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ER-5468*

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Legacy report on the 1997 *Uniform Building Code*

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 40 00—Roofing and Siding Panels

FABRAL STEEL ROOF AND WALL PANELS

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1.0 SUBJECT

Fabral Steel Roof and Wall Panels.

2.0 DESCRIPTION

2.1 General:

The Fabral steel roof and wall panels are steel panels available in three profiles: Hefti-Rib, Mighti-Rib PBR, and V-Beam. The Hefti-Rib and V-Beam panels are fabricated in No. 26, 24, 22, 20 and 18 gage [0.0190, 0.0236, 0.0296, 0.0356 and 0.0466 inch (0.48, 0.60, 0.75, 0.90 and 1.18 mm) base-metal thicknesses, respectively] steel thicknesses. The Mighti-Rib PBR panel is fabricated in No. 26, 24 and 22 gage [0.0190, 0.0236 and 0.0296 inch (0.48, 0.60 and 0.75 mm) base-metal thicknesses, respectively] steel thicknesses. The No. 26 gage thick [0.0190 inch (0.48 mm) base-metal thickness steel panels are fabricated from cold-formed steel conforming with either ASTM A 653 SS, Grade 80, with a G90 galvanized coating, or cold-formed steel conforming to ASTM A 792 SS, Grade 80, with an AZ50 aluminum-zinc-alloy coating (Galvalume). The No. 24, 22, 20 and 18 gage thick [0.0236, 0.0296, 0.0356, and 0.0466 inch (0.60, 0.75, 0.90, and 1.18 mm) base-metal thicknesses, respectively] steel panels are fabricated from cold-formed steel conforming with ASTM A 653 SS, Grade 40, with a G90 galvanized coating, or cold-formed steel conforming with ASTM A 792 SS, Grade 40, with an AZ50 aluminum-zinc-alloy coating (Galvalume). Panel profiles and dimensions are shown in Figure 1.

2.2 Design:

Panel section and strength properties are shown in Table 1. Allowable reactions based on web crippling are shown in Table 2. Panel allowable gravity and wind loads are shown in Table 3.

Where the Hefti-Rib, Mighti-Rib PBR, and V-Beam panels are used as horizontal diaphragms, the following apply:

1. A one-third increase described in Section 1612.3.3 of the code is not permitted for allowable shear values shown in Table 4.
2. Diaphragm design must comply with allowable shear values shown in Table 4.
3. Diaphragm deflection must not exceed the permitted relative deflection for walls between the diaphragm level and the floor below. Refer to Table 5 for deflection formulae, and Table 6 for diaphragm flexibility and deflection limitations.

2.3 Installation:

The Hefti-Rib, Mighti-Rib PBR, and V-Beam panels are attached to intermediate steel supporting members spaced at a maximum of 10 feet (3048 mm) on center with No. 12-14, 1-inch-long (25.4 mm), self-drilling, self-tapping, corrosion-resistant metal screws. The panels must be attached to structural supports as noted in Table 4 and as shown in Figure 2. The steel supporting members must have a No. 16 gage [0.60 inch (1.5 mm)] minimum thickness and a 50 ksi (380 MPa) minimum yield strength.

Fasteners are not required at the edge of diaphragm perimeter members that are parallel to the panel span. Side joint stitching must be fastened at each supporting structure 18 inches (457 mm) on center with No. 10-16, 1-inch-long, selfdrilling, corrosion-resistant metal screws. Panels must overlap 2 inches (51 mm) at panel ends.

2.4 Identification:

Each panel bears a label with the manufacturer's name (Fabral, Inc.) and address, the type of panel, and the evaluation report number (ICBO ES ER-5468).

3.0 EVIDENCE SUBMITTED

Data in accordance with the Acceptance Criteria for Steel Decks (AC43), dated July 1996.

4.0 FINDINGS

That the Fabral, Inc., steel roof and wall panels described in this report comply with the 1997 *Uniform Building Code*™, subject to the following conditions:

4.1 Panels are manufactured and installed in accordance with this report and the manufacturer's instructions.

4.2 The allowable loads and deflections are as set forth in this report. Calculations demonstrating that the applied loads comply with this report

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must be submitted to the building official for approval.

4.3 Panels are fabricated at the Fabral, Inc., manufacturing facilities in Lancaster, Pennsylvania; Cedar City, Utah; and Jackson, Georgia.

This report is subject to renewal in two years.

TABLE 1—PANEL SECTION PROPERTIES

Hefti-Rib panel section properties table

nominal panel thk.	design thickness (in.)*	yield strength (ksi)	moment of inertia ($in.^4$)		section modulus ($in.^3$)		design stress (ksi)	modulus of elasticity (ksi)
			positive	negative	positive	negative		
26 ga.	0.0183	80 ksi	0.0620	0.0600	0.0713	0.0624	36	29500
24 ga.	0.0230	40 ksi	0.0927	0.0947	0.1174	0.1100	24	29500
22 ga.	0.0295	40 ksi	0.1300	0.1300	0.1676	0.1544	24	29500
20 ga.	0.0358	40 ksi	0.1767	0.1733	0.2293	0.2200	24	29500
18 ga.	0.0474	40 ksi	0.2467	0.2433	0.3103	0.3000	24	29500

* This thickness is the uncoated steel thickness (i.e., minus paint and protective coatings).

Mighti-Rib PBR panel section properties table

nominal panel thk.	design thickness (in.)*	yield strength (ksi)	moment of inertia ($in.^4$)		section modulus ($in.^3$)		design stress (ksi)	modulus of elasticity (ksi)
			positive	negative	positive	negative		
26 ga.	0.0183	80	0.0330	0.0413	0.0341	0.0551	36	29500
24 ga.	0.0230	40	0.0473	0.0553	0.0500	0.0703	24	29500
22 ga.	0.0295	40	0.0700	0.0733	0.0765	0.0911	24	29500

* This thickness is the uncoated steel thickness (i.e., minus paint and protective coatings).

V-Beam panel section properties table

nominal panel thk.	design thickness (in.)*	yield strength (ksi)	moment of inertia ($in.^4$)		section modulus ($in.^3$)		design stress (ksi)	modulus of elasticity (ksi)
			positive	negative	positive	negative		
26 ga.	0.0183	80 ksi	0.0952	0.0922	0.0987	0.0868	36	29500
24 ga.	0.0230	40 ksi	0.1451	0.1470	0.1646	0.1589	24	29500
22 ga.	0.0295	40 ksi	0.1912	0.1950	0.2134	0.2141	24	29500
20 ga.	0.0358	40 ksi	0.2362	0.2362	0.2581	0.2581	24	29500
18 ga.	0.0474	40 ksi	0.3075	0.3075	0.3375	0.3375	24	29500

* This thickness is the uncoated steel thickness (i.e., minus paint and protective coatings).

For **SI:** 1 in. = 25.4 mm; 1 ksi = 6.89 MPa.
Section properties were calculated in accordance with 1996 edition of the AISI Cold-Formed Steel Design Manual.

