

WHITLEY MANUFACTURING CO., INC.

MODEL #: 7805

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39 TOTAL PAGES

Digitally signed
by Jeffrey
Walton
Date:
2022.03.03
10:33:31 -05'00'



COMcheck Software Version 4.1.5.2

Interior Lighting Compliance Certificate

Project Information

Energy Code: 2018 IECC
Project Title: Model #7275
Project Type: New Construction

Construction Site: Owner/Agent: Designer/Contractor:

Additional Efficiency Package(s)

Credits: 1.0 Required 1.0 Proposed
On-site Renewable Energy, 1.0 credit

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft ²)	C Allowed Watts / ft ²	D Allowed Watts (B X C)
1-Warehouse	6726	0.48	3228
Total Allowed Watts =			3228

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
1-Warehouse				
LED 1: LED Panel 55W:	1	14	56	784
LED 2: LED Panel 55W:	1	1	56	Exempt
Exemption: Exit signs				
LED 3: Other:	1	12	202	2424
Total Proposed Watts =				3208

Interior Lighting PASSES: Design 1% better than code

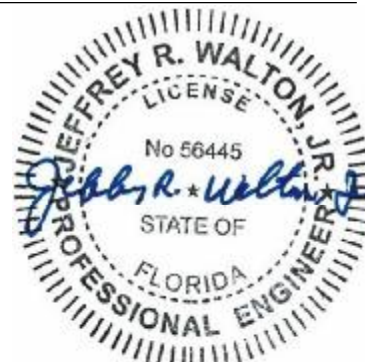
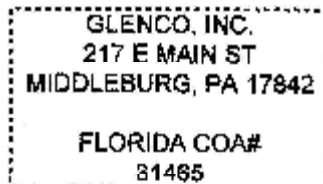
Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2018 IECC requirements in COMcheck Version 4.1.5.2 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Adam Parker
Name - Title

Adam Parker
Signature

2-17-22
Date



03/03/2022

Project Title: Model #7275
Data filename: V:\WhitleyManufacturing\Engineering\Standards\USA Modular (UPS MDC)\2022 MDC AND FEEDER\Jacksonville redraw\7805 Calcs\7805 comcheck.cck

Report date: 02/17/22

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COMcheck Software Version 4.1.5.2

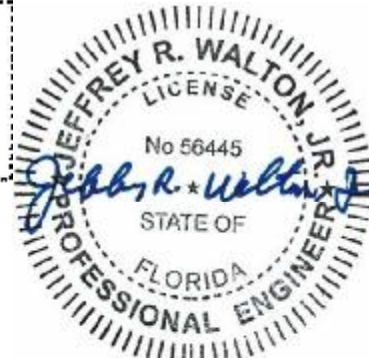
Exterior Lighting Compliance Certificate

Project Information

Energy Code: 2018 IECC
 Project Title: Model #7275
 Project Type: New Construction
 Exterior Lighting Zone: 3 (Other (LZ3))

GLENCO, INC.
 217 E MAIN ST
 MIDDLEBURG, PA 17842

FLORIDA COA#
 31485



Construction Site:

Owner/Agent:

Allowed Exterior Lighting Power

03/03/2022

A Area/Surface Category	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B X C)
Pedestrian and vehicular entrances and exits	3 ft of door	21	Yes	63
Pedestrian and vehicular entrances and exits	3 ft of door	21	Yes	63
Pedestrian and vehicular entrances and exits	3 ft of door	21	Yes	63
Pedestrian and vehicular entrances and exits	3 ft of door	21	Yes	63
Pedestrian and vehicular entrances and exits	3 ft of door	21	Yes	63
Pedestrian and vehicular entrances and exits	3 ft of door	21	Yes	63
Pedestrian and vehicular entrances and exits	3 ft of door	21	Yes	63
Pedestrian and vehicular entrances and exits	3 ft of door	21	Yes	63
Pedestrian and vehicular entrances and exits	3 ft of door	21	Yes	63
Total Tradable Watts (a) =				567
Total Allowed Watts =				567
Total Allowed Supplemental Watts (b) =				500

(a) Wattage tradeoffs are only allowed between tradable areas/surfaces.

(b) A supplemental allowance equal to 500 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Proposed Exterior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
<u>Pedestrian and vehicular entrances and exits (3 ft of door width): Tradable Wattage</u>				
LED 1: LED Linear 33W:	1	1	33	33
LED 2: LED Linear 33W:	1	1	33	33
LED 3: LED Linear 33W:	1	1	33	33
LED 4: LED Linear 33W:	1	1	33	33
LED 5: LED Linear 33W:	1	1	33	33
LED 6: LED Linear 33W:	1	1	33	33
LED 7: LED Linear 33W:	1	1	33	33
LED 8: LED Linear 33W:	1	1	33	33
LED 9: LED Linear 33W:	1	1	33	33
Total Tradable Proposed Watts =				297

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Exterior Lighting PASSES: Design 72% better than code

Exterior Lighting Compliance Statement

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed exterior lighting systems have been designed to meet the 2018 IECC requirements in COMcheck Version 4.1.5.2 and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Adam Parker

Name - Title

Adam Parker

Signature

2-17-22

Date

GLENCO, INC.
217 E MAIN ST
MIDDLEBURG, PA 17842

FLORIDA COA#
31465



03/03/2022



COMcheck Software Version 4.1.5.2

Inspection Checklist

Energy Code: 2018 IECC

Requirements: 0.0% were addressed directly in the COMcheck software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR4] ¹	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C103.2 [PR8] ¹	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the exterior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include exterior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C406 [PR9] ¹	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

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Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.2.2.2 [EL22] ¹	Spaces required to have light-reduction controls have a manual control that allows the occupant to reduce the connected lighting load in a reasonably uniform illumination pattern ≥ 50 percent.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.2.1.1 C405.2.1.1 [EL18] ¹	Occupancy sensors installed in classrooms/lecture/training rooms, conference/meeting/multipurpose rooms, copy/print rooms, lounges/breakrooms, enclosed offices, open plan office areas, restrooms, storage rooms, locker rooms, warehouse storage areas, and other spaces ≤ 300 sqft that are enclosed by floor-to-ceiling height partitions. Reference section language C405.2.1.2 for control function in warehouses and section C405.2.1.3 for open plan office spaces.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.2.1.2 [EL19] ¹	Occupancy sensors control function in warehouses: In warehouses, the lighting in aiseways and open areas is controlled with occupant sensors that automatically reduce lighting power by 50% or more when the areas are unoccupied. The occupant sensors control lighting in each aisleway independently and do not control lighting beyond the aisleway being controlled by the sensor.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.2.1.3 [EL20] ¹	Occupant sensor control function in open plan office areas: Occupant sensor controls in open office spaces ≥ 300 sq.ft. have controls 1) configured so that general lighting can be controlled separately in control zones with floor areas ≤ 600 sq.ft. within the space, 2) automatically turn off general lighting in all control zones within 20 minutes after all occupants have left the space, 3) are configured so that general lighting power in each control zone is reduced by $\geq 80\%$ of the full zone general lighting power within 20 minutes of all occupants leaving that control zone, and 4) are configured such that any daylight responsive control will activate space general lighting or control zone general lighting only when occupancy for the same area is detected.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.2.2.1, C405.2.2.2 [EL21] ²	Each area not served by occupancy sensors (per C405.2.1) have time-switch controls and functions detailed in sections C405.2.2.1 and C405.2.2.2.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.2.3, C405.2.3.1, C405.2.3.2 [EL23] ²	Daylight zones provided with individual controls that control the lights independent of general area lighting. See code section C405.2.3 Daylight-responsive controls for applicable spaces, C405.2.3.1 Daylight responsive control function and section C405.2.3.2 Sidelit zone.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.2.4 [EL26] ¹	Separate lighting control devices for specific uses installed per approved lighting plans.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.2.4 [EL27] ¹	Additional interior lighting power allowed for special functions per the approved lighting plans and is automatically controlled and separated from general lighting.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.2.5 [EL28] ^{null}	Automatic lighting controls for exterior lighting installed. Controls will be daylight controlled, set based on business operation time-of-day, or reduce connected lighting > 30%.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.3 [EL6] ¹	Exit signs do not exceed 5 watts per face.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.6 [EL26] ²	Low-voltage dry-type distribution electric transformers meet the minimum efficiency requirements of Table C405.6.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.7 [EL27] ²	Electric motors meet the minimum efficiency requirements of Tables C405.7(1) through C405.7(4). Efficiency verified through certification under an approved certification program or the equipment efficiency ratings shall be provided by motor manufacturer (where certification programs do not exist).	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.8.2, C405.8.2.1 [EL28] ²	Escalators and moving walks comply with ASME A17.1/CSA B44 and have automatic controls configured to reduce speed to the minimum permitted speed in accordance with ASME A17.1/CSA B44 or applicable local code when not conveying passengers.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.9 [EL29] ²	Total voltage drop across the combination of feeders and branch circuits <= 5%.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

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Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C303.3, C408.2.5.2 [FI17] ³	Furnished O&M instructions for systems and equipment to the building owner or designated representative.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C405.4.1 [FI18] ¹	Interior installed lamp and fixture lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Interior Lighting fixture schedule for values.
C405.5.1 [FI19] ¹	Exterior lighting power is consistent with what is shown on the approved lighting plans, demonstrating proposed watts are less than or equal to allowed watts.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Exterior Lighting fixture schedule for values.
C406.5 [FI49] ¹	On-site renewable efficiency package. One of the following levels of renewable energy must be satisfied: provide ≥ 1.75 Btu/h, or ≥ 0.50 watts per square foot of conditioned floor area OR provide ≥ 3 percent of the energy used within the building for mechanical and service water heating equipment and lighting.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.1.1 [FI57] ¹	Building operations and maintenance documents will be provided to the owner. Documents will cover manufacturers' information, specifications, programming procedures and means of illustrating to owner how building, equipment and systems are intended to be installed, maintained, and operated.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.2.5.1 [FI16] ³	Furnished as-built drawings for electric power systems within 90 days of system acceptance.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	
C408.3 [FI33] ¹	Lighting systems have been tested to ensure proper calibration, adjustment, programming, and operation.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Project Title: Model #7275

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WHITLEY MANUFACTURING CO., INC.

DATE: 02/17/22

MODEL # 7805

1. PERIMETER FRAME STRUCTURAL CALCULATIONS

WITH W-BEAM CROSS-MEMBERS (USED IN AXLE AREA AND AT HITCH MOUNTING ONLY)

DESIGN SPECIFICATIONS

YIELD OF STEEL =	36 ksi	E OF STEEL =	29000 ksi
ROOF DEAD LOAD =	10 psf	FLOOR DEAD LOAD* =	19 psf
ROOF LIVE LOAD =	40 psf	FLOOR DEAD LOAD** =	16 psf
WALL DEAD LOAD =	54 plf	FLOOR LIVE LOAD =	125 psf
		CONC. LIVE LOAD =	2000 lbs

* TOTAL FLOOR DEAD LOAD

** FLOOR DEAD LOAD @ CROSS-MEMBERS

FRAMING CONFIGURATION

WIDTH OF UNIT =	13.3 ft	XMEMB SPACING =	48 ins
LENGTH OF UNIT =	70.0 ft-MAX	XMEMB LENGTH =	156 ins
PIER SPACING =	12.0 ft-MAX	UNBRACED LENGTH =	24 ins

SPECIFY LAG BOLT INSTRUCTION
AT EVERY OTHER FLOOR JOIST

MAIN STRINGER

SECTION: W12X16

ALLOWABLE BENDING STRESS F_b =	23.76 ksi
ACTUAL BENDING STRESS f_b =	13.54 ksi SECTION OK
ALLOWABLE SHEAR STRESS F_v =	14.40 ksi
ACTUAL SHEAR STRESS f_v =	3.06 ksi SECTION OK
ALLOWABLE DEFL = SPAN/ 360 =	0.40 ins
ACTUAL MAXIMUM DEFL. =	0.11 DEFLECTION OK

CROSSMEMBER

SECTION: W10X12

ALLOWABLE BENDING STRESS F_b =	21.60 ksi
ACTUAL BENDING STRESS f_b =	13.38 ksi SECTION OK
ALLOWABLE SHEAR STRESS F_v =	14.40 ksi
MAXIMUM SHEAR FORCE V =	3.84 kips
ACTUAL SHEAR STRESS f_v =	2.05 ksi SECTION OK
LENGTH OF 0.125 WELD REQD =	5.00 ins EACH END
ALLOWABLE DEFL = SPAN/ 360 =	0.43 ins
ACTUAL MAXIMUM DEFL. =	0.23 DEFLECTION OK



GLENCO, INC.
 217 E MAIN ST
 MIDDLEBURG, PA 17842

 FLORIDA COA#
 31485

WHITLEY MANUFACTURING CO., INC.

DATE: 02/17/22

MODEL # 7805

2 PERIMETER FRAME STRUCTURAL CALCULATIONS

TYPICAL FORMED STEEL CROSS-MEMBER ONLY

DESIGN SPECIFICATIONS

YIELD OF STEEL =	36 ksi	E OF STEEL =	29000 ksi
ROOF DEAD LOAD =	10 psf	FLOOR DEAD LOAD* =	16 psf
ROOF LIVE LOAD =	40 psf	FLOOR LIVE LOAD =	125 psf
WALL DEAD LOAD =	54 plf	CONC. LIVE LOAD =	2000 lbs

* DEAD LOAD @ CROSS-MEMBERS

FRAMING CONFIGURATION

WIDTH OF UNIT =	13.3 ft	XMEMB SPACING =	24 ins
LENGTH OF UNIT =	70.0 ft	XMEMB LENGTH =	155 ins
PIER SPACING =	12.0 ft-MAX!	UNBRACED LENGTH =	80 ins

SPECIFY LAG BOLT INSTRUCTION
AT EVERY OTHER FLOOR JOIST

CROSSMEMBER

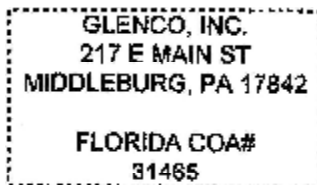
SECTION: U8X10GA

ALLOWABLE BENDING STRESS F_b =	21.60 ksi
ACTUAL BENDING STRESS f_b =	20.81 ksi SECTION OK

ALLOWABLE SHEAR STRESS F_v =	14.40 ksi
MAXIMUM SHEAR FORCE V =	2.21 kips
ACTUAL SHEAR STRESS f_v =	2.06 ksi SECTION OK

LENGTH OF 0.125 WELD REQD =	3.00 ins EACH END
-----------------------------	-------------------

ALLOWABLE DEFL = SPAN/ 360 =	0.430 ins
ACTUAL MAXIMUM DEFL. =	0.430 DEFLECTION OK



03/03/2022

ALGRIP™ Slip-Resistant Floor Plate Load Table

6 Carbon Steel Floor Plate

Thickness (Inches)	Span													Maximum span (in) @ 100 psf & 1/4" deflection
	1'-0"	1'-6"	2'-0"	2'-6"	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	
1/8"	333	148	83	53	37									19
3/16"	0.13	0.30	0.53	0.83	1.19									26
	750	333	188	120	83	61	47							
1/4"	0.09	0.20	0.35	0.55	0.79	1.08	1.41							32
	1,333	593	333	213	148	109	83	66	53					
5/16"	0.07	0.15	0.26	0.41	0.60	0.81	1.06	1.34	1.66					38
	2,083	926	521	333	231	170	130	103	83	69				
3/8"	0.05	0.12	0.21	0.33	0.48	0.65	0.85	1.07	1.32	1.60				43
	3,000	1,333	750	480	333	254	188	148	120	99	83			
1/2"	0.04	0.10	0.18	0.28	0.40	0.54	0.71	0.89	1.10	1.34	1.59			54
	5,333	2,370	1,333	853	593	435	333	263	213	176	148	126		
5/8"	0.03	0.07	0.13	0.21	0.30	0.41	0.53	0.67	0.83	1.00	1.19	1.40		64
	8,333	3,704	2,083	1,333	926	680	521	412	333	275	231	197	170	
3/4"	0.03	0.06	0.11	0.17	0.24	0.32	0.42	0.54	0.66	0.80	0.95	1.12	1.30	73
	12,000	5,333	3,000	1,920	1,333	980	750	593	480	397	333	284	245	
	0.02	0.05	0.09	0.14	0.20	0.27	0.35	0.45	0.55	0.67	0.79	0.93	1.08	

Values shown are for simple spans
Elastic modulus = 29,000,000 psi
Yield strength = 36,000 psi
Safety factor = 2.25

304 Stainless Steel Floor Plate

Values shown are for simple spans Elastic modulus = 28,000,000 psi Yield strength = 30,000 psi Safety factor = 2.25													
1/8"	278	123	69	44	31								19
	0.11	0.26	0.46	0.71	1.03								
3/16"	625	278	156	100	69	50	39						26
	0.08	0.17	0.30	0.48	0.69	0.93	1.22						
1/4"	1,111	494	278	178	123	91	69	55	44				32
	0.06	0.13	0.23	0.36	0.51	0.70	0.91	1.16	1.43				
5/16"	1,736	722	434	278	193	142	109	86	69	57	48	43	
	0.05	0.10	0.18	0.29	0.41	0.56	0.73	0.93	1.17	1.28	1.65		

Values shown are for simple spans
Elastic modulus = 28,000,000 psi
Yield strength = 30,000 psi
Safety factor = 2.25

WHITLEY MANUFACTURING CO., INC.

DATE: 02/17/22

MODEL #

7805

STEEL TUBE WALL STUD/COLUMN CALCULATION

DESIGN SPECIFICATIONS

YIELD OF STEEL = 46 ksi E OF STEEL = 29000 ksi
LATERAL LOAD: 20 psf

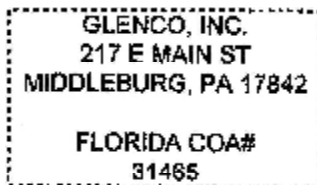
FRAMING CONFIGURATION: VERTICAL TUBE WALL FRAMING, WELDED CONSTRUCTION

COLUMN / STUD HEIGHT = 9.5 ft COLUMN / STUD SPACING = 29 ins MAX.
UNBRACED LENGTH = 114 ins
COLUMN / STUD LENGTH = 101 ins

STEEL TUBE COLUMN / STUD

SECTION: 3x2x1/8 TUBE

ALLOWABLE BENDING STRESS F_b = 12.57 ksi
ACTUAL BENDING STRESS f_b = 6.44 ksi SECTION OK
ALLOWABLE SHEAR STRESS F_v = 18.40 ksi
MAXIMUM SHEAR FORCE V = 0.23 kips
ACTUAL SHEAR STRESS f_v = 0.31 ksi SECTION OK
LENGTH OF 0.188 WELD REQD = 1.46 ins EACH END
ALLOWABLE DEFL = SPAN/ 240 = 0.55 ins
ACTUAL MAXIMUM DEFL. = 0.19 DEFLECTION OK



03/03/2022

WHITLEY MANUFACTURING CO., INC.

DATE: 02/17/22

MODEL #

7805

STEEL TUBE DOOR JAMB STUD / COLUMN CALCULATION

DOOR WIDTHS AND SPANS NOT EXCEEDING 60"

DESIGN SPECIFICATIONS

YIELD OF STEEL = 46 ksi E OF STEEL = 29000 ksi
LATERAL LOAD: 20 psf

FRAMING CONFIGURATION: VERTICAL TUBE WALL FRAMING, WELDED CONSTRUCTION

COLUMN / STUD HEIGHT = 9.5 ft COLUMN / STUD SPACING = 60 ins MAX
UNBRACED LENGTH = 114 ins
COLUMN / STUD LENGTH = 101 ins

STEEL TUBE COLUMN / STUD

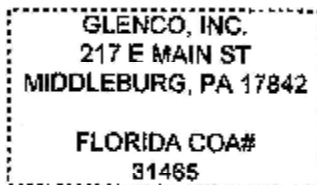
SECTION: 3x3x3/16 TUBE

ALLOWABLE BENDING STRESS F_b = 25.62 ksi
ACTUAL BENDING STRESS f_b = 7.79 ksi SECTION OK

ALLOWABLE SHEAR STRESS F_v = 18.40 ksi
MAXIMUM SHEAR FORCE V = 0.47 kips
ACTUAL SHEAR STRESS f_v = 0.42 ksi SECTION OK

LENGTH OF 0.188 WELD REQD = 1.95 ins EACH END

ALLOWABLE DEFL = SPAN/ 240 = 0.55 ins
ACTUAL MAXIMUM DEFL. = 0.23 DEFLECTION OK



03/03/2022

WHITLEY MANUFACTURING CO., INC.

