



Expanding Your Solutions



Sure-Board[®] for Shear

Series 200 S-F/200 S-P Non-Combustible Roof/Floor Sheathing

ASTM/Standards Declaration

ASTM & Code Standards

- C1325 (Cement Board)
- ASTM A653/653M, A924/924M & A1003/1003M
- 2012, 2015 IBC
- 2012, 2015 IRC
- 2013/2016 CBC
- IAPMO ER-185
- DSA Approved IR A-5
- UL H503 – UL Fire Test for 1 and 1-1/2 Hour assembly

LEED v4 for Building & Design Construction

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

Recycled Content

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

California's Proposition 65 Warning

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

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

Improve the quality of your next framing project with *Sure-Board*[®] Series 200S

Our revolutionary non-combustible sheathing panels will improve the quality and increase the efficiency during the installation on your next residential or midrise load bearing project.

When you incorporate Sure-Board[®] Series 200S sheathing, the finish product will prevent the need to work over uneven corrugated deck or have to bear the delay of pouring and finishing each level if you have been using a deep pandeck system.

These delays may be eliminated and production increased at no additional cost.

The installation of our series 200S panels do not require any new installation techniques for the field staff. Since the current methods and practices for installation are the same as those used for decades for plywood and OSB panels, we have the huge advantage of eliminating blocking and creating a great non-combustible structure for the future.

The Big One
Scan this QR to view
the Seismic Tests
Conducted at
UCSD's Shake Table



We put our building to the “Real Test” at the world’s largest outdoor shake table at UCSD.

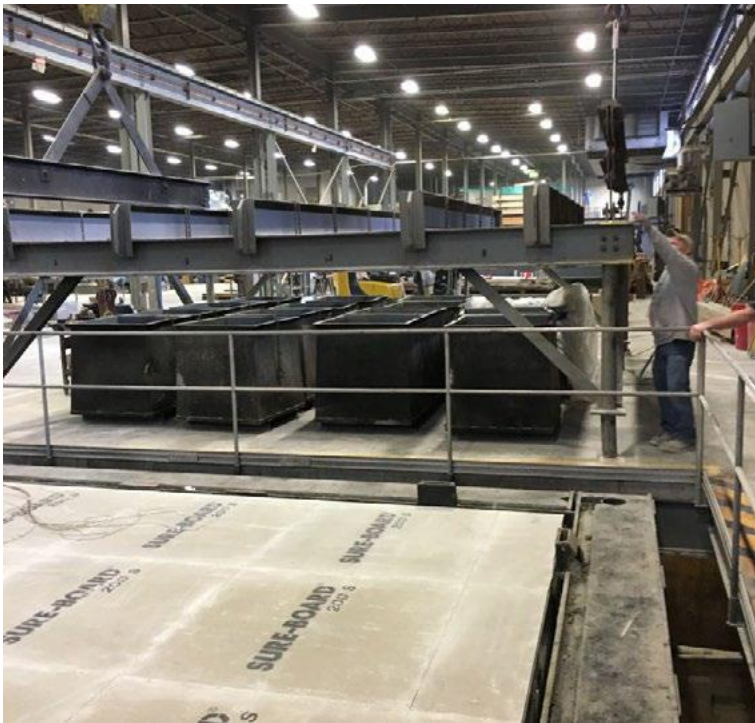
The First Revolutionary 6 Story CFS ShakeTable Test

*CEMCO and many industry partners along with H.U.D. and the California Seismic Safety Commission worked together on this program. DCI Engineering and the UCSD Engineering staff performed the first ever shake table test utilizing current code required lateral and diaphragm methods. Sure-Board[®] sheathing demonstrated amazing resilience with no measurable damage. The test program included 13 pretests of increased magnitude to finally reach the MCE or 150% of the 1994 Northridge 6.7 magnitude seismic event. There was no structural damage and this structure was totally intact and ready for use. Imagine if it were a medical facility or one of our children’s schools where the occupants must be kept safe at all costs. **Sure-Board[®] is the Best Solution.***

Sure-Board[®] Series 200S has proven results to make your building better and cost you less.



Sure-Board[®] Series 200S is the non-combustible alternative for any CFS sheathing application both large and small.

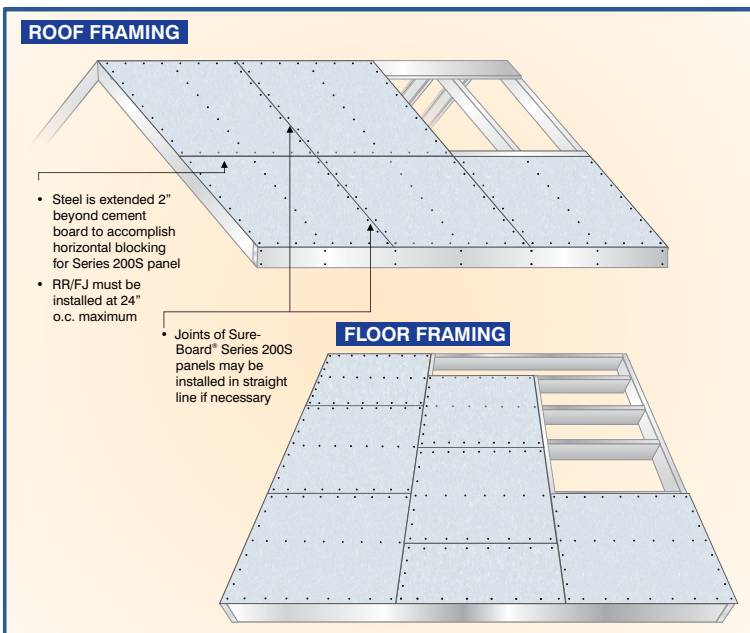


Sure-Board® Series 200S is UL approved for all 1 and 2 hour assemblies.

Sure-Board® Series 200S is Approved Nationwide

Sure-Board® Series 200S is certified using all national building codes. That includes the current IBC, IRC, CBC, DSA, GSA, Army Corp of Engineers, City of New York, City of Los Angeles, LARR 26040 to mention a few. IAPMO UES EC-012 and ER-185 Certify our panels performance through our extensive test program, for use on any CFS project Nationwide.

Sure-Board® Series 200S is the best investment in non-combustible sheathing for your building.
“OUR STEEL IS THE REAL DEAL.”



