DIAPHRAGM DESIGN MANUAL

THIRD EDITION

Appendix VIII Addendum August 2013

HILTI PIN X-HSN 24

Authored By

Dr. Larry Luttrell, P.E.

Revised and Adapted For

The ASD and LRFD methods
According to Table D5 of the 2007 Edition of the North American Specification for the Design of Cold-Formed Steel Structural Members

By

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USER INSTRUCTION

August 2013

Dear Specifier,

The SDI DDM03 is updated with this Addenda with Hilti X-HSN 24 fastener data.

The following steps can be followed:

- Replace pages 4-9 and 4-14 in Section IV of DDM03 with pages AVIII-5 and AVIII-6 of this Addenda
- Replace Tables on pages AIV-9, AIV-10 and AIV-13 of DDM03 with the ones on the corresponding pages AVIII-8, AVIII-9 and AVIII-10 in this Addenda;
- Replace Tables on page AV-4 of DDM03 with the ones on the corresponding page AVIII-13 in this Addenda;
- Replace diaphragm load tables on pages AV-49 to AV-52, AV-64, AV-92 to AV-94, and AV-135 to AV-138 of DDM03 with the corresponding diaphragm load tables from this Addenda (pages AVIII-14 to AVIII-25)

Thank you for updating your DDM03,

Steel Deck Institute

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

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

Buildex BX-12:

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

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

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

and

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

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

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

Hilti ENP2 and ENPH2

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

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

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

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

and

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

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

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

Hilti ENP2K, X-EDN19, X-EDNK22 or X-HSN 24

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

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

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

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

and

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

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

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 / X-HSN 24

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 ressistance 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 $\Omega_u = 3.0$.

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

SUPPORT FASTENER NOMINAL SHEAR STRENGTH							
	Q_f, lbf / Deck Thickness No.						
TYPE OF SUPPORT FASTENER	**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, ElcoTextron, Hilti or Simpson Strong-Tie #12 or #14 Srews	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. X-EDNK22 or X-HSN 24 (0.125" to 0.375" support steel)	763	914	1213	1489	1795	2348	2924

SUPPORT FASTENER FLEXIBILITY							
	S_f, in./Kip / Deck Thickness No.						
TYPE OF SUPPORT FASTENER	**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, ElcoTextron, Hilti or Simpson Strong-Tie #12 or #14 Srews	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. X-EDNK22 or X-HSN 24 (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							
	Q_S, lbf / Deck Thickness No.						
TYPE OF SIDE-LAP FASTENER	**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							
	Ss, in/Kip / Deck Thickness No.						
TYPE OF SIDE-LAP FASTENER	**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							
	Q_f, kN / Deck Thickness No.						
TYPE OF SUPPORT FASTENER	**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, ElcoTextron, Hilti or Simpson Strong-Tie #12 or #14 Srews	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. X-EDNK22 or X-HSN 24 (3 mm to 10 mm support steel)	3.41	4.03	5.34	6.63	7.91	10.42	12.86

SUPPORT FASTENER FLEXIBILITY							
	S_f, mm/kN / Deck Thickness No.						
TYPE OF SUPPORT FASTENER	**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, ElcoTextron, Hilti or Simpson Strong-Tie #12 or #14 Srews	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. X-EDNK22 or X-HSN 24 (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							
	Q_S, kN / Deck Thickness No.						
TYPE OF SIDE-LAP FASTENER	**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							
	Ss, mm/kN / Deck Thickness No.						
TYPE OF SIDE-LAP FASTENER	**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, lbf[1]		
	Hilti Fastener Type / Fastener Washer Diameter, in.		
	ENP2 / ENPH2 / ENP2K	X-EDN19 / X-EDNK22 / X-HSN 24	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-HSN 24	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

Table X & X-M - FASTENER PATTERN FACTORS

Deck Profile	Fastener Pattern	β Welds		β 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

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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 $f'_c = 125\ psi$.

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 X-HSN 24
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											
	#10 SCREWS	36/9 36/7 36/5 36/4 36/3		AV-13 thru AV-16	AVII-10 thru AVII-13	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	AVIII-14 thru AVIII-17
		30/6 30/4 30/3											
3'' ROOF DECK	WELDS	24/4	AV-53	AV-54									
	#10 SCREWS	24/4		AV-55	AVII-14	AV-57	AV-58	AV-59	AV-60	AV-61	AV-62	AV-63	AVIII-18

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 X-HSN 24
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	AVII-15 AVII-16 AVII-17	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	AVIII-19 AVIII-20 AVIII-21
	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 X-HSN 24
1 1/2'' x 6'' 2'' x 12'' 3'' x 12''	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	AVII-18 thru AVII-21	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	AVII-22 thru AVII-25

1.5 (WR, IR, NR)
t = design thickness = 0.0295"
SUPPORT FASTENING: Hilti ENP2K, X-EDN19, X-EDNK22 or X-HSN 24 (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
	6	2250	2050	1870	1715	1580	1465 *	1360 *	1270 *	1190 *	0.156
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
	6	1820	1640	1490	1360	1250	1155	1070	1000	935 *	0.184
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
	6	1480	1375	1275	1185	1105	1035	970	910	860	0.195
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
	6	1195	1125	1055	995	935	880	830	785	745	0.208
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
	6	1765	1590	1440	1310	1205	1110	1030	960	895 *	0.228
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" **ϕ (EQ): 0.65 Ω (EQ): 2.50**
SUPPORT FASTENING: Hilti ENP2K, X-EDN19, X-EDNK22 or X-HSN 24 (0.125" to 0.375" support steel) **ϕ (WIND): 0.70 Ω (WIND): 2.35**
SIDE-LAP FASTENING: #10 screws **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" **ϕ (EQ): 0.65 Ω (EQ): 2.50**
SUPPORT FASTENING: Hilti ENP2K, X-EDN19, X-EDNK22 or X-HSN 24 (0.125" to 0.375" support steel) **ϕ (WIND): 0.70 Ω (WIND): 2.35**
SIDE-LAP FASTENING: #10 screws **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" **ϕ (EQ): 0.65 Ω (EQ): 2.50**
SUPPORT FASTENING: Hilti ENP2K, X-EDN19, X-EDNK22 or X-HSN 24 (0.125" to 0.375" support steel) **ϕ (WIND): 0.70 Ω (WIND): 2.35**
SIDE-LAP FASTENING: #10 screws **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: Hilti ENP2K, X-EDN19, X-EDNK22 or X-HSN 24 (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
	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
24/4	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
	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
24/4	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
	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
24/4	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
	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
24/4	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: Hilti ENP2K, X-EDN19, X-EDNK22 or X-HSN 24 (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, SPAN, FT 1.0	1.5	2.0	2.5	3.0	3.5	4.0	K1
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
		4	1565	1355	1165	1010 *	885 *	780 *	700 *	0.161
	35/7	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
		3	1355	1180	1020	885 *	775 *	690 *	615 *	0.192
		4	1390	1235	1085	955 *	845 *	755 *	675 *	0.166
	35/5	0	825	680	565	480	415	360	320 *	0.491
		1	885	760	655	565	490	435 *	390 *	0.351
		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
	30/7	0	1200	915	725	600	505	440 *	385 *	0.450
		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
	30/5	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
		4	1100	990	880	785	700 *	625 *	565 *	0.225
	30/4	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
		3	840	765	690	620	555	500 *	455 *	0.281
		4	855	795	730	665	605 *	550 *	505 *	0.235
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	6035	5660	5470	5355	5280	5230	5185	0.675
		1	6355	5870	5630	5485	5390	5320	5265	0.460
		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
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4370	3995	3805	3695	3620	3565	3525	0.675
		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	30/4	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
		4	2860	2055	1655	1410	1250	1135	1050	0.235
TYPE II INSUL. FILL	30/4	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
		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, X-EDNK22 or X-HSN 24 (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 SPAN, FT 1.5	2.0	2.5	3.0	3.5	4.0	4.5	K1
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: Hilti ENP2K, X-EDN19, X-EDNK22 or X-HSN 24 (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 SPAN, FT 2.0	2.5	3.0	3.5	4.0	4.5	5.0	K1
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
		4	1860	1610	1410 *	1245 *	1115 *	1005 *	915 *	0.204
	35/7	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
		3	1625	1410	1240 *	1100 *	985 *	890 *	810 *	0.243
		4	1730	1520	1345 *	1200 *	1080 *	980 *	895 *	0.210
	35/5	0	900	760	655	575	510	460	415 *	0.622
		1	1040	895	780	690	615	555 *	505 *	0.445
		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
	30/7	0	1155	950	805	700	615	545 *	490 *	0.570
		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
	30/5	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
		4	1405	1250	1115	1000 *	900 *	820 *	750 *	0.285
	30/4	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
		3	1095	985	885	800	725 *	660 *	605 *	0.355
		4	1160	1060	965	880 *	805 *	740 *	680 *	0.297
2 1/2" NW CONC. (ABOVE DECK)	30/4	0	5805	5625	5505	5420	5355	5305	5265	0.855
		1	6060	5830	5675	5565	5480	5420	5365	0.582
		2	6315	6035	5845	5710	5610	5530	5470	0.441
		3	6575	6240	6015	5860	5740	5645	5570	0.355
		4	6830	6445	6190	6005	5865	5760	5675	0.297
2 1/2" LW CONC. (ABOVE DECK)	30/4	0	4140	3960	3840	3755	3690	3640	3600	0.855
		1	4395	4165	4010	3900	3820	3755	3705	0.582
		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
TYPE I INSUL. FILL	30/4	0	1345	1165	1045	960	895	845	805	0.855
		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
TYPE II INSUL. FILL	30/4	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: Hilti ENP2K, X-EDN19, X-EDNK22 or X-HSN 24 (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 SPAN, FT 4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	K1
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: Hilti ENP2K, X-EDN19, X-EDNK22 or X-HSN 24 (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 SPAN, FT 4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	K1
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

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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	0.212	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 ENP2K, X-EDN19, X-EDNK22 or X-HSN 24 (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 SPAN, FT 5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	K1
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

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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 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 ENP2K, X-EDN19, X-EDNK22 or X-HSN 24 (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 — SPAN, FT										
			6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	K1
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

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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]