

JORGENSEN ENGINEERING

STRUCTURAL CALCULATIONS

ISMAILER DECK REPLACEMENT
ADDRESS ROAD
CITY, CA



STRUCTURAL DESIGN CRITERIA:
2019 CALIFORNIA BUILDING CODE

DATE - SUBMITTAL
JANUARY 20, 2021 - PERMIT SUB
PREPARED BY:
RYE JORGENSEN, P.E.

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BUILDING LOADING & WEIGHTS

AREA LOADS

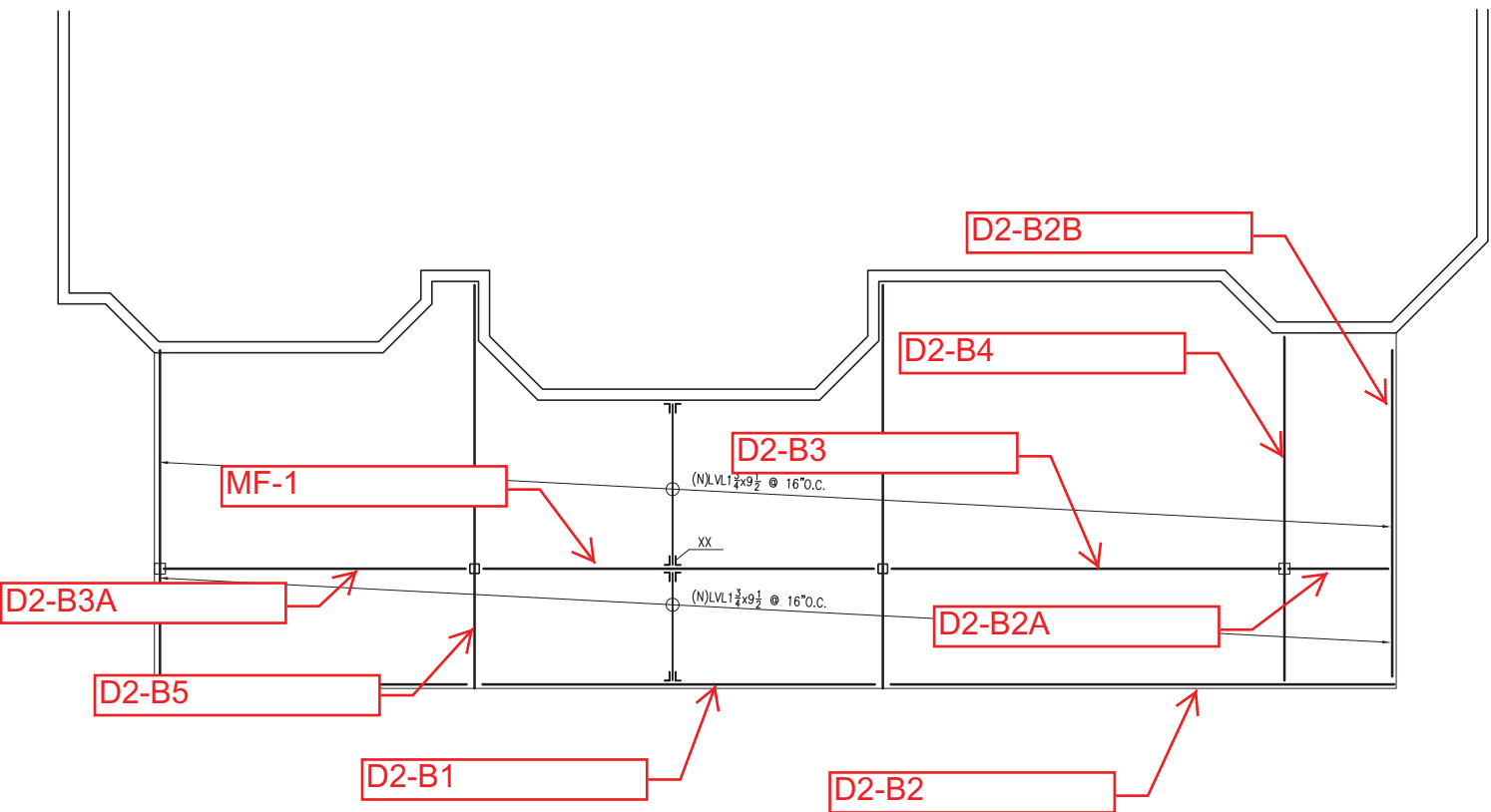
UNIT LOADS (psf)	UPPER DECK	LOWER DECK
STRUCTURAL SHEATHING	2.5	
JOIST	6	4
WATERPROOFING	2	0
DECKING SYSTEM	9	4
CEILING	2	0
INSULATION		0
MECH/ELEC		0
MISC.	0	0
MISC.	3.5	2
DEAD LOAD (VERTICAL)	25	10
PARTITIONS	0	0
DEAD LOAD (LATERAL)	25	10
LIVE LOADS (VERTICAL)	60	60
TOTAL LOAD	85	70

SECTION	TRIB AREA (SQFT)	WEIGHT (K)
UPPER DECK	700	17.5
LOWER DECK	700	7.0

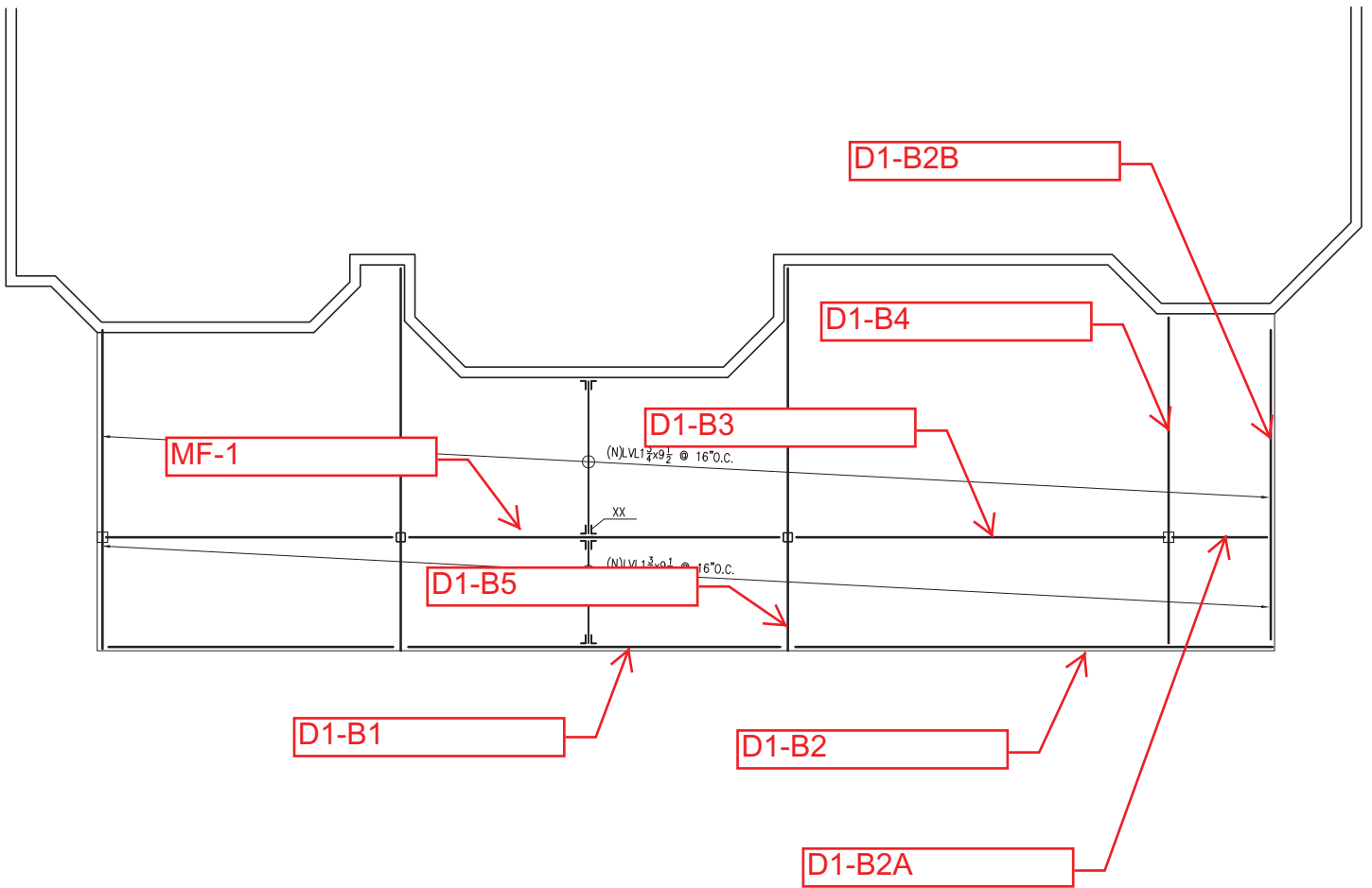
LEVEL	WEIGHT (K)
UPPER DECK	17.5
LOWER DECK	7.0

BUILDING WEIGHTS FOR SEISMIC DESIGN (K)

24.5



FRAMING KEY -
UPPER DECK



FRAMING KEY -
LOWER DECK

Title Block Line 6

Wood Beam

Lic. #: KW-06010065

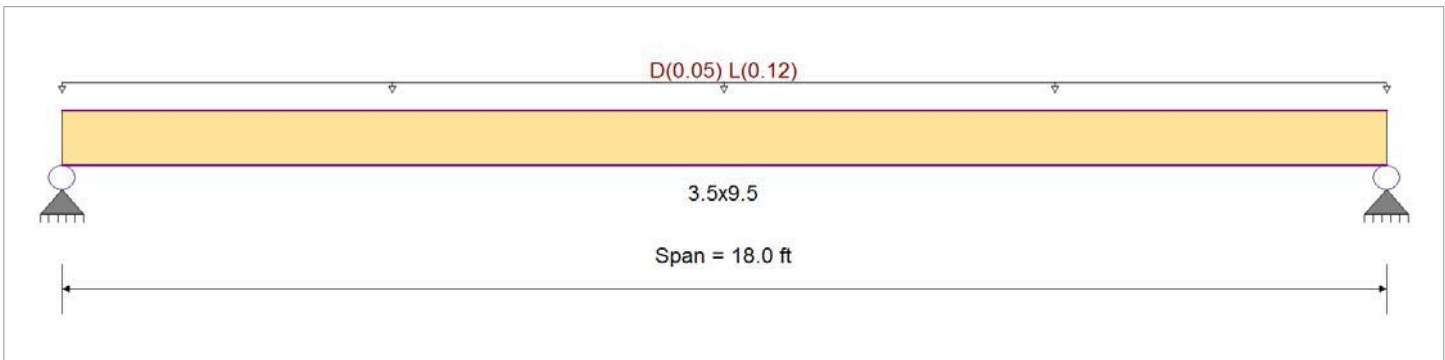
DESCRIPTION: D2-B1

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	2,900.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	2,900.0 psi	Ebend- xx
	Fc - Prll	2,900.0 psi	Eminbend - xx
Wood Species : Trus Joist	Fc - Perp	625.0 psi	
Wood Grade : Parallam PSL 2.2E	Fv	290.0 psi	
	Ft	2,025.0 psi	Density
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			45.070pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Uniform Load : D = 0.0250, L = 0.060 ksf, Tributary Width = 2.0 ft, (DECK)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.541 : 1	Maximum Shear Stress Ratio	=	0.217 : 1
Section used for this span	=	3.5x9.5	Section used for this span	=	3.5x9.5
	=	1,569.35psi		=	62.98 psi
	=	2,900.00psi		=	290.00 psi
Load Combination	=	+D+L+H	Load Combination	=	+D+L+H
Location of maximum on span	=	9.000ft	Location of maximum on span	=	17.212 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection		0.518 in	Ratio =		416 >=360
Max Upward Transient Deflection		0.000 in	Ratio =		0 <360
Max Downward Total Deflection		0.734 in	Ratio =		294 >=240
Max Upward Total Deflection		0.000 in	Ratio =		0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values							
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	f _v	F _v				
+D+H	Length = 18.0 ft	1	0.177	0.071	0.90	1.000	1.00	1.00	1.00	1.00	1.00	1.00	2.03	461.57	2610.00	0.00	0.00	0.00	0.00	0.00	261.00
+D+L+H	Length = 18.0 ft	1	0.541	0.217	1.00	1.000	1.00	1.00	1.00	1.00	1.00	1.00	6.89	1,569.35	2900.00	0.00	0.00	0.00	0.00	0.00	290.00
+D+Lr+H	Length = 18.0 ft	1	0.127	0.051	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.00	2.03	461.57	3625.00	0.00	0.00	0.00	0.00	0.00	362.50
+D+S+H	Length = 18.0 ft	1	0.138	0.056	1.15	1.000	1.00	1.00	1.00	1.00	1.00	1.00	2.03	461.57	3335.00	0.00	0.00	0.00	0.00	0.00	333.50
+D+0.750Lr+0.750L+H	Length = 18.0 ft	1	0.357	0.143	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.00	5.67	1,292.41	3625.00	0.00	0.00	0.00	0.00	0.00	362.50
+D+0.750L+0.750S+H	Length = 18.0 ft	1	0.388	0.156	1.15	1.000	1.00	1.00	1.00	1.00	1.00	1.00	5.67	1,292.41	3335.00	0.00	0.00	0.00	0.00	0.00	333.50
+D+0.60W+H	Length = 18.0 ft	1	0.099	0.040	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	2.03	461.57	4640.00	0.00	0.00	0.00	0.00	0.00	464.00

Title Block Line 6

Wood Beam

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 Jorgensen Engineering

Lic. #: KW-06010065

DESCRIPTION: D2-B1

Load Combination Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values						
		M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v				
+D+0.750Lr+0.750L+0.450W+H Length = 18.0 ft	1	0.279	0.112	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	5.67	1,292.41	4640.00	0.00	0.00	0.00	0.00	51.86	464.00
+D+0.750L+0.750S+0.450W+H Length = 18.0 ft	1	0.279	0.112	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	5.67	1,292.41	4640.00	0.00	0.00	0.00	0.00	51.86	464.00
+0.60D+0.60W+0.60H Length = 18.0 ft	1	0.060	0.024	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.22	276.94	4640.00	0.00	0.00	0.00	0.00	11.11	464.00
+D+0.70E+0.60H Length = 18.0 ft	1	0.099	0.040	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	2.03	461.57	4640.00	0.00	0.00	0.00	0.41	18.52	464.00
+D+0.750L+0.750S+0.5250E+H Length = 18.0 ft	1	0.279	0.112	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	5.67	1,292.41	4640.00	0.00	0.00	0.00	0.00	51.86	464.00
+0.60D+0.70E+H Length = 18.0 ft	1	0.060	0.024	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	1.22	276.94	4640.00	0.00	0.00	0.00	0.00	11.11	464.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.7341	9.066		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	1.530	1.530
Overall MINimum	1.080	1.080
+D+H	0.450	0.450
+D+L+H	1.530	1.530
+D+Lr+H	0.450	0.450
+D+S+H	0.450	0.450
+D+0.750Lr+0.750L+H	1.260	1.260
+D+0.750L+0.750S+H	1.260	1.260
+D+0.60W+H	0.450	0.450
+D+0.750Lr+0.750L+0.450W+H	1.260	1.260
+D+0.750L+0.750S+0.450W+H	1.260	1.260
+0.60D+0.60W+0.60H	0.270	0.270
+D+0.70E+0.60H	0.450	0.450
+D+0.750L+0.750S+0.5250E+H	1.260	1.260
+0.60D+0.70E+H	0.270	0.270
D Only	0.450	0.450
L Only	1.080	1.080
H Only		

Wood Beam

Lic. #: KW-06010065

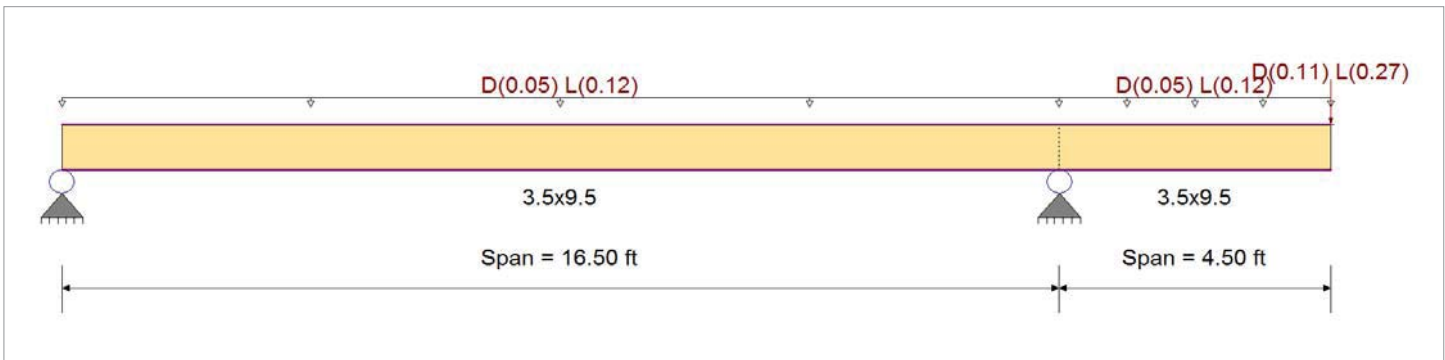
DESCRIPTION: D2-B2

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	2,900.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	2,900.0 psi	Ebend- xx
	Fc - Prll	2,900.0 psi	Eminbend - xx
Wood Species : Trus Joist	Fc - Perp	625.0 psi	
Wood Grade : Parallam PSL 2.2E	Fv	290.0 psi	
	Ft	2,025.0 psi	Density
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			45.070pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Load for Span Number 1
 Uniform Load : D = 0.0250, L = 0.060 ksf, Tributary Width = 2.0 ft, (DECK)
 Load for Span Number 2
 Uniform Load : D = 0.0250, L = 0.060 ksf, Tributary Width = 2.0 ft, (DECK)
 Point Load : D = 0.110, L = 0.270 k @ 4.50 ft, (D2-B2B)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.330	1	Maximum Shear Stress Ratio	=	0.231	: 1
Section used for this span	=	3.5x9.5		Section used for this span	=	3.5x9.5	
	=	956.62psi			=	67.00 psi	
	=	2,900.00psi			=	290.00 psi	
Load Combination	=	+D+L+H		Load Combination	=	+D+L+H	
Location of maximum on span	=	7.006ft		Location of maximum on span	=	15.763 ft	
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.238 in	Ratio =	832	>=	360	
Max Upward Transient Deflection		-0.084 in	Ratio =	1290	>=	360	
Max Downward Total Deflection		0.337 in	Ratio =	586	>=	240	
Max Upward Total Deflection		-0.120 in	Ratio =	902	>=	240	

