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JOB #LU 1517-1518 Horizon

SHEET NO 1	OF	
CALCULATED BY MCL	DATE	4/13/2021
CHECKED BY	DATE	
SCALE		

STRUCTURAL FOUNDATION CALCULATIONS (PER 2018 IBC) FOR 28' X 34' MODULAR

MATERIAL SUMMARY	MS-1
FLOOR FRAMING ANALYSIS	FLR-1 --> FLR-4
FOUNDATION ANALYSIS	FDN-1 --> FDN-6
LOADING ANALYSIS	L-1 --> L-6

4/15/2021

REGISTERED PROFESSIONAL ENGINEER
7584
OREGON
MAY 22, 2015
MICHAEL C. LEWIS

EXPIRES: 12/31/2022

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JOB #LU 1517-1518 Horizon		
SHEET NO MS-1	OF MS-1	
CALCULATED BY MCL	DATE	4/13/2021
CHECKED BY	DATE	
SCALE		

MATERIAL SUMMARY FOR
28' X 34' MODULAR

FLOOR FRAMING:

TYP FLR JOIST	USE	EXISTING 2X8 DF #2 @ 16" O.C., O.K. PER ATTACHED CALCS	SEE FLR-1-4

FOUNDATION:

TYP EXT FTG	USE	USE +/- 16 in. SQ. PADS OR 2 x 12 x 24 in. P.T. PADS AT 4' O.C.	SEE FDN-1
TYP INTERIOR FTG	USE	USE +/- 16 in. SQ. PADS OR 2 x 12 x 24 in P.T. PADS AT 3' O.C.	SEE FDN-1
ENDWALL COLUMN FTG	USE	(2) P.T. HF #2, 8 x 8 x 5.5 ' L	SEE FDN-3,5
BLDG SIDE ANCHORS	USE	USE MIN (3) HOLD DOWNS AT EA SIDEWALL	SEE FDN-4
BLDG END ANCHORS	USE	USE MIN (2) HOLD DOWNS AT EA ENDWALL	SEE FDN-4

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Project Title: HORIZON CHRISTIAN SCHOOL
Engineer: MCL
Project ID: LU 1517-1518
Project Descr: 28 X 34 MODULAR CLASSROOM

FLR-1 OF FLR-4

Printed: 13 APR 2021, 8:21AM

File: LU 1517-1518 Struct Calcs.ec6

Wood Beam

Lic. # : KW-06009251 MODERN BUILDING SYSTEMS

DESCRIPTION: TYP FLOOR JOIST- DIST LOAD (LIBRARY) - LU 1517-1518

CODE REFERENCES

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

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2018

Wood Species : Douglas Fir - Larch
Wood Grade : No.2

Fb +	900.0 psi
Fb -	900.0 psi
Fc - Prll	1,350.0 psi
Fc - Perp	625.0 psi
Fv	120.0 psi
Ft	575.0 psi

E : Modulus of Elasticity

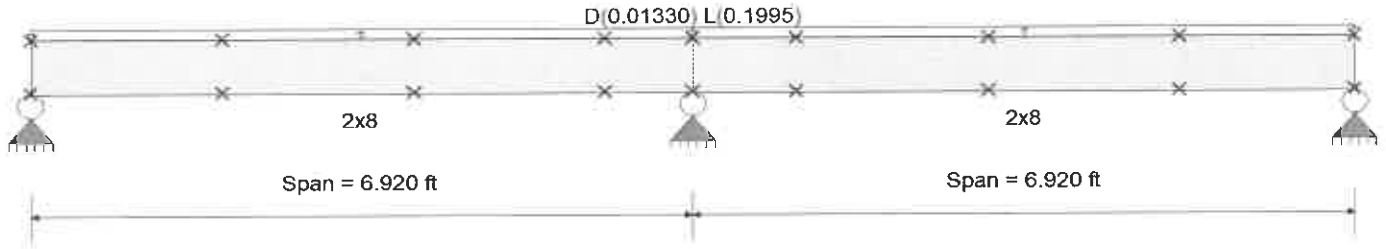
Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	32.210 pcf

Repetitive Member Stress Increase

Beam Bracing : Beam bracing is defined as a set spacing over all spans

Unbraced Lengths

First Brace starts at ft from Left-Most support
Regular spacing of lateral supports on length of beam = 2.0 ft



Applied Loads

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

Beam self weight calculated and added to loads
Loads on all spans...
Uniform Load on ALL spans : D = 0.010, L = 0.150 ksf, Tributary Width = 1.330 ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.956 : 1	Maximum Shear Stress Ratio	=	0.921 : 1
Section used for this span		2x8	Section used for this span		2x8
fb: Actual	=	1,176.51 psi	fv: Actual	=	110.53 psi
Fb: Allowable	=	1,231.14 psi	Fv: Allowable	=	120.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	0.000 ft	Location of maximum on span	=	6.920 ft
Span # where maximum occurs	=	Span # 2	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.057 in	Ratio =	1468 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.061 in	Ratio =	1361 >=240
Max Upward Total Deflection	0.000 in	Ratio =	0 <240

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	0.559	1.862	0.559
Overall MINimum	0.518	1.726	0.518
D Only	0.041	0.136	0.041
+D+L	0.559	1.862	0.559
+D+0.750L	0.429	1.430	0.429
+0.60D	0.024	0.082	0.024
L Only	0.518	1.726	0.518

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Project Title: HORIZON CHRISTIAN SCHOOL
Engineer: MCL
Project ID: LU 1517-1518
Project Descr: 28 X 34 MODULAR CLASSROOM

FLR-2 OF FLR-4

Printed: 13 APR 2021, 8:20AM
File: LU 1517-1518 Struct Calcs.ec6

MODERN BUILDING SYSTEMS

Wood Beam

Lic. # : KW-06009251

DESCRIPTION: TYP FLOOR JOIST - PT LOAD at CNTR (LIBRARY) - LU 1517-1518

CODE REFERENCES

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

Material Properties

Analysis Method : Allowable Stress Design
Load Combination : IBC 2018

Wood Species : Douglas Fir - Larch
Wood Grade : No.2

Fb +	900.0 psi
Fb -	900.0 psi
Fc - Prll	1,350.0 psi
Fc - Perp	625.0 psi
Fv	95.0 psi
Ft	575.0 psi

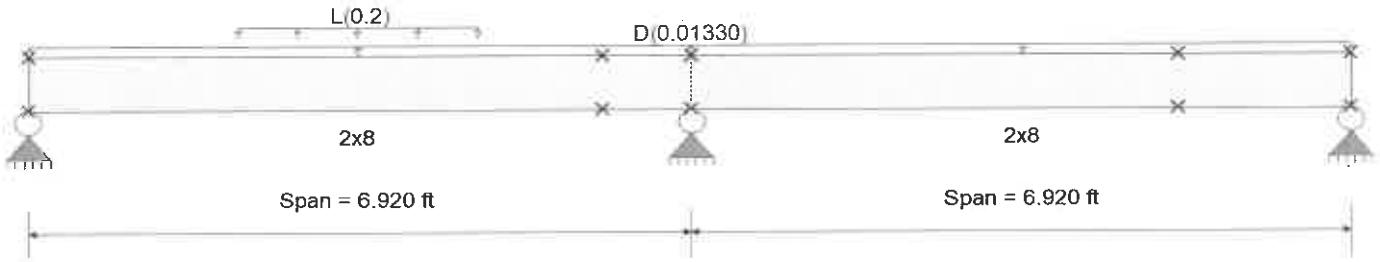
E : Modulus of Elasticity

Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	32.210 pcf

Beam Bracing : Beam bracing is defined as a set spacing over all spans
Repetitive Member Stress Increase

Unbraced Lengths

First Brace starts at ft from Left-Most support
Regular spacing of lateral supports on length of beam = 6.0 ft



Applied Loads

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

Beam self weight calculated and added to loads
Loads on all spans...
Uniform Load on ALL spans : D = 0.010 ksf, Tributary Width = 1.330 ft
Load for Span Number 1
Uniform Load : L = 0.20 k/ft, Extent = 2.20 -->> 4.70 ft, Tributary Width = 1.0 ft, (1k pt load over 2 joists; 0.5k on 1 joist (dist))

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.503 : 1	Maximum Shear Stress Ratio	=	0.512 : 1
Section used for this span		2x8	Section used for this span		2x8
fb: Actual	=	556.21 psi	fv: Actual	=	48.64 psi
Fb: Allowable	=	1,105.66 psi	Fv: Allowable	=	95.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	3.194 ft	Location of maximum on span	=	6.318 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.053 in	Ratio =	1565 >=360
Max Upward Transient Deflection	-0.022 in	Ratio =	3813 >=360
Max Downward Total Deflection	0.057 in	Ratio =	1446 >=240
Max Upward Total Deflection	-0.018 in	Ratio =	4567 >=240

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	0.247	0.475	-0.045
Overall MINimum	0.206	0.339	0.024
D Only	0.041	0.136	0.041
+D+L	0.247	0.475	-0.004
+D+0.750L	0.195	0.390	0.007
+0.60D	0.024	0.082	0.024
L Only	0.206	0.339	-0.045

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Project Title: HORIZON CHRISTIAN SCHOOL
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Project ID: LU 1517-1518
Project Descr: 28 X 34 MODULAR CLASSROOM

FLR-3 OF FLR-4

Printed: 13 APR 2021, 8:21AM
File: LU 1517-1518 Struct Calcs.ec6

MODERN BUILDING SYSTEMS

Wood Beam

Lic. # : KW-06009251

DESCRIPTION: TYP FLOOR JOIST - PT LOAD at SUPPORT (LIBRARY) - LU 1517-1518

CODE REFERENCES

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

Material Properties

Analysis Method : Allowable Stress Design
Load Combination IBC 2018

Wood Species : Douglas Fir - Larch
Wood Grade : No.2

Fb +	900.0 psi
Fb -	900.0 psi
Fc - Prll	1,350.0 psi
Fc - Perp	625.0 psi
Fv	110.0 psi
Ft	575.0 psi

