Farabaugh Engineering and Testing Inc.

Project No. T205-21

Report Date: June 29, 2021

No. Pages: 20 pgs (Inclusive)

PERFORMANCE REPORT

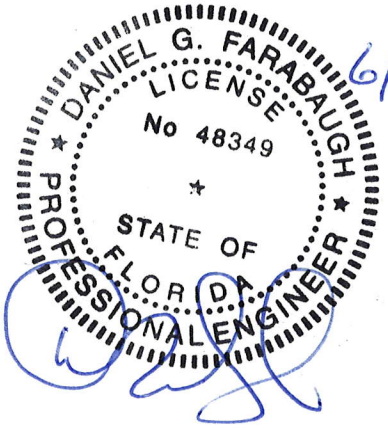
ASTM E-283 AIR LEAKAGE TEST
ASTM E-331 WATER PENETRATION TEST
AAMA 501.1 DYNAMIC WATER PENETRATION TEST
ASTM E330 UNIFORM LOAD TEST

ON

MODULARAL METAL PANEL
24" WIDE COVERAGE X 0.050" ALUMINUM

FOR

PETERSEN ALUMINUM CORP.
10551 PAC RD.
TYLER, TX. 75707



6/29/21

Prepared by:

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Approved by:

Daniel G. Farabaugh

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Trafford, PA 15085
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ISO 17025

MIAMI-DADE COUNTY DADE COUNTY ACCREDITED LABORATORY

AAMA ACCREDITED LABORATORY

TDI TEXAS ACCREDITED LABORATORY

Community Affairs FLORIDA ACCREDITED LABORATORY & QC ENTITY

Project No. T205-21

AIR LEAKAGE, WATER PENETRATION, DYNAMIC WATER & STRUCTUAL TESTING

Purpose

The purpose of this test is to establish the air, water, dynamic water infiltration rate and structural loads on a 8'-0" wide x 8'-0" high wall system.

Test Date

5-25-21 thru 5-28-21

Test Specimen

Manufacturer: Petersen Aluminum Corp.
10551 Pac Rd.
Tyler, TX. 75707

Test Specimen: ModularAL Metal Panel 24" wide coverage x 0.050" aluminum

Mock-up Size: 96" wide X 96 high (nominal) consisting of 12 panels x 24" wide x various lengths of 0.050" thick aluminum panels.

Mock up -Installation

- The test setup consisted of a 96" wide x 96" high mock-up that used 6" x 16 ga. vertical channel studs spaced at 24" o.c that were attached to the top and bottom horizontal 16 ga. channel track.

- 5/8"thick Densglass Gypsum board was attached to the vertical stud supports using #6 x 1" lg. self -drilling fasteners spaced at 10" o.c.

- The panel support consisted of 16 ga. Zee horizontal supports attached thru the gypsum board and into 16 ga. vertical channel supports using #12 x 1-1/2" long wafer-head self -drilling screws. Additional vertical Zee supports were used at the panel clip locations.

- 1" foam board insulation was between all zee supports and entire mock-up was covered with Ice and Water Shield.

- A 16 ga. lower "J" channel was along the bottom and two sides of the mock-up. The "J" channel had predrilled holes thru the top leg and a #12 -14 x 1-1/2" long wafer-head self-drilling screws spaced at 22" o.c. secured the lower "J" channel thru the gypsum board and into the 16 ga. stud/channel track. The lower "J" channel secured the ends of the foam board and zee supports.

- A starter clip was attached to the Zee support using #12 x 1" lg. wafer-head, self-drilling screws. A minimum of two fasteners per starter clip or 12" o.c max. spacing per clip based on length of clip.

- The starter panel engaged into a starter clip and was top-fastened with #12 x 1" lg. Stainless Steel Cap head w/EPDM Sealing washer fasteners at the predrilled holes spaced at 8" o.c. max. spacing.

- The vertical edge of the panel had two (2) clips to attach that edge to the 16 ga. vertical Zee supports using (2) #12 x 1" lg. wafer-head, self-drilling screws at each clip.

- A 0.08" aluminum "J" face trim was along the bottom and sides of the mock-up that sat on top of the lower "J" trim. The face trim was secured thru the lower 16 ga. trim and into stud supports with #14 x 3" lg. wafer-head, self-drilling screw spaced at 24" o.c..

- See installation details for location of fasteners at supports and attachment of each panel.

Test Procedure

The tests were conducted in accordance with the sections as shown in the following:

- ASTM E 283-04 " Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen",
- ASTM E-331-00," Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference"
- AAMA 501.1-05, " Standard Test Method for Exterior Windows, Curtain Walls and Doors for Water Penetration Using Dynamic Pressure."
- ASTM E-330-02, "Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference "

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ASTM E-283-04
AIR LEAKAGE TEST

Test Date: 5/25/21

Ambient Temperature = 76 deg. F Barometric Pressure = 29.98" Hg

POSITIVE PRESSURE
(INFILTRATION)

Static Pressure Differential (psf)	Actual Air Infiltration Rate (cfm/sf)
1.57	0.00
6.24	0.00
15.0	0.00

ASTM E-331-00
WATER PENETRATION TEST

POSITIVE PRESSURE
(INFILTRATION)

Test Date: 5/25/21

STATIC PRESSURE DIFFERENTIAL (PSF)	WATER SPRAY RATE (GAL/HR/SF)	TEST DURATION (MIN)	WATER INFILTRATION
15	5	15	None

Results:
As a result of the test pressure and water spray for the specified time duration, there was no water leakage on the interior side of the specimen.

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AAMA 501.1
DYNAMIC WATER TEST

Test Date: 5/28/18

Ambient Temperature = 79 deg. F Barometric Pressure = 30.16" Hg

POSITIVE PRESSURE
(INFILTRATION)

Test Pressure (psf)	Water Spray Rate (gal/sf/hr)	Time Duration (min)	Comments
15	5	15	No Leakage

Results:

As a result of the test pressure and water spray for the specified time duration, there was no water leakage on the interior side of the specimen.

ASTM E330 UNIFORM LOAD TEST

POSITIVE PRESSURE

Load Pressure (in-h20)	Load Pressure (psf)	Deflection #1 (in)	Deflection #2 (in)	Deflection #3 (in)
0	0.0	0.000	0.000	0.000
3	15.6	0.081	0.259	0.133
0	0.0	0.009	0.014	0.015
6	31.2	0.155	0.418	0.251
0	0.0	0.021	0.027	0.031
9	46.8	0.221	0.546	0.351
0	0.0	0.039	0.076	0.056
0	0.0	0.030	0.040	0.044
12	62.4	0.260	0.617	0.409
0	0.0	0.036	0.047	0.054
15	78.1	0.334	0.762	0.527
0	0.0	0.043	0.059	0.066
18	93.7	0.388	0.927	0.620
0	0.0	0.051	0.085	0.080
21	109.3	0.431	1.015	0.686
0	0.0	0.059	0.103	0.094
24	124.9	0.474	1.095	0.756
0	0.0	0.067	0.120	0.108
27	140.5	0.511	1.165	0.819
0	0.0	0.074	0.139	0.119
30	156.1	0.552	1.246	0.892
0	0.0	0.080	0.159	0.133
33	171.7	0.577	1.297	0.941
0	0.0	0.084	0.173	0.142
38.4	199.8	0.618	1.390	1.026
0	0.0	0.092	0.207	0.160

RESULTS

Upon completion of the testing at the positive pressures noted above there were no noticeable failures of the specimen