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values						
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v			
+D+H	Length = 16.50 ft	1	0.108	0.075	0.90	1.000	1.00	1.00	1.00	1.00	1.00	1.24	282.13	2610.00	0.00	0.00	0.00	0.44	19.68	261.00
	Length = 4.50 ft	2	0.087	0.075	0.90	1.000	1.00	1.00	1.00	1.00	1.00	1.00	228.22	2610.00	0.00	0.00	0.00	0.30	19.68	261.00
+D+L+H	Length = 16.50 ft	1	0.330	0.231	1.00	1.000	1.00	1.00	1.00	1.00	1.00	4.20	956.62	2900.00	1.49	67.00	290.00			
	Length = 4.50 ft	2	0.270	0.231	1.00	1.000	1.00	1.00	1.00	1.00	1.00	3.43	782.11	2900.00	1.01	67.00	290.00			
+D+Lr+H	Length = 16.50 ft	1	0.078	0.054	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.24	282.13	3625.00	0.00	0.00	0.00	0.44	19.68	362.50
	Length = 4.50 ft	2	0.063	0.054	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.00	228.22	3625.00	0.00	0.00	0.00	0.30	19.68	362.50
+D+S+H					1.000	1.00	1.00	1.00	1.00	1.00	1.00			0.00		0.00	0.00	0.00	0.00	0.00

Title Block Line 6

Wood Beam

Lic. #: KW-06010065

DESCRIPTION: D2-B2

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values			
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v
	Length = 16.50 ft	1	0.085	0.059	1.15	1.000	1.00	1.00	1.00	1.00	1.00	1.24	282.13	3335.00	0.44	19.68	333.50
	Length = 4.50 ft	2	0.068	0.059	1.15	1.000	1.00	1.00	1.00	1.00	1.00	1.00	228.22	3335.00	0.30	19.68	333.50
+D+0.750Lr+0.750L+H						1.000	1.00	1.00	1.00	1.00	1.00	1.00		0.00	0.00	0.00	0.00
	Length = 16.50 ft	1	0.217	0.152	1.25	1.000	1.00	1.00	1.00	1.00	1.00	3.46	788.00	3625.00	1.22	55.17	362.50
	Length = 4.50 ft	2	0.178	0.152	1.25	1.000	1.00	1.00	1.00	1.00	1.00	2.82	643.64	3625.00	0.83	55.17	362.50
+D+0.750L+0.750S+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 16.50 ft	1	0.236	0.165	1.15	1.000	1.00	1.00	1.00	1.00	1.00	3.46	788.00	3335.00	1.22	55.17	333.50
	Length = 4.50 ft	2	0.193	0.165	1.15	1.000	1.00	1.00	1.00	1.00	1.00	2.82	643.64	3335.00	0.83	55.17	333.50
+D+0.60W+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 16.50 ft	1	0.061	0.042	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.24	282.13	4640.00	0.44	19.68	464.00
	Length = 4.50 ft	2	0.049	0.042	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	228.22	4640.00	0.30	19.68	464.00
+D+0.750Lr+0.750L+0.450W+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 16.50 ft	1	0.170	0.119	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.46	788.00	4640.00	1.22	55.17	464.00
	Length = 4.50 ft	2	0.139	0.119	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.82	643.64	4640.00	0.83	55.17	464.00
+D+0.750L+0.750S+0.450W+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 16.50 ft	1	0.170	0.119	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.46	788.00	4640.00	1.22	55.17	464.00
	Length = 4.50 ft	2	0.139	0.119	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.82	643.64	4640.00	0.83	55.17	464.00
+0.60D+0.60W+0.60H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 16.50 ft	1	0.036	0.025	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.74	169.28	4640.00	0.26	11.81	464.00
	Length = 4.50 ft	2	0.030	0.025	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.60	136.93	4640.00	0.18	11.81	464.00
+D+0.70E+0.60H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 16.50 ft	1	0.061	0.042	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.24	282.13	4640.00	0.44	19.68	464.00
	Length = 4.50 ft	2	0.049	0.042	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	228.22	4640.00	0.30	19.68	464.00
+D+0.750L+0.750S+0.5250E+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 16.50 ft	1	0.170	0.119	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.46	788.00	4640.00	1.22	55.17	464.00
	Length = 4.50 ft	2	0.139	0.119	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.82	643.64	4640.00	0.83	55.17	464.00
+0.60D+0.70E+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 16.50 ft	1	0.036	0.025	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.74	169.28	4640.00	0.26	11.81	464.00
	Length = 4.50 ft	2	0.030	0.025	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.60	136.93	4640.00	0.18	11.81	464.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.3373	7.743		0.0000	0.000
	2	0.0000	7.743	+D+L+H	-0.1196	4.500

Vertical Reactions

Load Combination	Support notation : Far left is #1			Values in KIPS
	Support 1	Support 2	Support 3	
Overall MAXimum	1.195	2.755		
Overall MINimum	0.843	1.947		
+D+H	0.352	0.808		
+D+L+H	1.195	2.755		
+D+Lr+H	0.352	0.808		
+D+S+H	0.352	0.808		
+D+0.750Lr+0.750L+H	0.984	2.269		
+D+0.750L+0.750S+H	0.984	2.269		
+D+0.60W+H	0.352	0.808		
+D+0.750Lr+0.750L+0.450W+H	0.984	2.269		
+D+0.750L+0.750S+0.450W+H	0.984	2.269		
+0.60D+0.60W+0.60H	0.211	0.485		
+D+0.70E+0.60H	0.352	0.808		
+D+0.750L+0.750S+0.5250E+H	0.984	2.269		
+0.60D+0.70E+H	0.211	0.485		
D Only	0.352	0.808		
L Only	0.843	1.947		
H Only				

Title Block Line 6

Wood Beam

Lic. #: KW-06010065

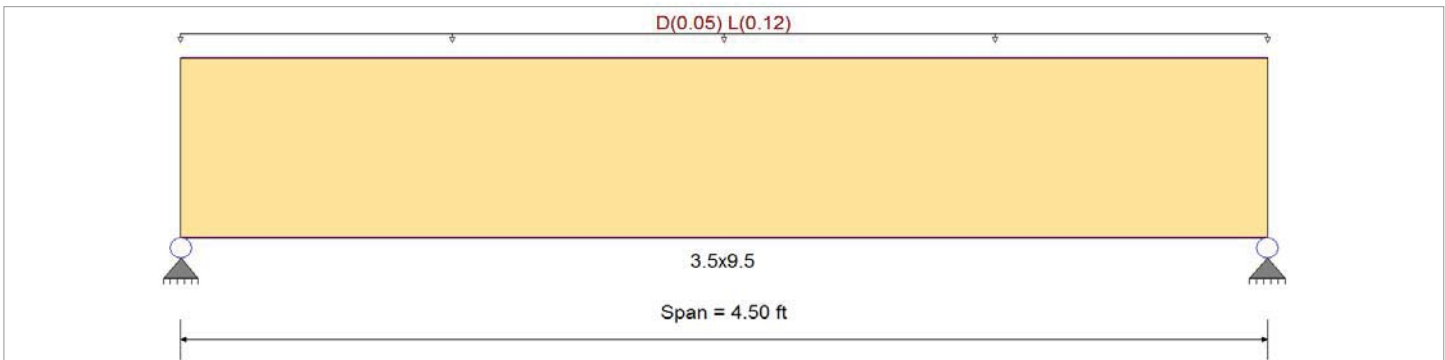
DESCRIPTION: D2-B2A

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	2,900.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	2,900.0 psi	Ebend- xx
	Fc - Prll	2,900.0 psi	Eminbend - xx
Wood Species : Trus Joist	Fc - Perp	625.0 psi	
Wood Grade : Parallam PSL 2.2E	Fv	290.0 psi	
	Ft	2,025.0 psi	Density
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			45.070pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Uniform Load : D = 0.0250, L = 0.060 ksf, Tributary Width = 2.0 ft, (DECK)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.034 : 1	Maximum Shear Stress Ratio	=	0.039 : 1
Section used for this span	=	3.5x9.5	Section used for this span	=	3.5x9.5
	=	98.08psi		=	11.21 psi
	=	2,900.00psi		=	290.00 psi
Load Combination	=	+D+L+H	Load Combination	=	+D+L+H
Location of maximum on span	=	2.250ft	Location of maximum on span	=	3.712 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection		0.002 in	Ratio =	26676	>=360
Max Upward Transient Deflection		0.000 in	Ratio =	0	<360
Max Downward Total Deflection		0.003 in	Ratio =	18830	>=240
Max Upward Total Deflection		0.000 in	Ratio =	0	<240

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values				
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	f _v	F _v	
+D+H	Length = 4.50 ft	1	0.011	0.013	0.90	1.000	1.00	1.00	1.00	1.00	1.00	0.13	28.85	2610.00	0.00	0.07	3.30	261.00
+D+L+H	Length = 4.50 ft	1	0.034	0.039	1.00	1.000	1.00	1.00	1.00	1.00	1.00	0.43	98.08	2900.00	0.00	0.25	11.21	290.00
+D+Lr+H	Length = 4.50 ft	1	0.008	0.009	1.25	1.000	1.00	1.00	1.00	1.00	1.00	0.13	28.85	3625.00	0.00	0.07	3.30	362.50
+D+S+H	Length = 4.50 ft	1	0.009	0.010	1.15	1.000	1.00	1.00	1.00	1.00	1.00	0.13	28.85	3335.00	0.00	0.07	3.30	333.50
+D+0.750Lr+0.750L+H	Length = 4.50 ft	1	0.022	0.025	1.25	1.000	1.00	1.00	1.00	1.00	1.00	0.35	80.78	3625.00	0.00	0.20	9.23	362.50
+D+0.750L+0.750S+H	Length = 4.50 ft	1	0.024	0.028	1.15	1.000	1.00	1.00	1.00	1.00	1.00	0.35	80.78	3335.00	0.00	0.20	9.23	333.50
+D+0.60W+H	Length = 4.50 ft	1	0.006	0.007	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.13	28.85	4640.00	0.00	0.07	3.30	464.00

Title Block Line 6

Wood Beam

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DESCRIPTION: D2-B2A

Load Combination Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values			
		M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v	
+D+0.750Lr+0.750L+0.450W+H Length = 4.50 ft	1	0.017	0.020	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.35	80.78	4640.00	0.00	0.00	0.00
+D+0.750L+0.750S+0.450W+H Length = 4.50 ft	1	0.017	0.020	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.35	80.78	4640.00	0.00	0.00	0.00
+0.60D+0.60W+0.60H Length = 4.50 ft	1	0.004	0.004	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.08	17.31	4640.00	0.00	0.00	0.00
+D+0.70E+0.60H Length = 4.50 ft	1	0.006	0.007	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.13	28.85	4640.00	0.00	0.00	0.00
+D+0.750L+0.750S+0.5250E+H Length = 4.50 ft	1	0.017	0.020	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.35	80.78	4640.00	0.00	0.00	0.00
+0.60D+0.70E+H Length = 4.50 ft	1	0.004	0.004	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.08	17.31	4640.00	0.00	0.00	0.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.0029	2.266		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	0.383	0.383
Overall MINimum	0.270	0.270
+D+H	0.113	0.113
+D+L+H	0.383	0.383
+D+Lr+H	0.113	0.113
+D+S+H	0.113	0.113
+D+0.750Lr+0.750L+H	0.315	0.315
+D+0.750L+0.750S+H	0.315	0.315
+D+0.60W+H	0.113	0.113
+D+0.750Lr+0.750L+0.450W+H	0.315	0.315
+D+0.750L+0.750S+0.450W+H	0.315	0.315
+0.60D+0.60W+0.60H	0.068	0.068
+D+0.70E+0.60H	0.113	0.113
+D+0.750L+0.750S+0.5250E+H	0.315	0.315
+0.60D+0.70E+H	0.068	0.068
D Only	0.113	0.113
L Only	0.270	0.270
H Only		

Title Block Line 6

Wood Beam

Lic. #: KW-06010065

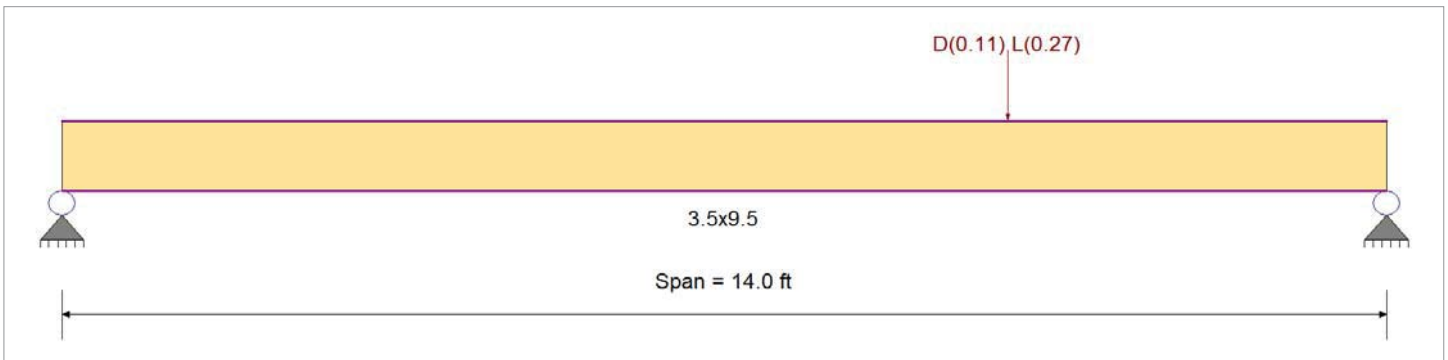
DESCRIPTION: D2-B2B

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	2,900.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	2,900.0 psi	Ebend- xx
	Fc - Prll	2,900.0 psi	Eminbend - xx
Wood Species : Trus Joist	Fc - Perp	625.0 psi	
Wood Grade : Parallam PSL 2.2E	Fv	290.0 psi	
	Ft	2,025.0 psi	Density
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			45.070pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Point Load : D = 0.110, L = 0.270 k @ 10.0 ft, (D2-B2A)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.085 1	Maximum Shear Stress Ratio =	0.042 : 1
Section used for this span =	3.5x9.5	Section used for this span =	3.5x9.5
	246.57 psi		12.24 psi
	2,900.00 psi		290.00 psi
Load Combination =	+D+L+H	Load Combination =	+D+L+H
Location of maximum on span =	9.964ft	Location of maximum on span =	10.015 ft
Span # where maximum occurs =	Span # 1	Span # where maximum occurs =	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.038 in	Ratio =	4453 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.053 in	Ratio =	3164 >=240
Max Upward Total Deflection	0.000 in	Ratio =	0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values						
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	Fv			
+D+H	Length = 14.0 ft	1	0.027	0.014	0.90	1.000	1.00	1.00	1.00	1.00	1.00	0.31	71.38	2610.00	0.00	0.00	0.00	0.08	3.54	261.00
+D+L+H	Length = 14.0 ft	1	0.085	0.042	1.00	1.000	1.00	1.00	1.00	1.00	1.00	1.08	246.57	2900.00	0.00	0.00	0.00	0.00	0.00	0.00
+D+Lr+H	Length = 14.0 ft	1	0.020	0.010	1.25	1.000	1.00	1.00	1.00	1.00	1.00	0.31	71.38	3625.00	0.00	0.00	0.00	0.08	3.54	362.50
+D+S+H	Length = 14.0 ft	1	0.021	0.011	1.15	1.000	1.00	1.00	1.00	1.00	1.00	0.31	71.38	3335.00	0.00	0.00	0.00	0.08	3.54	333.50
+D+0.750Lr+0.750L+H	Length = 14.0 ft	1	0.056	0.028	1.25	1.000	1.00	1.00	1.00	1.00	1.00	0.89	202.77	3625.00	0.00	0.00	0.00	0.22	10.07	362.50
+D+0.750L+0.750S+H	Length = 14.0 ft	1	0.061	0.030	1.15	1.000	1.00	1.00	1.00	1.00	1.00	0.89	202.77	3335.00	0.00	0.00	0.00	0.22	10.07	333.50
+D+0.60W+H	Length = 14.0 ft	1	0.015	0.008	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.31	71.38	4640.00	0.00	0.00	0.00	0.08	3.54	464.00

Title Block Line 6

Wood Beam

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DESCRIPTION: D2-B2B

Load Combination Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values			
		M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v	
+D+0.750Lr+0.750L+0.450W+H Length = 14.0 ft	1	0.044	0.022	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.89	202.77	4640.00	0.00	0.00	0.00
+D+0.750L+0.750S+0.450W+H Length = 14.0 ft	1	0.044	0.022	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.89	202.77	4640.00	0.00	0.00	0.00
+0.60D+0.60W+0.60H Length = 14.0 ft	1	0.009	0.005	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.19	42.83	4640.00	0.00	0.00	0.00
+D+0.70E+0.60H Length = 14.0 ft	1	0.015	0.008	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.31	71.38	4640.00	0.00	0.00	0.00
+D+0.750L+0.750S+0.5250E+H Length = 14.0 ft	1	0.044	0.022	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.89	202.77	4640.00	0.00	0.00	0.00
+0.60D+0.70E+H Length = 14.0 ft	1	0.009	0.005	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.19	42.83	4640.00	0.00	0.00	0.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.0531	7.766		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	0.109	0.271
Overall MINimum	0.077	0.193
+D+H	0.031	0.079
+D+L+H	0.109	0.271
+D+Lr+H	0.031	0.079
+D+S+H	0.031	0.079
+D+0.750Lr+0.750L+H	0.089	0.223
+D+0.750L+0.750S+H	0.089	0.223
+D+0.60W+H	0.031	0.079
+D+0.750Lr+0.750L+0.450W+H	0.089	0.223
+D+0.750L+0.750S+0.450W+H	0.089	0.223
+0.60D+0.60W+0.60H	0.019	0.047
+D+0.70E+0.60H	0.031	0.079
+D+0.750L+0.750S+0.5250E+H	0.089	0.223
+0.60D+0.70E+H	0.019	0.047
D Only	0.031	0.079
L Only	0.077	0.193
H Only		