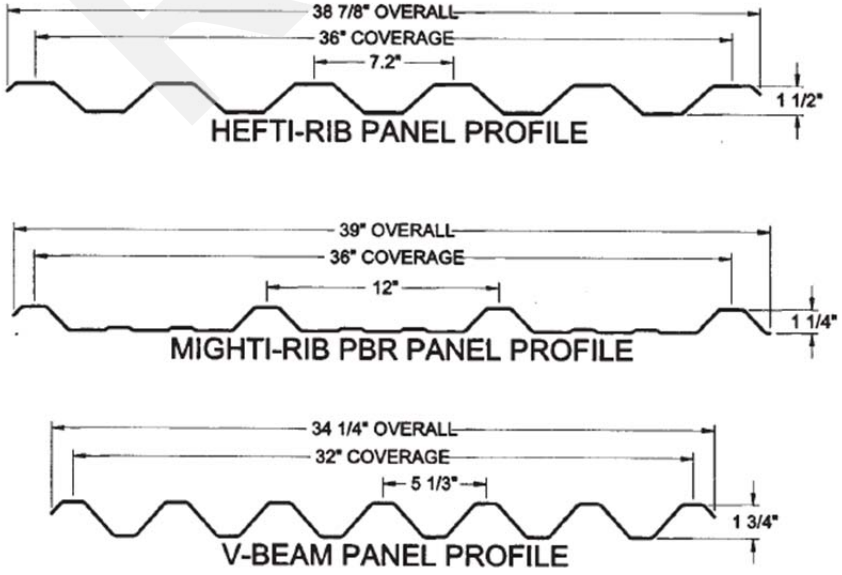

FIGURE 1—PANEL PROFILES

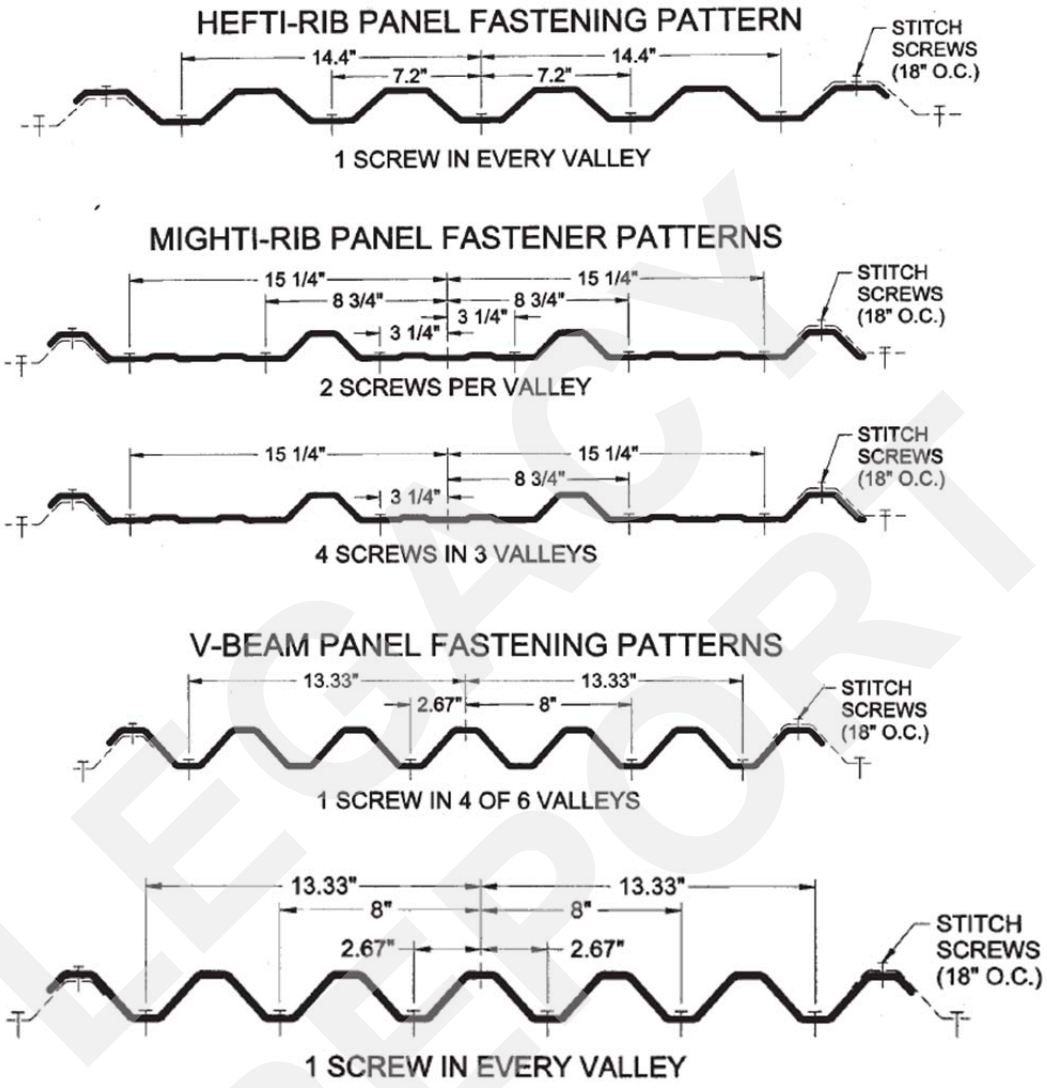

FIGURE 2—FASTENING PATTERNS

TABLE 2—ALLOWABLE REACTIONS BASED ON WEB CRIPPLING

panel name	panel thickness	minimum bearing length	allowable load per foot of panel coverage at reaction (kips/ft.)	
			end	interior
Hefti-Rib	26 ga.	2"	0.115	0.400
	24 ga.		0.147	0.469
	22 ga.		0.230	0.800
	20 ga.		0.389	1.196
	18 ga.		0.765	2.115
Mighti-Rib PBR	26 ga.	2"	0.085	0.298
	24 ga.		0.108	0.345
	22 ga.		0.168	0.585
V-Beam	26 ga.	2"	0.157	0.547
	24 ga.		0.202	0.643
	22 ga.		0.316	1.101
	20 ga.		0.537	1.648
	18 ga.		1.056	2.919

For SI: 1 ft. = 304.8 mm; 1 in. = 25.4 mm; 1 kip = 4.448 kN

Tabulated values are in accordance with web crippling requirements of the Specification of Design of Cold-formed Steel Structural Members, 1986 (with December 1989 Addendum), published by AISI, and referenced in Division VII, Chapter 22, of the Uniform Building Code for locations of a concentrated load, or for a reaction acting either on the top or bottom flange when the clear distance between the bearing edges of the concentrated load and adjacent, opposite concentrated loads or reactions is greater than 1.5 times the deck depth.

TABLE 3—GRAVITY AND WIND LOADS

Hefti-Rib panel gravity and wind uplift load table (loads are in psf)

panel thk. and yield strength	no. of spans	panel span													
		4'		5'		6'		7'		8'		9'		10'	
		gravity	wind	gravity	wind	gravity	wind	gravity	wind	gravity	wind	gravity	wind	gravity	wind
26 ga., 80 ksi	1	85	82	43	42	25	24	16	15	11	10	7	7	5	5
	2	94	142	60	91	42	58	31	37	23	25	18	17	13	13
	3	117	155	75	79	47	46	30	29	20	19	14	14	10	10
24 ga., 40 ksi	1	117	129	65	66	37	38	24	24	16	16	11	11	8	8
	2	110	156	70	100	49	69	36	51	28	39	22	27	18	20
	3	137	195	88	125	61	72	45	46	30	31	21	21	15	16
22 ga., 40 ksi	1	168	177	91	91	53	53	33	33	22	22	16	16	11	11
	2	154	223	99	143	69	99	50	73	39	53	30	45	25	27
	3	193	279	124	172	86	99	63	63	42	42	29	35	21	21
20 ga., 40 ksi	1	229	237	123	121	71	70	45	44	30	30	21	21	15	15
	2	220	305	141	195	98	136	72	100	55	71	43	50	35	36
	3	193	381	176	229	122	133	85	84	57	56	40	39	29	29
18 ga., 40 ksi	1	310	332	172	170	100	98	63	62	42	42	30	29	22	21
	2	300	413	192	264	133	183	98	135	75	100	59	70	48	51
	3	375	516	240	322	167	186	119	117	80	79	56	55	41	40

For SI: 1 ft. = 304.8 mm; 1 ksi = 6.89 MPa; 1 psf = 47.9 Pa.

