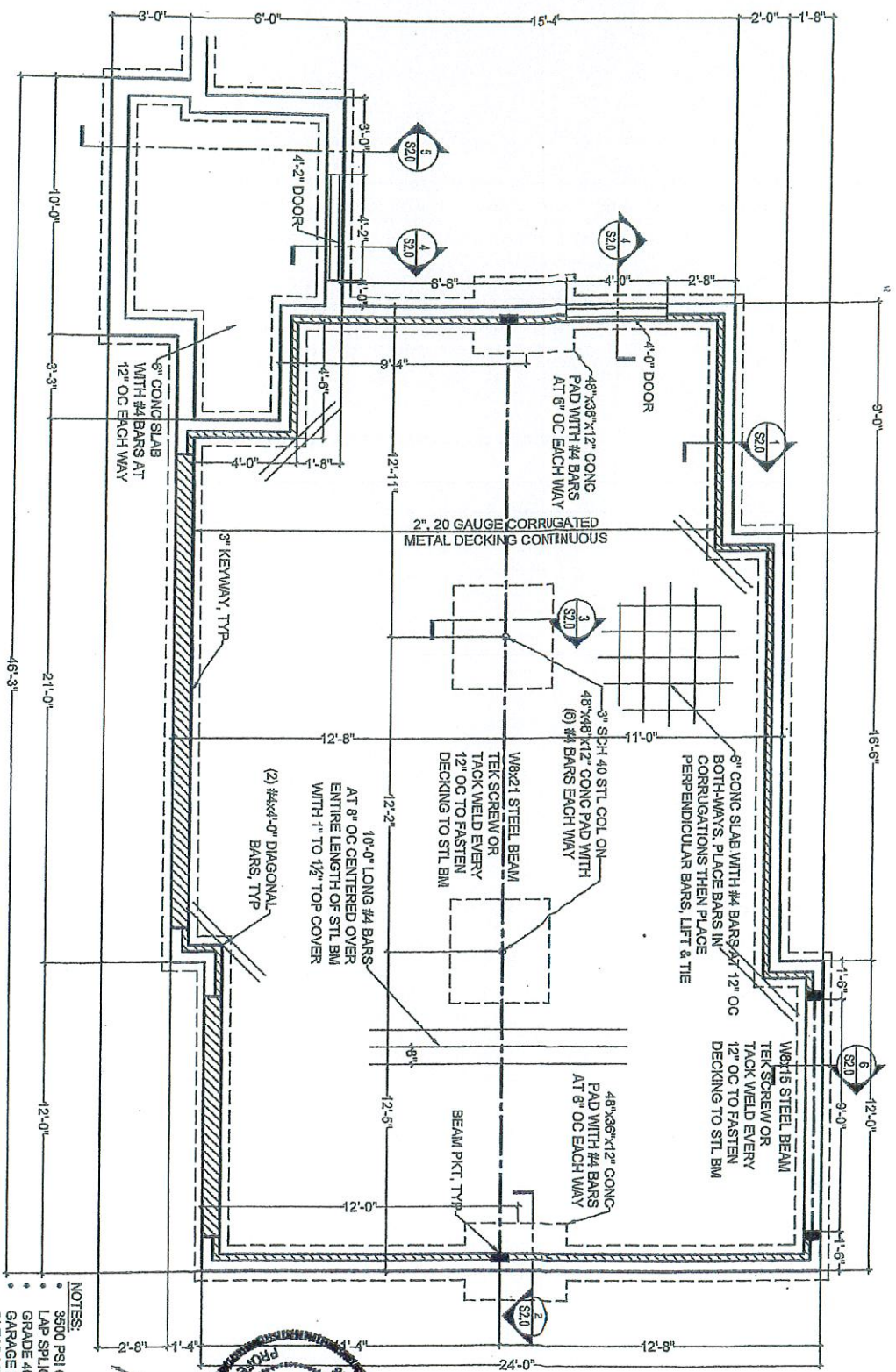


RELEASE FOR CONSTRUCTION
 AS NOTED ON PLANS REVIEW
 CODES ADMINISTRATION
 LEE'S SUMMIT, MISSOURI

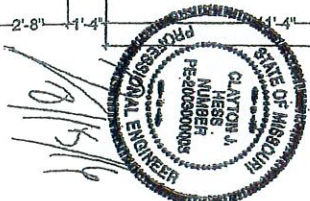
BY 7H
 DATE 6-8-11



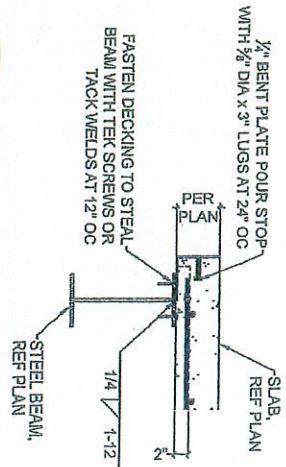
1 SUSPENDED SLAB LAYOUT
 S1.0 SCALE X" = 1'-0"



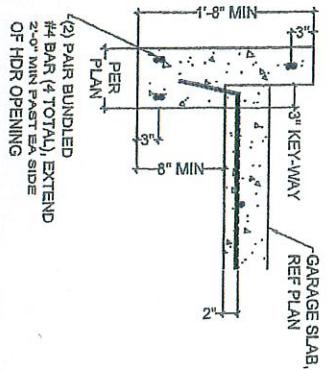
- NOTES:
- 3500 PSI CONCRETE
 - LAP SPLICES 24" MIN
 - GRADE 40 REBAR
 - GARAGE BEAM ABOVE SHALL CLEARSPAN, NO POINT LOADS ON SUSPENDED SLAB.
 - EMBED BARS 24" OR DRILL & EPOXY MIN 6" AT FDTN WALLS
 - SHORE DECKING AT MAX 8'-0" DURING CONSTRUCTION
