

ICC-ES Evaluation Report

ESR-5720

Issued July 2025

This report also contains:

- [City of Chicago Supplement](#)

Subject to renewal July 2026

- [CA Supplement](#)

- [FL Supplement w/ HVHZ](#)

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DIVISION: 05 00 00 — METALS Section: 05 31 00 — Steel Decking Section: 05 31 13 — Steel Floor Decking Section: 05 31 23 — Steel Roof Decking Section: 05 36 00 — Composite Metal Decking	REPORT HOLDER: BETCO, INC.	EVALUATION SUBJECT: 1½" METAL DECK (B-DECK), 3" METAL DECK (N-DECK), AND 2" COMPOSITE METAL DECK	
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1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2024, 2021, 2018 and 2015 [International Building Code® \(IBC\)](#)

Property evaluated:

- Structural

2.0 USES

BETCO Metal Decks are available in three series: 1½" Metal Deck (B-Deck), 3" Metal Deck (N-Deck), and 2" Composite Metal Deck (C-Deck). They are used as roof (B-Deck and N-Deck) and floor (C-Deck) decks to support vertical loads, and as components of horizontal diaphragms. Steel panels of the floor decks are topped with structural normal weight or lightweight concrete to form composite floor assemblies.

3.0 DESCRIPTION

3.1 Steel Decks:

The metal deck panels are cold-formed from steel sheets complying with ASTM A653 SS Grade 50 with a minimum G60 galvanized coating on both sides. The tensile strength-to-yield stress ratio of the steel sheets shall be larger than or equal to 1.08. The panels range from 1.5 to 3.06 inches (38.1 to 77.7 mm) in depth and 24 to 36 inches (610 to 914 mm) in cover width. See Table 1 and Figure 1 for deck panels specifications, including geometries and dimensions. Optional primer or finish paint coating applied over the galvanized coating is available for the top surface, bottom surface, or both surfaces. Deck panels for composite floor assemblies should not have primer coating on the top surface.

3.2 Supports:

Hot-rolled steel supports must comply with AISC 360. Cold-formed steel supports must comply with AISI S100. Wood supports must comply with the NDS and be structural lumber. Concrete supports must comply with ACI 318.

3.3 Connections:

3.3.1 Steel to Steel Connections: Welds, screws, button punches, power-actuated fasteners (PAF's), clinch connections, or proprietary fasteners used to attach deck panels to steel supports and at side-laps must be in accordance with AISI S100, AISI S310 and AWS D1.3, as applicable.

3.3.2 Steel to Wood Connections: Nails and screws used to attach deck panels to wood supports must be in accordance with the NDS and AISI S310.

3.3.3 Steel to Concrete Connections: PAF's and screws used to attach deck panels to concrete must be in accordance with AISI S100 and AISI S310.

3.4 Concrete Fill for Composite Steel Decks:

Normal weight and lightweight structural concrete must be in accordance with the IBC, which references ACI 318, and must have a minimum 28-day compressive strength of 3,000 psi (20.68 MPa). Lightweight concrete fill must be 115 pcf (1,842 kg/m³). Normal weight concrete fill must be 145 pcf (2,323 kg/m³).

4.0 DESIGN AND INSTALLATION

4.1 Vertical Load Design:

4.1.1 General: The steel decks and composite steel decks must be designed using the section properties in Table 2 and additional requirements of Sections 4.1 and 4.2, as applicable, and in accordance with:

- ANSI/SDI SD-2022 under the 2024 IBC.
- ANSI/SDI C-2017 for composite steel decks, ANSI/SDI NC-2017 for steel floor decks, and ANSI/SDI RD-2017 for steel roof decks under the 2021 and 2018 IBC.
- ANSI/SDI C-2011 for composite steel decks, ANSI/SDI NC-2010 for steel floor decks, and ANSI/SDI RD-2010 for steel roof decks under the 2015 IBC.

4.1.2 Web Crippling Strength: The web crippling design strengths of deck panels are provided in Table 3. The minimum permissible bearing length must be the largest of $\frac{3}{4}$ inch (19.1 mm), the length required to provide sufficient edge or end distance for the support fasteners, and the length required to provide sufficient strength to prevent web crippling under the design loads. Calculation of web crippling values with bearing lengths and/or support conditions other than those described in Table 3 must be in accordance with AISI S100.

4.1.3 Flexural Strength:

4.1.3.1 Bending of Steel Decks: Table 3 includes ASD moment capacities of all steel decks (no concrete infill). Allowable uniform superimposed downward and upward loads for different bare steel decks, based on their moment capacities in Table 3, are shown in Tables 4 and 5, respectively. Maximum spans for roof decks, based on the construction phase loads in ANSI/SDI SD-2022 and ANSI/SDI RD-2017, and the allowable moment capacities in Table 3, are shown in Table 6. Uniform superimposed service loads that cause L/240 deflection for bare steel decks (without considering panel's self-weight) are shown in Table 7, where L is the span length. Construction spans for the 2" Composite Metal Decks with wet concrete infill and construction loads per ANSI/SDI SD-2022 and ANSI/SDI C-2017, are shown in Table 8.

4.1.3.2 Positive Bending of Composite Steel Decks: The flexural strength of composite steel decks must be calculated per ANSI/SDI SD-2022 under the 2024 IBC or ANSI/SDI C-2017 under the 2021 IBC. Flexural strength controlled by deck-to-concrete bond can be calculated using the Prequalified Section Method in Section F3.2.1 of ANSI/SDI SD-2022 under the 2024 IBC (Appendix 2 of ANSI/SDI C-2017 under the 2021 IBC), using the section properties and information in Table 2 and Figure 1. Allowable ASD superimposed loads for the 2" Composite Metal Deck with normal weight concrete (NW) or lightweight concrete (LW) fill, based on the flexural capacity of the composite deck, are shown in Table 9.

