



Supplemental

Structural Calculations For:

Adams Cargotecture

3508 96th Ave SE

Mercer Island, WA 98040

PERMIT REVIEW CYCLE 3

Prepared for: Sam Adams

Job #: 13074-2022-01

Date: April 3rd, 2025



SEATTLE
TACOMA
CENTRAL WA

2124 Third Avenue, Suite 100, Seattle, WA 98121
1818 Tacoma Avenue S, Suite 200, Tacoma, WA 98402
414 N Pearl Street, Suite 1, Ellensburg, WA 98926

206.443.6212
+ ssfengineers.com

Criteria Sheet

Codes

Structural IBC 2018
Loading ASCE 7-16
Wood: NDS 2018
Steel: AISC 360-16
Concrete: ACI 318-14
Masonry: TMS 402/602-16

Project Location

Street & Number 3508 96th ave se
City: Mercer Is State: WA
ZIP: 98040
Latitude: 47.5792 N
Longitude: ##### W
Ground Elevation 85 ft

Occupancy Category

Risk Category: II ASCE 7 Table 1.5-1

Seismic Load Summary:

Analysis Procedure: Equivalent Lateral Force Procedure
Lateral System: Light-frame Steel Walls Sheathed with Steel Sheets for Seismic Resistance (Custom System)
R: 2.00 $C_d = 2$
Base Shear $V = 36$ kips $\Omega_o = 2$
 $S_s = 1.395$ $S_r = 0.486$
 $S_{DS} = 0.93$ $S_{DI} = 0.59$
 $C_s = 0.465$ $I_E = 1.0$



Story Information

Stories Above Grade (Including Mezzanine Levels) 3

Horizontal and Vertical Irregularities:

Is the building a "Regular Structure"? (No horizontal or vertical irregularities) Yes

Wind Load Summary:

$V = 98$ $K_{ZT} = 1.00$
Exposure = C

Dead Loads:

Container Roof		Container Floor		Container Ceiling	
Roofing	2 psf	Flooring	2 psf	panels 2mm painted	4 psf
18ga Metal Decking	3 psf	1 1/8 Ply	3.6 psf	ME/Misc.	1.5 psf
2mm Steel Cont. Roof Panel	4 psf	C5 @ 12" oc	6.7 psf	nded Steel Framing	1 psf
Foam Insulation (10")	2 psf	HSS 6x4x5/16 Bott. Rail	4.77 psf	Foam Insulation (4")	1 psf
Ceiling Steel Framing	1 psf	Foam Insulation (4")	1 psf	2" Gypboard Ceiling	2.2 psf
Ceiling Finish	2.2 psf	ME/Misc.	1.5 psf		
Misc./Mech.	1 psf		19.6 psf		9.7 psf
Solar Panels	5 psf	Use	20 psf	Use	10 psf
	20.2 psf				
Use	21 psf				

Live Loads:

Roof	25 psf
Floor	40 psf
Deck	60 psf

Snow Loading Criteria:

Ground Snow, p_g	25 psf	Flat Roof Snow Load, p_f	25.0 psf
Exposure Factor, C_e	1.00	Sloped Roof Snow Load, p_s	25.0 psf
Thermal Factor, C_t	1.00		
Importance Factor, I_s	1.00		
Slope Factor, C_s	1.00		

Soils:

Soils Report Provided? Yes

Allowable Bearing	1500 psf	Active	55/35 pcf (Restrained/Unrestrained)
Allowable Sliding, μ	0.3	Seismic Surcharge	7H-14H
Allowable Passive	250 pcf		



ADAM CARGOTECTURE

Criteria

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET 1

Wind Design - MWFRS

ASCE 7 Chapter 27 - Directional Procedure

Design Method	Strength
---------------	----------

Wind Coefficients

Exposure	C	
V=	98	mph
K _d =	0.85	Table 26.6-1
K _h =	0.98	Table 26.10-1
K _e =	1.00	Table 26.9-1
G=	0.85	26.9.4

Transverse Wind Pressures

L/B = 0.40 h/L = 1.84

Pressure Coefficients from Figure 27.3-1:

Bldg Face	C _p
Windward Wall	0.8
Leeward Wall	-0.50
Windward Roof	-1.3 / -0.18
Leeward Roof	-0.70

Location and Building Dimensions

Calculate K _{zt} ?	Yes	
K _{zt}	1.00	
Roof Type	Monoslope	
Roof Slope - Transverse Dir	5	degrees
Roof Slope - Long Dir	0	degrees
Ground to top of roof	29.5	ft
Bot of roof to top of roof	0	ft
Mean Roof Height, h	29.5	ft
Short Plan Dimension	16	ft
Long Plan Dimension	40	ft
Parapet ?	No	
Ground to top of parapet		ft
Average Parapet Height		ft

Velocity Pressure at Mean Roof Height, q _h =	20.4	psf
---	------	-----

Wall Pressures (Unfactored):

Ht	K _z	q _z	P _{ww walls}	P _{lw walls}	Strength P _{walls} (psf)
0-15	0.85	17.71	12.04	8.67	20.7
15-20	0.9	18.75	12.75	8.67	21.4
20-25	0.94	19.58	13.32	8.67	22.0
25-30	0.98	20.42	13.88	8.67	22.6
30-40	1.04	21.67	14.73	8.67	23.4
41-50	1.09	22.71	15.44	8.67	24.1
51-60	1.13	23.54	16.01	8.67	24.7
61-70	1.17	24.38	16.58	8.67	25.2
71-80	1.21	25.21	17.14	8.67	25.8
81-90	1.24	25.83	17.57	8.67	26.2
91-100	1.26	26.25	17.85	8.67	26.5

Roof Pressures (Unfactored)

Windward		Leeward	Strength Horiz Proj (psf)
Max	Min		
-3.1	-22.5	-12.1	9.01

Longitudinal Wind Pressures

L/B = 2.50 h/L = 0.74

Pressure Coefficients from Figure 27.4-1:

Bldg Face	C _p
Windward Wall	0.8
Leeward Wall	-0.28
Windward Roof	-1.09 / -0.18
Leeward Roof	-0.70

Wall Pressures (Unfactored):

Ht	K _z	q _z	P _{ww walls}	P _{lw walls}	Strength P _{walls} (psf)
0-15	0.85	17.71	12.04	4.77	16.81
15-20	0.9	18.75	12.75	4.77	17.52
20-25	0.94	19.58	13.32	4.77	18.08
25-30	0.98	20.42	13.88	4.77	18.65
30-40	1.04	21.67	14.73	4.77	19.50
41-50	1.09	22.71	15.44	4.77	20.21
51-60	1.13	23.54	16.01	4.77	20.78
61-70	1.17	24.38	16.58	4.77	21.34
71-80	1.21	25.21	17.14	4.77	21.91
81-90	1.24	25.83	17.57	4.77	22.33
91-100	1.26	26.25	17.85	4.77	22.62

Roof Pressures (Unfactored)

Windward		Leeward	Strength Horiz Proj (psf)
Max	Min		
-3.1	-18.9	-12.1	9.01



ADAM CARGOTECTURE

Wind Criteria

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET 3

2124 Third Ave, Suite 100, Seattle, WA 98121
934 Broadway, Suite 100, Tacoma, WA 98402

SEATTLE
TACOMA

ssengineering.com

SWENSON SAY FAGET

Seismic Weight**Roof Diaphragm**

Roof Area	640 ft ²
Roof Diaphragm Weight	13.4 kip
Side Walls Weight	3.0 kip
Door Wall Weight	1.0 kip
End Wall Weight	1.0 kip
Weight	18 kip

3rd Floor Diaphragm

Floor Area	640 ft ²
Floor Diaphragm Weight	12.8 kip
Side Walls Weight	3.0 kip
Door Wall Weight	1.0 kip
End Wall Weight	1.0 kip
Weight	18 kip

2nd Floor Ceiling Diaphragm

Ceiling Floor Area	640 ft ²
Ceiling Diaphragm Weight	6.4 kip
Side Walls Weight	3.0 kip
Door Wall Weight	1.0 kip
End Wall Weight	1.0 kip
Weight	11 kip

2nd Floor Diaphragm

Floor Area	640 ft ²
Floor Diaphragm Weight	12.8 kip
Side Walls Weight	3.0 kip
Door Wall Weight	1.0 kip
End Wall Weight	1.0 kip
Weight	18 kip

1st Floor Ceiling Diaphragm

Ceiling Floor Area	640 ft ²
Ceiling Diaphragm Weight	6.4 kip
Side Walls Weight	3.0 kip
Door Wall Weight	1.0 kip
End Wall Weight	1.0 kip
Weight	11 kip

Seismic Weight Summary

	3rd Floor Diaphragm	2nd Floor Ceiling	2nd Floor Diaphragm	1st Floor Ceiling	Total	
Roof Diaphragm						
	18.4	17.7	17.7	11.3	76.4	kips

Material Weights**Roof Diaphragm**

Roofing	2.0 psf
Metal Decking 18ga	3 psf
Corrugated Panels 2mm painted	4 psf
ME/Misc.	1.0 psf
Ceiling Suspended Steel Framing	1.0 psf
Foam Insulation (10" total)	2.0 psf
1/2" Gypboard Ceiling	2.2 psf
Solar Panels	5 psf

Total	20.2 psf
Use	21 psf

Side Walls

HSS 8x4x3/16 Top Rail	0.36 plf
Corrugated Panels 1.6mm painted	3.6 psf

Total	4.0 psf
-------	---------

End Wall

HSS 8x4x3/16 Top Rail	1.82 psf
Top Corner Castings	100 lbs
HSS 6x6x1/4 Corner Posts	4.8 psf
Corrugated Panels 2.0mm painted	4 psf
Bottom Castings	50 lbs

Total	12.6 psf
-------	----------

Door Wall	same as End Wall	12.6 psf
-----------	------------------	----------

Floor Diaphragm

Flooring	2 psf
1 1/8 Ply	3.6 psf
C5 @ 12" oc	6.7 psf
HSS 6x4x5/16 Bott. Rail	4.8 psf
Foam Insulation (4")	1.0 psf
ME/Misc.	1.5 psf

Total	19.6 psf
Use	20 psf

Typical Ceiling Diaphragm

Corrugated Panels 2mm painted	4 psf
ME/Misc.	1.5 psf
Ceiling Suspended Steel Framing	1.0 psf
Foam Insulation (4")	1.0 psf
1/2" Gypboard Ceiling	2.2 psf

Total	9.7 psf
Use	10 psf

2124 Third Ave, Suite 100, Seattle, WA 98121
934 Broadway, Suite 100, Tacoma, WA 98402

SEATTLE
TACOMA

ssfengineers.com

SWENSON SAY FAGÉT



ADAM CARGOTECHTURE

Seismic Weight

4/3/2025

DATE

PROJ. #

LTN

DESIGN

SHEET

Future Addition**40' x 20' x 9.5' tall one-story future addition****Roof Diaphragm**

Roof Area 800 ft²
 Roof Diaphragm Weight 20.0 kip

Walls Area 475 ft²
 Walls Weight 4.8 kip

Weight 24.8 kip

Floor Diaphragm

Floor Area 800 ft²
 Floor Diaphragm Weight 17.6 kip

Walls Area 475 ft²
 Walls Weight 4.8 kip

Weight 22.4 kip

Future Addition**Material Weights****Roof Diaphragm**

Roofing 2.0 psf
 Metal Deck 18GA 3 psf
 Steel Framing 8 psf
 ME/Misc. 2.0 psf
 Foam Insulation (10" total) 2.0 psf
 1/2" Gypboard Ceiling 2.2 psf
 Solar Panels 5 psf

Total 24.2 psf
 Use 25 psf

Floor Diaphragm

Flooring 2.0 psf
 1-1/8" Plywood 3.6 psf
 Metal Deck 18GA 3 psf
 Steel Framing 11 psf
 Foam Insulation (4" total) 1.0 psf
 ME/Misc. 1.5 psf

Total 21.6 psf
 Use 22 psf

Typical Exterior Walls 10 psf



ADAM CARGOTECHTURE
 Future Addition Seismic Weight

4/3/2025
 DATE
 PROJ. #
 LTN
 DESIGN
 SHEET

Lateral Load Horizontal Distribution**Roof Diaphragm** Story Shear 13.7 kip

Direction	Line	Trib. Width	Load (kip)	Added Load (kip)	Total Load (kip)	Wall Length (ft)	Shear (plf)
N-S	Grid 1	8	6.9	0	6.9	12	571
N-S	Grid 3	8	6.9	0	6.9	10	685
E-W	Grid A	20	6.9	0	6.9	Braced Frame	
E-W	Grid E	20	6.9	0	6.9	Braced Frame	

3rd Floor Diaphragm Story Shear 22.6 kip

*Note: Added Load is from future addition.

Direction	Line	Trib. Width	Load (kip)	Added Load * (kip)	Total Load (kip)	Wall Length (ft)	Shear (plf)
N-S	Grid 1	8	11.3	0	11.3	12	942
N-S	Grid 3	8	11.3	7.55	18.9	10	1885
E-W	Grid A	20	11.3	7.55	18.9	8	2356
E-W	Grid E	20	11.3	7.55	18.9	8	2356

2nd Floor Ceiling Story Shear 28.2 kip

*Note: Added Load is from future addition.

Direction	Line	Trib. Width	Load (kip)	Added Load * (kip)	Total Load (kip)	Wall Length (ft)	Shear (plf)
N-S	Grid 1	8	14.1	0	14.1	12	1175
N-S	Grid 3	8	14.1	7.55	21.7	10	2165
E-W	Grid A	20	14.1	7.55	21.7	8	2706
E-W	Grid E	20	14.1	7.55	21.7	8	2706

2nd Floor Diaphragm Story Shear 32.7 kip

*Note: Added Load is from future addition.

Direction	Line	Trib. Width	Load (kip)	Added Load * (kip)	Total Load (kip)	Wall Length (ft)	Shear (plf)
N-S	Grid 1	8	16.4	0	16.4	15	1090
N-S	Grid 3	8	16.4	10.9	27.3	10	2725
E-W	Grid A	20	16.4	10.9	27.3	8	3406
E-W	Grid E	20	16.4	10.9	27.3	8	3406

1st Floor Ceiling Story Shear 35.5 kip

*Note: Added Load is from future addition.

Direction	Line	Trib. Width	Load (kip)	Added Load * (kip)	Total Load (kip)	Wall Length (ft)	Shear (plf)
N-S	Grid 1	8	17.8	0	17.8	15	1183
N-S	Grid 3	8	17.8	10.9	28.7	10	2865
E-W	Grid A	20	17.8	10.9	28.7	8	3581
E-W	Grid E	20	17.8	10.9	28.7	8	3581



ADAM CARGOTECHTURE
LATERAL LOAD HORIZONTAL DISTRIBUTION

DATE

4/3/2025

PROJ. #

DESIGN

LTN

SHEET

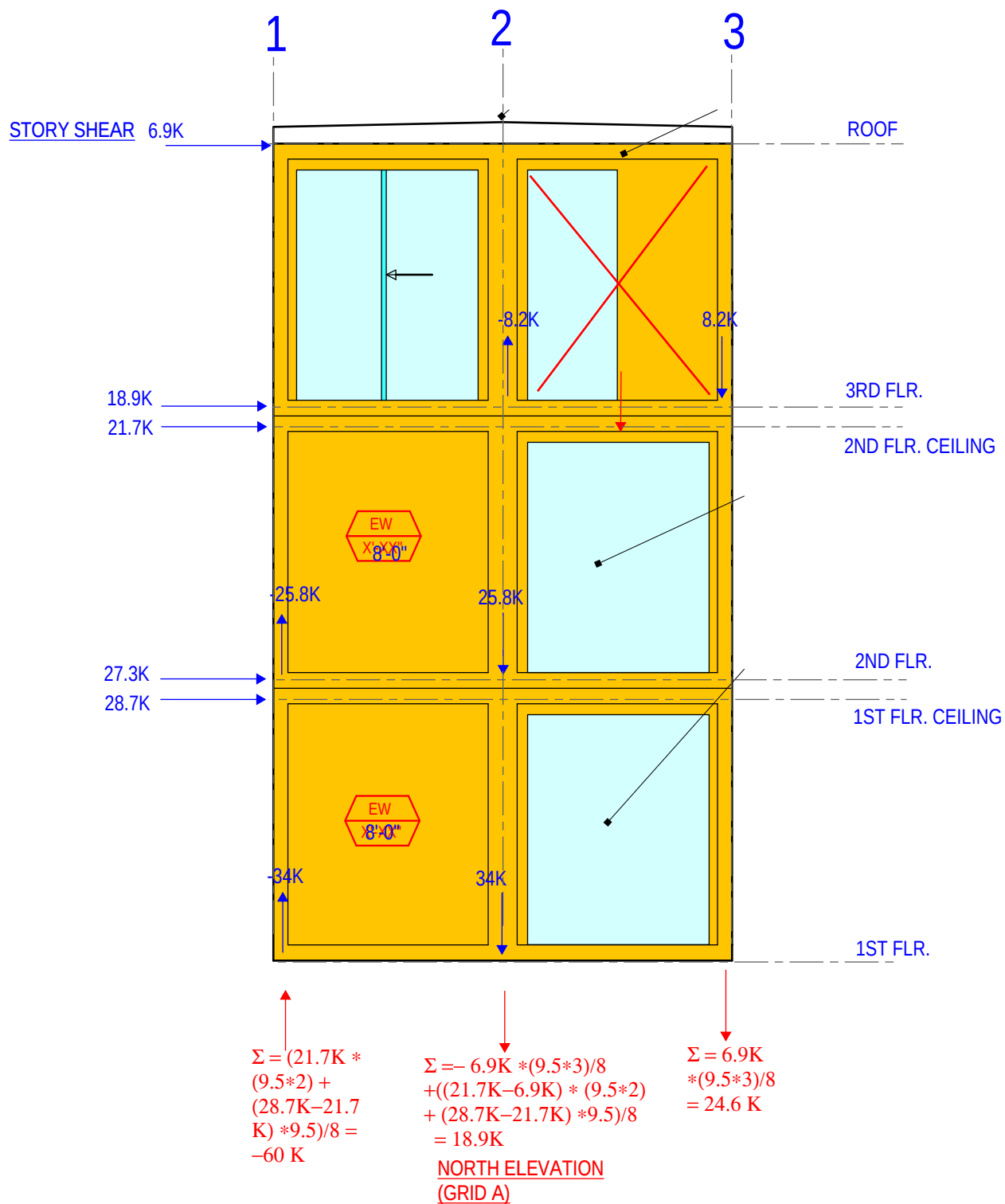
2124 Third Ave, Suite 100, Seattle, WA 98121 | 206.443.6212
934 Broadway, Suite 100, Tacoma, WA 98402 | 253.284.9470

