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Steel Deck Institute Diaphragm Design Manual: Third Edition

Larry D. Luttrell

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**STEEL DECK INSTITUTE
DIAPHRAGM DESIGN MANUAL**

THIRD EDITION

3



ERRATA TO DIAPHRAGM DESIGN MANUAL

THIRD EDITION

SEPTEMBER 2004

Page	Location	Instead of	Correction
4-14	Section 4.9.4, first line in first paragraph	ressistance	resistance
AI-2	Symbol for Slip relaxation constant	Kl_1	K_l
AI-2	Symbol for Panel length		l
AI-2	Symbol for Purlin or joist spacing	v	l_v
AI-2	Symbol for Resisting shear couples at panel ends and purlins	M_e, M_o	M_e, M_p
AIII-19	LRFD column	$S_n=2132plf \dots \phi S_n=0.80 \times 2132plf$ $=1706plf \{24.88kN/m\}$	$S_n=1425plf \dots \phi S_n=0.80 \times 1425plf$ $=1140plf \{16.63kN/m\}$
AIII-19	ASD column	$S_n/\Omega=2132/2.00=1066plf \{15.55kN/m\}$	$S_n/\Omega=1425/2.00=713plf \{10.40kN/m\}$
AIII-25	Top LRFD column	$\phi S_n=0.80 \times 2130plf=1704plf \{24.86kN/m\}$	$\phi S_n=0.80 \times 2050plf=1640plf \{23.93kN/m\}$
AIII-25	Top ASD column	$S_n/\Omega=2130/2.00=1065plf \{15.54kN/m\}$	$S_n/\Omega=2050/2.00=1025plf \{14.96kN/m\}$
AIII-25	Paragraph "To calculate the stiffness of the diaphragm,..."	$D_{xx}=39.3mm$	$D_{xx}=39m$
AIII-29	ASD portion	(See Appendix AIII, page AIII-21)	(See Appendix AIII, page AIII-23)
AIII-35	First paragraph	"...on a 24/8 connection pattern will be used which is..."	"...on a 24/8 connection pattern will be used, which is..."
AIII-71	First paragraph	"...considering possible use of 3/4in. {19mm}. shear studs..."	"...considering possible use of 3/4in. {19mm} shear studs..."
AIII-73	Second LRFD/ ASD portion	"...and meet the required spacing. However, ..."	"...and meet the required spacing. However, ..."
AIV-12	Heading of Table VII, Table VII-M, Table VIII, Table VIII-M		Add $\phi_u=0.5 \Omega_u=3.0$, (same as to Table VI and VI-M)
AIV-13	Heading of Table IX, Table IX-M		Add $\phi_u=0.5 \Omega_u=3.0$, (same as to Table VI and VI-M)
AIV-13	Table IX, X-EDN19/ X-EDNK22 column	1369, 1813 and 2287	1298, 1719 and 2168 respectively
AIV-13	Table IX-M, X-EDN19/ X-EDNK22 column	6.09, 8.06 and 10.17	5.77, 7.65 and 9.65 respectively
AV-3	Second paragraph from the bottom	"(rigid insulating boards should be held 3 in. away from...)"	"(rigid insulating boards should be held 3 ft away from...)"

DIAPHRAGM DESIGN MANUAL

THIRD EDITION

Appendix VI Addendum November 2006

HILTI PIN X-ENP-19 L15

Authored By

Dr. Larry Luttrell, P.E.

Revised and Adapted For

The ASD and LRFD methods

**According to Table D5 of the 2001 Edition of the North American
Specification for the Design of Cold-Formed Steel Structural Members**

As modified by

**The Supplement 2004 to the North American Specification for the Design of
Cold-Formed Steel Structural Members, 2001 Edition**

By

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USER INSTRUCTION

NOVEMBER 2006

Dear Specifier,

The SDI DDM03 is updated with this Addenda with Hilti X-ENP19 fastener data.

The following steps can be followed:

- Insert page AVI-5 of this Addenda in Section IV of DDM03;
- Replace Tables on pages AVI-9, AVI-10 and AVI-13 of DDM03 with the ones on the corresponding pages AVI-7, AVI-8 and AVI-9 in this Addenda;
- Insert page AVI-12 of this Addenda in Appendix V of DDM03, after page AV-4;
- Insert all X-ENP19 diaphragm load tables from this Addenda (page AVI-13 to AVI-24) in Appendix AV of DDM03.

Thank you for updating your DDM03,

Steel Deck Institute

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	PAGE
<u>ADDENDA TO SECTION IV</u>	AVI-5
<u>ADDENDA TO APPENDIX IV</u>	AVI-7
<u>ADDENDA TO APPENDIX V</u>	AVI-11

ADDITIONAL POWER DRIVEN FASTENERS

Refer to Section 4.6, 4.9 and 4.10 for general instruction on power driven fasteners in shear, tension and combined shear and tension.

Hilti X-ENP-19 L15

[Applicable for 1/4 in. {6mm} and thicker support steel]

For 0.0280 in. {0.71mm} ≤ t ≤ 0.060 in. {1.52mm}

$$Q_f = 56t (1-t), \text{ kip}$$

$$\left\{ Q_f = 9.81t(1-t/25.4) \right\}, \text{ kN} \quad (\text{Eq. A-VI-1})$$

and

$$S_f = \frac{0.75}{1000\sqrt{t}}, \frac{\text{in.}}{\text{kip}}$$

$$\left\{ S_f = \frac{21.6}{1000\sqrt{t}} \right\}, \frac{\text{mm}}{\text{kN}} \quad (\text{Eq. A-VI-2})$$

where t = base sheet metal thickness, in. {mm}

For $t < 0.0280$ in. {0.71mm}

$$Q_f = 61.1t (1-4t), \text{ kip}$$

$$\left\{ Q_f = 10.7t(1-t/6.35) \right\}, \text{ kN} \quad (\text{Eq. 4.6-5})$$

and

$$S_f = \frac{1.25}{1000\sqrt{t}}, \frac{\text{in.}}{\text{kip}}$$

$$\left\{ S_f = \frac{36}{1000\sqrt{t}} \right\}, \frac{\text{mm}}{\text{kN}} \quad (\text{Eq. 4.6-6})$$

where t = base sheet metal thickness, in. {mm}

The general equation for nominal resistance of these pins in tension is

$$T_{nov} = 1.7 t d_w F_u$$

where t is the thickness of the deck sheet in contact with fastener head, in.

d_w is the lesser of the actual diameter of the fastener washer (0.591) or 1/2 in.

F_u is the ultimate strength of the deck sheet, ksi

Diaphragm Tables with Hilti X-ENP-19 L15 used as support fastener are listed hereafter.

General Notes of Appendix V (page AV-3) is shown again on page AVI-11 for explanation of the tables.

Table IV - TYPICAL FASTENER VALUES - NOMINAL SHEAR STRENGTH (Q_f & Q_s) & FLEXIBILITY (S_f & S_s)

SUPPORT FASTENER NOMINAL SHEAR STRENGTH							
TYPE OF SUPPORT FASTENER	Q_f, lbf / Deck Thickness No.						
	28	26	24	22	20	18	16
5/8" puddle weld or equivalent				1739	2088	2710	3346
3/4" puddle weld or equivalent				2104	2531	3297	4086
16 gauge weld washer with 3/8" hole — E70XX	1199	1552	2371				
Buildex or ElcoTextron #12 or #14 TEKS	652	859	1325	1016	1233	1633	2060
Buildex BX-12	594	769	1147	1484	1734	2134	2473
Buildex BX-14	629	814	1215	1572	1837	2260	2620
Pneutek SDK61-series (0.113" to 0.155" support steel)	642	807	1173	1527	1828	2360	2896
Pneutek SDK63-series (0.155" to 0.25" support steel)	725	912	1325	1711	1973	2403	2812
Pneutek K64-series (0.187" to 0.312" support steel)	729	916	1332	1699	2209	2985	3686
Pneutek K66-series (0.281" & greater support steel)	621	780	1134	1814	2251	3101	4076
Hilti X-ENP-19L15 (0.25" min. support steel)	822	984	1306	1603	1933	2529	3149
Hilti ENP2 or ENPH2 (0.25" minimum support steel)	856	1015	1321	1590	1874	2347	2780
Hilti ENP2K, X-EDN19, or X-EDNK22 (0.125" to 0.375" support steel)	763	914	1213	1489	1795	2348	2924

SUPPORT FASTENER FLEXIBILITY							
TYPE OF SUPPORT FASTENER	S_f, in./Kip / Deck Thickness No.						
	28	26	24	22	20	18	16
5/8" puddle weld or equivalent				0.0067	0.0061	0.0053	0.0047
3/4" puddle weld or equivalent				0.0067	0.0061	0.0053	0.0047
16 gauge weld washer with 3/8" hole — E70XX	0.0094	0.0086	0.0074				
Buildex or ElcoTextron #12 or #14 TEKS	0.0107	0.0097	0.0084	0.0076	0.0069	0.0060	0.0053
Buildex BX-12	0.0205	0.0187	0.0162	0.0146	0.0132	0.0115	0.0102
Buildex BX-14	0.0205	0.0187	0.0162	0.0146	0.0132	0.0115	0.0102
Pneutek SDK61-series (0.113" to 0.155" support steel)	0.0246	0.0224	0.0194	0.0175	0.0159	0.0138	0.0123
Pneutek SDK63-series (0.155" to 0.25" support steel)	0.0246	0.0224	0.0194	0.0175	0.0159	0.0138	0.0123
Pneutek K64-series (0.187" to 0.312" support steel)	0.0246	0.0224	0.0194	0.0175	0.0159	0.0138	0.0123
Pneutek K66-series (0.281" & greater support steel)	0.0246	0.0224	0.0194	0.0175	0.0159	0.0138	0.0123
Hilti X-ENP-19L15 (0.25" min. support steel)	0.0061	0.0056	0.0049	0.0044	0.0040	0.0034	0.0031
Hilti ENP2 or ENPH2 (0.25" minimum support steel)	0.0102	0.0093	0.0081	0.0073	0.0066	0.0057	0.0051
Hilti ENP2K, X-EDN19, or X-EDNK22 (0.125" to 0.375" support steel)	0.0102	0.0093	0.0081	0.0073	0.0066	0.0057	0.0051

SIDE-LAP FASTENER NOMINAL SHEAR STRENGTH							
TYPE OF SIDE-LAP FASTENER	Q_s, lbf / Deck Thickness No.						
	28	26	24	22	20	18	16
5/8" puddle weld or 1.5" long fillet weld				1304	1566	2033	2510
#8 screws	280	337	449	555	673	891	1124
#10 screws	320	384	513	633	769	1018	1284
#12 screws	362	435	580	716	869	1151	1452
#14 screws	424	510	681	840	1020	1350	1703

SIDE-LAP FASTENER FLEXIBILITY							
TYPE OF SIDE-LAP FASTENER	S_s, in./Kip / Deck Thickness No.						
	28	26	24	22	20	18	16
5/8" puddle weld or 1.5" long fillet weld				0.0073	0.0066	0.0057	0.0051
#8 screws	0.0246	0.0224	0.0194	0.0175	0.0159	0.0138	0.0123
#10 screws	0.0246	0.0224	0.0194	0.0175	0.0159	0.0138	0.0123
#12 screws	0.0246	0.0224	0.0194	0.0175	0.0159	0.0138	0.0123
#14 screws	0.0246	0.0224	0.0194	0.0175	0.0159	0.0138	0.0123

Table IV-M - TYPICAL FASTENER VALUES - NOMINAL SHEAR STRENGTH (Q_f & Q_s) & FLEXIBILITY (S_f & S_s)

SUPPORT FASTENER NOMINAL SHEAR STRENGTH							
TYPE OF SUPPORT FASTENER	Q_f, kN / Deck Thickness No.						
	28	26	24	22	20	18	16
16 mm puddle weld or equivalent				7.80	9.27	12.11	14.83
19 mm puddle weld or equivalent				9.33	11.11	14.57	17.90
1.5 mm weld washer with 10 mm hole — E70XX	5.50	6.96	10.55				
Buildex and Elco Textron #12 or #14 TEKS	2.92	3.76	5.79	4.56	5.48	7.30	9.13
Buildex BX-12	2.66	3.37	5.02	6.60	7.65	9.47	10.92
Buildex BX-14	2.80	3.56	5.30	6.97	8.07	9.99	11.52
Pneutek SDK61-series (3 mm to 4 mm support steel)	2.87	3.54	5.13	6.81	8.07	10.49	12.77
Pneutek SDK63-series (4 mm to 6 mm support steel)	3.24	4.00	5.80	7.63	8.72	10.68	12.42
Pneutek K64-series (5 mm to 8 mm support steel)	3.26	4.02	5.83	7.59	9.73	13.27	16.26
Pneutek K66-series (7 mm & greater support steel)	2.77	3.42	4.96	8.07	9.89	13.73	17.85
Hilti X-ENP-19L15 (6mm min. support steel)	3.69	4.36	5.78	7.18	8.57	11.29	13.93
Hilti ENP2 or ENPH2 (6 mm minimum support steel)	3.82	4.47	5.81	7.08	8.27	10.41	12.26
Hilti ENP2K, X-EDN19, or X-EDNK22 (3 mm to 10 mm support steel)	3.41	4.03	5.34	6.63	7.91	10.42	12.86

SUPPORT FASTENER FLEXIBILITY							
TYPE OF SUPPORT FASTENER	S_f, mm/kN / Deck Thickness No.						
	28	26	24	22	20	18	16
16 mm puddle weld or equivalent				0.0382	0.0349	0.0302	0.0270
19 mm puddle weld or equivalent				0.0382	0.0349	0.0302	0.0270
1.5 mm weld washer with 10 mm hole — E70XX	0.0537	0.0493	0.0427				
Buildex and Elco Textron #12 or #14 TEKS	0.0607	0.0558	0.0483	0.0432	0.0394	0.0341	0.0305
Buildex BX-12	0.1166	0.1072	0.0928	0.0830	0.0758	0.0656	0.0587
Buildex BX-14	0.1166	0.1072	0.0928	0.0830	0.0758	0.0656	0.0587
Pneutek SDK61-series (3 mm to 4 mm support steel)	0.1400	0.1286	0.1114	0.0997	0.0910	0.0788	0.0705
Pneutek SDK63-series (4 mm to 6 mm support steel)	0.1400	0.1286	0.1114	0.0997	0.0910	0.0788	0.0705
Pneutek K64-series (5 mm to 8 mm support steel)	0.1400	0.1286	0.1114	0.0997	0.0910	0.0788	0.0705
Pneutek K66-series (7 mm & greater support steel)	0.1400	0.1286	0.1114	0.0997	0.0910	0.0788	0.0705
Hilti X-ENP-19L15 (6mm min. support steel)	0.0350	0.0322	0.0279	0.0249	0.0227	0.0197	0.0176
Hilti ENP2 or ENPH2 (6 mm minimum support steel)	0.0584	0.0537	0.0465	0.0416	0.0379	0.0329	0.0294
Hilti ENP2K, X-EDN19, or X-EDNK22 (3 mm to 10 mm. support steel)	0.0584	0.0537	0.0465	0.0416	0.0379	0.0329	0.0294

SIDE-LAP FASTENER NOMINAL SHEAR STRENGTH							
TYPE OF SIDE-LAP FASTENER	Q_s, kN / Deck Thickness No.						
	28	26	24	22	20	18	16
16 mm puddle weld or 38 mm fillet weld				5.85	6.95	9.08	11.1
#8 screws	1.25	1.48	1.97	2.47	2.96	3.95	4.94
#10 screws	1.43	1.69	2.26	2.82	3.38	4.51	5.64
#12 screws	1.62	1.91	2.55	3.19	3.83	5.10	6.38
#14 screws	1.90	2.24	2.99	3.74	4.49	5.99	7.48

SIDE-LAP FASTENER FLEXIBILITY							
TYPE OF SIDE-LAP FASTENER	S_s, mm/kN / Deck Thickness No.						
	28	26	24	22	20	18	16
16 mm puddle weld or 38 mm fillet weld				0.0416	0.0379	0.0329	0.0294
#8 screws	0.1400	0.1286	0.1114	0.0997	0.0910	0.0788	0.0705
#10 screws	0.1400	0.1286	0.1114	0.0997	0.0910	0.0788	0.0705
#12 screws	0.1400	0.1286	0.1114	0.0997	0.0910	0.0788	0.0705
#14 screws	0.1400	0.1286	0.1114	0.0997	0.0910	0.0788	0.0705

Table IX - HILTI FASTENER IN TENSION

Deck Thickness in.	T_n , lb ⁽¹⁾		
	Hilti Fastener Type / Fastener Washer Diameter, in.		
	ENP2/ ENPH2/ ENP2K	X-EDN19/ X-EDNK22	X-ENP-19L15
	0.591	0.474	0.591
0.0295	1128	1070	1128
0.0358	1369	1298	1369
0.0474	1813	1719	1813
0.0598	2287	2168	2287

⁽¹⁾ $T_{nov} = 1.7 t d_w F_u$ per this manual, page 4-14, section 4.9.3

Table IX-M - HILTI FASTENER IN TENSION

Deck Thickness in.	T_n , kN		
	Hilti Fastener Type / Fastener Washer Diameter, mm		
	ENP2/ ENPH2/ ENP2K	X-EDN19/ X-EDNK22	X-ENP-19L15
	15	12	15
0.75	5.02	4.76	5.02
0.91	6.09	5.77	6.09
1.20	8.06	7.65	8.06
1.52	10.17	9.65	10.17

LOAD TABLES

THE LOAD TABLES ARE SHOWING NOMINAL STRENGTH VALUES. THE VALUES MUST NOT BE USED WITHOUT APPLYING THE PROPER SAFETY OR RESISTANCE FACTOR.

LRFD

The values of the load tables must be multiplied by a resistance factor (number smaller than or equal to 0.70) when comparing to forces evaluated using Load and Resistance Factor Design.

ASD

The values of the load tables must be divided by a safety factor (number larger than or equal to 2.35) when comparing to forces evaluated using Allowable Stress Design.

The following load tables are for typical panel configurations and connector types. Specific design applications may dictate an arrangement, not listed, which would require the designer to make direct use of the strength and stiffness formulas shown in Sections 1 through 5.

The tables are arranged showing the fastener types, safety factor and resistance factor at the top along with the fastener patterns as defined in Appendix IV. For each steel base sheet metal design thickness given, nominal shear strengths are listed under the specific span lengths. The column "SIDE-LAP CONN./SPAN" shows the number of connectors between structural supports at the sheet edge. For example, "5" would represent six even spaces or stitch fasteners at 12 in. on center within a 6 ft deck span.

Nominal diaphragm shears due to panel buckling are tabulated at the bottom of the pages to check whether the panel buckling governs over connector strength for diaphragm design. The asterisk (*) in the strength table indicates the potential of panel buckling governing over connector strength under a certain type of lateral load. The tables were done in this manner because of the different safety or resistance factors that apply to connector strength and panel buckling.

For roof deck and composite floor deck, the steel yield point is taken at 33 ksi; form deck yield strength is taken at 80 ksi. Structural concrete strength is 3000 psi, and the densities are 145 pcf and 110 pcf for normal weight and light weight concrete respectively. Though design tables show side-lap stitch welds for all thickness listed, they are not recommended for design thickness of 0.0295 in. and less.

The Dxx-values are the warping constants for the particular connector pattern and panel profile. They may be substituted directly into the G' stiffness equation in Appendix IV. Dxx-values, K2-, K3-, and K4-values are listed in Appendix IV. K1-values are found with the appropriate load table.

The tables for structural concrete filled deck are for 1.5 in., 2 in. and 3 in. composite deck attached with a 36/4 pattern. The values would not appreciably change for 24 in. wide deck attached with a 24/3 pattern. The concrete thickness above the deck is 2.5 in. as a minimum.

The load tables for 9/16 in. form decks are shown with structural concrete fill of minimum 2.5 in. cover or with insulating concrete assembled as Type I and Type II attached at a basic 30/4 pattern. Type I decks have 2.5 in. of insulating concrete above the deck. Type II decks have insulating concrete poured to the top of the steel deck; Next, rigid insulating boards of expanded polystyrene, having about 2% of the area containing holes, are embedded into the insulating concrete with the excess concrete moving into the holes (rigid insulating boards should be held 3 ft away from diaphragm shear resisting lines); Finally a topping layer of 2 in. or more of insulating concrete is placed above the rigid insulating board. The strength of the insulating concrete is taken as $f'_c = 125 \text{ psi}$.

There may be shaded values or no values on portions of a load table. The shaded values do not comply with the minimum spacing for side-lap connections and shall not be used except with properly spaced side-lap connections. The shaded areas will be the rows for 0 side-lap connection and are shown for reference. A conservative approach to get nominal shear for diaphragms with button punched side-laps is to use the values from the 0 side-lap connection rows.

TABLE OF CONTENTS FOR DIAPHRAGM LOAD TABLES

STANDARD ROOF DECK

DECK TYPE	SIDE-LAP CONNECTION	FASTENING PATTERN	FRAME FASTENER
			HILTI
			X-ENP-19 L15
1 1/2" ROOF DECK	#10 SCREWS	36/9	AVI-13 thur AVI-16
		36/5	
		36/4	
		36/3	
		30/6	
		30/4	
		30/3	
3" ROOF DECK	#10 SCREWS	24/4	AVI-17

STANDARD FORM DECK (Side-lap Connection #10 Screws)

DECK TYPE	TYPE OF FILL	FASTENING PATTERN	FRAME FASTENER
			HILTI
			X-ENP-19 L15
9/16" X 2 1/2" FORM DECK	WITHOUT FILL	35/8	AVI-18 AVI-19 AVI-20
		36/7	
		36/6	
		36/5	
		36/7	
		30/5	
		30/4	
	N.W. & L.W. CONCRETE	30/4	
	TYPE I & T II INSULATING CONCRETE	30/4	

STANDARD COMPOSITE DECK (Support Fastener Pattern 36/4)

DECK TYPE	SIDE-LAP CONNECT.	TYPE OF CONCRETE	FRAME FASTENER
			HILTI
			X-ENP-19 L15
1 1/2" x 6" 2" x 12" 3" x 12"	#10 SCREWS	NONE (MULTIPLE FASTENER LAYOUT)	AVI-21 thur AVI-24
		NORMAL WEIGHT CONCRETE (2 1/2" COVER)	

1.5 (WR, IR, NR)

t = design thickness = 0.0295"

SUPPORT FASTENING: HiTi X-ENP-19 L15 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	MAXIMUM NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	K1
36/9	0	1640	1440	1285	1135	1015	915	835	765	705	0.211
	1	1785	1580	1410	1275	1140	1030	940			0.188
	2	1925	1710	1535	1390	1265	1145	1045	960	885 *	0.169
	3	2050	1835	1650	1500	1370	1260	1150	1055 *	975 *	0.154
	4	2170	1950	1765	1605	1470	1355	1255 *	1155 *	1065 *	0.141
	5	2280	2060	1870	1705	1565	1445 *	1345 *	1250 *	1155 *	0.130
	6	2380	2160	1970	1805	1660	1535 *	1425 *	1330 *	1245 *	0.121
36/7	0	1050	910	795	700	625	565	515	475	435	0.317
	1	1220	1065	945	840	755	680	620			0.267
	2	1380	1215	1080	975	880	795	725	670	615	0.230
	3	1530	1355	1210	1090	995	910	830	765	710	0.203
	4	1670	1485	1330	1205	1100	1010	935	865	800	0.181
	5	1795	1605	1450	1315	1205	1110	1025	955	890 *	0.163
	6	1910	1720	1555	1420	1300	1200	1115	1035 *	970 *	0.149
36/5	0	925	815	725	645	580	520	475	435	400	0.380
	1	1075	950	855	770	705	640	580			0.310
	2	1200	1075	970	880	805	740	685	630	585	0.262
	3	1310	1185	1075	985	905	835	775	720	675	0.227
	4	1410	1285	1175	1080	995	920	860	800	750	0.200
	5	1490	1370	1260	1165	1080	1005	935	875	825	0.179
	6	1565	1450	1340	1245	1160	1080	1010	950	895 *	0.162
36/4	0	710	625	555	490	435	395	355	325	300	0.475
	1	850	760	680	615	565	510	465			0.371
	2	970	875	790	725	665	610	570	520	480	0.304
	3	1065	970	890	820	755	700	650	610	570	0.258
	4	1145	1055	975	900	835	780	730	685	645	0.224
	5	1210	1125	1050	975	910	855	800	755	710	0.197
	6	1265	1185	1110	1045	980	920	865	820	775	0.177
30/6	0	955	815	710	625	560	505	460	420	390	0.422
	1	1130	985	870	765	685	620	565			0.349
	2	1300	1140	1010	910	815	735	670	615	570	0.298
	3	1455	1280	1145	1030	935	850	775	715	660	0.260
	4	1595	1415	1270	1145	1045	960	880	810	750	0.230
	5	1730	1545	1390	1260	1150	1055	980	910	840	0.207
	6	1850	1660	1500	1365	1250	1155	1070	995	930 *	0.188
30/4	0	865	765	680	605	545	490	445	410	375	0.475
	1	1005	895	805	730	665	605	550			0.385
	2	1125	1015	915	835	765	705	655	605	555	0.323
	3	1230	1120	1020	935	860	795	740	690	645	0.279
	4	1320	1210	1110	1025	945	880	820	770	720	0.245
	5	1395	1290	1190	1105	1025	960	895	840	790	0.219
	6	1460	1360	1265	1180	1100	1030	965	910	860	0.197

* DESIGN SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL DIAPHRAGM SHEAR DUE TO PANEL BUCKLING (S _b), PLF / SPAN, FT								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
NR	0.099	4130	3035	2320	1835	1485	1225	1030	880	755
IR	0.108	4410	3240	2480	1960	1585	1310	1100	935	810
WR	0.152	5695	4185	3205	2530	2050	1695	1420	1210	1045

NOTE:

ASB Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_b / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_b]

1.5 (WR, IR, NR)

t = design thickness = 0.0358"

SUPPORT FASTENING: Hilti X-ENP-19 L15 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	MAXIMUM NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	K1
36/9	0	1545	1380	1230	1115	1015	930	855	795	740	0.233
	1	1705	1535	1385	1250	1140					0.207
	2	1850	1675	1530	1390	1270	1165	1075	1000	930	0.186
	3	1995	1810	1655	1520	1395	1285	1185	1100 *	1025 *	0.169
	4	2130	1940	1775	1635	1515	1400	1295 *	1205 *	1125 *	0.155
	5	2255	2060	1895	1750	1620	1510 *	1405 *	1305 *	1220 *	0.143
	6	2380	2180	2005	1855	1725 *	1610 *	1510 *	1410 *	1315 *	0.133
36/7	0	960	850	760	685	625	575	530	490	460	0.349
	1	1140	1020	915	825	755					0.294
	2	1305	1175	1065	965	880	810	750	695	650	0.254
	3	1460	1320	1200	1100	1010	930	860	800	745	0.223
	4	1610	1460	1330	1220	1130	1045	970	900	845	0.199
	5	1750	1590	1455	1340	1240	1155	1075	1005	940 *	0.180
	6	1885	1715	1575	1455	1345	1255	1175	1100 *	1035 *	0.164
36/5	0	875	785	700	635	580	530	490	455	425	0.419
	1	1030	930	850	775	705					0.342
	2	1170	1065	975	895	830	765	710	660	615	0.289
	3	1300	1190	1090	1010	935	875	815	760	710	0.250
	4	1420	1305	1200	1115	1035	970	910	855	805	0.220
	5	1525	1410	1305	1215	1135	1060	995	940	890	0.197
	6	1620	1505	1400	1305	1225	1150	1080	1020	965 *	0.178
36/4	0	670	595	530	480	435	400	365	340	315	0.523
	1	820	745	680	620	565					0.408
	2	955	875	800	740	685	635	585	545	510	0.335
	3	1075	990	910	845	785	735	690	645	605	0.284
	4	1180	1090	1010	945	880	825	775	735	695	0.246
	5	1265	1180	1100	1030	970	910	860	810	770	0.217
	6	1345	1260	1185	1110	1045	990	935	885	840	0.195
30/6	0	860	760	680	615	560	515	475	440	410	0.465
	1	1050	930	835	755	685					0.385
	2	1220	1095	985	895	815	750	695	645	600	0.328
	3	1380	1245	1130	1035	945	865	800	745	695	0.286
	4	1535	1385	1265	1160	1070	985	910	850	795	0.254
	5	1680	1520	1390	1280	1180	1100	1020	950	890	0.228
	6	1815	1650	1515	1395	1290	1200	1125	1055	985 *	0.207
30/4	0	820	735	660	595	540	495	460	425	395	0.523
	1	970	880	800	735	670					0.424
	2	1110	1010	925	855	790	735	680	630	590	0.356
	3	1230	1130	1040	960	895	835	780	730	685	0.307
	4	1340	1235	1145	1065	990	930	870	820	775	0.270
	5	1440	1335	1240	1160	1085	1015	955	905	855	0.241
	6	1525	1425	1330	1245	1170	1100	1035	980	930	0.217

* DESIGN SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL DIAPHRAGM SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
NR	0.128	3255	2570	2085	1720	1445	1230	1060	925	810
IR	0.139	3465	2735	2215	1830	1540	1310	1130	985	865
WR	0.198	4515	3570	2890	2390	2005	1710	1475	1285	1125

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0474"

SUPPORT FASTENING: Hiiti X-ENP-19 L15 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50

φ (WIND): 0.70 Ω (WIND): 2.35

φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	MAXIMUM NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	K1
36/9	0	1625	1470	1340	1230	1135	1050	980	915	860	0.268
	1	1830	1655	1510							0.238
	2	2005	1840	1680	1540	1425	1325	1235	1155	1085	0.214
	3	2170	1995	1845	1700	1570	1460	1360	1275	1200 *	0.195
	4	2330	2150	1990	1855	1715	1595	1490 *	1395 *	1315 *	0.178
	5	2485	2295	2130	1985	1860	1730 *	1615 *	1515 *	1425 *	0.165
	6	2635	2440	2265	2115	1980 *	1865 *	1745 *	1635 *	1540 *	0.153
36/7	0	1000	905	825	760	700	650	605	570	535	0.401
	1	1205	1090	995							0.338
	2	1400	1275	1165	1070	990	920	860	810	760	0.292
	3	1575	1445	1335	1230	1135	1060	990	930	875	0.257
	4	1750	1605	1485	1380	1285	1195	1115	1050	985	0.229
	5	1915	1760	1630	1515	1415	1330	1245	1165	1100	0.207
	6	2070	1910	1770	1650	1545	1450	1365	1285	1215 *	0.189
36/5	0	925	835	765	700	645	600	560	525	495	0.482
	1	1110	1020	935							0.393
	2	1280	1175	1090	1015	940	870	815	765	720	0.332
	3	1435	1325	1230	1145	1075	1010	940	885	830	0.288
	4	1580	1465	1365	1275	1195	1125	1060	1005	945	0.253
	5	1715	1595	1490	1395	1310	1235	1170	1105	1050	0.227
	6	1840	1715	1610	1510	1420	1340	1270	1205	1145	0.205
36/4	0	700	635	575	530	485	450	420	395	370	0.602
	1	890	820	745							0.470
	2	1050	970	900	840	780	725	675	630	595	0.385
	3	1200	1110	1035	965	905	855	800	750	705	0.327
	4	1330	1240	1160	1085	1020	965	910	865	820	0.283
	5	1450	1355	1275	1195	1130	1070	1010	960	915	0.250
	6	1555	1460	1375	1300	1230	1165	1105	1055	1005	0.224
30/6	0	895	810	740	680	625	580	540	505	475	0.535
	1	1100	995	910							0.443
	2	1305	1180	1080	990	915	850	795	745	700	0.378
	3	1485	1360	1245	1145	1060	990	925	865	815	0.329
	4	1660	1525	1405	1305	1205	1125	1050	985	930	0.292
	5	1830	1680	1555	1445	1350	1260	1180	1105	1040	0.262
	6	1990	1835	1700	1580	1480	1390	1305	1225	1155	0.238
30/4	0	870	785	715	655	605	565	525	490	460	0.602
	1	1050	965	885							0.488
	2	1215	1120	1035	965	895	835	780	730	685	0.410
	3	1365	1265	1175	1095	1025	965	905	850	800	0.354
	4	1505	1395	1305	1220	1145	1080	1020	965	915	0.311
	5	1630	1520	1425	1335	1260	1185	1125	1065	1015	0.277
	6	1750	1635	1535	1445	1365	1290	1225	1160	1105	0.250

* DESIGN SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL DIAPHRAGM SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
NR	0.181	3335	2755	2315	1970	1700	1480	1300	1155	1030
IR	0.196	3540	2925	2460	2095	1805	1570	1380	1225	1090
WR	0.284	4675	3865	3245	2765	2385	2075	1825	1615	1440

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0598"

SUPPORT FASTENING: Hilti X-ENP-19 L15 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	K1
36/9	0	1680	1545	1425	1325	1235	1155	1085	1020	965	0.301
	1	1895									0.267
	2	2110	1940	1790	1665	1555	1455	1370			0.240
	3	2305	2135	1975	1835	1715	1610	1515	1430	1350 *	0.219
	4	2490	2315	2160	2010	1875	1760	1655	1565 *	1480 *	0.200
	5	2665	2485	2325	2180	2035	1910 *	1800 *	1700 *	1610 *	0.185
6	2835	2645	2480	2330	2195 *	2060 *	1940 *	1835 *	1735 *	0.172	
36/7	0	1035	950	880	815	765	715	670	635	600	0.451
	1	1250									0.380
	2	1465	1345	1245	1160	1085	1015	955			0.328
	3	1670	1545	1430	1330	1245	1170	1100	1040	985	0.289
	4	1860	1725	1610	1500	1405	1320	1245	1175	1115	0.258
	5	2040	1900	1775	1665	1565	1470	1385	1310	1240	0.233
6	2220	2070	1935	1815	1710	1620	1530	1445	1370 *	0.212	
36/5	0	955	880	810	755	705	660	620	585	555	0.541
	1	1170									0.442
	2	1360	1265	1180	1095	1025	960	905			0.373
	3	1535	1435	1340	1260	1185	1115	1050	990	940	0.323
	4	1705	1595	1495	1405	1330	1255	1190	1125	1065	0.285
	5	1865	1745	1640	1545	1460	1385	1315	1255	1195	0.255
6	2015	1890	1780	1680	1590	1510	1435	1370	1310	0.230	
36/4	0	725	665	615	570	530	495	465	440	415	0.676
	1	940									0.528
	2	1125	1050	980	910	850	800	750			0.433
	3	1295	1210	1135	1070	1010	950	895	845	800	0.367
	4	1450	1360	1280	1205	1140	1085	1030	980	925	0.318
	5	1595	1500	1415	1340	1270	1205	1145	1095	1045	0.281
6	1725	1630	1540	1460	1390	1320	1260	1205	1150	0.252	
30/6	0	925	850	785	730	680	640	600	565	535	0.601
	1	1140									0.498
	2	1355	1245	1155	1070	1000	940	885			0.424
	3	1570	1445	1335	1245	1160	1090	1025	970	920	0.370
	4	1760	1635	1520	1415	1325	1240	1170	1105	1050	0.328
	5	1950	1810	1690	1585	1485	1395	1315	1240	1175	0.294
6	2130	1985	1855	1740	1640	1545	1455	1375	1305	0.267	
30/4	0	900	825	760	710	660	620	580	545	515	0.676
	1	1110									0.548
	2	1295	1205	1130	1050	980	920	865			0.460
	3	1470	1370	1285	1210	1140	1070	1010	955	900	0.397
	4	1630	1525	1435	1350	1275	1210	1150	1090	1030	0.349
	5	1780	1675	1575	1485	1405	1335	1270	1210	1155	0.311
6	1925	1810	1710	1615	1535	1455	1385	1325	1265	0.281	

* DESIGN SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL DIAPHRAGM SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
NR	0.226	3255	2775	2390	2085	1830	1620	1445	1300	1170
IR	0.245	3460	2950	2540	2215	1945	1725	1535	1380	1245
WR	0.355	4570	3895	3355	2925	2570	2275	2030	1820	1645

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

3.0 DR SUPPORT FASTENING: Hilti X-ENP-19 L15 (0.25" min. support steel)
 SIDE-LAP FASTENING: #10 screws

ϕ (Buckling): 0.80 Ω (Buckling): 2.00 ϕ (EQ): 0.65 Ω (EQ): 2.50
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (WIND): 0.70 Ω (WIND): 2.35

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	MAXIMUM NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0295 \text{ in.}$									
		SPAN, FT									
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	K1
24/4	0	255	240	230	215	205	195	185	180	170	0.713
	2	415	390	370							0.456
	3	495	465	440	415	395	375	360	345	330	0.387
	4	575	540	510	485	460	435	415	400	380	0.335
	5	655	615	580	550	520	495	475	455	435	0.296
	6	730	690	650	615	585	560	530	510	490	0.265
	7	805	760	720	685	650	620	590	565	540	0.240
	8	870	825	780	745	710	680	650	620	595	0.219
	9	930	885	840	800	765	735	700	675	645	0.202
	10	990	945	900	855	820	785	750	720	695	0.187
	11	1050	1000	955	910	870	835	800	770	740	0.174
	I (in ⁴ /ft)	NOMINAL DIAPHRAGM SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
	0.551	2035	1800	1605	1440	1300	1180	1075	985	905	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	MAXIMUM NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0358 \text{ in.}$									
		SPAN, FT									
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	K1
24/4	0	275	260	250	235	225	215	205	200	190	0.785
	2	445									0.502
	3	530	505	480	455	435	415	400			0.426
	4	615	585	555	530	505	485	465	445	425	0.369
	5	705	665	630	600	575	550	525	505	485	0.326
	6	790	745	710	675	645	615	590	565	545	0.292
	7	875	825	785	750	715	685	655	630	605	0.264
	8	945	900	860	820	785	750	720	690	665	0.242
	9	1020	970	925	885	850	815	785	750	725	0.222
	10	1085	1035	990	950	910	875	840	810	780	0.206
	12	1220	1165	1115	1070	1030	990	950	915	885	0.179
		I (in ⁴ /ft)	NOMINAL DIAPHRAGM SHEAR DUE TO PANEL BUCKLING (S _n), PLF								
	0.714	2260	2025	1830	1660	1510	1380	1270	1170	1080	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	MAXIMUM NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0474 \text{ in.}$										
		SPAN, FT										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	K1	
24/4	0	325	310	295	280	270	260	250	240	230	0.903	
	3	630	600	570	550	525					0.490	
	4	730	695	665	635	610	585	565	540	520	0.425	
	5	835	795	755	725	695	665	640	615	595	0.375	
	6	935	890	850	815	780	750	720	695	670	0.336	
	7	1035	985	940	900	865	830	795	770	740	0.304	
	8	1135	1085	1035	990	950	910	875	845	815	0.278	
	9	1220	1170	1120	1075	1035	990	955	920	885	0.256	
	10	1305	1250	1200	1155	1110	1070	1030	995	960	0.237	
	11	1390	1330	1280	1230	1185	1140	1100	1065	1025	0.221	
	13	1550	1490	1430	1375	1325	1280	1235	1195	1155	0.194	
		I (in ⁴ /ft)	NOMINAL DIAPHRAGM SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
		1.036	2985	2710	2465	2255	2075	1910	1765	1635	1520	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	MAXIMUM NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0598 \text{ in.}$										
		SPAN, FT										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	K1	
24/4	0	365	350	335	325	310	300	290	280	270	1.015	
	3	715	685	660							0.550	
	4	835	800	765	735	705	680	655	635	610	0.477	
	5	950	910	870	835	805	775	745	720	695	0.422	
	6	1065	1020	980	940	905	870	840	810	785	0.378	
	7	1185	1135	1085	1040	1000	965	930	900	870	0.342	
	8	1300	1245	1195	1145	1100	1060	1020	985	955	0.312	
	9	1410	1350	1300	1250	1200	1155	1115	1075	1040	0.287	
	10	1510	1450	1395	1345	1295	1250	1205	1165	1125	0.266	
	11	1605	1545	1485	1435	1380	1335	1290	1250	1210	0.248	
	13	1795	1730	1665	1605	1550	1500	1450	1405	1365	0.218	
		I (in ⁴ /ft)	NOMINAL DIAPHRAGM SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
		1.295	3475	3175	2920	2690	2485	2305	2145	2000	1865	

* DESIGN SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

NOTE: ASD Required Strength (Service Applied Load) \Leftarrow Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Backing Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) \Leftarrow Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Backing Strength S_n]

9/16" x 2 1/2" FORM DECK
t = design thickness = 0.0149"

SUPPORT FASTENING: Hilti X-ENP-19 L15 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	MAXIMUM NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	
NO FILL (BARE DECK)	35/8	0	1360	1055	850	700	595 *	520 *	455 *	0.203
		1	1470	1175	960	805	685 *	600 *	530 *	0.174
		2	1555	1280	1060	895 *	770 *	675 *	600 *	0.152
		3	1620	1365	1150	985 *	855 *	750 *	670 *	0.136
		4	1675	1440	1235	1065 *	930 *	820 *	735 *	0.122
	35/7	0	1250	1000	815	680	580 *	505 *	450 *	0.216
		1	1335	1100	915	775	665 *	585 *	520 *	0.184
		2	1400	1185	1005	860 *	745 *	655 *	585 *	0.160
		3	1450	1255	1080	935 *	820 *	725 *	650 *	0.142
		4	1490	1315	1150	1005 *	890 *	790 *	710 *	0.127
	35/5	0	890	735	610	515	445	390	345 *	0.295
		1	950	815	695	600	525	460 *	415 *	0.238
		2	990	875	765	670	595 *	530 *	475 *	0.199
		3	1020	925	825	735	655 *	590 *	530 *	0.172
		4	1040	960	870	785	710 *	640 *	585 *	0.151
	30/7	0	1290	985	785	645	545	475 *	415 *	0.270
		1	1415	1115	900	750	640 *	555 *	490 *	0.227
		2	1510	1225	1010	845 *	725 *	635 *	560 *	0.196
		3	1585	1320	1105	940 *	810 *	710 *	630 *	0.173
		4	1645	1400	1190	1020 *	890 *	785 *	700 *	0.154
	30/5	0	950	750	610	505	430	375	330 *	0.360
		1	1040	855	710	600	520	455 *	400 *	0.288
		2	1100	940	800	685	595 *	525 *	470 *	0.240
		3	1145	1005	870	760	670 *	595 *	535 *	0.206
4		1180	1055	935	825 *	735 *	655 *	590 *	0.180	
30/4	0	765	625	520	435	375	330	290	0.405	
	1	830	710	605	520	455	400	360 *	0.316	
	2	870	770	675	595	525	470 *	420 *	0.259	
	3	900	815	730	655	585 *	525 *	475 *	0.220	
	4	915	850	775	700	635 *	580 *	530 *	0.191	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	6125	5715	5515	5390	5310	5255	5210	0.405
		1	6445	5930	5675	5520	5415	5345	5290	0.316
		2	6765	6145	5835	5650	5525	5435	5370	0.259
		3	7085	6355	5995	5775	5630	5525	5450	0.220
		4	7405	6570	6155	5905	5735	5620	5530	0.191
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4460	4055	3850	3730	3645	3590	3545	0.405
		1	4780	4265	4010	3855	3755	3680	3625	0.316
		2	5100	4480	4170	3985	3860	3770	3705	0.259
		3	5420	4695	4330	4110	3965	3865	3785	0.220
		4	5740	4905	4490	4240	4075	3955	3865	0.191
TYPE I INSUL. FILL	30/4	0	1665	1260	1055	935	855	795	750	0.405
		1	1985	1475	1215	1065	960	885	830	0.316
		2	2305	1685	1375	1190	1065	980	910	0.259
		3	2625	1900	1535	1320	1175	1070	990	0.220
		4	2945	2115	1695	1445	1280	1160	1070	0.191
TYPE II INSUL. FILL	30/4	0	1935	1530	1325	1205	1120	1065	1020	0.405
		1	2255	1740	1485	1330	1230	1155	1100	0.316
		2	2575	1955	1645	1460	1335	1245	1180	0.259
		3	2895	2170	1805	1585	1440	1340	1260	0.220
		4	3215	2380	1965	1715	1550	1430	1340	0.191

* DESIGN SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL DIAPHRAGM SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.0	1.5	2.0	2.5	3.0	3.5	4.0
NO FILL	ALL	0.011	4465	1985	1115	715	495	365	275

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0179"

SUPPORT FASTENING: Hilti X-ENP-19 L15 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	MAXIMUM NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.5	2.0	2.5	3.0	3.5	4.0	4.5	
NO FILL (BARE DECK)	35/8	0	1265	1015	840	715	620 *	545 *	490 *	0.222
		1	1410	1150	960	825 *	715 *	635 *	570 *	0.191
		2	1530	1270	1075 *	925 *	810 *	720 *	645 *	0.167
		3	1635	1380	1180 *	1025 *	900 *	800 *	720 *	0.149
		4	1725	1480	1275 *	1115 *	985 *	880 *	795 *	0.134
	35/7	0	1195	975	815	695	605 *	535 *	480 *	0.237
		1	1320	1095	925	800 *	700 *	620 *	555 *	0.202
		2	1420	1205	1030	895 *	790 *	700 *	630 *	0.175
		3	1505	1295	1125 *	985 *	870 *	780 *	705 *	0.155
	35/5	0	880	730	620	535	465	415	370 *	0.323
		1	975	835	720	625	555 *	495 *	445 *	0.261
		2	1050	920	805	710	635 *	570 *	515 *	0.219
		3	1105	985	880	785 *	705 *	640 *	580 *	0.188
	30/7	0	1180	935	770	655	565 *	500 *	440 *	0.296
		1	1335	1080	900	765 *	665 *	590 *	525 *	0.249
		2	1470	1210	1015	870 *	760 *	675 *	605 *	0.215
		3	1580	1325	1125 *	970 *	850 *	755 *	680 *	0.189
	30/5	0	900	730	605	515	450	395	355 *	0.395
		1	1025	850	720	620	545 *	480 *	435 *	0.316
		2	1125	955	820	715	630 *	565 *	505 *	0.263
		3	1205	1045	910	800 *	710 *	640 *	580 *	0.226
	30/4	0	750	620	525	450	395	350	315	0.444
		1	850	725	625	545	480	430 *	385 *	0.347
		2	925	810	710	630	560 *	505 *	455 *	0.284
3		980	875	785	700	630 *	570 *	520 *	0.241	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5875	5635	5490	5390	5320	5270	5230	0.444
		1	6135	5825	5640	5520	5430	5365	5315	0.347
		2	6390	6020	5795	5645	5540	5460	5400	0.284
		3	6645	6210	5950	5775	5650	5555	5485	0.241
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4215	3970	3825	3725	3660	3605	3565	0.444
		1	4470	4160	3980	3855	3765	3700	3650	0.347
		2	4725	4355	4130	3985	3875	3800	3735	0.284
		3	4980	4545	4285	4110	3985	3895	3820	0.241
TYPE I INSUL. FILL	30/4	0	1420	1175	1030	935	865	810	770	0.444
		1	1675	1370	1185	1060	975	910	855	0.347
		2	1935	1560	1340	1190	1085	1005	940	0.284
		3	2190	1755	1490	1320	1195	1100	1030	0.241
TYPE II INSUL. FILL	30/4	0	1690	1445	1300	1200	1135	1080	1040	0.444
		1	1945	1640	1455	1330	1240	1175	1125	0.347
		2	2200	1830	1605	1460	1350	1275	1210	0.284
		3	2455	2020	1760	1585	1460	1370	1295	0.241
		4	2715	2215	1915	1715	1570	1465	1380	0.209

* DESIGN SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL DIAPHRAGM SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.5	2.0	2.5	3.0	3.5	4.0	4.5
NO FILL	ALL	0.013	2580	1450	930	645	470	360	285

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0239"

SUPPORT FASTENING: Hilti X-ENP-19 L15 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	MAXIMUM NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			2.0	2.5	3.0	3.5	4.0	4.5	5.0	
NO FILL (BARE DECK)	35/8	0	1350	1115	950	825 *	725 *	650 *	585 *	0.257
		1	1530	1280	1095	950 *	845 *	755 *	685 *	0.220
		2	1690	1430	1230 *	1075 *	955 *	860 *	775 *	0.193
		3	1835	1570	1360 *	1195 *	1065 *	960 *	870 *	0.172
		4	1965	1695 *	1480 *	1310 *	1170 *	1055 *	960 *	0.155
	35/7	0	1295	1080	925	805	710 *	635 *	575 *	0.274
		1	1455	1230	1060	930 *	825 *	740 *	670 *	0.233
		2	1600	1370	1190 *	1045 *	930 *	840 *	765 *	0.203
		3	1725	1495	1310 *	1160 *	1035 *	935 *	850 *	0.179
		4	1830	1605	1415 *	1260 *	1135 *	1025 *	940 *	0.161
	35/5	0	970	820	705	620	550	495	445 *	0.373
		1	1110	955	835	735	655 *	590 *	540 *	0.301
		2	1220	1070	945	840 *	755 *	685 *	625 *	0.253
		3	1310	1170	1045	935 *	850 *	770 *	705 *	0.217
		4	1385	1250	1130 *	1025 *	930 *	855 *	785 *	0.191
	30/7	0	1245	1025	870	750	660 *	590 *	530 *	0.342
		1	1435	1195	1015	885 *	780 *	700 *	630 *	0.288
		2	1605	1350	1160 *	1010 *	895 *	805 *	725 *	0.249
		3	1760	1495	1290 *	1130 *	1005 *	905 *	820 *	0.219
		4	1895	1630 *	1415 *	1250 *	1115 *	1005 *	910 *	0.195
	30/5	0	965	805	685	595	525	470	420 *	0.456
		1	1130	955	825	720	640 *	575 *	520 *	0.365
		2	1270	1090	950	840 *	750 *	675 *	615 *	0.304
		3	1390	1210	1065	945 *	850 *	770 *	700 *	0.261
4		1485	1315	1170 *	1045 *	945 *	855 *	785 *	0.228	
30/4	0	825	695	595	520	465	415	375	0.513	
	1	965	830	725	640	570	515 *	470 *	0.401	
	2	1075	945	835	745	670 *	605 *	555 *	0.328	
	3	1165	1040	930	840 *	760 *	695 *	635 *	0.278	
	4	1235	1120	1015	920 *	840 *	770 *	710 *	0.241	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5875	5680	5550	5460	5390	5335	5290	0.513
		1	6130	5885	5720	5605	5515	5450	5395	0.401
		2	6385	6090	5890	5750	5645	5565	5495	0.328
		3	6645	6295	6065	5900	5775	5675	5600	0.278
		4	6900	6500	6235	6045	5900	5790	5700	0.241
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4210	4015	3885	3795	3725	3670	3630	0.513
		1	4465	4220	4055	3940	3855	3785	3730	0.401
		2	4720	4425	4230	4085	3980	3900	3835	0.328
		3	4980	4630	4400	4235	4110	4015	3935	0.278
		4	5235	4835	4570	4380	4240	4125	4040	0.241
TYPE I INSUL. FILL	30/4	0	1415	1220	1095	1000	930	880	835	0.513
		1	1670	1425	1265	1145	1060	990	935	0.401
		2	1930	1635	1435	1295	1190	1105	1040	0.328
		3	2185	1840	1605	1440	1315	1220	1140	0.278
		4	2440	2045	1775	1585	1445	1335	1245	0.241
TYPE II INSUL. FILL	30/4	0	1685	1490	1360	1270	1200	1145	1105	0.513
		1	1940	1695	1530	1415	1330	1260	1205	0.401
		2	2195	1900	1705	1560	1455	1375	1310	0.328
		3	2455	2105	1875	1710	1585	1490	1410	0.278
		4	2710	2310	2045	1855	1715	1600	1515	0.241

* DESIGN SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL DIAPHRAGM SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			2.0	2.5	3.0	3.5	4.0	4.5	5.0
NO FILL	ALL	0.017	2205	1410	980	720	550	435	350

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

$t = \text{design thickness} = 0.0295"$

SUPPORT FASTENING: HiTi X-ENP-19 L15 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	MAXIMUM NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	555	435	355	300	260	230	205	185	170	160	0.475
		1	680	565	465								0.371
		2	790	665	570	480	415	370					0.304
		3	890	755	650	570	495	440	395	360	330		0.258
		4	975	835	730	645	575	510	460	415	380	355	0.224
		5	1050	910	800	710	635	575	520	475	435 *	400 *	0.197
		6	1110	980	865	775	695	630	575	530 *	490 *	450 *	0.177
		8	1215	1090	980	885	805	735	675 *	625 *	580 *	540 *	0.146
2" x 12" NO FILL (BARE DECK)	36/4	0	540	425	345	295	255	230	205	185	170	160	0.475
		1	680	550	450								0.371
		2	790	665	555	475	415	370					0.304
		3	890	755	650	565	495	440	395	360	330		0.258
		4	975	835	730	645	575	510	460	415	380	355	0.224
		5	1050	910	800	710	635	575	520	475	435 *	400 *	0.197
		6	1110	980	865	775	695	630	575	530 *	490 *	450 *	0.177
		8	1215	1090	980	885	805	735	675 *	625 *	580 *	540 *	0.146
3" x 12" NO FILL (BARE DECK)	36/4	0	515	410	345	295	255	230	205	185	170	160	0.475
		1	675	540	450								0.371
		2	790	665	555	475	415	370					0.304
		3	890	755	650	565	495	440	395	360	330		0.258
		4	975	835	730	645	575	510	460	415	380	355	0.224
		5	1050	910	800	710	635	575	520	475	435 *	400 *	0.197
		6	1110	980	865	775	695	630	575	530 *	490 *	450 *	0.177
		8	1215	1090	980	885	805	735	675 *	625 *	580 *	540 *	0.146
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5500	5380	5300	5245	5200	5170	5140	5120	5100	5085	0.475
		1	5655	5505	5405								0.371
		2	5815	5635	5510	5425	5360	5310					0.304
		3	5975	5760	5615	5515	5440	5380	5330	5295	5260		0.258
		4	6130	5885	5725	5605	5520	5450	5395	5350	5315	5280	0.224
		5	6290	6015	5830	5695	5595	5520	5460	5410	5365	5330	0.197
		6	6450	6140	5935	5785	5675	5590	5520	5465	5420	5380	0.177
		8	6765	6395	6145	5970	5835	5730	5650	5580	5525	5475	0.146
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3835	3715	3635	3580	3540	3505	3480	3455	3440	3425	0.475
		1	3995	3845	3740								0.371
		2	4150	3970	3850	3760	3695	3645					0.304
		3	4310	4095	3955	3850	3775	3715	3670	3630	3595		0.258
		4	4470	4225	4060	3940	3855	3785	3730	3685	3650	3620	0.224
		5	4625	4350	4165	4035	3935	3855	3795	3745	3705	3665	0.197
		6	4785	4475	4270	4125	4015	3925	3860	3800	3755	3715	0.177
		8	5100	4730	4480	4305	4170	4070	3985	3915	3860	3815	0.146

* DESIGN SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL DIAPHRAGM SHEAR DUE TO PANEL BUCKLING (S_n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.165	3405	2180	1515	1110	850	670	545	450	375	320
2" x 12"	24/3 & 36/4	0.338	6115	3910	2715	1995	1525	1205	975	805	675	575
3" x 12"	24/3 & 36/4	0.797	11290	7225	5015	3685	2820	2230	1805	1490	1255	1065

NOTE: ASD Required Strength (Service Applied Load) \leq Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) \leq Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0358"

SUPPORT FASTENING: HiTi X-ENP-19 L15 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	MAXIMUM NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	670	530	435	365	315	275	250	225	205	190	0.523
		1	820	680	565								0.408
		2	955	800	685	585	510	445					0.335
		3	1075	910	785	690	605	530	480	435	400		0.284
		4	1180	1010	880	775	695	615	555	505	465	425	0.246
		5	1265	1100	970	860	770	695	630	575	525	485	0.217
		6	1345	1185	1045	935	840	765	695	640	590	545 *	0.195
		8	1465	1320	1185	1070	975	890	815	755 *	700 *	655 *	0.161
2" x 12" NO FILL (BARE DECK)	36/4	0	660	515	420	355	310	275	250	225	205	190	0.523
		1	820	670	550								0.408
		2	955	800	675	575	500	445					0.335
		3	1075	910	785	685	600	530	480	435	400		0.284
		4	1180	1010	880	775	695	615	555	505	465	425	0.246
		5	1265	1100	970	860	770	695	630	575	525	485	0.217
		6	1345	1185	1045	935	840	765	695	640	590	545 *	0.195
		8	1465	1320	1185	1070	975	890	815	755 *	700 *	655 *	0.161
3" x 12" NO FILL (BARE DECK)	36/4	0	630	495	415	355	310	275	250	225	205	190	0.523
		1	820	650	540								0.408
		2	955	800	670	575	500	445					0.335
		3	1075	910	785	685	600	530	480	435	400		0.284
		4	1180	1010	880	775	695	615	555	505	465	425	0.246
		5	1265	1100	970	860	770	695	630	575	525	485	0.217
		6	1345	1185	1045	935	840	765	695	640	590	545 *	0.195
		8	1465	1320	1185	1070	975	890	815	755 *	700 *	655 *	0.161
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5620	5480	5380	5315	5265	5225	5190	5165	5145	5125	0.523
		1	5815	5630	5510								0.408
		2	6005	5785	5640	5535	5455	5395					0.335
		3	6195	5940	5765	5645	5550	5480	5420	5375	5335		0.284
		4	6390	6090	5895	5755	5645	5565	5500	5445	5400	5360	0.246
		5	6580	6245	6025	5865	5745	5650	5575	5515	5465	5420	0.217
		6	6775	6400	6150	5975	5840	5735	5650	5585	5525	5480	0.195
		8	7160	6705	6405	6190	6030	5905	5805	5725	5655	5600	0.161
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3955	3815	3720	3650	3600	3560	3525	3500	3480	3460	0.523
		1	4150	3965	3845								0.408
		2	4340	4120	3975	3870	3790	3730					0.335
		3	4535	4275	4105	3980	3885	3815	3760	3710	3670		0.284
		4	4725	4430	4230	4090	3985	3900	3835	3780	3735	3695	0.246
		5	4920	4580	4360	4200	4080	3985	3910	3850	3800	3755	0.217
		6	5110	4735	4485	4310	4175	4070	3990	3920	3865	3815	0.195
		8	5495	5045	4745	4530	4365	4240	4140	4060	3990	3935	0.161

* DESIGN SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL DIAPHRAGM SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.212	4755	3040	2110	1550	1185	935	760	625	525	450
2" x 12"	24/3 & 36/4	0.420	8320	5325	3695	2715	2080	1640	1330	1100	925	785
3" x 12"	24/3 & 36/4	0.993	15395	9855	6840	5025	3850	3040	2460	2035	1710	1455

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

$t = \text{design thickness} = 0.0474"$

SUPPORT FASTENING: Hilti X-ENP-19 L15 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	MAXIMUM NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	880	700	575	485	420	370	325	295	270	250	0.602
		1	1080	890	745								0.470
		2	1255	1050	900	780	675	595					0.385
		3	1410	1200	1035	905	800	705	630	570	525		0.327
		4	1545	1330	1160	1020	910	820	735	665	610	565	0.283
		5	1665	1450	1275	1130	1010	915	835	755	695	640	0.250
		6	1765	1555	1375	1230	1105	1005	920	845	780	720	0.224
		8	1925	1730	1560	1410	1280	1170	1075	995	925	860	0.185
2" x 12" NO FILL (BARE DECK)	36/4	0	875	685	560	470	405	360	325	295	270	250	0.602
		1	1080	890	730								0.470
		2	1255	1050	900	760	660	585					0.385
		3	1410	1200	1035	905	785	700	630	570	525		0.327
		4	1545	1330	1160	1020	910	815	730	665	610	565	0.283
		5	1665	1450	1275	1130	1010	915	835	755	695	640	0.250
		6	1765	1555	1375	1230	1105	1005	920	845	780	720	0.224
		8	1925	1730	1560	1410	1280	1170	1075	995	925	860	0.185
3" x 12" NO FILL (BARE DECK)	36/4	0	840	655	540	465	405	360	325	295	270	250	0.602
		1	1080	855	710								0.470
		2	1255	1050	880	755	660	585					0.385
		3	1410	1200	1035	900	785	700	630	570	525		0.327
		4	1545	1330	1160	1020	910	815	730	665	610	565	0.283
		5	1665	1450	1275	1130	1010	915	835	755	695	640	0.250
		6	1765	1555	1375	1230	1105	1005	920	845	780	720	0.224
		8	1925	1730	1560	1410	1280	1170	1075	995	925	860	0.185
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5840	5655	5530	5440	5375	5320	5280	5245	5195		0.602
		1	6095	5860	5700								0.470
		2	6350	6060	5870	5730	5625	5545					0.385
		3	6605	6265	6040	5875	5755	5660	5585	5525	5470		0.327
		4	6860	6470	6210	6020	5880	5775	5685	5615	5555	5505	0.283
		5	7115	6670	6375	6165	6010	5885	5790	5710	5640	5585	0.250
		6	7370	6875	6545	6310	6135	6000	5890	5800	5725	5660	0.224
		8	7875	7280	6885	6605	6390	6225	6095	5985	5895	5820	0.185
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	4180	3990	3865	3775	3710	3655	3615	3580	3555	3530	0.602
		1	4430	4195	4035								0.470
		2	4685	4395	4205	4065	3965	3885					0.385
		3	4940	4600	4375	4210	4090	3995	3920	3860	3805		0.327
		4	5195	4805	4545	4360	4220	4110	4025	3950	3890	3840	0.283
		5	5450	5010	4715	4505	4345	4220	4125	4045	3975	3920	0.250
		6	5705	5210	4885	4650	4470	4335	4225	4135	4060	4000	0.224
		8	6215	5620	5220	4940	4725	4560	4430	4320	4230	4155	0.185

* DESIGN SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL DIAPHRAGM SHEAR DUE TO PANEL BUCKLING (S_n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.308	7765	4970	3450	2535	1940	1530	1240	1025	860	735
2" x 12"	24/3 & 36/4	0.560	12745	8155	5665	4160	3185	2515	2035	1685	1415	1205
3" x 12"	24/3 & 36/4	1.324	23580	15090	10480	7700	5895	4655	3770	3115	2620	2230

NOTE: ASD Required Strength (Service Applied Load) \leq Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) \leq Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0598"

SUPPORT FASTENING: Hilti X-ENP-19 L15 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	MAXIMUM NOMINAL SHEAR STRENGTH, PLF											K1
			SPAN, FT											
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0		
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	1095	880	725	615	530	465	415	370	335	310	0.676	
		1	1345	1115	940								0.528	
		2	1570	1315	1125	980	850	750					0.433	
		3	1765	1500	1295	1135	1010	895	800	720	660		0.367	
		4	1935	1665	1450	1280	1140	1030	925	840	765	705	0.318	
		5	2080	1815	1595	1415	1270	1145	1045	955	870	805	0.281	
		6	2205	1945	1725	1540	1390	1260	1150	1060	980	905	0.252	
		8	2405	2165	1955	1765	1605	1470	1350	1245	1160	1080	0.208	
2" x 12" NO FILL (BARE DECK)	36/4	0	1095	860	705	595	510	450	405	365	335	310	0.676	
		1	1345	1115	920								0.528	
		2	1570	1315	1125	960	835	735					0.433	
		3	1765	1500	1295	1135	995	875	790	715	660		0.367	
		4	1935	1665	1450	1280	1140	1020	915	835	765	705	0.318	
		5	2080	1815	1595	1415	1270	1145	1045	950	870	805	0.281	
		6	2205	1945	1725	1540	1390	1260	1150	1060	980	905	0.252	
		8	2405	2165	1955	1765	1605	1470	1350	1245	1160	1080	0.208	
3" x 12" NO FILL (BARE DECK)	36/4	0	1060	825	675	575	505	450	405	365	335	310	0.676	
		1	1345	1085	885								0.528	
		2	1570	1315	1100	945	825	735					0.433	
		3	1765	1500	1295	1125	985	875	790	715	660		0.367	
		4	1935	1665	1450	1280	1140	1020	915	835	765	705	0.318	
		5	2080	1815	1595	1415	1270	1145	1045	950	870	805	0.281	
		6	2205	1945	1725	1540	1390	1260	1150	1060	980	905	0.252	
		8	2405	2165	1955	1765	1605	1470	1350	1245	1160	1080	0.208	
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	6070	5840	5680	5570	5490	5425	5370	5330	5295	5265	0.676	
		1	6390	6095	5895								0.528	
		2	6715	6350	6110	5940	5810	5710					0.433	
		3	7035	6610	6325	6120	5970	5850	5755	5680	5615		0.367	
		4	7355	6865	6540	6305	6130	5995	5885	5795	5720	5660	0.318	
		5	7675	7120	6750	6490	6290	6135	6015	5910	5830	5755	0.281	
		6	7995	7380	6965	6670	6450	6280	6140	6030	5935	5855	0.252	
		8	8640	7890	7395	7040	6770	6565	6400	6260	6150	6055	0.208	
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	4410	4175	4020	3905	3825	3760	3705	3665	3630	3600	0.676	
		1	4730	4430	4235								0.528	
		2	5050	4690	4445	4275	4145	4045					0.433	
		3	5370	4945	4660	4460	4305	4185	4095	4015	3950		0.367	
		4	5690	5200	4875	4640	4465	4330	4220	4130	4060	3995	0.318	
		5	6015	5460	5090	4825	4625	4475	4350	4250	4165	4095	0.281	
		6	6335	5715	5300	5010	4785	4615	4480	4365	4270	4190	0.252	
		8	6975	6230	5730	5375	5110	4900	4735	4600	4485	4390	0.208	

* DESIGN SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL DIAPHRAGM SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.400	11250	7200	5000	3670	2810	2220	1800	1485	1250	1065
2" x 12"	24/3 & 36/4	0.700	17935	11480	7970	5855	4480	3540	2870	2370	1990	1695
3" x 12"	24/3 & 36/4	1.666	33355	21345	14820	10890	8335	6585	5335	4410	3705	3155

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

DIAPHRAGM DESIGN MANUAL

THIRD EDITION

September 2004

Authored By

Dr. Larry Luttrell, P.E.

Revised and Adapted For

The ASD and LRFD methods

**According to Table D5 of the 2001 Edition of the North American
Specification for the Design of Cold-Formed Steel Structural Members**

As modified by

**The Supplement 2004 to the North American Specification for the Design of
Cold-Formed Steel Structural Members, 2001 Edition**

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PREFACE

This manual is in continuity with the first and second edition of the Steel Deck Diaphragm Design Manual and is based on research, testing and analysis done at West Virginia University since 1965. The work, sponsored by the Steel Deck Institute and its member and associate member companies, has been under the direction of Dr. Larry Luttrell who is the technical advisor to the Steel Deck Institute. The Institute is very grateful to Dr. Luttrell for his untiring efforts and ongoing interest in this subject.

The manual explains the method developed to calculate the capacity of diaphragms made with steel decks and composite steel decks, and the use of the diaphragm capacity tables.

The diaphragm tables have been modified for ease of use either for Allowable Stress Design (ASD) or for Load and Resistance Factor Design (LRFD). Values in the tables must either be divided by a safety factor or multiplied by a resistance factor before they can be compared with the loads calculated with the corresponding design approach.

In this manual, the nominal resistance for welds and screws as shear connectors are calculated according to the formulas used in the previous editions of the Diaphragm Design Manual. Some of the results of the formulas used in this manual (Sections 4.2.1, Section 4.5, and Appendix IV Table IV) may slightly differ from the results obtained by applying the formulas shown in the 2001 Edition of the North American Specification for the Design of Cold-Formed Steel Structural Members. The safety factors and resistance factors to be applied on the nominal diaphragm capacities shown in the tables of Appendix V have been calculated taking into account the nominal resistance for welds and screws as shear connectors shown in Table IV of Appendix IV.

The illustrations and diaphragm resistance tables were prepared by Mr. Walter Schultz of Vulcraft and Mrs. Dong Li of Canam Steel.

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SECTION 1

INTRODUCTION

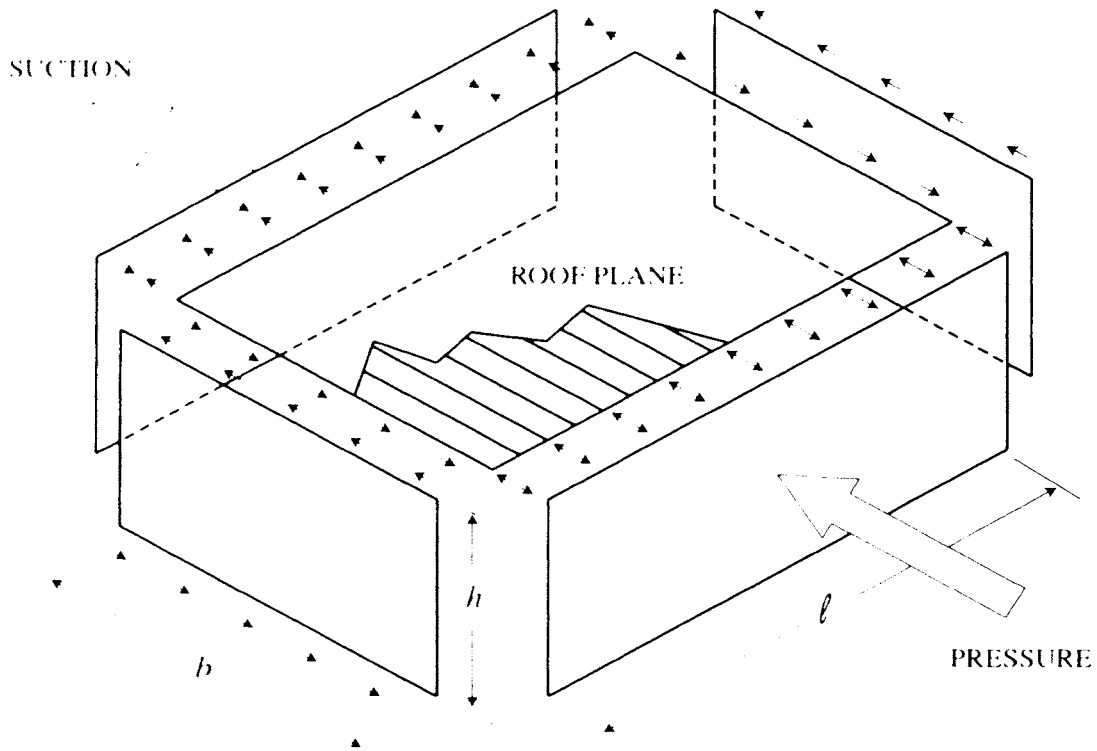


FIG 1.1-1 DIAPHRAGM COMPONENTS

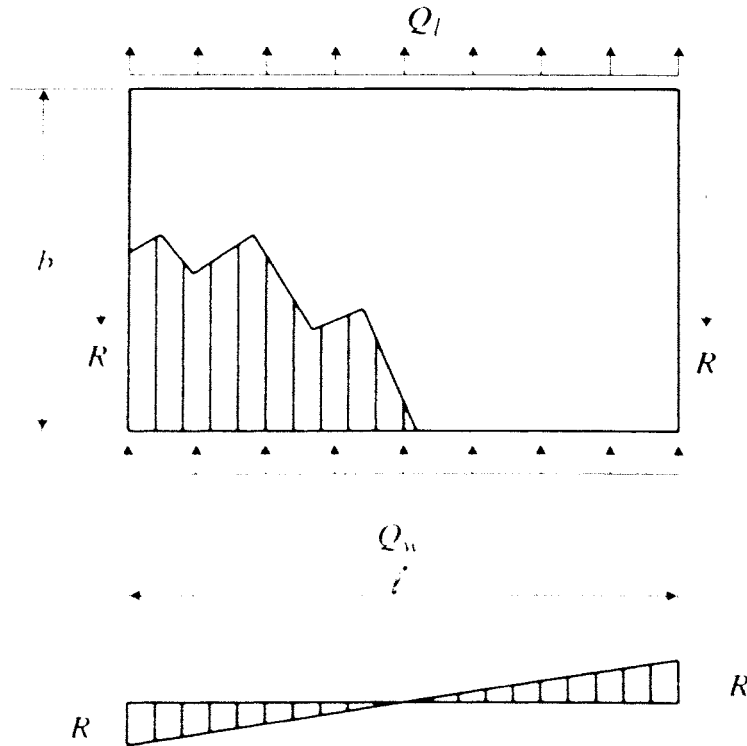


FIG 1.1-2 ROOF DIAPHRAGM

1.1 INTRODUCTION

Shear diaphragms are essentially planar structural systems such as those found in the roofs, floors, and walls of buildings. They are comprised of interconnected smaller units, attached to supporting members, such that the assemblies possess both in-plane shear strength and stiffness. Diaphragm design addresses the issue of selecting materials and designing connections such that the system can serve the function of transmitting in-plane forces.

Figure 1.1-1 illustrates the basic concept for a group of diaphragms, the principal one being the roof plane. The exploded view shows walls of length ℓ onto which pressures act. A line load can be delivered to the roof plane by any wall. The roof shown may be viewed as a simple horizontal girder, of depth b , with its end reactions provided by distributed shears along b at the wall intersection. Though it might be quite rigid and different from the roof, the end wall itself acts as a diaphragm between the roof and foundation levels.

The most basic design problem is illustrated in **Figure 1.1-2** where the "short-deep beam" or diaphragm receives line loads of Q_I and Q_W from the sidewalls. R then becomes $0.5\ell(Q_W + Q_I)$. From the shape of the shear diagram, five observations are apparent:

- a. The maximum average shear $S = R/b$ is at the end.
- b. Zones nearer mid-span may have smaller shears and thus less diaphragm strength is required.
- c. The larger design shears may be resisted using heavy panels and fewer connections or by more frequently connected lighter panels.
- d. Efficient use of materials may not be met by using a single diaphragm design for the entire roof area.
- e. The diaphragm is a short-deep beam.

The structure illustrated in **Figure 1.1-1** shows none of the roof supporting elements. However, such elements are important components of the diaphragm in that they act as stiffeners, similar to stiffeners in thin-web girders. Such elements protect the zone from general buckling. In addition, members with suitable connections to carry the flange forces must always bound diaphragms.

The behavior of a diaphragm is dependent on the types of panels used, the methods of attachment, and the geometry of the described area. It may be determined either from full scale testing or from the identified behavior of its component parts.

1.2 APPLICABLE DECK TYPES

Diaphragms may be assembled from a wide variety of panel profiles including the Narrow Rib (*NR*), Intermediate Rib (*IR*), and Wide Rib (*WR*) profiles described in the SDI Publication No. 30, Design Manual for Composite Decks, Form Decks, and Roof Decks. Such panels may vary from 0.0280 in. {0.71 mm} to 0.064 in. {1.63 mm} in thickness and with widths from 18 in. {457 mm} to 36 in. {914 mm} or more.

The test programs also have included longer spanning 3 in. {76 mm} Deep Rib (DR) roof deck profiles as well as certain wall panel arrangements interconnected to be shear resistant.

Although design tables are not shown in Appendix V for decks up to and including 7.5 in. {191 mm} deep, as well as cellular decks, the appropriate diaphragm values may be derived using the procedure illustrated herein for regular deck.

Diaphragm values for deck attached to wood structural members may be calculated using the Metal Construction Association publication, A Primer on Diaphragm Design (www.metalconstruction.org).

Corrugated form deck profiles, with thickness ranging from 0.014 in. {0.36 mm} upward and with depths from 9/16 in. {14 mm} upward to 1.5 in. {38 mm}, have been part of the studies on which this manual is based.

The design recommendations in the following sections are limited to properly interconnected diaphragm panels having thickness to between 0.014 in. {0.36 mm} and 0.064 in. {1.63 mm} with panel depths between the nominal limits of 9/16 in. {14 mm} and 3 in. {76 mm}.

1.3 CONNECTIONS

Given that the influence of panel geometry has been established, the more critical remaining parameters are those describing fasteners and how they perform. Fasteners commonly include welds, screws, and power driven nail-like pins. The two most essential pieces of information for any fastener are reliable values for its strength and stiffness. Tests for these properties are described in detail in Section 4.

1.4 DESIGN CONSIDERATIONS

This manual addresses those factors affecting the strength and stiffness of a diaphragm assembly. The formulas for diaphragm design values are based on a very large number of tests made in the laboratories at West Virginia University and in other laboratories over the past thirty-eight years. Sections 2, 3, and 4 show the development of strength formulas, stiffness formulas, and properties of selected fasteners.

Appendix III contains a series of example problems addressing the issue of analysis and design using both Allowable Stress Design (ASD) and Load and Resistance Factor Design (LRFD) requirements. Appendix V contains design load tables for diaphragms used to resist wind loads, earthquake loads or other forces. The load tables show the nominal strength of the diaphragm. This represents a departure from the load tables of the previous editions of the Diaphragm Design Manual. A few definitions follow using a tension rod as the example to illustrate the various definitions of strength.

Nominal strength is an applicable limit state: $P_n = A_g F_y$

LRFD

Factored nominal strength (or design strength): $\phi P_n = \phi A_g F_y$

Required strength is the factored applied load: $P_u = 1.2DL + 1.6LL \leq \phi P_n$

ASD

Allowable strength (or design strength): $P_n / \Omega = A_g F_y / \Omega$

Required strength is the service applied load: $P = DL + LL \leq P_n / \Omega$

SECTION 2

DIAPHRAGM STRENGTH

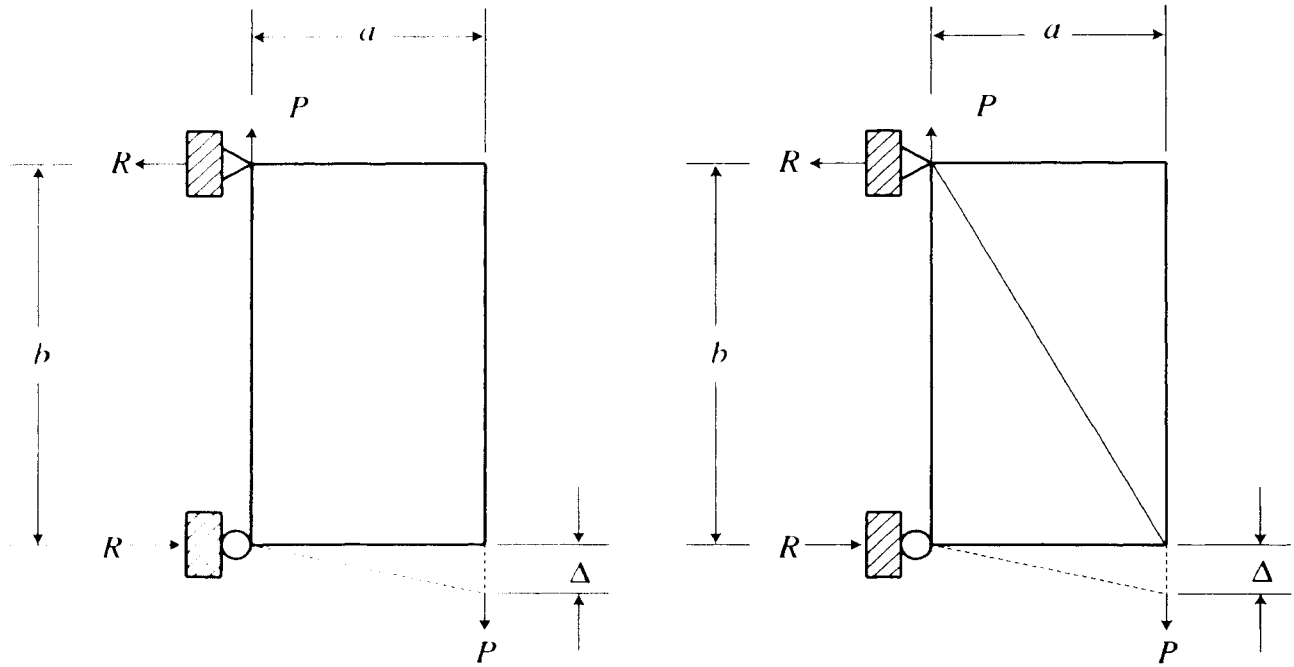


FIG 2.1 DIAPHRAGM AND TRUSS

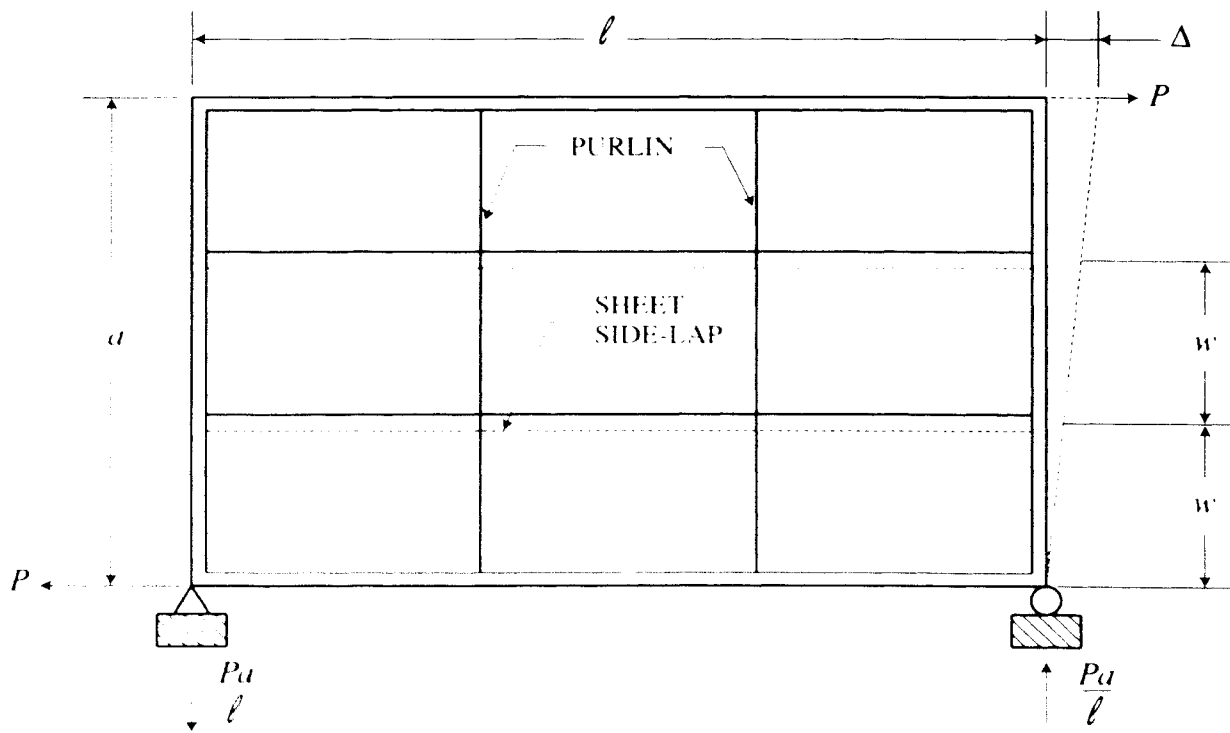


FIG 2.2-1 SCHEMATIC LAYOUT FOR DIAPHRAGM

2.1 DIAPHRAGM STRENGTH

The diaphragm is assembled to cover a specified area in such a way as to possess both predictable in-plane shear strength and stiffness. The principle elements are the supporting frame, the covering panels, and the interconnecting devices or fasteners. It can be a fairly flexible system somewhat analogous to a truss as in **Fig. 2.1**. Prior to installing the truss diagonal or attaching the diaphragm, neither of the frames possess much strength.

In **Fig. 2.1**, $R = P \frac{a}{b}$ where P is an external load acting along b . The truss diagonal force is made up of two components, R and P , such that the average shear parallel to b is P/b and the average shear parallel to a is R/a , $R/a = P/b$. Presuming edge members to have small changes in length, the average shear in the diaphragm also is P/b either horizontally or vertically. **Fig. 2.1** shows the cantilever test set up used to evaluate the strength and stiffness of various deck profiles. It is important to note that since the shear in either direction is the same ($R/a = P/b$), the direction of the deck corrugation does not affect the strength. Therefore the strength values listed in the tables in Appendix V apply to deck corrugation in either direction.

Unattached panels may not possess the ability to resist equal unit forces in perpendicular directions. However, when they are part of the diaphragm system, including perimeter members, the individual corrugations are held in position by end attachments and the corrugations are not free to close.

The shear strength of a diaphragm system can be limited by the strength of connections, local buckling in the panels, or by general plate-like buckling of the whole diaphragm area.

2.2 FASTENER LIMITATIONS

Consider the simple diaphragm in **Fig. 2.2-1** where three panels are represented. The panels may be connected to the support frame by structural connections, having strength Q_f along any structural member. Stitch or side-lap connections, having a strength Q_s , may be installed along the dashed lines to form sheet-to-sheet connections away from cross supports.

Edge Fasteners Limitations

Figure 2.2-2 represents the edge most half panel and the forces transferred to it from P as the nominal value P_n is approached. With $Q'_f = Q_f \frac{x_c}{w/2}$, equilibrium is obtained with:

$$P_n = (2\alpha_1 + n_p\alpha_2 + n_e) Q_f \quad (\text{Eq. 2.2-1})$$

where n_e = number of edge connectors between cross supports

$$(n_e = 3 \text{ in Fig. 2.2-2})$$

$$\alpha_j = \frac{\sum x_c}{w}, \text{ end distribution factor with summation across a full width } w.$$

x_c = distance from panel centerline to any fastener in a panel at the end support

w = panel width

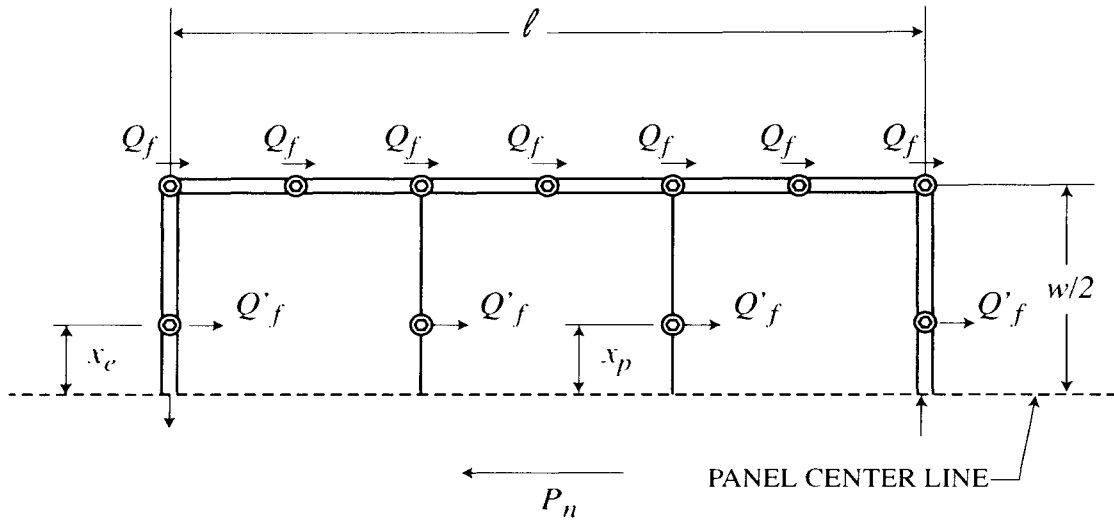


FIG 2.2-2 OUTER EDGE PANEL

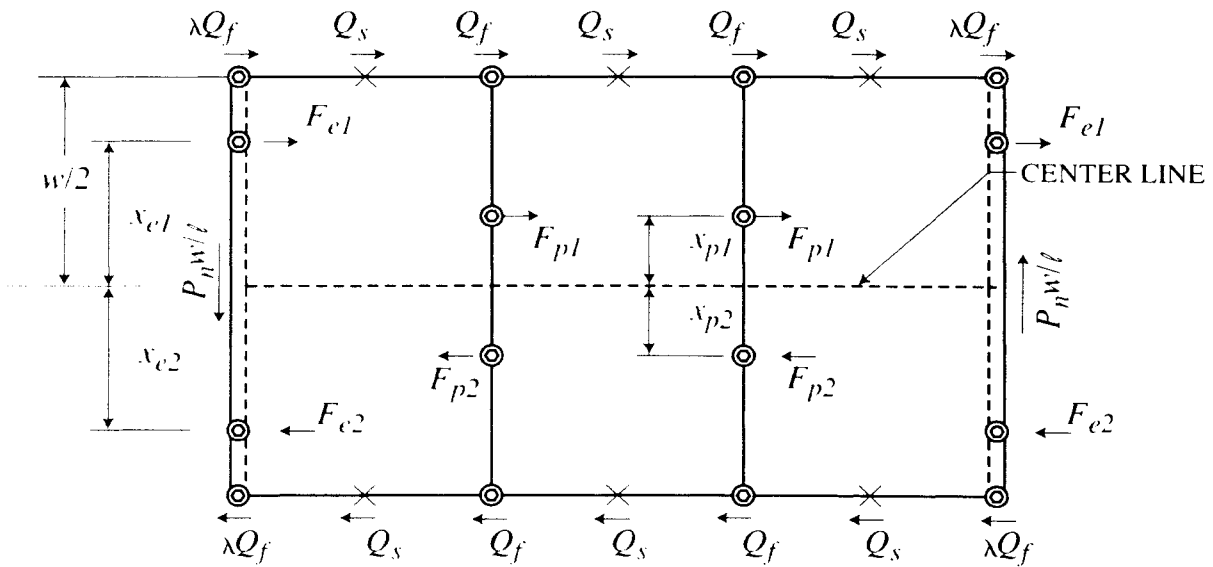


FIG 2.2-3 INTERIOR PANEL FORCE DISTRIBUTION

$$\alpha_2 = \text{purlin distribution factor similar to } \alpha_1, \alpha_2 = \frac{\sum x_p}{w}$$

x_p = distance from panel center line to any fastener in a panel at purlins

ℓ = panel length

n_p = no. of purlins excluding those at ends or end laps where connection patterns may differ

Q_f = structural fastener strength (see Section 4).

Equation 2.2-1 can be modified to:

$$S_{ne} = \frac{P_n}{\ell} = (2\alpha_1 + n_p\alpha_2 + n_c) \frac{Q_f}{\ell} \quad (\text{Eq. 2.2-2})$$

Note that the edge fasteners between purlins may require special details if the purlins set above the edge member. See example 6 of Appendix III.

Interior Panel Fastener Limitations

Figure 2.2-3 shows a free body of an interior panel where Q_s represents a side-lap (stitch) connector and $P_n \frac{w}{\ell}$ is the transferred end-member axial force. Those purlins away from a braced frame line or rigid wall have little ability to transfer axial forces. Considering rotational equilibrium about the lower right corner:

$$\left(\frac{P_n w}{\ell} \right) \ell = 2M_e + n_p M_p + n_s Q_s w \quad (\text{Eq. 2.2-3})$$

where

M_p = couple at purlin from F_{p1} , F_{p2} and Q_f

M_e = end member couple from F_{e1} , F_{e2} and λQ_f

Q_s = stitch connector strength (see Section 4)

n_s = number of stitch connectors within the length ℓ

($n_s = 3$ for case shown)

The magnitude of the F_p and F_e forces is difficult to define in terms of Q_f at the edge. As shear forces increase, yield can develop around edge fasteners and thus allow F_p and F_e to increase toward their yield values. However, they conservatively are presumed to be related linearly to Q_f through their position from centerline similar to the distribution shown in **Fig. 2.2-2**. Then:

$$\frac{Q_f}{w/2} = \frac{Q'_f}{x_e} \text{ and } Q'_f = Q_f \frac{2x_e}{w}$$

$$F_e = Q_f \frac{2x_e}{w} \text{ and } F_p = Q_f \frac{2x_p}{w}$$

$$M_p = \sum F_p x_p = Q_f \left(\frac{2}{w} \right) \sum (x_p^2)$$

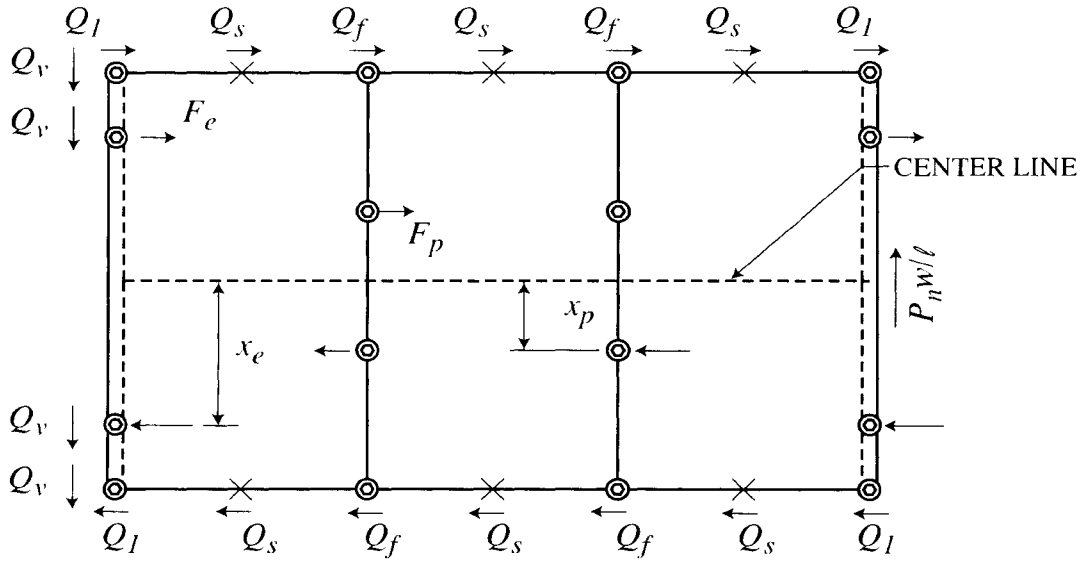


FIG 2.2-4a PANEL CORNER FORCES Q_l AND Q_v

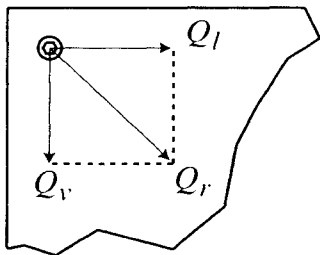


FIG 2.2-4b CORNER FORCE Q_r

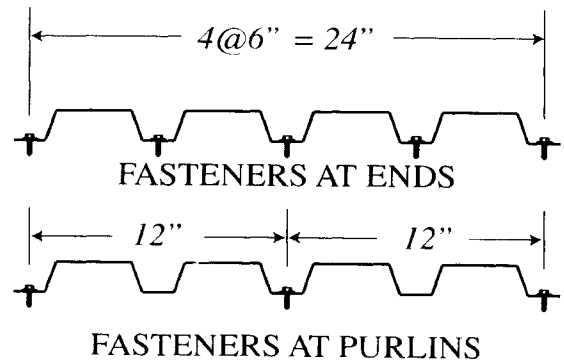


FIG 2.2-4c

As diaphragm loads increase, the panel corners tend to distort limiting the corner force transfer to a lower value λQ_c . Then:

$$M_c = Q_c \frac{2}{w} \sum x_c^2 + (\lambda - 1) Q_c w$$

Letting $\alpha_c = Q_c / Q_f$, Eq. 2.2-3 can be rewritten as:

$$S_{m1} = \left\{ 2A(\lambda - 1) + n_s \alpha_c + \frac{1}{w^2} \left[2n_p \sum (x_p^2) + 4 \sum (x_c^2) \right] \right\} \frac{Q_c \ell}{\ell} = \{ 2A[\lambda - 1] + B \} \frac{Q_c}{\ell} \quad (\text{Eq. 2.2-4})$$

with

$$B = n_s \alpha_c + \frac{1}{w^2} \left[2n_p \sum (x_p^2) + 4 \sum (x_c^2) \right]$$

$$\text{where } \lambda = 1 - \frac{h \ell_s^2}{240 \lambda t} \geq 0.7 \quad \text{for SI } \left\{ \lambda = 1 - \frac{h \ell_s^2}{369 \lambda t} \right\} \geq 0.7$$

h = panel depth, in.

$\{h$ = panel depth, mm}

t = base sheet metal thickness, in.

$\{t$ = base sheet metal thickness, mm}

ℓ_s = purlin spacing, ft

$\{\ell_s$ = purlin spacing, m}

$A = 2$ for double edge fasteners as in case 36/9, Table 1, Appendix IV

$= 1$ for single fastener at panel edges.

Note in **Fig. 2.2-3** that the resistance over the panel length ℓ is comprised of both M_p and M_c , M_c often being larger than M_p . Consider three cases assuming $\lambda = 1$ and $n_s = 0$. Use Eq. 2.2-4 with $w = 24$ in. and fasteners at 12 in. on center at the purlins and 6 in. on center at the ends as shown in **Fig. 2.2-4c**.

$$\sum (x_c^2) = 2(6^2 + 12^2) = 360 \text{ and } \sum (x_p^2) = 2(12^2) = 288$$

Case 1: Single span, $n_p = 0, \ell = \ell_s = 5$ ft

$$B_1 = \frac{(0 + 4 \times 360)}{24^2} = 2.50$$

$$S_{m1} = \frac{2.5}{5} Q_c = 0.5 Q_c$$

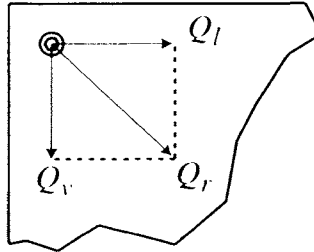


FIG 2.2-4b CORNER FORCE Q_r

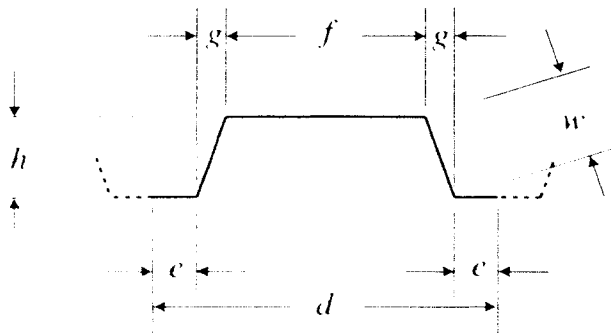


FIG 2.3-1 CORRUGATION DIMENSIONS

Case 2: Dual span, $n_p = 1, \ell = 2\ell_v = 10 \text{ ft}$

$$B_2 = \frac{(2 \times 288 + 4 \times 360)}{24^2} = 3.50$$

$$S_{n2} = \frac{3.5}{10} Q_f = 0.35 Q_f$$

Case 3: Triple span, $n_p = 2, \ell = 3\ell_v = 15 \text{ ft}$

$$B_3 = \frac{(4 \times 288 + 4 \times 360)}{24^2} = 4.50$$

$$S_{n3} = \frac{4.5}{15} Q_f = 0.3 Q_f$$

The first case has 2 lines of connections per 5 feet or a $2/5 = 0.40$ index, the second has a $3/10 = 0.30$ index, and the last has a $4/15 = 0.27$ index. These relative values become closer with the addition of side-lap connections, but strength is still influenced by the number of attached support lines per unit length.

Corner Fastener Limitations

The maximum possible resultant force that could exist on a corner fastener as in **Fig. 2.2-4b** is:

$$Q_r = \sqrt{Q_l^2 + Q_v^2} \text{ or } Q_r^2 = Q_l^2 + Q_v^2$$

$$\text{where } Q_v = \frac{P_n}{N\ell} = \frac{S_n}{N}$$

N = number of fasteners per unit length across the width w

$Q_l = Q_f$ value from Eq. 2.2-4 with $\lambda = 1$

Then $Q_l = S_n \left(\frac{\ell}{B} \right)$ and letting Q_r approach Q_f :

$$Q_f^2 = S_n^2 \left(\frac{\ell^2}{B^2} + \frac{1}{N^2} \right)$$

The fasteners at panel corners then limit S_n to:

$$S_{nc} = Q_f \frac{\sqrt{N^2 B^2}}{\sqrt{\ell^2 N^2 + B^2}} = \frac{Q_f}{\sqrt{\frac{\ell^2 N^2 + B^2}{N^2 B^2}}} \quad (\text{Eq. 2.2-5})$$

2.3 STABILITY LIMITATIONS

The probability of plate-like shear buckling, producing diagonal waves across the whole diaphragm, is small for most common installations. For thin diaphragms, with small depth h and relatively long spans ℓ_v , buckling may result when the fasteners are closely spaced. Such behavior has been noted in diaphragms that are $0.0179 \text{ in. } \{0.45 \text{ mm}\}$ and thinner, in some thin *WR* type wall panel profiles, and in certain $0.0295 \text{ in. } \{0.75 \text{ mm}\}$ thick diaphragms with very closely spaced side-lap connections and where larger than usual ℓ_v values were involved.

In two span diaphragms, the central support does little to limit wave formation. But, when larger numbers of spans are used, the interior purlins do limit buckling. For relatively ideal corrugated diaphragms, Easley (10)* has presented an approach to the critical shear load. That approach is modified here, conservatively treating the limiting case as being controlled by two end spans, resulting in a critical load of:

$$S_{nb} = \frac{36\beta E}{\ell_v^2} \sqrt[4]{\frac{I^3 r^3 \left(\frac{d}{s}\right)}{12}} \quad (\text{Eq. 2.3-1})$$

where β = panel buckling factor = 1.75

I = panel moment of inertia, per width w

d = panel corrugation pitch (see **Figure 2.3-1**)

s = developed flute width per width d , $s = 2(e + w) + f$

Letting $\ell = 2\ell_v$, tending toward the lower bound two-span case,

$$S_{nb} = \frac{9\beta E}{\ell_v^2} \sqrt[4]{\frac{I^3 r^3 \left(\frac{d}{s}\right)}{12}} \quad (\text{Eq. 2.3-2})$$

* Reference 10 of Appendix II

The bold numbers in parentheses refer to the list of references in Appendix II.

This equation is simplified to the following

a) in US units

$$S_{nb} = \frac{3250}{\ell_v^2} \sqrt[4]{I^3 t^3 \left(\frac{d}{s}\right)} \text{ kip/ft} \quad (\text{Eq. 2.3-3})$$

where ℓ_v = purlin spacing, ft

I = panel moment of inertia, in⁴ per foot of width

t = panel metal thickness, in.

E = 29500 ksi

or b) in SI units

$$S_{nb} = \frac{1.78}{\ell_v^2} \sqrt[4]{I^3 t^3 \left(\frac{d}{s}\right)} \text{ kN/m} \quad (\text{Eq. 2.3-4})$$

where ℓ_v = purlin spacing, m

I = panel moment of inertia, mm⁴ per mm of width

t = panel metal thickness, mm

E = 210 kN/mm²

2.4 RESISTANCE FACTORS / SAFETY FACTORS

The shear strengths from Section 2.2 must be modified by resistance factors (ϕ factors) per the "Load and Resistance Factor Design" (LRFD) or by safety factors (Ω factors) per the "Allowable Stress Design" (ASD) to account for possible understrength conditions. Connection quality is paramount to the evaluation.

The "Load and Resistance Factored Design" (LRFD) approach was described extensively in the first edition of the SDI Diaphragm Design Manual, 1981. In that source, the nominal and mean resistances from full-scale tests were evaluated. The coefficient of variation in strength with welded connections, as expected, is greater than when mechanical connections are used.

The same variation studies were applied to the direct shear strength tests for fasteners as described in Section 4. Since the quality of mechanical connectors is easier to control, variation in their strength is smaller than for welded connections and their performance is more predictable.

The resistance factors and safety factors for diaphragms are as follows based on the Supplement 2004 to the North American Specification for the Design of Cold-Formed Steel Structural Members, 2001 Edition, (39).

Factors of Safety and Resistance Factors for Diaphragms					
Load Type or Combinations Including	Connection Type ¹	Limit State			
		Connection Related		Panel Buckling ²	
		USA and Mexico		USA and Mexico	
		Ω_d (ASD)	ϕ_d (LRFD)	Ω_d (ASD)	ϕ_d (LRFD)
Earthquake	Welds	3.00	0.55	2.00	0.80
	Screws	2.50	0.65		
Wind	Welds	2.35	0.70		
	Screws	2.35	0.70		
All Others	Welds	2.65	0.60		
	Screws	2.50	0.65		

NOTES: 1. When fastener combinations are used within a diaphragm system, the more severe factor is used.

2. Panel buckling is out of plane buckling and not local buckling at fasteners. The more severe factored limit state controls the design.

3. For mechanical fasteners other than screws, sufficient test data and calibration calculations prove that the use of power driven fasteners, such as those from Pneutek, Hilti, Buildex, is allowed in accordance with the North American Specification for the Design of Cold-Formed Steel Structural Members (37) and the same resistance factors or safety factors that control screwed system can be used to obtain proper diaphragm design strength.

4. SDI's method of calculation for diaphragm allows the various design codes and specifications to dictate the load factors and, the test results to dictate the resistance factor and safety factor developed in accordance with the methodology of the codes and specifications.

2.5 DESIGN DIAPHRAGM SHEAR STRENGTH

The design strength of the diaphragm ϕS_n (LRFD) or S_n / Ω (ASD) shall be the lowest value obtained from the limit states of edge fastener strength, interior panel fastener strength, corner fastener strength and shear buckling.

a) For edge fastener, interior and corner fastener strength

$$S_n = \min (S_{nc}, S_m, S_c)$$

For ϕ factors (LRFD) or Ω factors (ASD), see Table 2.1 (above).

b) For shear buckling

$$S_n = S_{nb}$$

$$\phi = 0.80$$

$$\Omega = 2.00$$

where

S_{nc} is the value from Eq. 2.2-2

S_m is the value from Eq. 2.2-4

S_c is the value from Eq. 2.2-5

S_{nb} is the value from Eq. 2.3-3 or Eq. 2.3-4

2.6 LIMITING CONDITIONS

The quality of a diaphragm can be limited by inattention to details particularly at edge and end terminations.

End Laps

At interior positions, panels must be sufficiently overlapped to provide adequate end distances for the connector used. A minimum end distance for fasteners used should be one inch requiring an end lap not less than two inches. Within the system, end laps may be staggered or on a continuous line without particular effect on the diaphragm strength. However, greater care must be exercised in making connections through multiple layers of deck at the panel corners on the end lap. If panels are butted at their ends rather than end lapped, as is common with floor decks, then each panel must be individually connected at its ends with the specified pattern.

Side-laps

The overlapping edges of panels should be in close contact to allow minimum eccentricity on fasteners in the lap. When stitch fasteners connect adjacent panels between supports, equivalent or superior fasteners should be used on the edgemoat panel at the diaphragm perimeter to ensure the transfer of maximum diaphragm shear along the perimeter member.

Welds

Welds should be made by qualified operators following AWS D1.3 Specifications. An approximate field check on quality control is described in Section 4.2.1.1. Welding thin material usually requires a much lower power setting and lower burn-off rate than in heavy steel units. Particular care is required when welding deck to joists in order to avoid damage to joist chords.

Screws

Screws must be installed using properly calibrated tools to avoid overdriving that can strip the threads at side-laps or sever the screw when it is placed into heavier support steel.

Power Driven Fasteners

These fasteners must be installed following the manufacturer's recommendations. Care must be exercised in setting the driving force to obtain the proper depth of penetration. Once driven properly, these nail-like fasteners are very resistant to extraction by uplift forces. In uplift tests on sheet material, the usual mode of failure is one of tearing the sheet around the head or washer leaving the fastener in place.

Split Panels

Finishing out a diaphragm at its edge may require a split panel at what usually is a higher shear zone in the structure. Formulas in this section may be used to evaluate this special case noting the partial panel width w . Such a partial panel should be connected in every valley at all supports regardless of adjacent fastener patterns. Extra stitch connectors should be considered at the split panel side-lap. Full panel may be back-lapped and used to finish out the edge.

Longitudinal Edges

In applications where joists terminate on a shear wall, the edge-most diaphragm panel may not contact the wall. If intermediate stitch fasteners have been required on side-laps, similar intermediate fasteners must exist at the edge. These can be accommodated by installing a block-like spacer on the wall, to match the joist elevation, and then making connections to the block. A "collecting angle" may also be used as in Example Problem 6 of Appendix III.

Mixed Panel Lengths

When decks are installed with multiple spans, occasional shorter panels may be required. In a large diaphragm area, the shear strength can be determined satisfactorily by using the typical 3 span panel length.

Load Tables

Design load tables, based on Section 2 formulas, are given in Appendix V for typical Steel Deck Institute profiles. The table headings describe the means of connection, the panel width and thickness, span length ℓ_v , and the fastening pattern. The "Side-lap" column in any table gives the number of stitch or intermediate connections between structural supports. The tabular values are nominal values and are based on a conservative "3 or more" span condition. The user should then get the proper design values by modifying the nominal values with resistance factor ϕ (LRFD) or safety factor Ω (ASD).

While the appended tables address specific profiles, the formulas on which they are based have been checked against full-scale diaphragm tests on decks ranging in depth from $5/8$ in. {16 mm} to 3 in. {76 mm} with thickness from 0.015 in. {0.36 mm} to 0.064 in. {1.63 mm}. The design formulas are applicable to these ranges and appropriate design tables can be developed from them.

Perimeter / Intermediate Connections

The spacing e of fasteners on perimeter or intermediate support elements, such as chord, struts and shear transfer elements, must be determined using the following equation:

$$e \leq \frac{Q_f}{S_n} \quad \text{if the full strength is needed.}$$

LRFD: $e \leq \frac{\phi Q_f}{S_u}$ if the required strength S_u is less than the factored strength.

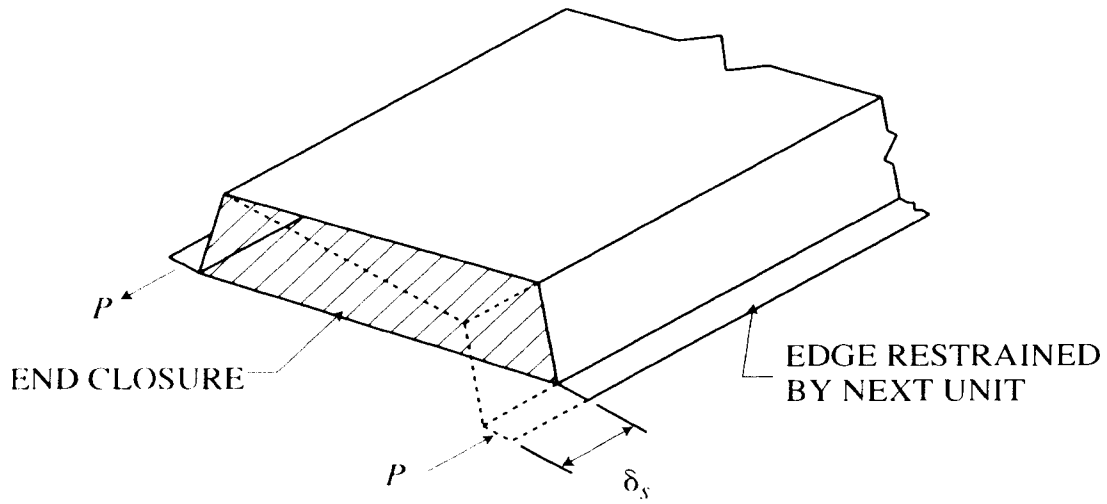
or

ASD: $e \leq \frac{Q_f/\Omega}{S_u}$ if the required strength S_u is less than the allowable strength.

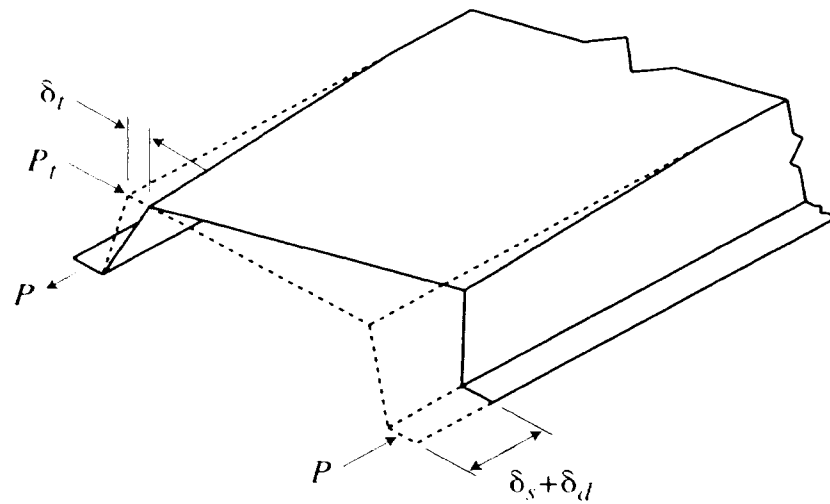
where Q_f = nominal structural connector strength
 S_n = nominal strength of diaphragm
 S_u = required diaphragm strength

To keep the same diaphragm rigidity, the spacing of attachment of the panels at perimeter parallel to the deck flutes should not be larger than that for the interior side-lap fasteners.

SECTION 3
DIAPHRAGM STIFFNESS



(a) UNIT RESTRAINED AGAINST END WARPING



(b) OPEN-ENDED UNIT

FIG 3.2-1 SHEAR DISTORTIONS

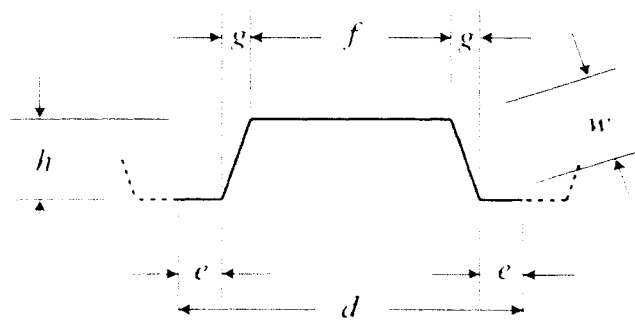


FIG 3.2-2 CORRUGATION DIMENSIONS

3.1 DIAPHRAGM STIFFNESS

The stiffness of a diaphragm is a direct indication of how it distorts in its own plane under the influence of shear forces. The need to know such movement is particularly important when assessing the transfer of forces, through a diaphragm, between adjacent frames or shear walls.

The stiffness of a diaphragm may be measured by testing an assembly such as that in **Fig. 2.2-1**. As the load P increases, the shear deflection Δ is noted. The average shear strain in the system is $\gamma = \frac{\Delta}{a}$ while the average shear stress within the diaphragm is $\tau = \frac{P}{\ell t}$.

