VULCRAFT®

LEGACY ROOF DECK DIAPHRAGM TABLES

OBSOLETE

MARCH 2018

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DIAPHRAGM DESIGN

Diaphragm design information for Vulcraft roof and floor decks is based on the Steel Deck Institute "Diaphragm Design Manual, Third Edition" (DDM03) in accordance with the 2015 IBC.

ROOF DECK

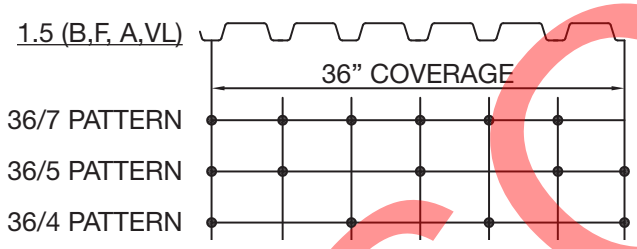
Historically, published diaphragm design tables for roof deck have been based on diaphragm shear loads only. These historical tables have not considered the condition of wind uplift in conjunction with diaphragm shear due to wind loads. When support fasteners must resist a significant amount of tension load due to wind uplift, the allowable shear strength of those fasteners is reduced. As net wind uplift increases, allowable diaphragm shear capacity decreases. The effects of uplift are included in the diaphragm tables in the Vulcraft catalogs for the PunchLok II System and DoveTail Deck.

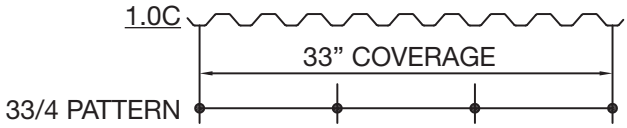
Vulcraft Diaphragm Calculator: Vulcraft is pleased to introduce the Vulcraft Diaphragm Calculator to assist in the determination of diaphragm capacity and stiffness of roof decks without fill. The Diaphragm Calculator can determine capacity governed by seismic, wind only, or wind in conjunction with uplift. Access the diaphragm calculator at: www.vulcraft.com.

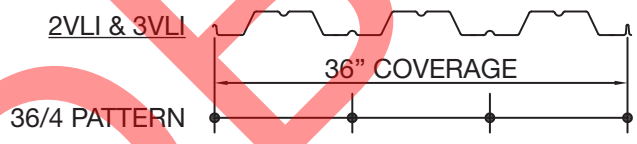
Diaphragm Design Resources: Additional diaphragm design information for Vulcraft roof decks is available at www.vulcraft.com, including:

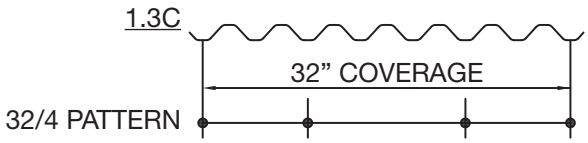
- Vulcraft PunchLok II System Catalogs
- Vulcraft DoveTail Deck Catalogs
- Vulcraft Deck Catalog

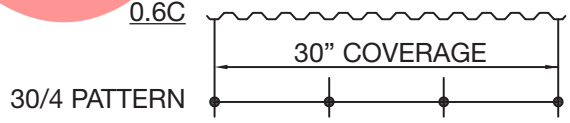
TYPICAL FASTENER LAYOUT

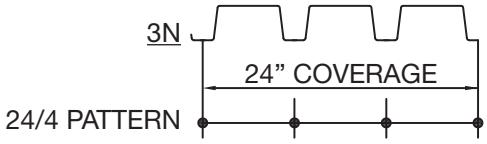












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1.5B / 1.5BI ROOF DECK

- 22 Gage
- Support Fasteners: 3/4" puddle welds
- Sidelap Fasteners: welded[1]

36/7 Attachment Pattern

Factor of safety = 2.35

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	585	509	443	391	350	**316**	**288**	**264**	**244**	**226**	**210**	**197**	**186**	**177**	**168**	0.486
1	734	643	572	514	461	417	380									0.287
2	866	766	685	619	563	517	473	435	402	374	349	328	310			0.204
3	982	877	790	717	656	603	558	519	481	448	419	384	343	308	278	0.158
4	1083	977	886	808	742	685	635	592	554	494	434	384	343	308	278	0.129
5	1169	1064	972	892	823	762	709	657	567	494	434	384	343	308	278	0.109
6	1244	1142	1050	969	898	835	771	657	567	494	434	384	343	308	278	0.094
7	1308	1210	1120	1039	967	902	771	657	567	494	434	384	343	308	278	0.083
8	1362	1269	1182	1103	1030	918	771	657	567	494	434	384	343	308	278	0.074
9	1409	1321	1238	1160	1088	918	771	657	567	494	434	384	343	308	278	0.067
10	1450	1367	1287	1212	1111	918	771	657	567	494	434	384	343	308	278	0.061

D_B = 129 K2 = 870

36/5 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	518	455	405	361	323	**292**	**266**	**244**	**225**	**208**	**194**	**182**	**172**	**163**	**155**	0.583
1	641	572	514	466	426	392	358									0.319
2	741	670	609	557	512	473	439	410	383	356	333	312	295			0.219
3	821	752	691	637	590	548	511	478	449	423	399	378	343	308	278	0.167
4	884	820	760	707	658	615	576	541	510	481	434	384	343	308	278	0.135
5	934	875	819	767	719	675	635	599	566	494	434	384	343	308	278	0.113
6	974	920	868	818	772	728	688	652	567	494	434	384	343	308	278	0.098
7	1006	957	909	862	818	775	736	657	567	494	434	384	343	308	278	0.086
8	1032	988	944	900	858	817	771	657	567	494	434	384	343	308	278	0.076
9	1054	1014	973	933	893	854	771	657	567	494	434	384	343	308	278	0.069
10	1071	1035	998	960	923	886	771	657	567	494	434	384	343	308	278	0.063

D_B = 758 K2 = 870

36/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	396	349	310	273	244	**219**	**199**	**182**	**168**	**155**	**144**	**135**	**127**	**121**	**115**	0.728
1	514	461	416	379	347	320	292									0.358
2	602	550	504	463	428	397	370	346	324	303	283	266	251			0.237
3	666	618	574	534	497	465	436	409	386	364	345	328	312	296	278	0.177
4	714	671	630	592	556	523	493	466	441	418	397	378	343	308	278	0.142
5	749	712	674	639	605	573	543	516	490	467	434	384	343	308	278	0.118
6	776	743	710	677	645	615	586	559	534	494	434	384	343	308	278	0.101
7	796	767	738	708	679	651	623	597	567	494	434	384	343	308	278	0.088
8	812	787	761	734	707	681	655	630	567	494	434	384	343	308	278	0.078
9	824	802	779	755	731	706	682	657	567	494	434	384	343	308	278	0.071
10	834	815	794	773	750	728	706	657	567	494	434	384	343	308	278	0.064

D_B = 1072 K2 = 870

[1]The **bold** values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button-punched sidelaps with 1.5BI deck.

$$G' = \frac{K_2}{3.78 + \frac{0.3 * D_x}{SPAN} + 3 * K_1 * SPAN}, \text{ Kips/inch}$$

SPAN is in feet

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1.5B / 1.5BI / 1.5F / 1.5A ROOF DECK

- 22 Gage
- Support Fasteners: 5/8" puddle welds[1]
- Sidelap Fasteners: welded[2]

36/7 Attachment Pattern

Factor of safety = 2.35

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.) 3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	K1
0	484	420	366	323	289	**261**	**238**	**218**	**201**	**187**	**174**	**163**	**154**	**146**	**139**	0.486
1	630	554	493	443	400	362	330									0.287
2	757	673	604	546	498	457	423	389	360	335	313	283	252			0.204
3	865	778	704	641	587	542	502	467	417	363	319	283	252	226	204	0.158
4	956	869	793	727	670	620	568	484	417	363	319	283	252	226	204	0.129
5	1031	947	871	804	745	676	568	484	417	363	319	283	252	226	204	0.109
6	1093	1013	940	873	813	676	568	484	417	363	319	283	252	226	204	0.094
7	1145	1070	999	934	818	676	568	484	417	363	319	283	252	226	204	0.083
8	1188	1118	1051	988	818	676	568	484	417	363	319	283	252	226	204	0.074
9	1224	1160	1097	1009	818	676	568	484	417	363	319	283	252	226	204	0.067
10	1254	1195	1136	1009	818	676	568	484	417	363	319	283	252	226	204	0.061