E : Modulus of Elasticity

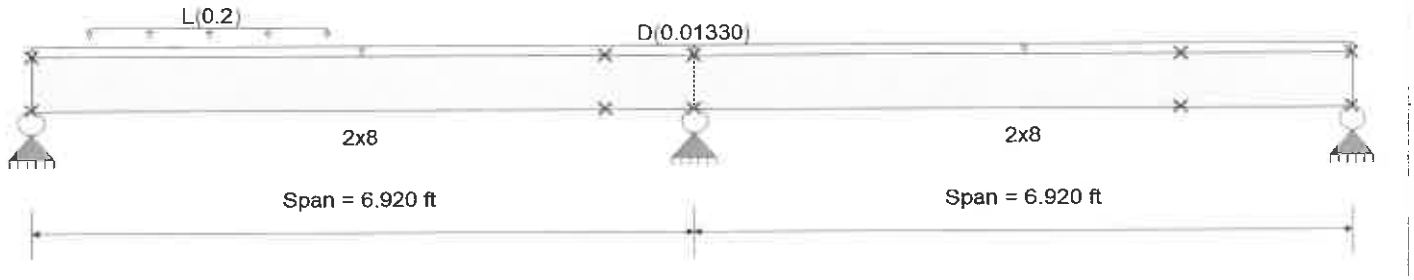
Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	32.210 pcf

Repetitive Member Stress Increase

Beam Bracing : Beam bracing is defined as a set spacing over all spans

Unbraced Lengths

First Brace starts at ft from Left-Most support
Regular spacing of lateral supports on length of beam = 6.0 ft



Applied Loads

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

Beam self weight calculated and added to loads
Loads on all spans...
Uniform Load on ALL spans : D = 0.010 ksf, Tributary Width = 1.330 ft
Load for Span Number 1
Uniform Load : L = 0.20 k/ft, Extent = 0.60 -->> 3.10 ft, Tributary Width = 1.0 ft, (1k pt load over 2 joists; 0.5k on 1 joist (dist))

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.444 : 1	Maximum Shear Stress Ratio	=	0.461 : 1
Section used for this span		2x8	Section used for this span		2x8
fb: Actual	=	490.37 psi	fv: Actual	=	50.68 psi
Fb: Allowable	=	1,105.66 psi	Fv: Allowable	=	110.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	2.314 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	0.042 in	Ratio =	1995 >=360
Max Upward Transient Deflection	-0.015 in	Ratio =	5705 >=360
Max Downward Total Deflection	0.046 in	Ratio =	1802 >=240
Max Upward Total Deflection	-0.011 in	Ratio =	7496 >=240

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	0.377	0.330	0.041
Overall MINimum	0.336	0.194	0.024
D Only	0.041	0.136	0.041
+D+L	0.377	0.330	0.011
+D+0.750L	0.293	0.281	0.018
+0.60D	0.024	0.082	0.024
L Only	0.336	0.194	-0.030

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Project Title: HORIZON CHRISTIAN SCHOOL
Engineer: MCL
Project ID: LU 1517-1518
Project Descr: 28 X 34 MODULAR CLASSROOM

FLR-4 of FLR-4

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File: LU 1517-1518 Struct Calcs.ec6

MODERN BUILDING SYSTEMS

Wood Beam

Lic. # : KW-06009251

DESCRIPTION: TYP FLOOR JOIST- SUPT BEAM (LIBRARY) - LU 1517-1518

CODE REFERENCES

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

Material Properties

Analysis Method : Allowable Stress Design
Load Combination IBC 2018

Wood Species : Douglas Fir - Larch
Wood Grade : No.2

Fb +	900.0 psi
Fb -	900.0 psi
Fc - Prll	1,350.0 psi
Fc - Perp	625.0 psi
Fv	160.0 psi
Ft	575.0 psi

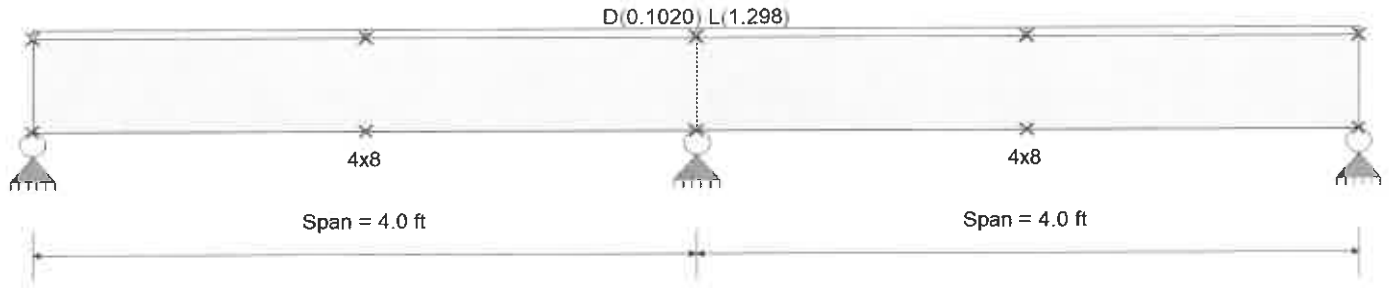
E : Modulus of Elasticity

Ebend- xx	1,600.0 ksi
Eminbend - xx	580.0 ksi
Density	32.210 pcf

Beam Bracing : Beam bracing is defined as a set spacing over all spans

Unbraced Lengths

First Brace starts at ft from Left-Most support
Regular spacing of lateral supports on length of beam = 2.0 ft



Applied Loads

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

Beam self weight calculated and added to loads
Loads on all spans...
Uniform Load on ALL spans : D = 0.1020, L = 1.298 k/ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.943 : 1	Maximum Shear Stress Ratio	=	0.986 : 1
Section used for this span		4x8	Section used for this span		4x8
fb: Actual	=	1,100.28 psi	fv: Actual	=	157.71 psi
Fb: Allowable	=	1,166.98 psi	Fv: Allowable	=	160.00 psi
Load Combination		+D+L	Load Combination		+D+L
Location of maximum on span	=	4.000 ft	Location of maximum on span	=	3.398 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.018 in	Ratio =	2727 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.019 in	Ratio =	2518 >=240
Max Upward Total Deflection	0.000 in	Ratio =	0 <240

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	2.109	7.028	2.109
Overall MINimum	1.947	6.490	1.947
D Only	0.162	0.538	0.162
+D+L	2.109	7.028	2.109
+D+0.750L	1.622	5.406	1.622
+0.60D	0.097	0.323	0.097
L Only	1.947	6.490	1.947

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JOB # LU 1517-1518 Horizon

SHEET NO FDN-1	OF FDN- 6
CALCULATED BY MCL	4/13/2021
CHECKED BY	DATE

FOUNDATION DESIGN

MODULAR

BUILDING LENGTH (L) =	34.00 '	SITE TYPE =	ASPHALT
BUILDING WIDTH (B) =	27.67 '	MAX BRG PRESSURE =	2000 psf
FRAME RAIL OFFSET =	N/A		
FLOOR TRIB WIDTH =	6.92 '		
ROOF OVERHANG =	0.50 '		
ROOF TRIB WIDTH =	7.42 '		
WALL PLATE HEIGHT =	8.00 '	(ABOVE F.F.)	
TRANSVERSE WIND/SEIS. =	4243 #		
LONGIT. WIND/SEIS. =	3468 #		
WIND UPLIFT =	8734 #		
SNOW LOAD =	25 psf		
BUILDING WEIGHT =	26146 #	(No Snow, No Solar)	
F.F. HEIGHT	2.50 '	(ABOVE GRADE)	
AVG. ROOF HEIGHT	13.00 '	(ABOVE GRADE)	
PIER PAD AREA	1.78 ft^2		

AT EXTERIOR FTG

LOAD TO SKIRTWALL 0 plf

DL = 7.42'(12 psf)+8'(10 psf)+6.92'/2(10 psf) = 204 plf

LL = 6.92' / 2 X 150 psf = 519 plf

SL = 7.42' X 25 psf = 185 plf

D + L = 722 plf

D + S = 389 plf

D + 0.75L +0.75S = 732 plf **CONTROLS**

PIER SPACING = 4.00 '

q = (732plf - 0plf) X (4') / 1.78 ft^2 = 1644 psf

∴ OK on ASPHALT

USE +/- 16 in. SQ. PADS OR 2 x 12 x 24 in. P.T. PADS AT 4' O.C.

AT INTERIOR FTG

DL = 6.92' (10 psf) = 69 plf

LL = 6.92' (150 psf) = 1037 plf

D + L = 1106 plf **CONTROLS**

PIER SPACING = 3.00 '

q = 1106plf X (3') / 1.78 ft^2 = 1865 psf

∴ OK on ASPHALT

USE +/- 16 in. SQ. PADS OR 2 x 12 x 24 in P.T. PADS AT 3' O.C.

