



167 Marlborough Street
- FRONT VIEW



167 Marlborough St
FRONT ST VIEW



167 Marlborough Street
- FRONT SIDE VIEW



167 Marlborough Street
- REAR ALLEY VIEW



167 Marlborough Street
- REAR SIDE VIEW



167 Marlborough Street
- Existing Window
Canopy - EXTERIOR

167 Marlborough Street
Existing window canopy
- TOP VIEW



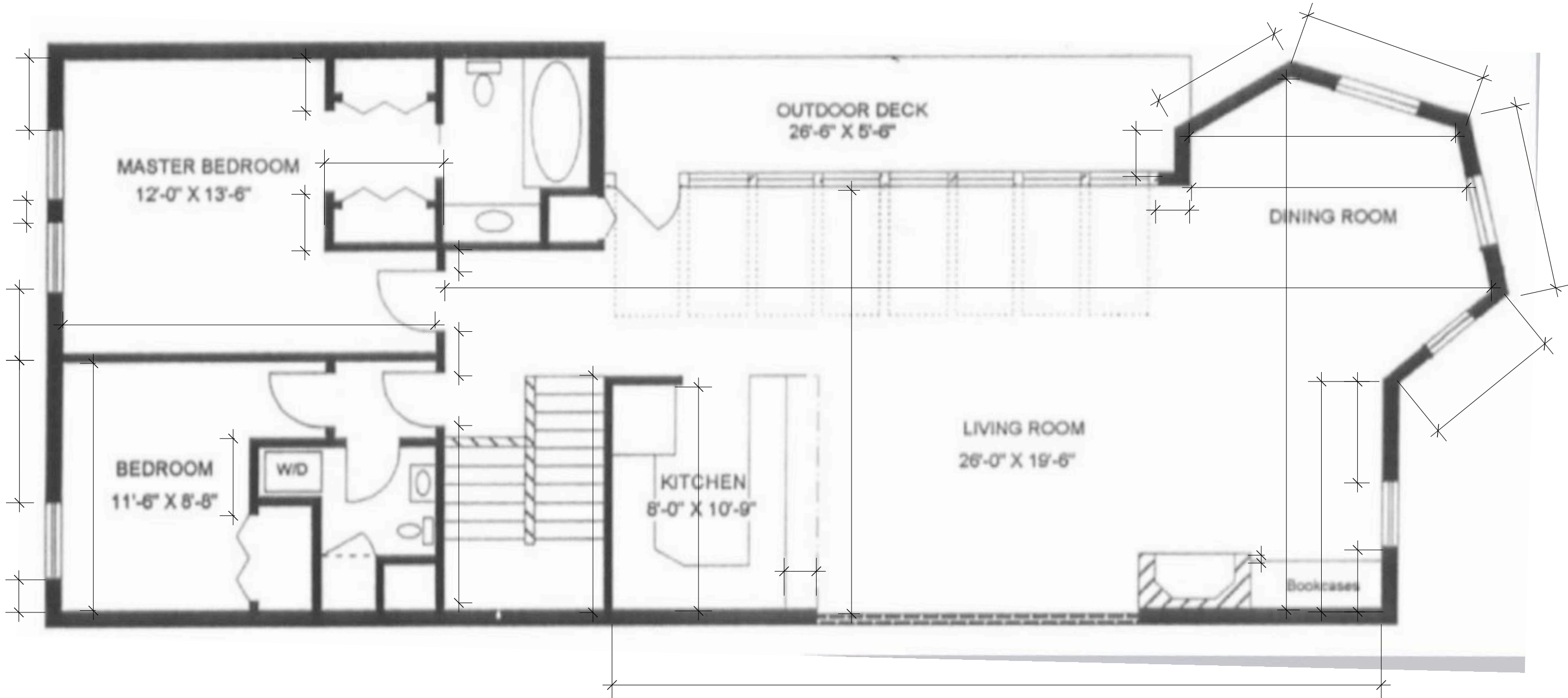


167 Marlborough Street
- Existing Window
Canopy - EXTERIOR



167 Marlborough Street
- Existing exterior

167 Marlborough Street #5 - Floor Plan



167 Marlborough Street -
ENGINEERING SPECS
FOR REPLACEMENT
UNIT

SOLAR INNOVATIONS, INC.

31 ROBERT'S ROAD
PINE GROVE, PA. 17963
PHONE: 570-915-1500 FAX: 800-618-0743

ENGINEERING CALCULATIONS FOR:

**MARLBOROUGH PROJECT
LOCATED IN 167 MARLBOROUGH ST.
BOSTON, MA. 02116**

**CUSTOM LEAN-TO DESIGN UNIT
89" PROJECTION X 295" WIDTH
(FOUNDATION, BASEWALL DESIGN, AND EXISTING STRUCTURE
ARE TO BE DESIGNED AND ENGINEERED BY OTHERS)**

THE ABOVE INDICATED PROJECT HAS BEEN EXAMINED FOR

**40 PSF GROUND SNOW LOAD
120 mph EXPOSURE C WIND LOAD
AS PER THE REQUIREMENTS OF THE
780 CMR 10TH EDITION, 2018 I.B.C., ASCE7-16**

DRAWING INDEX:

Notes	Page 1
Elevations/Sections	Pages 2-3
Details	Pages 4-9

CALCULATIONS INDEX:

Cover Sheet	1 page
STAAD Information and Pictures	1-3 pages
STAAD analysis	1-52 pages
Excel Calculations Cover Sheet	1 page
Excel Calculations	1-24 pages

(Note: Summary on page 24)



EXP. 06/30/2026

ENGINEERING FIRM:
EMC2 ENGINEERING MANAGEMENT CONSULTANTS LLC
LAWRENCE DUFFY
315 HOMESTEAD DR. LEBANON PA 17042
717.889.3622 LAWRENCE@EMC2EMC.COM



SealPact 2025-06-27 13:09:43 EST
Click seal or scan QR Code for
verification; otherwise not valid.

		Job No.	Sheet No. 1	Rev
Software licensed to EMC2 Structural Design Inc Connected User: Lawrence Duffy				
Job Title		Part	Ref	
Client		By	Date 19-JUNE-25	Chd
File 167 Marlborough.STD		Date Time 19-Jun-2025 18:04		

Job Information

	Engineer	Checked	Approved
Name:			
Date:	19-JUNE-25		

Comments:	
Structure Type:	SPACE FRAME

Geometry

Entity Type	Count	Highest
Nodes	61	61
Analytical Members	62	62
Plates	40	102

Load Cases

Load Case Type	Count
Primary	4
Combination	5

Included in this printout are data for:

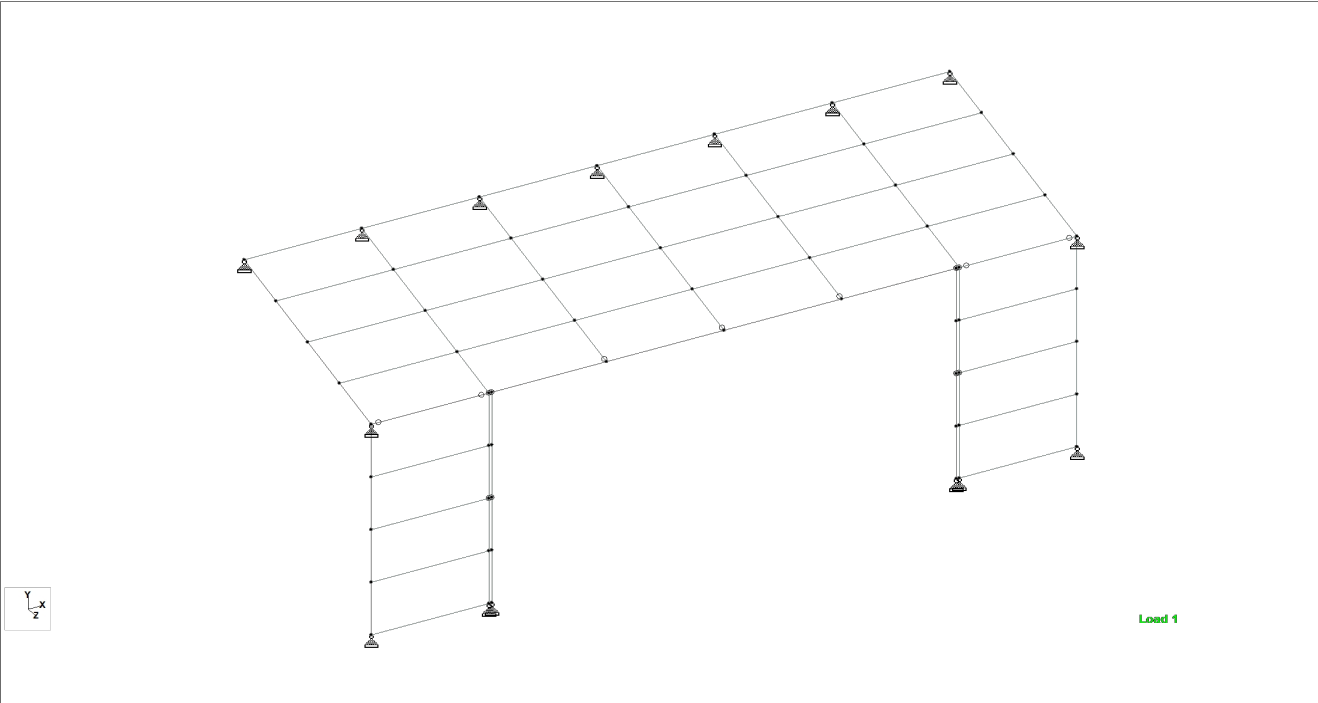
All	The Whole Structure
-----	---------------------

Load Case Table

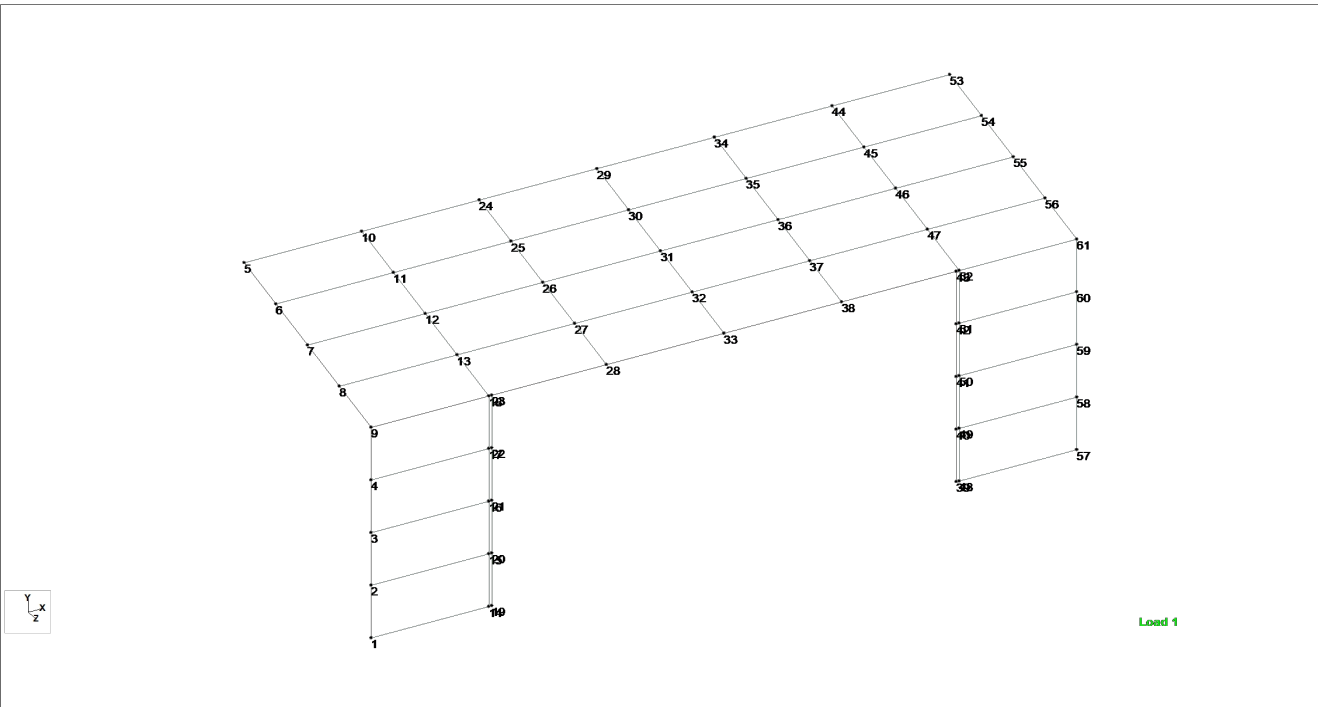
Included in this printout are results for load cases:

L/C	Type	Name
1	Primary	DEAD LOAD
2	Primary	SNOW LOAD (BALANCED / NO DRIFTING)
3	Primary	POSITIVE WIND (C&C)
4	Primary	NEGATIVE WIND (C&C)
5	Combination	1.05 DEAD + ROOF/SNOW
6	Combination	1.05 DEAD + 0.6 POS WIND
7	Combination	0.6 DEAD + 0.6 NEG WIND
8	Combination	1.05 DEAD + .75 ROOF/SNOW + .45 POS WIND
9	Combination	1.05 DEAD + .75 ROOF/SNOW + .45 NEG WIND

Bentley® Software licensed to EMC2 Structural Design Inc Connected User: Lawrence Duffy		Job No.	Sheet No.	Rev
			2	
Job Title		Part	Ref	
Client		By	Date	Chd
			19-JUNE-25	
File 167 Marlborough.STD		Date Time 19-Jun-2025 18:04		

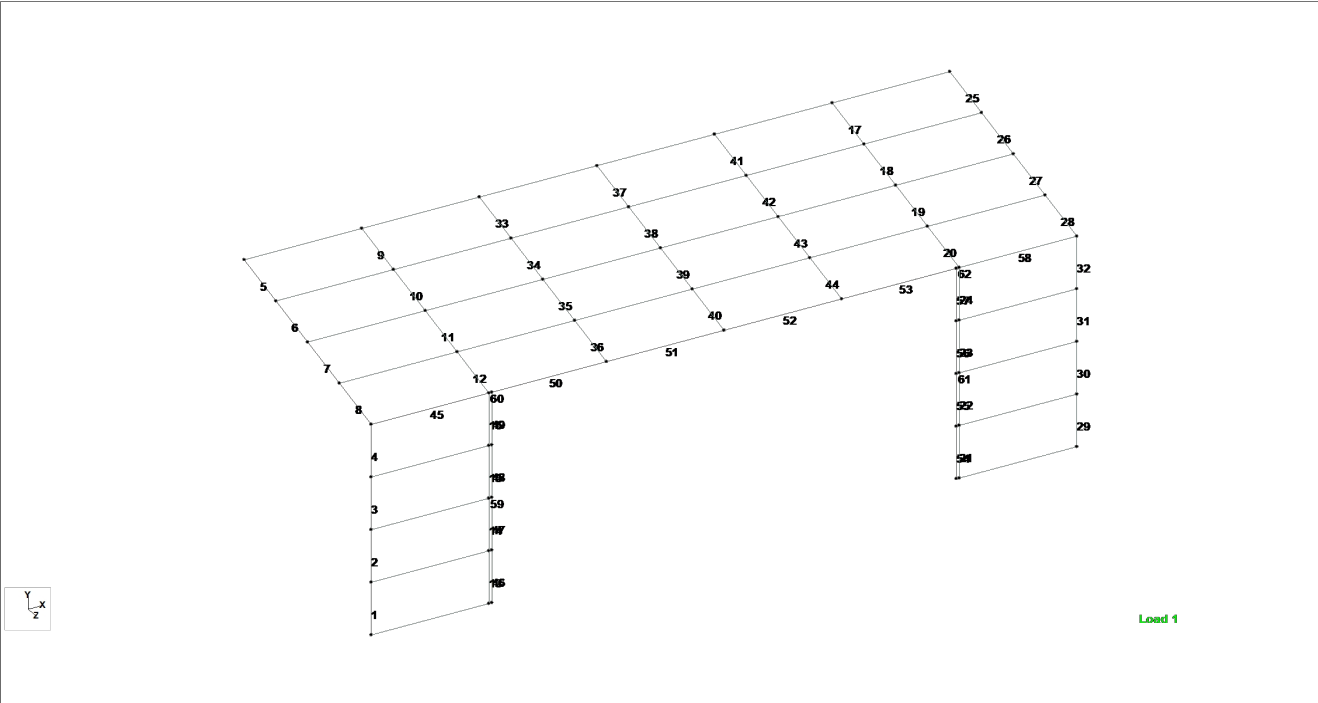


SUPPORTS AND RELEASES

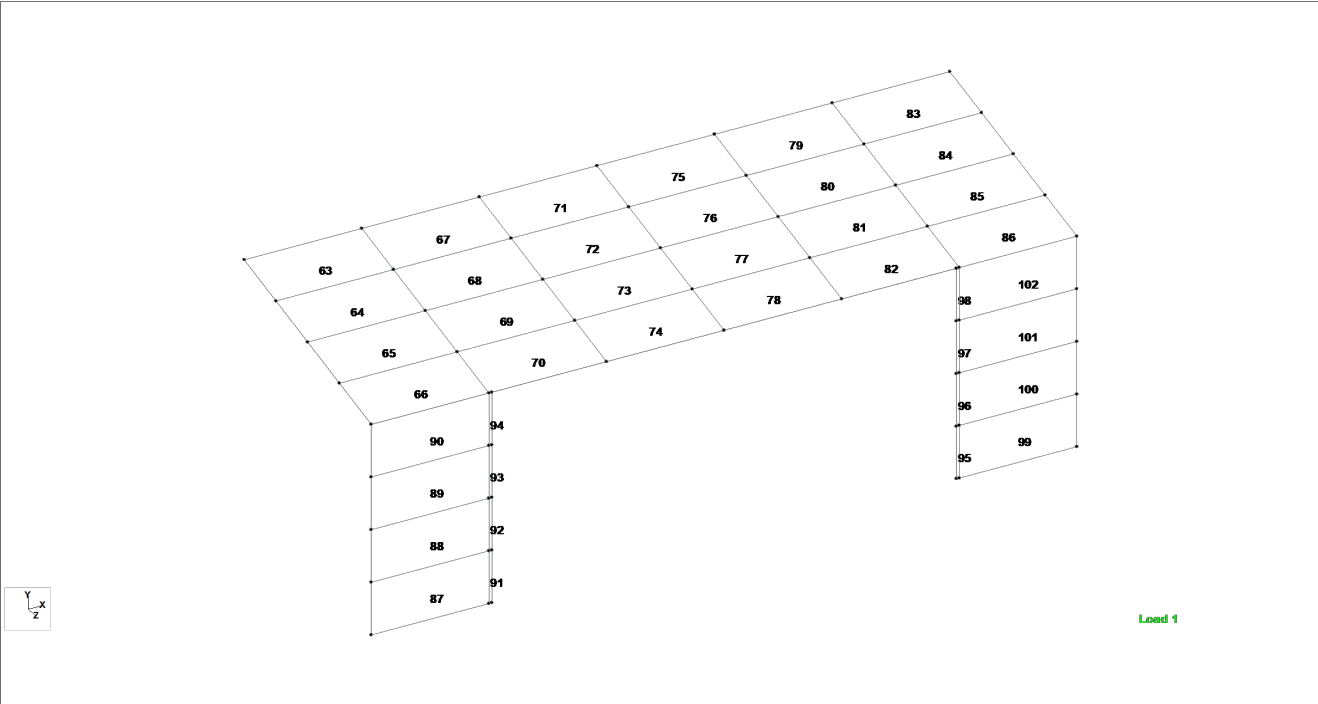


NODES

Bentley® Software licensed to EMC2 Structural Design Inc Connected User: Lawrence Duffy		Job No.	Sheet No.	Rev
			3	
Job Title		Part	Ref	
Client		By	Date	Chd
File 167 Marlborough.STD		Date Time	19-JUNE-25 19-Jun-2025 18:04	



BEAMS



PLATES

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PAGE NO. 1

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*****
*
*          STAAD.Pro 2023          *
*          Version  23.00.03.25    *
*          Proprietary Program of  *
*          Bentley Systems, Inc.   *
*          Date=    JUN 19, 2025   *
*          Time=    18: 5:58       *
*
*          Licensed to: EMC2 Structural Design Inc
*****
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1. STAAD SPACE MARLBOROUGH PROJECT
INPUT FILE: C:\Users\lawre\Documents\Business\2025\Solar Innovations\Marlborough\167 Marlborough.STD
2. START JOB INFORMATION
3. ENGINEER DATE 19-JUNE-25
4. END JOB INFORMATION
5. INPUT WIDTH 79
6. UNIT INCHES POUND
7. JOINT COORDINATES
8. 1 0 0 92; 2 0 23.8125 92; 3 0 47.625 92; 4 0 71.4375 92; 5 2.84E-14 123.729 0
9. 6 2.84E-14 116.609 23; 7 2.84E-14 109.49 46; 8 2.84E-14 102.37 69
10. 9 2.84E-14 95.25 92; 10 49.1667 123.729 0; 11 49.1667 116.609 23
11. 12 49.1667 109.49 46; 13 49.1667 102.37 69; 14 49.1667 0 92
12. 15 49.1667 23.8125 92; 16 49.1667 47.625 92; 17 49.1667 71.4375 92
13. 18 49.1667 95.25 92; 19 50.3667 0 92; 20 50.3667 23.8125 92
14. 21 50.3667 47.625 92; 22 50.3667 71.4375 92; 23 50.3667 95.25 92
15. 24 98.3333 123.729 0; 25 98.3333 116.609 23; 26 98.3333 109.49 46
16. 27 98.3333 102.37 69; 28 98.3333 95.25 92; 29 147.5 123.729 0
17. 30 147.5 116.609 23; 31 147.5 109.49 46; 32 147.5 102.37 69; 33 147.5 95.25 92
18. 34 196.667 123.729 0; 35 196.667 116.609 23; 36 196.667 109.49 46
19. 37 196.667 102.37 69; 38 196.667 95.25 92; 39 244.633 0 92
20. 40 244.633 23.8125 92; 41 244.633 47.625 92; 42 244.633 71.4375 92
21. 43 244.633 95.25 92; 44 245.833 123.729 0; 45 245.833 116.609 23
22. 46 245.833 109.49 46; 47 245.833 102.37 69; 48 245.833 0 92
23. 49 245.833 23.8125 92; 50 245.833 47.625 92; 51 245.833 71.4375 92
24. 52 245.833 95.25 92; 53 295 123.729 0; 54 295 116.609 23; 55 295 109.49 46
25. 56 295 102.37 69; 57 295 0 92; 58 295 23.8125 92; 59 295 47.625 92
26. 60 295 71.4375 92; 61 295 95.25 92
27. MEMBER INCIDENCES
28. 1 1 2; 2 2 3; 3 3 4; 4 4 9; 5 6 5; 6 7 6; 7 8 7; 8 9 8; 9 11 10; 10 12 11
29. 11 13 12; 12 18 13; 13 14 15; 14 15 16; 15 16 17; 16 17 18; 17 45 44; 18 46 45
30. 19 47 46; 20 52 47; 21 48 49; 22 49 50; 23 50 51; 24 51 52; 25 54 53; 26 55 54
31. 27 56 55; 28 61 56; 29 57 58; 30 58 59; 31 59 60; 32 60 61; 33 25 24; 34 26 25
32. 35 27 26; 36 28 27; 37 30 29; 38 31 30; 39 32 31; 40 33 32; 41 35 34; 42 36 35
33. 43 37 36; 44 38 37; 45 9 18; 46 19 20; 47 20 21; 48 21 22; 49 22 23; 50 23 28
34. 51 28 33; 52 33 38; 53 38 43; 54 39 40; 55 40 41; 56 41 42; 57 42 43; 58 52 61
35. 59 16 21; 60 18 23; 61 41 50; 62 43 52
36. ELEMENT INCIDENCES SHELL
37. 63 6 5 10 11; 64 7 6 11 12; 65 8 7 12 13; 66 9 8 13 18; 67 11 10 24 25
38. 68 12 11 25 26; 69 13 12 26 27; 70 18 13 27 28; 71 25 24 29 30; 72 26 25 30 31
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MARLBOROUGH PROJECT

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39. 73 27 26 31 32; 74 28 27 32 33; 75 30 29 34 35; 76 31 30 35 36; 77 32 31 36 37
 40. 78 33 32 37 38; 79 35 34 44 45; 80 36 35 45 46; 81 37 36 46 47; 82 38 37 47 52
 41. 83 45 44 53 54; 84 46 45 54 55; 85 47 46 55 56; 86 52 47 56 61; 87 1 2 15 14
 42. 88 2 3 16 15; 89 3 4 17 16; 90 4 9 18 17; 91 14 15 20 19; 92 15 16 21 20
 43. 93 16 17 22 21; 94 17 18 23 22; 95 39 40 49 48; 96 40 41 50 49; 97 41 42 51 50
 44. 98 42 43 52 51; 99 48 49 58 57; 100 49 50 59 58; 101 50 51 60 59
 45. 102 51 52 61 60
 46. START USER TABLE

WARNING PLATE NO. 91(JOINTS 14 - 15 - 20 - 19)
 IS BADLY SHAPED, WARPED, NOT CONVEX, OR NOT NUMBERED COUNTER-CLOCKWISE.

WARNING PLATE NO. 92(JOINTS 15 - 16 - 21 - 20)
 IS BADLY SHAPED, WARPED, NOT CONVEX, OR NOT NUMBERED COUNTER-CLOCKWISE.

WARNING PLATE NO. 93(JOINTS 16 - 17 - 22 - 21)
 IS BADLY SHAPED, WARPED, NOT CONVEX, OR NOT NUMBERED COUNTER-CLOCKWISE.

WARNING PLATE NO. 94(JOINTS 17 - 18 - 23 - 22)
 IS BADLY SHAPED, WARPED, NOT CONVEX, OR NOT NUMBERED COUNTER-CLOCKWISE.

WARNING PLATE NO. 95(JOINTS 39 - 40 - 49 - 48)
 IS BADLY SHAPED, WARPED, NOT CONVEX, OR NOT NUMBERED COUNTER-CLOCKWISE.

WARNING PLATE NO. 96(JOINTS 40 - 41 - 50 - 49)
 IS BADLY SHAPED, WARPED, NOT CONVEX, OR NOT NUMBERED COUNTER-CLOCKWISE.

WARNING PLATE NO. 97(JOINTS 41 - 42 - 51 - 50)
 IS BADLY SHAPED, WARPED, NOT CONVEX, OR NOT NUMBERED COUNTER-CLOCKWISE.

WARNING PLATE NO. 98(JOINTS 42 - 43 - 52 - 51)
 IS BADLY SHAPED, WARPED, NOT CONVEX, OR NOT NUMBERED COUNTER-CLOCKWISE.

47. TABLE 1 SOLAR_MASTER.TXT
 48. END
 49. DEFINE MATERIAL START
 50. ISOTROPIC ALUMINUM
 51. E 1E+07
 52. POISSON 0.33
 53. DENSITY 0.098
 54. ALPHA 1.28E-05
 55. DAMP 0.03
 56. G 3.7594E+06
 57. TYPE ALUMINUM
 58. *
 59. ISOTROPIC GLASS
 60. E 1
 61. POISSON 0.22
 62. DENSITY 0.0902778
 63. ALPHA 1.28E-05
 64. DAMP 2.8026E-44
 65. *
 66. END DEFINE MATERIAL
 67. MEMBER PROPERTY
 68. 1 TO 32 UPTABLE 1 G2HEAVYBAR(H11829)
 69. 33 TO 44 UPTABLE 1 2X4RAFTERINSERT(H14358H12754)
 70. 45 TO 58 UPTABLE 1 DOUBLE2X8RAFTER(H11366)

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71. 59 TO 62 UPTABLE 1 1SCREWMUNTIN(S33541)
72. ELEMENT PROPERTY
73. 63 TO 86 THICKNESS 0.5
74. 87 TO 102 THICKNESS 0.4375
75. CONSTANTS
76. BETA 90 MEMB 1 TO 4 13 TO 16 21 TO 24 29 TO 32
77. BETA 180 MEMB 54 TO 57
78. MATERIAL ALUMINUM MEMB 1 TO 62
79. MATERIAL GLASS MEMB 63 TO 102
80. SUPPORTS
81. 1 5 9 10 14 19 24 29 34 39 44 48 53 57 61 PINNED
82. MEMBER RELEASE
83. 36 40 44 45 58 TO 62 START MY MZ
84. 45 58 TO 62 END MY MZ
85. UNIT FEET POUND
86. LOAD 1 LOADTYPE DEAD TITLE DEAD LOAD
87. SELFWEIGHT Y -1
88. LOAD 2 LOADTYPE SNOW TITLE SNOW LOAD (BALANCED / NO DRIFTING)
89. ELEMENT LOAD
90. 63 TO 86 PR GY -35
91. LOAD 3 LOADTYPE WIND TITLE POSITIVE WIND (C&C)
92. ELEMENT LOAD
93. 87 TO 102 PR 37
94. 63 TO 86 PR 17
95. JOINT LOAD
96. 28 33 38 FZ -506
97. MEMBER LOAD
98. 51 52 LIN Z 0 0 -86
99. 50 TRAP Z -86 0 1.94861 3.99722
100. 50 TRAP Z -4.19797 -86 0 1.94861
101. 60 TRAP Z 0 -4.19797 0 0.1
102. 53 TRAP Z -86 0 1.94858 3.99717
103. 53 TRAP Z -4.19801 -86 0 1.94858
104. 62 TRAP Z 0 -4.19801 0 0.0999997
105. 46 TO 49 54 TO 57 UNI GZ -86
106. LOAD 4 LOADTYPE WIND TITLE NEGATIVE WIND (C&C)
107. ELEMENT LOAD
108. 87 TO 102 PR -49
109. 63 TO 86 PR -97
110. JOINT LOAD
111. 28 33 38 FZ 678
112. MEMBER LOAD
113. 51 52 LIN Z 0 0 115
114. 50 TRAP Z 115 0 1.94861 3.99722
115. 50 TRAP Z 5.61357 115 0 1.94861
116. 60 TRAP Z 0 5.61357 0 0.1
117. 53 TRAP Z 115 0 1.94858 3.99717
118. 53 TRAP Z 5.61362 115 0 1.94858
119. 62 TRAP Z 0 5.61362 0 0.0999997
120. 46 TO 49 54 TO 57 UNI GZ 115
121. LOAD COMB 5 1.05 DEAD + ROOF/SNOW
122. 1 1.05 2 1.0
123. LOAD COMB 6 1.05 DEAD + 0.6 POS WIND
124. 1 1.05 3 0.6
125. LOAD COMB 7 0.6 DEAD + 0.6 NEG WIND
126. 1 0.6 4 0.6

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127. LOAD COMB 8 1.05 DEAD + .75 ROOF/SNOW + .45 POS WIND
 128. 1 1.05 2 0.75 3 0.45
 129. LOAD COMB 9 1.05 DEAD + .75 ROOF/SNOW + .45 NEG WIND
 130. 1 1.05 2 0.75 4 0.45
 131. UNIT INCHES POUND
 132. PERFORM ANALYSIS

*** NOTE: UNIT COMMAND SHOULD BE SPECIFIED BEFORE PRE-PROCESSING OR
 POST-PROCESSING COMMANDS TO DEFINE INPUT OR OUTPUT UNITS.

** WARNING ** A SOFT MATERIAL WITH (1.0 / 3.150E+06) TIMES THE STIFFNESS OF
 CONCRETE ENTERED. PLEASE CHECK.

P R O B L E M S T A T I S T I C S

NUMBER OF JOINTS	61	NUMBER OF MEMBERS	62
NUMBER OF PLATES	40	NUMBER OF SOLIDS	0
NUMBER OF SURFACES	0	NUMBER OF SUPPORTS	15

Using 64-bit analysis engine.

SOLVER USED IS THE IN-CORE ADVANCED MATH SOLVER

TOTAL	PRIMARY LOAD CASES =	4,	TOTAL DEGREES OF FREEDOM =	321
TOTAL	LOAD COMBINATION CASES =	5	SO FAR.	

133. LOAD LIST 5 TO 9
 134. PRINT JOINT DISPLACEMENTS ALL
 JOINT DISPLACE ALL

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MARLBOROUGH PROJECT

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JOINT DISPLACEMENT (INCH RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
1	5	0.00000	0.00000	0.00000	0.00086	0.00000	0.00000
	6	0.00000	0.00000	0.00000	-0.00100	0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00070	-0.00000	-0.00000
	8	0.00000	0.00000	0.00000	-0.00019	0.00000	0.00000
	9	0.00000	0.00000	0.00000	0.00114	-0.00000	-0.00000
2	5	-0.00001	-0.00006	0.01931	0.00070	0.00000	0.00000
	6	-0.00001	-0.00006	-0.02110	-0.00061	0.00000	0.00000
	7	0.00002	-0.00003	0.01374	0.00030	-0.00000	-0.00000
	8	-0.00001	-0.00006	-0.00314	-0.00000	0.00000	0.00000
	9	0.00001	-0.00006	0.02414	0.00072	-0.00000	-0.00000
3	5	-0.00002	-0.00008	0.03089	0.00021	0.00000	0.00000
	6	-0.00001	-0.00008	-0.02611	0.00020	0.00000	0.00000
	7	0.00003	-0.00004	0.01184	-0.00042	-0.00000	0.00000
	8	-0.00002	-0.00008	0.00072	0.00029	0.00000	0.00000
	9	0.00001	-0.00008	0.03102	-0.00017	-0.00000	0.00000
4	5	-0.00001	-0.00006	0.02703	-0.00060	0.00000	-0.00000
	6	-0.00001	-0.00006	-0.01371	0.00070	0.00000	-0.00000
	7	0.00002	-0.00003	-0.00173	-0.00049	-0.00000	0.00000
	8	-0.00001	-0.00006	0.00748	0.00013	0.00000	-0.00000
	9	0.00001	-0.00006	0.01808	-0.00080	-0.00000	0.00000
5	5	0.00000	0.00000	0.00000	0.00262	0.00000	-0.00000
	6	0.00000	0.00000	0.00000	0.00068	0.00000	-0.00000
	7	0.00000	0.00000	0.00000	-0.00283	-0.00000	0.00000
	8	0.00000	0.00000	0.00000	0.00224	0.00000	-0.00000
	9	0.00000	0.00000	0.00000	-0.00025	-0.00000	0.00000
6	5	0.00000	-0.05425	-0.01668	0.00174	0.00000	-0.00000
	6	-0.00000	-0.01368	-0.00421	0.00039	0.00000	-0.00000
	7	0.00000	0.05806	0.01799	-0.00179	-0.00000	0.00000
	8	-0.00000	-0.04591	-0.01413	0.00143	0.00000	-0.00000
	9	0.00000	0.00466	0.00153	-0.00010	-0.00000	0.00000
7	5	0.00000	-0.07265	-0.02234	-0.00021	0.00000	-0.00000
	6	-0.00000	-0.01574	-0.00485	-0.00020	0.00000	-0.00000
	7	0.00000	0.07437	0.02304	0.00043	-0.00000	0.00000
	8	-0.00000	-0.05956	-0.01832	-0.00029	0.00000	-0.00000
	9	0.00000	0.00369	0.00126	0.00017	-0.00000	0.00000
8	5	0.00000	-0.04671	-0.01435	-0.00183	0.00000	-0.00000
	6	-0.00000	-0.00646	-0.00198	-0.00048	0.00000	-0.00000
	7	0.00000	0.04296	0.01331	0.00199	-0.00000	0.00000
	8	-0.00000	-0.03555	-0.01092	-0.00157	0.00000	-0.00000
	9	0.00000	-0.00127	-0.00031	0.00018	-0.00000	0.00000
9	5	0.00000	0.00000	0.00000	-0.00174	0.00000	-0.00000
	6	0.00000	0.00000	0.00000	0.00016	0.00000	-0.00000
	7	0.00000	0.00000	0.00000	0.00106	-0.00000	0.00000
	8	0.00000	0.00000	0.00000	-0.00102	0.00000	-0.00000
	9	0.00000	0.00000	0.00000	-0.00045	-0.00000	0.00000
10	5	0.00000	0.00000	0.00000	0.00524	0.00040	-0.00127

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MARLBOROUGH PROJECT

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JOINT DISPLACEMENT (INCH RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
11	6	0.00000	0.00000	0.00000	0.00179	0.00026	-0.00084
	7	0.00000	0.00000	0.00000	-0.00641	-0.00061	0.00195
	8	0.00000	0.00000	0.00000	0.00481	0.00045	-0.00145
	9	0.00000	0.00000	0.00000	-0.00104	-0.00017	0.00055
	5	0.00004	-0.10854	-0.03353	0.00349	0.00040	-0.00127
12	6	0.00002	-0.03649	-0.01170	0.00113	0.00026	-0.00084
	7	-0.00006	0.13188	0.04187	-0.00419	-0.00061	0.00195
	8	0.00004	-0.09925	-0.03099	0.00316	0.00045	-0.00145
	9	-0.00001	0.02090	0.00730	-0.00063	-0.00017	0.00055
	5	0.00009	-0.14621	-0.04527	-0.00036	0.00040	-0.00127
13	6	0.00005	-0.04674	-0.01531	-0.00026	0.00026	-0.00084
	7	-0.00012	0.17432	0.05603	0.00063	-0.00061	0.00195
	8	0.00009	-0.13186	-0.04145	-0.00043	0.00045	-0.00145
	9	-0.00003	0.02567	0.00949	0.00021	-0.00017	0.00055
	5	0.00014	-0.09611	-0.02998	-0.00358	0.00040	-0.00127
14	6	0.00008	-0.02754	-0.00982	-0.00119	0.00026	-0.00084
	7	-0.00020	0.10993	0.03711	0.00436	-0.00061	0.00195
	8	0.00015	-0.08422	-0.02719	-0.00327	0.00045	-0.00145
	9	-0.00005	0.01341	0.00630	0.00069	-0.00017	0.00055
	5	0.00000	0.00000	0.00000	0.00165	0.00040	0.00127
15	6	0.00000	0.00000	0.00000	-0.00073	0.00026	0.00084
	7	0.00000	0.00000	0.00000	-0.00030	-0.00061	-0.00194
	8	0.00000	0.00000	0.00000	0.00055	0.00045	0.00144
	9	0.00000	0.00000	0.00000	0.00097	-0.00017	-0.00055
	5	-0.02771	-0.00121	0.03713	0.00134	0.00040	0.00095
16	6	-0.01834	-0.00071	-0.01499	-0.00039	0.00026	0.00063
	7	0.04241	0.00147	-0.00856	-0.00051	-0.00061	-0.00145
	8	-0.03159	-0.00127	0.01339	0.00059	0.00045	0.00108
	9	0.01208	0.00026	0.02027	0.00058	-0.00017	-0.00041
	5	-0.04031	-0.00238	0.05920	0.00039	0.00040	-0.00000
17	6	-0.02668	-0.00139	-0.01640	0.00026	0.00026	-0.00000
	7	0.06170	0.00297	-0.02349	-0.00063	-0.00061	0.00000
	8	-0.04597	-0.00251	0.02698	0.00045	0.00045	-0.00000
	9	0.01757	0.00056	0.02495	-0.00019	-0.00017	0.00000
	5	-0.02763	-0.00350	0.05118	-0.00119	0.00040	-0.00095
18	6	-0.01829	-0.00203	-0.00580	0.00047	0.00026	-0.00063
	7	0.04229	0.00448	-0.03109	0.00031	-0.00061	0.00146
	8	-0.03151	-0.00370	0.02962	-0.00044	0.00045	-0.00109
	9	0.01204	0.00089	0.01349	-0.00062	-0.00017	0.00042
	5	0.00019	-0.00460	-0.00201	-0.00340	0.00040	-0.00127
19	6	0.00012	-0.00263	-0.00259	-0.00051	0.00026	-0.00084
	7	-0.00028	0.00602	0.00594	0.00332	-0.00061	0.00195
	8	0.00021	-0.00486	-0.00323	-0.00264	0.00045	-0.00145
	9	-0.00008	0.00127	0.00303	0.00004	-0.00017	0.00055
	5	0.00000	0.00000	0.00000	-0.00012	0.00082	0.00111
	6	0.00000	0.00000	0.00000	-0.00387	-0.00430	0.00073

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MARLBOROUGH PROJECT

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JOINT DISPLACEMENT (INCH RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
20	7	0.00000	0.00000	0.00000	0.00526	0.00520	-0.00170
	8	0.00000	0.00000	0.00000	-0.00298	-0.00269	0.00127
	9	0.00000	0.00000	0.00000	0.00386	0.00449	-0.00048
	5	-0.02515	-0.00051	-0.00288	-0.00012	0.00082	0.00090
21	6	-0.01665	-0.00036	-0.08778	-0.00332	-0.00430	0.00060
	7	0.03850	0.00075	0.11940	0.00453	0.00521	-0.00138
	8	-0.02868	-0.00059	-0.06768	-0.00257	-0.00269	0.00103
	9	0.01096	0.00020	0.08750	0.00331	0.00449	-0.00039
22	5	-0.04032	-0.00101	-0.00578	-0.00012	0.00081	0.00027
	6	-0.02669	-0.00072	-0.15335	-0.00212	-0.00432	0.00018
	7	0.06172	0.00150	0.20912	0.00293	0.00524	-0.00042
	8	-0.04598	-0.00117	-0.11873	-0.00167	-0.00271	0.00031
23	9	0.01757	0.00041	0.15273	0.00211	0.00451	-0.00012
	5	-0.03542	-0.00151	-0.00873	-0.00013	0.00079	-0.00079
	6	-0.02344	-0.00107	-0.18891	-0.00092	-0.00436	-0.00053
	7	0.05421	0.00225	0.25878	0.00132	0.00531	0.00122
24	8	-0.04039	-0.00175	-0.14730	-0.00077	-0.00276	-0.00091
	9	0.01544	0.00063	0.18787	0.00090	0.00455	0.00035
	5	0.00026	-0.00200	-0.01175	-0.00013	0.00076	-0.00231
	6	0.00017	-0.00142	-0.20230	-0.00038	-0.00444	-0.00153
25	7	-0.00039	0.00301	0.27883	0.00060	0.00544	0.00354
	8	0.00029	-0.00232	-0.15928	-0.00037	-0.00284	-0.00264
	9	-0.00011	0.00085	0.20075	0.00036	0.00462	0.00101
	5	0.00000	0.00000	0.00000	0.01119	0.00093	-0.00299
26	6	0.00000	0.00000	0.00000	0.00520	0.00042	-0.00135
	7	0.00000	0.00000	0.00000	-0.01515	-0.00116	0.00374
	8	0.00000	0.00000	0.00000	0.01126	0.00091	-0.00294
	9	0.00000	0.00000	0.00000	-0.00334	-0.00021	0.00068
27	5	0.00003	-0.23659	-0.07315	0.00834	0.00093	-0.00299
	6	0.00002	-0.11042	-0.03521	0.00397	0.00042	-0.00135
	7	-0.00005	0.32064	0.10093	-0.01138	-0.00116	0.00374
	8	0.00004	-0.23831	-0.07449	0.00845	0.00091	-0.00294
28	9	-0.00002	0.07088	0.02326	-0.00256	-0.00021	0.00068
	5	0.00007	-0.35587	-0.11008	0.00169	0.00093	-0.00299
	6	0.00005	-0.17033	-0.05480	0.00111	0.00042	-0.00135
	7	-0.00011	0.48608	0.15379	-0.00258	-0.00116	0.00374
	8	0.00008	-0.36134	-0.11336	0.00192	0.00091	-0.00294
	9	-0.00003	0.10956	0.03647	-0.00073	-0.00021	0.00068
	5	0.00010	-0.31417	-0.09727	-0.00496	0.00093	-0.00299
	6	0.00007	-0.16098	-0.05297	-0.00175	0.00042	-0.00135
	7	-0.00015	0.43846	0.14070	0.00622	-0.00116	0.00374
	8	0.00011	-0.32620	-0.10334	-0.00461	0.00091	-0.00294
	9	-0.00005	0.10399	0.03591	0.00109	-0.00021	0.00068
	5	0.00013	-0.15515	-0.04824	-0.00013	0.00076	-0.00304
	6	0.00009	-0.10112	-0.03552	-0.00037	-0.00137	-0.00190
	7	-0.00020	0.23563	0.07955	0.00059	0.00134	0.00452

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JOINT DISPLACEMENT (INCH RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
29	8	0.00015	-0.17579	-0.05772	-0.00036	-0.00054	-0.00338
	9	-0.00006	0.06623	0.02531	0.00035	0.00155	0.00122
	5	0.00000	0.00000	0.00000	0.01209	-0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00572	0.00000	-0.00000
	7	0.00000	0.00000	0.00000	-0.01643	-0.00000	0.00000
30	8	0.00000	0.00000	0.00000	0.01223	0.00000	-0.00000
	9	0.00000	0.00000	0.00000	-0.00366	-0.00000	0.00000
	5	-0.00000	-0.25737	-0.07942	0.00924	-0.00000	0.00000
	6	-0.00000	-0.12277	-0.03768	0.00449	0.00000	-0.00000
	7	0.00000	0.35065	0.10830	-0.01266	-0.00000	0.00000
31	8	-0.00000	-0.26096	-0.08038	0.00943	0.00000	-0.00000
	9	0.00000	0.07858	0.02432	-0.00288	-0.00000	0.00000
	5	-0.00000	-0.39743	-0.12262	0.00259	-0.00000	0.00000
	6	0.00000	-0.19503	-0.05974	0.00163	0.00000	-0.00000
	7	-0.00000	0.54610	0.16854	-0.00386	-0.00000	0.00000
32	8	0.00000	-0.40665	-0.12514	0.00289	0.00000	-0.00000
	9	-0.00000	0.12497	0.03859	-0.00105	-0.00000	0.00000
	5	-0.00000	-0.37650	-0.11608	-0.00406	-0.00000	0.00000
	6	0.00000	-0.19802	-0.06037	-0.00123	0.00000	-0.00000
	7	-0.00000	0.52847	0.16281	0.00494	-0.00000	0.00000
33	8	0.00000	-0.39416	-0.12102	-0.00364	0.00000	-0.00000
	9	-0.00000	0.12710	0.03909	0.00078	-0.00000	0.00000
	5	-0.00000	-0.23826	-0.07332	-0.00013	-0.00000	0.00000
	6	0.00000	-0.15051	-0.04539	-0.00037	0.00001	0.00000
	7	-0.00000	0.35564	0.10903	0.00058	-0.00001	-0.00000
34	8	0.00000	-0.26639	-0.08128	-0.00036	0.00000	0.00000
	9	-0.00000	0.09703	0.02955	0.00035	-0.00001	-0.00000
	5	0.00000	0.00000	0.00000	0.01119	-0.00093	0.00299
	6	0.00000	0.00000	0.00000	0.00520	-0.00042	0.00135
	7	0.00000	0.00000	0.00000	-0.01515	0.00116	-0.00375
35	8	0.00000	0.00000	0.00000	0.01126	-0.00091	0.00294
	9	0.00000	0.00000	0.00000	-0.00334	0.00021	-0.00069
	5	-0.00003	-0.23659	-0.07315	0.00834	-0.00093	0.00299
	6	-0.00002	-0.11041	-0.03521	0.00397	-0.00042	0.00135
	7	0.00005	0.32063	0.10092	-0.01138	0.00116	-0.00375
36	8	-0.00004	-0.23830	-0.07448	0.00845	-0.00091	0.00294
	9	0.00002	0.07087	0.02325	-0.00256	0.00021	-0.00069
	5	-0.00007	-0.35587	-0.11008	0.00169	-0.00093	0.00299
	6	-0.00005	-0.17032	-0.05479	0.00111	-0.00042	0.00135
	7	0.00011	0.48606	0.15378	-0.00258	0.00116	-0.00375
37	8	-0.00008	-0.36133	-0.11335	0.00192	-0.00091	0.00294
	9	0.00003	0.10954	0.03646	-0.00073	0.00021	-0.00069
	5	-0.00010	-0.31417	-0.09727	-0.00496	-0.00093	0.00299
	6	-0.00007	-0.16096	-0.05296	-0.00175	-0.00042	0.00135
	7	0.00015	0.43843	0.14068	0.00622	0.00116	-0.00375
	8	-0.00011	-0.32619	-0.10333	-0.00461	-0.00091	0.00294

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JOINT DISPLACEMENT (INCH RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
38	9	0.00005	0.10397	0.03589	0.00109	0.00021	-0.00069
	5	-0.00013	-0.15514	-0.04824	-0.00013	-0.00076	0.00304
	6	-0.00009	-0.10110	-0.03551	-0.00036	0.00135	0.00190
	7	0.00020	0.23559	0.07953	0.00058	-0.00131	-0.00452
	8	-0.00015	-0.17577	-0.05770	-0.00035	0.00052	0.00338
39	9	0.00006	0.06620	0.02529	0.00034	-0.00152	-0.00122
	5	0.00000	0.00000	0.00000	-0.00012	-0.00082	-0.00111
	6	0.00000	0.00000	0.00000	-0.00385	0.00424	-0.00073
	7	0.00000	0.00000	0.00000	0.00523	-0.00513	0.00170
	8	0.00000	0.00000	0.00000	-0.00296	0.00265	-0.00127
40	9	0.00000	0.00000	0.00000	0.00383	-0.00443	0.00048
	5	0.02515	-0.00051	-0.00288	-0.00012	-0.00082	-0.00090
	6	0.01664	-0.00036	-0.08722	-0.00330	0.00424	-0.00060
	7	-0.03849	0.00075	0.11866	0.00450	-0.00513	0.00138
	8	0.02868	-0.00059	-0.06727	-0.00255	0.00265	-0.00103
41	9	-0.01096	0.00020	0.08695	0.00329	-0.00444	0.00039
	5	0.04032	-0.00101	-0.00578	-0.00012	-0.00081	-0.00027
	6	0.02668	-0.00072	-0.15223	-0.00210	0.00426	-0.00018
	7	-0.06170	0.00150	0.20764	0.00289	-0.00516	0.00042
	8	0.04597	-0.00117	-0.11789	-0.00165	0.00267	-0.00031
42	9	-0.01756	0.00041	0.15161	0.00208	-0.00445	0.00012
	5	0.03542	-0.00151	-0.00873	-0.00013	-0.00079	0.00079
	6	0.02343	-0.00107	-0.18724	-0.00090	0.00431	0.00053
	7	-0.05420	0.00225	0.25655	0.00129	-0.00524	-0.00122
	8	0.04038	-0.00175	-0.14605	-0.00076	0.00272	0.00091
43	9	-0.01543	0.00063	0.18619	0.00088	-0.00449	-0.00035
	5	-0.00026	-0.00200	-0.01175	-0.00013	-0.00076	0.00231
	6	-0.00017	-0.00142	-0.20007	-0.00036	0.00438	0.00153
	7	0.00039	0.00301	0.27585	0.00057	-0.00537	-0.00354
	8	-0.00029	-0.00232	-0.15761	-0.00035	0.00280	0.00264
44	9	0.00011	0.00085	0.19852	0.00033	-0.00457	-0.00101
	5	0.00000	0.00000	0.00000	0.00524	-0.00040	0.00127
	6	0.00000	0.00000	0.00000	0.00179	-0.00026	0.00084
	7	0.00000	0.00000	0.00000	-0.00641	0.00061	-0.00195
	8	0.00000	0.00000	0.00000	0.00481	-0.00045	0.00145
45	9	0.00000	0.00000	0.00000	-0.00104	0.00017	-0.00055
	5	-0.00004	-0.10854	-0.03353	0.00349	-0.00040	0.00127
	6	-0.00002	-0.03649	-0.01170	0.00113	-0.00026	0.00084
	7	0.00006	0.13188	0.04187	-0.00419	0.00061	-0.00195
	8	-0.00004	-0.09925	-0.03099	0.00316	-0.00045	0.00145
46	9	0.00001	0.02090	0.00730	-0.00063	0.00017	-0.00055
	5	-0.00009	-0.14621	-0.04527	-0.00036	-0.00040	0.00127
	6	-0.00005	-0.04674	-0.01531	-0.00026	-0.00026	0.00084
	7	0.00012	0.17432	0.05603	0.00063	0.00061	-0.00195
	8	-0.00009	-0.13186	-0.04145	-0.00043	-0.00045	0.00145
	9	0.00003	0.02567	0.00949	0.00021	0.00017	-0.00055

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JOINT DISPLACEMENT (INCH RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
47	5	-0.00014	-0.09610	-0.02998	-0.00358	-0.00040	0.00127
	6	-0.00008	-0.02754	-0.00982	-0.00119	-0.00026	0.00084
	7	0.00020	0.10993	0.03711	0.00436	0.00061	-0.00195
	8	-0.00015	-0.08422	-0.02719	-0.00327	-0.00045	0.00145
	9	0.00005	0.01341	0.00630	0.00069	0.00017	-0.00055
48	5	0.00000	0.00000	0.00000	0.00165	-0.00040	-0.00127
	6	0.00000	0.00000	0.00000	-0.00073	-0.00026	-0.00084
	7	0.00000	0.00000	0.00000	-0.00030	0.00061	0.00194
	8	0.00000	0.00000	0.00000	0.00055	-0.00045	-0.00144
	9	0.00000	0.00000	0.00000	0.00097	0.00017	0.00055
49	5	0.02771	-0.00121	0.03713	0.00134	-0.00040	-0.00095
	6	0.01833	-0.00071	-0.01499	-0.00039	-0.00026	-0.00063
	7	-0.04240	0.00147	-0.00856	-0.00051	0.00061	0.00145
	8	0.03159	-0.00127	0.01339	0.00059	-0.00045	-0.00108
	9	-0.01207	0.00026	0.02027	0.00058	0.00017	0.00041
50	5	0.04031	-0.00238	0.05920	0.00039	-0.00040	0.00000
	6	0.02667	-0.00139	-0.01640	0.00026	-0.00026	0.00000
	7	-0.06169	0.00297	-0.02349	-0.00063	0.00061	-0.00000
	8	0.04596	-0.00251	0.02698	0.00045	-0.00045	0.00000
	9	-0.01756	0.00056	0.02495	-0.00019	0.00017	-0.00000
51	5	0.02763	-0.00350	0.05118	-0.00119	-0.00040	0.00095
	6	0.01828	-0.00203	-0.00580	0.00047	-0.00026	0.00063
	7	-0.04228	0.00448	-0.03109	0.00031	0.00061	-0.00146
	8	0.03150	-0.00370	0.02962	-0.00044	-0.00045	0.00109
	9	-0.01204	0.00089	0.01349	-0.00062	0.00017	-0.00042
52	5	-0.00019	-0.00460	-0.00201	-0.00340	-0.00040	0.00127
	6	-0.00012	-0.00263	-0.00259	-0.00051	-0.00026	0.00084
	7	0.00028	0.00602	0.00594	0.00332	0.00061	-0.00195
	8	-0.00021	-0.00486	-0.00323	-0.00264	-0.00045	0.00145
	9	0.00008	0.00127	0.00303	0.00004	0.00017	-0.00055
53	5	0.00000	0.00000	0.00000	0.00262	-0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00068	-0.00000	0.00000
	7	0.00000	0.00000	0.00000	-0.00283	0.00000	-0.00000
	8	0.00000	0.00000	0.00000	0.00224	-0.00000	0.00000
	9	0.00000	0.00000	0.00000	-0.00025	0.00000	-0.00000
54	5	-0.00000	-0.05425	-0.01669	0.00174	-0.00000	0.00000
	6	0.00000	-0.01368	-0.00421	0.00039	-0.00000	0.00000
	7	-0.00000	0.05806	0.01799	-0.00179	0.00000	-0.00000
	8	0.00000	-0.04591	-0.01413	0.00143	-0.00000	0.00000
	9	-0.00000	0.00466	0.00153	-0.00010	0.00000	-0.00000
55	5	-0.00000	-0.07265	-0.02234	-0.00021	-0.00000	0.00000
	6	0.00000	-0.01574	-0.00485	-0.00020	-0.00000	0.00000
	7	-0.00000	0.07437	0.02304	0.00043	0.00000	-0.00000
	8	0.00000	-0.05956	-0.01832	-0.00029	-0.00000	0.00000
	9	-0.00000	0.00369	0.00126	0.00017	0.00000	-0.00000
56	5	-0.00000	-0.04671	-0.01435	-0.00183	-0.00000	0.00000

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JOINT DISPLACEMENT (INCH RADIANS) STRUCTURE TYPE = SPACE

JOINT	LOAD	X-TRANS	Y-TRANS	Z-TRANS	X-ROTAN	Y-ROTAN	Z-ROTAN
	6	0.00000	-0.00646	-0.00198	-0.00048	-0.00000	0.00000
	7	-0.00000	0.04296	0.01331	0.00199	0.00000	-0.00000
	8	0.00000	-0.03555	-0.01092	-0.00157	-0.00000	0.00000
	9	-0.00000	-0.00127	-0.00031	0.00018	0.00000	-0.00000
57	5	0.00000	0.00000	0.00000	0.00086	-0.00000	-0.00000
	6	0.00000	0.00000	0.00000	-0.00100	-0.00000	-0.00000
	7	0.00000	0.00000	0.00000	0.00070	0.00000	0.00000
	8	0.00000	0.00000	0.00000	-0.00019	-0.00000	-0.00000
	9	0.00000	0.00000	0.00000	0.00114	0.00000	0.00000
58	5	0.00001	-0.00006	0.01931	0.00070	-0.00000	-0.00000
	6	0.00001	-0.00006	-0.02110	-0.00061	-0.00000	-0.00000
	7	-0.00002	-0.00003	0.01374	0.00030	0.00000	0.00000
	8	0.00001	-0.00006	-0.00314	-0.00000	-0.00000	-0.00000
	9	-0.00001	-0.00006	0.02414	0.00072	0.00000	0.00000
59	5	0.00002	-0.00008	0.03089	0.00021	-0.00000	0.00000
	6	0.00001	-0.00008	-0.02611	0.00020	-0.00000	0.00000
	7	-0.00003	-0.00004	0.01184	-0.00042	0.00000	-0.00000
	8	0.00002	-0.00008	0.00072	0.00029	-0.00000	0.00000
	9	-0.00001	-0.00008	0.03102	-0.00017	0.00000	-0.00000
60	5	0.00001	-0.00006	0.02703	-0.00060	-0.00000	0.00000
	6	0.00001	-0.00006	-0.01371	0.00070	-0.00000	0.00000
	7	-0.00002	-0.00003	-0.00173	-0.00049	0.00000	-0.00000
	8	0.00001	-0.00006	0.00748	0.00013	-0.00000	0.00000
	9	-0.00001	-0.00006	0.01808	-0.00080	0.00000	-0.00000
61	5	0.00000	0.00000	0.00000	-0.00174	-0.00000	0.00000
	6	0.00000	0.00000	0.00000	0.00016	-0.00000	0.00000
	7	0.00000	0.00000	0.00000	0.00106	0.00000	-0.00000
	8	0.00000	0.00000	0.00000	-0.00102	-0.00000	0.00000
	9	0.00000	0.00000	0.00000	-0.00045	0.00000	-0.00000

***** END OF LATEST ANALYSIS RESULT *****

135. PRINT MEMBER FORCES ALL
 MEMBER FORCES ALL

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MARLBOROUGH PROJECT

-- PAGE NO. 12

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- POUN INCH (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
1	5	1	45.30	-40.10	0.01	-0.00	0.00	0.00
		2	-40.86	40.10	-0.01	0.00	-0.18	-954.86
	6	1	45.30	97.00	0.00	-0.00	0.00	0.00
		2	-40.86	-97.00	-0.00	0.00	-0.12	2309.70
	7	1	25.88	-98.94	-0.01	0.00	-0.00	-0.00
		2	-23.34	98.94	0.01	-0.00	0.27	-2356.06
	8	1	45.30	46.40	0.01	-0.00	0.00	0.00
		2	-40.86	-46.40	-0.01	0.00	-0.20	1104.85
	9	1	45.29	-102.95	-0.00	0.00	-0.00	-0.00
		2	-40.85	102.95	0.00	-0.00	0.08	-2451.50
2	5	2	16.58	-40.10	0.00	-0.00	0.19	954.86
		3	-12.14	40.10	-0.00	0.00	-0.26	-1909.73
	6	2	16.58	6.75	0.00	-0.00	0.12	-2309.70
		3	-12.14	-6.75	-0.00	0.00	-0.17	2470.37
	7	2	9.47	20.58	-0.00	0.00	-0.28	2356.06
		3	-6.94	-20.58	0.00	-0.00	0.39	-1866.11
	8	2	16.58	-21.29	0.00	-0.00	0.21	-1104.85
		3	-12.14	21.29	-0.00	0.00	-0.29	597.94
	9	2	16.58	-13.31	-0.00	0.00	-0.08	2451.50
		3	-12.14	13.31	0.00	-0.00	0.11	-2768.50
3	5	3	-12.14	-40.10	-0.00	-0.00	0.26	1909.73
		4	16.58	40.10	0.00	0.00	-0.19	-2864.59
	6	3	-12.14	-83.50	-0.00	-0.00	0.17	-2470.37
		4	16.58	83.50	0.00	0.00	-0.12	482.02
	7	3	-6.93	140.09	0.00	0.00	-0.39	1866.11
		4	9.47	-140.09	-0.00	-0.00	0.28	1469.85
	8	3	-12.14	-88.97	-0.00	-0.00	0.29	-597.94
		4	16.58	88.97	0.00	0.00	-0.21	-1520.74
	9	3	-12.14	76.33	0.00	0.00	-0.11	2768.50
		4	16.58	-76.33	-0.00	-0.00	0.08	-950.99
4	5	4	-40.85	-40.10	-0.01	-0.00	0.18	2864.59
		9	45.29	40.10	0.01	0.00	-0.00	-3819.46
	6	4	-40.85	-173.75	-0.00	-0.00	0.12	-482.02
		9	45.29	173.75	0.00	0.00	-0.00	-3655.36
	7	4	-23.35	259.61	0.01	0.00	-0.27	-1469.85
		9	25.88	-259.61	-0.01	-0.00	0.00	7651.81
	8	4	-40.85	-156.66	-0.01	-0.00	0.20	1520.74
		9	45.29	156.66	0.01	0.00	-0.00	-5251.19
	9	4	-40.86	165.96	0.00	0.00	-0.08	950.99
		9	45.30	-165.96	-0.00	-0.00	0.00	3001.02

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MARLBOROUGH PROJECT

-- PAGE NO. 13

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- POUN INCH (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
5	5	6	-77.44	-210.99	0.00	-0.00	0.00	-5131.61
		5	78.77	215.28	-0.00	0.00	-0.00	0.00
	6	6	-13.76	-69.43	-0.00	-0.00	0.00	-1723.23
		5	15.08	73.72	0.00	0.00	0.00	0.00
	7	6	-7.99	253.99	0.00	0.00	-0.00	6085.80
		5	8.75	-251.54	-0.00	-0.00	-0.00	-0.00
	8	6	-61.52	-191.75	-0.00	-0.00	0.00	-4668.46
		5	62.85	196.04	0.00	0.00	0.00	0.00
	9	6	-61.62	38.88	0.00	0.00	-0.00	884.45
		5	62.95	-34.59	-0.00	-0.00	-0.00	-0.00
6	5	7	-25.27	-42.48	-0.00	-0.00	-0.00	-6205.96
		6	26.60	46.77	0.00	0.00	0.00	5131.61
	6	7	-4.13	3.58	-0.00	0.00	0.00	-1688.57
		6	5.46	0.70	0.00	-0.00	-0.00	1723.23
	7	7	-2.50	32.53	0.00	0.00	-0.00	6839.60
		6	3.26	-30.08	-0.00	-0.00	0.00	-6085.80
	8	7	-19.99	-26.15	-0.00	-0.00	0.00	-5349.80
		6	21.32	30.44	0.00	0.00	-0.00	4668.46
	9	7	-20.09	-6.38	0.00	0.00	-0.00	679.19
		6	21.42	10.67	-0.00	-0.00	0.00	-884.45
7	5	8	26.89	126.04	-0.00	-0.00	-0.00	-3223.03
		7	-25.56	-121.75	0.00	0.00	0.00	6205.96
	6	8	5.49	76.60	0.00	-0.00	0.00	103.98
		7	-4.16	-72.31	-0.00	0.00	-0.00	1688.57
	7	8	3.00	-188.92	-0.00	0.00	-0.00	2261.44
		7	-2.24	191.37	0.00	-0.00	0.00	-6839.60
	8	8	21.54	139.45	0.00	-0.00	0.00	-2043.99
		7	-20.21	-135.16	-0.00	0.00	-0.00	5349.80
	9	8	21.43	-51.64	-0.00	0.00	-0.00	-615.73
		7	-20.11	55.93	0.00	-0.00	0.00	-679.19
8	5	9	79.06	294.55	0.00	-0.00	-0.00	3817.19
		8	-77.73	-290.26	-0.00	0.00	0.00	3223.03
	6	9	15.12	149.61	0.00	-0.00	-0.00	3654.44
		8	-13.79	-145.32	-0.00	0.00	-0.00	-103.98
	7	9	8.50	-410.38	-0.00	0.00	0.00	-7648.74
		8	-7.74	412.83	0.00	-0.00	0.00	-2261.44
	8	9	63.07	305.05	0.00	-0.00	-0.00	5248.99
		8	-61.74	-300.76	-0.00	0.00	-0.00	2043.99
	9	9	62.96	-96.90	-0.00	0.00	0.00	-3000.35
		8	-61.64	101.19	0.00	-0.00	0.00	615.73
9	5	11	-47.89	-419.49	-0.00	0.00	0.03	-10151.60
		10	49.22	423.78	0.00	-0.00	0.00	0.00

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MARLBOROUGH PROJECT

-- PAGE NO. 14

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- POUN INCH (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
6	11	11	293.48	-156.52	-0.00	0.00	0.08	-3820.05
		10	-292.15	160.80	0.00	-0.00	0.00	0.00
	7	11	-747.56	538.05	0.01	-0.00	-0.12	12925.16
		10	748.32	-535.60	-0.01	0.00	-0.00	-0.00
	8	11	188.07	-396.40	-0.00	0.00	0.07	-9595.78
		10	-186.75	400.69	0.00	-0.00	0.00	0.00
9	11	11	-595.20	101.64	0.00	-0.00	-0.07	2395.51
		10	596.53	-97.35	-0.00	0.00	-0.00	-0.00
	10	5	55.11	-86.75	-0.00	-0.00	0.05	-12291.83
		11	-53.79	91.04	0.00	0.00	-0.03	10151.60
	6	12	311.40	-14.77	-0.00	-0.00	0.15	-4227.27
		11	-310.07	19.06	0.00	0.00	-0.08	3820.05
7	12	12	-737.34	92.66	0.00	0.00	-0.24	15126.64
		11	738.09	-90.21	-0.00	-0.00	0.12	-12925.16
	8	12	269.81	-69.48	-0.00	-0.00	0.15	-11320.27
		11	-268.48	73.77	0.00	0.00	-0.07	9595.78
	9	12	-513.48	6.81	0.00	0.00	-0.14	2507.91
		11	514.81	-2.52	-0.00	-0.00	0.07	-2395.51
11	5	13	158.11	245.99	-0.00	-0.00	0.08	-6420.86
		12	-156.79	-241.70	0.00	0.00	-0.05	12291.83
	6	13	329.32	126.95	-0.00	-0.00	0.22	-1222.25
		12	-327.99	-122.67	0.00	0.00	-0.15	4227.27
	7	13	-727.10	-352.67	0.00	0.00	-0.35	6605.89
		12	727.86	355.12	-0.00	-0.00	0.24	-15126.64
8	13	13	351.54	257.42	-0.00	-0.00	0.21	-5174.01
		12	-350.22	-253.13	0.00	0.00	-0.15	11320.27
	9	13	-431.75	-87.97	0.00	0.00	-0.21	338.17
		12	433.08	92.26	-0.00	-0.00	0.14	-2507.91
12	5	18	261.12	578.73	-0.00	-0.00	0.10	7461.45
		13	-259.79	-574.44	0.00	0.00	-0.08	6420.86
	6	18	347.23	268.69	-0.00	-0.00	0.25	5195.31
		13	-345.91	-264.40	0.00	0.00	-0.20	1222.25
	7	18	-716.86	-798.04	0.00	0.00	-0.40	-12637.86
		13	717.62	800.49	-0.00	-0.00	0.32	-6605.89
13	8	18	433.27	584.34	-0.00	-0.00	0.25	8843.32
		13	-431.95	-580.05	0.00	0.00	-0.20	5174.01
	9	18	-350.02	-182.78	0.00	0.00	-0.23	-4114.19
		13	351.34	187.07	-0.00	-0.00	0.19	-338.17
	5	14	920.48	-78.14	13.78	0.00	-0.03	-0.04
		15	-916.04	78.14	-13.78	-0.00	-328.02	-1860.78
6	14	14	545.98	84.21	9.12	0.01	-0.02	-0.07
		15	-541.54	-84.21	-9.12	-0.01	-217.11	2005.41

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MARLBOROUGH PROJECT

-- PAGE NO. 15

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- POUN INCH (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
7	14	15	-1119.07	-51.23	-21.09	-0.01	0.05	0.12
		15	1121.61	51.23	21.09	0.01	502.07	-1220.02
	8	14	970.82	11.35	15.71	0.01	-0.03	-0.08
		15	-966.38	-11.35	-15.71	-0.01	-374.06	270.39
	9	14	-195.02	-94.60	-6.00	-0.01	0.01	0.07
		15	199.46	94.60	6.00	0.01	142.96	-2252.77
14	5	15	891.18	-78.18	13.80	0.02	328.01	1860.72
		16	-886.74	78.18	-13.80	-0.02	-656.69	-3722.35
	6	15	516.67	-8.30	9.14	0.05	217.09	-2005.54
		16	-512.23	8.30	-9.14	-0.05	-434.64	1807.80
	7	15	-1135.82	71.32	-21.13	-0.08	-502.04	1220.23
		16	1138.36	-71.32	21.13	0.08	1005.13	478.12
	8	15	941.52	-58.06	15.74	0.05	374.04	-270.53
		16	-937.08	58.06	-15.74	-0.05	-748.85	-1112.01
	9	15	-224.33	-2.71	-6.02	-0.04	-142.95	2252.88
		16	228.77	2.71	6.02	0.04	286.20	-2317.49
15	5	16	861.85	-78.23	-13.76	0.06	656.80	3720.55
		17	-857.41	78.23	13.76	-0.06	-329.06	-5583.51
	6	16	487.34	-100.88	-9.11	0.12	434.71	-1816.18
		17	-482.90	100.88	9.11	-0.12	-217.83	-586.01
	7	16	-1152.59	193.97	21.06	-0.21	-1005.29	-465.60
		17	1155.12	-193.97	-21.06	0.21	503.71	5084.41
	8	16	912.19	-127.53	-15.69	0.13	748.97	1104.54
		17	-907.75	127.53	15.69	-0.13	-375.27	-4141.29
	9	16	-253.66	89.23	6.00	-0.11	-286.25	2325.59
		17	258.10	-89.23	-6.00	0.11	143.45	-200.81
16	5	17	832.55	-78.28	-13.82	0.09	329.11	5583.56
		18	-828.11	78.28	13.82	-0.09	-0.14	-7447.72
	6	17	458.04	-193.50	-9.14	0.22	217.86	585.95
		18	-453.60	193.50	9.14	-0.22	-0.16	-5193.57
	7	17	-1169.35	316.66	21.14	-0.36	-503.79	-5084.36
		18	1171.88	-316.66	-21.14	0.36	0.30	12624.81
	8	17	882.89	-197.02	-15.75	0.22	375.33	4141.28
		18	-878.45	197.02	15.75	-0.22	-0.21	-8832.89
	9	17	-282.97	181.21	6.02	-0.21	-143.47	200.88
		18	287.41	-181.21	-6.02	0.21	0.13	4114.28
17	5	45	-47.89	-419.49	0.00	-0.00	-0.03	-10151.57
		44	49.22	423.78	-0.00	0.00	-0.00	0.00
	6	45	293.52	-156.52	0.00	-0.00	-0.07	-3820.03
		44	-292.19	160.80	-0.00	0.00	-0.00	0.00
	7	45	-747.62	538.05	-0.01	0.00	0.12	12925.11
		44	748.37	-535.60	0.01	-0.00	0.00	-0.00

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MARLBOROUGH PROJECT

-- PAGE NO. 16

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- POUN INCH (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	8	45	188.11	-396.40	0.00	-0.00	-0.07	-9595.75
		44	-186.78	400.69	-0.00	0.00	-0.00	0.00
	9	45	-595.24	101.64	-0.00	0.00	0.07	2395.49
		44	596.57	-97.35	0.00	-0.00	0.00	-0.00
18	5	46	55.11	-86.75	0.00	0.00	-0.05	-12291.79
		45	-53.79	91.04	-0.00	-0.00	0.03	10151.57
	6	46	311.44	-14.77	0.00	0.00	-0.15	-4227.24
		45	-310.11	19.06	-0.00	-0.00	0.07	3820.03
	7	46	-737.39	92.66	-0.00	-0.00	0.24	15126.57
		45	738.15	-90.21	0.00	0.00	-0.12	-12925.11
	8	46	269.84	-69.48	0.00	0.00	-0.14	-11320.23
		45	-268.51	73.77	-0.00	-0.00	0.07	9595.75
	9	46	-513.52	6.81	-0.00	-0.00	0.14	2507.89
		45	514.85	-2.52	0.00	0.00	-0.07	-2395.49
	19	47	158.11	245.99	0.00	0.00	-0.08	-6420.84
		46	-156.79	-241.70	-0.00	-0.00	0.05	12291.79
	6	47	329.36	126.95	0.00	0.00	-0.22	-1222.23
		46	-328.03	-122.67	-0.00	-0.00	0.15	4227.24
	7	47	-727.16	-352.67	-0.00	-0.00	0.35	6605.85
		46	727.91	355.12	0.00	0.00	-0.24	-15126.57
	8	47	351.57	257.42	0.00	0.00	-0.21	-5173.98
		46	-350.25	-253.13	-0.00	-0.00	0.14	11320.23
	9	47	-431.79	-87.97	-0.00	-0.00	0.21	338.16
		46	433.12	92.26	0.00	0.00	-0.14	-2507.89
	20	52	261.12	578.73	0.00	0.00	-0.10	7461.42
		47	-259.79	-574.44	-0.00	-0.00	0.08	6420.84
	6	52	347.27	268.69	0.00	0.00	-0.25	5195.32
		47	-345.95	-264.40	-0.00	-0.00	0.20	1222.23
	7	52	-716.91	-798.04	-0.00	-0.00	0.40	-12637.86
		47	717.67	800.49	0.00	0.00	-0.32	-6605.85
	8	52	433.30	584.33	0.00	0.00	-0.25	8843.31
		47	-431.98	-580.05	-0.00	-0.00	0.20	5173.98
	9	52	-350.06	-182.78	-0.00	-0.00	0.23	-4114.20
		47	351.38	187.07	0.00	0.00	-0.19	-338.16
21	5	48	920.48	-78.14	-13.78	-0.00	0.03	-0.04
		49	-916.04	78.14	13.78	0.00	328.03	-1860.77
	6	48	545.99	84.21	-9.12	-0.01	0.02	-0.07
		49	-541.55	-84.21	9.12	0.01	217.04	2005.44
	7	48	-1119.09	-51.23	21.08	0.01	-0.05	0.12
		49	1121.62	51.23	-21.08	-0.01	-501.98	-1220.06
	8	48	970.83	11.35	-15.71	-0.01	0.03	-0.08
		49	-966.39	-11.35	15.71	0.01	374.01	270.42