DATE: 02/17/22

MODEL #

7805

STEEL TUBE DOOR JAMB STUD / COLUMN CALCULATION

DOOR WIDTHS UP TO 96"

DESIGN SPECIFICATIONS

YIELD OF STEEL = 46 ksi E OF STEEL = 29000 ksi
LATERAL LOAD: 20 psf

FRAMING CONFIGURATION: VERTICAL TUBE WALL FRAMING, WELDED CONSTRUCTION

COLUMN / STUD HEIGHT = 9.5 ft COLUMN / STUD SPACING = 96 ins MAX
UNBRACED LENGTH = 114 ins
COLUMN / STUD LENGTH = 101 ins

STEEL TUBE COLUMN / STUD

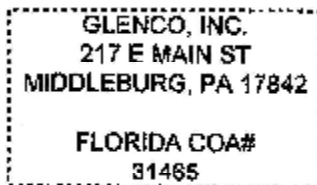
SECTION: 3x3x1/8 TUBE

ALLOWABLE BENDING STRESS F_b = 31.74 ksi
ACTUAL BENDING STRESS f_b = 10.26 ksi SECTION OK

ALLOWABLE SHEAR STRESS F_v = 18.40 ksi
MAXIMUM SHEAR FORCE V = 0.76 kips
ACTUAL SHEAR STRESS f_v = 0.51 ksi SECTION OK

LENGTH OF 0.188 WELD REQD = 2.52 ins EACH END

ALLOWABLE DEFL = SPAN/ 240 = 0.55 ins
ACTUAL MAXIMUM DEFL. = 0.31 DEFLECTION OK



03/03/2022

STEEL ROOF SUPPORT COLUMN CALCULATION

MODEL: 7805

SINGLE- OR DOUBLE-WIDE, TYPICAL WALL VERTICAL TUBE STUD / COLUMNS1st STORY ROOF:

L/L = 40.00 PSF

D/L = 6.76 PSF

TOTAL = 46.76 PSF

SPAN LENGTH: 5.00 FT. MAXIMUM

SPAN WIDTH: 6.67 FT

UNIFORM ROOF LOAD = 1558.67 LB'S.

HVAC UNIT # N/A LOAD = 0.00 LB'S.

TOTAL ROOF LOAD = 1558.67 LBS

TOTAL 1st STORY MATE LINE COLUMN LOADS: 1558.67 LB'S**TOTAL LOAD ON 1st STORY COLUMN = 1559 lbs**

FIRST STORY COLUMN SIZE= 1/8"x 3"x 3" SQ. TUBE

WT= 4.8 plf

Fy= 46.0 ksi

Fb= 27.6 ksi

L= 114 in

rzz= 1.08 in

A= 1.44 in²Izz= 2.08 in⁴

L/r= 105.56

Cc= 111.55

Fs= 1.92

NOTE ----> Fall= 13.26 ksi

NOTE ----> Fact= 1.08 ksi

OK

GLENCO, INC.
 217 E MAIN ST
 MIDDLEBURG, PA 17842

 FLORIDA COA#
 31465



03/03/2022

STEEL ROOF SUPPORT COLUMN CALCULATION

MODEL: 7805

SINGLE- OR DOUBLE-WIDE, TYPICAL WALL JAMB STUD / COLUMNS

1st STORY ROOF:

L/L = 40.00 PSF

D/L = 6.76 PSF

TOTAL = 46.76 PSF

SPAN LENGTH: 6.50 FT. MAXIMUM

SPAN WIDTH: 8.00 FT

UNIFORM ROOF LOAD = 2431.52 LB'S.

HVAC UNIT # N/A LOAD = 0.00 LB'S.

TOTAL ROOF LOAD = 2431.52 LBS

TOTAL 1st STORY MATE LINE COLUMN LOADS: 2431.52 LB'S

TOTAL LOAD ON 1st STORY COLUMN = 2432 lbs

FIRST STORY COLUMN SIZE= 1/8"x 3"x 3" SQ. TUBE

WT= 4.8 plf

Fy= 46.0 ksi

Fb= 27.6 ksi

L= 114 in

rzz= 1.08 in

A= 1.44 in^2

Izz= 2.08 in^4

L/r= 105.56

Cc= 111.55

Fs= 1.92

NOTE ----> Fall= 13.26 ksi

NOTE ----> Fact= 1.69 ksi

OK

GLENCO, INC.
217 E MAIN ST
MIDDLEBURG, PA 17842

FLORIDA COA#
31485



03/03/2022

WHITLEY MANUFACTURING CO., INC.

DATE: 02/17/22

MODEL #

7805

FORMED STEEL RAFTER CALCULATION

NOTE: CALCULATION IS CONSERVATIVE: LOW SIDE HEIGHT USED FOR CALCULATION

DESIGN SPECIFICATIONS

YIELD OF STEEL = 36 ksi MIN. E OF STEEL = 29000 ksi
 ROOF DEAD LOAD = 7 psf
 ROOF LIVE LOAD = 40 psf

FRAMING CONFIGURATION

WIDTH OF UNIT = 13.3 ft RAFTER SPACING = 48 ins
 LENGTH OF UNIT = 70 ft RAFTER LENGTH = 157 ins
 COLUMN SPACING = 13.3 ft UNBRACED LENGTH = 160 ins
 SPAN CONDITION: SINGLE-SPAN SPECIFY LAG BOLT INSTRUCTION
 AT EVERY OTHER FLOOR JOIST

STEEL RAFTER TYPE

SECTION: U8X11GA

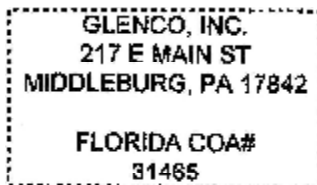
ALLOWABLE BENDING STRESS F_b = 21.60 ksi
 ACTUAL BENDING STRESS f_b = 17.05 ksi SECTION OK

ALLOWABLE SHEAR STRESS F_v = 14.40 ksi
 MAXIMUM SHEAR FORCE V = 1.25 kips
 ACTUAL SHEAR STRESS f_v = 1.32 ksi SECTION OK

LENGTH OF 0.125 WELD REQD = 2.00 ins EACH END

ALLOWABLE DEFL = SPAN/ 240 = 0.65 ins
 ACTUAL MAXIMUM DEFL. = 0.37 DEFLECTION OK

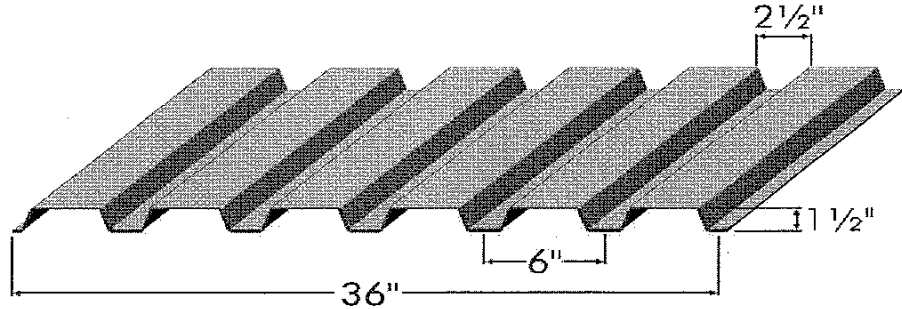
TOES ON FORMED CHANNELS MUST BE TWO INCHES LONG.



SECTION PROPERTIES

fy = 33 ksi

GAGE	t (in)	Wd (psf)	Ip (in^4)	In (in^4)	Sp (in^3)	Sn (in^3)	Rbe (lb/ft)		Rbi (lb/ft)		Va (lb/ft)	
							LRFD	ASD	LRFD	ASD	LRFD	ASD
22	0.0295	1.7	0.162	0.187	0.194	0.202	597	430	1404	1013	2587	1794
20	0.0358	2.0	0.209	0.227	0.240	0.250	828	597	2167	1563	3140	2177
18	0.0474	2.7	0.299	0.304	0.327	0.335	1344	969	3815	2751	4157	2882
16	0.0598	3.3	0.383	0.383	0.420	0.422	2028	1462	5919	4269	5245	3636



MAXIMUM ALLOWABLE UNIFORM TOTAL LOADS, (psf) **

SINGLE SPAN								DOUBLE SPAN								TRIPLE SPAN								
GAGE	22		20		18		16		22		20		18		16		22		20		18		16	
span	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD	LRFD	ASD
3'-0"	398	284	400	352	400	400	400	400	374	270	400	349	400	400	400	400	400	307	400	400	400	400	400	400
3'-6"	257	209	330	259	400	352	400	400	321	211	400	260	400	348	400	400	365	259	400	319	400	400	400	400
4'-0"	176	160	224	198	317	270	400	347	256	162	315	200	400	269	400	339	315	200	388	247	400	331	400	400
4'-6"	126	126	161	157	226	213	286	274	204	129	251	159	337	213	400	269	229	180	294	197	400	264	400	333
5'-0"	95	95	120	120	167	167	211	211	166	105	204	129	274	174	346	219	170	130	217	160	306	215	389	271
5'-6"	74	74	92	92	128	128	161	161	137	87	169	107	227	144	287	182	130	108	165	133	232	179	295	225
6'-0"	59	59	74	74	101	101	126	126	116	73	143	90	191	121	242	153	103	91	130	112	181	151	229	190
6'-6"			60	60	82	82	102	102	99	63	122	77	164	103	206	131	83	78	104	96	145	129	182	162
7'-0"			50	50	67	67	83	83	84	54	105	67	141	89	178	113	68	67	85	83	118	111	148	140
7'-6"					57	57	70	70			88	58	122	78	153	98		71	71	98	97	122	122	
8'-0"					48	48	59	59			75	51	102	69	128	87		60	60	82	82	103	103	
8'-6"							51	51					87	61	109	77				70	70	87	87	
9'-0"							44	44					75	54	93	68				61	61	75	75	
9'-6"													65	49	81	61				53	53	65	65	
10'-0"															71	56							57	57
10'-6"															62	50							51	51
11'-0"																								
MAXIMUM CONSTRUCTION SPANS																								
span	5'-9"		6'-6"		7'-9"		8'-10"		8'-9"		7'-8"		9'-2"		10'-5"		6'-9"		7'-8"		9'-2"		10'-5"	
cantilever	2'-0"		2'-4"		2'-8"		3'-0"		2'-0"		2'-4"		2'-8"		3'-0"		2'-0"		2'-4"		2'-8"		3'-0"	
FM	6'-0"		6'-6"		7'-5"		-		6'-0"		6'-6"		7'-5"		-		6'-0"		6'-6"		7'-5"		-	

MAXIMUM CONSTRUCTION SPANS

span	5'-9"	6'-6"	7'-9"	8'-10"	6'-9"	7'-8"	9'-2"	10'-5"	6'-9"	7'-8"	9'-2"	10'-5"
cantilever	2'-0"	2'-4"	2'-8"	3'-0"	2'-0"	2'-4"	2'-8"	3'-0"	2'-0"	2'-4"	2'-8"	3'-0"
FM	6'-0"	6'-6"	7'-5"	-	6'-0"	6'-6"	7'-5"	-	6'-0"	6'-6"	7'-5"	-

	LRFD	ASD	design method
3'-0"	398	284	maximum allowable uniform total (dead+live) load **
			span (center-to-center of supports)

- t Design thickness of deck
- Wd Weight of deck (uncoated)
- As Average area of steel of deck per foot width
- Ip Moment of inertia of deck for positive bending
- In Moment of inertia of deck for negative bending
- Sp Section modulus of deck for positive bending
- Sn Section modulus of deck for negative bending
- Rbe Allowable exterior web crippling value per foot of deck (based on 2' of end bearing)
- Rbi Allowable interior web crippling value per foot of deck (based on 4' of interior bearing)
- Va Allowable shear value per foot of deck

- span Maximum single or multiple span during construction
- cantilever Maximum cantilever during construction
- FM Maximum allowable span per Factory Mutual
- fy 33 ksi (for determining maximum loads)
- f span 26 ksi (for determining maximum spans)
- ** An assumed 10 psf dead load is added to deflection

The section property table is based on AISI's Cold-Formed Steel Design Manual, 1996 Edition.

The loads and maximum construction spans are based on the Design Manual for Composite Decks, Form Decks, Roof Decks and Cellular Deck Floor Systems with Electrical Distribution Pub No. 30 Available as acoustical see page 38 for additional information

ASCE-7-16 WIND / SEISMIC CALCULATION, FOR LIGHT FRAME STEEL CONSTRUCTION
SINGLE-WIDE MODULAR DOCK UNIT

date: 3-8-17 REV. 0
 MODEL NUMBER: 7805
 Project Location : FLORIDA
 Long Dimension (x) = 70.00 ft.
 Short Dimension(y) = 13.33 ft.
 Building perimeter = 166.667 ft.
 Ext. Wall Height = 9.67 ft.
 Bldg. Height, abv. Grade = 12.73 ft.
 Bldg. Floor, dead load = 20.24 psf
 Bldg. Ext. Walls, dead load = 6.10 psf
 Additional dead load = 5 psf *

**NOTE: CALCULATION IS FOR
 UNIT w/ HIGHEST % OF WALL
 WALL OPENINGS TO WALL AREA**

Basic Wind Speed (V) = 118 MPH (ASCE 7-16, Fig. 26.5-1A, B, C)
 Wind Exposure Category: C (ASCE 7-16, Section 26.7)
 $h = 12.73$ Ft
 $K_z = 0.85$ (ASCE 7-16, Table 27.3-1)
 $K_{zt} = 1.00$ (ASCE 7-16, Table 26.8-1)
 $K_d = 0.85$ (ASCE 7-16, Table 26.6-1)
 $G = 0.85$ (ASCE 7-16, 26.9)
 $GC_{pi} = 0.18$ (ASCE 7-16, Table 26.11.1)
 $I = 1.00$ (ASCE 7-16, Table 1.5-2)
 $q = q_z$ at height z

*No Int. walls; dead load for site-installed equipment
 Bldg. Roof, dead load = 6.76 psf

Velocity Pressure: $q_z = 0.00256 K_z K_{zt} K_d V^2 = 25.75$ psf
 C_p windward walls = 0.8 (ASCE 7-16, Fig. 27.4-1)

Construction Type: Ordinary steel concentrically braced frame

Design Wind Press. Windw'rd wall: $p = qGC_p - q_iGC_{pi} = 12.88$ psf
 C_p leeward walls = -0.5 (ASCE 7-16, Fig. 27.4-1)

Design Wind Press. Leew'rd wall: $p = qGC_p - q_iGC_{pi} = -15.58$ psf

C_s roof, parallel to ridge = -0.18 (ASCE 7-16, Fig. 27.4-1)

Design Wind Press. Roof, parallel to ridge: $p = qGC_s - q_iGC_{pi} = -8.58$ psf

C_s roof, perp. to ridge = -0.7 Windw'rd.

Design Wind Press. Roof, perp. to ridge, windw'rd side: $p = qGC_s - q_iGC_{pi} = -19.96$ psf

C_s roof, perp. to ridge = -0.5 Leeward.

Design Wind Press. Roof, perp. to ridge, leeward side: $p = qGC_s - q_iGC_{pi} = -15.58$ psf

Table 20.3-1 Seismic Site class Defined: D (Stiff soil)

Site coefficients & adjusted max. considered earthquake
 spectral response acceleration parameters

Figure 22-2: $S_s = 0.086$ $F_a = 1.600$

$S_{MS} = F_a S_s = 0.138$

Figure 22-2: $S_1 = 0.051$ $F_v = 2.400$

$S_{M1} = F_v S_1 = 0.122$

Design spectral response acceleration parameters

$S_{DS} = \frac{2}{3} S_{MS} = 0.092$

$S_{D1} = \frac{4}{3} S_{M1} = 0.082$

Building configuration:

Regular

Section 1.5-1 Seismic Risk Category and Importance Factor

Seismic use group: II (Table 1.5-1)

Seismic importance factor: 1.00

Table 11.6-1 Seismic Design Category (short period):

$S_{DS} = 0.092$ Design Category = B

Table 11.6-2 Seismic Design Category (1second period):

$S_{D1} = 0.082$ Design Category = B

Section 12.14: Simplified Analysis

Simplified Analysis per 12.14.1.1 allowed
 for simple buildings with bearing wall or
 building frame systems complying with
 the limitations set forth in 12.14.1.1.

12.14.8.1 Seismic base shear (simplified)

$F S_{DS} = 1.00 \times 0.092$

$V = \frac{W}{R} = \frac{39691.2 \text{ Lb's.}}{3.25} = 1120.31 \text{ Lb's}$

Note: $F = 1.0$ for 1-story bldg.

$R =$ Response Modification Factor: 3.25

$W =$ Building dead load (calculated from weights and dimensions below):

Wd = floor wt.	70.00 FT	X	13.33 FT	X	20.24 PSF	=	18891.0 LBS
We =Ext. wall wt.	166.67 FT	X	9.67 FT	X	6.10 PSF	=	9824.8 LBS
Wi =equip. wt.	70.00 FT	X	13.33 FT	X	5.00 PSF	=	4666.7 LBS
Wf = roof wt.	70.00 FT	X	13.33 FT	X	6.76 PSF	=	6308.8 LBS

$W = 39691.2 \text{ LBS}$

Vertical distribution:

$1.2 S_{DS}$

$F_x = \frac{R}{1.2 S_{DS}} \times W_x$

$W_x =$ Effective seismic wt. (W), at height x

For single-story structure:

$F_x = V/x = 1120.3 \text{ LBS}$

$F_{x1} = \frac{w_{x1}}{W} V = \frac{6308.81}{39691.25} \times 1120.31 \text{ Lb's} = 178.07 \text{ Lb's}$ lb, @ ROOF

$F_{xi} = \frac{w_{xi}}{W} V = \frac{16133.57}{39691.25} \times 1120.31 \text{ Lb's} = 455.38 \text{ Lb's}$ lb, @ FLOOR

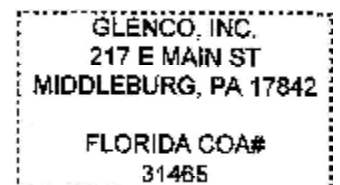
ASCE-7, 12.14.8.5 Drift limits (simplified):

Design story drift taken as 1% of story height)

$\Delta = .01 h_{sx} =$ design drift = 1.5275 In.

$h_{sx} =$ height of story = 12.73 Ft.

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w_{xI} = Seismic weight at level xI = 6308.81 Lb's at roof
 w_x = Seismic weight at level x = 16133.57 Lb's at floor
 w_i = Seismic weight at level i = 39691.25 Lb's at base

ASCE-7, 12.14.8.2 Horizontal Shear Distribution (simplified):

$$V_x = F_x = 1120.3 \text{ Lb}$$

$$V_{xI} = F_{xI} = 178.1 \text{ Lb}$$

$$V_{xi} = F_{xi} = 455.4 \text{ Lb}$$

COMPARE SEISMIC AND WIND SHEAR:

X - DIMENSION (ALWAYS LONGEST DIMENSION OF BUILDING)

WIND SHEAR (x-axis):

$$V_{wx} = \text{Design Wind Pressure } x (\text{Bldg. Length Ft } x \text{ Height Ft}) = 13883.4 \text{ LBS}$$

$$\text{Use greater of } V_{wx} \text{ (Wind Shear) or } V \text{ (Seismic Shear): } V_{wx} = 13883.4 \text{ LBS} > V = 1120.3 \text{ LBS}$$

WIND SHEAR CONTROLS IN X DIRECTION

Y - DIMENSION (ALWAYS SHORTEST DIMENSION OF BUILDING)

WIND SHEAR (y-axis):

$$V_{wy} = \text{Design Wind Pressure } x (\text{Bldg. Width Ft } x \text{ Height Ft}) = 2644.5 \text{ LBS}$$

$$\text{Compare } V_{wy} \text{ (Wind Shear) to } V \text{ (Seismic Shear); use greater value } V_{wy} = 2644.5 \text{ LBS} > V = 1120.3 \text{ LBS}$$

WIND SHEAR CONTROLS IN Y DIRECTION

VERTICAL UPLIFT

$$V_{wU} = \text{Design Uplift Pressure } x (\text{Bldg. Width Ft } x \text{ Length Ft}) = 18628.6 \text{ LBS}$$

CHECK FOR LATERAL LOAD AND UPLIFT RESISTANCE:

X - DIRECTION, SIDE WALL TO FLOOR:

Side Walls w/ Doors

$$\text{Lateral load + uplift: } 32512.0 \text{ LBS} = 16255.99 \text{ Lbs} < 84000 \text{ Lbs}$$

Bead size: 3/16 In. 2 (S.W.)