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JOB # LU 1517-1518 Horizon

SHEET NO FDN-2	OF FDN-6
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CHECKED BY	DATE
SCALE	

AT ENDWALL COLUMN FTG

COLUMN DL = 4317 #
COLUMN SL = 8135 #
DL = [3' (10 psf) + 10.5' (10 psf)] X 6.92' = 934 #
LL = 3' (150 psf) X 6.92' = 3112 #

D + L = 8362 #
D + S = 13386 #
D + 0.75L +0.75S = 13686 # **CONTROLS**
<13860# Therefore OK. (See FDN- 3,5)

AT MIDSPAN COLUMN FTG

COLUMN DL = 0 #
COLUMN SL = 0 #
DL = 6.92' (10 psf) (3') = 207 #
LL = 6.92' (150 psf) (3') = 3112 #

D + L = 3319 # **CONTROLS**
D + S = 207 #
D + 0.75L +0.75S = 2541 #
~~<32400# Therefore OK. (See FDN- 3,6,7)~~

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JOB # LU 1517-1518 Horizon

SHEET NO FDN-3	OF FDN- 6
CALCULATED BY MCL	4/13/2021
CHECKED BY	DATE
SCALE	

@ ENDWALL COLUMN FOOTING

TRY 2 P.T. HF #2, 8 x 8 x 5.50 ' L

Width (b) each = 0.63 '

Pmax = 2000psf X 2 X 0.63' X 5.5' = 13860 #

DL % = 41%
SL % = 59%

W_{DL} = 2000psf X 0.63' X 0.41 = 511 plf
W_{SL} = 2000psf X 0.63' X 0.59 = 749 plf

@ MIDSPAN COLUMN FOOTING

TRY 6 (FLAT) P.T. HF #2, 4 x 8 x 4.50 ' L

Width (b) each = 0.60 '

Pmax = 2000psf X 6 X 0.6' X 4.5' = 32400 #

DL % = 100%
SL % = 0%

W_{DL} = 2000psf X 0.6' X 1 = 1200 plf
W_{SL} = 2000psf X 0.6' X 0 = 0 plf

@ MIDSPAN INTERMEDIATE POST

TRY 2 DF #2, 6 x 10 x 3.50 ' L

Width (b) each = 0.46 '

W_{DL} = 2000psf X 4.5' X 1 / 2 MEMBERS = 4500 plf
W_{SL} = 2000psf X 4.5' X 0 / 2 MEMBERS = 0 plf

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JOB # LU 1517-1518 Horizon

SHEET NO FDN-4	OF FDN-6
CALCULATED BY MCL	4/13/2021
CHECKED BY	DATE
SCALE	

MOD TRANSVERSE LOADING ANCHORAGE

N =	4243# /2094# =	3 ANCHORS
Mot =	4243# / 2 X 13' + 4243# / 2 X 2.5' + 8734# X 27.67' / 2 =	154 k-ft
Mr =	26146# X 27.67' / 2 =	362 k-ft
w/ ANCHORS =	3 X 2094# X 27.67' =	174 k-ft
TOTAL =	(362k-ft X 0.6) + 174k-ft = > 154k-ft therefore OK	391 k-ft

MIN NUMBER = 3 ANCHORS

USE MIN (3) HOLD DOWNS AT EA SIDEWALL

MOD LONGITUDINAL LOADING ANCHORAGE

N =	3468# /2094# =	2 ANCHORS
Mot =	3468# / 2 X 13' + 3468# / 2 X 2.5 ' + 8734# X 34' / 2 =	175 k-ft
Mr =	26146# X 34' / 2 =	444 k-ft
w/ ANCHORS =	2 X 2094# X 34' =	142 k-ft
TOTAL =	(444k-ft X 0.6) + 142k-ft = > 175k-ft therefore OK	409 k-ft

MIN NUMBER = 2

USE MIN (2) HOLD DOWNS AT EA ENDWALL

MOBILE UNIT CONNECTION TO CHASSIS

(TRANSVERSE LOADING) T = 154 k-ft - (0.6) X 362 k-ft / 27.67 ft /2 = -1144 # PER STRAP

PER NAIL VALUE (SIMP C-2017 PG 302) 211 # DF

N= 12 NAILS 12 (MIN)

N/A

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Project Title: HORIZON CHRISTIAN SCHOOL
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Project ID: LU 1517-1518
Project Descr: 28 X 34 MODULAR CLASSROOM

FDH-5 OF FDH-6

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File: LU 1517-1518 Struct Calcs.ecb

MODERN BUILDING SYSTEMS

Wood Beam

Lic. # : KW-06009251

DESCRIPTION: ENDWALL COLUMN FTG - LU 1517-1518

CODE REFERENCES

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

Material Properties

Analysis Method : Allowable Stress Design
Load Combination IBC 2018

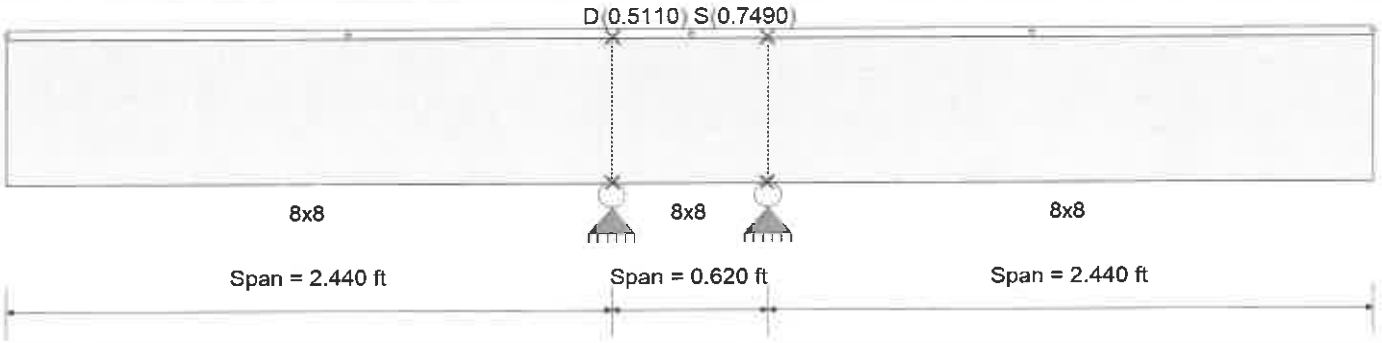
Wood Species : Hem Fir
Wood Grade : No.2

Beam Bracing : Completely Unbraced

Fb +	675.0 psi
Fb -	675.0 psi
Fc - Prll	500.0 psi
Fc - Perp	405.0 psi
Fv	95.0 psi
Ft	350.0 psi

E : Modulus of Elasticity

Ebend- xx	1,100.0 ksi
Eminbend - xx	400.0 ksi
Density	27.70 pcf



Applied Loads

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

Loads on all spans...
Uniform Load on ALL spans : D = 0.5110, S = 0.7490 k/ft

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio	=	0.825 : 1	Maximum Shear Stress Ratio	=	0.560 : 1
Section used for this span		8x8	Section used for this span		8x8
fb: Actual	=	640.13 psi	fv: Actual	=	61.15 psi
Fb: Allowable	=	776.25 psi	Fv: Allowable	=	109.25 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	2.440 ft	Location of maximum on span	=	1.820 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	0.030 in	Ratio =	1968 >=360
Max Upward Transient Deflection	0.000 in	Ratio =	0 <360
Max Downward Total Deflection	0.050 in	Ratio =	1168 >=240
Max Upward Total Deflection	-0.001 in	Ratio =	6976 >=240

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3	Support 4
Overall MAXimum		3.465	3.465	
Overall MINimum		2.060	2.060	
D Only		1.405	1.405	
+D+S		3.465	3.465	
+D+0.750S		2.950	2.950	
+0.60D		0.843	0.843	
S Only		2.060	2.060	

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Project Title: HORIZON CHRISTIAN SCHOOL
Engineer: MCL
Project ID: LU 1517-1518
Project Descr: 28 X 34 MODULAR CLASSROOM

FDN-6 OF FDN-6

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File: LU 1517-1518 Struct Calcs.ec6

MODERN BUILDING SYSTEMS

Wood Beam

Lic. # : KW-06009251

DESCRIPTION: (2) LVL RIDGE BEAM - LU 1517-1518

CODE REFERENCES

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

Material Properties

Analysis Method : Allowable Stress Design
Load Combination IBC 2018

Wood Species : Murphy LVL 3100Fb-2.0E x 24" Deep
Wood Grade : Manufactured

Fb +	2,736.0 psi
Fb -	2,736.0 psi
Fc - Prll	3,200.0 psi
Fc - Perp	750.0 psi
Fv	290.0 psi
Ft	2,100.0 psi

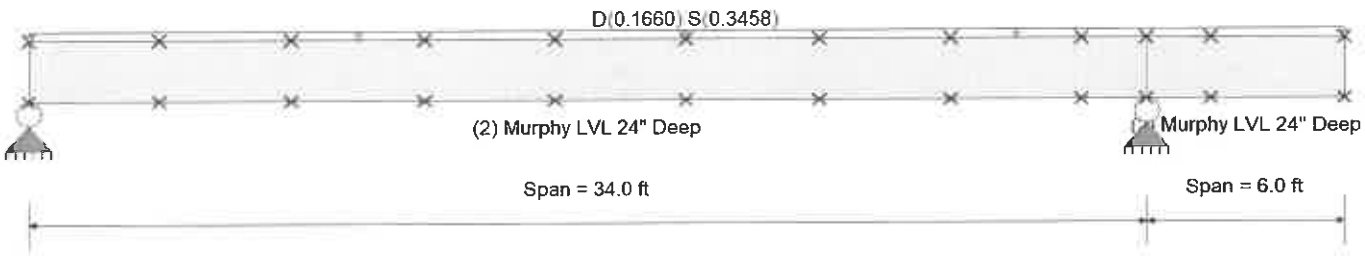
E : Modulus of Elasticity

Ebend- xx	2,000.0 ksi
Eminbend - xx	1,800.0 ksi
Density	35.0 pcf

Beam Bracing : Beam bracing is defined as a set spacing over all spans

Unbraced Lengths

First Brace starts at ft from Left-Most support
Regular spacing of lateral supports on length of beam = 4.0 ft



Applied Loads

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

Beam self weight calculated and added to loads
Loads on all spans...
Uniform Load on ALL spans : D = 0.0120, S = 0.0250 ksf, Tributary Width = 13.830 ft

DESIGN SUMMARY

Design N.G.