D_F = 226 D_A = 356 D_B = 129 K2 = 870

36/5 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.) 3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	K1
0	428	376	335	299	267	**241**	**220**	**201**	**186**	**172**	**160**	**150**	**142**	**134**	**128**	0.583
1	549	491	443	402	368	338	312									0.319
2	642	584	533	489	451	418	388	363	340	320	299	281	252			0.219
3	713	658	608	564	524	488	457	428	403	363	319	283	252	226	204	0.167
4	766	716	670	626	586	550	517	484	417	363	319	283	252	226	204	0.135
5	807	762	719	678	640	604	568	484	417	363	319	283	252	226	204	0.113
6	838	798	759	721	685	650	568	484	417	363	319	283	252	226	204	0.098
7	862	827	792	757	723	676	568	484	417	363	319	283	252	226	204	0.086
8	881	850	819	787	755	676	568	484	417	363	319	283	252	226	204	0.076
9	896	869	841	812	782	676	568	484	417	363	319	283	252	226	204	0.069
10	908	884	859	832	806	676	568	484	417	363	319	283	252	226	204	0.063

D_F = 886 D_A = 974 D_B = 758 K2 = 870

36/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.) 3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	K1
0	328	288	256	226	201	**181**	**165**	**151**	**139**	**128**	**119**	**112**	**105**	**100**	**95**	0.728
1	442	398	361	329	302	278	257									0.358
2	522	480	442	409	379	353	329	309	290	273	258	242	229			0.237
3	577	540	505	472	443	415	391	368	348	330	313	283	252	226	204	0.177
4	615	583	552	522	494	467	443	420	399	363	319	283	252	226	204	0.142
5	642	615	588	561	535	510	486	464	417	363	319	283	252	226	204	0.118
6	662	639	615	591	568	545	522	484	417	363	319	283	252	226	204	0.101
7	676	657	636	615	594	573	552	484	417	363	319	283	252	226	204	0.088
8	687	670	653	634	615	596	568	484	417	363	319	283	252	226	204	0.078
9	695	681	666	649	633	615	568	484	417	363	319	283	252	226	204	0.071
10	702	690	676	662	647	631	568	484	417	363	319	283	252	226	204	0.064

D_F = 1216 D_A = 1282 D_B = 1072 K2 = 870

[1] A 3/8" x 1-1/4" arc seam weld shall be used with F deck or A Deck.
[2] The **bold** values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button-punched sidelaps with 1.5BI deck.

$$G' = \frac{K_2}{\frac{3.78 + 0.3 * D_x}{SPAN} + 3 * K_1 * SPAN}, \text{ Kips/inch}$$

SPAN is in feet Substitute D_B, D_F, or D_A for D_X

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1.5B / 1.5F / 1.5A ROOF DECK

- 22 Gage
- Support Fasteners: 5/8" puddle welds[1]
- Sidelap Fasteners: #10 TEK screws

36/7 Attachment Pattern

Factor of safety = 2.35

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	484	420	366	323	289											0.486
1	557	487	432	383	343	310	283									0.377
2	626	550	489	440	397	359	328	301	278	259	241	227	214			0.308
3	691	610	545	491	447	408	373	343	317	295	275	258	244	226	204	0.261
4	751	667	598	541	493	452	418	384	355	330	309	283	252	226	204	0.226
5	806	720	648	588	537	494	457	425	394	363	319	283	252	226	204	0.199
6	857	769	696	633	580	534	495	461	417	363	319	283	252	226	204	0.178
7	903	816	741	676	621	574	532	484	417	363	319	283	252	226	204	0.161
8	946	859	783	717	661	611	568	484	417	363	319	283	252	226	204	0.147
9	985	899	823	757	698	648	568	484	417	363	319	283	252	226	204	0.135
10	1021	936	860	794	735	676	568	484	417	363	319	283	252	226	204	0.125

$D_F = 226$ $D_A = 356$ $D_B = 129$ K2 = 870

36/5 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	428	376	335	299	267											0.583
1	490	435	389	352	321	290	265									0.433
2	546	488	440	399	365	336	309	284	263	244	228	214	202			0.345
3	594	536	486	443	407	376	348	325	301	280	261	245	232	220	204	0.286
4	637	579	529	485	446	413	384	359	336	316	295	277	252	226	204	0.245
5	675	618	567	523	483	449	419	392	368	346	319	283	252	226	204	0.214
6	707	652	602	558	518	483	451	423	398	363	319	283	252	226	204	0.190
7	736	683	634	590	550	514	482	453	417	363	319	283	252	226	204	0.171
8	761	710	663	619	580	544	511	481	417	363	319	283	252	226	204	0.155
9	782	735	689	647	607	571	538	484	417	363	319	283	252	226	204	0.142
10	801	756	713	671	633	597	564	484	417	363	319	283	252	226	204	0.131

$D_F = 886$ $D_A = 974$ $D_B = 758$ K2 = 870

36/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	328	288	256	226	201											0.728
1	388	345	310	281	255	230	210									0.509
2	439	395	358	326	299	276	255	234	216	200	186	175	165			0.391
3	482	438	400	367	339	314	292	272	254	236	220	207	195	185	176	0.318
4	518	476	438	405	375	349	325	305	286	270	254	238	225	213	203	0.267
5	548	508	471	438	408	381	357	335	316	298	282	268	252	226	204	0.231
6	573	535	500	467	438	411	386	364	343	325	308	283	252	226	204	0.203
7	594	559	525	494	464	437	413	390	369	350	319	283	252	226	204	0.181
8	611	579	547	517	489	462	437	415	394	363	319	283	252	226	204	0.164
9	626	596	567	538	510	484	460	437	416	363	319	283	252	226	204	0.149
10	639	611	583	556	530	504	481	458	417	363	319	283	252	226	204	0.137

$D_F = 1216$ $D_A = 1282$ $D_B = 1072$ K2 = 870

[1] A 3/8" x 1-1/4" arc seam weld shall be used with F deck or A Deck.

$$G' = \frac{K_2}{\frac{3.78 + 0.3*D_x}{SPAN} + 3*K_1 * SPAN}, \text{ Kips/inch}$$

SPAN is in feet Substitute D_B, D_F, or D_A for D_X

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1.5B / 1.5F / 1.5A ROOF DECK

- 22 Gage
- Support Fasteners: #12 TEK screws
- Sidelap Fasteners: #10 TEK screws

36/7 Attachment Pattern

Factor of safety = 2.35

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	283	246	214	189	169											0.549
1	355	311	276	248	223	202	184									0.414
2	419	371	332	299	273	250	229	210	195	181	169	159	150			0.333
3	475	424	382	347	317	292	270	251	233	217	203	190	180	170	162	0.278
4	524	473	429	391	359	332	308	287	268	252	236	222	210	199	189	0.239
5	566	515	471	432	398	369	343	321	301	283	267	253	240	226	204	0.209
6	602	553	508	469	435	404	377	353	332	313	295	280	252	226	204	0.186
7	633	585	542	503	468	437	409	384	361	341	319	283	252	226	204	0.168
8	659	614	572	534	499	467	439	413	389	363	319	283	252	226	204	0.152
9	682	639	599	562	527	495	466	440	416	363	319	283	252	226	204	0.140
10	701	661	623	587	553	521	492	466	417	363	319	283	252	226	204	0.129