4.2 Horizontal Load (Diaphragm) Design:

4.2.1 Panels without Concrete Fill (Steel Deck): Diaphragm shear strength and stiffness of the steel deck panels and panel connections must be determined in accordance with AISI S310, using the section properties in Table 2 and Figure 1.

4.2.2 Panels with Concrete Fill (Composite Steel Deck): Diaphragm design (including shear strength and stiffness) of the steel decks considering the contribution of concrete fill must be determined in

accordance with the design and construction detail requirements specified in AISI S310, using the section properties in Table 2 and Figure 1.

4.3 Installation:

4.3.1 General: The deck panels must be installed in accordance with this report, ANSI/SDI SD-2022 under the 2024 IBC (ANSI/SDI C for composite steel decks, ANSI/SDI NC for steel floor decks, and ANSI/SDI RD for steel roof decks under the 2021, 2018 and 2015 IBC), and BETCO published installation guidelines and instructions. If there is a conflict between BETCO published installation guidelines and instructions and this report, this report governs. Deck panels and fasteners must be installed at locations in accordance with the plans and specifications approved by the code official. Fasteners must be installed in accordance with the applicable standards and specifications and fasteners manufacturer recommendations.

4.3.2 Composite Steel Decks: Steel panels must be clean and free of foreign material prior to placement of concrete. Reinforcement for crack control due to temperature and shrinkage shall be provided in accordance with ANSI/SDI SD-2022 under the 2024 IBC (ANSI/SDI C under the 2021, 2018 and 2015 IBC).

5.0 CONDITIONS OF USE:

The BETCO Metal Decks described in this report comply with, or are suitable alternatives to what is specified in the codes indicated in Section 1.0 of this report, subject to the following conditions:

- 5.1 The base-metal thickness for all steel deck panels delivered to the jobsite must be at least 95 percent of the design thickness, t , in Table 2 of this evaluation report.
- 5.2 The minimum loads of IBC Chapter 16 in addition to the construction loads required by referenced standards in 2024 IBC Section 2208.1 (2021 IBC Section 2210.1.1) must be considered by the design professional based on the specific occupancy or use, as applicable.
- 5.3 Special inspections must be provided in accordance with Chapter 17 of the IBC.
- 5.4 Fasteners used in connections are outside the scope of this report.
- 5.5 Calculations and details demonstrating that the loads applied to the deck panels comply with this report must be submitted to the code official for approval. Calculations and drawings must be prepared, signed and sealed by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.6 Concrete-filled sections must not be used to support loads that are predominantly vibratory, such as those for operation of heavy machinery, reciprocating motors and moving loads.
- 5.7 Vertical load design of deck panels, without concrete fill, must be based on section properties noted within this ICC-ES evaluation report.
- 5.8 When the steel deck panels are used as roof decks, the panels must be covered with an approved code-complying roof covering.
- 5.9 The steel deck panels are manufactured in Statesville, North Carolina, under an approved quality control program with annual inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

Data in accordance with the [ICC-ES Acceptance Criteria for Steel Deck Roof and Floor Systems \(AC43\)](#), dated August 2022 (editorially revised November 2023).

7.0 IDENTIFICATION

- 7.1 The ICC-ES mark of conformity, electronic labeling, or the evaluation report number (ICC-ES ESR-5720) along with the name, registered trademark, or registered logo of the report holder must be included in the product label.
- 7.2 In addition, each bundle of the BETCO Metal Decks are identified by a label bearing the deck panel profile name; the design thickness; the minimum specified yield strength; and the cover width of the panel.

7.3 The report holder's contact information is the following:

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SYMBOLS AND DEFINITIONS

Symbol	Definition
h or D_w	Flat dimension of web measured in plane of the web (in.).
F'_c	Minimum specified compressive strength of concrete (psf).
I_g	Gross moment of inertia of full unreduced section per 12-inch width of the steel panel (in. ⁴).
I_{ep}	Effective moment of inertia in positive bending per 12-inch width of the steel panel (in. ⁴).
I_{en}	Effective moment of inertia in negative bending per 12-inch width of the steel panel (in. ⁴).
I_{DS}	Effective moment of inertia for single-span deck for deflection calculations under uniform load (in. ⁴).
I_{DM+}	Effective moment of inertia for multi-span deck for deflection calculations under uniform load (in. ⁴), when positive bending controls.
I_{DM-}	Effective moment of inertia for multi-span deck for deflection calculations under uniform load (in. ⁴), when negative bending controls.
M_{np}/Ω	ASD design bending strength under positive (downward) bending (in-lb/ft).
M_{nn}/Ω	ASD design bending strength under negative (upward) bending (in-lb/ft).
P_h	Embossment height (in.).
R_{be}/Ω	ASD design web crippling strength over supports at sheet ends (lb/ft). (End Reaction per Table G5-5 of AISI S100)
R_{bi}/Ω	ASD design web crippling strength over interior sheet supports (lb/ft). (Interior Reaction per Table G5-5 of AISI S100)
S_{e+}	Effective section modulus in positive bending per 12-inch (1 ft) width of the steel panel (in. ³).
S_{e-}	Effective section modulus in negative bending per 12-inch (1 ft) width of the steel panel (in. ³).
t	Base (uncoated) design steel thickness (in.).
V_n/Ω	ASD design vertical shear strength (lb/ft).
W	Embossment width (in.).

TABLE 1—DECK PANEL SPECIFICATIONS

USE	PRODUCT		MATERIALS		DIMENSION OF STEEL SECTION (inches)		
	Series	Type	Steel Grade	Concrete	Depth	Cover Width	Design Base Metal Thickness. Ga (inch)
Steel Roof Decks	B-Deck	1½" Metal Deck	50	N/A	1.5	30 or 36	22, 20, 18 or 16 Ga (0.0295, 0.0358, 0.0474 or 0.0598 in.)
	N-Deck	3" Metal Deck	50	N/A	3.06	24	22, 20, 18 or 16 Ga (0.0295, 0.0358, 0.0474 or 0.0598 in.)
Composite Floor Decks	C-Deck	2" Composite Metal Deck	50	$F'_c = 3,000 \text{ psi}$	2	36	22, 20, 18 or 16 Ga (0.0295, 0.0358, 0.0474 or 0.0598 in.)