1. Lower of allowable stress or L/180 deflection is tabulated.
2. Wind uplift loads have been increased by ⅓.

TABLE 3—GRAVITY AND WIND LOADS—(Continued)

Mighti-Rib PBR panel gravity and wind uplift load table (loads are in psf)

panel thk. and yield strength	no. of spans	panel span													
		4'		5'		6'		7'		8'		9'		10'	
		gravity	wind	gravity	wind	gravity	wind	gravity	wind	gravity	wind	gravity	wind	gravity	wind
26 ga., 80 ksi	1	45	56	23	29	13	17	–	–	–	–	–	–	–	–
	2	83	68	53	44	32	30	20	22	14	17	–	12	–	–
	3	85	85	44	54	25	32	16	20	–	13	–	–	–	–
24 ga., 40 ksi	1	50	75	32	39	19	22	12	14	–	–	–	–	–	–
	2	70	67	45	43	31	30	23	22	18	17	14	13	–	–
	3	88	83	56	53	36	37	23	27	15	18	–	13	–	–
22 ga., 40 ksi	1	77	100	49	51	28	30	18	19	12	13	–	–	–	–
	2	91	102	58	65	40	45	30	33	23	25	18	20	15	15
	3	114	127	73	81	51	56	34	35	23	24	16	17	12	12

For SI: 1 ft. = 304.8 mm; 1 ksi = 6.89 MPa; 1 psf = 47.9 Pa.
1. Lower of allowable stress or L/180 deflection is tabulated.
2. Wind uplift loads have been increased by ⅓.

V-Beam panel gravity and wind uplift load table (loads are in psf)

panel thk. and yield strength	no. of spans	panel span													
		4'		5'		6'		7'		8'		9'		10'	
		gravity	wind	gravity	wind	gravity	wind	gravity	wind	gravity	wind	gravity	wind	gravity	wind
26 ga., 80 ksi	1	130	126	67	64	38	37	24	23	16	16	11	11	8	8
	2	130	197	83	126	58	88	43	57	33	38	26	27	20	19
	3	163	238	104	122	72	71	46	44	31	30	22	21	16	15
24 ga., 40 ksi	1	165	201	101	103	59	59	37	37	25	25	17	18	13	13
	2	159	219	102	140	71	97	52	71	40	55	31	42	25	31
	3	199	274	127	175	88	113	65	71	47	47	33	33	24	24
22 ga., 40 ksi	1	213	266	134	136	77	79	49	50	33	33	23	23	17	17
	2	213	284	137	182	95	126	70	93	53	71	42	56	34	41
	3	267	355	171	227	119	149	87	94	62	63	43	44	32	32
20 ga., 40 ksi	1	258	322	165	165	96	96	60	60	40	40	28	28	21	21
	2	258	343	165	220	115	153	84	112	65	86	51	68	41	50
	3	323	429	206	275	143	181	105	114	76	76	54	54	39	39
18 ga., 40 ksi	1	338	420	215	215	124	124	78	78	52	52	52	37	27	27
	2	338	449	216	287	150	200	110	147	84	112	84	89	54	65
	3	422	561	270	359	187	235	138	148	99	99	99	111	51	51

For SI: 1 ft. = 304.8 mm; 1 ksi = 6.89 MPa; 1 psf = 47.9 Pa.
1. Lower of allowable stress or L/180 deflection is tabulated.
2. Wind loads have been increased by ⅓.

TABLE 4—DIAPHRAGM DESIGN VALUES

HEFTI-RIB® PANEL ALLOWABLE DIAPHRAGM SHEAR STRENGTH AND STIFFNESS (G') VALUES
1 SCREW PER PANEL VALLEY FOR ALL SUPPORTS

span (ft.)	no. of spans	26 ga. (80 ksi)		24 ga. (40 ksi)		22 ga. (40 ksi)		20 ga. (40 ksi)		18 ga. (40 ksi)	
		strength (kips/ft.)	stiffness (kips/in.)	strength (kips/ft.)	stiffness (kips/in.)	strength (kips/ft.)	stiffness (kips/in.)	strength (kips/ft.)	stiffness (kips/in.)	strength (kips/ft.)	stiffness (kips/in.)
4	1	0.2401	40.017	0.2208	58.065	0.2832	83.821	0.3432	106.696	0.4560	145.843
	2	0.1980	53.289	0.1656	71.535	0.2124	96.038	0.2574	115.800	0.3420	149.057
	3	0.1760	61.436	0.1472	78.844	0.1888	101.981	0.2288	119.878	0.3040	150.360
	4	0.1650	66.466	0.1380	83.010	0.1770	105.134	0.2145	121.892	0.2850	150.838
	5	0.1584	69.743	0.1325	85.582	0.1699	106.986	0.2059	123.005	0.2736	151.004
	6	0.1540	71.860	0.1288	87.173	0.1652	108.075	0.2002	123.603	0.2660	150.987
	7	0.1590	73.340	0.1262	88.251	0.1618	108.785	0.1961	123.966	0.2606	150.919
5	1	0.2049	43.865	0.1766	61.747	0.2266	86.561	0.2746	107.599	0.3648	143.129
	2	0.1584	55.691	0.1325	72.846	0.1699	95.753	0.2059	113.564	0.2736	143.732
	3	0.1408	62.445	0.1178	78.519	0.1510	100.051	0.1830	116.193	0.2432	144.044
	4	0.1320	66.431	0.1104	81.638	0.1416	102.267	0.1716	117.450	0.2280	144.063
	5	0.1267	68.953	0.1060	83.519	0.1359	103.542	0.1647	118.122	0.2189	143.983
	6	0.1232	70.548	0.1030	84.661	0.1322	104.274	0.1602	118.460	0.2128	143.838
	7	0.1207	71.648	0.1009	85.424	0.1295	104.744	0.1569	118.653	0.2085	143.693
6	1	0.1760	46.689	0.1472	64.158	0.1888	87.997	0.2288	107.500	0.3040	140.314
	2	0.1320	57.196	0.1104	73.412	0.1416	95.102	0.1716	111.504	0.2280	139.538
	3	0.1173	62.896	0.0981	77.964	0.1259	98.359	0.1525	113.285	0.2027	139.355
	4	0.1100	66.157	0.0920	80.407	0.1180	100.008	0.1430	114.116	0.1900	139.156
	5	0.1056	68.180	0.0883	81.859	0.1133	100.944	0.1373	114.545	0.1824	138.966
	6	0.1027	69.443	0.0859	82.727	0.1101	101.471	0.1335	114.745	0.1773	138.769
	7	0.1006	70.304	0.0841	83.302	0.1079	101.803	0.1307	114.848	0.1737	138.596
7	1	0.1509	48.814	0.1262	65.790	0.1618	88.740	0.1961	106.991	0.2606	137.731
	2	0.1131	58.184	0.0946	73.619	0.1214	94.369	0.1471	109.717	.01954	136.201
	3	0.1006	63.079	0.0841	77.373	0.1079	96.930	0.1307	110.969	0.1737	135.757
	4	0.0943	65.817	0.0789	79.354	0.1011	98.211	0.1226	111.539	0.1629	135.450
	5	0.0905	67.493	0.0757	80.520	0.0970	98.930	0.1177	111.824	0.1563	135.210
	6	0.0880	68.528	0.0736	81.209	0.0944	99.328	0.1144	111.942	0.1520	134.993
	7	0.0862	69.229	0.0721	81.663	0.0925	99.575	0.1121	111.995	0.1489	134.812
8	1	0.1320	50.452	0.1104	66.928	0.1416	89.100	0.1716	106.327	0.2280	135.447
	2	0.0990	58.859	0.0828	73.645	0.1062	93.656	0.1287	108.191	0.1710	133.502
	3	0.0880	63.126	0.0736	76.811	0.0944	95.729	0.1144	109.094	0.1520	132.918
	4	0.0825	65.474	0.0690	78.463	0.0885	96.757	0.1073	109.496	0.1425	132.557
	5	0.0792	66.896	0.0662	79.427	0.0850	97.329	0.1030	109.689	0.1368	132.295
	6	0.0770	67.768	0.0644	79.992	0.0826	97.641	0.1001	109.757	0.1330	132.073
9	1	0.1173	51.742	0.0981	67.741	0.1259	89.240	0.1525	105.624	0.2027	133.452
	2	0.0880	59.333	0.0736	73.579	0.0944	92.997	0.1144	106.888	0.1520	131.281
	3	0.0782	63.103	0.0654	76.299	0.0839	94.714	0.1017	107.550	0.1351	130.623
	4	0.0733	65.151	0.0613	77.706	0.0787	95.561	0.0953	107.839	0.1267	130.238
	5	0.0704	66.382	0.0589	78.522	0.0755	96.029	0.0915	107.970	0.1216	129.968
10	1	0.1056	52.775	0.0883	68.335	0.1133	89.253	0.1373	104.932	0.1824	131.709
	2	0.0792	59.675	0.0662	73.466	0.0850	92.399	0.1030	105.768	0.1368	129.427
	3	0.0704	63.044	0.0589	75.839	0.0755	93.850	0.0915	106.260	0.1216	128.732
	4	0.0660	64.855	0.0552	77.059	0.0708	94.561	0.0858	106.469	0.1140	128.338
	5	0.0634	65.937	0.0530	77.762	0.0680	94.952	0.0824	106.558	0.1094	128.069

