

**LIGHTWEIGHT  
STRUCTURAL FRAMING SYSTEM  
FOR  
COMMERCIAL AND RESIDENTIAL CONSTRUCTION**

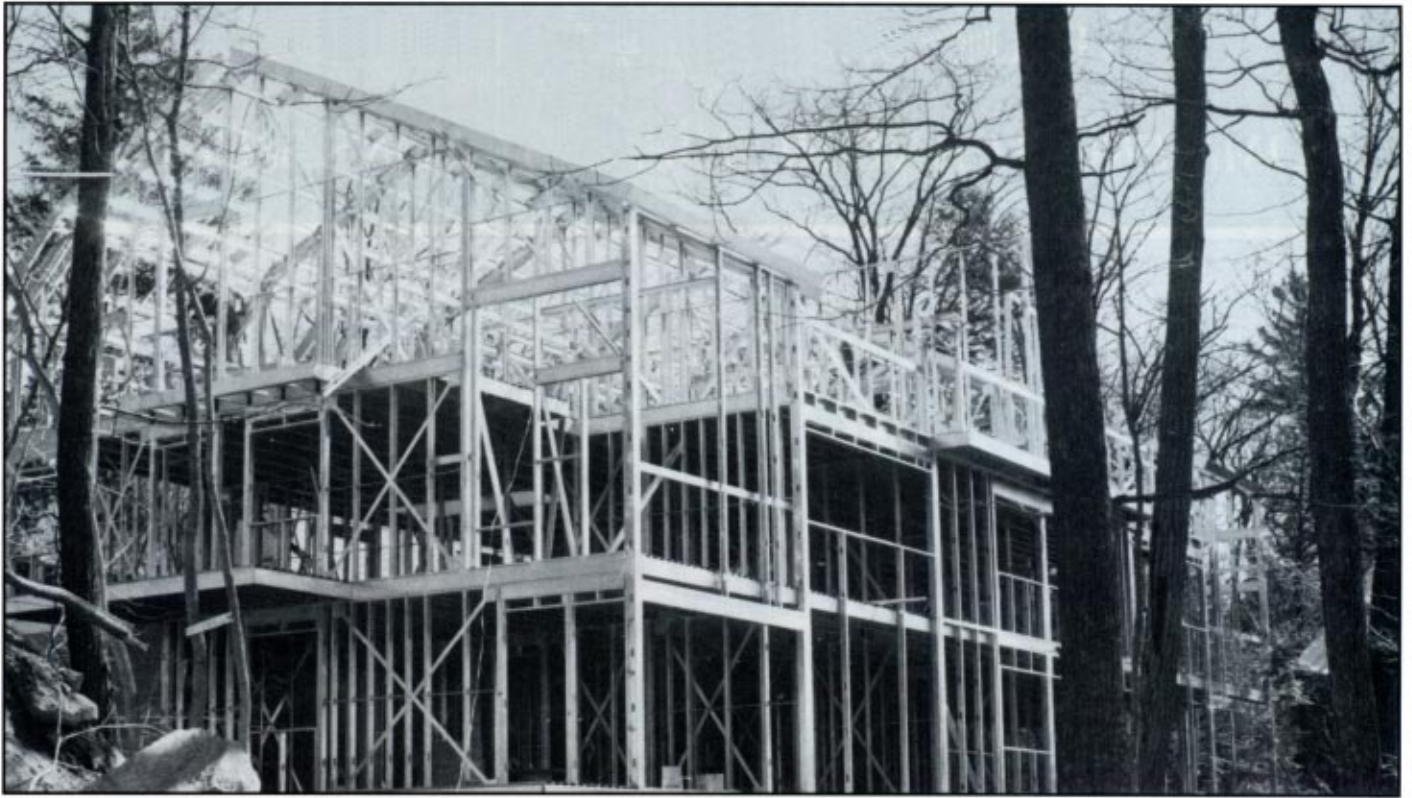


**BAILEY**



THE BAILEY GROUP  
OF  
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**BEFORE:** Typical stud and joist construction in a three story axial load bearing project. Visible are the cantilevered balconies, floor, roof, and wall assemblies.



**AFTER** The building after application of exterior grade sheathing and finished with metal siding. The Bailey/Mantane steel framing systems are compatible with most exterior cladding materials such as brick, stucco, siding etc.

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## LEADERS IN THE CANADIAN CONSTRUCTION PRODUCTS INDUSTRY

Bailey Metal Products Limited and Mantane Construction Products Limited are proud of their position as the premier manufacturers of a complete line of wall and ceiling systems for the construction industry in Canada.

