-46	0.585	Pass
C313	2	2	HSS 6x6x3/8	A500B-46	0.251	Pass
C245	2	2	HSS 6x6x1/2	A500B-46	0.868	Pass
C266	3	3	HSS 6x6x3/8	A500B-46	0.340	Pass
C268	3	1	HSS 6x6x5/8	A500B-46	0.439	Pass
C273	3	3	HSS 6x6x3/8	A500B-46	0.136	Pass
C249	2	2	HSS 6x6x3/8	A500B-46	0.617	Pass
C247	2	2	HSS 6x6x1/2	A500B-46	0.608	Pass
C246	2	2	HSS 6x6x1/2	A500B-46	0.565	Pass
C272	3	3	HSS 6x6x1/2	A500B-46	0.127	Pass
C250	2	1	HSS 6x6x5/8	A500B-46	0.099	Pass

C323



Static

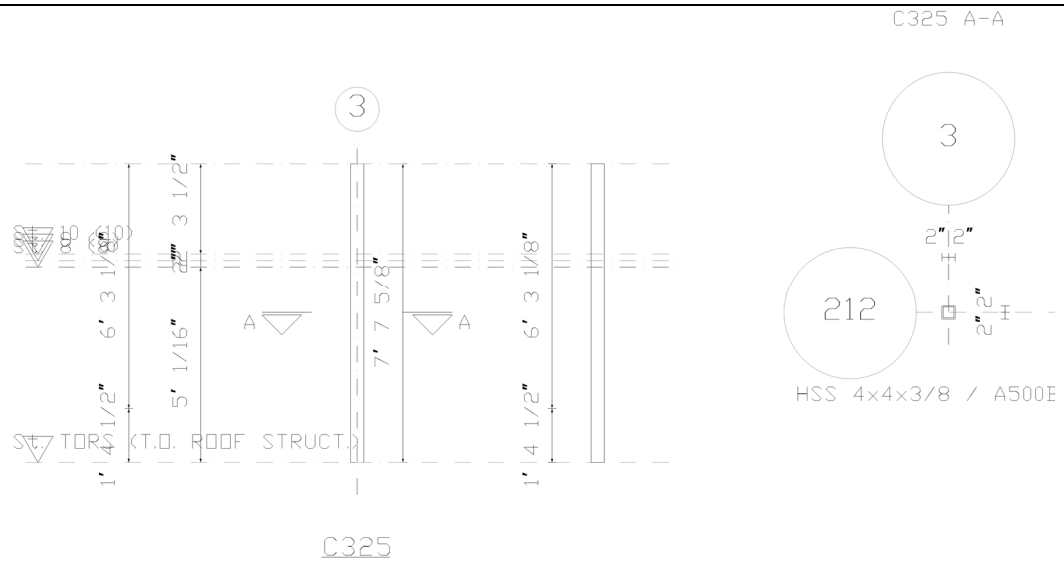
Summary HSS 4x4x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	286	-11.1	51.2	kip	0.218	Pass
Shear Minor	159	-0.5	51.2	kip	0.009	Pass
Flexure Major	286	14.7	22.0	kip ft	0.666	Pass
Flexure Minor	287	-1.7	22.0	kip ft	0.077	Pass
Axial Tension	313	-1.7	197.9	kip	0.009	Pass
Axial Compression	222	2.6	175.4	kip	0.015	Pass
Combined Forces	1	-	-	-	0.000	Warning
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

C325

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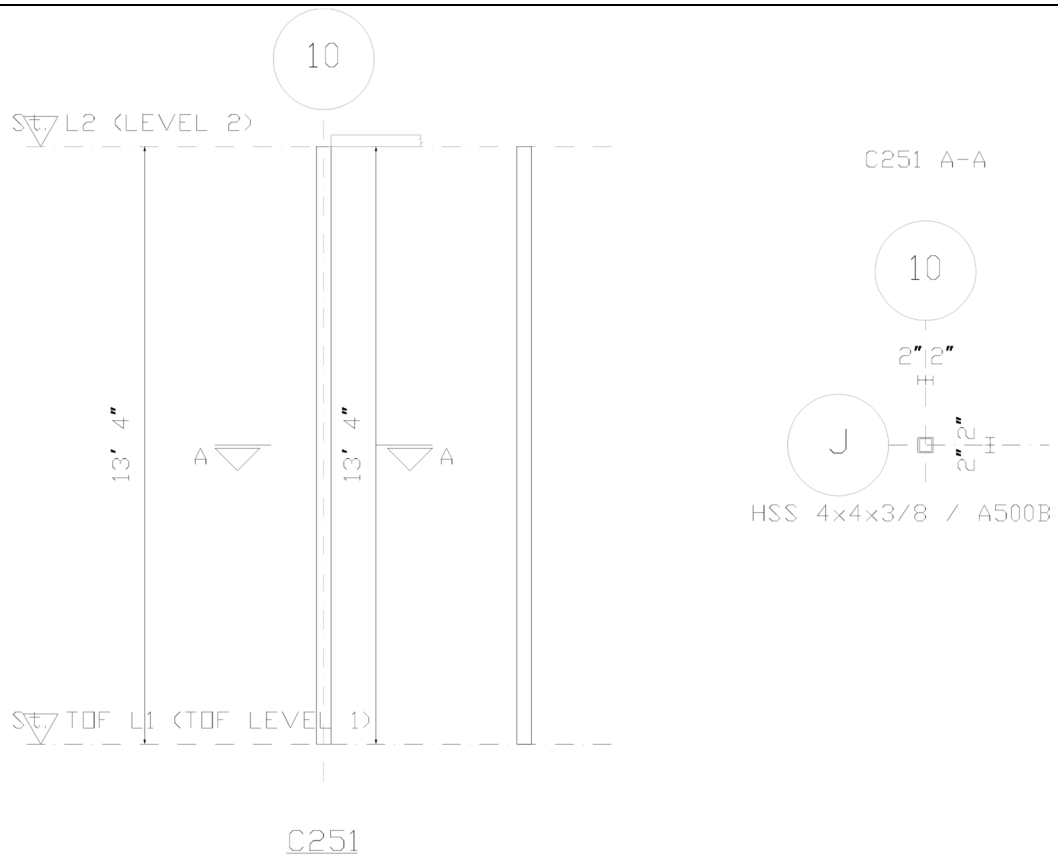
Summary HSS 4x4x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	249	9.1	51.2	kip	0.178	Pass
Shear Minor	159	0.8	51.2	kip	0.016	Pass
Flexure Major	249	-12.4	22.0	kip ft	0.562	Pass
Flexure Minor	224	3.0	22.0	kip ft	0.138	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	5	1.0	166.0	kip	0.006	Pass
Combined Forces	1	-	-	-	0.000	Warning
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

C251

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Static

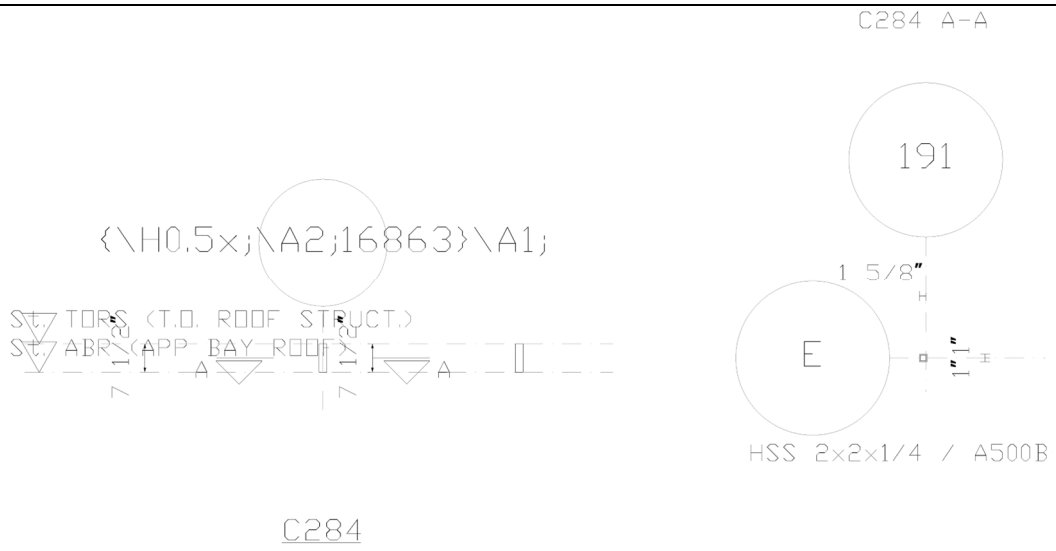
Summary HSS 4x4x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	No	Significant	Forces	kip	-	Not required
Shear Minor	No	Significant	Forces	kip	-	Not required
Flexure Major	9	-1.6	22.0	kip ft	0.071	✔ Pass
Flexure Minor	7	1.5	22.0	kip ft	0.070	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	9	34.9	89.1	kip	0.392	✔ Pass
Combined Forces	9	-	-	-	0.518	✔ Pass

C284

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C284

Static

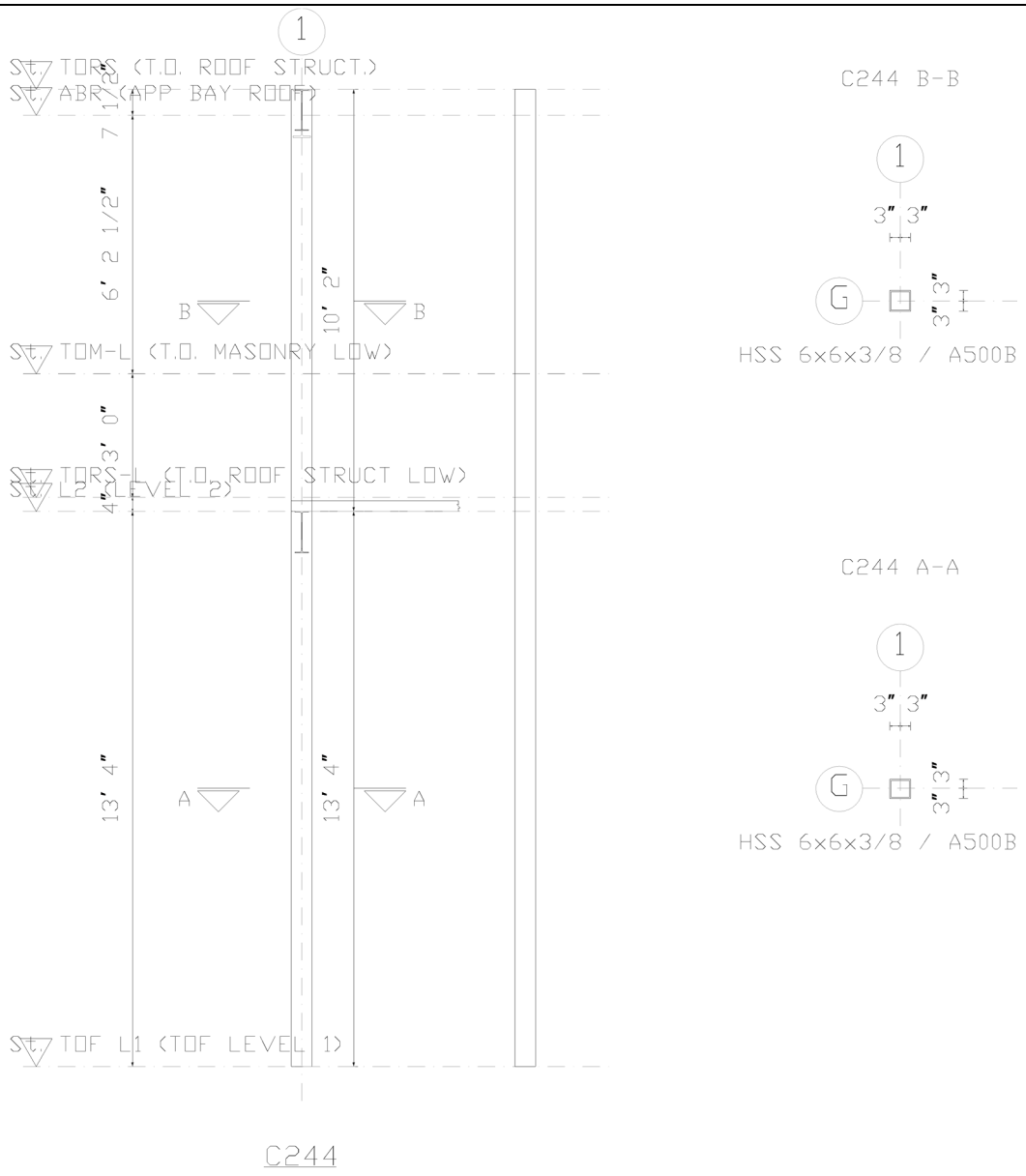
Summary HSS 6x6x1/2 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	265	-9.0	106.4	kip	0.084	Pass
Shear Minor	287	1.0	106.4	kip	0.009	Pass
Flexure Major	265	-27.5	68.3	kip ft	0.403	Pass
Flexure Minor	224	5.6	68.3	kip ft	0.082	Pass
Axial Tension	323	-0.6	403.2	kip	0.001	Pass
Axial Compression	110	7.2	402.9	kip	0.018	Pass
Combined Forces	1	-	-	-	0.000	Warning

C244

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Static

Summary HSS 6x6x3/8 (A500B-46)

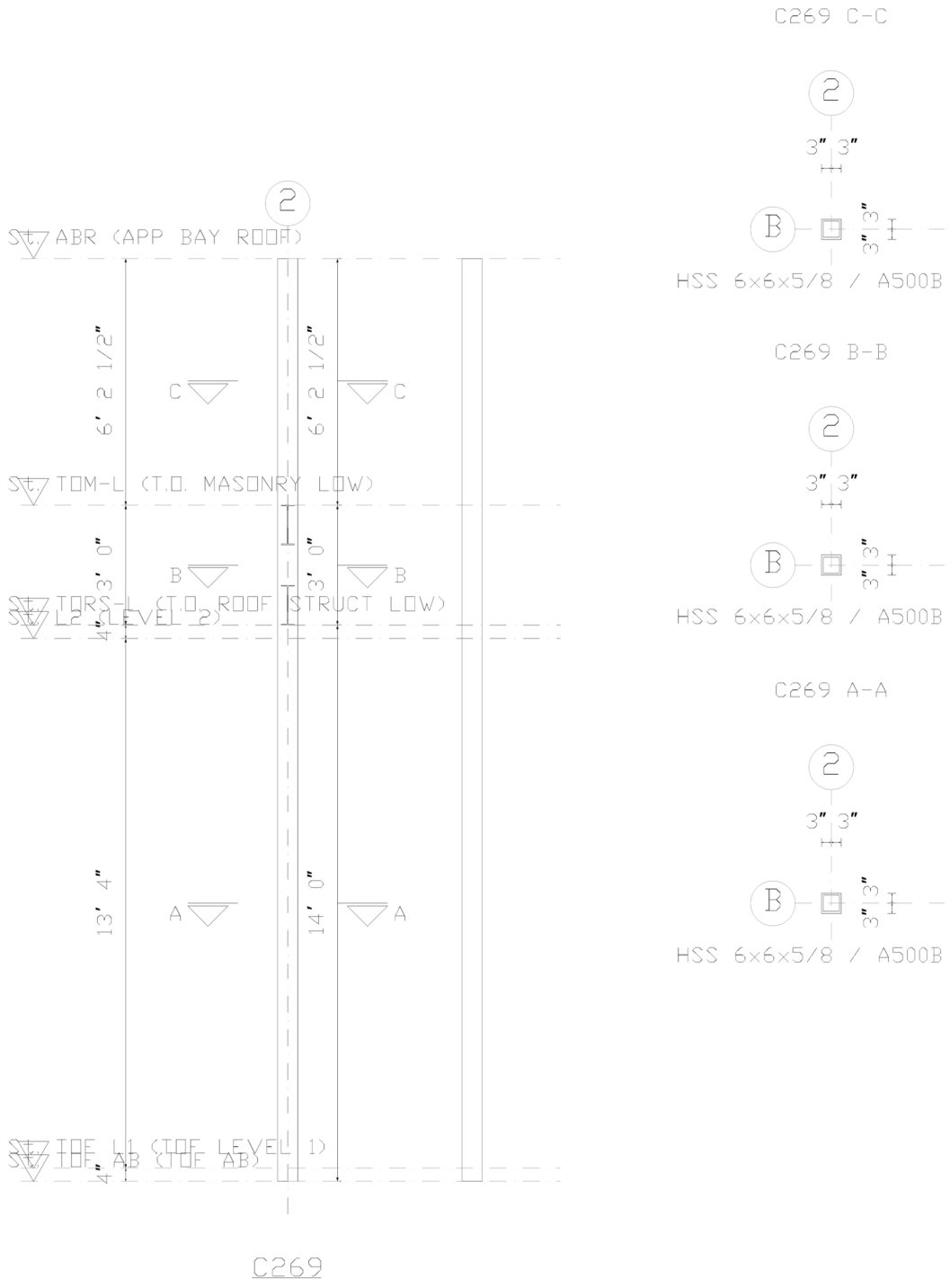
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	286	-4.7	85.9	kip	0.054	✔ Pass
Shear Minor	224	0.2	85.9	kip	0.003	✔ Pass
Flexure Major	286	27.3	54.5	kip ft	0.501	✔ Pass
Flexure Minor	224	-2.4	54.5	kip ft	0.044	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	20	29.8	225.2	kip	0.132	✔ Pass
Combined Forces	282	-	-	-	0.554	✔ Pass

