



BURNSIDE

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Dear Mr. Lyle:

Re: Structural Review of AridDek Aluminum Decking Product
File No.: PIA018755

R.J. Burnside & Associates Limited (Burnside) was retained by Wahoo Decks to review their AridDek product to determine whether it meets the structural requirements of Canadian design standards. This review has been based on production shop drawings, material properties and product samples provided by Wahoo Decks. No load testing or material testing of any kind has been performed by Burnside in the course of this review.

AridDek is a system of extruded aluminum deck boards manufactured by Wahoo Decks. This system consists of three different profiles: a start board, a main board and a finish board. When installed, the boards interlock such that water is channelled to the integrated gutter system to create a dry area beneath the deck. The profiles of the extruded sections are shown on the attached production shop drawings. Based on the information provided, it is our understanding that the product is manufactured from 6005-T5 aluminum with the following material properties:

- Ultimate tensile strength (F_u): 260MPa
- Yield tensile strength (F_y): 240MPa
- Modulus of elasticity (E): 69GPa
- Density: 0.0975 lb/in³

CSA S157-05 "Strength Design in Aluminum" has been used to calculate the bending and shear strength of the extruded sections. Each profile consists of several elements (webs and flanges) that contribute to the strength of the section. For each element of each profile, the limiting stress was calculated in accordance with CSA S157-05

"Strength Design in Aluminum" and this limiting stress was used to calculate the bending and shear strengths of the section. For each of the three profiles, the bending strength, shear strength and stiffness calculated were divided by the width of the exposed walking surface to determine the resistance of the section per unit width. The governing value from the three profiles was used to calculate the maximum allowable load for each span length and support condition.

In addition to the calculations described, a finite element model was constructed of an assembly consisting of one start board, two main boards and one finish board. The calculated loads were applied to the model to verify that the limiting stresses in each element were not exceeded.

Under typical installations, the deck boards will be subjected to dead loads, live loads and snow loads. Dead loads consist of the self-weight of the deck boards. Based on our calculations, the dead load will be approximately 2.23 lb/ft². Live loads consist of loads from any furniture or other installed fixtures supported on the deck as well as live loads due to use and occupancy. The specified live load will vary for each installation based on the occupancy served (for example residential vs. commercial decks). Snow loads consist of the load due to snow accumulation on the surface and an allowance for absorbed rain. The specified snow load will vary for each installation based on the climatic data for the geographic location and the influence of adjacent structures (for example snow shadow effects and snow sliding from adjacent surfaces).

This structural review has been performed based on the limit states criteria of The National Building Code of Canada 2005 (NBCC). To meet the ultimate limit states criteria, the deck boards must have adequate strength to resist the effects of all of the following applicable factored load combinations:

- 1.25 Dead + 1.50 Live
- 1.25 Dead + 1.50 Snow
- 1.25 Dead + 1.50 Live + 0.50 Snow
- 1.25 Dead + 1.50 Snow + 0.50 Live

To meet the serviceability limit states criteria, the deflection of the deck boards must not exceed 1/360 of the span under and of the following specified load combinations:

- 1.00 Live
- 1.00 Snow
- 1.00 Live + 0.50 Snow
- 1.00 Snow + 0.50 Live

In addition to the deflection criteria of the serviceability limit states, it is also necessary to ensure that vibrations of the walking surface do not make occupants uncomfortable. For this reason, floor systems should have a minimum harmonic frequency that is compatible with the intended occupancy. The finite element model was used to determine the harmonic frequency of the deck board assembly. Based on this analysis, the harmonic frequency of the deck boards is considered acceptable for the intended application.

Based on the analysis performed, the maximum allowable applied loads for various span lengths and support conditions were calculated. The loads tabulated are combined live

and snow loads. These loads are tabulated in Table 1 for simply-supported spans and in Table 2 for spans continuous over multiple supports.

Table 1 Maximum allowable loads for simply-supported spans

Span Length (in)	Maximum Allowable Applied Load (lb/ft ²)
12	1946
18	575
24	241
30	122
36	70
42	43
48	28

Table 2 Maximum allowable loads for continuous spans

Span Length (in)	Maximum Allowable Applied Load (lb/ft ²)
12	2014
18	814
24	342
30	174
36	99
42	62
48	40

It is our opinion that the AridDek extruded aluminum decking product meets the structural requirements of The National Building Code of Canada 2005 for the tabulated loads specified. These load tables are to be used for estimating purposes only and do not constitute a structural review of the product for a specific installation.

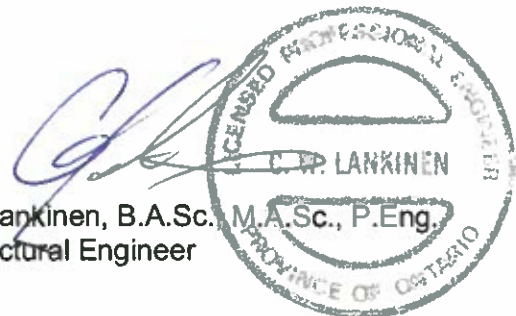
We trust that this is the information that you require. If you have any questions regarding the contents of this letter or the analysis performed, please contact the undersigned.

Yours truly,

R.J. Burnside & Associates Limited



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Encl. Production shop drawings (3 pages)
Start Board: Die No. GAS-49143
Main Board: Die No. GAS-49141
Finish Board: Die No. GAS-49142