D_F = 226 D_A = 356 D_B = 129 K2 = 870

36/5 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	250	220	196	175	156											0.659
1	310	276	249	225	206	189	173									0.474
2	358	324	295	269	248	229	213	198	185	172	161	151	143			0.370
3	397	364	334	308	285	265	247	231	217	205	193	183	173	164	155	0.304
4	427	396	368	342	319	298	279	262	247	233	221	209	199	190	181	0.257
5	452	423	396	371	348	327	307	290	274	260	246	234	223	213	204	0.223
6	471	445	420	396	373	352	333	315	299	284	270	258	246	226	204	0.197
7	486	463	440	417	396	375	356	339	322	307	293	280	252	226	204	0.177
8	499	478	456	435	415	395	377	359	343	328	314	283	252	226	204	0.160
9	509	490	471	451	432	413	395	378	362	347	319	283	252	226	204	0.146
10	518	500	483	464	446	429	412	395	379	363	319	283	252	226	204	0.134

D_F = 886 D_A = 974 D_B = 758 K2 = 870

36/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	191	169	150	132	118											0.823
1	248	223	201	183	168	155	141									0.554
2	291	266	244	224	207	192	179	167	157	147	137	129	121			0.417
3	322	299	278	258	241	225	211	198	187	176	167	159	151	143	136	0.334
4	345	325	305	286	269	253	239	226	214	202	192	183	175	167	160	0.279
5	362	344	326	309	293	277	263	250	237	226	215	206	197	188	181	0.240
6	375	359	343	328	312	298	284	271	259	247	236	226	217	208	200	0.210
7	385	371	357	343	329	315	302	289	277	266	255	245	235	226	204	0.187
8	392	380	368	355	342	329	317	305	293	282	272	262	252	226	204	0.168
9	398	388	377	365	353	342	330	319	308	297	287	277	252	226	204	0.153
10	403	394	384	373	363	352	341	331	320	310	300	283	252	226	204	0.140

D_F = 1216 D_A = 1282 D_B = 1072 K2 = 870

$$G' = \frac{K_2}{3.78 + \frac{0.3 * D_x}{SPAN} + 3 * K_1 * SPAN}, \text{ Kips/inch}$$

SPAN is in feet Substitute D_B, D_F, or D_A for D_X

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OBSOLETE

1.5B / 1.5BI ROOF DECK

- 20 Gage
- Support Fasteners: 3/4" puddle welds
- Sidelap Fasteners: welded[1]

36/7 Attachment Pattern

Factor of safety = 2.35

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.) 3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	K1
0	704	612	535	473	423	**382**	**349**	**320**	**295**	**274**	**256**	**239**	**225**	**212**	**202**	0.535
1	882	773	687	618	556	504	460									0.317
2	1041	921	824	744	677	621	571	525	486	452	422	396	373			0.225
3	1180	1055	950	862	788	725	671	623	581	541	505	474	447	422	381	0.174
4	1302	1174	1065	972	892	823	764	712	666	625	589	527	470	422	381	0.142
5	1406	1279	1169	1073	989	916	852	796	746	676	595	527	470	422	381	0.120
6	1495	1373	1263	1165	1079	1003	936	876	777	676	595	527	470	422	381	0.104
7	1572	1454	1346	1249	1162	1084	1014	901	777	676	595	527	470	422	381	0.092
8	1638	1526	1421	1325	1238	1159	1057	901	777	676	595	527	470	422	381	0.082
9	1694	1589	1488	1394	1308	1229	1057	901	777	676	595	527	470	422	381	0.074
10	1743	1644	1548	1457	1372	1258	1057	901	777	676	595	527	470	422	381	0.068

D_B = 97 K2 = 1056

36/5 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.) 3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	K1
0	623	548	488	437	391	**353**	**322**	**295**	**273**	**253**	**236**	**220**	**207**	**196**	**186**	0.642
1	771	688	618	561	512	471	433									0.351
2	891	806	733	670	616	569	528	492	461	431	402	377	355			0.242
3	987	904	831	766	709	658	614	574	539	508	480	455	429	406	381	0.184
4	1063	985	914	849	791	739	692	650	613	579	548	520	470	422	381	0.149
5	1123	1052	984	922	864	811	763	720	680	644	595	527	470	422	381	0.125
6	1171	1106	1043	983	927	875	827	783	743	676	595	527	470	422	381	0.108
7	1210	1151	1093	1037	983	932	885	841	777	676	595	527	470	422	381	0.094
8	1241	1188	1135	1082	1031	982	936	893	777	676	595	527	470	422	381	0.084
9	1267	1219	1170	1121	1073	1027	982	901	777	676	595	527	470	422	381	0.076
10	1288	1245	1200	1155	1110	1065	1023	901	777	676	595	527	470	422	381	0.069

D_B = 567 K2 = 1056

36/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.) 3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	K1
0	477	420	374	331	295	**266**	**242**	**222**	**204**	**189**	**176**	**164**	**154**	**145**	**138**	0.802
1	618	554	501	456	417	384	353									0.394
2	723	661	606	557	515	477	445	416	390	367	342	321	302			0.261
3	801	743	690	642	598	559	524	492	464	438	415	394	375	356	338	0.195
4	858	807	757	711	668	629	593	560	530	503	477	455	433	414	381	0.156
5	901	856	811	768	727	689	653	620	589	561	535	511	470	422	381	0.130
6	933	893	853	814	776	740	705	672	642	613	587	527	470	422	381	0.111
7	957	923	887	852	817	782	749	718	688	660	595	527	470	422	381	0.097
8	976	946	915	883	850	819	788	758	729	676	595	527	470	422	381	0.086
9	991	965	937	908	879	849	820	792	764	676	595	527	470	422	381	0.078
10	1003	980	955	929	902	875	848	822	777	676	595	527	470	422	381	0.071

D_B = 802 K2 = 1056

[1]The **bold** values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button-punched sidelaps with 1.5BI deck.

$$G' = \frac{K_2}{3.78 + \frac{0.3 * D_x}{SPAN} + 3 * K_1 * SPAN}, \text{ Kips/inch}$$

SPAN is in feet

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OBSOLETE

1.5B / 1.5BI / 1.5F / 1.5A ROOF DECK

- 20 Gage
- Support Fasteners: 5/8" puddle welds[1]
- Sidelap Fasteners: welded[2]

36/7 Attachment Pattern

Factor of safety = 2.35

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.) 3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	K1
0	581	505	441	390	349	**316**	**288**	**264**	**244**	**226**	**211**	**197**	**185**	**175**	**167**	0.535
1	757	665	592	532	482	437	399									0.317
2	910	808	725	656	598	549	507	469	434	404	377	354	333			0.225
3	1039	934	845	770	705	650	602	561	524	492	437	387	345	310	279	0.174
4	1148	1043	952	873	804	744	692	646	570	497	437	387	345	310	279	0.142
5	1238	1137	1046	966	894	832	776	661	570	497	437	387	345	310	279	0.120
6	1313	1217	1128	1048	976	912	776	661	570	497	437	387	345	310	279	0.104
7	1375	1285	1200	1122	1050	924	776	661	570	497	437	387	345	310	279	0.092
8	1426	1343	1262	1187	1116	924	776	661	570	497	437	387	345	310	279	0.082
9	1470	1392	1317	1244	1118	924	776	661	570	497	437	387	345	310	279	0.074
10	1506	1435	1364	1295	1118	924	776	661	570	497	437	387	345	310	279	0.068

D_F = 169 D_A = 266 D_B = 97 K2 = 1056

36/5 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.) 3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	K1
0	514	452	402	361	323	**292**	**266**	**244**	**225**	**209**	**194**	**182**	**171**	**161**	**153**	0.642
1	659	589	531	483	441	406	376									0.351
2	771	701	640	587	542	501	466	436	408	384	361	339	319			0.242
3	856	790	730	677	629	586	548	514	484	457	432	387	345	310	279	0.184
4	920	860	804	752	704	661	621	585	553	497	437	387	345	310	279	0.149
5	968	915	863	814	768	725	686	649	570	497	437	387	345	310	279	0.125
6	1006	959	912	866	822	781	742	661	570	497	437	387	345	310	279	0.108
7	1035	993	951	909	868	829	776	661	570	497	437	387	345	310	279	0.094
8	1058	1021	983	945	907	870	776	661	570	497	437	387	345	310	279	0.084
9	1076	1043	1009	974	939	905	776	661	570	497	437	387	345	310	279	0.076
10	1091	1062	1031	1000	967	924	776	661	570	497	437	387	345	310	279	0.069