In addition to Lightweight Steel Framing Systems, the Bailey Group of Companies manufacture a comprehensive product line including drywall studs, track, trims, metal lath, suspended acoustic ceiling systems, agricultural roofing, siding and eavestrouthing.

With manufacturing facilities in Toronto, Vancouver, Calgary, Cambridge and Montreal, The Bailey Group of Companies are well positioned to provide the service upon which, our Companies have built their reputation.

### Building with the BAILEY Residential Steel Framing System

The details and load tables within the Bailey Lightweight Structural Framing System Manual are equally applicable to both commercial and residential construction.

The residential home building industry is converting from conventional lumber framing to steel framing in single and multiple family buildings.

Building with the Bailey Residential Steel Framing System:

- Offers substantial cost savings
- Meets all Hydro and building codes requirements
- Ensures straight walls and floors
- Offers rapid assembly of pre-cut sections, shipped complete with pre-punched service knockouts

Please contact Bailey Metal Products for additional information on your residential projects.

## SCOPE OF THIS BROCHURE

As the Industry Leaders in Steel Framing Systems development, Bailey Metal Products Limited and Mantane Construction Products Limited realize the need for a comprehensive Lightweight Steel Framing Systems (LSF) brochure. This manual, covering both stud and joist systems and conforming to the requirements of CAN3-S136-84 LIMIT STATES DESIGN, fulfills that need.

The enclosed tables were developed by Mr. Tom Trestain, P.Eng., an independent Structural Engineer, who is recognized as an authority in the field of lightweight steel framing construction.

**These tables can be used by architects and engineers with the knowledge and comfort that a number of structural effects, so often ignored in other LSF product literature, have been included.**

*These effects include the influence of cut-outs on the axial capacity of studs and on the moment and shear capacity of studs and joists. The engineering for the cut-outs has been based on the latest testing by the American Iron and Steel Institute and the Metal Lath Steel Framing Association. This research has been supplemented by some further work based on finite element studies. Also included is the concept of the "all steel design approach" where designers can engineer their wall systems without relying on the sometimes nebulous restraint of sheathings. The "all steel" approach incorporates an explicit treatment of warping torsion, a secondary effect which always occurs when studs are loaded by wind.*

We suggest the use of this brochure in conjunction with the following CSSBI publications:

1. "Lightweight Steel Framing Manual" – CSSBI publication, dated August 1988 which provides an overview of the LSF industry, the benefits of this type of construction, suggested contractual arrangement for a typical LSF project and a Guide Specification which is designed to be incorporated in its entirety into your project contract documents.
2. "Lightweight Steel Framing Design Manual" – CSSBI publication, dated July 1991 which includes worked examples to help you design and detail you wall and floor systems.
3. "Guide Specification for Lightweight Steel Framing – CSSBI S6-9Ø". This document is similar to the Guide Specification in Reference 1 except that it can be incorporated into your contract documents by simply referencing "CSSBI S6-9Ø". LSF joists, rafters, axial load bearing studs and wind bearing studs are included.
4. "Guide Specification for Wind Bearing Steel Studs – CSSBI S5-9Ø". This document is a shorter version of Reference 3 covering wind bearing studs only.

We are pleased to make this brochure available to the industry. We are here to serve you!

## INTRODUCTION

The technical data in this brochure is intended as an aid to the design professional and should not be used to replace the judgment of a qualified Engineer or Architect.

## 1. WALL STUD, TRACK AND FLOOR JOIST SECTION PROPERTIES

### 1.1 General

- .1 Structural properties are computed in accordance with CSA Standard CAN3 S136-84 Cold Formed Steel Structural Members (Limit States Design).
- .2 Steel meets the requirements of ASTM A446 Standard Specification for Steel Sheet, Zinc Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality. Galvanized coating is to a minimum G90 (Z275), a 50% heavier coating than the G60 (Z180) recommended by the CSSBI Guide Specification for Lightweight Steel Framing S6-90. Minimum grades are:
  - Grade A, 33 ksi (228 Mpa) minimum yield, for .048" material and thinner.
  - Grade D, 50 ksi (345 Mpa) minimum yield, for .060" material and thicker.
- .3 Section properties are computed on the basis of the black metal thicknesses shown. The under-run in thickness permitted by ASTM A446 is not accounted for in the design calculations.
- .4 Weights per foot are based on uncoated, unperforated steel.
- .5 Moment and shear capacities have been reduced to account for the effects of the web perforations.
- .6 Perforations are assumed to be spaced at a minimum of 24" o.c. The distance from the centreline of the last perforation to the end of the member is assumed to be 12" minimum for studs and 24" minimum for joists.
- .7 The increase in yield from the cold work of forming has been conservatively neglected in the calculations.

