ICC-ES Evaluation Report

ESR-3270

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DIVISION: 05 00 00 — METALS **Section: 05 05 23 — Metal Fastenings** **Section: 05 31 00 — Steel Decking**	**REPORT HOLDER: ITW BUILDEX**	**EVALUATION SUBJECT: ITW BUILDEX TEKS® SELF-DRILLING SCREWS**	

1.0 EVALUATION SCOPE

Compliance with the following codes:

2018, 2015 and 2012 *International Building Code®* (IBC)

Property evaluated:

Structural

2.0 USES

The ITW Buildex TEKS® self-drilling tapping fasteners (screws) are used in connections of bare and concrete filled steel deck diaphragms. The #12-24 TEKS/4, TEKS/4.5, TEKS/5.0 and TEKS/5 are used to connect steel deck panels to supporting framing. The #10-16 TEKS/1 & TEKS/3 and #12-14 TEKS/1 & TEKS/3 are used to connect steel deck panel sidelaps.

3.0 DESCRIPTION

3.1 TEKS:

As recognized in ESR-1976, the TEKS fasteners are case hardened from carbon steel conforming to ASTM A510, Grade 1018 to 1022; have hex washer heads (HWH); comply with the material, process, and performance requirements of ASTM C1513-13; have threads complying with ASME B18.6.4; have proprietary drill points and flutes designated as TEKS/1, TEKS/2, TEKS/3, TEKS/4, TEKS/4.5, TEKS/5.0 and TEKS/5; and are coated with a corrosion preventive coating identified as Climaseal®, which complies with the minimum corrosion resistance requirements of ASTM F1941-15. See Table 1 for TEKS Fastener Selector Guide.

3.2 Steel Deck Panels:

Roof and floor decks must comply with the dimensional requirements contained in Table 2.

Roof deck panels must comply with ASTM A653 SS Grade 33 (minimum), with minimum G60 galvanized coating or be phosphatized steel complying with ASTM A1008-13, SS Grade 33 (minimum).

Floor deck panels must comply with ASTM A653 SS Grade 40 (minimum), with minimum G60 galvanized coating or be phosphatized steel complying with ASTM A1008-13, SS Grade 40 (minimum).

3.3 Structural Steel Framing:

Structural steel framing supporting the steel deck panels (such as bar joists and structural steel shapes) must be manufactured from code-compliant steel having minimum strength requirements of ASTM A36, ASTM A572 Grade 50, or ASTM A992-11.

3.4 Concrete Fill:

Concrete fill must be either normal weight [(145 lb/ft^3) (2323 kg/m^3)] or lightweight [(110 lb/ft^3) (1762 kg/m^3)] specified in accordance with the applicable code and have a minimum 28-day compressive strength of 3,000 psi (20.7 MPa). Concrete reinforcement must comply with the applicable code.

4.0 DESIGN AND INSTALLATION

4.1 Design:

For symbols and definitions, see the American Iron and Steel Institute's *North American Standard for the Design of Profiled Steel Diaphragm Panels* (AISI S310-16).

4.1.1 Diaphragm Shear and Stiffness by Calculations: Diaphragm shear and stiffness by calculations may be determined in accordance with AISI S310-16 while using Tables 1 through 9 and the following safety and resistance factors.

BARE DECK PANELS				
Load Type or Combinations Including	**TEKS Connections**		**Panel Buckling**	
	Ω_{df} (ASD)	**ϕ_{df} (LRFD)**	**Ω_{db} (ASD)**	**ϕ_{db} (LRFD)**
Earthquake (Seismic)	2.50	0.65	2.00	0.80
Wind	2.35	0.70		
All Others	2.50	0.65		

CONCRETE FILLED DECK PANELS WITH TEKS CONNECTIONS		
Load Type or Combinations Including	**Ω (ASD)**	**ϕ (LRFD)**
Earthquake (Seismic)	3.25	0.50
Wind		
All Others		

4.1.2 Diaphragm Shear and Stiffness by Tabulated Values: Diaphragm shear and stiffness may be determined per Tables 10 through 21.

4.1.3 Uplift/Tension: For designs considering uplift/tension forces, the #12-24 TEKS pullout and pullover strength, when installed through steel decks and into support steel, are provided in Tables 23 and 24, while the tension strength of the #12-24 TEKS alone are provided in Table 25.

4.1.4 Shear: For information regarding the TEKS shear strength installed in different gages of steel and installed through different gages of steel and into supports, see ESR-1976.

4.2 Installation:

Steel deck panel ends must overlap a minimum of 2 inches (51 mm). End lap and corner lap conditions of two- and four-deck layers must be snug and tight to one another and the supporting steel frame, prior to frame fastener attachment.

The TEKS at supports perpendicular to the deck panels spans must be spaced per the layout in Figure 1. For spans greater than 5 feet, the TEKS at perimeter supports and sidelaps must not exceed 36 inches on center. The TEKS must penetrate through the supporting steel with a minimum three threads protruding past the back side of the support steel.

5.0 CONDITIONS OF USE

Steel deck diaphragms comprised of steel deck panels attached to steel supports with TEKS as described in this report, comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

5.1 The fasteners are manufactured, identified and installed in accordance with this report, the manufacturer's instructions and the approved plans. If there is a conflict, this report governs.

5.2 The base metal thickness for deck panels delivered to the jobsite must be at least 95 percent of the design metal thickness.

5.3 The minimum loads of IBC Section 1607 must be considered by the design professional based on the specific occupancy or use, as applicable.

5.4 Special inspection shall comply with IBC Chapter 17.

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 The Diaphragm Flexibility Limitations in Table 22 must be considered.

5.7 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.

5.8 When the steel deck panels are used as roof decks, the panels must be covered with an approved code-complying roof covering.

6.0 EVIDENCE SUBMITTED

6.1 Data in accordance with the ICC-ES Acceptance Criteria for Steel Deck Roof and Floor Systems (AC43), dated February 2020 (Editorially revised February 2021).

6.2 Data in accordance with the ICC-ES Acceptance Criteria for Steel Deck Roof and Floor Systems (AC43), dated October 2010 (Editorially Revised September 2013).

6.3 Data in accordance with the ICC-ES Acceptance Criteria for Tapping Screw Fasteners (AC118), dated January 2018 (Editorially Revised December 2020).

7.0 IDENTIFICATION

7.1 All Buildex TEKS screws described in this report are identified by a "BX" stamped on the screw head. All fasteners are packaged in containers noting the product designation, the company name (ITW Buildex), fastener description (model, point type, diameter and length), lot number and the evaluation report number (ESR-3270).

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

ITW BUILDEX
155 HARLEM AVENUE
GLENVIEW, ILLINOIS 60025
(800) 848-5611
www.itwbuildex.com
techsupport@itwccna.com

For **SI** dimensions: 1 inch = 25.4 mm, 1 foot (12 inches) = 304.8 mm, 1 kip (1000 lbf) = 4.448kN

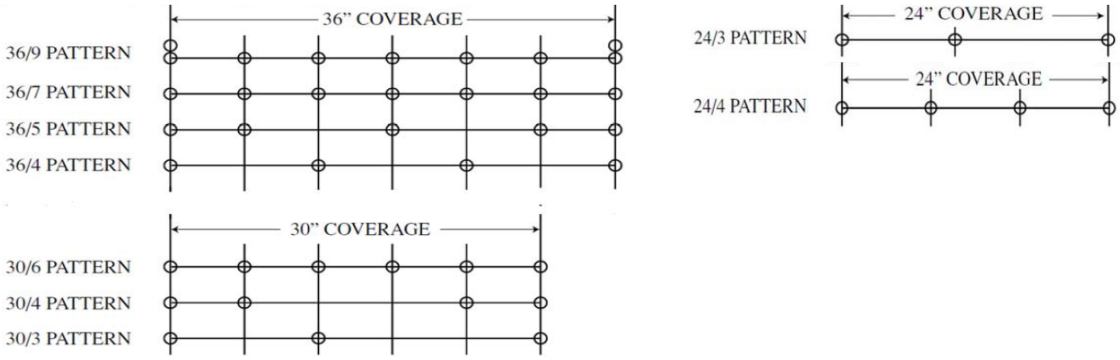


FIGURE 1—TEKS SUPPORT FASTENER LAYOUT

Notes:
1. For nestable-type decks, support fasteners on the sides are installed through both connecting steel deck panels and into the supporting framing.
2. For interlocking-type decks, equal numbers of support fasteners on the sides must be installed on each side of the sidelap and into supporting framing.