Title Block Line 6

Wood Beam

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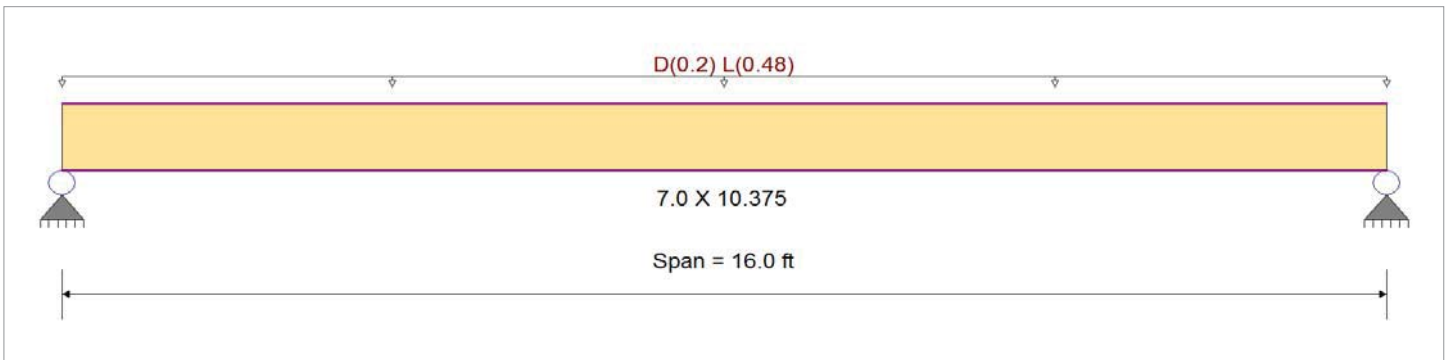
DESCRIPTION: D2-B3

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	2,900.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	2,900.0 psi	Ebend- xx
	Fc - Prll	2,900.0 psi	Eminbend - xx
Wood Species : Trus Joist	Fc - Perp	625.0 psi	
Wood Grade : Parallam PSL 2.2E	Fv	290.0 psi	
	Ft	2,025.0 psi	Density
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			45.070pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Uniform Load : D = 0.0250, L = 0.060 ksf, Tributary Width = 8.0 ft, (DECK)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.717 : 1	Maximum Shear Stress Ratio	=	0.348 : 1
Section used for this span	=	7.0 X 10.375	Section used for this span	=	7.0 X 10.375
	=	2,079.30psi		=	100.88 psi
	=	2,900.00psi		=	290.00 psi
Load Combination	=	+D+L+H	Load Combination	=	+D+L+H
Location of maximum on span	=	8.000ft	Location of maximum on span	=	15.182 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection		0.497 in	Ratio =		386 >=360
Max Upward Transient Deflection		0.000 in	Ratio =		0 <360
Max Downward Total Deflection		0.704 in	Ratio =		272 >=240
Max Upward Total Deflection		0.000 in	Ratio =		0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values								
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	f _v	F _v					
+D+H	Length = 16.0 ft	1	0.234	0.114	0.90	1.000	1.00	1.00	1.00	1.00	1.00	1.00	6.40	611.56	2610.00	0.00	0.00	0.00	0.00	0.00	261.00	
+D+L+H	Length = 16.0 ft	1	0.717	0.348	1.00	1.000	1.00	1.00	1.00	1.00	1.00	1.00	21.76	2,079.30	2900.00	0.00	0.00	0.00	0.00	0.00	0.00	290.00
+D+Lr+H	Length = 16.0 ft	1	0.169	0.082	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.00	6.40	611.56	3625.00	0.00	0.00	0.00	0.00	0.00	0.00	362.50
+D+S+H	Length = 16.0 ft	1	0.183	0.089	1.15	1.000	1.00	1.00	1.00	1.00	1.00	1.00	6.40	611.56	3335.00	0.00	0.00	0.00	0.00	0.00	0.00	333.50
+D+0.750Lr+0.750L+H	Length = 16.0 ft	1	0.472	0.229	1.25	1.000	1.00	1.00	1.00	1.00	1.00	1.00	17.92	1,712.36	3625.00	0.00	0.00	0.00	0.00	0.00	0.00	362.50
+D+0.750L+0.750S+H	Length = 16.0 ft	1	0.513	0.249	1.15	1.000	1.00	1.00	1.00	1.00	1.00	1.00	17.92	1,712.36	3335.00	0.00	0.00	0.00	0.00	0.00	0.00	333.50
+D+0.60W+H	Length = 16.0 ft	1	0.132	0.064	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	6.40	611.56	4640.00	0.00	0.00	0.00	0.00	0.00	0.00	464.00

Title Block Line 6

Wood Beam

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DESCRIPTION: D2-B3

Load Combination Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values		
		M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F ^b	V	f _v	F ^v
+D+0.750Lr+0.750L+0.450W+H Length = 16.0 ft	1	0.369	0.179	1.60	1.000	1.00	1.00	1.00	1.00	1.00	17.92	1,712.36	4640.00	0.00	0.00	0.00
+D+0.750L+0.750S+0.450W+H Length = 16.0 ft	1	0.369	0.179	1.60	1.000	1.00	1.00	1.00	1.00	1.00	17.92	1,712.36	4640.00	4.02	83.07	464.00
+0.60D+0.60W+0.60H Length = 16.0 ft	1	0.079	0.038	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.84	366.94	4640.00	0.00	0.00	0.00
+D+0.70E+0.60H Length = 16.0 ft	1	0.132	0.064	1.60	1.000	1.00	1.00	1.00	1.00	1.00	6.40	611.56	4640.00	0.00	0.00	0.00
+D+0.750L+0.750S+0.5250E+H Length = 16.0 ft	1	0.369	0.179	1.60	1.000	1.00	1.00	1.00	1.00	1.00	17.92	1,712.36	4640.00	1.44	29.67	464.00
+0.60D+0.70E+H Length = 16.0 ft	1	0.079	0.038	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.84	366.94	4640.00	0.00	0.00	0.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.7037	8.058		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	5.440	5.440
Overall MINimum	3.840	3.840
+D+H	1.600	1.600
+D+L+H	5.440	5.440
+D+Lr+H	1.600	1.600
+D+S+H	1.600	1.600
+D+0.750Lr+0.750L+H	4.480	4.480
+D+0.750L+0.750S+H	4.480	4.480
+D+0.60W+H	1.600	1.600
+D+0.750Lr+0.750L+0.450W+H	4.480	4.480
+D+0.750L+0.750S+0.450W+H	4.480	4.480
+0.60D+0.60W+0.60H	0.960	0.960
+D+0.70E+0.60H	1.600	1.600
+D+0.750L+0.750S+0.5250E+H	4.480	4.480
+0.60D+0.70E+H	0.960	0.960
D Only	1.600	1.600
L Only	3.840	3.840
H Only		

Title Block Line 6

Wood Beam

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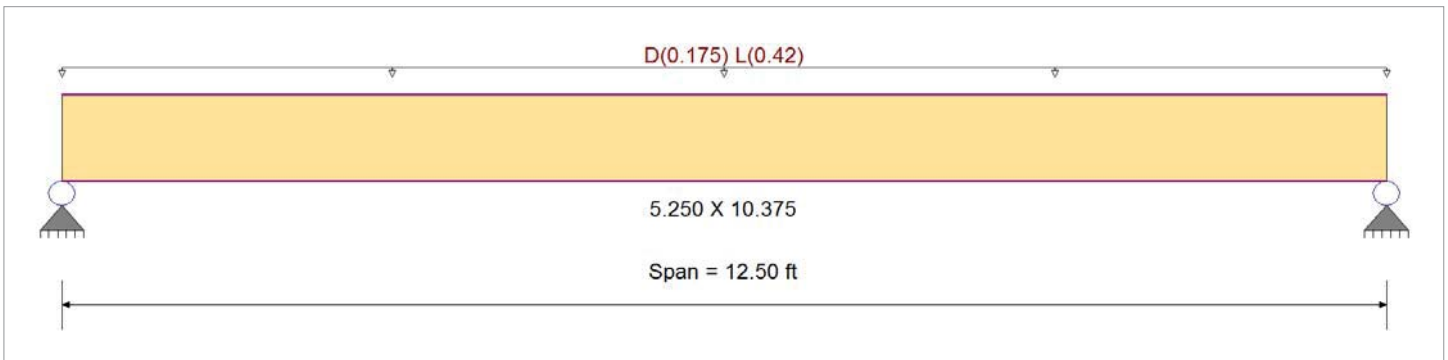
DESCRIPTION: D2-B3A

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	2,900.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	2,900.0 psi	Ebend- xx
	Fc - Prll	2,900.0 psi	Eminbend - xx
Wood Species : Trus Joist	Fc - Perp	625.0 psi	
Wood Grade : Parallam PSL 2.2E	Fv	290.0 psi	
	Ft	2,025.0 psi	Density
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			45.070pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Uniform Load : D = 0.0250, L = 0.060 ksf, Tributary Width = 7.0 ft, (DECK)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.511 : 1	Maximum Shear Stress Ratio =	0.307 : 1
Section used for this span =	5.250 X 10.375	Section used for this span =	5.250 X 10.375
	1,480.62psi		88.95 psi
	2,900.00psi		290.00 psi
Load Combination =	+D+L+H	Load Combination =	+D+L+H
Location of maximum on span =	6.250ft	Location of maximum on span =	11.679 ft
Span # where maximum occurs =	Span # 1	Span # where maximum occurs =	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.216 in	Ratio =	694 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.306 in	Ratio =	490 >=240
Max Upward Total Deflection	0.000 in	Ratio =	0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values						
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	Fv			
+D+H	Length = 12.50 ft	1	0.167	0.100	0.90	1.000	1.00	1.00	1.00	1.00	1.00	3.42	435.48	2610.00	0.00	0.00	0.00	0.00	0.00	0.00
+D+L+H	Length = 12.50 ft	1	0.511	0.307	1.00	1.000	1.00	1.00	1.00	1.00	1.00	11.62	1,480.62	2900.00	0.00	0.00	0.00	0.00	0.00	0.00
+D+Lr+H	Length = 12.50 ft	1	0.120	0.072	1.25	1.000	1.00	1.00	1.00	1.00	1.00	3.42	435.48	3625.00	0.00	0.00	0.00	0.00	0.00	0.00
+D+S+H	Length = 12.50 ft	1	0.131	0.078	1.15	1.000	1.00	1.00	1.00	1.00	1.00	3.42	435.48	3335.00	0.00	0.00	0.00	0.00	0.00	0.00
+D+0.750Lr+0.750L+H	Length = 12.50 ft	1	0.336	0.202	1.25	1.000	1.00	1.00	1.00	1.00	1.00	9.57	1,219.34	3625.00	0.00	0.00	0.00	2.66	73.26	362.50
+D+0.750L+0.750S+H	Length = 12.50 ft	1	0.366	0.220	1.15	1.000	1.00	1.00	1.00	1.00	1.00	9.57	1,219.34	3335.00	0.00	0.00	0.00	2.66	73.26	333.50
+D+0.60W+H	Length = 12.50 ft	1	0.094	0.056	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.42	435.48	4640.00	0.00	0.00	0.00	0.00	0.00	0.00

Title Block Line 6

Wood Beam

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 Jorgensen Engineering

Lic. #: KW-06010065

DESCRIPTION: D2-B3A

Load Combination Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values			
		M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v	
+D+0.750Lr+0.750L+0.450W+H Length = 12.50 ft	1	0.263	0.158	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	9.57	1,219.34	4640.00	0.00	0.00	0.00
+D+0.750L+0.750S+0.450W+H Length = 12.50 ft	1	0.263	0.158	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	9.57	1,219.34	4640.00	0.00	0.00	0.00
+0.60D+0.60W+0.60H Length = 12.50 ft	1	0.056	0.034	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	2.05	261.29	4640.00	0.00	0.00	0.00
+D+0.70E+0.60H Length = 12.50 ft	1	0.094	0.056	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	3.42	435.48	4640.00	0.00	0.00	0.00
+D+0.750L+0.750S+0.5250E+H Length = 12.50 ft	1	0.263	0.158	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	9.57	1,219.34	4640.00	0.00	0.00	0.00
+0.60D+0.70E+H Length = 12.50 ft	1	0.056	0.034	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	2.05	261.29	4640.00	0.00	0.00	0.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.3058	6.296		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	3.719	3.719
Overall MINimum	2.625	2.625
+D+H	1.094	1.094
+D+L+H	3.719	3.719
+D+Lr+H	1.094	1.094
+D+S+H	1.094	1.094
+D+0.750Lr+0.750L+H	3.063	3.063
+D+0.750L+0.750S+H	3.063	3.063
+D+0.60W+H	1.094	1.094
+D+0.750Lr+0.750L+0.450W+H	3.063	3.063
+D+0.750L+0.750S+0.450W+H	3.063	3.063
+0.60D+0.60W+0.60H	0.656	0.656
+D+0.70E+0.60H	1.094	1.094
+D+0.750L+0.750S+0.5250E+H	3.063	3.063
+0.60D+0.70E+H	0.656	0.656
D Only	1.094	1.094
L Only	2.625	2.625
H Only		

Title Block Line 6

Wood Beam

Lic. # : KW-06010065

DESCRIPTION: D2-B4

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	2,900.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	2,900.0 psi	Ebend- xx
	Fc - Prll	2,900.0 psi	Eminbend - xx
Wood Species : Trus Joist	Fc - Perp	625.0 psi	
Wood Grade : Parallam PSL 2.2E	Fv	290.0 psi	Density
	Ft	2,025.0 psi	45.070pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Load for Span Number 1
 Uniform Load : D = 0.0250, L = 0.060 ksf, Tributary Width = 1.330 ft, (DECK)
 Load for Span Number 2
 Uniform Load : D = 0.0250, L = 0.060 ksf, Tributary Width = 1.330 ft, (DECK)
 Point Load : D = 0.810, L = 1.954 k @ 4.0 ft, (D2-B2)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.470	1	Maximum Shear Stress Ratio	=	0.243	: 1
Section used for this span		7x9.5		Section used for this span		7x9.5	
	=	1,363.12psi			=	70.55 psi	
	=	2,900.00psi			=	290.00 psi	
Load Combination		+D+L+H		Load Combination		+D+L+H	
Location of maximum on span	=	12.500ft		Location of maximum on span	=	12.500ft	
Span # where maximum occurs	=	Span # 1		Span # where maximum occurs	=	Span # 1	
Maximum Deflection							
Max Downward Transient Deflection		0.250 in	Ratio =	384	>=	360	
Max Upward Transient Deflection		-0.096 in	Ratio =	1570	>=	360	
Max Downward Total Deflection		0.353 in	Ratio =	270	>=	240	
Max Upward Total Deflection		-0.135 in	Ratio =	1110	>=	240	

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values						
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v			
+D+H	Length = 12.50 ft	1	0.153	0.079	0.90	1.000	1.00	1.00	1.00	1.00	1.00	3.51	399.58	2610.00	0.00	0.00	0.00	0.92	20.68	261.00
	Length = 4.0 ft	2	0.153	0.079	0.90	1.000	1.00	1.00	1.00	1.00	1.00	3.51	399.58	2610.00	0.00	0.00	0.00	0.92	20.68	261.00
+D+L+H	Length = 12.50 ft	1	0.470	0.243	1.00	1.000	1.00	1.00	1.00	1.00	1.00	11.96	1,363.12	2900.00	3.13	70.55	290.00	3.13	70.55	290.00
	Length = 4.0 ft	2	0.470	0.243	1.00	1.000	1.00	1.00	1.00	1.00	1.00	11.96	1,363.12	2900.00	3.13	70.55	290.00	3.13	70.55	290.00
+D+Lr+H	Length = 12.50 ft	1	0.110	0.057	1.25	1.000	1.00	1.00	1.00	1.00	1.00	3.51	399.58	3625.00	0.00	0.00	0.00	0.92	20.68	362.50
	Length = 4.0 ft	2	0.110	0.057	1.25	1.000	1.00	1.00	1.00	1.00	1.00	3.51	399.58	3625.00	0.00	0.00	0.00	0.92	20.68	362.50
+D+S+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00			0.00	0.00			0.00

