

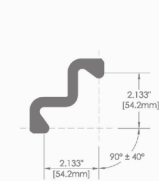
**LARSEN**  
HOT ROLLED



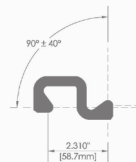
# **Z-Pile® HR®**

[sheet-pile.com/zpile](http://sheet-pile.com/zpile)

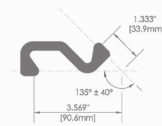
## **PilePro® Sheet Pile Connectors**



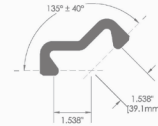
**HR® Omega**



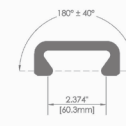
**HR® 90**



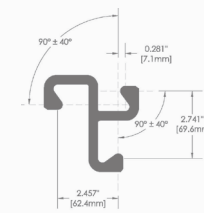
**HR® Colt**



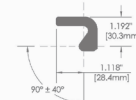
**HR® 135**



**HR® 180**



**HR® Tee**

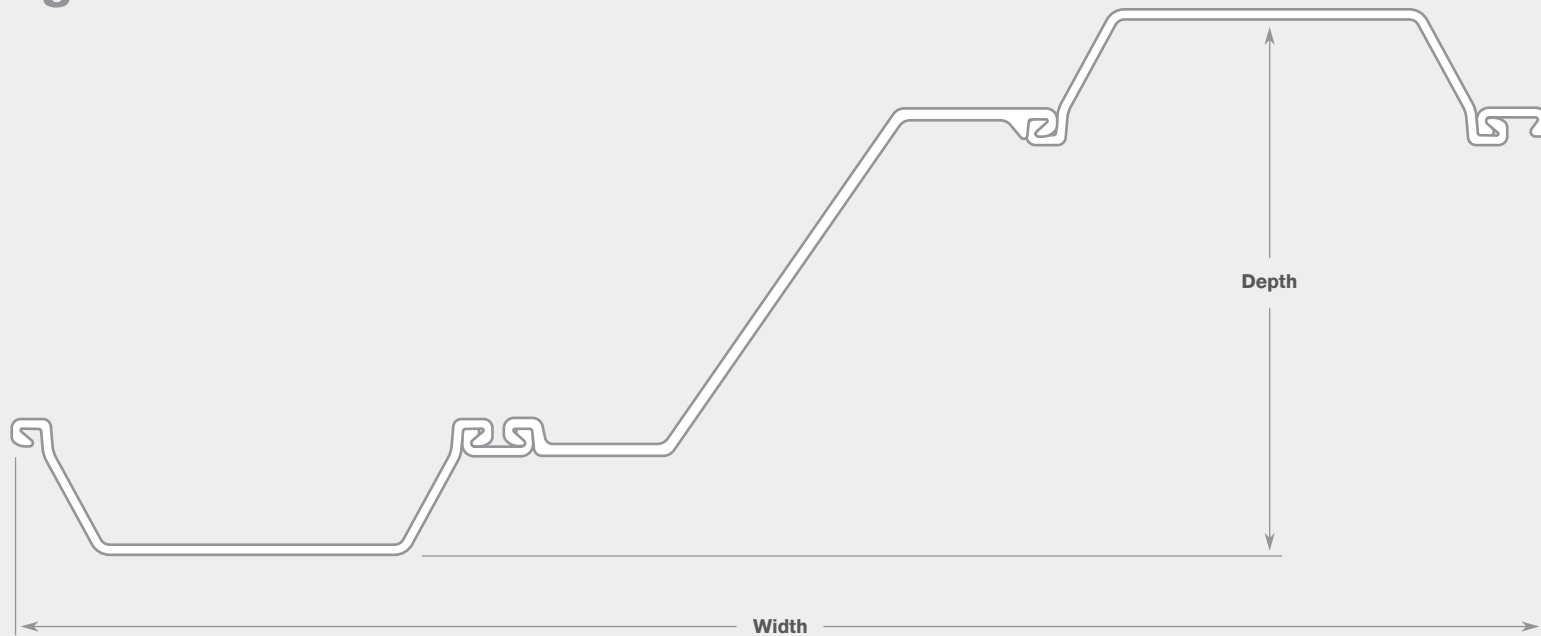


**C9®**

Sheet Pile LLC is the owner and assignee of US 7,390,145, related to these connectors.

