



ICC-ES Evaluation Report

ESR-2620

Reissued July 2023

This report is subject to renewal July 2025.

DIVISION: 05 00 00—METALS
Section: 05 40 00—Cold-Formed Metal Framing

DIVISION: 09 00 00—FINISHES
Section: 09 22 16.13—Non-Structural Metal Stud Framing

REPORT HOLDER:

WARE INDUSTRIES, INC. (DBA MarinoWARE)

EVALUATION SUBJECT:

VIPERSTUD DRYWALL FRAMING SYSTEM (NON-STRUCTURAL): VIPER25, VIPER20, VIPER20D, VIPER 18MIL, VIPER 27MIL, VIPER 30MIL, AND VIPER 33MIL

ADDITIONAL LISTEES:

CEMCO, LLC

IMPERIAL BUILDING PRODUCTS

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2021, 2018, 2015, and 2012 *International Building Code*® (IBC)
- 2021 and 2018 *International Residential Code*® (IRC)

For evaluation for compliance with codes adopted by California Office of Statewide Health Planning and Development (OSHPD) and Division of the State Architect (DSA), see ESR-2620 CBC and CRC Supplement.

Property evaluated:

Structural

2.0 USES

ViperStud studs and tracks are used for framing of interior nonload-bearing walls and ceiling framing.

3.0 DESCRIPTION

3.1 General:

Products recognized under this report are limited to the ViperStud studs and tracks noted in Table 2. The studs are roll-formed in a “C” shape with a rib (ViperRib) in the flange,

an offset (planking) in the web and knurling on the flanges. The tracks are channel-shaped and are available in two types: solid flanges and slotted flanges. Solid flange tracks have offsets (planking) in the web with flange widths of 1.25 inches (31.75 mm). Slotted flange tracks have a straight web with flange widths of 2.5-inch (63.5 mm) and are limited to top track applications in walls. The last two digits of the member’s ID in Table 2 represent its minimum uncoated base-metal thickness in mils for studs and tracks. Minimum and design thicknesses are:

Mils	Minimum Base-Metal Thickness (inches)	Design Thickness (inches)
15	0.0147	0.0155
18*	0.0181	0.0190
20	0.0195	0.0205
21	0.0209	0.0220
27	0.0269	0.0283
30	0.0296	0.0312
33	0.0329	0.0346

For SI: 1 inch = 25.4 mm.

*For Grade 33 studs and tracks the minimum uncoated base-metal thickness and design thickness are 0.0179 and 0.0188 inches, respectively.

The studs are manufactured with and without punch-outs. The overall dimensions for the punch-outs are:

MANUFACTURER	MEMBER DEPTH	
	1 ⁵ / ₈ " & 2 ¹ / ₂ "	3 ⁵ / ₈ ", 4" & 6"
MarinoWARE	0.75" x 1.75"	1.50" x 2.50"
CEMCO	0.75" x 2.00"	1.50" x 2.75"
Imperial Building Products	0.75"x3.53"	1.50"x4.22"

For SI: 1 inch = 25.4 mm.

Punch-outs are spaced 24 inches (610 mm) on center along the centerline of the member, with a minimum distance of 10 inches (254 mm) from the end of the member to the near edge of the punch-out, when provided. See Figure 1 for stud and track configurations. See Figure 2 for punch-out configurations. See Table 1 for manufacturing locations.

3.2 Material:

3.2.1 Steel:

The members, as noted in Table 2, are formed from coils of steel complying with ASTM A1003; Nonstructural Grade 33 (NS33), Nonstructural Grade 50 (NS50), Nonstructural Grade 57 (NS57), and Nonstructural Grade 70 (NS70). The coating is minimum G40., AZ50, or GF30. Other protective coating with an equivalent corrosion resistance may be used and is subject to approval by the building official

3.2.2 Gypsum Wallboard: For composite wall assemblies, gypsum wallboard must be a minimum of 5/8 inch (15.9 mm) thick and Type X, complying with ASTM C1396 and manufactured by one of the following companies: American Gypsum; CertainTeed; Georgia Pacific; Lafarge; National Gypsum; or USG. For non-composited wall assemblies, the gypsum wallboard is allowed to be any gypsum wallboard allowed by the applicable code.

3.2.3 Fasteners: Fasteners for attaching the gypsum wallboard to the studs and tracks must be No. 6, Type S, fine thread drywall bugle head screws conforming to ASTM C1002. Fasteners for attaching the stud to the top slotted flange track must be No. 8 self-piercing screws with minimum head diameter of 0.4 inches (Phillips truss head or pan head).

4.0 DESIGN AND INSTALLATION

4.1 Design:

Allowable wall heights for interior nonload-bearing composite wall design are shown in Table 3.

Allowable wall heights for interior nonload-bearing non-composite wall design are shown in Tables 5 and 6.

Allowable spans for ceiling framing are shown in Table 7.

Spans noted in Tables 5, 6, and 7 are based on the section properties noted in Table 4.

4.2 Installation:

Installation of ViperStud studs and tracks must be in accordance with the approved plans and this report. The approved plans must be available on the jobsite at all times during installation.

4.2.1 For composite system walls, fastening of studs to tracks is optional, except when a slotted flange top track is used. The stud must be fastened to the slotted track through the slot mid-length using #8 self-piercing screws. End bearing of the stud on the track must be a minimum of 1 inch (25 mm) for solid flange tracks (xxxVT125 tracks) and 1 5/8 inches (41.3 mm) for slotted flange tracks (xxxCST250 or xxxSLT250 tracks). Gypsum wallboard must be installed on both sides of the wall framing for the full wall height, with the long dimension of the gypsum wallboard parallel to the studs. Placement of joints in the gypsum sheathing must be in accordance with Sections 4.6.3 and 4.6.4 of GA-216 (Gypsum Association Application and Finishing of Gypsum Panel Products) or Section 7.5 of ASTM C840.

Maximum spacing of fasteners fastening the gypsum wallboard to the studs and tracks must be as follows:

STUD SPACING	STUDS	TRACKS
12" o.c.	16" o.c.	16" o.c.
16" o.c.	16" o.c.	16" o.c.
24" o.c.	12" o.c.	12" o.c.

For **SI**: 1 inch = 25.4 mm.

Exception: Gypsum wallboard fastening to slotted flange top tracks (xxxCST250 or xxxSLT250) is not required.

4.2.2 Sheathing used with ceiling framing and non-composite system walls must be installed in accordance with the applicable code requirements for the sheathing material.

5.0 CONDITIONS OF USE

The ViperStud studs and tracks described in this report comply with, or are suitable alternatives to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** Installation must comply with the approved plans and this report. In the event of a conflict, this report governs.
- 5.2** The interior nonload-bearing wall assemblies are limited to interior installations where the superimposed axial load is zero pounds.
- 5.3** Design of the attachment of the wall to the surrounding structure is outside the scope of this report.
- 5.4** Installation of the gypsum wallboard must meet the requirements of ASTM C840 or GA-216.
- 5.5** Use of ViperStud studs and tracks in other than non-structural applications, as defined by AISI S220, is outside the scope of this report.
- 5.6** Complete construction documents and calculations verifying compliance with this report must be submitted to the code official for each project. The calculations and construction documents must be prepared and sealed by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.7** ViperStud studs and tracks described in this report are manufactured under an approved quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

- 6.1** Data in accordance with the ICC-ES Acceptance Criteria for Cold-formed Steel Framing Members (AC46), dated October 2019 and editorially revised December 2020.
- 6.2** Data in accordance with the ICC-ES Acceptance Criteria for Cold-formed Steel Framing Members—Interior Nonload-bearing Wall Assemblies (AC86), dated June 2019 and editorially revised October 2021.

7.0 IDENTIFICATION

- 7.1** Each ViperStud stud and track covered by this report must have a legible label or stamp, at a maximum spacing of 96 inches (2438 mm) on center, indicating the manufacturer’s name or initials [MarinoWARE (MW), CEMCO, or Imperial Building Products]; the minimum bare metal thickness in mils or inches; the minimum yield strength in ksi (if other than 33 ksi); the coating designation (if other than G40); the designation “NS”; and the evaluation report number (ESR-2620).
- 7.2** The report holder’s contact information is the following:
WARE INDUSTRIES, INC. (dba MarinoWARE)
400 METUCHEN ROAD
SOUTH PLAINFIELD, NEW JERSEY 07080
(908) 757-9000
www.marinoware.com
- 7.3** The additional listees’ information is the following:
CEMCO, LLC
263 NORTH COVINA LANE
CITY OF INDUSTRY, CALIFORNIA 91746
(800) 775-2362
www.cemcosteel.com
IMPERIAL BUILDING PRODUCTS
4500, BERNARD-LEFEBVRE STREET
LAVAL, QUEBEC H7C 0A5
(450) 728-4500

TABLE 1—MANUFACTURING LOCATIONS

MARINOWARE
 South Plainfield, NJ 07080
 Griffin, GA 30223
 East Chicago, IN 46312

CEMCO
 City of Industry, CA 91746
 Pittsburg, CA 94565
 Denver, CO 80204
 Fort Worth, TX 76140

IMPERIAL BUILDING PRODUCTS
 Quebec, Canada H7C 0A5
 Ontario, Canada L6T 5V8

TABLE 2—MEMBER THICKNESS

MEMBER (name)	STUD ID ¹	TRACK ID ¹		MINIMUM YIELD STRENGTH (ksi) ⁴
		Solid Flange	Slotted Flange ³	
Viper25	xxxVS125-15	xxxVT125-15	xxxSLT250-18 or xxxCST250-18	50 (stud and solid flange track) 70 (slotted flange track)
Viper20	xxxVS125-18	xxxVT125-18	xxxSLT250-18 or xxxCST250-18	70 (stud and slotted flange track) 50 (solid flange track)
Viper20D (1.625 – 3.625) ²	xxxVS125-20	xxxVT125-20	xxxSLT250-18 or xxxCST250-18	57 (stud) 50 (solid flange track) 70 (slotted flange track)
Viper20D (4.00 – 6.00) ²	xxxVS125-21	xxxVT125-21	xxxSLT250-18 or xxxCST250-18	57 (stud) 50 (solid flange track) 70 (slotted flange track)
Viper 18mil	xxxVS125-18	xxxVT125-18	xxxSLT250-27 or xxxCST250-27	33 (stud and solid flange track) 33 (slotted flange track)
Viper 27mil	xxxVS125-27	xxxVT125-27	xxxSLT250-27 or xxxCST250-27	33 (stud and solid flange track) 33 (slotted flange track)
Viper 30mil	xxxVS125-30	xxxVT125-30	xxxSLT250-30 or xxxCST250-30	33 (stud and solid flange track) 33 (slotted flange track)
Viper 33mil	xxxVS125-33	xxxVT125-33	xxxSLT250-33 or xxxCST250-33	33 (stud and solid flange track) 33 (slotted flange track)

For **SI**: 1 inch = 25.4 mm, 1 ksi = 6.895 MPa.

¹xxx is the web size in ¹/₁₀₀ of an inch. The top track is solid flange track or slotted flange track. The bottom track is always solid flange track.

²Applicable range of depths, in inches, for the member.

³Tracks with slotted flanges are available with a web depth (measured from inside flange to inside flange) of 2.5 - 6.0 inches. Their use is limited to top tracks and as specified in Footnote 6 of Table 3.

⁴The minimum yield strength corresponds to the grade of steel noted in Section 3.2.1.