For SI: 1 in. = 25.4 mm; 1 ft. = 304.8 mm; 1 lb./ft. = 14.59 N/m; 1 kip/in. = 175 kN/m; 1 ksi = 6.89 MPa

NOTES:
1. Stitch screws are #10 x 1", 18" o.c.
2. All sheet-to-support screws are #12 x 1".
3. Above values were determined in accordance with Steel Deck Institute Diaphragm Design Manual with a 2.5 safety factor.
4. For wind loads only, the above design strength values can be multiplied by 1.064 for a 2.35 safety factor.
5. No edge attachments were figured at the extreme edges of the diaphragm.

TABLE 4—DIAPHRAGM DESIGN VALUES—(Continued)

MIGHTI-RIB® PBR PANEL ALLOWABLE DIAPHRAGM SHEAR STRENGTH AND STIFFNESS (G') VALUES
2 SCREWS PER PANEL VALLEY FOR ALL SUPPORTS

span (ft.)	no. of spans	26 ga. (80 ksi) strength (kips/ft.)	26 ga. (80 ksi) stiffness (kips/in.)	24 ga. (40 ksi) strength (kips/ft.)	24 ga. (40 ksi) stiffness (kips/in.)	22 ga. (40 ksi) strength (kips/ft.)	22 ga. (40 ksi) stiffness (kips/in.)
4	1	0.2880	36.279	0.2786	54.406	0.3753	81.265
	2	0.2498	51.104	0.2089	70.743	0.2680	97.539
	3	0.2220	61.057	0.1857	80.349	0.2382	105.966
	4	0.2082	67.579	0.1741	86.102	0.2233	110.615
	5	0.1998	71.997	0.1671	89.769	0.2144	113.418
	6	0.1943	74.934	0.1625	92.093	0.2084	115.109
	7	0.1903	77.028	0.1592	93.694	0.2042	116.232
5	1	0.2446	40.551	0.2228	58.997	0.2858	85.380
	2	0.1998	54.284	0.1671	72.999	0.2144	98.130
	3	0.1776	62.785	0.1486	80.645	0.1905	104.360
	4	0.1665	68.061	0.1393	85.019	0.1786	107.672
	5	0.1599	71.508	0.1337	87.726	0.1715	109.620
	6	0.1554	73.741	0.1300	89.402	0.1667	110.765
	7	0.1523	75.304	0.1273	90.539	0.1633	111.513
6	1	0.2156	43.823	0.1857	62.178	0.2382	87.803
	2	0.1665	56.378	0.1393	74.176	0.1786	97.940
	3	0.1480	63.692	0.1238	80.404	0.1588	102.723
	4	0.1388	68.060	0.1161	83.857	0.1489	105.205
	5	0.1332	70.845	0.1114	85.952	0.1429	106.639
	6	0.1295	72.616	0.1083	87.228	0.1389	107.466
	7	0.1269	73.841	0.1061	88.084	0.1361	107.498
7	1	0.1903	46.372	0.1592	64.436	0.2042	89.248
	2	0.1427	57.808	0.1194	74.784	0.1531	97.445
	3	0.1269	64.170	0.1061	79.966	0.1361	101.235
	4	0.1189	67.864	0.0995	82.777	0.1276	103.168
	5	0.1142	70.177	0.0955	84.459	0.1225	104.271
	6	0.1110	71.629	0.0929	85.470	0.1191	104.896
	7	0.1088	72.624	0.0910	86.143	0.1167	105.294
8	1	0.1665	48.391	0.1393	66.074	0.1786	90.109
	2	0.1249	58.816	0.1045	75.077	0.1340	96.846
	3	0.1110	64.412	0.0929	79.471	0.1191	99.927
	4	0.1041	67.592	0.0870	81.816	0.1116	101.479
	5	0.0999	69.557	0.0836	83.205	0.1072	102.357
	6	0.0971	70.779	0.0812	84.032	0.1042	102.846
9	1	0.1480	50.014	0.1238	67.286	0.1588	90.610
	2	0.1110	59.546	0.0929	75.190	0.1191	96.229
	3	0.0987	64.520	0.0825	78.977	0.1059	98.788
	4	0.0925	67.300	0.0774	80.973	0.0992	100.066
	5	0.0888	69.000	0.0743	82.146	0.0953	100.782
10	1	0.1332	51.338	0.1114	68.198	0.1429	90.884
	2	0.0999	60.087	0.0836	75.199	0.1072	95.634
	3	0.0888	64.549	0.0743	78.507	0.0953	97.797
	4	0.0833	67.010	0.0696	80.236	0.0893	98.870
	5	0.0799	68.503	0.0669	81.244	0.0857	99.467

For SI: 1 in. = 25.4 mm; 1 ft. = 304.8 mm; 1 lb./ft. = 14.59 N/m; 1 kip/in. = 175 kN/m; 1 ksi = 6.89 MPa

NOTES:

1. Stitch screws are #10 x 1", 18" o.c.
2. All sheet-to-support screws are #12 x 1".
3. Above values were determined in accordance with Steel Deck Institute Diaphragm Design Manual with a 2.5 safety factor.
4. For wind loads only, the above design strength values can be multiplied by 1.064 for a 2.35 safety factor.
5. No edge attachments were figured at the extreme edges of the diaphragm.

TABLE 4—DIAPHRAGM DESIGN VALUES—(Continued)

MIGHTI-RIB® PBR PANEL ALLOWABLE DIAPHRAGM SHEAR STRENGTH AND STIFFNESS (G') VALUES
2 SCREWS PER PANEL VALLEY FOR END SUPPORTS AND 4 SCREWS IN 3 VALLEYS FOR INTERMEDIATE SUPPORTS

