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**EVALUATION OF DIZAL INC., PRINTED ALUMINUM SIDING SYSTEM IDENTIFIED AS
“DIGITALLY PRINTED ALUMINUM SIDING / 6”
FOR IMPACT RESISTANCE IN ACCORDANCE WITH ISO 7895**

Report to:	DiZal Inc. 1020 Bouvier, Suite 400 Quebec City, Quebec G2K 0K9
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Report No.:	16-06-M0274-2 5 Pages, 1 Appendix
Proposal No.:	16-006-457671
Date:	March 15, 2017

1.0 INTRODUCTION

At the request of DiZal Inc., Exova was retained to evaluate the "Digitally Printed Aluminum Siding / 6" extruded Aluminum cladding system for evaluation purposes. The testing was conducted in accordance to a CCMC Draft Technical Guide (Reference only) and ISO 7892 as outlined in Proposal Number: 16-006-457671 for Impact Resistance.

Upon receipt and construction, the specimen was assigned the following Exova Specimen Number:

Client Specimen Description

Digitally Printed Aluminum Siding / 6" (Horizontal Cladding- Impact)
Digitally Printed Aluminum Siding / 6" (Vertical Cladding- Impact)
(for CCMC Draft Technical Guide, "Impact Resistance" Testing)

Exova Specimen No.

16-06-M0274-1
16-06-M0274-2

Specimens were constructed by DiZal Inc.'s representative at Exova on November 29, 2016

2.0 PROCEDURE

Test Method	Test Description
CCMC Draft Technical Guide referencing ISO 7895	Impact Resistance

2.1 TEST WALL CONSTRUCTION

Two test walls were constructed, one to test the siding for impact resistance testing in horizontal and one to test in the vertical orientation.

The cladding system installed in the horizontal orientation was secured to the exterior face of the wall section directly to the plywood sheathing using the same stud spacing pattern as the framing members. A full-width aluminum starter strip as fastened along the bottom of the wall on the exterior face using #8 38mm (1-1/2") long Robison screws fastened every 406 mm (16") on centre. The starter strip along the bottom edge that engaged the backside of the first course of siding.

Each test wall section was installed into a steel transport frame lined with (51 mm x 152 mm) 2" x 6" SPF lumber.

DiZal Inc. provided installation details are located in Appendix A. The cladding on both test walls was installed by DiZal Inc. personnel. A general construction detail of the wall section constructed is located in Appendix B of this test report. *Note: The wall assemblies did not contain furring strips.*

Impact Resistance Test Samples

The 1219 mm (48") wide by x 1219 mm (48") high test wall sections were constructed by Exova trained staff at Exova's Mississauga facility on November 25, 2016. Two test walls were constructed to test the siding in the horizontal and vertical orientation. All materials used (*with exception of the DiZal Inc. material*) were commercially purchased.

The impact resistance base wall sections consisted of nominal 2" x 6" SPF studs and head and sill plates and 12.7 mm (1/2") plywood sheathing. The spacing between each stud section was nominally 406 mm (16") on-center, except for the last stud at one end of the test wall, where the stud was positioned 387 mm (15-1/4") on centre from the outside edge of the adjacent perimeter stud.

The head and sill plates were fastened to the studs using two #8 x 3" long flathead screws per stud end. The plywood sheathing was fastened to the SPF framing using 2-1/4" long x 0.099" thick galvanized ardox nails on nominal 406 mm (16") on centers.

2.1 TEST WALL CONSTRUCTION (CONTINUED)

The cladding system installed in the horizontal orientation was secured to the exterior face of the wall section directly to the plywood sheathing using the same stud spacing pattern as the framing members. A starter strip was used with this sample. The cladding system was fastened using #8 x 38 mm (1-1/2") long Robison screws fastened every 406 mm (16") centers.

2.2 TEST DATES

Cladding Horizontal:

Test Criteria

Impact Resistance (Large Soft Bag)
Impact Resistance (Small Hard Ball)

Testing Dates

January 12, 2017
January 12, 2017

Cladding Vertical:

Test Criteria

Impact Resistance (Large Soft Bag)
Impact Resistance (Small Hard Ball)

Testing Dates

January 12, 2017
January 12, 2017

3.0 SUMMARIZED TEST RESULTS

Cladding Horizontal and Vertical

Table 1 – Summarized Test Results CCMC Draft Technical Guide Impact Resistance			
Test	Requirements	Results	Comment
Impact Resistance	The cladding system shall be capable of withstanding the applied impact loads specified in CCMC Draft Technical guide, Table 1 without any deterioration in the performance or safety of the system	The cladding system withstood the applied impact loads from CCMC Draft Technical Guide, Table 1 without any deterioration in the performance or safety of the system <i>(Test results are presented in Section 4, Tables 7-8)</i>	Meets Requirement