TABLE 3—COMPOSITE WALL LIMITING HEIGHTS^{1,2,3,4,5} (ft-in)

DEPTH (in)	MEMBER (name) (STUD SECTION ID)	SPACING (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
1 ⁵ / ₈ ⁶	Viper25 (162VS125-15)	12	13-9	11-4	9-10	12-0	9-11	8-3	10-11	8-10	----
		16	12-6	10-4	8-8	10-11	8-10	----	9-11	7-11	----
		24	10-11	8-10	----	9-5	----	----	8-2	----	----
	Viper20 (162VS125-18)	12	13-10	11-0	9-7	12-1	9-7	8-5	11-0	8-9	----
		16	12-7	10-0	8-9	11-0	8-9	7-11	10-0	7-11	----
		24	11-0	8-9	----	9-7	----	----	8-9	----	----
	Viper20D (162VS125-20)	12	14-3	11-3	9-10	12-5	9-10	8-5	11-3	8-10	----
16		12-11	10-3	8-10	11-3	8-10	----	10-3	7-11	----	
24		11-3	8-10	----	9-10	----	----	8-10	----	----	
Viper 18mil (162VS125-18)	12	12-10	10-7	9-4	11-3	9-3	8-2	10-3	8-5	----	
	16	11-9	9-8	8-6	10-3	8-5	----	9-4	----	----	
	24	10-3	8-5	----	8-0	----	----	8-2	----	----	
Viper 27mil (162VS125-27)	12	14-4	11-5	9-11	12-6	9-11	8-5	11-5	8-10	---	
	16	13-0	10-4	8-10	11-5	8-10	---	10-4	7-10	----	
	24	11-5	8-10	---	9-10	---	----	8-6	----	----	
Viper 30mil (162VS125-30)	12	14-7	11-6	10-0	12-9	10-0	8-6	11-7	8-11	---	
	16	13-3	10-5	8-11	11-7	8-11	---	10-6	7-10	---	
	24	11-7	8-11	---	10-1	---	---	8-10	---	---	
Viper 33mil (162VS125-33)	12	14-11	11-10	10-4	13-0	10-4	8-10	11-10	9-4	7-11	
	16	13-6	10-9	9-4	11-10	9-4	7-11	10-9	8-4	---	
	24	11-10	9-4	7-11	10-4	7-11	---	9-4	---	---	
2 ¹ / ₂	Viper25 (250VS125-15)	12	17-3	14-5	12-9	15-0	12-7	11-1	13-8	11-6	10-1
		16	15-8	13-1	11-7	13-8	11-6	10-1	12-3	10-5	8-9
		24	13-8	11-6	10-1	11-6	10-0	8-2	10-0	8-8	---
	Viper20 (250VS125-18)	12	18-2	14-5	12-7	15-10	12-7	11-0	14-5	11-5	9-10
		16	16-6	13-1	11-5	14-5	11-5	9-10	13-1	10-4	8-10
		24	14-5	11-5	9-10	12-7	9-10	8-5	11-5	8-10	----
	Viper20D (250VS125-20)	12	17-11	14-10	13-2	5-8	13-0	11-6	14-3	11-10	10-5
16		16-4	13-6	12-0	14-3	11-10	10-5	12-11	10-9	9-4	
24		14-3	11-10	10-5	12-5	10-4	8-9	11-3	9-2	---	
Viper 18mil (250VS125-18)	12	17-5	14-5	12-7	14-7	12-7	11-0	12-8	11-5	9-8	
	16	15-6	13-1	11-6	12-8	11-6	9-8	8-11	8-6	----	
	24	12-7	11-5	9-8	10-4	9-8	8-0	8-11	8-6	----	
Viper 27mil (250VS125-27)	12	18-3	14-5	12-8	15-11	12-8	11-0	14-4	11-6	10-0	
	16	16-7	13-2	11-6	14-4	11-6	10-0	12-5	10-5	8-11	
	24	14-4	11-6	10-0	11-9	10-0	8-6	10-2	8-11	---	
Viper 30mil (250VS125-30)	12	18-9	14-10	13-0	16-4	13-0	11-4	14-10	11-10	10-4	
	16	17-0	13-6	11-10	14-10	11-10	10-4	13-6	10-9	9-3	
	24	14-10	11-10	10-4	12-9	10-4	8-10	11-0	9-3	7-10	
Viper 33mil (250VS125-33)	12	19-4	15-4	13-5	16-10	13-5	11-8	15-4	12-2	10-8	
	16	17-7	13-11	12-2	15-4	12-2	10-8	13-11	11-0	9-8	
	24	15-4	12-2	10-8	13-5	10-8	9-2	12-0	9-8	8-2	
3 ⁵ / ₈	Viper25 (362VS125-15)	12	20-10	17-3	15-2	18-2	15-1	13-3	15-10	13-9	12-0
		16	18-11	15-9	13-9	15-10	13-9	12-0	13-9	12-6	10-11
		24	15-10	13-9	12-0	12-11	12-0	10-6	11-3	10-11	9-6
	Viper20 (362VS125-18)	12	21-11	18-0	15-10	19-1	15-9	13-10	17-5	14-3	12-7
		16	19-11	16-4	14-5	17-5	14-3	12-7	15-10	13-0	11-4
		24	17-5	14-3	12-7	15-2	12-6	10-10	13-10	11-3	9-9
	Viper20D (362VS125-20)	12	21-10	17-11	15-9	19-1	15-8	13-9	17-4	14-3	12-6
16		19-10	16-4	14-4	17-4	14-3	12-6	15-4	12-11	11-4	
24		17-4	14-3	12-6	14-6	12-5	10-11	12-7	11-4	9-11	
Viper 18mil (362VS125-18)	12	18-7	15-11	13-11	17-8	15-4	13-5	15-3	13-11	12-2	
	16	18-9	15-11	13-11	15-3	13-11	12-2	13-3	12-8	10-11	
	24	15-3	13-11	12-2	12-6 ⁶	12-2	10-6	10-10 ⁶	10-10 ⁶	9-5 ⁶	
Viper 27mil (362VS125-27)	12	22-9	18-1	15-10	19-11	15-10	13-10	17-7	14-4	12-6	
	16	20-8	16-5	14-4	17-7	14-4	12-6	15-3	13-0	11-2	
	24	17-7	14-4	12-5	14-4 ⁶	12-6	10-8	12-5 ⁶	11-2 ⁶	---	
Viper 30mil (362VS125-30)	12	23-3	18-6	16-2	20-4	16-2	14-1	18-6	14-8	12-10	
	16	21-2	16-9	14-8	18-6	14-8	12-10	16-4	13-4	11-6	
	24	18-6	14-8	12-10	15-4	12-10	11-0	13-4 ⁶	11-6	9-11	
Viper 33mil (362VS125-33)	12	23-10	18-11	16-6	20-10	16-6	14-5	18-11	15-0	13-1	
	16	21-8	17-2	15-0	18-11	15-0	13-1	17-2	13-8	11-10	
	24	18-11	15-0	13-1	16-6	13-1	11-4	14-4 ⁶	11-10	10-3	

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa

(To be continued)

TABLE 3—COMPOSITE WALL LIMITING HEIGHTS^{1,2,3,4,5} (ft-in) – Continued

DEPTH (in)	MEMBER (name) (STUD SECTION ID)	SPACING (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
4	Viper25 (400VS125-15)	12	22-1	18-3	16-3	19-3	15-11	14-2	16-8	14-6	12-11
		16	20-0	16-7	14-9	16-8	14-6	12-11	14-5	13-2	11-9
		24	16-8	14-6	12-11	13-7	12-8	11-3	11-9	11-6	10-1
	Viper20 (400VS125-18)	12	22-11	18-11	16-8	20-0	16-7	14-7	18-2	15-1	13-3
		16	20-10	17-3	15-2	18-2	15-1	13-3	16-6	13-8	12-1
		24	18-2	15-1	13-3	15-10	13-2	11-7	14-5	11-11	10-5
	Viper20D (400VS125-21)	12	24-0	19-1	16-8	21-0	16-8	14-7	19-1	15-2	13-3
		16	21-10	17-4	15-2	19-1	15-2	13-3	17-4	13-9	12-0
		24	19-1	15-2	13-3	16-8	13-3	11-7	14-11	12-0	10-5
	Viper 18mil (400VS125-18)	12	20-6	18-5	16-3	16-9	16-1	14-2	14-6	14-6	12-11
		16	17-9	16-9	14-9	14-6	14-6	12-11	12-7	12-7	11-9
		24	14-6	14-6	12-11	11-10 ⁶	11-10	11-2	10-3 ⁶	10-3 ⁶	9-11 ⁶
	Viper 27mil (400VS125-27)	12	24-9	19-8	17-2	20-7	17-2	15-0	17-10	15-7	13-8
		16	21-10	17-11	15-7	17-10	15-7	13-8	15-5	14-2	12-4
		24	17-10	15-7	13-8	14-7 ⁶	13-8	11-10	12-7 ⁶	12-4 ⁶	10-9 ⁶
	Viper 30mil (400VS125-30)	12	25-2	20-0	17-6	22-0	17-6	15-3	19-5	15-11	13-10
		16	22-11	18-2	15-11	19-5	15-11	13-10	16-10	14-5	12-7
		24	19-5	15-11	13-10	15-10	13-10	12-1	13-9 ⁶	12-7	10-11
Viper 33mil (400VS125-33)	12	25-8	20-4	17-10	22-5	17-10	15-7	20-4	16-2	14-1	
	16	23-4	18-6	16-2	20-4	16-2	14-1	18-4	14-8	12-10	
	24	20-4	16-2	14-1	17-3	14-2	12-4	15-0 ⁶	12-10	11-2	
6	Viper25 (600VS125-15)	12	24-8	23-9	21-1	22-3	20-9	18-5	20-0	18-10	16-9
		16	22-11	21-7	19-2	20-0	18-10	16-9	17-5	17-2	15-3
		24	20-0	18-10	16-9	16-5	16-5	14-8	14-2	14-2	13-0
	Viper20 (600VS125-18)	12	30-6	26-0	23-0	26-7	22-9	20-1	24-2	20-8	18-4
		16	27-8	23-7	20-11	24-2	20-8	18-4	21-12	18-9	16-8
		24	24-2	20-8	18-4	20-11	18-0	16-0	18-1	16-5	14-7
	Viper20D (600VS125-21)	12	29-1	25-7	22-6	25-10	22-4	19-8	23-8	20-4	17-11
		16	26-9	23-3	20-6	23-8	20-4	17-11	21-9	18-6	16-3
		24	23-8	20-4	17-11	20-11	17-9	15-7	18-2	16-2	14-2
	Viper 18mil (600VS125-18)	12	25-5	24-9	21-8	20-9	20-9	18-11	18-0	18-0	17-2
		16	22-0	22-0	19-8	18-0	18-0	17-2	15-7 ⁶	15-7 ⁶	15-7 ⁶
		24	18-0	18-0	17-2	14-8 ⁶	14-8 ⁶	14-8 ⁶	12-9 ⁶	12-9 ⁶	12-9 ⁶
	Viper 27mil (600VS125-27)	12	29-7	25-11	22-8	24-2	22-8	19-9	20-11	20-7	18-0
		16	25-7	23-6	20-7	20-11	20-7	18-0	18-1 ⁶	18-1 ⁶	16-4 ⁶
		24	20-11	20-7	18-0	17-1 ⁶	17-1 ⁶	15-8 ⁶	14-9 ⁶	14-9 ⁶	14-2 ⁶
	Viper 30mil (600VS125-30)	12	31-10	26-9	23-4	26-0	23-4	20-5	22-6	21-3	18-6
		16	27-7	24-3	21-3	22-6	21-3	18-6	19-6 ⁶	19-3 ⁶	16-10
		24	22-6	21-3	18-6	18-5 ⁶	18-5 ⁶	16-2	15-11 ⁶	15-11 ⁶	14-8 ⁶
Viper 33mil (600VS125-33)	12	34-5	27-7	24-1	28-1	24-1	21-1	24-4	21-11	19-2	
	16	29-10	25-1	21-11	24-4	21-11	19-2	21-1 ⁶	19-11	17-5	
	24	24-4	21-11	19-2	19-11 ⁶	19-2 ⁶	16-9	17-2 ⁶	17-2 ⁶	15-2 ⁶	

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa

¹Sheathing, 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.

