

DIAPHRAGM B-DECK

WELDED ATTACHMENT



1.5WR22

Design thickness	0.0295 in.
Support fastening	5/8" arc spot welds or equivalent
Side-lap fastening	#10 screws

F _u	50 ksi
F _y	40 ksi
F _{xx}	60 ksi

Loading	ϕ_{df}	Ω_{df}
Seismic	0.55	3.00
Wind	0.75	2.15
Other	0.55	3.00

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S _{nf} , plf ^{1,2}									K ₁ 1/ft
		Span, ft.									
		3	3.5	4	4.5	5	5.5	6	6.5	7	
36/9	0	1940	1705	1520	1345	1200					0.324
	1	2045	1805	1610	1445	1290	1165	1060			0.272
	2	2150	1905	1705	1540	1385	1250	1140	1045	960	0.234
	3	2250	2000	1795	1620	1475	1335	1215	1115	1025	0.206
	4	2350	2090	1880	1705	1555	1415	1290	1185	1095	0.183
	5	2440	2180	1965	1780	1630	1500	1370	1255	1160	0.165
	6	2525	2265	2045	1860	1700	1570	1445	1325	1225	0.151
36/7	0	1240	1075	935	825	740					0.486
	1	1365	1190	1050	930	830	750	685			0.377
	2	1490	1300	1155	1030	925	835	760	700	645	0.308
	3	1605	1410	1255	1125	1015	920	840	770	710	0.261
	4	1715	1510	1350	1215	1105	1000	915	840	775	0.226
	5	1820	1610	1440	1300	1185	1085	990	910	845	0.199
	6	1925	1705	1530	1385	1260	1160	1070	980	910	0.178
36/5	0	1095	965	860	765	685					0.583
	1	1205	1065	950	860	775	700	640			0.433
	2	1305	1160	1040	940	860	785	715	655	605	0.345
	3	1395	1250	1125	1020	935	860	790	725	670	0.286
	4	1485	1335	1205	1100	1005	925	860	795	735	0.245
	5	1560	1410	1280	1170	1075	995	920	860	805	0.214
	6	1630	1485	1355	1240	1145	1055	985	920	860	0.190
36/4	0	840	740	655	575	515					0.728
	1	945	835	750	675	605	545	495			0.509
	2	1040	930	835	760	695	630	575	525	485	0.391
	3	1125	1010	915	835	765	705	650	595	550	0.318
	4	1200	1085	990	905	835	770	715	665	615	0.267
	5	1265	1155	1060	975	900	835	775	725	680	0.231
	6	1325	1220	1120	1035	960	890	830	780	730	0.203

¹ Nominal shear strength of bare deck shown above may be limited by shear buckling. See Table below.

	ϕ_{df}	Ω_{df}
Buckling	0.80	2.00

Deck Profile	l in ⁴ /ft	Nominal Shear Due to Panel Buckling, S _{nb} , plf ²								
		Span, ft.								
		3	3.5	4	4.5	5	5.5	6	6.5	7
WR	0.173	15257	11209	8582	6781	5493	4539	3814	3250	2802

² Design Strengths: ASD Required strength (Service Applied Load) $\leq \text{Min} \{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$ • LRFD Required strength (Factored Applied Load) $\leq \text{Min} \{\phi_{df} S_{nf}, \phi_{db} S_{nb}\}$

1.5WR20

Design thickness	0.0358 in.
Support fastening	5/8" arc spot welds or equivalent
Side-lap fastening	#10 screws