Following the classic definition for shear modulus:

$$G = \frac{\tau}{\gamma} = \frac{P a}{\ell t \Delta} \quad (\text{Eq. 3.1-1})$$

Since the diaphragm is not a thick flat plate, its stiffness is not linear with the thickness t . Noting that the average shear in **Fig. 2.2-1** is equal either along the panel direction or across the panels:

$$S = \frac{P}{\ell} = \frac{R}{a} = \frac{Pa}{\ell a} \quad (\text{Eq. 3.1-2})$$

Then the stiffness G' is defined within the linear test range of P vs. Δ as:

$$G' = Gt = \frac{P a}{\ell \Delta} = \frac{Pa/\ell}{\Delta} \quad (\text{Eq. 3.1-3})$$

Typical values for G' in $0.03 \text{ in. } \{0.76 \text{ mm}\}$ thick material may be on the order $50 \text{ kip/in. } \{8.75 \text{ kN/m}\}$ depending on the deck profile and intensity of the connection pattern used. This translates to an effective modulus $G = G'/t = 1667 \text{ ksi } \{11500 \text{ MPa}\}$, well below that of the base material typically about $G = 11300 \text{ ksi } \{77900 \text{ MPa}\}$. Roof diaphragms may routinely be an order of magnitude more flexible than flat continuous plates of similar thickness.

3.2 FACTORS AFFECTING STIFFNESS

Consider a corrugated element as in **Fig. 3.2-1**, to represent a unit width of a diaphragm. As P forces are applied parallel to the edges, shear displacements δ_s ensue. The end closure prohibits changes in the cell geometry through the presence of a restraint P_r and the cell is in virtually pure shear around its girth. Were the end closure effect removed while maintaining P at a fixed level, relaxation would occur through warping and δ_s would increase to $\delta_s + \delta_d$ as shown. For the whole system, Δ_s represents the total shear deflection for all corrugation and Δ_d the sum of all warping relaxation. Then G' could be expressed as:

$$G' = \frac{Pa\ell}{\Delta_s + \Delta_d} \quad (\text{Eq. 3.2-1})$$

The introduction of discrete connections at panel side-laps further increases the deflection relaxation under load by an amount of Δ_c , such that:

$$G' = \frac{Pa\ell}{\Delta_s + \Delta_d + \Delta_c} \quad (\text{Eq. 3.2-2})$$

The evaluation of the Δ terms is given detailed treatment in References 18 and 19 of Appendix II. All 3 terms involve E , t , ℓ , and P and lead to a modified form:

$$G' = \frac{Et}{2(1+\nu)\frac{s}{d} + D_w + C} \quad (\text{Eq. 3.2-3})$$

where E = modulus of elasticity

ν = Poisson's ratio, 0.3

D_w = warping coefficient

C = slip coefficient

d = panel corrugation pitch (see **Figure 2.4-1**)

s = developed flute width per width d , $s = 2(c + w) + f$

t = base sheet metal thickness

3.3 STIFFNESS COEFFICIENTS

The slip coefficient C depends on the shear forces directly at the side-laps which, in turn, depend on the number and location of fasteners in a panel. For the entire width of a diaphragm:

$$C = E \frac{t}{w} S_f \left[\frac{2}{2\alpha_1 + n_p \alpha_2 + 2n_s \frac{S_f}{S_s}} \right] \ell \quad (\text{Eq. 3.3-1})$$

where w = panel width

S_f = structural connector flexibility

S_s = side-lap connector flexibility

ℓ = panel length

α_1, α_2 = see Section 2.2 for definition

n_p, n_s = see Section 2.2 for definition

E = modulus of elasticity

It is noted that C depends only on ℓ once a particular profile has been selected and its thickness and fastener arrangement established.

The warping coefficients D_n measure the warping relaxation at the ends of the diaphragm panels. The warping is smaller with frequently spaced end connections and penetrates the diaphragm less when purlins are more closely spaced.

The solution for D_n may involve a mixture of warping constants D depending on fastener arrangements at panel ends. Reference 18 presents a detailed solution for D values, a summary of which is given in Appendix IV.

For common 1.5 in. deep decks having 6 in. pitches and end fasteners located in valleys as indicated:

$$D_n = \frac{D}{\ell} \quad (\text{Eq. 3.3-2})$$

Table 3.3-1
D values

Type	t		Valley Spacing							
			Each		Alternate		Third		Fourth	
	(in.)	(mm)	(in.)	(m)	(in.)	(m)	(in.)	(m)	(in.)	(m)
WR	0.0295	0.75	1549	39.34	12864	326.7	26504	673.2	42404	1077
	0.0358	0.91	1159	29.44	9623	244.4	19825	503.6	31719	805.6
	0.0474	1.20	761	19.33	6316	160.4	13013	330.5	20819	528.8
IR	0.0295	0.75	2712	68.88	14589	370.6	29131	739.9	46128	1172
	0.0358	0.91	2028	51.51	10913	277.2	21790	553.5	34505	876.4
	0.0474	1.20	1331	33.81	7163	181.9	14303	363.3	22648	575.3
NR	0.0295	0.75	4271	108.5	15388	390.9	29303	744.3	45650	1160
	0.0358	0.91	3195	81.15	11511	292.4	21919	556.7	34147	867.3
	0.0474	1.20	2097	53.26	7555	191.9	14387	365.4	22413	569.2

The effect of D_n is reduced to ρD_n depending on the number of equal spans ℓ_v within the sheet length ℓ . ρ values are given in Table 3.3-2.

Table 3.3-2
 ρ values

Spans	1	2	3	4	5	6
ρ	1.00	1.00	0.90	0.80	0.71	0.64

The stiffness formula is
$$G' = \frac{Et}{2.6 \frac{s}{d} + \rho D_n + C} \quad (\text{Eq. 3.3-3})$$

An alternate form of G' is presented in Appendix IV and, for those cases, its numerical value is obtained by simple substitution.

3.4 STIFFNESS EXAMPLE

(Refer to Problem 6, Appendix III.)

- Wide rib deck (WR) with $t = 0.0295$ in. and 30/4 weld pattern on all supports (See Appendix IV for weld pattern definition).
- 3 span condition with $\ell = 3\ell_v = 18.0$ ft and $n_p = 2$ interior purlins.
- 5/8 in. diameter welds along supports and 2 No. 10 screws per span on all side-laps.
- The steel is ASTM A 653 SS grade 33 with $F_u = 45$ ksi.

Eq. 4.4-1: $S_f = 6.70 \times 10^{-3}$ in./kip

Eq. 4.5.1-2: $S_s = 17.5 \times 10^{-3}$ in./kip

From Table I in Appendix IV, $\alpha_1 = \alpha_2 = 1.60$ and $n_s = (3 \text{ spans}) (2 \text{ screws/span}) = 6$.

$$C = E \frac{t}{w} S_f \left[\frac{2}{2\alpha_1 + n_p \alpha_2 + 2n_s \frac{S_f}{S_s}} \right] \ell$$

$$C = (29500) \left[\frac{0.0295}{30} \right] (0.0067) \left[\frac{2}{2(1.60) + 2(1.60) + 2(6) \left[\frac{0.0067}{0.01747} \right]} \right] (18)(12) = 7.63$$

The 30/4 fastener pattern (see Appendix III, Problem 6) is such that 2/5 of the width is the "single valley" type and 3/5 is of the "third valley" type. From Table 3.3-1, $D_1 = 1549 \text{ in.}$ and $D_3 = 26504 \text{ in.}$, and from Table 3.3-2 for the 3 span case $\rho = 0.9$. Then for

$$\rho D_n = \rho \frac{D}{\ell} = 0.9 \left[\frac{2}{5} D_1 + \frac{3}{5} D_3 \right] \frac{1}{(18)(12)} = 68.8$$

For Type WR, IR, and NR decks, $s/d = 1.454$, and

$$G' = \frac{Et}{2.6 \frac{s}{d} + \rho D_n + C} = \frac{(29500) (0.0295)}{2.6(1.454) + 68.8 + 7.63} = 10.8 \text{ kip/in.}$$

Note that the D_n term is very sensitive to D_3 and that significant increases in stiffness would result from the addition of a single fastener on either end of the panels along their centerlines.

This example shows the method for proportioning the D (warping) values when unequal end-of-panel spaces are encountered. Appendix IV contains a listing from which warping values for profiles can be determined.

For all listed shapes in the load tables in Appendix V, G' may be found by simple substitution. Appendix IV lists simplified equations for the calculation of shear stiffness. For bare (no fill) decks, the simplified equation is

$$G' = \frac{K_2}{K_1 + \frac{0.3D_{11}}{\ell_v} + 3K_1\ell_v}$$

Where K_1 , K_2 , K_4 , and D_{11} are selected from the appropriate tables. For this example,

$$K_1 = 0.424 \text{ ft}^{-1} \text{ (from appropriate load table)}$$

$$K_2 = 870 \text{ kip/in.}$$

$$K_4 = 3.78$$

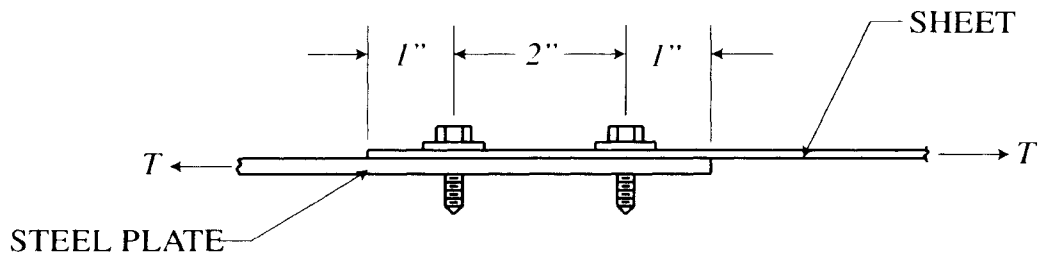
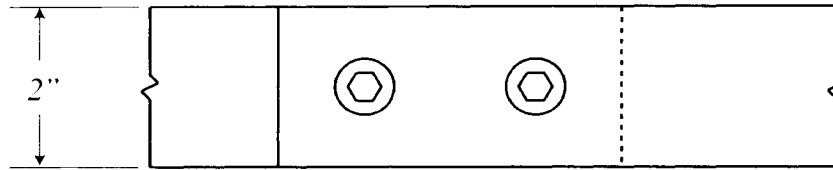
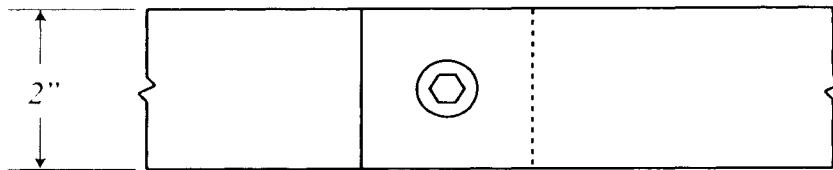
$$D_{11} = DWR = 1377 \text{ ft}$$

$$\ell_v = 6 \text{ ft}$$

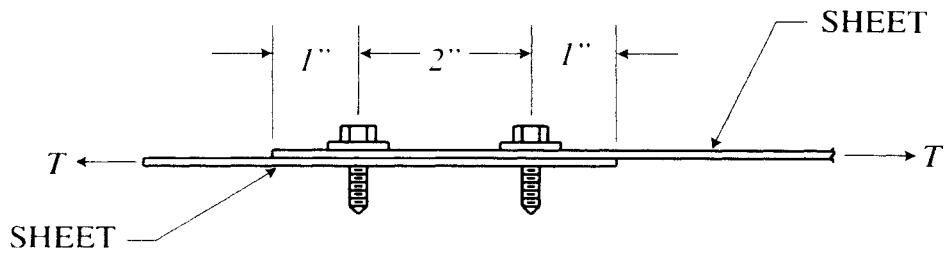
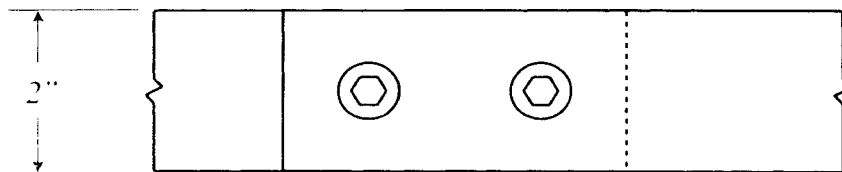
$$G' = \frac{K_2}{K_4 + \frac{0.3D_{11}}{\ell_v} + 3K_1\ell_v} = \frac{870}{3.78 + \frac{0.3(1377)}{6} + 3(0.424)(6)} = 10.8 \text{ kip/in.}$$

SECTION 4

CONNECTIONS



SHEET-TO-STRUCTURE CONNECTIONS



SHEET-TO-SHEET (SIDE-LAP) CONNECTIONS

FIG 4.1 CONNECTORS

4.1 CONNECTIONS

The major parts comprising a diaphragm are the deck panels, the structural members to which they are connected, and the connecting devices or fasteners. The fastener types include welds, screws, power driven pins, or other mechanical devices having predictable performance. The strength and stiffness of a diaphragm depend on the panel properties, the span arrangements, and the connection quality. Changes from one type of connector to another affect the diaphragm response only to the degree that connections now exhibit different strength and stiffness. Thus it is essential to know both the fastener shear strength and shear stiffness.

A thirty-year study, under the sponsorship of the Steel Deck Institute and its member companies, has been made at West Virginia University. These studies have led to specific fastener shear strength values Q and shear flexibility values S . For diaphragm fasteners, the following definitions are used:

Structural Connection: A fastener connecting one or more sheets to heavier frame or structural members. Values are indicated by a subscript f .

Side-lap Connection: A fastener connecting adjacent panels to each other, but not connecting to the frame members.

Stitch Connection: Same as side-lap connection. Values are denoted by a subscript s .

Superior fastener performance ensues when connected parts are in close contact thus keeping shear eccentricity to a minimum. Individual fastener tests are made by assembling elements as in **Figure 4.1**. Fasteners are installed as dictated by specifications and the system loading. During the loading sequence, both the strength and slip are noted.

The test assembly may involve light gauge material of similar thickness, representing a side-lap or stitch connection, leading to:

Q_s = Stitch connector strength

S_s = Stitch connector flexibility

When the test specimen involves a thinner unit attached to a heavier unit, representing a structural connection,

Q_f = Structural connector strength

S_f = Structural connector flexibility

Large groups of tests were conducted to establish repeatability and the influence of such variables as sheet thickness and yield strength. Cross-checks then are made against full-scale diaphragm tests. Given that different fastener types have differing stiffness and strength values, one-on-one substitutions may not be possible. The different fastener types may be selected on cost, reliability, or work force qualifications.

The tests reported in Section 4 have been made using **ASTM A 611** (replaced by A 1008) steels in **Grades C, D and E**; **ASTM A 446** (replaced by A 653) steels in **Grades A through E**; and other miscellaneous steels with known properties. In arc-spot welds made without washers, the material strength F_u may not have great significance especially when it is below $60 \text{ ksi } \{410 \text{ MPa}\}$. The welding operation raises sheet temperature until metallurgical changes result near the weld, impairing strength built in either by cold rolling or other controlled means.

Welds made through weld washers result in the attached sheet being clamped down. The washer absorbs heat, limits burnout of the panel, and affords stability to the sheet under the washer (**20, 22 and 23**). Weld washers are recommended for panels thinner than $0.0280 \text{ in. } \{0.71 \text{ mm}\}$.

4.2 ARC-SPOT WELDS

Arc-spot welds, or puddle welds, are produced by striking an arc on the upper sheet, forcing a hole to form, while the lower unit is being raised to fusion temperature. With the attainment of proper temperature, the electrode is moved in a pattern until the hole is filled and fusion attained on the arc-puddle perimeter. The relative strength, in a series of welds, can be varied significantly by modest changes in welding times.

4.2.1 ARC-SPOT WELDS TO STRUCTURAL MEMBERS

The welding of thinner sheet materials to heavy structural members requires intimate contact between the units for proper heat transfer. Further, a proper balance between the welding time and the electrode burn-off rate is essential to good quality welding. For base sheet metal thickness t , between $0.0280 \text{ in. } \{0.71 \text{ mm}\}$ and $0.064 \text{ in. } \{1.63 \text{ mm}\}$, the nominal shear strength has been found to be:

$$Q_f = 2.2tF_u(d-t), \text{ kip} \quad * \text{ See text in preface.}$$

$$\left\{ Q_f = \frac{2.2tF_u(d-t)}{1000} \right\}, \text{ kN} \quad (\text{Eq. 4.2.1-1})$$

where d = average visible diameter (limited to a minimum of $0.5 \text{ in. } \{13 \text{ mm}\}$)

F_u = specified minimum steel strength, $\text{ksi } \{\text{MPa}\}$

t = base sheet metal thickness, $\text{in. } \{\text{mm}\}$

For typical steel diaphragms using A 653 SS grade 33 steels having $F_y = 33 \text{ ksi } \{230 \text{ MPa}\}$, $F_u = 45 \text{ ksi } \{310 \text{ MPa}\}$, and with $d = 5/8 \text{ in. } \{16 \text{ mm}\}$:

$$Q_f = 99t(0.625-t), \text{ kip}$$

$$\left\{ Q_f = 0.682t(16-t) \right\}, \text{ kN} \quad (\text{Eq. 4.2.1-2})$$

Few connections within the diaphragm penetrate multiple panel layers, and it is required that slightly increased welding times be employed at such locations.

4.2.1.1 ARC-SPOT WELD QUALITY CONTROL

Welding machine power settings required usually are well below those needed for welding in hot-rolled steels. The settings should be such that burn-off rates are between $0.15 \text{ in. } \{4 \text{ mm}\}$ and $0.25 \text{ in. } \{6 \text{ mm}\}$ of rod per second in typical E60XX or E70XX 5/32 in. rods. The time required per weld may vary between 3 to 6 seconds or more depending on the properties of parts being connected. Heavier support steel requires more welding time, but increased power settings may burn out the panel faster than electrode material can be deposited.

A preliminary field quality check can be made by placing a pair of welds in adjacent valleys at one end of a panel. An inspection should show the weld material in fused contact over most of the weld perimeter. Spotty contact may indicate power settings that are excessive. The opposite end of the panel can be rotated, within the panel plane, placing the welds in shear, and continued rotation can lead to separation.

Separation, leaving no apparent external perimeter distress, but occurring at the sheet-to-structure plane, may indicate insufficient welding time and poor fusion with the support steel. Failure around the external weld perimeter, showing distress within the panel, but the weld still attached to the support steel, indicates a higher quality weld. The ending of the welding operation may not permit complete fusion on the whole perimeter. Fusion should be visible over no less than 3/4 of the weld perimeter.

4.2.2 SIDE-LAP WELDS

In adjacent diaphragm panels with nestable or flat overlapping edges, sheet-to-sheet or stitch connections may be required away from supporting members. The placement of arc-spot weld at such side-laps is difficult and, the thinner the material, the more difficult is the welding operation. Welding of side-laps is not recommended for material of $0.0280 \text{ in. } \{0.71 \text{ mm}\}$ or thinner. It is quite likely that welding in such thin materials will lead to a hole, which is to be expected, but the perimeter must be fused. Where excellent nesting exists and using well qualified operators, sheet-to-sheet welds have been found to exhibit strengths:

$$Q_s = 0.75Q_f \quad (\text{Eq. 4.2.2-1})$$

where Q_f is defined in Eq. 4.2.1-1.

4.3 WELDS WITH WASHERS

The weld washer functions as a heat sink allowing hole formation in thinner panels, without excessive growth of the hole, as support steel temperature is increased. The washer subsequently is filled with the weld stem growing into the support steel and anchored on the washer's hole perimeter. As the weld metal cools and contracts, the washer is clamped down on the attached sheet. Weld washers are recommended for panels thinner than $0.0280 \text{ in. } \{0.71 \text{ mm}\}$.

Extensive studies involving washers of various thickness, with different hole sizes, and used on various types of sheet steel have been conducted at West Virginia University (20, 22). An efficiency study involving washers of several different thickness, has indicated that $0.060 \text{ in. } \{1.52 \text{ mm}\}$ thick washers are best suited for typical operations. During the welding process, the sheet temperature reaches elevated values over an area significantly larger than the weld stem. This leads to local relief of cold-work stresses locked in during panel forming operations. For F_u values between $60 \text{ ksi } \{410 \text{ MPa}\}$ and $120 \text{ ksi } \{830 \text{ MPa}\}$, no significant influence of F_u was found and the material near the weld behaved as if it were fully relieved. For such washers, the strength was found to be:

$$Q_f = 99t(1.33d_o + 0.3F_{xx}t), \text{ kip}$$

$$\left\{ Q_f = 17.3t \left(\frac{d_o}{19.1} + \frac{F_{xx}t}{584} \right) \right\}, \text{ kN} \quad (\text{Eq.4.3-1})$$

where d_o = hole diameter, in. {mm}

F_{xx} = electrode strength, ksi {MPa}

t = sheet thickness, in. {mm}

Using a 16 gauge washer with $d_o = 3/8 \text{ in. } \{10 \text{ mm}\}$ and $F_u = 45 \text{ ksi } \{310 \text{ MPa}\}$,

$$E60XX: Q_f = 99t(0.50 + 18t), \text{ kip} \quad (\text{Eq. 4.3-2})$$

$$E70XX: Q_f = 99t(0.50 + 21t), \text{ kip} \quad (\text{Eq. 4.3-3})$$

For washers with elongated or slotted holes of $1 \text{ in. } \{25 \text{ mm}\}$ long by $1/4 \text{ in. } \{6 \text{ mm}\}$ wide, and having loads applied parallel to the weld axis,

$$E60XX: Q_f = 99t(0.50 + 36t), \text{ kip} \quad (\text{Eq. 4.3-4})$$

It is noted that this slotted weld, at $1/4 \text{ in. } \{6 \text{ mm}\}$ by $1 \text{ in. } \{25 \text{ mm}\}$, presents a larger weld area than does the $3/8 \text{ in. } \{10 \text{ mm}\}$ diameter round weld, requires more weld material, and is stronger.

Nominal $5/8 \text{ in. } \{16 \text{ mm}\}$ diameter arc-spot weld of good quality are more efficiently obtained in metals thicker than $0.0280 \text{ in. } \{0.71 \text{ mm}\}$ than are welds through washers. Thus washers are not recommended for panels having thicknesses of $0.0280 \text{ in. } \{0.71 \text{ mm}\}$ or greater. In no cases should washers be used at interior side-laps.

4.4 WELD FLEXIBILITIES

The amount of slip or movement experienced, as welds are shear loaded in thin steel elements, is very small relative to that for most mechanical connectors. The movement essentially is limited to panel distortion around the weld. The flexibility factor for both arc-spot welds and welds through washers is well represented by:

$$S_f = \frac{1.15}{1000\sqrt{t}} \cdot \frac{\text{in.}}{\text{kip}}$$

$$\left\{ S_f = \frac{33.1}{1000\sqrt{t}} \right\} \cdot \frac{\text{mm}}{\text{kN}} \quad (\text{Eq. 4.4-1})$$

where t = base sheet metal thickness, $\text{in. } \{\text{mm}\}$

Properly made side-lap welds can have similar distortion in both layers of material and are more flexible:

$$S_f = \frac{1.25}{1000\sqrt{t}} \cdot \frac{\text{in.}}{\text{kip}}$$

$$\left\{ S_f = \frac{36.0}{1000\sqrt{t}} \right\} \cdot \frac{\text{mm}}{\text{kN}} \quad (\text{Eq. 4.4-2})$$

where t = base sheet metal thickness, $\text{in. } \{\text{mm}\}$

4.5 SCREW CONNECTIONS

Screw connections may be either self-drilling types or self-tapping types that require a drilled hole for installation. The most commonly used screws are No. 12 and No. 14, though the smaller No. 8 and No. 10 may sometimes be used for side-lap connections. The screw shear strength is dependent on both the screw diameter and the yield strength of the connected sheets.

In connecting thin elements to heavier structural units such as bar joists or beam flanges, little difference exists in the shear strength for No. 12 and No. 14 screws. This is because the failure mode is one in which the sheet material tends to "roll up" on the bearing side of the screw and one or two tearing lines develop in the sheet. This result is obtained for both screw sizes and, for sheet-to-structural steel connections:

For No. 12 or No. 14 screws

[Applicable for 0.0385 in. (0.9 mm) and thicker support steel]

$$Q_f = 1.25F_y t (1 - 0.005F_y), \text{ kip} \quad * \text{ See text in preface.}$$

$$\left\{ Q_f = \frac{F_y t}{31.5} \left(1 - \frac{F_y}{1380} \right) \right\}, \text{ kN} \quad (\text{Eq. 4.5-1})$$

where t = base sheet metal thickness, in. {mm}

F_y = yield strength of sheet steel, ksi {MPa}

For stitch connections between sheets at the side-laps, a different performance ensues. The screw, not being anchored into a thicker and more rigid element, tips over more easily and, thus, is more flexible. Its strength may be limited by bearing-tearing in the sheets or, with sufficient tipping, a tearing-pull out combination.

The SDI screw studies indicate that stitch screw shear strength is virtually independent of F_y in all steel panels commonly used as deck diaphragms. The studies concluded that for stitch screws:

$$Q_s = 115dt, \text{ kip}$$

$$\{ Q_s = 0.793dt \}, \text{ kN} \quad (\text{Eq. 4.5-2})$$

where t = base sheet metal thickness, in. {mm}

and d = major diameter of the screw, in. {mm}

For the stitch screws studied, the following data were obtained:

Size	d (in.)	Q_s (kip)	d (mm)	Q_s (kN)
8	0.1635	18.8 t	4.15	3.29 t
10	0.1867	21.5 t	4.74	3.76 t
12	0.2111	24.3 t	5.36	4.25 t
14	0.2477	28.5 t	6.29	4.99 t

4.5.1 SCREW FLEXIBILITIES

For No. 12 and No. 14 screws connecting sheets to heavier support steel material:

$$S_f = \frac{1.30}{1000\sqrt{t}} \cdot \frac{\text{in.}}{\text{kip}}$$

$$\left\{ S_f = \frac{37.4}{1000\sqrt{t}} \right\}, \frac{\text{mm}}{\text{kN}} \quad (\text{Eq.4.5.1-1})$$

where t = base sheet metal thickness, in. {mm}

For stitch screw specimens, the load-slip curve stays virtually linear and constant at lower loads. The use of larger screws only leads to a later deviation from the curve. Thus:

$$S_s = \frac{3.0}{1000\sqrt{t}} \cdot \frac{\text{in.}}{\text{kip}}$$

$$\left\{ S_s = \frac{86.3}{1000\sqrt{t}} \right\} \cdot \frac{\text{mm}}{\text{kN}} \quad (\text{Eq. 4.5.1-2})$$

where t = base sheet metal thickness, in. {mm}

4.5.2 SCREW QUALITY CONTROL

The quality of the screw itself is not a major problem though they can sometimes fracture while being driven into heavier support steel. The more common problem is one of allowing the screw to thread-up on the upper sheet before becoming engaged in lower sheets thus leaving major eccentricities between units. Such screws should be removed and redriven nearby while forcing sheet layers to remain in contact.

4.6 POWER DRIVEN FASTENERS

Sheet-to-structural connections can be made using nail-like pins, driven either with pneumatic devices or using powder actuated tools. Such fasteners are made from hardened steel and usually have heat-treated knurled shafts to enhance anchorage. The shaft may have a slight taper and a fixed head, and can be fitted with washers, concave to the driving direction, to absorb the final driving energy and thus clamp the sheet in position.

Since there are no predrilled holes, the driving operation displaces material and leaves it locked under the head or the washers resulting in a very stiff connection. The driving depth is controlled by the power selection for the tool used. Fastener strength is controlled by driving depths. These can be determined by establishing tight contact between the fixed head and the deck, or by measurements on the washered fastener, after driving, which are set by the manufacturer.

The studies made at West Virginia University have involved tests wherein the back-up plates (See **Fig. 4.1**) were $3/16$ in. {5 mm}, $1/4$ in. {6 mm}, $5/16$ in. {8 mm} cold rolled A 36 straps or thicker wide flange beams (**13**, **21**, **22**). The backing element thickness has virtually no effect on shear strength since the thinner sheet material will control performance through its bearing on the pin diameter. Within sheet thickness between 0.024 in. {0.61 mm} and 0.1006 in. {2.56 mm}, bearing controlled - shear failures did not develop across the fastener diameter.

Buildex BX-14:

$$Q_f = 62.5t(1-5t), \text{ kip}$$

$$\left\{ Q_f = 10.9t \left(1 - \frac{t}{5.08} \right) \right\} \cdot \text{kN} \quad (\text{Eq. 4.6-1})$$

where t = base sheet metal thickness, in. {mm}

and

$$S_f = \frac{2.5}{1000\sqrt{t}} \cdot \frac{\text{in.}}{\text{kip}}$$

$$\left\{ S_f = \frac{71.9}{1000\sqrt{t}} \right\}, \frac{mm}{kN} \quad (\text{Eq. 4.6-2})$$

where t = base sheet metal thickness, in. {mm}

Buildex BX-12:

$$Q_f = 59.0t (1-5t), \text{ kip}$$

$$\left\{ Q_f = 10.33t \left(1 - \frac{t}{5.08} \right) \right\}, \text{ kN} \quad (\text{Eq. 4.6-3})$$

where t = base sheet metal thickness, in. {mm}

and

$$S_f = \frac{2.5}{1000\sqrt{t}}, \frac{\text{in.}}{\text{kip}}$$

$$\left\{ S_f = \frac{71.9}{1000\sqrt{t}} \right\}, \frac{mm}{kN} \quad (\text{Eq. 4.6-4})$$

where t = base sheet metal thickness, in. {mm}

Hilti ENP2 and ENPH2

[Applicable for 1/4 in. {6 mm} and thicker support steel]

$$Q_f = 61.1t (1-4t), \text{ kip}$$

$$\left\{ Q_f = 10.7t \left(1 - \frac{t}{6.35} \right) \right\}, \text{ kN} \quad (\text{Eq. 4.6-5})$$

where t = base sheet metal thickness, in. {mm}

and

$$S_f = \frac{1.25}{1000\sqrt{t}}, \frac{\text{in.}}{\text{kip}}$$

$$\left\{ S_f = \frac{36.0}{1000\sqrt{t}} \right\}, \frac{mm}{kN} \quad (\text{Eq. 4.6-6})$$

where t = base sheet metal thickness, in. {mm}

Hilti ENP2K, X-EDN19, or X-EDNK22

[Applicable for 1/8 in. {3 mm} through 3/8 in. {10 mm} support steel]

$$Q_f = 52.0t (1-t), \text{ kip}$$

$$\left\{ Q_f = 9.11t \left(1 - \frac{t}{25.4} \right) \right\}, \text{ kN} \quad (\text{Eq. 4.6-7})$$

where t = base sheet metal thickness, in. {mm}

and

$$S_f = \frac{1.25}{1000\sqrt{t}}, \frac{\text{in.}}{\text{kip}}$$

$$\left\{ S_f = \frac{36.0}{1000\sqrt{t}} \right\}, \frac{mm}{kN} \quad (\text{Eq. 4.6-8})$$

Pneutek SDK61-series

[Applicable for support steel thickness from 0.113 in. {2.9 mm} to 0.155 in. {3.9 mm}]

For 0.0280 in. {0.71 mm} $\leq t \leq$ 0.060 in. {1.52 mm}

$$Q_f = 55t (1 - 2t), \text{ kip}$$

$$\left\{ Q_f = 9.65t \left(1 - \frac{t}{12.7} \right) \right\}, \text{ kN} \quad (\text{Eq. 4.6-9})$$

where t = base sheet metal thickness, in. {mm}

For $t < 0.0280$ in. {0.71 mm}

$$Q_f = 33.2t (1 + 20t), \text{ kip}$$

$$\left\{ Q_f = 5.81t \left(1 + \frac{t}{1.27} \right) \right\}, \text{ kN} \quad (\text{Eq. 4.6-10})$$

where t = base sheet metal thickness, in. {mm}

and

$$S_f = \frac{3.0}{1000\sqrt{t}}, \frac{\text{in.}}{\text{kip}}$$

$$\left\{ S_f = \frac{86.3}{1000\sqrt{t}} \right\}, \frac{\text{mm}}{\text{kN}} \quad (\text{Eq. 4.6-11})$$

where t = base sheet metal thickness, in. {mm}

Pneutek SDK63-series

[Applicable for support steel thickness from 0.155 in. {3.9 mm} to 0.25 in. {6.4 mm}]

For 0.0280 in. {0.71 mm} $\leq t \leq$ 0.060 in. {1.52 mm}

$$Q_f = 42.4 \left(\frac{t-0.006}{4.95} \right)^{0.6}, \text{ kip}$$

$$\left\{ Q_f = 189 \left(\frac{t-0.152}{126} \right)^{0.6} \right\}, \text{ kN} \quad (\text{Eq. 4.6-12})$$

where t = base sheet metal thickness, in. {mm}

For $t < 0.0280$ in. {0.71 mm}

$$Q_f = 37.5t (1 + 20t), \text{ kip}$$

$$\left\{ Q_f = 6.57t (1 + 0.787t) \right\}, \text{ kN} \quad (\text{Eq. 4.6-13})$$

where t = base sheet metal thickness, in. {mm}

and

$$S_f = \frac{3.0}{1000\sqrt{t}}, \frac{\text{in.}}{\text{kip}}$$

$$\left\{ S_f = \frac{86.3}{1000\sqrt{t}} \right\}, \frac{\text{mm}}{\text{kN}} \quad (\text{Eq. 4.6-14})$$

where t = base sheet metal thickness, in. {mm}

Pneutek K64-series

[Applicable for support steel thickness from 0.187 in. {4.7 mm} to 0.312 in. {7.9 mm}]

For 0.0280 in. {0.71 mm} $\leq t \leq$ 0.060 in. {1.52 mm}

$$Q_f = 42.4 \left(\frac{t-0.018}{2.45} \right)^{0.6}, \text{kip}$$

$$\left\{ Q_f = 189 \left(\frac{t-0.457}{62.2} \right)^{0.6} \right\}, \text{kN} \quad (\text{Eq. 4.6-15})$$

where t = base sheet metal thickness, in. {mm}

For $t < 0.0280$ in. {0.71 mm}

$$Q_f = 37.7t (1 + 20t), \text{kip}$$

$$\{ Q_f = 6.60t (1 + 0.787t) \}, \text{kN} \quad (\text{Eq. 4.6-16})$$

where t = base sheet metal thickness, in. {mm}

and

$$S_f = \frac{3.0}{1000\sqrt{t}}, \frac{\text{in.}}{\text{kip}}$$

$$\left\{ S_f = \frac{86.3}{1000\sqrt{t}} \right\}, \frac{\text{mm}}{\text{kN}} \quad (\text{Eq. 4.6-17})$$

where t = base sheet metal thickness, in. {mm}

Pneutek K66-series

[Applicable for support steel thickness from 0.281 in. {7.1 mm} and up]

For 0.0280 in. {0.71 mm} $\leq t \leq$ 0.060 in. {1.52 mm}

$$Q_f = 55t (1 + 4t), \text{kip}$$

$$\{ Q_f = 9.63t (1 + 0.157t) \}, \text{kN} \quad (\text{Eq. 4.6-18})$$

where t = base sheet metal thickness, in. {mm}

For $t < 0.0280$ in. $\{0.71$ mm $\}$

$$Q_f = 32.1t(1 + 20t), \text{ kip}$$

$$\{Q_f = 5.62t(1 + 0.787t)\}, \text{ kN} \quad (\text{Eq. 4.6-19})$$

where t = base sheet metal thickness, in. $\{mm\}$

and

$$S_f = \frac{3.0}{1000\sqrt{t}} \cdot \frac{\text{in.}}{\text{kip}}$$

$$\left\{ S_f = \frac{86.3}{1000\sqrt{t}} \right\} \cdot \frac{\text{mm}}{\text{kN}} \quad (\text{Eq. 4.6-20})$$

where t = base sheet metal thickness, in. $\{mm\}$

4.6.1 QUALITY CONTROL

A driven fastener should be installed such that the head projects outward, from the attached part, to limits set by the manufacturer. The axis of the fastener must be substantially perpendicular to the sheet prior to driving, usually within $\pm 10^\circ$.

The Q_f and S_f values in Section 4.6 were established using the **Fig. 4.1** test arrangement. However, when placing pins at the edge of overlaps in a diaphragm, the available flat width is limited. In full scale diaphragm tests, the distances from the pin center to the edge of a sheet were kept at or larger than $3/8$ in. $\{10$ mm $\}$. At end laps, the end distance was kept at or greater than 1 in. $\{25$ mm $\}$. Thus, it is recommended that edge and end fasteners have:

Minimum side-lap edge distances: $3/8$ in. $\{10$ mm $\}$

Minimum end/end lap distance: 1.0 in. $\{25$ mm $\}$

4.7 BUTTON PUNCHED SIDE-LAPS

In certain panels, one edge has an upstanding single element while the opposite side has a folded-over double element. As panels are placed, the single element is inserted into the double element producing an upstanding side-lap that can be button punched for some interlocking. The tool used forms a 3 layer nest of small cone that is left in a slightly loose state, due to elastic rebound, as the forming force is removed.

Button punched side-laps do stabilize panel edges, but may contribute little to diaphragm strength. They can vary greatly in shape and effectiveness. Typical values from well controlled diaphragm tests at West Virginia University have led to strength and stiffness values of:

$$Q_s = 240t^2, \text{ kip}$$

$$\{Q_s = 1.67t^2\}, \text{ kN} \quad (\text{Eq. 4.7-1})$$

where t = base sheet metal thickness, in. $\{mm\}$

and

$$S_s = \frac{30.0}{1000\sqrt{t}} \cdot \frac{\text{in.}}{\text{kip}}$$

$$\left\{ S_s = \frac{86.3}{1000\sqrt{t}} \right\} \cdot \frac{\text{mm}}{\text{kN}} \quad (\text{Eq. 4.7-2})$$

In a typical $0.0295 \text{ in. } \{0.75 \text{ mm}\}$ thickness, Eq. 4.7-1 yields a 209 pounds $\{930\text{N}\}$ strength which is about 30% of the strength with a No. 12 stitch screw. The flexibility is several times greater than that for a No. 12 screw.

The quality of button punching is difficult to maintain. The quality of the attachment depends on the care and the energy used by the installer and the tool that is used. A conservative approach for using the tables in Appendix V for diaphragms with button punched side-laps is to consider the button punches as having zero strength and then use the first line in each table. If a totally controlled mechanical punching device is developed, the strength and stiffness values can be established and appropriate load tables generated.

Diaphragms, required to resist higher shears, may be required to have structural connections immediately to either side of the upstanding side-lap at supports. Otherwise, the majority of shear force will be transmitted across panel edges through the button punches only. (See **Fig. 16** of Appendix III.)

4.8 OTHER CONNECTIONS

The diaphragm studies have included fasteners other than those described in the preceding sections. Included were various sizes of pneumatically driven pins, screws with plastic covered heads, and blind rivets similar to pop-rivets. Given their individual strength and stiffness, their influence in diaphragms is equally as predictable as is that of the connections reported.

The introduction of some new connector for diaphragms requires that its strength and stiffness be found. Diaphragm design using it then can be accomplished directly. Full scale testing, as might be required, then is in the proper role of confirming expected performance.

4.9 FASTENERS IN TENSION

In addition to resisting loads in shear, the connections in diaphragms are often loaded in tension. Such loads generally are the result of uplift pressures from wind forces. See the Steel Deck Institute publication, Roof Deck Construction Handbook, or the American Iron and Steel Institute publication, the 2001 edition of the North American Specification for the Design of Cold-Formed Steel Structural Members (37), for a complete discussion on this subject.

4.9.1 ARC-SPOT WELDS

The American Iron and Steel Institute (AISI) publication, the 2001 edition of the North American Specification for the Design of Cold-Formed Steel Structural Members (37), defines the nominal strength of an arc-spot weld in tension. At the side-lap connection within the deck system where the arc-spot weld is loaded in tension with eccentricity, the nominal tensile strength of the weld connection is taken as 70% of the value defined by the AISI publication. Appendix IV lists the nominal tensile resistance of some common concentrically tension-loaded arc-spot welds connecting single sheet to supporting member.

4.9.2 SCREW CONNECTIONS

Provisions for screw connections in tension are also found in the American Iron and Steel Institute publication, the 2001 edition of the North American Specification for the Design of Cold-Formed Steel Structural Members (37). The nominal strength of a screw loaded in tension is based on the lesser of the pull-out strength and the pull-over strength. Appendix IV lists the nominal resistance of several commonly encountered screws loaded in tension.

4.9.3 POWER DRIVEN FASTENERS

Provisions for power driven fasteners have been developed by the fastener manufacturers.

Buildex BX-12 / BX-14

The general equation for nominal resistance of these pins in tension is

$$T_{nov} = 1.5 t d_w F_u$$

where t is the thickness of the deck sheet in contact with fastener head, in.

d_w is the lesser of the actual diameter of the fastener washer (0.562) or 1/2 in.

F_u is the ultimate strength of the deck sheet, ksi

Hilti ENP2 / ENPH2 / ENP2K

The general equation for these pins in tension is

$$T_{nov} = 1.7 t d_w F_u$$

where t is the thickness of the deck sheet, in.

d_w is the lesser of the actual diameter of the fastener washer (0.591) or 1/2 in.

F_u is the ultimate strength of the deck sheet, ksi

Hilti X-EDN19 / X-EDNK22

The general equation for these pins in tension is

$$T_{nov} = 1.7 t d_w F_u$$

where t is the thickness of the deck sheet, in.

d_w is the lesser of the actual diameter of the fastener washer (0.474) or 1/2 in.

F_u is the ultimate strength of the deck sheet, ksi

Pneutek SDK61-, SDK63-, K64-, and K66- series

The general equation for nominal resistance of these pins in tension is

$$T_{nov} = 32.2 D_h t^2 F_u$$

where D_h is the diameter of the head of the pin, in.

t is the thickness of the deck sheet, in.

F_u is the ultimate strength of the deck sheet, ksi

4.9.4 RESISTANCE FACTORS / SAFETY FACTORS

The tension strengths from Section 4.9 must be modified by resistance factors (ϕ factors) per the "Load and Resistance Factor Design" (LRFD) or by safety factors (Ω factors) per the "Allowable Stress Design" (ASD).

The resistance factor for welded construction subject to tension is $\phi_u = 0.6$ and the resistance factor for screws or power-driven fasteners subject to tension is $\phi_u = 0.5$.

The safety factor for welded construction subject to tension is $\Omega_u = 2.5$ and for screws or power-driven fasteners subject to tension is $\Omega_u = 3.0$.

4.10 COMBINED SHEAR AND TENSION ON FASTENERS

In addition to shear forces and tension forces on the diaphragm, there is the question of their interaction. Research at West Virginia University has concluded that there is an interaction between the two forces.

The interaction between shear and tension for arc-spot welds is described by

$$\text{LRFD: } \left(\frac{Q_u}{\phi Q_f} \right)^{1.5} + \left(\frac{T_u}{\phi_u T_n} \right)^{1.5} \leq 1$$

$$\text{If } \left(\frac{T_u}{\phi_u T_n} \right)^{1.5} \leq 0.15, \text{ no interaction check is required}$$

$$\text{ASD: } \left(\frac{\Omega Q}{Q_f} \right)^{1.5} + \left(\frac{\Omega_u T}{T_n} \right)^{1.5} \leq 1.0$$

$$\text{If } \left(\frac{\Omega_u T}{T_n} \right)^{1.5} \leq 0.15, \text{ no interaction check is required}$$

For screw fasteners and Hilti power driven fasteners, the shear-tension interaction is described by

$$\text{If } \frac{T_u}{\phi_u T_n} > 0.15, \quad \frac{T_u}{\phi_u T_n} + 0.85 \left(\frac{Q_u}{\phi Q_f} \right) \leq 1$$

$$\text{If } \frac{\Omega_u T}{T_n} > 0.15, \quad \frac{\Omega_u T}{T_n} + 0.85 \left(\frac{\Omega Q}{Q_f} \right) \leq 1$$

For Pneutek fasteners the shear-tension interaction is described by

$$\frac{Q_u}{\phi Q_f} + \left(\frac{T_u}{\phi_u T_n} \right)^2 \leq 1$$

$$\text{If } \left(\frac{T_u}{\phi_u T_n} \right)^2 \leq 0.15, \text{ no interaction check is required}$$

$$\frac{\Omega Q}{Q_f} + \left(\frac{\Omega_u T}{T_n} \right)^2 \leq 1$$

$$\text{If } \left(\frac{\Omega_u T}{T_n} \right)^2 \leq 0.15, \text{ no interaction check is required}$$

where Q_u = required shear strength
(including the appropriate
load factor)

T_u = required tensile strength
(including the appropriate
load factor)

ϕQ_f = factored nominal shear
strength

$\phi_u T_n$ = factored nominal tensile
strength

ϕ = resistance factor for a
connection in shear

ϕ_u = resistance factor for a weld
connection in tension = 0.6

ϕ_u = resistance factor for a
screw, Hilti or Pneutek
connection in tension = 0.5

where Q = required shear strength
(service value)

T = required tensile strength
(service value)

Q_f/Ω = allowable shear
strength

T_n/Ω_u = allowable tensile
strength

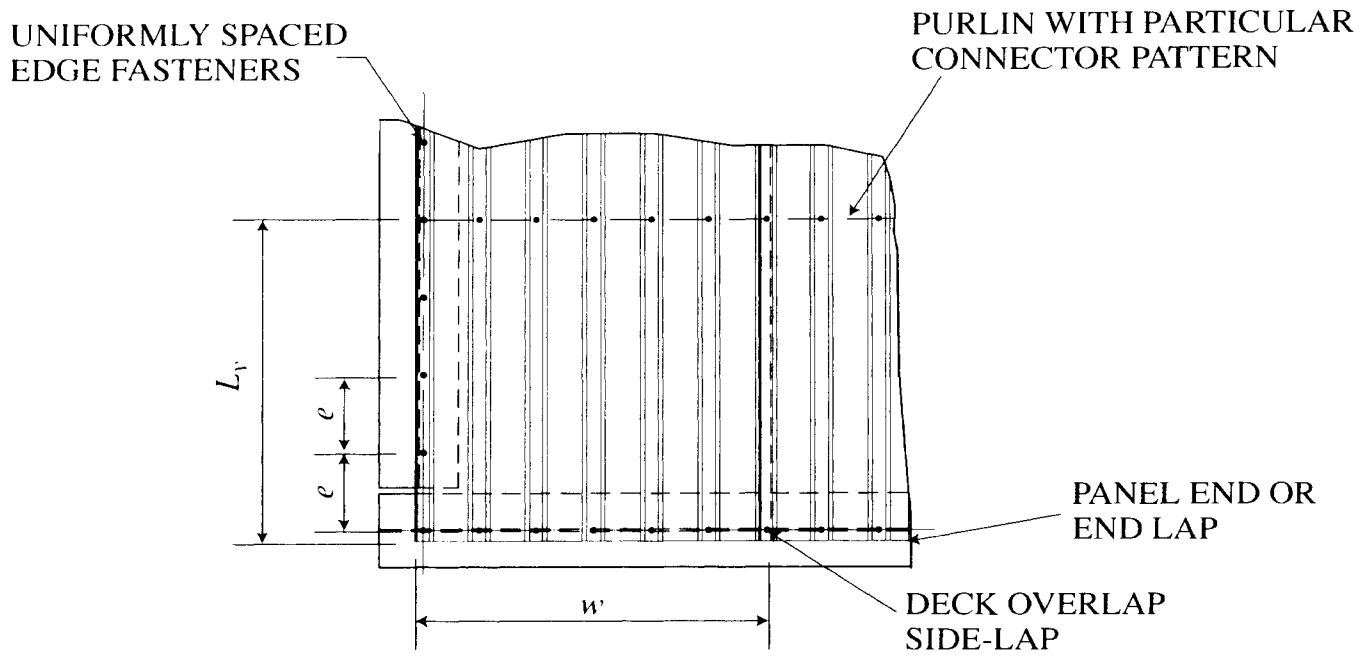
Ω = safety factor for a
connection in shear

Ω_u = safety factor for a weld
connection in
tension = 2.5

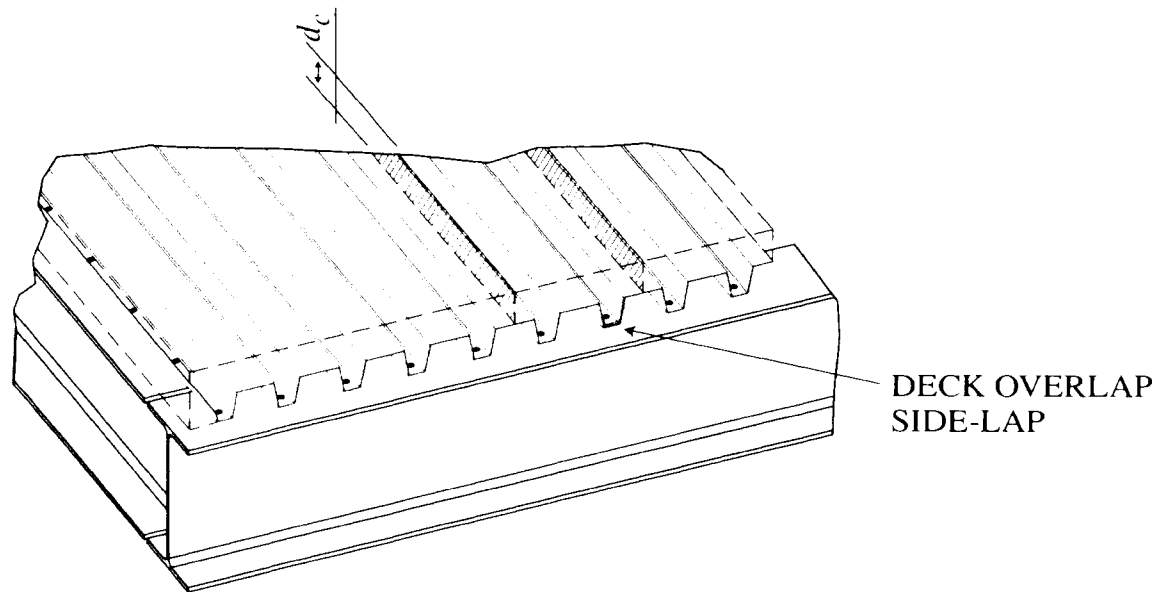
Ω_u = safety factor for a screw,
Hilti or Pneutek connec-
tion in tension = 3.0

SECTION 5

FILLED DIAPHRAGMS



(a) PANEL LAYOUT AND FASTENER ARRANGEMENT



(b) CONCRETE FILLED DIAPHRAGM SHOWING COVER DEPTH OVER TOP OF STEEL DECK

FIG 5.1

5.1 CONCRETE FILLED DIAPHRAGMS

Steel diaphragms may be reinforced with overlay of insulating concrete, structural concrete, or by directly attached flat panels used to produce a flat surface. Such devices present additional paths through which shear forces may traverse the diaphragm. Consider the diaphragm segment shown in **Fig. 5.1** where the shaded areas are shear zones in the concrete above the steel deck. The shallowest zone above the top of the deck would present a shear area along the side-lap. The concrete that fills the corrugations prohibits or limits end warping and local corner buckling. Without local warping, the shear term of Eq. 2.2-4 would approach unity.

Concrete nominal shear strength for deep webs are reported in the form $V_n = kd_c b \sqrt{f'_c}$ where k is a factor and $d_c b$ is the "web area" available for shear transfer (**30**). For the interior areas of a diaphragm, the shear strength takes the form:

$$S_n = \frac{BQ_f}{\ell} + kbd_c \sqrt{f'_c} \quad (\text{Eq. 5.1-1})$$

where $B = n_s \alpha_s + \frac{I}{w^2} [2n_p \Sigma(x_p^2) + 4\Sigma(x_c^2)]$ from Section 2

Q_f = structural connector strength

ℓ = panel length

k = test constant

b = unit width, for US units $b = 12 \text{ in.}$, for SI units $b = 1000 \text{ mm}$

d_c = concrete cover depth

f'_c = specified compressive strength of concrete

5.2 INSULATING CONCRETE

Lightweight insulating concrete, with vermiculite aggregate, is used over "centering" type corrugated galvanized decks.

Type I insulating concrete without insulation board:

Tests using a minimum d_c of 2.5 in. {65 mm} (**15**) have shown that the diaphragm shear strength, away from the perimeter, is increased above that of the base diaphragm to:

$$S_n = \frac{BQ_f}{\ell} + kbd_c \sqrt{f'_c} \quad (\text{Eq. 5.2-1})$$

where for US units $k = \frac{4}{3}$ and for SI units $k = 0.111$

Type II insulating concrete with insulation board:

In certain constructions, a layer of insulating concrete is placed to a level slightly above corrugation crests. Rigid insulation boards of expanded cellular polystyrene, having about 2% of the area containing holes, are then embedded into the concrete and the excess concrete moves into the openings. Insulation boards are held 3 ft away from the diaphragm shear resisting lines. A topping coat of 2 in. {50 mm} of similar concrete then is used to finish the diaphragms. Such diaphragms (35, 36) have been found to exhibit interior shear strength of at least

$$S_n = \frac{BQ_f}{\ell} + 0.064\sqrt{f'_c}, \text{ kip/ft} \quad \left\{ S_n = \frac{BQ_f}{\ell} + 11.2\sqrt{f'_c} \right\}, \text{ kN/m} \quad (\text{Eq. 5.2-2})$$

where B is defined above

Q_f = structural connector strength, kip {kN}

ℓ = panel length, ft {m}

d_c = concrete cover depth, in. {mm}

f'_c = specified compressive strength of concrete, psi {MPa}

The types of welding and perimeter member connections may vary or cover depths may be increased leading to higher shear values. However, as a minimum, the following shear strength equations are to be used for Types I and II assemblies: $f'_c = 125 \text{ psi } \{0.862 \text{ MPa}\}$:

$$\text{Type I} \quad S_n = \frac{BQ_f}{\ell} + 0.447, \text{ kip/ft with } d_c = 2.5 \text{ in.} \quad (\text{Eq. 5.2-3})$$

$$\left\{ S_n = \frac{BQ_f}{\ell} + 6.70 \right\}, \text{ kN/m with } d_c = 65 \text{ mm}$$

$$\text{Type II} \quad S_n = \frac{BQ_f}{\ell} + 0.716, \text{ kip/ft} \quad (\text{Eq. 5.2-4})$$

$$\left\{ S_n = \frac{BQ_f}{\ell} + 10.4 \right\}, \text{ kN/m}$$

5.3 STRUCTURAL CONCRETE

The effect of adding normal or lightweight structural concrete to a steel diaphragm may greatly increase shear strength given sufficient perimeter attachments to transfer forces across the diaphragm perimeters. With greater concrete cover depths, the interior shear strength can approach that for a reinforced flat slab of thickness d_c . For concrete-filled floor deck diaphragms having cover depths between 2 in. and 6 in., measured shear stresses on the order of $3.5\sqrt{f'_c}$ over the shear area $d_c \ell$ have been reported (26). Shear increases with depth and methods of attachment, but as a minimum for decks having at least $d_c = 2.5 \text{ in. } \{65 \text{ mm}\}$ and $6 \times 6\text{-}W1.4 \times W1.4 \{152 \times 152 - MW9.1 \times MW9.1\}$ mesh reinforcement,

$$S_n = \frac{BQ_f}{\ell} + kbd_c \sqrt{f'_c} \quad (\text{Eq. 5.3-1})$$

$$\text{where for US units } k = \frac{w^{1.5}}{585(10^3)} \text{ and for SI units } k = \frac{w^{1.5}}{452(10^6)}$$

w is shown in Eq. 5.3-2

As a minimum, the following shear strength equations are to be used for assemblies with $d_c = 2.5 \text{ in. } \{65 \text{ mm}\}$ and $f'_c = 3000 \text{ psi } \{20 \text{ MPa}\}$;

$$\text{For } w = 145 \text{ pcf, } S_n = \frac{BQ_f}{\ell} + 4.90, \text{ kip/ft}$$

$$\text{For } w = 110 \text{ pcf, } S_n = \frac{BQ_f}{\ell} + 3.24, \text{ kip/ft} \quad (\text{Eq. 5.3-2})$$

$$\text{For } w = 2300 \text{ kg/m}^3, S_n = \frac{BQ_f}{\ell} + 70.9, \text{ kN/m}$$

$$\text{For } w = 1750 \text{ kg/m}^3, S_n = \frac{BQ_f}{\ell} + 47.1, \text{ kN/m}$$

5.4 PERIMETER CONNECTIONS

The perimeter connections at the extreme ends of the panels are spaced as dictated by the B term in Eq. 5.3-1. However, since the concrete fill may add significantly to the strength within the system, it may be necessary to increase the number or strength of perimeter connections in order to develop strengths indicated in Eq. 5.3-1.

If the full strength is needed, perimeter edge fasteners must be spaced no greater than

$$e = \frac{Q_f}{S_n} \quad (\text{Eq. 5.4-1})$$

where Q_f = nominal structural connector strength

S_n = nominal linear diaphragm shear

with e not to exceed 30 in. {750 mm} when L_v is 5 ft 0 in. {1.50 m} or more.

LRFD: If the required strength (S_u) is less than the factored nominal strength

$$e = \frac{\phi Q_f}{S_u} \leq e_{max} \quad (\text{Eq. 5.4-2})$$

where ϕQ_f = factored structural connector strength

S_u = required linear diaphragm shear factored for LRFD

e_{max} = 30 in. or 750 mm

ASD: If the required strength (S) is less than the allowable strength

$$e = \frac{Q_f/\Omega}{S} \leq e_{max} \quad (\text{Eq. 5.4-2})$$

where Q_f/Ω = allowable structural connector strength

S = required linear diaphragm shear in service value for ASD

e_{max} = 30 in. or 750 mm

Intermediate side-lap fasteners for concrete filled diaphragm add little to the diaphragm shear strength once the wet concrete has cured. However, there are reasonable maximum spacings to limit the differential deflection between adjacent panels which can result in concrete leakage. The 30 in. maximum spacing is a practical limit from common practice. See section 2.6 for further instructions.

5.5 STUD CONNECTIONS

Perimeter connections may include shear studs extending into the concrete leading to enhanced shear strength. Stud nominal shear strength values may be used in Eq. 5.4-1 to substitute for part or all of the perimeter connections. The AISC-LRFD Manual of Steel Construction assigns design strength for shear values and reduction coefficients to account for their being placed through steel deck profiles. (Refer to Example Problem 16 in Appendix III.)

5.6 STIFFNESS AND DEFLECTIONS

The presence of concrete fill over the corrugated shape of a diaphragm substantially eliminates panel end warping for loads within the design range. Thus the ρD_n term of Eq. 3.3-3 approaches zero. Further, the steel panel shear force is proportionately smaller with the added concrete shear resistance and the total stiffness is increased to,

$$G' = \frac{Et}{2.6\left(\frac{s}{d}\right)+C} + 3.5d_c (f'_c)^{0.7}, \text{ kip/in.}$$

$$\left\{ G' = \frac{Et}{2.6\left(\frac{s}{d}\right)+C} + 0.786d_c (f'_c)^{0.7} \right\}, \text{ kN/mm}$$

$$G' = \frac{K_2}{k_4 + 3K_1 \ell_v} + K_3 \quad (\text{Eq. 5.6-1})$$

where C = coefficient defined in Eq. 3.3-1

E = modulus of elasticity = 29500 ksi {210,000 MPa = 210 kN/mm²}

t = base sheet metal thickness, in. {mm}

d_c = thickness of concrete above deck, in. {mm}

f'_c = specified compressive strength of concrete, psi {MPa}

K_2, K_3 and K_4 = coefficient found in Appendix AIV

5.7 RESISTANCE FACTORS / SAFETY FACTORS:

Filled diaphragms are assembled from steel deck and a material that covers the steel deck. Noting that the combination of the steel deck and the covering material can lead to increased variability, the filled diaphragms have the following resistance factors / safety factors:

Table 5.1		
ϕ	Ω	Diaphragm Condition
0.50	3.25	For filled diaphragms subjected to earthquake loads, or subjected to load combinations which include earthquake loads.
0.50	3.25	For filled diaphragms subjected to wind loads, or subjected to load combinations which include wind loads.
0.50	3.25	For filled diaphragms subjected to load combinations not involving wind or earthquake loads.

5.8 OTHER SYSTEMS

Systematic attachment of rigid flat panels to the top corrugations of a diaphragm can increase both diaphragm strength and stiffness. Such panels can include mineral boards (20) or other flat panel units suitable to receive an upper finish. Properly located attachments through the panels and into the tops of deck corrugations, particularly on the diaphragm perimeter, limit warping and increase shear stiffness. The flat elements themselves provide additional shear transfer paths. Testing may be required for determining system shear values.

APPENDIX I

SYMBOLS

APPENDIX II

REFERENCES

APPENDIX I

Symbols

a	Diaphragm width perpendicular to panel span direction - may be taken as equal to joist length for finding G' or S_n
b	Diaphragm dimension, or
b	Panel unit width, 12 in. for US unit or 1000 mm for SI unit
C	Slip relaxation constant
d	External diameter of arc-spot weld, or
d	Corrugation pitch
D, D_n, D_{λ}	Panel warping constants, or
D	Panel depth
E	Modulus of Elasticity, 29500 ksi $\{210000 \text{ MPa} = 210 \text{ kN/mm}^2\}$
F_y	Panel yield strength
F_u	Panel ultimate strength
F_{ex}	Electrode strength
G	Elastic modulus in shear
G'	Diaphragm shear stiffness
I	Panel moment of inertia per unit panel width
K_1	Slip relaxation constant
ℓ	Panel length
s	Purlin or joist spacing
M_e, M_s	Resisting shear couples at panel ends and purlins
n_e	Number of intermediate sheet-to-structure connections per panel length and between purlins at the diaphragm edge
n_p	Number of purlins in length ℓ excluding those at ends and end laps
n_s	Number of intermediate side-lap connections in length ℓ per panel side-lap
n_{sf}	The number of panels in the width a
N	The average number of connectors per unit width along panel ends
P	Required allowable diaphragm strength for ASD
P_n	Nominal diaphragm strength
P_u	Required factored diaphragm strength for LRFD

Q	Fastener required allowable shear strength
Q_f	Fastener strength, panel-to-frame
Q_s	Fastener strength, panel-to-panel
Q_u	Fastener required factored shear strength
q_w, q_L, q_E	Line loads at diaphragm edges
R_w, R_L, R_w	Diaphragm reactions
S	Required allowable linear diaphragm shear for ASD
S_f	Fastener flexibility factors, panel-to-frame
S_s	Fastener flexibility factors, panel-to-panel
S_n	Nominal linear diaphragm shear
S_u	Required factored linear diaphragm shear for LRFD
s	Developed width of corrugation per pitch d
T	Fastener required allowable tensile strength
T_n	Fastener nominal tensile strength
T_{nov}	Fastener nominal pull over strength
T_u	Fastener required factored tensile strength
t	Base sheet metal thickness
w	Panel width, or
w, w_c	Concrete weight
x_e	Distance from panel centerline to fastener at end support
x_p	Distance from panel centerline to fastener at purlins
α_1, α_2	Fastener weighing factors
β	Fastener pattern factor / Panel buckling factor
γ	Shear Strains
Δ	Total shear displacement = $\Delta_s + \Delta_c + \Delta_e + \Delta_m$
ϕ, ϕ_u	Resistance factor
ρ	Purlin effect on warping
ν	Poisson's Ratio
τ	Shear stress
Ω, Ω_u	Safety factor

APPENDIX II

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APPENDIX III
SHEAR DIAPHRAGM EXAMPLES

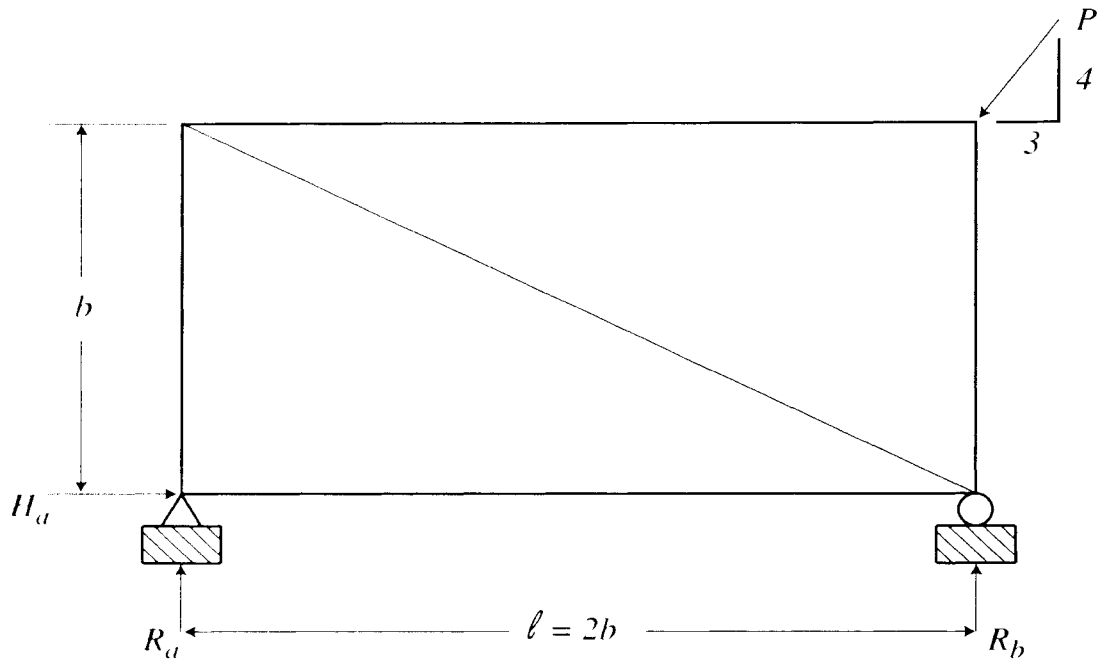


FIG. 1.1

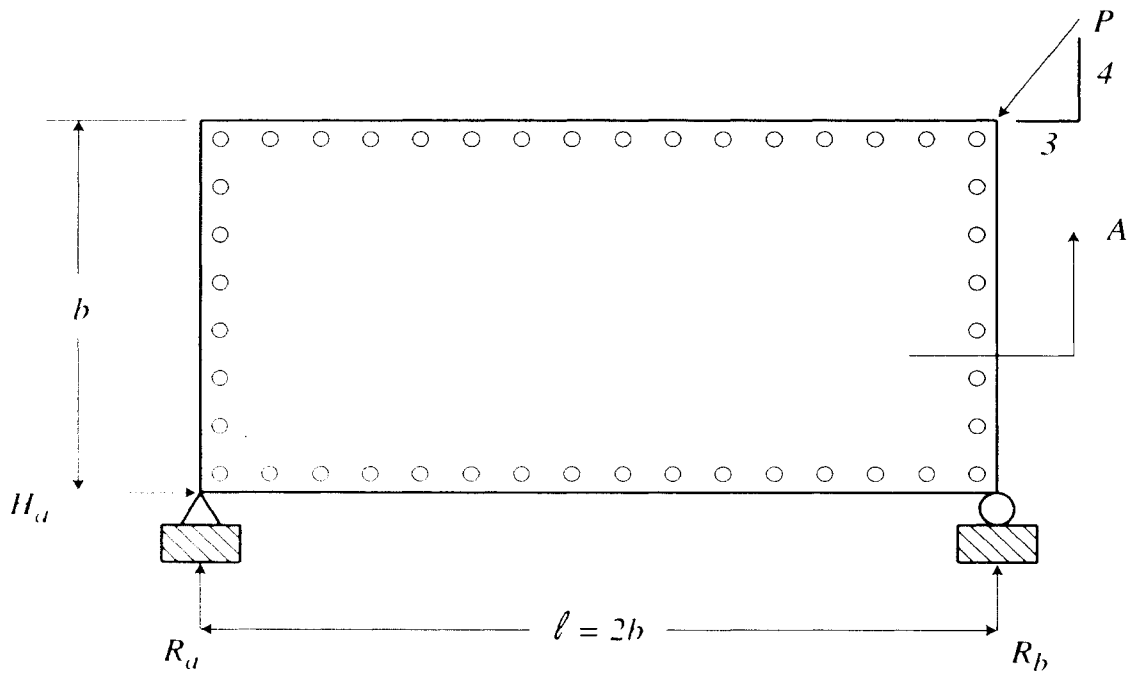
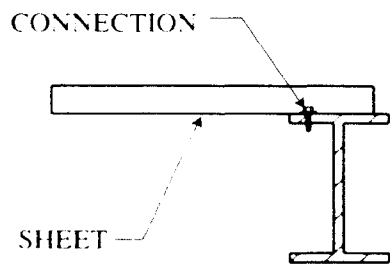


FIG. 1.2



SECTION - A

INTRODUCTION

The following series of design examples are arranged to illustrate selected problems encountered in the use of diaphragms. The more common problems usually are not in the assessment of either strength or stiffness, but in the structural analysis itself and particularly in the determination of deflections. For indeterminate structural systems, it is essential to know displacements, else the proper assignment of force distribution through the system may not be possible.

The first five examples introduce simple behavioral concepts including simple methods of deflection calculations. The remaining examples focus more toward design evaluations and, necessarily, they are limited to a specific loading condition. The assumed loading conditions are for illustrative purposes. A specific building design must be based on its own design loads that come from any direction.

EXAMPLE 1 DIAPHRAGM BEHAVIOR

The rectangular areas of **Figures 1.1** and **1.2** have different shear transfer systems. Compare the two when all perimeter areas are pin-connected at their ends.

$$P = 15 \text{ kip}$$

$$P = 66.7 \text{ kN}$$

a.	Components of P, Horizontal:	$P_h = \frac{3}{5} P$	$P_h = 9 \text{ kip}$	$\{P_h = 40.0 \text{ kN}\}$
	Vertical:	$P_v = \frac{4}{5} P$	$P_v = 12 \text{ kip}$	$\{P_v = 53.4 \text{ kN}\}$
	Find:	$H_a = P_h$	$H_a = 9 \text{ kip}$	$\{H_a = 40.0 \text{ kN}\}$
		$R_a = 4.5 \text{ kip}$	$\{R_a = 20.0 \text{ kN}\}$	$R_b = 7.5 \text{ kip}$
				$\{R_b = 33.4 \text{ kN}\}$

b. Truss (Figure 1.1)

The truss diagonal has a horizontal component of $9 \text{ kip } \{40.0 \text{ kN}\}$ and a vertical component of $4.5 \text{ kip } \{20.0 \text{ kN}\}$ resulting in a tension force of $10.1 \text{ kip } \{44.7 \text{ kN}\}$. The average shear across the panels is, parallel to $2b$,

$$S = \frac{9 \text{ kip}}{2b} = \frac{4.5 \text{ kip}}{b} \quad \left\{ \frac{40 \text{ kN}}{2b} = \frac{20 \text{ kN}}{b} \right\}$$

and parallel to b , $S = \frac{4.5 \text{ kip}}{b} \quad \left\{ \frac{20 \text{ kN}}{b} \right\}$, an equal value.

c. Diaphragm (Figure 1.2)

The diaphragm resists distortion of the rectangular area, as does the diagonal member in the truss. The average shears along both the long and short dimensions are:

$$S = \frac{H_a}{2b} = \frac{R_a}{b} = \frac{4.5 \text{ kip}}{b} \quad \left\{ \frac{20 \text{ kN}}{b} \right\}$$

Notes: The perimeter members are integral parts of the system and must be stable in order to transfer forces through the system. Given the diaphragm stiffness properties, its deflection under the load can be precisely modeled by a properly arranged truss. (See example 3.)

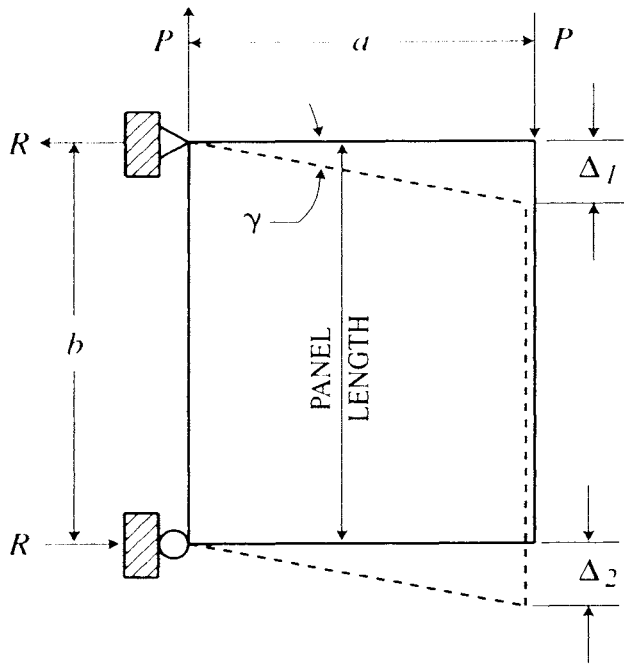


FIG 2.1

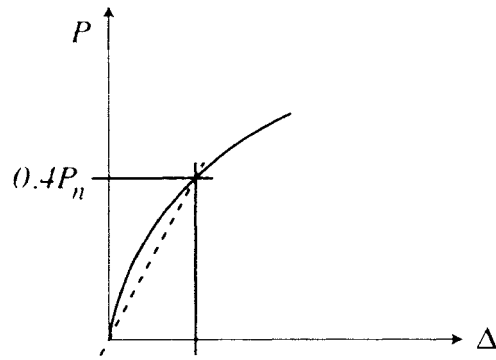
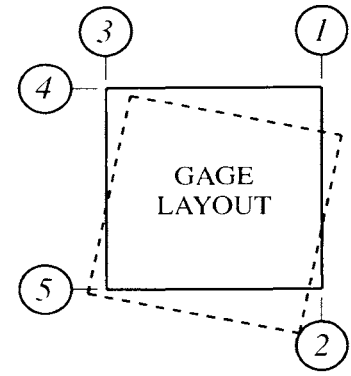


FIG 2.2

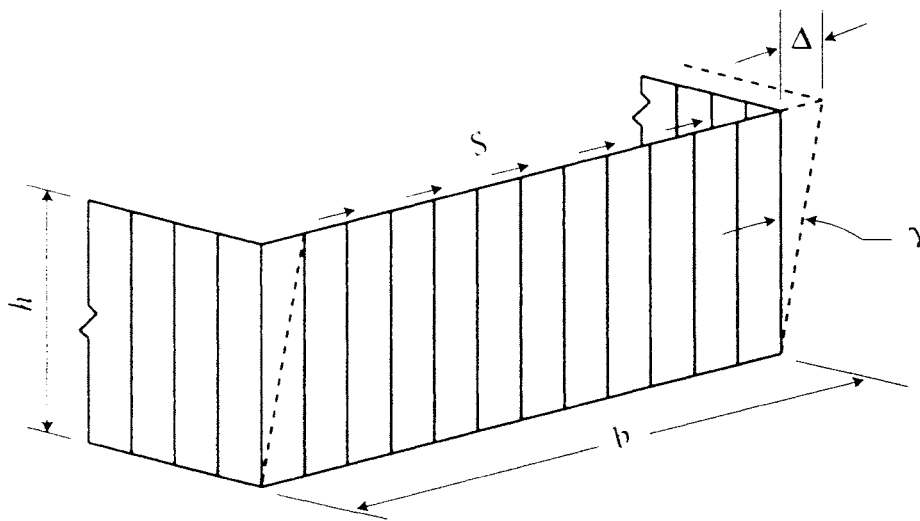


FIG 2.3

EXAMPLE 2 STIFFNESS

A diaphragm of width a and length b is to be tested to confirm predicted strength and stiffness values. **Figure 2.1** indicates the shape of the assembly.

a. For various stages of the gradually applied load P , record all corner movements as indicated by the gage layout. Gages 3, 4, and 5 will indicate any movement of the supports, which must be removed to arrive at the actual shear deflection. Δ_1 will be virtually identical to Δ_2 noting that axial strains in the perimeter members will be small. Find the net shear deflection to be:

$$\Delta = \frac{g_1 + g_2}{2} - g_3 - \frac{a}{b} (g_4 + g_5)$$

where g values are the net movements at each gage position.

b. Plot P versus Δ as in **Fig. 2.2**. G' is defined as relative to the slope of the line through $0.4 P_n$ in the substantially linear range. For small angles, the angle γ of **Fig. 2.1** and its tangent are essentially equal. Then,

$$G' = \frac{S}{\gamma} = \frac{P a}{\Delta b} = \frac{0.4 P_n a}{\Delta b}$$

$$S_n = \frac{P_n}{b} = \frac{R_n}{a}$$

P_n = ultimate observed load.

Notes: The average shears are identical either parallel to a or b . Stiffness depends, among other factors, on panel length and the fastener patterns. Had the panels spanned a shorter dimension a , a different stiffness value could have developed.

c. Suppose $G' = 20 \text{ kip/in. } \{3.50 \text{ kN/mm}\}$, find the displacement Δ in the wall system of **Fig. 2.3**.

The analysis has led to $S = 150 \text{ plf } \{2.19 \text{ kN/m}\}$ along the wall top. The wall is $h = 18 \text{ ft } \{5.49 \text{ m}\}$ high and $b = 42 \text{ ft } \{12.8 \text{ m}\}$ wide.

$$G' = \frac{S}{\gamma} = \frac{S h}{\Delta} \quad \text{or} \quad \Delta = \frac{S h}{G'}$$

$$\Delta = 0.135 \text{ in. } \{3.4 \text{ mm}\}$$

Note: A structural member must exist at the top and bottom of the wall along b for continuous shear transfer.

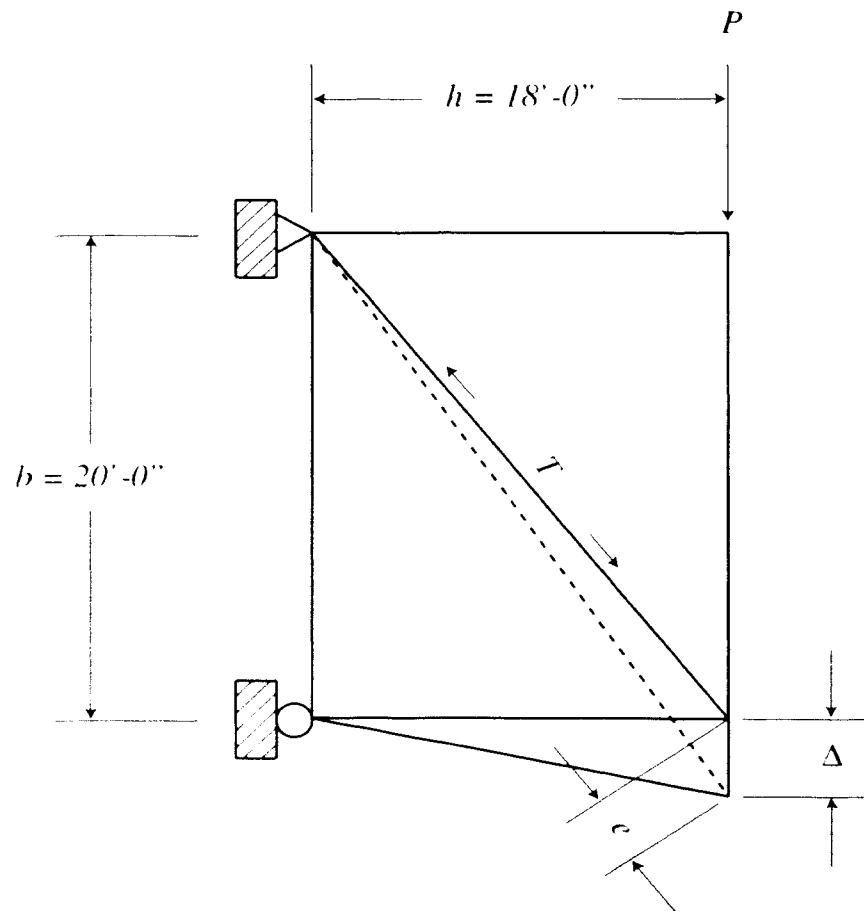
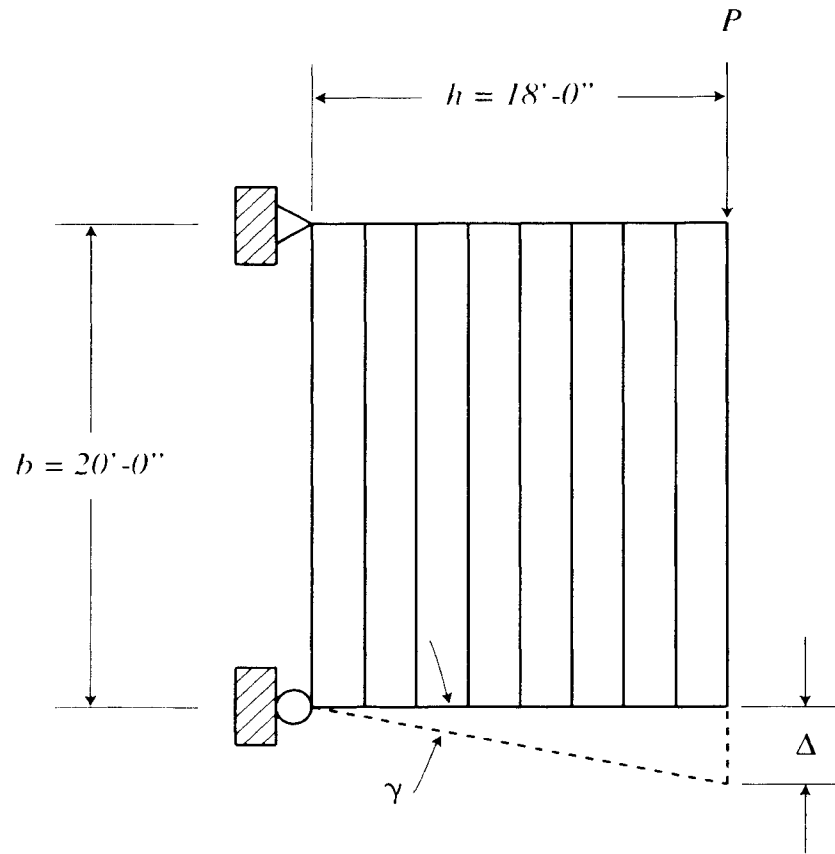


FIG 3

EXAMPLE 3 TRUSS ANALOGY

A diaphragm area of $h = 18 \text{ ft } \{5.49 \text{ m}\}$ and $b = 20 \text{ ft } \{6.10 \text{ m}\}$ has been found to have a stiffness of $G' = 15 \text{ kip/in. } \{2.63 \text{ kN/mm}\}$ and an unnotched design shear $S = 200 \text{ plf } \{2.92 \text{ kN/m}\}$. Find the shear deflection and compare the evaluation to deflections in a truss of similar size. $P = S b$, $P = 4 \text{ kip } \{17.8 \text{ kN}\}$.

$$\text{a.} \quad G' = \frac{S}{\gamma} = \frac{P/b}{\Delta/h} = \frac{Ph}{\Delta b} \quad \Delta = \frac{Ph}{G'b} \quad \Delta = 0.24 \text{ in.} \quad \{6.1 \text{ mm}\}$$

b. Consider the truss in **Figure 3** as having pinned connections and a steel rod of $d = 0.75 \text{ in. } \{19 \text{ mm}\}$ and area A_d . The four perimeter members are presumed to have very large areas relative to A_d , as often is the case for supplemental bracing. Then,

$$A_d = \frac{\pi d^2}{4} \quad A_d = 0.442 \text{ in}^2 \quad \{285 \text{ mm}^2\}$$

$$L_d = \sqrt{h^2 + b^2} \quad L_d = 26.91 \text{ ft} \quad \{8.20 \text{ m}\}$$

$$T = P \left(\frac{L_d}{b} \right) \quad T = 5.38 \text{ kip} \quad \{23.9 \text{ kN}\}$$

$$e = \left(\frac{T}{A_d E} \right) L_d \quad e = 0.133 \text{ in.} \quad \{3.27 \text{ mm}\}$$

$$\Delta = \frac{L_d}{b} e \quad \Delta = 0.179 \text{ in.} \quad \{4.40 \text{ mm}\}$$

c. Find the area A_d required for the truss to have a deflection $\Delta = 0.24 \text{ in. } \{6.10 \text{ mm}\}$.

$$\Delta = \left(\frac{L_d}{b} \right) e = \left(\frac{L_d}{b} \right) \left(\frac{T}{A_d E} \right) L_d = \frac{L_d^2 T}{b E A_d}$$

$$A_d = \frac{L_d^2 T}{\Delta b E} \quad A_d = 0.33 \text{ in}^2 \quad \{206 \text{ mm}^2\}$$

d. Suppose the systems in a.(diaphragm system) and b.(truss system) were used jointly. Find the final displacement and how the load is shared.

$$\text{The stiffness of the truss system is: } G'_t = \frac{Ph}{\Delta b} \quad G'_t = 20.1 \text{ kip/in.} \quad \{3.52 \text{ kN/mm}\}$$

The stiffness of the diaphragm is given as $15 \text{ kip/in. } \{2.63 \text{ kN/m}\}$.

The combined or system stiffness is $G'_s = G' + G'_t$ $G'_s = 35.1 \text{ kip/in.}$ $\{6.14 \text{ kN/mm}\}$

The truss will carry $P_t = \frac{G'_t}{G'_s} P$ $P_t = 2.29 \text{ kip}$ $\{10.2 \text{ kN}\}$

The diaphragm will carry $P_d = \frac{G'}{G'_s} P$ $P_d = 1.71 \text{ kip}$ $\{7.61 \text{ kN}\}$

The deformation compatibility is confirmed by checking the deflection of the components.

The system deflection is $\Delta_s = \frac{P h}{G'_s b}$ $\Delta_s = 0.103 \text{ in.}$ $\{2.61 \text{ mm}\}$

The truss deflection is $\Delta_t = \frac{P_t h}{G'_t b}$ $\Delta_t = 0.103 \text{ in.}$ $\{2.61 \text{ mm}\}$

The diaphragm deflection is $\Delta_d = \frac{P_d h}{G' b}$ $\Delta_d = 0.103 \text{ in.}$ $\{2.61 \text{ mm}\}$

Note: In mixed systems, loads are shared in proportion to the relative stiffness. Further it can be seen that a single diagonal could be used to model the stiffness of a diaphragm.

For further information of mixed systems, refer to "The Interaction of Shear Diaphragms and Diagonal Bracing" by Walter A. Jankowski and Dr. Don Sherman presented at the Ninth International Specialty Conference on Cold-Formed Steel Structures, St. Louis, Missouri, November 8-9, 1988.

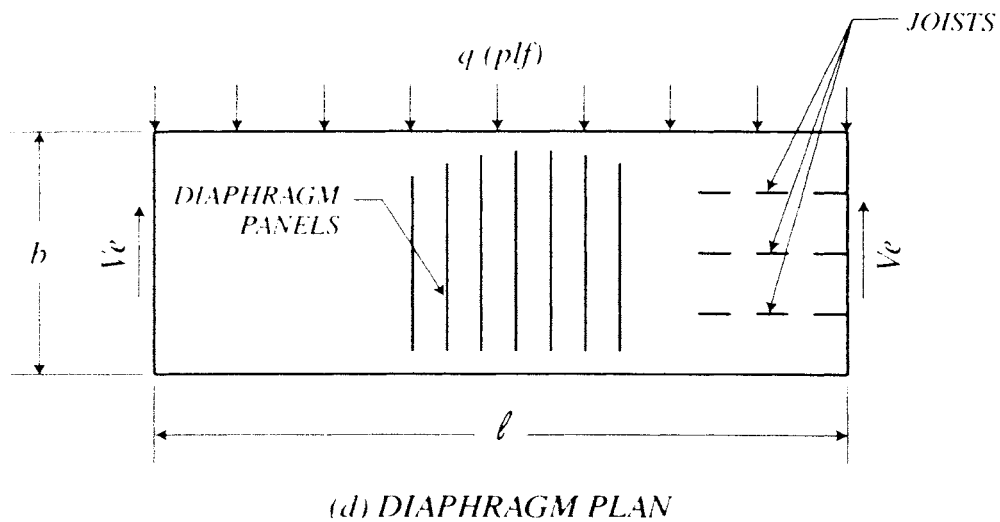
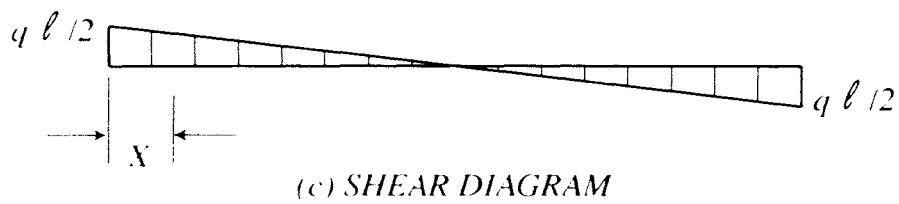
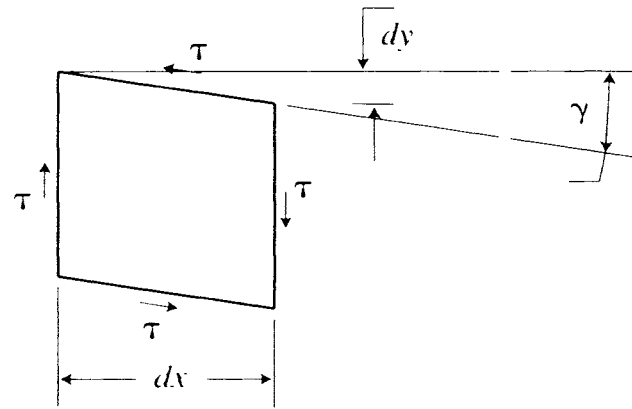
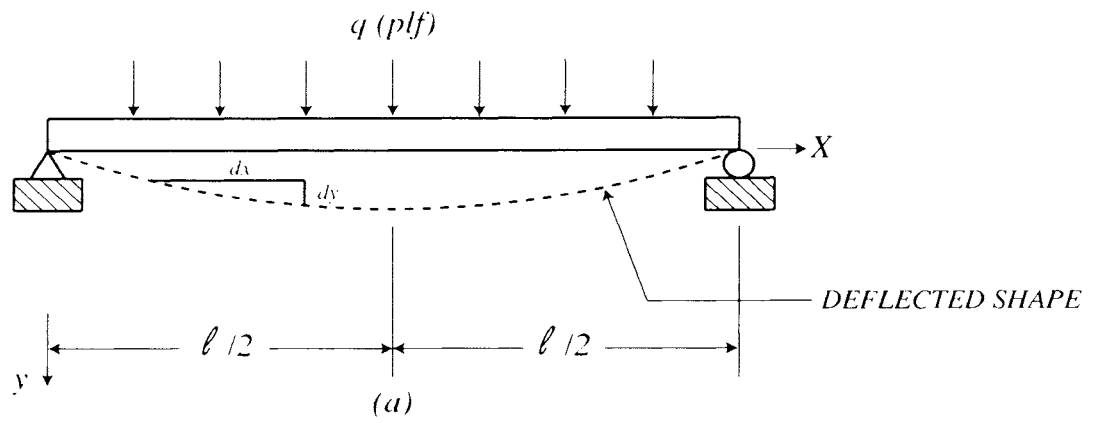


FIG 4

EXAMPLE 4 DEFLECTIONS

The diaphragm of **Fig. 4(d)** represents the roof diaphragm indicated in **Fig. 4(a)** where q is the total un-factored line load from both the windward and leeward walls. Find the deflection at the centerline of the diaphragm given:

$$q = 200 \text{ plf } \{2.92 \text{ kN/m}\} \quad b = 40 \text{ ft} \quad \{12.2 \text{ m}\}$$

$$\ell = 125 \text{ ft } \{38.1 \text{ m}\} \quad G' = 30 \text{ kip/in.} \quad \{5.25 \text{ kN/m}\}$$

Joist beams are at 10 ft on center, each with area $A_{jt} = 10 \text{ in}^2$

$$V_e = \frac{q\ell}{2} \quad \text{and } V_e = S_{max} \quad S = \frac{V_e}{b} \quad S = 313 \text{ plf} \quad \{4.56 \text{ kN/m}\}$$

Consider the moment of inertia conservatively as being comprised from the two outermost joists only. Then,

$$I = 2 A_{jt} \left(\frac{b}{2} \right)^2 \quad I = 1.15 \times 10^6 \text{ in}^4 \quad \{4.80 \times 10^{11} \text{ mm}^4\}$$

$$\text{Bending deflection: } \Delta_b = \frac{5 q \ell^4}{384 E I} \quad \Delta_b = 0.032 \text{ in.} \quad \{0.795 \text{ mm}\}$$

Shear deflection: From Example 2, the shear strain γ is $\gamma = \frac{S}{G'} = \frac{dy}{dx}$, the slope of the shear deflected shape. At any point x in **Fig 4(c)**, the average shear across the diaphragm is:

$$S = \frac{\left(\frac{q\ell}{2} - qx \right)}{b} \quad \text{and} \quad \frac{S}{G'} = \frac{dy}{dx} = \frac{q}{b G'} \left(\frac{\ell}{2} - x \right)$$

$$\Delta_s = \int_0^{\frac{\ell}{2}} dy = \int \frac{q}{b G'} \left(\frac{\ell}{2} - x \right) dx \quad \text{leading to} \quad \Delta_s = \frac{q \ell^2}{8 b G'} \quad \Delta_s = 0.326 \text{ in.} \quad \{8.3 \text{ mm}\}$$

$$\text{The total deflection calculated is} \quad \Delta = \Delta_b + \Delta_s \quad \Delta = 0.358 \text{ in.} \quad \{9.1 \text{ mm}\}$$

Note that the Δ_b value is based on beam theory requiring the "beam" to be several times longer than it is deep and which theory presumes a G' stiffness an order of magnitude greater than what is common in diaphragms. (See Section 3.1.) Further note that, even if a bending theory were applicable, the $I = 1.15 \times 10^6 \text{ in}^4$ may be considerably too small. The more correct deflection then is design $\Delta_{max} = 0.326 \text{ in.}$

STIFFNESS AND FLEXIBILITY Some design manuals specify diaphragm flexibility for the purpose of finding displacement (32). Using the **Fig 4(d)** diaphragm, compare the cited Canadian reference to SDI stiffness values.

Canadian

$$\ell = 125 \text{ ft}$$

$$w = 200 \text{ plf}$$

$$D = 40 \text{ ft}$$

$$R = \frac{w \ell}{2}$$

$$V_{ave} = \frac{R}{2D}$$

$$F = 33.33 \text{ in./lbf}$$

$$\Delta_w = \frac{V_{ave} \ell F}{2000000} \quad \Delta_w = 0.325 \text{ in.}$$

Then
$$\frac{V_{ave} \ell F}{2(10^6)} = \frac{\frac{R}{2D} \ell F}{2(10^6)} = \frac{w \ell}{4D} \frac{\ell F}{2(10^6)} = \frac{q \ell^2}{8bG'}$$

But noting that $b = D$, the resulting equality is $wF = \frac{q}{G'} \cdot 10^6$

SDI

$$\ell = 125 \text{ ft}$$

$$q = 200 \text{ plf}$$

$$b = 40 \text{ ft}$$

$$V_e = \frac{q \ell}{2}$$

$$V_e = 12.5 \text{ kip}$$

$$G' = 30 \text{ kip/in.}$$

$$\Delta = \frac{q \ell^2}{8 b G'} \quad \Delta = 0.326 \text{ in.}$$

Some authorities define diaphragms as in the following list that shows direct comparisons.

	F (micro in./lbf)	SDI G' (kip/in.)
Flexible	70 to 150	14.3 to 6.67
Semi-flexible	10 to 70	100 to 14.3
Semi-rigid	1 to 10	1000 to 100
Rigid	less than 1	over 1000
	F (micro mm/N)	SDI G' (kN/mm)
Flexible	400 to 850	2.50 to 1.17
Semi-flexible	60 to 400	17.5 to 2.50
Semi-rigid	6 to 60	175 to 17.5
Rigid	less than 6	over 175

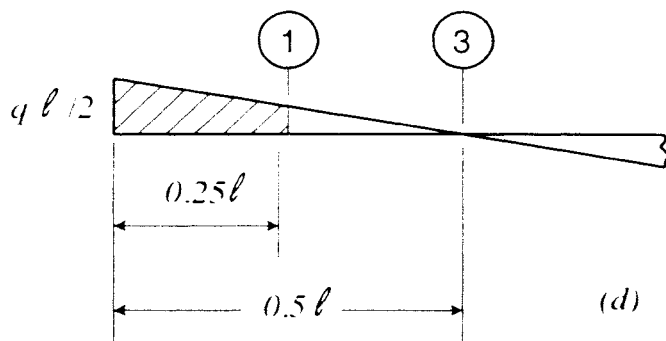
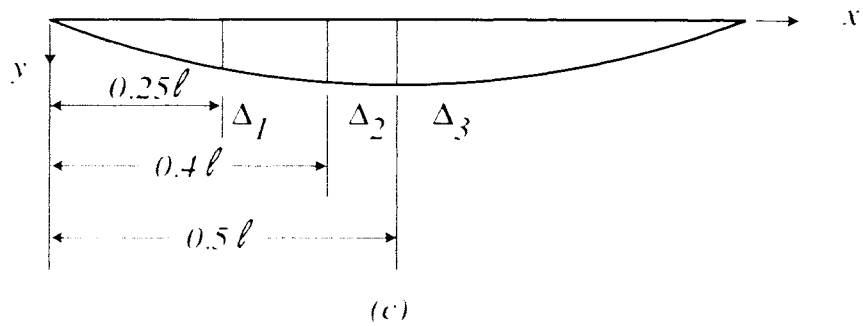
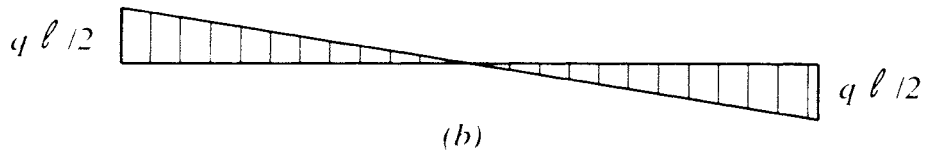
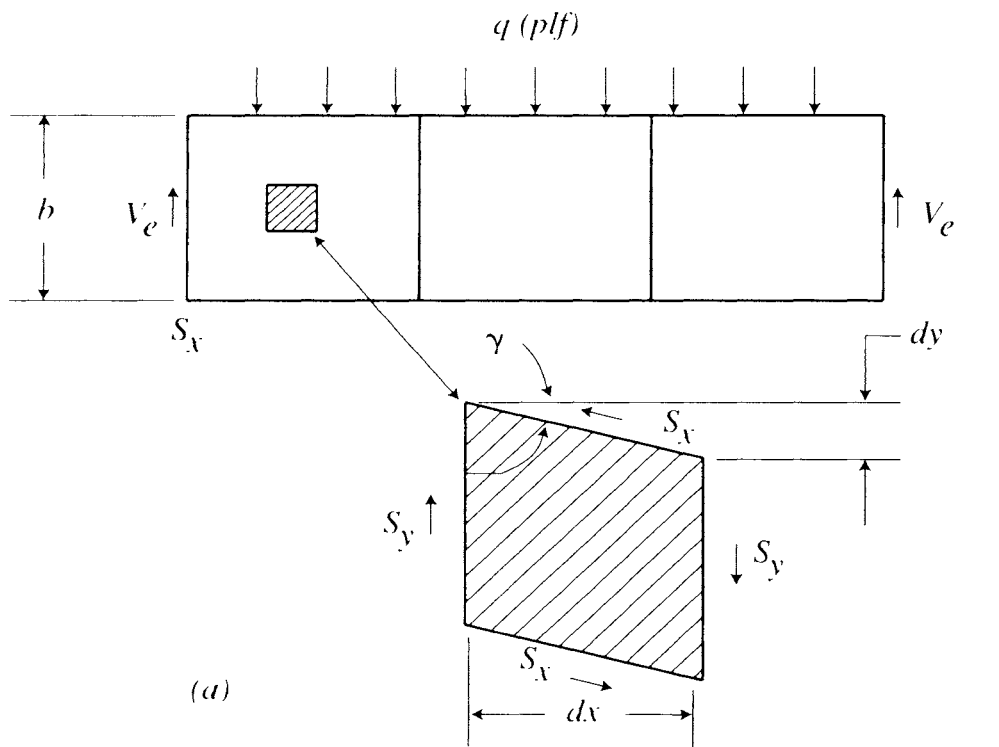


FIG 5 SHEAR DEFLECTIONS

EXAMPLE 5 SIMPLIFIED DEFLECTIONS

The general deflection for a very long and narrow diaphragm may be found from the general equations:

$$\text{Bending} \quad \frac{d^2y}{dx^2} = -\frac{M}{EI} \quad (\text{a})$$

$$\text{Shear} \quad \frac{dy}{dx} = \frac{V}{bG} \quad (\text{b})$$

where V = total shear force across b at any point x of **Fig. 5**. With $\frac{dV}{dx} = -q$, the general equation is:

$$\frac{d^2y}{dx^2} = -\frac{1}{EI} \left(M + \frac{qEI}{bG} \right)$$

For a uniformly loaded diaphragm, on a simple span, the maximum deflection at $x = \frac{\ell}{2}$ is:

$$\Delta = \frac{5q\ell^4}{384EI} + \frac{q\ell^2}{8bG} \quad (\text{c})$$

It is important to note that the bending term presumes plane section bending and, further, a length of "several times" the depth is expected. Equation (a) simply is not applicable to most diaphragms because they are short, deep, and shear sensitive.

The second term of Equation (c) may be compared to the area enclosed by half the shear diagram of **Fig. 5(b)** where the area is $q\ell^2/8$. Referring to **Example 4**,

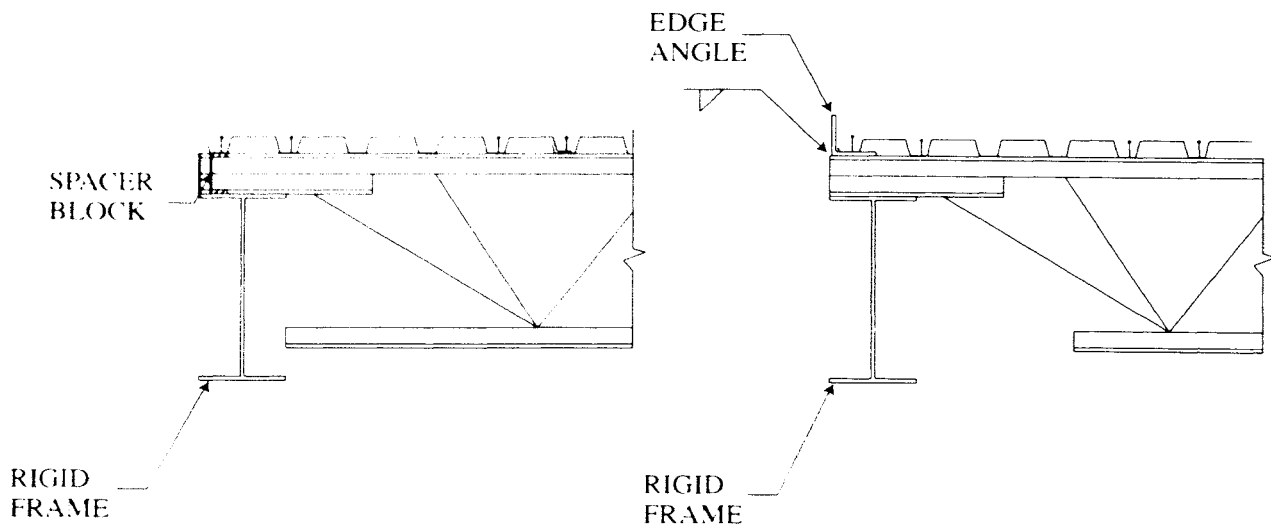
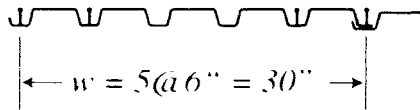
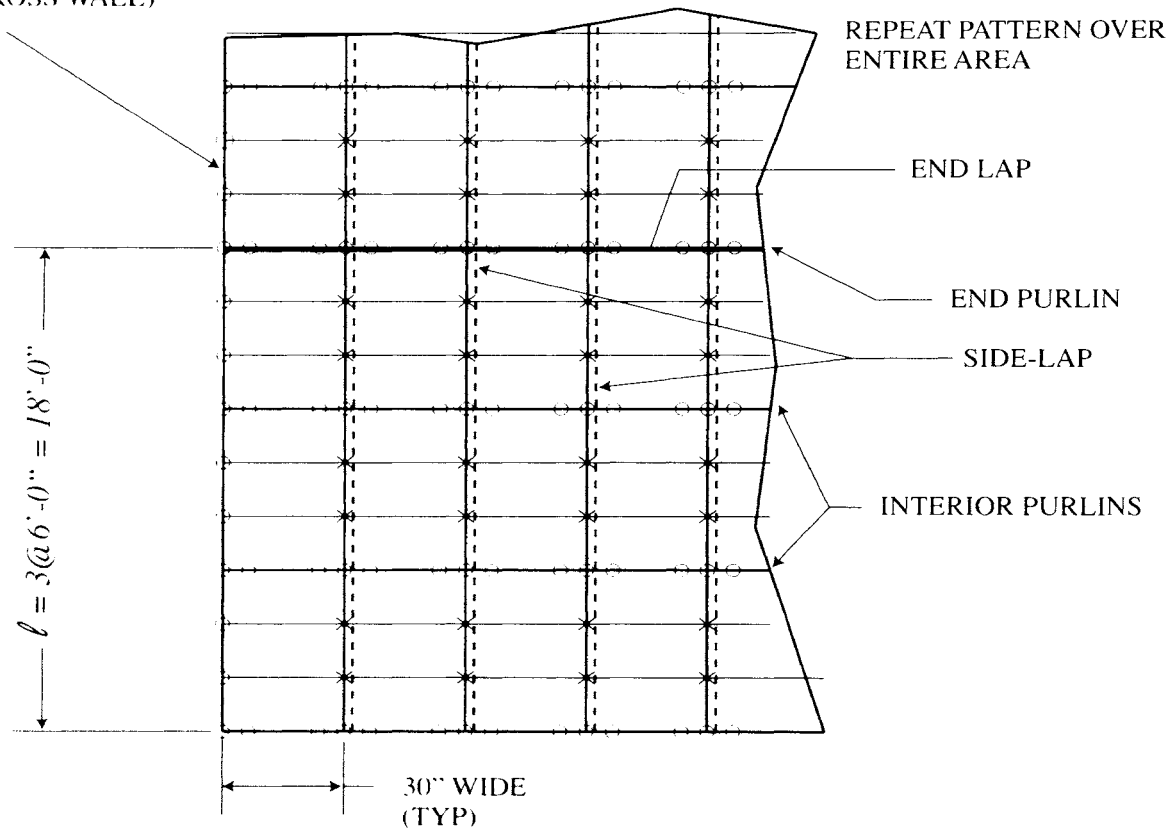
$$\Delta_s = \int_0^x \frac{q}{2bG} (\ell - 2x) dx = \frac{q}{2bG} (\ell x - x^2)$$

$$\text{At } x = \ell/4, \text{ for example, } \Delta = \frac{3q\ell^2}{32bG}$$

$$\text{The shaded area in Fig. 5(d) is } \frac{1}{2} \frac{\ell}{4} \left(\frac{q\ell}{2} + \frac{q\ell}{4} \right) = \frac{3q\ell^2}{32}$$

The change in shear deflection, between two points, equals the shear diagram area between the same two points, divided by the shear width b and the shear diaphragm stiffness G .

EXTREME EDGE
(END CROSS WALL)



SECTION A. ALTERNATIVES FOR INTERMEDIATE
EDGE WELD POSITIONS

FIG 6

EXAMPLE 6 STRENGTH EVALUATION

A diaphragm has $\ell = 18 \text{ ft } \{5.49 \text{ m}\}$ long WR type panels on three equal spans as in **Fig. 6**. The design thickness is $t = 0.0295 \text{ in. } \{0.75 \text{ mm}\}$, and $d_{\text{weld}} = 0.625 \text{ in. } \{15.9 \text{ mm}\}$ arc-spot welds are used in a 30/4 pattern on all supports and at the ends. (See Appendix IV for typical fastener patterns.) Two No. 10 stitch screws are to be used at the side-laps within each span. Find the design shear load.

$$\text{Eq. 4.2.1-1: } F_u = 45 \text{ ksi } \{310 \text{ MPa}\} \quad Q_f = 2.2 t F_u (d_{\text{weld}} - t) \quad Q_f = 1739 \text{ lbf } \{7.74 \text{ kN}\}$$

$$\text{Eq. 4.5-2: } d_{\text{screw}} = 0.1867 \text{ in. } \{4.74 \text{ mm}\} \quad Q_s = 115 dt = 115(0.1867 \text{ in.})(0.0295 \text{ in.})$$

$$Q_s = 633 \text{ lbf } \{3.76 \text{ t} = 2.82 \text{ kN}\} \quad \alpha_s = \frac{Q_s}{Q_f} \quad \alpha_s = 0.364$$

$$\text{Eq. 2.2-4: } \ell_v = \frac{\ell}{3}, \text{ ft } \{m\} \quad h = 1.5 \text{ in. } \{38.1 \text{ mm}\} \quad t = 0.0295 \text{ in. } \{0.75 \text{ mm}\}$$

$$\lambda = 1 - \frac{h\ell_v}{240\sqrt{t}} = 0.782 \quad n_s = 6 \quad (\text{3 spans x 2 screws per span})$$

$$\text{Eq. 2.2-1: } w = 30 \text{ in. } \{762 \text{ mm}\} \text{ (width of deck sheet)}$$

The distance from the centerline of the deck for each weld is

$$x_1 = 9 \text{ in. } \{229 \text{ mm}\} \quad x_2 = 15 \text{ in. } \{381 \text{ mm}\} \quad x_3 = 9 \text{ in.} \quad x_4 = 15 \text{ in.}$$

$$\alpha_i = \frac{\sum_{i=1}^4 x_i}{w} \quad \alpha_1 = 1.6000 \quad \text{(fastener attachment at interior purlins is the same as for exterior purlins)} \quad \alpha_2 = \alpha_1$$

$$n_e = 6 \quad (\text{3 spans x 2 screws per span}) \quad n_p = 2 \quad (\text{2 interior purlins})$$

$$\text{Eq. 2.2-2: } S_{ne} = (2 \alpha_1 + n_p \alpha_2 + n_e) \frac{Q_f}{\ell} \quad S_{ne} = 1198 \text{ plf} \quad \{17.5 \text{ kN/m}\}$$

(Edge fastener limitation)

$$\text{Eq. 2.2-4a: } B = n_s \alpha_s + \frac{1}{w^2} \left[2 n_p \sum_{p=1}^4 (x_p)^2 + 4 \sum_{c=1}^4 (x_c)^2 \right] \quad B = 7.624$$

(Interior panel fastener limitation)

$$A = 1 \quad S_{ni} = [2 A (\lambda - 1) + B] \frac{Q_f}{\ell} \quad S_{ni} = 694 \text{ plf} \quad \{10.1 \text{ kN/m}\}$$

$$\text{Eq. 2.2-5: } N = \frac{1.20}{\text{ft}} \quad (\text{3 welds per 30 in. (2.50 ft) sheet width})$$

$$\{N = 3.94 \text{ m}^{-1} \quad \text{3 welds per 0.762 m sheet width}\}$$

(Corner fastener limitation)

$$S_{nc} = Q_f \sqrt{\frac{N^2 B^2}{\ell^2 N^2 + B^2}} \quad S_{nc} = 695 \text{ plf} \quad \{10.1 \text{ kN/m}\}$$

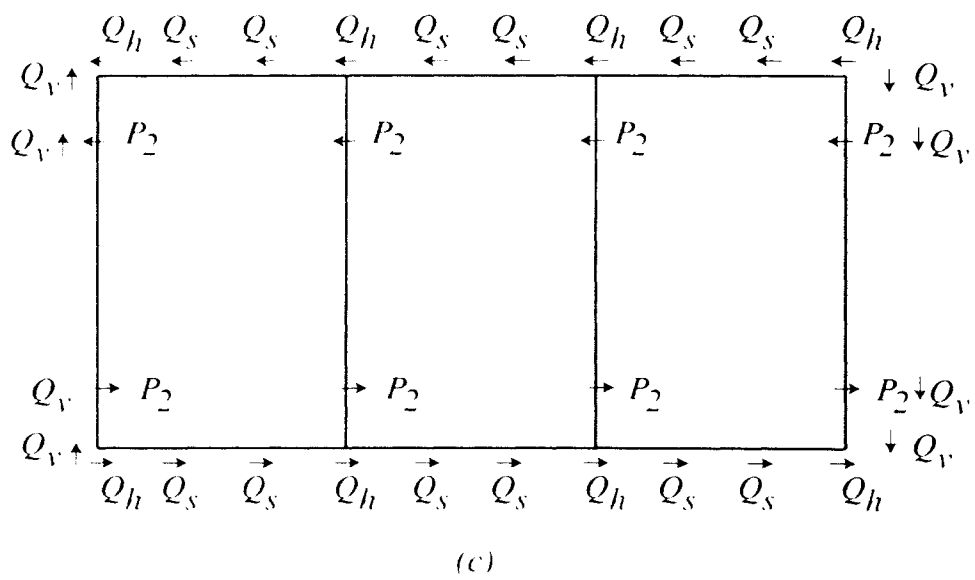
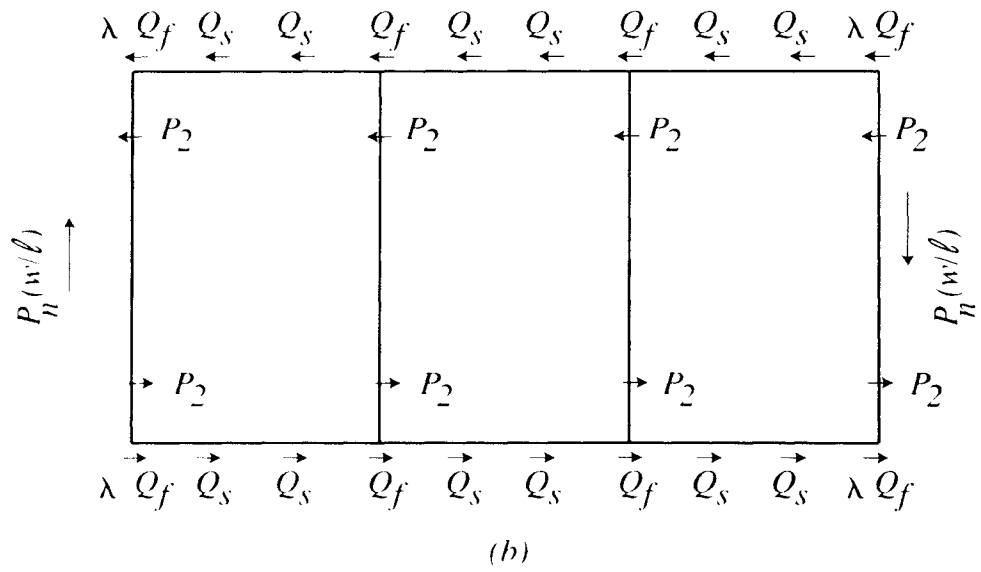
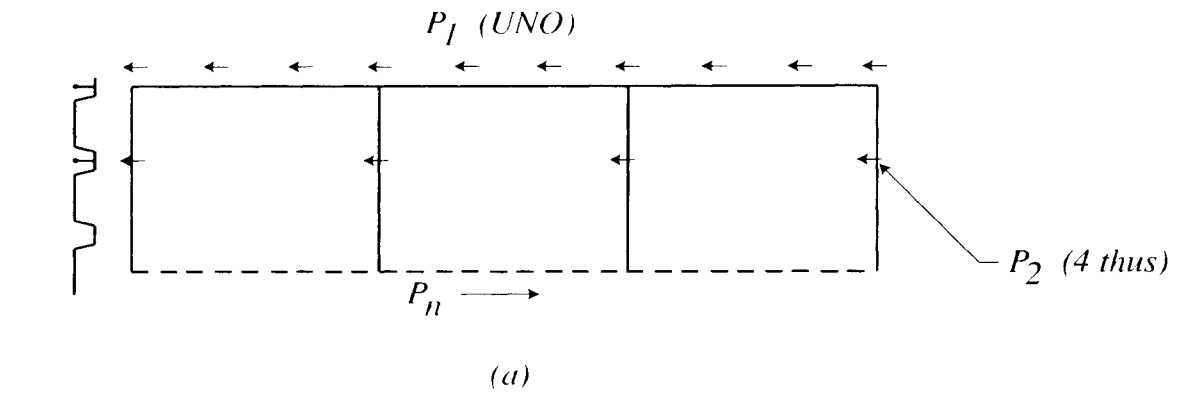


FIG 6.1

Assume the diaphragm is subject to wind loading, then

LRFD

$$\phi = 0.70$$

The factored design shear is:

$$\phi S_n = 0.70 \min (S_{nc}, S_{mi}, S_{nc})$$

$$\phi S_n = 486 \text{ plf } \{7.09 \text{ kN/m}\}$$

Check the panel buckling limit

From Table 2.1 on page 2-12

$$\phi = 0.80$$

The nominal diaphragm shear due to panel buckling for 1.5 in. WR deck $t = 0.0295 \text{ in.}$, $S_n = 2132 \text{ plf}$, from page AV-13.

$$\phi S_n = 0.80 \times 2132 \text{ plf} = 1706 \text{ plf } \{24.88 \text{ kN/m}\}$$

Panel buckling is not governing the diaphragm design

Compare the design load to 0.70 times the nominal value from Appendix V, page AV-13

$$\text{i.e. } 0.70 \times 695 \text{ plf} = 487 \text{ plf } \{7.10 \text{ kN/m}\}$$

ASD

$$\Omega = 2.35$$

The allowable design shear is:

$$S_n / \Omega = \min (S_{nc}, S_{mi}, S_{nc}) / \Omega$$

$$S_n / \Omega = 295 \text{ plf } \{4.30 \text{ kN/m}\}$$

Check the panel buckling limit

From Table 2.1 on page 2-12

$$\Omega = 2.00$$

$$S_n / \Omega = 2132 / 2.00 = 1066 \text{ plf } \{15.55 \text{ kN/m}\}$$

Compare the design load to the nominal value from Appendix V, page AV-13, divided

$$\text{by } 2.35 \text{ i.e. } 695 \text{ plf} / 2.35 = 296 \text{ plf } \{4.32 \text{ kN/m}\}$$

The edge support angle must deliver the design load to the lateral loading resisting member. In this case the small force ($486 \text{ plf} \times 6 \text{ ft} = 2.92 \text{ kip factored}$) or ($296 \text{ plf} \times 6 \text{ ft} = 1.78 \text{ kip allowable}$) could easily be accommodated by a 3/16 in. x 1 in. fillet weld and an angle 2 in. x 2 in. x 3/16 in.