Shear per inch of bead: 0.8 kip

Weld Tensile strength: 60 ksi

Section Qty.
or Location:

Weld length
per section:

Total length of weld:

Wall Section length:	0.63 Ft.	Dbl. End Col.	9.00 In. Ea.	9.00 In.
Wall Section length:	2.98 Ft.	1 Per Side	12.00 In. Ea.	12.00 In.
Wall Section length:	4.00 Ft.	6 Per Side	12.00 In. Ea.	72.00 In.
Wall Section length:	3.50 Ft.	1 Per Side	12.00 In. Ea.	12.00 In.

Total shear resistance: 84000 Lbs



03/03/2022

X-DIRECTION ROOF TO SIDE WALL:

Bott. flange roof side rail to top tube of side wall)

Lateral load + uplift: 16255.99 Lbs

Bead size:

Weld spacing:

32 In. OC

Bead length, per weld: 2.00 In.

Total number of welds:

26

16255.99 Lbs < 31200 Lbs

Nom. Tensile strength of weld: 60 ksi

Total length of weld:

52.00 In.

OK

Shear per inch of bead: 0.6 kip

Total shear resistance: 31200 Lbs

Y - DIRECTION, END WALL TO FLOOR:

$$\text{Lateral load (uplift resisted by S/W's): } 2644.45 \text{ LBS} = 1322.23 \text{ Lbs} < 33600 \text{ Lbs} \quad \text{OK}$$

Exterior End Wall

Bead size: 3/16 In. 2 (E.W.)

Shear per inch of bead: 0.8 kip

Weld Tensile strength: 60 ksi

Section Qty.
or Location:

Weld length
per section:

Total length of weld:

Wall Section length:	13.33 Ft.	1Ea.	42.00 In. Ea.	42.00 In.
----------------------	-----------	------	---------------	-----------

Total shear resistance: 33600 Lbs

Y - DIRECTION, ROOF TO END WALL

Bott. flange roof side rail to top tube of side wall)

Lateral load only: 1322.23 Lbs

Bead size: 1/8 In.

Weld spacing:

32 In. OC

Bead length, per weld: 2.00 In.

Total number of welds:

5.00

1322.23 Lbs < 6000 Lbs

Nom. Tensile strength of weld: 60 ksi

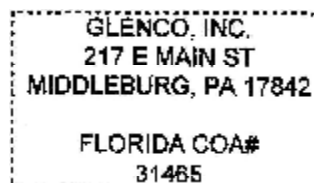
Total length of weld:

10.00 In.

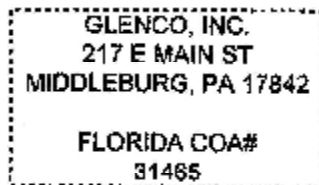
OK

Shear per inch of bead: 0.6 kip

Total shear resistance: 6000 Lbs



MOD DOCK STEEL CONSTRUCTION, STRUCTURAL STEEL SUPERSTRUCTURE			
LOCATION	FASTENER	SIZE	QUANTITY OR SPACING
PERIMETER FRAME CONNECTIONS STEEL:			
STEEL FLOOR PLATE TO FRAME AND CROSSMEMBERS	WELD	1" LONG BEAD BEAD SIZE 3/16"	NOMINAL 24" ON CENTER AT EACH CROSS-MEMBER.
STEEL FLOOR PLATE TO FRAME SIDE RAILS	WELD	MIN. 3" LONG BEAD BEAD SIZE 3/16"	WELD AT EACH VERTICAL TUBE LOCATION
TYPICAL WALL CONNECTIONS, STEEL TUBE FRAMING			
BOTTOM AND TOP PLATE TUBE SPLICE: BUTT SPLICE	WELD	FILLET WELD (2) SIDES; FILLET SIZE: MATCH TUBE WALL THICKNESS	BEVEL TUBE ENDS @ BUTT JOINTS BEFORE WELDING; GRIND FINISHED WELDS
TUBE BOTTOM PLATES TO STEEL DECK	WELD	3/16" BEAD MINIMUM 1" LONG BEAD	WELD 10" - 12" ON CENTER INTERIOR AND EXTERIOR OF BOTTOM PLATE TUBE
VERTICAL TUBE STUDS TO BOTTOM AND TOP PLATE TUBES	WELD	3" BEAD BEAD SIZE 3/16"	ON TWO SIDES OF TUBE
SIDEWALLS TO ENDWALLS	WELD	2"L x 1/8" BEAD, INTERIOR & EXTERIOR OF CORNER, 24" O.C.	
COLUMN CONNECTION TO FLOOR @ MATE LINE			
3"x 3" TUBE TO BOTT. 4"x4"x 3/8" PLATE	WELD	2 1/2"L x 3/16' BEAD, (4) SIDES OF COLUMN	
4"x 4"x 3/8" BOTTOM PLATE TO FLOOR	WELD	3 1/2"L x 3/16' BEAD, (4) SIDES OF COLUMN	
COLUMN CONNECTION TO ROOF BEAM @ MATE LINE			
3"x 3" TUBE TO TOP 4"x4"x 3/8" PLATE	WELD	2 1/2"L x 3/16' BEAD, (4) SIDES OF COLUMN	
4"x 4"x 3/8" TO PLATE TO FLOOR	WELD	3 1/2"L x 3/16' BEAD, (4) SIDES OF COLUMN	
EXTERIOR WALL - INTERIOR COVERING TO STEEL TUBE FRAMING:			
STEEL - SHEET OR CORRUGATED	SCREW	#9 x 1 1/2" GASKETED HEX HD. SCREW, WITH STEEL-CUTTING POINT	SPACED 9" O.C. TOP & BOTT, 18" O.C. IN FIELD; SECREW PANEL LAP JOINTS FIELD ROWS & LAP JOINT SCREWS SPACED APPROX. 38" O.C. VERTICALLY
EXTERIOR WALL COVERING TO STEEL TUBE FRAMING:			
STEEL - SHEET OR CORRUGATED	SCREW	#9 x 1 1/2" GASKETED HEX HD. SCREW, WITH STEEL-CUTTING POINT	SPACED 9" O.C. TOP & BOTT, 18" O.C. IN FIELD; SECREW PANEL LAP JOINTS FIELD ROWS & LAP JOINT SCREWS SPACED APPROX. 38" O.C. VERTICALLY
UP TO 120 MPH WIND ZONES EXPOSURE C	SCREW	#9 x 1 1/2" GASKETED HEX HD. SCREW, WITH STEEL-CUTTING POINT	SPACED 6" O.C. TOP & BOTT, 8" O.C. IN FIELD; SECREW PANEL LAP JOINTS FIELD ROWS & LAP JOINT SCREWS SPACED SCREW AT EACH HORIZONTAL TUBE
ROOF:			
11-GAUGE ROOF SIDERAIL SPLICE	WELD	1/8" BEAD	FULL WIDTH TOP & BOTTOM FLANGE
11-GAUGE ROOF SIDERAIL SPLICE PLATE	WELD	1/8" BEAD	1" LONG x 4" O.C., VERTICAL EDGES
ROOF RAFTER TO SIDERAIL	WELD	1/8" BEAD	FULL WIDTH BOTTOM FLANGE; 1 1/2" L. BEAD NOMINAL 4" O.C. @ VERTICAL EDGES
ROOF ASSEMBLY TO WALLS (STEEL STUDS) STEEL ROOF:			
TUBE TOP PLATES TO ROOF SIDE RAIL	WELD	2" BEAD BEAD SIZE 3/16"	32" O.C., EXTERIOR ONLY - SINGLE WIDE MODULES, 1" LONG WELD, RAFTER TO TOP PLATE TUBE, AT EACH RAFTER, DBL. WIDE MODULES ONLY.
STEEL DECK TO ROOF TRUSSES	SCREWS	#8 X 1/2" MIN.	12" O.C. NOMINAL AT EVERY JOIST/RAFTER
ALTERNATE:	TACK WASHERS	WELD	EVERY JOIST/RAFTER AT 12" O.C. NOM.
FINISHED ROOFING MATERIALS:			
GALVANIZED SHEET	DRIP-RAIL OR TERMINATION BAR USED TO CLAMP ROOF, SEE BELOW		
EPDM	PER MANUFACTURERS INST. (FULLY ADHERED SYSTEM)		
TPO	PER MANUFACTURERS INST. (FULLY ADHERED SYSTEM)		
DRIP-RAIL OR TERMINATION BAR TO ROOF	SCREW	1"x # 10 OR # 12 TEK	4" O.C. NOMINAL FULL PERIMETER OF ROOF





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ESR-3500

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Reissued 01/2016

This report is subject to renewal 01/2017

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

SECTION: 07 21 00—THERMAL INSULATION

REPORT HOLDER:

ICYNENE, INC.

6747 CAMPOBELLO ROAD
MISSISSAUGA, ONTARIO L5N 2L7
CANADA

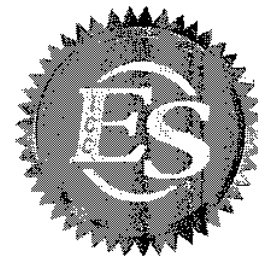
EVALUATION SUBJECT:

ICYNENE PROSEAL



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ICC-ES Evaluation Report

ESR-3500

Reissued January 2016

This report is subject to renewal January 2017.

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A Subsidiary of the International Code Council®

**DIVISION: 07 00 00—THERMAL AND MOISTURE
PROTECTION**

Section: 07 21 00—Thermal Insulation

REPORT HOLDER:

ICYNENE, INC.
6747 CAMPOBELLO ROAD
MISSISSAUGA, ONTARIO L5N 2L7
CANADA
(905) 363-4040
www.icynene.com
jevans@icynene.com

EVALUATION SUBJECT:

ICYNENE PROSEAL

1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2015, 2012 and 2009 *International Building Code*® (IBC)
- 2015, 2012 and 2009 *International Residential Code*® (IRC)
- 2015, 2012 and 2009 *International Energy Conservation Code*® (IECC)

Properties evaluated:

- Surface-burning characteristics
- Physical properties
- Thermal resistance (*R*-values)
- Attic and crawl-space installation
- Air permeability
- Vapor permeability
- Fire resistance
- Exterior walls of Types I–IV construction

1.2 Evaluation to the following green standard:

- 2008 ICC 700 *National Green Building Standard*™ (ICC 700-2008)

Attributes verified:

- See Section 3.1

2.0 USES

Icynene ProSeal spray foam is used as a nonstructural thermal insulating material in Types I, II, III, IV and V

construction under the IBC and dwellings under the IRC. The insulation is for use in wall cavities, floor assemblies, ceiling assemblies, or attics and crawl spaces when installed in accordance with Section 4.4. Under the IRC, the insulation may be used as air-impermeable insulation when installed in accordance with Section 3.4, and as a vapor retarder when installed in accordance with Section 3.5. Icynene ProSeal spray foam may be used in fire-resistance-rated construction when installed in accordance with Section 4.5, and in Types I through IV construction when installed in accordance with Section 4.6.

3.0 DESCRIPTION

3.1 ProSeal Insulation:

Icynene ProSeal foam plastic insulation is a two-component, medium-density, closed-cell, spray-applied foam plastic with a nominal density of 2.4 pcf. The polyurethane foam is produced by combining Icynene Based Seal MDI isocyanate (the A component) and Icynene ProSeal resin (the B component). The products have a shelf life of 12 months when stored in factory-sealed containers at temperatures between 60°F and 85°F (16°C and 29°C). The Icynene ProSeal is supplied in one formula for all climates.

The attributes of the insulation have been verified as conforming to the requirements of ICC 700-2008 Section 703.2.1.1.1(c) as an air impermeable insulation. Note that decisions on compliance for those areas rest with the user of this report. The user is advised of the project-specific provisions that may be contingent upon meeting specific conditions, and the verification of those conditions is outside the scope of this report. These codes or standards often provide supplemental information as guidance.

3.2 Surface Burning Characteristics:

The Icynene ProSeal insulation, at a maximum thickness of 4 inches (102 mm) and a nominal density of 2.4 pcf, has a flame-spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84.

3.3 Thermal Resistance:

Icynene ProSeal insulation has a thermal resistance, *R*-value, at a mean temperature of 75°F (24°C) as shown in Table 1.

3.4 Air Permeability:

Icynene ProSeal insulation, at a minimum 1.4-inch (35.6 mm) thickness, is considered air-impermeable insulation in accordance with 2012 IRC Section R806.5

(2009 IRC Section R806.4), based on testing in accordance with ASTM E2178.

3.5 Vapor Permeability:

Icynene ProSeal insulation has a vapor permeance of less than 1 perm (5.7×10^{-11} kg/Pa-s-m²) at a minimum thickness of 1.5 inches (38.1 mm) and may be used where a Class II vapor retarder is required by the applicable code.

3.6 Intumescent Coatings:

3.6.1 DC 315: DC 315 intumescent coating, manufactured by International Fireproof Technology, Inc., is a water-based coating supplied in 5-gallon (19 L) pails and 55 gallon (208 L) drums. The coating material has a shelf life of 24 months when stored in factory-sealed containers at temperatures between 41°F (5°C) and 95°F (35°C).

4.0 DESIGN AND INSTALLATION

4.1 General:

Icynene ProSeal must be installed in accordance with the manufacturer's published installation instructions, this report and the applicable code. The manufacturer's published installation instructions and this report must be strictly adhered to, and a copy of the instructions and this evaluation report must be available on the jobsite at all times during installation.

4.2 Application:

Icynene ProSeal must be applied using spray equipment specified by Icynene, Inc. The insulation must not be used in areas having a maximum service temperature greater than 180°F (82°C), must not be used in electrical outlet or junction boxes or in contact with rain or water, and must be protected from the weather during and after application. Where Icynene ProSeal is used as an air-impermeable barrier, such as in unventilated attic spaces regulated by IRC Section R806, the insulation must be installed at a minimum thickness of 1.4 inches (35.6 mm). The insulation is applied to the intended thickness, with the first pass being a maximum of 3 inches (76 mm) and all additional passes being a maximum of 2 inches (51 mm). Where multiple passes are required, the cure time between each pass is in accordance with the manufacturer's instructions.

4.3 Thermal Barrier:

4.3.1 Application with a Prescriptive Thermal Barrier: Icynene ProSeal spray foam insulation must be separated from the interior of the building by an approved thermal barrier, such as 1/2-inch-thick (12.7 mm) gypsum board installed using mechanical fasteners in accordance with the applicable code, or an equivalent 15-minute thermal barrier complying with, and installed in accordance with, IBC Section 2603.4 or IRC Section R316.4, as applicable. When installation is within an attic or crawl space as described in Section 4.4, a thermal barrier is not required between the foam plastic and the attic or crawl space, but is required between the insulation and the interior of the building. There is no thickness limit when installation is behind a code-prescribed thermal barrier except as noted in Sections 4.4.2.1, 4.4.2.2 and 4.4.3.

4.3.2 Application without a Prescriptive Thermal Barrier with DC 315 Intumescent Coating: Icynene ProSeal may be installed without the 15-minute thermal barrier prescribed in IBC Section 2603.4 and IRC Section R316.4, when the installation is in accordance with this section. The Icynene ProSeal insulation and the DC 315 intumescent coating may be spray-applied to the interior facing of walls, the underside of roof sheathing or roof

rafters, and in crawl spaces, and may be left exposed as an interior finish without a 15-minute thermal barrier or ignition barrier. The thickness of the insulation applied to the underside of the roof sheathing must not exceed 14 inches (356 mm). The thickness of the insulation applied to vertical wall surfaces must not exceed 8 inches (203 mm). The insulation must be covered on all surfaces with DC 315 intumescent coating at a minimum wet film thickness of 24 mils wet (0.61 mm) [16 mils dry (0.41 mm)] at an application rate of 1 gallon (3.8 L) per 66.8 square feet (6.15 M²). The coating must be applied over the Icynene ProSeal insulation in accordance with the coating manufacturer's instructions and this report. Surfaces to be coated must be dry, clean, and free of dirt, loose debris and other substances that could interfere with adhesion of the coating. The coating is applied in one coat with low-pressure airless spray equipment.

4.4 Attics and Crawl Spaces:

4.4.1 Application with a Prescriptive Ignition Barrier: When Icynene ProSeal insulation is installed within attics or crawl spaces where entry is made only for service of utilities, an ignition barrier must be installed in accordance with IBC Section 2603.4.1.6 or IRC Sections R316.5.3 and R316.5.4, as applicable. The ignition barrier must be consistent with the requirements for the type of construction required by the applicable code, and must be installed in a manner so that the foam plastic insulation is not exposed. Icynene ProSeal insulation may be installed in unvented attics in accordance with 2012 IRC Section R806.5 (2009 IRC Section R806.4).

4.4.2 Application without a Prescriptive Ignition Barrier: Where Icynene ProSeal spray foam is installed in an attic or crawl space without a prescriptive ignition barrier, in accordance with Sections 4.4.2.1 and 4.4.2.2, the following conditions apply:

1. Entry to the attic or crawl space is only for the service of utilities and no storage is permitted.
2. There are no interconnected attic, crawl space or basement areas.
3. Air in the attic or crawl space is not circulated to other parts of the building.
4. Combustion air is provided in accordance with IMC (*International Mechanical Code*®) Section 701.
5. Attic ventilation is provided when required by IBC Section 1203.2 or IRC Section R806, except when air-impermeable insulation is permitted in unvented attics in accordance with 2012 IRC Section R806.5 (2009 IRC Section R806.4).
6. Under-floor (crawl space) ventilation is provided when required by IBC Section 1203.3 or IRC Section R408.1, as applicable.

4.4.2.1 Attics and Crawl Spaces – Uncoated: The thickness of the foam plastic applied to the underside of the roof sheathing and/or rafters, or the underside of floors, must not exceed 8 inches (203 mm). The thickness of the spray foam insulation applied to vertical wall surfaces must not exceed 6 inches (152 mm). The insulation does not require a code-prescribed ignition barrier or coating.

4.4.2.2 Attic and Crawl Spaces - Coated: The thickness of the foam plastic applied to the underside of the roof sheathing and/or rafters, or the underside of floors, must not exceed 14 inches (356 mm). The thickness of the spray foam insulation applied to vertical wall surfaces must not exceed 8 inches (203 mm).

The Icynene ProSeal insulation must be covered on all surfaces with either:

DC315: at a minimum dry film thickness of 3 mils (0.08 mm) [wet film thickness of 4 mils (0.10 mm)] at a rate of 401 square feet (37 m²) per gallon (3.8 L).

The coating must be applied over the Icynene ProSeal insulation in accordance with the coating manufacturer's instructions and this report. Surfaces to be coated must be dry, clean, and free of dirt, loose debris and other substances that could interfere with adhesion of the coating. The coating is applied in one coat with low-pressure airless spray equipment.

4.4.3 Use on Attic Floors: Icynene ProSeal insulation may be installed exposed at a maximum thickness of 14 inches (356 mm) between and over the joists in attic floors. The insulation must be separated from the interior of the building by an approved thermal barrier. An ignition barrier in accordance with the IBC Section 2603.4 and IRC Section R316.5.3 may be omitted.

4.5 One-hour Non-load-bearing Fire-resistance-rated Wall Assembly:

4.5.1 Exterior Face: Nominally 6-inch-deep (152 mm), No. 18 gage galvanized steel studs, spaced 16 inches (406 mm) on center, are fastened to No. 18 gage galvanized steel floor and ceiling tracks. One layer of 1/2-inch-thick (12.7 mm) Georgia Pacific DensGlass® Gold Exterior Sheathing is installed parallel to the steel studs with vertical joints offset a minimum of 16 inches (406 mm) from the vertical joints of the interior Type X gypsum board, and the horizontal joints offset a minimum of 24 inches (610 mm) from the horizontal joints of the gypsum board. The sheathing is attached using 1 1/4-inch long (31.7 mm), self-drilling drywall screws spaced 8 inches (203 mm) on center around the perimeter and in the field. Hohmann & Barnard DW-10 brick ties, 6 inches (152 mm) long by 1 1/2 inches (38 mm) wide, are spaced 16 inches (406.4 mm) on center vertically on each steel stud, and secured using two 1 5/8-inch-long (41.3) self-drilling screws, through 4-inch (102 mm) red clay brick [3 1/2 inches (88.9 mm) by 2 1/4 inches (57.1 mm) by 7 3/4 inches (197 mm)], laid in a running bond pattern with Type S mortar, leaving a nominally 1-inch (25.4 mm) air gap between the brick and the exterior sheathing. The stud cavity is filled with Icynene ProSeal insulation to a maximum nominal thickness of 6 inches.

