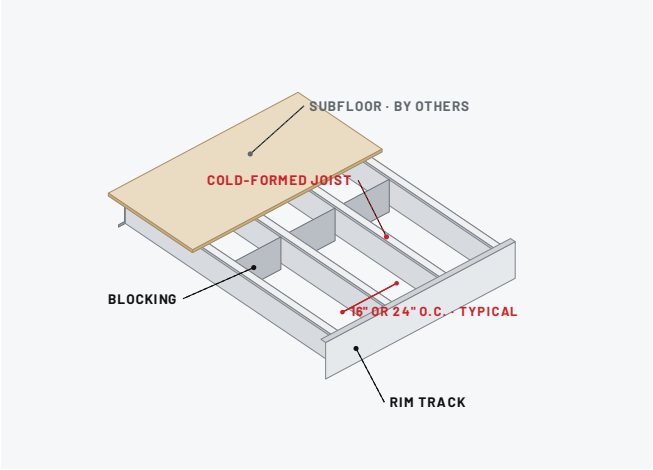
LSF COLD-FORMED JOIST FRAMING SYSTEM

Cold-formed joists, rim track and accessories for light steel framed floors and roofs



PRODUCT 03 · LSF FLOORING SYSTEM

Cold-formed steel joists for light steel framed (LSF) floors, mezzanines and roofs. A cold-formed joist floor is light, dry and non-combustible, and it goes up with the same tools and screws as steel stud walls. Joists sit side by side at a set spacing, rim track caps their ends, and bridging, blocking and the subfloor keep them straight.

- 88 sections: depths 6", 8", 10", 12" and 14"
- Flanges 1-5/8" to 3", with 1/2" or 5/8" lips
- Thickness 43 to 97 mil for floors; 33 mil also offered at 6" and 8"
- Matching rim track in every depth
- Commonly used for clear spans of about 10 to 30 ft
- Hot-dip galvanized G60 steel

DEPTHS	FLANGES	LIPS	THICKNESS	MIN. YIELD	COATING
6" – 14"	1-5/8" – 3"	1/2" · 5/8"	43 – 97 mil	33 · 50 ksi	G60 · Z180

1 WHERE IT IS USED

- Floors in mid-rise and low-rise steel-framed buildings
- Mezzanines and platforms
- Flat and sloped roofs, and ceiling joists
- Infill floors in steel or concrete frames

DESIGNED BY AN ENGINEER

Floor joists need a structural design. Joist size, spacing, span, bracing, web stiffeners and connections come from the project's design professional.

2 PART NUMBER

1000	S	162	-54
WEB DEPTH	MEMBER	FLANGE	THICKNESS
1/100 in · 1000 = 10"	S = stud · T = track	1/100 in · 162 = 1-5/8"	mils · 54 = 0.054" min.

Joists use the same four-part designator as studs: depth and flange in 1/100 inch, S for stud or joist, thickness in mils. Rim track uses T. Example: 1000S162-54 joist with 1000T125-54 rim track.

3 THE PARTS OF A COLD-FORMED JOIST FLOOR

PART	WHAT IT DOES	TYPICAL MEMBER
Cold-formed joist	Spans between walls or beams and carries the floor	C-section 6"–14", 43–97 mil
Rim track	Caps the joist ends and holds them in line	Track of the same depth
Web stiffener	Stiffens the web at bearings and point loads	Stud or track piece
Blocking & bridging	Keeps joists straight and stops them rolling	Track pieces, strap, channel
Clips	Fix joists to rim track, headers and beams	Joist end and support clips
Subfloor	Floor surface; braces the top flange	Sheathing or steel deck, by others

STEEL
Steel is a non-combustible material

DIMENSIONALLY STABLE
Steel does not rot, shrink, warp or twist with moisture

ORDERED TO LENGTH
Joists come in the length you order

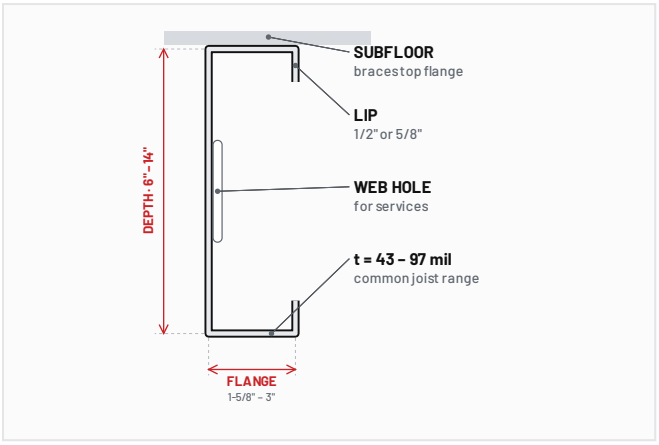
RECYCLABLE
Offcuts and scrap steel can be recycled

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PROFILE, SIZES & WEIGHTS

88 cold-formed joist sections · 6" to 14" deep

4 JOIST PROFILE



Section not to scale. Depth and flange are outside dimensions.

