Farabaugh Engineering and Testing Inc.

Project No. T206-21

Report Date: June 29, 2021

No. Pages: 18 pgs (Inclusive)

PERFORMANCE REPORT

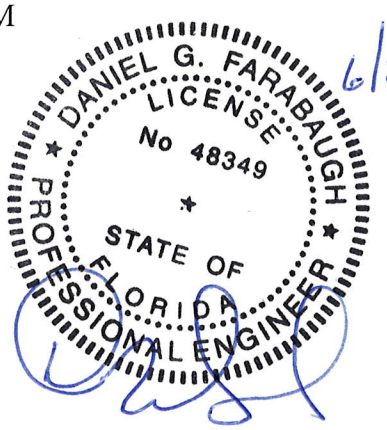
ASTM E330 UNIFORM LOAD TEST

ON

MODULARAL METAL PANEL
30" WIDE COVERAGE X 0.080" ALUMINUM

FOR

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



6/29/21

Prepared by:

Paul G. Farabaugh

Approved by:

Daniel G. Farabaugh

DANIEL G. FARABAUGH, P.E.
255 Saunders Station Rd
Trafford, PA 15085
412-373-9238

Project No. T206-21

STRUCTUAL TESTING

Purpose

The purpose of this test is to establish the structural loads on a 8'-0" wide x 8'-0" high wall system.

Test Date

5-28-21 thru 6-3-21

Test Specimen

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

Test Specimen: ModularAL Metal Panel 30" wide coverage x 0.080" aluminum

Mock-up Size: 96" wide X 96 high (nominal) consisting of 12 panels x 30" 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-330-02, "Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference "

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	0.074	0.294	0.099
0	0.0	0.001	0.008	0.008
6	31.2	0.153	0.458	0.198
0	0.0	0.010	0.026	0.024
9	46.8	0.215	0.583	0.281
0	0.0	0.015	0.032	0.033
12	62.4	0.273	0.705	0.362
0	0.0	0.021	0.043	0.043
15	78.1	0.334	0.893	0.453
0	0.0	0.028	0.055	0.056
18	93.7	0.381	0.975	0.518
0	0.0	0.038	0.071	0.069
21	109.3	0.430	1.067	0.591
0	0.0	0.044	0.082	0.078
24	124.9	0.473	1.144	0.654
0	0.0	0.051	0.093	0.088
27	140.5	0.515	1.220	0.716
0	0.0	0.059	0.107	0.096
30	156.1	0.555	1.292	0.779
0	0.0	0.063	0.113	0.104
33	171.7	0.590	1.360	0.837
0	0.0	0.068	0.129	0.114
38.4	199.8	0.656	1.480	0.945
0	0.0	0.079	0.156	0.130

RESULTS

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

NEGATIVE PRESSURE

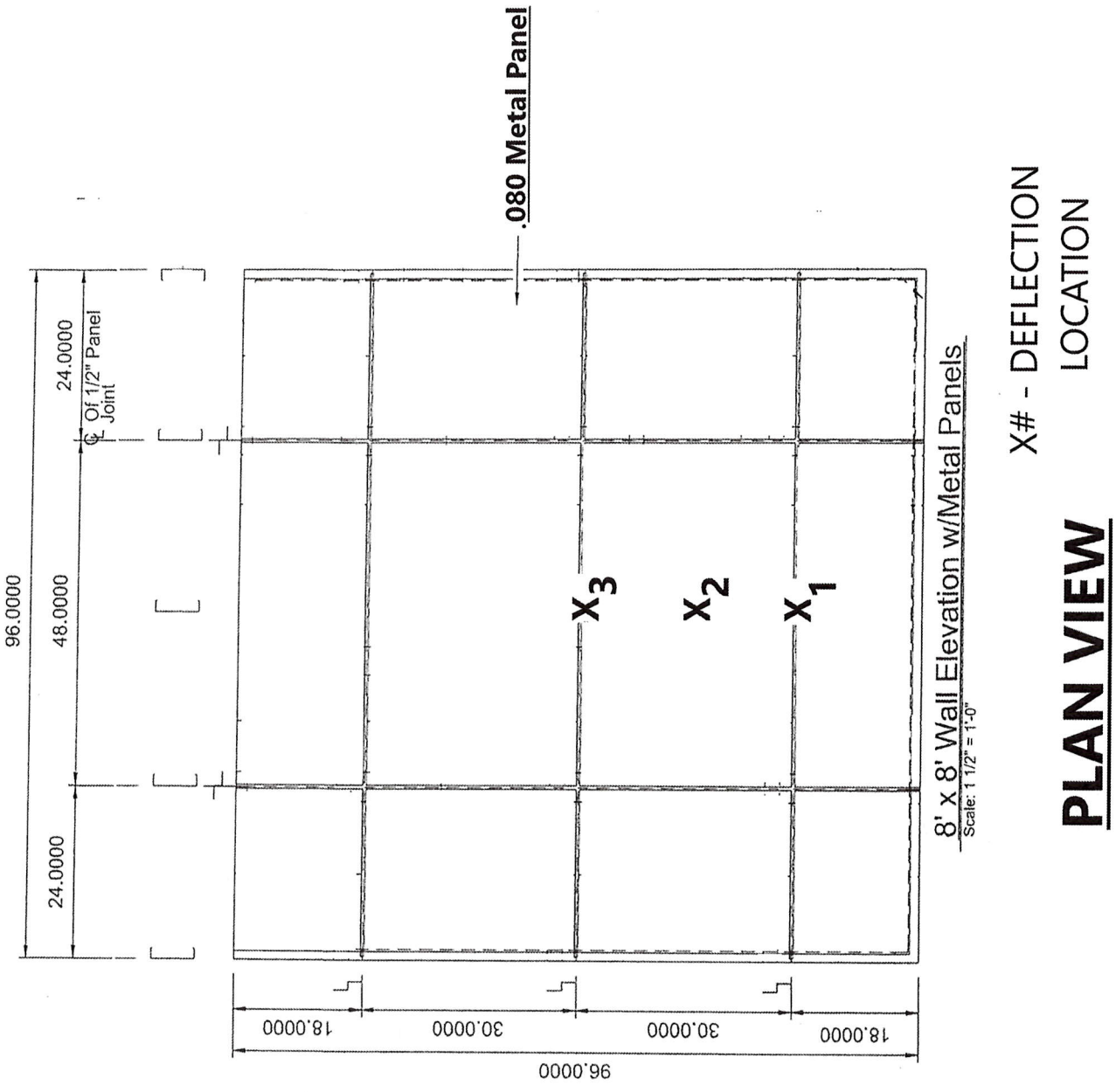
Load Pressure (in-h20)	Load Pressure (psf)	Deflection #1 (in)	Deflection #2 (in)	Deflection #3 (in)
0	0.0	0.000	0.000	0.000
2	10.4	0.052	0.182	0.048
0	0.0	0.006	0.007	0.006
4	20.8	0.130	0.329	0.129
0	0.0	0.021	0.029	0.022
6	31.2	0.209	0.454	0.215
0	0.0	0.039	0.052	0.041
8	41.6	0.299	0.587	0.317
0	0.0	0.061	0.082	0.064
10	52.0	0.407	0.734	0.443
0	0.0	0.082	0.103	0.096
12	62.4	0.501	0.850	0.525
0	0.0	0.126	0.159	0.142
14	72.9	0.599	0.977	0.634
0	0.0	0.159	0.202	0.183
16	83.3	0.699	1.103	0.748
0	0.0	0.190	0.237	0.225
18	93.7	0.820	1.258	0.884
0	0.0	0.237	0.291	0.278
20	104.1	0.919	1.386	1.004
0	0.0	0.279	0.343	0.332