span (ft.)	no. of spans	26 ga. (80 ksi) strength (kips/ft.)	26 ga. (80 ksi) stiffness (kips/in.)	24 ga. (40 ksi) strength (kips/ft.)	24 ga. (40 ksi) stiffness (kips/in.)	22 ga. (40 ksi) strength (kips/ft.)	22 ga. (40 ksi) stiffness (kips/in.)
4	1	0.2880	36.279	0.2786	54.406	0.3537	81.265
	2	0.2315	50.563	0.1936	69.803	0.2483	96.025
	3	0.1976	59.897	0.1653	78.575	0.2120	103.288
	4	0.1807	65.878	0.1511	83.597	0.1938	107.129
	5	0.1705	69.860	0.1426	86.754	0.1829	109.362
	6	0.1637	72.462	0.1369	88.703	0.1756	110.648
	7	0.1589	74.292	0.1329	90.019	0.1704	111.470
5	1	0.2446	40.551	0.2228	58.997	0.2858	85.380
	2	0.1852	53.686	0.1549	72.015	0.1986	96.631
	3	0.1581	61.599	0.1322	78.866	0.1696	101.854
	4	0.1445	66.407	0.1209	82.672	0.1550	104.508
	5	0.1364	64.496	0.1141	87.971	0.1463	106.007
	6	0.1310	71.463	0.1095	86.355	0.1405	106.839
	7	0.1271	72.821	0.1063	87.273	0.1364	107.356
6	1	0.2156	43.823	0.1857	62.178	0.2382	87.803
	2	0.1543	55.754	0.1291	73.193	0.1655	96.499
	3	0.1317	62.525	0.1102	78.711	0.1413	100.406
	4	0.1204	66.488	0.1007	81.683	0.1292	102.338
	5	0.1137	68.975	0.0951	83.444	0.1219	103.406
	6	0.1092	70.529	0.0913	84.484	0.1171	103.979
	7	0.1059	71.590	0.0886	85.164	0.1136	104.375
7	1	0.1903	46.372	0.1592	64.436	0.2042	89.248
	2	0.1323	57.178	0.1106	73.824	0.1419	96.077
	3	0.1129	63.043	0.0944	78.371	0.1211	99.095
	4	0.1032	66.384	0.0863	80.769	0.1107	100.560
	5	0.0974	68.444	0.0815	82.169	0.1045	101.355
	6	0.0936	69.715	0.0782	82.984	0.1004	101.768
	7	0.0908	70.575	0.0759	83.512	0.0974	102.011
8	1	0.1665	48.391	0.1393	66.074	0.1786	90.109
	2	0.1157	58.192	0.0968	74.149	0.1241	95.554
	3	0.0988	63.334	0.0826	77.973	0.1060	97.948
	4	0.0903	66.203	0.0755	79.958	0.0969	99.093
	5	0.0853	67.950	0.0713	81.104	0.0915	99.706
	6	0.0819	69.018	0.0685	81.764	0.0878	100.041
9	1	0.1480	50.014	0.1238	67.286	0.1588	90.610
	2	0.1029	58.935	0.0860	74.300	0.1104	95.011
	3	0.0878	63.492	0.0734	77.570	0.0942	96.953
	4	0.0803	65.995	0.0672	79.248	0.0861	97.870
	5	0.0758	67.505	0.0634	80.210	0.0813	98.355
10	1	0.1332	51.338	0.1114	68.198	0.1429	90.884
	2	0.0926	59.492	0.0774	74.347	0.0993	94.484
	3	0.0790	63.571	0.0661	77.184	0.0848	96.087
	4	0.0723	65.784	0.0604	78.628	0.0775	96.839
	5	0.0682	67.109	0.0570	79.450	0.0732	97.230

For SI: 1 in. = 25.4 mm; 1 ft. = 304.8 mm; 1 lb./ft. = 14.59 N/m; 1 kip/in. = 175 kN/m; 1 ksi = 6.89 MPa.

NOTES:
1. Stitch screws are #10 x 1", 18" o.c.
2. All sheet-to-support screws are #12 x 1".
3. Above values were determined in accordance with Steel Deck Institute Diaphragm Design Manual with a 2.5 safety factor.
4. For wind loads only, the above design strength values can be multiplied by 1.064 for a 2.35 safety factor.
5. No edge attachments were figured at the extreme edges of the diaphragm.

TABLE 4—DIAPHRAGM DESIGN VALUES—(Continued)

MIGHTI-RIB® PBR PANEL ALLOWABLE DIAPHRAGM SHEAR STRENGTH AND STIFFNESS (G') VALUES
4 SCREWS IN 3 PANEL VALLEYS FOR ALL SUPPORTS

span (ft.)	no. of spans	26 ga. (80 ksi) strength (kips/ft.)	26 ga. (80 ksi) stiffness (kips/in.)	24 ga. (40 ksi) strength (kips/ft.)	24 ga. (40 ksi) stiffness (kips/in.)	22 ga. (40 ksi) strength (kips/ft.)	22 ga. (40 ksi) stiffness (kips/in.)
4	1	0.2584	35.406	0.2172	52.638	0.2786	77.933
	2	0.1948	49.390	0.1629	67.779	0.2090	92.797
	3	0.1731	58.654	0.1448	76.587	0.1857	100.464
	4	0.1623	64.674	0.1358	81.834	0.1741	104.692
	5	0.1558	68.731	0.1303	85.169	0.1672	107.243
	6	0.1515	71.421	0.1267	87.282	0.1625	108.787
	7	0.1484	73.335	0.1241	88.738	0.1592	109.817
5	1	0.2078	39.460	0.1738	56.914	0.2229	81.708
	2	0.1558	52.407	0.1303	69.928	0.1672	93.743
	3	0.1385	60.346	0.1159	76.998	0.1486	99.239
	4	0.1299	65.249	0.1086	81.037	0.1393	102.317
	5	0.1247	68.444	0.1043	83.537	0.1337	104.136
	6	0.1212	70.512	0.1014	85.089	0.1300	105.214
	7	0.1187	71.960	0.0993	86.144	0.1274	105.924
6	1	0.1731	42.572	0.1448	59.902	0.1857	83.991
	2	0.1299	54.434	0.1086	71.127	0.1393	93.489
	3	0.1154	61.304	0.0965	76.948	0.1238	98.003
	4	0.1082	65.397	0.0905	80.180	0.1161	100.364
	5	0.1039	68.004	0.0869	82.146	0.1114	101.740
	6	0.1010	69.665	0.0845	83.350	0.1083	102.544
	7	0.0989	70.814	0.0828	84.161	0.1061	103.067
7	1	0.1484	45.008	0.1241	62.052	0.1592	85.417
	2	0.1113	55.857	0.0931	71.819	0.1194	93.238
	3	0.0989	61.872	0.0828	76.719	0.1061	96.889
	4	0.0928	65.362	0.0776	79.387	0.0995	98.772
	5	0.0890	67.549	0.0745	80.990	0.0955	99.858
	6	0.0866	68.926	0.0724	81.961	0.0929	100.486
	7	0.0848	69.872	0.0709	82.611	0.0910	100.890
8	1	0.1299	46.952	0.1086	63.643	0.1393	86.327
	2	0.0974	56.891	0.0815	72.225	0.1045	92.886
	3	0.0866	62.218	0.0724	76.428	0.0929	95.916
	4	0.0812	65.248	0.0679	78.684	0.0871	97.463
	5	0.0779	67.123	0.0652	80.027	0.0836	98.350
	6	0.0758	68.294	0.0634	80.835	0.0813	98.856
9	1	0.1154	48.530	0.0965	64.849	0.1238	86.917
	2	0.0866	57.666	0.0724	72.461	0.0929	92.504
	3	0.0770	62.433	0.0644	76.124	0.0826	95.073
	4	0.0721	65.102	0.0603	78.069	0.0774	96.375
	5	0.0693	66.739	0.0579	79.219	0.0743	97.116
10	1	0.1039	48.829	0.0869	65.781	0.1114	87.301
	2	0.0779	58.262	0.0652	72.593	0.0836	92.127
	3	0.0693	62.566	0.0579	75.829	0.0743	93.341
	4	0.0649	64.947	0.0543	77.532	0.0697	95.458
	5	0.0623	66.395	0.0521	78.534	0.0669	96.091

For SI: 1 in. = 25.4 mm; 1 ft. = 304.8 mm; 1 lb./ft. = 14.59 N/m; 1 kip/in. = 175 kN/m; 1 ksi = 6.89 MPa.

NOTES:
1. Stitch screws are #10 x 1", 18" o.c.
2. All sheet-to-support screws are #12 x 1".
3. Above values were determined in accordance with Steel Deck Institute Diaphragm Design Manual with a 2.5 safety factor.
4. For wind loads only, the above design strength values can be multiplied by 1.064 for a 2.35 safety factor.
5. No edge attachments were figured at the extreme edges of the diaphragm.