SEATTLE
TACOMA

ssfengineers.com

SWENSON SAY FAGET

LATERAL LOADING (STRENGTH)

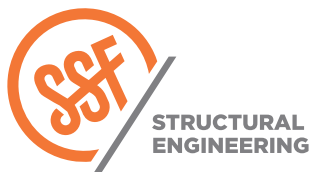


2124 Third Avenue, Suite 100, Seattle, WA 98121
1818 Tacoma Avenue S, Suite 200, Tacoma, WA 98402
414 N Pearl Street, Suite 1, Ellensburg, WA 98926

SEATTLE
TACOMA
CENTRAL WA

206.443.6212
⊕ ssfengineers.com

SWENSON SAY FAGÉT



ADAMS CARGOTECHTURE

PROJECT

KEY PLANS

03.25.2025

DATE _____

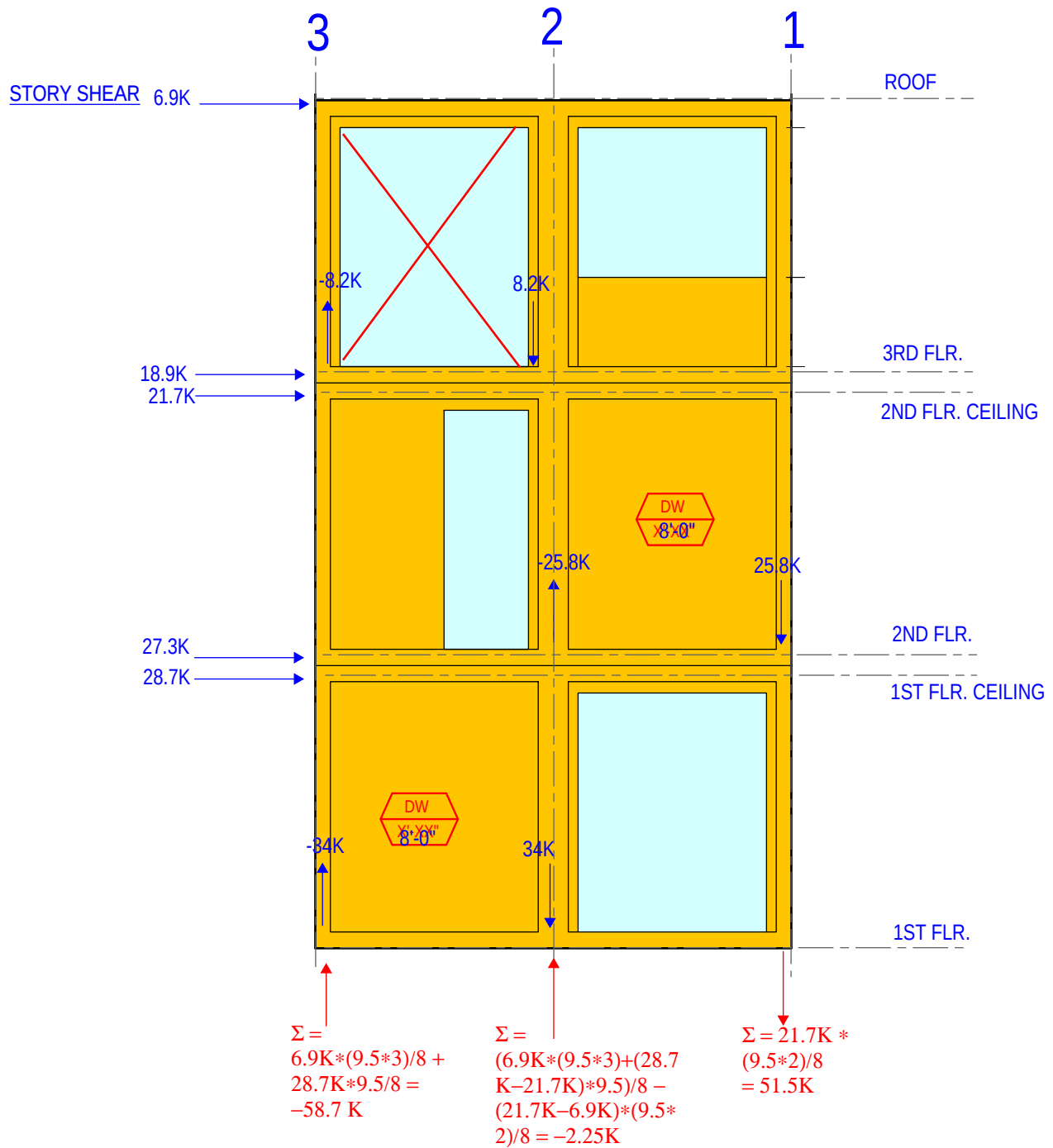
PROJ. #

LTN

DESIGN

SHEET

**LATERAL LOADING
(STRENGTH)**



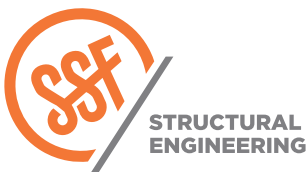
**SOUTH ELEVATION
(GRID E)**

2124 Third Avenue, Suite 100, Seattle, WA 98121
1818 Tacoma Avenue S, Suite 200, Tacoma, WA 98402
414 N Pearl Street, Suite 1, Ellensburg, WA 98926

**SEATTLE
TACOMA
CENTRAL WA**

206.443.6212
ssfengineers.com

SWENSON SAY FAGET



ADAMS CARGOTECHTURE

PROJECT

KEY PLANS

03.25.2025

DATE

PROJ. #

LTN

DESIGN

SHEET

**LATERAL LOADING
(STRENGTH)**

E

A

STORY SHEAR

6.9K

11.3K

14.1K

16.4K

17.8K

ROOF

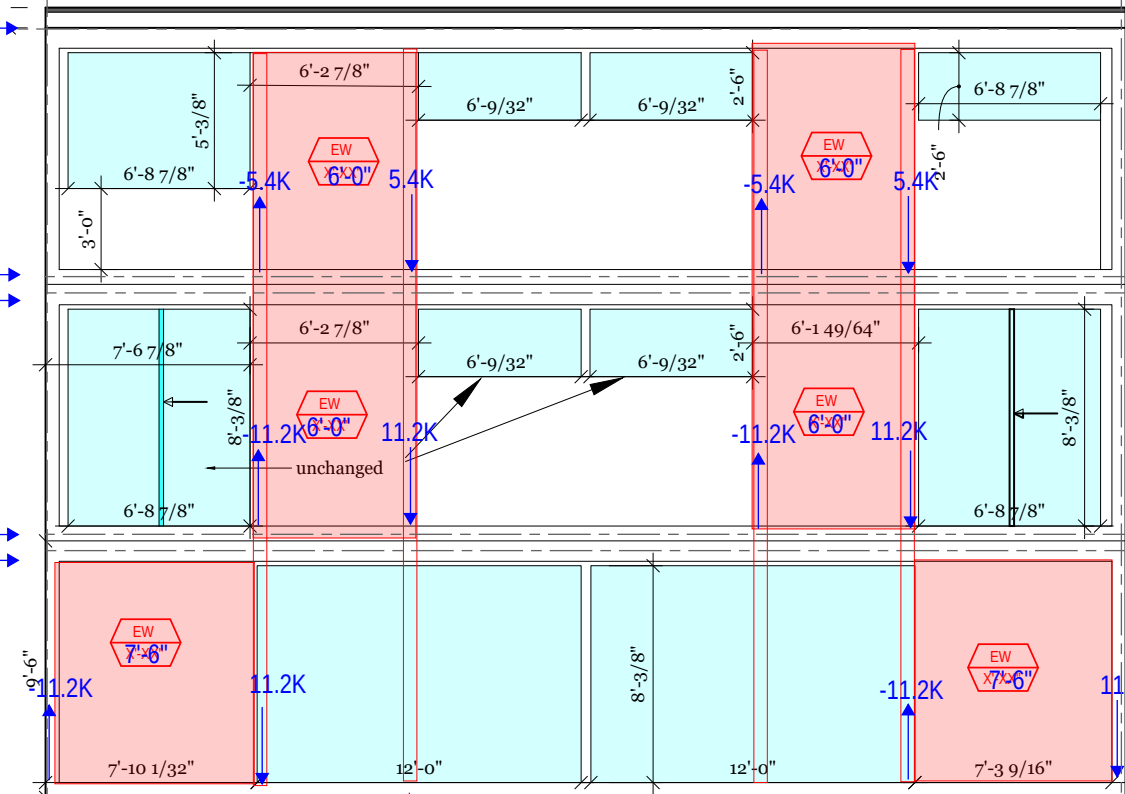
3RD FLR.

**2ND FLR.
CEILING**

2ND FLR.

**1ST FLR.
CEILING**

1ST FLR.



$$\Sigma = 17.8K/2 * 9.5/7.5 = -11.2K$$

$$\Sigma = (6.9K/2 * (9.5 * 3) + (14.1K - 6.9) / 2 * (9.5 * 2)) / 6 - (17.8K - 14.1) / 2 * 9.5 / 7.5 = -25.4K$$

$$\Sigma = (6.9K/2 * (9.5 * 3) + (14.1K - 6.9) / 2 * (9.5 * 2)) / 6 = 27.8K$$

$$\Sigma = (6.9K/2 * (9.5 * 3) + (14.1K - 6.9) / 2 * (9.5 * 2)) / 6 = -27.8K$$

$$\Sigma = (6.9K/2 * (9.5 * 3) + (14.1K - 6.9) / 2 * (9.5 * 2)) / 6 - (17.8K - 14.1) / 2 * 9.5 / 7.5 = 25.4K$$

$$\Sigma = 17.8K/2 * 9.5/7.5 = 11.2K$$

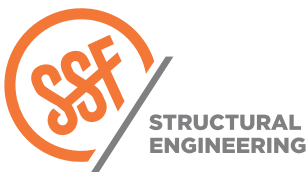
EAST ELEVATION (GRID 1)

2124 Third Avenue, Suite 100, Seattle, WA 98121
1818 Tacoma Avenue S, Suite 200, Tacoma, WA 98402
414 N Pearl Street, Suite 1, Ellensburg, WA 98926

**SEATTLE
TACOMA
CENTRAL WA**

206.443.6212
+ ssfengineers.com

SWENSON SAY FAGET



ADAMS CARGOTECHTURE

PROJECT

KEY PLANS

03.25.2025

DATE

PROJ. #

LTN

DESIGN

SHEET

**LATERAL LOADING
(STRENGTH)**

A

E

STORY SHEAR

6.9K

ROOF

18.9K

21.7K

27.3K

28.7K

3RD FLR.

**2ND FLR.
CEILING**

2ND FLR.

**1ST FLR.
CEILING**

1ST FLR.

$$\Sigma = 21.7K \cdot (9.5 \cdot 2) / 10 = -41.2K$$

$$\Sigma = (21.7K - 6.9K) \cdot (9.5 \cdot 2) / 10 - 6.9K \cdot (9.5 \cdot 3) / 10 = 8.5K$$

$$\Sigma = 6.9K \cdot (9.5 \cdot 3) / 10 = 19.7K$$

$$\Sigma = 28.7K \cdot 9.5 / 10 = -27.3K$$

$$\Sigma = 28.7K \cdot 9.5 / 10 = 27.3K$$

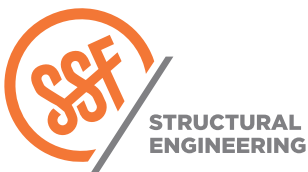
**WEST ELEVATION
(GRID 3)**

2124 Third Avenue, Suite 100, Seattle, WA 98121
1818 Tacoma Avenue S, Suite 200, Tacoma, WA 98402
414 N Pearl Street, Suite 1, Ellensburg, WA 98926

**SEATTLE
TACOMA
CENTRAL WA**

206.443.6212
+ ssfengineers.com

SWENSON SAY FAGÉT



ADAMS CARGOTECHTURE

PROJECT

KEY PLANS

03.25.2025

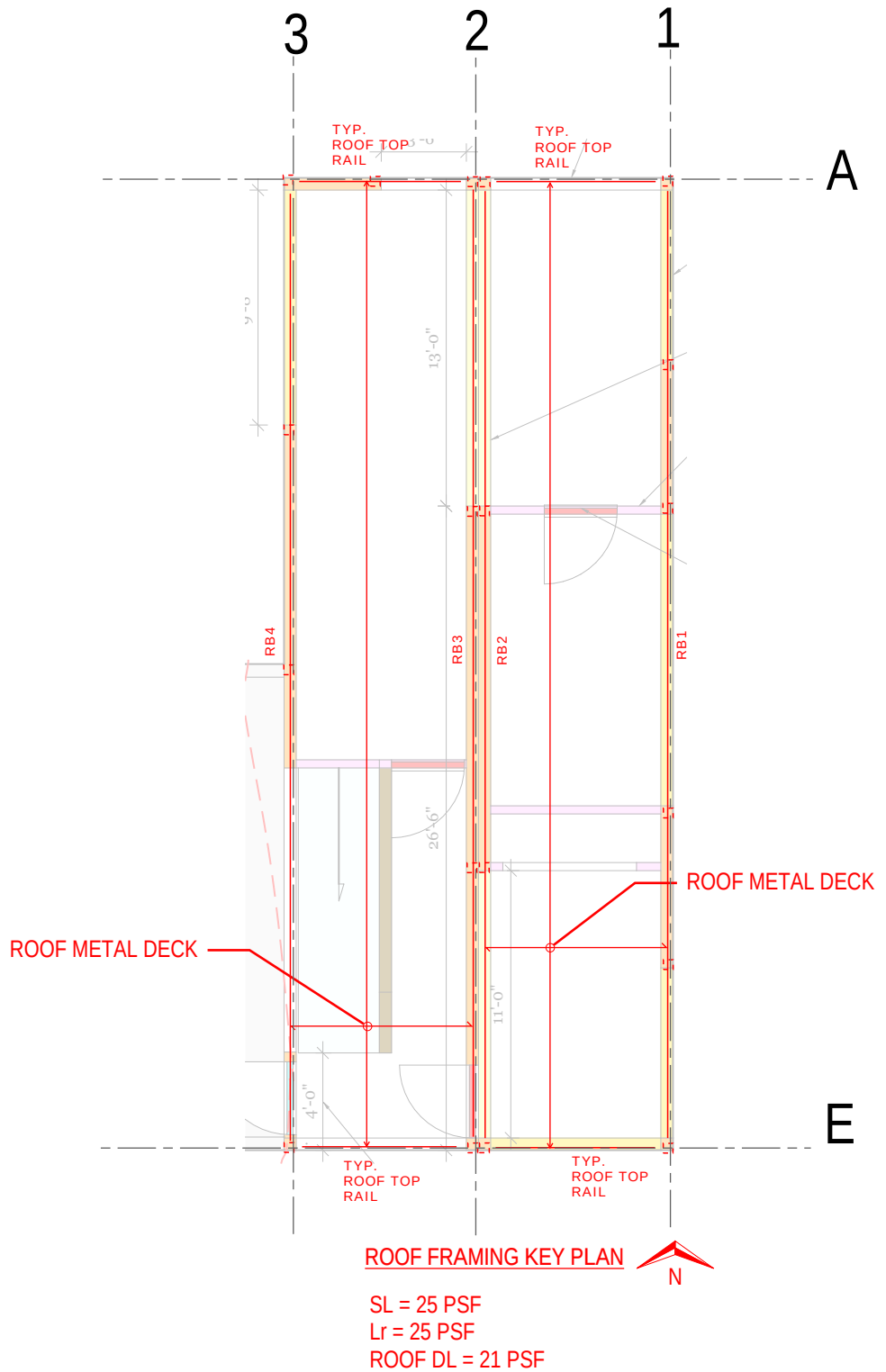
DATE

PROJ. #

LTN

DESIGN

SHEET

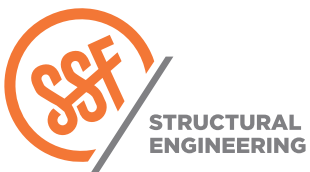


2124 Third Avenue, Suite 100, Seattle, WA 98121
1818 Tacoma Avenue S, Suite 200, Tacoma, WA 98402
414 N Pearl Street, Suite 1, Ellensburg, WA 98926

SEATTLE
TACOMA
CENTRAL WA

206.443.6212
ssfengineers.com

SWENSON SAY FAGÉT



ADAMS CARGOTECHTURE

PROJECT

KEY PLANS

03.25.2025

DATE

PROJ. #

LTN

DESIGN

SHEET

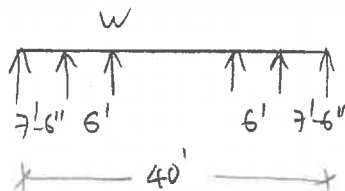
GRAVITY DESIGN: ROOF

$$SL = 25 \text{ PSF}$$

$$L_r = 25 \text{ PSF}$$

$$DL = 21 \text{ PSF}$$

RB1:



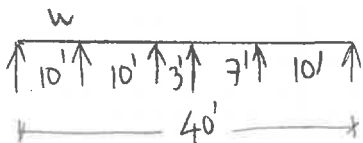
$$w = (21 \text{ PSF} + 25 \text{ PSF}) \times 4' \text{ trib.} = 184 \text{ PLF}$$