Maximum Bending Stress Ratio	=	0.979 : 1	Maximum Shear Stress Ratio	=	0.517 : 1
Section used for this span		(2) Murphy LVL 24" D	Section used for this span		(2) Murphy LVL 24" D
fb: Actual	=	2,990.89 psi	fv: Actual	=	172.32 psi
Fb: Allowable	=	3,055.89 psi	Fv: Allowable	=	333.50 psi
Load Combination		+D+S	Load Combination		+D+S
Location of maximum on span	=	16.525 ft	Location of maximum on span	=	32.101 ft
Span # where maximum occurs	=	Span # 1	Span # where maximum occurs	=	Span # 1

Maximum Deflection

Max Downward Transient Deflection	1.404 in	Ratio =	290 >=240
Max Upward Transient Deflection	-0.730 in	Ratio =	196 <240
Max Downward Total Deflection	2.150 in	Ratio =	189 >=180
Max Upward Total Deflection	-1.117 in	Ratio =	128 <180

Vertical Reactions

Support notation : Far left is #1 Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum	8.716	12.452	
Overall MINimum	5.695	8.135	
D Only	3.022	4.317	
+D+S	8.716	12.452	
+D+0.750S	7.293	10.418	
+0.60D	1.813	2.590	
S Only	5.695	8.135	

RXT'S ONLY

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JOB #	LU 1517-1518 Horizon		
SHEET NO	L-1	OF	L-6
CALCULATED BY	MCL	DATE	4/13/2021
CHECKED BY		DATE	
SCALE			

WIND ANALYSIS FOR ENCLOSED SIMPLE DIAPHRAGM LOW-RISE BUILDINGS - BASED ON IBC 2018 / ASCE 7-16 CHAPTER 28, PART 2

INPUT DATA

Risk Category =	RC	II		(Table 1.5-1)
Basic Wind Speed =	Vult	110	Vasd =85	mph (3 sec gust)(Fig 26.5-1)
Exposure Category =	EC	B		(Sec. 26.7)
Topographic Factor =	Kzt	1.00		(Sec. 26.8 & 26.8-1)
Adjustment Factor =	Lambda	1.00		(Sec 28.6-1)
Building Length =	L	34.00	ft	
Building width =	B	27.67	ft	8:00:14 AM
Building Height to Eave =	he	11.00	ft	
Building Height to Ridge =	hr	15.00	ft	
Eave Overhang	oh	0.50	ft	
Building End Zone =	a	3.00	ft	
Roof Pitch =	RP	2.0	:12	
Approx. Roof Angle =	RA	10	degrees	(Ref. Fig. 28.6-1)

OUTPUT

Wind Pressure, ps30 (Fig. 28.6-1)

Horizontal	A-ps30	21.60	psf
Horizontal	B-ps30	-9.00	psf
Horizontal	C-ps30	14.40	psf
Horizontal	D-ps30	-5.20	psf
Vertical	E-ps30	-23.10	psf
Vertical	F-ps30	-14.10	psf
Vertical	G-ps30	-16.00	psf
Vertical	H-ps30	-10.80	psf
O.H.	Eoh-ps30	-32.30	psf
O.H.	Goh-ps30	-25.30	psf

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JOB #	LU 1517-1518 Horizon		
SHEET NO	L-2	OF	L-6
CALCULATED BY	MCL	DATE	4/13/2021
CHECKED BY		DATE	
SCALE			

Wind Pressure, ps

ps = Lambda * Kzt * ps30				Min Loading
Horizontal	A-ps	21.60	psf	16.00
Horizontal	B-ps	-9.00	psf	8.00
Horizontal	C-ps	14.40	psf	16.00
Horizontal	D-ps	-5.20	psf	8.00
Vertical	E-ps	-23.10	psf	0.00
Vertical	F-ps	-14.10	psf	0.00
Vertical	G-ps	-16.00	psf	0.00
Vertical	H-ps	-10.80	psf	0.00
O.H.	Eoh-ps	-32.30	psf	
O.H.	Goh-ps	-25.30	psf	

CASE A - Transverse Wind				Min Loading
	A-tw	1426	lbs	1056 lbs
Set to 0	B-tw	-216	lbs	192 lbs
	C-tw	4435	lbs	4928 lbs
Set to 0	D-tw	-582	lbs	896 lbs
Total		5861	lbs (SD)	7072 lbs
Convert to ASD x		0.6		0.6
Total Force on building side L =		**3516**	**lbs (ASD)**	**4243** lbs

CASE B - Longitudinal Wind				
	A-lw	745	lbs	552 lbs
	C-lw	4705	lbs	5227 lbs
Total		5450	lbs (SD)	5779 lbs
Convert to ASD x		0.6		0.6
Total Force on building end B =		**3270**	**lbs (ASD)**	**3468 lbs**

CASE A - Transverse Uplift			
w/ gable end OH uplift	E-up	-2077	lbs
w/ gable end OH uplift	F-up	-1268	lbs
w/ gable end OH uplift	G-up	-6309	lbs
w/ gable end OH uplift	H-up	-4258	lbs
sidewall eaves OH uplift	Eoh-up	-139	lbs
sidewall eaves OH uplift	Goh-up	-505	lbs
Total		**-14557**	**lbs (SD)**
Convert to ASD x		0.6	
Total Uplift Force =		**-8734**	**lbs (ASD)**

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JOB #LU 1517-1518 Horizon

SHEET NO L-3	OF	L-6
CALCULATED BY MCL	DATE	4/13/2021
CHECKED BY	DATE	
SCALE		

28' x 34' MODULAR

SEISMIC per IBC 2018 / ASCE 7-16, Sec. 12.8 Equivalent Lateral Force Procedure

ASCE 7-16 Table 1.5-1	Risk Category		II	
ASCE 7-16 Table 1.5-2	Seismic Importance Factor	Ie =	1.00	
ASCE 7-16 Table 12.2-1	Response Modification Factor	R =	6.50	
ASCE 7-16 11.4.3	Site Class		D	
USGS Data	Short Spectral Response Accel.	Ss =	0.841	
ASCE 7-16 Table 11.4-1 & Sec 11.4.4	Site Coefficient	Fa =	1.200	
ASCE 7-16 Eqn. 11.4-1	Sms = Ss * Fa	Sms =	1.009	
ASCE 7-16 Eqn 11.4-3	Sds = 2/3 * Sms	Sds =	0.673	
ASCE 7-16 Sec. 12.8.1.3		Sds Max =	0.673	
USGS Data	Long Spectral Response Accel.	S1 =	0.387	
ASCE 7-16 Table 11.4-2	Site Coefficient	Fv =	1.913	
ASCE 7-16 Eqn. 11.4-2	Sm1 = S1 * Fv	Sm1 =	0.740	
ASCE 7-16 Eqn 11.4-4	Sd1 = 2/3 * Sm1	Sd1 =	0.494	
Short Period Transition Sec 11.4.6	Ts = Sd1 / Sds	Ts=	0.734	
Building Period Eqn. 12.8-7	Ta= Ct*hn^(x)= 0.02*13'^0.75	Ta=	0.137	
ACSE 7-16 Sec. 11.4.8	Check Ta <= 1.5*Ts, 0.137<=1.1		OK	
ASCE 7-16 Eqn. 12.8-2	Cs = Sds/(R/Ie)= 0.673/(6.50/1.00)	Cs =	0.104	
ASCE 7-16 Eqn. 12.8-3	Csmax: Not checked (conservative)			
ASCE 7-16 Eqn. 12.8-5	Csmin = 0.044*Sds*Ie >= 0.01	Csmin =	0.030	
ASCE 7-16 Eqn. 12.8-6	If S1> 0.6 Csmin = 0.5*S1/(R/Ie)	Csmin =	N/A	
ASCE 7-16 Table 11.6-1	Seismic Design Cat.		D	
	Base Shear			
ASCE 7-16 Eqn 12.8-1	$V = Cs * W * 0.7$	V =	0.072	W
ASCE 7-16 Eqn 12.8-5	$V = Csmin * W * 0.7$	Vmin =	0.021	W
IBC 2018 1605.3.1	Note: 0.7 converts to ASD			

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JOB #LU 1517-1518 Horizon

SHEET NO L-4	OF	L-6
CALCULATED BY MCL	DATE	4/13/2021
CHECKED BY	DATE	
SCALE		

Building Weight Estimate

	Roof (psf)		Exterior Wall (psf)
Comp	2.5	15/32 T1-11	1.7
7/16 Shtg	1.5	2x6 @ 16	1.7
2x10 @24	1.9	R-21U	1.3
R-42L	2.0	5/8 Gyp	2.8
Drp Grd	1.8		0
	0		0
	0		0
Total	9.7		7.5

	Interior Wall (psf)		Floor (psf)
5/8 Gyp	2.8	Misc	1.0
2x4 @ 16	1.1	23/32 Shtg	2.5
5/8 Gyp	2.8	2x8 @ 16	2.2
	0	R-30U	1.6
	0		0
	0		0
Total	6.7		7.3

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JOB #LU 1517-1518 Horizon

SHEET NO L-5	OF	L-6	
CALCULATED BY	MCL	DATE	4/13/2021
CHECKED BY		DATE	
SCALE			

Building Weight (con't)

No Snow	28.67 '	35.00 '	0.0 psf	=	0	lbs
Roof =	28.67 '	35.00 '	9.7 psf	=	9733	lbs
Ext. Wall =	8.00 '	123.34 '	7.5 psf	=	7400	lbs
Int. Wall =	8.00 '	40.00 '	6.7 psf	=	2144	lbs
Floor =	27.67 '	34.00 '	7.3 psf	=	6868	lbs
Chassis =				=	0	lbs
Solar =	28.67 '	35.00 '	0.0 psf		0	lbs
			Enter 0 or 4			

Total **Includes solar, if any ->** **W=** **26146** **lbs**

Wr = Total DL tributary to roof 14506 lbs
W1 = Total DL tributary to floor 11640 lbs

Fx Story (Shearwall) Force Table

Story	Height	Weight		Story Force - k Fx= wx*hx/ (∑ wx*hx)*V	Fx Coef = V*hx/(∑ wx*hx)	Story Shear
	(hx)	(wx)	(wx*hx)			(Vx)
R	11.00 '	14.51 k	160 k-ft	**1.60 k**	0.110	1.60 k
1	2.50 '	11.64 k	29 k-ft	**0.29 k**	0.025	1.89 k
Grade	0.00 '					
Sum (∑)		**26.15 k**	**189 k-ft**	**V= 1.89 k**	**= Base Shear**	

Shear Value Comparison	OK

L-6 OF L-6

ATC Hazards by Location

Search Information

Address:	7400 SW Sagert St, Tualatin, OR 97062, USA
Coordinates:	45.3745391, -122.7531223
Elevation:	224 ft
Timestamp:	2021-04-12T22:45:04.705Z
Hazard Type:	Seismic
Reference Document:	ASCE7-16
Risk Category:	II
Site Class:	D-default