RESULTS:

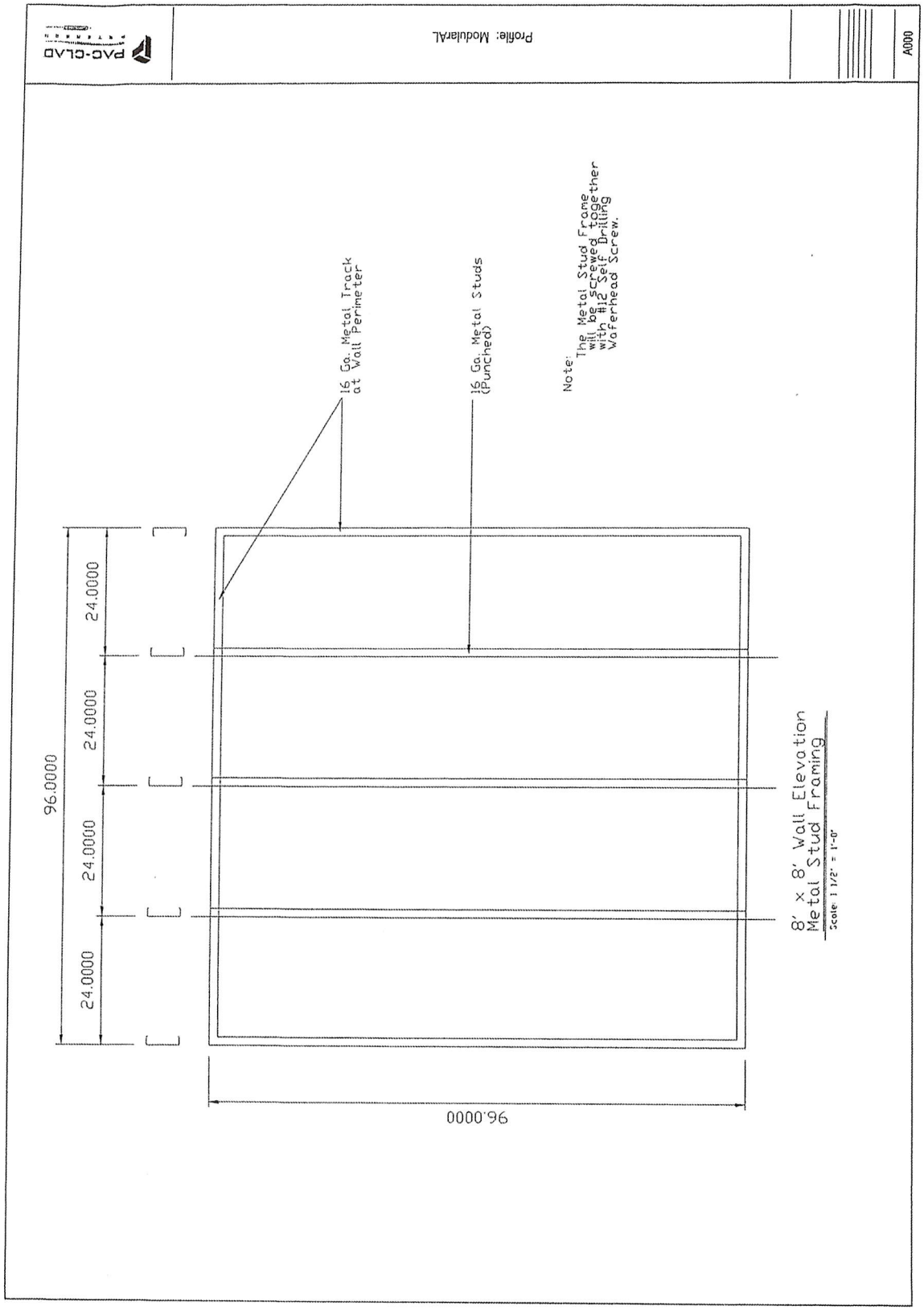
Maximum Test Load = 107.7 psf (Zee support fastener pulled out of 16 ga. metal stud supports)