D_F = 663 D_A = 728 D_B = 567 K2 = 1056

36/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.) 3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	K1
0	393	346	309	273	244	**220**	**200**	**183**	**168**	**156**	**145**	**135**	**127**	**120**	**114**	0.802
1	530	478	433	395	362	334	310									0.394
2	626	576	531	491	455	423	395	370	348	328	310	292	275			0.261
3	693	648	606	567	531	499	469	442	418	396	376	357	340	310	279	0.195
4	738	700	663	627	593	561	532	504	479	456	434	387	345	310	279	0.156
5	771	739	706	674	642	612	584	557	532	497	437	387	345	310	279	0.130
6	794	767	739	710	682	654	627	602	570	497	437	387	345	310	279	0.111
7	812	788	764	739	713	688	663	639	570	497	437	387	345	310	279	0.097
8	825	805	784	761	739	716	693	661	570	497	437	387	345	310	279	0.086
9	835	818	799	780	759	739	718	661	570	497	437	387	345	310	279	0.078
10	843	828	812	794	776	758	739	661	570	497	437	387	345	310	279	0.071

D_F = 909 D_A = 959 D_B = 802 K2 = 1056

[1] A 3/8" x 1-1/4" arc seam weld shall be used with F deck or A Deck.
[2] The **bold** values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button-punched sidelaps with 1.5BI deck.

$$G' = \frac{K_2}{3.78 + \frac{0.3 * D_x}{SPAN} + 3 * K_1 * SPAN}, \text{ Kips/inch}$$

SPAN is in feet Substitute D_B, D_F, or D_A for D_X

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1.5B / 1.5F / 1.5A ROOF DECK

- 20 Gage
- Support Fasteners: 5/8" puddle welds[1]
- Sidelap Fasteners: #10 TEK screws

36/7 Attachment Pattern

Factor of safety = 2.35

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	581	505	441	390	349											0.535
1	670	585	519	463	414	375	342									0.415
2	754	662	589	530	480	434	397	365	337	313	293	274	258			0.340
3	832	735	656	592	538	493	451	415	384	357	333	313	294	279	265	0.287
4	904	803	720	652	594	545	504	465	431	401	374	351	331	310	279	0.249
5	971	867	781	709	648	596	551	512	477	444	415	387	345	310	279	0.219
6	1032	927	839	764	700	645	597	556	520	488	437	387	345	310	279	0.196
7	1089	983	893	816	749	692	642	599	560	497	437	387	345	310	279	0.178
8	1140	1036	944	866	797	738	686	640	570	497	437	387	345	310	279	0.162
9	1187	1084	993	913	843	782	728	661	570	497	437	387	345	310	279	0.149
10	1230	1129	1038	957	886	824	769	661	570	497	437	387	345	310	279	0.138

D_F = 169 D_A = 266 D_B = 97 K2 = 1056

36/5 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	514	452	402	361	323											0.642
1	589	523	468	423	386	351	320									0.477
2	656	587	529	481	439	404	374	344	318	296	276	259	243			0.380
3	715	645	585	534	490	452	420	391	365	339	317	297	280	265	251	0.315
4	767	697	637	584	538	498	463	433	405	381	358	336	316	299	279	0.270
5	812	744	683	630	583	541	505	472	443	418	394	374	345	310	279	0.236
6	852	786	726	672	624	582	544	510	480	453	428	387	345	310	279	0.209
7	886	823	764	711	663	620	581	546	515	486	437	387	345	310	279	0.188
8	916	856	799	747	699	656	616	580	548	497	437	387	345	310	279	0.171
9	942	885	830	779	732	689	649	613	570	497	437	387	345	310	279	0.156
10	965	911	858	809	763	720	680	644	570	497	437	387	345	310	279	0.144

D_F = 663 D_A = 728 D_B = 567 K2 = 1056

36/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	393	346	309	273	244											0.802
1	466	415	373	338	308	279	254									0.561
2	528	476	431	393	360	332	308	284	262	243	227	212	199			0.431
3	580	528	482	443	408	378	352	328	308	287	268	251	236	223	212	0.350
4	623	573	528	488	452	420	392	368	345	326	308	289	272	258	245	0.294
5	659	612	568	528	492	459	430	404	381	360	341	323	308	292	277	0.254
6	689	645	603	563	528	495	466	439	414	392	372	354	337	310	279	0.224
7	715	673	633	595	560	528	498	471	446	423	402	383	345	310	279	0.200
8	736	697	659	623	589	557	528	500	475	452	430	387	345	310	279	0.180
9	753	718	682	648	615	584	555	527	502	479	437	387	345	310	279	0.164
10	768	736	702	670	638	608	580	553	527	497	437	387	345	310	279	0.151

D_F = 909 D_A = 959 D_B = 802 K2 = 1056

[1] A 3/8" x 1-1/4" arc seam weld shall be used with F deck or A Deck.

$$G' = \frac{K_2}{3.78 + \frac{0.3 * D_x}{SPAN} + 3 * K_1 * SPAN}, \text{ Kips/inch}$$

SPAN is in feet Substitute D_B, D_F, or D_A for D_X

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1.5B / 1.5F / 1.5A ROOF DECK

- 20 Gage
- Support Fasteners: #12 TEK screws
- Sidelap Fasteners: #10 TEK screws

36/7 Attachment Pattern

Factor of safety = 2.35

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	343	298	261	230	206											0.605
1	430	377	335	301	272	246	224									0.456
2	508	450	402	363	331	303	279	257	237	221	206	193	182			0.366
3	576	515	464	421	385	354	328	305	284	264	247	232	218	207	196	0.306
4	636	573	520	475	436	402	373	348	325	306	288	270	255	241	229	0.263
5	687	625	571	524	483	448	417	389	365	343	324	306	291	276	262	0.230
6	730	671	617	569	527	490	458	428	402	379	358	340	323	307	279	0.205
7	768	710	658	611	568	530	496	466	438	414	392	372	345	310	279	0.185
8	800	745	694	648	605	567	532	501	473	447	424	387	345	310	279	0.168
9	827	776	727	681	639	601	566	534	505	478	437	387	345	310	279	0.154
10	851	803	756	712	671	632	597	565	536	497	437	387	345	310	279	0.142

$D_F = 169$ $D_A = 266$ $D_B = 97$ K2 = 1056

36/5 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	304	267	238	213	191											0.726
1	376	335	302	274	250	230	211									0.522
2	435	393	358	327	301	278	258	241	225	210	197	184	173			0.408
3	482	441	406	374	346	322	300	281	264	248	235	222	210	199	189	0.334
4	519	481	446	415	387	361	338	318	299	283	268	254	242	230	220	0.283
5	548	513	481	450	422	396	373	352	333	315	299	284	271	259	247	0.246
6	572	540	509	480	453	428	404	383	363	345	328	313	299	286	274	0.217
7	590	562	534	506	480	455	432	411	391	372	355	339	325	310	279	0.195
8	606	580	554	528	504	480	457	436	416	398	380	364	345	310	279	0.176
9	618	595	571	547	524	501	480	459	440	421	404	387	345	310	279	0.161
10	628	607	586	564	542	520	500	480	460	442	425	387	345	310	279	0.148

$D_F = 663$ $D_A = 728$ $D_B = 567$ K2 = 1056

36/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	232	205	182	161	144											0.907
1	301	270	244	222	204	188	173									0.610
2	353	323	296	272	251	233	217	203	191	179	167	157	148			0.459
3	391	363	337	313	292	273	256	240	227	214	203	192	183	174	165	0.368
4	419	394	370	347	327	307	290	274	259	246	233	222	212	203	194	0.307
5	439	418	396	375	355	337	319	303	288	274	261	250	239	229	219	0.264
6	455	436	417	397	379	361	344	329	314	300	287	275	263	253	243	0.231
7	467	450	433	416	399	382	366	351	336	323	310	297	286	275	265	0.206
8	476	461	446	431	415	400	385	370	356	343	330	318	306	295	279	0.185
9	483	471	457	443	429	415	401	387	373	361	348	336	325	310	279	0.168
10	489	478	466	453	440	427	414	401	389	376	364	353	341	310	279	0.154

