



Expanding Your Solutions



# ViperStud® Product Catalog

Interior Non-Load Bearing Studs and Track



# The Proprietary Steel Framing System That Has Withstood the Test of Time ...

## A Track Record You Can Count On, Verified Code Compliant

By providing a lighter, stronger, more efficient framing system, ViperStud® has earned the trust of industry leaders nationwide. Made from high-strength steel and formed with exclusive ViperRib technology, ViperStud® is the flat steel system that will be here for the long term, you can count on that.

### Code Information

ViperStud Drywall Framing has been verified by the following IAS Accredited Test Agencies and/or certified by the Product Evaluation Agencies listed here.



**Patents** ViperStud Patent #D621,964  
ViperTrack Patent #D621,963

### IBC/IRC 2012/2015/2018/2021 Compliant

ViperStud complies with 2015 ICC-ES code compliance certification programs. Please see the full versions of these reports at [www.cemcosteel.com](http://www.cemcosteel.com).

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### ViperStud Drywall Framing System is tested or conforms to these standards:

- **AISI S100-16/S2-20** North American Specification for the Design of Cold-Formed Steel Structural Members
- **AISI S220** North American Standard for Cold-Formed Steel Framing—Non-Structural Members
- **ASTM A1003** Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic Coated for Cold-Formed Framing Members
- **ASTM C645** Standard Specification for Nonstructural Steel Framing Members
- **ASTM A653/A653M** Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- **ASTM C754** Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products
- **ASTM E90** Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
- **ASTM E119** Standard Test Methods for Fire Tests of Building construction and Materials. Fire rated for 1, 2, 3, and 4 hour rated walls.
- **ASTM E72** Standard Test Methods of Conducting Strength Tests of Panels for Building Construction
- **ASTM C1629** Standard Classification for Abuse-Resistant Non-decorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels

### ViperStud is listed in the following:

- ICC-ES ESR-2620
- NYC Department of Buildings MEA 56-08-M, MEA 56-08-M Vol 2, MEA 235-08-M

### Architectural Testing Approved & ICC ES Code Compliant

Viper25, Viper20, Viper 30mil, and Viper 33mil manufactured by CEMCO received an evaluation report (ESR# 2620) from ICC Evaluation Service (ICC-ES), providing evidence that the ViperStud Drywall Framing System meets code requirements. Building officials, architects, contractors, specifiers, designers and others utilize these Evaluation Reports to provide a basis for using or approving metal

framing in construction projects following the International Building Code.

### LEED v4 for Building & Design Construction

- MR Prerequisite: Construction and Demolition Waste Management Planning
- MR Credit: Construction and Demolition Waste Management
- MR Credit: Building Product Disclosure and Optimization—Sourcing of Raw Materials, Option 2
- MR Credit: Building Product Disclosure and Optimization—Material Ingredients, Option 1
- MR Credit: Building Life-Cycle Impact Reduction, Option 4

### Recycled Content

- Total Recycled Content: 36.9%
- Post-Consumer: 19.8%
- Pre-Consumer: 14.4%

### California's Proposition 65 Warning

California's Safe Drinking Water and Toxic Enforcement Act of 1986 – commonly referred to as Proposition 65 ("Prop 65") (27 Cal. Code Reg. § 25600, et seq.) – has recently changed, requiring manufacturers to provide a warning based on its knowledge about the presence of one or more of the almost 900 listed chemicals which are known to the State of California to cause cancer and birth defects, or other reproductive harm. With a few exceptions, manufacturers operating in the state of California as well as those entities who distribute, import, package, and/or supply products into the State of California are now required provide a "clear and reasonable" warning to consumers that their products may contain one or more of these listed chemicals or compounds. The complete list is available at [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

In compliance with the new requirements, we are notifying each of our customers that CEMCO products contain Nickel (metallic) and/or other chemicals listed which are known to the State of California to cause cancer and birth defects or other reproductive harm. Safety data sheets from our major suppliers are available from CEMCO on our website at [www.cemcosteel.com](http://www.cemcosteel.com).

## A High Strength, Flat Steel Drywall Framing System

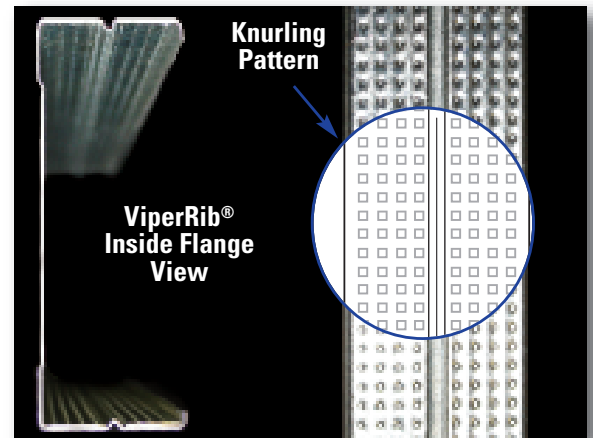
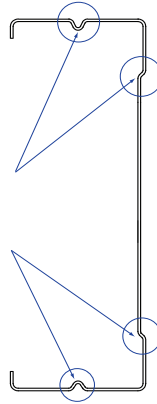
The ViperStud® Drywall Framing System offers all the benefits of conventional flat steel studs with a design that performs even better. The ViperStud® drywall framing system is interchangeable with conventional framing components. Since ViperStud® is flat steel, it is easy to plumb and mark, make minor adjustments and use laser levels. This makes installation the same as conventional studs. No extra training or special fasteners are required for installation.

### Knurl & Rib Technology

The stud and track system utilizes a knurled flange and reinforcing ribs along with a flat stud design. Knurling is the pattern of small ridges formed on the flange to prevent screws from walking. Since knurling is only formed on one side of the steel, the stud stays flat, never compromising the strength or thickness of the steel.

ViperRib® technology applies a reinforced ribbing over the web and flange of ViperStud. The ribs provide added strength, are less prone to twist and creating "high-shoulders" when finishing gypsum board.

**ViperRib® Technology**  
makes ViperStud stronger  
& less prone to twist or buckle.



## The One-Track System

We've tested ViperTrack25 extensively with Viper25 studs. Our third-party testing proves that it is not necessary to use the same thickness track as the stud. Now you can submit a lighter gauge track with your Viper20 studs and reduce your cost.

- Saves money
- Fewer items to inventory
- Supported by testing

*Not applicable for Impact or Abuse Rated walls. Fire rated walls should be built per specific assembly requirements.*

**SAFETY**  
**EDGED**  
 BY **CEMCO**



## PHYSICAL PROPERTIES



## ViperStud®

| MODEL NO.    | DESIGN THICKNESS (in) | MINIMUM THICKNESS (in) | YIELD (ksi) | WEB SIZES (in)            | COATING <sup>1,2</sup> | FLANGE (in) | RETURN LIP |
|--------------|-----------------------|------------------------|-------------|---------------------------|------------------------|-------------|------------|
| VIPER25      | 0.0155                | 0.0147                 | 50          | 1-5/8, 2-1/2, 3-5/8, 4, 6 | G40                    | 1-1/4       | 1/4        |
| *VIPER 18mil | 0.0188                | 0.0179                 | 33          | 1-5/8, 2-1/2, 3-5/8, 4, 6 | G40                    | 1-1/4       | 1/4        |
| VIPER20      | 0.0190                | 0.0181                 | 70          | 1-5/8, 2-1/2, 3-5/8, 4, 6 | G40                    | 1-1/4       | VARIOUS    |
| VIPER 30mil  | 0.0312                | 0.0296                 | 33          | 1-5/8, 2-1/2, 3-5/8, 4, 6 | G40                    | 1-1/4       | 1/4        |
| VIPER 33mil  | 0.0346                | 0.0329                 | 33          | 1-5/8, 2-1/2, 3-5/8, 4, 6 | G40                    | 1-1/4       | 1/4        |

## ViperTrack®

| MODEL NO.         | DESIGN THICKNESS (in) | MINIMUM THICKNESS (in) | YIELD (ksi) | WEB SIZES (in)            | COATING <sup>1,2</sup> | FLANGE (in) |
|-------------------|-----------------------|------------------------|-------------|---------------------------|------------------------|-------------|
| VIPERTRACK25      | 0.0155                | 0.0147                 | 50          | 1-5/8, 2-1/2, 3-5/8, 4, 6 | G40                    | 1-1/4       |
| *VIPERTRACK 18mil | 0.0188                | 0.0179                 | 33          | 1-5/8, 2-1/2, 3-5/8, 4, 6 | G40                    | 1-1/4       |
| VIPERTRACK20      | 0.0190                | 0.0181                 | 50          | 1-5/8, 2-1/2, 3-5/8, 4, 6 | G40                    | 1-1/4       |
| VIPERTRACK 30mil  | 0.0312                | 0.0296                 | 33          | 1-5/8, 2-1/2, 3-5/8, 4, 6 | G40                    | 1-1/4       |
| VIPERTRACK 33mil  | 0.0346                | 0.0329                 | 33          | 1-5/8, 2-1/2, 3-5/8, 4, 6 | G40                    | 1-1/4       |

## Notes:

- Per ASTM C645 & ASTM A1003 Table 1.
- G60 and G90 available upon request.
- Knockout size for 1-5/8" & 2-1/2" stud is 3/4" x 1-3/4".  
Knockout size for 3-5/8", 4", and 6" stud is 1-1/2" x 2-1/2".

\*For Select Markets Only

Viper25 (15 mil) is equivalent to conventional 25 gauge (18 mil) studs, and Viper20 (18 mil/70 ksi) is equivalent to conventional 20 gauge studs (30 mil). ASTM C 645 Section 5.1 allows for permissible dimensional thickness variations. Section 8.2 allows for thickness variations and exemptions from minimum section property values, if specified performance requirements are not met. The ViperStud Drywall Framing products meet and exceed these requirements.



## DEEP LEG DEFLECTION TRACK

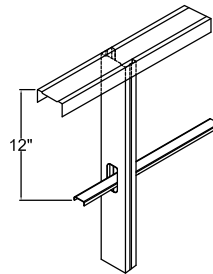
Deflection track can be required at the top of a wall to allow for anticipation downward movement of the primary structure. A gap is provided between the end of the stud and track to accommodate this movement. The studs are not fastened to the track to allow movement up or down. The bridging is required within 12" from the top to keep the stud in place and provide rotational restraint. The leg of the track must be long enough to provide the required gap, bearing surface for the studs and allow for construction tolerances.

| MODEL NO.        | DESIGN THICKNESS (in) | MINIMUM THICKNESS (in) | YIELD (ksi) | COATING <sup>4,5</sup> | WEB SIZES (in) <sup>2</sup> | LEG SIZE (in) | GAP (in) | LOAD (lb.) | MAX HEIGHT 5 psf, 16" o.c. |
|------------------|-----------------------|------------------------|-------------|------------------------|-----------------------------|---------------|----------|------------|----------------------------|
| VIPERTRACK25     | 0.0155                | 0.0147                 | 50          | G40                    | 1-5/8, 2-1/2, 3-5/8, 4, 6   | 2"            | 1/2"     | 34         | 10'-4"                     |
| *VIPERTRACK18mil | 0.0188                | 0.0179                 | 33          | G40                    | 1-5/8, 2-1/2, 3-5/8, 4, 6   | 2"            | 1/2"     | 33         | 9' 11"                     |
| VIPERTRACK20     | 0.0190                | 0.0181                 | 70          | G40                    | 1-5/8, 2-1/2, 3-5/8, 4, 6   | 2"            | 1/2"     | 72         | 21' 6"                     |
|                  |                       |                        |             |                        | 2-1/2, 3-5/8, 4, 6          | 2-1/2"        | 3/4"     | 48         | 14'-4"                     |
|                  |                       |                        |             |                        | 2-1/2, 3-5/8, 4, 6          | 3"            | 1"       | 36         | 10'-9"                     |
| VIPERTRACK 30mil | 0.0312                | 0.0296                 | 33          | G40                    | 1-5/8, 2-1/2, 3-5/8, 4, 6   | 2"            | 1/2"     | 92         | 27'-6"                     |
|                  |                       |                        |             |                        | 2-1/2, 3-5/8, 4, 6          | 2-1/2"        | 3/4"     | 61         | 18'-4"                     |
|                  |                       |                        |             |                        | 2-1/2, 3-5/8, 4, 6          | 3"            | 1"       | 46         | 13'-9"                     |
| VIPERTRACK 33mil | 0.0346                | 0.0329                 | 33          | G40                    | 1-5/8, 2-1/2, 3-5/8, 4, 6   | 2"            | 1/2"     | 113        | 33'-10"                    |
|                  |                       |                        |             |                        | 2-1/2, 3-5/8, 4, 6          | 2-1/2"        | 3/4"     | 75         | 22'-7"                     |
|                  |                       |                        |             |                        | 2-1/2, 3-5/8, 4, 6          | 3"            | 1"       | 56         | 16'-11"                    |

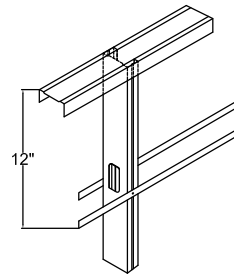
## Notes:

- Max wall height based on track capacity and specified gap.
- Wall height may also be limited by stud member. Check stud height separately of track capacity.
- 1-5/8" deep leg track available with max 2" leg.
- Wall studs are not fastened to deep leg track.
- G60, G90 available upon request.
- Coating per ASTM C645 & ASTM A 1003, Table 1.

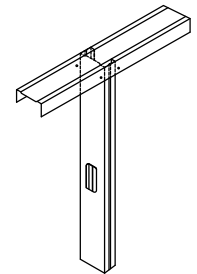
\* For Select Markets Only



**A. ALTERNATIVE 1**  
WITH CRC CHANNEL AND  
BRC CLIP. 12" DOWN  
FROM THE STUD END.



**B. ALTERNATIVE 2**  
ATTACHING FLAT STRAP  
AT EACH SIDE OF THE  
STUD FLANGE. 12" DOWN  
FROM THE STUD END.



**C. ALTERNATIVE 3**  
ATTACHING 2 SCREWS AT  
EACH LEG OF THE DEEP  
LEG TRACK, NEAR THE  
STUD FLANGES. (TOTAL 4  
SCREWS)



## SECTION PROPERTIES



## VIPERSTUD®

| MODEL NO.   | GAUGE (mils) | MEMBER                             | DESIGN (in) | MIN. (in) | YIELD (ksi) | WEIGHT (lb/ft) | GROSS PROPERTIES |                      |                     |                      |                     | EFFECTIVE PROPERTIES  |                      | MOMENTS                    |                                          |                                                 |                                                 | CRITICAL UNBRACED LENGTH (in) |
|-------------|--------------|------------------------------------|-------------|-----------|-------------|----------------|------------------|----------------------|---------------------|----------------------|---------------------|-----------------------|----------------------|----------------------------|------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------|
|             |              |                                    |             |           |             |                | AREA (in²)       | I <sub>x</sub> (in⁴) | R <sub>x</sub> (in) | I <sub>y</sub> (in⁴) | R <sub>y</sub> (in) | I <sub>xd</sub> (in⁴) | S <sub>x</sub> (in³) | Allowable Moment Ma (in-k) | Local Buckling Nominal Moment Mnl (in-k) | Distortional Buckling Nominal Moment Mnd (in-k) | Nominal Moment for Conventional Studs Mn (in-k) |                               |
| VIPER25     | 25EQ (15)    | 162VS125-15 (25EQ)                 | 0.0155      | 0.0147    | 50          | 0.24           | 0.071            | 0.032                | 0.671               | 0.0000               | 0.461               | 0.032                 | 0.024                | 0.66                       | 1.42                                     | 1.20                                            | 1.02 (18MIL)                                    | 25.1                          |
|             |              | 250VS125-15 (25EQ)                 | 0.0155      | 0.0147    | 50          | 0.29           | 0.085            | 0.084                | 0.998               | 0.0170               | 0.452               | 0.090                 | 0.042                | 1.17                       | 2.72                                     | 2.12                                            | 1.72 (18MIL)                                    | 24.8                          |
|             |              | 362VS125-15 <sup>4</sup> (25EQ)    | 0.0155      | 0.0147    | 50          | 0.35           | 0.102            | 0.199                | 1.390               | 0.0190               | 0.435               | 0.205                 | 0.058                | 1.60                       | 3.48                                     | 2.90                                            | 2.47 (18MIL)                                    | 24.5                          |
|             |              | 400VS125-15 <sup>4</sup> (25EQ)    | 0.0155      | 0.0147    | 50          | 0.37           | 0.108            | 0.250                | 1.520               | 0.0200               | 0.429               | 0.255                 | 0.061                | 1.69                       | 3.99                                     | 3.06                                            | 2.74 (18MIL)                                    | 24.4                          |
|             |              | 600VS125-15 <sup>5</sup> (25EQ)    | 0.0155      | 0.0147    | 50          | 0.47           | 0.139            | 0.659                | 2.180               | 0.0220               | 0.397               | 0.628                 | 0.085                | 2.36                       | 5.90                                     | 4.27                                            | 4.13 (18MIL)                                    | 23.7                          |
| VIPER20     | 20EQ (18)    | 162VS125-18-70 (20EQ)              | 0.0190      | 0.0181    | 70          | 0.285          | 0.084            | 0.039                | 0.683               | 0.0179               | 0.462               | 0.0328                | 0.0285               | 1.19                       | 1.99                                     | 2.02                                            | 1.99 (30MIL)                                    | 21.2                          |
|             |              | 250VS125-18-70 (20EQ)              | 0.0190      | 0.0181    | 70          | 0.351          | 0.103            | 0.106                | 1.010               | 0.0227               | 0.469               | 0.0942                | 0.0581               | 2.09                       | 4.07                                     | 3.49                                            | 3.49 (30MIL)                                    | 21.9                          |
|             |              | 362VS125-18-70 (20EQ)              | 0.0190      | 0.0181    | 70          | 0.423          | 0.124            | 0.249                | 1.420               | 0.0256               | 0.454               | 0.213                 | 0.0755               | 3.08                       | 5.28                                     | 5.14                                            | 5.14 (30MIL)                                    | 21.5                          |
|             |              | 400VS125-18-70 (20EQ)              | 0.0190      | 0.0181    | 70          | 0.449          | 0.132            | 0.315                | 1.550               | 0.0266               | 0.449               | 0.265                 | 0.085                | 3.44                       | 5.93                                     | 5.74                                            | 5.74 (30MIL)                                    | 21.5                          |
|             |              | 600VS125-18-70 <sup>5</sup> (20EQ) | 0.0190      | 0.0181    | 70          | 0.586          | 0.172            | 0.846                | 2.220               | 0.0319               | 0.430               | 0.647                 | 0.151                | 5.41                       | 10.60                                    | 9.04                                            | 9.00 (30MIL)                                    | 21.5                          |
| VIPER 30MIL | 20 (30)      | 162VS125-30                        | 0.0312      | 0.0296    | 33          | 0.46           | 0.135            | 0.062                | 0.688               | 0.0280               | 0.455               | 0.062                 | 0.067                | 1.32                       | 2.21                                     | 2.38                                            | 1.99 (30MIL)                                    | 30.8                          |
|             |              | 250VS125-30                        | 0.0312      | 0.0296    | 33          | 0.55           | 0.161            | 0.166                | 1.020               | 0.0320               | 0.045               | 0.163                 | .0120                | 2.31                       | 3.96                                     | 3.86                                            | 3.49 (30MIL)                                    | 30.1                          |
|             |              | 362VS125-30                        | 0.0312      | 0.0296    | 33          | 0.67           | 0.197            | 0.391                | 1.410               | 0.0370               | 0.431               | 0.385                 | 0.172                | 3.39                       | 5.67                                     | 5.85                                            | 5.14 (30MIL)                                    | 29.7                          |
|             |              | 400VS125-30                        | 0.0312      | 0.0296    | 33          | 0.71           | 0.209            | 0.493                | 1.540               | 0.0380               | 0.425               | 0.486                 | 0.191                | 3.78                       | 6.31                                     | 6.52                                            | 5.74 (30MIL)                                    | 29.6                          |
|             |              | 600VS125-30                        | 0.0312      | 0.0296    | 33          | 0.92           | 0.271            | 1.310                | 2.190               | 0.0420               | 0.392               | 1.230                 | 0.341                | 5.95                       | 11.30                                    | 9.93                                            | 9.00 (30MIL)                                    | 28.7                          |
| VIPER 33MIL | 20 (33)      | 162VS125-33                        | 0.0346      | 0.0329    | 33          | 0.50           | 0.147            | 0.069                | 0.683               | 0.0300               | 0.453               | 0.068                 | 0.077                | 1.53                       | 2.55                                     | 2.71                                            | 2.29 (33MIL)                                    | 30.8                          |
|             |              | 250VS125-33                        | 0.0346      | 0.0329    | 33          | 0.61           | 0.178            | 0.183                | 1.010               | 0.0360               | 0.447               | 0.181                 | 0.137                | 2.65                       | 4.53                                     | 4.42                                            | 4.02 (33MIL)                                    | 30.1                          |
|             |              | 362VS125-33                        | 0.0346      | 0.0329    | 33          | 0.75           | 0.220            | 0.432                | 1.400               | 0.0400               | 0.429               | 0.428                 | 0.201                | 3.96                       | 6.62                                     | 6.75                                            | 6.00 (33MIL)                                    | 29.7                          |
|             |              | 400VS125-33                        | 0.0346      | 0.0329    | 33          | 0.78           | 0.230            | 0.544                | 1.540               | 0.0410               | 0.424               | 0.539                 | 0.224                | 4.42                       | 7.38                                     | 7.53                                            | 6.70 (33MIL)                                    | 29.5                          |
|             |              | 600VS125-33                        | 0.0346      | 0.0329    | 33          | 1.02           | 0.301            | 1.440                | 2.190               | 0.0460               | 0.391               | 1.390                 | 0.400                | 6.93                       | 13.20                                    | 11.60                                           | 10.55 (33MIL)                                   | 28.6                          |

## Notes:

- Nominal Moments for Viper25 are based on testing. Allowable moment (Ma) is calculated with safety factor of 1.81 in accordance with chapter F of AISI S100-16/S2-20 specification.
- Nominal moment for Viper20, Viper 30mil, Viper 33mil and conventional studs are based on calculations per AISI S100-16/S2-20.
- Section properties are in accordance with AISI S100-16/S2-20.
- Web depth-to-thickness ratio exceeds 200.
- Web depth-to-thickness ratio exceeds 260.
- ViperStud is considered fully braced when the unbraced length is less than listed Lu.
- K<sub>D</sub> assumed to be zero for distortional buckling moments.

