



Diaphragm Shear Loads for OneDek™ RD1 Roof Deck Panel

OneDek™ RD1 Roof Deck Panel

Panel thickness = 2" (R16), 2.5" (R20), 3" (R24), 4" (R32), 5" (R41), 6" (R49)

Support fastening: #12-24 DP4 Fasteners, 8" on center across 40" panel width

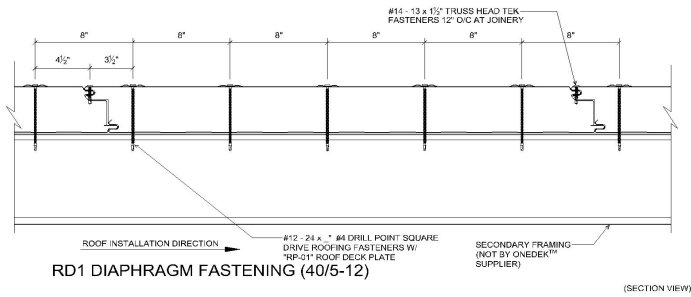
Support fastening at side joint (where No. 22 gage panels are required for the loading conditions, optional for other installations):
1/4-14 DP3 or DP5 Fasteners, (2) per WC-01 clip at side joint

Side-lap fastening: #14-14 x 1 1/2" DP2 Fasteners, 6" or 12" on center along length of panel joint

Support thickness: 16 gauge - 3/16" steel

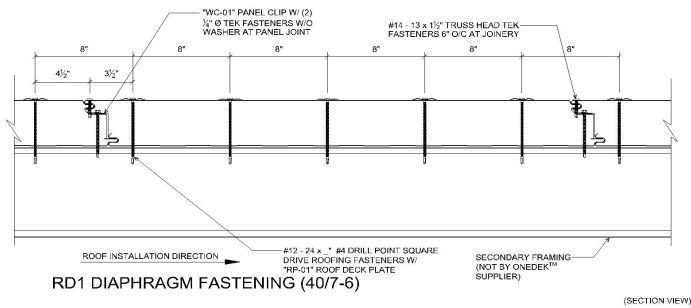
Shear Design	ASD Ω_{df}	LRFD ϕ_{df}
Seismic	2.30	0.70
Wind	2.00	0.80

Panel Gauge	Fastening System	Fastener Layout	Side-lap Stitch Along Span	Nominal (Unfactored) Shear Strength, S_{nt} , plf							Shear Stiffness (kip/in) G'
				Span (ft)							
				5	5.5	6	6.5	7	7.5	8	
26 GA ext - 26 GA int	40/5-12	40/5	12" o/c	844	823	802	781	759	738	717	28.0
26 GA ext - 24 GA int	40/5-12	40/5	12" o/c	856	851	845	840	835	829	824	39.5
22 GA ext - 22 GA int	40/7-6	40/7	6" o/c	1903	1861	1819	1777	1734	1692	1650	84.5



Notes:

- Safety factors or resistance factors **shall be applied** to the tabulated nominal shear strength.
ASD Available Strength (Allowable Service Applied Load) $\leq S_{nt}/\Omega_{df}$
LRFD Available Strength (Factored Applied Load) $\leq \phi_{df}S_{nt}$
- Design strength factors specified per requirements of AISI-S310.
- The diaphragm shear spans shown are based on shear load testing per AISI-S907
- Refer to transverse load span table for allowable gravity and wind uplift loads.
- White single-ply roofing membrane or architectural single skin roof panels must be installed for weatherproofing.
- Thermal effect due to temperature differentials have not been considered.
- Structural capacity of steel supports has not been considered.
- Panel attachment at rake edge or any perimeter edge, including cutouts, parallel to the length of the panels shall be fastened with #12-24 DP4 fasteners with RP-01 Roof Deck Plates at the same spacing used at the panel side lap.
- All panel ends with straight horizontal cuts or skewed cuts shall be fastened with #12-24 DP4 fasteners with RP-01 Roof Deck Plates and, if necessary, 1/4-14 DP3 or DP5 Fasteners, (2) per WC-01 clip at side joint at the same spacing and frequency as the design fastening system.
- Consult your AWIP representative for snow load design.
- Consult your AWIP representative for project specific requirements.