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

C269



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Project Name: FIRE STATION 5		

Static

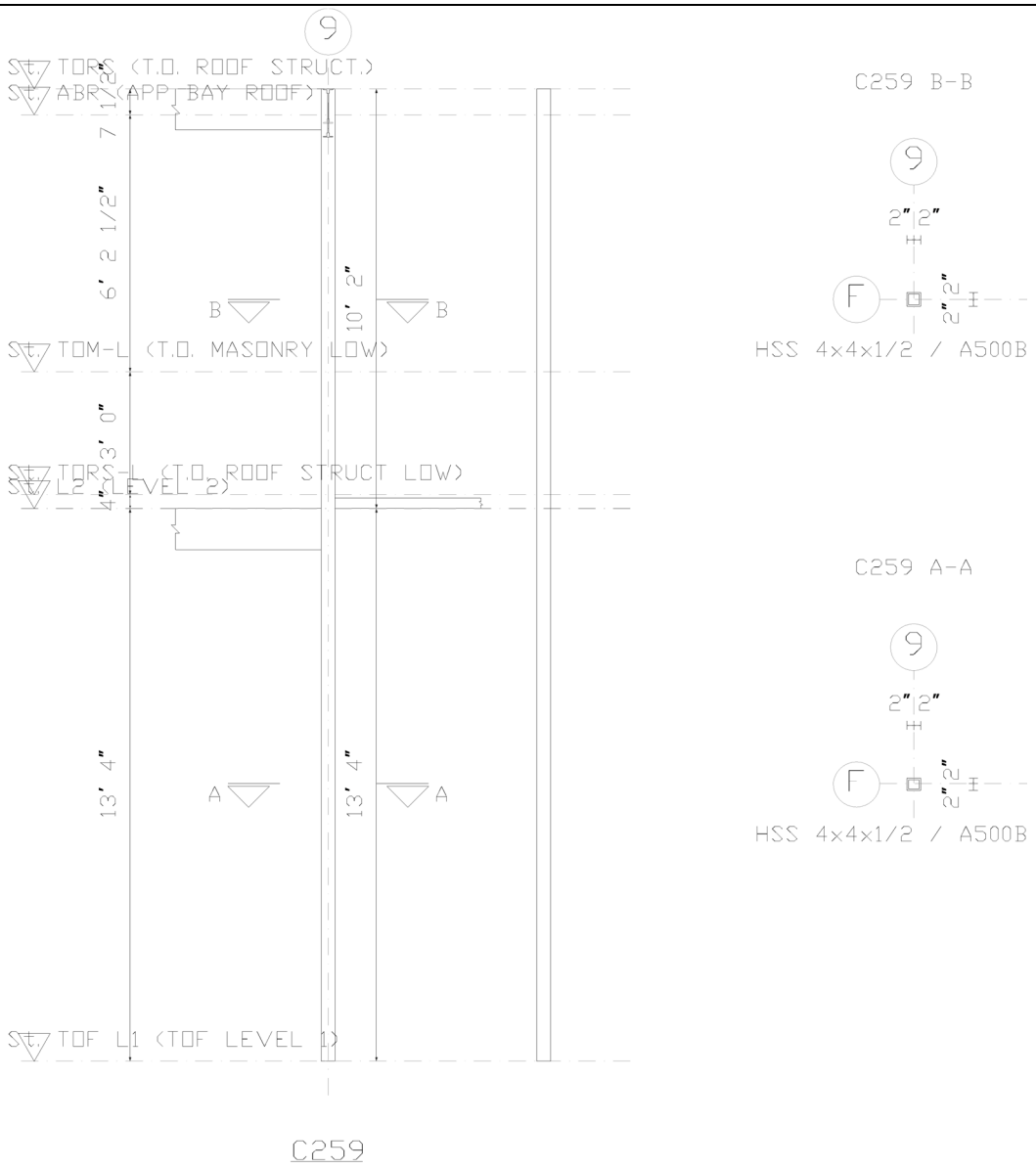
Summary HSS 6x6x5/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	283	-4.5	122.9	kip	0.037	Pass
Shear Minor	307	3.5	122.9	kip	0.029	Pass
Flexure Major	283	-14.4	80.0	kip ft	0.180	Pass
Flexure Minor	244	-20.2	80.0	kip ft	0.252	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	144	23.1	160.5	kip	0.144	Pass
Combined Forces	276	-	-	-	0.462	Pass
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

C259

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Static

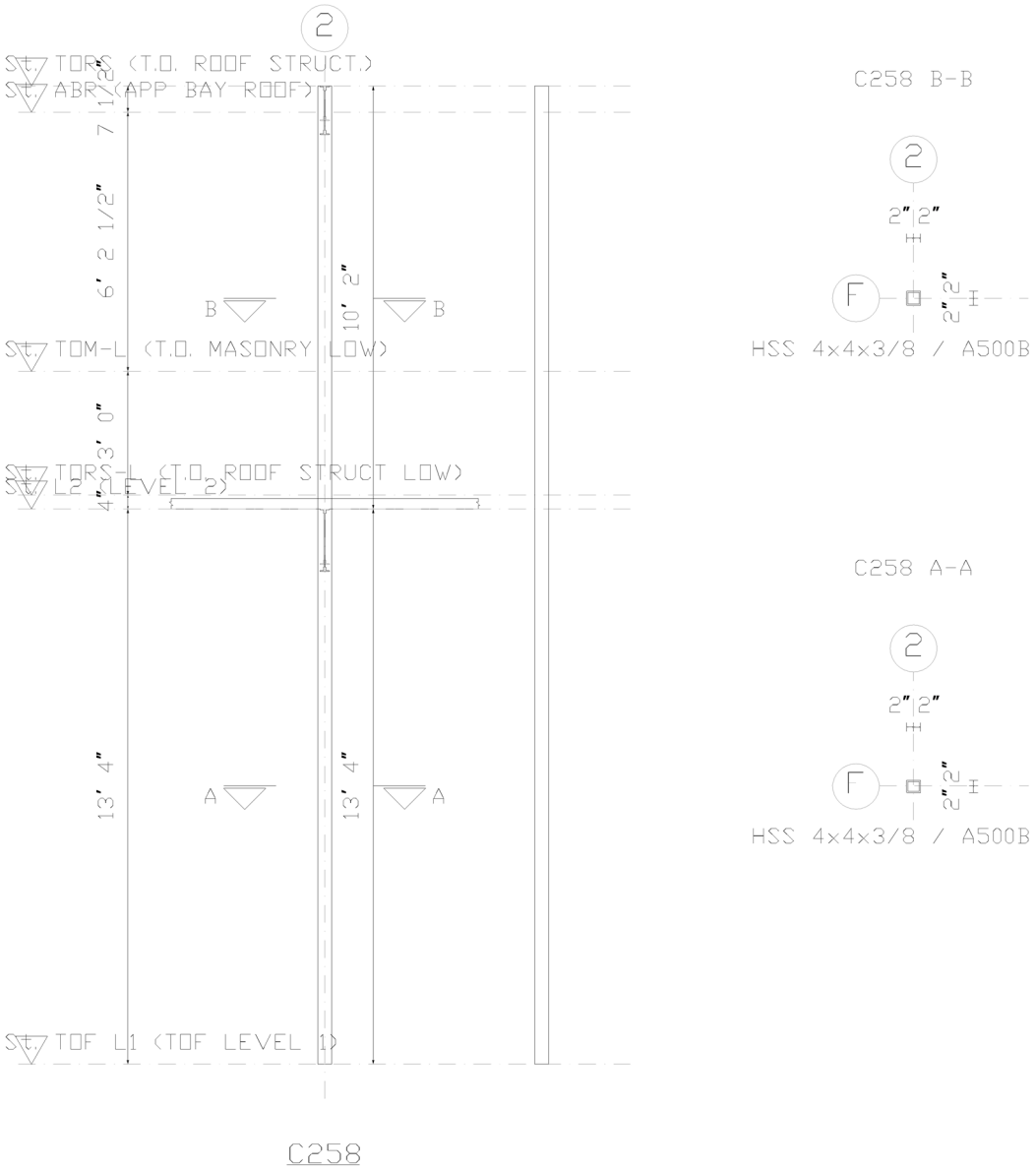
Summary HSS 4x4x1/2 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	No	Significant	Forces	kip	-	Not required
Shear Minor	No	Significant	Forces	kip	-	Not required
Flexure Major	9	-1.2	26.6	kip ft	0.044	✔ Pass
Flexure Minor	8	2.9	26.6	kip ft	0.110	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	17	77.2	104.7	kip	0.737	✔ Pass
Combined Forces	17	-	-	-	0.861	✔ Pass

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C258



Static

Summary HSS 4x4x3/8 (A500B-46)

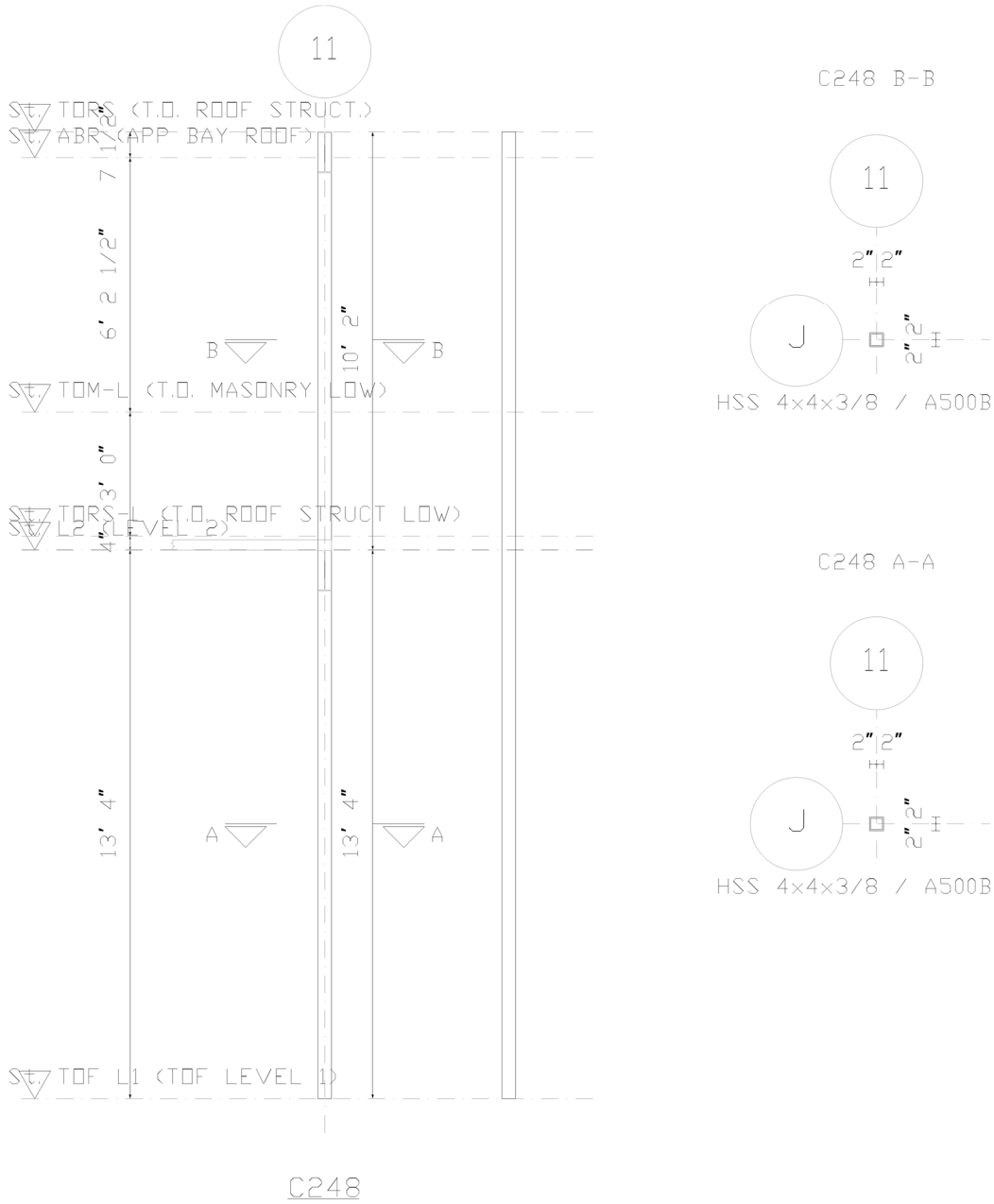
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	No	Significant	Forces	kip	-	Not required
Shear Minor	No	Significant	Forces	kip	-	Not required
Flexure Major	179	-0.6	22.0	kip ft	0.029	✔ Pass
Flexure Minor	158	-2.0	22.0	kip ft	0.090	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required

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Revision:	Date:	Sheet No. 750
Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Compression	17	82.5	89.1	kip	0.926	Pass
Combined Forces	17	-	-	-	0.946	Pass

C248



Static

Summary HSS 4x4x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass

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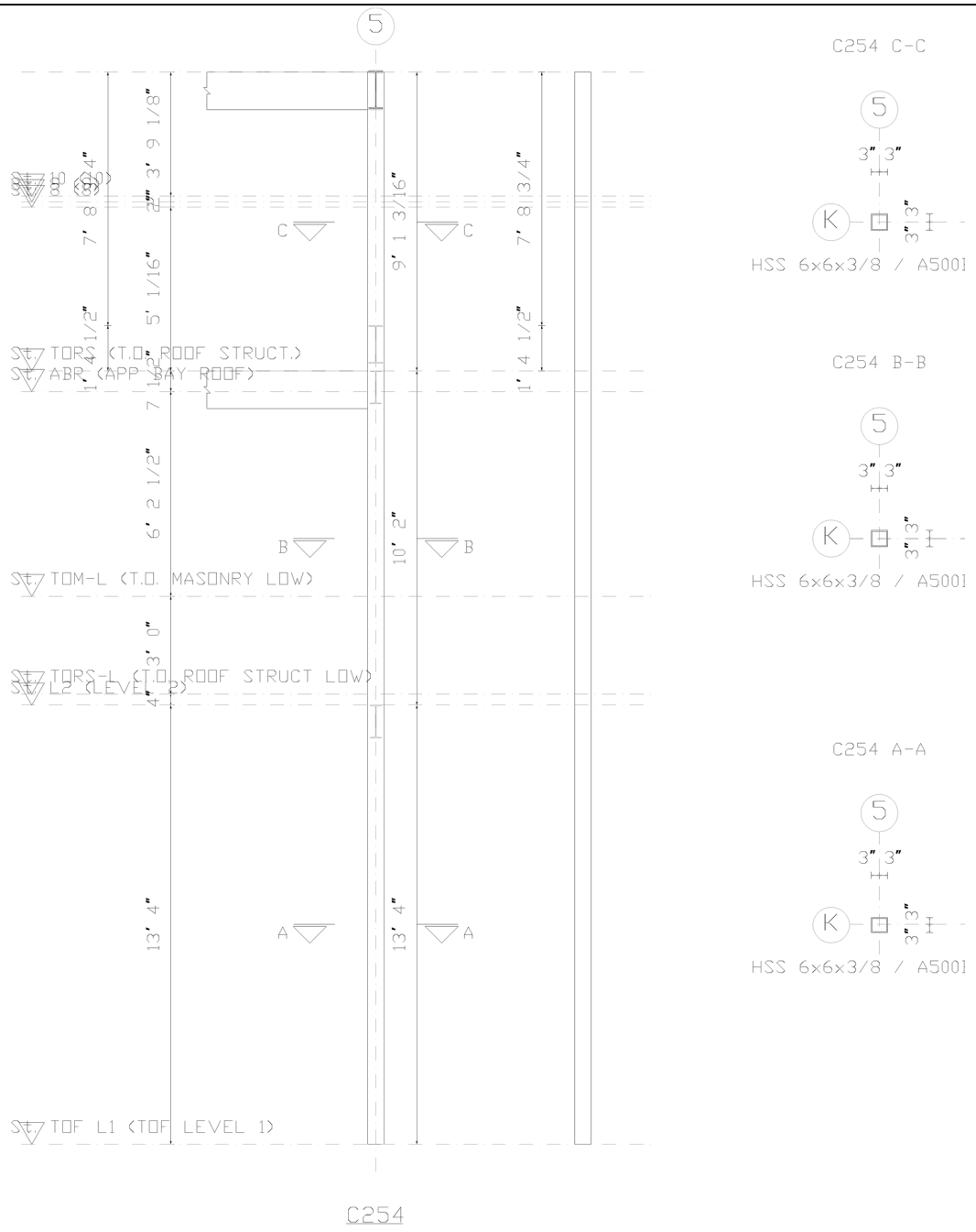
Made by: JMB	Date: 10/17/2022	Job No. 21-18
Revision:	Date:	Sheet No. 751
Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Major	No	Significant	Forces	kip	-	Not required
Shear Minor	No	Significant	Forces	kip	-	Not required
Flexure Major	170	-0.9	22.0	kip ft	0.039	✔ Pass
Flexure Minor	96	5.1	22.0	kip ft	0.232	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	27	25.7	89.1	kip	0.289	✔ Pass
Combined Forces	18	-	-	-	0.378	✔ Pass

C254

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Revision:	Date:	Sheet No. 752
Project Name: FIRE STATION 5		



Static

Summary HSS 6x6x3/8 (A500B-46)