4.5.2 Interior Face: Type X gypsum board, 5/8 inch (15.9 mm) thick and complying with ASTM C1396, is applied to the interior side with the long edge parallel to steel studs, and is secured using 1 1/4-inch-long (31.7 mm), self-drilling drywall screws spaced 8 inches (203 mm) on center around the perimeter and 12 inches (305 mm) on center in the field. The gypsum board joints must be treated with vinyl or casein, dry or premixed joint compound applied in two coats to cover all exposed screw heads and gypsum board butt joints. A minimum 2-inch-wide (51 mm) paper, plastic, or fiberglass tape is embedded in the first layer of compound over butt joints of the gypsum board.

4.6 Exterior Walls in Type I, II, III and IV Construction:

4.6.1 General: When used on exterior walls of Types I, II, III or IV construction, the assembly must comply with IBC Section 2603.5 and this section, and the Icynene ProSeal insulation must be installed at a maximum thickness of 6 inches (152 mm). The potential heat of Icynene ProSeal insulation is 2785 Btu/ft² (31 629 kJ/m²) per inch of thickness, when tested in accordance with NFPA 259.

4.6.2 Exterior Face: Nominally 6-inch-deep, No. 18 gage, galvanized steel studs, spaced 16 inches (406 mm) on center, are fastened to No. 18 gage galvanized steel floor and ceiling track using No. 8, 7/8-inch-long (22.2 mm), self-tapping, pan head framing screws. Georgia Pacific DensGlass® Gold Exterior Sheathing, 1/2 inch (12.7 mm) thick, is installed over the exterior side of steel studs with the long end perpendicular to the steel studs, using No. 6, Type S, 1 1/4-inch (31.7 mm), self-tapping bugle head screws spaced 8 inches (203.2 mm) on center around the perimeter and in the field. The stud cavity is filled with Icynene ProSeal insulation to a maximum nominal thickness of 6 inches.

4.6.3 Interior Face: Type X gypsum board, 5/8 inches (15.9 mm) thick and complying with ASTM C1396, is installed, with the long dimension perpendicular to steel studs, with No. 6, Type S, 1 1/4-inch-long (31.7 mm), self-tapping bugle head screws spaced 8 inches (203 mm) on center around the perimeter and 12 inches (305 mm) in the field. The gypsum board joints must be treated with vinyl or casein, dry or premixed joint compound applied in two coats to cover all exposed screw heads and gypsum board butt joints. A minimum 2-inch-wide (51 mm) paper, plastic, or fiberglass tape is embedded in the first layer of compound over butt joints of the gypsum board.

4.6.4 Exterior Wall Covering: Details of the exterior wall covering must be provided to the code official by the report holder, designer or specifier, with an engineering analysis demonstrating that (1) the exterior wall covering conforms to ASTM E136 and (2) the addition of the wall covering to the assembly described in this section does not negatively affect conformance of the assembly with the requirements of IBC Section 2603.5.

5.0 CONDITIONS OF USE

The Icynene ProSeal spray foam insulation described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The product must be installed in accordance with the manufacturer's published installation instructions, this evaluation report and the applicable code. In the event of a conflict between the manufacturer's published installation instructions and this report, this report governs.
- 5.2 The insulation must be separated from the interior of the building by an approved 15-minute thermal barrier in accordance with IBC Section 2603.4, except when installation is as described in Section 4.3.2 or in attics and crawl spaces as described in Section 4.4.2.
- 5.3 The insulation must not exceed the thickness and density noted in Sections 3.2, 4.3, 4.4, 4.5 and 4.6 of this report.
- 5.4 The insulation must be protected from the weather during and after application.
- 5.5 The insulation must be applied by installers certified by Icynene, Inc.
- 5.6 Use of the insulation in areas where the probability of termite infestation is "very heavy" must be in accordance with IRC Section R318.4 or 2012 IBC Section 2603.9 (2009 IBC Section 2603.8), as applicable.
- 5.7 Jobsite certification and labeling of the insulation must comply with IRC Sections N1101.4 and N1101.4.1 and IECC Sections 303.1.1 and 303.1.2, as applicable.

- 5.8 The A and B components of the insulation are produced under a quality-control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation, (AC377), dated May 2015, including reports of tests in accordance with Appendix X of AC377.
- 6.2 Report of air permeance test in accordance with ASTM E2178.
- 6.3 Report of vapor permeance test in accordance with ASTM E96.
- 6.4 Engineering analysis of a fire-resistance test in accordance with ASTM E119.
- 6.5 Engineering analysis of a fire test in accordance with NFPA 285.
- 6.6 Report of a room corner fire test in accordance with NFPA 286.

- 6.7 Report of a potential heat test in accordance with NFPA 259.

- 6.8 Report of a critical radiant flux test in accordance with ASTM E970.

7.0 IDENTIFICATION

Containers of Icynene ProSeal components are identified with a label bearing the Icynene, Inc., name and address; the product trade name [Icynene ProSeal]; the lot number; the flame spread and smoke developed indices; mixing instructions; density; the shelf life and the expiration date; and the evaluation report number (ESR-3500).

Intumescent coatings are identified with the manufacturer's name and address, the product trade name and use instructions.

TABLE 1—THERMAL RESISTANCE (R-VALUES)

THICKNESS (inches)	R-VALUE (°F.ft².h/Btu)
1.0	7.1
3.5	24
4.0	28
5.5	38
6.0	42
7.5	52
8.5	59
9.5	66
10.0	69
11.25	78

For SI: 1 inch = 25.4 mm; 1°F.ft².h/Btu = 0.176110°K.m².h/W.

¹R-values are calculated based on tested K-values at 1- and 3.5-inch thicknesses.

H-SHIELD CG

Flat Premium Performance Faced Polyisocyanurate Insulation

H-Shield CG

PRODUCT DESCRIPTION

H-Shield-CG is a rigid roof insulation panel composed of a closed cell polyisocyanurate foam core manufactured on-line to a premium performance coated glass facer on both sides.

PREMIUM PERFORMANCE ATTRIBUTES

- Manufactured with NexGen Chemistry: Contains no CFCs, HCFCs, is Zero ODP, EPA Compliant, and has virtually no GWP
- Provides improved dimensional stability, fire performance and resistance to mold growth
- Has achieved FM 4450 and UL 1256 for direct application to steel deck constructions
- Provides wind uplift ratings in fully adhered systems from FM 1-60 to FM 1-270
- Achieves a Class A combustible deck assembly rating without the use of a fire rated slip sheet or the presence of a gypsum cover board when applied at a thickness of 3" or greater in a single layer or in combination of multiple layers (ie: two layers of 1.5")
- Achieves a Class B combustible deck assembly rating without the use of a fire rated slip sheet or gypsum cover board when applied at a thickness of 1.9" or greater in a single layer

PANEL CHARACTERISTICS

- Available in 4'x4' (1220mm x 1220mm) and 4'x8' (1220mm x 2440mm) panels in thicknesses of 1" (25mm) to 4.5" (114mm)
- ASTM C 1289 Type II, Class 2 Grade 2 (20 psi) or Grade 3 (25 psi)

APPLICATIONS

- Specified for Single-Ply membranes (Ballasted, Mechanically Attached and Fully Adhered), BUR, Modified Bitumen, Coal-Tar

H-SHIELD CG THERMAL VALUES

THICKNESS (INCHES) (MM)	LTTR R VALUE*	FLUTE SPANABILITY
1.00 25	5.6	2 5/8"
1.50 38	8.6	4 3/8"
1.80 46	10.2	4 3/8"
2.00 51	11.4	4 3/8"
2.50 64	14.4	4 3/8"
2.60 66	15.0	4 3/8"
3.00 76	17.4	4 3/8"
3.50 89	20.5	4 3/8"
3.80 97	22.3	4 3/8"
4.00 102	23.6	4 3/8"
4.30 109	25.5	4 3/8"
4.50 114	26.8	4 3/8"

*NEW Long Term Thermal Resistance Values are based on ASTM C 1289, effective 1/1/2014, which provides updated 15 year time weighted averages.

Codes and Compliances

- ASTM C 1289 Type II, Class 2 Grade 2 (20 psi) or Grade 3 (25 psi)
- International Building Code (IBC) Chapter 26
- State of Florida Product Approval Number FL 5968
- Miami Dade County, FL NOA NO: 09-0915.15 - Exp. 1.14.2015

Underwriters Laboratories Inc Classifications

- UL 1256
- Insulated Metal Deck Construction Assemblies – No. 120, 123, 292
- UL 790
- UL 263 Hourly Rated P Series Roof Assemblies

UL Classified for use in Canada

- Refer to UL Directory of Products Certified for Canada for more details

Factory Mutual Approvals

- FM 4450, FM 4470
- Approved for Class 1 insulated steel, concrete, and gypsum roof deck constructions for 1-60 to 1-270. Refer to FM Approval's RoofNav for details on specific systems

LEED Potential Credits for Polyiso Use (PRE LEED V4)

For current LEED V4 contribution information go to www.PIMA.org or www.hpanels.com

Energy and Atmosphere

- Optimize Energy Performance · Measurement & Verification

Materials & Resources

- Material Reuse · Construction Waste Management
- Recycled Content · Local and Regional Materials

Innovation and Design



TYPICAL PHYSICAL PROPERTY DATA CHART PER ASTM C 1289 POLYISO FOAM CORE ONLY

PROPERTY	TEST METHOD	VALUE
Compressive Strength	ASTM D 1621	20 psi* (138kPa, Grade 2)
Dimensional Stability	ASTM D 2126	2% linear change (7 days)
Moisture Vapor Transmission	ASTM E 96	< 1 perm (57.5ng/(Pa·s·m²))
Water Absorption	ASTM C 209	< 1% volume
Resistance to Mold	ASTM D 3273	Passed (10)
Service Temperature		-100° to 250° F (-73°C to 122°C)

*Also available in 25 psi, Grade 3

WARNINGS AND LIMITATIONS

Insulation must be protected from open flame and kept dry at all times. Install only as much insulation as can be covered the same day by completed roof covering material. Hunter Panels will not be responsible for specific building and roof design by others, for deficiencies in construction or workmanship, for dangerous conditions on the job site or for improper storage and handling. Technical specifications shown in this literature are intended to be used as general guidelines only and are subject to change without notice. For more information refer to the Storage and Handling Technical Bulletin at www.hpanels.com, or refer to PIMA Technical Bulletin No. 109: *Storage & Handling Recommendations for Polyiso Roof Insulation* at www.polyiso.org.

INSTALLATION

Single-Ply Systems

Ballasted Single-Ply

H-Shield CG panels are loosely laid on the roof deck. Butt the edges of the insulation panels and stagger the joints. Install the roof covering according to the manufacturer's specifications.

Mechanically Attached Single-Ply Systems

H-Shield CG must be secured to the roof deck (appropriate to the deck type) with fasteners and plates. Butt the edges of the insulation panels and stagger the joints. Install the roof covering according to the manufacturer's specification.

Fully Adhered Single-Ply

Each H-Shield CG panel must be secured to the roof deck with fasteners and plates (appropriate to the deck type). Maximum 4'x4' (1220mm x 1220mm) panels of H-Shield CG may be adhered to a prepared concrete deck or subsequent layers of insulation with a full mopping of hot steep asphalt, insulation adhesive or cold applied mastic. Butt edges and stagger joints of adjacent panels. Install the roof covering according to the manufacturer's specifications.

Built Up, Coal Tar And Modified Bitumen Systems

Each H-Shield CG panel must be secured to the roof deck with fasteners and plates (appropriate to the deck type). Maximum 4'x4' (1220mm x 1220mm) panels of H-Shield CG may be adhered to a prepared concrete deck or subsequent layers of insulation with a full mopping of hot steep asphalt, insulation adhesive or cold applied mastic. Butt edges and stagger joints of adjacent panels. Install the roof covering according to the manufacturer's specifications.

FASTENING REQUIREMENTS*

FM RATING	MINIMUM THICKNESS	#OF FASTENERS PER 4X8		
		FIELD	PERIMETER	CORNER
1-60	2.0	8	20	20
1-75	2.0	8	20	32
1-90	2.0	8	20	32
1-105	2.0	12	24	32
1-150	2.0	20	32	
1-270	2.0	32		

* Contact your membrane manufacturer for their specific fastening requirements

**R-30.0, Two layers of
2.6" H-Shield CG with
Single-Ply membrane**

HUNTER
Energy Smart Polyiso

HUNTERPANELS.COM

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HUNTER
CONTINUOUS INSULATION

Hunter Panels Xci 286

Polyisocyanurate Foam Core Manufactured On-Line to Glass Fiber Reinforced Foil Facers on Each Side for Exposed Interior Applications

DESCRIPTION

Xci 286 is an energy-efficient rigid foam insulation composed of a polyisocyanurate foam core manufactured online to glass fiber reinforced foil facers. It can be used in new construction, or used for interior retrofit within existing buildings. Xci 286 is designed for exposed interior wall or ceiling use in commercial, residential, industrial, agricultural and metal building applications.

FEATURES AND BENEFITS

- Polyiso offers highest R-value per inch of any foam plastic insulation
- Designed for use continuous insulation to assist in meeting the most current ASHRAE 90.1, IECC, IBC and IRC standards
- Meets IBC Section 2603.5 and IRC Section R316
- Passed NFPA 286 Corner Burn Test for walls or ceilings only, with or without joint treatment, allowing product to be left exposed on interior application without a thermal barrier
- Flame spread of <25 per ASTM E84
- Manufactured with NexGen Chemistry: Zero Ozone Depleting Potential (ODP); Contains no CFC's or HCFC's; Virtually zero Global Warming Potential (GWP). Use of Xci products helps reduce the carbon footprint of buildings.
- Both sides reinforced foil, one side reflective, one side white, either side maybe left exposed

APPLICATIONS

- Provides exposed interior continuous insulation in the following applications: commercial, residential (attic knee walls and floors, crawl spaces), industrial, agricultural, and metal buildings
- Suitable for interior use in a wide variety of applications including: masonry, concrete, tilt-up, agricultural, industrial, post-frame, pre-engineered metal buildings, parking structures, basements and crawlspaces.
- Provides exterior sheathing options in tested NFPA 285 wall assemblies. Contact Hunter XCI for details.

PANEL CHARACTERISTICS

- ASTM C1289 Type 1, Class 1, Grade 3 (min 25 psi)
- Available in 4' x 8' (1220mm x 2440mm) panels in thicknesses ranging from 1" (25mm) – 3.1" (79mm)
- Special cuts available upon request (i.e. 16" or 24" width x 96" length)

CODES AND COMPLIANCES

- ASTM C1289
- International Building Code Chapter 26
- NFPA 286 passed for exposed interior walls or ceilings applications
- ASTM E84 Flame Spread of 25 or less
- Wisconsin Building Product Evaluation Report 201402-1

HUNTER PANELS Xci 286



HUNTER PANELS Xci 286



Typical Physical Property Data Chart

Property	Test Method	Value
Flame Spread Index foam core	ASTM E 84	< 25
Smoke Developed foam core	ASTM E 84	< 450
Compressive Strength	ASTM D 1621	25psi (172 kPa Grade 3)
Service Temperature		-100° to 250° F (-73°C to 122°C)

Commercial/Residential

Hunter Panels Xci 286

Polyisocyanurate Foam Core Manufactured On-Line to Glass Fiber Reinforced Foil Facers on Each Side for Exposed Interior Applications

WARNINGS AND LIMITATIONS

Consult local building codes and insurance authorities regarding special applications or details required when using Xci 286 as an exposed product. Insulation must be protected from open flame. Hunter Panels will not be responsible for specific building design by others, for deficiencies in construction or workmanship, for dangerous conditions on the job site, or for improper storage and handling. Technical specifications shown in this literature are intended to be used as general guidelines only and are subject to change without notice. Call Hunter Panels for more specific details.

INSTALLATION

- Xci 286 boards are lightweight and easily cut with a knife or saw
- Installs quickly and easily with mechanical or adhesive attachment
- Xci 286 is not a structural sheathing, always follow local codes for structural bracing
- Xci 286 must not be used as a nailing base for any other products
- Seams can be taped if desired or required by local code

JOB-SITE STORAGE

Good construction practice dictates that all insulations should be protected from moisture and direct sunlight during job-site storage. Pallets of Hunter Panels Xci 286 are double packaged in a UV resistant polyethylene bag. This moisture resistant package is designed for protection from the elements during flat-bed shipment from our factories to the jobsite, and for storage on-site during phase construction. Outdoor storage for extended periods of time (i.e. in excess of 45–60 days) requires additional breathable waterproof tarpaulins and elevated storage above ground level by a minimum of 4".

Xci 286 Thermal Values

Thickness (inches)	Thickness (mm)	R Value*
1.0	25	6.3
1.5	38	9.5
1.6	41	10.1
2.0	51	12.6
2.1	53	13.3
2.5	64	15.8
3.0	76	18.9
3.1	79	19.5

*Initial thermal values are determined by using ASTM C518 at 75 degree F mean temperature.

HUNTER PANELS Xci 286



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888.746.1114
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LEED POTENTIAL CREDITS FOR POLYISO USE

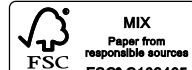
Energy and Atmosphere

- Optimize Energy Performance
- Measurement & Verification

Materials & Resources

- Material Reuse
- Construction Waste Management
- Recycled Content
- Local and Regional Materials

Innovation and Design



WHITLEY MANUFACTURING CO., INC.

DATE: 02/17/22

MODEL # 7805

1. END WALL PANEL

PANEL DIMENSIONS: 12.00 FT. WIDE x 16.73 FT. HIGH
END UPRIGHTS: C10"x 20 LB/FT CHANNEL ASTM A36
ATTACHED BACK-TO-BACK TO FORM I-BEAM SHAPE
HORIZONTAL MBRS: 3x3x1/8 TUBE ASTM A500 HSS
HORIZONTAL MBR SPACING: 39 IN. O.C.
TYPICAL HORIZONTAL END WALL MEMBERS

DESIGN SPECIFICATIONS

YIELD OF STEEL CHANNEL 36 ksi E OF STEEL = 29000 ksi
YIELD OF STEEL TUBE = 46 ksi LATERAL (WIND) LOAD = 21.13 psf

FRAMING CONFIGURATION

SPACING OF UPRIGHTS = 12.0 ft SPACING OF HORIZ. MBR'S = 39 ins
LENTH OF UPRIGHT = 16.7 ft LENGTH OF HORIZ. MBR = 133 ins
LENGTH BETWEEN SUPT'S = 16.7 ft-MAX! UNBRACED LENGTH = 136 ins

UPRIGHT CHANNEL SECTION:

SECTION: C10X20

ALLOWABLE BENDING STRESS $F_b = 21.60$ ksi
ACTUAL BENDING STRESS $f_b = 10.72$ ksi SECTION OK

ALLOWABLE SHEAR STRESS $F_v = 14.40$ ksi
ACTUAL SHEAR STRESS $f_v = 1.31$ ksi SECTION OK

ALLOWABLE DEFL = SPAN/ 360 = 0.56 ins
ACTUAL MAXIMUM DEFL. = 0.31 DEFLECTION OK

HORIZONTAL MEMBERS:

SECTION: 3x3x1/8 TUBE

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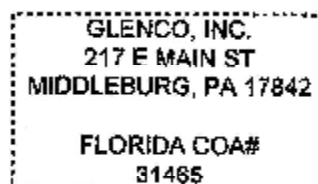
ALLOWABLE BENDING STRESS $F_b = 12.68$ ksi
ACTUAL BENDING STRESS $f_b = 10.59$ ksi SECTION OK

ALLOWABLE SHEAR STRESS $F_v = 21.16$ ksi
MAXIMUM SHEAR FORCE $V = 0.41$ kips
ACTUAL SHEAR STRESS $f_v = 0.63$ ksi SECTION OK

WELDING: 0.125-IN. BEAD, LENGTH REQ'D: 1.00 ins EACH END

ALLOWABLE DEFL = SPAN/ 240 = 0.55 ins
ACTUAL MAXIMUM DEFL. = 0.37 DEFLECTION OK

TOES ON FORMED CHANNELS MUST BE TWO INCHES LONG.