The strength of the diaphragm can also be developed from free body diagrams along with the principles outlined in Chapter 2.

For the edge fastener limitation, the forces along the centerline of the deck equal the forces on the connections. The strength of the connection varies linearly from the centerline. Refer to **Fig. 6.1(a)**.

$$P_1 = Q_f \qquad P_2 = \frac{9}{15} P_1 \qquad P_2 = 1043 \text{ lbf } \{4.64 \text{ kN/m}\}$$

$$P_n = 10 P_1 + 4 P_2 \qquad S_{nc} = \frac{P_n}{\ell} \qquad S_{nc} = 1198 \text{ plf } \{17.5 \text{ kN/m}\}$$

which agrees with the previous calculation.

For the interior panel fastener limitation, the moments generated by the connection forces are equated with those developed in the deck panel. Refer to **Fig 6.1(b)**. Taking moments about the centerline of the deck panel:

$$M_c = 4 Q_f (15 \text{ in.}) + 4 \lambda Q_f (15 \text{ in.}) + 8 P_2 (9 \text{ in.}) + 12 Q_s (15 \text{ in.}) \qquad M_c = 375022 \text{ in.-lbf}$$

$$\{4 Q_f (381 \text{ mm}) + 4 \lambda Q_f (381 \text{ mm}) + 8 P_2 (229 \text{ mm}) + 12 Q_s (381 \text{ mm}) = 42415 \text{ mm-kN}\}$$

The force along the ends of the deck results in the moment: $P_n \left(\frac{w}{\ell} \right) \ell = P_n w$

$$\text{Therefore, } P_n = \frac{M_c}{w} \qquad P_n = 12501 \text{ lbf } \{55.66 \text{ kN}\} \qquad \text{and} \qquad S_{mi} = \frac{P_n}{\ell} \qquad S_{mi} = 694 \text{ plf } \{10.14 \text{ kN/m}\}$$

For the corner fastener limitation, moments are again taken by the connection forces, but are equated with the connection strength, noting that the connection strength is the resultant of the horizontal and vertical components of the corner connection. Refer to **Fig. 6.1(c)**

$$M_c = 8Q_h(15 \text{ in.}) + 8\left(\frac{9 \text{ in.}}{15 \text{ in.}}\right)Q_h(9 \text{ in.}) + 12(\alpha_s Q_h)(15 \text{ in.}) = 228.72 Q_h$$

$$\{8Q_h(381 \text{ mm}) + 8\left(\frac{229 \text{ mm}}{381 \text{ mm}}\right)Q_h(229 \text{ mm}) + 12(\alpha_s Q_h)(381 \text{ mm}) = 5813 Q_h, \text{ mm-kN}\}$$

The force along the ends of the deck again results in the moment: $P_n \left(\frac{w'}{\ell}\right) \ell = P_n w'$

Equating

$$228.72 Q_h = P_n w', \text{ in.-lbf}$$

$$\{5813 Q_h = P_n w', \text{ mm-kN}\}$$

$$P_n = 7.624 Q_h$$

$$\{P_n = 7.629 Q_h\}$$

and noting that $\frac{P_n}{\ell} = S_n = \frac{0.4236 Q_h}{\text{ft}}$, so $Q_h = \frac{S_n}{0.4236 / \text{ft}}$

$$\left\{ S_n = \frac{1.3896 Q_h}{\text{m}}, Q_h = \frac{S_n}{1.3896 / \text{m}} \right\}$$

The average diaphragm force S_n is developed in N connections as Q_v .

In this case $N = \frac{1.2}{\text{ft}}$, so $Q_v = \frac{S_n}{N} = \frac{S_n}{1.2/\text{ft}}$. $\left\{ N = 3.94 \text{ m}^{-1}, Q_v = \frac{S_n}{3.94/\text{m}} \right\}$

The resultant of Q_v and Q_h approaches the connection strength Q_f .

$$Q_f = \sqrt{Q_v^2 + Q_h^2} = S_n \sqrt{\left[\frac{1}{1.2/\text{ft}}\right]^2 + \left[\frac{1}{0.4236/\text{ft}}\right]^2} = 2.5035 (\text{ft}) (S_n)$$

$$\left\{ Q_f = S_n \sqrt{\left[\frac{1}{3.94/\text{m}}\right]^2 + \left[\frac{1}{1.3896/\text{m}}\right]^2} = 0.763 (\text{m}) (S_n) \right\}$$

$$S_n = \frac{Q_f}{2.5035 \text{ ft}} = \frac{1739 \text{ lbf}}{2.5035 \text{ ft}} = 695 \text{ plf}$$

$$\left\{ S_n = \frac{7.74 \text{ kN}}{0.763 \text{ m}} = 10.13 \text{ kN/m} \right\}$$

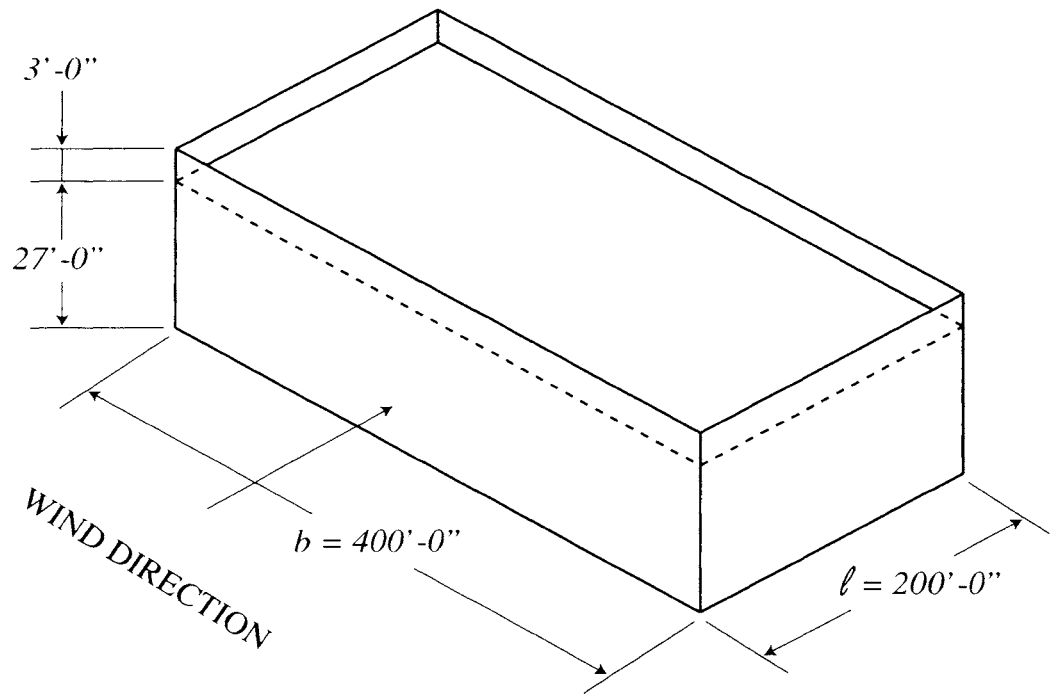


FIG 7.1

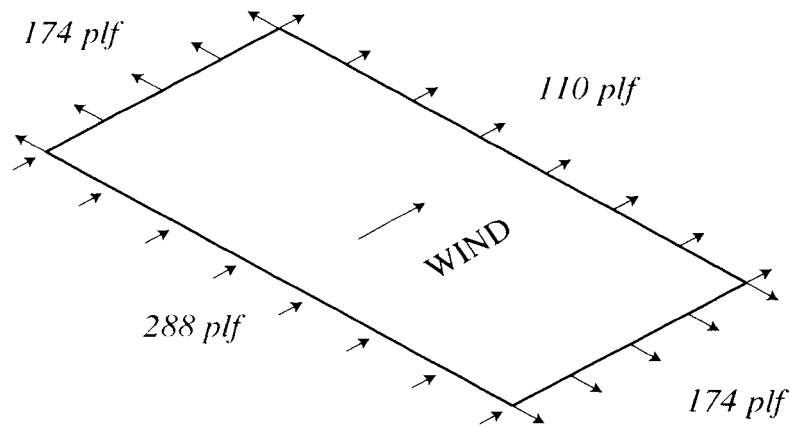


FIG 7.2 (internal suction)

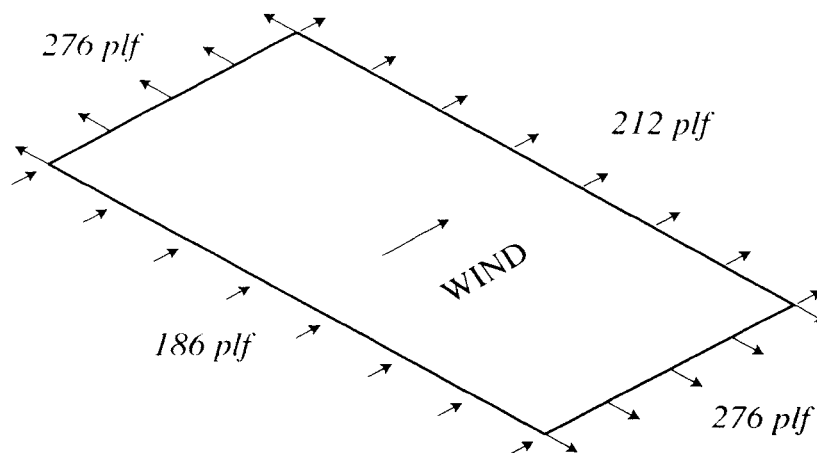


FIG 7.3 (internal pressure)

EXAMPLE 7 ROOF DESIGN

Make a preliminary design for the roof deck needed for a $\ell = 200 \text{ ft } \{61 \text{ m}\} \times b = 400 \text{ ft } \{122 \text{ m}\} \times 30 \text{ ft } \{9.14 \text{ m}\}$ warehouse. The construction involves tilt-up wall panels that rely on the roof diaphragm for stability.

Consider the structure both with and without an expansion joint at $b/2$. Refer to **Fig. 7.1** for details.

There are a number of references and codes for determining wind loads on buildings. Minimum Design Loads for Buildings and Other Structures (ASCE 7-98) is one such reference. Rather than calculate the forces in this example, the following line loads to the roof diaphragm are as given in **Fig 7.2** and **Fig 7.3**.

Note that the "down wind" loads: $w = 398 \text{ plf } \{5.81 \text{ kN/m}\} = 288 + 110 = 186 + 212$. The internal pressure effects lead to no net diaphragm shears; those pressure effects simply move throughout the diaphragm support structure to the opposite wall. Wall-to-roof connections must be designed accordingly.

LRFD

The loads given are to be factored, using a wind load factor $\gamma_w = 1.6$, the total diaphragm shear delivered to the end walls is: $R_{ult} = \gamma_w w \frac{b}{2}$, then $R_{ult} = 127 \text{ kip } \{567 \text{ kN}\}$.

Along the 200-ft end wall, the average shear is:

$$S_u = \frac{R_{ult}}{\ell} \quad S_u = 635 \text{ plf } \{9.30 \text{ kN/m}\}$$

ASD

The total diaphragm shear delivered to the end walls is: $R = w \frac{b}{2}$, then $R = 79 \text{ kip } \{354 \text{ kN}\}$.

$$S = \frac{R}{\ell} \quad S = 398 \text{ plf } \{5.81 \text{ kN/m}\}$$

Note that the required diaphragm shears vary with the shear diagram as in **Figure 7.4**.

The roof diaphragm will be zoned into 3 different areas. Zoning is a good way to optimize the economy of the roof diaphragm.

In Zone 1, the required diaphragm strength is

LRFD

$$S_u = 635 \text{ plf } \{9.30 \text{ kN/m}\}$$

ASD

$$S = 398 \text{ plf } \{5.81 \text{ kN/m}\}$$

Select a WR deck with design thickness $t = 0.0295 \text{ in. } \{0.75 \text{ mm}\}$ and with a 36/7 pattern of 5/8 in. puddle weld and No. 10 stitch screws. The deck span is $\ell_v = 5 \text{ ft } \{1.52 \text{ m}\}$. From Appendix V, page AV-13, with 5 stitch screws per deck span, resistance factor ϕ and safety factor Ω are from Table 2.1 (page 2-12), the design strength is:

$$\phi S_u = 0.70 \times 1265 = 886 \text{ plf } \{12.92 \text{ kN/m}\}$$

$$> S_u = 635 \text{ plf } \{9.30 \text{ kN/m}\}$$

$$\frac{S_u}{\Omega} = \frac{1265}{2.35} = 538 \text{ plf } \{7.85 \text{ kN/m}\}$$

$$> S = 398 \text{ plf } \{5.81 \text{ kN/m}\}$$

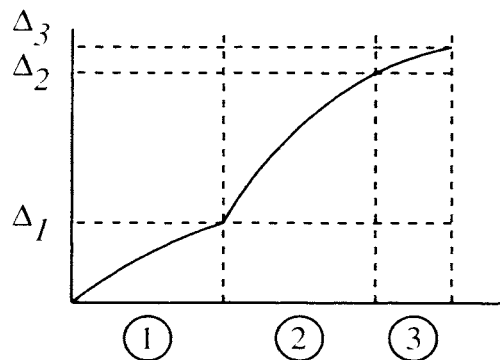
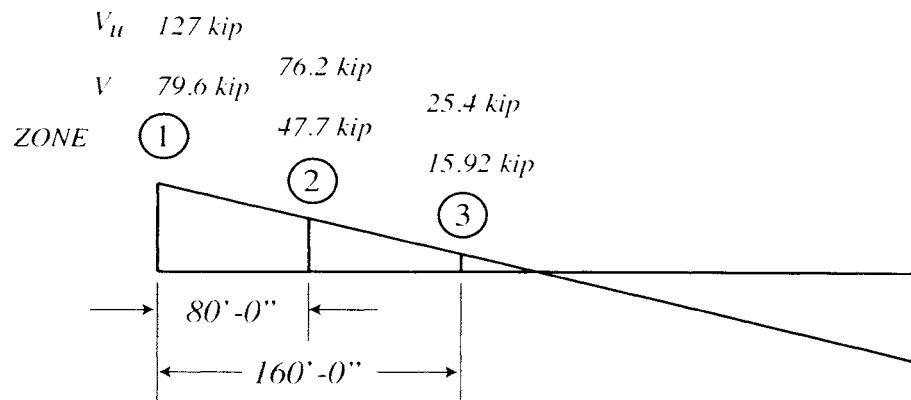
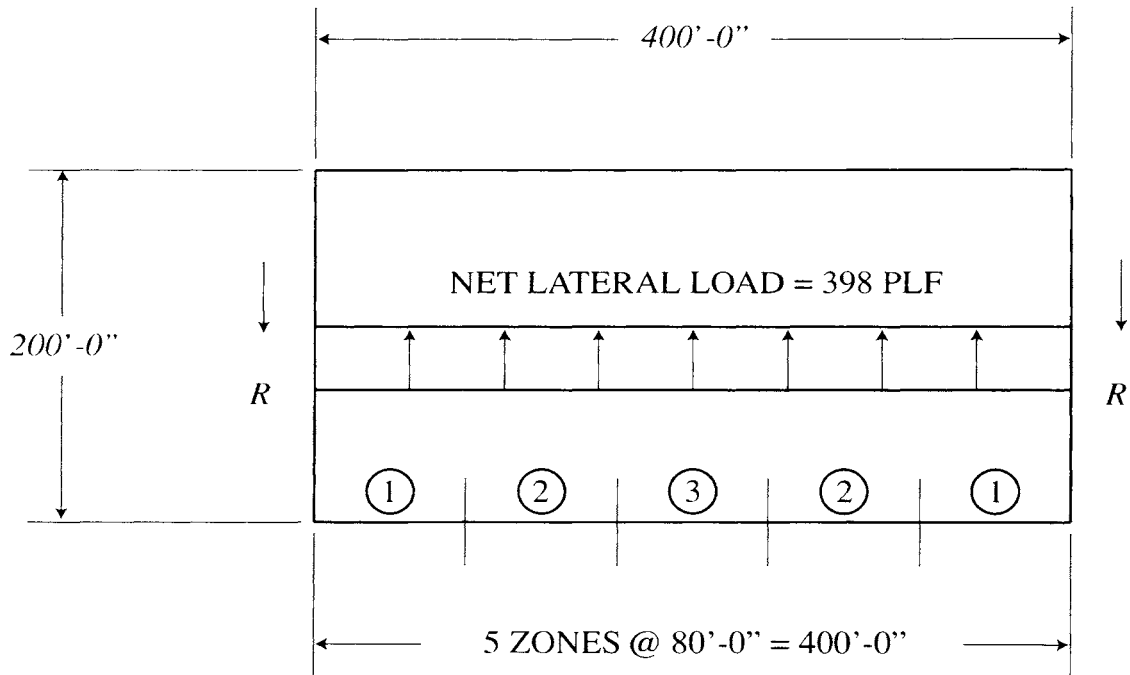


FIG 7.4 DEFLECTION SOLUTIONS

Panel buckling strength limit check. From page AV-13,

LRFD

$$\phi S_n = 0.80 \times 2130 = 1704 \text{ plf } \{24.86 \text{ kN/m}\}$$

$$> \phi S_n (\text{strength}) = 886 \text{ plf } \{12.92 \text{ kN/m}\}$$

ASD

$$\frac{S_n}{\Omega} = \frac{2130}{2.00} = 1065 \text{ plf } \{15.54 \text{ kN/m}\}$$

$$> \frac{S}{\Omega} (\text{strength}) = 538 \text{ plf } \{7.85 \text{ kN/m}\}$$

So panel-buckling strength is not governing the diaphragm design.

To calculate the stiffness of the diaphragm, several additional data are required. From page AV-13, $K_1 = 0.199 / \text{ft} \{3.387 \times 0.199 = 0.674 / \text{m}\}$. From page AIV-6, $K_2 = 870 \text{ kip/in.} \{158 \text{ kN/mm}\}$, $K_4 = 3.78$, and from page AIV-7, $D_{xx} = 129 \text{ ft} \{\text{from page AIV-8, } D_{xx} = 39.3 \text{ mm}\}$

$$G' = \frac{K_2}{K_4 + \frac{0.3 D_{xx}}{\ell_v} + 3 K_1 \ell_v} \quad G' = 60.0 \text{ kip/in.} \quad \{10.81 \text{ kN/mm}\}$$

Following Example 5 and using shear areas, the deflection for Zone 1 is calculated.

$$\Delta_1 = \frac{(79.6 + 47.76) \text{ kip}}{2 (200 \text{ ft})} \frac{80 \text{ ft}}{G'} \quad \Delta_1 = 0.425 \text{ in.} \quad \{10.48 \text{ mm}\}$$

In Zone 2, the required diaphragm strength is

LRFD

$$S_u = \frac{\gamma_w 47.76 \text{ kip}}{\ell} , S_u = 382 \text{ plf } \{5.57 \text{ kN/m}\}$$

ASD

$$S = \frac{47.76 \text{ kip}}{\ell} , S = 239 \text{ plf } \{3.48 \text{ kN/m}\}$$

Select a WR deck with design thickness $t = 0.0295 \text{ in.} \{0.75 \text{ mm}\}$ and with a 36/5 pattern of 5/8 in. puddle weld and use 1-No. 10 stitch screw per deck span (See Appendix V, page AV-13). This attachment pattern will develop a design strength of

$$\phi S_n = 0.70 \times 755 \text{ plf} = 529 \text{ plf } \{7.71 \text{ kN/m}\}$$

$$> S_u = 382 \text{ plf } \{5.57 \text{ kN/m}\}$$

$$\frac{S_n}{\Omega} = \frac{755}{2.35} = 321 \text{ plf } \{4.69 \text{ kN/m}\}$$

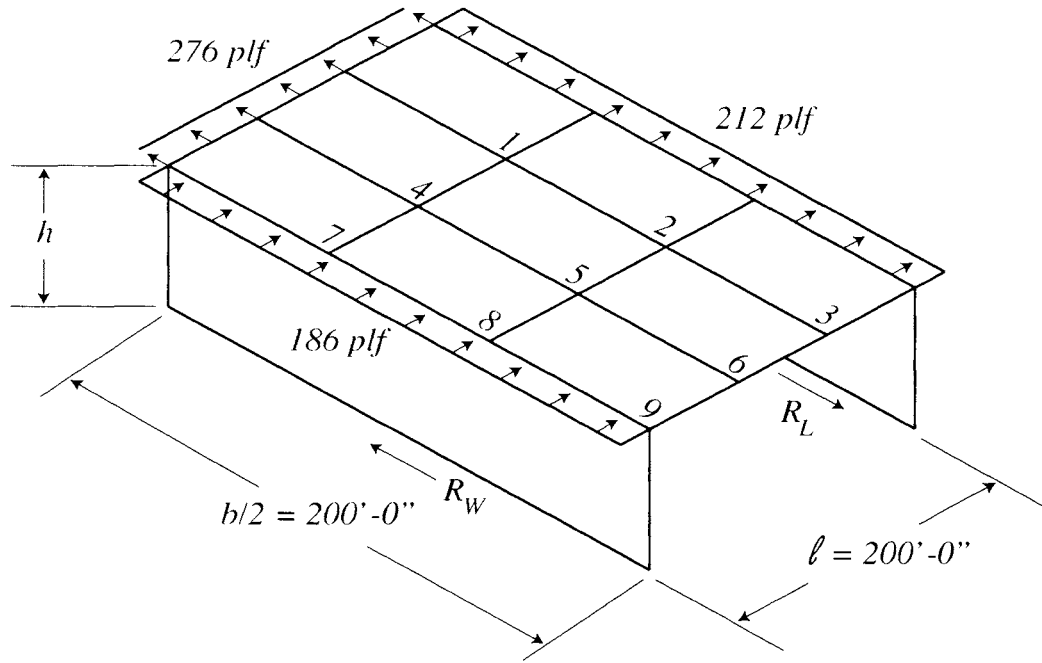
$$> S = 239 \text{ plf } \{3.48 \text{ kN/m}\}$$

$$K_1 = 0.433 \text{ ft}^{-1} \quad K_2 = 870 \text{ kip/in.} \quad K_4 = 3.78 \quad D_{xx} = 758 \text{ ft}$$

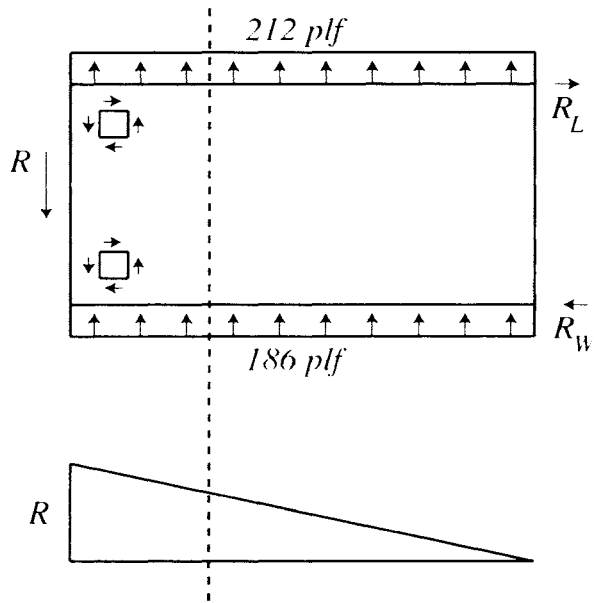
$$\{K_1 = 1.47 \text{ m}^{-1} \quad K_2 = 158 \text{ kN/mm} \quad K_4 = 3.78 \quad D_{xx} = 231 \text{ m}\}$$

$$G' = \frac{K_2}{K_4 + \frac{0.3 D_{xx}}{\ell_v} + 3 K_1 \ell_v} \quad G' = 15.0 \text{ kip/in.} \quad \{2.82 \text{ kN/mm}\}$$

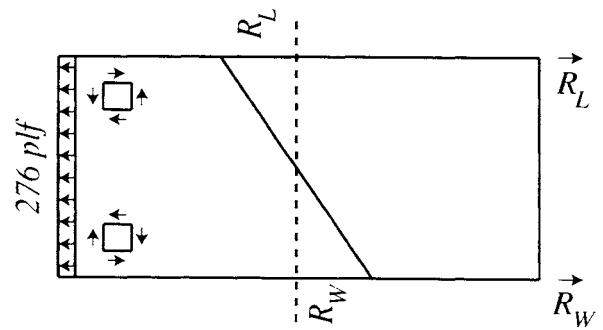
$$\Delta_2 = \Delta_1 + \frac{(47.76 + 15.92) \text{ kip}}{2 (200 \text{ ft})} \frac{80 \text{ ft}}{G'} \quad \Delta_2 = 1.301 \text{ in.} \quad \{30.4 \text{ mm}\}$$



(a) OPEN ENDED STRUCTURE WITH NINE ROOF ZONES



(b) SHEAR DIAGRAM FOR LATERAL LOADS



(c) END WALL LOADS AND SHEAR VARIATIONS

FIG 7.5

In Zone 3, the required diaphragm strength is

LRFD

ASD

$$S_u = \frac{\gamma_w 15.92 \text{ kip}}{\ell}, S_u = 127 \text{ plf } \{1.86 \text{ kN/m}\}$$

$$S = \frac{15.92 \text{ kip}}{\ell}, S = 79.6 \text{ plf } \{1.16 \text{ kN/m}\}$$

Select a WR deck with design thickness $t = 0.0295 \text{ in. } \{0.75 \text{ mm}\}$ and with a 36/4 pattern of 5/8 in. puddle weld and use no stitch screw per deck span (See Appendix V, page AV-13). This attachment pattern will develop a design strength of

$$\phi S_u = 0.70 \times 475 = 333 \text{ plf } \{4.85 \text{ kN/m}\}$$

$$\frac{S_n}{\Omega} = \frac{475}{2.35} = 202 \text{ plf } \{2.95 \text{ kN/m}\}$$

$$> S_u = 127 \text{ plf } \{1.86 \text{ kN/m}\}$$

$$> S = 79.6 \text{ plf } \{1.16 \text{ kN/m}\}$$

$$K_1 = 0.729 \text{ ft}^{-1}$$

$$K_2 = 870 \text{ kip/in.}$$

$$K_4 = 3.78$$

$$D_{xy} = 1072 \text{ ft}$$

$$\{K_1 = 2.47 \text{ m}^{-1}$$

$$K_2 = 158 \text{ kN/mm}$$

$$K_4 = 3.78$$

$$D_{xy} = 327 \text{ m}\}$$

$$G' = \frac{K_2}{K_4 + \frac{0.3 D_{xy} + 3 K_1 \ell_v}{\ell_v}}$$

$$G' = 11.0 \text{ kip/in. } \{1.99 \text{ kN/mm}\}$$

$$\Delta_3 = \Delta_2 + \frac{(15.92 \text{ kip})}{2 (200 \text{ ft})} \frac{40 \text{ ft}}{G'}$$

$$\Delta_3 = 1.446 \text{ in. } \{34 \text{ mm}\}$$

Notes: 1. From a strength viewpoint, these diaphragms are adequate, but note the strong influence of the fastener patterns in Zone 2 on the stiffness. This has led to a fairly large deflection, which may be excessive, and a new design for this zone may be necessary.

2. Examine wind load effects from other directions. Usually it will be most severe when loads are received from the long walls and delivered to the short walls.

3. Note the potential economic advantage of selecting a particular fastener pattern and then using different panel thickness for the various roof zones.

COMBINATION DIAPHRAGM SHEAR AND UPLIFT

The interaction between shear and tension is addressed in Chapter 4. For the purposes of illustration, an uplift load on the general roof area $w_{up} = 30 \text{ psf } \{1.44 \text{ kPa}\}$ is assumed.

Refer to SDI publication, Roof Deck Construction Handbook, pages 5 and 15. The left column of the page 5 table shows three types of welds. The Type 3 side-lap welds, for example, are 0.7 times as strong in tension as Type 1 welds because of eccentric uplift loading. No similar reduction applies to screws since they are away from the panel edge. The Handbook lists k -factors in Table 4 on page 15. These factors measure the effective fasteners per deck cover width noting that edge fasteners may be shared with adjacent panels.

Checking Zone 1, with 5/8 in. diameter welds @ 36/7 pattern

$$k = 5 \text{ (interior fasteners)} + 2 \text{ (edge fasteners)} \times 0.7 \text{ (effective)} / 2 \text{ (shared)} = 5.7$$

β = fastener pattern factor = effective support fasteners per unit cover width

$$\beta = k/\text{panel cover width} = 5.7/3 = 1.9 \text{ ft}^{-1} \{5.7/0.914 = 6.234 \text{ m}^{-1}\}$$

LRFD

Each fastener on interior purlins then has an effective tributary area of

$$\ell_v/\beta = 5/1.9 = 2.63 \text{ ft}^2 \{0.244 \text{ m}^2\}, \text{ leading to:}$$

$$T_u = \gamma_w w_{up} (\ell_v/\beta) = 1.6 (30) (2.63) = 126 \text{ lbf} \{0.56 \text{ kN}\}$$

The design strength of a 5/8 in. diameter weld as concentrically loaded in tension is (See Appendix IV, page AIV-11, Tables V and V-M):

$$\phi_u T_n = 0.6 (1175) = 705 \text{ lbf} \quad \{0.6 (5.23) = 3.14 \text{ kN}\}$$

The limiting individual connections will exhibit shear ratios in the same manner as the diaphragm shears:

$$\frac{Q_u}{\phi Q_f} = \frac{S_u}{\phi S_n} = \frac{635}{886} = 0.717 \quad \left\{ \frac{9.3}{10.5} = 0.916 \right\}$$

$$\left(\frac{T_u}{\phi_u T_n} \right)^{1.5} + \left(\frac{S_u}{\phi S_n} \right)^{1.5} = \left(\frac{126}{705} \right)^{1.5} + \left(\frac{635}{886} \right)^{1.5} = 0.68 < 1.0 \quad \text{OK}$$

$$\left\{ \left(\frac{0.56}{3.14} \right)^{1.5} + \left(\frac{9.3}{12.92} \right)^{1.5} = 0.69 < 1.0 \right\}$$

Had the uplift wind load, w_{up} , been much larger than 30 psf {1.44 kPa}, the first term of the interaction equation would have been similarly larger and the interaction test could have failed. In such a case, the fastener pattern might be changed to a 36/9 pattern reducing both terms in the interaction formula. Alternately, other fastener types and layouts might be explored.

ASD

$$S = 398 \text{ plf} \quad \{5.81 \text{ kN/m}\} \quad (\text{See Appendix AIII, page AIII-21})$$

$$\frac{S_u}{\Omega} = \frac{1265}{2.35} = 538 \text{ plf} \quad \{7.85 \text{ kN/m}\} \quad (\text{See Table 2.1, page 2-12})$$

$$T = w_{up} (\ell_v/\beta) = (30) (2.63) = 78.9 \text{ lbf} \quad \{(1.44) (0.244) = 0.35 \text{ kN}\}$$

$$\frac{T_u}{\Omega_u} = \frac{1175}{2.5} = 470 \text{ lbf} \quad \left\{ \frac{5.23}{2.5} = 2.09 \text{ kN} \right\}$$

$$\left(\frac{\Omega_u T_u}{T_n} \right)^{1.5} + \left(\frac{\Omega S_u}{S_n} \right)^{1.5} = \left(\frac{78.9}{470} \right)^{1.5} + \left(\frac{398}{538} \right)^{1.5} = 0.70 < 1.0 \quad \text{OK}$$

$$\left\{ \left(\frac{0.35}{2.09} \right)^{1.5} + \left(\frac{5.81}{7.85} \right)^{1.5} = 0.70 < 1.0 \right\}$$

EXPANSION JOINTS

Consider the building to have an expansion joint at $b/2$ such that either end is substantially independent. The "chord" forces, formerly developed in spandrel beams along the b dimension, must now be developed in the windward and leeward sidewalls; these walls now act as diaphragms.

Consider the loading case from **Figure 7.3** applied to the "open ended" structure of **Figure 7.5a**. The problem is divided into two parts; first, the windward and leeward forces are considered; and secondly, the side wall forces will be superimposed.

Windward and Leeward Forces, Figure 7.5b:

$$\text{The total reaction: } R = (212 + 186) plf \left(\frac{b}{2} \right) \quad R = 79.6 \text{ kip} \quad \{R = 354 \text{ kN}\}$$

$$\text{The average shear along the end wall is: } S = \frac{R}{\ell} \quad S = 398 \text{ plf} \quad \{S = 5.81 \text{ kN/m}\}$$

At some distance from the end wall, such as $100 \text{ ft} \{30.5 \text{ m}\}$, the total shear force is:

$$V = [R - 100 \text{ ft} (212 + 186) plf] \quad V = 39.8 \text{ kip} \quad \{V = 177 \text{ kN}\}$$

$$\text{The shear is } S_{100} = \frac{V}{\ell} \quad S_{100} = 199 \text{ plf} \quad \{S_{30.5} = 2.90 \text{ kN/m}\}$$

The average unit shear changes with the shear diagram.

The sidewall reaction forces R_L and R_W as shown in **Figure 7.5c**, formerly chord forces, are:

$$R_L = \frac{1}{\ell} (212 + 186) plf (200 \text{ ft}) (100 \text{ ft}) \quad R_L = 39.8 \text{ kip} \quad \{R_L = 177 \text{ kN}\} \quad R_W = R_L$$

R_W and R_L vary from zero at the expansion joint to a maximum at the end wall. If the wall stiffness is consistent along b , the variation is virtually linear. The maximum shear then is twice the average shear.

$$S = 2 \left(\frac{R_L}{200 \text{ ft}} \right) \quad S = 398 \text{ plf} \quad \{S = 5.81 \text{ kN/m}\}$$

At any point in a diaphragm, the average shears in the system, parallel to the deck span, exactly equal those perpendicular to the span. The perimeter beams have axial forces and are an integral part of the system, eliminating accordion like collapse of the deck.

Endwall forces, Figure 7.5c:

$$\text{The total reaction on the sidewalls is } R_c = 276 \text{ plf} (\ell) \quad R_c = 55.2 \text{ kip} \quad \{R_c = 246 \text{ kN}\}$$

$$\text{The maximum total shear force on any one line parallel to } b \text{ is } R_l = \frac{R_c}{2}$$
$$R_l = 27.6 \text{ kip} \quad \{R_l = 123 \text{ kN}\}$$

$$\text{with the maximum diaphragm shear being: } S_l = \frac{R_l}{200 \text{ ft}} \quad S_l = 138 \text{ plf} \quad \{S_l = 2.01 \text{ kN/m}\}$$

With changes along the end wall, the shear diagram also changes, as in **Figure 7.5c**. At the $1/3$ point of the end wall, the shear in the diaphragm is 46 plf .

ADDITION OF SHEARS

The small element forces, shown near the left corners of **Figures 7.5b** and **7.5c**, have directions dependent on the shear diagram. As shown and following the values from the prior section, the upper left block would have a maximum shear of $398 + 138 = 536$ plf and the lower block could have a value of $398 - 138 = 260$ plf. However, the wind direction may reverse leaving either block at a maximum of 536 plf. This approach is used in the following table.

The addition of shears from different load conditions is direct since the orthogonal values always are equal. Therefore, it is good practice to consider either different deck thickness or fastener patterns to meet the actual conditions; there is little reason for the roof diaphragm to be everywhere identical. Consider the present case with the roof subdivided into nine zones as indicated in **Figure 7.5a**.

Maximum Shears (plf) for Zone									
Loading Condition	1	2	3	4	5	6	7	8	9
Figure 7.5b	398	265	133	398	265	133	398	265	133
Figure 7.5c	138	138	138	46	46	46	138	138	138
Totals	536	403	271	444	311	179	536	403	271

The deck selection can be managed as per previous examples. However, too many zones could become troublesome to manage during the construction, but perhaps three would not.

FURTHER DISCUSSION OF DIAPHRAGM SHEARS

Considering the windward and leeward forces shown in **Figure 7.5a** combined as a single load w and designating the origin to be point 9, the shears parallel to the end wall at any point x (along the sidewall) is:

$$V_E = wx$$

The diaphragm shear parallel to the endwall at any point x is:

$$S_E = \frac{wx}{\ell}$$

Considering the other direction, the shear parallel to the side walls is the chord force that is developed over a unit distance. The "chord forces" at any point x are:

$$P = \frac{M}{\ell} = \frac{wx^2}{2\ell}$$

The change of P over a unit distance is the diaphragm shear:

$$S_s = \frac{dP}{dx} = \frac{wx}{\ell}$$

$S_s = S_E$; therefore the diaphragm shears are identical in values on orthogonal faces.

Similar formulations can be developed for other loadings or other diaphragm configurations.

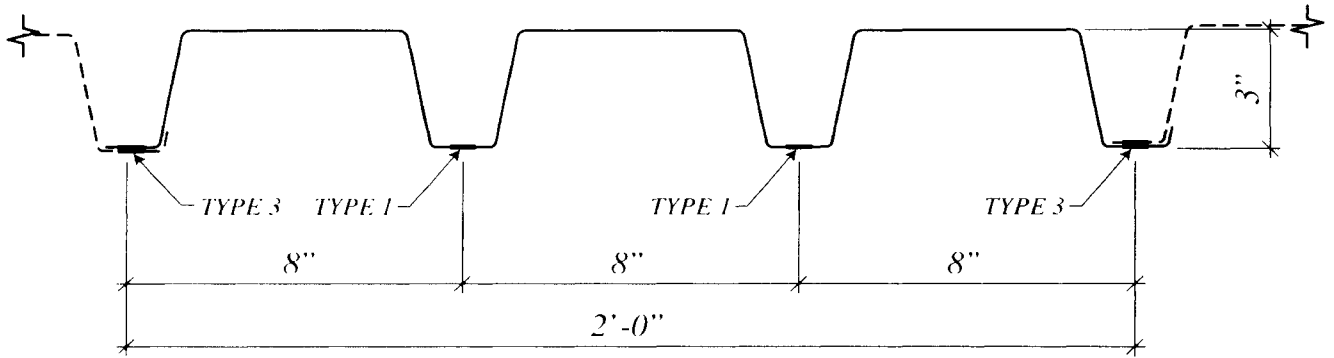


FIG 7a.1

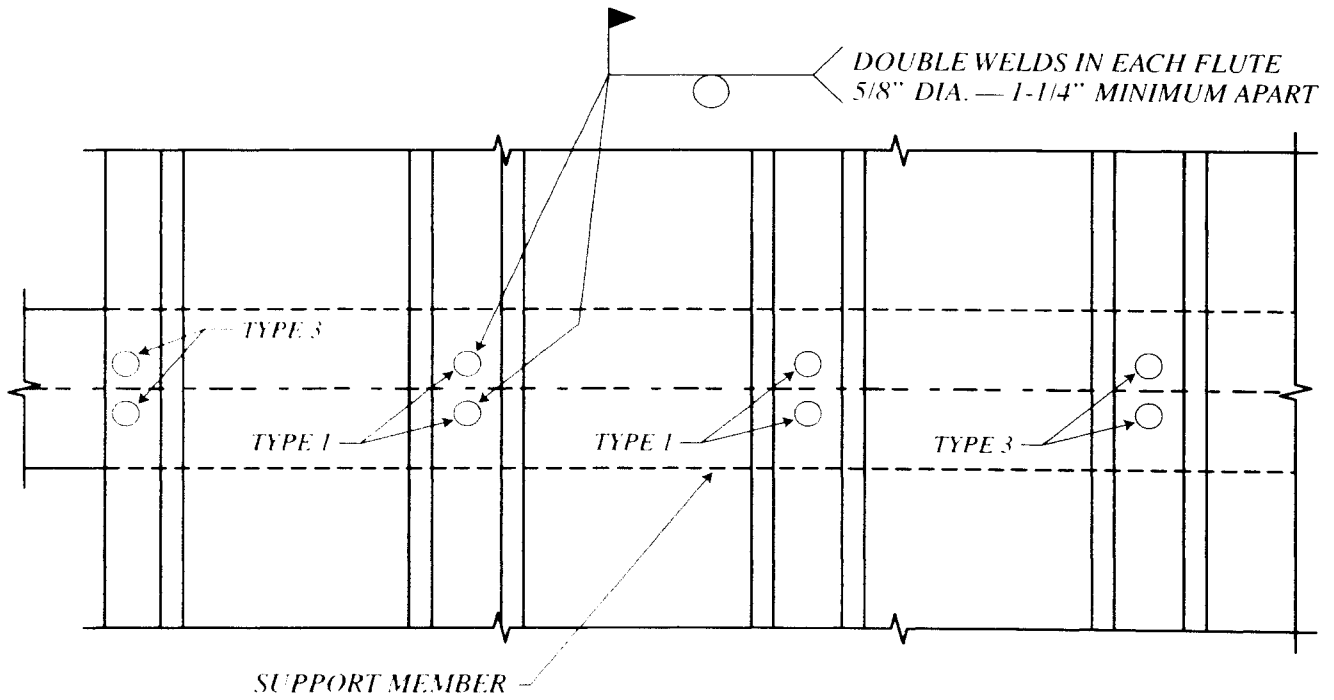


FIG 7a.2

EXAMPLE 7A. ROOF DECK DESIGN FOR UPLIFT AND SHEAR INTERACTION

A 3 in. {76 mm} Deep Rib deck, design thickness $t = 0.0358$ in. (20 gauge) {0.91 mm}, is proposed for a diaphragm where the deck has 3 spans at 13 ft. {3.96 m}. Use ASD design. It is expected that 5/8 in. {15 mm} diameter welds on a 24/8 connection pattern will be used which is equivalent to a 24/4 layout but with double fasteners in each valley. Refer to pages AIV-3 and AIV-7.

$$\text{Required anchorage} = 520 \text{ plf } \{7.59 \text{ kN/m}\}$$

$$\text{Required diaphragm shear} = 220 \text{ plf } \{3.21 \text{ kN/m}\}$$

$$\text{Panel length: } L = 3L_v = 39 \text{ ft } \{11.89 \text{ m}\}$$

Each purlin has 4 interior welds (Type 1) and 4 edge welds (Type 3) per panel.

See Roof Deck Construction Handbook (RDCH), Fig. 3 and the Table 4 k-values, however use the Table V on page AIV-11 in this manual for concentrically loaded tensile capacity.

$$5/8 \text{ in. diameter welds:} \quad \text{Type 1: } T_u / \Omega_u = 1410 / 2.5 = 564 \text{ lbf where } \Omega_u = 2.5 \text{ for weld in tension.}$$

$$\text{Type 3: } T_u / \Omega_u = 1410 \times 0.7 / 2.5 = 395 \text{ lbf}$$

$$\text{Strength ratio Type 3 / Type 1} = 395 / 564 = 0.7$$

$$k = 4 \text{ (interior)} + 4 \text{ (edge)} (0.7) / 2 \text{ (shared)} = 5.4$$

$$\beta = k / 2 \text{ ft (cover width)} = 2.7 \text{ ft}^{-1}$$

$$\{15 \text{ mm diameter welds:} \quad \text{Type 1: } T_u / \Omega_u = 6.27 / 2.5 = 2.508 \text{ kN where } \Omega_u = 2.5 \text{ for weld in tension.}$$

$$\text{Type 3: } T_u / \Omega_u = 6.27 \times 0.7 / 2.5 = 1.76 \text{ kN}$$

$$\text{Strength ratio Type 3 / Type 1} = 1.76 / 2.508 = 0.7$$

$$k = 4 \text{ (interior)} + 4 \text{ (edge)} (0.7) / 2 \text{ (shared)} = 5.4$$

$$\beta = k / 0.61 \text{ m (cover width)} = 8.858 \text{ m}^{-1}$$

$$\text{Uplift capacity for weld group:} \quad P = \beta (564) = 1523 \text{ plf } \{22.22 \text{ kN/m}\} \text{ with no shear acting.}$$

$$\text{Maximum uplift pressure with three spans: } P = 1.1 w_{up} L_v = 1.1 (13 w_{up}) \text{ and } w_{up} = 107 \text{ psf}$$

$$\{P = 1.1 (3.96 w_{up}) \text{ and } w_{up} = 5 \text{ kPa}\}$$

$$\text{Actual uplift pressure: } (520 / 1523) w_{up} = 0.34 (107) = 36 \text{ psf} \quad \{(7.59 / 22.22) (5) = 1.74 \text{ kPa}\}$$

$$\text{Deck flexural capacity for uplift loading:} \quad 39 \text{ psf for stress.} \quad (\text{See RDCH, Table 1-3DR.})$$

$$49 \text{ psf for deflection}$$

Deck bending OK

Shear and Tension interaction with both effects from wind:

$$(\Omega_u T / T_u)^{1.5} + (\Omega Q / Q_t)^{1.5} = 1$$

$$\text{SDI welds:} \quad Q_t = 2.2 F_u t (d - t) = 2.088 \text{ kip} \\ \{8.74 \text{ kN}\}$$

$$\text{No.10 stitch screws:} \quad Q_s = 21.5 t = 0.770 \text{ kip} \\ \{Q_s = 3.76 t = 3.43 \text{ kN}\}$$

$$(\Omega Q / Q_t)^{1.5} = 1 - (0.34)^{1.5} = 0.80 \text{ and } Q = 0.86 Q_t / \Omega$$

Reduced available weld shear strength: $Q_f = 0.86 (2088 \text{ lbf}) = 1799 \text{ lbf}$
 $\{Q_f = 0.86 (8.74 \text{ kN}) = 7.52 \text{ kN}\}$

$$S_u = [2A (\lambda - 1) + B] Q_f / L$$

where $B = n_s \alpha_s + 2 n_p \alpha_p^2 + 4 \alpha_c^2$

and $\alpha_p^2 = \alpha_c^2 = \text{Double the 24/4 pattern values}$

$$\alpha_p^2 = 2 (0.556) = 1.112 \quad \text{See Appendix AIV, pages AIV-3 and AIV-7.}$$

$$n_p = 2 \text{ interior purlins}$$

$$\alpha_s = 770/1799 = 0.428 \quad \{3.43/7.52 = 0.456\}$$

Let $n_s = 3 \text{ spans} \times 6 \text{ per span} = 18 \text{ stitch screws per side-lap}$

then $B = 0.428 n_s + 8 (1.112) = 0.428 (18) + 8.896 = 16.6$

$$\{B = 0.456 n_s + 8 (1.112) = 17.1\}$$

$$\lambda = 1 - 3 \times 13 / [240 (0.0358)^{0.5}] = 0.141 < 0.7 \quad \text{Use minimum } \lambda = 0.7 \quad (\text{See Eq. 2.2-4a})$$

$$\{\lambda = 1 - 76 \times 3.96 / [369 (0.91)^{0.5}] = 0.145 < 0.7 \quad \text{Use minimum } \lambda = 0.7\}$$

With double welds at panel corners, $A = 2$ and

$$S_u = [2 \times 2 (0.7 - 1) + B] Q_f / L = 15.4 (1799/39) = 710 \text{ plf} \quad \{15.9 (7.52/11.89) = 10.06 \text{ kN/m}\}$$

Check panel corners with: $N = 6/2 = 3 \text{ ft}^{-1} \quad \{6/0.61 = 9.84 \text{ m}^{-1}\}$ fasteners per unit cover width.

$$S_u = [N^2 B^2 / (L^2 N^2 + B^2)]^{0.5} Q_f = [2480 / (13689 + 276)]^{0.5} (1799) = 758 \text{ plf} > 710 \text{ plf}$$

$$\{S_u = [28326 / (13688 + 293)]^{0.5} (7.52) = 10.7 \text{ kN/m} > 10.06 \text{ kN/m}\}$$

$$S_{all} = 710 / 2.35 = 302 \text{ plf} \quad \{10.06 / 2.35 = 4.28 \text{ kN/m}\}$$

> Required 220 plf $\{3.21 \text{ kN/m}\}$ OK, but could check with fewer stitch screws.

Alternate Solution.

Consider using No. 12 screws and the same 24/8 support fastener pattern as above.

$$k = 4 \text{ (interior)} + 4 \text{ (edge)} / 2 \text{ (shared)} = 6 \quad \text{(No reduction for edge screws in tension.)}^*$$

$$\beta = k / 2 \text{ ft (cover)} = 3.0 \text{ ft}^{-1} \quad \{6/0.61 \text{ (cover)} = 9.836 \text{ m}^{-1}\}$$

$$T = 520 / \beta = 520/3 = 173 \text{ lbf / screw} \quad \{0.77 \text{ kN}\}$$

$$T_n = 965 \text{ lbf} \quad \{4.29 \text{ kN}\} \quad \text{(Pullover strength)}$$

$$T_n / \Omega_u = 965/3 = 322 \text{ lbf per screw} \quad \{1.43 \text{ kN}\} \quad \text{(See Table VI on page AIV-11)}$$

$$\Omega_u T / T_n = 173/322 = 0.54 > 0.15 \quad \text{Interaction check required}$$

$$\Omega_u T / T_n + 0.85 (\Omega Q / Q_f) = 1 \quad \text{(SDI interaction formula for screws)}$$

* Future editions of the North American Specification for the Design of Cold-Formed Steel Structural Members may modify this condition. (Note the 0.7 prying factor with support welds in side-lap flutes.)

Then: $(\Omega Q / Q_f) = (1 - 0.54) / 0.85 = 0.54$

$Q_s = 770 \text{ lbf}$ $\{3.43 \text{ kN}\}$ for No. 10 stitch fasteners as before

$Q_f = 1.25 F_y t (1 - 0.005 F_y) = 1.25 (33) (0.0358) (1 - 0.165) = 1.233 \text{ kip} = 1233 \text{ lbf}$

$\{Q_f = [F_y t / 31.5] (1 - F_y / 1380) = [230 (0.91) / 31.5] (1 - 230 / 1380) = 5.54 \text{ kN}\}$

Available $Q_f = 0.54 (1233) = 667 \text{ lbf}$ $\{3.0 \text{ kN}\}$

$\alpha_s = Q_s / Q_f = 770 / 667 = 1.154$ Then $B = n_s (1.154) + 8.896$

$\{\alpha_s = 3.43 / 3.0 = 1.143\}$ $\{B = n_s (1.143) + 8.896\}$

Try 7 stitch screws per span and $B = 21 (1.154) + 8.896 = 33.13$ $\{B = 32.9\}$

$n_s = 3 \times 7 = 21$

$B = 21 (1.154) + 8.896 = 33.13$ $\{B = 32.9\}$

$S_u = [4 (-0.3) + 33.13] 667 / 39 = 546 \text{ plf}$

$\{S_u = [4 (-0.3) + 32.9] 3.0 / 11.89 = 8.0 \text{ kN/m}\}$

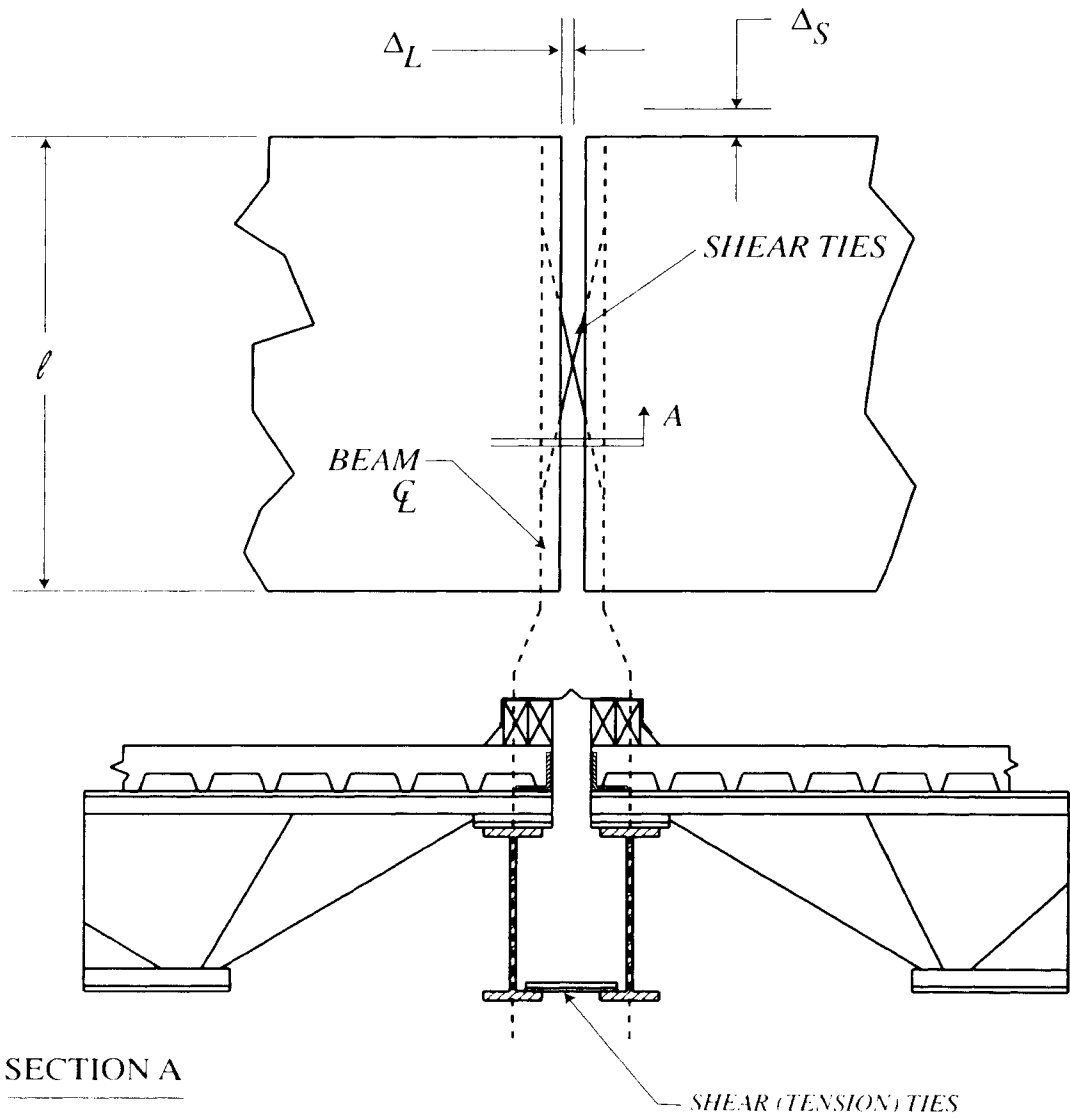
or

$S_u = \{(3 \times 33.13)^2 / [(39 \times 3)^2 + (33.13)^2]\}^{0.5} 667 = 545 \text{ plf}$ (Equal limits)

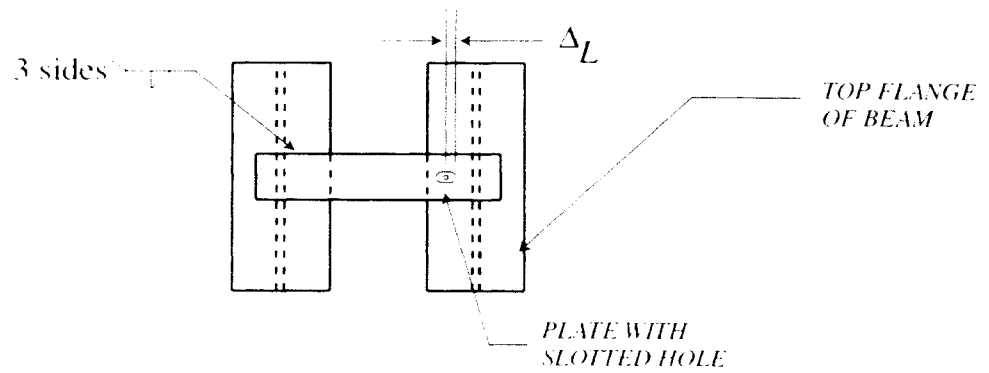
$\{S_u = \{(9.84 \times 32.9)^2 / [(11.89 \times 9.84)^2 + (32.9)^2]\}^{0.5} 3.0 = 8.0 \text{ kN/m}\}$

$S_{all} = 545 / 2.35 = 232$ $\{3.4 \text{ kN/m}\}$

> 220 $\{3.21 \text{ kN/m}\}$ OK



(a) SHEAR (TENSION) TIES



(b) SLOTTED PLATE

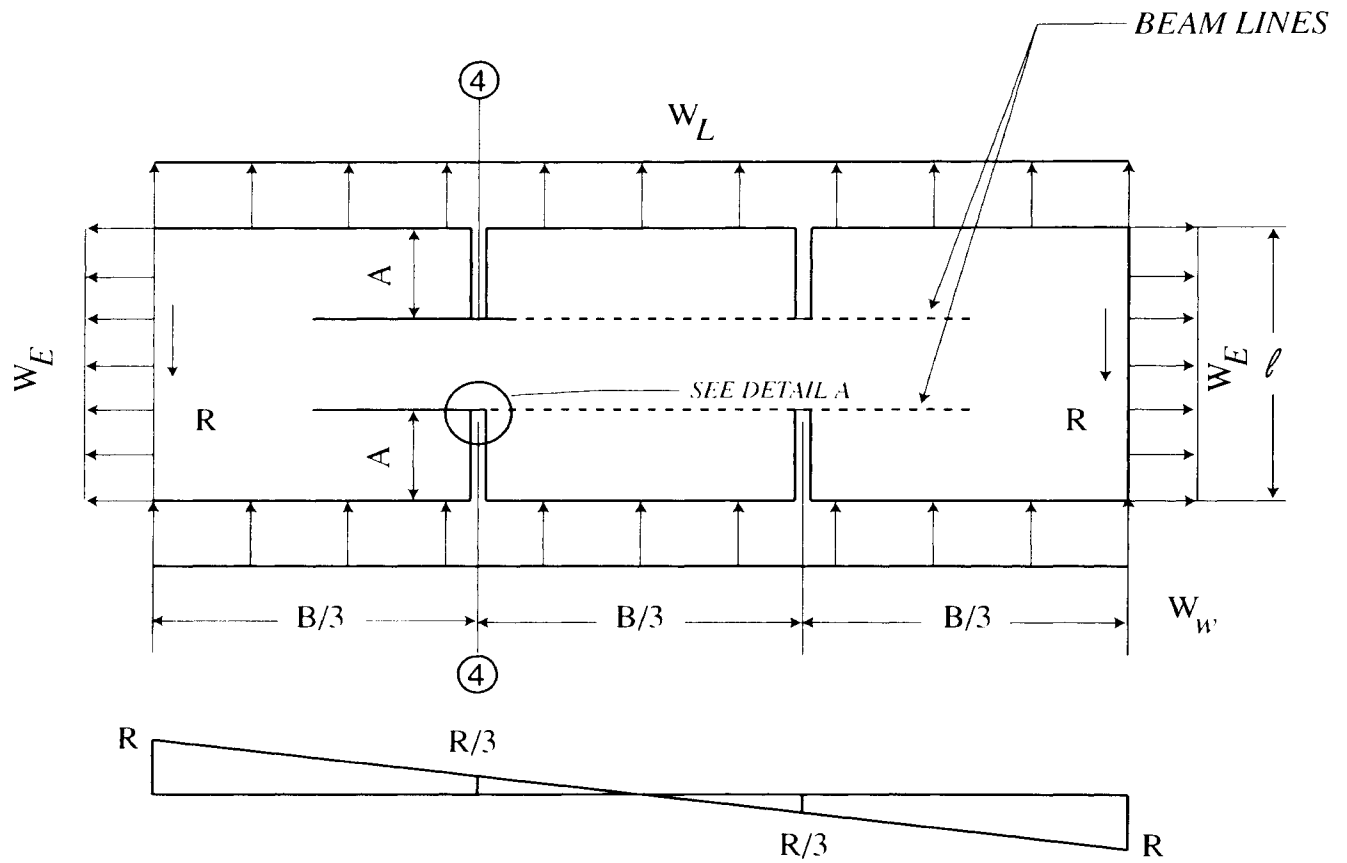
FIG 8.1

EXAMPLE 8 EXPANSION JOINTS

Buildings are subject to non-symmetric load conditions. Thus it is not realistic to leave a structure, free to move parallel to the joints, as in the latter part of the previous example. The joint cover could try to span the joint and be damaged. Various solutions might be considered as in **Figure 8.1**.

The function of the expansion joint is to permit relatively free movement Δ_L as in **Figure 8.1**. A pair of crossed tension members, essentially parallel to the joint and connected to the main beams, would virtually eliminate Δ_S but not impede Δ_L . They would be designed as counters or tension members.

A slotted stub apparatus, welded to one beam and slotted on the opposite end, could transfer shears from one side to the other, shears arising from unbalanced loadings for example. The stub design and performance will depend on connections, the flange width of the support beam, and the frequency of top flange bracing. The torque imposed on the beam must be considered.



(a) SHEAR DIAGRAM

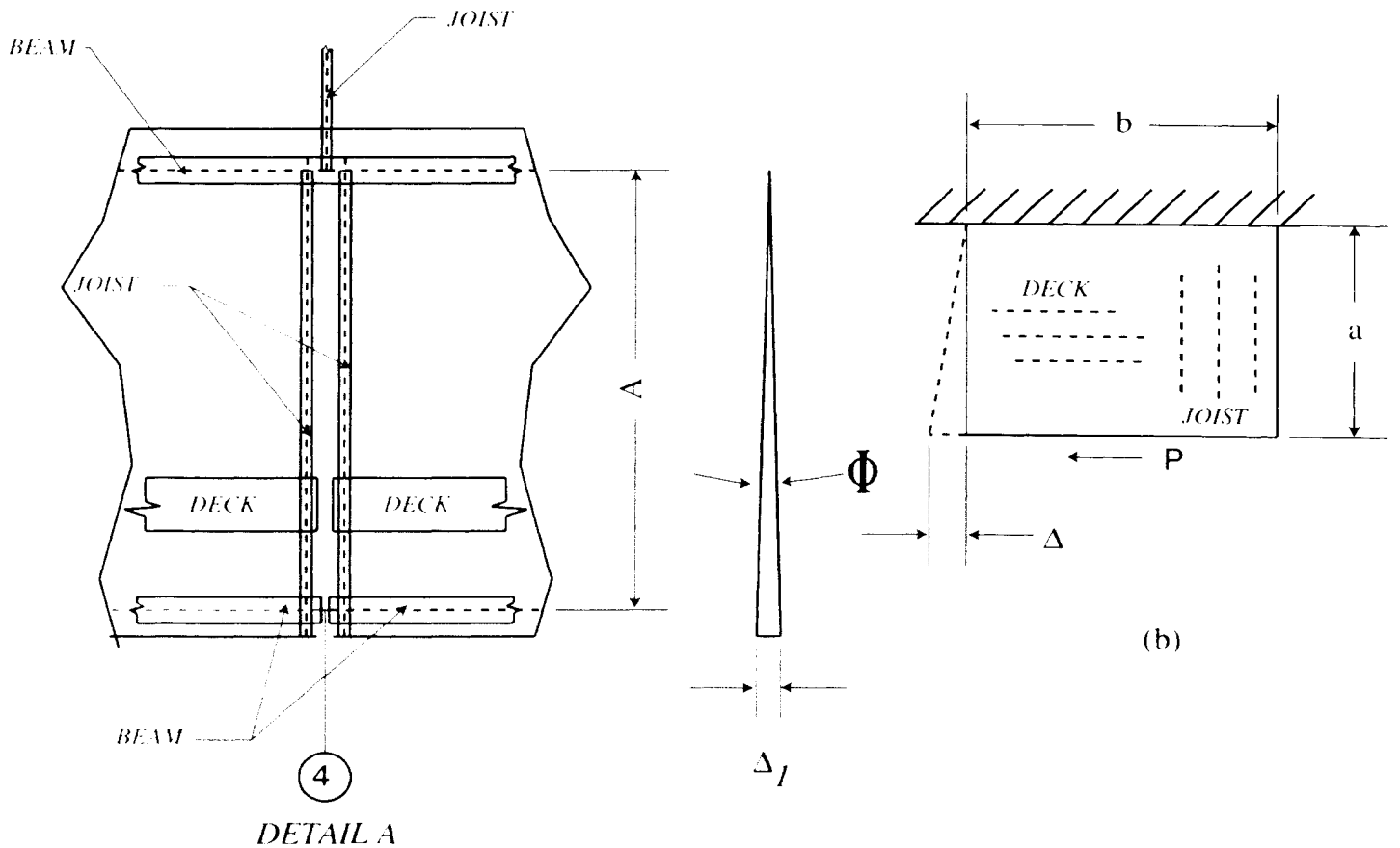


FIG 8.2

The expansion joint perhaps should not extend completely across the roof. Consider a roof structure such as that in **Figure 8.2**. The end loads w_E now have a path to the opposite side, particularly in the mid-region. Given the tributary area supported by the beam lines, about one-half the w_E forces will not introduce shears on the long walls; they are balanced by opposing forces at the opposite wall.

The stiffness of the diaphragm system G' is known. Noting the load P on **Figure 8.2b**, stiffness is defined as

$$G' = \frac{Pa}{\Delta b} = \left(\frac{P}{b} \right) \frac{a}{\Delta} = S \frac{a}{\Delta}$$

Suppose the sidewall joint of Detail A opens with $\Delta_j = 0.5 \text{ in. } \{ \Delta_j = 12.7 \text{ mm} \}$, and further, suppose $A = 75 \text{ ft } \{ a = 22.9 \text{ m} \}$. Then the movement could have been $\Delta = 0.25 \text{ in.}$ for either side of the joint. With the diaphragm stiffness assumed at

$$G' = 40 \text{ kip/in.} \quad \left\{ G' = 7.01 \text{ kN/mm} \right\} \quad S = G' \frac{\Delta}{A} \quad S = 133 \text{ plf} \quad \left\{ S = 1.95 \text{ kN/m} \right\}$$

This force would be transferred along the joist at the joint, through the joist end into the beam, and from the beam to the parallel opposite joist. The wall has now been permitted to relax, but the mid-third of the diaphragm along line 4-4 remains effective.

Along line 4-4, just to the right of the expansion joint, the average shear force is $R/3$. The average shear is

$$S = \frac{R/3}{\ell} = \frac{R}{3\ell}$$

when the right side joists deliver their accumulated forces to the beam lines, the remaining diaphragm between beams acts as a link. With Detail A at the third point of the diaphragm, the line 4-4 unit shear is:

$$S = \frac{R/3}{\ell/3} = \frac{R}{\ell}$$

the same as at the building ends.

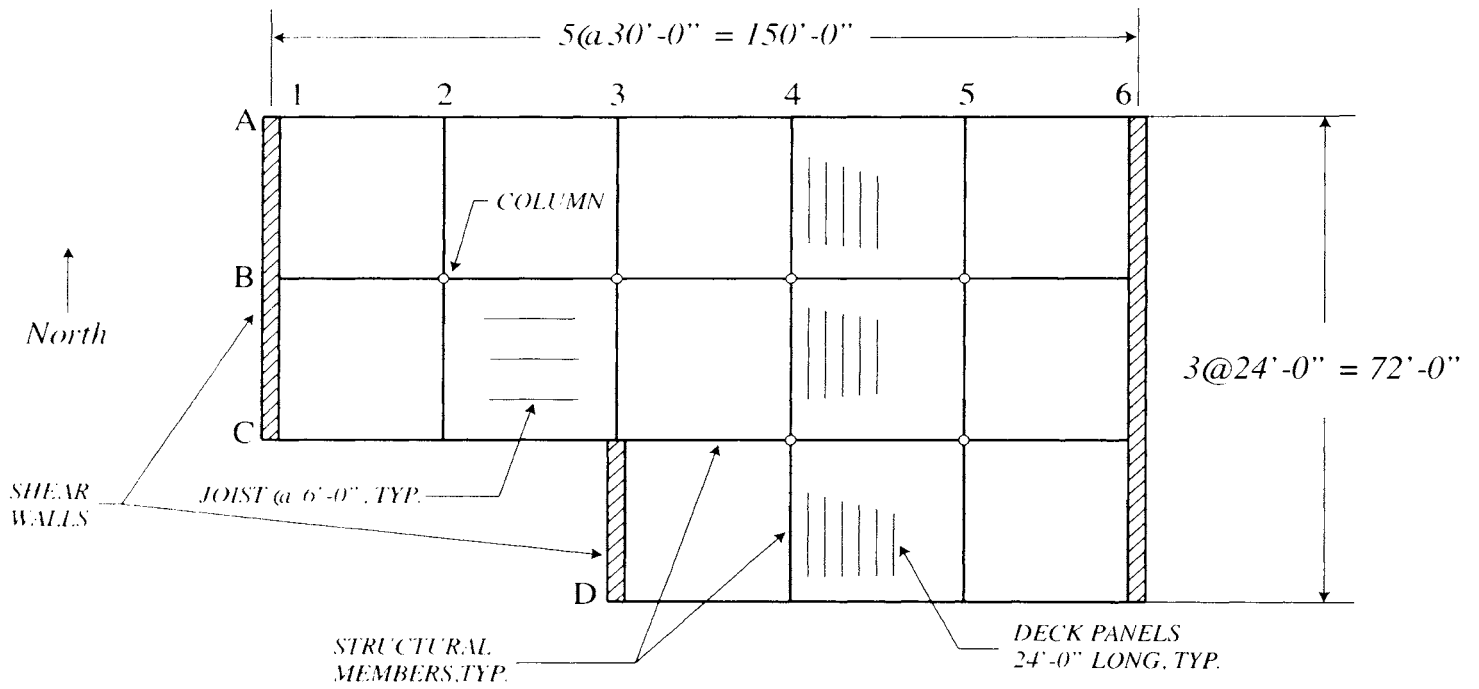


FIG 9.1

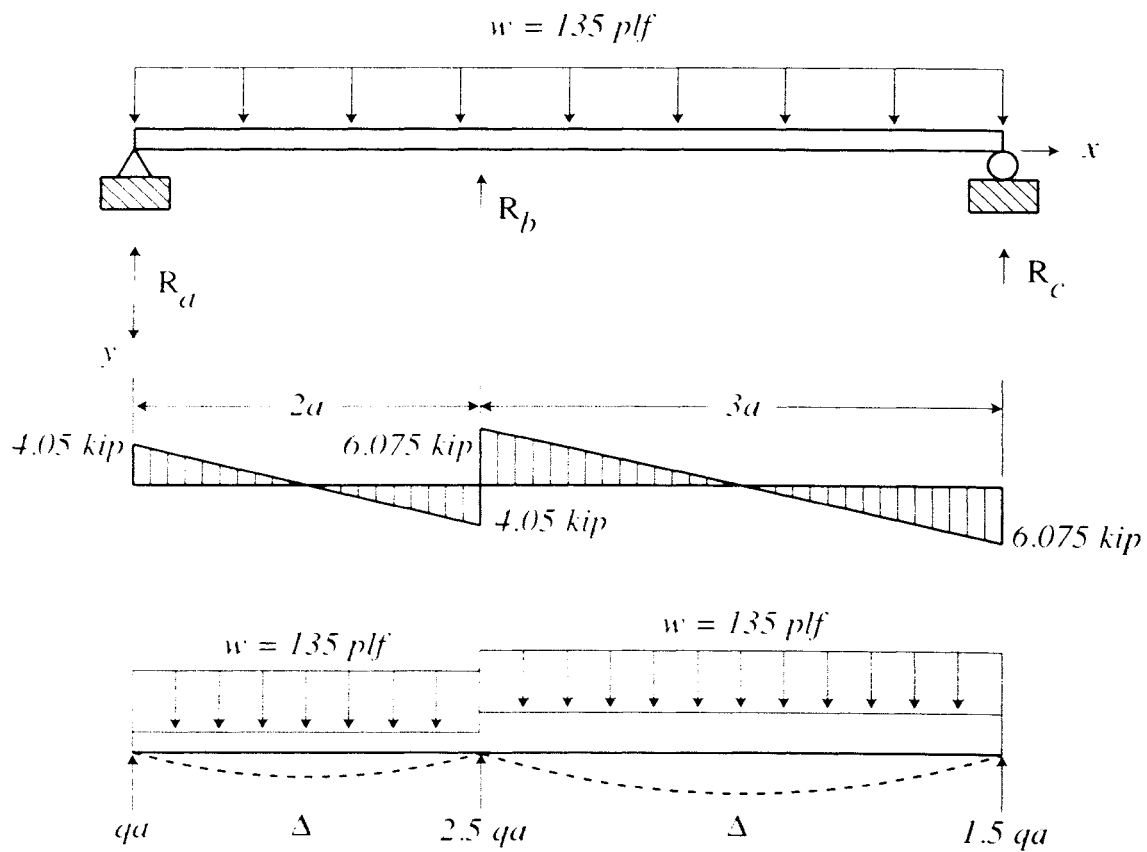


FIG 9.2

EXAMPLE 9 NON-SYMMETRIC DIAPHRAGMS

The building roof plan, shown in **Fig. 9.1**, is a roof receiving $w = 135 \text{ plf} \{1.97 \text{ kN/m}\}$ in its plane. The 3 shear walls are considered as being shear rigid in their own plane. Evaluate the roof system.

The most likely critical area is at the short shear wall in line 3. It receives loads both directly and from the line 3 "collector beam" anchored to it as in **Fig. 9.4**.

The diaphragm is short, deep, and presumed to be shear sensitive. With no deflection at the short wall, the wall reactions are as indicated in **Fig. 9.2**.

$$R_a = w \cdot \frac{60}{2} \text{ ft} \qquad R_a = 4.050 \text{ kip} \qquad \{R_a = 18.0 \text{ kN}\}$$

$$R_b = w \cdot \frac{(60 + 90)}{2} \text{ ft} \qquad R_b = 10.125 \text{ kip} \qquad \{R_b = 45.0 \text{ kN}\}$$

$$R_c = w \cdot \frac{90}{2} \text{ ft} \qquad R_c = 6.075 \text{ kip} \qquad \{R_c = 27.0 \text{ kN}\}$$

Following Example Problem 5 and using shear diagram areas to find deflections:

$$\text{Deflection at Line 2:} \quad \Delta_2 = \frac{4.0 \text{ kip} (30 \text{ ft}/2)}{48 \text{ ft} (G')} = \frac{1.266}{G'}$$

$$\text{Deflection at Line 4.5:} \quad \Delta_{4.5} = \frac{6.075 \text{ kip} (45 \text{ ft}/2)}{72 \text{ ft} (G')} = \frac{1.898}{G'}$$

$$\text{Maximum diaphragm shear at Line 1:} \quad S_1 = \frac{R_a}{48 \text{ ft}} \qquad S_1 = 84 \text{ plf} \qquad \{S_1 = 1.23 \text{ kN/m}\}$$

$$\text{Maximum diaphragm shear at Line 6:} \quad S_6 = \frac{R_c}{72 \text{ ft}} \qquad S_6 = 84 \text{ plf} \qquad \{S_6 = 1.23 \text{ kN/m}\}$$

As indicated in **Fig. 9.2**, the maximum diaphragm shear for the roof deck is 84 plf . However, the Line 3 accumulates shears for a total thrust of:

$$T = (S_1 + S_6) 48 \text{ ft} \qquad T = 8.06 \text{ kip} \qquad \{T = 36.0 \text{ kN}\}$$

This thrust is reversible depending on the direction of the loading. The total shear delivered to the short wall is:

$$R_b = T + S_6 (24 \text{ ft}) \qquad R_b = 10.125 \text{ kip} \qquad \{R_b = 45.04 \text{ kN}\}$$

This is the same value calculated previously. The maximum diaphragm shear in the short wall is:

$$S_{\text{wall}} = \frac{R_b}{24 \text{ ft}} \qquad S_{\text{wall}} = 422 \text{ plf} \qquad \{S_{\text{wall}} = 6.16 \text{ kN/m}\}$$

A review of **Fig. 9.4** will lead to the obvious need for little or no slip being allowed at the beam anchorage. Otherwise, potentially crippling local stresses will be delivered to the diaphragm. The joists at the wall must be anchored to deliver the 84 plf diaphragm shear.

Wall Movements. Shear walls tend toward in-plane rotation due to eccentricity between the base level and top-of-wall shears. In heavy walls, gravity forces usually will prohibit any uplift at the base, but such tendencies must be checked.

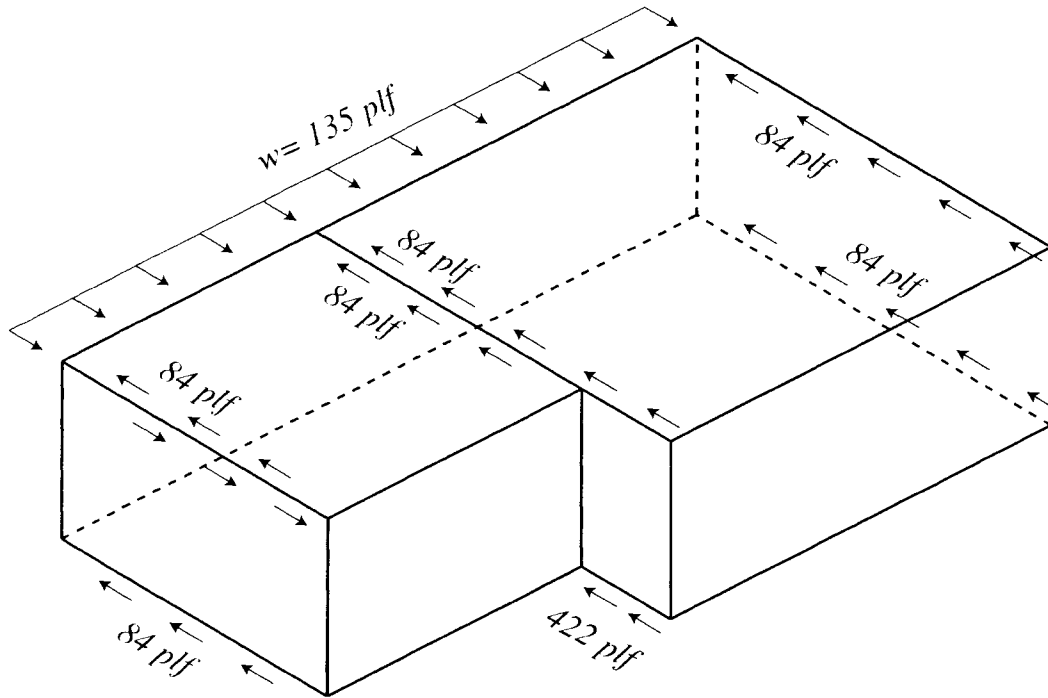


FIG 9.3 SHEARS

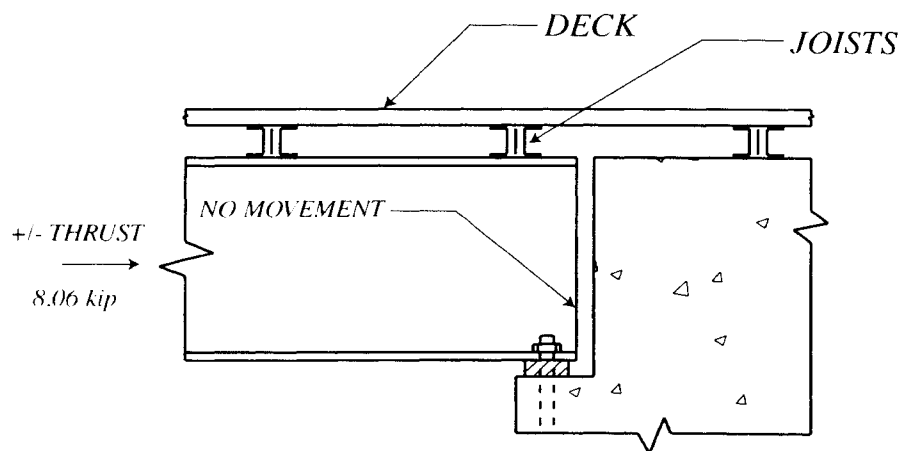


FIG 9.4

The limits that are placed on wall deflections, normal to the wall, reflect architectural considerations relative to appearance. Further, the limits must be such that the walls do not experience undue strains or curvature. For example, local deflections between girt lines in metal wall assemblies often are limited to values of 1/120 to 1/180 times the girt spacing.

Suppose the roof diaphragm in this example has the rather low stiffness of $G' = 12 \text{ kip/in.}$

$\{2.102 \text{ kN/mm}\}$ and the wall height $h = 30 \text{ ft } \{9.144 \text{ m}\}$.

$$\Delta_2 = \frac{4.05 \text{ kip} \left(\frac{30}{2} \right) \text{ ft}}{(48 \text{ ft}) G'} \quad \Delta_2 = 0.105 \text{ in.} \quad \{\Delta_2 = 3 \text{ mm}\}$$

$$\Delta_{4.5} = \frac{6.075 \text{ kip} \left(\frac{45}{2} \right) \text{ ft}}{(72 \text{ ft}) G'} \quad \Delta_{4.5} = 0.158 \text{ in.} \quad \{\Delta_{4.5} = 4 \text{ mm}\}$$

If the walls are masonry, the deflection limit frequently is fixed at,*

$$\Delta_w = \frac{H^2 f}{0.01 E_w t_w}$$

where H = wall height, ft
 f = allowable flexural compressive stress, psi
 E_w = modulus of elasticity, psi
 t_w = wall thickness, in.

In a paper presented at the 1978 masonry conference, Holm* listed the following typical properties for normal weight block:

$$E_w = 22(w^{1.5})\sqrt{f'_c} = 1.54 \times 10^6 \text{ psi}$$

with

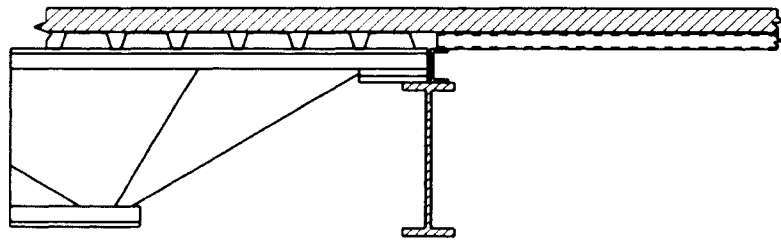
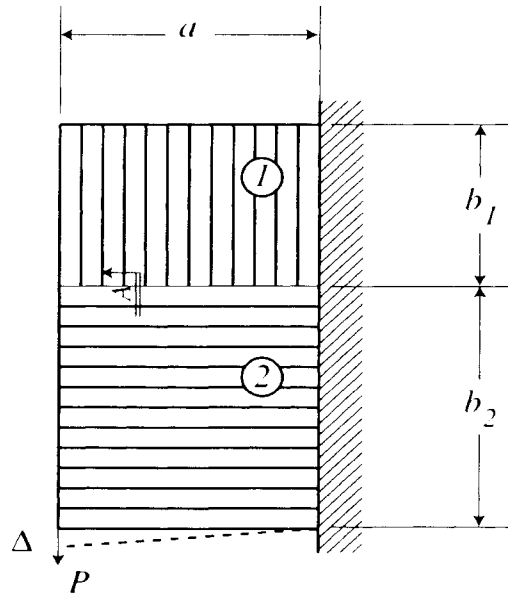
$$w = 135 \text{ pcf and } f'_c = 2000 \text{ psi}$$

Limiting the stress to a typical values of $f = 0.3 f'_c = 600 \text{ psi}$, and presuming the 30 ft high wall to be 12 in. thick,

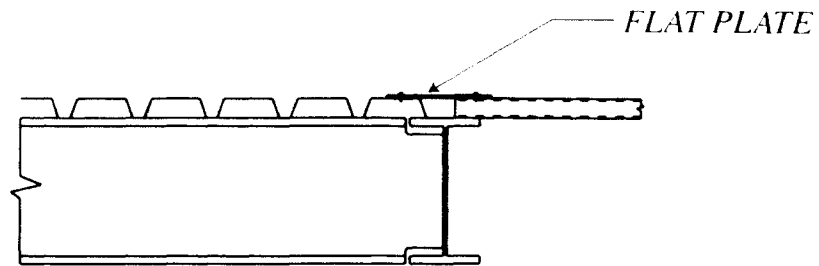
$$\Delta_w = \frac{30^2 (600)}{0.01 (1.54 \times 10^6) (12)} = 2.92 \text{ in.}$$

Obviously the $\Delta = 0.16 \text{ in.}$ is less than the latter value simply implying that moderately high wall movements may not cause undue wall stresses.

*See References 24 and 29 of Appendix II. For further reading, see "Structural Properties of Block Concrete", by T. A. Holm, Proceedings of the North American Masonry Conference, University of Colorado, Boulder, 1978.



SECTION A - CASE 1



SECTION A - CASE 2

FIG 10

EXAMPLE 10 MIXED LENGTH PANELS

Adjacent diaphragm zones may differ in stiffness because of different panel lengths. **Figure 10** shows a case where diaphragm panels change direction. Two possible sections are shown.

Case 1. The C-shaped channel is used to permit the roof to have a common top elevation. Local warping may occur in the diaphragm over the channel and this can be minimized by frequent connection, perhaps in every valley to resist the design shear.

Case 2. The top elevation is uniform. The flat plate is used to retard warping or simply to close off the gap.

Analysis Find the system stiffness G' .

$$G' = \frac{P}{\Delta} \frac{a}{b_1 + b_2} \quad \text{or} \quad \Delta = \frac{P}{G'} \frac{a}{b_1 + b_2} \quad (\text{a})$$

In Zone 1:

$$S_1 = \frac{P_1}{b_1} = \frac{G'_1 \Delta}{a}$$

In Zone 2:

$$S_2 = \frac{P_2}{b_2} = \frac{G'_2 \Delta}{a}$$

Noting that

$$P = P_1 + P_2 = \frac{\Delta}{a} (b_1 G'_1 + b_2 G'_2) \quad (\text{b})$$

From (a) and (b):

$$P = \frac{G' \Delta (b_1 + b_2)}{a} = \frac{\Delta}{a} (b_1 G'_1 + b_2 G'_2)$$

Then the mixed system stiffness is:

$$G' = \frac{b_1 G'_1 + b_2 G'_2}{b_1 + b_2} \quad (\text{c})$$

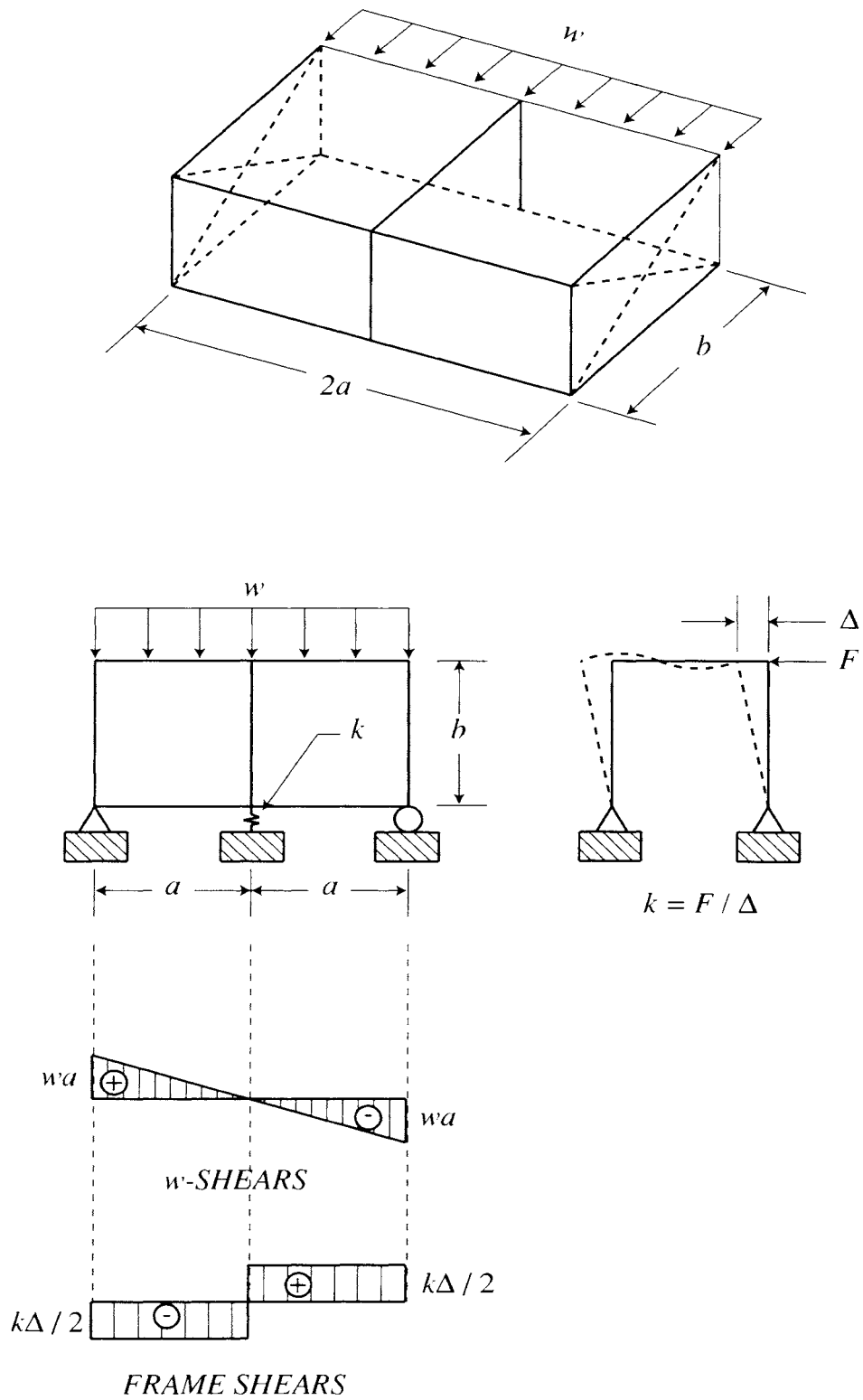


FIG 11

EXAMPLE 11 RIGID FRAME

The building in **Figure 11** has a semi-rigid interior frame. Such frames often are designed to support their tributary area and here could be presumed to resist about half or wa of the lateral load. Find the more correct distribution.

$$\text{Given: } w = 145 \text{ plf} \quad a = 45 \text{ ft} \quad b = 40 \text{ ft} \quad G' = 16 \text{ kip/in.}$$

$$\{w = 2.12 \text{ kN/m} \quad a = 13.7 \text{ m} \quad b = 12.2 \text{ m} \quad G' = 2.80 \text{ kN/mm}\}$$

With the column and beam sizes known for the frame and referring to **Figure 11**, it has been evaluated to find:

$$k = \frac{F}{\Delta} = 1.75 \text{ kip/in.} = 0.306 \text{ kN/mm}$$

In the left diaphragm, the general shear is:

$$v = wa - wx - \frac{k\Delta}{2}, \text{ where } k\Delta = F,$$

the force share of load going to the frame and hence to the foundation.

Following Example 4 to find the deflection at the frame by using shear areas:

$$\Delta = \frac{I}{bG'} \left(wa \frac{a}{2} - \frac{k\Delta}{2} a \right)$$

$$\Delta \left(1 + \frac{ka}{2bG'} \right) = \frac{wa^2}{2bG'}, \quad \Delta = \frac{wa^2}{2bG' \left(1 + \frac{ka}{2bG'} \right)} \quad \Delta = 0.216 \text{ in.} \quad \{\Delta = 5.5 \text{ mm.}\}$$

$$F = k\Delta \quad F = 0.378 \text{ kip} \quad \{F = 1.68 \text{ kN}\}$$

Without the diaphragm, F would have been about

$$F = wa \quad F = 6.52 \text{ kip} \quad \{F = 29.0 \text{ kN}\}$$

The diaphragm transfers loads away from the semi-rigid frame, and the transfer can be important to frame member sizes.

Analysis by the Stiffness Method

This frame and diaphragm system can be quickly analyzed by the stiffness method. From the principles laid out previously (in particular in Example 2), the stiffness of the diaphragm is the force required inducing an unit displacement. In **Figure 11** the only degree-of-freedom is at the semi-rigid frame. The stiffness of the diaphragm is then:

$$k_d = \frac{2bG'}{a}$$

$$\text{The load carried by the semi-rigid frame is then simply: } F = wa \frac{k}{k + k_d} \quad F = 0.378 \text{ kip}$$

which of course is identical to the previous answer.

$$\{1.68 \text{ kN}\}$$

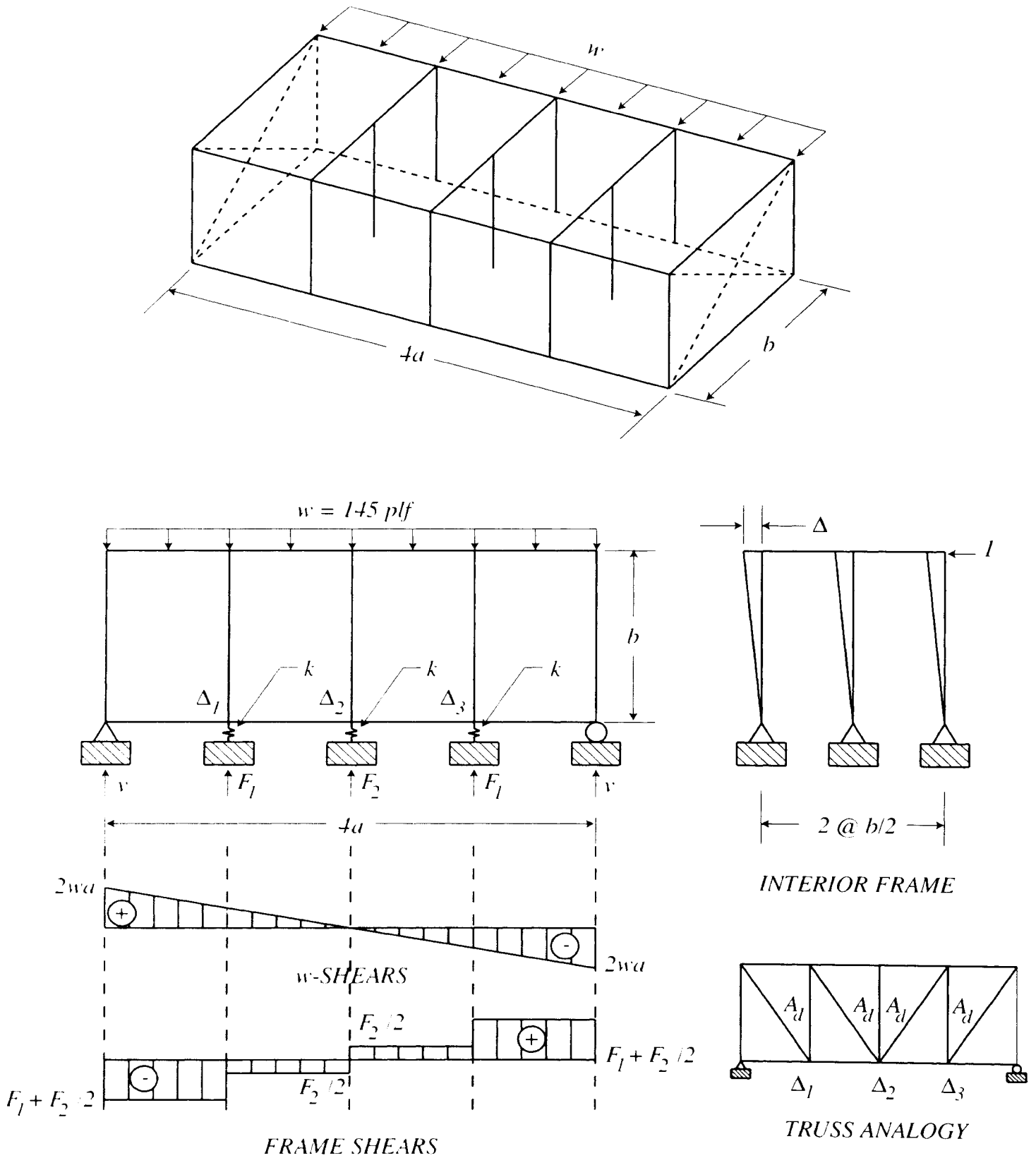


FIG 12

EXAMPLE 12 RIGID FRAMES

The building in **Figure 12** has three semi-rigid interior frames and shear rigid end walls.

The roof is covered with a diaphragm having $G' = 30 \text{ kip/in.}$ $\{G' = 5.25 \text{ kN/mm}\}$

and the frames have a stiffness of $k = 2 \text{ kip/in.}$ $\{k = 0.35 \text{ kN/mm}\}$.

Data given: $w = 145 \text{ plf}$ $a = 38 \text{ ft}$ $b = 72 \text{ ft}$

$\{w = 2.116 \text{ kN/m}$ $a = 11.6 \text{ m}$ $b = 21.9 \text{ m}\}$

Find the total lateral forces transferred to each frame.

Solution. The shear diagram is drawn in 2 separate parts, for k - and w -forces, to make area calculations easier. Using shear diagram areas for deflection, as was done in Example 5,

$$\Delta_1 = \frac{I}{bG'} (2wa + wa) \left(\frac{a}{2}\right) - \left(F_1 + \frac{F_2}{2}\right)a$$

Since $k = F / \Delta$ at any frame,

$$bG' \Delta_1 = \frac{3}{2} wa^2 - \left(k\Delta_1 + \frac{k\Delta_2}{2}\right)a$$

$$(2160 + 76)\Delta_1 + 38\Delta_2 = 314 \quad (\text{a})$$

$$bG' \Delta_2 = 2wa \left(\frac{2a}{2}\right) - \left(F_1 + \frac{F_2}{2} + \frac{F_2}{2}\right)a$$

$$76\Delta_1 + (2160 + 76)\Delta_2 = 419 \quad (\text{b})$$

Solving (a) and (b) leads to $\Delta_1 = 0.137 \text{ in.}$ $\{3.5 \text{ mm}\}$ and $\Delta_2 = 0.183 \text{ in.}$ $\{4.6 \text{ mm}\}$, and then to $F_1 = k\Delta_1 = 0.276 \text{ kip}$ $\{1.23 \text{ kN}\}$ and $F_2 = 0.366 \text{ kip}$ $\{1.63 \text{ kN}\}$.

It is observed that even with this moderately flexible diaphragm, little of the frame tributary load of $wa = 5.51 \text{ kip}$ $\{24.5 \text{ kN}\}$ is transferred to the foundation through the frames. Most of the loads goes through the diaphragm area, to the end walls, and then to the foundation. Frame member sizes then may be smaller than when the design was based on tributary area loads.

Analysis by the Stiffness Method

The stiffness of a diaphragm segment is simply: $k_d = G \frac{b}{a}$ $k_d = 56.8 \text{ kip/in.}$ $\{k_d = 9.95 \text{ kN/mm}\}$

Thus the force required to induce the unit displacement at each semi-rigid frame is $2k_d + k$ and the restraining force at the ends of each displaced diaphragm segment is $-k_d$. It is noted that the chords of the diaphragm provide no continuity between the frames, so there is no restraining force related to the semi-rigid frames. The numbering system for the displacements is noted in **Figure 12**.

$$S = \begin{pmatrix} 2k_d + k & -k_d & 0 \\ -k_d & 2k_d + k & -k_d \\ 0 & -k_d & 2k_d + k \end{pmatrix}$$

$$S = \begin{pmatrix} 115.684 & -56.842 & 0 \\ -56.842 & 115.684 & -56.842 \\ 0 & -56.842 & 115.684 \end{pmatrix} \text{ kip/in.} \quad \{S = \begin{pmatrix} 20.259 & -9.955 & 0 \\ -9.955 & 20.259 & -9.955 \\ 0 & -9.955 & 20.259 \end{pmatrix} \text{ kN/mm}\}$$

The force matrix is the tributary area loads to each frame:

$$P = \begin{pmatrix} -5.51 \\ -5.51 \\ -5.51 \end{pmatrix} \text{ kip} \quad \{P = \begin{pmatrix} -24.51 \\ -24.51 \\ -24.51 \end{pmatrix} \text{ kN}\}$$

The deflections are then calculated by inverting the stiffness matrix and multiplying it by the force matrix:

$$\Delta = S^{-1} (-P) \quad \Delta = \begin{pmatrix} 0.137 \\ 0.183 \\ 0.137 \end{pmatrix} \text{ in.} \quad \{\Delta = \begin{pmatrix} 3.5 \\ 4.6 \\ 3.5 \end{pmatrix} \text{ mm}\}$$

These deflections, of course, are the same as those obtained by the previous solution.

Analysis by the Truss Analogy

To model the diaphragm as a horizontal truss, the shear diaphragm panel is replaced by a web as follows (using the principles of Example 3):

$$L_d = \sqrt{a^2 + b^2} \quad L_d = 81.4 \text{ ft} \quad \{L_d = 24.8 \text{ m}\}$$
$$A_d = \frac{L_d^3 G'}{a b E} \quad A_d = 2.407 \text{ in}^2 \quad \{A_d = 1501 \text{ mm}^2\}$$

Using basic principles from any text modeling stiffness of truss members, the force required to move a node a unit displacement is:

$$\alpha = \text{atan} \left(\frac{b}{a} \right) \quad S_w = \frac{E A_d}{L_d} (\sin \alpha)^2$$

The restraining force is simply $-S_w$ applied to opposing ends of the panel being displaced.

The stiffness matrix of the truss elements is:

$$S_t = \begin{pmatrix} 2 S_w & -S_w & 0 \\ -S_w & 2 S_w & -S_w \\ 0 & -S_w & 2 S_w \end{pmatrix}$$

and the stiffness matrix of the frame and diaphragm system is:

$$S = \begin{pmatrix} 2 S_w + k & -S_w & 0 \\ -S_w & 2 S_w + k & -S_w \\ 0 & -S_w & 2 S_w + k \end{pmatrix}$$
$$S = \begin{pmatrix} 115.684 & -56.842 & 0 \\ -56.842 & 115.684 & -56.842 \\ 0 & -56.842 & 115.684 \end{pmatrix} \text{ kip/in.} \quad \{S = \begin{pmatrix} 20.232 & -9.94 & 0 \\ -9.94 & 20.232 & -9.94 \\ 0 & -9.94 & 20.232 \end{pmatrix} \text{ kN/mm}\}$$

This matrix is identical to the previously solved example. The problem could of course be solved using a standard structural analysis problem.

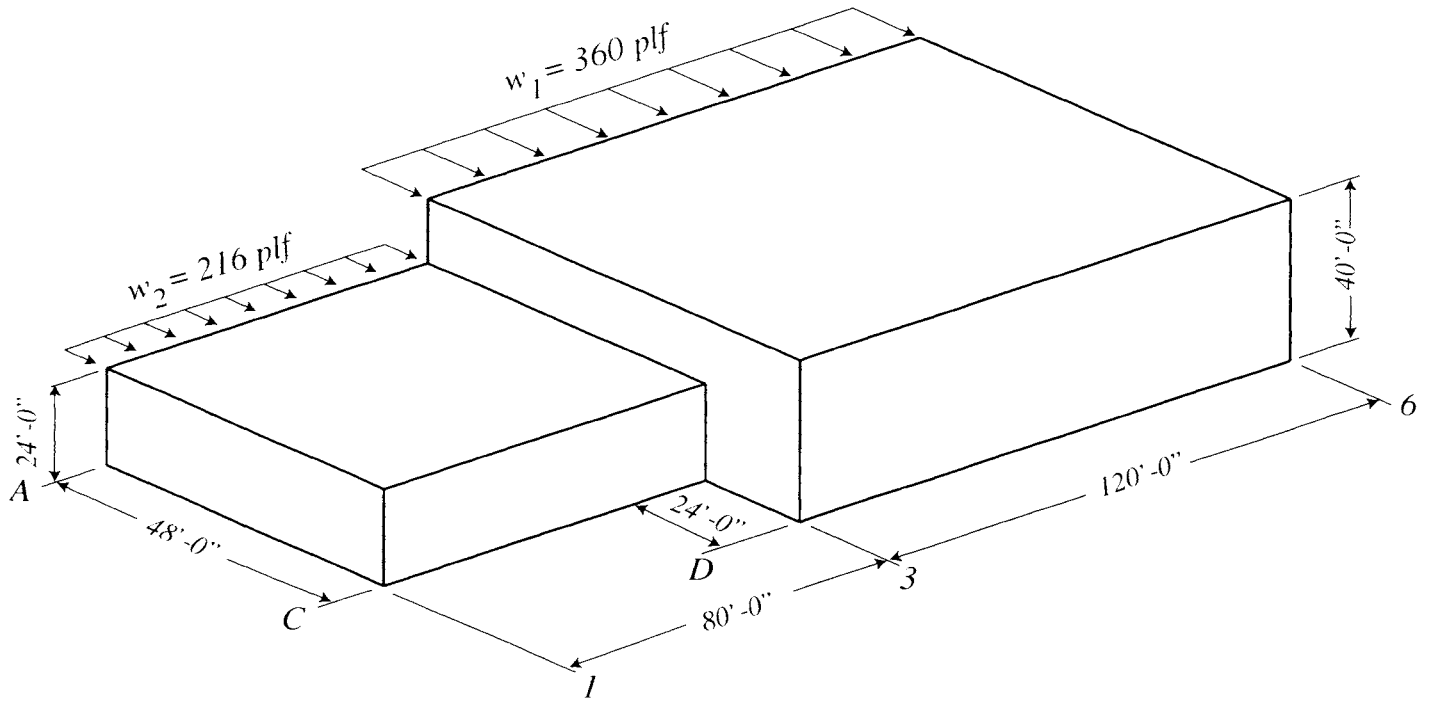


FIG 13.1 TWO LEVEL BUILDING

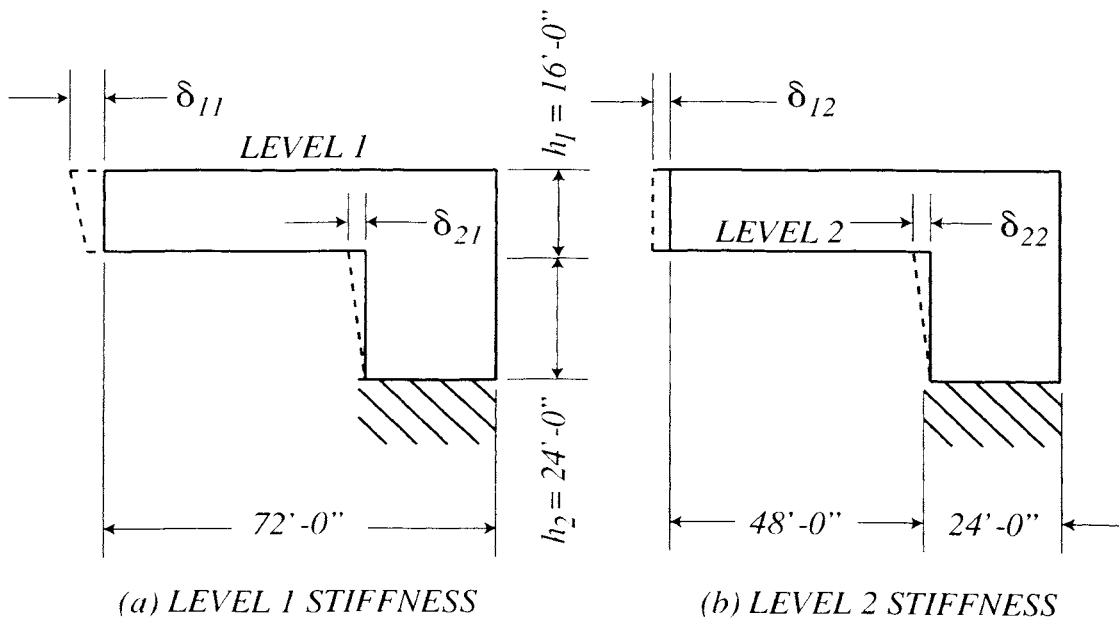


FIG 13.2 INTERIOR CROSS WALL AT LINE 3

EXAMPLE 13 SPLIT LEVEL DIAPHRAGMS

The building in **Fig 13.1** has the same roof plan as in **Fig 9.1**, but the roofs are at different levels. The east and west end walls, Lines 1 and 6 are shear rigid, but the structural steel system has little lateral stiffness of its own. The wall at Line 3 is a diaphragm with a stiffness of

$$G'_{wall} = 20 \text{ kip/in.} \quad \{3.50 \text{ kN/mm}\} \text{ and both roof levels have the same stiffness of}$$

$$G'_{roof} = 50 \text{ kip/in.} \quad \{8.76 \text{ kN/mm}\}.$$

Evaluate the shear distribution through the system for the line loads shown at the roof levels.

a. Line 3 Diaphragm - This system receives loads at two levels and may transfer forces between roof levels 1 and 2. This two degree-of-freedom problem requires mixed spring-like stiffness, following **Fig 13.2**. For unit loads:

$$\delta_{22} = \frac{h_2}{(24 \text{ ft}) G'_{wall}} \quad \delta_{22} = 0.05 \text{ in./kip} \quad \{\delta_{22} = 0.286 \text{ mm/kN}\}$$

$$\delta_{12} = \delta_{22} \quad \delta_{21} = \delta_{22} \quad \text{for the Level 1 unit shear.}$$

$$\delta_{11} = \delta_{21} + \frac{h_1}{(72 \text{ ft}) G'_{wall}} \quad \delta_{11} = 0.0611 \text{ in./kip} \quad \{\delta_{11} = 0.349 \text{ mm/kN}\}$$

b. Roof Level 2 - From the **Fig 13.3** shear diagram and using Example 5 definitions for the right-side deflection of Diaphragm 2:

$$\Delta_2 = \frac{1}{b_2 G'_{roof}} \left[\frac{V_2}{2} \frac{V_2}{V_2 + R_2} \ell_2 - \frac{R_2}{2} \ell_2 \left(1 - \frac{V_2}{V_2 + R_2} \right) \right] = \frac{\ell_2}{2b_2 G'_{roof}} \left(\frac{V_2^2 - R_2^2}{V_2 + R_2} \right) = \frac{\ell_2}{2b_2 G'_{roof}} (V_2 - R_2)$$

Note that each diaphragm must be in equilibrium. Then

$$V_2 + R_2 = w_2 \ell_2$$

Then Δ_2 can be expressed in terms of the sought variable R_2 :

$$\Delta_2 = \frac{\ell_2}{2b_2 G'_{roof}} (w_2 \ell_2 - 2R_2) \quad (\text{a})$$

Note that the T_2 and C_2 forces must be developed for equilibrium.

c. Roof Level 1 - Following the above approach for the displacement at R_1 :

$$\Delta_1 = \frac{\ell_1}{2b_1 G'_{roof}} (w_1 \ell_1 - 2R_1) \quad (\text{b})$$

d. Line 3 Shear Wall - Shears from both levels affect displacements and they will be R times greater than the values from Part a above.

$$\Delta_1 = R_1 \delta_{11} + R_2 \delta_{12} = 0.0611 R_1 + 0.0500 R_2 \quad (\text{c})$$

$$\Delta_2 = R_2 \delta_{22} + R_1 \delta_{21} = 0.0500 R_1 + 0.0500 R_2 \quad (\text{d})$$

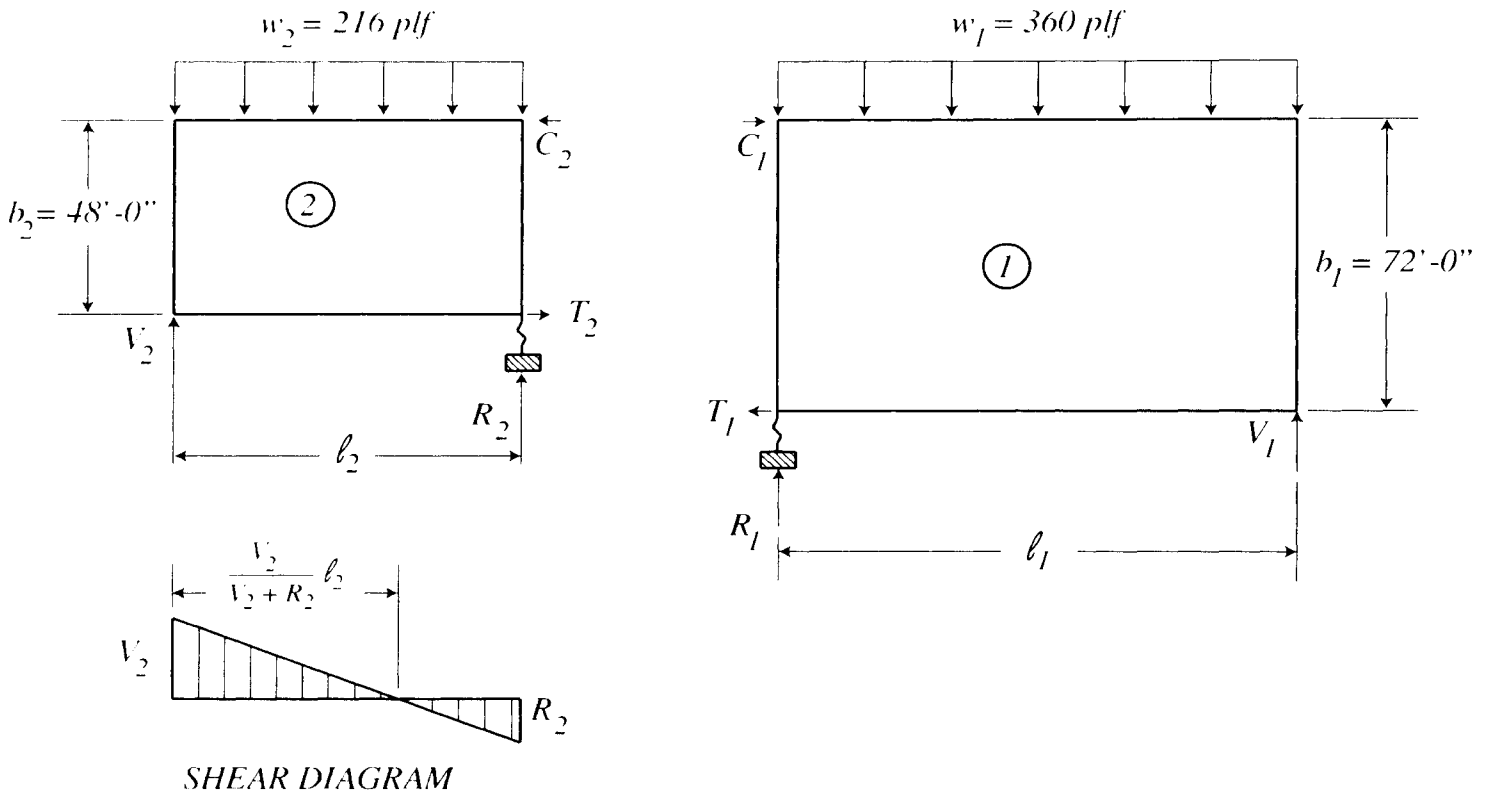


FIG 13.3 ROOF AREAS 1 AND 2

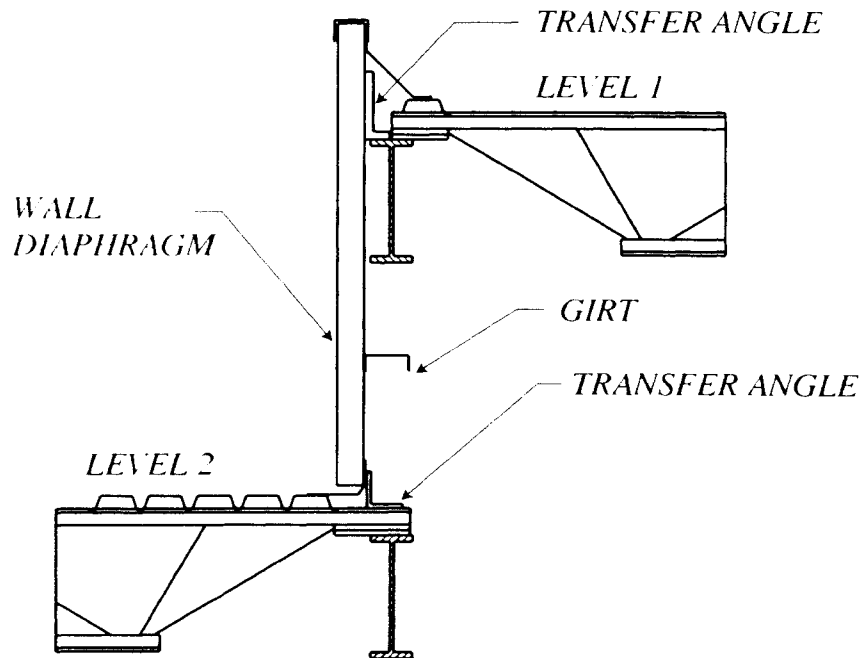


FIG 13.4 VERTICAL DIAPHRAGM SECTION

With $G'_{roof} = 50 \text{ kip/in. } \{8.75 \text{ kN/mm}\}$, $w_1 = 360 \text{ plf } \{5.27 \text{ kN/m}\}$, and $w_2 = 216 \text{ plf } \{3.16 \text{ kN/m}\}$, and using the given dimensions with Equations (a) through (d) leads to:

$$0.0611R_1 + 0.0500R_2 = 0.0167(w_1 \ell_1 - 2R_1)$$

$$0.0500R_1 + 0.0500R_2 = 0.0167(w_2 \ell_2 - 2R_2)$$

and

$$0.0945R_1 + 0.0500R_2 = 0.720$$

$$0.0500R_1 + 0.0834R_2 = 0.288$$

then

$$R_1 = 8.48 \text{ kip and } R_2 = -1.63 \text{ kip} \quad \{R_1 = 37.72 \text{ kN and } R_2 = -7.25 \text{ kN}\}$$

From Equations (c) and (d):

$$\Delta_1 = 0.437 \text{ in. and } \Delta_2 = 0.343 \text{ in.} \quad \{\Delta_1 = 11 \text{ mm and } \Delta_2 = 8.7 \text{ mm}\}$$

e. Shear Summary - Refer to **Fig 13.3**.

$$V_2 = w_2 \ell_2 - R_2 = 18.91 \text{ kip and } S = \frac{V_2}{48 \text{ ft}} = 394 \text{ plf} \quad \{V_2 = 84.12 \text{ kN, } S = 5.77 \text{ kN/m}\}$$

$$V_1 = w_1 \ell_1 - R_1 = 34.72 \text{ kip and } S = \frac{V_1}{72 \text{ ft}} = 482 \text{ plf} \quad \{V_1 = 154.44 \text{ kN, } S = 7.06 \text{ kN/m}\}$$

The lower roof receives loads from the upper level and the transfer is through the cross wall of **Fig 13.2**. That wall has:

$$\text{Upper portion: } S = \frac{8.48 \text{ kip}}{72 \text{ ft}} = 118 \text{ plf} \quad \{S = 1.73 \text{ kN/m}\}$$

$$\text{Lower portion: } S = \frac{(8.48 - 1.63) \text{ kip}}{24 \text{ ft}} = 285 \text{ plf} \quad \{S = 4.17 \text{ kN/m}\}$$

f. Special Details - The eave forces T_1 , T_2 , and C_1 must be transferred to the foundation through their sidewall diaphragms as in Example 7. The force C_2 may be resisted either in its own wall diaphragm or distributed into the higher parallel wall by a distribution beam. This transfer problem is analogous to the thrust delivery of Example 9 and its illustration in **Fig. 9.4**. The roof to wall shear transfers at Line 3 may be made following the scheme presented in **Fig 13.4**. Positive connections are made through the angles or similar devices to transfer only $118 \text{ plf } \{1.73 \text{ kN/m}\}$ between roof levels and could be rather small.