$D_F = 909$ $D_A = 959$ $D_B = 802$ K2 = 1056

$$G' = \frac{K_2}{3.78 + \frac{0.3 * D_x}{SPAN} + 3 * K_1 * SPAN}, \text{ Kips/inch}$$

SPAN is in feet Substitute D_B, D_F, or D_A for D_X

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OBSOLETE

1.5B / 1.5BI ROOF DECK

- 18 Gage
- Support Fasteners: 3/4" puddle welds
- Sidelap Fasteners: welded[1]

36/7 Attachment Pattern

Factor of safety = 2.35

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.) 3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	K1
0	917	797	701	620	555	**502**	**458**	**421**	**389**	**361**	**337**	**315**	**296**	**279**	**264**	0.615
1	1148	1007	894	804	728	660	602									0.364
2	1355	1199	1072	968	881	808	746	687	636	592	553	519	489			0.259
3	1536	1372	1236	1121	1025	943	872	811	757	707	661	621	585	553	524	0.200
4	1693	1527	1385	1264	1160	1071	993	925	866	813	766	723	681	644	597	0.164
5	1829	1664	1520	1395	1286	1191	1108	1035	970	912	861	815	737	662	597	0.138
6	1946	1785	1642	1515	1403	1304	1217	1139	1070	1008	933	827	737	662	597	0.120
7	2046	1892	1751	1624	1511	1409	1319	1238	1165	1062	933	827	737	662	597	0.106
8	2131	1985	1849	1724	1610	1507	1415	1331	1219	1062	933	827	737	662	597	0.094
9	2205	2067	1936	1814	1701	1598	1505	1413	1219	1062	933	827	737	662	597	0.085
10	2268	2138	2013	1895	1784	1682	1588	1413	1219	1062	933	827	737	662	597	0.078

D_B = 63 K2 = 1398

36/5 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.) 3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	K1
0	812	714	635	572	514	**464**	**423**	**389**	**359**	**333**	**311**	**291**	**273**	**258**	**243**	0.739
1	1003	895	805	730	667	613	567									0.404
2	1159	1049	953	872	801	740	687	641	600	564	527	495	466			0.278
3	1284	1177	1081	996	922	856	798	747	702	661	624	591	561	531	503	0.212
4	1383	1282	1189	1105	1029	961	900	846	797	752	712	676	643	613	585	0.171
5	1462	1369	1281	1199	1124	1055	993	936	885	838	795	756	721	662	597	0.144
6	1525	1440	1358	1279	1206	1139	1076	1018	966	917	873	827	737	662	597	0.124
7	1575	1498	1422	1349	1279	1212	1151	1093	1040	991	933	827	737	662	597	0.109
8	1616	1547	1477	1408	1341	1278	1218	1161	1108	1058	933	827	737	662	597	0.097
9	1649	1587	1523	1459	1396	1335	1277	1222	1169	1062	933	827	737	662	597	0.087
10	1677	1620	1562	1503	1444	1386	1330	1277	1219	1062	933	827	737	662	597	0.080

D_B = 372 K2 = 1398

36/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.) 3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	K1
0	621	547	487	435	389	**351**	**320**	**293**	**270**	**250**	**233**	**218**	**204**	**192**	**181**	0.923
1	804	721	652	593	543	500	463									0.454
2	941	860	788	725	669	621	578	541	507	477	449	421	396			0.301
3	1043	967	898	835	778	727	681	640	603	570	539	512	487	464	441	0.225
4	1117	1050	986	925	869	818	771	728	689	653	621	591	564	538	515	0.180
5	1172	1113	1055	999	946	896	849	806	766	729	695	664	635	608	583	0.150
6	1214	1163	1111	1059	1010	962	917	874	835	797	763	730	700	662	597	0.128
7	1246	1201	1155	1108	1062	1018	975	934	895	858	823	791	737	662	597	0.112
8	1271	1232	1190	1149	1107	1065	1025	985	948	912	878	827	737	662	597	0.099
9	1290	1256	1219	1182	1143	1105	1067	1030	994	960	926	827	737	662	597	0.090
10	1306	1276	1243	1209	1174	1139	1104	1069	1035	1002	933	827	737	662	597	0.081

D_B = 526 K2 = 1398

[1]The **bold** values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button-punched sidelaps with 1.5BI deck.

$$G' = \frac{K_2}{3.78 + \frac{0.3 * D_x}{SPAN} + 3 * K_1 * SPAN}, \text{ Kips/inch}$$

SPAN is in feet

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OBSOLETE

1.5B / 1.5BI / 1.5F / 1.5A ROOF DECK

- **18 Gage**
- **Support Fasteners: 5/8" puddle welds[1]**
- **Sidelap Fasteners: welded[2]**

36/7 Attachment Pattern

Factor of safety = 2.35

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	754	655	576	510	456	**413**	**377**	**346**	**320**	**297**	**277**	**259**	**244**	**230**	**217**	0.615
1	982	863	768	691	627	570	521									0.364
2	1181	1049	941	851	776	713	658	612	567	528	493	463	436			0.259
3	1349	1212	1097	999	916	844	782	728	681	639	601	565	532	484	437	0.200
4	1490	1354	1236	1133	1044	966	898	839	786	739	683	605	540	484	437	0.164
5	1607	1475	1358	1253	1161	1079	1007	943	886	777	683	605	540	484	437	0.138
6	1704	1579	1465	1361	1267	1183	1108	1034	892	777	683	605	540	484	437	0.120
7	1784	1668	1558	1456	1363	1278	1202	1034	892	777	683	605	540	484	437	0.106
8	1852	1743	1639	1540	1449	1365	1214	1034	892	777	683	605	540	484	437	0.094
9	1908	1807	1709	1615	1526	1443	1214	1034	892	777	683	605	540	484	437	0.085
10	1955	1862	1770	1681	1595	1445	1214	1034	892	777	683	605	540	484	437	0.078

D_F = 111 D_A = 175 D_B = 63 K2 = 1398

36/5Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	667	587	522	470	422	**382**	**348**	**320**	**295**	**274**	**256**	**239**	**225**	**212**	**200**	0.739
1	855	765	690	626	573	527	488									0.404
2	1000	910	831	763	703	651	605	565	530	498	470	443	417			0.278
3	1111	1025	948	878	816	761	712	668	628	593	561	532	505	482	437	0.212
4	1194	1116	1043	976	914	857	806	760	718	680	645	605	540	484	437	0.171
5	1257	1188	1121	1057	997	941	890	843	799	759	683	605	540	484	437	0.144
6	1306	1244	1183	1124	1067	1014	963	916	872	777	683	605	540	484	437	0.124
7	1343	1289	1234	1180	1127	1076	1027	981	892	777	683	605	540	484	437	0.109
8	1373	1325	1276	1226	1177	1129	1082	1034	892	777	683	605	540	484	437	0.097
9	1397	1354	1310	1265	1219	1174	1131	1034	892	777	683	605	540	484	437	0.087
10	1416	1378	1338	1297	1256	1214	1172	1034	892	777	683	605	540	484	437	0.080

D_F = 435 D_A = 478 D_B = 372 K2 = 1398

36/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	511	450	401	358	320	**289**	**263**	**241**	**222**	**206**	**192**	**179**	**168**	**158**	**149**	0.923
1	688	620	562	512	470	434	402									0.454
2	813	748	689	637	591	550	513	481	452	426	403	382	360			0.301
3	899	841	787	736	690	648	609	574	543	514	488	464	442	422	403	0.225
4	958	909	860	814	770	729	690	655	622	592	564	538	514	484	437	0.180
5	1001	959	916	874	834	795	758	723	690	660	631	605	540	484	437	0.150
6	1031	995	959	922	885	849	814	781	749	719	683	605	540	484	437	0.128
7	1053	1023	992	959	926	893	861	830	799	770	683	605	540	484	437	0.112
8	1071	1045	1017	988	959	929	900	871	842	777	683	605	540	484	437	0.099
9	1084	1061	1037	1012	986	959	932	905	879	777	683	605	540	484	437	0.090
10	1094	1075	1054	1031	1008	984	959	934	892	777	683	605	540	484	437	0.081