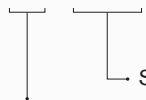


## Configuration A



SECTION NAME:

**42 - 2010**



Section width in mm

Section modulus (elastic) in  $\text{cm}^3/\text{m} \div 100$

These are examples from a large variety of possible Z-Pile® solutions.

Please configure your own system on [sheet-pile.com/zpile](https://sheet-pile.com/zpile)

*Sheet Pile LLC is the owner and assignee of numerous patents and IP, that may be related to this sheet pile solution.*

| Section | Solution Type | Width   | Depth   | Web Thickness | Flange Thickness | Panel Cross Section Area           | Panel Weight | Panel Moment of Inertia            | Panel Section Modulus              | Coating Area                            | Coating Area Waterside                  | Weight                                  | Moment of Inertia                        | Section Modulus                          | Configuration |
|---------|---------------|---------|---------|---------------|------------------|------------------------------------|--------------|------------------------------------|------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|------------------------------------------|------------------------------------------|---------------|
|         |               | in (mm) | in (mm) | in (mm)       | in (mm)          | in <sup>2</sup> (cm <sup>2</sup> ) | lb/ft (kg/m) | in <sup>4</sup> (cm <sup>4</sup> ) | in <sup>3</sup> (cm <sup>3</sup> ) | ft <sup>2</sup> /ft (m <sup>2</sup> /m) | ft <sup>2</sup> /ft (m <sup>2</sup> /m) | lb/ft <sup>2</sup> (kg/m <sup>2</sup> ) | in <sup>4</sup> /ft (cm <sup>4</sup> /m) | in <sup>3</sup> /ft (cm <sup>3</sup> /m) |               |
| 15-2080 | Z             | 81.9    | 24.1    | 0.4           | 0.4              | 38.25                              | 130.2        | 2326.7                             | 193.8                              | 17.55                                   | 8.78                                    | 19.1                                    | 341                                      | 28.4                                     | A             |
|         |               | 2080    | 611     | 9.5           | 9.6              | 246.8                              | 193.7        | 96845.6                            | 3175.3                             | 5.35                                    | 2.68                                    | 93.1                                    | 46560.4                                  | 1526.6                                   |               |
| 17-2080 | Z             | 81.9    | 24      | 0.4           | 0.4              | 41.04                              | 139.7        | 2570.7                             | 214.1                              | 17.55                                   | 8.78                                    | 20.5                                    | 376.7                                    | 31.4                                     | A             |
|         |               | 2080    | 610     | 9.5           | 9.6              | 264.78                             | 207.9        | 107000                             | 3508.2                             | 5.35                                    | 2.68                                    | 99.9                                    | 51442.3                                  | 1686.6                                   |               |
| 17-2010 | Z             | 79.1    | 22.2    | 0.3           | 0.3              | 39.13                              | 133.2        | 2547.3                             | 211.5                              | 17.55                                   | 8.78                                    | 20.2                                    | 386.3                                    | 32.1                                     | A             |
|         |               | 2010    | 563     | 8.5           | 8.6              | 252.47                             | 198.2        | 106027.5                           | 3465.2                             | 5.35                                    | 2.68                                    | 98.6                                    | 52750                                    | 1724                                     |               |
| 19-2010 | Z             | 79.1    | 27      | 0.4           | 0.4              | 38.33                              | 130.5        | 3195.5                             | 236.6                              | 17.59                                   | 8.79                                    | 19.8                                    | 484.6                                    | 35.9                                     | A             |
|         |               | 2010    | 686     | 9.5           | 9.6              | 247.32                             | 194.1        | 133004.7                           | 3877.7                             | 5.36                                    | 2.68                                    | 96.6                                    | 66171.5                                  | 1929.2                                   |               |
| 21-2010 | Z             | 79.1    | 25.2    | 0.3           | 0.3              | 40.2                               | 136.8        | 3489.5                             | 257.7                              | 17.59                                   | 8.79                                    | 20.7                                    | 529.1                                    | 39.1                                     | A             |
|         |               | 2010    | 640     | 8.4           | 8.5              | 259.38                             | 203.6        | 145242.6                           | 4223                               | 5.36                                    | 2.68                                    | 101.3                                   | 72260                                    | 2101                                     |               |
| 21-2080 | Z             | 81.9    | 24.4    | 0.4           | 0.4              | 46.74                              | 159.1        | 3321.9                             | 271.3                              | 18.37                                   | 9.19                                    | 23.3                                    | 486.8                                    | 39.8                                     | A             |
|         |               | 2080    | 621     | 9.5           | 9.6              | 301.53                             | 236.7        | 138268.1                           | 4445.9                             | 5.6                                     | 2.8                                     | 113.8                                   | 66475                                    | 2137.5                                   |               |