03/03/2022

MODEL: 7805

STEEL END WALL COLUMN VERTICAL LOADS**FIRST STORY LOADS**1st STORY ROOF:

L/L = 40 PSF

D/L = 15 PSF (Includes, lighting, misc. elec., & heaters)

TOTAL = 55 PSF

SPAN LENGTH: 62.28125 FT

SPAN WIDTH: 12 FT

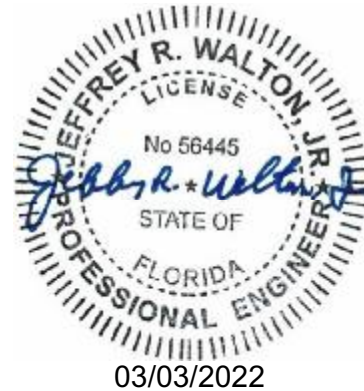
UNIFORM ROOF LOAD = 41105.625 LB'S.

HVAC UNIT # N/A LOAD = 0 LB'S.

TOTAL ROOF LOAD = 41105.625 LBS

GLENCO, INC.
217 E MAIN ST
MIDDLEBURG, PA 17842

FLORIDA COA#
31465

**TOTAL 1st STORY LOADS: 41105.63 LB'S****LOAD DISTRIBUTED
BETWEEN FOUR
COLUMNS**

TOTAL ROOF LOAD = 41105.63 lbs
TOTAL LOAD ON COLUMN = 10276.41 lbs
SIZE= C10"x 20 lb/ft. CHANNEL
WT= 20.0 plf
Fy= 36.0 ksi
Fb= 21.6 ksi
L= 221 in
rx= 3.66 in
A= 5.88 in²
Ixx= 78.90 in⁴
L/r= 60.38
Cc= 126.10
Fs= 1.83

NOTE ----> Fall= 17.39 ksi
NOTE ----> Fact= 6.99 ksi

OK

WHITLEY MANUFACTURING CO., INC.

DATE: 02/17/22

MODEL # 7805

1. SIDE WALL PANEL -- RESISTS WIND & SEISMIC LOADS ONLY

PANEL DIMENSIONS: 8.00 FT. WIDE 18.13 FT. HIGH
END UPRIGHTS: DOUBLE FORMED U, 11 GA. x 2 1/2" x 9" x 2 1/2" SECTIONS
ATTACHED BACK-TO-BACK TO FORM I-BEAM SHAPE
HORIZONTAL MBRS: FORMED U, 11 GA. x 2 1/2" x 6" x 2 1/2" SECTIONS
HORIZONTAL MBR SPACING: 48 IN. O.C.

DESIGN SPECIFICATIONS

YIELD OF STEEL = 36 ksi
E OF STEEL = 29000 ksi
LATERAL (WIND) LOAD = 21.13 psf

FRAMING CONFIGURATION

SPACING OF UPRIGHTS = 8.0 ft
LENGTH OF UPRIGHT = 18.1 ft
LENGTH BETWEEN SUPT'S = 14.8 ft-MAX!
SPACING OF HORIZ. MBR'S = 48 ins
LENGTH OF HORIZ. MBR = 93 ins
UNBRACED LENGTH = 93 ins

UPRIGHT CHANNEL SECTION:

SECTION: U9X11GA

ALLOWABLE BENDING STRESS $F_b = 21.60$ ksi
ACTUAL BENDING STRESS $f_b = 10.15$ ksi SECTION OK

ALLOWABLE SHEAR STRESS $F_v = 14.40$ ksi
ACTUAL SHEAR STRESS $f_v = 0.58$ ksi SECTION OK

ALLOWABLE DEFL = $\text{SPAN} / 360 = 0.49$ ins
ACTUAL MAXIMUM DEFL. = 0.25 DEFLECTION OK

HORIZONTAL MEMBERS:

SECTION: U6x11GA

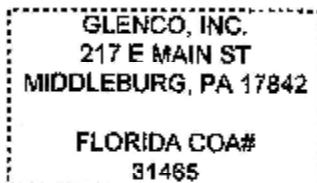
ALLOWABLE BENDING STRESS $F_b = 21.60$ ksi
ACTUAL BENDING STRESS $f_b = 4.55$ ksi SECTION OK

ALLOWABLE SHEAR STRESS $F_v = 14.40$ ksi
MAXIMUM SHEAR FORCE $V = 0.34$ kips
ACTUAL SHEAR STRESS $f_v = 0.47$ ksi SECTION OK

WELDING: 0.125-IN. BEAD, LENGTH REQ'D: 1.00 ins EACH END

ALLOWABLE DEFL = $\text{SPAN} / 360 = 0.26$ ins
ACTUAL MAXIMUM DEFL. = 0.05 DEFLECTION OK

TOES ON FORMED CHANNELS MUST BE TWO INCHES LONG.



WHITLEY MANUFACTURING CO., INC.

DATE: 02/17/22

MODEL #

7805

STEEL RAFTER CALCULATIONS

DESIGN SPECIFICATIONS

YIELD OF STEEL =	36 ksi	E OF STEEL =	29000 ksi
ROOF DEAD LOAD =	15 psf		
ROOF LIVE LOAD =	40 psf		

FRAMING CONFIGURATION

WIDTH OF UNIT =	12.0 ft	RAFTER SPACING =	48 ins
LENGTH OF UNIT =	64.531 ft	RAFTER LENGTH =	141 ins
COLUMN SPACING =	64.5 ft	UNBRACED LENGTH =	138 ins
SPAN CONDITION:	SINGLI-SPAN		

STEEL RAFTER TYPE

SECTION: U10X12GA

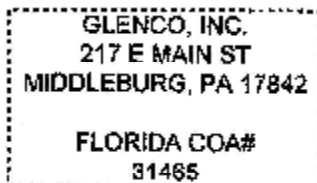
ALLOWABLE BENDING STRESS F_b =	21.60 ksi
ACTUAL BENDING STRESS f_b =	15.44 ksi SECTION OK

ALLOWABLE SHEAR STRESS F_v =	14.40 ksi
MAXIMUM SHEAR FORCE V =	1.32 kips
ACTUAL SHEAR STRESS f_v =	1.28 ksi SECTION OK

LENGTH OF 0.125 WELD REQD = 2.00 ins EACH END

ALLOWABLE DEFL = SPAN/ 240 =	0.59 ins
ACTUAL MAXIMUM DEFL. =	0.21 DEFLECTION OK

TOES ON FORMED CHANNELS MUST BE TWO INCHES LONG.



03/03/2022

WIND / SEISMIC CALCULATION, FOR MOMENT FRAME CONSTRUCTION

THIS WORKSHEET FOR DOCK MODULES ONLY

date: 3-31-16 REV. 0

MODEL NUMBER: **7805**

Project Location : **FLORIDA**

Longest Roof (x) = **64.53 ft.** Longest roof in center section

Long Dimension (x) = **64.53 ft.** Longest exposed side wall

Short Dimension(y) = **12.00 ft.** Widest module

Building perimeter = **385.06 ft.**

Ext. Wall Height = **18.13 ft.**

Bldg. Height, abv. Grade = **23.13 ft.**

Bldg. Floor, dead load = **0.00 psf (slab, by site contractor)**

Bldg. Ext. Walls, dead load = **9.50 psf**

Additional dead load = **15 psf ***

*Int. wall dead load for seismic calculations, N/A to modular

Bldg. Roof, dead load = **15.00 psf**

Basic Wind Speed (V) = **118 MPH** (ASCE 7-16, Fig. 26.5-1A-C)

Wind Exposure Category: **C** (ASCE 7-16, Section 26.7)

$h = 23.13$ ft

$K_z = 0.9$ (ASCE 7-16, Table 27.3-1)

$K_{zt} = 1.00$ (ASCE 7-16, Table 26.8-1)

$K_d = 0.85$ (ASCE 7-16, Table 26.6-1)

$G = 0.85$ (ASCE 7-16, 26.9)

$GC_{pi} = 0.18$ (ASCE 7-16, Table 26.11.1)

$q = q_z$ at height z

Eq 27.3.1: Velocity Pressure: $q_z = 0.00256 K_z K_{zt} K_d V^2 = 27.27$ psf

C_p windward walls = **0.8** (ASCE 7-16, Fig. 27.4-1)

Design Wind Press. Windw'rd wall: $p = q GC_p - q_i GC_{pi} = 13.63$ psf

C_p leeward walls = **-0.5** (ASCE 7-16, Fig. 27.4-1)

Design Wind Press. Leew'rd wall: $p = q GC_p - q_i GC_{pi} = -16.50$ psf

C_s roof, parallel to ridge = **-0.18** (ASCE 7-16, Fig. 27.4-1)

Design Wind Press. Roof, parallel to ridge: $p = q GC_s - q_i GC_{pi} = -9.08$ psf

C_s roof, perp. to ridge = **-0.7 Windw'rd.**

Design Wind Press. Roof, perp. to ridge, windw'rd side: $p = q GC_s - q_i GC_{pi} = -21.13$ psf

C_s roof, perp. to ridge = **-0.5 Leeward.**

Design Wind Press. Roof, perp. to ridge, leeward side: $p = q GC_s - q_i GC_{pi} = -16.50$ psf

Construction Type: Type C4, STEEL ORDINARY MOMENT FRAME

Wind/Seismic Force Resisting System, Table 12.14-1

NOTE: INFO BELOW FROM CHAPTER 16, INTERNATIONAL BUILDING CODE, EXCEPT AS NOTED.

1613.5.2 Seismic Site class Defined: **D**

1613.5.3 Site coefficients & adjusted max. considered earthquake spectral response acceleration parameters

Table 1613.5(1): $S_s = 0.086$ Table 1613.5.3(1) $F_a = 1.600$

$S_{MS} = F_a S_s = 0.138$

Table 1613.5(2): $S_1 = 0.051$ Table 1613.5.3(2) $F_v = 2.400$

$S_{M1} = F_v S_1 = 0.122$

1613.5.4 Design spectral response acceleration parameters

$S_{DS} = 2/3 S_{MS} = 0.092$

$S_{D1} = 2/3 S_{M1} = 0.082$

1613.5.6 Seismic use groups and occupancy importance factor:

Seismic use group: **II** (table 1604.5) Seismic importance factor: **1.00**

Table 1613.5.6(1) Seismic Design Category (short period):

$S_{DS} = 0.092$ Design Category = **B**

Table 1613.5.6(2) Seismic Design Category (1second period):

$S_{D1} = 0.0816$ Design Category = **B**

1616.6.1 Simplified Analysis

Simplified Analysis per 1617.5 allowed per limitation no. 1, as noted below:

1. Buildings of light-framed construction not exceeding three stories in height, excluding basements.

ASCE-7, 12.14.8.1 Seismic Base Shear (simplified):

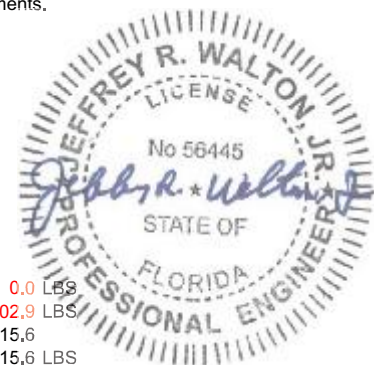
ASCE 7-16, Table 12.2-1 R = Response Modification Factor: **3.50**

W = Building dead load (calculated from weights and dimensions below):

$$V = \frac{FS_{DS}}{R} W = \frac{1.00 \times 0.092}{3.5} 89534.2 \text{ Lb's.} = 2346.65 \text{ Lb's}$$

Note: $F = 1.0$ for 1-story bldg.

Wd = floor wt.	64.53 FT	X	12.00 FT	X	0.00 PSF	=
We =Ext. wall wt.	385.06 FT	X	18.13 FT	X	9.50 PSF	=
Wi =Int. wall wt.	64.53 FT	X	12.00 FT	X	15.00 PSF	=
Wf = roof wt.	64.53 FT	X	12.00 FT	X	15.00 PSF	=

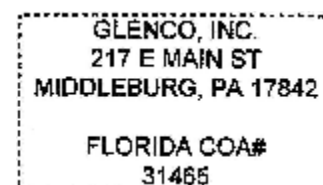


$W = 89534.2$ LBS

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ASCE-7, 12.14.8.2 Vertical Shear Distribution (simplified):

$$F_x = \frac{w_x}{W} V = \frac{89534.20}{89534.20} \times 2346.6487 = 2346.6 \text{ lb, @ base}$$



$$F_{xI} = \frac{w_{xI}}{W} V = \frac{11615.63}{89534.20} \times 2346.6487 = 304.4 \text{ lb, @ roof}$$

w_{xI} = Seismic weight at level xI = 11615.63 Lb's at roof
 w_x = Seismic weight at level x = 89534.20 Lb's at base
 w_i = Seismic weight at level i = 89534.20 Lb's at base

ASCE-7, 12.14.8.2 Horizontal Shear Distribution (simplified):

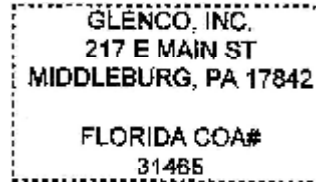
$$V_x = F_x = 2346.6 \text{ Lb} \quad V_{xI} = F_{xI} = 304.4 \text{ Lb}$$

ASCE-7, 12.14.8.5 Drift limits (simplified):

Design story drift taken as 1% of story height)

$$\Delta = .01 h_{sx} = \text{design drift} = 2.775 \text{ in.}$$

$$h_{sx} = \text{height of story} = 23.13 \text{ Ft.}$$



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COMPARE SEISMIC AND WIND SHEAR:

X - DIMENSION

(ALWAYS LONGEST DIMENSION OF BUILDING)

WIND SHEAR (x-axis):

$V_{wx} =$ Design Wind Pressure x (Bldg. Length Ft x Height Ft) = 24619.1 LBS
 Use greater of V_{wx} (Wind Shear) or V (Seismic Shear): $V_{wx} = 24619.1 \text{ LBS} > V = 2346.6 \text{ LBS}$
WIND SHEAR CONTROLS IN X DIRECTION

Y - DIMENSION

(ALWAYS SHORTEST DIMENSION OF BUILDING)

WIND SHEAR (y-axis):

$V_{wy} =$ Design Wind Pressure x (Bldg. Width Ft x Height Ft) = 4578.1 LBS

Compare V_{wy} (Wind Shear) to V (Seismic Shear); use greater value
 $V_{wy} = 4578.1 \text{ LBS} > V = 2346.6 \text{ LBS}$
WIND SHEAR CONTROLS IN Y DIRECTION

UPLIFT LOAD

VERTICAL WIND PRESSURE

$V_u =$ Design Vertical Wind Pres. x (Bldg. Width Ft x Length Ft) = -16365.09 LB's
 $V_u = -16365.09 \text{ LB's}$

Note: Assume 1/2 of roof weight resists uplift forces = 11615.63 LB's x 0.50 = 5807.8 lb's
 TOTAL UPLIFT = $V_u = -16365.09 \text{ LB's}$
 LESS PORTION OF STRUCTURE DEAD LOAD = 5807.81 LB's
 NET UPLIFT = -10557.28 LB's = -13.63 PSF

SIDE WALL TO SIDE WALL PANEL CONNECTION

WALL PANEL HEIGHT: 18.13 Ft WALL PANEL WIDTH: 12.00 Ft WALL PANEL AREA: 217.50 Ft²
 WIND PRESSURE @ PANEL CONNECTION: 217.50 Ft² x 16.50 PSF = 3588.228 LB'S.
 CONNECTION: WELD BEAD SIZE: 0.125-IN. X 1.50-IN. LONG WELD SPACING: 48.00 -IN. O.C.
 ALLOWABLE SHEAR: 0.125-IN. BEAD: 1.19 KIP/IN.* No. OF WELDS, S/W SECTION TO S/W SECTION: (6)
 * REDUCED BY 50% TOTAL WELD RESISTANCE: 14318.912 LB'S.
 OK; FASTENER CAPACITY EQUALS OR EXCEEDS LOAD

SIDE WALL TO END WALL PANEL CONNECTION (ASSUME END WALL FIXED)

(CONNECTION OF STEEL SPACER PLATES TO SIDE WALL FRAMING)
 SPACER PLATES WELDED @ HORIZ. MEMBERS, TOTAL NO. OF CONNECTIONS: 6 Ea. Side Total No. of Welds: 12
 WALL PANEL HEIGHT: 18.13 Ft WALL PANEL WIDTH: 8.00 Ft WALL PANEL AREA: 145.00 Ft²
 WIND PRESSURE @ PANEL CONNECTION: 145.00 Ft² x 16.50 PSF = 2392.152 LB'S.
 CONNECTION: WELD BEAD SIZE: 0.125-IN. X 2.00-IN. LONG
 ALLOWABLE SHEAR: 0.125-IN. BEAD: 1.59 KIP/IN.* NUMBER OF WELDS, EACH UPRIGHT TO BASE CHANNEL: (12)
 * REDUCED BY 50% TOTAL WELD RESISTANCE: 19091.88 LB'S.
 OK; FASTENER CAPACITY EQUALS OR EXCEEDS LOAD

(CONNECTION OF E/W CHANNEL TO STEEL SPACER PLATES @ SIDE WALL)
 WELD SPACING: 24 IN. O.C. E/W HEIGHT: 13.17 FT. WELD QTY: 8
 WALL PANEL HEIGHT: 18.13 Ft WALL PANEL WIDTH: 12.08 Ft WALL PANEL AREA: 219.01 Ft²
 WIND PRESSURE @ PANEL CONNECTION: 219.01 Ft² x 16.50 PSF = 3613.146 LB'S.
 CONNECTION: WELD BEAD SIZE: 0.250-IN. X 2.00-IN. LONG
 ALLOWABLE SHEAR: 0.250-IN. BEAD: 3.18 KIP/IN.* NUMBER OF WELDS, EACH UPRIGHT TO BASE CHANNEL: (8)
 * REDUCED BY 50% TOTAL WELD RESISTANCE: 25455.84 LB'S.
 OK; FASTENER CAPACITY EQUALS OR EXCEEDS LOAD

END WALL TO SIDE WALL PANEL CONNECTION (ASSUME SIDE WALL FIXED)

WALL PANEL HEIGHT: 13.17 Ft WALL PANEL WIDTH: 11.50 Ft WALL PANEL AREA: 151.42 Ft²
 WIND PRESSURE @ PANEL CONNECTION: 151.42 Ft² x 16.50 PSF = 2498.012 LB'S.

(CONNECTION OF E/W CHANNEL TO STEEL SPACER PLATES @ SIDE WALL)

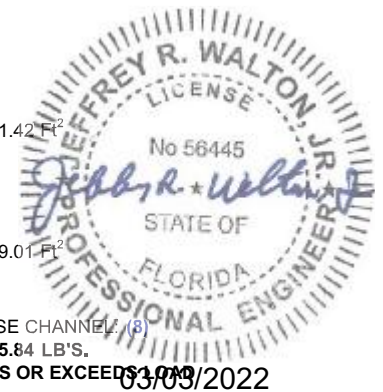
WELD SPACING: 24 IN. O.C. E/W HEIGHT: 13.17 FT. WELD QTY: 8
 WALL PANEL HEIGHT: 18.13 Ft WALL PANEL WIDTH: 12.08 Ft WALL PANEL AREA: 219.01 Ft²
 WIND PRESSURE @ PANEL CONNECTION: 219.01 Ft² x 16.50 PSF = 3613.146 LB'S.

CONNECTION: WELD BEAD SIZE: 0.250-IN. X 2.00-IN. LONG

ALLOWABLE SHEAR: 0.250-IN. BEAD: 3.18 KIP/IN.*
 * REDUCED BY 50%

NUMBER OF WELDS, EACH UPRIGHT TO BASE CHANNEL: (3)
 TOTAL WELD RESISTANCE: 25455.84 LB'S.

OK; FASTENER CAPACITY EQUALS OR EXCEEDS LOAD

**END WALL TO END WALL PANEL CONNECTION**

WALL PANEL HEIGHT: 18.42 Ft WALL PANEL WIDTH: 12.00 Ft WALL PANEL AREA: 221.00 Ft²
 WIND PRESSURE @ PANEL CONNECTION: 221.00 Ft² x 16.50 PSF = 3645.97 LB'S.

