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SERVICE DE CONSULTATION DE VALLEYFIELD INC
Service d'ingénierie

Le 28 octobre 2016

DekSmart Railings / Century Aluminium Railings
Phone : 778-516-6000
Fax : 778-765-6003

Réf : Rapport d'évaluation de produit pour leur conformité
au Code de Construction du Québec 2010

Monsieur

Pour faire suite au mandat que vous nous avez confié, il me fait plaisir de vous soumettre notre rapport de vérification du « Test report » de la firme Intertek (rapport numéro 102024155COQ-001 du 25 Février 2015), pour votre produit appelé « 8 ft Component Picket System » qui pourrait être traduit en français à « Système de garde corps de 8 pieds avec poteau ». Vous trouverez ci-joint une copie de ce rapport.

Le but de notre étude était de vérifier si le rapport et les essais réalisés par la firme Intertek étaient aussi valables au Québec selon le CCQ 2010 qu'ils le sont pour le Code National du Bâtiment du Canada 2010.

Selon le rapport de la firme Intertek, les essais ont été réalisés pour vérifier si la capacité de ce produit est conforme aux exigences des articles suivants du CCQ-2010 :

Article 9.8.8.2 1) à 4) RÉSISTANCE DES GARDE-CORPS
qui stipule :

- 1) *Les garde-corps doivent être conçus de façon à résister aux charges spécifiques prescrites au tableau 9.8.8.2*

Tableau 9.8.8.2

Emplacement du garde-corps	Charges de calcul minimales		
	charge appliquée horizontalement vers l'intérieur ou l'extérieur, à n'importe quel point de la hauteur minimale requise d'un garde-corps	charge appliquée horizontalement vers l'extérieur ou l'intérieur, sur les éléments constitutifs des garde-corps, y compris les panneaux pleins et les poteaux	charge verticale appliquée uniformément à la partie supérieure du garde-corps
garde-corps à l'intérieur d'un logement et garde-corps extérieur ne desservant pas plus de 2 logements	0,5 kN/m OU charge concentrée de 1,0 kN appliquée à n'importe quel point	0,5 kN appliquée sur une largeur maximale de 300 mm et à une hauteur de 300 mm	1,5 kN/m

- 3) *Il n'est pas obligatoire de considérer que plusieurs des charges prescrites au tableau 9.8.8.2 agissent simultanément.*

Article 9.8.8.3 1) HAUTEUR DES GARDE-CORPS qui stipule :

- 1) Sous réserve des paragraphes 2) à 4), tous les garde-corps doivent avoir une hauteur d'au moins 1070 mm.

Article 9.8.8.5 1) OUVERTURES qui stipule :

- 1) *Sous réserve du paragraphe 2), les parties ajourées d'un garde-corps exigé à l'article 9.8.8.1 ne doivent pas permettre le passage d'un objet sphérique de 100 mm de diamètre, sauf s'il peut être démontré que les ouvertures dépassant cette limite ne présentent pas de danger de par leur emplacement et leur dimension.*

Article 9.8.8.6 1) et 2) CONCEPTION DES GARDE-COPRS NE FACILITANT PAS L'ESCALADE qui stipule :

- 1) Les garde-corps exigés en vertu de l'article 9.8.8.1; , sauf ceux des établissements industriels et sauf s'il peut être démontré que l'emplacement et les dimensions des ouvertures ne présentent pas de danger, ne doivent avoir ni élément de fixation, ni saillir, ni partie ajourée pouvant en faciliter l'escalade.
- 2) Les garde-corps sont réputés conformes au paragraphe 1) si tous les éléments en saillie sur le plan vertical et situés à une hauteur de 140 mm à 900 mm au-dessus du plancher ou de la surface de circulation piétonnière protégé par le garde-corps respectent au moins l'un des alinéas suivants :
 - a) Ils sont espacés de plus de 450 mm les uns des autres, horizontalement et verticalement;
 - b) Ils ne sont pas décalés de plus de 15 mm horizontalement;
 - c) Ils n'offrent pas d'appui pour le pied de plus de 45 mm horizontalement et 200 mm verticalement; ou
 - d) Ils ont une pente supérieure à 2 : 1 sur la saillie

Il est important de noter les points suivants avant d'aller plus loin. Premièrement, le texte de ces articles est le même dans le CNB 2010 et dans le CCQ 2010. Deuxièmement, tel qu'indiqué dans le rapport d'Intertek, la fixation au support du produit n'a pas été vérifiée, puisque les conditions de fixation changent d'un projet à l'autre. Aussi, le rapport d'essai ne certifie que la résistance du produit lui-même.

Le rapport de la compagnie Intertek indique que leurs essais ont effectivement vérifié la résistance de ce produit selon plusieurs cas de chargements possibles, tel que spécifié dans les articles du CCQ-2010 cités précédemment. Les résultats de ces essais indiquent que ce produit a résisté adéquatement aux essais de chargement qu'ils ont réalisés. Le rapport indique également que le produit est conforme aux autres exigences (hauteurs, etc.) des ces articles du CCQ-2010.

Aussi, nous pouvons conclure que ce produit est conforme aux critères spécifiés aux articles cités précédemment du CCQ-2010.

Espérant le tout à votre entière satisfaction, je demeure à votre disposition pour toutes informations additionnelles.

Bien à vous



Gérard Pilon, Ing

TEST REPORT

Intertek

REPORT NUMBER: 102024155COQ-001
ORIGINAL ISSUE DATE: February 25, 2015

EVALUATION CENTER

INTERTEK TESTING SERVICES NA LTD.
1500 BRIGANTINE DRIVE
COQUITLAM, BC V3K 7C1

RENDERED TO

CENTURY ALUMINUM RAILINGS
A DIVISION OF BEAVER HOME IMPROVEMENTS
9685 AGUR STREET
SUMMERLAND, BC V0H1Z2
CANADA

PRODUCT EVALUATED:
8 ft. Component Picket System

EVALUATION PROPERTY:
Load Requirements

Report of 8 ft. Component Picket System for compliance with the applicable requirements of the following criteria:

- **2010 National Building Code of Canada**
 - Section 9.8.8.2, 9.8.8.3, 9.8.8.5, and 9.8.8.6
- **2012 Ontario Building Code**
 - Section 9.8.8.2, 9.8.8.3, 9.8.8.5, and 9.8.8.6
- **2006 Alberta Building Code**
 - Section 9.8.8.2, 9.8.8.3, 9.8.8.5, and 9.8.8.6
- **2012 British Columbia Building Code**
 - Section 9.8.8.2, 9.8.8.3, 9.8.8.5, and 9.8.8.6