For SI Units: 1 inch = 25.4 mm; 1 ksi = 1,000 psi = 6.895 MPa

TABLE 2—STEEL SECTION PROPERTIES (NON-COMPOSITE)¹

DECK PANEL		DIMENSIONS (inches)			Weight (psf)	SECTION PROPERTIES FOR 1 ft WIDTH						
Type	Grade	Gage	t (in.)	h (in.)		I _g (in. ⁴ /ft)	I _{ep} (in. ⁴ /ft)	I _{en} (in. ⁴ /ft)	I _{DS} or I _{DM+} ² (in. ⁴ /ft)	I _{DM-} ³ (in. ⁴ /ft)	S _{e+} (in. ³ /ft)	S _{e-} (in. ³ /ft)
1½" Metal Deck	50	22	0.0295	1.063	1.6	0.177	0.130	0.163	0.146	0.168	0.172	0.175
		20	0.0358	1.052	2.0	0.213	0.167	0.207	0.182	0.209	0.216	0.223
		18	0.0474	1.032	2.6	0.280	0.247	0.277	0.258	0.278	0.293	0.297
		16	0.0598	1.011	3.0	0.353	0.333	0.350	0.340	0.351	0.375	0.377
3" Metal Deck	50	22	0.0295	2.672	1.8	0.915	0.591	0.793	0.699	0.833	0.357	0.396
		20	0.0358	2.660	2.2	1.110	0.753	1.026	0.872	1.054	0.466	0.528
		18	0.0474	2.638	2.9	1.465	1.076	1.433	1.206	1.443	0.692	0.751
		16	0.0598	2.615	3.7	1.850	1.470	1.835	1.597	1.840	0.898	0.966
2" Composite Metal Deck	50	22	0.0295	1.761	1.6	0.330	0.277	0.273	0.294	0.292	0.237	0.244
		20	0.0358	1.750	1.9	0.400	0.357	0.350	0.371	0.367	0.317	0.324
		18	0.0474	1.731	2.5	0.527	0.507	0.500	0.513	0.509	0.471	0.479
		16	0.0598	1.711	3.2	0.667	0.660	0.653	0.662	0.658	0.622	0.629

For SI Units: 1 inch = 25.4 mm

¹ See Page 4 for definitions of variable symbols shown in this table. See Figure 1 for deck profile configuration and dimensions.² The effective moment of inertia for single-span steel deck (non-composite) for deflection calculations under uniform load, I_{DS}, and the effective moment of inertia for multi-span steel deck (non-composite) for deflection calculations under uniform load when positive bending controls, I_{DM+}, are calculated as follows:

$$I_{DS} \text{ or } I_{DM+} = (I_g + 2I_{ep})/3$$

³ The effective moment of inertia for multi-span steel deck (non-composite) for deflection calculations under uniform load when negative bending controls, I_{DM-}, is calculated as follows:

$$I_{DM-} = (I_g + 2I_{en})/3$$

TABLE 3—ASD DESIGN VALUES FOR STEEL DECKS (NON-COMPOSITE)^{1,2}

Deck Type	Grade	Gage	M _{np} /Ω (in-lb/ft)	M _{nn} /Ω (in-lb/ft)	V _n /Ω (lb/ft)	R _{be} /Ω (lb/ft) for Bearing Length =			R _{bi} /Ω (lb/ft) for Bearing Length =		
						1½ in.	2 in.	3 in.	1½ in.	2 in.	3 in.
1½" Metal Deck	50	22	5150	5232	2473	809	889	1024	1151	1249	1413
		20	6462	6676	2989	1154	1265	1450	1675	1811	2039
		18	8772	8902	3929	1930	2104	2397	2872	3090	3454
		16	11238	11297	4917	2952	3206	3632	4478	4797	5331
3" Metal Deck	50	22	10681	11843	2653	581	639	735	942	1022	1156
		20	13942	15799	4206	838	918	1052	1364	1474	1660
		18	20728	22472	7289	1418	1546	1761	2324	2500	2795
		16	26886	28922	9318	2188	2376	2692	3609	3866	4297
Bearing Length =						2 in.	3 in.	4 in.	2 in.	3 in.	4 in.
2" Composite Metal Deck	50	22	7105	7311	2033	417	480	533	649	735	806
		20	9481	9701	2815	594	681	754	932	1049	1148
		18	14102	14351	3709	991	1129	1245	1571	1757	1913
		16	18633	18822	4641	1513	1714	1884	2420	2690	2917

For SI Units: 1 inch = 25.4 mm; 1 pound = 4.448 N; 1 ft = 0.305 m

¹ See Page 4 for definitions of variable symbols shown in this table.² Web crippling design strengths, R_{be} and R_{bi}, are for the case of one-flange loading with deck panels fastened to supports.