## VIPERTRACK®

| PRODUCT<br>NAME       | LEG<br>SIZE<br>(in) | WEIGHT<br>(lb/ft) | DESIGN<br>(in) | MIN.<br>(in) | YIELD<br>(ksi) | GROSS PROPERTIES           |                                      |                                      |                        |                                      |                                      |                        | EFFECTIVE PROPERTIES                  |                                       |              | TORSIONAL PROPERTIES   |                                         |                                      |                        |       |  |
|-----------------------|---------------------|-------------------|----------------|--------------|----------------|----------------------------|--------------------------------------|--------------------------------------|------------------------|--------------------------------------|--------------------------------------|------------------------|---------------------------------------|---------------------------------------|--------------|------------------------|-----------------------------------------|--------------------------------------|------------------------|-------|--|
|                       |                     |                   |                |              |                | AREA<br>(in <sup>2</sup> ) | I <sub>x</sub><br>(in <sup>4</sup> ) | S <sub>x</sub><br>(in <sup>3</sup> ) | R <sub>x</sub><br>(in) | I <sub>y</sub><br>(in <sup>4</sup> ) | S <sub>y</sub><br>(in <sup>3</sup> ) | R <sub>y</sub><br>(in) | I <sub>xd</sub><br>(in <sup>4</sup> ) | S <sub>xe</sub><br>(in <sup>3</sup> ) | Ma<br>(in-k) | X <sub>o</sub><br>(in) | Jx10 <sup>3</sup><br>(in <sup>4</sup> ) | C <sub>w</sub><br>(in <sup>6</sup> ) | R <sub>o</sub><br>(in) | β     |  |
| VIPERTRACK 1.25" LEG  |                     |                   |                |              |                |                            |                                      |                                      |                        |                                      |                                      |                        |                                       |                                       |              |                        |                                         |                                      |                        |       |  |
| 162VT125-15 (25EQ)    | 1.25                | 0.22              | 0.0155         | 0.0147       | 50             | 0.064                      | 0.035                                | 0.040                                | 0.736                  | 0.011                                | 0.013                                | 0.412                  | 0.022                                 | 0.018                                 | 0.53         | -0.877                 | 0.0051                                  | 0.006                                | 1.22                   | 0.480 |  |
| 250VT125-15 (25EQ)    | 1.25                | 0.26              | 0.0155         | 0.0147       | 50             | 0.078                      | 0.086                                | 0.066                                | 1.050                  | 0.012                                | 0.013                                | 0.400                  | 0.054                                 | 0.027                                 | 0.80         | -0.768                 | 0.0062                                  | 0.015                                | 1.36                   | 0.683 |  |
| 362VT125-15 (25EQ)    | 1.25                | 0.32              | 0.0155         | 0.0147       | 50             | 0.095                      | 0.197                                | 0.105                                | 1.440                  | 0.014                                | 0.014                                | 0.381                  | 0.115                                 | 0.039                                 | 1.15         | -0.665                 | 0.0076                                  | 0.035                                | 1.63                   | 0.833 |  |
| 400VT125-15 (25EQ)    | 1.25                | 0.34              | 0.0155         | 0.0147       | 50             | 0.101                      | 0.247                                | 0.120                                | 1.560                  | 0.014                                | 0.014                                | 0.374                  | 0.141                                 | 0.043                                 | 1.27         | -0.638                 | 0.0081                                  | 0.043                                | 1.73                   | 0.864 |  |
| 600VT125-15 (25EQ)    | 1.25                | 0.45              | 0.0155         | 0.0147       | 50             | 0.132                      | 0.642                                | 0.210                                | 2.210                  | 0.015                                | 0.015                                | 0.342                  | 0.325                                 | 0.063                                 | 1.90         | -0.523                 | 0.0106                                  | 0.109                                | 2.29                   | 0.948 |  |
| 162VT125-18-50 (20EQ) | 1.25                | 0.26              | 0.0190         | 0.0181       | 50             | 0.077                      | 0.033                                | 0.042                                | 0.660                  | 0.013                                | 0.015                                | 0.407                  | 0.0190                                | 0.0180                                | 0.44         | -0.878                 | 0.0092                                  | 0.0060                               | 1.170                  | 0.438 |  |
| 250VT125-18-50 (20EQ) | 1.25                | 0.32              | 0.0190         | 0.0181       | 50             | 0.093                      | 0.091                                | 0.073                                | 0.986                  | 0.014                                | 0.016                                | 0.392                  | 0.0550                                | 0.0350                                | 0.88         | -0.747                 | 0.0011                                  | 0.0160                               | 1.300                  | 0.668 |  |
| 362VT125-18-50 (20EQ) | 1.25                | 0.39              | 0.0190         | 0.0181       | 50             | 0.115                      | 0.218                                | 0.121                                | 1.377                  | 0.016                                | 0.016                                | 0.370                  | 0.1320                                | 0.0570                                | 1.43         | -0.636                 | 0.0138                                  | 0.0380                               | 1.560                  | 0.834 |  |
| 400VT125-18-50 (20EQ) | 1.25                | 0.41              | 0.0190         | 0.0181       | 50             | 0.122                      | 0.275                                | 0.139                                | 1.503                  | 0.016                                | 0.016                                | 0.363                  | 0.1660                                | 0.0650                                | 1.62         | -0.606                 | 0.0146                                  | 0.0480                               | 1.660                  | 7.000 |  |
| 600VT125-18-50 (20EQ) | 1.25                | 0.54              | 0.0190         | 0.0181       | 50             | 0.160                      | 0.740                                | 0.248                                | 2.152                  | 0.017                                | 0.011                                | 0.330                  | 0.4200                                | 0.1050                                | 2.63         | -0.490                 | 0.0192                                  | 0.1220                               | 2.230                  | 0.952 |  |
| 162VT125-30           | 1.25                | 0.44              | 0.0312         | 0.0296       | 33             | 0.129                      | 0.071                                | 0.080                                | 0.741                  | 0.022                                | 0.025                                | 0.409                  | 0.056                                 | 0.051                                 | 1.00         | -0.868                 | 0.0419                                  | 0.012                                | 1.21                   | 0.488 |  |
| 250VT125-30           | 1.25                | 0.53              | 0.0312         | 0.0296       | 33             | 0.156                      | 0.175                                | 0.132                                | 1.060                  | 0.025                                | 0.027                                | 0.397                  | 0.142                                 | 0.090                                 | 1.77         | -0.760                 | 0.0508                                  | 0.030                                | 1.36                   | 0.689 |  |
| 362VT125-30           | 1.25                | 0.65              | 0.0312         | 0.0296       | 33             | 0.192                      | 0.399                                | 0.211                                | 1.440                  | 0.027                                | 0.028                                | 0.378                  | 0.331                                 | 0.152                                 | 3.00         | -0.658                 | 0.0621                                  | 0.069                                | 1.63                   | 0.837 |  |
| 400VT125-30           | 1.25                | 0.69              | 0.0312         | 0.0296       | 33             | 0.203                      | 0.499                                | 0.240                                | 1.570                  | 0.028                                | 0.028                                | 0.371                  | 0.417                                 | 0.176                                 | 3.47         | -0.631                 | 0.0659                                  | 0.086                                | 1.73                   | 0.867 |  |
| 600VT125-30           | 1.25                | 0.90              | 0.0312         | 0.0296       | 33             | 0.266                      | 1.300                                | 0.421                                | 2.210                  | 0.031                                | 0.029                                | 0.339                  | 1.030                                 | 0.250                                 | 4.94         | -0.517                 | 0.0862                                  | 0.216                                | 2.29                   | 0.949 |  |
| 162VT125-33           | 1.25                | 0.49              | 0.0346         | 0.0329       | 33             | 0.143                      | 0.079                                | 0.088                                | 0.742                  | 0.024                                | 0.028                                | 0.408                  | 0.064                                 | 0.059                                 | 1.16         | -0.866                 | 0.0571                                  | 0.013                                | 1.21                   | 0.489 |  |
| 250VT125-33           | 1.25                | 0.59              | 0.0346         | 0.0329       | 33             | 0.174                      | 0.195                                | 0.146                                | 1.060                  | 0.027                                | 0.029                                | 0.396                  | 0.162                                 | 0.103                                 | 2.04         | -0.758                 | 0.0692                                  | 0.033                                | 1.36                   | 0.690 |  |
| 362VT125-33           | 1.25                | 0.72              | 0.0346         | 0.0329       | 33             | 0.212                      | 0.443                                | 0.234                                | 1.440                  | 0.030                                | 0.031                                | 0.377                  | 0.375                                 | 0.173                                 | 3.43         | -0.657                 | 0.0848                                  | 0.077                                | 1.63                   | 0.838 |  |
| 400VT125-33           | 1.25                | 0.77              | 0.0346         | 0.0329       | 33             | 0.225                      | 0.554                                | 0.266                                | 1.570                  | 0.031                                | 0.031                                | 0.370                  | 0.473                                 | 0.200                                 | 3.95         | -0.629                 | 0.0899                                  | 0.096                                | 1.73                   | 0.868 |  |
| 600VT125-33           | 1.25                | 1.00              | 0.0346         | 0.0329       | 33             | 0.295                      | 1.440                                | 0.467                                | 2.210                  | 0.034                                | 0.032                                | 0.339                  | 1.190                                 | 0.298                                 | 5.89         | -0.516                 | 0.1180                                  | 0.239                                | 2.29                   | 0.949 |  |

## Notes:

- Section properties are in accordance with AISI S100-16/S2-20.
- Cold-work of forming is not included.
- The effective moment of inertia for deflection is calculated based on AISI S100-16/S2-20 procedure 1 for serviceability determination.
- The center line bend radius is greater than 2 times the design thickness or 3/32".
- Web-to-thickness ratio exceeds 200.
- Web-to-thickness ratio exceeds 260.
- Flange-width-to-thickness-ratio exceeds 60, only gross properties will be determined.



## DEEP LEG VIPERTRACK SECTION PROPERTIES



## VIPERTRACK®

| PRODUCT<br>NAME        | LEG<br>SIZE<br>(in) | WEIGHT<br>(lb/ft) | DESIGN<br>(in) | MIN.<br>(in) | YIELD<br>(ksi) | GROSS PROPERTIES |                         |                         |                        |                         |                         |                        | EFFECTIVE<br>PROPERTIES  |                          |              | TORSIONAL PROPERTIES |                |             |            |       |  |
|------------------------|---------------------|-------------------|----------------|--------------|----------------|------------------|-------------------------|-------------------------|------------------------|-------------------------|-------------------------|------------------------|--------------------------|--------------------------|--------------|----------------------|----------------|-------------|------------|-------|--|
|                        |                     |                   |                |              |                | AREA<br>(in²)    | I <sub>x</sub><br>(in⁴) | S <sub>x</sub><br>(in³) | R <sub>x</sub><br>(in) | I <sub>y</sub><br>(in⁴) | S <sub>y</sub><br>(in³) | R <sub>y</sub><br>(in) | I <sub>xd</sub><br>(in⁴) | S <sub>xe</sub><br>(in³) | Ma<br>(in-k) | Xo<br>(in)           | Jx10³<br>(in⁴) | Cw<br>(in⁶) | Ro<br>(in) | β     |  |
| VIPERTRACK 1.50" LEG   |                     |                   |                |              |                |                  |                         |                         |                        |                         |                         |                        |                          |                          |              |                      |                |             |            |       |  |
| 162VT150-15' (25EQ)    | 1.50                | 0.2424            | 0.0155         | 0.0147       | 50             | 0.0713           | 0.0364                  | 0.0439                  | 0.7141                 | 0.0173                  | 0.0349                  | 0.4930                 | 0.0167                   | 0.0142                   | 0.3542       | -1.101               | 0.0057         | 0.0083      | 1.402      | 0.355 |  |
| 250VT150-15' (25EQ)    | 1.50                | 0.2885            | 0.0155         | 0.0147       | 50             | 0.0849           | 0.0928                  | 0.0733                  | 1.0455                 | 0.0197                  | 0.0466                  | 0.4819                 | 0.0459                   | 0.0262                   | 0.6552       | -0.965               | 0.0068         | 0.0223      | 1.502      | 0.586 |  |
| 362VT150-15' (25EQ)    | 1.50                | 0.3478            | 0.0155         | 0.0147       | 50             | 0.1023           | 0.2138                  | 0.1169                  | 1.4450                 | 0.0219                  | 0.0611                  | 0.4621                 | 0.1059                   | 0.0414                   | 1.0358       | -0.840               | 0.0082         | 0.0525      | 1.734      | 0.902 |  |
| 400VT150-15' (25EQ)    | 1.50                | 0.3676            | 0.0155         | 0.0147       | 50             | 0.1081           | 0.2679                  | 0.1329                  | 1.5742                 | 0.0224                  | 0.0658                  | 0.4552                 | 0.1318                   | 0.0466                   | 1.1644       | -0.806               | 0.0087         | 0.0658      | 1.826      | 1.010 |  |
| 600VT150-15' (25EQ)    | 1.50                | 0.4730            | 0.0155         | 0.0147       | 50             | 0.1391           | 0.6952                  | 0.2305                  | 2.2354                 | 0.2460                  | 0.0900                  | 0.4205                 | 0.3220                   | 0.1904                   | 1.8545       | -0.667               | 0.0111         | 0.1677      | 2.370      | 1.607 |  |
| 162VT150-18'-50 (20EQ) | 1.50                | 0.2975            | 0.0190         | 0.0181       | 50             | 0.0875           | 0.0448                  | 0.0539                  | 0.7156                 | 0.0213                  | 0.0428                  | 0.4936                 | 0.0225                   | 0.0195                   | 0.4870       | -1.102               | 0.0011         | 0.0103      | 1.404      | 0.437 |  |
| 250VT150-18'-50 (20EQ) | 1.50                | 0.3540            | 0.0190         | 0.0181       | 50             | 0.1041           | 0.1141                  | 0.0899                  | 1.0469                 | 0.0243                  | 0.0570                  | 0.4825                 | 0.0623                   | 0.0370                   | 0.9239       | -0.966               | 0.0125         | 0.0275      | 1.504      | 0.721 |  |
| 362VT150-18'-50 (20EQ) | 1.50                | 0.4267            | 0.0190         | 0.0181       | 50             | 0.1255           | 0.2627                  | 0.1434                  | 1.4468                 | 0.0269                  | 0.0746                  | 0.4627                 | 0.1446                   | 0.0589                   | 1.4728       | -0.841               | 0.0151         | 0.0646      | 1.736      | 1.109 |  |
| 400VT150-18'-50 (20EQ) | 1.50                | 0.4509            | 0.0190         | 0.0181       | 50             | 0.1326           | 0.3292                  | 0.1631                  | 1.5755                 | 0.0273                  | 0.0804                  | 0.4558                 | 0.1804                   | 0.0663                   | 1.6582       | -0.807               | 0.0160         | 0.0811      | 1.828      | 1.242 |  |
| 600VT150-18'-50 (20EQ) | 1.50                | 0.5801            | 0.0190         | 0.0181       | 50             | 0.1706           | 0.8537                  | 0.2828                  | 2.2368                 | 0.3030                  | 0.1098                  | 0.4211                 | 0.4437                   | 0.1061                   | 2.6535       | -0.668               | 0.2053         | 0.2065      | 2.372      | 1.976 |  |
| 162VT150-30            | 1.50                | 0.4906            | 0.0312         | 0.0296       | 33             | 0.1443           | 0.0749                  | 0.0888                  | 0.7205                 | 0.0355                  | 0.0700                  | 0.4957                 | 0.0507                   | 0.0484                   | 0.7990       | -1.107               | 0.0468         | 0.0173      | 1.411      | 0.481 |  |
| 250VT150-30            | 1.50                | 0.5834            | 0.0312         | 0.0296       | 33             | 0.1716           | 0.1898                  | 0.1481                  | 1.0517                 | 0.0403                  | 0.0930                  | 0.4847                 | 0.1350                   | 0.0880                   | 1.4524       | -0.971               | 0.0557         | 0.0460      | 1.551      | 0.791 |  |
| 362VT150-30            | 1.50                | 0.7027            | 0.0312         | 0.0296       | 33             | 0.2067           | 0.4354                  | 0.2392                  | 1.4515                 | 0.0446                  | 0.1214                  | 0.4648                 | 0.3245                   | 0.1518                   | 2.5047       | -0.846               | 0.0671         | 0.1046      | 1.743      | 1.215 |  |
| 400VT150-30            | 1.50                | 0.7425            | 0.0312         | 0.0296       | 33             | 0.2184           | 0.5453                  | 0.2685                  | 1.5802                 | 0.0458                  | 0.1304                  | 0.4580                 | 0.4095                   | 0.2387                   | 2.8797       | -0.812               | 0.0709         | 0.1354      | 1.835      | 1.360 |  |
| 600VT150-30            | 1.50                | 0.9547            | 0.0312         | 0.0296       | 33             | 0.2808           | 1.4106                  | 0.4654                  | 2.2141                 | 0.0503                  | 0.1776                  | 0.4232                 | 1.0401                   | 0.4209                   | 4.7787       | -0.672               | 0.0911         | 0.3442      | 2.378      | 2.162 |  |
| 162VT150-33            | 1.50                | 0.5446            | 0.0346         | 0.0329       | 33             | 0.1602           | 0.0835                  | 0.0986                  | 0.7219                 | 0.0395                  | 0.0775                  | 0.4963                 | 0.0586                   | 0.0567                   | 0.9351       | -1.109               | 0.0639         | 0.0193      | 1.413      | 0.535 |  |
| 250VT150-33            | 1.50                | 0.6476            | 0.0346         | 0.0329       | 33             | 0.1905           | 0.2112                  | 0.1644                  | 1.0530                 | 0.0485                  | 0.1029                  | 0.4853                 | 0.1551                   | 0.1022                   | 2.0199       | -0.973               | 0.0760         | 0.0513      | 1.513      | 0.880 |  |
| 362VT150-33            | 1.50                | 0.7799            | 0.0346         | 0.0329       | 33             | 0.2294           | 0.4841                  | 0.2621                  | 1.4528                 | 0.0497                  | 0.1343                  | 0.4654                 | 0.3806                   | 0.2351                   | 3.4576       | -0.847               | 0.0915         | 0.1203      | 1.745      | 1.351 |  |
| 400VT150-33            | 1.50                | 0.8240            | 0.0346         | 0.0329       | 33             | 0.2424           | 0.6062                  | 0.2979                  | 1.5815                 | 0.0510                  | 0.1444                  | 0.4586                 | 0.4692                   | 0.2027                   | 4.0050       | -0.813               | 0.0967         | 0.1509      | 1.836      | 1.513 |  |
| 600VT150-33            | 1.50                | 1.0593            | 0.0346         | 0.0329       | 33             | 0.3116           | 1.5670                  | 0.5164                  | 2.2427                 | 0.0559                  | 0.1961                  | 0.4238                 | 1.2029                   | 0.4708                   | 6.7643       | -0.673               | 0.1243         | 0.3832      | 2.380      | 2.404 |  |
| VIPERTRACK 2.00" LEG   |                     |                   |                |              |                |                  |                         |                         |                        |                         |                         |                        |                          |                          |              |                      |                |             |            |       |  |
| 162VT200-15 (25EQ)     | 2.00                | 0.30              | 0.0155         | 0.0147       | 50             | 0.087            | 0.052                   | 0.060                   | 0.773                  | 0.038                   | 0.030                   | 0.663                  | 0.025                    | 0.017                    | 0.50         | -1.57                | 0.0070         | 0.0212      | 1.87       | 0.295 |  |
| 250VT200-15 (25EQ)     | 2.00                | 0.34              | 0.0155         | 0.0147       | 50             | 0.101            | 0.126                   | 0.096                   | 1.117                  | 0.044                   | 0.032                   | 0.662                  | 0.060                    | 0.026                    | 0.79         | -1.43                | 0.0081         | 0.0535      | 1.93       | 0.453 |  |
| 362VT200-15 (25EQ)     | 2.00                | 0.40              | 0.0155         | 0.0147       | 50             | 0.118            | 0.278                   | 0.148                   | 1.533                  | 0.050                   | 0.034                   | 0.648                  | 0.127                    | 0.039                    | 1.16         | -1.28                | 0.0095         | 0.1220      | 2.10       | 0.629 |  |
| 400VT200-15 (25EQ)     | 2.00                | 0.42              | 0.0155         | 0.0147       | 50             | 0.124            | 0.345                   | 0.167                   | 1.667                  | 0.051                   | 0.034                   | 0.642                  | 0.155                    | 0.043                    | 1.28         | -1.24                | 0.0100         | 0.1520      | 2.17       | 0.676 |  |
| 600VT200-15 (25EQ)     | 2.00                | 0.53              | 0.0155         | 0.0147       | 50             | 0.155            | 0.859                   | 0.281                   | 2.353                  | 0.057                   | 0.036                   | 0.608                  | 0.357                    | 0.065                    | 1.93         | -1.06                | 0.0124         | 0.3840      | 2.65       | 0.841 |  |
| 162VT200-18-70 (20EQ)  | 2.00                | 0.36              | 0.0190         | 0.0181       | 70             | 0.105            | 0.049                   | 0.061                   | 0.681                  | 0.045                   | 0.036                   | 0.656                  | 0.020                    | 0.017                    | 0.59         | -1.591               | 0.0013         | 0.022       | 1.85       | 0.261 |  |
| 250VT200-18-70 (20EQ)  | 2.00                | 0.41              | 0.0190         | 0.0181       | 70             | 0.122            | 0.130                   | 0.105                   | 1.032                  | 0.052                   | 0.038                   | 0.653                  | 0.058                    | 0.033                    | 1.15         | -1.415               | 0.0147         | 0.059       | 1.87       | 0.427 |  |
| 362VT200-18-70 (20EQ)  | 2.00                | 0.49              | 0.0190         | 0.0181       | 70             | 0.143            | 0.303                   | 0.169                   | 1.455                  | 0.058                   | 0.040                   | 0.637                  | 0.136                    | 0.053                    | 1.84         | -1.253               | 0.0172         | 0.137       | 2.02       | 0.616 |  |
| 400VT200-18-70 (20EQ)  | 2.00                | 0.51              | 0.0190         | 0.0181       | 70             | 0.150            | 0.380                   | 0.192                   | 1.591                  | 0.060                   | 0.041                   | 0.631                  | 0.170                    | 0.059                    | 2.07         | -1.209               | 0.0181         | 0.172       | 2.10       | 0.667 |  |
| 600VT200-18-70 (20EQ)  | 2.00                | 0.64              | 0.0190         | 0.0181       | 70             | 0.188            | 0.983                   | 0.329                   | 2.285                  | 0.067                   | 0.042                   | 0.595                  | 0.421                    | 0.095                    | 3.34         | -1.023               | 0.0227         | 0.439       | 2.57       | 0.842 |  |
| 162VT200-30            | 2.00                | 0.60              | 0.0312         | 0.0296       | 33             | 0.176            | 0.107                   | 0.120                   | 0.779                  | 0.077                   | 0.060                   | 0.660                  | 0.069                    | 0.055                    | 1.09         | -1.56                | 0.057          | 0.043       | 1.87       | 0.299 |  |
| 250VT200-30            | 2.00                | 0.69              | 0.0312         | 0.0296       | 33             | 0.203            | 0.256                   | 0.193                   | 1.120                  | 0.088                   | 0.064                   | 0.659                  | 0.174                    | 0.098                    | 1.94         | -1.42                | 0.066          | 0.108       | 1.92       | 0.457 |  |
| 362VT200-30            | 2.00                | 0.81              | 0.0312         | 0.0296       | 33             | 0.238            | 0.563                   | 0.298                   | 1.540                  | 0.099                   | 0.068                   | 0.645                  | 0.400                    | 0.167                    | 3.29         | -1.27                | 0.077          | 0.246       | 2.10       | 0.633 |  |
| 400VT200-30            | 2.00                | 0.85              | 0.0312         | 0.0296       | 33             | 0.250            | 0.698                   | 0.336                   | 1.670                  | 0.102                   | 0.068                   | 0.639                  | 0.502                    | 0.188                    | 3.71         | -1.23                | 0.081          | 0.306       | 2.17       | 0.680 |  |
| 600VT200-30            | 2.00                | 1.06              | 0.0312         | 0.0296       | 33             | 0.312            | 1.735                   | 0.564                   | 2.360                  | 0.114                   | 0.072                   | 0.605                  | 1.270                    | 0.276                    | 5.45         | -1.05                | 0.101          | 0.769       | 2.65       | 0.843 |  |
| 162VT200-33            | 2.00                | 0.66              | 0.0346         | 0.0329       | 33             | 0.195            | 0.119                   | 0.133                   | 0.780                  | 0.085                   | 0.066                   | 0.660                  | 0.080                    | 0.064                    | 1.27         | -1.56                | 0.078          | 0.048       | 1.87       | 0.300 |  |
| 250VT200-33            | 2.00                | 0.77              | 0.0346         | 0.0329       | 33             | 0.225            | 0.284                   | 0.214                   | 1.120                  | 0.098                   | 0.071                   | 0.658                  | 0.199                    | 0.113                    | 2.23         | -1.42                | 0.090          | 0.120       | 1.92       | 0.458 |  |
| 362VT200-33            | 2.00                | 0.90              | 0.0346         | 0.0329       | 33             | 0.264            | 0.626                   | 0.330                   | 1.540                  | 0.110                   | 0.075                   | 0.644                  | 0.455                    | 0.191                    | 3.76         | -1.27                | 0.105          | 0.272       | 2.10       | 0.634 |  |
| 400VT200-33            | 2.00                | 0.94              | 0.0346         | 0.0329       | 33             | 0.277            | 0.775                   | 0.373                   | 1.670                  | 0.113                   | 0.076                   | 0.638                  | 0.570                    | 0.220                    | 4.34         | -1.23                | 0.111          | 0.340       | 2.17       | 0.680 |  |
| 600VT200-33            | 2.00                | 1.18              | 0.0346         | 0.0329       | 33             | 0.347            | 1.930                   | 0.625                   | 2.360                  | 0.126                   | 0.080                   | 0.604                  | 1.480                    | 0.338                    | 6.69         | -1.05                | 0.138          | 0.852       | 2.65       | 0.844 |  |