NEGATIVE PRESSURE

Load Pressure (in-h20)	Load Pressure (psf)	Deflection #1 (in)	Deflection #2 (in)	Deflection #3 (in)
0	0.0	0.000	0.000	0.000
2	10.4	0.059	0.178	0.068
0	0.0	0.002	0.008	0.003
4	20.8	0.156	0.335	0.168
0	0.0	0.018	0.036	0.019
6	31.2	0.247	0.462	0.250
0	0.0	0.031	0.059	0.028
8	41.6	0.347	0.590	0.339
0	0.0	0.052	0.094	0.046
10	52.0	0.438	0.704	0.419
0	0.0	0.067	0.103	0.062
12	62.4	0.553	0.849	0.539
0	0.0	0.097	0.141	0.088
14	72.9	0.673	0.992	0.647
0	0.0	0.128	0.174	0.113
16	83.3	0.783	1.121	0.745
0	0.0	0.157	0.204	0.136
18	93.7	0.903	1.256	0.836
0	0.0	0.201	0.251	0.169

RESULTS:

Maximum Test Load = 177.3 psf (Seam Disengagement with Zee support fastener pulled out of 16 ga. metal stud supports)

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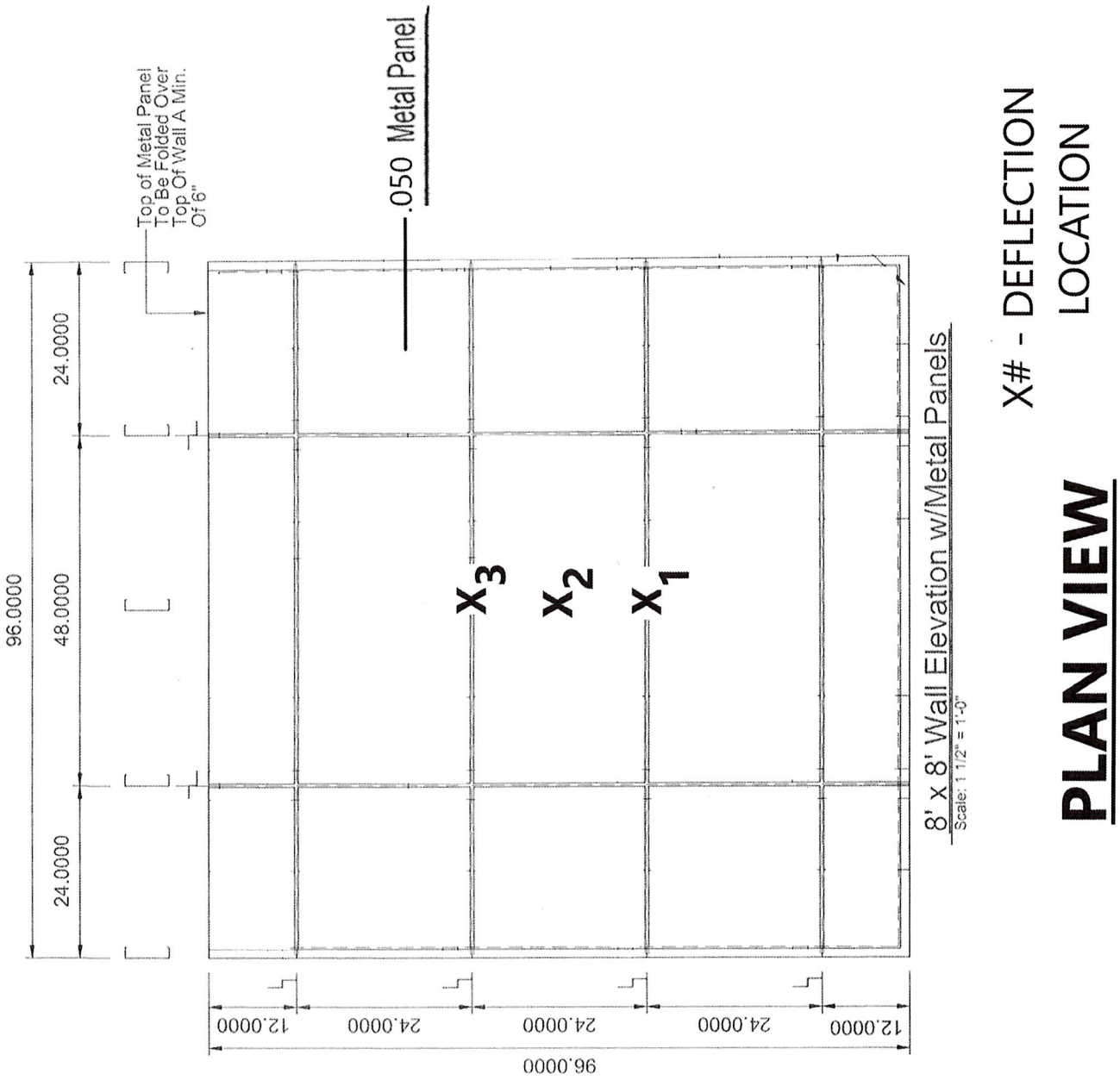
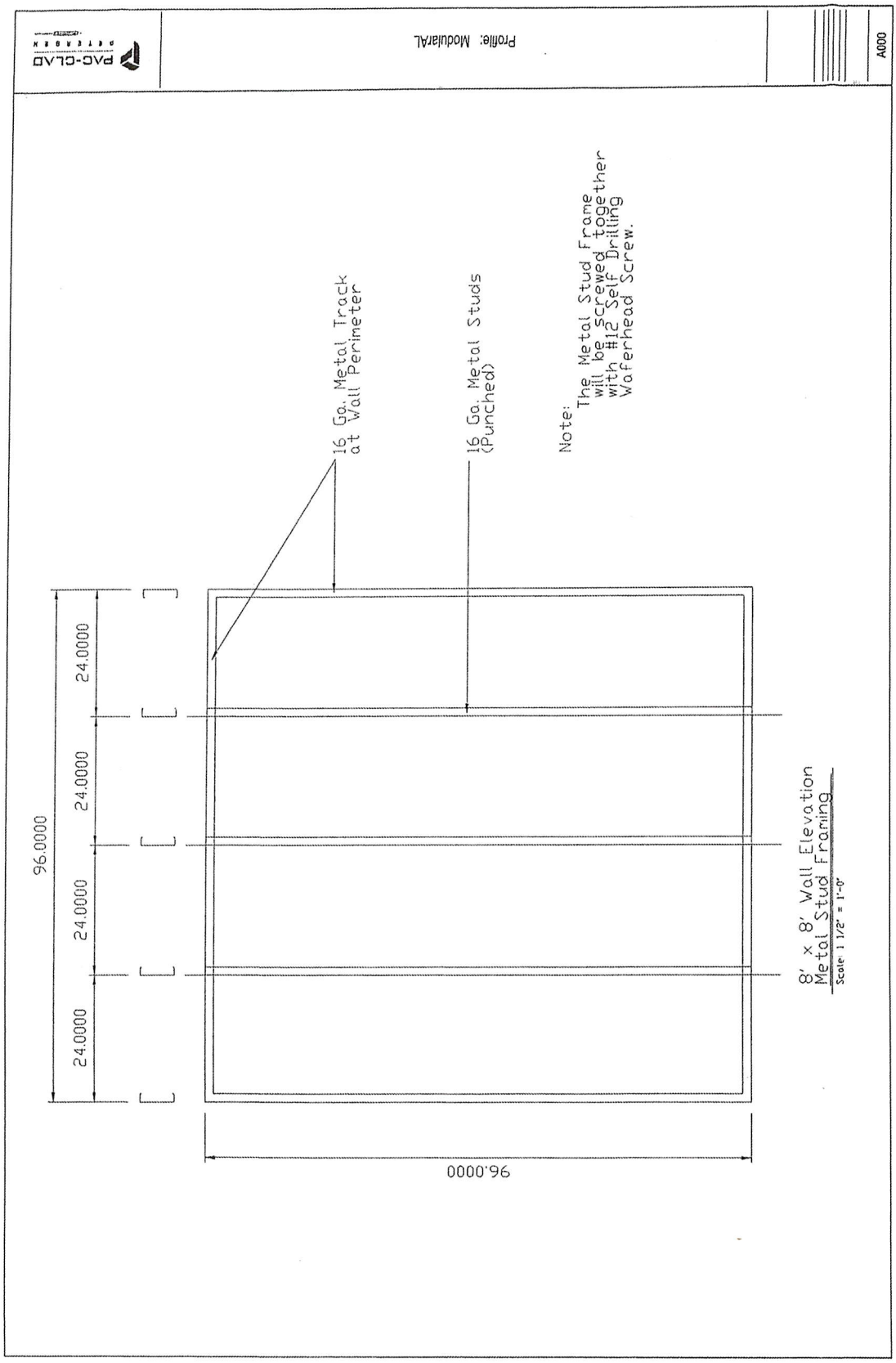
STRUCTURAL TEST SETUP