FASTENER TYPE: HEX BOLT, GRADE 8 5/8"x 2 1/2" In LONG

MATERIAL THICKNESS: (2) @ 1/4"

PULL OUT: N/A

PULL OVER: N/A

SHEAR LOAD CAPACITY: 1550 LB/BOLT

TENSION LOAD CAPACITY: 3050 LB/BOLT

NOTE: MINIMUM VALUE MUST BE USED

FASTENER SPACING: (6) PER COLUMN
 NO. OF FASTENERS, PER CONNECTION: 6

TOTAL FASTENER LOAD CAPACITY: 9300.00 LB's

OK; FASTENER CAPACITY EQUALS OR EXCEEDS LOAD

END WALL TO ROOF CONNECTIONS

ROOF PANEL LENGTH: 64.53 Ft ROOF PANEL WIDTH: 12.00 Ft ROOF PANEL AREA: 774.38 Ft²

WIND PRESSURE @ PANEL CONNECTION: 774.38 Ft² x -21.13 PSF = 16365.09 LB'S. per ROOF PANEL

ASSUME UPLIFT RESISTED BY COLUMN TO TRUSS CONNECTIONS:

FASTENER TYPE: HEX BOLT, GRADE 8 1/2"x 2 1/2" In LONG

MATERIAL THICKNESS: (2) @ 1/4"

PULL OUT: N/A

PULL OVER: N/A

SHEAR LOAD CAPACITY: 7296 LB/BOLT

TENSION LOAD CAPACITY: 10394 LB/BOLT

NOTE: MINIMUM VALUE MUST BE USED

FASTENER SPACING: (8) PER TRUSS
 NO. OF FASTENERS, PER CONNECTION: 8

TOTAL FASTENER LOAD CAPACITY: 58364.00 LB's

OK; FASTENER CAPACITY EQUALS OR EXCEEDS LOAD

RAFTER TO END BRACKET CONNECTION -- WELDED

ROOF PANEL LENGTH: 64.53 Ft ROOF PANEL WIDTH: 12.00 Ft ROOF PANEL AREA: 774.38 Ft²

WIND PRESSURE @ PANEL CONNECTION: 774.38 Ft² x 16.50 PSF = 12775.33 LB'S. per ROOF PANEL

RAFTER SPACING: 48.00 -IN. O.C. EQUIVALENT UPLIFT PER RAFTER: 791.88 LB's

FASTENER TYPE: WELD BEAD SIZE: 0.125-IN. X 2.00-IN. LONG

NUMBER OF WELDS, EACH END: (5)

ALLOWABLE SHEAR: 0.125-IN. BEAD: 1.59 KIP/IN.*

* REDUCED BY 50% SAFETY FACTOR

TOTAL WELD RESISTANCE TO UPLIFT: 15909.9 LB'S.

OK; FASTENER CAPACITY EQUALS OR EXCEEDS LOAD

END BRACKET TO TRUSS TOP CHORD CONNECTION -- WELD (Dwg. Sheet S4.4)

ROOF PANEL LENGTH: 64.53 Ft ROOF PANEL WIDTH: 15.00 Ft ROOF PANEL AREA: 774.38 Ft²

WIND PRESSURE @ PANEL CONNECTION: 774.38 Ft² x 16.50 PSF = 12775.33 LB'S. per ROOF PANEL

BRACKET SPACING: 48.00 -IN. O.C. EQUIVALENT UPLIFT PER BRACKET: 395.94 LB's

FASTENER TYPE: WELD BEAD SIZE: 0.125-IN. X 2.00-IN. LONG

NUMBER OF WELDS, EACH END: (4)

ALLOWABLE SHEAR: 0.125-IN. BEAD: 0.80 KIP/IN.*

* REDUCED BY 50% SAFETY FACTOR

TOTAL WELD RESISTANCE TO UPLIFT: 6363.96 LB'S.

OK; FASTENER CAPACITY EQUALS OR EXCEEDS LOAD

SIDE WALL PANEL UPRIGHTS TO BASE PLATE CONNECTION, WELDED

WALL PANEL HEIGHT: 18.13 Ft WALL PANEL WIDTH: 8.00 Ft WALL PANEL AREA: 145.00 Ft²

WIND PRESSURE @ PANEL CONNECTION: 145.00 Ft² x 16.50 PSF = 2392.152 LB'S.

ASSUME ONE HALF HORIZONTAL WIND PRESSURE RESISTED @ TOP OF PANEL CONNECTION TO ROOF STRUCTURE;

ONE HALF HORIZONTAL WIND PRESSURE RESISTED @ BASE OF PANEL CONNECTION TO BASE CHANNEL

TOTAL HORIZ. PRESSURE: 2392.15 LB's / 2 = 1196.08 LB's LOAD RESISTED BY BASE CHANNEL

CONNECTION: WELD BEAD SIZE: 0.125-IN. X 0.50-IN. LONG

WELD SPACING: 48.00 -IN. O.C.

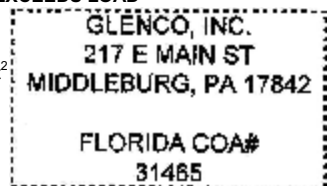
ALLOWABLE SHEAR: 0.125-IN. BEAD: 0.40 KIP/IN.*

* REDUCED BY 50%

NUMBER OF WELDS, EACH UPRIGHT TO BASE CHANNEL: (2)

TOTAL WELD RESISTANCE: 1590.9903 LB'S.

OK; FASTENER CAPACITY EQUALS OR EXCEEDS LOAD

**SIDE WALL PANEL UPRIGHTS TO ROOF STRUCTURE CONNECTION, SCREWED**

WALL PANEL HEIGHT: 18.13 Ft WALL PANEL WIDTH: 8.00 Ft WALL PANEL AREA: 145.00 Ft²

WIND PRESSURE @ PANEL CONNECTION: 145.00 Ft² x 16.50 PSF = 2392.152 LB'S.

ASSUME ONE HALF HORIZONTAL WIND PRESSURE RESISTED @ TOP OF PANEL CONNECTION TO ROOF STRUCTURE;

ONE HALF HORIZONTAL WIND PRESSURE RESISTED @ BASE OF PANEL CONNECTION TO BASE CHANNEL

TOTAL HORIZ. PRESSURE: 2392.15 LB's / 2 = 1196.08 LB's LOAD RESISTED BY CONNECTION TO ROOF

FASTENER TYPE: TEK SCREW SIZE: # 12x 0.875 In LONG

MATERIAL THICKNESS: 11 -GA. MAT'L:

PULL OUT: 344 LB/SCREW

FASTENER SPACING: (8) PER WALL PANEL

NO. OF FASTENERS, PER CONNECTION: 16

38

PULL OVER: 1167 LB/SCREW
SHEAR LOAD CAPACITY: 1094 LB/SCREW
TENSION LOAD CAPACITY: 724 LB/SCREW

TOTAL FASTENER LOAD CAPACITY: 5504.00 LB's
OK; FASTENER CAPACITY EQUALS OR EXCEEDS LOAD

END WALL PANEL UPRIGHTS TO END WALL PANEL BASE PLATE, WELDED

WALL PANEL HEIGHT: 16.75 Ft WALL PANEL WIDTH: 12.00 Ft WALL PANEL AREA: 201.00 Ft²
WIND PRESSURE @ PANEL CONNECTION: 201.00 Ft² x 16.50 PSF = 3316.018 LB'S.
ALTERNATE CONNECTION: WELD BEAD SIZE: 0.250-IN. X 1.50-IN. LONG WELD SPACING/QTY: 2 EA. COL.
ALLOWABLE SHEAR: 0.250-IN. BEAD: 2.39 KIP/IN.* NUMBER OF WELDS, EACH UPRIGHT TO BASE CHANNEL: (2)
* REDUCED BY 50% TOTAL WELD RESISTANCE: 9545.9415 LB'S.
OK; FASTENER CAPACITY EQUALS OR EXCEEDS LOAD

SIDE WALL PANEL TO FOUNDATION / FLOOR SLAB CONNECTION -- CONCRETE EXPANSION ANCHOR OR WELDED CONNECTION TO EMBEDDED STEEL BASE PLATE

LOADS: NET UPLIFT: 0.00 LB's UPLIFT NOT APPLICABLE TO WALL PANEL
HORIZ. WIND: 4036.76 LB's MAXIMUM (X-AXIS)
TOTAL LOAD: 4036.76 LB's
CONNECTION: END WALL COLUMN / BASE CHANNEL CONNECTION TO FOUNDATION

LOADS APPLIED:
EACH COLUMN CONNECTION RESISTS ONE-EIGHTH OF NET UPLIFT: 0.00 LB's / 8 = 0.0 LB's
EACH COL. CONNECTION RESISTS ONE-HALF OF HORIZ. WIND PRESSURE: 4036.76 LB's / 2 = 2018.4 LB's
TOTAL LOAD, PER COLUMN: 2018.4 LB's
CONNECTION TO FOUNDATION: CONCRETE EXPANSION ANCHOR SIZE: 5/8" DIA. x 6" L.
ALLOWABLE LOAD: 3380 LB'S.**
ANCHOR QUANTITY PER COLUMN: (2) TOTAL RESISTANCE: 6760 LB'S.
** REDUCED TO 65% OF PULL OUT VALUE
OK; FASTENER CAPACITY EQUALS OR EXCEEDS LOAD

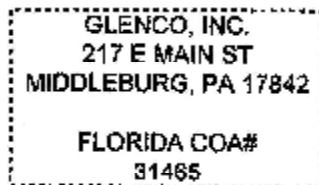
CONNECTION TO FOUNDATION: COLUMN / BASE CHANNEL WELDED TO EMBEDDED ANCHOR PLATE:
RECOMMENDED MINIMUM ANCHOR PLATE: 3/8" x 12" x 12", CENTERED ON END WALL COLUMN LOCATIONS
ALTERNATE CONNECTION: WELD BEAD SIZE: 0.375-IN. X 5.00-IN. LONG MIN. WELD SPACING OR QTY: (1) PER COL.
ALLOWABLE SHEAR: 0.375-IN. BEAD: 11.93 KIP/IN.*
* REDUCED BY 50% TOTAL WELD RESISTANCE: 11932.427 LB'S.
OK; FASTENER CAPACITY EQUALS OR EXCEEDS LOAD

END WALL PANEL TO FOUNDATION / FLOOR SLAB CONNECTION -- CONCRETE EXPANSION ANCHOR OR WELDED CONNECTION TO EMBEDDED STEEL BASE PLATE

LOADS: NET UPLIFT: 10557.28 LB's
HORIZ. WIND: 24619.12 LB's MAXIMUM (X-AXIS)
TOTAL LOAD: 35176.40 LB's
CONNECTION: END WALL COLUMN / BASE PLATE CONNECTION TO FOUNDATION

LOADS APPLIED:
EACH COLUMN CONNECTION RESISTS ONE-QUARTER OF NET UPLIFT: 10557.28 LB's / 4 = 2639.3 LB's
EACH COL. CONNECTION RESISTS ONE-HALF OF HORIZ. WIND PRESSURE: 24619.12 LB's / 2 = 12309.6 LB's
TOTAL LOAD, PER COLUMN: 14948.9 LB's
CONNECTION TO FOUNDATION: CONCRETE EXPANSION ANCHOR SIZE: 5/8" DIA. x 6" L.
ALLOWABLE LOAD: 3380 LB'S.**
ANCHOR QUANTITY PER END WALL: (5) TOTAL RESISTANCE: 16900 LB'S.
** REDUCED TO 65% OF PULL OUT VALUE
OK; FASTENER CAPACITY EQUALS OR EXCEEDS LOAD


CONNECTION TO FOUNDATION: COLUMN / BASE CHANNEL WELDED TO EMBEDDED ANCHOR PLATE:
RECOMMENDED MINIMUM ANCHOR PLATE: 3/8" x 12" x 12", CENTERED ON END WALL COLUMN LOCATIONS
ALTERNATE CONNECTION: WELD BEAD SIZE: 0.375-IN. X 3.25-IN. LONG MIN. WELD SPACING OR QTY: (2) PER COL.
ALLOWABLE SHEAR: 0.375-IN. BEAD: 7.76 KIP/IN.*
* REDUCED BY 50% TOTAL WELD RESISTANCE: 15512.155 LB'S.
OK; FASTENER CAPACITY EQUALS OR EXCEEDS LOAD



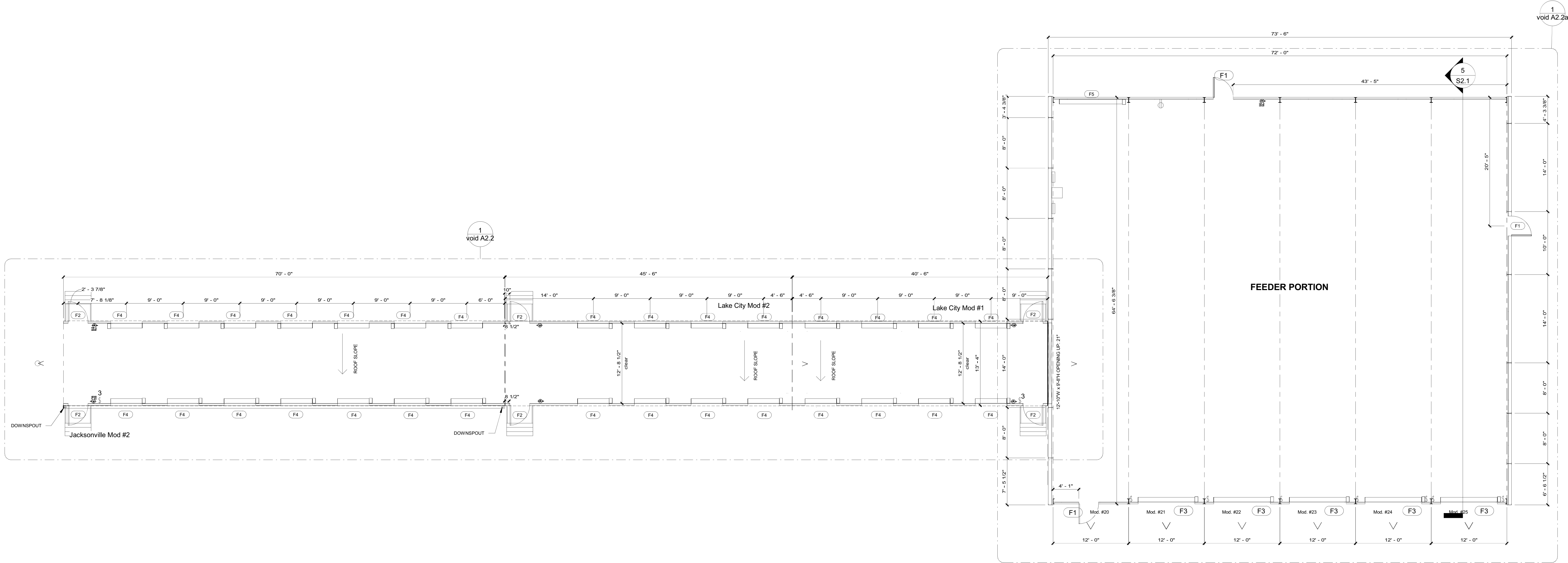
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LICENSE
No 56445
Jeffrey R. Walton, Jr.
STATE OF
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PROFESSIONAL ENGINEER

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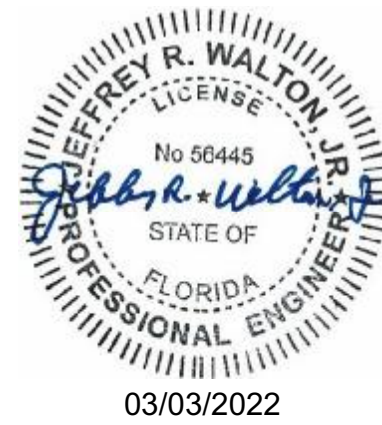
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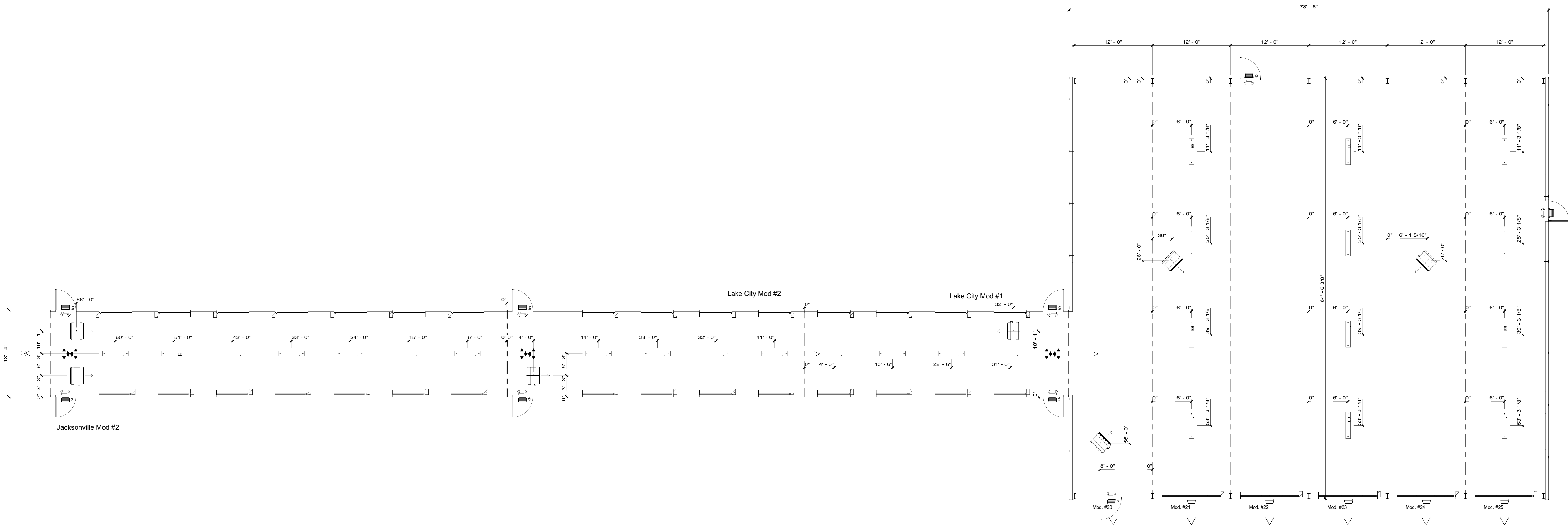
Legend

Note: Identification hexagons on the drawings and in the symbol legend correspond to the project specifications.

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1	revised per deviation report	3-23-16											Checked By: PG	Model# 7805		Quote No.	2-17-22
													Rev:	VARIOUS MODULE SIZES		Model No. 7805	As indicated
																Job No.	Page No.
																A2.1	



Legend


Note: Identification hexagons on the drawings and in the symbol legend correspond to the project specifications.