| 22-2010 | Z             | 79.1    | 28.5    | 0.5           | 0.5              | 42.86                              | 145.9        | 3892.8                             | 273.1                              | 17.81                                   | 8.91                                    | 22.1                                    | 590.3                                    | 41.4                                     | A             |
|         |               | 2010    | 724     | 12.2          | 12.3             | 276.53                             | 217.1        | 162029                             | 4475.9                             | 5.43                                    | 2.72                                    | 108                                     | 80611.5                                  | 2226.8                                   |               |
| 26-2010 | Z             | 79.1    | 28.5    | 0.5           | 0.5              | 47.78                              | 162.6        | 4500.5                             | 315.8                              | 17.81                                   | 8.91                                    | 24.7                                    | 682.5                                    | 47.9                                     | A             |
|         |               | 2010    | 724     | 12.2          | 12.3             | 308.24                             | 242          | 187323.7                           | 5174.7                             | 5.43                                    | 2.72                                    | 120.4                                   | 93195.9                                  | 2574.5                                   |               |
| 27-2010 | Z             | 79.1    | 27.4    | 0.4           | 0.4              | 46.82                              | 159.3        | 4478.9                             | 326.9                              | 18.41                                   | 9.2                                     | 24.2                                    | 679.2                                    | 49.6                                     | A             |
|         |               | 2010    | 697     | 9.5           | 9.6              | 302.05                             | 237.1        | 186424.6                           | 5357                               | 5.61                                    | 2.8                                     | 118                                     | 92748.6                                  | 2665.2                                   |               |
| 28-2080 | Z             | 81.9    | 28.5    | 0.4           | 0.4              | 52.39                              | 178.3        | 4981.3                             | 349.5                              | 19.36                                   | 9.68                                    | 26.1                                    | 729.9                                    | 51.2                                     | A             |
|         |               | 2080    | 725     | 9.5           | 9.6              | 338.03                             | 265.4        | 207335.5                           | 5727.5                             | 5.9                                     | 2.95                                    | 127.6                                   | 99680.5                                  | 2753.6                                   |               |
| 29-2010 | Z             | 79.1    | 28.3    | 0.5           | 0.6              | 50.72                              | 172.6        | 5322.6                             | 353.5                              | 18.64                                   | 9.32                                    | 26.2                                    | 807.1                                    | 53.6                                     | A             |
|         |               | 2010    | 720     | 12.2          | 16.1             | 327.23                             | 256.9        | 221542.2                           | 5792.8                             | 5.68                                    | 2.84                                    | 127.8                                   | 110220                                   | 2882                                     |               |
| 30-2010 | Z             | 79.1    | 28.9    | 0.5           | 0.5              | 51.35                              | 174.7        | 5323.9                             | 368.5                              | 18.67                                   | 9.33                                    | 26.5                                    | 807.3                                    | 55.9                                     | A             |
|         |               | 2010    | 734     | 12.2          | 12.3             | 331.26                             | 260          | 221598.7                           | 6038.1                             | 5.69                                    | 2.84                                    | 129.4                                   | 110248.1                                 | 3004                                     |               |
| 33-2010 | Z             | 79.1    | 29.6    | 0.3           | 0.3              | 51.55                              | 175.5        | 6271                               | 408.5                              | 19.42                                   | 9.71                                    | 26.6                                    | 950.9                                    | 61.9                                     | A             |
|         |               | 2010    | 752.6   | 8.4           | 8.5              | 332.61                             | 261.1        | 261018.6                           | 6693.3                             | 5.92                                    | 2.96                                    | 129.9                                   | 129860                                   | 3330                                     |               |
| 36-2080 | Z             | 81.9    | 29.8    | 0.4           | 0.4              | 60.84                              | 207          | 6800.5                             | 457                                | 19.36                                   | 9.68                                    | 30.3                                    | 996.5                                    | 67                                       | A             |
|         |               | 2080    | 757     | 9.5           | 9.6              | 392.5                              | 308.1        | 283056.6                           | 7488.3                             | 5.9                                     | 2.95                                    | 148.1                                   | 136084.9                                 | 3600.1                                   |               |