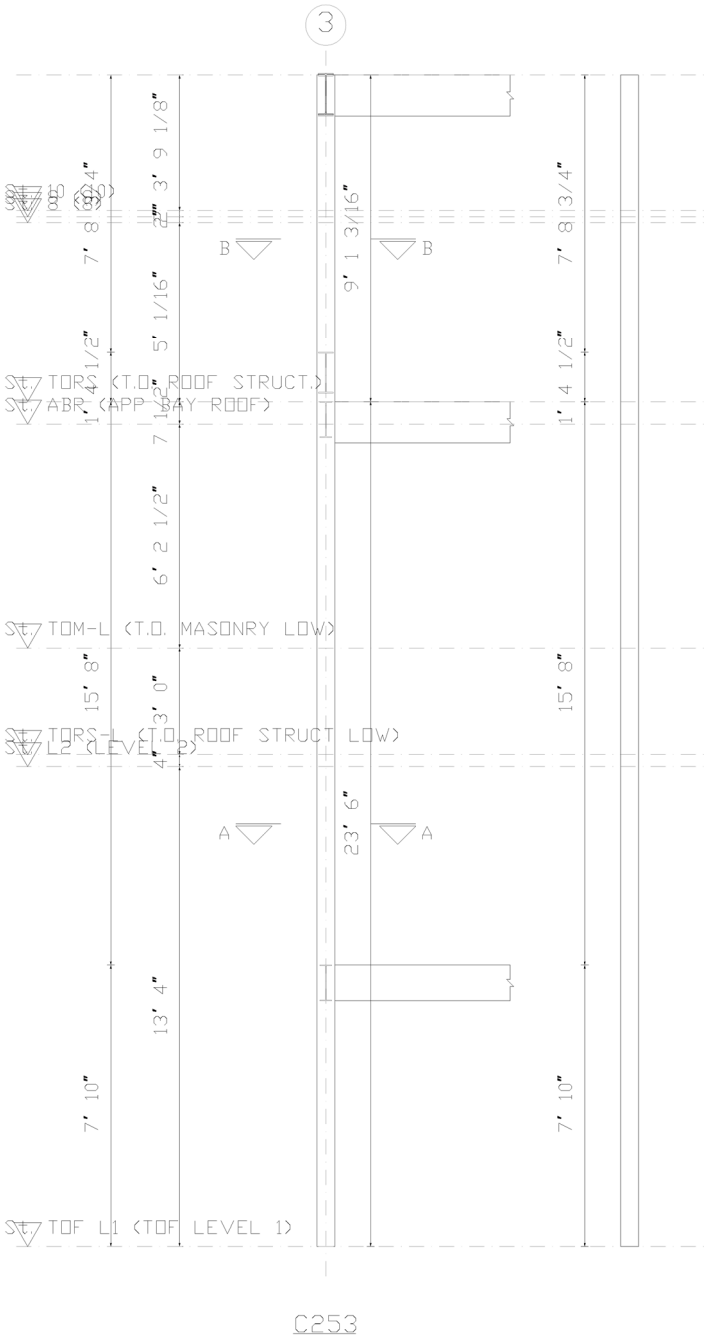
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	286	3.1	85.9	kip	0.036	Pass
Shear Minor	96	3.2	85.9	kip	0.038	Pass
Flexure Major	158	-9.0	54.5	kip ft	0.165	Pass

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Revision:	Date:	Sheet No. 753
Project Name: FIRE STATION 5		

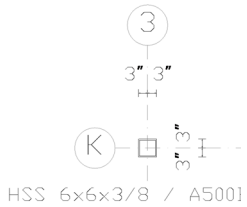
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexure Minor	96	-21.4	54.5	kip ft	0.393	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	96	20.1	111.9	kip	0.180	✔ Pass
Combined Forces	158	-	-	-	0.641	✔ Pass

C253

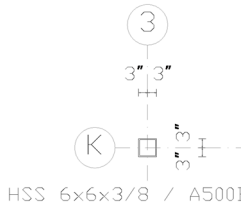


C253

C253 B-B



C253 A-A



Static

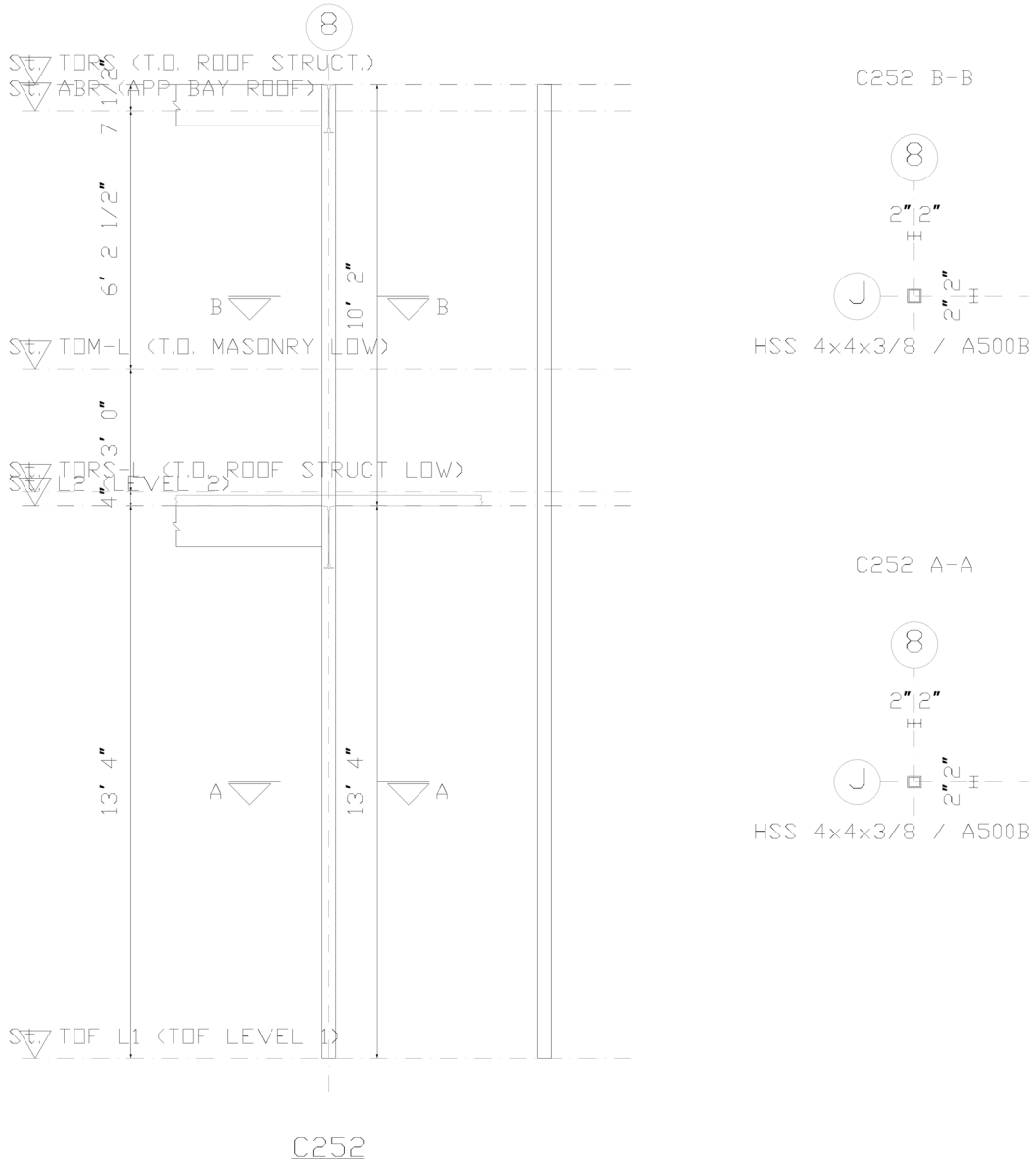
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Revision:	Date:	Sheet No. 754
Project Name: FIRE STATION 5		

Summary HSS 6x6x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	240	2.5	85.9	kip	0.029	✔ Pass
Shear Minor	128	-3.2	85.9	kip	0.038	✔ Pass
Flexure Major	128	8.6	54.5	kip ft	0.157	✔ Pass
Flexure Minor	128	21.5	54.5	kip ft	0.395	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	128	20.3	198.5	kip	0.102	✔ Pass
Combined Forces	128	-	-	-	0.562	✔ Pass

C252



C252

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Revision:	Date:	Sheet No. 755
Project Name: FIRE STATION 5		

Static

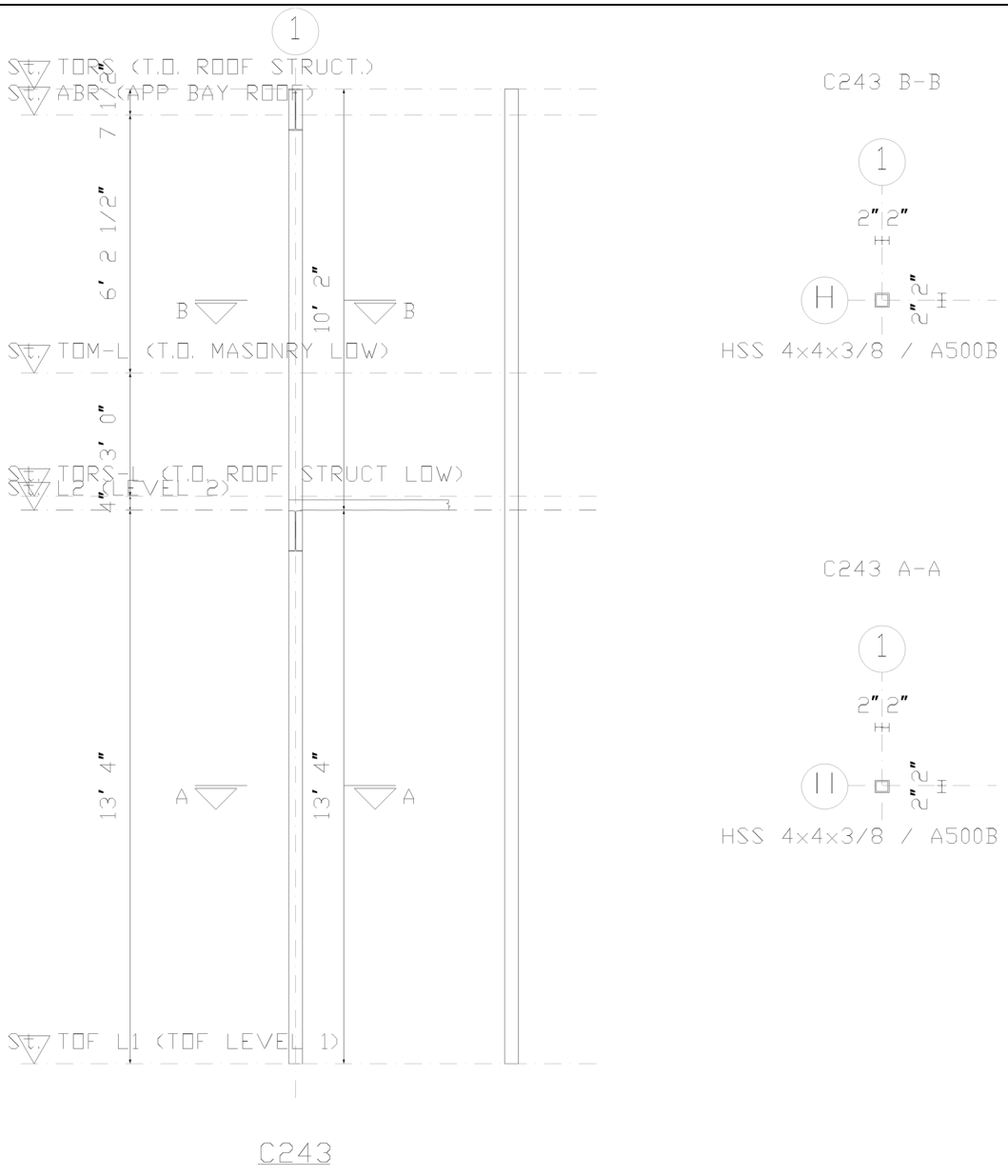
Summary HSS 4x4x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	No	Significant	Forces	kip	-	Not required
Shear Minor	No	Significant	Forces	kip	-	Not required
Flexure Major	9	-1.0	22.0	kip ft	0.047	✔ Pass
Flexure Minor	128	-4.0	22.0	kip ft	0.181	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	20	40.3	89.1	kip	0.452	✔ Pass
Combined Forces	17	-	-	-	0.564	✔ Pass

C243

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Revision:	Date:	Sheet No. 756
Project Name: FIRE STATION 5		



Static

Summary HSS 4x4x3/8 (A500B-46)

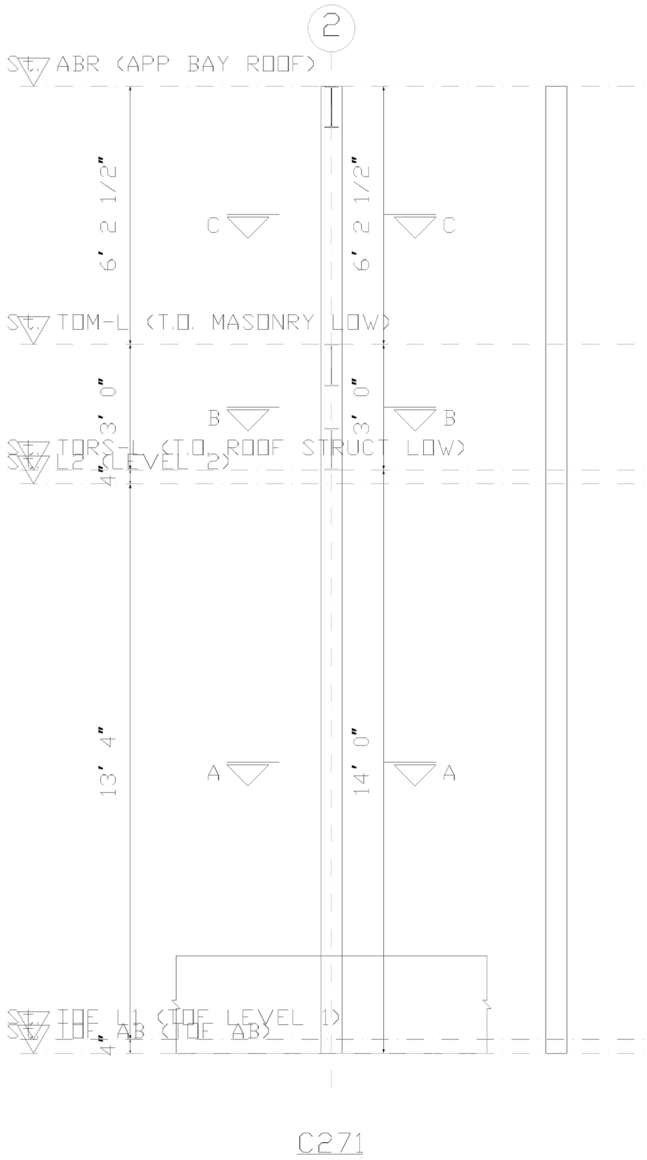
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	2	Compact	-	-	-	✔ Pass
Shear Major	No	Significant	Forces	kip	-	Not required
Shear Minor	No	Significant	Forces	kip	-	Not required
Flexure Major	179	-0.6	22.0	kip ft	0.026	✔ Pass
Flexure Minor	224	-0.6	22.0	kip ft	0.029	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	26	1.7	89.1	kip	0.019	✔ Pass
Combined Forces	195	-	-	-	0.051	✔ Pass

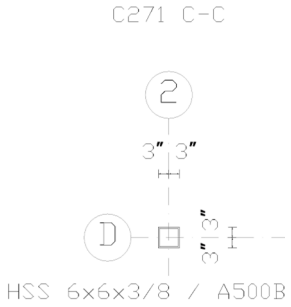
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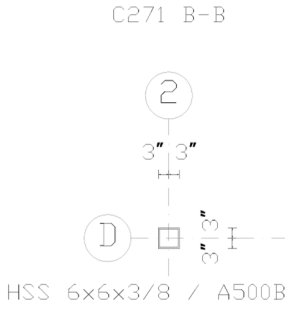
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Project Name: FIRE STATION 5		

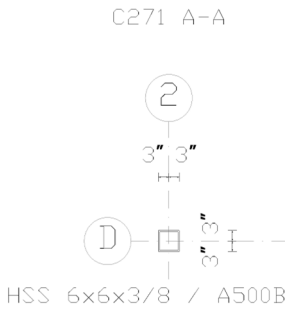
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

