

DIAPHRAGM N-DECK

WELDED ATTACHMENT



N-Deck 32/3 Weld Pattern

| | |
|--------------------|-----------------------------------|
| Support fastening | 5/8" arc spot welds or equivalent |
| Side-lap fastening | AISI #10 screws or equivalent |

| | |
|-----------------|--------|
| F _u | 60 ksi |
| F _y | 50 ksi |
| F _{xx} | 60 ksi |

| | | |
|---------|------|------|
| Loading | φdf | Ωdf |
| 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 _{nr} , plf ^{1,2} | | | | | | | | | K ₁ 1/ft |
|---|--------------------|--|--|------|------|------|------|------|------|------|------------------------|
| | | Span, ft. | | | | | | | | | |
| | | 8 | 8.5 | 9 | 9.5 | 10 | 10.5 | 11 | 11.5 | 12 | |
| 3DR22 0.0295" 32/3 | 2 | 435 | 410 | 385 | | | | | | | 0.508 |
| | 3 | 505 | 475 | 445 | 425 | 400 | 385 | 365 | 350 | 335 | 0.401 |
| | 4 | 570 | 540 | 510 | 480 | 455 | 435 | 415 | 395 | 380 | 0.331 |
| | 5 | 635 | 605 | 570 | 540 | 510 | 490 | 465 | 445 | 425 | 0.282 |
| | 6 | 685 | 655 | 620 | 595 | 565 | 540 | 515 | 495 | 470 | 0.246 |
| | 7 | 735 | 700 | 670 | 640 | 610 | 585 | 565 | 540 | 520 | 0.217 |
| | 8 | 780 | 745 | 715 | 685 | 655 | 630 | 605 | 580 | 560 | 0.195 |
| | 9 | 825 | 790 | 755 | 725 | 695 | 670 | 645 | 620 | 595 | 0.177 |
| | 10 | 865 | 830 | 795 | 765 | 735 | 705 | 680 | 655 | 635 | 0.162 |
| | 11 | 905 | 870 | 835 | 800 | 770 | 745 | 715 | 690 | 670 | 0.149 |
| | 12 | 940 | 905 | 870 | 840 | 805 | 780 | 750 | 725 | 700 | 0.138 |
| | | I, in4/ft | Nominal Shear Strength due to Panel Buckling, S_{nb}, plf | | | | | | | | |
| | 0.808 | 6643 | 5884 | 5249 | 4711 | 4252 | 3856 | 3514 | 3215 | 2952 | |

| Fastener Layout | Side-lap Conn/Span | Nominal Shear Strength, S _{nr} , plf ^{1,2} | | | | | | | | | K ₁ 1/ft |
|--|--------------------|--|--|------|------|------|------|------|------|------|------------------------|
| | | Span, ft. | | | | | | | | | |
| | | 9.0 | 9.5 | 10.0 | 10.5 | 11.0 | 11.5 | 12.0 | 12.5 | 13.0 | |
| 3DR20 0.0358 32/3 | 2 | 510 | | | | | | | | | 0.560 |
| | 3 | 595 | 565 | 535 | 510 | 485 | 465 | 445 | | | 0.442 |
| | 4 | 675 | 640 | 610 | 580 | 555 | 530 | 505 | 485 | 465 | 0.365 |
| | 5 | 760 | 720 | 680 | 650 | 620 | 595 | 570 | 545 | 525 | 0.311 |
| | 6 | 825 | 790 | 755 | 720 | 685 | 655 | 630 | 605 | 580 | 0.270 |
| | 7 | 890 | 850 | 815 | 780 | 750 | 720 | 690 | 665 | 635 | 0.240 |
| | 8 | 950 | 910 | 870 | 835 | 805 | 775 | 745 | 720 | 695 | 0.215 |
| | 9 | 1005 | 965 | 925 | 890 | 855 | 825 | 795 | 765 | 740 | 0.195 |
| | 10 | 1060 | 1015 | 975 | 940 | 905 | 875 | 840 | 815 | 785 | 0.178 |
| | 11 | 1110 | 1065 | 1025 | 990 | 955 | 920 | 890 | 860 | 830 | 0.164 |
| | 12 | 1160 | 1115 | 1075 | 1035 | 1000 | 965 | 935 | 905 | 875 | 0.152 |
| | | I, in4/ft | Nominal Shear Strength due to Panel Buckling, S_{nb}, plf | | | | | | | | |
| | 0.989 | 7060 | 6337 | 5719 | 5187 | 4726 | 4324 | 3971 | 3660 | 3384 | |