### 2.2 Wall Stud Section Properties

- .1 The moment of inertia,  $I_x$ , is a fully effective inertia for checking serviceability only. The studs are fully effective at specified load levels.
- .2 Factored web crippling,  $P_r$ , assumes 1" of bearing.

### 2.3 Track Section Properties

- .1 Factored moment,  $M_{rx}$ , assumes  $F_c = F_y$  therefore CAN3 S136-84 Clause 6.4.2.3 is not checked.
- .2 The deflection inertia,  $I_x$ , includes the effects of local buckling at the stress level resulting from specified live loads only.

### 2.4 Joist Section Properties

- .1 The moment of inertia,  $I_x$ , is for checking serviceability only. The joists are fully effective at specified load levels.

## 2. WIND BEARING STUDS MAXIMUM ALLOWABLE HEIGHT TABLE SHEATHED AND UNSHEATHED

### 3.1 General

- .1 The allowable heights are computed in accordance with the requirements of the National Building Code of Canada 1985 and CAN3-S136-84 Cold Formed Steel Structural Members, Limit States Design.
- .2 Stud material, geometry and properties conform to the Wall Stud Section Properties Table and Commentary Items 2.1 to 2.2.

- .3 Asterisks indicate span lengths where the factored end reaction exceeds the factored web crippling resistance,  $P_r$ .
- .4 Design end connections for the applied wind shear. Where asterisks occur reduce the allowable span or design end connections that are not susceptible to web crippling.
- .5 Refer to the Design Example for Wind Bearing Studs.

### 3.2 Sheathed Allowable Heights

- .1 The "Sheathed" allowable heights are limited by end shear or midspan moment. Sheathing providing full lateral support on both sides of the studs is assumed. The sheathings are to have adequate strength and rigidity to prevent the studs from buckling laterally and to resist the torsional component of loads not applied through the shear centre. Loads are assumed to be uniformly distributed.
- .2 Provide bridging at 5'-0" o.c., or less, in order to align members during erection and to provide the necessary structural integrity during construction as well as in the completed structure. Design the bridging to prevent stud rotation and translation about the minor axis.

### 3.3 Unsheathed Allowable Heights

- .1 The "Unsheathed" allowable heights are limited by end shear or the interaction of longitudinal warping torsion and major axis flexural bending. Sheathing is **not** relied on to restrain the studs.
- .2 Lateral support is assumed to be provided by bridging conforming to the following schedule.

Unsheathed Allowable Height (Feet)	No. of Rows of Equally Spaced Bridging
0.0 – 4.9	0
5.0 – 9.9	1
10.0 – 14.9	2
15.0 – 19.9	3
	etc.

The number of bridging lines is determined using the Unsheathed Allowable Height even if the Deflection Allowance Height or the Web Crippling Allowable Height is less.

Design bridging for the accumulated torsion between bridging lines in accordance with CAN3-S136-84.

- .3 Loads are uniformly distributed and are assumed to have a torsional eccentricity equal to the distance from the shear centre to the centreline of the flange.

### 3.4 L/360 Allowable Heights

- .1 The "L/360" allowable heights are limited by deflection only. No strength criteria have been imposed.
- .2 Allowable heights for other deflection limits can be calculated by multiplying the L/360 allowable heights by the following factors:

Required Deflection Limit	Factor
L/1000	0.711
L/720	0.794
L/600	0.843
L/360	1.000
L/240	1.145
L180	1.260

In no case shall the deflection allowable height exceed the strength allowable height either sheathed or unsheathed, whichever is pertinent.

#### 4. COMBINED WIND AND AXIAL LOAD BEARING STUD TABLES SHEATHED AND UNSHEATHED

##### 4.1 General

- .1 The factored loads are computed in accordance with the requirements of the National Building Code of Canada 1985 and CAN3-S136-84 Cold Formed Steel Structural Members, Limit States Design, with the exception that studs are included which have stiffened element w/t ratios exceeding 150.
- .2 Stud material, geometry and properties conform to the Wall Stud Section Properties Table and Commentary Items 2.1 to 2.2.
- .3 No specific provisions are presently included in CAN3-S136-84 for the design of compression members with large web perforations. Local buckling at the perforations has been conservatively calculated assuming that the flat web elements adjacent to the perforations behave as completely unstiffened elements.
- .4 Wind loads are assumed to be uniformly distributed.
- .5 Web crippling is not checked.
- .6 Factored loads do not include any load combination factors. Refer to the Design Example for Combined Wind and Axial Load Bearing Studs.
- .7 Design the stud end connections to transmit the applied wind shear and axial load.

