

**Negative Wind Test for Wall Assemblies to be used in Manufactured Homes:  
Specimen 1**

Client: American Frame MFG. Co.  
Job Number: AFMCO052112-17  
Test Method: *FMHCSS, Section 3280.401(b), Ultimate Load Test Procedure*

Performed By: Todd Ferguson  
Witnessed By: Jacob Yoder

<b>General:</b>	<b>Apparatus:</b>	<b>Asset No.</b>	<b>Ambient Test Conditions:</b>
Received: 7/16/2012	Length Measure:	01385	Ambient Temp.: 73.4 deg. F
Fabrication Date: 7/18/2012	Vacuum Table:	00023	Ambient R.H.: 46.4%
Test Date: 7/26/2012	Manometer:	00337	Sensor Asset No.: 00576
Test Location: NTA, Inc. Nappanee, IN	Moisture Meter:	00830	
	Balance:	00468	

**Specimen Description:**

Specimen No.: 49290  
Clear Span: 96-in.  
Width: 49.5-in.  
Dead Weight: 2.76 psf  
Framing: (4) 2 x 4 Stud SPF 16-in. oc  
Ext. Sheathing: OSB Manufactured by LP Building Products (Mill #407), Span Rated 24/0, Exposure 1 Sheathing, APA Certified PS 2-04 Sheathing, Produced 4/19/2012 3/8-in. OSB 16ga. x 7/16 x 1-1/2-in. Staple 6/6-in. oc edge/field

**Loading Conditions:**

HUD Wind Zone: Zone II (Corner)  
Design Pressure: 48 psf  
Deflection Limit (L/180): 0.533-in.

Ext. Siding: Panels Décor Stone Siding (Urethane Tongue & Groove Decorative Stone Panels)  
#9 x 2-1/2-in. Screw 8-in oc  
Adhesive cure time was 7 days

Int. Sheathing: American Gypsum 5/16-in. Gypsum, Fastening: 19ga. x 3/16 x 3/4-in. Staple 6/0-in. oc edge/field and Pemco 3100 by Alpha Adhesives, 3/8-in. average bead size each framing member

Wood MC: 11.1% - 14.4%

**Specimen 1 Ultimate Load Test Deflection Data**

Load Stages	Applied Pressure (psf)	Left Stud Deflection (in.)			Right Stud Deflection (in.)		
		Top Support	Mid Span	Bottom Support	Top Support	Mid Span	Bottom Support
0 (REF)	0.0	0.000	0.000	0.000	0.000	0.000	0.000
1/4LL	12.5	0.002	0.087	0.024	0.018	0.091	0.027
1/2LL	23.9	0.009	0.162	0.040	0.031	0.170	0.046
3/4LL	36.4	0.022	0.238	0.050	0.045	0.251	0.058
LL	47.8	0.032	0.317	0.059	0.056	0.333	0.067
5/4LL	61.4	0.044	0.409	0.070	0.066	0.431	0.077
5/2LL	120.3	--	--	--	--	--	--

**Net LL Deflection: 0.272-in. at 48 psf**

**Ultimate Uniform Load: 153 psf**

**Failure Mode:** *Sheathing to framing fastener withdrawal and pull through at bottom of specimen, resulting in fastener pull through at bottom plate to stud connection.*

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**Negative Wind Test for Wall Assemblies to be used in Manufactured Homes:  
Specimen 2**

Client: American Frame MFG. Co.  
Job Number: AFMCO052112-17  
Test Method: *FMHCSS, Section 3280.401(b), Ultimate Load Test Procedure*

Performed By: Todd Ferguson  
Witnessed By: Jacob Yoder

<b>General:</b>	<b>Apparatus:</b>	<b>Asset No.</b>	<b>Ambient Test Conditions:</b>
Received: 7/16/2012	Length Measure:	01385	Ambient Temp.: 73.7 deg. F
Fabrication Date: 7/18/2012	Vacuum Table:	00023	Ambient R.H.: 45.6%
Test Date: 7/26/2012	Manometer:	00337	Sensor Asset No.: 00576
Test Location: NTA, Inc. Nappanee, IN	Moisture Meter:	00830	
	Balance:	00468	