C271









Static

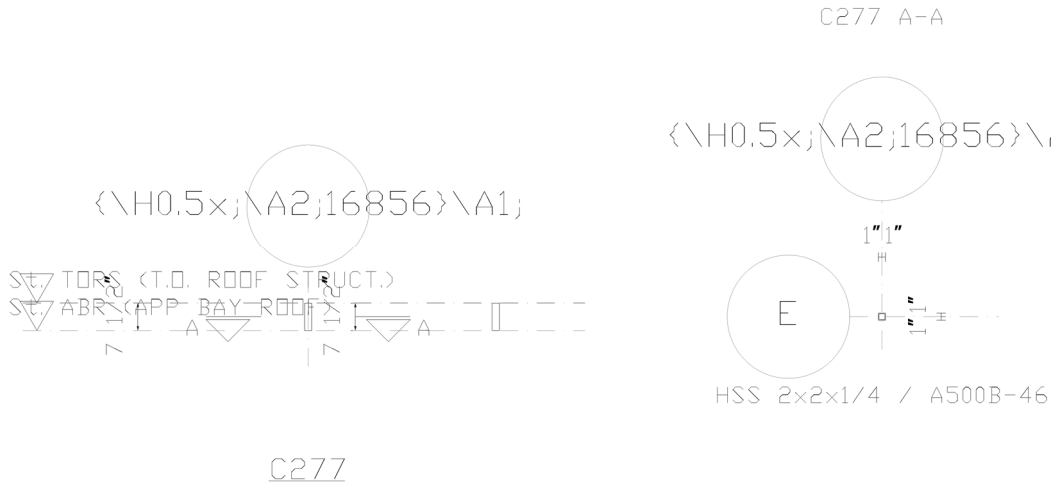
Summary HSS 6x6x3/8 (A500B-46)

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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	29	5.0	85.9	kip	0.058	Pass
Shear Minor	307	-2.0	85.9	kip	0.023	Pass
Flexure Major	19	-17.7	54.5	kip ft	0.324	Pass
Flexure Minor	224	-9.2	54.5	kip ft	0.168	Pass
Axial Tension	179	-2.7	313.8	kip	0.009	Pass
Axial Compression	155	6.9	114.8	kip	0.060	Pass
Combined Forces	244	-	-	-	0.459	Pass
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

C277



Static

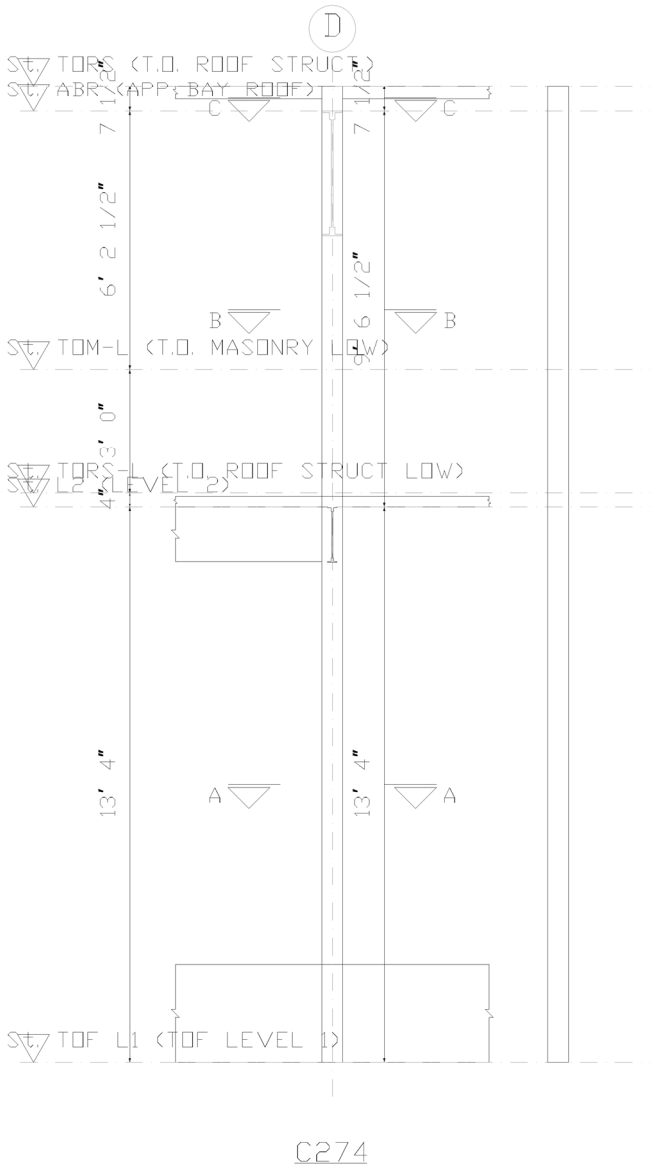
Summary HSS 2x2x1/4 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	319	-0.3	15.1	kip	0.021	Pass
Shear Minor	7	1.6	15.1	kip	0.109	Pass
Flexure Major	96	0.6	3.3	kip ft	0.169	Pass
Flexure Minor	7	-1.0	3.3	kip ft	0.311	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	96	1.9	62.0	kip	0.031	Pass
Combined Forces	1	-	-	-	0.000	Warning

C274

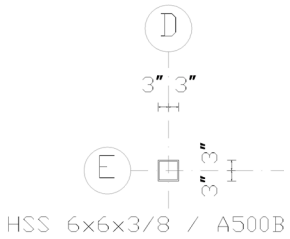
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Revision:	Date:	Sheet No. 759
Project Name: FIRE STATION 5		

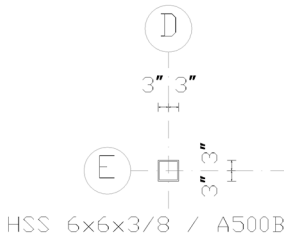


C274

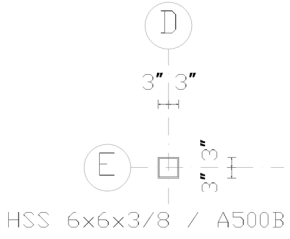
C274 C-C



C274 B-B



C274 A-A



Static

Summary HSS 6x6x3/8 (A500B-46)

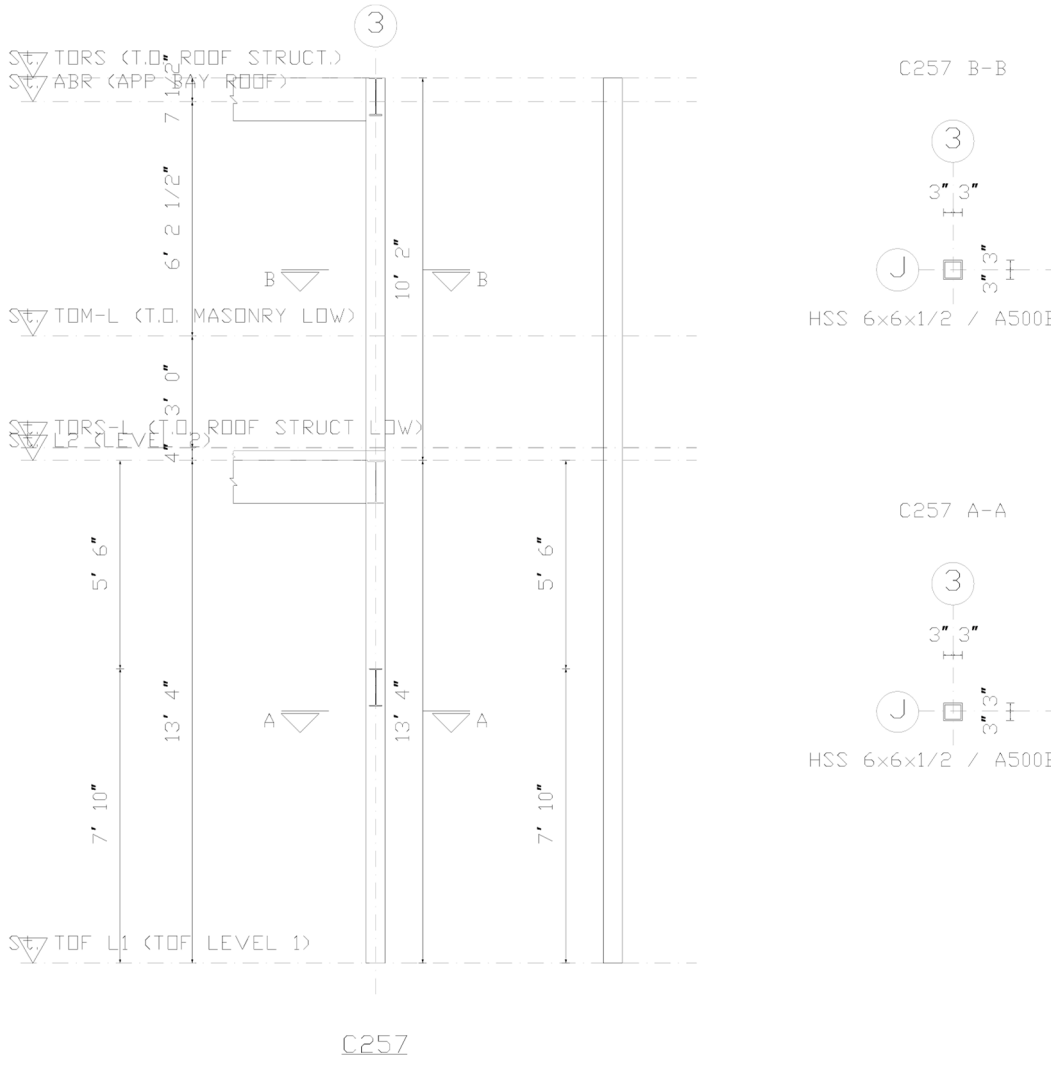
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass

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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	247	1.1	85.9	kip	0.012	Pass
Shear Minor	128	15.4	85.9	kip	0.179	Pass
Flexure Major	106	-3.2	54.5	kip ft	0.058	Pass
Flexure Minor	96	21.4	54.5	kip ft	0.393	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	27	147.9	225.2	kip	0.656	Pass
Combined Forces	28	-	-	-	0.740	Pass
Design Note	Major and/or Minor Axes Strut Restrained					Warning

C257



C257

Static

Summary HSS 6x6x1/2 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass

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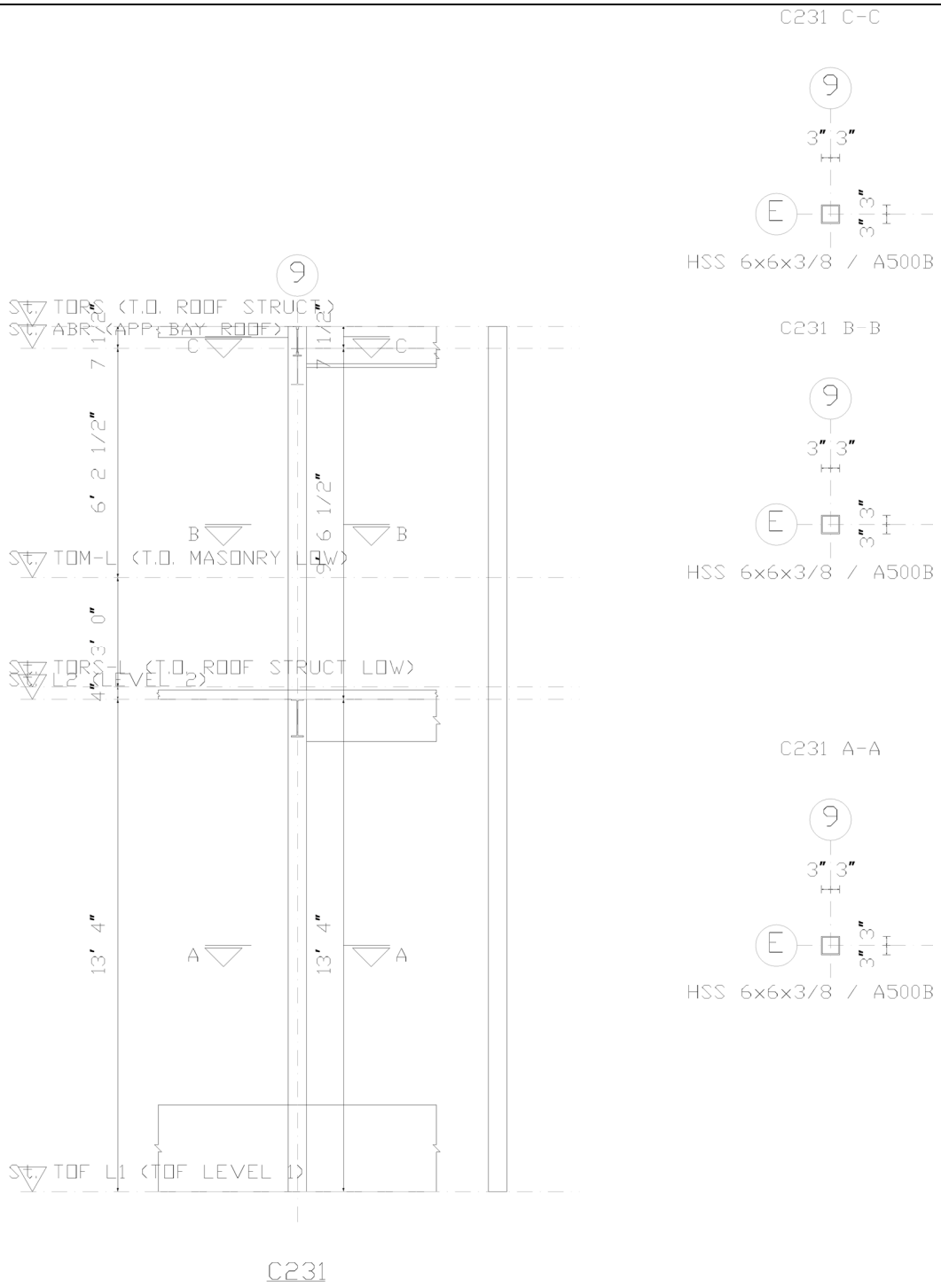
Made by: JMB	Date: 10/17/2022	Job No. 21-18
Revision:	Date:	Sheet No. 761
Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	144	0.6	106.4	kip	0.006	✔ Pass
Shear Minor	224	4.3	106.4	kip	0.040	✔ Pass
Flexure Major	179	-3.9	68.3	kip ft	0.057	✔ Pass
Flexure Minor	224	-24.8	68.3	kip ft	0.364	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	17	33.5	285.1	kip	0.118	✔ Pass
Combined Forces	282	-	-	-	0.411	✔ Pass

C231

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Project Name: FIRE STATION 5		



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Summary HSS 6x6x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass

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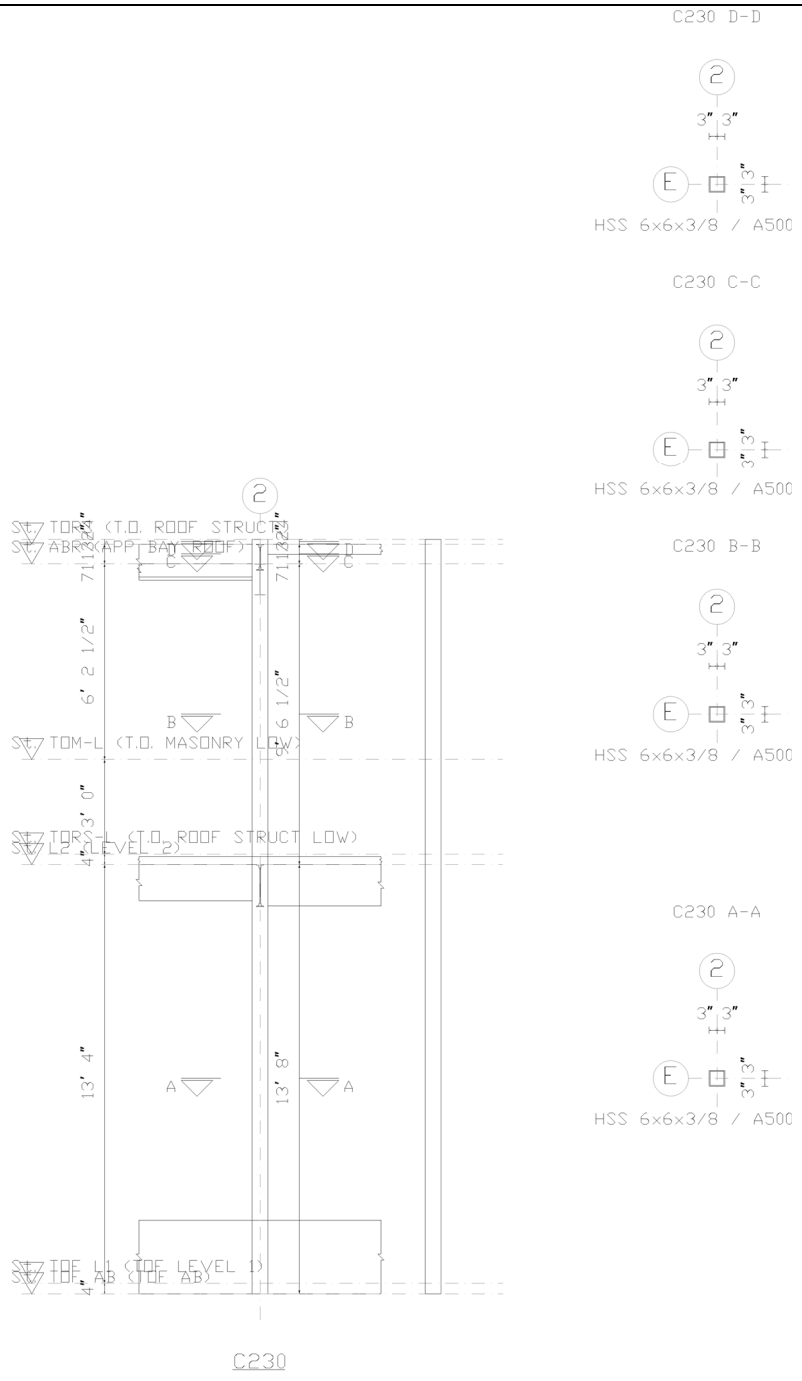
Made by: JMB	Date: 10/17/2022	Job No. 21-18
Revision:	Date:	Sheet No. 763
Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	227	-3.0	85.9	kip	0.034	✔ Pass
Shear Minor	96	-39.9	85.9	kip	0.465	✔ Pass
Flexure Major	163	-4.1	54.5	kip ft	0.075	✔ Pass
Flexure Minor	128	-20.4	54.5	kip ft	0.374	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	28	98.5	225.2	kip	0.437	✔ Pass
Combined Forces	96	-	-	-	0.577	✔ Pass