TABLE 4—DIAPHRAGM DESIGN VALUES—(Continued)

V-BEAM PANEL ALLOWABLE DIAPHRAGM SHEAR STRENGTH AND STIFFNESS (G') VALUES
1 SCREW IN 4 OF 6 PANEL VALLEYS FOR ALL SUPPORTS

span (ft.)	no. of spans	26 ga. (80 ksi)		24 ga. (40 ksi)		22 ga. (40 ksi)		20 ga. (40 ksi)		18 ga. (40 ksi)	
		strength (kips/ft.)	stiffness (kips/in.)	strength (kips/ft.)	stiffness (kips/in.)	strength (kips/ft.)	stiffness (kips/in.)	strength (kips/ft.)	stiffness (kips/in.)	strength (kips/ft.)	stiffness (kips/in.)
4	1	0.2415	6.053	0.2147	10.330	0.2754	18.182	0.3337	27.633	0.4434	48.908
	2	0.1925	11.151	0.1610	18.360	0.2065	30.746	0.2503	44.329	0.3325	71.770
	3	0.1711	16.815	0.1431	26.645	0.1836	42.493	0.2225	58.456	0.2956	88.272
	4	0.1604	22.533	0.1342	34.394	0.1721	52.499	0.2086	69.488	0.2771	99.651
	5	0.1540	28.063	0.1288	41.359	0.1652	60.779	0.2002	77.991	0.2660	107.639
	6	0.1497	32.985	0.1252	47.161	0.1606	67.208	0.1947	84.227	0.2586	113.093
	7	0.1467	37.400	0.1227	52.074	0.1573	72.349	0.1907	88.998	0.2534	117.052
5	1	0.2048	7.390	0.1717	12.473	0.2203	21.613	0.2670	32.279	0.3547	55.390
	2	0.1540	13.323	0.1288	21.532	0.1652	35.208	0.2002	49.536	0.2660	77.270
	3	0.1369	19.628	0.1145	30.356	0.1469	47.058	0.1780	63.031	0.2365	91.807
	4	0.1283	25.706	0.1073	38.164	0.1377	56.553	0.1668	72.927	0.2217	101.265
	5	0.1232	31.326	0.1030	44.841	0.1322	64.024	0.1602	80.197	0.2128	107.614
	6	0.1198	36.128	0.1002	50.172	0.1285	69.598	0.1557	85.340	0.2069	111.875
	7	0.1173	40.284	0.0981	54.531	0.1259	73.919	0.1525	89.171	0.2027	114.885
6	1	0.1711	8.658	0.1431	14.457	0.1836	24.682	0.2225	36.265	0.2956	60.540
	2	0.1283	15.293	0.1073	24.295	0.1377	38.894	0.1668	53.588	0.2217	81.115
	3	0.1141	22.060	0.0954	33.395	0.1224	50.560	0.1483	66.285	0.1971	93.944
	4	0.1070	28.319	0.0895	41.075	0.1147	59.455	0.1390	75.154	0.1847	101.948
	5	0.1027	33.890	0.0859	47.383	0.1101	66.189	0.1335	81.445	0.1773	107.199
	6	0.0998	38.493	0.0835	52.256	0.1071	71.066	0.1298	85.782	0.1724	110.614
	7	0.0978	42.365	0.0818	56.136	0.1049	74.764	0.1271	88.954	0.1689	113.011
7	1	0.1467	9.862	0.1227	16.296	0.1573	27.434	0.1907	39.708	0.2534	64.692
	2	0.1100	17.087	0.0920	26.718	0.1180	41.979	0.1430	56.809	0.1900	83.901
	3	0.0978	24.178	0.0818	35.919	0.1049	53.314	0.1271	68.687	0.1689	95.301
	4	0.0917	30.502	0.0767	43.378	0.0983	61.612	0.1192	76.672	0.1583	102.194
	5	0.0880	35.949	0.0736	49.304	0.0944	67.706	0.1144	82.186	0.1520	106.625
	6	0.0856	40.326	0.0716	53.762	0.0918	72.021	0.1112	85.916	0.1478	109.467
	7	0.0838	43.924	0.0701	57.241	0.0899	75.238	0.1090	88.607	0.1448	111.442
8	1	0.1283	11.006	0.1073	18.004	0.1377	29.913	0.1668	42.701	0.2217	68.087
	2	0.0963	18.725	0.0805	28.855	0.1033	44.592	0.1251	59.417	0.1663	85.985
	3	0.0856	26.038	0.0716	38.045	0.0918	55.527	0.1112	70.515	0.1478	96.196
	4	0.0802	32.349	0.0671	45.239	0.0860	63.267	0.1043	77.749	0.1386	102.223
	5	0.0770	37.634	0.0644	50.798	0.0826	68.813	0.1001	82.641	0.1330	106.039
	6	0.0749	41.782	0.0626	54.892	0.0803	72.671	0.0973	85.902	0.1293	108.460
9	1	0.1141	12.094	0.0954	19.593	0.1224	32.154	0.1483	45.321	0.1971	70.901
	2	0.0856	20.226	0.0716	30.754	0.0918	46.829	0.1112	61.564	0.1478	87.584
	3	0.0761	27.682	0.0636	39.857	0.0816	57.340	0.0989	71.943	0.1314	96.804
	4	0.0713	33.931	0.0596	46.770	0.0765	64.570	0.0927	78.539	0.1232	102.143
	5	0.0684	39.036	0.0572	51.989	0.0734	69.648	0.0890	82.926	0.1182	105.484
10	1	0.1027	13.129	0.0859	21.074	0.1101	34.188	0.1335	47.631	0.1773	73.262
	2	0.0770	21.606	0.0644	32.449	0.0826	48.764	0.1001	63.358	0.1330	88.840
	3	0.0684	29.146	0.0572	41.418	0.0734	58.849	0.0890	73.083	0.1182	97.227
	4	0.0642	35.300	0.0537	48.050	0.0688	65.619	0.0834	79.135	0.1108	102.009
	5	0.0616	40.220	0.0515	52.957	0.0661	70.294	0.0801	83.105	0.1064	104.975

For SI: 1 in. = 25.4 mm; 1 ft. = 304.8 mm; 1 lb./ft. = 14.59 N/m; 1 kip/in. = 175 kN/m; 1 ksi = 6.89 MPa

NOTES:
1. Stitch screws are #10 x 1", 18" o.c.
2. All sheet-to-support screws are #12 x 1".
3. Above values were determined in accordance with Steel Deck Institute Diaphragm Design Manual with a 2.5 safety factor.
4. For wind loads only, the above design strength values can be multiplied by 1.064 for a 2.35 safety factor.
5. No edge attachments were figured at the extreme edges of the diaphragm.