RB2 & RB3:



$$w = 184 \text{ PLF}$$

RB4:



$$w = 184 \text{ PLF}$$

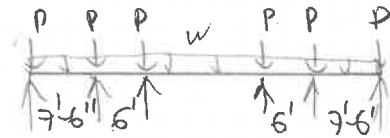
3RD FLOOR FRAMING

$$LL = 40 \text{ PSF}$$

$$\text{Roof Deck } LL = 60 \text{ PSF}$$

$$\text{Floor } DL = 20 \text{ PSF}$$

3FB1:



$$P = \text{From RB1}$$

$$w = (20 \text{ PSF} + 40 \text{ PSF}) \times 4' \text{ trib.} = 240 \text{ PLF}$$

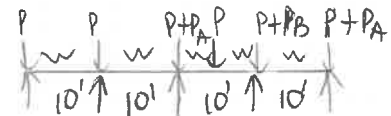
3FB2 & 3FB3:



$$P = \text{From RB2 or RB3}$$

$$w = 240 \text{ PLF}$$

3FB4:



$$P = \text{From RB4}$$

$$w = 240 \text{ PLF}$$

$$P_A = \text{From future addition}$$

$$= (25 \text{ PSF} + 60 \text{ PSF}) \times 20' \times 10' \text{ trib.} = 17^K$$

$$P_B = (25 \text{ PSF} + 60 \text{ PSF}) \times 20' \times 5' \text{ trib.} = 8.5^K$$

Beam Analysis

Beam: RB1						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.084	0.100		0.184	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁				0.000	
	P ₂				0.000	
	P ₃				0.000	
	P ₄				0.000	
	P ₅				0.000	
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	6
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	0.607 0.00
R ₂	1.077 7.50
R ₃	1.995 13.50
R ₄	1.995 26.50
R ₅	1.077 32.50
R ₆	0.607 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	20.00
Shear, k	0.00
Moment, k-ft	M = 1.78
Deflection, in	D = -0.04
Δ/Span	L/3612

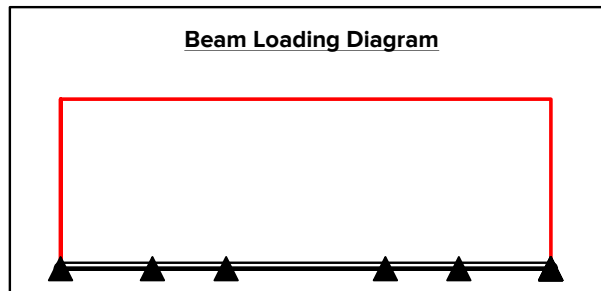
Load Factors	
Dead	1.00
Live	0.00
Roof Live	1.00
Seismic	0.00

Stresses @ Input Location	
f _v (psi)	0
f _b (psi)	2588

Max/Min Stresses	
f _{v,MAX} (psi)	462
f _{v,MIN} (psi)	-462
f _{b,MAX} (psi)	2583
f _{b,MIN} (psi)	-3047

Beam Properties	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	33.1
S (in ³)	8.27
A (in ²)	2.6
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS8x4x3/16	
F _y , ksi		50	
Beam Weight (plf)		14.53	
Axis of Bending		Strong	
Unbr. Length (L _b), ft		0	
C _b		1	
A _w	2.6 in ²	V _n /Ω _v	46.9 k
S	8.27 in ³	Φ _v V _n	70.3 k
Z	10.2 in ³	M _n /Ω _b	25.4 k-ft
I	33.1 in ⁴	Φ _b M _n	38.3 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	0.607	-0.773	-0.619	1	-0.01 (★)	3.5	L/8928	0	0	L/∞
Span 2	0.305	-0.799	-2.1	-	0.006 (★)	11.1	L/11840	0	7.5	L/∞
Span 3	1.2	-1.2	-2.1	1.78	-0.043 (★)	20	L/3617	0	13.5	L/∞
Span 4	0.799	-0.305	-2.1	-	0.006 (★)	28.9	L/11840	0	26.6	L/∞
Span 5	0.773	-0.607	-0.619	1	-0.01 (★)	36.5	L/8928	0	32.6	L/∞



PROJECT ADAMS CARGOTECHTURE
Roof Framing

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET 1

Beam Analysis

Beam: Roof RB2 & RB3						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.084	0.100		0.184	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁				0.000	
	P ₂				0.000	
	P ₃				0.000	
	P ₄				0.000	
	P ₅				0.000	
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions		
# of Supports		4
Total Beam Length		40.00
Left End Condition		Pinned
Right End Condition		Pinned
R ₁	0.885	0.00
R ₂	3.018	13.00
R ₃	2.756	29.00
R ₄	0.701	40.00
R ₅	0.000	40.00
R ₆	0.000	40.00
R ₇	0.000	40.00
R ₈	0.000	40.00
R ₉	0.000	40.00
R ₁₀	0.000	40.00

Demand Output		
Location, ft		21.20
Shear, k	V	0.00
Moment, k-ft	M =	2.16
Deflection, in	D =	-0.07
Δ/Span		L/2842

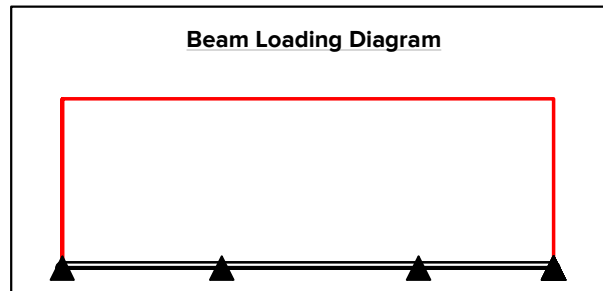
Load Factors	
Dead	1.00
Live	0.00
Roof Live	1.00
Seismic	0.00

Stresses @ Input	
Location	
f _v (psi)	1
f _b (psi)	3130

Max/Min Stresses	
f _v _MAX (psi)	581
f _v _MIN (psi)	-581
f _b _MAX (psi)	3134
f _b _MIN (psi)	-5877

Beam Proper	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	33.1
S (in ³)	8.27
A (in ²)	2.6
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS8x4x3/16	
F _y , ksi		50	
Beam Weight (plf)		14.53	
Axis of Bending		Strong	
Unbr. Length (L _b), ft		0	
C _b		1	
A _w	2.6 in ²	V _n /Ω _v	46.9 k
S	8.27 in ³	Φ _v V _n	70.3 k
Z	10.2 in ³	M _n /Ω _b	25.4 k-ft
I	33.1 in ⁴	Φ _b M _n	38.3 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	0.885	-1.51	-4.05	2.13	-0.048 (↓)	5.4	L/3240	0	0	L/∞
Span 2	1.51	-1.43	-4.05	2.16	-0.068 (↓)	21.2	L/2809	0	13	L/∞
Span 3	1.32	-0.701	-3.42	1.33	-0.018 (↓)	35.8	L/7307	0	29	L/∞



PROJECT ADAMS CARGO

Roof Framing

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET 1

Beam Analysis

Beam: RB4						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.084	0.100		0.100	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁				0.000	
	P ₂				0.000	
	P ₃				0.000	
	P ₄				0.000	
	P ₅				0.000	
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	6
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	0.389 0.00
R ₂	1.167 10.00
R ₃	0.768 20.00
R ₄	0.192 23.00
R ₅	1.083 30.00
R ₆	0.402 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	36.00
Shear, k	0.00
Moment, k-ft	M = 0.81
Deflection, in	D = -0.01
Δ/Span	L/9645

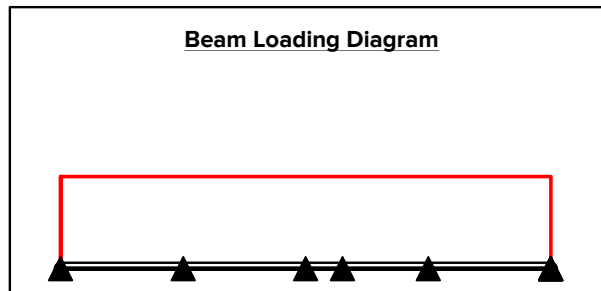
Load Factors	
Dead	0.00
Live	0.00
Roof Live	1.00
Seismic	0.00

Stresses @ Input Location	
f _v (psi)	-1
f _b (psi)	1172

Max/Min Stresses	
f _{v,MAX} (psi)	193
f _{v,MIN} (psi)	-197
f _{b,MAX} (psi)	985
f _{b,MIN} (psi)	-1354

Beam Properties	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	33.1
S (in ³)	8.27
A (in ²)	2.6
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS8x4x3/16	
F _y , ksi		50	
Beam Weight (plf)		14.53	
Axis of Bending		Strong	
Unbr. Length (L _b), ft		20	
C _b		1	
A _w	2.6 in ²	V _n /Ω _v	46.9 k
S	8.27 in ³	Φ _v V _n	70.3 k
Z	10.2 in ³	M _n /Ω _b	25.4 k-ft
I	33.1 in ⁴	Φ _b M _n	38.3 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	0.327	-0.513	-0.933	0.635	-0.021 (†)	4.3	L/5714	0	0	L/∞
Span 2	0.467	-0.373	-0.933	0.363	-0.009 (†)	15.5	L/13227	0	10.1	L/∞
Span 3	0.272	0.181	-0.467	-	0.001 (†)	21.2	L/34560	0	20.1	L/∞
Span 4	0.181	-0.407	-0.823	0.164	0.002 (†)	28.7	L/41760	0	23	L/∞
Span 5	0.502	-0.338	-0.823	0.679	-0.023 (†)	35.5	L/5176	0	30.1	L/∞



PROJECT ADAMS CARGOTECHTURE
Roof Framing

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET 2

Beam Analysis

Beam: Typical C5 Joists @ 12" OC						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.020	0.040		0.060	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁				0.000	
	P ₂				0.000	
	P ₃				0.000	
	P ₄				0.000	
	P ₅				0.000	
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	2
Total Beam Length	8.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	0.240 0.00
R ₂	0.240 8.00
R ₃	0.000 8.00
R ₄	0.000 8.00
R ₅	0.000 8.00
R ₆	0.000 8.00
R ₇	0.000 8.00
R ₈	0.000 8.00
R ₉	0.000 8.00
R ₁₀	0.000 8.00

Demand Output	
Location, ft	4.00
Shear, k	0.00
Moment, k-ft	0.48
Deflection, in	-0.03
Δ/Span	L/3766

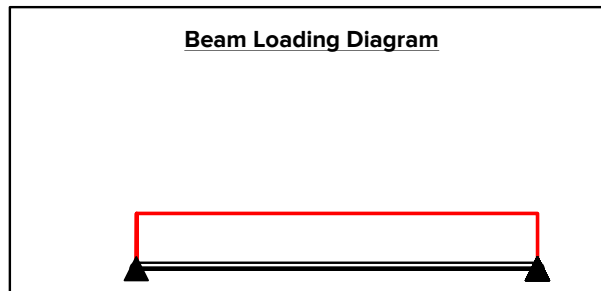
Load Factors	
Dead	1.00
Live	1.00
Roof Live	1.00
Seismic	0.00

Stresses @ Input Location	
f _v (psi)	0
f _b (psi)	1926

Max/Min Stresses	
f _{v,MAX} (psi)	253
f _{v,MIN} (psi)	-253
f _{b,MAX} (psi)	1926
f _{b,MIN} (psi)	0

Beam Properties	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	7.48
S (in ³)	2.99
A (in ²)	0.95
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		C5x6.7	
F _y , ksi		36	
Beam Weight (plf)		6.7	
Axis of Bending		Strong	
Unbr. Length (L _b), ft		8	
C _b		1	
A _w	0.95 in ²	V _n /Ω _v	12.3 k
S	2.99 in ³	Φ _v V _n	18.5 k
Z	3.55 in ³	M _n /Ω _b	4.43 k-ft
I	7.48 in ⁴	Φ _b M _n	6.65 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	0.24	-0.24	-	0.48	-0.025 (†)	4	L/3840	-0.017 (†)	4	L/5647

2124 Third Ave, Suite 100, Seattle, WA 98121
 934 Broadway, Suite 100, Tacoma, WA 98402
 SEATTLE TACOMA
 ssfengineers.com
 SWENSON SAY FAGET



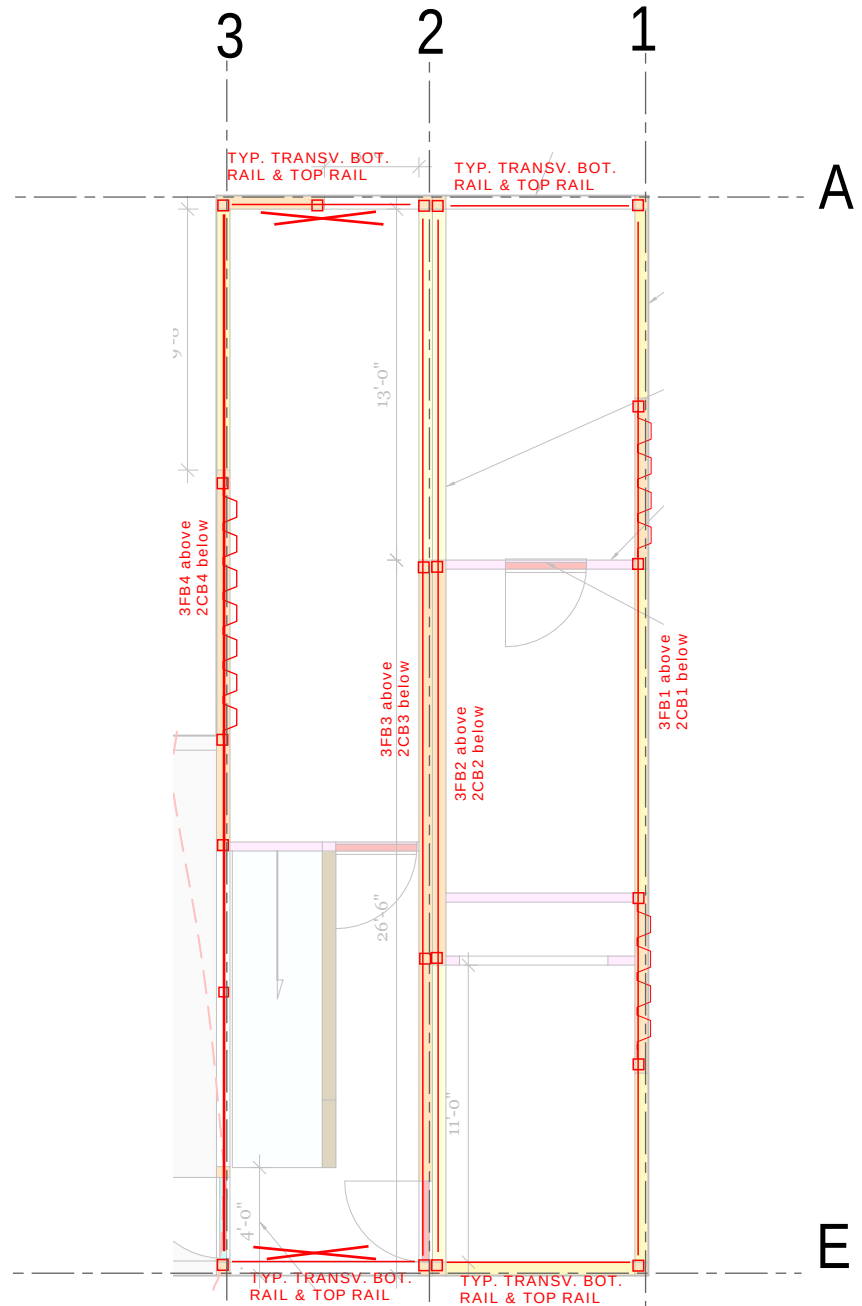
PROJECT ADAMS CARGOTECHTURE

DATE 4/3/2025

PROJ. #

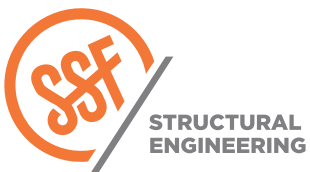
DESIGN LTN

SHEET



3RD FLOOR FRAMING KEY PLAN

LL = 40 PSF
 ROOF DECK LL = 60 PSF
 FLOOR DL = 20 PSF
 CEILING DL = 10 PSF



ADAMS CARGOTECHTURE

PROJECT

KEY PLANS

03.25.2025

DATE

PROJ. #

LTN

DESIGN

SHEET

SWENSON SAY FAGÉT

206.443.6212
 ssfengineers.com

SEATTLE
 TACOMA
 CENTRAL WA

2124 Third Avenue, Suite 100, Seattle, WA 98121
 1818 Tacoma Avenue S, Suite 200, Tacoma, WA 98402
 414 N Pearl Street, Suite 1, Ellensburg, WA 98926

Beam Analysis

Beam: 3FB1						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.080	0.160		0.240	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	0.28		0.33	0.607	0.0
	P ₂	0.49		0.59	1.077	7.5
	P ₃	0.91		1.08	1.995	13.5
	P ₄	0.91		1.08	1.995	26.5
	P ₅	0.49		0.59	1.077	32.5
	P ₆	0.28		0.33	0.607	40.0
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	6
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	1.400 0.00
R ₂	2.482 7.50
R ₃	4.598 13.50
R ₄	4.598 26.50
R ₅	2.482 32.50
R ₆	1.400 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	20.00
Shear, k	0.00
Moment, k-ft	M = 2.33
Deflection, in	D = -0.11
Δ/Span	L/1372

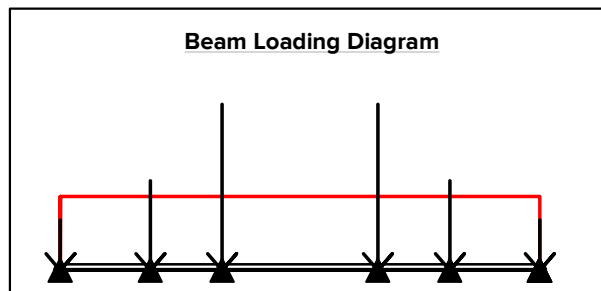
Load Factors	
Dead	1.00
Live	1.00
Roof Live	1.00
Seismic	0.00

Stresses @ Input	
Location	
f _v (psi)	0
f _b (psi)	5113

Max/Min Stresses	
f _v MAX (psi)	817
f _v MIN (psi)	-817
f _b MAX (psi)	5121
f _b MIN (psi)	-6022

