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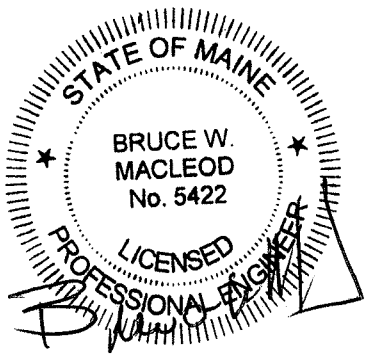
Project: Bangor Savings ATM
Portland, Maine
By: BWM
Job ID: 2011-165
Date: 5/31/2011

Bangor Savings Bank
ATM
Portland, Maine

COLD FORMED METAL FRAMING CALCULATIONS
MSE Job #2011-165

Submittal #1

PREPARED BY
MacLeod Structural Engineers, P.A.
Gorham, Maine
May 27, 2011



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DESIGN CRITERIA:

Building Design Code: IBC 2009 w/ ASCE 7-05

Design Loads:

Dead Loads:	Partition Weight - 10 psf
	Roof Dead Load - 15 psf
Design Wind:	Location: Portland, Maine
	Basic Wind Speed = 100 mph
	Exposure Category "B"
	Importance Factor = 1.0
Snow Load:	Ground Snow Load = 60 psf
	Snow Exposure Factor = 1.0
	Importance Factor = 1.0

Deflection Criteria For Studs: Standard Per Code - Unless Job Specifications Are More Stringent

Walls:	L/240 At Non-Masonry Backup
	L/600 At Masonry Backup
Floors:	L/360 (Live Load)
Roof:	L/360

Materials:

Cold Formed Metal Framing Materials Based On Dietrich Industries Standards.
Calculation Based On Min. Fy = 33 ksi for all materials (Unless Noted)

Fasteners:

Unless Noted Otherwise: Use Only The Following Fasteners:

1.) P.A.F. = 0.145" Dia. (min.) Powder Actuated Fastener (Hilti)
Use 1 1/4" Length For Attachment To Concrete
Use 5/8" Length For Attachment To Steel

2.) Use #10-16 Screws Typical For All Light gage To Light Gage Connections

3.) Use #12 Screws for Manufacturers Clips Where Required/Indicated

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www.struware.com

Code Search

I. Code: ASCE 7 - 05

II. Occupancy:

Occupancy Group = I Institutional

III. Type of Construction:

Fire Rating:
Roof = 0.0 hr
Floor = 0.0 hr

IV. Live Loads:

Roof angle (θ) 0.00 / 12 0.0 deg

Roof 0 to 200 sf: 20 psf
200 to 600 sf: 24 - 0.02Area, but not less than 12 psf
over 600 sf: 12 psf

Floor	100 psf
Stairs & Exitways	100 psf
Balcony	100 psf
Mechanical	N/A
Partitions	15 psf

V. Wind Loads : ASCE 7 - 05

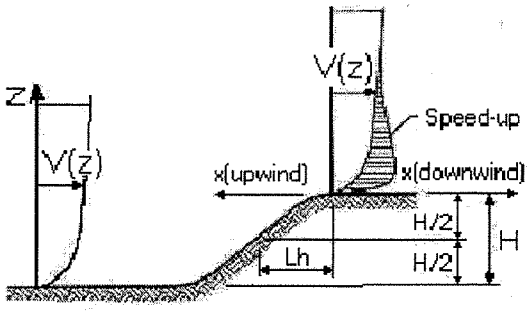
Importance Factor	1.00
Basic Wind speed	100 mph
Directionality (Kd)	0.85
Mean Roof Ht (h)	16.0 ft
Parapet ht above grd	16.0 ft
Exposure Category	B
Enclosure Classif.	Enclosed Building
Internal pressure	+/-0.18
Building length (L)	14.0 ft
Least width (B)	11.0 ft
Kh case 1	0.701
Kh case 2	0.585

Topographic Factor (Kzt)

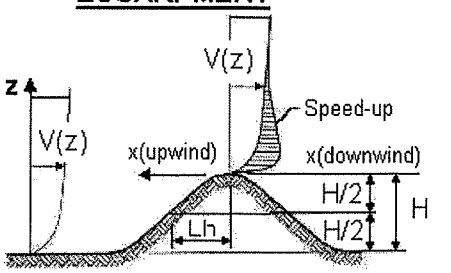
Topography	Flat	
Hill Height (H)	0.0 ft	H< 60ft;exp B
Half Hill Length (Lh)	0.0 ft	∴ Kzt=1.0
Actual H/Lh =	0.00	
Use H/Lh =	0.00	
Modified Lh =	0.0 ft	
From top of crest: x=	0.0 ft	
Bldg up/down wind?	downwind	

H/Lh= 0.00	K_1 =	0.000
x/Lh = 0.00	K_2 =	0.000
z/Lh = 0.00	K_3 =	1.000

At Mean Roof Ht:
$Kzt = (1+K_1K_2K_3)^2$ = 1.000



ESCARPMENT



2D RIDGE or 3D AXISYMMETRICAL HILL

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V. Wind Loads - MWFRS all h (Enclosed/partially enclosed only)

Kh (case 2) =	0.59	h =	16.0 ft	GCpi =	+/-0.18
Base pressure (q_h) =	**12.7 psf**	ridge ht =	16.0 ft	G =	0.85
Roof Angle =	0.0 deg	L =	14.0 ft	qi = qh	
Roof tributary area - (h/2)*L:	112 sf	B =	11.0 ft		
(h/2)*B:	88 sf				

Surface Pressures (psf) / Surface	Wind Normal to Ridge (psf) B/L = 0.79 Cp	q_hGC_p	h/L = 1.45 w/+q_iGC_{pi}	w/-q_hGC_{pi}	Wind Parallel to Ridge (psf) L/B = 1.27 Dist.*	Cp	q_hGC_p	h/L = 1.14 w/ +q_iGC_{pi}	w/ -q_hGC_{pi}
Windward Wall (WW)	0.80	8.7	see table below			0.80	8.7	see table below	
Leeward Wall (LW)	-0.50	-5.4	-7.7	-3.1		-0.45	-4.8	-7.1	-2.5
Side Wall (SW)	-0.70	-7.6	-9.9	-5.3		-0.70	-7.6	-9.9	-5.3
Leeward Roof (LR)		**				Included in windward roof			
Windward Roof: 0 to h/2*	-1.28	-13.9	-16.2	-11.6	0 to h/2*	-1.30	-14.1	-16.4	-11.8
> h/2*	-0.70	-7.6	-9.9	-5.3	> h/2*	-0.70	-7.6	-9.9	-5.3

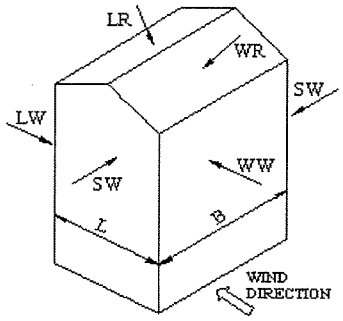
*Horizontal distance from windward edge

**Roof angle < 10 degrees. Therefore, leeward roof is included in windward roof pressure zones.

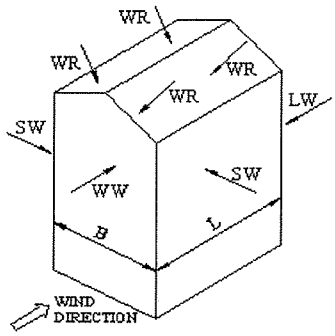
For monoslope roofs, entire roof surface is either windward or leeward surface.

Windward Wall Pressures at "z" (psf)

	z	Kz	Kzt	Windward Wall q_zGC_p	w/+q_iGC_{pi}	w/-q_hGC_{pi}	Combined WW + LW Normal to Ridge	Parallel to Ridge
	0 to 15'	0.57	1.00	8.5 psf	6.2 psf	10.8 psf	13.9 psf	13.3 psf
h=	16.0 ft	0.59	1.00	8.7	6.4	11.0	14.1	13.5



WIND NORMAL TO RIDGE



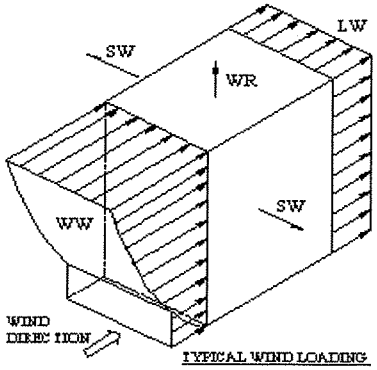
WIND PARALLEL TO RIDGE

NOTE:
See figure 6-9 of ASCE7 for the application of full and partial loading of the above wind pressures. There are 4 different loading cases.

Parapet

z	Kz	Kzt	qp (psf)
17.0 ft	0.60	1.00	13.0

Windward parapet: 19.4 psf (GCpn = +1.5)
Leeward parapet: -13.0 psf (GCpn = -1.0)



TYPICAL WIND LOADING

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V. Wind Loads - Components & Cladding: Buildings h≤60' & Alternate design 60'<h<90'

Kz = Kh (case 1) = 0.70 GCpi = +/-0.18
Base pressure (qh) = **15.2 psf** a = 3.0 ft
Minimum parapet height at building perimeter = 3.0 ft

NOTE: If tributary area is greater than 700sf, MWFRS pressure may be used.

Roof Angle = 0.0 deg
Type of roof = Gable

Roof

	GCp +/- GCpi			Surface Pressure (psf)			User input	
Area	10 sf	50 sf	100 sf	10 sf	50 sf	100 sf	20 sf	70 sf
Negative Zone 1	-1.18	-1.11	-1.08	-18.0 psf	-16.9 psf	-16.5 psf	-17.5 psf	-16.7 psf
Negative Zone 2	-1.98	-1.49	-1.28	-30.2 psf	-22.7 psf	-19.5 psf	-27.0 psf	-21.2 psf
Negative Zone 3	-1.98	-1.49	-1.28	-30.2 psf	-22.7 psf	-19.5 psf	-27.0 psf	-21.2 psf
Positive All Zones	0.48	0.41	0.38	10.0 psf	10.0 psf	10.0 psf	10.0 psf	10.0 psf
Overhang Zone 1&2	-1.70	-1.63	-1.60	-25.9 psf	-24.9 psf	-24.4 psf	-25.5 psf	-24.6 psf
Overhang Zone 3	-1.70	-1.63	-1.60	-25.9 psf	-24.9 psf	-24.4 psf	-25.5 psf	-24.6 psf

Negative zone 3 = zone 2, since parapet >= 3ft.