AT A GLANCE

SECTION	Cold-formed joist with lips
DEPTHS	6" · 8" · 10" · 12" · 14"
FLANGES	1-5/8" · 2" · 2-1/2" · 3"
LIPS	1/2" (S162) · 5/8" (S200–S300)
THICKNESS	43 · 54 · 68 · 97 mil
LENGTHS	Any length you order
STANDARD	ASTM C955 · CSA S136 design

5 SIZES OFFERED & APPROXIMATE WEIGHT, LB/FT

JOIST	DEPTH	FLANGE	33 MIL	43 MIL	54 MIL	68 MIL	97 MIL
600S162	6"	1-5/8"	1.17	**1.52**	**1.89**	**2.36**	**3.29**
600S200		2"	1.29	**1.67**	**2.09**	**2.60**	**3.63**
600S250		2-1/2"	1.41	**1.83**	**2.28**	**2.84**	**3.98**
600S300		3"	1.52	**1.98**	**2.47**	**3.09**	**4.32**
800S162	8"	1-5/8"	1.41	**1.83**	**2.28**	**2.84**	**3.98**
800S200		2"	1.52	**1.98**	**2.47**	**3.09**	**4.32**
800S250		2-1/2"	1.64	**2.13**	**2.66**	**3.33**	**4.67**
800S300		3"	1.76	**2.29**	**2.86**	**3.57**	**5.02**
1000S162	10"	1-5/8"	–	2.13	**2.66**	**3.33**	**4.67**
1000S200		2"	–	2.29	**2.86**	**3.57**	**5.02**
1000S250		2-1/2"	–	2.44	**3.05**	**3.81**	**5.36**
1000S300		3"	–	2.59	**3.24**	**4.06**	**5.71**
1200S162	12"	1-5/8"	–	2.44	3.05	**3.81**	**5.36**
1200S200		2"	–	2.59	3.24	**4.06**	**5.71**
1200S250		2-1/2"	–	2.75	3.43	**4.30**	**6.05**
1200S300		3"	–	2.90	3.63	**4.54**	**6.40**
1400S162	14"	1-5/8"	–	2.75	3.43	**4.30**	**6.05**
1400S200		2"	–	2.90	3.63	**4.54**	**6.40**
1400S250		2-1/2"	–	3.06	3.82	**4.78**	**6.75**
1400S300		3"	–	3.21	4.01	**5.03**	**7.09**

Bold = thickness commonly used as a floor joist at that depth; grey = also offered, used more as a stud or track. A dash means not offered. Approximate weights from nominal dimensions, base steel only; for handling and shipping estimates, not for design. 1 lb/ft = 1.488 kg/m.

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RIM TRACK, MATERIAL & USES

What goes with the joists, and the steel they use

6 RIM TRACK

RIM TRACK	DEPTH	LEGS	THICKNESSES, MIL
600T	6"	1-1/4" · 2" · 3"	33 · 43 · 54 · 68 · 97
800T	8"	1-1/4" · 2" · 3"	33 · 43 · 54 · 68 · 97
1000T	10"	1-1/4" · 2" · 3"	33 · 43 · 54 · 68 · 97
1200T	12"	1-1/4" · 2" · 3"	43 · 54 · 68 · 97
1400T	14"	1-1/4" · 2" · 3"	43 · 54 · 68 · 97

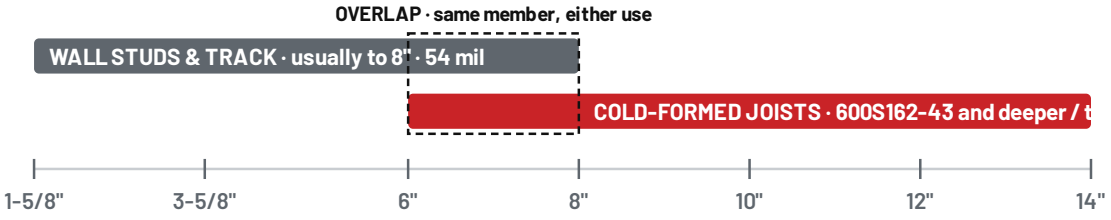
Rim track has the same depth as the joists and no lips. It caps the joist ends, carries loads from walls above, and is usually the same thickness as the joists or as the design requires.

