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Attn.: Mr. Michael Petersen

FROM : T.M. Shingler, P.E.
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President
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DATE : February 3, 2005

SUBJECT : 2" TITE-LOC Plus Roof Panel @ 18" wide
x 24 ga. steel
ASTM E-1592 Procedure for the Determination of
Wind Uplift Capacity @ 2.0 ft & 5.0 ft o/c clips

TEST PROCEDURE : ASTM E-1592
STANDARD TEST METHOD FOR THE STRUCTURAL
PERFORMANCE OF SHEET METAL ROOF AND SIDING
SYSTEMS BY UNIFORM STATIC AIR PRESSURE
DIFFERENCE

PURPOSE : To determine the Ultimate Wind Uplift Capacity of
the submitted metal roof system when fastened at
various panel clip spacings.

TEST DATE : September 18, 2002, (3 spans @ 5.0 ft o/c)
September 30, 2002, (7 spans @ 2.0 ft o/c)

TEST SPECIMEN : 2" TITE-LOC Plus Roof Panel @ 18" wide
x 24 ga. Steel

TEST CHAMBER : Composed of a floor mounted reinforced
aluminum frame capped with simulated purlins
consisting of 16 gage steel hat sections
in combination with steel wide flange beams
designed to support the test specimen.
The test pressures were applied to the
specimen via a 4 mil plastic film designed
to accurately configure to the panel profile
and give both the panel shape and the
sidejoint elements full degree of freedom
during the loading process.

PURLIN MEMBERS : 16 gage steel hat-sections bolted to the
top flange of W6 x 15 wide flange beams,
placed at 5.0 ft or 2.0 ft centers to
represent the maximum and minimum purlin
spacing extremes for the roof panel being
tested.

PRESSURE INDICATOR : Two (2) Digital Pressure Indicators
manufactured by Micro-Pneumatic Logic,
Inc. with a full-range accuracy of 1/10"
H2O and traceable to the National Bureau
of Standards

DIGIMATIC CALIPER : Mitutoyo Series Model No. CD-12" CP
with a full-range accuracy of 0.001 in.

INSTALLATION : The system was inverted and panels were
installed with two (2) piece sliding clips
which were screw-attached to the top flanges
of the 16 gage steel hat sections using two
(2) 1/4-14 x 1 1/4" long self-drilling screws
with a #2 drill point.
Side joints consisted of mating male/female
interlocking ribs via electric power seamer.
Continuity fasteners were located at the
extreme ends of panels and consisted of single
self-drilling screws driven into the panel
flanges.
One end of the mock-up had panel fastening to
simulate a "fixed" end, with the opposite end
"free".
A transparent/flexible plastic film (Visqueen
@ 4 mils thick) was applied over panels at the
edges and ends of the panels and sealed with
duct tape to every configuration to create a
vacuum seal. Lateral joints were also taped
the entire length of the panel to ensure
vacuum seal.

PROCEDURE : The individual panels were installed into the
test chamber as a six (6) panel wide array per
standard field techniques. Specific deflection
measurement targets were established on key
panels.
These targets and their locations are illustrated
on an enclosed sketch.
Two (2) identical pressure gages were installed
onto the test chamber for cross checking of test
pressures and insuring accuracy of pressure data.

Initially the system was preloaded to (-) 5 psf
to insure proper seating of the panels, clips
and plastic film.
After the preloading process, initial deflection
measurements were taken at the six (6) key panel
locations. These initial deflection readings
represented the zero position/zero load specimen
status from which all readings were referenced.
Individual data sheets and graphic plots of the
deflection readings are enclosed with this
report.

A "step loading" procedure was used with pressure increments as indicated on enclosed data sheets.

At each incremental pressure level, the test pressure was maintained for an excess of sixty (60) seconds.

After the sixty (60) second pressure "hold" period, measurements were recorded at each of the six (6) critical panel locations.

Also during this time period....broad-flat areas of the panels, sidejoints and clips were visually checked for signs of localized distress.

At the end of each pressure "hold" phase, the test chamber was returned to a zero pressure status and deflection measurements were once again recorded to check for meaningful "set" in the system.

Ever-increasing pressure values were applied and deflection values recorded both at the pressure as well as at zero.

This procedure continued until the Ultimate Uplift Pressure of the panel or a panel system component demonstrated "distress".

The Allowable Uplift Capacity for the tested panel system is the Ultimate Uplift Pressure divided by a Factor-of-Safety of 2.00.

The Allowable Uplift Pressure for the panel system was established at 2.0 ft & 5.0 ft, with intermediate Allowable Uplift Pressures being determined via linear interpolation between the two (2) test-established extremes.

E-1592 TEST RESULTS :

Span, ft.	Ultimate Pressure, psf	Allowable Pressure, psf
2.0	198.8	99.4
5.0	63.6	31.8

ALLOWABLE WIND UPLIFT LOAD/SPAN CHART :

Panel Span, feet	Allowable Wind Uplift Pressure, psf
2.0	99.4
2.5	88.1
3.0	76.8
3.5	65.6
4.0	54.3
4.5	43.0
5.0	31.8

General Notes :

1. The Allowable Pressure is the Ultimate Test Pressure divided by a Factor-of-Safety (Load Factor) of 2.00
2. The published Allowable Wind Uplift Pressure considers panel buckling strength, sidejoint disengagement resistance and clip/sidejoint interactive strength only.
3. The clip-to-substrate fastener capacity must be investigated by a Florida-registered structural engineer and consider the clip pry coefficient where applicable.
4. Tests were conducted by Farabaugh Engineering & Testing, Inc. in strict accordance with the ASTM E-1592 procedure.

***** END OF REPORT *****