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MARLBOROUGH PROJECT

-- PAGE NO. 17

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- POUN INCH (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
9	48		-195.03	-94.60	6.00	0.01	-0.01	0.07
		49	199.47	94.60	-6.00	-0.01	-142.89	-2252.79
22	5	49	891.17	-78.18	-13.80	-0.02	-328.01	1860.71
		50	-886.73	78.18	13.80	0.02	656.69	-3722.34
	6	49	516.68	-8.30	-9.13	-0.05	-217.02	-2005.56
		50	-512.24	8.30	9.13	0.05	434.49	1807.85
	7	49	-1135.84	71.32	21.12	0.08	501.95	1220.27
		50	1138.37	-71.32	-21.12	-0.08	-1004.94	478.04
	8	49	941.52	-58.06	-15.74	-0.05	-373.98	-270.55
		50	-937.08	58.06	15.74	0.05	748.74	-1111.96
	9	49	-224.34	-2.71	6.01	0.04	142.88	2252.91
		50	228.78	2.71	-6.01	-0.04	-286.06	-2317.54
23	5	50	861.85	-78.23	13.76	-0.06	-656.80	3720.54
		51	-857.41	78.23	-13.76	0.06	329.07	-5583.50
	6	50	487.35	-100.88	9.10	-0.12	-434.57	-1816.15
		51	-482.91	100.88	-9.10	0.12	217.76	-586.00
	7	50	-1152.60	193.96	-21.06	0.20	1005.10	-465.63
		51	1155.14	-193.96	21.06	-0.20	-503.62	5084.38
	8	50	912.19	-127.53	15.69	-0.13	-748.87	1104.55
		51	-907.76	127.53	-15.69	0.13	375.22	-4141.27
	9	50	-253.67	89.23	-5.99	0.11	286.11	2325.56
		51	258.11	-89.23	5.99	-0.11	-143.38	-200.82
24	5	51	832.55	-78.28	13.82	-0.09	-329.11	5583.54
		52	-828.11	78.28	-13.82	0.09	0.14	-7447.70
	6	51	458.05	-193.49	9.14	-0.22	-217.79	585.95
		52	-453.61	193.49	-9.14	0.22	0.16	-5193.50
	7	51	-1169.36	316.66	-21.14	0.36	503.69	-5084.34
		52	1171.90	-316.66	21.14	-0.36	-0.30	12624.70
	8	51	882.89	-197.02	15.75	-0.22	-375.27	4141.26
		52	-878.45	197.02	-15.75	0.22	0.21	-8832.82
	9	51	-282.99	181.21	-6.02	0.21	143.40	200.88
		52	287.43	-181.21	6.02	-0.21	-0.13	4114.21
25	5	54	-77.44	-210.99	-0.00	0.00	-0.00	-5131.64
		53	78.77	215.28	0.00	-0.00	0.00	0.00
	6	54	-13.76	-69.43	0.00	0.00	-0.00	-1723.24
		53	15.08	73.72	-0.00	-0.00	-0.00	0.00
	7	54	-7.99	253.99	-0.00	-0.00	0.00	6085.84
		53	8.75	-251.54	0.00	0.00	0.00	-0.00
	8	54	-61.53	-191.76	0.00	0.00	-0.00	-4668.49
		53	62.85	196.04	-0.00	-0.00	-0.00	0.00
	9	54	-61.62	38.88	-0.00	-0.00	0.00	884.46
		53	62.95	-34.59	0.00	0.00	0.00	-0.00

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MARLBOROUGH PROJECT

-- PAGE NO. 18

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- POUN INCH (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
26	5	55	-25.27	-42.48	0.00	0.00	0.00	-6206.00
		54	26.60	46.77	-0.00	-0.00	-0.00	5131.64
	6	55	-4.13	3.58	0.00	-0.00	-0.00	-1688.58
		54	5.46	0.70	-0.00	0.00	0.00	1723.24
	7	55	-2.50	32.53	-0.00	-0.00	0.00	6839.65
		54	3.26	-30.08	0.00	0.00	-0.00	-6085.84
	8	55	-19.99	-26.15	0.00	0.00	-0.00	-5349.83
		54	21.32	30.44	-0.00	-0.00	0.00	4668.49
	9	55	-20.09	-6.38	-0.00	-0.00	0.00	679.20
		54	21.42	10.67	0.00	0.00	-0.00	-884.46
27	5	56	26.89	126.04	0.00	0.00	0.00	-3223.05
		55	-25.56	-121.75	-0.00	-0.00	-0.00	6206.00
	6	56	5.49	76.60	-0.00	0.00	-0.00	103.98
		55	-4.16	-72.31	0.00	-0.00	0.00	1688.58
	7	56	3.00	-188.92	0.00	-0.00	0.00	2261.45
		55	-2.24	191.37	-0.00	0.00	-0.00	-6839.65
	8	56	21.54	139.45	-0.00	0.00	-0.00	-2044.00
		55	-20.21	-135.16	0.00	-0.00	0.00	5349.83
	9	56	21.43	-51.64	0.00	-0.00	0.00	-615.73
		55	-20.11	55.93	-0.00	0.00	-0.00	-679.20
28	5	61	79.06	294.55	-0.00	0.00	0.00	3817.22
		56	-77.73	-290.26	0.00	-0.00	-0.00	3223.05
	6	61	15.12	149.61	-0.00	0.00	0.00	3654.46
		56	-13.79	-145.32	0.00	-0.00	0.00	-103.98
	7	61	8.50	-410.38	0.00	-0.00	-0.00	-7648.79
		56	-7.74	412.83	-0.00	0.00	-0.00	-2261.45
	8	61	63.07	305.05	-0.00	0.00	0.00	5249.02
		56	-61.74	-300.76	0.00	-0.00	0.00	2044.00
	9	61	62.96	-96.90	0.00	-0.00	-0.00	-3000.37
		56	-61.64	101.19	-0.00	0.00	-0.00	615.73
29	5	57	45.30	-40.10	-0.01	0.00	-0.00	0.00
		58	-40.86	40.10	0.01	-0.00	0.18	-954.87
	6	57	45.30	97.00	-0.00	0.00	-0.00	0.00
		58	-40.86	-97.00	0.00	-0.00	0.12	2309.71
	7	57	25.88	-98.94	0.01	-0.00	0.00	-0.00
		58	-23.34	98.94	-0.01	0.00	-0.27	-2356.07
	8	57	45.30	46.40	-0.01	0.00	-0.00	0.00
		58	-40.86	-46.40	0.01	-0.00	0.20	1104.86
	9	57	45.29	-102.95	0.00	-0.00	0.00	-0.00
		58	-40.85	102.95	-0.00	0.00	-0.08	-2451.52
30	5	58	16.58	-40.10	-0.00	0.00	-0.19	954.87
		59	-12.14	40.10	0.00	-0.00	0.26	-1909.74

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MARLBOROUGH PROJECT

-- PAGE NO. 19

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- POUN INCH (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	6	58	16.58	6.75	-0.00	0.00	-0.12	-2309.71
		59	-12.14	-6.75	0.00	-0.00	0.17	2470.39
	7	58	9.47	20.58	0.00	-0.00	0.28	2356.07
		59	-6.94	-20.58	-0.00	0.00	-0.39	-1866.12
	8	58	16.58	-21.29	-0.00	0.00	-0.21	-1104.86
		59	-12.14	21.29	0.00	-0.00	0.29	597.95
	9	58	16.58	-13.31	0.00	-0.00	0.08	2451.52
		59	-12.14	13.31	-0.00	0.00	-0.11	-2768.52
31	5	59	-12.14	-40.10	0.00	0.00	-0.26	1909.74
		60	16.58	40.10	-0.00	-0.00	0.19	-2864.61
	6	59	-12.14	-83.50	0.00	0.00	-0.17	-2470.39
		60	16.58	83.50	-0.00	-0.00	0.12	482.02
	7	59	-6.93	140.09	-0.00	-0.00	0.39	1866.12
		60	9.47	-140.09	0.00	0.00	-0.28	1469.85
	8	59	-12.14	-88.97	0.00	0.00	-0.29	-597.95
		60	16.58	88.97	-0.00	-0.00	0.21	-1520.75
	9	59	-12.14	76.33	-0.00	-0.00	0.11	2768.52
		60	16.58	-76.33	0.00	0.00	-0.08	-951.00
32	5	60	-40.85	-40.10	0.01	0.00	-0.18	2864.61
		61	45.29	40.10	-0.01	-0.00	0.00	-3819.48
	6	60	-40.85	-173.75	0.00	0.00	-0.12	-482.02
		61	45.29	173.75	-0.00	-0.00	0.00	-3655.38
	7	60	-23.35	259.61	-0.01	-0.00	0.27	-1469.85
		61	25.88	-259.61	0.01	0.00	-0.00	7651.85
	8	60	-40.85	-156.66	0.01	0.00	-0.20	1520.75
		61	45.29	156.66	-0.01	-0.00	0.00	-5251.23
	9	60	-40.86	165.96	-0.00	-0.00	0.08	951.00
		61	45.30	-165.96	0.00	0.00	-0.00	3001.04
33	5	25	-94.94	-499.23	0.00	0.00	-0.00	-12098.93
		24	96.97	505.79	-0.00	-0.00	-0.00	0.00
	6	25	1133.55	-212.74	0.00	0.00	-0.02	-5201.06
		24	-1131.52	219.30	-0.00	-0.00	-0.00	-0.00
	7	25	-1833.39	667.99	-0.00	-0.00	0.03	16038.04
		24	1834.55	-664.25	0.00	0.00	0.00	-0.00
	8	25	786.14	-490.50	0.00	0.00	-0.02	-11888.74
		24	-784.11	497.06	-0.00	-0.00	-0.00	0.00
	9	25	-1443.69	142.10	-0.00	-0.00	0.02	3342.28
		24	1445.72	-135.54	0.00	0.00	0.00	0.00
34	5	26	8.78	-164.23	0.00	0.00	-0.01	-16131.87
		25	-6.75	170.78	-0.00	-0.00	0.00	12098.93
	6	26	1152.18	-68.69	0.00	0.00	-0.05	-6933.82
		25	-1150.15	75.25	-0.00	-0.00	0.02	5201.06

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MARLBOROUGH PROJECT

-- PAGE NO. 20

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- POUN INCH (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
7	26	26	-1822.77	223.85	-0.00	-0.00	0.07	21382.57
		25	1823.93	-220.11	0.00	0.00	-0.03	-16038.04
	25	26	868.58	-161.29	0.00	0.00	-0.04	-15850.94
		25	-866.55	167.85	-0.00	-0.00	0.02	11888.74
	26	26	-1361.26	49.51	-0.00	-0.00	0.05	4455.29
		25	1363.29	-42.95	0.00	0.00	-0.02	-3342.28
35	5	27	112.48	170.78	0.00	0.00	-0.01	-12098.93
		26	-110.45	-164.22	-0.00	-0.00	0.01	16131.87
	6	27	1170.80	75.27	0.00	-0.00	-0.07	-5200.51
		26	-1168.77	-68.71	-0.00	0.00	0.05	6933.82
	7	27	-1812.13	-220.14	-0.00	0.00	0.09	16037.17
		26	1813.29	223.89	0.00	-0.00	-0.07	-21382.57
	8	27	951.01	167.86	0.00	0.00	-0.05	-11888.33
		26	-948.98	-161.30	-0.00	-0.00	0.04	15850.94
	9	27	-1278.83	-42.98	-0.00	0.00	0.07	3341.63
		26	1280.86	49.53	0.00	-0.00	-0.05	-4455.29
36	5	28	216.18	505.79	-0.00	0.00	0.00	0.00
		27	-214.15	-499.23	0.00	-0.00	0.00	12098.93
	6	28	1189.42	219.28	-0.00	-0.00	0.00	0.00
		27	-1187.39	-212.72	0.00	0.00	0.01	5200.51
	7	28	-1801.49	-664.21	0.00	0.00	0.00	0.00
		27	1802.65	667.96	-0.00	-0.00	-0.02	-16037.17
	8	28	1033.45	497.05	-0.00	-0.00	0.00	0.00
		27	-1031.42	-490.49	0.00	0.00	0.01	11888.33
	9	28	-1196.40	-135.51	0.00	0.00	0.00	0.00
		27	1198.43	142.07	-0.00	-0.00	-0.01	-3341.63
37	5	30	-273.73	-499.23	-0.00	-0.00	0.00	-12098.94
		29	275.76	505.79	0.00	0.00	-0.00	0.00
	6	30	-356.35	-212.73	-0.00	-0.00	0.00	-5200.73
		29	358.38	219.28	0.00	0.00	-0.00	0.00
	7	30	274.74	667.97	0.00	0.00	-0.00	16037.61
		29	-273.58	-664.23	-0.00	-0.00	0.00	-0.00
	8	30	-446.53	-490.49	-0.00	-0.00	0.00	-11888.50
		29	448.56	497.05	0.00	0.00	-0.00	0.00
	9	30	10.05	142.08	0.00	0.00	-0.00	3341.95
		29	-8.02	-135.52	-0.00	-0.00	0.00	-0.00
38	5	31	-170.02	-164.23	-0.00	-0.00	0.00	-16132.02
		30	172.05	170.79	0.00	0.00	-0.00	12098.94
	6	31	-337.72	-68.73	-0.00	-0.00	0.00	-6934.56
		30	339.75	75.29	0.00	0.00	-0.00	5200.73
	7	31	285.36	223.92	0.00	0.00	-0.00	21383.67
		30	-284.20	-220.17	-0.00	-0.00	0.00	-16037.61

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MARLBOROUGH PROJECT

-- PAGE NO. 21

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- POUN INCH (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	8	31	-364.09	-161.32	-0.00	-0.00	0.00	-15851.59
		30	366.12	167.88	0.00	0.00	-0.00	11888.50
	9	31	92.47	49.55	0.00	0.00	-0.00	4456.00
		30	-90.44	-42.99	-0.00	-0.00	0.00	-3341.95
39	5	32	-66.32	170.78	-0.00	-0.00	0.00	-12099.02
		31	68.35	-164.23	0.00	0.00	-0.00	16132.02
	6	32	-319.10	75.28	-0.00	-0.00	0.00	-5200.89
		31	321.13	-68.73	0.00	0.00	-0.00	6934.56
	7	32	296.00	-220.16	0.00	0.00	-0.00	16037.75
		31	-294.84	223.91	-0.00	-0.00	0.00	-21383.67
	8	32	-281.66	167.87	-0.00	-0.00	0.00	-11888.67
		31	283.69	-161.32	0.00	0.00	-0.00	15851.59
	9	32	174.91	-42.99	0.00	0.00	-0.00	3342.00
		31	-172.88	49.55	-0.00	-0.00	0.00	-4456.00
40	5	33	37.39	505.80	0.00	0.00	0.00	0.00
		32	-35.36	-499.24	-0.00	-0.00	-0.00	12099.02
	6	33	-300.47	219.29	0.00	-0.00	0.00	0.00
		32	302.50	-212.73	-0.00	0.00	-0.00	5200.89
	7	33	306.63	-664.23	-0.00	0.00	0.00	0.00
		32	-305.47	667.98	0.00	-0.00	0.00	-16037.75
	8	33	-199.22	497.06	0.00	-0.00	0.00	0.00
		32	201.25	-490.50	-0.00	0.00	-0.00	11888.67
	9	33	257.34	-135.53	-0.00	0.00	0.00	0.00
		32	-255.30	142.08	0.00	-0.00	0.00	-3342.00
41	5	35	-94.94	-499.23	-0.00	-0.00	0.00	-12098.89
		34	96.97	505.79	0.00	0.00	0.00	0.00
	6	35	1130.90	-212.74	-0.00	-0.00	0.02	-5201.04
		34	-1128.87	219.30	0.00	0.00	0.00	-0.00
	7	35	-1829.84	667.99	0.00	0.00	-0.03	16037.99
		34	1831.00	-664.24	-0.00	-0.00	-0.00	-0.00
	8	35	784.14	-490.50	-0.00	-0.00	0.02	-11888.70
		34	-782.11	497.06	0.00	0.00	0.00	0.00
	9	35	-1441.02	142.10	0.00	0.00	-0.02	3342.27
		34	1443.05	-135.54	-0.00	-0.00	-0.00	0.00
42	5	36	8.78	-164.23	-0.00	-0.00	0.01	-16131.82
		35	-6.75	170.78	0.00	0.00	-0.00	12098.89
	6	36	1149.52	-68.69	-0.00	-0.00	0.05	-6933.80
		35	-1147.49	75.25	0.00	0.00	-0.02	5201.04
	7	36	-1819.22	223.85	0.00	0.00	-0.07	21382.50
		35	1820.38	-220.11	-0.00	-0.00	0.03	-16037.99
	8	36	866.59	-161.29	-0.00	-0.00	0.04	-15850.89
		35	-864.56	167.85	0.00	0.00	-0.02	11888.70

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MARLBOROUGH PROJECT

-- PAGE NO. 22

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- POUN INCH (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	9	36	-1358.60	49.51	0.00	0.00	-0.05	4455.27
		35	1360.63	-42.95	-0.00	-0.00	0.02	-3342.27
43	5	37	112.48	170.78	-0.00	-0.00	0.01	-12098.89
		36	-110.45	-164.22	0.00	0.00	-0.01	16131.82
	6	37	1168.15	75.27	-0.00	0.00	0.07	-5200.49
		36	-1166.12	-68.71	0.00	-0.00	-0.05	6933.80
	7	37	-1808.58	-220.14	0.00	-0.00	-0.09	16037.12
		36	1809.74	223.89	-0.00	0.00	0.07	-21382.50
	8	37	949.02	167.86	-0.00	-0.00	0.05	-11888.29
		36	-946.99	-161.30	0.00	0.00	-0.04	15850.89
	9	37	-1276.17	-42.98	0.00	-0.00	-0.07	3341.62
		36	1278.20	49.53	-0.00	0.00	0.05	-4455.27
44	5	38	216.18	505.79	0.00	-0.00	0.00	0.00
		37	-214.15	-499.23	-0.00	0.00	-0.00	12098.89
	6	38	1186.77	219.27	0.00	0.00	0.00	0.00
		37	-1184.74	-212.72	-0.00	-0.00	-0.01	5200.49
	7	38	-1797.94	-664.21	-0.00	-0.00	0.00	0.00
		37	1799.10	667.95	0.00	0.00	0.02	-16037.12
	8	38	1031.45	497.04	0.00	0.00	0.00	0.00
		37	-1029.42	-490.49	-0.00	-0.00	-0.01	11888.29
	9	38	-1193.73	-135.51	-0.00	-0.00	0.00	0.00
		37	1195.76	142.07	0.00	0.00	0.01	-3341.62
45	5	9	-204.74	13.68	0.00	2.27	0.00	0.00
		18	204.74	13.68	-0.00	-2.27	0.00	0.00
	6	9	-135.53	13.68	0.00	0.92	0.00	0.00
		18	135.53	13.68	-0.00	-0.92	0.00	0.00
	7	9	313.41	7.82	-0.00	-3.07	0.00	0.00
		18	-313.41	7.82	0.00	3.07	0.00	0.00
	8	9	-233.49	13.68	0.00	2.21	0.00	0.00
		18	233.49	13.68	-0.00	-2.21	0.00	0.00
	9	9	89.25	13.68	-0.00	-0.67	0.00	0.00
		18	-89.25	13.68	0.00	0.67	0.00	0.00
46	5	19	1161.29	-334.11	-0.17	0.00	-0.04	0.03
		20	-1148.04	334.11	0.17	-0.00	4.02	-7955.91
	6	19	832.71	-221.14	208.02	0.01	-0.07	0.02
		20	-819.46	221.14	-105.63	-0.01	-3734.26	-5265.89
	7	19	-1695.32	511.39	-277.99	-0.01	0.12	-0.04
		20	1702.89	-511.39	141.07	0.01	4989.36	12177.56
	8	19	1346.45	-381.00	155.90	0.01	-0.08	0.03
		20	-1333.19	381.00	-79.11	-0.01	-2798.03	-9072.57
	9	19	-453.75	145.62	-208.61	-0.01	0.07	-0.01
		20	467.01	-145.62	105.92	0.01	3744.91	3467.59

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MARLBOROUGH PROJECT

-- PAGE NO. 23

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- POUN INCH (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
47	5	20	1147.45	-334.09	-0.13	0.02	-4.08	7955.92
		21	-1134.19	334.09	0.13	-0.02	7.24	-15911.34
	6	20	818.86	-221.13	103.49	0.05	3734.13	5265.90
		21	-805.61	221.13	-1.10	-0.05	-4979.37	-10531.47
	7	20	-1703.23	511.36	-138.27	-0.08	-4989.15	-12177.58
		21	1710.81	-511.36	1.35	0.08	6651.49	24354.40
	8	20	1332.60	-380.98	77.53	0.05	2797.89	9072.58
		21	-1319.35	380.98	-0.73	-0.05	-3729.72	-18144.60
	9	20	-467.60	145.61	-103.80	-0.05	-3744.79	-3467.60
		21	480.85	-145.61	1.11	0.05	4993.82	6934.98
48	5	21	1133.57	-361.66	-0.08	0.06	-9.04	15911.23
		22	-1120.32	361.66	0.08	-0.06	10.87	-24523.33
	6	21	804.99	-239.38	-0.98	0.12	4970.99	10531.40
		22	-791.74	239.38	103.38	-0.12	-3728.49	-16231.57
	7	21	-1711.15	553.57	1.36	-0.21	-6638.97	-24354.23
		22	1718.73	-553.57	-138.28	0.21	4976.39	37536.11
	8	21	1318.73	-412.42	-0.79	0.13	3722.25	18144.47
		22	-1305.48	412.42	77.58	-0.13	-2789.16	-27965.29
	9	21	-481.47	157.63	0.96	-0.12	-4985.73	-6934.93
		22	494.72	-157.63	-103.66	0.12	3740.11	10688.47
49	5	22	1119.72	-361.72	-0.03	0.09	-10.83	24523.29
		23	-1106.47	361.72	0.03	-0.09	11.46	-33136.80
	6	22	791.14	-239.42	-105.41	0.22	3728.43	16231.54
		23	-777.89	239.42	207.81	-0.22	0.82	-21932.64
	7	22	-1719.05	553.66	140.94	-0.37	-4976.35	-37536.05
		23	1726.62	-553.66	-277.86	0.37	-9.97	50720.09
	8	22	1304.88	-412.49	-79.08	0.23	2789.15	27965.25
		23	-1291.62	412.49	155.87	-0.23	8.22	-37787.68
	9	22	-495.31	157.65	105.68	-0.21	-3740.04	-10688.45
		23	508.56	-157.65	-208.38	0.21	0.76	14442.61
50	5	23	143.16	1106.14	-0.01	0.00	0.10	33136.91
		28	-143.16	-1079.45	0.01	-0.00	0.53	19280.70
	6	23	94.74	777.57	-208.90	-0.01	0.28	21932.72
		28	-94.74	-750.88	314.48	0.01	12612.54	14724.43
	7	23	-219.11	-1726.80	279.30	0.01	-0.45	-50720.27
		28	219.11	1742.05	-420.49	-0.01	-16863.44	-32474.10
	8	23	163.25	1291.30	-156.68	-0.01	0.27	37787.81
		28	-163.25	-1264.60	235.87	0.01	9459.78	23511.14
	9	23	-62.38	-508.88	209.47	0.01	-0.27	-14442.66
		28	62.38	535.57	-315.35	-0.01	-12647.19	-10606.73
51	5	28	143.16	360.43	56.93	0.00	-0.52	-19280.69
		33	-143.16	-333.07	-56.93	-0.00	-2798.47	36329.28

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-- PAGE NO. 24

MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- POUN INCH (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
6	28	33	94.74	121.57	440.90	-0.01	-12612.46	-14724.40
		33	-94.74	-94.21	-335.19	0.01	-6466.55	20028.81
	7	28	-219.11	-362.32	-626.47	0.01	16863.32	32474.06
		33	219.11	377.95	485.12	-0.01	10463.34	-50672.41
	8	28	163.24	318.19	367.37	-0.01	-9459.71	-23511.12
		33	-163.24	-290.83	-288.09	0.01	-6653.63	38482.88
9	28	33	-62.38	-16.88	-429.30	0.01	12647.10	10606.70
		33	62.38	44.24	323.29	-0.01	5854.06	-12109.37
52	5	33	143.16	-333.08	-56.93	-0.00	2798.47	-36329.28
		38	-143.16	360.44	56.93	0.00	0.52	19280.23
	6	33	94.74	-94.52	-332.70	-0.01	6466.55	-20028.81
		38	-94.74	121.89	438.40	0.01	12489.77	14708.69
	7	33	-219.11	378.38	481.78	0.01	-10463.34	50672.41
		38	219.11	-362.75	-623.13	-0.01	-16699.26	-32452.75
	8	33	163.24	-291.07	-286.21	-0.01	6653.63	-38482.88
		38	-163.24	318.44	365.50	0.01	9367.69	23499.04
	9	33	-62.38	44.56	320.78	0.01	-5854.06	12109.37
		38	62.38	-17.20	-426.80	-0.01	-12524.06	-10591.05
53	5	38	143.16	-1079.45	0.01	-0.00	-0.53	-19280.23
		43	-143.16	1106.15	-0.01	0.00	-0.10	-33136.95
	6	38	94.74	-750.41	314.44	-0.01	-12489.85	-14708.72
		43	-94.74	777.10	-208.86	0.01	-0.28	-21925.56
	7	38	-219.11	1741.43	-420.43	0.01	16699.38	32452.78
		43	219.11	-1726.17	279.25	-0.01	0.44	50710.71
	8	38	163.25	-1264.26	235.84	-0.01	-9367.76	-23499.06
		43	-163.25	1290.95	-156.66	0.01	-0.27	-37782.46
	9	38	-62.38	535.10	-315.32	0.01	12524.14	10591.07
		43	62.38	-508.41	209.43	-0.01	0.26	14435.47
54	5	39	1161.29	-334.11	0.17	-0.00	0.04	0.03
		40	-1148.04	334.11	-0.17	0.00	-4.02	-7955.92
	6	39	832.24	-221.07	-208.02	-0.01	0.07	0.02
		40	-818.99	221.07	105.62	0.01	3734.25	-5264.18
	7	39	-1694.70	511.30	277.99	0.01	-0.12	-0.04
		40	1702.27	-511.30	-141.07	-0.01	-4989.34	12175.27
	8	39	1346.10	-380.95	-155.90	-0.01	0.08	0.03
		40	-1332.85	380.95	79.11	0.01	2798.02	-9071.29
	9	39	-453.28	145.55	208.61	0.01	-0.07	-0.01
		40	466.54	-145.55	-105.92	-0.01	-3744.89	3465.87
55	5	40	1147.45	-334.09	0.13	-0.02	4.08	7955.92
		41	-1134.20	334.09	-0.13	0.02	-7.24	-15911.36
	6	40	818.40	-221.05	-103.49	-0.05	-3734.12	5264.18
		41	-805.15	221.05	1.10	0.05	4979.33	-10528.04

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MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- POUN INCH (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
7	40		-1702.61	511.27	138.27	0.08	4989.13	-12175.28
	41		1710.18	-511.27	-1.35	-0.08	-6651.44	24349.81
	40		1332.26	-380.92	-77.53	-0.05	-2797.89	9071.29
	41		-1319.00	380.92	0.73	0.05	3729.69	-18142.03
	40		-467.13	145.54	103.80	0.05	3744.78	-3465.87
	41		480.38	-145.54	-1.11	-0.05	-4993.78	6931.52
56	5	41	1133.58	-361.66	0.08	-0.06	9.04	15911.25
		42	-1120.33	361.66	-0.08	0.06	-10.87	-24523.35
	6	41	804.53	-239.30	0.98	-0.12	-4971.03	10527.96
		42	-791.28	239.30	-103.38	0.12	3728.48	-16226.27
	7	41	-1710.53	553.47	-1.36	0.21	6639.03	-24349.65
		42	1718.10	-553.47	138.28	-0.21	-4976.38	37529.04
	8	41	1318.38	-412.36	0.79	-0.13	-3722.28	18141.90
		42	-1305.13	412.36	-77.58	0.13	2789.15	-27961.33
	9	41	-481.00	157.55	-0.97	0.12	4985.77	-6931.48
		42	494.25	-157.55	103.66	-0.12	-3740.10	10683.15
	5	42	1119.72	-361.72	0.03	-0.09	10.83	24523.31
		43	-1106.47	361.72	-0.03	0.09	-11.46	-33136.83
57	6	42	790.68	-239.34	105.42	-0.22	-3728.43	16226.24
		43	-777.43	239.34	-207.81	0.22	-0.91	-21925.48
	7	42	-1718.43	553.56	-140.94	0.36	4976.34	-37528.98
		43	1726.00	-553.56	277.87	-0.36	10.10	50710.54
	8	42	1304.53	-412.43	79.08	-0.22	-2789.14	27961.29
		43	-1291.28	412.43	-155.88	0.22	-8.29	-37782.33
	9	42	-494.84	157.58	-105.69	0.21	3740.04	-10683.13
		43	508.09	-157.58	208.38	-0.21	-0.67	14435.42
	5	52	-204.74	13.68	0.00	-2.27	0.00	0.00
		61	204.74	13.68	-0.00	2.27	0.00	0.00
	6	52	-135.46	13.68	0.00	-0.92	0.00	0.00
		61	135.46	13.68	-0.00	0.92	0.00	0.00
58	7	52	313.31	7.82	-0.00	3.07	0.00	0.00
		61	-313.31	7.82	0.00	-3.07	0.00	0.00
	8	52	-233.44	13.68	0.00	-2.21	0.00	0.00
		61	233.44	13.68	-0.00	2.21	0.00	0.00
	9	52	89.18	13.68	-0.00	0.67	0.00	0.00
		61	-89.18	13.68	0.00	-0.67	0.00	0.00
	5	16	27.57	0.02	0.00	1.78	0.00	0.00
		21	-27.57	0.02	-0.00	-1.78	0.00	0.00
	6	16	18.25	0.02	0.00	8.28	0.00	0.00
		21	-18.25	0.02	-0.00	-8.28	0.00	0.00
	7	16	-42.20	0.01	-0.00	-12.37	0.00	0.00
		21	42.20	0.01	0.00	12.37	0.00	0.00

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MEMBER END FORCES STRUCTURE TYPE = SPACE

ALL UNITS ARE -- POUN INCH (LOCAL)

MEMBER	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
	8	16	31.44	0.02	0.00	7.38	0.00	0.00
		21	-31.44	0.02	-0.00	-7.38	0.00	0.00
	9	16	-12.01	0.02	-0.00	-8.00	0.00	0.00
		21	12.01	0.02	0.00	8.00	0.00	0.00
60	5	18	-218.58	0.02	0.00	-11.39	0.00	0.00
		23	218.58	0.02	-0.00	11.39	0.00	0.00
	6	18	-144.69	0.02	0.04	-0.47	0.00	0.00
		23	144.69	0.02	0.08	0.47	0.00	0.00
	7	18	334.58	0.01	-0.06	9.46	0.00	0.00
		23	-334.58	0.01	-0.11	-9.46	0.00	0.00
	8	18	-249.27	0.02	0.03	-7.91	0.00	0.00
		23	249.27	0.02	0.06	7.91	0.00	0.00
	9	18	95.28	0.02	-0.04	-1.10	0.00	0.00
		23	-95.28	0.02	-0.08	1.10	0.00	0.00
61	5	41	27.57	0.02	0.00	-1.78	0.00	0.00
		50	-27.57	0.02	-0.00	1.78	0.00	0.00
	6	41	18.24	0.02	0.00	-8.20	0.00	0.00
		50	-18.24	0.02	-0.00	8.20	0.00	0.00
	7	41	-42.19	0.01	-0.00	12.26	0.00	0.00
		50	42.19	0.01	0.00	-12.26	0.00	0.00
	8	41	31.43	0.02	0.00	-7.32	0.00	0.00
		50	-31.43	0.02	-0.00	7.32	0.00	0.00
	9	41	-12.01	0.02	-0.00	7.92	0.00	0.00
		50	12.01	0.02	0.00	-7.92	0.00	0.00
62	5	43	-218.58	0.02	0.00	11.39	0.00	0.00
		52	218.58	0.02	-0.00	-11.39	0.00	0.00
	6	43	-144.61	0.02	0.04	0.55	0.00	0.00
		52	144.61	0.02	0.08	-0.55	0.00	0.00
	7	43	334.48	0.01	-0.06	-9.57	0.00	0.00
		52	-334.48	0.01	-0.11	9.57	0.00	0.00
	8	43	-249.21	0.02	0.03	7.97	0.00	0.00
		52	249.21	0.02	0.06	-7.97	0.00	0.00
	9	43	95.20	0.02	-0.04	1.02	0.00	0.00
		52	-95.20	0.02	-0.08	-1.02	0.00	0.00

***** END OF LATEST ANALYSIS RESULT *****

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MARLBOROUGH PROJECT

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MEMBER STRESSES ALL

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MARLBOROUGH PROJECT

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MEMBER STRESSES

ALL UNITS ARE POUN/SQ INCH

MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
1	5	.0	25.0 C	0.0	0.0	25.0	22.1	0.0
		1.0	22.5 C	0.1	374.6	397.2	22.1	0.0
	6	.0	25.0 C	0.0	0.0	25.0	53.5	0.0
		1.0	22.5 C	0.1	906.0	928.6	53.5	0.0
	7	.0	14.3 C	0.0	0.0	14.3	54.6	0.0
		1.0	12.9 C	0.2	924.2	937.3	54.6	0.0
	8	.0	25.0 C	0.0	0.0	25.0	25.6	0.0
		1.0	22.5 C	0.2	433.4	456.1	25.6	0.0
	9	.0	25.0 C	0.0	0.0	25.0	56.8	0.0
		1.0	22.5 C	0.1	961.6	984.2	56.8	0.0
2	5	.0	9.1 C	0.2	374.6	383.9	22.1	0.0
		1.0	6.7 C	0.2	749.1	756.0	22.1	0.0
	6	.0	9.1 C	0.1	906.0	915.2	3.7	0.0
		1.0	6.7 C	0.1	969.0	975.9	3.7	0.0
	7	.0	5.2 C	0.2	924.2	929.6	11.4	0.0
		1.0	3.8 C	0.3	732.0	736.1	11.4	0.0
	8	.0	9.1 C	0.2	433.4	442.7	11.7	0.0
		1.0	6.7 C	0.2	234.5	241.5	11.7	0.0
	9	.0	9.1 C	0.1	961.6	970.8	7.3	0.0
		1.0	6.7 C	0.1	1086.0	1092.8	7.3	0.0
3	5	.0	6.7 T	0.2	749.1	756.0	22.1	0.0
		1.0	9.2 T	0.2	1123.7	1133.0	22.1	0.0
	6	.0	6.7 T	0.1	969.0	975.9	46.1	0.0
		1.0	9.1 T	0.1	189.1	198.3	46.1	0.0
	7	.0	3.8 T	0.3	732.0	736.1	77.3	0.0
		1.0	5.2 T	0.2	576.6	582.0	77.3	0.0
	8	.0	6.7 T	0.2	234.5	241.5	49.1	0.0
		1.0	9.2 T	0.2	596.5	605.8	49.1	0.0
	9	.0	6.7 T	0.1	1086.0	1092.8	42.1	0.0
		1.0	9.1 T	0.1	373.0	382.2	42.1	0.0

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MEMBER STRESSES

ALL UNITS ARE POUN/SQ INCH

MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
4	5	.0	22.5 T	0.1	1123.7	1146.3	22.1	0.0
		1.0	25.0 T	0.0	1498.2	1523.2	22.1	0.0
	6	.0	22.5 T	0.1	189.1	211.7	95.9	0.0
		1.0	25.0 T	0.0	1433.8	1458.8	95.9	0.0
	7	.0	12.9 T	0.2	576.6	589.7	143.3	0.0
		1.0	14.3 T	0.0	3001.5	3015.8	143.3	0.0
	8	.0	22.5 T	0.2	596.5	619.2	86.5	0.0
		1.0	25.0 T	0.0	2059.8	2084.8	86.5	0.0
	9	.0	22.5 T	0.1	373.0	395.6	91.6	0.0
		1.0	25.0 T	0.0	1177.2	1202.2	91.6	0.0
5	5	.0	42.7 T	0.0	2012.9	2055.7	116.4	0.0
		1.0	43.5 T	0.0	0.0	43.5	118.8	0.0
	6	.0	7.6 T	0.0	675.9	683.5	38.3	0.0
		1.0	8.3 T	0.0	0.0	8.3	40.7	0.0
	7	.0	4.4 T	0.0	2387.2	2391.6	140.2	0.0
		1.0	4.8 T	0.0	0.0	4.8	138.8	0.0
	8	.0	34.0 T	0.0	1831.2	1865.2	105.8	0.0
		1.0	34.7 T	0.0	0.0	34.7	108.2	0.0
	9	.0	34.0 T	0.0	346.9	380.9	21.5	0.0
		1.0	34.7 T	0.0	0.0	34.7	19.1	0.0
6	5	.0	13.9 T	0.0	2434.3	2448.3	23.4	0.0
		1.0	14.7 T	0.0	2012.9	2027.6	25.8	0.0
	6	.0	2.3 T	0.0	662.4	664.6	2.0	0.0
		1.0	3.0 T	0.0	675.9	679.0	0.4	0.0
	7	.0	1.4 T	0.0	2682.9	2684.3	18.0	0.0
		1.0	1.8 T	0.0	2387.2	2389.0	16.6	0.0
	8	.0	11.0 T	0.0	2098.5	2109.5	14.4	0.0
		1.0	11.8 T	0.0	1831.2	1843.0	16.8	0.0
	9	.0	11.1 T	0.0	266.4	277.5	3.5	0.0
		1.0	11.8 T	0.0	346.9	358.8	5.9	0.0

