

RELEASED FOR CONSTRUCTION

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

BY JSF
DATE 9/25/15



**APEX
ENGINEERS**

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Fax: 816.421.1050
www.apex-engineers.com

STRUCTURAL DESIGN REVIEW
KANSAS ENGINEERING LICENSE:
992
MISSOURI ENGINEERING LICENSE:
2003004678

PROJECT:
DEERBROOK COVENANT CHURCH
201 NE TUDOR
LEE'S SUMMIT, MO

CLIENT:
RON MYRICK DESIGN BUILDERS, INC
1205 SW WINTERGREEN LN
BLUE SPRINGS, MO 64015

PROJECT #

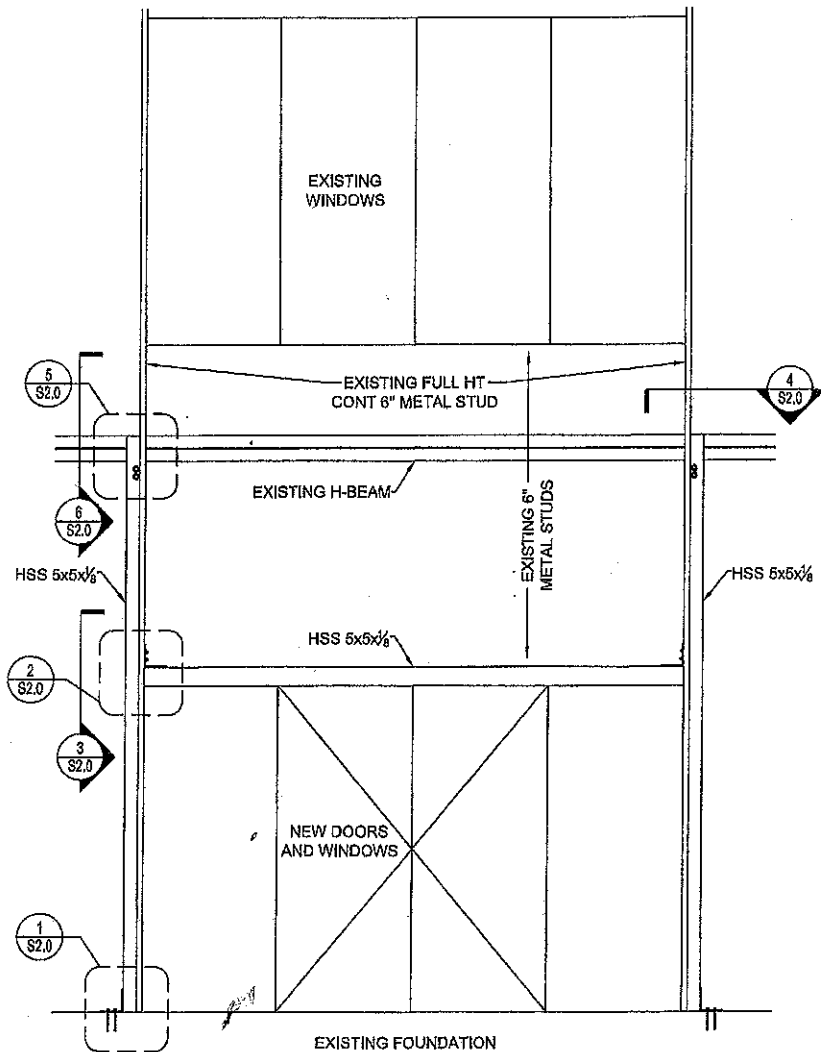
DRAWING NAME

DATE: COMMENTS:

DRAWN BY: APEX
CHECKED BY:

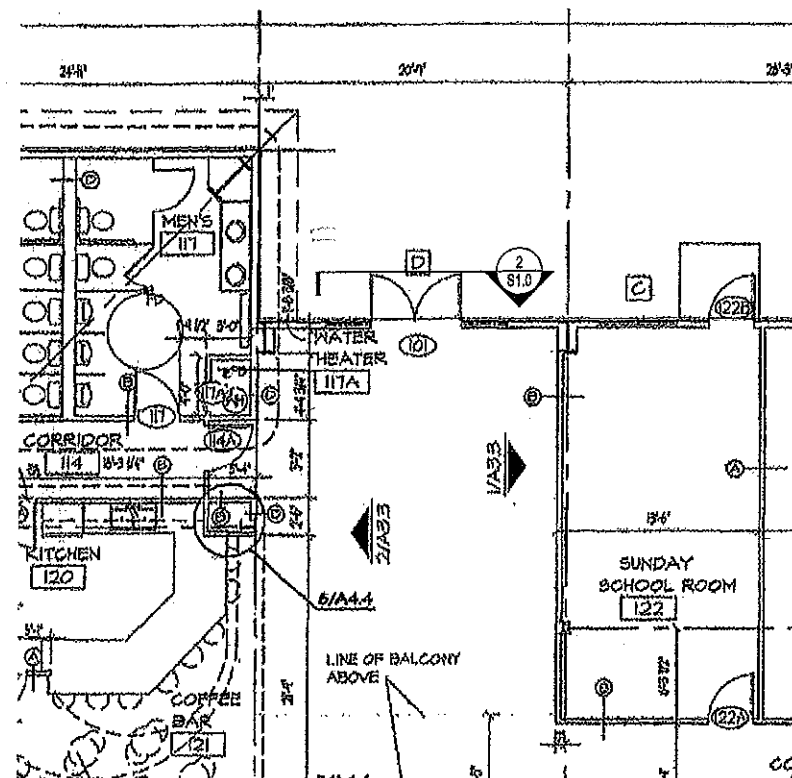
SHEET #

S1.0



2 EXTERIOR ELEVATION

S1.0 SCALE $\frac{3}{8}" = 1'-0"$



1 PLAN VIEW

S1.0 SCALE $\frac{1}{8}" = 1'-0"$

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STRUCTURAL DESIGN REVIEW

KANSAS ENGINEERING LICENSE: 832
MISSOURI ENGINEERING LICENSE: 2003004873

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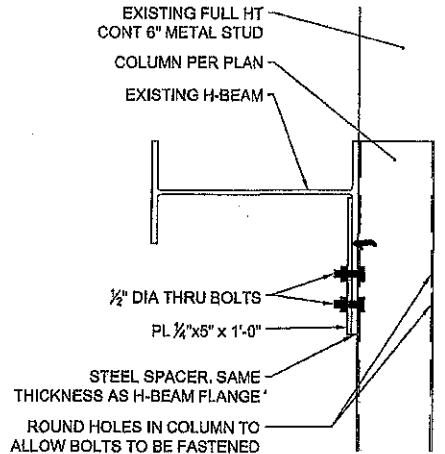
DRAWING NAME

DATE: COMMENTS:

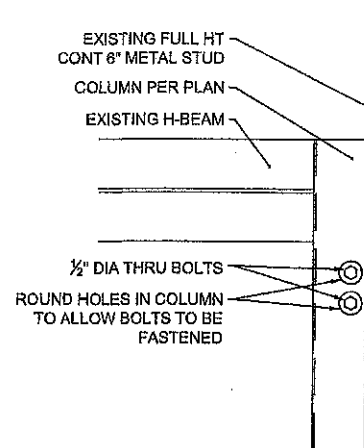
DRAWN BY: APEX
CHECKED BY:

SHEET #

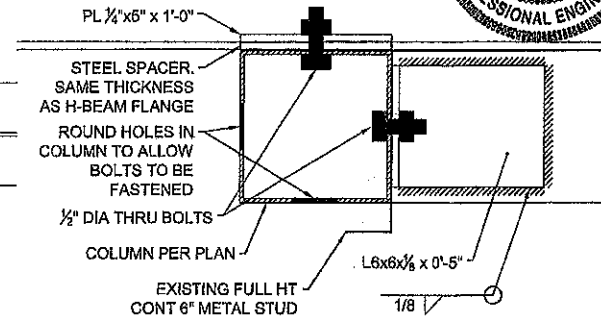
S2.0



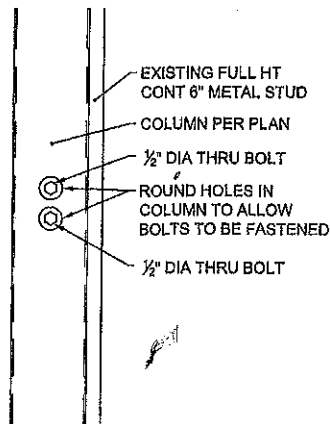
6 CLMN TO H-BM CNXN (SIDE)
S2.0 SCALE 1-1/2" = 1'-0"



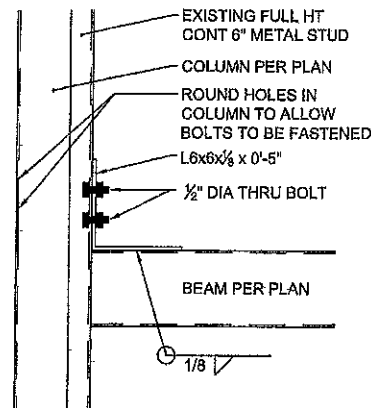
5 CLMN TO H-BM CNXN (FRONT)
S2.0 SCALE 1-1/2" = 1'-0"



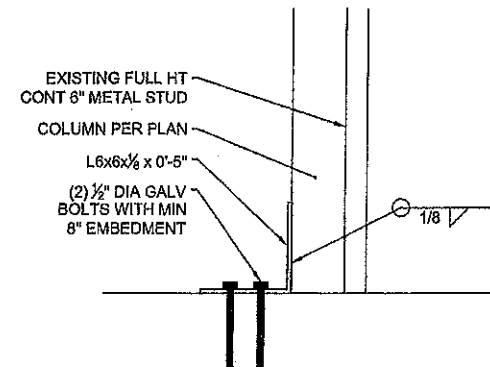
4 COLUMN TO H-BEAM (TOP)
S2.0 SCALE 3" = 1'-0"



3 BM TO CLMN CNXN (SIDE)
S2.0 SCALE 1-1/2" = 1'-0"



2 BM TO CLMN CNXN (FRONT)
S2.0 SCALE 1-1/2" = 1'-0"



1 FOUNDATION ANCHORS
S2.0 SCALE 1-1/2" = 1'-0"



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Project Title:
Engineer:
Project Descr:

Project ID:

Printed: 21 SEP 2015, 10:34AM

Steel Beam

File = G:\Projects\Ron Myrick\Deerbrook Covenant Church_201 NE Tudor\Engineering\beam calcs.ec8

ENERCALC, INC. 1983-2014, Build: 6.14.11.17, Ver: 6.14.11.17

Fig. #: KW-06005244

Licensee: APEX ENGINEERS INC

Description: Header over Doors

CODE REFERENCES

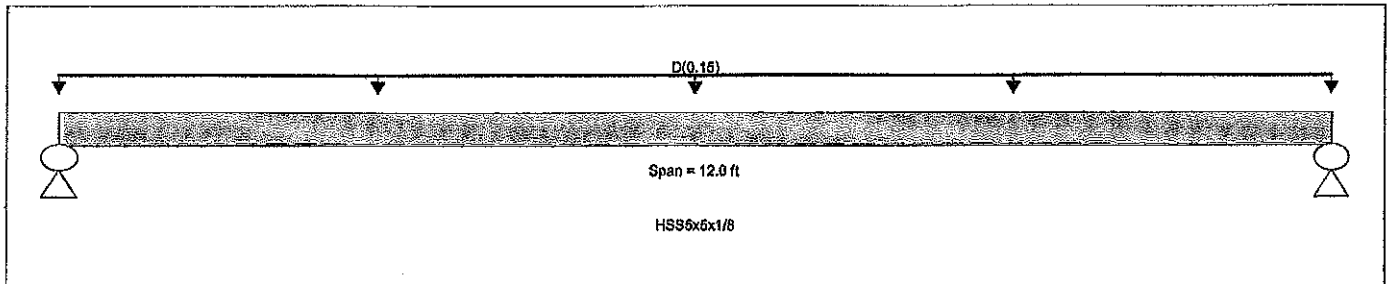
Calculations per AISC 360-10, IBC 2012, ASCE 7-10