 - FDTN WALL DESIGN BY OTHERS



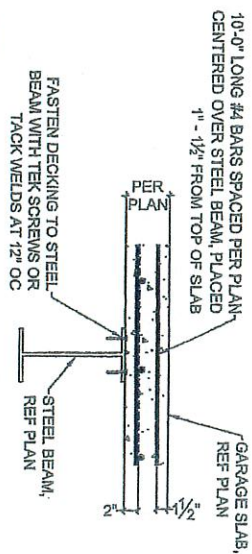
SHEET # S1.0	PROJECT # _____	PROJECT: Lot 30 Monticello	STRUCTURAL DESIGN REVIEW KANSAS ENGINEERING LICENSE NO. 20023000008 CLAYTON A. HESS 2002000008	APEX ENGINEERS 1000 BATTING RD KANSAS CITY, MO 64110 Ph: 816.451.3222 Fax: 816.451.1060 www.apex-engineers.com
	DRAWING NAME SUSPENDED SLAB LAYOUT	CLIENT: D & D BUILDING		
DATE: _____ COMMENTS: _____	DRAWN BY: APEX CHECKED BY: _____			



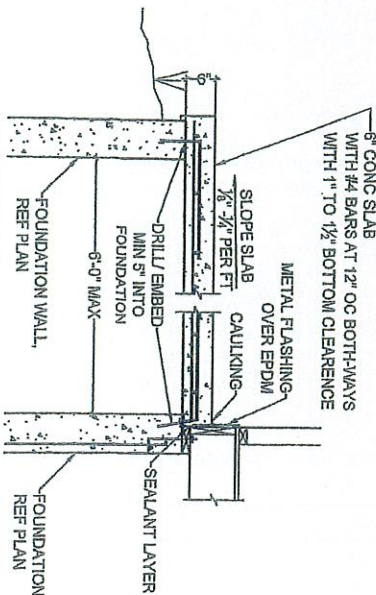
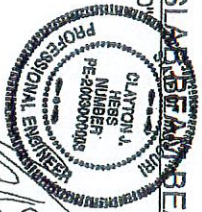
6 POUR STOP DETAIL
S2.0 SCALE: $\frac{3}{4}" = 1'-0"$