TABLE 1—TEKS FASTENER SELECTOR GUIDE

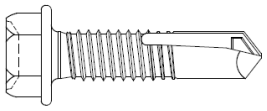
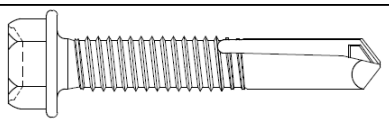
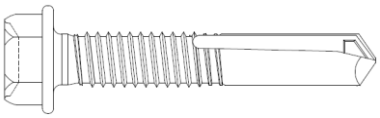
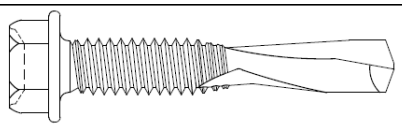
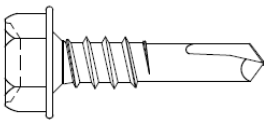
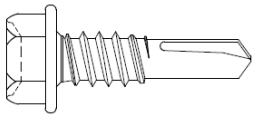
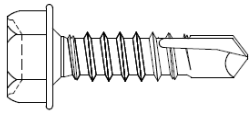
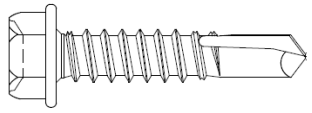
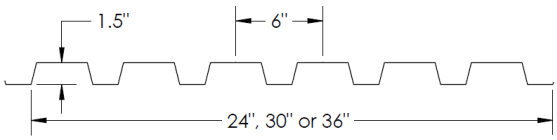
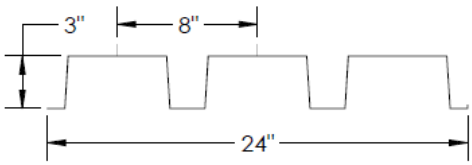
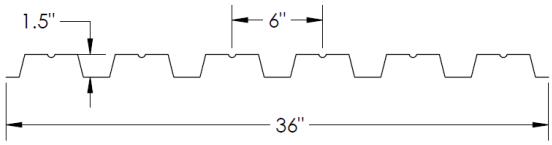
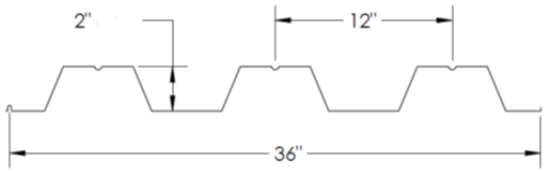
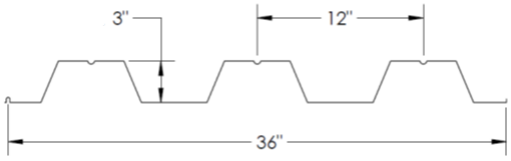
DESCRIPTION (dia.-tpi) (head/point)	NOMINAL SHANK DIAMETER (inch)	WASHER HEAD DIAMETER (inch)	APPLICATIONS	FASTENER FIGURES
TEKS at Support Connections				
#12-24 HWH TEKS/4	0.216	0.415	Structural steel framing with thickness $1/8" \le t_{support} \le 1/4"$	
#12-24 HWH TEKS/4.5	0.216	0.415	Structural steel framing with thickness $1/8" \le t_{support} \le 3/8"$	
#12-24 HWH TEKS/5.0	0.216	0.415	Structural steel framing with thickness $1/8" \le t_{support} \le 1/2"$	
#12-24 HWH TEKS/5	0.216	0.415	Structural steel framing with thickness $1/8" \le t_{support} \le 1/2"$	
TEKS at Side-lap Connections				
#10-16 HWH TEKS/1	0.190	0.400	Side-lap connections No. 22, 20, 18 gage steel deck	
#12-14 HWH TEKS/1	0.216	0.415	Side-lap connections No. 22, 20, 18 gage steel deck	
#10-16 HWH TEKS/3	0.190	0.400	Side-lap connections No. 22, 20, 18, 16 gage steel deck	
#12-14 HWH TEKS/3	0.216	0.415	Side-lap connections No. 22, 20, 18, 16 gage steel deck	

TABLE 2—STEEL DECK PANEL PANELS

DECK PANEL	PROFILE (Nestable-Type Sidelap shown, Interlocking Sidelap may also be used)	FOR USE WITH SECTION 4.1.1		MINIMUM STRENGTH
		GAGE (design metal thickness, in.)[1]	MINIMUM I_{xg} (in.^{4}/ft.)	
1.5" WR, IR, and NR Roof Deck	 (1 ½-inch-deep deck with 6-inch on center flutes)	22 (0.0295)	0.114 (NR) 0.125 (IR) 0.173 (WR)	F_y = 33 ksi F_u = 45 ksi
		20 (0.0358)	0.138 (NR) 0.151 (IR) 0.210 (WR)	
		18 (0.0474)	0.184 (NR) 0.201 (IR) 0.279 (WR)	
		16 (0.0598)	0.233 (NR) 0.254 (IR) 0.353 (WR)	
3" DR Roof Deck	 (3-inch-deep deck with 8-inch on center flutes)	22 (0.0295)	0.808	
		20 (0.0358)	0.988	
		18 (0.0474)	1.323	
		16 (0.0598)	1.672	
1.5" x 6" Floor Deck	 (1 ½-inch-deep deck with 6-inch on center flutes)	22 (0.0295)	0.173	F_y = 40 ksi F_u = 52 ksi
		20 (0.0358)	0.210	
		18 (0.0474)	0.279	
		16 (0.0598)	0.353	
2" x 12" Floor Deck	 (2-inch-deep deck with 12-inch on center flutes)	22 (0.0295)	0.296	
		20 (0.0358)	0.377	
		18 (0.0474)	0.500	
		16 (0.0598)	0.632	
3" x 12" Floor Deck	 (3-inch-deep deck with 12-inch on center flutes)	22 (0.0295)	0.735	
		20 (0.0358)	0.932	
		18 (0.0474)	1.267	
		16 (0.0598)	1.600	

[1]The base metal thickness delivered to the jobsite must be at least 95 percent of the design metal thickness.

TABLE 3—SUPPORT FASTENER NOMINAL SHEAR STRENGTH, P_{nf}, (lbf)
(for use with Section 4.1.1)

SUPPORT FASTENER	ROOF DECK GAGE- F_y = 33 ksi (DESIGN BASE METAL THICKNESS, in.)				FLOOR DECK GAGE - F_y = 40 ksi (DESIGN BASE METAL THICKNESS, in.)			
	22 (0.0295)	20 (0.0358)	18 (0.0474)	16 (0.0598)	22 (0.0295)	20 (0.0358)	18 (0.0474)	16 (0.0598)
#12-24 TEKS/4 #12-24 TEKS/4.5 #12-24 TEKS/5.0 #12-24 TEKS/5	1016	1233	1633	2060	1180	1432	1896	2392

TABLE 4 SIDE-LAP FASTENER NOMINAL SHEAR STRENGTH, P_{ns}, (lbf)
(for use with Section 4.1.1)

SIDELAP FASTENER	DECK PANEL GAGE/ DECK PANEL GAGE (DESIGN BASE METAL THICKNESS, in / DESIGN BASE METAL THICKNESS, in.)			
	22/22 (0.0295/0.0295)	20/20 (0.0358/0.0358)	18/18 (0.0474/0.0474)	16/16 (0.0598/0.0598)
#10-16 TEKS/1	633	769	1018	-
#10-16 TEKS/3	633	769	1018	1284
#12-14 TEKS/1	716	869	1151	-
#12-14 TEKS/3	716	869	1151	1452

TABLE 5—SUPPORT FASTENER FLEXIBILITY (S_f) AND SIDELAP FASTENER FLEXIBILITY (S_s)
(for use with Section 4.1.1)