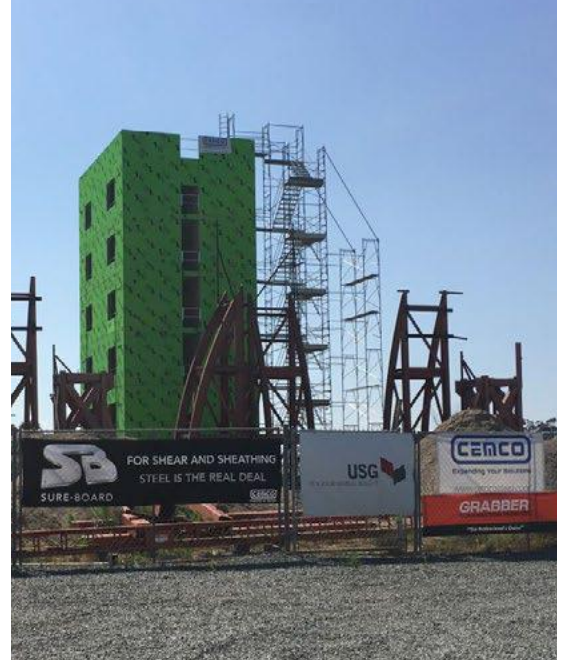
Sure-Board® Series 200S Floor/Roof Cross Sections

Sure-Board® Series 200S

is available Nationwide through thousands of distributors in all 50 states.

About CEMCO®

California Expanded Metal Products Co. (CEMCO®) is the premier manufacturer of cold-formed steel framing and metal lath products in the Western United States. Its steel-framing product segments include FAS™ head-of-wall products, ProX Header®, Pro X RO-Rough Opening framing system, Sure Span® steel framing floor joist system, Sure-Board® for shear-wall panels, ViperStud® interior stud framing system, metal lath and water management products along with its SFIA Code Certified steel framing products. Founded in 1974, CEMCO is the leader in quality, service, and product development, and offers one of the broadest product lines available in cold-formed steel framing used for both the commercial and residential construction markets.



SURE-BOARD®
Series 200S Sheathing

IAPMO ES ER-185
LARR #26040
DSA IR A-5



SURE-BOARD®
Series 200S Sheathing

IAPMO ES ER-185
LARR #26040
DSA IR A-5



TABLE 1
NOMINAL DESIGN STRENGTHS FOR SURE-BOARD® SERIES 200S STRUCTURAL PANELS
- FLOOR AND ROOF SHEATHING CONTINUOUS OVER TWO OR MORE SPANS

| Span Rating, (Inches) (o.c.) | Nominal Strength (PSF) | Allowable Strength (ASD) (psf) | Factored Resistance (LRFD) (psf) | Concentrated Load, LBF |
|------------------------------|------------------------|--------------------------------|----------------------------------|------------------------|
| 24 maximum | 435 | 215 | 260 | 2,000 |

For SI: 1 inch = 25.4 mm, 1 psf = 47.88 Pa, 1 lbf = 4.448 N

¹ Maximum allowable strength for panels supported at 24 inches on center is 100 PSF for a deflection limit of L/360. Panels are capable of supporting an allowable concentrated load of 2,000 lbs. within the deflection limit of L/360 on properly designed and constructed framing members.

² Series 200S panels installed for floors shall include minimum No. 20 gauge (0.033 inch) thick steel sheets.

³ Series 200S panels installed for roofs shall include minimum No. 20 gauge (0.033 inch) thick steel sheets.

SURE-BOARD®
Series 200S Sheathing

IAPMO ES ER-185
LARR #26040
DSA IR A-5



TABLE 2
NOMINAL SHEAR STRENGTH FOR BLOCKED HORIZONTAL DIAPHRAGMS, LBS/FT
SURE-BOARD® SERIES 200S STRUCTURAL PANELS

| Screw Spacing, Inches | Field | Nominal Strength, (Rn) | Allowable Strength, (ASD) | Factored Resistance (LRFD) |
|-----------------------|-------|------------------------|---------------------------|----------------------------|
| 2 | 6 | 2,770 | 1,110 | 1,380 |
| 3 | 6 | 2,730 | 1,090 | 1,360 |
| 4 | 6 | 1,980 | 790 | 990 |
| 6 | 6 | 1,320 | 530 | 660 |

For SI: 1 inch = 25.4 mm, 1 lb/ft = 14.5939 N/mm.

The equation Eq. (1) within the IAPMO Evaluation Report ER-185 shall be used to estimate the mid-span deflection of SURE-BOARD's MGO and fiber-cement simple span diaphragms:

TABLE 3
ALLOWABLE WIND UPLIFT LOADS FOR
SURE-BOARD® SERIES 200S STRUCTURAL PANELS^{1,2}

| CFS Specifications | Allowable Wind Uplift, (ASD) (psf) | | | | Allowable Wind Uplift, (ASD) (psf) | | | | |
|----------------------------|------------------------------------|-------------------------|-------------------------|-------------------------|------------------------------------|-------------------------|-------------------------|-------------------------|--|
| | 24 (inch) Joist Spacing | 24 (inch) Joist Spacing | 16 (inch) Joist Spacing | 16 (inch) Joist Spacing | 16 (inch) Joist Spacing | 16 (inch) Joist Spacing | 16 (inch) Joist Spacing | 16 (inch) Joist Spacing | |
| Designated Thickness mills | 33 | 43 | 54 | 68 | 97 | 118 | | | |
| Design Thickness, In. | 0.0346 | 0.0451 | 0.0566 | 0.0713 | 0.1017 | 0.1242 | | | |
| Fy ksi | 33 | 33 | 50 | 50 | 50 | 50 | | | |
| Fu ksi | 45 | 45 | 65 | 65 | 65 | 65 | | | |
| No. 6 | 30.5 | 36.2 | 41.9 | 47.6 | 45.8 | 54.3 | | | |
| No. 8 | 39.5 | 47.2 | 54.6 | 62.1 | 59.3 | 70.7 | | | |
| No. 10 | 47.4 | 54.6 | 62.1 | 69.4 | 65.3 | 79.4 | | | |
| No. 12 | 45.8 | 54.6 | 62.1 | 69.4 | 65.3 | 79.4 | | | |
| No. 6 | 54.3 | 62.9 | 71.5 | 79.4 | 79.4 | 95.3 | | | |
| No. 8 | 62.9 | 71.5 | 81.9 | 93.2 | 95.3 | 119.1 | | | |
| No. 10 | 70.7 | 81.9 | 93.2 | 119.1 | 119.1 | 149.1 | | | |
| No. 12 | 62.9 | 71.5 | 81.9 | 93.2 | 95.3 | 119.1 | | | |

For SI: 1 inch = 25.4 mm, 1 lbf = 4.448 N, 1 psf = 47.88 Pa, 1 psi = 6.89 kPa

¹ Allowable wind uplift based on screw spacings of 6 inches on center maximum at all panel edges and 12 inches on center maximum in the field/interior of the panels.

² If field/interior spacing is reduced from 12 inches on center, wind uplift may be proportionally increased.