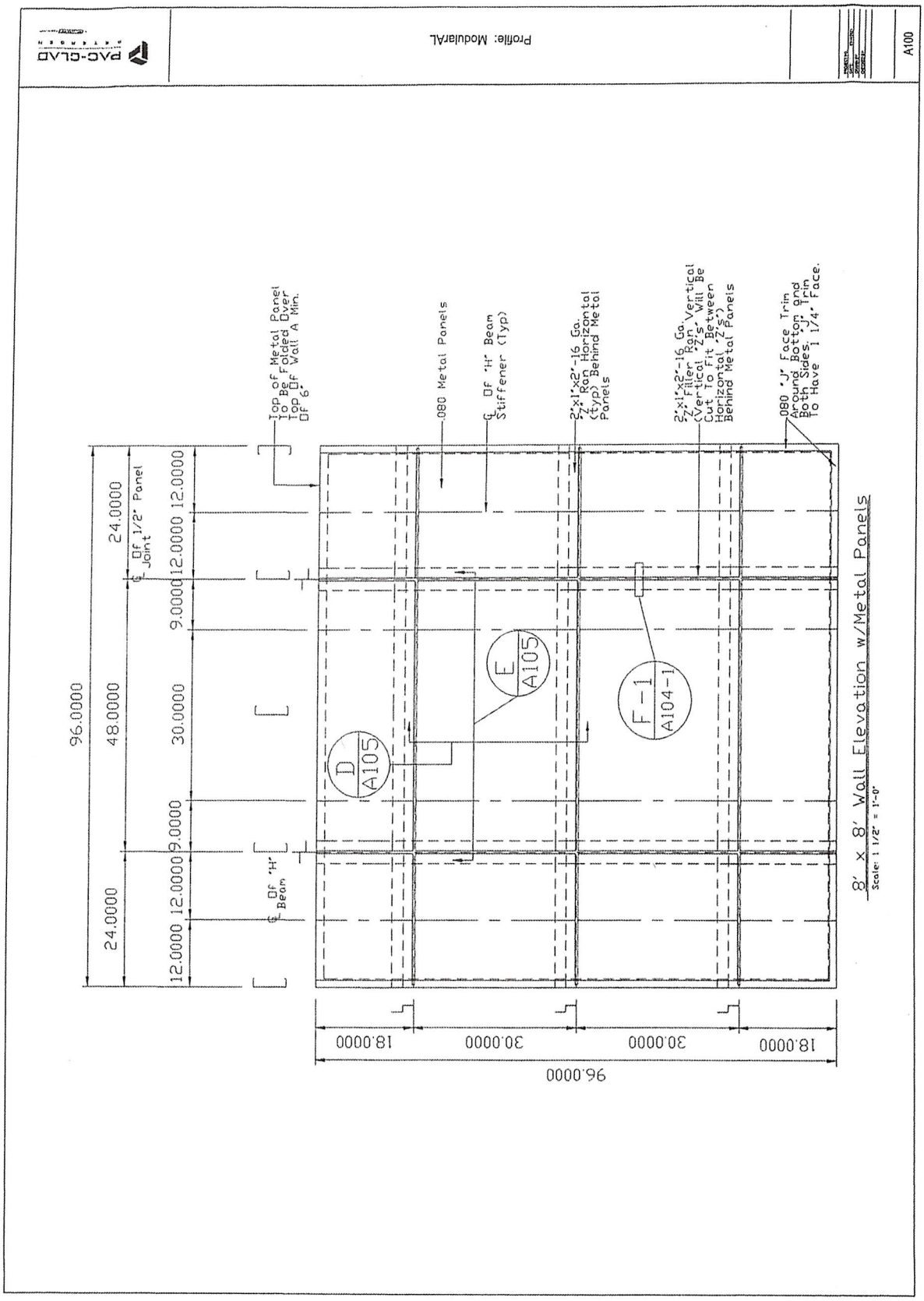
Project No. T206-21

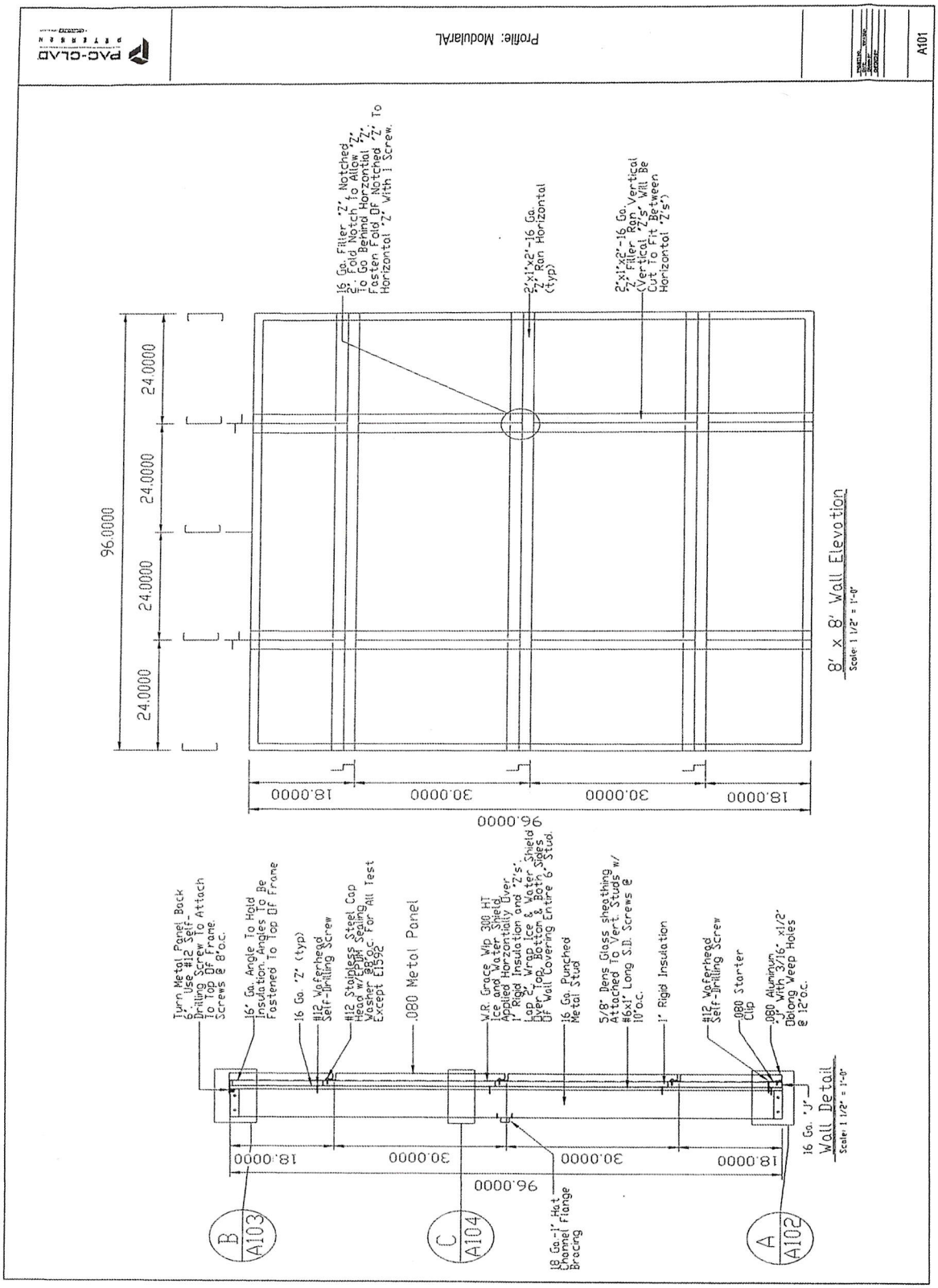
STRUCTURAL TEST SETUP

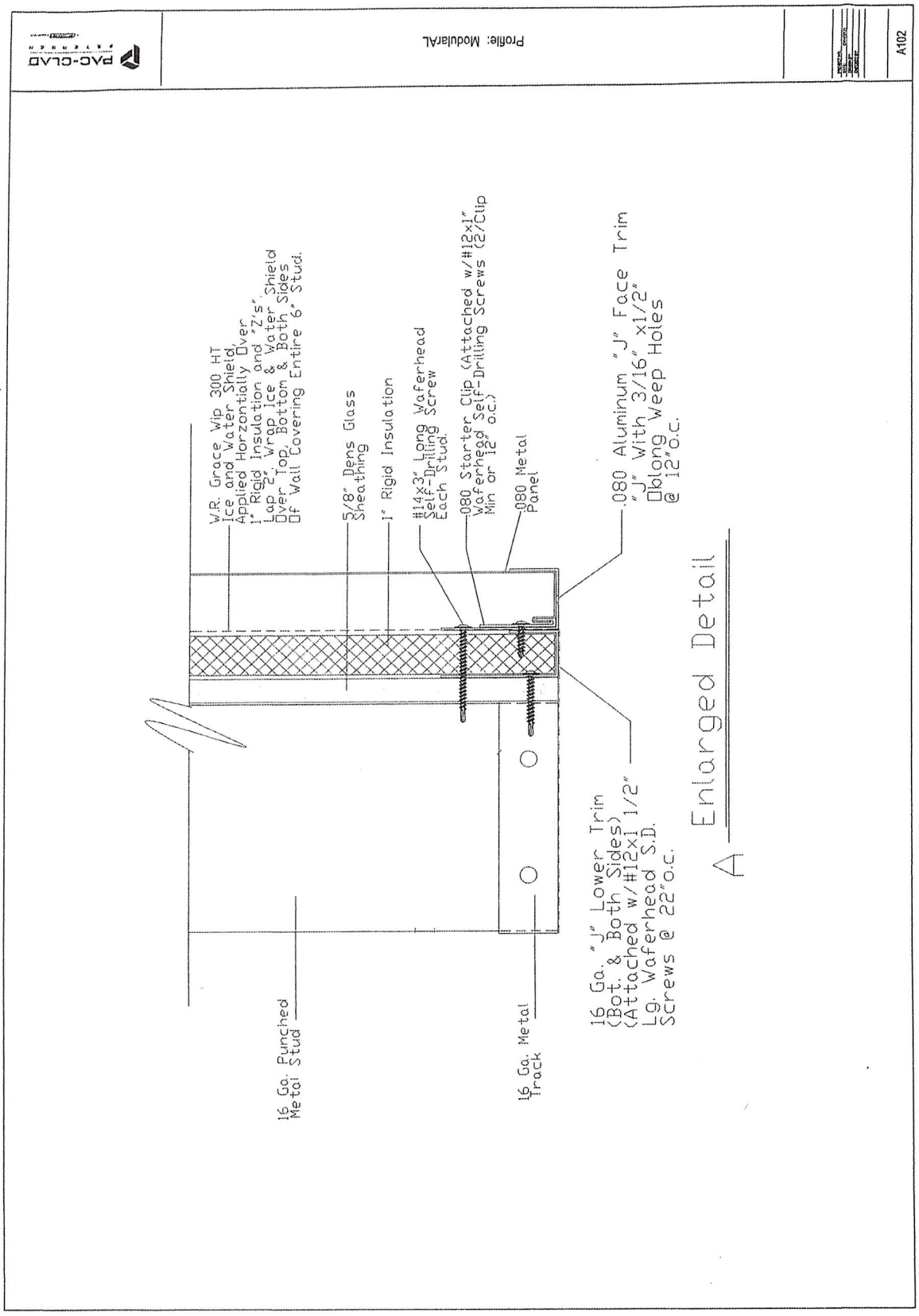


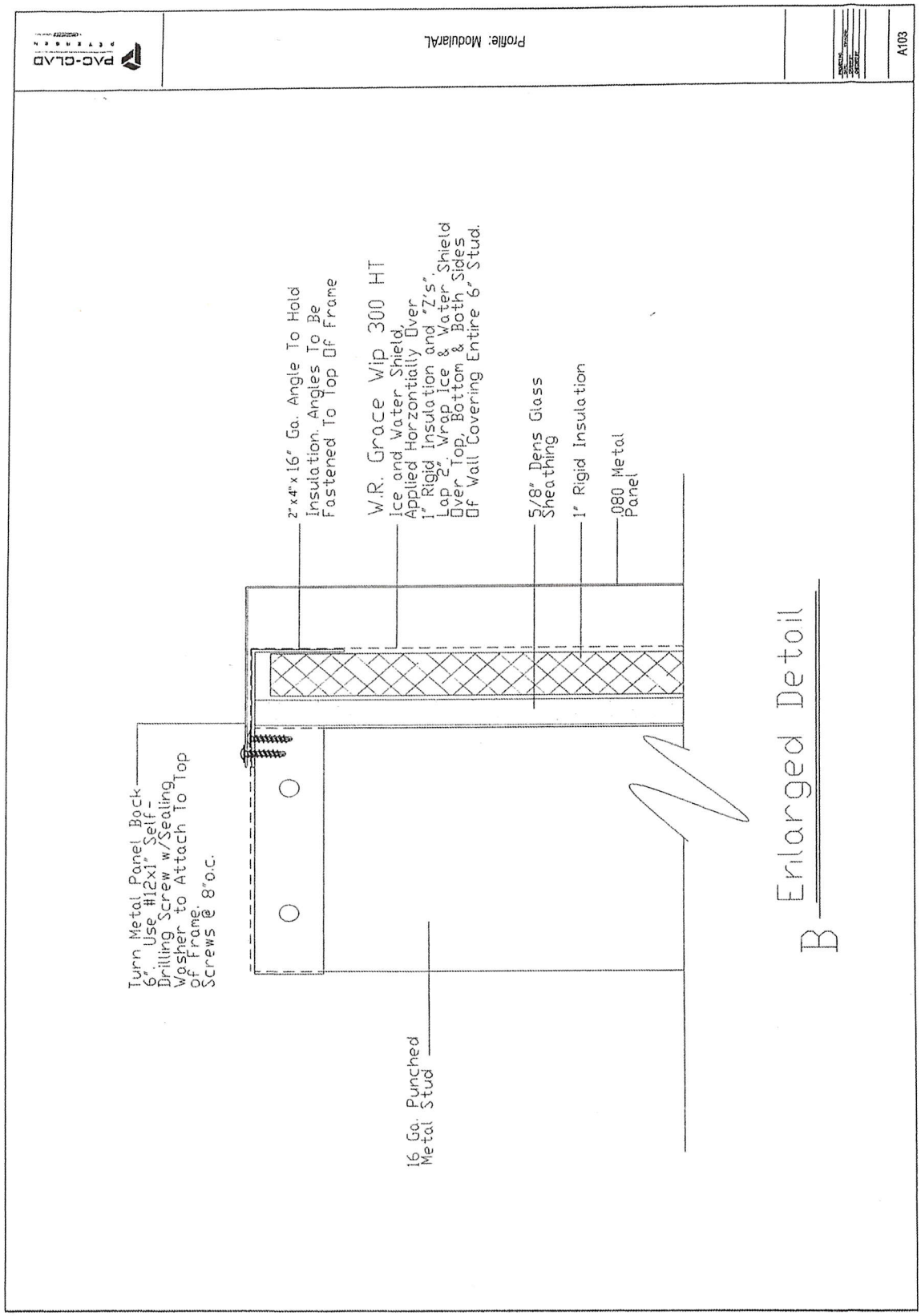
Project No. T206-21

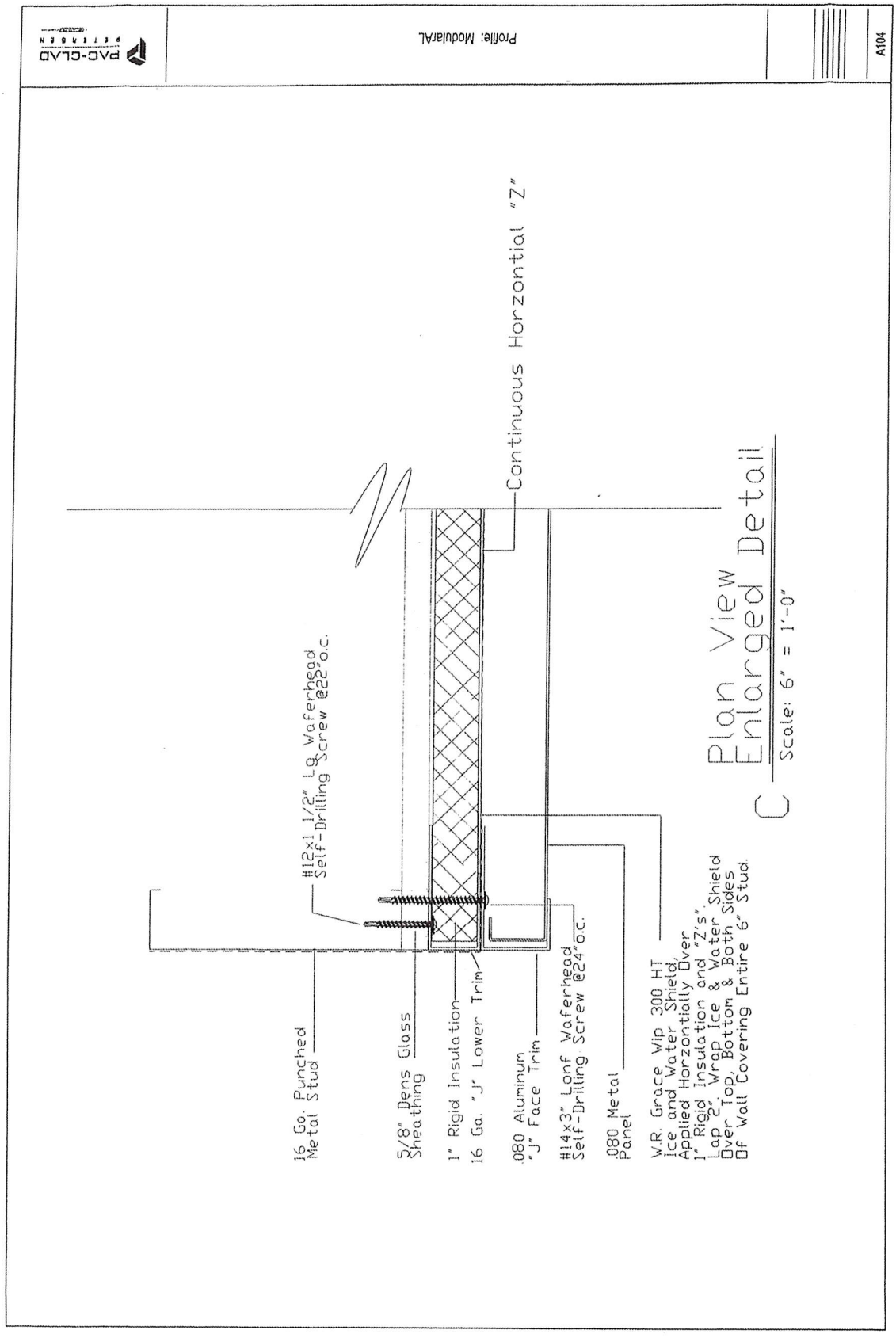


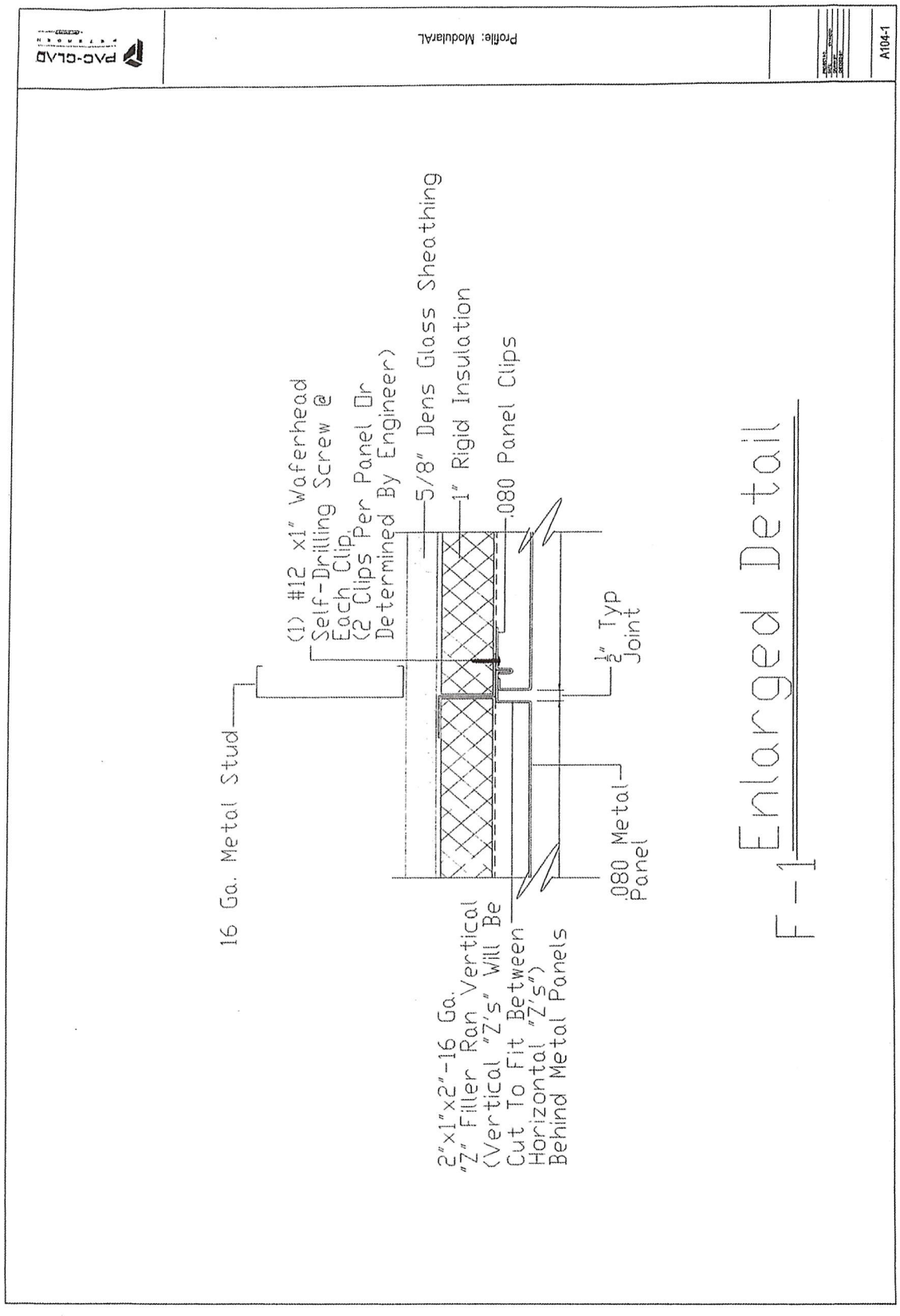

PAC-CLAD
Profile: Modular/AL
A100
Top of Metal Panel To Be Folded Over Top Of Wall A Min. Of 6"
.080 Metal Panels
℄ Of "H" Beam Stiffener (Typ)
2"x1"x2"-16 Ga. Z's Ran Horizontal (Typ) Behind Metal Panels
2"x1"x2"-16 Ga. Vertical Z's Filler Ran Vertical Z's Will Be Cut To Fit Between Horizontal Z's Behind Metal Panels
.080 "J" Face Trim Around Bottom and Both Sides. "J" Trim To Have 1 1/4" Face.
℄ Of 1/2" Panel Joint
℄ Of "H" Beam
D A105
E A105
F-1 A104-1
96.0000
48.0000
30.0000
24.0000
12.0000
9.0000
18.0000
8' x 8' Wall Elevation w/Metal Panels
Scale: 1 1/2" = 1'-0"