²Sheathing must be fastened to the studs with fasteners as specified in Section 3.2.3 and installed per Section 4.2.1.

³Placement 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.

⁴The bottom and top tracks are xxxVT125 (solid flange track). Slotted flange track (xxxCST250 or xxxSLT250) may be used for the top track except as specified in Footnote 6.

⁵End bearing must be a minimum of 1 inch for xxxVT125 (solid flange track) and 1⁵/₈ inches for xxxCST250 or xxxSLT250 (slotted flange track).

⁶Slotted flange tracks are not allowed for these heights and are outside the scope of this report.

TABLE 4—STUD SECTION PROPERTIES

MEMBER (name)	STUD SECTION ID	MIL THICKNESS (mils)	WEIGHT (lb/ft)	GROSS					EFFECTIVE		MOMENTS			CRITICAL UNBRACED LENGTH
				Area (in ²)	I _x (in ⁴)	r _x (in)	I _y (in ⁴)	r _y (in)	I _{xd} (in ⁴)	S _x (in ³)	ALLOWABLE MOMENT ³ M _a (in-k)	LOCAL BUCKLING NOMINAL MOMENT M _{nl} (in-k)	DISTORTIONAL BUCKLING NOMINAL MOMENT M _{nd} (in-k)	
Viper25	162VS125-15	15	0.242	0.071	0.0320	0.671	0.0151	0.461	0.0322	0.0258	0.663	1.42	1.20	25.1
	250VS125-15	15	0.289	0.085	0.0844	0.998	0.0173	0.452	0.0903	0.0423	1.170	2.72	2.12	24.8
	362VS125-15 ¹	15	0.348	0.102	0.1990	1.390	0.0193	0.435	0.2050	0.0580	1.600	3.48	2.90	24.5
	400VS125-15 ¹	15	0.367	0.108	0.2500	1.520	0.0198	0.429	0.2550	0.0612	1.690	3.99	3.06	24.4
	600VS125-15 ²	15	0.473	0.139	0.6590	2.180	0.0219	0.397	0.6280	0.0854	2.360	5.90	4.27	23.7
Viper20	162VS125-18	19	0.285	0.0839	0.0391	0.683	0.0179	0.462	0.0328	0.0285	1.19	1.99	2.02	21.2
	250VS125-18	19	0.351	0.103	0.106	1.01	0.0227	0.469	0.0942	0.0581	2.09	4.07	3.49	21.9
	362VS125-18	19	0.423	0.124	0.249	1.42	0.0256	0.454	0.213	0.0755	3.08	5.28	5.14	21.5
	400VS125-18	19	0.449	0.132	0.315	1.55	0.0266	0.449	0.265	0.0847	3.44	5.93	5.74	21.5
	600VS125-18	19	0.586	0.172	0.846	2.22	0.0319	0.430	0.647	0.151	5.41	10.6	9.04	21.5
Viper20D	162VS125-20	20	0.315	0.093	0.0419	0.673	0.0195	0.459	0.0498	0.0403	1.270	2.74	2.14	23.4
	250VS125-20	20	0.376	0.111	0.1110	1.000	0.0225	0.451	0.1290	0.0651	2.050	4.50	3.71	23.1
	362VS125-20	20	0.454	0.134	0.2610	1.400	0.0251	0.433	0.2980	0.0904	2.850	6.10	5.15	22.8
	400VS125-21	21	0.515	0.152	0.3520	1.520	0.0275	0.426	0.3770	0.1170	3.690	8.02	6.67	22.7
	600VS125-21 ²	21	0.665	0.196	0.9290	2.180	0.0304	0.394	0.8690	0.1610	5.060	11.20	9.16	22.0

For SI: 1 plf = 14.5939 N/m, 1 inch = 25.4 mm, 1 inch² = 645.16 mm², 1 inch³ = 16,387.064 mm³, 1 inch⁴ = 416,231 mm⁴, 1 lb = 0.4536 kg, 1 kip-in = 112.99 N-m. See next page for notes.

(To be continued)

TABLE 4—STUD SECTION PROPERTIES (Continued)

MEMBER (name)	STUD SECTION ID	MIL THICKNES S (mils)	WEIGHT (lb/ft)	GROSS					EFFECTIVE		MOMENTS			CRITICAL UNBRACED LENGTH
				Area (in ²)	I _x (in ⁴)	r _x (in)	I _y (in ⁴)	r _y (in)	I _{xd} (in ⁴)	S _x (in ³)	M _a (in-k)	M _{nl} (in-k)	M _{nd} (in-k)	
Viper 27mil	162VS125-27	27	0.417	0.123	0.0569	0.682	0.0254	0.456	0.0560	0.0586	1.160	1.93	2.10	30.7
	250VS125-27	27	0.506	0.149	0.1510	1.010	0.0299	0.449	0.1480	0.1060	2.030	3.49	3.39	30.2
	362VS125-27	27	0.611	0.180	0.3560	1.410	0.0335	0.432	0.3500	0.1480	2.930	4.89	5.11	29.8
	400VS125-27	27	0.645	0.190	0.4490	1.540	0.0344	0.426	0.4410	0.1650	3.260	5.45	5.69	29.6
	600VS125-27 ¹	27	0.838	0.246	1.1900	2.200	0.0382	0.394	1.1000	0.2900	5.150	9.65	8.59	28.8
Viper 30mil	162VS125-30	30	0.459	0.135	0.0623	0.680	0.0279	0.455	0.0615	0.0670	1.320	2.21	2.38	30.8
	250VS125-30	30	0.547	0.161	0.1660	1.020	0.0323	0.448	0.1630	0.1200	2.310	3.96	3.86	30.1
	362VS125-30	30	0.669	0.197	0.3910	1.410	0.0366	0.431	0.3850	0.1720	3.390	5.67	5.85	29.7
	400VS125-30	30	0.711	0.209	0.4930	1.540	0.0377	0.425	0.4860	0.1910	3.780	6.31	6.52	29.6
	600VS125-30	30	0.924	0.271	1.3100	2.190	0.0418	0.392	1.2300	0.3410	5.950	11.30	9.93	28.7
Viper 33mil	162VS125-33	33	0.500	0.147	0.0686	0.683	0.0302	0.453	0.0681	0.0773	1.530	2.55	2.71	30.8
	250VS125-33	33	0.606	0.178	0.1830	1.010	0.0356	0.447	0.1810	0.1370	2.650	4.53	4.42*	30.1
	362VS125-33	33	0.748	0.220	0.4320	1.400	0.0404	0.429	0.4280	0.2010	3.960	6.62	6.75	29.7
	400VS125-33	33	0.783	0.230	0.5440	1.540	0.0413	0.424	0.5390	0.2240	4.420	7.38	7.53	29.5
	600VS125-33	33	1.023	0.301	1.4400	2.190	0.0459	0.391	1.3900	0.4000	6.930	13.20	11.6	28.6

For SI: 1 plf = 14.5939 N/m, 1 inch = 25.4 mm, 1 inch² = 645.16 mm², 1 inch³ = 16,387.064 mm³, 1 inch⁴ = 416,231 mm⁴, 1 lb = 0.4536 kg, 1 kip-in = 112.99 N-m.

¹Web depth-to-thickness ratio exceeds 200.

²Web depth-to-thickness ratio exceeds 260.

³The allowable moment is the lesser of the allowable local buckling moment and allowable distortional buckling moment. K_φ is assumed to be zero for distortional buckling moments.

SYMBOLS

I_x = Strong axis moment of inertia

r_x = Strong axis radius of gyration

I_y = Weak axis moment of inertia

r_y = Weak axis radius of gyration

I_{xd} = Effective Strong axis moment of inertia

S_x = Effective Strong axis section modulus

M_a = Strong axis allowable bending moment (inclusive of safety factor) based on the critical unbraced length less than or equal to that tabulated.

M_{nl} = Nominal moment based on local buckling

M_{nd} = Nominal moment based on distortional buckling

L_u = Maximum unbraced length at which the member is considered to be fully braced for design purposes.

K_φ = Rotational stiffness

TABLE 5—LIMITING HEIGHTS FOR FULLY BRACED¹ NON-COMPOSITE WALLS

Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER25	162VS125-15	12	9'-5"	8'-4"	7'-6"	6'-7"	7'-8"	7'-2"	6'-7"	--	6'-7"	6'-7"	6'-0"	--
		16	8'-1"	7'-6"	6'-10"	6'-0"	6'-7"	6'-7"	6'-0"	--	--	--	--	--
		24	6'-7"	6'-7"	6'-0"	--	--	--	--	--	--	--	--	--
	250VS125-15	12	12'-6"	11'-7"	10'-7"	9'-2"	10'-2"	10'-2"	9'-2"	8'-1"	8'-10"	8'-10"	8'-5"	7'-4"
		16	10'-10"	10'-7"	9'-7"	8'-5"	8'-10"	8'-10"	8'-5"	7'-4"	7'-8"	7'-8"	7'-7"	6'-8"
		24	8'-10"	8'-10"	8'-5"	7'-4"	7'-1"	7'-1"	7'-1"	6'-5"	--	--	--	--
	362VS125-15	12	14'-7"	14'-7"	13'-11"	12'-1"	11'-11"	11'-11"	11'-11"	10'-7"	10'-4"	10'-4"	10'-4"	9'-7"
		16	12'-8"	12'-8"	12'-7"	11'-0"	10'-4"	10'-4"	10'-4"	9'-7"	9'-0"	9'-0"	9'-0"	8'-10"
		24	10'-4"	10'-4"	10'-4"	9'-7"	8'-5"	8'-5"	8'-5"	8'-5"	6'-7"	6'-7"	6'-7"	6'-7"
	400VS125-15	12	15'-0"	15'-0"	15'-0"	13'-1"	12'-4"	12'-4"	12'-4"	11'-5"	10'-7"	10'-7"	10'-7"	10'-5"
		16	13'-0"	13'-0"	13'-0"	11'-11"	10'-7"	10'-7"	10'-7"	10'-5"	9'-2"	9'-2"	9'-2"	9'-2"
		24	10'-7"	10'-7"	10'-7"	10'-5"	8'-6"	8'-6"	8'-6"	8'-6"	6'-5"	6'-5"	6'-5"	6'-5"
	600VS125-15	12	17'-8"	17'-8"	17'-8"	17'-7"	14'-1"	14'-1"	14'-1"	14'-1"	10'-7"	10'-7"	10'-7"	10'-7"
		16	15'-5"	15'-5"	15'-5"	15'-5"	10'-7"	10'-7"	10'-7"	10'-7"	7'-11"	7'-11"	7'-11"	7'-11"
		24	10'-7"	10'-7"	10'-7"	10'-7"	7'-0"	7'-0"	7'-0"	7'-0"	--	--	--	--
Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER20	162VS125-18	12	9'-6"	---	7'-7"	6'-7"	8'-4"	---	6'-7"	5'-10"	7'-7"	---	6'-0"	5'-2"
		16	8'-7"	---	6'-11"	6'-0"	7'-7"	---	6'-0"	5'-2"	6'-11"	---	5'-5"	4'-10"
		24	7'-7"	---	6'-0"	5'-2"	6'-7"	---	5'-2"	4'-7"	6'-0"	---	4'-10"	4'-2"
	250VS125-18	12	13'-6"	---	10'-8"	9'-5"	11'-10"	---	9'-5"	8'-2"	10'-8"	---	8'-6"	7'-5"
		16	12'-4"	---	9'-8"	8'-6"	10'-8"	---	8'-6"	7'-5"	9'-8"	---	7'-8"	6'-10"
		24	10'-8"	---	8'-6"	7'-5"	9'-5"	---	7'-5"	6'-6"	8'-4"	---	6'-10"	5'-11"
	362VS125-18	12	17'-8"	---	14'-1"	12'-4"	15'-6"	---	12'-4"	10'-8"	14'-1"	---	11'-2"	9'-10"
		16	16'-1"	---	12'-10"	11'-2"	14'-1"	---	11'-2"	9'-10"	12'-5"	---	10'-1"	8'-11"
		24	14'-1"	---	11'-2"	9'-10"	11'-8"	---	9'-10"	8'-6"	10'-1"	---	8'-11"	7'-8"
	400VS125-18	12	19'-1"	---	15'-1"	13'-2"	16'-8"	---	13'-2"	11'-7"	15'-1"	---	12'-0"	10'-6"
		16	17'-4"	---	13'-10"	12'-0"	15'-1"	---	12'-0"	10'-6"	13'-1"	---	10'-11"	9'-6"
		24	15'-1"	---	12'-0"	10'-6"	12'-5"	---	10'-6"	9'-2"	10'-8"	---	9'-6"	8'-4"
	600VS125-18	12	25'-8"	---	20'-5"	17'-10"	21'-11"	---	17'-10"	15'-7"	19'-0"	---	16'-2"	14'-1"
		16	23'-4"	---	18'-6"	16'-2"	19'-0"	---	16'-2"	14'-1"	15'-10"	---	14'-8"	12'-10"
		24	19'-0"	---	16'-2"	14'-1"	14'-0"	---	14'-0"	12'-5"	10'-6"	---	10'-6"	10'-6"

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

¹Bracing is required at internals not exceeding maximum unbraced length (L_u) listed in Table 4.

(To be continued)

TABLE 5—LIMITING HEIGHTS FOR FULLY BRACED¹ NON-COMPOSITE WALLS (Continued)

Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER20D	162VS125-20	12	10'-11"	9'-6"	8'-8"	7'-7"	9'-6"	8'-4"	7'-7"	6'-7"	8'-8"	7'-7"	6'-11"	6'-0"
		16	9'-11"	8'-8"	7'-11"	6'-11"	8'-8"	7'-7"	6'-11"	6'-0"	7'-8"	6'-11"	6'-4"	--
		24	8'-8"	7'-7"	6'-11"	6'-0"	7'-2"	6'-7"	6'-0"	--	6'-4"	6'-0"	--	--
	250VS125-20	12	15'-0"	13'-1"	11'-11"	10'-5"	13'-1"	11'-6"	10'-5"	9'-1"	11'-8"	10'-5"	9'-6"	8'-4"
		16	13'-7"	11'-11"	10'-10"	9'-6"	11'-8"	10'-5"	9'-6"	8'-4"	10'-1"	9'-6"	8'-7"	7'-6"
		24	11'-8"	10'-5"	9'-6"	8'-4"	9'-6"	9'-1"	8'-4"	7'-2"	8'-4"	8'-4"	7'-6"	6'-7"
	362VS125-20	12	19'-6"	17'-4"	15'-10"	13'-10"	15'-11"	15'-1"	13'-10"	12'-0"	13'-10"	13'-10"	12'-6"	10'-11"
		16	16'-11"	15'-10"	14'-4"	12'-6"	13'-10"	13'-10"	12'-6"	10'-11"	11'-11"	11'-11"	11'-5"	9'-11"
		24	13'-10"	13'-10"	12'-6"	10'-11"	11'-2"	11'-2"	10'-11"	9'-6"	9'-8"	9'-8"	9'-8"	8'-8"
	400VS125-21	12	21'-6"	18'-8"	17'-0"	14'-11"	18'-1"	16'-5"	14'-11"	13'-0"	15'-8"	14'-11"	13'-6"	11'-10"
		16	19'-2"	17'-0"	15'-6"	13'-6"	15'-8"	14'-11"	13'-6"	11'-10"	13'-7"	13'-6"	12'-4"	10'-8"
		24	15'-8"	14'-11"	13'-6"	11'-10"	12'-10"	12'-10"	11'-10"	10'-4"	11'-1"	11'-1"	10'-8"	9'-5"
600VS125-21	12	26'-0"	24'-10"	22'-6"	19'-8"	21'-2"	21'-2"	19'-8"	17'-2"	18'-5"	18'-5"	17'-11"	15'-7"	
	16	22'-6"	22'-6"	20'-5"	17'-11"	18'-5"	18'-5"	17'-11"	15'-7"	15'-11"	15'-11"	15'-11"	14'-2"	
	24	18'-5"	18'-5"	17'-11"	15'-7"	15'-0"	15'-0"	15'-0"	13'-7"	12'-1"	12'-1"	12'-1"	12'-1"	
Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER 27mil	162VS125-27	12	11'-5"	9'-11"	9'-0"	7'-11"	9'-11"	8'-8"	7'-11"	6'-11"	8'-10"	7'-11"	7'-2"	6'-4"
		16	10'-4"	9'-0"	8'-2"	7'-2"	8'-10"	7'-11"	7'-2"	6'-4"	7'-7"	7'-2"	6'-6"	--
		24	8'-10"	7'-11"	7'-2"	6'-4"	7'-2"	6'-11"	6'-4"	--	6'-2"	6'-2"	--	--
	250VS125-27	12	15'-8"	13'-8"	12'-6"	10'-11"	13'-5"	12'-0"	10'-11"	9'-6"	11'-7"	10'-11"	9'-11"	8'-7"
		16	14'-2"	12'-6"	11'-4"	9'-11"	11'-7"	10'-11"	9'-11"	8'-7"	10'-1"	9'-11"	9'-0"	7'-11"
		24	11'-7"	10'-11"	9'-11"	8'-7"	9'-6"	9'-6"	8'-7"	7'-7"	8'-2"	8'-2"	7'-11"	6'-11"
	362VS125-27	12	19'-10"	18'-4"	16'-7"	14'-6"	16'-1"	16'-0"	14'-6"	12'-8"	14'-0"	14'-0"	13'-2"	11'-6"
		16	17'-1"	16'-7"	15'-1"	13'-2"	14'-0"	14'-0"	13'-2"	11'-6"	12'-1"	12'-1"	12'-0"	10'-6"
		24	14'-0"	14'-0"	13'-2"	11'-6"	11'-5"	11'-5"	11'-5"	10'-1"	9'-11"	9'-11"	9'-11"	9'-1"
	400VS125-27	12	20'-11"	19'-8"	17'-11"	15'-8"	17'-0"	17'-0"	15'-8"	13'-8"	14'-8"	14'-8"	14'-2"	12'-5"
		16	18'-1"	17'-11"	16'-4"	14'-2"	14'-8"	14'-8"	14'-2"	12'-5"	12'-10"	12'-10"	12'-10"	11'-4"
		24	14'-8"	14'-8"	14'-2"	12'-5"	12'-0"	12'-0"	12'-0"	10'-11"	10'-5"	10'-5"	10'-5"	9'-11"
600VS125-27	12	26'-2"	26'-2"	24'-5"	21'-4"	21'-5"	21'-5"	21'-4"	18'-7"	18'-6"	18'-6"	18'-6"	16'-11"	
	16	22'-8"	22'-8"	22'-1"	19'-4"	18'-6"	18'-6"	18'-6"	16'-11"	15'-4"	15'-4"	15'-4"	15'-4"	
	24	18'-6"	18'-6"	18'-6"	16'-11"	13'-7"	13'-7"	13'-7"	13'-7"	10'-2"	10'-2"	10'-2"	10'-2"	

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

¹Bracing is required at internals not exceeding maximum unbraced length (L_u) listed in Table 4.

(To be continued)

TABLE 5—LIMITING HEIGHTS FOR FULLY BRACED¹ NON-COMPOSITE WALLS (Continued)

Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf				
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	
VIPER 30mil	162VS125-30	12	11'-8"	10'-2"	9'-4"	8'-1"	10'-2"	8'-11"	8'-1"	7'-1"	9'-4"	8'-1"	7'-5"	6'-6"	
		16	10'-8"	9'-4"	8'-6"	7'-5"	9'-4"	8'-1"	7'-5"	6'-6"	8'-1"	7'-5"	6'-8"	--	
		24	9'-4"	8'-1"	7'-5"	6'-6"	7'-8"	7'-1"	6'-6"	--	6'-7"	6'-6"	--	--	
	250VS125-30	12	16'-2"	14'-2"	12'-11"	11'-4"	14'-2"	12'-5"	11'-4"	9'-10"	12'-5"	11'-4"	10'-2"	8'-11"	
		16	14'-8"	12'-11"	11'-8"	10'-2"	12'-5"	11'-4"	10'-2"	8'-11"	10'-8"	10'-2"	9'-4"	8'-1"	
		24	12'-5"	11'-4"	10'-2"	8'-11"	10'-1"	9'-10"	8'-11"	7'-10"	8'-10"	8'-10"	8'-1"	7'-1"	
	362VS125-30	12	21'-4"	18'-11"	17'-2"	15'-0"	17'-5"	16'-6"	15'-0"	13'-1"	15'-0"	15'-0"	13'-7"	11'-11"	
		16	18'-5"	17'-2"	15'-7"	13'-7"	15'-0"	15'-0"	13'-7"	11'-11"	13'-0"	13'-0"	12'-5"	10'-10"	
		24	15'-0"	15'-0"	13'-7"	11'-11"	12'-4"	12'-4"	11'-11"	10'-5"	10'-7"	10'-7"	10'-7"	9'-5"	
	400VS125-30	12	22'-6"	20'-5"	18'-6"	16'-2"	18'-4"	17'-10"	16'-2"	14'-1"	15'-11"	15'-11"	14'-8"	12'-11"	
		16	19'-5"	18'-6"	16'-10"	14'-8"	15'-11"	15'-11"	14'-8"	12'-11"	13'-8"	13'-8"	13'-5"	11'-8"	
		24	15'-11"	15'-11"	14'-8"	12'-11"	13'-0"	13'-0"	12'-11"	11'-2"	11'-2"	11'-2"	11'-2"	10'-2"	
	600VS125-30	12	28'-2"	27'-10"	25'-4"	22'-1"	23'-0"	23'-0"	22'-1"	19'-4"	19'-11"	19'-11"	19'-11"	17'-6"	
		16	24'-5"	24'-5"	23'-0"	20'-1"	19'-11"	19'-11"	19'-11"	17'-6"	17'-2"	17'-2"	17'-2"	15'-11"	
		24	19'-11"	19'-11"	19'-11"	17'-6"	16'-4"	16'-4"	16'-4"	15'-4"	12'-5"	12'-5"	12'-5"	12'-5"	
	Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
				L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
	VIPER 33mil	162VS125-33	12	12'-1"	10'-7"	9'-7"	8'-5"	10'-7"	9'-4"	8'-5"	7'-4"	9'-7"	8'-5"	7'-7"	6'-8"
16			11'-0"	9'-7"	8'-8"	7'-7"	9'-7"	8'-5"	7'-7"	6'-8"	8'-8"	7'-7"	6'-11"	6'-1"	
24			9'-7"	8'-5"	7'-7"	6'-8"	8'-2"	7'-4"	6'-8"	--	7'-1"	6'-8"	6'-1"	--	
250VS125-33		12	16'-10"	14'-8"	13'-4"	11'-7"	14'-8"	12'-10"	11'-7"	10'-2"	13'-4"	11'-7"	10'-7"	9'-2"	
		16	15'-4"	13'-4"	12'-1"	10'-7"	13'-4"	11'-7"	10'-7"	9'-2"	11'-6"	10'-7"	9'-7"	8'-5"	
		24	13'-4"	11'-7"	10'-7"	9'-2"	10'-10"	10'-2"	9'-2"	8'-1"	9'-5"	9'-2"	8'-5"	7'-4"	
362VS125-33		12	22'-5"	19'-7"	17'-10"	15'-6"	18'-10"	17'-1"	15'-6"	13'-7"	16'-4"	15'-6"	14'-1"	12'-4"	
		16	19'-11"	17'-10"	16'-1"	14'-1"	16'-4"	15'-6"	14'-1"	12'-4"	14'-1"	14'-1"	12'-10"	11'-2"	
		24	16'-4"	15'-6"	14'-1"	12'-4"	13'-4"	13'-4"	12'-4"	10'-10"	11'-6"	11'-6"	11'-2"	9'-10"	
400VS125-33		12	24'-2"	21'-1"	19'-2"	16'-10"	19'-10"	18'-6"	16'-10"	14'-7"	17'-2"	16'-10"	15'-2"	13'-4"	
		16	21'-0"	19'-2"	17'-5"	15'-2"	17'-2"	16'-10"	15'-2"	13'-4"	14'-11"	14'-11"	13'-10"	12'-1"	
		24	17'-2"	16'-10"	15'-2"	13'-4"	14'-0"	14'-0"	13'-4"	11'-7"	12'-1"	12'-1"	12'-1"	10'-7"	
600VS125-33		12	30'-5"	28'-11"	26'-4"	23'-0"	24'-10"	24'-10"	23'-0"	20'-1"	21'-6"	21'-6"	20'-11"	18'-2"	
		16	26'-4"	26'-4"	23'-11"	20'-11"	21'-6"	21'-6"	20'-11"	18'-2"	18'-7"	18'-7"	18'-7"	16'-7"	
		24	21'-6"	21'-6"	20'-11"	18'-2"	17'-6"	17'-6"	17'-6"	15'-11"	15'-2"	15'-2"	15'-2"	14'-6"	

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa

¹Bracing is required at internals not exceeding maximum unbraced length (L_u) listed in Table 4.

TABLE 6—LIMITING HEIGHTS FOR NON-COMPOSITE WALLS BRACED 4 FEET ON CENTERS

Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER25	162VS125-15	12	8'-8"	8'-4"	7'-6"	6'-7"	7'-1"	7'-1"	6'-7"	--	6'-1"	6'-1"	6'-0"	--
		16	7'-6"	7'-6"	6'-10"	6'-0"	6'-1"	6'-1"	6'-0"	--	--	--	--	--
		24	6'-1"	6'-1"	6'-0"	--	--	--	--	--	--	--	--	--
	250VS125-15	12	11'-10"	11'-7"	10'-7"	9'-2"	9'-7"	9'-7"	9'-2"	8'-1"	8'-5"	8'-5"	8'-5"	7'-4"
		16	10'-2"	10'-2"	9'-7"	8'-5"	8'-5"	8'-5"	8'-5"	7'-4"	7'-2"	7'-2"	7'-2"	6'-8"
		24	8'-5"	8'-5"	8'-5"	7'-4"	6'-8"	6'-8"	6'-8"	6'-5"	--	--	--	--
	362VS125-15	12	13'-2"	13'-2"	13'-2"	12'-1"	10'-10"	10'-10"	10'-10"	10'-7"	9'-4"	9'-4"	9'-4"	9'-4"
		16	11'-5"	11'-5"	11'-5"	11'-0"	9'-4"	9'-4"	9'-4"	9'-4"	7'-10"	7'-10"	7'-10"	7'-10"
		24	9'-4"	9'-4"	9'-4"	9'-4"	6'-11"	6'-11"	6'-11"	6'-11"	--	--	--	--
	400VS125-15	12	13'-10"	13'-10"	13'-10"	13'-1"	11'-4"	11'-4"	11'-4"	11'-4"	9'-10"	9'-10"	9'-10"	9'-10"
		16	12'-0"	12'-0"	12'-0"	11'-11"	9'-10"	9'-10"	9'-10"	9'-10"	7'-5"	7'-5"	7'-5"	7'-5"
		24	9'-10"	9'-10"	9'-10"	9'-10"	6'-6"	6'-6"	6'-6"	6'-6"	--	--	--	--
	600VS125-15	12	14'-1"	14'-1"	14'-1"	14'-1"	9'-5"	9'-5"	9'-5"	9'-5"	7'-1"	7'-1"	7'-1"	7'-1"
		16	10'-7"	10'-7"	10'-7"	10'-7"	7'-1"	7'-1"	7'-1"	7'-1"	--	--	--	--
		24	7'-1"	7'-1"	7'-1"	7'-1"	--	--	--	--	--	--	--	--
Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER20	162VS125-18	12	9'-6"	---	7'-7"	6'-7"	8'-4"	---	6'-7"	5'-10"	7'-5"	---	6'-0"	5'-2"
		16	8'-7"	---	6'-11"	6'-0"	7'-5"	---	6'-0"	5'-2"	6'-5"	---	5'-5"	4'-10"
		24	7'-5"	---	6'-0"	5'-2"	6'-0"	---	5'-2"	4'-7"	5'-2"	---	4'-10"	4'-2"
	250VS125-18	12	13'-6"	---	10'-8"	9'-5"	11'-10"	---	9'-5"	8'-2"	10'-8"	---	8'-6"	7'-5"
		16	12'-4"	---	9'-8"	8'-6"	10'-8"	---	8'-6"	7'-5"	9'-4"	---	7'-8"	6'-10"
		24	10'-8"	---	8'-6"	7'-5"	8'-10"	---	7'-5"	6'-6"	7'-7"	---	6'-10"	5'-11"
	362VS125-18	12	17'-1"	---	14'-1"	12'-4"	14'-0"	---	12'-4"	10'-8"	12'-1"	---	11'-2"	9'-10"
		16	14'-10"	---	12'-10"	11'-2"	12'-1"	---	11'-2"	9'-10"	10'-6"	---	10'-1"	8'-11"
		24	12'-1"	---	11'-2"	9'-10"	9'-11"	---	9'-10"	8'-6"	8'-7"	---	8'-7"	7'-8"
	400VS125-18	12	18'-1"	---	15'-1"	13'-2"	14'-10"	---	13'-2"	11'-7"	12'-10"	---	12'-0"	10'-6"
		16	15'-8"	---	13'-10"	12'-0"	12'-10"	---	12'-0"	10'-6"	11'-1"	---	10'-11"	9'-6"
		24	12'-10"	---	12'-0"	10'-6"	10'-6"	---	10'-6"	9'-2"	9'-1"	---	9'-1"	8'-4"
	600VS125-18	12	23'-10"	---	20'-5"	17'-10"	19'-6"	---	17'-0"	15'-7"	16'-10"	---	16'-2"	14'-1"
		16	20'-7"	---	18'-6"	16'-2"	16'-10"	---	16'-2"	14'-1"	14'-7"	---	14'-7"	12'-10"
		24	16'-10"	---	16'-2"	14'-1"	13'-10"	---	13'-10"	12'-5"	10'-6"	---	10'-6"	10'-6"

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

(To be continued)

TABLE 6—LIMITING HEIGHTS FOR NON-COMPOSITE WALLS BRACED 4 FEET ON CENTERS (Continued)

Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER20D	162VS125-20	12	10'-7"	9'-6"	8'-8"	7'-7"	8'-7"	8'-4"	7'-7"	6'-7"	7'-6"	7'-6"	6'-11"	6'-0"
		16	9'-2"	8'-8"	7'-11"	6'-11"	7'-6"	7'-6"	6'-11"	6'-0"	6'-6"	6'-6"	6'-4"	--
		24	7'-6"	7'-6"	6'-11"	6'-0"	6'-1"	6'-1"	6'-0"	--	--	--	--	--
	250VS125-20	12	14'-4"	13'-1"	11'-11"	10'-5"	11'-8"	11'-6"	10'-5"	9'-1"	10'-1"	10'-1"	9'-6"	8'-4"
		16	12'-5"	11'-11"	10'-10"	9'-6"	10'-1"	10'-1"	9'-6"	8'-4"	8'-10"	8'-10"	8'-7"	7'-6"
		24	10'-1"	10'-1"	9'-6"	8'-4"	8'-4"	8'-4"	8'-4"	7'-2"	7'-2"	7'-2"	7'-2"	6'-7"
	362VS125-20	12	16'-2"	16'-2"	15'-10"	13'-10"	13'-2"	13'-2"	13'-2"	12'-0"	11'-5"	11'-5"	11'-5"	10'-11"
		16	14'-0"	14'-0"	14'-0"	12'-6"	11'-5"	11'-5"	11'-5"	10'-11"	9'-11"	9'-11"	9'-11"	9'-11"
		24	11'-5"	11'-5"	11'-5"	10'-11"	9'-4"	9'-4"	9'-4"	9'-4"	8'-1"	8'-1"	8'-1"	8'-1"
	400VS125-21	12	17'-10"	17'-10"	17'-0"	14'-11"	14'-7"	14'-7"	14'-7"	13'-0"	12'-7"	12'-7"	12'-7"	11'-10"
		16	15'-6"	15'-6"	15'-6"	13'-6"	12'-7"	12'-7"	12'-7"	11'-10"	10'-11"	10'-11"	10'-11"	10'-8"
		24	12'-7"	12'-7"	12'-7"	11'-10"	10'-4"	10'-4"	10'-4"	10'-4"	8'-11"	8'-11"	8'-11"	8'-11"
600VS125-21	12	23'-1"	23'-1"	22'-6"	19'-8"	18'-11"	18'-11"	18'-11"	17'-2"	16'-5"	16'-5"	16'-5"	15'-7"	
	16	20'-0"	20'-0"	20'-0"	17'-11"	16'-5"	16'-5"	16'-5"	15'-7"	12'-10"	12'-10"	12'-10"	12'-10"	
	24	16'-5"	16'-5"	16'-5"	15'-7"	11'-5"	11'-5"	11'-5"	11'-5"	8'-7"	8'-7"	8'-7"	8'-7"	
Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER 27mil	162VS125-27	12	11'-5"	9'-11"	9'-0"	7'-11"	9'-7"	8'-8"	7'-11"	6'-11"	8'-4"	7'-11"	7'-2"	6'-4"
		16	10'-2"	9'-0"	8'-2"	7'-2"	8'-4"	7'-11"	7'-2"	6'-4"	7'-2"	7'-2"	6'-6"	--
		24	8'-4"	7'-11"	7'-2"	6'-4"	6'-10"	6'-10"	6'-4"	5'-6"	--	--	--	--
	250VS125-27	12	15'-7"	13'-10"	12'-6"	10'-11"	12'-10"	12'-0"	10'-11"	9'-6"	11'-0"	10'-11"	9'-11"	8'-8"
		16	13'-6"	12'-6"	11'-5"	9'-11"	11'-0"	10'-11"	9'-11"	8'-8"	9'-7"	9'-7"	9'-0"	7'-11"
		24	11'-0"	10'-11"	9'-11"	8'-8"	9'-0"	9'-0"	8'-8"	7'-7"	7'-10"	7'-10"	7'-10"	6'-11"
	362VS125-27	12	18'-7"	18'-4"	16'-8"	14'-7"	15'-2"	15'-2"	14'-7"	12'-8"	13'-2"	13'-2"	13'-2"	11'-6"
		16	16'-1"	16'-1"	15'-1"	13'-2"	13'-2"	13'-2"	13'-2"	11'-6"	11'-5"	11'-5"	11'-5"	10'-6"
		24	13'-2"	13'-2"	13'-2"	11'-6"	10'-8"	10'-8"	10'-8"	10'-1"	9'-4"	9'-4"	9'-4"	9'-2"
	400VS125-27	12	19'-7"	19'-7"	18'-0"	15'-8"	16'-0"	16'-0"	15'-8"	13'-8"	13'-11"	13'-11"	13'-11"	12'-6"
		16	17'-0"	17'-0"	16'-4"	14'-4"	13'-11"	13'-11"	13'-11"	12'-6"	12'-0"	12'-0"	12'-0"	11'-4"
		24	13'-11"	13'-11"	13'-11"	12'-6"	11'-4"	11'-4"	11'-4"	10'-11"	9'-10"	9'-10"	9'-10"	9'-10"
600VS125-27	12	25'-11"	25'-11"	24'-7"	21'-6"	21'-2"	21'-2"	21'-2"	18'-8"	18'-4"	18'-4"	18'-4"	17'-0"	
	16	22'-6"	22'-6"	22'-4"	19'-6"	18'-4"	18'-4"	18'-4"	17'-0"	14'-5"	14'-5"	14'-5"	14'-5"	
	24	18'-4"	18'-4"	18'-4"	17'-0"	12'-10"	12'-10"	12'-10"	12'-10"	9'-7"	9'-7"	9'-7"	9'-7"	

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa

(To be continued)

TABLE 6—LIMITING HEIGHTS FOR NON-COMPOSITE WALLS BRACED 4 FEET ON CENTERS (Continued)

Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER 30mil	162VS125-30	12	11'-10"	10'-4"	9'-4"	8'-2"	10'-4"	9'-0"	8'-2"	7'-1"	8'-11"	8'-2"	7'-5"	6'-6"
		16	10'-8"	9'-4"	8'-6"	7'-5"	8'-11"	8'-2"	7'-5"	6'-6"	7'-8"	7'-5"	6'-8"	--
		24	8'-11"	8'-2"	7'-5"	6'-6"	7'-4"	7'-1"	6'-6"	--	6'-4"	6'-4"	--	--
	250VS125-30	12	16'-4"	14'-2"	12'-11"	11'-4"	13'-7"	12'-5"	11'-4"	9'-11"	11'-10"	11'-4"	10'-4"	9'-0"
		16	14'-5"	12'-11"	11'-8"	10'-4"	11'-10"	11'-4"	10'-4"	9'-0"	10'-2"	10'-2"	9'-4"	8'-1"
		24	11'-10"	11'-4"	10'-4"	9'-0"	9'-7"	9'-7"	9'-0"	7'-10"	8'-4"	8'-4"	8'-1"	7'-1"
	362VS125-30	12	20'-0"	19'-0"	17'-2"	15'-0"	16'-4"	16'-4"	15'-0"	13'-1"	14'-2"	14'-2"	13'-8"	11'-11"
		16	17'-4"	17'-2"	15'-7"	13'-8"	14'-2"	14'-2"	13'-8"	11'-11"	12'-4"	12'-4"	12'-4"	10'-10"
		24	14'-2"	14'-2"	13'-8"	11'-11"	11'-7"	11'-7"	11'-7"	10'-5"	10'-0"	10'-0"	10'-0"	9'-6"
	400VS125-30	12	21'-1"	20'-6"	18'-7"	16'-4"	17'-2"	17'-2"	16'-4"	14'-2"	14'-11"	14'-11"	14'-10"	12'-11"
		16	18'-4"	18'-4"	16'-11"	14'-10"	14'-11"	14'-11"	14'-10"	12'-11"	12'-11"	12'-11"	12'-11"	11'-8"
		24	14'-11"	14'-11"	14'-10"	12'-11"	12'-2"	12'-2"	12'-2"	11'-4"	10'-7"	10'-7"	10'-7"	10'-2"
	600VS125-30	12	28'-0"	28'-0"	25'-6"	22'-4"	22'-10"	22'-10"	22'-4"	19'-6"	19'-10"	19'-10"	19'-10"	17'-8"
		16	24'-2"	24'-2"	23'-2"	20'-2"	19'-10"	19'-10"	19'-10"	17'-8"	17'-1"	17'-1"	17'-1"	16'-1"
		24	19'-10"	19'-10"	19'-10"	17'-8"	15'-7"	15'-7"	15'-7"	15'-6"	11'-8"	11'-8"	11'-8"	11'-8"
Member (name)	Section ID XXXVS125-XX	Spacing (in. o.c.)	5 psf				7.5 psf				10 psf			
			L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360	L/120	L/180	L/240	L/360
VIPER 33mil	162VS125-33	12	12'-2"	10'-7"	9'-8"	8'-5"	10'-7"	9'-4"	8'-5"	7'-5"	9'-6"	8'-5"	7'-8"	6'-8"
		16	11'-1"	9'-8"	8'-10"	7'-8"	9'-6"	8'-5"	7'-8"	6'-8"	8'-2"	7'-8"	7'-0"	6'-1"
		24	9'-6"	8'-5"	7'-8"	6'-8"	7'-8"	7'-5"	6'-8"	--	6'-8"	6'-8"	6'-1"	--
	250VS125-33	12	16'-11"	14'-8"	13'-5"	11'-8"	14'-5"	12'-11"	11'-8"	10'-2"	12'-6"	11'-8"	10'-7"	9'-4"
		16	15'-4"	13'-5"	12'-2"	10'-7"	12'-6"	11'-8"	10'-7"	9'-4"	10'-10"	10'-7"	9'-7"	8'-5"
		24	12'-6"	11'-8"	10'-7"	9'-4"	10'-2"	10'-2"	9'-4"	8'-1"	8'-10"	8'-10"	8'-5"	7'-5"
	362VS125-33	12	21'-4"	19'-7"	17'-10"	15'-7"	17'-5"	17'-1"	15'-7"	13'-7"	15'-1"	15'-1"	14'-1"	12'-5"
		16	18'-5"	17'-10"	16'-2"	14'-1"	15'-1"	15'-1"	14'-1"	12'-5"	13'-0"	13'-0"	12'-11"	11'-2"
		24	15'-1"	15'-1"	14'-1"	12'-5"	12'-4"	12'-4"	12'-4"	10'-10"	10'-8"	10'-8"	10'-8"	9'-10"
	400VS125-33	12	22'-6"	21'-2"	19'-4"	16'-10"	18'-4"	18'-4"	16'-10"	14'-8"	15'-11"	15'-11"	15'-4"	13'-4"
		16	19'-5"	19'-4"	17'-6"	15'-4"	15'-11"	15'-11"	15'-4"	13'-4"	13'-10"	13'-10"	13'-10"	12'-1"
		24	15'-11"	15'-11"	15'-4"	13'-4"	13'-0"	13'-0"	13'-0"	11'-8"	11'-2"	11'-2"	11'-2"	10'-7"
	600VS125-33	12	29'-10"	29'-2"	26'-6"	23'-1"	24'-4"	24'-4"	23'-1"	20'-2"	21'-1"	21'-1"	21'-0"	18'-5"
		16	25'-10"	25'-10"	24'-1"	21'-0"	21'-1"	21'-1"	21'-0"	18'-5"	18'-4"	18'-4"	18'-4"	16'-8"
		24	21'-1"	21'-1"	21'-0"	18'-5"	17'-2"	17'-2"	17'-2"	16'-0"	14'-6"	14'-6"	14'-6"	14'-6"

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

TABLE 7—ALLOWABLE CEILING SPANS

L/240		4 psf						6 psf					
Member (name)	Section ID XXXVS125-XX	Unsupported ¹ Joist Spacing (in) o.c.			Supported at Midspan ¹ Joist Spacing (in) o.c.			Unsupported ¹ Joist Spacing (in) o.c.			Supported at Midspan ¹ Joist Spacing (in) o.c.		
		12	16	24	12	16	24	12	16	24	12	16	24
VIPER25	162VS125-15	7'-3"	6'-9"	6'-0"	8'-1"	7'-4"	6'-5"	6'-6"	6'-0"	5'-5"	7'-1"	6'-5"	5'-7"
	250VS125-15	8'-2"	7'-7"	6'-10"	11'-3"	10'-4"	9'-0"	7'-4"	6'-10"	6'-2"	10'-0"	9'-0"	7'-8"
	362VS125-15	9'-1"	8'-6"	7'-8"	12'-0"	11'-0"	9'-9"	8'-3"	7'-8"	6'-11"	10'-8"	9'-9"	8'-5"
	400VS125-15	9'-5"	8'-9"	7'-10"	12'-5"	11'-4"	10'-0"	8'-6"	7'-10"	7'-1"	11'-0"	10'-0"	8'-9"
	600VS125-15	10'-8"	9'-11"	8'-11"	14'-4"	13'-2"	11'-8"	9'-7"	8'-11"	8'-1"	12'-9"	11'-8"	8'-10"
VIPER20	162VS125-19	7'-9"	7'-3"	6'-6"	8'-5"	7'-7"	6'-7"	7'-0"	6'-6"	5'-10"	7'-3"	6'-7"	5'-8"
	250VS125-19	8'-9"	8'-1"	7'-4"	12'-0"	10'-10"	9'-5"	7'-11"	7'-4"	6'-7"	10'-5"	9'-5"	8'-2"
	362VS125-19	9'-7"	8'-11"	8'-0"	13'-6"	12'-6"	11'-1"	8'-8"	8'-0"	7'-3"	12'-1"	11'-1"	9'-10"
	400VS125-19	9'-10"	9'-2"	8'-3"	13'-10"	12'-9"	11'-5"	9'-10"	9'-2"	8'-3"	12'-4"	11'-5"	10'-2"
	600VS125-19	11'-2"	10'-4"	9'-4"	15'-10"	14'-8"	13'-1"	10'-1"	9'-4"	8'-5"	14'-2"	13'-1"	11'-8"
VIPER20D	162VS125-20	7'-10"	7'-3"	6'-6"	9'-4"	8'-6"	7'-5"	7'-1"	6'-6"	5'-10"	8'-2"	7'-5"	6'-6"
	250VS125-20	8'-10"	8'-2"	7'-4"	12'-4"	11'-4"	10'-2"	7'-11"	7'-4"	6'-7"	11'-0"	10'-2"	8'-11"
	362VS125-20	9'-10"	9'-1"	8'-2"	13'-6"	12'-4"	10'-11"	8'-10"	8'-2"	7'-5"	11'-11"	10'-11"	9'-8"
	400VS125-21	10'-4"	9'-7"	8'-7"	14'-4"	13'-2"	11'-7"	9'-3"	8'-7"	7'-9"	12'-8"	11'-7"	10'-3"
	600VS125-21	11'-8"	10'-10"	9'-9"	16'-6"	15'-3"	13'-7"	10'-6"	9'-9"	8'-9"	14'-9"	13'-7"	12'-0"
VIPER 27mil	162VS125-27	8'-11"	8'-3"	7'-4"	9'-9"	8'-10"	7'-9"	8'-0"	7'-4"	6'-7"	8'-6"	7'-9"	6'-9"
	250VS125-27	10'-0"	9'-2"	8'-3"	13'-6"	12'-3"	10'-9"	8'-11"	8'-3"	7'-5"	11'-10"	10'-9"	9'-4"
	362VS125-27	11'-0"	10'-2"	9'-2"	15'-6"	14'-4"	12'-9"	9'-10"	9'-2"	8'-3"	13'-10"	12'-9"	11'-4"
	400VS125-27	11'-4"	10'-6"	9'-5"	15'-11"	14'-9"	13'-1"	10'-2"	9'-5"	8'-6"	14'-3"	13'-1"	11'-8"
	600VS125-27	12'-9"	11'-10"	10'-8"	18'-4"	16'-11"	15'-2"	11'-6"	10'-8"	9'-7"	16'-5"	15'-2"	13'-7"
VIPER 30mil	162VS125-30	9'-4"	8'-7"	7'-8"	10'-1"	9'-2"	8'-0"	8'-4"	7'-8"	6'-10"	8'-10"	8'-0"	7'-0"
	250VS125-30	10'-4"	9'-6"	8'-6"	13'-11"	12'-8"	11'-1"	9'-2"	8'-6"	7'-7"	12'-2"	11'-1"	9'-8"
	362VS125-30	11'-4"	10'-6"	9'-5"	16'-0"	14'-10"	13'-3"	10'-2"	9'-5"	8'-6"	14'-4"	13'-3"	11'-9"
	400VS125-30	11'-8"	10'-10"	9'-8"	16'-5"	15'-2"	13'-7"	10'-6"	9'-8"	8'-9"	14'-9"	13'-7"	12'-1"
	600VS125-30	13'-1"	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	9'-9"	8'-11"	7'-11"	10'-5"	9'-5"	8'-3"	8'-8"	7'-11"	7'-1"	9'-1"	8'-3"	7'-3"
	250VS125-33	10'-9"	9'-10"	8'-10"	14'-5"	13'-1"	11'-5"	9'-7"	8'-10"	7'-11"	12'-7"	11'-5"	10'-0"
	362VS125-33	11'-9"	10'-11"	9'-9"	16'-7"	15'-4"	13'-9"	10'-7"	9'-9"	8'-9"	14'-10"	13'-9"	12'-2"
	400VS125-33	12'-1"	11'-2"	10'-0"	17'-0"	15'-8"	14'-1"	10'-10"	10'-0"	9'-0"	15'-3"	14'-1"	12'-7"
	600VS125-33	13'-6"	12'-6"	11'-3"	19'-5"	18'-0"	16'-3"	12'-2"	11'-3"	10'-1"	17'-6"	16'-3"	14'-6"

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

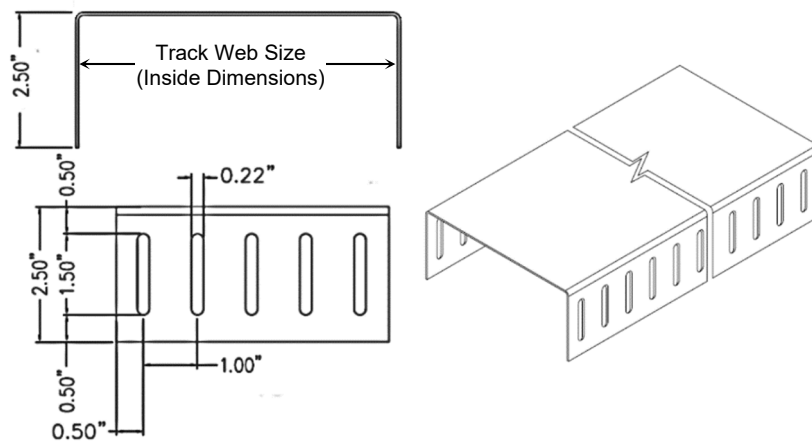
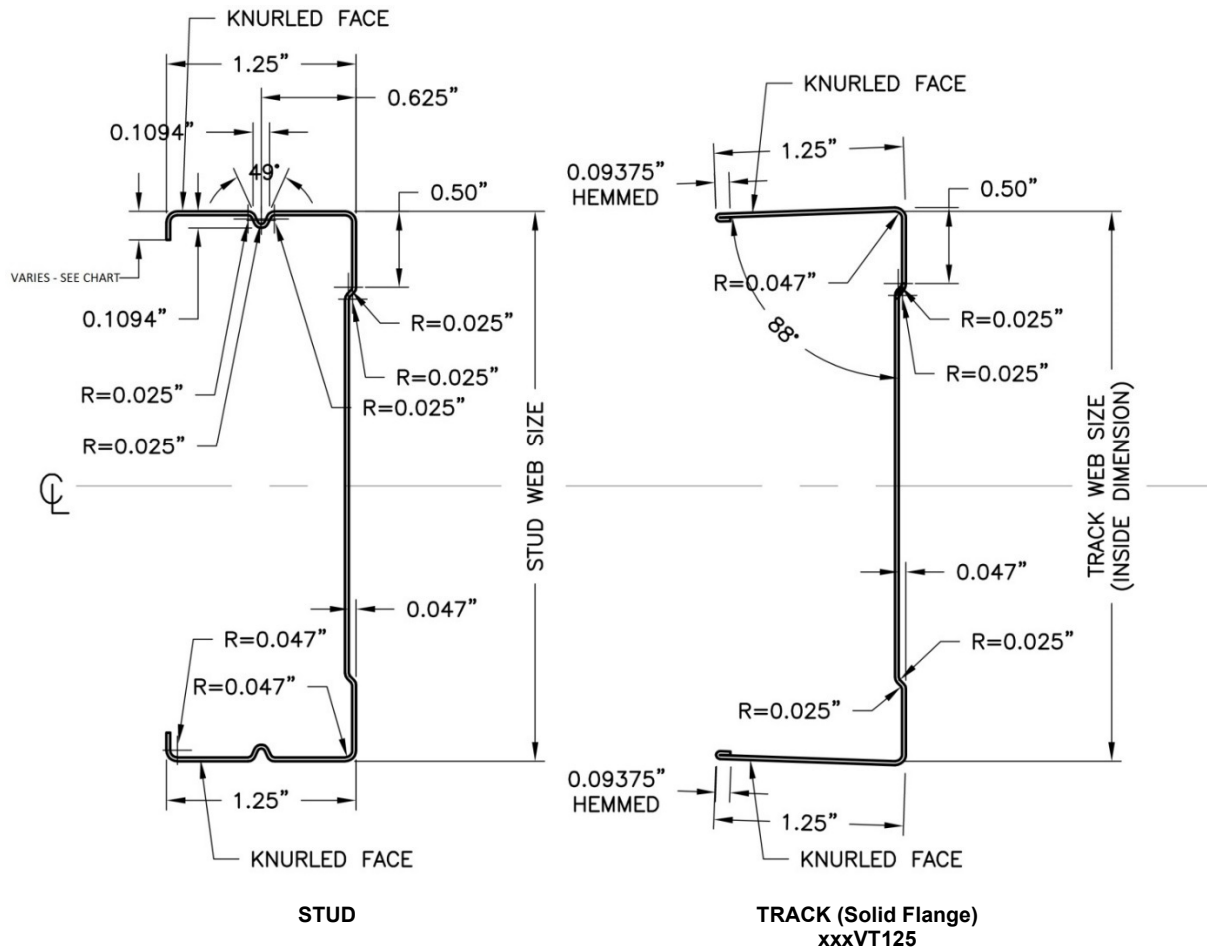
¹All values are for simple spans, with compression flange either unbraced or braced at midspan. All framing members are laterally braced at ends.

TABLE 7—ALLOWABLE CEILING SPANS (Continued)

L/360		4 psf						6 psf					
Member (name)	Section ID XXXVS125-XX	Unsupported ¹ Joist Spacing (in) o.c.			Supported at Midspan ¹ Joist Spacing (in) o.c.			Unsupported ¹ Joist Spacing (in) o.c.			Supported at Midspan ¹ Joist Spacing (in) o.c.		
		12	16	24	12	16	24	12	16	24	12	16	24
VIPER25	162VS125-15	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	8'-2"	7'-7"	6'-10"	10'-0"	9'-0"	7'-11"	7'-4"	6'-10"	6'-2"	8'-8"	7'-11"	6'-11"
	362VS125-15	9'-1"	8'-6"	7'-8"	12'-0"	11'-0"	9'-9"	8'-3"	7'-8"	6'-11"	10'-7"	9'-9"	8'-5"
	400VS125-15	9'-5"	8'-9"	7'-10"	12'-5"	11'-4"	10'-0"	8'-6"	7'-10"	7'-1"	11'-0"	10'-0"	8'-9"
	600VS125-15	10'-8"	9'-11"	8'-11"	14'-4"	13'-2"	11'-8"	9'-7"	8'-11"	8'-1"	12'-9"	11'-8"	8'-10"
VIPER20	162VS125-19	7'-6"	6'-10"	5'-11"	7'-4"	6'-8"	5'-9"	6'-6"	5'-11"	5'-2"	6'-4"	5'-9"	5'-0"
	250VS125-19	8'-9"	8'-1"	7'-4"	10'-5"	9'-6"	8'-3"	7'-11"	7'-4"	6'-7"	9'-1"	8'-3"	7'-2"
	362VS125-19	9'-7"	8'-11"	8'-0"	13'-6"	12'-6"	11'-0"	8'-8"	8'-0"	7'-3"	12'-1"	11'-0"	9'-7"
	400VS125-19	9'-10"	9'-2"	8'-3"	13'-10"	12'-9"	11'-5"	8'-11"	8'-3"	7'-5"	12'-4"	11'-5"	10'-2"
	600VS125-19	11'-2"	10'-4"	9'-4"	15'-10"	14'-8"	13'-1"	10'-1"	9'-4"	8'-5"	14'-2"	13'-1"	11'-8"
VIPER20D	162VS125-20	7'-10"	7'-3"	6'-6"	8'-2"	7'-5"	6'-6"	7'-1"	6'-6"	5'-8"	7'-2"	6'-6"	5'-8"
	250VS125-20	8'-10"	8'-2"	7'-4"	11'-3"	10'-2"	8'-11"	7'-11"	7'-4"	6'-7"	9'-9"	8'-11"	7'-9"
	362VS125-20	9'-10"	9'-1"	8'-2"	13'-6"	12'-4"	10'-11"	8'-10"	8'-2"	7'-5"	11'-11"	10'-11"	9'-8"
	400VS125-21	10'-4"	9'-7"	8'-7"	14'-4"	13'-2"	11'-7"	9'-3"	8'-7"	7'-9"	12'-8"	11'-7"	10'-3"
	600VS125-21	11'-8"	10'-10"	9'-9"	16'-6"	15'-3"	13'-7"	10'-6"	9'-9"	8'-9"	14'-9"	13'-7"	12'-0"
VIPER 27mil	162VS125-27	8'-6"	7'-9"	6'-9"	8'-6"	7'-9"	6'-9"	7'-6"	6'-9"	5'-11"	7'-5"	6'-9"	5'-11"
	250VS125-27	10'-0"	9'-2"	8'-3"	11'-10"	10'-9"	9'-4"	8'-11"	8'-3"	7'-5"	10'-4"	9'-4"	8'-2"
	362VS125-27	11'-0"	10'-2"	9'-2"	15'-6"	14'-4"	12'-6"	9'-10"	9'-2"	8'-3"	13'-9"	12'-6"	10'-11"
	400VS125-27	11'-4"	10'-6"	9'-5"	15'-11"	14'-9"	13'-1"	10'-2"	9'-5"	8'-6"	14'-3"	13'-1"	11'-8"
	600VS125-27	12'-9"	11'-10"	10'-8"	18'-4"	16'-11"	15'-2"	11'-6"	10'-8"	9'-7"	16'-5"	15'-2"	13'-7"
VIPER 30mil	162VS125-30	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	10'-4"	9'-6"	8'-6"	12'-2"	11'-1"	9'-8"	9'-2"	8'-6"	7'-7"	10'-8"	9'-8"	8'-5"
	362VS125-30	11'-4"	10'-6"	9'-5"	16'-0"	14'-9"	12'-11"	10'-2"	9'-5"	8'-6"	14'-2"	12'-11"	11'-3"
	400VS125-30	11'-8"	10'-10"	9'-8"	16'-5"	15'-2"	13'-7"	10'-6"	9'-8"	8'-9"	14'-9"	13'-7"	12'-1"
	600VS125-30	13'-1"	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	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	10'-9"	9'-10"	8'-10"	12'-7"	11'-5"	10'-0"	9'-7"	8'-10"	7'-11"	11'-0"	10'-0"	8'-9"
	362VS125-33	11'-9"	10'-11"	9'-9"	16'-7"	15'-3"	13'-4"	10'-7"	9'-9"	8'-9"	14'-8"	13'-4"	11'-8"
	400VS125-33	12'-1"	11'-2"	10'-0"	17'-0"	15'-8"	14'-1"	10'-10"	10'-0"	9'-0"	15'-3"	14'-1"	12'-7"
	600VS125-33	13'-6"	12'-6"	11'-3"	19'-5"	18'-0"	16'-3"	12'-2"	11'-3"	10'-1"	17'-6"	16'-3"	14'-6"

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa.

¹All values are for simple spans, with compression flange either unbraced or braced at midspan. All framing members are laterally braced at ends.



TRACK (Slotted Flange)
xxxCST250 or xxxSLT250

VIPER20					
Web (in.)	1 ⁵ / ₈	2 ¹ / ₂	3 ⁵ / ₈	4	6
Lip (in.)	0.263	0.330	0.330	0.338	0.400

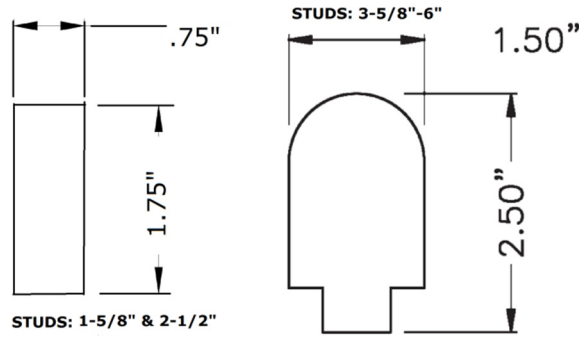
The lip dimension for all other studs is 0.250 inch.

STUD WEB SIZES (OUTSIDE DIMENSIONS):
1⁵/₈", 2¹/₂", 3⁵/₈", 4" & 6"

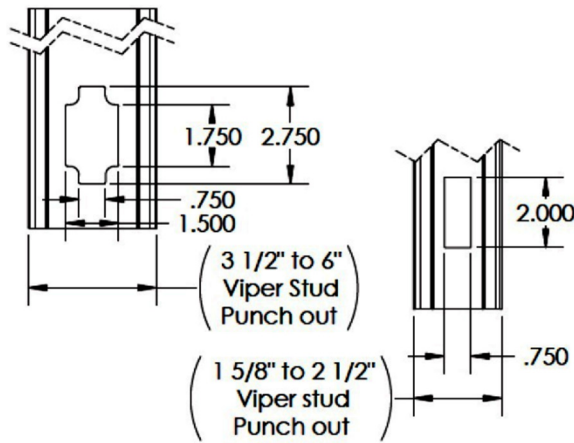
TRACK WEB SIZES (INSIDE DIMENSIONS):
1⁵/₈" (Limited to tracks with solid flanges), 2¹/₂", 3⁵/₈", 4" & 6"

The hemmed track flange is limited to xxxVT125-15 members.

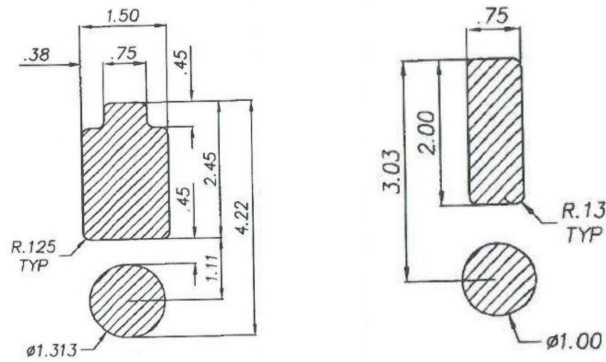
FIGURE 1—STUD AND TRACK CONFIGURATION



MarinoWARE



CEMCO, LLC



Studs: 3-1/2" to 6"

Studs: 1-5/8" to 2-1/2"

Imperial Building Products

FIGURE 2—PUNCH-OUT CONFIGURATIONS

DIVISION: 05 00 00—METALS

Section: 05 40 00—Cold-Formed Metal Framing

DIVISION: 09 00 00—FINISHES

Section: 09 22 16.13—Non-Structural Metal Stud Framing

REPORT HOLDER:

WARE INDUSTRIES, INC. (DBA MarinoWARE)

EVALUATION SUBJECT:

VIPERSTUD DRYWALL FRAMING SYSTEM (NON-STRUCTURAL): VIPER25, VIPER20, VIPER20D, VIPER 18MIL, VIPER 27MIL, VIPER 30MIL, AND VIPER 33MIL

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that the ViperStud Drywall Framing Systems (Non-Structural): Viper25, Viper20, Viper20D, Viper 18mil, Viper 27mil, Viper 30mil, and Viper 33mil, described in ICC-ES evaluation report ESR-2620, have also been evaluated for compliance with the codes noted below as adopted by the New York City Department of Building.

Applicable code editions:

- 2022 New York City Building Code

2.0 CONCLUSIONS

The ViperStud Drywall Framing Systems (Non-Structural): Viper25, Viper20, Viper20D, Viper 18mil, Viper 27mil, Viper 30mil, and Viper 33mil, described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-2620, comply with the *New York City Building Code* Chapter 22, and are subject to conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The ViperStud Drywall Framing Systems (Non-Structural): Viper25, Viper20, Viper20D, Viper 18mil, Viper 27mil, Viper 30mil, and Viper 33mil, described in the evaluation report must comply with all the following conditions:

- All applicable sections in the evaluation report ESR-2620.
- The design, installation, conditions of use and identification of the ViperStud Drywall Framing Systems (Non-Structural): Viper25, Viper20, Viper20D, Viper 18mil, Viper 27mil, Viper 30mil, and Viper 33mil are in accordance with the 2015 *International Building Code*® (2015 IBC) provisions noted in the evaluation report ESR-2620.
- The design, installation, and inspection are in accordance with additional requirements of the 2022 *New York City Building Code* Chapters 16, 17 and 22, as applicable.

This supplement expires concurrently with the evaluation report, reissued July 2023.

DIVISION: 05 00 00—METALS

Section: 05 40 00—Cold-Formed Metal Framing

DIVISION: 09 00 00—FINISHES

Section: 09 22 16.13—Non-Structural Metal Stud Framing

REPORT HOLDER:

WARE INDUSTRIES, INC. (DBA MarinoWARE)

EVALUATION SUBJECT:

VIPERSTUD DRYWALL FRAMING SYSTEM (NON-STRUCTURAL): VIPER25, VIPER20, VIPER20D, VIPER 18MIL, VIPER 27MIL, VIPER 30MIL, AND VIPER 33MIL

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that Viperstud Drywall Framing Systems (Non-Structural): Viper25, Viper20, Viper20D, Viper 18mil, Viper 27mil, Viper 30mil, and Viper 33mil, described in ICC-ES evaluation report ESR-2620, have also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2022 California Building Code (CBC)

For evaluation of applicable Chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see section 2.1.1 and 2.1.2 below.

- 2022 California Residential Code (CRC)

2.0 CONCLUSIONS**2.1 CBC:**

The Viperstud Drywall Framing Systems (Non-Structural): Viper25, Viper20, Viper 20D, Viper 18mil, Viper 27mil, Viper 30mil, and Viper 33mil, described in Sections 2.0 through 7.0 of the evaluation report ESR-2620, comply with CBC Chapter 22, provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of the CBC Chapters 16, 17, and 22 as applicable.

2.1.1 OSHPD: The Viperstud Drywall Framing Systems (Non-Structural): Viper25, Viper20, Viper 20D, Viper 18mil, Viper 27mil, Viper 30mil, and Viper 33mil, described in Sections 2.0 through 7.0 of the evaluation report ESR-2620, comply with amended Sections in CBC Chapters 16, 17 and 22, and CBC Chapters 16A, 17A and 22A provided the design and installation are in accordance with the 2021 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements in Section 2.1.1.1 of this supplement:

2.1.1.1 Conditions of Use:

1. In accordance with CBC Section 2211.2 and 2211A.2, for cold-formed steel light-frame construction, the design and installation of nonstructural members and connections shall be in accordance with AISI S220 for noncomposite assembly design. Where nonstructural members do not qualify for design under AISI 220, the design and installation of nonstructural members and connectors shall be in accordance with AISI S240 or S100 [OSHPD 1, 1R, 2, 4, and 5].
2. Storage racks and wall-hung cabinet loading per Table 1607.1 [OSHPD 1R, 2, and 5] and Table 1607A.1 [OSHPD 1 and 4] is excluded from this supplement.

2.1.2 DSA: The Viperstud Drywall Framing Systems (Non-Structural): Viper25, Viper20, Viper 20D, Viper 18mil, Viper 27mil, Viper 30mil, and Viper 33mil, described in Sections 2.0 through 7.0 of the evaluation report ESR-2620, comply with amended Sections in CBC Chapters 16 and 22, and CBC Chapters 16A, 17A and 22A, provided the design and installation are in

accordance with the 2021 *International Building Code*[®] (IBC) provisions noted in the evaluation report and the additional requirements in Section 2.1.2.1 of this supplement:

2.1.2.1 Conditions of Use:

1. In accordance with CBC Section 2211A.2, for cold-formed steel light-frame construction, the design and installation of nonstructural members and connections shall be in accordance with AISI S220 for noncomposite assembly design. Where nonstructural members do not qualify for design under AISI 220, the design and installation of nonstructural members and connectors shall be in accordance with AISI S240 or S100 [DSA-SS].
2. Storage racks and wall-hung cabinet loading per Table 1607A.1 [DSA-SS] is excluded from this supplement.
3. Storage racks and wall-hung cabinet loading per Section 1617.5.1.5 [DSA-SS/CC] is excluded from this supplement.

2.2 CRC:

The Viperstud Drywall Framing Systems (Non-Structural): Viper25, Viper20, Viper20D, Viper 18mil, Viper 27mil, Viper 30mil, and Viper 33mil, described in Sections 2.0 through 7.0 of the evaluation report ESR-2620, comply with the 2022 CRC, provided the design and installation are in accordance with the 2021 *International Residential Code*[®] (IRC) provisions noted in the evaluation report.

This supplement expires concurrently with the evaluation report, reissued July 2023.

DIVISION: 05 00 00—METALS

Section: 05 40 00—Cold-Formed Metal Framing

DIVISION: 09 00 00—FINISHES

Section: 09 22 16.13—Non-Structural Metal Stud Framing

REPORT HOLDER:

WARE INDUSTRIES, INC. (DBA MarinoWARE)

EVALUATION SUBJECT:

VIPERSTUD DRYWALL FRAMING SYSTEM (NONSTRUCTURAL): VIPER25, VIPER20, VIPER20D, VIPER 18MIL, VIPER 27MIL, VIPER 30MIL, AND VIPER 33MIL

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that the ViperStud Drywall Framing System (Nonstructural), described in ICC-ES evaluation report ESR-2620, has also been evaluated for compliance with the codes noted below.

Applicable code editions:

- 2020 Florida Building Code—Building
- 2020 Florida Building Code—Residential

2.0 CONCLUSIONS

The ViperStud Drywall Framing System (Nonstructural), described in Sections 2.0 through 7.0 of ICC-ES evaluation report ESR-2620, complies with the *Florida Building Code—Building* and the *Florida Building Code—Residential*, provided the design requirements are determined in accordance with the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable. The installation requirements noted in ICC-ES evaluation report ESR-2620 for the 2018 *International Building Code* meet the requirements of the *Florida Building Code—Building* or the *Florida Building Code—Residential*, as applicable.

Use of the ViperStud Drywall Framing System (Nonstructural) has also been found to be in compliance with the High-Velocity Hurricane Zone provisions of the *Florida Building Code—Building* and the *Florida Building Code—Residential*.

For products falling under Florida Rule 61G20-3, verification that the report holder's quality-assurance program is audited by a quality-assurance entity approved by the Florida Building Commission for the type of inspections being conducted is the responsibility of an approved validation entity (or the code official when the report holder does not possess an approval by the Commission).

This supplement expires concurrently with the evaluation report, reissued July 2023.