##### 4.2 Sheathed Tables

- .1 The factored loads are limited by the interaction of axial load and major axis bending due to wind. End shear due to wind alone is also checked.
- .2 = 0.9 (CAN3-S136-84 Clause 6.6 and 6.7)
- .3 Sheathing providing full lateral support on both sides of the studs is assumed. The sheathings are to have adequate strength and rigidity to prevent the studs from buckling laterally and to resist the torsional component of loads not applied through the shear centre. (Some wallboard and sheathing materials provide partial support only. Refer to CAN3-S136-84 Clause 6.8 or use the unsheathed tables.)
- .4 Axial loads are assumed to be concentrically applied to studs with respect to the X and Y axes. For loads applied eccentrically about the X axis consult your Bailey/Mantane representative.
- .5 Provide bridging at 4'-0" o.c. or less in order to align members during erection and to provide the necessary structural integrity during construction as well as in the completed structure. Design the bridging to prevent stud rotation and translation about the minor axis.

##### 4.3 Unsheathed Tables

- .1 The factored loads are limited by the interaction of axial load, major axis flexural bending due to the wandering centroid end eccentricity (the difference between the fully effective gross centroid and the effective net centroid). End shear due to wind alone is also checked.
- .2 = 0.75 (CAN3-S136-84 Clause 6.6 and 6.7)

- .3 Sheathing is **not** relied on to restrain the studs. Lateral support is assumed to be provided by bridging conforming to the following schedule.

Stud Height (Feet)	No. of Rows of Equally Spaced Bridging
8 – 9	2
10 – 12	3
14 – 16	4
18	5

Design bridging for the accumulated torsion between bridging lines in combination with 2% of the factored compressive force in the stud. Refer to CAN3-S136-84.

- .4 Wind loads are assumed to have a torsional eccentricity equal to the distance from the shear centre to the centreline of the flange.
- .5 Axial loads are assumed to be applied to the ends of the studs such that uniform bearing across the entire area of the stud is achieved. For loads applied eccentrically about the X axis consult your Bailey/Mantane representative.

#### 5. FLOOR JOIST LOAD TABLES

- .1 The Load Tables are computed in accordance with the requirements of the National Building Code of Canada 1985 and CAN3-S136-84 Code Formed Steel Structural Members, Limit States Design.
- .2 Joist material, geometry and properties conform to the Floor Joist Section Properties Table and General Notes 2.1 and 2.4.
- .3 Strength loads limited by maximum moment of maximum shear. It is assumed that the joist webs are reinforced at the location of concentrated loads or reactions, therefore, web crippling is not checked. Design end connections for the applied shear.
- .4 Strength loads are to be checked against factored design loads using a live load factor of 1.5 and a dead load factor of 1.25 in accordance with the requirements of the National Building Code. Deflection loads are to be checked against specified loads. Refer to the Design Example for Floor Joists.
- .5 The joists are assumed to be fully restrained with respect to lateral instability and with respect to torsionally eccentric loads not applied through the shear centre.
- .6 Allowable specified loads for the other deflection limits can be calculated by multiplying the L/360 specified loads by the following factors:

Required Deflection Limit	Factor
L/360	1.0
L/300	1.2
L/240	1.5
L/180	2.0

- .7 Provide bridging at 7'-0" o.c. or less in order to align members during erection and to provide the necessary structural integrity during construction as well as in the completed structure. Design the bridging to prevent joist rotation and translation about the minor axis.