PAC-CLAD
Profile: Modular
A000
16 Ga. Metal Track
at Wall Perimeter
16 Ga. Metal Studs
(Punched)
Note:
The Metal Stud Frame
will be Screwed together
with #12 Self Drilling
Waferhead Screw.
24.0000
24.0000
24.0000
24.0000
96.0000
96.0000
8' x 8' Wall Elevation
Metal Stud Framing
Scale: 1 1/2" = 1'-0"

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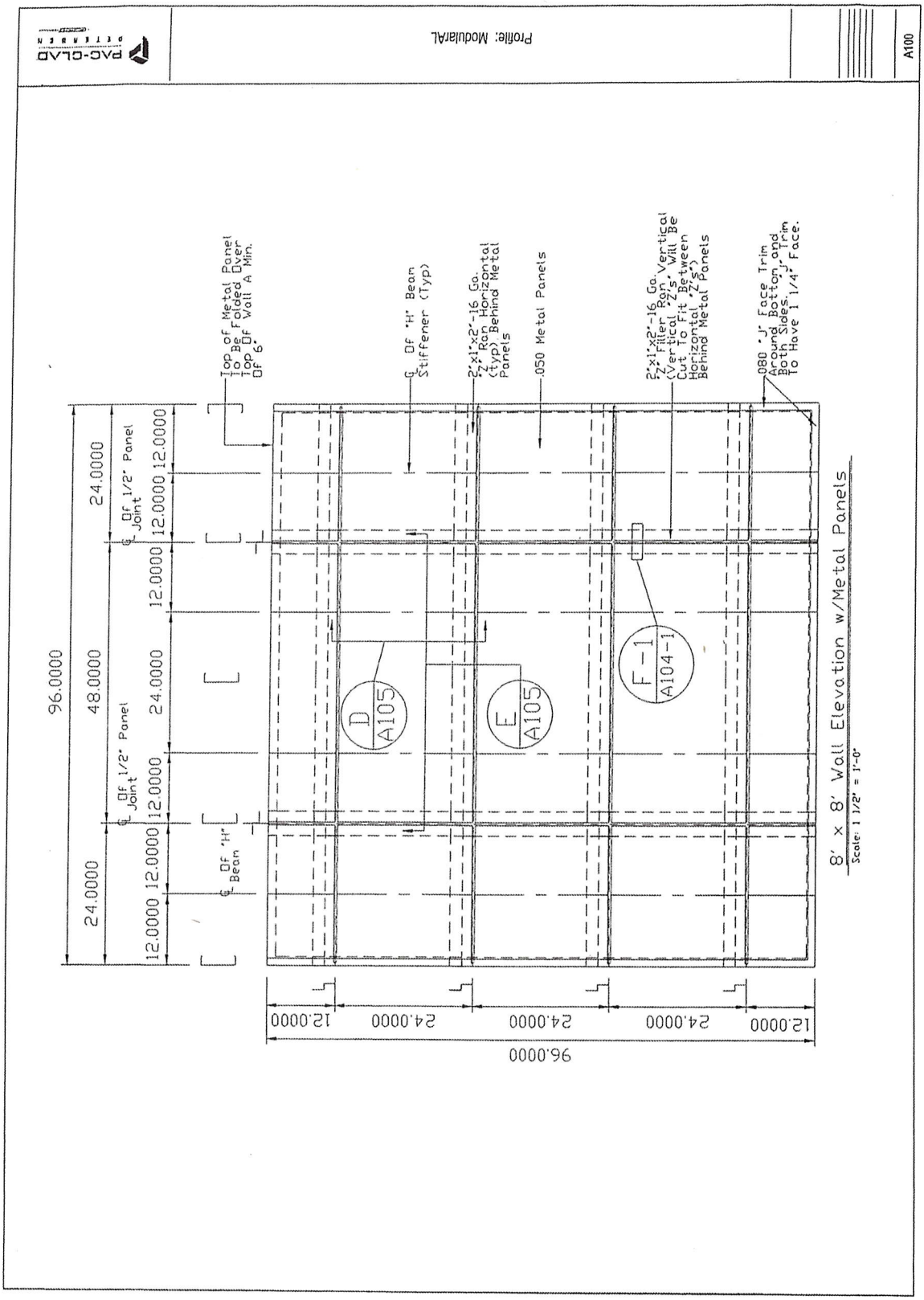