DECK PANEL GAGE (DESIGN BASE METAL THICKNESS, in.)		22 (0.0295)	20 (0.0358)	18 (0.0474)	16 (0.0598)
#12-24 TEKS/4 #12-24 TEKS/4.5 **#12-24 TEKS/5.0** #12-24 TEKS/5	**S_f, (in./kip)**	0.0076	0.0069	0.0060	0.0053
#10-16 TEKS/1 #10-16 TEKS/3 #12-14 TEKS/1 #12-14 TEKS/3	**S_s, (in./kip)**	0.0175	0.0159	0.0138	0.0123

TABLE 6—ROOF DECK DIMENSIONS FOR WARPING CALCULATIONS[1]
(for use with Section 4.1.1)

ROOF DECK TYPE	D_d (in.)	w (in.)	d (in.)	2e (in.)	f (in.)	s = 2(e + w) + f (in.) (AISI S310 Eq. D2.1-2)
1.5" WR	1.47	1.53	6.00	1.56	3.56	8.19
1.5" IR	1.47	1.59	6.00	0.53	4.24	7.95
1.5" NR	1.47	1.51	6.00	0.36	4.99	8.36
3" DR	3.00	3.07	8.00	1.49	5.24	12.86

[1]See AISI S310 Figure D2.1-1 for panel configuration.

TABLE 7— γ_c VALUES
(for use with Section 4.1.1)

SPANS	1	2	3	4	5	6
γ_c	1.00	1.00	0.90	0.80	0.71	0.64

TABLE 8—DIAPHRAGM STRENGTH (S) AND STIFFNESS FACTOR (G') EQUATION VARIABLE VALUES FOR DECK PANELS
(for use with Section 4.1.1, D_{xx} is also for use with Tables 10-21)

DECK TYPE	FRAME FASTENER PATTERN	A	α See Note 1	$\frac{\Sigma(x^2)}{w^2}$ See Note 2	N, ft^{-1}	s/d	WARPING CONSTANT, D_{xx}, ft See Note 3			
							D22	D20	D18	D16
1.5" WR, IR, or NR ROOF DECK	36/9	2	3.000	1.278	2 .333	1.365 1.325 1.393	103 186 318	77 139 238	51 92 156	36 65 110
	36/7	1	2.000	0.778	2.000	1.365 1.325 1.393	103 186 318	77 139 238	51 92 156	36 65 110
	36/5	1	1.667	0.722	1.333	1.365 1.325 1.393	607 637 857	454 477 641	298 313 421	210 221 297
	36/4	1	1.333	0.556	1.000	1.365 1.325 1.393	860 863 1126	643 645 842	422 424 553	298 299 390
	30/6	1	1.800	0.700	2.000	1.365 1.325 1.393	103 186 318	77 139 238	51 92 156	36 65 110
	30/4	1	1.600	0.680	1.200	1.365 1.325 1.393	1102 1090 1410	824 815 1054	541 535 692	382 377 488
3" DR ROOF DECK	24/4	1	1.333	0.556	1.500	1.608	603	451	296	209
1.5" FLOOR DECK	36/4	1	1.333	0.556	1.000	1.365	860	643	422	298
2" FLOOR DECK	36/4 24/3	1	1.333 1.000	0.556 0.500	1.000 1.000	1.206 1.206	139	104	68	48
3" FLOOR DECK	36/4 24/3	1	1.333 1.000	0.556 0.556	1.000 1.000	1.360 1.360	271	203	133	94

Notes:
1. $\alpha = \alpha_1, \alpha_2, \alpha_3, \text{or } \alpha_4$ (see AISI S310 for definitions)
2. $x = x_e, x_p, x_{ee}, or\ x_{pe}$ (see AISI S310 definitions)
3. $D_n = D_{xx}/L$ (D_n is for use with AISI S310 equations, D_{xx} is for use with Tables 10-21)

TABLE 9—K VALUES FOR GENERAL STIFFNESS EQUATIONS
(for use with Tables 10 through 21)

DECK PANEL GAGE (DESIGN METAL THICKNESS, in.)		K_2 (kip/in.)	DECK PROFILE	K_4
22 (0.0295)		870	**1.5 NR Roof Deck**	3.62
20 (0.0358)		1056	**1.5 IR Roof Deck**	3.45
18 (0.0474)		1398	**1.5 WR Roof Deck**	3.55
16 (0.0598)		1764	**3 DR Roof Deck**	4.18
CONCRETE TYPE	**f'_c (psi)**	**K_3 (kip/in.)**	**1.5" x 6" Floor Deck**	3.55
Normal Weight (145 pcf)	3000	2380	**2" x 12" Floor Deck**	3.14
Lightweight Concrete (110 pcf)			**3" x 12" Floor Deck**	3.54

TABLE NOTES FOR TABLES 10 THROUGH 21

1. Diaphragm Shear Strength

Bare Decks
$S_{ASD} = \text{Min}\ (S_{nf}/\Omega_{df},\ S_{nb}/\Omega_{db})$
$S_{LRFD} = \text{Min}\ (\phi_{df}S_{nf},\ \phi d_{db}S_{nb})$

Concrete-Filled Decks
$S_{ASD} = S_n/\Omega$
$S_{LRFD} = \phi S_n$

Load Type or Combinations Including	Bare Decks				Concrete Filled Decks	
	Screw Connections		Panel Buckling			
	ϕ_{df}	Ω_{df}	ϕ_{db}	Ω_{db}	ϕ	Ω
Seismic	0.65	2.50	0.80	2.00	0.50	3.25
Wind	0.70	2.35				
Other	0.65	2.50				

2. Diaphragm Stiffness:

Bare steel decks based on triple span conditions:

$$G' = \frac{K_2}{K_4 + \frac{0.3D_{xx}}{L_v} + 3K_1L_v}\ (\text{kips/inch}) \text{ and } F = \frac{1000}{G'}\ (\text{micro} - \text{inches/lbf})$$

For concrete filled steel decks based on 1 or more span conditions.

$$G' = \frac{K_2}{K_4 + 3K_1L_v} + K_3\ (\text{kips/inch}) \text{ and } F = \frac{1000}{G'}\ (\text{micro} - \text{inches/lbf})$$

Where,

L_v = span (i.e., purlin or joist spacing) ft

D_{xx}: see Table 8, ft

K_1: see Tables 10 - 21, ft^{-1}

K_2 and K_3: see Table 9, kips/in.

K_4: see Table 9

3. Bare Steel Decks: The number of perimeter edge support fasteners must be at least equivalent to the number of side-lap connections per span.

4. Concrete Filled Decks: The number of perimeter edge and perimeter end support fasteners for concrete-filled diaphragms must be determined per AISI S310-13 Section 4.4. However, the number of perimeter edge and perimeter end support fasteners must be at least equivalent to the number of side-lap connections per span.

TABLE 10—S_{nf}, S_{nb}, and K_1 for 22 GAGE (0.0295 in.) 1.5 WR, IR, AND NR DECK PANELS (F_y = 33 ksi, F_u = 45 ksi)

Support Screws: #12-24 TEKS/4, TEKS/4.5, **TEKS/5.0** or TEKS/5
Side-lap Screws: #10-16 TEKS/1, TEKS/3, #12-14 TEKS/1, or TEKS/3