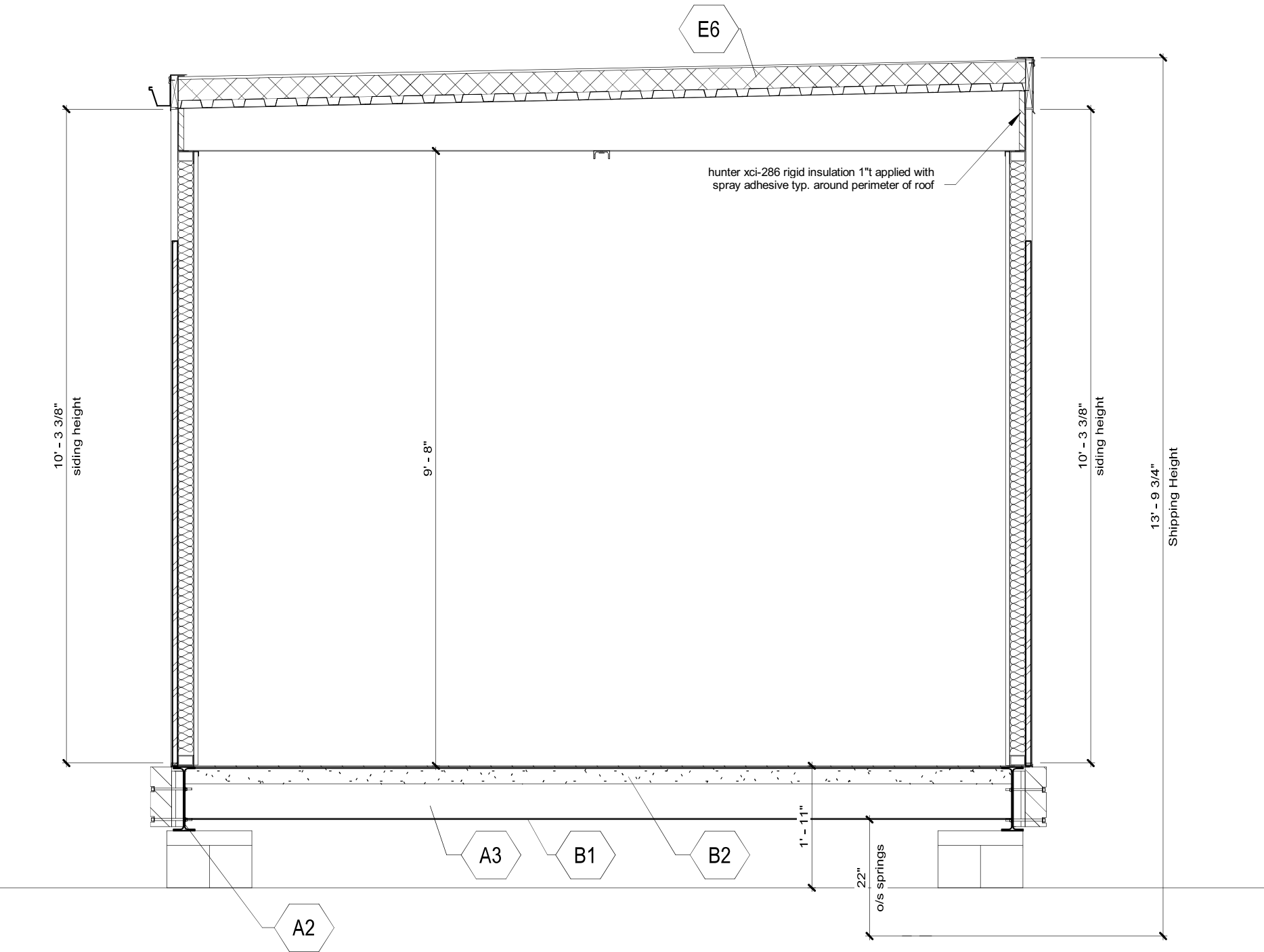
1 Ceiling Plan Overall
1/8" = 1'-0"

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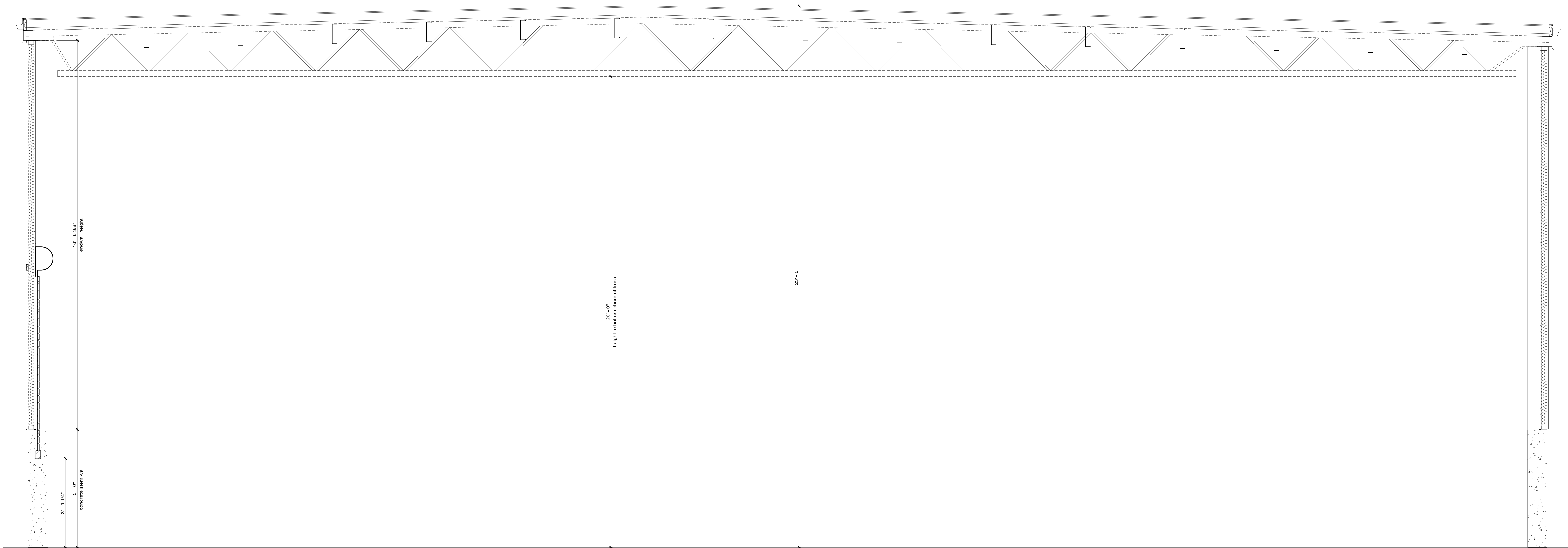


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No.			Description			Date				Rev:						Model No. 7805		Page No.	
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2 Cross Section Mod's 1,2,3
1/2" = 1'-0"

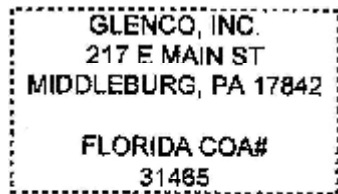


5 Longitudinal Section Mod's 20-30
1/2" = 1'-0"

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						Rev:			Model No.			Job No.																				
									7805			S2.1																				



1/2" DENSDECK

4" rigid foam insulation

2x tapered from 6"h to 9 3/8"h

steel roof cap

roof close-up angle 2"x7"x14ga.

b-deck

hunter xci-286 rigid insulation 1"t applied with spray adhesive typ. around perimeter of roof

end rafter

Niffitone R-Loc 26ga. Steel Siding

j-channel

steel siding

steel liner panel

7/8"

2"

custom bent steel "L"

Niffone R-Loc 26ga. steel siding

Niffon R-Loc Steel J-Channel

5/8"

4x12 oak timber

4"

1 1/2" COUNTER BORE 3/4"

9/16" DRILL THRU

5 3/4"

1 1/2" COUNTER BORE 3/4"

9/16" DRILL THRU

W12x16 MAIN RAIL

volmanized 2x6 10 1/2" L vertical w/ 1 layer 3/4" volmanized plywood 11 1/4" H in main rail as covered at both ends

3/4"

3/8"

10 1/2"

SIDING DETAIL @ DOCK BUMPER LOCATIONS

BACK-TO-BACK
MATELINE

EXTERIOR WALL

3 1/2"

3 1/2"

1/4" T. STEEL PLATE
W/ 3/8" LAG BOLT
ATTACHMENT
(SHIP LOOSE)

4"x3" ALUM.
DOWNSPOUT

4x12 LUMBER
BUMPER

8"

2 1/2"

2 1/2"

13"

Technical drawing of a ship's bow structure, showing dimensions and components. The drawing includes a central rectangular area labeled "4\" x 3\" ALUM. DOWNSPOUT (SHIP LOOSE) AS REQ'D.". To the left of this area is a "1/4\" T. STEEL PLATE W/ 3/8\" LAG BOLT ATTACHMENT (SHIP LOOSE)". To the right is a "4x12 LUMBER BUMPER". The drawing is annotated with various dimensions: a vertical dimension of "10\" on the right side; horizontal dimensions of "2 1/2\"", "8\"", and "2 1/2\" at the top; and vertical dimensions of "1\"", "2\"", "3\"", "3\"", and "2\"" on the left side. A "4\" WIDE SAFETY YELLOW STRIP" is indicated at the top right. The drawing is labeled "FIG. 1" in the bottom right corner.

MDC Downspout Detail at back to back
matelines

Diagram illustrating the roof edge detail assembly, showing the following components and their installation:

- 1/2" DENSDECK**: The top layer of the roof deck.
- 6" W self-adhesive flashing applied over edge cap/insulation at the corner of roof**: Flashing applied to the corner of the roof.
- 60 mil epdm rubber roofing- run epdm over edge cap and into gutter**: EPDM rubber roofing applied over the edge cap and into the gutter.
- 22 ga b-deck**: The bottom layer of the roof deck.
- rigid foam insulation**: Insulation applied below the roof deck.
- 24ga. McElroy PBR steel siding**: The exterior siding material.
- steel roof edge cap (low side)**: The edge cap installed on the low side of the roof.
- termination bar typ.**: A bar used to terminate the flashing or roofing material.
- gutter w/ ferrules and 6"L deck screws (min) as required**: The gutter assembly, including ferrules and screws.
- Gutter Hanger**: The hanger used to support the gutter.
- mule-hide lap sealant**: Sealant applied to the mule-hide joint.
- mule-hide water block**: A water block used to seal the mule-hide joint.

[illegible]The logo for Whitley Manufacturing, featuring a large, stylized 'WM' monogram. The 'W' is filled with a cross-hatch pattern, while the 'M' is solid black. Below the monogram, the words 'WHITLEY' and 'MANUFACTURING' are printed in a clean, sans-serif font, stacked vertically.

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AMP

Checked By:
PG

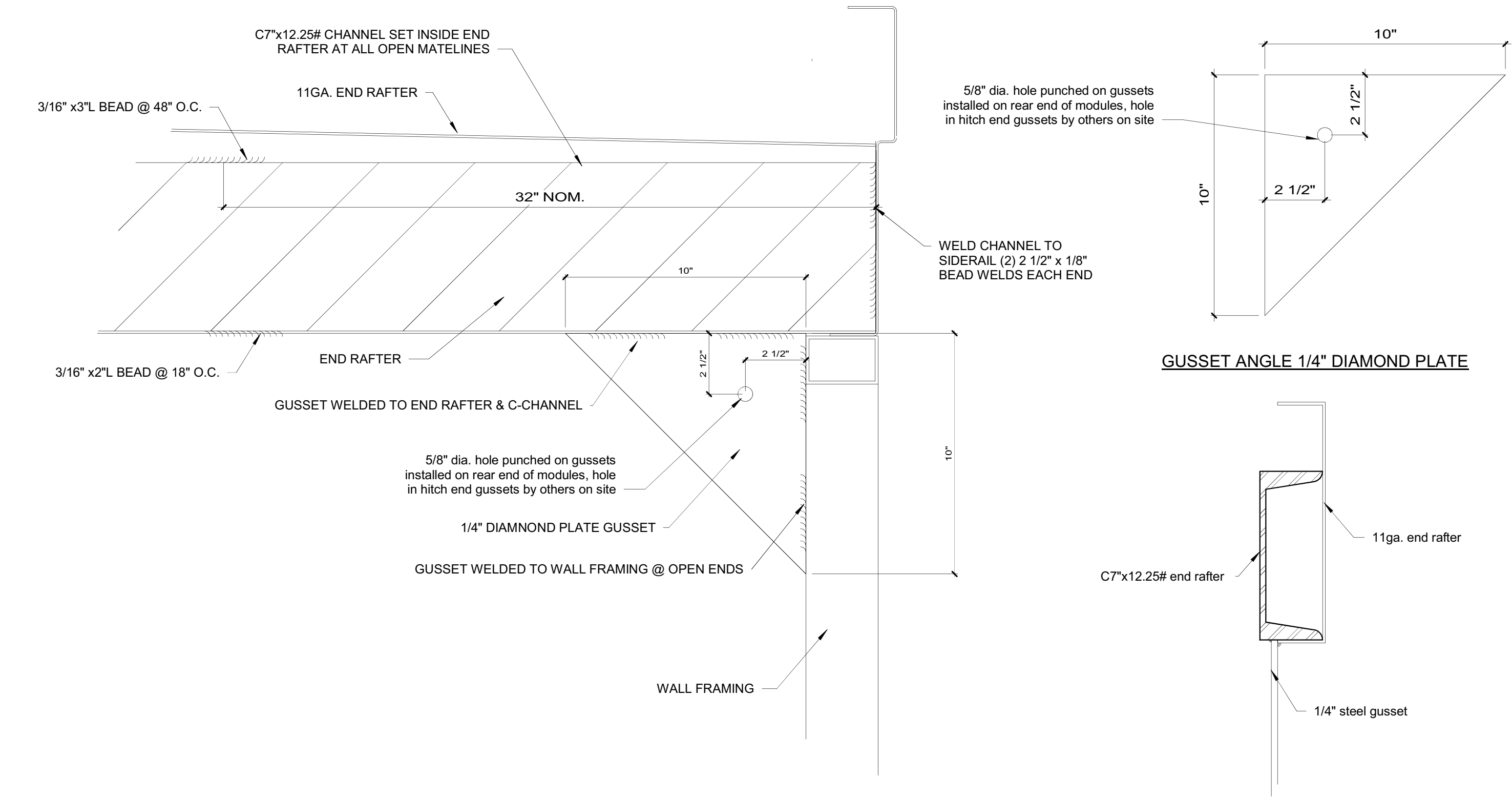
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Model# 7805
VARIOUS MODULE SIZES

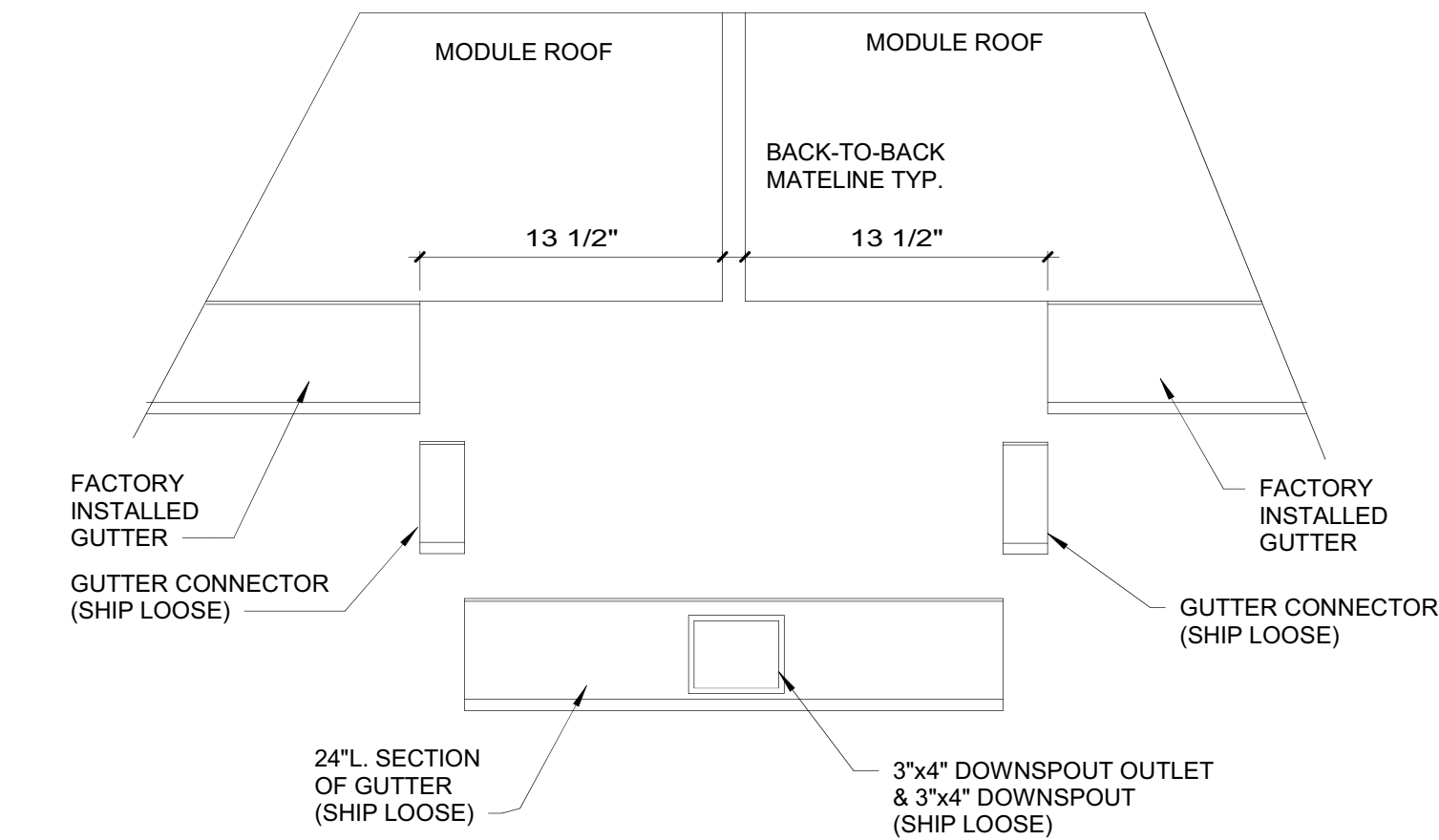
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1 GUSSET DETAIL
3" = 1'-0"