Wind Uplift and Bending Strength for OneDek™ RD1 Roof Deck Panel

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Support fastening: #12-24 DP4 Fasteners, 8" on center across 40" panel width

Support fastening at side joint (where No. 22 gage panels are required for the loading conditions, optional for other installations):

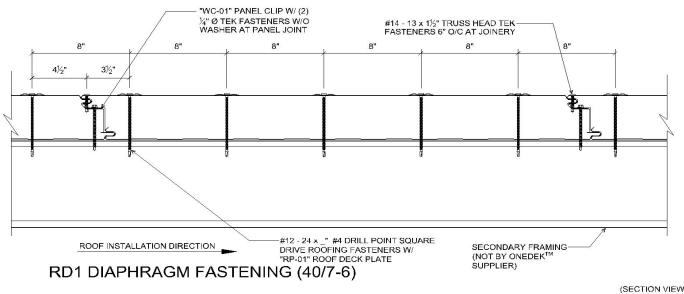
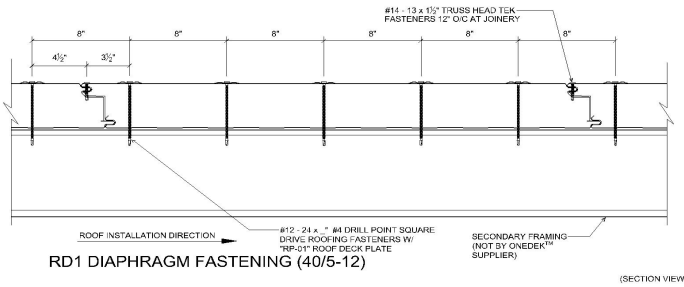
1/4-14 DP3 or DP5 Fasteners, (2) per WC-01 clip at side joint

Side-lap fastening: #14-14 x 1 1/2" DP2 Fasteners, 6" or 12" on center along length of panel joint

Support thickness: 16 gauge - 3/16" steel

Panel Gauge	Fastening System	Fastener Layout	Side-lap Stitch Along Span	Design Method	Wind Uplift Connection Strength, P, psf (see notes)						
					Span (ft)						
					5	5.5	6	6.5	7	7.5	8
26 GA ext - 26 GA int	40/5-12	40/5	12" o/c	ASD	88	80	73	68	62	58	55
26 GA ext - 24 GA int	40/5-12	40/5	12" o/c		88	80	73	68	62	58	55
22 GA ext - 22 GA int	40/7-6	40/7	6" o/c		123	112	102	95	88	82	77
26 GA ext - 26 GA int	40/5-12	40/5	12" o/c	LRFD	132	120	110	102	93	87	83
26 GA ext - 24 GA int	40/5-12	40/5	12" o/c		132	120	110	102	93	87	83
22 GA ext - 22 GA int	40/7-6	40/7	6" o/c		185	168	153	143	132	123	116

Panel Thickness	Min. Panel Gauge	Panel Weight (PSF)	Design Method	Panel Out-of-Plane Bending Strength, P, psf (see notes)						
				Span (ft)						
				5	5.5	6	6.5	7	7.5	8
2"	26 GA ext - 26 GA int	2.22	ASD	58	51	45	40	36	32	29
				75	66	59	53	48	43	39
				92	82	73	66	60	54	49
				114	102	92	83	76	69	64
				146	131	118	107	98	90	83
				177	159	144	131	120	110	102
2.5"	26 GA ext - 26 GA int	2.34	LRFD	93	82	72	64	58	51	46
				120	106	94	85	77	69	62
				147	131	117	106	96	86	78
				182	163	147	133	122	110	102
				234	210	189	171	157	144	133
				283	254	230	210	192	176	163



Notes:

- Design safety factors or resistance factors **have been applied** to loads for wind uplift and bending.
 ASD Available Strength (Allowable Service Applied Load) $\leq P$
 $\Omega_{buckling} = 2.50, \Omega_{shear} = 3.00, \Omega_{fastening} = 3.00$
 LRFD Available Strength (Ultimate Factored Applied Load) $\leq P$
 $\phi_{buckling} = 0.64, \phi_{shear} = 0.53, \phi_{fastening} = 0.50$
- The lowest allowable load between wind uplift connection strength and out-of-plane bending shall be used to determine maximum span.
- Spans shown are based on transverse load testing per ASTM-E72 and strength of fastening systems.
- Snow load design has not been taken into consideration. Contact your AWIP representative for snow load analysis.
- Deflection Limit = $L/240$
- White single-ply roofing membrane or architectural single skin roof panels must be installed for weatherproofing.
- Thermal effect due to temperature differentials have not been considered.
- Structural capacity of steel supports has not been considered.
- Consult your AWIP representative for project specific requirements.