Basic Parameters

Name	Value	Description
S_S	0.841	MCE_R ground motion (period=0.2s)
S_1	0.387	MCE_R ground motion (period=1.0s)
S_{MS}	1.009	Site-modified spectral acceleration value
S_{M1}	* null	Site-modified spectral acceleration value
S_{DS}	0.673	Numeric seismic design value at 0.2s SA
S_{D1}	* null	Numeric seismic design value at 1.0s SA

* See Section 11.4.8

▾Additional Information

Name	Value	Description
SDC	* null	Seismic design category
F_a	1.2	Site amplification factor at 0.2s
F_v	* null	Site amplification factor at 1.0s
CR_S	0.885	Coefficient of risk (0.2s)
CR_1	0.865	Coefficient of risk (1.0s)
PGA	0.383	MCE_G peak ground acceleration
F_{PGA}	1.217	Site amplification factor at PGA
PGA_M	0.466	Site modified peak ground acceleration
T_L	16	Long-period transition period (s)
SsRT	0.841	Probabilistic risk-targeted ground motion (0.2s)
SsUH	0.95	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.387	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.447	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

* See Section 11.4.8

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

ULTIMATE FRICTION FACTORS AND ADHESION FOR DISSIMILAR MATERIALS
(NAVFAC DM 7.2, Table 1, p7.2-63)

Interface Materials	Friction factor	Friction angle, degrees
Mass concrete on the following foundation materials:		
Clean sound rock	0.70	35
Clean gravel, gravel-sand mixtures, coarse sand	0.55 to 0.60	29 to 31
Clean fine to medium sand, silty medium to coarse sand, silty or clayey gravel	0.45 to 0.55	24 to 29
Clean fine sand, silty or clayey fine to medium sand	0.35 to .045	19 to 24
Fine sandy silt, non-plastic silt	0.30 to 0.35	17 to 19
Very stiff and hard residual or pre-consolidated clay	0.40 to 0.50	22 to 26
Medium stiff and stiff clay and silty clay	0.30 to 0.35	17 to 19
(Masonry on foundation materials has same friction factors.)		
Steel sheet piles against the following soils:		
Clean gravel, gravel-sand mixtures, well-graded rock fill with spalls	0.40	22
Clean sand, silty sand-gravel mixture, single size hard rock fill	0.30	17
Silty sand, gravel or sand mixed with silt or clay	0.25	14
Fine sandy silt, non-plastic silt	0.20	11
Formed concrete or concrete sheet piling against the following soils:		
Clean gravel, gravel-sand mixtures, well-graded rock fill with spalls	0.40 to 0.50	22 to 26
Clean sand, silty sand-gravel mixture, single size hard rock fill	0.30 to 0.40	17 to 22
Silty sand, gravel or sand mixed with silt or clay	0.30	17
Fine sandy silt, non-plastic silt	0.25	14
Various structural materials:		
Masonry on masonry, igneous and metamorphic rocks:		
Dressed soft rock on dressed soft rock	0.70	35
Dressed hard rock on dressed soft rock	0.65	33
Dressed hard rock on dressed hard rock	0.55	29
Masonry on wood (cross grain)	0.50	26
Steel on steel at sheet pile interlocks	0.30	17

Interface Materials (Cohesion)	Adhesion C_a (psf)
Very soft cohesive soil (0 - 250 psf)	0 - 250
Soft cohesive soil (250 - 500 psf)	250 - 500
Medium stiff cohesive soil (500 - 1000 psf)	500 - 750
Stiff cohesive soil (1000 - 2000 psf)	750 - 950
Very stiff cohesive soil (2000 - 4000 psf)	950 - 1,300

PGM Inc

TIE DOWNS

ENGINEERED TIE DOWN SYSTEM

GENERAL NOTES

CO

DESIGN LOADS:

DESIGN LOADS:

* WIND ——— 15 PSF (70 MPH EXPOSURE "C") CAC T-25 and COMPLIES WITH 2018 IBC Vult = 115 MPH Exp C
* SOIL BEARING ——— 1000 PSF
* TIE DOWN STRAP ——— 3150# WORKING LOAD
* SEISMIC ZONE ——— 4 CAC T-25 AND 2015 IBC S_s=1.5 Fa=1.4 S_{DS}1.41 Site Class D

TIE DOWN STRAPS TO BE MIN. 1 1/4" WIDE x 0.035 THICKNESS ZINC PLATED AND MEET ASTM D-3953-97 ALT. STRAP; 1 1/4" WIDE X 0.029" THICK ZINC PLATED F'ult' =5400 LBS

* EARTH AUGERS ——— 2962 # (TESTED TO 4750# MIN.)
* CROSS DRIVES ——— 2962 # (TESTED TO 4750# MIN.)
* CONCRETE SLAB ANCHORS ——— 2962 # (CALCULATED)

1. THE CHARTS SHOW THE REQUIRED NUMBER OF TIE DOWNS ON THE SIDES AND ENDS OF THE MANUFACTURED HOME.
2. COMBINATIONS OF THE DIFFERENT TYPES OF TIE DOWNS CAN BE USED.
3. FOR ALL TIE DOWN INSTALLATIONS, THE MANUFACTURED HOME CHASSIS MEMBERS ARE SHOWN AS "I" BEAMS, (FOR ILLUSTRATION PURPOSE ONLY) CHASSIS BEAMS
4. SIDE TIE DOWNS ARE REQUIRED ALONG THE OUTSIDE CHASSIS BEAMS. END TIE DOWNS ARE REQUIRED AT EACH END OF EACH TRANSPORTABLE SECTION OF THE MANUFACTURED HOME.
5. END TIE DOWNS CAN BE LOCATED WITHIN 18" OF EITHER SIDE OF CHASSIS BEAM

6. THE SIZES, TYPES, LENGTHS, ECT, OF MATERIALS SHOWN HEREON ARE MINIMUM, LARGER, LONGER, HEAVIER MATERIALS SUPPLIED BY SAC INDUSTRIES, INC. MAY BE USED AT THE SAME SPACING AND LOCATION SHOWN.
7. ALL PARTS ARE COATED WITH RUST RESISTANT INDUSTRIAL SHOP PRIMER

STATE APPROVAL

PGM Inc
21822 Old Hwy 99
Centralia, WA 98532
888-265-8981

PACIFIC CONSULTING ENGINEERS
9739 North Vista Drive
Kingman, AZ 86401
PH 916-296-7376

ENGINEERS APPROVAL

OR

REGISTERED PROFESSIONAL ENGINEER 14621 OREGON JULY 14, 1972 DAVID A. DAHMEN

EXP 12/31/24

WA

DAVID R. DAHMEN STATE OF WASHINGTON 14176 REGISTERED PROFESSIONAL ENGINEER

EXP 7-17-21

ID

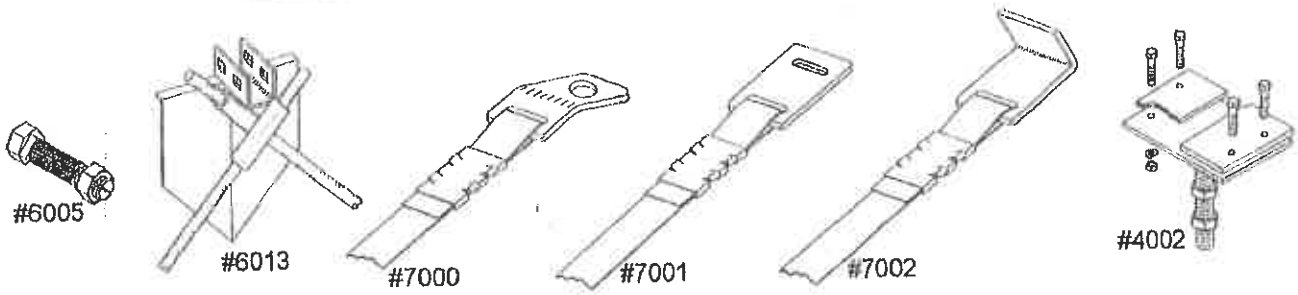
UT

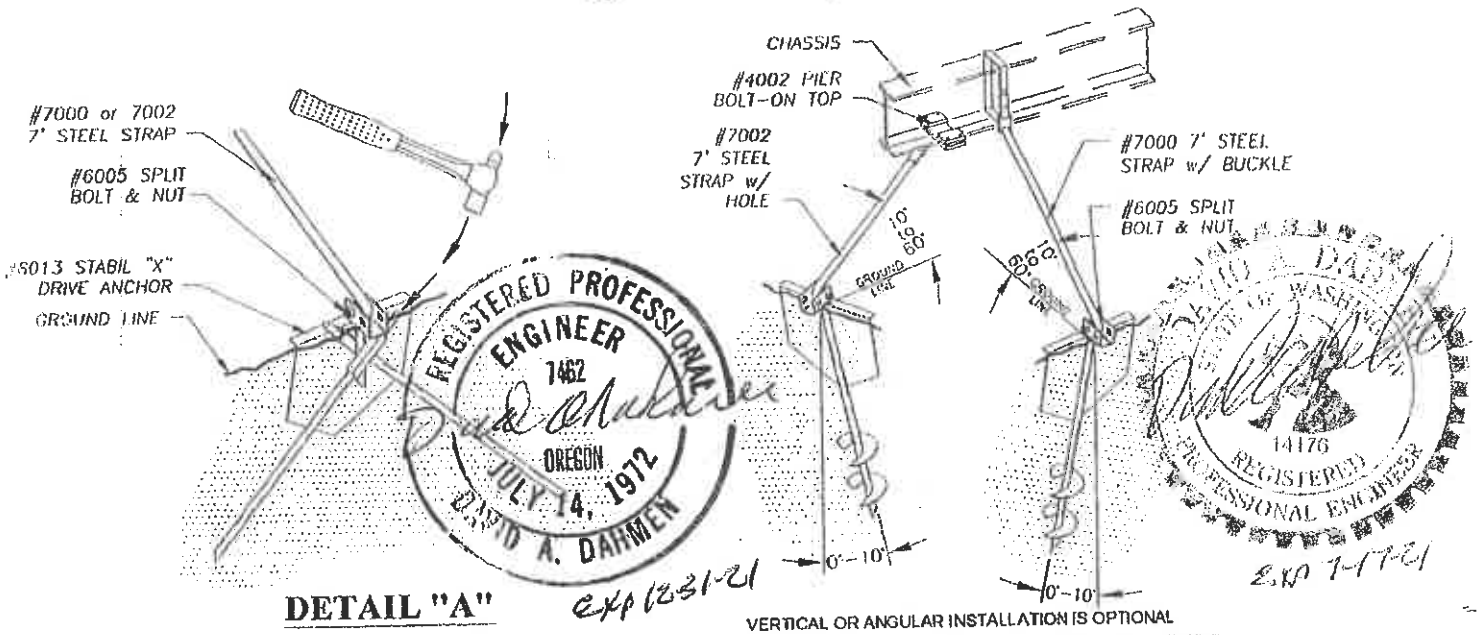
AZ

CA

NV

SAC IND. STABIL-X DRIVE TIE DOWN ANCHORS





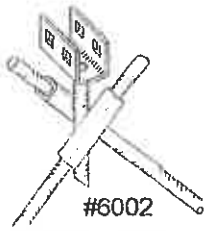
DETAIL "A"