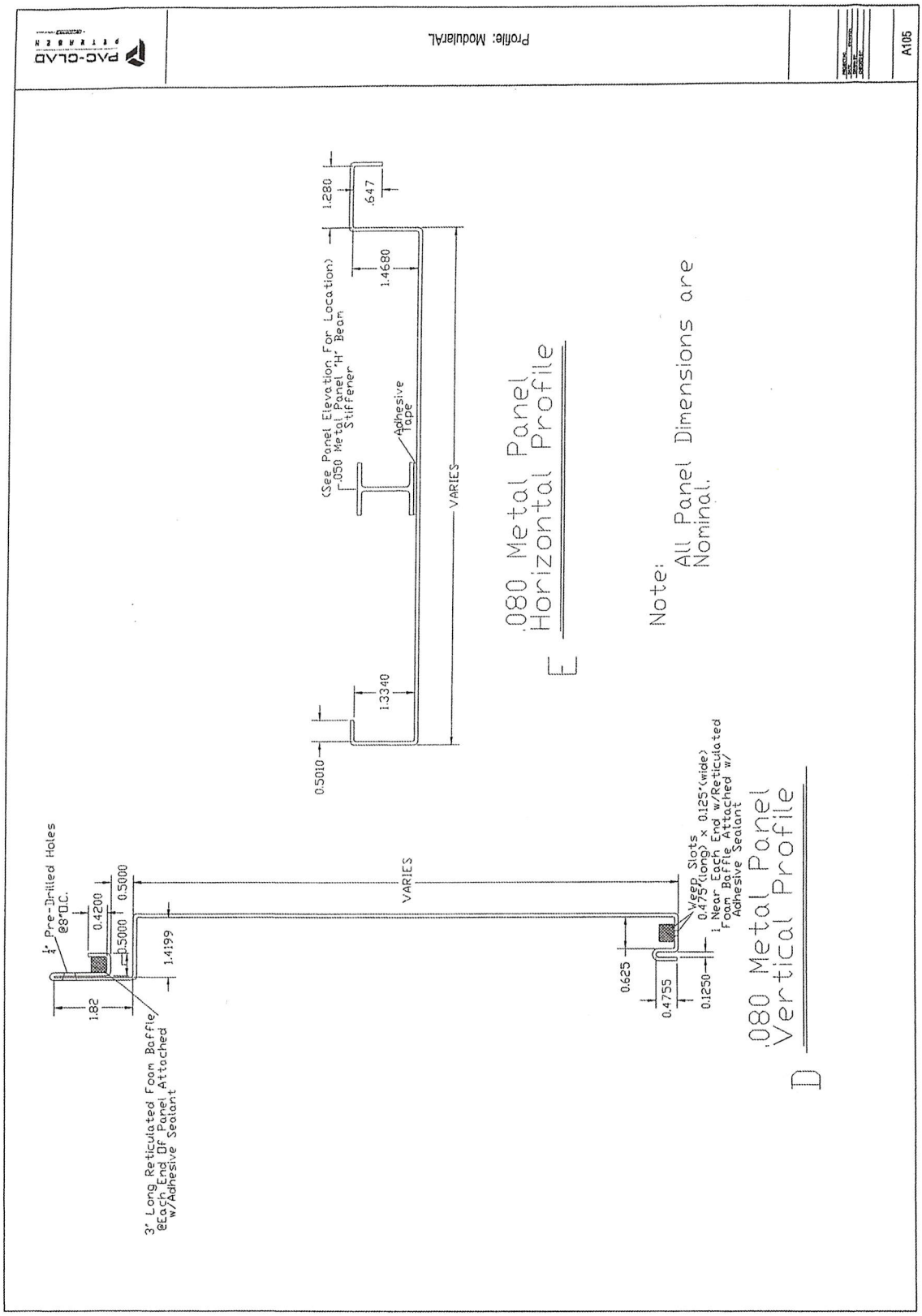

PAC-CLAD
PETERSEN
Profile: Modular/AL
A101
16 Ga. Filler 'Z' Notched 2" Fold Notch to Allow 'Z' To Go Behind Horzontial 'Z'. Fasten Fold Of Notched 'Z' To Horizontal 'Z' With 1 Screw.
2"x1"x2"-16 Ga. 'Z' Ran Horizontal (typ)
2"x1"x2"-16 Ga. 'Z' Filler Ran Vertical (Vertical 'Z's' Will Be Cut To Fit Between Horizontal 'Z's')
96.0000
24.0000
24.0000
24.0000
24.0000
18.0000
30.0000
30.0000
18.0000
96.0000
8' x 8' Wall Elevation
Scale: 1 1/2" = 1'-0"
Turn Metal Panel Back 6" Use #12 Self-Drilling Screw To Attach To Top Of Frame. Screws @ 8"o.c.
16 Ga. Angle To Hold Insulation. Angles To Be Fastened To Top Of Frame
16 Ga. 'Z' (typ)
#12 Wafferhead Self-Drilling Screw
#12 Stainless Steel Cap Head w/ EPDM Sealing Washer Use SS. For All Test Except ETL92
.080 Metal Panel
W.R. Grace Wip 300 HT Ice and Water Shield Applied Horizontally Over 1" Rigid Insulation and 'Z's'. Lap 2" Wrap Ice & Water Shield Over Top Bottom & Both Sides Of Wall Covering Entire 6" Stud.
16 Ga. Punched Metal Stud
5/8" Dens Glass sheathing Attached To Vert. Studs w/ #6x1" Long S.D. Screws @ 10"o.c.
1" Rigid Insulation