OneDek™ RD1 Diaphragm Strength Comparison to Traditional Roof Decks

OneDek™ RD1 Roof Deck Panel

Panel thickness = 2" (R16), 2.5" (R20), 3" (R24), 4" (R32), 5" (R41), 6" (R49)

Support fastening: #12-24 DP4 Fasteners, 8" on center across 40" panel width

Support fastening at side joint (where No. 22 gage panels are required for the loading conditions, optional for other installations):

1/4-14 DP3 or DP5 Fasteners, (2) per WC-01 clip at side joint

Side-lap fastening: #14-14 x 1 1/2" DP2 Fasteners, 6" or 12" on center along length of panel joint

Support thickness: 16 gauge - 3/16" steel

Fasteners		
Shear Design	ASD Ω_{df}	LRFD ϕ_{df}
Seismic	2.30	0.70
Wind	2.00	0.80

Panel Gauge	Fastening System	Fastener Layout	Side-lap Stitch Along Span	Nominal (Unfactored) Shear Strength, S_{nfr} , plf							
				Span (ft)							
				5	5.5	6	6.5	7	7.5	8	
26 GA ext - 26 GA int	40/5-12	40/5	12" o/c	844	823	802	781	759	738	717	
26 GA ext - 24 GA int	40/5-12	40/5	12" o/c	856	851	845	840	835	829	824	
22 GA ext - 22 GA int	40/7-6	40/7	6" o/c	1903	1861	1819	1777	1734	1692	1650	

1.5(WR, IR, NR)

Design thickness: See table below

Support fastening: #12 screws

Side-lap fastening: #10 screws

Support thickness: 16 gauge - 3/16" steel

Yield Strength: 33 ksi

Fasteners		
Shear Design	ASD Ω_{df}	LRFD ϕ_{df}
Seismic	2.30	0.70
Wind	2.00	0.80

Traditional Deck Type	Fastener Layout	Side-lap Stitch Connection/Span	Nominal Shear Strength, S_{nfr} , plf							
			5	5.5	6	6.5	7	7.5	8	
1.5(WR, IR, NR)22 - .0295 in	36/9	5 per span	835	775	720	670	630	n/a	n/a	
1.5(WR, IR, NR)20 - .0358 in	36/9	5 per span	1050	975	905	845	795	750	705	
1.5(WR, IR, NR)20 - .0358 in	36/9	4 per span	970	900	835	780	730	680	635	
1.5(WR, IR, NR)20 - .0358 in	36/7	6 per span	920	855	795	745	700	660	620	
1.5(WR, IR, NR)18 - .0474 in	36/5	5 per span	1035	975	920	870	820	780	740	
1.5(WR, IR, NR)18 - .0474 in	36/4	6 per span	925	885	845	810	775	740	710	

1.5(WR, IR, NR)

Design thickness: See table below

Support fastening: 5/8 in. arc spot welds

Side-lap fastening: 5/8 in. arc spot welds

Support thickness: 16 gauge - 3/16" steel

Yield Strength: 33 ksi

Welds		
Shear Design	ASD Ω_{df}	LRFD ϕ_{df}
Seismic	3.00	0.55
Wind	2.15	0.75

Traditional Deck Type	Fastener Layout	Side-lap arc spot weld/Span	Nominal Shear Strength, S_{nfr} , plf							
			5	5.5	6	6.5	7	7.5	8	
1.5(WR, IR, NR)20 - .0358 in	36/9	3 per span	2125	1965	1825	1700	1590	1480	1380	
1.5(WR, IR, NR)20 - .0358 in	36/9	4 per span	2345	2175	2025	1895	1775	1675	1580	