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MEMBER STRESSES

ALL UNITS ARE POUN/SQ INCH

MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
7	5	.0	14.8 C	0.0	1264.3	1279.1	69.6	0.0
		1.0	14.1 C	0.0	2434.3	2448.4	67.2	0.0
	6	.0	3.0 C	0.0	40.8	43.8	42.3	0.0
		1.0	2.3 C	0.0	662.4	664.7	39.9	0.0
	7	.0	1.7 C	0.0	887.1	888.7	104.3	0.0
		1.0	1.2 C	0.0	2682.9	2684.1	105.6	0.0
	8	.0	11.9 C	0.0	801.8	813.7	77.0	0.0
		1.0	11.2 C	0.0	2098.5	2109.7	74.6	0.0
	9	.0	11.8 C	0.0	241.5	253.4	28.5	0.0
		1.0	11.1 C	0.0	266.4	277.5	30.9	0.0
8	5	.0	43.6 C	0.0	1497.3	1541.0	162.6	0.0
		1.0	42.9 C	0.0	1264.3	1307.2	160.2	0.0
	6	.0	8.3 C	0.0	1433.5	1441.8	82.6	0.0
		1.0	7.6 C	0.0	40.8	48.4	80.2	0.0
	7	.0	4.7 C	0.0	3000.3	3005.0	226.5	0.0
		1.0	4.3 C	0.0	887.1	891.3	227.8	0.0
	8	.0	34.8 C	0.0	2059.0	2093.8	168.4	0.0
		1.0	34.1 C	0.0	801.8	835.8	166.0	0.0
	9	.0	34.8 C	0.0	1176.9	1211.7	53.5	0.0
		1.0	34.0 C	0.0	241.5	275.5	55.8	0.0
9	5	.0	26.4 T	0.0	3982.0	4008.5	231.5	0.0
		1.0	27.2 T	0.0	0.0	27.2	233.9	0.0
	6	.0	162.0 C	0.1	1498.4	1660.5	86.4	0.0
		1.0	161.2 C	0.0	0.0	161.2	88.7	0.0
	7	.0	412.6 T	0.1	5070.0	5482.7	297.0	0.0
		1.0	413.0 T	0.0	0.0	413.0	295.6	0.0
	8	.0	103.8 C	0.1	3764.0	3867.9	218.8	0.0
		1.0	103.1 C	0.0	0.0	103.1	221.1	0.0
	9	.0	328.5 T	0.1	939.7	1268.2	56.1	0.0
		1.0	329.2 T	0.0	0.0	329.2	53.7	0.0

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MARLBOROUGH PROJECT

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MEMBER STRESSES

ALL UNITS ARE POUN/SQ INCH

MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
10	5	.0	30.4 C	0.0	4821.6	4852.0	47.9	0.0
		1.0	29.7 C	0.0	3982.0	4011.7	50.2	0.0
	6	.0	171.9 C	0.1	1658.2	1830.2	8.2	0.0
		1.0	171.1 C	0.1	1498.4	1669.6	10.5	0.0
	7	.0	406.9 T	0.2	5933.5	6340.7	51.1	0.0
		1.0	407.4 T	0.1	5070.0	5477.4	49.8	0.0
	8	.0	148.9 C	0.1	4440.5	4589.5	38.3	0.0
		1.0	148.2 C	0.1	3764.0	3912.3	40.7	0.0
	9	.0	283.4 T	0.1	983.7	1267.3	3.8	0.0
		1.0	284.1 T	0.1	939.7	1223.8	1.4	0.0
11	5	.0	87.3 C	0.1	2518.6	2606.0	135.8	0.0
		1.0	86.5 C	0.0	4821.6	4908.1	133.4	0.0
	6	.0	181.8 C	0.2	479.4	661.4	70.1	0.0
		1.0	181.0 C	0.1	1658.2	1839.3	67.7	0.0
	7	.0	401.3 T	0.3	2591.2	2992.8	194.6	0.0
		1.0	401.7 T	0.2	5933.5	6335.4	196.0	0.0
	8	.0	194.0 C	0.2	2029.5	2223.7	142.1	0.0
		1.0	193.3 C	0.1	4440.5	4633.9	139.7	0.0
	9	.0	238.3 T	0.2	132.7	371.1	48.6	0.0
		1.0	239.0 T	0.1	983.7	1222.9	50.9	0.0
12	5	.0	144.1 C	0.1	2926.8	3071.0	319.4	0.0
		1.0	143.4 C	0.1	2518.6	2662.1	317.0	0.0
	6	.0	191.6 C	0.2	2037.9	2229.7	148.3	0.0
		1.0	190.9 C	0.2	479.4	670.5	145.9	0.0
	7	.0	395.6 T	0.3	4957.3	5353.3	440.4	0.0
		1.0	396.1 T	0.3	2591.2	2987.5	441.8	0.0
	8	.0	239.1 C	0.2	3468.9	3708.2	322.5	0.0
		1.0	238.4 C	0.2	2029.5	2268.1	320.1	0.0
	9	.0	193.2 T	0.2	1613.8	1807.2	100.9	0.0
		1.0	193.9 T	0.2	132.7	326.7	103.2	0.0

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MEMBER STRESSES

ALL UNITS ARE POUN/SQ INCH

MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
13	5	.0	508.0 C	0.0	0.0	508.1	43.1	7.6
		1.0	505.6 C	266.2	729.9	1501.7	43.1	7.6
	6	.0	301.3 C	0.0	0.0	301.4	46.5	5.0
		1.0	298.9 C	176.2	786.6	1261.7	46.5	5.0
	7	.0	617.6 T	0.0	0.0	617.7	28.3	11.6
		1.0	619.0 T	407.5	478.6	1505.1	28.3	11.6
	8	.0	535.8 C	0.0	0.0	535.9	6.3	8.7
		1.0	533.4 C	303.6	106.1	943.0	6.3	8.7
	9	.0	107.6 T	0.0	0.0	107.7	52.2	3.3
		1.0	110.1 T	116.0	883.7	1109.8	52.2	3.3
14	5	.0	491.8 C	266.2	729.9	1487.9	43.1	7.6
		1.0	489.4 C	533.0	1460.1	2482.5	43.1	7.6
	6	.0	285.2 C	176.2	786.7	1248.0	4.6	5.0
		1.0	282.7 C	352.8	709.1	1344.6	4.6	5.0
	7	.0	626.9 T	407.5	478.6	1513.0	39.4	11.7
		1.0	628.3 T	815.8	187.5	1631.6	39.4	11.7
	8	.0	519.6 C	303.6	106.1	929.3	32.0	8.7
		1.0	517.2 C	607.8	436.2	1561.2	32.0	8.7
	9	.0	123.8 T	116.0	883.7	1123.5	1.5	3.3
		1.0	126.3 T	232.3	909.1	1267.6	1.5	3.3
15	5	.0	475.7 C	533.1	1459.4	2468.1	43.2	7.6
		1.0	473.2 C	267.1	2190.2	2930.5	43.2	7.6
	6	.0	269.0 C	352.8	712.4	1334.2	55.7	5.0
		1.0	266.5 C	176.8	229.9	673.2	55.7	5.0
	7	.0	636.1 T	815.9	182.6	1634.7	107.1	11.6
		1.0	637.5 T	408.8	1994.4	3040.7	107.1	11.6
	8	.0	503.4 C	607.9	433.3	1544.6	70.4	8.7
		1.0	501.0 C	304.6	1624.5	2430.0	70.4	8.7
	9	.0	140.0 T	232.3	912.2	1284.6	49.2	3.3
		1.0	142.4 T	116.4	78.8	337.6	49.2	3.3

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MEMBER STRESSES

ALL UNITS ARE POUN/SQ INCH

MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
16	5	.0	459.5 C	267.1	2190.2	2916.8	43.2	7.6
		1.0	457.0 C	0.1	2921.4	3378.6	43.2	7.6
	6	.0	252.8 C	176.8	229.8	659.5	106.8	5.0
		1.0	250.3 C	0.1	2037.2	2287.7	106.8	5.0
	7	.0	645.4 T	408.9	1994.4	3048.6	174.8	11.7
		1.0	646.8 T	0.2	4952.2	5599.2	174.8	11.7
	8	.0	487.3 C	304.6	1624.4	2416.3	108.7	8.7
		1.0	484.8 C	0.2	3464.8	3949.8	108.7	8.7
	9	.0	156.2 T	116.4	78.8	351.4	100.0	3.3
		1.0	158.6 T	0.1	1613.9	1772.6	100.0	3.3
	17	5	.0	26.4 T	0.0	3982.0	4008.5	231.5
			1.0	27.2 T	0.0	0.0	27.2	233.9
17	6	.0	162.0 C	0.1	1498.4	1660.5	86.4	0.0
		1.0	161.3 C	0.0	0.0	161.3	88.7	0.0
	7	.0	412.6 T	0.1	5070.0	5482.7	297.0	0.0
		1.0	413.0 T	0.0	0.0	413.0	295.6	0.0
	8	.0	103.8 C	0.1	3764.0	3867.9	218.8	0.0
		1.0	103.1 C	0.0	0.0	103.1	221.1	0.0
	9	.0	328.5 T	0.1	939.6	1268.2	56.1	0.0
		1.0	329.3 T	0.0	0.0	329.3	53.7	0.0
18	5	.0	30.4 C	0.0	4821.5	4852.0	47.9	0.0
		1.0	29.7 C	0.0	3982.0	4011.7	50.2	0.0
	6	.0	171.9 C	0.1	1658.2	1830.2	8.2	0.0
		1.0	171.2 C	0.1	1498.4	1669.7	10.5	0.0
	7	.0	407.0 T	0.2	5933.5	6340.7	51.1	0.0
		1.0	407.4 T	0.1	5070.0	5477.5	49.8	0.0
	8	.0	148.9 C	0.1	4440.4	4589.5	38.3	0.0
		1.0	148.2 C	0.1	3764.0	3912.3	40.7	0.0
	9	.0	283.4 T	0.1	983.7	1267.3	3.8	0.0
		1.0	284.1 T	0.1	939.6	1223.9	1.4	0.0

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MEMBER STRESSES

ALL UNITS ARE POUN/SQ INCH

MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
19	5	.0	87.3 C	0.1	2518.6	2605.9	135.8	0.0
		1.0	86.5 C	0.0	4821.5	4908.1	133.4	0.0
	6	.0	181.8 C	0.2	479.4	661.4	70.1	0.0
		1.0	181.0 C	0.1	1658.2	1839.3	67.7	0.0
	7	.0	401.3 T	0.3	2591.2	2992.8	194.6	0.0
		1.0	401.7 T	0.2	5933.5	6335.4	196.0	0.0
	8	.0	194.0 C	0.2	2029.5	2223.7	142.1	0.0
		1.0	193.3 C	0.1	4440.4	4633.9	139.7	0.0
	9	.0	238.3 T	0.2	132.6	371.1	48.6	0.0
		1.0	239.0 T	0.1	983.7	1222.9	50.9	0.0
20	5	.0	144.1 C	0.1	2926.8	3071.0	319.4	0.0
		1.0	143.4 C	0.1	2518.6	2662.1	317.0	0.0
	6	.0	191.7 C	0.2	2037.9	2229.8	148.3	0.0
		1.0	190.9 C	0.2	479.4	670.5	145.9	0.0
	7	.0	395.7 T	0.3	4957.3	5353.3	440.4	0.0
		1.0	396.1 T	0.3	2591.2	2987.5	441.8	0.0
	8	.0	239.1 C	0.2	3468.9	3708.2	322.5	0.0
		1.0	238.4 C	0.2	2029.5	2268.1	320.1	0.0
	9	.0	193.2 T	0.2	1613.8	1807.2	100.9	0.0
		1.0	193.9 T	0.2	132.6	326.7	103.2	0.0
21	5	.0	508.0 C	0.0	0.0	508.1	43.1	7.6
		1.0	505.6 C	266.2	729.9	1501.7	43.1	7.6
	6	.0	301.3 C	0.0	0.0	301.4	46.5	5.0
		1.0	298.9 C	176.2	786.6	1261.7	46.5	5.0
	7	.0	617.6 T	0.0	0.0	617.7	28.3	11.6
		1.0	619.0 T	407.4	478.6	1505.0	28.3	11.6
	8	.0	535.8 C	0.0	0.0	535.9	6.3	8.7
		1.0	533.4 C	303.6	106.1	943.0	6.3	8.7
	9	.0	107.6 T	0.0	0.0	107.7	52.2	3.3
		1.0	110.1 T	116.0	883.7	1109.7	52.2	3.3

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MEMBER STRESSES

ALL UNITS ARE POUN/SQ INCH

MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
22	5	.0	491.8 C	266.2	729.9	1487.9	43.1	7.6
		1.0	489.4 C	533.0	1460.1	2482.5	43.1	7.6
	6	.0	285.2 C	176.1	786.7	1248.0	4.6	5.0
		1.0	282.7 C	352.6	709.1	1344.5	4.6	5.0
	7	.0	626.9 T	407.4	478.7	1512.9	39.4	11.7
		1.0	628.3 T	815.6	187.5	1631.4	39.4	11.7
	8	.0	519.6 C	303.5	106.1	929.3	32.0	8.7
		1.0	517.2 C	607.7	436.2	1561.1	32.0	8.7
	9	.0	123.8 T	116.0	883.7	1123.5	1.5	3.3
		1.0	126.3 T	232.2	909.1	1267.5	1.5	3.3
23	5	.0	475.7 C	533.1	1459.4	2468.1	43.2	7.6
		1.0	473.2 C	267.1	2190.2	2930.5	43.2	7.6
	6	.0	269.0 C	352.7	712.4	1334.1	55.7	5.0
		1.0	266.5 C	176.7	229.9	673.1	55.7	5.0
	7	.0	636.1 T	815.8	182.6	1634.5	107.0	11.6
		1.0	637.5 T	408.7	1994.4	3040.7	107.0	11.6
	8	.0	503.4 C	607.8	433.3	1544.5	70.4	8.7
		1.0	501.0 C	304.5	1624.4	2430.0	70.4	8.7
	9	.0	140.0 T	232.2	912.2	1284.4	49.2	3.3
		1.0	142.5 T	116.4	78.8	337.6	49.2	3.3
24	5	.0	459.5 C	267.1	2190.2	2916.8	43.2	7.6
		1.0	457.0 C	0.1	2921.4	3378.6	43.2	7.6
	6	.0	252.8 C	176.8	229.8	659.4	106.8	5.0
		1.0	250.3 C	0.1	2037.2	2287.7	106.8	5.0
	7	.0	645.4 T	408.8	1994.4	3048.6	174.8	11.7
		1.0	646.8 T	0.2	4952.1	5599.2	174.8	11.7
	8	.0	487.3 C	304.6	1624.4	2416.3	108.7	8.7
		1.0	484.8 C	0.2	3464.7	3949.7	108.7	8.7
	9	.0	156.2 T	116.4	78.8	351.4	100.0	3.3
		1.0	158.6 T	0.1	1613.8	1772.6	100.0	3.3

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MEMBER STRESSES

ALL UNITS ARE POUN/SQ INCH

MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
25	5	.0	42.7 T	0.0	2012.9	2055.7	116.4	0.0
		1.0	43.5 T	0.0	0.0	43.5	118.8	0.0
	6	.0	7.6 T	0.0	676.0	683.5	38.3	0.0
		1.0	8.3 T	0.0	0.0	8.3	40.7	0.0
	7	.0	4.4 T	0.0	2387.2	2391.6	140.2	0.0
		1.0	4.8 T	0.0	0.0	4.8	138.8	0.0
	8	.0	34.0 T	0.0	1831.3	1865.2	105.8	0.0
		1.0	34.7 T	0.0	0.0	34.7	108.2	0.0
	9	.0	34.0 T	0.0	346.9	380.9	21.5	0.0
		1.0	34.7 T	0.0	0.0	34.7	19.1	0.0
26	5	.0	13.9 T	0.0	2434.3	2448.3	23.4	0.0
		1.0	14.7 T	0.0	2012.9	2027.6	25.8	0.0
	6	.0	2.3 T	0.0	662.4	664.6	2.0	0.0
		1.0	3.0 T	0.0	676.0	679.0	0.4	0.0
	7	.0	1.4 T	0.0	2682.9	2684.3	18.0	0.0
		1.0	1.8 T	0.0	2387.2	2389.0	16.6	0.0
	8	.0	11.0 T	0.0	2098.5	2109.5	14.4	0.0
		1.0	11.8 T	0.0	1831.3	1843.0	16.8	0.0
	9	.0	11.1 T	0.0	266.4	277.5	3.5	0.0
		1.0	11.8 T	0.0	346.9	358.8	5.9	0.0
27	5	.0	14.8 C	0.0	1264.3	1279.1	69.6	0.0
		1.0	14.1 C	0.0	2434.3	2448.5	67.2	0.0
	6	.0	3.0 C	0.0	40.8	43.8	42.3	0.0
		1.0	2.3 C	0.0	662.4	664.7	39.9	0.0
	7	.0	1.7 C	0.0	887.1	888.7	104.3	0.0
		1.0	1.2 C	0.0	2682.9	2684.1	105.6	0.0
	8	.0	11.9 C	0.0	801.8	813.7	77.0	0.0
		1.0	11.2 C	0.0	2098.5	2109.7	74.6	0.0
	9	.0	11.8 C	0.0	241.5	253.4	28.5	0.0
		1.0	11.1 C	0.0	266.4	277.5	30.9	0.0

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MEMBER STRESSES

ALL UNITS ARE POUN/SQ INCH

MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
28	5	.0	43.6 C	0.0	1497.3	1541.0	162.6	0.0
		1.0	42.9 C	0.0	1264.3	1307.2	160.2	0.0
	6	.0	8.3 C	0.0	1433.5	1441.8	82.6	0.0
		1.0	7.6 C	0.0	40.8	48.4	80.2	0.0
	7	.0	4.7 C	0.0	3000.3	3005.0	226.5	0.0
		1.0	4.3 C	0.0	887.1	891.3	227.8	0.0
	8	.0	34.8 C	0.0	2059.0	2093.8	168.4	0.0
		1.0	34.1 C	0.0	801.8	835.8	166.0	0.0
	9	.0	34.8 C	0.0	1176.9	1211.7	53.5	0.0
		1.0	34.0 C	0.0	241.5	275.5	55.8	0.0
29	5	.0	25.0 C	0.0	0.0	25.0	22.1	0.0
		1.0	22.5 C	0.1	374.6	397.2	22.1	0.0
	6	.0	25.0 C	0.0	0.0	25.0	53.5	0.0
		1.0	22.5 C	0.1	906.0	928.6	53.5	0.0
	7	.0	14.3 C	0.0	0.0	14.3	54.6	0.0
		1.0	12.9 C	0.2	924.2	937.3	54.6	0.0
	8	.0	25.0 C	0.0	0.0	25.0	25.6	0.0
		1.0	22.5 C	0.2	433.4	456.1	25.6	0.0
	9	.0	25.0 C	0.0	0.0	25.0	56.8	0.0
		1.0	22.5 C	0.1	961.6	984.2	56.8	0.0
30	5	.0	9.1 C	0.2	374.6	383.9	22.1	0.0
		1.0	6.7 C	0.2	749.1	756.0	22.1	0.0
	6	.0	9.1 C	0.1	906.0	915.3	3.7	0.0
		1.0	6.7 C	0.1	969.0	975.9	3.7	0.0
	7	.0	5.2 C	0.2	924.2	929.6	11.4	0.0
		1.0	3.8 C	0.3	732.0	736.1	11.4	0.0
	8	.0	9.1 C	0.2	433.4	442.7	11.7	0.0
		1.0	6.7 C	0.2	234.5	241.5	11.7	0.0
	9	.0	9.1 C	0.1	961.6	970.8	7.3	0.0
		1.0	6.7 C	0.1	1086.0	1092.8	7.3	0.0

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MEMBER STRESSES

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MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
31	5	.0	6.7 T	0.2	749.1	756.0	22.1	0.0
		1.0	9.2 T	0.2	1123.7	1133.0	22.1	0.0
	6	.0	6.7 T	0.1	969.0	975.9	46.1	0.0
		1.0	9.1 T	0.1	189.1	198.3	46.1	0.0
	7	.0	3.8 T	0.3	732.0	736.1	77.3	0.0
		1.0	5.2 T	0.2	576.6	582.0	77.3	0.0
	8	.0	6.7 T	0.2	234.5	241.5	49.1	0.0
		1.0	9.2 T	0.2	596.5	605.8	49.1	0.0
	9	.0	6.7 T	0.1	1086.0	1092.8	42.1	0.0
		1.0	9.1 T	0.1	373.0	382.3	42.1	0.0
32	5	.0	22.5 T	0.1	1123.7	1146.4	22.1	0.0
		1.0	25.0 T	0.0	1498.2	1523.2	22.1	0.0
	6	.0	22.5 T	0.1	189.1	211.7	95.9	0.0
		1.0	25.0 T	0.0	1433.9	1458.9	95.9	0.0
	7	.0	12.9 T	0.2	576.6	589.7	143.3	0.0
		1.0	14.3 T	0.0	3001.5	3015.8	143.3	0.0
	8	.0	22.5 T	0.2	596.5	619.2	86.5	0.0
		1.0	25.0 T	0.0	2059.8	2084.8	86.5	0.0
	9	.0	22.5 T	0.1	373.0	395.6	91.6	0.0
		1.0	25.0 T	0.0	1177.2	1202.2	91.6	0.0
33	5	.0	34.3 T	0.0	4729.9	4764.2	180.2	0.0
		1.0	35.0 T	0.0	0.0	35.0	182.5	0.0
	6	.0	409.1 C	0.0	2033.3	2442.4	76.8	0.0
		1.0	408.3 C	0.0	0.0	408.3	79.1	0.0
	7	.0	661.6 T	0.0	6269.9	6931.5	241.1	0.0
		1.0	662.1 T	0.0	0.0	662.1	239.7	0.0
	8	.0	283.7 C	0.0	4647.8	4931.5	177.0	0.0
		1.0	283.0 C	0.0	0.0	283.0	179.4	0.0
	9	.0	521.0 T	0.0	1306.6	1827.6	51.3	0.0
		1.0	521.7 T	0.0	0.0	521.7	48.9	0.0

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MEMBER STRESSES

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MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
34	5	.0	3.2 C	0.0	6306.6	6309.7	59.3	0.0
		1.0	2.4 C	0.0	4729.9	4732.4	61.6	0.0
	6	.0	415.8 C	0.0	2710.7	3126.5	24.8	0.0
		1.0	415.1 C	0.0	2033.3	2448.4	27.2	0.0
	7	.0	657.8 T	0.1	8359.3	9017.1	80.8	0.0
		1.0	658.2 T	0.0	6269.9	6928.1	79.4	0.0
	8	.0	313.5 C	0.0	6196.7	6510.2	58.2	0.0
		1.0	312.7 C	0.0	4647.8	4960.5	60.6	0.0
	9	.0	491.3 T	0.0	1741.7	2233.0	17.9	0.0
		1.0	492.0 T	0.0	1306.6	1798.6	15.5	0.0
35	5	.0	40.6 C	0.0	4729.9	4770.5	61.6	0.0
		1.0	39.9 C	0.0	6306.6	6346.4	59.3	0.0
	6	.0	422.5 C	0.1	2033.1	2455.6	27.2	0.0
		1.0	421.8 C	0.0	2710.7	3132.5	24.8	0.0
	7	.0	654.0 T	0.1	6269.5	6923.6	79.4	0.0
		1.0	654.4 T	0.1	8359.3	9013.7	80.8	0.0
	8	.0	343.2 C	0.0	4647.6	4990.8	60.6	0.0
		1.0	342.5 C	0.0	6196.7	6539.2	58.2	0.0
	9	.0	461.5 T	0.1	1306.4	1767.9	15.5	0.0
		1.0	462.2 T	0.0	1741.7	2204.0	17.9	0.0
36	5	.0	78.0 C	0.0	0.0	78.0	182.5	0.0
		1.0	77.3 C	0.0	4729.9	4807.2	180.2	0.0
	6	.0	429.2 C	0.0	0.0	429.2	79.1	0.0
		1.0	428.5 C	0.0	2033.1	2461.6	76.8	0.0
	7	.0	650.1 T	0.0	0.0	650.1	239.7	0.0
		1.0	650.5 T	0.0	6269.5	6920.1	241.1	0.0
	8	.0	373.0 C	0.0	0.0	373.0	179.4	0.0
		1.0	372.2 C	0.0	4647.6	5019.8	177.0	0.0
	9	.0	431.8 T	0.0	0.0	431.8	48.9	0.0
		1.0	432.5 T	0.0	1306.4	1738.9	51.3	0.0

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MEMBER STRESSES

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MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
37	5	.0	98.8 T	0.0	4729.9	4828.7	180.2	0.0
		1.0	99.5 T	0.0	0.0	99.5	182.5	0.0
	6	.0	128.6 T	0.0	2033.2	2161.8	76.8	0.0
		1.0	129.3 T	0.0	0.0	129.3	79.1	0.0
	7	.0	99.1 C	0.0	6269.7	6368.9	241.1	0.0
		1.0	98.7 C	0.0	0.0	98.7	239.7	0.0
	8	.0	161.1 T	0.0	4647.7	4808.8	177.0	0.0
		1.0	161.9 T	0.0	0.0	161.9	179.4	0.0
	9	.0	3.6 C	0.0	1306.5	1310.1	51.3	0.0
		1.0	2.9 C	0.0	0.0	2.9	48.9	0.0
38	5	.0	61.4 T	0.0	6306.6	6368.0	59.3	0.0
		1.0	62.1 T	0.0	4729.9	4792.0	61.6	0.0
	6	.0	121.9 T	0.0	2711.0	2832.9	24.8	0.0
		1.0	122.6 T	0.0	2033.2	2155.8	27.2	0.0
	7	.0	103.0 C	0.0	8359.7	8462.7	80.8	0.0
		1.0	102.6 C	0.0	6269.7	6372.3	79.5	0.0
	8	.0	131.4 T	0.0	6197.0	6328.4	58.2	0.0
		1.0	132.1 T	0.0	4647.7	4779.8	60.6	0.0
	9	.0	33.4 C	0.0	1742.0	1775.4	17.9	0.0
		1.0	32.6 C	0.0	1306.5	1339.1	15.5	0.0
39	5	.0	23.9 T	0.0	4730.0	4753.9	61.6	0.0
		1.0	24.7 T	0.0	6306.6	6331.3	59.3	0.0
	6	.0	115.2 T	0.0	2033.2	2148.4	27.2	0.0
		1.0	115.9 T	0.0	2711.0	2826.9	24.8	0.0
	7	.0	106.8 C	0.0	6269.8	6376.6	79.5	0.0
		1.0	106.4 C	0.0	8359.7	8466.1	80.8	0.0
	8	.0	101.6 T	0.0	4647.7	4749.4	60.6	0.0
		1.0	102.4 T	0.0	6197.0	6299.4	58.2	0.0
	9	.0	63.1 C	0.0	1306.5	1369.6	15.5	0.0
		1.0	62.4 C	0.0	1742.0	1804.4	17.9	0.0

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MEMBER STRESSES

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MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
40	5	.0	13.5 C	0.0	0.0	13.5	182.5	0.0
		1.0	12.8 C	0.0	4730.0	4742.7	180.2	0.0
	6	.0	108.4 T	0.0	0.0	108.4	79.1	0.0
		1.0	109.2 T	0.0	2033.2	2142.4	76.8	0.0
	7	.0	110.7 C	0.0	0.0	110.7	239.7	0.0
		1.0	110.2 C	0.0	6269.8	6380.0	241.1	0.0
	8	.0	71.9 T	0.0	0.0	71.9	179.4	0.0
		1.0	72.6 T	0.0	4647.7	4720.4	177.0	0.0
	9	.0	92.9 C	0.0	0.0	92.9	48.9	0.0
		1.0	92.1 C	0.0	1306.5	1398.6	51.3	0.0
41	5	.0	34.3 T	0.0	4729.9	4764.2	180.2	0.0
		1.0	35.0 T	0.0	0.0	35.0	182.5	0.0
	6	.0	408.1 C	0.0	2033.3	2441.4	76.8	0.0
		1.0	407.4 C	0.0	0.0	407.4	79.1	0.0
	7	.0	660.4 T	0.0	6269.9	6930.2	241.1	0.0
		1.0	660.8 T	0.0	0.0	660.8	239.7	0.0
	8	.0	283.0 C	0.0	4647.7	4930.7	177.0	0.0
		1.0	282.2 C	0.0	0.0	282.3	179.4	0.0
	9	.0	520.0 T	0.0	1306.6	1826.7	51.3	0.0
		1.0	520.8 T	0.0	0.0	520.8	48.9	0.0
42	5	.0	3.2 C	0.0	6306.5	6309.7	59.3	0.0
		1.0	2.4 C	0.0	4729.9	4732.4	61.6	0.0
	6	.0	414.8 C	0.0	2710.7	3125.6	24.8	0.0
		1.0	414.1 C	0.0	2033.3	2447.4	27.2	0.0
	7	.0	656.5 T	0.0	8359.2	9015.8	80.8	0.0
		1.0	656.9 T	0.0	6269.9	6926.8	79.4	0.0
	8	.0	312.7 C	0.0	6196.7	6509.5	58.2	0.0
		1.0	312.0 C	0.0	4647.7	4959.8	60.6	0.0
	9	.0	490.3 T	0.0	1741.7	2232.1	17.9	0.0
		1.0	491.0 T	0.0	1306.6	1797.7	15.5	0.0

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MEMBER STRESSES

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MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
43	5	.0	40.6 C	0.0	4729.9	4770.5	61.6	0.0
		1.0	39.9 C	0.0	6306.5	6346.4	59.3	0.0
	6	.0	421.6 C	0.1	2033.1	2454.7	27.2	0.0
		1.0	420.8 C	0.0	2710.7	3131.5	24.8	0.0
	7	.0	652.7 T	0.1	6269.5	6922.3	79.4	0.0
		1.0	653.1 T	0.0	8359.2	9012.4	80.8	0.0
	8	.0	342.5 C	0.0	4647.6	4990.1	60.6	0.0
		1.0	341.7 C	0.0	6196.7	6538.5	58.2	0.0
	9	.0	460.5 T	0.0	1306.4	1767.0	15.5	0.0
		1.0	461.3 T	0.0	1741.7	2203.0	17.9	0.0
44	5	.0	78.0 C	0.0	0.0	78.0	182.5	0.0
		1.0	77.3 C	0.0	4729.9	4807.2	180.2	0.0
	6	.0	428.3 C	0.0	0.0	428.3	79.1	0.0
		1.0	427.5 C	0.0	2033.1	2460.6	76.8	0.0
	7	.0	648.8 T	0.0	0.0	648.8	239.7	0.0
		1.0	649.3 T	0.0	6269.5	6918.8	241.1	0.0
	8	.0	372.2 C	0.0	0.0	372.2	179.4	0.0
		1.0	371.5 C	0.0	4647.6	5019.1	177.0	0.0
	9	.0	430.8 T	0.0	0.0	430.8	48.9	0.0
		1.0	431.5 T	0.0	1306.4	1737.9	51.3	0.0
45	5	.0	37.9 T	0.0	0.0	37.9	2.5	0.0
		1.0	37.9 T	0.0	0.0	37.9	2.5	0.0
	6	.0	25.1 T	0.0	0.0	25.1	2.5	0.0
		1.0	25.1 T	0.0	0.0	25.1	2.5	0.0
	7	.0	57.9 C	0.0	0.0	57.9	1.4	0.0
		1.0	57.9 C	0.0	0.0	57.9	1.4	0.0
	8	.0	43.2 T	0.0	0.0	43.2	2.5	0.0
		1.0	43.2 T	0.0	0.0	43.2	2.5	0.0
	9	.0	16.5 C	0.0	0.0	16.5	2.5	0.0
		1.0	16.5 C	0.0	0.0	16.5	2.5	0.0

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MEMBER STRESSES

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MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
46	5	.0	214.7 C	0.0	0.0	214.7	61.8	0.0
		1.0	212.3 C	0.9	704.2	917.4	61.8	0.0
	6	.0	154.0 C	0.0	0.0	154.0	40.9	38.5
		1.0	151.5 C	826.1	466.1	1443.7	40.9	19.5
	7	.0	313.5 T	0.0	0.0	313.5	94.6	51.4
		1.0	314.9 T	1103.7	1077.9	2496.5	94.6	26.1
	8	.0	249.0 C	0.0	0.0	249.0	70.4	28.8
		1.0	246.5 C	619.0	803.1	1668.5	70.4	14.6
	9	.0	83.9 T	0.0	0.0	83.9	26.9	38.6
		1.0	86.3 T	828.4	306.9	1221.7	26.9	19.6
47	5	.0	212.2 C	0.9	704.2	917.3	61.8	0.0
		1.0	209.7 C	1.6	1408.4	1619.8	61.8	0.0
	6	.0	151.4 C	826.0	466.1	1443.6	40.9	19.1
		1.0	149.0 C	1101.5	932.2	2182.7	40.9	0.2
	7	.0	314.9 T	1103.7	1077.9	2496.5	94.6	25.6
		1.0	316.3 T	1471.4	2155.8	3943.5	94.6	0.2
	8	.0	246.4 C	618.9	803.1	1668.4	70.4	14.3
		1.0	243.9 C	825.1	1606.1	2675.1	70.4	0.1
	9	.0	86.5 T	828.4	306.9	1221.8	26.9	19.2
		1.0	88.9 T	1104.7	613.9	1807.5	26.9	0.2
48	5	.0	209.6 C	2.0	1408.4	1620.0	66.9	0.0
		1.0	207.1 C	2.4	2170.8	2380.3	66.9	0.0
	6	.0	148.8 C	1099.6	932.2	2180.7	44.3	0.2
		1.0	146.4 C	824.8	1436.8	2408.0	44.3	19.1
	7	.0	316.4 T	1468.6	2155.8	3940.8	102.4	0.3
		1.0	317.8 T	1100.8	3322.6	4741.2	102.4	25.6
	8	.0	243.8 C	823.4	1606.1	2673.3	76.3	0.1
		1.0	241.4 C	617.0	2475.4	3333.8	76.3	14.3
	9	.0	89.0 T	1102.9	613.9	1805.8	29.1	0.2
		1.0	91.5 T	827.4	946.1	1864.9	29.1	19.2

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MEMBER STRESSES

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MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
49	5	.0	207.0 C	2.4	2170.8	2380.2	66.9	0.0
		1.0	204.6 C	2.5	2933.2	3140.3	66.9	0.0
	6	.0	146.3 C	824.8	1436.8	2407.8	44.3	19.5
		1.0	143.8 C	0.2	1941.4	2085.4	44.3	38.4
	7	.0	317.9 T	1100.8	3322.6	4741.3	102.4	26.1
		1.0	319.3 T	2.2	4489.6	4811.1	102.4	51.4
	8	.0	241.3 C	617.0	2475.4	3333.7	76.3	14.6
		1.0	238.8 C	1.8	3344.9	3585.5	76.3	28.8
	9	.0	91.6 T	827.3	946.1	1865.0	29.2	19.5
		1.0	94.0 T	0.2	1278.4	1372.6	29.2	38.5
50	5	.0	26.5 C	0.0	2933.2	2959.7	204.5	0.0
		1.0	26.5 C	0.1	1706.7	1733.3	199.6	0.0
	6	.0	17.5 C	0.1	1941.4	1959.0	143.8	38.6
		1.0	17.5 C	2790.0	1303.4	4110.9	138.8	58.1
	7	.0	40.5 T	0.1	4489.7	4530.3	319.3	51.6
		1.0	40.5 T	3730.4	2874.5	6645.4	322.1	77.7
	8	.0	30.2 C	0.1	3344.9	3375.1	238.8	29.0
		1.0	30.2 C	2092.6	2081.2	4203.9	233.8	43.6
	9	.0	11.5 T	0.1	1278.4	1290.0	94.1	38.7
		1.0	11.5 T	2797.7	938.9	3748.1	99.0	58.3
51	5	.0	26.5 C	0.1	1706.7	1733.3	66.6	10.5
		1.0	26.5 C	619.1	3215.8	3861.3	61.6	10.5
	6	.0	17.5 C	2790.0	1303.4	4110.9	22.5	81.5
		1.0	17.5 C	1430.5	1772.9	3220.9	17.4	62.0
	7	.0	40.5 T	3730.3	2874.5	6645.4	67.0	115.8
		1.0	40.5 T	2314.6	4485.4	6840.5	69.9	89.7
	8	.0	30.2 C	2092.6	2081.2	4203.9	58.8	67.9
		1.0	30.2 C	1471.9	3406.4	4908.5	53.8	53.3
	9	.0	11.5 T	2797.7	938.9	3748.1	3.1	79.4
		1.0	11.5 T	1295.0	1071.9	2378.4	8.2	59.8