Sure-Board® Series 200S FLOOR/ROOF Sheathing Information Table

| SURE-BOARD® STANDARDS & SPECIFICATIONS: |
|--|
| The Sure-Board® Series 200S Structural Sheathing Panels laminated with water soluble adhesive to 1/2" / 3/4" fiber cement panels listed under ASTM C1325 and others. The steel sheet is 20 gauge (0.033 inch / 0.838 mm) minimum base-metal thickness complying with ASTM A653 CS/GRAD 33 minimum, and ASTM A1003/A1003M. The sheets are provided with a G-40 hot dipped galvanized coating conforming to ASTM A924. |
| SERIES 200S FLOOR SHEATHING: 3/4" Thick Fiber Cement Sheathing is laminated to 20 gauge (0.033 inch / 0.838 mm) steel sheet for use as typical floor sheathing with framing members at 24" o.c. maximum spacing. |
| SERIES 200S ROOF SHEATHING: 1/2" Thick Fiber Cement Sheathing is laminated to 20 gauge (0.033 inch / 0.838 mm) steel sheet for use as typical roof sheathing with framing members at 24" o.c. maximum spacing. |
| Both floor and roof sheathing are manufactured in 48" x 48" panels for easy installation. |
| FASTENERS SPECIFICATIONS: Fasteners to attach the Sure-Board® Series 200S panels to CFS members are self drilling/self tapping pilot point bungle head screws, #8 x 1 5/8" long winged drill by grabber super drive LOX drive screws or equal. Screws must have cutting nubs under screw head to seat into fiber cement sheathing properly. |
| DESIGN OF FLOOR/ROOF SYSTEM: All floor and roof members and the installation of these members are responsibility of EOR and contractors. |

Sure-Board®
IAPMO ES ER-185 Series 200S



Expanding Your Solutions
www.cemcosteel.com

Visit www.sureboard.com
and www.floorsheathing.com

Denver Manufacturing Facility
490 Osage Street • Denver, CO 80204
(303) 572-3626 • Fax (303) 572-3627

Corporate Offices & Main Production Plant
263 N. Covina Lane • City of Industry, CA 91744
(800) 775-2362 • Fax (626) 330-7598

Northern California Manufacturing Facility
1001-A Pittsburg Antioch Hwy. • Pittsburg, CA 94565
(925) 473-9340 • Fax (925) 473-9341

Technical Support:
support@sureboard.com
Toll Free: (866) 469-7432

Expanding Your Structural Floor and Roof Sheathing Solutions ...



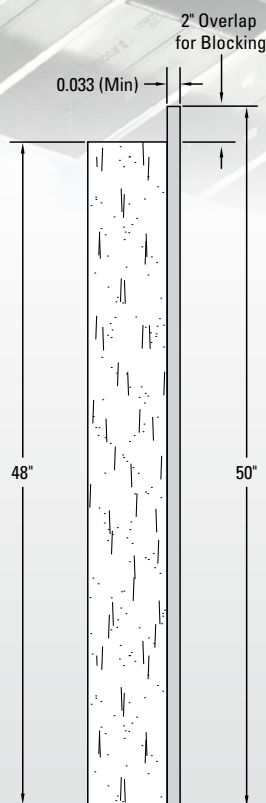
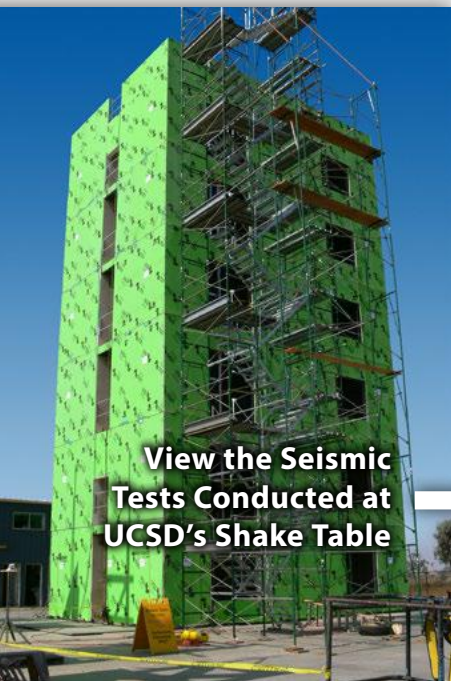
Expanding Your Solutions

P R E S E N T S

NON-COMBUSTIBLE

SURE-BOARD® SERIES 200S-F/200S-P

FLOOR/ROOF SHEATHING



Typical Fiber Cement Sheathing
(1/2" or 3/4" Thickness)



CEMCO® introduces our newest innovation, Sure-Board® Series 200S-F (FLOOR & FLAT-ROOF) and Series 200S-P (PITCHED ROOF) sheathing products. Series 200S-F/200S-P panels are available as follows:

Series 200S-F (FLOOR & FLAT-ROOF):

- Size: 3/4" x 48" x 48"
- Steel thickness: 33 mil

Series 200S-P (PITCHED ROOF):

- Size: 1/2" x 48" x 48"
- Steel thickness: 33 mil

Benefits of Sure-Board® Series 200S-F/200S-P floor and roof sheathing products include:

- Structural sheathing panels attachment to cold-formed steel framed floor/roof systems by screws.
- Full 2" steel overlap eliminating the need for horizontal blocking at joints.
- 48" x 48" panels require single installer.
- Less expensive to install than other non-combustible sheathing options.
- Meet or exceed 2018, 2021 IBC and IRC requirements— IAPMO ER 185.
- Meet or exceed 2019 California Building and California Residential Codes— IAPMO ER-126 & 185.
- DSA Approved IR A-5.
- UL Fire Test for 1 and 1-1/2-hour assembly—UL H503.
- Several sound tested assemblies each exceeding an STC of 50.

View the Seismic
Tests Conducted at
UCSD's Shake Table

Design No. H503
BXUV.H503
Fire-resistance Ratings - ANSI/UL 263

Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

BXUV - Fire Resistance Ratings - ANSI/UL 263
BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

Design No. H503
October 25, 2016

Unrestrained Assembly Rating — 1, 1-1/2, or 2 Hr. (See Items 4, 5, and 6)

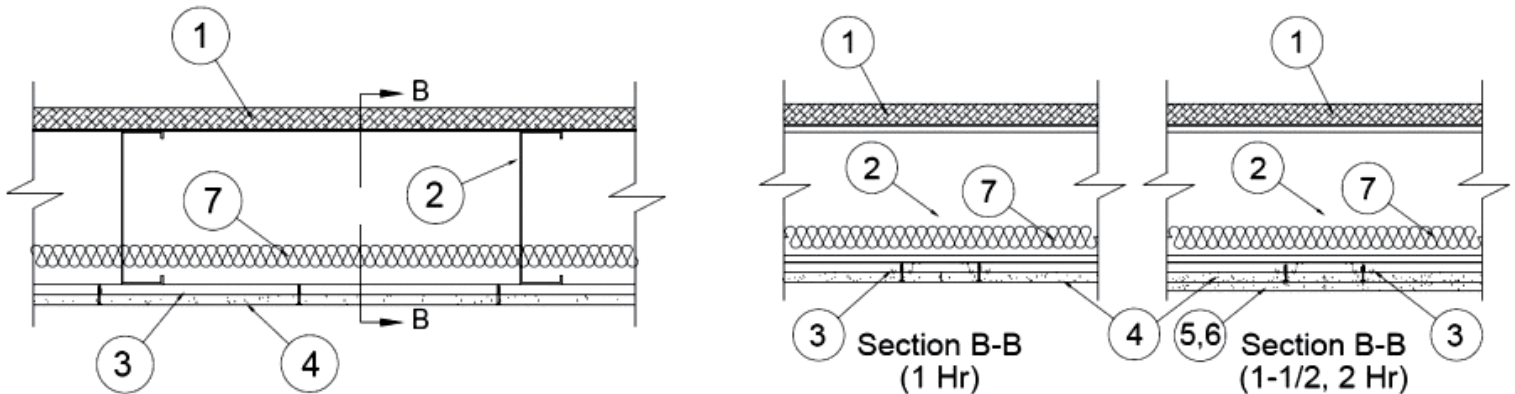
This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide BXUV or BXUV7

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.