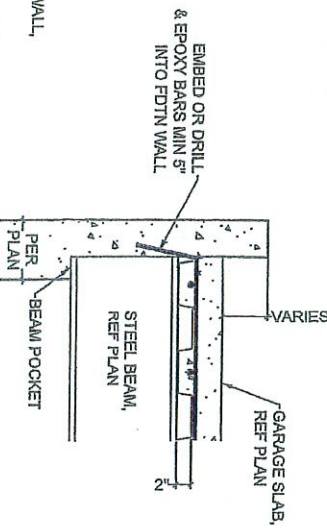
4 CONCRETE HEADER DETAIL
S2.0 SCALE: $\frac{3}{4}" = 1'-0"$



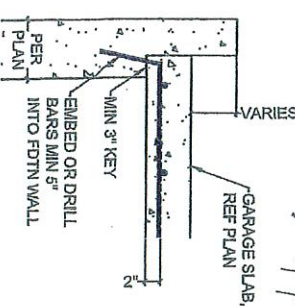
3 GARAGE SLAB BEAM BEARING
S2.0 SCALE: $\frac{3}{4}" = 1'-0"$



5 SUSPENDED PORCH STOOP
S2.0 SCALE: $\frac{1}{2}" = 1'-0"$



2 GARAGE SLAB BEAM BEARING
S2.0 SCALE: $\frac{3}{4}" = 1'-0"$



1 GARAGE SLAB BEARING
S2.0 SCALE: $\frac{3}{4}" = 1'-0"$

- FORMWORK OPTIONS:
1. PROVIDE WILCRAFT 2M1 (OR EQUAL) CORRUGATED DECKING (SHORE AT MID-SPAN DURING CONSTRUCTION, OR PLYWOOD FORMS WITH EXPANDABLE BAR JOISTS OR TEMPORARY FRAMED WALLS BY CONTRACTOR.

- STEEL DECKING NOTES:
- MINIMUM $\frac{1}{2}"$ BEARING
 - FASTEN TO SUPPORT STEEL WITH $\frac{1}{2}"$ VISIBLE PUDDLE WELDS AT EDGE RIBS & 12" CTRS. ALONG END BEARING
 - FASTEN SIDE LAPS & PERIMETER EDGES AT 36" CTRS. WITH #10 TEK SCREWS OR $\frac{1}{8}"$ PUDDLE WELDS
 - MAX UNSUPPORTED CONSTRUCTION SPAN 6'-0"

 APEX ENGINEERS 1600 BALTIMORE AVE., SUITE 102 KANSAS CITY, MO 64108 PH: 816.421.2322 FAX: 816.421.1060 www.apexengineers.com	STRUCTURAL DESIGN REVIEW	PROJECT:	Lot 30 Monticello
	KANSAS ENGINEERING LICENSE: PE-2003001005	CLIENT:	D & D BUILDING
	ISSUED FOR EXAMINING LICENSE: 200004673		
DRAWING NAME SUSPENDED SLAB DETAILS		PROJECT #	
DATE: COMMENTS:		DRAWN BY: APEX CHECKED BY: ---	
SHEET # S2.0			



Apex Engineers, Inc.
1600 Baltimore Ave, Suite 102
Kansas City, MO 64108
Ph. 816.421.3222
Fax 816.421.1050
www.apex-engineers.com

Project Title:
Engineer:
Project Descr:

Project ID:

1 of 3

Concrete Beam

Lic. #: KW-06005244

Licensee: APEX ENGINEERS INC

Description: Suspended Slab

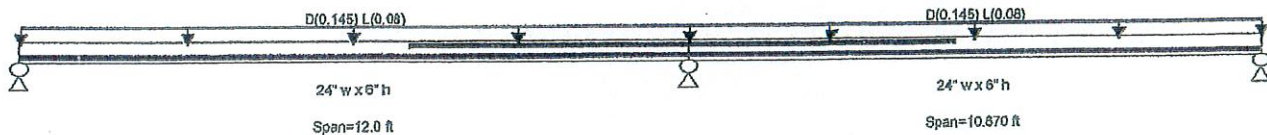
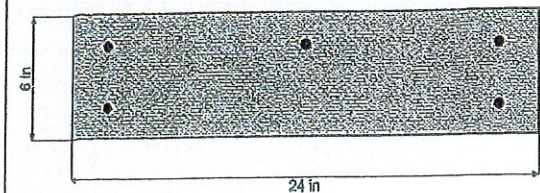
CODE REFERENCES

Calculations per ACI 318-11, IBC 2012, ASCE 7-10

Load Combination Set: ASCE 7-10

Material Properties

f'_c	=	3.0 ksi	ϕ Phi Values	Flexure:	0.90
$f_r = f'_c \cdot \frac{1}{2} \cdot 7.50$	=	410.792 psi		Shear:	0.750
ψ Density	=	145.0 pcf	β_1	=	0.850
λ LWt Factor	=	1.0			
Elastic Modulus	=	3,122.0 ksi	F_y - Stirrups	=	40.0 ksi
f_y - Main Rebar	=	40.0 ksi	E - Stirrups	=	29,000.0 ksi
E - Main Rebar	=	29,000.0 ksi	Stirrup Bar Size #	=	3
			Number of Resisting Legs Per Stirrup	=	2



Cross Section & Reinforcing Details

Rectangular Section, Width = 24.0 in, Height = 6.0 in

Span #1 Reinforcing....

2-#4 at 1.50 in from Bottom, from 0.0 to 12.0 ft in this span

3-#4 at 1.50 in from Top, from 7.0 to 12.0 ft in this span

Span #2 Reinforcing....

2-#4 at 1.50 in from Bottom, from 0.0 to 12.0 ft in this span

3-#4 at 1.50 in from Top, from 0.0 to 5.0 ft in this span

Applied Loads

Load for Span Number 1

Uniform Load: $D = 0.07250$, $L = 0.040$ ksf, Tributary Width = 2.0 ft

Load for Span Number 2

Uniform Load: $D = 0.07250$, $L = 0.040$ ksf, Tributary Width = 2.0 ft

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

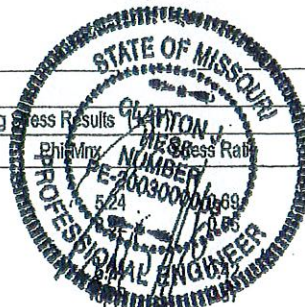
DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.687 : 1	Maximum Deflection	
Section used for this span	Typical Section	Max Downward Transient Deflection	0.019 in Ratio = 7598 >= 36
M_u : Applied	3.602 k-ft	Max Upward Transient Deflection	-0.007 in Ratio = 17973 >= 36
$M_n \cdot \Phi$: Allowable	5.243 k-ft	Max Downward Total Deflection	0.042 in Ratio = 3390 >= 60
Location of maximum on span	4.898 ft	Max Upward Total Deflection	-0.003 in Ratio = 50093 >= 60
Span # where maximum occurs	Span # 1		

Maximum Forces & Stresses for Load Combinations

Load Combination	Span #	Location (ft)	Bending	Stress Results	Phi Min	Phi Max
Segment Length		In Span	Mu: Max			
MAXIMUM BENDING Envelope						
Span # 1	1	12.000	3.60			
Span # 2	2	10.670	-4.90			
+1.40D+1.60H						
Span # 1	1	12.000	2.19			
Span # 2	2	10.670	-3.29			
+1.20D+0.50L+1.60L+1.60H, LL Comb Run (L ²)						
Span # 1	1	12.000	-3.61	8.92	0.41	
Span # 2	2	10.670	2.65	5.24	0.51	
+1.20D+0.50L+1.60L+1.60H, LL Comb Run (L ²)						