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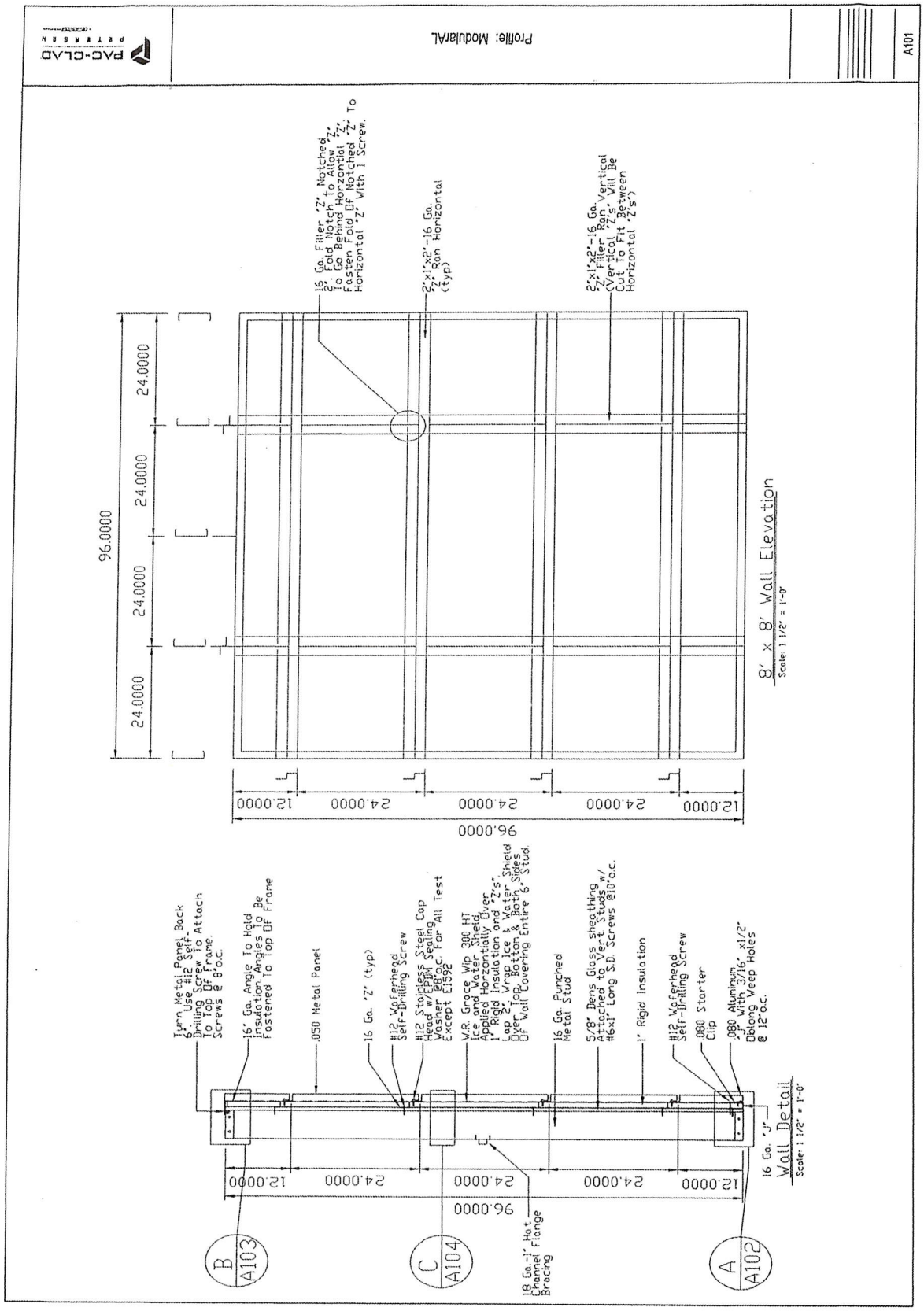