F_u	50 ksi
F_y	40 ksi
F_{xx}	60 ksi

Loading	ϕ_{df}	Ω_{df}
Seismic	0.55	3.00
Wind	0.75	2.15
Other	0.55	3.00

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S _{nf} , plf ^{1,2}									K ₁ 1/ft
		Span, ft.									
		4	4.5	5	5.5	6	6.5	7	7.5	8	
36/9	0	1855	1650	1475							0.357
	1	1980	1785	1600	1445	1315					0.299
	2	2100	1900	1720	1555	1420	1300	1200	1115	1035	0.258
	3	2220	2010	1830	1670	1520	1395	1290	1195	1115	0.226
	4	2335	2115	1935	1775	1625	1490	1375	1275	1190	0.202
	5	2445	2220	2030	1870	1725	1585	1465	1360	1270	0.182
	6	2555	2325	2130	1960	1815	1680	1550	1440	1345	0.166
36/7	0	1150	1015	910							0.535
	1	1300	1150	1030	935	850					0.415
	2	1435	1285	1155	1045	955	875	810	750	700	0.340
	3	1565	1405	1275	1155	1055	970	895	835	780	0.287
	4	1690	1525	1385	1270	1160	1065	985	915	855	0.249
	5	1810	1635	1490	1365	1260	1160	1075	1000	930	0.219
	6	1930	1745	1595	1465	1350	1255	1160	1080	1010	0.196
36/5	0	1050	940	840							0.642
	1	1175	1060	965	870	795					0.477
	2	1290	1170	1065	980	895	825	760	705	660	0.380
	3	1405	1275	1165	1075	995	920	850	790	735	0.315
	4	1510	1375	1260	1165	1080	1005	935	870	810	0.270
	5	1605	1470	1355	1250	1160	1085	1015	950	890	0.236
	6	1700	1560	1440	1335	1240	1160	1090	1025	965	0.209
36/4	0	805	710	635							0.802
	1	925	835	755	685	620					0.561
	2	1040	945	865	795	725	665	615	570	530	0.431
	3	1145	1045	960	885	820	760	700	650	605	0.350
	4	1240	1140	1050	970	900	840	790	735	685	0.294
	5	1330	1225	1135	1050	980	915	860	810	760	0.254
	6	1410	1305	1210	1130	1055	990	930	875	830	0.224

¹ Nominal shear strength of bare deck shown above may be limited by shear buckling. See Table below.

	ϕ_{df}	Ω_{df}
Buckling	0.80	2.00

Deck Profile	I in ⁴ /ft	Nominal Shear Due to Panel Buckling, S_{nb} plf ²								
		Span, ft.								
		4	4.5	5	5.5	6	6.5	7	7.5	8
WR	0.210	11482	9072	7348	6073	5103	4348	3749	3266	2870

² Design Strengths: ASD Required strength (Service Applied Load) $\leq \text{Min} \{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$ • LRFD Required strength (Factored Applied Load) $\leq \text{Min} \{\phi_{df} S_{nf}, \phi_{db} S_{nb}\}$

1.5WR18

Design thickness	0.0474 in.
Support fastening	5/8" arc spot welds or equivalent
Side-lap fastening	#10 screws

F_u	50 ksi
F_y	40 ksi
F_{xx}	60 ksi

Loading	ϕ_{df}	Ω_{df}
Seismic	0.55	3.00
Wind	0.75	2.15
Other	0.55	3.00

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S_{nf} , plf ^{1,2}									K_1 1/ft
		Span, ft.									
		5	5.5	6	6.5	7	7.5	8	8.5	9	
36/9	0	1935									0.410
	1	2120	1920	1750							0.344
	2	2290	2090	1905	1750	1615	1500	1400	1310	1230	0.297
	3	2450	2250	2060	1895	1750	1625	1515	1420	1335	0.261
	4	2600	2390	2215	2035	1885	1750	1635	1530	1440	0.232
	5	2750	2530	2345	2180	2015	1875	1750	1640	1545	0.210
	6	2890	2670	2475	2305	2150	2000	1865	1750	1645	0.191
36/7	0	1190									0.615
	1	1375	1245	1135							0.478
	2	1565	1415	1295	1190	1100	1020	955	895	840	0.391
	3	1730	1585	1450	1335	1235	1145	1070	1005	945	0.330
	4	1895	1735	1605	1475	1365	1270	1190	1115	1050	0.286
	5	2050	1885	1740	1615	1500	1395	1305	1225	1155	0.253
	6	2205	2030	1875	1745	1630	1520	1425	1335	1260	0.226
36/5	0	1100									0.739
	1	1275	1165	1065							0.549
	2	1430	1315	1215	1120	1035	965	900	845	790	0.437
	3	1580	1455	1350	1255	1170	1090	1015	955	895	0.363
	4	1720	1590	1475	1375	1290	1210	1135	1065	1000	0.310
	5	1855	1720	1600	1495	1400	1315	1245	1175	1105	0.271
	6	1985	1840	1715	1605	1510	1420	1340	1270	1205	0.241
36/4	0	830									0.923
	1	1015	920	840							0.645
	2	1165	1075	995	915	845	785	730	685	645	0.496
	3	1305	1210	1120	1045	980	910	850	795	750	0.403
	4	1440	1335	1245	1160	1090	1025	965	905	850	0.339
	5	1560	1455	1355	1270	1195	1130	1065	1010	955	0.293
	6	1675	1565	1465	1375	1295	1225	1160	1100	1045	0.257

¹ Nominal shear strength of bare deck shown above may be limited by shear buckling. See Table below.