7 MATERIAL BY THICKNESS

THICKNESS	GAUGE REF.	MIN. BASE STEEL	DESIGN THICKNESS	MIN. YIELD	COLOUR
33	20 ga	0.033" · 0.84 mm	0.0346" · 0.88 mm	33 ksi · 230 MPa	White
43	18 ga	0.043" · 1.09 mm	0.0451" · 1.15 mm	33 ksi · 230 MPa	Yellow
54	16 ga	0.054" · 1.37 mm	0.0566" · 1.44 mm	50 ksi · 340 MPa	Green
68	14 ga	0.068" · 1.73 mm	0.0713" · 1.81 mm	50 ksi · 340 MPa	Orange
97	12 ga	0.097" · 2.46 mm	0.1017" · 2.58 mm	50 ksi · 340 MPa	Red

Steel to ASTM A1003/A1003M, G60 (Z180) hot-dip zinc coating to ASTM A653/A653M, members to ASTM C955. Thickness is minimum base steel without coating; specify by mils. Where 54 mil or heavier is used, show the 50 ksi yield on the drawings.

8 STUD OR JOIST?



From 600S162-43 up, the same C-section can work as a wall stud or a floor joist. Walls seldom go past 8" deep and 54 mil; deeper and heavier sections are used mainly as joists. The part number is the same either way.

SPANS & SPACING

Cold-formed joist floors are commonly used for clear spans of about 10 to 30 ft, with joists at 12", 16" or 24" o.c. Deeper, wider and thicker sections span farther; two-span (continuous) joists can span farther than single spans. The allowable span for a given floor depends on the dead and live loads, the deflection limit, the spacing and the bracing, and is set by the design professional.

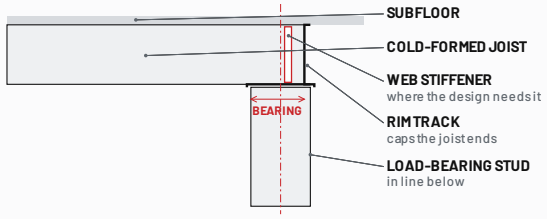
9 WHAT CHANGES THE SPAN

SPAN GOES UP WITH	SPAN GOES DOWN WITH
↑ Deeper joist	↓ Heavier dead or live load
↑ Thicker steel	↓ Stricter deflection limit (L/480)
↑ Wider flange	↓ Wider spacing
↑ Closer spacing	↓ Point loads or openings
↑ Continuous over two spans	↓ Short bearing or less bracing

FLOOR SYSTEM & DETAILS

Bearing, web stiffeners, holes and bridging

10 BEARING AT A WALL



Joists bear on the wall below, in line with the studs where the design calls for it. Bearing length, web stiffeners and clips are set by the design; engineered tables usually state the bearing length they assume.

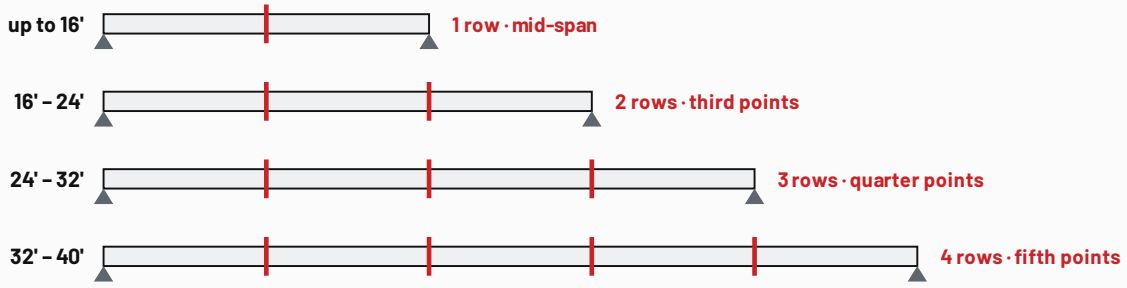
11 WEB STIFFENERS

- Short stud or track pieces fixed to the joist web
- Commonly at interior supports, and at end supports where loads are high or bearing is short
- Under concentrated loads, such as posts and walls above
- Size, length and screws as the design requires