Apex Engineers, Inc.
1600 Baltimore Ave, Suite 102
Kansas City, MO 64108
Ph. 816.421.3222
Fax 816.421.1050
www.apex-engineers.com

Project Title:
Engineer:
Project Descr:

Project ID:

2 of 3

Steel Beam

Lic. #: KW-06005244

Licensee: APEX ENGINEERS INC

Description: Center Stl Bm

CODE REFERENCES

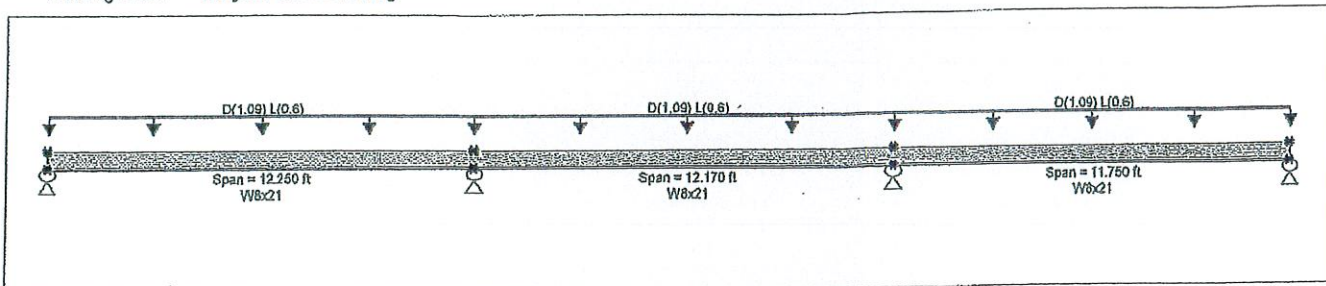
Calculations per AISC 360-10, IBC 2012, ASCE 7-10

Load Combination Set: ASCE 7-10

Material Properties

Analysis Method: Allowable Strength Design
Beam Bracing: Completely Unbraced
Bending Axis: Major Axis Bending

Fy: Steel Yield: 36.0 ksi
E: Modulus: 29,000.0 ksi



Applied Loads

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

Beam self weight calculated and added to loading
Load for Span Number 1
Uniform Load: D = 1.090, L = 0.60 k/ft, Tributary Width = 1.0 ft
Load for Span Number 2
Uniform Load: D = 1.090, L = 0.60 k/ft, Tributary Width = 1.0 ft
Load for Span Number 3
Uniform Load: D = 1.090, L = 0.60 k/ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.707 : 1	Maximum Shear Stress Ratio =	0.423 : 1
Section used for this span	W8x21	Section used for this span	W8x21
Ma: Applied	25.898 k-ft	Va: Applied	12.594 k
Mn / Omega: Allowable	36.647 k-ft	Vn / Omega: Allowable	29.808 k
Load Combination	+D+L+H	Load Combination	+D+L+H
Location of maximum on span	12.250 ft	Location of maximum on span	12.250 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.074 in Ratio = 1,988 >= 600.		
Max Upward Transient Deflection	-0.004 in Ratio = 33,499 >= 600.		
Max Downward Total Deflection	0.211 in Ratio = 697 >= 600.		
Max Upward Total Deflection	-0.012 in Ratio = 11747 >= 600.		