TABLE 4—DIAPHRAGM DESIGN VALUES—(Continued)

V-BEAM PANEL ALLOWABLE DIAPHRAGM SHEAR STRENGTH AND STIFFNESS (G') VALUES
1 SCREW IN PER VALLEY FOR END SUPPORTS AND 1 SCREW IN 4 OF 6 VALLEYS FOR INTERMEDIATE SUPPORTS

span (ft.)	no. of spans	26 ga. (80 ksi) strength (kips/ft.)	26 ga. (80 ksi) stiffness (kips/in.)	24 ga. (40 ksi) strength (kips/ft.)	24 ga. (40 ksi) stiffness (kips/in.)	22 ga. (40 ksi) strength (kips/ft.)	22 ga. (40 ksi) stiffness (kips/in.)	20 ga. (40 ksi) strength (kips/ft.)	20 ga. (40 ksi) stiffness (kips/in.)	18 ga. (40 ksi) strength (kips/ft.)	18 ga. (40 ksi) stiffness (kips/in.)
4	1	0.2675	55.859	0.2718	74.787	0.3516	99.985	0.4261	120.991	0.5661	156.348
	2	0.2280	62.946	0.1907	79.253	0.2446	100.845	0.2965	117.752	0.3939	146.698
	3	0.1948	66.155	0.1629	80.976	0.2090	100.926	0.2533	116.149	0.3365	142.690
	4	0.1782	67.759	0.1490	81.695	0.1912	100.753	0.2317	115.094	0.3078	140.414
	5	0.1682	68.652	0.1470	82.023	0.1805	100.533	0.2187	114.343	0.2906	138.935
	6	0.1616	69.138	0.1351	82.135	0.1733	100.288	0.2101	113.754	0.2791	137.873
	7	0.1568	69.436	0.1312	82.167	0.1682	100.069	0.2039	113.293	0.2709	137.080
5	1	0.2255	57.686	0.2193	75.261	0.2813	98.494	0.3409	117.236	0.4529	148.894
	2	0.1824	62.732	0.1526	77.616	0.1957	97.553	0.2372	112.725	0.3151	139.028
	3	0.1558	64.915	0.1303	78.474	0.1672	97.035	0.2026	110.816	0.2692	135.174
	4	0.1426	65.963	0.1192	78.776	0.1529	96.613	0.1853	109.679	0.2462	133.059
	5	0.1346	66.527	0.1126	78.876	0.1444	96.274	0.1750	108.913	0.2325	131.711
	6	0.1293	66.816	0.1081	78.862	0.1387	95.977	0.1680	108.339	0.2233	130.759
	7	0.1255	66.984	0.1049	78.816	0.1346	95.733	0.1631	107.901	0.2167	130.056
6	1	0.1975	58.607	0.1827	75.033	0.2344	96.765	0.2841	113.852	0.3774	142.912
	2	0.1520	62.260	0.1272	76.109	0.1631	94.894	0.1976	108.865	0.2676	133.369
	3	0.1299	63.808	0.1086	76.486	0.1393	94.101	0.1688	106.895	0.2243	129.772
	4	0.1188	64.529	0.0994	76.569	0.1274	93.579	0.1544	105.774	0.2052	127.836
	5	0.1121	64.905	0.0938	76.554	0.1203	93.200	0.1458	105.038	0.1937	126.617
	6	0.1077	65.086	0.0901	76.480	0.1156	92.893	0.1400	104.500	0.1861	125.765
	7	0.1046	65.183	0.0874	76.400	0.1122	92.649	0.1359	104.094	0.1806	125.138
7	1	0.1774	59.045	0.1566	74.524	0.2009	95.097	0.2435	110.935	0.3235	138.087
	2	0.1303	61.729	0.1090	74.800	0.1398	92.742	0.1694	105.837	0.2251	129.039
	3	0.1113	62.863	0.0931	74.895	0.1194	91.825	0.1447	103.903	0.1923	125.710
	4	0.1018	63.378	0.0852	74.855	0.1092	91.260	0.1324	102.830	0.1759	123.941
	5	0.0961	63.638	0.0804	74.777	0.1031	90.882	0.1250	102.138	0.1660	122.835
	6	0.0923	63.753	0.0772	74.675	0.0990	90.580	0.1200	101.639	0.1595	122.066
	7	0.0896	63.810	0.0750	74.579	0.0961	90.345	0.1165	101.265	0.1548	121.504
8	1	0.1624	59.217	0.1371	73.915	0.1758	93.577	0.2130	108.447	0.2831	134.142
	2	0.1140	61.211	0.0954	73.678	0.1223	90.981	0.1482	103.409	0.1969	125.627
	3	0.0974	62.062	0.0815	73.600	0.1045	90.015	0.1266	101.549	0.1682	122.547
	4	0.0891	62.440	0.0745	73.489	0.0956	89.452	0.1158	100.535	0.1539	120.925
	5	0.0841	62.624	0.0703	73.378	0.0902	89.072	0.1093	99.887	0.1453	119.916
	6	0.0808	62.698	0.0676	73.261	0.0867	88.783	0.1050	99.425	0.1395	119.219
9	1	0.1457	59.239	0.1218	73.290	0.1563	92.220	0.1894	106.321	0.2516	130.870
	2	0.1014	60.730	0.0848	72.718	0.1087	89.520	0.1318	101.424	0.1751	122.873
	3	0.0866	61.381	0.0724	72.531	0.0929	88.543	0.1126	99.650	0.1496	120.016
	4	0.0792	61.664	0.0662	72.377	0.0850	87.989	0.1030	98.696	0.1368	118.522
	5	0.0748	61.797	0.0625	72.247	0.0802	87.662	0.0972	98.091	0.1291	117.597
10	1	0.1311	59.174	0.1096	72.684	0.1406	91.018	0.1704	104.492	0.2264	128.119
	2	0.0912	60.292	0.0763	71.891	0.0979	88.290	0.1186	99.772	0.1576	120.604
	3	0.0779	60.798	0.0652	71.635	0.0836	87.324	0.1013	98.088	0.1346	117.946
	4	0.0713	61.013	0.0596	71.456	0.0765	86.787	0.0927	97.190	0.1231	116.563
	5	0.0673	61.110	0.0563	71.316	0.0722	86.435	0.0875	96.624	0.1162	115.709

For SI: 1 in. = 25.4 mm; 1 ft. = 304.8 mm; 1 lb./ft. = 14.59 N/m; 1 kip/in. = 175 kN/m; 1 ksi = 6.89 MPa.

NOTES:
1. Stitch screws are #10 x 1", 18" o.c.
2. All sheet-to-support screws are #12 x 1".
3. Above values were determined in accordance with Steel Deck Institute Diaphragm Design Manual with a 2.5 safety factor.
4. For wind loads only, the above design strength values can be multiplied by 1.064 for a 2.35 safety factor.
5. No edge attachments were figured at the extreme edges of the diaphragm.

TABLE 4—DIAPHRAGM DESIGN VALUES—(Continued)