Walls

	GCp +/- GCpi			Surface Pressure (psf)			User input	
Area	10 sf	100 sf	500 sf	10 sf	100 sf	500 sf	50 sf	85 sf
Negative Zone 4	-1.17	-1.01	-0.90	-17.8 psf	-15.4 psf	-13.7 psf	-16.1 psf	-15.6 psf
Negative Zone 5	-1.44	-1.12	-0.90	-22.0 psf	-17.1 psf	-13.7 psf	-18.6 psf	-17.4 psf
Positive Zone 4 & 5	1.08	0.92	0.81	16.5 psf	14.0 psf	12.3 psf	14.8 psf	14.2 psf

Note: GCp reduced by 10% due to roof angle <= 10 deg.

Parapet

qp = 15.2 psf

CASE A = pressure towards building
CASE B = pressure away from building

Solid Parapet Pressure	10 sf	100 sf	500 sf
CASE A : Interior zone :	41.2 psf	31.3 psf	26.4 psf
Corner zone :	41.2 psf	31.3 psf	26.4 psf
CASE B : Interior zone :	-28.8 psf	-24.0 psf	-20.6 psf
Corner zone :	-32.9 psf	-25.7 psf	-20.6 psf

Rooftop Structures & Equipment

Dist from mean roof height to centroid of Af = 10.0 ft
Height of equipment (he) = 0.0 ft
Gust Effect Factor (G) = 0.85
Base pressure (qz) = **17.9 Kd** psf

Cross-Section Square
Directionality (Kd) 0.90
Width (D) 10.0 ft
Type of Surface N/A

h/D = 0.00

Square (wind along diagonal)
Cf = 1.00
Af = 10.0 sf
Adjustment Factor (Adj) = 1.90
F = qz G Cf Af Adj= **13.7 Af**
F = 137 lbs

Square (wind normal to face)
C_f = 1.30
A_f = 10.0 sf
Adjustment Factor (Adj) = 1.900
F = q_z G C_f A_f Adj= **17.8 Af**
F = 178 lbs

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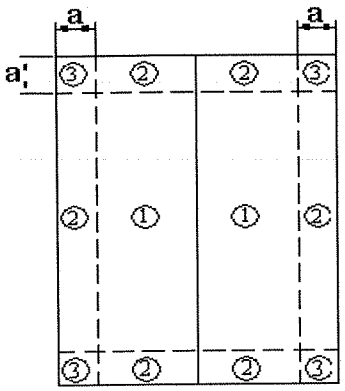
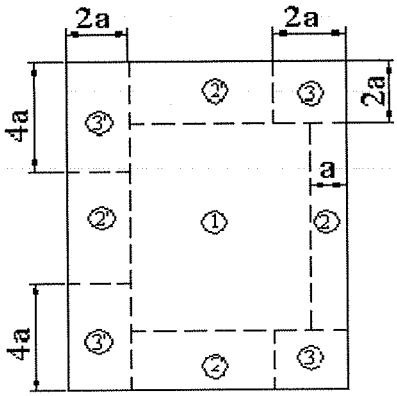
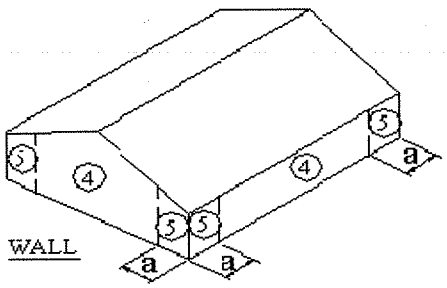
Location of Wind Pressure Zones

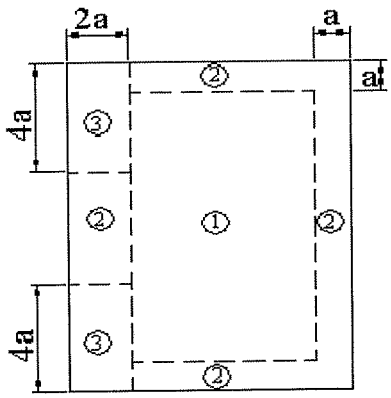


θ ≤ 7 degrees and
Monoslope ≤ 3 degrees

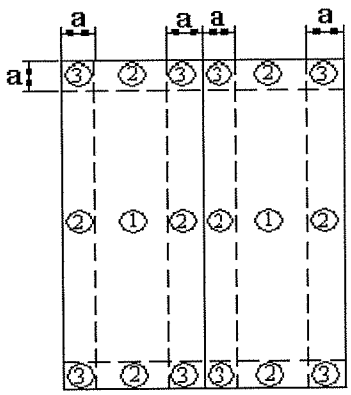


Monoslope roofs
3° < θ ≤ 10°

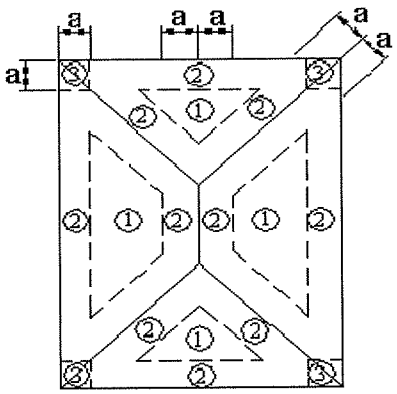




Monoslope roofs 10° < θ ≤ 30°



θ > 7 degrees



θ > 7 degrees

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VI. Seismic Loads: ASCE 7- 05

http://eqint.cr.usgs.gov/eq-men/html/lookup-2002-interp-06.html

Occupancy Category: II
Importance Factor (I) : 1.00
Site Class : D

Ss (0.2 sec) = 32.00 %g
S1 (1.0 sec) = 10.00 %g

Fa =	1.544	Sms =	0.494	Sds =	0.329	Design Category =	B
Fv =	2.400	Sm1 =	0.240	Sd1 =	0.160	Design Category =	C

Seismic Design Category = **C**
Number of Stories: 1
Structure Type: Not applicable
Horizontal Struct Irregularities: No plan Irregularity
Vertical Structural Irregularities: No vertical Irregularity

Flexible Diaphragms: Yes
Building System: **Bearing Wall Systems**
Seismic resisting system: **Light frame walls with shear panels - wood structural panels/sheet steel panels**
System Building Height Limit: **Height not limited**
Actual Building Height (hn) = 16.0 ft

DESIGN COEFFICIENTS AND FACTORS

Response Modification Factor (R) = 6.5
System Over-Strength Factor (Ωo) = 2.5
Deflection Amplification Factor (Cd) = 4
Sds = 0.329
Sd1 = 0.160

ρ = redundancy coefficient
Seismic Load Effect (E) = ρQ_E +/- $0.2S_{DS}$ D = ρQ_E +/- 0.066D — Q_E = horizontal seismic force
Special Seismic Load Effect (E) = $\Omega o\, Q_E$ +/- $0.2S_{DS}$ D = 2.5 Q_E +/- 0.066D — D = dead load

PERMITTED ANALYTICAL PROCEDURES

Index Force Analysis (Seismic Category A only) Method Not Permitted

Simplified Analysis Use Equivalent Lateral Force Analysis

Equivalent Lateral-Force Analysis - Permitted

Building period coef. (C_T) =	0.020			Cu = 1.58
Approx fundamental period (Ta) =	$C_T h_n^x$ =	0.160 sec	x= 0.75	Tmax = CuTa = 0.253
User calculated fundamental period (T) =		0 sec		Use T = 0.160
Long Period Transition Period (TL) =	ASCE7 map =	error		
Seismic response coef. (Cs) =	SdsI/R =	0.051		
need not exceed Cs =	Sd1 I TL/RT^2 =	0.154		
but not less than Cs =		0.010		
USE Cs =		0.010		

Design Base Shear V = error

Model & Seismic Response Analysis - Permitted (see code for procedure)

ALLOWABLE STORY DRIFT

Structure Type: Non- masonry, 4 story or less designed to accommodate the story drift

Allowable story drift = 0.025hsx where hsx is the story height below level x

ALLOWABLE

TABLE 1 - ALLOWABLE SCREW LOADS (lbf)

Steel Gauge			26 - gauge		20 - gauge		18 - gauge		16 - gauge		14 - gauge		12 - gauge		1/8" in.		3/16" in.		1/4" in.	
Screw Size	Drill Point		Pullout/ Tension	Lap Shear	Pullout/ Tension	Lap Shear	Pullout/ Tension	Lap Shear	Pullout/ Tension	Lap Shear	Pullout/ Tension	Lap Shear	Pullout/ Tension	Lap Shear	Pullout/ Tension	Lap Shear	Pullout/ Tension	Lap Shear	Pullout/ Tension	Lap Shear
10-16	Teks 1	1107	21	74	103	208	154	339	195	-	-	-	-	-	-	-	-	-	-	-
10-16	Teks 3	1545, 1791	-	-	73	193	113	339	151	389	202	433	339	-	-	-	-	-	-	-
12-14	Teks 1	1109	26	109	108	230	167	382	206	-	-	-	-	-	-	-	-	-	-	-
12-14	Teks 2,3	1140, 1123	-	-	88	203	143	353	178	423	242	535	420	616	557	-	939	-	-	-
12-24	Teks 4	1088	-	-	-	-	-	-	164	-	236	-	401	533	572	656	1151	-	1225	-
12-24	Teks 5	1072	-	-	-	-	-	-	140	-	201	-	315	-	464	711	977	722	1115	713
1/4-14	Teks 1	1399	27	130	169	280	173	435	209	-	-	-	-	-	-	-	-	-	-	-
1/4-14	Teks 2,3	1155	-	-	55	211	117	401	146	467	214	645	369	665	430	703	964	-	-	-
1/4-28	Teks 5	1074	-	-	-	-	-	-	154	-	218	-	359	-	498	887	1032	900	1264	907
Lap Shear Loads for 1/2" Oriented Strand Board (OSB), 1/2" & 3/4" Plywood to 20g-12g Steel																				
10-16	Teks 3	1077	1/2" OSB	-	156	-	147	-	148	-	158	-	132	-	-	-	-	-	-	-
10-16	Teks 3	1077	1/2" Plywood	-	187	-	130	-	163	-	188	-	209	-	-	-	-	-	-	-
10-16	Teks 3	1077	3/4" Plywood	-	218	-	180	-	228	-	277	-	240	-	-	-	-	-	-	-
10-24	Teks 3	1082	1/2" OSB	-	-	-	-	-	138	-	117	-	155	-	-	-	-	-	-	-
10-24	Teks 3	1082	1/2" Plywood	-	-	-	-	-	205	-	204	-	150	-	-	-	-	-	-	-
10-24	Teks 3	1082	3/4" Plywood	-	-	-	-	-	286	-	265	-	206	-	-	-	-	-	-	-
Lap Shear Loads for 2x4 DFL Lumber to 16g -1/8" Steel																				
12-24	Teks 4	1094	2x4 DFL	-	-	-	-	-	225	-	290	-	302	-	272	-	-	-	-	-
1/4-20	Teks 4	1096	2x4 DFL	-	-	-	-	-	216	-	273	-	195	-	272	-	-	-	-	-

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PROJECT: BANGOR SAVINGS ATM

BY: BM JOB NO. 2011-165

DATE: 5/11 SHEET NO. 8

NOTES:

ROOF RAFTERS SPAN = 10'+/-

LOADS

DL = 15psf

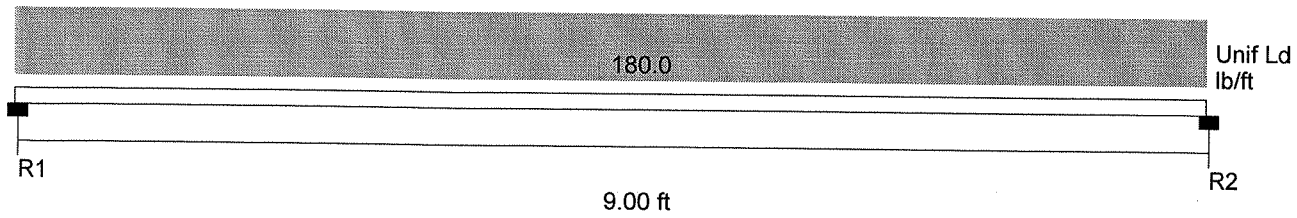
SNOW = 120psf

- SEE ATTACHED CALC USE 800S162-54 @16"OC

2001 North American Specification

Project: Bangor Savings ATM
Model: Roof Rafters 16"oc Dead +Snow

Date: 6/9/2011



Section : 800S162-54 Single C Stud (X-X Axis)
Maxo = 3065.9 Ft-Lb **Moment of Inertia, I =** 5.600 in^4

Fy = 50.0 ksi
Va = 2091.3 lb

Loads have not been modified for strength checks
Loads have not been modified for deflection calculations

Flexural and Deflection Check

Span	Mmax Ft-Lb	Mmax/ Maxo	Mpos Ft-Lb	Bracing (in)	Ma(Brc) Ft-Lb	Mpos/ Ma(Brc)	Deflection (in)	Deflection Ratio
Center Span	1822.5	0.594	1822.5	Full	3065.9	0.594	0.161	L/671

Combined Bending and Web Crippling

Reaction or Pt Load	Load P(lb)	Brng (in)	Pa (lb)	Mmax (Ft-Lb)	Intr. Value	Stiffen Req'd ?
R1	**810.0**	1.50	651.4	0.0	1.49	**YES**
R2	**810.0**	1.50	651.4	0.0	1.49	**YES**

Combined Bending and Shear

Reaction or Pt Load	Vmax (lb)	Mmax (Ft-Lb)	Va Factor	V/Va	M/Ma	Intr. Unstiffen	Intr. Stiffen
R1	810.0	0.0	1.00	0.39	0.00	0.15	NA
R2	810.0	0.0	1.00	0.39	0.00	0.15	NA

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By:BWM
Job ID: 20
Date:6/9/2011
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03b. Clip L Outstanding Leg Fastener Capacity: Eccentric Shear (Vertical and Horizontal Loading) And Tension

For: Screw Attachment of Clip L FOR ROOF RAFTER TO BOX BEAM

# of Rows	$n_r := 4$	Spacing of Rows	$s_r := 1\text{in}$
# of Columns	$n_c = 1$	width of outstanding leg	$s_c := 2\text{in}$
Fastener Allowable Tension	$T_a := 151\text{lbf}$	Fastener Allowable Shear	$V_a := 389\text{lbf}$

Load Information

$P_1 := 810\text{lbf}$ P1 is Eccentric to Fasteners Above

$P_4 := 0\text{lbf}$ P4 is Concentric

$P_2 := 0\text{lbf}$ F2 is Concentric

Location of P1
e = 1 in

$e := \frac{s_c}{2}$

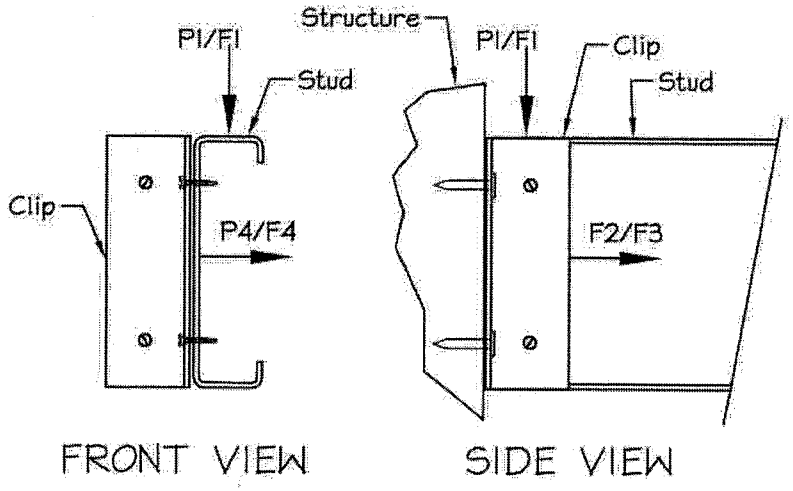
Clip L Information Dietrich S685 series Clip

Clip Gage	$G_S := 14$
Clip Yield Stress	$F_y := 50\text{ksi}$
Clip Ultimate Stress	$F_u = 65\,\text{ksi}$
Number of #10-16 Screws	$No := 3$
Allowable F1 Load	$E_{a1} := 1126\text{lbf}$
Allow F2/F3 Load	$E_{a2} := 0.0\text{lbf}$
Check Combined Loads on Clip	$U_E = 0.517$

Clip = "OK"

Fastener to Structure Analysis Results

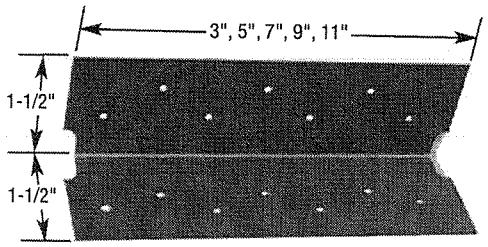
Fastener With Max Load	$Max_{fastener} = \begin{pmatrix} 1 \\ 4 \end{pmatrix}$
Max. Resultant Shear on Fastener	$V_{max} = 285.6\,\text{lbf}$
Max Tension on Fastener	$T_p = 0\,\text{lbf}$
Combined Tension/Shear on Fastener	$U_p = 0.734$
Fastener to Structure check	Fastener = "OK"



9.2

EasyClip™ S-Series™ Support Clips are used in any rigid connection application not requiring a long leg.

- *1-1/2" x 1-1/2" legs.*
- *Lengths available in 3", 5", 7", 9" and 11".*
- *Available in 16, 14 and 12 gauge.*
- *Prepunched for faster and more accurate fastener placement.*



EasyClip™ S-Series™ Support Clip

Dietrich™ EasyClip™ S-Series™ support clips are used for rigid connections in window and door framing. These clips are also used in joist, bypass or other miscellaneous connections to secure one framing member to another or to secure framing members to the structural frame. EasyClip™ S-Series™ clips are prepunched for faster and more accurate fastener placement.

Alternative Products

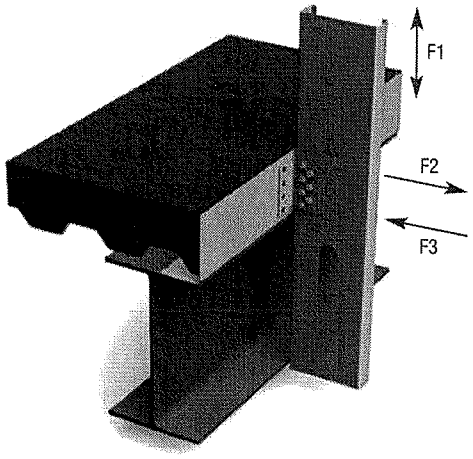
EasyClip™ U-Series™, EasyClip™ X-Series™, EasyClip™ D-Series™ or EasyClip™ B-Series™

Product Dimensions

1-1/2" x 1-1/2" x 3" (38.1mm x 38.1mm x 76.2 mm)
1-1/2" x 1-1/2" x 5" (38.1mm x 38.1mm x 127 mm)
1-1/2" x 1-1/2" x 7" (38.1mm x 38.1mm x 178 mm)
1-1/2" x 1-1/2" x 9" (38.1mm x 38.1mm x 229 mm)
1-1/2" x 1-1/2" x 11" (38.1mm x 38.1mm x 279 mm)

Material Specifications

Gauge: 16 gauge (54 mils)
Design Thickness: 0.0566 inches (1.438 mm)
Gauge: 14 gauge (68 mils)
Design Thickness: 0.0713 inches (1.811 mm)
Gauge: 12 gauge (97 mils)
Design Thickness: 0.1017 inches (2.583 mm)
Coating: G90 (Z275) hot-dipped galvanized coating
Yield Strength: Mill-certified SS Grade 50 ksi (340 MPa)
ASTM: A 653/A 653M



Installation

E-Series™ support clips are attached to the cold-formed steel (CFS) framing members using #10 minimum self-drilling screws driven through the clip holes into the steel framing. When not filling all holes, install fasteners symmetrically starting at the top and bottom edges and move toward the center of the clip. Clip can also be welded to the CFS framing. Connections to the building frame can be made with powder-actuated fasteners, drill-in concrete anchors or welding. When using the tabular values for a welded clip, provide a full weld to the structure, top to bottom, along the outside of the clip. A 3/4" minimum weld on the outside edge of the 1-1/2" leg is also required to control warping or to hold the clip in place before final welding.