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2 Introduction

Intertek Testing Services NA Ltd. (Intertek) has conducted a test program on a railing system submitted by Century Aluminum Railings – A Division of Beaver Home Improvements. The evaluation was carried out to determine whether their 8 ft. Component Picket System would resist the required loads for dwelling units and exterior guards serving not more than 2 dwelling units, as specified in the following Building Codes:

- 2010 National Building Code of Canada (NBC)
 - Section 9.8.8.2, *Loads On Guards*
 - Section 9.8.8.3, *Height of Guards*
 - Section 9.8.8.5, *Openings in Guards*
 - Section 9.8.8.6, *Design of Guards to Not Facilitate Climbing*
- 2012 Ontario Building Code (OBC)
 - Section 9.8.8.2, *Loads On Guards*
 - Section 9.8.8.3, *Height of Guards*
 - Section 9.8.8.5, *Openings in Guards*
 - Section 9.8.8.6, *Guards Designed Not to Facilitate Climbing*
- 2006 Alberta Building Code (ABC)
 - Section 9.8.8.2, *Loads On Guards*
 - Section 9.8.8.3, *Height of Guards*
 - Section 9.8.8.5, *Openings in Guards*
 - Section 9.8.8.6, *Design to Prevent Climbing*
- 2012 British Columbia Building Code (BCBC)
 - Section 9.8.8.2, *Loads On Guards*
 - Section 9.8.8.3, *Height of Guards*
 - Section 9.8.8.5, *Openings in Guards*
 - Section 9.8.8.6, *Design of Guards to Not Facilitate Climbing*

This evaluation was conducted in the month of February 2015.

3 Test Samples

3.1. SAMPLE SELECTION

The client submitted various railing components to assemble one (1) 8 ft. guard rail system to the Evaluation Center on February 19, 2015 (Coquitlam ID# VAN1502191013-001). Components submitted were posts with caps, pickets, top and bottom rails, picket spacers, and fasteners.

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

The assembled railing system was identified as the following:

Table 1. Railing Details				
Railing	Posts and Base	Picket	Rails	Other
8 ft. Component Picket System	2-1/2" x 2-1/2" (6063-T54 aluminum) with 4" x 4" x 1/4" base (6005A-T6 aluminum)	5/8" x 5/8" 6063-T54 aluminum	Top and bottom rail 6063-T54 aluminum	2 support legs spaced equally under bottom rail; 6063-T54 aluminum

Note: The installation of the guardrail to the deck was not within the scope of this report, and is subject to evaluation and approval by the building official. Four 3/8 in. grade 5 bolts and washers on each post were used to install the specimen for testing.

4 Testing and Evaluation Methods

The evaluation was conducted in accordance with the testing procedures of ASTM E935-13e1, *Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings*. The test specimen was loaded at a rate to achieve the specified loads between 10 seconds and 5 minutes. The specified test loads were held for one minute before the load was released. As per Section 9.8.8.2 of the 2010 NBC, 2012 OBC, 2006 ABC, and 2012 BCBC, the following tests were conducted for use within dwelling units and exterior guards serving not more than 2 dwelling units:

4.1 2010 NBC/2012 OBC/2006 ABC/2012 BCBC: SECTION 9.8.8.2. LOADS ON GUARDS

- 1) The minimum specified horizontal load applied inward or outward at the top of every required guard shall be 0.5 kN/m or a concentrated load of 1.0 kN applied at any point
- 2) Individual elements within the *guard*, including solid panels and pickets, shall be designed for a concentrated load of 0.5 kN applied over an area of 300 mm x 300 mm located at any point in the element or elements so as to engage 3 balusters.
- 3) The minimum specified load applied vertically at the top of every required *guard* shall be 1.5 kN/m.
- 4) None of the loads specified above need be considered to act simultaneously.

Notes:

1. A safety factor of 1.67-2.24 was applied to the above loads.

4.2 2010 NBC/2012 OBC/2006 ABC/2012 BCBC: SECTION 9.8.8.3 HEIGHT OF GUARDS

- 1) All guards shall be not less than 1070 mm high.

4.3 2010 NBC/2012 OBC/2006 ABC/2012 BCBC: SECTION 9.8.8.5 OPENINGS IN GUARDS

- 1) Openings through any guard shall be of a size that will prevent the passage of a spherical object having a diameter of 100 mm unless it can be shown that the location and size of openings that exceed this limit do not present a hazard.

4.4 2010 NBC/2012 OBC/2006 ABC/2012 BCBC: SECTION 9.8.8.6 DESIGN OF GUARDS TO NOT FACILITATE CLIMBING

- 1) Guards except those in industrial occupancies and where it can be shown that the location and size of openings do not present a hazard, shall be designed so that no member, attachment or opening facilitates climbing.
- 2) Guards shall be deemed to comply with Sentence (1) where all elements protruding from the vertical and located within the area between 140 mm and 900 mm above the floor or walking surface protected by the guard conform to one of the following clauses:
 - a) they are located more than 450mm horizontally and 20 mm vertically, or
 - b) they provide not more than 15 mm horizontal offset,
 - c) they do not provide a toe-space more than 45mm horizontally and 20 mm vertically, or
 - d) they present more than a 2-in-1 slope on the offset.

4.5 IN-FILL LOAD TEST

A load of 0.83 kN (187 lbf) was applied using a 300 mm x 300 mm square block on the center of the railing system normal to the in-fill so as to engage 3 glass balusters. After release of the load, the system was evaluated for failure, any evidence of disengagements of any component and visible cracks in any component.

4.6 UNIFORM LOAD TEST

The top rail of the guardrail system was subjected to two separate tests where a maximum equivalent uniform load of 0.83 kN/m (57 plf) was applied horizontally and 2.50 kN/m (171 plf) was applied vertically. The loads were applied using quarter point loads. After release of the load, the system was evaluated for failure, any evidence of disengagements of any component and visible cracks in any component.

4.7 CONCENTRATED LOAD TEST

The top rail of the guardrail system was subjected to three separate tests where a concentrated load was applied at the following locations:

- 1.67 kN (375 lbs) horizontally at the centre of the guardrail,
- 2.24 kN (503 lbs) horizontally at the top rail adjacent to the post connection to verify the connection capacity, and
- 1.67 kN (375 lbs) horizontally at the top of the post.

5 Testing and Evaluation Results

5.1. RESULTS AND OBSERVATIONS

The product test results are shown in Table 1 below and a copy of the test data is located in Appendix A.