The Line 3 cross wall, being both flexible and near the mid-length of the building, does not receive shear on the same scale as does the rigid short wall in **Fig 9**. This is because the wall does have flexibility to move somewhat away from the load. The 24 ft diaphragm length, being short, does have a moderately high average shear and it might be required that this diaphragm segment be reinforced. This could be accomplished by supplemental diagonal bracing designed following Example 3.

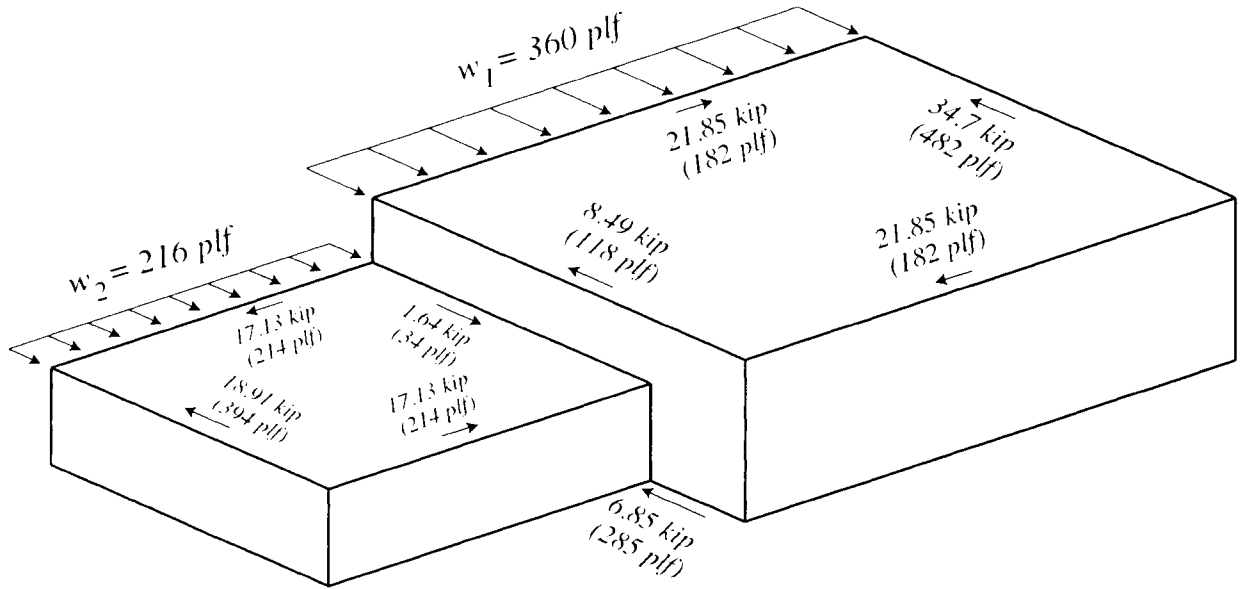


FIG 13.5 DIAPHRAGM SHEARS

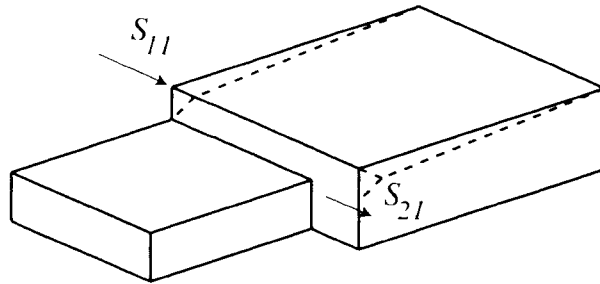


FIG 13.6a UNIT DEFLECTION AT 1

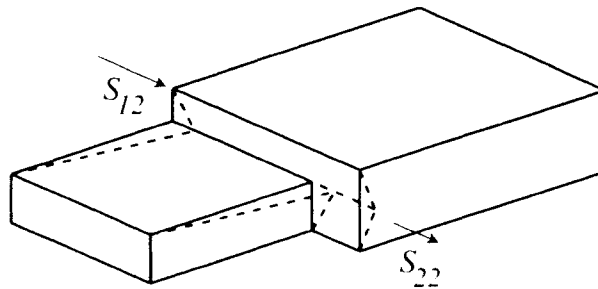


FIG 13.6b UNIT DEFLECTION AT 2

g. Stiffness Method - As in the previous example, the split-level diaphragm can be solved by the stiffness method. Referring to **Fig. 13.6a** and **13.6b**, the following stiffness matrix is developed:

$$S_{11} = G'_{roof} \left(\frac{72 \text{ ft}}{120 \text{ ft}} \right) + G'_{wall} \left(\frac{72 \text{ ft}}{16 \text{ ft}} \right) \quad S_{21} = -G'_{wall} \left(\frac{72 \text{ ft}}{16 \text{ ft}} \right)$$

$$S_{12} = -G'_{wall} \left(\frac{72 \text{ ft}}{16 \text{ ft}} \right) \quad S_{22} = G'_{wall} \left(\frac{72 \text{ ft}}{16 \text{ ft}} \right) + G'_{wall} \left(\frac{24 \text{ ft}}{24 \text{ ft}} \right) + G'_{roof} \left(\frac{48 \text{ ft}}{80 \text{ ft}} \right)$$

$$S = \begin{pmatrix} S_{11} & S_{12} \\ S_{21} & S_{22} \end{pmatrix} \quad S = \begin{pmatrix} 120 & -90 \\ -90 & 140 \end{pmatrix} \text{ kip/in.} \quad \{S = \begin{pmatrix} 21.0 & -15.8 \\ -15.8 & 24.5 \end{pmatrix} \text{ kN/mm}\}$$

The forces that restrain the structure are:

$$F_1 = -w_1 \frac{120 \text{ ft}}{2} \quad F_2 = -w_2 \frac{80 \text{ ft}}{2} \quad F = \begin{pmatrix} F_1 \\ F_2 \end{pmatrix} \quad F = \begin{pmatrix} -21.6 \\ -8.64 \end{pmatrix} \text{ kip} \quad \{F = \begin{pmatrix} -96.082 \\ -38.433 \end{pmatrix} \text{ kN}\}$$

The deflections are then calculated by

$$\Delta = S^{-1} (-F) \quad \Delta = \begin{pmatrix} \Delta_1 \\ \Delta_2 \end{pmatrix} = \begin{pmatrix} 0.437 \\ 0.343 \end{pmatrix} \text{ in.} \quad \{\Delta = \begin{pmatrix} 11 \\ 9 \end{pmatrix} \text{ mm}\}$$

These deflections agree with those previously calculated.

Forces within the diaphragm can be calculated using basic principles of stiffness analysis. For example the forces are calculated as follows:

The shear forces in the diaphragms at Line 3 are:

$$R_1 = -21.6 \text{ kip} + G'_{roof} \left(\frac{72 \text{ ft}}{120 \text{ ft}} \right) (\Delta_1) \quad R_1 = -8.49 \text{ kip} \quad \{R_1 = -37.8 \text{ kN}\}$$

$$R_2 = -8.64 \text{ kip} + G'_{roof} \left(\frac{48 \text{ ft}}{80 \text{ ft}} \right) (\Delta_2) \quad R_2 = 1.64 \text{ kip} \quad \{R_2 = 7.29 \text{ kN}\}$$

The shear forces in the wall diaphragms at Line 3 are:

For the higher wall diaphragm:

$$P_{hw} = -G'_{wall} \left(\frac{72 \text{ ft}}{16 \text{ ft}} \right) (\Delta_1) + G'_{wall} \left(\frac{72 \text{ ft}}{16 \text{ ft}} \right) (\Delta_2) \quad P_{hw} = -8.49 \text{ kip} \quad \{P_{hw} = -37.8 \text{ kN}\}$$

For the lower wall diaphragm:

$$P_{lw} = -G'_{wall} \left(\frac{24 \text{ ft}}{24 \text{ ft}} \right) (\Delta_2) \quad P_{lw} = -6.85 \text{ kip} \quad \{P_{lw} = -30.5 \text{ kN}\}$$

Again, the forces in the diaphragm are summarized in **Fig 13.5**.

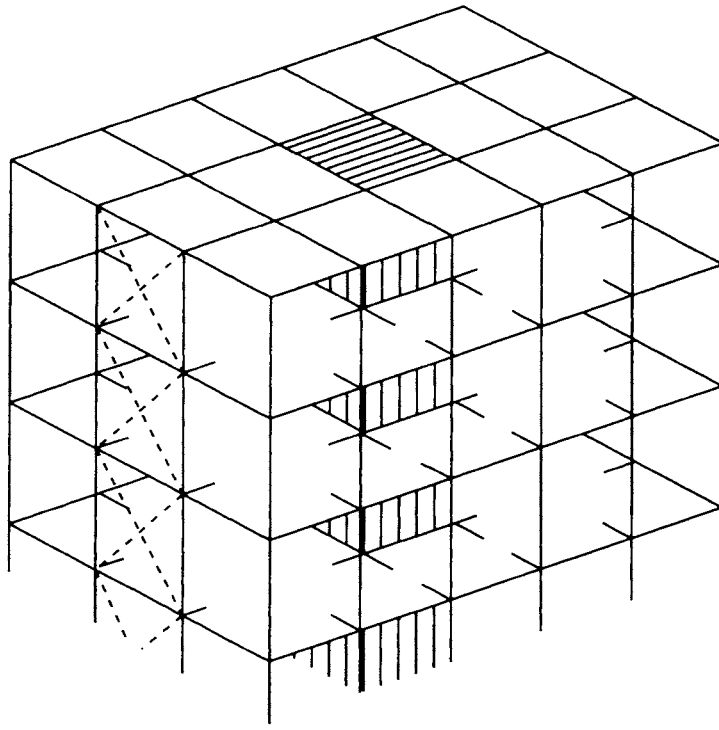


FIG 14.1

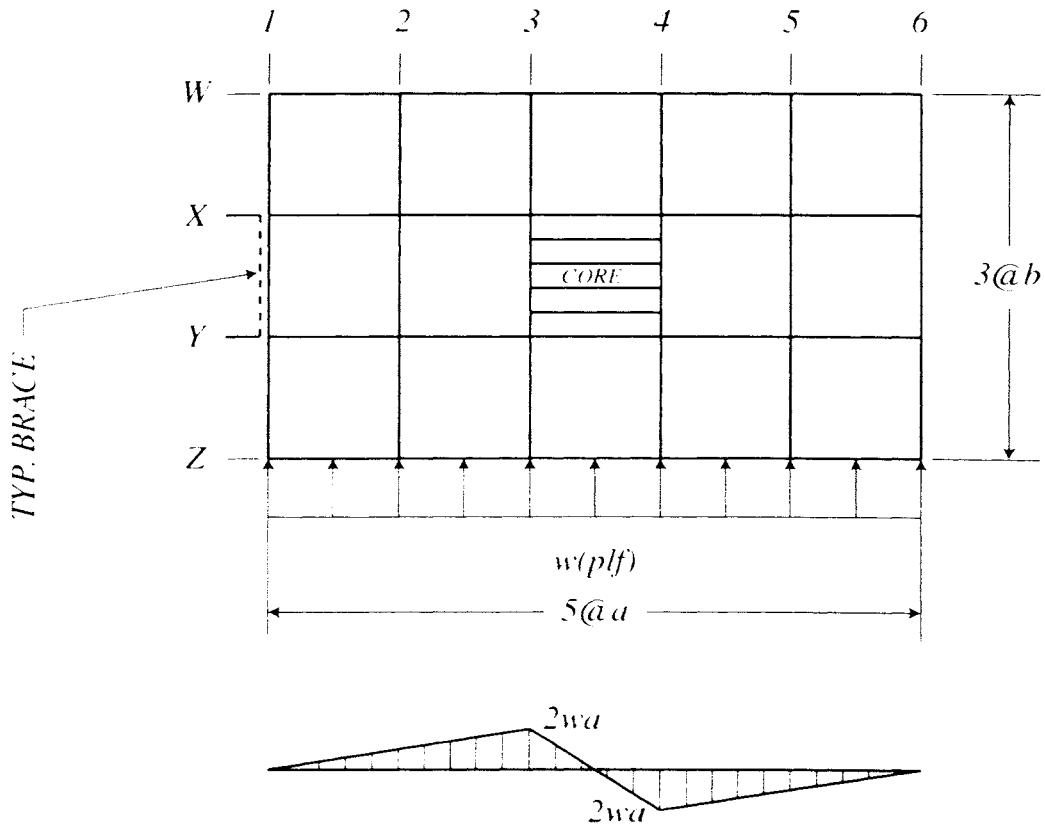


FIG 14.2 FLOOR PLAN AND SHEAR DIAGRAM

EXAMPLE 14 Floor Diaphragms.

Multistory structures may have floor layouts where a central core is used as the principal element for resisting lateral forces. A core, such as that indicated for the building of **Fig. 14.1** where certain columns have been omitted for clarity, may attract forces over a rather short length b near the center of the structure. For unsymmetrical load cases, torsion will be present and it may be necessary to add secondary bracing in the walls such as that indicated to the left in the figure.

Consider one floor as in **Fig. 14.2** where the core is to resist all lateral loads w . Examine the shear distribution in the core vicinity.

1. To the left of Line 3 (or right of Line 4), the average diaphragm shear force is $2wa$ and the average diaphragm shear across the floor width is

$$S = \frac{2wa}{3b} \quad (\text{a})$$

If the only attachment to the core wall were in the diaphragm and along dimension b , the average local diaphragm shear is more intense and would be,

$$S = \frac{2wa}{b} \quad (\text{b})$$

2. If the beams in Line 3 or 4 are attached to the core at their ends, a corner stress problem can be eliminated. For example, the Beam YZ on Line 3 attracts shears from the left for a total axial force of

$$C = b \frac{2wa}{3b} = \frac{2wa}{3} \quad (\text{c})$$

It may also receive, depending on the details between Lines 3 and 4, about half the load between those lines. Then the beam end anchorage required would be about

$$C = \frac{2wa}{3} + \frac{wa}{2} \quad (\text{d})$$

The anchorage is similar to that in Example 9 in which very little movement at the beam ends could be permitted.

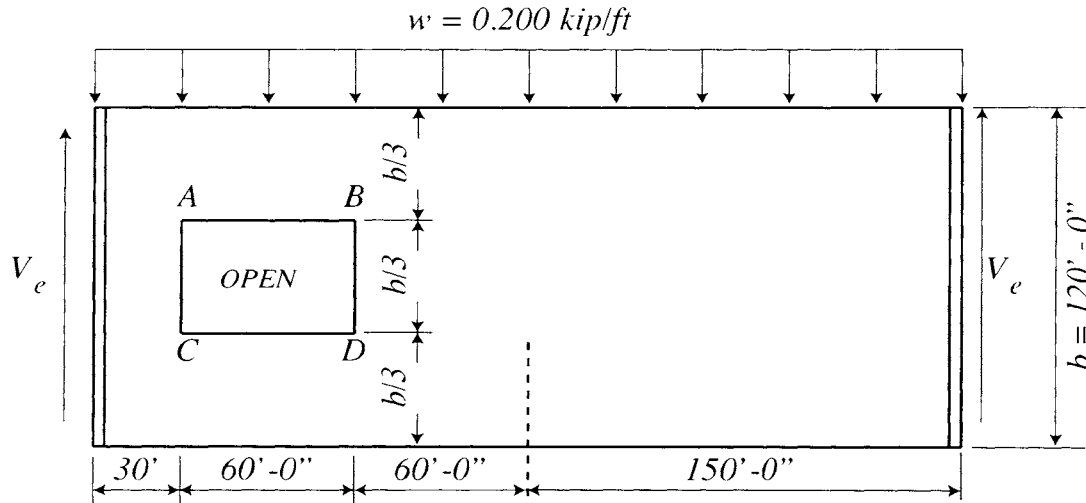
3. Relative to the nearest core wall, the maximum deflection at the diaphragm end is found from the shear diagram:

$$\Delta = \frac{2wa}{3bG'} \frac{2a}{2} = \frac{2wa^2}{3bG'} \quad (\text{e})$$

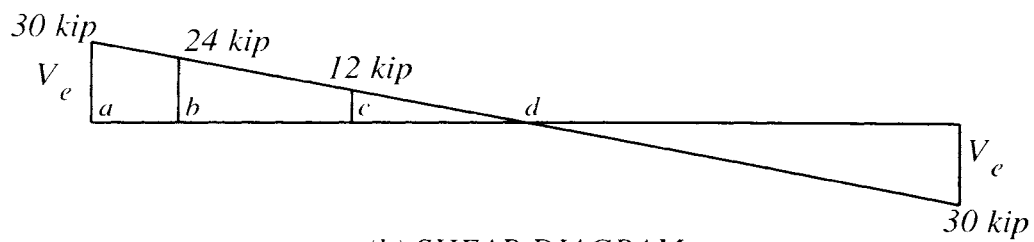
Floor diaphragms usually will be concrete filled and quite stiff. Suppose $G' = 30 \text{ kip/in}$ $\{5.25 \text{ kN/mm}\}$, $w = 250 \text{ plf}$ $\{3.65 \text{ kN/m}\}$, $a = 40 \text{ ft}$ $\{12.2 \text{ m}\}$, and $b = 30 \text{ ft}$ $\{9.14 \text{ m}\}$.

$$\Delta = \frac{2wa^2}{3bG'} \quad \Delta = 0.03 \text{ in.} \quad \{\Delta = 0.8 \text{ mm}\}$$

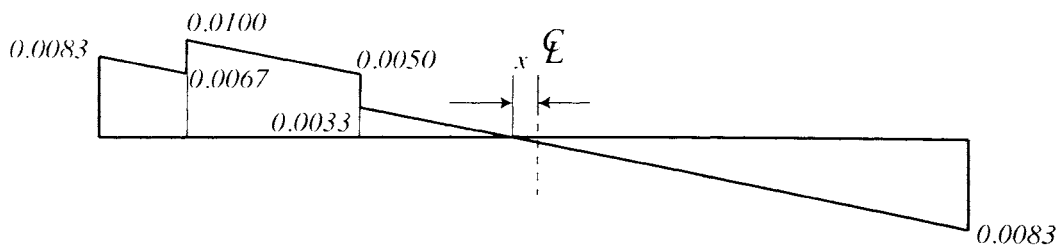
See Example 16 for other floor diaphragm examples.



(a) DIAPHRAGM PLAN



(b) SHEAR DIAGRAM



(c) V/bG' VARIATION

FIG 15 DIAPHRAGMS WITH OPEN AREAS

Example 15 Diaphragm With Open Areas.

Diaphragms with open areas must be designed to account for force transfer around the openings. The transfer must be arranged such that high local force concentrations are avoided.

Consider the diaphragm of **Fig. 15a** which has an opening $60\text{ ft} \times 40\text{ ft}$ $\{18.3\text{ m} \times 12.2\text{ m}\}$ nearer the left end as shown. With $w = 0.200\text{ kip/ft}$ $\{2.92\text{ kN/m}\}$, $G' = 30\text{ kip/in.}$ $\{5.25\text{ kN/mm}\}$, $l = 300\text{ ft}$ $\{91.4\text{ m}\}$ and $b = 120\text{ ft}$ $\{36.6\text{ m}\}$, determine the shear forces around the opening, the maximum deflection, and design the force transfer mechanism. The maximum shear is

$$V_e = \frac{wl}{2} = 30.0\text{ kip} \quad \{133\text{ kN}\} \quad (\text{a})$$

The regions marked ab and cd on the shear diagram are for areas having the established stiffness G' over the full width b . Within the 60 ft zone marked bc having the open area, unique stiffness also exists. For the purpose here, that zone is considered to be two-thirds as stiff as the full width diaphragms. Then following the **Example 5** simplified deflection method with V/bG' variations as shown in **Fig. 15c**, the deflections are:

$$\text{At } b: \Delta_b = \frac{30\text{ kip} + 24\text{ kip}}{2(120\text{ ft})} \cdot \frac{30\text{ ft}}{30\text{ kip/in.}} = \frac{0.0083 + 0.0067}{2} (30) = 0.225\text{ in.} \quad \{5.72\text{ mm}\} \quad (\text{b})$$

$$\text{At } c: \Delta_c = \Delta_b + \frac{24\text{ kip} + 12\text{ kip}}{2(120\text{ ft})} \cdot \frac{60\text{ ft}}{20\text{ kip/in.}} = 0.225\text{ in.} + \frac{0.0100 + 0.0050}{2} (60) = 0.675\text{ in.} \quad \{17.15\text{ mm}\} \quad (\text{c})$$

The maximum shear deflection is at the point where the V/bG' diagram is zero. That point is at x to the left of mid-span such that the area to the left and right are equal.

$$A_{\text{left}} = 0.675 + \frac{0.0033}{2} (60 - x); \quad A_{\text{rt}} = \frac{0.0083}{2} (150 + x)$$

$$\text{Then } x = 26\text{ ft} \quad \{7.92\text{ m}\} \quad \text{and} \quad \Delta_{\text{max}} = \frac{0.0083}{2} (150 + x) = 0.73\text{ in.} \quad \{18.54\text{ mm}\} \quad (\text{d})$$

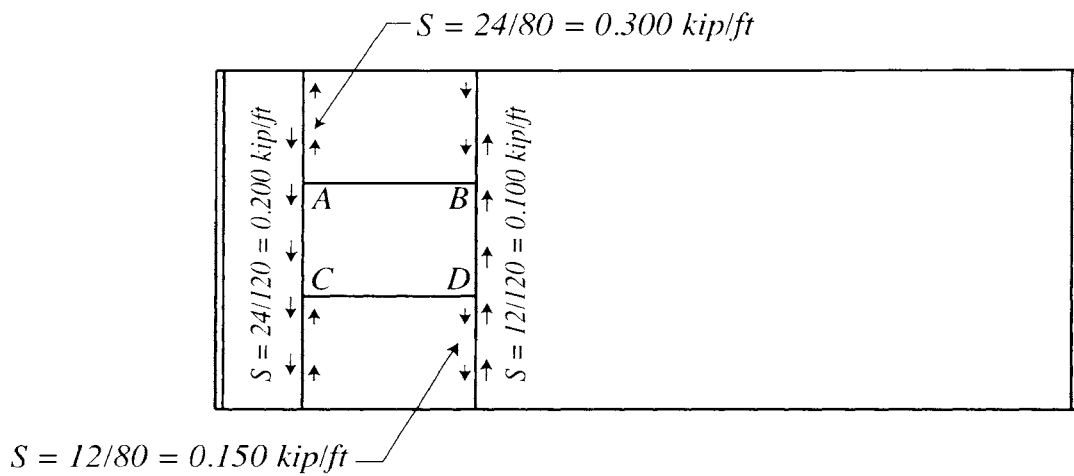
The forces in the vicinity of the opening may be determined from **Fig. 15d** showing the average shears to either side of the frame lines containing AC and BD . From the shear diagram and noting the shear length available;

$$\text{AC left:} \quad S = 24\text{ kip}/120\text{ ft} = 0.200\text{ kip/ft} \quad \{2.92\text{ kN/m}\}$$

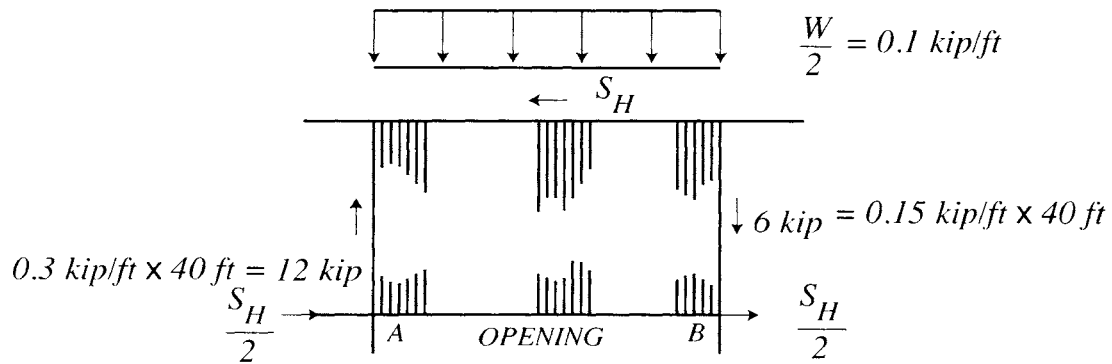
$$\text{AC right:} \quad S = 24\text{ kip}/(120\text{ ft} - 40\text{ ft}) = 0.300\text{ kip/ft} \quad \{4.38\text{ kN/m}\}$$

$$\text{BD left:} \quad S = 12\text{ kip}/(120\text{ ft} - 40\text{ ft}) = 0.150\text{ kip/ft} \quad \{2.19\text{ kN/m}\}$$

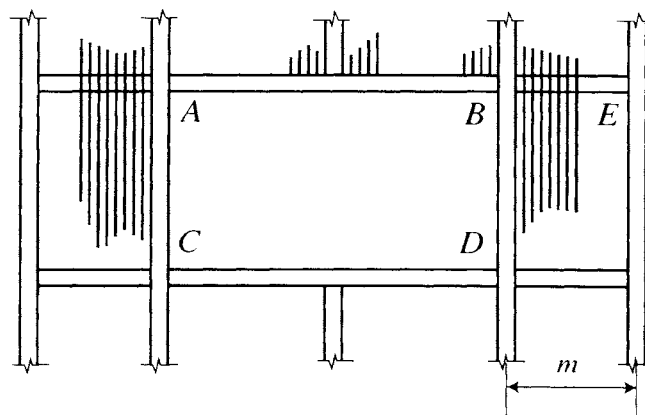
$$\text{BD right:} \quad S = 12\text{ kip}/120\text{ ft} = 0.100\text{ kip/ft} \quad \{1.46\text{ kN/m}\}$$



(d) AVERAGE SHEARS



(e) ADJACENT DIAPHRAGM PERIMETER FORCES



(f) FRAME AT OPENING

FIG 15 CONTINUED

The zone above AB or below CD must be in equilibrium through axial forces S_H in members AB and CD as in **Fig. 15e**. These S_H forces must be transferred into adjacent diaphragms over distances m , as in **Fig. 15f**, sufficiently great to avoid corner crippling. In lieu of a more detailed analysis, presume that half of the $w = 0.200 \text{ kip/ft}$ $\{2.92 \text{ kN/m}\}$ line load is acting on the upper zone and half on the lower zone as with "down wind" suction. Then from **Fig. 15e**, equilibrium can be established by summation of moments about the upper left corner:

$$S_H = \frac{I}{40} (0.100 \text{ kip/ft} \times 60 \text{ ft} \times 30 \text{ ft} + 6 \text{ kip} \times 60 \text{ ft}) = 13.5 \text{ kip} \quad \{60 \text{ kN}\} \quad (\text{e})$$

Half of this force can be transferred into adjacent diaphragms through extensions such as BE and over a length of m of **Fig. 15f**. Assume the load is wind load.

Suppose the diaphragm design thickness is $t = 0.0295 \text{ in.}$ $\{0.75 \text{ mm}\}$, $m = 15 \text{ ft}$ $\{4.57 \text{ m}\}$, and that powder actuated fasteners are used for connections. From Section 4.6

Buildex BX-14:	$Q_f = 62.5t (1-5t) = 1.572 \text{ kip}$	$\{7 \text{ kN}\}$
Hilti ENP2 and ENPH2:	$Q_f = 61.1t (1-4t) = 1.590 \text{ kip}$	$\{7.1 \text{ kN}\}$

Noting a resistance factor of $\phi = 0.70$ or a safety factor of $\Omega = 2.35$ for mechanical connectors from Section 2.4, page 2-12, the transfer of $S_H/2$ into the diaphragms adjacent would require n fasteners along m .

LRFD

Use a wind load factor $\gamma_w = 1.60$.

$$n = \frac{\gamma_w S_H}{2} \frac{I}{\phi Q_f} = 10 \quad \text{ASD} \quad n = \frac{S_H}{2} \frac{\Omega}{Q_f} = 10 \quad (\text{f})$$

With $m = 15 \text{ ft}$, the S_H force is delivered as shear along both sides of the extension:

$$S = \frac{S_H}{2} \frac{I}{2m} = 0.225 \text{ kip/ft} \quad \{3.28 \text{ kN/m}\} \quad (\text{g})$$

It is clear that large openings should be arranged such that their corners lie on major beam lines thus allowing the transfer length m to be great and the concentrated shear forces to be small.

With m fixed at 15 ft in the above example, the near-by diaphragm zones are required to resist:

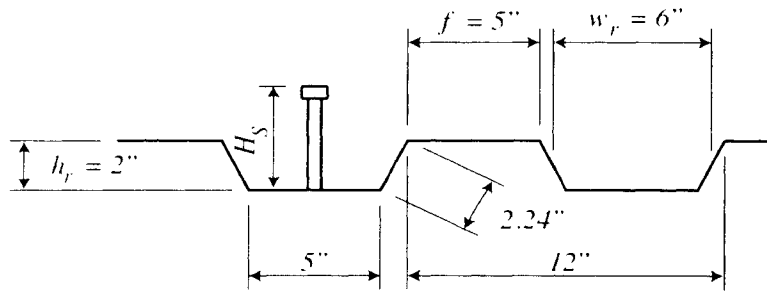
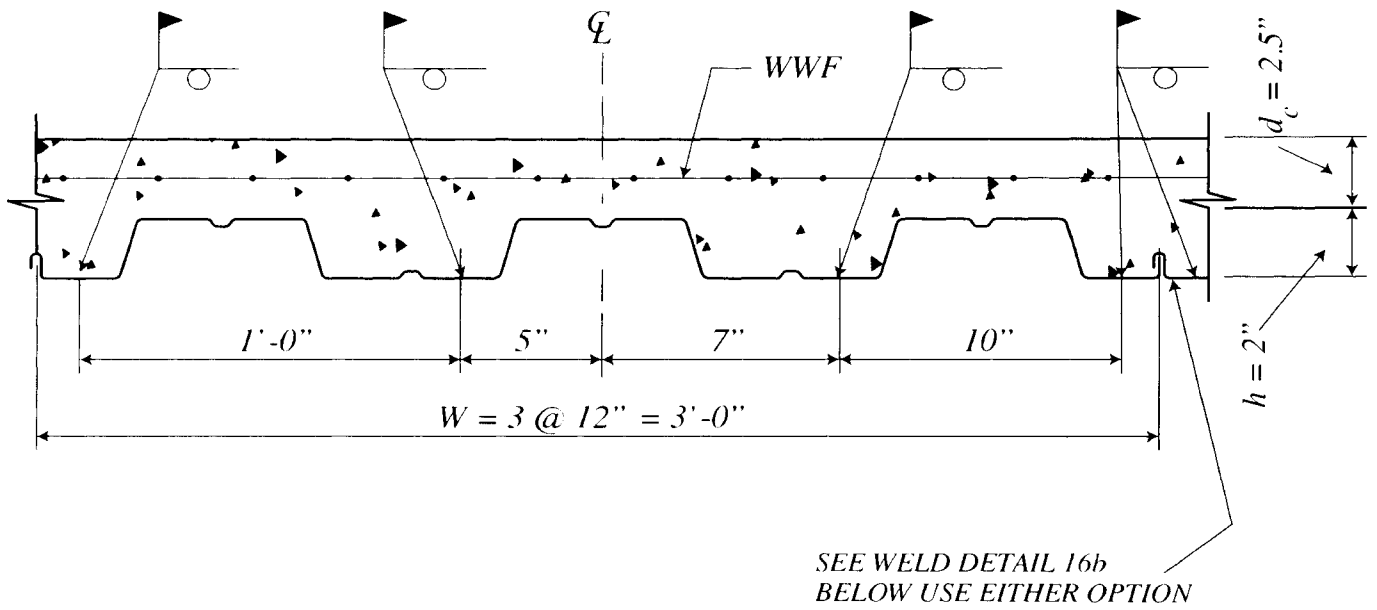
$ab:$	$S = 0.200 + 0.225 = 0.425 \text{ kip/ft}$	$\{6.2 \text{ kN/m}\}$
$cd:$	$S = 0.100 + 0.225 = 0.325 \text{ kip/ft}$	$\{4.74 \text{ kN/m}\}$

Since the diaphragm above AB must be designed for a 0.300 kip/ft $\{4.38 \text{ kN/m}\}$ un-factored shear, consider the needed length of m to keep the ab zone at a design shear of similar magnitude. From

$$\frac{S_H}{2} \frac{I}{2m} + 0.200 \text{ kip/ft} = 0.300 \text{ kip/ft}$$

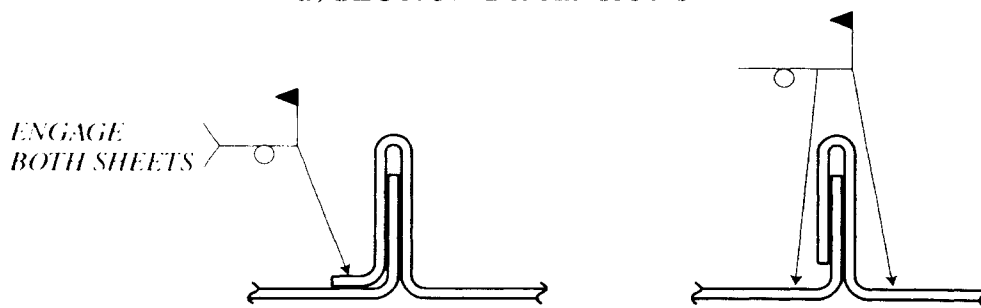
$$m = 33.75 \text{ ft} \quad \{10.27 \text{ m}\}$$

The 10 fasteners from Eq. f, along the BE-type extensions, must be included above those required for the basic design of the ab or cd zones.



AISC DIMENSIONS

a) SECTION DIMENSIONS



b) DETAIL FOR SIDE-LAP WELDING AT SUPPORTS
WITH ALTERNATE LAP DETAIL

FIG 16

Example 16 Concrete Filled Floor Diaphragm.

A floor system is fabricated using normal weight concrete over a 2 in. {50.8 mm} deep steel section as in **Fig. 16a**. The steel panel lengths are at least $3l_v$ long where l_v is the cross support beam spacing. Evaluate the composite system for strength and stiffness considering possible use of 3/4 in. {19 mm} shear studs on the diaphragm perimeter. The analysis has led to a maximum un-factored required shear of 0.750 kip/ft {10.94 kN/m}.

Data: Assume the shear is due to the lateral wind load,

LRFD

Use a load factor $\gamma_w = 1.6$

Factored required shear

$$S_u = 1.6 (0.750) = 1.2 \text{ kip/ft } \{17.5 \text{ kN/m}\}$$

$$f'_c = 3000 \text{ psi } \{20 \text{ MPa}\}; \quad d_c = 2.5 \text{ in. } \{64 \text{ mm}\} \text{ cover}; \quad w_c = 150 \text{ pcf } \{2400 \text{ kg/m}^3\};$$

Welds: E70XX 5/8 in. {16 mm} diameter, all positions

$t = 0.0358 \text{ in. } \{0.91 \text{ mm}\}; w = 36 \text{ in. } \{914 \text{ mm}\} \text{ cover width}; \text{ No. 10 stitch screws};$

Minimum $\ell = 3\ell_v = 27 \text{ ft } 0 \text{ in. } \{8.23 \text{ m}\}$ (three or more span conditions)

ASD

The allowable required shear

$$S = 0.75 \text{ kip/ft } \{10.94 \text{ kN/m}\}$$

Following Section 5.3

$$S_n = \frac{BQ_f}{l} + kbd_c \sqrt{f'_c} = \frac{BQ_f}{l} + 5.16, \quad k = \frac{w_c^{1/3}}{585 \times 10^3}, \quad b = 12 \text{ in.} \quad (\text{Eq. 5.3.1})$$

$$\{S_n = \frac{BQ_f}{l} + 74.45, \quad k = \frac{w_c^{1/3}}{452 \times 10^6}, \quad b = 1000 \text{ mm}\}$$

$$B = n_s \alpha_s + \frac{I}{w^2} [2n_p \sum(x_p^2) + 4\sum(x_c^2)] \quad (\text{Eq. 2.2-4})$$

$$Q_s = 21.5t = 0.77 \text{ kip} \quad (\text{Section 4.5})$$

$$\{Q_s = 3.76t = 3.42 \text{ kN}\}$$

$$Q_f = 99t (0.625 - t) = 2.088 \text{ kip} \quad (\text{Eq. 4.2.1-2})$$

$$\{Q_f = 0.682t (16 - t) = 9.37 \text{ kN}\}$$

$$n_s \alpha_s = 3 \text{ spans (2 screws / span)} (Q_s / Q_f) = 2.21$$

$$\sum x_p^2 = \sum x_c^2 = 5^2 + 17^2 + 7^2 + 17^2 = 652$$

Note that $\sum x^2$ may be slightly different if a single side-lap weld is used as may be possible with the left detail of **Fig. 16b**.

Then

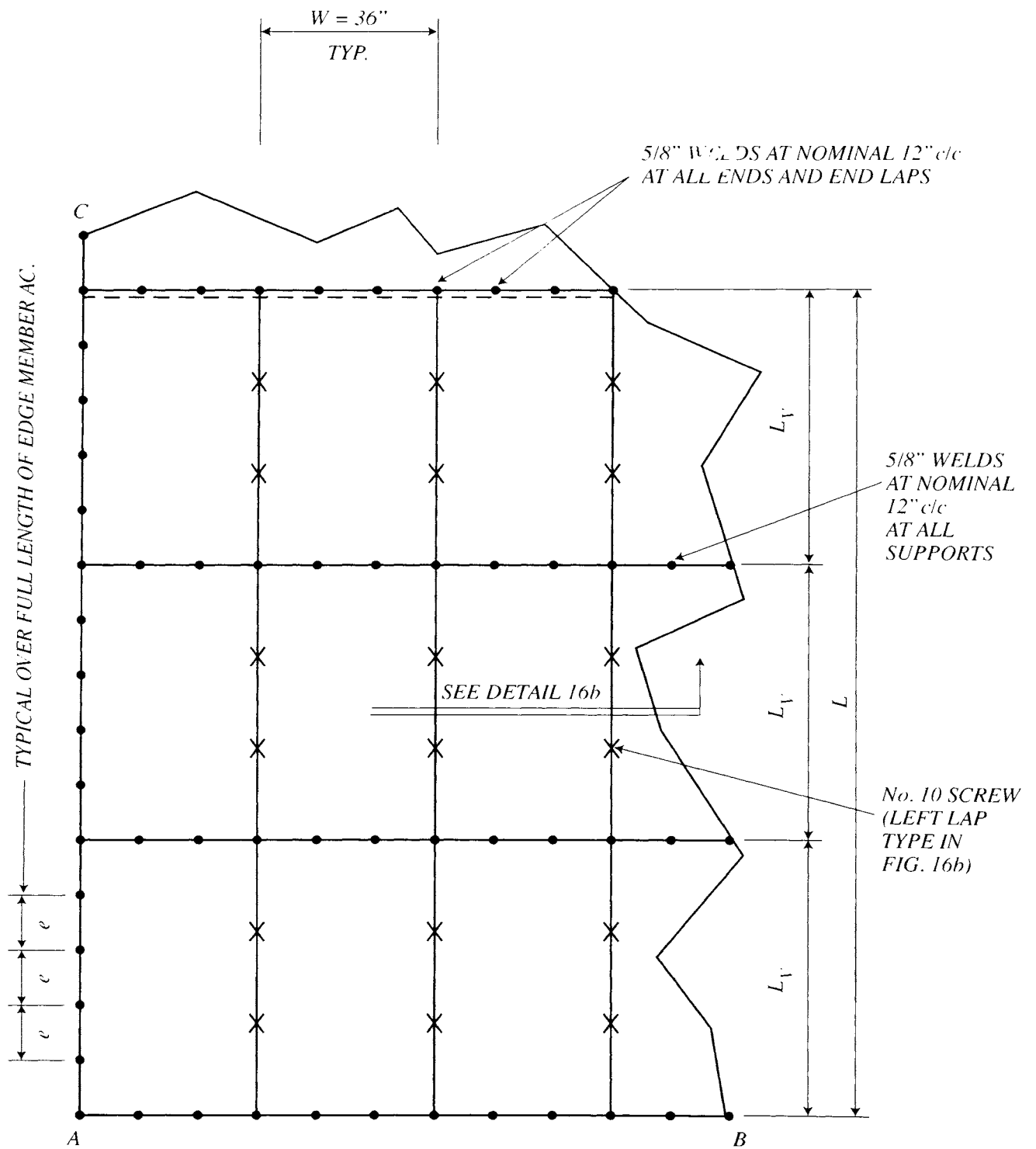
$$B = 6.23$$

and

$$S_n = 5.64 \text{ kip/ft}$$

$$\{S_n = 81.5 \text{ kN/m}\}$$

The 5.64 kip/ft value represents the maximum nominal strength available away from perimeter members.



c) TYPICAL DECK LAYOUT

FIG 16 continued

With the resistance factor of $\phi = 0.50$ or a safety factor of $\Omega = 3.25$ for filled diaphragm under wind load (Table 5.1, page 5-6),

LRFD

The design strength of diaphragm is
 $\phi S_u = 2.82 \text{ kip/ft } \{41.14 \text{ kN/m}\}$
 $> S_u = 1.2 \text{ kip/ft } \{17.5 \text{ kN/m}\}.$

ASD

$$\frac{S_u}{\Omega} = 1.74 \text{ kip/ft } \{25.4 \text{ kN/m}\}$$

$$> S = 0.75 \text{ kip/ft } \{10.94 \text{ kN/m}\}.$$

Using the 5/8 in. {19 mm} welds with $Q_f = 2.088 \text{ kip } \{9.288 \text{ kN}\}$ in shear,

LRFD

$$e = \phi Q_f / S_u = 10.44 \text{ in. } \{265 \text{ mm}\}$$

ASD

$$e = \frac{Q_f / \Omega}{S} = 10.28 \text{ in. } \{261 \text{ mm}\}$$

Along member AC of Fig. 16c with $\ell_v = 9 \text{ ft} = 108 \text{ in.}$, 10 intermediate welds within ℓ_v would allow $e = 9.82 \text{ in. } \{249 \text{ mm}\}$ and meet the required spacing. However, along member AB, the spacing was fixed at an average of 12 in. The inclusion of at least one extra weld, within w of Fig. 16a, would be required at panel ends on the diaphragm perimeter. With the fastener spacing across panel ends at 12 in., the required shear would be

LRFD

$$(10.44/12) (1.2) = 10.44 \text{ kip/ft}$$

$$\{15.2 \text{ kN/m}\}$$

ASD

$$(10.28/12) (0.75) = 0.64 \text{ kip/ft}$$

$$\{9.37 \text{ kN/m}\}$$

The addition of one extra weld per panel would lead to an average end spacing of 36 in/4 welds = 9 in. noting that the former average count was three welds per panel or a 12 in. spacing.

Shear studs may be used on the perimeter for force transfer with values established following Section 15, and commentary, of the AISC Manual of Steel Construction, Ninth Edition. Given the general dimension of Fig. 16a, coefficients are developed for shears perpendicular and parallel to the deck:

$$N_r = 1 \text{ stud per valley}$$

$$w_r = 6 \text{ in. rib opening}$$

$$h_r = 2 \text{ in. rib height}$$

$$H_s = 3.5 \text{ in. stud height}$$

$$Q_n = 0.5 A_s (f_c' E_c)^{0.5} = 21.0 \text{ kip for } 3/4 \text{ in. studs.}$$

$$Q_n \text{ not to exceed } A_s F_u \text{ of } 0.4418 (60) = 26.5 \text{ kip. (Follow AISC for symbols)}$$

$$\text{Perpendicular: } FAC = \frac{0.85}{(N_r)^{0.5}} \left(\frac{w_r}{h_r} \right) \left(\frac{H_s}{h_r} - 1.0 \right) = 1.91; \text{ use } 1.00$$

$$\text{Parallel: } w_r / h_r = 3.00 > 1.5, \text{ use } FAC = 1.00$$

Suppose it is desired to develop the maximum shear strength of 5.64 kip/ft through perimeter studs. Then using the value Q_n in lieu of the Q_f value earlier, the maximum stud spacing at the edge would be

$$e = \frac{12 (21.0)}{5.64} = 44.7 \text{ in.}$$

It is clear that the common AISC maximum spacing of $e = 36 \text{ in.}$ for these systems is sufficient for the diaphragm transfer.

It is expected that this diaphragm is a very rigid diaphragm because the concrete both carries much of the shear and retards end warping in the steel panels. For **Eq. 5.6-1**, the developed width per flute, $s/d = 14.48/12 = 1.207$ or $s/d = 1.206$ (Table I, page AIV-7). For the C term, as in **Eq. 3.3-1**:

$$\alpha_1 = \alpha_2 = \frac{1}{36} (5 + 17 + 7 + 17) = 1.278$$

$$S_f = 1.15 \times 10^{-3} / (t)^{0.5} = 0.0061 \text{ in./kip} \quad \{0.0347 \text{ mm/kN}\} \quad (\text{Eq. 4.4-1})$$

$$S_s = 3 \times 10^{-3} / (t)^{0.5} = 0.0159 \text{ in./kip} \quad \{0.0907 \text{ mm/kN}\}$$

$$n_p = 2 \text{ interior purlins within } \ell$$

$$n_s = 6 \text{ stitch screws per panel length}$$

$$\text{then, } C = \frac{29500 (0.0358) (0.0061)}{36} \left(\frac{24 \times 27}{4 \times 1.278 + 12 \times 0.38} \right) = 11.99 \quad (\text{Eq. 3.3-1})$$

$$\{C = \frac{210 (0.91) (0.0347)}{914} \left(\frac{2}{4 \times 1.278 + 12 \times 0.38} \right) (8.23) (1000) = 12.35\}$$

$$\text{and, } G' = \frac{29500 \times 0.0358}{2.6 \times 1.206 + 11.99} + 3.5 (2.5) (3000)^{0.7} = 2447 \text{ kip/in.} \quad (\text{Eq. 5.6-1})$$

$$\{G' = \frac{210 \times 0.91}{2.6 \times 1.206 + 12.35} + 0.786 (64) (20)^{0.7} = 422 \text{ kN/mm}\}$$

The $G' = 2447 \text{ kip/in.}$ value defines a very stiff composite system as can be seen from the list included in Example Problem 4.

APPENDIX IV
TYPICAL FASTENER LAYOUT
WARPING FACTOR DEVELOPMENT
DIAPHRAGM DESIGN TABLES

Typical Fastener Layout

1.5(WR,IR,NR)



36/9 PATTERN



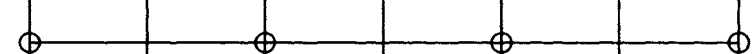
36/7 PATTERN



36/5 PATTERN



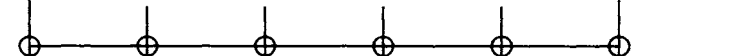
* 36/4 PATTERN



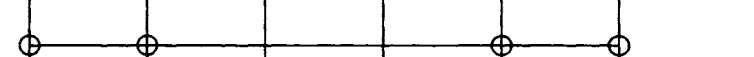
36/3 PATTERN



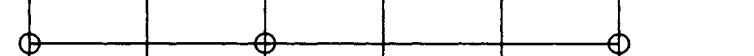
30/6 PATTERN



30/4 PATTERN



30/3 PATTERN

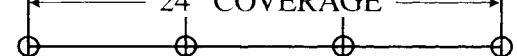


* This pattern is also used for 1.5 in. WR composite deck.

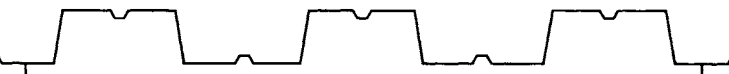
3 DR



24/4 PATTERN



1.5 in., 2 in. or 3 in. COMPOSITE



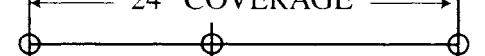
36/4 PATTERN



2 in. or 3 in. COMPOSITE



24/3 PATTERN



9/16 FORM



35/8 PATTERN



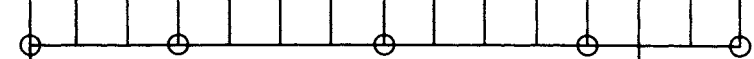
35/7 PATTERN



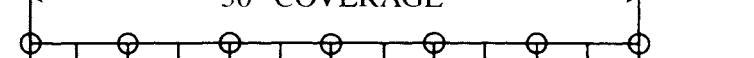
35/6 PATTERN



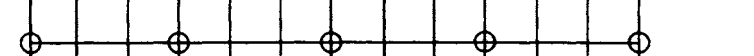
35/5 PATTERN



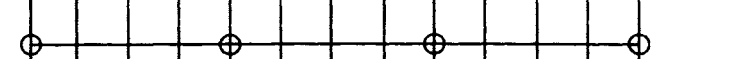
30/7 PATTERN



30/5 PATTERN



30/4 PATTERN

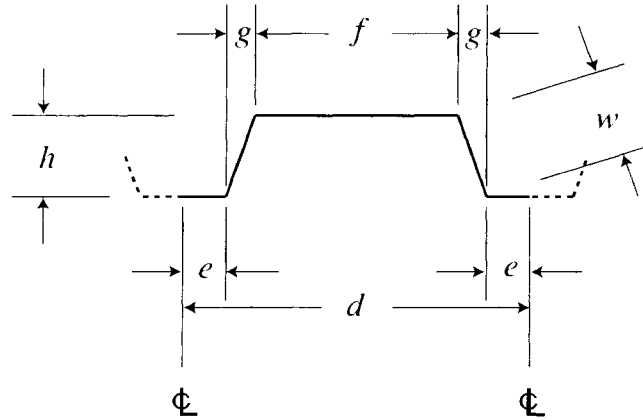


Warping Factor Development

D -values for warping are given in Table 3.3-1 for the more common 1.5 in. deep standard SDI profiles. They were developed following the rather detailed material from Reference 18 that is summarized below and suited to programmed use. The profile of one corrugation is as shown where dimensions are in inches and are presumed to represent flat elements between their intersection points. The symbols used herein are intended only for this appendix.

Not all of the values in the listing below are needed for any one end fastener layout. Beginning with WT , values are established for subsequent use leading to $DW1$ through $DW4$ representing D -values for bottom end fasteners in each, alternate, every third, and fourth valleys respectively.

Listing



$$WT = 4f^2(f + w)$$

$$WB = 16e^2(2e + w)$$

$$PW = \frac{I}{t^{1.5}}$$

$$D1 = \frac{h^2(2w + 3f)}{3}$$

$$A = 2 \frac{e}{f}$$

$$D2 = \frac{D1}{2}$$

$$V = 2(e + w) + f$$

$$D3 = \frac{I}{12} \left[\frac{h^2}{d^2} \right] \left[V(4e^2 - 2ef + f^2) + d^2(3f + 2w) \right]$$

$$C1 = \frac{I}{D3 - \frac{D2}{2}}$$

$$C4 = \frac{A}{D1 \left[\frac{e}{f} \right] + D2}$$

$$C2 = \frac{I}{D2 \left[\frac{e}{f} \right] + D3}$$

$$C5 = \frac{A}{(0.5 + A)D1 + D2}$$

$$C3 = \frac{I}{(0.5 + A)D2 + D3}$$

$$C6 = \frac{I}{(0.5 + A)D1 + D3 + \frac{D2}{2}}$$

$$D4(1) = \left(\frac{24f}{C1}\right)^4 \sqrt{\frac{C1}{WT}}$$

$$D4(4) = \left(\frac{48e}{C4}\right)^4 \sqrt{\frac{C4}{WB}}$$

$$D4(2) = \left(\frac{24f}{C2}\right)^4 \sqrt{\frac{C2}{WT}}$$

$$D4(5) = \left(\frac{48e}{C5}\right)^4 \sqrt{\frac{C5}{WB}}$$

$$D4(3) = \left(\frac{24f}{C3}\right)^4 \sqrt{\frac{C3}{WT}}$$

$$D4(6) = \left(\frac{24f}{C6}\right)^4 \sqrt{\frac{C6}{WT}}$$

$$G4(1) = D4(1)$$

$$C41 = \frac{A}{(1.5A+1)D1+D2}$$

$$G4(2) = 2[D4(2)]+ A [D4(4)]$$

$$C42 = \frac{I}{D3+(1.5A+1)D2}$$

$$G4(3) = 2[D4(3)]+ D4(6) + 2A[D4(5)]$$

$$C43 = \frac{A}{(2A+1)D1+2[D2]}$$

$$C44 = \frac{I}{(1.5A+1)D1+(0.5A+1)[D2]+D3}$$

$$D41 = \left(\frac{48e}{C41}\right)^4 \sqrt{\frac{C41}{WB}}$$

$$D42 = \left(\frac{24f}{C42}\right)^4 \sqrt{\frac{C42}{WT}}$$

$$D43 = \left(\frac{48e}{C43}\right)^4 \sqrt{\frac{C43}{WB}}$$

$$D44 = \left(\frac{24f}{C44}\right)^4 \sqrt{\frac{C44}{WT}}$$

$$G44 = 2(D42 + D44) + A[2(D41) + D43]$$

$$DW1 = G4(1)\left(\frac{f}{d}\right)PW$$

$$DW3 = G4(3)\left(\frac{f}{3d}\right)PW$$

$$DW2 = G4(2)\left(\frac{f}{2d}\right)PW$$

$$DW4 = G44\left(\frac{f}{4d}\right)PW$$

Any computer program developed following the above list should be checked against the values of Table 3.3-1 for a preliminary check of its accuracy. For that table, the following inch dimensions were used.

Type	h	w	d	e	f	g	s
WR	1.50	1.5052	6.00	1.000	3.750	0.125	8.760
IR	1.50	1.5052	6.00	0.625	4.500	0.125	8.760
NR	1.50	1.5117	6.00	0.250	5.125	0.1875	8.648

General Stiffness Equations

BARE DECKS:
$$G' = \frac{K_2}{K_4 + \frac{0.3D_{xx}}{\ell_v} + 3K_1 \ell_v}$$
 (for deck with triple span condition)

FILLED DECKS:
$$G' = \frac{K_2}{K_4 + 3K_1 \ell_v} + K_3$$

For US units, ℓ_v is purlin or joist spacing in feet.

For SI units, ℓ_v is purlin or joist spacing in meters.

D_{xx} : select the appropriate value of D_{xx} from Table I, ft, or Table I-M, m.

K_1 : see load tables for the value, ft^{-1}

{ To convert to m^{-1} , multiply K_1 from load table by 3.387. i.e. (3.281) $\left\{ \frac{210000 \text{ MPa}}{(29500 \text{ ksi}) (6.895)} \right\}$ }

Type	Thickness		K_2	
28	0.0149 in.	0.38 mm	440 kip/in.	80 kN/mm
26	0.0179 in.	0.45 mm	528 kip/in.	95 kN/mm
24	0.0239 in.	0.60 mm	705 kip/in.	126 kN/mm
22	0.0295 in.	0.75 mm	870 kip/in.	158 kN/mm
20	0.0358 in.	0.91 mm	1056 kip/in.	191 kN/mm
18	0.0474 in.	1.20 mm	1398 kip/in.	252 kN/mm
16	0.0598 in.	1.52 mm	1764 kip/in.	319 kN/mm

Concrete type	f'_c		K_3	
insulating concrete	125 psi	0.860 MPa	260 kip/in.	46 kN/mm
structural concrete	3000 psi	21 MPa	2380 kip/in.	430 kN/mm

Deck profile	K_4
WR,IR,NR	3.78
DR	4.31
9/16" x 2.5" form deck	3.20
1.5" x 6" composite deck	3.78
2" x 12" composite	3.14
3" x 12" composite deck	3.54

Table I

TYPICAL FASTENER PATTERNS														
Deck Type	Deck Profile	Fastener Pattern	α	$\sum \left(\frac{x}{w}\right)^2$	N ft ⁻¹	s/d	A	Warping Constant, Dxx, ft						
								D28	D26	D24	D22	D20	D18	D16
1.5" ROOF DECK	WR IR NR	36/9	3.000	1.278	2.333	1.454	2				129 226 356	97 169 266	63 111 175	45 78 123
	WR IR NR	36/7	2.000	0.778	2.000	1.454	1				129 226 356	97 169 266	63 111 175	45 78 123
	WR IR NR	36/5	1.667	0.722	1.333	1.454	1				758 886 974	567 663 728	372 435 478	262 307 337
	WR IR NR	36/4	1.333	0.556	1.000	1.454	1				1072 1216 1282	802 909 959	526 597 630	371 421 444
	WR IR NR	36/3	1.000	0.500	0.667	1.454	1				2209 2428 2442	1652 1816 1827	1084 1192 1199	765 841 846
	WR IR NR	30/6	1.800	0.700	2.000	1.454	1				129 226 356	97 169 266	63 111 175	45 78 123
	WR IR NR	30/4	1.600	0.680	1.200	1.454	1				1377 1547 1608	1030 1157 1202	676 760 789	477 536 557
	WR IR NR	30/3	1.100	0.510	0.800	1.454	1				1754 1943 1978	1312 1453 1480	861 954 971	607 673 685
3" ROOF DECK	DR	24/4	1.333	0.556	1.500	1.658	1				653	488	321	226
9/16" FORM DECK	2.5" PITCH	35/8	2.286	0.857	2.400	1.232	1	126	97	63				
		35/7	2.143	0.847	2.057	1.232		189	143	93				
		35/6	1.714	0.674	1.714	1.232		250	190	124				
		35/5	1.571	0.663	1.371	1.232		365	277	181				
		30/7	2.000	0.778	2.400	1.232	128	97	63					
30/5	1.500	0.625	1.600	1.232	270	205	134							
30/4	1.333	0.556	1.200	1.232	436	331	216							
1.5" COMP. DECK	6" PITCH	36/4	1.333	0.556	1.000	1.454	1				1072	802	526	371
2" COMP. DECK	12" PITCH	36/4	1.333	0.556	1.000	1.206	1				139	104	68	48
		24/3	1.000	0.500	1.000	1.206		139	104	68	48			
3" COMP. DECK	12" PITCH	36/4	1.333	0.556	1.000	1.360	1				271	203	133	94
		24/3	1.000	0.500	1.000	1.360		271	203	133	94			

Table II

Deck Type	Deck Profile	Moment of Inertia, in ⁴ / ft / Deck Thickness No.						
		28	26	24	22	20	18	16
1.5" ROOF DECK	WR				0.152	0.198	0.284	0.355
	IR				0.108	0.139	0.196	0.245
	NR				0.099	0.128	0.181	0.226
3" ROOF DECK	DR				0.551	0.714	1.036	1.295
9/16" FORM DECK	2.5" PITCH	0.011	0.013	0.017				
COMP.	1.5" x 6"				0.165	0.212	0.308	0.400
	2" x 12"				0.338	0.420	0.560	0.700
	3" x 12"				0.797	0.993	1.324	1.666

Table III

Steel Property	Panel Yield Strength, ksi / Deck Thickness No.						
	28	26	24	22	20	18	16
F _y	80	80	80	33	33	33	33
F _u				45	45	45	45
E	29500						

Table I-M

TYPICAL FASTENER PATTERNS														
Deck Type	Deck Profile	Fastener Pattern	α	$\sum (\frac{x}{w})^2$	N m ⁻¹	s/d	A	Warping Constant, Dxx, m						
								D28	D26	D24	D22	D20	D18	D16
1.5" ROOF DECK	WR IR NR	36/9	3.000	1.278	7.652	1.454	2				39 69 109	30 52 81	19 34 53	14 24 38
	WR IR NR	36/7	2.000	0.778	6.560	1.454	1				39 69 109	30 52 81	19 34 53	14 24 38
	WR IR NR	36/5	1.667	0.722	4.373	1.454	1				231 270 297	173 202 222	113 133 146	80 94 103
	WR IR NR	36/4	1.333	0.556	3.280	1.454	1				327 371 391	245 277 292	160 182 192	113 128 135
	WR IR NR	36/3	1.000	0.500	2.187	1.454	1				673 740 745	504 554 557	330 363 366	233 256 258
	WR IR NR	30/6	1.800	0.700	6.560	1.454	1				39 69 109	30 52 81	19 34 53	14 24 38
	WR IR NR	30/4	1.600	0.680	3.936	1.454	1				420 472 490	314 353 366	206 232 241	145 163 170
	WR IR NR	30/3	1.100	0.510	2.624	1.454	1				535 592 603	400 443 451	263 291 296	185 205 209
3" ROOF DECK	DR	24/4	1.333	0.556	4.920	1.658	1				199	149	98	69
9/16" FORM DECK	2.5" PITCH	35/8	2.286	0.857	7.872	1.232	1	38	30	19				
		35/7	2.143	0.847	6.747	1.232		58	44	28				
		35/6	1.714	0.674	5.622	1.232		76	58	38				
		35/5	1.571	0.663	4.497	1.232		111	84	55				
		30/7	2.000	0.778	7.872	1.232	39	30	19					
	30/5	1.500	0.625	5.248	1.232	1	82	63	41					
	30/4	1.333	0.556	3.936	1.232		133	101	66					
1.5" COMP. DECK	6" PITCH	36/4	1.333	0.556	3.280	1.454	1				327	245	160	113
2" COMP. DECK	12" PITCH	36/4	1.333	0.556	3.280	1.206	1				42	32	21	15
		24/3	1.000	0.500	3.280	1.206		42	32	21	15			
3" COMP. DECK	12" PITCH	36/4	1.333	0.556	3.280	1.360	1				83	62	41	29
		24/3	1.000	0.500	3.280	1.360		83	62	41	29			

Table II-M

Deck Type	Deck Profile	Moment of Inertia, mm ⁴ / mm / Deck Thickness No.						
		28	26	24	22	20	18	16
1.5" ROOF DECK	WR				208	270	388	485
	IR				148	190	268	335
	NR				135	175	247	309
3" ROOF DECK	DR				753	975	1415	1769
9/16" FORM DECK	2.5" PITCH	15	18	23				
COMP.	1.5" x 6"				225	290	421	546
	2" x 12"				462	574	765	956
	3" x 12"				1089	1357	1809	2276

Table III-M

Steel Property	Panel Yield Strength, MPa / Deck Thickness No.						
	28	26	24	22	20	18	16
F _y	550	550	550	230	230	230	230
F _u				310	310	310	310
E	210000						

Table IV - TYPICAL FASTENER VALUES - NOMINAL SHEAR STRENGTH (Q_f & Q_s) & FLEXIBILITY (S_f & S_s)

SUPPORT FASTENER NOMINAL SHEAR STRENGTH							
TYPE OF SUPPORT FASTENER	Q_f , lbf / Deck Thickness No.						
	28	26	24	22	20	18	16
5/8" puddle weld or equivalent				1739	2088	2710	3346
3/4" puddle weld or equivalent				2104	2531	3297	4086
16 gauge weld washer with 3/8" hole — E70XX	1199	1552	2371				
Buildex or ElcoTextron #12 or #14 TEKS	652	859	1325	1016	1233	1633	2060
Buildex BX-12	594	769	1147	1484	1734	2134	2473
Buildex BX-14	629	814	1215	1572	1837	2260	2620
Pneutek SDK61-series (0.113" to 0.155" support steel)	642	807	1173	1527	1828	2360	2896
Pneutek SDK63-series (0.155" to 0.25" support steel)	725	912	1325	1711	1973	2403	2812
Pneutek K64-series (0.187" to 0.312" support steel)	729	916	1332	1699	2209	2985	3686
Pneutek K66-series (0.281" & greater support steel)	621	780	1134	1814	2251	3101	4076
Hilti ENP2 or ENPH2 (0.25" minimum support steel)	856	1015	1321	1590	1874	2347	2780
Hilti ENP2K, X-EDN19, or X-EDNK22 (0.125" to 0.375" support steel)	763	914	1213	1489	1795	2348	2924

SUPPORT FASTENER FLEXIBILITY							
TYPE OF SUPPORT FASTENER	S_f , in./Kip / Deck Thickness No.						
	28	26	24	22	20	18	16
5/8" puddle weld or equivalent				0.0067	0.0061	0.0053	0.0047
3/4" puddle weld or equivalent				0.0067	0.0061	0.0053	0.0047
16 gauge weld washer with 3/8" hole — E70XX	0.0094	0.0086	0.0074				
Buildex or ElcoTextron #12 or #14 TEKS	0.0107	0.0097	0.0084	0.0076	0.0069	0.0060	0.0053
Buildex BX-12	0.0205	0.0187	0.0162	0.0146	0.0132	0.0115	0.0102
Buildex BX-14	0.0205	0.0187	0.0162	0.0146	0.0132	0.0115	0.0102
Pneutek SDK61-series (0.113" to 0.155" support steel)	0.0246	0.0224	0.0194	0.0175	0.0159	0.0138	0.0123
Pneutek SDK63-series (0.155" to 0.25" support steel)	0.0246	0.0224	0.0194	0.0175	0.0159	0.0138	0.0123
Pneutek K64-series (0.187" to 0.312" support steel)	0.0246	0.0224	0.0194	0.0175	0.0159	0.0138	0.0123
Pneutek K66-series (0.281" & greater support steel)	0.0246	0.0224	0.0194	0.0175	0.0159	0.0138	0.0123
Hilti ENP2 or ENPH2 (0.25" minimum support steel)	0.0102	0.0093	0.0081	0.0073	0.0066	0.0057	0.0051
Hilti ENP2K, X-EDN19, or X-EDNK22 (0.125" to 0.375" support steel)	0.0102	0.0093	0.0081	0.0073	0.0066	0.0057	0.0051

SIDE-LAP FASTENER NOMINAL SHEAR STRENGTH							
TYPE OF SIDE-LAP FASTENER	Q_s , lbf / Deck Thickness No.						
	28	26	24	22	20	18	16
5/8" puddle weld or 1.5" long fillet weld				1304	1566	2033	2510
#8 screws	280	337	449	555	673	891	1124
#10 screws	320	384	513	633	769	1018	1284
#12 screws	362	435	580	716	869	1151	1452
#14 screws	424	510	681	840	1020	1350	1703

SIDE-LAP FASTENER FLEXIBILITY							
TYPE OF SIDE-LAP FASTENER	S_s , in./Kip / Deck Thickness No.						
	28	26	24	22	20	18	16
5/8" puddle weld or 1.5" long fillet weld				0.0073	0.0066	0.0057	0.0051
#8 screws	0.0246	0.0224	0.0194	0.0175	0.0159	0.0138	0.0123
#10 screws	0.0246	0.0224	0.0194	0.0175	0.0159	0.0138	0.0123
#12 screws	0.0246	0.0224	0.0194	0.0175	0.0159	0.0138	0.0123
#14 screws	0.0246	0.0224	0.0194	0.0175	0.0159	0.0138	0.0123

Table IV-M - TYPICAL FASTENER VALUES - NOMINAL SHEAR STRENGTH (Q_f & Q_s) & FLEXIBILITY (S_f & S_s)

SUPPORT FASTENER NOMINAL SHEAR STRENGTH							
TYPE OF SUPPORT FASTENER	Q_f , kN / Deck Thickness No.						
	28	26	24	22	20	18	16
16 mm puddle weld or equivalent				7.80	9.27	12.11	14.83
19 mm puddle weld or equivalent				9.33	11.11	14.57	17.90
1.5 mm weld washer with 10 mm hole — E70XX	5.50	6.96	10.55				
Buildex and Elco Textron #12 or #14 TEKS	2.92	3.76	5.79	4.56	5.48	7.30	9.13
Buildex BX-12	2.66	3.37	5.02	6.60	7.65	9.47	10.92
Buildex BX-14	2.80	3.56	5.30	6.97	8.07	9.99	11.52
Pneutek SDK61-series (3 mm to 4 mm support steel)	2.87	3.54	5.13	6.81	8.07	10.49	12.77
Pneutek SDK63-series (4 mm to 6 mm support steel)	3.24	4.00	5.80	7.63	8.72	10.68	12.42
Pneutek K64-series (5 mm to 8 mm support steel)	3.26	4.02	5.83	7.59	9.73	13.27	16.26
Pneutek K66-series (7 mm & greater support steel)	2.77	3.42	4.96	8.07	9.89	13.73	17.85
Hilti ENP2 or ENPH2 (6 mm minimum support steel)	3.82	4.47	5.81	7.08	8.27	10.41	12.26
Hilti ENP2K, X-EDN19, or X-EDNK22 (3 mm to 10 mm support steel)	3.41	4.03	5.34	6.63	7.91	10.42	12.86

SUPPORT FASTENER FLEXIBILITY							
TYPE OF SUPPORT FASTENER	S_f , mm/kN / Deck Thickness No.						
	28	26	24	22	20	18	16
16 mm puddle weld or equivalent				0.0382	0.0349	0.0302	0.0270
19 mm puddle weld or equivalent				0.0382	0.0349	0.0302	0.0270
1.5 mm weld washer with 10 mm hole — E70XX	0.0537	0.0493	0.0427				
Buildex and Elco Textron #12 or #14 TEKS	0.0607	0.0558	0.0483	0.0432	0.0394	0.0341	0.0305
Buildex BX-12	0.1166	0.1072	0.0928	0.0830	0.0758	0.0656	0.0587
Buildex BX-14	0.1166	0.1072	0.0928	0.0830	0.0758	0.0656	0.0587
Pneutek SDK61-series (3 mm to 4 mm support steel)	0.1400	0.1286	0.1114	0.0997	0.0910	0.0788	0.0705
Pneutek SDK63-series (4 mm to 6 mm support steel)	0.1400	0.1286	0.1114	0.0997	0.0910	0.0788	0.0705
Pneutek K64-series (5 mm to 8 mm support steel)	0.1400	0.1286	0.1114	0.0997	0.0910	0.0788	0.0705
Pneutek K66-series (7 mm & greater support steel)	0.1400	0.1286	0.1114	0.0997	0.0910	0.0788	0.0705
Hilti ENP2 or ENPH2 (6 mm minimum support steel)	0.0584	0.0537	0.0465	0.0416	0.0379	0.0329	0.0294
Hilti ENP2K, X-EDN19, or X-EDNK22 (3 mm to 10 mm. support steel)	0.0584	0.0537	0.0465	0.0416	0.0379	0.0329	0.0294

SIDE-LAP FASTENER NOMINAL SHEAR STRENGTH							
TYPE OF SIDE-LAP FASTENER	Q_s , kN / Deck Thickness No.						
	28	26	24	22	20	18	16
16 mm puddle weld or 38 mm fillet weld				5.85	6.95	9.08	11.1
#8 screws	1.25	1.48	1.97	2.47	2.96	3.95	4.94
#10 screws	1.43	1.69	2.26	2.82	3.38	4.51	5.64
#12 screws	1.62	1.91	2.55	3.19	3.83	5.10	6.38
#14 screws	1.90	2.24	2.99	3.74	4.49	5.99	7.48

SIDE-LAP FASTENER FLEXIBILITY							
TYPE OF SIDE-LAP FASTENER	S_s , mm/kN / Deck Thickness No.						
	28	26	24	22	20	18	16
16 mm puddle weld or 38 mm fillet weld				0.0416	0.0379	0.0329	0.0294
#8 screws	0.1400	0.1286	0.1114	0.0997	0.0910	0.0788	0.0705
#10 screws	0.1400	0.1286	0.1114	0.0997	0.0910	0.0788	0.0705
#12 screws	0.1400	0.1286	0.1114	0.0997	0.0910	0.0788	0.0705
#14 screws	0.1400	0.1286	0.1114	0.0997	0.0910	0.0788	0.0705

Table V - WELDS IN TENSION $\phi_u = 0.6$ $\Omega_u = 2.5$

Deck Thickness in.	T_n , lbf ⁽¹⁾ Visible Diameter, in.			
	0.500	0.625	0.750	1.000
0.0295	930	1175	1425	1915
0.0358	1110	1410	1710	2310
0.0474	1435	1835	2230	3025
0.0598	1760	2265	2765	3765

⁽¹⁾ $T_n = \text{Minimum} (\pi d_e^2 F_{xx} / 4, 0.8 (F_u / F_y)^2 t_d F_u)$
per Reference 37, Section E2.2.2.

$F_{xx} = 70$ ksi, $F_u = 45$ ksi, $F_y = 33$ ksi

This table is for concentrically loaded arc spot weld connecting single sheet to support.

Refer to Reference 37 for tensile strength of eccentrically loaded welds on butted or lapped end supports, or in side-lap flutes over supports.

Table V-M - WELDS IN TENSION $\phi_u = 0.6$ $\Omega_u = 2.5$

Deck Thickness mm	T_n , kN Visible Diameter, mm			
	13	16	19	25
0.75	4.14	5.23	6.34	8.52
0.91	4.94	6.27	7.61	10.28
1.20	6.38	8.16	9.92	13.46
1.52	7.83	10.08	12.30	16.75

Table VI - SCREWS IN TENSION $\phi_u = 0.5$ $\Omega_u = 3.0$

Deck Thickness in.	T_n , lbf / $t_{c(\min)}$ ⁽¹⁾ , in.					
	Screw Type / Screw Head or Washer Diameter, in.					
	#10		#12		1/4"	
	0.400	0.415	0.400	0.430	0.480	0.520
0.0295	795 0.077	825 0.080	795 0.068	855 0.073	955 0.069	995 0.072
0.0358	965 0.094	1005 0.097	965 0.083	1040 0.089	1160 0.084	1210 0.087
0.0474	1280 0.124	1330 0.129	1280 0.110	1375 0.118	1535 0.111	1600 0.116
0.0598	1615 0.157	1675 0.162	1615 0.138	1735 0.149	1940 0.140	2020 0.146

⁽¹⁾ $T_n = \text{Minimum} (P_{not}, P_{nov})$ per Reference 37, Section E4.4.

$F_{u1} = 45$ ksi, $F_{u2} = 65$ ksi

$t_c =$ lesser of depth of penetration and thickness of member not in contact with screw head.

Pull-over governs, as shown, when actual t_c is thicker than t_c (min);
Pull-out governs when actual t_c is thinner than t_c (min).

Table VI-M - SCREWS IN TENSION $\phi_u = 0.5$ $\Omega_u = 3.0$

Deck Thickness mm	T_n , kN / $t_{c(\min)}$, mm					
	Screw Type / Screw Head or Washer Diameter, mm					
	#10		#12		6.4 mm	
	10.2	10.5	10.2	10.9	12.2	13.2
0.75	3.54 2.0	3.67 2.0	3.54 1.7	3.80 1.9	4.25 1.8	4.43 1.8
0.91	4.29 2.4	4.47 2.5	4.29 2.1	4.63 2.3	5.16 2.1	5.38 2.2
1.20	5.69 3.2	5.92 3.3	5.69 2.8	6.12 3.0	6.83 2.8	7.12 2.9
1.52	7.18 4.0	7.45 4.1	7.18 3.5	7.72 3.8	8.63 3.6	8.99 3.7

Table VII - BUILDEX FASTENER IN TENSION

Deck	T_n , lbf ⁽¹⁾	
Thickness	Buildex Fastener Type (0.562 in. Washer Diameter)	
in.	BX-14	BX-12
0.0295	996	996
0.0358	1208	1208
0.0474	1600	1600
0.0598	2018	2018

⁽¹⁾ $T_{nov} = 1.5 t d_w F_u$ per this manual, page 4-14, section 4.9.3

Table VII-M - BUILDEX FASTENER IN TENSION

Deck	T_n , kN	
Thickness	Buildex Fastener Type (14.3 mm Washer Diameter)	
mm	BX-14	BX-12
0.75	4.43	4.43
0.91	5.37	5.37
1.20	7.12	7.12
1.52	8.98	8.98

Table VIII - PNEUTEK FASTENER IN TENSION

Deck	T_n , lbf ⁽¹⁾			
Thickness	Pneutek Fastener Type (0.5 in. Head Diameter)			
in.	SDK61-series	SDK63-series	K64-series	K66-series
0.0295	630	630	630	630
0.0358	929	929	929	929
0.0474	1093 ⁽²⁾	1628	1628	1628
0.0598	1093 ⁽²⁾	2463 ⁽²⁾	2591	2591

⁽¹⁾ $T_{nov} = 32.2 D_h t^2 F_u$ per this manual, page 4-14, section 4.9.3

⁽²⁾ Nominal tensile capacity is limited by the nominal pull-out of the fastener from the applicable support steel thickness.

Table VIII-M - PNEUTEK FASTENER IN TENSION

Deck	T_n , kN			
Thickness	Pneutek Fastener Type (12.7 mm Head Diameter)			
mm	SDK61-series	SDK63-series	K64-series	K66-series
0.75	2.80	2.80	2.80	2.80
0.91	4.13	4.13	4.13	4.13
1.20	4.86	7.24	7.24	7.24
1.52	4.86	10.96	11.52	11.52

Table IX - HILTI FASTENER IN TENSION

Deck Thickness in.	T_n , lbf ⁽¹⁾	
	Hilti Fastener Type / Fastener Washer Diameter, in.	
	ENP2/ ENPH2/ ENP2K	X-EDN19/ X-EDNK22
	0.591	0.474
0.0295	1128	1070
0.0358	1369	1369
0.0474	1813	1813
0.0598	2287	2287

⁽¹⁾ $T_{nov} = 1.7 t d_w F_u$ per this manual, page 4-14, section 4.9.3

Table IX-M - HILTI FASTENER IN TENSION

Deck Thickness in.	T_n , kN	
	Hilti Fastener Type / Fastener Washer Diameter, mm	
	ENP2/ ENPH2/ ENP2K	X-EDN19/ X-EDNK22
	15	12
0.75	5.02	4.76
0.91	6.09	6.09
1.20	8.06	8.06
1.52	10.17	10.17

Table X & X-M - FASTENER PATTERN FACTORS

Deck Profile	Fastener Pattern	β		β	
		Welds		Mechanical Fasteners	
		ft ⁻¹	m ⁻¹	ft ⁻¹	m ⁻¹
WR, IR, NR	36/7	1.900	6.234	2.000	6.565
	36/5	1.233	4.046	1.333	4.376
	36/4	0.900	2.953	1.000	3.282
	36/3	0.567	1.859	0.667	2.188
WR, IR, NR	30/6	1.880	6.168	2.000	6.562
	30/4	1.080	3.543	1.200	3.937
	30/3	0.680	2.231	0.800	2.625
DR	24/4	1.350	4.429	1.500	4.918

APPENDIX V

LOAD TABLES

LOAD TABLES

THE LOAD TABLES ARE SHOWING NOMINAL STRENGTH VALUES. THE VALUES MUST NOT BE USED WITHOUT APPLYING THE PROPER SAFETY OR RESISTANCE FACTOR.

LRFD

The values of the load tables must be multiplied by a resistance factor (number smaller than or equal to 0.70) when comparing to forces evaluated using Load and Resistance Factor Design.

ASD

The values of the load tables must be divided by a safety factor (number larger than or equal to 2.35) when comparing to forces evaluated using Allowable Stress Design.

The following load tables are for typical panel configurations and connector types. Specific design applications may dictate an arrangement, not listed, which would require the designer to make direct use of the strength and stiffness formulas shown in Sections 1 through 5.

The tables are arranged showing the fastener types, safety factor and resistance factor at the top along with the fastener patterns as defined in Appendix IV. For each steel base sheet metal design thickness given, nominal shear strengths are listed under the specific span lengths. The column "SIDE-LAP CONN./SPAN" shows the number of connectors between structural supports at the sheet edge. For example, "5" would represent six even spaces or stitch fasteners at 12 in. on center within a 6 ft deck span.

Nominal diaphragm shears due to panel buckling are tabulated at the bottom of the pages to check whether the panel buckling governs over connector strength for diaphragm design. The asterisk (*) in the strength table indicates the potential of panel buckling governing over connector strength under a certain type of lateral load. The tables were done in this manner because of the different safety or resistance factors that apply to connector strength and panel buckling.

For roof deck and composite floor deck, the steel yield point is taken at 33 ksi; form deck yield strength is taken at 80 ksi. Structural concrete strength is 3000 psi, and the densities are 145 pcf and 110 pcf for normal weight and light weight concrete respectively. Though design tables show side-lap stitch welds for all thickness listed, they are not recommended for design thickness of 0.0295 in. and less.

The Dxx-values are the warping constants for the particular connector pattern and panel profile. They may be substituted directly into the G' stiffness equation in Appendix IV. Dxx-values, K2-, K3-, and K4-values are listed in Appendix IV. K1-values are found with the appropriate load table.

The tables for structural concrete filled deck are for 1.5 in., 2 in. and 3 in. composite deck attached with a 36/4 pattern. The values would not appreciably change for 24 in. wide deck attached with a 24/3 pattern. The concrete thickness above the deck is 2.5 in. as a minimum.

The load tables for 9/16 in. form decks are shown with structural concrete fill of minimum 2.5 in. cover or with insulating concrete assembled as Type I and Type II attached at a basic 30/4 pattern. Type I decks have 2.5 in. of insulating concrete above the deck. Type II decks have insulating concrete poured to the top of the steel deck; Next, rigid insulating boards of expanded polystyrene, having about 2% of the area containing holes, are embedded into the insulating concrete with the excess concrete moving into the holes (rigid insulating boards should be held 3 in. away from diaphragm shear resisting lines); Finally a topping layer of 2 in. or more of insulating concrete is placed above the rigid insulating board. The strength of the insulating concrete is taken as $f'_c = 125 \text{ psi}$.

There may be shaded values or no values on portions of a load table. The shaded values do not comply with the minimum spacing for side-lap connections and shall not be used except with properly spaced side-lap connections. The shaded areas will be the rows for 0 side-lap connection and are shown for reference. A conservative approach to get nominal shear for diaphragms with button punched side-laps is to use the values from the 0 side-lap connection rows.

TABLE OF CONTENTS FOR DIAPHRAGM LOAD TABLES

STANDARD ROOF DECK

DECK TYPE	SIDE-LAP CONNECTION	FASTENING PATTERN	FRAME FASTENER											
			WELDS		SCREWS	BUILDEX		PNEUTEK				HILTI		
			3/4" P.W.	5/8" P.W.	#12	BX-12	BX-14	SDK61-SERIES	SDK63-SERIES	K64-SERIES	K66-SERIES	ENP2 ENPH2	ENP2K X-EDN19 X-EDNK22	
1 1/2" ROOF DECK	WELDS	36/9 36/7 36/5 36/4 36/3	AV-5 thru AV-8	AV-9 thru AV-12										
		30/6 30/4 30/3												
		36/9 36/7 36/5 36/4 36/3				AV-13 thru AV-16	AV-17 thru AV-20	AV-21 thru AV-24	AV-25 thru AV-28	AV-29 thru AV-32	AV-33 thru AV-36	AV-37 thru AV-40	AV-41 thru AV-44	AV-45 thru AV-48
	#10 SCREWS	30/6 30/4 30/3												
		36/9 36/7 36/5 36/4 36/3												
		30/6 30/4 30/3												
3" ROOF DECK	WELDS	24/4	AV-53	AV-54										
	#10 SCREWS	24/4		AV-55	AV-56	AV-57	AV-58	AV-59	AV-60	AV-61	AV-62	AV-63	AV-64	

STANDARD FORM DECK (Side-lap Connection #10 Screws)

DECK TYPE	TYPE OF FILL	FASTENING PATTERN	FRAME FASTENER										
			WELDS		SCREWS	BUILDEX		PNEUTEK				HILTI	
			3/4" P.W. with weld washer	5/8" P.W. with weld washer	#12	BX-12	BX-14	SDK61-SERIES	SDK63-SERIES	K64-SERIES	K66-SERIES	ENP2 ENPH2	ENP2K X-EDN19 X-EDNK22
9/16" x 2 1/2" FORM DECK	WITHOUT FILL	35/8 35/7 35/6 35/5 30/7 30/5 30/4		AV-65 AV-66 AV-67	AV-68 AV-69 AV-70	AV-71 AV-72 AV-73	AV-74 AV-75 AV-76	AV-77 AV-78 AV-79	AV-80 AV-81 AV-82	AV-83 AV-84 AV-85	AV-86 AV-87 AV-88	AV-89 AV-90 AV-91	AV-92 AV-93 AV-94
		N.W. & L.W. CONCRETE	30/4										
		TYPE I & II INSULATING CONCRETE	30/4										

STANDARD COMPOSITE DECK (Support Fastener Pattern 36/4)

DECK TYPE	SIDE-LAP CONNECT.	TYPE OF CONCRETE	FRAME FASTENER										
			WELDS		SCREWS	BUILDEX		PNEUTEK				HILTI	
			3/4" P.W.	5/8" P.W.	#12	BX-12	BX-14	SDK61-SERIES	SDK63-SERIES	K64-SERIES	K66-SERIES	ENP2 ENPH2	ENP2K X-EDN19 X-EDNK22
1 1/2" x 6"	WELDS	NONE (MULTIPLE FASTENER LAYOUT)		AV-95 thru AV-98									
		NORMAL WEIGHT CONCRETE (2 1/2" COVER)											
	#10 SCREWS	LIGHT WEIGHT CONCRETE (2 1/2" COVER)		AV-99 thru AV-102	AV-103 thru AV-106	AV-107 thru AV-110	AV-111 thru AV-114	AV-115 thru AV-118	AV-119 thru AV-122	AV-123 thru AV-126	AV-127 thru AV-130	AV-131 thru AV-134	AV-135 thru AV-138

1.5 (WR, IR, NR)

t = design thickness = 0.0295"

SUPPORT FASTENING: 3/4" puddle weld or equivalent

SIDE-LAP FASTENING: 5/8" puddle weld or 1 1/2" long fillet weld - not recommended by SDI

φ (EQ): 0.55 Ω (EQ): 3.00
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.60 Ω (Other): 2.65

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	K1
36/9	0	2150	1890	1685	1490	1330	1200	1095	1000	920 *	0.324
	1	2450	2170	1945	1760	1595	1440 *	1310 *			0.222
	2	2715	2430	2190	1985	1815 *	1670 *	1530 *	1405 *	1295 *	0.169
	3	2950	2660	2415	2200 *	2020 *	1865 *	1730 *	1605 *	1480 *	0.136
	4	3160	2870	2620	2400 *	2210 *	2045 *	1905 *	1775 *	1665 *	0.114
	5	3345	3060	2810 *	2585 *	2390 *	2220 *	2070 *	1935 *	1815 *	0.098
36/7	0	1375	1195	1040	920	820	745	675	620	575	0.486
	1	1725	1510	1345	1205	1085	980	895			0.287
	2	2035	1800	1610	1455	1325	1215	1110	1020 *	945 *	0.204
	3	2310	2060	1855	1685	1540	1415 *	1310 *	1220 *	1130 *	0.158
	4	2545	2295	2080	1900	1745 *	1610 *	1495 *	1390 *	1300 *	0.129
	5	2750	2500	2285	2100 *	1935 *	1790 *	1665 *	1555 *	1460 *	0.109
36/5	0	1215	1070	955	850	760	685	625	570	530	0.583
	1	1505	1345	1210	1095	1000	920	840			0.319
	2	1740	1575	1430	1310	1205	1110	1030	960	900 *	0.219
	3	1930	1765	1625	1495	1385	1285	1200 *	1125 *	1055 *	0.167
	4	2075	1925	1785	1660	1545	1445 *	1355 *	1270 *	1195 *	0.135
	5	2195	2055	1925	1800	1690	1585 *	1490 *	1405 *	1330 *	0.113
36/4	0	930	820	730	640	575	515	470	430	395	0.729
	1	1210	1085	980	890	815	750	685			0.358
	2	1415	1290	1185	1090	1005	935	870	815	765	0.237
	3	1565	1455	1350	1255	1170	1095	1025	960	905 *	0.177
	4	1680	1575	1480	1390	1305	1230	1160	1095 *	1035 *	0.142
	5	1760	1670	1585	1500	1420	1345	1275 *	1210 *	1150 *	0.118
30/6	0	1250	1070	930	820	735	665	605	555	510	0.647
	1	1610	1410	1250	1110	995	900	820			0.366
	2	1935	1705	1525	1375	1250	1135	1040	955	885 *	0.256
	3	2220	1980	1775	1610	1470	1350	1250 *	1155 *	1070 *	0.196
	4	2470	2220	2010	1830	1675	1545 *	1435 *	1335 *	1250 *	0.159
	5	2685	2435	2220	2035	1870 *	1730 *	1610 *	1500 *	1405 *	0.134
30/4	0	1135	1000	890	795	710	645	585	535	495	0.728
	1	1415	1265	1140	1035	950	875	800			0.391
	2	1635	1485	1355	1245	1145	1060	985	920	865	0.267
	3	1805	1660	1535	1420	1320	1230	1145	1075 *	1010 *	0.203
	4	1935	1805	1685	1570	1470	1375	1295 *	1215 *	1150 *	0.164
	5	2035	1920	1805	1700	1600	1510 *	1425 *	1345 *	1275 *	0.137
6	2115	2010	1905	1805	1710 *	1620 *	1540 *	1460 *	1390 *	0.118	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
NR	0.099	4130	3035	2325	1835	1485	1230	1035	880	760
IR	0.108	4410	3240	2480	1960	1590	1310	1100	940	810
WR	0.152	5700	4185	3205	2535	2050	1695	1425	1215	1045

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0358"

SUPPORT FASTENING: 3/4" puddle weld or equivalent

SIDE-LAP FASTENING: 5/8" puddle weld or 1 1/2" long fillet weld

φ (EQ): 0.55 Ω (EQ): 3.00
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.60 Ω (Other): 2.65

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	K1
36/9	0	2025	1805	1615	1455	1325	1215	1120	1040	965 *	0.357
	1	2340	2115	1925	1740	1585					0.244
	2	2630	2390	2185	2010 *	1850 *	1700 *	1570 *	1455 *	1360 *	0.186
	3	2900	2645	2430 *	2240 *	2080 *	1935 *	1790 *	1665 *	1555 *	0.150
	4	3150	2885	2660 *	2460 *	2290 *	2135 *	2000 *	1875 *	1750 *	0.126
	5	3375	3110 *	2875 *	2670 *	2490 *	2325 *	2185 *	2055 *	1945 *	0.108
36/7	0	1255	1110	995	900	820	750	695	645	600	0.535
	1	1615	1450	1310	1185	1080					0.317
	2	1935	1750	1590	1460	1340	1235	1140	1060 *	990 *	0.225
	3	2235	2025	1850	1705	1575	1465 *	1365 *	1270 *	1190 *	0.174
	4	2505	2285	2095	1935	1795 *	1670 *	1565 *	1470 *	1385 *	0.142
	5	2745	2520	2325	2155 *	2005 *	1870 *	1755 *	1650 *	1555 *	0.120
36/5	0	1145	1025	920	830	755	695	640	595	555	0.642
	1	1455	1315	1205	1105	1020					0.351
	2	1720	1575	1445	1335	1240	1155	1085	1010	945 *	0.242
	3	1950	1800	1665	1545	1440	1350	1265 *	1195 *	1130 *	0.184
	4	2150	1995	1860	1735	1625	1530 *	1440 *	1360 *	1285 *	0.149
	5	2315	2165	2030	1905	1795 *	1690 *	1600 *	1515 *	1435 *	0.125
36/4	0	880	780	695	625	570	520	480	445	415	0.803
	1	1175	1070	980	905	830					0.394
	2	1425	1310	1210	1120	1045	975	915	860	805	0.261
	3	1620	1510	1405	1315	1230	1155	1090	1030	975 *	0.195
	4	1780	1670	1570	1480	1395	1315	1245 *	1180 *	1120 *	0.156
	5	1905	1805	1710	1620	1535	1455 *	1385 *	1320 *	1255 *	0.130
30/6	0	1125	995	890	805	730	670	620	575	535	0.713
	1	1500	1340	1205	1090	995					0.404
	2	1830	1650	1500	1375	1255	1155	1065	990	925	0.282
	3	2135	1935	1765	1625	1500	1395	1290 *	1200 *	1120 *	0.216
	4	2415	2200	2015	1860	1720 *	1605 *	1500 *	1410 *	1320 *	0.175
	5	2670	2445	2250	2080 *	1935 *	1805 *	1690 *	1590 *	1500 *	0.148
30/4	0	1075	965	860	780	710	650	600	555	520	0.802
	1	1375	1245	1140	1050	970					0.431
	2	1630	1495	1375	1275	1185	1105	1035	975	910	0.294
	3	1845	1705	1585	1475	1380	1295	1215	1145 *	1085 *	0.224
	4	2025	1890	1765	1655	1555	1465 *	1380 *	1305 *	1240 *	0.180
	5	2170	2045	1925	1810	1710 *	1615 *	1530 *	1455 *	1380 *	0.151
6	2295	2170	2060	1950	1850 *	1755 *	1670 *	1590 *	1515 *	0.130	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
NR	0.128	3260	2575	2085	1725	1450	1235	1065	925	815
IR	0.139	3465	2740	2220	1835	1540	1310	1130	985	865
WR	0.198	4520	3570	2890	2390	2010	1710	1475	1285	1130

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0474"

SUPPORT FASTENING: 3/4" puddle weld or equivalent

SIDE-LAP FASTENING: 5/8" puddle weld or 1 1/2" long fillet weld

φ (EQ): 0.55 Ω (EQ): 3.00
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.60 Ω (Other): 2.65

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	K1
36/9	0	2120	1915	1745	1600	1480	1370	1280	1195	1120	0.410
	1	2510	2285	2085							0.281
	2	2845	2615	2420	2230	2060 *	1915 *	1785 *	1675 *	1575 *	0.214
	3	3160	2915	2705 *	2520 *	2350 *	2185 *	2040 *	1915 *	1800 *	0.172
	4	3460	3200 *	2975 *	2780 *	2605 *	2450 *	2295 *	2150 *	2025 *	0.144
	5	3740	3470 *	3235 *	3025 *	2840 *	2675 *	2525 *	2390 *	2250 *	0.124
	6	4000 *	3725 *	3480 *	3265 *	3070 *	2895 *	2735 *	2595 *	2465 *	0.109
36/7	0	1305	1180	1075	990	915	850	790	740	695	0.615
	1	1710	1550	1415							0.364
	2	2070	1900	1750	1615	1495	1390	1300	1220	1150	0.259
	3	2410	2215	2050	1905	1780	1660	1555 *	1460 *	1375 *	0.200
	4	2725	2515	2335	2175	2035 *	1910 *	1800 *	1700 *	1600 *	0.164
	5	3025	2800	2605	2430 *	2280 *	2145 *	2025 *	1915 *	1815 *	0.138
	6	3295	3065	2860 *	2675 *	2515 *	2370 *	2240 *	2120 *	2015 *	0.120
36/5	0	1205	1090	995	915	845	785	730	685	640	0.738
	1	1565	1440	1330							0.404
	2	1880	1740	1615	1505	1410	1325	1240	1160	1095	0.278
	3	2165	2010	1875	1755	1650	1555	1465	1390 *	1320 *	0.212
	4	2420	2260	2115	1985	1870	1770 *	1675 *	1590 *	1510 *	0.171
	5	2640	2480	2330	2200	2080 *	1970 *	1870 *	1775 *	1695 *	0.144
	6	2835	2675	2530	2395 *	2270 *	2155 *	2050 *	1955 *	1865 *	0.124
36/4	0	915	825	750	690	635	590	550	510	480	0.923
	1	1275	1175	1090							0.454
	2	1575	1460	1360	1270	1195	1125	1055	990	930	0.301
	3	1830	1710	1600	1505	1415	1340	1270	1205	1145	0.225
	4	2045	1925	1815	1710	1620	1535	1460	1390 *	1325 *	0.180
	5	2225	2105	1995	1895	1800	1715 *	1635 *	1560 *	1490 *	0.150
	6	2375	2260	2155	2055	1960 *	1875 *	1790 *	1715 *	1645 *	0.128
30/6	0	1170	1055	965	885	815	755	705	660	620	0.821
	1	1575	1425	1300							0.465
	2	1950	1790	1640	1510	1395	1300	1215	1140	1070	0.324
	3	2295	2110	1950	1810	1685	1570	1470	1380 *	1300 *	0.249
	4	2620	2415	2240	2085	1950 *	1830 *	1725 *	1620 *	1525 *	0.202
	5	2925	2705	2515	2345 *	2200 *	2065 *	1950 *	1845 *	1750 *	0.170
	6	3205	2975	2775 *	2595 *	2435 *	2295 *	2165 *	2050 *	1950 *	0.147
30/4	0	1135	1025	935	855	790	735	685	640	600	0.923
	1	1485	1365	1265							0.496
	2	1790	1660	1540	1440	1350	1270	1190	1120	1055	0.339
	3	2060	1920	1795	1680	1580	1490	1410	1335 *	1270 *	0.257
	4	2295	2155	2020	1905	1795	1700 *	1610 *	1530 *	1460 *	0.207
	5	2500	2355	2225	2105	1990 *	1890 *	1800 *	1710 *	1635 *	0.174
	6	2675	2535	2405	2285 *	2170 *	2065 *	1970 *	1880 *	1800 *	0.150

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
NR	0.181	3335	2760	2320	1975	1705	1485	1305	1155	1030
IR	0.196	3545	2930	2460	2095	1805	1575	1385	1225	1095
WR	0.284	4680	3865	3250	2770	2385	2080	1830	1620	1445

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0598"

SUPPORT FASTENING: 3/4" puddle weld or equivalent

SIDE-LAP FASTENING: 5/8" puddle weld or 1 1/2" long fillet weld

φ (EQ): 0.55 Ω (EQ): 3.00
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.60 Ω (Other): 2.65

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	K1
36/9	0	2180	2005	1850	1715	1600	1500	1410	1325	1255	0.461
	1	2600									0.316
	2	2995	2775	2565	2385 *	2230 *	2090 *	1965 *			0.240
	3	3350	3120	2920 *	2720 *	2545 *	2385 *	2245 *	2120 *	2005 *	0.194
	4	3685	3440 *	3220 *	3030 *	2855 *	2680 *	2525 *	2385 *	2255 *	0.162
	5	4005 *	3745 *	3515 *	3310 *	3125 *	2960 *	2800 *	2645 *	2510 *	0.140
	6	4310 *	4040 *	3800 *	3580 *	3385 *	3210 *	3050 *	2905 *	2760 *	0.123
36/7	0	1345	1235	1140	1060	990	930	870	825	780	0.691
	1	1760									0.409
	2	2170	2005	1860	1730	1615	1520	1430			0.290
	3	2535	2360	2200	2065	1930	1815	1710 *	1615 *	1530 *	0.225
	4	2885	2690	2515	2365	2225 *	2105 *	1990 *	1880 *	1780 *	0.184
	5	3220	3010	2820 *	2650 *	2500 *	2365 *	2245 *	2135 *	2035 *	0.155
	6	3535	3310 *	3110 *	2930 *	2770 *	2620 *	2490 *	2370 *	2260 *	0.135
36/5	0	1240	1140	1055	980	915	855	805	760	715	0.829
	1	1650									0.454
	2	2000	1865	1745	1640	1540	1445	1360			0.312
	3	2320	2170	2040	1920	1815	1720	1630	1550 *	1470 *	0.238
	4	2615	2460	2315	2185	2070	1965 *	1870 *	1780 *	1700 *	0.192
	5	2885	2720	2570	2435 *	2310 *	2200 *	2095 *	2000 *	1910 *	0.161
	6	3130	2960	2805 *	2665 *	2535 *	2415 *	2305 *	2205 *	2115 *	0.139
36/4	0	940	860	795	740	690	645	605	570	535	1.037
	1	1350									0.510
	2	1680	1575	1475	1390	1310	1235	1160			0.338
	3	1980	1860	1755	1655	1570	1490	1415	1350	1290	0.253
	4	2245	2120	2005	1900	1805	1720	1640	1565 *	1500 *	0.202
	5	2470	2345	2230	2120	2020	1930 *	1845 *	1765 *	1695 *	0.168
	6	2665	2545	2425	2320	2215 *	2125 *	2035 *	1955 *	1875 *	0.144
30/6	0	1200	1105	1020	945	885	830	780	735	695	0.922
	1	1620									0.522
	2	2040	1875	1735	1615	1510	1420	1335			0.364
	3	2415	2240	2095	1950	1825	1715	1615	1525 *	1445 *	0.279
	4	2770	2580	2410	2265	2130 *	2010 *	1895 *	1790 *	1695 *	0.227
	5	3110	2900	2720	2555 *	2410 *	2280 *	2160 *	2055 *	1950 *	0.191
	6	3430	3210 *	3010 *	2835 *	2680 *	2535 *	2410 *	2290 *	2185 *	0.165
30/4	0	1165	1070	990	920	855	800	755	710	670	1.037
	1	1565									0.557
	2	1910	1780	1670	1570	1480	1395	1310			0.381
	3	2220	2080	1955	1845	1745	1655	1570	1495 *	1425 *	0.289
	4	2500	2355	2220	2100	1995	1895 *	1805 *	1720 *	1645 *	0.233
	5	2755	2600	2465	2340	2225 *	2120 *	2020 *	1930 *	1850 *	0.195
	6	2975	2825	2685	2555 *	2435 *	2325 *	2225 *	2130 *	2040 *	0.168

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
NR	0.226	3260	2775	2395	2085	1835	1625	1450	1300	1175
IR	0.245	3460	2950	2545	2215	1945	1725	1540	1380	1245
WR	0.355	4570	3895	3360	2925	2570	2280	2030	1825	1645

NOTE:
 ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0295"

SUPPORT FASTENING: 5/8" puddle weld or equivalent

SIDE-LAP FASTENING: 5/8" puddle weld or 1 1/2" long fillet weld - not recommended by SDI

φ (EQ): 0.55 Ω (EQ): 3.00

φ (WIND): 0.70 Ω (WIND): 2.35

φ (Other): 0.60 Ω (Other): 2.65

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	K1
36/9	0	1775	1565	1390	1235	1100	995	905	825	760	0.324
	1	2070	1840	1650	1495	1360	1230	1120			0.222
	2	2330	2090	1890	1720	1575	1450 *	1340 *	1230 *	1135 *	0.169
	3	2550	2310	2105	1925	1770 *	1635 *	1520 *	1420 *	1320 *	0.136
	4	2740	2505	2295	2115 *	1955 *	1815 *	1690 *	1580 *	1480 *	0.114
	5	2900	2675	2470	2285 *	2120 *	1975 *	1845 *	1730 *	1630 *	0.098
36/7	0	1135	990	860	760	680	615	560	515	475	0.486
	1	1480	1300	1160	1040	940	850	775			0.287
	2	1780	1580	1420	1285	1170	1075	995	915	845	0.204
	3	2035	1830	1655	1505	1380	1275	1180	1100 *	1025 *	0.158
	4	2245	2040	1865	1710	1575	1455 *	1355 *	1265 *	1185 *	0.129
	5	2425	2225	2045	1890	1750 *	1630 *	1520 *	1420 *	1335 *	0.109
36/5	0	1005	885	785	700	630	565	515	475	435	0.583
	1	1290	1155	1040	945	865	795	735			0.319
	2	1510	1370	1255	1150	1060	980	915	850	800	0.219
	3	1675	1545	1430	1325	1230	1145	1075	1005	945 *	0.167
	4	1800	1685	1575	1470	1380	1295	1215 *	1145 *	1080 *	0.135
	5	1895	1790	1690	1595	1505	1420 *	1340 *	1270 *	1205 *	0.113
36/4	0	770	680	600	530	475	425	390	355	325	0.729
	1	1040	935	850	775	710	655	605			0.358
	2	1225	1130	1040	960	890	830	775	725	680	0.237
	3	1355	1270	1185	1110	1040	975	920	865	820	0.177
	4	1445	1370	1300	1225	1160	1100	1040	985	940 *	0.142
	5	1510	1445	1380	1320	1255	1200	1145	1090 *	1040 *	0.118
30/6	0	1035	885	770	680	605	550	500	455	420	0.647
	1	1390	1220	1080	970	870	785	715			0.366
	2	1700	1510	1350	1220	1110	1020	935	860	795	0.256
	3	1970	1765	1590	1445	1325	1220	1130	1050 *	980 *	0.196
	4	2190	1985	1810	1655	1520	1405 *	1305 *	1220 *	1140 *	0.159
	5	2375	2175	2000	1840	1705 *	1580 *	1475 *	1380 *	1295 *	0.134
30/4	0	940	825	740	660	590	530	485	445	410	0.728
	1	1210	1085	985	895	820	755	700			0.391
	2	1415	1295	1185	1090	1010	935	870	815	765	0.267
	3	1560	1450	1350	1255	1170	1095	1025	965	910 *	0.203
	4	1670	1575	1480	1390	1305	1230	1160	1095 *	1040 *	0.164
	5	1750	1665	1580	1500	1420	1345	1275 *	1210 *	1150 *	0.137
6	1815	1740	1660	1585	1515	1445 *	1375 *	1315 *	1255 *	0.118	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
NR	0.099	4130	3035	2325	1835	1485	1230	1035	880	760
IR	0.108	4410	3240	2480	1960	1590	1310	1100	940	810
WR	0.152	5700	4185	3205	2535	2050	1695	1425	1215	1045

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0358"

SUPPORT FASTENING: 5/8" puddle weld or equivalent

SIDE-LAP FASTENING: 5/8" puddle weld or 1 1/2" long fillet weld

φ (EQ): 0.55 Ω (EQ): 3.00
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.60 Ω (Other): 2.65

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	K1
36/9	0	1670	1490	1330	1200	1095	1005	925	855	800	0.357
	1	1985	1795	1635	1485	1355					0.244
	2	2270	2065	1890	1740	1610	1485 *	1370 *	1275 *	1190 *	0.186
	3	2525	2310	2125	1965	1825 *	1705 *	1595 *	1485 *	1385 *	0.150
	4	2760	2540	2345	2175 *	2030 *	1895 *	1780 *	1675 *	1580 *	0.126
	5	2965	2745	2550 *	2375 *	2220 *	2080 *	1955 *	1845 *	1745 *	0.108
36/7	0	1035	915	820	740	675	620	575	530	495	0.535
	1	1390	1250	1135	1025	935					0.317
	2	1705	1540	1405	1290	1190	1100	1020	950	885	0.225
	3	1985	1810	1660	1530	1415	1320	1235 *	1155 *	1085 *	0.174
	4	2235	2050	1890	1750	1625	1520 *	1425 *	1340 *	1265 *	0.142
	5	2460	2270	2100	1955	1825 *	1710 *	1605 *	1510 *	1430 *	0.120
36/5	0	945	845	760	685	625	575	530	490	455	0.642
	1	1250	1135	1035	955	885					0.351
	2	1505	1380	1270	1180	1095	1025	960	900	850	0.242
	3	1715	1590	1480	1380	1290	1210	1135	1075 *	1015 *	0.184
	4	1890	1765	1655	1550	1460	1375	1300 *	1230 *	1165 *	0.149
	5	2030	1915	1805	1705	1610	1525 *	1445 *	1375 *	1310 *	0.125
36/4	0	725	640	575	515	470	430	395	365	340	0.803
	1	1020	930	850	785	730					0.394
	2	1250	1155	1070	995	930	870	820	770	730	0.261
	3	1425	1335	1250	1175	1105	1040	985	930	885	0.195
	4	1560	1475	1395	1320	1250	1185	1125	1070 *	1020 *	0.156
	5	1660	1585	1510	1440	1375	1310	1250 *	1195 *	1145 *	0.130
30/6	0	930	820	735	665	605	555	510	475	440	0.713
	1	1300	1165	1045	950	865					0.404
	2	1620	1465	1335	1220	1125	1035	960	890	835	0.282
	3	1910	1735	1590	1465	1355	1260	1180	1100 *	1030 *	0.216
	4	2170	1985	1830	1690	1570	1465 *	1370 *	1290 *	1215 *	0.175
	5	2400	2210	2045	1900	1770 *	1655 *	1555 *	1465 *	1385 *	0.148
30/4	0	885	795	710	645	585	535	495	460	425	0.802
	1	1180	1075	985	905	840					0.431
	2	1425	1310	1210	1125	1050	980	920	865	820	0.294
	3	1620	1505	1405	1315	1230	1160	1090	1030	975 *	0.224
	4	1775	1665	1570	1475	1395	1315	1245 *	1180 *	1125 *	0.180
	5	1895	1800	1705	1615	1530	1455 *	1385 *	1320 *	1255 *	0.151
6	1995	1905	1815	1730	1650	1575 *	1505 *	1440 *	1375 *	0.130	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
NR	0.128	3260	2575	2085	1725	1450	1235	1065	925	815
IR	0.139	3465	2740	2220	1835	1540	1310	1130	985	865
WR	0.198	4520	3570	2890	2390	2010	1710	1475	1285	1130