Title Block Line 6

Wood Beam

Lic. #: KW-06010065

DESCRIPTION: D2-B4

Load Combination Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values		
		M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	f _b	F _b	V	f _v	F _v
Length = 12.50 ft	1	0.120	0.062	1.15	1.000	1.00	1.00	1.00	1.00	1.00	3.51	399.58	3335.00	0.92	20.68	333.50
Length = 4.0 ft	2	0.120	0.062	1.15	1.000	1.00	1.00	1.00	1.00	1.00	3.51	399.58	3335.00	0.92	20.68	333.50
+D+0.750Lr+0.750L+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 12.50 ft	1	0.310	0.160	1.25	1.000	1.00	1.00	1.00	1.00	1.00	9.85	1,122.23	3625.00	2.58	58.08	362.50
Length = 4.0 ft	2	0.310	0.160	1.25	1.000	1.00	1.00	1.00	1.00	1.00	9.85	1,122.23	3625.00	2.58	58.08	362.50
+D+0.750L+0.750S+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 12.50 ft	1	0.337	0.174	1.15	1.000	1.00	1.00	1.00	1.00	1.00	9.85	1,122.23	3335.00	2.58	58.08	333.50
Length = 4.0 ft	2	0.337	0.174	1.15	1.000	1.00	1.00	1.00	1.00	1.00	9.85	1,122.23	3335.00	2.58	58.08	333.50
+D+0.60W+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 12.50 ft	1	0.086	0.045	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.51	399.58	4640.00	0.92	20.68	464.00
Length = 4.0 ft	2	0.086	0.045	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.51	399.58	4640.00	0.92	20.68	464.00
+D+0.750Lr+0.750L+0.450W+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 12.50 ft	1	0.242	0.125	1.60	1.000	1.00	1.00	1.00	1.00	1.00	9.85	1,122.23	4640.00	2.58	58.08	464.00
Length = 4.0 ft	2	0.242	0.125	1.60	1.000	1.00	1.00	1.00	1.00	1.00	9.85	1,122.23	4640.00	2.58	58.08	464.00
+D+0.750L+0.750S+0.450W+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 12.50 ft	1	0.242	0.125	1.60	1.000	1.00	1.00	1.00	1.00	1.00	9.85	1,122.23	4640.00	2.58	58.08	464.00
Length = 4.0 ft	2	0.242	0.125	1.60	1.000	1.00	1.00	1.00	1.00	1.00	9.85	1,122.23	4640.00	2.58	58.08	464.00
+0.60D+0.60W+0.60H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 12.50 ft	1	0.052	0.027	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.10	239.75	4640.00	0.55	12.41	464.00
Length = 4.0 ft	2	0.052	0.027	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.10	239.75	4640.00	0.55	12.41	464.00
+D+0.70E+0.60H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 12.50 ft	1	0.086	0.045	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.51	399.58	4640.00	0.92	20.68	464.00
Length = 4.0 ft	2	0.086	0.045	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.51	399.58	4640.00	0.92	20.68	464.00
+D+0.750L+0.750S+0.5250E+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 12.50 ft	1	0.242	0.125	1.60	1.000	1.00	1.00	1.00	1.00	1.00	9.85	1,122.23	4640.00	2.58	58.08	464.00
Length = 4.0 ft	2	0.242	0.125	1.60	1.000	1.00	1.00	1.00	1.00	1.00	9.85	1,122.23	4640.00	2.58	58.08	464.00
+0.60D+0.70E+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 12.50 ft	1	0.052	0.027	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.10	239.75	4640.00	0.55	12.41	464.00
Length = 4.0 ft	2	0.052	0.027	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.10	239.75	4640.00	0.55	12.41	464.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.0000	0.000	+D+L+H	-0.1350	7.682
	2	0.3531	4.000		0.0000	7.682

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	-0.250	4.880	
Overall MINimum	-0.073	3.448	
+D+H	-0.073	1.431	
+D+L+H	-0.250	4.880	
+D+Lr+H	-0.073	1.431	
+D+S+H	-0.073	1.431	
+D+0.750Lr+0.750L+H	-0.206	4.018	
+D+0.750L+0.750S+H	-0.206	4.018	
+D+0.60W+H	-0.073	1.431	
+D+0.750Lr+0.750L+0.450W+H	-0.206	4.018	
+D+0.750L+0.750S+0.450W+H	-0.206	4.018	
+0.60D+0.60W+0.60H	-0.044	0.859	
+D+0.70E+0.60H	-0.073	1.431	
+D+0.750L+0.750S+0.5250E+H	-0.206	4.018	
+0.60D+0.70E+H	-0.044	0.859	
D Only	-0.073	1.431	
L Only	-0.178	3.448	
H Only			

Wood Beam

Lic. #: KW-06010065

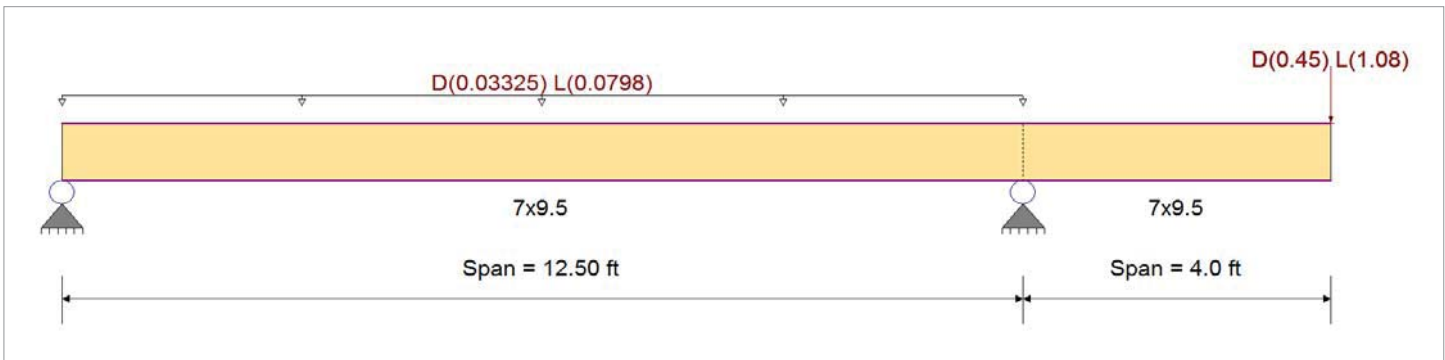
DESCRIPTION: D2-B5

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	2,900.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	2,900.0 psi	Ebend- xx
	Fc - Prll	2,900.0 psi	Eminbend - xx
Wood Species : Trus Joist	Fc - Perp	625.0 psi	
Wood Grade : Parallam PSL 2.2E	Fv	290.0 psi	Density
	Ft	2,025.0 psi	45.070pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Load for Span Number 1
 Uniform Load : D = 0.0250, L = 0.060 ksf, Tributary Width = 1.330 ft, (DECK)
 Load for Span Number 2
 Point Load : D = 0.450, L = 1.080 k @ 4.0 ft, (D2-B1)
 Point Load : D = 0.450, L = 1.080 k @ 4.0 ft, (D2-B1)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.481 : 1	Maximum Shear Stress Ratio	=	0.238 : 1
Section used for this span	=	7x9.5	Section used for this span	=	7x9.5
	=	1,394.98psi		=	69.02 psi
	=	2,900.00psi		=	290.00 psi
Load Combination	=	+D+L+H	Load Combination	=	+D+L+H
Location of maximum on span	=	12.500ft	Location of maximum on span	=	12.500ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection		0.257 in	Ratio =		372 >=360
Max Upward Transient Deflection		-0.098 in	Ratio =		1523 >=360
Max Downward Total Deflection		0.365 in	Ratio =		262 >=240
Max Upward Total Deflection		-0.139 in	Ratio =		1075 >=240

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values						
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v			
+D+H	Length = 12.50 ft	1	0.157	0.078	0.90	1.000	1.00	1.00	1.00	1.00	1.00	3.60	410.29	2610.00	0.00	0.00	0.00	0.90	20.30	261.00
	Length = 4.0 ft	2	0.157	0.078	0.90	1.000	1.00	1.00	1.00	1.00	1.00	3.60	410.29	2610.00	0.00	0.00	0.00	0.90	20.30	261.00
+D+L+H	Length = 12.50 ft	1	0.481	0.238	1.00	1.000	1.00	1.00	1.00	1.00	1.00	12.24	1,394.98	2900.00	3.06	69.02	290.00	3.06	69.02	290.00
	Length = 4.0 ft	2	0.481	0.238	1.00	1.000	1.00	1.00	1.00	1.00	1.00	12.24	1,394.98	2900.00	3.06	69.02	290.00	3.06	69.02	290.00
+D+Lr+H	Length = 12.50 ft	1	0.113	0.056	1.25	1.000	1.00	1.00	1.00	1.00	1.00	3.60	410.29	3625.00	0.00	0.00	0.00	0.90	20.30	362.50
	Length = 4.0 ft	2	0.113	0.056	1.25	1.000	1.00	1.00	1.00	1.00	1.00	3.60	410.29	3625.00	0.00	0.00	0.00	0.90	20.30	362.50
+D+S+H					1.000	1.00	1.00	1.00	1.00	1.00				0.00			0.00	0.00	0.00	

Title Block Line 6

Wood Beam

Lic. #: KW-06010065

DESCRIPTION: D2-B5

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values			
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v
	Length = 12.50 ft	1	0.123	0.061	1.15	1.000	1.00	1.00	1.00	1.00	1.00	3.60	410.29	3335.00	0.90	20.30	333.50
	Length = 4.0 ft	2	0.123	0.061	1.15	1.000	1.00	1.00	1.00	1.00	1.00	3.60	410.29	3335.00	0.90	20.30	333.50
+D+0.750Lr+0.750L+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 12.50 ft	1	0.317	0.157	1.25	1.000	1.00	1.00	1.00	1.00	1.00	10.08	1,148.81	3625.00	2.52	56.84	362.50
	Length = 4.0 ft	2	0.317	0.157	1.25	1.000	1.00	1.00	1.00	1.00	1.00	10.08	1,148.81	3625.00	2.52	56.84	362.50
+D+0.750L+0.750S+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 12.50 ft	1	0.344	0.170	1.15	1.000	1.00	1.00	1.00	1.00	1.00	10.08	1,148.81	3335.00	2.52	56.84	333.50
	Length = 4.0 ft	2	0.344	0.170	1.15	1.000	1.00	1.00	1.00	1.00	1.00	10.08	1,148.81	3335.00	2.52	56.84	333.50
+D+0.60W+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 12.50 ft	1	0.088	0.044	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.60	410.29	4640.00	0.90	20.30	464.00
	Length = 4.0 ft	2	0.088	0.044	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.60	410.29	4640.00	0.90	20.30	464.00
+D+0.750Lr+0.750L+0.450W+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 12.50 ft	1	0.248	0.123	1.60	1.000	1.00	1.00	1.00	1.00	1.00	10.08	1,148.81	4640.00	2.52	56.84	464.00
	Length = 4.0 ft	2	0.248	0.123	1.60	1.000	1.00	1.00	1.00	1.00	1.00	10.08	1,148.81	4640.00	2.52	56.84	464.00
+D+0.750L+0.750S+0.450W+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 12.50 ft	1	0.248	0.123	1.60	1.000	1.00	1.00	1.00	1.00	1.00	10.08	1,148.81	4640.00	2.52	56.84	464.00
	Length = 4.0 ft	2	0.248	0.123	1.60	1.000	1.00	1.00	1.00	1.00	1.00	10.08	1,148.81	4640.00	2.52	56.84	464.00
+0.60D+0.60W+0.60H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 12.50 ft	1	0.053	0.026	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.16	246.17	4640.00	0.54	12.18	464.00
	Length = 4.0 ft	2	0.053	0.026	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.16	246.17	4640.00	0.54	12.18	464.00
+D+0.70E+0.60H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 12.50 ft	1	0.088	0.044	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.60	410.29	4640.00	0.90	20.30	464.00
	Length = 4.0 ft	2	0.088	0.044	1.60	1.000	1.00	1.00	1.00	1.00	1.00	3.60	410.29	4640.00	0.90	20.30	464.00
+D+0.750L+0.750S+0.5250E+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 12.50 ft	1	0.248	0.123	1.60	1.000	1.00	1.00	1.00	1.00	1.00	10.08	1,148.81	4640.00	2.52	56.84	464.00
	Length = 4.0 ft	2	0.248	0.123	1.60	1.000	1.00	1.00	1.00	1.00	1.00	10.08	1,148.81	4640.00	2.52	56.84	464.00
+0.60D+0.70E+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
	Length = 12.50 ft	1	0.053	0.026	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.16	246.17	4640.00	0.54	12.18	464.00
	Length = 4.0 ft	2	0.053	0.026	1.60	1.000	1.00	1.00	1.00	1.00	1.00	2.16	246.17	4640.00	0.54	12.18	464.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+D+L+H	-0.1394	7.682
	2	0.3647	4.000		0.0000	7.682

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	-0.273	4.746	
Overall MINimum	-0.080	3.350	
+D+H	-0.080	1.396	
+D+L+H	-0.273	4.746	
+D+Lr+H	-0.080	1.396	
+D+S+H	-0.080	1.396	
+D+0.750Lr+0.750L+H	-0.225	3.908	
+D+0.750L+0.750S+H	-0.225	3.908	
+D+0.60W+H	-0.080	1.396	
+D+0.750Lr+0.750L+0.450W+H	-0.225	3.908	
+D+0.750L+0.750S+0.450W+H	-0.225	3.908	
+0.60D+0.60W+0.60H	-0.048	0.837	
+D+0.70E+0.60H	-0.080	1.396	
+D+0.750L+0.750S+0.5250E+H	-0.225	3.908	
+0.60D+0.70E+H	-0.048	0.837	
D Only	-0.080	1.396	
L Only	-0.192	3.350	
H Only			

Title Block Line 6

Wood Beam

Lic. #: KW-06010065

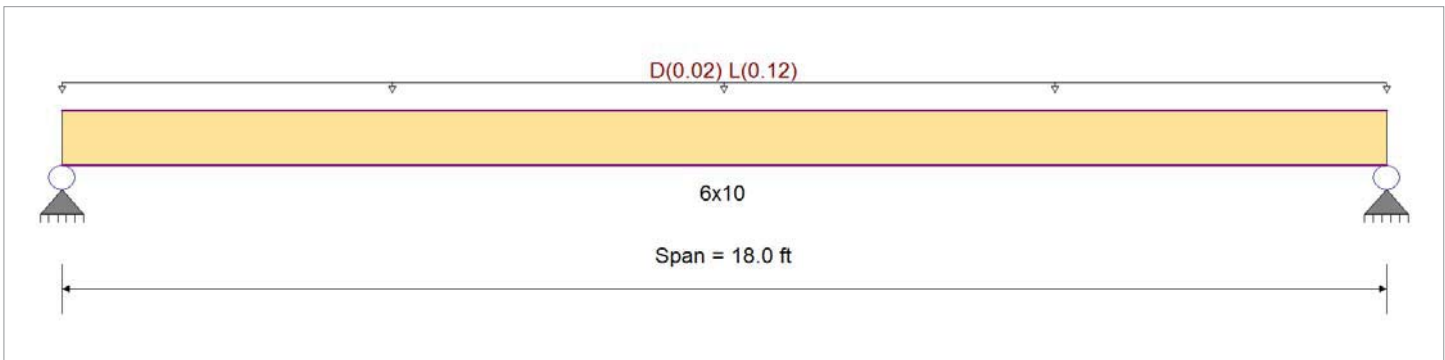
DESCRIPTION: D1-B1

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	1,200.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	1,200.0 psi	Ebend- xx
	Fc - Prll	1,550.0 psi	Eminbend - xx
Wood Species : Douglas Fir - Larch	Fc - Perp	625.0 psi	
Wood Grade : No.1 & Better	Fv	180.0 psi	Density
	Ft	800.0 psi	31.210pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Uniform Load : D = 0.010, L = 0.060 ksf, Tributary Width = 2.0 ft, (DECK)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.685 : 1	Maximum Shear Stress Ratio	=	0.183 : 1
Section used for this span	=	6x10	Section used for this span	=	6x10
	=	822.44psi		=	33.00 psi
	=	1,200.00psi		=	180.00 psi
Load Combination	=	+D+L+H	Load Combination	=	+D+L+H
Location of maximum on span	=	9.000ft	Location of maximum on span	=	17.212 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection		0.403 in	Ratio =		535 >=360
Max Upward Transient Deflection		0.000 in	Ratio =		0 <360
Max Downward Total Deflection		0.470 in	Ratio =		459 >=240
Max Upward Total Deflection		0.000 in	Ratio =		0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values						
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	Fv			
+D+H	Length = 18.0 ft	1	0.109	0.029	0.90	1.000	1.00	1.00	1.00	1.00	1.00	0.81	117.49	1080.00	0.00	0.00	0.00	0.16	4.71	162.00
+D+L+H	Length = 18.0 ft	1	0.685	0.183	1.00	1.000	1.00	1.00	1.00	1.00	1.00	5.67	822.44	1200.00	0.00	0.00	0.00	1.15	33.00	180.00
+D+Lr+H	Length = 18.0 ft	1	0.078	0.021	1.25	1.000	1.00	1.00	1.00	1.00	1.00	0.81	117.49	1500.00	0.00	0.00	0.00	0.16	4.71	225.00
+D+S+H	Length = 18.0 ft	1	0.085	0.023	1.15	1.000	1.00	1.00	1.00	1.00	1.00	0.81	117.49	1380.00	0.00	0.00	0.00	0.16	4.71	207.00
+D+0.750Lr+0.750L+H	Length = 18.0 ft	1	0.431	0.115	1.25	1.000	1.00	1.00	1.00	1.00	1.00	4.46	646.20	1500.00	0.00	0.00	0.00	0.90	25.93	225.00
+D+0.750L+0.750S+H	Length = 18.0 ft	1	0.468	0.125	1.15	1.000	1.00	1.00	1.00	1.00	1.00	4.46	646.20	1380.00	0.00	0.00	0.00	0.90	25.93	207.00
+D+0.60W+H	Length = 18.0 ft	1	0.061	0.016	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.81	117.49	1920.00	0.00	0.00	0.00	0.16	4.71	288.00

Title Block Line 6

Wood Beam

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DESCRIPTION: D1-B1

Load Combination Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values			
		M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v	
+D+0.750Lr+0.750L+0.450W+H Length = 18.0 ft	1	0.337	0.090	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	4.46	646.20	1920.00	0.00	0.00	0.00
+D+0.750L+0.750S+0.450W+H Length = 18.0 ft	1	0.337	0.090	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	4.46	646.20	1920.00	0.00	0.00	0.00
+0.60D+0.60W+0.60H Length = 18.0 ft	1	0.037	0.010	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.49	70.50	1920.00	0.00	0.00	0.00
+D+0.70E+0.60H Length = 18.0 ft	1	0.061	0.016	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.81	117.49	1920.00	0.00	0.00	0.00
+D+0.750L+0.750S+0.5250E+H Length = 18.0 ft	1	0.337	0.090	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	4.46	646.20	1920.00	0.00	0.00	0.00
+0.60D+0.70E+H Length = 18.0 ft	1	0.037	0.010	1.60	1.000	1.00	1.00	1.00	1.00	1.00	1.00	0.49	70.50	1920.00	0.00	0.00	0.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.4702	9.066		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	1.260	1.260
Overall MINimum	1.080	1.080
+D+H	0.180	0.180
+D+L+H	1.260	1.260
+D+Lr+H	0.180	0.180
+D+S+H	0.180	0.180
+D+0.750Lr+0.750L+H	0.990	0.990
+D+0.750L+0.750S+H	0.990	0.990
+D+0.60W+H	0.180	0.180
+D+0.750Lr+0.750L+0.450W+H	0.990	0.990
+D+0.750L+0.750S+0.450W+H	0.990	0.990
+0.60D+0.60W+0.60H	0.108	0.108
+D+0.70E+0.60H	0.180	0.180
+D+0.750L+0.750S+0.5250E+H	0.990	0.990
+0.60D+0.70E+H	0.108	0.108
D Only	0.180	0.180
L Only	1.080	1.080
H Only		