Table 1. Test Results				
Section	Property	Result	Requirement	Pass/Fail
9.8.8.2	In-fill Load	187 lbs	187 lbs	Pass
	Vertical Uniform Load	171 lbs/ft	171 lbs/ft	Pass
	Horizontal Uniform Load	57 lbs/ft	57 lbs/ft	Pass
	Mid-span Concentrated Load	375 lbs	375 lbs	Pass
	Adjacent to Post Connection Concentrated Load	503 lbs	503 lbs	Pass
	Top of Post	375 lbs	375 lbs	Pass
	Top of Post Ultimate Failure	561 lbs	As Reported	As Reported
9.8.8.3	Height of Guards	1070 mm	≥ 1070 mm	Pass
9.8.8.5	Openings in Guards	Between pickets: 98 mm Under bottom rail: 64 mm	< 100 mm	Pass
9.8.8.6	Design to Not Facilitate Climbing	No elements protruding from the vertical between 140 mm and 900 mm	No elements from the vertical between 140 mm and 900 mm that facilitate climbing	Pass

6 Conclusion

The Century Aluminum Railings 8 ft. Component Picket System identified and evaluated in this test report has complied with the load requirements for guards within dwelling units and in exterior guards serving not more than 2 dwelling units, as specified in the following Building Codes:

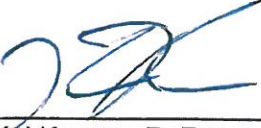
- 2010 National Building Code of Canada (NBC)
 - Section 9.8.8.2, *Loads On Guards*
 - Section 9.8.8.3, *Height of Guards*
 - Section 9.8.8.5, *Openings in Guards*
 - Section 9.8.8.6, *Design of Guards to Not Facilitate Climbing*
- 2012 Ontario Building Code (OBC)
 - Section 9.8.8.2, *Loads On Guards*
 - Section 9.8.8.3, *Height of Guards*
 - Section 9.8.8.5, *Openings in Guards*
 - Section 9.8.8.6, *Guards Designed Not to Facilitate Climbing*
- 2006 Alberta Building Code (ABC)
 - Section 9.8.8.2, *Loads On Guards*
 - Section 9.8.8.3, *Height of Guards*
 - Section 9.8.8.5, *Openings in Guards*
 - Section 9.8.8.6, *Design to Prevent Climbing*
- 2012 British Columbia Building Code (BCBC)
 - Section 9.8.8.2, *Loads On Guards*
 - Section 9.8.8.3, *Height of Guards*
 - Section 9.8.8.5, *Openings in Guards*
 - Section 9.8.8.6, *Design of Guards to Not Facilitate Climbing*

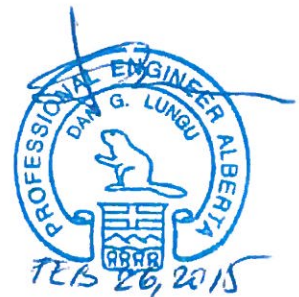
The product test results are presented in Section 5 of this report.

INTERTEK TESTING SERVICES NA LTD.

Reported by: 
Chris Chang, P.Eng.
Engineer, Building Products

Reviewed by: 
Dan Lungu, P. Eng.
Engineer, Manufactured Housing

Reviewed by: 
Kai Kooner, P. Eng.
Manager, Building Products



APPENDIX A: Test Data (3 pages)



Company	Century Aluminum Railings	Technician(s)	Chris Chang
Project No.	G102024155	Reviewer	Dan Lungu / Kal Kooner
Models	8 ft. Component Picket System	Start/End Date	February 24-25, 2015
Product Name	Same as above	Sample ID	VAN1502191013-001
Standard	2010 NBC/2012 OBC/2012 BCBC, Section 9.8.8.2, 9.8.8.3, 9.8.8.5, 9.8.8.6		

Test Data Package

Table of Contents

Sheet	Page
Table of Contents (This Sheet)	1
Load on Guards	2
Dimensional Checks	3

Test: Loads on Guards

Date: 24-Feb-15

Client: Century Aluminum Railings

Product: 8 ft. Component Picket System

Post Spacing: 8.25 ft 2.51 m

Height of Guard: 42 in 1070 mm

Opening in Guard: 3.875 in 98 mm

Method: 2010 National Building Code of Canada, 9.8.8.2 Loads on Guards

2012 Ontario Building Code, 9.8.8.2 Loads on Guards

2006 Alberta Building Code, Section 9.8.8.2

2012 British Columbia Building Code, 9.8.8.2 Loads on Guards

Safety Factor: 2.24 (based on a resistance factor $\phi = 0.67$ for connection-fasteners)

1.67 (based on a resistance factor $\phi = 0.9$ for aluminum-ductile)

Equipment: Artech 5000 lbf Load Cell (Intertek ID# P60690, cal due November 2015)

Vaisala Temp/RH Indicator (Intertek ID# 9-0176, cal due July 2015)

Stopwatch (Intertek ID# P60624, cal due July 2015)

Mitutoyo Digital Caliper (Intertek ID# P60005, cal due May 2015)

Time/Temp/RH: 8:00AM / 22.0°C / 49.0%

Project: G102024155

Eng/Tech: Chris Chang

Reviewer: Kal Kooner

Dan Lungu

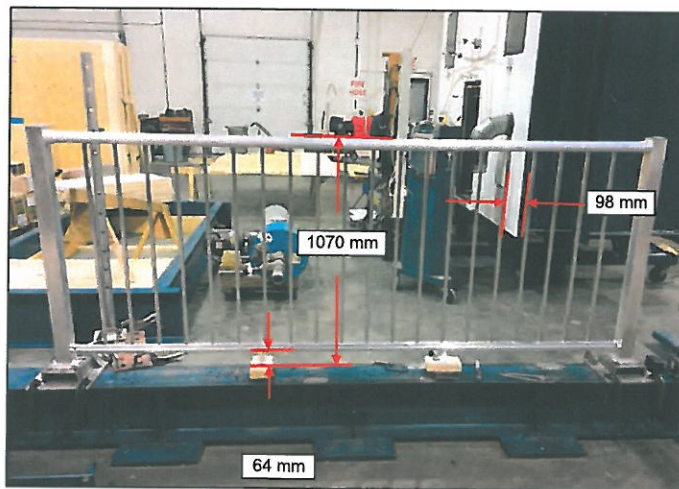
Direction	Test	Design Load (Inward/Outward) (lbf)	Factored Load	Calculated Moment (lbf-ft)	Equivalent Quarter-Point Load (lbf)	Required Proof Load (lbf)	Deflections (in.)	Pass/Fail
Outward	Individual Elements (over 12 in. x 12 in.)	112	187	-	-	187	1.754	Pass
	Vertical Uniform Load (per ft)	103	171	1457	706	1413	0.216	Pass
	Horizontal Uniform Load (per ft)	34	57	486	235	471	2.829	Pass
	Midspan Horizontal Concentrated Load	225	375	-	-	375	2.869	Pass
	Top Rail Adjacent to Alum Connection Concentrated Load	225	503	-	-	503	3.730	Pass
	Top of Post	225	375	-	-	375	2.144	Pass