TABLE 4—ASD UNIFORM SUPERIMPOSED DOWNWARD LOADS FOR BARE DECKS (NON-COMPOSITE) (psf)^{1,2}

1½" Metal Deck												
Span Condition	Gage	Span Length										
		5' – 0"	5' – 6"	6' – 0"	6' – 6"	7' – 0"	7' – 6"	8' – 0"	8' – 6"	9' – 0"	9' – 6"	10' – 0"
Single	22	136	112	94	80	68	59	52	46	41	36	33
	20	170	140	118	100	86	75	65	58	51	46	41
	18	231	191	160	136	117	101	89	78	70	62	56
	16	297	245	205	174	150	130	114	101	89	80	72
Double	22	138	114	95	81	70	60	53	47	41	37	33
	20	176	145	122	103	89	77	68	60	53	47	43
	18	235	194	162	138	119	103	90	80	71	63	57
	16	298	246	206	175	151	131	115	101	90	80	72
Triple	22	173	143	120	102	87	76	67	59	52	47	42
	20	221	182	153	130	112	97	85	75	67	60	54
	18	294	243	203	173	149	129	113	100	89	80	72
	16	374	308	259	220	189	164	144	127	113	101	91
3" Metal Deck												
Span Condition	Gage	Span Length										
		10' – 0"	11' – 0"	12' – 0"	13' – 0"	14' – 0"	15' – 0"	16' – 0"	17' – 0"	18' – 0"	19' – 0"	20' – 0"
Single	22	69	57	48	40	35	30	26	23	20	18	16
	20	91	75	62	53	45	39	34	30	26	24	21
	18	135	111	93	79	68	59	51	45	40	35	32
	16	176	144	121	102	88	76	66	58	52	46	41
Double	22	77	63	53	45	38	33	29	26	23	20	18
	20	103	85	71	60	52	45	39	34	30	27	24
	18	147	121	101	86	74	64	56	49	43	39	35
	16	189	156	130	110	95	82	72	63	56	50	45
Triple	22	97	80	67	57	49	42	37	32	29	26	23
	20	129	107	89	76	65	56	49	43	38	34	31
	18	184	152	127	108	93	80	70	62	55	49	44
	16	237	195	164	139	119	103	90	80	71	63	57
2" Composite Metal Deck (Bare Deck)												
Span Condition	Gage	Span Length										
		6' – 0"	7' – 0"	8' – 0"	9' – 0"	10' – 0"	11' – 0"	12' – 0"	13' – 0"	14' – 0"	15' – 0"	16' – 0"
Single	22	130	95	72	57	46	38	31	26	23	19	17
	20	174	127	97	76	61	50	42	36	30	26	23
	18	259	189	144	114	92	75	63	53	45	39	34
	16	342	250	191	150	121	99	83	70	60	52	45
Double	22	134	98	75	59	47	39	32	27	23	20	17
	20	178	130	99	78	63	52	43	36	31	27	23
	18	263	193	147	116	93	77	64	54	46	40	35
	16	345	253	193	152	122	101	84	71	61	53	46
Triple	22	168	123	94	74	59	49	41	34	29	25	22
	20	223	163	124	98	79	65	54	46	39	34	30
	18	330	242	184	145	117	96	81	68	59	51	44
	16	433	317	242	190	154	126	106	90	77	67	58

For SI Units: 1 inch = 25.4 mm; 1 ft = 305 mm; 1 pound = 4.448 N.

¹ Provided loads are uniformly distributed superimposed loads in psf. Span length assumes center-to-center spacing of supports. Tabulated loads shall not be increased by assuming clear span dimensions.

² Tabulated ASD loads were calculated based on the moment capacities in Table 3. Other limit states such as web crippling and shear have not been accounted for in this table and must be determined by a registered design professional.

TABLE 5— ASD UNIFORM SUPERIMPOSED UPWARD LOADS FOR BARE DECKS (NON-COMPOSITE) (psf)^{1,2}

1½" Metal Deck												
Span Condition	Gage	Span Length										
		5' – 0"	5' – 6"	6' – 0"	6' – 6"	7' – 0"	7' – 6"	8' – 0"	8' – 6"	9' – 0"	9' – 6"	10' – 0"
Single	22	141	117	98	84	73	64	56	50	45	40	36
	20	180	149	126	107	93	81	72	64	57	51	47
	18	240	199	167	143	124	108	95	85	76	68	62
	16	304	252	212	181	157	137	121	107	96	86	78
Double	22	139	115	97	83	72	63	55	49	44	40	36
	20	174	144	122	104	90	79	69	62	55	50	45
	18	237	196	165	141	122	107	94	84	75	67	61
	16	303	251	211	180	156	136	120	107	95	86	78
Triple	22	173	143	121	103	89	78	69	61	55	49	45
	20	217	180	152	129	112	98	86	77	68	62	56
	18	295	244	206	176	152	133	117	104	93	84	76
	16	378	313	263	225	194	169	149	133	119	107	97
3" Metal Deck												
Span Condition	Gage	Span Length										
		10' – 0"	11' – 0"	12' – 0"	13' – 0"	14' – 0"	15' – 0"	16' – 0"	17' – 0"	18' – 0"	19' – 0"	20' – 0"
Single	22	81	67	57	49	42	37	33	29	26	24	22
	20	108	89	75	65	56	49	43	39	35	31	29
	18	153	127	107	92	79	69	61	55	49	44	40
	16	197	163	138	118	102	89	79	70	63	57	52
Double	22	73	61	51	44	38	33	30	26	24	22	20
	20	95	79	67	57	50	44	39	34	31	28	25
	18	141	117	99	85	73	64	57	51	46	41	37
	16	183	152	128	110	95	83	74	66	59	53	49
Triple	22	91	75	64	54	47	41	37	33	29	26	24
	20	118	98	83	71	61	54	48	42	38	34	31
	18	176	146	123	105	91	80	70	63	56	51	46
	16	228	189	159	136	118	103	91	81	73	66	60

For SI Units: 1 inch = 25.4 mm; 1 ft = 305 mm; 1 pound = 4.448 N.

¹ Provided loads are uniformly distributed superimposed loads in psf. Span length assumes center-to-center spacing of supports. Tabulated loads shall not be increased by assuming clear span dimensions.

² Tabulated ASD loads were calculated based on the moment capacities in Table 3. Other limit states such as web crippling and shear have not been accounted for in this table and must be determined by a registered design professional.