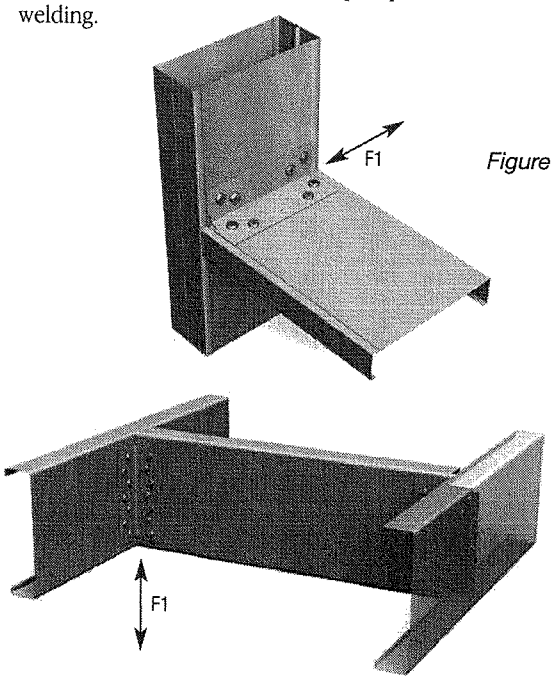


Figure 1

EasyClip™ S-Series™ Support Clips

DMF Product Code	Thickness				Size		Weight/Piece		Packaging
	Gauge	Mils	Design Thickness		Inches	mm	lbs	kg	Pcs/ Bucket
			Inches	mm					
S543	16	54	0.0566	1.438	1-1/2 x 1-1/2 x 3	38.1 x 38.1 x 76.2	0.140	0.064	400
S545	16	54	0.0566	1.438	1-1/2 x 1-1/2 x 5	38.1 x 38.1 x 127	0.240	0.109	200
S547	16	54	0.0566	1.438	1-1/2 x 1-1/2 x 7	38.1 x 38.1 x 178	0.340	0.154	100
S549	16	54	0.0566	1.438	1-1/2 x 1-1/2 x 9	38.1 x 38.1 x 229	0.430	0.195	100
S541	16	54	0.0566	1.438	1-1/2 x 1-1/2 x 11	38.1 x 38.1 x 279	0.530	0.240	100
S683	14	68	0.0713	1.811	1-1/2 x 1-1/2 x 3	38.1 x 38.1 x 76.2	0.180	0.082	200
S685	14	68	0.0713	1.811	1-1/2 x 1-1/2 x 5	38.1 x 38.1 x 127	0.300	0.136	200
S687	14	68	0.0713	1.811	1-1/2 x 1-1/2 x 7	38.1 x 38.1 x 178	0.420	0.191	100
S689	14	68	0.0713	1.811	1-1/2 x 1-1/2 x 9	38.1 x 38.1 x 229	0.540	0.245	100
S681	14	68	0.0713	1.811	1-1/2 x 1-1/2 x 11	38.1 x 38.1 x 279	0.660	0.299	100
S973	12	97	0.1017	2.583	1-1/2 x 1-1/2 x 3	38.1 x 38.1 x 76.2	0.260	0.118	200
S975	12	97	0.1017	2.583	1-1/2 x 1-1/2 x 5	38.1 x 38.1 x 127	0.430	0.195	150
S977	12	97	0.1017	2.583	1-1/2 x 1-1/2 x 7	38.1 x 38.1 x 178	0.600	0.272	100
S979	12	97	0.1017	2.583	1-1/2 x 1-1/2 x 9	38.1 x 38.1 x 229	0.770	0.349	80
S971	12	97	0.1017	2.583	1-1/2 x 1-1/2 x 11	38.1 x 38.1 x 279	0.940	0.426	70

EasyClip™ S-Series™ Support Clips Allowable Clip Capacities (lbs) Using #10–16 Self-Drilling Screws

Clip	No. of Screws to Steel Framing (1)	Stud Thickness and Yield Strength											
		20 ga (33 mil)			18 ga (43 mil)			16 ga (54mil)					
		33 ksi			33 ksi			33 ksi			50 ksi		
		F1	F2	F3	F1	F2	F3	F1	F2	F3	F1	F2	F3
S543	3	295(295)	210(531)	531	437(437)	210(788)	788	616(555)	210(1110)	1110	777(555)	210(1195)	1400
S545	2	317(317)	354(354)	354	470(470)	371(525)	525	662(662)	371(740)	740	835(835)	371(933)	933
	5	651(651)	371(885)	885	965(965)	371(1313)	1313	1361(1361)	371(1850)	1850	1716(1460)	371(2105)	2333
S547	4	653(653)	531(708)	708	969(969)	531(1050)	1050	1365(1365)	531(1480)	1480	1722(1722)	531(1867)	1867
	7	1029(1029)	531(1239)	1239	1526(1526)	531(1838)	1838	2151(2151)	531(2591)	2591	2712(2456)	531(3015)	3267
S549	4	679(679)	692(708)	708	1007(1007)	692(1050)	1050	1420(1420)	692(1480)	1480	1790(1790)	692(1867)	1867
	9	1408(1408)	692(1593)	1593	2090(2090)	692(2363)	2363	2945(2945)	692(3331)	3331	3714(3452)	692(3925)	4200
S541	6	1015(1015)	852(1062)	1062	1505(1505)	852(1576)	1576	2121(2121)	852(2221)	2221	2675(2675)	852(2800)	2800
	11	1785(1785)	852(1947)	1947	2648(2648)	852(2889)	2889	3732(3732)	852(4071)	4071	4706(4432)	852(4835)	5133
S683	3	295(295)	333(531)	531	437(437)	333(788)	788	616(616)	333(1110)	1110	777(699)	333(1400)	1400
S685	2	317(317)	354(354)	354	470(470)	525(525)	525	662(662)	587(740)	740	835(835)	587(933)	933
	5	651(651)	587(885)	885	965(965)	587(1313)	1313	1361(1361)	587(1850)	1850	1716(1716)	587(2333)	2333
S687	4	653(653)	708(708)	708	969(969)	841(1050)	1050	1365(1365)	841(1480)	1480	1722(1722)	841(1867)	1867
	7	1029(1029)	841(1239)	1239	1526(1526)	841(1838)	1838	2151(2151)	841(2591)	2591	2712(2712)	841(3267)	3267
S689	4	679(679)	708(708)	708	1007(1007)	1050(1050)	1050	1420(1420)	1095(1480)	1480	1790(1790)	1095(1867)	1867
	9	1408(1408)	1095(1593)	1593	2090(2090)	1095(2363)	2363	2945(2945)	1095(3331)	3331	3714(3714)	1095(4200)	4200
S681	6	1015(1015)	1062(1062)	1062	1505(1505)	1349(1576)	1576	2121(2121)	1349(2221)	2221	2675(2675)	1349(2800)	2800
	11	1785(1785)	1349(1947)	1947	2648(2648)	1349(2889)	2889	3732(3732)	1349(4071)	4071	4706(4706)	1349(5133)	5133
S973	3	295(295)	531(531)	531	437(437)	679(788)	788	616(616)	679(1110)	1110	777(777)	679(1400)	1400
S975	2	317(317)	354(354)	354	470(470)	525(525)	525	662(662)	740(740)	740	835(835)	933(933)	933
	5	651(651)	885(885)	885	965(965)	1196(1313)	1313	1361(1361)	1196(1850)	1850	1716(1716)	1196(2333)	2333
S977	4	653(653)	708(708)	708	969(969)	1050(1050)	1050	1365(1365)	1480(1480)	1480	1722(1722)	1713(1867)	1867
	7	1029(1029)	1239(1239)	1239	1526(1526)	1713(1838)	1838	2151(2151)	1713(2591)	2591	2712(2712)	1713(3267)	3267
S979	4	679(679)	708(708)	708	1007(1007)	1050(1050)	1050	1420(1420)	1480(1480)	1480	1790(1790)	1867(1867)	1867
	9	1408(1408)	1593(1593)	1593	2090(2090)	2229(2363)	2363	2945(2945)	2229(3331)	3331	3714(3714)	2229(4200)	4200
S971	6	1015(1015)	1062(1062)	1062	1505(1505)	1576(1576)	1576	2121(2121)	2221(2221)	2221	2675(2675)	2746(2800)	2800
	11	1785(1785)	1947(1947)	1947	2648(2648)	2746(2889)	2889	3732(3732)	2746(4071)	4071	4706(4706)	2746(5133)	5133

Table Notes

Screw Capacity Notes:

1) The tabulated value indicates the number of screws in a single clip leg attached to the cold-formed steel (CFS) framing.
2) Screws shall be attached in a symmetric manner, starting at the outside holes and moving to the center. Reference Figure 1 on opposite page
3) The allowable values for F1 are based only on the shear capacity of the clip leg attached to the CFS framing. The capacity of the attachment to other materials and structures must be checked separately.
4) The allowable values for F2 assume mechanical fasteners are attached to the structure, and are along the vertical centerline of the clip leg. Mechanical fasteners to other materials and structures must be checked separately.
5) The screw diameter must be 0.19" (min.) for #10 screws.
6) The ultimate screw shear strength must be a minimum of 1400 lbs. for #10 screws.
7) When clips have combinations of F1, F2, and F3, use a linear interaction for combinations of F1 and F3, and a squared interaction for combinations of F1 and F2.
8) Screws must be long enough so that at least 3 exposed threads are visible after installation.
9) Screw capacity is based on the 1996 AISI Specification.
10) Allowable loads have not been increased 33% for wind or seismic.
11) For connections made to 14 ga. (68 mils.) and 12 ga. (97 mils.), use the tabulated values for 16 ga. (54 mils.), 50 ksi.
12) It is the responsibility of the design professional to detail the drawings for proper clip attachment.
13) Contact Dietrich Design Group at 1-800-873-2443 for technical assistance.