## 6. SYMBOLS

t	=	black metal thickness
A	=	out to out depth of stud or joist (in.)
	=	inside depth of track (in.)
B1, B2	=	out to out width of flange (in.)
C	=	out to out depth of lip stiffener (in.)
r	=	inside bend radius (in.)
D	=	height of rectangular perforation (in.)
D <sup>1</sup>	=	diameter of round perforation (in.)
E	=	length of rectangular perforation (in.)
X <sub>cg</sub>	=	distance to centroid from back of web for the fully effective section(in.)
X <sub>sc</sub>	=	distance from back of web to the shear centre (in.)
C <sub>w</sub>	=	warping torsional constant (in. <sup>6</sup> )
J	=	St. Venant torsional constant (in. <sup>4</sup> )
j	=	torsional-flexural buckling parameter for singly symmetric beam-columns (in.)
I <sub>x</sub>	=	moment of inertia about the major axis for deflection calculation (in. <sup>4</sup> )
I <sub>y</sub>	=	fully effective moment of inertia about the minor axis for use in CAN3-S136-84, Clause 6.4.2 (I <sub>yc</sub> ≈I <sub>y</sub> /2in. <sup>4</sup> )
r <sub>x</sub>	=	fully effective radius of gyration about the major axis (in.)
r <sub>y</sub>	=	fully effective radius of gyration about the minor axis (in.)
S <sub>xc</sub>	=	fully effective section modulus for use in CAN3-S136-84, Clause 6.4.2 (in. <sup>3</sup> )
M <sub>rx</sub>	=	fully braced factored moment resistance about the major axis (in.kips)
M <sub>ry</sub>	=	fully braced factored moment resistance about the minor axis with the web in compression or with the lips in compression (in.kips)
V <sub>r</sub>	=	factored shear resistance (kips)
P <sub>r</sub>	=	factored web crippling resistance (kips)

## 7. DESIGN EXAMPLES FOR WIND BEARING STUDS

### Example 1

#### Given

Specified Wind Load = 30 psf

Height of Studs = 10'-6"

Maximum Allowable Deflection = L/360

Stud depth for architectural considerations = 6"

Restraint of sheathing to be neglected

#### Calculations

Try 6 x .048 studs at 24" o.c.

From the Wind Bearing Studs Maximum Allowable Height Table

Unsheathed Allowable Height = 12.1' > 10.5' **OK**

L/360 Allowable Height = 12.0' > 10.5' **OK**

The asterisks in the table indicate that an end connection not susceptible to web crippling is required or the allowable span is to be reduced.

Check the reduced allowable span.

$$H(\text{reduced}) = \frac{1000 P_r}{.5W_f (\text{Spacing}/12)}$$

where W<sub>f</sub> = factored wind load

$$= 1.5(30)$$

$$= 45 \text{ psf}$$

P<sub>r</sub> = factored web crippling resistance from the Wall Stud Section Properties Table for 1" bearing length

$$= 0.488 \text{ kips}$$

$$H(\text{reduced}) = \frac{1000(.488)}{.5(45)(24/12)} = 10.8' > 10.5' \text{ OK}$$

#### Conclusion

Use 6 x .048 studs at 24" o.c. with 2 rows of bridging. For bridging see Commentary Item 3.3.2.

### Example 2

#### Given

Specified Wind Load = 25 psf

Height of Studs = 9.8'

Maximum Allowable Deflection = L/360

Stud depth for architectural considerations = 3-5/8"

Restraint of sheathing to be neglected.

#### Calculations

Try 3-5/8" x .048 studs at 16" o.c.

From the Wind Bearing Studs Maximum Allowable Height Table

$$\text{Unsheathed Allowable Height} = 11.7' > 9.8' \text{ OK}$$

$$\text{L/360 Allowable Height} = 9.9' > 9.8' \text{ OK}$$

#### Conclusion

Use 3-5/8 x .048 studs at 16" o.c. with two rows of bridging. For the unsheathed case, the number of bridging lines is determined from the bridging schedule (Commentary Item 3.3.2) using the Unsheathed Allowable Height of 11.7' not the Deflection Allowable Height of 9.9' (nor the Web Crippling Allowable Height when it controls).

#### Note

In some situations, fewer lines of bridging may be acceptable. Consult your Bailey/Mantane representative.

## 8. DESIGN EXAMPLE FOR COMBINED WIND AND AXIAL LOAD BEARING STUDS

#### Given

Specified Loads: Axial Live Load = 2.8 kips per stud

Axial Dead Load = 1.0 kips per stud

Wind Load = 25 psf

Height of studs = 10'-0"

Stud depth for architectural considerations = 6"

Maximum allowable deflection under wind alone = L/360

Restraint of sheathing to be neglected

#### Calculations

Try 6 x .048 studs at 16" o.c.