TABLE 6—ROOF DECK CONSTRUCTION SPANS^{1,2}

1½" Metal Deck			3" Metal Deck		
Span Condition	Gage	Span Length	Span Condition	Gage	Span Length
Single Span ¹	22	8'-04"	Single Span ¹	22	16'-07"
	20	10'-03"		20	20'-10"
	18	13'-05"		18	28'-07"
	16	16'-08"		16	34'-01"
Double or Triple Spans ¹	22	10'-02"	Double or Triple Spans ¹	22	20'-02"
	20	12'-06"		20	25'-03"
	18	16'-04"		18	34'-05"
	16	20'-02"		16	40'-08"
Cantilever Span ²	22	2'-01"	Cantilever Span ²	22	4'-04"
	20	2'-07"		20	5'-07"
	18	3'-04"		18	7'-06"
	16	4'-02"		16	9'-02"

For SI Units: 1 inch = 25.4 mm; 1 ft = 305 mm; 1 pound = 4.448 N.

¹ All spans based on construction loads were calculated using a 200-pound service load on a 1 foot width of deck, in accordance with ANSI/SDI RD-2017 (Section 2.4.A.3) and ANSI/SDI SD-2022 (Section 2.2.1).

² All cantilever spans based on construction loads were calculated using a 200-pound service load on a 1 foot width of deck and a 10 psf uniform distributed load, in accordance with ANSI/SDI RD-2017 (Section 2.4.A.4) and ANSI/SDI SD-2022 (Section 2.2.2).

TABLE 7—UNIFORM SUPERIMPOSED SERVICE LOAD THAT CAUSES L/240 DEFLECTION FOR BARE DECKS (NON-COMPOSITE), psf^{1,2}

1½" Metal Deck												
Span Condition	Gage	Span Length										
		5' – 0"	5' – 6"	6' – 0"	6' – 6"	7' – 0"	7' – 6"	8' – 0"	8' – 6"	9' – 0"	9' – 6"	10' – 0"
Single	22	76	57	44	35	28	23	19	16	13	11	10
	20	96	72	55	44	35	28	23	19	16	14	12
	18	135	102	78	62	49	40	33	28	23	20	17
	16	179	134	103	81	65	53	44	36	31	26	22
Double	22	184	138	107	84	67	55	45	37	32	27	23
	20	230	173	133	105	84	68	56	47	40	34	29
	18	326	245	189	148	119	97	80	66	56	48	41
	16	430	323	249	196	157	127	105	88	74	63	54
Triple	22	144	108	83	66	52	43	35	29	25	21	18
	20	180	135	104	82	66	53	44	37	31	26	23
	18	255	192	148	116	93	76	62	52	44	37	32
	16	336	253	195	153	123	100	82	68	58	49	42
3" Metal Deck												
Span Condition	Gage	Span Length										
		10' – 0"	11' – 0"	12' – 0"	13' – 0"	14' – 0"	15' – 0"	16' – 0"	17' – 0"	18' – 0"	19' – 0"	20' – 0"
Single	22	46	34	27	21	17	14	11	9	8	7	6
	20	57	43	33	26	21	17	14	12	10	8	7
	18	79	59	46	36	29	23	19	16	14	12	10
	16	105	79	61	48	38	31	26	21	18	15	13
Double	22	110	83	64	50	40	33	27	22	19	16	14
	20	138	104	80	63	50	41	34	28	24	20	17
	18	191	143	110	87	69	56	47	39	33	28	24
	16	252	190	146	115	92	75	62	51	43	37	32
Triple	22	86	65	50	39	32	26	21	18	15	13	11
	20	108	81	62	49	39	32	26	22	18	16	13
	18	149	112	86	68	54	44	36	30	26	22	19
	16	198	148	114	90	72	59	48	40	34	29	25
2" Composite Metal Deck (Bare Deck)												
Span Condition	Gage	Span Length										
		6' – 0"	7' – 0"	8' – 0"	9' – 0"	10' – 0"	11' – 0"	12' – 0"	13' – 0"	14' – 0"	15' – 0"	16' – 0"
Single	22	89	56	37	26	19	14	11	9	7	6	5
	20	111	70	47	33	24	18	14	11	9	7	6
	18	155	97	65	46	33	25	19	15	12	10	8
	16	200	126	84	59	43	32	25	20	16	13	11
Double	22	200	126	84	59	43	32	25	20	16	13	11
	20	256	161	108	76	55	42	32	25	20	16	14
	18	366	230	154	108	79	59	46	36	29	23	19
	16	478	301	202	142	103	78	60	47	38	31	25
Triple	22	157	99	66	46	34	25	20	15	12	10	8
	20	200	126	85	59	43	33	25	20	16	13	11
	18	286	180	121	85	62	46	36	28	23	18	15
	16	374	236	158	111	81	61	47	37	29	24	20

For SI Units: 1 inch = 25.4 mm; 1 ft = 305 mm; 1 pound = 4.448 N.

¹ Span length assumes center-to-center spacing of supports and did not consider self-weight of the panel. Tabulated loads shall not be increased by assuming clear span dimensions.² For loads that cause L/120 deflection, multiply by 2.0. For loads that cause L/180 deflection, multiply by 1.33. For loads that cause L/360 deflection, multiply by 0.667.