## Notes:

1. Section properties are in accordance with AISI S100-16/S2-20.
2. Cold-work of forming is not included.
3. The effective moment of inertia for deflection is calculated based on AISI S100-16/S2-20 procedure 1 for serviceability determination.

4. The center line bend radius is greater than 2 times the design thickness or 3/32".
5. Web-to-thickness ratio exceeds 200.
6. Web-to-thickness ratio exceeds 260.
7. Flange-width-to-thickness-ratio exceeds 60, only gross properties will be determined.



## DEEP LEG VIPERTRACK SECTION PROPERTIES (CONTINUED)



## VIPERTRACK®

| PRODUCT<br>NAME       | LEG<br>SIZE<br>(in) | WEIGHT<br>(lb/ft) | DESIGN<br>(in) | MIN.<br>(in) | YIELD<br>(ksi) | GROSS PROPERTIES |                         |                         |                        |                         |                         |                        | EFFECTIVE<br>PROPERTIES  |                          |              | TORSIONAL PROPERTIES   |                |                         |                        |       |  |
|-----------------------|---------------------|-------------------|----------------|--------------|----------------|------------------|-------------------------|-------------------------|------------------------|-------------------------|-------------------------|------------------------|--------------------------|--------------------------|--------------|------------------------|----------------|-------------------------|------------------------|-------|--|
|                       |                     |                   |                |              |                | AREA<br>(in²)    | I <sub>x</sub><br>(in⁴) | S <sub>x</sub><br>(in³) | R <sub>x</sub><br>(in) | I <sub>y</sub><br>(in⁴) | S <sub>y</sub><br>(in³) | R <sub>y</sub><br>(in) | I <sub>xd</sub><br>(in⁴) | S <sub>xe</sub><br>(in³) | Ma<br>(in-k) | X <sub>o</sub><br>(in) | Jx10³<br>(in⁴) | C <sub>w</sub><br>(in⁶) | R <sub>o</sub><br>(in) | β     |  |
| VIPERTRACK 2.50" LEG  |                     |                   |                |              |                |                  |                         |                         |                        |                         |                         |                        |                          |                          |              |                        |                |                         |                        |       |  |
| 250VT250-18-70 (20EQ) | 2.50                | 0.54              | 0.0190         | 0.0181       | 70             | 0.160            | 0.179                   | 0.145                   | 1.059                  | 0.155                   | 0.081                   | 0.986                  | 0.063                    | 0.033                    | 1.17         | -2.634                 | 0.0192         | 0.1840                  | 2.77                   | 0.273 |  |
| 362VT250-18-70 (20EQ) | 2.50                | 0.62              | 0.0190         | 0.0181       | 70             | 0.162            | 0.359                   | 0.200                   | 1.487                  | 0.107                   | 0.061                   | 0.812                  | 0.143                    | 0.053                    | 1.85         | -1.695                 | 0.0195         | 0.2540                  | 2.40                   | 0.500 |  |
| 400VT250-18-70 (20EQ) | 2.50                | 0.64              | 0.0190         | 0.0181       | 70             | 0.169            | 0.488                   | 0.226                   | 1.628                  | 0.110                   | 0.062                   | 0.807                  | 0.178                    | 0.060                    | 2.09         | -1.642                 | 0.0204         | 0.3170                  | 2.45                   | 0.551 |  |
| 600VT250-18-70 (20EQ) | 2.50                | 0.77              | 0.0190         | 0.0181       | 70             | 0.207            | 1.143                   | 0.383                   | 2.348                  | 0.124                   | 0.065                   | 0.774                  | 0.438                    | 0.096                    | 3.36         | -1.416                 | 0.0249         | 0.8060                  | 2.85                   | 0.753 |  |
| 162VT250-30           | 2.50                | 0.71              | 0.0312         | 0.0296       | 33             | 0.207            | 0.131                   | 0.147                   | 0.794                  | 0.140                   | 0.090                   | 0.822                  | 0.076                    | 0.057                    | 1.13         | -2.04                  | 0.0672         | 0.0800                  | 2.34                   | 0.239 |  |
| 250VT250-30           | 2.50                | 0.80              | 0.0312         | 0.0296       | 33             | 0.234            | 0.310                   | 0.233                   | 1.150                  | 0.161                   | 0.097                   | 0.828                  | 0.190                    | 0.102                    | 2.01         | -1.88                  | 0.0761         | 0.1990                  | 2.35                   | 0.363 |  |
| 362VT250-30           | 2.50                | 0.92              | 0.0312         | 0.0296       | 33             | 0.270            | 0.673                   | 0.356                   | 1.580                  | 0.181                   | 0.102                   | 0.820                  | 0.437                    | 0.167                    | 3.30         | -1.71                  | 0.0875         | 0.4490                  | 2.47                   | 0.521 |  |
| 400VT250-30           | 2.50                | 0.96              | 0.0312         | 0.0296       | 33             | 0.281            | 0.831                   | 0.400                   | 1.720                  | 0.187                   | 0.104                   | 0.816                  | 0.548                    | 0.185                    | 3.66         | -1.66                  | 0.0913         | 0.5600                  | 2.52                   | 0.568 |  |
| 600VT250-30           | 2.50                | 1.17              | 0.0312         | 0.0296       | 33             | 0.344            | 2.030                   | 0.659                   | 2.430                  | 0.211                   | 0.110                   | 0.784                  | 1.330                    | 0.275                    | 5.43         | -1.44                  | 0.1120         | 1.4000                  | 2.93                   | 0.758 |  |
| 162VT250-33           | 2.50                | 0.78              | 0.0346         | 0.0329       | 33             | 0.230            | 0.145                   | 0.163                   | 0.796                  | 0.155                   | 0.100                   | 0.821                  | 0.088                    | 0.066                    | 1.31         | -2.04                  | 0.0917         | 0.0890                  | 2.34                   | 0.239 |  |
| 250VT250-33           | 2.50                | 0.89              | 0.0346         | 0.0329       | 33             | 0.260            | 0.344                   | 0.258                   | 1.150                  | 0.178                   | 0.107                   | 0.827                  | 0.218                    | 0.117                    | 2.32         | -1.88                  | 0.1040         | 0.2210                  | 2.35                   | 0.363 |  |
| 362VT250-33           | 2.50                | 1.02              | 0.0346         | 0.0329       | 33             | 0.299            | 0.748                   | 0.395                   | 1.580                  | 0.201                   | 0.114                   | 0.820                  | 0.498                    | 0.198                    | 3.92         | -1.71                  | 0.1190         | 0.4980                  | 2.47                   | 0.522 |  |
| 400VT250-33           | 2.50                | 1.06              | 0.0346         | 0.0329       | 33             | 0.312            | 0.923                   | 0.443                   | 1.720                  | 0.207                   | 0.115                   | 0.815                  | 0.623                    | 0.226                    | 4.46         | -1.66                  | 0.1240         | 0.6210                  | 2.52                   | 0.569 |  |
| 600VT250-33           | 2.50                | 1.30              | 0.0346         | 0.0329       | 33             | 0.381            | 2.250                   | 0.730                   | 2.430                  | 0.234                   | 0.122                   | 0.783                  | 1.580                    | 0.336                    | 6.64         | -1.44                  | 0.1520         | 1.5500                  | 2.93                   | 0.759 |  |
| VIPERTRACK 3.00" LEG  |                     |                   |                |              |                |                  |                         |                         |                        |                         |                         |                        |                          |                          |              |                        |                |                         |                        |       |  |
| 250VT300-18-70 (20EQ) | 3.00                | 0.59              | 0.0190         | 0.0181       | 70             | 0.175            | 0.237                   | 0.180                   | 1.170                  | 0.173                   | 0.089                   | 0.995                  | 0.098                    | 0.041                    | 1.39         | -2.36                  | 0.0245         | 0.2160                  | 2.81                   | 0.298 |  |
| 362VT300-18-70 (20EQ) | 3.00                | 0.67              | 0.0190         | 0.0181       | 70             | 0.181            | 0.413                   | 0.230                   | 1.510                  | 0.175                   | 0.086                   | 0.984                  | 0.163                    | 0.060                    | 1.50         | -2.152                 | 0.0218         | 0.4210                  | 2.81                   | 0.412 |  |
| 400VT300-18-70 (20EQ) | 3.00                | 0.75              | 0.0190         | 0.0181       | 70             | 0.188            | 0.516                   | 0.260                   | 1.656                  | 0.181                   | 0.087                   | 0.981                  | 0.184                    | 0.060                    | 2.10         | -2.092                 | 0.0227         | 0.5260                  | 2.84                   | 0.458 |  |
| 600VT300-18-70 (20EQ) | 3.00                | 0.90              | 0.0190         | 0.0181       | 70             | 0.226            | 1.301                   | 0.436                   | 2.397                  | 0.205                   | 0.092                   | 0.952                  | 0.451                    | 0.096                    | 3.38         | -1.831                 | 0.0272         | 1.3250                  | 3.16                   | 0.665 |  |
| 162VT300-30           | 3.00                | 0.81              | 0.0312         | 0.0296       | 33             | 0.238            | 0.155                   | 0.174                   | 0.805                  | 0.229                   | 0.126                   | 0.980                  | 0.081                    | 0.058                    | 1.15         | -2.53                  | 0.0773         | 0.1340                  | 2.83                   | 0.201 |  |
| 250VT300-30           | 3.00                | 0.90              | 0.0312         | 0.0296       | 33             | 0.266            | 0.363                   | 0.274                   | 1.170                  | 0.262                   | 0.135                   | 0.993                  | 0.204                    | 0.104                    | 2.06         | -2.35                  | 0.0862         | 0.3290                  | 2.80                   | 0.299 |  |
| 362VT300-30           | 3.00                | 1.02              | 0.0312         | 0.0296       | 33             | 0.301            | 0.783                   | 0.414                   | 1.610                  | 0.296                   | 0.144                   | 0.992                  | 0.469                    | 0.165                    | 3.25         | -2.16                  | 0.0976         | 0.7380                  | 2.87                   | 0.435 |  |
| 400VT300-30           | 3.00                | 1.06              | 0.0312         | 0.0296       | 33             | 0.312            | 0.964                   | 0.464                   | 1.760                  | 0.306                   | 0.146                   | 0.989                  | 0.587                    | 0.183                    | 3.61         | -2.10                  | 0.1010         | 0.9180                  | 2.91                   | 0.479 |  |
| 600VT300-30           | 3.00                | 1.28              | 0.0312         | 0.0296       | 33             | 0.375            | 2.320                   | 0.754                   | 2.490                  | 0.347                   | 0.155                   | 0.962                  | 1.380                    | 0.274                    | 5.41         | -1.85                  | 0.1220         | 2.2900                  | 3.25                   | 0.674 |  |
| 162VT300-33           | 3.00                | 0.90              | 0.0346         | 0.0329       | 33             | 0.264            | 0.172                   | 0.192                   | 0.807                  | 0.254                   | 0.139                   | 0.979                  | 0.094                    | 0.068                    | 1.34         | -2.52                  | 0.1050         | 0.1490                  | 2.82                   | 0.202 |  |
| 250VT300-33           | 3.00                | 1.00              | 0.0346         | 0.0329       | 33             | 0.295            | 0.404                   | 0.303                   | 1.170                  | 0.290                   | 0.150                   | 0.993                  | 0.234                    | 0.120                    | 2.38         | -2.35                  | 0.1180         | 0.3660                  | 2.80                   | 0.300 |  |
| 362VT300-33           | 3.00                | 1.14              | 0.0346         | 0.0329       | 33             | 0.334            | 0.869                   | 0.459                   | 1.620                  | 0.328                   | 0.159                   | 0.992                  | 0.535                    | 0.200                    | 3.96         | -2.16                  | 0.1330         | 0.8190                  | 2.87                   | 0.436 |  |
| 400VT300-33           | 3.00                | 1.18              | 0.0346         | 0.0329       | 33             | 0.347            | 1.070                   | 0.514                   | 1.760                  | 0.339                   | 0.162                   | 0.988                  | 0.669                    | 0.223                    | 4.40         | -2.10                  | 0.1380         | 1.0200                  | 2.91                   | 0.480 |  |
| 600VT300-33           | 3.00                | 1.41              | 0.0346         | 0.0329       | 33             | 0.416            | 2.580                   | 0.836                   | 2.490                  | 0.384                   | 0.171                   | 0.961                  | 1.640                    | 0.334                    | 6.60         | -1.85                  | 0.1660         | 2.5400                  | 3.25                   | 0.675 |  |

## Notes:

1. Section properties are in accordance with AISI S100-16/S2-20.
2. Cold-work of forming is not included.
3. The effective moment of inertia for deflection is calculated based on AISI S100-16/S2-20 procedure 1 for serviceability determination.
4. The center line bend radius is greater than 2 times the design thickness or 3/32".
5. Web-to-thickness ratio exceeds 200.
6. Web-to-thickness ratio exceeds 260.
7. Flange-width-to-thickness-ratio exceeds 60, only gross properties will be determined.



## SELECT MARKETS ONLY (18 mil, 33 ksi)



## VIPERSTUD® SECTION PROPERTIES

| MODEL NO.   | GAUGE (mils) | MEMBER               | DESIGN (in) | MIN. (in) | YIELD (ksi) | WEIGHT (lb/ft) | GROSS PROPERTIES |                      |                     |                      |                     | EFFECTIVE PROPERTIES  |                      | MOMENTS   |                                                 |                                                        |                                                  | CRITICAL UNBRACED LENGTH (in) |
|-------------|--------------|----------------------|-------------|-----------|-------------|----------------|------------------|----------------------|---------------------|----------------------|---------------------|-----------------------|----------------------|-----------|-------------------------------------------------|--------------------------------------------------------|--------------------------------------------------|-------------------------------|
|             |              |                      |             |           |             |                | AREA (in²)       | I <sub>x</sub> (in⁴) | R <sub>x</sub> (in) | I <sub>y</sub> (in⁴) | R <sub>y</sub> (in) | I <sub>xd</sub> (in⁴) | S <sub>x</sub> (in³) | Ma (in-k) | Local Buckling Nominal Moment² Viper Mnl (in-k) | Distortional Buckling Nominal Moment² Viper Mnd (in-k) | Nominal Moment for Conventional Studs³ Mn (in-k) |                               |
| VIPER 18mil | 25 (18)      | 162VS125-18 (25 ga.) | 0.0188      | 0.0179    | 33          | 0.28           | 0.069            | 0.039                | 0.684               | 0.018                | 0.461               | 0.037                 | 0.035                | 0.68      | 1.14                                            | 1.23                                                   | 1.02 (18MIL)                                     | 30.70                         |
|             |              | 250VS125-18 (25 ga.) | 0.0188      | 0.0179    | 33          | 0.34           | 0.099            | 0.102                | 1.015               | 0.020                | 0.454               | 0.098                 | 0.065                | 1.29      | 2.15                                            | 1.95                                                   | 1.72 (18MIL)                                     | 29.70                         |
|             |              | 362VS125-18 (25 ga.) | 0.0188      | 0.0179    | 33          | 0.41           | 0.120            | 0.241                | 1.414               | 0.023                | 0.437               | 0.237                 | 0.084                | 1.65      | 2.76                                            | 2.89                                                   | 2.47 (18MIL)                                     | 29.90                         |
|             |              | 400VS125-18 (25 ga.) | 0.0188      | 0.0179    | 33          | 0.43           | 0.127            | 0.303                | 1.542               | 0.024                | 0.431               | 0.299                 | 0.093                | 1.83      | 3.06                                            | 3.20                                                   | 2.74 (18MIL)                                     | 29.80                         |

## Notes:

- Section properties are in accordance with AISI S100-16/S2-20. Viper 25 and Viper20 section properties are based on testing. Allowable moment (Ma) is calculated with a safety factor of 1.81 in accordance with Chapter F of AISI S100-16/S2-20 specification.
- Nominal moment for Viper 18 mil, Viper 30 mil, and Viper 33 mil conventional studs are based on calculations in accordance with AISI S100-16/S2-20. Allowable moments (Ma) can be calculated with a 1.67 safety factor.
- Section properties are in accordance with AISI S100-16/S2-20.
- Web depth-to-thickness ratio exceeds 200.
- Web depth-to-thickness ratio exceeds 260.
- ViperStud is considered fully braced when unbraced length is less than listed Lu.
- K $\Phi$  assumed to be zero for distortional buckling moments.