| Fastener Layout | Side-lap Conn/Span | Nominal Shear Strength, S_{nr} plf ^{1,2} | | | | | | | | | K_1 | |
|--|--------------------|---|--|------|------|------|------|------|------|------|-------|--|
| | | Span, ft. | | | | | | | | | | |
| | | 10.0 | 10.5 | 11.0 | 11.5 | 12.0 | 12.5 | 13.0 | 13.5 | 14.0 | 1/ft | |
| 3DR18 0.0474 32/3 | 3 | 745 | 710 | 675 | 645 | 620 | | | | | 0.508 | |
| | 4 | 855 | 815 | 780 | 745 | 715 | 685 | 660 | 635 | 610 | 0.420 | |
| | 5 | 970 | 925 | 880 | 840 | 805 | 775 | 745 | 715 | 690 | 0.357 | |
| | 6 | 1060 | 1020 | 975 | 940 | 900 | 865 | 830 | 800 | 770 | 0.311 | |
| | 7 | 1145 | 1100 | 1060 | 1020 | 980 | 950 | 915 | 885 | 850 | 0.276 | |
| | 8 | 1230 | 1180 | 1135 | 1095 | 1055 | 1020 | 985 | 955 | 925 | 0.247 | |
| | 9 | 1305 | 1255 | 1210 | 1170 | 1130 | 1090 | 1055 | 1020 | 990 | 0.224 | |
| | 10 | 1380 | 1330 | 1285 | 1240 | 1195 | 1160 | 1120 | 1085 | 1055 | 0.205 | |
| | 11 | 1450 | 1400 | 1350 | 1305 | 1265 | 1225 | 1185 | 1150 | 1115 | 0.189 | |
| | 12 | 1515 | 1465 | 1415 | 1370 | 1325 | 1285 | 1245 | 1210 | 1175 | 0.175 | |
| | 13 | 1575 | 1525 | 1475 | 1430 | 1385 | 1345 | 1305 | 1270 | 1235 | 0.163 | |
| | l, in4/ft | | Nominal Shear Strength due to Panel Buckling, S_{nb} plf | | | | | | | | | |
| | 1.323 | | 8782 | 7966 | 7258 | 6640 | 6099 | 5620 | 5196 | 4819 | 4481 | |

| Fastener Layout | Side-lap Conn/Span | Nominal Shear Strength, S_{nr} plf ^{1,2} | | | | | | | | | K_1 | |
|--|--------------------|---|--|------|------|------|------|------|------|------|-------|--|
| | | Span, ft. | | | | | | | | | | |
| | | 11.0 | 11.5 | 12.0 | 12.5 | 13.0 | 13.5 | 14.0 | 14.5 | 15.0 | 1/ft | |
| 3DR16 0.0598 32/3 | 3 | 860 | 825 | 790 | | | | | | | 0.571 | |
| | 4 | 1005 | 965 | 925 | 885 | 850 | 820 | 790 | 765 | 740 | 0.471 | |
| | 5 | 1140 | 1100 | 1055 | 1015 | 975 | 940 | 905 | 875 | 845 | 0.401 | |
| | 6 | 1255 | 1210 | 1165 | 1125 | 1090 | 1050 | 1020 | 985 | 950 | 0.350 | |
| | 7 | 1365 | 1315 | 1270 | 1225 | 1185 | 1150 | 1115 | 1080 | 1045 | 0.310 | |
| | 8 | 1465 | 1415 | 1370 | 1325 | 1280 | 1240 | 1205 | 1170 | 1135 | 0.278 | |
| | 9 | 1565 | 1510 | 1465 | 1415 | 1375 | 1330 | 1290 | 1255 | 1220 | 0.252 | |
| | 10 | 1655 | 1600 | 1550 | 1505 | 1460 | 1415 | 1375 | 1335 | 1300 | 0.230 | |
| | 11 | 1740 | 1690 | 1635 | 1590 | 1540 | 1500 | 1455 | 1415 | 1380 | 0.212 | |
| | 12 | 1820 | 1770 | 1715 | 1670 | 1620 | 1575 | 1535 | 1495 | 1455 | 0.197 | |
| | 13 | 1895 | 1845 | 1790 | 1745 | 1695 | 1650 | 1605 | 1565 | 1525 | 0.184 | |
| | l, in4/ft | | Nominal Shear Strength due to Panel Buckling, S_{nb} plf | | | | | | | | | |
| | 1.672 | | 10299 | 9423 | 8654 | 7975 | 7374 | 6838 | 6358 | 5927 | 5538 | |

| | | |
|----------|-------------|---------------|
| | ϕ_{df} | Ω_{df} |
| Buckling | 0.80 | 2.00 |