D_F = 597 D_A = 630 D_B = 526 K2 = 1398

[1] A 3/8" x 1-1/4" arc seam weld shall be used with F deck or A Deck.
[2] The **bold** values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button-punched sidelaps with 1.5BI deck.

$$G' = \frac{K_2}{3.78 + \frac{0.3 * D_x}{SPAN} + 3 * K_1 * SPAN}, \text{ Kips/inch}$$

SPAN is in feet Substitute D_B, D_F, or D_A for D_X

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1.5B / 1.5F / 1.5A ROOF DECK

- 18 Gage
- Support Fasteners: 5/8" puddle welds[1]
- Sidelap Fasteners: #10 TEK screws

36/7 Attachment Pattern

Factor of safety = 2.35

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	754	655	576	510	456											0.615
1	872	762	675	606	543	492	449									0.478
2	983	863	768	691	627	570	521	479	443	412	385	361	340			0.391
3	1086	959	857	773	703	644	593	546	505	470	439	412	388	366	347	0.330
4	1181	1049	941	852	777	713	659	612	567	528	493	463	436	412	390	0.286
5	1269	1134	1022	927	848	780	721	671	627	586	548	514	484	458	434	0.253
6	1349	1213	1097	1000	916	844	782	728	681	639	602	565	532	484	437	0.226
7	1423	1286	1169	1068	982	907	842	785	734	690	650	605	540	484	437	0.204
8	1490	1354	1236	1134	1044	967	899	839	787	740	683	605	540	484	437	0.187
9	1552	1418	1299	1195	1104	1025	954	892	837	777	683	605	540	484	437	0.172
10	1607	1476	1358	1254	1162	1080	1008	944	887	777	683	605	540	484	437	0.159

D_F = 111 D_A = 175 D_B = 63 K2 = 1398

36/5 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	667	587	522	470	422											0.739
1	767	680	609	551	502	460	420									0.549
2	855	765	690	627	573	527	488	453	419	390	364	341	321			0.437
3	933	842	764	697	640	591	548	511	478	447	418	392	369	349	330	0.363
4	1001	910	831	763	703	651	606	566	530	499	471	443	417	394	373	0.310
5	1060	972	893	823	762	708	660	618	580	547	516	489	465	440	417	0.271
6	1111	1026	948	879	817	761	712	668	628	593	561	532	506	482	437	0.241
7	1155	1074	999	930	867	811	761	715	674	637	604	573	540	484	437	0.216
8	1194	1117	1044	976	914	858	807	760	718	680	645	605	540	484	437	0.196
9	1228	1155	1085	1019	958	901	850	803	760	721	683	605	540	484	437	0.180
10	1257	1188	1121	1057	997	942	890	843	800	760	683	605	540	484	437	0.166

D_F = 435 D_A = 478 D_B = 372 K2 = 1398

36/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	511	450	401	358	320											0.923
1	607	541	486	440	402	367	335									0.645
2	689	620	562	513	470	434	402	374	346	321	300	281	264			0.496
3	757	689	630	578	533	494	460	429	403	379	354	332	312	295	279	0.403
4	813	748	690	637	591	550	514	481	452	426	403	382	360	340	322	0.339
5	860	799	742	690	643	601	563	529	499	471	446	424	403	384	365	0.293
6	899	842	787	737	690	648	609	575	543	514	488	464	442	422	403	0.257
7	932	878	827	778	732	690	652	616	584	554	527	502	479	458	437	0.230
8	959	909	861	814	770	729	691	655	622	592	564	538	514	484	437	0.207
9	981	936	891	846	804	764	726	691	658	627	599	573	540	484	437	0.189
10	1001	959	917	875	834	795	758	724	691	660	632	605	540	484	437	0.174

D_F = 597 D_A = 630 D_B = 526 K2 = 1398

[1] A 3/8" x 1-1/4" arc seam weld shall be used with F deck or A Deck.

$$G' = \frac{K_2}{3.78 + \frac{0.3 * D_x}{SPAN} + 3 * K_1 * SPAN}, \text{ Kips/inch}$$

SPAN is in feet Substitute D_B, D_F, or D_A for D_X

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1.5B / 1.5F / 1.5A ROOF DECK

- 18 Gage
- Support Fasteners: #12 TEK screws
- Sidelap Fasteners: #10 TEK screws

36/7 Attachment Pattern

Factor of safety = 2.35

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	454	395	347	307	275											0.696
1	570	500	444	399	362	327	299									0.525
2	673	596	533	481	438	402	371	342	316	294	275	258	243			0.422
3	763	682	614	558	510	469	434	403	377	352	329	309	291	275	261	0.352
4	842	759	689	629	577	533	494	461	431	405	381	360	339	321	304	0.303
5	909	828	756	694	640	593	552	515	483	454	429	406	385	366	347	0.265
6	967	888	817	754	698	649	606	567	533	502	475	450	427	407	388	0.236
7	1016	941	871	808	752	702	657	617	580	548	519	492	468	446	426	0.212
8	1059	987	919	858	801	751	705	663	626	592	561	533	507	484	437	0.193
9	1095	1027	963	902	847	796	749	707	669	634	602	572	540	484	437	0.177
10	1126	1063	1001	942	888	837	791	748	709	673	640	605	540	484	437	0.164

D_F = 111 D_A = 175 D_B = 63 K2 = 1398

36/5 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	402	353	315	283	254											0.835
1	498	444	399	362	331	304	281									0.601
2	576	521	474	433	398	368	341	318	298	280	262	246	232			0.469
3	638	585	537	495	458	426	397	372	349	329	311	294	279	264	250	0.385
4	687	637	591	549	512	478	448	421	396	374	355	337	320	305	291	0.326
5	726	680	636	596	559	525	494	466	440	417	396	377	359	343	328	0.283
6	757	715	675	636	600	566	535	507	481	457	435	414	396	378	362	0.250
7	782	744	706	670	636	603	573	544	518	493	470	449	430	412	395	0.224
8	802	768	733	700	667	635	606	578	551	527	504	482	462	444	426	0.203
9	818	788	756	725	694	664	635	608	582	557	535	513	493	474	437	0.185
10	832	804	775	746	717	689	661	635	610	586	563	541	521	484	437	0.170

D_F = 435 D_A = 478 D_B = 372 K2 = 1398

36/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	3'-0"	3'-6"	4'-0"	4'-6"	5'-0"	5'-6"	6'-0"	6'-6"	7'-0"	7'-6"	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	
0	308	271	241	215	193											1.044
1	399	358	324	294	270	248	230									0.702
2	467	427	391	360	333	309	288	269	252	237	224	210	197			0.528
3	518	480	446	415	387	362	339	318	300	283	268	255	242	231	220	0.424
4	555	521	490	460	432	407	384	362	343	325	309	294	281	268	257	0.354
5	582	553	524	497	470	446	423	401	381	363	346	331	316	303	290	0.304
6	602	577	552	526	502	478	456	435	415	397	380	364	349	335	322	0.266
7	618	596	573	550	528	506	485	465	445	427	410	394	378	364	351	0.237
8	630	611	591	570	550	529	509	490	471	454	437	421	405	391	377	0.213
9	640	623	605	587	568	549	530	512	494	477	461	445	430	416	402	0.194
10	648	633	617	600	583	566	548	531	515	498	482	467	452	438	424	0.178

D_F = 597 D_A = 630 D_B = 526 K2 = 1398

$$G' = \frac{K_2}{3.78 + \frac{0.3 * D_x}{SPAN} + 3 * K_1 * SPAN}, \text{ Kips/inch}$$

SPAN is in feet Substitute D_B, D_F, or D_A for D_X

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DIAPHRAGM - 3N / 3NI

3N / 3NI ROOF DECK

- **Support Fasteners: 3/4" puddle welds**
- **Sidelap Fasteners: welded[1]**

$$G' = \frac{K_2}{4.31 + \frac{0.3 * D_x}{SPAN} + 3 * K_1 * SPAN}, \text{ Kips/inch}$$

SPAN is in feet

[1]The **bold** values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button-punched sidelaps with 3NI deck.