V-BEAM PANEL ALLOWABLE DIAPHRAGM SHEAR STRENGTH AND STIFFNESS (G') VALUES
1 SCREW PER PANEL VALLEY FOR ALL SUPPORTS

span (ft.)	no. of spans	26 ga. (80 ksi)		24 ga. (40 ksi)		22 ga. (40 ksi)		20 ga. (40 ksi)		18 ga. (40 ksi)	
		strength (kips/ft.)	stiffness (kips/in.)	strength (kips/ft.)	stiffness (kips/in.)	strength (kips/ft.)	stiffness (kips/in.)	strength (kips/ft.)	stiffness (kips/in.)	strength (kips/ft.)	stiffness (kips/in.)
4	1	0.2720	55.925	0.2755	74.893	0.3540	100.148	0.4290	121.215	0.5700	156.675
	2	0.2419	63.964	0.2070	80.725	0.2655	102.872	0.3218	120.361	0.4275	150.250
	3	0.2200	67.825	0.1840	82.259	0.2360	103.934	0.2860	119.923	0.3800	147.689
	4	0.2063	69.856	0.1725	84.481	0.2213	104.338	0.2681	119.534	0.3563	146.217
	5	0.1980	71.041	0.1656	85.141	0.2124	104.493	0.2574	119.210	0.3420	145.245
	6	0.1925	71.734	0.1610	85.484	0.2065	104.507	0.2503	118.912	0.3325	144.530
	7	0.1886	72.183	0.1577	85.684	0.2023	104.476	0.2452	118.664	0.3257	143.989
5	1	0.2292	57.757	0.2208	75.371	0.2832	98.654	0.3432	117.449	0.4560	149.195
	2	0.1980	63.722	0.1656	79.001	0.2124	99.403	0.2574	115.067	0.3420	142.154
	3	0.1760	66.464	0.1472	80.543	0.1888	99.704	0.2288	114.126	0.3040	139.498
	4	0.1650	67.861	0.1380	81.252	0.1770	99.750	0.2145	113.530	0.2850	138.036
	5	0.1584	68.657	0.1325	81.666	0.1699	99.711	0.2059	113.105	0.2736	137.097
	6	0.1540	69.108	0.1288	81.784	0.1652	99.618	0.2002	112.764	0.2660	136.423
	7	0.1509	69.394	0.1262	81.871	0.1618	99.523	0.1961	112.495	0.2606	135.920
6	1	0.2007	58.680	0.1840	75.142	0.2360	96.918	0.2860	114.052	0.3800	143.189
	2	0.1650	63.202	0.1380	77.395	0.1770	96.579	0.2145	110.974	0.2850	136.146
	3	0.1467	65.234	0.1227	78.361	0.1573	96.486	0.1907	109.830	0.2533	133.571
	4	0.1357	66.248	0.1150	78.784	0.1475	96.356	0.1788	109.162	0.2375	132.184
	5	0.1320	66.815	0.1104	78.987	0.1416	96.226	0.1716	108.711	0.2280	131.306
	6	0.1283	67.128	0.1073	79.063	0.1377	96.087	0.1668	108.366	0.2217	130.685
	7	0.1257	67.322	0.1051	79.091	0.1349	95.966	0.1634	108.100	0.2172	130.226
7	1	0.1803	59.118	0.1577	74.630	0.2023	95.242	0.2452	111.123	0.3257	138.341
	2	0.1414	62.617	0.1183	75.991	0.1517	94.282	0.1839	107.748	0.2443	131.532
	3	0.1257	64.176	0.1051	76.601	0.1349	93.975	0.1634	106.533	0.2172	129.092
	4	0.1179	64.941	0.0986	76.853	0.1264	93.754	0.1532	105.851	0.2036	127.796
	5	0.1131	65.363	0.0946	76.961	0.1214	93.580	0.1471	105.402	0.1954	126.983
	6	0.1100	65.590	0.0920	76.985	0.1180	93.422	0.1430	105.068	0.1900	126.413
	7	0.1078	65.727	0.0901	76.981	0.1156	93.291	0.1401	104.813	0.1861	125.994
8	1	0.1650	59.289	0.1380	74.017	0.1770	93.714	0.2145	108.622	0.2850	134.376
	2	0.1238	62.044	0.1035	74.783	0.1328	92.394	0.1609	105.152	0.2138	127.886
	3	0.1100	63.274	0.0920	75.162	0.1180	91.969	0.1430	103.929	0.1900	125.593
	4	0.1031	63.871	0.0863	75.306	0.1106	91.701	0.1341	103.258	0.1781	124.387
	5	0.0990	64.196	0.0828	75.356	0.1062	91.506	0.1287	102.823	0.1710	123.634
	6	0.0963	64.365	0.0805	75.349	0.1033	91.341	0.1251	102.504	0.1663	123.110
9	1	0.1467	59.308	0.1227	73.387	0.1573	92.349	0.1907	106.484	0.2533	131.087
	2	0.1100	61.513	0.0920	73.745	0.1180	90.823	0.1430	103.024	0.1900	124.935
	3	0.0978	62.504	0.0818	73.969	0.1049	90.332	0.1271	101.823	0.1689	122.785
	4	0.0917	62.981	0.0767	74.041	0.0983	90.040	0.1192	101.173	0.1583	121.662
	5	0.0880	63.238	0.0736	74.054	0.0944	89.836	0.1144	100.757	0.1520	120.964
10	1	0.1320	59.242	0.1104	72.777	0.1416	91.140	0.1716	104.645	0.2280	128.321
	2	0.0990	61.029	0.0828	72.850	0.1062	89.499	0.1287	101.251	0.1710	122.501
	3	0.0880	61.844	0.0736	72.966	0.0944	88.973	0.1144	100.085	0.1520	120.463
	4	0.0825	62.232	0.0690	72.990	0.0885	88.671	0.1073	99.461	0.1425	119.435
	5	0.0792	62.439	0.0662	72.978	0.0850	88.465	0.1030	99.065	0.1368	118.786

For SI: 1 in. = 25.4 mm; 1 ft. = 304.8 mm; 1 lb./ft. = 14.59 N/m; 1 kip/in. = 175 kN/m; 1 ksi = 6.89 MPa.

NOTES:
1. Stitch screws are #10 x 1", 18" o.c.
2. All sheet-to-support screws are #12 x 1".
3. Above values were determined in accordance with Steel Deck Institute Diaphragm Design Manual with a 2.5 safety factor.
4. For wind loads only, the above design strength values can be multiplied by 1.064 for a 2.35 safety factor.
5. No edge attachments were figured at the extreme edges of the diaphragm.

TABLE 5—DEFLECTION OF HORIZONTAL DIAPHRAGMS

TYPE OF DIAPHRAGM	LOADING CONDITION	BENDING DEFLECTION, Δ_b	SHEAR DEFLECTION, Δ_s
Simple Beam (at center)	Uniform Load	$\frac{5wL^4(12)^3}{384EI}$	$\frac{wL^2}{8G'b}$
Simple Beam (at center)	Load P applied at center	$\frac{PL^3(12)^3}{48EI}$	$\frac{PL}{4G'b}$
Simple Beam (at center)	Load P applied one-third points of span	$\frac{23PL^3(12)^3}{648EI}$	$\frac{PL}{3G'b}$
Cantilever Beam (at free end)	Uniform Load	$\frac{wa^4(12)^3}{8EI}$	$\frac{wa^2}{2G'b}$
Cantilever Beam (at free end)	Load P applied at free end	$\frac{Pa^3(12)^3}{3EI}$	$\frac{Pa}{G'b}$

For **SI:** 1 inch = 25.4 mm, 1 ksi = 6.89 MPa, 1 kip/inch = 175 kN/m, 1 foot = 304.8 mm, 1 kip = 4.448 kN, 1 kip/foot = 14.59 kN/m.

where:

E = Modulus of elasticity of steel, 29,500 ksi.
I = Moment of inertia of flange perimeter members about the centroidal axis of the diaphragm (inch^4).
G' = Shear stiffness of the diaphragm obtained from Table 3 (kip/inch).
L = Span length of a simple beam (foot).
a = Span length of cantilever beam (foot).
b = Depth of analogous beam (foot).
P = Concentrated load (kip).
w = Uniform load (kip/foot).

NOTE: The total deflection of shear diaphragms consists of both the bending and shear deflections:

$$\Delta_{total} = \Delta_b + \Delta_s$$

where:

Δ_{total} = Total deflection of shear diaphragm (inch).
Δ_b = Bending deflection (inch).
Δ_s = Shear deflection including the deflection due to seam slip and profile distortion (inch).

TABLE 6—HORIZONTAL DIAPHRAGM STIFFNESS LIMITATIONS

STIFFNESS CATEGORY	SHEAR STIFFNESS G' (kip/inch)	MAXIMUM SPAN IN FEET FOR MASONRY OR CONCRETE WALLS	SPAN DEPTH LIMITATION			
			Rotation Not Considered in Diaphragm Design		Rotation Considered in Diaphragm Design	
			Masonry or Concrete Walls	Flexible Walls[1]	Masonry or Concrete Walls	Flexible Walls[1]
Very flexible	<7	Not used	Not used	2:1	Not used	1½:1
Flexible	7-14	200	2:1 or as required for deflection	3:1	Not used	2:1
Semi-flexible	14-100	400	2½:1 or as required for deflection	4:1	As required for deflection	2½:1
Semi-stiff	100-1,000	No limitation	3:1 or as required for deflection	5:1	As required for deflection	3:1
Stiff	>1,000	No limitation	As required for deflection	No limitation	As required for deflection	3½:1

For **SI:** 1 foot = 304.8 mm, 1 kip/inch = 175 kN/m.

[1]When applying these limitations to cantilever diaphragms, the span depth-ratio will be one-half that shown.