FASTENER LAYOUT	SIDE-LAP CONN/SPAN	BASED ON 3-SPAN-CONDITION NOMINAL SHEAR STRENGTH, S_{nf}, plf SPAN, ft.									K_1, 1/ft
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	
36/9	0	1035	910	810	720	640					0.366
	1	1180	1045	940	845	765	695	630			0.301
	2	1310	1170	1055	960	875	805	735	675	625	0.255
	3	1425	1285	1165	1060	975	900	835	775	715	0.222
	4	1525	1385	1265	1160	1070	990	920	855	805	0.196
	5	1615	1475	1355	1250	1155	1070	1000	935	875	0.176
	6	1690	1560	1440	1330	1235	1150	1075	1010	950	0.159
36/7	0	660	575	500	440	395					0.549
	1	830	730	645	580	520	470	430			0.414
	2	980	870	775	700	640	585	535	490	455	0.333
	3	1115	995	895	815	745	685	630	590	545	0.278
	4	1230	1110	1005	915	840	775	720	670	630	0.239
	5	1325	1210	1105	1015	935	865	805	750	705	0.209
	6	1410	1295	1190	1100	1020	945	885	825	775	0.186
36/5	0	585	515	460	410	365					0.659
	1	725	645	580	525	480	440	405			0.474
	2	840	760	690	630	580	535	495	465	435	0.370
	3	930	850	785	720	670	620	580	540	510	0.304
	4	1000	930	860	800	745	695	655	615	575	0.257
	5	1060	990	930	870	815	765	720	680	640	0.223
	6	1105	1045	985	930	875	825	780	740	700	0.197
36/4	0	445	395	350	305	275					0.823
	1	580	520	470	430	390	360	330			0.554
	2	680	620	570	525	485	450	420	390	365	0.417
	3	755	700	650	605	565	525	495	465	435	0.334
	4	810	760	715	670	630	595	560	530	500	0.279
	5	850	805	765	725	685	650	615	585	555	0.240
	6	880	840	805	765	730	695	665	635	605	0.210
30/6	0	600	515	445	395	350					0.732
	1	775	680	600	535	480	435	395			0.538
	2	935	825	735	660	600	550	500	460	425	0.425
	3	1070	955	860	775	710	650	600	555	515	0.351
	4	1190	1070	970	885	810	745	690	645	600	0.299
	5	1295	1175	1070	980	905	835	775	725	680	0.261
	6	1385	1270	1165	1070	990	920	860	800	755	0.231
30/4	0	545	480	430	380	340					0.823
	1	680	610	550	500	455	420	385			0.585
	2	785	715	655	600	550	510	475	445	415	0.454
	3	870	800	740	685	635	590	555	520	485	0.371
	4	935	870	810	760	710	665	625	585	555	0.314
	5	980	925	870	820	770	725	685	650	615	0.272
	6	1020	970	920	870	825	785	740	705	670	0.240

DECK PROFILE	I_{xg} in^4/ft	NOMINAL SHEAR DUE TO PANEL BUCKLING, S_{nb}, plf SPAN, ft								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
NR	0.114	11246	8263	6326	4998	4049	3346	2812	2396	2066
IR	0.125	12191	8956	6857	5418	4389	3627	3048	2597	2239
WR	0.173	15500	11388	8719	6889	5580	4612	3875	3302	2847

See Table Notes on Page 7.

TABLE 11— S_{nf}, S_{nb}, and K_1 for 20 GAGE (0.0358 in.) 1.5 WR, IR, AND NR DECK PANELS (F_y = 33 ksi, F_u = 45 ksi)

Support Screws: #12-24 TEKS/4, TEKS/4.5, **TEKS/5.0** or TEKS/5
Side-lap Screws: #10-16 TEKS/1, TEKS/3, #12-14 TEKS/1, or TEKS/3

FASTENER LAYOUT	SIDE-LAP CONN/SPAN	BASED ON 3-SPAN-CONDITION NOMINAL SHEAR STRENGTH, S_{nf}, plf SPAN, ft.									K_1, 1/ft
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	
36/9	0	985	875	785							0.403
	1	1140	1030	935	845	770					0.331
	2	1280	1165	1065	980	900	825	765	710	660	0.281
	3	1415	1290	1185	1090	1010	945	875	810	755	0.244
	4	1535	1405	1295	1200	1115	1040	975	915	855	0.216
	5	1645	1515	1400	1300	1215	1135	1065	1005	945	0.193
	6	1745	1615	1500	1395	1305	1225	1150	1085	1025	0.175
36/7	0	610	540	480							0.605
	1	785	705	635	575	525					0.456
	2	945	850	775	710	655	600	555	515	480	0.366
	3	1090	985	900	830	770	715	665	620	580	0.306
	4	1220	1115	1020	945	875	815	760	715	675	0.263
	5	1340	1230	1135	1050	975	910	855	805	760	0.230
	6	1445	1335	1235	1150	1075	1005	945	890	840	0.205
36/5	0	555	500	445							0.726
	1	705	640	585	535	495					0.522
	2	840	765	705	650	605	565	525	490	460	0.408
	3	950	875	810	755	700	655	615	580	550	0.334
	4	1045	975	905	845	790	745	700	660	625	0.283
	5	1125	1055	990	930	875	825	780	740	700	0.246
	6	1195	1125	1060	1005	950	895	850	810	770	0.217
36/4	0	425	375	335							0.907
	1	570	520	475	440	405					0.610
	2	690	635	590	545	510	475	445	420	390	0.459
	3	790	735	685	640	600	565	530	500	475	0.368
	4	865	815	765	720	680	640	605	575	545	0.307
	5	930	880	830	790	750	710	675	640	610	0.264
	6	975	930	890	845	805	770	735	700	670	0.231
30/6	0	545	480	430							0.806
	1	730	655	585	530	480					0.592
	2	890	805	730	670	610	560	520	480	450	0.468
	3	1040	945	860	790	730	680	630	585	545	0.387
	4	1180	1075	985	905	840	780	730	685	640	0.330
	5	1300	1190	1095	1015	945	880	825	775	730	0.287
	6	1415	1300	1205	1115	1040	975	915	860	815	0.255
30/4	0	520	465	420							0.907
	1	665	605	555	510	470					0.645
	2	795	725	670	620	575	540	505	475	440	0.500
	3	900	830	770	720	670	630	590	560	530	0.409
	4	985	920	860	805	755	715	675	635	605	0.346
	5	1060	995	935	885	835	790	745	710	675	0.299
	6	1115	1060	1005	950	900	855	815	775	740	0.264

DECK PROFILE	I_{xg} in^4/ft	NOMINAL SHEAR DUE TO PANEL BUCKLING, S_{nb}, plf SPAN, ft								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
NR	0.138	8467	6690	5419	4478	3763	3206	2765	2408	2117
IR	0.151	9177	7251	5873	4854	4079	3475	2997	2610	2294
WR	0.210	11665	9216	7465	6170	5184	4417	3809	3318	2916

See Table Notes on Page 7.

TABLE 12—S_{nf}, S_{nb}, and K_1 for 18 GAGE (0.0474 in.) 1.5 WR, IR, AND NR DECK PANELS (F_y = 33 ksi, F_u = 45 ksi)

Support Screws: #12-24 TEKS/4, TEKS/4.5, **TEKS/5.0** or TEKS/5
Side-lap Screws: #10-16 TEKS/1, TEKS/3, #12-14 TEKS/1, or TEKS/3

FASTENER LAYOUT	SIDE-LAP CONN/SPAN	BASED ON 3-SPAN-CONDITION NOMINAL SHEAR STRENGTH, S_{nf}, plf SPAN, ft.									K_1, 1/ft
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	
36/9	0	1050									0.464
	1	1240	1130	1030							0.381
	2	1410	1295	1200	1105	1020	950	885	830	780	0.324
	3	1570	1445	1340	1250	1165	1085	1010	950	890	0.281
	4	1715	1590	1475	1380	1290	1215	1140	1070	1005	0.248
	5	1855	1725	1605	1505	1410	1330	1255	1190	1120	0.223
	6	1990	1850	1730	1620	1525	1440	1360	1290	1225	0.202
36/7	0	645									0.696
	1	845	765	700							0.525
	2	1025	940	870	800	740	690	645	605	570	0.422
	3	1195	1100	1015	945	885	825	770	725	680	0.352
	4	1355	1250	1160	1080	1010	950	895	845	795	0.303
	5	1500	1390	1295	1210	1135	1065	1005	950	900	0.265
	6	1640	1525	1420	1330	1250	1180	1115	1055	1000	0.236
36/5	0	595									0.835
	1	775	710	660							0.601
	2	935	860	800	745	700	655	615	575	540	0.469
	3	1075	1000	930	870	820	770	725	690	655	0.385
	4	1200	1120	1050	985	930	875	830	790	750	0.326
	5	1310	1230	1160	1090	1030	980	930	880	840	0.283
	6	1405	1330	1255	1190	1125	1070	1020	970	925	0.250
36/4	0	450									1.044
	1	630	580	540							0.702
	2	780	725	675	630	590	555	525	490	460	0.528
	3	905	845	795	745	705	665	630	595	565	0.424
	4	1015	955	900	850	805	760	725	690	655	0.354
	5	1105	1045	990	940	895	850	810	775	740	0.304
	6	1175	1120	1070	1020	975	930	890	850	815	0.266
30/6	0	575									0.928
	1	780	705	645							0.682
	2	970	885	815	750	690	645	600	565	530	0.539
	3	1140	1050	970	900	840	780	730	685	645	0.445
	4	1305	1200	1115	1035	970	910	855	805	755	0.380
	5	1455	1345	1250	1165	1090	1025	970	915	870	0.331
	6	1595	1480	1380	1290	1210	1140	1075	1020	970	0.293
30/4	0	560									1.044
	1	735	675	625							0.742
	2	890	820	765	715	670	630	590	555	520	0.576
	3	1020	950	890	835	785	740	700	665	630	0.470
	4	1140	1070	1005	945	890	845	800	760	725	0.398
	5	1240	1170	1105	1045	990	940	895	850	810	0.344
	6	1330	1260	1195	1135	1080	1025	980	935	895	0.304