## VIPERTRACK® SECTION PROPERTIES

| PRODUCT NAME                        | LEG SIZE (in) | WEIGHT (lb/ft) | DESIGN (in) | MIN. (in) | YIELD (ksi) | GROSS PROPERTIES        |                                   |                                   |                     |                                   |                                   |                     | EFFECTIVE PROPERTIES               |                                    |           | TORSIONAL PROPERTIES |                                      |                                   |                     |       |  |
|-------------------------------------|---------------|----------------|-------------|-----------|-------------|-------------------------|-----------------------------------|-----------------------------------|---------------------|-----------------------------------|-----------------------------------|---------------------|------------------------------------|------------------------------------|-----------|----------------------|--------------------------------------|-----------------------------------|---------------------|-------|--|
|                                     |               |                |             |           |             | AREA (in <sup>2</sup> ) | I <sub>x</sub> (in <sup>4</sup> ) | S <sub>x</sub> (in <sup>3</sup> ) | R <sub>x</sub> (in) | I <sub>y</sub> (in <sup>4</sup> ) | S <sub>y</sub> (in <sup>3</sup> ) | R <sub>y</sub> (in) | I <sub>xd</sub> (in <sup>4</sup> ) | S <sub>xe</sub> (in <sup>3</sup> ) | Ma (in-k) | X <sub>o</sub> (in)  | Jx10 <sup>3</sup> (in <sup>4</sup> ) | C <sub>w</sub> (in <sup>6</sup> ) | R <sub>o</sub> (in) | B     |  |
| VIPERTRACK 1.25" LEG                |               |                |             |           |             |                         |                                   |                                   |                     |                                   |                                   |                     |                                    |                                    |           |                      |                                      |                                   |                     |       |  |
| 162VT125-18 (25 ga.)                | 1.25          | 0.26           | 0.0188      | 0.0179    | 33          | 0.077                   | 0.042                             | 0.048                             | 0.733               | 0.013                             | 0.0149                            | 0.411               | 0.030                              | 0.025                              | 0.50      | -0.878               | 0.009                                | 0.007                             | 1.215               | 0.478 |  |
| 250VT125-18 (25 ga.)                | 1.25          | 0.32           | 0.0188      | 0.0179    | 33          | 0.094                   | 0.105                             | 0.080                             | 1.057               | 0.015                             | 0.0160                            | 0.399               | 0.079                              | 0.046                              | 0.90      | -0.766               | 0.011                                | 0.018                             | 1.366               | 0.685 |  |
| 362VT125-18 (25 ga.)                | 1.25          | 0.39           | 0.0188      | 0.0179    | 33          | 0.115                   | 0.240                             | 0.127                             | 1.442               | 0.017                             | 0.0168                            | 0.380               | 0.192                              | 0.066                              | 1.30      | -0.664               | 0.014                                | 0.042                             | 1.632               | 0.835 |  |
| 400VT125-18 (25 ga.)                | 1.25          | 0.42           | 0.0188      | 0.0179    | 33          | 0.122                   | 0.300                             | 0.145                             | 1.566               | 0.017                             | 0.0170                            | 0.374               | 0.244                              | 0.072                              | 1.43      | -0.636               | 0.014                                | 0.053                             | 1.731               | 0.865 |  |
| 600VT125-18 <sup>6,7</sup> (25 ga.) | 1.25          | 0.54           | 0.0188      | 0.0179    | 33          | 0.160                   | 0.779                             | 0.254                             | 2.208               | 0.019                             | 0.0176                            | 0.342               | -                                  | -                                  | -         | -0.521               | 0.019                                | 0.132                             | 2.294               | 0.948 |  |
| VIPERTRACK 2.00" LEG                |               |                |             |           |             |                         |                                   |                                   |                     |                                   |                                   |                     |                                    |                                    |           |                      |                                      |                                   |                     |       |  |
| 250VT200-18 <sup>7</sup> (25 ga.)   | 2.00          | 0.42           | 0.0188      | 0.0179    | 33          | 0.122                   | 0.154                             | 0.116                             | 1.121               | 0.053                             | 0.0383                            | 0.661               | -                                  | -                                  | -         | -1.43                | 0.014                                | 0.066                             | 1.93                | 0.455 |  |
| 362VT200-18 <sup>7</sup> (25 ga.)   | 2.00          | 0.49           | 0.0188      | 0.0179    | 33          | 0.144                   | 0.339                             | 0.180                             | 1.537               | 0.060                             | 0.0407                            | 0.647               | -                                  | -                                  | -         | -1.28                | 0.017                                | 0.149                             | 2.10                | 0.630 |  |
| 400VT200-18 <sup>7</sup> (25 ga.)   | 2.00          | 0.51           | 0.0188      | 0.0179    | 33          | 0.151                   | 0.420                             | 0.203                             | 1.670               | 0.062                             | 0.0412                            | 0.642               | -                                  | -                                  | -         | -1.24                | 0.018                                | 0.186                             | 2.17                | 0.677 |  |
| 600VT200-18 <sup>6,7</sup> (25 ga.) | 2.00          | 0.64           | 0.0188      | 0.0179    | 33          | 0.188                   | 1.039                             | 0.339                             | 2.350               | 0.069                             | 0.0434                            | 0.607               | -                                  | -                                  | -         | -1.06                | 0.022                                | 0.464                             | 2.65                | 0.841 |  |

## Notes:

- Section properties are in accordance with AISI S100-16/S2-20.
- Cold-work of forming is not included.
- The effective moment of inertia for deflection is calculated based on AISI S100-16/S2-20 procedure 1 for serviceability determination.
- The center line bend radius is greater than 2 times the design thickness or 3/32".
- Web-to-thickness ratio exceeds 200.
- Web-to-thickness ratio exceeds 260.
- Flange-width-to-thickness-ratio exceeds 60.



## COMPOSITE LIMITING HEIGHTS – 5/8" TYPE X



| MODEL NO.   | DEPTH  | GAUGE (mil.) | MEMBER                | DESIGN (in) | MIN. (in) | YIELD (ksi) | SPACING O.C. (in) | 5 PSF   |         |         | 7.5 PSF |         |         | 10 PSF  |         |         |
|-------------|--------|--------------|-----------------------|-------------|-----------|-------------|-------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|             |        |              |                       |             |           |             |                   | L/120   | L/240   | L/360   | L/120   | L/240   | L/360   | L/120   | L/240   | L/360   |
| VIPER25     | 1-5/8" | 25EQ (15)    | 162VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 12                | 13'-9"  | 11'-4"  | 9'-10"  | 12'-0"  | 9'-11"  | 8'-3"   | 10'-11" | 8'-10"  | --      |
|             |        |              | 162VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 16                | 12'-6"  | 10'-4"  | 8'-8"   | 10'-11" | 8'-10"  | --      | 9'-11"  | 7'-11"  | --      |
|             |        |              | 162VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 24                | 10'-11" | 8'-10"  | --      | 9'-5"   | --      | --      | 8'-2"   | --      | --      |
|             | 2-1/2" | 25EQ (15)    | 250VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 12                | 17'-3"  | 14'-5"  | 12'-9"  | 15'-0"  | 12'-7"  | 11'-1"  | 13'-8"  | 11'-6"  | 10'-1"  |
|             |        |              | 250VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 16                | 15'-8"  | 13'-1"  | 11'-7"  | 13'-8"  | 11'-6"  | 10'-1"  | 12'-3"  | 10'-5"  | 8'-9"   |
|             |        |              | 250VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 24                | 13'-8"  | 11'-6"  | 10'-1"  | 11'-6"  | 10'-0"  | 8'-2"   | 10'-0"  | 8'-8"   | --      |
|             | 3-5/8" | 25EQ (15)    | 362VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 12                | 20'-10" | 17'-3"  | 15'-2"  | 18'-2"  | 15'-1"  | 13'-3"  | 15'-10" | 13'-9"  | 12'-0"  |
|             |        |              | 362VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 16                | 18'-11" | 15'-9"  | 13'-9"  | 15'-10" | 13'-9"  | 12'-0"  | 13'-9"  | 12'-6"  | 10'-11" |
|             |        |              | 362VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 24                | 15'-10" | 13'-9"  | 12'-0"  | 12'-11" | 12'-0"  | 10'-6"  | 11'-3"  | 10'-11" | 9'-6"   |
|             | 4"     | 25EQ (15)    | 400VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 12                | 22'-1"  | 18'-3"  | 16'-3"  | 19'-3"  | 15'-11" | 14'-2"  | 16'-8"  | 14'-6"  | 12'-11" |
|             |        |              | 400VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 16                | 20'-0"  | 16'-7"  | 14'-9"  | 16'-8"  | 14'-6"  | 12'-11" | 14'-5"  | 13'-2"  | 11'-9"  |
|             |        |              | 400VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 24                | 16'-8"  | 14'-6"  | 12'-11" | 13'-7"  | 12'-8"  | 11'-3"  | 11'-9"  | 11'-6"  | 10'-1"  |
|             | 6"     | 25EQ (15)    | 600VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 12                | 24'-8"  | 23'-9"  | 21'-1"  | 22'-3"  | 20'-9"  | 18'-5"  | 20'-0"  | 18'-10" | 16'-9"  |
|             |        |              | 600VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 16                | 22'-11" | 21'-7"  | 19'-2"  | 20'-0"  | 18'-10" | 16'-9"  | 17'-5"  | 17'-2"  | 15'-3"  |
|             |        |              | 600VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 24                | 20'-0"  | 18'-10" | 16'-9"  | 16'-5"  | 16'-5"  | 14'-8"  | 13'-6"  | 13'-6"  | 13'-0"  |
| VIPER20     | 1-5/8" | 20EQ (18)    | 162VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 12                | 13'-10" | 11'-0"  | 9'-7"   | 12'-1"  | 9'-7"   | 8'-5"   | 11'-0"  | 8'-9"   | --      |
|             |        |              | 162VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 16                | 12'-7"  | 10'-0"  | 8'-9"   | 11'-0"  | 8'-9"   | 7'-11"  | 10'-0"  | 7'-11"  | --      |
|             |        |              | 162VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 24                | 11'-0"  | 8'-9"   | --      | 9'-7"   | --      | --      | 8'-9"   | --      | --      |
|             | 2-1/2" | 20EQ (18)    | 250VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 12                | 18'-2"  | 14'-5"  | 12'-7"  | 15'-10" | 12'-7"  | 11'-0"  | 14'-5"  | 11'-5"  | 9'-10"  |
|             |        |              | 250VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 16                | 16'-6"  | 13'-1"  | 11'-5"  | 14'-5"  | 11'-5"  | 9'-10"  | 13'-1"  | 10'-4"  | 8'-10"  |
|             |        |              | 250VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 24                | 14'-5"  | 11'-5"  | 9'-10"  | 12'-7"  | 9'-10"  | 8'-5"   | 11'-5"  | 8'-10"  | --      |
|             | 3-5/8" | 20EQ (18)    | 362VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 12                | 21'-11" | 18'-0"  | 15'-10" | 19'-1"  | 15'-9"  | 13'-10" | 17'-5"  | 14'-3"  | 12'-7"  |
|             |        |              | 362VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 16                | 19'-11" | 16'-4"  | 14'-5"  | 17'-5"  | 14'-3"  | 12'-7"  | 15'-10" | 13'-0"  | 11'-4"  |
|             |        |              | 362VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 24                | 17'-5"  | 14'-3"  | 12'-7"  | 15'-2"  | 12'-6"  | 10'-10" | 13'-6"  | 11'-3"  | 9'-9"   |
|             | 4"     | 20EQ (18)    | 400VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 12                | 22'-11" | 18'-11" | 16'-8"  | 20'-0"  | 16'-7"  | 14'-7"  | 18'-2"  | 15'-1"  | 13'-3"  |
|             |        |              | 400VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 16                | 20'-10" | 17'-3"  | 15'-2"  | 18'-2"  | 15'-1"  | 13'-3"  | 16'-6"  | 13'-8"  | 12'-1"  |
|             |        |              | 400VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 24                | 18'-2"  | 15'-1"  | 13'-3"  | 15'-10" | 13'-2"  | 11'-7"  | 14'-5"  | 11'-11" | 10'-5"  |
|             | 6"     | 20EQ (18)    | 600VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 12                | 30'-6"  | 26'-0"  | 23'-0"  | 26'-7"  | 22'-9"  | 20'-1"  | 24'-2"  | 20'-8"  | 18'-4"  |
|             |        |              | 600VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 16                | 27'-8"  | 23'-7"  | 20'-11" | 24'-2"  | 20'-8"  | 18'-4"  | 22'-0"  | 18'-9"  | 16'-8"  |
|             |        |              | 600VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 24                | 24'-2"  | 20'-8"  | 18'-4"  | 20'-11" | 18'-0"  | 16'-0"  | 18'-1"  | 16'-5"  | 14'-7"  |
| VIPER 30MIL | 1-5/8" | 20 (30)      | 162VS125-30           | 0.0312      | 0.0296    | 33          | 12                | 14'-7"  | 11'-6"  | 10'-0"  | 12'-9"  | 10'-0"  | 8'-6"   | 11'-7"  | 8'-11"  | --      |
|             |        |              | 162VS125-30           | 0.0312      | 0.0296    | 33          | 16                | 13'-3"  | 10'-5"  | 8'-11"  | 11'-7"  | 8'-11"  | --      | 10'-6"  | 7'-10"  | --      |
|             |        |              | 162VS125-30           | 0.0312      | 0.0296    | 33          | 24                | 11'-7"  | 8'-11"  | --      | 10'-1"  | --      | --      | 8'-10"  | --      | --      |
|             | 2-1/2" | 20 (30)      | 250VS125-30           | 0.0312      | 0.0296    | 33          | 12                | 18'-9"  | 14'-10" | 13'-0"  | 16'-4"  | 13'-0"  | 11'-4"  | 14'-10" | 11'-10" | 10'-4"  |
|             |        |              | 250VS125-30           | 0.0312      | 0.0296    | 33          | 16                | 17'-0"  | 13'-6"  | 11'-10" | 14'-10" | 11'-10" | 10'-4"  | 13'-6"  | 10'-9"  | 9'-3"   |
|             |        |              | 250VS125-30           | 0.0312      | 0.0296    | 33          | 24                | 14'-10" | 11'-10" | 10'-4"  | 12'-9"  | 10'-4"  | 8'-10"  | 11'-0"  | 9'-3"   | --      |
|             | 3-5/8" | 20 (30)      | 362VS125-30           | 0.0312      | 0.0296    | 33          | 12                | 23'-3"  | 18'-6"  | 16'-2"  | 20'-4"  | 16'-2"  | 14'-1"  | 18'-6"  | 14'-8"  | 12'-10" |
|             |        |              | 362VS125-30           | 0.0312      | 0.0296    | 33          | 16                | 21'-2"  | 16'-9"  | 14'-8"  | 18'-6"  | 14'-8"  | 12'-10" | 16'-4"  | 13'-4"  | 11'-6"  |
|             |        |              | 362VS125-30           | 0.0312      | 0.0296    | 33          | 24                | 18'-6"  | 14'-8"  | 12'-10" | 15'-4"  | 12'-10" | 11'-0"  | 13'-4"  | 11'-6"  | 9'-11"  |
|             | 4"     | 20 (30)      | 400VS125-30           | 0.0312      | 0.0296    | 33          | 12                | 25'-2"  | 20'-0"  | 17'-6"  | 22'-0"  | 17'-6"  | 15'-3"  | 19'-5"  | 15'-11" | 13'-10" |
|             |        |              | 400VS125-30           | 0.0312      | 0.0296    | 33          | 16                | 22'-11" | 18'-2"  | 15'-11" | 19'-5"  | 15'-11" | 13'-10" | 16'-10" | 14'-5"  | 12'-7"  |
|             |        |              | 400VS125-30           | 0.0312      | 0.0296    | 33          | 24                | 19'-5"  | 15'-11" | 13'-10" | 15'-10" | 13'-10" | 12'-1"  | 13'-6"  | 12'-7"  | 10'-11" |
|             | 6"     | 20 (30)      | 600VS125-30           | 0.0312      | 0.0296    | 33          | 12                | 31'-10" | 26'-9"  | 23'-4"  | 26'-0"  | 23'-4"  | 20'-5"  | 22'-6"  | 21'-3"  | 18'-6"  |
|             |        |              | 600VS125-30           | 0.0312      | 0.0296    | 33          | 16                | 27'-7"  | 24'-3"  | 21'-3"  | 22'-6"  | 21'-3"  | 18'-6"  | 19'-6"  | 19'-3"  | 16'-10" |
|             |        |              | 600VS125-30           | 0.0312      | 0.0296    | 33          | 24                | 22'-6"  | 21'-3"  | 18'-6"  | 18'-0"  | 18'-0"  | 16'-2"  | 13'-6"  | 13'-6"  | 13'-6"  |
| VIPER 33MIL | 1-5/8" | 20 (33)      | 162VS125-33           | 0.0346      | 0.0329    | 33          | 12                | 14'-11" | 11'-10" | 10'-4"  | 13'-0"  | 10'-4"  | 8'-10"  | 11'-10" | 9'-4"   | --      |
|             |        |              | 162VS125-33           | 0.0346      | 0.0329    | 33          | 16                | 13'-6"  | 10'-9"  | 9'-4"   | 11'-10" | 9'-4"   | --      | 10'-9"  | 8'-4"   | --      |
|             |        |              | 162VS125-33           | 0.0346      | 0.0329    | 33          | 24                | 11'-10" | 9'-4"   | --      | 10'-4"  | --      | --      | 9'-4"   | --      | --      |
|             | 2-1/2" | 20 (33)      | 250VS125-33           | 0.0346      | 0.0329    | 33          | 12                | 19'-4"  | 15'-4"  | 13'-5"  | 16'-10" | 13'-5"  | 11'-8"  | 15'-4"  | 12'-2"  | 10'-8"  |
|             |        |              | 250VS125-33           | 0.0346      | 0.0329    | 33          | 16                | 17'-7"  | 13'-11" | 12'-2"  | 15'-4"  | 12'-2"  | 10'-8"  | 13'-11" | 11'-0"  | 9'-8"   |
|             |        |              | 250VS125-33           | 0.0346      | 0.0329    | 33          | 24                | 15'-4"  | 12'-2"  | 10'-8"  | 13'-5"  | 10'-8"  | 9'-2"   | 12'-0"  | 9'-8"   | --      |
|             | 3-5/8" | 20 (33)      | 362VS125-33           | 0.0346      | 0.0329    | 33          | 12                | 23'-10" | 18'-11" | 16'-6"  | 20'-10" | 16'-6"  | 14'-5"  | 18'-11" | 15'-0"  | 13'-1"  |
|             |        |              | 362VS125-33           | 0.0346      | 0.0329    | 33          | 16                | 21'-8"  | 17'-2"  | 15'-0"  | 18'-11" | 15'-0"  | 13'-1"  | 17'-2"  | 13'-8"  | 11'-10" |
|             |        |              | 362VS125-33           | 0.0346      | 0.0329    | 33          | 24                | 18'-11" | 15'-0"  | 13'-1"  | 16'-6"  | 13'-1"  | 11'-4"  | 13'-6"  | 11'-10" | 10'-3"  |
|             | 4"     | 20 (33)      | 400VS125-33           | 0.0346      | 0.0329    | 33          | 12                | 25'-8"  | 20'-4"  | 17'-10" | 22'-5"  | 17'-10" | 15'-7"  | 20'-4"  | 16'-2"  | 14'-1"  |
|             |        |              | 400VS125-33           | 0.0346      | 0.0329    | 33          | 16                | 23'-4"  | 18'-6"  | 16'-2"  | 20'-4"  | 16'-2"  | 14'-1"  | 18'-4"  | 14'-8"  | 12'-10" |
|             |        |              | 400VS125-33           | 0.0346      | 0.0329    | 33          | 24                | 20'-4"  | 16'-2"  | 14'-1"  | 17'-3"  | 14'-2"  | 12'-4"  | 13'-6"  | 12'-10" | 11'-2"  |
|             | 6"     | 20 (33)      | 600VS125-33           | 0.0346      | 0.0329    | 33          | 12                | 34'-5"  | 27'-7"  | 24'-1"  | 28'-1"  | 24'-1"  | 21'-1"  | 24'-4"  | 21'-11" | 19'-2"  |
|             |        |              | 600VS125-33           | 0.0346      | 0.0329    | 33          | 16                | 29'-10" | 25'-1"  | 21'-11" | 24'-4"  | 21'-11" | 19'-2"  | 20'-3"  | 19'-11" | 17'-5"  |
|             |        |              | 600VS125-33           | 0.0346      | 0.0329    | 33          | 24                | 24'-4"  | 21'-11" | 19'-2"  | 18'-0"  | 18'-0"  | 16'-9"  | 13'-6"  | 13'-6"  | 13'-6"  |

## Notes:

- Sheathing, as specified in Section 3.2.2, must be attached to both faces of the wall for the full height of the wall with the long dimension parallel to the studs.
- Sheathing must be fastened to the studs with fasteners as specified in Section 3.2.3 and installed per Section 4.2.1.
- Placement of joints in the gypsum sheathing must be in accordance with Sections 4.6.3 and 4.6.4 of GA-216 or Section 7.5 of ASTM C840.
- The bottom and top tracks are xxxVT125 (solid flange track). A minimum 30 mil slotted flange track (xxxCST250 or xxxSLT250) may be used for the top track.
- End-bearing must be a minimum of 1 inch for xxxVT125 (solid flange track) and 1-5/8 inches for xxxCST250 or xxxSLT250 (slotted flange track).
- Notes 1, 2, & 3 are referenced in ICC ESR 2620 page 5.
- For any other top tracks not listed in note 4, please contact technical services for assistance.
- For GWB installed horizontally, see table for "Non-Composite Limiting Heights- Fully Braced" (see above).