| Section | Solution Type | Width   | Depth   | Web Thickness | Flange Thickness | Panel Cross Section Area           | Panel Weight | Panel Moment of Inertia            | Panel Section Modulus              | Coating Area                            | Coating Area Waterside                  | Weight                                  | Moment of Inertia                        | Section Modulus                          | Configuration |
|---------|---------------|---------|---------|---------------|------------------|------------------------------------|--------------|------------------------------------|------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|------------------------------------------|------------------------------------------|---------------|
|         |               | in (mm) | in (mm) | in (mm)       | in (mm)          | in <sup>2</sup> (cm <sup>2</sup> ) | lb/ft (kg/m) | in <sup>4</sup> (cm <sup>4</sup> ) | in <sup>3</sup> (cm <sup>3</sup> ) | ft <sup>2</sup> /ft (m <sup>2</sup> /m) | ft <sup>2</sup> /ft (m <sup>2</sup> /m) | lb/ft <sup>2</sup> (kg/m <sup>2</sup> ) | in <sup>4</sup> /ft (cm <sup>4</sup> /m) | in <sup>3</sup> /ft (cm <sup>3</sup> /m) |               |
| 37-2010 | Z             | 79.1    | 33      | 0.5           | 0.5              | 57                                 | 194          | 7460.9                             | 452.3                              | 19.65                                   | 9.83                                    | 29.4                                    | 1131.4                                   | 68.6                                     | A             |
|         |               | 2010    | 838     | 12.2          | 12.3             | 367.75                             | 288.7        | 310547                             | 7411.6                             | 5.99                                    | 3                                       | 143.6                                   | 154501                                   | 3687.4                                   |               |
| 39-2080 | Z             | 81.9    | 29.9    | 0.4           | 0.4              | 64.34                              | 219          | 7456.8                             | 499.7                              | 19.82                                   | 9.91                                    | 32.1                                    | 1092.7                                   | 73.2                                     | A             |
|         |               | 2080    | 759     | 9.5           | 9.6              | 415.11                             | 325.9        | 310377                             | 8189.4                             | 6.04                                    | 3.02                                    | 156.7                                   | 149219.7                                 | 3937.2                                   |               |
| 41-2080 | Z             | 81.9    | 30      | 0.4           | 0.4              | 66.08                              | 224.9        | 7787                               | 520.5                              | 19.82                                   | 9.91                                    | 33                                      | 1141.1                                   | 76.3                                     | A             |
|         |               | 2080    | 761     | 9.5           | 9.6              | 426.34                             | 334.7        | 324121.1                           | 8529.5                             | 6.04                                    | 3.02                                    | 160.9                                   | 155827.4                                 | 4100.7                                   |               |
| 42-2010 | Z             | 79.1    | 30.9    | 0.3           | 0.3              | 59.33                              | 201.9        | 8450.8                             | 515.4                              | 19.42                                   | 9.71                                    | 30.6                                    | 1281.5                                   | 78.2                                     | A             |
|         |               | 2010    | 785     | 8.4           | 8.5              | 382.8                              | 300.5        | 351750                             | 8446                               | 5.92                                    | 2.96                                    | 149.5                                   | 175000                                   | 4202                                     |               |
| 44-2010 | Z             | 79.1    | 32.8    | 0.4           | 0.4              | 62.41                              | 212.4        | 8764.7                             | 535.2                              | 19.39                                   | 9.69                                    | 32.2                                    | 1329.1                                   | 81.2                                     | A             |
|         |               | 2010    | 833     | 9.5           | 9.6              | 402.68                             | 316.1        | 364812.9                           | 8769.5                             | 5.91                                    | 2.96                                    | 157.3                                   | 181499                                   | 4363                                     |               |
| 47-2010 | Z             | 79.1    | 32.8    | 0.4           | 0.4              | 64.42                              | 219.2        | 9434.1                             | 574.6                              | 19.85                                   | 9.92                                    | 33.2                                    | 1430.6                                   | 87.1                                     | A             |
|         |               | 2010    | 833     | 9.5           | 9.6              | 415.62                             | 326.3        | 392677.2                           | 9416.7                             | 6.05                                    | 3.02                                    | 162.3                                   | 195361.8                                 | 4684.9                                   |               |
| 49-2010 | Z             | 79.1    | 32.9    | 0.4           | 0.4              | 66.16                              | 225.2        | 9854.6                             | 598.8                              | 19.85                                   | 9.92                                    | 34.1                                    | 1494.4                                   | 90.8                                     | A             |
|         |               | 2010    | 836     | 9.5           | 9.6              | 426.86                             | 335.1        | 410179.5                           | 9812.9                             | 6.05                                    | 3.02                                    | 166.7                                   | 204069.4                                 | 4882                                     |               |
| 51-2010 | Z             | 79.1    | 34.3    | 0.5           | 0.5              | 68.95                              | 234.6        | 10723.7                            | 626.2                              | 20.11                                   | 10.06                                   | 35.6                                    | 1626.2                                   | 95                                       | A             |
|         |               | 2010    | 871     | 12.2          | 12.3             | 444.83                             | 349.2        | 446353.6                           | 10261                              | 6.13                                    | 3.06                                    | 173.7                                   | 222066.5                                 | 5105                                     |               |
| 53-2010 | Z             | 79.1    | 34.4    | 0.5           | 0.5              | 70.69                              | 240.6        | 11194.7                            | 650.7                              | 20.11                                   | 10.06                                   | 36.5                                    | 1697.6                                   | 98.7                                     | A             |
|         |               | 2010    | 874     | 12.2          | 12.3             | 456.07                             | 358          | 465959.2                           | 10662.7                            | 6.13                                    | 3.06                                    | 178.1                                   | 231820.5                                 | 5304.8                                   |               |
| 54-2010 | Z             | 79.1    | 34.2    | 0.6           | 0.9              | 77.75                              | 264.6        | 11851.9                            | 658.7                              | 20.01                                   | 10.01                                   | 40.1                                    | 1797.2                                   | 99.9                                     | A             |
|         |               | 2010    | 869     | 16            | 23.1             | 501.6                              | 393.8        | 493314.3                           | 10793.7                            | 6.1                                     | 3.05                                    | 195.9                                   | 245430                                   | 5370                                     |               |
| 56-2010 | Z             | 79.1    | 35.9    | 0.4           | 0.6              | 72.06                              | 245.2        | 12316.3                            | 687.5                              | 20.54                                   | 10.27                                   | 37.2                                    | 1867.7                                   | 104.3                                    | A             |
|         |               | 2010    | 911     | 11.2          | 15.1             | 464.92                             | 365          | 512644.7                           | 11266.9                            | 6.26                                    | 3.13                                    | 181.6                                   | 255047.1                                 | 5605.4                                   |               |
| 57-2010 | Z             | 79.1    | 35.9    | 0.5           | 0.6              | 73.6                               | 250.5        | 12404.3                            | 692.5                              | 20.54                                   | 10.27                                   | 38                                      | 1881                                     | 105                                      | A             |
|         |               | 2010    | 911     | 12.2          | 16.1             | 474.81                             | 372.7        | 516306                             | 11347.4                            | 6.26                                    | 3.13                                    | 185.4                                   | 256868.6                                 | 5645.5                                   |               |
| 58-2010 | Z             | 79.1    | 35.9    | 0.4           | 0.6              | 73.8                               | 251.2        | 12803.8                            | 713.2                              | 20.54                                   | 10.27                                   | 38.1                                    | 1941.6                                   | 108.2                                    | A             |
|         |               | 2010    | 913     | 11.2          | 15.1             | 476.16                             | 373.8        | 532935.5                           | 11687.2                            | 6.26                                    | 3.13                                    | 186                                     | 265142.1                                 | 5814.5                                   |               |
| 59-2010 | Z             | 79.1    | 36      | 0.5           | 0.6              | 75.34                              | 256.4        | 12908.6                            | 717.5                              | 20.54                                   | 10.27                                   | 38.9                                    | 1957.5                                   | 108.8                                    | A             |
|         |               | 2010    | 914     | 12.2          | 16.1             | 486.05                             | 381.5        | 537296.5                           | 11757                              | 6.26                                    | 3.13                                    | 189.8                                   | 267311.7                                 | 5849.3                                   |               |