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0474"

SUPPORT FASTENING: 5/8" puddle weld or equivalent

SIDE-LAP FASTENING: 5/8" puddle weld or 1 1/2" long fillet weld

φ (EQ): 0.55 Ω (EQ): 3.00

φ (WIND): 0.70 Ω (WIND): 2.35

φ (Other): 0.60 Ω (Other): 2.65

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	K1
36/9	0	1745	1575	1435	1315	1215	1130	1050	985	925	0.410
	1	2125	1945	1775							0.281
	2	2450	2260	2090	1945	1795	1670	1560 *	1460 *	1375 *	0.214
	3	2760	2550	2370	2210	2070 *	1940 *	1815 *	1700 *	1600 *	0.172
	4	3045	2825	2630	2460 *	2310 *	2175 *	2055 *	1940 *	1825 *	0.144
	5	3305	3080	2880 *	2700 *	2540 *	2395 *	2265 *	2145 *	2040 *	0.124
	6	3550	3320 *	3110 *	2925 *	2755 *	2605 *	2465 *	2340 *	2230 *	0.109
36/7	0	1075	970	885	815	750	700	650	610	575	0.615
	1	1475	1340	1225							0.364
	2	1825	1675	1550	1435	1330	1240	1160	1090	1025	0.259
	3	2150	1985	1840	1710	1600	1500	1415	1325 *	1250 *	0.200
	4	2455	2270	2110	1970	1845	1735 *	1640 *	1550 *	1470 *	0.164
	5	2730	2535	2365	2215	2080 *	1960 *	1855 *	1755 *	1670 *	0.138
	6	2980	2780	2605	2445 *	2305 *	2175 *	2060 *	1955 *	1860 *	0.120
36/5	0	990	895	820	750	695	645	600	560	530	0.738
	1	1345	1240	1145							0.404
	2	1650	1530	1420	1330	1245	1170	1105	1040	980	0.278
	3	1920	1790	1670	1570	1475	1390	1315	1250	1190 *	0.212
	4	2145	2015	1895	1785	1685	1595	1515 *	1440 *	1370 *	0.171
	5	2340	2210	2090	1980	1880	1785 *	1695 *	1620 *	1545 *	0.144
	6	2510	2380	2265	2150	2050 *	1955 *	1865 *	1780 *	1705 *	0.124
36/4	0	750	680	620	565	520	485	450	420	395	0.923
	1	1105	1020	945							0.454
	2	1390	1290	1205	1130	1060	1000	945	895	845	0.301
	3	1620	1520	1430	1350	1275	1210	1145	1090	1040	0.225
	4	1810	1710	1620	1540	1460	1390	1325	1265	1210 *	0.180
	5	1960	1870	1780	1700	1625	1550	1485	1420 *	1360 *	0.150
	6	2080	1995	1915	1835	1760	1690	1625 *	1560 *	1500 *	0.128
30/6	0	960	870	790	725	670	625	580	545	510	0.821
	1	1365	1240	1130							0.465
	2	1730	1585	1465	1350	1250	1165	1090	1020	960	0.324
	3	2065	1900	1760	1635	1530	1435	1345	1260	1190 *	0.249
	4	2370	2195	2035	1900	1780	1675	1575 *	1490 *	1415 *	0.202
	5	2655	2465	2300	2150	2020 *	1900 *	1795 *	1700 *	1615 *	0.170
	6	2910	2715	2540	2385 *	2245 *	2120 *	2005 *	1900 *	1810 *	0.147
30/4	0	930	840	765	705	650	605	560	525	495	0.923
	1	1280	1180	1090							0.496
	2	1570	1460	1360	1270	1195	1125	1060	1005	945	0.339
	3	1825	1705	1600	1505	1415	1340	1270	1205	1145	0.257
	4	2035	1915	1810	1710	1615	1535	1460	1390 *	1325 *	0.207
	5	2210	2095	1990	1890	1795	1710 *	1630 *	1555 *	1490 *	0.174
	6	2360	2250	2145	2045	1955 *	1870 *	1785 *	1710 *	1640 *	0.150

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	
NR	0.181	3335	2760	2320	1975	1705	1485	1305	1155	1030	
IR	0.196	3545	2930	2460	2095	1805	1575	1385	1225	1095	
WR	0.284	4680	3865	3250	2770	2385	2080	1830	1620	1445	

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0598"

SUPPORT FASTENING: 5/8" puddle weld or equivalent

SIDE-LAP FASTENING: 5/8" puddle weld or 1 1/2" long fillet weld

φ (EQ): 0.55 Ω (EQ): 3.00
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.60 Ω (Other): 2.65

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	K1
36/9	0	1785	1640	1515	1405	1310	1230	1155	1085	1025	0.461
	1	2205									0.316
	2	2585	2405	2230	2075	1940	1820	1710 *			0.240
	3	2925	2730	2555	2400 *	2255 *	2115 *	1990 *	1880 *	1780 *	0.194
	4	3250	3040	2850 *	2685 *	2535 *	2400 *	2270 *	2145 *	2030 *	0.162
	5	3555	3330 *	3135 *	2955 *	2795 *	2650 *	2520 *	2400 *	2280 *	0.140
	6	3840 *	3610 *	3400 *	3215 *	3045 *	2890 *	2750 *	2625 *	2505 *	0.123
36/7	0	1100	1010	935	870	810	760	715	675	635	0.691
	1	1520									0.409
	2	1910	1775	1650	1540	1440	1350	1270			0.290
	3	2270	2110	1975	1855	1745	1645	1550	1465	1390 *	0.225
	4	2605	2435	2280	2145	2025	1915 *	1815 *	1725 *	1640 *	0.184
	5	2920	2735	2570	2420 *	2290 *	2170 *	2060 *	1960 *	1870 *	0.155
	6	3215	3020	2845 *	2685 *	2545 *	2415 *	2295 *	2190 *	2090 *	0.135
36/5	0	1015	935	865	800	750	700	660	620	585	0.829
	1	1415									0.454
	2	1755	1640	1535	1445	1365	1290	1215			0.312
	3	2065	1935	1820	1720	1625	1540	1465	1395	1335	0.238
	4	2340	2205	2080	1970	1870	1780	1695 *	1615 *	1545 *	0.192
	5	2580	2445	2320	2200	2095 *	2000 *	1905 *	1825 *	1745 *	0.161
	6	2795	2655	2530	2410 *	2300 *	2200 *	2105 *	2020 *	1935 *	0.139
36/4	0	770	705	650	605	565	525	495	465	440	1.037
	1	1165									0.510
	2	1490	1395	1310	1235	1170	1110	1050			0.338
	3	1770	1665	1575	1490	1415	1345	1280	1225	1170	0.253
	4	2005	1900	1805	1715	1635	1560	1490	1430	1370 *	0.202
	5	2200	2100	2005	1915	1830	1755	1680 *	1615 *	1550 *	0.168
	6	2365	2265	2175	2085	2005	1925 *	1850 *	1785 *	1720 *	0.144
30/6	0	985	905	835	775	725	680	635	600	570	0.922
	1	1400									0.522
	2	1810	1675	1550	1445	1350	1270	1195			0.364
	3	2170	2020	1890	1770	1665	1565	1475	1395	1320	0.279
	4	2515	2345	2195	2065	1945	1840	1745 *	1655 *	1570 *	0.227
	5	2835	2655	2490	2345	2215 *	2100 *	1995 *	1895 *	1810 *	0.191
	6	3135	2945	2770 *	2615 *	2475 *	2345 *	2230 *	2125 *	2030 *	0.165
30/4	0	955	875	810	750	700	655	615	580	550	1.037
	1	1345									0.557
	2	1680	1570	1475	1385	1310	1240	1175			0.381
	3	1975	1855	1750	1650	1565	1485	1415	1350	1290	0.289
	4	2230	2110	1995	1895	1800	1715	1635	1560 *	1495 *	0.233
	5	2455	2330	2215	2110	2015	1925 *	1840 *	1760 *	1690 *	0.195
	6	2645	2525	2410	2305	2205 *	2115 *	2025 *	1945 *	1870 *	0.168

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
NR	0.226	3260	2775	2395	2085	1835	1625	1450	1300	1175
IR	0.245	3460	2950	2545	2215	1945	1725	1540	1380	1245
WR	0.355	4570	3895	3360	2925	2570	2280	2030	1825	1645

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum (Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling))

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0295"

SUPPORT FASTENING: 5/8" puddle weld or equivalent

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.55 Ω (EQ): 3.00
 ϕ (WIND): 0.70 Ω (WIND): 2.35
 ϕ (Other): 0.60 Ω (Other): 2.65

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	K1
36/9	0	1775	1565	1390	1235	1100	995	905	825	760	0.324
	1	1925	1700	1520	1370	1230	1110	1010			0.272
	2	2065	1835	1645	1485	1355	1225	1115	1020 *	945 *	0.234
	3	2195	1960	1765	1600	1460	1340	1220 *	1120 *	1035 *	0.206
	4	2315	2075	1875	1705	1560	1440 *	1325 *	1215 *	1125 *	0.183
	5	2430	2190	1985	1810	1660	1530 *	1420 *	1315 *	1215 *	0.165
	6	2535	2295	2085	1910	1755 *	1620 *	1505 *	1405 *	1305 *	0.151
36/7	0	1135	990	860	760	680	615	560	515	475	0.486
	1	1310	1145	1015	900	805	730	665			0.377
	2	1470	1295	1150	1035	935	845	770	710	655	0.308
	3	1625	1435	1280	1155	1050	960	875	805	745	0.261
	4	1765	1565	1405	1270	1160	1065	980	905	835	0.226
	5	1895	1690	1525	1380	1265	1160	1075	1000	925 *	0.199
	6	2015	1810	1635	1490	1365	1255	1165	1085 *	1015 *	0.178
36/5	0	1005	885	785	700	630	565	515	475	435	0.583
	1	1150	1020	915	825	755	680	620			0.433
	2	1280	1145	1035	940	860	790	725	670	615	0.345
	3	1395	1260	1140	1040	955	880	820	765	710	0.286
	4	1495	1360	1240	1140	1050	970	905	845	790	0.245
	5	1585	1450	1335	1230	1135	1055	985	920	865	0.214
	6	1660	1535	1415	1310	1215	1135	1060	995	935 *	0.190
36/4	0	770	680	600	530	475	425	390	355	325	0.729
	1	910	810	730	660	600	540	495			0.509
	2	1030	930	840	765	705	650	600	550	505	0.391
	3	1135	1030	940	865	795	735	685	640	600	0.318
	4	1215	1120	1030	950	880	820	765	715	675	0.267
	5	1290	1195	1105	1030	960	895	840	790	740	0.231
	6	1345	1260	1175	1100	1030	965	905	855	805	0.203
30/6	0	1035	885	770	680	605	550	500	455	420	0.647
	1	1210	1055	930	820	735	665	605			0.491
	2	1380	1210	1075	960	860	780	710	650	605	0.395
	3	1540	1355	1205	1085	985	895	815	750	695	0.331
	4	1685	1490	1335	1205	1095	1005	920	845	785	0.284
	5	1820	1620	1455	1320	1205	1105	1020	945	875 *	0.249
	6	1945	1740	1570	1430	1305	1200	1115	1035 *	965 *	0.222
30/4	0	940	825	740	660	590	530	485	445	410	0.728
	1	1080	960	860	780	710	645	590			0.536
	2	1205	1080	975	890	815	750	695	640	590	0.424
	3	1310	1185	1080	990	910	840	780	730	680	0.350
	4	1405	1280	1175	1080	1000	925	865	805	755	0.299
	5	1485	1365	1260	1165	1080	1005	940	880	830	0.260
	6	1550	1440	1335	1240	1155	1080	1015	950	895 *	0.231

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
NR	0.099	4130	3035	2325	1835	1485	1230	1035	880	760
IR	0.108	4410	3240	2480	1960	1590	1310	1100	940	810
WR	0.152	5700	4185	3205	2535	2050	1695	1425	1215	1045

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0358"

SUPPORT FASTENING: 5/8" puddle weld or equivalent

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.55 Ω (EQ): 3.00
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.60 Ω (Other): 2.65

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	K1
36/9	0	1670	1490	1330	1200	1095	1005	925	855	800	0.357
	1	1825	1650	1485	1340	1220					0.299
	2	1975	1790	1630	1480	1350	1240	1145	1060 *	990 *	0.258
	3	2120	1925	1760	1615	1480	1360	1255 *	1165 *	1085 *	0.226
	4	2260	2055	1880	1730	1605	1475 *	1365 *	1265 *	1180 *	0.202
	5	2390	2180	2000	1845	1710 *	1595 *	1475 *	1370 *	1280 *	0.182
36/7	0	1035	915	820	740	675	620	575	530	495	0.535
	1	1220	1090	975	880	805					0.415
	2	1385	1245	1130	1020	930	855	795	735	690	0.340
	3	1540	1390	1265	1160	1060	975	900	840	785	0.287
	4	1695	1530	1395	1280	1185	1095	1010	940	880	0.249
	5	1835	1665	1525	1400	1295	1205	1120	1045	975 *	0.219
36/5	0	945	845	760	685	625	575	530	490	455	0.642
	1	1100	995	905	825	750					0.477
	2	1245	1130	1030	950	880	810	750	695	650	0.380
	3	1375	1255	1150	1065	985	920	860	800	745	0.315
	4	1495	1370	1265	1170	1090	1015	950	895	840	0.270
	5	1605	1480	1370	1270	1185	1110	1040	980	925	0.236
36/4	0	725	640	575	515	470	430	395	365	340	0.803
	1	875	795	725	655	600					0.561
	2	1015	925	845	780	725	665	615	570	535	0.431
	3	1135	1040	960	890	825	770	725	675	630	0.350
	4	1240	1145	1060	990	925	865	810	765	725	0.294
	5	1335	1240	1155	1080	1010	950	895	845	800	0.254
30/6	0	930	820	735	665	605	555	510	475	440	0.713
	1	1120	990	885	805	730					0.541
	2	1290	1160	1040	940	860	790	730	680	635	0.435
	3	1455	1310	1190	1080	990	910	840	780	730	0.364
	4	1610	1455	1325	1215	1115	1025	950	885	825	0.313
	5	1755	1590	1450	1335	1235	1145	1060	985	920	0.275
30/4	0	885	795	710	645	585	535	495	460	425	0.802
	1	1035	940	855	780	715					0.590
	2	1175	1070	980	905	835	775	715	665	620	0.467
	3	1300	1190	1095	1015	940	880	820	765	715	0.386
	4	1415	1305	1205	1115	1040	975	915	860	810	0.329
	5	1520	1405	1305	1215	1135	1065	1000	945	890	0.287
6	1610	1495	1395	1305	1220	1150	1080	1020	970 *	0.254	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
NR	0.128	3260	2575	2085	1725	1450	1235	1065	925	815
IR	0.139	3465	2740	2220	1835	1540	1310	1130	985	865
WR	0.198	4520	3570	2890	2390	2010	1710	1475	1285	1130

NOTE:
 ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0474"

SUPPORT FASTENING: 5/8" puddle weld or equivalent

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.55 Ω (EQ): 3.00
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.60 Ω (Other): 2.65

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	K1
36/9	0	1745	1575	1435	1315	1215	1130	1050	985	925	0.410
	1	1945	1760	1605							0.344
	2	2125	1945	1775	1630	1505	1400	1305	1220	1150	0.297
	3	2290	2105	1945	1785	1650	1535	1435	1340 *	1260 *	0.261
	4	2455	2260	2095	1945	1795	1670	1560 *	1460 *	1375 *	0.232
	5	2610	2410	2235	2080	1945	1805 *	1685 *	1580 *	1490 *	0.210
	6	2760	2550	2370	2210	2070 *	1940 *	1815 *	1700 *	1600 *	0.191
36/7	0	1075	970	885	815	750	700	650	610	575	0.615
	1	1275	1155	1055							0.478
	2	1475	1340	1225	1125	1040	970	905	850	800	0.391
	3	1655	1515	1395	1285	1190	1105	1035	970	910	0.330
	4	1825	1675	1550	1440	1335	1240	1160	1090	1025	0.286
	5	1990	1835	1695	1575	1475	1375	1285	1210	1140	0.253
	6	2155	1985	1840	1710	1600	1505	1415	1330 *	1250 *	0.226
36/5	0	990	895	820	750	695	645	600	560	530	0.738
	1	1180	1080	985							0.549
	2	1345	1240	1145	1065	985	915	855	800	755	0.437
	3	1505	1390	1290	1200	1125	1050	980	920	865	0.363
	4	1650	1530	1425	1330	1245	1170	1105	1040	980	0.310
	5	1790	1665	1550	1450	1365	1285	1215	1150	1090	0.271
	6	1920	1790	1675	1570	1475	1395	1320	1250	1190 *	0.241
36/4	0	750	680	620	565	520	485	450	420	395	0.923
	1	945	865	790							0.645
	2	1105	1020	945	880	815	755	705	660	620	0.496
	3	1255	1160	1080	1010	945	890	830	780	735	0.403
	4	1390	1295	1205	1130	1065	1000	945	900	845	0.339
	5	1510	1415	1325	1245	1175	1110	1050	995	950	0.293
	6	1620	1525	1435	1350	1275	1210	1145	1090	1040	0.257
30/6	0	960	870	790	725	670	625	580	545	510	0.821
	1	1165	1055	960							0.622
	2	1365	1240	1130	1040	960	895	835	785	735	0.501
	3	1555	1425	1300	1195	1105	1030	960	905	850	0.419
	4	1730	1585	1465	1355	1250	1165	1090	1020	965	0.360
	5	1900	1745	1615	1500	1400	1300	1215	1140	1075	0.316
	6	2065	1900	1760	1640	1530	1435	1345	1260	1190 *	0.281
30/4	0	930	840	765	705	650	605	560	525	495	0.923
	1	1115	1025	935							0.679
	2	1280	1180	1090	1015	940	875	815	765	720	0.537
	3	1430	1325	1230	1145	1075	1010	945	885	835	0.444
	4	1575	1460	1360	1270	1195	1125	1060	1005	945	0.379
	5	1705	1585	1485	1390	1310	1235	1165	1105	1050	0.330
	6	1825	1705	1600	1505	1415	1340	1270	1205	1145	0.293

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
NR	0.181	3335	2760	2320	1975	1705	1485	1305	1155	1030
IR	0.196	3545	2930	2460	2095	1805	1575	1385	1225	1095
WR	0.284	4680	3865	3250	2770	2385	2080	1830	1620	1445

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum {φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n}

1.5 (WR, IR, NR)

t = design thickness = 0.0598"

SUPPORT FASTENING: 5/8" puddle weld or equivalent

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.55 Ω (EQ): 3.00
 ϕ (WIND): 0.70 Ω (WIND): 2.35
 ϕ (Other): 0.60 Ω (Other): 2.65

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	K1
36/9	0	1785	1640	1515	1405	1310	1230	1155	1085	1025	0.461
	1	2000									0.387
	2	2215	2035	1880	1750	1630	1530	1440			0.333
	3	2420	2235	2065	1920	1795	1680	1580	1490 *	1410 *	0.293
	4	2600	2420	2250	2090	1955	1830	1725 *	1625 *	1540 *	0.261
	5	2775	2585	2420	2260	2115 *	1985 *	1865 *	1760 *	1670 *	0.235
	6	2950	2750	2575	2420 *	2275 *	2135 *	2010 *	1895 *	1795 *	0.214
36/7	0	1100	1010	935	870	810	760	715	675	635	0.691
	1	1315									0.537
	2	1530	1405	1300	1210	1130	1060	1000			0.439
	3	1735	1605	1485	1380	1290	1215	1140	1080	1020	0.371
	4	1930	1790	1670	1555	1455	1365	1285	1215	1150	0.322
	5	2115	1965	1835	1720	1615	1515	1430	1350	1280	0.284
	6	2295	2135	1995	1875	1765	1665	1570	1485	1410 *	0.254
36/5	0	1015	935	865	800	750	700	660	620	585	0.829
	1	1230									0.617
	2	1425	1325	1230	1145	1070	1005	945			0.491
	3	1600	1490	1395	1310	1230	1155	1085	1025	970	0.408
	4	1770	1655	1550	1460	1375	1305	1230	1160	1100	0.349
	5	1930	1810	1700	1600	1510	1435	1360	1295	1230	0.304
	6	2085	1955	1840	1735	1645	1560	1480	1410	1350 *	0.270
36/4	0	770	705	650	605	565	525	495	465	440	1.037
	1	985									0.725
	2	1175	1095	1020	945	885	830	780			0.557
	3	1345	1255	1180	1110	1045	980	920	870	825	0.452
	4	1505	1410	1325	1250	1180	1120	1065	1005	955	0.381
	5	1650	1550	1460	1380	1310	1245	1185	1130	1075	0.329
	6	1785	1685	1590	1510	1430	1360	1295	1240	1185	0.289
30/6	0	985	905	835	775	725	680	635	600	570	0.922
	1	1200									0.699
	2	1410	1300	1200	1120	1045	980	920			0.562
	3	1625	1495	1385	1290	1205	1130	1065	1005	955	0.471
	4	1825	1695	1570	1460	1365	1280	1210	1140	1080	0.405
	5	2015	1870	1745	1630	1525	1435	1350	1275	1210	0.355
	6	2195	2045	1910	1790	1685	1585	1495	1410	1340	0.316
30/4	0	955	875	810	750	700	655	615	580	550	1.037
	1	1170									0.763
	2	1355	1260	1175	1095	1020	960	900			0.603
	3	1530	1425	1335	1255	1185	1110	1045	985	935	0.499
	4	1695	1585	1485	1400	1320	1250	1190	1120	1065	0.425
	5	1850	1735	1630	1540	1455	1380	1310	1250	1190	0.371
	6	1995	1875	1765	1670	1580	1500	1430	1365	1305	0.329

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
NR	0.226	3260	2775	2395	2085	1835	1625	1450	1300	1175
IR	0.245	3460	2950	2545	2215	1945	1725	1540	1380	1245
WR	0.355	4570	3895	3360	2925	2570	2280	2030	1825	1645

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0295"

SUPPORT FASTENING: Buildex or Elco Textron #12 or #14 TEKS screws

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50

φ (WIND): 0.70 Ω (WIND): 2.35

φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	K1
36/9	0	1040	915	815	720	645	580	530	485	445	0.366
	1	1185	1050	940	850	770	695	635	585	545	0.301
	2	1315	1175	1060	960	880	810	740	680	625	0.255
	3	1425	1285	1165	1065	975	900	835	775	715	0.222
	4	1530	1390	1265	1160	1070	990	920	860	805	0.196
	5	1615	1480	1360	1250	1155	1075	1000	935	880 *	0.176
36/7	0	665	575	500	445	395	360	325	300	275	0.549
	1	835	730	650	585	525	475	430	400	375	0.414
	2	985	870	780	705	640	585	540	500	465	0.333
	3	1115	1000	900	815	745	685	635	590	550	0.278
	4	1230	1110	1010	920	845	780	725	675	630	0.239
	5	1330	1210	1105	1015	935	865	805	755	705	0.209
36/5	0	590	515	460	410	365	330	300	275	255	0.659
	1	730	650	585	530	485	445	405	375	345	0.474
	2	840	760	690	635	580	540	500	465	435	0.370
	3	930	855	785	725	670	625	580	545	510	0.304
	4	1005	930	865	805	750	700	655	615	580	0.257
	5	1060	995	930	870	815	770	720	680	645	0.223
36/4	0	450	395	350	310	275	250	225	205	190	0.824
	1	585	525	475	430	395	365	330	305	280	0.554
	2	685	625	575	525	485	450	420	395	370	0.417
	3	755	705	655	605	565	530	495	465	440	0.334
	4	810	765	715	675	630	595	560	530	500	0.279
	5	850	810	765	725	690	650	620	585	560	0.240
30/6	0	605	515	450	395	355	320	290	265	245	0.732
	1	780	680	605	540	480	435	395	365	335	0.538
	2	935	825	735	665	605	550	505	460	425	0.425
	3	1075	955	860	780	710	655	605	560	520	0.351
	4	1195	1075	975	885	810	750	695	645	605	0.299
	5	1300	1180	1075	985	905	840	780	725	680	0.261
30/4	0	550	485	430	385	345	310	280	260	240	0.823
	1	685	610	550	500	460	420	390	365	340	0.585
	2	790	720	655	600	555	515	475	445	415	0.454
	3	870	805	740	685	640	595	555	520	490	0.371
	4	935	875	815	760	710	665	625	590	555	0.314
	5	985	930	875	820	775	730	690	650	615	0.272
6	1025	975	920	875	830	785	745	705	670	0.240	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	
NR	0.099	4130	3035	2320	1835	1485	1225	1030	880	755	
IR	0.108	4410	3240	2480	1960	1585	1310	1100	935	810	
WR	0.152	5695	4185	3205	2530	2050	1695	1420	1210	1045	

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0358"

SUPPORT FASTENING: Buildex or Elco Textron #12 or #14 TEKS screws

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	K1
36/9	0	985	880	785	710	645	590	545	505	470	0.403
	1	1140	1030	940	850	775	715	665	620	585	0.331
	2	1285	1165	1065	980	900	830	765	710	665	0.281
	3	1415	1290	1185	1095	1015	945	875	815	760	0.244
	4	1540	1410	1300	1200	1120	1045	980	915	855	0.216
	5	1650	1520	1405	1305	1215	1135	1065	1005	950 *	0.193
	6	1750	1620	1505	1400	1310	1225	1155	1090 *	1030 *	0.175
36/7	0	610	540	485	440	400	365	340	315	295	0.605
	1	790	710	640	580	525	475	435	400	375	0.456
	2	945	855	775	715	655	605	560	520	485	0.366
	3	1090	990	905	830	770	715	670	620	580	0.306
	4	1225	1115	1025	945	875	820	765	720	675	0.263
	5	1340	1230	1135	1055	980	915	855	805	760	0.230
	6	1450	1340	1240	1155	1075	1005	945	890	840	0.205
36/5	0	560	500	450	405	370	340	310	290	270	0.725
	1	710	645	585	540	495	455	420	395	370	0.522
	2	840	770	705	655	605	565	530	495	460	0.408
	3	955	880	815	755	705	660	620	585	550	0.334
	4	1050	975	910	850	795	745	705	665	630	0.283
	5	1130	1060	990	930	875	825	780	740	705	0.246
	6	1195	1130	1065	1005	950	900	855	810	770	0.217
36/4	0	430	380	340	305	280	255	235	215	200	0.907
	1	575	525	480	440	405	375	350	330	310	0.610
	2	695	640	590	550	510	475	450	420	395	0.459
	3	790	735	685	640	600	565	535	505	475	0.368
	4	870	815	765	720	680	645	610	580	550	0.307
	5	930	880	835	790	750	710	675	645	615	0.264
	6	980	935	890	850	810	770	735	705	675	0.231
30/6	0	550	485	435	390	355	325	300	280	260	0.806
	1	735	655	585	530	485	445	410	385	360	0.592
	2	895	805	735	670	615	565	520	485	455	0.468
	3	1045	945	865	795	735	680	630	585	550	0.387
	4	1180	1075	985	910	840	785	735	690	645	0.330
	5	1305	1195	1100	1020	945	885	825	780	735	0.287
	6	1415	1305	1205	1120	1045	975	915	865	815	0.255
30/4	0	525	470	420	380	345	315	290	270	250	0.907
	1	670	610	555	510	475	445	415	390	365	0.645
	2	795	730	670	620	580	540	505	475	445	0.500
	3	900	835	775	720	675	630	595	560	530	0.409
	4	990	925	865	810	760	715	675	640	605	0.346
	5	1060	1000	940	885	835	790	750	710	675	0.299
	6	1120	1060	1005	955	905	860	815	775	740	0.264

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
NR	0.128	3255	2570	2085	1720	1445	1230	1060	925	810
IR	0.139	3465	2735	2215	1830	1540	1310	1130	985	865
WR	0.198	4515	3570	2890	2390	2005	1710	1475	1285	1125

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0474"

SUPPORT FASTENING: Buildex or Elco Textron #12 or #14 TEKS screws

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	K1
36/9	0	1050	950	865	795	730	680	635	590	555	0.464
	1	1245	1135	1035							0.381
	2	1410	1300	1200	1105	1025	950	885	830	780	0.324
	3	1570	1450	1345	1250	1170	1085	1015	950	895	0.281
	4	1720	1590	1480	1380	1295	1215	1140	1070	1010	0.248
	5	1860	1725	1610	1505	1415	1330	1255	1190	1120	0.223
	6	1990	1855	1730	1625	1525	1440	1360	1290	1230 *	0.202
36/7	0	645	585	535	490	455	420	390	365	345	0.696
	1	850	770	705							0.525
	2	1030	945	870	805	745	690	645	605	570	0.422
	3	1200	1100	1020	950	885	825	775	725	685	0.352
	4	1355	1250	1160	1080	1015	950	895	845	795	0.303
	5	1505	1395	1295	1210	1135	1070	1010	955	905	0.265
	6	1640	1525	1425	1335	1250	1180	1115	1055	1005	0.236
36/5	0	595	540	495	450	420	390	360	340	320	0.835
	1	775	715	660							0.601
	2	935	865	800	750	700	660	615	580	545	0.469
	3	1075	1000	935	875	820	770	730	690	655	0.385
	4	1205	1125	1050	990	930	880	835	790	750	0.326
	5	1315	1235	1160	1095	1035	980	930	885	845	0.283
	6	1410	1330	1260	1190	1130	1075	1020	975	930	0.250
36/4	0	455	410	370	340	315	290	270	255	240	1.044
	1	635	585	540							0.702
	2	780	725	675	630	595	560	525	495	465	0.529
	3	910	850	795	750	705	665	630	600	570	0.424
	4	1015	955	900	850	805	765	725	690	660	0.354
	5	1105	1045	995	945	895	855	815	775	745	0.304
	6	1180	1125	1070	1025	975	935	890	855	820	0.266
30/6	0	580	525	475	440	405	375	350	325	305	0.928
	1	780	710	645							0.682
	2	970	890	815	750	695	645	605	565	535	0.539
	3	1145	1050	970	900	840	780	730	685	645	0.445
	4	1305	1205	1115	1040	970	910	860	805	760	0.380
	5	1455	1345	1250	1170	1095	1030	970	920	870	0.331
	6	1595	1485	1380	1295	1215	1145	1080	1025	970	0.293
30/4	0	560	505	460	425	390	365	340	315	300	1.044
	1	735	680	630							0.742
	2	890	825	765	715	670	630	595	555	525	0.576
	3	1025	955	890	835	785	740	700	665	630	0.470
	4	1140	1070	1005	945	895	845	800	760	725	0.398
	5	1245	1170	1105	1045	990	940	895	855	815	0.344
	6	1330	1260	1195	1135	1080	1030	980	935	895	0.304

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
NR	0.181	3335	2755	2315	1970	1700	1480	1300	1155	1030
IR	0.196	3540	2925	2460	2095	1805	1570	1380	1225	1090
WR	0.284	4675	3865	3245	2765	2385	2075	1825	1615	1440

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0598"

SUPPORT FASTENING: Buildex or Elco Textron #12 or #14 TEKS screws

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	K1
36/9	0	1100	1010	935	865	805	755	710	670	630	0.521
	1	1315									0.428
	2	1515	1405	1300	1210	1130	1060	995			0.363
	3	1695	1580	1480	1380	1290	1210	1140	1075	1015	0.316
	4	1865	1745	1635	1535	1450	1360	1280	1210	1145	0.279
	5	2030	1900	1785	1680	1585	1500	1425	1345	1275	0.250
36/7	0	675	620	575	535	500	470	440	415	390	0.782
	1	890									0.590
	2	1100	1015	940	875	820	770	725			0.474
	3	1285	1195	1115	1050	980	920	870	820	775	0.396
	4	1465	1365	1280	1200	1130	1070	1010	955	905	0.340
	5	1635	1530	1430	1345	1270	1205	1140	1085	1035	0.298
36/5	0	625	575	530	495	460	430	405	380	360	0.938
	1	835									0.675
	2	1010	945	885	830	780	735	690			0.527
	3	1175	1100	1035	975	920	870	830	790	745	0.432
	4	1330	1245	1175	1110	1050	1000	950	905	865	0.366
	5	1465	1380	1305	1235	1175	1115	1065	1015	970	0.318
36/4	0	475	435	400	370	345	325	305	285	270	1.173
	1	680									0.788
	2	855	795	750	705	665	625	590			0.594
	3	1005	945	890	840	795	755	720	685	655	0.476
	4	1140	1075	1015	965	915	875	830	795	760	0.397
	5	1255	1190	1130	1075	1025	980	935	900	860	0.341
30/6	0	605	555	515	480	445	415	390	370	350	1.042
	1	820									0.766
	2	1035	950	880	820	765	720	675			0.605
	3	1225	1140	1060	990	925	870	820	775	735	0.500
	4	1405	1310	1225	1150	1085	1020	965	910	865	0.426
	5	1580	1475	1380	1300	1225	1160	1100	1045	990	0.371
30/4	0	585	540	500	465	430	405	380	360	340	1.172
	1	790									0.834
	2	965	905	845	795	750	705	665			0.647
	3	1125	1055	995	935	885	840	800	760	725	0.528
	4	1270	1195	1130	1065	1010	960	915	875	835	0.447
	5	1395	1320	1250	1185	1130	1075	1025	980	940	0.387
	6	1510	1435	1365	1300	1240	1180	1130	1080	1040	0.341

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
NR	0.226	3255	2775	2390	2085	1830	1620	1445	1300	1170
IR	0.245	3460	2950	2540	2215	1945	1725	1535	1380	1245
WR	0.355	4570	3895	3355	2925	2570	2275	2030	1820	1645

NOTE:
 ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0295"

SUPPORT FASTENING: Buildex BX-12

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	K1
36/9	0	1515	1335	1185	1050	940	845	770	705	650	0.704
	1	1665	1470	1315	1190	1065	965	875	800	745	0.497
	2	1800	1600	1440	1300	1190	1080	980	900	830	0.384
	3	1925	1725	1555	1410	1290	1190	1085	1000	920 *	0.313
	4	2045	1840	1665	1515	1390	1280	1190 *	1095 *	1010 *	0.264
	5	2150	1945	1770	1615	1485	1375	1275 *	1190 *	1105 *	0.228
	6	2245	2045	1865	1710	1575	1460 *	1360 *	1270 *	1190 *	0.201
36/7	0	970	845	735	650	580	525	475	440	405	1.056
	1	1140	1000	885	790	705	640	585	540	505	0.650
	2	1300	1145	1020	920	835	755	690	630	585	0.469
	3	1450	1285	1150	1035	945	865	795	730	675	0.367
	4	1580	1410	1270	1150	1050	965	890	825	765	0.302
	5	1705	1530	1380	1255	1150	1060	980	915	855	0.256
	6	1815	1640	1490	1360	1250	1150	1070	995	935 *	0.222
36/5	0	860	755	670	600	535	485	440	405	370	1.266
	1	1005	890	800	720	660	600	545	500	465	0.724
	2	1130	1010	915	830	760	700	650	600	555	0.507
	3	1235	1120	1020	930	855	790	735	685	645	0.390
	4	1330	1215	1115	1025	945	880	820	765	720	0.317
	5	1410	1300	1200	1110	1030	960	895	840	790	0.267
	6	1475	1370	1275	1185	1105	1030	970	910	855	0.230
36/4	0	655	580	515	455	405	365	330	300	280	1.584
	1	795	710	640	580	530	480	435	400	370	0.817
	2	910	825	750	685	630	580	540	495	460	0.551
	3	1005	920	845	775	720	665	620	580	545	0.415
	4	1080	1000	925	860	800	745	695	655	615	0.333
	5	1140	1065	995	930	870	815	765	720	680	0.278
	6	1190	1120	1055	990	935	880	830	785	740	0.239
30/6	0	880	755	655	580	520	470	425	390	360	1.407
	1	1060	925	815	720	645	585	530	490	455	0.831
	2	1225	1075	955	860	770	700	635	585	540	0.589
	3	1380	1215	1085	980	890	815	740	680	630	0.456
	4	1520	1350	1210	1095	1000	915	845	780	720	0.373
	5	1645	1475	1325	1205	1100	1015	940	875	810	0.315
	6	1760	1585	1435	1310	1200	1110	1025	955	895 *	0.272
30/4	0	800	705	630	560	500	455	410	380	350	1.583
	1	940	840	755	680	625	570	520	480	445	0.889
	2	1060	955	865	790	725	665	620	575	530	0.618
	3	1160	1055	965	885	815	755	705	655	615	0.474
	4	1245	1145	1055	970	900	840	780	735	690	0.384
	5	1315	1220	1130	1050	980	915	855	805	755	0.323
	6	1375	1285	1200	1120	1050	985	925	870	820	0.278

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
NR	0.099	4130	3035	2320	1835	1485	1225	1030	880	755
IR	0.108	4410	3240	2480	1960	1585	1310	1100	935	810
WR	0.152	5695	4185	3205	2530	2050	1695	1420	1210	1045

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0358"

SUPPORT FASTENING: Buildex BX-12

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	K1
36/9	0	1390	1235	1105	1000	910	835	770	710	660	0.775
	1	1545	1395	1260	1140	1035	970	910	855	800	0.547
	2	1690	1530	1400	1280	1165	1070	990	915	855	0.423
	3	1830	1665	1520	1400	1295	1190	1095	1020	950 *	0.345
	4	1965	1790	1640	1515	1405	1305	1205	1120 *	1045 *	0.291
	5	2090	1910	1755	1625	1510	1405	1315 *	1225 *	1145 *	0.251
	6	2205	2025	1865	1730	1610	1505 *	1410 *	1325 *	1240 *	0.221
36/7	0	860	760	680	615	560	515	475	440	410	1.163
	1	1040	930	835	755	690	645	605	570	540	0.716
	2	1205	1085	985	895	820	750	695	645	605	0.517
	3	1360	1225	1120	1025	945	870	805	750	700	0.404
	4	1505	1365	1245	1145	1060	985	915	850	795	0.332
	5	1640	1495	1370	1260	1170	1085	1015	955	890	0.282
	6	1765	1615	1485	1370	1275	1185	1110	1045	985 *	0.245
36/5	0	785	705	630	570	520	475	440	405	380	1.395
	1	940	850	775	710	645	595	555	520	490	0.797
	2	1080	980	900	830	765	710	660	610	570	0.558
	3	1205	1105	1015	940	870	815	760	715	665	0.429
	4	1315	1215	1120	1040	970	905	850	800	755	0.349
	5	1420	1315	1220	1135	1065	995	940	885	835	0.294
	6	1505	1405	1310	1225	1150	1080	1020	965	915	0.254
36/4	0	605	535	475	430	390	355	330	305	285	1.745
	1	750	680	625	570	520	485	455	430	405	0.900
	2	885	810	745	685	635	595	555	510	475	0.607
	3	995	920	850	790	735	690	645	610	570	0.458
	4	1095	1015	945	885	825	775	730	690	655	0.367
	5	1175	1100	1030	970	910	860	810	765	730	0.307
	6	1245	1175	1105	1045	985	930	885	840	795	0.263
30/6	0	770	680	610	550	500	460	425	395	365	1.550
	1	960	850	765	690	630	585	545	510	480	0.915
	2	1130	1015	915	830	760	695	645	600	560	0.649
	3	1285	1160	1055	970	885	815	755	700	655	0.503
	4	1435	1300	1185	1090	1005	935	865	805	750	0.410
	5	1575	1435	1310	1205	1115	1040	970	905	845	0.347
	6	1710	1560	1430	1320	1225	1140	1065	1000	945 *	0.300
30/4	0	735	660	590	535	485	445	410	380	355	1.744
	1	885	800	735	675	615	575	540	510	485	0.979
	2	1020	930	855	790	730	680	630	585	545	0.681
	3	1140	1045	965	895	835	780	730	685	645	0.522
	4	1245	1150	1070	995	930	870	815	770	730	0.423
	5	1340	1245	1160	1085	1015	955	900	850	805	0.356
	6	1420	1325	1245	1165	1100	1035	980	925	880	0.307

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
NR	0.128	3255	2570	2085	1720	1445	1230	1060	925	810
IR	0.139	3465	2735	2215	1830	1540	1310	1130	985	865
WR	0.198	4515	3570	2890	2390	2005	1710	1475	1285	1125

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum (Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling))

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0474"

SUPPORT FASTENING: Buildex BX-12

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50

φ (WIND): 0.70 Ω (WIND): 2.35

φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	K1
36/9	0	1375	1240	1130	1035	955	890	825	775	725	0.892
	1	1575	1425	1300							0.630
	2	1745	1600	1470	1350	1250	1160	1080	1015	950	0.487
	3	1905	1755	1625	1505	1395	1295	1210	1135	1065	0.396
	4	2065	1905	1765	1645	1540	1430	1335	1255	1180 *	0.335
	5	2215	2050	1905	1775	1665	1565	1465	1375 *	1290 *	0.289
	6	2355	2185	2035	1900	1785	1680	1585 *	1490 *	1405 *	0.255
36/7	0	845	765	695	640	590	550	515	480	450	1.338
	1	1050	950	865							0.823
	2	1235	1135	1035	955	880	820	765	720	675	0.595
	3	1410	1295	1195	1110	1030	955	895	840	790	0.465
	4	1580	1455	1345	1250	1170	1090	1020	960	905	0.382
	5	1740	1605	1485	1385	1295	1215	1145	1080	1015	0.324
	6	1890	1745	1625	1515	1420	1335	1260	1190	1130	0.282
36/5	0	780	705	645	590	545	505	475	440	415	1.605
	1	965	885	815							0.917
	2	1130	1040	965	895	835	780	725	680	640	0.642
	3	1280	1185	1100	1025	965	905	855	800	755	0.494
	4	1420	1320	1230	1150	1080	1020	960	910	865	0.401
	5	1545	1440	1350	1265	1195	1125	1065	1010	960	0.338
	6	1660	1555	1460	1375	1300	1230	1165	1105	1055	0.292
36/4	0	590	535	485	445	410	380	355	330	310	2.008
	1	780	715	655							1.036
	2	935	865	805	750	700	650	610	570	535	0.698
	3	1075	1000	930	875	820	775	730	690	650	0.526
	4	1200	1120	1050	985	930	880	835	790	750	0.423
	5	1305	1225	1155	1090	1030	980	930	885	840	0.353
	6	1400	1325	1250	1185	1125	1070	1020	970	930	0.303
30/6	0	755	685	625	570	530	490	455	430	400	1.784
	1	960	870	795							1.053
	2	1160	1055	960	885	820	760	710	665	630	0.747
	3	1335	1225	1130	1040	965	895	840	785	740	0.579
	4	1505	1385	1280	1190	1110	1035	965	905	855	0.472
	5	1670	1540	1425	1325	1240	1165	1095	1025	965	0.399
	6	1825	1685	1565	1460	1365	1285	1210	1145	1080	0.345
30/4	0	735	665	605	555	510	475	445	415	390	2.007
	1	915	840	775							1.127
	2	1070	990	920	855	800	745	695	655	615	0.783
	3	1220	1130	1050	985	925	870	820	775	730	0.600
	4	1350	1260	1175	1105	1035	980	925	880	835	0.487
	5	1470	1375	1290	1215	1145	1080	1025	975	930	0.409
	6	1575	1480	1395	1315	1245	1180	1120	1065	1015	0.353

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
NR	0.181	3335	2755	2315	1970	1700	1480	1300	1155	1030
IR	0.196	3540	2925	2460	2095	1805	1570	1380	1225	1090
WR	0.284	4675	3865	3245	2765	2385	2075	1825	1615	1440

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0598"

SUPPORT FASTENING: Buildex BX-12

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	K1
36/9	0	1320	1210	1120	1040	970	905	850	805	760	1.002
	1	1535									0.707
	2	1745	1610	1485	1380	1290	1210	1140			0.547
	3	1930	1795	1670	1555	1450	1360	1280	1210	1145	0.445
	4	2105	1960	1835	1725	1610	1510	1425	1345	1270	0.376
	5	2275	2125	1990	1875	1765	1665	1565	1480	1400 *	0.325
	6	2435	2280	2140	2015	1905	1805	1710 *	1615 *	1530 *	0.286
36/7	0	815	745	690	640	600	560	530	500	470	1.503
	1	1025									0.925
	2	1240	1140	1060	985	920	865	815			0.668
	3	1435	1330	1240	1155	1080	1015	955	905	855	0.523
	4	1615	1505	1405	1320	1240	1165	1100	1040	985	0.429
	5	1795	1670	1565	1470	1385	1310	1240	1175	1115	0.364
	6	1965	1835	1720	1615	1525	1445	1370	1305	1240	0.316
36/5	0	750	690	640	595	555	520	485	460	435	1.803
	1	965									1.030
	2	1145	1065	1000	935	875	820	770			0.721
	3	1315	1230	1155	1085	1025	970	915	865	820	0.555
	4	1475	1380	1300	1225	1160	1100	1045	995	950	0.451
	5	1620	1525	1440	1360	1285	1220	1165	1110	1060	0.380
	6	1760	1660	1565	1485	1410	1340	1275	1220	1165	0.328
36/4	0	570	520	480	445	415	390	365	345	325	2.255
	1	785									1.164
	2	960	895	840	790	735	690	650			0.784
	3	1120	1050	985	930	880	835	790	750	710	0.591
	4	1260	1190	1120	1060	1005	955	910	870	830	0.475
	5	1390	1315	1245	1180	1125	1070	1020	975	935	0.396
	6	1505	1430	1360	1295	1230	1175	1125	1075	1035	0.340
30/6	0	725	670	615	575	535	500	470	445	420	2.004
	1	940									1.183
	2	1155	1065	985	915	855	805	755			0.839
	3	1355	1260	1170	1085	1015	955	900	850	805	0.650
	4	1545	1435	1340	1260	1175	1105	1040	985	935	0.530
	5	1725	1605	1500	1410	1330	1255	1185	1120	1060	0.448
	6	1895	1770	1660	1560	1470	1390	1320	1255	1190	0.388
30/4	0	705	650	600	555	520	485	455	430	405	2.254
	1	915									1.266
	2	1095	1020	955	895	840	790	740			0.880
	3	1260	1175	1105	1040	985	930	885	835	790	0.674
	4	1410	1325	1245	1175	1115	1060	1005	960	915	0.547
	5	1550	1460	1380	1305	1240	1180	1120	1070	1025	0.459
	6	1675	1585	1500	1425	1355	1290	1230	1180	1125	0.396

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
NR	0.226	3255	2775	2390	2085	1830	1620	1445	1300	1170
IR	0.245	3460	2950	2540	2215	1945	1725	1535	1380	1245
WR	0.355	4570	3895	3355	2925	2570	2275	2030	1820	1645

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum (Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling))

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0295"

SUPPORT FASTENING: Buildex BX-14

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50

φ (WIND): 0.70 Ω (WIND): 2.35

φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	K1
36/9	0	1605	1410	1260	1115	995	900	815	750	690	0.704
	1	1755	1550	1385	1250	1120	1015	920			0.497
	2	1890	1680	1510	1365	1245	1130	1030	945	870 *	0.384
	3	2020	1805	1625	1475	1350	1240	1135	1040 *	960 *	0.313
	4	2135	1920	1735	1580	1450	1335	1240 *	1140 *	1050 *	0.264
	5	2245	2030	1840	1685	1545	1425 *	1325 *	1235 *	1140 *	0.228
	6	2345	2130	1940	1780	1640	1515 *	1410 *	1315 *	1230 *	0.201
36/7	0	1025	895	775	685	615	555	505	465	430	1.056
	1	1200	1050	930	825	740	670	610			0.650
	2	1360	1195	1065	960	865	785	715	660	610	0.469
	3	1510	1335	1195	1075	980	900	820	755	700	0.367
	4	1645	1465	1315	1190	1085	1000	925	855	790	0.302
	5	1770	1585	1430	1300	1190	1095	1015	945	880 *	0.256
	6	1885	1700	1540	1405	1290	1190	1100	1025 *	960 *	0.222
36/5	0	910	800	710	635	565	510	465	425	395	1.266
	1	1055	935	840	760	690	625	570			0.724
	2	1180	1060	955	870	795	730	675	620	575	0.507
	3	1290	1170	1060	970	890	825	765	715	665	0.390
	4	1390	1265	1160	1065	980	910	845	790	745	0.317
	5	1470	1350	1245	1150	1065	990	925	865	815	0.267
	6	1540	1430	1325	1230	1145	1070	1000	940	885 *	0.230
36/4	0	695	615	545	480	430	385	350	320	295	1.584
	1	835	745	670	605	555	500	455			0.817
	2	955	860	780	715	655	605	560	515	475	0.551
	3	1050	960	875	805	745	690	645	600	565	0.415
	4	1130	1040	960	890	825	770	720	675	635	0.333
	5	1195	1110	1035	965	900	845	790	745	705	0.278
	6	1245	1170	1095	1030	965	910	855	810	765	0.239
30/6	0	935	800	695	615	550	495	450	415	380	1.407
	1	1110	970	855	755	675	610	555			0.831
	2	1280	1120	995	895	800	725	660	610	560	0.589
	3	1435	1265	1130	1015	925	840	770	705	650	0.456
	4	1575	1400	1255	1135	1035	950	875	805	745	0.373
	5	1705	1525	1370	1245	1140	1045	965	900	835	0.315
	6	1825	1640	1485	1350	1240	1140	1055	985	920 *	0.272
30/4	0	850	750	665	595	530	480	435	400	370	1.583
	1	990	880	790	715	655	595	540			0.889
	2	1110	1000	905	825	755	695	645	595	550	0.618
	3	1215	1100	1005	920	850	785	730	680	640	0.474
	4	1300	1190	1095	1010	935	870	810	760	710	0.384
	5	1375	1270	1175	1090	1015	945	885	830	780	0.323
	6	1435	1340	1245	1165	1085	1020	955	900	850	0.278

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
NR	0.099	4130	3035	2320	1835	1485	1225	1030	880	755
IR	0.108	4410	3240	2480	1960	1585	1310	1100	935	810
WR	0.152	5695	4185	3205	2530	2050	1695	1420	1210	1045

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0358"

SUPPORT FASTENING: Buildex BX-14

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	K1
36/9	0	1470	1310	1170	1055	965	880	815	755	700	0.775
	1	1625	1470	1325	1195	1090					0.547
	2	1775	1605	1465	1335	1220	1120	1035	960	895	0.423
	3	1915	1740	1590	1465	1345	1235	1145	1060 *	990 *	0.345
	4	2050	1865	1710	1580	1460	1355	1255 *	1165 *	1085 *	0.291
	5	2175	1990	1830	1690	1565	1460 *	1360 *	1265 *	1180 *	0.251
	6	2295	2105	1940	1795	1670 *	1560 *	1460 *	1370 *	1280 *	0.221
36/7	0	910	805	720	650	595	545	505	470	435	1.163
	1	1095	975	875	790	725					0.716
	2	1255	1130	1025	930	850	780	725	675	630	0.517
	3	1410	1275	1160	1065	980	900	835	775	725	0.404
	4	1560	1415	1290	1185	1095	1020	945	880	820	0.332
	5	1695	1545	1415	1300	1205	1120	1050	980	915	0.282
	6	1825	1670	1530	1415	1310	1220	1145	1075 *	1010 *	0.245
36/5	0	830	745	665	605	550	505	465	430	400	1.395
	1	985	890	810	740	675					0.797
	2	1125	1025	935	865	800	740	685	635	595	0.558
	3	1255	1145	1055	975	905	845	790	740	690	0.429
	4	1370	1260	1165	1080	1005	940	880	830	785	0.349
	5	1475	1365	1265	1175	1100	1030	970	915	865	0.294
	6	1565	1455	1355	1270	1190	1115	1050	995	940 *	0.254
36/4	0	640	565	505	455	415	380	350	325	300	1.745
	1	790	715	655	595	540					0.900
	2	920	840	775	715	660	615	570	530	490	0.607
	3	1040	955	880	820	765	715	670	630	590	0.458
	4	1140	1055	980	915	855	800	755	715	675	0.367
	5	1225	1145	1070	1000	940	885	835	790	750	0.307
	6	1300	1220	1145	1080	1020	960	910	865	820	0.263
30/6	0	815	720	645	585	530	485	450	415	390	1.550
	1	1010	890	800	725	660					0.915
	2	1175	1055	955	865	785	725	670	620	580	0.649
	3	1335	1205	1095	1000	915	840	780	725	675	0.503
	4	1485	1345	1225	1125	1040	960	890	825	770	0.410
	5	1630	1480	1350	1245	1150	1070	1000	930	870	0.347
	6	1765	1605	1475	1360	1260	1170	1095	1030	965 *	0.300
30/4	0	780	700	625	565	515	470	435	405	375	1.744
	1	930	840	770	705	645					0.979
	2	1065	970	890	820	760	710	655	610	570	0.681
	3	1185	1090	1005	930	865	805	755	710	665	0.522
	4	1295	1195	1110	1030	960	900	845	795	755	0.423
	5	1390	1290	1205	1125	1050	985	930	880	830	0.356
	6	1475	1380	1290	1210	1135	1070	1010	955	905	0.307

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
NR	0.128	3255	2570	2085	1720	1445	1230	1060	925	810
IR	0.139	3465	2735	2215	1830	1540	1310	1130	985	865
WR	0.198	4515	3570	2890	2390	2005	1710	1475	1285	1125

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0474"

SUPPORT FASTENING: Buildex BX-14

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	K1
36/9	0	1455	1315	1195	1100	1015	940	875	820	770	0.892
	1	1655	1500	1365							0.630
	2	1825	1680	1535	1410	1305	1210	1130	1060	995	0.487
	3	1990	1835	1695	1570	1450	1350	1260	1180	1110	0.396
	4	2150	1985	1840	1715	1595	1485	1385	1300	1220 *	0.335
	5	2300	2130	1975	1845	1725	1620	1510 *	1420 *	1335 *	0.289
	6	2445	2265	2110	1970	1850	1740 *	1640 *	1540 *	1450 *	0.255
36/7	0	895	810	740	680	625	580	545	510	480	1.338
	1	1100	995	910							0.823
	2	1290	1180	1080	990	915	855	795	750	705	0.595
	3	1465	1345	1240	1150	1065	990	925	870	815	0.465
	4	1635	1500	1390	1290	1205	1125	1050	985	930	0.382
	5	1795	1655	1535	1425	1335	1255	1180	1105	1045	0.324
	6	1950	1800	1670	1560	1460	1370	1295	1225	1155	0.282
36/5	0	825	750	680	625	580	535	500	470	440	1.605
	1	1010	930	850							0.917
	2	1175	1085	1005	935	870	810	755	710	665	0.642
	3	1330	1230	1140	1065	1000	940	880	830	780	0.494
	4	1470	1365	1270	1190	1115	1050	995	940	895	0.401
	5	1600	1490	1395	1310	1230	1160	1100	1040	990	0.338
	6	1720	1610	1510	1420	1340	1265	1200	1140	1085	0.292
36/4	0	625	565	515	470	435	405	375	350	330	2.008
	1	815	750	685							1.036
	2	975	900	835	780	725	675	630	590	555	0.698
	3	1115	1035	965	905	850	800	755	710	670	0.526
	4	1240	1160	1085	1020	960	905	860	815	775	0.423
	5	1350	1270	1195	1125	1065	1005	955	910	865	0.353
	6	1450	1370	1295	1225	1160	1100	1050	1000	955	0.303
30/6	0	800	725	660	605	560	520	485	455	425	1.784
	1	1005	910	830							1.053
	2	1205	1095	1000	920	850	790	740	695	650	0.747
	3	1385	1270	1170	1075	995	925	865	810	765	0.579
	4	1555	1430	1320	1225	1140	1060	995	930	880	0.472
	5	1720	1585	1465	1365	1275	1195	1120	1050	990	0.399
	6	1880	1735	1610	1500	1400	1315	1240	1170	1105	0.345
30/4	0	775	700	640	585	540	505	470	440	410	2.007
	1	955	880	810							1.127
	2	1120	1030	955	890	835	775	725	680	640	0.783
	3	1265	1175	1090	1020	955	900	850	800	750	0.600
	4	1400	1305	1215	1140	1070	1010	955	905	860	0.487
	5	1520	1420	1335	1255	1180	1115	1060	1005	955	0.409
	6	1630	1530	1440	1360	1285	1215	1155	1100	1045	0.353

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
NR	0.181	3335	2755	2315	1970	1700	1480	1300	1155	1030
IR	0.196	3540	2925	2460	2095	1805	1570	1380	1225	1090
WR	0.284	4675	3865	3245	2765	2385	2075	1825	1615	1440

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0598"

SUPPORT FASTENING: Buildex BX-14

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	K1
36/9	0	1400	1285	1185	1100	1025	960	905	850	805	1.002
	1	1615									0.707
	2	1825	1680	1555	1445	1350	1265	1190			0.547
	3	2010	1870	1735	1615	1510	1415	1330	1255	1190	0.445
	4	2190	2040	1910	1785	1670	1565	1475	1390	1315	0.376
	5	2360	2205	2065	1940	1830	1715	1615	1525 *	1445 *	0.325
36/7	0	860	790	730	680	635	595	560	530	500	1.503
	1	1075									0.925
	2	1290	1185	1100	1020	955	895	845			0.668
	3	1485	1380	1280	1195	1115	1050	985	935	885	0.523
	4	1670	1555	1450	1360	1275	1200	1130	1070	1010	0.429
	5	1850	1725	1610	1515	1425	1350	1275	1205	1140	0.364
36/5	0	795	730	675	630	585	550	515	485	460	1.803
	1	1010									1.030
	2	1190	1110	1040	970	905	850	800			0.721
	3	1365	1275	1195	1125	1060	1000	945	890	845	0.555
	4	1525	1430	1345	1265	1195	1135	1075	1025	975	0.451
	5	1675	1575	1485	1400	1325	1260	1195	1140	1090	0.380
36/4	0	605	555	510	475	440	410	385	365	345	2.255
	1	815									1.164
	2	995	930	870	815	760	715	670			0.784
	3	1155	1085	1020	960	905	860	815	770	730	0.591
	4	1305	1225	1155	1095	1035	985	935	895	855	0.475
	5	1435	1355	1285	1215	1155	1100	1050	1000	960	0.396
30/6	0	770	710	655	605	565	530	500	470	445	2.004
	1	985									1.183
	2	1200	1105	1020	950	890	835	785			0.839
	3	1405	1300	1205	1120	1050	985	925	875	830	0.650
	4	1590	1480	1380	1290	1210	1135	1070	1010	960	0.530
	5	1775	1650	1545	1450	1365	1285	1210	1145	1085	0.448
30/4	0	745	685	635	590	550	515	485	455	430	2.254
	1	960									1.266
	2	1135	1060	990	930	870	815	770			0.880
	3	1305	1220	1145	1080	1015	965	910	860	815	0.674
	4	1460	1370	1290	1215	1150	1090	1035	990	945	0.547
	5	1600	1510	1425	1345	1275	1215	1155	1100	1055	0.459
6	1730	1635	1550	1470	1395	1330	1265	1210	1160	0.396	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
NR	0.226	3255	2775	2390	2085	1830	1620	1445	1300	1170
IR	0.245	3460	2950	2540	2215	1945	1725	1535	1380	1245
WR	0.355	4570	3895	3355	2925	2570	2275	2030	1820	1645

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0295"

SUPPORT FASTENING: Pneutek SDK61-series (0.113" to 0.155" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50
 ϕ (WIND): 0.70 Ω (WIND): 2.35
 ϕ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	K1
36/9	0	1560	1370	1220	1080	965	870	795	725	670	0.844
	1	1705	1510	1350	1220	1095	985	900			0.563
	2	1845	1640	1475	1335	1215	1100	1005	920	850	0.422
	3	1970	1765	1590	1445	1320	1215	1110	1020 *	940 *	0.338
	4	2090	1880	1700	1550	1420	1310	1210 *	1115 *	1030 *	0.281
	5	2195	1985	1805	1650	1515	1400	1300 *	1210 *	1120 *	0.241
6	2295	2085	1905	1745	1605	1485 *	1385 *	1290 *	1210 *	0.211	
36/7	0	1000	870	755	665	595	540	490	450	415	1.267
	1	1170	1025	905	810	725	655	595			0.724
	2	1330	1170	1040	940	850	770	700	645	595	0.507
	3	1480	1310	1170	1055	960	880	810	745	685	0.390
	4	1615	1435	1290	1170	1070	980	905	840	775	0.317
	5	1735	1555	1405	1280	1170	1080	1000	930	870 *	0.267
6	1850	1670	1515	1380	1270	1170	1085	1010 *	945 *	0.230	
36/5	0	885	775	690	615	550	495	455	415	385	1.520
	1	1030	910	820	740	675	615	560			0.800
	2	1155	1035	935	850	775	715	665	610	565	0.543
	3	1265	1145	1040	950	875	810	750	700	655	0.411
	4	1360	1240	1135	1045	965	895	830	780	730	0.330
	5	1440	1325	1220	1130	1045	975	910	855	800	0.276
6	1510	1400	1300	1205	1125	1050	985	925	870 *	0.237	
36/4	0	675	595	530	465	415	375	340	310	285	1.901
	1	815	730	655	595	540	490	445			0.894
	2	930	840	765	700	640	590	550	505	465	0.585
	3	1025	940	860	790	730	680	630	590	555	0.434
	4	1105	1020	945	875	810	755	710	665	625	0.345
	5	1165	1090	1015	945	885	830	780	735	690	0.287
6	1220	1145	1075	1010	950	895	845	795	755	0.245	
30/6	0	905	775	675	595	535	480	440	400	370	1.689
	1	1085	945	835	735	660	595	545			0.921
	2	1250	1100	975	875	785	710	650	595	550	0.633
	3	1405	1240	1105	1000	905	825	755	695	640	0.483
	4	1545	1375	1230	1115	1015	930	860	790	730	0.390
	5	1675	1500	1350	1225	1120	1030	955	885	825	0.327
6	1795	1615	1460	1330	1220	1125	1040	970	905 *	0.281	
30/4	0	825	725	645	580	515	465	425	390	360	1.900
	1	965	860	770	700	640	580	530			0.981
	2	1085	975	885	805	740	680	630	585	540	0.661
	3	1185	1080	985	905	830	770	715	670	625	0.498
	4	1270	1165	1075	990	920	855	795	745	700	0.400
	5	1345	1245	1155	1070	995	930	870	815	770	0.334
6	1405	1310	1225	1140	1070	1000	940	885	835	0.287	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
NR	0.099	4130	3035	2320	1835	1485	1225	1030	880	755
IR	0.108	4410	3240	2480	1960	1585	1310	1100	935	810
WR	0.152	5695	4185	3205	2530	2050	1695	1420	1210	1045

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0358"

SUPPORT FASTENING: Pneutek SDK61-series (0.113" to 0.155" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	K1
36/9	0	1465	1305	1165	1050	960	880	810	750	700	0.930
	1	1620	1460	1320	1190	1085	1015	955	900	850	0.620
	2	1765	1600	1460	1330	1215	1115	1030	955	890	0.465
	3	1910	1735	1585	1460	1340	1235	1140	1060 *	985 *	0.372
	4	2040	1860	1705	1575	1455	1350	1250 *	1160 *	1085 *	0.310
	5	2170	1980	1820	1685	1560	1455 *	1360 *	1265 *	1180 *	0.266
	6	2290	2100	1935	1790	1665 *	1555 *	1455 *	1365 *	1275 *	0.233
36/7	0	910	805	720	650	590	545	500	465	435	1.395
	1	1090	975	870	790	720	670	630	600	570	0.797
	2	1250	1125	1025	930	850	780	720	670	625	0.558
	3	1405	1270	1155	1060	975	900	830	775	720	0.429
	4	1555	1410	1285	1180	1090	1015	940	875	820	0.349
	5	1690	1540	1410	1300	1200	1120	1045	980	915	0.294
	6	1820	1665	1525	1410	1310	1220	1140	1070 *	1010 *	0.254
36/5	0	830	740	665	600	545	500	465	430	400	1.674
	1	980	885	810	740	675	630	600	570	540	0.881
	2	1120	1020	935	860	795	740	680	635	590	0.598
	3	1250	1145	1050	970	900	840	790	735	690	0.453
	4	1365	1255	1160	1075	1000	935	880	825	780	0.364
	5	1470	1360	1260	1175	1095	1025	965	910	860	0.304
	6	1560	1450	1355	1265	1185	1115	1050	990	940 *	0.262
36/4	0	635	560	500	455	410	375	345	320	300	2.094
	1	785	710	650	590	540	500	470	445	420	0.985
	2	920	840	770	710	660	615	565	525	490	0.644
	3	1035	950	880	815	760	710	665	630	585	0.478
	4	1135	1050	980	910	855	800	755	710	670	0.381
	5	1220	1140	1065	1000	940	885	835	790	750	0.316
	6	1295	1215	1145	1075	1015	960	910	860	820	0.270
30/6	0	815	720	640	580	530	485	445	415	385	1.861
	1	1005	890	795	720	655	600	560	525	495	1.015
	2	1170	1055	950	860	785	720	665	620	580	0.698
	3	1330	1200	1090	1000	915	840	775	720	675	0.532
	4	1480	1340	1225	1120	1035	960	885	825	770	0.429
	5	1625	1475	1350	1240	1150	1070	995	925	865	0.360
	6	1760	1605	1470	1355	1255	1170	1095	1025	965 *	0.310
30/4	0	775	695	625	560	510	470	435	400	375	2.093
	1	925	840	765	700	640	590	550	515	485	1.080
	2	1060	970	885	820	760	705	655	605	565	0.728
	3	1185	1085	1000	925	860	805	755	710	660	0.549
	4	1290	1190	1105	1025	960	895	845	795	750	0.441
	5	1385	1290	1200	1120	1050	985	925	875	830	0.368
	6	1470	1375	1285	1205	1130	1065	1005	950	905	0.316

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
NR	0.128	3255	2570	2085	1720	1445	1230	1060	925	810
IR	0.139	3465	2735	2215	1830	1540	1310	1130	985	865
WR	0.198	4515	3570	2890	2390	2005	1710	1475	1285	1125

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0474"

SUPPORT FASTENING: Pneutek SDK61-series (0.113" to 0.155" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	K1
36/9	0	1520	1370	1250	1145	1060	980	915	855	805	1.070
	1	1720	1555	1420							0.714
	2	1895	1740	1590	1460	1350	1255	1170	1095	1030	0.535
	3	2060	1895	1755	1615	1495	1390	1295	1215	1145	0.428
	4	2215	2045	1895	1765	1640	1525	1425	1335 *	1255 *	0.357
	5	2370	2190	2035	1895	1775	1660	1550 *	1455 *	1370 *	0.306
	6	2515	2330	2170	2025	1895	1785 *	1680 *	1575 *	1480 *	0.268
36/7	0	935	845	770	710	655	610	565	530	500	1.606
	1	1140	1030	940							0.918
	2	1330	1215	1110	1020	945	880	820	770	725	0.642
	3	1505	1380	1275	1180	1090	1015	950	890	840	0.494
	4	1675	1540	1425	1325	1235	1150	1075	1010	950	0.401
	5	1840	1695	1570	1460	1365	1280	1205	1130	1065	0.338
	6	1995	1840	1710	1595	1490	1400	1320	1250	1175	0.292
36/5	0	865	780	710	655	605	560	525	490	460	1.926
	1	1050	965	880							1.014
	2	1215	1120	1035	965	895	830	775	730	685	0.688
	3	1370	1265	1175	1095	1025	965	905	850	800	0.521
	4	1510	1400	1305	1220	1145	1080	1020	965	910	0.419
	5	1645	1530	1430	1340	1260	1190	1125	1065	1015	0.350
	6	1765	1650	1545	1455	1370	1295	1225	1165	1110	0.301
36/4	0	655	590	540	495	455	420	390	365	345	2.409
	1	845	775	710							1.134
	2	1000	925	860	800	745	695	645	605	570	0.741
	3	1145	1065	990	925	870	820	775	725	685	0.551
	4	1275	1190	1115	1045	985	930	880	835	790	0.438
	5	1390	1300	1225	1155	1090	1030	975	930	885	0.364
	6	1490	1405	1325	1250	1185	1125	1070	1020	970	0.311
30/6	0	835	755	690	635	585	540	505	475	445	2.141
	1	1040	940	860							1.168
	2	1245	1125	1030	945	875	815	760	715	670	0.803
	3	1420	1305	1200	1100	1020	950	885	830	785	0.612
	4	1595	1465	1355	1255	1165	1085	1015	950	895	0.494
	5	1760	1620	1500	1395	1305	1220	1140	1070	1010	0.414
	6	1920	1770	1640	1530	1430	1345	1265	1190	1125	0.357
30/4	0	810	735	670	615	565	525	490	460	430	2.408
	1	990	910	840							1.243
	2	1155	1065	985	920	855	795	745	700	655	0.838
	3	1300	1205	1120	1050	980	925	870	815	770	0.632
	4	1440	1340	1250	1170	1100	1035	980	930	880	0.507
	5	1565	1460	1365	1285	1210	1145	1080	1025	975	0.423
	6	1675	1570	1475	1390	1315	1245	1180	1120	1070	0.364

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
NR	0.181	3335	2755	2315	1970	1700	1480	1300	1155	1030
IR	0.196	3540	2925	2460	2095	1805	1570	1380	1225	1090
WR	0.284	4675	3865	3245	2765	2385	2075	1825	1615	1440

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0598"

SUPPORT FASTENING: Pneutek SDK61-series (0.113" to 0.155" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	K1
36/9	0	1545	1420	1310	1215	1135	1060	1000	940	890	1.202
	1	1760									0.802
	2	1975	1815	1680	1560	1455	1365	1285			0.601
	3	2165	2010	1860	1730	1615	1515	1425	1345	1275	0.481
	4	2345	2185	2045	1900	1775	1665	1570	1480	1400 *	0.401
	5	2520	2350	2200	2070	1935	1820	1710 *	1615 *	1530 *	0.344
36/7	0	950	875	810	750	700	655	620	585	550	1.803
	1	1165									1.031
	2	1380	1270	1175	1095	1025	960	905			0.721
	3	1580	1465	1360	1265	1185	1110	1045	990	935	0.555
	4	1770	1645	1535	1435	1345	1260	1190	1125	1065	0.451
	5	1950	1815	1695	1595	1500	1415	1330	1260	1195	0.380
36/5	0	880	810	745	695	650	605	570	540	510	2.164
	1	1095									1.139
	2	1280	1190	1115	1035	970	910	855			0.773
	3	1455	1360	1270	1195	1125	1060	1000	945	895	0.585
	4	1620	1515	1420	1340	1265	1200	1135	1080	1020	0.470
	5	1775	1665	1565	1475	1400	1325	1260	1200	1145	0.393
36/4	0	665	610	565	525	485	455	430	405	380	2.706
	1	880									1.273
	2	1065	990	930	865	810	760	715			0.832
	3	1230	1150	1080	1015	960	910	855	810	765	0.618
	4	1380	1295	1220	1155	1090	1035	985	940	895	0.492
	5	1520	1430	1355	1280	1215	1155	1100	1050	1005	0.408
30/6	0	850	780	725	670	625	585	550	520	490	2.405
	1	1065									1.312
	2	1280	1175	1090	1015	945	890	835			0.902
	3	1490	1375	1275	1185	1110	1040	980	925	875	0.687
	4	1680	1560	1455	1355	1270	1190	1120	1060	1005	0.555
	5	1865	1735	1620	1520	1430	1340	1265	1195	1135	0.465
30/4	0	825	760	700	650	605	570	535	505	475	2.705
	1	1040									1.396
	2	1220	1135	1065	995	930	870	820			0.941
	3	1390	1300	1220	1145	1080	1020	960	910	860	0.710
	4	1550	1450	1365	1285	1215	1155	1095	1045	990	0.570
	5	1695	1595	1505	1420	1345	1275	1215	1160	1105	0.476
6	1835	1730	1635	1545	1470	1395	1330	1270	1215	0.408	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
NR	0.226	3255	2775	2390	2085	1830	1620	1445	1300	1170
IR	0.245	3460	2950	2540	2215	1945	1725	1535	1380	1245
WR	0.355	4570	3895	3355	2925	2570	2275	2030	1820	1645

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0295"

SUPPORT FASTENING: Pneutek SDK63-series (0.155" to 0.25" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	K1
36/9	0	1750	1535	1370	1215	1085	975	890	815	750	0.844
	1	1895	1675	1500	1350	1210	1090	995			0.563
	2	2035	1810	1620	1465	1335	1205	1100	1010 *	930 *	0.422
	3	2165	1935	1740	1580	1440	1325	1205 *	1105 *	1020 *	0.338
	4	2285	2050	1850	1685	1545	1420 *	1310 *	1205 *	1110 *	0.281
	5	2400	2160	1960	1790	1640	1515 *	1405 *	1300 *	1200 *	0.241
36/7	0	1120	970	845	745	670	605	550	505	465	1.267
	1	1290	1130	1000	890	795	720	655			0.724
	2	1455	1275	1135	1020	920	835	760	700	645	0.507
	3	1605	1415	1265	1140	1040	950	865	795	735	0.390
	4	1745	1550	1390	1255	1145	1050	970	895	830	0.317
	5	1875	1675	1505	1370	1250	1150	1065	990	920 *	0.267
36/5	0	990	870	775	690	615	555	510	465	430	1.520
	1	1135	1005	900	815	745	675	615			0.800
	2	1265	1130	1020	925	845	780	720	660	610	0.543
	3	1380	1245	1130	1030	945	875	810	755	700	0.411
	4	1480	1345	1230	1125	1040	960	895	835	780	0.330
	5	1565	1435	1320	1215	1125	1045	975	910	855	0.276
36/4	0	760	665	595	520	465	420	380	350	320	1.901
	1	900	800	720	650	595	535	485			0.894
	2	1020	915	830	760	695	640	590	545	500	0.585
	3	1120	1020	930	855	790	730	680	635	590	0.434
	4	1200	1105	1020	940	870	810	760	710	665	0.345
	5	1270	1180	1095	1020	950	885	830	780	735	0.287
30/6	0	1015	870	755	670	595	540	490	450	415	1.689
	1	1195	1040	915	810	725	655	595			0.921
	2	1365	1195	1060	950	850	770	700	645	595	0.633
	3	1520	1340	1195	1075	975	885	805	740	685	0.483
	4	1665	1475	1320	1195	1085	995	915	840	775	0.390
	5	1800	1605	1440	1305	1190	1095	1015	935	865	0.327
30/4	0	925	815	725	650	580	525	475	435	400	1.900
	1	1065	945	850	770	700	640	580			0.981
	2	1190	1065	965	880	805	740	685	630	585	0.661
	3	1295	1175	1070	980	900	830	775	720	675	0.498
	4	1385	1265	1160	1070	990	915	855	800	750	0.400
	5	1465	1350	1245	1155	1070	995	930	875	820	0.334
6	1530	1420	1320	1230	1145	1070	1005	945	890 *	0.287	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
NR	0.099	4130	3035	2320	1835	1485	1225	1030	880	755
IR	0.108	4410	3240	2480	1960	1585	1310	1100	935	810
WR	0.152	5695	4185	3205	2530	2050	1695	1420	1210	1045

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0358"

SUPPORT FASTENING: Pneutek SDK63-series (0.155" to 0.25" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	K1
36/9	0	1580	1405	1260	1135	1035	950	875	810	755	0.930
	1	1735	1565	1410	1275	1160					0.620
	2	1885	1705	1555	1415	1290	1185	1095	1015	945 *	0.465
	3	2025	1840	1680	1545	1420	1300	1205	1115 *	1040 *	0.372
	4	2160	1970	1805	1660	1540	1420 *	1315 *	1220 *	1140 *	0.310
	5	2290	2090	1920	1775	1645	1535 *	1425 *	1320 *	1235 *	0.266
	6	2415	2210	2035	1880	1750 *	1630 *	1530 *	1425 *	1330 *	0.233
36/7	0	980	865	775	700	640	585	540	500	470	1.395
	1	1160	1035	930	840	765					0.797
	2	1325	1195	1085	980	895	825	760	705	660	0.558
	3	1485	1340	1215	1115	1025	940	870	810	755	0.429
	4	1630	1475	1345	1240	1145	1060	980	910	855	0.349
	5	1775	1610	1475	1355	1255	1165	1090	1015	950 *	0.294
	6	1905	1735	1595	1470	1360	1270	1185	1115 *	1045 *	0.254
36/5	0	895	800	715	645	590	540	500	465	430	1.674
	1	1045	945	865	785	720					0.881
	2	1190	1080	990	910	840	775	720	670	625	0.598
	3	1320	1205	1105	1025	950	885	830	770	720	0.453
	4	1440	1320	1220	1130	1050	980	920	865	815	0.364
	5	1545	1425	1320	1230	1145	1075	1010	950	900	0.304
	6	1640	1525	1415	1320	1235	1160	1095	1030	975 *	0.262
36/4	0	685	605	540	490	445	405	375	345	320	2.094
	1	835	760	690	630	570					0.985
	2	970	885	815	750	695	645	595	550	515	0.644
	3	1090	1000	925	855	795	745	700	655	610	0.478
	4	1195	1105	1025	955	890	835	785	740	700	0.381
	5	1285	1195	1115	1045	980	920	870	820	780	0.316
	6	1365	1275	1200	1125	1060	1000	945	895	850	0.270
30/6	0	875	775	695	625	570	525	485	450	415	1.861
	1	1070	945	845	765	700					1.015
	2	1240	1115	1000	905	825	760	700	655	610	0.698
	3	1400	1260	1145	1045	955	880	810	755	705	0.532
	4	1555	1405	1280	1175	1085	995	920	860	800	0.429
	5	1700	1540	1405	1295	1195	1110	1030	960	895	0.360
	6	1835	1670	1530	1410	1305	1215	1135	1065 *	995 *	0.310
30/4	0	835	750	670	605	555	505	470	435	405	2.093
	1	990	895	815	745	680					1.080
	2	1125	1025	940	865	800	745	685	640	595	0.728
	3	1250	1145	1055	975	905	845	790	740	690	0.549
	4	1360	1255	1160	1075	1005	940	880	830	785	0.441
	5	1460	1355	1260	1170	1095	1030	970	915	865	0.368
	6	1550	1445	1345	1260	1185	1110	1050	990	940 *	0.316

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
NR	0.128	3255	2570	2085	1720	1445	1230	1060	925	810
IR	0.139	3465	2735	2215	1830	1540	1310	1130	985	865
WR	0.198	4515	3570	2890	2390	2005	1710	1475	1285	1125

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0474"

SUPPORT FASTENING: Pneutek SDK63-series (0.155" to 0.25" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	K1
36/9	0	1545	1395	1275	1170	1080	1000	930	870	820	1.070
	1	1750	1580	1445							0.714
	2	1920	1765	1610	1480	1370	1270	1185	1110	1045	0.535
	3	2085	1920	1775	1640	1515	1405	1315	1230	1155	0.428
	4	2245	2070	1920	1790	1660	1545	1440	1350 *	1270 *	0.357
	5	2400	2215	2060	1920	1795	1680	1570 *	1470 *	1385 *	0.306
	6	2545	2360	2195	2050	1920	1805 *	1695 *	1590 *	1495 *	0.268
36/7	0	950	860	785	720	665	620	575	540	510	1.606
	1	1155	1045	955							0.918
	2	1350	1230	1125	1035	955	890	830	780	735	0.642
	3	1525	1400	1290	1190	1100	1025	960	900	845	0.494
	4	1695	1560	1440	1340	1250	1160	1085	1020	960	0.401
	5	1860	1710	1585	1475	1380	1295	1215	1140	1075	0.338
	6	2015	1860	1725	1610	1505	1415	1330	1260	1185 *	0.292
36/5	0	880	795	725	665	615	570	530	500	470	1.926
	1	1065	975	895							1.014
	2	1230	1135	1050	975	905	840	785	740	695	0.688
	3	1385	1280	1190	1110	1040	975	915	860	805	0.521
	4	1530	1420	1320	1235	1160	1090	1030	975	920	0.419
	5	1660	1545	1445	1355	1275	1200	1135	1075	1025	0.350
	6	1785	1665	1560	1470	1385	1305	1240	1175	1120	0.301
36/4	0	665	600	550	500	465	430	400	375	350	2.409
	1	855	785	715							1.134
	2	1015	935	870	810	755	700	655	615	575	0.741
	3	1160	1075	1000	935	880	830	780	730	690	0.551
	4	1290	1200	1125	1055	995	935	885	840	800	0.438
	5	1405	1315	1235	1165	1100	1040	985	935	895	0.364
	6	1505	1420	1340	1265	1200	1135	1080	1030	980	0.311
30/6	0	850	770	700	645	595	550	515	480	450	2.141
	1	1055	955	870							1.168
	2	1260	1140	1040	955	885	825	770	720	680	0.803
	3	1440	1320	1210	1115	1030	960	895	840	790	0.612
	4	1610	1480	1365	1270	1175	1095	1025	960	905	0.494
	5	1780	1635	1515	1410	1315	1230	1150	1080	1020	0.414
	6	1940	1790	1655	1545	1445	1355	1275	1200	1130	0.357
30/4	0	825	745	680	625	575	535	500	465	440	2.408
	1	1005	925	850							1.243
	2	1170	1080	1000	930	865	805	755	705	665	0.838
	3	1320	1220	1135	1060	995	935	880	825	775	0.632
	4	1455	1355	1265	1185	1110	1045	990	940	890	0.507
	5	1580	1475	1380	1300	1220	1155	1095	1035	985	0.423
	6	1695	1590	1490	1405	1325	1255	1190	1130	1080	0.364

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
NR	0.181	3335	2755	2315	1970	1700	1480	1300	1155	1030
IR	0.196	3540	2925	2460	2095	1805	1570	1380	1225	1090
WR	0.284	4675	3865	3245	2765	2385	2075	1825	1615	1440

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0598"

SUPPORT FASTENING: Pneutek SDK63-series (0.155" to 0.25" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	K1
36/9	0	1500	1380	1275	1180	1100	1030	970	915	865	1.202
	1	1715									0.802
	2	1930	1775	1640	1525	1425	1335	1255			0.601
	3	2120	1970	1825	1695	1585	1485	1395	1320	1250	0.481
	4	2300	2140	2005	1865	1745	1635	1540	1455	1375 *	0.401
	5	2470	2305	2160	2030	1905	1785	1680 *	1590 *	1505 *	0.344
	6	2640	2465	2310	2175	2055	1940 *	1825 *	1725 *	1635 *	0.301
36/7	0	925	850	785	730	680	640	600	565	535	1.803
	1	1140									1.031
	2	1355	1245	1150	1070	1000	940	885			0.721
	3	1550	1440	1335	1245	1165	1090	1030	970	920	0.555
	4	1740	1615	1510	1415	1325	1245	1170	1105	1050	0.451
	5	1920	1790	1670	1570	1480	1395	1315	1240	1180	0.380
	6	2095	1955	1830	1720	1620	1530	1455	1375	1305	0.328
36/5	0	855	785	725	675	630	590	555	520	495	2.164
	1	1070									1.139
	2	1255	1165	1090	1015	950	890	840			0.773
	3	1430	1335	1250	1175	1105	1040	980	930	880	0.585
	4	1590	1490	1400	1315	1245	1180	1120	1065	1005	0.470
	5	1745	1640	1540	1455	1375	1305	1240	1180	1130	0.393
	6	1890	1775	1675	1585	1500	1425	1360	1295	1240	0.338
36/4	0	645	595	550	510	475	445	415	390	370	2.706
	1	860									1.273
	2	1045	975	910	850	795	745	700			0.832
	3	1205	1130	1060	1000	945	895	845	795	755	0.618
	4	1360	1275	1200	1135	1075	1020	970	925	885	0.492
	5	1495	1410	1330	1260	1200	1140	1085	1035	990	0.408
	6	1620	1530	1450	1380	1315	1250	1195	1140	1095	0.349
30/6	0	825	760	700	650	610	570	535	505	475	2.405
	1	1040									1.312
	2	1255	1155	1070	995	930	870	820			0.902
	3	1465	1350	1250	1165	1090	1025	965	910	860	0.687
	4	1655	1535	1435	1335	1250	1175	1105	1045	990	0.555
	5	1840	1710	1600	1500	1410	1325	1250	1180	1120	0.465
	6	2015	1880	1760	1650	1555	1470	1390	1315	1245	0.401
30/4	0	800	735	680	630	590	550	520	490	460	2.705
	1	1015									1.396
	2	1195	1115	1040	975	910	855	805			0.941
	3	1365	1275	1195	1125	1060	1005	945	895	845	0.710
	4	1520	1425	1340	1265	1195	1135	1080	1025	975	0.570
	5	1670	1570	1480	1400	1325	1260	1195	1140	1090	0.476
	6	1805	1700	1610	1525	1445	1375	1310	1250	1195	0.408

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
NR	0.226	3255	2775	2390	2085	1830	1620	1445	1300	1170
IR	0.245	3460	2950	2540	2215	1945	1725	1535	1380	1245
WR	0.355	4570	3895	3355	2925	2570	2275	2030	1820	1645

NOTE:
 ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0295"

SUPPORT FASTENING: Pneutek K64-series (0.187" to 0.312" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	K1
36/9	0	1735	1525	1360	1205	1075	970	885	810	745	0.844
	1	1885	1665	1490	1345	1205	1085	990			0.563
	2	2025	1795	1610	1460	1330	1200	1095	1005	925 *	0.422
	3	2155	1920	1730	1570	1435	1315	1200 *	1100 *	1015 *	0.338
	4	2275	2040	1845	1675	1535	1415 *	1305 *	1200 *	1105 *	0.281
	5	2385	2150	1950	1780	1635	1505 *	1395 *	1295 *	1195 *	0.241
	6	2490	2255	2050	1875	1725 *	1595 *	1485 *	1385 *	1290 *	0.211
36/7	0	1110	965	840	740	665	600	545	500	460	1.267
	1	1285	1120	995	885	790	715	650			0.724
	2	1445	1270	1130	1015	915	830	760	695	645	0.507
	3	1595	1410	1260	1135	1035	945	865	795	735	0.390
	4	1735	1545	1385	1250	1140	1050	970	890	825	0.317
	5	1865	1665	1500	1360	1245	1145	1060	985	915 *	0.267
	6	1985	1780	1610	1470	1345	1240	1150	1070 *	1000 *	0.230
36/5	0	985	865	770	685	615	555	505	460	425	1.520
	1	1130	1000	895	810	740	670	610			0.800
	2	1260	1125	1015	920	845	775	715	655	605	0.543
	3	1370	1240	1125	1025	940	870	805	750	700	0.411
	4	1470	1340	1220	1120	1035	955	890	830	780	0.330
	5	1560	1430	1310	1210	1120	1040	970	910	850	0.276
	6	1635	1510	1395	1290	1200	1120	1045	980	925 *	0.237
36/4	0	755	665	590	520	465	415	380	345	320	1.901
	1	895	795	715	650	590	530	485			0.894
	2	1015	915	825	755	690	640	590	540	500	0.585
	3	1115	1015	925	850	785	725	675	630	590	0.434
	4	1195	1100	1015	935	870	810	755	705	665	0.345
	5	1265	1175	1090	1015	945	885	830	780	735	0.287
	6	1325	1240	1155	1085	1015	950	895	845	795	0.245
30/6	0	1010	865	750	665	595	535	485	445	410	1.689
	1	1190	1035	910	805	720	650	595			0.921
	2	1355	1190	1055	945	845	765	700	640	595	0.633
	3	1515	1335	1190	1070	970	880	805	740	685	0.483
	4	1660	1470	1315	1190	1080	990	910	835	775	0.390
	5	1795	1600	1435	1300	1190	1090	1010	935	865	0.327
	6	1920	1720	1550	1410	1290	1190	1100	1025 *	955 *	0.281
30/4	0	915	810	720	645	575	520	470	435	400	1.900
	1	1060	940	845	765	700	635	580			0.981
	2	1180	1060	960	875	800	735	685	630	580	0.661
	3	1290	1165	1065	975	895	830	770	715	670	0.498
	4	1380	1260	1155	1065	985	915	850	795	745	0.400
	5	1455	1345	1240	1150	1065	990	925	870	820	0.334
	6	1525	1415	1315	1225	1140	1065	1000	940	885 *	0.287

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
NR	0.099	4130	3035	2320	1835	1485	1225	1030	880	755
IR	0.108	4410	3240	2480	1960	1585	1310	1100	935	810
WR	0.152	5695	4185	3205	2530	2050	1695	1420	1210	1045

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0358"

SUPPORT FASTENING: Pnutek K64-series (0.187" to 0.312" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50
 ϕ (WIND): 0.70 Ω (WIND): 2.35
 ϕ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	K1
36/9	0	1770	1575	1410	1270	1155	1060	980	905	845	0.930
	1	1925	1735	1560	1410	1285					0.620
	2	2075	1875	1710	1550	1415	1295	1200	1110 *	1035 *	0.465
	3	2220	2010	1835	1690	1540	1415 *	1305 *	1215 *	1130 *	0.372
	4	2355	2145	1960	1805	1670 *	1535 *	1415 *	1315 *	1230 *	0.310
	5	2490	2270	2080	1920	1780 *	1650 *	1525 *	1420 *	1325 *	0.266
	6	2615	2390	2195	2030 *	1885 *	1755 *	1635 *	1520 *	1420 *	0.233
36/7	0	1095	970	870	785	715	655	605	560	525	1.395
	1	1280	1140	1020	925	845					0.797
	2	1445	1300	1175	1065	970	895	825	765	715	0.558
	3	1605	1445	1315	1205	1100	1010	935	870	810	0.429
	4	1755	1590	1445	1330	1225	1130	1045	970	910	0.349
	5	1900	1725	1575	1445	1340	1245	1155	1075 *	1005 *	0.294
	6	2040	1855	1700	1565	1450	1345	1260 *	1175 *	1100 *	0.254
36/5	0	1000	895	800	725	660	605	560	520	485	1.674
	1	1155	1045	950	865	790					0.881
	2	1300	1180	1080	990	915	840	780	725	675	0.598
	3	1430	1305	1200	1105	1025	955	890	825	770	0.453
	4	1555	1425	1310	1215	1130	1055	985	925	865	0.364
	5	1670	1535	1420	1315	1225	1145	1075	1015	955 *	0.304
	6	1770	1635	1520	1415	1320	1235	1165	1095 *	1035 *	0.262
36/4	0	770	680	605	545	495	455	420	390	360	2.094
	1	920	830	760	685	625					0.985
	2	1055	960	880	815	755	690	640	595	555	0.644
	3	1180	1080	995	920	855	800	750	695	650	0.478
	4	1290	1190	1100	1025	955	895	840	790	745	0.381
	5	1385	1285	1195	1115	1045	980	925	870	825	0.316
	6	1470	1375	1285	1205	1130	1065	1005	950	900	0.270
30/6	0	980	870	775	700	640	585	540	500	465	1.861
	1	1175	1040	930	840	765					1.015
	2	1350	1210	1085	980	895	820	760	705	660	0.698
	3	1510	1360	1235	1120	1025	940	870	810	755	0.532
	4	1665	1505	1370	1255	1150	1060	980	910	850	0.429
	5	1815	1645	1500	1375	1270	1175	1090	1015	945 *	0.360
	6	1960	1775	1625	1495	1385	1285	1200	1115 *	1045 *	0.310
30/4	0	935	840	750	680	620	570	525	485	450	2.093
	1	1090	985	900	820	745					1.080
	2	1230	1115	1025	940	870	805	745	690	645	0.728
	3	1355	1240	1140	1055	980	910	855	795	740	0.549
	4	1470	1355	1250	1160	1080	1005	945	890	835	0.441
	5	1575	1455	1350	1255	1175	1100	1035	975	920	0.368
	6	1670	1550	1445	1350	1265	1185	1115	1055	1000 *	0.316

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
NR	0.128	3255	2570	2085	1720	1445	1230	1060	925	810
IR	0.139	3465	2735	2215	1830	1540	1310	1130	985	865
WR	0.198	4515	3570	2890	2390	2005	1710	1475	1285	1125

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0474"

SUPPORT FASTENING: Pneutek K64-series (0.187" to 0.312" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50
 ϕ (WIND): 0.70 Ω (WIND): 2.35
 ϕ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	K1
36/9	0	1920	1735	1580	1450	1340	1240	1155	1080	1015	1.070
	1	2125	1920	1750							0.714
	2	2305	2105	1920	1765	1630	1515	1410	1320 *	1240 *	0.535
	3	2475	2275	2090	1920	1775	1650	1540 *	1440 *	1355 *	0.428
	4	2635	2425	2245	2075	1920	1785 *	1665 *	1560 *	1470 *	0.357
	5	2795	2575	2390	2225	2065 *	1920 *	1795 *	1680 *	1580 *	0.306
	6	2950	2725	2530	2355 *	2205 *	2055 *	1920 *	1800 *	1695 *	0.268
36/7	0	1180	1070	975	895	825	770	715	670	630	1.606
	1	1385	1255	1145							0.918
	2	1585	1440	1315	1210	1120	1040	970	910	855	0.642
	3	1765	1620	1485	1365	1265	1175	1100	1030	970	0.494
	4	1940	1780	1645	1520	1410	1310	1225	1150	1085	0.401
	5	2110	1940	1795	1665	1555	1445	1355	1270	1195 *	0.338
	6	2275	2095	1940	1805	1685	1580	1480	1390 *	1310 *	0.292
36/5	0	1090	990	900	825	765	710	660	620	580	1.926
	1	1280	1175	1070							1.014
	2	1450	1335	1235	1140	1055	980	915	860	810	0.688
	3	1610	1485	1375	1280	1200	1115	1045	980	920	0.521
	4	1760	1630	1515	1410	1325	1245	1170	1100	1035	0.419
	5	1905	1765	1645	1535	1440	1360	1280	1215	1145	0.350
	6	2035	1895	1770	1660	1560	1470	1390	1315	1250 *	0.301
36/4	0	830	745	680	625	575	535	495	465	435	2.409
	1	1025	930	850							1.134
	2	1185	1095	1015	935	865	805	750	705	660	0.741
	3	1335	1235	1150	1075	1005	940	880	825	775	0.551
	4	1475	1370	1280	1195	1125	1060	1000	940	885	0.438
	5	1605	1495	1400	1315	1235	1165	1105	1050	995	0.364
	6	1720	1610	1515	1425	1345	1270	1205	1145	1090	0.311
30/6	0	1055	955	870	800	740	685	640	600	560	2.141
	1	1260	1140	1040							1.168
	2	1465	1325	1210	1115	1030	955	895	840	790	0.803
	3	1655	1510	1380	1270	1175	1095	1020	955	900	0.612
	4	1835	1680	1550	1425	1320	1230	1150	1075	1015	0.494
	5	2010	1845	1705	1580	1465	1365	1275	1195	1125	0.414
	6	2175	2000	1850	1720	1605	1500	1405	1315	1240 *	0.357
30/4	0	1025	925	845	775	715	665	620	580	545	2.408
	1	1210	1110	1015							1.243
	2	1375	1265	1175	1090	1005	935	875	820	770	0.838
	3	1530	1415	1315	1225	1145	1070	1000	940	885	0.632
	4	1675	1555	1445	1350	1265	1190	1125	1060	995	0.507
	5	1810	1685	1570	1475	1385	1305	1230	1170	1110	0.423
	6	1935	1810	1690	1590	1495	1410	1335	1265	1205 *	0.364

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
NR	0.181	3335	2755	2315	1970	1700	1480	1300	1155	1030
IR	0.196	3540	2925	2460	2095	1805	1570	1380	1225	1090
WR	0.284	4675	3865	3245	2765	2385	2075	1825	1615	1440

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0598"

SUPPORT FASTENING: Pneutek K64-series (0.187" to 0.312" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	K1
36/9	0	1970	1805	1670	1550	1445	1350	1270	1195	1130	1.202
	1	2180									0.802
	2	2395	2200	2035	1890	1765	1655	1555			0.601
	3	2605	2400	2220	2065	1925	1805	1700 *	1600 *	1515 *	0.481
	4	2790	2595	2405	2235	2085	1955 *	1840 *	1735 *	1645 *	0.401
	5	2970	2765	2585	2405 *	2245 *	2110 *	1985 *	1870 *	1775 *	0.344
	6	3145	2930	2745 *	2575 *	2410 *	2260 *	2125 *	2010 *	1900 *	0.301
36/7	0	1210	1115	1030	955	895	835	785	740	700	1.803
	1	1425									1.031
	2	1640	1510	1395	1300	1215	1140	1070			0.721
	3	1855	1705	1580	1470	1375	1290	1215	1150	1085	0.555
	4	2045	1900	1765	1640	1535	1440	1360	1285	1215	0.451
	5	2235	2075	1940	1815	1695	1590	1500	1420	1345 *	0.380
	6	2415	2250	2100	1970	1855	1745	1645	1555 *	1470 *	0.328
36/5	0	1120	1030	950	885	825	770	725	685	645	2.164
	1	1335									1.139
	2	1530	1425	1320	1225	1145	1075	1010			0.773
	3	1710	1595	1490	1395	1305	1225	1155	1090	1030	0.585
	4	1885	1755	1645	1550	1460	1375	1295	1225	1160	0.470
	5	2050	1915	1795	1690	1600	1515	1435	1360	1290	0.393
	6	2205	2065	1940	1830	1730	1640	1560	1485	1415 *	0.338
36/4	0	850	780	720	665	620	580	545	510	485	2.706
	1	1060									1.273
	2	1260	1170	1085	1010	940	880	830			0.832
	3	1430	1335	1250	1175	1100	1035	970	920	870	0.618
	4	1595	1490	1400	1320	1245	1180	1115	1055	995	0.492
	5	1745	1640	1540	1455	1380	1305	1245	1185	1125	0.408
	6	1885	1775	1675	1585	1505	1430	1360	1295	1240	0.349
30/6	0	1085	995	920	855	795	745	700	660	625	2.405
	1	1300									1.312
	2	1510	1390	1285	1195	1120	1050	985			0.902
	3	1725	1590	1470	1370	1280	1200	1130	1065	1010	0.687
	4	1935	1785	1655	1540	1440	1350	1270	1200	1140	0.555
	5	2125	1970	1835	1710	1600	1500	1415	1335	1265	0.465
	6	2310	2145	2005	1880	1760	1655	1560	1470	1395 *	0.401
30/4	0	1050	965	890	830	775	725	680	640	605	2.705
	1	1265									1.396
	2	1455	1355	1260	1170	1095	1025	965			0.941
	3	1630	1520	1425	1340	1255	1175	1110	1045	990	0.710
	4	1800	1680	1580	1485	1400	1325	1250	1180	1120	0.570
	5	1960	1835	1725	1625	1535	1455	1385	1315	1250	0.476
	6	2110	1980	1865	1760	1665	1580	1505	1435	1370 *	0.408

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
NR	0.226	3255	2775	2390	2085	1830	1620	1445	1300	1170
IR	0.245	3460	2950	2540	2215	1945	1725	1535	1380	1245
WR	0.355	4570	3895	3355	2925	2570	2275	2030	1820	1645

NOTE:
 ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0295"

SUPPORT FASTENING: Pneutek K66-series (0.281" & thicker support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50
 ϕ (WIND): 0.70 Ω (WIND): 2.35
 ϕ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	K1
36/9	0	1855	1630	1450	1285	1150	1035	940	865	795	0.844
	1	2000	1770	1580	1425	1275	1150	1050			0.563
	2	2140	1900	1705	1540	1400	1265	1155	1060 *	975 *	0.422
	3	2275	2025	1825	1655	1510	1380	1260 *	1155 *	1065 *	0.338
	4	2395	2145	1935	1760	1610	1485 *	1365 *	1255 *	1155 *	0.281
	5	2510	2260	2045	1865	1710 *	1575 *	1460 *	1350 *	1250 *	0.241
36/7	0	1185	1030	895	790	710	640	585	535	495	1.267
	1	1360	1185	1050	935	835	755	690			0.724
	2	1520	1335	1190	1070	960	870	795	730	675	0.507
	3	1675	1480	1320	1190	1080	985	900	825	765	0.390
	4	1815	1610	1445	1305	1190	1090	1005	925	855	0.317
	5	1950	1740	1565	1420	1295	1190	1100	1020 *	945 *	0.267
36/5	0	1050	920	820	730	655	590	540	495	455	1.520
	1	1195	1060	950	855	780	705	645			0.800
	2	1325	1185	1070	970	885	815	750	690	635	0.543
	3	1445	1300	1175	1075	985	910	840	785	725	0.411
	4	1545	1405	1280	1170	1080	1000	930	865	810	0.330
	5	1635	1495	1370	1260	1165	1085	1010	945	885 *	0.276
36/4	0	805	710	630	555	495	445	405	370	340	1.901
	1	945	840	755	685	620	560	510			0.894
	2	1065	960	870	790	725	670	615	565	520	0.585
	3	1170	1065	970	890	820	760	705	660	610	0.434
	4	1255	1150	1060	980	905	840	785	735	690	0.345
	5	1330	1230	1140	1055	985	920	860	805	760	0.287
30/6	0	1080	925	805	710	635	570	520	475	440	1.689
	1	1255	1095	960	850	760	685	625			0.921
	2	1425	1250	1110	990	885	800	730	670	620	0.633
	3	1585	1395	1240	1120	1015	915	835	770	710	0.483
	4	1735	1535	1370	1235	1125	1030	945	865	800	0.390
	5	1870	1665	1495	1350	1235	1130	1045	965	890 *	0.327
30/4	0	980	865	770	685	615	555	505	460	425	1.900
	1	1120	995	895	810	740	670	610			0.981
	2	1245	1115	1010	920	840	775	715	655	605	0.661
	3	1355	1225	1115	1020	935	865	805	750	695	0.498
	4	1450	1320	1210	1110	1025	950	885	830	775	0.400
	5	1530	1405	1295	1200	1110	1035	965	905	850	0.334
6	1600	1485	1375	1275	1190	1110	1040	975	920 *	0.287	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
NR	0.099	4130	3035	2320	1835	1485	1225	1030	880	755
IR	0.108	4410	3240	2480	1960	1585	1310	1100	935	810
WR	0.152	5695	4185	3205	2530	2050	1695	1420	1210	1045

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum (Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling))

LRFD Required Strength (Factored Applied Load) <= Minimum (ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n)

1.5 (WR, IR, NR)

t = design thickness = 0.0358"

SUPPORT FASTENING: Pneutek K66-series (0.281" & thicker support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50
 ϕ (WIND): 0.70 Ω (WIND): 2.35
 ϕ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	K1
36/9	0	1800	1605	1435	1295	1180	1080	995	925	860	0.930
	1	1960	1765	1590	1435	1310					0.620
	2	2110	1905	1740	1575	1435	1320	1215	1130 *	1050 *	0.465
	3	2255	2045	1865	1715	1565	1435 *	1325 *	1230 *	1150 *	0.372
	4	2390	2175	1990	1830	1690 *	1555 *	1435 *	1335 *	1245 *	0.310
	5	2525	2300	2110	1945	1800 *	1670 *	1545 *	1435 *	1340 *	0.266
	6	2650	2420	2225	2055 *	1905 *	1780 *	1655 *	1540 *	1435 *	0.233
36/7	0	1120	990	885	800	730	670	620	575	535	1.395
	1	1300	1160	1040	940	855					0.797
	2	1465	1320	1190	1080	985	905	835	780	725	0.558
	3	1625	1465	1335	1220	1115	1025	945	880	820	0.429
	4	1780	1610	1465	1345	1240	1140	1055	985	920	0.349
	5	1925	1745	1595	1465	1355	1260	1165	1085 *	1015 *	0.294
	6	2065	1875	1715	1580	1465	1360	1270 *	1190 *	1110 *	0.254
36/5	0	1020	915	815	740	675	615	570	530	490	1.674
	1	1175	1060	965	880	800					0.881
	2	1320	1195	1095	1005	930	855	790	735	685	0.598
	3	1450	1325	1215	1120	1040	965	900	835	780	0.453
	4	1575	1445	1330	1230	1140	1065	1000	940	875	0.364
	5	1690	1555	1435	1330	1240	1160	1090	1025	970 *	0.304
	6	1795	1655	1535	1430	1335	1250	1175	1110 *	1050 *	0.262
36/4	0	780	690	620	555	505	465	425	395	370	2.094
	1	935	845	770	695	635					0.985
	2	1070	975	895	825	765	700	645	600	560	0.644
	3	1195	1095	1010	935	870	810	755	705	655	0.478
	4	1305	1205	1115	1035	965	905	850	800	750	0.381
	5	1405	1300	1210	1130	1055	990	935	880	835	0.316
	6	1490	1390	1300	1215	1140	1075	1015	960	910	0.270
30/6	0	1000	885	790	715	650	595	550	510	475	1.861
	1	1195	1055	945	855	780					1.015
	2	1365	1225	1100	995	905	835	770	715	670	0.698
	3	1530	1375	1250	1135	1035	950	880	820	765	0.532
	4	1685	1520	1385	1270	1165	1070	990	920	860	0.429
	5	1835	1660	1515	1390	1285	1190	1100	1025	955 *	0.360
	6	1980	1795	1640	1510	1395	1300	1210	1125 *	1050 *	0.310
30/4	0	955	855	765	695	630	580	535	495	460	2.093
	1	1105	1000	915	830	760					1.080
	2	1245	1135	1040	955	885	815	755	700	655	0.728
	3	1375	1255	1155	1065	990	925	865	800	750	0.549
	4	1490	1370	1265	1170	1090	1020	955	900	845	0.441
	5	1600	1475	1365	1270	1185	1110	1045	985	930	0.368
	6	1695	1570	1460	1365	1275	1200	1130	1065 *	1010 *	0.316

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
NR	0.128	3255	2570	2085	1720	1445	1230	1060	925	810
IR	0.139	3465	2735	2215	1830	1540	1310	1130	985	865
WR	0.198	4515	3570	2890	2390	2005	1710	1475	1285	1125

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0474"

SUPPORT FASTENING: Pnutek K66-series (0.281" & thicker support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	K1
36/9	0	1995	1805	1645	1505	1390	1290	1200	1125	1055	1.070
	1	2200	1990	1810							0.714
	2	2380	2175	1980	1820	1680	1560	1455	1365 *	1280 *	0.535
	3	2550	2345	2150	1975	1825	1700 *	1585 *	1485 *	1395 *	0.428
	4	2715	2500	2310	2135	1975 *	1835 *	1710 *	1605 *	1510 *	0.357
	5	2875	2650	2455	2285 *	2120 *	1970 *	1840 *	1725 *	1620 *	0.306
36/7	0	1225	1110	1015	930	860	800	745	700	655	1.606
	1	1430	1295	1185							0.918
	2	1635	1480	1350	1245	1150	1070	1000	935	880	0.642
	3	1815	1660	1520	1400	1295	1205	1125	1055	995	0.494
	4	1990	1825	1685	1555	1440	1340	1255	1175	1110	0.401
	5	2160	1985	1835	1705	1585	1475	1380	1295	1220 *	0.338
36/5	0	1135	1025	935	860	795	735	685	645	605	1.926
	1	1325	1210	1105							1.014
	2	1495	1375	1270	1170	1085	1010	940	885	830	0.688
	3	1655	1525	1415	1315	1230	1145	1070	1000	945	0.521
	4	1805	1670	1550	1445	1355	1275	1195	1120	1055	0.419
	5	1950	1810	1685	1575	1475	1390	1310	1240	1170	0.350
36/4	0	860	775	705	650	600	555	515	480	450	2.409
	1	1055	960	875							1.134
	2	1220	1125	1040	960	890	825	770	720	680	0.741
	3	1370	1270	1180	1100	1030	960	895	840	790	0.551
	4	1515	1405	1310	1225	1150	1085	1025	960	905	0.438
	5	1645	1530	1430	1345	1265	1190	1130	1070	1015	0.364
30/6	0	1100	995	905	830	770	715	665	620	585	2.141
	1	1300	1180	1075							1.168
	2	1505	1365	1245	1145	1060	985	920	860	810	0.803
	3	1700	1550	1415	1300	1205	1120	1045	980	925	0.612
	4	1880	1720	1585	1460	1350	1255	1175	1100	1035	0.494
	5	2055	1885	1740	1615	1495	1390	1300	1220	1150	0.414
30/4	0	1065	965	880	805	745	690	645	600	565	2.408
	1	1250	1150	1050							1.243
	2	1415	1305	1205	1120	1035	960	900	840	790	0.838
	3	1575	1450	1350	1255	1175	1100	1025	960	905	0.632
	4	1720	1595	1480	1385	1300	1220	1150	1080	1020	0.507
	5	1855	1725	1610	1505	1415	1335	1260	1195	1130	0.423
6	1985	1850	1730	1625	1530	1440	1365	1295	1230 *	0.364	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

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φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
NR	0.181	3335	2755	2315	1970	1700	1480	1300	1155	1030
IR	0.196	3540	2925	2460	2095	1805	1570	1380	1225	1090
WR	0.284	4675	3865	3245	2765	2385	2075	1825	1615	1440

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0598"

SUPPORT FASTENING: Pneutek K66-series (0.281" & thicker support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50

φ (WIND): 0.70 Ω (WIND): 2.35

φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	K1
36/9	0	2175	2000	1845	1715	1595	1495	1405	1325	1250	1.202
	1	2390									0.802
	2	2605	2395	2210	2055	1920	1795	1690 *			0.601
	3	2820	2590	2395	2225	2080	1950 *	1830 *	1730 *	1635 *	0.481
	4	3010	2790	2580	2400 *	2240 *	2100 *	1975 *	1865 *	1765 *	0.401
	5	3190	2970	2765 *	2570 *	2400 *	2250 *	2120 *	2000 *	1890 *	0.344
36/7	0	1340	1230	1140	1060	990	925	870	820	775	1.803
	1	1555									1.031
	2	1770	1625	1505	1400	1310	1225	1155			0.721
	3	1980	1825	1690	1570	1470	1380	1300	1225	1160	0.555
	4	2185	2020	1870	1745	1630	1530	1440	1360	1290	0.451
	5	2370	2205	2055	1915	1790	1680	1585	1495 *	1420 *	0.380
36/5	0	1240	1140	1050	975	910	855	800	755	715	2.164
	1	1450									1.139
	2	1655	1535	1420	1320	1230	1155	1090			0.773
	3	1835	1710	1595	1490	1395	1305	1230	1160	1100	0.585
	4	2010	1875	1755	1650	1555	1460	1375	1295	1230	0.470
	5	2180	2035	1910	1795	1695	1605	1515	1430	1355 *	0.393
36/4	0	940	860	795	735	685	640	600	565	535	2.706
	1	1150									1.273
	2	1355	1255	1160	1080	1005	945	885			0.832
	3	1530	1425	1335	1250	1165	1095	1030	970	920	0.618
	4	1695	1585	1485	1400	1320	1245	1175	1105	1050	0.492
	5	1850	1735	1630	1540	1455	1380	1310	1240	1175	0.408
30/6	0	1200	1100	1015	945	880	825	775	730	690	2.405
	1	1415									1.312
	2	1625	1495	1385	1285	1205	1130	1060			0.902
	3	1840	1695	1570	1460	1365	1280	1205	1135	1075	0.687
	4	2055	1890	1750	1630	1525	1430	1345	1270	1205	0.555
	5	2245	2085	1935	1800	1685	1580	1490	1405	1335	0.465
30/4	0	1160	1070	985	915	855	800	750	710	670	2.705
	1	1375									1.396
	2	1570	1460	1355	1260	1175	1100	1035			0.941
	3	1750	1630	1525	1430	1335	1255	1180	1115	1055	0.710
	4	1920	1795	1680	1580	1490	1405	1320	1250	1185	0.570
	5	2085	1950	1830	1725	1630	1540	1465	1385	1310	0.476
6	2235	2100	1975	1860	1760	1670	1585	1510 *	1440 *	0.408	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
NR	0.226	3255	2775	2390	2085	1830	1620	1445	1300	1170
IR	0.245	3460	2950	2540	2215	1945	1725	1535	1380	1245
WR	0.355	4570	3895	3355	2925	2570	2275	2030	1820	1645

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0295"