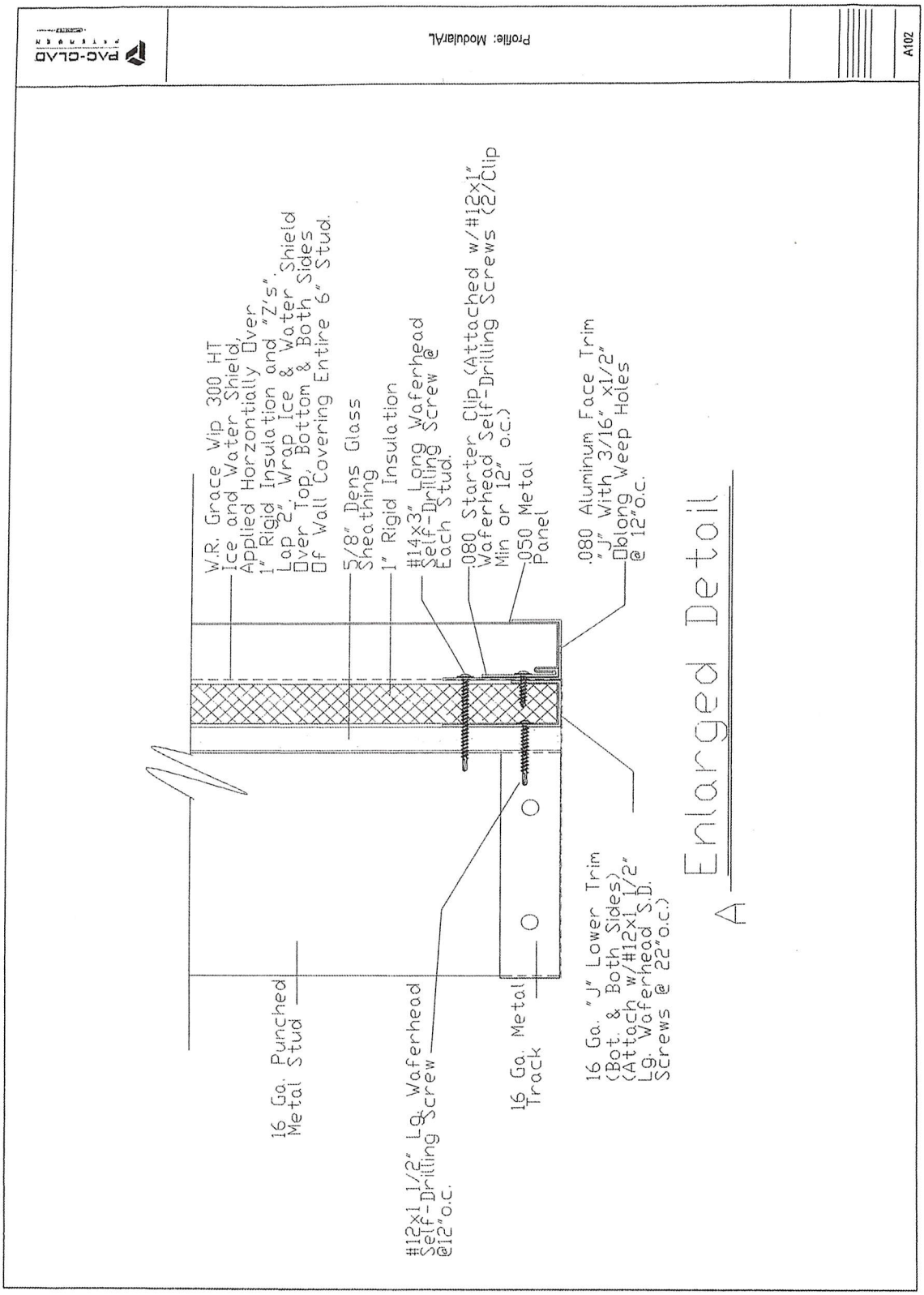
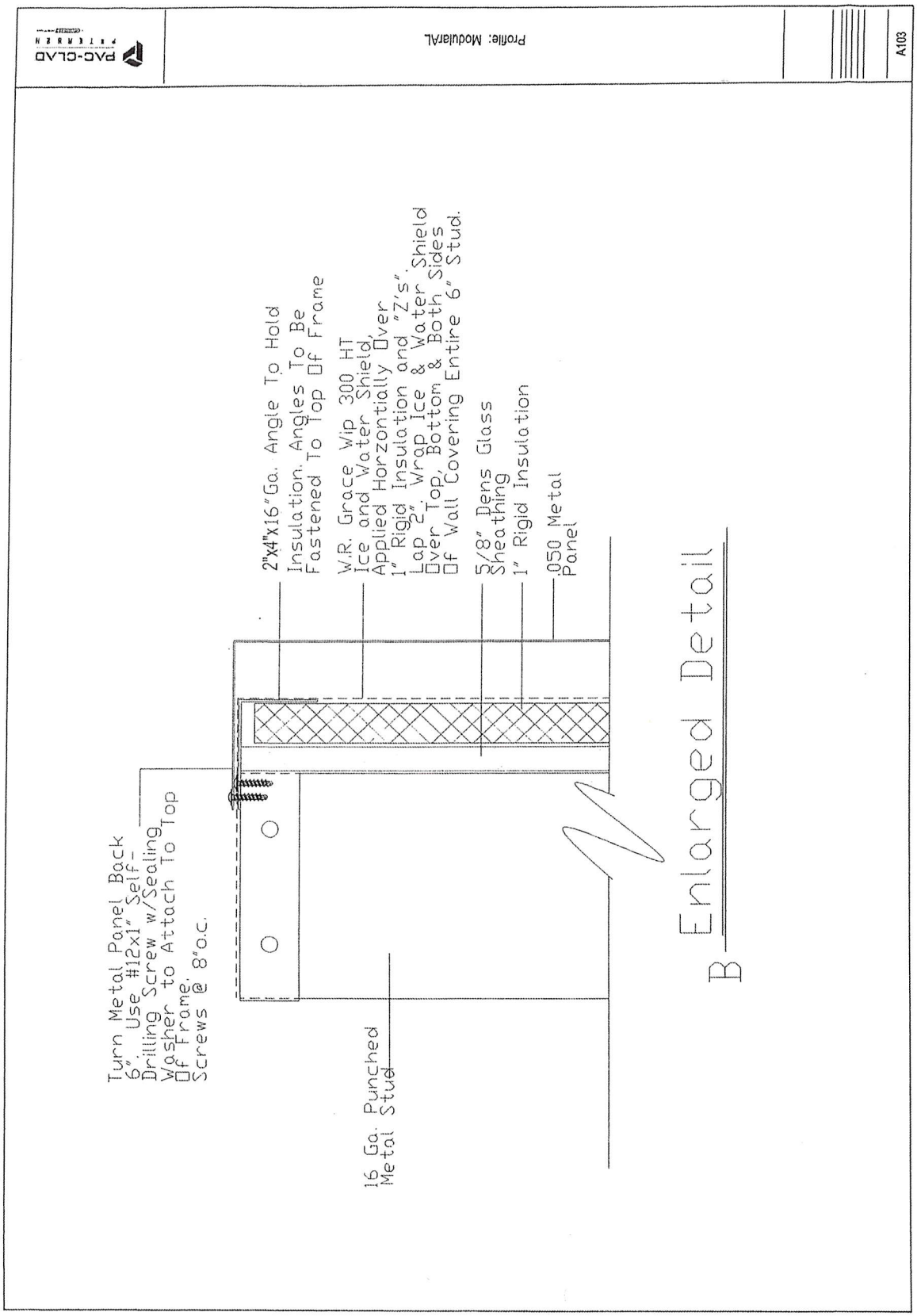
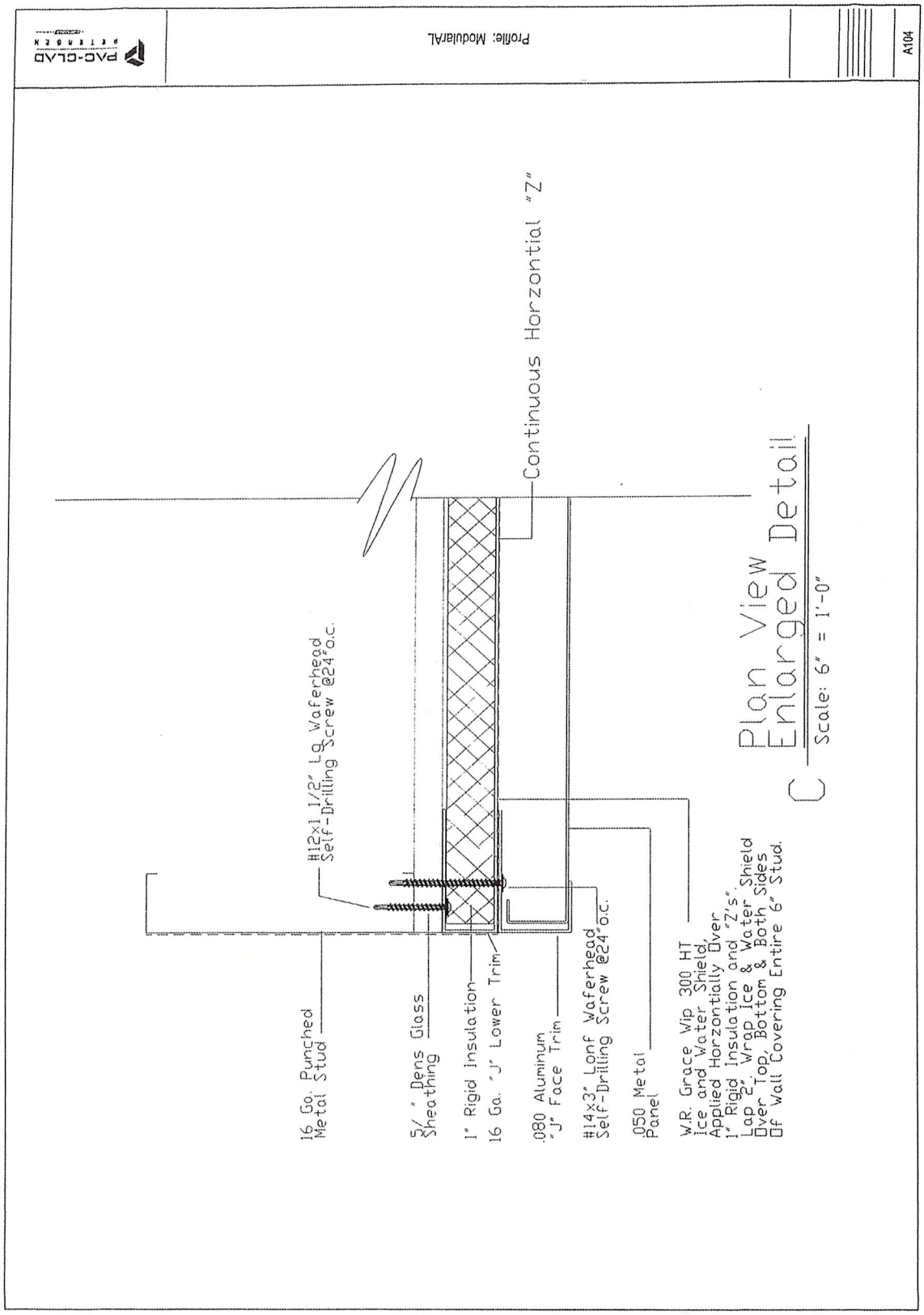