VERTICAL OR ANGULAR INSTALLATION IS OPTIONAL

STABIL-X DRIVE TIE DOWN
SEE DETAIL "A"

INSTALLATION INSTRUCTIONS

1. CONTRACTORS WARNING: CHECK FIRST FOR UNDERGROUND UTILITIES.
2. DRIVE STABILIZER PLATE INTO GROUND.
3. DRIVE CROSS RODS THROUGH HEAD TUBES INTO SOIL AS SHOWN.
4. ATTACH STRAPS TO CHASSIS BEAM IN MANNER SHOWN.
5. IF ANGLE OF SIDE STRAP IS GREATER THEN 60°, STRAP CONNECTION CAN BE MADE FROM ANCHOR TO OPPOSITE CHASSIS BEAM.
6. INSERT STRAP THROUGH SPLIT BOLT. CUT OFF EXCESS STRAP AND TIGHTEN BOLT UNTIL STRAP IS SNUG.
7. #6002 ANCHOR CAN BE USED WHERE HARD OR ROCKY SOIL OCCURS. IF THE GROUND SURFACE IS OTHER THAN ROCKY SOIL OR MINIMUM 2" ASPHALT, USE STABIL-X ANCHOR OR ENCASE ANCHOR WITH 12"x12"x12" CUBE OF CONCRETE.
8. WHEN #6002 ANCHOR IS USED FOR ANY REQUIRED ANCHOR – (2) ANCHORS MUST BE USED AT THAT LOCATION.



#6002
SEE NOTE #7
AND NOTE #8

EARTH AUGERS						CROSS DRIVE ANCHORS						CONCRETE SLAB ANCHORS					
MAX. LENGTH OF MFG'D HOME	36'	54'	72'			MAX. LENGTH OF MFG'D HOME	36'	54'	72'			MAX. LENGTH OF MFG'D HOME	36'	54'	72'		
MIN. NO. OF SIDE TIE DOWNS	2	3	4			MIN. NO. OF SIDE TIE DOWNS	2	3	4			MIN. NO. OF SIDE TIE DOWNS	2	3	4		

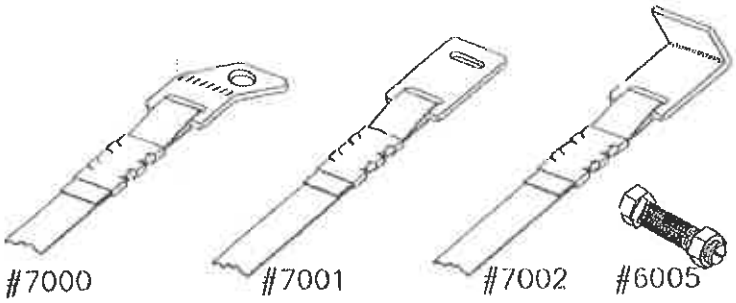
NOTE:

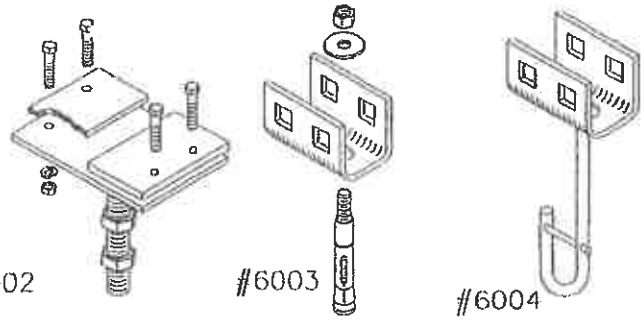
SIDE TIE–DOWNS: MUST BE WITHIN 24" OF THE END OF THE CHASSIS BEAM.

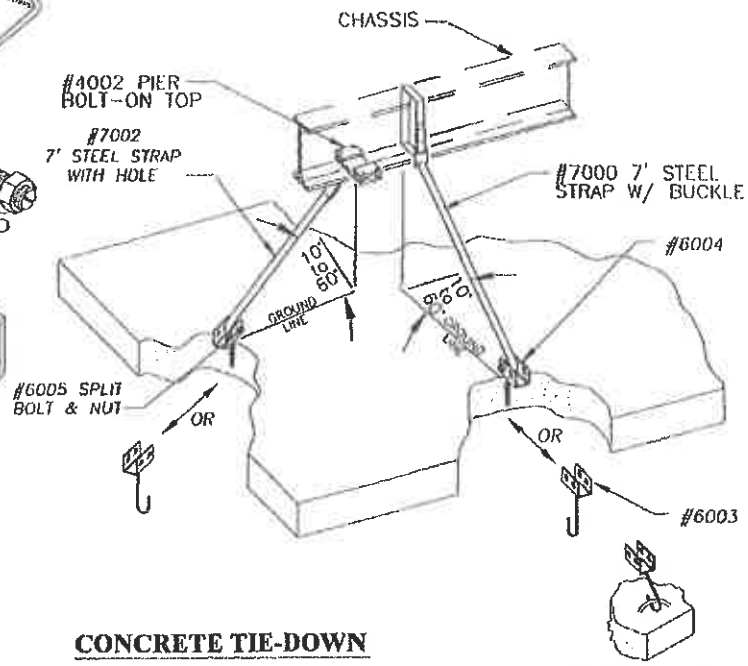
END TIE–DOWNS: CAN BE LOCATED WITHIN 24" OF EITHER SIDE OF CHASSIS BEAM ONE TIE–DOWN IS MANDATORY AT EACH END OF "I"BEAM (SEE PAGE #1 GENERAL NOTE #5).

IF SIDE WALL TIE–DOWN GROUND ANCHOR LOCATION IS SUCH THAT THE ANGLE BETWEEN THE GROUND AND STRAP EXCEEDS 60°, CONNECT THE TIE STRAP TO THE INSIDE CHASSIS BEAM ON DOUBLE AND TRIPLE WIDES AND THE OPPOSITE CHASSIS BEAM ON SINGLE WIDES.

SAC IND. CONCRETE TIE DOWN ANCHORS







CONCRETE TIE-DOWN

ALTERNATE CONNECTION

INSTALLATION INSTRUCTIONS

NEW CONCRETE - #6004

1. PLACE CONCRETE ANCHOR INTO WET CONCRETE, AND ALLOW TO PROPERLY CURE.
2. ALTERNATE CONNECTION REQUIRES #5 REBAR PROPERLY EMBEDDED IN CONCRETE.

EXSISTING CONCRETE - #6003

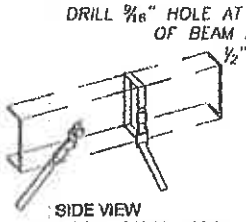
1. CONCRETE MUST BE A MINIMUM 3½" THICK AND IN GOOD CONDITION.
2. MINIMUM SLAB AREA OF EACH ANCHOR IS 28 SQUARE FEET.
3. DRILL PROPER SIZE HOLE IN SLAB, A MINIMUM OF 12" FROM ANY SIDE.
4. EXPANSION BOLT IS ⅝" x 3½" WITH MINIMUM 2¾" EMBEDMENT AND 6,180 POUNDS PULL OUT, 7,160 POUNDS SHEAR.

CHASSIS CONNECTION

1. ATTACH STRAPS TO CHASSIS BEAM IN MANNER SHOWN.
2. IF ANGLE OF SIDE STRAP IS GREATER THAN 60°, STRAP CONNECTION CAN BE MADE FROM ANCHOR TO OPPOSITE CHASSIS BEAM.
3. INSERT STRAP THROUGH SPLIT BOLT, CUT OFF EXCESS STRAP AND TIGHTEN BOLT UNTIL STRAP IS SNUG.

NOTE: SIDE TIE DOWNS ARE REQUIRED ALONG THE OUTSIDE CHASSIS BEAMS. END TIE DOWNS ARE REQUIRED AT EACH END OF EACH TRANSPORTABLE SECTION OF THE MANUFACTURED HOME.

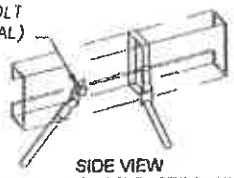
NOTE: A COMBINATION OF DIFFERENT TYPES OF TIE DOWNS CAN BE USED.



SIDE VIEW

"C" BEAM CHASSIS

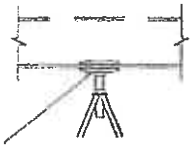
SEE GENERAL NOTE #3



SIDE VIEW

"RFC" BEAM CHASSIS

SEE GENERAL NOTE #3



SIDE VIEW END VIEW

END TIE DOWN

NOTE: END TIE DOWN CAN BE LOCATED WITHIN 18" OF EITHER SIDE OF CHASSI BEAM AXIS.

CONTRACTORS CERTIFICATION

I CERTIFY THAT I HAVE INSTALLED THE SAC IND., INC. ANCHORING SYSTEM AS PER THE INSTALLATION INSTRUCTIONS. I HAVE MADE NO MODIFICATIONS TO THE ANCHORING SYSTEM OR THE BUILDING STRUCTURE.