12 HOLES IN JOISTS

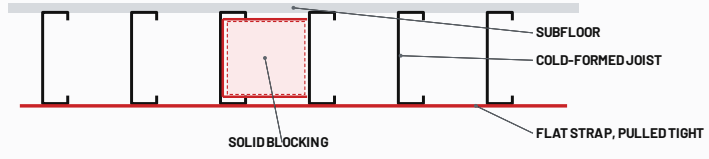
- Run services through the web knockouts, on the centreline
- Keep holes away from bearings and point loads
- Holes cut on site, or larger than the knockouts, need the designer's approval and may need reinforcing
- Never cut or notch flanges or lips

13 BRIDGING ROWS BY SPAN



A common pattern for joist bridging rows, set at equal spacing along the span. The subfloor braces the top flange; bridging and blocking brace the bottom flange and stop the joists rolling. Number, spacing and type of bridging follow the design to CSA S136.

14 STRAP BRIDGING & BLOCKING



A common method: flat steel strap screwed to the bottom flange of every joist and pulled tight, with solid blocking between joists at intervals and at the ends of each strap run. Internal bridging with channel through the knockouts is another option. Strap size, blocking spacing and screws follow the design.

FLOOR VIBRATION

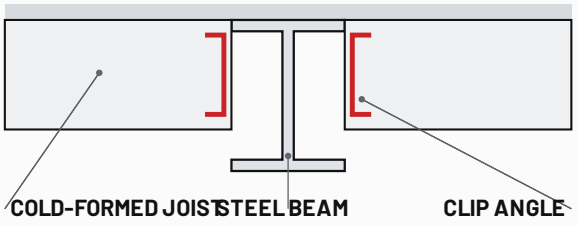
A floor can be strong enough and still feel lively underfoot. Stiffer joists, closer spacing, a stiffer subfloor, bridging and strongbacks all help. Comfort criteria are part of the design.

CONNECTION DETAILS

How cold-formed joists meet beams, walls, concrete and openings

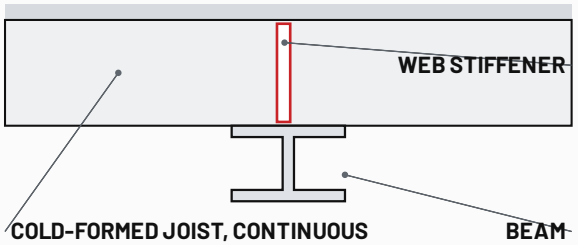
15 TYPICAL CONNECTION DETAILS

HUNG FLUSH ON A STEEL BEAM



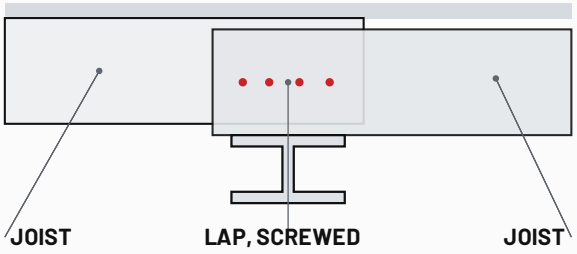
Joist ends meet the beam web and are fixed with clip angles; the top of the joists sits level with the beam.

ONE JOIST OVER A MIDDLE SUPPORT



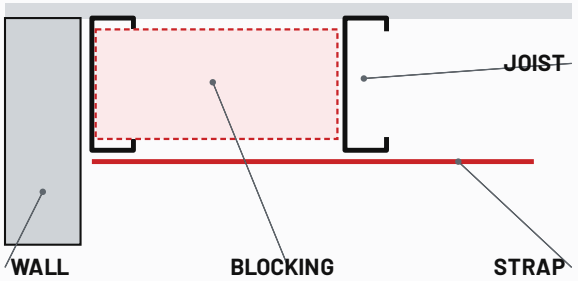
Joist runs over the support as one piece; web stiffeners at the support where the design needs them.

TWO JOISTS LAPPED ON A SUPPORT



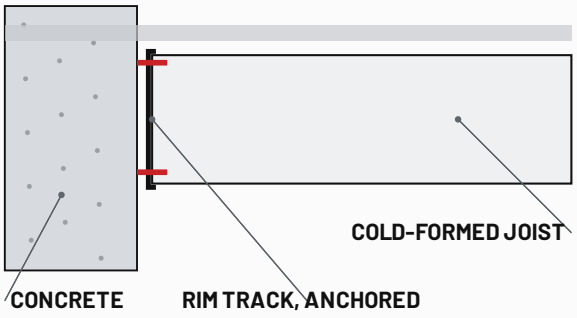
Two joists overlap on the support and are screwed together, as detailed.