4.0 DETAILED IMPACT TEST RESULTS

Table 2- Safety Impact Results CCMC Draft Technical Guide Exova Specimen Number: 16-06-M0274-1- Horizontal Cladding				
Impact Body	Dynamic Mass	Energy	Requirements	Results
Large Soft	50 kg	100 N.m	The cladding may be damaged but must not: - Allow the impact body to penetrate through; - Be dislodged from its fixings; - Allow falling debris, capable of injuring people; - Impair the safety of the structure if the cladding has a structural function or is fixed to a structural element	No Deterioration was Observed. Meets Requirement
Small Hard	1 kg	10 N.m	The cladding system must fulfill the above requirements but the impact body may pass through the cladding	No Deterioration was Observed. Meets Requirement

Table 3 - Retention Performance Impact Results CCMC Draft Technical Guide Exova Specimen Number: 16-06-M0274-1- Horizontal Cladding				
Impact Body	Dynamic Mass	Energy	Requirements	Result
Large Soft	50 kg	34 N.m	The cladding system must retain all its functional characteristics and its overall appearance.	No Deterioration was Observed. Meets Requirement
Small Soft	3 kg	60 N.m		No Deterioration was Observed. Meets Requirement
Hard	1 kg	10 N.m		No Deterioration was Observed. Meets Requirement

5.0 IMPACT TEST RESULTS- VERTICAL CLADDING

Table 4 - Safety Impact Results CCMC Draft Technical Guide Exova Specimen Number: 16-06-M0274-2- Vertical Cladding				
Impact Body	Dynamic Mass	Energy	Requirements	Results
Large Soft	50 kg	100 N.m	The cladding may be damaged but must not: - Allow the impact body to penetrate through; - Be dislodged from its fixings; - Allow falling debris, capable of injuring people; - Impair the safety of the structure if the cladding has a structural function or is fixed to a structural element	No Deterioration was Observed. Meets Requirement
Small Hard	1 kg	10 N.m	The cladding system must fulfill the above requirements but the impact body may pass through the cladding	No Deterioration was Observed. Meets Requirement

Table 5 - Retention Performance Impact Results CCMC Draft Technical Guide Exova Specimen Number: 16-06-M0274-2- Vertical Cladding				
Impact Body	Dynamic Mass	Energy	Requirements	Result
Large Soft	50 kg	34 N.m	The cladding system must retain all its functional characteristics and its overall appearance.	No Deterioration was Observed. Meets Requirement
Small Soft	3 kg	60 N.m		No Deterioration was Observed. Meets Requirement
Hard	1 kg	10 N.m		No Deterioration was Observed. Meets Requirement

6.0 CONCLUSION

Exova Specimens 16-06-M0274-1 identified as "Digitally Printed Aluminum Siding / 6" installed in the horizontal orientation were tested for general evaluation purposes for Impact Resistance for cladding installed in the horizontal orientation.

Exova Specimens 16-06-M0274-2 identified as "Digitally Printed Aluminum Siding / 6" installed in the vertical orientation were tested for general evaluation purposes for Impact Resistance for cladding installed in the vertical orientation.

7.0 REPORT REVISION SUMMARY

Revision No:
16-06-M0274-2

Date:
2017-March 15

Description of Revisions:
Original Document

Reported by:


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APPENDIX A

Client Installation Guide and Product Drawings
(As Provided by DiZal Inc.)

(11 Pages)



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| INSTALLATION GUIDE |

INSTALLATION STEPS



1. IMPORTANT NOTES

Use galvanized screws #8 x 1.5" every 16"

Aluminum undergoes expansion and contraction due to temperature variation. Do not screw completely. Keep 1/16" and screw in the center of the slot.

Always use a piece of wood to "snap" the cap on the base of the accessories. A protection must be used on the wood not to damage the texture.



2. TO START

Install the base of the J-Trim, H-Trim and outside corner first.

Screw through the base every 16".



3. STARTER STRIP

Install the starter strip as showed and keep 3/16" on both ends for expansion and contraction.

Make sure the starter strip is level.

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4. PLANKS

The planks must be well insert one on the other before screwing.

Always start left to right.



5. J-TRIM

Keep 3/16" between the trim and the plank to permit expansion and contraction.

Use a piece of wood to "snap" the cap on the base of the J-Trim.



6. H-TRIM

Keep 3/16" between the trim and the plank to permit expansion and contraction.

Use a piece of wood to "snap" the cap on the base of the H-Trim.

INSTALLATION STEPS



7. OUTSIDE CORNER (OSC)

Keep 3/16" between the outside corner and the plank to permit expansion and contraction.

Use a piece of wood to "snap" the cap to the base of the OSC.

A protection must be used on the wood not to damage the texture.



8. INSIDE CORNER

To make an inside corner, finish the first wall with J-Trim 1 3/4" and start the adjacent wall with J-Trim 1".

Keep 3/16" between the trims and the planks to permit expansion and contraction.

Use a piece of wood to "snap" the cap on the base of the J-Trim.



9. LAST ROW

On the last row use J-Trim 1" or J-Trim 1 3/4" as shown.

Install a small spacer 0.400" to avoid movement on the last row.

Keep 3/16" from the "snap wall" and on both ends of the plank for expansion and contraction.

Use a piece of wood to "snap" the cap on the base of the J-Trim.