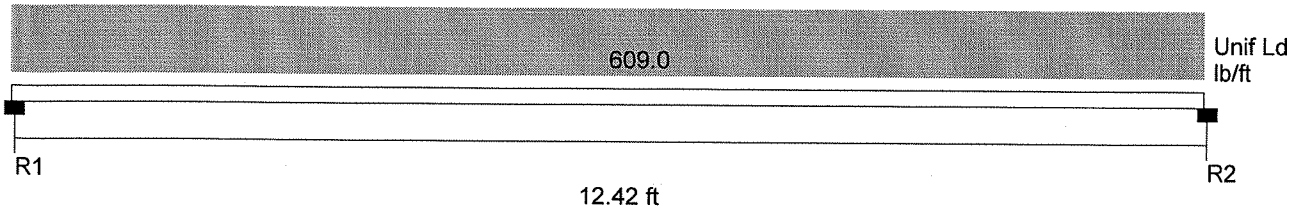
Weld Capacity Notes:

1) F1 and F2 values in parentheses are maximum shear and tension capacities when the clips are welded to the base structure (min 3/16" — 36 ksi steel)
2) Listed weld capacities are computed assuming a E60XX welding rod or wire.
3) The clips are to be welded to the structure along the back corner and along the complete length of the clip. When secondary welds are used to hold the clip in place, they are not used in capacity calculations.

2001 North American Specification

Project: Bangor Savings ATM
Model: Roof Box Beam

Date: 6/9/2011



Section : (2) 1000S200-68 Boxed C Stud (X-X Axis)
Maxo = 12077.3 Ft-Lb **Moment of Inertia, I =** 27.331 in^4

Fy = 50.0 ksi
Va = 6690.8 lb

Loads have not been modified for strength checks
Loads have not been modified for deflection calculations

Flexural and Deflection Check

Span	Mmax Ft-Lb	Mmax/ Maxo	Mpos Ft-Lb	Bracing (in)	Ma(Brc) Ft-Lb	Mpos/ Ma(Brc)	Deflection (in)	Deflection Ratio
Center Span	11742.9	0.972	11742.9	Full	12077.3	0.972	0.404	L/369

Combined Bending and Web Crippling

Reaction or Pt Load	Load P(lb)	Brng (in)	Pa (lb)	Mmax (Ft-Lb)	Intr. Value	Stiffen Req'd ?
R1	**3781.9**	6.00	3110.9	0.0	1.46	**YES**
R2	**3781.9**	6.00	3110.9	0.3	1.46	**YES**

Combined Bending and Shear

Reaction or Pt Load	Vmax (lb)	Mmax (Ft-Lb)	Va Factor	V/Va	M/Ma	Intr. Unstiffen	Intr. Stiffen
R1	3781.9	0.0	1.00	0.57	0.00	0.32	NA
R2	3781.8	0.3	1.00	0.57	0.00	0.32	NA

MACLEOD STRUCTURAL ENGINEERS, P.A.
404 MAIN STREET
GORHAM, MAINE 04038
PHONE (207) 839-0980
FAX (207) 839-0982

PROJECT: BANGOR SAVINGS ATM

BY: BM JOB NO. 2011-165

DATE: 5/11 SHEET NO. 11

NOTES:

LATERAL FORCES

N

SEISMIC

WEIGHTS

ROOF = 11 x 14 x 15 psf = 2,310

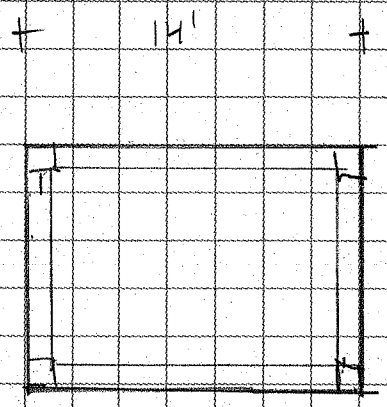
WALLS = 2 x 14 x 17 x 10 psf = 4,760

SNOW = 14 x 14 x 120 psf x 0.2 = ~~1,294~~ 3,696

~~8,363#~~ 10,766

V = 0.05 x ~~8364~~ = ~~418#~~

10766 = 538#

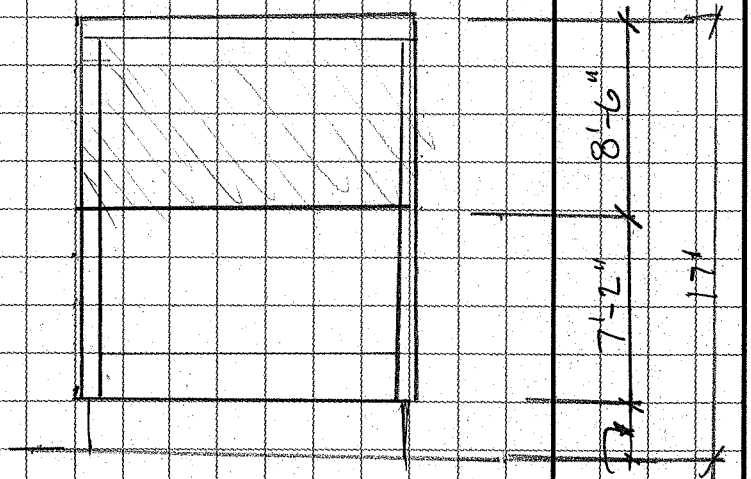


PLAN

WIND

- USE 20 psf

$F_W = \frac{15.67'}{2} \times 14' \times 20\,psf = 2{,}194\#$



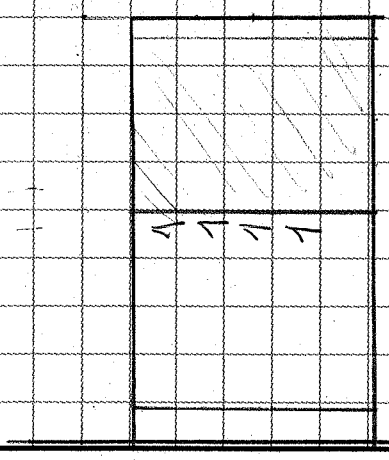
EAST/WEST SHEAR WALLS

V = 1.1K

$S = \frac{1.1^k}{11'} = 100\,plf$

- USE ½" PLYWOOD SHEARWALL w/ #10 SCREWS @ 6" O/C.

$S_{allow} = \frac{165\,plf}{2.5} = 660\,plf$



WEST ELEV.

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FAX (207) 839-0982

PROJECT: BANGOR SAVINGS ATM

BY: BM JOB NO. 2011-165

DATE: 5/11 SHEET NO. 12

NOTES:

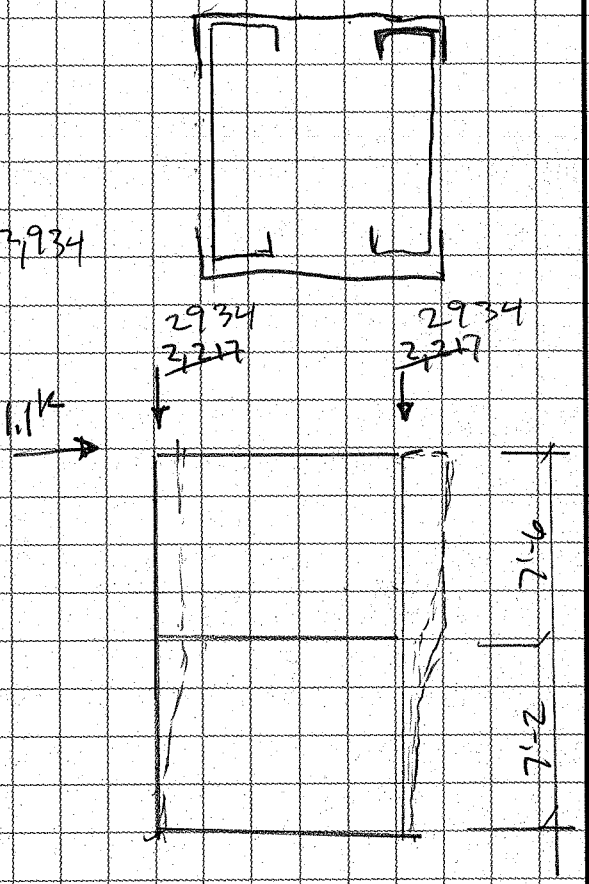
CHECK END BOX POSTS FOR COMBINED AXIAL + LATERAL

(2) 1000S200-68 STUDS

+ (2) 1000T200-68 TRACKS

AXIAL LOAD = ~~2,217#~~ D+0.75S = 3,934

LATERAL LOAD = 1,100# (WIND)



- SEE ATTACHED CALCS)

USE (2) 1000S200-54

+ (2) 1000T200-54

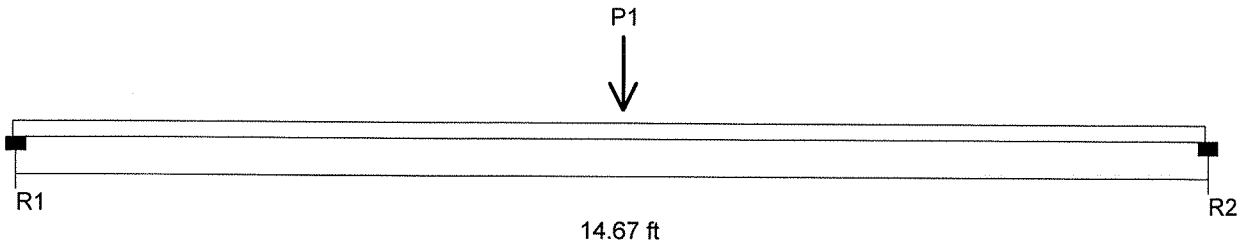
BOXED POST

(SCREWED @ 12" OC)