SUPPORT FASTENING: Hilti ENP2 or ENPH2 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50
 ϕ (WIND): 0.70 Ω (WIND): 2.35
 ϕ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	K1
36/9	0	1625	1430	1270	1125	1005	910	825	755	695	0.352
	1	1770	1565	1400	1265	1135	1025	930			0.291
	2	1910	1700	1525	1380	1260	1140	1035	950	880 *	0.248
	3	2040	1820	1640	1490	1360	1250	1145	1050 *	970 *	0.217
	4	2155	1935	1750	1595	1460	1345	1250 *	1145 *	1060 *	0.192
	5	2265	2045	1860	1695	1560	1440 *	1335 *	1245 *	1150 *	0.172
	6	2365	2145	1955	1795	1650	1525 *	1420 *	1325 *	1240 *	0.156
36/7	0	1040	905	785	695	620	560	510	470	435	0.528
	1	1210	1060	940	835	750	675	615			0.402
	2	1375	1205	1075	965	875	790	720	665	615	0.325
	3	1520	1345	1205	1085	990	905	830	760	705	0.272
	4	1660	1475	1325	1200	1095	1005	930	860	795	0.235
	5	1785	1595	1440	1310	1200	1105	1020	950	885 *	0.206
	6	1900	1710	1550	1415	1295	1195	1110	1035 *	965 *	0.184
36/5	0	920	810	720	640	575	520	470	430	400	0.633
	1	1065	945	845	765	700	635	575			0.461
	2	1190	1070	965	875	800	740	685	625	580	0.362
	3	1305	1180	1070	980	900	830	770	720	670	0.298
	4	1400	1275	1165	1070	990	915	855	795	750	0.253
	5	1485	1365	1255	1160	1075	1000	930	875	820	0.220
	6	1555	1440	1335	1240	1150	1075	1005	945	890 *	0.195
36/4	0	705	620	550	485	435	390	355	325	300	0.792
	1	845	755	675	615	560	505	460			0.539
	2	960	870	785	720	660	610	565	520	480	0.409
	3	1060	965	885	815	750	695	650	605	570	0.329
	4	1140	1050	970	895	835	775	725	680	640	0.275
	5	1205	1120	1045	970	905	850	795	750	705	0.237
	6	1255	1180	1105	1035	975	915	860	815	770	0.208
30/6	0	945	810	705	620	555	500	455	420	385	0.704
	1	1125	980	860	760	680	615	560			0.522
	2	1290	1130	1005	900	810	730	665	615	565	0.415
	3	1445	1275	1135	1025	930	845	775	710	655	0.345
	4	1590	1410	1260	1140	1040	955	880	810	745	0.295
	5	1720	1535	1380	1255	1145	1050	975	905	840	0.257
	6	1840	1650	1495	1360	1245	1150	1065	990	925 *	0.228
30/4	0	860	755	675	600	540	485	440	405	375	0.792
	1	1000	890	800	725	660	600	545			0.569
	2	1120	1005	910	830	760	700	650	600	555	0.444
	3	1225	1110	1015	930	855	790	735	685	645	0.365
	4	1310	1200	1105	1020	940	875	815	765	715	0.309
	5	1385	1280	1185	1100	1020	955	890	835	785	0.268
	6	1450	1350	1255	1170	1095	1025	960	905	855	0.237

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
NR	0.099	4130	3035	2320	1835	1485	1225	1030	880	755
IR	0.108	4410	3240	2480	1960	1585	1310	1100	935	810
WR	0.152	5695	4185	3205	2530	2050	1695	1420	1210	1045

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0358"

SUPPORT FASTENING: Hilti ENP2 or ENPH2 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	K1
36/9	0	1500	1335	1195	1080	980	900	830	770	715	0.388
	1	1655	1495	1350	1220	1110					0.321
	2	1805	1635	1490	1360	1240	1135	1050	975	910	0.274
	3	1945	1765	1615	1485	1365	1255	1160	1075 *	1005 *	0.239
	4	2080	1895	1735	1600	1485	1375	1270 *	1180 *	1100 *	0.211
	5	2210	2015	1855	1710	1590	1480 *	1380 *	1280 *	1195 *	0.190
36/7	0	930	825	735	665	605	555	515	475	445	0.581
	1	1110	995	890	805	735					0.443
	2	1275	1150	1040	945	865	795	735	680	635	0.358
	3	1430	1290	1175	1080	990	910	845	785	735	0.300
	4	1580	1430	1305	1200	1110	1030	955	885	830	0.258
	5	1720	1560	1430	1315	1220	1135	1060	990	925	0.227
36/5	0	850	760	680	615	560	515	475	440	410	0.698
	1	1000	905	825	755	690					0.507
	2	1145	1040	950	875	810	750	695	645	600	0.399
	3	1270	1165	1070	990	915	855	800	745	700	0.328
	4	1390	1275	1180	1095	1015	950	890	840	790	0.279
	5	1495	1380	1280	1190	1110	1040	980	925	875	0.243
36/4	0	650	575	515	465	420	385	355	330	305	0.872
	1	800	725	665	605	550					0.594
	2	935	855	785	725	670	625	575	535	500	0.450
	3	1050	970	895	830	770	720	675	635	595	0.362
	4	1155	1070	995	925	865	810	765	720	680	0.303
	5	1240	1155	1080	1015	950	895	845	800	755	0.261
30/6	0	835	735	660	595	540	495	460	425	395	0.775
	1	1025	905	810	735	670					0.575
	2	1195	1070	965	875	800	735	680	630	590	0.458
	3	1355	1220	1110	1015	925	850	790	735	685	0.380
	4	1505	1360	1240	1140	1050	970	900	835	780	0.325
	5	1650	1495	1365	1255	1165	1080	1010	940	875	0.283
30/4	0	795	715	640	575	525	480	445	410	385	0.872
	1	945	855	780	715	655					0.627
	2	1080	985	905	835	775	720	665	615	575	0.490
	3	1205	1105	1015	940	875	820	765	720	670	0.402
	4	1315	1210	1120	1045	975	910	855	805	760	0.340
	5	1410	1310	1220	1135	1065	1000	940	885	840	0.295
6	1495	1395	1305	1220	1150	1080	1020	965	915	0.261	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	
NR	0.128	3255	2570	2085	1720	1445	1230	1060	925	810	
IR	0.139	3465	2735	2215	1830	1540	1310	1130	985	865	
WR	0.198	4515	3570	2890	2390	2005	1710	1475	1285	1125	

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0474"

SUPPORT FASTENING: Hilti ENP2 or ENPH2 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50
 ϕ (WIND): 0.70 Ω (WIND): 2.35
 ϕ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	K1
36/9	0	1510	1365	1245	1140	1055	975	910	850	800	0.446
	1	1715	1550	1415							0.369
	2	1885	1730	1585	1455	1345	1250	1165	1090	1025	0.315
	3	2050	1885	1745	1610	1490	1385	1290	1210	1140	0.274
	4	2210	2035	1890	1760	1635	1520	1420	1330 *	1250 *	0.243
	5	2360	2180	2025	1890	1770	1655	1545 *	1450 *	1365 *	0.218
	6	2510	2320	2160	2015	1890	1780 *	1675 *	1570 *	1475 *	0.198
36/7	0	930	840	765	705	650	605	565	530	495	0.669
	1	1130	1025	935							0.510
	2	1325	1210	1105	1015	940	875	820	765	720	0.412
	3	1500	1375	1270	1175	1085	1010	945	885	835	0.345
	4	1670	1535	1420	1320	1230	1145	1075	1005	950	0.297
	5	1835	1690	1565	1455	1360	1280	1200	1125	1060	0.261
	6	1990	1835	1705	1590	1485	1395	1315	1245	1175	0.233
36/5	0	860	775	710	650	600	560	520	485	455	0.803
	1	1045	960	880							0.584
	2	1210	1115	1030	960	890	830	775	725	685	0.459
	3	1365	1260	1170	1090	1020	960	900	845	795	0.378
	4	1505	1395	1300	1215	1140	1075	1015	960	910	0.321
	5	1635	1525	1425	1335	1255	1185	1120	1065	1010	0.279
	6	1760	1645	1540	1450	1365	1290	1225	1160	1105	0.247
36/4	0	650	590	535	490	450	420	390	365	340	1.004
	1	840	770	705							0.683
	2	1000	920	855	800	745	690	645	605	570	0.518
	3	1140	1060	990	925	865	815	770	725	680	0.417
	4	1270	1185	1110	1040	980	925	875	830	790	0.349
	5	1385	1300	1220	1150	1085	1025	975	925	880	0.300
	6	1485	1400	1320	1250	1185	1120	1065	1015	970	0.263
30/6	0	830	750	685	630	580	540	505	470	440	0.892
	1	1035	935	855							0.662
	2	1240	1120	1025	940	870	810	755	710	670	0.526
	3	1415	1300	1195	1100	1015	945	885	830	780	0.437
	4	1590	1460	1350	1255	1165	1080	1010	950	895	0.373
	5	1755	1615	1495	1390	1300	1220	1140	1070	1005	0.326
	6	1915	1765	1640	1525	1425	1340	1265	1190	1120	0.289
30/4	0	805	730	665	610	565	525	485	455	430	1.004
	1	990	910	835							0.722
	2	1150	1060	985	915	855	795	740	695	655	0.563
	3	1295	1200	1120	1045	980	920	870	815	765	0.462
	4	1435	1335	1245	1165	1095	1035	975	925	880	0.392
	5	1555	1455	1365	1280	1205	1140	1080	1025	975	0.340
	6	1670	1565	1470	1385	1310	1240	1175	1120	1065	0.300

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
NR	0.181	3335	2755	2315	1970	1700	1480	1300	1155	1030
IR	0.196	3540	2925	2460	2095	1805	1570	1380	1225	1090
WR	0.284	4675	3865	3245	2765	2385	2075	1825	1615	1440

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0598"

SUPPORT FASTENING: Hilti ENP2 or ENPH2 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	K1
36/9	0	1485	1365	1260	1170	1090	1020	960	900	855	0.501
	1	1700									0.415
	2	1910	1760	1625	1510	1410	1320	1245			0.354
	3	2100	1955	1810	1680	1570	1475	1385	1310	1240	0.308
	4	2280	2125	1985	1855	1730	1625	1530	1445	1365 *	0.273
	5	2450	2290	2145	2015	1890	1775	1670 *	1580 *	1495 *	0.245
	6	2620	2445	2295	2160	2040	1925 *	1815 *	1715 *	1625 *	0.223
36/7	0	915	840	775	720	675	630	595	560	530	0.751
	1	1130									0.573
	2	1340	1235	1145	1065	995	935	880			0.462
	3	1540	1430	1325	1235	1155	1085	1020	965	915	0.388
	4	1725	1605	1500	1405	1315	1235	1165	1100	1045	0.334
	5	1910	1775	1660	1560	1470	1385	1305	1235	1170	0.293
	6	2080	1940	1820	1710	1610	1525	1445	1370	1300	0.261
36/5	0	845	775	715	665	620	580	545	515	490	0.902
	1	1060									0.656
	2	1245	1155	1080	1010	945	885	835			0.515
	3	1415	1325	1240	1165	1100	1035	975	920	875	0.424
	4	1580	1480	1390	1310	1235	1170	1110	1055	1000	0.361
	5	1735	1625	1530	1445	1370	1295	1235	1175	1120	0.314
	6	1875	1765	1665	1575	1495	1420	1350	1290	1230	0.277
36/4	0	640	585	540	500	470	440	410	385	365	1.127
	1	855									0.768
	2	1035	965	905	845	790	740	695			0.582
	3	1200	1120	1055	995	940	890	840	790	750	0.468
	4	1350	1270	1195	1130	1070	1015	965	920	880	0.392
	5	1485	1400	1325	1255	1190	1135	1080	1030	985	0.337
	6	1610	1520	1445	1370	1305	1245	1190	1135	1090	0.296
30/6	0	815	750	695	645	600	565	530	500	470	1.002
	1	1030									0.744
	2	1245	1145	1060	985	920	865	815			0.591
	3	1455	1345	1245	1160	1085	1015	955	905	855	0.491
	4	1645	1525	1425	1330	1245	1165	1100	1040	985	0.419
	5	1825	1700	1590	1490	1405	1320	1240	1175	1115	0.366
	6	2005	1870	1750	1640	1550	1465	1385	1310	1240	0.325
30/4	0	795	730	675	625	585	545	515	485	455	1.127
	1	1005									0.811
	2	1185	1105	1035	965	905	850	800			0.633
	3	1355	1265	1185	1115	1055	1000	940	890	840	0.519
	4	1510	1415	1335	1255	1190	1125	1070	1020	970	0.440
	5	1660	1560	1470	1390	1315	1250	1190	1135	1085	0.382
	6	1790	1690	1600	1515	1440	1370	1305	1245	1190	0.337

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
NR	0.226	3255	2775	2390	2085	1830	1620	1445	1300	1170
IR	0.245	3460	2950	2540	2215	1945	1725	1535	1380	1245
WR	0.355	4570	3895	3355	2925	2570	2275	2030	1820	1645

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0295"

SUPPORT FASTENING: Hilti ENP2K, X-EDN19 or X-EDNK22 (0.125" to 0.375" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50
 ϕ (WIND): 0.70 Ω (WIND): 2.35
 ϕ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	K1
36/9	0	1520	1340	1190	1055	940	850	775	710	655	0.352
	1	1670	1475	1320	1190	1070	965	880			0.291
	2	1805	1605	1440	1305	1190	1080	985	905	835	0.248
	3	1930	1730	1560	1415	1295	1190	1090	1000	925 *	0.217
	4	2050	1840	1670	1520	1395	1285	1190 *	1100 *	1015 *	0.192
	5	2155	1950	1770	1620	1490	1375	1275 *	1190 *	1105 *	0.172
36/7	0	975	845	735	650	580	525	480	440	405	0.528
	1	1145	1000	890	790	710	640	585			0.402
	2	1305	1150	1025	920	835	755	690	635	585	0.325
	3	1450	1285	1150	1040	945	870	795	730	675	0.272
	4	1585	1415	1270	1150	1050	965	895	830	765	0.235
	5	1710	1530	1385	1260	1155	1060	985	915	855	0.206
36/5	0	860	755	675	600	535	485	440	405	375	0.633
	1	1005	895	800	725	660	600	545			0.461
	2	1130	1015	915	835	765	705	650	600	555	0.362
	3	1240	1125	1020	935	860	795	740	690	645	0.298
	4	1335	1220	1115	1025	950	880	820	765	720	0.253
	5	1415	1300	1200	1110	1030	960	895	840	790	0.220
36/4	0	660	580	515	455	405	365	330	305	280	0.792
	1	800	715	640	580	530	480	435			0.539
	2	915	825	750	685	630	580	540	500	460	0.409
	3	1010	920	845	780	720	670	620	580	545	0.329
	4	1085	1000	925	860	800	745	700	655	615	0.275
	5	1145	1070	995	930	870	815	765	725	680	0.237
30/6	0	885	760	660	580	520	470	425	390	360	0.704
	1	1065	925	815	720	645	585	535			0.522
	2	1230	1080	960	860	775	700	640	585	540	0.415
	3	1380	1220	1090	980	895	815	745	685	630	0.345
	4	1520	1350	1215	1095	1000	920	850	780	725	0.295
	5	1650	1475	1330	1210	1105	1015	940	875	815	0.257
30/4	0	805	710	630	565	505	455	415	380	350	0.792
	1	945	840	755	685	625	570	520			0.569
	2	1065	955	865	790	725	670	620	575	530	0.444
	3	1165	1060	965	885	820	755	705	660	615	0.365
	4	1250	1145	1055	975	905	840	785	735	690	0.309
	5	1320	1220	1135	1055	980	915	860	805	760	0.268
6	1380	1285	1200	1125	1050	985	925	875	825	0.237	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0
NR	0.099	4130	3035	2320	1835	1485	1225	1030	880	755
IR	0.108	4410	3240	2480	1960	1585	1310	1100	935	810
WR	0.152	5695	4185	3205	2530	2050	1695	1420	1210	1045

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum (Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling))

LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0358"

SUPPORT FASTENING: Hilti ENP2K, X-EDN19 or X-EDNK22 (0.125" to 0.375" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	K1
36/9	0	1435	1280	1145	1035	940	860	795	735	685	0.388
	1	1590	1435	1300	1175	1070					0.321
	2	1740	1575	1440	1315	1195	1100	1015	940	880	0.274
	3	1880	1710	1565	1440	1325	1215	1125	1045	975 *	0.239
	4	2015	1835	1685	1550	1440	1335	1235 *	1145 *	1070 *	0.211
	5	2140	1955	1800	1660	1545	1440 *	1345 *	1250 *	1165 *	0.190
	6	2260	2070	1910	1770	1645	1535 *	1440 *	1350 *	1260 *	0.172
36/7	0	890	790	705	640	580	535	490	455	425	0.581
	1	1070	960	860	775	710					0.443
	2	1235	1110	1010	915	835	770	710	660	620	0.358
	3	1390	1255	1145	1050	965	890	820	765	715	0.300
	4	1535	1390	1270	1170	1080	1005	930	865	810	0.258
	5	1675	1525	1395	1285	1190	1105	1035	970	905	0.227
	6	1800	1645	1510	1395	1295	1210	1130	1060 *	1000 *	0.202
36/5	0	815	730	650	590	535	490	455	420	390	0.698
	1	965	875	795	730	665					0.507
	2	1105	1005	920	850	785	730	675	625	585	0.399
	3	1235	1130	1040	960	890	830	780	730	680	0.328
	4	1350	1240	1145	1065	990	925	870	820	775	0.279
	5	1450	1345	1245	1160	1085	1015	955	900	855	0.243
	6	1540	1435	1340	1250	1170	1100	1040	980	930	0.215
36/4	0	625	550	495	445	405	370	340	315	295	0.872
	1	775	700	640	585	530					0.594
	2	905	830	760	700	650	605	560	520	485	0.450
	3	1020	940	870	805	750	705	660	620	580	0.362
	4	1120	1040	965	900	845	790	745	705	665	0.303
	5	1205	1125	1055	990	930	875	825	780	740	0.261
	6	1275	1200	1130	1065	1005	950	900	855	810	0.229
30/6	0	800	705	630	570	520	475	440	405	380	0.775
	1	990	875	785	710	645					0.575
	2	1155	1040	940	850	775	710	660	610	570	0.458
	3	1315	1185	1080	990	905	830	770	715	670	0.380
	4	1465	1325	1210	1110	1025	950	880	815	765	0.325
	5	1610	1460	1335	1230	1135	1060	990	920	860	0.283
	6	1740	1585	1455	1345	1245	1160	1085	1020	955 *	0.251
30/4	0	760	685	610	550	505	460	425	395	365	0.872
	1	910	825	755	690	630					0.627
	2	1045	955	875	810	750	700	645	600	560	0.490
	3	1170	1070	990	915	850	795	745	700	655	0.402
	4	1275	1180	1090	1015	945	885	835	785	745	0.340
	5	1370	1275	1185	1105	1035	975	915	865	820	0.295
	6	1450	1355	1270	1190	1120	1055	995	945	895	0.261

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
NR	0.128	3255	2570	2085	1720	1445	1230	1060	925	810
IR	0.139	3465	2735	2215	1830	1540	1310	1130	985	865
WR	0.198	4515	3570	2890	2390	2005	1710	1475	1285	1125

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

1.5 (WR, IR, NR)

t = design thickness = 0.0474"

SUPPORT FASTENING: Hilti ENP2K, X-EDN19 or X-EDNK22 (0.125" to 0.375" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	K1
36/9	0	1510	1365	1245	1140	1055	975	910	850	800	0.446
	1	1715	1550	1415							0.369
	2	1885	1730	1585	1455	1345	1250	1165	1090	1025	0.315
	3	2050	1885	1745	1610	1490	1385	1290	1210	1140	0.274
	4	2210	2040	1890	1760	1635	1520	1420	1330 *	1250 *	0.243
	5	2360	2185	2025	1890	1770	1655	1545 *	1450 *	1365 *	0.218
	6	2510	2325	2160	2020	1890	1780 *	1675 *	1570 *	1480 *	0.198
36/7	0	930	840	765	705	650	605	565	530	495	0.669
	1	1135	1025	935							0.510
	2	1325	1210	1105	1020	940	875	820	770	720	0.412
	3	1500	1375	1270	1175	1085	1010	945	885	835	0.345
	4	1670	1535	1420	1320	1235	1145	1075	1005	950	0.297
	5	1835	1690	1565	1455	1360	1280	1200	1125	1060	0.261
	6	1990	1835	1705	1590	1485	1395	1315	1245	1175	0.233
36/5	0	860	775	710	650	600	560	520	485	455	0.803
	1	1045	960	880							0.584
	2	1210	1115	1030	960	890	830	775	725	685	0.459
	3	1365	1260	1170	1090	1025	960	900	845	795	0.378
	4	1505	1400	1300	1220	1145	1075	1015	960	910	0.321
	5	1640	1525	1425	1335	1255	1185	1120	1065	1010	0.279
	6	1760	1645	1540	1450	1365	1290	1225	1160	1105	0.247
36/4	0	650	590	535	490	450	420	390	365	340	1.004
	1	840	770	705							0.683
	2	1000	920	855	800	745	690	645	605	570	0.518
	3	1140	1060	990	925	865	815	770	725	680	0.417
	4	1270	1185	1110	1040	980	925	875	830	790	0.349
	5	1385	1300	1220	1150	1085	1025	975	925	880	0.300
	6	1485	1400	1320	1250	1185	1125	1065	1015	970	0.263
30/6	0	830	750	685	630	580	540	505	470	440	0.892
	1	1035	935	855							0.662
	2	1240	1120	1025	940	870	810	755	710	670	0.526
	3	1420	1300	1195	1100	1015	945	885	830	780	0.437
	4	1590	1460	1350	1255	1165	1080	1010	950	895	0.373
	5	1755	1615	1495	1390	1300	1220	1140	1070	1005	0.326
	6	1915	1765	1640	1525	1430	1340	1265	1190	1120	0.289
30/4	0	805	730	665	610	565	525	485	455	430	1.004
	1	990	910	835							0.722
	2	1150	1060	985	915	855	795	740	695	655	0.563
	3	1300	1200	1120	1045	980	920	870	815	765	0.462
	4	1435	1335	1245	1165	1095	1035	975	925	880	0.392
	5	1560	1455	1365	1280	1205	1140	1080	1025	975	0.340
	6	1670	1565	1475	1390	1310	1240	1175	1120	1065	0.300

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0
NR	0.181	3335	2755	2315	1970	1700	1480	1300	1155	1030
IR	0.196	3540	2925	2460	2095	1805	1570	1380	1225	1090
WR	0.284	4675	3865	3245	2765	2385	2075	1825	1615	1440

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum (Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling))

LRFD Required Strength (Factored Applied Load) <= Minimum (φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n)

1.5 (WR, IR, NR)

t = design thickness = 0.0598"

SUPPORT FASTENING: Hiiti ENP2K, X-EDN19 or X-EDNK22 (0.125" to 0.375" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50
 φ (WIND): 0.70 Ω (WIND): 2.35
 φ (Other): 0.65 Ω (Other): 2.50

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF									
		SPAN, FT									
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	K1
36/9	0	1560	1435	1325	1230	1145	1075	1005	950	895	0.501
	1	1775									0.415
	2	1990	1830	1690	1570	1465	1375	1295			0.354
	3	2180	2025	1875	1740	1625	1525	1435	1355	1280	0.308
	4	2360	2200	2055	1915	1790	1675	1580	1490 *	1410 *	0.273
	5	2535	2365	2215	2080	1950	1830	1720 *	1625 *	1540 *	0.245
	6	2705	2525	2365	2225	2100 *	1980 *	1865 *	1760 *	1665 *	0.223
36/7	0	960	885	815	760	710	665	625	590	555	0.751
	1	1175									0.573
	2	1390	1280	1185	1100	1030	965	910			0.462
	3	1590	1475	1365	1275	1190	1115	1050	995	940	0.388
	4	1780	1655	1545	1445	1350	1270	1195	1130	1070	0.334
	5	1960	1825	1705	1600	1510	1420	1335	1265	1200	0.293
	6	2135	1990	1865	1750	1650	1560	1480	1400	1325	0.261
36/5	0	890	815	755	700	655	610	575	545	515	0.902
	1	1100									0.656
	2	1290	1200	1120	1045	975	915	860			0.515
	3	1465	1365	1280	1200	1135	1065	1005	950	900	0.424
	4	1630	1525	1430	1345	1270	1205	1145	1085	1025	0.361
	5	1785	1675	1575	1485	1405	1330	1265	1205	1150	0.314
	6	1930	1815	1710	1615	1530	1455	1385	1320	1260	0.277
36/4	0	675	615	570	530	490	460	430	405	385	1.127
	1	885									0.768
	2	1070	1000	935	870	815	760	715			0.582
	3	1235	1155	1085	1025	965	915	860	810	770	0.468
	4	1390	1305	1230	1160	1095	1040	990	945	895	0.392
	5	1530	1440	1360	1285	1220	1160	1105	1055	1010	0.337
	6	1655	1565	1480	1405	1340	1275	1215	1165	1115	0.296
30/6	0	860	790	730	680	630	590	555	525	495	1.002
	1	1075									0.744
	2	1290	1185	1095	1020	955	895	840			0.591
	3	1500	1380	1280	1190	1115	1045	985	930	880	0.491
	4	1690	1570	1465	1365	1275	1195	1125	1065	1010	0.419
	5	1875	1745	1630	1530	1435	1345	1270	1200	1140	0.366
	6	2055	1915	1790	1680	1585	1495	1415	1335	1265	0.325
30/4	0	835	765	710	655	615	575	540	510	480	1.127
	1	1050									0.811
	2	1230	1145	1070	1000	935	875	825			0.633
	3	1400	1305	1225	1155	1090	1025	965	915	865	0.519
	4	1560	1460	1370	1295	1225	1160	1100	1050	995	0.440
	5	1705	1605	1510	1430	1350	1285	1220	1165	1110	0.382
	6	1845	1740	1640	1555	1475	1400	1335	1275	1220	0.337

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

φ (Buckling): 0.80 Ω (Buckling): 2.00

DECK PROFILE	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT								
		6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
NR	0.226	3255	2775	2390	2085	1830	1620	1445	1300	1170
IR	0.245	3460	2950	2540	2215	1945	1725	1535	1380	1245
WR	0.355	4570	3895	3355	2925	2570	2275	2030	1820	1645

NOTE:

ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

3.0 DR SUPPORT FASTENING: 3/4" puddle weld or equivalent
 SIDE-LAP FASTENING: 5/8" puddle weld or 1 1/2" long fillet weld

ϕ (Buckling): 0.80 Ω (Buckling): 2.00 ϕ (EQ): 0.55 Ω (EQ): 3.00
 ϕ (Other): 0.60 Ω (Other): 2.65 ϕ (WIND): 0.70 Ω (WIND): 2.35

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0295 \text{ in.}$									
		SPAN, FT									
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	K1
24/4	0	335	320	300	285	270	255	245	235	225	1.093
	2	665	625	590							0.356
	3	825	780	735	695	660	630	600	575	550	0.266
	4	990	930	880	835	790	755	720	690	660	0.213
	5	1125	1065	1015	965	920	880	840	800	770	0.177
	6	1255	1190	1135	1080	1035	990	950	910	875	0.152
	7	1380	1310	1250	1195	1140	1095	1050	1010	970	0.133
	8	1495	1425	1360	1300	1245	1195	1150	1105	1065 *	0.118
	9	1600	1530	1465	1400	1345	1290	1240 *	1195 *	1155 *	0.106
	10	1700	1630	1560	1500	1440	1385 *	1330 *	1285 *	1240 *	0.096
	11	1795	1720	1655	1590	1530 *	1470 *	1420 *	1370 *	1320 *	0.088
	I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S_n), PLF									
	0.551	2035	1800	1605	1440	1300	1180	1075	985	905	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0358 \text{ in.}$										
		SPAN, FT										
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	K1	
24/4	0	360	340	325	310	295	280	270	260	250	1.204	
	2	710									0.392	
	3	885	835	795	755	720	690	660			0.293	
	4	1055	1000	950	905	865	825	795	760	730	0.234	
	5	1220	1160	1110	1055	1005	965	925	885	850	0.195	
	6	1365	1300	1245	1190	1140	1095	1055	1010	975	0.167	
	7	1500	1435	1370	1315	1260	1215	1165	1125	1085	0.146	
	8	1635	1560	1495	1435	1380	1325	1280	1230	1190	0.130	
	9	1760	1685	1615	1550	1490	1435	1385	1335	1290 *	0.117	
	10	1875	1800	1730	1660	1600	1545	1490 *	1440 *	1390 *	0.106	
	12	2090	2015	1940	1870	1805 *	1740 *	1685 *	1630 *	1580 *	0.090	
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S_n), PLF									
		0.714	2260	2025	1830	1660	1510	1380	1270	1170	1080	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0474 \text{ in.}$										
		SPAN, FT										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	K1	
24/4	0	425	405	385	370	350	340	325	315	300	1.385	
	3	1035	985	940	900	860					0.337	
	4	1235	1175	1125	1075	1030	990	950	915	885	0.269	
	5	1440	1370	1310	1250	1200	1150	1105	1065	1030	0.224	
	6	1615	1545	1480	1425	1370	1315	1265	1215	1175	0.192	
	7	1785	1710	1640	1575	1515	1460	1410	1360	1315	0.168	
	8	1945	1865	1790	1725	1660	1600	1545	1495	1445	0.149	
	9	2100	2015	1940	1865	1800	1735	1680	1620	1570	0.134	
	10	2245	2160	2080	2005	1935	1870	1805	1745	1690	0.122	
	11	2385	2300	2215	2135	2065	1995	1930	1870 *	1810 *	0.112	
	13	2645	2555	2465	2385	2310	2235 *	2165 *	2100 *	2040 *	0.096	
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S_n), PLF									
		1.036	2985	2710	2465	2255	2075	1910	1765	1635	1520	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0598 \text{ in.}$										
		SPAN, FT										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	K1	
24/4	0	475	455	435	420	405	390	375	360	350	1.556	
	3	1160	1110	1065							0.379	
	4	1390	1330	1275	1220	1175	1130	1090	1055	1020	0.303	
	5	1615	1545	1480	1425	1370	1320	1270	1225	1185	0.252	
	6	1830	1760	1690	1625	1560	1505	1450	1400	1355	0.216	
	7	2025	1950	1875	1805	1740	1685	1625	1575	1520	0.189	
	8	2215	2130	2050	1980	1910	1845	1785	1730	1675	0.168	
	9	2395	2310	2225	2145	2075	2005	1940	1880	1825	0.151	
	10	2570	2480	2390	2310	2230	2160	2090	2030	1965	0.137	
	11	2740	2640	2550	2465	2385	2310	2240	2170	2105	0.126	
	13	3050	2950	2855	2760	2675	2595	2520 *	2445 *	2375 *	0.108	
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S_n), PLF									
		1.295	3475	3175	2920	2690	2485	2305	2145	2000	1865	

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 THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.
 NOTE: ASD Required Strength (Service Applied Load) \leq Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) \leq Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

3.0 DR SUPPORT FASTENING: 5/8" puddle weld or equivalent
 SIDE-LAP FASTENING: 5/8" puddle weld or 1 1/2" long fillet weld

ϕ (Buckling): 0.80 Ω (Buckling): 2.00 ϕ (EQ): 0.55 Ω (EQ): 3.00
 ϕ (Other): 0.60 Ω (Other): 2.65 ϕ (WIND): 0.70 Ω (WIND): 2.35

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0295 in.									
		SPAN, FT									
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	K1
24/4	0	280	260	250	235	225	210	205	195	185	1.093
	2	605	570	540							0.356
	3	770	725	685	645	615	585	560	535	510	0.266
	4	915	865	820	785	745	710	675	650	620	0.213
	5	1045	990	945	900	860	825	790	755	730	0.177
	6	1165	1110	1055	1010	965	925	890	855	825	0.152
	7	1275	1220	1165	1115	1070	1025	985	950	915	0.133
	8	1380	1320	1265	1215	1165	1120	1075	1040	1000	0.118
	9	1475	1415	1360	1305	1255	1210	1165	1125	1085 *	0.106
	10	1565	1500	1445	1390	1340	1290	1245 *	1205 *	1165 *	0.096
	11	1645	1585	1525	1470	1420	1370 *	1325 *	1280 *	1240 *	0.088
I (in ⁴ / ft)		NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
0.551		2035	1800	1605	1440	1300	1180	1075	985	905	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0358 in.									
		SPAN, FT									
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	K1
24/4	0	300	280	270	255	245	235	225	215	205	1.204
	2	645									0.392
	3	820	775	740	705	670	640	615			0.293
	4	985	940	895	850	815	780	745	715	690	0.234
	5	1130	1080	1030	990	945	910	875	840	810	0.195
	6	1270	1215	1160	1110	1070	1025	990	950	920	0.167
	7	1400	1340	1285	1230	1185	1140	1095	1060	1020	0.146
	8	1520	1455	1400	1345	1295	1245	1200	1160	1120	0.130
	9	1630	1565	1505	1450	1400	1350	1305	1260	1220	0.117
	10	1735	1670	1610	1550	1500	1445	1400	1355 *	1310 *	0.106
	12	1920	1855	1795	1735	1680	1625 *	1575 *	1530 *	1485 *	0.090
	I (in ⁴ / ft)		NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF								
0.714		2260	2025	1830	1660	1510	1380	1270	1170	1080	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0474 in.										
		SPAN, FT										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	K1	
24/4	0	350	330	315	300	290	280	265	260	250	1.385	
	3	960	910	870	835	800					0.337	
	4	1160	1105	1055	1010	965	930	895	860	830	0.269	
	5	1340	1280	1230	1180	1135	1090	1050	1010	975	0.224	
	6	1505	1445	1385	1330	1280	1235	1190	1150	1115	0.192	
	7	1665	1600	1535	1480	1425	1375	1325	1285	1240	0.168	
	8	1815	1745	1680	1620	1560	1505	1455	1410	1365	0.149	
	9	1955	1885	1815	1750	1690	1635	1580	1530	1485	0.134	
	10	2090	2015	1945	1880	1815	1755	1700	1650	1600	0.122	
	11	2215	2135	2065	2000	1935	1875	1815	1760	1710	0.112	
	13	2435	2360	2290	2220	2150	2090	2030 *	1970 *	1920 *	0.096	
	I (in ⁴ / ft)		NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
	1.036		2985	2710	2465	2255	2075	1910	1765	1635	1520	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0598 in.										
		SPAN, FT										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	K1	
24/4	0	390	375	360	345	330	320	305	295	285	1.556	
	3	1075	1030	985							0.379	
	4	1305	1245	1195	1145	1100	1060	1025	990	955	0.303	
	5	1515	1455	1400	1345	1295	1245	1205	1160	1125	0.252	
	6	1710	1645	1585	1525	1470	1420	1375	1330	1290	0.216	
	7	1895	1825	1760	1695	1640	1585	1530	1485	1440	0.189	
	8	2075	1995	1925	1860	1800	1740	1685	1635	1585	0.168	
	9	2240	2160	2090	2020	1950	1890	1830	1775	1725	0.151	
	10	2400	2320	2240	2170	2100	2035	1975	1915	1860	0.137	
	11	2550	2465	2385	2310	2240	2175	2110	2050	1995	0.126	
	13	2825	2740	2655	2580	2505	2435	2365	2305 *	2240 *	0.108	
	I (in ⁴ / ft)		NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
	1.295		3475	3175	2920	2690	2485	2305	2145	2000	1865	

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 NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

3.0 DR SUPPORT FASTENING: 5/8" puddle weld or equivalent
SIDE-LAP FASTENING: #10 screws

ϕ (Buckling): 0.80 Ω (Buckling): 2.00 ϕ (EQ): 0.55 Ω (EQ): 3.00
 ϕ (Other): 0.60 Ω (Other): 2.65 ϕ (WIND): 0.70 Ω (WIND): 2.35

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0295 \text{ in.}$									
		SPAN, FT									
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	K1
24/4	0	280	260	250	235	225	210	205	195	185	1.093
	2	435	410	390							0.587
	3	515	485	460	435	415	395	375	360	345	0.476
	4	595	560	530	500	475	455	435	415	395	0.401
	5	675	635	600	570	540	515	490	470	450	0.346
	6	755	710	670	635	605	575	550	525	505	0.305
	7	830	785	740	700	665	635	605	580	555	0.272
	8	895	850	810	770	730	695	665	635	610	0.246
	9	960	910	870	825	790	755	720	690	660	0.224
	10	1025	975	925	885	845	805	775	745	715	0.206
	11	1085	1030	985	940	895	860	825	790	760	0.190
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S_n), PLF								
	0.551	2035	1800	1605	1440	1300	1180	1075	985	905	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0358 \text{ in.}$										
		SPAN, FT										
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	K1	
24/4	0	300	280	270	255	245	235	225	215	205	1.204	
	2	470									0.646	
	3	555	525	500	475	455	435	415			0.525	
	4	640	605	575	550	525	500	480	460	445	0.442	
	5	725	685	650	620	595	565	545	520	500	0.381	
	6	810	765	730	695	665	635	610	585	560	0.336	
	7	895	850	805	770	735	700	670	645	620	0.300	
	8	975	930	885	840	805	770	735	705	680	0.270	
	9	1050	1000	955	910	870	835	800	770	740	0.247	
	10	1120	1065	1020	975	935	900	865	830	795	0.227	
	12	1255	1200	1145	1100	1055	1015	975	940	905	0.195	
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S_n), PLF									
		0.714	2260	2025	1830	1660		1510	1380	1270	1170	1080

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0474 \text{ in.}$										
		SPAN, FT										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	K1	
24/4	0	350	330	315	300	290	280	265	260	250	1.385	
	3	655	620	595	570	545					0.604	
	4	755	720	685	655	630	605	580	560	540	0.508	
	5	855	815	780	745	715	685	660	635	610	0.439	
	6	960	915	870	835	800	765	735	710	685	0.386	
	7	1060	1010	965	920	885	850	815	785	755	0.345	
	8	1160	1105	1055	1010	970	930	895	860	830	0.311	
	9	1255	1200	1150	1100	1055	1010	970	935	905	0.284	
	10	1340	1285	1230	1180	1135	1090	1050	1010	975	0.261	
	11	1425	1365	1310	1260	1210	1165	1125	1085	1050	0.241	
	13	1590	1525	1465	1405	1355	1305	1260	1220	1180	0.210	
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S_n), PLF									
		1.036	2985	2710	2465	2255	2075	1910	1765	1635	1520	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0598 \text{ in.}$										
		SPAN, FT										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	K1	
24/4	0	390	375	360	345	330	320	305	295	285	1.556	
	3	740	710	680							0.678	
	4	855	820	785	755	725	700	675	650	630	0.571	
	5	975	930	895	855	825	795	765	740	715	0.493	
	6	1090	1045	1000	960	925	890	855	825	800	0.434	
	7	1205	1155	1105	1060	1020	985	950	915	885	0.387	
	8	1325	1265	1215	1165	1120	1080	1040	1005	970	0.350	
	9	1440	1380	1320	1270	1220	1175	1130	1095	1055	0.319	
	10	1540	1480	1425	1370	1320	1270	1225	1180	1140	0.293	
	11	1640	1575	1515	1460	1410	1360	1315	1270	1230	0.271	
	13	1835	1765	1700	1635	1580	1530	1480	1430	1385	0.235	
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S_n), PLF									
		1.295	3475	3175	2920	2690	2485	2305	2145	2000	1865	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING.
 THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.
 NOTE: ASD Required Strength (Service Applied Load) \leq Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) \leq Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

3.0 DR SUPPORT FASTENING: Buildex or Elco Textron #12 or #14 TEKS screws
SIDE-LAP FASTENING: #10 screws

ϕ (Buckling): 0.80 Ω (Buckling): 2.00 ϕ (EQ): 0.65 Ω (EQ): 2.50
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (WIND): 0.70 Ω (WIND): 2.35

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0295 in.									
		SPAN, FT									
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	K1
24/4	0	165	155	145	135	130	125	120	115	110	1.235
	2	320	300	285							0.625
	3	400	375	355	335	320	305	290	280	265	0.502
	4	480	450	425	405	385	365	350	335	320	0.419
	5	545	515	490	470	445	425	405	390	375	0.359
	6	610	580	550	525	500	480	460	440	425	0.315
	7	670	635	605	580	555	530	510	490	470	0.280
	8	725	690	660	630	605	580	555	535	515	0.252
	9	775	740	710	680	650	625	600	580	560	0.229
	10	825	790	755	725	695	670	645	620	600	0.210
	11	870	835	800	770	740	715	690	665	640	0.194
	I (in ⁴ /ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
	0.551	2035	1800	1605	1440	1300	1180	1075	985	905	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0358 in.									
		SPAN, FT									
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	K1
24/4	0	175	165	160	150	145	140	130	125	120	1.361
	2	345									0.689
	3	430	410	390	370	355	340	325			0.553
	4	515	490	465	445	425	405	390	370	360	0.461
	5	595	570	540	515	495	470	450	435	415	0.396
	6	665	635	610	580	560	535	515	495	475	0.347
	7	735	700	670	645	620	595	570	550	530	0.308
	8	800	765	735	705	675	650	625	605	580	0.278
	9	860	825	790	760	730	705	680	655	630	0.253
	10	920	880	845	815	785	755	730	705	680	0.232
	12	1025	985	950	915	885	855	825	800	770	0.199
		I (in ⁴ /ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF								
	0.714	2260	2025	1830	1660	1510	1380	1270	1170	1080	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0474 in.										
		SPAN, FT										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	K1	
24/4	0	210	200	190	180	175	170	160	155	150	1.566	
	3	515	490	470	450	430					0.636	
	4	615	585	560	535	515	495	475	455	440	0.531	
	5	720	685	655	625	600	575	555	530	515	0.455	
	6	805	770	740	710	680	655	630	605	585	0.399	
	7	890	850	820	785	755	730	705	680	655	0.355	
	8	970	930	895	860	830	800	770	745	720	0.320	
	9	1045	1005	965	930	900	865	835	810	785	0.291	
	10	1120	1075	1035	1000	965	930	900	870	845	0.266	
	11	1190	1145	1105	1065	1030	995	965	935	905	0.246	
	13	1320	1275	1230	1190	1150	1115	1080	1050	1015	0.213	
		I (in ⁴ /ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
		1.036	2985	2710	2465	2255	2075	1910	1765	1635	1520	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0598 in.										
		SPAN, FT										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	K1	
24/4	0	240	230	220	210	205	195	190	180	175	1.759	
	3	590	565	540							0.714	
	4	705	675	650	620	600	575	555	535	520	0.596	
	5	825	790	755	725	695	670	645	625	605	0.512	
	6	930	895	860	830	795	765	740	715	690	0.448	
	7	1030	990	955	920	885	855	830	800	775	0.399	
	8	1130	1085	1045	1010	975	940	910	880	855	0.359	
	9	1220	1175	1135	1095	1055	1020	990	960	930	0.326	
	10	1310	1260	1215	1175	1135	1100	1065	1035	1000	0.299	
	11	1395	1345	1300	1255	1215	1175	1140	1105	1075	0.276	
	13	1550	1500	1450	1405	1365	1320	1285	1245	1210	0.240	
		I (in ⁴ /ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
		1.295	3475	3175	2920	2690	2485	2305	2145	2000	1865	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING.
 THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.
 NOTE: ASD Required Strength (Service Applied Load) <= Minimum (Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling))
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

3.0 DR SUPPORT FASTENING: Buildex BX-12
SIDE-LAP FASTENING: #10 screws

ϕ (Buckling): 0.80 Ω (Buckling): 2.00 ϕ (EQ): 0.65 Ω (EQ): 2.50
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (WIND): 0.70 Ω (WIND): 2.35

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0295 \text{ in.}$									
		SPAN, FT									
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	K1
24/4	0	240	225	210	200	190	180	175	165	160	2.376
	2	395	375	350							0.826
	3	475	445	425	400	380	360	345	330	315	0.623
	4	555	520	495	465	445	425	405	385	370	0.500
	5	635	595	565	535	505	485	460	440	425	0.418
	6	710	670	635	600	570	545	520	495	475	0.359
	7	775	735	700	665	635	605	575	550	530	0.314
	8	840	800	760	725	690	660	635	605	580	0.279
	9	905	860	815	780	745	715	685	655	630	0.252
	10	960	915	870	835	795	765	735	705	675	0.229
	11	1020	970	925	885	850	815	780	750	725	0.210
	$I \text{ (in}^4 \text{ / ft)}$	NOMINAL SHEAR DUE TO PANEL BUCKLING (S_n), PLF									
	0.551	2035	1800	1605	1440	1300	1180	1075	985	905	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0358 \text{ in.}$									
		SPAN, FT									
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	K1
24/4	0	245	235	220	210	200	195	185	180	170	2.617
	2	420									0.910
	3	505	475	455	430	410	395	380			0.686
	4	590	560	530	505	480	460	440	425	410	0.551
	5	675	640	605	580	550	530	505	485	465	0.460
	6	760	720	685	650	620	595	570	545	525	0.395
	7	835	795	760	725	690	660	635	610	585	0.346
	8	910	865	825	790	760	730	700	670	645	0.308
	9	975	930	890	855	820	785	755	730	705	0.277
	10	1045	995	955	915	880	845	810	785	755	0.252
	12	1170	1120	1075	1030	990	955	920	885	855	0.214
		$I \text{ (in}^4 \text{ / ft)}$	NOMINAL SHEAR DUE TO PANEL BUCKLING (S_n), PLF								
	0.714	2260	2025	1830	1660	1510	1380	1270	1170	1080	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0474 \text{ in.}$										
		SPAN, FT										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	K1	
24/4	0	275	260	250	240	230	220	210	205	195	3.011	
	3	580	550	525	505	485					0.790	
	4	680	650	620	590	565	545	525	505	485	0.634	
	5	785	745	710	680	650	625	600	580	560	0.529	
	6	885	840	805	770	735	705	680	655	630	0.454	
	7	980	935	895	855	820	790	760	730	705	0.398	
	8	1065	1020	980	940	905	870	835	805	775	0.354	
	9	1150	1100	1055	1015	980	940	910	880	850	0.319	
	10	1230	1180	1135	1090	1050	1010	975	945	915	0.290	
	11	1310	1260	1210	1165	1120	1080	1045	1010	975	0.266	
	13	1460	1405	1350	1300	1255	1215	1175	1135	1100	0.228	
		$I \text{ (in}^4 \text{ / ft)}$	NOMINAL SHEAR DUE TO PANEL BUCKLING (S_n), PLF									
		1.036	2985	2710	2465	2255	2075	1910	1765	1635	1520	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0598 \text{ in.}$										
		SPAN, FT										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	K1	
24/4	0	290	275	265	255	245	235	225	220	210	3.382	
	3	640	610	585							0.887	
	4	755	720	690	665	640	615	595	575	555	0.712	
	5	870	835	800	765	740	710	685	660	640	0.595	
	6	990	945	905	870	835	805	775	750	725	0.510	
	7	1100	1055	1015	975	935	900	870	840	810	0.447	
	8	1200	1150	1110	1070	1030	995	960	925	895	0.398	
	9	1295	1245	1200	1155	1115	1080	1045	1010	980	0.358	
	10	1390	1340	1290	1245	1200	1160	1125	1090	1055	0.326	
	11	1485	1430	1375	1330	1285	1240	1200	1165	1130	0.299	
	13	1655	1600	1545	1490	1445	1395	1355	1315	1275	0.256	
		$I \text{ (in}^4 \text{ / ft)}$	NOMINAL SHEAR DUE TO PANEL BUCKLING (S_n), PLF									
		1.295	3475	3175	2920	2690	2485	2305	2145	2000	1865	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING.
 THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.
 NOTE: ASD Required Strength (Service Applied Load) \leq Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) \leq Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

3.0 DR SUPPORT FASTENING: Buildex BX-14
SIDE-LAP FASTENING: #10 screws

ϕ (Buckling): 0.80 Ω (Buckling): 2.00 ϕ (EQ): 0.65 Ω (EQ): 2.50
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (WIND): 0.70 Ω (WIND): 2.35

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0295 \text{ in.}$									
		SPAN, FT									
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	K1
24/4	0	250	235	225	210	200	190	185	175	170	2.376
	2	410	385	365							0.826
	3	490	460	435	410	390	375	355	340	325	0.623
	4	570	535	505	480	455	435	415	395	380	0.500
	5	650	610	575	545	520	495	470	450	430	0.418
	6	725	685	645	610	580	555	530	505	485	0.359
	7	795	755	715	680	645	615	585	560	535	0.314
	8	860	815	775	740	705	675	645	615	590	0.279
	9	925	875	835	795	760	730	695	670	645	0.252
	10	985	935	890	850	815	780	745	720	690	0.229
	11	1040	990	945	905	865	830	795	765	735	0.210
	I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S_n), PLF									
	0.551	2035	1800	1605	1440	1300	1180	1075	985	905	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0358 \text{ in.}$										
		SPAN, FT										
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	K1	
24/4	0	260	250	235	225	215	205	195	190	180	2.617	
	2	435									0.910	
	3	520	490	465	445	425	405	390			0.686	
	4	605	570	545	515	495	470	455	435	420	0.551	
	5	690	655	620	590	565	540	515	495	475	0.460	
	6	775	735	695	665	635	605	580	555	535	0.395	
	7	855	815	775	735	705	675	645	620	595	0.346	
	8	930	885	845	810	775	740	710	680	655	0.308	
	9	1000	950	910	870	835	800	770	740	715	0.277	
	10	1065	1020	975	935	895	860	825	795	770	0.252	
	12	1195	1145	1095	1050	1010	970	935	905	870	0.214	
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S_n), PLF									
		0.714	2260	2025	1830	1660	1510	1380	1270	1170	1080	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0474 \text{ in.}$										
		SPAN, FT										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	K1	
24/4	0	290	275	265	250	240	230	225	215	205	3.011	
	3	595	565	540	520	495					0.790	
	4	695	665	635	605	580	560	535	515	500	0.634	
	5	800	760	725	695	665	640	615	590	570	0.529	
	6	900	860	820	785	750	720	695	665	645	0.454	
	7	1000	955	910	870	835	800	770	740	715	0.398	
	8	1090	1040	1000	960	920	885	850	820	790	0.354	
	9	1175	1125	1080	1035	995	960	925	895	860	0.319	
	10	1255	1205	1155	1110	1070	1030	995	960	930	0.290	
	11	1335	1280	1230	1185	1140	1100	1065	1025	995	0.266	
	13	1490	1430	1375	1325	1280	1235	1195	1155	1120	0.228	
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S_n), PLF									
		1.036	2985	2710	2465	2255	2075	1910	1765	1635	1520	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF $t = \text{design thickness} = 0.0598 \text{ in.}$										
		SPAN, FT										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	K1	
24/4	0	305	290	280	270	260	250	240	230	225	3.382	
	3	655	625	600							0.887	
	4	770	740	710	680	655	630	605	585	565	0.712	
	5	890	850	815	780	750	725	700	675	650	0.595	
	6	1005	960	920	885	850	820	790	765	740	0.510	
	7	1120	1075	1030	990	950	915	880	850	825	0.447	
	8	1225	1175	1130	1090	1050	1010	975	940	910	0.398	
	9	1320	1270	1225	1180	1135	1100	1060	1030	995	0.358	
	10	1420	1365	1315	1265	1225	1180	1145	1105	1075	0.326	
	11	1510	1455	1400	1355	1305	1265	1220	1185	1150	0.299	
	13	1690	1630	1570	1520	1470	1420	1375	1335	1295	0.256	
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S_n), PLF									
		1.295	3475	3175	2920	2690	2485	2305	2145	2000	1865	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING.
 THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.
 NOTE: ASD Required Strength (Service Applied Load) \leq Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) \leq Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

3.0 DR SUPPORT FASTENING: Pneutek SDK61-series (0.113" to 0.155" support steel) ϕ (Buckling): 0.80 Ω (Buckling): 2.00 ϕ (EQ): 0.65 Ω (EQ): 2.50
SIDE-LAP FASTENING: #10 screws ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (WIND): 0.70 Ω (WIND): 2.35

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0295 in.									
		SPAN, FT									
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	K1
24/4	0	245	230	220	205	195	185	180	170	165	2.851
	2	405	380	360							0.877
	3	480	455	430	405	385	365	350	335	320	0.651
	4	560	530	500	475	450	430	410	390	375	0.518
	5	640	605	570	540	515	490	465	445	425	0.430
	6	720	675	640	605	575	550	525	500	480	0.368
	7	785	745	710	675	640	610	580	555	535	0.321
	8	850	805	765	730	700	670	640	610	585	0.285
	9	915	865	825	785	750	720	690	665	635	0.256
	10	975	925	880	840	805	770	740	710	685	0.233
	11	1030	980	935	895	855	820	790	760	730	0.213
	I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
	0.551	2035	1800	1605	1440	1300	1180	1075	985	905	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0358 in.									
		SPAN, FT									
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	K1
24/4	0	260	245	235	225	215	205	195	190	180	3.140
	2	430									0.966
	3	515	490	465	445	425	405	390			0.718
	4	600	570	540	515	495	470	450	435	415	0.571
	5	690	650	620	590	565	540	515	495	475	0.474
	6	775	730	695	665	630	605	580	555	535	0.405
	7	855	815	775	735	700	670	645	620	595	0.354
	8	925	885	845	805	770	740	710	680	655	0.314
	9	995	950	910	870	835	800	770	740	715	0.282
	10	1065	1015	970	930	895	860	825	795	770	0.256
	12	1195	1140	1095	1050	1010	970	935	900	870	0.217
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF								
	0.714	2260	2025	1830	1660	1510	1380	1270	1170	1080	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0474 in.										
		SPAN, FT										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	K1	
24/4	0	305	290	275	265	250	240	235	225	215	3.614	
	3	610	580	555	530	505					0.826	
	4	710	675	645	615	590	570	545	525	505	0.657	
	5	810	775	740	705	675	650	625	600	580	0.545	
	6	915	870	830	795	760	730	705	675	650	0.466	
	7	1015	965	925	885	845	810	780	750	725	0.407	
	8	1105	1060	1015	970	930	895	860	825	800	0.361	
	9	1190	1140	1095	1050	1010	975	935	905	870	0.325	
	10	1275	1220	1175	1125	1085	1045	1010	975	940	0.295	
	11	1355	1300	1250	1200	1155	1115	1075	1040	1005	0.270	
	13	1510	1455	1395	1345	1295	1250	1210	1170	1130	0.231	
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
		1.036	2985	2710	2465	2255	2075	1910	1765	1635	1520	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0598 in.										
		SPAN, FT										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	K1	
24/4	0	340	325	310	295	285	275	265	255	250	4.059	
	3	690	660	630							0.928	
	4	805	770	735	710	680	655	630	610	590	0.738	
	5	920	880	845	810	780	750	725	700	675	0.613	
	6	1040	995	950	915	880	845	815	785	760	0.524	
	7	1155	1105	1060	1015	975	940	905	875	845	0.457	
	8	1265	1215	1165	1120	1075	1035	1000	965	930	0.406	
	9	1370	1315	1265	1215	1175	1130	1090	1055	1020	0.365	
	10	1465	1410	1355	1305	1260	1220	1180	1140	1105	0.331	
	11	1560	1505	1445	1395	1345	1300	1260	1220	1180	0.303	
	13	1745	1680	1620	1565	1515	1465	1415	1375	1330	0.260	
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
		1.295	3475	3175	2920	2690	2485	2305	2145	2000	1865	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING.
 THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.
 NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

3.0 DR SUPPORT FASTENING: Pneutek SDK63-series (0.155" to 0.25" support steel)
SIDE-LAP FASTENING: #10 screws

ϕ (Buckling): 0.80 Ω (Buckling): 2.00 ϕ (EQ): 0.65 Ω (EQ): 2.50
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (WIND): 0.70 Ω (WIND): 2.35

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0295 in.									
		SPAN, FT									
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	K1
24/4	0	275	260	245	230	220	210	200	190	185	2.851
	2	435	405	385							0.877
	3	510	480	455	430	410	390	370	355	340	0.651
	4	590	555	525	500	475	450	430	410	395	0.518
	5	670	630	595	565	535	510	485	465	445	0.430
	6	750	705	665	630	600	570	545	520	500	0.368
	7	825	780	735	700	665	630	605	575	550	0.321
	8	890	845	805	765	725	690	660	630	605	0.285
	9	955	905	860	820	785	750	720	685	660	0.256
	10	1020	965	920	875	840	800	770	740	710	0.233
	11	1080	1025	975	930	890	855	820	785	755	0.213
	I (in ⁴ / ft)		NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF								
0.551		2035	1800	1605	1440	1300	1180	1075	985	905	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0358 in.										
		SPAN, FT										
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	K1	
24/4	0	280	265	255	240	230	220	210	200	195	3.140	
	2	450									0.966	
	3	535	510	485	460	440	420	405			0.718	
	4	625	590	560	535	510	485	465	450	430	0.571	
	5	710	670	635	605	580	555	530	510	490	0.474	
	6	795	750	715	680	650	620	595	570	550	0.405	
	7	880	835	790	755	720	690	660	635	610	0.354	
	8	955	910	870	825	790	755	725	695	670	0.314	
	9	1025	980	935	895	855	820	785	755	725	0.282	
	10	1095	1045	1000	955	915	880	845	815	785	0.256	
	12	1230	1175	1125	1080	1035	995	960	925	890	0.217	
	I (in ⁴ / ft)		NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
	0.714		2260	2025	1830	1660	1510	1380	1270	1170	1080	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0474 in.										
		SPAN, FT										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	K1	
24/4	0	310	295	280	270	255	245	235	230	220	3.614	
	3	615	585	560	535	510					0.826	
	4	715	680	650	620	595	570	550	530	510	0.657	
	5	815	780	745	710	680	655	630	605	585	0.545	
	6	920	875	835	800	765	735	705	680	655	0.466	
	7	1020	970	930	890	850	815	785	755	730	0.407	
	8	1115	1065	1020	975	935	900	865	830	800	0.361	
	9	1200	1150	1100	1060	1015	980	940	905	875	0.325	
	10	1285	1230	1180	1135	1090	1050	1015	980	945	0.295	
	11	1365	1310	1255	1210	1165	1120	1085	1045	1010	0.270	
	13	1520	1460	1405	1355	1305	1260	1215	1175	1140	0.231	
	I (in ⁴ / ft)		NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
	1.036		2985	2710	2465	2255	2075	1910	1765	1635	1520	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0598 in.										
		SPAN, FT										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	K1	
24/4	0	330	315	300	290	275	265	260	250	240	4.059	
	3	680	650	620							0.928	
	4	795	760	730	700	675	650	625	605	585	0.738	
	5	910	870	835	800	770	745	715	690	670	0.613	
	6	1030	985	945	905	870	840	810	780	755	0.524	
	7	1145	1095	1050	1010	970	935	900	870	840	0.457	
	8	1255	1205	1155	1110	1070	1030	990	955	925	0.406	
	9	1355	1300	1250	1205	1165	1125	1085	1045	1010	0.365	
	10	1450	1395	1345	1295	1250	1205	1165	1130	1095	0.331	
	11	1545	1490	1435	1385	1335	1290	1250	1210	1170	0.303	
	13	1730	1665	1605	1550	1500	1450	1405	1360	1320	0.260	
	I (in ⁴ / ft)		NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
	1.295		3475	3175	2920	2690	2485	2305	2145	2000	1865	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

3.0 DR SUPPORT FASTENING: Pnutek K64-series (0.187" to 0.312" support steel)
SIDE-LAP FASTENING: #10 screws

ϕ (Buckling): 0.80 Ω (Buckling): 2.00 ϕ (EQ): 0.65 Ω (EQ): 2.50
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (WIND): 0.70 Ω (WIND): 2.35

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0295 in.									
		SPAN, FT									
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	K1
24/4	0	270	255	240	230	220	210	200	190	180	2.851
	2	430	405	385							0.877
	3	510	480	455	430	410	390	370	355	340	0.651
	4	590	555	525	495	470	450	430	410	395	0.518
	5	670	630	595	565	535	510	485	465	445	0.430
	6	745	705	665	630	600	570	545	520	500	0.368
	7	825	780	735	695	660	630	600	575	550	0.321
	8	890	840	800	760	725	690	660	630	605	0.285
	9	955	905	860	820	780	750	715	685	655	0.256
	10	1015	965	920	875	835	800	770	735	710	0.233
	11	1075	1020	975	930	890	850	815	785	755	0.213
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF								
	0.551	2035	1800	1605	1440	1300	1180	1075	985	905	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0358 in.										
		SPAN, FT										
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	K1	
24/4	0	315	300	285	270	260	245	235	225	220	3.140	
	2	485									0.966	
	3	570	540	515	490	465	445	430			0.718	
	4	655	620	590	565	535	515	490	475	455	0.571	
	5	740	705	670	635	605	580	555	535	515	0.474	
	6	825	785	745	710	675	645	620	595	575	0.405	
	7	915	865	820	780	745	715	685	655	630	0.354	
	8	1000	945	900	855	815	780	750	720	690	0.314	
	9	1070	1020	975	930	885	850	815	780	750	0.282	
	10	1145	1090	1040	995	955	915	875	840	810	0.256	
	12	1280	1225	1170	1120	1075	1035	995	955	925	0.217	
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
		0.714	2260	2025	1830	1660	1510	1380	1270	1170	1080	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0474 in.										
		SPAN, FT										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	K1	
24/4	0	385	365	350	335	320	305	295	285	275	3.614	
	3	690	655	625	600	575					0.826	
	4	790	750	720	685	660	630	610	585	565	0.657	
	5	890	850	810	775	745	715	685	660	635	0.545	
	6	995	945	905	865	830	795	765	735	710	0.466	
	7	1095	1045	995	950	915	875	840	810	780	0.407	
	8	1195	1140	1090	1040	995	960	920	885	855	0.361	
	9	1300	1235	1180	1130	1080	1040	1000	960	930	0.325	
	10	1390	1330	1275	1220	1165	1120	1075	1035	1000	0.295	
	11	1475	1410	1355	1300	1250	1200	1155	1115	1075	0.270	
	13	1640	1575	1510	1450	1400	1345	1300	1255	1215	0.231	
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
		1.036	2985	2710	2465	2255	2075	1910	1765	1635	1520	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0598 in.										
		SPAN, FT										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	K1	
24/4	0	430	410	395	380	365	350	340	325	315	4.059	
	3	780	745	715							0.928	
	4	895	860	820	790	760	730	705	680	660	0.738	
	5	1015	970	930	890	860	825	795	770	745	0.613	
	6	1130	1080	1035	995	955	920	890	855	830	0.524	
	7	1245	1195	1145	1095	1055	1015	980	945	915	0.457	
	8	1365	1305	1250	1200	1155	1110	1070	1035	1000	0.406	
	9	1480	1415	1355	1305	1255	1205	1165	1125	1085	0.365	
	10	1595	1530	1465	1405	1350	1300	1255	1210	1170	0.331	
	11	1695	1630	1565	1510	1450	1395	1345	1300	1255	0.303	
	13	1895	1820	1750	1690	1630	1575	1520	1475	1425	0.260	
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
		1.295	3475	3175	2920	2690	2485	2305	2145	2000	1865	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING.
 THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.
 NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

3.0 DR SUPPORT FASTENING: Pneutek K66-series (0.281" & thicker support steel)
SIDE-LAP FASTENING: #10 screws

ϕ (Buckling): 0.80 Ω (Buckling): 2.00 ϕ (EQ): 0.65 Ω (EQ): 2.50
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (WIND): 0.70 Ω (WIND): 2.35

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0295 in.									
		SPAN, FT									
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	K1
24/4	0	290	275	260	245	235	220	210	200	195	2.851
	2	450	425	400							0.877
	3	530	495	470	445	425	405	385	370	350	0.651
	4	610	570	540	510	485	465	440	425	405	0.518
	5	685	645	610	580	550	525	500	480	460	0.430
	6	765	720	680	645	615	585	555	535	510	0.368
	7	845	795	750	710	675	645	615	590	565	0.321
	8	915	865	820	780	740	705	670	645	615	0.285
	9	980	930	880	840	800	765	730	700	670	0.256
	10	1040	990	940	895	855	820	785	755	720	0.233
	11	1105	1050	1000	950	910	870	835	800	770	0.213
	I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
	0.551	2035	1800	1605	1440	1300	1180	1075	985	905	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0358 in.									
		SPAN, FT									
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	K1
24/4	0	320	305	290	275	260	250	240	230	220	3.140
	2	490									0.966
	3	575	545	520	495	470	450	435			0.718
	4	660	630	595	570	540	520	495	475	460	0.571
	5	750	710	675	640	610	585	560	540	520	0.474
	6	835	790	750	715	680	650	625	600	575	0.405
	7	920	870	825	785	750	720	690	660	635	0.354
	8	1005	950	905	860	820	785	755	725	695	0.314
	9	1080	1030	980	935	890	855	815	785	755	0.282
	10	1150	1095	1050	1005	960	920	880	845	815	0.256
	12	1290	1230	1175	1130	1080	1040	1000	965	930	0.217
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF								
	0.714	2260	2025	1830	1660	1510	1380	1270	1170	1080	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0474 in.										
		SPAN, FT										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	K1	
24/4	0	400	380	360	345	330	320	305	295	285	3.614	
	3	705	670	640	610	585					0.826	
	4	805	765	730	700	670	645	620	595	575	0.657	
	5	905	865	825	790	755	725	695	670	650	0.545	
	6	1010	960	915	875	840	805	775	745	720	0.466	
	7	1110	1055	1010	965	925	890	855	820	795	0.407	
	8	1210	1155	1100	1055	1010	970	930	900	865	0.361	
	9	1315	1250	1195	1140	1095	1050	1010	975	940	0.325	
	10	1410	1345	1285	1230	1180	1130	1090	1050	1010	0.295	
	11	1495	1430	1370	1315	1265	1215	1165	1125	1085	0.270	
	13	1665	1595	1530	1470	1415	1365	1315	1270	1230	0.231	
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
		1.036	2985	2710	2465	2255	2075	1910	1765	1635	1520	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0598 in.										
		SPAN, FT										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	K1	
24/4	0	475	455	435	420	400	385	375	360	350	4.059	
	3	825	790	755							0.928	
	4	940	900	865	830	795	770	740	715	690	0.738	
	5	1060	1015	970	930	895	865	830	805	775	0.613	
	6	1175	1125	1080	1035	995	960	925	890	860	0.524	
	7	1290	1235	1185	1135	1095	1055	1015	980	950	0.457	
	8	1410	1350	1290	1240	1190	1150	1105	1070	1035	0.406	
	9	1525	1460	1400	1345	1290	1245	1200	1155	1120	0.365	
	10	1640	1570	1505	1445	1390	1340	1290	1245	1205	0.331	
	11	1755	1685	1615	1550	1490	1435	1380	1335	1290	0.303	
	13	1960	1880	1810	1745	1680	1625	1565	1510	1460	0.260	
		I (in ⁴ / ft)	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
		1.295	3475	3175	2920	2690	2485	2305	2145	2000	1865	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING.
 THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.
 NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

3.0 DR SUPPORT FASTENING: Hiiti ENP2 or ENPH2 (0.25" min. support steel)
SIDE-LAP FASTENING: #10 screws

ϕ (Buckling): 0.80 Ω (Buckling): 2.00 ϕ (EQ): 0.65 Ω (EQ): 2.50
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (WIND): 0.70 Ω (WIND): 2.35

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0295 in.									
		SPAN, FT									
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	K1
24/4	0	255	240	225	215	205	195	185	175	170	1.188
	2	415	390	365							0.613
	3	490	465	440	415	395	375	360	345	330	0.494
	4	570	540	510	480	455	435	415	400	380	0.413
	5	650	610	580	550	520	495	475	455	435	0.355
	6	730	685	650	615	585	555	530	510	485	0.312
	7	800	760	720	680	645	615	590	565	540	0.277
	8	865	820	780	745	710	675	645	620	590	0.250
	9	930	880	840	800	765	730	700	670	645	0.228
	10	990	940	895	855	815	780	750	720	695	0.209
	11	1045	995	950	910	870	830	800	770	740	0.193
	I (in ⁴ / ft)		NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF								
0.551		2035	1800	1605	1440	1300	1180	1075	985	905	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0358 in.										
		SPAN, FT										
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	K1	
24/4	0	265	255	240	230	220	210	200	190	185	1.309	
	2	440									0.675	
	3	525	495	470	450	430	410	390			0.544	
	4	610	575	550	520	500	475	455	440	420	0.455	
	5	695	660	625	595	570	545	520	500	480	0.391	
	6	780	740	700	670	640	610	585	560	540	0.343	
	7	865	820	780	740	710	675	650	625	600	0.306	
	8	935	890	850	815	780	745	715	685	660	0.275	
	9	1005	960	915	875	840	810	775	745	715	0.251	
	10	1075	1025	980	940	900	865	835	800	775	0.230	
	12	1205	1150	1105	1060	1015	980	940	910	875	0.197	
	I (in ⁴ / ft)		NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
	0.714		2260	2025	1830	1660	1510	1380	1270	1170	1080	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0474 in.										
		SPAN, FT										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	K1	
24/4	0	300	285	275	260	250	240	230	225	215	1.506	
	3	605	575	550	525	505					0.626	
	4	710	675	645	615	590	565	545	525	505	0.524	
	5	810	770	735	705	675	650	625	600	580	0.450	
	6	910	870	830	795	760	730	700	675	650	0.395	
	7	1015	965	920	880	845	810	780	750	725	0.352	
	8	1105	1055	1010	970	930	890	860	825	795	0.317	
	9	1190	1140	1090	1050	1010	970	935	900	870	0.288	
	10	1275	1220	1170	1125	1085	1045	1005	970	940	0.265	
	11	1355	1300	1245	1200	1155	1115	1075	1040	1005	0.245	
	13	1510	1450	1395	1345	1295	1250	1205	1170	1130	0.212	
	I (in ⁴ / ft)		NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
	1.036		2985	2710	2465	2255	2075	1910	1765	1635	1520	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0598 in.										
		SPAN, FT										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	K1	
24/4	0	325	310	295	285	275	265	255	245	240	1.691	
	3	675	645	620							0.703	
	4	790	755	725	695	670	645	620	600	580	0.588	
	5	910	870	830	800	770	740	715	690	665	0.506	
	6	1025	980	940	900	865	835	805	775	750	0.444	
	7	1140	1090	1045	1005	965	930	895	865	835	0.395	
	8	1250	1200	1155	1105	1065	1025	990	955	920	0.356	
	9	1350	1295	1245	1200	1160	1120	1080	1045	1010	0.324	
	10	1445	1390	1340	1290	1245	1205	1165	1125	1090	0.297	
	11	1540	1485	1430	1380	1330	1285	1245	1205	1170	0.275	
	13	1725	1660	1600	1545	1495	1445	1400	1355	1315	0.238	
	I (in ⁴ / ft)		NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
	1.295		3475	3175	2920	2690	2485	2305	2145	2000	1865	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING.
 THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.
 NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

3.0 DR SUPPORT FASTENING: Hilti ENP2K, X-EDN19 or X-EDN22 (0.125" to 0.375" support steel) ϕ (Buckling): 0.80 Ω (Buckling): 2.00 ϕ (EQ): 0.65 Ω (EQ): 2.50
 SIDE-LAP FASTENING: #10 screws ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (WIND): 0.70 Ω (WIND): 2.35

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0295 in.									
		SPAN, FT									
		8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	K1
24/4	0	240	225	210	200	190	180	175	165	160	1.188
	2	395	375	355							0.613
	3	475	450	425	400	380	365	345	330	315	0.494
	4	555	525	495	470	445	425	405	385	370	0.413
	5	635	595	565	535	510	485	460	440	425	0.355
	6	710	670	635	600	570	545	520	495	475	0.312
	7	780	735	700	665	635	605	575	550	530	0.277
	8	840	800	760	725	690	660	635	605	580	0.250
	9	905	860	820	780	745	715	685	655	630	0.228
	10	965	915	875	835	800	765	735	705	680	0.209
	11	1020	970	925	885	850	815	780	750	725	0.193
I (in ⁴ / ft)		NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
0.551		2035	1800	1605	1440	1300	1180	1075	985	905	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0358 in.									
		SPAN, FT									
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	K1
24/4	0	255	240	230	220	210	200	190	185	175	1.309
	2	425									0.675
	3	510	485	460	440	420	400	385			0.544
	4	595	565	540	510	490	470	450	430	415	0.455
	5	685	645	615	585	560	535	510	490	475	0.391
	6	770	730	690	660	630	600	575	555	530	0.343
	7	850	810	770	730	700	670	640	615	590	0.306
	8	920	875	835	800	770	735	705	675	650	0.275
	9	990	945	900	865	830	795	765	735	710	0.251
	10	1055	1010	965	925	890	855	820	790	765	0.230
	12	1185	1135	1085	1045	1005	965	930	895	865	0.197
	I (in ⁴ / ft)		NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF								
0.714		2260	2025	1830	1660	1510	1380	1270	1170	1080	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0474 in.										
		SPAN, FT										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	K1	
24/4	0	300	285	275	260	250	240	230	225	215	1.506	
	3	605	580	550	525	505					0.626	
	4	710	675	645	615	590	565	545	525	505	0.524	
	5	810	770	735	705	675	650	625	600	580	0.450	
	6	910	870	830	795	760	730	700	675	650	0.395	
	7	1015	965	920	880	845	810	780	750	725	0.352	
	8	1105	1055	1010	970	930	890	860	825	795	0.317	
	9	1190	1140	1090	1050	1010	970	935	900	870	0.288	
	10	1275	1220	1170	1125	1085	1045	1005	970	940	0.265	
	11	1355	1300	1250	1200	1155	1115	1075	1040	1005	0.245	
	13	1510	1450	1395	1345	1295	1250	1210	1170	1130	0.212	
	I (in ⁴ / ft)		NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
	1.036		2985	2710	2465	2255	2075	1910	1765	1635	1520	

FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF t = design thickness = 0.0598 in.										
		SPAN, FT										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	K1	
24/4	0	340	325	315	300	290	280	270	260	250	1.691	
	3	690	660	635							0.703	
	4	810	775	740	710	685	660	635	615	590	0.588	
	5	925	885	845	815	780	755	725	700	680	0.506	
	6	1040	995	955	915	880	850	820	790	765	0.444	
	7	1160	1110	1060	1020	980	945	910	880	850	0.395	
	8	1270	1220	1170	1120	1080	1040	1000	965	935	0.356	
	9	1370	1320	1270	1220	1175	1135	1095	1055	1020	0.324	
	10	1470	1415	1360	1310	1265	1220	1180	1145	1105	0.297	
	11	1565	1505	1450	1400	1350	1305	1265	1225	1185	0.275	
	13	1750	1690	1625	1570	1515	1470	1420	1375	1335	0.238	
	I (in ⁴ / ft)		NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF									
	1.295		3475	3175	2920	2690	2485	2305	2145	2000	1865	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]

LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0149"

SUPPORT FASTENING: 16 gauge weld washer w/ 3/8" hole-E70

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.55 Ω (EQ): 3.00 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.60 Ω (Other): 2.65 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	
NO FILL (BARE DECK)	35/8	0	1980	1540	1235	1025 *	870 *	755 *	665 *	0.311
		1	2095	1660	1350 *	1125 *	960 *	835 *	740 *	0.248
		2	2190	1770	1455 *	1220 *	1050 *	915 *	810 *	0.207
		3	2270	1870	1555 *	1315 *	1130 *	990 *	880 *	0.177
	35/7	4	2335	1960	1645 *	1400 *	1215 *	1065 *	950 *	0.155
		0	1820	1455	1185	990 *	845 *	735 *	650 *	0.331
		1	1910	1560	1290 *	1085 *	935 *	815 *	725 *	0.261
		2	1985	1655	1385 *	1175 *	1015 *	890 *	790 *	0.216
	35/5	3	2045	1735	1470 *	1260 *	1095 *	965 *	860 *	0.184
		4	2095	1805	1550 *	1340 *	1170 *	1035 *	925 *	0.160
		0	1295	1070	890	750	650 *	565 *	505 *	0.452
		1	1360	1155	980	840 *	730 *	640 *	570 *	0.331
	30/7	2	1410	1225	1055	915 *	800 *	710 *	635 *	0.261
		3	1450	1280	1120	985 *	870 *	775 *	695 *	0.215
		4	1480	1330	1180	1045 *	930 *	835 *	755 *	0.183
		0	1880	1435	1140	940 *	795 *	690 *	605 *	0.414
	30/5	1	2005	1565	1260	1045 *	890 *	770 *	680 *	0.322
		2	2115	1685	1370 *	1145 *	980 *	850 *	755 *	0.263
		3	2205	1795	1475 *	1240 *	1065 *	930 *	825 *	0.222
		4	2285	1890	1575 *	1335 *	1150 *	1005 *	895 *	0.193
	30/4	0	1380	1095	885	735	630 *	545 *	485 *	0.552
		1	1475	1200	990	835 *	715 *	625 *	555 *	0.399
		2	1550	1295	1085	925 *	800 *	700 *	625 *	0.313
		3	1605	1375	1170	1005 *	875 *	775 *	690 *	0.257
2 1/2" NW CONC. (ABOVE DECK)	4	1655	1440	1245	1080 *	950 *	840 *	755 *	0.218	
	0	1115	915	755	635	545	480 *	425 *	0.621	
	1	1185	1000	845	725	630 *	555 *	490 *	0.434	
	2	1235	1070	925	800	700 *	620 *	555 *	0.334	
2 1/2" LW CONC. (ABOVE DECK)	3	1270	1130	990	870 *	770 *	685 *	615 *	0.271	
	4	1300	1175	1045	930 *	830 *	745 *	675 *	0.228	
	0	6680	6090	5790	5615	5495	5410	5350	0.621	
	1	7000	6300	5950	5740	5605	5505	5430	0.434	
TYPE I INSUL. FILL	30/4	2	7320	6515	6110	5870	5710	5595	5510	0.334
		3	7640	6730	6270	6000	5815	5685	5590	0.271
		4	7960	6940	6430	6125	5925	5775	5670	0.228
		0	5015	4425	4130	3950	3830	3750	3685	0.621
TYPE II INSUL. FILL	30/4	1	5335	4635	4290	4080	3940	3840	3765	0.434
		2	5655	4850	4450	4205	4045	3930	3845	0.334
		3	5975	5065	4610	4335	4150	4020	3925	0.271
		4	6295	5275	4770	4460	4260	4115	4005	0.228
NO FILL	ALL	0	2220	1630	1335	1155	1040	955	890	0.621
		1	2540	1845	1495	1285	1145	1045	970	0.434
		2	2860	2055	1655	1415	1250	1135	1050	0.334
		3	3180	2270	1815	1540	1360	1230	1130	0.271
NO FILL	ALL	4	3500	2485	1975	1670	1465	1320	1210	0.228
		0	2490	1900	1605	1425	1305	1225	1160	0.621
		1	2810	2110	1765	1555	1415	1315	1240	0.434
		2	3130	2325	1925	1680	1520	1405	1320	0.334
NO FILL	ALL	3	3450	2540	2085	1810	1625	1495	1400	0.271
		4	3770	2750	2245	1935	1735	1590	1480	0.228

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.0	1.5	2.0	2.5	3.0	3.5	4.0
NO FILL	ALL	0.011	4465	1985	1115	715	495	365	275

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0179"

SUPPORT FASTENING: 16 gauge weld washer w/ 3/8" hole-E70

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.55 Ω (EQ): 3.00 φ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25

φ (WIND): 0.70 Ω (WIND): 2.35 φ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25

φ (Other): 0.60 Ω (Other): 2.65 φ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.5	2.0	2.5	3.0	3.5	4.0	4.5	
NO FILL (BARE DECK)	35/8	0	1995	1600	1325 *	1125 *	975 *	860 *	770 *	0.340
		1	2140	1735 *	1445 *	1235 *	1075 *	950 *	850 *	0.272
		2	2275	1865 *	1565 *	1340 *	1170 *	1035 *	930 *	0.226
		3	2395	1985 *	1675 *	1445 *	1260 *	1120 *	1005 *	0.194
	35/7	4	2505	2100 *	1785 *	1540 *	1350 *	1200 *	1080 *	0.170
		0	1885	1535	1280 *	1095 *	955 *	845 *	755 *	0.363
		1	2010	1660	1395 *	1200 *	1050 *	930 *	835 *	0.286
		2	2125	1775 *	1505 *	1300 *	1140 *	1010 *	910 *	0.236
	35/5	3	2225	1880 *	1610 *	1395 *	1225 *	1095 *	985 *	0.201
		4	2310	1975 *	1705 *	1485 *	1310 *	1170 *	1055 *	0.175
		0	1385	1150	975	840 *	735 *	650 *	585 *	0.495
		1	1490	1260	1075 *	935 *	825 *	735 *	660 *	0.363
	30/7	2	1575	1355	1170 *	1025 *	905 *	810 *	730 *	0.286
		3	1645	1435	1255 *	1110 *	985 *	885 *	800 *	0.236
		4	1705	1505	1335 *	1185 *	1060 *	955 *	870 *	0.201
		0	1855	1475	1215 *	1030 *	890 *	785 *	695 *	0.454
	30/5	1	2015	1620	1345 *	1140 *	990 *	875 *	780 *	0.353
		2	2160	1755 *	1465 *	1250 *	1090 *	960 *	860 *	0.288
		3	2295	1885 *	1580 *	1355 *	1185 *	1050 *	940 *	0.244
		4	2410	2005 *	1695 *	1460 *	1275 *	1130 *	1015 *	0.211
	30/4	0	1415	1145	955	815 *	705 *	625 *	555 *	0.605
		1	1545	1275	1070 *	920 *	800 *	710 *	635 *	0.437
		2	1660	1390	1180 *	1020 *	895 *	795 *	715 *	0.343
		3	1755	1490	1280 *	1115 *	980 *	875 *	785 *	0.281
2 1/2" NW CONC. (ABOVE DECK)	4	1840	1585	1375 *	1200 *	1065 *	950 *	860 *	0.239	
	0	1185	980	825	710	620 *	550 *	490 *	0.681	
	1	1290	1090	930	805 *	710 *	630 *	570 *	0.476	
	2	1375	1185	1025	895 *	795 *	710 *	640 *	0.366	
2 1/2" LW CONC. (ABOVE DECK)	3	1445	1265	1110 *	980 *	870 *	785 *	710 *	0.297	
	4	1505	1335	1185 *	1055 *	945 *	850 *	775 *	0.250	
	0	6435	6055	5825	5670	5560	5480	5415	0.681	
	1	6695	6245	5975	5800	5670	5575	5500	0.476	
TYPE I INSUL. FILL	30/4	2	6950	6440	6130	5925	5780	5670	5585	0.366
		3	7205	6630	6285	6055	5890	5765	5670	0.297
		4	7460	6820	6440	6185	6000	5865	5755	0.250
		0	4775	4390	4160	4005	3895	3815	3750	0.681
TYPE II INSUL. FILL	30/4	1	5030	4580	4315	4135	4005	3910	3835	0.476
		2	5285	4775	4465	4265	4115	4005	3920	0.366
		3	5540	4965	4620	4390	4225	4105	4005	0.297
		4	5795	5160	4775	4520	4335	4200	4095	0.250
TYPE I INSUL. FILL	30/4	0	1980	1595	1365	1215	1105	1020	960	0.681
		1	2235	1790	1520	1340	1215	1120	1045	0.476
		2	2490	1980	1675	1470	1325	1215	1130	0.366
		3	2750	2175	1830	1600	1435	1310	1215	0.297
TYPE II INSUL. FILL	30/4	4	3005	2365	1980	1725	1545	1405	1300	0.250
		0	2250	1865	1635	1480	1370	1290	1225	0.681
		1	2505	2055	1790	1610	1480	1385	1310	0.476
		2	2760	2250	1940	1740	1590	1480	1395	0.366
TYPE II INSUL. FILL	30/4	3	3015	2440	2095	1865	1700	1580	1480	0.297
		4	3270	2635	2250	1995	1810	1675	1570	0.250

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

φ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.5	2.0	2.5	3.0	3.5	4.0	4.5
NO FILL	ALL	0.013	2580	1450	930	645	470	360	285

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0239"

SUPPORT FASTENING: 16 gauge weld washer w/ 3/8" hole-E70

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.55 Ω (EQ): 3.00 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.60 Ω (Other): 2.65 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			2.0	2.5	3.0	3.5	4.0	4.5	5.0	
NO FILL (BARE DECK)	35/8	0	2445	2025 *	1720 *	1490 *	1315 *	1175 *	1060 *	0.393
		1	2625 *	2185 *	1865 *	1620 *	1435 *	1280 *	1160 *	0.314
		2	2800 *	2345 *	2005 *	1750 *	1550 *	1385 *	1255 *	0.262
		3	2965 *	2495 *	2145 *	1875 *	1660 *	1490 *	1350 *	0.224
	35/7	4	3120 *	2645 *	2280 *	1995 *	1775 *	1590 *	1445 *	0.196
		0	2345	1960 *	1675 *	1460 *	1290 *	1155 *	1045 *	0.420
		1	2510	2110 *	1815 *	1585 *	1405 *	1260 *	1140 *	0.331
		2	2665 *	2260 *	1945 *	1705 *	1515 *	1360 *	1235 *	0.273
	35/5	3	2810 *	2400 *	2075 *	1825 *	1625 *	1460 *	1325 *	0.232
		4	2945 *	2530 *	2200 *	1940 *	1730 *	1560 *	1415 *	0.202
		0	1760	1490	1280 *	1120 *	995 *	895 *	810 *	0.572
		1	1905	1625 *	1410 *	1240 *	1105 *	995 *	905 *	0.419
	30/7	2	2030	1755 *	1530 *	1355 *	1210 *	1090 *	995 *	0.330
		3	2145	1870 *	1645 *	1460 *	1310 *	1185 *	1080 *	0.273
		4	2250	1980 *	1750 *	1560 *	1405 *	1275 *	1165 *	0.232
		0	2255	1855 *	1575 *	1365 *	1200 *	1070 *	960 *	0.524
	30/5	1	2450	2025 *	1725 *	1495 *	1320 *	1180 *	1060 *	0.407
		2	2630 *	2190 *	1870 *	1625 *	1435 *	1285 *	1165 *	0.333
		3	2805 *	2350 *	2010 *	1755 *	1550 *	1390 *	1260 *	0.282
		4	2970 *	2500 *	2150 *	1880 *	1665 *	1495 *	1355 *	0.244
	30/4	0	1750	1455	1245 *	1080 *	955 *	855 *	765 *	0.699
		1	1920	1615 *	1385 *	1210 *	1070 *	960 *	870 *	0.506
		2	2080	1760 *	1520 *	1330 *	1180 *	1060 *	960 *	0.396
		3	2220	1900 *	1645 *	1450 *	1290 *	1160 *	1055 *	0.325
2 1/2" NW CONC. (ABOVE DECK)	4	2350	2025 *	1770 *	1560 *	1395 *	1255 *	1145 *	0.276	
	0	1495	1260	1080	945 *	840 *	750 *	680 *	0.787	
	1	1640	1400	1215 *	1065 *	950 *	855 *	775 *	0.550	
	2	1775	1530	1335 *	1180 *	1055 *	950 *	865 *	0.422	
2 1/2" LW CONC. (ABOVE DECK)	3	1885	1645 *	1450 *	1285 *	1155 *	1045 *	950 *	0.343	
	4	1990	1750 *	1555 *	1385 *	1250 *	1135 *	1035 *	0.289	
	0	4995	4645	4410	4245	4120	4020	3945	0.787	
	1	5250	4850	4580	4390	4245	4135	4045	0.550	
TYPE I INSUL. FILL	2	5510	5055	4755	4535	4375	4250	4150	0.422	
	3	5765	5260	4925	4685	4505	4365	4250	0.343	
	4	6020	5465	5095	4830	4630	4475	4355	0.289	
	0	2200	1850	1615	1450	1325	1225	1150	0.787	
TYPE II INSUL. FILL	1	2460	2055	1790	1595	1455	1340	1250	0.550	
	2	2715	2260	1960	1745	1580	1455	1355	0.422	
	3	2970	2465	2130	1890	1710	1570	1455	0.343	
	4	3230	2670	2300	2035	1840	1685	1560	0.289	
NO FILL	ALL	0	2470	2120	1885	1720	1595	1495	1420	0.787
		1	2725	2325	2055	1865	1720	1610	1520	0.550
		2	2985	2530	2230	2010	1850	1725	1625	0.422
		3	3240	2735	2400	2160	1980	1840	1725	0.343
4	3495	2940	2570	2305	2105	1950	1830	0.289		

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			2.0	2.5	3.0	3.5	4.0	4.5	5.0
NO FILL	ALL	0.017	2205	1410	980	720	550	435	350

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0149"

SUPPORT FASTENING: Buildex or Elco Textron #12 or #14 TEKS screws

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	
NO FILL (BARE DECK)	35/8	0	1080	840	675	555	475	410	360 *	0.351
		1	1185	955	785	655	565	490 *	435 *	0.273
		2	1260	1050	880	750	645 *	565 *	505 *	0.224
		3	1320	1130	965	830 *	725 *	640 *	570 *	0.189
		4	1365	1195	1035	905 *	795 *	705 *	635 *	0.164
	35/7	0	990	790	645	540	460	400	355 *	0.374
		1	1075	890	745	630	545	480 *	425 *	0.287
		2	1130	970	830	715	625 *	550 *	490 *	0.233
		3	1175	1035	900	790	695 *	615 *	555 *	0.196
		4	1205	1085	960	850 *	755 *	680 *	610 *	0.169
	35/5	0	705	585	485	410	355	310	275	0.511
		1	765	660	570	490	430	380	340 *	0.361
		2	800	715	635	560	495	445 *	400 *	0.280
		3	825	755	680	615	555	500 *	455 *	0.228
		4	840	785	720	660	600 *	550 *	505 *	0.192
	30/7	0	1025	780	620	510	435	375	330 *	0.468
		1	1145	910	740	615	525	455 *	405 *	0.353
		2	1230	1015	840	710	610 *	535 *	475 *	0.284
		3	1295	1100	930	795	690 *	610 *	540 *	0.237
		4	1345	1170	1005	875 *	765 *	680 *	605 *	0.204
	30/5	0	755	595	480	400	340	300	265	0.624
		1	840	700	585	495	430	375	335 *	0.435
		2	895	775	665	575	505	445 *	400 *	0.334
		3	930	830	730	645	570 *	510 *	460 *	0.271
4		955	870	785	700	630 *	565 *	515 *	0.228	
30/4	0	610	500	410	345	300	260	230	0.702	
	1	670	580	495	430	375	335	300	0.472	
	2	705	630	560	495	440	395	355 *	0.356	
	3	725	670	605	550	495	450 *	410 *	0.285	
	4	740	695	640	590	540	495 *	455 *	0.238	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5870	5550	5390	5290	5225	5180	5145	0.702
		1	6190	5760	5550	5420	5335	5270	5225	0.472
		2	6510	5975	5710	5545	5440	5365	5305	0.356
		3	6830	6190	5870	5675	5545	5455	5385	0.285
		4	7150	6400	6030	5805	5655	5545	5465	0.238
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4205	3885	3725	3625	3565	3515	3480	0.702
		1	4525	4100	3885	3755	3670	3610	3560	0.472
		2	4845	4310	4045	3885	3775	3700	3640	0.356
		3	5165	4525	4205	4010	3885	3790	3720	0.285
		4	5485	4740	4365	4140	3990	3880	3800	0.238
TYPE I INSUL. FILL	30/4	0	1415	1090	930	835	770	725	690	0.702
		1	1735	1305	1090	960	875	815	770	0.472
		2	2055	1520	1250	1090	985	905	850	0.356
		3	2375	1730	1410	1220	1090	1000	930	0.285
		4	2695	1945	1570	1345	1195	1090	1010	0.238
TYPE II INSUL. FILL	30/4	0	1680	1360	1200	1100	1040	990	955	0.702
		1	2000	1575	1360	1230	1145	1085	1035	0.472
		2	2320	1785	1520	1360	1250	1175	1115	0.356
		3	2640	2000	1680	1485	1360	1265	1195	0.285
		4	2960	2215	1840	1615	1465	1355	1275	0.238

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.0	1.5	2.0	2.5	3.0	3.5	4.0
NO FILL	ALL	0.011	4465	1985	1115	715	495	365	275

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK
t = design thickness = 0.0179"

SUPPORT FASTENING: Buildex or Elco Textron #12 or #14 TEKS screws

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.5	2.0	2.5	3.0	3.5	4.0	4.5	
NO FILL (BARE DECK)	35/8	0	1105	885	735	625	540	475 *	425 *	0.385
		1	1245	1020	855	730	640 *	565 *	505 *	0.300
		2	1365	1140	965	835 *	730 *	650 *	580 *	0.245
		3	1465	1245	1065 *	925 *	815 *	730 *	655 *	0.208
		4	1545	1335	1160 *	1015 *	900 *	805 *	730 *	0.180
	35/7	0	1045	850	710	605	530	470 *	420 *	0.410
		1	1165	970	825	710	620 *	550 *	495 *	0.315
		2	1265	1075	925	805 *	710 *	630 *	570 *	0.255
		3	1340	1165	1015	890 *	790 *	710 *	640 *	0.215
	35/5	0	770	640	540	465	405	360	325	0.560
		1	865	740	640	560	495	440 *	400 *	0.396
		2	930	820	720	640	570 *	515 *	465 *	0.306
		3	980	885	790	710	640 *	580 *	530 *	0.250
	30/7	0	1030	820	675	570	495	435 *	385 *	0.513
		1	1185	960	800	680	595 *	525 *	470 *	0.387
		2	1310	1085	915	785 *	685 *	610 *	545 *	0.311
		3	1420	1195	1020	885 *	775 *	690 *	620 *	0.260
	30/5	0	785	635	530	450	390	345	310	0.684
		1	910	755	640	555	485	430 *	385 *	0.477
		2	1005	860	740	645	570 *	510 *	460 *	0.366
		3	1075	940	825	730	650 *	585 *	530 *	0.297
	30/4	0	655	540	455	390	345	305	275	0.770
		1	755	645	560	485	430	385	345 *	0.517
		2	820	725	640	570	510	455 *	415 *	0.390
3		870	785	705	635	575 *	525 *	480 *	0.313	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5755	5540	5415	5330	5270	5225	5185	0.770
		1	6010	5735	5565	5455	5380	5320	5275	0.517
		2	6265	5925	5720	5585	5490	5415	5360	0.390
		3	6520	6115	5875	5715	5600	5510	5445	0.313
		4	6780	6310	6030	5840	5705	5605	5530	0.261
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4090	3875	3750	3665	3605	3560	3525	0.770
		1	4345	4070	3905	3795	3715	3655	3610	0.517
		2	4600	4260	4055	3920	3825	3750	3695	0.390
		3	4860	4455	4210	4050	3935	3845	3780	0.313
		4	5115	4645	4365	4175	4045	3945	3865	0.261
TYPE I INSUL. FILL	30/4	0	1295	1085	955	870	810	765	730	0.770
		1	1550	1275	1110	1000	920	860	815	0.517
		2	1810	1470	1265	1130	1030	960	900	0.390
		3	2065	1660	1420	1255	1140	1055	985	0.313
		4	2320	1850	1570	1385	1250	1150	1070	0.261
TYPE II INSUL. FILL	30/4	0	1565	1350	1225	1140	1080	1035	1000	0.770
		1	1820	1545	1380	1270	1190	1130	1085	0.517
		2	2075	1735	1530	1395	1300	1225	1170	0.390
		3	2335	1930	1685	1525	1410	1320	1255	0.313
		4	2590	2120	1840	1650	1520	1420	1340	0.261

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.5	2.0	2.5	3.0	3.5	4.0	4.5
NO FILL	ALL	0.013	2580	1450	930	645	470	360	285

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0239"

SUPPORT FASTENING: Buildex or Elco Textron #12 or #14 TEKS screws

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			2.0	2.5	3.0	3.5	4.0	4.5	5.0	
NO FILL (BARE DECK)	35/8	0	1365	1130	960	835 *	735 *	660 *	590 *	0.445
		1	1545	1295	1105	965 *	855 *	765 *	690 *	0.346
		2	1710	1445	1245 *	1090 *	965 *	865 *	785 *	0.283
		3	1855	1585	1375 *	1205 *	1075 *	965 *	880 *	0.240
		4	1985	1710 *	1495 *	1320 *	1180 *	1065 *	970 *	0.208
	35/7	0	1310	1095	935	815	720 *	645 *	585 *	0.474
		1	1475	1245	1075	940 *	835 *	750 *	680 *	0.364
		2	1615	1385	1200 *	1060 *	945 *	850 *	770 *	0.295
		3	1740	1510	1320 *	1170 *	1045 *	945 *	860 *	0.248
	35/5	0	985	835	715	630	555	500 *	455 *	0.647
		1	1120	965	845	745	665 *	600 *	545 *	0.458
		2	1235	1080	955	850 *	765 *	690 *	630 *	0.354
		3	1325	1180	1055	945 *	855 *	780 *	715 *	0.289
	30/7	0	1260	1040	880	760	670 *	595 *	535 *	0.593
		1	1450	1205	1030	895 *	790 *	705 *	640 *	0.447
		2	1625	1365	1170 *	1020 *	905 *	810 *	735 *	0.359
		3	1780	1510	1305 *	1145 *	1015 *	915 *	830 *	0.300
	30/5	0	980	815	695	605	535	475	430 *	0.791
		1	1145	970	835	730	650 *	580 *	525 *	0.552
		2	1285	1105	960	845 *	755 *	680 *	620 *	0.423
		3	1405	1225	1075	955 *	855 *	775 *	705 *	0.344
	30/4	0	835	705	605	530	470	420	380	0.890
		1	975	840	735	645	575	520 *	475 *	0.598
		2	1090	955	845	755	675 *	615 *	560 *	0.450
3		1175	1050	940	845 *	765 *	700 *	640 *	0.361	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5885	5690	5560	5465	5395	5340	5295	0.890
		1	6145	5895	5730	5610	5525	5455	5400	0.598
		2	6400	6100	5900	5760	5650	5570	5500	0.450
		3	6655	6305	6070	5905	5780	5685	5605	0.361
		4	6915	6510	6245	6050	5910	5795	5710	0.301
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4225	4025	3895	3800	3730	3675	3635	0.890
		1	4480	4230	4065	3950	3860	3790	3735	0.598
		2	4735	4435	4235	4095	3990	3905	3840	0.450
		3	4990	4640	4410	4240	4115	4020	3940	0.361
		4	5250	4845	4580	4390	4245	4135	4045	0.301
TYPE I INSUL. FILL	30/4	0	1430	1235	1100	1010	940	885	840	0.890
		1	1685	1440	1275	1155	1065	1000	945	0.598
		2	1945	1645	1445	1300	1195	1110	1045	0.450
		3	2200	1850	1615	1450	1325	1225	1150	0.361
		4	2455	2055	1785	1595	1450	1340	1250	0.301
TYPE II INSUL. FILL	30/4	0	1700	1500	1370	1275	1205	1150	1110	0.890
		1	1955	1705	1540	1425	1335	1265	1210	0.598
		2	2210	1910	1710	1570	1465	1380	1315	0.450
		3	2465	2115	1885	1715	1590	1495	1415	0.361
		4	2725	2320	2055	1865	1720	1610	1520	0.301

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			2.0	2.5	3.0	3.5	4.0	4.5	5.0
NO FILL	ALL	0.017	2205	1410	980	720	550	435	350

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK
t = design thickness = 0.0149"
SUPPORT FASTENING: Buildex BX-12
SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50 φ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
φ (WIND): 0.70 Ω (WIND): 2.35 φ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
φ (Other): 0.65 Ω (Other): 2.50 φ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	
NO FILL (BARE DECK)	35/8	0	980	765	610	505	430	375	330 *	0.675
		1	1085	880	720	605	520	455 *	400 *	0.436
		2	1160	970	815	695	605 *	530 *	470 *	0.322
		3	1215	1045	900	775	680 *	600 *	535 *	0.256
		4	1255	1105	965	845 *	750 *	665 *	600 *	0.212
	35/7	0	905	720	590	490	420	365	325 *	0.720
		1	985	820	685	585	505	440 *	395 *	0.455
		2	1040	895	770	665	580 *	515 *	460 *	0.332
		3	1080	955	835	735	650 *	580 *	520 *	0.262
		4	1105	1000	895	795	710 *	640 *	575 *	0.216
	35/5	0	645	530	440	375	320	280	250	0.982
		1	700	605	525	455	400	355	315	0.547
		2	735	660	585	520	465	415	375 *	0.379
		3	755	695	630	570	515	470 *	425 *	0.290
		4	770	720	665	615	560	515 *	475 *	0.235
	30/7	0	930	710	565	465	395	340	300	0.900
		1	1050	835	680	570	485	425 *	375 *	0.554
		2	1135	940	780	665	570 *	500 *	445 *	0.400
		3	1195	1020	870	745	650 *	575 *	510 *	0.313
		4	1240	1085	940	820 *	720 *	640 *	575 *	0.257
	30/5	0	685	540	440	365	310	270	240	1.200
		1	770	645	540	460	395	350	310	0.655
		2	820	715	620	535	470	420 *	375 *	0.450
		3	855	765	680	605	535	480 *	435 *	0.343
4		875	805	730	655	590 *	535 *	485 *	0.277	
30/4	0	555	455	375	315	270	235	210	1.351	
	1	610	530	460	400	350	310	275	0.697	
	2	645	585	520	460	415	370	335 *	0.470	
	3	665	615	565	510	465	425 *	385 *	0.354	
	4	675	640	595	550	505	465 *	430 *	0.284	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5785	5490	5345	5255	5200	5155	5125	1.351
		1	6105	5705	5505	5385	5305	5245	5205	0.697
		2	6425	5920	5665	5510	5410	5340	5285	0.470
		3	6745	6130	5825	5640	5520	5430	5365	0.354
		4	7065	6345	5985	5770	5625	5520	5445	0.284
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4120	3825	3680	3595	3535	3490	3460	1.351
		1	4440	4040	3840	3720	3640	3585	3540	0.697
		2	4760	4255	4000	3850	3745	3675	3620	0.470
		3	5080	4465	4160	3975	3855	3765	3700	0.354
		4	5400	4680	4320	4105	3960	3860	3780	0.284
TYPE I INSUL. FILL	30/4	0	1325	1035	885	800	740	700	665	1.351
		1	1645	1245	1045	925	845	790	745	0.697
		2	1965	1460	1205	1055	955	880	825	0.470
		3	2285	1675	1365	1185	1060	975	905	0.354
		4	2605	1885	1525	1310	1165	1065	985	0.284
TYPE II INSUL. FILL	30/4	0	1595	1300	1155	1070	1010	965	935	1.351
		1	1915	1515	1315	1195	1115	1060	1015	0.697
		2	2235	1730	1475	1325	1220	1150	1095	0.470
		3	2555	1940	1635	1450	1330	1240	1175	0.354
		4	2875	2155	1795	1580	1435	1335	1255	0.284

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

φ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.0	1.5	2.0	2.5	3.0	3.5	4.0
NO FILL	ALL	0.011	4465	1985	1115	715	495	365	275

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK
 t = design thickness = 0.0179"
 SUPPORT FASTENING: Buildex BX-12
 SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50 φ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 φ (WIND): 0.70 Ω (WIND): 2.35 φ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 φ (Other): 0.65 Ω (Other): 2.50 φ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.5	2.0	2.5	3.0	3.5	4.0	4.5	
NO FILL (BARE DECK)	35/8	0	990	795	655	560	485	425 *	380 *	0.740
		1	1130	925	775	665	580 *	515 *	460 *	0.478
		2	1245	1040	885	765 *	670 *	595 *	535 *	0.353
		3	1335	1145	985	860 *	760 *	675 *	610 *	0.280
		4	1415	1230	1070 *	945 *	840 *	750 *	680 *	0.232
	35/7	0	935	760	635	545	475	420 *	375 *	0.789
		1	1055	880	750	645	565 *	505 *	450 *	0.499
		2	1150	980	845	740 *	650 *	580 *	525 *	0.364
		3	1220	1065	935	825 *	730 *	655 *	595 *	0.287
		4	1280	1135	1010	900 *	805 *	725 *	660 *	0.237
	35/5	0	685	570	485	415	365	325	290	1.077
		1	780	670	580	510	450	405	365 *	0.600
		2	845	750	660	590	525	475 *	430 *	0.415
		3	890	805	725	655	595 *	540 *	495 *	0.318
		4	925	850	780	710	650 *	595 *	550 *	0.257
	30/7	0	920	730	605	510	440	390	345 *	0.987
		1	1075	870	730	620	540	480 *	430 *	0.607
		2	1200	995	840	725	635 *	565 *	505 *	0.439
		3	1300	1100	945	820 *	720 *	645 *	580 *	0.343
		4	1385	1195	1035	910 *	805 *	720 *	650 *	0.282
	30/5	0	700	570	475	405	350	310	275	1.316
		1	825	690	585	505	445	395	355 *	0.718
		2	915	785	680	595	530	475 *	425 *	0.493
		3	980	865	765	675	605 *	545 *	495 *	0.376
4		1030	925	830	745 *	675 *	610 *	560 *	0.304	
30/4	0	585	485	410	350	305	270	245	1.480	
	1	685	590	510	445	395	350	320	0.764	
	2	745	665	590	525	470	425 *	385 *	0.515	
	3	790	720	650	590	535	485 *	445 *	0.388	
	4	820	760	700	640	590 *	540 *	500 *	0.312	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5665	5475	5360	5285	5230	5190	5160	1.480
		1	5920	5665	5515	5410	5340	5285	5245	0.764
		2	6175	5860	5670	5540	5450	5380	5330	0.515
		3	6435	6050	5820	5670	5560	5480	5415	0.388
		4	6690	6245	5975	5795	5670	5575	5500	0.312
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4000	3810	3695	3620	3565	3525	3495	1.480
		1	4255	4005	3850	3750	3675	3620	3580	0.764
		2	4515	4195	4005	3875	3785	3720	3665	0.515
		3	4770	4385	4160	4005	3895	3815	3750	0.388
		4	5025	4580	4310	4135	4005	3910	3835	0.312
TYPE I INSUL. FILL	30/4	0	1205	1015	905	825	775	730	700	1.480
		1	1465	1210	1055	955	885	830	785	0.764
		2	1720	1400	1210	1085	995	925	870	0.515
		3	1975	1595	1365	1210	1100	1020	955	0.388
		4	2230	1785	1520	1340	1210	1115	1040	0.312
TYPE II INSUL. FILL	30/4	0	1475	1285	1170	1095	1040	1000	970	1.480
		1	1730	1480	1325	1225	1150	1095	1055	0.764
		2	1990	1670	1480	1350	1260	1195	1140	0.515
		3	2245	1860	1635	1480	1370	1290	1225	0.38
		4	2500	2055	1785	1610	1480	1385	1310	0.312

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

φ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.5	2.0	2.5	3.0	3.5	4.0	4.5
NO FILL	ALL	0.013	2580	1450	930	645	470	360	285

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK
t = design thickness = 0.0239"
SUPPORT FASTENING: Buildex BX-12
SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			2.0	2.5	3.0	3.5	4.0	4.5	5.0	
NO FILL (BARE DECK)	35/8	0	1185	980	835	725	640 *	570 *	515 *	0.855
		1	1360	1140	975	850 *	755 *	675 *	610 *	0.553
		2	1520	1290	1110	975 *	865 *	780 *	705 *	0.408
		3	1660	1425	1240 *	1090 *	975 *	875 *	795 *	0.324
		4	1780	1545	1355 *	1200 *	1075 *	970 *	885 *	0.268
	35/7	0	1135	950	810	705	625	560 *	505 *	0.912
		1	1295	1100	950	830 *	735 *	660 *	600 *	0.576
		2	1435	1235	1075	945 *	845 *	760 *	690 *	0.421
		3	1555	1355	1190 *	1055 *	945 *	855 *	780 *	0.332
		4	1655	1460	1295 *	1155 *	1040 *	945 *	865 *	0.274
	35/5	0	850	720	620	545	485	435	395	1.244
		1	990	855	745	660	590	530 *	485 *	0.693
		2	1095	965	855	765	685 *	625 *	570 *	0.480
		3	1180	1055	950	855 *	775 *	710 *	650 *	0.367
		4	1245	1135	1030	935 *	855 *	785 *	725 *	0.297
	30/7	0	1090	900	760	660	580	515 *	465 *	1.140
		1	1280	1065	910	790	700 *	625 *	565 *	0.702
		2	1450	1220	1050	920 *	815 *	730 *	660 *	0.507
		3	1595	1360	1180 *	1035 *	925 *	830 *	755 *	0.397
		4	1725	1490	1300 *	1150 *	1030 *	925 *	845 *	0.326
	30/5	0	850	705	600	525	465	415	370	1.520
		1	1010	860	740	650	575	515 *	470 *	0.829
		2	1145	990	865	765	680 *	615 *	560 *	0.570
		3	1255	1105	975	870 *	780 *	710 *	645 *	0.434
4		1345	1200	1070	965 *	870 *	795 *	730 *	0.351	
30/4	0	725	610	525	460	405	365	330	1.711	
	1	865	745	650	575	515	465	420 *	0.883	
	2	970	855	760	680	610	555 *	505 *	0.595	
	3	1050	945	850	770	700 *	640 *	585 *	0.449	
	4	1110	1015	925	845 *	775 *	715 *	660 *	0.360	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5755	5585	5470	5390	5330	5280	5245	1.711
		1	6010	5790	5640	5535	5460	5395	5345	0.883
		2	6270	5995	5815	5685	5585	5510	5450	0.595
		3	6525	6200	5985	5830	5715	5625	5550	0.449
		4	6780	6405	6155	5975	5845	5740	5655	0.360
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4090	3920	3805	3725	3665	3620	3580	1.711
		1	4345	4125	3980	3875	3795	3735	3685	0.883
		2	4605	4330	4150	4020	3920	3845	3785	0.595
		3	4860	4535	4320	4165	4050	3960	3890	0.449
		4	5115	4740	4490	4315	4180	4075	3990	0.360
TYPE I INSUL. FILL	30/4	0	1300	1130	1015	935	870	825	785	1.711
		1	1555	1335	1185	1080	1000	940	890	0.883
		2	1810	1540	1355	1225	1130	1055	995	0.595
		3	2065	1745	1525	1375	1255	1165	1095	0.449
		4	2325	1950	1700	1520	1385	1280	1200	0.360
TYPE II INSUL. FILL	30/4	0	1565	1395	1280	1200	1140	1095	1055	1.711
		1	1820	1600	1455	1350	1270	1210	1160	0.883
		2	2080	1805	1625	1495	1395	1320	1260	0.595
		3	2335	2010	1795	1640	1525	1435	1365	0.449
		4	2590	2215	1965	1790	1655	1550	1465	0.360

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			2.0	2.5	3.0	3.5	4.0	4.5	5.0
NO FILL	ALL	0.017	2205	1410	980	720	550	435	350

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK
t = design thickness = 0.0149"
SUPPORT FASTENING: Buildex BX-14
SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	
NO FILL (BARE DECK)	35/8	0	1040	810	650	535	455	395	350 *	0.675
		1	1145	925	760	635	545	475 *	420 *	0.436
		2	1220	1020	855	730	630 *	550 *	490 *	0.322
		3	1275	1095	940	810	705 *	625 *	555 *	0.256
		4	1320	1160	1010	880 *	775 *	690 *	620 *	0.212
	35/7	0	955	765	620	520	445	385	340 *	0.720
		1	1040	865	720	615	530	465 *	410 *	0.455
		2	1095	940	805	695	605 *	535 *	480 *	0.332
		3	1135	1000	875	765	675 *	600 *	540 *	0.262
		4	1165	1050	935	830 *	740 *	660 *	600 *	0.216
	35/5	0	680	560	465	395	340	300	265	0.982
		1	740	640	550	475	415	370	330 *	0.547
		2	775	695	615	545	485	435 *	390 *	0.379
		3	795	730	665	595	540	490 *	445 *	0.290
		4	810	760	700	640	585 *	535 *	490 *	0.235
	30/7	0	985	755	600	495	420	360	320 *	0.900
		1	1105	880	715	595	510	445 *	390 *	0.554
		2	1190	985	815	690	595 *	520 *	465 *	0.400
		3	1255	1065	905	775	675 *	595 *	530 *	0.313
		4	1305	1135	980	855 *	750 *	665 *	595 *	0.257
	30/5	0	725	575	465	385	330	285	255	1.200
		1	810	675	565	480	415	365	325 *	0.655
		2	865	750	645	560	490	435 *	390 *	0.450
		3	900	805	710	630	555	500 *	450 *	0.343
4		925	845	760	685	615 *	555 *	505 *	0.277	
30/4	0	585	480	395	335	285	250	225	1.351	
	1	645	560	480	415	365	325	290	0.697	
	2	680	610	545	485	430	385	350 *	0.470	
	3	700	645	590	535	485	440 *	400 *	0.354	
	4	715	670	625	575	525	485 *	445 *	0.284	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5835	5525	5370	5275	5215	5170	5135	1.351
		1	6155	5740	5530	5405	5320	5260	5215	0.697
		2	6475	5950	5690	5535	5430	5355	5295	0.470
		3	6795	6165	5850	5660	5535	5445	5375	0.354
		4	7115	6380	6010	5790	5640	5535	5455	0.284
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4175	3860	3705	3615	3550	3505	3475	1.351
		1	4495	4075	3865	3740	3660	3600	3555	0.697
		2	4815	4290	4025	3870	3765	3690	3635	0.470
		3	5130	4500	4185	3995	3870	3780	3715	0.354
		4	5450	4715	4345	4125	3980	3870	3795	0.284
TYPE I INSUL. FILL	30/4	0	1380	1070	915	820	760	715	680	1.351
		1	1700	1280	1075	950	865	805	760	0.697
		2	2020	1495	1235	1075	970	895	840	0.470
		3	2340	1710	1395	1205	1080	990	920	0.354
		4	2660	1920	1555	1330	1185	1080	1000	0.284
TYPE II INSUL. FILL	30/4	0	1650	1335	1180	1090	1025	980	950	1.351
		1	1970	1550	1340	1215	1135	1075	1030	0.697
		2	2290	1765	1500	1345	1240	1165	1110	0.470
		3	2605	1975	1660	1470	1345	1255	1190	0.354
		4	2925	2190	1820	1600	1455	1345	1270	0.284

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.0	1.5	2.0	2.5	3.0	3.5	4.0
NO FILL	ALL	0.011	4465	1985	1115	715	495	365	275