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MARLBOROUGH PROJECT

-- PAGE NO. 45

MEMBER STRESSES

ALL UNITS ARE POUN/SQ INCH

MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
52	5	.0	26.5 C	619.1	3215.8	3861.3	61.6	10.5
		1.0	26.5 C	0.1	1706.6	1733.2	66.6	10.5
	6	.0	17.5 C	1430.5	1772.9	3220.9	17.5	61.5
		1.0	17.5 C	2762.9	1302.0	4082.4	22.5	81.1
	7	.0	40.5 T	2314.6	4485.4	6840.5	70.0	89.1
		1.0	40.5 T	3694.0	2872.7	6607.2	67.1	115.2
	8	.0	30.2 C	1471.9	3406.4	4908.5	53.8	52.9
		1.0	30.2 C	2072.2	2080.1	4182.5	58.9	67.6
	9	.0	11.5 T	1295.0	1071.9	2378.4	8.2	59.3
		1.0	11.5 T	2770.5	937.5	3719.5	3.2	78.9
53	5	.0	26.5 C	0.1	1706.6	1733.2	199.6	0.0
		1.0	26.5 C	0.0	2933.2	2959.7	204.5	0.0
	6	.0	17.5 C	2762.9	1302.0	4082.4	138.8	58.1
		1.0	17.5 C	0.1	1940.8	1958.4	143.7	38.6
	7	.0	40.5 T	3694.1	2872.7	6607.2	322.0	77.7
		1.0	40.5 T	0.1	4488.8	4529.4	319.2	51.6
	8	.0	30.2 C	2072.2	2080.1	4182.5	233.8	43.6
		1.0	30.2 C	0.1	3344.4	3374.7	238.7	29.0
	9	.0	11.5 T	2770.5	937.5	3719.5	98.9	58.3
		1.0	11.5 T	0.1	1277.8	1289.4	94.0	38.7
54	5	.0	214.7 C	0.0	0.0	214.7	61.8	0.0
		1.0	212.3 C	0.9	704.2	917.4	61.8	0.0
	6	.0	153.9 C	0.0	0.0	153.9	40.9	38.5
		1.0	151.4 C	826.1	466.0	1443.5	40.9	19.5
	7	.0	313.3 T	0.0	0.0	313.4	94.5	51.4
		1.0	314.7 T	1103.7	1077.7	2496.2	94.5	26.1
	8	.0	248.9 C	0.0	0.0	248.9	70.4	28.8
		1.0	246.4 C	619.0	803.0	1668.4	70.4	14.6
	9	.0	83.8 T	0.0	0.0	83.8	26.9	38.6
		1.0	86.3 T	828.4	306.8	1221.5	26.9	19.6

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MARLBOROUGH PROJECT

-- PAGE NO. 46

MEMBER STRESSES

ALL UNITS ARE POUN/SQ INCH

MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
55	5	.0	212.2 C	0.9	704.2	917.3	61.8	0.0
		1.0	209.7 C	1.6	1408.4	1619.8	61.8	0.0
	6	.0	151.3 C	826.0	466.0	1443.3	40.9	19.1
		1.0	148.9 C	1101.5	931.9	2182.3	40.9	0.2
	7	.0	314.8 T	1103.6	1077.7	2496.2	94.5	25.6
		1.0	316.2 T	1471.4	2155.4	3943.0	94.5	0.2
	8	.0	246.3 C	618.9	803.0	1668.2	70.4	14.3
		1.0	243.9 C	825.0	1605.9	2674.8	70.4	0.1
	9	.0	86.4 T	828.4	306.8	1221.5	26.9	19.2
		1.0	88.8 T	1104.7	613.6	1807.1	26.9	0.2
56	5	.0	209.6 C	2.0	1408.4	1620.0	66.9	0.0
		1.0	207.1 C	2.4	2170.8	2380.3	66.9	0.0
	6	.0	148.8 C	1099.6	931.9	2180.3	44.2	0.2
		1.0	146.3 C	824.8	1436.3	2407.4	44.2	19.1
	7	.0	316.3 T	1468.6	2155.4	3940.3	102.3	0.3
		1.0	317.7 T	1100.8	3322.0	4740.5	102.3	25.6
	8	.0	243.8 C	823.4	1605.9	2673.1	76.2	0.1
		1.0	241.3 C	617.0	2475.1	3333.4	76.2	14.3
	9	.0	88.9 T	1102.9	613.6	1805.4	29.1	0.2
		1.0	91.4 T	827.3	945.7	1864.4	29.1	19.2
57	5	.0	207.0 C	2.4	2170.8	2380.2	66.9	0.0
		1.0	204.6 C	2.5	2933.2	3140.3	66.9	0.0
	6	.0	146.2 C	824.8	1436.3	2407.3	44.3	19.5
		1.0	143.7 C	0.2	1940.8	2084.7	44.3	38.4
	7	.0	317.7 T	1100.8	3322.0	4740.5	102.4	26.1
		1.0	319.1 T	2.2	4488.8	4810.2	102.4	51.4
	8	.0	241.2 C	617.0	2475.1	3333.3	76.3	14.6
		1.0	238.8 C	1.8	3344.4	3585.0	76.3	28.8
	9	.0	91.5 T	827.3	945.6	1864.5	29.1	19.5
		1.0	93.9 T	0.1	1277.8	1371.9	29.1	38.5

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MARLBOROUGH PROJECT

-- PAGE NO. 47

MEMBER STRESSES

ALL UNITS ARE POUN/SQ INCH

MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
58	5	.0	37.9 T	0.0	0.0	37.9	2.5	0.0
		1.0	37.9 T	0.0	0.0	37.9	2.5	0.0
	6	.0	25.0 T	0.0	0.0	25.0	2.5	0.0
		1.0	25.0 T	0.0	0.0	25.0	2.5	0.0
	7	.0	57.9 C	0.0	0.0	57.9	1.4	0.0
		1.0	57.9 C	0.0	0.0	57.9	1.4	0.0
	8	.0	43.2 T	0.0	0.0	43.2	2.5	0.0
		1.0	43.2 T	0.0	0.0	43.2	2.5	0.0
	9	.0	16.5 C	0.0	0.0	16.5	2.5	0.0
		1.0	16.5 C	0.0	0.0	16.5	2.5	0.0
59	5	.0	74.6 C	0.0	0.0	74.6	0.1	0.0
		1.0	74.6 C	0.0	0.0	74.6	0.1	0.0
	6	.0	49.4 C	0.0	0.0	49.4	0.1	0.0
		1.0	49.4 C	0.0	0.0	49.4	0.1	0.0
	7	.0	114.2 T	0.0	0.0	114.2	0.0	0.0
		1.0	114.2 T	0.0	0.0	114.2	0.0	0.0
	8	.0	85.1 C	0.0	0.0	85.1	0.1	0.0
		1.0	85.1 C	0.0	0.0	85.1	0.1	0.0
	9	.0	32.5 T	0.0	0.0	32.5	0.1	0.0
		1.0	32.5 T	0.0	0.0	32.5	0.1	0.0
60	5	.0	591.6 T	0.0	0.0	591.6	0.1	0.0
		1.0	591.6 T	0.0	0.0	591.6	0.1	0.0
	6	.0	391.6 T	0.0	0.0	391.6	0.1	0.1
		1.0	391.6 T	0.0	0.0	391.6	0.1	0.2
	7	.0	905.5 C	0.0	0.0	905.5	0.0	0.2
		1.0	905.5 C	0.0	0.0	905.5	0.0	0.3
	8	.0	674.6 T	0.0	0.0	674.6	0.1	0.1
		1.0	674.6 T	0.0	0.0	674.6	0.1	0.2
	9	.0	257.9 C	0.0	0.0	257.9	0.1	0.1
		1.0	257.9 C	0.0	0.0	257.9	0.1	0.2

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MARLBOROUGH PROJECT

-- PAGE NO. 48

MEMBER STRESSES

ALL UNITS ARE POUN/SQ INCH

MEMB	LD	SECT	AXIAL	BEND-Y	BEND-Z	COMBINED	SHEAR-Y	SHEAR-Z
61	5	.0	74.6 C	0.0	0.0	74.6	0.1	0.0
		1.0	74.6 C	0.0	0.0	74.6	0.1	0.0
	6	.0	49.4 C	0.0	0.0	49.4	0.1	0.0
		1.0	49.4 C	0.0	0.0	49.4	0.1	0.0
	7	.0	114.2 T	0.0	0.0	114.2	0.0	0.0
		1.0	114.2 T	0.0	0.0	114.2	0.0	0.0
	8	.0	85.1 C	0.0	0.0	85.1	0.1	0.0
		1.0	85.1 C	0.0	0.0	85.1	0.1	0.0
	9	.0	32.5 T	0.0	0.0	32.5	0.1	0.0
		1.0	32.5 T	0.0	0.0	32.5	0.1	0.0
62	5	.0	591.6 T	0.0	0.0	591.6	0.1	0.0
		1.0	591.6 T	0.0	0.0	591.6	0.1	0.0
	6	.0	391.4 T	0.0	0.0	391.4	0.1	0.1
		1.0	391.4 T	0.0	0.0	391.4	0.1	0.2
	7	.0	905.2 C	0.0	0.0	905.2	0.0	0.2
		1.0	905.2 C	0.0	0.0	905.2	0.0	0.3
	8	.0	674.5 T	0.0	0.0	674.5	0.1	0.1
		1.0	674.5 T	0.0	0.0	674.5	0.1	0.2
	9	.0	257.7 C	0.0	0.0	257.7	0.1	0.1
		1.0	257.7 C	0.0	0.0	257.7	0.1	0.2

***** END OF LATEST ANALYSIS RESULT *****

137. PRINT SUPPORT REACTION ALL
SUPPORT REACTION ALL

Wednesday, June 18, 2025 1:19 PM

MARLBOROUGH PROJECT

-- PAGE NO. 49

SUPPORT REACTIONS -UNIT POUN INCH STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
1	5	0.01	57.44	-40.10	0.00	0.00	0.00
	6	0.01	57.44	142.12	0.00	0.00	0.00
	7	-0.02	32.82	-158.70	0.00	0.00	0.00
	8	0.01	57.44	80.24	0.00	0.00	0.00
	9	-0.00	57.43	-147.77	0.00	0.00	0.00
5	5	-0.00	314.90	-11.58	0.00	0.00	0.00
	6	0.00	108.93	13.59	0.00	0.00	0.00
	7	-0.00	-343.95	-118.12	0.00	0.00	0.00
	8	0.00	288.85	2.58	0.00	0.00	0.00
	9	-0.00	-32.15	-96.89	0.00	0.00	0.00
9	5	-204.73	461.83	51.68	0.00	0.00	0.00
	6	-135.53	252.55	254.87	0.00	0.00	0.00
	7	313.39	-455.12	-484.21	0.00	0.00	0.00
	8	-233.48	464.16	225.11	0.00	0.00	0.00
	9	89.25	-20.55	-326.11	0.00	0.00	0.00
10	5	0.00	591.29	78.30	0.00	0.00	0.00
	6	0.00	135.32	339.04	0.00	0.00	0.00
	7	-0.01	-502.85	-943.98	0.00	0.00	0.00
	8	0.00	493.53	306.19	0.00	0.00	0.00
	9	-0.00	47.97	-651.70	0.00	0.00	0.00
14	5	13.77	932.92	-78.14	0.00	0.00	0.00
	6	9.12	558.41	130.45	0.00	0.00	0.00
	7	-21.08	-1111.97	-112.47	0.00	0.00	0.00
	8	15.71	983.26	46.03	0.00	0.00	0.00
	9	-6.00	-182.59	-140.53	0.00	0.00	0.00
19	5	334.11	1161.58	-0.17	0.00	0.00	0.00
	6	221.14	833.00	209.11	0.00	0.00	0.00
	7	-511.40	-1695.15	-279.43	0.00	0.00	0.00
	8	381.00	1346.74	156.72	0.00	0.00	0.00
	9	-145.62	-453.46	-209.70	0.00	0.00	0.00
24	5	-0.00	683.76	56.94	0.00	0.00	0.00
	6	-0.00	-57.02	1158.17	0.00	0.00	0.00
	7	0.00	-304.51	-2019.68	0.00	0.00	0.00
	8	-0.00	408.94	905.33	0.00	0.00	0.00
	9	0.00	262.61	-1474.20	0.00	0.00	0.00
29	5	0.00	736.64	-113.86	0.00	0.00	0.00
	6	0.00	383.56	-265.10	0.00	0.00	0.00
	7	-0.00	-927.91	-5.83	0.00	0.00	0.00
	8	0.00	773.46	-272.21	0.00	0.00	0.00
	9	-0.00	-167.28	-85.48	0.00	0.00	0.00
34	5	0.00	683.76	56.94	0.00	0.00	0.00
	6	0.00	-56.24	1155.63	0.00	0.00	0.00
	7	-0.00	-305.56	-2016.28	0.00	0.00	0.00
	8	0.00	409.53	903.42	0.00	0.00	0.00
	9	-0.00	261.82	-1471.65	0.00	0.00	0.00
39	5	-334.11	1161.59	-0.17	0.00	0.00	0.00

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MARLBOROUGH PROJECT

-- PAGE NO. 50

SUPPORT REACTIONS -UNIT POUN INCH STRUCTURE TYPE = SPACE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
	6	-221.07	832.54	209.11	0.00	0.00	0.00
	7	511.30	-1694.52	-279.43	0.00	0.00	0.00
	8	-380.95	1346.39	156.72	0.00	0.00	0.00
	9	145.55	-452.99	-209.70	0.00	0.00	0.00
44	5	-0.00	591.29	78.30	0.00	0.00	0.00
	6	-0.00	135.31	339.07	0.00	0.00	0.00
	7	0.01	-502.83	-944.03	0.00	0.00	0.00
	8	-0.00	493.52	306.22	0.00	0.00	0.00
	9	0.00	47.98	-651.74	0.00	0.00	0.00
48	5	-13.77	932.92	-78.14	0.00	0.00	0.00
	6	-9.11	558.43	130.45	0.00	0.00	0.00
	7	21.08	-1111.98	-112.47	0.00	0.00	0.00
	8	-15.70	983.27	46.04	0.00	0.00	0.00
	9	6.00	-182.60	-140.53	0.00	0.00	0.00
53	5	0.00	314.90	-11.58	0.00	0.00	0.00
	6	-0.00	108.93	13.59	0.00	0.00	0.00
	7	0.00	-343.95	-118.12	0.00	0.00	0.00
	8	-0.00	288.86	2.58	0.00	0.00	0.00
	9	0.00	-32.15	-96.89	0.00	0.00	0.00
57	5	-0.01	57.44	-40.10	0.00	0.00	0.00
	6	-0.01	57.44	142.12	0.00	0.00	0.00
	7	0.02	32.82	-158.70	0.00	0.00	0.00
	8	-0.01	57.44	80.24	0.00	0.00	0.00
	9	0.00	57.43	-147.77	0.00	0.00	0.00
61	5	204.73	461.83	51.68	0.00	0.00	0.00
	6	135.45	252.55	254.88	0.00	0.00	0.00
	7	-313.29	-455.12	-484.22	0.00	0.00	0.00
	8	233.43	464.16	225.12	0.00	0.00	0.00
	9	-89.17	-20.55	-326.12	0.00	0.00	0.00

***** END OF LATEST ANALYSIS RESULT *****

138. FINISH

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MARLBOROUGH PROJECT

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MARLBOROUGH PROJECT

-- PAGE NO. 52

***** END OF THE STAAD.Pro RUN *****

**** DATE= JUN 19,2025 TIME= 18: 5:58 ****

 * For technical assistance on STAAD.Pro, please visit *
 * <http://www.bentley.com/en/support/> *
 * *
 * Details about additional assistance from *
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**CUSTOM LEAN-TO UNIT
MARLBOROUGH PROJECT
ALLOWABLE STRESS AND CONNECTION
CALCULATIONS:**

SHEET NO:	1	OF:	24
CALCULATED BY:	Lawrence Duffy	DATE:	6/19/2025
CHECKED BY:		DATE:	
STAMPED BY:		DATE:	

DOUBLE 2 X 8" RAFTER (H11366)

ALLOY:6005-T5

INPUTS

Allowable Stresses for Building

Effective Length Factor, k: 1.000

SPEC 3.4.1

Length, L (in): 196.000

$\sigma =$ 19000 psi

Radius of Gyration, r (in): 2.891

SPEC 3.4.2

2 EDGE Width of Section, b (in): 7.165

$\sigma =$ 19000 psi

Corresponding Thickness, t (in): 0.110

SPEC 3.4.7

SHEAR Height of Section, h (in): 8.000

$\sigma =$ $51000/(k*L/r)^2$ = 3467 psi

Corresponding Thickness, t (in): 0.110

SPEC 3.4.9

Unbraced Length, L_b (in): 196.000

$\sigma =$ $490/(b/t)$ = 7523 psi

Radius of Gyration, r_y (in): 1.293

SPEC 3.4.14

Moment of Inertia, Strong Axis (in⁴): 45.189

$\sigma =$ $23.9-0.24(L_b I_x / .5Y(I_y J)^{.5})e^{0.5}$ = 20360 psi

Moment of Inertia, Weak Axis (in⁴): 9.041

SPEC 3.4.18

Centroid to Outer Fiber Comp. Side, $\bar{Y}$ (in): 4.028

$\sigma =$ $40.5-0.27(h/t)$ = 20864 psi

Torsional Constant, J (in⁴): 45.189

SPEC 3.4.20

$\sigma =$ $39000/(h/t)^2$ = 7373 psi

MEMBER CONSTANTS

KL/r = 121.28

2 EDGE b/t = 65.14

SHEAR h/t = 72.73

$L_b/r_y =$ 151.60

$L_b I_x / (0.5*\bar{Y}*(I_y*J)^{.5}) =$ 217.57

MAXIMUM ALLOWABLE STRESSES

TENSION = 19000 psi

COMPRESSION: = 3467 psi

BENDING: = 19000 psi

SHEAR = 7373 psi

SHEET NO:	2	OF:	24
CALCULATED BY:	Lawrence Duffy	DATE:	6/19/2025
CHECKED BY:		DATE:	
STAMPED BY:		DATE:	

HEAVY GLAZING BAR 11829

ALLOY:6005-T5

INPUTS

Allowable Stresses for Building

Effective Length Factor, k: 1.000

SPEC 3.4.1

Length, L (in): 97.000

$\sigma =$ 19000 psi

Radius of Gyration, r (in): 0.825

SPEC 3.4.2

2 EDGE Width of Section, b (in): 4.850

$\sigma =$ 19000 psi

Corresponding Thickness, t (in): 0.100

SPEC 3.4.7

SHEAR Height of Section, h (in): 5.500

$\sigma =$ $51000/(k*L/r)^2 =$ 3686 psi

Corresponding Thickness, t (in): 0.100

SPEC 3.4.9

Unbraced Length, L_b (in): 97.000

$\sigma =$ $490/(b/t) =$ 10103 psi

Radius of Gyration, r_y (in): 0.825

SPEC 3.4.14

Moment of Inertia, Strong Axis (in⁴): 7.010

$\sigma =$ $23.9-0.24(L_b I_x / .5Y(I_y J)^{0.5})e^{0.5} =$ 20871 psi

Moment of Inertia, Weak Axis (in⁴): 1.232

SPEC 3.4.18

Centroid to Outer Fiber Comp. Side, $\bar{Y}$ (in): 2.906

$\sigma =$ $40.5-0.27(h/t) =$ 25650 psi

Torsional Constant, J (in⁴): 7.010

SPEC 3.4.20

$\sigma =$ $15.6-.099(h/t) =$ 10155 psi

MEMBER CONSTANTS

KL/r = 117.63

2 EDGE b/t = 48.50

SHEAR h/t = 55.00

$L_b/r_y =$ 117.63

$L_b I_x / (0.5*\bar{Y}*(I_y*J)^{0.5}) =$ 159.26

MAXIMUM ALLOWABLE STRESSES

TENSION = 19000 psi

COMPRESSION: = 3686 psi

BENDING: = 19000 psi

SHEAR = 10155 psi

SOLAR
INNOVATIONS

JOB:	MARLBOROUGH PROJECT		
SHEET NO:	3	OF:	24
CALCULATED BY:	Lawrence Duffy	DATE:	6/19/2025
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STAMPED BY:		DATE:	

2 X 4" GLAZING BAR (H14358) WITH INSERT (12754)

ALLOY:6063-T6

Allowable Stresses for Building

SPEC 3.4.1				INPUTS		
$\sigma =$	15000	psi		Effective Length Factor, k:	1.000	
SPEC 3.4.2				Length, L (in):	96.000	
$\sigma =$	15000	psi		Radius of Gyration, r (in):	1.360	
SPEC 3.4.7				2 EDGE Width of Section, b (in):	2.886	
$\sigma =$	$51000/(k*L/r)^2$	= 4112	psi	Corresponding Thickness, t (in):	0.100	
SPEC 3.4.14				SHEAR Height of Section, h (in):	4.000	
$\sigma =$	$16.7-0.141(L_b I_x/.5Y(I_y J)e0.5)e0.5$	= 14770	psi	Corresponding Thickness, t (in):	0.100	
SPEC 3.4.18				Unbraced Length, L _b (in):	96.000	
$\sigma =$	20000	= 20000	psi	Radius of Gyration, r _y (in):	0.690	
SPEC 3.4.20				Moment of Inertia, Strong Axis (in4):	5.115	
$\sigma =$	$10.7-.056(h/t)$	= 8460	psi	Moment of Inertia, Weak Axis (in4):	1.316	
					Centroid to Outer Fiber Comp. Side, $\hat{Y}$ (in):	2.021
					Torsional Constant, J (in4):	5.115

MEMBER CONSTANTS

	KL/r =	111.37
2 EDGE	b/t =	28.86
SHEAR	h/t =	40.00
	L _b /r _y =	139.21
	$L_b I_x/(0.5*\bar{Y}*(I_y*J)^0.5)=$	187.29

MAXIMUM ALLOWABLE STRESSES

TENSION =	15000	psi
COMPRESSION: =	4112	psi
BENDING: =	14770	psi
SHEAR =	8460	psi

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L-CLIP TO FOUNDATION

FASTENERS: 2 0.375 " X 4.000 " LAG BOLTS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: 6063-T5

$$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$$

T1: Thickness of Piece 1 (in): .25

$$=(.375)(.25)(22)/2/2.34 = 1762.8 \#$$

Fastener Type: LAG BOLTS

$$P_{as} = Ns * Pns_{min}$$

Thread Type: SPACED THREADS

$$=(2)(1762.8) = 3525.6 \#$$

Crown (C) or Valley (V) Fastening: C

D2: Diameter of Head/Washer (in): .72

D1: Nominal Diameter of Fastener (in): 0.375

L: Length of Fasteners (in): 4.000

ALLOWABLE CONNECTION TENSION

Ns: Number of Screws: 2

$$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s$$

$$=(.72 - 0.375)(.25)(22)(1)/3 = 632.5 \#$$

$$P_{at} = Ns * Pn_{min}$$

Aluminum Alloy Structural Values:

$$=(2)(632.5) = 1265.0 \#$$

F_{tu1}: Ultimate Tension of Piece 1 (ksi): 22

F_{ty1}: Yield Tension of Piece 1 (ksi): 16

MAXIMUM ALLOWABLE SHEAR PER SCREW

$$P = F_v * A = 0.17 * 95000 * 3.14 * D^{2/4}$$

$$= 1784$$

$$P_{at} = Ns * P$$

$$=(2)(1784) = 3567 \#$$

MAXIMUM ALLOWABLE LOADS

SHEAR: 3525.6 #

TENSION: 1265.0 #

NOTE: THESE CALCULATIONS PERTAIN TO THE CONNECTIONS UP TO, BUT NOT INCLUDING,
THE CONNECTIONS TO THE EXISTING STRUCTURE AND/OR ANY NEW CONSTRUCTION.
THE CONNECTIONS TO THE EXISTING STRUCTURE AND/OR ANY NEW CONSTRUCTION
MUST BE ANALYZED ACCORDING TO CONDITIONS SPECIFIC TO EACH JOB BY OTHERS.

UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

JOB:	MARLBOROUGH PROJECT		
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L-CLIP TO FOUNDATION

FASTENERS: 2 0.375 " X 4.000 " LAG BOLTS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: **6063-T5**

$$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$$

T1: Thickness of Piece 1 (in): **.25**

$$=(.375)(.25)(22)/2/2.34 = 1762.8 \#$$

Fastener Type: **LAG BOLTS**

$$P_{as} = N_s * P_{ns_{min}}$$

Thread Type: **SPACED THREADS**

$$=(2)(1762.8) = 3525.6 \#$$

Crown (C) or Valley (V) Fastening: **C**

D2: Diameter of Head/Washer (in): **1**

D1: Nominal Diameter of Fastener (in): **0.375**

L: Length of Fasteners (in): **4.000**

ALLOWABLE CONNECTION TENSION

Ns: Number of Screws: **2**

$$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s$$

$$=(1 - 0.375)(.25)(22)(1)/3 = 1145.8 \#$$

$$P_{at} = N_s * P_{n_{min}}$$

Aluminum Alloy Structural Values:

$$=(2)(1145.8) = 2291.7 \#$$

F_{tu1}: Ultimate Tension of Piece 1 (ksi): **22**

F_{ty1}: Yield Tension of Piece 1 (ksi): **16**

MAXIMUM ALLOWABLE SHEAR PER SCREW

$$P = F_v * A = 0.17 * 95000 * 3.14 * D^{2/4}$$

$$= 1784$$

$$P_{at} = N_s * P$$

$$=(2)(1784) = 3567 \#$$

MAXIMUM ALLOWABLE LOADS

SHEAR: **3525.6 #**

TENSION: **2291.7 #**

NOTE: THESE CALCULATIONS PERTAIN TO THE CONNECTIONS UP TO, BUT NOT INCLUDING, THE CONNECTIONS TO THE EXISTING STRUCTURE AND/OR ANY NEW CONSTRUCTION. THE CONNECTIONS TO THE EXISTING STRUCTURE AND/OR ANY NEW CONSTRUCTION MUST BE ANALYZED ACCORDING TO CONDITIONS SPECIFIC TO EACH JOB BY OTHERS.

UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

Calculations Conform to (AA) ADM2000

JOB:	MARLBOROUGH PROJECT		
SHEET NO:	5	OF:	24
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L-CLIP TO HEAVY GLAZING BAR

FASTENERS: 2 0.250 " X 1.000 " TEK SCREWS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: 6063-T5

$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$ T1: Thickness of Piece 1 (in): .25

$= (.250)(.25)(22)/2/2.34 = 1175.2 \#$ A2: Alloy of Piece 2: 6005-T5

$P_{ns} = 2(D1)(T2)(F_{tu2})/n_u$ T2: Thickness of Piece 2 (in): .1

$= (.250)(.1)(38)/2/2.34 = 812.0 \#$ Fastener Type: TEK SCREWS

$P_{ns} = ((T2)(T2)(D1))E0.5 * 4.2(F_{tu2})$ for $T2 \leq T1$ Thread Type: SPACED THREADS

$= ((.1)(.1)(.1)(0.25))E0.5 * 4.2(38000) = 2523.5$ Crown (C) or Valley (V) Fastening: C

$P_{as} = N_s * P_{ns_{min}}$ D2: Diameter of Head/Washer (in): .48

$= (2)(812.0) = 1623.9 \#$ D1: Nominal Diameter of Fastener (in): 0.250

L: Length of Fasteners (in): 1.000

Asn: Thread Stripping Area of Internal Thread (Per Inch): 0.032

ALLOWABLE CONNECTION TENSION

n, Threads Per Inch: 14

$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s$ tc, Thread Engagement Depth: 0.1

$= (.48 - 0.25)(.25)(22)(1)/3 = 421.7 \#$ Ns: Number of Screws: 2

$P_{not} = (K_s)(D1)(tc)(F_{ty2})/n_s$

$= 350.0 \#$

$P_{at} = N_s * P_{n_{min}}$

$= (2)(350.0) = 700.0 \#$

Aluminum Alloy Structural Values:

F_{tu1} : Ultimate Tension of Piece 1 (ksi): 22

MAXIMUM ALLOWABLE SHEAR PER SCREW

F_{ty1} : Yield Tension of Piece 1 (ksi): 16

$P = F_v * A = 0.17 * 95000 * 3.14 * D^{2/4}$ F_{tu2} : Ultimate Tension of Piece 2 (ksi): 38

$= 792.8$ F_{ty2} : Yield Bearing of Piece 2 (ksi): 35

$P_{at} = N_s * P$

$= (2)(793) = 1586 \#$

MAXIMUM ALLOWABLE LOADS

Coefficients:

SHEAR: 1585.5 # Coefficient, Ks = 1.2

TENSION: 700.0 # Coefficient 2/n = 0.14285714

Coefficient, 4/n = 0.28571429

UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

Calculations Conform to (AA) ADM2000

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U-CLIP TO FOUNDATION

FASTENERS: 6 0.375 " X 4.000 " LAG BOLTS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: 6063-T6

$$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$$

T1: Thickness of Piece 1 (in): .25

$$=(.375)(.25)(30)/2/2.34 = 2403.8 \#$$

Fastener Type: LAG BOLTS

$$P_{as} = Ns * P_{ns_{min}}$$

Thread Type: SPACED THREADS

$$=(6)(2403.8) = 14423.1 \#$$

Crown (C) or Valley (V) Fastening: C

D2: Diameter of Head/Washer (in): .72

D1: Nominal Diameter of Fastener (in): 0.375

L: Length of Fasteners (in): 4.000

ALLOWABLE CONNECTION TENSION

Ns: Number of Screws: 6

$$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s$$

$$=(.72 - 0.375)(.25)(30)(1)/3 = 862.5 \#$$

$$P_{at} = Ns * P_{n_{min}}$$

Aluminum Alloy Structural Values:

$$=(6)(862.5) = 5175.0 \#$$

F_{tu1}: Ultimate Tension of Piece 1 (ksi): 30

F_{ty1}: Yield Tension of Piece 1 (ksi): 25

MAXIMUM ALLOWABLE SHEAR PER SCREW

$$P = F_v * A = 0.17 * 95000 * 3.14 * D^{2/4}$$

$$= 1784$$

$$P_{at} = Ns * P$$

$$=(6)(1784) = 10702 \#$$

MAXIMUM ALLOWABLE LOADS

SHEAR: 14423.1 #

TENSION: 5175.0 #

NOTE: THESE CALCULATIONS PERTAIN TO THE CONNECTIONS UP TO, BUT NOT INCLUDING,
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THE CONNECTIONS TO THE EXISTING STRUCTURE AND/OR ANY NEW CONSTRUCTION
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UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

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2X8 GLAZING BAR TO U-CLIP

FASTENERS: 10 0.250 " X 1.000 " TEK SCREWS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: **6005-T5**

$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$ T1: Thickness of Piece 1 (in): **.11**

$= (.250)(.11)(38)/2/2.34 = 893.2 \#$ A2: Alloy of Piece 2: **6063-T6**

$P_{ns} = 2(D1)(T2)(F_{tu2})/n_u$ T2: Thickness of Piece 2 (in): **.15**

$= (.250)(.15)(30)/2/2.34 = 961.5 \#$ Fastener Type: **TEK SCREWS**

$P_{ns} = ((T2)(T2)(T2)(D1))E0.5 * 4.2(F_{tu2})$ for **$T2 \leq T1$** Thread Type: **SPACED THREADS**

$= ((.15)(.15)(.15)(0.25))E0.5 * 4.2(30000) = N/A$ Crown (C) or Valley (V) Fastening: **V**

$P_{as} = N_s * P_{ns_{min}}$ D2: Diameter of Head/Washer (in): **.442**

$= (10)(893.2) = 8931.6 \#$ D1: Nominal Diameter of Fastener (in): **0.250**

L: Length of Fasteners (in): **1.000**

Asn: Thread Stripping Area of Internal Thread (Per Inch): **0.032**

ALLOWABLE CONNECTION TENSION

n, Threads Per Inch: **14**

$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s$ tc, Thread Engagement Depth: **0.15**

$= (.442 - 0.25)(.11)(38)(0.7)/3 = 187.3 \#$ Ns: Number of Screws: **10**

$P_{not} = ((Ks)(D1)(F_{ty2})(4/n-tc)+3.26(D1)(F_{tu2})(tc-2/n))/ns$

$= 397.5 \#$

$P_{at} = N_s * P_{n_{min}}$

$= (10)(187.3) = 1872.6 \#$

Aluminum Alloy Structural Values:

F_{tu1} : Ultimate Tension of Piece 1 (ksi): **38**

F_{ty1} : Yield Tension of Piece 1 (ksi): **35**

F_{tu2} : Ultimate Tension of Piece 2 (ksi): **30**

F_{ty2} : Yield Bearing of Piece 2 (ksi): **25**

MAXIMUM ALLOWABLE SHEAR PER SCREW

$P = F_v * A = 0.17 * 95000 * 3.14 * D^2/4$

$= 792.8$

$P_{at} = N_s * P$

$= (10)(793) = 7928 \#$

MAXIMUM ALLOWABLE LOADS

Coefficients:

SHEAR: **7927.6 #** Coefficient, Ks = **1.2**

TENSION: **1872.6 #** Coefficient 2/n = **0.14285714**

Coefficient, 4/n = **0.28571429**

UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

Calculations Conform to (AA) ADM2000

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2X8 GLAZING BAR TO U-CLIP

FASTENERS: 8 0.216 " X 0.500 " MACHINE SCREWS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: 6005-T5

$$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$$
$$T1: \text{Thickness of Piece 1 (in): } .11$$
$$=(.216)(.11)(38)2/2.34 = 771.7 \#$$

A2: Alloy of Piece 2: 6063-T6

$$P_{ns} = 2(D1)(T2)(F_{tu2})/n_u$$
$$T2: \text{Thickness of Piece 2 (in): } .15$$
$$=(.216)(.15)(30)2/2.34 = 830.8 \#$$

Fastener Type: MACHINE SCREWS

$$P_{ns} = ((T2)(T2)(T2)(D1))E0.5 * 4.2(F_{tu2}) \text{ for } T2 \leq T1$$
$$Thread Type: UNC$$
$$=((.15)(.15)(.15)(0.216))E0.5 * 4.2(30000) = N/A$$

Crown (C) or Valley (V) Fastening: V

$$P_{as} = N_s * P_{ns_{min}}$$
$$D2: \text{Diameter of Head/Washer (in): } .35$$
$$=(8)(771.7) = 6173.5 \#$$

D1: Nominal Diameter of Fastener (in): 0.216

L: Length of Fasteners (in): 0.500

Asn: Thread Stripping Area of Internal Thread (Per Inch): 0.024

ALLOWABLE CONNECTION TENSION

n, Threads Per Inch: 24

$$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s$$
$$tc, \text{ Thread Engagement Depth: } 0.15$$
$$=(.35 - 0.216)(.11)(38)(0.7)/3 = 130.7 \#$$

Ns: Number of Screws: 8

$$P_{not} = ((Ks)(D1)(F_{ty2})(0.25-tc)+1.16(Asn)(F_{tu2})(tc-0.125))/ns$$
$$= 223.0 \#$$

$$P_{at} = N_s * P_{n_{min}}$$
$$=(8)(130.7) = 1045.6 \#$$

Aluminum Alloy Structural Values:

F_{tu1}: Ultimate Tension of Piece 1 (ksi): 38

MAXIMUM ALLOWABLE SHEAR PER SCREW

F_{ty1}: Yield Tension of Piece 1 (ksi): 35

$$P = F_v * A = 0.17 * 95000 * 3.14 * D^{2/4}$$
$$F_{tu2}: \text{Ultimate Tension of Piece 2 (ksi): } 30$$
$$= 591.8$$

F_{ty2}: Yield Bearing of Piece 2 (ksi): 25

$$P_{at} = N_s * P$$
$$=(8)(592) = 4734 \#$$

MAXIMUM ALLOWABLE LOADS

Coefficients:

SHEAR: 4734.3 # Coefficient, Ks = 1.2

TENSION: 1045.6 # Coefficient 2/n = 0.08333333

Coefficient, 4/n = 0.16666667

UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

Calculations Conform to (AA) ADM2000

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U-CLIP TO 2X8 GLAZING BAR

FASTENERS: 6 0.250 " X 1.000 " TEK SCREWS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: 6063-T6

$$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$$
T1: Thickness of Piece 1 (in): .25

$$=(.250)(.25)(30)2/2.34 = 1602.6 \#$$
A2: Alloy of Piece 2: 6005-T5

$$P_{ns} = 2(D1)(T2)(F_{tu2})/n_u$$
T2: Thickness of Piece 2 (in): .11

$$=(.250)(.11)(38)2/2.34 = 893.2 \#$$
Fastener Type: TEK SCREWS

$$P_{ns} = ((T2)(T2)(T2)(D1))E0.5 * 4.2(F_{tu2}) \text{ for } T2 \leq T1$$
Thread Type: SPACED THREADS

$$=((.11)(.11)(.11)(0.25))E0.5 * 4.2(38000) = 2911.3$$
Crown (C) or Valley (V) Fastening: C

$$P_{as} = N_s * P_{ns_{min}}$$
D2: Diameter of Head/Washer (in): .48

$$=(6)(893.2) = 5359.0 \#$$
D1: Nominal Diameter of Fastener (in): 0.250

L: Length of Fasteners (in): 1.000

Asn: Thread Stripping Area of Internal Thread (Per Inch): 0.032

ALLOWABLE CONNECTION TENSION

n, Threads Per Inch: 14

$$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s$$
tc, Thread Engagement Depth: 0.11

$$=(.48 - 0.25)(.25)(30)(1)/3 = 575.0 \#$$
Ns: Number of Screws: 6

$$P_{not} = (K_s)(D1)(tc)(F_{ty2})/n_s$$

$$= 385.0 \#$$

$$P_{at} = N_s * P_{n_{min}}$$

$$=(6)(385.0) = 2310.0 \#$$

Aluminum Alloy Structural Values:

$$F_{tu1}$$
: Ultimate Tension of Piece 1 (ksi): 30

MAXIMUM ALLOWABLE SHEAR PER SCREW

$$F_{ty1}$$
: Yield Tension of Piece 1 (ksi): 25

$$P = F_v * A = 0.17 * 95000 * 3.14 * D^{2/4}$$
$$F_{tu2}$$
: Ultimate Tension of Piece 2 (ksi): 38

$$= 792.8$$
$$F_{ty2}$$
: Yield Bearing of Piece 2 (ksi): 35

$$P_{at} = N_s * P$$

$$=(6)(793) = 4757 \#$$

MAXIMUM ALLOWABLE LOADS

Coefficients:

SHEAR: 4756.6 # Coefficient, Ks = 1.2

TENSION: 2310.0 # Coefficient 2/n = 0.14285714

Coefficient, 4/n = 0.28571429

UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

Calculations Conform to (AA) ADM2000

JOB:	MARLBOROUGH PROJECT		
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STAMPED BY:		DATE:	

U-CLIP TO E. WALL

FASTENERS: 4 0.250 " X 3.000 " LAG BOLTS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: 6063-T6

$$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$$

T1: Thickness of Piece 1 (in): .25

$$=(.250)(.25)(30)/2/2.34 = 1602.6 \#$$

Fastener Type: LAG BOLTS

$$P_{as} = Ns * P_{ns_{min}}$$

Thread Type: SPACED THREADS

$$=(4)(1602.6) = 6410.3 \#$$

Crown (C) or Valley (V) Fastening: C

D2: Diameter of Head/Washer (in): .48

D1: Nominal Diameter of Fastener (in): 0.250

L: Length of Fasteners (in): 3.000

ALLOWABLE CONNECTION TENSION

Ns: Number of Screws: 4

$$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s$$

$$=(.48 - 0.25)(.25)(30)(1)/3 = 575.0 \#$$

$$P_{at} = Ns * P_{n_{min}}$$

Aluminum Alloy Structural Values:

$$=(4)(575.0) = 2300.0 \#$$

F_{tu1}: Ultimate Tension of Piece 1 (ksi): 30

F_{ty1}: Yield Tension of Piece 1 (ksi): 25

MAXIMUM ALLOWABLE SHEAR PER SCREW

$$P = F_v * A = 0.17 * 95000 * 3.14 * D^{2/4}$$

$$= 792.8$$

$$P_{at} = Ns * P$$

$$=(4)(793) = 3171 \#$$

MAXIMUM ALLOWABLE LOADS

SHEAR: 6410.3 #

TENSION: 2300.0 #

NOTE: THESE CALCULATIONS PERTAIN TO THE CONNECTIONS UP TO, BUT NOT INCLUDING,
THE CONNECTIONS TO THE EXISTING STRUCTURE AND/OR ANY NEW CONSTRUCTION.
THE CONNECTIONS TO THE EXISTING STRUCTURE AND/OR ANY NEW CONSTRUCTION
MUST BE ANALYZED ACCORDING TO CONDITIONS SPECIFIC TO EACH JOB BY OTHERS.

UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

JOB:	MARLBOROUGH PROJECT	
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U-CLIP TO HEAVY GLAZING BAR		
FASTENERS:	4 0.216 " X 0.500 "	MACHINE SCREWS
Equation Inputs:		
ALLOWABLE CONNECTION BEARING	A1: Alloy of Piece 1: 6063-T6	
$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$	T1: Thickness of Piece 1 (in):	.25
$= (.216)(.25)(30)/2/2.34 =$	1384.6 #	A2: Alloy of Piece 2: 6005-T5
$P_{ns} = 2(D1)(T2)(F_{tu2})/n_u$	T2: Thickness of Piece 2 (in):	.1
$= (.216)(.1)(38)/2/2.34 =$	701.5 #	Fastener Type: MACHINE SCREWS
$P_{ns} = ((T2)(T2)(D1))E0.5 * 4.2(F_{tu2}) \text{ for } T2 \leq T1$	Thread Type:	UNC
$= ((.1)(.1)(.1)(0.216))E0.5 * 4.2(38000) =$	2345.6	Crown (C) or Valley (V) Fastening: V
$P_{as} = N_s * P_{ns_{min}}$	D2: Diameter of Head/Washer (in):	.35
$= (4)(701.5) =$	2806.2 #	D1: Nominal Diameter of Fastener (in): 0.216
	L: Length of Fasteners (in):	0.500
	Asn: Thread Stripping Area of Internal Thread (Per Inch):	0.024
ALLOWABLE CONNECTION TENSION	n, Threads Per Inch:	24
$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s$	tc, Thread Engagement Depth:	0.1
$= (.35 - 0.216)(.25)(30)(0.7)/3 =$	234.5 #	Ns: Number of Screws: 4
$P_{not} = (K_s)(D1)(tc)(F_{ty2})/n_s$		
$=$	302.4 #	
$P_{at} = N_s * P_{n_{min}}$		
$= (4)(234.5) =$	938.0 #	Aluminum Alloy Structural Values:
	F_{tu1} : Ultimate Tension of Piece 1 (ksi):	30
MAXIMUM ALLOWABLE SHEAR PER SCREW	F_{ty1} : Yield Tension of Piece 1 (ksi):	25
$P = F_v * A = 0.17 * 95000 * 3.14 * D^2/4$	F_{tu2} : Ultimate Tension of Piece 2 (ksi):	38
$=$	591.8	F_{ty2} : Yield Bearing of Piece 2 (ksi): 35
$P_{at} = N_s * P$		
$= (4)(592) =$	2367 #	
MAXIMUM ALLOWABLE LOADS	Coefficients:	
SHEAR:	2367.2 #	Coefficient, Ks = 1.2
TENSION:	938.0 #	Coefficient 2/n = 0.08333333
		Coefficient, 4/n = 0.16666667
	UNC THREADS: Types C,D,F,G,T	
	SPACED THREADS: Types AB,B,BP,BF,BT	
	Calculations Conform to (AA) ADM2000	

JOB:	MARLBOROUGH PROJECT	
SHEET NO:	12	OF: 24
CALCULATED BY:	Lawrence Duffy	DATE: 6/19/2025
CHECKED BY:		DATE:
STAMPED BY:		DATE:

SADDLE LUG TO E. WALL

FASTENERS: 10 0.250 " X 3.000 " LAG BOLTS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: 6063-T5

$$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$$
$$=(.250)(.125)(22)/2/2.34 = 587.6 \#$$

T1: Thickness of Piece 1 (in): .125

Fastener Type: LAG BOLTS

$$P_{as} = Ns * Pns_{min}$$
$$=(10)(587.6) = 5876.1 \#$$

Thread Type: SPACED THREADS

Crown (C) or Valley (V) Fastening: C

D2: Diameter of Head/Washer (in): .48

D1: Nominal Diameter of Fastener (in): 0.250

L: Length of Fasteners (in): 3.000

ALLOWABLE CONNECTION TENSION

Ns: Number of Screws: 10

$$P_{nov} = (D2 - D1)(T1)(F_{tu1})(C)/n_s$$
$$=(.48 - 0.25)(.125)(22)(1)/3 = 210.8 \#$$

$$P_{at} = Ns * Pn_{min}$$
$$=(10)(210.8) = 2108.3 \#$$

Aluminum Alloy Structural Values:

F_{tu1}: Ultimate Tension of Piece 1 (ksi): 22

F_{ty1}: Yield Tension of Piece 1 (ksi): 16

MAXIMUM ALLOWABLE SHEAR PER SCREW

$$P = F_v * A = 0.17 * 95000 * 3.14 * D^{2/4}$$
$$= 792.8$$

$$P_{at} = Ns * P$$
$$=(10)(793) = 7928 \#$$

MAXIMUM ALLOWABLE LOADS

SHEAR: 5876.1 #

TENSION: 2108.3 #

NOTE: THESE CALCULATIONS PERTAIN TO THE CONNECTIONS UP TO, BUT NOT INCLUDING,
THE CONNECTIONS TO THE EXISTING STRUCTURE AND/OR ANY NEW CONSTRUCTION.
THE CONNECTIONS TO THE EXISTING STRUCTURE AND/OR ANY NEW CONSTRUCTION
MUST BE ANALYZED ACCORDING TO CONDITIONS SPECIFIC TO EACH JOB BY OTHERS.

UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

JOB:	MARLBOROUGH PROJECT		
SHEET NO:	13	OF:	24
CALCULATED BY:	Lawrence Duffy	DATE:	6/19/2025
CHECKED BY:		DATE:	
STAMPED BY:		DATE:	

SADDLE LUG TO E. WALL

FASTENERS: 10 0.250 " X 3.000 " LAG BOLTS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: 6063-T5

$$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$$
$$=(.250)(.125)(22)/2/2.34 = 587.6 \#$$

T1: Thickness of Piece 1 (in): .125

Fastener Type: LAG BOLTS

$$P_{as} = Ns * Pns_{min}$$
$$=(10)(587.6) = 5876.1 \#$$

Thread Type: SPACED THREADS

Crown (C) or Valley (V) Fastening: C

D2: Diameter of Head/Washer (in): .625

D1: Nominal Diameter of Fastener (in): 0.250

L: Length of Fasteners (in): 3.000

ALLOWABLE CONNECTION TENSION

Ns: Number of Screws: 10

$$P_{nov} = (D2 - D1)(T1)(F_{tu1})(C)/n_s$$
$$=(.625 - 0.25)(.125)(22)(1)/3 = 343.8 \#$$

$$P_{at} = Ns * Pn_{min}$$
$$=(10)(343.8) = 3437.5 \#$$

Aluminum Alloy Structural Values:

F_{tu1}: Ultimate Tension of Piece 1 (ksi): 22

F_{ty1}: Yield Tension of Piece 1 (ksi): 16

MAXIMUM ALLOWABLE SHEAR PER SCREW

$$P = F_v * A = 0.17 * 95000 * 3.14 * D^{2/4}$$
$$= 792.8$$

$$P_{at} = Ns * P$$
$$=(10)(793) = 7928 \#$$

MAXIMUM ALLOWABLE LOADS

SHEAR: 5876.1 #

TENSION: 3437.5 #

NOTE: THESE CALCULATIONS PERTAIN TO THE CONNECTIONS UP TO, BUT NOT INCLUDING,
THE CONNECTIONS TO THE EXISTING STRUCTURE AND/OR ANY NEW CONSTRUCTION.
THE CONNECTIONS TO THE EXISTING STRUCTURE AND/OR ANY NEW CONSTRUCTION
MUST BE ANALYZED ACCORDING TO CONDITIONS SPECIFIC TO EACH JOB BY OTHERS.

UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

JOB:	MARLBOROUGH PROJECT		
SHEET NO:	14	OF:	24
CALCULATED BY:	Lawrence Duffy	DATE:	6/19/2025
CHECKED BY:		DATE:	
STAMPED BY:		DATE:	

HEAVY GLAZING BAR TO SADDLE LUG

FASTENERS: 10 0.216 " X 0.500 " MACHINE SCREWS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: 6005-T5

$$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$$
T1: Thickness of Piece 1 (in): .1

$$=(.216)(.1)(38)2/2.34 = 701.5 \#$$
A2: Alloy of Piece 2: 6063-T5

$$P_{ns} = 2(D1)(T2)(F_{tu2})/n_u$$
T2: Thickness of Piece 2 (in): .125

$$=(.216)(.125)(22)2/2.34 = 507.7 \#$$
Fastener Type: MACHINE SCREWS

$$P_{ns} = ((T2)(T2)(T2)(D1))E0.5 * 4.2(F_{tu2}) \text{ for } T2 \leq T1$$
Thread Type: UNC

$$=((.125)(.125)(.125)(0.216))E0.5 * 4.2(22000) = N/A$$
Crown (C) or Valley (V) Fastening: V

$$P_{as} = N_s * P_{ns_{min}}$$
D2: Diameter of Head/Washer (in): .35

$$=(10)(507.7) = 5076.9 \#$$
D1: Nominal Diameter of Fastener (in): 0.216

L: Length of Fasteners (in): 0.500

Asn: Thread Stripping Area of Internal Thread (Per Inch): 0.024

ALLOWABLE CONNECTION TENSION

n, Threads Per Inch: 24

$$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s$$
tc, Thread Engagement Depth: 0.125

$$=(.35 - 0.216)(.1)(38)(0.7)/3 = 118.8 \#$$
Ns: Number of Screws: 10

$$P_{not} = (Ks)(D1)(tc)(F_{ty2})/n_s$$

$$= 172.8 \#$$

$$P_{at} = N_s * P_{n_{min}}$$

$$=(10)(118.8) = 1188.1 \#$$

Aluminum Alloy Structural Values:

$$F_{tu1}$$
: Ultimate Tension of Piece 1 (ksi): 38

$$F_{ty1}$$
: Yield Tension of Piece 1 (ksi): 35

$$F_{tu2}$$
: Ultimate Tension of Piece 2 (ksi): 22

$$F_{ty2}$$
: Yield Bearing of Piece 2 (ksi): 16

MAXIMUM ALLOWABLE SHEAR PER SCREW

$$P = F_v * A = 0.17 * 95000 * 3.14 * D^{2/4}$$

$$= 591.8$$

$$P_{at} = N_s * P$$

$$=(10)(592) = 5918 \#$$

MAXIMUM ALLOWABLE LOADS

Coefficients:

SHEAR: 5076.9 # Coefficient, Ks = 1.2

TENSION: 1188.1 # Coefficient 2/n = 0.08333333

Coefficient, 4/n = 0.16666667

UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

Calculations Conform to (AA) ADM2000

JOB:	MARLBOROUGH PROJECT	
SHEET NO:	15	OF: 24
CALCULATED BY:	Lawrence Duffy	DATE: 6/19/2025
CHECKED BY:		DATE:
STAMPED BY:		DATE:

2X4 GLAZING BAR TO SADDLE LUG

FASTENERS: 10 0.216 " X 0.500 " MACHINE SCREWS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: 6063-T6

$$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$$
$$T1: \text{Thickness of Piece 1 (in): } .1$$
$$=(.216)(.1)(30)2/2.34 = 553.8 \#$$

A2: Alloy of Piece 2: 6063-T5

$$P_{ns} = 2(D1)(T2)(F_{tu2})/n_u$$
$$T2: \text{Thickness of Piece 2 (in): } .125$$
$$=(.216)(.125)(22)2/2.34 = 507.7 \#$$

Fastener Type: MACHINE SCREWS

$$P_{ns} = ((T2)(T2)(D1))E0.5 * 4.2(F_{tu2}) \text{ for } T2 \leq T1$$
$$Thread Type: UNC$$
$$=((.125)(.125)(.125)(.0216))E0.5 * 4.2(22000) = N/A$$

Crown (C) or Valley (V) Fastening: V

$$P_{as} = N_s * P_{ns_{min}}$$
$$D2: \text{Diameter of Head/Washer (in): } .35$$
$$=(10)(507.7) = 5076.9 \#$$

D1: Nominal Diameter of Fastener (in): 0.216

L: Length of Fasteners (in): 0.500

Asn: Thread Stripping Area of Internal Thread (Per Inch): 0.024

ALLOWABLE CONNECTION TENSION

n, Threads Per Inch: 24

$$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s$$
$$tc, \text{ Thread Engagement Depth: } 0.125$$
$$=(.35 - 0.216)(.1)(30)(0.7)/3 = 93.8 \#$$

Ns: Number of Screws: 10

$$P_{not} = (Ks)(D1)(tc)(F_{ty2})/n_s$$
$$= 172.8 \#$$

$$P_{at} = N_s * P_{n_{min}}$$
$$=(10)(93.8) = 938.0 \#$$

Aluminum Alloy Structural Values:

F_{tu1}: Ultimate Tension of Piece 1 (ksi): 30

MAXIMUM ALLOWABLE SHEAR PER SCREW

F_{ty1}: Yield Tension of Piece 1 (ksi): 25

$$P = F_v * A = 0.17 * 95000 * 3.14 * D^{2/4}$$
$$F_{tu2}: \text{Ultimate Tension of Piece 2 (ksi): } 22$$
$$= 591.8$$

F_{ty2}: Yield Bearing of Piece 2 (ksi): 16

$$P_{at} = N_s * P$$
$$=(10)(592) = 5918 \#$$

MAXIMUM ALLOWABLE LOADS

Coefficients:

SHEAR: 5076.9 # Coefficient, Ks = 1.2

TENSION: 938.0 # Coefficient 2/n = 0.08333333

Coefficient, 4/n = 0.16666667

UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

JOB:	MARLBOROUGH PROJECT	
SHEET NO:	16	OF: 24
CALCULATED BY:	Lawrence Duffy	DATE: 6/19/2025
CHECKED BY:		DATE:
STAMPED BY:		DATE:

L-CLIP TO 2X8 GLAZING BAR

FASTENERS: 8 0.250 " X 1.500 " TEK SCREWS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: **6063-T5**

$$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u \quad T1: \text{Thickness of Piece 1 (in): } .25$$

$$=(.250)(.25)(22)2/2.34 = 1175.2 \# \quad A2: \text{Alloy of Piece 2: } \mathbf{6005-T5}$$

$$P_{ns} = 2(D1)(T2)(F_{tu2})/n_u \quad T2: \text{Thickness of Piece 2 (in): } .185$$

$$=(.250)(.185)(38)2/2.34 = 1502.1 \# \quad \text{Fastener Type: } \mathbf{TEK \ SCREWS}$$

$$P_{ns} = ((T2)(T2)(T2)(D1))E0.5 * 4.2(F_{tu2}) \text{ for } \mathbf{T2 \leq T1} \quad \text{Thread Type: } \mathbf{SPACED \ THREADS}$$

$$=((.185)(.185)(.185)(0.25))E0.5 * 4.2(38000) = 6349.8 \quad \text{Crown (C) or Valley (V) Fastening: } \mathbf{C}$$

$$P_{as} = N_s * P_{ns_{min}} \quad D2: \text{Diameter of Head/Washer (in): } .48$$

$$=(8)(1175.2) = 9401.7 \# \quad D1: \text{Nominal Diameter of Fastener (in): } \mathbf{0.250}$$

$$L: \text{Length of Fasteners (in): } \mathbf{1.500}$$

$$A_{sn}: \text{Thread Stripping Area of Internal Thread (Per Inch): } \mathbf{0.032}$$

ALLOWABLE CONNECTION TENSION

n, Threads Per Inch: **14**

$$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s \quad t_c, \text{ Thread Engagement Depth: } \mathbf{0.185}$$

$$=(.48 - 0.25)(.25)(22)(1)/3 = 421.7 \# \quad N_s: \text{Number of Screws: } \mathbf{8}$$

$$P_{not} = ((K_s)(D1)(F_{ty2})(4/n-t_c)+3.26(D1)(F_{tu2})(t_c-2/n))/n_s$$

$$= 787.6 \#$$

$$P_{at} = N_s * P_{n_{min}}$$

$$=(8)(421.7) = 3373.3 \#$$

Aluminum Alloy Structural Values:

$$F_{tu1}: \text{Ultimate Tension of Piece 1 (ksi): } 22$$

$$F_{ty1}: \text{Yield Tension of Piece 1 (ksi): } 16$$

$$F_{tu2}: \text{Ultimate Tension of Piece 2 (ksi): } 38$$

$$F_{ty2}: \text{Yield Bearing of Piece 2 (ksi): } 35$$

MAXIMUM ALLOWABLE SHEAR PER SCREW

$$P = F_v * A = 0.17 * 95000 * 3.14 * D^{2/4}$$

$$= 792.8$$

$$P_{at} = N_s * P$$

$$=(8)(793) = 6342 \#$$

MAXIMUM ALLOWABLE LOADS

Coefficients:

$$\text{SHEAR: } \mathbf{6342.1 \#} \quad \text{Coefficient, } K_s = \mathbf{1.2}$$

$$\text{TENSION: } \mathbf{3373.3 \#} \quad \text{Coefficient } 2/n = \mathbf{0.14285714}$$

$$\text{Coefficient, } 4/n = \mathbf{0.28571429}$$

UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

Calculations Conform to (AA) ADM2000

JOB:	MARLBOROUGH PROJECT	
SHEET NO:	17	OF: 24
CALCULATED BY:	Lawrence Duffy	DATE: 6/19/2025
CHECKED BY:		DATE:
STAMPED BY:		DATE:

L-CLIP TO 2X4 GLAZING BAR

FASTENERS: 8 0.250 " X 1.500 " TEK SCREWS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: 6063-T5

$$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$$

T1: Thickness of Piece 1 (in): .25

$$=(.250)(.25)(22)2/2.34 = 1175.2 \text{ \#}$$

A2: Alloy of Piece 2: 6063-T6

$$P_{ns} = 2(D1)(T2)(F_{tu2})/n_u$$

T2: Thickness of Piece 2 (in): .1

$$=(.250)(.1)(30)2/2.34 = 641.0 \text{ \#}$$

Fastener Type: TEK SCREWS

$$P_{ns} = ((T2)(T2)(D1))E0.5 * 4.2(F_{tu2}) \text{ for } T2 \leq T1$$

Thread Type: SPACED THREADS

$$=((.1)(.1)(.1)(0.25))E0.5 * 4.2(30000) = 1992.2$$

Crown (C) or Valley (V) Fastening: C

$$P_{as} = N_s * P_{ns_{min}}$$

D2: Diameter of Head/Washer (in): .48

$$=(8)(641.0) = 5128.2 \text{ \#}$$

D1: Nominal Diameter of Fastener (in): 0.250

L: Length of Fasteners (in): 1.500

Asn: Thread Stripping Area of Internal Thread (Per Inch): 0.032

ALLOWABLE CONNECTION TENSION

n, Threads Per Inch: 14

$$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s$$

tc, Thread Engagement Depth: 0.1

$$=(.48 - 0.25)(.25)(22)(1)/3 = 421.7 \text{ \#}$$

Ns: Number of Screws: 8

$$P_{not} = (K_s)(D1)(tc)(F_{ty2})/n_s$$

$$= 250.0 \text{ \#}$$

$$P_{at} = N_s * P_{n_{min}}$$

$$=(8)(250.0) = 2000.0 \text{ \#}$$

Aluminum Alloy Structural Values:

F_{tu1}: Ultimate Tension of Piece 1 (ksi): 22

MAXIMUM ALLOWABLE SHEAR PER SCREW

F_{ty1}: Yield Tension of Piece 1 (ksi): 16

$$P = F_v * A = 0.17 * 95000 * 3.14 * D^{2/4}$$

F_{tu2}: Ultimate Tension of Piece 2 (ksi): 30

$$= 792.8$$

F_{ty2}: Yield Bearing of Piece 2 (ksi): 25

$$P_{at} = N_s * P$$

$$=(8)(793) = 6342 \text{ \#}$$

MAXIMUM ALLOWABLE LOADS

Coefficients:

SHEAR: 5128.2 #

Coefficient, Ks = 1.2

TENSION: 2000.0 #

Coefficient 2/n = 0.14285714

Coefficient, 4/n = 0.28571429

UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

Calculations Conform to (AA) ADM2000

JOB:	MARLBOROUGH PROJECT	
SHEET NO:	18	OF: 24
CALCULATED BY:	Lawrence Duffy	DATE: 6/19/2025
CHECKED BY:		DATE:
STAMPED BY:		DATE:

HEAVY GLAZING BAR TO I-BEAM ASSEMBLY

FASTENERS: 8 0.190 " X 0.750 " TEK SCREWS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: 6005-T5

$$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$$
T1: Thickness of Piece 1 (in): .125

$$=(.190)(.125)(38)2/2.34 = 771.4 \#$$
A2: Alloy of Piece 2: 6063-T5

$$P_{ns} = 2(D1)(T2)(F_{tu2})/n_u$$
T2: Thickness of Piece 2 (in): .2308

$$=(.190)(.2308)(22)2/2.34 = 824.6 \#$$
Fastener Type: TEK SCREWS

$$P_{ns} = ((T2)(T2)(D1))E0.5 * 4.2(F_{tu2}) \text{ for } T2 \leq T1$$
Thread Type: SPACED THREADS

$$=((.2308)(.2308)(.2308)(0.19))E0.5 * 4.2(22000) = \text{N/A}$$
Crown (C) or Valley (V) Fastening: C

$$P_{as} = N_s * P_{ns_{min}}$$
D2: Diameter of Head/Washer (in): .384

$$=(8)(771.4) = 6170.9 \#$$
D1: Nominal Diameter of Fastener (in): 0.190

L: Length of Fasteners (in): 0.750

Asn: Thread Stripping Area of Internal Thread (Per Inch): 0.018

ALLOWABLE CONNECTION TENSION

n, Threads Per Inch: 16

$$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s$$
tc, Thread Engagement Depth: 0.2308

$$=(.384 - 0.19)(.125)(38)(1)/3 = 307.2 \#$$
Ns: Number of Screws: 8

$$P_{not} = ((K_s)(D1)(F_{ty2})(4/n-tc)+3.26(D1)(F_{tu2})(tc-2/n))/n_s$$

$$= 503.9 \#$$

$$P_{at} = N_s * P_{n_{min}}$$

$$=(8)(307.2) = 2457.3 \#$$

Aluminum Alloy Structural Values:

$$F_{tu1}$$
: Ultimate Tension of Piece 1 (ksi): 38

$$F_{ty1}$$
: Yield Tension of Piece 1 (ksi): 35

$$F_{tu2}$$
: Ultimate Tension of Piece 2 (ksi): 22

$$F_{ty2}$$
: Yield Bearing of Piece 2 (ksi): 16

MAXIMUM ALLOWABLE SHEAR PER SCREW

$$P = F_v * A = 0.17 * 95000 * 3.14 * D^{2/4}$$

$$= 457.9$$

$$P_{at} = N_s * P$$

$$=(8)(458) = 3663 \#$$

MAXIMUM ALLOWABLE LOADS

Coefficients:

SHEAR: 3663.2 # Coefficient, Ks = 1.2

TENSION: 2457.3 # Coefficient 2/n = 0.125

Coefficient, 4/n = 0.25

UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

Calculations Conform to (AA) ADM2000

JOB:	MARLBOROUGH PROJECT	
SHEET NO:	19	OF: 24
CALCULATED BY:	Lawrence Duffy	DATE: 6/19/2025
CHECKED BY:		DATE:
STAMPED BY:		DATE:

CHEVRON PLATE TO I-BEAM ASSEMBLY (11617)		
FASTENERS:	8 0.216 " X 1.000 "	TEK SCREWS
Equation Inputs:		
ALLOWABLE CONNECTION BEARING	A1: Alloy of Piece 1: 6063-T5	
$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$	T1: Thickness of Piece 1 (in):	.125
$= (.216)(.125)(22)/2.34 =$	507.7 #	A2: Alloy of Piece 2: 6063-T5
$P_{ns} = 2(D1)(T2)(F_{tu2})/n_u$	T2: Thickness of Piece 2 (in):	.125
$= (.216)(.125)(22)/2.34 =$	507.7 #	Fastener Type: TEK SCREWS
$P_{ns} = ((T2)(T2)(D1))E0.5 * 4.2(F_{tu2})$ for $T2 \leq T1$	Thread Type:	SPACED THREADS
$= ((.125)(.125)(.125)(0.216))E0.5 * 4.2(22000) =$	1897.9	Crown (C) or Valley (V) Fastening: V
$P_{as} = N_s * P_{ns_{min}}$	D2: Diameter of Head/Washer (in):	.35
$= (8)(507.7) =$	4061.5 #	D1: Nominal Diameter of Fastener (in): 0.216
	L: Length of Fasteners (in):	1.000
	Asn: Thread Stripping Area of Internal Thread (Per Inch):	0.024
ALLOWABLE CONNECTION TENSION	n, Threads Per Inch:	14
$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s$	tc, Thread Engagement Depth:	0.125
$= (.35 - 0.216)(.125)(22)(0.7)/3 =$	86.0 #	Ns: Number of Screws: 8
$P_{not} = (K_s)(D1)(tc)(F_{ty2})/n_s$		
$=$	172.8 #	
$P_{at} = N_s * P_{n_{min}}$		
$= (8)(86.0) =$	687.9 #	Aluminum Alloy Structural Values:
	F_{tu1} : Ultimate Tension of Piece 1 (ksi):	22
MAXIMUM ALLOWABLE SHEAR PER SCREW	F_{ty1} : Yield Tension of Piece 1 (ksi):	16
$P = F_v * A = 0.17 * 95000 * 3.14 * D^{2/4}$	F_{tu2} : Ultimate Tension of Piece 2 (ksi):	22
$=$	591.8	F_{ty2} : Yield Bearing of Piece 2 (ksi): 16
$P_{at} = N_s * P$		
$= (8)(592) =$	4734 #	
MAXIMUM ALLOWABLE LOADS	Coefficients:	
SHEAR:	4061.5 #	Coefficient, Ks = 1.2
TENSION:	687.9 #	Coefficient 2/n = 0.14285714
		Coefficient, 4/n = 0.28571429
	UNC THREADS: Types C,D,F,G,T	
	SPACED THREADS: Types AB,B,BP,BF,BT	
	Calculations Conform to (AA) ADM2000	

JOB:	MARLBOROUGH PROJECT		
SHEET NO:	20	OF:	24
CALCULATED BY:	Lawrence Duffy	DATE:	6/19/2025
CHECKED BY:		DATE:	
STAMPED BY:		DATE:	

I-BEAM ASSEMBLY (11617) TO CHEVRON PLATES

(2 PLATES)

TUBE BENDING:

$S = 7.01 \text{ IN}^4 / 2.906 \text{ IN} = 2.4122 \text{ IN}^3$

$M = \sigma S = (19000 \text{ PSI})(2.4122 \text{ IN}^3) = 45833 \text{ IN}\# = 3819 \text{ FT}\#$

PLATE BENDING:

$S = 2 * 1/8" * (4.36)^2 / 6 = 0.792 \text{ IN}^3$

$M = \sigma S = (28000 \text{ PSI})(0.792 \text{ IN}^3) = 22177 \text{ IN}\# = 1848 \text{ FT}\#$

PLATE SHEAR:

$A_p = 2 * 1/8" * (4.36") = 1.09 \text{ IN}^2$

$V_a = 1.09 \text{ IN}^2 * 7500 \text{ PSI} = 8175 \text{ \#}$

JOB:	MARLBOROUGH PROJECT		
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CHECKED BY:		DATE:	
STAMPED BY:		DATE:	

2 X 8" RAFTER (H11366) TO INSERT (H11365)

FASTENERS: 8 0.190 " X 0.750 " TEK SCREWS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: **6005-T5**

$$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u \quad T1: \text{Thickness of Piece 1 (in): } .185$$

$$=(.190)(.185)(38)2/2.34 = 1141.6 \# \quad A2: \text{Alloy of Piece 2: } \mathbf{6005-T5}$$

$$P_{ns} = 2(D1)(T2)(F_{tu2})/n_u \quad T2: \text{Thickness of Piece 2 (in): } .25$$

$$=(.190)(.25)(38)2/2.34 = 1542.7 \# \quad \text{Fastener Type: } \mathbf{TEK SCREWS}$$

$$P_{ns} = ((T2)(T2)(T2)(D1))E0.5 * 4.2(F_{tu2}) \text{ for } T2 \leq T1 \quad \text{Thread Type: } \mathbf{SPACED THREADS}$$

$$=((.25)(.25)(.25)(.019))E0.5 * 4.2(38000) = N/A \quad \text{Crown (C) or Valley (V) Fastening: } \mathbf{C}$$

$$P_{as} = N_s * P_{ns_{min}} \quad D2: \text{Diameter of Head/Washer (in): } .384$$

$$=(8)(1141.6) = 9133.0 \# \quad D1: \text{Nominal Diameter of Fastener (in): } \mathbf{0.190}$$

$$L: \text{Length of Fasteners (in): } \mathbf{0.750}$$

$$A_{sn}: \text{Thread Stripping Area of Internal Thread (Per Inch): } \mathbf{0.018}$$

ALLOWABLE CONNECTION TENSION

n, Threads Per Inch: **24**

$$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s \quad t_c, \text{Thread Engagement Depth: } \mathbf{0.25}$$

$$=(.384 - 0.19)(.185)(38)(1)/3 = 454.6 \# \quad N_s: \text{Number of Screws: } \mathbf{8}$$

$$P_{not} = 1.63(D1)(t_c)(F_{tu2})/n_s$$

$$= 980.7 \#$$

$$P_{at} = N_s * P_{n_{min}}$$

$$=(8)(454.6) = 3636.9 \#$$

Aluminum Alloy Structural Values:

$$F_{tu1}: \text{Ultimate Tension of Piece 1 (ksi): } 38$$

$$F_{ty1}: \text{Yield Tension of Piece 1 (ksi): } 35$$

$$F_{tu2}: \text{Ultimate Tension of Piece 2 (ksi): } 38$$

$$F_{ty2}: \text{Yield Bearing of Piece 2 (ksi): } 35$$

MAXIMUM ALLOWABLE SHEAR PER SCREW

$$P = F_v * A = 0.17 * 95000 * 3.14 * D^{2/4}$$

$$= 457.9$$

$$P_{at} = N_s * P$$

$$=(8)(458) = 3663 \#$$

MAXIMUM ALLOWABLE LOADS

Coefficients:

$$\text{SHEAR: } \mathbf{3663.2 \#} \quad \text{Coefficient, } K_s = \mathbf{1.2}$$

$$\text{TENSION: } \mathbf{3636.9 \#} \quad \text{Coefficient } 2/n = \mathbf{0.08333333}$$

$$\text{Coefficient, } 4/n = \mathbf{0.16666667}$$

UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

Calculations Conform to (AA) ADM2000

JOB:	MARLBOROUGH PROJECT		
SHEET NO:	22	OF:	24
CALCULATED BY:	Lawrence Duffy	DATE:	6/19/2025
CHECKED BY:		DATE:	
STAMPED BY:		DATE:	

CHEVRON PLATES TO INSERT (H11365)

FASTENERS: 8 0.216 " X 1.000 " TEK SCREWS

Equation Inputs:

ALLOWABLE CONNECTION BEARING

A1: Alloy of Piece 1: 6005-T5

$$P_{ns} = 2(D1)(T1)(F_{tu1})/n_u$$
$$T1: \text{Thickness of Piece 1 (in): } .1875$$
$$=(.216)(.1875)(38)2/2.34 = 1315.4 \#$$

A2: Alloy of Piece 2: 6063-T5

$$P_{ns} = 2(D1)(T2)(F_{tu2})/n_u$$
$$T2: \text{Thickness of Piece 2 (in): } .125$$
$$=(.216)(.125)(22)2/2.34 = 507.7 \#$$

Fastener Type: TEK SCREWS

$$P_{ns} = ((T2)(T2)(T2)(D1))E0.5 * 4.2(F_{tu2}) \text{ for } T2 \leq T1$$
$$Thread Type: SPACED THREADS$$
$$=((.125)(.125)(.125)(.216))E0.5 * 4.2(22000) = 1897.9$$

Crown (C) or Valley (V) Fastening: V

$$P_{as} = Ns * P_{ns_{min}}$$
$$D2: \text{Diameter of Head/Washer (in): } .35$$
$$=(8)(507.7) = 4061.5 \#$$

D1: Nominal Diameter of Fastener (in): 0.216

L: Length of Fasteners (in): 1.000

Asn: Thread Stripping Area of Internal Thread (Per Inch): 0.024

ALLOWABLE CONNECTION TENSION

n, Threads Per Inch: 14

$$P_{nov} = (D2-D1)(T1)(F_{tu1})(C)/n_s$$
$$tc, \text{ Thread Engagement Depth: } 0.125$$
$$=(.35 - 0.216)(.1875)(38)(0.7)/3 = 222.8 \#$$

Ns: Number of Screws: 8

$$P_{not} = (Ks)(D1)(tc)(F_{ty2})/n_s$$
$$= 172.8 \#$$

$$P_{at} = Ns * P_{n_{min}}$$
$$=(8)(172.8) = 1382.4 \#$$

Aluminum Alloy Structural Values:

F_{tu1}: Ultimate Tension of Piece 1 (ksi): 38

MAXIMUM ALLOWABLE SHEAR PER SCREW

F_{ty1}: Yield Tension of Piece 1 (ksi): 35

$$P = F_v * A = 0.17 * 95000 * 3.14 * D^2/4$$
$$F_{tu2}: \text{Ultimate Tension of Piece 2 (ksi): } 22$$
$$= 591.8$$

F_{ty2}: Yield Bearing of Piece 2 (ksi): 16

$$P_{at} = Ns * P$$
$$=(8)(592) = 4734 \#$$

MAXIMUM ALLOWABLE LOADS

Coefficients:

SHEAR: 4061.5 # Coefficient, Ks = 1.2

TENSION: 1382.4 # Coefficient 2/n = 0.14285714

Coefficient, 4/n = 0.28571429

UNC THREADS: Types C,D,F,G,T

SPACED THREADS: Types AB,B,BP,BF,BT

Calculations Conform to (AA) ADM2000

JOB:	MARLBOROUGH PROJECT		
SHEET NO:	23	OF:	24
CALCULATED BY:	Lawrence Duffy	DATE:	6/19/2025
CHECKED BY:		DATE:	
STAMPED BY:		DATE:	

INSERT (H11365) TO CHEVRON PLATES

(2 PLATES)

TUBE BENDING:

$S = 22.59 \text{ IN}^4 / 4.028 \text{ IN} = 5.608 \text{ IN}^3$

$M = \sigma S = (19000 \text{ PSI})(5.608 \text{ IN}^3) = 106556 \text{ IN}\# = 8879 \text{ FT}\#$

PLATE BENDING:

$S = 2 * 3/16" * (6.625")^2 / 6 = 2.743 \text{ IN}^3$

$M = \sigma S = (28000 \text{ PSI})(2.743 \text{ IN}^3) = 76808 \text{ IN}\# = 6400 \text{ FT}\#$