2001 North American Specification

Project: Bangor Savings ATM
Model: Roof Box Post w/ Axial + Lateral Loads

Date: 6/9/2011



Point Loads	P1
Load(lb)	1100
X-Dist.(ft)	7.50

Section : (2) 1000S162-68 Boxed C Stud (X-X Axis)
Maxo = 10751.0 Ft-Lb **Moment of Inertia, I =** 23.956 in^4

Fy = 50.0 ksi
Va = 6690.8 lb

Loads have not been modified for strength checks
Loads have not been modified for deflection calculations

Flexural and Deflection Check

Span	Mmax Ft-Lb	Mmax/ Maxo	Mpos Ft-Lb	Bracing (in)	Ma(Brc) Ft-Lb	Mpos/ Ma(Brc)	Deflection (in)	Deflection Ratio
Center Span	4032.2	0.375	4032.2	Full	10751.0	0.375	0.177	L/996

Combined Bending and Web Crippling

Reaction or Pt Load	Load P(lb)	Brng (in)	Pa (lb)	Mmax (Ft-Lb)	Intr. Value	Stiffen Req'd ?
R1	537.6	6.00	3110.9	0.0	0.21	No
R2	562.4	6.00	3110.9	0.0	0.22	No
P1	1100.0	1.50	4175.1	4030.2	0.69	No

Combined Bending and Shear

Reaction or Pt Load	Vmax (lb)	Mmax (Ft-Lb)	Va Factor	V/Va	M/Ma	Intr. Unstiffen	Intr. Stiffen
R1	537.6	0.0	1.00	0.08	0.00	0.01	NA
R2	562.4	0.0	1.00	0.08	0.00	0.01	NA
P1	562.4	4030.2	1.00	0.08	0.37	0.15	NA

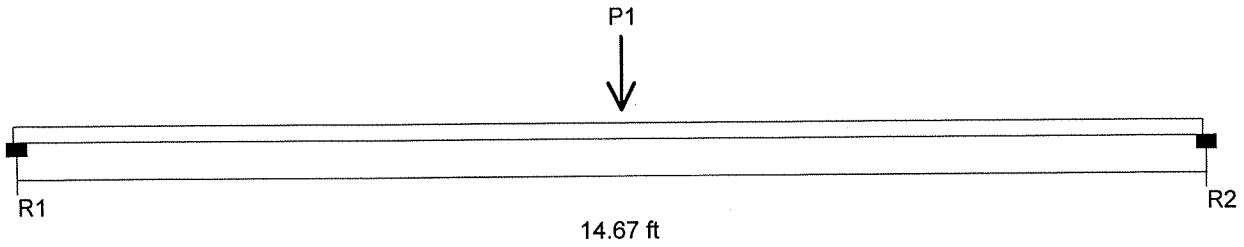
Combined Bending and Axial Load

Span	Axial Ld (lb)	Bracing (in) KyLy	Bracing (in) KtLt	Max KL/r	Allow Ld (lb)	P/Pa	Intr. Value
Center Span	2934.0 (c)	48.0	48.0	50	20860.7 (c)	0.14	0.52

Member Interconnection Spacing = 12.00 in
See NASPEC C4.5 for add'nl interconnection requirements

2001 North American Specification

Project: Bangor Savings ATM **Date:** 6/9/2011
Model: Roof Box Post w/ Axial + Lateral Loads



Point Loads	P1
Load(lb)	1100
X-Dist.(ft)	7.50

Section : (2) 1000T200-68 Boxed (X-X Axis) **Fy =** 50.0 ksi
Maxo = 8403.5 Ft-Lb **Moment of Inertia, I =** 23.640 in^4 **Va =** 6522.0 lb

Loads have not been modified for strength checks
Loads have not been modified for deflection calculations

Flexural and Deflection Check

Span	Mmax Ft-Lb	Mmax/ Maxo	Mpos Ft-Lb	Bracing (in)	Ma(Brc) Ft-Lb	Mpos/ Ma(Brc)	Deflection (in)	Deflection Ratio
Center Span	4032.2	0.480	4032.2	Full	8403.5	0.480	0.179	L/983

Combined Bending and Web Crippling

Reaction or Pt Load	Load P(lb)	Brng (in)	Pa (lb)	Mmax (Ft-Lb)	Intr. Value	Stiffen Req'd ?
R1	537.6	6.00	2423.6	0.0	0.27	No
R2	562.4	6.00	2423.6	0.0	0.28	No
P1	1100.0	1.50	2873.0	4030.2	0.94	No

Combined Bending and Shear

Reaction or Pt Load	Vmax (lb)	Mmax (Ft-Lb)	Va Factor	V/Va	M/Ma	Intr. Unstiffen	Intr. Stiffen
R1	537.6	0.0	1.00	0.08	0.00	0.01	NA
R2	562.4	0.0	1.00	0.09	0.00	0.01	NA
P1	562.4	4030.2	1.00	0.09	0.48	0.24	NA

Combined Bending and Axial Load

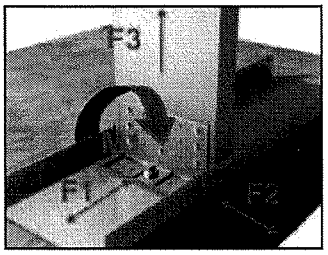
Span	Axial Ld (lb)	Bracing (in) KyLy	Bracing (in) KtLt	Max KL/r	Allow Ld (lb)	P/Pa	Intr. Value
Center Span	2934.0 (c)	48.0	48.0	48	19295.1 (c)	0.15	0.64

Member Interconnection Spacing = 12.00 in
See NASPEC C4.5 for add'nl interconnection requirements

14.1

Load Direction

Loads:
M1 = Moment-Carrying
F1 = Lateral
F2 = Horizontal
F3 = Vertical

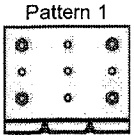


Quantity / Order Information

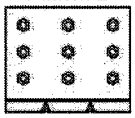
Designation	Qty/Box	Lbs/Box	Pcs/Skid	Lbs/Skid
CL362-68	50	20	2250	900
CL362-118	50	36	2250	1620
CL400-68	50	23	5600	2576
CL400-118	50	39	5600	4368
CL600-68	50	30	2250	1350
CL600-118	50	47	2250	2115
CL800-68	50	39	2250	1755
CL800-118	50	64	2250	2880
CL (H) Plate	50	30	5600	3360

Allowable Loads

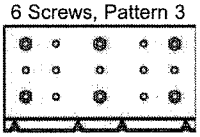
4 Screws, Pattern 1



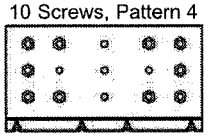
9 Screws, Pattern 2



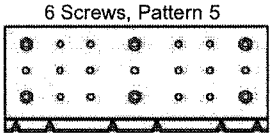
6 Screws, Pattern 3



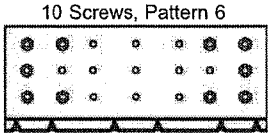
10 Screws, Pattern 4



6 Screws, Pattern 5



10 Screws, Pattern 6



Stud Thickness Mils (ga)	Fy (yield) Stud (ksi)	CL362-68 / CL400-68 4 Screws, Pattern 1				CL600-68 6 Screws, Pattern 3				CL800-68 6 Screws, Pattern 5			
		F1 (kips)	F2 (kips)	F3 (kips)	M1 (in-kips)	F1 (kips)	F2 (kips)	F3 (kips)	M1 (in-kips)	F1 (kips)	F2 (kips)	F3 (kips)	M1 (in-kips)
33 (20)	33	0.190	0.535	0.754	1.108	0.285	0.874	1.130	1.713	0.285	0.976	1.130	2.479
33 (20)	50	0.275	0.773	1.089	1.601	0.413	1.263	1.209	2.324	0.413	1.410	1.154	3.203
43 (18)	33	0.248	0.796	1.122	1.649	0.372	1.301	1.209	2.324	0.372	1.452	1.154	3.203
43 (18)	50	0.359	1.150	1.153	1.779	0.538	1.880	1.209	2.324	0.538	2.098	1.154	3.203
54 (16)	33	0.312	1.120	1.153	1.779	0.468	1.829	1.209	2.324	0.468	2.042	1.154	3.203
54 (16)	50	0.450	1.617	1.153	1.779	0.675	2.511	1.209	2.324	0.675	2.901	1.154	3.203
68 (14)	50	0.568	2.025	1.153	1.779	0.852	2.511	1.209	2.324	0.852	2.901	1.154	3.203
97 (12)	50	0.810	2.025	1.153	1.779	1.215	2.511	1.209	2.324	1.215	2.901	1.154	3.203

Stud Thickness Mils (ga)	Fy (yield) Stud (ksi)	CL362-118 / CL400-118 4 Screws, Pattern 1				CL600-118 6 Screws, Pattern 3				CL800-118 6 Screws, Pattern 5			
		F1 (kips)	F2 (kips)	F3 (kips)	M1 (in-kips)	F1 (kips)	F2 (kips)	F3 (kips)	M1 (in-kips)	F1 (kips)	F2 (kips)	F3 (kips)	M1 (in-kips)
33 (20)	33	0.190	0.535	0.754	1.108	0.285	0.874	1.130	1.713	0.285	0.976	1.130	2.479
33 (20)	50	0.275	0.773	1.089	1.601	0.413	1.263	1.633	2.475	0.413	1.410	1.663	3.582
43 (18)	33	0.248	0.796	1.122	1.649	0.372	1.301	1.682	2.549	0.372	1.452	1.682	3.689
43 (18)	50	0.359	1.150	1.620	2.383	0.538	1.880	2.225	3.683	0.538	2.098	2.431	5.330
54 (16)	33	0.312	1.120	1.577	2.319	0.468	1.829	2.225	3.584	0.468	2.042	2.366	5.188
54 (16)	50	0.450	1.617	2.225	2.617	0.675	2.642	2.225	3.855	0.675	2.950	2.666	7.493
68 (14)	50	0.568	2.287	2.225	2.617	0.852	3.736	2.225	3.855	0.852	4.171	2.666	9.198
97 (12)	50	0.810	2.411	2.225	2.617	1.215	3.939	2.225	3.855	1.215	4.398	2.666	9.198