## NON-COMPOSITE LIMITING HEIGHTS – FULLY BRACED



| MODEL NO.   | DEPTH  | GAUGE (mil.) | MEMBER                | DESIGN (in) | MIN. (in) | YIELD (ksi) | SPACING O.C. (in) | 5 PSF     |           |          | 7.5 PSF   |           |         | 10 PSF    |           |          |
|-------------|--------|--------------|-----------------------|-------------|-----------|-------------|-------------------|-----------|-----------|----------|-----------|-----------|---------|-----------|-----------|----------|
|             |        |              |                       |             |           |             |                   | L/120     | L/240     | L/360    | L/120     | L/240     | L/360   | L/120     | L/240     | L/360    |
| VIPER25     | 1-5/8" | 25EQ (15)    | 162VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 12                | 9'-5"     | 7'-6"     | 6'-7"    | 7'-8"     | 6'-7"     | --      | 6'-7"     | 6'-0"     | --       |
|             |        |              | 162VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 16                | 8'-1"     | 6'-10"    | 6'-0"    | 6'-7"     | 6'-0"     | --      | --        | --        | --       |
|             |        |              | 162VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 24                | 6'-7"     | 6'-0"     | --       | --        | --        | --      | --        | --        | --       |
|             | 2-1/2" | 25EQ (15)    | 250VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 12                | 12'-6"    | 10'-7"    | 9'-2"    | 10'-2"    | 9'-2"     | 8'-1"   | 8'-10"    | 8'-5"     | 7'-4"    |
|             |        |              | 250VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 16                | 10'-10"   | 9'-7"     | 8'-5"    | 8'-10"    | 8'-5"     | 7'-4"   | 7'-8"     | 7'-7"     | 6'-8"    |
|             |        |              | 250VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 24                | 8'-10"    | 8'-5"     | 7'-4"    | 7'-1"     | 7'-1"     | 6'-5"   | --        | --        | --       |
|             | 3-5/8" | 25EQ (15)    | 362VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 12                | 14'-7"    | 13'-11"   | 12'-1"   | 11'-11"   | 11'-11"   | 10'-7"  | 10'-4"    | 10'-4"    | 9'-7"    |
|             |        |              | 362VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 16                | 12'-8"    | 12'-7"    | 11'-0"   | 10'-4"    | 10'-4"    | 9'-7"   | 9'-0"     | 9'-0"     | 8'-10"   |
|             |        |              | 362VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 24                | 10'-4"    | 10'-4"    | 9'-7"    | 8'-5"     | 8'-5"     | 8'-5"   | 6'-7"     | 6'-7"     | 6'-7"    |
|             | 4"     | 25EQ (15)    | 400VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 12                | 15'-0"    | 15'-0"    | 13'-1"   | 12'-4"    | 12'-4"    | 11'-5"  | 10'-7"    | 10'-7"    | 10'-5"   |
|             |        |              | 400VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 16                | 13'-0"    | 13'-0"    | 11'-11"  | 10'-7"    | 10'-7"    | 10'-7"  | 9'-2"     | 9'-2"     | 9'-2"    |
|             |        |              | 400VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 24                | 10'-7"    | 10'-7"    | 10'-5"   | 8'-6"     | 8'-6"     | 8'-6"   | 6'-5"     | 6'-5"     | 6'-5"    |
|             | 6"     | 25EQ (15)    | 600VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 12                | 17'-8"    | 17'-8"    | 17'-7"   | 14'-1"    | 14'-1"    | 14'-1"  | 10'-7"    | 10'-7"    | 10'-7"   |
|             |        |              | 600VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 16                | 15'-5"    | 15'-5"    | 15'-5" f | 10'-7"    | 10'-7"    | 10'-7"  | 7'-11"    | 7'-11"    | 7'-11"   |
|             |        |              | 600VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 24                | 10'-7"    | 10'-7"    | 10'-7"   | 7'-0"     | 7'-0"     | 7'-0"   | --        | --        | --       |
| VIPER20     | 1-5/8" | 20EQ (18)    | 162VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 12                | 9'-6"     | 7'-7"     | 6'-7"    | 8'-4"     | 6'-7"     | --      | 7'-7"     | 6'-0"     | --       |
|             |        |              | 162VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 16                | 8'-7"     | 6'-11"    | 6'-0"    | 7'-7"     | 6'-0"     | --      | 6'-11"    | --        | --       |
|             |        |              | 162VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 24                | 7'-7"     | 6'-0"     | 5'-2"    | 6'-7"     | --        | --      | 6'-0"     | --        | --       |
|             | 2-1/2" | 20EQ (18)    | 250VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 12                | 13'-6"    | 10'-8"    | 9'-5"    | 11'-10"   | 9'-5"     | 8'-2"   | 10'-8"    | 8'-6"     | 7'-5"    |
|             |        |              | 250VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 16                | 12'-4"    | 9'-8"     | 8'-6"    | 10'-8"    | 8'-6"     | 7'-5"   | 9'-8"     | 7'-8"     | 6'-10"   |
|             |        |              | 250VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 24                | 10'-8"    | 8'-6"     | 7'-5"    | 9'-5"     | 7'-5"     | 6'-6"   | 8'-4"     | 6'-10"    | --       |
|             | 3-5/8" | 20EQ (18)    | 362VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 12                | 17'-8"    | 14'-1"    | 12'-4"   | 15'-6"    | 12'-4"    | 10'-8"  | 14'-1"    | 11'-2"    | 9'-10"   |
|             |        |              | 362VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 16                | 16'-10"   | 12'-10"   | 11'-2"   | 14'-1"    | 11'-2"    | 9'-10"  | 12'-5"    | 10'-1"    | 8'-11"   |
|             |        |              | 362VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 24                | 14'-1"    | 11'-2"    | 9'-10"   | 11'-8"    | 9'-10"    | 8'-6"   | 10'-1"    | 8'-11"    | 7'-8"    |
|             | 4"     | 20EQ (18)    | 400VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 12                | 19'-1"    | 15'-1"    | 13'-2"   | 16'-8"    | 13'-2"    | 11'-7"  | 15'-1"    | 12'-0"    | 10'-6"   |
|             |        |              | 400VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 16                | 17'-4"    | 13'-0"    | 12'-0"   | 15'-1"    | 12'-0"    | 10'-6"  | 13'-1"    | 10'-11"   | 9'-6"    |
|             |        |              | 400VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 24                | 15'-1"    | 12'-0"    | 10'-6"   | 12'-5"    | 10'-6"    | 9'-2"   | 10'-8"    | 9'-6"     | 8'-4"    |
|             | 6"     | 20EQ (18)    | 600VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 12                | 25'-8"    | 20'-5"    | 17'-10"  | 21'-11"   | 17'-10"   | 15'-7"  | 19'-0"    | 16'-2"    | 14'-1"   |
|             |        |              | 600VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 16                | 23'-4"    | 18'-6"    | 16'-2"   | 19'-0"    | 16'-2"    | 14'-1"  | 15'-10"   | 14'-8"    | 12'-10"  |
|             |        |              | 600VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 24                | 19'-0"    | 16'-2"    | 14'-1"   | 14'-0"    | 14'-0"    | 12'-5"  | 10'-6"    | 10'-6"    | 10'-6"   |
| VIPER 30MIL | 1-5/8" | 20 (30)      | 162VS125-30           | 0.0312      | 0.0296    | 33          | 12                | 11'-8"    | 9'-4"     | 8'-1"    | 10'-2"    | 8'-1"     | 7'-1"   | 9'-4"     | 7'-5"     | 6'-6"    |
|             |        |              | 162VS125-30           | 0.0312      | 0.0296    | 33          | 16                | 10'-8"    | 8'-6"     | 7'-5"    | 9'-4"     | 7'-5"     | 6'-6"   | 8'-1" f   | 6'-8"     | --       |
|             |        |              | 162VS125-30           | 0.0312      | 0.0296    | 33          | 24                | 9'-4"     | 7'-5"     | 6'-6"    | 7'-8" f   | 6'-6"     | --      | 6'-7" f   | --        | --       |
|             | 2-1/2" | 20 (30)      | 250VS125-30           | 0.0312      | 0.0296    | 33          | 12                | 16'-2"    | 12'-11"   | 11'-4"   | 14'-2"    | 11'-4"    | 9'-10"  | 12'-5" f  | 10'-2"    | 8'-11"   |
|             |        |              | 250VS125-30           | 0.0312      | 0.0296    | 33          | 16                | 14'-8"    | 11'-8"    | 10'-2"   | 12'-5" f  | 10'-2"    | 8'-11"  | 10'-8" f  | 9'-4"     | 8'-1"    |
|             |        |              | 250VS125-30           | 0.0312      | 0.0296    | 33          | 24                | 12'-5" f  | 10'-2"    | 8'-11"   | 10'-1" f  | 8'-11"    | 7'-10"  | 8'-10" f  | 7'-1"     | 7'-1"    |
|             | 3-5/8" | 20 (30)      | 362VS125-30           | 0.0312      | 0.0296    | 33          | 12                | 21'-4" f  | 17'-2"    | 15'-0"   | 17'-5" f  | 15'-0"    | 13'-1"  | 15'-0" f  | 13'-7"    | 11'-11"  |
|             |        |              | 362VS125-30           | 0.0312      | 0.0296    | 33          | 16                | 18'-5" f  | 15'-7"    | 13'-7"   | 15'-0" f  | 13'-7"    | 11'-11" | 13'-0" f  | 12'-5"    | 10'-10"  |
|             |        |              | 362VS125-30           | 0.0312      | 0.0296    | 33          | 24                | 15'-0" f  | 13'-7"    | 11'-11"  | 12'-4" f  | 11'-11"   | 10'-5"  | 10'-7" f  | 10'-7" f  | 9'-5"    |
|             | 4"     | 20 (30)      | 400VS125-30           | 0.0312      | 0.0296    | 33          | 12                | 22'-6" f  | 18'-6"    | 16'-2"   | 18'-4" f  | 16'-2"    | 14'-1"  | 15'-11" f | 14'-8"    | 12'-11"  |
|             |        |              | 400VS125-30           | 0.0312      | 0.0296    | 33          | 16                | 19'-5" f  | 16'-10"   | 14'-8"   | 15'-11" f | 14'-8"    | 12'-11" | 13'-8" f  | 13'-5"    | 11'-8"   |
|             |        |              | 400VS125-30           | 0.0312      | 0.0296    | 33          | 24                | 15'-11" f | 14'-8"    | 12'-11"  | 13'-0" f  | 12'-11"   | 11'-2"  | 11'-2" f  | 11'-2" f  | 10'-2"   |
|             | 6"     | 20 (30)      | 600VS125-30           | 0.0312      | 0.0296    | 33          | 12                | 28'-2" f  | 25'-4"    | 22'-1"   | 23'-0" f  | 22'-1"    | 19'-4"  | 19'-11" f | 19'-11" f | 17'-6"   |
|             |        |              | 600VS125-30           | 0.0312      | 0.0296    | 33          | 16                | 24'-5" f  | 23'-0"    | 20'-1"   | 19'-11" f | 19'-11" f | 17'-6"  | 17'-2" f  | 17'-2" f  | 15'-11"  |
|             |        |              | 600VS125-30           | 0.0312      | 0.0296    | 33          | 24                | 19'-11" f | 19'-11" f | 17'-6"   | 16'-4" f  | 16'-4" f  | 15'-4"  | 12'-5" w  | 12'-5" w  | 12'-5" w |
| VIPER 33MIL | 1-5/8" | 20 (33)      | 162VS125-33           | 0.0346      | 0.0329    | 33          | 12                | 12'-1"    | 9'-7"     | 8'-5"    | 10'-7"    | 8'-5"     | 7'-4"   | 9'-7"     | 7'-7"     | 6'-8"    |
|             |        |              | 162VS125-33           | 0.0346      | 0.0329    | 33          | 16                | 11'-0"    | 8'-8"     | 7'-7"    | 9'-7"     | 7'-7"     | 6'-8"   | 8'-8" f   | 6'-11"    | 6'-1"    |
|             |        |              | 162VS125-33           | 0.0346      | 0.0329    | 33          | 24                | 9'-7"     | 7'-7"     | 6'-8"    | 8'-2" f   | 6'-8"     | --      | 7'-1" f   | 6'-1"     | --       |
|             | 2-1/2" | 20 (33)      | 250VS125-33           | 0.0346      | 0.0329    | 33          | 12                | 16'-10"   | 13'-4"    | 11'-7"   | 14'-8"    | 11'-7"    | 10'-2"  | 13'-4" f  | 10'-7"    | 9'-2"    |
|             |        |              | 250VS125-33           | 0.0346      | 0.0329    | 33          | 16                | 15'-4"    | 12'-1"    | 10'-7"   | 13'-4" f  | 10'-7"    | 9'-2"   | 11'-6" f  | 9'-7"     | 8'-5"    |
|             |        |              | 250VS125-33           | 0.0346      | 0.0329    | 33          | 24                | 13'-4" f  | 10'-7"    | 9'-2"    | 10'-10" f | 9'-2"     | 8'-1"   | 9'-5" f   | 8'-5"     | 7'-4"    |
|             | 3-5/8" | 20 (33)      | 362VS125-33           | 0.0346      | 0.0329    | 33          | 12                | 22'-5"    | 17'-10"   | 15'-6"   | 18'-10" f | 15'-6"    | 13'-7"  | 16'-4" f  | 14'-1"    | 12'-4"   |
|             |        |              | 362VS125-33           | 0.0346      | 0.0329    | 33          | 16                | 19'-11" f | 16'-1"    | 14'-1"   | 16'-4" f  | 14'-1"    | 12'-4"  | 14'-1" f  | 12'-10"   | 11'-2"   |
|             |        |              | 362VS125-33           | 0.0346      | 0.0329    | 33          | 24                | 16'-4" f  | 14'-1"    | 12'-4"   | 13'-4" f  | 12'-4"    | 10'-10" | 11'-6" f  | 11'-2"    | 9'-10"   |
|             | 4"     | 20 (33)      | 400VS125-33           | 0.0346      | 0.0329    | 33          | 12                | 24'-2"    | 19'-2"    | 16'-10"  | 19'-10" f | 16'-10"   | 14'-7"  | 17'-2" f  | 15'-2"    | 13'-4"   |
|             |        |              | 400VS125-33           | 0.0346      | 0.0329    | 33          | 16                | 21'-0" f  | 17'-5"    | 15'-2"   | 17'-2" f  | 15'-2"    | 13'-4"  | 14'-11" f | 13'-10"   | 12'-1"   |
|             |        |              | 400VS125-33           | 0.0346      | 0.0329    | 33          | 24                | 17'-2" f  | 15'-2"    | 13'-4"   | 14'-0" f  | 13'-4"    | 11'-7"  | 12'-1" f  | 12'-1"    | 10'-7"   |
|             | 6"     | 20 (33)      | 600VS125-33           | 0.0346      | 0.0329    | 33          | 12                | 30'-5" f  | 26'-4"    | 23'-0"   | 24'-10" f | 23'-0"    | 20'-1"  | 21'-6" f  | 20'-11"   | 18'-2"   |
|             |        |              | 600VS125-33           | 0.0346      | 0.0329    | 33          | 16                | 26'-4" f  | 23'-11"   | 20'-11"  | 21'-6" f  | 20'-11"   | 18'-2"  | 18'-7" f  | 18'-7" f  | 16'-7"   |
|             |        |              | 600VS125-33           | 0.0346      | 0.0329    | 33          | 24                | 21'-6" f  | 20'-11"   | 18'-2"   | 17'-6" f  | 17'-6" f  | 15'-11" | 15'-2" f  | 15'-2" f  | 14'-6"   |

"f"-flexure controls; "s"-shear controls; "w"-web crippling controls. No letter next to the number means deflection controls.

## Notes:

- Limiting heights are in accordance with AISI S100-16/S2-20 using all steel non-composite design.
- Limiting heights are established by considering flexure, shear, web crippling, and deflection.
- For bending, studs are assumed to be adequately braced to develop full allowable moment. Studs are considered fully braced when unbraced length is less than the  $L_u$ . See section properties table on page 5 for  $L_u$  values.
- For web crippling, when  $h/t \leq 200$ , the web crippling values are computed based on section G6 of AISI S100-16/S2-20, when  $h/t > 200$ , the web crippling values are based on testing with a bearing length of 1".
- No web stiffeners are required for studs with  $h/t < 200$ , web crippling and shear values have been confirmed by testing.
- The factory punchouts are in accordance with AISI standards. The distance from the center of the last punchout to the end of the stud is 12".
- Use non-composite tables when 1/2 inch gypsum board, horizontal board, RC channel, furring channel, or sound clips are used.
- Review fire rated assemblies for additional requirements.