Beam Properties	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	16.4
S (in ³)	5.46
A (in ²)	1.91
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS6x4x3/16
F _y , ksi	50	
Beam Weight (plf)	11.97	
Axis of Bending	Strong	
Unbr. Length (L _b), ft	15	
C _b	1	
A _w	1.91 in ²	V _n /Ω _v 34.3 k
S	5.46 in ³	Φ _v V _n 51.5 k
Z	6.6 in ³	M _n /Ω _b 16.5 k-ft
I	16.4 in ⁴	Φ _b M _n 24.8 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	1.4	-1.01	-0.808	1.31	-0.026 (★)	3.5	L/3434	-0.017 (★)	3.5	L/5252
Span 2	0.397	-1.04	-2.74	-	0.015 (★)	11.1	L/4736	0.01 (★)	11.1	L/7104
Span 3	1.56	-1.56	-2.74	2.33	-0.114 (★)	20	L/1364	-0.076 (★)	20	L/2046
Span 4	1.04	-0.397	-2.74	-	0.015 (★)	28.9	L/4736	0.01 (★)	28.9	L/7104
Span 5	1.01	-0.792	-0.808	1.31	-0.026 (★)	36.5	L/3434	-0.017 (★)	36.5	L/5252



PROJECT ADAMS CARGOTECHTURE

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET

Beam Analysis

Beam: 3FB2 & 3FB3 - D + 0.75L + 0.75Lr						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.080	0.160		0.200	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	0.40		0.48	0.765	0.00
	P ₂	1.38		1.64	2.608	13.00
	P ₃	1.26		1.50	2.382	29.00
	P ₄	0.32		0.38	0.606	40.00
	P ₅				0.000	
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	4
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	1.726 0.00
R ₂	5.889 13.00
R ₃	5.378 29.00
R ₄	1.367 40.00
R ₅	0.000 40.00
R ₆	0.000 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	13.00
Shear, k	V -1.64
Moment, k-ft	M = -4.40
Deflection, in	D = 0.00
Δ/Span	L/

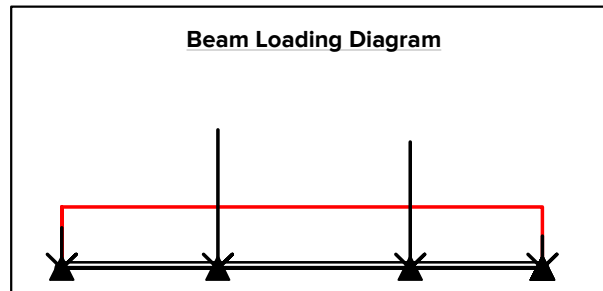
Load Factors	
Dead	1.00
Live	0.75
Roof Live	0.75
Seismic	0.00

Stresses @ Input Location	
f _v (psi)	-858
f _b (psi)	-9667

Max/Min Stresses	
f _v _MAX (psi)	906
f _v _MIN (psi)	-859
f _b _MAX (psi)	5143
f _b _MIN (psi)	-9670

Beam Proper	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	16.4
S (in ³)	5.46
A (in ²)	1.91
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS6x4x3/16	
F _y , ksi		50	
Beam Weight (plf)		11.97	
Axis of Bending		Strong	
Unbr. Length (L _b), ft		0	
C _b		1	
A _w	1.91 in ²	V _n /Ω _v	34.3 k
S	5.46 in ³	Φ _v V _n	51.5 k
Z	6.6 in ³	M _n /Ω _b	16.5 k-ft
I	16.4 in ⁴	Φ _b M _n	24.8 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	1.73	-1.64	-4.4	2.31	-0.128 (†)	5.4	L/1215	-0.085 (†)	5.4	L/1830
Span 2	1.64	-1.56	-4.4	2.34	-0.178 (†)	21.2	L/1073	-0.119 (†)	21.2	L/1605
Span 3	1.44	-0.762	-3.72	1.45	-0.048 (†)	35.8	L/2740	-0.032 (†)	35.8	L/4110



PROJECT ADAMS CARGO
3RD FLOOR FRAMING

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET 2

Beam Analysis

Beam: 3FB2 & 3FB3 - D + L						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.080	0.160		0.240	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	0.40		0.48	0.404	0.00
	P ₂	1.38		1.64	1.378	13.00
	P ₃	1.26		1.50	1.258	29.00
	P ₄	0.32		0.38	0.320	40.00
	P ₅				0.000	
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	4
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	1.558 0.00
R ₂	5.315 13.00
R ₃	4.854 29.00
R ₄	1.234 40.00
R ₅	0.000 40.00
R ₆	0.000 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	21.20
Shear, k	V 0.00
Moment, k-ft	M = 2.81
Deflection, in	D = -0.18
Δ/Span	L/1080

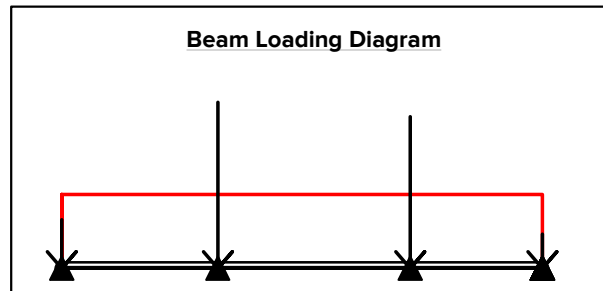
Load Factors	
Dead	1.00
Live	1.00
Roof Live	0.00
Seismic	0.00

Stresses @ Input	
Location	
f _v (psi)	1
f _b (psi)	6183

Max/Min Stresses	
f _v _MAX (psi)	1031
f _v _MIN (psi)	-1031
f _b _MAX (psi)	6176
f _b _MIN (psi)	-11604

Beam Proper	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	16.4
S (in ³)	5.46
A (in ²)	1.91
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS6x4x3/16
F _y , ksi		50
Beam Weight (plf)		11.97
Axis of Bending		Strong
Unbr. Length (L _b), ft		0
C _b		1
A _w	1.91 in ²	V _n /Ω _v 34.3 k
S	5.46 in ³	Φ _v V _n 51.5 k
Z	6.6 in ³	M _n /Ω _b 16.5 k-ft
I	16.4 in ⁴	Φ _b M _n 24.8 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	1.56	-1.97	-5.28	2.77	-0.128 (†)	5.4	L/1215	-0.085 (†)	5.4	L/1830
Span 2	1.97	-1.87	-5.28	2.81	-0.178 (†)	21.2	L/1073	-0.119 (†)	21.2	L/1605
Span 3	1.73	-0.914	-4.47	1.74	-0.048 (†)	35.8	L/2740	-0.032 (†)	35.8	L/4110



PROJECT ADAMS CARGO
3RD FLOOR FRAMING

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET 3

Beam Analysis

Beam: 3FB4						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.080	0.160		0.240	0
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	0.33		0.39	0.716	0.00
	P ₂	0.98		1.17	2.147	10.00
	P ₃	3.15	6	0.77	9.918	20.00
	P ₄	0.16		0.19	0.353	23.00
	P ₅	5.91	12	1.08	18.993	30
	P ₆	2.84	6	0.40	9.242	40
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	5
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	1.666 0.00
R ₂	4.846 10.00
R ₃	12.442 20.00
R ₄	21.846 30.00
R ₅	10.168 40.00
R ₆	0.000 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Load Factors	
Dead	1.00
Live	1.00
Roof Live	1.00
Seismic	0.00

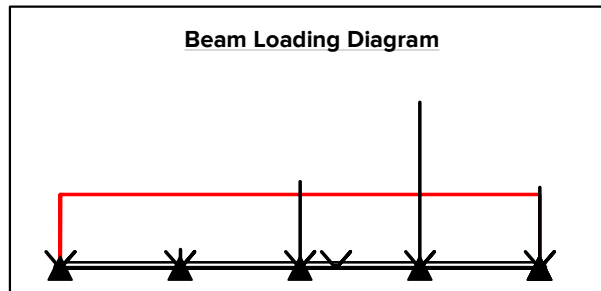
Stresses @ Input	
Location	
f _v (psi)	0
f _b (psi)	4134

Max/Min Stresses	
f _v _MAX (psi)	874
f _v _MIN (psi)	-759
f _b _MAX (psi)	4132
f _b _MIN (psi)	-6022

Demand Output	
Location, ft	3.96
Shear, k	0.00
Moment, k-ft	1.88
Deflection, in	-0.06
Δ/Span	L/2099

Beam Properties	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	16.4
S (in ³)	5.46
A (in ²)	1.91
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS6x4x3/16
F _y , ksi	50	
Beam Weight (plf)	11.97	
Axis of Bending	Strong	
Unbr. Length (L _b), ft	0	
C _b	1	
A _w	1.91 in ²	V _n /Ω _v 34.3 k
S	5.46 in ³	Φ _v V _n 51.5 k
Z	6.6 in ³	M _n /Ω _b 16.5 k-ft
I	16.4 in ⁴	Φ _b M _n 24.8 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	1.67	-1.45	-2.5	1.88	-0.058 (↑)	4.4	L/2069	-0.038 (↑)	4.4	L/3158
Span 2	1.25	-1.15	-2.5	0.753	-0.011 (↑)	15.3	L/10822	-0.011 (↑)	15.4	L/10822
Span 3	1.37	-1.38	-2.74	1.22	-0.027 (↑)	24.5	L/4409	-0.011 (↑)	24.6	L/10822
Span 4	1.47	-0.926	-2.74	1.79	-0.053 (↑)	35.7	L/2246	-0.038 (↑)	35.6	L/3133



PROJECT ADAMS CARGOTECHTURE

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET

Beam Analysis

Beam: 2CB1						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.040			0.040	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	0.5	0.5	0.3	1.40	0.0
	P ₂	1.0	0.9	0.6	2.48	7.5
	P ₃	1.8	1.7	1.1	4.60	13.5
	P ₄	1.8	1.7	1.1	4.60	26.5
	P ₅	1.0	0.9	0.6	2.48	32.5
	P ₆	0.5	0.5	0.3	1.40	40.0
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	6
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	1.532 0.00
R ₂	2.716 7.50
R ₃	5.032 13.50
R ₄	5.032 26.50
R ₅	2.716 32.50
R ₆	1.532 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	20.00
Shear, k	0.00
Moment, k-ft	0.39
Deflection, in	-0.01
Δ/Span	L/16617

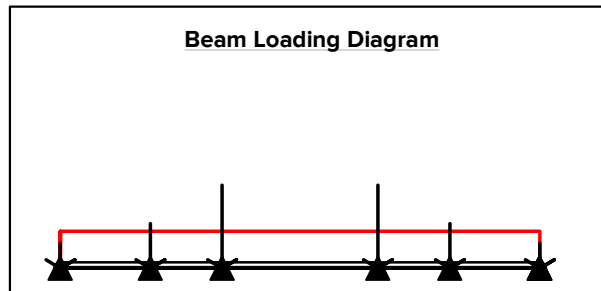
Load Factors	
Dead	1.00
Live	1.00
Roof Live	1.00
Seismic	0.00

Stresses @ Input	
Location	
f _v (psi)	0
f _b (psi)	563

Max/Min Stresses	
f _v MAX (psi)	588
f _v MIN (psi)	-100
f _b MAX (psi)	563
f _b MIN (psi)	-663

Beam Properties	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	33.1
S (in ³)	8.27
A (in ²)	2.6
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS8x4x3/16	
F _y , ksi		50	
Beam Weight (plf)		14.53	
Axis of Bending		Strong	
Unbr. Length (L _b), ft		0	
C _b		1	
A _w	2.6 in ²	V _n /Ω _v	46.9 k
S	8.27 in ³	Φ _v V _n	70.3 k
Z	10.2 in ³	M _n /Ω _b	25.4 k-ft
I	33.1 in ⁴	Φ _b M _n	38.3 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	1.53	-0.168	-0.135	0.218	-0.002 (★)	3.5	L/44640	0 (★)	7.4	L/∞
Span 2	0.066	-0.174	-0.457	-	0.001 (★)	11.1	L/71040	0 (★)	13.4	L/∞
Span 3	0.26	-0.26	-0.457	0.388	-0.009 (★)	20	L/17280	0 (★)	26.3	L/∞
Span 4	0.174	-0.066	-0.457	-	0.001 (★)	28.9	L/71040	0 (★)	32.1	L/∞
Span 5	0.168	-0.132	-0.135	0.218	-0.002 (★)	36.5	L/44640	0 (★)	38.5	L/∞



PROJECT ADAMS CARGOTECHTURE

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET

Beam Analysis

Beam: 2CB2 & 2CB3 - D +0.75L + 0.75Lr						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.040			0.040	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	0.79	0.77	0.48	1.726	0.0
	P ₂	2.69	2.62	1.64	5.889	13.0
	P ₃	2.46	2.40	1.50	5.378	29.0
	P ₄	0.62	0.61	0.38	1.367	40.0
	P ₅				0.000	
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	4
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	1.919 0.00
R ₂	6.545 13.00
R ₃	5.977 29.00
R ₄	1.520 40.00
R ₅	0.000 40.00
R ₆	0.000 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	21.20
Shear, k	0.00
Moment, k-ft	0.47
Deflection, in	-0.01
Δ/Span	L/13074

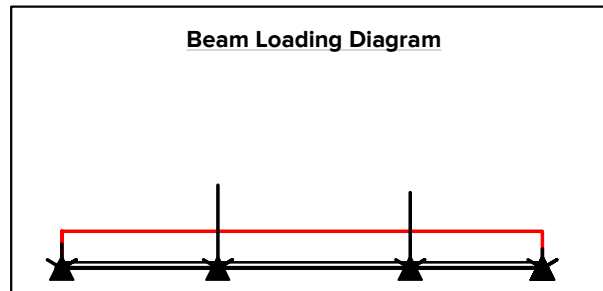
Load Factors	
Dead	1.00
Live	0.75
Roof Live	0.75
Seismic	0.00

Stresses @ Input	
Location	
f _v (psi)	0
f _b (psi)	680

Max/Min Stresses	
f _v MAX (psi)	738
f _v MIN (psi)	-126
f _b MAX (psi)	681
f _b MIN (psi)	-1277

Beam Proper	
E (ksi)	29000
b (in)	12
d (in)	1
I (in ⁴)	33.1
S (in ³)	8.27
A (in ²)	2.6
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS8x4x3/16	
F _y , ksi		50	
Beam Weight (plf)		14.53	
Axis of Bending		Strong	
Unbr. Length (L _b), ft		0	
C _b		1	
A _w	2.6 in ²	V _n /Ω _v	46.9 k
S	8.27 in ³	Φ _v V _n	70.3 k
Z	10.2 in ³	M _n /Ω _b	25.4 k-ft
I	33.1 in ⁴	Φ _b M _n	38.3 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	1.92	-0.328	-0.88	0.462	-0.011 (↑)	5.4	L/14138	0 (↑)	11.9	L/∞
Span 2	0.328	-0.312	-0.88	0.469	-0.015 (↑)	21.2	L/12736	0 (↑)	28.3	L/∞
Span 3	0.288	-0.152	-0.744	0.29	-0.004 (↑)	35.8	L/32880	0 (↑)	39.5	L/∞



PROJECT ADAMS CARGO
 2ND FLOOR CEILING FRAMING

DATE 4/3/2025
 PROJ. #
 DESIGN LTN
 SHEET

Beam Analysis

Beam: 2CB2 & 2CB3 - D + L						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.040			0.040	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	0.79	0.77	0.48	1.558	0.00
	P ₂	2.69	2.62	1.64	5.315	13.00
	P ₃	2.46	2.40	1.50	4.854	29.00
	P ₄	0.62	0.61	0.38	1.234	40.00
	P ₅				0.000	
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	4
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	1.750 0.00
R ₂	5.971 13.00
R ₃	5.453 29.00
R ₄	1.386 40.00
R ₅	0.000 40.00
R ₆	0.000 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	21.20
Shear, k	0.00
Moment, k-ft	0.47
Deflection, in	-0.01
Δ/Span	L/13074

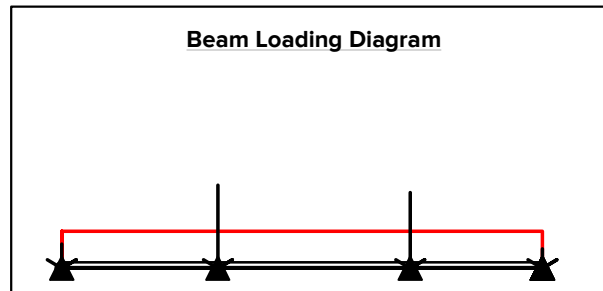
Load Factors	
Dead	1.00
Live	1.00
Roof Live	0.00
Seismic	0.00

Stresses @ Input	
Location	
f _v (psi)	0
f _b (psi)	680

Max/Min Stresses	
f _v MAX (psi)	673
f _v MIN (psi)	-126
f _b MAX (psi)	681
f _b MIN (psi)	-1277

Beam Proper	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	33.1
S (in ³)	8.27
A (in ²)	2.6
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS8x4x3/16	
F _y , ksi		50	
Beam Weight (plf)		14.53	
Axis of Bending		Strong	
Unbr. Length (L _b), ft		0	
C _b		1	
A _w	2.6 in ²	V _n /Ω _v	46.9 k
S	8.27 in ³	Φ _v V _n	70.3 k
Z	10.2 in ³	M _n /Ω _b	25.4 k-ft
I	33.1 in ⁴	Φ _b M _n	38.3 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	1.75	-0.328	-0.88	0.462	-0.011 (↑)	5.4	L/14138	0 (↑)	11.9	L/∞
Span 2	0.328	-0.312	-0.88	0.469	-0.015 (↑)	21.2	L/12736	0 (↑)	28.3	L/∞
Span 3	0.288	-0.152	-0.744	0.29	-0.004 (↑)	35.8	L/32880	0 (↑)	39.5	L/∞



PROJECT ADAMS CARGO
 2ND FLOOR CEILING FRAMING

DATE 4/3/2025
 PROJ. #
 DESIGN LTN
 SHEET

Beam Analysis

Beam: 2CB4						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.040			0.040	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	0.6	0.6	0.39	1.666	0.00
	P ₂	1.9	1.8	1.14	4.846	10.00
	P ₃	4.0	7.5	0.93	12.442	20.00
	P ₄	6.9	13.8	1.14	21.846	30.00
	P ₅	3.1	6.6	0.39	10.168	40
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	5
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	1.823 0.00
R ₂	5.303 10.00
R ₃	12.814 20.00
R ₄	22.303 30.00
R ₅	10.325 40.00
R ₆	0.000 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	3.92
Shear, k	0.00
Moment, k-ft	M = 0.31
Deflection, in	D = 0.00
Δ/Span	L/26149

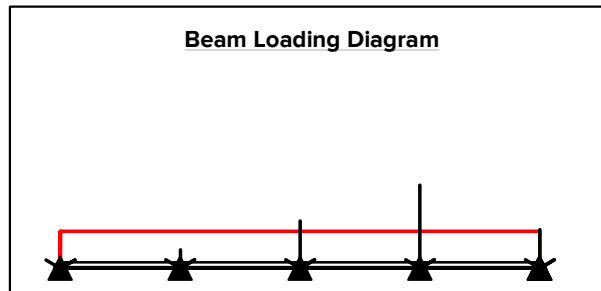
Load Factors	
Dead	1.00
Live	1.00
Roof Live	1.00
Seismic	0.00

Stresses @ Input	
Location	
f _v (psi)	0
f _b (psi)	448

Max/Min Stresses	
f _v MAX (psi)	700
f _v MIN (psi)	-93
f _b MAX (psi)	448
f _b MIN (psi)	-622

Beam Properties	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	33.1
S (in ³)	8.27
A (in ²)	2.6
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS8x4x3/16	
F _y , ksi		50	
Beam Weight (plf)		14.53	
Axis of Bending		Strong	
Unbr. Length (L _b), ft		0	
C _b		1	
A _w	2.6 in ²	V _n /Ω _v	46.9 k
S	8.27 in ³	Φ _v V _n	70.3 k
Z	10.2 in ³	M _n /Ω _b	25.4 k-ft
I	33.1 in ⁴	Φ _b M _n	38.3 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	1.82	-0.243	-0.429	0.309	-0.005 (↑)	4.4	L/24000	0 (↑)	10	L/∞
Span 2	0.214	-0.186	-0.429	0.145	-0.001 (↑)	15.4	L/119040	0 (↑)	19.9	L/∞
Span 3	0.186	-0.214	-0.429	0.145	-0.001 (↑)	24.6	L/119040	0 (↑)	29.6	L/∞
Span 4	0.243	-0.157	-0.429	0.309	-0.005 (↑)	35.6	L/23808	0 (↑)	39.8	L/∞



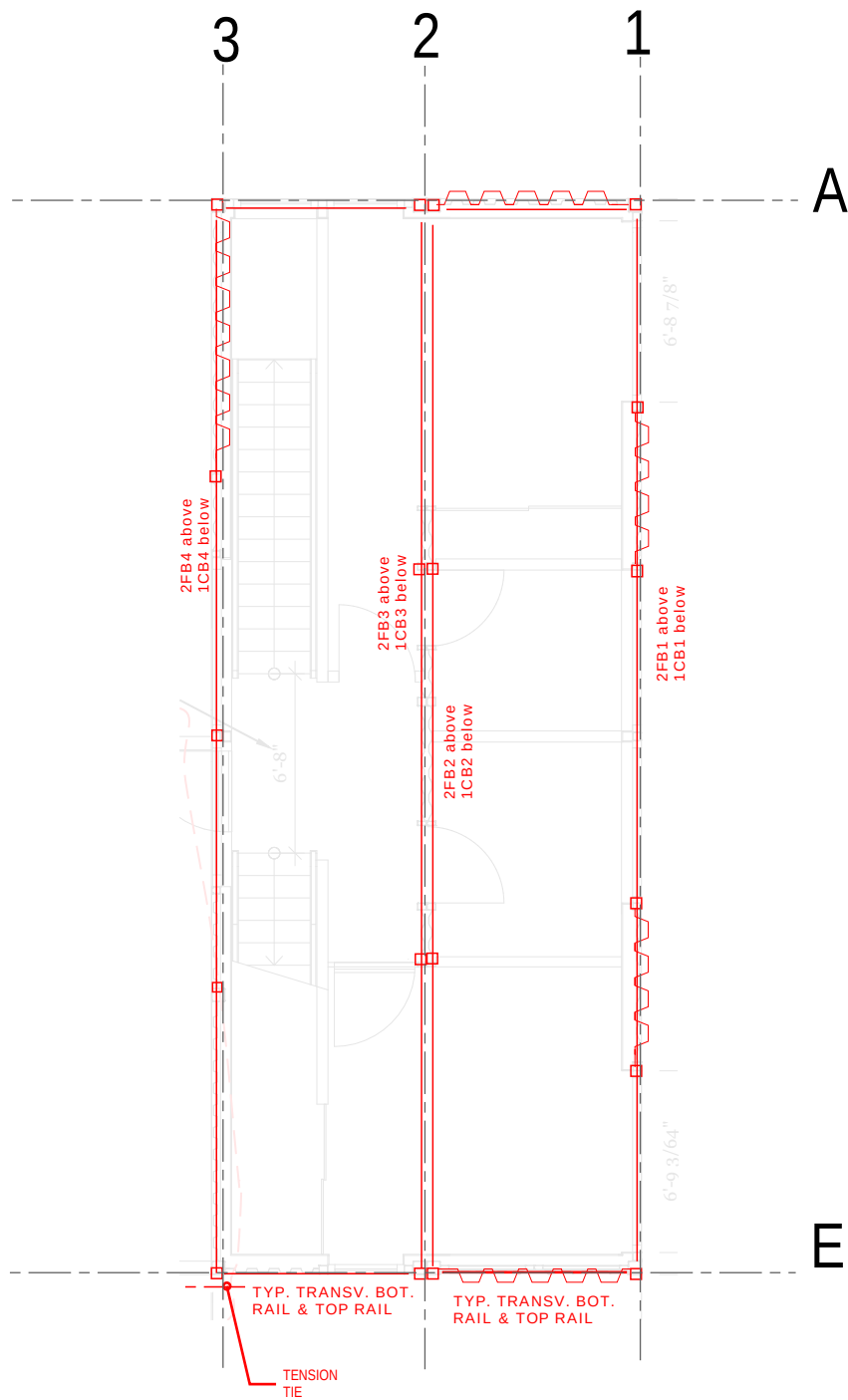
PROJECT ADAMS CARGOTECHTURE

DATE 4/3/2025

PROJ. #

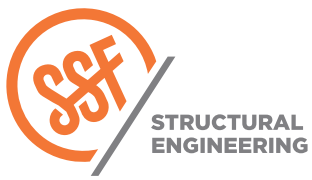
DESIGN LTN

SHEET



2ND FLOOR FRAMING KEY PLAN

LL = 40 PSF
 FLOOR DL = 20 PSF
 CEILING DL = 10 PSF



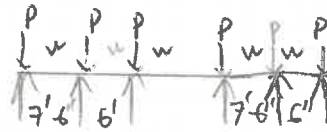
ADAMS CARGOTECHTURE
 PROJECT
 KEY PLANS

03.25.2025
 DATE
 PROJ. # LTN
 DESIGN
 SHEET

GRAVITY DESIGN : 2ND FLR. CEILING FRAMING

Ceiling DL = 10 PSF

2CB1:



P = From 3FB1

$$w = 10 \text{ PSF} \times 4' \text{ trib} = 40 \text{ PLF}$$

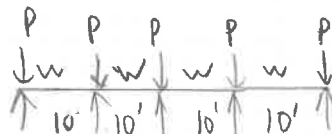
2CB2 & 2CB3:



P = From 3FB2 or 3FB3

$$w = 40 \text{ PLF}$$

2CB4:



P = From 3FB4

$$w = 40 \text{ PLF}$$

2ND FLR. FRAMING

LL = 40 PSF

DL = 20 PSF

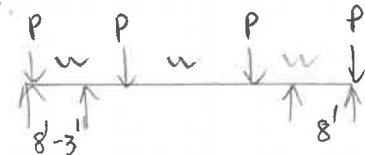
2FB1:



P = From 2CB1

$$w = (20 + 40) \text{ PSF} \times 4' \text{ trib} = 240 \text{ PLF}$$

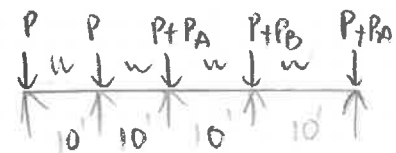
2FB2 & 2FB3:



P = From 2CB2 or 2CB3

- 2FB2 & 2FB3 assumed to share load w/ 1CB2 & 1CB3 w/ distribution according to member's stiffness
- $$w = (20 \text{ PSF} \times 4') + \left(\frac{16.4}{16.4 + 33.1} \right) (40 \text{ PSF} \times 4') = 133 \text{ PLF}$$

2FB4:



$$w = 240 \text{ PLF}$$

P = From 2CB4

P_A = From future addition

$$= (25 \text{ PSF} + 40 \text{ PSF}) \times 20' \times 5' \text{ trib} = 6.5 \text{ K}$$

$$P_B = (25 \text{ PSF} + 40 \text{ PSF}) \times 20' \times 10' \text{ trib} = 13 \text{ K}$$

Beam Analysis

Beam: 2FB1						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.080	0.160		0.240	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	0.7	0.5	0.33	1.532	0.00
	P ₂	1.2	0.9	0.59	2.716	7.50
	P ₃	2.2	1.7	1.08	5.032	13.50
	P ₄	2.2	1.7	1.08	5.032	26.50
	P ₅	1.2	0.9	0.59	2.716	32.5
	P ₆	0.67	0.53	0.33	1.532	40
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions

# of Supports	6
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	2.324 0.00
R ₂	4.121 7.50
R ₃	7.635 13.50
R ₄	7.635 26.50
R ₅	4.121 32.50
R ₆	2.324 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output

Location, ft	20.00
Shear, k	0.00
Moment, k-ft	2.33
Deflection, in	-0.11
Δ/Span	L/1372

Load Factors

Dead	1.00
Live	1.00
Roof Live	1.00
Seismic	0.00

Stresses @ Input

Location	
f _v (psi)	0
f _b (psi)	5113

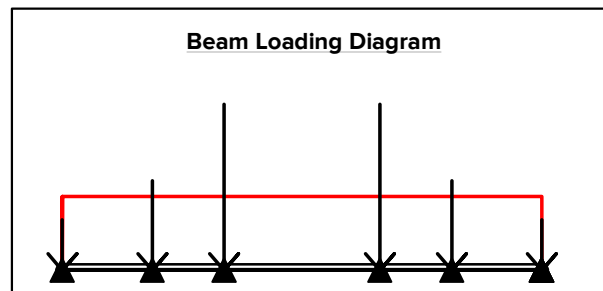
Max/Min Stresses

f _v MAX (psi)	1215
f _v MIN (psi)	-817
f _b MAX (psi)	5121
f _b MIN (psi)	-6022

Beam Properties

E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	16.4
S (in ³)	5.46
A (in ²)	1.91
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS6x4x3/16
F _y , ksi	50	
Beam Weight (plf)	11.97	
Axis of Bending	Strong	
Unbr. Length (L _b), ft	0	
C _b	1	
A _w	1.91 in ²	V _n /Ω _v 34.3 k
S	5.46 in ³	Φ _v V _n 51.5 k
Z	6.6 in ³	M _n /Ω _b 16.5 k-ft
I	16.4 in ⁴	Φ _b M _n 24.8 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	2.32	-1.01	-0.808	1.31	-0.026 (★)	3.5	L/3434	-0.017 (★)	3.5	L/5252
Span 2	0.397	-1.04	-2.74	-	0.015 (★)	11.1	L/4736	0.01 (★)	11.1	L/7104
Span 3	1.56	-1.56	-2.74	2.33	-0.114 (★)	20	L/1364	-0.076 (★)	20	L/2046
Span 4	1.04	-0.397	-2.74	-	0.015 (★)	28.9	L/4736	0.01 (★)	28.9	L/7104
Span 5	1.01	-0.792	-0.808	1.31	-0.026 (★)	36.5	L/3434	-0.017 (★)	36.5	L/5252



PROJECT ADAMS CARGOTECHTURE

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET

Beam Analysis

Beam: 2FB2 & 2FB3 - D + 0.75 L + 0.75 Lr						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.080	0.053		0.120	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	0.32	0.25	0.16	0.633	0.00
	P ₂	1.11	0.86	0.54	2.160	13.00
	P ₃	1.01	0.79	0.50	1.975	29.00
	P ₄	0.26	0.20	0.13	0.502	40.00
	P ₅				0.000	
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	4
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	-0.144 0.00
R ₂	5.184 8.25
R ₃	5.276 32.00
R ₄	-0.262 40.00
R ₅	0.000 40.00
R ₆	0.000 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Load Factors	
Dead	1.00
Live	0.75
Roof Live	0.75
Seismic	0.00

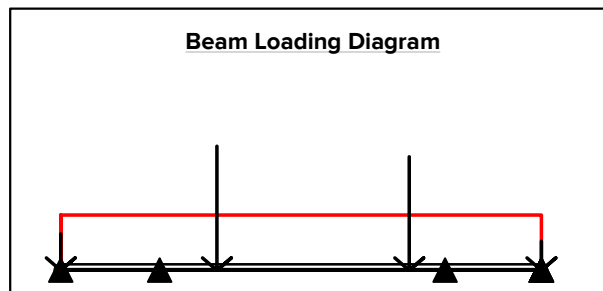
Stresses @ Input Location	
f _v (psi)	-58
f _b (psi)	14001

Max/Min Stresses	
f _v _MAX (psi)	1791
f _v _MIN (psi)	-1864
f _b _MAX (psi)	14110
f _b _MIN (psi)	-23077

Demand Output	
Location, ft	19.72
Shear, k	V -0.11
Moment, k-ft	M = 6.37
Deflection, in	D = -1.17
Δ/Span	L/243

Beam Proper	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	16.4
S (in ³)	5.46
A (in ²)	1.91
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS6x4x3/16	
F _y , ksi		50	
Beam Weight (plf)		11.97	
Axis of Bending		Strong	
Unbr. Length (L _b), ft		0	
C _b		1	
A _w	1.91 in ²	V _n /Ω _v	34.3 k
S	5.46 in ³	Φ _v V _n	51.5 k
Z	6.6 in ³	M _n /Ω _b	16.5 k-ft
I	16.4 in ⁴	Φ _b M _n	24.8 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	-0.777	-1.76	-10.5	-	0.161 (†)	4.9	L/614	0.058 (†)	4.9	L/1705
Span 2	3.42	-3.56	-10.5	6.42	-1.33 (†)	19.7	L/214	-0.494 (†)	19.8	L/575
Span 3	1.72	0.764	-9.94	0	0.144 (†)	35.3	L/660	0.052 (†)	35.3	L/1828



PROJECT ADAMS CARGO
2nd FLOOR FRAMING

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET

Beam Analysis

Beam: 2FB2 & 2FB3 - D + L						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.080	0.053		0.133	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	0.32	0.25	0.16	0.578	0.00
	P ₂	1.11	0.86	0.54	1.970	13.00
	P ₃	1.01	0.79	0.50	1.802	29.00
	P ₄	0.26	0.20	0.13	0.459	40.00
	P ₅				0.000	
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	4
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	-0.147 0.00
R ₂	5.221 8.25
R ₃	5.308 32.00
R ₄	-0.262 40.00
R ₅	0.000 40.00
R ₆	0.000 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	19.04
Shear, k	0.00
Moment, k-ft	6.57
Deflection, in	-1.18
Δ/Span	L/242

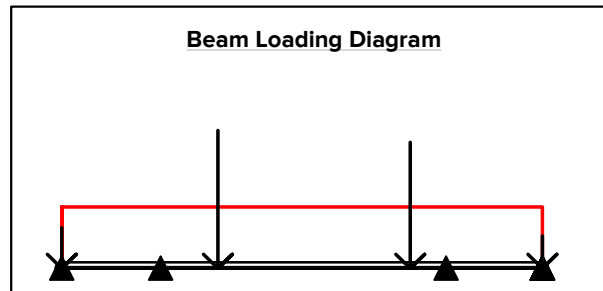
Load Factors	
Dead	1.00
Live	1.00
Roof Live	0.00
Seismic	0.00

Stresses @ Input Location	
f _v (psi)	-1
f _b (psi)	14437

Max/Min Stresses	
f _v _MAX (psi)	1780
f _v _MIN (psi)	-1843
f _b _MAX (psi)	14440
f _b _MIN (psi)	-23077

Beam Proper	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	16.4
S (in ³)	5.46
A (in ²)	1.91
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS6x4x3/16
F _y , ksi		50
Beam Weight (plf)		11.97
Axis of Bending		Strong
Unbr. Length (L _b), ft		0
C _b		1
A _w	1.91 in ²	V _n /Ω _v 34.3 k
S	5.46 in ³	Φ _v V _n 51.5 k
Z	6.6 in ³	M _n /Ω _b 16.5 k-ft
I	16.4 in ⁴	Φ _b M _n 24.8 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	-0.725	-1.82	-10.5	-	0.161 (†)	4.9	L/614	0.058 (†)	4.9	L/1705
Span 2	3.4	-3.52	-10.5	6.57	-1.33 (†)	19.7	L/214	-0.494 (†)	19.8	L/575
Span 3	1.78	0.721	-10	0	0.144 (†)	35.3	L/660	0.052 (†)	35.3	L/1828



PROJECT ADAMS CARGO

2nd FLOOR FRAMING

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET

Beam Analysis

Beam: 2FB4						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.080	0.160		0.240	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	0.8	0.6	0.79	2.216	0.00
	P ₂	2.3	1.8	2.29	6.446	10.00
	P ₃	6.9	11.5	1.86	20.257	20.00
	P ₄	12.3	21.8	2.29	36.446	30.00
	P ₅	5.8	10.6	0.79	17.216	40
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	5
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	3.159 0.00
R ₂	9.189 10.00
R ₃	22.486 20.00
R ₄	39.189 30.00
R ₅	18.159 40.00
R ₆	0.000 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	30.00
Shear, k	V -1.29
Moment, k-ft	M = -2.57
Deflection, in	D = 0.00
Δ/Span	L/