| Section | Solution Type | Width   | Depth   | Web Thickness | Flange Thickness | Panel Cross Section Area           | Panel Weight | Panel Moment of Inertia            | Panel Section Modulus              | Coating Area                            | Coating Area Waterside                  | Weight                                  | Moment of Inertia                        | Section Modulus                          | Configuration |
|---------|---------------|---------|---------|---------------|------------------|------------------------------------|--------------|------------------------------------|------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|------------------------------------------|------------------------------------------|---------------|
|         |               | in (mm) | in (mm) | in (mm)       | in (mm)          | in <sup>2</sup> (cm <sup>2</sup> ) | lb/ft (kg/m) | in <sup>4</sup> (cm <sup>4</sup> ) | in <sup>3</sup> (cm <sup>3</sup> ) | ft <sup>2</sup> /ft (m <sup>2</sup> /m) | ft <sup>2</sup> /ft (m <sup>2</sup> /m) | lb/ft <sup>2</sup> (kg/m <sup>2</sup> ) | in <sup>4</sup> /ft (cm <sup>4</sup> /m) | in <sup>3</sup> /ft (cm <sup>3</sup> /m) |               |
| 60-2010 | Z             | 79.1    | 34.3    | 0.6           | 0.8              | 82.07                              | 279.3        | 13237.9                            | 735.8                              | 20.54                                   | 10.27                                   | 42.4                                    | 2007.4                                   | 111.6                                    | A             |
|         |               | 2010    | 870     | 16            | 20.1             | 529.51                             | 415.7        | 551001.3                           | 12056.9                            | 6.26                                    | 3.13                                    | 206.8                                   | 274130                                   | 5998.5                                   |               |
| 61-2010 | Z             | 79.1    | 34.4    | 0.6           | 0.9              | 83.66                              | 284.7        | 13531.5                            | 748.8                              | 20.47                                   | 10.24                                   | 43.2                                    | 2051.9                                   | 113.5                                    | A             |
|         |               | 2010    | 873     | 16            | 23.1             | 539.76                             | 423.7        | 563222.1                           | 12270.6                            | 6.24                                    | 3.12                                    | 210.8                                   | 280210                                   | 6104.8                                   |               |