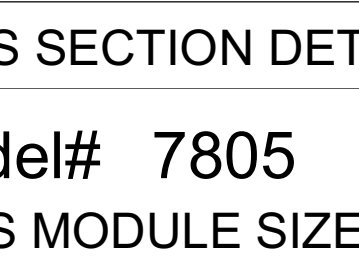


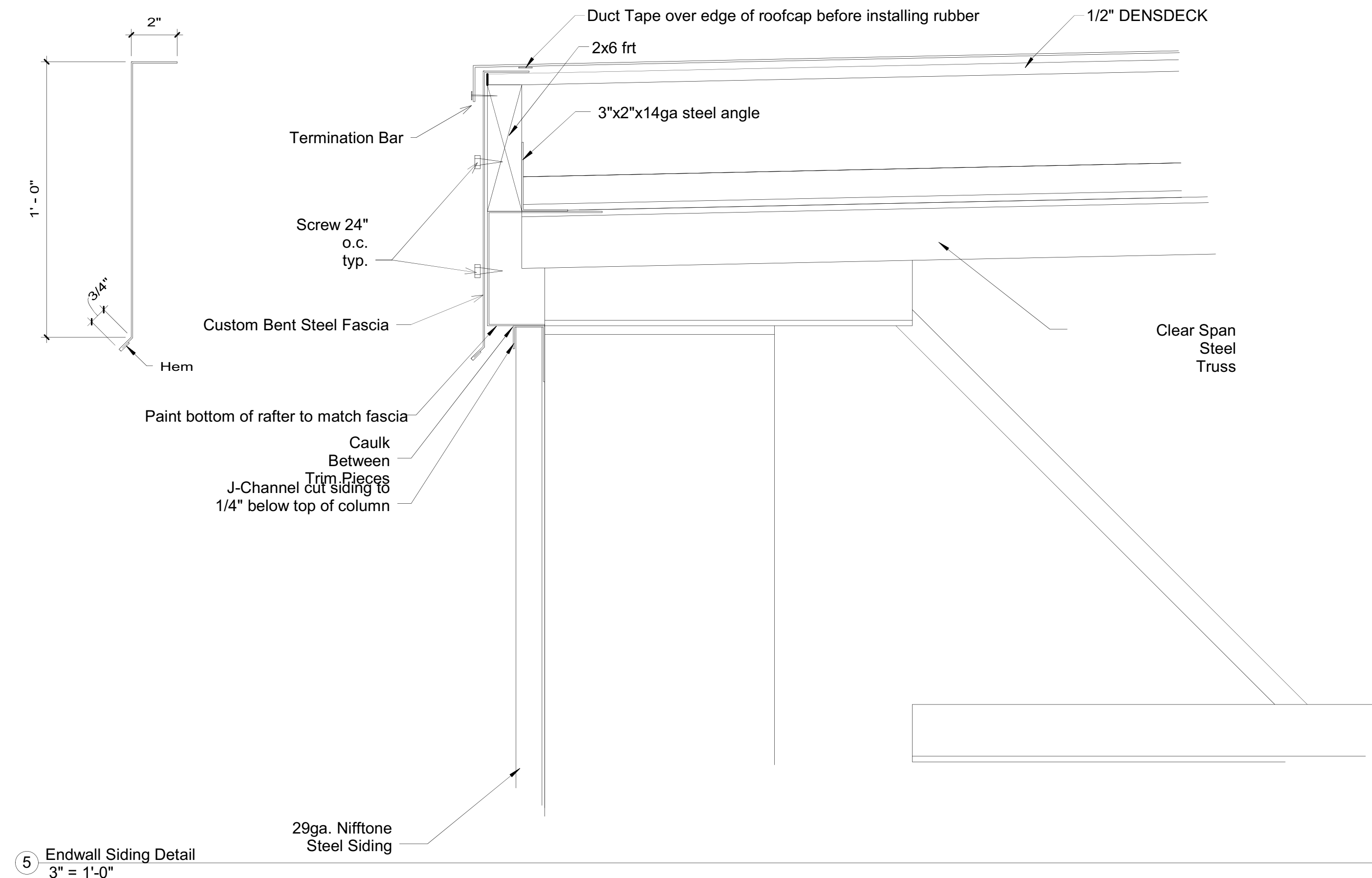
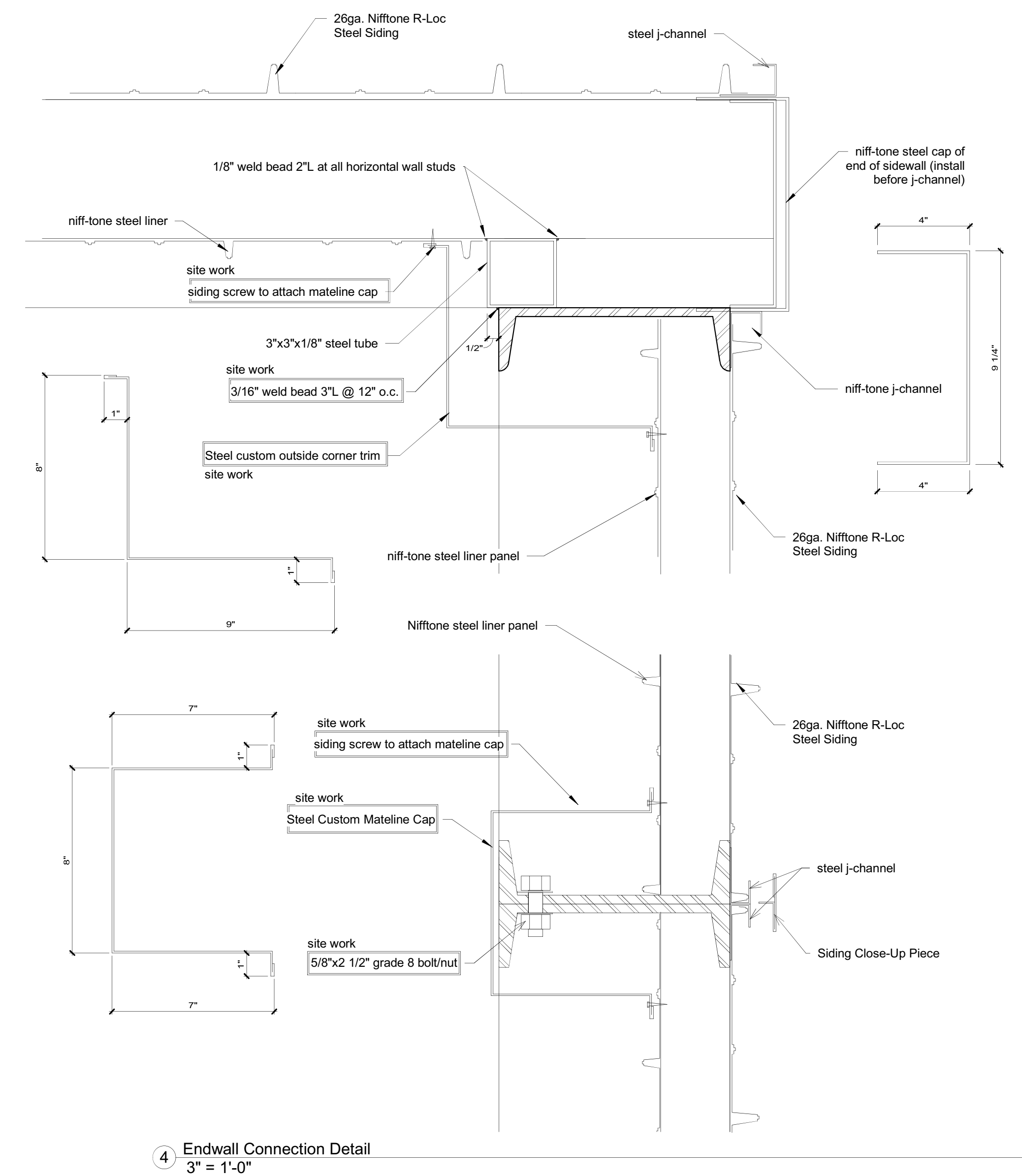
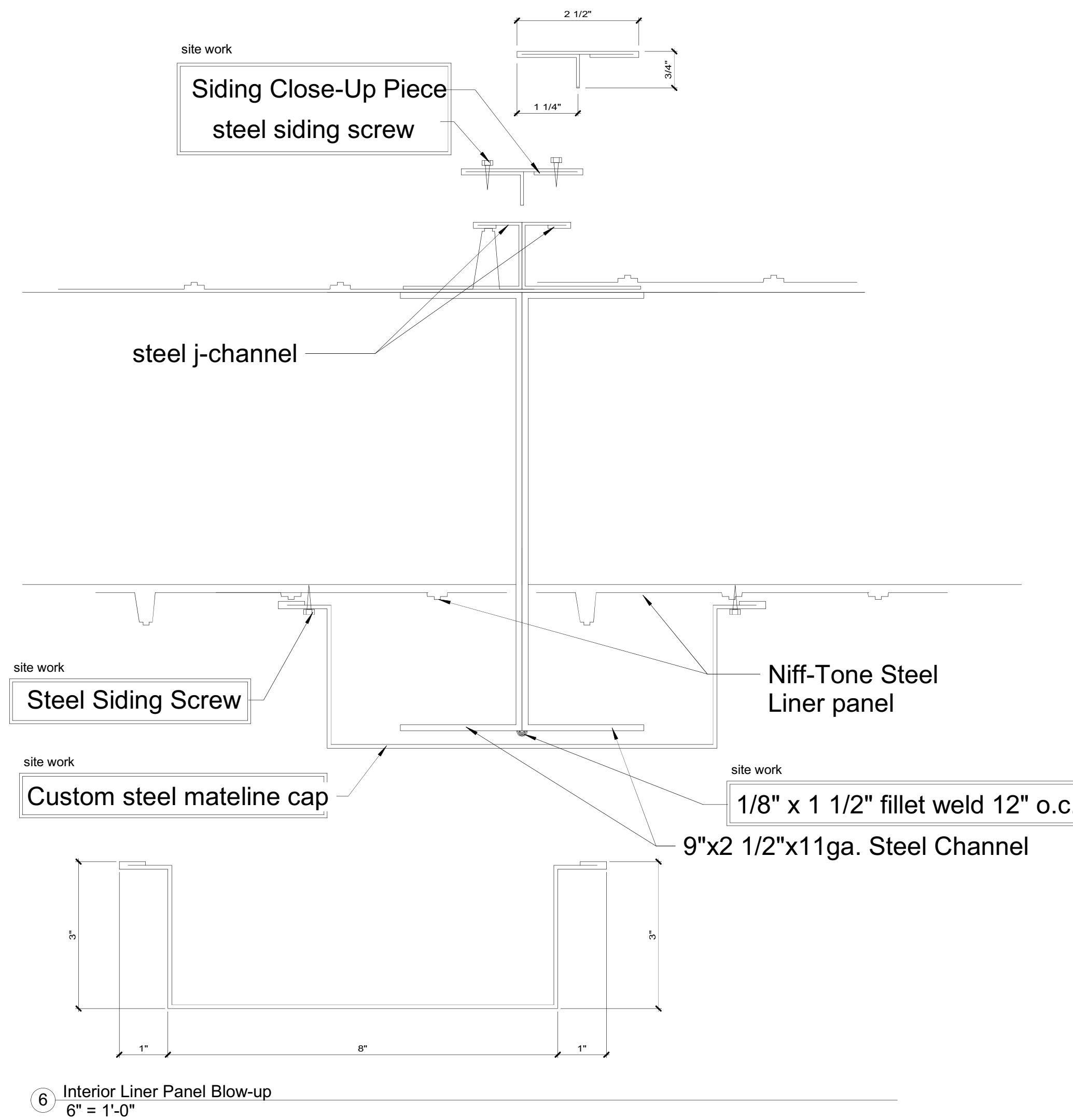
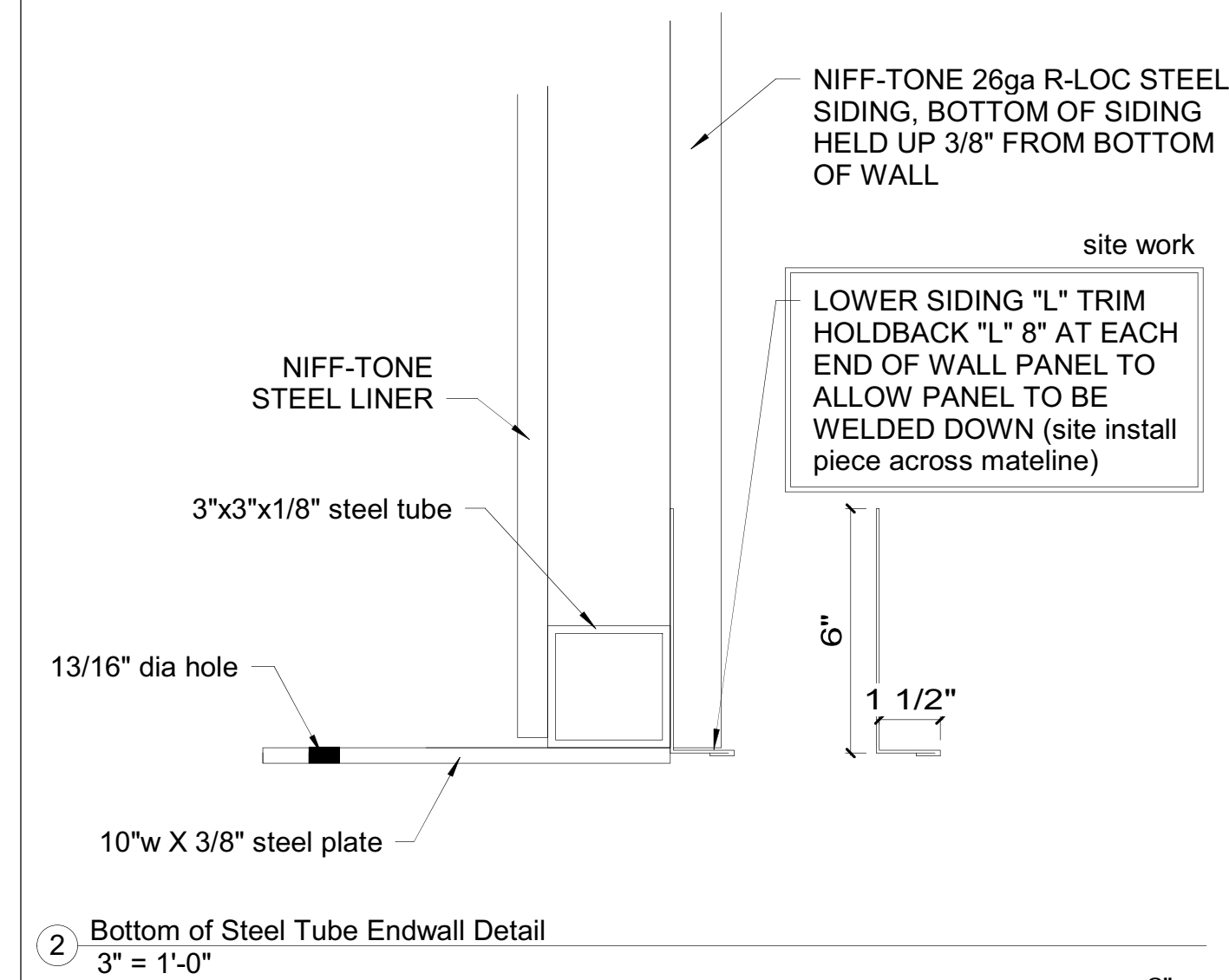
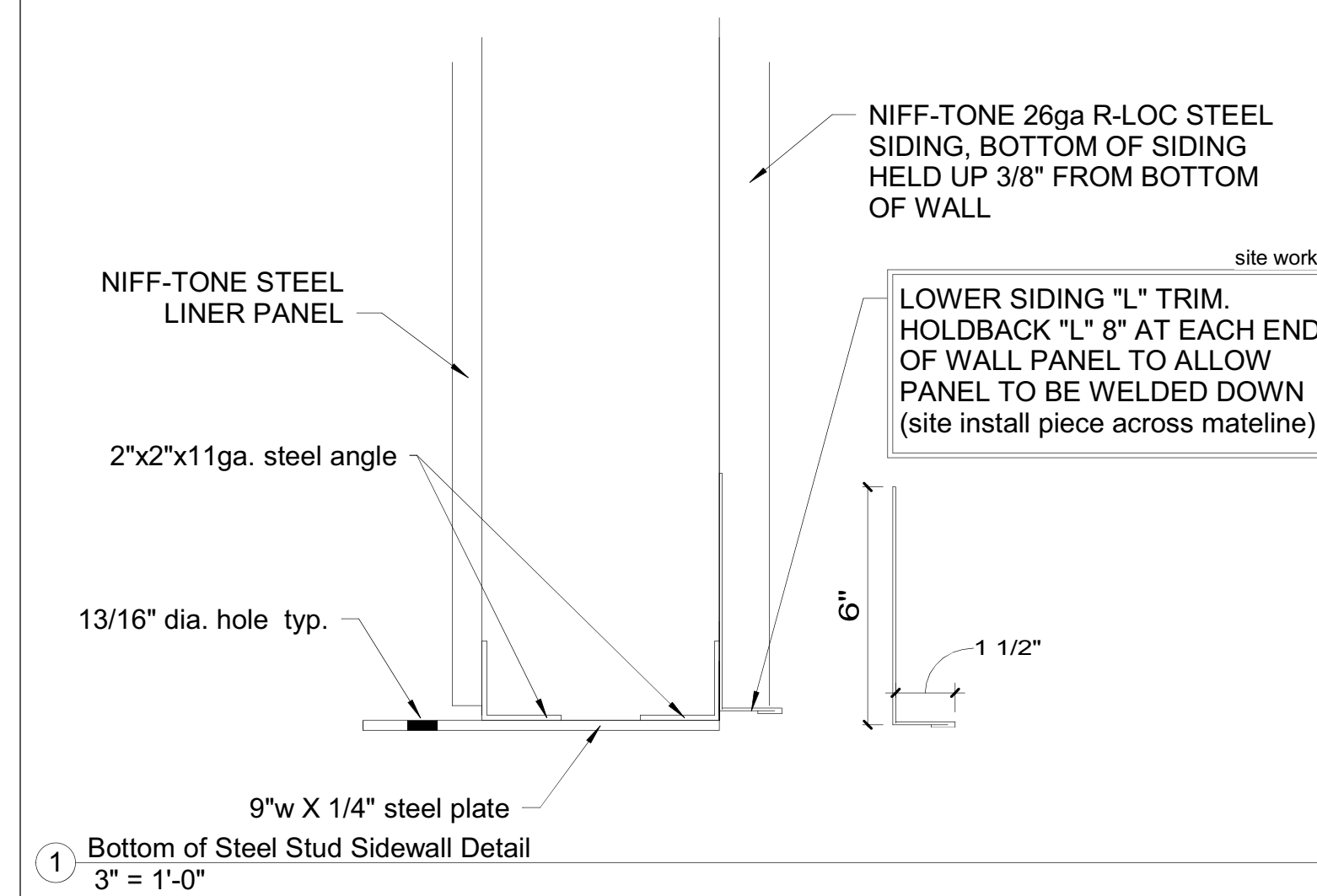
2 GUTTER CLOSE-UP DETAIL
1 1/2" = 1'-0"

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FOLDING BUILDING SIDING DETAILS

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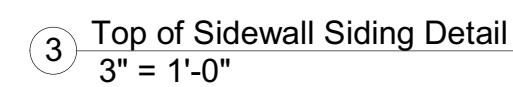
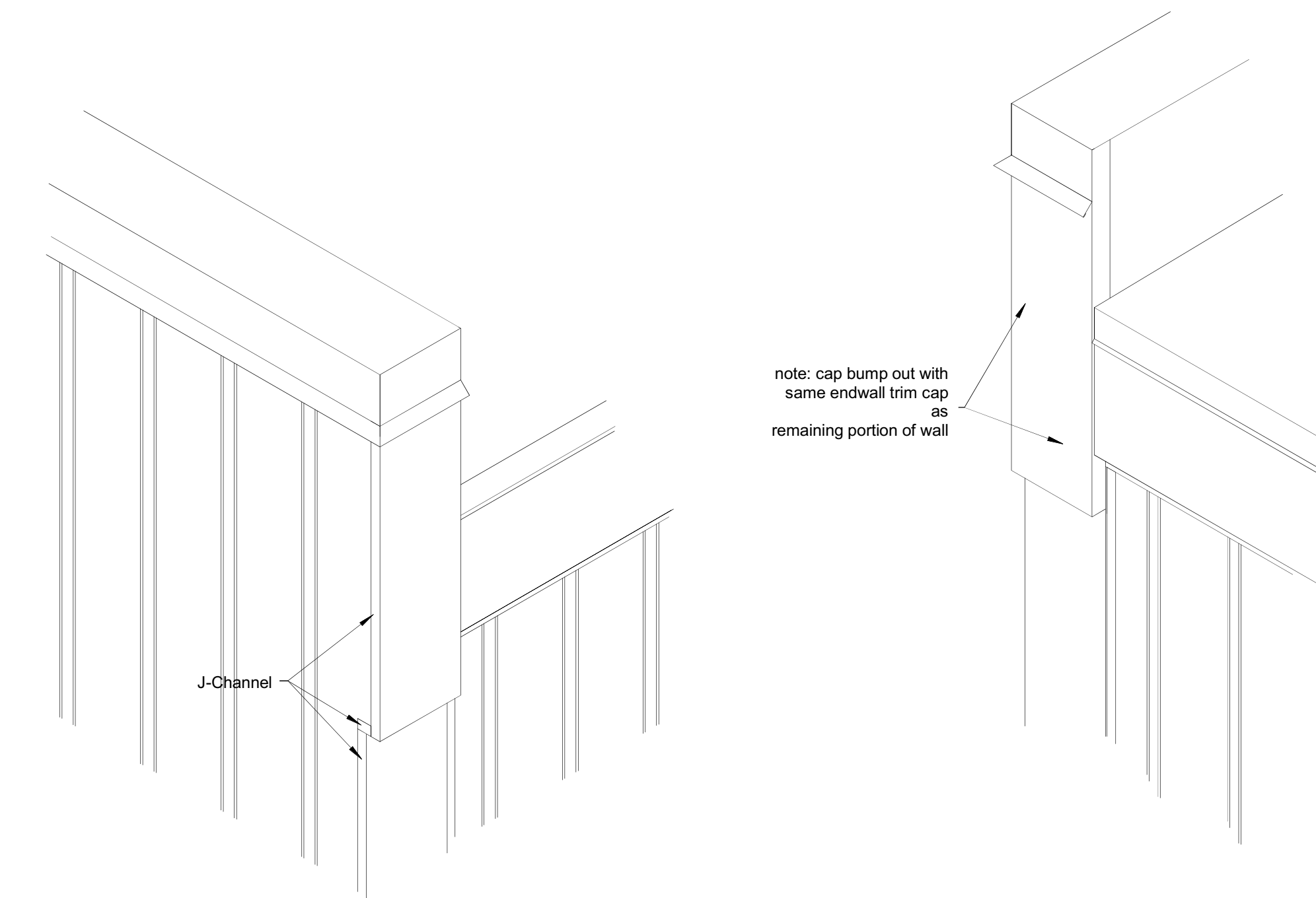
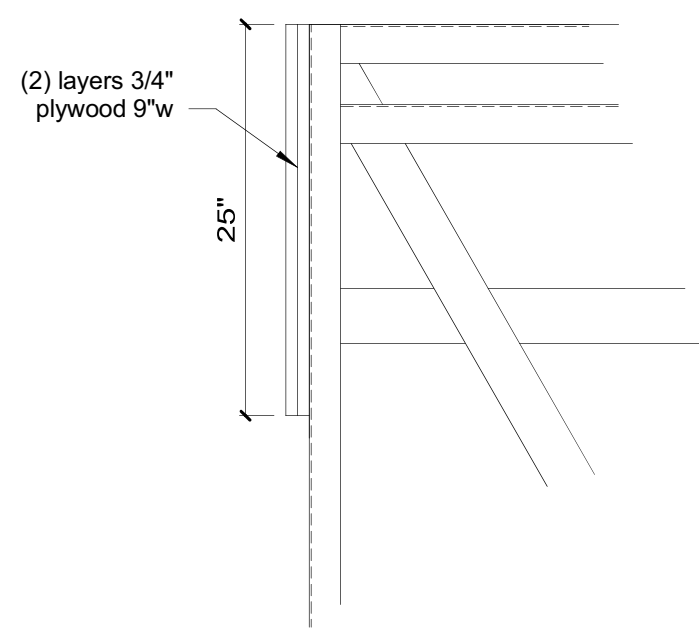
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