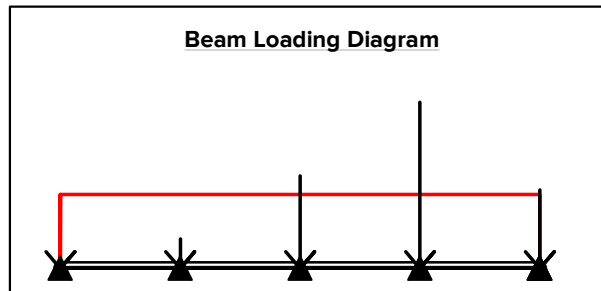
Load Factors	
Dead	1.00
Live	1.00
Roof Live	1.00
Seismic	0.00

Stresses @ Input Location	
f _v (psi)	-673
f _b (psi)	-5651

Max/Min Stresses	
f _v MAX (psi)	1654
f _v MIN (psi)	-764
f _b MAX (psi)	4066
f _b MIN (psi)	-5648

Beam Properties	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	16.4
S (in ³)	5.46
A (in ²)	1.91
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS6x4x3/16
F _y , ksi	50	
Beam Weight (plf)	11.97	
Axis of Bending	Strong	
Unbr. Length (L _b), ft	0	
C _b	1	
A _w	1.91 in ²	V _n /Ω _v 34.3 k
S	5.46 in ³	Φ _v V _n 51.5 k
Z	6.6 in ³	M _n /Ω _b 16.5 k-ft
I	16.4 in ⁴	Φ _b M _n 24.8 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	3.16	-1.46	-2.57	1.85	-0.056 (†)	4.4	L/2143	-0.038 (†)	4.4	L/3158
Span 2	1.29	-1.11	-2.57	0.872	-0.016 (†)	15.4	L/7440	-0.011 (†)	15.4	L/10822
Span 3	1.11	-1.29	-2.57	0.872	-0.016 (†)	24.6	L/7440	-0.011 (†)	24.6	L/10822
Span 4	1.46	-0.943	-2.57	1.85	-0.056 (†)	35.6	L/2126	-0.038 (†)	35.6	L/3133



PROJECT ADAMS CARGOTECHTURE

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET

Beam Analysis

Beam: 1CB1						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.040			0.040	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	0.9	1.1	0.33	2.324	0.00
	P ₂	1.7	1.9	0.59	4.121	7.50
	P ₃	3.1	3.5	1.08	7.635	13.50
	P ₄	3.1	3.5	1.08	7.635	26.50
	P ₅	1.7	1.9	0.59	4.121	32.5
	P ₆	0.94	1.06	0.33	2.324	40
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	6
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	2.456 0.00
R ₂	4.356 7.50
R ₃	8.068 13.50
R ₄	8.068 26.50
R ₅	4.356 32.50
R ₆	2.456 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Load Factors	
Dead	1.00
Live	1.00
Roof Live	1.00
Seismic	0.00

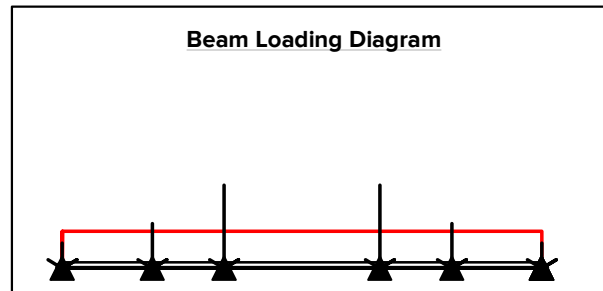
Stresses @ Input	
Location	
f _v (psi)	0
f _b (psi)	563

Max/Min Stresses	
f _v MAX (psi)	946
f _v MIN (psi)	-100
f _b MAX (psi)	563
f _b MIN (psi)	-663

Demand Output	
Location, ft	20.00
Shear, k	0.00
Moment, k-ft	0.39
Deflection, in	-0.01
Δ/Span	L/16617

Beam Properties	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	33.1
S (in ³)	8.27
A (in ²)	2.6
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS8x4x3/16	
F _y , ksi		50	
Beam Weight (plf)		14.53	
Axis of Bending		Strong	
Unbr. Length (L _b), ft		0	
C _b		1	
A _w	2.6 in ²	V _n /Ω _v	46.9 k
S	8.27 in ³	Φ _v V _n	70.3 k
Z	10.2 in ³	M _n /Ω _b	25.4 k-ft
I	33.1 in ⁴	Φ _b M _n	38.3 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	2.46	-0.168	-0.135	0.218	-0.002 (↑)	3.5	L/44640	0 (↑)	7.4	L/∞
Span 2	0.066	-0.174	-0.457	-	0.001 (↑)	11.1	L/71040	0 (↑)	13.4	L/∞
Span 3	0.26	-0.26	-0.457	0.388	-0.009 (↑)	20	L/17280	0 (↑)	23.8	L/∞
Span 4	0.174	-0.066	-0.457	-	0.001 (↑)	28.9	L/71040	0 (↑)	27	L/∞
Span 5	0.168	-0.132	-0.135	0.218	-0.002 (↑)	36.5	L/44640	0 (↑)	37.4	L/∞



PROJECT ADAMS CARGOTECHTURE

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET

Beam Analysis

Beam: 1CB2 & 1CB3 - D + 0.75 L + 0.75 Lr						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.040	0.107		0.120	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	0.66	0.52	0.32	1.285	0.00
	P ₂	2.24	1.76	1.10	4.385	13.00
	P ₃	2.05	1.61	1.01	4.010	29.00
	P ₄	0.52	0.41	0.25	1.020	40.00
	P ₅				0.000	
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	4
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	-0.208 0.00
R ₂	7.977 8.25
R ₃	8.157 32.00
R ₄	-0.411 40.00
R ₅	0.000 40.00
R ₆	0.000 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Load Factors	
Dead	1.00
Live	0.75
Roof Live	0.75
Seismic	0.00

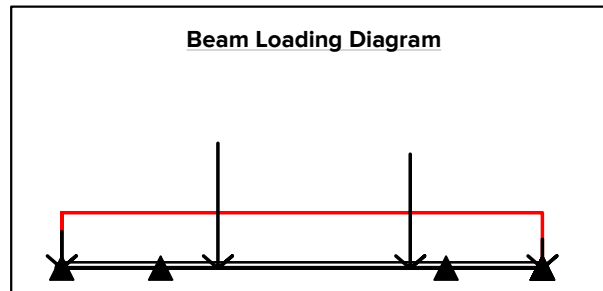
Stresses @ Input	
Location	
f _v (psi)	-98
f _b (psi)	13389

Max/Min Stresses	
f _v MAX (psi)	2112
f _v MIN (psi)	-2215
f _b MAX (psi)	13785
f _b MIN (psi)	-23797

Demand Output	
Location, ft	19.56
Shear, k	V -0.26
Moment, k-ft	M = 9.23
Deflection, in	D = -0.89
Δ/Span	L/321

Beam Proper	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	33.1
S (in ³)	8.27
A (in ²)	2.6
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS8x4x3/16	
F _y , ksi		50	
Beam Weight (plf)		14.53	
Axis of Bending		Strong	
Unbr. Length (L _b), ft		0	
C _b		1	
A _w	2.6 in ²	V _n /Ω _v	46.9 k
S	8.27 in ³	Φ _v V _n	70.3 k
Z	10.2 in ³	M _n /Ω _b	25.4 k-ft
I	33.1 in ⁴	Φ _b M _n	38.3 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	-1.49	-2.49	-16.4	-	0.137 (†)	4.9	L/722	0.059 (†)	4.9	L/1676
Span 2	5.49	-5.76	-16.4	9.5	-1.05 (†)	19.6	L/271	-0.497 (†)	19.8	L/572
Span 3	2.39	1.43	-15.3	-	0.12 (†)	35.3	L/792	0.053 (†)	35.3	L/1793



PROJECT ADAMS CARGO
 1ST FLOOR CEILING FRAMING

DATE 4/3/2025
 PROJ. # _____
 DESIGN LTN
 SHEET _____

Beam Analysis

Beam: 1CB2 & 1CB3 - D + L						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.040	0.107		0.147	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	0.66	0.52	0.32	1.173	0.00
	P ₂	2.24	1.76	1.10	4.000	13.00
	P ₃	2.05	1.61	1.01	3.658	29.00
	P ₄	0.52	0.41	0.25	0.931	40.00
	P ₅				0.000	
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	4
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	-0.215 0.00
R ₂	8.054 8.25
R ₃	8.221 32.00
R ₄	-0.411 40.00
R ₅	0.000 40.00
R ₆	0.000 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	8.24
Shear, k	V -2.60
Moment, k-ft	M = -16.43
Deflection, in	D = 0.00
Δ/Span	L/131812

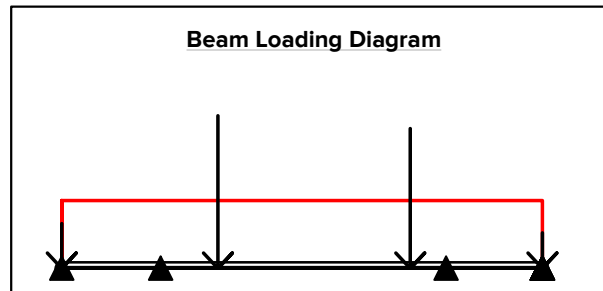
Load Factors	
Dead	1.00
Live	1.00
Roof Live	0.00
Seismic	0.00

Stresses @ Input Location	
f _v (psi)	-1000
f _b (psi)	-23837

Max/Min Stresses	
f _v MAX (psi)	2096
f _v MIN (psi)	-2192
f _b MAX (psi)	14089
f _b MIN (psi)	-23942

Beam Proper	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	33.1
S (in ³)	8.27
A (in ²)	2.6
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS8x4x3/16	
F _y , ksi		50	
Beam Weight (plf)		14.53	
Axis of Bending		Strong	
Unbr. Length (L _b), ft		0	
C _b		1	
A _w	2.6 in ²	V _n /Ω _v	46.9 k
S	8.27 in ³	Φ _v V _n	70.3 k
Z	10.2 in ³	M _n /Ω _b	25.4 k-ft
I	33.1 in ⁴	Φ _b M _n	38.3 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	-1.39	-2.6	-16.5	-	0.137 (†)	4.9	L/722	0.059 (†)	4.9	L/1676
Span 2	5.45	-5.7	-16.5	9.71	-1.05 (†)	19.6	L/271	-0.497 (†)	19.8	L/572
Span 3	2.52	1.34	-15.4	0	0.12 (†)	35.3	L/792	0.053 (†)	35.3	L/1793



PROJECT ADAMS CARGO
 1ST FLOOR CEILING FRAMING

DATE 4/3/2025
 PROJ. #
 DESIGN LTN
 SHEET

Beam Analysis

Beam: 1CB4						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.040			0.040	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	1.1	1.3	0.79	3.159	0.00
	P ₂	3.2	3.7	2.29	9.189	10.00
	P ₃	7.6	13.0	1.86	22.486	20.00
	P ₄	13.2	23.7	2.29	39.189	30.00
	P ₅	6.1	11.3	0.79	18.159	40
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	5
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	3.316 0.00
R ₂	9.646 10.00
R ₃	22.857 20.00
R ₄	39.646 30.00
R ₅	18.316 40.00
R ₆	0.000 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	3.92
Shear, k	0.00
Moment, k-ft	M = 0.31
Deflection, in	D = 0.00
Δ/Span	L/26149

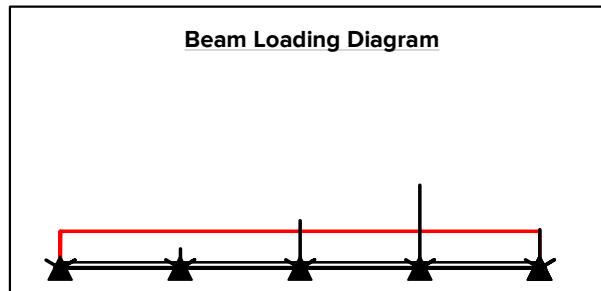
Load Factors	
Dead	1.00
Live	1.00
Roof Live	1.00
Seismic	0.00

Stresses @ Input	
Location	
f _v (psi)	0
f _b (psi)	448

Max/Min Stresses	
f _{v,MAX} (psi)	1277
f _{v,MIN} (psi)	-93
f _{b,MAX} (psi)	448
f _{b,MIN} (psi)	-622

Beam Properties	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	33.1
S (in ³)	8.27
A (in ²)	2.6
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS8x4x3/16	
F _y , ksi		50	
Beam Weight (plf)		14.53	
Axis of Bending		Strong	
Unbr. Length (L _b), ft		0	
C _b		1	
A _w	2.6 in ²	V _n /Ω _v	46.9 k
S	8.27 in ³	Φ _v V _n	70.3 k
Z	10.2 in ³	M _n /Ω _b	25.4 k-ft
I	33.1 in ⁴	Φ _b M _n	38.3 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	3.32	-0.243	-0.429	0.309	-0.005 (↑)	4.4	L/24000	0 (↑)	10	L/∞
Span 2	0.214	-0.186	-0.429	0.145	-0.001 (↑)	15.4	L/119040	0 (↑)	19.8	L/∞
Span 3	0.186	-0.214	-0.429	0.145	-0.001 (↑)	24.6	L/119040	0 (↑)	28.9	L/∞
Span 4	0.243	-0.157	-0.429	0.309	-0.005 (↑)	35.6	L/23808	0 (↑)	39.5	L/∞



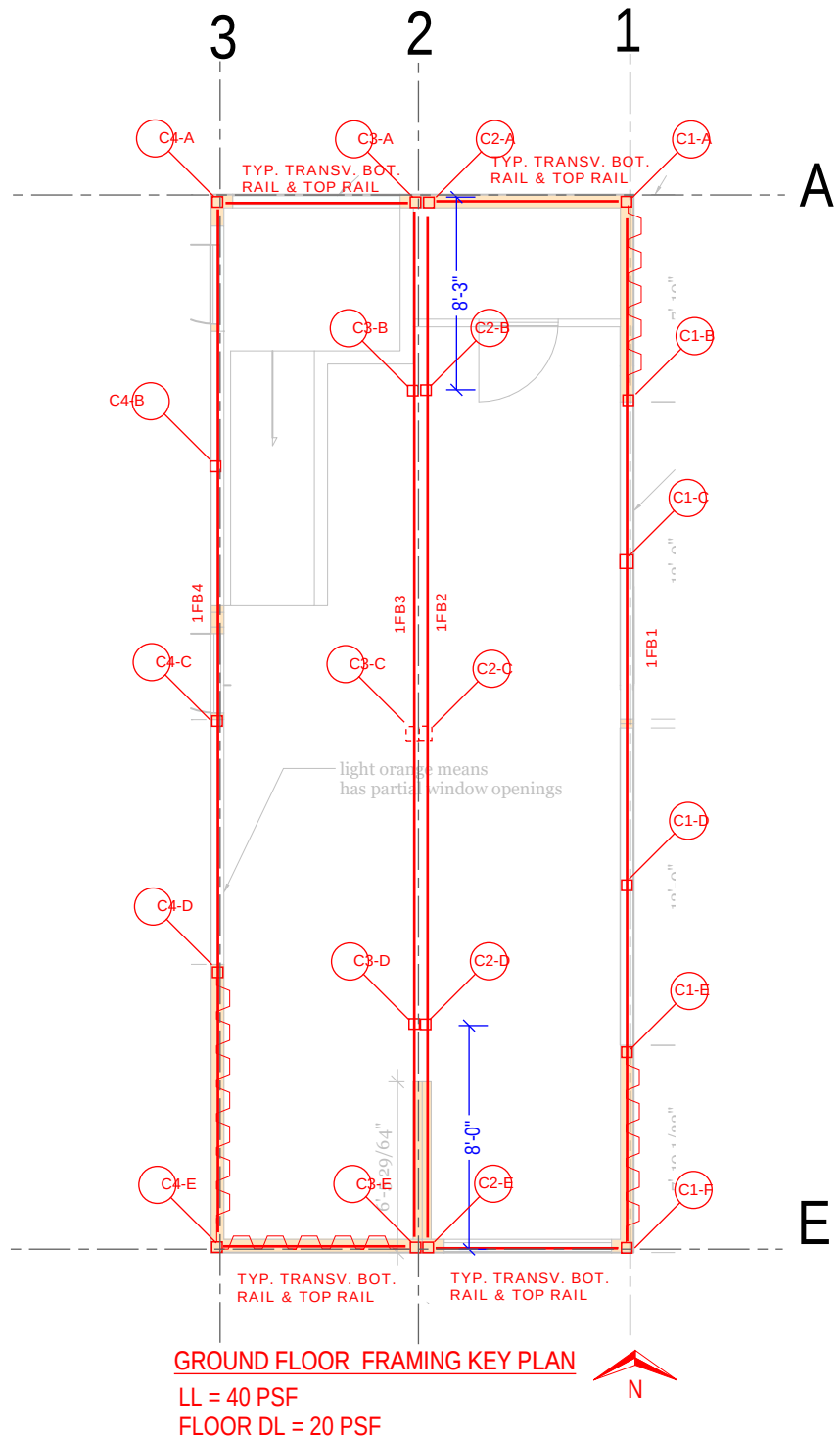
PROJECT ADAMS CARGOTECHTURE

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET

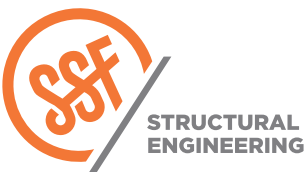


2124 Third Avenue, Suite 100, Seattle, WA 98121
 1818 Tacoma Avenue S, Suite 200, Tacoma, WA 98402
 414 N Pearl Street, Suite 1, Ellensburg, WA 98926