C230

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Project Name: FIRE STATION 5		



Static

Summary HSS 6x6x3/8 (A500B-46)

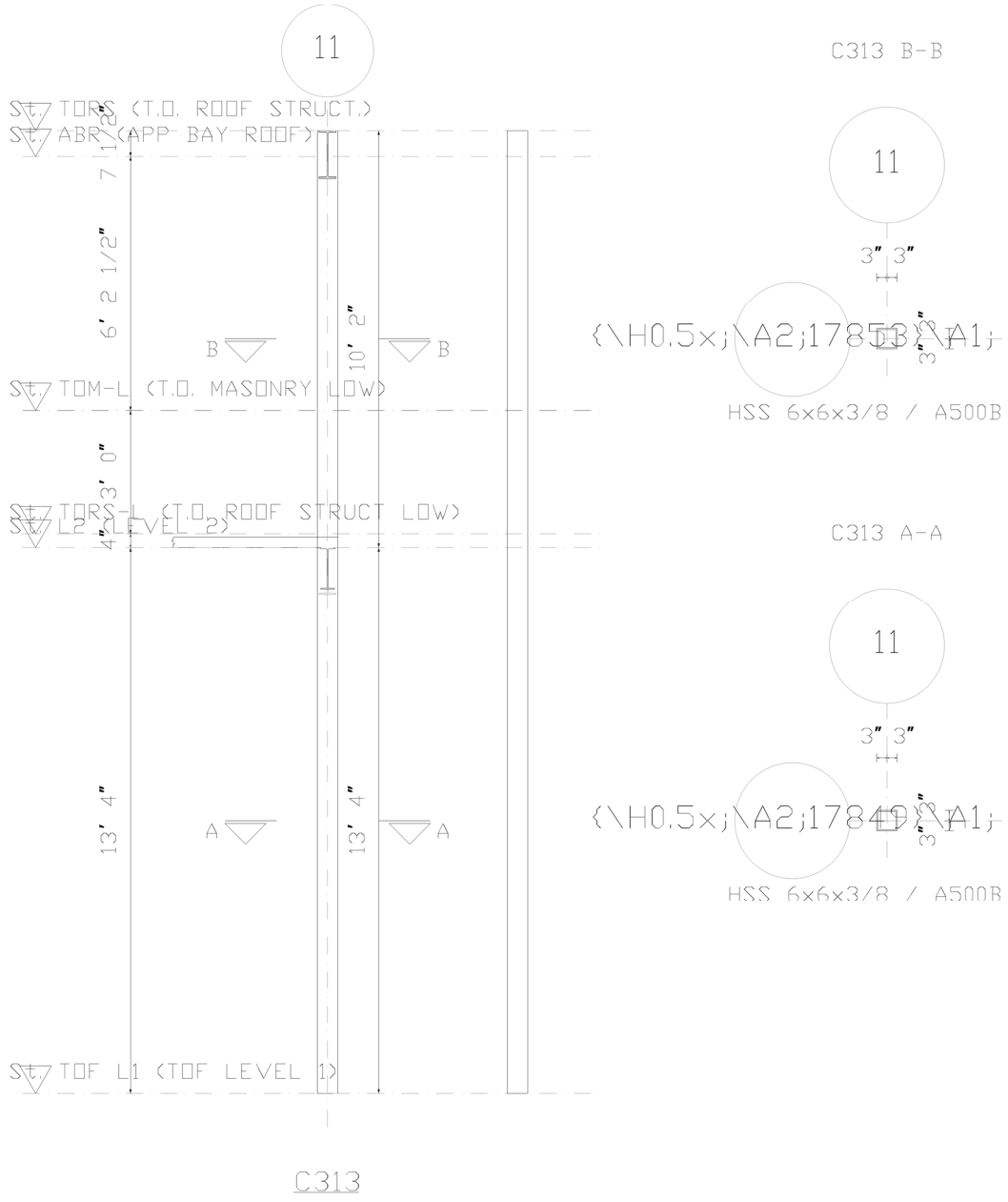
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	249	7.0	85.9	kip	0.081	Pass
Shear Minor	7	-9.3	85.9	kip	0.108	Pass

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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Flexure Major	27	-13.0	54.5	kip ft	0.238	Pass
Flexure Minor	256	-22.8	54.5	kip ft	0.418	Pass
Axial Tension	196	-1.0	313.8	kip	0.003	Pass
Axial Compression	27	47.2	221.5	kip	0.213	Pass
Combined Forces	27	-	-	-	0.585	Pass
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

C313



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Revision:	Date:	Sheet No. 766
Project Name: FIRE STATION 5		

Static

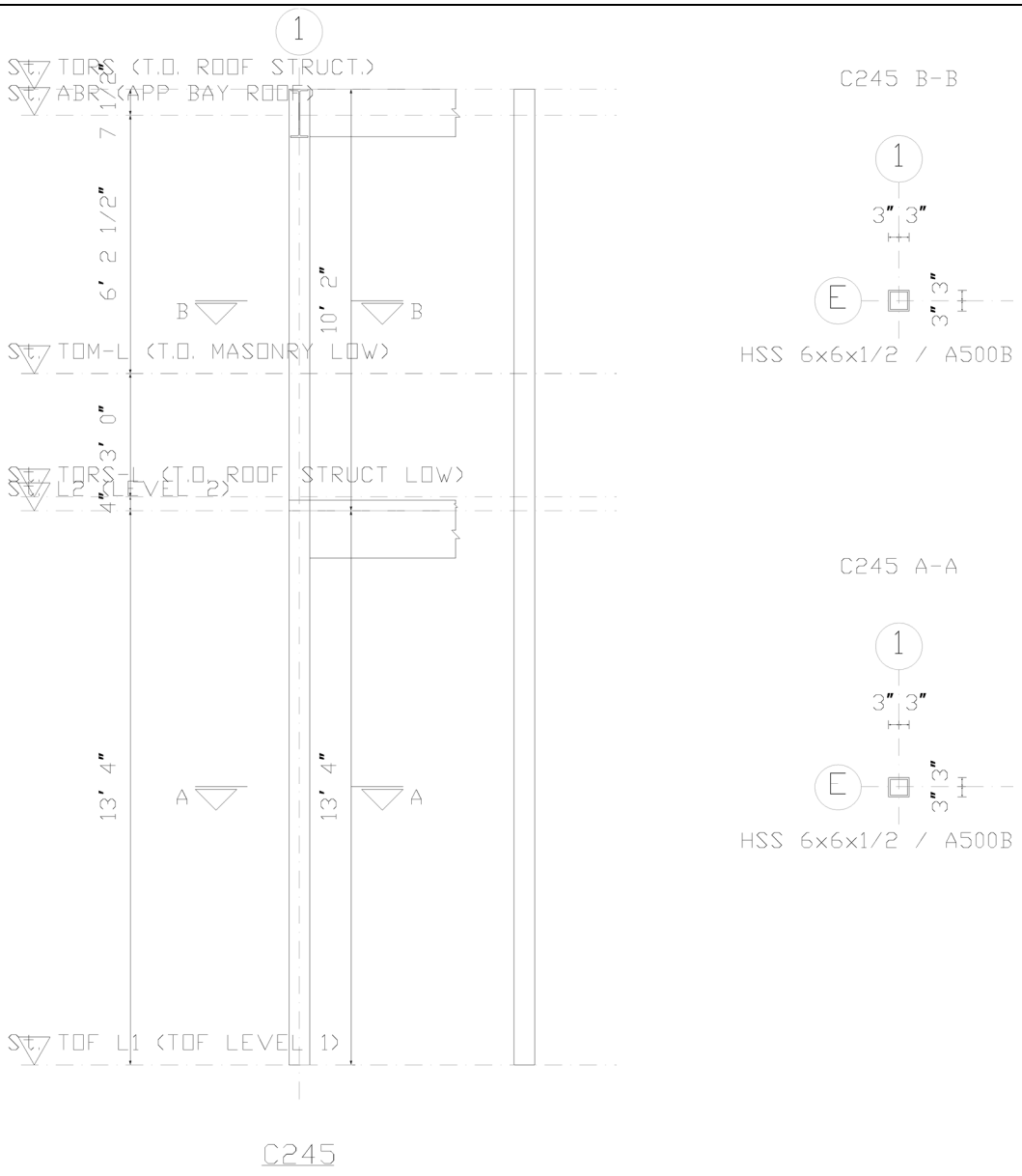
Summary HSS 6x6x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	170	1.1	85.9	kip	0.013	Pass
Shear Minor	228	0.2	85.9	kip	0.002	Pass
Flexure Major	170	-11.3	54.5	kip ft	0.208	Pass
Flexure Minor	228	-2.0	54.5	kip ft	0.038	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	20	38.6	225.2	kip	0.172	Pass
Combined Forces	234	-	-	-	0.251	Pass
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

C245

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Project Name: FIRE STATION 5		



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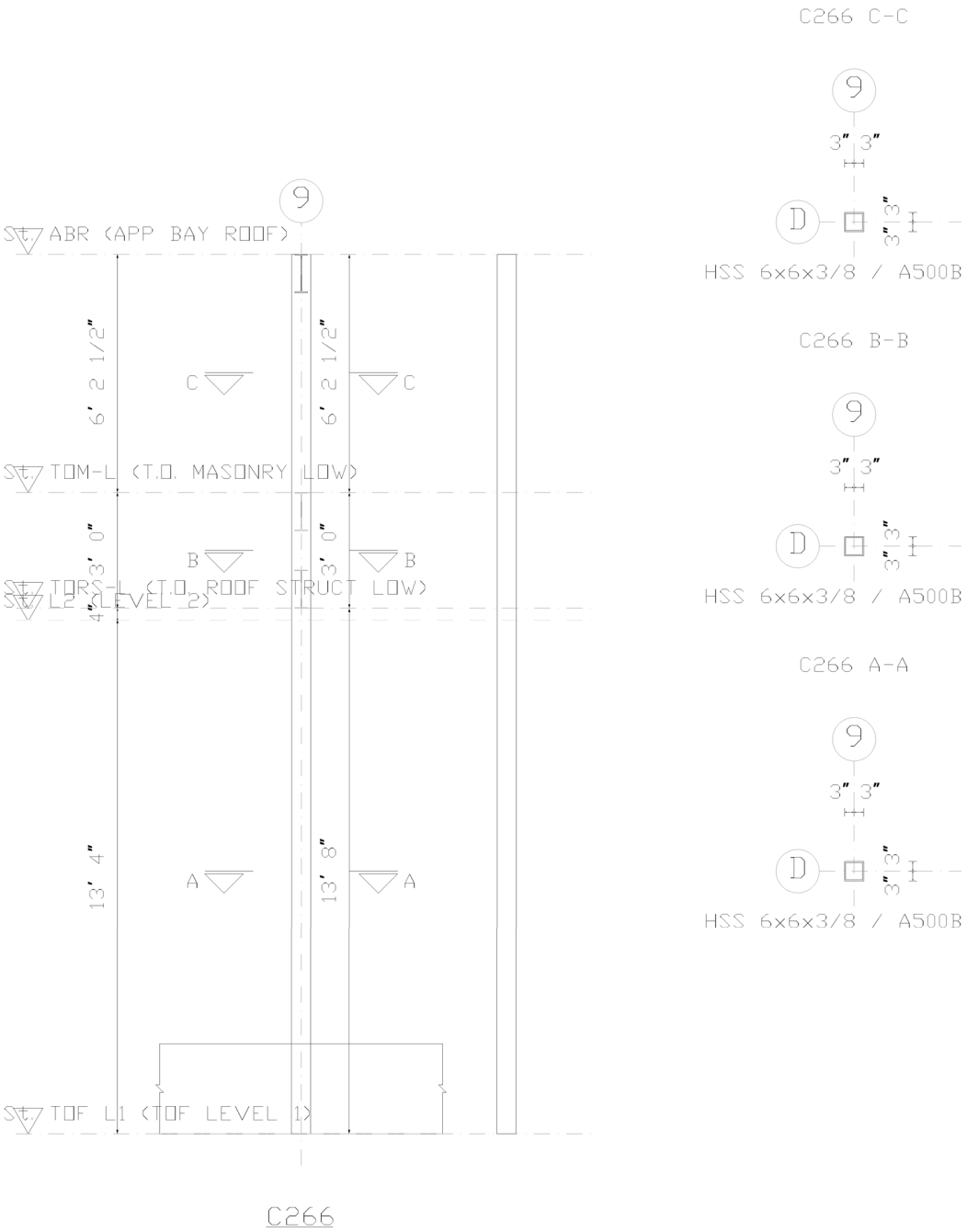
Summary HSS 6x6x1/2 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	249	4.3	106.4	kip	0.041	✔ Pass
Shear Minor	256	-6.6	106.4	kip	0.062	✔ Pass
Flexure Major	253	-25.3	68.3	kip ft	0.370	✔ Pass
Flexure Minor	256	34.3	68.3	kip ft	0.502	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	18	38.0	285.1	kip	0.133	✔ Pass
Combined Forces	253	-	-	-	0.868	✔ Pass

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C266



C266

Static

Summary HSS 6x6x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	103	4.1	85.9	kip	0.048	✔ Pass

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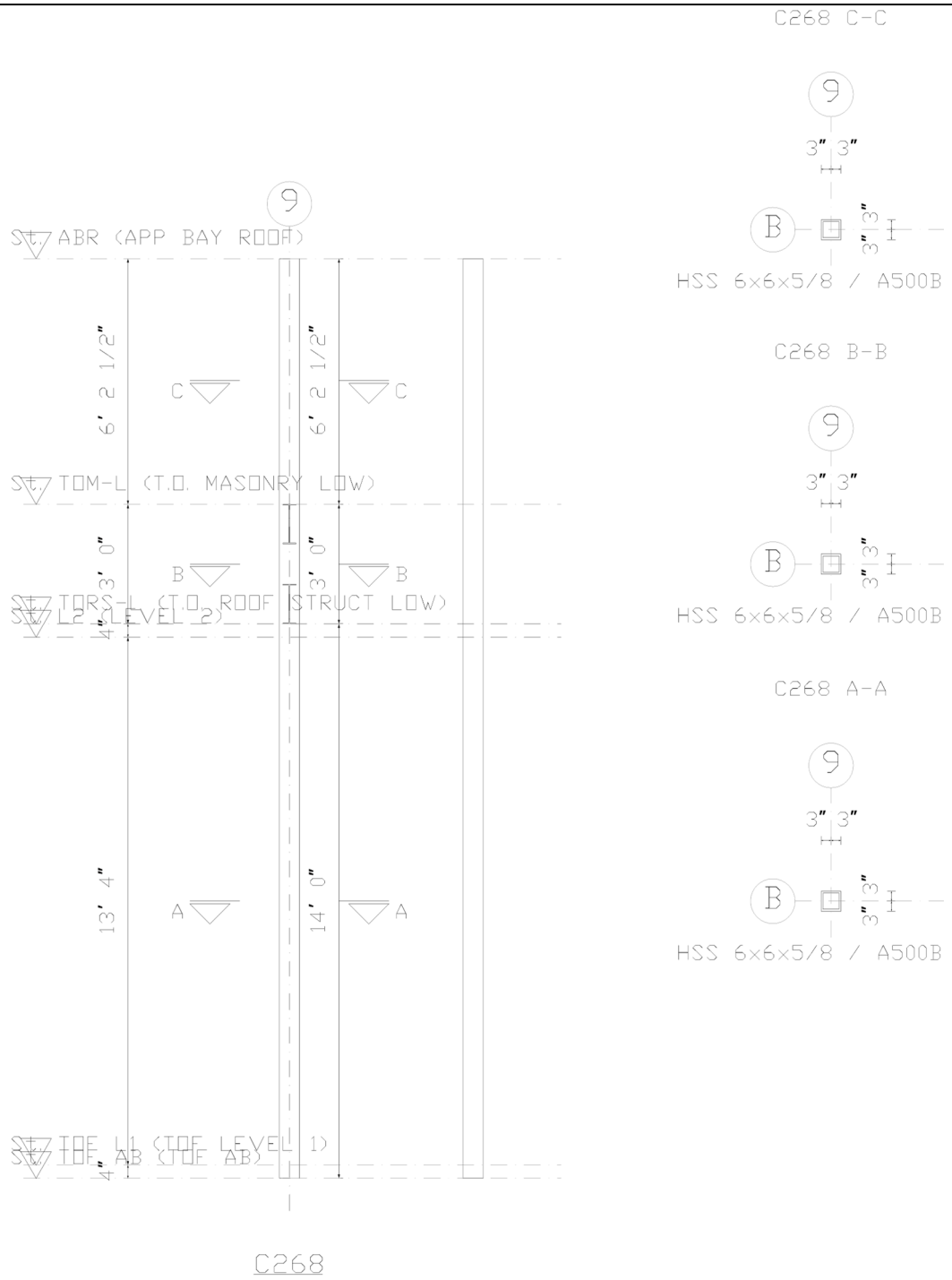
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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Minor	212	2.3	85.9	kip	0.026	Pass
Flexure Major	179	7.5	54.5	kip ft	0.137	Pass
Flexure Minor	211	-10.9	54.5	kip ft	0.200	Pass
Axial Tension	307	-2.1	313.8	kip	0.007	Pass
Axial Compression	139	7.7	118.1	kip	0.065	Pass
Combined Forces	179	-	-	-	0.340	Pass
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