# NON-COMPOSITE LIMITING HEIGHTS – BRACED 48" O.C.

| MODEL NO.   | DEPTH  | GAUGE (mil.) | MEMBER                | DESIGN (in) | MIN. (in) | YIELD (ksi) | SPACING O.C. (in) | 5 PSF     |           |           | 7.5 PSF   |           |           | 10 PSF    |           |           |
|-------------|--------|--------------|-----------------------|-------------|-----------|-------------|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|             |        |              |                       |             |           |             |                   | L/120     | L/240     | L/360     | L/120     | L/240     | L/360     | L/120     | L/240     | L/360     |
| VIPER25     | 1-5/8" | 25EQ (15)    | 162VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 12                | 8'-8" f   | 7'-6" f   | 6'-7" f   | 7'-1" f   | 6'-7" f   | --        | 6'-1" f   | 6'-0" f   | --        |
|             |        |              | 162VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 16                | 7'-6" f   | 6'-10" f  | 6'-0" f   | 6'-1" f   | 6'-0" f   | --        | --        | --        | --        |
|             |        |              | 162VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 24                | 6'-1" f   | 6'-0" f   | --        | --        | --        | --        | --        | --        | --        |
|             | 2-1/2" | 25EQ (15)    | 250VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 12                | 11'-10" f | 10'-7" f  | 9'-2" f   | 9'-7" f   | 9'-2" f   | 8'-1" f   | 8'-5" f   | 8'-5" f   | 7'-4" f   |
|             |        |              | 250VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 16                | 10'-2" f  | 9'-7" f   | 8'-5" f   | 8'-5" f   | 8'-5" f   | 7'-4" f   | 7'-2" f   | 7'-2" f   | 6'-8" f   |
|             |        |              | 250VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 24                | 8'-5" f   | 8'-5" f   | 7'-4" f   | 6'-8" w   | 6'-8" w   | 6'-5" f   | --        | --        | --        |
|             | 3-5/8" | 25EQ (15)    | 362VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 12                | 13'-2" f  | 13'-2" f  | 12'-1" f  | 10'-10" f | 10'-10" f | 10'-7" f  | 9'-4" f   | 9'-4" f   | 9'-4" f   |
|             |        |              | 362VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 16                | 11'-5" f  | 11'-5" f  | 11'-0" f  | 9'-4" f   | 9'-4" f   | 9'-4" f   | 7'-10" w  | 7'-10" w  | 7'-10" w  |
|             |        |              | 362VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 24                | 9'-4" f   | 9'-4" f   | 9'-4" f   | 6'-11" w  | 6'-11" w  | 6'-11" w  | --        | --        | --        |
|             | 4"     | 25EQ (15)    | 400VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 12                | 13'-10" f | 13'-10" f | 13'-1" f  | 11'-4" f  | 11'-4" f  | 11'-4" f  | 9'-10" f  | 9'-10" f  | 9'-10" f  |
|             |        |              | 400VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 16                | 12'-0" f  | 12'-0" f  | 11'-11" f | 9'-10" f  | 9'-10" f  | 9'-10" f  | 7'-5" w   | 7'-5" w   | 7'-5" w   |
|             |        |              | 400VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 24                | 9'-10" f  | 9'-10" f  | 9'-10" f  | 6'-6" w   | 6'-6" w   | 6'-6" w   | --        | --        | --        |
|             | 6"     | 25EQ (15)    | 600VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 12                | 14'-1" w  | 14'-1" w  | 14'-1" w  | 9'-5" w   | 9'-5" w   | 9'-5" w   | 7'-1" w   | 7'-1" w   | 7'-1" w   |
|             |        |              | 600VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 16                | 10'-7" w  | 10'-7" w  | 10'-7" w  | 7'-1" w   | 7'-1" w   | 7'-1" w   | --        | --        | --        |
|             |        |              | 600VS125-15 (25EQ)    | 0.0155      | 0.0147    | 50          | 24                | 7'-1" w   | 7'-1" w   | 7'-1" w   | --        | --        | --        | --        | --        | --        |
| VIPER20     | 1-5/8" | 20EQ (18)    | 162VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 12                | 9'-6" f   | 7'-7" f   | 6'-7" f   | 8'-4" f   | 6'-7" f   | --        | 7'-5" f   | 6'-0" f   | --        |
|             |        |              | 162VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 16                | 8'-7" f   | 6'-11" f  | 6'-0" f   | 7'-5" f   | 6'-0" f   | --        | 6'-5" f   | --        | --        |
|             |        |              | 162VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 24                | 7'-5" f   | 6'-0" f   | 5'-2" f   | 6'-0" f   | --        | --        | --        | --        | --        |
|             | 2-1/2" | 20EQ (18)    | 250VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 12                | 13'-6" f  | 10'-8" f  | 9'-5" f   | 11'-10" f | 9'-5" f   | 8'-2" f   | 10'-8" f  | 8'-6" f   | 7'-5" f   |
|             |        |              | 250VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 16                | 12'-4" f  | 9'-8" f   | 8'-6" f   | 10'-8" f  | 8'-6" f   | 7'-5" f   | 9'-4" f   | 7'-8" f   | 6'-10" f  |
|             |        |              | 250VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 24                | 10'-8" f  | 8'-6" f   | 7'-5" f   | 8'-10" f  | 7'-5" f   | 6'-6" f   | 7'-7" f   | 6'-10" f  | --        |
|             | 3-5/8" | 20EQ (18)    | 362VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 12                | 17'-1" f  | 14'-1" f  | 12'-4" f  | 14'-0" f  | 12'-4" f  | 10'-8" f  | 12'-1" f  | 11'-2" f  | 9'-10" f  |
|             |        |              | 362VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 16                | 14'-10" f | 12'-10" f | 11'-2" f  | 12'-1" f  | 11'-2" f  | 9'-10" f  | 10'-6" f  | 10'-1" f  | 8'-11" f  |
|             |        |              | 362VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 24                | 12'-1" f  | 11'-2" f  | 9'-10" f  | 9'-11" f  | 9'-10" f  | 8'-6" f   | 8'-7" f   | 8'-7" f   | 7'-8" f   |
|             | 4"     | 20EQ (18)    | 400VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 12                | 18'-1" f  | 15'-1" f  | 13'-2" f  | 14'-10" f | 13'-2" f  | 11'-7" f  | 12'-10" f | 12'-0" f  | 10'-6" f  |
|             |        |              | 400VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 16                | 15'-8" f  | 13'-10" f | 12'-0" f  | 12'-10" f | 12'-0" f  | 10'-6" f  | 11'-1" f  | 10'-11" f | 9'-6" f   |
|             |        |              | 400VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 24                | 12'-10" f | 12'-0" f  | 10'-6" f  | 10'-6" f  | 10'-6" f  | 9'-2" f   | 9'-1" f   | 9'-1" f   | 8'-4" f   |
|             | 6"     | 20EQ (18)    | 600VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 12                | 23'-10" f | 20'-5" f  | 17'-10" f | 19'-6" f  | 17'-0" f  | 15'-7" f  | 16'-10" f | 16'-2" f  | 14'-1" f  |
|             |        |              | 600VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 16                | 20'-7" f  | 18'-6" f  | 16'-2" f  | 16'-10" f | 16'-2" f  | 14'-1" f  | 14'-7" f  | 14'-7" f  | 12'-10" f |
|             |        |              | 600VS125-18-70 (20EQ) | 0.0190      | 0.0181    | 70          | 24                | 16'-10" f | 16'-2" f  | 14'-1" f  | 16'-10" f | 13'-10" f | 12'-5" f  | 10'-6" f  | 10'-6" f  | 10'-6" f  |
| VIPER 30MIL | 1-5/8" | 20 (30)      | 162VS125-30           | 0.0312      | 0.0296    | 33          | 12                | 11'-10" f | 9'-4" f   | 8'-2" f   | 10'-4" f  | 8'-2" f   | 7'-1" f   | 8'-11" f  | 7'-5" f   | 6'-6" f   |
|             |        |              | 162VS125-30           | 0.0312      | 0.0296    | 33          | 16                | 10'-8" f  | 8'-6" f   | 7'-5" f   | 8'-11" f  | 7'-5" f   | 6'-6" f   | 7'-8" f   | 6'-8" f   | --        |
|             |        |              | 162VS125-30           | 0.0312      | 0.0296    | 33          | 24                | 8'-11" f  | 7'-5" f   | 6'-6" f   | 7'-4" f   | 6'-6" f   | --        | 6'-4" f   | --        | --        |
|             | 2-1/2" | 20 (30)      | 250VS125-30           | 0.0312      | 0.0296    | 33          | 12                | 16'-4" f  | 12'-11" f | 11'-4" f  | 13'-7" f  | 11'-4" f  | 9'-11" f  | 11'-10" f | 10'-4" f  | 9'-0" f   |
|             |        |              | 250VS125-30           | 0.0312      | 0.0296    | 33          | 16                | 14'-5" f  | 11'-8" f  | 10'-4" f  | 11'-10" f | 10'-4" f  | 9'-0" f   | 10'-2" f  | 9'-4" f   | 8'-1" f   |
|             |        |              | 250VS125-30           | 0.0312      | 0.0296    | 33          | 24                | 11'-10" f | 10'-4" f  | 9'-0" f   | 9'-7" f   | 9'-0" f   | 7'-10" f  | 8'-4" f   | 8'-1" f   | 7'-1" f   |
|             | 3-5/8" | 20 (30)      | 362VS125-30           | 0.0312      | 0.0296    | 33          | 12                | 20'-0" f  | 17'-2" f  | 15'-0" f  | 16'-4" f  | 15'-0" f  | 13'-1" f  | 14'-2" f  | 13'-8" f  | 11'-11" f |
|             |        |              | 362VS125-30           | 0.0312      | 0.0296    | 33          | 16                | 17'-4" f  | 15'-7" f  | 13'-8" f  | 14'-2" f  | 13'-8" f  | 11'-11" f | 12'-4" f  | 12'-4" f  | 10'-10" f |
|             |        |              | 362VS125-30           | 0.0312      | 0.0296    | 33          | 24                | 14'-2" f  | 13'-8" f  | 11'-11" f | 11'-7" f  | 11'-7" f  | 10'-5" f  | 10'-0" f  | 10'-0" f  | 9'-6" f   |
|             | 4"     | 20 (30)      | 400VS125-30           | 0.0312      | 0.0296    | 33          | 12                | 21'-1" f  | 18'-7" f  | 16'-4" f  | 17'-2" f  | 16'-4" f  | 14'-2" f  | 14'-11" f | 14'-10" f | 12'-11" f |
|             |        |              | 400VS125-30           | 0.0312      | 0.0296    | 33          | 16                | 18'-4" f  | 16'-11" f | 14'-10" f | 14'-11" f | 14'-10" f | 12'-11" f | 12'-11" f | 12'-11" f | 11'-8" f  |
|             |        |              | 400VS125-30           | 0.0312      | 0.0296    | 33          | 24                | 14'-11" f | 14'-10" f | 12'-11" f | 12'-2" f  | 12'-2" f  | 11'-4" f  | 10'-7" f  | 10'-7" f  | 10'-2" f  |
|             | 6"     | 20 (30)      | 600VS125-30           | 0.0312      | 0.0296    | 33          | 12                | 28'-0" f  | 25'-6" f  | 22'-4" f  | 22'-10" f | 22'-4" f  | 19'-6" f  | 19'-10" f | 19'-10" f | 17'-8" f  |
|             |        |              | 600VS125-30           | 0.0312      | 0.0296    | 33          | 16                | 24'-2" f  | 23'-2" f  | 20'-2" f  | 19'-10" f | 19'-10" f | 17'-8" f  | 17'-1" f  | 17'-1" f  | 16'-1" f  |
|             |        |              | 600VS125-30           | 0.0312      | 0.0296    | 33          | 24                | 19'-10" f | 19'-10" f | 17'-8" f  | 15'-7" w  | 15'-7" w  | 15'-6" f  | 11'-8" w  | 11'-8" w  | 11'-8" w  |
| VIPER 33MIL | 1-5/8" | 20 (33)      | 162VS125-33           | 0.0346      | 0.0329    | 33          | 12                | 12'-2" f  | 9'-8" f   | 8'-5" f   | 10'-7" f  | 8'-5" f   | 7'-5" f   | 9'-6" f   | 7'-8" f   | 6'-8" f   |
|             |        |              | 162VS125-33           | 0.0346      | 0.0329    | 33          | 16                | 11'-1" f  | 8'-10" f  | 7'-8" f   | 9'-6" f   | 7'-8" f   | 6'-8" f   | 8'-2" f   | 7'-0" f   | 6'-1" f   |
|             |        |              | 162VS125-33           | 0.0346      | 0.0329    | 33          | 24                | 9'-6" f   | 7'-8" f   | 6'-8" f   | 7'-8" f   | 6'-8" f   | --        | 6'-8" f   | 6'-1" f   | --        |
|             | 2-1/2" | 20 (33)      | 250VS125-33           | 0.0346      | 0.0329    | 33          | 12                | 16'-11" f | 13'-5" f  | 11'-8" f  | 14'-5" f  | 11'-8" f  | 10'-2" f  | 12'-6" f  | 10'-7" f  | 9'-4" f   |
|             |        |              | 250VS125-33           | 0.0346      | 0.0329    | 33          | 16                | 15'-4" f  | 12'-2" f  | 10'-7" f  | 12'-6" f  | 10'-7" f  | 9'-4" f   | 10'-10" f | 9'-7" f   | 8'-5" f   |
|             |        |              | 250VS125-33           | 0.0346      | 0.0329    | 33          | 24                | 12'-6" f  | 10'-7" f  | 9'-4" f   | 10'-2" f  | 9'-4" f   | 8'-1" f   | 8'-10" f  | 8'-5" f   | 7'-5" f   |
|             | 3-5/8" | 20 (33)      | 362VS125-33           | 0.0346      | 0.0329    | 33          | 12                | 21'-4" f  | 17'-10" f | 15'-7" f  | 17'-5" f  | 15'-7" f  | 13'-7" f  | 15'-1" f  | 14'-1" f  | 12'-5" f  |
|             |        |              | 362VS125-33           | 0.0346      | 0.0329    | 33          | 16                | 18'-5" f  | 16'-2" f  | 14'-1" f  | 15'-1" f  | 14'-1" f  | 12'-5" f  | 13'-0" f  | 12'-11" f | 11'-2" f  |
|             |        |              | 362VS125-33           | 0.0346      | 0.0329    | 33          | 24                | 15'-1" f  | 14'-1" f  | 12'-5" f  | 12'-4" f  | 12'-4" f  | 10'-10" f | 10'-8" f  | 10'-8" f  | 9'-10" f  |
|             | 4"     | 20 (33)      | 400VS125-33           | 0.0346      | 0.0329    | 33          | 12                | 22'-6" f  | 19'-4" f  | 16'-10" f | 18'-4" f  | 16'-10" f | 14'-8" f  | 15'-11" f | 15'-4" f  | 13'-4" f  |
|             |        |              | 400VS125-33           | 0.0346      | 0.0329    | 33          | 16                | 19'-5" f  | 17'-6" f  | 15'-4" f  | 15'-11" f | 15'-4" f  | 13'-4" f  | 13'-10" f | 13'-10" f | 12'-1" f  |
|             |        |              | 400VS125-33           | 0.0346      | 0.0329    | 33          | 24                | 15'-11" f | 15'-4" f  | 13'-4" f  | 13'-0" f  | 13'-0" f  | 11'-8" f  | 11'-2" f  | 11'-2" f  | 10'-7" f  |
|             | 6"     | 20 (33)      | 600VS125-33           | 0.0346      | 0.0329    | 33          | 12                | 29'-10" f | 26'-6" f  | 23'-1" f  | 24'-4" f  | 23'-1" f  | 20'-2" f  | 21'-1" f  | 21'-0" f  | 18'-5" f  |
|             |        |              | 600VS125-33           | 0.0346      | 0.0329    | 33          | 16                | 25'-10" f | 24'-1" f  | 21'-0" f  | 21'-1" f  | 21'-0" f  | 18'-5" f  | 18'-4" f  | 18'-4" f  | 16'-8" f  |
|             |        |              | 600VS125-33           | 0.0346      | 0.0329    | 33          | 24                | 21'-1" f  | 21'-0" f  | 18'-5" f  | 17'-2" f  | 17'-2" f  | 16'-0" f  | 14'-6" w  | 14'-6" w  | 14'-6" w  |

"f"-flexure controls; "s"-shear controls; "w"-web crippling controls. No letter next to the number means deflection controls.

## Notes:

- Limiting heights are in accordance with AISI S100-16/S2-20 using all steel non-composite design.
- Limiting heights are established by considering flexure, shear, web crippling and deflection.
- Lateral-Torsional buckling moments are based on section F of AISI S100-16/S2-20, with max discrete bracing of 48" o.c.
- For web crippling, when  $h/t \leq 200$ , the web crippling values are computed based on section G6 of AISI S100-16/S2-20, when  $h/t > 200$ , the web crippling values are based on testing with a bearing length of 1".
- No web stiffeners are required for studs with  $h/t < 200$ , web crippling and shear values have been confirmed by testing.
- The factory punchouts are in accordance with AISI standards. The distance from the center of the last punchout to the end of the stud is 12".
- Use non-composite tables when 1/2 inch gypsum board, horizontal board, RC channel, furring channel, or sound clips are used.
- Review fire rated assemblies for additional requirements.

## SELECT MARKETS ONLY (18 mil, 33 ksi)

COMPOSITE LIMITING HEIGHTS – 5/8" TYPE X<sup>3</sup>

| MODEL NO.   | DEPTH  | GAUGE (mil.) | MEMBER              | DESIGN (in) | MIN. (in) | YIELD (ksi) | SPACING O.C. (in) | 5 PSF    |          |         | 7.5 PSF   |           |          | 10 PSF    |           |          |
|-------------|--------|--------------|---------------------|-------------|-----------|-------------|-------------------|----------|----------|---------|-----------|-----------|----------|-----------|-----------|----------|
|             |        |              |                     |             |           |             |                   | L/120    | L/240    | L/360   | L/120     | L/240     | L/360    | L/120     | L/240     | L/360    |
| VIPER 18MIL | 1-5/8" | 25 (18)      | 162VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 12                | 12'-10"  | 10'-7"   | 9'-4"   | 11'-3"    | 9'-3"     | 8'-2"    | 10'-3"    | 8'-5"     | --       |
|             |        |              | 162VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 16                | 11'-9"   | 9'-8"    | 8'-6"   | 10'-3"    | 8'-5"     | --       | 9'-4"     | --        | --       |
|             |        |              | 162VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 24                | 10'-3"   | 8'-5"    | --      | 8'-11"    | --        | --       | 8'-2"     | --        | --       |
|             | 2-1/2" | 25 (18)      | 250VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 12                | 17'-5"   | 14'-5"   | 12'-7"  | 14'-7" f  | 12'-7"    | 11'-0"   | 12'-8" f  | 11'-5"    | 9'-8"    |
|             |        |              | 250VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 16                | 15'-6" f | 13'-1"   | 11'-6"  | 12'-8" f  | 11'-5"    | 9'-8"    | 11'-0" f  | 10'-3"    | 8'-6"    |
|             |        |              | 250VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 24                | 12'-8" f | 11'-5"   | 9'-8"   | 10'-4" f  | 9'-8"     | 8'-1"    | 8'-11" f  | 8'-6"     | --       |
|             | 3-5/8" | 25 (18)      | 362VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 12                | 21'-7" f | 17'-7"   | 15'-4"  | 17'-8" f  | 15'-4"    | 13'-5"   | 15'-3" f  | 13'-11"   | 12'-2"   |
|             |        |              | 362VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 16                | 18'-9" f | 15'-11"  | 13'-11" | 15'-3" f  | 13'-11"   | 12'-2"   | 13'-3" f  | 12'-8"    | 11'-0"   |
|             |        |              | 362VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 24                | 15'-3" f | 13'-11"  | 12'-2"  | 12'-6" f  | 12'-2"    | 10'-6"   | 10'-10" f | 10'-10" f | 9'-5"    |
|             | 4"     | 25 (18)      | 400VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 12                | 20'-6" f | 18'-5"   | 16'-3"  | 16'-9" f  | 16'-1"    | 14'-2"   | 14'-6" f  | 14'-6" f  | 12'-11"  |
|             |        |              | 400VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 16                | 17'-9" f | 16'-9"   | 14'-9"  | 14'-6" f  | 14'-6" f  | 12'-11"  | 12'-7" f  | 12'-7" f  | 11'-9"   |
|             |        |              | 400VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 24                | 14'-6" f | 14'-6" f | 12'-11" | 11'-10" f | 11'-10" f | 11'-2"   | 10'-3" f  | 10'-3" f  | 9'-11"   |
|             | 6"     | 25 (18)      | 600VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 12                | 25'-5" f | 24'-9"   | 21'-8"  | 20'-9" f  | 20'-9" f  | 18'-11"  | 18'-0" f  | 18'-0" f  | 17'-2"   |
|             |        |              | 600VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 16                | 22'-0" f | 22'-0" f | 19'-8"  | 18'-0" f  | 18'-0" f  | 17'-2"   | 15'-7" f  | 15'-7" f  | 15'-7" f |
|             |        |              | 600VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 24                | 18'-0" f | 18'-0" f | 17'-2"  | 14'-8" f  | 14'-8" f  | 14'-8" f | 12'-9" f  | 12'-9" f  | 12'-9" f |

## Notes:

1. Sheathing, as specified in Section 3.2.2, must be attached to both faces of the wall for the full height of the wall with the long dimension parallel to the studs.
2. Sheathing must be fastened to the studs with fasteners as specified in Section 3.2.3 and installed per Section 4.2.1.
3. Placement of joints in the gypsum sheathing must be in accordance with Sections 4.6.3 and 4.6.4 of GA-216 or Section 7.5 of ASTM C840.
4. The bottom and top tracks are xxxVT125 (solid flange track). A minimum 30 mil slotted flange track (xxxCST250 or xxxSLT250) may be used for the top track.
5. End-bearing must be a minimum of 1 inch for xxxVT125 (solid flange track) and 1-5/8 inches for xxxCST250 or xxxSLT250 (slotted flange track).
6. Notes 1, 2, & 3 are referenced in ICC ESR 2620 page 5.
7. For any other top tracks not listed in note 4, please contact technical services for assistance.

## NON-COMPOSITE LIMITING HEIGHTS – FULLY BRACED

| MODEL NO.   | DEPTH  | GAUGE (mil.) | MEMBER              | DESIGN (in) | YIELD (ksi) | SPACING O.C. (in) | 5 PSF   |         |         | 7.5 PSF |        |         | 10 PSF |        |        |
|-------------|--------|--------------|---------------------|-------------|-------------|-------------------|---------|---------|---------|---------|--------|---------|--------|--------|--------|
|             |        |              |                     |             |             |                   | L/120   | L/240   | L/360   | L/120   | L/240  | L/360   | L/120  | L/240  | L/360  |
| VIPER 18MIL | 1-5/8" | 25 (18)      | 162VS125-18 (25ga.) | 0.0188      | 33          | 12                | 9' 6"   | 7' 10"  | 6' 10"  | 7' 9"   | 6' 10" | 5' 11"  | 6' 8"  | 6' 2"  | 5' 5"  |
|             |        |              | 162VS125-18 (25ga.) | 0.0188      | 33          | 16                | 8' 3"   | 7' 1"   | 6' 2"   | 6' 8"   | 6' 2"  | 5' 5"   | 5' 10" | 5' 7"  | 4' 11" |
|             |        |              | 162VS125-18 (25ga.) | 0.0188      | 33          | 24                | 6' 8"   | 6' 2"   | 5' 5"   | 5' 6"   | 5' 5"  | 4' 8"   | 4' 9"  | 4' 9"  | 4' 3"  |
|             | 2-1/2" | 25 (18)      | 250VS125-18 (25ga.) | 0.0188      | 33          | 12                | 12' 5"  | 10' 10" | 9' 5"   | 10' 1"  | 9' 5"  | 8' 3"   | 8' 9"  | 8' 7"  | 7' 6"  |
|             |        |              | 250VS125-18 (25ga.) | 0.0188      | 33          | 16                | 10' 9"  | 9' 10"  | 8' 7"   | 8' 9"   | 8' 7"  | 7' 6"   | 7' 7"  | 7' 7"  | 6' 9"  |
|             |        |              | 250VS125-18 (25ga.) | 0.0188      | 33          | 24                | 8' 9"   | 8' 7"   | 7' 6"   | 6' 11"  | 6' 11" | 6' 6"   | 5' 2"  | 5' 2"  | 5' 2"  |
|             | 3-5/8" | 25 (18)      | 362VS125-18 (25ga.) | 0.0188      | 33          | 12                | 14' 10" | 14' 6"  | 12' 8"  | 12' 1"  | 12' 1" | 11' 1"  | 9' 8"  | 9' 8"  | 9' 8"  |
|             |        |              | 362VS125-18 (25ga.) | 0.0188      | 33          | 16                | 12' 10" | 12' 10" | 11' 6"  | 9' 8"   | 9' 8"  | 9' 8"   | 7' 3"  | 7' 3"  | 7' 3"  |
|             |        |              | 362VS125-18 (25ga.) | 0.0188      | 33          | 24                | 9' 8"   | 9' 8"   | 9' 8"   | 6' 5"   | 6' 5"  | 6' 5"   | 4' 10" | 4' 10" | 4' 10" |
|             | 4"     | 25 (18)      | 400VS125-18 (25ga.) | 0.0188      | 33          | 12                | 15' 7"  | 15' 7"  | 13' 9"  | 12' 9"  | 12' 9" | 12' 0"  | 11' 0" | 11' 0" | 11' 0" |
|             |        |              | 400VS125-18 (25ga.) | 0.0188      | 33          | 16                | 13' 6"  | 13' 6"  | 12' 5"  | 11' 0"  | 11' 0" | 10' 11" | 9' 6"  | 9' 6"  | 9' 6"  |
|             |        |              | 400VS125-18 (25ga.) | 0.0188      | 33          | 24                | 11' 0"  | 11' 0"  | 10' 11" | 9' 0"   | 9' 0"  | 9' 0"   | 7' 9"  | 7' 9"  | 7' 9"  |
|             | 6"     | 25 (18)      | 600VS125-18 (25ga.) | 0.0188      | 33          | 12                | -       | -       | -       | -       | -      | -       | -      | -      | -      |
|             |        |              | 600VS125-18 (25ga.) | 0.0188      | 33          | 16                | -       | -       | -       | -       | -      | -       | -      | -      | -      |
|             |        |              | 600VS125-18 (25ga.) | 0.0188      | 33          | 24                | -       | -       | -       | -       | -      | -       | -      | -      | -      |

"f"-flexure controls; "s"-shear controls; "w"-web crippling controls. No letter next to the number means deflection controls.