SEATTLE
TACOMA
CENTRAL WA

206.443.6212
 ssfengineers.com

SWENSON SAY FAGET



ADAMS CARGOTECHTURE

PROJECT

KEY PLANS

03.25.2025

DATE

PROJ. #

LTN

DESIGN

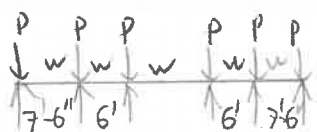
SHEET

GRAVITY DESIGN: 1ST FLR. CEILING

FRAMING

Ceiling DL = 10 PSF

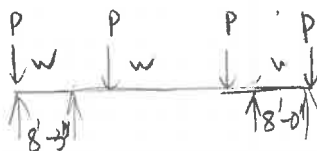
1CB1:



P = From 2FB1

$$w = 10 \text{ PSF} \times 4' \text{ mb.} = 40 \text{ PLF}$$

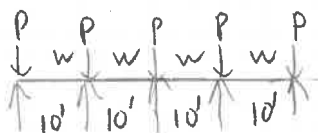
1CB2 & 1CB3:



P = From 2CB2 OR 2CB3

$$w = (10 \text{ PSF} \times 4') + 0.67 \times (40 \text{ PSF} \times 4') = 147 \text{ PLF}$$

1CB4:



P = From 2FB4

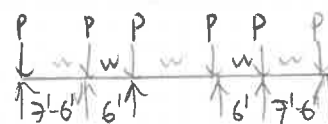
$$w = 10 \text{ PSF} \times 4' = 40 \text{ PLF}$$

1ST FLR. FRAMING

LL = 40 PSF

DL = 20 PSF

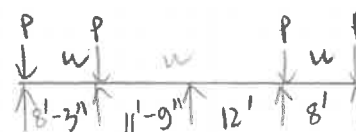
1FC1:



P = From 1CB1

$$w = (20 + 40) \times 4' = 240 \text{ PLF}$$

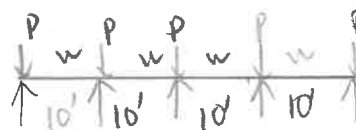
1FB2 & 1FB3:



P = From (1CB2 + 2FB2) or (1CB3 + 2FB3)

$$w = (20 + 40) \times 4' = 240 \text{ PLF}$$

1CF4:



P = From 1CB4

$$w = (20 + 40) \text{ PSF} \times 4' = 240 \text{ PLF}$$

Beam Analysis

Beam: 1FB1						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.080	0.160		0.240	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	1.1	1.1	0.33	2.456	0.00
	P ₂	1.9	1.9	0.59	4.356	7.50
	P ₃	3.5	3.5	1.08	8.068	13.50
	P ₄	3.5	3.5	1.08	8.068	26.50
	P ₅	1.9	1.9	0.59	4.356	32.5
	P ₆	1.07	1.06	0.33	2.456	40
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	6
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	3.248 0.00
R ₂	5.761 7.50
R ₃	10.671 13.50
R ₄	10.671 26.50
R ₅	5.761 32.50
R ₆	3.248 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	20.00
Shear, k	0.00
Moment, k-ft	2.33
Deflection, in	-0.11
Δ/Span	L/1372

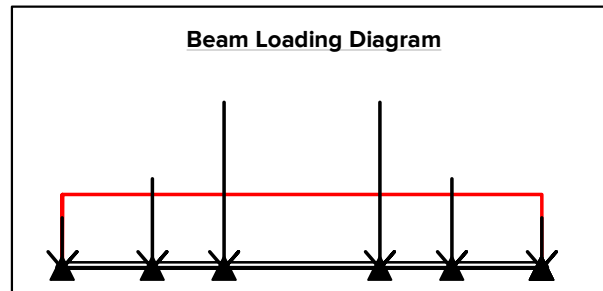
Load Factors	
Dead	1.00
Live	1.00
Roof Live	1.00
Seismic	0.00

Stresses @ Input	
Location	
f _v (psi)	0
f _b (psi)	5113

Max/Min Stresses	
f _v MAX (psi)	1702
f _v MIN (psi)	-817
f _b MAX (psi)	5121
f _b MIN (psi)	-6022

Beam Properties	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	16.4
S (in ³)	5.46
A (in ²)	1.91
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS6x4x3/16
F _y , ksi	50	
Beam Weight (plf)	11.97	
Axis of Bending	Strong	
Unbr. Length (L _b), ft	0	
C _b	1	
A _w	1.91 in ²	V _n /Ω _v 34.3 k
S	5.46 in ³	Φ _v V _n 51.5 k
Z	6.6 in ³	M _n /Ω _b 16.5 k-ft
I	16.4 in ⁴	Φ _b M _n 24.8 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	3.25	-1.01	-0.808	1.31	-0.026 (★)	3.5	L/3434	-0.017 (★)	3.5	L/5252
Span 2	0.397	-1.04	-2.74	-	0.015 (★)	11.1	L/4736	0.01 (★)	11.1	L/7104
Span 3	1.56	-1.56	-2.74	2.33	-0.114 (★)	20	L/1364	-0.076 (★)	20	L/2046
Span 4	1.04	-0.397	-2.74	-	0.015 (★)	28.9	L/4736	0.01 (★)	28.9	L/7104
Span 5	1.01	-0.792	-0.808	1.31	-0.026 (★)	36.5	L/3434	-0.017 (★)	36.5	L/5252



PROJECT ADAMS CARGOTECHTURE

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET

Beam Analysis

Beam: 1FB2 & 1FB3 - D + 0.75L + 0.75Lr						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.080	0.160		0.200	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	6.67	4.5	2.14	11.650	8.25
	P ₂	6.30	4.6	2.21	11.393	32.00
	P ₃				0.000	
	P ₄				0.000	
	P ₅				0.000	
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	5
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	0.584 0.00
R ₂	13.846 8.25
R ₃	2.459 20.00
R ₄	13.609 32.00
R ₅	0.544 40.00
R ₆	0.000 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	26.16
Shear, k	0.01
Moment, k-ft	1.32
Deflection, in	-0.05
Δ/Span	L/3058

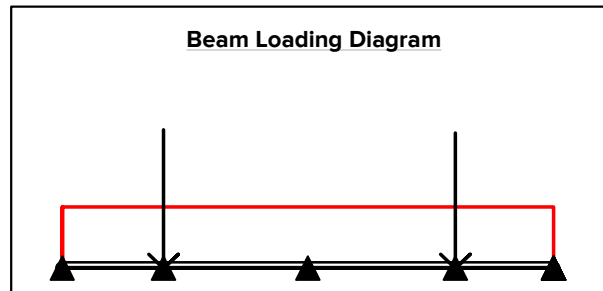
Load Factors	
Dead	1.00
Live	0.75
Roof Live	0.75
Seismic	0.00

Stresses @ Input Location	
f _v (psi)	4
f _b (psi)	2907

Max/Min Stresses	
f _v _MAX (psi)	649
f _v _MIN (psi)	-639
f _b _MAX (psi)	2901
f _b _MIN (psi)	-5538

Beam Proper	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	16.4
S (in ³)	5.46
A (in ²)	1.91
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS6x4x3/16	
F _y , ksi		50	
Beam Weight (plf)		11.97	
Axis of Bending		Strong	
Unbr. Length (L _b), ft		0	
C _b		1	
A _w	1.91 in ²	V _n /Ω _v	34.3 k
S	5.46 in ³	Φ _v V _n	51.5 k
Z	6.6 in ³	M _n /Ω _b	16.5 k-ft
I	16.4 in ⁴	Φ _b M _n	24.8 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	0.584	-1.07	-1.99	0.852	-0.017 (↑)	3.3	L/5816	-0.011 (↑)	3.3	L/8989
Span 2	1.13	-1.22	-2.52	1.2	-0.047 (↑)	13.9	L/2982	-0.031 (↑)	13.9	L/4521
Span 3	1.24	-1.16	-2.52	1.32	-0.057 (↑)	26.2	L/2509	-0.038 (↑)	26.2	L/3764
Span 4	1.06	-0.544	-2.04	0.741	-0.012 (↑)	37	L/7920	-0.008 (↑)	37	L/11880



PROJECT ADAMS CARGO
1ST FLOOR FRAMING

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET

Beam Analysis

Beam: 1FB2 & 1FB3 - D + L						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.080	0.160		0.240	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	6.67	4.5	2.14	11.170	8.25
	P ₂	6.30	4.6	2.21	10.880	32.00
	P ₃				0.000	
	P ₄				0.000	
	P ₅				0.000	
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	5
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	0.701 0.00
R ₂	13.806 8.25
R ₃	2.951 20.00
R ₄	13.539 32.00
R ₅	0.653 40.00
R ₆	0.000 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	26.16
Shear, k	0.01
Moment, k-ft	1.59
Deflection, in	-0.06
Δ/Span	L/2549

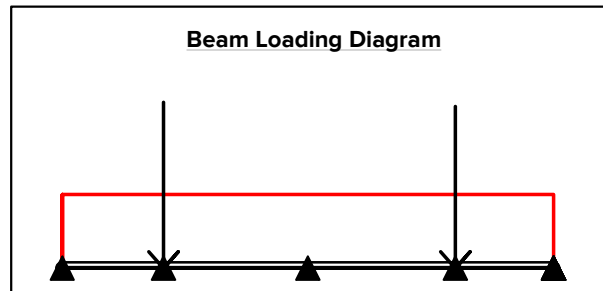
Load Factors	
Dead	1.00
Live	1.00
Roof Live	0.00
Seismic	0.00

Stresses @ Input Location	
f _v (psi)	5
f _b (psi)	3488

Max/Min Stresses	
f _v MAX (psi)	780
f _v MIN (psi)	-764
f _b MAX (psi)	3495
f _b MIN (psi)	-6637

Beam Proper	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	16.4
S (in ³)	5.46
A (in ²)	1.91
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS6x4x3/16	
F _y , ksi		50	
Beam Weight (plf)		11.97	
Axis of Bending		Strong	
Unbr. Length (L _b), ft		0	
C _b		1	
A _w	1.91 in ²	V _n /Ω _v	34.3 k
S	5.46 in ³	Φ _v V _n	51.5 k
Z	6.6 in ³	M _n /Ω _b	16.5 k-ft
I	16.4 in ⁴	Φ _b M _n	24.8 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	0.701	-1.28	-2.39	1.02	-0.017 (↑)	3.3	L/5816	-0.011 (↑)	3.3	L/8989
Span 2	1.36	-1.46	-3.02	1.44	-0.047 (↑)	13.9	L/2982	-0.031 (↑)	13.9	L/4521
Span 3	1.49	-1.39	-3.02	1.59	-0.057 (↑)	26.2	L/2509	-0.038 (↑)	26.2	L/3764
Span 4	1.27	-0.653	-2.45	0.889	-0.012 (↑)	37	L/7920	-0.008 (↑)	37	L/11880



PROJECT ADAMS CARGO
1ST FLOOR FRAMING

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET

Beam Analysis

Beam: 1FB4						
Load	Dead	Live	Roof Live	Seismic	Factored	Location
Distributed (k/ft)	W ₁	0.080	0.160		0.240	
	W ₂				0.000	
	W ₃				0.000	
	W ₄				0.000	
	W ₅				0.000	
	W ₆				0.000	
	W ₇				0.000	
	W ₈				0.000	
	W ₉				0.000	
	W ₁₀				0.000	
Trapezoidal (k/ft/ft)	t ₁				0.000	
	t ₂				0.000	
	t ₃				0.000	
	t ₄				0.000	
	t ₅				0.000	
	t ₆				0.000	
Point (k)	P ₁	1.3	1.3	0.79	3.316	0.00
	P ₂	3.7	3.7	2.29	9.646	10.00
	P ₃	8.0	13.0	1.86	22.857	20.00
	P ₄	13.7	23.7	2.29	39.646	30.00
	P ₅	6.3	11.3	0.79	18.316	40
	P ₆				0.000	
	P ₇				0.000	
	P ₈				0.000	
	P ₉				0.000	
	P ₁₀				0.000	

Support Locations and Reactions	
# of Supports	5
Total Beam Length	40.00
Left End Condition	Pinned
Right End Condition	Pinned
R ₁	4.259 0.00
R ₂	12.389 10.00
R ₃	25.086 20.00
R ₄	42.389 30.00
R ₅	19.259 40.00
R ₆	0.000 40.00
R ₇	0.000 40.00
R ₈	0.000 40.00
R ₉	0.000 40.00
R ₁₀	0.000 40.00

Demand Output	
Location, ft	4.40
Shear, k	V -0.11
Moment, k-ft	M = 1.83
Deflection, in	D = -0.06
Δ/Span	L/2130

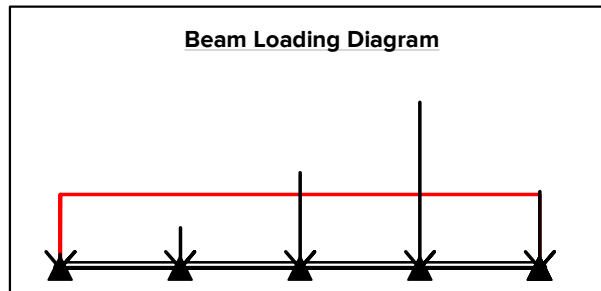
Load Factors	
Dead	1.00
Live	1.00
Roof Live	1.00
Seismic	0.00

Stresses @ Input Location	
f _v (psi)	-59
f _b (psi)	4012

Max/Min Stresses	
f _{v,MAX} (psi)	2230
f _{v,MIN} (psi)	-764
f _{b,MAX} (psi)	4066
f _{b,MIN} (psi)	-5648

Beam Properties	
E (ksi)	29000
b (in)	
d (in)	
I (in ⁴)	16.4
S (in ³)	5.46
A (in ²)	1.91
I (Override)	
S (Override)	
A (Override)	

Steel Beam Section		HSS6x4x3/16
F _y , ksi	50	
Beam Weight (plf)	11.97	
Axis of Bending	Strong	
Unbr. Length (L _b), ft	0	
C _b	1	
A _w	1.91 in ²	V _n /Ω _v 34.3 k
S	5.46 in ³	Φ _v V _n 51.5 k
Z	6.6 in ³	M _n /Ω _b 16.5 k-ft
I	16.4 in ⁴	Φ _b M _n 24.8 k-ft



Span	V _L (kips)	V _R (kips)	M(-) (k-ft)	M(+) (k-ft)	Δ _{TL} (in)	@ x =	L/	Δ _{LL} (in)	@ x =	L/
Span 1	4.26	-1.46	-2.57	1.85	-0.056 (↑)	4.4	L/2143	-0.038 (↑)	4.4	L/3158
Span 2	1.29	-1.11	-2.57	0.872	-0.016 (↑)	15.4	L/7440	-0.011 (↑)	15.4	L/10822
Span 3	1.11	-1.29	-2.57	0.872	-0.016 (↑)	24.6	L/7440	-0.011 (↑)	24.6	L/10822
Span 4	1.46	-0.943	-2.57	1.85	-0.056 (↑)	35.6	L/2126	-0.038 (↑)	35.6	L/3133



PROJECT ADAMS CARGOTECHTURE

DATE 4/3/2025

PROJ. #

DESIGN LTN

SHEET

GRAVITY DESIGN

HSS 6 x 4 x 1/4 COLUMN:

$$l = 9' - 6" \text{ MAX.}$$

Compression:

$$\frac{P_n}{\Omega} = 89.2 \text{ K}$$

$$\phi P_n = 134 \text{ K}$$

Tension:

$$\frac{P_n}{\Omega} = 100 \text{ K}$$

$$\phi P_n = 150 \text{ K}$$

HSS 4 x 4 x 1/4 COLUMN:

$$l = 9' - 6" \text{ MAX}$$

Compression:

$$\frac{P_n}{\Omega} = 66.9 \text{ K}$$

$$\phi P_n = 101 \text{ K}$$

Tension:

$$\frac{P_n}{\Omega} = 78.4 \text{ K}$$

$$\phi P_n = 118 \text{ K}$$

HSS 4 x 3 x 3/16 COLUMN:

$$l = 9' - 6" \text{ MAX}$$

Compression:

$$\frac{P_n}{\Omega} = 34.3 \text{ K}$$

$$\phi P_n = 51.6 \text{ K}$$

Tension:

$$\frac{P_n}{\Omega} = 52.1 \text{ K}$$

$$\phi P_n = 78.1 \text{ K}$$



**STRUCTURAL
ENGINEERING**

PROJECT

ADAMS CARGO

DATE

04.01.25

PROJ. #

LTN

DESIGN

SHEET

1ST FLOOR/ GROUND FLOOR COLUMN

Service Loads (kip)						Load Combinations						Size
Mark	DL	LL	Lr	Ex	Ey	Load Combo A	Load Combo B	Load Combo C(x-dir)	Load Combo C(y-dir)	Load Combo D(x-dir)	Load Combo D(y- dir)	
C1-A	1.1	1.1	0.3	60	11.2	3.1	2.9	62.4	13.6	-59.0	-10.2	HSS 6x4x1/4
C1-B	1.9	1.9	0.6		25.4	5.6	5.1	4.3	29.7	1.7	-23.7	HSS 6x4x1/4
C1-C	3.5	3.5	1.1		27.8	10.3	9.4	7.9	35.7	3.2	-24.6	HSS 6x4x1/4
C1-D	3.5	3.5	1.1		27.8	10.3	9.4	7.9	35.7	3.2	-24.6	HSS 6x4x1/4
C1-E	1.9	1.9	0.6		25.4	5.6	5.1	4.3	29.7	1.7	-23.7	HSS 6x4x1/4
C1-F	1.1	1.1	0.3	51.5	11.2	3.1	2.9	53.9	13.6	-50.5	-10.2	HSS 6x4x1/4
C2-A/C3-A				18.9		0.0	0.0	18.9	0.0	-18.9	0.0	HSS 6x4x1/4
C2-B/C3-B	3.63	4.42	1.4			12.1	11.0	9.1	9.1	3.3	3.3	HSS 4x3x3/16
C2-D/C3-D	3.72	4.50	1.4			12.4	11.2	9.2	9.2	3.3	3.3	HSS 4x3x3/16
C2-E/C3-E				2.25		0.0	0.0	2.3	0.0	-2.3	0.0	HSS 6x4x1/4
C4-A	1.3	1.3	0.8	24.6	41.2	3.9	4.0	27.5	44.1	-23.5	-40.1	HSS 6x4x1/4
C4-B	3.7	3.7	2.3		8.5	11.4	11.8	8.6	17.1	3.3	-5.2	HSS 6x4x1/4
C4-C	8.0	13.0	1.9		19.7	31.3	25.6	23.0	42.7	7.2	-12.5	HSS 6x4x1/4
C4-D	13.7	23.7	2.3		27.3	55.4	43.8	40.6	67.9	12.3	-15.0	HSS 6x4x1/4
C4-E	6.3	11.3	0.8	58.7	27.3	25.9	20.0	77.6	46.2	-53.1	-21.7	HSS 6x4x1/4