**Specimen Description:**

Specimen No.: 49291  
Clear Span: 96-in.  
Width: 49.5-in.  
Dead Weight: 2.87 psf  
Framing: (4) 2 x 4 Stud SPF 16-in. oc  
Ext. Sheathing: OSB Manufactured by LP Building Products (Mill #407), Span Rated 24/0, Exposure 1 Sheathing, APA Certified PS 2-04 Sheathing, Produced 4/19/2012 3/8-in. OSB 16ga. x 7/16 x 1-1/2-in. Staple 6/6-in. oc edge/field

**Loading Conditions:**

HUD Wind Zone: Zone II (Corner)  
Design Pressure: 48 psf  
Deflection Limit (L/180): 0.533-in.

Ext. Siding: Panels Décor Stone Siding (Urethane Tongue & Groove Decorative Stone Panels)  
#9 x 2-1/2-in. Screw 8-in oc

Int. Sheathing: American Gypsum 5/16-in. Gypsum, Fastening: 19ga. x 3/16 x 3/4-in. Staple 6/0-in. oc edge/field and Pemco 3100 by Alpha Adhesives, 3/8-in. average bead size each framing member

Wood MC: 12% - 16%

**Specimen 2 Ultimate Load Test Deflection Data**

Load Stages	Applied Pressure (psf)	Left Stud Deflection (in.)			Right Stud Deflection (in.)		
		Top Support	Mid Span	Bottom Support	Top Support	Mid Span	Bottom Support
0 (REF)	0.0	0.000	0.000	0.000	0.000	0.000	0.000
1/4LL	12.5	0.060	0.100	0.011	0.023	0.084	0.021
1/2LL	23.9	0.075	0.163	0.019	0.031	0.146	0.030
3/4LL	37.4	0.090	0.248	0.030	0.041	0.233	0.041
LL	47.8	0.100	0.318	0.037	0.050	0.304	0.049
5/4LL	60.3	0.115	0.407	0.045	0.063	0.393	0.057
5/2LL	120.4	--	--	--	--	--	--

**Net LL Deflection: 0.252-in. at 48 psf**  
**Ultimate Uniform Load: 177 psf**  
**Failure Mode: Screw head pull through on second panel from bottom.**

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**Negative Wind Test for Wall Assemblies to be used in Manufactured Homes:  
Specimen 3**

Client: American Frame MFG. Co.  
Job Number: AFMCO052112-17  
Test Method: *FMHCSS, Section 3280.401(b), Ultimate Load Test Procedure*

Performed By: Todd Ferguson  
Witnessed By: Jacob Yoder

<b>General:</b>	<b>Apparatus:</b>	<b>Asset No.</b>	<b>Ambient Test Conditions:</b>
Received: 7/16/2012	Length Measure:	01385	Ambient Temp.: 73.5 deg. F
Fabrication Date: 7/18/2012	Vacuum Table:	00023	Ambient R.H.: 52.2%
Test Date: 7/26/2012	Manometer:	00337	Sensor Asset No.: 00576
Test Location: NTA, Inc. Nappanee, IN	Moisture Meter:	00830	
	Balance:	00468	

**Specimen Description:**

Specimen No.: 49292  
Clear Span: 96-in.  
Width: 49.5-in.  
Dead Weight: 2.94 psf  
Framing: (4) 2 x 4 Stud SPF 16-in. oc  
Ext. Sheathing: OSB Manufactured by LP Building Products (Mill #407), Span Rated 24/0, Exposure 1 Sheathing, APA Certified PS 2-04 Sheathing, Produced 4/19/2012 3/8-in. OSB 16ga. x 7/16 x 1-1/2-in. Staple 6/6-in. oc edge/field

**Loading Conditions:**

HUD Wind Zone: Zone II (Corner)  
Design Pressure: 48 psf  
Deflection Limit (L/180): 0.533-in.