1. Units, Partition Panel* — Steel faced floor panels. Panels secured to top chord of steel joists with #8, 1-5/8 in. cement board Grabber screws spaced 6 in. OC.

CALIFORNIA EXPANDED METAL PRODUCTS CO — Sure-Board® Series 200S

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Sure-Board® Series 200S



2. Steel Joists — C-shaped, galvanized steel sections, 10 in. min depth with 2 in. min. flanges and 5/8 in. min. stiffening flanges. The web of each joist may be provided with maximum 1-1/2 in. high by 3-1/2 in. long knockouts at the joist mid-depth. Knockouts spaced 24 in. OC minimum. The minimum coated steel thickness shall be 0.055 in. Joists spaced max 24 in. OC. At joist rim splices bearing on supports, joist rims are connected using an overlapping section of a 20 in. long splice plate (a joist piece), with four 3/4 in. long self-drilling #10-16 TEK screws to each rim piece. Joists secured to joist rims with three 3/4 in. TEK screws secured through both legs of minimum 2 in. by 2 in. by 6 in. long steel angles.

2A. Bridging — (Not Shown) — For use with Item 2 — Location of lateral bracing to be specified on truss engineering. 10 in. deep section of joist (Item 2) with notches cut for securement to joists (Item 2). Bridging secured with three 3/4 in. TEK screws secured through both legs of minimum 2 in. by 2 in. by 6 in. long steel angles.

CONTACT TECHNICAL SUPPORT FOR ENTIRE UL REPORT (866) 469-7432

2B. Structural Steel Members* — JoistRite channel-shaped joists, min 10. deep with min 2 in. wide flanges and 3/4 in. long stiffening flanges. JoistRite rim track, min 10 in. deep with min 1-1/2 in. top flange and min 2-5/16 in. bottom flange. The joists and rim tracks are fabricated from min 16 MSG galv steel. Joists spaced max 24 in. OC. Floor joists attached to rim track using channel-shaped steel web stiffeners. At rim track splices bearing on supports, rim tracks are connected using an overlapping section of a 12 in. long splice plate, with four 3/4 in. long self-drilling #10 screws to each rim piece.

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Type JR JoistRite floor joists, Type JT JoistRite rim track

2B1. Blocking & Bridging — Installed before construction loads are applied. The blocking consists of JoistRite solid blocking placed between each joist. Blocking should be installed max. 7 ft. OC along the joist length. Blocking attached to the top and bottom joist flanges with one #10 3/4 in. long self-drilling screw at each end tab of blocking. Blocking is fabricated from min 18 MSG galv steel, min 1-15/16 in. flanges, having the same depth as the joists. In addition, bridging consists of 1/2 in. by 1-1/2 in. cold-rolled channel, min No. 16 GA, attached to the bottom flanges of the joists and blocking. Cold-rolled channel attached to each blocking bottom flange with four #10 3/4 in. long self-drilling screws and to joist bottom flange with two screws.

2B2. Web Stiffeners — Not Shown — JoistRite web stiffeners, min 3-5/8 in. wide with min 9/16 in. flange and min 1-1/4 in. flange, having the same depth as the joists. Fabricated from min 16 MSG galv steel. Secured to each joist and track with #10 3/4 in. long self-drilling screws.

2C. Structural Steel Members* — The proprietary joists are channel-shaped, 10 in. min depth. Joists are fabricated from min No. 16 MSG galv steel. Joists spaced max 24 in. OC. Joists attached to rim joist with three #10 3/4 in. long self-drilling screws at the rim track clip to the outside of the web joist, and a #10 1/2 in. long screw through the top and bottom flange of the joists to the top and bottom flange of the rim track. At rim joist splices bearing on supports, rim joists are connected using an overlapping section of a 12 in. long splice plate (a joist piece), with six 3/4 in. long self-drilling #10 screws to each rim piece.

CALIFORNIA EXPANDED METAL PRODUCTS CO — Type SSCJ floor joists, SSRT rim joists

2D. Joist Bridging — Not Shown — Installed immediately after joists are erected and before construction loads are applied. The structural bridging, Type CEMCO Sure Bridging, consisting of No. 18 MSG galv steel, 2-1/2 in. wide by 25-1/2 in. long with 1-5/16 in. long legs structural bridging staggered between the steel joists and attached to the bottom joist flange with two #10 1/2 in. long self-drilling screws at each end tab of bridging. Solid bridging consisting of cut to length joist sections placed between outer joists and at center joist with 8 ft OC max spacing. Solid bridging is seated in the structural bridging and is screw-attached at joist web using Type CEMCO Sure-Support Clips (1-1/2 in. by 1-1/2 in. by 7 in. long, 16 MSG, min 50 ksi support clip) with three #10 3/4 in. long self-drilling screws per leg on one side and the other side with Type CEMCO Sure-Support Clips (4 in. by 1-1/2 in. by 7 in. long, 16 MSG, min 50 ksi support clip) with three #10 3/4 in. long self-drilling screws per leg.

3. Resilient Channels — 1/2 in. deep, min. 2 in. wide formed of 25 MSG galv steel with a 1/2 in. fastening surface, spaced 12 in. OC perpendicular to joists. Channel splices overlapped 3 in. beneath steel joists. Channels secured to each joist with 1/2 in. Type S-12 pan head screws. Channels oriented opposite at wallboard butt joints (spaced 6 in. OC) as shown in the above illustration.

4. Gypsum Board* — For 1 hour rating and base layer of 2 hour system — Single layer of nom 5/8 in. thick, 48 in. wide gypsum panels installed with long dimension perpendicular to resilient channels and side joints centered between joists. Gypsum panels secured with 1-1/4 in. long Type S bugle-head screws. Screws provided 1-1/2 and 4 in. and from side edges of the board 8 in. OC in the field. Butt joints of adjacent pieces offset minimum 3 ft.