Wood Beam

Lic. # : KW-06010065

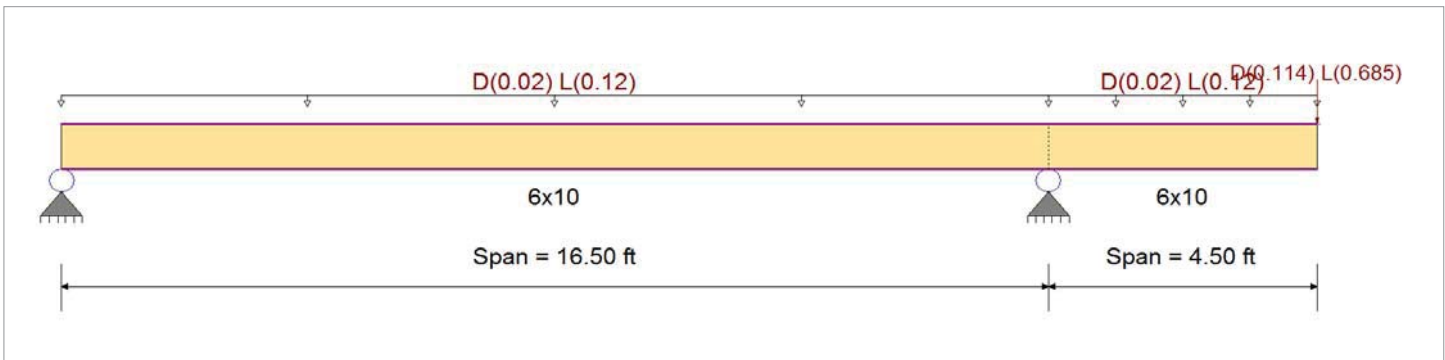
DESCRIPTION: D1-B2

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	1,000.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	1,000.0 psi	Ebend- xx
	Fc - Prll	1,500.0 psi	Eminbend - xx
Wood Species : Douglas Fir - Larch	Fc - Perp	625.0 psi	
Wood Grade : No.1	Fv	180.0 psi	Density
	Ft	675.0 psi	31.210pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Load for Span Number 1
 Uniform Load : D = 0.010, L = 0.060 ksf, Tributary Width = 2.0 ft, (DECK)
 Load for Span Number 2
 Uniform Load : D = 0.010, L = 0.060 ksf, Tributary Width = 2.0 ft, (DECK)
 Point Load : D = 0.1140, L = 0.6850 k @ 4.50 ft, (D1-B2B)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.727 : 1	Maximum Shear Stress Ratio	=	0.216 : 1
Section used for this span	=	6x10	Section used for this span	=	6x10
	=	727.14psi		=	38.92 psi
	=	1,000.00psi		=	180.00 psi
Load Combination	=	+D+L+H	Load Combination	=	+D+L+H
Location of maximum on span	=	16.500ft	Location of maximum on span	=	15.763 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection		0.083 in	Ratio =		1298 >=360
Max Upward Transient Deflection		0.000 in	Ratio =		0 <360
Max Downward Total Deflection		0.097 in	Ratio =		1114 >=240
Max Upward Total Deflection		0.000 in	Ratio =		0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values			
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v
+D+H	Length = 16.50 ft	1	0.115	0.034	0.90	1.000	1.00	1.00	1.00	1.00	1.00	0.72	103.78	900.00	0.00	0.00	0.00
	Length = 4.50 ft	2	0.115	0.034	0.90	1.000	1.00	1.00	1.00	1.00	1.00	0.72	103.78	900.00	0.19	5.56	162.00
+D+L+H	Length = 16.50 ft	1	0.727	0.216	1.00	1.000	1.00	1.00	1.00	1.00	1.00	5.01	727.14	1000.00	1.36	38.92	180.00
	Length = 4.50 ft	2	0.727	0.216	1.00	1.000	1.00	1.00	1.00	1.00	1.00	5.01	727.14	1000.00	1.32	38.92	180.00
+D+Lr+H	Length = 16.50 ft	1	0.083	0.025	1.25	1.000	1.00	1.00	1.00	1.00	1.00	0.72	103.78	1250.00	0.00	0.00	0.00
	Length = 4.50 ft	2	0.083	0.025	1.25	1.000	1.00	1.00	1.00	1.00	1.00	0.72	103.78	1250.00	0.19	5.56	225.00
+D+S+H						1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00

Title Block Line 6

Wood Beam

Lic. #: KW-06010065

DESCRIPTION: D1-B2

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values			
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	Fv
	Length = 16.50 ft	1	0.090	0.027	1.15	1.000	1.00	1.00	1.00	1.00	1.00	0.72	103.78	1150.00	0.19	5.56	207.00
	Length = 4.50 ft	2	0.090	0.027	1.15	1.000	1.00	1.00	1.00	1.00	0.72	103.78	1150.00	0.19	5.56	207.00	
+D+0.750Lr+0.750L+H						1.000	1.00	1.00	1.00	1.00			0.00		0.00	0.00	0.00
	Length = 16.50 ft	1	0.457	0.136	1.25	1.000	1.00	1.00	1.00	1.00	3.94	571.30	1250.00	1.07	30.58	225.00	
	Length = 4.50 ft	2	0.457	0.136	1.25	1.000	1.00	1.00	1.00	1.00	3.94	571.30	1250.00	1.04	30.58	225.00	
+D+0.750L+0.750S+H						1.000	1.00	1.00	1.00	1.00			0.00		0.00	0.00	0.00
	Length = 16.50 ft	1	0.497	0.148	1.15	1.000	1.00	1.00	1.00	1.00	3.94	571.30	1150.00	1.07	30.58	207.00	
	Length = 4.50 ft	2	0.497	0.148	1.15	1.000	1.00	1.00	1.00	1.00	3.94	571.30	1150.00	1.04	30.58	207.00	
+D+0.60W+H						1.000	1.00	1.00	1.00	1.00			0.00		0.00	0.00	0.00
	Length = 16.50 ft	1	0.065	0.019	1.60	1.000	1.00	1.00	1.00	1.00	0.72	103.78	1600.00	0.19	5.56	288.00	
	Length = 4.50 ft	2	0.065	0.019	1.60	1.000	1.00	1.00	1.00	1.00	0.72	103.78	1600.00	0.19	5.56	288.00	
+D+0.750Lr+0.750L+0.450W+H						1.000	1.00	1.00	1.00	1.00			0.00		0.00	0.00	0.00
	Length = 16.50 ft	1	0.357	0.106	1.60	1.000	1.00	1.00	1.00	1.00	3.94	571.30	1600.00	1.07	30.58	288.00	
	Length = 4.50 ft	2	0.357	0.106	1.60	1.000	1.00	1.00	1.00	1.00	3.94	571.30	1600.00	1.04	30.58	288.00	
+D+0.750L+0.750S+0.450W+H						1.000	1.00	1.00	1.00	1.00			0.00		0.00	0.00	0.00
	Length = 16.50 ft	1	0.357	0.106	1.60	1.000	1.00	1.00	1.00	1.00	3.94	571.30	1600.00	1.07	30.58	288.00	
	Length = 4.50 ft	2	0.357	0.106	1.60	1.000	1.00	1.00	1.00	1.00	3.94	571.30	1600.00	1.04	30.58	288.00	
+0.60D+0.60W+0.60H						1.000	1.00	1.00	1.00	1.00			0.00		0.00	0.00	0.00
	Length = 16.50 ft	1	0.039	0.012	1.60	1.000	1.00	1.00	1.00	1.00	0.43	62.27	1600.00	0.12	3.33	288.00	
	Length = 4.50 ft	2	0.039	0.012	1.60	1.000	1.00	1.00	1.00	1.00	0.43	62.27	1600.00	0.11	3.33	288.00	
+D+0.70E+0.60H						1.000	1.00	1.00	1.00	1.00			0.00		0.00	0.00	0.00
	Length = 16.50 ft	1	0.065	0.019	1.60	1.000	1.00	1.00	1.00	1.00	0.72	103.78	1600.00	0.19	5.56	288.00	
	Length = 4.50 ft	2	0.065	0.019	1.60	1.000	1.00	1.00	1.00	1.00	0.72	103.78	1600.00	0.19	5.56	288.00	
+D+0.750L+0.750S+0.5250E+H						1.000	1.00	1.00	1.00	1.00			0.00		0.00	0.00	0.00
	Length = 16.50 ft	1	0.357	0.106	1.60	1.000	1.00	1.00	1.00	1.00	3.94	571.30	1600.00	1.07	30.58	288.00	
	Length = 4.50 ft	2	0.357	0.106	1.60	1.000	1.00	1.00	1.00	1.00	3.94	571.30	1600.00	1.04	30.58	288.00	
+0.60D+0.70E+H						1.000	1.00	1.00	1.00	1.00			0.00		0.00	0.00	0.00
	Length = 16.50 ft	1	0.039	0.012	1.60	1.000	1.00	1.00	1.00	1.00	0.43	62.27	1600.00	0.12	3.33	288.00	
	Length = 4.50 ft	2	0.039	0.012	1.60	1.000	1.00	1.00	1.00	1.00	0.43	62.27	1600.00	0.11	3.33	288.00	

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.1368	6.913		0.0000	0.000
+D+L+H	2	0.0969	4.500		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	0.851	2.888	
Overall MINimum	0.730	2.475	
+D+H	0.122	0.412	
+D+L+H	0.851	2.888	
+D+Lr+H	0.122	0.412	
+D+S+H	0.122	0.412	
+D+0.750Lr+0.750L+H	0.669	2.269	
+D+0.750L+0.750S+H	0.669	2.269	
+D+0.60W+H	0.122	0.412	
+D+0.750Lr+0.750L+0.450W+H	0.669	2.269	
+D+0.750L+0.750S+0.450W+H	0.669	2.269	
+0.60D+0.60W+0.60H	0.073	0.247	
+D+0.70E+0.60H	0.122	0.412	
+D+0.750L+0.750S+0.5250E+H	0.669	2.269	
+0.60D+0.70E+H	0.073	0.247	
D Only	0.122	0.412	
L Only	0.730	2.475	
H Only			

Title Block Line 6

Wood Beam

Lic. #: KW-06010065

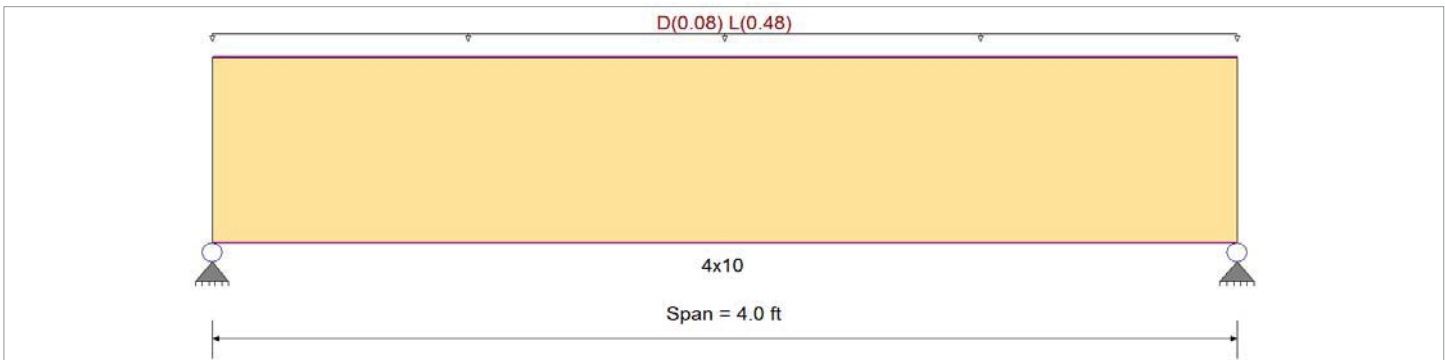
DESCRIPTION: D1-B2A

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	1,000.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	1,000.0 psi	Ebend- xx
	Fc - Prll	1,500.0 psi	Eminbend - xx
Wood Species : Douglas Fir - Larch	Fc - Perp	625.0 psi	
Wood Grade : No.1	Fv	180.0 psi	Density
	Ft	675.0 psi	31.210pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Uniform Load : D = 0.010, L = 0.060 ksf, Tributary Width = 8.0 ft, (DECK)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.224 : 1	Maximum Shear Stress Ratio	=	0.179 : 1
Section used for this span	=	4x10	Section used for this span	=	4x10
	=	269.28psi		=	32.20 psi
	=	1,200.00psi		=	180.00 psi
Load Combination	=	+D+L+H	Load Combination	=	+D+L+H
Location of maximum on span	=	2.000ft	Location of maximum on span	=	3.241 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection		0.007 in	Ratio =		6773 >=360
Max Upward Transient Deflection		0.000 in	Ratio =		0 <360
Max Downward Total Deflection		0.008 in	Ratio =		5805 >=240
Max Upward Total Deflection		0.000 in	Ratio =		0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values						
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	f _v	F _v			
+D+H	Length = 4.0 ft	1	0.036	0.028	0.90	1.200	1.00	1.00	1.00	1.00	1.00	0.16	38.47	1080.00	0.00	0.00	0.00	0.10	4.60	162.00
+D+L+H	Length = 4.0 ft	1	0.224	0.179	1.00	1.200	1.00	1.00	1.00	1.00	1.00	1.12	269.28	1200.00	0.00	0.00	0.00	0.69	32.20	180.00
+D+Lr+H	Length = 4.0 ft	1	0.026	0.020	1.25	1.200	1.00	1.00	1.00	1.00	1.00	0.16	38.47	1500.00	0.00	0.00	0.00	0.10	4.60	225.00
+D+S+H	Length = 4.0 ft	1	0.028	0.022	1.15	1.200	1.00	1.00	1.00	1.00	1.00	0.16	38.47	1380.00	0.00	0.00	0.00	0.10	4.60	207.00
+D+0.750Lr+0.750L+H	Length = 4.0 ft	1	0.141	0.112	1.25	1.200	1.00	1.00	1.00	1.00	1.00	0.88	211.57	1500.00	0.00	0.00	0.00	0.55	25.30	225.00
+D+0.750L+0.750S+H	Length = 4.0 ft	1	0.153	0.122	1.15	1.200	1.00	1.00	1.00	1.00	1.00	0.88	211.57	1380.00	0.00	0.00	0.00	0.55	25.30	207.00
+D+0.60W+H	Length = 4.0 ft	1	0.020	0.016	1.60	1.200	1.00	1.00	1.00	1.00	1.00	0.16	38.47	1920.00	0.00	0.00	0.00	0.10	4.60	288.00

Title Block Line 6

Wood Beam

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DESCRIPTION: D1-B2A

Load Combination Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values		
		M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v
+D+0.750Lr+0.750L+0.450W+H Length = 4.0 ft	1	0.110	0.088	1.60	1.200	1.00	1.00	1.00	1.00	1.00	0.88	211.57	1920.00	0.55	25.30	288.00
+D+0.750L+0.750S+0.450W+H Length = 4.0 ft	1	0.110	0.088	1.60	1.200	1.00	1.00	1.00	1.00	1.00	0.88	211.57	1920.00	0.55	25.30	288.00
+0.60D+0.60W+0.60H Length = 4.0 ft	1	0.012	0.010	1.60	1.200	1.00	1.00	1.00	1.00	1.00	0.10	23.08	1920.00	0.06	2.76	288.00
+D+0.70E+0.60H Length = 4.0 ft	1	0.020	0.016	1.60	1.200	1.00	1.00	1.00	1.00	1.00	0.16	38.47	1920.00	0.10	4.60	288.00
+D+0.750L+0.750S+0.5250E+H Length = 4.0 ft	1	0.110	0.088	1.60	1.200	1.00	1.00	1.00	1.00	1.00	0.88	211.57	1920.00	0.55	25.30	288.00
+0.60D+0.70E+H Length = 4.0 ft	1	0.012	0.010	1.60	1.200	1.00	1.00	1.00	1.00	1.00	0.10	23.08	1920.00	0.06	2.76	288.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.0083	2.015		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	1.120	1.120
Overall MINimum	0.960	0.960
+D+H	0.160	0.160
+D+L+H	1.120	1.120
+D+Lr+H	0.160	0.160
+D+S+H	0.160	0.160
+D+0.750Lr+0.750L+H	0.880	0.880
+D+0.750L+0.750S+H	0.880	0.880
+D+0.60W+H	0.160	0.160
+D+0.750Lr+0.750L+0.450W+H	0.880	0.880
+D+0.750L+0.750S+0.450W+H	0.880	0.880
+0.60D+0.60W+0.60H	0.096	0.096
+D+0.70E+0.60H	0.160	0.160
+D+0.750L+0.750S+0.5250E+H	0.880	0.880
+0.60D+0.70E+H	0.096	0.096
D Only	0.160	0.160
L Only	0.960	0.960
H Only		