## Notes:

1. Limiting heights are in accordance with AISI S100-16/S2-20 using all steel non-composite design.
2. Limiting heights are established by considering flexure, shear, web crippling, and deflection.
3. For bending, studs are assumed to be adequately braced to develop full allowable moment. Studs are considered fully braced when unbraced length is less than the  $L_u$ . See section properties table on page 5 for  $L_u$  values.
4. For web crippling, when  $h/t \leq 200$ , the web crippling values are computed based on section G6 of AISI S100-16/S2-20, when  $h/t > 200$ , the web crippling values are based on testing with a bearing length of 1".
5. No web stiffeners are required for studs with  $h/t < 200$ , web crippling and shear values have been confirmed by testing.
6. The factory punchouts are in accordance with AISI standards. The distance from the center of the last punchout to the end of the stud is 12".
7. Use non-composite tables when 1/2 inch gypsum board, horizontal board, RC channel, furring channel, or sound clips are used.



**SELECT MARKETS ONLY (18 mil, 33 ksi)****NON-COMPOSITE LIMITING HEIGHTS – BRACED 48" O.C.**

| MODEL NO.   | DEPTH  | GAUGE (mil.) | MEMBER              | DESIGN (in) | MIN. (in) | YIELD (ksi) | SPACING O.C. (in) | 5 PSF   |         |         | 7.5 PSF |        |         | 10 PSF |        |         |
|-------------|--------|--------------|---------------------|-------------|-----------|-------------|-------------------|---------|---------|---------|---------|--------|---------|--------|--------|---------|
|             |        |              |                     |             |           |             |                   | L/120   | L/240   | L/360   | L/120   | L/240  | L/360   | L/120  | L/240  | L/360   |
| VIPER 18MIL | 1-5/8" | 25 (18)      | 162VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 12                | 8' 11"  | 7' 10"  | 6' 10"  | 7' 4"   | 6' 10" | 5' 11"  | 6' 4"  | 6' 2"  | 5' 5"   |
|             |        |              | 162VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 16                | 7' 9"   | 7' 1"   | 6' 2"   | 6' 4"   | 6' 2"  | 5' 5"   | 5' 6"  | 5' 6"  | 4' 11"  |
|             |        |              | 162VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 24                | 6' 4"   | 6' 2"   | 5' 5"   | 5' 2"   | 5' 2"  | 4' 8"   | 4' 6"  | 4' 6"  | 4' 3"   |
|             | 2-1/2" | 25 (18)      | 250VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 12                | 12' 1"  | 10' 10" | 9' 5"   | 9' 11"  | 9' 5"  | 8' 3"   | 8' 7"  | 8' 7"  | 7' 6"   |
|             |        |              | 250VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 16                | 10' 6"  | 9' 10"  | 8' 7"   | 8' 7"   | 8' 7"  | 7' 6"   | 7' 5"  | 7' 5"  | 6' 9"   |
|             |        |              | 250VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 24                | 8' 7"   | 8' 7"   | 7' 6"   | 6' 11"  | 6' 11" | 6' 6"   | 5' 2"  | 5' 2"  | 5' 2"   |
|             | 3-5/8" | 25 (18)      | 362VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 12                | 15' 1"  | 14' 6"  | 12' 8"  | 12' 4"  | 12' 4" | 11' 1"  | 9' 8"  | 9' 8"  | 9' 8"   |
|             |        |              | 362VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 16                | 13' 1"  | 13' 1"  | 11' 6"  | 9' 8"   | 9' 8"  | 9' 8"   | 7' 3"  | 7' 3"  | 7' 3"   |
|             |        |              | 362VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 24                | 9' 8"   | 9' 8"   | 9' 8"   | 6' 5"   | 6' 5"  | 6' 5"   | 4' 10" | 4' 10" | 4' 10"  |
|             | 4"     | 25 (18)      | 400VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 12                | 15' 11" | 15' 8"  | 13' 8"  | 13' 0"  | 13' 0" | 12' 10" | 11' 3" | 11' 3" | 10' 10" |
|             |        |              | 400VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 16                | 13' 9"  | 13' 9"  | 12' 5"  | 12' 5"  | 11' 3" | 10' 10" | 9' 9"  | 9' 9"  | 9' 9"   |
|             |        |              | 400VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 24                | 11' 3"  | 11' 3"  | 10' 10" | 10' 10" | 9' 2"  | 9' 2"   | 7' 11" | 7' 11" | 7' 11"  |
|             | 6"     | 25 (18)      | 600VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 12                | -       | -       | -       | -       | -      | -       | -      | -      | -       |
|             |        |              | 600VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 16                | -       | -       | -       | -       | -      | -       | -      | -      | -       |
|             |        |              | 600VS125-18 (25ga.) | 0.0188      | 0.0179    | 33          | 24                | -       | -       | -       | -       | -      | -       | -      | -      | -       |

"f"-flexure controls; "s"-shear controls; "w"-web crippling controls. No letter next to the number means deflection controls.

**Notes:**

- Limiting heights are in accordance with AISI S100-16/S2-20 using all steel non-composite design.
- Limiting heights are established by considering flexure, shear, web crippling and deflection.
- Lateral-Torsional buckling moments are based on section F of AISI S100-16/S2-20, with max discrete bracing of 48" o.c.
- For web crippling, when  $h/t \leq 200$ , the web crippling values are computed based on section G of AISI S100-16/S2-20, when  $h/t > 200$ , the web crippling values are based on testing with a bearing length of 1".
- No web stiffeners are required for studs with  $h/t < 200$ , web crippling and shear values have been confirmed by testing.
- The factory punchouts are in accordance with AISI standards. The distance from the center of the last punchout to the end of the stud is 12".
- Use non-composite tables when 1/2 inch gypsum board, horizontal board, RC channel, furring channel, or sound clips are used.

## ALLOWABLE CEILING SPANS



| L/240       |                       |        | 4 PSF<br>LATERAL SUPPORT OF COMPRESSION FLANGE |         |         |                                 |         |         | 6 PSF<br>LATERAL SUPPORT OF COMPRESSION FLANGE |         |         |                                 |         |         |
|-------------|-----------------------|--------|------------------------------------------------|---------|---------|---------------------------------|---------|---------|------------------------------------------------|---------|---------|---------------------------------|---------|---------|
| MODEL NO.   | MEMBER                | Fy ksi | Unsupported Joist Spacing (in) O.C.            |         |         | Midspan Joist Spacing (in) O.C. |         |         | Unsupported Joist Spacing (in) O.C.            |         |         | Midspan Joist Spacing (in) O.C. |         |         |
|             |                       |        | 12                                             | 16      | 24      | 12                              | 16      | 24      | 12                                             | 16      | 24      | 12                              | 16      | 24      |
| VIPER25     | 162VS125-15 (25EQ)    | 50     | 7'-3"f                                         | 6'-9"f  | 6'-0"f  | 8'-1"                           | 7'-4"   | 6'-5"   | 6'-6"f                                         | 6'-0"f  | 5'-5"f  | 7'-1"                           | 6'-5"   | 5'-7"   |
|             | 250VS125-15 (25EQ)    | 50     | 8'-2"f                                         | 7'-7"f  | 6'-10"f | 11'-3"f                         | 10'-4"  | 9'-0"f  | 7'-4"f                                         | 6'-10"f | 6'-2"f  | 10'-0"                          | 9'-0"f  | 7'-8"f  |
|             | 362VS125-15 (25EQ)    | 50     | 9'-1"f                                         | 8'-6"f  | 7'-8"f  | 12'-0"f                         | 11'-0"  | 9'-9"f  | 8'-3"f                                         | 7'-8"f  | 6'-11"f | 10'-8"f                         | 9'-9"f  | 8'-5"f  |
|             | 400VS125-15 (25EQ)    | 50     | 9'-5"f                                         | 8'-9"f  | 7'-10"f | 12'-5"f                         | 11'-4"  | 10'-0"f | 8'-6"f                                         | 7'-10"f | 7'-1"f  | 11'-0"f                         | 10'-0"f | 8'-9"f  |
|             | 600VS125-15 (25EQ)    | 50     | 10'-8"f                                        | 9'-11"f | 8'-11"f | 14'-4"f                         | 13'-2"  | 11'-8"f | 9'-7"f                                         | 8'-11"f | 8'-1"f  | 12'-9"f                         | 11'-8"f | 8'-10"w |
| VIPER20     | 162VS125-18-70 (20EQ) | 70     | 7'-9"f                                         | 7'-3"f  | 6'-6"f  | 8'-5"                           | 7'-7"   | 6'-7"   | 7'-0"f                                         | 6'-6"f  | 5'-10"f | 7'-3"f                          | 6'-7"f  | 5'-8"f  |
|             | 250VS125-18-70 (20EQ) | 70     | 8'-9"f                                         | 8'-1"f  | 7'-4"f  | 12'-0"f                         | 10'-10" | 9'-5"f  | 7'-11"f                                        | 7'-4"f  | 6'-7"f  | 10'-5"f                         | 9'-5"f  | 8'-2"f  |
|             | 362VS125-18-70 (20EQ) | 70     | 9'-7"f                                         | 8'-11"f | 8'-0"f  | 13'-6"f                         | 12'-6"  | 11'-1"f | 8'-8"f                                         | 8'-0"f  | 7'-3"f  | 12'-1"f                         | 11'-1"f | 9'-10"f |
|             | 400VS125-18-70 (20EQ) | 70     | 9'-10"f                                        | 9'-2"f  | 8'-3"f  | 13'-10"f                        | 12'-9"  | 11'-5"f | 9'-10"f                                        | 9'-2"f  | 8'-3"f  | 12'-4"f                         | 11'-5"f | 10'-2"f |
|             | 600VS125-18-70 (20EQ) | 70     | 11'-2"f                                        | 10'-4"f | 9'-4"f  | 15'-10"f                        | 14'-8"  | 13'-1"f | 10'-1"f                                        | 9'-4"f  | 8'-5"f  | 14'-2"f                         | 13'-1"f | 11'-8"f |
| VIPER 30MIL | 162VS125-30           | 33     | 9'-4"f                                         | 8'-7"f  | 7'-8"f  | 10'-1"                          | 9'-2"   | 8'-0"   | 8'-4"f                                         | 7'-8"f  | 6'-10"f | 8'-10"                          | 8'-0"   | 7'-0"   |
|             | 250VS125-30           | 33     | 10'-4"f                                        | 9'-6"f  | 8'-6"f  | 13'-11                          | 12'-8"  | 11'-1"  | 9'-2"f                                         | 8'-6"f  | 7'-7"f  | 12'-2"                          | 11'-1"  | 9'-8"   |
|             | 362VS125-30           | 33     | 11'-4"f                                        | 10'-6"f | 9'-5"f  | 16'-0"f                         | 14'-10" | 13'-3"f | 10'-2"f                                        | 9'-5"f  | 8'-6"f  | 14'-4"f                         | 13'-3"f | 11'-9"f |
|             | 400VS125-30           | 33     | 11'-8"f                                        | 10'-10" | 9'-8"f  | 16'-5"f                         | 15'-2"  | 13'-7"  | 10'-6"f                                        | 9'-8"f  | 8'-9"f  | 14'-9"f                         | 13'-7"f | 12'-1"f |
|             | 600VS125-30           | 33     | 13'-1"f                                        | 12'-2"f | 10'-11" | 18'-10"                         | 17'-6"  | 15'-8"  | 11'-9"f                                        | 10'-11" | 9'-10"  | 16'-11"                         | 15'-8"  | 14'-1"f |
| VIPER 33MIL | 162VS125-33           | 33     | 9'-9"f                                         | 8'-11"f | 7'-11"  | 10'-5"                          | 9'-5"   | 8'-3"   | 8'-8"f                                         | 7'-11"  | 7'-1"f  | 9'-1"                           | 8'-3"   | 7'-3"   |
|             | 250VS125-33           | 33     | 10'-9"f                                        | 9'-10"  | 8'-10"  | 14'-5"                          | 13'-1"  | 11'-5"  | 9'-7"f                                         | 8'-10"  | 7'-11"  | 12'-7"                          | 11'-5"  | 10'-0"  |
|             | 362VS125-33           | 33     | 11'-9"f                                        | 10'-11" | 9'-9"   | 16'-7"f                         | 15'-4"  | 13'-9"  | 10'-7"f                                        | 9'-9"   | 8'-9"   | 14'-10"                         | 13'-9"  | 12'-2"f |
|             | 400VS125-33           | 33     | 12'-1"f                                        | 11'-2"f | 10'-0"  | 17'-0"                          | 15'-8"  | 14'-1"  | 10'-10"                                        | 10'-0"  | 9'-0"   | 15'-3"                          | 14'-1"  | 12'-7"f |
|             | 600VS125-33           | 33     | 13'-6"f                                        | 12'-6"  | 11'-3"  | 19'-5"                          | 18'-0"  | 16'-3"  | 12'-2"                                         | 11'-3"  | 10'-1"  | 17'-6"                          | 16'-3"  | 14'-6"  |

| L/360       |                       |        | 4 PSF<br>LATERAL SUPPORT OF COMPRESSION FLANGE |         |         |                                 |        |         | 6 PSF<br>LATERAL SUPPORT OF COMPRESSION FLANGE |         |        |                                 |         |         |
|-------------|-----------------------|--------|------------------------------------------------|---------|---------|---------------------------------|--------|---------|------------------------------------------------|---------|--------|---------------------------------|---------|---------|
| MODEL NO.   | MEMBER                | Fy ksi | Unsupported Joist Spacing (in) O.C.            |         |         | Midspan Joist Spacing (in) O.C. |        |         | Unsupported Joist Spacing (in) O.C.            |         |        | Midspan Joist Spacing (in) O.C. |         |         |
|             |                       |        | 12                                             | 16      | 24      | 12                              | 16     | 24      | 12                                             | 16      | 24     | 12                              | 16      | 24      |
| VIPER25     | 162VS125-15 (25EQ)    | 50     | 7'-1"                                          | 6'-5"   | 5'-7"   | 7'-1"                           | 6'-5"  | 5'-7"   | 6'-2"                                          | 5'-7"   | 4'-11" | 6'-2"                           | 5'-7"   | 4'-11"  |
|             | 250VS125-15 (25EQ)    | 50     | 8'-2"f                                         | 7'-7"f  | 6'-10"  | 10'-0"                          | 9'-0"  | 7'-11"  | 7'-4"f                                         | 6'-10"  | 6'-2"f | 8'-8"                           | 7'-11"  | 6'-11"  |
|             | 362VS125-15 (25EQ)    | 50     | 9'-1"f                                         | 8'-6"f  | 7'-8"   | 12'-0"                          | 11'-0" | 9'-9"   | 8'-3"f                                         | 7'-8"   | 6'-11" | 10'-7"                          | 9'-9"   | 8'-5"   |
|             | 400VS125-15 (25EQ)    | 50     | 9'-5"f                                         | 8'-9"f  | 7'-10"  | 12'-5"                          | 11'-4" | 10'-0"  | 8'-6"f                                         | 7'-10"  | 7'-1"f | 11'-0"                          | 10'-0"  | 8'-9"   |
|             | 600VS125-15 (25EQ)    | 50     | 10'-8"f                                        | 9'-11"  | 8'-11"  | 14'-4"f                         | 13'-2" | 11'-8"  | 9'-7"f                                         | 8'-11"  | 8'-1"f | 12'-9"                          | 11'-8"  | 8'-10"w |
| VIPER20     | 162VS125-18-70 (20EQ) | 70     | 7'-6"f                                         | 6'-10"  | 5'-11"  | 7'-4"f                          | 6'-8"  | 5'-9"   | 6'-6"f                                         | 5'-11"  | 5'-2"  | 6'-4"                           | 5'-9"   | 5'-0"   |
|             | 250VS125-18-70 (20EQ) | 70     | 8'-9"f                                         | 8'-1"f  | 7'-4"   | 10'-5"                          | 9'-6"  | 8'-3"   | 7'-11"                                         | 7'-4"   | 6'-7"  | 9'-1"                           | 8'-3"   | 7'-2"   |
|             | 362VS125-18-70 (20EQ) | 70     | 9'-7"f                                         | 9'-11"  | 8'-0"   | 13'-6"f                         | 12'-6" | 11'-0"  | 8'-8"                                          | 8'-0"   | 7'-3"  | 12'-1"                          | 10'-0"  | 9'-7"   |
|             | 400VS125-18-70 (20EQ) | 70     | 9'-10"                                         | 9'-2"   | 8'-3"   | 13'-10"                         | 12'-9" | 11'-5"  | 8'-11"                                         | 8'-3"   | 7'-5"  | 12'-4"                          | 11'-5"  | 10'-2"  |
|             | 600VS125-18-70 (20EQ) | 70     | 11'-2"f                                        | 10'-4"  | 9'-4"   | 15'-10"                         | 14'-8" | 13'-1"  | 10'-1"                                         | 9'-4"   | 8'-5"  | 14'-2"                          | 13'-1"  | 11'-8"  |
| VIPER 30MIL | 162VS125-30           | 33     | 8'-10"                                         | 8'-0"   | 7'-0"   | 8'-10"                          | 8'-0"  | 7'-0"   | 7'-8"                                          | 7'-0"   | 6'-1"  | 7'-8"                           | 7'-0"   | 6'-1"   |
|             | 250VS125-30           | 33     | 10'-4"f                                        | 9'-6"   | 8'-6"   | 12'-2"                          | 11'-1" | 9'-8"   | 9'-2"                                          | 8'-6"   | 7'-7"  | 10'-8"                          | 9'-8"   | 8'-5"   |
|             | 362VS125-30           | 33     | 11'-4"f                                        | 10'-6"  | 9'-5"   | 16'-0"                          | 14'-9" | 12'-11" | 10'-2"                                         | 9'-5"   | 8'-6"  | 14'-2"                          | 12'-11" | 11'-3"  |
|             | 400VS125-30           | 33     | 11'-8"f                                        | 10'-10" | 9'-8"   | 16'-5"                          | 15'-2" | 13'-7"  | 10'-6"                                         | 9'-8"   | 8'-9"  | 14'-9"                          | 13'-7"  | 12'-1"  |
|             | 600VS125-30           | 33     | 13'-1"f                                        | 12'-2"  | 10'-11" | 18'-10"                         | 17'-6" | 15'-8"  | 11'-9"                                         | 10'-11" | 9'-10" | 16'-11"                         | 15'-8"  | 14'-1"  |
| VIPER 33MIL | 162VS125-33           | 33     | 9'-1"                                          | 8'-3"   | 7'-3"   | 9'-1"                           | 8'-3"  | 7'-3"   | 7'-11"                                         | 7'-3"   | 6'-4"  | 7'-11"                          | 7'-3"   | 6'-4"   |
|             | 250VS125-33           | 33     | 10'-9"f                                        | 9'-10"  | 8'-10"  | 12'-7"                          | 11'-5" | 10'-0"  | 9'-7"                                          | 8'-10"  | 7'-11" | 11'-0"                          | 10'-0"  | 8'-9"   |
|             | 362VS125-33           | 33     | 11'-9"f                                        | 10'-11" | 9'-9"   | 16'-7"                          | 15'-3" | 13'-4"  | 10'-7"                                         | 9'-9"   | 8'-9"  | 14'-8"                          | 13'-4"  | 11'-8"  |
|             | 400VS125-33           | 33     | 12'-1"f                                        | 11'-2"  | 10'-0"  | 17'-0"                          | 15'-8" | 14'-1"  | 10'-10"                                        | 10'-0"  | 9'-0"  | 15'-3"                          | 14'-1"  | 12'-7"  |
|             | 600VS125-33           | 33     | 13'-6"f                                        | 12'-6"  | 11'-3"  | 19'-5"                          | 18'-0" | 16'-3"  | 12'-2"                                         | 11'-3"  | 10'-1" | 17'-6"                          | 16'-3"  | 14'-6"  |

"f"-flexure controls; "s"-shear controls; "w"-web crippling controls. No letter next to the number means deflection controls.