Ext. Siding: Panels Décor Stone Siding (Urethane Tongue & Groove Decorative Stone Panels)  
#9 x 2-1/2-in. Screw 8-in oc

Int. Sheathing: American Gypsum 5/16-in. Gypsum, Fastening: 19ga. x 3/16 x 3/4-in. Staple 6/0-in. oc edge/field and Pemco 3100 by Alpha Adhesives, 3/8-in. average bead size each framing member

Wood MC: 11.6% - 16.2%

**Specimen 3 Ultimate Load Test Deflection Data**

Load Stages	Applied Pressure (psf)	Left Stud Deflection (in.)			Right Stud Deflection (in.)		
		Top Support	Mid Span	Bottom Support	Top Support	Mid Span	Bottom Support
0 (REF)	0.0	0.000	0.000	0.000	0.000	0.000	0.000
1/4LL	12.5	0.045	0.092	0.015	0.024	0.099	0.061
1/2LL	23.9	0.061	0.163	0.024	0.036	0.171	0.078
3/4LL	36.4	0.079	0.247	0.034	0.049	0.254	0.089
LL	47.8	0.093	0.331	0.044	0.061	0.335	0.098
5/4LL	60.3	0.105	0.423	0.052	0.074	0.423	0.108
5/2LL	120.5	--	--	--	--	--	--

**Net LL Deflection: 0.259-in. at 48 psf**  
**Ultimate Uniform Load: 138 psf**  
**Failure Mode: Screw head pull through along bottom panel.**

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**Negative Wind Test for Wall Assemblies to be used in Manufactured Homes:  
Results Summary**

Client: American Frame MFG. Co.  
Job Number: AFMCO052112-17  
Test Method: *FMHCSS, Section 3280.401(b), Ultimate Load Test Procedure*

Performed By: Todd Ferguson  
Witnessed By: Jacob Yoder

**Specimen Description:**

Clear Span: 96-in.  
Width: 49.5-in.

**Loading Conditions:**

HUD Wind Zone: Zone II (Corner)  
Design Pressure: 48 psf  
Deflection Limit (L/180): 0.533-in.

Framing: (4) 2 x 4 Stud SPF 16-in. oc  
Ext. Sheathing: *OSB Manufactured by LP Building Products (Mill #407), Span Rated 24/0, Exposure 1 Sheathing, APA Certified PS 2-04 Sheathing, Produced 4/19/2012 3/8-in. OSB 16ga. x 7/16 x 1-1/2-in. Staple 6/6-in. oc edge/field*

Ext. Siding: *Panels Décor Stone Siding (Urethane Tongue & Groove Decorative Stone Panels) #9 x 2-1/2-in. Screw 8-in oc*

Int. Sheathing: *American Gypsum 5/16-in. Gypsum, Fastening: 19ga. x 3/16 x 3/4-in. Staple 6/0-in. oc edge/field and Pemco 3100 by Alpha Adhesives, 3/8-in. average bead size each framing member*

Wood MC: 11.1% - 16.2%

**Overall Test Results**

Specimen	Specimen No.	Ultimate Pressure (psf)	Service Deflection (in.)
1	49290	153	0.272
2	49291	177	0.252
3	49292	138	0.259

**Average Ultimate Pressure<sup>b</sup>: 156 psf, Pass (48 psf x 2.5 - Specimen Dead Load = Min. Ultimate Pressure)**  
**Average Midspan Deflection<sup>a</sup>: 0.261-in., Pass (L/180 = 0.533-in.)**

<sup>a</sup>Midspan deflection less the average of the support deflections.

<sup>b</sup>If the orientation of specimen during testing is horizontal, the specimen dead load may be subtracted from the design pressure to obtain the required minimum ultimate pressure.

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