	ϕ_{df}	Ω_{df}
Buckling	0.80	2.00

Deck Profile	I in ⁴ /ft	Nominal Shear Due to Panel Buckling, S_{nb} plf ²								
		Span, ft.								
		5	5.5	6	6.5	7	7.5	8	8.5	9
WR	0.279	11211	9265	7786	6634	5720	4983	4379	3879	3460

² Design Strengths: ASD Required strength (Service Applied Load) $\leq \text{Min} \{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$ • LRFD Required strength (Factored Applied Load) $\leq \text{Min} \{\phi_{df} S_{nf}, \phi_{db} S_{nb}\}$

1.5WR16

Design thickness	0.0598 in.
Support fastening	5/8" arc spot welds or equivalent
Side-lap fastening	#10 screws

F_u	50 ksi
F_y	40 ksi
F_{xx}	60 ksi

Loading	ϕ_{df}	Ω_{df}
Seismic	0.55	3.00
Wind	0.75	2.15
Other	0.55	3.00

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S _{nf} , plf ^{1,2}									K ₁ 1/ft
		Span, ft.									
		6	6.5	7	7.5	8	8.5	9	9.5	10	
36/9	0	2205									0.387
	1	2425	2230	2060	1915	1785	1675	1575			0.333
	2	2640	2430	2250	2090	1950	1830	1720	1625	1535	0.293
	3	2830	2630	2440	2270	2120	1985	1870	1765	1670	0.261
	4	3015	2805	2625	2445	2285	2140	2015	1905	1800	0.235
	5	3195	2980	2790	2620	2450	2300	2165	2040	1935	0.214
	6	3370	3145	2945	2770	2615	2455	2310	2180	2065	0.197
36/7	0	1440									0.537
	1	1660	1530	1415	1315	1230	1155	1085			0.439
	2	1885	1735	1605	1495	1395	1310	1235	1165	1105	0.371
	3	2080	1930	1795	1670	1560	1465	1380	1305	1235	0.322
	4	2275	2115	1975	1845	1725	1620	1530	1445	1370	0.284
	5	2460	2290	2140	2010	1890	1780	1675	1585	1500	0.254
	6	2645	2465	2305	2165	2040	1930	1825	1725	1635	0.229
36/5	0	1350									0.617
	1	1550	1440	1335	1245	1160	1090	1025			0.491
	2	1735	1615	1515	1420	1325	1245	1170	1105	1050	0.408
	3	1915	1785	1675	1575	1485	1400	1320	1245	1180	0.349
	4	2085	1950	1830	1720	1625	1540	1460	1385	1315	0.304
	5	2245	2105	1980	1865	1765	1670	1590	1515	1445	0.270
	6	2395	2250	2120	2005	1895	1800	1710	1630	1560	0.243
36/4	0	1075									0.725
	1	1275	1185	1100	1020	955	895	840			0.557
	2	1455	1355	1270	1195	1120	1050	990	935	885	0.452
	3	1620	1515	1425	1340	1270	1200	1135	1075	1015	0.381
	4	1775	1665	1570	1480	1405	1330	1265	1205	1150	0.329
	5	1920	1810	1705	1615	1530	1455	1385	1320	1265	0.289
	6	2055	1940	1835	1740	1655	1575	1500	1435	1370	0.258

¹ Nominal shear strength of bare deck shown above may be limited by shear buckling. See Table below.

	ϕ_{df}	Ω_{df}
Buckling	0.80	2.00

Deck Profile	I in ⁴ /ft	Nominal Shear Due to Panel Buckling, S_{nb} plf ²								
		Span, ft.								
		6	6.5	7	7.5	8	8.5	9	9.5	10
WR	0.353	11049	9414	8117	7071	6215	5505	4910	4407	3977

² Design Strengths: ASD Required strength (Service Applied Load) $\leq \text{Min} \{S_{nf} / \Omega_{df}, S_{nb} / \Omega_{db}\}$ • LRFD Required strength (Factored Applied Load) $\leq \text{Min} \{\phi_{df} S_{nf}, \phi_{db} S_{nb}\}$