TABLE 8—CONSTRUCTION SPANS BASED ON CONSTRUCTION LOADS FOR THE 2" COMPOSITE METAL DECK (WITH WET CONCRETE INFILL)^{1,2}

Overall Slab Thickness (Concrete Topping Thick.) Weight of Composite Deck	Gage	Maximum Unshored Clear Span					
		Normal Weight Concrete – 145 pcf (NW)			Lightweight Concrete – 115 pcf (LW)		
		1 Span	2 Spans	3 Spans	1 Span	2 Spans	3 Spans
4.0" (2") NW = 39psf & LW = 31psf	22	7' 10"	9' 1"	9' 3"	8' 5"	9' 9"	10' 0"
	20	9' 5"	10' 6"	10' 10"	10' 2"	11' 3"	11' 8"
	18	10' 6"	12' 9"	13' 2"	11' 4"	13' 8"	14' 2"
	16	11' 5"	14' 7"	15' 1"	12' 4"	15' 8"	16' 3"
4.5" (2.5") NW = 45psf & LW = 35psf	22	7' 5"	8' 8"	8' 10"	8' 1"	9' 5"	9' 7"
	20	9' 0"	10' 0"	10' 4"	9' 9"	10' 10"	11' 2"
	18	10' 0"	12' 2"	12' 6"	10' 10"	13' 2"	13' 8"
	16	10' 11"	13' 11"	14' 4"	11' 10"	15' 1"	15' 7"
5.0" (3") NW = 51psf & LW = 39psf	22	7' 2"	8' 3"	8' 5"	7' 10"	9' 1"	9' 3"
	20	8' 8"	10' 4"	10' 9"	9' 6"	11' 5"	11' 10"
	18	9' 7"	11' 7"	12' 0"	10' 6"	12' 9"	13' 2"
	16	10' 5"	13' 4"	13' 9"	11' 5"	14' 7"	15' 1"
5.5" (3.5") NW = 57psf & LW = 44psf	22	6' 10"	7' 11"	8' 1"	7' 6"	8' 9"	8' 11"
	20	8' 3"	9' 2"	9' 6"	9' 0"	10' 1"	10' 5"
	18	9' 3"	11' 2"	11' 6"	10' 1"	12' 3"	12' 8"
	16	10' 1"	12' 9"	13' 2"	11' 0"	14' 0"	14' 6"
6.0" (4") NW = 63psf & LW = 48psf	22	6' 7"	7' 8"	7' 9"	7' 3"	8' 6"	8' 7"
	20	7' 11"	8' 10"	9' 1"	8' 9"	9' 9"	10' 1"
	18	8' 11"	10' 9"	11' 1"	9' 9"	11' 10"	12' 3"
	16	9' 9"	12' 4"	12' 9"	10' 8"	13' 7"	14' 0"
6.5" (4.5") NW = 69psf & LW = 53psf	22	6' 5"	7' 5"	7' 6"	7' 0"	8' 2"	8' 4"
	20	7' 8"	8' 6"	8' 10"	8' 5"	9' 5"	9' 9"
	18	8' 8"	10' 4"	10' 9"	9' 6"	11' 5"	11' 10"
	16	9' 5"	11' 10"	12' 3"	10' 4"	13' 1"	13' 7"

For **SI** Units: 1 inch = 25.4 mm; 1 ft = 305 mm; 1 pound = 4.448 N.

¹ Tabulated spans were calculated based on the moment capacities in Table 3. Other limit states such as serviceability, web crippling, and shear have not been accounted for in this table and must be determined by a registered design professional.

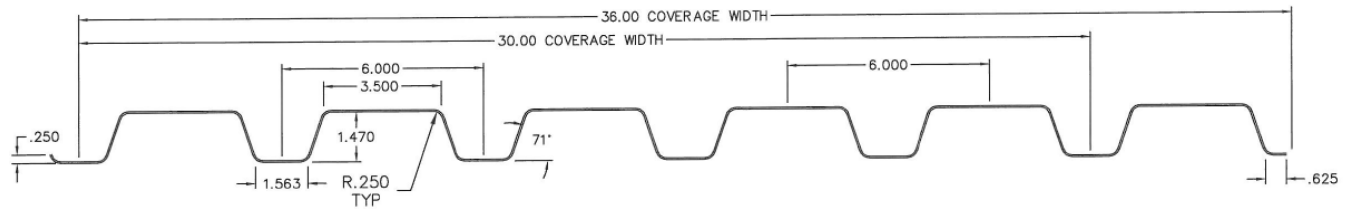
² Required bearing should be determined based on specific span conditions.

TABLE 9—ASD COMPOSITE DECK SLAB ALLOWABLE SUPERIMPOSED LOAD (PSF) FOR THE 2" COMPOSITE METAL DECK WITH NORMAL WEIGHT CONCRETE (NW) OR LIGHTWEIGHT CONCRETE (LW) FILL^{1,2}