#12 Wafferhead Self-Drilling Screw
.080 Starter Clip
.080 Aluminum 'J' With 3/16" x1/2" Oblong Weep Holes @ 12"o.c.
16 Ga. 'J'
Wall Detail
Scale: 1 1/2" = 1'-0"
18.0000
30.0000
30.0000
18.0000
96.0000
18 Ga.-1" Hat Channel Flange Bracing
B A103
C A104
A A102


PAC-CLAD
Profile: Modular4L
A102
W.R. Grace Wip 300 HT
Ice and Water Shield
Applied Horizontally 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.)
.080 Metal
Panel
.080 Aluminum "J" Face Trim
"J" With 3/16" x1/2"
Oblong Weep Holes
@ 12"o.c.
16 Ga. Punched
Metal Stud
16 Ga. Metal
Track
16 Ga. "J" Lower Trim
(Bot. & Both Sides)
(Attached w/#12x1 1/2"
Lg. Waferhead S.D.
Screws @ 22"o.c.
Enlarged Detail
A

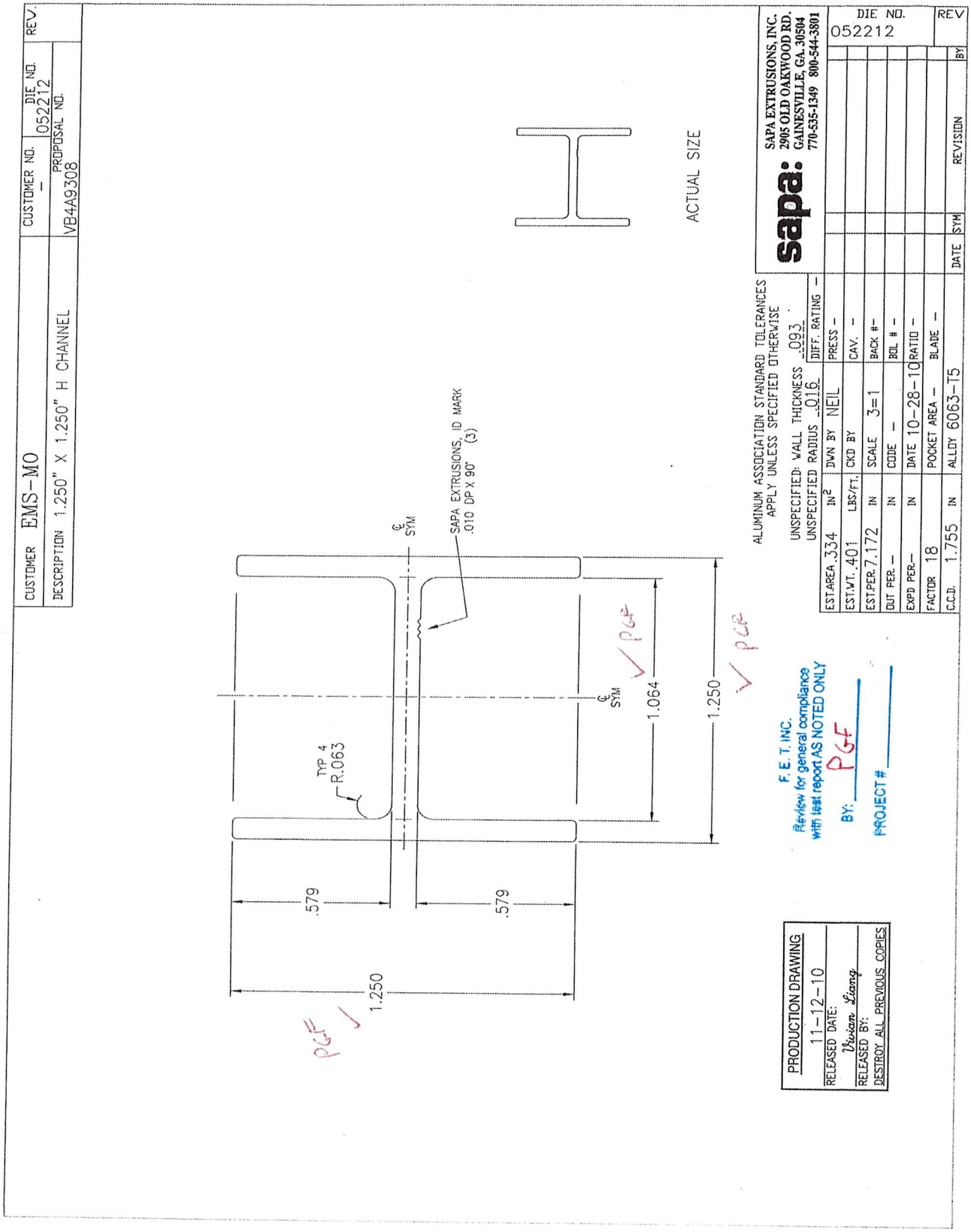

PAC-CLAD
Profile: Modular/L
A103
Turn Metal Panel Back 6" Use #12x1" Self-Drilling Screw w/Sealing Washer to Attach To Top of Frame. Screws @ 8"o.c.
16 Ga. Punched Metal Stud
2"x4"x16" Ga. Angle To Hold Insulation. Angles To Be Fastened To Top Of Frame
W.R. Grace Wip 300 HT Ice and Water Shield Applied Horizontially 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
.080 Metal Panel
B Enlarged Detail