LOAD COMBINATIONS (LRFD)

A. 1.2D + 1.6L + 0.5Lr

B. 1.2D + 1.6Lr + L

C. 1.2D + E + L + 0.2S

D. 0.9D - E

Section	Compressive Strength (ϕP_n) (k)*	Tension Strength (ϕP_n) (k)*
HSS 6x4x1/4	134	150
HSS 4x4x1/4	101.0	118
HSS 4x3x3/16	51.6	78.1

* Note: Strength at 9'-6" max. unbraced length

2124 Third Ave, Suite 100, Seattle, WA 98121 | ☎ 206.443.6212
934 Broadway, Suite 100, Tacoma, WA 98402 | ☎ 253.284.9470
SEATTLE
TACOMA

ssengineers.com

SWENSON SAY FAGET



ADAMS CARGOTECHTURE

1ST FLOOR/ GROUND FLOOR COLUMN

4/3/2025

DATE

PROJ. #

LTN

DESIGN

SHEET

FOUNDATION LOAD @ BELOW GROUND FLOOR FRAMING

Mark	Service Loads (kip)					Load Combinations					
	DL	LL	Lr	Ex	Ey	Load Combo A	Load Combo B	Load Combo C(x-dir)	Load Combo C(y-dir)	Load Combo D(x-dir)	Load Combo D(y-dir)
C1-A	1.3	1.6	0.3	60	11.2	4.3	3.7	63.3	14.5	-58.8	-10.0
C1-B	2.4	2.8	0.6		25.4	7.6	6.6	5.8	31.2	2.1	-23.3
C1-C	4.4	5.2	1.1		27.8	14.1	12.2	10.7	38.5	3.9	-23.9
C1-D	4.4	5.2	1.1		27.8	14.1	12.2	10.7	38.5	3.9	-23.9
C1-E	2.4	2.8	0.6		25.4	7.6	6.6	5.8	31.2	2.1	-23.3
C1-F	1.3	1.6	0.3	51.5	11.2	4.3	3.7	54.8	14.5	-50.3	-10.0
C2-A/C3-A	0.23	0.47	0.0	18.9		1.0	0.7	19.6	0.7	-18.7	0.2
C2-B/C3-B	7.55	6.26	2.1			20.1	18.7	15.7	15.7	6.8	6.8
C2-C/C3-C	0.98	1.97	0.0			4.3	3.1	3.1	3.1	0.9	0.9
C2-D/C3-D	7.19	6.35	2.2			19.9	18.5	15.4	15.4	6.5	6.5
C2-E/C3-E	0.22	0.44	0.0	2.25		1.0	0.7	2.9	0.7	-2.1	0.2
C4-A	1.6	1.9	0.8	24.6	41.2	5.3	5.0	28.5	45.1	-23.2	-39.8
C4-B	4.6	5.5	2.3		8.5	15.5	14.7	11.5	20.0	4.2	-4.3
C4-C	8.8	14.5	1.9		19.7	34.6	28.0	25.4	45.1	7.9	-11.8
C4-D	14.6	25.5	2.3		27.3	59.5	46.7	43.5	70.8	13.2	-14.1
C4-E	6.6	11.9	0.8	58.7	27.3	27.3	21.0	78.6	47.2	-52.8	-21.4

LOAD COMBINATIONS (LRFD)

A. $1.2D + 1.6L + 0.5Lr$

B. $1.2D + 1.6Lr + L$

C. $1.2D + E + L + 0.2S$

D. $0.9D - E$

2124 Third Ave, Suite 100, Seattle, WA 98121
934 Broadway, Suite 100, Tacoma, WA 98402

SEATTLE
TACOMA

ssfeengineers.com

SWENSON SAY FAGET



ADAMS CARGOTECHTURE

FOUNDATION LOAD @ BELOW GROUND FLOOR FRAMING

4/3/2025

DATE

PROJ. #

LTN

DESIGN

SHEET

Spread Footing Soil Bearing Design

Service Loads Loading

Dead Load =	15.2 kips
Live Load =	16.8 kips
Wind/EQ Load =	0.0 kips
Wind/EQ Moment (M_v) =	0 ft-kips
Gravity Load Eccentricity ($\pm X$) =	0.00 ft.
Footing Weight =	3.1 kips
Total Load =	35.1 kips
Total Moment =	0 ft-kips

Service Load Factors

DL	1
LL	1
EQ/Wind	0

Soil Properties

Allowable Soil Brg. (Q_a) =	1.50 ksf
Overburden Density (γ_s) =	120 psf
Net Ftg Wt? ($\gamma_c - \gamma_s$)	No

Column Dimensions and Location

Column X_c Dimension (D_x) =	6.00 in.
Column Y_c Dimension (D_y) =	4.00 in.
Column Face from right (Cr) =	2.25 ft.
Column Face from left (Cl) =	2.25 ft.

Soil Bearing Check (Allowable)

Eccentricity =	0.00 ft.
Leng. Soil Brg. Under Ftg. =	5.00 ft.
q_{max} =	1.41 ksf
q_{min} =	1.41 ksf

OK

Footing Dimensions

L Dimension (X) =	5.00 ft.
B Dimension (Y) =	5.00 ft.
Footing Thickness (t) =	10.00 in.
Ftg Overburden (O_t) =	0.00 ft.

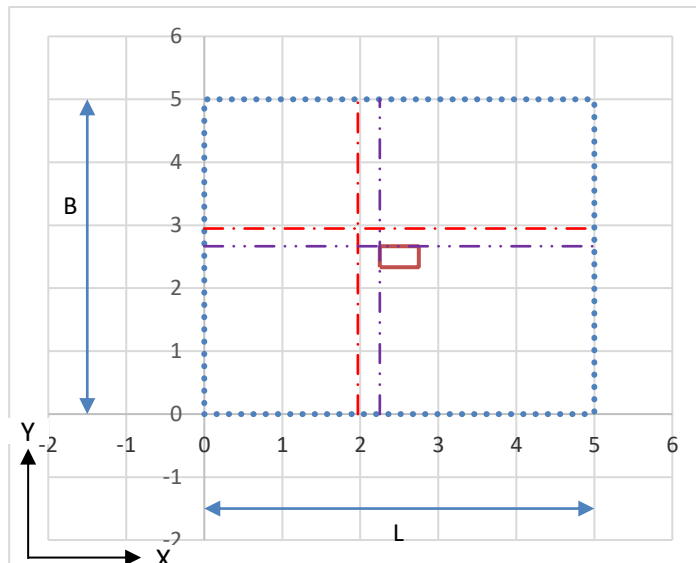
Soil Pressure Equations:

$$e \leq L/6$$

$$q_{max} = \frac{Q}{LB} \left(1 + \frac{6e}{L} \right)$$

$$e > L/6$$

$$q_{max} = \frac{4Q}{3L(L-2e)}$$



ADAMS CONTAINER

PROJECT

C2-B + C3-B FOOTING

C2-D + C3-D SIMILAR

4/3/2025

DATE

PROJ. #

LTN

DESIGN

SHEET

Spread Footing Concrete Design - ACI 318-14

Footing Properties

Concrete Strength (f'_c) =	3000 psi
Rebar Yield Strength (f_y) =	60000 psi
Reinforcing Clear Cover (c_{vr}) =	3.00 in.
Reinforcing Depth (d) =	6.75 in.

Factored Loads

Factored Total Load =	48.9 kips
Factored Total moment =	0 ft-kips

Factored Bearing

Eccentricity =	0.00 ft.
Length of Soil Brg. Under Ftg. =	5.00 ft.
q_{max} =	1.95 ksf
q_{colr} =	1.95 ksf
q_{coll} =	1.95 ksf
q_{min} =	1.95 ksf

Flexural Design - X Direction (About Y-Axis)

Bar Size =	#4
Bars =	5
M_u =	25 ft-kips
ϕM_n =	29 ft-kips
ρ_{min} =	0.0018
ρ_{req} =	0.0021
A_s Required =	0.83 sq. in.
A_s Provided =	1.00 sq. in.

OK

Controls

OK

One-Way Shear Design - X Direction

V_u =	19 kips
ϕV_n =	33 kips

OK

β =	1.000
$\gamma_s = 2/(\beta+1)$ =	1.00
Provide $A_{s,req}\gamma_s$ =	0.83 sq. in.

Provide evenly distributed bars in each direction.

Strength Load Factors

DL	1.2
LL	1.6
EQ/Wind	0

Factored Moments and Shears

	M_u k-ft	V_u kips
X Right Side	25	19
X Left Side	25	19
Y Both Sides	27	20

Flexural Design - Y Direction (About X-Axis)

Bar Size =	#4
Bars =	5
M_u =	27 ft-kips
ϕM_n =	29 ft-kips
ρ_{min} =	0.0018
ρ_{req} =	0.0022
A_s Required =	0.90 sq. in.
A_s Provided =	1.00 sq. in.

OK

Controls

OK

One-Way Shear Design - Y Direction

V_u =	20 kips
ϕV_n =	33 kips

OK

Two-Way (Punching) Shear Design

b_o =	47 in
v_u =	47 kips
ϕv_n =	50 kips

OK

Concrete Capacity Equations:

$$M_n = A_s F_y \left[d - \frac{1}{2} \left(\frac{A_s F_y}{0.85 f'_c b} \right) \right] \quad v_n = \min \left(\frac{4 \sqrt{f'_c}}{\left(2 + \frac{4}{\beta} \right) \sqrt{f'_c}} \right) b_o d$$

$$V_n = 2 \gamma \sqrt{f'_c} b_w d \quad b_o = 2(Dx + d) + 2(Dy + d)$$

$$\beta = \max(Dx, Dy) / \min(Dx, Dy)$$

ADAMS CONTAINER

4/3/2025

PROJECT

C2-B + C3-B FOOTING

C2-D + C3-D SIMILAR

DATE

PROJ. #

LTN

DESIGN

SHEET

Spread Footing Soil Bearing Design

Service Loads Loading

Dead Load =	2.0 kips
Live Load =	4.0 kips
Wind/EQ Load =	0.0 kips
Wind/EQ Moment (M_v) =	0 ft-kips
Gravity Load Eccentricity ($\pm X$) =	0.00 ft.
Footing Weight =	0.6 kips
Total Load =	6.6 kips
Total Moment =	0 ft-kips

Service Load Factors

DL	1
LL	1
EQ/Wind	0

Soil Properties

Allowable Soil Brg. (Q_a) =	1.50 ksf
Overburden Density (γ_s) =	120 psf
Net Ftg Wt? ($\gamma_c - \gamma_s$)	No

Column Dimensions and Location

Column Xc Dimension (D_x) =	6.00 in.
Column Yc Dimension (D_y) =	4.00 in.
Column Face from right (Cr) =	0.88 ft.
Column Face from left (Cl) =	0.88 ft.

Soil Bearing Check (Allowable)

Eccentricity =	0.00 ft.
Leng. Soil Brg. Under Ftg. =	2.25 ft.
q_{max} =	1.31 ksf
q_{min} =	1.31 ksf

OK

Footing Dimensions

L Dimension (X) =	2.25 ft.
B Dimension (Y) =	2.25 ft.
Footing Thickness (t) =	10.00 in.
Ftg Overburden (O_t) =	0.00 ft.

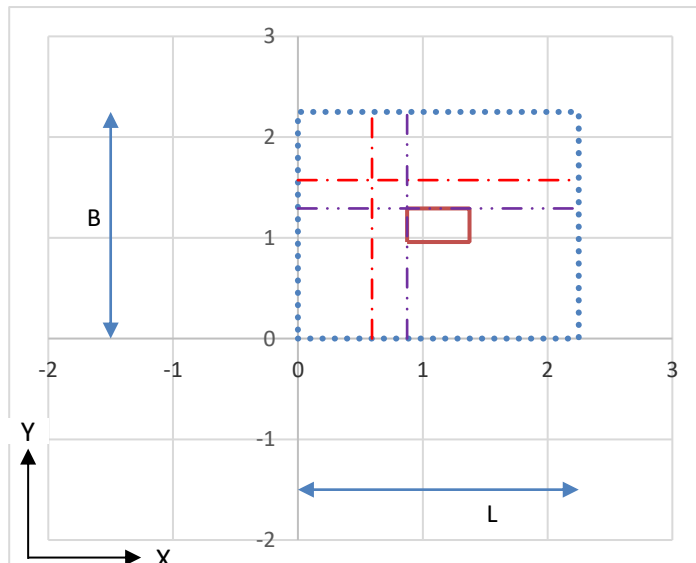
Soil Pressure Equations:

$$e \leq L/6$$

$$q_{max} = \frac{Q}{LB} \left(1 + \frac{6e}{L} \right)$$

$$e > L/6$$

$$q_{max} = \frac{4Q}{3L(L-2e)}$$



ADAMS CONTAINER

PROJECT

C2-C + C3-C FOOTING

4/3/2025

DATE

PROJ. #

LTN

DESIGN

SHEET

Spread Footing Concrete Design - ACI 318-14

Footing Properties

Concrete Strength (f'_c) =	3000 psi
Rebar Yield Strength (f_y) =	60000 psi
Reinforcing Clear Cover (c _{vr}) =	3.00 in.
Reinforcing Depth (d) =	6.75 in.

Factored Loads

Factored Total Load =	9.6 kips
Factored Total moment =	0 ft-kips

Factored Bearing

Eccentricity =	0.00 ft.
Length of Soil Brg. Under Ftg. =	2.25 ft.
q _{max} =	1.89 ksf
q _{colr} =	1.89 ksf
q _{coll} =	1.89 ksf
q _{min} =	1.89 ksf

Flexural Design - X Direction (About Y-Axis)

Bar Size =	#4
Bars =	2
Mu =	2 ft-kips
ØMn =	12 ft-kips
ρ _{min} =	0.0018
ρ _{req} =	0.0003
A _s Required =	0.33 sq. in.
A _s Provided =	0.40 sq. in.

OK
Controls

OK

One-Way Shear Design - X Direction

Vu =	3 kips
ØVn =	15 kips

OK

β =	1.000
γ _s = 2/(β+1) =	1.00
Provide A _{s,req} γ _s =	0.33 sq. in.

Provide evenly distributed bars in each direction.

Strength Load Factors

DL	1.2
LL	1.6
EQ/Wind	0

Factored Moments and Shears

	Mu k-ft	Vu kips
X Right Side	2	3
X Left Side	2	3
Y Both Sides	2	3

Flexural Design - Y Direction (About X-Axis)

Bar Size =	#4
Bars =	2
Mu =	2 ft-kips
ØMn =	12 ft-kips
ρ _{min} =	0.0018
ρ _{req} =	0.0004
A _s Required =	0.33 sq. in.
A _s Provided =	0.40 sq. in.

OK
Controls

OK

One-Way Shear Design - Y Direction

Vu =	3 kips
ØVn =	15 kips

OK

Two-Way (Punching) Shear Design

b _o =	47 in
vu =	8 kips
Øvn =	50 kips

OK

Concrete Capacity Equations:

$$Mn = A_s F_y \left[d - \frac{1}{2} \left(\frac{A_s F_y}{0.85 f'_c b} \right) \right] \quad vn = \min \left(\begin{array}{l} 4\sqrt{f'_c} \\ \left(2 + \frac{4}{\beta} \right) \sqrt{f'_c} \\ \left(2 + \frac{\alpha_s d}{b_o} \right) \sqrt{f'_c} \end{array} \right) b_o d$$

$$Vn = 2 \gamma \sqrt{f'_c} b_w d \quad b_o = 2(Dx + d) + 2(Dy + d)$$

$$\beta = \max(Dx, Dy) / \min(Dx, Dy)$$

ADAMS CONTAINER

4/3/2025

PROJECT

C2-C + C3-C FOOTING

DATE

PROJ. #

LTN

DESIGN

SHEET

HSS COLUMN TO CONTAINER
FITTING:

Fitting Strength: Uplift controls

TOP OR INTERMEDIATE

$$\text{FITTING} = 195 \text{ kN} = 43.875^{\text{K}}$$

BOTTOM OR

$$\text{INT. FITTING} = 390 \text{ kN} = 87.75^{\text{K}}$$

(FROM ISO 1161)

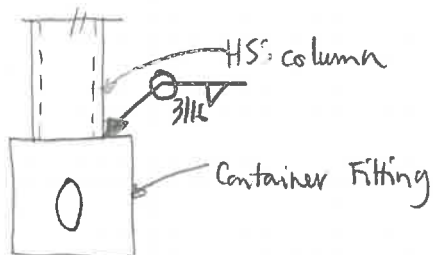
Loading:

$$\text{MAX. UPLIFT @ TOP INT.} = 29.7^{\text{K}}$$

$$\text{MAX UPLIFT @ TOP CORNER} = 29.7^{\text{K}}$$

$$\text{MAX UPLIFT @ BOT. INT.} = 55.5^{\text{K}}$$

$$\text{MAX UPLIFT @ BOT. CORNER} = 63.4^{\text{K}}$$



If HSS $4 \times 4 \times 1/4$: $3/16''$ Weld (Fillet)

$$\begin{aligned}\phi R_n &= 1.392 \times D \times \ell \\ &= 1.392 \times 3 \times (4 \times 4'') = 66.8^{\text{K}}\end{aligned}$$

If HSS $6 \times 4 \times 3/16$: $3/16''$ Weld (Fillet)

$$\begin{aligned}\phi R_n &= 1.392 \times D \times \ell \\ &= 1.392 \times 3 \times (4'' \times 2 + 6'' \times 2) \\ &= 83.5^{\text{K}}\end{aligned}$$



PROJECT

ADAMS CARGO

DATE

04.01.25

PROJ. #

LTV

DESIGN

SHEET