Stud Thickness Mils (ga)	Fy (yield) Stud (ksi)	CL362-118 (H) / CL400-118 (H) 9 Screws, Pattern 2				CL600-118 (H) 10 Screws, Pattern 4				CL800-118 (H) 10 Screws, Pattern 6			
		F1 (kips)	F2 (kips)	F3 (kips)	M1 (in-kips)	F1 (kips)	F2 (kips)	F3 (kips)	M1 (in-kips)	F1 (kips)	F2 (kips)	F3 (kips)	M1 (in-kips)
33 (20)	33	0.285	0.980	1.696	1.653	0.380	1.481	1.884	3.248	0.380	1.664	1.884	4.710
33 (20)	50	0.413	1.415	2.450	2.388	0.550	2.139	2.722	4.693	0.550	2.404	2.722	6.805
43 (18)	33	0.372	1.458	2.524	2.460	0.496	2.204	2.804	4.834	0.496	2.476	2.804	7.010
43 (18)	50	0.538	2.107	3.646	3.554	0.718	3.184	4.051	6.826	0.718	3.577	4.051	10.128
54 (16)	33	0.468	2.050	3.548	3.458	0.624	3.099	3.943	6.797	0.624	3.481	3.943	9.856
54 (16)	50	0.675	2.961	5.126	4.147	0.900	4.476	5.620	6.826	0.900	5.029	5.695	11.857
68 (14)	50	0.852	4.187	5.620	4.147	1.136	6.329	5.620	6.826	1.136	7.110	7.446	11.857
97 (12)	50	1.215	4.415	5.620	4.147	1.620	6.460	5.620	6.826	1.620	7.497	7.446	11.857

- Loads listed reflect force in a single direction. When multiple loads react on the connection, it is the responsibility of the designer to check the interaction of forces.
- All guide holes may not require fasteners. Fastener amount determined by the designer. Screw fasteners should be symmetrically placed in guide holes. Refer to screw pattern diagrams above for placement.
- Allowable loads have not been increased for wind, seismic, or other factors, and are based on use of #12 screws.
- Torsional effects are considered on screw groups for F2 allowable loads.
- M1 allowable moments are based on 0.02 rad. (1.1 degrees) rotation serviceability limit.

Patent Pending

RAM International

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Units system : English
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Geometry data

GLOSSARY

Cb22, Cb33 : Moment gradient coefficients
Cm22, Cm33 : Coefficients applied to bending term in interaction formula
d0 : Tapered member section depth at J end of member
DJX : Rigid end offset distance measured from J node in axis X
DJY : Rigid end offset distance measured from J node in axis Y
DJZ : Rigid end offset distance measured from J node in axis Z
DKX : Rigid end offset distance measured from K node in axis X
DKY : Rigid end offset distance measured from K node in axis Y
DKZ : Rigid end offset distance measured from K node in axis Z
dL : Tapered member section depth at K end of member
Ig factor : Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22 : Effective length factor about axis 2
K33 : Effective length factor about axis 3
L22 : Member length for calculation of axial capacity
L33 : Member length for calculation of axial capacity
LB pos : Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg : Lateral unbraced length of the compression flange in the negative side of local axis 2
RX : Rotation about X
RY : Rotation about Y
RZ : Rotation about Z
TO : 1 = Tension only member 0 = Normal member
TX : Translation in X
TY : Translation in Y
TZ : Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Floor
1	0.00	0.00	0.00	0
2	0.00	7.16	0.00	0
3	0.00	14.67	0.00	0
4	10.00	0.00	0.00	0
5	10.00	7.16	0.00	0
6	10.00	14.67	0.00	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
1	1	1	0	0	0	0
4	1	1	0	0	0	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	1	3	POST	SSMA_S 1000S200-68	50 ksi	0.00	0.00	0.00
2	4	6	POST	SSMA_S 1000S200-68	50 ksi	0.00	0.00	0.00
3	3	6	BEAM	SSMA_S 1000S162-54	33 ksi	0.00	0.00	0.00
4	2	5	BEAM	SSMA_S 400S162-54	33 ksi	0.00	0.00	0.00
5	2	6	DIAG	SSMA_S 400S162-54	33 ksi	0.00	0.00	0.00

Hinges

		Node-J				Node-K					
Member	TO	M33	M22	V3	V2	M33	M22	V3	V2	TOR	AXL
3	0	1	0	0	0	1	0	0	0	0	0
4	0	1	0	0	0	1	0	0	0	0	0
5	0	1	0	0	0	1	0	0	0	0	0

Design data

Member	LBpos [ft]	LBneg [ft]	K33	K22	L33 [ft]	L22 [ft]	CM33	CM22	Cb33	Cb22
1	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
2	1.00	1.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00
3	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00

RAM International

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Steel Code Check

Design by group for controlling load condition
Design code A S D

CODE CHECK
MAX. INTERACTION RATIO PER DESCRIPTION
REL.F = Bending stress ratio (if rel.f=NPC, it is not possible to calculate)
S.Ratio = Shear interaction ratio
Stat.b = Station where max. B.Ratio occurs
Stat.v = Station where max. S.Ratio occurs

NOTE.- Non-steel members are not printed
Important.- Maximum values will only be computed from graphically selected elements

---

MAX. INTERACTION RATIO IN DESCRIPTIC**BEAM**

OCCURS AT MEMBER : 3
SECTION : SSMA_S 1000S162-54
OCCURS FOR CONDITION : DWR=0.6dl+WR
DESIGN STATUS : OK

B.RATIO	**Eqn**	**STAT.B** [ft]	**Axial** [Lb]	**M33** [Kip*in]	**M22** [Kip*in]
0.23	C5.2.1-1	0.00	-1629.29	0.00	0.00

S.RATIO	**Eqn**	**STAT.V** [ft]	**V2** [Lb]	**V3** [Lb]	**Tor** [Kip*in]
0.00	C3.3.1-1	0.00	0.00	0.00	0.00

MAX. INTERACTION RATIO IN DESCRIPTIC**DIAG**

OCCURS AT MEMBER : 5
SECTION : SSMA_S 400S162-54
OCCURS FOR CONDITION : DWL=0.6dl+WL
DESIGN STATUS : OK

B.RATIO	**Eqn**	**STAT.B** [ft]	**Axial** [Lb]	**M33** [Kip*in]	**M22** [Kip*in]
0.57	C5.2.1-1	0.00	-2687.21	0.00	0.00

S.RATIO	**Eqn**	**STAT.V** [ft]	**V2** [Lb]	**V3** [Lb]	**Tor** [Kip*in]
0.00	C3.3.1-1	0.00	0.00	0.00	0.00

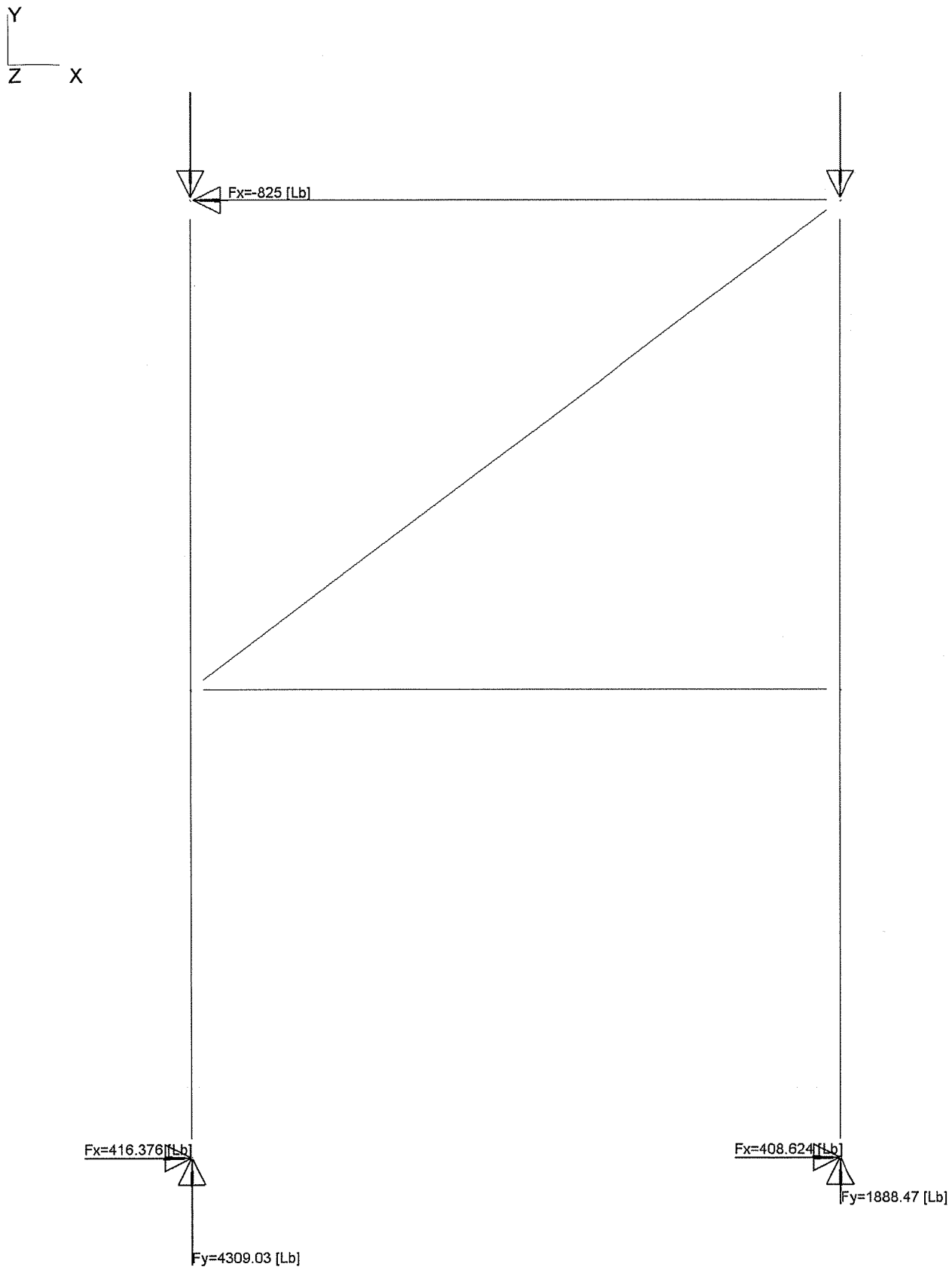
MAX. INTERACTION RATIO IN DESCRIPTIC**POST**