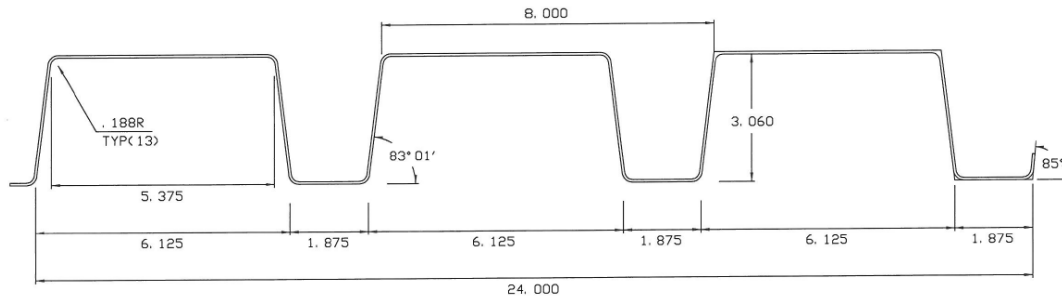
Concrete (NW or LW)	Gage	Slab Thick. (in.)	Wt. (psf)	Span Length														
				7' 0"	7' 6"	8' 0"	8' 6"	9' 0"	9' 6"	10' 0"	10' 6"	11' 0"	11' 6"	12' 0"	12' 6"	13' 0"	13' 6"	14' 0"
NW	22	4	39	285	246	213	186	164	145	128	114	102	92	82	74	67	60	55
		4.5	45	347	299	260	227	200	177	157	140	125	112	101	91	82	74	67
		5	51	400	355	308	270	237	210	187	167	149	134	121	109	99	89	81
		5.5	57	400	400	358	313	276	244	217	194	174	156	141	127	115	105	95
		6	63	400	400	400	358	316	280	249	222	199	179	162	146	133	120	109
		6.5	69	400	400	400	400	356	315	281	251	225	203	183	166	150	136	124
NW	20	4	39	345	298	259	227	200	177	158	141	127	114	103	93	84	77	70
		4.5	45	400	362	315	276	244	216	193	172	155	139	126	114	103	94	86
		5	51	400	400	374	328	289	257	229	205	184	166	150	136	124	112	102
		5.5	57	400	400	400	381	336	299	266	239	214	193	175	159	144	131	120
		6	63	400	400	400	400	385	342	305	273	246	222	201	182	166	151	138
		6.5	69	400	400	400	400	400	385	344	308	277	250	227	206	187	171	156
NW	18	4	39	400	391	341	300	265	235	210	189	170	154	139	127	115	105	96
		4.5	45	400	400	400	364	322	286	256	230	207	187	170	154	141	129	118
		5	51	400	400	400	400	382	340	304	273	246	223	202	184	168	154	141
		5.5	57	400	400	400	400	400	395	354	318	287	259	236	215	196	179	164
		6	63	400	400	400	400	400	400	400	364	328	297	270	246	225	206	189
		6.5	69	400	400	400	400	400	400	400	400	371	336	305	278	254	233	214
NW	16	4	39	400	400	400	373	331	294	264	237	214	194	176	161	147	135	124
		4.5	45	400	400	400	400	400	358	320	288	260	236	215	196	179	164	151
		5	51	400	400	400	400	400	400	380	342	309	281	255	233	213	196	180
		5.5	57	400	400	400	400	400	400	400	399	360	327	298	272	249	228	210
		6	63	400	400	400	400	400	400	400	400	400	375	341	312	285	262	241
		6.5	69	400	400	400	400	400	400	400	400	400	400	386	352	323	296	273
LW	22	4	31	277	239	208	182	161	143	127	113	102	92	83	75	68	62	56
		4.5	35	339	292	255	223	197	175	156	139	125	113	102	92	84	76	70
		5	39	400	348	303	266	235	209	186	167	150	135	122	111	101	92	84
		5.5	44	400	400	353	310	273	243	217	194	175	158	143	130	118	108	98
		6	48	400	400	400	355	314	279	249	223	201	181	164	149	136	124	113
		6.5	53	400	400	400	400	354	314	281	252	227	205	186	169	154	140	128
LW	20	4	31	334	289	252	221	195	173	155	139	125	113	102	93	84	77	70
		4.5	35	400	352	307	270	239	212	189	170	153	138	125	114	104	95	87
		5	39	400	400	366	321	284	253	226	203	183	165	150	137	125	114	104
		5.5	44	400	400	400	374	331	294	263	236	213	193	175	159	145	133	122
		6	48	400	400	400	400	379	338	302	271	245	222	201	183	168	153	141
		6.5	53	400	400	400	400	400	381	341	307	277	251	228	207	189	173	159
LW	18	4	31	400	377	329	289	256	228	204	183	166	150	136	124	114	104	95
		4.5	35	400	400	400	352	312	278	249	224	202	183	167	152	139	128	117
		5	39	400	400	400	400	372	331	297	267	241	219	199	182	166	153	140
		5.5	44	400	400	400	400	400	386	346	311	281	255	232	212	194	178	164
		6	48	400	400	400	400	400	400	397	357	323	293	267	244	224	205	189
		6.5	53	400	400	400	400	400	400	400	400	365	332	302	276	253	232	214
LW	16	4	31	400	400	400	358	318	283	254	229	207	188	171	156	143	131	121
		4.5	35	400	400	400	400	387	345	309	279	252	229	209	191	175	161	148
		5	39	400	400	400	400	400	400	369	332	301	273	249	228	209	192	177
		5.5	44	400	400	400	400	400	400	400	387	351	319	291	266	244	224	207
		6	48	400	400	400	400	400	400	400	400	400	367	334	306	281	258	238
		6.5	53	400	400	400	400	400	400	400	400	400	400	378	346	318	293	270

For SI Units: 1 inch = 25.4 mm; 1 ft = 305 mm; 1 pound = 4.448 N.

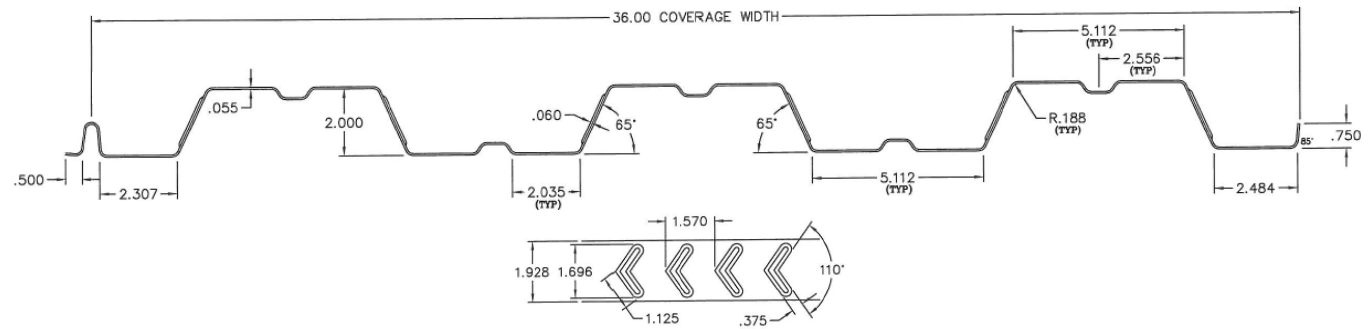
¹ Concrete fill must be as specified in Section 3.4 of this report.² The provided ASD design values are based on the moment capacity of the composite deck. Other limit states such as serviceability, web crippling, and shear have not been accounted for in this table and must be determined by a registered design professional.