EDGE JOIST BESIDE A WALL



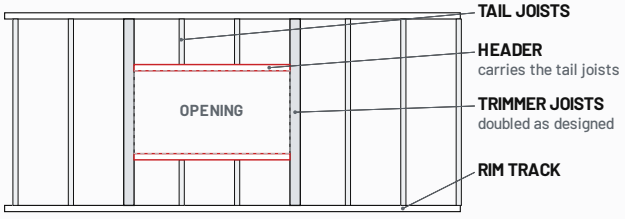
The edge joist runs beside the wall; blocking and strap tie it back to the next joists.

RIM TRACK ON A CONCRETE WALL



Rim track is anchored to the wall and joists are fixed to the rim track or clip angles.

HEADER & TRIMMERS AT AN OPENING



Tail joists hang from a header, which passes their load to doubled trimmer joists.

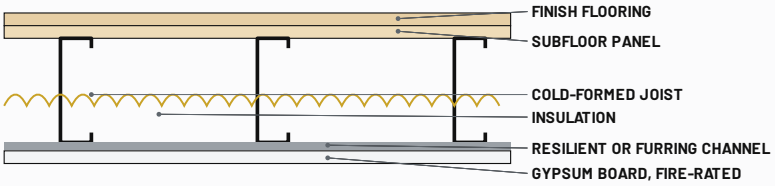
Schematic details for orientation only, not to scale. Every connection, clip, screw pattern, anchor and stiffener is set by the design professional and shown on the shop drawings.

FIRE & SOUND

Floor-ceiling assemblies built with cold-formed joists

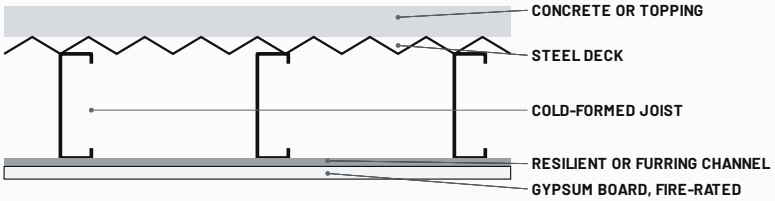
16 FIRE-RATED FLOOR & CEILING ASSEMBLIES

Steel joist floors are commonly built to listed fire-resistance designs. Ratings from 3/4 hour to 2 hours are common, depending on the subfloor, the ceiling and the number of gypsum board layers. Three common families are shown.



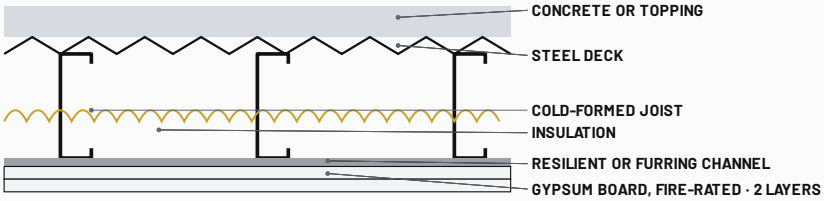
PANEL SUBFLOOR

Structural wood panel subfloor and finish flooring on the joists, insulation between joists, gypsum board on channels below.



STEEL DECK & CONCRETE

Steel deck screwed to the joists with a concrete slab or topping, and a gypsum board ceiling on channels below.



DECK, TOPPING & 2 LAYERS

Steel deck with topping, insulation between joists, and two layers of fire-rated gypsum board for higher ratings.

A RATING BELONGS TO THE LISTED DESIGN

A fire-resistance rating (CAN/ULC-S101) applies only to a tested and listed assembly, built exactly as listed: joist depth, thickness and spacing, subfloor, bridging, channels, board type and layers, screws and insulation. Pick a listing that covers the products being used, and follow every item in it. Ask us which listings may suit your project.

17 SOUND CONTROL

- STC (airborne sound) and IIC (impact sound) depend on the whole floor-ceiling assembly
- Resilient channels or isolation clips under the joists cut sound passing through
- Insulation between joists and a heavier subfloor or topping help
- Seal the edges and penetrations; the details matter as much as the parts

Schematic sections only. They are not listed designs and do not carry a rating.