(18)

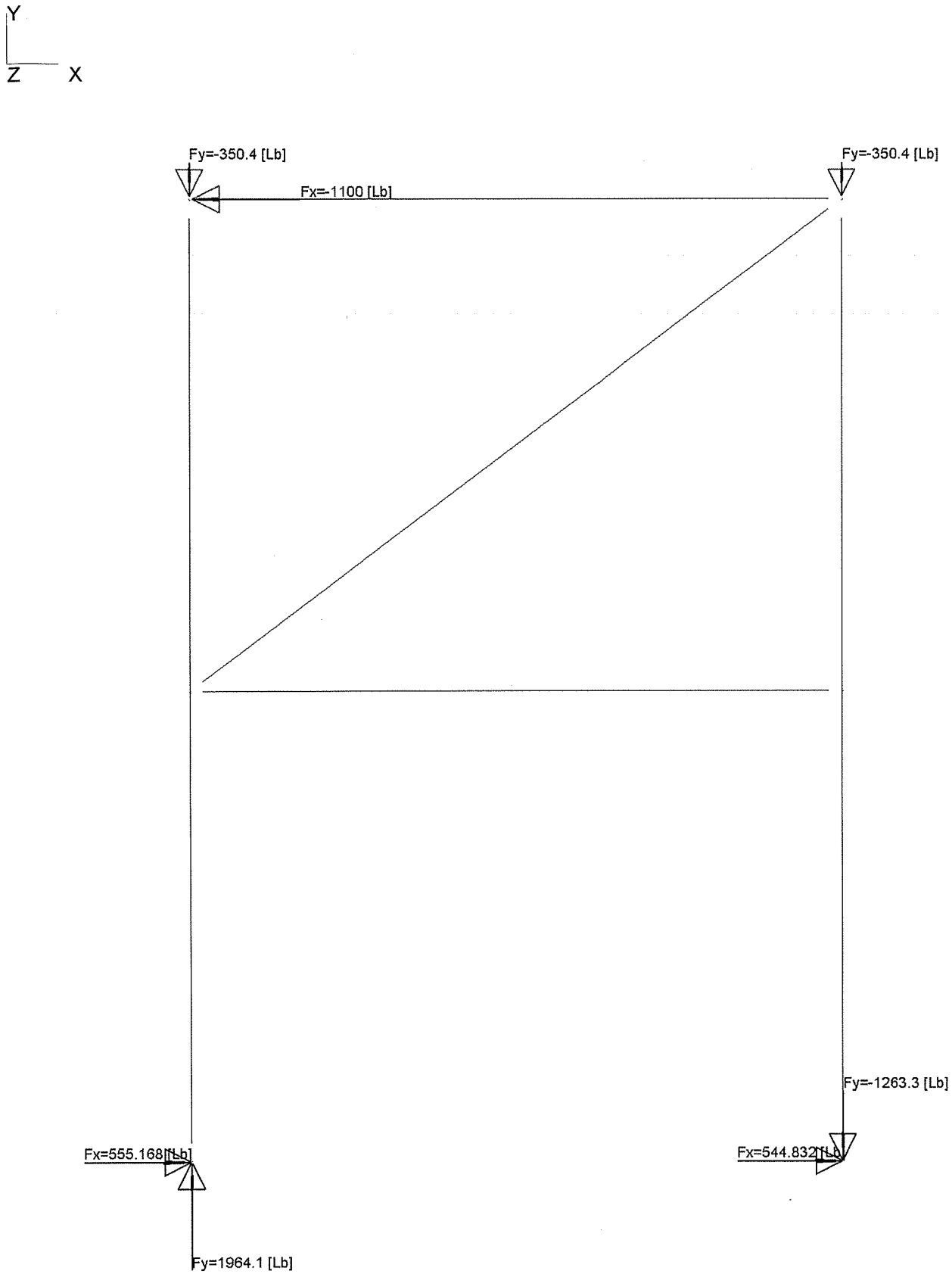
OCCURS AT MEMBER : 2
SECTION : SSMA_S 1000S200-68
OCCURS FOR CONDITION : DLWR=dl+.75LL+.75WR
DESIGN STATUS : OK

B.RATIO	Eqn	STAT.B [ft]	Axial [Lb]	M33 [Kip*in]	M22 [Kip*in]
0.70	C5.2.1-2	7.34	-4309.03	34.29	0.00

S.RATIO	Eqn	STAT.V [ft]	V2 [Lb]	V3 [Lb]	Tor [Kip*in]
0.19	C3.3.1-1	7.34	389.58	0.00	0.00



Short End Wall
LC = DL+0.75*(SL + Wind)



Short End Wall
LC = 0.6DL+ Wind

MACLEOD STRUCTURAL ENGINEERS, P.A.
404 MAIN STREET
GORHAM, MAINE 04038
PHONE (207) 839-0980
FAX (207) 839-0982

PROJECT: BANGOR SAV. ATM

BY: BM JOB NO. 2011-166

DATE: 5/11 SHEET NO. (21)

NOTES:

SHEARWALL

25 = 100 plf.

- USE ½" plywood w/ edge spacing = 6" oc

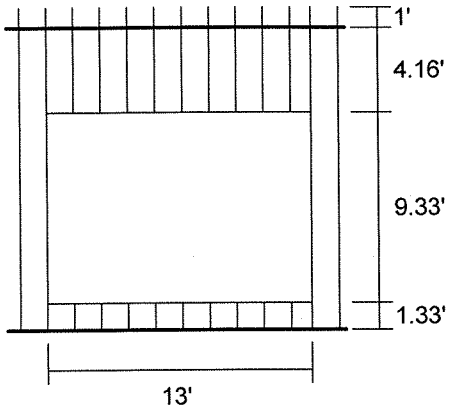
25o = 660 plf

- ATTACH TOP & BOTT EDGES TO BOX BEAM
  W/ (5) #10-16s, Tw = 5 x 151 = 755#
  & w/ (2) #10's @ 8" oc VERTICALLY up EA. END ALONG Box POST.

2001 North American Specification

Project: Bangor Savings ATM
Model: Curtainwall Head/ Sill - Wind Load

Date: 5/31/2011



Design Loads

Wall Lateral Pressure = 20 psf
RO Lateral Pressure: Head/Sill Only
Parapet Lateral Pressure = 20 psf
Lateral Element Forces multiplied by 1 for strength checks
Lateral Forces multiplied by 0.7 for deflection determination
Gravity Load at Header = 10 psf

Header (Lateral) Try Built-Up Members

Section	M/Ma	V/Va	Stiffen Req'd	M+P intr.
600S200-54 (50)	0.615	0.170	No	N/A
600T200-54 (50)	0.693	0.140	No	N/A

Uniform Lateral Load = 132.5 lb/ft End Reaction = 861.2 lb
Header Deflection (Lat.) = L/460

Use Header Lateral as noted above

Sill Try Built-Up Members

Section	M/Ma	V/Va	Stiffen Req'd	M+P intr.
600S200-54 (50)	0.495	0.140	No	N/A
600T200-54 (50)	0.557	0.110	No	N/A

Sill Uniform Load = 106.6 lb/ft End Reaction = 692.9 lb
Sill Deflection = L/572

Use Sill as noted above

MacLeod Structural Engineers
Structural Consultants
404 Main Street
Gorham, Maine 04038
Phone (207) 839-0980
Fax (207) 839-0982

Project:_
By:BWM
Job ID: 20
Date:5/31/2011
Page:1 of 1

03b. Clip L Outstanding Leg Fastener Capacity: Eccentric Shear (Vertical and Horizontal Loading) And Tension

For: Screw Attachment of Clip L to LGF Box Post At Window Header/Sill:

# of Rows	$n_r := 5$	Spacing of Rows	$s_r := 1\,in$
# of Columns	$n_c = 1$	width of outstanding leg	$s_c := 2in$
Fastener Allowable Tension	$T_a := 151lbf$	Fastener Allowable Shear	$V_a := 389lbf$

Load Information

$P_1 := 861lbf$ P1 is Eccentric to Fasteners Above

$P_4 := 0lbf$ P4 is Concentric

$P_2 := 0lbf$ F2 is Concentric

Location of P1
$e = 1\,in$
$e := \frac{s_c}{2}$

Clip L Information Dietrich S685 series Clip

Clip Gage	$G_S := 14$
Clip Yield Stress	$F_y := 50ksi$
Clip Ultimate Stress	$F_u = 65\,ksi$
Number of #10-16 Screws	$No := 5$
Allowable F1 Load	$E_{a1} := 1716lbf$
Allow F2/F3 Load	$E_{a2} := 0.0lbf$
Check Combined Loads on Clip	$U_E = 0.252$

Clip = "OK"

Fastener to Structure Analysis Results

Fastener With Max Load	$Max_{fastener} = \begin{pmatrix} 1 \\ 5 \end{pmatrix}$
Max. Resultant Shear on Fastener	$V_{max} = 236.7\,lbf$
Max Tension on Fastener	$T_p = 0\,lbf$
Combined Tension/Shear on Fastener	$U_p = 0.608$
Fastener to Structure check	Fastener = "OK"