NATIONAL GYPSUM CO — Type FSW-C

5. Gypsum Board* — For 1-1/2 Hour Rating — Two layers of nom 5/8 in. thick, 48 in. wide gypsum panels. Base layer installed per Item 4. Face layer installed with long dimension perpendicular to resilient channels and side joints centered between joists, staggered 24 in. OC from base layer. Gypsum panels secured with 1-5/8 in. long Type S bugle-head screws. Screws provided 1-1/2 and 4 in. and from side edges of the board 8 in. OC in the field. Butt joints of adjacent pieces offset minimum 3 ft.

Any 5/8 in. thick, 4 ft. wide, Gypsum Board UL Classified for Fire Resistance (CKNX) eligible for use in Design Nos. U305 and L501.

6. Gypsum Board* — For 2 Hour Rating — Two layers of nom 5/8 in. thick, 48 in. wide gypsum panels. Base layer installed with long dimension perpendicular to resilient channels and side joints centered between joists. Gypsum panels secured with 1-1/4 in. long Type S bugle-head screws. Screws provided 1-1/2 and 4 in. and from side edges of the board 8 in. OC in the field. Butt joints of adjacent pieces offset minimum 4 ft. Face layer installed with long dimension perpendicular to resilient channels and side joints centered between joists, staggered 24 in. OC from base layer. Gypsum panels secured with 1-5/8 in. long Type S bugle-head screws. Screws provided 1-1/2 and 4 in. and from side edges of the board 8 in. OC in the field. Butt joints of adjacent pieces offset minimum 4 ft. Butt joints of face layer offset minimum 2 ft. from butt joints of base layer.

NATIONAL GYPSUM CO — Type FSW-C

7. Batts and Blankets* — Mineral wool or glass fiber insulation, min 6 in. thick, bearing the UL Classification Marking for Surface Burning Characteristics. Insulation fitted in the concealed space, draped over the resilient channels.

8. Joint System — Not Shown — Vinyl, dry or premixed joint compound, applied in two coats to joints and screw heads; paper tape, 2 in. wide, embedded in first layer of compound over all joints.

* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.



www.dci-engineers.com
Seattle
Portland
Spokane
San Diego
Austin
Irvine
San Francisco
Anchorage
Los Angeles

October 26, 2016

Peng Li, S.E. CASp.
Senior Engineer
Department of Planning, Building, and Code Enforcement
City of San Jose, California

Re: UCSD Shake Table Test

Dear Sir:

DCI Engineers recently assisted UCSD with a shake table test for a CFS 6 story building. The test was intended to show how this type of building would perform during a design level seismic event. The following is a description of the building and how it was developed.

The floor plan was developed to represent a typical residential double loaded corridor layout. It was sized to be as large as possible and still fit on the UCSD shake table. The structure was ballooned framed with cold formed steel (CFS) walls and floors. The lateral system consisted of Sure-Board Series 200S diaphragms spanning between Sure-Board series 200 shearwalls. A standard Zone 4 tie-down system was utilized at the ends of each shearwall along with standard CFS compression studs. Standard gypsum board was provided on the non-shear walls. In order to capture all of the mass that would be typical for a building like this, steel mass plates were added to all of the floor levels and the roof. Each of the mass plates was bolted down at only two locations so that their mass could be captured in the shake table test but they would not add additional strength or stiffness to the floor diaphragms. These plates were sized to represent mass that would occur in a typical fully finished building from floor toppings, finishes, exterior stucco, etc. These finishes were not provided on the test building both for ease of construction and to provide better clarity on the behavior of the structural systems.

The final mass of the building and seismic forces were independently checked by UCSD. The mass was also confirmed by reviewing the shipping weight for all of the CFS.

The buildings lateral design was based 2012/2015 CBC design requirements for the materials used and the USGS ground motion for downtown Los Angeles. The Sure-Board series 200 screw attachment and the rod tie-down system were designed to resist this force based on code allowable values. The CFS compression studs and rods at the ends of the shearwalls were designed for omega level forces as required by ASCE 7-10 for an R=6.5.

The building was subjected to multiple shake tests. The test runs were 25%, 50%, 100% and 150% of design level events. A ground motion was selected which would represent an earthquake typically found on a fault in California. The earthquake was scaled to represent the above indicated percentages. The 150% ground motion was the maximum and represented the earthquake that would be the design basis under the current CBC.

After each earthquake the building was inspected for damage. All cracks and permanent wall displacements were noted. The damage for the 150% earthquake was very minor and was much less than what we would be predicted by the current CBC. Damage included some cracking of exterior walls and minor buckling of rim tracks. This is particularly interesting since the building was subjected to multiple lower level earthquakes before being subjected to the design level event.

It is DCI's opinion that the high performance was related to the following two key factors:

1. The balloon framing for the walls provides a more direct load path for the building shear to transfer loads down to the ground (shake table).
2. The compression post and rod tie-down systems seems to provide a high degree of seismic resilience, which is not adequately incorporated in the determination of the R-factor of 6.5. This is particularly true because the compression post and rods are designed for omega level forces. While this force amplification is a somewhat arbitrary code requirement and not based on explicit research, it does seem to reduce the level of damage you might see in a typical building at the ends of the shearwalls.

Based on the positive results of the shake table test DCI would have no concerns designing CFS buildings with Sureboard shearwalls up to seven or even eight stories.

Sincerely,
DCI Engineers

A handwritten signature in blue ink, appearing to read 'H. Jones II', with a stylized flourish at the end.

Harry Jones II PE, SE
Principal



Expanding Your Solutions

Corporate Headquarters
13191 Crossroads Pkwy N., Ste 325
City of Industry, CA 91746
Phone: 800.775.2362
Fax: 626.330.7598

Manufacturing Facilities
City of Industry, CA
Denver, CO
Ft. Worth, TX
Pittsburg, CA

Structural Engineering/Design
1001-A Pittsburgh Antioch Hwy
Pittsburg, CA 94565
Phone: 800.775.2362
Fax: 626.330.7598

Technical Services
13191 Crossroads Pkwy N., Ste 325
City of Industry, CA 91746
Phone: 800.416.2278
Fax: 626.249.5004

SURE-BOARD SERIES 200S-P (PITCHED ROOF) SHEATHING PANELS

Geometric Properties

Sure-Board® for Shear Series 200S-P (Pitched Roof) panels are 1/2" x 48" x 48" fiber cement panels backed with 33 mil (20 gauge) thick sheet of hot-dipped G40 galvanized steel for use in fire-rated roof sheathing assemblies. Each panel has a 2" overhang of steel to provide for backing at horizontal joints. G60 and G90 coated steel is available upon special request only, and will incur extended lead-times and delivery.

Steel Thickness

| Thickness (mil.) | Design Thickness (in.) ¹ | Minimum Thickness (in.) ^{1,2} | Yield (KSI) | Panel Sizes (in.) |
|------------------|-------------------------------------|--|-------------|-------------------|
| 33 | 0.0346 | 0.0329 | 33 | 1/2" x 48" x 48" |

Notes:

1. Uncoated steel thickness. Thickness is for carbon steel.
2. Minimum Thickness represents 95% of the design thickness and is the minimum acceptable thickness delivered to the job site, based on section A4.3 of the AISI S100-2012.