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

²Design 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 Weld Pattern

| | |
|--------------------|-----------------------------------|
| Support fastening | 5/8" arc spot welds or equivalent |
| Side-lap fastening | AISI #10 screws or equivalent |

| | |
|-----------------|--------|
| F _u | 60 ksi |
| F _y | 50 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 _{nr} , plf ^{1,2} | | | | | | | | | K ₁ 1/ft |
|---|--------------------|--|--|------|------|------|------|------|------|------|------------------------|
| | | Span, ft. | | | | | | | | | |
| | | 8 | 8.5 | 9 | 9.5 | 10 | 10.5 | 11 | 11.5 | 12 | |
| 3DR22 0.0295" 32/5 | 2 | 520 | 490 | 465 | | | | | | | 0.412 |
| | 3 | 590 | 555 | 525 | 495 | 470 | 450 | 430 | 410 | 395 | 0.339 |
| | 4 | 660 | 620 | 585 | 555 | 525 | 500 | 480 | 460 | 440 | 0.288 |
| | 5 | 730 | 685 | 645 | 615 | 580 | 555 | 530 | 505 | 485 | 0.250 |
| | 6 | 800 | 750 | 710 | 670 | 640 | 605 | 580 | 555 | 530 | 0.221 |
| | 7 | 865 | 815 | 770 | 730 | 695 | 660 | 630 | 600 | 575 | 0.198 |
| | 8 | 935 | 880 | 830 | 785 | 750 | 710 | 680 | 650 | 625 | 0.179 |
| | 9 | 1000 | 945 | 895 | 845 | 805 | 765 | 730 | 700 | 670 | 0.164 |
| | 10 | 1060 | 1005 | 955 | 905 | 860 | 815 | 780 | 745 | 715 | 0.151 |
| | 11 | 1115 | 1060 | 1005 | 960 | 915 | 870 | 830 | 795 | 760 | 0.140 |
| | 12 | 1175 | 1115 | 1060 | 1010 | 960 | 920 | 880 | 840 | 805 | 0.130 |
| | | I, in4/ft | Nominal Shear Strength due to Panel Buckling, S_{nb}, plf | | | | | | | | |
| | 0.808 | 6643 | 5884 | 5249 | 4711 | 4252 | 3856 | 3514 | 3215 | 2952 | |

| Fastener Layout | Side-lap Conn/Span | Nominal Shear Strength, S _{nr} , plf ^{1,2} | | | | | | | | | K ₁ 1/ft |
|---|--------------------|--|--|------|------|------|------|------|------|------|------------------------|
| | | Span, ft. | | | | | | | | | |
| | | 9.0 | 9.5 | 10.0 | 10.5 | 11.0 | 11.5 | 12.0 | 12.5 | 13.0 | |
| 3DR20 0.0358" 32/5 | 2 | 615 | | | | | | | | | 0.454 |
| | 3 | 695 | 660 | 625 | 595 | 570 | 545 | 520 | | | 0.373 |
| | 4 | 780 | 740 | 700 | 665 | 635 | 610 | 585 | 560 | 540 | 0.317 |
| | 5 | 860 | 815 | 775 | 740 | 705 | 675 | 645 | 620 | 595 | 0.275 |
| | 6 | 945 | 895 | 850 | 810 | 770 | 735 | 705 | 680 | 650 | 0.243 |
| | 7 | 1025 | 970 | 920 | 880 | 840 | 800 | 770 | 735 | 710 | 0.218 |
| | 8 | 1105 | 1050 | 995 | 950 | 905 | 865 | 830 | 795 | 765 | 0.197 |
| | 9 | 1190 | 1125 | 1070 | 1020 | 970 | 930 | 890 | 855 | 820 | 0.180 |
| | 10 | 1270 | 1205 | 1145 | 1090 | 1040 | 995 | 950 | 915 | 880 | 0.166 |
| | 11 | 1340 | 1275 | 1215 | 1160 | 1105 | 1060 | 1015 | 975 | 935 | 0.154 |
| | 12 | 1410 | 1340 | 1280 | 1225 | 1175 | 1120 | 1075 | 1030 | 990 | 0.143 |
| | | I, in4/ft | Nominal Shear Strength due to Panel Buckling, S_{nb}, plf | | | | | | | | |
| | 0.989 | 7060 | 6337 | 5719 | 5187 | 4726 | 4324 | 3971 | 3660 | 3384 | |