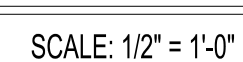
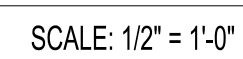
PLATE SHEAR:

$A_p = 2 * 3/16" * 6.625" = 2.484 \text{ IN}^2$

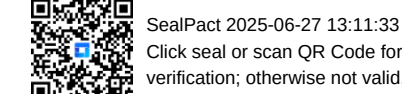
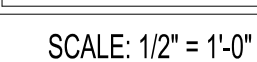
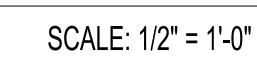
$V_a = 2.484 \text{ IN}^2 * 7500 \text{ PSI} = 18632 \text{ \#}$

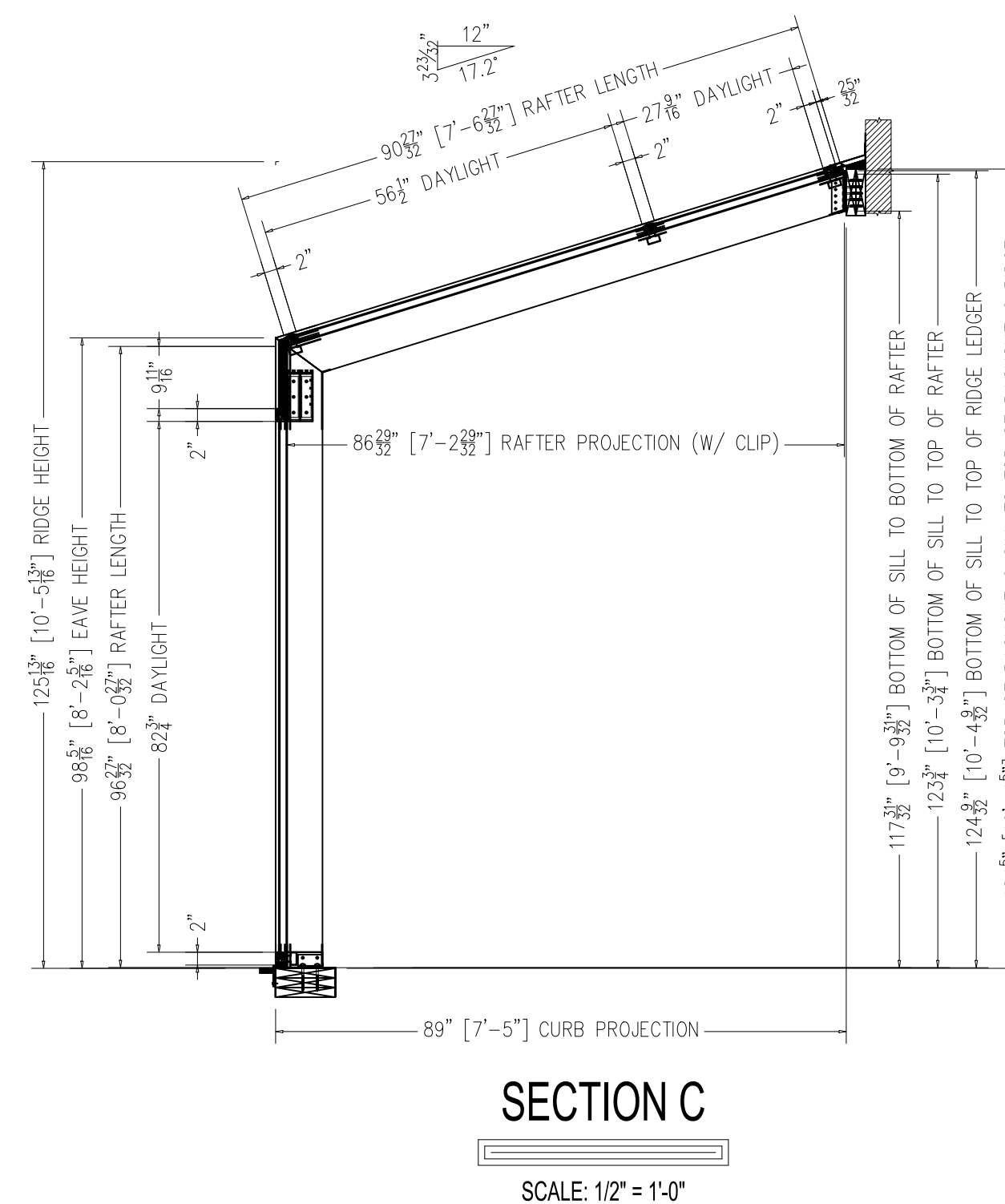
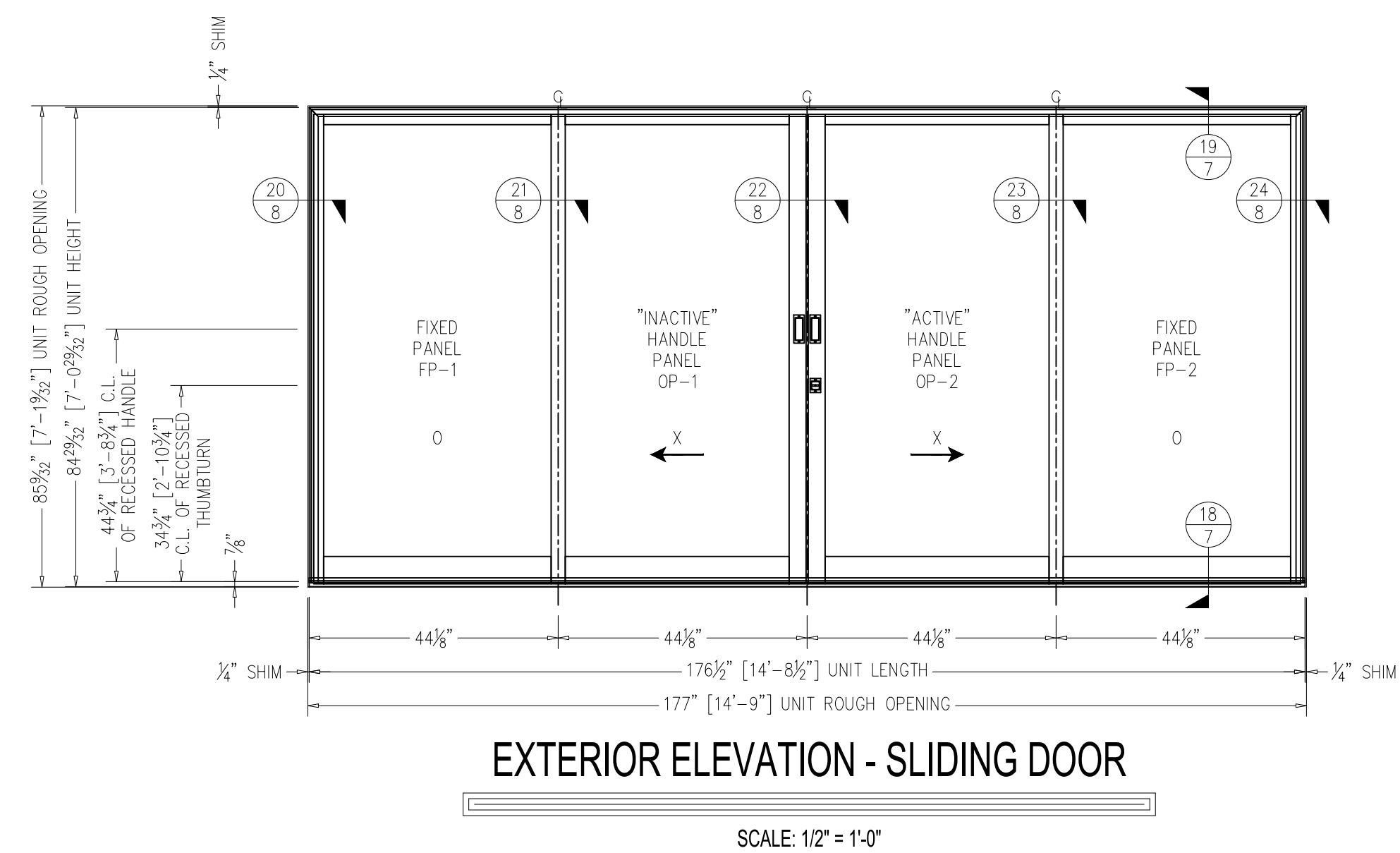
SUMMARY OF CONNECTIONS:				MAX.ACTUAL LOADING
FROM STAAD MODEL/HAND CALCS				
ALL IS OKAY				
COLUMNS TO SILL:	END	CENTER	2X8	
UPLIFT:	1265	1585	5175	0, 1112, 1695
SHEAR:	342	476	1428	159, 141, 280
(IN PLANE) SHEAR:	342	476	1428	0, 22, 512
RAFTER TO E. WALL	END	CENTER	2X4I	
VERTICAL:	541	1418	1418	344, 592, 928
PULLOUT:	2300	2108	3437	119, 944, 2020
"EAVE" CONNECTION	2X4I	2X8D		
UPLIFT/DOWN:	3663	3663		1172, 1727
SHEAR:	4061	4061		801, 1742
MOMENT:	1848 FT#	6400 FT#		1053, 4227 FT#
HEADER TO E. WALL:				
VERTICAL:	1027			465
SHEAR:	1027			485
PULLOUT:	4734			314
HEADER TO COLUMN:				
AXIAL:	2310			314
RAFTER TO HEADER:				
UPLIFT:	3373			668
AXIAL:	5128			1803

PRE. ENG.: BP	DRAFTER: STEVEN FLYNN	QUOTE: 87817	ORIGINAL DRAWING DATE: 4/23/25
CUTLISTER: XXX	PROJECT COORDINATOR: PETER WHITLOCK [EXT: 3805]	JOB NO.: 25-01-170	COVER PAGE: SHEET No. 01 OF 9



SCALE: 1/2" = 1'-0"





193" [16'-1"] RAFTER LENGTH

47 3/4" [3'-11 3/4"] BAR TO C

48 3/4" [4'-0 3/4"] C TO C

48 3/4" [4'-0 3/4"] C TO C

47 3/4" [3'-11 3/4"] BAR TO C

93 3/8" [7'-9 3/8"] RAFTER LENGTH

43" [3'-7"]

2"

2"

B5 B6 B7 B8

RAFTER ELEVATION

SCALE: 1/2" = 1'-0"

SEAL OF THE BOARD OF ARCHITECTURE



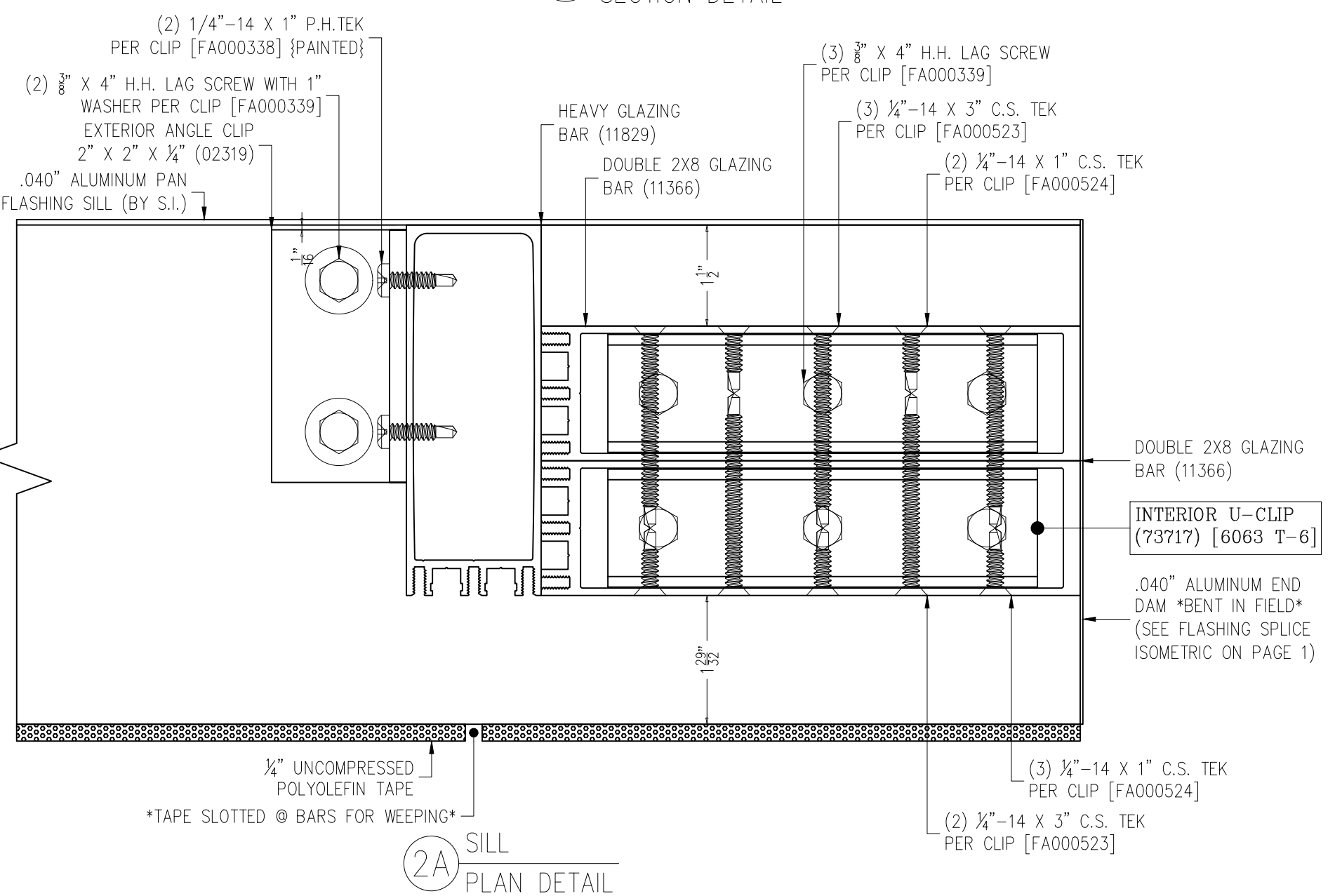
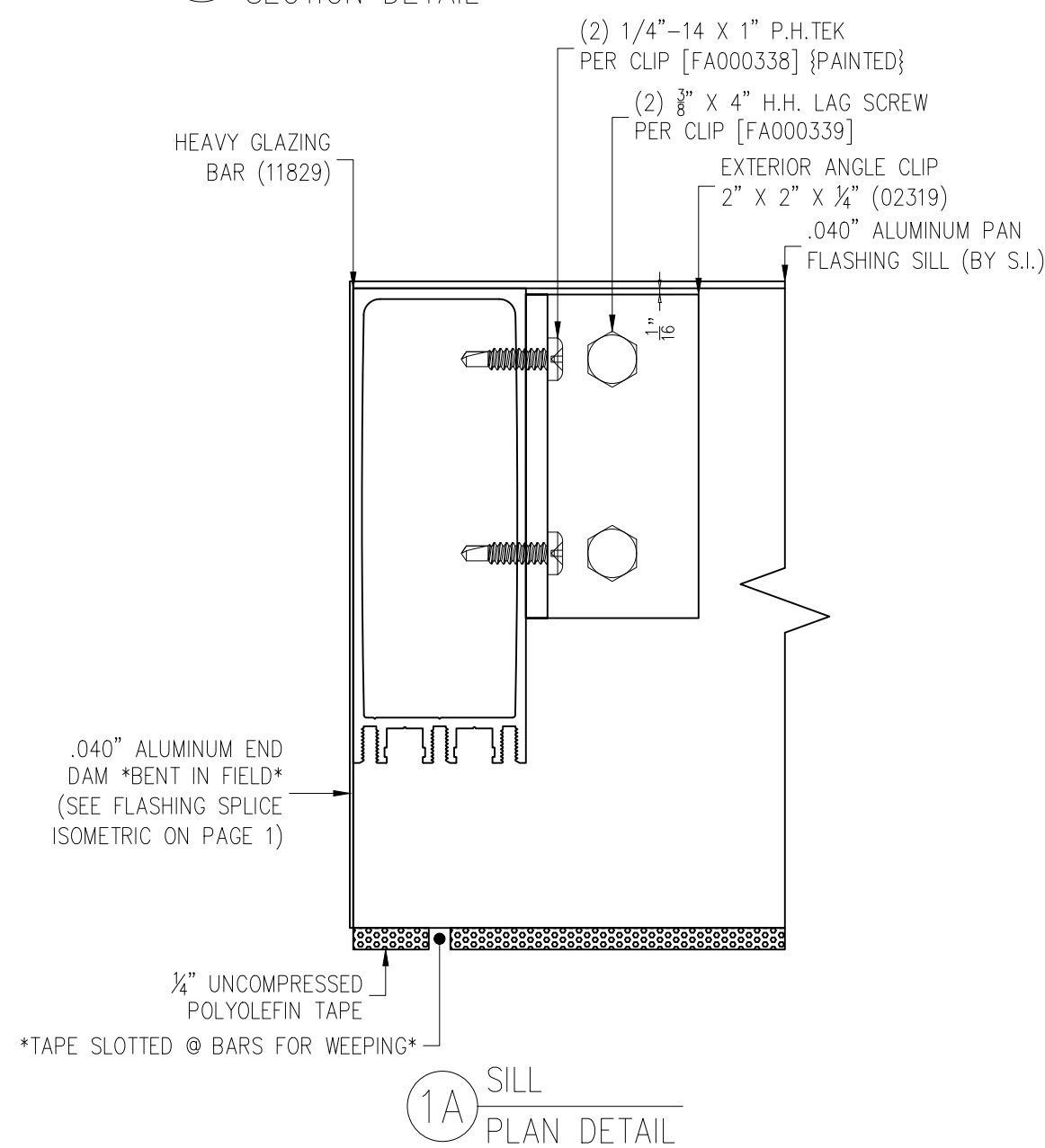
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SUNSPACE DESIGN INC. MAINE
YORK ME 03909

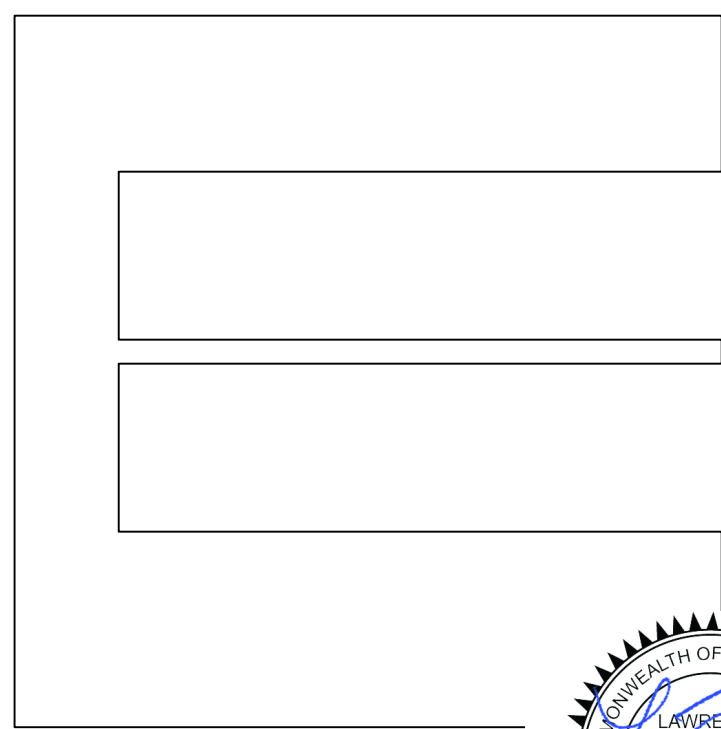
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STEVEN FLYNN

PROJECT MANAGER:
PETER WHITLOCK [EXT: 3805]

PAGE No.:
4 OF 9



INSTALLATION NOTE:
TEMPORARY JIG FOR
SETTING U-CLIPS
REMOVE BEFORE
INSTALLING DOUBLE 2X8's



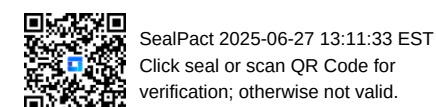
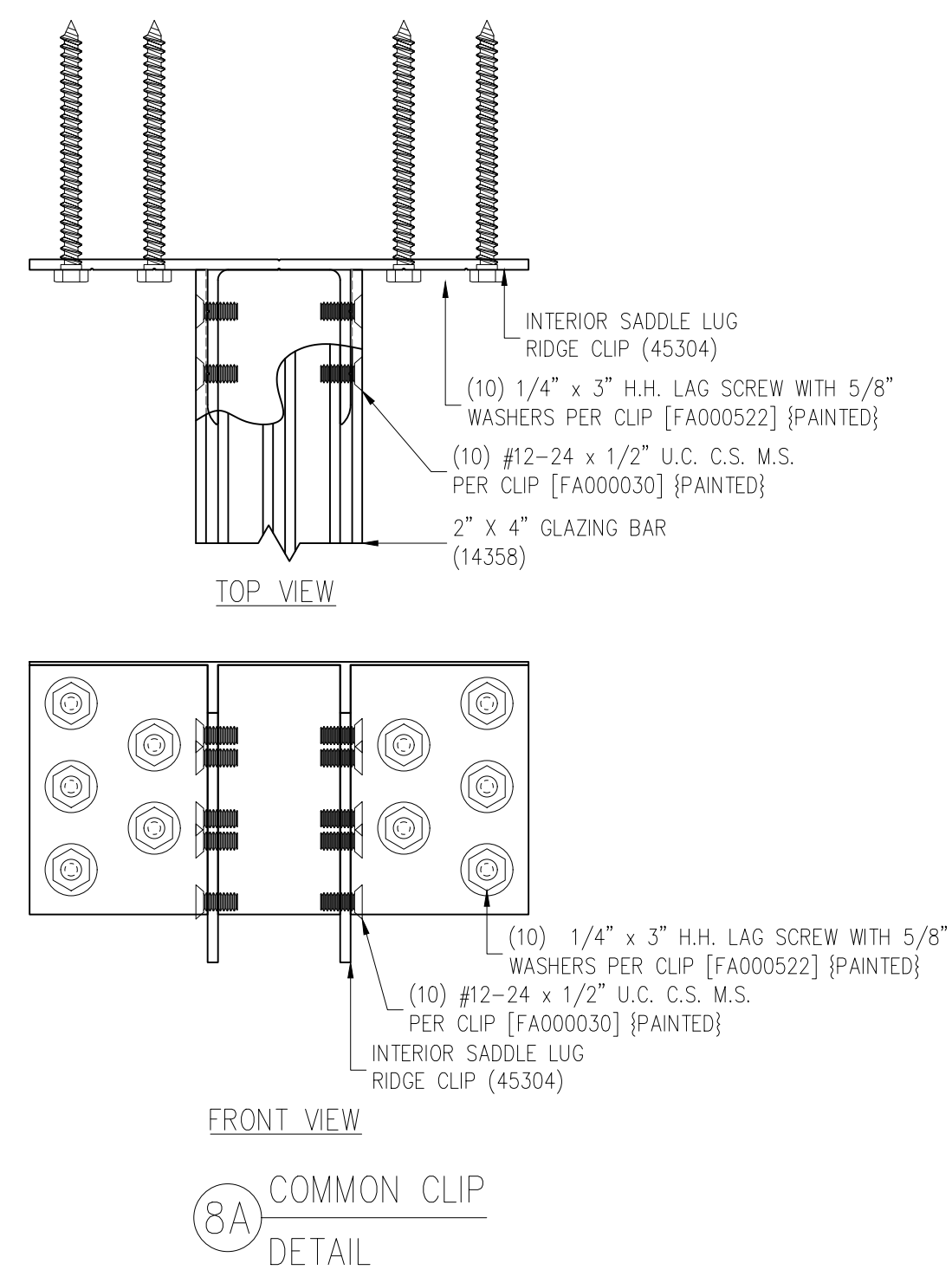
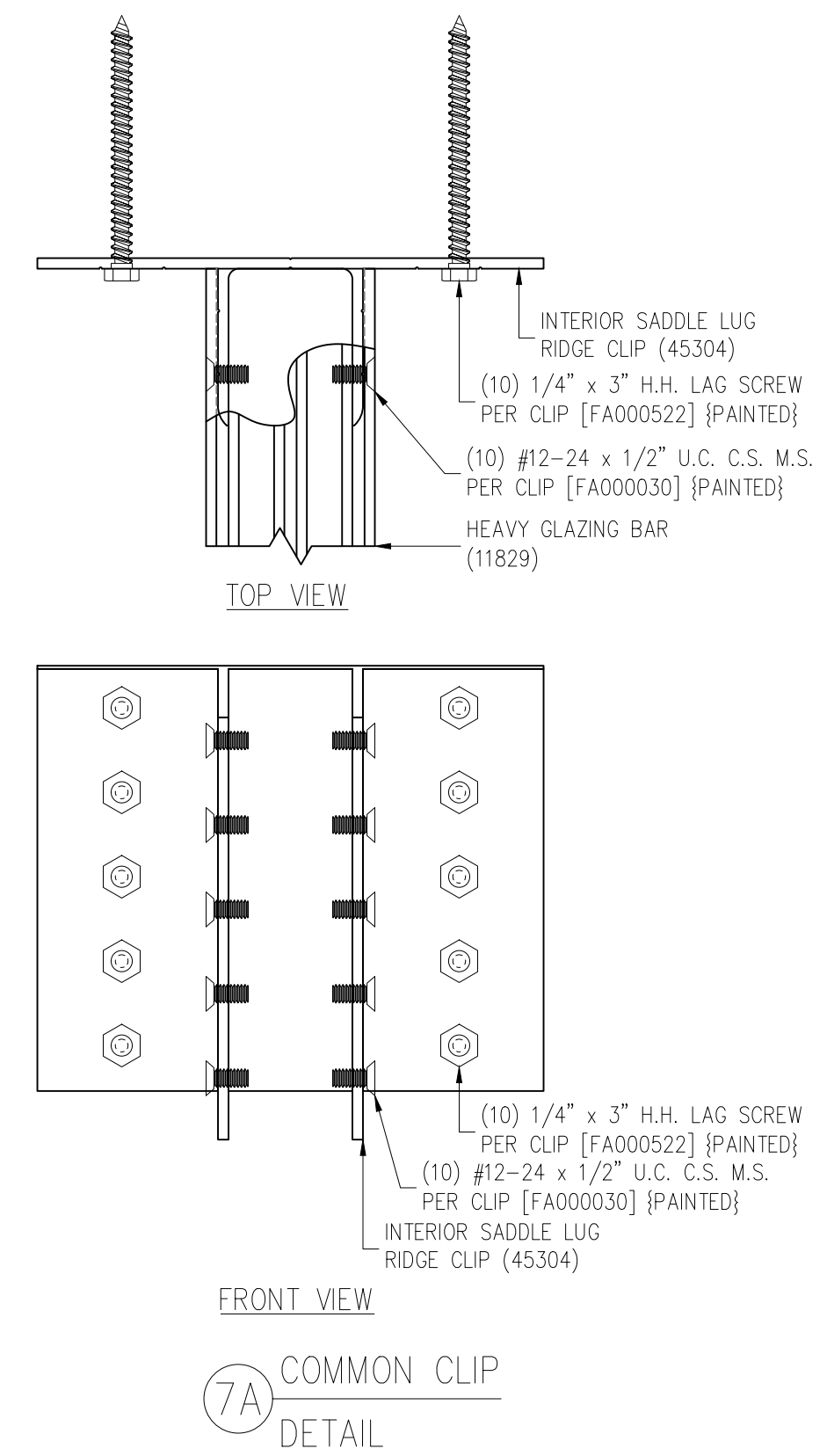
U-CLIP JIG
DETAIL



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EXP. 06/30/2020



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#	DATE	BY			

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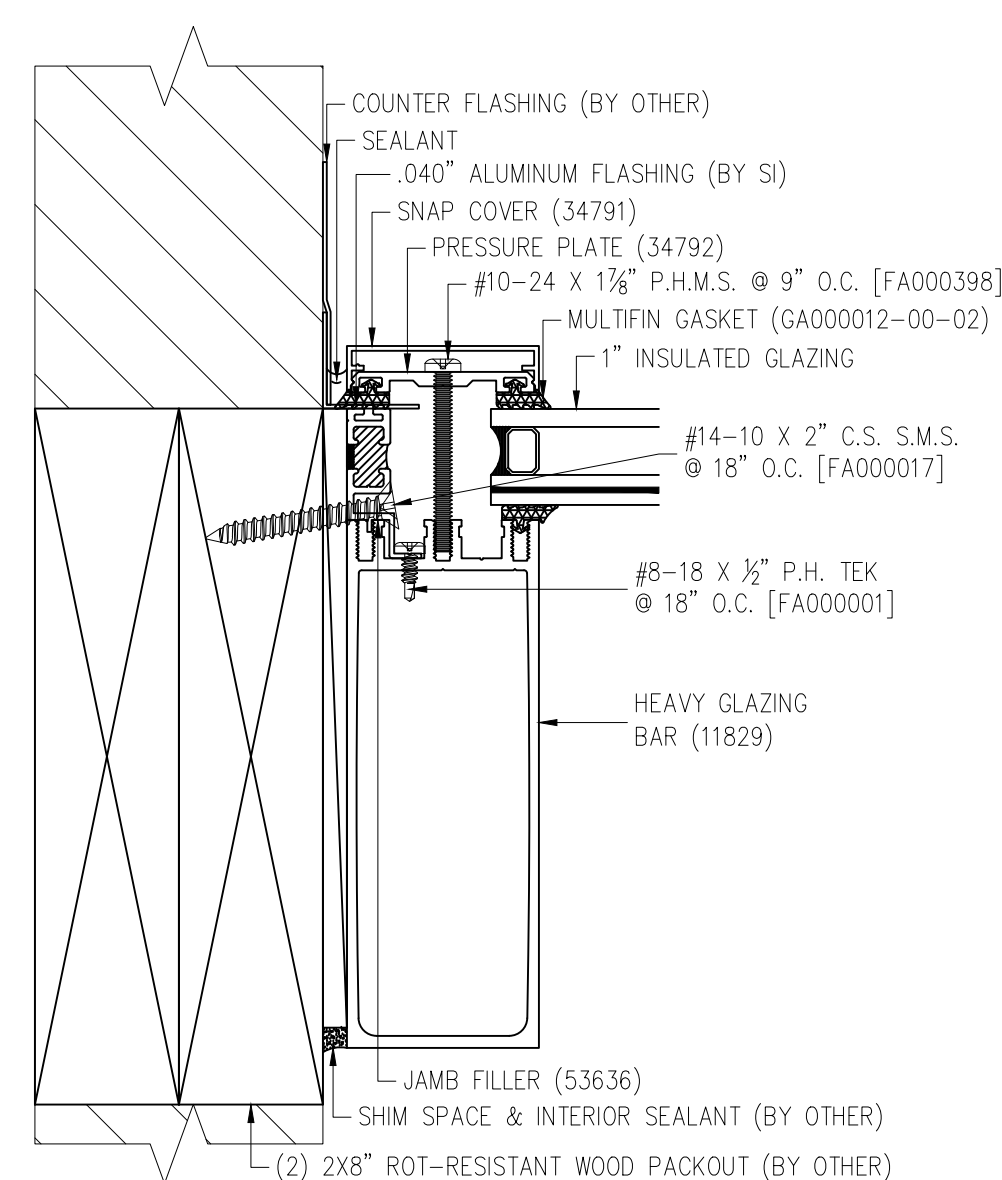
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DRAWING SCALE:
6" = 1'-0"

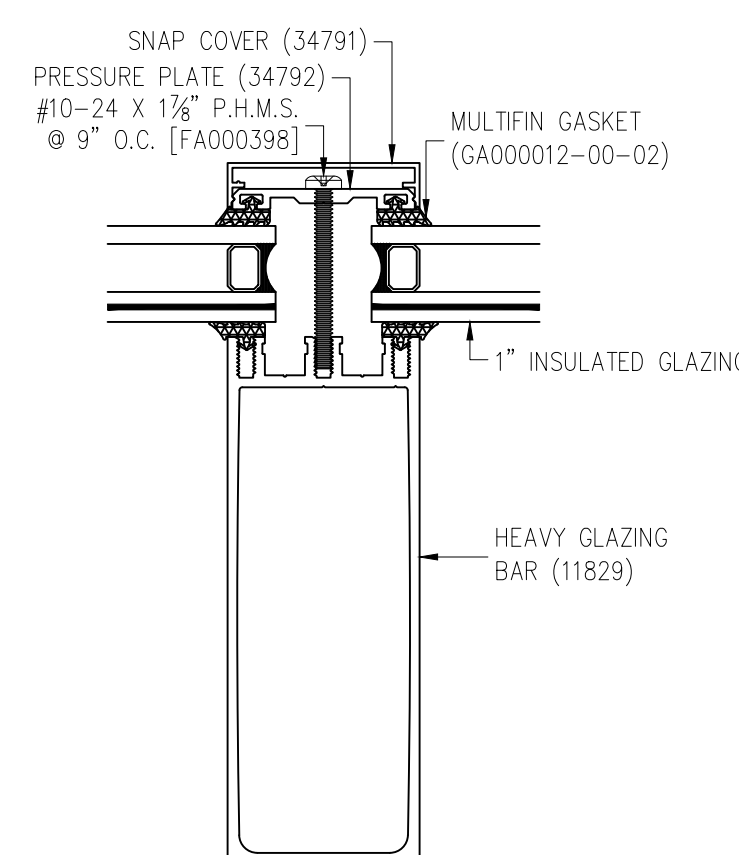
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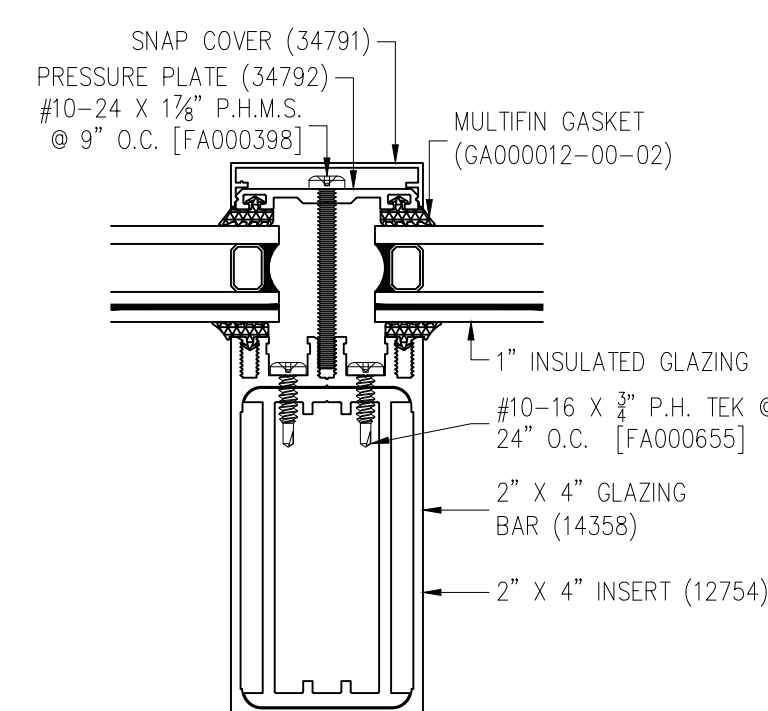
PAGE No.:
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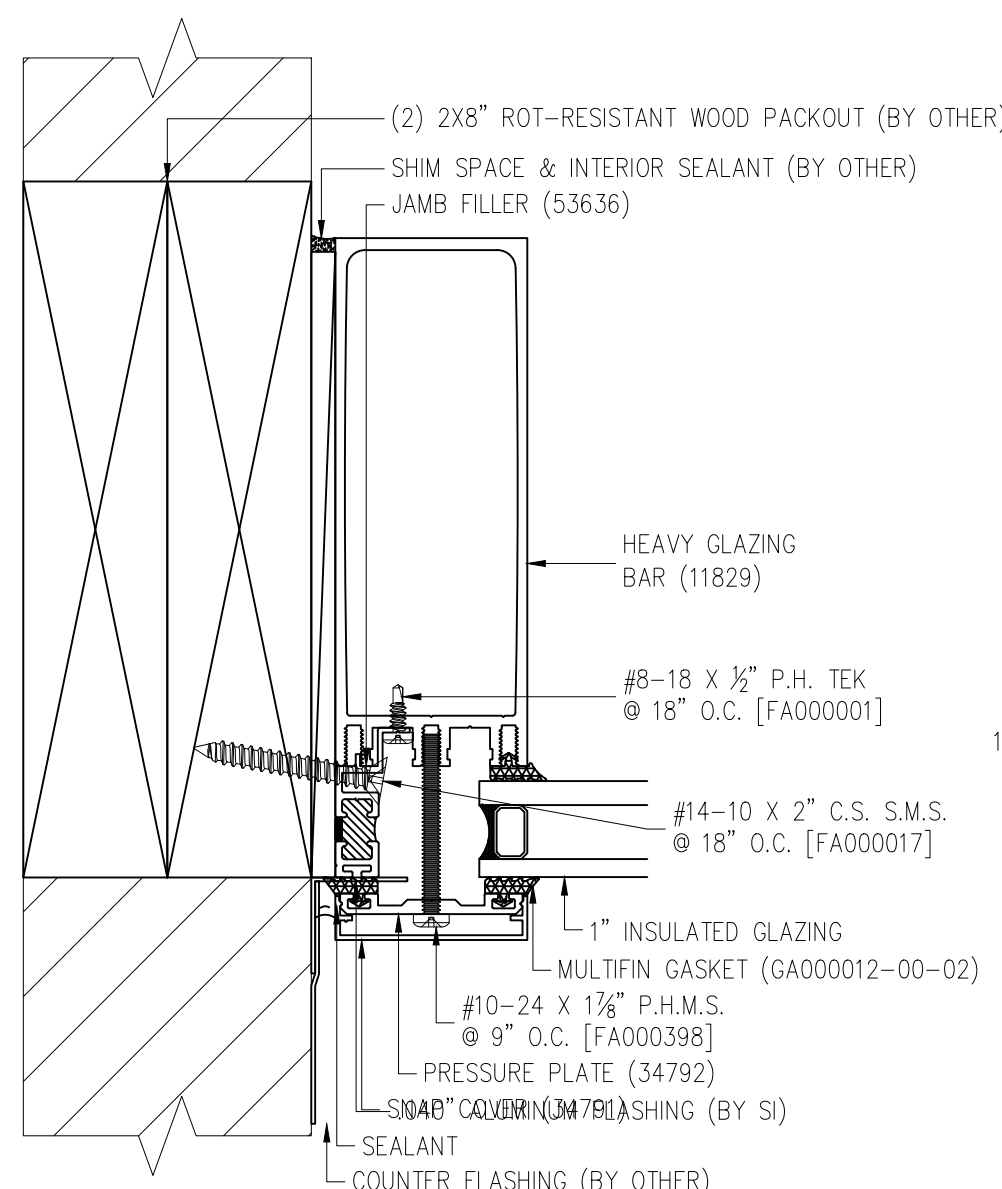
9 SLOPED RAFTER
JAMB DETAIL



