

# DIAPHRAGM N-DECK

## SCREW ATTACHMENT - BUTTON PUNCH 80KSI



### N-Deck 32/3 Screw Pattern - Button Punch 80KSI

Support fastening	AISI #12 screws or equivalent
Side-lap fastening	Non-piercing Button Punch

$F_u$	62 ksi
$F_y$	60 ksi
$F_{xx}$	60 ksi

Loading	$\phi_{df}$	$\Omega_{df}$
Seismic	0.70	2.30
Wind	0.80	2.00
Other	0.70	2.30

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, $S_{nr}$ , plf <sup>1,2</sup>									$K_1$ 1/ft
		Span, ft.									
		8	8.5	9	9.5	10	10.5	11	11.5	12	
<b>3DR22</b> <b>0.0295"</b> <b>32/3</b>	2	170	160	150							1.093
	3	185	170	160	155	145	140	130	125	120	1.033
	4	195	185	175	165	155	150	140	135	130	0.980
	5	210	195	185	175	165	160	150	145	140	0.932
	6	220	205	195	185	175	165	160	150	145	0.889
	7	235	220	205	195	185	175	170	160	155	0.849
	8	245	230	220	205	195	185	180	170	165	0.813
	9	260	240	230	215	205	195	185	180	170	0.779
	10	270	255	240	225	215	205	195	185	180	0.749
	11	285	265	250	240	225	215	205	195	190	0.720
	12	295	280	260	250	235	225	215	205	195	0.694
	<b>l, in4/ft</b>		<b>Nominal Shear Strength due to Panel Buckling, <math>S_{nb}</math>, plf</b>								
0.808		6643	5884	5249	4711	4252	3856	3514	3215	2952	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, $S_{nr}$ , plf <sup>1,2</sup>									$K_1$ 1/ft
		Span, ft.									
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	
<b>3DR20</b> <b>0.0358</b> <b>32/3</b>	2	180									1.204
	3	190	180	170	165	155	150	140			1.139
	4	200	190	180	170	165	155	150	145	140	1.080
	5	210	200	190	180	175	165	160	150	145	1.027
	6	225	210	200	190	180	175	165	160	155	0.979
	7	235	220	210	200	190	185	175	170	160	0.935
	8	245	235	220	210	200	190	185	175	170	0.895
	9	255	245	230	220	210	200	190	185	175	0.858
	10	270	255	240	230	220	210	200	190	185	0.825
	11	280	265	250	240	230	220	210	200	190	0.793
	12	290	275	260	250	235	225	215	210	200	0.764
	<b>l, in4/ft</b>		<b>Nominal Shear Strength due to Panel Buckling, <math>S_{nb}</math>, plf</b>								
0.989		7060	6337	5719	5187	4726	4324	3971	3660	3384	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, $S_{nr}$ plf <sup>1,2</sup>									$K_1$	
		Span, ft.										
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	1/ft	
<b>3DR18</b> <b>0.0474</b> <b>32/3</b>	3	215	205	195	190	180					1.310	
	4	225	215	205	195	190	180	175	170	160	1.242	
	5	235	225	215	205	195	190	180	175	170	1.182	
	6	245	235	225	215	205	195	190	185	175	1.126	
	7	255	245	235	225	215	205	195	190	185	1.076	
	8	265	255	245	230	220	215	205	195	190	1.030	
	9	275	265	250	240	230	220	215	205	195	0.988	
	10	285	275	260	250	240	230	220	210	205	0.949	
	11	295	285	270	260	245	235	230	220	210	0.913	
	12	305	295	280	265	255	245	235	225	220	0.879	
	13	315	300	290	275	265	255	245	235	225	0.849	
	<b>l, in4/ft</b>		<b>Nominal Shear Strength due to Panel Buckling, <math>S_{nb}</math> plf</b>									
	1.323		8782	7966	7258	6640	6099	5620	5196	4819	4481	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, $S_{nr}$ plf <sup>1,2</sup>									$K_1$	
		Span, ft.										
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	1/ft	
<b>3DR16</b> <b>0.0598</b> <b>32/3</b>	3	240	230	220							1.471	
	4	250	240	230	220	210	205	195	190	185	1.396	
	5	260	250	240	230	220	210	205	195	190	1.327	
	6	270	260	245	235	230	220	210	205	195	1.265	
	7	280	265	255	245	235	225	220	210	205	1.209	
	8	290	275	265	255	245	235	225	220	210	1.157	
	9	295	285	270	260	250	240	235	225	215	1.109	
	10	305	295	280	270	260	250	240	230	225	1.066	
	11	315	300	290	275	265	255	245	240	230	1.025	
	12	325	310	295	285	275	265	255	245	235	0.988	
	13	335	320	305	295	280	270	260	250	245	0.953	
	<b>l, in4/ft</b>		<b>Nominal Shear Strength due to Panel Buckling, <math>S_{nb}</math> plf</b>									
	1.672		10299	9423	8654	7975	7374	6838	6358	5927	5538	

	$\phi_{df}$	$\Omega_{df}$
Buckling	0.80	2.00

<sup>1</sup>Nominal shear strength of bare deck shown above may be limited by shear buckling.