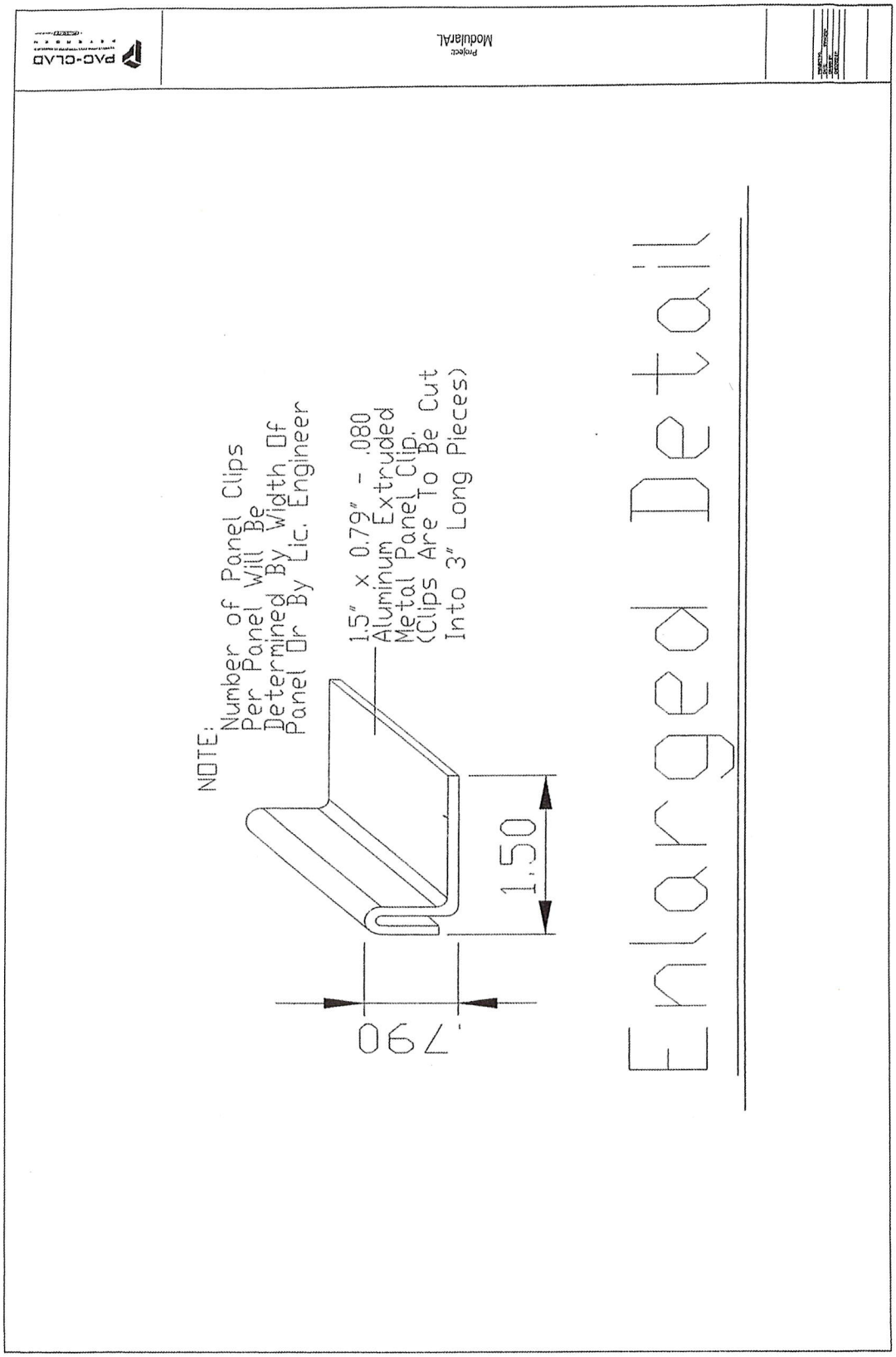

PAC-CLAD
PETERSEN
Profile: Modular/AL
A104
Continuous Horzontial "Z"
#12x1 1/2" Lg Waferhead
Self-Drilling Screw @22"o.c.
16 Ga. Punched
Metal Stud
5/8" Dens Glass
Sheathing
1" Rigid Insulation
16 Ga. "J" Lower Trim
.080 Aluminum
"J" Face Trim
#14x3" Lonf Waferhead
Self-Drilling Screw @24"o.c.
.080 Metal
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.
Plan View
Enlarged Detail
C
Scale: 6" = 1'-0"


PAC-CLAD
Profile: Modular
A104-1
F-1 Enlarged Detail
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
1/2" Typ Joint
.080 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

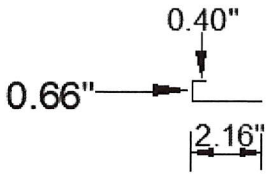

PAC-CLAD
PETERSEN
Profile: Modular
A105
.080 Metal Panel
Horizontal Profile
E
Note:
All Panel Dimensions are
Nominal.
(See Panel Elevation For Location)
.050 Metal Panel "H" Beam
Stiffener
Adhesive
Tape
1.280
.647
1.4680
VARIES
1.3340
0.5010
1" Pre-Drilled Holes
@9"O.C.
0.4200
0.5000
0.5000
1.4199
1.82
3" Long Reticulated Foam Baffle
@Each End Of Panel Attached
w/Adhesive Sealant
VARIES
Weep Slots
0.475"(long) x 0.125"(wide)
1 Near Each End w/Reticulated
Foam Baffle Attached w/
Adhesive Sealant
0.625
0.4755
0.1250
.080 Metal Panel
Vertical Profile
D

Project No. T206-21

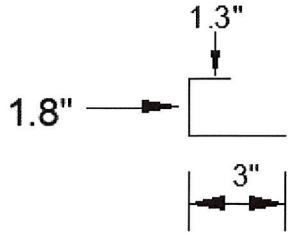



PAC-CLAD
Project
Modular
NOTE:
Number of Panel Clips
Per Panel Will Be
Determined By Width Of
Panel Or By Lic. Engineer
1.5" x 0.79" - .080
Aluminum Extruded
Metal Panel Clip.
(Clips Are To Be Cut
Into 3" Long Pieces)
1.50
.790
Enlarged Detail

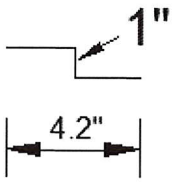
ADDITIONAL SUPPORT AND TRIM EXTRUSIONS



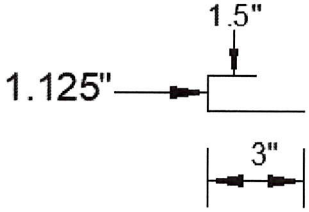
0.080" ALUM.
STARTER CLIP



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

Project No. T206-21

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
0.080"Alum.	**0.4943 x 0.0787**	**0.0389**	**840**	**884**	**21600**	**22700**	**7.5**	**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

Please send your comments and concerns to us at feedback@spectrochemicalme.com
For more information call: 724-334-4140

Respectfully submitted,

Todd A. Ault
Laboratory Manager