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx/Omega	
+D+H														
Dsgn. L = 9.80 ft		1	0.363	0.183	13.28	-0.12	13.28	61.04	36.55	1.14	1.00	5.46	44.71	29.81
Dsgn. L = 2.45 ft		1	0.459	0.274	-0.00	-16.82	16.82	61.20	36.65	1.76	1.00	8.18	44.71	29.81
Dsgn. L = 3.33 ft		2	0.459	0.230	-0.00	-16.82	16.82	61.20	36.65	1.82	1.00	8.86	44.71	29.81
Dsgn. L = 5.68 ft		2	0.119	0.106	4.36	-0.14	4.36	61.20	36.65	1.14	1.00	4.67	44.71	29.81
Dsgn. L = 3.16 ft		2	0.426	0.264	-0.00	-15.61	15.61	61.20	36.65	1.81	1.00	12.10	44.71	29.81
Dsgn. L = 2.43 ft		3	0.426	0.264	0.19	-15.61	15.61	61.20	36.65	1.75	1.00	12.10	44.71	29.81
Dsgn. L = 9.32 ft		3	0.332	0.174	12.16		12.16	61.20	36.65	1.14	1.00	8.01	44.71	29.81
+D+L+H														
Dsgn. L = 9.80 ft		1	0.560	0.282	20.45	-0.18	20.45	61.04	36.55	1.14	1.00	5.46	44.71	29.81
Dsgn. L = 2.45 ft		1	0.707	0.423	-0.00	-25.90	25.90	61.20	36.65	1.76	1.00	8.18	44.71	29.81
Dsgn. L = 3.33 ft		2	0.707	0.354	-0.00	-25.90	25.90	61.20	36.65	1.82	1.00	8.86	44.71	29.81
Dsgn. L = 5.68 ft		2	0.183	0.163	6.72	-0.22	6.72	61.20	36.65	1.14	1.00	4.67	44.71	29.81
Dsgn. L = 3.16 ft		2	0.656	0.406	-0.00	-24.03	24.03	61.20	36.65	1.81	1.00	12.10	44.71	29.81
Dsgn. L = 2.43 ft		3	0.656	0.406	0.30	-24.03	24.03	61.20	36.65	1.75	1.00	12.10	44.71	29.81
Dsgn. L = 9.32 ft		3	0.511	0.269	18.73		18.73	61.20	36.65	1.14	1.00	8.01	44.71	29.81
+D+Lr+H														
Dsgn. L = 9.80 ft		1	0.363	0.183	13.28	-0.12	13.28	61.04	36.55	1.14	1.00	5.46	44.71	29.81
Dsgn. L = 2.45 ft		1	0.459	0.274	-0.00	-16.82	16.82	61.20	36.65	1.76	1.00	8.18	44.71	29.81
Dsgn. L = 3.33 ft		2	0.459	0.230	-0.00	-16.82	16.82	61.20	36.65	1.82	1.00	8.86	44.71	29.81



Apex Engineers, Inc.
1600 Baltimore Ave, Suite 102
Kansas City, MO 64108
Ph. 816.421.3222
Fax 816.421.1050
www.apex-engineers.com

Project Title:
Engineer:
Project Descr:

Project ID:

3 of 3

Steel Beam

Lic. #: KW-06005244

Licensee: APEX ENGINEERS INC.

Description: Sll bm at rear of susp slab

CODE REFERENCES

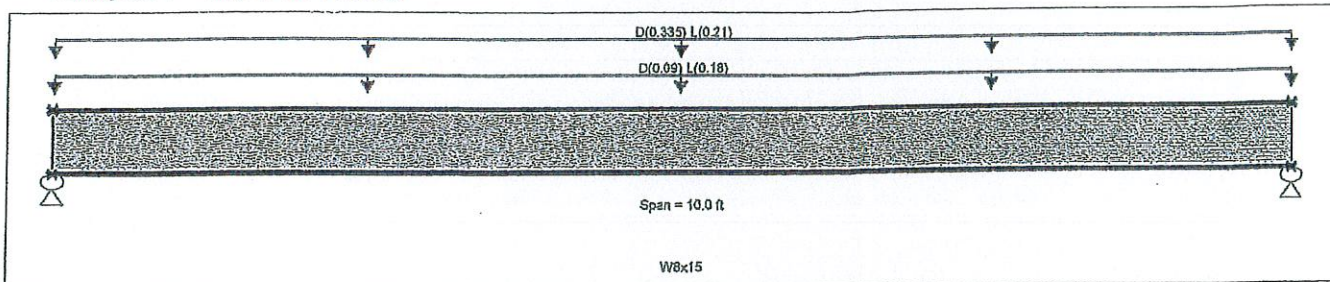
Calculations per AISC 360-10, IBC 2012, ASCE 7-10

