DIAPHRAGM DESIGN MANUAL

FOURTH EDITION

ADDENDUM 2 - NOVEMBER 2016

SIMPSON STRONG-TIE XM SCREWS

Add Eqn. 6.8-3 to page 6-13 for Simpson Strong-Tie XM Screws. Replace pages 6-13 and 6-14 with pages 6-13.2 and 6-14.2.

Add values to Table 9A-1 (page 9A-3) for Simpson Strong-Tie XM screws. Replace page 9A-3 with page 9A-3.2.

Add values to Table 9A-2 (page 9A-4) for Simpson Strong-Tie XM screws. Replace page 9A-4 with page 9A-4.2.

Add values to Table 9A-8 (page 9A-7) for Simpson Strong-Tie XM screws. Replace page 9A-7 with page 9A-7.2.

Add information to the TABLE OF CONTENTS of Section 12 (page 12-4) for Simpson Strong-Tie XM screws. Replace page 12-4 with page 12-4.2. Note that page 12-4.2 also includes some editorial changes to page 12-4.

Add Tables for Simpson Strong-Tie XM screws as indicted on new pages 12-123 thru 12-132.

Section 6.8 Alternate Screws

Simpson Strong-Tie XL Screw:

[Applicable for 1/8 in. {3 mm} and thicker support steel]

$$P_{nf} = 78(t_{deck})(t_{support})^{0.15}, \text{ kips} \qquad \text{(Eqn. 6.8-1)}$$

$$\left\{P_{nf} = 8.41(t_{deck})(t_{support})^{0.15}\right\}, \text{ kN}$$

Where:

t_{deck} = base steel thickness of deck, inches {mm}

$t_{support}$ = thickness of support steel, inches {mm}

and

$$S_f = \frac{1.3}{1000\sqrt{t}}, \text{ inch/kip} \qquad \text{(Eqn. 6.8-2)}$$

$$\left\{S_f = \frac{37.4}{1000\sqrt{t}}\right\}, \text{ mm/kN}$$

Where:

t = base steel thickness of deck, inches {mm}

Simpson Strong-Tie XM Screw:

[Applicable for 1/8 in. {3 mm} and thicker supporting steel]

For 0.125 in. {3 mm} $\leq t_{support} \leq$ 0.1875 in. {4.5 mm}

$$P_{nf} = 240\,(t_{deck})^{1.5}, \text{ kips} \qquad \text{(Eqn. 6.8-3)}$$

$$\left\{P_{nf} = 8.34\,(t_{deck})^{1.5}\right\}, \text{ kN}$$

Where:

t_{deck} = base steel thickness of deck, inches {mm}

$t_{support}$ = thickness of support steel, inches {mm}

For $t_{support} > 0.1875$ in. {4.5 mm}

$$P_{nf} = 53\left(t_{deck}\right), \text{ kips} \qquad \text{(Eqn. 6.8-4)}$$

$$\left\{P_{nf} = 9.28\left(t_{deck}\right)\right\}, \text{ kN}$$

Where:

t_{deck} = base steel thickness of deck, inches {mm}

$t_{support}$ = thickness of support steel, inches {mm}

and

$$S_f = \frac{1.3}{1000\sqrt{t}}, \text{ inch/kip} \qquad \text{(Eqn. 6.8-5)}$$

$$\left\{S_f = \frac{37.4}{1000\sqrt{t}}\right\}, \text{ mm/kN}$$

Where:

t = base steel thickness of deck, inches {mm}

Table 9A-1 Support Fastener Nominal Shear Strength (lbs)

Support Fastener	P_{nf}, lbs / Deck Gage										
	Form Deck			Roof Deck				Composite Deck			
	26	24	22	22	20	18	16	22	20	18	16
Buildex, Elco, Hilti, Simpson Strong-Tie or Triangle #12 or #14 screws	940	1255	1549	1016	1233	1633	2060	1180	1432	1896	2392
Hilti X-ENP-19L15 (0.250" minimum support steel)	1015	1321	1603	1603	1933	2529	3149	1603	1933	2529	3149
Hilti ENP2 or ENPH (0.250" minimum support steel)	1015	1321	1590	1590	1874	2347	2780	1590	1874	2347	2780
Hilti ENP2K, X-EDN19, X-EDNK22, or X-HSN24 (0.125" to 0.375" support steel)	914	1213	1489	1489	1795	2348	2924	1489	1795	2348	2924
Pneutek SDK61-series (0.113" to 0.155" support steel)	807	1173	1527	1527	1828	2360	2896	1527	1828	2360	2896
Pneutek SDK63-series (0.155" to 0.250" support steel)	912	1325	1711	1711	1973	2403	2812	1711	1973	2403	2812
Pneutek K64-series (0.187" to 0.312" support steel)	916	1332	1699	1699	2209	2985	3686	1699	2209	2985	3686
Pneutek K66-series (0.281" and thicker support steel)	780	1134	1814	1814	2251	3101	4076	1814	2251	3101	4076
Buildex BX-12	962	1242	1484	1484	1734	2134	2473	1484	1734	2134	2473
Buildex BX-14	1019	1315	1572	1572	1837	2260	2620	1572	1837	2260	2620
Simpson Strong-Tie XL Screw (0.250" to 0.375" support steel)	--	--	1869	1869	2268	3003	3110	1869	2268	3003	3110
Simpson Strong-Tie XL Screw (0.125" to 0.249" support steel)	--	--	1684	1684	2044	2707	3110	1684	2044	2707	3110
Simpson Strong-Tie XM Screw (0.188" to 0.375" support steel)	--	--	1564	1564	1897	2512	3110	1564	1897	2512	3110
Simpson Strong-Tie XM Screw (0.125" to 0.1875" support steel)	--	--	1216	1216	1626	2477	3110	1216	1626	2477	3110