Load Combination Set: ASCE7-10

Material Properties

Analysis Method: Allowable Strength Design
Beam Bracing: Beam is Fully Braced against lateral-torsional buckling
Bending Axis: Major Axis Bending
Load Combination: ASCE7-10

Fy: Steel Yield: 46.0 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 = 0.010 ksf, Tributary Width = 15.0 ft

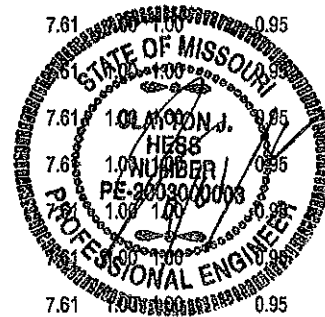
DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.374 : 1	Maximum Shear Stress Ratio =	0.053 : 1
Section used for this span	HSS5x5x1/8	Section used for this span	HSS5x5x1/8
Ma: Applied	2.847 k-ft	Va: Applied	0.9489 k
Mn / Omega: Allowable	7.607 k-ft	Vn / Omega: Allowable	17.837 k
Load Combination	+D+H	Load Combination	+D+H
Location of maximum on span	6.000 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	0.000 in	Ratio =	0 < 360
Max Upward Transient Deflection	0.000 in	Ratio =	0 < 360
Max Downward Total Deflection	0.291 in	Ratio =	494
Max Upward Total Deflection	0.000 in	Ratio =	0 < 360

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 = 12.00 ft		1	0.374	0.053	2.85		2.85	12.70	7.61	1.00	1.00	0.95	29.79	17.84
+D+L+H														
Dsgn. L = 12.00 ft		1	0.374	0.053	2.85		2.85	12.70	7.61	1.00	1.00	0.95	29.79	17.84
+D+Lr+H														
Dsgn. L = 12.00 ft		1	0.374	0.053	2.85		2.85	12.70	7.61	1.00	1.00	0.95	29.79	17.84
+D+S+H														
Dsgn. L = 12.00 ft		1	0.374	0.053	2.85		2.85	12.70	7.61	1.00	1.00	0.95	29.79	17.84
+D+0.750Lr+0.750L+H														
Dsgn. L = 12.00 ft		1	0.374	0.053	2.85		2.85	12.70	7.61	1.00	1.00	0.95	29.79	17.84
+D+0.750L+0.750S+H														
Dsgn. L = 12.00 ft		1	0.374	0.053	2.85		2.85	12.70	7.61	1.00	1.00	0.95	29.79	17.84
+D+0.60W+H														
Dsgn. L = 12.00 ft		1	0.374	0.053	2.85		2.85	12.70	7.61	1.00	1.00	0.95	29.79	17.84
+D+0.70E+H														
Dsgn. L = 12.00 ft		1	0.374	0.053	2.85		2.85	12.70	7.61	1.00	1.00	0.95	29.79	17.84
+D+0.750Lr+0.750L+0.450W+H														
Dsgn. L = 12.00 ft		1	0.374	0.053	2.85		2.85	12.70	7.61	1.00	1.00	0.95	29.79	17.84
+D+0.750L+0.750S+0.450W+H														
Dsgn. L = 12.00 ft		1	0.374	0.053	2.85		2.85	12.70	7.61	1.00	1.00	0.95	29.79	17.84
+D+0.750L+0.750S+0.5250E+H														
Dsgn. L = 12.00 ft		1	0.374	0.053	2.85		2.85	12.70	7.61	1.00	1.00	0.95	29.79	17.84
+0.60D+0.60W+0.60H														
Dsgn. L = 12.00 ft		1	0.225	0.032	1.71		1.71	12.70	7.61	1.00	1.00	0.57	29.79	17.84





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Project Title:
Engineer:
Project Descr:

Project ID:

Printed: 21 SEP 2016, 10:34AM

Steel Column

File = G:\Projects\Ron Myrick\Deerbrook Covenant Church_201 NE Tudor\Engineering\beam calcs.sc6

ENERCALC, INC. 1983-2014, Build: 6.14.11.17, Ver: 6.14.11.17

Fig. #: KW-06005244

Licensee: APEX ENGINEERS, INC.

