PANEL DESIGN TECHNICAL NOTES

GENERAL

This document is intended to assist in the design and engineering of Steelway through fastened roof panels and roof decks. Some applicable products include StrucSeal, StormSeal, VersaSeal, and DiamondSeal. It also applies to RD-156 when used in either roof deck or floor deck applications.

The Steelway load tables are maximum uniformly distributed specified (unfactored) loads. The load tables contained on these data sheets were prepared by Dr. R.M. Schuster, Professor Emeritus of Structural Engineering, University of Waterloo, Ontario.

USE OF LOAD TABLES

Strength - Limit States Design principles were used in the development of the load tables in accordance with CSA-S136-01, Cold Formed Steel Structural Members and the National Building Code of Canada, 2005. The maximum uniformly distributed specified load obtained from the load table must be equal to or greater than the (Specified live load + 0.833 times the specified dead load); where 0.833 = 1.25/1.5.

Conservative Strength Approach - The maximum uniformly distributed specified load obtained from the load table must be equal to or greater than (Specified live load + specified dead load).

Serviceability - Maximum specified deflection loads given in the tables must be compared with their respective specified live loads.

Steel Specifications and Finishes - please refer to the specific panel load table for the steel grade and coating.

Factored Load Tables - There are some load tables requiring the use of "factored" loads when checking for strength. This is not required when using Steelway load tables. Caution should be used when panel tables based on "factored" loads are compared to Steelway specified (unfactored) load tables as their capacity will appear greater. Never use "unfactored" loads when selecting a panel from these tables as the deck will be seriously overstressed.

Perforated Panel - For perforated decking panels (RD-156), reduce loads in table by 5%. No reduction in stiffness values. (Based on CSSBI Fact Sheet #27: Design of Acoustic Deck)

DESIGN EXAMPLE (IMPERIAL)

Given:

• Triple span continuous	L = 6.0 ft each span
• Panel thickness	t = 0.030 in.
• L/240 deflection limit	
• Bearing length	n = 2.5 in.
• Specified loads	
1) Dead loads (DL)	
a) panel 2 psf	
b) superimposed 8 psf	DL = 10 psf
2) Live load (LL)	LL = 35 psf

Solution:

Strength

1) Specified loads
   [LL + 0.833 DL]
   [35 + 0.833 (10)] = 43.3 psf
2) Maximum specified load (from Table under 3-span) is 84 psf. Since 84 > 43.3 OK
3) Check end web crippling (n = 2.5 in.)
   a) Specified end reaction 0.400(43.3) 6.0 = 104 lb/ft
   b) Maximum specified end reaction (from section property table)

$Pe = Pe1 + Pe2 \sqrt{n / t}$

$Pe = 175 + 43.8 \sqrt{2.5 / 0.030} = 575$ lb/ft

Since 575 > 104 OK

The maximum specified interior reaction (from section property table)

$Pi = Pi1 + Pi2 \sqrt{n / t}$

Attachment of panels to supporting structural members must be checked by a qualified designer for all uplift and lateral loads as specified by National or Provincial Building Codes.