Type 22 - 24/4 Attachment Pattern

Factor of safety = 2.35

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	
0	**143**	**135**	**127**	**121**	**115**	**109**	**104**	**100**	**96**	**92**	**88**	**85**	**82**	**79**	**76**	1.093
2	282	266	251													0.356
3	352	331	313	296	281	268	256	245	234							0.266
4	421	396	374	354	337	321	306	293	281	269	259	249	241	232	225	0.213
5	479	454	432	411	392	374	357	341	327	314	302	291	280	271	262	0.177
6	534	507	483	460	440	421	404	388	373	358	344	332	320	309	299	0.152
7	586	558	532	508	486	466	447	429	413	398	384	371	359	347	336	0.133
8	635	606	578	553	530	508	488	470	452	436	421	407	394	381	370	0.118
9	681	651	622	596	572	549	528	509	490	473	457	442	428	399	373	0.106
10	724	693	664	637	612	589	567	546	527	509	492	461	428	399	373	0.096

D_{3N} = 653 K2 = 870

Type 20 - 24/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	
0	**173**	**162**	**153**	**145**	**138**	**131**	**125**	**120**	**115**	**110**	**106**	**102**	**99**	**95**	**92**	1.204
2	339	319	301													0.392
3	422	398	376	356	338	322	307	294	282							0.293
4	506	476	450	426	405	385	368	352	337	324	311	300	289	279	270	0.234
5	576	546	519	494	471	449	428	410	393	377	363	349	337	325	314	0.195
6	642	610	580	553	529	506	485	466	448	430	414	398	384	371	359	0.167
7	704	670	639	610	584	559	537	516	497	478	462	446	431	417	403	0.146
8	763	728	695	665	637	611	587	564	544	524	506	489	473	458	444	0.130
9	818	782	748	716	687	660	635	611	589	569	549	531	514	498	483	0.117
10	870	833	798	766	735	707	681	656	633	612	591	572	554	537	510	0.106

D_{3N} = 448 K2 = 1056

Type 18 - 24/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	
0	**225**	**212**	**200**	**189**	**180**	**171**	**163**	**156**	**150**	**144**	**138**	**133**	**128**	**124**	**120**	1.385
2	441	415	392													0.451
3	549	517	488	462	439	418	399	382	366							0.337
4	657	619	584	553	526	501	478	457	438	421	404	389	376	363	351	0.269
5	748	709	674	642	612	583	557	532	510	490	471	454	437	422	408	0.224
6	834	792	754	719	687	658	630	605	582	559	538	518	499	482	466	0.192
7	915	871	830	793	759	727	698	670	645	622	600	579	560	542	524	0.168
8	992	946	903	864	827	794	762	733	706	681	658	635	615	595	577	0.149
9	1064	1016	972	931	893	858	825	794	766	739	714	690	668	647	628	0.134
10	1131	1082	1037	995	956	919	885	853	823	795	768	743	720	698	677	0.122

D_{3N} = 321 K2 = 1398

Type 16 - 24/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	
0	**279**	**262**	**248**	**235**	**223**	**212**	**203**	**194**	**186**	**178**	**171**	**165**	**159**	**154**	**149**	1.556
2	546	513	485													0.507
3	679	639	604	572	543	517	494	472	453							0.379
4	812	765	722	684	650	619	591	565	542	520	500	481	464	448	433	0.303
5	925	877	833	794	757	721	688	658	631	605	582	561	541	522	505	0.252
6	1031	980	932	889	849	813	779	748	720	691	664	640	617	596	576	0.216
7	1132	1077	1027	980	938	899	862	829	797	768	741	716	692	669	647	0.189
8	1227	1169	1117	1068	1023	981	943	907	873	842	813	785	760	736	713	0.168
9	1315	1256	1202	1151	1104	1060	1020	982	946	913	882	853	826	800	776	0.151
10	1399	1338	1282	1230	1182	1136	1094	1054	1017	982	950	919	890	863	837	0.137

D_{3N} = 226 K2 = 1764

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DIAPHRAGM - 3N / 3NI

3N / 3NI ROOF DECK

- **Support Fasteners: 5/8" puddle welds**
- **Sidelap Fasteners: welded[1]**

$$G' = \frac{K_2}{4.31 + \frac{0.3 * D_x}{SPAN} + 3 * K_1 * SPAN}, \text{ Kips/inch}$$

SPAN is in feet

[1]The **bold** values do not comply with the minimum spacing requirements for sidelap connections and shall not be used except with properly spaced button-punched sidelaps with 3NI deck.

Type 22 - 24/4 Attachment Pattern

Factor of safety = 2.35

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.) 8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	K1
0	**119**	**112**	**105**	**100**	**95**	**90**	**86**	**82**	**79**	**76**	**73**	**70**	**68**	**65**	**63**	1.093
2	257	242	229													0.356
3	327	307	290	275	261	249	238	227	218							0.266
4	388	368	350	333	317	302	288	276	264	253	244	235	226	219	211	0.213
5	444	421	401	383	366	350	336	322	310	298	286	276	266	257	248	0.177
6	495	471	450	430	411	394	378	364	350	337	326	314	304	294	285	0.152
7	543	518	495	474	455	436	419	404	389	375	362	350	339	328	318	0.133
8	587	562	538	516	495	476	458	442	426	411	398	385	373	361	350	0.118
9	628	602	578	555	534	514	496	478	462	446	432	418	405	393	373	0.106
10	665	639	615	592	570	550	531	513	496	480	464	450	428	399	373	0.096

D_{3N} = 653 K2 = 870

Type 20 - 24/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.) 8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	K1
0	**142**	**134**	**127**	**120**	**114**	**108**	**104**	**99**	**95**	**91**	**88**	**84**	**81**	**79**	**76**	1.204
2	309	291	275													0.392
3	392	369	349	330	314	299	285	273	262							0.293
4	466	442	420	400	380	362	346	331	317	304	293	282	272	262	254	0.234
5	533	506	482	459	439	420	403	387	372	358	344	331	319	308	298	0.195
6	595	566	540	516	494	473	454	437	420	405	391	378	365	353	342	0.167
7	652	622	595	569	546	524	504	485	467	450	435	420	407	394	382	0.146
8	705	675	646	620	595	572	550	530	512	494	477	462	447	434	421	0.130
9	754	723	694	667	641	617	595	574	554	536	518	502	486	472	458	0.117
10	799	768	738	711	685	660	637	616	595	576	558	540	524	509	494	0.106

D_{3N} = 448 K2 = 1056

Type 18 - 24/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.) 8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	K1
0	**185**	**174**	**164**	**156**	**148**	**141**	**134**	**129**	**123**	**118**	**114**	**109**	**106**	**102**	**99**	1.385
2	401	377	356													0.451
3	509	479	453	429	407	388	370	354	339							0.337
4	605	574	545	519	494	470	449	429	412	395	380	366	353	341	329	0.269
5	691	657	625	596	570	545	523	502	483	464	446	430	415	400	387	0.224
6	772	735	701	670	641	614	590	567	546	526	507	490	474	459	444	0.192
7	846	808	772	739	708	680	654	629	606	585	565	546	528	512	496	0.168
8	915	876	839	804	772	742	714	688	664	641	620	600	581	563	546	0.149
9	979	938	901	865	832	801	772	745	720	695	673	651	631	612	594	0.134
10	1037	996	958	922	889	857	827	799	772	747	724	701	680	660	641	0.122