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK
t = design thickness = 0.0179"
SUPPORT FASTENING: Buildex BX-14
SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50 φ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
φ (WIND): 0.70 Ω (WIND): 2.35 φ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
φ (Other): 0.65 Ω (Other): 2.50 φ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.5	2.0	2.5	3.0	3.5	4.0	4.5	
NO FILL (BARE DECK)	35/8	0	1050	840	695	590	515	455 *	405 *	0.740
		1	1190	975	815	700	610 *	540 *	485 *	0.478
		2	1305	1090	925	800 *	700 *	625 *	560 *	0.353
		3	1400	1195	1025	895 *	790 *	705 *	635 *	0.280
	35/7	4	1480	1280	1115 *	980 *	870 *	780 *	705 *	0.232
		0	990	805	675	575	500	445 *	395 *	0.789
		1	1110	925	785	680	595 *	530 *	475 *	0.499
		2	1205	1030	885	770 *	680 *	610 *	550 *	0.364
	35/5	3	1285	1115	975	855 *	760 *	685 *	620 *	0.287
		4	1345	1190	1050	935 *	835 *	755 *	685 *	0.237
		0	730	605	510	440	385	345	310	1.077
		1	825	705	610	535	470	420 *	380 *	0.600
	30/7	2	890	785	695	615	550 *	495 *	450 *	0.415
		3	940	845	760	685	615 *	560 *	510 *	0.318
		4	975	895	815	740 *	675 *	620 *	570 *	0.257
		0	975	775	640	540	470	415	365 *	0.987
	30/5	1	1130	915	765	650	565 *	500 *	450 *	0.607
		2	1255	1040	880	755 *	660 *	585 *	525 *	0.439
		3	1360	1150	985	855 *	750 *	670 *	600 *	0.343
		4	1445	1245	1075 *	940 *	835 *	745 *	675 *	0.282
	30/4	0	745	600	500	425	370	330	290	1.316
		1	865	725	615	530	465	415	370 *	0.718
		2	960	825	710	625	550 *	490 *	445 *	0.493
		3	1030	905	795	705	630 *	565 *	515 *	0.376
2 1/2" NW CONC. (ABOVE DECK)	4	1080	970	865	775 *	700 *	635 *	575 *	0.304	
	0	620	515	435	370	325	290	260	1.480	
	1	720	615	535	465	410	370	335 *	0.764	
	2	785	695	615	545	490	440 *	400 *	0.515	
2 1/2" LW CONC. (ABOVE DECK)	3	830	755	680	615	555 *	505 *	460 *	0.388	
	4	860	795	730	670	610 *	560 *	515 *	0.312	
	0	5710	5510	5385	5305	5250	5205	5175	1.480	
	1	5965	5700	5540	5435	5360	5300	5260	0.764	
TYPE I INSUL. FILL	2	6220	5890	5695	5565	5470	5400	5345	0.515	
	3	6480	6085	5850	5690	5580	5495	5430	0.388	
	4	6735	6275	6000	5820	5690	5590	5515	0.312	
	0	4045	3845	3725	3645	3585	3540	3510	1.480	
TYPE II INSUL. FILL	1	4300	4035	3875	3770	3695	3640	3595	0.764	
	2	4560	4230	4030	3900	3805	3735	3680	0.515	
	3	4815	4420	4185	4025	3915	3830	3765	0.388	
	4	5070	4615	4340	4155	4025	3925	3850	0.312	
TYPE I INSUL. FILL	0	1250	1050	930	850	790	750	715	1.480	
	1	1510	1245	1085	980	900	845	800	0.764	
	2	1765	1435	1240	1105	1010	940	885	0.515	
	3	2020	1625	1390	1235	1120	1035	970	0.388	
TYPE II INSUL. FILL	4	2275	1820	1545	1360	1230	1135	1055	0.312	
	0	1520	1320	1200	1120	1060	1015	985	1.480	
	1	1775	1510	1350	1245	1170	1115	1070	0.764	
	2	2035	1705	1505	1375	1280	1210	1155	0.515	
TYPE II INSUL. FILL	3	2290	1895	1660	1500	1390	1305	1240	0.388	
	4	2545	2090	1815	1630	1500	1400	1325	0.312	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

φ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.5	2.0	2.5	3.0	3.5	4.0	4.5
NO FILL	ALL	0.013	2580	1450	930	645	470	360	285

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK
t = design thickness = 0.0239"
SUPPORT FASTENING: Buildex BX-14
SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			2.0	2.5	3.0	3.5	4.0	4.5	5.0	
NO FILL (BARE DECK)	35/8	0	1255	1040	880	765	675 *	605 *	545 *	0.855
		1	1435	1200	1025	895 *	790 *	710 *	640 *	0.553
		2	1595	1350	1165 *	1020 *	905 *	810 *	735 *	0.408
		3	1735	1485	1290 *	1135 *	1010 *	910 *	830 *	0.324
	35/7	4	1860	1610	1410 *	1245 *	1115 *	1005 *	915 *	0.268
		0	1205	1005	860	750	660 *	595 *	535 *	0.912
		1	1365	1155	995	870 *	775 *	695 *	630 *	0.576
		2	1505	1290	1125 *	990 *	880 *	795 *	720 *	0.421
	35/5	3	1625	1415	1240 *	1100 *	985 *	890 *	810 *	0.332
		4	1730	1520	1345 *	1200 *	1080 *	980 *	895 *	0.274
		0	905	765	660	575	510	460	415 *	1.244
		1	1040	895	785	690	620	555 *	505 *	0.693
	30/7	2	1150	1010	895	795	715 *	650 *	595 *	0.480
		3	1235	1105	990	890 *	805 *	735 *	675 *	0.367
		4	1305	1185	1070	975 *	890 *	815 *	750 *	0.297
		0	1155	955	805	700	615	550 *	490 *	1.140
	30/5	1	1345	1120	955	830 *	735 *	655 *	595 *	0.702
		2	1515	1275	1095	955 *	850 *	760 *	690 *	0.507
		3	1665	1420	1230 *	1080 *	960 *	860 *	780 *	0.397
		4	1800	1550	1350 *	1195 *	1065 *	960 *	875 *	0.326
	30/4	0	900	750	640	555	490	440	395	1.520
		1	1065	900	775	680	605	540 *	490 *	0.829
		2	1200	1035	900	795	710 *	640 *	580 *	0.570
		3	1315	1150	1015	900 *	810 *	735 *	670 *	0.434
2 1/2" NW CONC. (ABOVE DECK)	4	1405	1250	1115	1000 *	905 *	820 *	750 *	0.351	
	0	765	645	555	485	430	385	350	1.711	
	1	905	780	680	600	540	485	440 *	0.883	
	2	1015	895	790	705	635 *	575 *	525 *	0.595	
2 1/2" LW CONC. (ABOVE DECK)	3	1100	985	885	800	725 *	660 *	605 *	0.449	
	4	1165	1060	965	880 *	805 *	740 *	680 *	0.360	
	0	5805	5625	5505	5420	5355	5305	5265	1.711	
	1	6060	5830	5675	5565	5485	5420	5365	0.883	
TYPE I INSUL. FILL	2	6320	6035	5845	5710	5610	5535	5470	0.595	
	3	6575	6240	6020	5860	5740	5645	5575	0.449	
	4	6830	6445	6190	6005	5870	5760	5675	0.360	
	0	4140	3960	3840	3755	3690	3640	3600	1.711	
TYPE II INSUL. FILL	1	4400	4165	4010	3900	3820	3755	3705	0.883	
	2	4655	4370	4185	4050	3950	3870	3805	0.595	
	3	4910	4575	4355	4195	4075	3985	3910	0.449	
	4	5170	4780	4525	4340	4205	4095	4010	0.360	
TYPE I INSUL. FILL	0	1350	1170	1050	960	900	850	810	1.711	
	1	1605	1375	1220	1110	1025	960	910	0.883	
	2	1860	1580	1390	1255	1155	1075	1015	0.595	
	3	2120	1785	1560	1400	1280	1190	1115	0.449	
TYPE II INSUL. FILL	4	2375	1990	1730	1550	1410	1305	1220	0.360	
	0	1615	1435	1315	1230	1165	1115	1075	1.711	
	1	1875	1640	1485	1375	1295	1230	1180	0.883	
	2	2130	1845	1660	1525	1425	1345	1280	0.595	
TYPE II INSUL. FILL	3	2385	2050	1830	1670	1550	1460	1385	0.449	
	4	2645	2255	2000	1815	1680	1570	1485	0.360	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			2.0	2.5	3.0	3.5	4.0	4.5	5.0
NO FILL	ALL	0.017	2205	1410	980	720	550	435	350

NOTE: ASD Required Strength (Service Applied Load) <= Minimum (Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling))
LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0149"

SUPPORT FASTENING: Pneutek SDK61-series (0.113" to 0.155" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65

Ω (EQ): 2.50

φ (FILLED, EQ): 0.50

Ω (FILLED, EQ): 3.25

φ (WIND): 0.70

Ω (WIND): 2.35

φ (FILLED, WIND): 0.50

Ω (FILLED, WIND): 3.25

φ (Other): 0.65

Ω (Other): 2.50

φ (FILLED, Other): 0.50

Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	
NO FILL (BARE DECK)	35/8	0	1065	825	660	550	465	405	355 *	0.810
		1	1165	945	775	650	555	485 *	430 *	0.489
		2	1245	1040	870	740	640 *	560 *	500 *	0.350
		3	1300	1115	955	820 *	715 *	630 *	565 *	0.273
		4	1345	1180	1025	895 *	785 *	700 *	625 *	0.223
	35/7	0	975	780	635	530	455	395	350 *	0.864
		1	1060	880	735	625	540	470 *	420 *	0.508
		2	1115	960	820	705	615 *	545 *	485 *	0.360
		3	1160	1020	890	780	685 *	610 *	550 *	0.279
		4	1190	1070	950	840 *	750 *	670 *	605 *	0.227
	35/5	0	695	575	475	405	350	305	270	1.179
		1	755	650	560	485	425	375	335 *	0.603
		2	790	705	625	555	490	440 *	395 *	0.405
		3	810	745	675	605	545	495 *	450 *	0.305
		4	825	770	710	650	595 *	545 *	500 *	0.245
	30/7	0	1010	770	610	505	425	370	325 *	1.080
		1	1125	895	730	605	520	450 *	400 *	0.617
		2	1215	1000	830	700	605 *	530 *	470 *	0.432
		3	1280	1085	920	790	685 *	605 *	535 *	0.332
		4	1325	1155	995	865 *	760 *	670 *	600 *	0.270
	30/5	0	740	585	475	395	335	295	260	1.440
		1	825	690	575	490	420	370	330 *	0.720
		2	880	765	655	570	500	440 *	395 *	0.480
		3	915	820	720	635	565	505 *	455 *	0.360
4		940	860	775	695	625 *	560 *	510 *	0.288	
30/4	0	600	490	405	340	295	255	225	1.621	
	1	660	570	490	425	370	330	295	0.763	
	2	695	625	555	490	435	390	355 *	0.499	
	3	715	660	600	545	490	445 *	405 *	0.370	
	4	730	685	635	585	535	490 *	450 *	0.295	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5855	5540	5380	5285	5220	5175	5140	1.621
		1	6175	5750	5540	5415	5330	5270	5220	0.763
		2	6495	5965	5700	5540	5435	5360	5300	0.499
		3	6815	6180	5860	5670	5540	5450	5380	0.370
		4	7135	6390	6020	5795	5650	5540	5460	0.295
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4195	3875	3715	3620	3560	3515	3480	1.621
		1	4510	4090	3875	3750	3665	3605	3560	0.763
		2	4830	4300	4035	3875	3770	3695	3640	0.499
		3	5150	4515	4195	4005	3880	3785	3720	0.370
		4	5470	4730	4355	4135	3985	3880	3800	0.295
TYPE I INSUL. FILL	30/4	0	1400	1080	925	830	765	720	685	1.621
		1	1720	1295	1085	955	870	810	765	0.763
		2	2040	1510	1245	1085	980	900	845	0.499
		3	2360	1720	1405	1210	1085	995	925	0.370
		4	2680	1935	1565	1340	1190	1085	1005	0.295
TYPE II INSUL. FILL	30/4	0	1670	1350	1190	1095	1035	990	955	1.621
		1	1985	1565	1350	1225	1140	1080	1035	0.763
		2	2305	1775	1510	1350	1245	1170	1115	0.499
		3	2625	1990	1670	1480	1355	1260	1195	0.370
		4	2945	2205	1830	1610	1460	1355	1275	0.295

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

φ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.0	1.5	2.0	2.5	3.0	3.5	4.0
NO FILL	ALL	0.011	4465	1985	1115	715	495	365	275

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0179"

SUPPORT FASTENING: Pneutek SDK61-series (0.113" to 0.155" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65

Ω (EQ): 2.50

φ (FILLED, EQ): 0.50

Ω (FILLED, EQ): 3.25

φ (WIND): 0.70

Ω (WIND): 2.35

φ (FILLED, WIND): 0.50

Ω (FILLED, WIND): 3.25

φ (Other): 0.65

Ω (Other): 2.50

φ (FILLED, Other): 0.50

Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.5	2.0	2.5	3.0	3.5	4.0	4.5	
NO FILL (BARE DECK)	35/8	0	1040	835	690	585	510	450 *	400 *	0.888
		1	1180	965	810	695	605 *	535 *	480 *	0.536
		2	1295	1085	920	795 *	695 *	620 *	555 *	0.384
		3	1390	1185	1020	890 *	785 *	700 *	630 *	0.299
	35/7	4	1470	1275	1110 *	975 *	865 *	775 *	700 *	0.245
		0	980	800	670	570	495	440 *	395 *	0.947
		1	1100	920	780	675	590 *	525 *	470 *	0.557
		2	1195	1020	880	765 *	675 *	605 *	545 *	0.395
	35/5	3	1275	1110	965	850 *	755 *	680 *	615 *	0.306
		4	1335	1180	1045	930 *	830 *	750 *	680 *	0.249
		0	720	600	505	435	385	340	305	1.292
		1	815	700	605	530	470	420 *	380 *	0.661
	30/7	2	885	780	690	610	545 *	490 *	445 *	0.444
		3	930	840	755	680	615 *	555 *	510 *	0.334
		4	965	885	810	735	675 *	615 *	565 *	0.268
		0	965	770	635	535	465	410	365 *	1.184
	30/5	1	1120	910	760	645	565 *	495 *	445 *	0.677
		2	1245	1035	870	750 *	655 *	580 *	525 *	0.474
		3	1350	1140	975	845 *	745 *	665 *	600 *	0.364
		4	1435	1235	1070 *	935 *	830 *	740 *	670 *	0.296
	30/4	0	735	595	495	425	370	325	290	1.579
		1	860	720	610	525	460	410	370 *	0.789
		2	950	820	705	620	545 *	490 *	440 *	0.526
		3	1020	900	790	700	625 *	560 *	510 *	0.395
2 1/2" NW CONC. (ABOVE DECK)	4	1070	960	860	770 *	695 *	630 *	575 *	0.316	
	0	615	510	430	370	320	285	255	1.777	
	1	715	610	530	465	410	365	330 *	0.836	
	2	780	690	610	545	485	440 *	400 *	0.547	
2 1/2" LW CONC. (ABOVE DECK)	3	825	745	675	610	550 *	500 *	460 *	0.406	
	4	855	790	725	665	610 *	560 *	515 *	0.323	
	0	4040	3840	3720	3640	3580	3540	3505	1.777	
	1	4295	4030	3875	3765	3690	3635	3590	0.836	
TYPE I INSUL. FILL	30/4	2	4550	4225	4025	3895	3800	3730	3675	0.547
		3	4805	4415	4180	4025	3910	3830	3765	0.406
		4	5065	4605	4335	4150	4020	3925	3850	0.323
		0	1245	1045	925	845	790	745	715	1.777
TYPE II INSUL. FILL	30/4	1	1500	1240	1080	975	900	840	800	0.836
		2	1755	1430	1235	1100	1010	940	885	0.547
		3	2015	1620	1385	1230	1120	1035	970	0.406
		4	2270	1815	1540	1360	1230	1130	1055	0.323
NO FILL	ALL	0	1515	1315	1195	1115	1055	1015	980	1.777
		1	1770	1505	1350	1245	1165	1110	1065	0.836
		2	2025	1700	1500	1370	1275	1205	1150	0.547
		3	2280	1890	1655	1500	1385	1305	1240	0.406
4	2540	2080	1810	1625	1495	1400	1325	0.323		

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

φ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.5	2.0	2.5	3.0	3.5	4.0	4.5
NO FILL	ALL	0.013	2580	1450	930	645	470	360	285

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK
 t = design thickness = 0.0239"

SUPPORT FASTENING: Pneutek SDK61-series (0.113" to 0.155" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50 φ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 φ (WIND): 0.70 Ω (WIND): 2.35 φ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 φ (Other): 0.65 Ω (Other): 2.50 φ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			2.0	2.5	3.0	3.5	4.0	4.5	5.0	
NO FILL (BARE DECK)	35/8	0	1210	1000	850	740	650 *	585 *	525 *	1.026
		1	1390	1165	995	870 *	770 *	690 *	625 *	0.620
		2	1550	1310	1130 *	990 *	880 *	790 *	715 *	0.444
		3	1690	1450	1260 *	1110 *	990 *	890 *	810 *	0.346
	35/7	4	1810	1570	1375 *	1220 *	1090 *	985 *	895 *	0.283
		0	1160	970	830	720	640 *	570 *	515 *	1.094
		1	1320	1120	965	845 *	750 *	675 *	610 *	0.644
		2	1460	1255	1090	965 *	860 *	775 *	705 *	0.456
	35/5	3	1580	1375	1210 *	1070 *	960 *	870 *	790 *	0.353
		4	1685	1485	1315 *	1175 *	1055 *	960 *	875 *	0.288
		0	870	735	635	555	495	445	400	1.493
		1	1010	870	760	670	600	540 *	490 *	0.764
	30/7	2	1115	980	870	775	700 *	635 *	580 *	0.513
		3	1200	1075	965	870 *	785 *	720 *	660 *	0.386
		4	1270	1150	1045	950 *	870 *	795 *	735 *	0.310
		0	1115	920	780	675	595	530 *	475 *	1.368
	30/5	1	1305	1085	925	805	715 *	640 *	575 *	0.782
		2	1475	1240	1065	935 *	825 *	740 *	670 *	0.547
		3	1625	1385	1200 *	1055 *	935 *	840 *	765 *	0.421
		4	1755	1515	1320 *	1165 *	1040 *	940 *	855 *	0.342
	30/4	0	865	720	615	535	475	425	380	1.824
		1	1030	875	755	660	585	525 *	475 *	0.912
		2	1165	1005	880	775	695 *	625 *	570 *	0.608
		3	1280	1120	990	880 *	790 *	715 *	655 *	0.456
2 1/2" NW CONC. (ABOVE DECK)	30/4	4	1370	1220	1090	975 *	885 *	805 *	735 *	0.365
		0	740	625	535	470	415	375	335	2.053
		1	880	760	660	585	525	470	430 *	0.966
		2	985	870	770	690	620	565 *	515 *	0.632
2 1/2" LW CONC. (ABOVE DECK)	30/4	3	1070	960	865	780	710 *	645 *	595 *	0.469
		4	1130	1030	940	860 *	785 *	725 *	670 *	0.373
		0	5775	5600	5485	5400	5340	5290	5250	2.053
		1	6030	5805	5655	5550	5465	5405	5355	0.966
TYPE I INSUL. FILL	30/4	2	6285	6010	5825	5695	5595	5520	5455	0.632
		3	6545	6215	5995	5840	5725	5635	5560	0.469
		4	6800	6420	6170	5990	5850	5745	5665	0.373
		0	4110	3935	3820	3735	3675	3625	3590	2.053
TYPE II INSUL. FILL	30/4	1	4365	4140	3990	3885	3805	3740	3690	0.966
		2	4625	4345	4160	4030	3930	3855	3795	0.632
		3	4880	4550	4335	4175	4060	3970	3895	0.469
		4	5135	4755	4505	4325	4190	4085	4000	0.373
TYPE I INSUL. FILL	30/4	0	1315	1145	1025	945	880	835	795	2.053
		1	1575	1350	1200	1090	1010	950	900	0.966
		2	1830	1555	1370	1235	1140	1060	1000	0.632
		3	2085	1760	1540	1385	1265	1175	1105	0.469
TYPE II INSUL. FILL	30/4	4	2345	1965	1710	1530	1395	1290	1205	0.373
		0	1585	1410	1295	1210	1150	1100	1065	2.053
		1	1840	1615	1465	1360	1280	1215	1165	0.966
		2	2100	1820	1635	1505	1405	1330	1270	0.632
TYPE II INSUL. FILL	30/4	3	2355	2025	1810	1650	1535	1445	1370	0.469
		4	2610	2230	1980	1800	1665	1560	1475	0.373

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

φ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			2.0	2.5	3.0	3.5	4.0	4.5	5.0
NO FILL	ALL	0.017	2205	1410	980	720	550	435	350

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0149"

SUPPORT FASTENING: Pneutek SDK63-series (0.155" to 0.25" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	
NO FILL (BARE DECK)	35/8	0	1200	935	750	620	525	455 *	405 *	0.810
		1	1305	1050	860	720	615 *	535 *	475 *	0.489
		2	1385	1150	960	815	700 *	615 *	545 *	0.350
		3	1450	1230	1045	895 *	780 *	685 *	610 *	0.273
		4	1495	1300	1120	975 *	855 *	755 *	675 *	0.223
	35/7	0	1105	880	720	600	515	445 *	395 *	0.864
		1	1185	980	820	695	600 *	525 *	465 *	0.508
		2	1250	1065	905	780	675 *	595 *	530 *	0.360
		3	1295	1130	980	855 *	750 *	665 *	595 *	0.279
		4	1330	1185	1045	920 *	815 *	730 *	655 *	0.227
	35/5	0	785	650	540	455	395	345	305	1.179
		1	845	730	625	540	470	415	370 *	0.603
		2	885	785	690	610	540	480 *	435 *	0.405
		3	910	830	745	665	595 *	540 *	490 *	0.305
		4	925	860	785	715	650 *	590 *	540 *	0.245
	30/7	0	1140	870	690	570	480	415	365 *	1.080
		1	1260	995	810	675	575 *	500 *	440 *	0.617
		2	1350	1105	915	770	660 *	580 *	510 *	0.432
		3	1420	1195	1005	860 *	745 *	655 *	580 *	0.332
		4	1475	1270	1085	940 *	820 *	725 *	645 *	0.270
	30/5	0	835	660	535	445	380	330	290	1.440
		1	925	765	640	540	465	410	365 *	0.720
		2	985	845	725	625	545	480 *	430 *	0.480
		3	1025	905	790	695	615 *	545 *	490 *	0.360
4		1050	950	850	755	675 *	605 *	550 *	0.288	
30/4	0	675	555	455	385	330	290	255	1.621	
	1	740	635	545	470	410	360	325 *	0.763	
	2	775	695	610	540	480	425 *	385 *	0.499	
	3	800	735	660	595	535	485 *	440 *	0.370	
	4	815	760	700	640	585 *	530 *	490 *	0.295	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5980	5620	5440	5335	5265	5210	5175	1.621
		1	6300	5835	5600	5460	5370	5305	5255	0.763
		2	6620	6050	5760	5590	5475	5395	5335	0.499
		3	6940	6260	5920	5720	5585	5485	5415	0.370
		4	7260	6475	6080	5845	5690	5575	5495	0.295
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4315	3955	3780	3670	3600	3550	3510	1.621
		1	4635	4170	3940	3800	3705	3640	3590	0.763
		2	4955	4385	4100	3925	3810	3730	3670	0.499
		3	5275	4595	4260	4055	3920	3820	3750	0.370
		4	5595	4810	4420	4185	4025	3915	3830	0.295
TYPE I INSUL. FILL	30/4	0	1525	1165	985	875	805	755	715	1.621
		1	1840	1375	1145	1005	910	845	795	0.763
		2	2160	1590	1305	1135	1020	935	875	0.499
		3	2480	1805	1465	1260	1125	1030	955	0.370
		4	2800	2015	1625	1390	1230	1120	1035	0.295
TYPE II INSUL. FILL	30/4	0	1790	1430	1255	1145	1075	1025	985	1.621
		1	2110	1645	1415	1275	1180	1115	1065	0.763
		2	2430	1860	1575	1400	1265	1205	1145	0.499
		3	2750	2070	1735	1530	1395	1295	1225	0.370
		4	3070	2285	1895	1660	1500	1390	1305	0.295

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.0	1.5	2.0	2.5	3.0	3.5	4.0
NO FILL	ALL	0.011	4465	1985	1115	715	495	365	275

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK
 t = design thickness = 0.0179"

SUPPORT FASTENING: Pneutek SDK63-series (0.155" to 0.25" support steel)
 SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.5	2.0	2.5	3.0	3.5	4.0	4.5	
NO FILL (BARE DECK)	35/8	0	1175	940	780	660	575 *	505 *	450 *	0.888
		1	1315	1075	900	770 *	670 *	595 *	530 *	0.536
		2	1435	1195	1010	870 *	765 *	680 *	610 *	0.384
		3	1535	1300	1115 *	970 *	850 *	760 *	685 *	0.299
	35/7	4	1620	1395	1210 *	1055 *	935 *	835 *	755 *	0.245
		0	1110	900	755	645	560 *	495 *	445 *	0.947
		1	1230	1025	865	745 *	655 *	580 *	520 *	0.557
		2	1330	1130	970	840 *	740 *	660 *	595 *	0.395
	35/5	3	1410	1220	1060	930 *	825 *	740 *	665 *	0.306
		4	1475	1300	1140 *	1010 *	900 *	810 *	735 *	0.249
		0	815	675	575	495	430	385	345 *	1.292
		1	910	780	675	585	520	465 *	420 *	0.661
	30/7	2	980	860	755	670	595 *	535 *	485 *	0.444
		3	1035	925	830	740 *	670 *	605 *	550 *	0.334
		4	1075	980	885	805 *	730 *	665 *	610 *	0.268
		0	1090	870	715	605	525	460 *	410 *	1.184
	30/5	1	1245	1010	840	715	625 *	550 *	495 *	0.677
		2	1380	1135	955	820 *	720 *	635 *	570 *	0.474
		3	1490	1250	1065 *	920 *	810 *	720 *	645 *	0.364
		4	1580	1350	1160 *	1015 *	895 *	800 *	720 *	0.296
	30/4	0	830	675	560	480	415	370	325	1.579
		1	955	795	675	580	510	450 *	405 *	0.789
		2	1055	900	775	675	595 *	530 *	480 *	0.526
		3	1130	985	860	760 *	675 *	605 *	550 *	0.395
30/4	4	1185	1055	935	835 *	750 *	675 *	615 *	0.316	
	0	695	575	485	415	365	325	290	1.777	
	1	795	680	585	510	450	405	365 *	0.836	
	2	865	760	670	595	530	475 *	435 *	0.547	
2 1/2" NW CONC. (ABOVE DECK)	3	915	825	740	665	600 *	545 *	495 *	0.406	
	4	950	870	795	725	660 *	605 *	555 *	0.323	
	0	5805	5580	5445	5355	5290	5240	5205	1.777	
	1	6060	5770	5600	5485	5400	5340	5290	0.836	
2 1/2" LW CONC. (ABOVE DECK)	2	6320	5965	5750	5610	5510	5435	5375	0.547	
	3	6575	6155	5905	5740	5620	5530	5460	0.406	
	4	6830	6350	6060	5865	5730	5625	5545	0.323	
	0	4140	3915	3780	3690	3625	3580	3540	1.777	
TYPE I INSUL. FILL	1	4400	4110	3935	3820	3735	3675	3625	0.836	
	2	4655	4300	4090	3945	3845	3770	3710	0.547	
	3	4910	4495	4240	4075	3955	3865	3795	0.406	
	4	5165	4685	4395	4205	4065	3965	3880	0.323	
TYPE II INSUL. FILL	0	1350	1125	990	900	835	785	750	1.777	
	1	1605	1315	1140	1025	945	880	835	0.836	
	2	1860	1505	1295	1155	1055	975	920	0.547	
	3	2115	1700	1450	1280	1165	1075	1005	0.406	
TYPE II INSUL. FILL	4	2375	1890	1605	1410	1275	1170	1090	0.323	
	0	1615	1390	1255	1165	1100	1055	1015	1.777	
	1	1875	1585	1410	1295	1210	1150	1100	0.836	
	2	2130	1775	1565	1420	1320	1245	1185	0.547	
TYPE II INSUL. FILL	3	2385	1970	1715	1550	1430	1340	1270	0.406	
	4	2640	2160	1870	1680	1540	1440	1360	0.323	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.5	2.0	2.5	3.0	3.5	4.0	4.5
NO FILL	ALL	0.013	2580	1450	930	645	470	360	285

NOTE: ASD Required Strength (Service Applied Load) <= Minimum (Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling))
 LRFD Required Strength (Factored Applied Load) <= Minimum (ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n)

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0239"

SUPPORT FASTENING: Pneutek SDK63-series (0.155" to 0.25" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			2.0	2.5	3.0	3.5	4.0	4.5	5.0	
NO FILL (BARE DECK)	35/8	0	1365	1130	960	835 *	735 *	660 *	590 *	1.026
		1	1545	1295	1105	965 *	855 *	765 *	690 *	0.620
		2	1710	1445	1245 *	1090 *	965 *	865 *	785 *	0.444
		3	1855	1585	1375 *	1205 *	1075 *	965 *	880 *	0.346
		4	1985	1710 *	1495 *	1320 *	1180 *	1065 *	970 *	0.283
	35/7	0	1310	1095	935	815	720 *	645 *	585 *	1.094
		1	1475	1245	1075	940 *	835 *	750 *	680 *	0.644
		2	1615	1385	1200 *	1060 *	945 *	850 *	770 *	0.456
		3	1740	1510	1320 *	1170 *	1045 *	945 *	860 *	0.353
		4	1850	1620 *	1430 *	1275 *	1145 *	1035 *	945 *	0.288
	35/5	0	985	835	715	630	555	500 *	455 *	1.493
		1	1120	965	845	745	665 *	600 *	545 *	0.764
		2	1235	1080	955	850 *	765 *	690 *	630 *	0.513
		3	1325	1180	1055	945 *	855 *	780 *	715 *	0.386
		4	1400	1265	1140 *	1035 *	940 *	860 *	790 *	0.310
	30/7	0	1260	1040	880	760	670 *	595 *	535 *	1.368
		1	1450	1205	1030	895 *	790 *	705 *	640 *	0.782
		2	1625	1365	1170 *	1020 *	905 *	810 *	735 *	0.547
		3	1775	1510	1305 *	1145 *	1015 *	915 *	830 *	0.421
		4	1915	1645 *	1430 *	1260 *	1125 *	1010 *	920 *	0.342
	30/5	0	980	815	695	605	535	475	430 *	1.824
		1	1145	970	835	730	650 *	580 *	525 *	0.912
		2	1285	1105	960	845 *	755 *	680 *	620 *	0.608
		3	1405	1225	1075	955 *	855 *	775 *	705 *	0.456
4		1500	1330	1180 *	1055 *	950 *	865 *	790 *	0.365	
30/4	0	835	705	605	530	470	420	380	2.053	
	1	975	840	735	645	575	520 *	475 *	0.966	
	2	1090	955	845	755	675 *	615 *	560 *	0.632	
	3	1175	1050	940	845 *	765 *	700 *	640 *	0.469	
	4	1245	1130	1025	930 *	850 *	780 *	715 *	0.373	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5885	5690	5560	5465	5395	5340	5295	2.053
		1	6145	5895	5730	5610	5525	5455	5400	0.966
		2	6400	6100	5900	5760	5650	5570	5500	0.632
		3	6655	6305	6070	5905	5780	5685	5605	0.469
		4	6915	6510	6245	6050	5910	5795	5710	0.373
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4225	4025	3895	3800	3730	3675	3635	2.053
		1	4480	4230	4065	3950	3860	3790	3735	0.966
		2	4735	4435	4235	4095	3990	3905	3840	0.632
		3	4990	4640	4410	4240	4115	4020	3940	0.469
		4	5250	4845	4580	4390	4245	4135	4045	0.373
TYPE I INSUL. FILL	30/4	0	1430	1235	1100	1010	940	885	840	2.053
		1	1685	1440	1275	1155	1065	1000	945	0.966
		2	1940	1645	1445	1300	1195	1110	1045	0.632
		3	2200	1850	1615	1450	1325	1225	1150	0.469
		4	2455	2055	1785	1595	1450	1340	1250	0.373
TYPE II INSUL. FILL	30/4	0	1700	1500	1370	1275	1205	1150	1110	2.053
		1	1955	1705	1540	1425	1335	1265	1210	0.966
		2	2210	1910	1710	1570	1465	1380	1315	0.632
		3	2465	2115	1885	1715	1590	1495	1415	0.469
		4	2725	2320	2055	1865	1720	1610	1520	0.373

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			2.0	2.5	3.0	3.5	4.0	4.5	5.0
NO FILL	ALL	0.017	2205	1410	980	720	550	435	350

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0149"

SUPPORT FASTENING: Pneutek K64-series (0.187" to 0.312" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50 φ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25

φ (WIND): 0.70 Ω (WIND): 2.35 φ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25

φ (Other): 0.65 Ω (Other): 2.50 φ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1	
			SPAN, FT								
			1.0	1.5	2.0	2.5	3.0	3.5	4.0		
NO FILL (BARE DECK)	35/8	0	1205	940	750	625	530	460 *	405 *	0.810	
		1	1315	1055	865	725	620 *	540 *	480 *	0.489	
		2	1395	1155	965	815	705 *	615 *	550 *	0.350	
		3	1455	1240	1050	900 *	785 *	690 *	615 *	0.273	
		4	1505	1305	1125	975 *	855 *	760 *	680 *	0.223	
	35/7	0	1110	885	720	605	515	450 *	395 *	0.864	
		1	1195	985	820	695	600 *	525 *	465 *	0.508	
		2	1255	1070	910	780	680 *	600 *	535 *	0.360	
		3	1300	1135	985	855 *	750 *	665 *	600 *	0.279	
		4	1335	1190	1045	925 *	820 *	730 *	660 *	0.227	
	35/5	0	790	650	540	460	395	345	305	1.179	
		1	850	730	625	540	475	420 *	375 *	0.603	
		2	890	790	695	610	540	485 *	435 *	0.405	
		3	915	830	745	670	600 *	540 *	490 *	0.305	
		4	930	865	790	715	650 *	590 *	540 *	0.245	
	30/7	0	1145	875	695	570	485	420 *	370 *	1.080	
		1	1265	1000	810	675	575 *	500 *	445 *	0.617	
		2	1360	1110	915	775	665 *	580 *	515 *	0.432	
		3	1430	1200	1010	860 *	745 *	655 *	585 *	0.332	
		4	1485	1275	1090	940 *	820 *	725 *	650 *	0.270	
	30/5	0	840	665	540	450	385	335	295	1.440	
		1	930	770	640	545	470	410	365 *	0.720	
		2	990	850	725	625	545	485 *	430 *	0.480	
		3	1030	910	795	695	615 *	550 *	495 *	0.360	
4		1055	955	850	760	675 *	610 *	550 *	0.288		
30/4	0	680	555	460	390	335	290	260	1.621		
	1	740	640	545	470	410	365	325 *	0.763		
	2	780	695	615	540	480	430 *	385 *	0.499		
	3	805	735	665	595	535	485 *	440 *	0.370		
	4	820	765	705	640	585 *	535 *	490 *	0.295		
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5985	5625	5445	5335	5265	5215	5175	1.621	
		1	6305	5840	5605	5465	5370	5305	5255	5255	0.763
		2	6625	6050	5765	5595	5480	5395	5335	5335	0.499
		3	6945	6265	5925	5720	5585	5485	5415	5415	0.370
		4	7265	6480	6085	5850	5690	5580	5495	5495	0.295
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4320	3960	3780	3675	3600	3550	3510	1.621	
		1	4640	4175	3940	3800	3710	3640	3590	3590	0.763
		2	4960	4390	4100	3930	3815	3730	3670	3670	0.499
		3	5280	4600	4260	4055	3920	3825	3750	3750	0.370
		4	5600	4815	4420	4185	4025	3915	3830	3830	0.295
TYPE I INSUL. FILL	30/4	0	1530	1170	990	880	810	755	715	1.621	
		1	1850	1380	1150	1010	915	845	795	795	0.763
		2	2170	1595	1310	1135	1020	940	875	875	0.499
		3	2490	1810	1470	1265	1125	1030	955	955	0.370
		4	2810	2020	1630	1390	1235	1120	1035	1035	0.295
TYPE II INSUL. FILL	30/4	0	1795	1435	1255	1150	1075	1025	985	1.621	
		1	2115	1650	1415	1275	1185	1115	1065	1065	0.763
		2	2435	1865	1575	1405	1290	1205	1145	1145	0.499
		3	2755	2075	1735	1530	1395	1300	1225	1225	0.370
		4	3075	2290	1895	1660	1500	1390	1305	1305	0.295

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

φ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.0	1.5	2.0	2.5	3.0	3.5	4.0
NO FILL	ALL	0.011	4465	1985	1115	715	495	365	275

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0179"

SUPPORT FASTENING: Pneutek K64-series (0.187" to 0.312" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50 φ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25

φ (WIND): 0.70 Ω (WIND): 2.35 φ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25

φ (Other): 0.65 Ω (Other): 2.50 φ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.5	2.0	2.5	3.0	3.5	4.0	4.5	
NO FILL (BARE DECK)	35/8	0	1180	945	785	665	575 *	510 *	455 *	0.888
		1	1320	1080	905	775 *	675 *	595 *	535 *	0.536
		2	1440	1200	1015	875 *	765 *	680 *	610 *	0.384
		3	1545	1305	1120 *	970 *	855 *	760 *	685 *	0.299
	35/7	4	1630	1400	1210 *	1060 *	940 *	840 *	760 *	0.245
		0	1115	905	760	650	565 *	500 *	445 *	0.947
		1	1235	1030	870	750 *	655 *	585 *	525 *	0.557
		2	1335	1135	975	845 *	745 *	665 *	600 *	0.395
	35/5	3	1415	1225	1065 *	935 *	825 *	740 *	670 *	0.306
		4	1485	1305	1145 *	1015 *	905 *	815 *	740 *	0.249
		0	820	680	575	495	435	385	345 *	1.292
		1	915	785	675	590	520	465 *	420 *	0.661
	30/7	2	985	865	760	675	600 *	540 *	490 *	0.444
		3	1040	930	830	745 *	670 *	605 *	555 *	0.334
		4	1080	985	890	805 *	735 *	670 *	615 *	0.268
		0	1100	875	720	610	525	465 *	410 *	1.184
	30/5	1	1255	1015	845	720	625 *	555 *	495 *	0.677
		2	1385	1140	960	825 *	720 *	640 *	575 *	0.474
		3	1495	1255	1070 *	925 *	810 *	720 *	650 *	0.364
		4	1585	1355	1165 *	1015 *	895 *	800 *	720 *	0.296
	30/4	0	835	675	565	480	420	370	330 *	1.579
		1	960	800	680	585	510	455 *	410 *	0.789
		2	1060	905	780	680	600 *	535 *	480 *	0.526
		3	1135	990	865	765 *	680 *	610 *	550 *	0.395
30/4	4	1190	1060	940	840 *	750 *	680 *	620 *	0.316	
	0	700	580	485	420	365	325	290	1.777	
	1	800	685	590	515	455	405	365 *	0.836	
	2	870	765	675	595	530	480 *	435 *	0.547	
2 1/2" NW CONC. (ABOVE DECK)	3	920	825	740	665	600 *	545 *	500 *	0.406	
	4	955	875	800	725	660 *	605 *	555 *	0.323	
	0	5810	5585	5450	5355	5295	5245	5205	1.777	
	1	6065	5775	5600	5485	5400	5340	5290	0.836	
2 1/2" LW CONC. (ABOVE DECK)	2	6325	5970	5755	5615	5510	5435	5375	0.547	
	3	6580	6160	5910	5740	5620	5530	5460	0.406	
	4	6835	6350	6065	5870	5730	5630	5550	0.323	
	0	4145	3920	3785	3695	3630	3580	3540	1.777	
TYPE I INSUL. FILL	1	4405	4110	3940	3820	3740	3675	3630	0.836	
	2	4660	4305	4090	3950	3850	3770	3715	0.547	
	3	4915	4495	4245	4080	3960	3870	3800	0.406	
	4	5170	4690	4400	4205	4070	3965	3885	0.323	
TYPE II INSUL. FILL	0	1355	1125	990	900	835	785	750	1.777	
	1	1610	1320	1145	1030	945	885	835	0.836	
	2	1865	1510	1300	1155	1055	980	920	0.547	
	3	2120	1705	1450	1285	1165	1075	1005	0.406	
TYPE II INSUL. FILL	4	2380	1895	1605	1415	1275	1170	1090	0.323	
	0	1620	1395	1260	1170	1105	1055	1015	1.777	
	1	1880	1585	1415	1295	1215	1150	1105	0.836	
	2	2135	1780	1565	1425	1325	1245	1190	0.547	
TYPE II INSUL. FILL	3	2390	1970	1720	1555	1435	1345	1275	0.406	
	4	2645	2165	1875	1680	1545	1440	1360	0.323	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

φ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.5	2.0	2.5	3.0	3.5	4.0	4.5
NO FILL	ALL	0.013	2580	1450	930	645	470	360	285

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0239"

SUPPORT FASTENING: Pneutek K64-series (0.187" to 0.312" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50 φ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25

φ (WIND): 0.70 Ω (WIND): 2.35 φ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25

φ (Other): 0.65 Ω (Other): 2.50 φ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			2.0	2.5	3.0	3.5	4.0	4.5	5.0	
NO FILL (BARE DECK)	35/8	0	1375	1140	965	840 *	740 *	660 *	595 *	1.026
		1	1555	1300	1110	970 *	855 *	765 *	695 *	0.620
		2	1715	1450	1250 *	1095 *	970 *	870 *	790 *	0.444
		3	1860	1590	1380 *	1210 *	1080 *	970 *	880 *	0.346
		4	1990	1720 *	1500 *	1325 *	1185 *	1065 *	970 *	0.283
	35/7	0	1320	1100	940	820	725 *	650 *	590 *	1.094
		1	1480	1255	1080	945 *	840 *	750 *	680 *	0.644
		2	1625	1390	1205 *	1060 *	945 *	850 *	775 *	0.456
		3	1750	1515	1325 *	1175 *	1050 *	950 *	865 *	0.353
	35/5	0	990	835	720	630	560	505 *	455 *	1.493
		1	1130	970	845	750	665 *	600 *	545 *	0.764
		2	1240	1085	960	855 *	765 *	695 *	635 *	0.513
		3	1330	1185	1060	950 *	860 *	780 *	715 *	0.386
	30/7	0	1270	1045	885	765	675 *	600 *	540 *	1.368
		1	1460	1210	1035	900 *	795 *	710 *	640 *	0.782
		2	1630	1370	1175 *	1025 *	910 *	815 *	735 *	0.547
		3	1785	1515	1310 *	1145 *	1020 *	915 *	830 *	0.421
	30/5	0	985	820	700	610	535	480	430 *	1.824
		1	1150	975	840	735	650 *	585 *	530 *	0.912
		2	1290	1110	965	850 *	760 *	685 *	620 *	0.608
		3	1410	1230	1080	960 *	860 *	780 *	710 *	0.456
	30/4	0	840	710	610	530	470	425	380	2.053
		1	980	845	735	650	580	520 *	475 *	0.966
		2	1095	960	850	755	680 *	615 *	560 *	0.632
3		1180	1055	945	850 *	770 *	700 *	645 *	0.469	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5890	5695	5560	5470	5400	5345	5300	2.053
		1	6150	5900	5735	5615	5525	5455	5400	0.966
		2	6405	6105	5905	5760	5655	5570	5505	0.632
		3	6660	6310	6075	5910	5785	5685	5605	0.469
		4	6920	6515	6245	6055	5910	5800	5710	0.373
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4230	4030	3900	3805	3735	3680	3635	2.053
		1	4485	4235	4070	3950	3860	3795	3740	0.966
		2	4740	4440	4240	4100	3990	3905	3840	0.632
		3	4995	4645	4410	4245	4120	4020	3945	0.469
		4	5255	4850	4585	4390	4245	4135	4045	0.373
TYPE I INSUL. FILL	30/4	0	1435	1235	1105	1010	940	885	840	2.053
		1	1690	1440	1275	1160	1070	1000	945	0.966
		2	1950	1650	1445	1305	1195	1115	1045	0.632
		3	2205	1855	1620	1450	1325	1230	1150	0.469
		4	2460	2060	1790	1600	1455	1340	1255	0.373
TYPE II INSUL. FILL	30/4	0	1705	1505	1375	1280	1210	1155	1110	2.053
		1	1960	1710	1545	1425	1335	1270	1215	0.966
		2	2215	1915	1715	1575	1465	1380	1315	0.632
		3	2475	2120	1885	1720	1595	1495	1420	0.469
		4	2730	2325	2060	1865	1720	1610	1520	0.373

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

φ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			2.0	2.5	3.0	3.5	4.0	4.5	5.0
NO FILL	ALL	0.017	2205	1410	980	720	550	435	350

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0149"

SUPPORT FASTENING: Pneutek K66-series (0.281" & thicker support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	
NO FILL (BARE DECK)	35/8	0	1025	800	640	530	450	390	345 *	0.810
		1	1130	915	750	630	540	470 *	415 *	0.489
		2	1205	1010	845	720	625 *	545 *	485 *	0.350
		3	1265	1085	930	800	700 *	620 *	550 *	0.273
	35/7	4	1305	1145	1000	875 *	770 *	685 *	615 *	0.223
		0	945	755	615	515	440	380	340 *	0.864
		1	1025	855	715	605	525	460 *	410 *	0.508
		2	1085	930	795	690	600 *	530 *	475 *	0.360
	35/5	3	1125	990	865	760	670 *	595 *	535 *	0.279
		4	1155	1040	925	820 *	730 *	655 *	595 *	0.227
		0	675	555	460	390	335	295	260	1.179
		1	730	630	545	470	415	365	325 *	0.603
	30/7	2	765	685	610	540	480	430 *	385 *	0.405
		3	785	725	655	590	535	485 *	440 *	0.305
		4	800	750	690	635	580 *	530 *	485 *	0.245
		0	975	745	590	485	415	355	315	1.080
	30/5	1	1095	870	710	590	505	440 *	390 *	0.617
		2	1180	975	810	685	590 *	515 *	460 *	0.432
		3	1240	1055	895	770	670 *	590 *	525 *	0.332
		4	1290	1125	975	845 *	740 *	660 *	590 *	0.270
	30/4	0	715	565	460	380	325	285	250	1.440
		1	800	670	560	475	410	360	320 *	0.720
		2	855	740	640	555	485	430 *	385 *	0.480
		3	890	795	705	620	550	495 *	445 *	0.360
2 1/2" NW CONC. (ABOVE DECK)	4	915	835	755	675	610 *	550 *	500 *	0.288	
	0	580	475	390	330	285	250	220	1.621	
	1	640	555	475	415	360	320	285	0.763	
	2	670	605	540	480	425	385	345 *	0.499	
2 1/2" LW CONC. (ABOVE DECK)	3	695	640	585	530	480	435 *	400 *	0.370	
	4	705	665	615	570	525	480 *	440 *	0.295	
	0	5825	5520	5365	5270	5210	5165	5135	1.621	
	1	6145	5730	5525	5400	5320	5260	5215	0.763	
TYPE I INSUL. FILL	2	6465	5945	5685	5530	5425	5350	5295	0.499	
	3	6785	6160	5845	5655	5530	5440	5375	0.370	
	4	7105	6370	6005	5785	5640	5535	5455	0.295	
	0	4160	3855	3700	3610	3545	3505	3470	1.621	
TYPE II INSUL. FILL	1	4480	4065	3860	3735	3655	3595	3550	0.763	
	2	4800	4280	4020	3865	3760	3685	3630	0.499	
	3	5120	4495	4180	3995	3865	3780	3710	0.370	
	4	5440	4705	4340	4120	3975	3870	3790	0.295	
TYPE I INSUL. FILL	0	1370	1060	905	815	755	710	675	1.621	
	1	1690	1275	1065	945	860	800	755	0.763	
	2	2010	1485	1225	1070	965	895	835	0.499	
	3	2325	1700	1385	1200	1075	985	915	0.370	
TYPE II INSUL. FILL	4	2645	1915	1545	1325	1180	1075	995	0.295	
	0	1635	1330	1175	1085	1020	980	945	1.621	
	1	1955	1540	1335	1210	1130	1070	1025	0.763	
	2	2275	1755	1495	1340	1235	1160	1105	0.499	
TYPE II INSUL. FILL	3	2595	1970	1655	1470	1340	1255	1185	0.370	
	4	2915	2180	1815	1595	1450	1345	1265	0.295	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.0	1.5	2.0	2.5	3.0	3.5	4.0
NO FILL	ALL	0.011	4465	1985	1115	715	495	365	275

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK
 t = design thickness = 0.0179"

SUPPORT FASTENING: Pneutek K66-series (0.281" & thicker support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.5	2.0	2.5	3.0	3.5	4.0	4.5	
NO FILL (BARE DECK)	35/8	0	1005	805	665	565	490	435 *	385 *	0.888
		1	1145	940	785	675	590 *	520 *	465 *	0.536
		2	1260	1055	895	775 *	680 *	605 *	545 *	0.384
		3	1355	1155	995	865 *	765 *	685 *	615 *	0.299
	35/7	4	1430	1240	1085 *	955 *	845 *	760 *	685 *	0.245
		0	950	770	645	550	480	425 *	380 *	0.947
		1	1070	890	755	655	575 *	510 *	455 *	0.557
		2	1165	995	855	745 *	660 *	590 *	530 *	0.395
	35/5	3	1240	1080	945	830 *	740 *	665 *	600 *	0.306
		4	1295	1150	1020	905 *	815 *	735 *	665 *	0.249
		0	695	580	490	420	370	330	295	1.292
		1	790	680	590	515	455	410	370 *	0.661
	30/7	2	855	760	670	595	530	480 *	435 *	0.444
		3	905	815	735	665	600 *	545 *	500 *	0.334
		4	935	865	790	720	655 *	605 *	555 *	0.268
		0	935	745	610	520	450	395	350 *	1.184
	30/5	1	1085	885	735	630	545 *	485 *	435 *	0.677
		2	1215	1005	850	730	640 *	570 *	510 *	0.474
		3	1315	1115	955	830 *	730 *	650 *	585 *	0.364
		4	1400	1205	1045	915 *	810 *	725 *	655 *	0.296
	30/4	0	710	575	480	410	355	315	280	1.579
		1	835	700	595	510	450	400	360 *	0.789
		2	925	795	690	605	535	480 *	430 *	0.526
		3	990	875	770	685	610 *	550 *	500 *	0.395
2 1/2" NW CONC. (ABOVE DECK)	4	1040	935	840	755 *	680 *	615 *	565 *	0.316	
	0	595	490	415	355	310	275	250	1.777	
	1	690	595	515	450	400	355	320	0.836	
	2	755	670	595	530	475	430 *	390 *	0.547	
2 1/2" LW CONC. (ABOVE DECK)	3	800	725	660	595	540	490 *	450 *	0.406	
	4	830	770	705	650	595 *	545 *	505 *	0.323	
	0	5675	5485	5365	5290	5235	5195	5160	1.777	
	1	5930	5675	5520	5420	5345	5290	5245	0.836	
TYPE I INSUL. FILL	2	6190	5865	5675	5545	5455	5385	5330	0.547	
	3	6445	6060	5830	5675	5565	5480	5420	0.406	
	4	6700	6250	5980	5800	5675	5580	5505	0.323	
	0	4010	3820	3705	3625	3570	3530	3500	1.777	
TYPE II INSUL. FILL	1	4270	4010	3855	3755	3680	3625	3585	0.836	
	2	4525	4205	4010	3880	3790	3720	3670	0.547	
	3	4780	4395	4165	4010	3900	3820	3755	0.406	
	4	5035	4590	4320	4140	4010	3915	3840	0.323	
TYPE I INSUL. FILL	0	1220	1025	910	835	780	735	705	1.777	
	1	1475	1220	1065	960	890	835	790	0.836	
	2	1730	1410	1215	1090	995	930	875	0.547	
	3	1985	1600	1370	1215	1105	1025	960	0.406	
TYPE II INSUL. FILL	4	2245	1795	1525	1345	1215	1120	1045	0.323	
	0	1485	1295	1180	1100	1045	1005	975	1.777	
	1	1745	1485	1330	1230	1155	1100	1060	0.836	
	2	2000	1680	1485	1355	1265	1195	1145	0.547	
TYPE II INSUL. FILL	3	2255	1870	1640	1485	1375	1295	1230	0.406	
	4	2510	2065	1795	1615	1485	1390	1315	0.323	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.5	2.0	2.5	3.0	3.5	4.0	4.5
NO FILL	ALL	0.013	2580	1450	930	645	470	360	285

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0239"

SUPPORT FASTENING: Pneutek K66-series (0.281" & thicker support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			2.0	2.5	3.0	3.5	4.0	4.5	5.0	
NO FILL (BARE DECK)	35/8	0	1170	970	825	715	630	565 *	505 *	1.026
		1	1350	1130	965	845 *	745 *	670 *	605 *	0.620
		2	1505	1280	1100	965 *	860 *	770 *	700 *	0.444
		3	1645	1410	1230 *	1085 *	965 *	870 *	790 *	0.346
		4	1765	1535	1345 *	1195 *	1070 *	965 *	880 *	0.283
	35/7	0	1125	940	800	700	615	555 *	500 *	1.094
		1	1285	1090	940	820	730 *	655 *	595 *	0.644
		2	1420	1220	1065	940 *	835 *	755 *	685 *	0.456
		3	1540	1340	1180 *	1045 *	940 *	850 *	775 *	0.353
		4	1640	1445	1285 *	1150 *	1035 *	940 *	860 *	0.288
	35/5	0	840	715	615	535	475	430	390	1.493
		1	980	845	740	655	585	525 *	480 *	0.764
		2	1085	955	845	755	680 *	620 *	565 *	0.513
		3	1170	1050	940	850 *	770 *	705 *	645 *	0.386
		4	1235	1125	1020	930 *	850 *	780 *	720 *	0.310
	30/7	0	1080	890	755	655	575	510 *	460 *	1.368
		1	1270	1055	900	785	695 *	620 *	560 *	0.782
		2	1435	1210	1040	910 *	805 *	725 *	655 *	0.547
		3	1585	1350	1170 *	1030 *	915 *	825 *	750 *	0.421
		4	1710	1480	1290 *	1140 *	1020 *	920 *	840 *	0.342
	30/5	0	840	700	595	520	455	410	365	1.824
		1	1000	850	735	640	570	510 *	465 *	0.912
		2	1135	980	855	755	675 *	610 *	555 *	0.608
		3	1245	1095	965	860 *	775 *	705 *	640 *	0.456
4		1335	1190	1065	955 *	865 *	790 *	725 *	0.365	
30/4	0	715	605	520	455	400	360	325	2.053	
	1	855	740	645	570	510	460	420 *	0.966	
	2	960	845	750	670	605	550 *	505 *	0.632	
	3	1040	935	845	760	695 *	635 *	580 *	0.469	
	4	1100	1005	920	840 *	770 *	710 *	655 *	0.373	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5745	5575	5465	5385	5325	5280	5240	2.053
		1	6000	5780	5635	5530	5455	5390	5345	0.966
		2	6260	5985	5805	5680	5580	5505	5445	0.632
		3	6515	6195	5980	5825	5710	5620	5550	0.469
		4	6770	6400	6150	5970	5840	5735	5650	0.373
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4080	3915	3800	3720	3660	3615	3575	2.053
		1	4340	4120	3970	3865	3790	3730	3680	0.966
		2	4595	4325	4145	4015	3915	3840	3780	0.632
		3	4850	4530	4315	4160	4045	3955	3885	0.469
		4	5105	4735	4485	4305	4175	4070	3985	0.373
TYPE I INSUL. FILL	30/4	0	1290	1120	1010	930	870	820	785	2.053
		1	1545	1325	1180	1075	995	935	885	0.966
		2	1800	1530	1350	1220	1125	1050	990	0.632
		3	2060	1735	1520	1365	1250	1165	1090	0.469
		4	2315	1940	1690	1515	1380	1275	1195	0.373
TYPE II INSUL. FILL	30/4	0	1555	1390	1275	1195	1135	1090	1050	2.053
		1	1815	1595	1445	1340	1265	1205	1155	0.966
		2	2070	1800	1620	1490	1390	1315	1255	0.632
		3	2325	2005	1790	1635	1520	1430	1360	0.469
		4	2580	2210	1960	1780	1650	1545	1460	0.373

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			2.0	2.5	3.0	3.5	4.0	4.5	5.0
NO FILL	ALL	0.017	2205	1410	980	720	550	435	350

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK
 t = design thickness = 0.0149"

SUPPORT FASTENING: Hilti ENP2 or ENPH2 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50 φ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 φ (WIND): 0.70 Ω (WIND): 2.35 φ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 φ (Other): 0.65 Ω (Other): 2.50 φ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	
NO FILL (BARE DECK)	35/8	0	1415	1100	885	730	620 *	540 *	475 *	0.338
		1	1525	1220	995	830 *	710 *	620 *	550 *	0.265
		2	1610	1325	1095	925 *	800 *	700 *	620 *	0.218
		3	1680	1410	1190	1015 *	880 *	770 *	685 *	0.185
		4	1735	1490	1270	1095 *	955 *	845 *	755 *	0.161
	35/7	0	1300	1040	850	710	605 *	525 *	465 *	0.360
		1	1390	1145	950	800	690 *	605 *	535 *	0.279
		2	1455	1230	1040	890 *	770 *	680 *	605 *	0.227
		3	1505	1300	1120	965 *	845 *	750 *	670 *	0.192
		4	1545	1360	1185	1040 *	915 *	815 *	730 *	0.166
	35/5	0	930	765	635	540	465	405	360 *	0.491
		1	990	845	725	620	540	480 *	425 *	0.351
		2	1030	910	795	695	610 *	545 *	490 *	0.274
		3	1060	955	850	755	675 *	605 *	545 *	0.224
		4	1080	995	900	810	730 *	660 *	600 *	0.190
	30/7	0	1345	1025	815	670	570 *	495 *	435 *	0.450
		1	1465	1155	935	775	660 *	575 *	510 *	0.343
		2	1565	1270	1040	875 *	750 *	655 *	580 *	0.277
		3	1645	1365	1140	965 *	835 *	730 *	650 *	0.232
		4	1705	1445	1225	1050 *	915 *	805 *	715 *	0.200
	30/5	0	990	780	635	525	450	390	345 *	0.600
		1	1080	885	735	620	535	470 *	415 *	0.424
		2	1140	970	825	710	615 *	540 *	485 *	0.327
		3	1190	1040	900	785	690 *	610 *	545 *	0.267
4		1220	1090	965	850 *	755 *	675 *	605 *	0.225	
30/4	0	800	655	540	455	390	340	305	0.675	
	1	865	740	630	540	470	415	370 *	0.460	
	2	905	800	700	615	540	480 *	435 *	0.349	
	3	935	845	755	675	600 *	540 *	490 *	0.281	
	4	955	880	800	725	655 *	595 *	540 *	0.235	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	6175	5750	5540	5410	5325	5265	5220	0.675
		1	6495	5965	5700	5540	5435	5360	5300	0.460
		2	6815	6175	5860	5670	5540	5450	5380	0.349
		3	7135	6390	6020	5795	5645	5540	5460	0.281
		4	7455	6605	6180	5925	5755	5635	5540	0.235
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4510	4085	3875	3750	3665	3605	3560	0.675
		1	4830	4300	4035	3875	3770	3695	3640	0.460
		2	5150	4515	4195	4005	3875	3785	3720	0.349
		3	5470	4725	4355	4130	3985	3875	3800	0.281
		4	5790	4940	4515	4260	4090	3970	3880	0.235
TYPE I INSUL. FILL	30/4	0	1715	1295	1080	955	870	810	765	0.675
		1	2035	1505	1240	1085	975	900	845	0.460
		2	2355	1720	1400	1210	1085	995	925	0.349
		3	2675	1935	1560	1340	1190	1085	1005	0.281
		4	2995	2145	1720	1465	1295	1175	1085	0.235
TYPE II INSUL. FILL	30/4	0	1985	1560	1350	1225	1140	1080	1035	0.675
		1	2305	1775	1510	1350	1245	1170	1115	0.460
		2	2625	1990	1670	1480	1350	1260	1195	0.349
		3	2945	2200	1830	1605	1460	1350	1275	0.281
		4	3265	2415	1990	1735	1565	1445	1355	0.235

* NOMINAL SHEAR ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

φ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.0	1.5	2.0	2.5	3.0	3.5	4.0
NO FILL	ALL	0.011	4465	1985	1115	715	495	365	275

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0179"

SUPPORT FASTENING: Hilti ENP2 or ENPH2 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.5	2.0	2.5	3.0	3.5	4.0	4.5	
NO FILL (BARE DECK)	35/8	0	1305	1050	865	735	640 *	565 *	505 *	0.370
		1	1450	1185	990	845 *	735 *	650 *	585 *	0.291
		2	1575	1305	1100 *	950 *	830 *	735 *	660 *	0.239
		3	1680	1415	1205 *	1045 *	920 *	820 *	735 *	0.203
		4	1770	1510	1305 *	1135 *	1005 *	895 *	810 *	0.177
	35/7	0	1235	1005	840	720	625 *	555 *	495 *	0.395
		1	1355	1125	955	820 *	720 *	635 *	570 *	0.306
		2	1460	1235	1055	915 *	805 *	720 *	645 *	0.249
		3	1545	1330	1150 *	1005 *	890 *	795 *	720 *	0.210
		4	1615	1410	1235 *	1090 *	970 *	870 *	790 *	0.182
	35/5	0	910	755	640	550	480	425 *	385 *	0.538
		1	1005	860	740	645	570 *	505 *	455 *	0.385
		2	1080	945	825	730	650 *	580 *	525 *	0.300
		3	1135	1010	900	805 *	720 *	650 *	595 *	0.245
		4	1180	1070	965	870 *	785 *	715 *	655 *	0.208
	30/7	0	1215	965	795	675	585 *	515 *	455 *	0.493
		1	1370	1110	920	785 *	685 *	605 *	540 *	0.376
		2	1505	1240	1040	890 *	780 *	690 *	620 *	0.304
		3	1620	1355	1150 *	990 *	870 *	775 *	695 *	0.255
		4	1720	1460	1250 *	1085 *	955 *	855 *	770 *	0.219
	30/5	0	925	750	625	535	465	410	365 *	0.658
		1	1055	875	740	635	555 *	495 *	445 *	0.464
		2	1155	980	840	730	645 *	575 *	520 *	0.359
		3	1235	1070	930	820 *	725 *	650 *	590 *	0.292
4		1295	1145	1010	895 *	800 *	725 *	655 *	0.247	
30/4	0	775	640	540	465	405	360	325	0.740	
	1	875	745	640	560	495	440 *	395 *	0.504	
	2	950	830	730	645	575 *	515 *	465 *	0.382	
	3	1005	900	800	715	645 *	585 *	530 *	0.308	
	4	1045	950	860	780 *	710 *	645 *	590 *	0.257	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5910	5655	5505	5405	5335	5280	5240	0.740
		1	6165	5850	5660	5535	5445	5375	5325	0.504
		2	6420	6040	5815	5660	5555	5475	5410	0.382
		3	6675	6235	5970	5790	5665	5570	5495	0.308
		4	6935	6425	6120	5920	5775	5665	5580	0.257
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4245	3995	3845	3740	3670	3615	3575	0.740
		1	4500	4185	3995	3870	3780	3715	3660	0.504
		2	4755	4380	4150	4000	3890	3810	3745	0.382
		3	5015	4570	4305	4125	4000	3905	3830	0.308
		4	5270	4760	4460	4255	4110	4000	3915	0.257
TYPE I INSUL. FILL	30/4	0	1450	1200	1050	950	875	825	780	0.740
		1	1705	1390	1205	1075	985	920	865	0.504
		2	1965	1585	1355	1205	1095	1015	955	0.382
		3	2220	1775	1510	1335	1205	1110	1040	0.308
		4	2475	1970	1665	1460	1315	1210	1125	0.257
TYPE II INSUL. FILL	30/4	0	1720	1470	1320	1215	1145	1090	1050	0.740
		1	1975	1660	1470	1345	1255	1190	1135	0.504
		2	2230	1855	1625	1475	1365	1285	1220	0.382
		3	2490	2045	1780	1600	1475	1380	1305	0.308
		4	2745	2235	1935	1730	1585	1475	1390	0.257

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.5	2.0	2.5	3.0	3.5	4.0	4.5
NO FILL	ALL	0.013	2580	1450	930	645	470	360	285

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK
t = design thickness = 0.0239"

SUPPORT FASTENING: Hilti ENP2 or ENPH2 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			2.0	2.5	3.0	3.5	4.0	4.5	5.0	
NO FILL (BARE DECK)	35/8	0	1365	1130	960	830 *	735 *	655 *	590 *	0.428
		1	1540	1290	1105	960 *	850 *	760 *	690 *	0.336
		2	1705	1440	1240 *	1085 *	965 *	865 *	785 *	0.276
		3	1850	1580	1370 *	1205 *	1070 *	965 *	875 *	0.235
	35/7	4	1980	1710 *	1490 *	1320 *	1175 *	1060 *	965 *	0.204
		0	1305	1090	935	815	720 *	645 *	585 *	0.456
		1	1470	1245	1070	940 *	830 *	745 *	675 *	0.353
		2	1615	1380	1200 *	1055 *	940 *	845 *	770 *	0.288
	35/5	3	1740	1505	1320 *	1165 *	1045 *	945 *	860 *	0.243
		4	1845	1620 *	1430 *	1270 *	1140 *	1035 *	945 *	0.210
		0	980	830	715	625	555	500 *	450 *	0.622
		1	1120	965	840	740	665 *	595 *	545 *	0.445
	30/7	2	1230	1080	955	850 *	760 *	690 *	630 *	0.346
		3	1325	1175	1050	945 *	855 *	780 *	710 *	0.284
		4	1395	1260	1140 *	1030 *	940 *	860 *	790 *	0.240
		0	1260	1035	880	760	670 *	595 *	535 *	0.570
	30/5	1	1445	1205	1025	890 *	790 *	705 *	635 *	0.434
		2	1620	1360	1165 *	1020 *	905 *	810 *	735 *	0.351
		3	1775	1505	1300 *	1140 *	1015 *	910 *	825 *	0.294
		4	1910	1640 *	1425 *	1255 *	1120 *	1010 *	915 *	0.253
	30/4	0	975	815	695	605	535	475	425 *	0.760
		1	1140	965	830	730	645 *	580 *	525 *	0.537
		2	1285	1100	960	845 *	755 *	680 *	615 *	0.415
		3	1400	1220	1075	955 *	855 *	775 *	705 *	0.338
2 1/2" NW CONC. (ABOVE DECK)	4	1500	1325	1175 *	1055 *	950 *	865 *	790 *	0.285	
	0	835	700	605	530	470	420	380	0.855	
	1	975	840	730	645	575	520 *	470 *	0.582	
	2	1085	955	845	750	675 *	610 *	560 *	0.441	
2 1/2" LW CONC. (ABOVE DECK)	3	1175	1050	940	845 *	765 *	700 *	640 *	0.355	
	4	1245	1125	1020	930 *	845 *	775 *	715 *	0.297	
	0	5885	5690	5555	5465	5395	5340	5295	0.855	
	1	6140	5895	5730	5610	5520	5455	5400	0.582	
TYPE I INSUL. FILL	2	6395	6100	5900	5755	5650	5570	5500	0.441	
	3	6655	6305	6070	5905	5780	5680	5605	0.355	
	4	6910	6510	6240	6050	5905	5795	5705	0.297	
	0	4220	4025	3895	3800	3730	3675	3630	0.855	
TYPE II INSUL. FILL	1	4475	4230	4065	3945	3860	3790	3735	0.582	
	2	4735	4435	4235	4095	3985	3905	3835	0.441	
	3	4990	4640	4405	4240	4115	4020	3940	0.355	
	4	5245	4845	4575	4385	4245	4130	4045	0.297	
TYPE I INSUL. FILL	0	1425	1230	1100	1005	935	880	840	0.855	
	1	1685	1435	1270	1155	1065	995	940	0.582	
	2	1940	1640	1440	1300	1195	1110	1045	0.441	
	3	2195	1845	1615	1445	1320	1225	1145	0.355	
TYPE II INSUL. FILL	4	2455	2050	1785	1595	1450	1340	1250	0.297	
	0	1695	1500	1370	1275	1205	1150	1105	0.855	
	1	1950	1705	1540	1420	1335	1265	1210	0.582	
	2	2210	1910	1710	1570	1460	1380	1310	0.441	
TYPE II INSUL. FILL	3	2465	2115	1880	1715	1590	1495	1415	0.355	
	4	2720	2320	2050	1860	1720	1605	1520	0.297	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			2.0	2.5	3.0	3.5	4.0	4.5	5.0
NO FILL	ALL	0.017	2205	1410	980	720	550	435	350

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0149"

SUPPORT FASTENING: HiTi ENP2K, X-EDN19 or X-EDNK22 (0.125" to 0.375" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.0	1.5	2.0	2.5	3.0	3.5	4.0	
NO FILL (BARE DECK)	35/8	0	1265	980	785	650	555	480 *	425 *	0.338
		1	1370	1100	900	755	645 *	560 *	495 *	0.265
		2	1455	1200	1000	845 *	730 *	640 *	565 *	0.218
		3	1515	1285	1090	930 *	810 *	710 *	635 *	0.185
	35/7	4	1565	1355	1165	1010 *	885 *	780 *	700 *	0.161
		0	1160	925	755	630	540	470 *	415 *	0.360
		1	1245	1030	855	725	625 *	545 *	485 *	0.279
		2	1310	1110	945	810	705 *	620 *	555 *	0.227
	35/5	3	1355	1180	1020	885 *	775 *	690 *	615 *	0.192
		4	1390	1235	1085	955 *	845 *	755 *	675 *	0.166
		0	825	680	565	480	415	360	320 *	0.491
		1	885	760	655	565	490	435 *	390 *	0.351
	30/7	2	925	820	720	635	560	500 *	450 *	0.274
		3	955	865	775	690	620 *	560 *	505 *	0.224
		4	970	900	820	740	670 *	610 *	555 *	0.190
		0	1200	915	725	600	505	440 *	385 *	0.450
	30/5	1	1320	1045	845	705	600 *	520 *	460 *	0.343
		2	1415	1150	950	800	685 *	600 *	530 *	0.277
		3	1485	1245	1045	890 *	770 *	675 *	600 *	0.232
		4	1545	1320	1130	970 *	845 *	745 *	665 *	0.200
	30/4	0	880	695	565	470	400	350	310	0.600
		1	970	800	665	565	485	425 *	380 *	0.424
		2	1030	880	755	650	565	500 *	445 *	0.327
		3	1070	945	825	720	635 *	565 *	505 *	0.267
2 1/2" NW CONC. (ABOVE DECK)	4	1100	990	880	785	700 *	625 *	565 *	0.225	
	0	710	580	480	405	350	305	270	0.675	
	1	775	665	570	490	430	380	335 *	0.460	
	2	815	725	635	560	495	445 *	400 *	0.349	
2 1/2" LW CONC. (ABOVE DECK)	3	840	765	690	620	555	500 *	455 *	0.281	
	4	855	795	730	665	605 *	550 *	505 *	0.235	
	0	6035	5660	5470	5355	5280	5230	5185	0.675	
	1	6355	5870	5630	5485	5390	5320	5265	0.460	
TYPE I INSUL. FILL	2	6675	6085	5790	5615	5495	5410	5345	0.349	
	3	6995	6300	5950	5740	5600	5500	5425	0.281	
	4	7315	6510	6110	5870	5710	5595	5505	0.235	
	0	4370	3995	3805	3695	3620	3565	3525	0.675	
TYPE II INSUL. FILL	1	4690	4210	3965	3820	3725	3655	3605	0.460	
	2	5010	4420	4125	3950	3830	3745	3685	0.349	
	3	5330	4635	4285	4075	3940	3840	3765	0.281	
	4	5650	4850	4445	4205	4045	3930	3845	0.235	
TYPE I INSUL. FILL	0	1580	1200	1015	900	825	770	730	0.675	
	1	1900	1415	1175	1030	930	860	810	0.460	
	2	2220	1630	1335	1155	1040	955	890	0.349	
	3	2540	1840	1495	1285	1145	1045	970	0.281	
TYPE II INSUL. FILL	4	2860	2055	1655	1410	1250	1135	1050	0.235	
	0	1845	1470	1280	1170	1095	1040	1000	0.675	
	1	2165	1685	1440	1295	1200	1130	1080	0.460	
	2	2485	1895	1600	1425	1305	1220	1160	0.349	
TYPE II INSUL. FILL	3	2805	2110	1760	1550	1415	1315	1240	0.281	
	4	3125	2325	1920	1680	1520	1405	1320	0.235	

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.0	1.5	2.0	2.5	3.0	3.5	4.0
NO FILL	ALL	0.011	4465	1985	1115	715	495	365	275

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0179"

SUPPORT FASTENING: Hilti ENP2K, X-EDN19 or X-EDN22 (0.125" to 0.375" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50 φ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25

φ (WIND): 0.70 Ω (WIND): 2.35 φ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25

φ (Other): 0.65 Ω (Other): 2.50 φ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			1.5	2.0	2.5	3.0	3.5	4.0	4.5	
NO FILL (BARE DECK)	35/8	0	1175	945	780	665	575 *	510 *	455 *	0.370
		1	1320	1075	900	770 *	675 *	595 *	535 *	0.291
		2	1440	1195	1015	875 *	765 *	680 *	610 *	0.239
		3	1540	1305	1115 *	970 *	855 *	760 *	685 *	0.203
		4	1625	1400	1210 *	1060 *	935 *	840 *	755 *	0.177
	35/7	0	1110	905	755	645	565 *	500 *	445 *	0.395
		1	1235	1025	870	750 *	655 *	580 *	525 *	0.306
		2	1335	1130	970	845 *	745 *	665 *	595 *	0.249
		3	1415	1220	1060	930 *	825 *	740 *	670 *	0.210
		4	1480	1300	1145 *	1010 *	905 *	810 *	735 *	0.182
	35/5	0	815	680	575	495	435	385	345 *	0.538
		1	915	780	675	590	520	465 *	420 *	0.385
		2	985	865	760	670	600 *	540 *	490 *	0.300
		3	1035	930	830	745 *	670 *	605 *	550 *	0.245
		4	1075	980	890	805 *	730 *	665 *	610 *	0.208
	30/7	0	1095	870	715	605	525	465 *	410 *	0.493
		1	1250	1010	840	720	625 *	550 *	495 *	0.376
		2	1380	1140	960	825 *	720 *	640 *	570 *	0.304
		3	1490	1250	1065 *	920 *	810 *	720 *	645 *	0.255
		4	1585	1350	1165 *	1015 *	895 *	800 *	720 *	0.219
	30/5	0	835	675	565	480	415	370	330 *	0.658
		1	960	800	675	585	510	455 *	405 *	0.464
		2	1055	900	775	675	600 *	535 *	480 *	0.359
		3	1130	985	865	760 *	680 *	610 *	550 *	0.292
4		1190	1055	940	835 *	750 *	680 *	615 *	0.247	
30/4	0	695	575	485	420	365	325	290	0.740	
	1	795	680	590	515	455	405	365 *	0.504	
	2	865	765	670	595	530	480 *	435 *	0.382	
	3	915	825	740	665	600 *	545 *	495 *	0.308	
	4	955	875	795	725	660 *	605 *	555 *	0.257	
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5810	5580	5445	5355	5290	5245	5205	0.740
		1	6065	5775	5600	5485	5400	5340	5290	0.504
		2	6320	5965	5755	5610	5510	5435	5375	0.382
		3	6575	6160	5910	5740	5620	5530	5460	0.308
		4	6835	6350	6060	5870	5730	5625	5545	0.257
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4145	3920	3785	3690	3630	3580	3540	0.740
		1	4400	4110	3935	3820	3740	3675	3625	0.504
		2	4655	4305	4090	3950	3845	3770	3715	0.382
		3	4915	4495	4245	4075	3955	3870	3800	0.308
		4	5170	4685	4400	4205	4065	3965	3885	0.257
TYPE I INSUL. FILL	30/4	0	1350	1125	990	900	835	785	750	0.740
		1	1605	1315	1145	1025	945	880	835	0.504
		2	1865	1510	1295	1155	1055	980	920	0.382
		3	2120	1700	1450	1285	1165	1075	1005	0.308
		4	2375	1895	1605	1410	1275	1170	1090	0.257
TYPE II INSUL. FILL	30/4	0	1620	1395	1260	1165	1105	1055	1015	0.740
		1	1875	1585	1410	1295	1215	1150	1100	0.504
		2	2130	1780	1565	1425	1320	1245	1190	0.382
		3	2390	1970	1720	1550	1430	1345	1275	0.308
		4	2645	2160	1875	1680	1540	1440	1360	0.257

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

φ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.5	2.0	2.5	3.0	3.5	4.0	4.5
NO FILL	ALL	0.013	2580	1450	930	645	470	360	285

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

9/16" x 2 1/2" FORM DECK

t = design thickness = 0.0239"

SUPPORT FASTENING: Niti ENP2K, X-EDN19 or X-EDNK22 (0.125" to 0.375" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF							K1
			SPAN, FT							
			2.0	2.5	3.0	3.5	4.0	4.5	5.0	
NO FILL (BARE DECK)	35/8	0	1250	1035	880	765	675 *	605 *	540 *	0.428
		1	1430	1200	1025	895 *	790 *	710 *	640 *	0.336
		2	1590	1345	1160 *	1015 *	905 *	810 *	735 *	0.276
		3	1735	1485	1290 *	1135 *	1010 *	910 *	825 *	0.235
	35/7	4	1860	1610	1410 *	1245 *	1115 *	1005 *	915 *	0.204
		0	1200	1005	860	745	660 *	590 *	535 *	0.456
		1	1365	1155	995	870 *	775 *	695 *	630 *	0.353
		2	1505	1290	1120	990 *	880 *	795 *	720 *	0.288
	35/5	3	1625	1410	1240 *	1100 *	985 *	890 *	810 *	0.243
		4	1730	1520	1345 *	1200 *	1080 *	980 *	895 *	0.210
		0	900	760	655	575	510	460	415 *	0.622
		1	1040	895	780	690	615	555 *	505 *	0.445
	30/7	2	1150	1010	890	795	715 *	650 *	595 *	0.346
		3	1235	1105	990	890 *	805 *	735 *	675 *	0.284
		4	1305	1180	1070	975 *	885 *	815 *	750 *	0.240
		0	1155	950	805	700	615	545 *	490 *	0.570
	30/5	1	1345	1120	955	830 *	735 *	655 *	595 *	0.434
		2	1515	1275	1095	955 *	845 *	760 *	690 *	0.351
		3	1665	1415	1225 *	1075 *	960 *	860 *	780 *	0.294
		4	1795	1550	1350 *	1190 *	1065 *	960 *	870 *	0.253
	30/4	0	895	745	635	555	490	435	390	0.760
		1	1060	900	775	680	600	540 *	490 *	0.537
		2	1200	1030	900	795	710 *	640 *	580 *	0.415
		3	1310	1150	1015	900 *	810 *	735 *	670 *	0.338
2 1/2" NW CONC. (ABOVE DECK)	4	1405	1250	1115	1000 *	900 *	820 *	750 *	0.285	
	0	765	645	555	485	430	385	345	0.855	
	1	905	780	680	600	535	485	440 *	0.582	
	2	1015	895	790	705	635 *	575 *	525 *	0.441	
2 1/2" LW CONC. (ABOVE DECK)	3	1095	985	885	800	725 *	660 *	605 *	0.355	
	4	1160	1060	965	880 *	805 *	740 *	680 *	0.297	
	0	4140	3960	3840	3755	3690	3640	3600	0.855	
	1	4395	4165	4010	3900	3820	3755	3705	0.582	
TYPE I INSUL. FILL	2	4655	4370	4180	4050	3945	3870	3805	0.441	
	3	4910	4575	4355	4195	4075	3980	3910	0.355	
	4	5165	4780	4525	4340	4205	4095	4010	0.297	
	0	1345	1165	1045	960	895	845	805	0.855	
TYPE II INSUL. FILL	1	1605	1370	1220	1110	1025	960	910	0.582	
	2	1860	1575	1390	1255	1155	1075	1010	0.441	
	3	2115	1780	1560	1400	1280	1190	1115	0.355	
	4	2375	1990	1730	1550	1410	1305	1215	0.297	
NO FILL	ALL	0	1615	1435	1315	1230	1165	1115	1075	0.855
		1	1870	1640	1485	1375	1295	1230	1180	0.582
		2	2130	1845	1655	1525	1420	1345	1280	0.441
		3	2385	2050	1830	1670	1550	1455	1385	0.355
4	2640	2255	2000	1815	1680	1570	1485	0.297		

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT						
			1.5	2.0	2.5	3.0	3.5	4.0	4.5
NO FILL	ALL	0.017	2205	1410	980	720	550	435	350

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0295"

SUPPORT FASTENING: 5/8" puddle weld or equivalent

SIDE-LAP FASTENING: 5/8" puddle weld or 1 1/2" long fillet weld

ϕ (EQ): 0.55 Ω (EQ): 3.00 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.60 Ω (Other): 2.65 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	600	475	390	325	280	250	225	205	185	170	0.729
		1	850	710	605								0.358
		2	1040	890	775	680	605	540					0.237
		3	1185	1040	920	820	735	665	610	560 *	510 *		0.177
		4	1300	1160	1040	940	850	775 *	710 *	655 *	610 *	565 *	0.142
		5	1380	1255	1145	1040	950	875 *	805 *	745 *	695 *	650 *	0.118
		6	1445	1335	1230	1130	1040 *	965 *	895 *	830 *	775 *	725 *	0.101
		8	1535	1445	1355	1270	1190 *	1110 *	1040 *	980 *	920 *	870 *	0.078
2" x 12" NO FILL (BARE DECK)	36/4	0	590	460	375	320	280	250	225	205	185	170	0.729
		1	850	710	590								0.358
		2	1040	890	775	680	605	540					0.237
		3	1185	1040	920	820	735	665	610	560 *	510 *		0.177
		4	1300	1160	1040	940	850	775 *	710 *	655 *	610 *	565 *	0.142
		5	1380	1255	1145	1040	950	875 *	805 *	745 *	695 *	650 *	0.118
		6	1445	1335	1230	1130	1040 *	965 *	895 *	830 *	775 *	725 *	0.101
		8	1535	1445	1355	1270	1190 *	1110 *	1040 *	980 *	920 *	870 *	0.078
3" x 12" NO FILL (BARE DECK)	36/4	0	560	445	370	320	280	250	225	205	185	170	0.729
		1	850	705	590								0.358
		2	1040	890	775	680	605	540					0.237
		3	1185	1040	920	820	735	665	610	560 *	510 *		0.177
		4	1300	1160	1040	940	850	775 *	710 *	655 *	610 *	565 *	0.142
		5	1380	1255	1145	1040	950	875 *	805 *	745 *	695 *	650 *	0.118
		6	1445	1335	1230	1130	1040 *	965 *	895 *	830 *	775 *	725 *	0.101
		8	1535	1445	1355	1270	1190 *	1110 *	1040 *	980 *	920 *	870 *	0.078
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5550	5420	5335	5275	5225	5190	5160	5140	5120	5105	0.729
		1	5875	5680	5550								0.358
		2	6200	5940	5770	5645	5555	5480					0.237
		3	6525	6205	5985	5830	5715	5625	5555	5495	5445		0.177
		4	6855	6465	6205	6020	5880	5770	5685	5615	5555	5505	0.142
		5	7180	6725	6420	6205	6040	5915	5815	5730	5665	5605	0.118
		6	7505	6985	6640	6390	6205	6060	5945	5850	5770	5705	0.101
		8	8160	7505	7075	6765	6530	6350	6205	6085	5990	5905	0.078
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3885	3755	3670	3610	3565	3525	3500	3475	3455	3440	0.729
		1	4210	4015	3890								0.358
		2	4535	4280	4105	3980	3890	3815					0.237
		3	4865	4540	4320	4170	4050	3960	3890	3830	3780		0.177
		4	5190	4800	4540	4355	4215	4105	4020	3950	3890	3840	0.142
		5	5515	5060	4755	4540	4380	4250	4150	4070	4000	3940	0.118
		6	5840	5320	4975	4725	4540	4395	4280	4185	4110	4040	0.101
		8	6495	5845	5410	5100	4865	4685	4540	4425	4325	4240	0.078

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.165	3405	2180	1515	1110	850	670	545	450	375	320
2" x 12"	24/3 & 36/4	0.338	6115	3910	2715	1995	1525	1205	975	805	675	575
3" x 12"	24/3 & 36/4	0.797	11290	7225	5015	3685	2820	2230	1805	1490	1255	1065

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0358"

SUPPORT FASTENING: 5/8" puddle weld or equivalent

SIDE-LAP FASTENING: 5/8" puddle weld or 1 1/2" long fillet weld

ϕ (EQ): 0.55 Ω (EQ): 3.00 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.60 Ω (Other): 2.65 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	725	575	470	395	340	300	270	245	225	205	0.803
		1	1020	850	730								0.394
		2	1250	1070	930	820	730	645					0.261
		3	1425	1250	1105	985	885	800	730	670	615 *		0.195
		4	1560	1395	1250	1125	1020	930	855	790 *	730 *	680 *	0.156
		5	1660	1510	1375	1250	1145	1050	970 *	895 *	835 *	780 *	0.130
		6	1735	1600	1475	1355	1250	1155 *	1070 *	1000 *	930 *	875 *	0.111
		8	1840	1735	1630	1525	1425 *	1335 *	1250 *	1175 *	1105 *	1040 *	0.086
2" x 12" NO FILL (BARE DECK)	36/4	0	715	560	455	385	335	300	270	245	225	205	0.803
		1	1020	850	715								0.394
		2	1250	1070	930	820	725	645					0.261
		3	1425	1250	1105	985	885	800	730	670	615 *		0.195
		4	1560	1395	1250	1125	1020	930	855	790 *	730 *	680 *	0.156
		5	1660	1510	1375	1250	1145	1050	970 *	895 *	835 *	780 *	0.130
		6	1735	1600	1475	1355	1250	1155 *	1070 *	1000 *	930 *	875 *	0.111
		8	1840	1735	1630	1525	1425 *	1335 *	1250 *	1175 *	1105 *	1040 *	0.086
3" x 12" NO FILL (BARE DECK)	36/4	0	680	535	445	385	335	300	270	245	225	205	0.803
		1	1020	850	705								0.394
		2	1250	1070	930	820	725	645					0.261
		3	1425	1250	1105	985	885	800	730	670	615 *		0.195
		4	1560	1395	1250	1125	1020	930	855	790 *	730 *	680 *	0.156
		5	1660	1510	1375	1250	1145	1050	970 *	895 *	835 *	780 *	0.130
		6	1735	1600	1475	1355	1250	1155 *	1070 *	1000 *	930 *	875 *	0.111
		8	1840	1735	1630	1525	1425 *	1335 *	1250 *	1175 *	1105 *	1040 *	0.086
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5680	5525	5420	5345	5290	5250	5215	5185	5160	5140	0.803
		1	6070	5835	5680								0.394
		2	6460	6150	5940	5795	5685	5595					0.261
		3	6855	6465	6205	6020	5880	5770	5685	5615	5555		0.195
		4	7245	6775	6465	6240	6075	5945	5840	5755	5685	5625	0.156
		5	7635	7090	6725	6465	6270	6120	5995	5900	5815	5745	0.130
		6	8030	7405	6985	6690	6465	6290	6155	6040	5945	5865	0.111
		8	8810	8030	7510	7135	6860	6640	6465	6325	6205	6105	0.086
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	4015	3860	3755	3685	3630	3585	3550	3520	3500	3480	0.803
		1	4405	4175	4020								0.394
		2	4800	4485	4280	4130	4020	3935					0.261
		3	5190	4800	4540	4355	4215	4105	4020	3950	3890		0.195
		4	5580	5115	4800	4580	4410	4280	4175	4090	4020	3960	0.156
		5	5970	5425	5060	4800	4605	4455	4335	4235	4150	4080	0.130
		6	6365	5740	5325	5025	4800	4630	4490	4375	4280	4200	0.111
		8	7145	6365	5845	5475	5195	4975	4805	4660	4545	4440	0.086

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.212	4755	3040	2110	1550	1185	935	760	625	525	450
2" x 12"	24/3 & 36/4	0.420	8320	5325	3695	2715	2080	1640	1330	1100	925	785
3" x 12"	24/3 & 36/4	0.993	15395	9855	6840	5025	3850	3040	2460	2035	1710	1455

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0474"

SUPPORT FASTENING: 5/8" puddle weld or equivalent

SIDE-LAP FASTENING: 5/8" puddle weld or 1 1/2" long fillet weld

ϕ (EQ): 0.55 Ω (EQ): 3.00 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.60 Ω (Other): 2.65 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	750	620	520	450	395	350	315	290	265	250	0.923
		1	1105	945									0.454
		2	1390	1205	1060	945	845						0.301
		3	1620	1430	1275	1145	1040	950	870	800			0.225
		4	1810	1620	1460	1325	1210	1110	1025	950	885 *	825 *	0.180
		5	1960	1780	1625	1485	1360	1255	1165	1085 *	1010 *	950 *	0.150
		6	2080	1915	1760	1625	1500	1390	1295 *	1210 *	1135 *	1065 *	0.128
		8	2255	2115	1980	1850	1735	1625 *	1525 *	1435 *	1350 *	1280 *	0.099
2" x 12" NO FILL (BARE DECK)	36/4	0	735	600	505	435	385	350	315	290	265	250	0.923
		1	1105	940									0.454
		2	1390	1205	1060	945	840						0.301
		3	1620	1430	1275	1145	1040	950	870	800			0.225
		4	1810	1620	1460	1325	1210	1110	1025	950	885 *	825 *	0.180
		5	1960	1780	1625	1485	1360	1255	1165	1085 *	1010 *	950 *	0.150
		6	2080	1915	1760	1625	1500	1390	1295 *	1210 *	1135 *	1065 *	0.128
		8	2255	2115	1980	1850	1735	1625 *	1525 *	1435 *	1350 *	1280 *	0.099
3" x 12" NO FILL (BARE DECK)	36/4	0	700	580	495	435	385	350	315	290	265	250	0.923
		1	1105	920									0.454
		2	1390	1205	1060	945	840						0.301
		3	1620	1430	1275	1145	1040	950	870	800			0.225
		4	1810	1620	1460	1325	1210	1110	1025	950	885 *	825 *	0.180
		5	1960	1780	1625	1485	1360	1255	1165	1085 *	1010 *	950 *	0.150
		6	2080	1915	1760	1625	1500	1390	1295 *	1210 *	1135 *	1065 *	0.128
		8	2255	2115	1980	1850	1735	1625 *	1525 *	1435 *	1350 *	1280 *	0.099
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5710	5575	5480	5405	5350	5305	5270	5240	5215	5190	0.923
		1	6115	5915									0.454
		2	6520	6250	6060	5915	5805						0.301
		3	6930	6590	6350	6170	6030	5915	5825	5745			0.225
		4	7335	6930	6640	6425	6255	6120	6010	5915	5840	5770	0.180
		5	7740	7270	6930	6675	6480	6325	6195	6085	5995	5915	0.150
		6	8145	7605	7220	6930	6705	6525	6380	6255	6150	6065	0.128
		8	8960	8285	7800	7440	7160	6930	6750	6595	6465	6355	0.099
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	4045	3910	3815	3745	3685	3640	3605	3575	3550	3530	0.923
		1	4450	4250									0.454
		2	4855	4590	4395	4250	4140						0.301
		3	5265	4925	4685	4505	4365	4250	4160	4085			0.225
		4	5670	5265	4975	4760	4590	4455	4345	4255	4175	4110	0.180
		5	6075	5605	5265	5015	4815	4660	4530	4420	4330	4255	0.150
		6	6485	5945	5555	5265	5040	4860	4715	4590	4490	4400	0.128
		8	7295	6620	6140	5775	5495	5270	5085	4930	4800	4690	0.099

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0
1 1/2" x 6"	36/4	0.308	4970	3450	2535	1940	1530	1240	1025	860	735	630
2" x 12"	24/3 & 36/4	0.560	8155	5665	4160	3185	2515	2035	1685	1415	1205	1040
3" x 12"	24/3 & 36/4	1.324	15090	10480	7700	5895	4655	3770	3115	2620	2230	1925

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0598"

SUPPORT FASTENING: 5/8" puddle weld or equivalent

SIDE-LAP FASTENING: 5/8" puddle weld or 1 1/2" long fillet weld

φ (EQ): 0.55 Ω (EQ): 3.00 φ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 φ (WIND): 0.70 Ω (WIND): 2.35 φ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 φ (Other): 0.60 Ω (Other): 2.65 φ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	770	650	565	495	440	395	360	330	305	285	1.037
		1	1165										0.510
		2	1490	1310	1170	1050							0.338
		3	1770	1575	1415	1280	1170	1075	985				0.253
		4	2005	1805	1635	1490	1370	1265	1170	1090	1020	955 *	0.202
		5	2200	2005	1830	1680	1550	1435	1335	1250 *	1170 *	1100 *	0.168
		6	2365	2175	2005	1850	1720	1600	1495 *	1400 *	1315 *	1240 *	0.144
		8	2610	2445	2285	2140	2005	1880 *	1770 *	1670 *	1575 *	1495 *	0.112
2" x 12" NO FILL (BARE DECK)	36/4	0	750	635	545	475	430	390	360	330	305	285	1.037
		1	1165										0.510
		2	1490	1310	1170	1035							0.338
		3	1770	1575	1415	1280	1170	1075	985				0.253
		4	2005	1805	1635	1490	1370	1265	1170	1090	1020	955 *	0.202
		5	2200	2005	1830	1680	1550	1435	1335	1250 *	1170 *	1100 *	0.168
		6	2365	2175	2005	1850	1720	1600	1495 *	1400 *	1315 *	1240 *	0.144
		8	2610	2445	2285	2140	2005	1880 *	1770 *	1670 *	1575 *	1495 *	0.112
3" x 12" NO FILL (BARE DECK)	36/4	0	715	615	535	475	430	390	360	330	305	285	1.037
		1	1135										0.510
		2	1490	1310	1165	1035							0.338
		3	1770	1575	1415	1280	1170	1075	985				0.253
		4	2005	1805	1635	1490	1370	1265	1170	1090	1020	955 *	0.202
		5	2200	2005	1830	1680	1550	1435	1335	1250 *	1170 *	1100 *	0.168
		6	2365	2175	2005	1850	1720	1600	1495 *	1400 *	1315 *	1240 *	0.144
		8	2610	2445	2285	2140	2005	1880 *	1770 *	1670 *	1575 *	1495 *	0.112
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5730	5615	5525	5455	5400	5355	5320	5285	5260	5235	1.037
		1	6150										0.510
		2	6570	6330	6150	6015							0.338
		3	6985	6690	6465	6290	6155	6040	5945				0.253
		4	7405	7045	6780	6570	6405	6270	6155	6060	5975	5905	0.202
		5	7820	7405	7095	6850	6655	6495	6365	6250	6155	6070	0.168
		6	8240	7765	7405	7130	6905	6725	6575	6445	6335	6240	0.144
		8	9075	8480	8035	7685	7410	7180	6990	6830	6695	6575	0.112
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	4065	3950	3860	3790	3735	3690	3655	3620	3595	3570	1.037
		1	4485										0.510
		2	4905	4665	4490	4350							0.338
		3	5320	5025	4800	4630	4490	4375	4280				0.253
		4	5740	5385	5115	4905	4740	4605	4490	4395	4310	4240	0.202
		5	6160	5740	5430	5185	4990	4830	4700	4585	4490	4410	0.168
		6	6575	6100	5745	5465	5240	5060	4910	4780	4670	4575	0.144
		8	7415	6815	6370	6020	5745	5515	5325	5165	5030	4910	0.112

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

φ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
1 1/2" x 6"	36/4	0.400	5000	3670	2810	2220	1800	1485	1250	1065	915	800
2" x 12"	24/3 & 36/4	0.700	7970	5855	4480	3540	2870	2370	1990	1695	1460	1275
3" x 12"	24/3 & 36/4	1.666	14820	10890	8335	6585	5335	4410	3705	3155	2720	2370

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0295"

SUPPORT FASTENING: 5/8" puddle weld or equivalent

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.55 Ω (EQ): 3.00 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.60 Ω (Other): 2.65 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	600	475	390	325	280	250	225	205	185	170	0.729
		1	730	600	495								0.509
		2	840	705	600	505	440	390					0.391
		3	940	795	685	600	520	460	415	375	345		0.318
		4	1030	880	765	675	595	530	475	435	395	365	0.267
		5	1105	960	840	740	665	600	540	490	450*	415*	0.231
		6	1175	1030	905	805	725	655	600	550*	505*	465*	0.203
		8	1285	1150	1030	925	840	765	700*	645*	600*	555*	0.164
2" x 12" NO FILL (BARE DECK)	36/4	0	590	460	375	320	280	250	225	205	185	170	0.729
		1	730	585	480								0.509
		2	840	705	585	500	435	390					0.391
		3	940	795	685	590	515	460	415	375	345		0.318
		4	1030	880	765	675	595	530	475	435	395	365	0.267
		5	1105	960	840	740	665	600	540	490	450*	415*	0.231
		6	1175	1030	905	805	725	655	600	550*	505*	465*	0.203
		8	1285	1150	1030	925	840	765	700*	645*	600*	555*	0.164
3" x 12" NO FILL (BARE DECK)	36/4	0	560	445	370	320	280	250	225	205	185	170	0.729
		1	720	575	475								0.509
		2	840	700	585	500	435	390					0.391
		3	940	795	685	590	515	460	415	375	345		0.318
		4	1030	880	765	675	595	530	475	435	395	365	0.267
		5	1105	960	840	740	665	600	540	490	450*	415*	0.231
		6	1175	1030	905	805	725	655	600	550*	505*	465*	0.203
		8	1285	1150	1030	925	840	765	700*	645*	600*	555*	0.164
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5550	5420	5335	5275	5225	5190	5160	5140	5120	5105	0.729
		1	5705	5545	5440								0.509
		2	5865	5675	5545	5455	5385	5330					0.391
		3	6025	5800	5650	5545	5465	5400	5350	5310	5280		0.318
		4	6180	5925	5755	5635	5545	5470	5415	5370	5330	5300	0.267
		5	6340	6055	5860	5725	5620	5545	5480	5425	5385	5345	0.231
		6	6500	6180	5965	5815	5700	5615	5540	5485	5435	5395	0.203
		8	6815	6435	6180	5995	5860	5755	5670	5600	5540	5490	0.164
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3885	3755	3670	3610	3565	3525	3500	3475	3455	3440	0.729
		1	4045	3885	3775								0.509
		2	4200	4010	3880	3790	3720	3670					0.391
		3	4360	4135	3985	3880	3800	3740	3690	3650	3615		0.318
		4	4520	4265	4095	3970	3880	3810	3750	3705	3665	3635	0.267
		5	4675	4390	4200	4060	3960	3880	3815	3765	3720	3680	0.231
		6	4835	4515	4305	4150	4040	3950	3880	3820	3770	3730	0.203
		8	5150	4770	4515	4335	4195	4090	4005	3935	3880	3830	0.164

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.165	3405	2180	1515	1110	850	670	545	450	375	320
2" x 12"	24/3 & 36/4	0.338	6115	3910	2715	1995	1525	1205	975	805	675	575
3" x 12"	24/3 & 36/4	0.797	11290	7225	5015	3685	2820	2230	1805	1490	1255	1065

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0358"

SUPPORT FASTENING: 5/8" puddle weld or equivalent

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.55 Ω (EQ): 3.00 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.60 Ω (Other): 2.65 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	725	575	470	395	340	300	270	245	225	205	0.803
		1	875	725	600								0.561
		2	1015	845	725	615	535	470					0.431
		3	1135	960	825	725	630	555	500	455	415		0.350
		4	1240	1060	925	810	725	640	575	525	480	445	0.294
		5	1335	1155	1010	895	800	725	650	595	545	500	0.254
		6	1415	1240	1095	975	875	790	725	665	610	560	0.224
		8	1550	1385	1240	1115	1010	920	845	780	725	675	0.180
2" x 12" NO FILL (BARE DECK)	36/4	0	715	560	455	385	335	300	270	245	225	205	0.803
		1	875	710	585								0.561
		2	1015	845	710	600	525	470					0.431
		3	1135	960	825	710	625	555	500	455	415		0.350
		4	1240	1060	925	810	720	640	575	525	480	445	0.294
		5	1335	1155	1010	895	800	725	650	595	545	500	0.254
		6	1415	1240	1095	975	875	790	725	665	610	560	0.224
		8	1550	1385	1240	1115	1010	920	845	780	725	675	0.180
3" x 12" NO FILL (BARE DECK)	36/4	0	680	535	445	385	335	300	270	245	225	205	0.803
		1	875	690	575								0.561
		2	1015	845	705	600	525	470					0.431
		3	1135	960	825	710	625	555	500	455	415		0.350
		4	1240	1060	925	810	720	640	575	525	480	445	0.294
		5	1335	1155	1010	895	800	725	650	595	545	500	0.254
		6	1415	1240	1095	975	875	790	725	665	610	560	0.224
		8	1550	1385	1240	1115	1010	920	845	780	725	675	0.180
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5680	5525	5420	5345	5290	5250	5215	5185	5160	5140	0.803
		1	5870	5675	5550								0.561
		2	6065	5830	5675	5565	5485	5420					0.431
		3	6255	5985	5805	5675	5580	5505	5445	5395	5355		0.350
		4	6445	6140	5935	5785	5675	5590	5520	5465	5420	5380	0.294
		5	6640	6290	6060	5895	5770	5675	5600	5535	5485	5440	0.254
		6	6830	6445	6190	6005	5870	5760	5675	5605	5545	5495	0.224
		8	7215	6755	6445	6225	6060	5930	5830	5745	5675	5615	0.180
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	4015	3860	3755	3685	3630	3585	3550	3520	3500	3480	0.803
		1	4205	4015	3885								0.561
		2	4400	4165	4015	3900	3820	3755					0.431
		3	4590	4320	4140	4010	3915	3840	3780	3730	3690		0.350
		4	4785	4475	4270	4120	4010	3925	3860	3800	3755	3715	0.294
		5	4975	4630	4395	4230	4110	4010	3935	3870	3820	3775	0.254
		6	5170	4780	4525	4340	4205	4095	4010	3940	3885	3835	0.224
		8	5550	5090	4780	4560	4395	4270	4165	4080	4010	3950	0.180

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.212	4755	3040	2110	1550	1185	935	760	625	525	450
2" x 12"	24/3 & 36/4	0.420	8320	5325	3695	2715	2080	1640	1330	1100	925	785
3" x 12"	24/3 & 36/4	0.993	15395	9855	6840	5025	3850	3040	2460	2035	1710	1455

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0474"

SUPPORT FASTENING: 5/8" puddle weld or equivalent

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.55 Ω (EQ): 3.00 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.60 Ω (Other): 2.65 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	750	620	520	450	395	350	315	290	265	250	0.923
		1	945	790									0.645
		2	1105	945	815	705	620						0.496
		3	1255	1080	945	830	735	655	595	545			0.403
		4	1390	1205	1065	945	845	755	685	630	580	540	0.339
		5	1510	1325	1175	1050	950	860	780	715	660	610	0.293
		6	1620	1435	1275	1145	1040	950	870	800	735	685	0.257
		8	1810	1625	1465	1325	1210	1110	1025	950	885*	825*	0.207
2" x 12" NO FILL (BARE DECK)	36/4	0	735	600	505	435	385	350	315	290	265	250	0.923
		1	940	770									0.645
		2	1105	940	795	690	610						0.496
		3	1255	1080	940	815	725	655	595	545			0.403
		4	1390	1205	1065	945	840	755	685	630	580	540	0.339
		5	1510	1325	1175	1050	950	855	780	715	660	610	0.293
		6	1620	1435	1275	1145	1040	950	870	800	735	685	0.257
		8	1810	1625	1465	1325	1210	1110	1025	950	885*	825*	0.207
3" x 12" NO FILL (BARE DECK)	36/4	0	700	580	495	435	385	350	315	290	265	250	0.923
		1	905	750									0.645
		2	1105	920	785	690	610						0.496
		3	1255	1080	935	815	725	655	595	545			0.403
		4	1390	1205	1065	945	840	755	685	630	580	540	0.339
		5	1510	1325	1175	1050	950	855	780	715	660	610	0.293
		6	1620	1435	1275	1145	1040	950	870	800	735	685	0.257
		8	1810	1625	1465	1325	1210	1110	1025	950	885*	825*	0.207
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5710	5575	5480	5405	5350	5305	5270	5240	5215	5190	0.923
		1	5910	5745									0.645
		2	6115	5915	5770	5660	5575						0.496
		3	6320	6085	5915	5790	5690	5610	5545	5495			0.403
		4	6520	6255	6060	5915	5805	5715	5640	5580	5525	5480	0.339
		5	6725	6420	6205	6045	5915	5815	5730	5665	5605	5555	0.293
		6	6930	6590	6350	6170	6030	5915	5825	5750	5685	5630	0.257
		8	7335	6930	6640	6425	6255	6120	6010	5920	5840	5775	0.207
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	4045	3910	3815	3745	3685	3640	3605	3575	3550	3530	0.923
		1	4250	4080									0.645
		2	4450	4250	4105	3995	3915						0.496
		3	4655	4420	4250	4125	4025	3950	3885	3830			0.403
		4	4860	4590	4395	4250	4140	4050	3975	3915	3865	3820	0.339
		5	5060	4760	4540	4380	4250	4150	4070	4000	3940	3890	0.293
		6	5265	4930	4685	4505	4365	4255	4160	4085	4020	3965	0.257
		8	5675	5265	4980	4760	4590	4455	4345	4255	4175	4110	0.207

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0
1 1/2" x 6"	36/4	0.308	4970	3450	2535	1940	1530	1240	1025	860	735	630
2" x 12"	24/3 & 36/4	0.560	8155	5665	4160	3185	2515	2035	1685	1415	1205	1040
3" x 12"	24/3 & 36/4	1.324	15090	10480	7700	5895	4655	3770	3115	2620	2230	1925

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRF Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0598"

SUPPORT FASTENING: 5/8" puddle weld or equivalent

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.55 Ω (EQ): 3.00 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.60 Ω (Other): 2.65 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	770	650	565	495	440	395	360	330	305	285	1.037
		1	985										0.725
		2	1175	1020	885	780							0.557
		3	1345	1180	1045	920	825	745	680				0.452
		4	1505	1325	1180	1065	955	860	785	725	675	630	0.381
		5	1650	1460	1310	1185	1075	980	895	825	765	715	0.329
		6	1785	1590	1430	1295	1185	1090	1000	925	855	800	0.289
		8	2025	1825	1655	1510	1385	1280	1185	1105	1035	970	0.233
2" x 12" NO FILL (BARE DECK)	36/4	0	750	635	545	475	430	390	360	330	305	285	1.037
		1	965										0.725
		2	1175	1000	865	760							0.557
		3	1345	1180	1025	905	815	740	680				0.452
		4	1505	1325	1180	1050	945	855	785	725	675	630	0.381
		5	1650	1460	1310	1185	1070	975	895	825	765	715	0.329
		6	1785	1590	1430	1295	1185	1090	1000	925	855	800	0.289
		8	2025	1825	1655	1510	1385	1280	1185	1105	1035	970	0.233
3" x 12" NO FILL (BARE DECK)	36/4	0	715	615	535	475	430	390	360	330	305	285	1.037
		1	930										0.725
		2	1145	980	855	760							0.557
		3	1345	1165	1020	905	815	740	680				0.452
		4	1505	1325	1180	1050	945	855	785	725	675	630	0.381
		5	1650	1460	1310	1185	1070	975	895	825	765	715	0.329
		6	1785	1590	1430	1295	1185	1090	1000	925	855	800	0.289
		8	2025	1825	1655	1510	1385	1280	1185	1105	1035	970	0.233
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5730	5615	5525	5455	5400	5355	5320	5285	5260	5235	1.037
		1	5945										0.725
		2	6160	5980	5845	5740							0.557
		3	6375	6165	6005	5885	5785	5705	5640				0.452
		4	6585	6345	6165	6025	5915	5820	5745	5680	5625	5575	0.381
		5	6800	6530	6325	6170	6040	5940	5855	5780	5715	5665	0.329
		6	7015	6715	6485	6310	6170	6055	5960	5880	5810	5750	0.289
		8	7445	7080	6810	6595	6430	6290	6175	6075	5990	5920	0.233
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	4065	3950	3860	3790	3735	3690	3655	3620	3595	3570	1.037
		1	4280										0.725
		2	4495	4315	4180	4075							0.557
		3	4710	4500	4340	4220	4120	4040	3975				0.452
		4	4925	4685	4505	4360	4250	4160	4080	4015	3960	3915	0.381
		5	5135	4865	4665	4505	4380	4275	4190	4115	4055	4000	0.329
		6	5350	5050	4825	4650	4505	4390	4295	4215	4145	4085	0.289
		8	5780	5415	5145	4935	4765	4625	4510	4410	4330	4255	0.233

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
1 1/2" x 6"	36/4	0.400	5000	3670	2810	2220	1800	1485	1250	1065	915	800
2" x 12"	24/3 & 36/4	0.700	7970	5855	4480	3540	2870	2370	1990	1695	1460	1275
3" x 12"	24/3 & 36/4	1.666	14820	10890	8335	6585	5335	4410	3705	3155	2720	2370

NOTE: ASD Required Strength (Service Applied Load) <= Minimum (Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling))
 LRFD Required Strength (Factored Applied Load) <= Minimum (ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n)

COMPOSITE DECK

t = design thickness = 0.0295"

SUPPORT FASTENING: Buildex and Elco Textron #12 or #14 TEKS screws

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	350	275	225	190	165	145	130	120	110	100	0.824
		1	475	395	330								0.554
		2	575	485	420	370	320	285					0.417
		3	655	565	495	440	395	355	320	290	265		0.334
		4	715	630	560	500	450	410	375	345	320	295	0.279
		5	765	690	620	560	505	460	425	390	365	340	0.240
		6	805	735	665	610	555	510	470	435	405	380 *	0.210
		8	865	805	745	690	640	595	550	515	480 *	455 *	0.168
2" x 12" NO FILL (BARE DECK)	36/4	0	345	270	220	185	165	145	130	120	110	100	0.824
		1	475	395	325								0.554
		2	575	485	420	365	320	285					0.417
		3	655	565	495	440	395	355	320	290	265		0.334
		4	715	630	560	500	450	410	375	345	320	295	0.279
		5	765	690	620	560	505	460	425	390	365	340	0.240
		6	805	735	665	610	555	510	470	435	405	380 *	0.210
		8	865	805	745	690	640	595	550	515	480 *	455 *	0.168
3" x 12" NO FILL (BARE DECK)	36/4	0	325	260	215	185	165	145	130	120	110	100	0.824
		1	475	385	325								0.554
		2	575	485	420	365	320	285					0.417
		3	655	565	495	440	395	355	320	290	265		0.334
		4	715	630	560	500	450	410	375	345	320	295	0.279
		5	765	690	620	560	505	460	425	390	365	340	0.240
		6	805	735	665	610	555	510	470	435	405	380 *	0.210
		8	865	805	745	690	640	595	550	515	480 *	455 *	0.168
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5280	5205	5155	5120	5095	5070	5055	5040	5030	5020	0.824
		1	5440	5330	5260	5300	5250	5210					0.554
		2	5600	5460	5365	5300	5250	5210					0.417
		3	5755	5585	5470	5390	5330	5285	5245	5215	5190		0.334
		4	5915	5710	5580	5480	5410	5355	5310	5270	5240	5215	0.279
		5	6075	5840	5685	5570	5490	5425	5370	5330	5295	5265	0.240
		6	6230	5965	5790	5660	5570	5495	5435	5385	5345	5315	0.210
		8	6550	6220	6000	5845	5725	5635	5560	5500	5450	5410	0.168
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3615	3540	3490	3455	3430	3410	3390	3375	3365	3355	0.824
		1	3775	3670	3595								0.554
		2	3935	3795	3705	3635	3585	3550					0.417
		3	4090	3920	3810	3725	3665	3620	3580	3550	3525		0.334
		4	4250	4050	3915	3820	3745	3690	3645	3610	3575	3550	0.279
		5	4410	4175	4020	3910	3825	3760	3710	3665	3630	3600	0.240
		6	4565	4300	4125	4000	3905	3830	3770	3725	3685	3650	0.210
		8	4885	4555	4335	4180	4060	3970	3900	3840	3790	3745	0.168

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.165	3405	2180	1515	1110	850	670	545	450	375	320
2" x 12"	24/3 & 36/4	0.338	6115	3910	2715	1995	1525	1205	975	805	675	575
3" x 12"	24/3 & 36/4	0.797	11290	7225	5015	3685	2820	2230	1805	1490	1255	1065

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0358"

SUPPORT FASTENING: Buildex and Elco Textron #12 or #14 TEKS screws

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	430	340	280	235	200	175	160	145	130	120	0.907
		1	575	480	405								0.610
		2	695	590	510	450	395	345					0.459
		3	790	685	600	535	475	430	390	355	325		0.368
		4	870	765	680	610	550	500	455	420	390	360	0.307
		5	930	835	750	675	615	560	515	475	440	410	0.264
		6	980	890	810	735	675	620	570	530	490	460	0.231
		8	1050	975	905	835	775	720	670	625	585	550	0.185
2" x 12" NO FILL (BARE DECK)	36/4	0	420	330	270	225	200	175	160	145	130	120	0.907
		1	575	480	395								0.610
		2	695	590	510	445	390	345					0.459
		3	790	685	600	535	475	430	390	355	325		0.368
		4	870	765	680	610	550	500	455	420	390	360	0.307
		5	930	835	750	675	615	560	515	475	440	410	0.264
		6	980	890	810	735	675	620	570	530	490	460	0.231
		8	1050	975	905	835	775	720	670	625	585	550	0.185
3" x 12" NO FILL (BARE DECK)	36/4	0	405	315	265	225	200	175	160	145	130	120	0.907
		1	575	470	390								0.610
		2	695	590	510	445	390	345					0.459
		3	790	685	600	535	475	430	390	355	325		0.368
		4	870	765	680	610	550	500	455	420	390	360	0.307
		5	930	835	750	675	615	560	515	475	440	410	0.264
		6	980	890	810	735	675	620	570	530	490	460	0.231
		8	1050	975	905	835	775	720	670	625	585	550	0.185
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5360	5270	5210	5165	5135	5105	5085	5070	5055	5045	0.907
		1	5555	5425	5335								0.610
		2	5745	5575	5465	5385	5325	5280					0.459
		3	5940	5730	5595	5495	5420	5365	5320	5280	5250		0.368
		4	6130	5885	5720	5605	5515	5450	5395	5350	5315	5280	0.307
		5	6320	6040	5850	5715	5615	5535	5470	5420	5375	5340	0.264
		6	6515	6190	5980	5825	5710	5620	5550	5490	5440	5400	0.231
		8	6900	6500	6235	6045	5900	5790	5700	5630	5570	5520	0.185
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3700	3605	3545	3500	3470	3445	3425	3405	3395	3380	0.907
		1	3890	3760	3675								0.610
		2	4080	3915	3800	3720	3660	3615					0.459
		3	4275	4065	3930	3830	3755	3700	3655	3615	3585		0.368
		4	4465	4220	4060	3940	3855	3785	3730	3685	3650	3620	0.307
		5	4660	4375	4185	4050	3950	3870	3810	3755	3715	3675	0.264
		6	4850	4530	4315	4160	4045	3955	3885	3825	3775	3735	0.231
		8	5235	4835	4570	4380	4240	4125	4040	3965	3905	3855	0.185

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.212	4755	3040	2110	1550	1185	935	760	625	525	450
2" x 12"	24/3 & 36/4	0.420	8320	5325	3695	2715	2080	1640	1330	1100	925	785
3" x 12"	24/3 & 36/4	0.993	15395	9855	6840	5025	3850	3040	2460	2035	1710	1455

NOTE: ASD Required Strength (Service Applied Load) <= Minimum (Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling))
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0474"