Table 9A-2 Support Fastener Flexibility

Support Fastener	S_f, in./kip / Deck Gage										
	Form Deck			Roof Deck				Composite Deck			
	26	24	22	22	20	18	16	22	20	18	16
Buildex, Elco, Hilti, Simpson Strong-Tie or Triangle #12 or #14 screws	0.0097	0.0084	0.0076	0.0076	0.0069	0.0060	0.0053	0.0076	0.0069	0.0060	0.0053
Hilti X-ENP-19L15 (0.250" minimum support steel)	0.0093	0.0081	0.0044	0.0044	0.0040	0.0034	0.0031	0.0044	0.0040	0.0034	0.0031
Hilti ENP2 or ENPH (0.250" minimum support steel)	0.0093	0.0081	0.0073	0.0073	0.0066	0.0057	0.0051	0.0073	0.0066	0.0057	0.0051
Hilti ENP2K, X-EDN19, X-EDNK22, or X-HSN24 (0.125" to 0.375" support steel)	0.0093	0.0081	0.0073	0.0073	0.0066	0.0057	0.0051	0.0073	0.0066	0.0057	0.0051
Pneutek SDK61-series (0.113" to 0.155" support steel)	0.0224	0.0194	0.0175	0.0175	0.0159	0.0138	0.0123	0.0175	0.0159	0.0138	0.0123
Pneutek SDK63-series (0.155" to 0.250" support steel)	0.0224	0.0194	0.0175	0.0175	0.0159	0.0138	0.0123	0.0175	0.0159	0.0138	0.0123
Pneutek K64-series (0.187" to 0.312" support steel)	0.0224	0.0194	0.0175	0.0175	0.0159	0.0138	0.0123	0.0175	0.0159	0.0138	0.0123
Pneutek K66-series (0.281" and thicker support steel)	0.0224	0.0194	0.0175	0.0175	0.0159	0.0138	0.0123	0.0175	0.0159	0.0138	0.0123
Buildex BX-12	0.0187	0.0162	0.0146	0.0146	0.0132	0.0115	0.0102	0.0146	0.0132	0.0115	0.0102
Buildex BX-14	0.0187	0.0162	0.0146	0.0146	0.0132	0.0115	0.0102	0.0146	0.0132	0.0115	0.0102
Simpson Strong-Tie XL Screw (0.125" to 0.375" support steel)	--	--	0.0076	0.0076	0.0069	0.0060	0.0053	0.0076	0.0069	0.0060	0.0053
Simpson Strong-Tie XM Screw (0.125" to 0.375" support steel)	--	--	0.0076	0.0076	0.0069	0.0060	0.0053	0.0076	0.0069	0.0060	0.0053

Table 9A-8 Simpson Strong Tie Fastener Nominal Tension Capacity[1]

Deck Thickness (in.)	Nominal Pull-Over (lbs)		Support Thickness (in.)	Nominal Pull-Out (lbs)			
	XM Screw	XL Screw		XM Screw		XL Screw	
				F_u = 50 ksi [2]	F_u = 65 ksi [2]	F_u = 50 ksi [2]	F_u = 65 ksi [2]
0.0295	750	1295	0.125	1150	1490	1150	1490
0.0358	1020	1705	0.1875	1720	2240	1720	2240
0.0474	1400	2490	0.25	2295	2985	2295	2985
0.0598	1930	2775	0.375	3445	4475	3445	4475

[1] For tension connections, the lesser of the pull-over and pull-out capacities found in the above table shall be used for design.

[2] F_u is minimum tensile strength of support steel.

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ROOF DECK (Side-Lap Connection: No. 10 Screws)

Deck Type	Fastening Pattern	Support Fastener										
				Pneutek				Hilti			Simpson Strong-Tie	
		5/8 in. Arc Spot Welds	No. 12 * Screws	SDK61 Series	SDK63 Series	K64 Series	K66 Series	ENP2 ENPH2	ENP2K X-ENDK22 X-EDN19 X-HSN24	X-ENP-19 L15	XL Screw	XM Screw
1-1/2" Roof Deck	36/9 36/7 36/5 36/4	12-5 thru 12-8	12-9 thru 12-12	12-13 thru 12-16	12-17 thru 12-20	12-21 thru 12-24	12-25 thru 12-28	12-29 thru 12-32	12-33 thru 12-36	12-37 thru 12-40	12-41 thru 12-48	12-123 thru 12-130
	30/6 30/4											
3" Roof Deck	24/4	12-49	12-50	12-51	12-52	12-53	12-54	12-55	12-56	12-57	12-58, 12-59	12-131, 12-132

* No. 12 Screws by Buildex, Elco, Hilti, Simpson Strong-Tie or Triangle.

FORM DECK (Side-Lap Connection: No. 10 Screws)

Deck Type	Type of Fill	Fastening Pattern	Support Fastener								
					Pneutek				Hilti		
			Weld with Weld Washer	No. 12 * Screws	SDK61 Series	SDK63 Series	K64 Series	K66 Series	ENP2 ENPH2	ENP2K X-ENDK22 X-EDN19 X-HSN24	X-ENP-19 L15
9/16" x 2-1/2" Form Deck	Without Fill	35/8 35/7 35/5	12-60 thru 12-62	12-63 thru 12-65	12-66 thru 12-68	12-69 thru 12-71	12-72 thru 12-74	12-75 thru 12-77	12-78 thru 12-80	12-81 thru 12-83	12-84 thru 12-86
		30/7 30/5 30/4									
	NW & LW Concrete	30/4									
	Type I Insulating Fill	30/4									

* No. 12 Screws by Buildex, Elco, Hilti, Simpson Strong-Tie or Triangle.

COMPOSITE DECK (Support Fastener Pattern: 36/4)

Deck Type	Side-Lap Connection	Type of Fill	Support Fastener								
					Pneutek				Hilti		
			5/8 in. Arc Spot Welds	No. 12 * Screws	SDK61 Series	SDK63 Series	K64 Series	K66 Series	ENP2 ENPH2	ENP2K, X-ENDK22 X-EDN19 X-HSN24	X-ENP-19 L15
1-1/2" x 6" 2" x 12" 3" x 12"	Welds	None NW Concrete LW Concrete	12-87 thru 12-90	12-91 thru 12-94	12-95 thru 12-98	12-99 thru 12-102	12-103 thru 12-106	12-107 thru 12-110	12-111 thru 12-114	12-115 thru 12-118	12-119 thru 12-122
	No. 10 Screws	None NW Concrete LW Concrete									

* No. 12 Screws by Buildex, Elco, Hilti, Simpson Strong-Tie or Triangle.

F_u= 45 ksi
F_y= 33 ksi

Loading	ϕ_{df}	Ω_{df}
Seismic	0.65	2.50
Wind	0.70	2.35
Other	0.65	2.50

1.5(WR, IR)22
Design thickness = 0.0295 in.
Support fastening: Simpson Strong-Tie XM Screw
Side-lap fastening: Buildex, Elco, Hilti, or Simpson Strong-Tie #10 screws
0.125" to 0.1875" thick Support Steel