| Fastener Layout | Side-lap Conn/Span | Nominal Shear Strength, S_{nr} plf ^{1,2} | | | | | | | | | K_1 |
|--|--------------------|---|---|------|------|------|------|------|------|------|-------|
| | | Span, ft. | | | | | | | | | |
| | | 10.0 | 10.5 | 11.0 | 11.5 | 12.0 | 12.5 | 13.0 | 13.5 | 14.0 | 1/ft |
| 3DR18 0.0474 32/5 | 3 | 865 | 825 | 785 | 750 | 720 | | | | | 0.429 |
| | 4 | 975 | 930 | 890 | 850 | 815 | 780 | 750 | 725 | 695 | 0.364 |
| | 5 | 1090 | 1035 | 990 | 945 | 905 | 870 | 835 | 805 | 775 | 0.317 |
| | 6 | 1200 | 1145 | 1090 | 1045 | 1000 | 960 | 925 | 890 | 860 | 0.280 |
| | 7 | 1315 | 1250 | 1195 | 1140 | 1095 | 1050 | 1010 | 975 | 940 | 0.251 |
| | 8 | 1425 | 1360 | 1295 | 1240 | 1190 | 1140 | 1095 | 1055 | 1020 | 0.227 |
| | 9 | 1540 | 1465 | 1400 | 1340 | 1280 | 1230 | 1185 | 1140 | 1100 | 0.207 |
| | 10 | 1640 | 1570 | 1500 | 1435 | 1375 | 1320 | 1270 | 1220 | 1180 | 0.191 |
| | 11 | 1740 | 1665 | 1595 | 1530 | 1470 | 1410 | 1355 | 1305 | 1260 | 0.177 |
| | 12 | 1835 | 1755 | 1685 | 1615 | 1555 | 1495 | 1440 | 1390 | 1340 | 0.165 |
| | 13 | 1925 | 1845 | 1770 | 1700 | 1635 | 1575 | 1520 | 1470 | 1420 | 0.154 |
| | l, in4/ft | | Nominal Shear Strength due to Panel Buckling, S_{nb}, plf | | | | | | | | |
| | 1.323 | | 8782 | 7966 | 7258 | 6640 | 6099 | 5620 | 5196 | 4819 | 4481 |

| Fastener Layout | Side-lap Conn/Span | Nominal Shear Strength, S_{nr} plf ^{1,2} | | | | | | | | | K_1 |
|--|--------------------|---|---|------|------|------|------|------|------|------|-------|
| | | Span, ft. | | | | | | | | | |
| | | 11.0 | 11.5 | 12.0 | 12.5 | 13.0 | 13.5 | 14.0 | 14.5 | 15.0 | 1/ft |
| 3DR16 0.0598 32/5 | 3 | 990 | 945 | 905 | | | | | | | 0.482 |
| | 4 | 1135 | 1085 | 1040 | 995 | 960 | 925 | 890 | 860 | 830 | 0.409 |
| | 5 | 1280 | 1220 | 1170 | 1125 | 1080 | 1040 | 1005 | 970 | 935 | 0.356 |
| | 6 | 1425 | 1360 | 1305 | 1250 | 1205 | 1160 | 1115 | 1080 | 1045 | 0.314 |
| | 7 | 1570 | 1500 | 1435 | 1380 | 1325 | 1275 | 1230 | 1190 | 1150 | 0.282 |
| | 8 | 1710 | 1640 | 1570 | 1505 | 1450 | 1395 | 1345 | 1300 | 1255 | 0.255 |
| | 9 | 1845 | 1775 | 1700 | 1635 | 1570 | 1515 | 1460 | 1410 | 1360 | 0.233 |
| | 10 | 1970 | 1895 | 1820 | 1755 | 1690 | 1630 | 1570 | 1520 | 1465 | 0.215 |
| | 11 | 2095 | 2015 | 1935 | 1865 | 1800 | 1740 | 1680 | 1625 | 1575 | 0.199 |
| | 12 | 2215 | 2130 | 2050 | 1975 | 1905 | 1845 | 1780 | 1725 | 1670 | 0.185 |
| | 13 | 2330 | 2245 | 2160 | 2085 | 2010 | 1945 | 1880 | 1820 | 1765 | 0.173 |
| | l, in4/ft | | Nominal Shear Strength due to Panel Buckling, S_{nb}, plf | | | | | | | | |
| | 1.672 | | 10299 | 9423 | 8654 | 7975 | 7374 | 6838 | 6358 | 5927 | 5538 |

| | | |
|----------|-------------|---------------|
| | ϕ_{df} | Ω_{df} |
| Buckling | 0.80 | 2.00 |

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

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