C268

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Static

Summary HSS 6x6x5/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass

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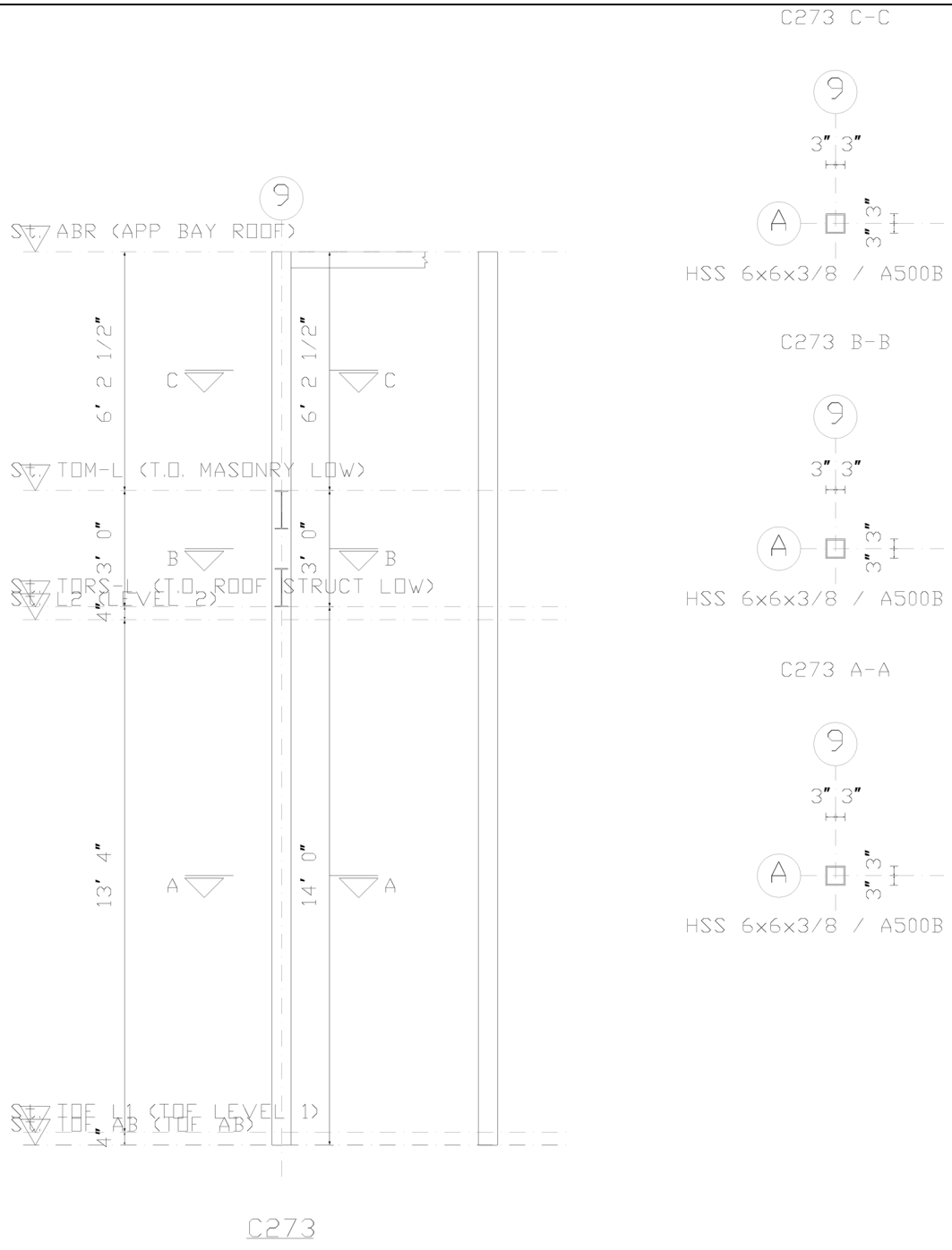
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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Major	267	-3.5	122.9	kip	0.029	Pass
Shear Minor	307	-3.5	122.9	kip	0.029	Pass
Flexure Major	139	-12.8	80.0	kip ft	0.160	Pass
Flexure Minor	244	20.2	80.0	kip ft	0.252	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	128	23.5	160.5	kip	0.147	Pass
Combined Forces	276	-	-	-	0.439	Pass
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

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Project Name: FIRE STATION 5		



Static

Summary HSS 6x6x3/8 (A500B-46)

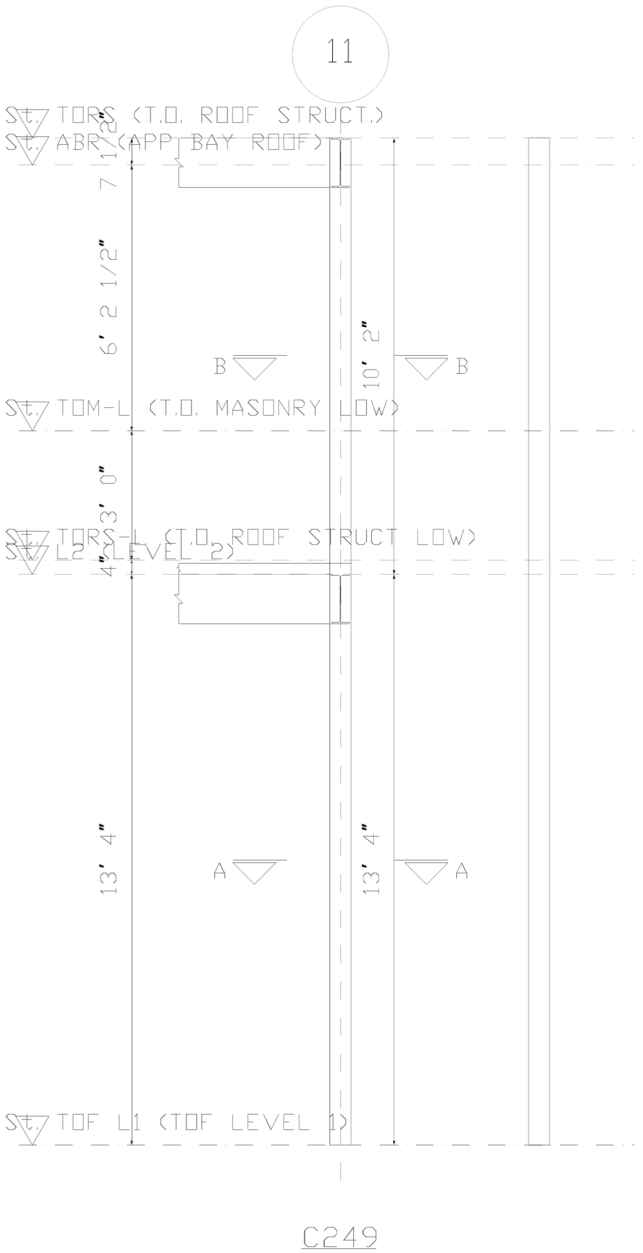
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	103	1.6	85.9	kip	0.018	✔ Pass

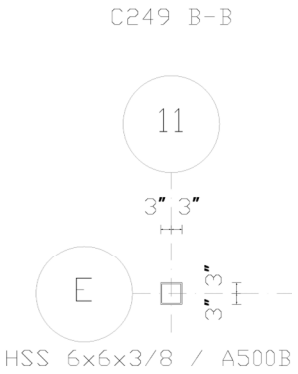
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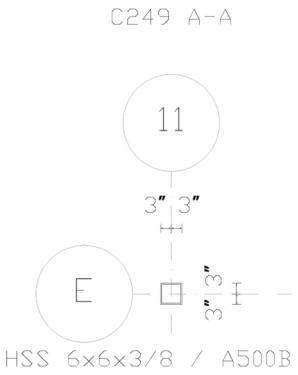
Made by: JMB	Date: 10/17/2022	Job No. 21-18
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Project Name: FIRE STATION 5		

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Minor	256	0.4	85.9	kip	0.004	✔ Pass
Flexure Major	103	6.5	54.5	kip ft	0.119	✔ Pass
Flexure Minor	256	0.3	54.5	kip ft	0.006	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	122	7.8	292.0	kip	0.027	✔ Pass
Combined Forces	112	-	-	-	0.136	✔ Pass

C249







Static

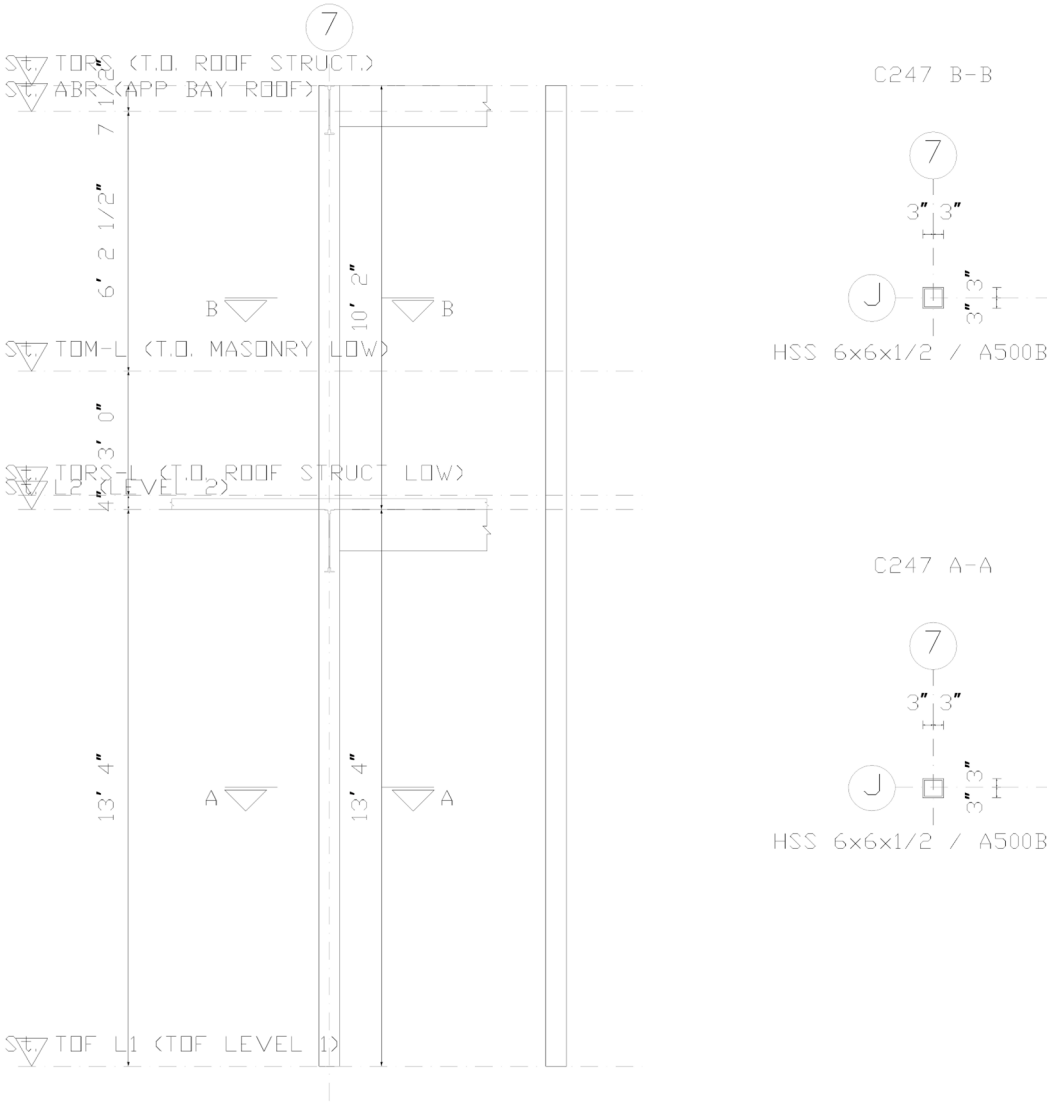
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Project Name: FIRE STATION 5		

Summary HSS 6x6x3/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	234	1.4	85.9	kip	0.017	✔ Pass
Shear Minor	224	4.9	85.9	kip	0.057	✔ Pass
Flexure Major	234	-7.3	54.5	kip ft	0.135	✔ Pass
Flexure Minor	224	-27.0	54.5	kip ft	0.496	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	17	25.3	225.2	kip	0.112	✔ Pass
Combined Forces	234	-	-	-	0.617	✔ Pass

C247



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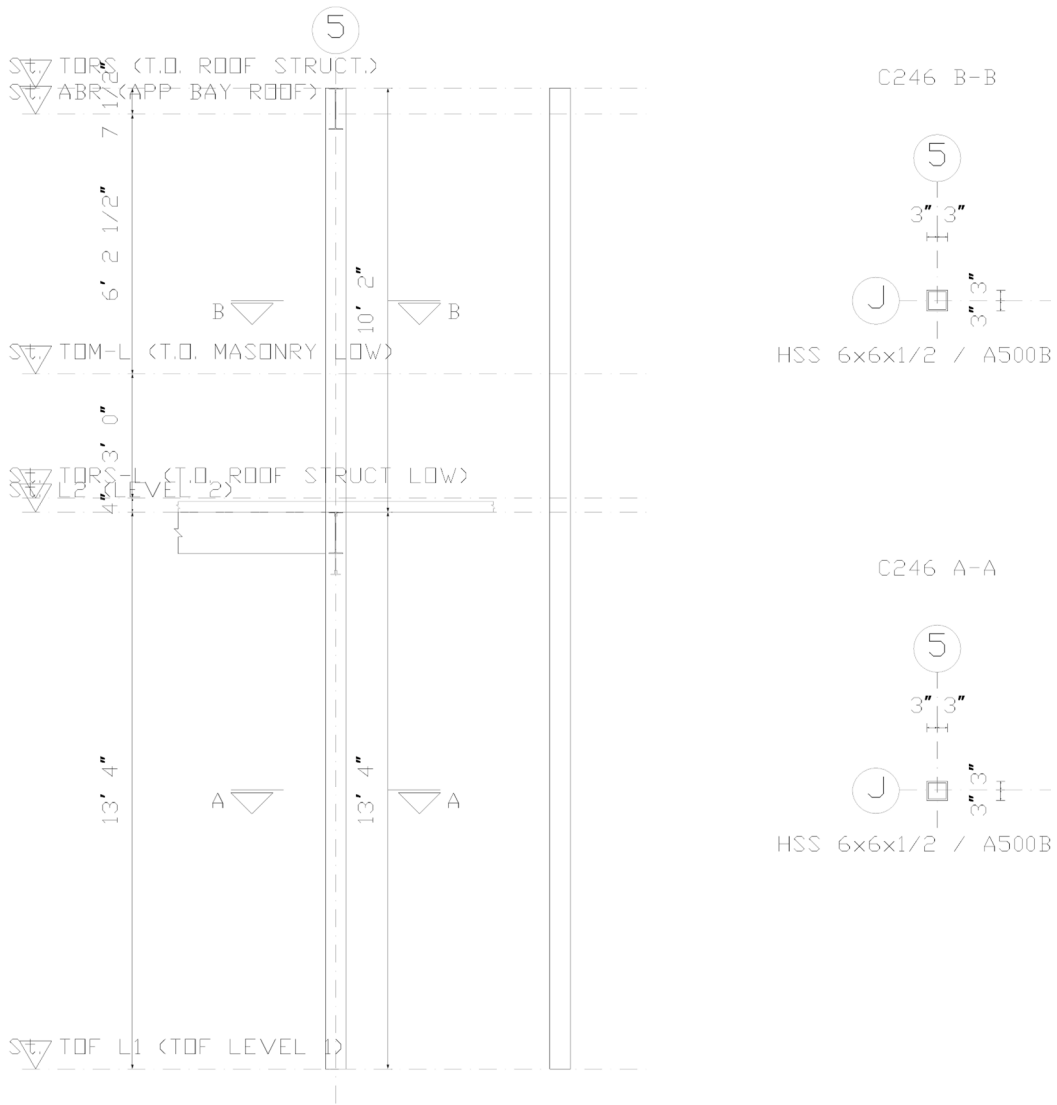
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Revision:	Date:	Sheet No. 775
Project Name: FIRE STATION 5		

Static

Summary HSS 6x6x1/2 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	179	0.3	106.4	kip	0.002	Pass
Shear Minor	27	7.3	106.4	kip	0.069	Pass
Flexure Major	179	-3.1	68.3	kip ft	0.046	Pass
Flexure Minor	27	38.6	68.3	kip ft	0.565	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	17	62.3	285.1	kip	0.218	Pass
Combined Forces	224	-	-	-	0.608	Pass