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf}, plf[1,2] Span, ft. 3	3.5	4	4.5	5	5.5	6	6.5	7	K_1 1/ft
36/9	0	1240	1090	970	860	765					0.366
	1	1385	1225	1100	990	895	805	735			0.301
	2	1520	1355	1220	1105	1010	920	840	770	710	0.255
	3	1640	1475	1330	1210	1110	1020	945	870	800	0.222
	4	1750	1580	1435	1310	1205	1115	1035	965	890	0.196
	5	1845	1680	1535	1405	1295	1200	1115	1045	980	0.176
	6	1935	1770	1625	1495	1385	1285	1195	1120	1050	0.159
36/7	0	790	690	600	530	470					0.549
	1	965	845	750	670	600	540	495			0.414
	2	1120	985	880	795	720	655	600	550	510	0.333
	3	1260	1120	1005	910	830	760	705	650	600	0.278
	4	1385	1240	1120	1015	930	855	795	740	690	0.239
	5	1495	1350	1225	1120	1030	950	880	820	770	0.209
	6	1590	1450	1325	1215	1120	1035	965	900	845	0.186
36/5	0	700	615	550	490	435					0.659
	1	845	750	675	610	555	510	465			0.474
	2	965	870	785	715	655	605	560	525	485	0.370
	3	1065	970	885	810	750	695	645	605	565	0.304
	4	1145	1055	970	900	835	775	725	680	635	0.257
	5	1215	1125	1045	975	910	850	795	750	705	0.223
	6	1270	1190	1110	1040	975	915	865	815	770	0.197
36/4	0	535	470	420	370	330					0.823
	1	675	600	540	490	450	410	375			0.554
	2	780	710	645	590	545	505	470	440	405	0.417
	3	865	795	735	680	630	585	550	515	480	0.334
	4	930	865	805	755	705	660	620	580	550	0.279
	5	980	920	865	815	765	725	680	645	610	0.240
	6	1015	965	915	865	820	780	740	700	665	0.210
30/6	0	720	615	535	470	420					0.732
	1	895	785	695	615	550	495	450			0.538
	2	1060	930	830	745	675	610	555	510	475	0.425
	3	1205	1065	955	865	785	720	665	610	565	0.351
	4	1335	1195	1075	975	890	820	760	705	655	0.299
	5	1450	1305	1185	1080	990	915	845	790	735	0.261
	6	1555	1410	1285	1175	1085	1005	930	870	815	0.231
30/4	0	655	575	515	460	410					0.823
	1	790	705	635	575	525	485	440			0.585
	2	905	820	745	680	625	575	535	500	465	0.454
	3	995	910	835	770	715	660	615	575	540	0.371
	4	1070	990	915	850	790	740	690	650	610	0.314
	5	1130	1055	985	920	865	810	760	715	675	0.272
	6	1175	1110	1045	980	925	870	825	780	735	0.240

[1] Nominal shear strength shown above may be limited by shear buckling. See Table below.

	ϕ_{db}	Ω_{db}
Buckling	0.80	2.00

Deck Profile	I in^4/ft	Nominal Shear Due to Panel Buckling, S_{nb}, plf[2] Span, ft 3	3.5	4	4.5	5	5.5	6	6.5	7
IR	0.125	12191	8956	6857	5418	4389	3627	3048	2597	2239
WR	0.173	15500	11388	8719	6889	5580	4612	3875	3302	2847

[2] Design Strengths:

ASD Required strength (Service Applied Load) <= Min $\{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$

LRFD Required strength (Factored Applied Load) <= Min $\{\phi_{df}S_{nf}, \phi_{db}S_{nb}\}$

F_u= 45 ksi
F_y= 33 ksi

Loading	ϕ_{df}	Ω_{df}
Seismic	0.65	2.50
Wind	0.70	2.35
Other	0.65	2.50

1.5(WR, IR)20
Design thickness = 0.0358 in.
Support fastening: Simpson Strong-Tie XM Screw
Side-lap fastening: Buildex, Elco, Hilti, or Simpson Strong-Tie #10 screws
0.125" to 0.1875" thick Support Steel

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf}, plf[1,2] Span, ft. 4	4.5	5	5.5	6	6.5	7	7.5	8	K_1 1/ft
36/9	0	1300	1155	1035							0.403
	1	1455	1310	1190	1075	975					0.331
	2	1600	1450	1325	1215	1105	1015	935	870	810	0.281
	3	1740	1580	1445	1335	1235	1135	1045	970	905	0.244
	4	1870	1705	1565	1445	1340	1250	1155	1075	1005	0.216
	5	1995	1825	1680	1555	1445	1345	1260	1175	1100	0.193
	6	2105	1935	1785	1655	1545	1440	1350	1270	1195	0.175
36/7	0	805	710	635							0.605
	1	985	880	790	715	650					0.456
	2	1145	1030	935	855	780	715	665	615	575	0.366
	3	1300	1175	1070	980	905	835	775	720	670	0.306
	4	1440	1310	1195	1100	1020	945	885	820	770	0.263
	5	1575	1435	1315	1215	1125	1050	980	920	865	0.230
	6	1700	1555	1430	1325	1230	1145	1075	1010	950	0.205
36/5	0	735	655	590							0.726
	1	885	800	730	670	610					0.522
	2	1025	935	855	790	730	680	630	585	545	0.408
	3	1150	1055	970	895	835	780	730	685	640	0.334
	4	1260	1160	1075	1000	930	870	820	770	730	0.283
	5	1355	1260	1170	1090	1020	960	905	850	805	0.246
	6	1440	1345	1260	1180	1105	1040	985	930	880	0.217
36/4	0	560	495	445							0.907
	1	710	645	590	540	490					0.610
	2	840	770	705	655	605	565	525	490	455	0.459
	3	950	880	815	755	705	660	620	585	550	0.368
	4	1045	975	905	845	795	745	705	665	630	0.307
	5	1125	1055	990	930	875	825	780	740	700	0.264
	6	1190	1125	1060	1000	945	895	850	810	770	0.231
30/6	0	720	635	570							0.806
	1	910	805	720	655	595					0.592
	2	1075	965	875	795	725	665	615	570	535	0.468
	3	1235	1110	1010	930	850	785	725	675	630	0.387
	4	1380	1250	1140	1050	970	900	835	775	725	0.330
	5	1515	1380	1265	1165	1080	1005	940	880	820	0.287
	6	1645	1505	1380	1275	1185	1105	1035	970	915	0.255
30/4	0	685	615	550							0.907
	1	835	760	690	635	580					0.645
	2	970	885	815	750	695	650	600	560	520	0.500
	3	1085	1000	925	855	795	745	700	655	620	0.409
	4	1190	1100	1020	950	890	835	785	740	700	0.346
	5	1280	1190	1110	1040	975	920	865	820	775	0.299
	6	1355	1270	1195	1120	1055	995	940	895	850	0.264

[1] Nominal shear strength shown above may be limited by shear buckling. See Table below.

	ϕ_{db}	Ω_{db}
Buckling	0.80	2.00

Deck Profile	I in^4/ft	Nominal Shear Due to Panel Buckling, S_{nb}, plf[2] Span, ft 4	4.5	5	5.5	6	6.5	7	7.5	8
IR	0.151	9177	7251	5873	4854	4079	3475	2997	2610	2294
WR	0.210	11665	9216	7465	6170	5184	4417	3809	3318	2916

[2] Design Strengths:

ASD Required strength (Service Applied Load) <= Min $\{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$

LRFD Required strength (Factored Applied Load) <= Min $\{\phi_{df}S_{nf}, \phi_{db}S_{nb}\}$

F_u= 45 ksi
F_y= 33 ksi

Loading	ϕ_{df}	Ω_{df}
Seismic	0.65	2.50
Wind	0.70	2.35
Other	0.65	2.50

1.5(WR, IR)18
Design thickness = 0.0474 in.
Support fastening: Simpson Strong-Tie XM Screw
Side-lap fastening: Buildex, Elco, Hilti, or Simpson Strong-Tie #10 screws
0.125" to 0.1875" thick Support Steel

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf}, plf[1,2] Span, ft. 5	5.5	6	6.5	7	7.5	8	8.5	9	K_1 1/ft
36/9	0	1590									0.464
	1	1795	1620	1480							0.381
	2	1965	1805	1650	1515	1400	1300	1210	1135	1065	0.324
	3	2135	1965	1815	1670	1545	1435	1340	1255	1180	0.281
	4	2295	2115	1960	1825	1690	1570	1465	1375	1295	0.248
	5	2450	2260	2100	1955	1830	1705	1595	1495	1405	0.223
	6	2595	2400	2235	2085	1955	1835	1720	1615	1520	0.202
36/7	0	980									0.696
	1	1180	1070	975							0.525
	2	1375	1255	1145	1055	975	905	845	795	745	0.422
	3	1555	1425	1315	1210	1120	1040	975	915	860	0.352
	4	1725	1585	1465	1360	1265	1180	1100	1035	975	0.303
	5	1890	1740	1610	1495	1400	1310	1230	1155	1085	0.265
	6	2045	1885	1750	1630	1525	1430	1350	1275	1200	0.236
36/5	0	905									0.835
	1	1090	1000	915							0.601
	2	1255	1155	1070	995	920	855	800	750	705	0.469
	3	1410	1305	1210	1130	1055	990	930	870	820	0.385
	4	1555	1445	1345	1255	1175	1110	1045	990	930	0.326
	5	1690	1575	1470	1375	1295	1220	1150	1090	1035	0.283
	6	1815	1695	1585	1490	1405	1325	1255	1190	1130	0.250
36/4	0	685									1.044
	1	875	800	730							0.702
	2	1035	955	885	825	765	710	665	620	585	0.528
	3	1180	1095	1020	950	895	840	790	740	695	0.424
	4	1310	1220	1140	1070	1005	950	900	850	810	0.354
	5	1430	1335	1255	1180	1115	1055	1000	950	905	0.304
	6	1530	1440	1360	1285	1215	1150	1095	1040	990	0.266
30/6	0	875									0.928
	1	1080	975	890							0.682
	2	1280	1160	1060	975	900	840	780	735	690	0.539
	3	1465	1340	1230	1130	1045	975	910	855	805	0.445
	4	1640	1505	1390	1290	1190	1110	1035	975	915	0.380
	5	1805	1660	1535	1430	1335	1245	1165	1095	1030	0.331
	6	1965	1815	1680	1565	1460	1370	1290	1210	1140	0.293
30/4	0	850									1.044
	1	1030	945	870							0.742
	2	1195	1100	1020	950	880	820	765	720	675	0.576
	3	1345	1245	1155	1080	1010	950	895	840	790	0.470
	4	1480	1375	1285	1200	1130	1065	1005	950	900	0.398
	5	1610	1500	1405	1320	1240	1170	1110	1050	1000	0.344
	6	1725	1615	1515	1425	1345	1275	1205	1145	1090	0.304

[1] Nominal shear strength shown above may be limited by shear buckling. See Table below.

	ϕ_{db}	Ω_{db}
Buckling	0.80	2.00

Deck Profile	I in^4/ft	Nominal Shear Due to Panel Buckling, S_{nb}, plf[2] Span, ft 5	5.5	6	6.5	7	7.5	8	8.5	9
IR	0.201	8964	7408	6225	5304	4573	3984	3501	3102	2767
WR	0.279	11390	9413	7909	6739	5811	5062	4449	3941	3515

[2] Design Strengths:

ASD Required strength (Service Applied Load) <= Min $\{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$

LRFD Required strength (Factored Applied Load) <= Min $\{\phi_{df}S_{nf}, \phi_{db}S_{nb}\}$

F_u= 45 ksi
F_y= 33 ksi

Loading	ϕ_{df}	Ω_{df}
Seismic	0.65	2.50
Wind	0.70	2.35
Other	0.65	2.50

1.5(WR, IR)16
Design thickness = 0.0598 in.
Support fastening: Simpson Strong-Tie XM Screw
Side-lap fastening: Buildex, Elco, Hilti, or Simpson Strong-Tie #10 screws
0.125" to 0.1875" thick Support Steel

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf}, plf[1,2] Span, ft. 6	6.5	7	7.5	8	8.5	9	9.5	10	K_1 1/ft
36/9	1	1870									0.428
	2	2085	1915	1770	1645	1535	1440	1355			0.363
	3	2285	2115	1955	1820	1700	1590	1495	1410	1335	0.316
	4	2465	2295	2140	1990	1860	1740	1640	1550	1465	0.279
	5	2640	2460	2305	2160	2020	1895	1780	1685	1595	0.250
	6	2810	2620	2455	2310	2180	2045	1925	1820	1720	0.227
	7	2975	2780	2610	2455	2315	2195	2070	1955	1850	0.207
36/7	1	1235									0.590
	2	1450	1330	1235	1145	1070	1005	945			0.474
	3	1655	1530	1415	1320	1230	1155	1090	1030	975	0.396
	4	1840	1710	1595	1490	1395	1310	1230	1165	1105	0.340
	5	2025	1885	1760	1650	1555	1460	1375	1300	1230	0.298
	6	2205	2055	1920	1805	1700	1605	1515	1435	1360	0.265
	7	2375	2215	2075	1950	1840	1740	1650	1570	1490	0.239
36/5	1	1155									0.675
	2	1345	1250	1165	1085	1015	950	895			0.527
	3	1525	1420	1330	1250	1175	1100	1040	980	930	0.432
	4	1690	1580	1480	1395	1315	1245	1180	1115	1055	0.366
	5	1850	1730	1630	1535	1450	1375	1305	1245	1185	0.318
	6	1995	1875	1765	1670	1580	1500	1425	1360	1300	0.281
	7	2135	2010	1900	1795	1705	1620	1540	1470	1405	0.251
36/4	1	925									0.788
	2	1115	1040	970	900	840	790	740			0.594
	3	1280	1200	1125	1060	1000	940	885	835	790	0.476
	4	1435	1350	1270	1195	1130	1075	1020	970	920	0.397
	5	1580	1485	1405	1325	1260	1195	1135	1085	1035	0.341
	6	1710	1615	1530	1450	1375	1310	1250	1195	1140	0.299
	7	1830	1735	1645	1565	1490	1420	1355	1300	1245	0.266
30/6	1	1125									0.766
	2	1340	1235	1140	1060	990	930	875			0.605
	3	1555	1430	1325	1230	1150	1080	1020	960	910	0.500
	4	1745	1620	1510	1405	1310	1230	1160	1095	1040	0.426
	5	1935	1800	1680	1575	1475	1385	1305	1230	1165	0.371
	6	2115	1970	1840	1730	1625	1535	1445	1365	1295	0.329
	7	2290	2135	2000	1880	1770	1675	1585	1500	1425	0.295
30/4	1	1100									0.834
	2	1280	1195	1115	1040	970	910	855			0.647
	3	1455	1355	1270	1195	1130	1060	1000	945	895	0.528
	4	1615	1510	1420	1340	1265	1200	1140	1080	1020	0.447
	5	1765	1660	1560	1475	1395	1325	1260	1200	1145	0.387
	6	1910	1795	1695	1605	1520	1445	1375	1310	1255	0.341
	7	2040	1925	1820	1725	1640	1560	1490	1420	1360	0.305

[1] Nominal shear strength shown above may be limited by shear buckling. See Table below.