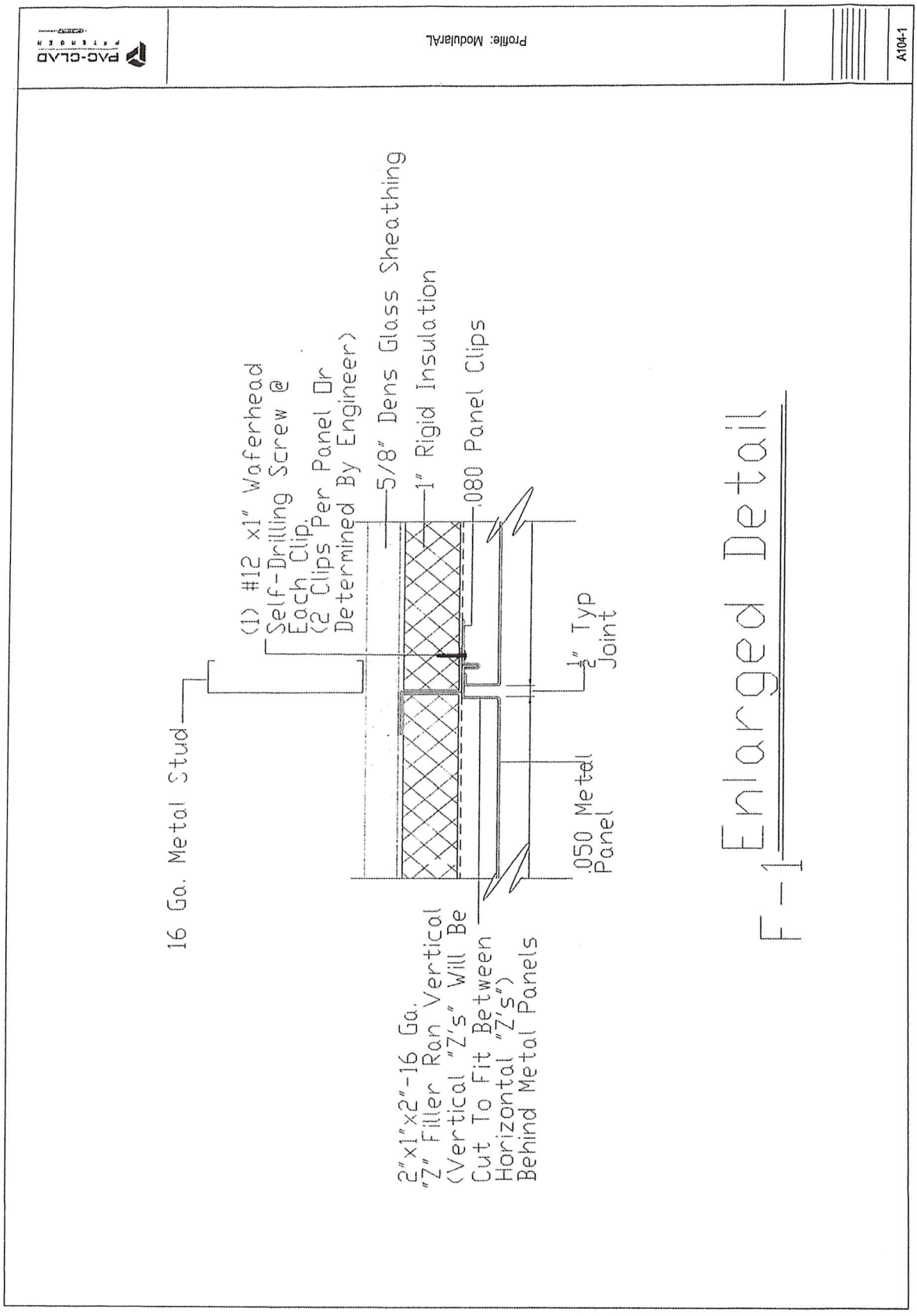
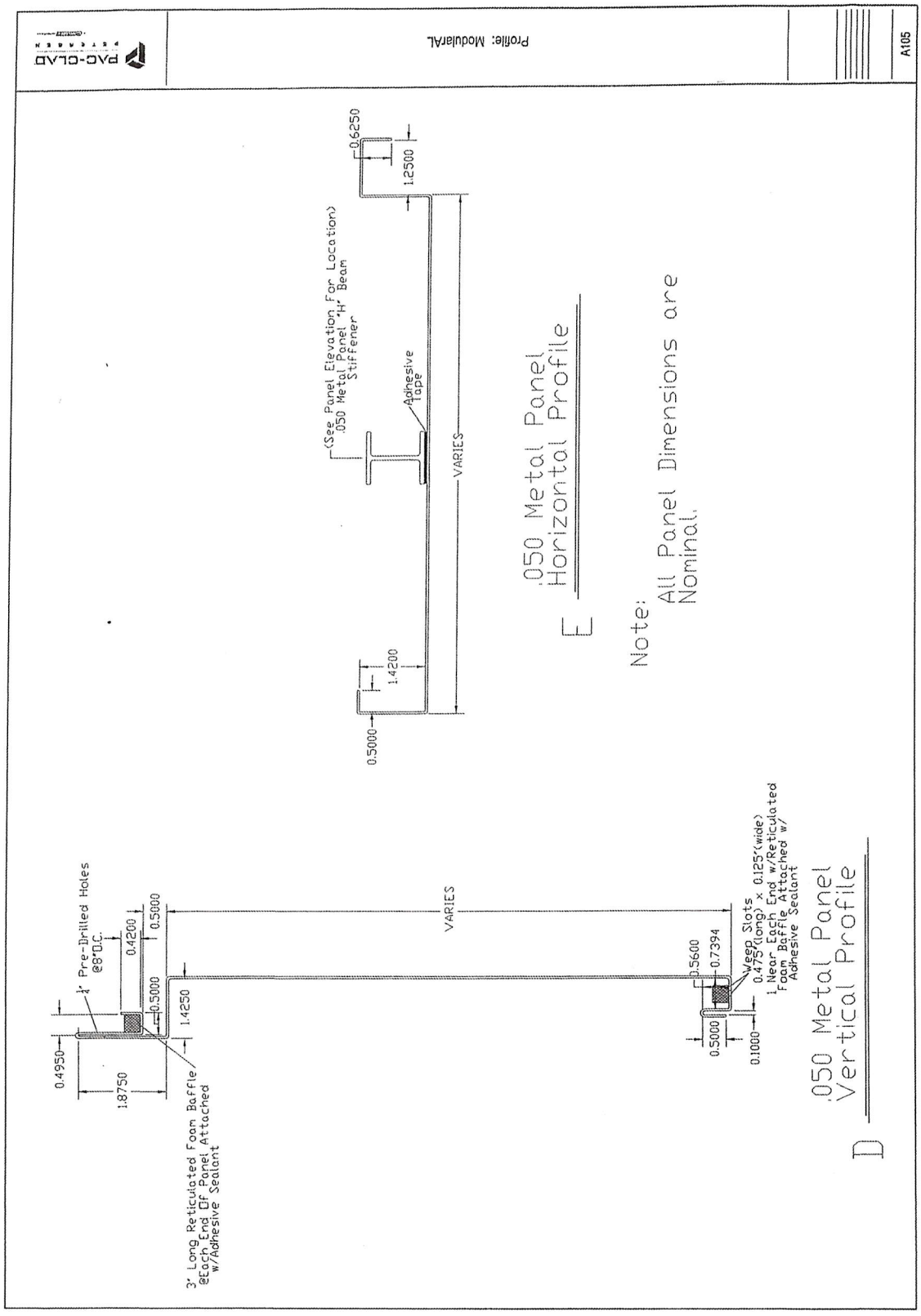


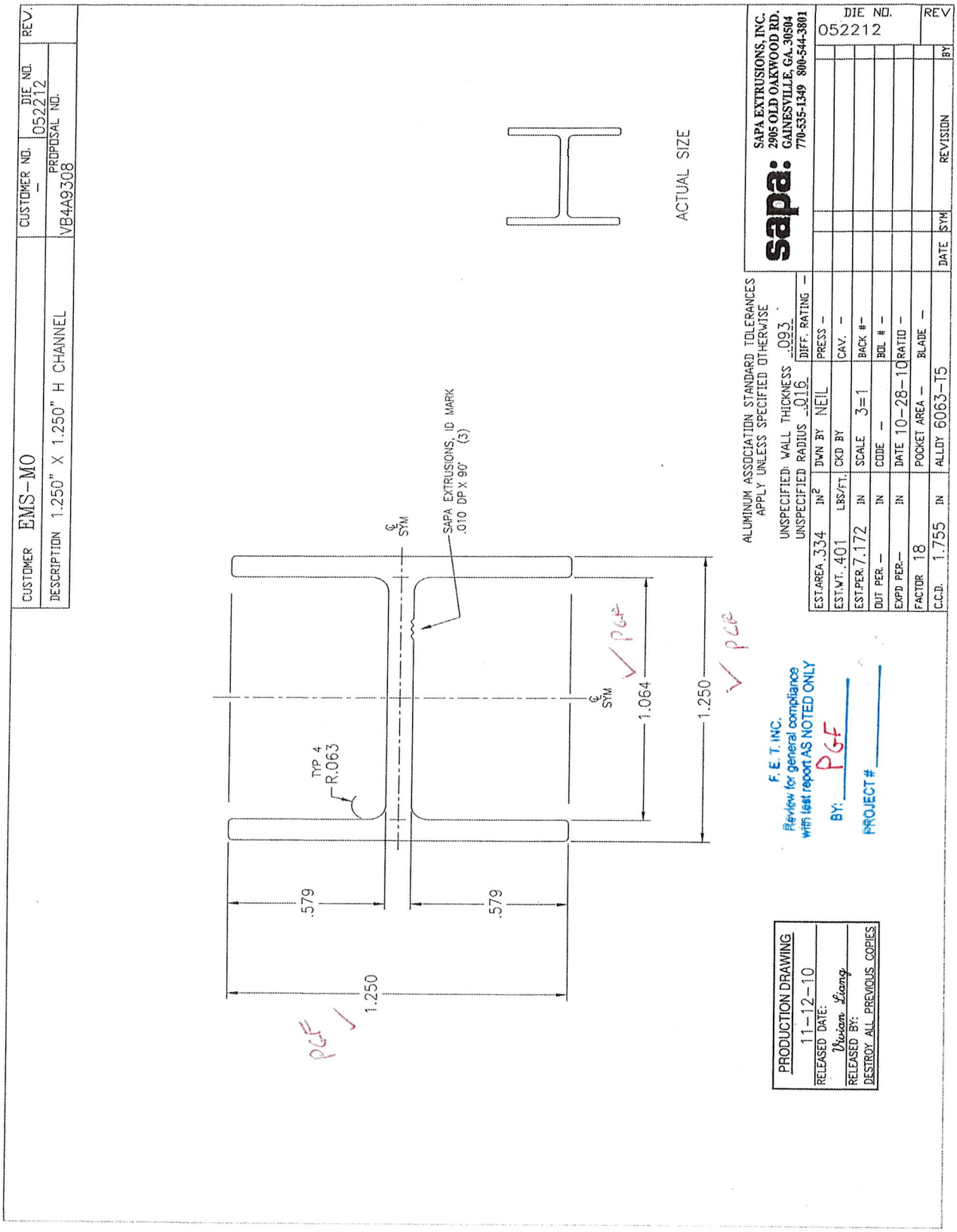

PAC-CLAD
Profile: Modular/L
A102
W.R. Grace Vip 300 HT
Ice and Water Shield,
Applied Horzontially Over
1" Rigid Insulation and "Z's".
Lap 2". Wrap Ice & Water Shield
Over Top, Bottom & Both Sides
Of Wall Covering Entire 6" Stud.
5/8" Dens Glass
Sheathing
1" Rigid Insulation
#14x3" Long Waferhead
Self-Drilling Screw @
Each Stud.
.080 Starter Clip (Attached w/#12x1"
Waferhead Self-Drilling Screws (2/Clip
Min or 12" o.c.)
.050 Metal
Panel
.080 Aluminum Face Trim
"J" With 3/16" x1/2"
Oblong Weep Holes
@ 12"o.c.
16 Ga. Punched
Metal Stud
#12x1 1/2" Lg. Waferhead
Self-Drilling Screw
@12"o.c.
16 Ga. Metal
Track
16 Ga. "J" Lower Trim
(Bot. & Both Sides)
(Attach w/#12x1 1/2"
Lg. Waferhead S.D.
Screws @ 22"o.c.)
A
Enlarged Detail

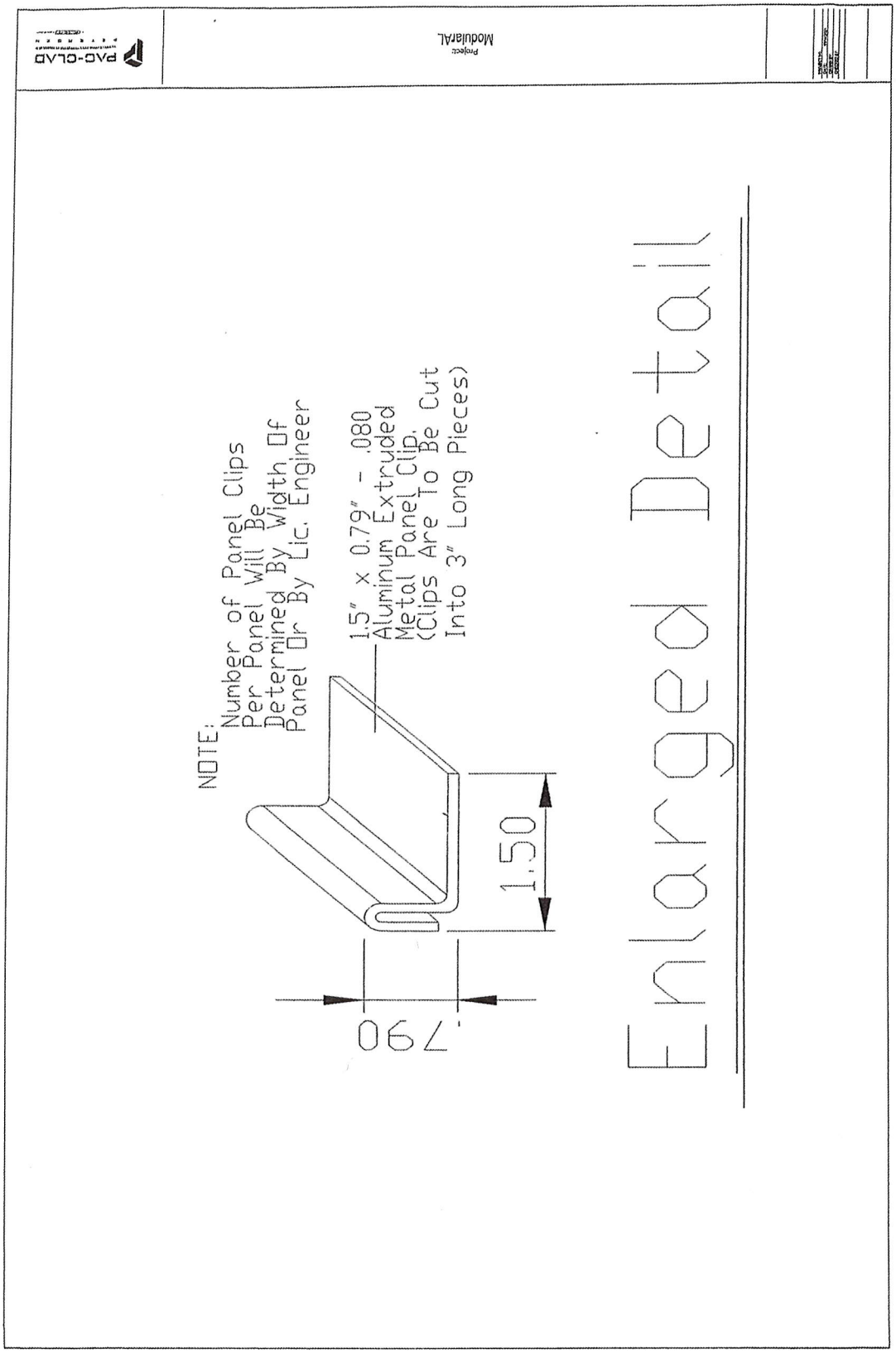

PAC-CLAD
PETERSEN
Profile: Modular/AL
A103
Enlarged Detail B
2"X4"x16"Ga. Angle To Hold Insulation. Angles To Be Fastened To Top Of Frame
W.R. Grace Wip 300 HT Ice and Water Shield Applied Horzontially Over 1" Rigid Insulation and "Z's". Lap 2". Wrap Ice & Water Shield Over Top, Bottom & Both Sides Of Wall Covering Entire 6" Stud.
5/8" Dens Glass Sheathing
1" Rigid Insulation
.050 Metal Panel
Turn Metal Panel Back 6". Use #12x1" Self-Drilling Screw w/Sealing Washer to Attach To Top Of Frame. Screws @ 8"o.c.
16 Ga. Punched Metal Stud