<sup>2</sup>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)  $\leq \text{Min} \{\phi_{df}S_{nf}, \phi_{db}S_{nb}\}$

**N-Deck 32/5 Screw Pattern - Button Punch 80KSI**

Support fastening	AISI #12 screws or equivalent
Side-lap fastening	Non-piercing Button Punch

F <sub>u</sub>	62 ksi
F <sub>y</sub>	60 ksi
F <sub>xx</sub>	60 ksi

Loading	φ <sub>df</sub>	Ω <sub>df</sub>
Seismic	0.70	2.30
Wind	0.80	2.00
Other	0.70	2.30

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S <sub>nr</sub> , plf <sup>1,2</sup>									K <sub>1</sub> 1/ft
		Span, ft.									
		8	8.5	9	9.5	10	10.5	11	11.5	12	
<b>3DR22 0.0295" 32/5</b>	2	215	200	190							0.758
	3	225	215	200	190	180	170	165	155	150	0.729
	4	240	225	210	200	190	180	175	165	160	0.702
	5	250	235	225	210	200	190	180	175	165	0.677
	6	265	250	235	220	210	200	190	185	175	0.653
	7	275	260	245	230	220	210	200	190	185	0.632
	8	290	270	255	245	230	220	210	200	190	0.611
	9	300	285	265	255	240	230	220	210	200	0.592
	10	315	295	280	265	250	240	225	215	210	0.574
	11	325	305	290	275	260	250	235	225	215	0.558
	12	340	320	300	285	270	255	245	235	225	0.542
		<b>I, in4/ft</b>	<b>Nominal Shear Strength due to Panel Buckling, S<sub>nb</sub>, plf</b>								
	0.808	6643	5884	5249	4711	4252	3856	3514	3215	2952	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, S <sub>nr</sub> , plf <sup>1,2</sup>									K <sub>1</sub> 1/ft
		Span, ft.									
		9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	
<b>3DR20 0.0358 32/5</b>	2	225									0.835
	3	235	225	215	205	195	185	175			0.803
	4	250	235	225	210	205	195	185	180	170	0.773
	5	260	245	235	220	210	200	195	185	180	0.745
	6	270	255	245	230	220	210	200	195	185	0.720
	7	280	265	255	240	230	220	210	200	195	0.696
	8	295	275	265	250	240	230	220	210	200	0.674
	9	305	290	275	260	250	235	225	220	210	0.653
	10	315	300	285	270	255	245	235	225	215	0.633
	11	325	310	295	280	265	255	245	235	225	0.614
	12	335	320	305	290	275	265	250	240	235	0.597
		<b>I, in4/ft</b>	<b>Nominal Shear Strength due to Panel Buckling, S<sub>nb</sub>, plf</b>								
	0.989	7060	6337	5719	5187	4726	4324	3971	3660	3384	

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, $S_{nr}$ plf <sup>1,2</sup>									$K_1$
		Span, ft.									
		10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	1/ft
<b>3DR18</b> <b>0.0474</b> <b>32/5</b>	3	275	260	250	235	225					0.924
	4	285	270	255	245	235	225	215	210	200	0.889
	5	295	280	265	255	245	235	225	215	210	0.858
	6	305	290	275	265	250	240	235	225	215	0.828
	7	315	300	285	270	260	250	240	230	225	0.801
	8	325	310	295	280	270	260	250	240	230	0.775
	9	335	315	305	290	275	265	255	245	235	0.751
	10	345	325	310	300	285	275	265	255	245	0.728
	11	355	335	320	305	295	280	270	260	250	0.707
	12	365	345	330	315	300	290	280	270	260	0.687
	13	375	355	340	325	310	300	285	275	265	0.668
	<b>l, in4/ft</b>		<b>Nominal Shear Strength due to Panel Buckling, <math>S_{nb}</math> plf</b>								
	1.323		8782	7966	7258	6640	6099	5620	5196	4819	4481

Fastener Layout	Side-lap Conn/Span	Nominal Shear Strength, $S_{nr}$ plf <sup>1,2</sup>									$K_1$
		Span, ft.									
		11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	1/ft
<b>3DR16</b> <b>0.0598</b> <b>32/5</b>	3	305	295	280							1.037
	4	315	300	290	275	265	255	245	240	230	0.999
	5	325	310	295	285	275	265	255	245	235	0.964
	6	335	320	305	295	280	270	260	255	245	0.930
	7	345	330	315	300	290	280	270	260	250	0.899
	8	350	335	320	310	295	285	275	265	255	0.870
	9	360	345	330	315	305	295	285	275	265	0.843
	10	370	355	340	325	315	300	290	280	270	0.818
	11	380	365	345	335	320	310	295	285	275	0.794
	12	390	370	355	340	330	315	305	295	285	0.771
	13	395	380	365	350	335	325	310	300	290	0.750
	<b>l, in4/ft</b>		<b>Nominal Shear Strength due to Panel Buckling, <math>S_{nb}</math> plf</b>								
	1.672		10299	9423	8654	7975	7374	6838	6358	5927	5538

	$\phi_{df}$	$\Omega_{df}$
Buckling	0.80	2.00

<sup>1</sup> Nominal shear strength of bare deck shown above may be limited by shear buckling.

<sup>2</sup> 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)  $\leq \text{Min} \{\phi_{df} S_{nf}, \phi_{db} S_{nb}\}$