Direction	Test	Design Load (Inward/Outward) (kN)	Factored Load	Calculated Moment (kNm)	Equivalent Quarter-Point Load (kN)	Required Proof Load (kN)	Deflections (mm)	Pass/Fail
Outward	Individual Elements (over 300 mm in. x 300 mm)	0.5	0.83	-	-	0.83	44.5	Pass
	Vertical Uniform Load (per m)	1.5	2.50	1.98	3.14	6.29	5.5	Pass
	Horizontal Uniform Load (per m)	0.5	0.83	0.66	1.05	2.10	71.8	Pass
	Midspan Horizontal Concentrated Load	1	1.67	-	-	1.67	72.9	Pass
	Top Rail Adjacent to Alum Connection Concentrated Load	1	2.24	-	-	2.24	94.7	Pass
	Top of Post	1	1.67	-	-	1.67	54.4	Pass

Test:	Dimensional Checks	Project:	G102024155
Date:	24-Feb-15	Eng/Tech:	Chris Chang
Client:	Century Aluminum Railings	Reviewer:	Kal Kooner
Product:	8 ft. Component Picket System		Dan Lungu
Post Spacing:	8.25 ft	2.51	m
Height of Guard:	42 in	1070	mm
Opening in Guard:	3.875 in	98	mm
Method:	2010 National Building Code of Canada 2012 Ontario Building Code 2006 Alberta Building Code 2012 British Columbia Building Code 9.8.8.3 Height of Guards 9.8.8.5 Openings in Guards 9.8.8.6 Design of Guards to Not Facilitate Climbing / Guards Designed Not to Facilitate Climbing / <i>Design to Prevent Climbing</i>		
Time/Temp./RH:	8:00AM / 22.0°C / 49.0%		
Equipment:	Vaisala Temp/RH Indicator (Intertek ID# 9-0176, cal due July 2015) Tape Measure (Intertek ID# P60494, cal due August 2015)		

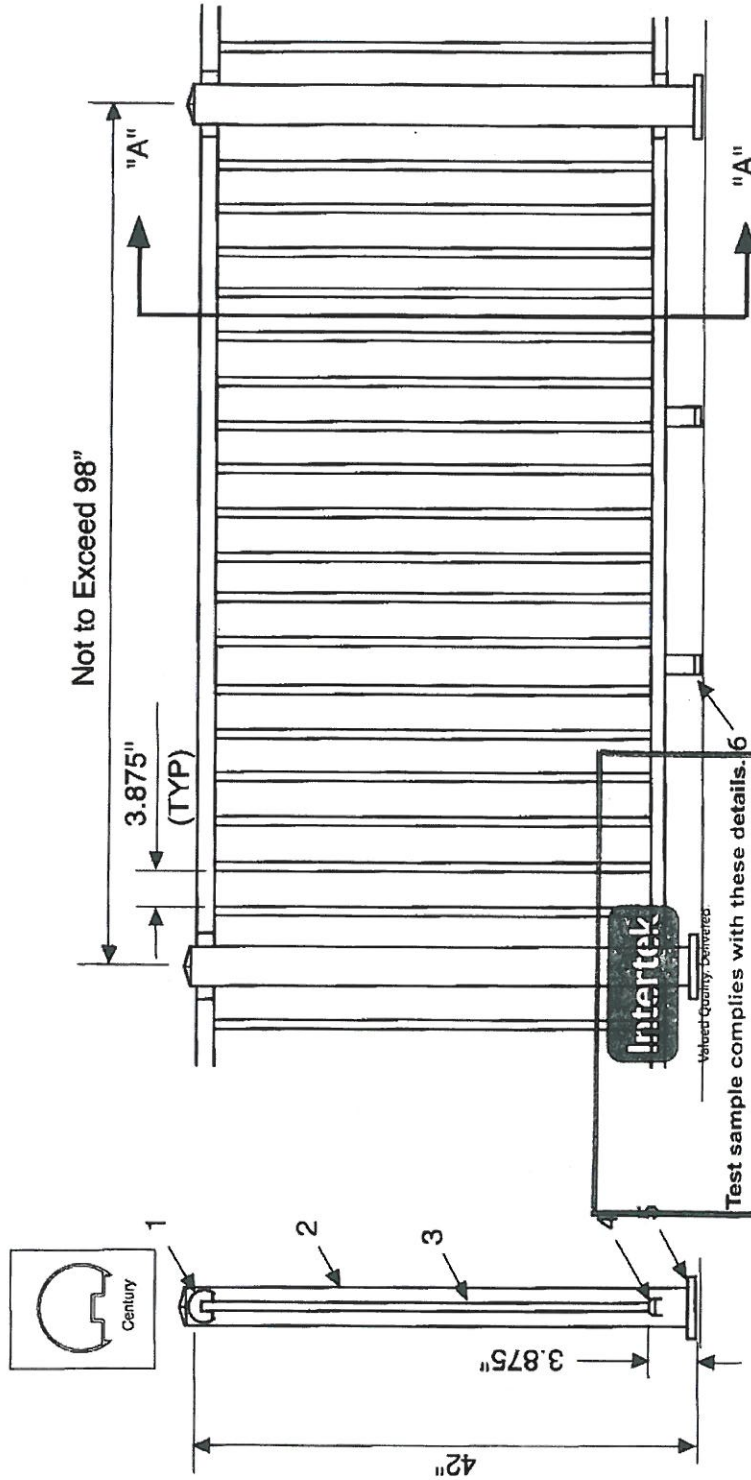
Description	Measured Dimension (mm)	Requirement (mm)	Pass/Fail
9.8.8.3 Height of Guards	1070	≥ 1070	Pass
9.8.8.5 Openings in Guards	Between Pickets	98	Pass
	Under Bottom Rail	64	Pass

Description	Result	Requirement	Pass/Fail
9.8.8.6 Design of Guards to Not Facilitate Climbing / Guards Designed Not to Facilitate Climbing	No elements protruding from the vertical between 140 mm and 900 mm that facilitate climbing	No elements protruding from the vertical between 140 mm and 900 mm that facilitate climbing	Pass



APPENDIX B: Drawings (10 pages)

5/8" x 5/8" x 8' Component Picket Railing - Surface Mount



ELEVATION OF BALCONY RAILING

NOT TO SCALE

SECTION "A-A"

NOT TO SCALE

Notes: 1. This guard system complies with the requirements of Part 9 of the 2010 Canadian Building Code (NBC), 2012 British Columbia Building Code (BCBC) and the 2012 Ontario Building Code (OBC).
2. Fastening detail to be determined on-site and is not within the scope of this document.