PAC-CLAD
PETERSEN
Profile: Modular/AL
A104
Continuous Horzontial "Z"
#12x1 1/2" Lg Waferhead
Self-Drilling Screw @24"o.c.
16 Ga. Punched
Metal Stud
5/8" Dens Glass
Sheathing
1" Rigid Insulation
16 Ga. "J" Lower Trim
.080 Aluminum
"J" Face Trim
#14x3" Lonf Waferhead
Self-Drilling Screw @24" o.c.
.050 Metal
Panel
W.R. Grace Wip 300 HT
Ice and Water Shield,
Applied Horzontially Over
1" Rigid Insulation and "Z's".
Lap 2". Wrap Ice & Water Shield
Over Top, Bottom & Both Sides
Of Wall Covering Entire 6" Stud.
C Plan View
Enlarged Detail
Scale: 6" = 1'-0"

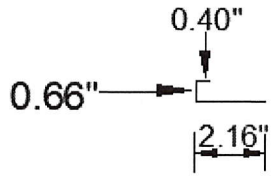

PAC-CLAD
Profile: Modular/AL
A104-1
16 Ga. Metal Stud
(1) #12 x1" Waferhead
Self-Drilling Screw @
Each Clip.
(2 Clips Per Panel Or
Determined By Engineer)
5/8" Dens Glass Sheathing
1" Rigid Insulation
.080 Panel Clips
1" Typ
Joint
.050 Metal
Panel
2"x1"x2"-16 Ga.
"Z" Filler Ran Vertical
(Vertical "Z's" Will Be
Cut To Fit Between
Horizontal "Z's")
Behind Metal Panels
F-1 Enlarged Detail


PAC-CLAD
PETERSEN
Profile: Modular4L
A105
.050 Metal Panel
Horizontal Profile
E
Note:
All Panel Dimensions are
Nominal.
(See Panel Elevation For Location)
.050 Metal Panel "H" Beam
Stiffener
Adhesive
Tape
VARIES
0.6250
1.2300
1.4200
0.5000
Pre-Drilled Holes
@8" O.C.
0.4200
0.5000
0.5000
1.4250
0.4950
1.8750
3" Long Reticulated Foam Baffle
@Each End Of Panel Attached
w/Adhesive Sealant
VARIES
0.5600
0.7394
Weep Slots
0.475"(long) x 0.125"(wide)
1 Near Each End w/Reticulated
Foam Baffle Attached w/
Adhesive Sealant
0.5000
0.1000
.050 Metal Panel
Vertical Profile
D

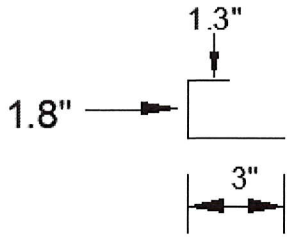

CUSTOMER EMS-MO
DESCRIPTION 1.250" X 1.250" H CHANNEL
CUSTOMER NO. –
PROPOSAL NO. VB4A9308
DIE NO. 052212
REV.
SAPA EXTRUSIONS, INC.
2905 OLD OAKWOOD RD.
GAINESVILLE, GA 30504
770-535-1349 800-544-3801
DIE NO. 052212
REV
ALUMINUM ASSOCIATION STANDARD TOLERANCES APPLY UNLESS SPECIFIED OTHERWISE
UNSPECIFIED WALL THICKNESS .093
UNSPECIFIED RADIUS .016
DIFF. RATING –
ACTUAL SIZE
SAPA EXTRUSIONS, ID MARK .010 DP X 90° (3)
℄ SYM
TYP 4 R.063
.579
.579
1.064
1.250
1.250
EST.AREA .334 IN² DWN BY NEIL PRESS –
EST.WT. .401 LBS/FT. CKD BY CAV. –
EST.PER. 7.172 IN SCALE 3=1 BACK #–
OUT PER. – IN CODE – BOL # –
EXPD PER.– IN DATE 10-28-10 RATIO –
FACTOR 18 POCKET AREA – BLADE –
C.C.D. 1.755 IN ALLOY 6063-T5
DATE SYM REVISION BY
PRODUCTION DRAWING
11-12-10
RELEASED DATE:
Vivian Liang
RELEASED BY:
DESTROY ALL PREVIOUS COPIES
F. E. T. INC.
Review for general compliance with last report AS NOTED ONLY
BY: PGF
PROJECT #


PAC-CLAD
Project
ModularAL
Enlarged Detail
NOTE:
Number of Panel Clips
Per Panel Will Be
Determined By Width Of
Panel Or By Lic. Engineer
1.5" x 0.79" - .080
Aluminum Extruded
Metal Panel Clip.
(Clips Are To Be Cut
Into 3" Long Pieces)
1.50
.790

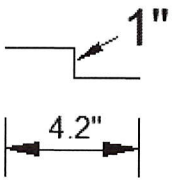
ADDITIONAL SUPPORT AND TRIM EXTRUSIONS



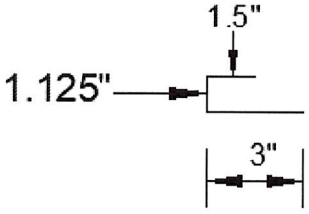
0.080" ALUM.
STARTER CLIP



0.080" ALUM. "J" FACE TRIM
(TESTING PURPOSES ONLY)



16 GA. ZEE SUPPORT



16 GA. "J" LOWER TRIM
(TESTING PURPOSES ONLY)

Spectrochemical Laboratories-Material Evaluation, Inc.
155 Prominence Drive, New Kensington, PA. 15068
Phone: (724) 334-4140 Fax: (724) 334-4143

Date: 28-May-21
Page No.: 1 of 1

Report of Tensile Testing

Client: Farabaugh Engineering & Testing (Ref. PO #: Verbal - P. Farabaugh)

PIN #	Dimensions (in.) Width x Thickness	Area (sq.- in.)	Yield Point (lb.)	Tensile Strength (lb.)	Yield Strength (psi.)	Tensile Strength (psi.)	Elongation (% in 2 in.)	Fracture Location
0.050"Alum.	0.4946 x 0.0481	0.0238	511	544	21500	22900	4.9	M/2 Break

Test Method: Q2300.04 rev.14 (ASTM A370-20, E8-21, or E646-16 : Yld. by 0.2% offset, Elong. after fracture)
Equipment Used: Instron 5900R60HVL (s/n: 1602) w/ Extensometer (s/n: E93054)
Performed By: T. Ault

Respectfully submitted,

Todd A. Ault
Laboratory Manager