Title Block Line 6

Wood Beam

Lic. #: KW-06010065

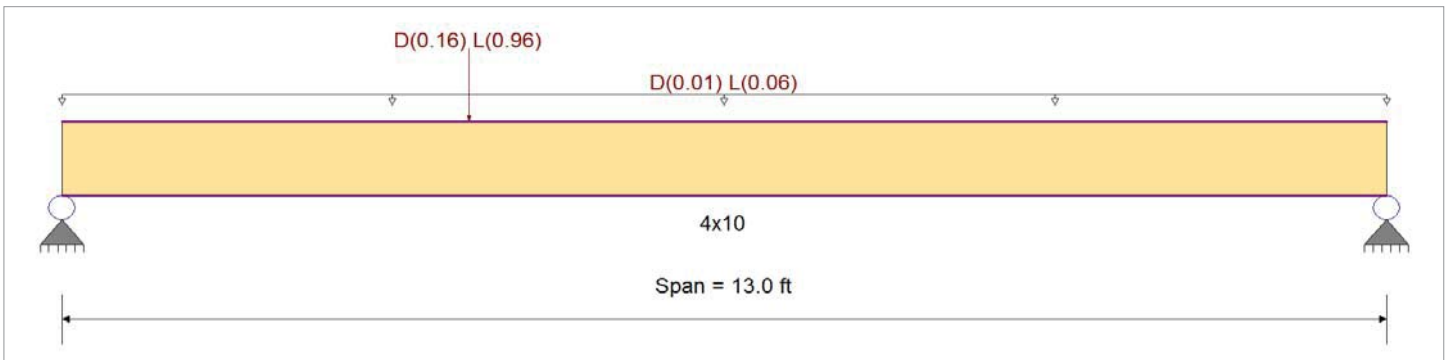
DESCRIPTION: D1-B2B

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	1,000.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	1,000.0 psi	Ebend- xx
	Fc - Prll	1,500.0 psi	Eminbend - xx
Wood Species : Douglas Fir - Larch	Fc - Perp	625.0 psi	
Wood Grade : No.1	Fv	180.0 psi	Density
	Ft	675.0 psi	31.210pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Uniform Load : D = 0.010, L = 0.060 ksf, Tributary Width = 1.0 ft, (DECK)
 Point Load : D = 0.160, L = 0.960 k @ 4.0 ft, (D1-B2A)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.873 : 1	Maximum Shear Stress Ratio	=	0.303 : 1
Section used for this span	=	4x10	Section used for this span	=	4x10
	=	1,047.28psi		=	54.54 psi
	=	1,200.00psi		=	180.00 psi
Load Combination	=	+D+L+H	Load Combination	=	+D+L+H
Location of maximum on span	=	4.033ft	Location of maximum on span	=	0.000ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection		0.257 in	Ratio =		606 >=360
Max Upward Transient Deflection		0.000 in	Ratio =		0 <360
Max Downward Total Deflection		0.300 in	Ratio =		520 >=240
Max Upward Total Deflection		0.000 in	Ratio =		0 <240

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values						
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v				
+D+H	Length = 13.0 ft	1	0.139	0.048	0.90	1.200	1.00	1.00	1.00	1.00	1.00	1.00	0.62	149.61	1080.00	0.00	0.00	0.00	0.17	7.79	162.00
+D+L+H	Length = 13.0 ft	1	0.873	0.303	1.00	1.200	1.00	1.00	1.00	1.00	1.00	1.00	4.36	1,047.28	1200.00	0.00	0.00	0.00	0.00	0.00	0.00
+D+Lr+H	Length = 13.0 ft	1	0.100	0.035	1.25	1.200	1.00	1.00	1.00	1.00	1.00	1.00	0.62	149.61	1500.00	0.00	0.00	0.00	0.17	7.79	225.00
+D+S+H	Length = 13.0 ft	1	0.108	0.038	1.15	1.200	1.00	1.00	1.00	1.00	1.00	1.00	0.62	149.61	1380.00	0.00	0.00	0.00	0.17	7.79	207.00
+D+0.750Lr+0.750L+H	Length = 13.0 ft	1	0.549	0.190	1.25	1.200	1.00	1.00	1.00	1.00	1.00	1.00	3.42	822.86	1500.00	0.00	0.00	0.00	0.92	42.86	225.00
+D+0.750L+0.750S+H	Length = 13.0 ft	1	0.596	0.207	1.15	1.200	1.00	1.00	1.00	1.00	1.00	1.00	3.42	822.86	1380.00	0.00	0.00	0.00	0.92	42.86	207.00
+D+0.60W+H						1.200	1.00	1.00	1.00	1.00	1.00	1.00			0.00			0.00	0.00	0.00	0.00

Title Block Line 6

Wood Beam

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DESCRIPTION: D1-B2B

Load Combination Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values		
		M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	f _b	F _b	V	f _v	F _v
Length = 13.0 ft	1	0.078	0.027	1.60	1.200	1.00	1.00	1.00	1.00	1.00	0.62	149.61	1920.00	0.17	7.79	288.00
+D+0.750Lr+0.750L+0.450W+H					1.200	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 13.0 ft	1	0.429	0.149	1.60	1.200	1.00	1.00	1.00	1.00	1.00	3.42	822.86	1920.00	0.92	42.86	288.00
+D+0.750L+0.750S+0.450W+H					1.200	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 13.0 ft	1	0.429	0.149	1.60	1.200	1.00	1.00	1.00	1.00	1.00	3.42	822.86	1920.00	0.92	42.86	288.00
+0.60D+0.60W+0.60H					1.200	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 13.0 ft	1	0.047	0.016	1.60	1.200	1.00	1.00	1.00	1.00	1.00	0.37	89.77	1920.00	0.10	4.68	288.00
+D+0.70E+0.60H					1.200	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 13.0 ft	1	0.078	0.027	1.60	1.200	1.00	1.00	1.00	1.00	1.00	0.62	149.61	1920.00	0.17	7.79	288.00
+D+0.750L+0.750S+0.5250E+H					1.200	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 13.0 ft	1	0.429	0.149	1.60	1.200	1.00	1.00	1.00	1.00	1.00	3.42	822.86	1920.00	0.92	42.86	288.00
+0.60D+0.70E+H					1.200	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 13.0 ft	1	0.047	0.016	1.60	1.200	1.00	1.00	1.00	1.00	1.00	0.37	89.77	1920.00	0.10	4.68	288.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.2999	6.120		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	1.230	0.800
Overall MINimum	1.055	0.685
+D+H	0.176	0.114
+D+L+H	1.230	0.800
+D+Lr+H	0.176	0.114
+D+S+H	0.176	0.114
+D+0.750Lr+0.750L+H	0.967	0.628
+D+0.750L+0.750S+H	0.967	0.628
+D+0.60W+H	0.176	0.114
+D+0.750Lr+0.750L+0.450W+H	0.967	0.628
+D+0.750L+0.750S+0.450W+H	0.967	0.628
+0.60D+0.60W+0.60H	0.105	0.069
+D+0.70E+0.60H	0.176	0.114
+D+0.750L+0.750S+0.5250E+H	0.967	0.628
+0.60D+0.70E+H	0.105	0.069
D Only	0.176	0.114
L Only	1.055	0.685
H Only		

Title Block Line 6

Wood Beam

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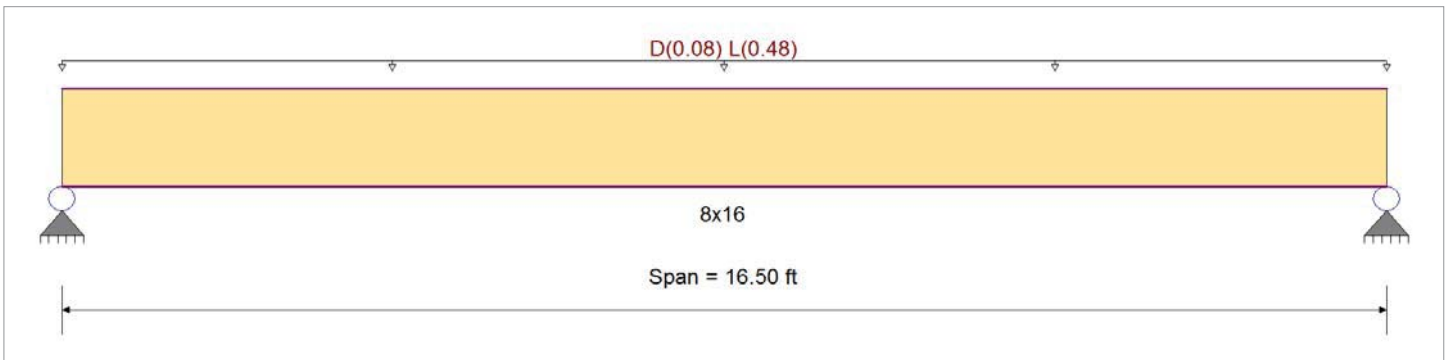
DESCRIPTION: D1-B3

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	1,000.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	1,000.0 psi	Ebend- xx
	Fc - Prll	1,500.0 psi	Eminbend - xx
Wood Species : Douglas Fir - Larch	Fc - Perp	625.0 psi	
Wood Grade : No.1	Fv	180.0 psi	Density
	Ft	675.0 psi	31.210pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Uniform Load : D = 0.010, L = 0.060 ksf, Tributary Width = 8.0 ft, (DECK)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.762	1	Maximum Shear Stress Ratio =	0.280	: 1
Section used for this span =	8x16		Section used for this span =	8x16	
	761.51 psi			50.48 psi	
	1,000.00 psi			180.00 psi	
Load Combination =	+D+L+H		Load Combination =	+D+L+H	
Location of maximum on span =	8.250ft		Location of maximum on span =	0.000ft	
Span # where maximum occurs =	Span # 1		Span # where maximum occurs =	Span # 1	
Maximum Deflection					
Max Downward Transient Deflection	0.204 in	Ratio =	972	>=360	
Max Upward Transient Deflection	0.000 in	Ratio =	0	<360	
Max Downward Total Deflection	0.237 in	Ratio =	833	>=240	
Max Upward Total Deflection	0.000 in	Ratio =	0	<240	

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values			
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	f _v	F _v
+D+H	Length = 16.50 ft	1	0.121	0.045	0.90	0.972	1.00	1.00	1.00	1.00	1.00	2.72	108.79	900.00	0.56	7.21	162.00
+D+L+H	Length = 16.50 ft	1	0.762	0.280	1.00	0.972	1.00	1.00	1.00	1.00	1.00	19.06	761.51	1000.00	3.91	50.48	180.00
+D+Lr+H	Length = 16.50 ft	1	0.087	0.032	1.25	0.972	1.00	1.00	1.00	1.00	1.00	2.72	108.79	1250.00	0.56	7.21	225.00
+D+S+H	Length = 16.50 ft	1	0.095	0.035	1.15	0.972	1.00	1.00	1.00	1.00	1.00	2.72	108.79	1150.00	0.56	7.21	207.00
+D+0.750Lr+0.750L+H	Length = 16.50 ft	1	0.479	0.176	1.25	0.972	1.00	1.00	1.00	1.00	1.00	14.97	598.33	1250.00	3.07	39.66	225.00
+D+0.750L+0.750S+H	Length = 16.50 ft	1	0.520	0.192	1.15	0.972	1.00	1.00	1.00	1.00	1.00	14.97	598.33	1150.00	3.07	39.66	207.00
+D+0.60W+H	Length = 16.50 ft	1	0.068	0.025	1.60	0.972	1.00	1.00	1.00	1.00	1.00	2.72	108.79	1600.00	0.56	7.21	288.00

Title Block Line 6

Wood Beam

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DESCRIPTION: D1-B3

Load Combination	Segment Length	Span #	Max Stress Ratios							Moment Values			Shear Values									
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	Fv					
+D+0.750Lr+0.750L+0.450W+H	Length = 16.50 ft	1	0.374	0.138	1.60	0.972	1.00	1.00	1.00	1.00	1.00	1.00	1.00	14.97	598.33	1600.00	0.00	0.00	0.00	0.00	39.66	288.00
+D+0.750L+0.750S+0.450W+H	Length = 16.50 ft	1	0.374	0.138	1.60	0.972	1.00	1.00	1.00	1.00	1.00	1.00	1.00	14.97	598.33	1600.00	0.00	0.00	0.00	0.00	39.66	288.00
+0.60D+0.60W+0.60H	Length = 16.50 ft	1	0.041	0.015	1.60	0.972	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.63	65.27	1600.00	0.00	0.00	0.00	0.00	4.33	288.00
+D+0.70E+0.60H	Length = 16.50 ft	1	0.068	0.025	1.60	0.972	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.72	108.79	1600.00	0.00	0.00	0.00	0.56	7.21	288.00
+D+0.750L+0.750S+0.5250E+H	Length = 16.50 ft	1	0.374	0.138	1.60	0.972	1.00	1.00	1.00	1.00	1.00	1.00	1.00	14.97	598.33	1600.00	0.00	0.00	0.00	0.00	39.66	288.00
+0.60D+0.70E+H	Length = 16.50 ft	1	0.041	0.015	1.60	0.972	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.63	65.27	1600.00	0.00	0.00	0.00	0.00	4.33	288.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.2374	8.310		0.0000	0.000

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	4.620	4.620
Overall MINimum	3.960	3.960
+D+H	0.660	0.660
+D+L+H	4.620	4.620
+D+Lr+H	0.660	0.660
+D+S+H	0.660	0.660
+D+0.750Lr+0.750L+H	3.630	3.630
+D+0.750L+0.750S+H	3.630	3.630
+D+0.60W+H	0.660	0.660
+D+0.750Lr+0.750L+0.450W+H	3.630	3.630
+D+0.750L+0.750S+0.450W+H	3.630	3.630
+0.60D+0.60W+0.60H	0.396	0.396
+D+0.70E+0.60H	0.660	0.660
+D+0.750L+0.750S+0.5250E+H	3.630	3.630
+0.60D+0.70E+H	0.396	0.396
D Only	0.660	0.660
L Only	3.960	3.960
H Only		

Wood Beam

Lic. #: KW-06010065

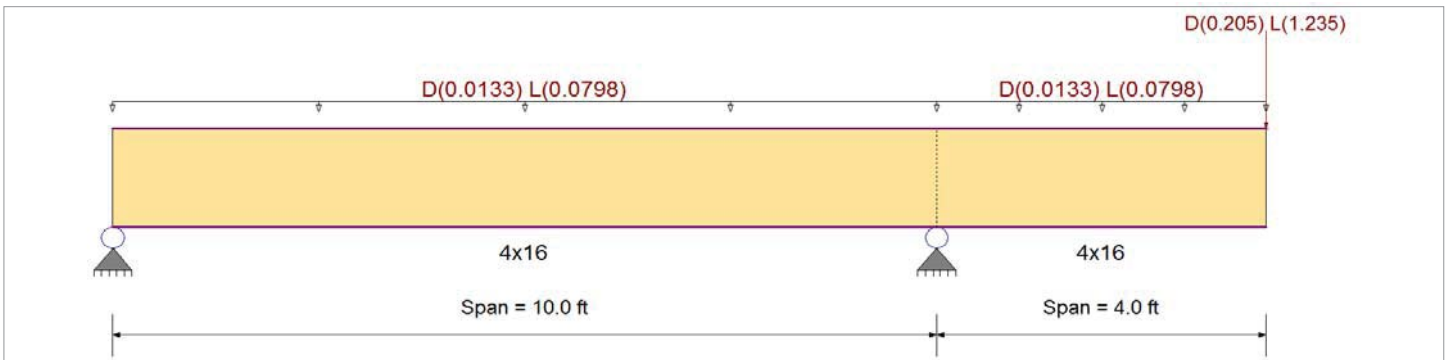
DESCRIPTION: D1-B4

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	1,000.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	1,000.0 psi	Ebend- xx
	Fc - Prll	1,500.0 psi	Eminbend - xx
Wood Species : Douglas Fir - Larch	Fc - Perp	625.0 psi	
Wood Grade : No.1	Fv	180.0 psi	Density
	Ft	675.0 psi	31.210pcf
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling			



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Load for Span Number 1
 Uniform Load : D = 0.010, L = 0.060 ksf, Tributary Width = 1.330 ft, (DECK)
 Load for Span Number 2
 Uniform Load : D = 0.010, L = 0.060 ksf, Tributary Width = 1.330 ft, (DECK)
 Point Load : D = 0.2050, L = 1.235 k @ 4.0 ft, (D1-B2/2)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.575 : 1	Maximum Shear Stress Ratio	=	0.265 : 1
Section used for this span	=	4x16	Section used for this span	=	4x16
	=	575.39psi		=	47.66 psi
	=	1,000.00psi		=	180.00 psi
Load Combination	=	+D+L+H	Load Combination	=	+D+L+H
Location of maximum on span	=	10.000ft	Location of maximum on span	=	10.000ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection		0.088 in	Ratio =		1086 >=360
Max Upward Transient Deflection		-0.026 in	Ratio =		4699 >=360
Max Downward Total Deflection		0.103 in	Ratio =		932 >=240
Max Upward Total Deflection		-0.030 in	Ratio =		4031 >=240

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios								Moment Values			Shear Values						
			M	V	C _d	C _{FV}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	f _v	F'v			
+D+H	Length = 10.0 ft	1	0.091	0.042	0.90	1.000	1.00	1.00	1.00	1.00	1.00	0.93	81.95	900.00	0.00	0.00	0.00	0.24	6.79	162.00
	Length = 4.0 ft	2	0.091	0.042	0.90	1.000	1.00	1.00	1.00	1.00	1.00	0.93	81.95	900.00	0.00	0.00	0.00	0.24	6.79	162.00
+D+L+H	Length = 10.0 ft	1	0.575	0.265	1.00	1.000	1.00	1.00	1.00	1.00	1.00	6.50	575.39	1000.00	1.70	47.66	180.00	1.70	47.66	180.00
	Length = 4.0 ft	2	0.575	0.265	1.00	1.000	1.00	1.00	1.00	1.00	1.00	6.50	575.39	1000.00	1.70	47.66	180.00	1.70	47.66	180.00
+D+Lr+H	Length = 10.0 ft	1	0.066	0.030	1.25	1.000	1.00	1.00	1.00	1.00	1.00	0.93	81.95	1250.00	0.00	0.00	0.00	0.24	6.79	225.00
	Length = 4.0 ft	2	0.066	0.030	1.25	1.000	1.00	1.00	1.00	1.00	1.00	0.93	81.95	1250.00	0.00	0.00	0.00	0.24	6.79	225.00
+D+S+H					1.000	1.00	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00	0.00	0.00	0.00