	ϕ_{db}	Ω_{db}
Buckling	0.80	2.00

Deck Profile	I in^4/ft	Nominal Shear Due to Panel Buckling, S_{nb}, plf[2] Span, ft 6	6.5	7	7.5	8	8.5	9	9.5	10
IR	0.254	8841	7533	6495	5658	4973	4405	3929	3527	3183
WR	0.353	11224	9564	8247	7184	6314	5593	4989	4477	4041

[2] Design Strengths:

ASD Required strength (Service Applied Load) <= Min $\{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$

LRFD Required strength (Factored Applied Load) <= Min $\{\phi_{df}S_{nf}, \phi_{db}S_{nb}\}$

F_u= 45 ksi
F_y= 33 ksi

Loading	ϕ_{df}	Ω_{df}
Seismic	0.65	2.50
Wind	0.70	2.35
Other	0.65	2.50

1.5(WR, IR)22
Design thickness = 0.0295 in.
Support fastening: Simpson Strong-Tie XM Screw
Side-lap fastening: Buildex, Elco, Hilti, or Simpson Strong-Tie #10 screws
0.188" to 0.375" thick Support Steel

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf}, plf[1,2] Span, ft. 3	3.5	4	4.5	5	5.5	6	6.5	7	K_1 1/ft
36/9	0	1595	1400	1250	1105	985					0.366
	1	1740	1540	1375	1245	1115	1005	915			0.301
	2	1880	1670	1500	1355	1240	1120	1020	935	865	0.255
	3	2010	1795	1615	1465	1340	1235	1125	1035	955	0.222
	4	2125	1910	1730	1575	1440	1330	1230	1130	1045	0.196
	5	2235	2020	1835	1675	1540	1420	1315	1230	1135	0.176
	6	2335	2120	1930	1770	1630	1510	1400	1310	1225	0.159
36/7	0	1020	885	770	680	610					0.549
	1	1190	1040	925	820	735	665	605			0.414
	2	1350	1190	1060	950	860	780	710	655	605	0.333
	3	1500	1325	1185	1070	975	895	815	750	695	0.278
	4	1635	1455	1310	1185	1080	995	920	850	785	0.239
	5	1760	1580	1425	1295	1185	1090	1010	940	875	0.209
	6	1875	1690	1530	1395	1280	1185	1095	1020	955	0.186
36/5	0	900	795	705	630	560					0.659
	1	1045	930	830	750	685	620	565			0.474
	2	1175	1050	950	860	790	725	670	620	570	0.370
	3	1285	1160	1055	965	885	820	760	710	660	0.304
	4	1380	1260	1150	1060	975	905	840	785	740	0.257
	5	1465	1345	1240	1145	1060	985	920	860	810	0.223
	6	1535	1420	1315	1220	1140	1060	995	935	880	0.197
36/4	0	690	605	540	475	425					0.823
	1	830	740	665	600	550	495	450			0.554
	2	945	855	775	705	650	600	555	510	470	0.417
	3	1045	950	870	800	740	685	640	595	560	0.334
	4	1120	1035	955	885	820	765	715	670	630	0.279
	5	1185	1105	1030	960	895	840	785	740	700	0.240
	6	1240	1165	1090	1025	960	905	850	805	760	0.210
30/6	0	925	795	690	610	545					0.732
	1	1105	965	850	750	670	605	550			0.538
	2	1270	1115	990	890	795	720	655	605	555	0.425
	3	1425	1260	1120	1010	920	835	765	700	650	0.351
	4	1570	1390	1245	1125	1025	940	870	800	740	0.299
	5	1700	1515	1365	1240	1130	1040	960	895	830	0.261
	6	1820	1635	1475	1345	1230	1135	1050	980	915	0.231
30/4	0	840	740	660	590	525					0.823
	1	980	875	785	710	650	590	540			0.585
	2	1105	990	895	815	750	690	640	590	545	0.454
	3	1205	1095	1000	915	845	780	725	675	635	0.371
	4	1290	1185	1090	1005	930	865	805	755	705	0.314
	5	1365	1265	1170	1085	1010	940	880	825	775	0.272
	6	1430	1330	1240	1155	1080	1010	950	895	845	0.240

[1] Nominal shear strength shown above may be limited by shear buckling. See Table below.

	ϕ_{db}	Ω_{db}
Buckling	0.80	2.00

Deck Profile	I in^4/ft	Nominal Shear Due to Panel Buckling, S_{nb}, plf[2] Span, ft 3	3.5	4	4.5	5	5.5	6	6.5	7
IR	0.125	12191	8956	6857	5418	4389	3627	3048	2597	2239
WR	0.173	15500	11388	8719	6889	5580	4612	3875	3302	2847

[2] Design Strengths:

ASD Required strength (Service Applied Load) <= Min $\{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$

LRFD Required strength (Factored Applied Load) <= Min $\{\phi_{df}S_{nf}, \phi_{db}S_{nb}\}$

F_u= 45 ksi
F_y= 33 ksi

Loading	ϕ_{df}	Ω_{df}
Seismic	0.65	2.50
Wind	0.70	2.35
Other	0.65	2.50

1.5(WR, IR)20
Design thickness = 0.0358 in.
Support fastening: Simpson Strong-Tie XM Screw
Side-lap fastening: Buildex, Elco, Hilti, or Simpson Strong-Tie #10 screws
0.188" to 0.375" thick Support Steel