ASTM & Code Standards:

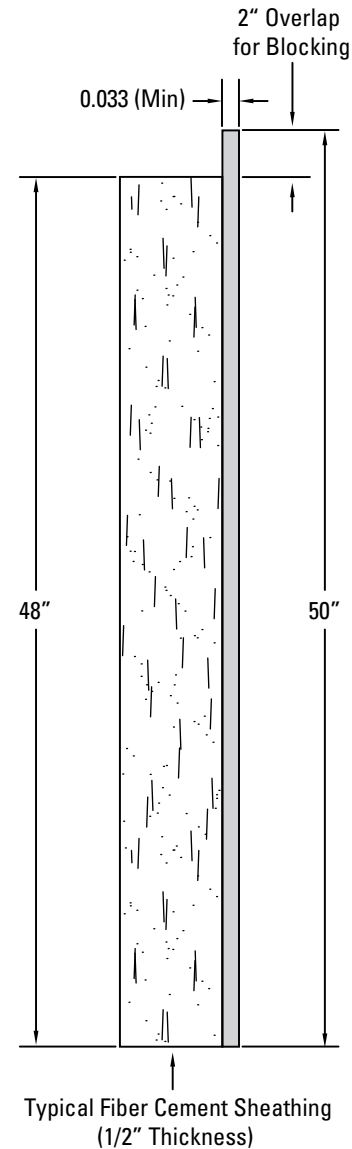
- C1325 (Cement Board)
- ASTM A653/653M, A924/924M & A1003/1003M
- IBC 2018 & 2021
- IRC 2018 & 2021
- CBC 2019
- IAPMO ER-126 & 185
- DSA Approved IR A-5
- UL H503 – UL Fire Test for 1 and 1-1/2 Hour assembly

CEMCO cold-formed steel framing products recycled steel:

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

LEED v4 for Building and Design Construction:

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



Technical Services

Technical Services: 800.416.2278
Structural Engineering/Design: 925.473.9340
www.cemcosteel.com



This technical information reflects the most current information available and supersedes any and all previous publications effective April 06, 2023.

04-06-23 AT



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SURE-BOARD SERIES 200S-F (FLOOR & FLAT-ROOF) SHEATHING PANELS

Geometric Properties

Sure-Board® for Shear Series 200S-F (Floor & Flat-Roof) panels are 3/4" x 48" x 48" fiber cement panels backed with 33 mil (20 gauge) thick sheet of hot-dipped G40 galvanized steel for use in fire-rated floor sheathing assemblies. Each panel has a 2" overhang of steel to provide for backing at horizontal joints. G60 and G90 coated steel is available upon special request only, and will incur extended lead-times and delivery.

Steel Thickness

| Thickness (mil.) | Design Thickness (in.) ¹ | Minimum Thickness (in.) ^{1,2} | Yield (KSI) | Panel Sizes (in.) |
|------------------|-------------------------------------|--|-------------|-------------------|
| 33 | 0.0346 | 0.0329 | 33 | 3/4" x 48" x 48" |

Notes:

- 1. Uncoated steel thickness. Thickness is for carbon steel.
- 2. Minimum Thickness represents 95% of the design thickness and is the minimum acceptable thickness delivered to the job site, based on section A4.3 of the AISI S100-2012

ASTM & Code Standards:

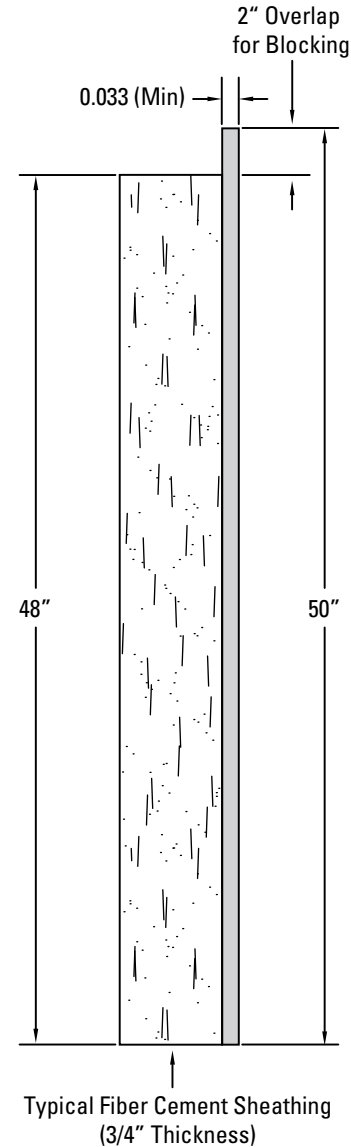
- C1325 (Cement Board)
- ASTM A653/653M, A924/924M & A1003/1003M
- IBC 2018 & 2021
- IRC 2018 & 2021
- CBC 2019
- IAPMO ER-126 & 185
- DSA Approved IR A-5
- UL H503 – UL Fire Test for 1 and 1-1/2 Hour assembly

CEMCO cold-formed steel framing products recycled steel:

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

LEED v4 for Building and Design Construction:

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



Technical Services

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SURE-BOARD®



SURE-BOARD® ...FOR SHEAR



Expanding Your Solutions

Improve the quality of your next framing project with *Sure-Board*[®]

The revolutionary *Sure-Board*[®] improves quality and successfully eliminates shear wall problems often encountered in the framing and construction process.

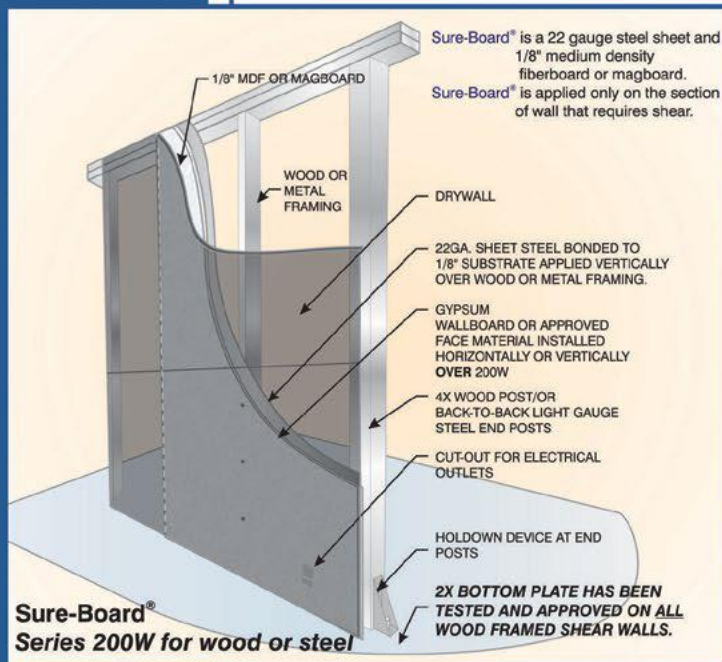


Sure-Board[®] Series 200

The *Sure-Board*[®] Series 200 Structural Shear Panels are Patented, IAPMO, ICC, DSA and City of Los Angeles approved products. The Series 200 is manufactured with a single 22 gage galvanized sheet of steel laminated to any manufactured version of gypsum panel with a water based EVA adhesive to create an incredibly STRONG shear panel that is 1 and 2 hour fire approved. Series 200W is also a Structural Shear Panel with one **Dynamic** difference. Since 200W is laminated to 1/8" MDF (medium density fiberboard) the attachment can be with nails or screws. This allows 200W to be attached to WOOD or STEEL framing members with exceptional results. 200W is used as a substrate shear panel and can be installed in the field or in a panelized process, saving even more time in the field. And as we all agree, TIME is MONEY.