C246



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Static

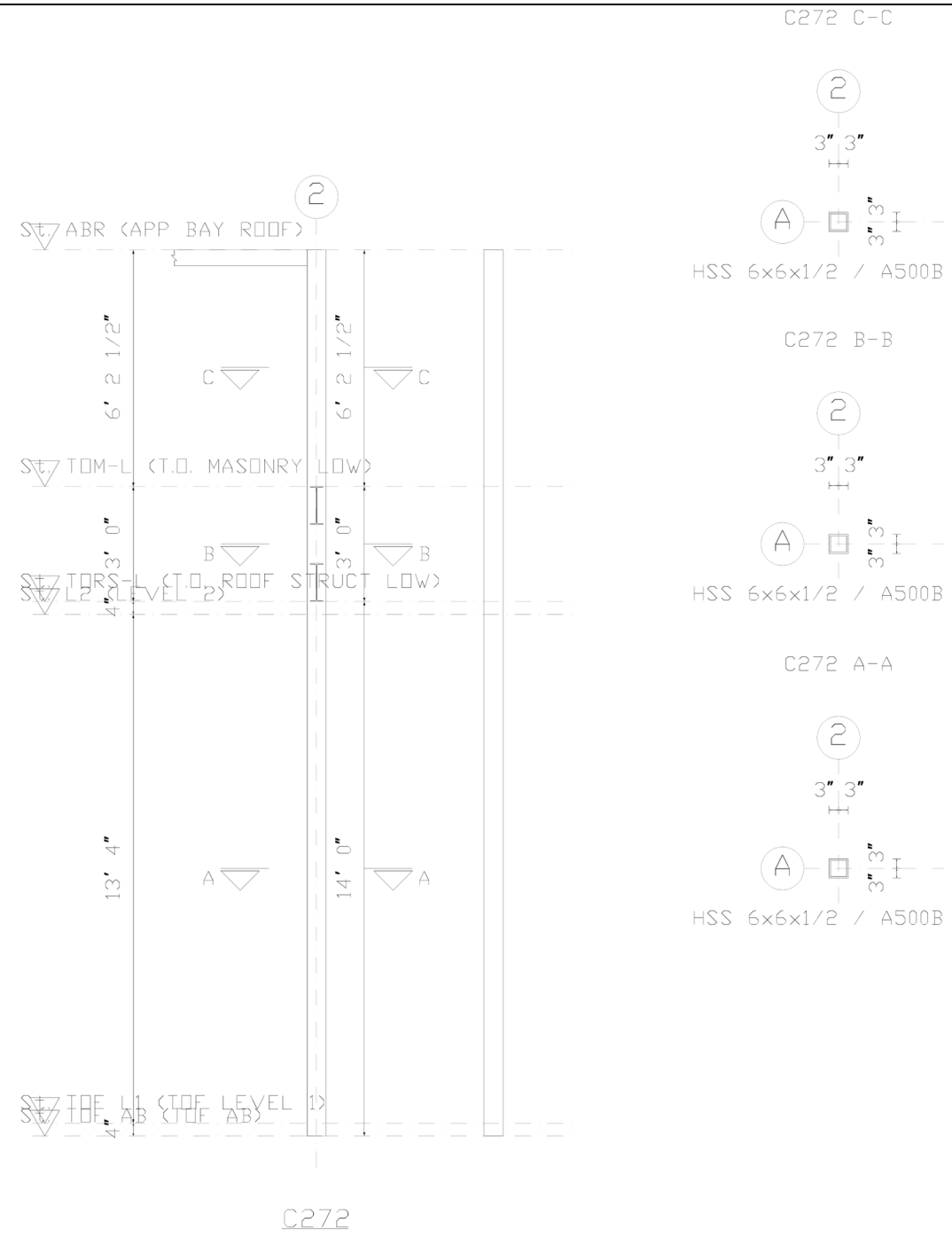
Summary HSS 6x6x1/2 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	179	0.3	106.4	kip	0.003	✔ Pass
Shear Minor	256	-6.8	106.4	kip	0.063	✔ Pass
Flexure Major	179	-3.3	68.3	kip ft	0.048	✔ Pass
Flexure Minor	256	36.4	68.3	kip ft	0.533	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	18	65.0	285.1	kip	0.228	✔ Pass
Combined Forces	256	-	-	-	0.565	✔ Pass

C272

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Project Name: FIRE STATION 5		



Static

Summary HSS 6x6x1/2 (A500B-46)

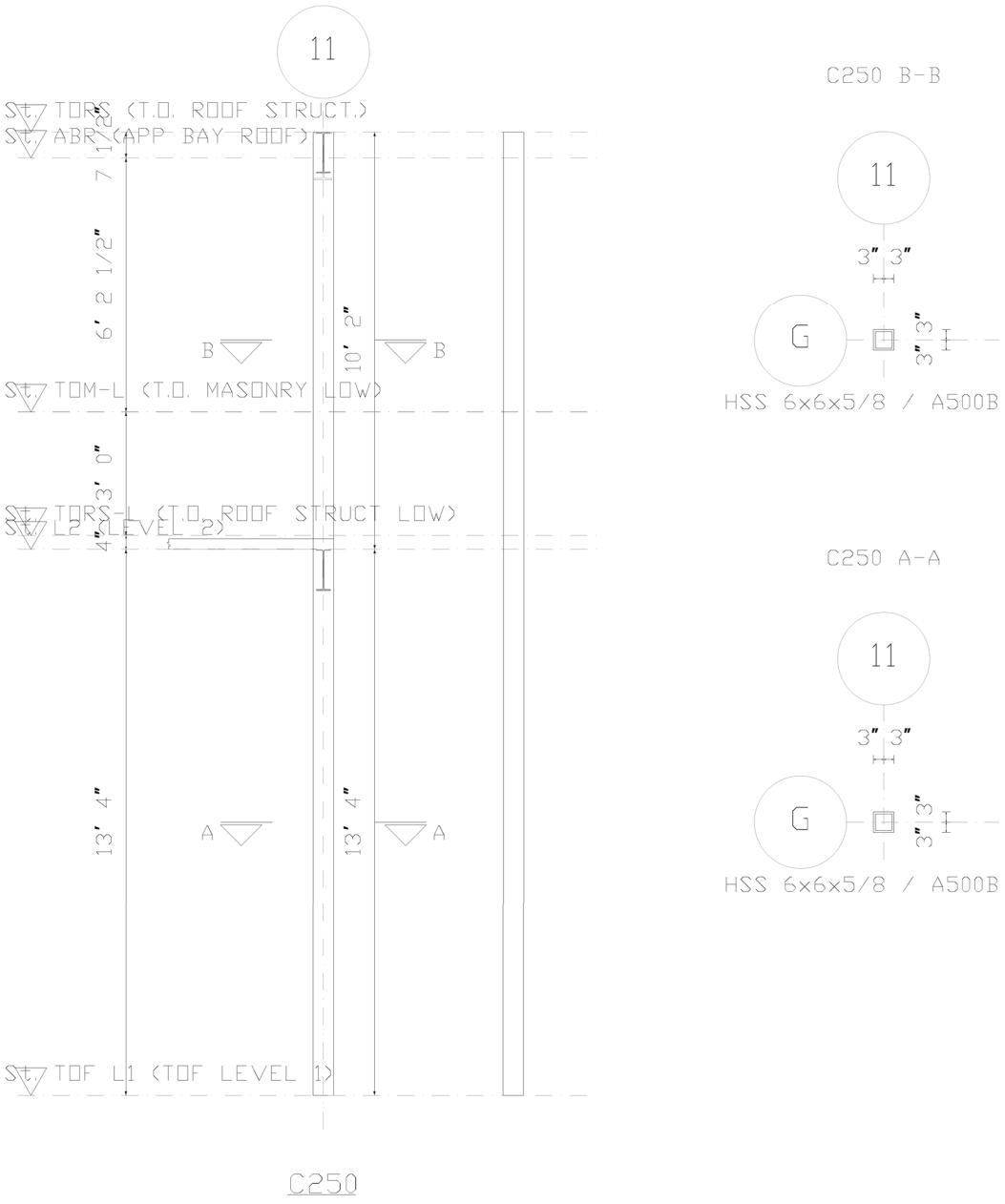
Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	✔ Pass
Flexural Classification	1	Compact	-	-	-	✔ Pass
Shear Major	119	1.8	106.4	kip	0.017	✔ Pass

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Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Shear Minor	224	-0.4	106.4	kip	0.004	✔ Pass
Flexure Major	119	7.7	68.3	kip ft	0.113	✔ Pass
Flexure Minor	224	-0.3	68.3	kip ft	0.005	✔ Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	139	6.2	275.2	kip	0.023	✔ Pass
Combined Forces	112	-	-	-	0.127	✔ Pass

C250



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Summary HSS 6x6x5/8 (A500B-46)

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Axial Classification	1	Non-slender	-	-	-	Pass
Flexural Classification	1	Compact	-	-	-	Pass
Shear Major	170	0.3	122.9	kip	0.003	Pass
Shear Minor	228	0.3	122.9	kip	0.002	Pass
Flexure Major	170	-4.2	80.0	kip ft	0.053	Pass
Flexure Minor	228	-3.1	80.0	kip ft	0.038	Pass
Axial Tension	No	Significant	Forces	kip	-	Not required
Axial Compression	20	12.3	335.9	kip	0.037	Pass
Combined Forces	238	-	-	-	0.099	Pass
Design Note	Top & Bottom Flanges Laterally Restrained					Warning
Design Note	Major and/or Minor Axes Strut Restrained					Warning

Concrete

Slab/Mat Design

Slab/Mat Design per Plane

St. TOF L1 (TOF LEVEL 1)

Slab/Mat Panels

Mat: MF 1, Panel: SI 2

Static & RSA

Reinforcement Design Summary

Reinforcement Layer	Reinforcement Provided	Area Provided [in²/ft]	Area Required [in²/ft]	Utilization
Bottom-X	#6-8"-B2	0.66	0.27	0.409
Bottom-Y	#6-8"-B1	0.66	0.32	0.481
Top-X	#6-8"-T2	0.66	0.19	0.285
Top-Y	#6-8"-T1	0.66	0.08	0.124

Bearing Pressure Summary

Bearing pressure checks	Max. value [ksf]	Limit [ksf]	Status	Utilization
Pressure	1.20	2.00	Pass	0.602

Static & RSA

Reinforcement Design Details

Bottom-X

Summary

Utilization ratio $A_{s,reqd} / A_{s,prov} = 0.409$

Analysis method First-order linear

Critical combination 29 (Final) $LRFD_{6.4}$-1.2D+L+1.6S+NL_{Dir2+}

Pass

Moment Capacity Check

$A_{s,prov\ X\ Bottom}$	0.66	in^2/ft
$M_{dX\ Bottom}$	-28.8	kip-ft/ft
$A_{s,req\ X\ Bottom}$	0.27	in^2/ft

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Utilization ratio $A_{s,reqd}$ / $A_{s,prov}$ = **0.409**

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bottom-Y

Summary

Utilization ratio	$A_{s,reqd}$ / $A_{s,prov}$ = **0.481**
Analysis method	First-order linear
Critical combination	29 (Final) $LRFD_{6.4}$-1.2D+L+1.6S+NL_{Dir2+}

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Bottom}$	0.66	in^2/ft
$M_{dY\ Bottom}$	-34.8	kip-ft/ft
$A_{s,req\ Y\ Bottom}$	0.32	in^2/ft

Utilization ratio $A_{s,reqd}$ / $A_{s,prov}$ = **0.481**

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-X

Summary

Utilization ratio	$A_{s,reqd}$ / $A_{s,prov}$ = **0.285**
Analysis method	First-order linear
Critical combination	30 (Final) $LRFD_{6.5}$-1.2D+L+1.6S+NL_{Dir2-}

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Top}$	0.66	in^2/ft
$M_{dX\ Top}$	20.1	kip-ft/ft
$A_{s,req\ X\ Top}$	0.19	in^2/ft

Utilization ratio $A_{s,reqd}$ / $A_{s,prov}$ = **0.285**

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass
Check Maximum Diameter	Pass

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Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-Y

Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.124**
Analysis method	First-order linear
Critical combination	27 (Final) $LRFD_{6.2}$-1.2D+L+1.6S+NL_{Dir1+}

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Top}$	0.66	in^2/ft
$M_{dY\ Top}$	9.0	kip-ft/ft
$A_{s,req\ Y\ Top}$	0.08	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.124**	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bearing Capacity

First-order linear

Max base pressure, q_{max}	1.20	ksf
Critical combination	112 (Final) $LRFD_{8.18}$-1.2D+1.6S+0.5W	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.602	
Pressure status	✔ Pass	

Grillage chase-down

Max base pressure, q_{max}	1.16	ksf
Critical combination	16 (Final) $LRFD_{4.1}$-1.2D+1.6L+0.5S	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.581	
Pressure status	✔ Pass	

FE chase-down

Max base pressure, q_{max}	1.16	ksf
Critical combination	16 (Final) $LRFD_{4.1}$-1.2D+1.6L+0.5S	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.579	
Pressure status	✔ Pass	

Tension Check

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First-order linear

Min base pressure, q_{min} 0.34 ksf

Critical combination 323 (Final) $LRFD_{12.37}$-0.9D+W

Tension status ✔ Pass

Grillage chase-down

Min base pressure, q_{min} 0.72 ksf

Critical combination 1 (Final) $LRFD_1$-1.4D

Tension status ✔ Pass

FE chase-down

Min base pressure, q_{min} 0.72 ksf

Critical combination 1 (Final) $LRFD_1$-1.4D

Tension status ✔ Pass

Mat: MF 1, Panel: SI 3

Static & RSA

Reinforcement Design Summary

Reinforcement Layer	Reinforcement Provided	Area Provided [in^2/ft]	Area Required [in^2/ft]	Utilization
Bottom-X	#6-8″-B2	0.66	0.07	0.104
Bottom-Y	#6-8″-B1	0.66	0.04	0.065
Top-X	#6-8″-T2	0.66	0.05	0.072
Top-Y	#6-8″-T1	0.66	0.06	0.098

Bearing Pressure Summary

Bearing pressure checks	Max. value [ksf]	Limit [ksf]	Status	Utilization
Pressure	1.24	2.00	✔ Pass	0.620

Static & RSA

Reinforcement Design Details

Bottom-X

Summary

Utilization ratio **$A_{s,reqd}$ / $A_{s,prov}$ = 0.104**

Analysis method First-order linear

Critical combination 29 (Final) $LRFD_{6.4}$-1.2D+L+1.6S+NL_{Dir2+}

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Bottom}$ 0.66 in^2/ft

$M_{dX\ Bottom}$ -8.1 kip-ft/ft

$A_{s,req\ X\ Bottom}$ 0.07 in^2/ft

Utilization ratio **$A_{s,reqd}$ / $A_{s,prov}$ = 0.104**

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter Pass

Check Maximum Diameter Pass

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Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bottom-Y

Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.065**
Analysis method	First-order linear
Critical combination	29 (Final) $LRFD_{6.4}$-1.2D+L+1.6S+NL_{Dir2+}

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Bottom}$	0.66	in^2/ft
$M_{dY\ Bottom}$	-5.1	kip-ft/ft
$A_{s,req\ Y\ Bottom}$	0.04	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.065**	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-X

Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.072**
Analysis method	First-order linear
Critical combination	27 (Final) $LRFD_{6.2}$-1.2D+L+1.6S+NL_{Dir1+}

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Top}$	0.66	in^2/ft
$M_{dX\ Top}$	5.6	kip-ft/ft
$A_{s,req\ X\ Top}$	0.05	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.072**	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-Y

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Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.098**
Analysis method	First-order linear
Critical combination	29 (Final) $LRFD_{6.4}$-1.2D+L+1.6S+NL_{Dir2+}

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Top}$	0.66	in^2/ft
$M_{dY\ Top}$	7.8	kip-ft/ft
$A_{s,req\ Y\ Top}$	0.06	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.098**	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bearing Capacity

First-order linear

Max base pressure, q_{max}	1.24	ksf
Critical combination	256 (Final) $LRFD_{10.34}$-1.2D+L+0.5S+W	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.620	
Pressure status	✔ Pass	

Grillage chase-down

Max base pressure, q_{max}	1.22	ksf
Critical combination	16 (Final) $LRFD_{4.1}$-1.2D+1.6L+0.5S	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.611	
Pressure status	✔ Pass	

FE chase-down

Max base pressure, q_{max}	1.22	ksf
Critical combination	16 (Final) $LRFD_{4.1}$-1.2D+1.6L+0.5S	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.612	
Pressure status	✔ Pass	

Tension Check

First-order linear

Min base pressure, q_{min}	0.44	ksf
Critical combination	291 (Final) $LRFD_{12.5}$-0.9D+W	
Tension status	✔ Pass	

Grillage chase-down

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Min base pressure, q_{min} 0.90 ksf
Critical combination 1 (Final) $LRFD_1$-1.4D
Tension status ✔ Pass

FE chase-down
Min base pressure, q_{min} 0.90 ksf
Critical combination 1 (Final) $LRFD_1$-1.4D
Tension status ✔ Pass

Mat: MF 1, Panel: SI 4
Static & RSA
Reinforcement Design Summary

Reinforcement Layer	Reinforcement Provided	Area Provided [in²/ft]	Area Required [in²/ft]	Utilization
Bottom-X	#6-8″-B2	0.66	0.04	0.057
Bottom-Y	#6-8″-B1	0.66	0.06	0.091
Top-X	#6-8″-T2	0.66	0.02	0.035
Top-Y	#6-8″-T1	0.66	0.02	0.027

Bearing Pressure Summary

Bearing pressure checks	Max. value [ksf]	Limit [ksf]	Status	Utilization
Pressure	1.31	2.00	✔ Pass	0.653