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf}, plf[1,2] Span, ft. 4	4.5	5	5.5	6	6.5	7	7.5	8	K_1 1/ft
36/9	0	1515	1350	1205							0.403
	1	1670	1510	1360	1230	1120					0.331
	2	1820	1650	1505	1370	1250	1145	1055	980	915	0.281
	3	1960	1780	1630	1500	1375	1265	1165	1085	1010	0.244
	4	2095	1910	1750	1615	1495	1380	1275	1185	1105	0.216
	5	2225	2030	1865	1725	1600	1490	1385	1290	1205	0.193
	6	2345	2150	1980	1830	1700	1590	1490	1390	1300	0.175
36/7	0	940	830	745							0.605
	1	1120	1000	895	810	740					0.456
	2	1285	1155	1050	950	870	800	740	685	640	0.366
	3	1440	1300	1185	1085	995	915	845	790	735	0.306
	4	1590	1440	1315	1205	1115	1035	955	890	830	0.263
	5	1730	1570	1435	1325	1225	1140	1065	995	930	0.230
	6	1860	1695	1555	1435	1330	1240	1160	1090	1025	0.205
36/5	0	855	770	685							0.726
	1	1010	915	830	760	695					0.522
	2	1150	1045	960	880	815	755	695	650	605	0.408
	3	1280	1170	1075	995	920	860	805	750	700	0.334
	4	1400	1285	1185	1100	1025	955	895	845	795	0.283
	5	1505	1390	1285	1200	1120	1045	985	925	875	0.246
	6	1600	1485	1380	1290	1205	1135	1070	1010	955	0.217
36/4	0	655	580	520							0.907
	1	805	730	665	605	550					0.610
	2	940	860	790	725	675	625	575	535	500	0.459
	3	1060	975	900	835	775	725	680	640	595	0.368
	4	1160	1075	1000	930	870	815	765	725	685	0.307
	5	1250	1165	1085	1020	955	900	845	800	760	0.264
	6	1325	1240	1165	1095	1035	975	925	875	830	0.231
30/6	0	840	745	665							0.806
	1	1035	915	820	740	675					0.592
	2	1200	1080	970	880	800	735	680	635	590	0.468
	3	1360	1225	1115	1020	930	855	790	735	685	0.387
	4	1515	1370	1245	1145	1055	975	900	840	785	0.330
	5	1660	1505	1375	1265	1170	1085	1010	940	880	0.287
	6	1795	1635	1495	1380	1275	1190	1110	1045	975	0.255
30/4	0	800	720	645							0.907
	1	955	865	785	720	655					0.645
	2	1090	990	910	840	775	720	665	620	580	0.500
	3	1210	1110	1025	945	880	820	770	720	675	0.409
	4	1320	1220	1130	1050	980	915	860	810	765	0.346
	5	1420	1315	1225	1140	1070	1005	945	890	845	0.299
	6	1505	1405	1310	1230	1155	1085	1025	970	920	0.264

[1] Nominal shear strength shown above may be limited by shear buckling. See Table below.

	ϕ_{db}	Ω_{db}
Buckling	0.80	2.00

Deck Profile	I in^4/ft	Nominal Shear Due to Panel Buckling, S_{nb}, plf[2] Span, ft 4	4.5	5	5.5	6	6.5	7	7.5	8
IR	0.151	9177	7251	5873	4854	4079	3475	2997	2610	2294
WR	0.210	11665	9216	7465	6170	5184	4417	3809	3318	2916

[2] Design Strengths:

ASD Required strength (Service Applied Load) <= Min $\{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$

LRFD Required strength (Factored Applied Load) <= Min $\{\phi_{df}S_{nf}, \phi_{db}S_{nb}\}$

F_u= 45 ksi
F_y= 33 ksi

Loading	ϕ_{df}	Ω_{df}
Seismic	0.65	2.50
Wind	0.70	2.35
Other	0.65	2.50

1.5(WR, IR)18
Design thickness = 0.0474 in.
Support fastening: Simpson Strong-Tie XM Screw
Side-lap fastening: Buildex, Elco, Hilti, or Simpson Strong-Tie #10 screws
0.188" to 0.375" thick Support Steel

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf}, plf[1,2] Span, ft. 5	5.5	6	6.5	7	7.5	8	8.5	9	K_1 1/ft
36/9	0	1615									0.464
	1	1815	1645	1500							0.381
	2	1990	1830	1665	1530	1415	1315	1225	1150	1080	0.324
	3	2155	1985	1835	1690	1560	1450	1355	1270	1190	0.281
	4	2315	2135	1980	1840	1705	1585	1480	1385	1305	0.248
	5	2470	2285	2120	1975	1850	1720	1605	1505	1420	0.223
	6	2620	2425	2255	2105	1970	1855	1735	1625	1530	0.202
36/7	0	990									0.696
	1	1195	1080	985							0.525
	2	1390	1265	1155	1065	985	915	855	800	755	0.422
	3	1565	1435	1325	1220	1130	1050	980	920	870	0.352
	4	1740	1595	1475	1370	1275	1185	1110	1040	980	0.303
	5	1905	1750	1620	1510	1410	1320	1235	1160	1095	0.265
	6	2060	1900	1765	1645	1535	1445	1360	1280	1205	0.236
36/5	0	915									0.835
	1	1105	1010	925							0.601
	2	1270	1170	1080	1005	930	865	810	760	715	0.469
	3	1425	1315	1220	1140	1065	1000	935	880	825	0.385
	4	1570	1455	1355	1265	1185	1115	1055	1000	940	0.326
	5	1705	1585	1480	1385	1305	1230	1160	1100	1045	0.283
	6	1830	1710	1600	1500	1415	1335	1265	1200	1140	0.250
36/4	0	695									1.044
	1	885	810	740							0.702
	2	1045	965	895	835	770	715	670	625	590	0.528
	3	1190	1105	1025	960	900	850	795	745	700	0.424
	4	1320	1230	1150	1080	1015	960	905	860	815	0.354
	5	1440	1350	1265	1190	1125	1060	1005	955	910	0.304
	6	1545	1455	1370	1295	1225	1160	1100	1050	1000	0.266
30/6	0	885									0.928
	1	1090	985	900							0.682
	2	1295	1170	1070	985	910	845	790	740	695	0.539
	3	1475	1355	1240	1140	1055	980	915	860	810	0.445
	4	1650	1515	1400	1295	1200	1115	1045	980	925	0.380
	5	1820	1675	1550	1440	1345	1255	1170	1100	1035	0.331
	6	1980	1825	1690	1575	1470	1380	1300	1220	1150	0.293
30/4	0	860									1.044
	1	1045	960	880							0.742
	2	1205	1110	1030	960	890	830	775	725	680	0.576
	3	1355	1255	1165	1090	1020	960	900	845	795	0.470
	4	1495	1390	1295	1210	1140	1070	1015	960	910	0.398
	5	1620	1515	1415	1330	1250	1180	1115	1060	1005	0.344
	6	1740	1630	1530	1440	1355	1285	1215	1155	1100	0.304

[1] Nominal shear strength shown above may be limited by shear buckling. See Table below.