COMPANY NAME: _____ CONTRACTORS LIC. # _____

PGM Inc.

Soil Class	Soil Description	Test Probe Values (in lbs.)	Recommended PGM Part	PGM part description
1	Hard Rock or Rocky	N/A	# 6011 or # 6002	Cross Drive Anchor W/ 30" Rods Cross Drive Anchor W/ 30" Rods
2	Very Dense and or Cemented Sands, Coarse Gravel, Cobbles and Clays	550+	# 6000 # 6006 # 6013	30" Auger Anchor W/2 4" Helix 12" Stabilizer Plate Stabil X - Drive
3	Medium Dense Coarse Sands, Sandy Gravels, Very Very Stiff Silts & Clays	351 to 550	Available Upon Request	
4a	Loose to Medium Dense Sands, Firm to Stiff Clays & Silts, Alluvial Fill	276 to 350	Available Upon Request	
4b	Very Loose Sands, Firm Clays & Silts Alluvial Fill	175 to 275	Available Upon Request	

Please Note : Each State, County or Municipality may require a specific anchor from the groups shown above for each soil classification.

Check local and stata regulations first.

PGM Inc

STEEL PIERS

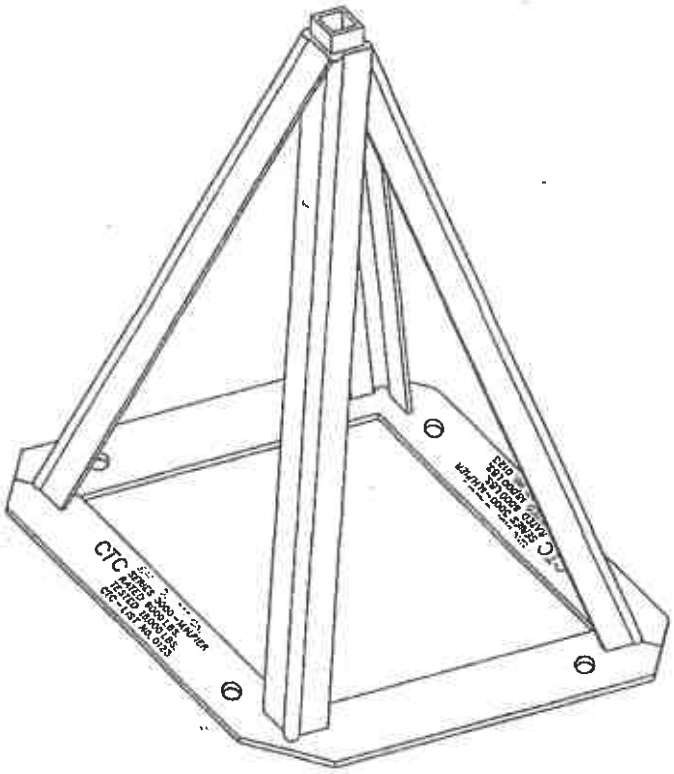
ADJUSTABLE STEEL PIERS & TOPS

GENERAL NOTES

DESIGN LOADS:

* STEEL PIERS ---------- 6,000 LB, RATED LOAD CAPACITY
  18,000 LB. MINIMUM TESTED LOAD CAPACITY

* STEEL PIERS SHALL BE COATED WITH RUST RESISTANT COATING AND SHALL BE LISTED AND LABELED FOR THE FOLLOWING LOAD:
  VERTICAL=6,000 POUNDS MAXIMUM



STATE APPROVAL

PGM Inc
21822 Old Hwy 99
Centralia, WA 98532
888-265-8981

PACIFIC CONSULTING ENGINEERS
9739 North Vista Drive
Kingman, AZ 86401
PH 916-296-7376

ENGINEER APPROVAL

CA

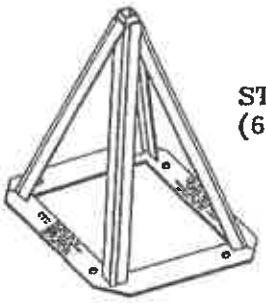
REGISTERED PROFESSIONAL ENGINEER
7462
OREGON
JULY 14, 1972
DAVID A. DAHMEN
EXP 12-31-21

DAVID A. DAHMEN
STATE OF WASHINGTON
14176
REGISTERED
PROFESSIONAL ENGINEER
EXP 7-17-21

PGM Inc SYSTEM SET

BOLT–ON TOP

(TYPICAL)



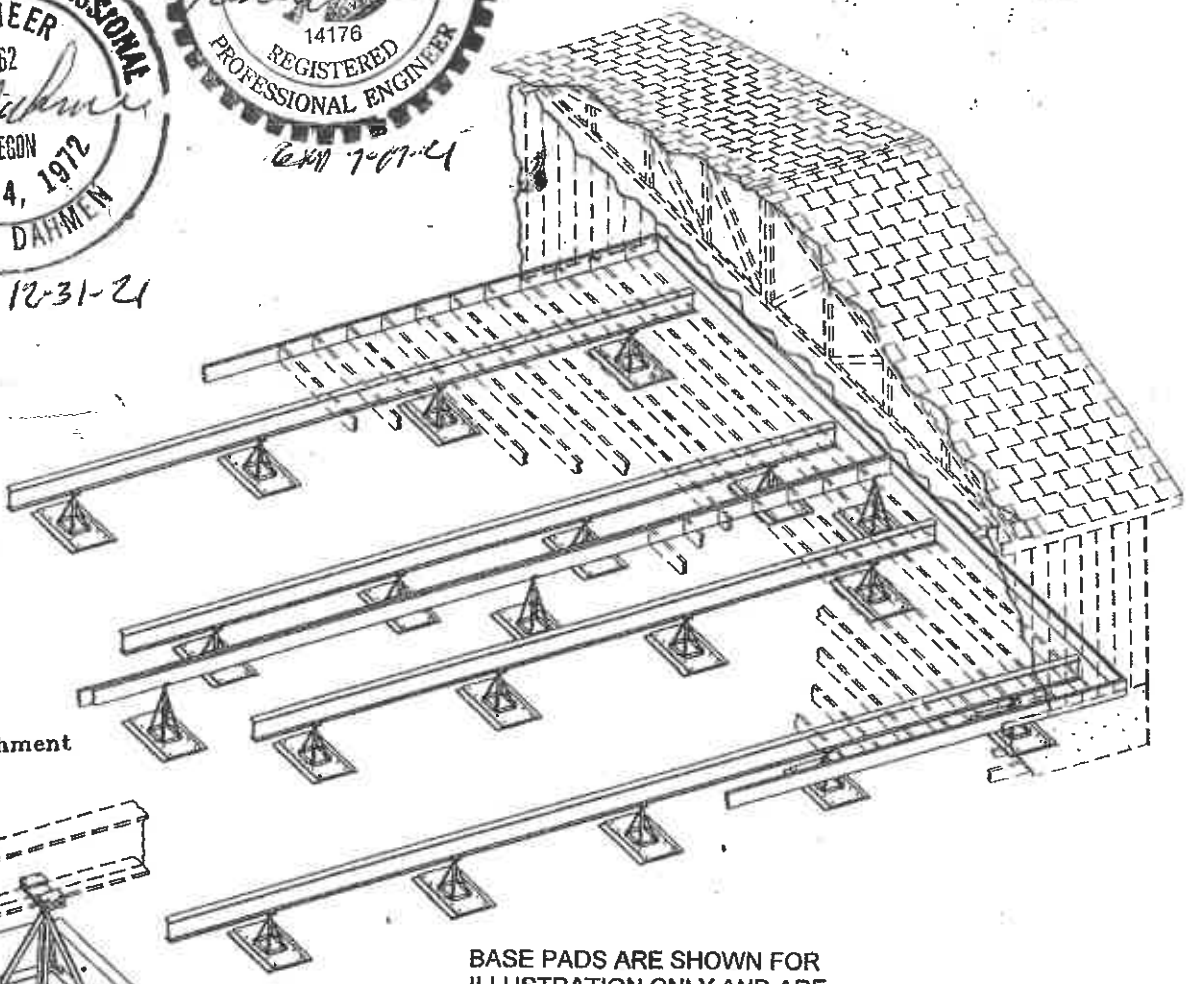
STEEL PIER
(6,000 LB RATED)

NOTES

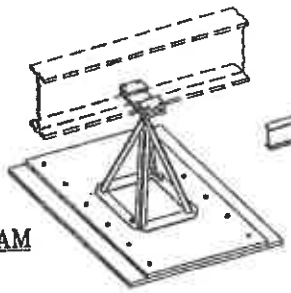
CHECK MANUFACTURED HOME SET UP INSTRUCTIONS FOR LOADS AND LOCATIONS.