DECK PROFILE	I_{xg} in^4/ft	NOMINAL SHEAR DUE TO PANEL BUCKLING, S_{nb}, plf SPAN, ft								
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
NR	0.184	8280	6843	5750	4900	4225	3680	3234	2865	2556
IR	0.201	8964	7408	6225	5304	4573	3984	3501	3102	2767
WR	0.279	11390	9413	7909	6739	5811	5062	4449	3941	3515

See Table Notes on Page 7.

TABLE 13—S_{nf}, S_{nb}, and K_1 for 16 GAGE (0.0598 in.) 1.5 WR, IR, AND NR DECK PANELS (F_y = 33 ksi, F_u = 45 ksi)

Support Screws: #12-24 TEKS/4, TEKS/4.5, **TEKS/5.0** or TEKS/5
Side-lap Screws: #10-16 TEKS/3 or #12-14 TEKS/3

FASTENER LAYOUT	SIDE-LAP CONN/SPAN	BASED ON 3-SPAN-CONDITION NOMINAL SHEAR STRENGTH, S_{nf}, plf SPAN, ft.									K_1, 1/ft
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	
36/9	1	1310									0.428
	2	1515	1400	1295	1205	1125	1055	990			0.363
	3	1695	1575	1475	1375	1285	1205	1135	1070	1015	0.316
	4	1865	1740	1630	1535	1445	1355	1280	1205	1145	0.279
	5	2030	1895	1780	1675	1585	1500	1420	1340	1270	0.250
	6	2185	2045	1925	1815	1715	1625	1545	1470	1400	0.227
	7	2330	2190	2060	1950	1845	1750	1665	1585	1515	0.207
36/7	1	890									0.590
	2	1095	1015	940	875	815	765	720			0.474
	3	1285	1195	1115	1045	980	920	865	820	775	0.396
	4	1465	1365	1275	1195	1130	1065	1010	955	905	0.340
	5	1635	1525	1430	1345	1270	1200	1140	1085	1030	0.298
	6	1795	1680	1575	1485	1405	1330	1265	1205	1145	0.265
	7	1945	1825	1720	1620	1535	1455	1385	1320	1260	0.239
36/5	1	830									0.675
	2	1010	940	880	830	780	730	690			0.527
	3	1175	1100	1030	970	920	870	825	785	745	0.432
	4	1325	1245	1175	1110	1050	995	945	900	860	0.366
	5	1460	1380	1305	1235	1170	1115	1060	1015	970	0.318
	6	1585	1500	1425	1350	1285	1225	1170	1120	1070	0.281
	7	1695	1610	1530	1460	1390	1330	1270	1220	1170	0.251
36/4	1	680									0.788
	2	850	795	745	700	660	625	585			0.594
	3	1000	940	885	840	795	755	715	685	650	0.476
	4	1135	1070	1015	960	915	870	830	795	760	0.397
	5	1250	1185	1130	1075	1025	980	935	895	860	0.341
	6	1350	1285	1230	1175	1125	1075	1030	990	950	0.299
	7	1435	1375	1320	1265	1215	1165	1120	1075	1035	0.266
30/6	1	815									0.766
	2	1030	950	880	815	765	715	675			0.605
	3	1220	1135	1060	990	925	870	820	775	730	0.500
	4	1405	1305	1220	1145	1080	1020	960	910	860	0.426
	5	1575	1470	1380	1295	1225	1155	1095	1045	990	0.371
	6	1740	1630	1530	1440	1360	1290	1225	1165	1110	0.329
	7	1895	1780	1670	1580	1490	1415	1345	1280	1225	0.295
30/4	1	790									0.834
	2	965	900	845	795	750	705	665			0.647
	3	1125	1055	990	935	885	835	795	755	720	0.528
	4	1265	1190	1125	1065	1010	960	915	870	830	0.447
	5	1395	1320	1250	1185	1125	1075	1025	980	935	0.387
	6	1505	1430	1360	1295	1235	1180	1130	1080	1035	0.341
	7	1605	1530	1460	1395	1335	1280	1225	1175	1130	0.305

DECK PROFILE	I_{xg} in^4/ft	NOMINAL SHEAR DUE TO PANEL BUCKLING, S_{nb}, plf SPAN, ft								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
NR	0.233	8173	6964	6005	5231	4597	4072	3632	3260	2942
IR	0.254	8841	7533	6495	5658	4973	4405	3929	3527	3183
WR	0.353	11224	9564	8247	7184	6314	5593	4989	4477	4041

See Table Notes on Page 7.

TABLE 14—S_{nf}, S_{nb}, and K_1 for 22 GAGE (0.0295 in.) 3 DR DECK PANELS (F_y = 33 ksi, F_u = 45 ksi)

Support Screws: #12-24 TEKS/4, TEKS/4.5, **TEKS/5.0** or TEKS/5
Side-lap Screws: #10-16 TEKS/1, TEKS/3, #12-14 TEKS/1, or TEKS/3

FASTENER LAYOUT	SIDE-LAP CONN/SPAN	BASED ON 3-SPAN-CONDITION NOMINAL SHEAR STRENGTH, S_{nf}, plf SPAN, ft.									K_1, 1/ft
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	
24/4	**2**	320	300	285							0.625
	3	400	375	355	335	320	300	290	275	265	0.502
	4	475	450	425	400	380	365	345	330	315	0.419
	5	545	515	490	465	445	425	405	385	370	0.359
	6	605	575	545	520	500	475	455	440	420	0.315
	7	665	635	605	575	550	530	505	485	470	0.280
	8	720	685	655	625	600	575	555	535	515	0.252
	9	775	740	705	675	650	625	600	575	555	0.229
	10	820	785	755	725	695	670	645	620	600	0.210
	11	865	830	800	765	740	710	685	660	640	0.194
	12	910	875	840	810	780	750	725	700	675	0.180

DECK PROFILE	I_{xg} in^4/ft	NOMINAL SHEAR DUE TO PANEL BUCKLING, S_{nb}, plf SPAN, ft								
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0
3 DR	0.808	6643	5884	5249	4711	4252	3856	3514	3215	2952

See Table Notes on Page 7.

TABLE 15— S_{nf}, S_{nb}, and K_1 for 20 GAGE (0.0358 in.) 3 DR DECK PANELS (F_y = 33 ksi, F_u = 45 ksi)

Support Screws: #12-24 TEKS/4, TEKS/4.5, **TEKS/5.0** or TEKS/5
Side-lap Screws: #10-16 TEKS/1, TEKS/3, #12-14 TEKS/1, or TEKS/3

FASTENER LAYOUT	SIDE-LAP CONN/SPAN	BASED ON 3-SPAN-CONDITION NOMINAL SHEAR STRENGTH, S_{nf}, plf SPAN, ft.									K_1, 1/ft
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	
24/4	**2**	345									0.689
	3	430	405	385	370	350	335	320			0.553
	4	515	485	465	440	420	400	385	370	355	0.461
	5	595	565	540	515	490	470	450	430	415	0.396
	6	665	635	605	580	555	535	515	495	475	0.347
	7	730	700	670	640	615	590	570	550	530	0.308
	8	795	760	730	700	675	645	625	600	580	0.278
	9	860	820	790	755	730	700	675	650	630	0.253
	10	915	880	645	810	780	755	725	700	680	0.232
	11	970	930	895	865	830	800	775	750	725	0.214
	12	1020	980	945	910	880	850	820	795	770	0.199

DECK PROFILE	I_{xg} in^4/ft	NOMINAL SHEAR DUE TO PANEL BUCKLING, S_{nb}, plf SPAN, ft								
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
3 DR	**0.989**	7060	6337	5719	5187	4726	4324	3971	3660	3384

See Table Notes on Page 7.