## Notes:

- Ceiling Spans are in accordance with AISI S100-16/S2-20 using all steel non-composite design.
- Ceiling Spans are established by considering flexure, shear, web crippling and deflection.
- For web crippling, when  $h/t \leq 200$ , the web crippling values are computed based on G6 of AISI S100-16/S2-20. When  $h/t > 200$ , the web crippling values are based on testing with a bearing length of 1".
- No web stiffeners are required for studs with  $h/t < 200$ , web crippling and shear values have been confirmed by testing.
- All values are for simple spans, with compression flange either unbraced or braced at midspan.
- Ceiling spans are based on total load of assembly, not including storage or live load for accessible ceilings.
- The factory punchouts are in accordance with AISI standards. The distance from the center of last punchout to the end of the stud is 12".



# SCREW ALLOWABLE LOADS (lbs.)

| MODEL NO.   | DESIGN THICKNESS (in) | MIN. THICKNESS (in) | F <sub>y</sub> YIELD (ksi) | F <sub>u</sub> TENSILE (ksi) | #6 SCREW<br>(0.138" Dia; 0.25" head) |          |           | #8 SCREW<br>(0.164" Dia; 0.3125" head) |          |           | #10 SCREW<br>(0.190" Dia; 0.34" head) |          |           | C645 SCREW PENETRATION TEST (P, F) |
|-------------|-----------------------|---------------------|----------------------------|------------------------------|--------------------------------------|----------|-----------|----------------------------------------|----------|-----------|---------------------------------------|----------|-----------|------------------------------------|
|             |                       |                     |                            |                              | SHEAR                                | PULL OUT | PULL OVER | SHEAR                                  | PULL OUT | PULL OVER | SHEAR                                 | PULL OUT | PULL OVER |                                    |
| VIPER25     | 0.0155                | 0.0147              | 50                         | 65                           | 75 <sup>9</sup>                      | 30       | 97        | 90 <sup>9</sup>                        | 36       | 121       | 93 <sup>9</sup>                       | 42       | 132       | PASS                               |
| VIPER20     | 0.019                 | 0.0181              | 70                         | 70                           | 95                                   | 52       | 140       | 104                                    | 62       | 195       | 112                                   | 72       | 226       | PASS                               |
| Viper 18MIL | 0.0188                | 0.0179              | 33                         | 45                           | 44                                   | 24       | 78        | 48                                     | 29       | 97        | 52                                    | 33       | 105       | -                                  |
| VIPER 30MIL | 0.0312                | 0.0296              | 33                         | 45                           | 95                                   | 40       | 129       | 103                                    | 48       | 161       | 111                                   | 55       | 175       | -                                  |
| VIPER 33MIL | 0.0346                | 0.0329              | 33                         | 45                           | 110                                  | 45       | 143       | 120                                    | 53       | 178       | 130                                   | 61       | 194       | -                                  |

## Notes:

- Capacities are in accordance with section J of AISI S100-16/S2-20 Specification.
- Capacities are based on Allowable Strength Design (ASD).
- Screw pull-out capacities are based on listed head diameter.
- Two sheets of equal thickness and tensile strength are assumed in tabulated values.
- When materials of different steel thickness and tensile strength are connected, use the lowest value for shear capacity (tilting and bearing), for pull-out capacity use sheet closest to screw tip and for pull-over capacity use sheet closest to screw head.
- Where multiple fasteners are used, screws are assumed to have a center-to-center spacing of at least 3 times the nominal diameter.
- Screws are assumed to have a center-of-screw to edge-of-steel dimension of at least 1.5 times the nominal diameter of the screw.
- When screws are subjected to combination of shear and tension forces, interaction equation of AISI S100-16/S2-20 Specification section J4.5 shall be used.
- Viper25 shear values are tested per AISI S100, S220 & AISI S905, tests conducted by Structural Testing & Research, Inc.
- Viper20 values are calculated per AISI S100 & S220.

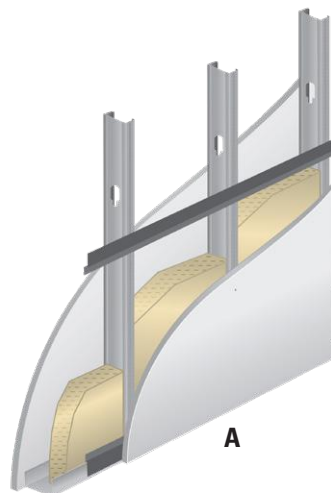
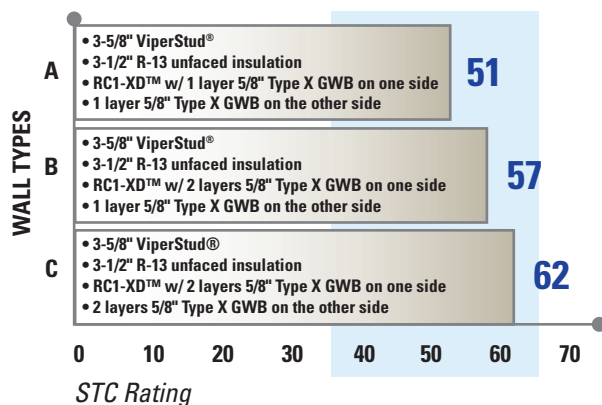
## SCREW PENETRATION TESTING (ASTM C 645, ASTM C 1002)

To pass screw penetration tests, studs must be capable of pulling the head of the screw below surface of gypsum board in less than 2 seconds without spin out.

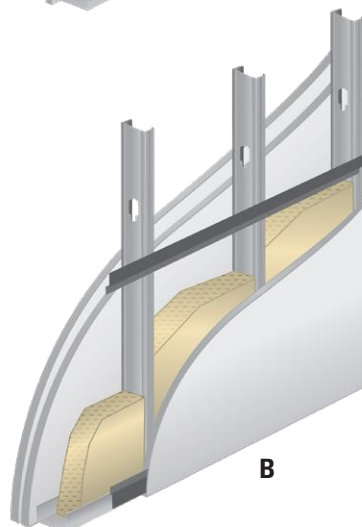
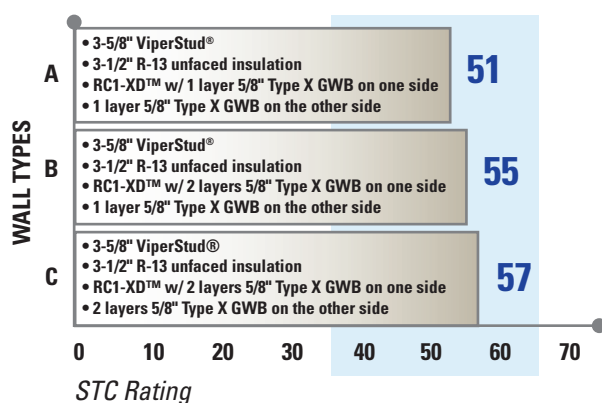
| HI-ABUSE/HI-IMPACT – VIPER20     |                |                             |                   |                       |
|----------------------------------|----------------|-----------------------------|-------------------|-----------------------|
| SHEATHING TYPE AND THICKNESS     | STEEL FRAMING  | SCREW TYPE                  | DRILL SPEED (rpm) | PASS/FAIL ASTM-C-1002 |
| USG 5/8" VHI                     | 3-5/8" VIPER20 | #6 X 1-1/4" TYPE S SHARP PT | 2500              | PASS                  |
|                                  |                |                             | 4000              | PASS                  |
| NATIONAL GYPSUM 5/8" HIGH IMPACT | 3-5/8" VIPER20 | #6 X 1-1/4" TYPE S SHARP PT | 2500              | PASS                  |
|                                  |                |                             | 4000              | PASS                  |
| NATIONAL GYPSUM 5/8" HIGH ABUSE  | 3-5/8" VIPER20 | #6 X 1-1/4" TYPE S SHARP PT | 2500              | PASS                  |
|                                  |                |                             | 4000              | PASS                  |

| CEMENT BOARD – VIPER20                    |               |                                                  |                   |                       |
|-------------------------------------------|---------------|--------------------------------------------------|-------------------|-----------------------|
| SHEATHING TYPE AND THICKNESS              | STEEL FRAMING | SCREW TYPE                                       | DRILL SPEED (rpm) | PASS/FAIL ASTM-C-1002 |
| USG 1/2"<br>Durock®                       | VIPER20       | #9 BUILDEX<br>ROCK-ON                            | 2500              | PASS                  |
|                                           |               |                                                  | 4000              | PASS                  |
|                                           |               | #9 PHILLIPS<br>CEMENT BOARD                      | 2500              | PASS                  |
|                                           |               |                                                  | 4000              | PASS                  |
| NATIONAL GYPSUM<br>5/8" PERMABASE         | VIPER20       | #9 BUILDEX<br>ROCK-ON                            | 2500              | PASS                  |
|                                           |               |                                                  | 4000              | PASS                  |
|                                           |               | #9 PHILLIPS<br>CEMENT BOARD                      | 2500              | PASS                  |
|                                           |               |                                                  | 4000              | PASS                  |
| GYPSUM BOARD – VIPER25 & VIPER20          |               |                                                  |                   |                       |
| 1/2" TYPE C<br>5/8" TYPE X<br>5/8" TYPE X | VIPER25       | #6 X1-1/4"<br>TYPE S SHARP PT<br>TYPE S SHARP PT | 2500              | PASS                  |
|                                           | VIPER25       |                                                  | 2500              | PASS                  |
|                                           | VIPER20       |                                                  | 2500              | PASS                  |

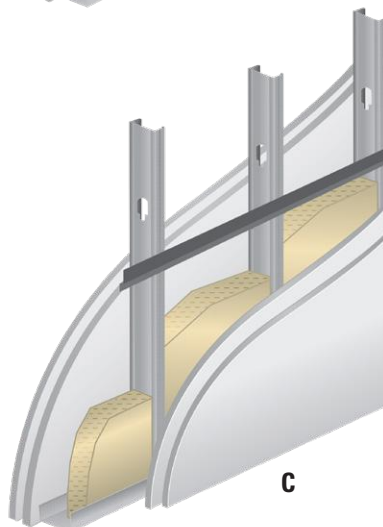
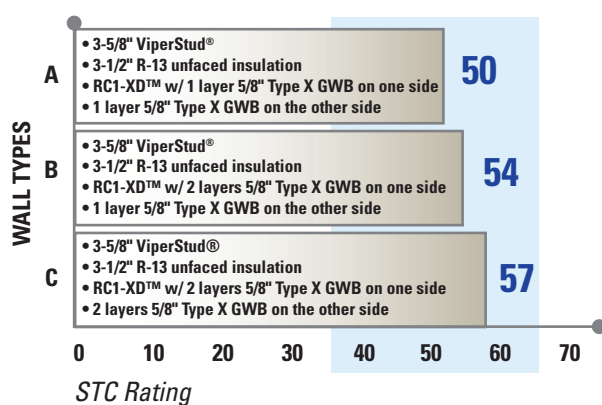
## VIPER20 24" O.C.



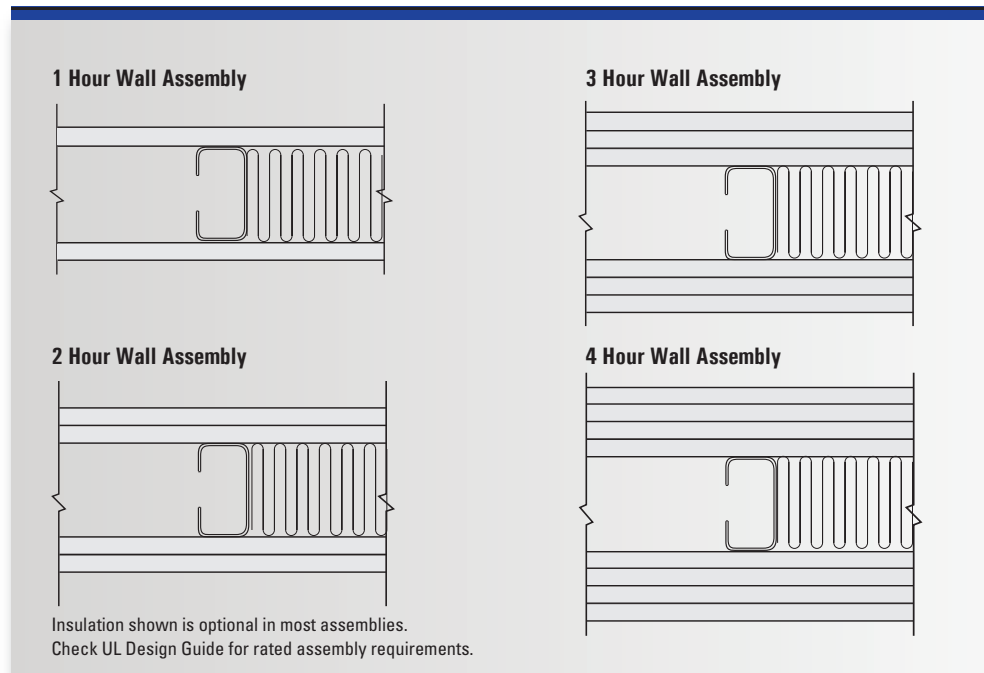
## VIPER20 16" O.C.



## VIPER 33 MIL 24" O.C.



## FIRE TESTING DATA (ASTM E 119)



**VIPERSTUD® IS  
FIRE TESTED**



## VIPERSTUD® FIRE TESTING DATA (ASTM E119)

| UL Design No. | ViperStud Min. Thickness | Wall Rating:    | UL Design No. | ViperStud Min. Thickness | Wall Rating:      |
|---------------|--------------------------|-----------------|---------------|--------------------------|-------------------|
| U375          | Viper25                  | 2 HR            | V412          | Viper20                  | 2 HR              |
| U403          | Viper20                  | 2 HR            | V416          | Viper20                  | 1 HR              |
| U407          | Viper25                  | 1/2 or 1 HR     | V417          | Viper25                  | 1 HR              |
| U408          | Viper20                  | 2 HR            | V418          | Viper20                  | 2 HR              |
| U411          | Viper20                  | 2 HR            | V419          | Viper20                  | 2 HR              |
| U412          | Viper20                  | 2 HR            | V425          | Viper20                  | 1 HR              |
| U419          | Viper25                  | 1, 2, 3 or 4 HR | V435          | Viper25                  | 1 HR              |
| U421          | Viper20                  | 2 HR            | V437          | Viper20                  | 1 HR Chase        |
| U431          | Viper20                  | 4 HR            | V438          | Viper25                  | 1, 2, 3, or 4 HR  |
| U435          | Viper20                  | 3 or 4 HR       | V443          | Viper20                  | 4 HR              |
| U436          | Viper20                  | 1, 2, or 3 HR   | V444          | Viper20                  | 1 HR              |
| U450          | Viper20                  | 1, 3, or 4 HR   | V448          | Viper25                  | 1 HR              |
| U451          | Viper20                  | 1 HR            | V449          | Viper20                  | 2 HR              |
| U454          | Viper20                  | 2 HR            | V452          | Viper25                  | 1 or 2 HR         |
| U463          | Viper20                  | 3 or 4 HR       | V469          | Viper25                  | 1 or 2 HR Chase   |
| U465          | Viper20                  | 1 HR Chase      | V476          | Viper20                  | 1, 3, or 4 HR     |
| U466          | Viper20                  | 1 HR            | V486          | Viper25                  | 1, 2, or 2-1/2 HR |
| U471          | Viper20                  | 1-1/2 HR        | V488          | Viper25                  | 1 or 2 HR Chase   |
| U475          | Viper20                  | 1, 2, 3 or 4 HR | V489          | Viper25                  | 1, 2, 3, or 4 HR  |
| U478          | Viper20                  | 3 HR            | V496          | Viper20                  | 1 or 2 HR Chase   |
| U491          | Viper20                  | 2 HR            | V498          | Viper25                  | 1, 2, 3, or 4 HR  |
| U493          | Viper25                  | 1, 2 HR Chase   | W411          | Viper25                  | 1/2 or 1 HR       |
| U494          | Viper20                  | 1 HR            | W415          | Viper20                  | 1 or 2 HR         |
| U495          | Viper20                  | 1 or 2 HR       | W423          | Viper25                  | 1/2 or 1 HR       |
| U496          | Viper20                  | 1 HR            | W424          | Viper25                  | 1/2 or 1 HR       |
| V410          | Viper20                  | 2 HR            | W432          | Viper25                  | 2 HR              |
|               |                          |                 | W433          | Viper25                  | 1/2 HR            |

Note: Check UL Design assembly for minimum stud web width and other requirements.  
Visit [www.cemcosteel.com](http://www.cemcosteel.com) for more information on fire rated assemblies.



# IMPACT TESTING (ASTM C 1629)



## Test Summary:

All tests were conducted to ASTM C 1629 standard using Test Method ASTM E 695 for Soft Body Impact Tests and ASTM C 1629 Annex 1 for Hard Body Impact Tests. Each test was repeated 3 times as required by the test method and results reported to the ASTM standard published values for Level Classification.

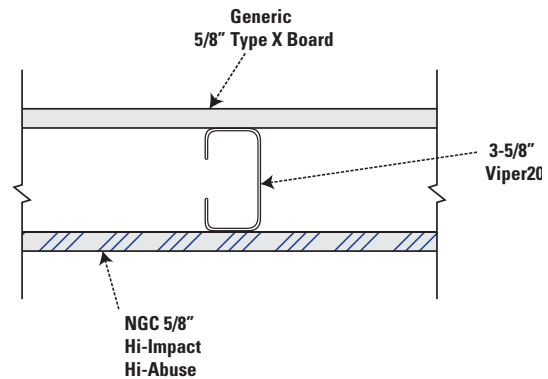
## Test Materials:

Steel Studs – Viper20 Stud and track spaced 16" o.c., do not use ViperTrack25 on Viper20 studs for impact resistant walls. Tests conducted using USG® & National Gypsum® boards.

Testing conducted by IAS Certified 3rd party testing lab Intertek Testing Services.

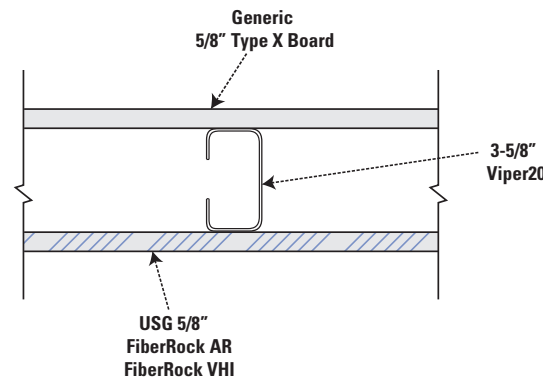
## NATIONAL GYPSUM®

|                                           |                                        |                           |
|-------------------------------------------|----------------------------------------|---------------------------|
| Soft Body Impact Test<br>Single Drop      | Board Assembly<br>3-5/8" NGC Hi-Abuse  | Classification<br>Level 2 |
| Soft Body Impact Test<br>Single Drop      | Board Assembly<br>3-5/8" NGC Hi-Impact | Classification<br>Level 3 |
| Soft Body Impact Test<br>Progressive Drop | Board Assembly<br>3-5/8" NGC Hi-Abuse  | Classification<br>Level 1 |
| Soft Body Impact Test<br>Progressive Drop | Board Assembly<br>3-5/8" NGC Hi-Impact | Classification<br>Level 3 |
| Hard Body Impact Test<br>Single Drop      | Board Assembly<br>3-5/8" NGC Hi-Impact | Classification<br>Level 3 |



## USG®

|                                           |                                            |                           |
|-------------------------------------------|--------------------------------------------|---------------------------|
| Soft Body Impact Test<br>Single Drop      | Board Assembly<br>3-5/8" USG FiberRock AR  | Classification<br>Level 2 |
| Soft Body Impact Test<br>Progressive Drop | Board Assembly<br>3-5/8" USG FiberRock VHI | Classification<br>Level 3 |
| Hard Body Impact Test<br>Single Drop      | Board Assembly<br>3-5/8" USG FiberRock AR  | Classification<br>Level 1 |
| Hard Body Impact Test<br>Single Drop      | Board Assembly<br>3-5/8" USG FiberRock VHI | Classification<br>Level 3 |



Soft body impact test using ViperStud.

- FiberRock VHI & FiberRock AR are registered trademarks of the United States Gypsum Co. (USG)
- Hi-Abuse, Hi-Impact, & Permabase are registered trademarks of the National Gypsum Co.
- ProRoc & ProRoc Extra are registered trademarks of CertainTeed.
- Protecta AR 100 is a registered trademark of Lafarge Gypsum.
- ComfortGuard AR & ComfortGuard IR are registered trademarks of Temple-Inland.
- Dens Brand is a trademark of Georgia Pacific.



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- Professional, certified engineering shop drawing and calculations.
- Use our project submittal form to submit your project online.

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- 2** Deliver shop drawings and structural solutions based on the client's needs.
- 3** Provide full engineering support through the life of the project.



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All transactions shall be governed by the laws of the State of California (including, without limitation, the provisions of the California Commercial Code), without giving affect to any conflict of law rule or principle of such state. The United Nations Convention for the International Sale of Goods shall not apply to this agreement.



# Expanding Your Solutions

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