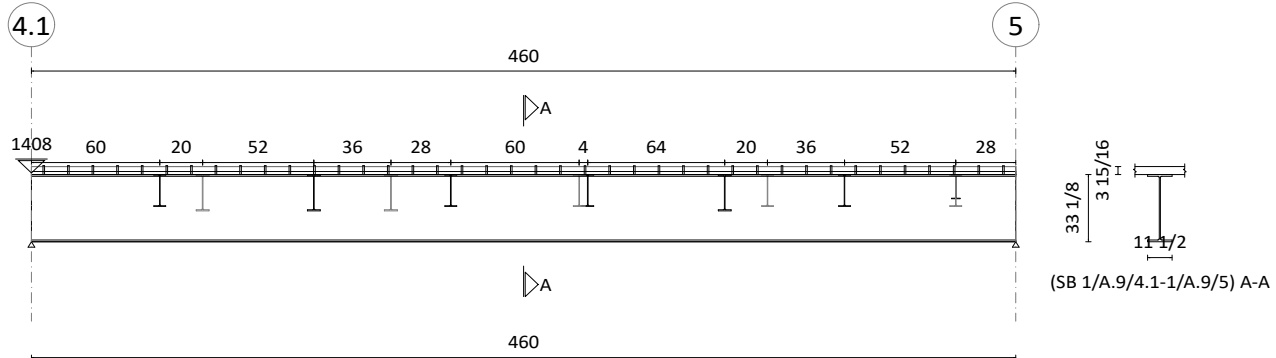
	Project				Job Ref.	
	Creech DRP PH2				Sheet no.	
	Admin Building				Page 1/3	
	Calc. by Allison Valencia	Date 11/7/2025	Chk'd by	Date	App'd by	Date

### SB 1/A.9/4.1-1/A.9/5



St. 1 (1): SB 1/A.9/4.1-1/A.9/5 - 1 (W 33x130 A992-50 (40) [Deformed # 3 @ 8])


### Restraints

Source	Distance / Length [ft, in]	LTB Top / Sub -Beam	LTB Top Factor	LTB Btm / Sub -Beam	LTB Btm Factor	Strut Major / Sub-Beam	Strut Major Factor	Strut Minor / Sub-Beam	Strut Minor Factor
support	0"	•		•		•		•	
sub-beam	5' 0"		1.000		1.000		1.000		1.000
member	5' 0"	•						•	
sub-beam	1' 8"		1.000		1.000		1.000		1.000
member	6' 8"	•						•	
sub-beam	4' 4"		1.000		1.000		1.000		1.000
member	11' 0"	•						•	
sub-beam	3' 0"		1.000		1.000		1.000		1.000
member	14' 0"	•						•	
sub-beam	2' 4"		1.000		1.000		1.000		1.000
member	16' 4"	•						•	
sub-beam	5' 0"		1.000		1.000		1.000		1.000
member	21' 4"	•						•	
sub-beam	4"		1.000		1.000		1.000		1.000
member	21' 8"	•						•	
sub-beam	5' 4"		1.000		1.000		1.000		1.000
member	27' 0"	•						•	
sub-beam	1' 8"		1.000		1.000		1.000		1.000
member	28' 8"	•						•	
sub-beam	3' 0"		1.000		1.000		1.000		1.000
member	31' 8"	•						•	
sub-beam	4' 4"		1.000		1.000		1.000		1.000
member	36' 0"	•						•	
sub-beam	2' 4"		1.000		1.000		1.000		1.000
support	38' 4"	•		•		•		•	

### Connectors\Layout

Name Diameter As welded height Specified ultimate tensile strength  
AISC 3/4 x 4 3/8 3/4 4 65.00

Distance end 1 [ft, in]	Distance end 2 [ft, in]	Number of connectors in length	Number of connectors in group	Group spacing distance [in]
0"	38' 4"	40	1	11 1/2

	Project				Job Ref.	
	Creech DRP PH2				Sheet no.	
	Admin Building				Page 2/3	
Calc. by	Date	Chk'd by	Date	App'd by	Date	
Allison Valencia	11/7/2025					

### Decking

Manufacturer Name Gauge Yield strength  
 USD B-LOK 33ksi 30" 1/32 in 33.00 ksi

### Slab

Overall depth Effective Width Concrete type Minimum compressive strength,  $f_c'$   
 3 15/16 in 8' 11" ft, in Normal 4.00 ksi