TABLE 16— S_{nf}, S_{nb}, and K_1 for 18 GAGE (0.0474 in.) 3 DR DECK PANELS (F_y = 33 ksi, F_u = 45 ksi)

Support Screws: #12-24 TEKS/4, TEKS/4.5, **TEKS/5.0** or TEKS/5
Side-lap Screws: #10-16 TEKS/1, TEKS/3, #12-14 TEKS/1, or TEKS/3

FASTENER LAYOUT	SIDE-LAP CONN/SPAN	BASED ON 3-SPAN-CONDITION NOMINAL SHEAR STRENGTH, S_{nf}, plf SPAN, ft.									K_1, 1/ft
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	
24/4	3	510	490	465	445	425					0.636
	4	615	585	560	535	510	490	470	455	440	0.531
	5	715	680	650	620	595	570	550	530	510	0.455
	6	805	770	735	705	680	655	630	605	585	0.399
	7	885	850	815	785	755	725	700	675	655	0.355
	8	965	930	890	855	825	795	770	745	720	0.319
	9	1045	1005	965	930	895	865	835	805	780	0.291
	10	1120	1075	1035	995	960	930	900	870	840	0.266
	11	1185	1145	1100	1065	1025	995	960	930	900	0.246
	12	1255	1210	1165	1125	1090	1055	1020	990	960	0.229
	13	1315	1270	1230	1185	1150	1110	1080	1045	1015	0.213

DECK PROFILE	I_{xg} in^4/ft	NOMINAL SHEAR DUE TO PANEL BUCKLING, S_{nb}, plf SPAN, ft								
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0
3 DR	1.323	8782	7966	7258	6640	6099	5620	5196	4819	4481

See Table Notes on Page 7.

TABLE 17— S_{nf}, S_{nb}, and K_1 for 16 GAGE (0.0598 in.) 3 DR DECK PANELS (F_y = 33 ksi, F_u = 45 ksi)

Support Screws: #12-24 TEKS/4, TEKS/4.5, **TEKS/5.0** or TEKS/5
Side-lap Screws: #10-16 TEKS/3 or #12-14 TEKS/3

FASTENER LAYOUT	SIDE-LAP CONN/SPAN	BASED ON 3-SPAN-CONDITION NOMINAL SHEAR STRENGTH, S_{nf}, plf Span, ft.									K_1, 1/ft
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	
24/4	3	590	560	540							0.714
	4	705	675	645	620	595	575	555	535	515	0.596
	5	820	785	750	720	695	670	645	620	600	0.512
	6	930	895	860	825	795	765	735	710	685	0.448
	7	1030	990	950	915	885	855	825	800	775	0.399
	8	1125	1080	1040	1005	970	940	905	880	850	0.359
	9	1220	1170	1130	1090	1055	1020	985	955	925	0.326
	10	1305	1260	1215	1175	1135	1095	1065	1030	1000	0.299
	11	1390	1340	1295	1255	1210	1175	1140	1105	1070	0.276
	12	1470	1420	1375	1330	1290	1250	1210	1175	1140	0.257
	13	1550	1500	1450	1405	1360	1320	1280	1245	1210	0.240

DECK PROFILE	I_{xg} in^4/ft	NOMINAL SHEAR DUE TO PANEL BUCKLING, S_{nb}, plf SPAN, ft								
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
3 DR	1.672	10299	9423	8654	7975	7374	6838	6358	5927	5538

See Table Notes on Page 7.

TABLE 18— S_{nf}, S_{nb}, and K_1 for 22 GAGE (0.0295 in.) FLOOR DECK PANELS (F_y = 40 ksi, F_u = 52 ksi)

Support Screws: #12-24 TEKS/4, TEKS/4.5, **TEKS/5.0** or TEKS/5
Side-lap Screws: #10-16 TEKS/1, TEKS/3, #12-14 TEKS/1, or TEKS/3

Type of Fill	Fastener Layout	Side-lap Conn/Span	NOMINAL SHEAR STRENGTH, S_{nf}, plf, SPAN, ft.									K_1, 1/ft
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	
BASED ON 3-SPAN-CONDITIONS												
1 1/2" X 6" No Fill (Bare Deck)	36/4	0	405	320								0.823
		1	530	440	365							0.554
		2	635	535	460	400	345	305				0.417
		3	720	620	540	475	425	375	340	310	280	0.334
		4	790	690	610	540	485	440	400	365	335	0.279
		5	850	755	670	600	540	495	450	415	385	0.240
		6	895	805	725	655	595	545	500	460	430	0.210
		8	970	890	815	750	690	635	590	545	510	0.168
2" X 12" No Fill (Bare Deck)	36/4	0	395	310								0.823
		1	530	435	355							0.554
		2	635	535	460	395	345	305				0.417
		3	720	620	540	475	425	375	340	310	280	0.334
		4	790	690	610	540	485	440	400	365	335	0.279
		5	850	755	670	600	540	495	450	415	385	0.240
		6	895	805	725	655	595	545	500	460	430	0.210
		8	970	890	815	750	690	635	590	545	510	0.168
3" X 12" No Fill (Bare Deck)	36/4	0	375	300								0.823
		1	530	425	355							0.554
		2	635	535	460	395	345	305				0.417
		3	720	620	540	475	425	375	340	310	280	0.334
		4	790	690	610	540	485	440	400	365	335	0.279
		5	850	755	670	600	540	495	450	415	385	0.240
		6	895	805	725	655	595	545	500	460	430	0.210
		8	970	890	815	750	690	635	590	545	510	0.168
BASED ON 1 OR MORE SPANS												
2 1/2" NW Conc. (Above Deck)	36/4	0	5340	5250								0.823
		1	5495	5380	5300							0.554
		2	5655	5505	5405	5335	5280	5235				0.417
		3	5815	5630	5510	5425	5360	5305	5265	5235	5205	0.334
		4	5970	5760	5615	5515	5435	5380	5330	5290	5260	0.279
		5	6130	5885	5720	5605	5515	5450	5395	5350	5310	0.240
		6	6290	6010	5825	5695	5595	5520	5455	5405	5365	0.210
		8	6535	6265	6040	5875	5755	5660	5585	5520	5470	0.168
2 1/2" LW Conc. (Above Deck)	36/4	0	3900	3810								0.823
		1	4055	3940	3860							0.554
		2	4215	4065	3965	3890	3840	3795				0.417
		3	4375	4190	4070	3985	3920	3865	3825	3795	3765	0.334
		4	4530	4320	4175	4075	3995	3935	3890	3850	3820	0.279
		5	4615	4445	4280	4165	4075	4010	3955	3910	3870	0.240
		6	4615	4570	4385	4255	4155	4080	4015	3965	3925	0.210
		8	4615	4615	4595	4435	4315	4220	4145	4080	4030	0.168

DECK PROFILE	I_{xg} in^4/ft	NOMINAL SHEAR DUE TO PANEL BUCKLING, S_{nb}, plf SPAN, ft								
		4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0
1.5" X 6"	0.173	8715	5575	3870	2845	2175	1720	1390	1150	965
2" X 12"	0.296	13440	8600	5970	4385	3360	2655	2150	1775	1490
3" X 12"	0.735	25800	16515	11465	8425	6450	5095	4125	3410	2865

See Table Notes on Page 7.