Title Block Line 6

Wood Beam

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 Jorgensen Engineering

Lic. #: KW-06010065

DESCRIPTION: D1-B4

Load Combination Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values		
		M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v
Length = 10.0 ft	1	0.071	0.033	1.15	1.000	1.00	1.00	1.00	1.00	1.00	0.93	81.95	1150.00	0.24	6.79	207.00
Length = 4.0 ft	2	0.071	0.033	1.15	1.000	1.00	1.00	1.00	1.00	1.00	0.93	81.95	1150.00	0.24	6.79	207.00
+D+0.750Lr+0.750L+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.362	0.166	1.25	1.000	1.00	1.00	1.00	1.00	1.00	5.11	452.03	1250.00	1.33	37.44	225.00
Length = 4.0 ft	2	0.362	0.166	1.25	1.000	1.00	1.00	1.00	1.00	1.00	5.11	452.03	1250.00	1.33	37.44	225.00
+D+0.750L+0.750S+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.393	0.181	1.15	1.000	1.00	1.00	1.00	1.00	1.00	5.11	452.03	1150.00	1.33	37.44	207.00
Length = 4.0 ft	2	0.393	0.181	1.15	1.000	1.00	1.00	1.00	1.00	1.00	5.11	452.03	1150.00	1.33	37.44	207.00
+D+0.60W+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.051	0.024	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.93	81.95	1600.00	0.24	6.79	288.00
Length = 4.0 ft	2	0.051	0.024	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.93	81.95	1600.00	0.24	6.79	288.00
+D+0.750Lr+0.750L+0.450W+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.283	0.130	1.60	1.000	1.00	1.00	1.00	1.00	1.00	5.11	452.03	1600.00	1.33	37.44	288.00
Length = 4.0 ft	2	0.283	0.130	1.60	1.000	1.00	1.00	1.00	1.00	1.00	5.11	452.03	1600.00	1.33	37.44	288.00
+D+0.750L+0.750S+0.450W+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.283	0.130	1.60	1.000	1.00	1.00	1.00	1.00	1.00	5.11	452.03	1600.00	1.33	37.44	288.00
Length = 4.0 ft	2	0.283	0.130	1.60	1.000	1.00	1.00	1.00	1.00	1.00	5.11	452.03	1600.00	1.33	37.44	288.00
+0.60D+0.60W+0.60H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.031	0.014	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.56	49.17	1600.00	0.14	4.07	288.00
Length = 4.0 ft	2	0.031	0.014	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.56	49.17	1600.00	0.14	4.07	288.00
+D+0.70E+0.60H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.051	0.024	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.93	81.95	1600.00	0.24	6.79	288.00
Length = 4.0 ft	2	0.051	0.024	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.93	81.95	1600.00	0.24	6.79	288.00
+D+0.750L+0.750S+0.5250E+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.283	0.130	1.60	1.000	1.00	1.00	1.00	1.00	1.00	5.11	452.03	1600.00	1.33	37.44	288.00
Length = 4.0 ft	2	0.283	0.130	1.60	1.000	1.00	1.00	1.00	1.00	1.00	5.11	452.03	1600.00	1.33	37.44	288.00
+0.60D+0.70E+H					1.000	1.00	1.00	1.00	1.00	1.00			0.00	0.00	0.00	0.00
Length = 10.0 ft	1	0.031	0.014	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.56	49.17	1600.00	0.14	4.07	288.00
Length = 4.0 ft	2	0.031	0.014	1.60	1.000	1.00	1.00	1.00	1.00	1.00	0.56	49.17	1600.00	0.14	4.07	288.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.0000	0.000	+D+L+H	-0.0298	6.145
	2	0.1030	4.000		0.0000	6.145

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	-0.185	2.928	
Overall MINimum	-0.026	2.511	
+D+H	-0.026	0.417	
+D+L+H	-0.185	2.928	
+D+Lr+H	-0.026	0.417	
+D+S+H	-0.026	0.417	
+D+0.750Lr+0.750L+H	-0.145	2.301	
+D+0.750L+0.750S+H	-0.145	2.301	
+D+0.60W+H	-0.026	0.417	
+D+0.750Lr+0.750L+0.450W+H	-0.145	2.301	
+D+0.750L+0.750S+0.450W+H	-0.145	2.301	
+0.60D+0.60W+0.60H	-0.016	0.250	
+D+0.70E+0.60H	-0.026	0.417	
+D+0.750L+0.750S+0.5250E+H	-0.145	2.301	
+0.60D+0.70E+H	-0.016	0.250	
D Only	-0.026	0.417	
L Only	-0.159	2.511	
H Only			

Title Block Line 6

Wood Beam

Lic. #: KW-06010065

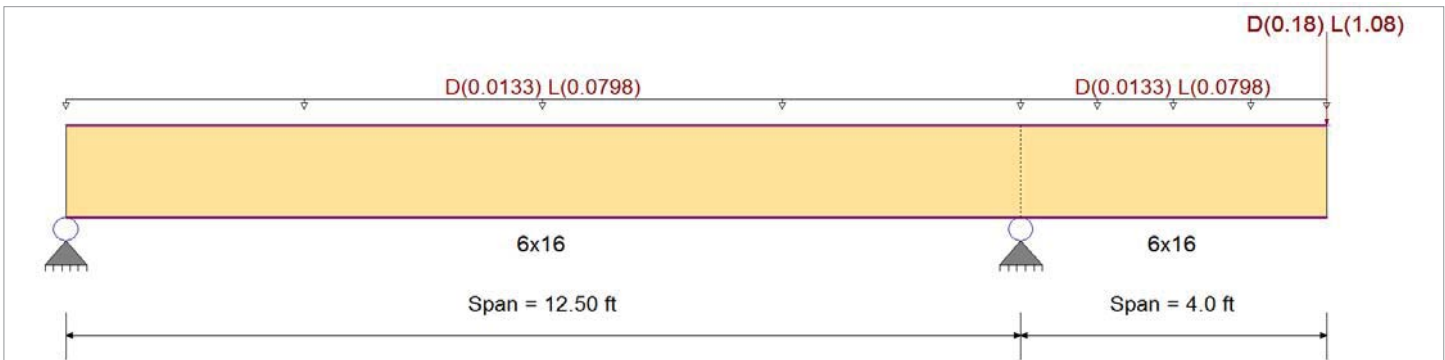
DESCRIPTION: D1-B5

CODE REFERENCES

Calculations per NDS 2018, IBC 2018, CBC 2019, ASCE 7-16
 Load Combination Set : ASCE 7-16

Material Properties

Analysis Method : Allowable Stress Design	Fb +	1,000.0 psi	E : Modulus of Elasticity
Load Combination ASCE 7-16	Fb -	1,000.0 psi	Ebend- xx
	Fc - Prll	1,500.0 psi	Eminbend - xx
Wood Species : Douglas Fir - Larch	Fc - Perp	625.0 psi	
Wood Grade : No.1	Fv	180.0 psi	Density
Beam Bracing : Beam is Fully Braced against lateral-torsional buckling	Ft	675.0 psi	31.210pcf



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Load for Span Number 1
 Uniform Load : D = 0.010, L = 0.060 ksf, Tributary Width = 1.330 ft, (DECK)
 Load for Span Number 2
 Uniform Load : D = 0.010, L = 0.060 ksf, Tributary Width = 1.330 ft, (DECK)
 Point Load : D = 0.180, L = 1.080 k @ 4.0 ft, (D1-B1)
 Point Load : D = 0.180, L = 1.080 k @ 4.0 ft, (D1-B1)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.590 : 1	Maximum Shear Stress Ratio	=	0.271 : 1
Section used for this span	=	6x16	Section used for this span	=	6x16
	=	589.83psi		=	48.81 psi
	=	1,000.00psi		=	180.00 psi
Load Combination	=	+D+L+H	Load Combination	=	+D+L+H
Location of maximum on span	=	12.500ft	Location of maximum on span	=	12.500ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1
Maximum Deflection					
Max Downward Transient Deflection		0.105 in	Ratio =		910 >=360
Max Upward Transient Deflection		-0.041 in	Ratio =		3645 >=360
Max Downward Total Deflection		0.123 in	Ratio =		780 >=240
Max Upward Total Deflection		-0.048 in	Ratio =		3124 >=240

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values			
			M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v	
+D+H	Length = 12.50 ft	1	0.094	0.043	0.90	0.972	1.00	1.00	1.00	1.00	1.00	1.55	84.26	900.00	0.00	0.00	0.00	0.00
	Length = 4.0 ft	2	0.094	0.043	0.90	0.972	1.00	1.00	1.00	1.00	1.00	1.55	84.26	900.00	0.40	6.97	162.00	162.00
+D+L+H	Length = 12.50 ft	1	0.590	0.271	1.00	0.972	1.00	1.00	1.00	1.00	1.00	10.82	589.83	1000.00	2.77	48.81	180.00	180.00
	Length = 4.0 ft	2	0.590	0.271	1.00	0.972	1.00	1.00	1.00	1.00	1.00	10.82	589.83	1000.00	2.77	48.81	180.00	180.00
+D+Lr+H	Length = 12.50 ft	1	0.067	0.031	1.25	0.972	1.00	1.00	1.00	1.00	1.00	1.55	84.26	1250.00	0.00	0.00	0.00	0.00
	Length = 4.0 ft	2	0.067	0.031	1.25	0.972	1.00	1.00	1.00	1.00	1.00	1.55	84.26	1250.00	0.40	6.97	225.00	225.00

Title Block Line 6

Wood Beam

Lic. #: KW-06010065

DESCRIPTION: D1-B5

Load Combination Segment Length	Span #	Max Stress Ratios									Moment Values			Shear Values			
		M	V	C _d	C _{F/V}	C _i	C _r	C _m	C _t	C _L	M	fb	F'b	V	fv	F'v	
+D+S+H																	
Length = 12.50 ft	1	0.073	0.034	1.15	0.972	1.00	1.00	1.00	1.00	1.00	1.55	84.26	1150.00	0.00	0.00	0.00	0.00
Length = 4.0 ft	2	0.073	0.034	1.15	0.972	1.00	1.00	1.00	1.00	1.00	1.55	84.26	1150.00	0.40	6.97	207.00	207.00
+D+0.750Lr+0.750L+H																	
Length = 12.50 ft	1	0.371	0.170	1.25	0.972	1.00	1.00	1.00	1.00	1.00	8.51	463.44	1250.00	0.00	0.00	0.00	0.00
Length = 4.0 ft	2	0.371	0.170	1.25	0.972	1.00	1.00	1.00	1.00	1.00	8.51	463.44	1250.00	2.18	38.35	225.00	225.00
+D+0.750L+0.750S+H																	
Length = 12.50 ft	1	0.403	0.185	1.15	0.972	1.00	1.00	1.00	1.00	1.00	8.51	463.44	1150.00	0.00	0.00	0.00	0.00
Length = 4.0 ft	2	0.403	0.185	1.15	0.972	1.00	1.00	1.00	1.00	1.00	8.51	463.44	1150.00	2.18	38.35	207.00	207.00
+D+0.60W+H																	
Length = 12.50 ft	1	0.053	0.024	1.60	0.972	1.00	1.00	1.00	1.00	1.00	1.55	84.26	1600.00	0.00	0.00	0.00	0.00
Length = 4.0 ft	2	0.053	0.024	1.60	0.972	1.00	1.00	1.00	1.00	1.00	1.55	84.26	1600.00	0.40	6.97	288.00	288.00
+D+0.750Lr+0.750L+0.450W+H																	
Length = 12.50 ft	1	0.290	0.133	1.60	0.972	1.00	1.00	1.00	1.00	1.00	8.51	463.44	1600.00	0.00	0.00	0.00	0.00
Length = 4.0 ft	2	0.290	0.133	1.60	0.972	1.00	1.00	1.00	1.00	1.00	8.51	463.44	1600.00	2.18	38.35	288.00	288.00
+D+0.750L+0.750S+0.450W+H																	
Length = 12.50 ft	1	0.290	0.133	1.60	0.972	1.00	1.00	1.00	1.00	1.00	8.51	463.44	1600.00	0.00	0.00	0.00	0.00
Length = 4.0 ft	2	0.290	0.133	1.60	0.972	1.00	1.00	1.00	1.00	1.00	8.51	463.44	1600.00	2.18	38.35	288.00	288.00
+0.60D+0.60W+0.60H																	
Length = 12.50 ft	1	0.032	0.015	1.60	0.972	1.00	1.00	1.00	1.00	1.00	0.93	50.56	1600.00	0.00	0.00	0.00	0.00
Length = 4.0 ft	2	0.032	0.015	1.60	0.972	1.00	1.00	1.00	1.00	1.00	0.93	50.56	1600.00	0.24	4.18	288.00	288.00
+D+0.70E+0.60H																	
Length = 12.50 ft	1	0.053	0.024	1.60	0.972	1.00	1.00	1.00	1.00	1.00	1.55	84.26	1600.00	0.00	0.00	0.00	0.00
Length = 4.0 ft	2	0.053	0.024	1.60	0.972	1.00	1.00	1.00	1.00	1.00	1.55	84.26	1600.00	0.40	6.97	288.00	288.00
+D+0.750L+0.750S+0.5250E+H																	
Length = 12.50 ft	1	0.290	0.133	1.60	0.972	1.00	1.00	1.00	1.00	1.00	8.51	463.44	1600.00	0.00	0.00	0.00	0.00
Length = 4.0 ft	2	0.290	0.133	1.60	0.972	1.00	1.00	1.00	1.00	1.00	8.51	463.44	1600.00	2.18	38.35	288.00	288.00
+0.60D+0.70E+H																	
Length = 12.50 ft	1	0.032	0.015	1.60	0.972	1.00	1.00	1.00	1.00	1.00	0.93	50.56	1600.00	0.00	0.00	0.00	0.00
Length = 4.0 ft	2	0.032	0.015	1.60	0.972	1.00	1.00	1.00	1.00	1.00	0.93	50.56	1600.00	0.24	4.18	288.00	288.00

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+L+H	1	0.0000	0.000	+D+L+H	-0.0480	7.612
	2	0.1230	4.000		0.0000	7.612

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	-0.284	4.340	
Overall MINimum	-0.041	3.720	
+D+H	-0.041	0.620	
+D+L+H	-0.284	4.340	
+D+Lr+H	-0.041	0.620	
+D+S+H	-0.041	0.620	
+D+0.750Lr+0.750L+H	-0.223	3.410	
+D+0.750L+0.750S+H	-0.223	3.410	
+D+0.60W+H	-0.041	0.620	
+D+0.750Lr+0.750L+0.450W+H	-0.223	3.410	
+D+0.750L+0.750S+0.450W+H	-0.223	3.410	
+0.60D+0.60W+0.60H	-0.024	0.372	
+D+0.70E+0.60H	-0.041	0.620	
+D+0.750L+0.750S+0.5250E+H	-0.223	3.410	
+0.60D+0.70E+H	-0.024	0.372	
D Only	-0.041	0.620	
L Only	-0.244	3.720	
H Only			

42 Topside Way, Mill Valley, CA 94941, USA

Latitude, Longitude: 37.8809786, -122.5009617



Date	1/13/2021, 11:35:25 AM
Design Code Reference Document	ASCE7-16
Risk Category	I
Site Class	D - Default (See Section 11.4.3)

Type	Value	Description
S _S	1.5	MCE _R ground motion. (for 0.2 second period)
S ₁	0.6	MCE _R ground motion. (for 1.0s period)
S _{MS}	1.8	Site-modified spectral acceleration value
S _{M1}	null -See Section 11.4.8	Site-modified spectral acceleration value
S _{DS}	1.2	Numeric seismic design value at 0.2 second SA
S _{D1}	null -See Section 11.4.8	Numeric seismic design value at 1.0 second SA

Type	Value	Description
SDC	null -See Section 11.4.8	Seismic design category
F _a	1.2	Site amplification factor at 0.2 second
F _v	null -See Section 11.4.8	Site amplification factor at 1.0 second
PGA	0.585	MCE _G peak ground acceleration
F _{PGA}	1.2	Site amplification factor at PGA
PGA _M	0.703	Site modified peak ground acceleration
T _L	12	Long-period transition period in seconds
S _{sRT}	1.778	Probabilistic risk-targeted ground motion. (0.2 second)
S _{sUH}	1.934	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration
S _{sD}	1.5	Factored deterministic acceleration value. (0.2 second)
S _{1RT}	0.709	Probabilistic risk-targeted ground motion. (1.0 second)
S _{1UH}	0.785	Factored uniform-hazard (2% probability of exceedance in 50 years) spectral acceleration.
S _{1D}	0.6	Factored deterministic acceleration value. (1.0 second)
PGA _d	0.585	Factored deterministic acceleration value. (Peak Ground Acceleration)
C _{RS}	0.919	Mapped value of the risk coefficient at short periods
C _{R1}	0.903	Mapped value of the risk coefficient at a period of 1 s

BASE SHEAR CALCULATION

SEISMIC GROUND MOTION VALUES (CBC 2019, SECTION 1613/ ASCE 7-16, SECTION 12.8)

SITE CLASS	D							
S _s	=	1.500	FA	=	1.20	S _{DS}	=	1.200
S ₁	=	0.600	Fv	=	1.50	S _{D1}	=	0.600
I	=	1.00						
R	=	3.5						
H	=	18	FT					
CT	=	0.02						
T	=	0.175	SEC					
T _L	=	12	SEC					

EQUIVALENT LATERAL FORCE PROCEDURE (CBC 2019, SECTION 1613/ ASCE 7-16, SECTION 12.8)

LC	=	.6D + .7E
E	=	EH + EV
EH	=	ρ * V
ρ	=	1.3

SEISMIC RESPONSE COEFFICIENT

Cs = [S _{DS} / (R / I)] * W	=	0.343	(ASCE 7-10, Eq. 12.8-2)
<i>BUT, NEED NOT EXCEED THE FOLLOWING:</i>			
Cs = [S _{D1} / [T * (R / I)]] *	=	0.981	(ASCE 7-10, Eq. 12.8-3)
<i>AND SHALL NOT BE LESS THAN,</i>			
Cs = 0.01	=	0.01	(ASCE 7-10, Eq. 12.8-5)
<i>OR,</i>			
Cs = [(0.5 * S ₁) / (R / I)]	=	0.086	(ASCE 7-10, Eq. 12.8-6)

SEISMIC BASE SHEAR

V	=	0.343	* W	(ASCE 7-10, Eq. 12.8-1)
.7*V*ρ	=	0.312		
W	=	24.5	KIPS	
V	=	7.6	KIPS	

DISTRIBUTION OF LATERAL LOADS

V (KIPS) = 7.6

VERTICAL DISTRIBUTION (CBC 2019, SECTION 1613/ ASCE 7-16, SECTION 12.8)

LEVEL	H (FT)	W (KIPS)	W * H	W * H/SUM(W*H)	Fx (KIPS)	STORY SHEAR (KIPS)
UPPER DECK	15	17.5	263	0.86	6.6	6.6
LOWER DECK	6	7.0	42	0.14	1.1	7.6
		24.5	305	1.00	7.6	