Replace your Present Shear Panels with Sure-Board[®] Today

The use of cross bracing, brace frames and plywood sheathing are the commonly used methods of our time. For the first time you can reduce your **INSTALLED COSTS** relating to lateral shear by as much as 30%. Don't hesitate, you need to make the change TODAY.



Sure-Board[®] 200 and 200W require no additional furring of the interior and exterior surfaces. The Series 200W when used as shear panels on Wood framing, require only a 1 1/2" thick bottom plate per the tested and approved assemblies. This item alone reduces the cost of cutting all of the studs and posts and reduces the labor time of framing on the first floor shear walls FOREVER!



Sure-Board®

is available through California Expanded Metal Products, Inc., (CEMCO)

Founded in 1974, CEMCO is recognized as the largest manufacturer of steel framing and metal lath systems in the Western United States.

With over 125 years combined experience in the manufacturing and marketing of steel products, there is no question why architects specify and contractors alike, request CEMCO products on more projects than any other manufacturer.

CEMCO's commitment to quality and service has awarded them some of the most prestigious projects ever built. CEMCO provided all of the steel framing and lath products for the most talked about construction project this century; The Getty Museum. 4.4 million feet of steel studs and track were produced and not one shipment was missed or one quality complaint received. More recently, over 3 million Sq. ft. of Sure-Board® structural panel were used on the West Coast alone. Sure-Board® is quickly becoming the shear panel of choice on many large steel and wood framing projects in the United States.

CEMCO distributes their products throughout the Western United States, Canada, Mexico and the Pacific Rim.

CEMCO products are available through a network of national building material dealers. We also continue to work very closely with the contractors for technical assistance, specifications, and submittals to ensure that quality and service remain synonymous with the CEMCO name.

Performance of Sure-Board®

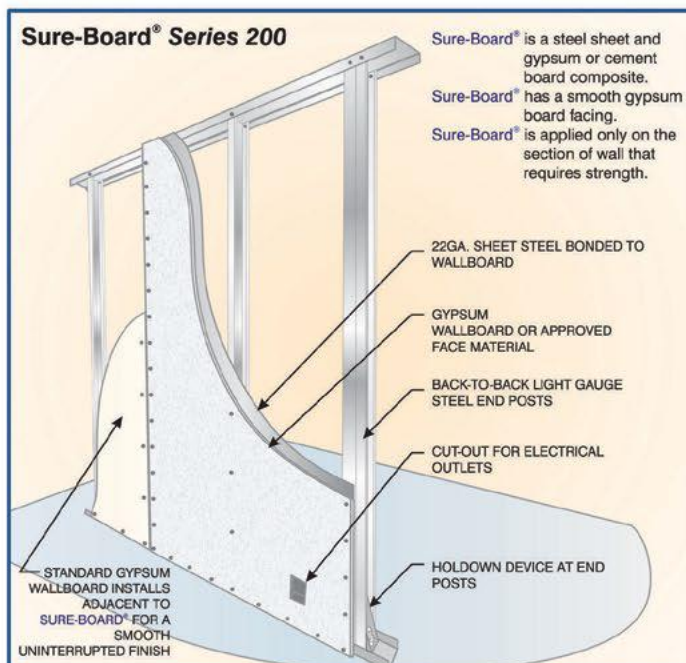
Sure-Board® has the highest tested strength to resist lateral load as well as significantly reduced lateral movement available with shear panel sheathing TODAY. Our patented products guarantee these tested results for our customers.

Sure-Board® has been tested with rigorous reverse cyclic testing protocol, unlike the accepted monotonic method used in the past. Our results are guaranteed to provide you with the safest and most reliable earthquake protection available. Our Series 200W has the ability to produce a wood framed shear wall that can perform far beyond anything that has been built in the past. Design your buildings with Sure-Board® "for Shear" TODAY.

Reduced Costs and Stronger Walls using Sure-Board®

Sure-Board® Series 200 and 200W have revolutionized the Wood and Light Gage framing industry. The reduced **Installed Costs** of Sure-Board® can also save time during the construction phase. Sure-Board® has exceptional resistance to earthquake as well as unequaled 1 and 2 hour fire performance.

Use Sure-Board® Series 200 and 200W on all of your Future Projects "for Shear".





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SURE-BOARD SERIES 200

Geometric Properties

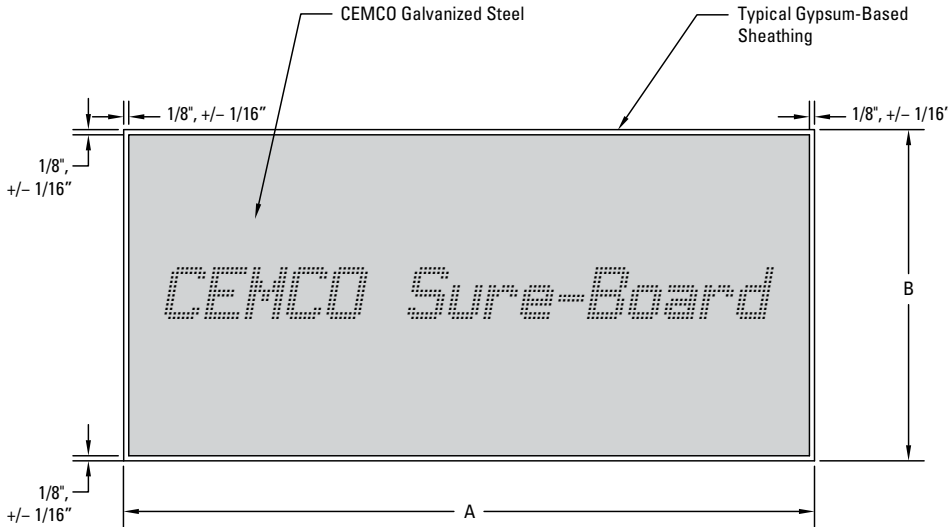
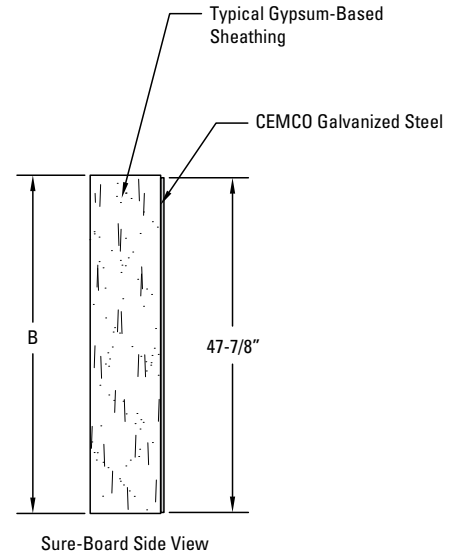
Sure-Board® Series 200 for Steel Framing is a steel sheet and gypsum board composite product that is installed on steel framed shearwalls at points requiring shear.