TABLE 19—S_{nf}, S_{nb}, and K_1 for 20 GAGE (0.0358 in.) FLOOR DECK PANELS (F_y = 40 ksi, F_u = 52 ksi)

Support Screws: #12-24 TEKS/4, TEKS/4.5, **TEKS/5.0** or TEKS/5
Side-lap Screws: #10-16 TEKS/1, TEKS/3, #12-14 TEKS/1, or TEKS/3

Type of Fill	Fastener Layout	Side-lap Conn/Span	NOMINAL SHEAR STRENGTH, S_{nf}, plf SPAN, ft. 4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	K_1, 1/ft
BASED ON 3-SPAN-CONDITIONS												
1 1/2" X 6" No Fill (Bare Deck)	36/4	0	495	390								0.907
		1	645	535	450							0.610
		2	770	650	560	490	425	375				0.459
		3	875	750	655	575	515	460	410	375	345	0.368
		4	960	840	740	655	590	535	485	445	405	0.307
		5	1030	915	815	730	660	600	550	505	465	0.264
		6	1090	980	880	795	725	660	605	560	520	0.231
		8	1175	1080	990	910	835	770	715	665	620	0.185
2" X 12" No Fill (Bare Deck)	36/4	0	485	380								0.907
		1	645	535	435							0.610
		2	770	650	560	480	420	370				0.459
		3	875	750	655	575	515	460	410	375	345	0.368
		4	960	840	740	655	590	535	485	445	405	0.307
		5	1030	915	815	730	660	600	550	505	465	0.264
		6	1090	980	880	795	725	660	605	560	520	0.231
		8	1175	1080	990	910	835	770	715	665	620	0.185
3" X 12" No Fill (Bare Deck)	36/4	0	465	365								0.907
		1	645	520	430							0.610
		2	770	650	560	480	420	370				0.459
		3	875	750	655	575	515	460	410	375	345	0.368
		4	960	840	740	655	590	535	485	445	405	0.307
		5	1030	915	815	730	660	600	550	505	465	0.264
		6	1090	980	880	795	725	660	605	560	520	0.231
		8	1175	1080	990	910	835	770	715	665	620	0.185
BASED ON 1 OR MORE SPANS												
2 1/2" NW Conc. (Above Deck)	36/4	0	5430	5325								0.907
		1	5625	5480	5385							0.610
		2	5815	5635	5510	5425	5360	5310				0.459
		3	6010	5785	5640	5535	5455	5395	5345	5305	5270	0.368
		4	6200	5940	5770	5645	5550	5480	5420	5375	5335	0.307
		5	6395	6095	5895	5755	5645	5565	5500	5445	5400	0.264
		6	6535	6250	6025	5865	5745	5650	5575	5515	5465	0.231
		8	6535	6535	6280	6085	5935	5820	5730	5655	5590	0.185
2 1/2" LW Conc. (Above Deck)	36/4	0	3990	3885								0.907
		1	4185	4040	3945							0.610
		2	4375	4195	4070	3985	3920	3870				0.459
		3	4570	4345	4200	4095	4015	3955	3905	3865	3830	0.368
		4	4615	4500	4325	4205	4110	4040	3980	3935	3895	0.307
		5	4615	4615	4455	4315	4205	4125	4060	4005	3960	0.264
		6	4615	4615	4585	4425	4305	4210	4135	4075	4025	0.231
		8	4615	4615	4615	4615	4495	4380	4290	4215	4150	0.185

DECK PROFILE	I_{xg} in^4/ft	NOMINAL SHEAR DUE TO PANEL BUCKLING, S_{nb}, plf SPAN, ft 4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0
1.5" X 6"	0.210	11660	7465	5180	3805	2915	2300	1865	1540	1295
2" X 12"	0.377	18610	11910	8270	6075	4650	3675	2975	2460	2065
3" X 12"	0.932	35640	22810	15840	11635	8910	7040	5700	4710	3960

See Table Notes on Page 7.

TABLE 20—S_{nf}, S_{nb}, and K_1 for 18 GAGE (0.0474 in.) FLOOR DECK PANELS (F_y = 40 ksi, F_u = 52 ksi)

Support Screws: #12-24 TEKS/4, TEKS/4.5, **TEKS/5.0** or TEKS/5
Side-lap Screws: #10-16 TEKS/1, TEKS/3, #12-14 TEKS/1, or TEKS/3

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN/SPAN	NOMINAL SHEAR STRENGTH, S_{nf}, plf SPAN, ft.									K_1, 1/ft
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
BASED ON 3-SPAN-CONDITIONS												
1 1/2" X 6" No Fill (Bare Deck)	36/4	0	525									1.044
		1	705	600								0.702
		2	860	740	650	565	500					0.528
		3	995	865	765	680	615	545	495	455		0.424
		4	1110	980	870	780	705	645	590	540	500	0.354
		5	1210	1080	965	875	795	725	670	620	575	0.304
		6	1295	1165	1055	960	875	805	745	690	640	0.266
		8	1430	1310	1205	1105	1020	945	880	820	765	0.213
2" X 12" No Fill (Bare Deck)	36/4	0	510									1.044
		1	705	585								0.702
		2	860	740	640	555	495					0.528
		3	995	865	765	680	605	545	495	455		0.424
		4	1110	980	870	780	705	645	590	540	500	0.354
		5	1210	1080	965	875	795	725	670	620	575	0.304
		6	1295	1165	1055	960	875	805	745	690	640	0.266
		8	1430	1310	1205	1105	1020	945	880	820	765	0.213
3" X 12" No Fill (Bare Deck)	36/4	0	485									1.044
		1	690	570								0.702
		2	860	740	635	555	495					0.528
		3	995	865	765	680	605	545	495	455		0.424
		4	1110	980	870	780	705	645	590	540	500	0.354
		5	1210	1080	965	875	795	725	670	620	575	0.304
		6	1295	1165	1055	960	875	805	745	690	640	0.266
		8	1430	1310	1205	1105	1020	945	880	820	765	0.213
BASED ON 1 OR MORE SPANS												
2 1/2" NW Conc. (Above Deck)	36/4	0	5465									1.044
		1	5665	5540								0.702
		2	5870	5710	5595	5505	5440					0.528
		3	6075	5880	5740	5635	5555	5490	5435	5390		0.424
		4	6280	6050	5885	5760	5665	5590	5525	5475	5430	0.354
		5	6480	6220	6030	5890	5780	5690	5620	5560	5510	0.304
		6	6535	6390	6175	6015	5890	5795	5710	5645	5590	0.266
		8	6535	6535	6465	6270	6120	5995	5895	5815	5745	0.213
2 1/2" LW Conc. (Above Deck)	36/4	0	4025									1.044
		1	4225	4100								0.702
		2	4430	4270	4155	4065	4000					0.528
		3	4615	4440	4300	4195	4115	4050	3995	3950		0.424
		4	4615	4610	4445	4320	4225	4150	4085	4035	3990	0.354
		5	4615	4615	4590	4450	4340	4250	4180	4120	4070	0.304
		6	4615	4615	4615	4575	4450	4355	4270	4205	4145	0.266
		8	4615	4615	4615	4615	4615	4555	4455	4375	4305	0.213

DECK PROFILE	I_{xg} in^4/ft	NOMINAL SHEAR DUE TO PANEL BUCKLING, S_{nb}, plf SPAN, ft								
		5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1.5" X 6"	0.279	11385	7905	5810	4445	3515	2845	2350	1975	1680
2" X 12"	0.500	18190	12630	9280	7105	5610	4545	3755	3155	2690
3" X 12"	1.267	35460	24625	18090	13850	10940	8865	7325	6155	5245

See Table Notes on Page 7.