Load Combination Set: ASCE 7-10

Material Properties

Analysis Method: Allowable Strength Design
Beam Bracing: Beam is Fully Braced against lateral-torsional buckling
Bending Axis: Major Axis Bending

Fy: Steel Yield: 36.0 ksi
E: Modulus: 29,000.0 ksi



Applied Loads

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

Beam self weight calculated and added to loading

Uniform Load: D = 0.0150, L = 0.030 ksf, Tributary Width = 6.0 ft

Uniform Load: D = 0.3350, L = 0.210 k/ft, Tributary Width = 1.0 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.425 : 1	Maximum Shear Stress Ratio =	0.145 : 1
Section used for this span	W8x15	Section used for this span	W8x15
Ma: Applied	10.375 k-ft	Va: Applied	4.150 k
Mn / Omega: Allowable	24.431 k-ft	Vn / Omega: Allowable	28.612 k
Load Combination	+D+L+H	Load Combination	+D+L+H
Location of maximum on span	5.000 ft	Location of maximum on span	0.000 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.063 in Ratio = 1,894 >= 600.		
Max Upward Transient Deflection	0.000 in Ratio = 0 < 600.0		
Max Downward Total Deflection	0.135 in Ratio = 890 >= 600.		
Max Upward Total Deflection	0.000 in Ratio = 0 < 600.0		

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values							Summary of Shear Values		
			M	V	Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
+D+H	Dsgn. L = 10.00 ft	1	0.225	0.077	5.50		5.50	40.80	24.43	1.00	1.00	2.20	42.92	28.61
+D+L+H	Dsgn. L = 10.00 ft	1	0.425	0.145	10.38		10.38	40.80	24.43	1.00	1.00	4.15	42.92	28.61
+D+Lr+H	Dsgn. L = 10.00 ft	1	0.225	0.077	5.50		5.50	40.80	24.43	1.00	1.00	2.20	42.92	28.61
+D+S+H	Dsgn. L = 10.00 ft	1	0.225	0.077	5.50		5.50	40.80	24.43	1.00	1.00		42.92	28.61
+D+0.750Lr+0.750L+H	Dsgn. L = 10.00 ft	1	0.375	0.128	9.16		9.16	40.80	24.43	1.00				28.61
+D+0.750L+0.750S+H	Dsgn. L = 10.00 ft	1	0.375	0.128	9.16		9.16	40.80	24.43	1.00	1.00			28.61
+D+0.60W+H	Dsgn. L = 10.00 ft	1	0.225	0.077	5.50		5.50	40.80	24.43	1.00				28.61
+D+0.70E+H	Dsgn. L = 10.00 ft	1	0.225	0.077	5.50		5.50	40.80	24.43	1.00				28.61
+D+0.750Lr+0.750L+0.450W+H	Dsgn. L = 10.00 ft	1	0.375	0.128	9.16		9.16	40.80	24.43	1.00				28.61
+D+0.750L+0.750S+0.450W+H	Dsgn. L = 10.00 ft	1	0.375	0.128	9.16		9.16	40.80	24.43	1.00	1.00			28.61
+D+0.750L+0.750S+0.5250E+H	Dsgn. L = 10.00 ft	1	0.375	0.128	9.16		9.16	40.80	24.43	1.00	1.00	3.66	42.92	28.61
+0.60D+0.60W+0.60H	Dsgn. L = 10.00 ft	1	0.135	0.046	3.30		3.30	40.80	24.43	1.00	1.00	1.32	42.92	28.61