9685 Agur St., Summerland, B.C. V0H 1Z2
Phone: (778) 516-6000 • Fax: (778) 516-6003 • Toll Free: 1-877-810-4841

		Material - Aluminum	Thickness	Alloy
1	Top Rail - Century	2.35" x 1.89	.083	6063-T54
2	Post - 2.50" x 2.50"		.075	6063-T54
3	Picket - .625" x .625"		.050	6063-T54
4	Bottom Rail - 1.06" x 1.41"		.070	6063-T54
5	Baseplate - 4" x 4"		.250	6005A-T6
6	Support Leg		.125	6063-T54

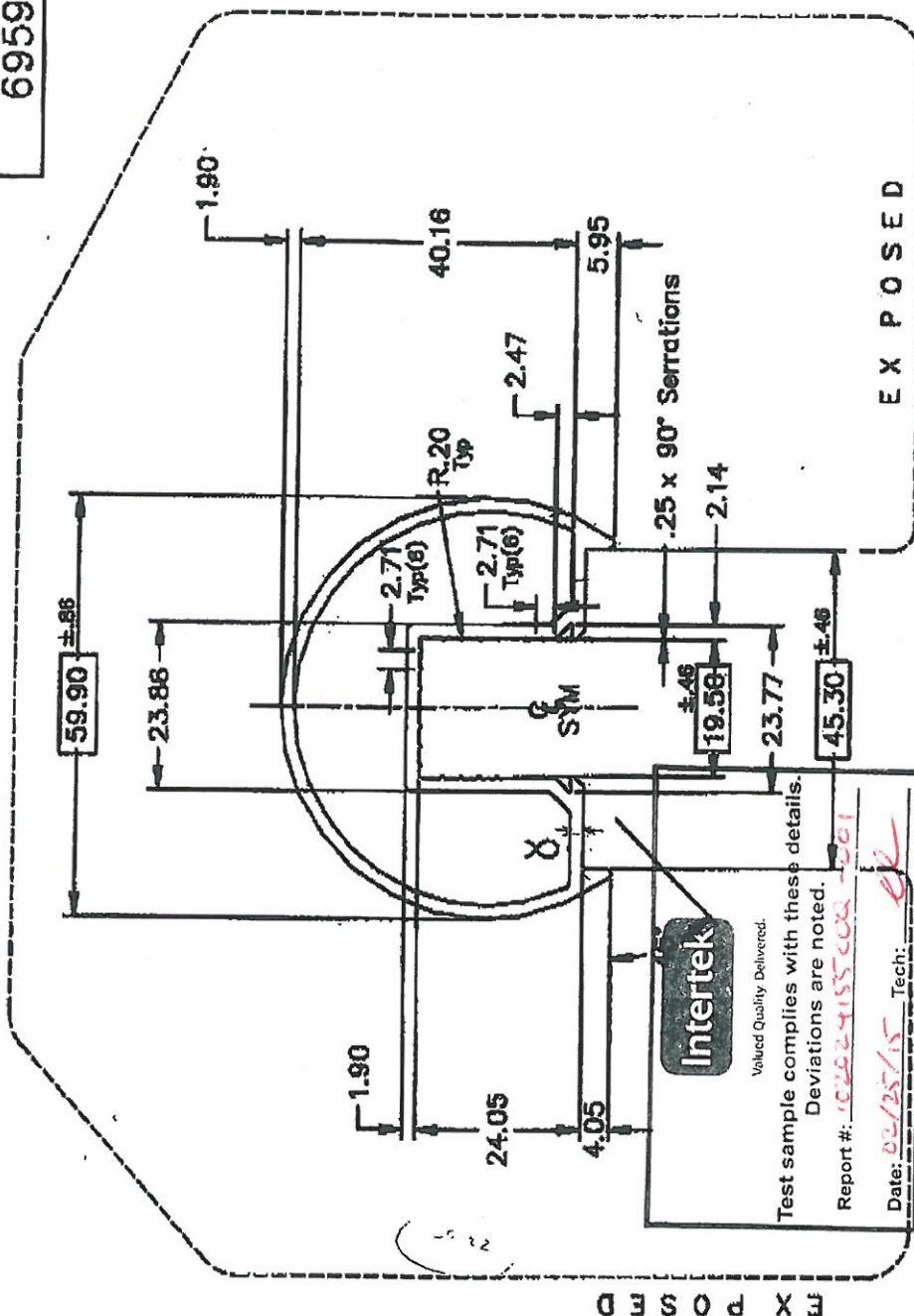


This is not an APEL EXTENSIONS LIMITED design. Customer MUST check and test the design ideas APEL is NOT responsible or liable for problems produced from it. APEL's only warranty is stated on APEL's order acknowledgment.

NOTE: Commercial tolerances to apply unless otherwise stated.

APEL SHAPE NO.

695950



☐ IMPORTANT DIMENSION(S)

Alloy	6063-T5	
Finish	MILL	
Exposed Surface	3	
Area (mm ²)	440.5	
Unred mass	1.185	
Perimeter	450.98	
Outside Perimeter	243.51	
Factor	381	
G.G.D.	60	
Break corners	.40	
Unmarked Thickness	1.90	
Unmarked Radii	.95	
Date	18SEP08	
Drawn by	JEJ	
Scale	1:1	
Gap Ratio		
T Toolmaker's Dimension * Close Tolerances X APEL ID Rib R Full radii Customer no.		
APEL SHAPE NO. 695950		
REV. MAY/01		



PRINT APPROVAL: BEAVER DEKSMART
CUSTOMER SIGNATURE INDICATES THAT DIMENSIONS AND TOLERANCES HAVE BEEN
ACCEPTED AS SHOWN. CUSTOMER ALSO ASSUMES ALL LEGAL RESPONSIBILITY FOR
HAVING THIS PROFILE MADE AND WILL FULLY PROTECT APEL EXTRUSIONS LTD. IN
CASE OF PATENT OR ANY OTHER CLAIMS.

DATE: SIGNED:

NOTE: Commercial tolerances to apply unless otherwise stated.