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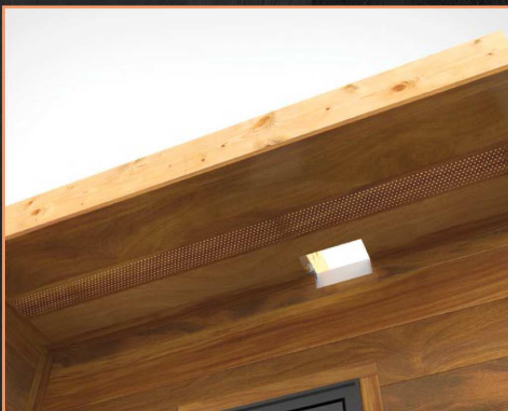
10. WINDOW

For a window or a door, simply use J-Trim 1" or J-Trim 1 3/4" as shown.



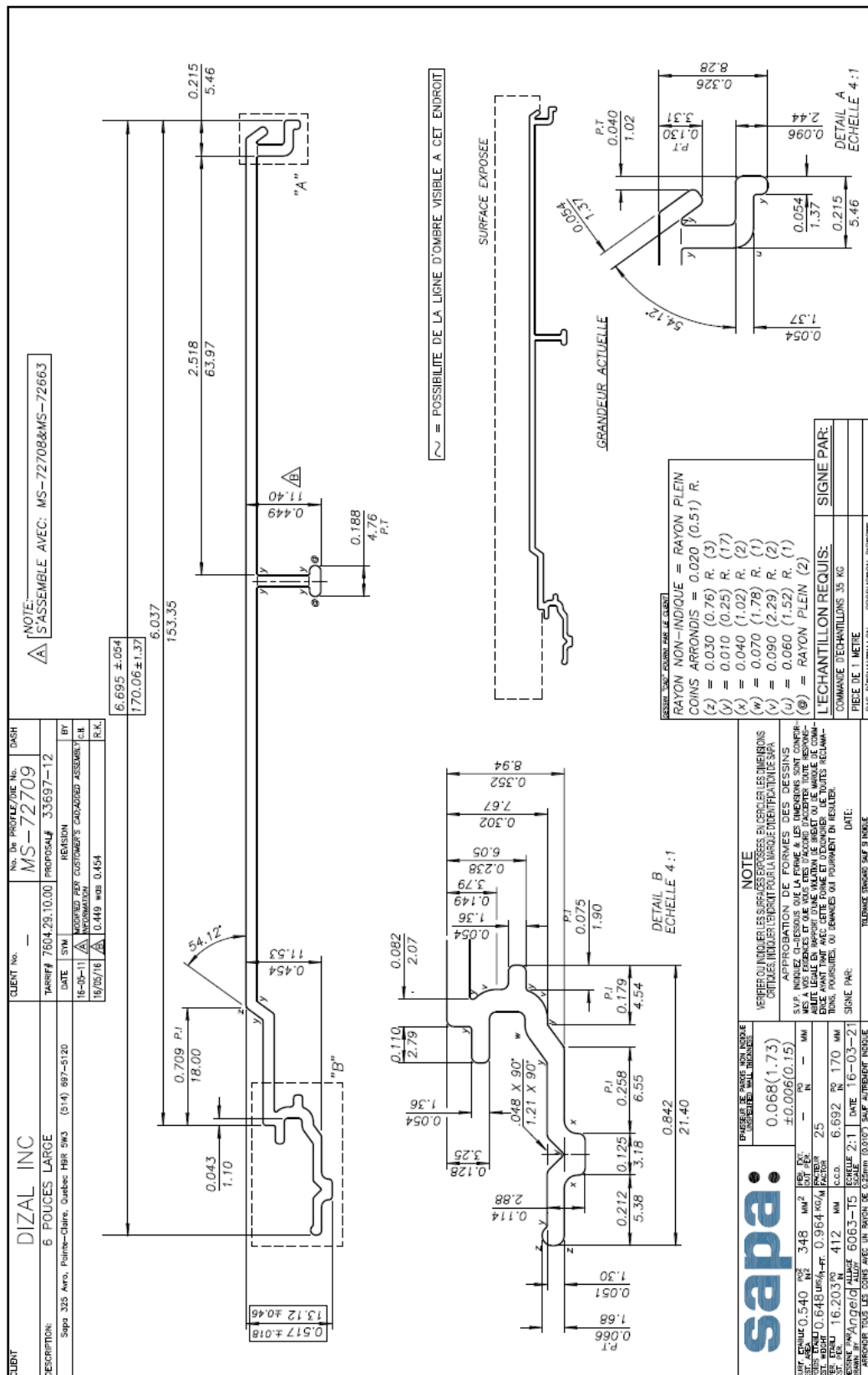
11. ADJACENT PLANKS

It is possible to install two planks without using an H-Trim. In that case, you must lock them at the junction and screw every 16" using the slots.



12. SOFFIT

The plank can be used as a soffit. The junction from the wall to the soffit is done as an inside corner. (Step 8.)



[illegible]