Exp 12-31-21

Exp 7-07-21

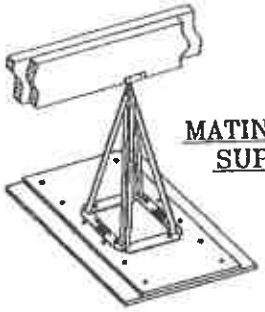


- **STATE APPROVED**
  Tested–Listed–Labeled
  Stamped in Base Plate
- **6,000 LB. RATED**
  3–1 Safety Factor
- **HOLES PRE–PUNCHED**
  In base for easy attachment to pad or footing

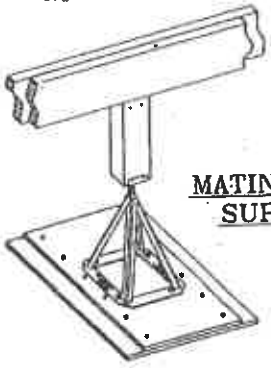


CHASSIS BEAM SUPPORT

BASE PADS ARE SHOWN FOR ILLUSTRATION ONLY AND ARE NOT A PART OF THE PIER APPROVAL

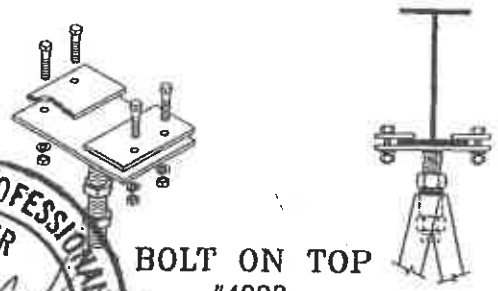


MATING LINE SUPPORT

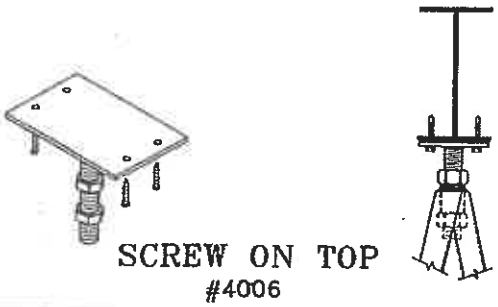


MATING LINE SUPPORT

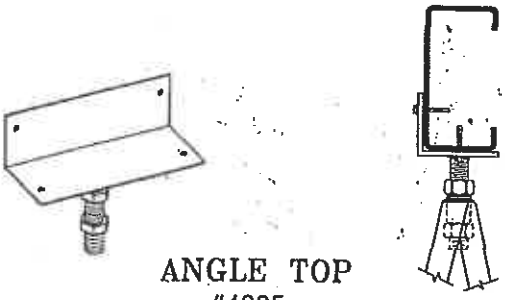
ADJUSTABLE STEEL TOPS



BOLT ON TOP
#4002

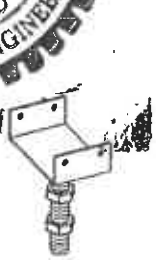


SCREW ON TOP
#4006

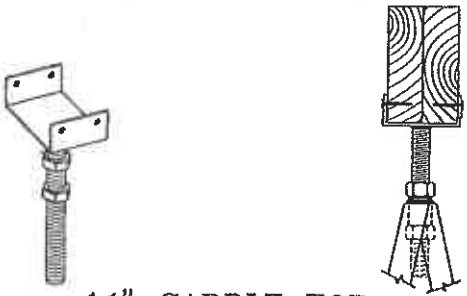


"L" TOP
#4003

ANGLE TOP
#4005



5" SADDLE TOP
#4000



11" SADDLE TOP
#4001

INSTALLATION INSTRUCTIONS

#4000 – PLACE SADDLE TOP FLUSH AGAINST MAIN CHASSIS BEAM AND OR MATING LINE – MAXIMUM HEIGHT ADJUSTMENT OF TOP IS 2".

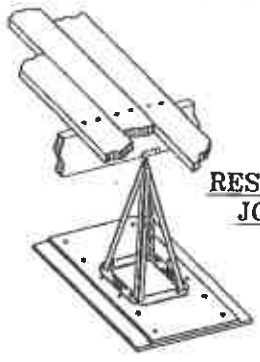
#4001 – 11" SADDLE CAN TO BE USED ON MATING LINE SUPPORTS, PORCHES AND DECKS – ATTACH TOP OF PIER WITH 2nd 3/4" NUT – MAXIMUM HEIGHT ADJUSTMENT OF TOP IS 8".

#4002 – ATTACH BOLT ON TOP TO "I" BEAM WITH (4) 3/8" BOLTS AND NUTS – WITH 2nd 3/4" NUT, ATTACH BOLT ON TOP TO PIER – MAXIMUM HEIGHT ADJUSTMENT OF TOP IS 2".

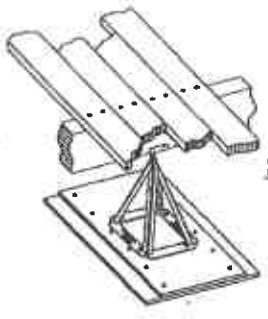
#4003 – PLACE "L" TOP FLUSH AGAINST MAIN BEAM – ALTERNATE "L" TOP DIRECTION EVERY OTHER PIER – MAXIMUM HEIGHT ADJUSTMENT OF TOP IS 2".

#4005 – PLACE ANGLE TOP FLUSH AGAINST MAIN BEAM ("C" BEAM or "RFC" BEAM) – MAXIMUM HEIGHT ADJUSTMENT OF TOP IS 2".

#4006 – ATTACH SCREW ON TOP TO MAIN CHASSIS BEAM WITH (4) #12 SMS TEK SCREWS. WHEN USED AT MATING LINE AND OR PERIMETER, ATTACH WITH NAILS OR SCREWS. MAXIMUM HEIGHT ADJUSTMENT OF TOP IS 2".



RESIDENTIAL FLOOR JOINT SUPPORT

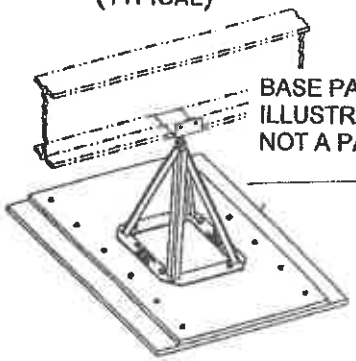


DECK SUPPORT

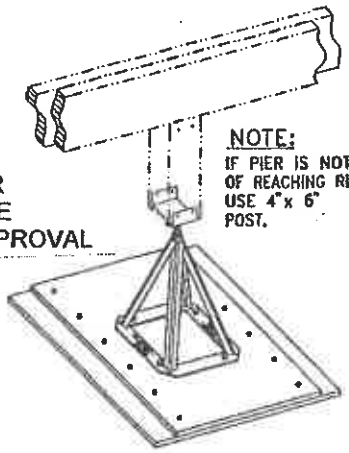
BASE PADS ARE SHOWN FOR ILLUSTRATION ONLY AND ARE NOT A PART OF THE PIER APPROVAL

ADJUSTABLE STEEL PIERS

CHASSIS BEAM SUPPORT (TYPICAL)

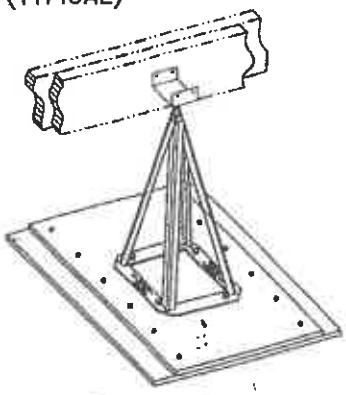


BASE PADS ARE SHOWN FOR ILLUSTRATION ONLY AND ARE NOT A PART OF THE PIER APPROVAL



NOTE: IF PIER IS NOT CAPABLE OF REACHING RIDGE BEAM, USE 4" x 6" WOOD POST.

MATING LINE SUPPORT (TYPICAL)



INSTALLATION INSTRUCTIONS

1. PREPARE A LEVEL SURFACE AT THE LOCATION OF EACH PIER TO INSURE A FULL CONTACT FOR THE FOOTING PAD. USE THE APPROPRIATE SIZE PAD FOR THE LOAD REQUIRED. REFER TO THE MANUFACTURERS SET UP MANUAL FOR SPECIFIC LOADS AND FOOTING SIZES.

2. SELECT THE APPROPRIATE SIZE PIERS FOR THE INSTALLATION BY DETERMINING THE PIER HEIGHT AT EACH SUPPORT LOCATION. MEASURE FROM THE TOP OF THE PAD TO THE BOTTOM OF THE CHASSIS BEAM TO INSURE THAT HEIGHT IS NO GREATER THAN 32".

3. SELECT THE APPROPRIATE TOP FOR THE CHASSIS BEAM OR MATING LINE. THE MAXIMUM ADJUSTMENT ON THE THREADED ROD ADJUSTER FOR CHASSIS BEAM SUPPORT IS 2". WHEN MORE HEIGHT IS NEEDED USE THE NEXT TALLER SIZE SUPPORT PIER.

4. PLACE THE PIER SUPPORT IN THE CENTER OF THE SUPPORT PAD. WHERE REQUIRED BY LOCAL CODE, ATTATCH THE SUPPORT PIER TO THE PAD USING APPROPRIATE FASTENERS. CAREFULLY ALIGN THE SUPPORT PIER AND TOP UNDER THE CHASSIS BEAM OR MATING LINE AND TIGHTEN UNTIL SNUG PLUS 1/2 TURN.

5. REPEAT THIS INSTALLATION PROCEDURE WITH EACH SUPPORT PIER. AFTER ALL THE SUPPORT PIERS HAVE BEEN INSTALLED, AND THE HOME SET UP HAS BEEN COMPLETED PER THE MANUFACTURERS SET UP INSTRUCTIONS, YOU MAY THEN REMOVE THE SAFTEY BLOCKING OF OTHER DEVICES USED TO LEVEL THE CHASSIS.

LABORATORY TESTING REPORT

PART No.	STAND SIZE	SAMPLE #1	SAMPLE #2	SAMPLE #3
3008	8"	23,100 Lbs.	24,600 Lbs.	23,200 Lbs.
3010	10"	25,130 Lbs.	25,950 Lbs.	24,320 Lbs.
3012	12"	27,200 Lbs.	26,500 Lbs.	26,300 Lbs.
3014	14"	27,700 Lbs.	28,175 Lbs.	26,175 Lbs.
3016	16"	28,250 Lbs.	27,700 Lbs.	23,400 Lbs.
3018	18"	26,400 Lbs.	33,300 Lbs.	25,500 Lbs.
3020	20"	24,950 Lbs.	25,000 Lbs.	23,225 Lbs.
3022	22"	20,500 Lbs.	22,400 Lbs.	24,200 Lbs.
3024	24"	22,225 Lbs.	21,650 Lbs.	23,000 Lbs.
3026	26"	22,250 Lbs.	21,500 Lbs.	19,700 Lbs.
3028	28"	20,550 Lbs.	23,720 Lbs.	21,310 Lbs.
3030	30'	22,950 Lbs.	26,550 Lbs.	21,500 Lbs.
3032	32"	21,200	22,000	21,900
3034	34"	20,900	21,200	21,000
3036	36"	20,500	19,900	19,800

PIER IDENTIFICATION STAMP

PGM Inc-Centralia, WA
SERIES 3000–M H PIER
RATED 6,000 LBS.
TESTED 18,000 LBS
C.T.C. LIST NO. 0123