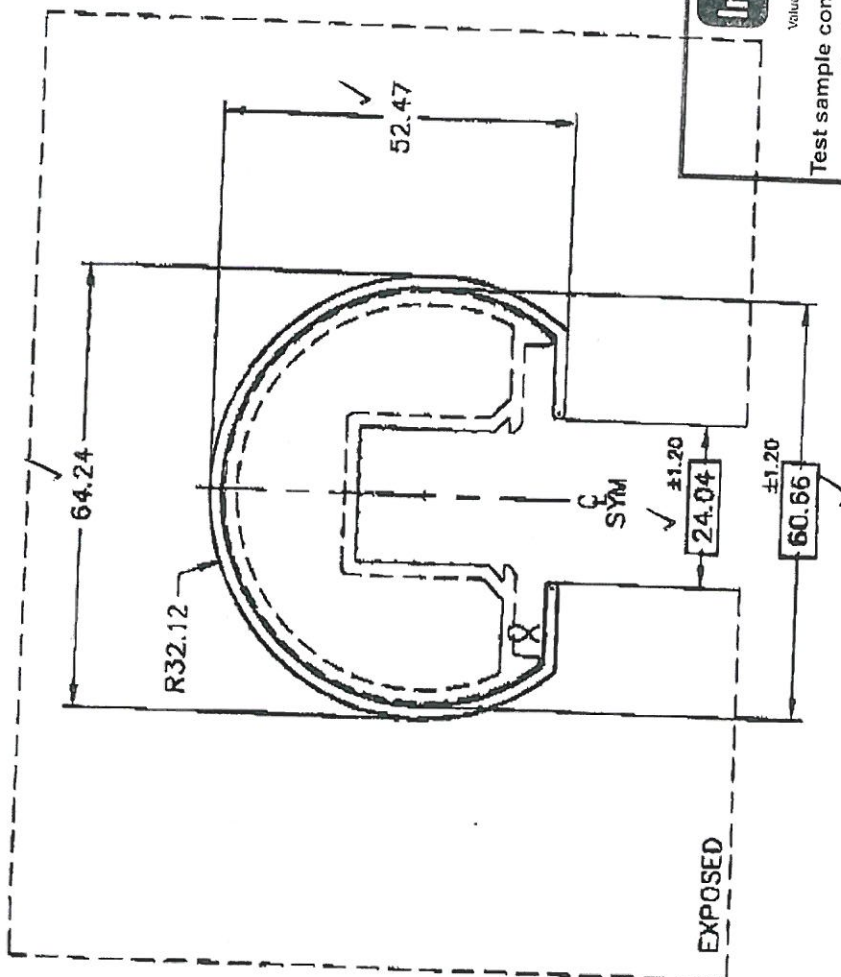
Revision Proposal Designer

1

It is not an APEL EXTRUSIONS LIMITED design. Customer
must check and test the design since APEL is not responsible
or liable for products produced from a APEL's only warranty
is stated on APEL's order acknowledgment.

APEL SHAPE NO.

672358



Valued Quality. Delivered.

Test sample complies with these details.
Deviations are noted.

Report #: 102024155 002 - 001

Date: 02/25/15 Tech: *AK*

SECTION TO SLEEVE
FIT WITH 695950 ✓

Finish	ARCH
Exposed Surface	2
Area (mm ² / in ²)	284.4
Lineal mass (kg/m - lb/ft)	.792
Perimeter (mm / in)	332.1
Outside Perimeter (mm / in)	
C.C.D. (mm / in)	64.2
Break corners (mm / in)	.38
Unmarked Thickness (mm / in)	1.79
Unmarked Radii	.89
Date	13MAY11
Drawn by	EJS
Scale	1:1
Gap Ratio	
☐ Important Dimension ☐ Toolmaker's Dimension ☒ Close Tolerance ☒ APEL ID Mark ☐ Full radii ☐ Metallurgical Strengthening may occur here and will not be a cause for rejection	
Customer no.	4990
APEL SHAPE NO.	672358
REV. NOV/10	

Description BEAVER CENTURY ROUND SLEEVE

Customer BEAVER DEKSMART

Date By Rev. *AK* *17, 2011*



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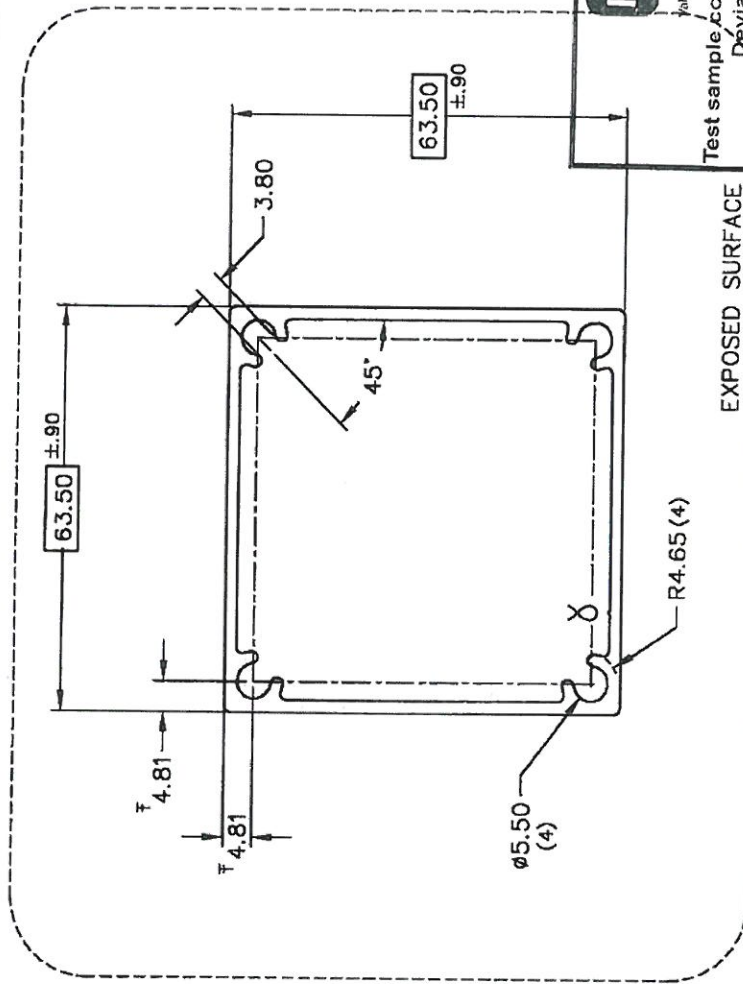
NOTE: Commercial tolerances to apply unless otherwise stated.