### Reinforcement

Transverse reinforcement Reinforcement for crack control or fire requirements  
 Type Area Yield strength Type Area Yield strength  
 Deformed # 3 @ 8 0.17 in<sup>2</sup>/ft 60.00 ksi 6x6 W1.4xW1.4 0.03 in<sup>2</sup>/ft 65.00 ksi

### Static Design Summary

Summary W 33x130 (40 (40))

Design Condition	#	Design Value	Design Capacity	Units	U.R.	Status
Construction Stage	-	-	-	-	-1.000	Not required
Classification	7	Compact	-	-	-	✓ Pass
Vertical Shear	8	-164.9	575.9	kip	0.286	✓ Pass
Flexure	8	1545.2	2156.2	kip ft	0.717	✓ Pass
Connector Resistance	7	18	40 (40)		-	✓ Pass
Natural Frequency	14	0.00	-	Hz	-	Not required
Deflection Self weight	14	0.1	-	in	-	-
Deflection Slab	14	0.3	1.9	in	0.166	✓ Pass
Deflection Dead	14	0.5	1.3	in	0.396	✓ Pass
Deflection Post Composite	14	0.5	1.3	in	0.396	✓ Pass
Deflection Total	14	0.9	1.9	in	0.471	✓ Pass

Regional code: United States (ACI/AISC), design code: AISC 360/341 LRFD (2016)

### Static Design Calculations

#### Classification

3D Building Analysis - Critical

7 LRFD<sub>1</sub>-1.4D - Critical

Span 1 W 33x130 A992-50 - Critical

Position 21' 4" - Critical

Web class Compact AISC 360 Table B4.1b

$h / t_w$  = **51.700**

$h / t_w$  limit for plastic stress distribution = **90.553**

#### Vertical Shear

3D Building Analysis - Critical

8 LRFD<sub>2</sub>-1.2D+1.6L - Critical

Span 1 W 33x130 A992-50 - Critical

Position 38' 4" - Critical


Position of  $V_{ry}$  = **38' 4"** ft, in

Required major axis shear strength,  $V_{ry}$  = **-164.9** kip

Design shear strength = **575.9** kip AISC 360 G2

Ratio = **0.286**

✓ Pass

	Project				Job Ref.	
	Creech DRP PH2				Sheet no.	
	Admin Building				Page 3/3	
Calc. by	Date	Chk'd by	Date	App'd by	Date	
Allison Valencia	11/7/2025					

#### Flexure

3D Building Analysis - Critical

8 LRFD<sub>2</sub>-1.2D+1.6L - Critical

Span 1 W 33x130 A992-50 - Critical

21' 8" Point Load Position - Critical

Distance of M along member = **21' 8"** ft, in

Required flexural strength,  $M_x$  = **1545.2** kip ft

Design flexural strength = **2156.2** kip ft

Ratio = **0.717**

✔ Pass

#### Connector Resistance

3D Building Analysis - Critical

7 LRFD<sub>1</sub>-1.4D - Critical

Span 1 W 33x130 A992-50 - Critical

21' 4" Max Moment Position - Critical

Layout and strength of shear connectors

Maximum group spacing,  $s$  = **11 1/2** in

Maximum permitted group spacing = **31 1/2** in

Number of shear connectors over full beam length 40

Number of shear connectors to critical point,  $N_a$  18

Degree of shear connection = **0.305**

Absolute minimum degree of shear connection = **0.250**

Optimum amount of shear connection = **0.500**

Partial shear connection

✔ Pass

#### Deflection

3D Building Analysis - Critical

14 (Operating) LRFD<sub>11.1</sub>-1.2D+L+0.15S+E - Critical

Span 1 W 33x130 A992-50 - Critical

Deflection Total - Critical

Short term inertia,  $I_{rs}$  = **13893.6** in<sup>4</sup>

Long term inertia,  $I_{rtL}$  = **10370.7** in<sup>4</sup>

Short term inertia @ partial interaction,  $I_{rs}$  = **10678.3** in<sup>4</sup>

Long term inertia @ partial interaction,  $I_{rtL}$  = **8732.2** in<sup>4</sup>

Position Total load deflection = **19' 2 5/8"** ft, in

Deflection with full shear connection  $n$ ,  $\delta$  = **0.8** in

Deflection of steel beam alone,  $\delta_s$  = **1.0** in

Minimum degree of shear connection = **30.52** %

Deflection with partial shear connection,  $\delta$  = **0.9** in

Span over limit = **1.9** in

Design limit = **1.9** in

Utilization Ratio = **0.471**

✔ Pass