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E-mail:		Date:	03/06/2025
Contact:			

Specifier's comments:

Project Details

Company:
Address:
Phone | Fax: |
E-mail:
Project Number:
Project Title:
Contract Number:
Structural Plan Sheet Number:
Prepared By:
Checked By:
Date: 3/5/2025
Comments:

Design Settings

Design Method: LSD CAN
Design Standard: AISI S310-20

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FIRST PDF
PLEASE SEE THIS PDF FIRST

Area Area 1

Deck Type:	Steel roof deck		
Support Construction:	Bar Joists	Sidelap Connections from	3 in
Joist / Beam Spacing:	8.33 ft	Sidelap Connections to	36 in
Joist / Beam Thickness:	0.184 in	Sidelap Connections incr	1 in
Deck Panel:	CANAM 3N - Fy = 50 ksi		
f_u / f_y :	60 ksi / 50 ksi		
Panel Type:	Nestable		
Panel Width:	24 in		

Zone Area 1 - Zone:

Required Input Loads

Relevant Loads:	I entered these forces.	wind
Diaphragm Shear Q:		200.00 plf
Net Uplift T (W):		73.00 psf
Req. Shear Stiffness G'_{req} :		0.00 kip/in

Proposed Diaphragm System

Frame Fastener: Hilti X-HSN 24

Deck Thickness: 20 ga (0.0358 in)

Pattern: 24/4 (610/4)

Pattern Drawing:



Sidelap Connector: S-SLC 01 M HWH Sidelap Connector

Sidelap Connector Spacing:	24 in
Edge Fastener Spacing:	24 in
Φ_{wind} :	0.75
Φ_{uplift} :	0.40
$\Phi_{PB, Buckling}$:	0.75

Note: Local web buckling, as shown in AISI S310-20, Eq. D2-2, has not been checked.

Proposed System Diaphragm Shear and Stiffness/Flexibility

Design Shear:	350 plf	Design Uplift:	121.01 psf
Shear Stiffness G:	33.37 kip/in		

But here I am getting 350 plf for shear and 121.01 psf for uplift.
My question is: Does it mean the diaphragm is good for 350 plf shear combined with 120.01 psf uplift?

Design Checks

Design Shear
Design Uplift
Shear Stiffness G

= 350 plf >= Q = 200.00 plf => OK
= 121.01 psf >= T = 73.00 psf => OK
= 33.37 kip/in >= G' = 0.00 kip/in => OK

Design OK

Area 1

Zone	Deck Gauge	Frame Fastener Pattern	Frame Fastener	Sidelap Connector	Sidelap Connector Spacing	Diaphragm shear, Q	Uplift, W	Stiffness, G'	Status
1 Zone	20 ga	24/4 (610/4)	Hilti X-HSN 24	S-SLC 01 M HWH Sidelap Connector	24 in o.c.	350 plf	121.01 psf	33.37 kip/in	OK

References:

- AISI S100** North American Specification for the Design of Cold-Formed Steel Structural Members
- AISI S310** North American Standard for the Design of Profiled Steel Diaphragm Panels
- SDI DDM04** Steel Deck Institute Diaphragm Design Manual Edition 4
- ESR-2776** Steel Deck Diaphragms attached with Hilti Powder-Actuated Fasteners and Hilti SLC Sidelap Connectors
- ESR-3693** Steel Deck Diaphragms attached with S-MD 12-24 x 1 5/8 M HWH5 Frame Fasteners
- ESR-2197** Steel Deck and Concrete Filled Diaphragms Attached with Hilti Fasteners
- AISI S100** North American Specification for the Design of Cold-Formed Steel Structural Members

Remarks; Your cooperation duties:

- Nominal diaphragm shear strength resistance strength is not calculated for local web buckling of the panel over the exterior support. Contact the deck manufacturer to review if this controls the design.
- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.



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- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis.



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SECOND PDF

Area Area 1

Deck Type:	Steel roof deck		
Support Construction:	Bar Joists	Sidelap Connections from	3 in
Joist / Beam Spacing:	8.33 ft	Sidelap Connections to	36 in
Joist / Beam Thickness:	0.184 in	Sidelap Connections incr	1 in
Deck Panel:	CANAM 3N - Fy = 50 ksi		
f_u / f_y :	60 ksi / 50 ksi		
Panel Type:	Nestable		
Panel Width:	24 in		

Zone Area 1 - Zone:

Required Input Loads

Relevant Loads:	<p>I entered these forces. It seems Hiti proposed the deck is good for this combination. (Please see othe PDF file)</p>	wind
Diaphragm Shear Q:		350.00 plf
Net Uplift T (W):		120.00 psf
Req. Shear Stiffness G'_{req} :		0.00 kip/in

Proposed Diaphragm System

Frame Fastener:	Hilti X-HSN 24	Deck Thickness:	20 ga (0.0358 in)
		Pattern:	24/4 (610/4)
		Pattern Drawing:	

Sidelap Connector: S-SLC 01 M HWH Sidelap Connector

Sidelap Connector Spacing:	24 in
Edge Fastener Spacing:	8.95 in
Φ_{wind} :	0.75
Φ_{uplift} :	0.40
$\Phi_{PB, Buckling}$:	0.75

Note: Local web buckling, as shown in AISI S310-20, Eq. D2-2, has not been checked.

Proposed System Diaphragm Shear and Stiffness/Flexibility

Design Shear:	16.8 plf	Design Uplift:	121.01 psf
Shear Stiffness G:	33.37 kip/in		

Design Checks

Design Shear = 16.8 plf < Q = 350.00 plf => Not Recommended
 Design Uplift = 121.01 psf >= T = 120.00 psf => OK
 Shear Stiffness G = 33.37 kip/in >= G' = 0.00 kip/in => OK

It seems diaphragm is not good for this combination. But, this combination was proposed by Hilti. Please see other PDF file. Could you please help me to see how Hilti diaphragm is working.

Design Not Recommended

Area 1

Zone	Deck Gauge	Frame Fastener Pattern	Frame Fastener	Sidelap Connector	Sidelap Connector Spacing	Diaphragm shear, Q	Uplift, W	Stiffness, G'	Status
1 Zone	20 ga	24/4 (610/4)	Hilti X-HSN 24	S-SLC 01 M HWH Sidelap Connector	24 in o.c.	16.8 plf	121.01 psf	33.37 kip/in	Not Recommended

One or more zones do not meet the design requirements

References:

- AISI S100** North American Specification for the Design of Cold-Formed Steel Structural Members
- AISI S310** North American Standard for the Design of Profiled Steel Diaphragm Panels
- SDI DDM04** Steel Deck Institute Diaphragm Design Manual Edition 4
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- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis.