



EVALUATION SUBJECT: SURE-BOARD® SERIES 200, 200W, AND 200B STRUCTURAL PANELS INSTALLED ON COLD-FORMED STEEL OR WOOD FRAMED SHEAR WALLS

REPORT HOLDER:

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CSI Division: 05-METALS
CSI Section: 05160-Metal Framing Systems

1.0 SCOPE OF EVALUATION

1.1 Compliance to the following codes & regulations:

- * • ~~2015~~, 2012, and 2009 International Building Code® (IBC)
- * • ~~2015~~, 2012, and 2009 International Residential Code® (IRC)
- Supplement- 2013 California Building Code® (CBC)

1.2 Evaluated in accordance with:

- EC 003-2012

1.3 Properties assessed:

- Structural

2.0 PRODUCT USE

2.1 General

2.1.1 Sure-Board® Series 200, 200W, and 200B Structural Panels are panels attached to cold-formed steel (CFS) or wood framing for shear wall applications within a Seismic Force-Resisting System conforming to items A.13 in Table 12.2-1 of ASCE 7-05, and A.15 and A.16 in Table 12.2-1 of ASCE 7-10; or a Wind Force Resisting System.

* **2.2.2** The structural panels are alternatives to cold-formed steel or wood stud light-frame shear wall systems described in Section 2211.6 of the ~~2015~~ and 2012 International Building Code (IBC), Section 2210.6 of the 2009 International Building Code (IBC), Section 2305 of the International Building Code (IBC), and Section 12.2 of ASCE/SEI 7. The structural panels may also be used where an engineered design is submitted in accordance with Section R301.1.3 of the International Residential Code (IRC).

3.0 PRODUCT DESCRIPTION

3.1 Sure-Board® Series 200, 200W, and 200B Series Structural Panels

3.1.1 Sure-Board® Series 200 Panels: Sure-Board® Series 200 Structural Panels consist of 1/2- to 3/4-inch thick (12.7 to 19.0 mm), tapered or square-edged, non-rated or Type-X fire-resistance-rated gypsum wallboard complying with ASTM C1396, C1278 or C1177, or cement board complying with ASTM C1325 factory-laminated with water-soluble adhesive to sheet steel. The sheet steel is No. 22 gage (0.027 inch/0.686 mm) minimum base-metal thickness complying with ASTM A653 CS, Grade 33 minimum, and is provided with a G40 hot-dipped galvanized coating conforming to ASTM A924. These panels are available in widths of 48 inches (1219 mm) and standard lengths of 8, 9, 10 and 12 feet (2438, 2743, 3048 and 3658 mm).

3.1.2 Sure-Board® Series 200W Panels: Sure-Board® Series 200W Structural Panels consist of minimum 1/8-inch (3.2 mm) thick, square-edge Medium Density Fiberboard (MDF) panels, ~~or equal complying with ANSI A208.2~~, factory-laminated with a water-soluble adhesive to sheet steel. The sheet steel is No. 22 gage (0.027 inch/0.686 mm) minimum base-metal thickness complying with ASTM A653 CS, Grade 33 minimum, and is provided with a G40 hot-dipped galvanized coating conforming to ASTM A924. These panels are available in widths of 48 inches (1219 mm) and standard lengths of 8, 9, 10 and 12 feet (2438, 2743, 3048 and 3658 mm) and the standard lengths may be pre-cut by request.

3.1.3 Sure-Board® Series 200B Panels: Sure-Board® Series 200B Structural Panels consist of 1/2- to 3/4-inch thick (12.7 to 19.0 mm), tapered or square-edged, non-rated or Type X fire-resistance-rated gypsum wallboard complying with ASTM C1396, C1278 or C1177, or cement board complying with ASTM C1325, factory-laminated with water-soluble adhesive to sheet steel. The sheet steel is No. 14 gage (0.071 inch/1.81 mm) minimum base-metal thickness complying with ASTM A653 CS, Grade 50 minimum, and is provided with a G60 hot-dipped galvanized coating conforming to ASTM A924. These panels are available in widths of 48 inches (1219 mm) and standard lengths of 8, 9, 10 and 12 feet (2438, 2743, 3048 and 3658 mm).

3.2 Fasteners

3.2.1 Sure-Board® Series 200 Panels Attached to Steel Framing (Tables 1 and 1A): The fasteners used for attaching the Sure-Board® Series 200 Structural Panels to

* Deleted by the City of Los Angeles

The product described in this Uniform Evaluation Service (UES) Report has been evaluated as an alternative material, design or method of construction in order to satisfy and comply with the intent of the provision of the code, as noted in this report, and for at least equivalence to that prescribed in the code in quality, strength, effectiveness, fire resistance, durability and safety, as applicable, in accordance with IBC Section 104.11.

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steel framing are self-drilling/self-tapping No. 2 pilot point bugle head screws. The No. 8 screws have a minimum diameter of 0.138 inch (3.5 mm), with a minimum 0.3145 inch (8.0 mm) head diameter and 1.25 inch (31.7 mm) minimum length, and shall comply with SAE J78 and ASTM C954.

3.2.2 Sure-Board® Series 200W Panels Attached to Steel Framing (Tables 2 and 3): The fasteners used for attaching the Sure-Board® Series 200W Structural Panels to steel framing are No. 10 - 0.19 inch (4.83 mm) minimum diameter, with a minimum 0.3145 inch (8.0 mm) diameter pan head and 0.75 inch (19.0 mm) minimum length screws, complying with SAE J78 and ASTM C954.

3.2.3 Sure-Board® Series 200B Panels Attached to Steel Framing (Table 1): The fasteners used for attaching the Sure-Board® Series 200B Structural Panels to steel framing are minimum No. 8 self-drilling screws with a minimum 0.138 inch (3.5 mm) diameter and minimum 1.25 inch (31.7 mm) length. The screw head is No. 2 pilot point bugle head having a minimum 0.3145 inch (8.0 mm) head diameter. The screws shall comply with SAE J78 and ASTM C954. Larger screw diameter is acceptable to use and maintain capacities listed in this report.

3.2.4 Sure-Board® Series 200 and 200W Panels Attached to Steel Framing (Table 6): Other fasteners for attaching Sure-Board® Series 200 and 200W Structural Panels to steel framing include power-driven fasteners (pneumatic pins) for specific assemblies listed in Table 6 of this report. The minimum 1¼ inch (31.8 mm) long by 0.100 inch (2.54 mm) diameter knurled shank pneumatic nails with a minimum 5/16 inch (7.94 mm) diameter head are produced by Aerosmith Inc. and shall comply with an evaluation report issued by an approved and accredited evaluation agency.

3.2.5 Sure-Board® Series 200W Panels Attached to Wood Framing (Table 4): The fasteners used for attaching the Sure-Board® Series 200W Structural Panels to wood framing are smooth shank 10d plywood nails measuring minimum 2.25 inches (57.2 mm) long by minimum 0.148 inch (3.8 mm) shank diameter.

3.2.6 Sure-Board® Series 200 Panels Attached to Wood Framing (Table 5): The fasteners used for attaching the Sure-Board® Series 200 Structural Panels to wood framing are No. 8 by minimum 2-inch (50.8 mm) long drywall wood screws.

3.3 Steel Framing

3.3.1 In this report, for steel framing members, the following gage reference numbers, and corresponding minimum design base-metal thicknesses shall apply:

- No. 14 gage: 0.071 inch (1.81 mm)
- No. 16 gage: 0.054 inch (1.37 mm)

- No. 18 gage: 0.043 inch (1.09 mm)
- No. 20 gage: 0.033 inch (0.84 mm)

3.3.2 Steel studs for shear walls are C-shaped, with a minimum depth of 3½ inches (89 mm) and a minimum flange width of 1⅝ inches (41 mm), with a ⅜-inch (9.5 mm) return lip for C-shaped stud. Tracks shall be a minimum of 3½ inches (89 mm) wide, with minimum 1¼-inch (31.7 mm) high flanges.

3.3.3 No. 14 and No. 16 gage steel members shall comply with ASTM A653 CS Grade 50, with minimum yield and tensile strengths of 50 ksi (340 MPa) and 65 ksi (450 MPa), respectively. The No. 18 and No. 20 gage members shall comply with ASTM A653 CS Grade 33, with minimum yield and tensile strengths of 33 ksi (230 MPa) and 45 ksi (310 MPa), respectively. Structural design shall be performed by the design professional in accordance with Section 2211.6 of the ~~2015 and~~ 2012 IBC, Section 2210.6 of the 2009 IBC, Section R301.1.3 of the IRC, AISI S100, and ASCE/SEI 7. Collector posts at each end of shear wall shall be minimum double stud and same gage as framing material, except as described in footnote 10 to Table 1 of this report. Actual collectors may be increased to larger or heavier gage element, as determined by the design professional. *

3.4 Wood Framing

3.4.1 Minimum framing members are Stud or Construction grade Douglas Fir (D.F.) or equal with a minimum Specific Gravity (S.G.) of 0.49, conforming to Chapter 23 of the IBC and IRC. Minimum framing member size for shear walls shall be nominal 2 by 4 studs.

3.4.2 End Posts for shear walls shall be minimum 4 by 4 No. 1 grade Douglas Fir or equal. Sill plates for shear walls shall be minimum 2 by 4 Standard grade or better Douglas Fir or equal.

3.4.3 Sill Plates for two-sided shear walls shall be minimum 2 by 4 Timberstrand®, 3 by 4 pressure-preservative treated Douglas Fir or equal, and shall be in compliance in a current evaluation report from an approved and accredited evaluation agency.

3.4.4 Fire-retardant-Treated wood framing material has been tested with Sure-Board® panels. All stated load capacities in Tables 4 and 5 of this report shall remain as stated in this report.

4.0 DESIGN AND INSTALLATION

4.1 Shear Wall Design

4.1.1 Seismic loadings shall be determined in accordance with IBC Section 1613 and ASCE/SEI 7 subject to limitations set forth for Seismic Force-Resisting Systems conforming to items A.13 in Table 12.2-1 of ASCE/SEI 7-



05, and A.15 and A.16 in Table 12.2-1 of ASCE/SEI 7-10. The shear walls shall be limited to height limits and seismic categories listed in ASCE/SEI 7, Table 12.2-1, for the respective light frame shear wall bearing wall system.

Wind loadings shall be determined in accordance with IBC Section 1609 and ASCE/SEI 7.

4.1.2 The Nominal (V_n) and Allowable Stress Design (V_{asd}) shear values for wind and earthquake forces are shown in Tables 1, 1A, 2, 3, 4, 5, and 6 of this report with associated deflections for shear walls using Sure-Board® Series 200, 200W, and 200B Structural Panels attached to Cold-Formed Steel or Wood studs. Nominal shear values shall be multiplied by the appropriate strength reduction factor to determine LRFD design strength in accordance with footnote 4 of Tables 1, 1A, 2, 3, 4, 5, and 6 of this report as set forth in ~~2015 and~~ 2012 IBC Section 2211.6, 2009 IBC Section 2210.6, Chapter 23 of the IBC, and R301.1.3 of the IRC.

4.1.3 The maximum shear-wall height-to-width ratio is 2½:1. Panels shall be fastened in accordance with footnote 2 of Tables 1, 1A, 2, 3, 4, 5, and 6 of this report.

4.1.4 Design of shear wall connections, such as uplift hold-downs, shear to base anchorage and shear transfer from horizontal elements are beyond the scope of this report and the design professional shall provide appropriate design and detailing information to the code official. The collector shall be designed in accordance to comply with the IBC or the IRC and be sized to exceed the loads resisted by the shear wall.

4.1.5 Cold-Formed Steel or Wood framing design for out-of-plane and axial loads shall comply with the IBC or IRC. For installation in Seismic Design Category C, D, E, and F, additional requirements in ~~2015 and~~ 2012 IBC Section 2211.6, 2009 IBC Section 2210.6, Chapter 23 of the IBC, or IRC, AISI S100, and ASCE/SEI 7 apply.

4.2 Installation

4.2.1 General

The panels shall be directly applied to the studs at interior and exterior shear walls and are limited to applications where there is no continuous direct exposure to the weather or damp environments other than during construction. Construction exposure shall not to exceed the board (gypsum, cement, or fiberboard) manufacturer's recommendations or shall be protected during construction from direct moisture exposure to gypsum. In areas that may be exposed to possible moisture intrusion, water resistant sheathing is required. Sure-Board® products may be installed as specified by the registered design professional on assemblies as permitted by the IBC or IRC in all Seismic Design Categories.

4.2.2 Steel Framing

4.2.2.1 Installation shall be in accordance with this report and the manufacturer's published Installation and Cutting Sure-Board® Series 200, 200W, and 200B instructions. Where conflicts occur, the more restrictive shall govern. Field repair of Sure-Board® Series 200, 200W, and 200B panels with surface damaged gypsum wallboard may be accomplished following Section 3 of *Installation and Cutting Sure-Board® Series 200, 200W, and 200B*, available from the manufacturer upon request or online at www.sureboard.com

4.2.2.2 Sure-Board® Series 200, 200W, and 200B Structural Panels shall be placed with the long dimension parallel or perpendicular to steel stud framing. The steel face shall be in contact with the framing. All panel edges (top and bottom) shall be fully blocked by framing studs, track, blocking, or flat straps of the same gage as the framing material and include an end collector element to be determined by the Design Professional in accordance with the IBC, IRC, the AISI S100, and the ASCE/SEI 7 seismic provisions. Minimum required collector elements are defined in Section 2.2.3 of this report, and are required at both shear wall ends. Maximum stud spacing shall not exceed 24 inches (610 mm) on center. Screws attaching panels shall be installed in one operation through the panels into the framing. Screws or pneumatic pin heads are required to be located ¾ inch (9.53 mm) minimum from panel edges. Screw heads shall be driven flush with surface. Screws shall penetrate at least three exposed threads into framing members.

4.2.2.3 A minimum panel size of 16 inches by 96 inches (406 mm by 2438 mm) is acceptable, provided all perimeter edges are fastened to framing members at the required spacing. All panels may be fastened at panel joint stud without staggering the fasteners at each panel. No panels shall be lapped over another at these lap joint studs. Joint spacing between panels shall range from 0 inch to 1/8 inch (0 to 3.2 mm). Top and Bottom track gaps to floors or ceilings are not limited except that panels shall have at least 1 inch (25.4 mm) minimum track leg height behind panel edges, without adding additional backing for fasteners. The designed fastener spacing shall apply to each panel edge. No panel edges shall be lapped and attached with a single row of fasteners.

4.2.2.4 Holes cut in Sure-Board® panels shall be approved by the code official based on the recommendations supplied by manufacturer and as recommended by the Design Professional.

4.2.3 Wood Framing

4.2.3.1 Installation shall be in accordance with this report and the manufacturer's published installation instructions. Field repair of Sure-Board® Series 200 Structural Panels with surface damaged gypsum wallboard may be accomplished following Section 3 of *Installation and Cutting Sure-Board® Series 200 and 200W*, available from



the manufacturer upon request or online at www.sureboard.com

4.2.3.2 Sure-Board® Series 200, 200W and 200B Structural Panels shall be placed with the long dimension parallel or perpendicular to stud framing. The steel face shall be in contact with the framing. All panel edges shall be fully blocked by framing studs, blocking or plates. Maximum stud spacing as tested shall not exceed **38** inches (610 mm) on center. Nail and screw heads are required to be located $\frac{3}{8}$ inch (9.53 mm) minimum from panel edges. Nail and screw heads shall be installed flush with surface of MDF, non-combustible sheathing or gypsum wallboard to accommodate application of finish material where required.

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4.2.3.3 A minimum panel size of **46** inches by 96 inches (406 mm by 2438 mm) is acceptable provided all perimeter edges are fastened to framing members at the required spacing. All panels may be fastened at panel joint stud without staggering the fasteners at each panel. No panels shall be lapped over another at these lap joint studs. Joint spacing between panels shall range from 0 inch to 1/8 inch (0 to 3.2 mm). Top and Bottom plate gaps to floors or ceilings are not limited except that panels shall have at least 1 inch (25.4 mm) minimum plate thickness behind panel edge, without adding additional blocking for fasteners. The designated fastener spacing applies to each panel edge. No panel edges can be lapped and attached with a single row of fasteners.

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4.2.3.4 Holes cut in Sure-Board® panels shall be approved by the code official based on the recommendations supplied by manufacturer and as recommended by the Design Professional.

4.3 Special Inspections

When required by the code official, periodic special inspections for seismic or wind resistance shall be in accordance with the requirements of IBC Chapter 17 corresponding to the applicable type (wood or cold-formed steel) of light-framed construction.

5.0 LIMITATIONS

The Sure-Board® Series 200, 200W, and 200B Structural Panels, described in this report, comply with the codes listed in Section 1.1 of this report, subject to the following conditions:

5.1 Panels are manufactured, identified and installed in accordance with this report.

5.2 The Nominal (V_n) and Allowable Stress Design (V_{asd}) shear values for shear walls are limited to the values noted in Tables 1, 1A, 2, 3, 4, 5, and 6 of this report. To determine the design strength values, the appropriate strength reduction factor, in accordance with ~~2015~~, 2012 IBC

*

Section 2211.6, 2009 IBC Section 2210.6, or Chapter 23 of the IBC, or Section R301.1.3 of the IRC shall be applied.

5.3 Plans and calculations demonstrating compliance with codes listed in Section 1.1 of this report and this report shall be submitted to the code official for approval.

5.4 Applied loads shall adjusted in accordance with Section 1605 of the IBC. Calculations shall demonstrate in addition to other requirements as stipulated by the code official, that the applied loads are less than the design loads described in the IBC, or IRC and this report.

5.5 All nominal and allowable load capacities provided to this report do not include 1.33 stress increase. The 1.33 increase for transient loads shall not be applied to allowable shear loads for these products.

5.6 The panels are produced at CEMCO, WARE INDUSTRIES, WELLBILT and INTERMAT facilities.

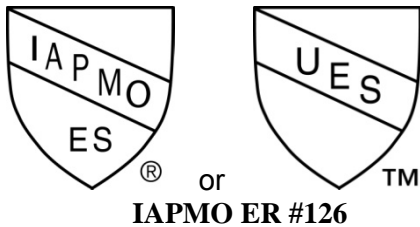
6.0 SUBSTANTIATING DATA

Data in accordance with the IAPMO Uniform ES Evaluation Criteria for the Testing and Analysis of Steel Sheet Sheathing for Wood and Cold Formed Steel Light Framed Structure Shear Walls (EC 003-2012) and an IAPMO Uniform ES approved quality control manual.



7.0 IDENTIFICATION

A label shall be affixed on at least one of the following: product, packaging, installation instructions or descriptive literature. The label shall include the company name or trademark, model number, and the IAPMO Uniform ES Mark of Conformity the name of the inspection agency (when applicable) and the Evaluation Report Number (ER-126) to identify the products recognized in this report. A die-stamp label may also substitute for the label. Either Mark of Conformity may be used as shown below:



Brian Gerber, P.E., S.E.
Vice President, Technical Operations
Uniform Evaluation Service

Richard Beck, PE, CBO, MCP
Vice President, Uniform Evaluation Service

GP Russ Chaney
CEO, The IAPMO Group

For additional information about this evaluation report please visit
www.uniform-es.org or email at info@uniform-es.org



TABLE 1 - NOMINAL AND ALLOWABLE SHEAR RESISTANCE TO WIND OR SEISMIC FORCES AND DISPLACEMENT (inches) FOR SHEAR WALLS WITH SURE-BOARD® SERIES 200/ SERIES 200B STRUCTURAL PANELS ATTACHED TO LIGHT GAGE STEEL C-STUDS AT 24" O.C. with SCREWS (pounds per foot) ¹

| STEEL FRAMING | FASTENER SPACING AT PANEL EDGES INCHES ON CENTER ⁶ | | | | | | | | | | | |
|--|---|----------------------------|------------------------------|--------------------------|----------------------------|------------------------------|--------------------------|----------------------------|------------------------------|--------------------------|----------------------------|------------------------------|
| | 6 | | | 4 | | | 3 | | | 2 | | |
| | $V_n^{2,3,4,7}$ (plf) | $V_{asd}^{2,3,8}$ (plf) | ΔV_{asd}^9 (inch) | $V_n^{2,3,4,7}$ (plf) | $V_{asd}^{2,3,8}$ (plf) | ΔV_{asd}^9 (inch) | $V_n^{2,3,4,7}$ (plf) | $V_{asd}^{2,3,8}$ (plf) | ΔV_{asd}^9 (inch) | $V_n^{2,3,4,7}$ (plf) | $V_{asd}^{2,3,8}$ (plf) | ΔV_{asd}^9 (inch) |
| No. 20 (0.033 inch) | 1,085 | 434 | 0.21 | 1,545 | 618 | 0.21 | 1,730 | 692 | 0.24 | 1,915 | 766 | 0.26 |
| | 1,543 ¹⁰ | 617 | 0.17 | 2,211 ¹⁰ | 885 | 0.22 | 2,486 ¹⁰ | 977 | 0.22 | 2,537 ¹⁰ | 906 | 0.16 |
| No. 18 (0.043 inch) | 1,405 ¹⁰ | 562 | 0.24 | 1,925 ¹⁰ | 770 | 0.23 | 2,821 ¹⁰ | 1,126 | 0.25 | 2,989 ¹⁰ | 1,196 | 0.21 |
| No. 16 (0.054 inch) | 1,697 | 678 | 0.25 | 2,306 | 922 | 0.25 | 2,957 ¹⁰ | 1,092 | 0.26 | 3,647 ¹⁰ | 1,253 | 0.28 |
| No.16 (0.054 inch) 2-Sided | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 5,011 ¹⁰ | 1,710 | 0.28 |
| No. 14 (0.071 inch) | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 3,292 | 1,257 | 0.24 |
| No. 14 (0.071 inch) 2-Sided *Fasteners 6" O.C. into intermediate framing | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 4,635* | 1,700 | 0.22 |

For SI: 1 inch = 25.4 mm, 1 lb/linear = 0.0146 N/mm.

¹ These values are for short-term loads due to wind or earthquake.

² The screws are described in Section 3.2.1 and are installed in accordance with Section 4.2.2.2 of IAPMO ES ER-126.

³ Tabulated values listed in tables are for panels applied to one side or two sides of a wall.

⁴ For load and resistance factor design (LRFD) loads, the tabulated V_n load values shall be multiplied by the resistance factor $\Phi = 0.55$ for Seismic or 0.60 for Wind.

⁵ Section 3.3.1 in IAPMO ES ER-126, describes minimum base metal thickness associated with gages.

⁶ All panel edges shall be blocked. Panels can be installed vertically or horizontally. Fasteners shall be spaced a maximum of 12 inches on center along intermediate framing members, except as specifically noted in Table 1 of this report.

⁷ V_n = Nominal Strength.

⁸ V_{asd} = ASD Design Load.

⁹ ΔV_{asd} = Deflection at V_{asd} design Load.

¹⁰ Nominal strength is based on double c-stud collectors (end posts) to be designed and installed using one gage thicker than the framing material used in the shear wall.

**** All shear walls shall be provided with holdowns.**

Allowable load values and deflections listed in tables are based on tests of 9-ft tall by 4-ft wide panels. Deflection calculations of shear walls with height-to-width ratios lower than 2.25:1 shall be based on a rational method using accepted engineering practices.



TABLE 1A - NOMINAL AND ALLOWABLE SHEAR RESISTANCE TO WIND OR EARTHQUAKE FORCES AND DISPLACEMENT (inches) FOR SHEAR WALLS WITH SURE-BOARD® SERIES 200/ SERIES 200B STRUCTURAL PANELS ATTACHED TO LIGHT GAGE STEEL C-STUDS AT 16" O.C. WITH SCREWS (pounds per foot) ¹

| STEEL FRAMING | FASTENER SPACING AT PANEL EDGES INCHES ON CENTER ⁶ | | | | | | | | | | | |
|--------------------------------|---|---|---------------------------------------|---|---|---------------------------------------|---|---|---------------------------------------|---|---|---------------------------------------|
| | 6 | | | 4 | | | 3 | | | 2 | | |
| Minimum Gage ⁵ | V _n ^{2,3,4,7} (plf) | V _{asd} ^{2,3,8} (plf) | ΔV _{asd} ⁹ (inch) | V _n ^{2,3,4,7} (plf) | V _{asd} ^{2,3,8} (plf) | ΔV _{asd} ⁹ (inch) | V _n ^{2,3,4,7} (plf) | V _{asd} ^{2,3,8} (plf) | ΔV _{asd} ⁹ (inch) | V _n ^{2,3,4,7} (plf) | V _{asd} ^{2,3,8} (plf) | ΔV _{asd} ⁹ (inch) |
| 14 (0.071 inch) 2-Sided | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- | 5,079 | 1,897 | 0.26 |

For SI: 1 inch = 25.4 mm, 1 lb/linear = 0.0146 N/mm.

¹ These values are for short-term loads due to wind or earthquake.

² The screws are described in Section 3.2.1 and are installed in accordance with Section 4.2.2.2 of IAPMO ES ER-126

³ Tabulated values listed in tables are for panels applied to one side or two sides of a wall.

⁴ For load and resistance factor design (LRFD) loads, the tabulated V_n load values shall be multiplied by the resistance factor Φ = 0.55 for Seismic or 0.60 for Wind.

⁵ Section 3.3.1 in IAPMO ES ER-126, describes minimum base metal thickness associated with gages.

⁶ All panel edges shall be blocked. Panels are installed vertically or horizontally. Fasteners shall be spaced a maximum of 12 inches on center along intermediate framing members.

⁷ V_n = Nominal Strength.

⁸ V_{asd} = ASD Design Load.

⁹ ΔV_{asd} = Deflection at V_{asd} design Load.

TABLE 2 - NOMINAL AND ALLOWABLE SHEAR RESISTANCE TO WIND OR EARTHQUAKE FORCES AND DISPLACEMENT (inches) FOR SHEAR WALLS WITH SUREBOARD® SERIES 200W// SERIES 200B STRUCTURAL PANELS ATTACHED TO LIGHT GAGE STEEL C-STUDS AT 16" O.C. WITH NO. 10 SCREWS (pounds per foot) ¹

| STEEL FRAMING | No. 10 SCREW SPACING AT PANEL EDGES AND FIELD 2/6, INCHES ON CENTER ⁶ | | |
|---------------------------------------|--|---|---------------------------------------|
| Minimum Gage ⁵ | V _n ^{2,3,4,7} (plf) | V _{asd} ^{2,3,8} (plf) | ΔV _{asd} ⁹ (inch) |
| No. 18-Ga. (0.043 in.) | 2,168 | 703 | 0.14 |
| No. 16-Ga. (0.054 in.) | 2,704 | 923 | 0.18 |
| No. 14-Ga. (0.071 in.) | 2,755 | 934 | 0.15 |
| No. 14-Ga. (0.071 in.) 2 Sided | 5,091 | 1,922 | 0.29 |

For SI: 1 inch = 25.4 mm, 1 plf = 0.0146 N/mm.

¹ These values are for short term loads due to wind or earthquake

² The screws as described in Section 3.2.2 and installed in accordance with Section 4.2.2.2 of IAPMO ES ER-126

³ Tabulated values listed in tables are for panels applied to one side or two sides of a wall.

⁴ For load and resistance factor design (LRFD) loads, the tabulated V_n load values shall be multiplied by the resistance factor Φ = 0.55 for Seismic or 0.60 for Wind.

⁵ Section 3.3.1 in evaluation report IAPMO ES ER-126, describes minimum base metal thickness associated with gages.

⁶ All panel edges shall be blocked. Panels are installed vertically or horizontally. Fasteners shall be spaced a maximum of 6 inches on center along intermediate framing members.

⁷ V_n = Nominal Strength.

⁸ V_{asd} = ASD Design Load.

⁹ ΔV_{asd} = Deflection at V_{asd} design Load.

**** All shear walls shall be provided with holdowns.**

Allowable load values and deflections listed in tables are based on tests of 9-ft tall by 4-ft wide panels. Deflection calculations of shear walls with height-to-width ratios lower than 2.25:1 shall be based on a rational method using accepted engineering practices.



TABLE 3 - NOMINAL AND ALLOWABLE SHEAR RESISTANCE TO WIND OR EARTHQUAKE FORCES AND DISPLACEMENT (inches) FOR SHEAR WALLS WITH SUREBOARD® SERIES 200W/ SERIES 200B STRUCTURAL PANELS ATTACHED TO LIGHT GAGE STEEL C-STUDS AT 24" O.C. WITH NO. 10 SCREWS (pounds per foot) ¹

| STEEL FRAMING | No. 10 SCREW SPACING AT PANEL EDGES AND FIELD 2/6, INCHES ON CENTER ⁶ | | |
|---------------------------|--|----------------------------|------------------------------|
| | $V_n^{2,3,4,7}$ (plf) | $V_{asd}^{2,3,8}$ (plf) | ΔV_{asd}^9 (inch) |
| Minimum Gage ⁵ | | | |
| No. 20-Ga. (0.033 in.) | 1,518 | 505 | 0.11 |
| No. 18-Ga. (0.043 in.) | 1,791 | 631 | 0.12 |

For SI: 1 inch = 25.4 mm, 1 plf = 0.0146 N/mm.

¹These values are for short term loads due to wind or earthquake

²The screws as described in Section 3.2.2 and installed in accordance with Section 4.2.2.2 of IAPMO ES ER-126.

³ Tabulated values listed in tables are for panels applied to one side or two sides of a wall.

⁴ For load and resistance factor design (LRFD) loads, the tabulated V_n load values shall be multiplied by the resistance factor $\Phi = 0.55$ for Seismic or 0.60 for Wind.

⁵ Section 3.3.1 in evaluation report IAPMO ES ER-126, describes minimum base metal thickness associated with gages.

⁶ All panel edges shall be blocked. Panels are installed vertically or horizontally. Fasteners shall be spaced a maximum of 6 inches on center along intermediate framing members.

⁷ V_n = Nominal Strength.

⁸ V_{asd} = ASD Design Load.

⁹ ΔV_{asd} = Deflection at V_{asd} design Load.

TABLE 4 - NOMINAL AND ALLOWABLE SHEAR RESISTANCE TO WIND OR EARTHQUAKE FORCES AND DISPLACEMENT (inches) FOR SHEAR WALLS WITH SURE-BOARD® SERIES 200W/ SERIES 200B STRUCTURAL PANELS ATTACHED TO DF STUDS AT 16" O.C. WITH 10D NAILS (pounds per foot) ¹

| FRAMING | 10d (2.25"min X .148) NAIL SPACING AT PANEL EDGES AND FIELD, INCHES ON CENTER ³ | | | | | | | | | | | |
|--|--|------------------------------|------------------------------|----------------------------|------------------------------|------------------------------|----------------------------|------------------------------|------------------------------|----------------------------|------------------------------|------------------------------|
| | 4/6 | | | 2/6 | | | 2/6 Two Sided ⁷ | | | 3/6 | | |
| Stud: 2 x 4 stud grade DF End post: 4 x 4 No. 1 grade DF *4 x 6 No. 1 grade DF Sill and top plate: 2 x 4 standard grade DF *Sill Plate: 2x4 TimberStrand or standard grade DF | $V_n^{2,3,4,5,6}$ (plf) | $V_{asd}^{2,3,5,7}$ (plf) | ΔV_{asd}^8 (inch) | $V_n^{2,3,4,5,6}$ (plf) | $V_{asd}^{2,3,5,7}$ (plf) | ΔV_{asd}^8 (inch) | $V_n^{2,3,4,5,6}$ (plf) | $V_{asd}^{2,3,5,7}$ (plf) | ΔV_{asd}^8 (inch) | $V_n^{2,3,4,5,6}$ (plf) | $V_{asd}^{2,3,5,7}$ (plf) | ΔV_{asd}^8 (inch) |
| | 1,453 | 583 | 0.18 | 2,357 | 950 | 0.23 | 4,884 | 1,827 | 0.24 | ----- | ----- | ----- |

For SI: 1 inch = 25.4 mm, 1 plf = 0.0146 N/mm.

¹These values are for short term loads due to wind or earthquake

²The nails are described in Section 3.2.5 and are installed in accordance with Section 4.2.3.2 in IAPMO ES ER-126.

³ All panel edges shall be blocked. Panels are installed vertically or horizontally. Fasteners shall be spaced a minimum of 6 inches on center along field framing members.

⁴ For load and resistance factor design (LRFD) loads, the tabulated V_n load values shall be multiplied by the resistance factor $\Phi = 0.55$ for Seismic or 0.60 for Wind.

⁵ Tabulated values listed in tables are for panels applied to one side or two sides of a wall.

⁶ V_n = Nominal Strength.

⁷ V_{asd} = ASD Design Load.

⁸ ΔV_{asd} = Deflection at V_{asd} design Load.

**** All shear walls shall be provided with holdowns.**

Allowable load values and deflections listed in tables are based on tests of 9-ft tall by 4-ft wide panels. Deflection calculations of shear walls with height-to-width ratios lower than 2.25:1 shall be based on a rational method using accepted engineering practices.



TABLE 5 - NOMINAL AND ALLOWABLE SHEAR RESISTANCE TO WIND OR EARTHQUAKE FORCES AND DISPLACEMENT (inches) FOR SHEAR WALLS WITH SURE-BOARD® SERIES 200/ SERIES 200B STRUCTURAL PANELS ATTACHED TO DF STUDS AT 16" O.C. WITH NO. 8 X 2" SCREWS (pounds per foot) ¹

| FRAMING | No. 8 X 2" SCREW SPACING AT PANEL EDGES AND FIELD, INCHES ON CENTER ³ | | | | | | | | |
|---|--|------------------------------|------------------------------|--------------------------|----------------------------|------------------------------|--|--|--|
| | 2/12 | | | 2/12 (2-Sided)* | | | | | |
| Stud: 2 x 4 stud grade DF End post: 4 x 4 No. 1 grade DF Sill and top plate: 2 x 4 standard grade DF *Sill Plate: 2x4 TimberStrand or standard grade DF | $V_n^{2,3,4,5,6}$ (plf) | $V_{asd}^{2,3,5,7}$ (plf) | ΔV_{asd}^8 (inch) | $V_n^{2,3,4,6}$ (plf) | $V_{asd}^{2,3,7}$ (plf) | ΔV_{asd}^8 (inch) | | | |
| | 2,751 | 1,086 | 0.23 | 4,501 | 1,800 | 0.23 | | | |

For SI: 1 inch = 25.4 mm, 1 plf = 0.0146 N/mm.

¹ These values are for short term loads due to wind or earthquake

² The screws are described in Section 3.2.6 and are installed in accordance with Section 4.2.3.2 in IAPMO ES ER-126.

³ All panel edges shall be blocked or backed. Panels are installed vertically or horizontally. Screws shall be spaced a minimum of 12 inches on center along field framing members.

⁴ For load and resistance factor design (LRFD) loads, the tabulated V_n load values shall be multiplied by the resistance factor $\Phi = 0.55$ for Seismic or 0.60 for Wind.

⁵ Tabulated values listed in tables are for panels applied to one side or two sides of a wall.

⁶ V_n = Nominal Strength.

⁷ V_{asd} = ASD Design Load.

⁸ ΔV_{asd} = Deflection at V_{asd} design Load.

TABLE 6 - NOMINAL AND ALLOWABLE SHEAR RESISTANCE TO WIND OR EARTHQUAKE FORCES AND DISPLACEMENT (inches) FOR SHEAR WALLS WITH SURE-BOARD® SERIES 200 / SERIES 200W/ SERIES 200B STRUCTURAL PANELS ATTACHED TO LIGHT GAGE STEEL C-STUDS AT 16" O.C. WITH COMBINED SCREWS AND PNEUMATIC PINS MANUFACTURED BY AEROSMITH INC. (pounds per foot) ¹

| FRAMING | SCREW / SCREW / PIN SPACING AT PANEL EDGES AND FIELD INCHES ON CENTER ³ | | | | | | | | | | | |
|---|--|------------------------------|------------------------------|---|------------------------------|------------------------------|---|------------------------------|------------------------------|---|------------------------------|------------------------------|
| | 2/12/2 ¹⁰ No. 18 gage 5/8" D/G | | | 2/12/2 ¹⁰ No. 16 gage 5/8" D/G | | | 2/12/2 ¹⁰ No. 18 gage 1/4" M/B | | | 2/12/2 ¹⁰ No. 16 gage 1/4" M/B | | |
| No. 18 gage ⁶ 3 5/8" C-stud @ 16" O.C. | $V_n^{2,3,4,5,7}$ (plf) | $V_{asd}^{2,3,5,8}$ (plf) | ΔV_{asd}^9 (inch) | $V_n^{2,3,4,5,7}$ (plf) | $V_{asd}^{2,3,5,8}$ (plf) | ΔV_{asd}^9 (inch) | $V_n^{2,3,4,5,7}$ (plf) | $V_{asd}^{2,3,5,8}$ (plf) | ΔV_{asd}^9 (inch) | $V_n^{2,3,4,5,7}$ (plf) | $V_{asd}^{2,3,5,8}$ (plf) | ΔV_{asd}^9 (inch) |
| No. 16 gage ⁶ 3 5/8" C-stud @ 16" O.C. | 2,449 | 975 | 0.21 | 2,825 | 1,100 | 0.24 | 2,201 | 811 | 0.17 | 2,495 | 932 | 0.19 |

For SI: 1 inch = 25.4 mm, 1 plf = 0.0146 N/mm.

¹ These values are for short term loads due to wind or earthquake

² The pins and screws are described in Section 3.2.4 and are installed in accordance with Section 4.2.2.2 in IAPMO ES ER-126.

³ All panel edges shall be blocked. Panels are installed vertically or horizontally. Fasteners shall be spaced a minimum of 12 inches on center along field framing members.

⁴ For load and resistance factor design (LRFD) loads, the tabulated V_n load values shall be multiplied by the resistance factor $\Phi = 0.55$ for Seismic / 0.60 for Wind.

⁵ Tabulated values listed in tables are for panels applied to one side or two sides of a wall.

⁶ Section 3.3.1 in evaluation report IAPMO ES ER-126, describes minimum base metal thickness associated with gages.

⁷ V_n = Nominal Strength.

⁸ V_{asd} = ASD Design Load.

⁹ ΔV_{asd} = Deflection at V_{asd} design Load.

¹⁰ Fastener Schedule:

A) All top/bottom track screwed only with No. 8 x 1 1/4" self-tapping screws at 2" o.c. B) No. 8 x 1 1/4" self-tapping screws at 12" o.c. at all vertical studs/posts C) 1 1/4" x 0.100-in knurled shank for DensGlass Gold (D/G) and 1 3/8" x 0.100-in for Magnesium oxide Board MgO (M/B) both at 2" o.c. between screws. (Designation for fasteners A) = 2" o.c. B) = 12" o.c. C) = 2" o.c.)

**** All shear walls shall be provided with holdowns.**

Allowable load values and deflections listed in tables are based on tests of 9-ft tall by 4-ft wide panels. Deflection calculations of shear walls with height-to-width ratios lower than 2.25:1 shall be based on a rational method using accepted engineering practices.



CALIFORNIA SUPPLEMENT

EVALUATION SUBJECT: SURE-BOARD® SERIES 200, 200W, AND 200B STRUCTURAL PANELS INSTALLED ON COLD-FORMED STEEL OR WOOD FRAMED SHEAR WALLS

REPORT HOLDER:

Intermat
2045 Placentia Avenue
Costa mesa, California 92627
www.sureboard.com
support@sureboard.com

CSI Division: 05-METALS
CSI Section: 05160-Metal Framing Systems

1.0 Compliance with the following codes:

- 2013 California Building Code® (CBC)

ADDITIONAL REQUIREMENTS:

2.0 USES

The structural panels are an alternative to Cold-Formed Steel or Wood stud shear wall systems described in Sections 2211 and 2305, respectively, of the 2013 California Building Code (CBC).

3.0 FRAMING

Steel Framing: Steel framing shall be in accordance with Section 2211 of the 2013 CBC.

Wood Framing: Minimum framing members shall conform to Chapter 23 of the 2013 CBC.

4.0 DESIGN AND INSTALLATION

4.1 Shear Wall Design: The Nominal (V_n) and Allowable Stress Design (V_{asd}) shear values for wind and earthquake forces are shown in Tables 1, 1A, 2, 3, 4, 5, and 6 of ER-126 with associated deflections for shear walls using Sure-Board® Series 200 and 200W Structural Panels attached to Cold-Formed Steel or Wood studs. Nominal shear values shall be multiplied by the appropriate strength reduction factor to determine LRFD design strength in accordance with footnote 4 of Tables 1, 1A, 2, 3, 4, 5, and 6 of ER-126 as set forth in Section 2211.6 or Section 2305 of the 2012 IBC.

The collector design shall comply with the 2013 CBC and sized to exceed the loads resisted by the shear wall.

Cold-Formed Steel or Wood framing design for out-of-plane and axial loads shall comply with the 2013 CBC. For installation in Seismic Design Category C, D, E, and F,

additional requirements for steel framing in Section 2211 of the 2013 CBC shall be observed.

4.2 Installation

4.2.1 Steel/Wood Framing: Sure-Board® Series 200, 200W, and 200B Structural Panels are placed with the long dimension parallel or perpendicular to stud framing. The steel face shall be in contact with the framing. All panel edges, top and bottom shall be fully blocked by framing studs, track, blocking, or flat strap of the same gage as the framing material and include an end collector element to be determined by the Design Professional and the registered design professional using the 2013 CBC.

5.0 LIMITATIONS

The Sure-Board® Series 200, 200W, and 200B Structural Panels, described in this report, comply with the codes listed in Section 1.0 of this supplement, subject to the following conditions:

5.1 The Nominal (V_n) and Allowable Stress Design (V_{asd}) shear values for wind and earthquake forces are shown in Tables 1, 1A, 2, 3, 4, 5, and 6 of ER-126. To determine the LRFD design values, the appropriate strength reduction factor, in accordance with Section 2211 or 2305 of the 2013 CBC shall be applied.

5.2 Applied loads shall be adjusted in accordance with Section 1605 of the 2013 CBC. Calculations shall demonstrate in addition to other requirements as stipulated by the building official, that the applied loads are less than the design loads described in 2013 CBC and this report.

6.0 SUBSTANTIATING DATA

Data in accordance with the IAPMO Uniform ES Evaluation Criteria for the Testing and Analysis of Steel Sheet Sheathing for Wood and Cold Formed Steel Light Framed Structure Shear Walls (EC 003-2012) and an IAPMO Uniform ES approved quality control manual.

For additional information about this evaluation report please visit www.uniform-es.org or email at info@uniform-es.org