Steel Thickness

| Length A (ft.) | Width B (ft.) | Sheathing Thickness (in.) | Steel Thickness Gauge (mil.) |
|----------------|---------------|---------------------------|------------------------------|
| 8, 9, 10, & 12 | 48 | 1/2 to 3/4 | 22 (27) |

Notes:

1. Requests for a specific brand of gypsum drywall must be made at the time of order.
2. Ordering certain specialty non-stock gypsum/cement board products, may result in extended lead-times.



ASTM & Code Standards:

- ASTM A653/653M, A924/924M & A1003/1003M (Steel)
- ASTM C1177, C1278, C1325 (Cement Board), C1396
- IBC 2018 & 2021
- IRC 2018 & 2021
- CBC 2019
- IAPMO ER-126 & 185
- DSA Approved IR A-5

CEMCO cold-formed steel framing products recycled steel:

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

LEED v4 for Building and Design Construction:

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

Technical Services

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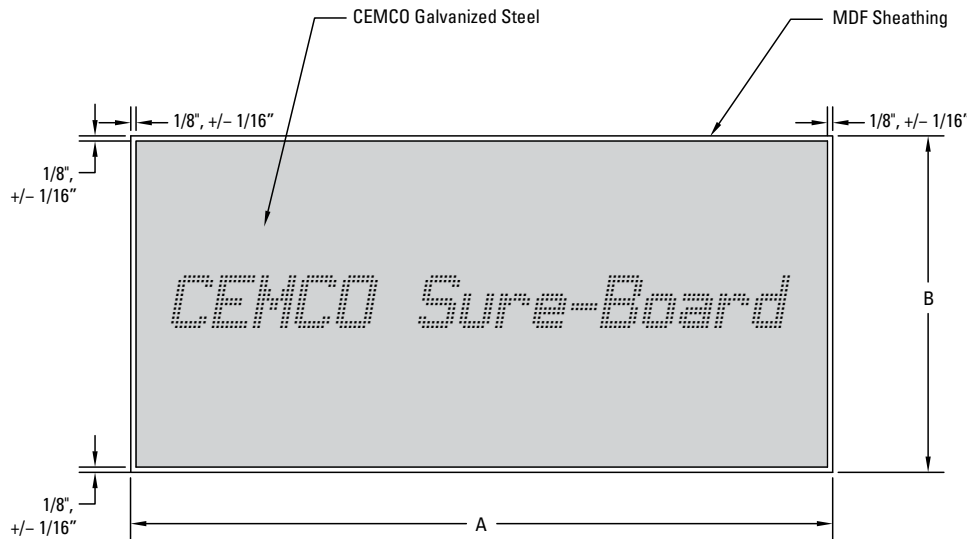
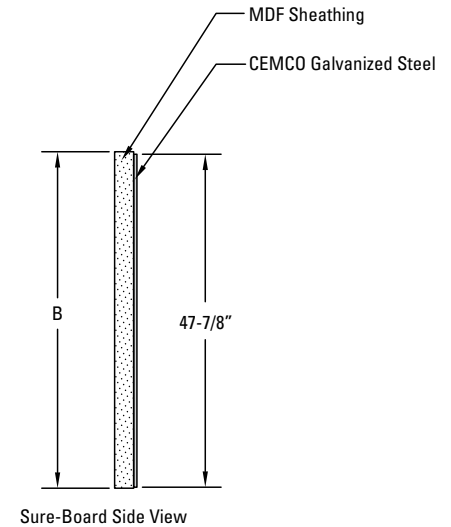
SURE-BOARD SERIES 200W

Geometric Properties

Sure-Board®W for Steel framing and Series 200W for Wood Framing are a steel sheet and medium density fiber board composite product that is installed on steel or wood framed shear walls at points requiring shear.

Steel Thickness

| Length A (ft.) | Width B (ft.) | Sheathing Thickness (in.) | Steel Thickness Gauge (mil.) |
|----------------|---------------|---------------------------|------------------------------|
| 8, 9, & 10 | 48 | 1/8 | 22 (27) |



ASTM & Code Standards:

- ASTM A653/653M, A924/924M & A1003/1003M (Steel)
- ASTM C1325 (Cement Board)
- IBC 2018 & 2021
- IRC 2018 & 2021
- CBC 2019
- IAPMO ER-126 & 185
- DSA Approved IR A-5

CEMCO cold-formed steel framing products recycled steel:

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- Post-Consumer: 19.8%
- Pre-Consumer: 14.4%

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- MR Credit: Construction and Demolition Waste Management.
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- MR Credit: Building Product Disclosure and Optimization – Environmental Product Declarations, Options 1 & 2.
- MR Credit: Building Product Disclosure and Optimization – Material Ingredients, Option 1.
- MR Credit: Building Life-Cycle Impact Reduction, Option 4.

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P: 925.473.9340 | **F:** 925.473.9341

Commerce City Colorado Manufacturing Facility

9410 Heinz Way, Commerce City, CO 80640

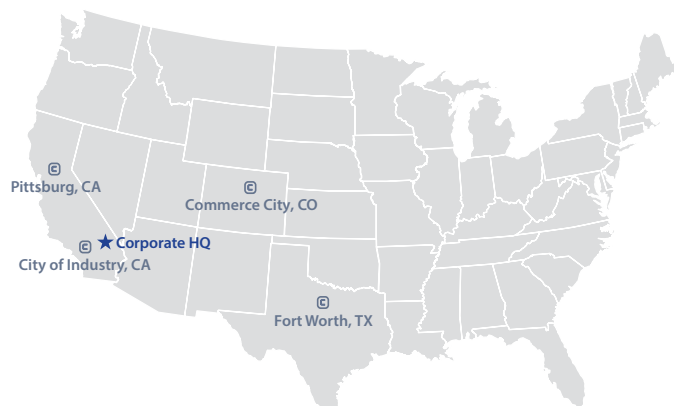
P: 303.572.3626 | **F:** 303.572.3627

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8600 Will Rogers Blvd, Fort Worth, TX 76140

P: 817.568.1525 | **F:** 817.568.2759

www.cemcosteel.com



Effective 02/03/2026