1 1/2" Metal Deck (B-Deck)



3" Metal Deck (N-Deck)



EMBOSS DETAIL

Type 1 (Type I) Embossment Details per ANSI/SDI SD-2022 Section F3.2.1 (ANSI/SDI C Appendix 2):
 $P_h = 0.06"$ $D_w = 1.927"$ $W = 0.375"$ $t = 0.0295", 0.0358", 0.0474" \text{ or } 0.0598"$

2" Composite Metal Deck (C-Deck).

FIGURE 1—METAL DECKS

DIVISION: 05 00 00—METALS**Section: 05 31 00—Steel Decking****Section: 05 31 13—Steel Floor Decking****Section: 05 31 23—Steel Roof Decking****Section: 05 36 00—Composite Metal Decking****REPORT HOLDER:**

BETCO, INC.

EVALUATION SUBJECT:**1¹/₂" METAL DECK (B-DECK), 3" METAL DECK (N-DECK), AND 2" COMPOSITE METAL DECK****1.0 REPORT PURPOSE AND SCOPE****Purpose:**

The purpose of this evaluation report supplement is to indicate that the 1¹/₂" Metal Deck (B-Deck), 3" Metal Deck (N-Deck), and 2" Composite Metal Deck, described in ICC-ES evaluation report [ESR-5720](#), have also been evaluated for compliance with the Chicago Construction Codes (Title 14 of the Chicago Municipal Code) as noted below.

Applicable code editions:

- 2019 *Chicago Building Code, Title 14B* (with Revised April 2022 Supplement)

2.0 CONCLUSIONS

The 1¹/₂" Metal Deck (B-Deck), 3" Metal Deck (N-Deck), and 2" Composite Metal Deck, described in Sections 2.0 through 7.0 of the evaluation report [ESR-5720](#), comply with Chapter 22 of the 2019 *Chicago Building Code, Title 14B* (with Revised April 2022 Supplement), and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The 1¹/₂" Metal Deck (B-Deck), 3" Metal Deck (N-Deck), and 2" Composite Metal Deck described in this evaluation report supplement must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-5720](#).
- The design, installation, conditions of use and identification of the 1¹/₂" Metal Deck (B-Deck), 3" Metal Deck (N-Deck), and 2" Composite Metal Deck must be in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-5720](#).
- The design, installation and inspection are in accordance with additional requirements of Chapters 16, 17, and 22 of Title 14B, as applicable.

This supplement expires concurrently with the evaluation report, dated July 2025.

ICC-ES Evaluation Report

ESR-5720 CA Supplement

Issued July 2025

This report is subject to renewal July 2026.

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A Subsidiary of the International Code Council®

DIVISION: 05 00 00—METALS

Section: 05 31 00—Steel Decking

Section: 05 31 13—Steel Floor Decking

Section: 05 31 23—Steel Roof Decking

Section: 05 36 00—Composite Metal Decking

REPORT HOLDER:

BETCO, INC.

EVALUATION SUBJECT:

1½" METAL DECK (B-DECK), 3" METAL DECK (N-DECK), AND 2" COMPOSITE METAL DECK

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the 1½" Metal Deck (B-Deck), 3" Metal Deck (N-Deck), and 2" Composite Metal Deck, described in ICC-ES evaluation report ESR-5720, have also been evaluated for compliance with the code noted below.

Applicable code edition(s):

- 2025 and 2022 *California Building Code* (CBC)

For evaluation of applicable Chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

2.0 CONCLUSIONS

2.1 CBC:

The 1½" Metal Deck (B-Deck), 3" Metal Deck (N-Deck), and 2" Composite Metal Deck, described in Sections 2.0 through 7.0 of the evaluation report ESR-5720, comply with CBC Chapter 22, provided the design and installation are in accordance with the 2024 and 2021 *International Building Code*® (IBC) provisions, as applicable, noted in the evaluation report and the additional requirements of CBC Chapter 16 and 17, as applicable.

2.1.1 OSHPD:

The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.1.2 DSA:

The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

This supplement expires concurrently with the evaluation report, issued July 2025.

ICC-ES Evaluation Report

ESR-5720 FL Supplement w/ HVHZ

Issued July 2025

This report is subject to renewal July 2026.

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A Subsidiary of the International Code Council®

DIVISION: 05 00 00—METALS

Section: 05 31 00—Steel Decking

Section: 05 31 13—Steel Floor Decking

Section: 05 31 23—Steel Roof Decking

Section: 05 36 00—Composite Metal Decking

REPORT HOLDER:

BETCO, INC.

EVALUATION SUBJECT:

1½" METAL DECK (B-DECK), 3" METAL DECK (N-DECK), AND 2" COMPOSITE METAL DECK

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the 1½" Metal Deck (B-Deck), 3" Metal Deck (N-Deck), and 2" Composite Metal Deck, recognized in ICC-ES evaluation report ESR-5720, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2023 Florida Building Code—Building

2.0 CONCLUSIONS

The 1½" Metal Deck (B-Deck), 3" Metal Deck (N-Deck), and 2" Composite Metal Deck, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-5720, comply with the 2023 *Florida Building Code—Building*. The design requirements shall be determined in accordance with the *Florida Building Code—Building*. The installation requirements noted in ICC-ES evaluation report ESR-5720 for the 2021 *International Building Code*® meet the requirements of the *Florida Building Code—Building*.

Use of the 1½" Metal Deck (B-Deck), 3" Metal Deck (N-Deck), and 2" Composite Metal Deck has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building*, except that the protection of metal must be in accordance with Section 2222.6 of the *Florida Building Code—Building*.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality assurance program is audited by a quality assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission). Florida Rule 61G20-3 is applicable to products and/or systems, which comprise the building envelope and structural frame, for compliance with the structural requirements of the Florida Building Code.

This supplement expires concurrently with the evaluation report, issued July 2025.