Alloy	6063-T54
Finish	ARCH
Exposed Surface	4
Area (mm ²)	541.11
Lineal mass	1.456
Perimeter	524.32
Outside Perimeter	252.37
Factor	360
C.C.D.	90
Break corners	.40
Unmarked Thickness	1.90
Unmarked Radii	.95
Date	9FEB09
Drawn by	JEJ
Scale	1:1
Gap Ratio	
† Toolmaker's Dimension	
* Close Tolerance	
OX APEL ID Rib	
R Full radii	
Customer no.	H212212075
APEL SHAPE NO.	695987

REV. MAY/01

APEL SHAPE NO.

695987



□ IMPORTANT DIMENSION(S)

Description 63.5 POST with Screw chases (2 1/2")

Customer BEAVER HOME IMPROVEMENTS



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Finish	ARCH	NOTE: Commercial tolerances to apply unless otherwise stated.									
Exposed Surface	3	SECTION TO SLEEVE FIT WITH 626646 EXPOSED ACTUAL SIZE Intertek Voluct Quality Reviewed. Test sample complies with these details. Deviations are noted. Report #: 102024155 000-001 Date: 02/25/15 Tech: <i>EL</i>									
Area (mm ²)	209										
Lineal mass	.562										
Perimeter	237.5										
Outside Perimeter											
C.C.D.	50.1										
Break corners	.42										
Unmarked Thickness	1.78										
Unmarked Radii											
Date	29SEPT99										
Drawn by	EJS										
Scale	2:1										
Gap Ratio											
☐ Important Dimension ☐ Toolmaker's Dimension ☒ Close Tolerance ☒ APEL ID Mark R Full radii Δ Metallurgical Streaking may occur here and will not be a cause for rejection											
Customer no.											

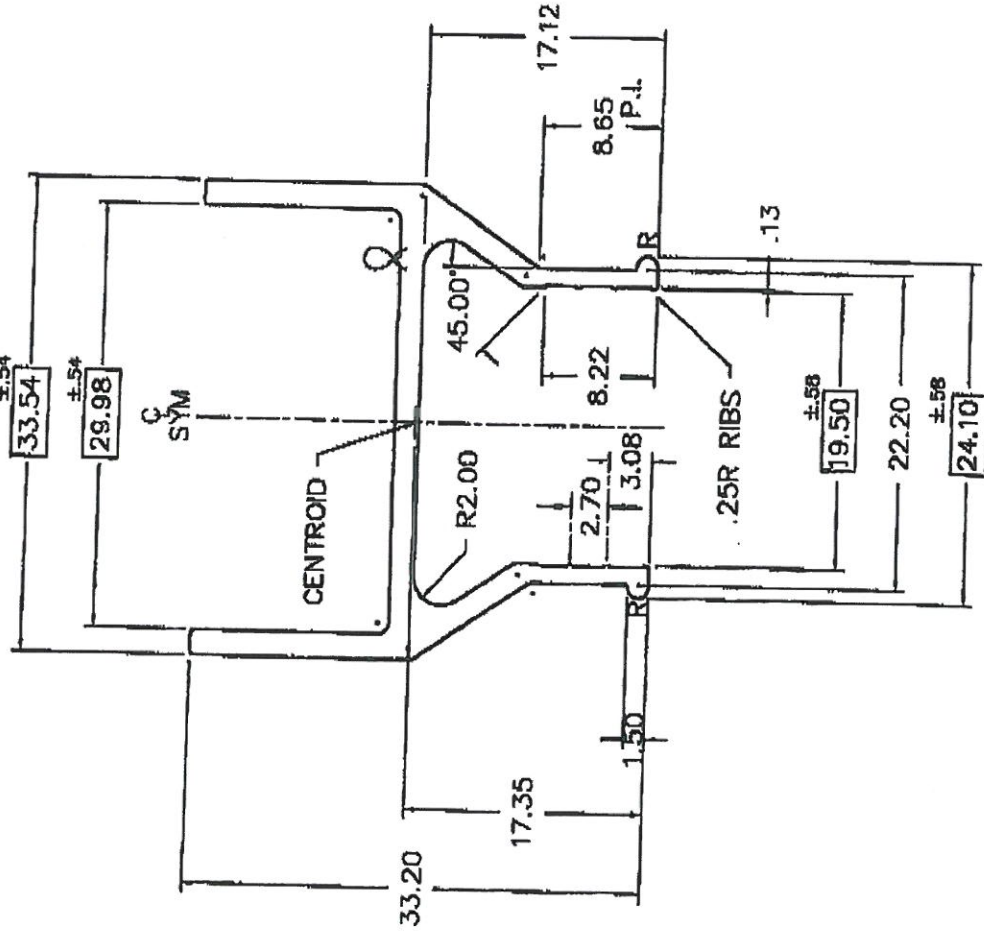
APEL SHAPE NO.		Description		Customer	
626647		A OUTSIDE SLEEVE FOR NEW BOTTOM RAIL		B DEKSMART RAILINGS	
REV. DEC/09		12OCT10 EJS		10FEB09 EJS	
		Date		By	



Extrusions Limited

Finish	ARCH
Exposed Surface	2
Area (mm ²)	176
Lined mass	.473
Perimeter	196.6
Outside Perimeter	
C.C.D.	43.5
Break corners	0.25
Unmarked Thickness	1.78
Unmarked Radii	.80
Date	12DEC03
Drawn by	EJS
Scale	2:1
Gap Ratio	
☐ Important Dimension ☐ Toolmaker's Dimension * Close Tolerance X APEL ID Mark R Full radii A Metallurgical Streaking may occur here and will not be a cause for rejection Customer no.	

NOTE: Commercial tolerances to apply unless otherwise stated.



Ixx 0.0100 x 10⁶ mm⁴
Sxx 0.0005 x 10⁶ mm³
Rxx 7.55 mm
Iyy 0.0283 x 10⁶ mm⁴
Syy 0.0016 x 10⁶ mm³
Ryy 12.66 mm

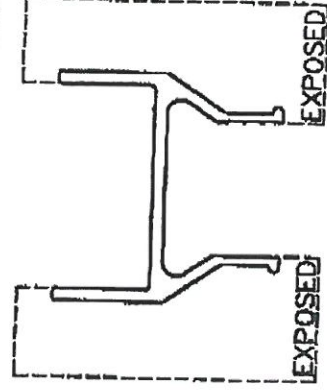
Intertek

Validated Quality Deliveries

Test sample complies with these details.
Deviations are noted.