D_{3N} = 321 K2 = 1398

Type 16 - 24/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.) 8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	K1
0	**228**	**215**	**203**	**192**	**182**	**174**	**166**	**159**	**152**	**146**	**140**	**135**	**130**	**126**	**122**	1.556
2	495	466	440													0.507
3	629	592	559	529	503	479	457	437	419							0.379
4	747	708	673	641	610	581	554	530	508	488	469	452	435	420	406	0.303
5	854	811	772	736	703	673	646	620	596	573	551	531	512	494	478	0.252
6	953	907	865	827	791	758	728	700	674	649	626	605	585	566	549	0.216
7	1045	997	953	912	874	839	807	776	748	722	697	674	652	631	612	0.189
8	1130	1081	1035	993	953	916	882	850	820	792	765	740	717	695	674	0.168
9	1208	1158	1112	1068	1028	989	953	920	888	859	831	804	779	756	734	0.151
10	1280	1230	1183	1139	1097	1058	1021	986	954	923	894	866	840	815	792	0.137

D_{3N} = 226 K2 = 1764

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3N / 3NI ROOF DECK

- **Support Fasteners: 5/8" puddle welds**
- **Sidelap Fasteners: #10 TEK Screws**

Type 22 - 24/4 Attachment Pattern

Factor of safety = 2.35

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	
2	186	175	165													0.587
3	220	207	195	185	176	167	160	153	146							0.476
4	253	238	225	213	203	193	184	176	169	162	156	150	145	140	135	0.401
5	287	270	255	242	230	219	209	200	191	184	177	170	164	158	153	0.346
6	321	302	285	270	257	244	233	223	214	205	197	190	183	177	171	0.305
7	353	334	315	298	284	270	258	247	236	227	218	210	203	196	189	0.272
8	382	362	344	327	310	296	282	270	259	248	239	230	222	214	207	0.246
9	409	388	369	352	336	321	307	293	281	270	260	250	241	233	225	0.224
10	436	414	394	376	359	343	329	316	304	291	280	270	260	251	243	0.206

D_{3N} = 653 K2 = 870

Type 20 - 24/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	
2	224	211	199													0.646
3	265	249	236	223	212	202	193	184	177							0.525
4	306	288	272	258	245	233	222	213	204	196	188	181	175	169	163	0.442
5	347	326	308	292	277	264	252	241	231	222	213	205	198	191	185	0.381
6	388	365	345	326	310	295	282	270	258	248	239	230	222	214	207	0.335
7	427	403	381	361	343	327	312	298	286	274	264	254	245	236	229	0.299
8	461	437	415	395	376	358	341	327	313	300	289	278	268	259	250	0.270
9	495	469	446	425	406	388	371	355	340	327	314	302	292	282	272	0.247
10	527	500	476	454	434	415	398	382	367	353	339	327	315	304	294	0.227

D_{3N} = 448 K2 = 1056

Type 18 - 24/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	
2	293	276	260													0.744
3	347	327	309	292	278	264	252	241	231							0.604
4	401	378	357	338	321	306	292	279	268	257	247	238	229	221	214	0.508
5	455	429	405	384	364	347	331	317	304	291	280	270	260	251	243	0.439
6	510	480	453	429	408	388	371	354	340	326	314	302	291	281	272	0.386
7	561	531	501	475	451	429	410	392	376	361	347	334	322	311	301	0.345
8	606	574	545	519	494	471	449	430	412	395	380	366	353	341	330	0.311
9	650	616	586	559	533	510	489	467	448	430	414	398	384	371	358	0.284
10	692	657	626	597	570	546	523	503	483	465	447	430	415	401	387	0.261

D_{3N} = 321 K2 = 1398

Type 16 - 24/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	
2	365	343	324													0.835
3	433	407	385	365	346	330	315	301	289							0.678
4	501	472	446	422	401	382	365	349	334	321	308	297	286	277	267	0.571
5	570	536	506	480	456	434	414	396	380	365	350	338	325	314	304	0.493
6	638	600	567	537	510	486	464	444	425	408	393	378	364	352	340	0.434
7	701	664	628	595	565	538	514	491	471	452	435	418	404	390	377	0.387
8	757	718	682	650	620	590	563	539	516	496	477	459	443	427	413	0.350
9	812	771	733	699	667	639	612	586	562	539	519	499	482	465	449	0.319
10	865	822	783	747	714	683	655	629	605	583	561	540	521	503	486	0.293

D_{3N} = 226 K2 = 1764

$$G' = \frac{K_2}{4.31 + \frac{0.3 * D_x}{SPAN} + 3 * K_1 * SPAN}, \text{ Kips/inch}$$

SPAN is in feet

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3N / 3NI ROOF DECK

- **Support Fasteners: #12 TEK Screws**
- **Sidelap Fasteners: #10 TEK Screws**

Type 22 - 24/4 Attachment Pattern

Factor of safety = 2.35

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	
2	137	129	121													0.625
3	170	160	151	143	136	130	124	118	114							0.502
4	204	192	181	172	163	155	148	142	136	131	126	121	117	113	109	0.419
5	232	220	209	199	190	181	173	165	158	152	146	141	136	131	127	0.359
6	259	246	234	223	213	204	196	188	181	174	167	161	155	150	145	0.315
7	284	270	258	246	235	226	217	208	200	193	186	180	174	168	163	0.280
8	308	293	280	268	257	246	237	228	219	212	204	197	191	185	179	0.252
9	330	315	302	289	277	266	256	247	238	229	222	214	208	201	195	0.229
10	351	336	322	309	297	285	275	265	256	247	239	231	224	217	210	0.210

D_{3N} = 653 K2 = 870

Type 20 - 24/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	
2	166	156	147													0.689
3	207	195	184	174	165	157	150	144	138							0.552
4	247	233	220	208	198	189	180	172	165	158	152	147	141	137	132	0.461
5	282	267	254	242	231	220	210	201	192	185	178	171	165	159	154	0.396
6	314	298	284	271	259	248	237	228	219	211	203	195	188	182	176	0.347
7	345	328	313	299	286	274	263	253	243	234	226	218	211	204	197	0.308
8	373	356	340	325	312	299	287	276	266	257	248	239	232	224	217	0.278
9	400	383	366	351	336	323	311	299	289	278	269	260	252	244	237	0.253
10	426	407	391	375	360	346	333	321	310	299	290	280	271	263	255	0.232

D_{3N} = 448 K2 = 1056

Type 18 - 24/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	
2	220	207	195													0.793
3	274	258	243	230	219	209	199	190	182							0.636
4	328	309	291	276	262	250	238	228	219	210	202	194	187	181	175	0.531
5	373	354	336	320	305	291	278	266	255	244	235	226	218	211	204	0.455
6	416	395	376	359	343	328	314	302	290	279	268	258	249	241	233	0.399
7	456	434	414	395	378	363	348	334	322	310	299	289	279	270	261	0.355
8	494	471	450	431	413	396	380	366	352	340	328	317	307	297	288	0.319
9	530	507	485	464	445	428	411	396	382	369	356	344	333	323	313	0.291
10	564	539	517	496	477	458	441	425	411	397	383	371	359	348	338	0.266

D_{3N} = 321 K2 = 1398

Type 16 - 24/4 Attachment Pattern

Number of Sidelap Fasteners	ALLOWABLE DIAPHRAGM SHEAR STRENGTH (plf) SPAN LENGTH (ft-in.)															K1
	8'-0"	8'-6"	9'-0"	9'-6"	10'-0"	10'-6"	11'-0"	11'-6"	12'-0"	12'-6"	13'-0"	13'-6"	14'-0"	14'-6"	15'-0"	
2	277	261	246													0.890
3	345	325	307	291	276	263	251	240	230							0.714
4	413	389	368	348	331	315	301	288	276	265	255	245	236	228	221	0.596
5	470	446	424	404	385	367	350	335	321	308	297	286	275	266	257	0.512
6	525	498	474	452	432	414	397	381	366	352	339	326	314	304	293	0.448
7	576	548	522	499	477	457	439	422	406	391	377	365	353	341	330	0.399
8	624	595	568	543	521	499	480	462	445	429	414	400	387	375	363	0.359
9	669	639	611	586	562	540	519	500	482	465	449	435	421	408	395	0.326
10	711	681	652	626	601	578	557	537	518	500	484	468	453	440	426	0.299

D_{3N} = 226 K2 = 1764

$$G' = \frac{K_2}{4.31 + \frac{0.3 * D_x}{SPAN} + 3 * K_1 * SPAN}, \text{ Kips/inch}$$

SPAN is in feet

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