# Specifications

When using steel sheet pile, it is necessary to make allowances for deviations from theoretical exactness. The degree of precision obtainable in the production of sheet pile is limited by the basic character of the rolling processes and normal limitations of mill equipment. Care must be taken during installation to assure that each element is being set at the desired driving dimension.

- Dimensions typically shown are nominal.
- Actual thicknesses vary due to mill rolling practices; however, permitted variations for such dimensions are not addressed.
- Interlocks should be reasonably free-sliding when threaded.
- Terms, tolerance, dimensions, and delivery conditions are in accordance with EN 10248 and/or ASTM A6.
- Welding is in accordance with AWS D1.1.

|                   | AMERICAN<br>ASTM A 6 |        | EUROPEAN<br>EN 10248                    |
|-------------------|----------------------|--------|-----------------------------------------|
| Mass              | 5%                   | -2.5%  | ± 5%                                    |
| Length            | + 5in.               | -0 in. | ± 200mm                                 |
| Height            |                      |        | ± 7mm                                   |
| Thickness         |                      |        | ± 0.5mm for ≤ 8.5mm<br>± 6% for > 8.5mm |
| Width Interlocked |                      |        | ± 3%                                    |
| Straightness      |                      |        | 0.2% of the length                      |
| Ends ou of Square |                      |        | 2% of the width                         |

# Available Steel Grades

| AMERICAN            |                |       | CANADIAN    |                |       | EUROPEAN  |                |       |
|---------------------|----------------|-------|-------------|----------------|-------|-----------|----------------|-------|
| ASTM                | YIELD STRENGTH |       | CSA G40.21  | YIELD STRENGTH |       | EN 10248  | YIELD STRENGTH |       |
|                     | (ksi)          | (MPa) |             | (ksi)          | (MPa) |           | (ksi)          | (MPa) |
| A 328               | 39             | 270   | Grade 260 W | 38             | 260   | S 240 GP  | 35             | 240   |
| A 572 Grade 42      | 42             | 290   | Grade 300 W | 44             | 300   | S 270 GP  | 39             | 270   |
| A 572 Grade 50      | 50             | 345   | Grade 355 W | 50             | 350   | S 320 GP  | 46             | 320   |
| A 572 Grade 55      | 55             | 380   | Grade 400 W | 58             | 400   | S 355 GP  | 51             | 355   |
| A 572 Grade 60      | 60             | 415   |             |                |       | S 390 GP  | 57             | 390   |
| A 572 Grade 65*     | 65             | 450   |             |                |       | S 430 GP  | 62             | 430   |
| A 588 Grade 50      | 50             | 345   |             |                |       | S 450 GP* | 65             | 450   |
| API 5L x70          | 70             | 485   |             |                |       |           |                |       |
| ASTM A 690 MARINER® | 50             | 345   |             |                |       |           |                |       |

## ENGINEERING DISCLAIMER

This publication contains information on the properties of hot-rolled sheet pile based on accepted engineering practices related to sheet pile products and projects. The use of the data contained herein must be supplemented with qualified professional judgment.

## LEGAL DISCLAIMER

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