Report #: 102624155 LAB-001

Date: 02/25/15 Tech: *RL*



ACTUAL SIZE

BOTTOM RAIL

Description

A B

DEKSMART RAILINGS

21 JULY 03 EJS CUSTOMER NAME CHANGED

10 FEB 03 EJS DESCRIPTION AND CUSTOMER NAME CHANGED

APEL SHAPE NO.

629082

REV. DEC/7



Extrusions Limited

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Finish		ARCH	
Exposed Surface	1		
Area (mm ²)	41		
Lined mass	.110		
Perimeter	66.3		
Outside Perimeter			
C.C.D.	27.0		
Break corners	0.25		
Unmarked Thickness	1.25		
Unmarked Radii			
Date	11MAR04		
Drawn by	EJS		
Scale	4:1		
Gap Ratio			
☐ Important Dimension ☒ Toolmaker's Dimension ☒ Close Tolerance ☒ APEL ID Mark R Full radii A Metallurgical Streaking may occur here and will not be a cause for rejection			
Customer no.			

NOTE: Commercial tolerances to apply unless otherwise stated.

APEL SHAPE NO. 615128

SECTION TO SNAP FIT OVER 629048 AND 629082

Intertek
Valued Quality Delivered

Test sample complies with these details.
Deviations are noted.

Report #: 102-024155-001-001
Date: 02/25/15 Tech: *ll*

SOCT10		EJS		CUSTOMER NAME CHANGED	
20JUN08	EJS	A	A	DEKSMART RAILINGS	
Date	By	Rev.	Rev.	Customer	

REV. DEC/09



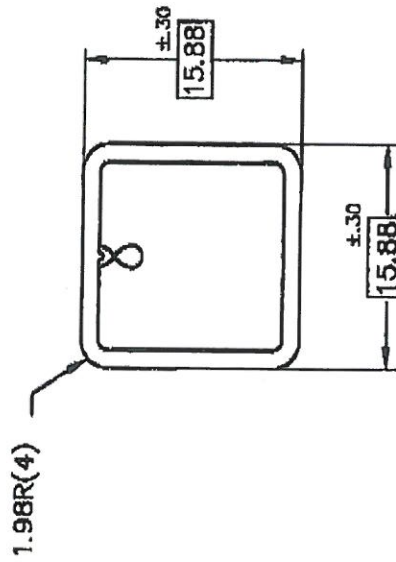
Extrusions Limited

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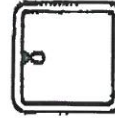
NOTE: Commercial tolerances to apply unless otherwise stated.

Finish	ARCH
Exposed Surface	4
Area (mm ²)	71
Lineal mass	.191
Perimeter	112.6
Outside Perimeter	60.1
C.C.D.	20.8
Break corners	.71
Unmarked Thickness	1.27
Unmarked Radii	
Date	22MAR02
Drawn by	EJS
Scale	2:1
Gap Ratio	

☐ Important Dimension
T Toolmaker's Dimension
* Close Tolerance
OX APEL ID Mark
R Full radii
▲ Metallurgical Streaking may occur here and will not be a cause for rejection
Customer no.



EXPOSED ALL AROUND



Valued Quality Services.

Test sample complies with these details.
Deviations are noted.

Report #: 10202-155-009-001

Date: 02/25/15 Tech: *AK*

APEL SHAPE NO.
695273

ACTUAL SIZE

5/8" PICKET

DEKSMART RAILINGS

Description

(B) (A)

Customer

19JULY02 (B) CUSTOMER NAME CHANGED

20MAR02 (A) CUSTOMER NAME CHANGED

Date By Rev

APEL SHAPE NO.

695273

REV. DEC.



Extrusions Limited

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Finish	ARCH
Exposed Surface	2
Area (mm ²)	540
Lineal mass	1.453
Perimeter	340.9
Outside Perimeter	
C.C.D.	89.2
Break corners	.80
Unmarked Thickness	3.18
Unmarked Radii	
Date	7DEC98
Drawn by	EJS
Scale	1:1
Gap Ratio	
☐ Important Dimension F Toolmaker's Dimension * Close Tolerance O APEL ID Mark R Full radii A Metallurgical Streaking may occur here and will not be a cause for rejection	
Customer no.	VS-10330

NOTE: Commercial tolerances to apply unless otherwise stated.

APPEL SHAPE NO. 628025

EXPOSED EXPOSED

±.46 28.96 ±.46 22.60 C SYM 9.52 74.25 12.70 58.37 63.50

Intertek Valued Quality Technology

Test sample complies with these details. Deviations are noted.

Report #: 102-024-135-000-001

Date: 02/25/15 Tech: [Signature]

19JULY98 EJS	19	CUSTOMER NAME CHANGED	Description	BOTTOM RAIL SUPPORT LEG
10FEB08 EJS	18	CUSTOMER NAME CHANGED		
Date	By	Rev.		

REV. DEC/

APPEL SHAPE NO. 628025

Customer

DEKSMART RAILINGS



Extrusions Limited

✓ CALGARY, ALTA.

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NOTE: Commercial tolerances to apply unless otherwise stated.

APEL SHAPE NO.
613029

Alloy	6060-T5
Finish	STD
Exposed Surface	0
Area (mm ²)	644.8
Lineal mass	1.735
Perimeter	214.9
Outside Perimeter	
Factor	124
C.C.D.	102.0
Break corners	.60
Unmarked Thickness	
Unmarked Radii	
Date	28JAN74
Drawn by	R.J.T.
Scale	1:1
Class no.	
Gap ratio	
T Tolerances's Discretion * Close Tolerances OK APEL 80 R Full nos Customer no.	

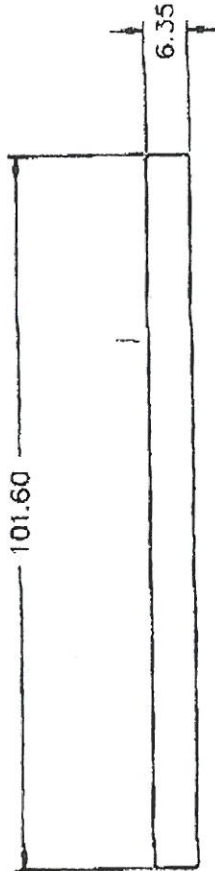


Valued Quality Engineering.

Test sample complies with these details.
Deviations are noted.

Report #: 102024135 800-001

Date: 02/25/15 Tech: KL



APEL SHAPE NO.		4" x 1/4" FLAT BAR		Description		APEL OPEN	
613029		400T95		REDRAWN, DIE REINSTATED DM		Customer	
		Date		Rev.			

APEL SHAPE NO.

613029

REV. SEPT/85