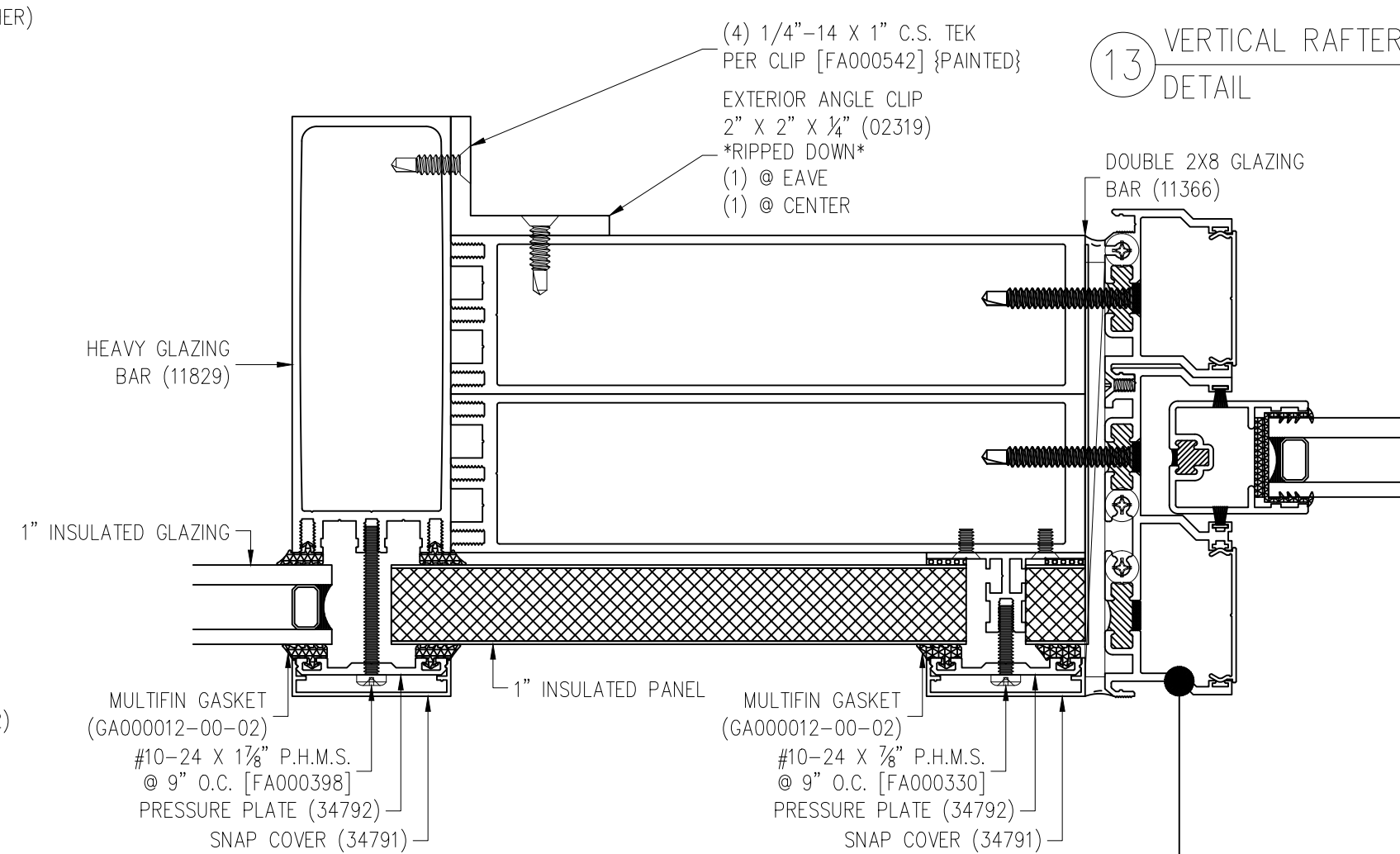
10 SLOPED RAFTER
DETAIL



11 SLOPED RAFTER
DETAIL

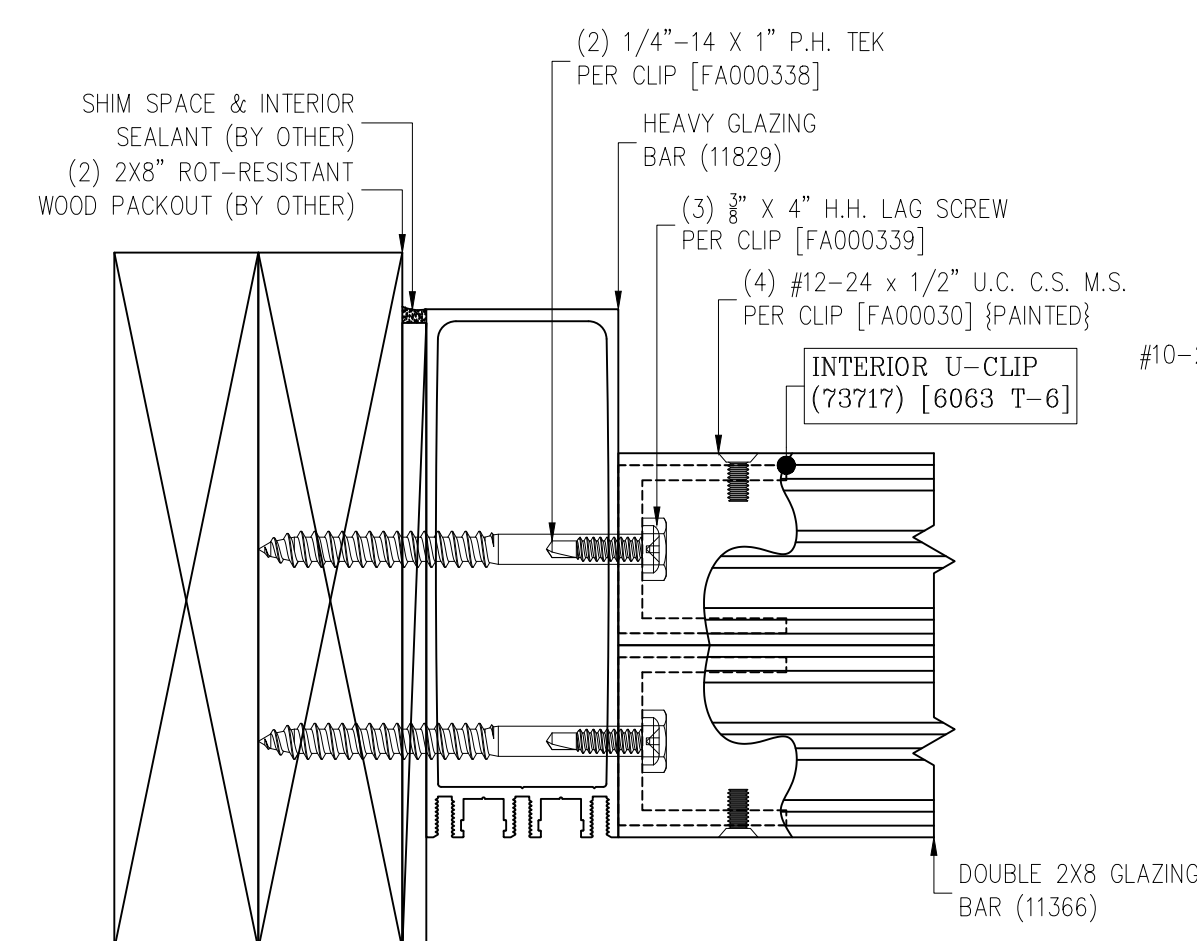


12 VERTICAL RAFTER
JAMB DETAIL

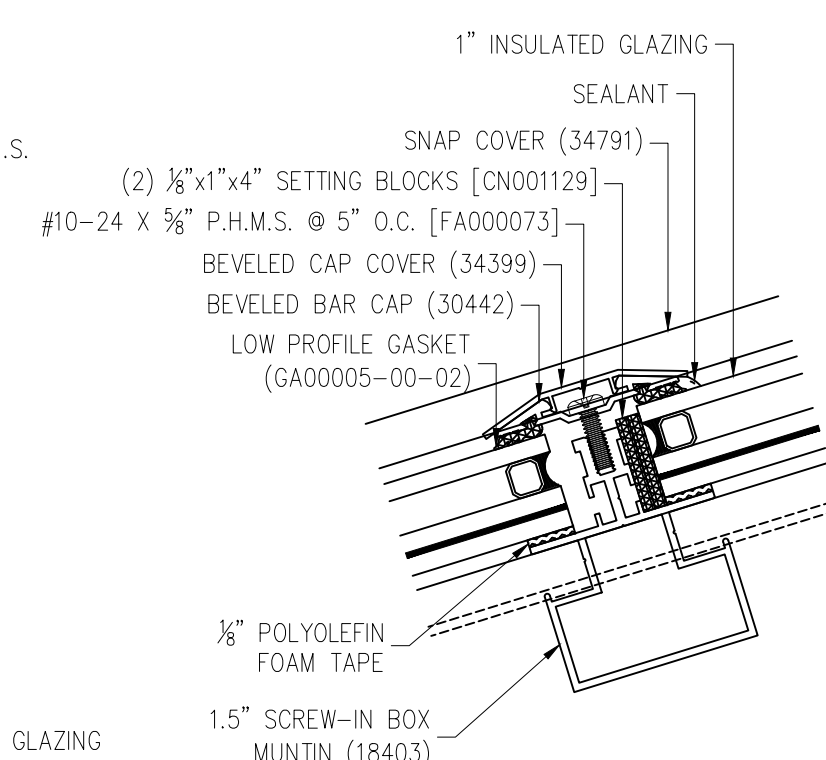


13 VERTICAL RAFTER
DETAIL

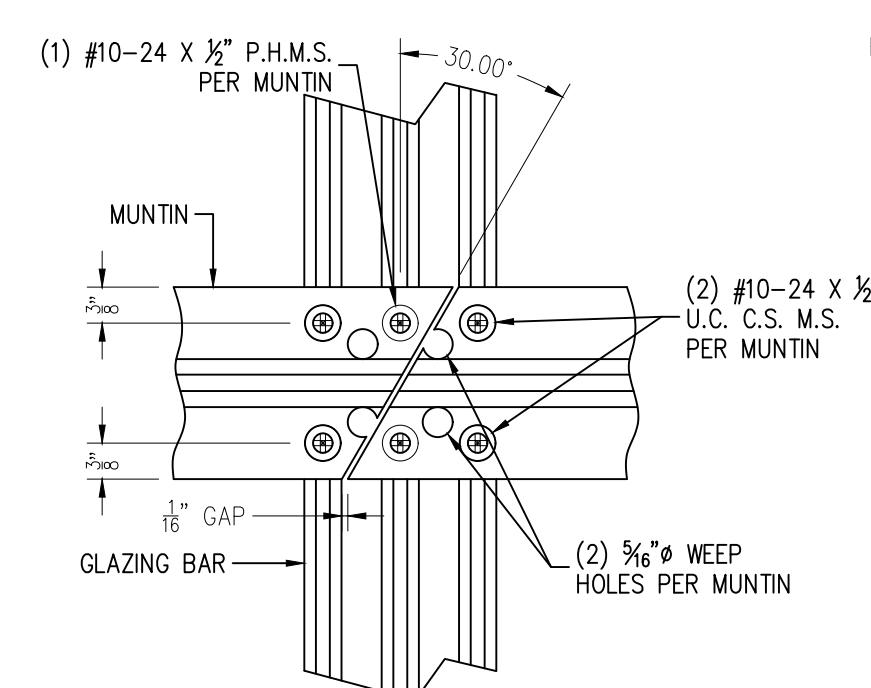
REFER TO PAGE #8 - DETAILS #20 & #24
FOR SLIDER JAMB DETAILS



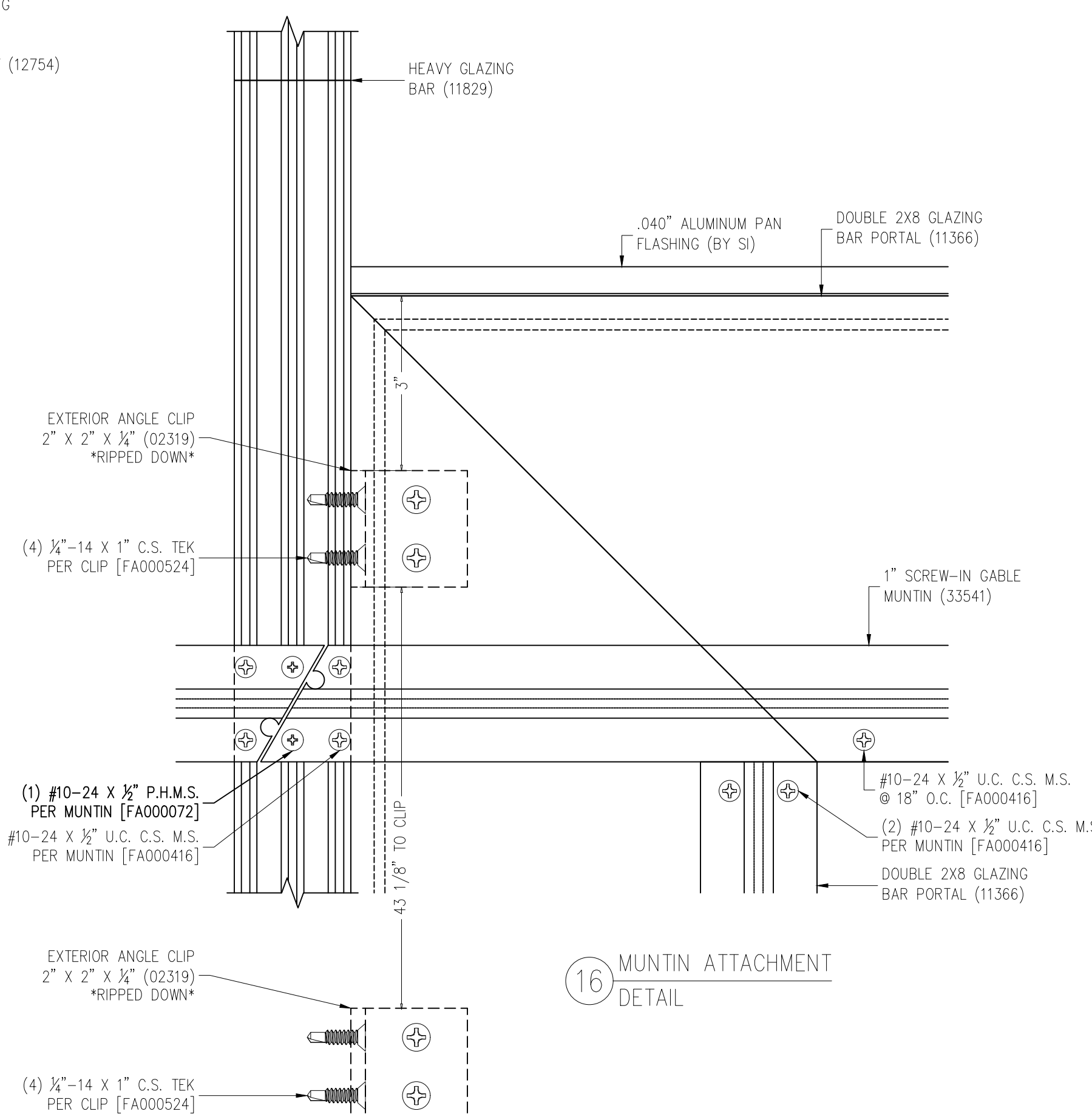
12A HEADER
CONNECTION DETAIL



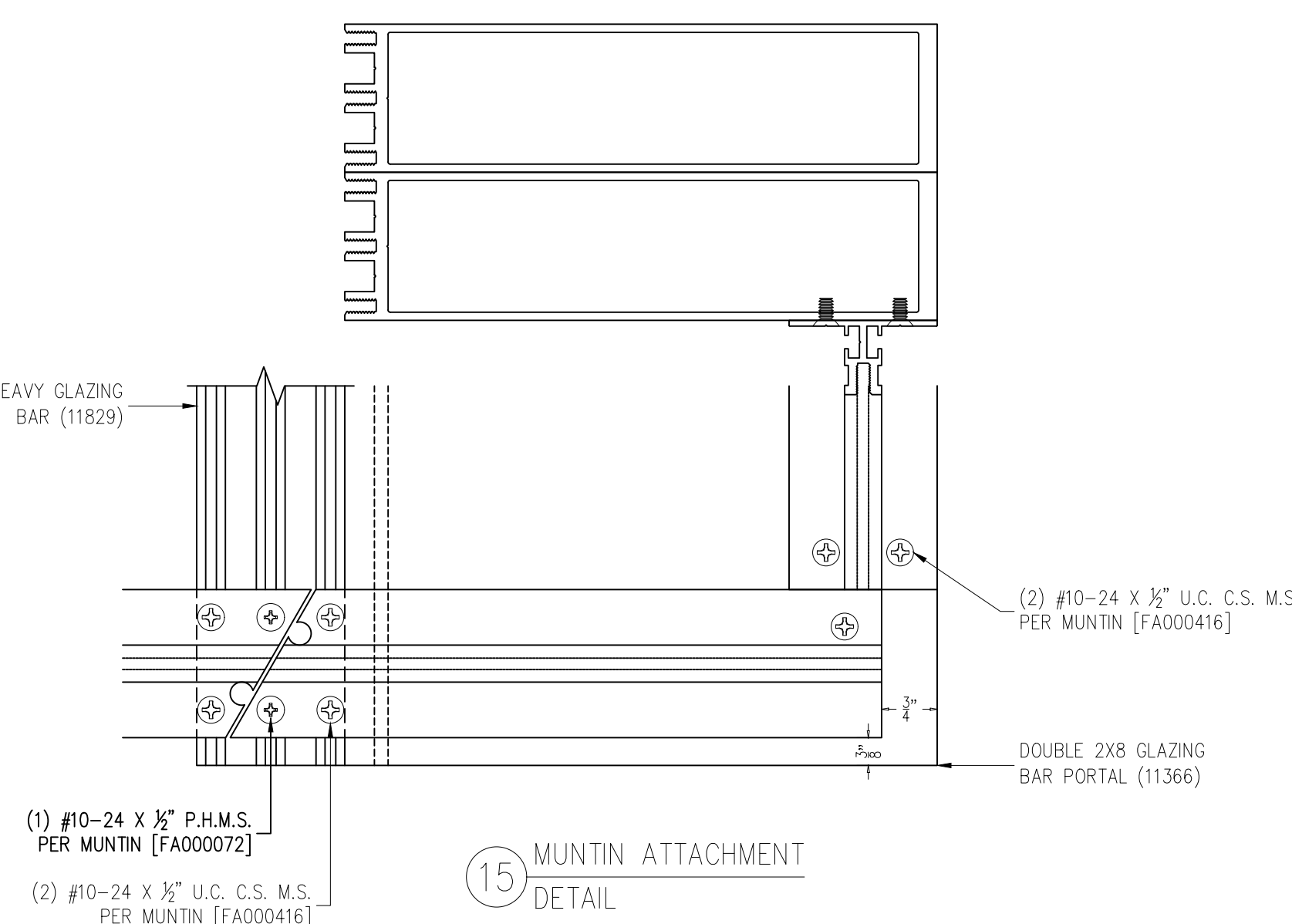
14 SLOPED MUNTIN
DETAIL



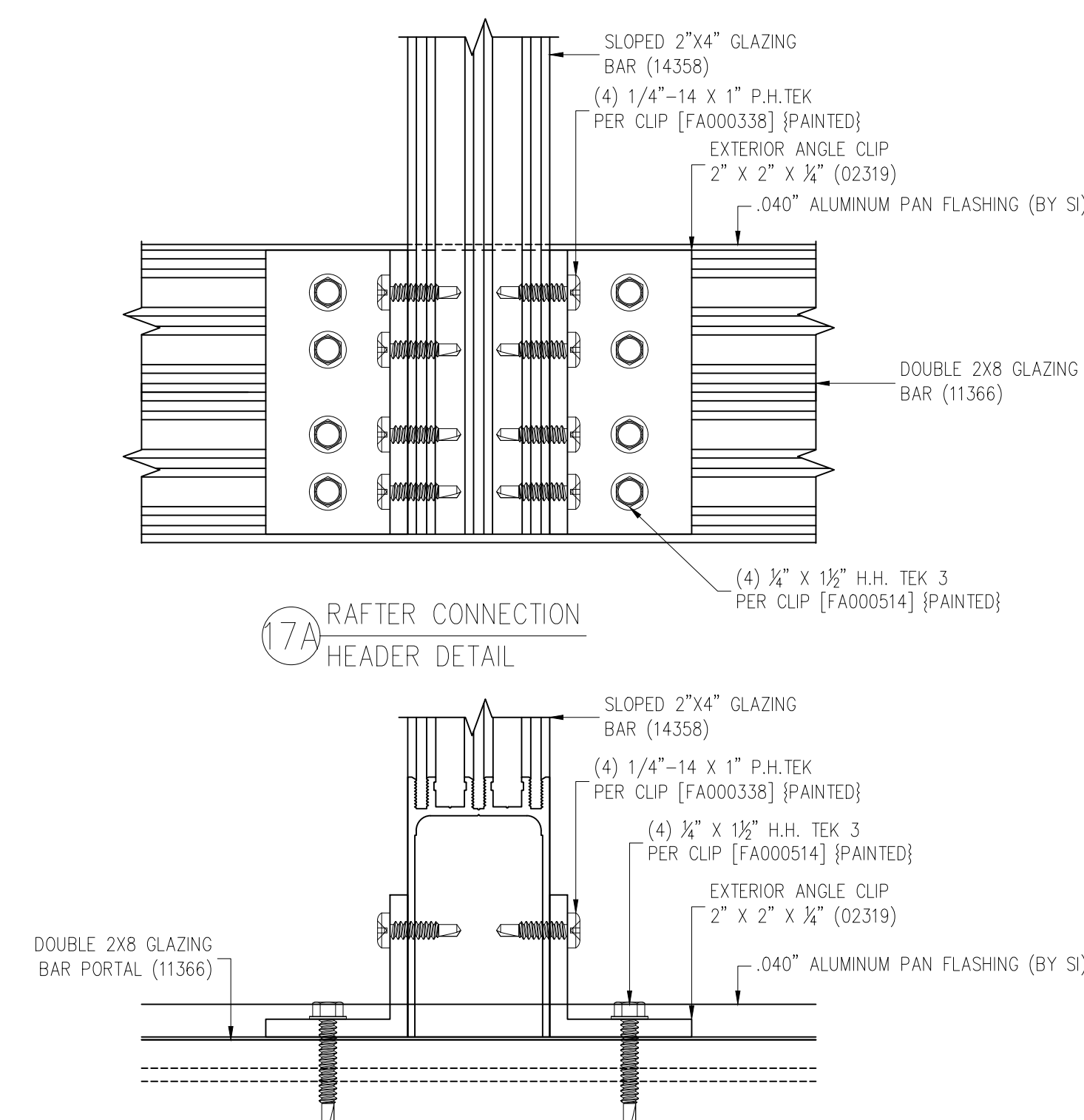
1" HORIZONTAL
MUNTIN DETAIL
LEVEL 2



16 MUNTIN ATTACHMENT
DETAIL

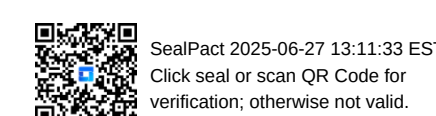


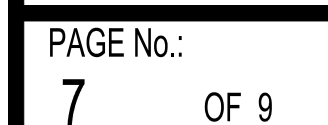
15 MUNTIN ATTACHMENT
DETAIL



17A RAFTER CONNECTION
HEADER DETAIL

17 RAFTER CONNECTION
HEADER DETAIL





-	4/23/25	SMF			

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PROJECT MANAGER:
PETER WHITLOCK [EXT: 3805]

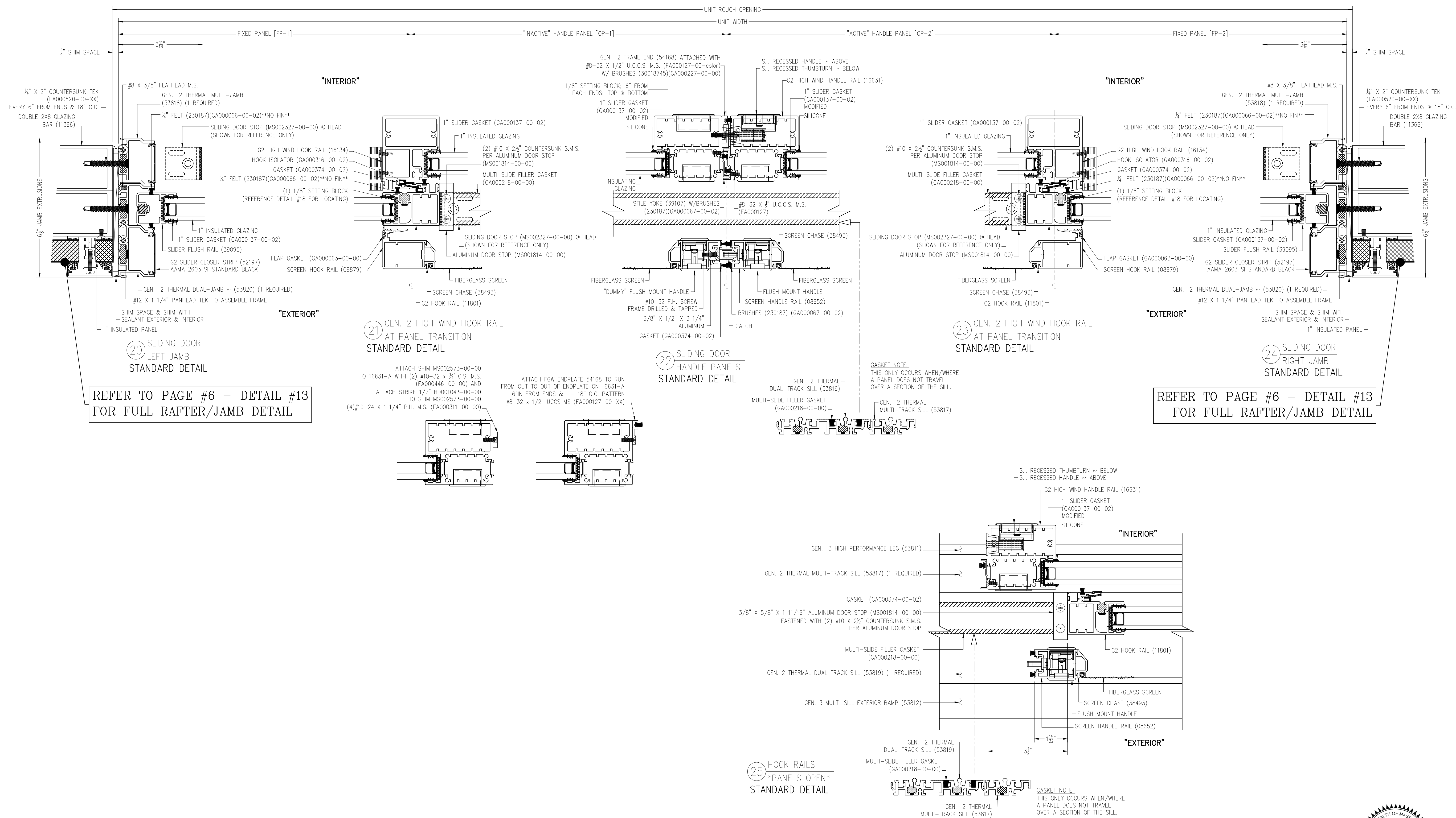
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25-01-170

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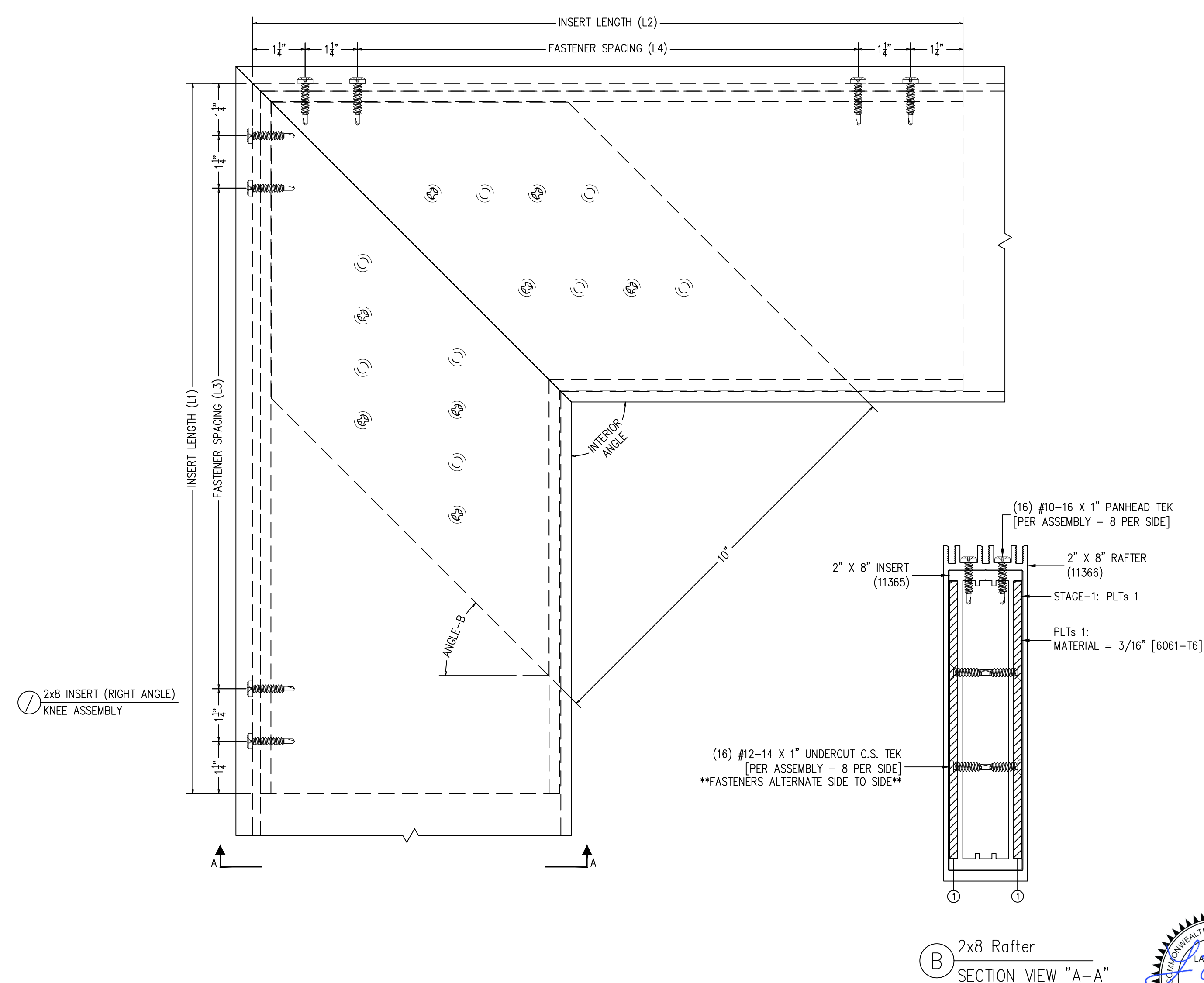
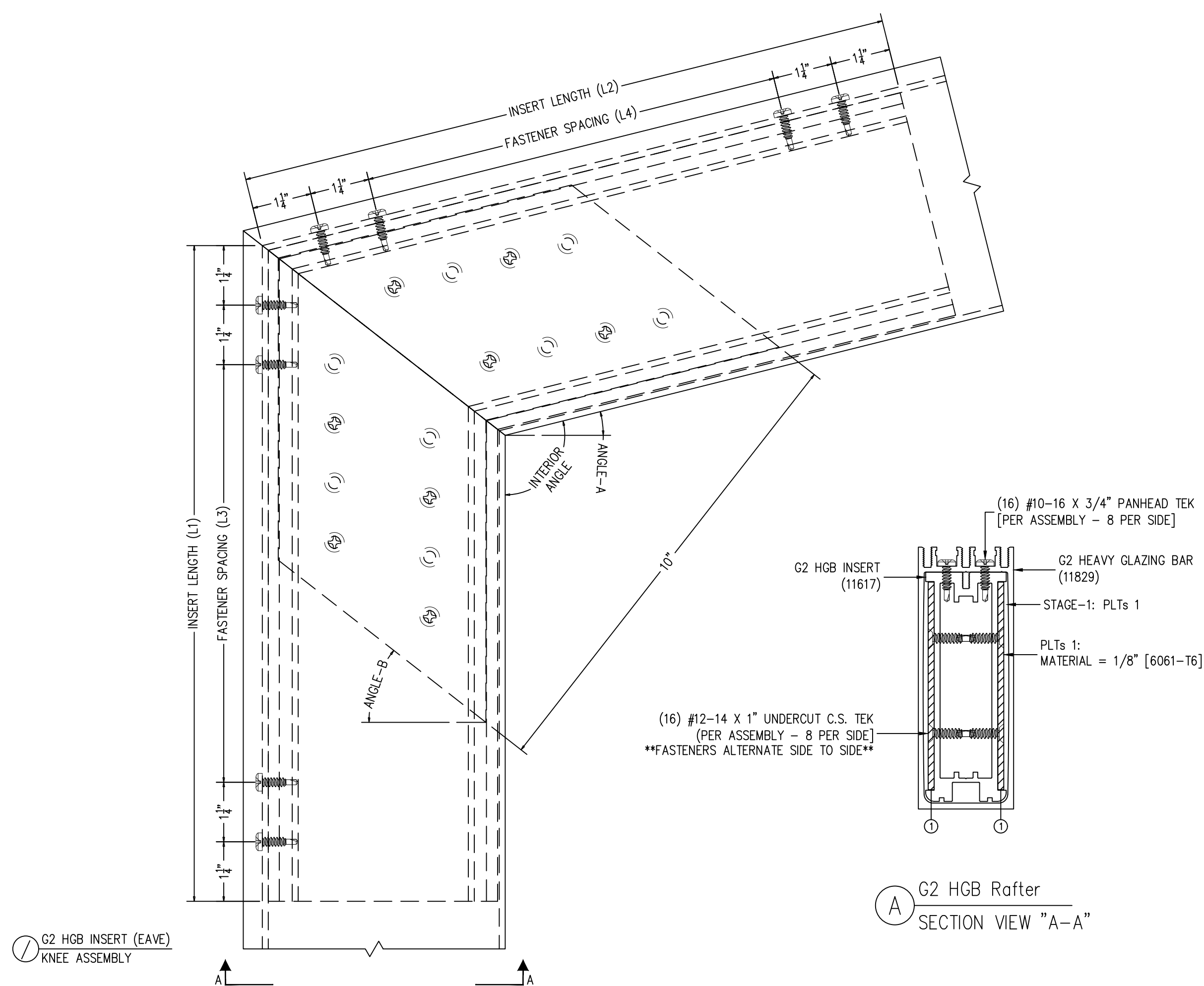
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Knee Type: G2 HGB Insert													Insert Fastener			Chevron Fastener			Chevron Plates - Total Qty		
Unit ID	Desig.	Rafter Setup	Location	Stage	Qty	Int. Angle	Angle-A	Angle-B	Dim. (L1)	Dim. (L2)	Dim. (L3)	Dim. (L4)	Type	Qty	Type	Qty	Pit-1	Pit-2	Pit-3		
A	A	Common	Eave	1	4	107.20	17.20	36.40	36	36	31	31	#10-16 x 3/4" P.H. Tek (FA000655)	64	#12-14 x 1" U.C.C.S. Tek (FA000512)	64	8	0	0		
Knee Type: 2x8 Insert													Insert Fastener			Chevron Fastener			Chevron Plates - Total Qty		
Unit ID	Desig.	Rafter Setup	Location	Stage	Qty	Int. Angle	Angle-A	Angle-B	Dim. (L1)	Dim. (L2)	Dim. (L3)	Dim. (L4)	Type	Qty	Type	Qty	Pit-1	Pit-2	Pit-3		
A	B	Common	Right Angle	1	4	90.00	0.00	45.00	36	36	31	31	#10-16 x 1" P.H. Tek (FA000003)	64	#12-14 x 1" U.C.C.S. Tek (FA000512)	64	8	0	0		



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