SUPPORT FASTENING: Buildex and Elco Textron #12 or #14 TEKS screws

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	455	370	315	270	240	210	190	175	160	150	1.044
		1	635	540									0.702
		2	780	675	595	525	465						0.529
		3	910	795	705	630	570	515	470	430			0.424
		4	1015	900	805	725	660	605	555	515	475	440	0.354
		5	1105	995	895	815	745	680	630	585	545	510	0.304
		6	1180	1070	975	890	820	755	700	650	610	570	0.266
		8	1290	1195	1110	1025	955	885	830	775	725	685	0.213
2" x 12" NO FILL (BARE DECK)	36/4	0	440	360	305	260	235	210	190	175	160	150	1.044
		1	635	530									0.702
		2	780	675	595	515	460						0.529
		3	910	795	705	630	570	515	470	430			0.424
		4	1015	900	805	725	660	605	555	515	475	440	0.354
		5	1105	995	895	815	745	680	630	585	545	510	0.304
		6	1180	1070	975	890	820	755	700	650	610	570	0.266
		8	1290	1195	1110	1025	955	885	830	775	725	685	0.213
3" x 12" NO FILL (BARE DECK)	36/4	0	420	350	300	260	235	210	190	175	160	150	1.044
		1	625	520									0.702
		2	780	675	590	515	460						0.529
		3	910	795	705	630	570	515	470	430			0.424
		4	1015	900	805	725	660	605	555	515	475	440	0.354
		5	1105	995	895	815	745	680	630	585	545	510	0.304
		6	1180	1070	975	890	820	755	700	650	610	570	0.266
		8	1290	1195	1110	1025	955	885	830	775	725	685	0.213
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5390	5310	5250	5205	5175	5145	5125	5105	5090	5075	1.044
		1	5590	5475									0.702
		2	5795	5645	5540	5460	5400						0.529
		3	6000	5815	5685	5590	5515	5450	5400	5360			0.424
		4	6205	5985	5830	5715	5625	5555	5495	5445	5405	5370	0.354
		5	6405	6155	5975	5845	5740	5655	5585	5530	5480	5440	0.304
		6	6610	6325	6120	5970	5850	5755	5680	5615	5560	5515	0.266
		8	7015	6665	6415	6225	6080	5960	5865	5785	5715	5660	0.213
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3725	3645	3585	3545	3510	3485	3460	3440	3425	3415	1.044
		1	3930	3815									0.702
		2	4130	3985	3875	3800	3735						0.529
		3	4335	4155	4020	3925	3850	3790	3740	3695			0.424
		4	4540	4320	4170	4050	3960	3890	3830	3780	3740	3705	0.354
		5	4740	4490	4315	4180	4075	3990	3925	3865	3820	3775	0.304
		6	4945	4660	4460	4305	4190	4095	4015	3950	3895	3850	0.266
		8	5355	5000	4750	4560	4415	4295	4200	4120	4055	3995	0.213

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0
1 1/2" x 6"	36/4	0.308	4970	3450	2535	1940	1530	1240	1025	860	735	630
2" x 12"	24/3 & 36/4	0.560	8155	5665	4160	3185	2515	2035	1685	1415	1205	1040
3" x 12"	24/3 & 36/4	1.324	15090	10480	7700	5895	4655	3770	3115	2620	2230	1925

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0598"

SUPPORT FASTENING: Buildex and Elco Textron #12 or #14 TEKS screws

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	475	400	345	305	270	245	220	205	190	175	1.173
		1	680										0.788
		2	855	750	665	590							0.594
		3	1005	890	795	720	655	595	540				0.476
		4	1140	1015	915	830	760	700	650	600	555	520	0.397
		5	1255	1130	1025	935	860	795	735	685	645	605	0.341
		6	1350	1230	1125	1035	955	885	820	770	720	675	0.299
		8	1510	1400	1295	1200	1120	1045	975	920	865	815	0.239
2" x 12" NO FILL (BARE DECK)	36/4	0	460	390	335	295	265	240	220	205	190	175	1.173
		1	675										0.788
		2	855	750	655	580							0.594
		3	1005	890	795	720	650	590	540				0.476
		4	1140	1015	915	830	760	700	650	600	555	520	0.397
		5	1255	1130	1025	935	860	795	735	685	645	605	0.341
		6	1350	1230	1125	1035	955	885	820	770	720	675	0.299
		8	1510	1400	1295	1200	1120	1045	975	920	865	815	0.239
3" x 12" NO FILL (BARE DECK)	36/4	0	440	375	330	295	265	240	220	205	190	175	1.173
		1	655										0.788
		2	855	745	650	580							0.594
		3	1005	890	795	720	650	590	540				0.476
		4	1140	1015	915	830	760	700	650	600	555	520	0.397
		5	1255	1130	1025	935	860	795	735	685	645	605	0.341
		6	1350	1230	1125	1035	955	885	820	770	720	675	0.299
		8	1510	1400	1295	1200	1120	1045	975	920	865	815	0.239
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5415	5340	5285	5245	5210	5180	5160	5140	5120	5110	1.173
		1	5625										0.788
		2	5840	5705	5605	5530							0.594
		3	6055	5890	5770	5670	5595	5530	5480				0.476
		4	6270	6075	5930	5815	5725	5650	5585	5535	5490	5450	0.397
		5	6485	6260	6090	5955	5850	5765	5695	5635	5580	5535	0.341
		6	6695	6440	6250	6100	5980	5880	5800	5730	5675	5620	0.299
		8	7125	6810	6570	6385	6235	6115	6015	5930	5855	5795	0.239
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3750	3675	3620	3580	3545	3520	3495	3475	3460	3445	1.173
		1	3965										0.788
		2	4175	4045	3945	3865							0.594
		3	4390	4225	4105	4010	3930	3870	3815				0.476
		4	4605	4410	4265	4150	4060	3985	3925	3870	3825	3785	0.397
		5	4820	4595	4425	4295	4190	4100	4030	3970	3915	3870	0.341
		6	5035	4775	4585	4435	4315	4220	4135	4070	4010	3960	0.299
		8	5460	5145	4905	4720	4575	4450	4350	4265	4190	4130	0.239

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
1 1/2" x 6"	36/4	0.400	5000	3670	2810	2220	1800	1485	1250	1065	915	800
2" x 12"	24/3 & 36/4	0.700	7970	5855	4480	3540	2870	2370	1990	1695	1460	1275
3" x 12"	24/3 & 36/4	1.666	14820	10890	8335	6585	5335	4410	3705	3155	2720	2370

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK
t = design thickness = 0.0295"
SUPPORT FASTENING: Buildex BX-12
SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	515	405	330	280	240	210	190	175	160	145	1.584
		1	640	530	435								0.817
		2	750	630	540	460	395	350					0.551
		3	845	720	620	545	475	425	380	345	315		0.415
		4	925	800	695	615	550	495	445	405	370	340	0.333
		5	995	870	765	680	610	555	505	460	425	390 *	0.278
		6	1055	935	830	740	670	610	555	510	475 *	440 *	0.239
		8	1150	1040	940	850	775	710	655 *	605 *	560 *	525 *	0.186
2" x 12" NO FILL (BARE DECK)	36/4	0	500	390	320	270	240	210	190	175	160	145	1.584
		1	640	520	425								0.817
		2	750	630	530	455	395	350					0.551
		3	845	720	620	545	475	425	380	345	315		0.415
		4	925	800	695	615	550	495	445	405	370	340	0.333
		5	995	870	765	680	610	555	505	460	425	390 *	0.278
		6	1055	935	830	740	670	610	555	510	475 *	440 *	0.239
		8	1150	1040	940	850	775	710	655 *	605 *	560 *	525 *	0.186
3" x 12" NO FILL (BARE DECK)	36/4	0	480	380	315	270	240	210	190	175	160	145	1.584
		1	635	505	425								0.817
		2	750	630	530	455	395	350					0.551
		3	845	720	620	545	475	425	380	345	315		0.415
		4	925	800	695	615	550	495	445	405	370	340	0.333
		5	995	870	765	680	610	555	505	460	425	390 *	0.278
		6	1055	935	830	740	670	610	555	510	475 *	440 *	0.239
		8	1150	1040	940	850	775	710	655 *	605 *	560 *	525 *	0.186
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5455	5345	5270	5220	5180	5150	5125	5105	5090	5075	1.584
		1	5615	5470	5375								0.817
		2	5770	5600	5480	5400	5340	5290					0.551
		3	5930	5725	5590	5490	5415	5360	5315	5275	5245		0.415
		4	6090	5850	5695	5580	5495	5430	5380	5335	5300	5270	0.333
		5	6245	5980	5800	5670	5575	5500	5440	5390	5350	5315	0.278
		6	6405	6105	5905	5760	5655	5570	5505	5450	5405	5365	0.239
		8	6720	6360	6115	5940	5815	5710	5630	5565	5510	5465	0.186
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3790	3680	3605	3555	3515	3485	3460	3440	3425	3410	1.584
		1	3950	3805	3715								0.817
		2	4105	3935	3820	3735	3675	3625					0.551
		3	4265	4060	3925	3825	3755	3695	3650	3615	3580		0.415
		4	4425	4185	4030	3915	3830	3765	3715	3670	3635	3605	0.333
		5	4580	4315	4135	4005	3910	3835	3775	3730	3690	3655	0.278
		6	4740	4440	4240	4100	3990	3905	3840	3785	3740	3700	0.239
		8	5055	4695	4450	4280	4150	4050	3965	3900	3845	3800	0.186

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.
 REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.165	3405	2180	1515	1110	850	670	545	450	375	320
2" x 12"	24/3 & 36/4	0.338	6115	3910	2715	1995	1525	1205	975	805	675	575
3" x 12"	24/3 & 36/4	0.797	11290	7225	5015	3685	2820	2230	1805	1490	1255	1065

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK
t = design thickness = 0.0358"
SUPPORT FASTENING: Buildex BX-12
SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	605	475	390	330	285	245	220	200	185	170	1.745
		1	750	625	520								0.900
		2	885	745	635	550	475	420					0.607
		3	995	850	735	645	570	505	455	410	380		0.458
		4	1095	945	825	730	655	590	530	480	440	410	0.367
		5	1175	1030	910	810	730	660	600	550	505	465	0.307
		6	1245	1105	985	885	795	725	665	610	565	525 *	0.263
		8	1355	1230	1115	1010	925	845	780	720 *	670 *	625 *	0.205
2" x 12" NO FILL (BARE DECK)	36/4	0	590	465	380	320	280	245	220	200	185	170	1.745
		1	750	615	505								0.900
		2	885	745	635	535	470	420					0.607
		3	995	850	735	645	565	505	455	410	380		0.458
		4	1095	945	825	730	655	590	530	480	440	410	0.367
		5	1175	1030	910	810	730	660	600	550	505	465	0.307
		6	1245	1105	985	885	795	725	665	610	565	525 *	0.263
		8	1355	1230	1115	1010	925	845	780	720 *	670 *	625 *	0.205
3" x 12" NO FILL (BARE DECK)	36/4	0	565	445	370	320	280	245	220	200	185	170	1.745
		1	750	600	500								0.900
		2	885	745	625	535	470	420					0.607
		3	995	850	735	645	565	505	455	410	380		0.458
		4	1095	945	825	730	655	590	530	480	440	410	0.367
		5	1175	1030	910	810	730	660	600	550	505	465	0.307
		6	1245	1105	985	885	795	725	665	610	565	525 *	0.263
		8	1355	1230	1115	1010	925	845	780	720 *	670 *	625 *	0.205
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5545	5420	5335	5270	5225	5190	5160	5140	5120	5100	1.745
		1	5740	5570	5460								0.900
		2	5930	5725	5590	5490	5420	5360					0.607
		3	6125	5880	5715	5600	5515	5445	5390	5350	5310		0.458
		4	6315	6035	5845	5710	5610	5530	5470	5420	5375	5340	0.367
		5	6510	6185	5975	5820	5705	5615	5545	5485	5440	5400	0.307
		6	6700	6340	6100	5930	5800	5700	5625	5555	5505	5455	0.263
		8	7085	6650	6360	6150	5995	5875	5775	5695	5630	5575	0.205
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3885	3755	3670	3610	3560	3525	3500	3475	3455	3440	1.745
		1	4075	3910	3795								0.900
		2	4270	4060	3925	3825	3755	3695					0.607
		3	4460	4215	4055	3935	3850	3780	3730	3685	3645		0.458
		4	4650	4370	4180	4045	3945	3870	3805	3755	3710	3675	0.367
		5	4845	4525	4310	4155	4040	3955	3880	3825	3775	3735	0.307
		6	5035	4675	4440	4265	4140	4040	3960	3895	3840	3795	0.263
		8	5420	4985	4695	4485	4330	4210	4115	4035	3965	3910	0.205

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.
 REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.212	4755	3040	2110	1550	1185	935	760	625	525	450
2" x 12"	24/3 & 36/4	0.420	8320	5325	3695	2715	2080	1640	1330	1100	925	785
3" x 12"	24/3 & 36/4	0.993	15395	9855	6840	5025	3850	3040	2460	2035	1710	1455

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK
t = design thickness = 0.0474"
SUPPORT FASTENING: Buildex BX-12
SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	590	485	410	355	310	275	250	230	210	195	2.008
		1	780	655									1.036
		2	935	805	700	610	535						0.698
		3	1075	930	820	730	650	580	525	485			0.526
		4	1200	1050	930	835	750	685	620	565	525	485	0.423
		5	1305	1155	1030	930	840	770	710	650	600	560	0.353
		6	1400	1250	1125	1020	930	850	785	725	675	630	0.303
		8	1550	1410	1290	1180	1085	1000	925	860	805	755*	0.236
2" x 12" NO FILL (BARE DECK)	36/4	0	580	475	400	340	305	275	250	230	210	195	2.008
		1	780	640									1.036
		2	935	805	690	595	530						0.698
		3	1075	930	820	725	645	580	525	485			0.526
		4	1200	1050	930	835	750	680	620	565	525	485	0.423
		5	1305	1155	1030	930	840	770	710	650	600	560	0.353
		6	1400	1250	1125	1020	930	850	785	725	675	630	0.303
		8	1550	1410	1290	1180	1085	1000	925	860	805	755*	0.236
3" x 12" NO FILL (BARE DECK)	36/4	0	550	455	390	340	305	275	250	230	210	195	2.008
		1	755	625									1.036
		2	935	795	680	595	530						0.698
		3	1075	930	820	725	645	580	525	485			0.526
		4	1200	1050	930	835	750	680	620	565	525	485	0.423
		5	1305	1155	1030	930	840	770	710	650	600	560	0.353
		6	1400	1250	1125	1020	930	850	785	725	675	630	0.303
		8	1550	1410	1290	1180	1085	1000	925	860	805	755*	0.236
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5535	5430	5355	5300	5255	5220	5190	5170	5150	5130	2.008
		1	5740	5600									1.036
		2	5945	5770	5645	5555	5480						0.698
		3	6150	5940	5790	5680	5595	5525	5470	5420			0.526
		4	6350	6110	5940	5810	5710	5630	5560	5505	5460	5420	0.423
		5	6555	6280	6085	5935	5820	5730	5655	5590	5540	5495	0.353
		6	6760	6450	6230	6065	5935	5830	5745	5675	5615	5565	0.303
		8	7165	6790	6520	6315	6160	6035	5930	5845	5775	5710	0.236
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3875	3770	3690	3635	3590	3555	3530	3505	3485	3465	2.008
		1	4075	3935									1.036
		2	4280	4105	3985	3890	3820						0.698
		3	4485	4275	4130	4020	3930	3860	3805	3760			0.526
		4	4685	4445	4275	4145	4045	3965	3900	3845	3795	3755	0.423
		5	4890	4615	4420	4270	4155	4065	3990	3930	3875	3830	0.353
		6	5095	4785	4565	4400	4270	4170	4085	4015	3955	3905	0.303
		8	5500	5125	4855	4655	4495	4370	4270	4185	4110	4050	0.236

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.
 REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0
1 1/2" x 6"	36/4	0.308	4970	3450	2535	1940	1530	1240	1025	860	735	630
2" x 12"	24/3 & 36/4	0.560	8155	5665	4160	3185	2515	2035	1685	1415	1205	1040
3" x 12"	24/3 & 36/4	1.324	15090	10480	7700	5895	4655	3770	3115	2620	2230	1925

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK
t = design thickness = 0.0598"
SUPPORT FASTENING: Buildex BX-12
SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	570	480	415	365	325	290	265	245	225	210	2.255
		1	785										1.164
		2	960	840	735	650							0.784
		3	1120	985	880	790	710	640	585				0.591
		4	1260	1120	1005	910	830	760	690	640	595	555	0.475
		5	1390	1245	1125	1020	935	860	795	740	685	640	0.396
		6	1505	1360	1230	1125	1035	955	885	825	770	725	0.340
		8	1695	1550	1425	1315	1215	1130	1050	985	925	870	0.265
2" x 12" NO FILL (BARE DECK)	36/4	0	555	470	400	350	315	290	265	245	225	210	2.255
		1	770										1.164
		2	960	835	725	640							0.784
		3	1120	985	880	780	700	640	585				0.591
		4	1260	1120	1005	910	830	755	690	640	595	555	0.475
		5	1390	1245	1125	1020	935	860	795	740	685	640	0.396
		6	1505	1360	1230	1125	1035	955	885	825	770	725	0.340
		8	1695	1550	1425	1315	1215	1130	1050	985	925	870	0.265
3" x 12" NO FILL (BARE DECK)	36/4	0	530	455	395	350	315	290	265	245	225	210	2.255
		1	745										1.164
		2	955	820	720	640							0.784
		3	1120	985	880	780	700	640	585				0.591
		4	1260	1120	1005	910	830	755	690	640	595	555	0.475
		5	1390	1245	1125	1020	935	860	795	740	685	640	0.396
		6	1505	1360	1230	1125	1035	955	885	825	770	725	0.340
		8	1695	1550	1425	1315	1215	1130	1050	985	925	870	0.265
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5515	5430	5365	5310	5270	5240	5210	5185	5165	5150	2.255
		1	5730										1.164
		2	5945	5795	5685	5595							0.784
		3	6155	5980	5845	5740	5655	5590	5530				0.591
		4	6370	6160	6005	5880	5785	5705	5640	5580	5535	5490	0.475
		5	6585	6345	6165	6025	5915	5820	5745	5680	5625	5575	0.396
		6	6800	6530	6325	6170	6040	5940	5850	5780	5715	5660	0.340
		8	7225	6895	6645	6455	6300	6170	6065	5975	5900	5835	0.265
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3850	3765	3700	3650	3605	3575	3545	3525	3500	3485	2.255
		1	4065										1.164
		2	4280	4130	4020	3935							0.784
		3	4495	4315	4180	4075	3990	3925	3865				0.591
		4	4710	4500	4340	4220	4120	4040	3975	3920	3870	3825	0.475
		5	4920	4680	4500	4360	4250	4155	4080	4015	3960	3915	0.396
		6	5135	4865	4660	4505	4380	4275	4190	4115	4055	4000	0.340
		8	5565	5230	4985	4790	4635	4510	4400	4315	4235	4170	0.265

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
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 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.
 REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
1 1/2" x 6"	36/4	0.400	5000	3670	2810	2220	1800	1485	1250	1065	915	800
2" x 12"	24/3 & 36/4	0.700	7970	5855	4480	3540	2870	2370	1990	1695	1460	1275
3" x 12"	24/3 & 36/4	1.666	14820	10890	8335	6585	5335	4410	3705	3155	2720	2370

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK
t = design thickness = 0.0295"
SUPPORT FASTENING: Buildex BX-14
SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	545	430	350	295	255	225	200	185	170	155	1.584
		1	670	555	455								0.817
		2	780	655	560	475	410	365					0.551
		3	875	745	645	565	490	435	390	355	325		0.415
		4	960	825	720	635	565	505	455	415	380	350	0.333
		5	1035	900	790	705	630	570	520	470	430	400 *	0.278
		6	1095	965	855	765	690	625	570	525 *	485 *	445 *	0.239
		8	1200	1075	970	875	795	730	670 *	620 *	575 *	535 *	0.186
2" x 12" NO FILL (BARE DECK)	36/4	0	530	415	340	290	250	225	200	185	170	155	1.584
		1	670	540	445								0.817
		2	780	655	550	470	410	365					0.551
		3	875	745	645	560	490	435	390	355	325		0.415
		4	960	825	720	635	565	505	455	415	380	350	0.333
		5	1035	900	790	705	630	570	520	470	430	400 *	0.278
		6	1095	965	855	765	690	625	570	525 *	485 *	445 *	0.239
		8	1200	1075	970	875	795	730	670 *	620 *	575 *	535 *	0.186
3" x 12" NO FILL (BARE DECK)	36/4	0	505	405	335	290	250	225	200	185	170	155	1.584
		1	665	530	440								0.817
		2	780	655	545	470	410	365					0.551
		3	875	745	645	560	490	435	390	355	325		0.415
		4	960	825	720	635	565	505	455	415	380	350	0.333
		5	1035	900	790	705	630	570	520	470	430	400 *	0.278
		6	1095	965	855	765	690	625	570	525 *	485 *	445 *	0.239
		8	1200	1075	970	875	795	730	670 *	620 *	575 *	535 *	0.186
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5485	5370	5295	5235	5195	5165	5135	5115	5100	5085	1.584
		1	5645	5495	5400								0.817
		2	5805	5625	5505	5420	5355	5305					0.551
		3	5960	5750	5610	5510	5435	5375	5325	5290	5255		0.415
		4	6120	5875	5715	5600	5510	5445	5390	5345	5310	5280	0.333
		5	6280	6005	5820	5690	5590	5515	5455	5405	5360	5325	0.278
		6	6435	6130	5925	5780	5670	5585	5515	5460	5415	5375	0.239
		8	6755	6385	6135	5960	5830	5725	5645	5575	5520	5475	0.186
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3825	3705	3630	3575	3530	3500	3475	3450	3435	3420	1.584
		1	3980	3835	3735								0.817
		2	4140	3960	3840	3755	3690	3640					0.551
		3	4300	4085	3945	3845	3770	3710	3665	3625	3595		0.415
		4	4455	4215	4050	3935	3850	3780	3725	3685	3645	3615	0.333
		5	4615	4340	4155	4025	3930	3850	3790	3740	3700	3665	0.278
		6	4775	4465	4260	4115	4005	3920	3855	3800	3750	3710	0.239
		8	5090	4720	4475	4295	4165	4060	3980	3915	3855	3810	0.186

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 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.
 REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.165	3405	2180	1515	1110	850	670	545	450	375	320
2" x 12"	24/3 & 36/4	0.338	6115	3910	2715	1995	1525	1205	975	805	675	575
3" x 12"	24/3 & 36/4	0.797	11290	7225	5015	3685	2820	2230	1805	1490	1255	1065

NOTE: ASD Required Strength (Service Applied Load) \leq Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) \leq Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0358"

SUPPORT FASTENING: Buildex BX-14

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	640	505	415	350	300	260	235	215	195	180	1.745
		1	790	655	540								0.900
		2	920	775	660	570	490	435					0.607
		3	1040	880	765	670	590	520	465	425	390		0.458
		4	1140	980	855	755	675	605	545	495	455	420	0.367
		5	1225	1070	940	835	750	680	620	565	515	475	0.307
		6	1300	1145	1020	910	820	745	680	625	580	535	0.263
		8	1415	1275	1150	1045	950	870	800	740	685	640	0.205
2" x 12" NO FILL (BARE DECK)	36/4	0	625	490	400	335	295	260	235	215	195	180	1.745
		1	790	645	530								0.900
		2	920	775	655	555	485	435					0.607
		3	1040	880	765	665	585	520	465	425	390		0.458
		4	1140	980	855	755	675	605	545	495	455	420	0.367
		5	1225	1070	940	835	750	680	620	565	515	475	0.307
		6	1300	1145	1020	910	820	745	680	625	580	535	0.263
		8	1415	1275	1150	1045	950	870	800	740	685	640	0.205
3" x 12" NO FILL (BARE DECK)	36/4	0	600	470	395	335	295	260	235	215	195	180	1.745
		1	790	625	520								0.900
		2	920	775	650	555	485	435					0.607
		3	1040	880	765	665	585	520	465	425	390		0.458
		4	1140	980	855	755	675	605	545	495	455	420	0.367
		5	1225	1070	940	835	750	680	620	565	515	475	0.307
		6	1300	1145	1020	910	820	745	680	625	580	535	0.263
		8	1415	1275	1150	1045	950	870	800	740	685	640	0.205
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5585	5450	5360	5295	5245	5205	5175	5150	5130	5115	1.745
		1	5775	5605	5485								0.900
		2	5970	5755	5615	5515	5435	5380					0.607
		3	6160	5910	5745	5625	5535	5465	5405	5360	5325		0.458
		4	6355	6065	5870	5735	5630	5550	5485	5430	5385	5350	0.367
		5	6545	6220	6000	5840	5725	5635	5560	5500	5450	5410	0.307
		6	6740	6370	6125	5950	5820	5720	5640	5570	5515	5470	0.263
		8	7125	6680	6385	6170	6015	5890	5790	5710	5645	5585	0.205
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3920	3785	3695	3630	3580	3545	3515	3490	3465	3450	1.745
		1	4115	3940	3825								0.900
		2	4305	4095	3950	3850	3775	3715					0.607
		3	4500	4245	4080	3960	3870	3800	3745	3700	3660		0.458
		4	4690	4400	4205	4070	3965	3885	3820	3770	3725	3685	0.367
		5	4880	4555	4335	4180	4060	3970	3895	3840	3790	3745	0.307
		6	5075	4710	4465	4290	4155	4055	3975	3905	3850	3805	0.263
		8	5460	5015	4720	4510	4350	4225	4130	4045	3980	3925	0.205

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.212	4755	3040	2110	1550	1185	935	760	625	525	450
2" x 12"	24/3 & 36/4	0.420	8320	5325	3695	2715	2080	1640	1330	1100	925	785
3" x 12"	24/3 & 36/4	0.993	15395	9855	6840	5025	3850	3040	2460	2035	1710	1455

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK
t = design thickness = 0.0474"
SUPPORT FASTENING: Buildex BX-14
SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	625	515	435	375	330	290	265	240	225	205	2.008
		1	815	685									1.036
		2	975	835	725	630	555						0.698
		3	1115	965	850	755	670	595	540	495			0.526
		4	1240	1085	960	860	775	700	635	580	535	500	0.423
		5	1350	1195	1065	955	865	790	725	665	615	570	0.353
		6	1450	1295	1160	1050	955	870	805	745	695	645	0.303
		8	1610	1460	1330	1210	1110	1025	950	880	825	770 *	0.236
2" x 12" NO FILL (BARE DECK)	36/4	0	615	500	420	360	320	290	265	240	225	205	2.008
		1	815	670									1.036
		2	975	835	710	615	550						0.698
		3	1115	965	850	745	660	595	540	495			0.526
		4	1240	1085	960	860	775	695	635	580	535	500	0.423
		5	1350	1195	1065	955	865	790	725	665	615	570	0.353
		6	1450	1295	1160	1050	955	870	805	745	695	645	0.303
		8	1610	1460	1330	1210	1110	1025	950	880	825	770 *	0.236
3" x 12" NO FILL (BARE DECK)	36/4	0	585	485	415	360	320	290	265	240	225	205	2.008
		1	785	655									1.036
		2	975	820	705	615	550						0.698
		3	1115	965	850	745	660	595	540	495			0.526
		4	1240	1085	960	860	775	695	635	580	535	500	0.423
		5	1350	1195	1065	955	865	790	725	665	615	570	0.353
		6	1450	1295	1160	1050	955	870	805	745	695	645	0.303
		8	1610	1460	1330	1210	1110	1025	950	880	825	770 *	0.236
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5575	5465	5385	5325	5275	5240	5210	5185	5160	5145	2.008
		1	5780	5630									1.036
		2	5980	5800	5675	5580	5505						0.698
		3	6185	5970	5820	5705	5615	5545	5485	5440			0.526
		4	6390	6140	5965	5830	5730	5645	5580	5525	5475	5435	0.423
		5	6590	6310	6110	5960	5840	5750	5670	5610	5555	5505	0.353
		6	6795	6480	6255	6085	5955	5850	5765	5690	5630	5580	0.303
		8	7205	6820	6545	6340	6180	6055	5950	5860	5790	5725	0.236
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3910	3800	3720	3660	3615	3575	3545	3520	3500	3480	2.008
		1	4115	3970									1.036
		2	4320	4140	4010	3915	3840						0.698
		3	4520	4310	4155	4040	3950	3880	3825	3775			0.526
		4	4725	4480	4300	4170	4065	3985	3915	3860	3810	3770	0.423
		5	4930	4645	4445	4295	4180	4085	4010	3945	3890	3845	0.353
		6	5130	4815	4590	4425	4290	4185	4100	4030	3970	3915	0.303
		8	5540	5155	4880	4675	4520	4390	4285	4200	4125	4060	0.236

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.
 REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0
1 1/2" x 6"	36/4	0.308	4970	3450	2535	1940	1530	1240	1025	860	735	630
2" x 12"	24/3 & 36/4	0.560	8155	5665	4160	3185	2515	2035	1685	1415	1205	1040
3" x 12"	24/3 & 36/4	1.324	15090	10480	7700	5895	4655	3770	3115	2620	2230	1925

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0598"

SUPPORT FASTENING: Buildex BX-14

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50 φ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25

φ (WIND): 0.70 Ω (WIND): 2.35 φ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25

φ (Other): 0.65 Ω (Other): 2.50 φ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	605	510	440	385	345	310	280	260	240	225	2.255
		1	815										1.164
		2	995	870	760	670							0.784
		3	1155	1020	905	815	730	660	600				0.591
		4	1305	1155	1035	935	855	775	710	655	605	565	0.475
		5	1435	1285	1155	1050	960	880	815	750	700	650	0.396
		6	1555	1400	1270	1155	1060	975	905	845	790	740	0.340
		8	1755	1600	1465	1350	1245	1155	1075	1005	945	890	0.265
2" x 12" NO FILL (BARE DECK)	36/4	0	590	495	425	375	335	305	280	260	240	225	2.255
		1	800										1.164
		2	995	860	745	660							0.784
		3	1155	1020	905	800	720	655	600				0.591
		4	1305	1155	1035	935	850	770	710	655	605	565	0.475
		5	1435	1285	1155	1050	960	880	815	750	700	650	0.396
		6	1555	1400	1270	1155	1060	975	905	845	790	740	0.340
		8	1755	1600	1465	1350	1245	1155	1075	1005	945	890	0.265
3" x 12" NO FILL (BARE DECK)	36/4	0	560	480	420	375	335	305	280	260	240	225	2.255
		1	775										1.164
		2	990	845	740	660							0.784
		3	1155	1020	900	800	720	655	600				0.591
		4	1305	1155	1035	935	850	770	710	655	605	565	0.475
		5	1435	1285	1155	1050	960	880	815	750	700	650	0.396
		6	1555	1400	1270	1155	1060	975	905	845	790	740	0.340
		8	1755	1600	1465	1350	1245	1155	1075	1005	945	890	0.265
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5550	5460	5390	5335	5295	5255	5230	5205	5180	5165	2.255
		1	5765										1.164
		2	5980	5825	5710	5620							0.784
		3	6195	6010	5870	5765	5680	5610	5550				0.591
		4	6410	6195	6030	5905	5805	5725	5655	5600	5550	5505	0.475
		5	6620	6375	6190	6050	5935	5840	5765	5695	5640	5590	0.396
		6	6835	6560	6355	6190	6065	5960	5870	5795	5730	5675	0.340
		8	7265	6925	6675	6475	6320	6190	6085	5995	5915	5850	0.265
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3890	3795	3725	3670	3630	3595	3565	3540	3520	3500	2.255
		1	4100										1.164
		2	4315	4160	4045	3955							0.784
		3	4530	4345	4210	4100	4015	3945	3885				0.591
		4	4745	4530	4370	4245	4145	4060	3990	3935	3885	3840	0.475
		5	4960	4715	4530	4385	4270	4175	4100	4035	3975	3925	0.396
		6	5170	4895	4690	4530	4400	4295	4205	4130	4070	4015	0.340
		8	5600	5265	5010	4815	4655	4525	4420	4330	4250	4185	0.265

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

φ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
1 1/2" x 6"	36/4	0.400	5000	3670	2810	2220	1800	1485	1250	1065	915	800
2" x 12"	24/3 & 36/4	0.700	7970	5855	4480	3540	2870	2370	1990	1695	1460	1275
3" x 12"	24/3 & 36/4	1.666	14820	10890	8335	6585	5335	4410	3705	3155	2720	2370

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0295"

SUPPORT FASTENING: Pneutek SDK61-series (0.113" to 0.155" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	530	415	340	285	245	220	195	180	165	150	1.901
		1	655	540	445								0.894
		2	765	640	550	465	405	360					0.585
		3	860	730	630	555	485	430	385	350	320		0.434
		4	945	810	710	625	560	500	450	410	375	345	0.345
		5	1015	885	780	690	620	560	510	465	425	395*	0.287
		6	1075	950	845	755	680	615	565	520*	480*	445*	0.245
		8	1175	1060	955	865	785	720	660*	610*	565*	530*	0.190
2" x 12" NO FILL (BARE DECK)	36/4	0	515	405	330	280	245	220	195	180	165	150	1.901
		1	655	530	435								0.894
		2	765	640	540	460	405	360					0.585
		3	860	730	630	550	480	430	385	350	320		0.434
		4	945	810	710	625	560	500	450	410	375	345	0.345
		5	1015	885	780	690	620	560	510	465	425	395*	0.287
		6	1075	950	845	755	680	615	565	520*	480*	445*	0.245
		8	1175	1060	955	865	785	720	660*	610*	565*	530*	0.190
3" x 12" NO FILL (BARE DECK)	36/4	0	490	390	325	280	245	220	195	180	165	150	1.901
		1	650	520	430								0.894
		2	765	640	540	460	405	360					0.585
		3	860	730	630	550	480	430	385	350	320		0.434
		4	945	810	710	625	560	500	450	410	375	345	0.345
		5	1015	885	780	690	620	560	510	465	425	395*	0.287
		6	1075	950	845	755	680	615	565	520*	480*	445*	0.245
		8	1175	1060	955	865	785	720	660*	610*	565*	530*	0.190
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5470	5355	5280	5230	5185	5155	5130	5110	5095	5080	1.901
		1	5630	5485	5385								0.894
		2	5785	5610	5495	5410	5345	5295					0.585
		3	5945	5735	5600	5500	5425	5365	5320	5285	5250		0.434
		4	6105	5865	5705	5590	5505	5435	5385	5340	5305	5275	0.345
		5	6260	5990	5810	5680	5585	5510	5445	5400	5355	5320	0.287
		6	6420	6115	5915	5770	5660	5580	5510	5455	5410	5370	0.245
		8	6735	6370	6125	5950	5820	5720	5635	5570	5515	5470	0.190
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3805	3695	3620	3565	3525	3490	3465	3445	3430	3415	1.901
		1	3965	3820	3725								0.894
		2	4125	3945	3830	3745	3680	3635					0.585
		3	4280	4075	3935	3835	3760	3705	3655	3620	3590		0.434
		4	4440	4200	4040	3925	3840	3775	3720	3675	3640	3610	0.345
		5	4600	4325	4145	4015	3920	3845	3785	3735	3695	3660	0.287
		6	4755	4455	4250	4105	4000	3915	3845	3790	3745	3705	0.245
		8	5075	4705	4460	4290	4155	4055	3975	3905	3850	3805	0.190

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.165	3405	2180	1515	1110	850	670	545	450	375	320
2" x 12"	24/3 & 36/4	0.338	6115	3910	2715	1995	1525	1205	975	805	675	575
3" x 12"	24/3 & 36/4	0.797	11290	7225	5015	3685	2820	2230	1805	1490	1255	1065

NOTE: ASD Required Strength (Service Applied Load) <= Minimum (Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling))
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0358"

SUPPORT FASTENING: Pneutek SDK61-series (0.113" to 0.155" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	635	500	410	345	300	260	235	215	195	180	2.094
		1	785	650	540								0.985
		2	920	770	660	565	490	430					0.644
		3	1035	880	760	665	585	515	465	425	390		0.478
		4	1135	980	855	755	670	605	540	495	450	415	0.381
		5	1220	1065	940	835	750	675	615	565	515	475	0.316
		6	1295	1145	1015	910	820	745	680	625	580	535 *	0.270
		8	1410	1270	1150	1040	945	865	795	735 *	685 *	640 *	0.209
2" x 12" NO FILL (BARE DECK)	36/4	0	625	490	400	335	295	260	235	215	195	180	2.094
		1	785	640	525								0.985
		2	920	770	655	555	485	430					0.644
		3	1035	880	760	665	580	515	465	425	390		0.478
		4	1135	980	855	755	670	600	540	495	450	415	0.381
		5	1220	1065	940	835	750	675	615	565	515	475	0.316
		6	1295	1145	1015	910	820	745	680	625	580	535 *	0.270
		8	1410	1270	1150	1040	945	865	795	735 *	685 *	640 *	0.209
3" x 12" NO FILL (BARE DECK)	36/4	0	595	470	390	335	295	260	235	215	195	180	2.094
		1	785	625	520								0.985
		2	920	770	645	555	485	430					0.644
		3	1035	880	760	665	580	515	465	425	390		0.478
		4	1135	980	855	755	670	600	540	495	450	415	0.381
		5	1220	1065	940	835	750	675	615	565	515	475	0.316
		6	1295	1145	1015	910	820	745	680	625	580	535 *	0.270
		8	1410	1270	1150	1040	945	865	795	735 *	685 *	640 *	0.209
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5580	5445	5355	5290	5245	5205	5175	5150	5130	5115	2.094
		1	5775	5600	5485								0.985
		2	5965	5755	5610	5510	5435	5375					0.644
		3	6160	5910	5740	5620	5530	5460	5405	5360	5320		0.478
		4	6350	6060	5870	5730	5625	5545	5485	5430	5385	5350	0.381
		5	6545	6215	5995	5840	5725	5630	5560	5500	5450	5410	0.316
		6	6735	6370	6125	5950	5820	5720	5635	5570	5515	5470	0.270
		8	7120	6675	6380	6170	6010	5890	5790	5710	5645	5585	0.209
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3920	3785	3690	3630	3580	3540	3510	3485	3465	3450	2.094
		1	4110	3935	3820								0.985
		2	4300	4090	3950	3845	3770	3710					0.644
		3	4495	4245	4075	3955	3870	3800	3740	3695	3660		0.478
		4	4685	4400	4205	4065	3965	3885	3820	3765	3725	3685	0.381
		5	4880	4550	4335	4175	4060	3970	3895	3835	3785	3745	0.316
		6	5070	4705	4460	4285	4155	4055	3975	3905	3850	3805	0.270
		8	5455	5010	4715	4505	4350	4225	4125	4045	3980	3920	0.209

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.212	4755	3040	2110	1550	1185	935	760	625	525	450
2" x 12"	24/3 & 36/4	0.42	8320	5325	3695	2715	2080	1640	1330	1100	925	785
3" x 12"	24/3 & 36/4	0.993	15395	9855	6840	5025	3850	3040	2460	2035	1710	1455

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0474"

SUPPORT FASTENING: Pneutek SDK61-series (0.113" to 0.155" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	655	540	455	390	345	305	275	250	235	215	2.409
		1	845	710									1.134
		2	1000	860	745	645	570						0.741
		3	1145	990	870	775	685	610	555	505			0.551
		4	1275	1115	985	880	790	710	645	590	545	505	0.438
		5	1390	1225	1090	975	885	805	740	675	625	580	0.364
		6	1490	1325	1185	1070	970	890	820	760	705	650	0.311
		8	1655	1500	1360	1240	1135	1045	965	895	835	785 *	0.241
2" x 12" NO FILL (BARE DECK)	36/4	0	640	525	440	380	335	305	275	250	235	215	2.409
		1	845	695									1.134
		2	1000	860	730	635	560						0.741
		3	1145	990	870	760	675	610	555	505			0.551
		4	1275	1115	985	880	790	710	645	590	545	505	0.438
		5	1390	1225	1090	975	885	805	740	675	625	580	0.364
		6	1490	1325	1185	1070	970	890	820	760	705	650	0.311
		8	1655	1500	1360	1240	1135	1045	965	895	835	785 *	0.241
3" x 12" NO FILL (BARE DECK)	36/4	0	610	505	430	380	335	305	275	250	235	215	2.409
		1	815	675									1.134
		2	1000	845	725	635	560						0.741
		3	1145	990	870	760	675	610	555	505			0.551
		4	1275	1115	985	880	790	710	645	590	545	505	0.438
		5	1390	1225	1090	975	885	805	740	675	625	580	0.364
		6	1490	1325	1185	1070	970	890	820	760	705	650	0.311
		8	1655	1500	1360	1240	1135	1045	965	895	835	785 *	0.241
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5605	5485	5405	5340	5295	5255	5220	5195	5175	5155	2.409
		1	5810	5655									1.134
		2	6010	5825	5695	5595	5520						0.741
		3	6215	5995	5840	5725	5630	5560	5500	5450			0.551
		4	6420	6165	5985	5850	5745	5660	5590	5535	5485	5445	0.438
		5	6620	6335	6130	5980	5860	5765	5685	5620	5565	5520	0.364
		6	6825	6505	6275	6105	5970	5865	5780	5705	5645	5590	0.311
		8	7230	6845	6565	6360	6200	6070	5965	5875	5800	5735	0.241
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3940	3825	3740	3680	3630	3590	3560	3530	3510	3490	2.409
		1	4145	3995									1.134
		2	4345	4165	4030	3930	3855						0.741
		3	4550	4335	4175	4060	3970	3895	3835	3785			0.551
		4	4755	4500	4320	4185	4080	3995	3930	3870	3825	3780	0.438
		5	4960	4670	4465	4315	4195	4100	4020	3955	3900	3855	0.364
		6	5160	4840	4615	4440	4310	4200	4115	4040	3980	3925	0.311
		8	5570	5180	4905	4695	4535	4405	4300	4210	4135	4070	0.241

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0
1 1/2" x 6"	36/4	0.308	4970	3450	2535	1940	1530	1240	1025	860	735	630
2" x 12"	24/3 & 36/4	0.56	8155	5665	4160	3185	2515	2035	1685	1415	1205	1040
3" x 12"	24/3 & 36/4	1.324	15090	10480	7700	5895	4655	3770	3115	2620	2230	1925

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0598"

SUPPORT FASTENING: Pneutek SDK61-series (0.113" to 0.155" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	665	565	485	430	380	340	310	285	265	250	2.706
		1	880										1.273
		2	1065	930	810	715							0.832
		3	1230	1080	960	855	765	690	630				0.618
		4	1380	1220	1090	985	895	810	735	680	630	590	0.492
		5	1520	1355	1215	1100	1005	925	845	780	725	675	0.408
		6	1645	1475	1330	1210	1110	1020	945	880	815	760	0.349
		8	1860	1690	1540	1415	1300	1205	1120	1045	980	920 *	0.271
2" x 12" NO FILL (BARE DECK)	36/4	0	650	550	470	415	370	340	310	285	265	250	2.706
		1	865										1.273
		2	1065	915	790	700							0.832
		3	1230	1080	950	840	755	690	630				0.618
		4	1380	1220	1090	985	885	805	735	680	630	590	0.492
		5	1520	1355	1215	1100	1005	920	845	780	725	675	0.408
		6	1645	1475	1330	1210	1110	1020	945	880	815	760	0.349
		8	1860	1690	1540	1415	1300	1205	1120	1045	980	920 *	0.271
3" x 12" NO FILL (BARE DECK)	36/4	0	620	530	465	415	370	340	310	285	265	250	2.706
		1	835										1.273
		2	1045	895	785	700							0.832
		3	1230	1080	945	840	755	690	630				0.618
		4	1380	1220	1090	985	885	805	735	680	630	590	0.492
		5	1520	1355	1215	1100	1005	920	845	780	725	675	0.408
		6	1645	1475	1330	1210	1110	1020	945	880	815	760	0.349
		8	1860	1690	1540	1415	1300	1205	1120	1045	980	920 *	0.271
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5620	5520	5440	5380	5335	5295	5260	5235	5210	5190	2.706
		1	5835										1.273
		2	6050	5885	5760	5665							0.832
		3	6260	6070	5920	5810	5720	5645	5585				0.618
		4	6475	6250	6085	5950	5845	5760	5690	5630	5580	5535	0.492
		5	6690	6435	6245	6095	5975	5880	5795	5730	5670	5620	0.408
		6	6905	6620	6405	6235	6105	5995	5905	5825	5760	5705	0.349
		8	7330	6985	6725	6525	6360	6230	6120	6025	5945	5875	0.271
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3955	3855	3775	3720	3670	3630	3600	3570	3545	3525	2.706
		1	4170										1.273
		2	4385	4220	4100	4005							0.832
		3	4600	4405	4260	4145	4055	3980	3920				0.618
		4	4810	4590	4420	4290	4185	4100	4025	3965	3915	3870	0.492
		5	5025	4770	4580	4430	4310	4215	4135	4065	4005	3955	0.408
		6	5240	4955	4740	4575	4440	4330	4240	4165	4095	4040	0.349
		8	5670	5320	5060	4860	4695	4565	4455	4360	4280	4210	0.271

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
1 1/2" x 6"	36/4	0.400	5000	3670	2810	2220	1800	1485	1250	1065	915	800
2" x 12"	24/3 & 36/4	0.700	7970	5855	4480	3540	2870	2370	1990	1695	1460	1275
3" x 12"	24/3 & 36/4	1.666	14820	10890	8335	6585	5335	4410	3705	3155	2720	2370

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0295"

SUPPORT FASTENING: Pneutek SDK63-series (0.155" to 0.25" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	595	465	380	320	275	245	220	200	185	170	1.901
		1	720	595	485								0.894
		2	830	695	590	500	435	385					0.585
		3	930	790	680	590	515	455	410	370	340		0.434
		4	1020	870	760	665	590	525	475	430	395	365	0.345
		5	1095	950	830	735	660	595	535	485	445 *	410 *	0.287
		6	1160	1020	900	800	720	650	595	545 *	500 *	460 *	0.245
		8	1270	1135	1020	915	830	760	695 *	640 *	595 *	555 *	0.190
2" x 12" NO FILL (BARE DECK)	36/4	0	580	450	365	315	275	245	220	200	185	170	1.901
		1	720	580	475								0.894
		2	830	695	580	495	435	385					0.585
		3	930	790	680	585	510	455	410	370	340		0.434
		4	1020	870	760	665	590	525	475	430	395	365	0.345
		5	1095	950	830	735	660	595	535	485	445 *	410 *	0.287
		6	1160	1020	900	800	720	650	595	545 *	500 *	460 *	0.245
		8	1270	1135	1020	915	830	760	695 *	640 *	595 *	555 *	0.190
3" x 12" NO FILL (BARE DECK)	36/4	0	550	440	365	315	275	245	220	200	185	170	1.901
		1	710	565	470								0.894
		2	830	690	575	495	435	385					0.585
		3	930	790	680	585	510	455	410	370	340		0.434
		4	1020	870	760	665	590	525	475	430	395	365	0.345
		5	1095	950	830	735	660	595	535	485	445 *	410 *	0.287
		6	1160	1020	900	800	720	650	595	545 *	500 *	460 *	0.245
		8	1270	1135	1020	915	830	760	695 *	640 *	595 *	555 *	0.190
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5540	5410	5325	5265	5220	5185	5160	5135	5115	5100	1.901
		1	5695	5540	5435								0.894
		2	5855	5665	5540	5450	5380	5325					0.585
		3	6015	5790	5645	5540	5460	5395	5350	5310	5275		0.434
		4	6170	5920	5750	5630	5540	5470	5410	5365	5325	5295	0.345
		5	6330	6045	5855	5720	5615	5540	5475	5425	5380	5345	0.287
		6	6490	6170	5960	5810	5695	5610	5540	5480	5430	5390	0.245
		8	6805	6425	6170	5990	5855	5750	5665	5595	5540	5490	0.190
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3875	3750	3665	3605	3560	3520	3495	3470	3450	3435	1.901
		1	4035	3875	3770								0.894
		2	4190	4000	3875	3785	3715	3665					0.585
		3	4350	4130	3980	3875	3795	3735	3685	3645	3610		0.434
		4	4510	4255	4085	3965	3875	3805	3750	3700	3665	3630	0.345
		5	4665	4380	4190	4055	3955	3875	3810	3760	3715	3680	0.287
		6	4825	4510	4295	4145	4035	3945	3875	3815	3770	3730	0.245
		8	5140	4760	4510	4325	4190	4085	4000	3930	3875	3825	0.190

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.165	3405	2180	1515	1110	850	670	545	450	375	320
2" x 12"	24/3 & 36/4	0.338	6115	3910	2715	1995	1525	1205	975	805	675	575
3" x 12"	24/3 & 36/4	0.797	11290	7225	5015	3685	2820	2230	1805	1490	1255	1065

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0358"

SUPPORT FASTENING: Pneutek SDK63-series (0.155" to 0.25" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	685	540	445	375	320	280	255	230	210	195	2.094
		1	835	690	570								0.985
		2	970	815	695	595	515	450					0.644
		3	1090	925	795	700	610	540	485	440	405		0.478
		4	1195	1025	890	785	700	625	560	510	465	430	0.381
		5	1285	1115	980	870	780	705	635	580	530	490	0.316
		6	1365	1200	1060	945	850	770	705	645	595	550	0.270
		8	1490	1335	1200	1085	985	900	825	760	705	660	0.209
2" x 12" NO FILL (BARE DECK)	36/4	0	675	525	430	360	315	280	255	230	210	195	2.094
		1	835	680	560								0.985
		2	970	815	685	580	510	450					0.644
		3	1090	925	795	690	605	535	485	440	405		0.478
		4	1195	1025	890	785	700	625	560	510	465	430	0.381
		5	1285	1115	980	870	780	705	635	580	530	490	0.316
		6	1365	1200	1060	945	850	770	705	645	595	550	0.270
		8	1490	1335	1200	1085	985	900	825	760	705	660	0.209
3" x 12" NO FILL (BARE DECK)	36/4	0	645	505	420	360	315	280	255	230	210	195	2.094
		1	835	660	550								0.985
		2	970	815	680	580	510	450					0.644
		3	1090	925	795	690	605	535	485	440	405		0.478
		4	1195	1025	890	785	700	625	560	510	465	430	0.381
		5	1285	1115	980	870	780	705	635	580	530	490	0.316
		6	1365	1200	1060	945	850	770	705	645	595	550	0.270
		8	1490	1335	1200	1085	985	900	825	760	705	660	0.209
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5635	5490	5390	5320	5270	5230	5195	5170	5150	5130	2.094
		1	5830	5645	5520								0.985
		2	6020	5795	5650	5540	5460	5400					0.644
		3	6210	5950	5775	5650	5560	5485	5425	5380	5340		0.478
		4	6405	6105	5905	5760	5655	5570	5505	5450	5405	5365	0.381
		5	6595	6260	6030	5870	5750	5655	5580	5520	5470	5425	0.316
		6	6790	6410	6160	5980	5845	5740	5660	5590	5530	5485	0.270
		8	7175	6720	6415	6200	6040	5915	5810	5730	5660	5600	0.209
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3970	3825	3730	3660	3605	3565	3535	3505	3485	3465	2.094
		1	4165	3980	3855								0.985
		2	4355	4135	3985	3880	3800	3735					0.644
		3	4550	4285	4110	3990	3895	3820	3765	3715	3675		0.478
		4	4740	4440	4240	4100	3990	3905	3840	3785	3740	3700	0.381
		5	4935	4595	4370	4205	4085	3995	3915	3855	3805	3760	0.316
		6	5125	4750	4495	4315	4185	4080	3995	3925	3870	3820	0.270
		8	5510	5055	4755	4535	4375	4250	4150	4065	3995	3940	0.209

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.212	4755	3040	2110	1550	1185	935	760	625	525	450
2" x 12"	24/3 & 36/4	0.42	8320	5325	3695	2715	2080	1640	1330	1100	925	785
3" x 12"	24/3 & 36/4	0.993	15395	9855	6840	5025	3850	3040	2460	2035	1710	1455

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0474"

SUPPORT FASTENING: Pneutek SDK63-series (0.155" to 0.25" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	665	550	465	400	350	310	280	255	235	220	2.409
		1	855	715									1.134
		2	1015	870	755	655	575						0.741
		3	1160	1000	880	780	690	615	560	510			0.551
		4	1290	1125	995	885	800	715	650	595	550	510	0.438
		5	1405	1235	1100	985	895	815	745	680	630	585	0.364
		6	1505	1340	1200	1080	980	895	825	765	705	655	0.311
		8	1675	1515	1375	1250	1145	1050	975	905	845 *	790 *	0.241
2" x 12" NO FILL (BARE DECK)	36/4	0	650	535	450	385	345	310	280	255	235	220	2.409
		1	855	700									1.134
		2	1015	870	740	640	570						0.741
		3	1160	1000	880	765	680	615	560	510			0.551
		4	1290	1125	995	885	795	715	650	595	550	510	0.438
		5	1405	1235	1100	985	895	815	745	680	630	585	0.364
		6	1505	1340	1200	1080	980	895	825	765	705	655	0.311
		8	1675	1515	1375	1250	1145	1050	975	905	845 *	790 *	0.241
3" x 12" NO FILL (BARE DECK)	36/4	0	620	515	440	385	345	310	280	255	235	220	2.409
		1	825	685									1.134
		2	1015	855	730	640	570						0.741
		3	1160	1000	875	765	680	615	560	510			0.551
		4	1290	1125	995	885	795	715	650	595	550	510	0.438
		5	1405	1235	1100	985	895	815	745	680	630	585	0.364
		6	1505	1340	1200	1080	980	895	825	765	705	655	0.311
		8	1675	1515	1375	1250	1145	1050	975	905	845 *	790 *	0.241
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5615	5500	5415	5350	5300	5260	5230	5200	5180	5160	2.409
		1	5820	5670									1.134
		2	6025	5835	5705	5605	5525						0.741
		3	6230	6005	5850	5730	5640	5565	5505	5455			0.551
		4	6430	6175	5995	5860	5755	5670	5600	5540	5490	5450	0.438
		5	6635	6345	6140	5985	5865	5770	5690	5625	5570	5520	0.364
		6	6840	6515	6285	6115	5980	5870	5785	5710	5650	5595	0.311
		8	7245	6855	6575	6365	6205	6075	5970	5880	5805	5740	0.241
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3955	3835	3750	3685	3635	3595	3565	3535	3515	3495	2.409
		1	4155	4005									1.134
		2	4360	4175	4040	3940	3865						0.741
		3	4565	4345	4185	4070	3975	3900	3840	3790			0.551
		4	4765	4515	4330	4195	4090	4005	3935	3875	3830	3785	0.438
		5	4970	4680	4475	4320	4200	4105	4025	3960	3905	3860	0.364
		6	5175	4850	4620	4450	4315	4205	4120	4045	3985	3930	0.311
		8	5580	5190	4915	4705	4540	4410	4305	4215	4140	4075	0.241

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0
1 1/2" x 6"	36/4	0.308	4970	3450	2535	1940	1530	1240	1025	860	735	630
2" x 12"	24/3 & 36/4	0.56	8155	5665	4160	3185	2515	2035	1685	1415	1205	1040
3" x 12"	24/3 & 36/4	1.324	15090	10480	7700	5895	4655	3770	3115	2620	2230	1925

NOTE: ASD Required Strength (Service Applied Load) <= Minimum (Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling))
 LRFD Required Strength (Factored Applied Load) <= Minimum (ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n)

COMPOSITE DECK

t = design thickness = 0.0598"

SUPPORT FASTENING: Pneutek SDK63-series (0.155" to 0.25" support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50 φ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25

φ (WIND): 0.70 Ω (WIND): 2.35 φ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25

φ (Other): 0.65 Ω (Other): 2.50 φ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	645	550	475	415	370	330	300	275	260	240	2.706
		1	860										1.273
		2	1045	910	795	700							0.832
		3	1205	1060	945	845	755	680	620				0.618
		4	1360	1200	1075	970	885	800	730	675	625	585	0.492
		5	1495	1330	1200	1085	990	910	835	770	715	670	0.408
		6	1620	1450	1315	1195	1095	1010	935	870	810	755	0.349
		8	1830	1665	1520	1395	1285	1190	1105	1035	970	910	0.271
2" x 12" NO FILL (BARE DECK)	36/4	0	630	530	455	400	360	330	300	275	260	240	2.706
		1	845										1.273
		2	1045	900	780	685							0.832
		3	1205	1060	940	830	745	680	620				0.618
		4	1360	1200	1075	970	875	795	730	675	625	585	0.492
		5	1495	1330	1200	1085	990	910	835	770	715	670	0.408
		6	1620	1450	1315	1195	1095	1010	935	870	810	755	0.349
		8	1830	1665	1520	1395	1285	1190	1105	1035	970	910	0.271
3" x 12" NO FILL (BARE DECK)	36/4	0	600	515	450	400	360	330	300	275	260	240	2.706
		1	815										1.273
		2	1030	880	770	685							0.832
		3	1205	1060	930	830	745	680	620				0.618
		4	1360	1200	1075	970	875	795	730	675	625	585	0.492
		5	1495	1330	1200	1085	990	910	835	770	715	670	0.408
		6	1620	1450	1315	1195	1095	1010	935	870	810	755	0.349
		8	1830	1665	1520	1395	1285	1190	1105	1035	970	910	0.271
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5600	5500	5425	5370	5320	5285	5250	5225	5200	5180	2.706
		1	5815										1.273
		2	6025	5865	5745	5655							0.832
		3	6240	6050	5905	5795	5705	5635	5575				0.618
		4	6455	6235	6070	5940	5835	5750	5680	5620	5570	5525	0.492
		5	6670	6415	6230	6080	5965	5865	5785	5720	5660	5610	0.408
		6	6885	6600	6390	6225	6090	5985	5895	5820	5750	5695	0.349
		8	7310	6965	6710	6510	6350	6215	6110	6015	5935	5865	0.271
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3935	3835	3760	3705	3660	3620	3590	3560	3540	3520	2.706
		1	4150										1.273
		2	4365	4205	4085	3990							0.832
		3	4575	4385	4245	4130	4045	3970	3910				0.618
		4	4790	4570	4405	4275	4170	4085	4015	3955	3905	3860	0.492
		5	5005	4755	4565	4415	4300	4205	4125	4055	3995	3945	0.408
		6	5220	4935	4725	4560	4430	4320	4230	4155	4090	4030	0.349
		8	5645	5305	5045	4845	4685	4555	4445	4350	4270	4205	0.271

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE Ø SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

φ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
1 1/2" x 6"	36/4	0.400	5000	3670	2810	2220	1800	1485	1250	1065	915	800
2" x 12"	24/3 & 36/4	0.700	7970	5855	4480	3540	2870	2370	1990	1695	1460	1275
3" x 12"	24/3 & 36/4	1.666	14820	10890	8335	6585	5335	4410	3705	3155	2720	2370

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0295"

SUPPORT FASTENING: Pneutek K64-series (0.187" to 0.312" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	590	465	380	320	275	240	220	200	180	170	1.901
		1	715	590	485								0.894
		2	825	690	590	500	430	385					0.585
		3	925	785	675	590	510	455	410	370	340		0.434
		4	1015	870	755	665	590	525	470	430	395	365	0.345
		5	1090	945	830	735	655	590	535	485	445 *	410 *	0.287
		6	1155	1015	895	795	715	650	590	545 *	500 *	460 *	0.245
		8	1265	1130	1015	915	830	755	695 *	640 *	595 *	550 *	0.190
2" x 12" NO FILL (BARE DECK)	36/4	0	575	450	365	310	270	240	220	200	180	170	1.901
		1	715	575	470								0.894
		2	825	690	575	490	430	385					0.585
		3	925	785	675	585	510	455	410	370	340		0.434
		4	1015	870	755	665	590	525	470	430	395	365	0.345
		5	1090	945	830	735	655	590	535	485	445 *	410 *	0.287
		6	1155	1015	895	795	715	650	590	545 *	500 *	460 *	0.245
		8	1265	1130	1015	915	830	755	695 *	640 *	595 *	550 *	0.190
3" x 12" NO FILL (BARE DECK)	36/4	0	545	435	365	310	270	240	220	200	180	170	1.901
		1	705	565	470								0.894
		2	825	690	575	490	430	385					0.585
		3	925	785	675	585	510	455	410	370	340		0.434
		4	1015	870	755	665	590	525	470	430	395	365	0.345
		5	1090	945	830	735	655	590	535	485	445 *	410 *	0.287
		6	1155	1015	895	795	715	650	590	545 *	500 *	460 *	0.245
		8	1265	1130	1015	915	830	755	695 *	640 *	595 *	550 *	0.190
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5535	5410	5325	5265	5220	5185	5155	5135	5115	5100	1.901
		1	5695	5535	5430								0.894
		2	5850	5660	5535	5445	5380	5325					0.585
		3	6010	5790	5640	5535	5455	5395	5345	5305	5275		0.434
		4	6170	5915	5745	5625	5535	5465	5410	5365	5325	5295	0.345
		5	6325	6040	5850	5715	5615	5535	5475	5420	5380	5340	0.287
		6	6485	6170	5960	5805	5695	5605	5535	5480	5430	5390	0.245
		8	6800	6420	6170	5990	5855	5745	5665	5595	5535	5490	0.190
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3870	3745	3660	3600	3555	3520	3490	3470	3450	3435	1.901
		1	4030	3870	3765								0.894
		2	4185	4000	3870	3780	3715	3660					0.585
		3	4345	4125	3975	3870	3795	3730	3680	3640	3610		0.434
		4	4505	4250	4085	3960	3870	3800	3745	3700	3660	3630	0.345
		5	4660	4380	4190	4055	3950	3870	3810	3755	3715	3680	0.287
		6	4820	4505	4295	4145	4030	3945	3875	3815	3765	3725	0.245
		8	5135	4760	4505	4325	4190	4085	4000	3930	3875	3825	0.190

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.165	3405	2180	1515	1110	850	670	545	450	375	320
2" x 12"	24/3 & 36/4	0.338	6115	3910	2715	1995	1525	1205	975	805	675	575
3" x 12"	24/3 & 36/4	0.797	11290	7225	5015	3685	2820	2230	1805	1490	1255	1065

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0358"

SUPPORT FASTENING: Pneutek K64-series (0.187" to 0.312" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2 x 6" NO FILL (BARE DECK)	36/4	0	770	605	495	420	360	315	285	260	235	220	2.094
		1	920	760	625								0.985
		2	1055	880	755	640	555	485					0.644
		3	1180	995	855	750	650	570	515	465	430		0.478
		4	1290	1100	955	840	745	655	590	535	490	455	0.381
		5	1385	1195	1045	925	825	740	670	605	555	515 *	0.316
		6	1470	1285	1130	1005	900	815	745	675	620 *	575 *	0.270
		8	1610	1435	1280	1150	1040	945	865	800 *	740 *	690 *	0.209
2" x 12" NO FILL (BARE DECK)	36/4	0	755	590	480	405	355	315	285	260	235	220	2.094
		1	920	745	610								0.985
		2	1055	880	735	625	545	485					0.644
		3	1180	995	855	735	640	570	515	465	430		0.478
		4	1290	1100	955	840	740	655	590	535	490	455	0.381
		5	1385	1195	1045	925	825	740	670	605	555	515 *	0.316
		6	1470	1285	1130	1005	900	815	745	675	620 *	575 *	0.270
		8	1610	1435	1280	1150	1040	945	865	800 *	740 *	690 *	0.209
3" x 12" NO FILL (BARE DECK)	36/4	0	720	565	470	405	355	315	285	260	235	220	2.094
		1	915	720	600								0.985
		2	1055	875	730	625	545	485					0.644
		3	1180	995	855	735	640	570	515	465	430		0.478
		4	1290	1100	955	840	740	655	590	535	490	455	0.381
		5	1385	1195	1045	925	825	740	670	605	555	515 *	0.316
		6	1470	1285	1130	1005	900	815	745	675	620 *	575 *	0.270
		8	1610	1435	1280	1150	1040	945	865	800 *	740 *	690 *	0.209
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5725	5560	5450	5370	5315	5270	5230	5200	5175	5155	2.094
		1	5915	5715	5580								0.985
		2	6105	5865	5705	5590	5505	5440					0.644
		3	6300	6020	5835	5700	5600	5525	5460	5410	5370		0.478
		4	6490	6175	5965	5810	5700	5610	5540	5480	5435	5395	0.381
		5	6685	6330	6090	5920	5795	5695	5615	5550	5495	5450	0.316
		6	6875	6480	6220	6030	5890	5780	5695	5620	5560	5510	0.270
		8	7260	6790	6475	6250	6080	5950	5845	5760	5690	5630	0.209
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	4060	3895	3785	3710	3650	3605	3570	3540	3515	3490	2.094
		1	4250	4050	3915								0.985
		2	4445	4205	4045	3930	3840	3775					0.644
		3	4635	4355	4170	4040	3940	3860	3800	3750	3705		0.478
		4	4830	4510	4300	4150	4035	3945	3875	3820	3770	3730	0.381
		5	5020	4665	4425	4255	4130	4030	3950	3890	3835	3790	0.316
		6	5210	4820	4555	4365	4225	4115	4030	3955	3900	3845	0.270
		8	5595	5125	4810	4585	4420	4290	4185	4095	4025	3965	0.209

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.212	4755	3040	2110	1550	1185	935	760	625	525	450
2" x 12"	24/3 & 36/4	0.42	8320	5325	3695	2715	2080	1640	1330	1100	925	785
3" x 12"	24/3 & 36/4	0.993	15395	9855	6840	5025	3850	3040	2460	2035	1710	1455

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0474"

SUPPORT FASTENING: Pneutek K64-series (0.187" to 0.312" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	830	680	575	495	435	385	350	320	295	275	2.409
		1	1025	850									1.134
		2	1185	1015	865	750	660						0.741
		3	1335	1150	1005	880	775	690	625	575			0.551
		4	1475	1280	1125	1000	885	790	720	660	610	565	0.438
		5	1605	1400	1235	1105	995	895	810	745	685	635	0.364
		6	1720	1515	1345	1205	1090	995	905	830	765	710	0.311
		8	1920	1715	1540	1390	1265	1160	1065	990*	920*	855*	0.241
2" x 12" NO FILL (BARE DECK)	36/4	0	810	660	555	480	425	385	350	320	295	275	2.409
		1	1010	830									1.134
		2	1185	1000	845	735	650						0.741
		3	1335	1150	990	860	765	690	625	575			0.551
		4	1475	1280	1125	985	880	790	720	660	610	565	0.438
		5	1605	1400	1235	1105	990	890	810	745	685	635	0.364
		6	1720	1515	1345	1205	1090	995	905	830	765	710	0.311
		8	1920	1715	1540	1390	1265	1160	1065	990*	920*	855*	0.241
3" x 12" NO FILL (BARE DECK)	36/4	0	770	640	545	480	425	385	350	320	295	275	2.409
		1	975	810									1.134
		2	1180	975	840	735	650						0.741
		3	1335	1145	985	860	765	690	625	575			0.551
		4	1475	1280	1125	985	880	790	720	660	610	565	0.438
		5	1605	1400	1235	1105	990	890	810	745	685	635	0.364
		6	1720	1515	1345	1205	1090	995	905	830	765	710	0.311
		8	1920	1715	1540	1390	1265	1160	1065	990*	920*	855*	0.241
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5790	5640	5535	5455	5395	5345	5305	5275	5245	5220	2.409
		1	5995	5810									1.134
		2	6195	5980	5825	5710	5620						0.741
		3	6400	6150	5975	5840	5735	5650	5585	5525			0.551
		4	6605	6320	6120	5965	5850	5755	5675	5610	5560	5510	0.438
		5	6805	6490	6265	6095	5960	5855	5770	5695	5635	5585	0.364
		6	7010	6660	6410	6220	6075	5955	5860	5780	5715	5655	0.311
		8	7420	7000	6700	6475	6300	6160	6045	5950	5870	5800	0.241
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	4125	3980	3875	3795	3730	3685	3645	3610	3580	3555	2.409
		1	4330	4150									1.134
		2	4535	4315	4165	4050	3960						0.741
		3	4735	4485	4310	4175	4070	3990	3920	3865			0.551
		4	4940	4655	4455	4305	4185	4090	4015	3950	3895	3845	0.438
		5	5145	4825	4600	4430	4300	4190	4105	4035	3970	3920	0.364
		6	5345	4995	4745	4555	4410	4295	4200	4120	4050	3995	0.311
		8	5755	5335	5035	4810	4635	4495	4385	4290	4205	4140	0.241

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0
1 1/2" x 6"	36/4	0.308	4970	3450	2535	1940	1530	1240	1025	860	735	630
2" x 12"	24/3 & 36/4	0.56	8155	5665	4160	3185	2515	2035	1685	1415	1205	1040
3" x 12"	24/3 & 36/4	1.324	15090	10480	7700	5895	4655	3770	3115	2620	2230	1925

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0598"

SUPPORT FASTENING: Pneutek K64-series (0.187" to 0.312" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	850	720	620	545	485	435	395	365	340	315	2.706
		1	1060										1.273
		2	1260	1085	940	830							0.832
		3	1430	1250	1100	970	870	785	715				0.618
		4	1595	1400	1245	1115	995	900	820	760	705	660	0.492
		5	1745	1540	1380	1245	1125	1020	930	860	795	745	0.408
		6	1885	1675	1505	1360	1240	1135	1035	955	890	830	0.349
		8	2135	1920	1735	1580	1445	1335	1235	1150	1070 *	1000 *	0.271
2" x 12" NO FILL (BARE DECK)	36/4	0	825	695	600	525	475	430	395	365	340	315	2.706
		1	1040										1.273
		2	1255	1065	920	810							0.832
		3	1430	1245	1080	955	860	780	715				0.618
		4	1595	1400	1240	1095	985	895	820	760	705	660	0.492
		5	1745	1540	1380	1240	1115	1015	930	860	795	745	0.408
		6	1885	1675	1505	1360	1240	1130	1035	955	890	830	0.349
		8	2135	1920	1735	1580	1445	1335	1235	1150	1070 *	1000 *	0.271
3" x 12" NO FILL (BARE DECK)	36/4	0	790	675	590	525	475	430	395	365	340	315	2.706
		1	1000										1.273
		2	1215	1040	910	810							0.832
		3	1430	1225	1070	955	860	780	715				0.618
		4	1595	1400	1235	1095	985	895	820	760	705	660	0.492
		5	1745	1540	1380	1240	1115	1015	930	860	795	745	0.408
		6	1885	1675	1505	1360	1240	1130	1035	955	890	830	0.349
		8	2135	1920	1735	1580	1445	1335	1235	1150	1070 *	1000 *	0.271
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5815	5685	5585	5510	5450	5400	5360	5325	5295	5270	2.706
		1	6030										1.273
		2	6245	6050	5910	5795							0.832
		3	6455	6235	6070	5940	5835	5750	5680				0.618
		4	6670	6420	6230	6080	5965	5870	5790	5720	5660	5610	0.492
		5	6885	6600	6390	6225	6095	5985	5895	5820	5755	5695	0.408
		6	7100	6785	6550	6370	6220	6100	6000	5915	5845	5780	0.349
		8	7525	7150	6870	6655	6480	6335	6215	6115	6030	5955	0.271
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	4150	4020	3925	3850	3785	3735	3695	3660	3630	3605	2.706
		1	4365										1.273
		2	4580	4390	4245	4135							0.832
		3	4795	4570	4405	4275	4170	4090	4015				0.618
		4	5005	4755	4565	4420	4300	4205	4125	4055	4000	3945	0.492
		5	5220	4940	4725	4560	4430	4320	4230	4155	4090	4035	0.408
		6	5435	5120	4885	4705	4555	4440	4340	4255	4180	4120	0.349
		8	5865	5490	5210	4990	4815	4670	4550	4450	4365	4290	0.271

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
1 1/2" x 6"	36/4	0.400	5000	3670	2810	2220	1800	1485	1250	1065	915	800
2" x 12"	24/3 & 36/4	0.700	7970	5855	4480	3540	2870	2370	1990	1695	1460	1275
3" x 12"	24/3 & 36/4	1.666	14820	10890	8335	6585	5335	4410	3705	3155	2720	2370

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRF Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0295"

SUPPORT FASTENING: Pneutek K66-series (0.281" & thicker support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	630	495	405	340	290	260	235	210	195	180	1.901
		1	755	620	510								0.894
		2	870	725	615	520	450	400					0.585
		3	970	820	705	610	530	470	425	385	350		0.434
		4	1060	905	785	690	610	540	485	440	405	375 *	0.345
		5	1140	985	860	760	680	610	550	500	460 *	425 *	0.287
		6	1210	1055	930	825	740	670	610	555 *	510 *	470 *	0.245
		8	1325	1180	1055	945	855	780 *	715 *	655 *	610 *	565 *	0.190
2" x 12" NO FILL (BARE DECK)	36/4	0	615	480	390	330	290	260	235	210	195	180	1.901
		1	755	605	495								0.894
		2	870	725	600	515	450	400					0.585
		3	970	820	705	605	530	470	425	385	350		0.434
		4	1060	905	785	690	610	540	485	440	405	375 *	0.345
		5	1140	985	860	760	680	610	550	500	460 *	425 *	0.287
		6	1210	1055	930	825	740	670	610	555 *	510 *	470 *	0.245
		8	1325	1180	1055	945	855	780 *	715 *	655 *	610 *	565 *	0.190
3" x 12" NO FILL (BARE DECK)	36/4	0	585	465	390	330	290	260	235	210	195	180	1.901
		1	745	590	495								0.894
		2	870	720	600	515	450	400					0.585
		3	970	820	705	605	530	470	425	385	350		0.434
		4	1060	905	785	690	610	540	485	440	405	375 *	0.345
		5	1140	985	860	760	680	610	550	500	460 *	425 *	0.287
		6	1210	1055	930	825	740	670	610	555 *	510 *	470 *	0.245
		8	1325	1180	1055	945	855	780 *	715 *	655 *	610 *	565 *	0.190
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5575	5440	5355	5290	5240	5205	5175	5150	5130	5110	1.901
		1	5735	5570	5460								0.894
		2	5895	5695	5565	5470	5400	5345					0.585
		3	6050	5820	5670	5560	5480	5415	5365	5320	5285		0.434
		4	6210	5950	5775	5650	5555	5485	5425	5380	5340	5305	0.345
		5	6370	6075	5880	5740	5635	5555	5490	5435	5390	5355	0.287
		6	6525	6200	5985	5830	5715	5625	5555	5495	5445	5405	0.245
		8	6845	6455	6195	6010	5875	5765	5680	5610	5550	5500	0.190
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3915	3780	3690	3625	3575	3540	3510	3485	3465	3445	1.901
		1	4070	3905	3795								0.894
		2	4230	4030	3900	3805	3735	3680					0.585
		3	4390	4160	4005	3895	3815	3750	3700	3660	3625		0.434
		4	4545	4285	4110	3985	3895	3820	3765	3715	3675	3640	0.345
		5	4705	4410	4215	4075	3975	3890	3825	3775	3730	3690	0.287
		6	4865	4540	4320	4170	4050	3960	3890	3830	3780	3740	0.245
		8	5180	4790	4535	4350	4210	4100	4015	3945	3885	3835	0.190

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.
 REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.165	3405	2180	1515	1110	850	670	545	450	375	320
2" x 12"	24/3 & 36/4	0.338	6115	3910	2715	1995	1525	1205	975	805	675	575
3" x 12"	24/3 & 36/4	0.797	11290	7225	5015	3685	2820	2230	1805	1490	1255	1065

NOTE: ASD Required Strength (Service Applied Load) <= Minimum (Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling))
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0358"

SUPPORT FASTENING: Pneutek K66-series (0.281" & thicker support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	780	620	505	425	370	320	290	260	240	220	2.094
		1	935	770	635								0.985
		2	1070	895	765	645	560	490					0.644
		3	1195	1010	870	755	655	575	520	470	435		0.478
		4	1305	1115	965	850	750	665	595	540	495	460	0.381
		5	1405	1210	1055	935	835	750	675	610	560	520	0.316
		6	1490	1300	1140	1015	910	820	750	680	625	575	0.270
		8	1635	1450	1295	1160	1050	955	875	805	745	695	0.209
2" x 12" NO FILL (BARE DECK)	36/4	0	770	600	490	410	360	320	290	260	240	220	2.094
		1	935	755	620								0.985
		2	1070	895	745	630	555	490					0.644
		3	1195	1010	870	740	650	575	520	470	435		0.478
		4	1305	1115	965	850	745	660	595	540	495	460	0.381
		5	1405	1210	1055	935	835	750	675	610	560	520	0.316
		6	1490	1300	1140	1015	910	820	750	680	625	575	0.270
		8	1635	1450	1295	1160	1050	955	875	805	745	695	0.209
3" x 12" NO FILL (BARE DECK)	36/4	0	735	575	480	410	360	320	290	260	240	220	2.094
		1	925	730	610								0.985
		2	1070	885	735	630	555	490					0.644
		3	1195	1010	865	740	650	575	520	470	435		0.478
		4	1305	1115	965	850	745	660	595	540	495	460	0.381
		5	1405	1210	1055	935	835	750	675	610	560	520	0.316
		6	1490	1300	1140	1015	910	820	750	680	625	575	0.270
		8	1635	1450	1295	1160	1050	955	875	805	745	695	0.209
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5740	5570	5460	5380	5320	5275	5240	5210	5180	5160	2.094
		1	5930	5725	5590								0.985
		2	6125	5880	5715	5600	5515	5445					0.644
		3	6315	6035	5845	5710	5610	5530	5470	5415	5375		0.478
		4	6505	6185	5975	5820	5705	5615	5545	5485	5440	5400	0.381
		5	6700	6340	6100	5930	5800	5700	5620	5555	5505	5455	0.316
		6	6890	6495	6230	6040	5900	5790	5700	5625	5565	5515	0.270
		8	7275	6800	6485	6260	6090	5960	5855	5765	5695	5635	0.209
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	4075	3910	3795	3715	3660	3610	3575	3545	3520	3495	2.094
		1	4265	4060	3925								0.985
		2	4460	4215	4055	3935	3850	3780					0.644
		3	4650	4370	4180	4045	3945	3870	3805	3755	3710		0.478
		4	4845	4525	4310	4155	4040	3955	3880	3825	3775	3735	0.381
		5	5035	4675	4435	4265	4140	4040	3960	3895	3840	3795	0.316
		6	5230	4830	4565	4375	4235	4125	4035	3965	3905	3850	0.270
		8	5610	5140	4820	4595	4425	4295	4190	4105	4030	3970	0.209

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.212	4755	3040	2110	1550	1185	935	760	625	525	450
2" x 12"	24/3 & 36/4	0.42	8320	5325	3695	2715	2080	1640	1330	1100	925	785
3" x 12"	24/3 & 36/4	0.993	15395	9855	6840	5025	3850	3040	2460	2035	1710	1455

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0474"

SUPPORT FASTENING: Pneutek K66-series (0.281" & thicker support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	860	705	600	515	450	400	360	330	305	285	2.409
		1	1055	875									1.134
		2	1220	1040	890	770	680						0.741
		3	1370	1180	1030	895	790	705	640	585			0.551
		4	1515	1310	1150	1025	905	810	730	670	620	575	0.438
		5	1645	1430	1265	1130	1015	910	825	755	695	650	0.364
		6	1760	1545	1370	1230	1110	1010	915	840	775	720	0.311
		8	1970	1750	1570	1415	1290	1180	1085	1005 *	930 *	865 *	0.241
2" x 12" NO FILL (BARE DECK)	36/4	0	840	685	580	495	440	400	360	330	305	285	2.409
		1	1045	855									1.134
		2	1220	1025	870	750	670						0.741
		3	1370	1180	1015	880	780	705	640	585			0.551
		4	1515	1310	1150	1005	895	805	730	670	620	575	0.438
		5	1645	1430	1265	1130	1005	905	825	755	695	650	0.364
		6	1760	1545	1370	1230	1110	1010	915	840	775	720	0.311
		8	1970	1750	1570	1415	1290	1180	1085	1005 *	930 *	865 *	0.241
3" x 12" NO FILL (BARE DECK)	36/4	0	800	665	570	495	440	400	360	330	305	285	2.409
		1	1005	835									1.134
		2	1210	1000	860	750	670						0.741
		3	1370	1170	1005	880	780	705	640	585			0.551
		4	1515	1310	1150	1005	895	805	730	670	620	575	0.438
		5	1645	1430	1265	1130	1005	905	825	755	695	650	0.364
		6	1760	1545	1370	1230	1110	1010	915	840	775	720	0.311
		8	1970	1750	1570	1415	1290	1180	1085	1005 *	930 *	865 *	0.241
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5825	5670	5560	5480	5415	5365	5320	5285	5260	5235	2.409
		1	6025	5840									1.134
		2	6230	6010	5850	5735	5640						0.741
		3	6435	6180	5995	5860	5755	5670	5600	5540			0.551
		4	6640	6350	6145	5990	5870	5770	5690	5625	5570	5525	0.438
		5	6840	6520	6290	6115	5980	5875	5785	5710	5650	5595	0.364
		6	7045	6690	6435	6240	6095	5975	5875	5795	5730	5670	0.311
		8	7450	7030	6725	6495	6320	6180	6060	5965	5885	5815	0.241
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	4160	4005	3895	3815	3750	3700	3660	3625	3595	3570	2.409
		1	4365	4175									1.134
		2	4565	4345	4190	4070	3980						0.741
		3	4770	4515	4335	4195	4090	4005	3935	3880			0.551
		4	4975	4685	4480	4325	4205	4105	4030	3965	3905	3860	0.438
		5	5180	4855	4625	4450	4315	4210	4120	4050	3985	3930	0.364
		6	5380	5025	4770	4580	4430	4310	4215	4135	4065	4005	0.311
		8	5790	5365	5060	4835	4655	4515	4400	4300	4220	4150	0.241

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0
1 1/2" x 6"	36/4	0.308	4970	3450	2535	1940	1530	1240	1025	860	735	630
2" x 12"	24/3 & 36/4	0.56	8155	5665	4160	3185	2515	2035	1685	1415	1205	1040
3" x 12"	24/3 & 36/4	1.324	15090	10480	7700	5895	4655	3770	3115	2620	2230	1925

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0598"

SUPPORT FASTENING: Pneutek K66-series (0.281" & thicker support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	940	795	685	600	535	480	435	400	375	350	2.706
		1	1150										1.273
		2	1355	1160	1005	885							0.832
		3	1530	1335	1165	1030	920	830	755				0.618
		4	1695	1485	1320	1175	1050	945	865	795	740	690	0.492
		5	1850	1630	1455	1310	1175	1065	970	895	830	775	0.408
		6	1995	1770	1585	1430	1305	1180	1080	995	925	860	0.349
		8	2260	2025	1825	1655	1515	1395	1290	1190	1105	1035	0.271
2" x 12" NO FILL (BARE DECK)	36/4	0	915	770	665	580	525	475	435	400	375	350	2.706
		1	1130										1.273
		2	1345	1140	985	865							0.832
		3	1530	1320	1145	1010	910	825	755				0.618
		4	1695	1485	1305	1150	1035	940	865	795	740	690	0.492
		5	1850	1630	1455	1295	1165	1060	970	895	830	775	0.408
		6	1995	1770	1585	1430	1295	1175	1080	995	925	860	0.349
		8	2260	2025	1825	1655	1515	1395	1290	1190	1105	1035	0.271
3" x 12" NO FILL (BARE DECK)	36/4	0	870	745	655	580	525	475	435	400	375	350	2.706
		1	1085										1.273
		2	1300	1115	975	865							0.832
		3	1515	1295	1135	1010	910	825	755				0.618
		4	1695	1480	1295	1150	1035	940	865	795	740	690	0.492
		5	1850	1630	1455	1295	1165	1060	970	895	830	775	0.408
		6	1995	1770	1585	1430	1295	1175	1080	995	925	860	0.349
		8	2260	2025	1825	1655	1515	1395	1290	1190	1105	1035	0.271
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5910	5770	5660	5575	5510	5455	5410	5370	5335	5305	2.706
		1	6125										1.273
		2	6340	6135	5980	5860							0.832
		3	6555	6320	6140	6005	5895	5805	5730				0.618
		4	6765	6500	6300	6145	6020	5920	5835	5765	5705	5650	0.492
		5	6980	6685	6460	6290	6150	6035	5945	5865	5795	5735	0.408
		6	7195	6870	6625	6430	6280	6155	6050	5960	5885	5820	0.349
		8	7625	7235	6945	6715	6535	6385	6265	6160	6070	5990	0.271
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	4250	4105	3995	3910	3845	3790	3745	3705	3670	3645	2.706
		1	4460										1.273
		2	4675	4470	4315	4195							0.832
		3	4890	4655	4475	4340	4230	4140	4065				0.618
		4	5105	4835	4640	4485	4360	4255	4170	4100	4040	3985	0.492
		5	5320	5020	4800	4625	4485	4375	4280	4200	4130	4070	0.408
		6	5530	5205	4960	4770	4615	4490	4385	4300	4220	4155	0.349
		8	5960	5570	5280	5055	4870	4725	4600	4495	4405	4330	0.271

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
1 1/2" x 6"	36/4	0.400	5000	3670	2810	2220	1800	1485	1250	1065	915	800
2" x 12"	24/3 & 36/4	0.700	7970	5855	4480	3540	2870	2370	1990	1695	1460	1275
3" x 12"	24/3 & 36/4	1.666	14820	10890	8335	6585	5335	4410	3705	3155	2720	2370

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0295"

SUPPORT FASTENING: Hilti ENP2 or ENP2 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	550	435	355	300	255	225	205	185	170	155	0.792
		1	675	560	460								0.539
		2	785	660	565	480	415	365					0.409
		3	885	750	650	570	495	440	395	360	330		0.329
		4	970	835	725	640	570	510	455	415	380	350	0.275
		5	1045	905	795	705	635	575	520	475	435 *	400 *	0.237
		6	1105	975	860	770	695	630	575	530 *	485 *	450 *	0.208
		8	1205	1085	975	880	800	730	675 *	620 *	575 *	535 *	0.167
2" x 12" NO FILL (BARE DECK)	36/4	0	540	420	340	290	255	225	205	185	170	155	0.792
		1	675	545	445								0.539
		2	785	660	555	470	415	365					0.409
		3	885	750	650	565	490	440	395	360	330		0.329
		4	970	835	725	640	570	510	455	415	380	350	0.275
		5	1045	905	795	705	635	575	520	475	435 *	400 *	0.237
		6	1105	975	860	770	695	630	575	530 *	485 *	450 *	0.208
		8	1205	1085	975	880	800	730	675 *	620 *	575 *	535 *	0.167
3" x 12" NO FILL (BARE DECK)	36/4	0	510	410	340	290	255	225	205	185	170	155	0.792
		1	670	535	445								0.539
		2	785	660	550	470	415	365					0.409
		3	885	750	650	565	490	440	395	360	330		0.329
		4	970	835	725	640	570	510	455	415	380	350	0.275
		5	1045	905	795	705	635	575	520	475	435 *	400 *	0.237
		6	1105	975	860	770	695	630	575	530 *	485 *	450 *	0.208
		8	1205	1085	975	880	800	730	675 *	620 *	575 *	535 *	0.167
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5495	5375	5295	5240	5200	5165	5140	5120	5100	5085	0.792
		1	5650	5500	5405								0.539
		2	5810	5630	5510	5420	5355	5305					0.409
		3	5970	5755	5615	5510	5435	5375	5330	5290	5260		0.329
		4	6125	5880	5720	5605	5515	5450	5395	5350	5310	5280	0.275
		5	6285	6010	5825	5695	5595	5520	5455	5405	5365	5330	0.237
		6	6445	6135	5930	5785	5675	5590	5520	5465	5415	5380	0.208
		8	6760	6390	6140	5965	5830	5730	5645	5580	5525	5475	0.167
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3830	3710	3635	3575	3535	3500	3475	3455	3435	3420	0.792
		1	3990	3840	3740								0.539
		2	4145	3965	3845	3760	3695	3645					0.409
		3	4305	4090	3950	3850	3775	3715	3665	3630	3595		0.329
		4	4465	4220	4055	3940	3850	3785	3730	3685	3650	3615	0.275
		5	4620	4345	4160	4030	3930	3855	3795	3745	3700	3665	0.237
		6	4780	4470	4265	4120	4010	3925	3855	3800	3755	3715	0.208
		8	5095	4725	4480	4300	4170	4065	3985	3915	3860	3810	0.167

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.
 THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.
 WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.
 REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.165	3405	2180	1515	1110	850	670	545	450	375	320
2" x 12"	24/3 & 36/4	0.338	6115	3910	2715	1995	1525	1205	975	805	675	575
3" x 12"	24/3 & 36/4	0.797	11290	7225	5015	3685	2820	2230	1805	1490	1255	1065

NOTE: ASD Required Strength (Service Applied Load) <= Minimum (Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling))
 LRFD Required Strength (Factored Applied Load) <= Minimum (ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n)

COMPOSITE DECK

t = design thickness = 0.0358"

SUPPORT FASTENING: Hilti ENP2 or ENP2 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	650	515	420	355	305	265	240	220	200	185	0.872
		1	800	665	550								0.594
		2	935	785	670	575	500	440					0.450
		3	1050	895	770	675	595	525	470	430	390		0.362
		4	1155	995	865	765	680	610	550	500	455	420	0.303
		5	1240	1080	950	845	755	685	625	570	520	480	0.261
		6	1315	1160	1030	920	830	750	690	630	585	540	0.229
		8	1435	1295	1165	1055	960	875	805	745 *	690 *	645 *	0.184
2" x 12" NO FILL (BARE DECK)	36/4	0	640	500	410	345	300	265	240	220	200	185	0.872
		1	800	655	535								0.594
		2	935	785	665	565	495	440					0.450
		3	1050	895	770	675	590	525	470	430	390		0.362
		4	1155	995	865	765	680	610	550	500	455	420	0.303
		5	1240	1080	950	845	755	685	625	570	520	480	0.261
		6	1315	1160	1030	920	830	750	690	630	585	540 *	0.229
		8	1435	1295	1165	1055	960	875	805	745 *	690 *	645 *	0.184
3" x 12" NO FILL (BARE DECK)	36/4	0	610	480	400	345	300	265	240	220	200	185	0.872
		1	800	635	530								0.594
		2	935	785	655	565	495	440					0.450
		3	1050	895	770	675	590	525	470	430	390		0.362
		4	1155	995	865	765	680	610	550	500	455	420	0.303
		5	1240	1080	950	845	755	685	625	570	520	480	0.261
		6	1315	1160	1030	920	830	750	690	630	585	540 *	0.229
		8	1435	1295	1165	1055	960	875	805	745 *	690 *	645 *	0.184
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5600	5460	5365	5300	5250	5215	5180	5155	5135	5120	0.872
		1	5790	5615	5495								0.594
		2	5985	5770	5625	5520	5445	5385					0.450
		3	6175	5920	5750	5630	5540	5470	5415	5365	5330		0.362
		4	6370	6075	5880	5740	5635	5555	5490	5435	5390	5355	0.303
		5	6560	6230	6010	5850	5730	5640	5565	5505	5455	5415	0.261
		6	6750	6380	6135	5960	5830	5725	5645	5575	5520	5475	0.229
		8	7135	6690	6390	6180	6020	5895	5795	5715	5650	5590	0.184
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3935	3795	3705	3635	3590	3550	3520	3495	3470	3455	0.872
		1	4125	3950	3830								0.594
		2	4320	4105	3960	3855	3780	3720					0.450
		3	4510	4255	4090	3965	3875	3805	3750	3705	3665		0.362
		4	4705	4410	4215	4075	3970	3890	3825	3775	3730	3690	0.303
		5	4895	4565	4345	4185	4070	3975	3905	3845	3790	3750	0.261
		6	5090	4720	4470	4295	4165	4060	3980	3910	3855	3810	0.229
		8	5470	5025	4730	4515	4355	4235	4135	4050	3985	3925	0.184

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.212	4755	3040	2110	1550	1185	935	760	625	525	450
2" x 12"	24/3 & 36/4	0.420	8320	5325	3695	2715	2080	1640	1330	1100	925	785
3" x 12"	24/3 & 36/4	0.993	15395	9855	6840	5025	3850	3040	2460	2035	1710	1455

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0474"

SUPPORT FASTENING: Hilti ENP2 or ENPH2 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

φ (EQ): 0.65 Ω (EQ): 2.50 φ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25

φ (WIND): 0.70 Ω (WIND): 2.35 φ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25

φ (Other): 0.65 Ω (Other): 2.50 φ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	650	535	450	390	340	305	275	250	230	215	1.004
		1	840	705									0.683
		2	1000	855	745	645	570						0.518
		3	1140	990	865	770	680	610	550	505			0.417
		4	1270	1110	980	875	790	710	645	590	545	505	0.349
		5	1385	1220	1085	975	880	805	735	675	625	580	0.300
		6	1485	1320	1185	1065	970	885	815	755	700	650	0.263
		8	1650	1495	1355	1235	1130	1040	965	895	835	785 *	0.211
2" x 12" NO FILL (BARE DECK)	36/4	0	635	520	435	375	335	300	275	250	230	215	1.004
		1	840	690									0.683
		2	1000	855	730	630	560						0.518
		3	1140	990	865	760	675	605	550	505			0.417
		4	1270	1110	980	875	785	710	645	590	545	505	0.349
		5	1385	1220	1085	975	880	805	735	675	625	580	0.300
		6	1485	1320	1185	1065	970	885	815	755	700	650	0.263
		8	1650	1495	1355	1235	1130	1040	965	895	835	785 *	0.211
3" x 12" NO FILL (BARE DECK)	36/4	0	605	500	430	375	335	300	275	250	230	215	1.004
		1	810	670									0.683
		2	1000	840	720	630	560						0.518
		3	1140	990	865	760	675	605	550	505			0.417
		4	1270	1110	980	875	785	710	645	590	545	505	0.349
		5	1385	1220	1085	975	880	805	735	675	625	580	0.300
		6	1485	1320	1185	1065	970	885	815	755	700	650	0.263
		8	1650	1495	1355	1235	1130	1040	965	895	835	785 *	0.211
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5600	5485	5400	5340	5290	5250	5220	5195	5170	5155	1.004
		1	5805	5655									0.683
		2	6005	5825	5690	5595	5515						0.518
		3	6210	5995	5840	5720	5630	5560	5500	5450			0.417
		4	6415	6165	5985	5850	5745	5660	5590	5535	5485	5445	0.349
		5	6620	6330	6130	5975	5855	5760	5685	5620	5565	5515	0.300
		6	6820	6500	6275	6105	5970	5865	5775	5705	5640	5590	0.263
		8	7230	6840	6565	6355	6195	6065	5960	5875	5800	5735	0.211
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3935	3820	3740	3675	3625	3590	3555	3530	3510	3490	1.004
		1	4140	3990									0.683
		2	4345	4160	4030	3930	3855						0.518
		3	4545	4330	4175	4055	3965	3895	3835	3785			0.417
		4	4750	4500	4320	4185	4080	3995	3925	3870	3820	3780	0.349
		5	4955	4670	4465	4310	4195	4095	4020	3955	3900	3855	0.300
		6	5160	4840	4610	4440	4305	4200	4110	4040	3980	3925	0.263
		8	5565	5175	4900	4695	4530	4405	4295	4210	4135	4070	0.211

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

φ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0
1 1/2" x 6"	36/4	0.308	4970	3450	2535	1940	1530	1240	1025	860	735	630
2" x 12"	24/3 & 36/4	0.560	8155	5665	4160	3185	2515	2035	1685	1415	1205	1040
3" x 12"	24/3 & 36/4	1.324	15090	10480	7700	5895	4655	3770	3115	2620	2230	1925

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
LRFD Required Strength (Factored Applied Load) <= Minimum [φ (EQ or WIND) x Nominal Shear Strength, φ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0598"

SUPPORT FASTENING: Hilti ENP2 or ENPH2 (0.25" min. support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	640	540	470	410	365	325	295	275	255	240	1.127
		1	855										0.768
		2	1035	905	790	695							0.582
		3	1200	1055	940	840	750	675	620				0.468
		4	1350	1195	1070	965	880	795	725	670	620	580	0.392
		5	1485	1325	1190	1080	985	905	830	770	715	665	0.337
		6	1610	1445	1305	1190	1090	1005	930	865	805	750	0.296
		8	1815	1655	1510	1385	1280	1185	1100	1030	965	905	0.237
2" x 12" NO FILL (BARE DECK)	36/4	0	625	525	450	395	355	325	295	275	255	240	1.127
		1	840										0.768
		2	1035	890	775	680							0.582
		3	1200	1055	935	825	740	675	620				0.468
		4	1350	1195	1070	965	870	790	725	670	620	580	0.392
		5	1485	1325	1190	1080	985	905	830	770	715	665	0.337
		6	1610	1445	1305	1190	1090	1005	930	865	805	750	0.296
		8	1815	1655	1510	1385	1280	1185	1100	1030	965	905	0.237
3" x 12" NO FILL (BARE DECK)	36/4	0	595	510	445	395	355	325	295	275	255	240	1.127
		1	810										0.768
		2	1020	875	765	680							0.582
		3	1200	1055	925	825	740	675	620				0.468
		4	1350	1195	1070	965	870	790	725	670	620	580	0.392
		5	1485	1325	1190	1080	985	905	830	770	715	665	0.337
		6	1610	1445	1305	1190	1090	1005	930	865	805	750	0.296
		8	1815	1655	1510	1385	1280	1185	1100	1030	965	905	0.237
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5590	5495	5420	5360	5315	5280	5250	5220	5200	5180	1.127
		1	5805										0.768
		2	6020	5860	5740	5650							0.582
		3	6235	6045	5900	5790	5700	5630	5570				0.468
		4	6445	6225	6060	5935	5830	5745	5675	5615	5565	5520	0.392
		5	6660	6410	6220	6075	5960	5865	5785	5715	5655	5605	0.337
		6	6875	6595	6380	6220	6085	5980	5890	5815	5750	5695	0.296
		8	7305	6960	6705	6505	6345	6215	6105	6010	5930	5865	0.237
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3925	3830	3755	3700	3655	3615	3585	3560	3535	3515	1.127
		1	4140										0.768
		2	4355	4195	4075	3985							0.582
		3	4570	4380	4235	4125	4040	3965	3905				0.468
		4	4785	4565	4400	4270	4165	4080	4010	3955	3900	3860	0.392
		5	4995	4745	4560	4410	4295	4200	4120	4050	3995	3945	0.337
		6	5210	4930	4720	4555	4425	4315	4225	4150	4085	4030	0.296
		8	5640	5295	5040	4840	4680	4550	4440	4350	4270	4200	0.237

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
1 1/2" x 6"	36/4	0.400	5000	3670	2810	2220	1800	1485	1250	1065	915	800
2" x 12"	24/3 & 36/4	0.700	7970	5855	4480	3540	2870	2370	1990	1695	1460	1275
3" x 12"	24/3 & 36/4	1.666	14820	10890	8335	6585	5335	4410	3705	3155	2720	2370

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0295"

SUPPORT FASTENING: HiTi ENP2K, X-EDN19 or X-EDN22 (0.125" to 0.375" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	515	405	330	280	240	210	190	175	160	145	0.792
		1	640	530	435								0.539
		2	750	630	540	460	400	355					0.409
		3	845	720	620	545	475	425	380	345	315		0.329
		4	925	800	700	615	550	495	445	405	370	340	0.275
		5	995	870	765	680	610	555	505	460	425	390 *	0.237
		6	1055	935	830	745	670	610	555	515	475 *	440 *	0.208
		8	1150	1040	940	850	775	710	655 *	605 *	560 *	525 *	0.167
2" x 12" NO FILL (BARE DECK)	36/4	0	505	395	320	275	240	210	190	175	160	145	0.792
		1	640	520	425								0.539
		2	750	630	530	455	395	355					0.409
		3	845	720	620	545	475	425	380	345	315		0.329
		4	925	800	700	615	550	495	445	405	370	340	0.275
		5	995	870	765	680	610	555	505	460	425	390 *	0.237
		6	1055	935	830	745	670	610	555	515	475 *	440 *	0.208
		8	1150	1040	940	850	775	710	655 *	605 *	560 *	525 *	0.167
3" x 12" NO FILL (BARE DECK)	36/4	0	480	380	320	275	240	210	190	175	160	145	0.792
		1	640	510	425								0.539
		2	750	630	530	455	395	355					0.409
		3	845	720	620	545	475	425	380	345	315		0.329
		4	925	800	700	615	550	495	445	405	370	340	0.275
		5	995	870	765	680	610	555	505	460	425	390 *	0.237
		6	1055	935	830	745	670	610	555	515	475 *	440 *	0.208
		8	1150	1040	940	850	775	710	655 *	605 *	560 *	525 *	0.167
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5455	5345	5270	5220	5180	5150	5125	5105	5090	5075	0.792
		1	5615	5470	5380								0.539
		2	5775	5600	5485	5400	5340	5290					0.409
		3	5930	5725	5590	5490	5420	5360	5315	5280	5245		0.329
		4	6090	5850	5695	5580	5495	5430	5380	5335	5300	5270	0.275
		5	6250	5980	5800	5670	5575	5500	5440	5395	5350	5320	0.237
		6	6405	6105	5905	5765	5655	5570	5505	5450	5405	5365	0.208
		8	6725	6360	6115	5945	5815	5715	5630	5565	5510	5465	0.167
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3790	3680	3610	3555	3515	3485	3460	3440	3425	3410	0.792
		1	3950	3810	3715								0.539
		2	4110	3935	3820	3735	3675	3625					0.409
		3	4265	4060	3925	3825	3755	3695	3650	3615	3585		0.329
		4	4425	4190	4030	3920	3835	3765	3715	3670	3635	3605	0.275
		5	4585	4315	4135	4010	3910	3840	3780	3730	3690	3655	0.237
		6	4740	4440	4240	4100	3990	3910	3840	3785	3740	3705	0.208
		8	5060	4695	4455	4280	4150	4050	3970	3900	3845	3800	0.167

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.165	3405	2180	1515	1110	850	670	545	450	375	320
2" x 12"	24/3 & 36/4	0.338	6115	3910	2715	1995	1525	1205	975	805	675	575
3" x 12"	24/3 & 36/4	0.797	11290	7225	5015	3685	2820	2230	1805	1490	1255	1065

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0358"

SUPPORT FASTENING: HiTi ENP2K, X-EDN19 or X-EDNK22 (0.125" to 0.375" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	625	495	405	340	295	255	230	210	190	175	0.872
		1	775	640	530								0.594
		2	905	760	650	560	485	425					0.450
		3	1020	870	750	660	580	510	460	420	385		0.362
		4	1120	965	845	745	665	600	540	490	450	415	0.303
		5	1205	1055	930	825	740	670	610	560	510	475	0.261
		6	1275	1130	1005	900	810	735	675	620	575	530	0.229
		8	1390	1255	1135	1030	940	860	790	730	680	635	0.184
2" x 12" NO FILL (BARE DECK)	36/4	0	615	480	390	330	290	255	230	210	190	175	0.872
		1	775	635	520								0.594
		2	905	760	645	550	480	425					0.450
		3	1020	870	750	660	575	510	460	420	385		0.362
		4	1120	965	845	745	665	595	540	490	450	415	0.303
		5	1205	1055	930	825	740	670	610	560	510	475	0.261
		6	1275	1130	1005	900	810	735	675	620	575	530	0.229
		8	1390	1255	1135	1030	940	860	790	730	680	635	0.184
3" x 12" NO FILL (BARE DECK)	36/4	0	585	460	385	330	290	255	230	210	190	175	0.872
		1	775	615	510								0.594
		2	905	760	640	550	480	425					0.450
		3	1020	870	750	660	575	510	460	420	385		0.362
		4	1120	965	845	745	665	595	540	490	450	415	0.303
		5	1205	1055	930	825	740	670	610	560	510	475	0.261
		6	1275	1130	1005	900	810	735	675	620	575	530	0.229
		8	1390	1255	1135	1030	940	860	790	730	680	635	0.184
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5570	5435	5350	5285	5235	5200	5170	5145	5125	5110	0.872
		1	5760	5590	5475								0.594
		2	5955	5745	5605	5505	5430	5370					0.450
		3	6145	5900	5730	5615	5525	5455	5400	5355	5320		0.362
		4	6340	6050	5860	5725	5620	5540	5480	5425	5380	5345	0.303
		5	6530	6205	5990	5835	5715	5625	5555	5495	5445	5405	0.261
		6	6725	6360	6115	5945	5815	5710	5630	5565	5510	5465	0.229
		8	7105	6665	6375	6165	6005	5885	5785	5705	5640	5580	0.184
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3905	3775	3685	3620	3575	3535	3505	3480	3460	3445	0.872
		1	4100	3925	3810								0.594
		2	4290	4080	3940	3840	3765	3705					0.450
		3	4480	4235	4070	3950	3860	3790	3735	3690	3655		0.362
		4	4675	4390	4195	4060	3960	3880	3815	3760	3720	3680	0.303
		5	4865	4540	4325	4170	4055	3965	3890	3830	3785	3740	0.261
		6	5060	4695	4455	4280	4150	4050	3970	3900	3845	3800	0.229
		8	5445	5005	4710	4500	4340	4220	4120	4040	3975	3920	0.184

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0
1 1/2" x 6"	36/4	0.212	4755	3040	2110	1550	1185	935	760	625	525	450
2" x 12"	24/3 & 36/4	0.420	8320	5325	3695	2715	2080	1640	1330	1100	925	785
3" x 12"	24/3 & 36/4	0.993	15395	9855	6840	5025	3850	3040	2460	2035	1710	1455

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0474"

SUPPORT FASTENING: HiTi ENP2K, X-EDN19 or X-EDNK22 (0.125" to 0.375" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	650	535	450	390	340	305	275	250	230	215	1.004
		1	840	705									0.683
		2	1000	855	745	645	570						0.518
		3	1140	990	865	770	680	610	550	505			0.417
		4	1270	1110	980	875	790	710	645	590	545	505	0.349
		5	1385	1220	1085	975	880	805	735	675	625	580	0.300
		6	1485	1320	1185	1065	970	890	815	755	700	650	0.263
		8	1650	1495	1355	1235	1130	1040	965	895	835	785 *	0.211
2" x 12" NO FILL (BARE DECK)	36/4	0	635	520	435	375	335	300	275	250	230	215	1.004
		1	840	690									0.683
		2	1000	855	730	630	560						0.518
		3	1140	990	865	760	675	605	550	505			0.417
		4	1270	1110	980	875	785	710	645	590	545	505	0.349
		5	1385	1220	1085	975	880	805	735	675	625	580	0.300
		6	1485	1320	1185	1065	970	890	815	755	700	650	0.263
		8	1650	1495	1355	1235	1130	1040	965	895	835	785 *	0.211
3" x 12" NO FILL (BARE DECK)	36/4	0	605	500	430	375	335	300	275	250	230	215	1.004
		1	810	670									0.683
		2	1000	840	720	630	560						0.518
		3	1140	990	865	760	675	605	550	505			0.417
		4	1270	1110	980	875	785	710	645	590	545	505	0.349
		5	1385	1220	1085	975	880	805	735	675	625	580	0.300
		6	1485	1320	1185	1065	970	890	815	755	700	650	0.263
		8	1650	1495	1355	1235	1130	1040	965	895	835	785 *	0.211
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5600	5485	5400	5340	5290	5250	5220	5195	5170	5155	1.004
		1	5805	5655									0.683
		2	6010	5825	5690	5595	5515						0.518
		3	6210	5995	5840	5720	5630	5560	5500	5450			0.417
		4	6415	6165	5985	5850	5745	5660	5590	5535	5485	5445	0.349
		5	6620	6335	6130	5975	5855	5760	5685	5620	5565	5515	0.300
		6	6820	6500	6275	6105	5970	5865	5775	5705	5640	5590	0.263
		8	7230	6840	6565	6355	6195	6065	5960	5875	5800	5735	0.211
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3935	3820	3740	3675	3625	3590	3555	3530	3510	3490	1.004
		1	4140	3990									0.683
		2	4345	4160	4030	3930	3855						0.518
		3	4545	4330	4175	4055	3965	3895	3835	3785			0.417
		4	4750	4500	4320	4185	4080	3995	3925	3870	3820	3780	0.349
		5	4955	4670	4465	4310	4195	4095	4020	3955	3900	3855	0.300
		6	5160	4840	4610	4440	4305	4200	4110	4040	3980	3925	0.263
		8	5565	5180	4900	4695	4530	4405	4295	4210	4135	4070	0.211

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80

Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0
1 1/2" x 6"	36/4	0.308	4970	3450	2535	1940	1530	1240	1025	860	735	630
2" x 12"	24/3 & 36/4	0.560	8155	5665	4160	3185	2515	2035	1685	1415	1205	1040
3" x 12"	24/3 & 36/4	1.324	15090	10480	7700	5895	4655	3770	3115	2620	2230	1925

NOTE: ASD Required Strength (Service Applied Load) <= Minimum [Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling)]
 LRFD Required Strength (Factored Applied Load) <= Minimum [ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n]

COMPOSITE DECK

t = design thickness = 0.0598"

SUPPORT FASTENING: HiTi EN2K, X-EDN19 or X-EDN22 (0.125" to 0.375" support steel)

SIDE-LAP FASTENING: #10 screws

ϕ (EQ): 0.65 Ω (EQ): 2.50 ϕ (FILLED, EQ): 0.50 Ω (FILLED, EQ): 3.25
 ϕ (WIND): 0.70 Ω (WIND): 2.35 ϕ (FILLED, WIND): 0.50 Ω (FILLED, WIND): 3.25
 ϕ (Other): 0.65 Ω (Other): 2.50 ϕ (FILLED, Other): 0.50 Ω (FILLED, Other): 3.25

TYPE OF FILL	FASTENER LAYOUT	SIDE-LAP CONN./SPAN	NOMINAL SHEAR STRENGTH, PLF										K1
			SPAN, FT										
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	
1 1/2" x 6" NO FILL (BARE DECK)	36/4	0	675	570	490	430	385	345	315	290	270	250	1.127
		1	885										0.768
		2	1070	935	815	715							0.582
		3	1235	1085	965	860	770	695	635				0.468
		4	1390	1230	1095	990	895	810	740	685	635	590	0.392
		5	1530	1360	1220	1105	1010	925	845	780	725	680	0.337
		6	1655	1480	1340	1215	1115	1025	950	880	820	765	0.296
		8	1870	1700	1550	1420	1305	1210	1125	1050	985	925 *	0.237
2" x 12" NO FILL (BARE DECK)	36/4	0	655	555	475	415	375	340	315	290	270	250	1.127
		1	870										0.768
		2	1070	920	795	700							0.582
		3	1235	1085	955	845	760	690	635				0.468
		4	1390	1230	1095	985	890	810	740	685	635	590	0.392
		5	1530	1360	1220	1105	1010	925	845	780	725	680	0.337
		6	1655	1480	1340	1215	1115	1025	950	880	820	765	0.296
		8	1870	1700	1550	1420	1305	1210	1125	1050	985	925 *	0.237
3" x 12" NO FILL (BARE DECK)	36/4	0	625	535	470	415	375	340	315	290	270	250	1.127
		1	840										0.768
		2	1055	905	790	700							0.582
		3	1235	1085	950	845	760	690	635				0.468
		4	1390	1230	1095	985	890	810	740	685	635	590	0.392
		5	1530	1360	1220	1105	1010	925	845	780	725	680	0.337
		6	1655	1480	1340	1215	1115	1025	950	880	820	765	0.296
		8	1870	1700	1550	1420	1305	1210	1125	1050	985	925 *	0.237
2 1/2" NW CONC. (ABOVE DECK)	36/4	0	5625	5525	5445	5385	5340	5300	5265	5240	5215	5195	1.127
		1	5840										0.768
		2	6055	5890	5765	5670							0.582
		3	6270	6075	5930	5815	5725	5650	5585				0.468
		4	6485	6255	6090	5955	5850	5765	5695	5635	5580	5535	0.392
		5	6695	6440	6250	6100	5980	5880	5800	5730	5670	5620	0.337
		6	6910	6625	6410	6240	6110	6000	5910	5830	5765	5705	0.296
		8	7340	6990	6730	6525	6365	6230	6120	6030	5950	5880	0.237
2 1/2" LW CONC. (ABOVE DECK)	36/4	0	3965	3860	3780	3720	3675	3635	3600	3575	3550	3530	1.127
		1	4175										0.768
		2	4390	4225	4105	4005							0.582
		3	4605	4410	4265	4150	4060	3985	3925				0.468
		4	4820	4595	4425	4295	4190	4100	4030	3970	3915	3870	0.392
		5	5035	4775	4585	4435	4315	4220	4135	4070	4010	3955	0.337
		6	5245	4960	4745	4580	4445	4335	4245	4165	4100	4045	0.296
		8	5675	5325	5065	4865	4700	4570	4460	4365	4285	4215	0.237

* NOMINAL SHEAR SHOWN ABOVE MAY BE LIMITED BY SHEAR BUCKLING. SEE TABLE BELOW.

THE SHADED VALUES DO NOT COMPLY WITH THE MINIMUM SPACING REQUIREMENTS FOR SIDE-LAP CONNECTIONS AND SHALL NOT BE USED EXCEPT WITH PROPERLY SPACED SIDE-LAP CONNECTIONS.

WHEN FILLED DIAPHRAGMS ARE USED, IT MAY BE NECESSARY TO INCREASE THE NUMBER, OR STRENGTH, OF THE PERIMETER CONNECTIONS TO DEVELOP THE VALUES SHOWN IN THE TABLE. CHECK SECTION 5.4.

REFER TO THE 0 SIDE-LAP CONNECTION ROWS FOR DESIGN SHEAR OF DIAPHRAGMS WITH BUTTON PUNCHED SIDE-LAPS.

ϕ (Buckling): 0.80 Ω (Buckling): 2.00

TYPE OF DECK NO FILL	FASTENER LAYOUT	I in ⁴ / ft	NOMINAL SHEAR DUE TO PANEL BUCKLING (S _n), PLF / SPAN, FT									
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0
1 1/2" x 6"	36/4	0.400	5000	3670	2810	2220	1800	1485	1250	1065	915	800
2" x 12"	24/3 & 36/4	0.700	7970	5855	4480	3540	2870	2370	1990	1695	1460	1275
3" x 12"	24/3 & 36/4	1.666	14820	10890	8335	6585	5335	4410	3705	3155	2720	2370

NOTE: ASD Required Strength (Service Applied Load) <= Minimum (Nominal Shear Strength / Ω (EQ or WIND), Nominal Buckling Strength S_n / Ω (Buckling))
 LRFD Required Strength (Factored Applied Load) <= Minimum (ϕ (EQ or WIND) x Nominal Shear Strength, ϕ (Buckling) x Nominal Buckling Strength S_n)