TABLE 21—S_{nf}, S_{nb}, and K_1 for 16 GAGE (0.0598 in.) FLOOR DECK PANELS (F_y = 40 ksi, F_u = 52 ksi)

Support Screws: #12-24 TEKS/4, TEKS/4.5, **TEKS/5.0** or TEKS/5
Side-lap Screws: #10-16 TEKS/3 or #12-14 TEKS/3

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN/SPAN	NOMINAL SHEAR STRENGTH, S_{nf}, plf SPAN, ft. 6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	K_1, 1/ft
BASED ON 3-SPAN-CONDITIONS												
1 1/2" X 6" No Fill (Bare Deck)	36/4	1	760									0.788
		2	935	820	720	635						0.594
		3	1095	965	860	775	695	630	575			0.476
		4	1235	1100	985	890	815	745	680	630	585	0.397
		5	1360	1220	1100	1000	915	845	780	725	675	0.341
		6	1475	1330	1210	1105	1015	940	870	810	760	0.299
		7	1570	1430	1310	1200	1110	1025	955	890	835	0.266
		8	1655	1520	1400	1290	1195	1110	1035	970	910	0.239
2" X 12" No Fill (Bare Deck)	36/4	1	750									0.788
		2	935	815	705	625						0.594
		3	1095	965	860	765	690	625	575			0.476
		4	1235	1100	985	890	815	745	680	630	585	0.397
		5	1360	1220	1100	1000	915	845	780	725	675	0.341
		6	1475	1330	1210	1105	1015	940	870	810	760	0.299
		7	1570	1430	1310	1200	1110	1025	955	890	835	0.266
		8	1655	1520	1400	1290	1195	1110	1035	970	910	0.239
3" X 12" No Fill (Bare Deck)	36/4	1	720									0.788
		2	935	800	700	625						0.594
		3	1095	965	860	765	690	625	575			0.476
		4	1235	1100	985	890	815	745	680	630	585	0.397
		5	1360	1220	1100	1000	915	845	780	725	675	0.341
		6	1475	1330	1210	1105	1015	940	870	810	760	0.299
		7	1570	1430	1310	1200	1110	1025	955	890	835	0.266
		8	1655	1520	1400	1290	1195	1110	1035	970	910	0.239
BASED ON 1 OR MORE SPANS												
2 1/2" NW Conc. (Above Deck)	36/4	1	5705									0.788
		2	5920	5775	5665	5580						0.594
		3	6135	5960	5825	5725	5640	5575	5520			0.476
		4	6350	6140	5985	5865	5770	5690	5625	5570	5520	0.397
		5	6535	6325	6145	6010	5900	5810	5730	5670	5615	0.341
		6	6535	6510	6310	6150	6025	5925	5840	5765	5705	0.299
		7	6535	6535	6470	6295	6155	6040	5945	5865	5795	0.266
		8	6535	6535	6535	6435	6285	6160	6055	5965	5890	0.239
2 1/2" LW Conc. (Above Deck)	36/4	1	4265									0.788
		2	4480	4335	4225	4140						0.594
		3	4615	4520	4385	4285	4200	4135	4080			0.476
		4	4615	4615	4545	4425	4330	4250	4185	4130	4080	0.397
		5	4615	4615	4615	4570	4460	4365	4290	4230	4175	0.341
		6	4615	4615	4615	4615	4585	4485	4400	4325	4265	0.299
		7	4615	4615	4615	4615	4615	4600	4505	4425	4355	0.266
		8	4615	4615	4615	4615	4615	4615	4615	4525	4450	0.239

DECK PROFILE	I_{xg} in^4/ft	NOMINAL SHEAR DUE TO PANEL BUCKLING, S_{nb}, plf SPAN, ft 6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0
1.5" X 6"	0.353	11220	8245	6310	4985	4040	3335	2805	2390	2060
2" X 12"	0.632	17915	13160	10075	7960	6445	5330	4475	3815	3290
3" X 12"	1.600	34905	25645	19630	15510	12565	10385	8725	7435	6410

See Table Notes on Page 7.

TABLE 22—DIAPHRAGM FLEXIBILITY LIMITATIONS TABLE[1,2,3,4]
(Only Applicable to the 2015 IBC and earlier codes)

FLEXIBILITY FACTOR (F)	MAXIMUM DIAPHRAGM SPAN FOR MASONRY OR CONCRETE WALLS (feet)	DIAPHRAGM SPAN-DEPTH LIMITATION			
		Rotation Not Considered in Diaphragm		Rotation Considered in Diaphragm	
		Masonry or Concrete Walls	Flexible Walls	Masonry or Concrete Walls	Flexible Walls
More than 150	Not used	Not used	2:1	Not used	$1^1/_2$:1
70-150	200	2:1 or as required for deflection	3:1	Not used	2:1
10-70	400	$2^1/_2$:1 or as required for deflection	4:1	As required for deflection	$2^1/_2$:1
1-10	No limitation	3:1 or as required for deflection	5:1	As required for deflection	3:1
Less than 1	No limitation	As required for deflection	No limitation	As required for deflection	$3^1/_2$:1

[1]Diaphragms are to be investigated regarding their flexibility and recommended span-depth limitations.
[2]Diaphragms supporting masonry or concrete walls are to have their deflections limited to the following amount:

$$\Delta_{wall} = \frac{H^2 f_c}{0.01 Et}$$

where:

H = Unsupported height of wall in feet.
t = Thickness of wall in inches.
E = Modulus of elasticity of wall material for deflection determination in pounds per square inch.
f_c = Allowable compression strength of wall material in flexure in pounds per square inch. For concrete, $f_c = 0.45\, f'_c$. For masonry, $f_c = F_b = 0.33\, f'_m$.

[3]The total deflection Δ of the diaphragm may be computed from the equation: $\Delta = \Delta_f + \Delta_w$

where:

Δ_f = Flexural deflection of the diaphragm determined in the same manner as the deflection of beams
Δ_w = The web deflection may be determined by the equation:

$$\Delta_w = \frac{q_{ave} L F}{10^6}$$

where:

L = Distance in feet between vertical resisting element (such as shear wall) and the point to which the deflection is to be determined.
q_{ave} = Average shear in diaphragm in pounds per foot over length L.
F = Flexibility factor: The average micro-inches a diaphragm web will deflect in a span of 1 foot under a shear of 1 pound per foot.

[4]When applying these limitations to cantilevered diaphragms, the allowable span-depth ratio will be half that shown.

Notes for Tables 23-25

[1] For tension connections, the lower of the fastener pull-out (Table 23), pullover (Table 24), and fastener tension strength (Table 25) must be used for design.
[2] For ASD, divide the tabulated values by 3.0.
[3] For LRFD, multiply the tabulated values by 0.5.
[4] For F_u = 58 ksi, multiply values by 1.29; for F_u = 65 ksi, multiply values by 1.44.
[5] Outside drilling capacity limits

TABLE 23—NOMINAL PULL-OUT STRENGTH (lbf) OF SUPPORT FASTENERS[1,2,3,4]

ITW BUILDEX SCREW DESIGNATION	NOMINAL DIAMETER (in.)	DESIGN THICKNESS OF MEMBER NOT IN CONTACT WITH THE SCREW HEAD (in.)					
		1/8	3/16	1/4	5/16	3/8	1/2
Support Steel F_u = 45 ksi							
#12-24 TEKS/4	0.216	1033	1545	2066	See Note 5	See Note 5	See Note 5
#12-24 TEKS/4.5	0.216	1033	1545	2066	2582	3098	See Note 5
#12-24 TEKS/5.0	0.216	1033	1545	2066	2582	3098	4131
#12-24 TEKS/5	0.216	1033	1545	2066	2582	3098	4131

TABLE 24—NOMINAL PULLOVER STRENGTH (lbf) OF SUPPORT FASTENERS[1,2,3]

ITW BUILDEX SCREW DESIGNATION	SCREW WASHER HEAD DIAMETER (in.)	DESIGN THICKNESS OF MEMBER IN CONTACT WITH THE SCREW HEAD (in.)			
		0.0295	**0.0358**	**0.0474**	**0.0598**
Roof Deck Steel F_u = 45 ksi					
#12-24 TEKS/4 #12-24 TEKS/4.5 #12-24 TEKS/5.0 #12-24 TEKS/5	0.415	826	1003	1328	1675
Floor Deck Steel F_u = 52 ksi					
#12-24 TEKS/4 #12-24 TEKS/4.5 #12-24 TEKS/5.0#12-24 TEKS/5	0.415	955	1159	1534	1936

TABLE 25—NOMINAL TENSILE STRENGTH OF SUPPORT FASTENERS[1,2,3]

ITW BUILDEX SCREW DESIGNATION	NOMINAL SHANK DIAMETER (in.)	TENSILE P_{ts} (lbf)
#12-24 TEKS/4 #12-24 TEKS/4.5 #12-24 TEKS/5.0 #12-24 TEKS/5	0.216	4750