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DESIGN, INSTALLATION & ORDERING

General guidance for design professionals and installers

18 WHAT THE DESIGN CHECKS

- **Bending** strength under floor load
- **Deflection** against the limit
- **Shear and web crippling** at bearings and point loads
- **Bracing** against lateral-torsional buckling
- **Vibration** for comfort
- **Connections** clips, screws and anchors

19 TYPICAL INSTALLATION

1. Fix rim track to the wall or beam below as designed.
2. Set joists at the design spacing, in line with the studs below where required.
3. Fix each joist to the rim track with clips or screws as detailed.
4. Add web stiffeners, blocking and bridging as designed.
5. Install the subfloor and fasten it to every joist.

General information only, not installation instructions. Install to the structural drawings, ASTM C1007 where applicable, and the building code.

20 DESIGN CRITERIA COMMONLY SPECIFIED

ITEM	COMMONLY SPECIFIED	GOVERNED BY
Live-load deflection, floors	L/360; L/480 for stiffer floors	Project specification
Total-load deflection, floors	L/240	Project specification
Deflection, roofs	L/240 to L/360, by finish	Project specification
Joist spacing	12" · 16" · 19.2" · 24" o.c.	Design
Bottom flange bracing	Bridging rows as designed	CSA S136 and design
End bearing	As designed; tables state their assumption	Design
Floor loads	National Building Code of Canada	Building code

Listed for orientation only. The building code, the project specification and the design professional govern every project.

ENGINEERED SELECTION TABLES

Our part numbers follow the CSSBI standard section designations. Confirm with us which engineered tables apply before relying on them, and have the final joist selection made by the engineer of record.

21 STANDARDS

- ASTM C955 · structural members
- ASTM A1003 · A653 · steel & coating
- CSA S136 · design
- AISI S240 · structural framing
- National Building Code of Canada

22 TYPICAL SCREWS

- Self-drilling, point rated for the total steel thickness
- Size and spacing as designed
- See our Fastening guide

23 STORAGE

Store bundles dry, off the ground and under ventilated cover. Lift long joists with spreader bars so they don't bend. Edges are sharp: use gloves and appropriate PPE.

24 TYPICAL SUBMITTALS

- Shop drawings sealed by a professional engineer
- Joist layout, connections, web stiffeners and bridging
- Engineering calculations, when requested
- Material test reports for steel and coating
- Product data for joists, track, clips and fasteners
- Proof of certification for the framing members

25 BEFORE YOU ORDER: CHECKLIST

- Joist part number and thickness from the structural drawings
- Lengths and quantities from the takeoff
- Rim track of the same depth
- Web stiffener and blocking pieces
- Bridging, strap and clips
- Screws and anchors

SPECIFYING & NOTICE

Specification outline, certification and notice

26 SPECIFICATION OUTLINE · 05 42 00

Part 1 General: design by a professional engineer to CSA S136 and the National Building Code; deflection and vibration criteria; submittals; quality assurance.

Part 2 Products: cold-formed steel joists and rim track to ASTM C955, steel to ASTM A1003, minimum yield 33 ksi (33–43 mil) and 50 ksi (54–97 mil), G60 coating to ASTM A653; sizes per the structural drawings; Saturn Metal DS-03; web stiffeners, bridging, clips and fasteners as shown.

Part 3 Execution: install to the shop drawings; bearing, bracing and bridging; protection of joists before the subfloor; touch-up of damaged coating; field review.

Certification: our cold-formed framing members are product certified by CISC to CSSBI 61:24. Certification covers only the members named in our current Product Scope Listing; confirm the status of a specific member with us before relying on it.

Related: load-bearing studs DS-02 · track Product 04 · clips and connectors Product 22.

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IMPORTANT NOTICE

This data sheet gives general product information only. It is not engineering, design or installation advice. A qualified design professional must review every application, and the building code and project documents always govern. It does not give span tables, load tables or section properties. Drawings are schematic and not to scale; dimensions are nominal and subject to standard tolerances. Values marked typical, approximate or commonly specified are for reference only. Standards are referenced by name for identification; always use the edition required by the governing code. Saturn Metal may change products and information without notice; confirm current data before ordering or specifying. Warranties and remedies, if any, are only those in Saturn Metal's written terms of sale. Names of standards bodies and certification programs belong to their owners. Saturn Metal is a manufacturer and/or supplier of metal products; this data sheet does not mean that the product shown is manufactured by Saturn Metal.

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