HORIZONTAL DISTRIBUTION

UPPER DECK LEVEL

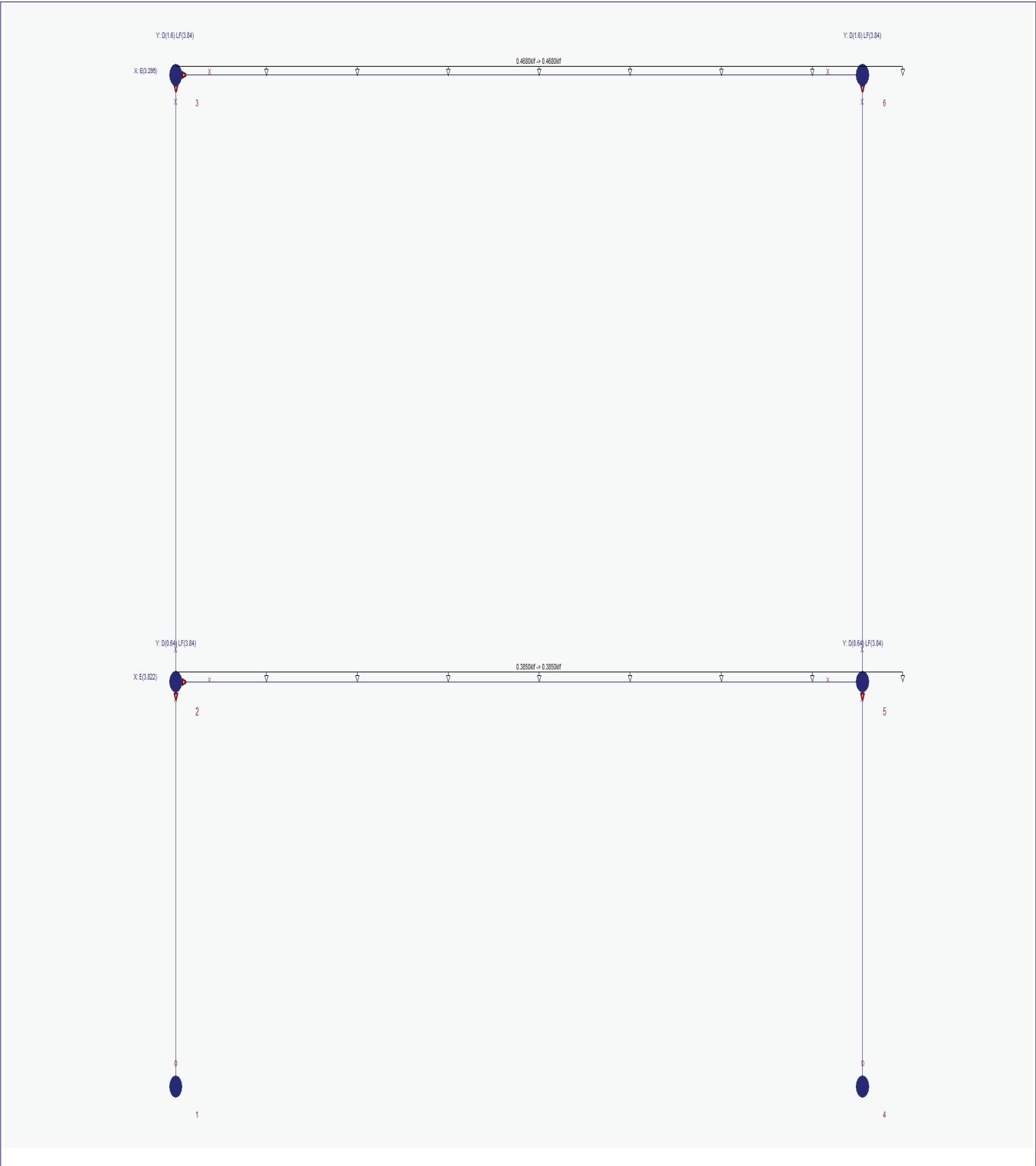
E/W DIRECTION - SEISMIC GOVERNS
 DIAPHRAGM AREA (SQFT) = 700
 DISTRIBUTED LOAD (KSQFT)= 0.009

LINE	TRIB AREA [SQFT]	TRIB LOAD [K]	LOAD FROM ABOVE [K]	TOTAL LOAD [K]	MODIFICATION FACTOR	WALL LENGTH [FT]	UNIT SHEAR [PLF]
1	350	3.3	0	3.3	1.0	1	3295
2	350	3.3	0	3.3	1.0	EXISTING	NO CHANGE
	700	6.6	0.0	6.6			

LOWER DECK LEVEL

E/W DIRECTION - SEISMIC GOVERNS
 DIAPHRAGM AREA (SQFT) = 700
 DISTRIBUTED LOAD (KSQFT)= 0.002

LINE	TRIB AREA [SQFT]	TRIB LOAD [K]	LOAD FROM ABOVE [K]	TOTAL LOAD [K]	MODIFICATION FACTOR [p]	WALL LENGTH [FT]	UNIT SHEAR [PLF]
1	350	0.5	3.3	3.8	1.0	1	3822
2	350	0.5	3.3	3.8	1.0	EXISTING	NO CHANGE
	700	1.1	6.6	7.6			



Title Block Line 6

2-D Frame

Lic. #: KW-06010065

Description :

Joints...

Joint Label	Joint Coordinates		X Translational Restraint	Y Translational Restraint	Z Rotational Restraint	Joint Temp deg F
	X ft	Y ft				
1	0.0	0.0	Fixed	Fixed	Fixed	0
2	0.0	6.0				0
3	0.0	15.0				0
4	17.0	0.0		Fixed	Fixed	0
5	17.0	6.0				0
6	17.0	15.0				0

Members...

Member Label	Property Label	Endpoint Joints		Member Length ft	Releases Specify Connectivity of Member Ends to Joints					
		I Joint	J Joint		I End			J End		
					x	y	z (rotation)	x	y	z (rotation)
1-2	ColLine 1	1	2	6.000	Fixed	Fixed	Pinned	Fixed	Fixed	Fixed
2-3	ColLine 1	2	3	9.000	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
2-5	BmLvl 1	2	5	17.000	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
3-6	BmLvl 2	3	6	17.000	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
4-5	ColLine 2	4	5	6.000	Fixed	Fixed	Pinned	Fixed	Fixed	Fixed
5-6	ColLine 2	5	6	9.000	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed

Member Sections...

Prop Label	Group Tag	Material	Area	Depth	Width	Ixx	Iyy
Default	Group	Default	1.0 in^2	0.0 in	0.0 in	1.0 in^4	1.0 in^4
HSS6x6x3/8	ColLine 1	Steel	7.580 in^2	6.0 in	6.0 in	39.50 in^4	39.50 in^4
HSS6x6x3/8	ColLine 2	Steel	7.580 in^2	6.0 in	6.0 in	39.50 in^4	39.50 in^4
HSS8x6x3/8	BmLvl 1	Steel	8.970 in^2	8.0 in	6.0 in	79.10 in^4	50.60 in^4
HSS8x6x3/8	BmLvl 2	Steel	8.970 in^2	8.0 in	6.0 in	79.10 in^4	50.60 in^4

Joint Loads....

Note: Loads labeled "Global Y" act downward (in "-Y" direction)

Joint Label	Load Direction	Load Magnitude							
		Dead	Roof Live	Live	Snow	Seismic	Wind	Earth	
3	Global X					3.295		k	
3	Global Y	1.60		3.840				k	
6	Global Y	1.60		3.840				k	
2	Global X					3.822		k	
2	Global Y	0.640		3.840				k	
5	Global Y	0.640		3.840				k	

Member Distributed Loads....

Note: Loads labeled "Global Y" act downward (in "-Y" direction)

Member Label	Load Direction	Load Extents Start End ft	Load Magnitude						
			Dead	Roof Live	Live	Snow	Seismic	Wind	Earth
3-6	Global Y	0.0	Start Mag :	0.1380		0.330			k/ft
		18.0	End Mag :	0.1380		0.330			k/ft
2-5	Global Y	0.0	Start Mag :	0.0550		0.330			k/ft
		18.0	End Mag :	0.0550		0.330			k/ft

Extreme Joint Displacements

Only Load Combinations giving maximum values are listed

Joint Label	Joint Displacements		
	X in	Y in	Z Radians
1 Max	0.0 E Only	0.0 E Only	0.0
1 Min	0.0 +D+0.750L+0.5250E	0.0 +D+L	0.0
2 Max	1.429 E Only	0.001394 E Only	-0.0000310 +0.60D

2-D Frame

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Extreme Joint Displacements				Only Load Combinations giving maximum values are listed
Joint Label	Joint Displacements			
	X in	Y in	Z Radians	
3 Max	1.932 E Only	0.001970 E Only	-0.000360 +0.60D	
3 Min	0.00240 +0.60D	-0.01025 +D+L	-0.001715 +D+L	
4 Max	1.415 E Only	0.0 +0.60D	0.0	
4 Min	0.004621 +0.60D	0.0 +D+L	0.0	
5 Max	1.432 E Only	-0.000763 +0.60D	0.001166 +D+L	
5 Min	0.00240 +0.60D	-0.005624 +D+L	-0.000239 E Only	
6 Max	1.929 E Only	-0.001580 +0.60D	0.001715 +D+L	
6 Min	0.002221 +0.60D	-0.01025 +D+L	-0.003217 E Only	

Extreme Joint Reactions				Only Load Combinations giving maximum values are listed
Joint Label	Joint Reactions			
	X k	Y k	Z k-ft	
1 Max	0.0 +0.60D	17.171 +D+L		
1 Min	-7.117 E Only	-4.256 E Only		
2 Max				
2 Min				
3 Max				
3 Min				
4 Max		17.171 +D+L		
4 Min		2.328 +0.60D		
5 Max				
5 Min				
6 Max				
6 Min				

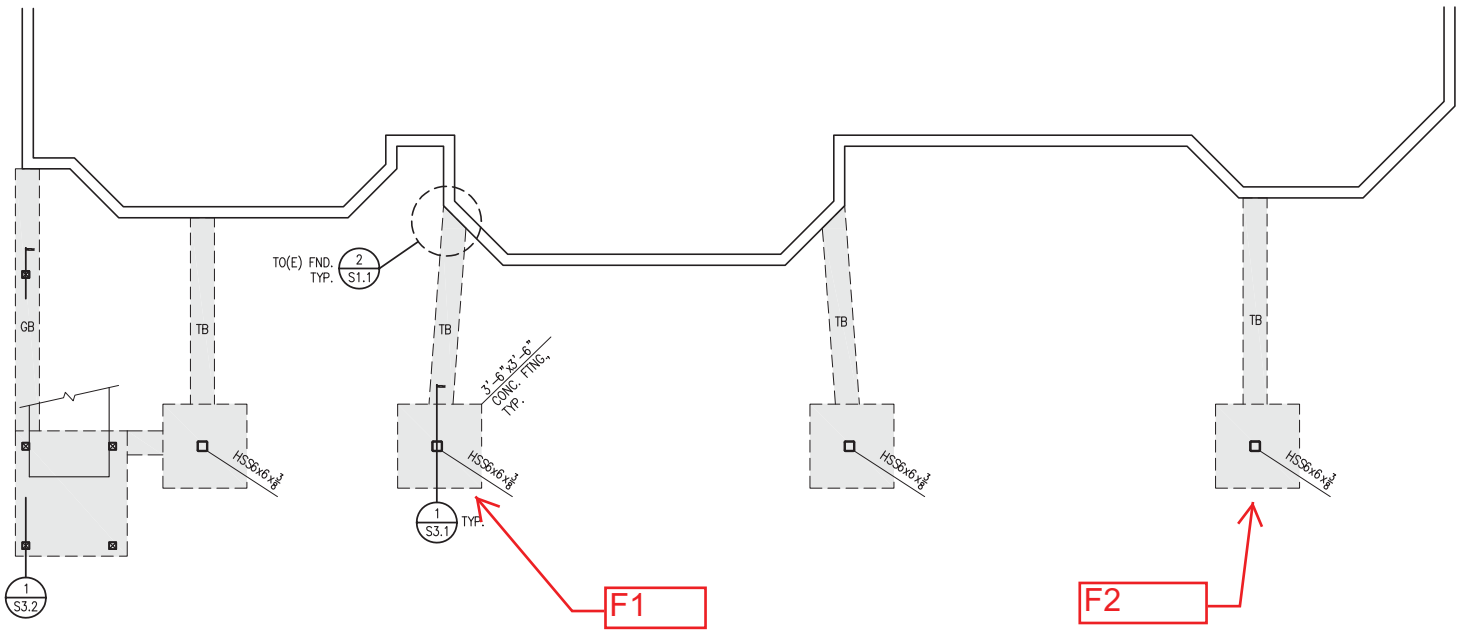
Extreme Member Forces								Only Load Combinations giving maximum values are listed
Mmbr Label	Axial	Dist from "I" Joint	Moment	Dist from "I" Joint	Shear	Dist from "I" Joint		
1-2 Max	0.6511k +0.60D+0.70E	0.0 ft	-0.4575 k-ft +D+0.750L+0.5250E	0.1224 ft	4.982 k +D+0.70E	0.0 ft		
1-2 Min	-17.171k +D+L	0.0 ft	-29.891 k-ft +D+0.70E	6.0 ft	3.736 k +D+0.750L+0.5250E	0.0 ft		
2-3 Max	-0.8433k +0.60D+0.70E	0.0 ft	8.058 k-ft +D+L	9.0 ft	-0.2285 k +0.60D	0.0 ft		
2-3 Min	-9.418k +D+L	0.0 ft	-9.913 k-ft +D+0.750L+0.5250E	0.0 ft	-1.683 k +D+L	0.0 ft		

2-D Frame

Lic. #: KW-06010065

Extreme Member Forces		Only Load Combinations giving maximum values are listed					
Mmbr Label	Axial	Dist from "I" Joint	Moment	Dist from "I" Joint	Shear	Dist from "I" Joint	
2-5 <i>Max</i>	3.139k <i>+D+0.750L+0.5250E</i>	0.0 ft	15.020 k-ft <i>+D+0.750L+0.5250E</i>	17.0 ft	3.273 k <i>+D+L</i>	0.0 ft	
2-5 <i>Min</i>	0.2285k <i>+0.60D</i>	0.0 ft	-23.434 k-ft <i>+0.60D+0.70E</i>	0.0 ft	-4.190 k <i>+D+0.750L+0.5250E</i>	17.0 ft	
3-6 <i>Max</i>	-0.2285k <i>+0.60D</i>	0.0 ft	13.227 k-ft <i>+D+0.750L+0.5250E</i>	17.0 ft	3.978 k <i>+D+L</i>	0.0 ft	
3-6 <i>Min</i>	-3.139k <i>+D+0.750L+0.5250E</i>	0.0 ft	-8.842 k-ft <i>+D+L</i>	8.327 ft	-3.978 k <i>+D+L</i>	17.0 ft	
4-5 <i>Max</i>	-2.328k <i>+0.60D</i>	0.0 ft	0.0 k-ft	0.0 ft	0.0 k	0.0 ft	
4-5 <i>Min</i>	-17.171k <i>+D+L</i>	0.0 ft	0.0 k-ft	0.0 ft	0.0 k	0.0 ft	
5-6 <i>Max</i>	-1.664k <i>+0.60D</i>	0.0 ft	15.020 k-ft <i>+D+0.750L+0.5250E</i>	0.0 ft	3.139 k <i>+D+0.750L+0.5250E</i>	0.0 ft	
5-6 <i>Min</i>	-9.418k <i>+D+L</i>	0.0 ft	-13.227 k-ft <i>+D+0.750L+0.5250E</i>	9.0 ft	0.2285 k <i>+0.60D</i>	0.0 ft	

Member Stress Checks...		Stress Checks per AISC 360-16 & NDS 2018								
Member Label	Section Label	Material	Max. Axial + Bending Stress Ratios				Max. Shear Stress Ratios			
			Load Combination	Ratio	Status	Dist (ft)	Load Combination	Ratio	Status	Dist (ft)
1-2	ColLine 1	Steel	+D+0.70E	0.760	PASS	6.00	+D+0.70E	0.080	PASS	0.00
2-3	ColLine 1	Steel	+D+0.750L+0.5250E	0.270	PASS	0.00	+D+L	0.027	PASS	0.00
2-5	BmLvl 1	Steel	+0.60D+0.70E	0.395	PASS	0.00	+D+0.750L+0.5250E	0.048	PASS	17.00
3-6	BmLvl 2	Steel	+D+0.750L+0.5250E	0.230	PASS	17.00	+D+L	0.046	PASS	17.00
4-5	ColLine 2	Steel	+D+L	0.081	PASS	0.00	N/A	0.000	PASS	0.00
5-6	ColLine 2	Steel	+D+0.750L+0.5250E	0.403	PASS	0.00	+D+0.750L+0.5250E	0.051	PASS	0.00



FOUNDATION KEY

SPREAD FOOTING - BEARING PRESSURE CHECK

F1 - ISOLATED

	TRIB (FT)	DL	LL(ROOF)	LL	
POINT LOAD - P (LBS)					= <u>17,170</u> (REACTION MF-1) 17,170

FOOTING WIDTH - W (FT) = 3.5

BEARING PRESSURE -Pb (PSF) = P/W^2 = 14,02

PRESUMPTIVE LOAD BEARING VALUE - CBC 2019 TABLE 1806.2 -Pa (PSF) = 1500

CHECK - Pa/Pb = 1.07

O.K.

F2 - ISOLATED

	TRIB (FT)	DL	LL(ROOF)	LL	
POINT LOAD - P (LBS)					= 5,440 (REACTION D2-B3) 4,880 (REACTION D2-B4) 4,620 (REACTION D1-B3) <u>2,928</u> (REACTION D1-B4) 17,868

FOOTING WIDTH - W (FT) = 3.5

BEARING PRESSURE -Pb (PSF) = P/W^2 = 14,59

PRESUMPTIVE LOAD BEARING VALUE - CBC 2019 TABLE 1806.2 -Pa (PSF) = 1500

CHECK - Pa/Pb = 1.03

O.K.