	ϕ_{db}	Ω_{db}
Buckling	0.80	2.00

Deck Profile	I in^4/ft	Nominal Shear Due to Panel Buckling, S_{nb}, plf[2] Span, ft 5	5.5	6	6.5	7	7.5	8	8.5	9
IR	0.201	8964	7408	6225	5304	4573	3984	3501	3102	2767
WR	0.279	11390	9413	7909	6739	5811	5062	4449	3941	3515

[2] Design Strengths:

ASD Required strength (Service Applied Load) <= Min $\{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$

LRFD Required strength (Factored Applied Load) <= Min $\{\phi_{df}S_{nf}, \phi_{db}S_{nb}\}$

F_u= 45 ksi
F_y= 33 ksi

Loading	ϕ_{df}	Ω_{df}
Seismic	0.65	2.50
Wind	0.70	2.35
Other	0.65	2.50

1.5(WR, IR)16
Design thickness = 0.0598 in.
Support fastening: Simpson Strong-Tie XM Screw
Side-lap fastening: Buildex, Elco, Hilti, or Simpson Strong-Tie #10 screws
0.188" to 0.375" thick Support Steel

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf}, plf[1,2] Span, ft. 6	6.5	7	7.5	8	8.5	9	9.5	10	K_1 1/ft
36/9	1	1870									0.428
	2	2085	1915	1770	1645	1535	1440	1355			0.363
	3	2285	2115	1955	1820	1700	1590	1495	1410	1335	0.316
	4	2465	2295	2140	1990	1860	1740	1640	1550	1465	0.279
	5	2640	2460	2305	2160	2020	1895	1780	1685	1595	0.250
	6	2810	2620	2455	2310	2180	2045	1925	1820	1720	0.227
	7	2975	2780	2610	2455	2315	2195	2070	1955	1850	0.207
36/7	1	1235									0.590
	2	1450	1330	1235	1145	1070	1005	945			0.474
	3	1655	1530	1415	1320	1230	1155	1090	1030	975	0.396
	4	1840	1710	1595	1490	1395	1310	1230	1165	1105	0.340
	5	2025	1885	1760	1650	1555	1460	1375	1300	1230	0.298
	6	2205	2055	1920	1805	1700	1605	1515	1435	1360	0.265
	7	2375	2215	2075	1950	1840	1740	1650	1570	1490	0.239
36/5	1	1155									0.675
	2	1345	1250	1165	1085	1015	950	895			0.527
	3	1525	1420	1330	1250	1175	1100	1040	980	930	0.432
	4	1690	1580	1480	1395	1315	1245	1180	1115	1055	0.366
	5	1850	1730	1630	1535	1450	1375	1305	1245	1185	0.318
	6	1995	1875	1765	1670	1580	1500	1425	1360	1300	0.281
	7	2135	2010	1900	1795	1705	1620	1540	1470	1405	0.251
36/4	1	925									0.788
	2	1115	1040	970	900	840	790	740			0.594
	3	1280	1200	1125	1060	1000	940	885	835	790	0.476
	4	1435	1350	1270	1195	1130	1075	1020	970	920	0.397
	5	1580	1485	1405	1325	1260	1195	1140	1085	1035	0.341
	6	1710	1615	1530	1450	1375	1310	1250	1195	1140	0.299
	7	1830	1735	1645	1565	1490	1420	1355	1300	1245	0.266
30/6	1	1125									0.766
	2	1340	1235	1140	1060	990	930	875			0.605
	3	1555	1430	1325	1230	1150	1080	1020	960	910	0.500
	4	1745	1620	1510	1405	1310	1230	1160	1095	1040	0.426
	5	1935	1800	1680	1575	1475	1385	1305	1230	1165	0.371
	6	2115	1970	1840	1730	1625	1535	1445	1365	1295	0.329
	7	2290	2135	2000	1880	1770	1675	1585	1500	1425	0.295
30/4	1	1100									0.834
	2	1280	1195	1115	1040	970	910	855			0.647
	3	1455	1355	1270	1195	1130	1060	1000	945	895	0.528
	4	1615	1515	1420	1340	1265	1200	1140	1080	1020	0.447
	5	1765	1660	1560	1475	1395	1325	1260	1200	1145	0.387
	6	1910	1795	1695	1605	1520	1445	1375	1310	1255	0.341
	7	2040	1925	1820	1725	1640	1560	1490	1420	1360	0.305

[1] Nominal shear strength shown above may be limited by shear buckling. See Table below.

	ϕ_{db}	Ω_{db}
Buckling	0.80	2.00

Deck Profile	I in^4/ft	Nominal Shear Due to Panel Buckling, S_{nb}, plf[2] Span, ft 6	6.5	7	7.5	8	8.5	9	9.5	10
IR	0.254	8841	7533	6495	5658	4973	4405	3929	3527	3183
WR	0.353	11224	9564	8247	7184	6314	5593	4989	4477	4041

[2] Design Strengths:

ASD Required strength (Service Applied Load) <= Min $\{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$

LRFD Required strength (Factored Applied Load) <= Min $\{\phi_{df}S_{nf}, \phi_{db}S_{nb}\}$

F_u= 45 ksi
F_y= 33 ksi

Loading	ϕ_{df}	Ω_{df}
Seismic	0.65	2.50
Wind	0.70	2.35
Other	0.65	2.50

Support fastening: Simpson Strong-Tie XM Screw
Side-lap fastening: Buildex, Elco, Hilti, or Simpson Strong-Tie #10 screws
0.125" to 0.1875" thick Support Steel

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf}, plf[1,2] Span, ft. 8	8.5	9	9.5	10	10.5	11	11.5	12	K_1 1/ft
3DR22 0.0295" 24/4	2	350	330	310							0.625
	3	430	405	380	360	345	325	310	300	285	0.502
	4	510	480	450	430	405	385	370	355	340	0.419
	5	585	555	525	495	470	450	425	410	390	0.359
	6	650	615	585	560	535	510	485	465	445	0.315
	7	715	680	645	615	590	560	540	515	495	0.280
	8	775	735	700	670	640	615	590	565	545	0.252
	9	830	790	755	720	690	665	635	610	590	0.229
	10	885	845	805	775	740	710	685	655	635	0.210
	11	935	895	855	820	790	755	730	700	675	0.194
	12	985	945	905	865	835	800	770	745	715	0.180
	I, in^4/ft	Nominal Shear Strength due to Panel Buckling, S_{nb}, plf									
	0.808	6643	5884	5249	4711	4252	3856	3514	3215	2952	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf}, plf[1,2] Span, ft. 9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	K_1 1/ft
3DR20 0.0358 24/4	2	400									0.689
	3	485	460	435	415	395	380	365			0.553
	4	570	540	515	490	465	445	425	410	395	0.461
	5	655	620	590	560	535	515	490	470	455	0.396
	6	740	700	665	635	605	580	555	535	515	0.347
	7	815	775	740	705	675	645	620	595	570	0.308
	8	885	845	805	770	740	710	680	655	630	0.278
	9	950	910	870	830	800	765	740	710	685	0.253
	10	1015	970	930	890	855	825	795	765	735	0.232
	11	1080	1035	990	950	915	880	845	815	790	0.214
	12	1140	1090	1045	1005	970	930	900	865	840	0.199
	I, in^4/ft	Nominal Shear Strength due to Panel Buckling, S_{nb}, plf									
	0.989	7060	6337	5719	5187	4726	4324	3971	3660	3384	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf}, plf[1,2] Span, ft. 10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	K_1 1/ft
3DR18 0.0474 24/4	3	620	590	565	540	515					0.636
	4	720	685	655	625	600	575	555	535	515	0.531
	5	825	785	750	715	685	660	635	610	590	0.455
	6	925	880	840	805	770	740	710	685	660	0.399
	7	1025	980	935	895	855	820	790	760	735	0.355
	8	1125	1075	1025	980	940	905	870	835	805	0.319
	9	1210	1160	1110	1065	1025	985	945	910	880	0.291
	10	1295	1240	1190	1145	1100	1060	1020	985	950	0.266
	11	1380	1320	1265	1220	1175	1130	1090	1055	1020	0.246
	12	1460	1400	1345	1290	1245	1200	1160	1120	1080	0.229
	13	1535	1475	1415	1365	1315	1270	1225	1185	1145	0.213
	I, in^4/ft	Nominal Shear Strength due to Panel Buckling, S_{nb}, plf									
	1.323	8782	7966	7258	6640	6099	5620	5196	4819	4481	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf}, plf[1,2] Span, ft. 11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	K_1 1/ft
3DR16 0.0598 24/4	3	710	680	650							0.714
	4	825	790	760	725	700	675	650	625	605	0.596
	5	945	900	865	830	800	770	740	715	690	0.512
	6	1060	1015	970	935	895	865	830	805	775	0.448
	7	1175	1125	1080	1035	995	960	925	890	860	0.399
	8	1295	1235	1185	1140	1095	1055	1015	980	950	0.359
	9	1400	1345	1290	1240	1195	1150	1110	1070	1035	0.326
	10	1500	1440	1385	1335	1285	1245	1200	1160	1120	0.299
	11	1595	1535	1480	1425	1375	1325	1285	1240	1205	0.276
	12	1695	1630	1570	1510	1460	1410	1365	1320	1280	0.257
	13	1785	1720	1655	1600	1545	1490	1445	1400	1355	0.240
	I, in^4/ft	Nominal Shear Strength due to Panel Buckling, S_{nb}, plf									
	1.672	10299	9423	8654	7975	7374	6838	6358	5927	5538	