Static & RSA
Reinforcement Design Details
Bottom-X
Summary
Utilization ratio **$A_{s,reqd}$ / $A_{s,prov}$ = 0.057**
Analysis method First-order linear
Critical combination 20 (Final) $LRFD_{4.5}$-1.2D+1.6L+0.5S+NL_{Dir2-}
✔ Pass

Moment Capacity Check
$A_{s,prov\ X\ Bottom}$ 0.66 in²/ft
$M_{dX\ Bottom}$ -4.4 kip-ft/ft
$A_{s,req\ X\ Bottom}$ 0.04 in²/ft
Utilization ratio **$A_{s,reqd}$ / $A_{s,prov}$ = 0.057**
✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bottom-Y
Summary

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Utilization ratio $A_{s,reqd}$ / $A_{s,prov}$ = **0.091**
Analysis method First-order linear
Critical combination 30 (Final) LRFD$_{6.5}$-1.2D+L+1.6S+NL$_{Dir2-}$

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Bottom}$	0.66	in^2/ft
$M_{dY\ Bottom}$	-7.2	kip-ft/ft
$A_{s,req\ Y\ Bottom}$	0.06	in^2/ft

Utilization ratio $A_{s,reqd}$ / $A_{s,prov}$ = **0.091**

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-X

Summary

Utilization ratio $A_{s,reqd}$ / $A_{s,prov}$ = **0.035**
Analysis method First-order linear
Critical combination 105 (Final) LRFD$_{8.11}$-1.2D+1.6S+0.5W

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Top}$	0.66	in^2/ft
$M_{dX\ Top}$	2.7	kip-ft/ft
$A_{s,req\ X\ Top}$	0.02	in^2/ft

Utilization ratio $A_{s,reqd}$ / $A_{s,prov}$ = **0.035**

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-Y

Summary

Utilization ratio $A_{s,reqd}$ / $A_{s,prov}$ = **0.027**
Analysis method First-order linear
Critical combination 105 (Final) LRFD$_{8.11}$-1.2D+1.6S+0.5W

✔ Pass

Moment Capacity Check

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$A_{s,prov\ Y\ Top}$	0.66	in^2/ft
$M_{dY\ Top}$	2.2	kip-ft/ft
$A_{s,req\ Y\ Top}$	0.02	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.027**	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bearing Capacity

First-order linear

Max base pressure, q_{max}	1.31	ksf
Critical combination	268 (Final) $LRFD_{10.46}$-1.2D+L+0.5S+W	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.653	
Pressure status	✔ Pass	

Grillage chase-down

Max base pressure, q_{max}	1.28	ksf
Critical combination	16 (Final) $LRFD_{4.1}$-1.2D+1.6L+0.5S	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.638	
Pressure status	✔ Pass	

FE chase-down

Max base pressure, q_{max}	1.28	ksf
Critical combination	16 (Final) $LRFD_{4.1}$-1.2D+1.6L+0.5S	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.640	
Pressure status	✔ Pass	

Tension Check

First-order linear

Min base pressure, q_{min}	0.46	ksf
Critical combination	307 (Final) $LRFD_{12.21}$-0.9D+W	
Tension status	✔ Pass	

Grillage chase-down

Min base pressure, q_{min}	0.87	ksf
Critical combination	1 (Final) $LRFD_1$-1.4D	
Tension status	✔ Pass	

FE chase-down

Min base pressure, q_{min}	0.87	ksf

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Critical combination 1 (Final) LRFD$_1$-1.4D
Tension status ✔ Pass

Mat: MF 1, Panel: SI 5
Static & RSA
Reinforcement Design Summary

Reinforcement Layer	Reinforcement Provided	Area Provided [in²/ft]	Area Required [in²/ft]	Utilization
Bottom-X	#6-8″-B2	0.66	0.02	0.025
Bottom-Y	#6-8″-B1	0.66	0.03	0.051
Top-X	#6-8″-T2	0.66	0.03	0.039
Top-Y	#6-8″-T1	0.66	0.01	0.017

Bearing Pressure Summary

Bearing pressure checks	Max. value [ksf]	Limit [ksf]	Status	Utilization
Pressure	1.11	2.00	✔ Pass	0.554

Static & RSA
Reinforcement Design Details
Bottom-X
Summary
Utilization ratio $\mathbf{A_{s,reqd} / A_{s,prov} = 0.025}$
Analysis method First-order linear
Critical combination 20 (Final) LRFD$_{4.5}$-1.2D+1.6L+0.5S+NL$_{Dir2-}$
✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Bottom}$	0.66	in²/ft
$M_{dX\ Bottom}$	-2.0	kip-ft/ft
$A_{s,req\ X\ Bottom}$	0.02	in²/ft

Utilization ratio $\mathbf{A_{s,reqd} / A_{s,prov} = 0.025}$
✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bottom-Y
Summary
Utilization ratio $\mathbf{A_{s,reqd} / A_{s,prov} = 0.051}$
Analysis method FE chase-down
Critical combination 26 (Final) LRFD$_{6.1}$-1.2D+L+1.6S
✔ Pass

Moment Capacity Check

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$A_{s,prov\ Y\ Bottom}$	0.66	in^2/ft
$M_{dY\ Bottom}$	-4.1	kip-ft/ft
$A_{s,req\ Y\ Bottom}$	0.03	in^2/ft
Utilization ratio	**$A_{s,reqd} / A_{s,prov}$ = 0.051**	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-X

Summary

Utilization ratio	**$A_{s,reqd} / A_{s,prov}$ = 0.039**
Analysis method	First-order linear
Critical combination	29 (Final) $LRFD_{6.4}$-1.2D+L+1.6S+NL_{Dir2+}

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Top}$	0.66	in^2/ft
$M_{dX\ Top}$	3.0	kip-ft/ft
$A_{s,req\ X\ Top}$	0.03	in^2/ft
Utilization ratio	**$A_{s,reqd} / A_{s,prov}$ = 0.039**	

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-Y

Summary

Utilization ratio	**$A_{s,reqd} / A_{s,prov}$ = 0.017**
Analysis method	First-order linear
Critical combination	27 (Final) $LRFD_{6.2}$-1.2D+L+1.6S+NL_{Dir1+}

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Top}$	0.66	in^2/ft
$M_{dY\ Top}$	1.3	kip-ft/ft
$A_{s,req\ Y\ Top}$	0.01	in^2/ft
Utilization ratio	**$A_{s,reqd} / A_{s,prov}$ = 0.017**	

✔ Pass

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Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bearing Capacity

First-order linear

Max base pressure, q_{max}	1.11	ksf
Critical combination	284 (Final) $LRFD_{10.62}$-1.2D+L+0.5S+W	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.554	
Pressure status	✔ Pass	

Grillage chase-down

Max base pressure, q_{max}	1.08	ksf
Critical combination	16 (Final) $LRFD_{4.1}$-1.2D+1.6L+0.5S	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.542	
Pressure status	✔ Pass	

FE chase-down

Max base pressure, q_{max}	1.09	ksf
Critical combination	16 (Final) $LRFD_{4.1}$-1.2D+1.6L+0.5S	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.544	
Pressure status	✔ Pass	

Tension Check

First-order linear

Min base pressure, q_{min}	0.45	ksf
Critical combination	307 (Final) $LRFD_{12.21}$-0.9D+W	
Tension status	✔ Pass	

Grillage chase-down

Min base pressure, q_{min}	0.84	ksf
Critical combination	1 (Final) $LRFD_1$-1.4D	
Tension status	✔ Pass	

FE chase-down

Min base pressure, q_{min}	0.84	ksf
Critical combination	1 (Final) $LRFD_1$-1.4D	
Tension status	✔ Pass	

Mat: MF 1, Panel: SI 6

Static & RSA

Reinforcement Design Summary

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Reinforcement Layer	Reinforcement Provided	Area Provided [in²/ft]	Area Required [in²/ft]	Utilization
Bottom-X	#6-8″-B2	0.66	0.03	0.045
Bottom-Y	#6-8″-B1	0.66	0.03	0.049
Top-X	#6-8″-T2	0.66	0.04	0.059
Top-Y	#6-8″-T1	0.66	0.03	0.040

Bearing Pressure Summary

Bearing pressure checks	Max. value [ksf]	Limit [ksf]	Status	Utilization
Pressure	1.09	2.00	✔ Pass	0.545

Static & RSA

Reinforcement Design Details

Bottom-X

Summary

Utilization ratio $A_{s,reqd} / A_{s,prov}$ = **0.045**

Analysis method First-order linear

Critical combination 29 (Final) $LRFD_{6.4}$-1.2D+L+1.6S+NL_{Dir2+}

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Bottom}$	0.66	in²/ft
$M_{dX\ Bottom}$	-3.5	kip-ft/ft
$A_{s,req\ X\ Bottom}$	0.03	in²/ft

Utilization ratio $A_{s,reqd} / A_{s,prov}$ = **0.045**

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bottom-Y

Summary

Utilization ratio $A_{s,reqd} / A_{s,prov}$ = **0.049**

Analysis method First-order linear

Critical combination 29 (Final) $LRFD_{6.4}$-1.2D+L+1.6S+NL_{Dir2+}

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Bottom}$	0.66	in²/ft
$M_{dY\ Bottom}$	-3.9	kip-ft/ft
$A_{s,req\ Y\ Bottom}$	0.03	in²/ft

Utilization ratio $A_{s,reqd} / A_{s,prov}$ = **0.049**

✔ Pass

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Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-X

Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.059**
Analysis method	First-order linear
Critical combination	30 (Final) LRFD$_{6.5}$-1.2D+L+1.6S+NL$_{Dir2-}$

Pass

Moment Capacity Check

$A_{s,prov\ X\ Top}$	0.66	in^2/ft
$M_{dX\ Top}$	4.5	kip-ft/ft
$A_{s,req\ X\ Top}$	0.04	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.059**	

Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-Y

Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.040**
Analysis method	First-order linear
Critical combination	29 (Final) LRFD$_{6.4}$-1.2D+L+1.6S+NL$_{Dir2+}$

Pass

Moment Capacity Check

$A_{s,prov\ Y\ Top}$	0.66	in^2/ft
$M_{dY\ Top}$	3.2	kip-ft/ft
$A_{s,req\ Y\ Top}$	0.03	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.040**	

Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1

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Check Maximum Area of Reinforcement Pass ACI 318-14 Section 8.3.3.1

Bearing Capacity

First-order linear

Max base pressure, q_{max}	1.09	ksf
Critical combination	284 (Final) $LRFD_{10.62}$-1.2D+L+0.5S+W	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.545	
Pressure status	✔ Pass	

Grillage chase-down

Max base pressure, q_{max}	1.06	ksf
Critical combination	16 (Final) $LRFD_{4.1}$-1.2D+1.6L+0.5S	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.532	
Pressure status	✔ Pass	

FE chase-down

Max base pressure, q_{max}	1.07	ksf
Critical combination	16 (Final) $LRFD_{4.1}$-1.2D+1.6L+0.5S	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.534	
Pressure status	✔ Pass	

Tension Check

First-order linear

Min base pressure, q_{min}	0.39	ksf
Critical combination	323 (Final) $LRFD_{12.37}$-0.9D+W	
Tension status	✔ Pass	

Grillage chase-down

Min base pressure, q_{min}	0.78	ksf
Critical combination	1 (Final) $LRFD_1$-1.4D	
Tension status	✔ Pass	

FE chase-down

Min base pressure, q_{min}	0.78	ksf
Critical combination	1 (Final) $LRFD_1$-1.4D	
Tension status	✔ Pass	

St. TOF AB (TOF AB)

Slab/Mat Panels

Mat: MF 2, Panel: SI 7

Static & RSA

Reinforcement Design Summary

Reinforcement Layer	Reinforcement Provided	Area Provided [in²/ft]	Area Required [in²/ft]	Utilization
Bottom-X	#6-8″-B2	0.66	0.11	0.166
Bottom-Y	#6-8″-B1	0.66	0.11	0.171

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Reinforcement Layer	Reinforcement Provided	Area Provided [in²/ft]	Area Required [in²/ft]	Utilization
Top-X	#6-6″-T2	0.88	0.01	0.008
Top-Y	#6-8″-T1	0.66	0.01	0.013

Bearing Pressure Summary

Bearing pressure checks	Max. value [ksf]	Limit [ksf]	Status	Utilization
Pressure	1.71	2.00	✔ Pass	0.857

Static & RSA

Reinforcement Design Details

Bottom-X

Summary

Utilization ratio **$A_{s,reqd}$ / $A_{s,prov}$ = 0.166**

Analysis method First-order linear

Critical combination 27 (Final) $LRFD_{6.2}$-1.2D+L+1.6S+NL_{Dir1+}

✔ Pass

Moment Capacity Check

$A_{s,prov\ X\ Bottom}$	0.66	in²/ft
$M_{dX\ Bottom}$	-11.8	kip-ft/ft
$A_{s,req\ X\ Bottom}$	0.11	in²/ft

Utilization ratio **$A_{s,reqd}$ / $A_{s,prov}$ = 0.166**

✔ Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Bottom-Y

Summary

Utilization ratio **$A_{s,reqd}$ / $A_{s,prov}$ = 0.171**

Analysis method First-order linear

Critical combination 27 (Final) $LRFD_{6.2}$-1.2D+L+1.6S+NL_{Dir1+}

✔ Pass

Moment Capacity Check

$A_{s,prov\ Y\ Bottom}$	0.66	in²/ft
$M_{dY\ Bottom}$	-12.5	kip-ft/ft
$A_{s,req\ Y\ Bottom}$	0.11	in²/ft

Utilization ratio **$A_{s,reqd}$ / $A_{s,prov}$ = 0.171**

✔ Pass

Limiting Reinforcement Parameters Checks

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Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-X

Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.008**
Analysis method	First-order linear
Critical combination	287 (Final) $LRFD_{12.1}$-0.9D+W

Pass

Moment Capacity Check

$A_{s,prov\ X\ Top}$	0.88	in^2/ft
$M_{dX\ Top}$	0.7	kip-ft/ft
$A_{s,req\ X\ Top}$	0.01	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.008**	

Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

Top-Y

Summary

Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.013**
Analysis method	First-order linear
Critical combination	307 (Final) $LRFD_{12.21}$-0.9D+W

Pass

Moment Capacity Check

$A_{s,prov\ Y\ Top}$	0.66	in^2/ft
$M_{dY\ Top}$	0.9	kip-ft/ft
$A_{s,req\ Y\ Top}$	0.01	in^2/ft
Utilization ratio	**$A_{s,reqd}$ / $A_{s,prov}$ = 0.013**	

Pass

Limiting Reinforcement Parameters Checks

Check Minimum Diameter	Pass	
Check Maximum Diameter	Pass	
Check Minimum Bar Distance	Pass	ACI 318-14 Section 25.2.1
Check Maximum Spacing Tension Bars	Pass	ACI 318-14 Sections 8.7.2.2, 24.3 and 7.7.2.3
Check Minimum Area of Reinforcement	Pass	ACI 318-14 Section 8.6.1.1
Check Maximum Area of Reinforcement	Pass	ACI 318-14 Section 8.3.3.1

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Bearing Capacity

First-order linear

Max base pressure, q_{max}	1.71	ksf
Critical combination	272 (Final) $LRFD_{10.50}$-1.2D+L+0.5S+W	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.857	
Pressure status	✔ Pass	

Grillage chase-down

Max base pressure, q_{max}	1.68	ksf
Critical combination	16 (Final) $LRFD_{4.1}$-1.2D+1.6L+0.5S	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.838	
Pressure status	✔ Pass	

FE chase-down

Max base pressure, q_{max}	1.67	ksf
Critical combination	16 (Final) $LRFD_{4.1}$-1.2D+1.6L+0.5S	
Allowable bearing pressure, q_a	2.00	ksf
Bearing capacity utilization ratio	0.833	
Pressure status	✔ Pass	

Tension Check

First-order linear

Min base pressure, q_{min}	0.24	ksf
Critical combination	307 (Final) $LRFD_{12.21}$-0.9D+W	
Tension status	✔ Pass	

Grillage chase-down

Min base pressure, q_{min}	0.64	ksf
Critical combination	1 (Final) $LRFD_1$-1.4D	
Tension status	✔ Pass	

FE chase-down

Min base pressure, q_{min}	0.64	ksf
Critical combination	1 (Final) $LRFD_1$-1.4D	
Tension status	✔ Pass	

Slab/Mat Design Summary

Static & RSA

Level	Slab	Reference	Type	Thickness [ft, in]	Grade	Utilization	Status
St. TOF AB (TOF AB) : -1' 0"ft, in	MF 2	SI 7	Foundation mat	2' 4"	4000 psi	0.914	✔ Pass
St. TOF L1 (TOF LEVEL 1) : -8"ft, in	MF 1	SI 4	Foundation mat	2' 4"	4000 psi	0.633	✔ Pass
St. TOF L1 (TOF LEVEL 1) : -8"ft, in	MF 1	SI 3	Foundation mat	2' 4"	4000 psi	0.608	✔ Pass
St. TOF L1 (TOF LEVEL 1) : -8"ft, in	MF 1	SI 2	Foundation mat	2' 4"	4000 psi	0.603	✔ Pass
St. TOF L1 (TOF LEVEL 1) : -8"ft, in	MF 1	SI 5	Foundation mat	2' 4"	4000 psi	0.553	✔ Pass
St. TOF L1 (TOF LEVEL 1) : -8"ft, in	MF 1	SI 6	Foundation mat	2' 4"	4000 psi	0.546	✔ Pass

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