Description: Side Columns

Code References

Calculations per AISC 360-10, IBC 2012, CBC 2013, ASCE 7-10

Load Combinations Used: ASCE 7-10

General Information

Steel Section Name: **HSS5x5x1/8**
Analysis Method: Allowable Strength
Steel Stress Grade
Fy: Steel Yield 46.0 ksi
E: Elastic Bending Modulus 29,000.0 ksi
Load Combination: ASCE 7-10

Overall Column Height 12.0 ft
Top & Bottom Fixity Top & Bottom Pinned
Brace condition for deflection (buckling) along columns:
X-X (width) axis:
Unbraced Length for X-X Axis buckling = 12.0 ft, K = 1.0
Y-Y (depth) axis:
Fully braced against buckling along Y-Y Axis

Applied Loads

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

Column self weight included: 97.788 lbs * Dead Load Factor

AXIAL LOADS...

Axial Load at 12.0 ft, D = 1.0 k

BENDING LOADS...

Lat. Uniform Load creating Mx-x, W = 0.120 k/ft

DESIGN SUMMARY

Bending & Shear Check Results

PASS Max. Axial+Bending Stress Ratio = **0.1840 : 1**
Load Combination **+D+0.60W+H**
Location of max. above base 5.960 ft
At maximum location values are ...
Pa: Axial 1.098 k
Pn / Omega: Allowable 40.380 k
Ma-x: Applied 1.296 k-ft
Mn-x / Omega: Allowable 7.607 k-ft
Ma-y: Applied 0.0 k-ft
Mn-y / Omega: Allowable 7.607 k-ft

Maximum SERVICE Load Reactions ..
Top along X-X 0.0 k
Bottom along X-X 0.0 k
Top along Y-Y 0.720 k
Bottom along Y-Y 0.720 k

Maximum SERVICE Load Deflections ...
Along Y-Y 0.2218 in at 6.040ft above base
for load combination: W Only
Along X-X 0.0 in at 0.0ft above base
for load combination:

PASS Maximum Shear Stress Ratio = **0.02422 : 1**
Load Combination **+D+0.60W+H**
Location of max. above base 12.0 ft
At maximum location values are ...
Va: Applied 0.4320 k
Vn / Omega: Allowable 17.837 k

Load Combination Results

Load Combination	Maximum Axial + Bending Stress Ratios			Maximum Shear Ratios		
	Stress Ratio	Status	Location	Stress Ratio	Status	Location
+D+H	0.027	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+L+H	0.027	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+Lr+H	0.027	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+S+H	0.027	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.750Lr+0.750L+H	0.027	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.750L+0.750S+H	0.027	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.60W+H	0.184	PASS	5.96 ft	0.024	PASS	0.00 ft
+D+0.70E+H	0.027	PASS	0.00 ft	0.000	PASS	0.00 ft
+D+0.750Lr+0.750L+0.450W+H	0.141	PASS	5.96 ft	0.017	PASS	0.00 ft
+D+0.750L+0.750S+0.450W+H	0.141	PASS	5.96 ft	0.017	PASS	0.00 ft
+D+0.750L+0.750S+0.5250E+H	0.027	PASS	0.00 ft	0.000	PASS	0.00 ft
+0.60D+0.60W+0.60H	0.179	PASS	5.96 ft	0.024	PASS	0.00 ft
+0.60D+0.70E+0.60H	0.016	PASS	0.00 ft	0.000	PASS	0.00 ft