[2] Design Strengths:

ASD Required strength (Service Applied Load) <= Min $\{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$

LRFD Required strength (Factored Applied Load) <= Min $\{\phi_{df}S_{nf}, \phi_{db}S_{nb}\}$

	ϕ_{db}	Ω_{db}
Buckling	0.80	2.00

F_u= 45 ksi
F_y= 33 ksi

Loading	ϕ_{df}	Ω_{df}
Seismic	0.65	2.50
Wind	0.70	2.35
Other	0.65	2.50

Support fastening: Simpson Strong-Tie XM Screw
Side-lap fastening: Buildex, Elco, Hilti, or Simpson Strong-Tie #10 screws
0.188" to 0.375" thick Support Steel

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf}, plf[1,2] Span, ft. 8	8.5	9	9.5	10	10.5	11	11.5	12	K_1 1/ft
3DR22 0.0295" 24/4	2	405	380	360							0.625
	3	485	455	430	410	390	370	350	335	325	0.502
	4	565	530	500	475	450	430	410	390	375	0.419
	5	645	605	570	540	515	490	470	445	430	0.359
	6	725	680	640	610	580	550	525	500	480	0.315
	7	790	750	710	675	640	610	585	555	535	0.280
	8	855	810	770	735	700	670	640	610	585	0.252
	9	920	875	830	790	755	725	695	665	640	0.229
	10	980	930	885	845	810	775	745	715	685	0.210
	11	1040	990	940	900	860	825	790	760	730	0.194
	12	1095	1040	995	950	910	875	840	805	775	0.180
	I, in^4/ft	Nominal Shear Strength due to Panel Buckling, S_{nb}, plf									
	0.808	6643	5884	5249	4711	4252	3856	3514	3215	2952	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf}, plf[1,2] Span, ft. 9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	K_1 1/ft
3DR20 0.0358 24/4	2	440									0.689
	3	525	495	470	450	430	410	390			0.553
	4	610	575	550	520	500	475	455	440	420	0.461
	5	695	660	625	595	570	545	520	500	480	0.396
	6	780	740	700	670	640	610	585	560	540	0.347
	7	865	820	780	740	710	675	650	620	600	0.308
	8	935	895	850	815	780	745	715	685	660	0.278
	9	1010	960	920	880	840	810	775	745	715	0.253
	10	1075	1030	980	940	900	865	835	805	775	0.232
	11	1145	1090	1045	1000	960	925	890	855	825	0.214
	12	1210	1155	1105	1060	1020	980	945	910	880	0.199
	I, in^4/ft	Nominal Shear Strength due to Panel Buckling, S_{nb}, plf									
	0.989	7060	6337	5719	5187	4726	4324	3971	3660	3384	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf}, plf[1,2] Span, ft. 10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	K_1 1/ft
3DR18 0.0474 24/4	3	625	595	570	545	520					0.636
	4	725	690	660	630	605	580	560	540	520	0.531
	5	830	790	755	720	690	660	635	615	590	0.455
	6	930	885	845	810	775	745	715	690	665	0.399
	7	1030	985	940	895	860	825	795	765	735	0.355
	8	1130	1080	1030	985	945	905	870	840	810	0.319
	9	1215	1165	1115	1070	1030	990	950	915	880	0.291
	10	1300	1245	1195	1150	1105	1065	1025	990	955	0.266
	11	1385	1325	1275	1225	1180	1135	1095	1060	1025	0.246
	12	1465	1405	1350	1300	1250	1205	1165	1125	1085	0.229
	13	1545	1480	1425	1370	1320	1275	1230	1190	1150	0.213
	I, in^4/ft	Nominal Shear Strength due to Panel Buckling, S_{nb}, plf									
	1.323	8782	7966	7258	6640	6099	5620	5196	4819	4481	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf}, plf[1,2] Span, ft. 11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	K_1 1/ft
3DR16 0.0598 24/4	3	710	680	650							0.714
	4	825	790	760	725	700	675	650	625	605	0.596
	5	945	900	865	830	800	770	740	715	690	0.512
	6	1060	1015	970	935	895	865	830	805	775	0.448
	7	1175	1125	1080	1035	995	960	925	890	860	0.399
	8	1295	1235	1185	1140	1095	1055	1015	980	950	0.359
	9	1400	1345	1290	1240	1195	1150	1110	1070	1035	0.326
	10	1500	1440	1385	1335	1285	1245	1200	1160	1120	0.299
	11	1595	1535	1480	1425	1375	1325	1285	1240	1205	0.276
	12	1695	1630	1570	1510	1460	1410	1365	1320	1280	0.257
	13	1785	1720	1655	1600	1545	1490	1445	1400	1355	0.240
	I, in^4/ft	Nominal Shear Strength due to Panel Buckling, S_{nb}, plf									
	1.672	10299	9423	8654	7975	7374	6838	6358	5927	5538	

[2] Design Strengths:

ASD Required strength (Service Applied Load) <= Min $\{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$

LRFD Required strength (Factored Applied Load) <= Min $\{\phi_{df}S_{nf}, \phi_{db}S_{nb}\}$

	ϕ_{db}	Ω_{db}
Buckling	0.80	2.00