The combination of factored loads is given by the 1985 National Building Code as:

Where:

$$= 0$$

$$= 1.25$$

$$= 1.50$$

$$= 1.50$$

$$= 1.00$$

$$= 1.00 \text{ or } 0.70$$

$$\begin{aligned} \text{a) Wind + Dead Load Case} & \\ \text{Factored Load Combination} &= 1.25D + 1.50Q \\ W_f (\text{factored wind load}) &= 1.50 Q \\ &= 1.50 (25) \\ &= 37.5 \text{ psf} \\ C_r (\text{factored axial load}) &= 1.25D \\ &= 1.25 (1.0) \\ &= 1.3 \text{ kips} \end{aligned}$$

From the unsheathed tables determine the maximum factored compressive resistance fro 37.5 psf factored wind (interpolate between 30 psf and 40 psf):

$$C_r = 3.8 \text{ kips} > C_r = 1.3 \text{ kips OK}$$

b) Dead + Live Load Case

$$\begin{aligned} \text{Factored Load Combination} &= 1.25D + 1.50L \\ W_f (\text{factored wind load}) &= 0 \text{ psf} \\ C_f (\text{factored axial load}) &= 1.50L + 1.25D \\ &= 1.50(2.8) + 1.25(1.0) \\ &= 5.5 \text{ kips} \end{aligned}$$

From the unsheathed tables determine the maximum factored compressive resistance for 0 psf factored wind:  
 $C_f = 5.9 \text{ kips} > C_f = 5.5 \text{ kips}$  **OK**

c) Wind + Dead + Live Load Case

$$\begin{aligned} \text{Factored Load Combination} &= 1.25D + 0.70(1.50Q) + 1.50L \\ W_f (\text{factored wind load}) &= 0.70(1.50Q) \\ &= 0.70(1.50)(25) \\ &= 26.3 \text{ psf} \\ C_f (\text{factored axial load}) &= 1.25D + 0.70(1.50)L \\ &= 1.25(1.0) + 0.70(1.50)(2.8) \\ &= 4.2 \text{ kips} \end{aligned}$$

From the unsheathed tables determine the maximum factored compressive resistance for 26.3 psf factored wind (interpolate between 20 psf and 30 psf)

$$C_f = 4.4 \text{ kips} > C_f = 4.2 \text{ kips}$$
 **OK**

d) Wind Load Case for Deflection Check

From the Wind Bearing Studs Maximum Allowable Height Table for 25 psf specified wind load:  
 $L/360$  Allowable Height = 14.6' > 10.5' **OK**

**Note**

For Combined Wind and Axial Load Bearing Studs, interpolation between wind loads is acceptable. Interpolation between heights is acceptable for sheathed tables but not for unsheathed tables since the number of rows of bridging may vary.

**Conclusion**

Use 6 x .048 stud at 16" o.c. with 3 rows of bridging (For bridging see Commentary Item 4.3.3)

## 9. DESIGN EXAMPLE FOR FLOOR JOISTS

**Given**

Specified Live Load = 40 psf  
 Specified Dead Load = 15 psf  
 Required joist depth for architectural considerations = 8" 15'0" Single Span

**Calculations**

Factored Load =  $1.50(40) + 1.25(15) = 78.8 \text{ psf}$   
 Try 8 x .075 joists at 24" o.c.  
 Strength = 112 psf > 78.8 psf **OK**  
 $L/360 = 47 \text{ psf} > 40 \text{ psf}$  **OK**

**Conclusion**

Use 8 x .075 joists at 24" o.c.

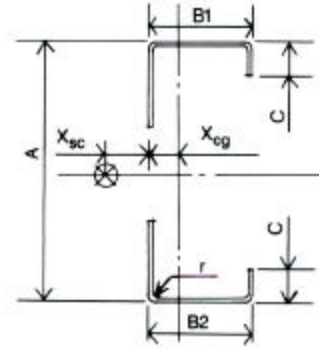
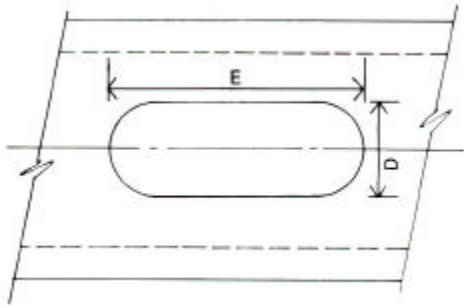
PRODUCT STANDARDS		
PREFERRED THICKNESS AND COLOUR CODES		
Standard Colour Code	Preferred Minimum Thickness Exclusive of Coating	
	(inches)	(mm)
Yellow	0.48	1.22
Green	.060	1.52
Orange	.075	1.91
<b>Note:</b> The standard colour code is painted on one end of product only. Orienting all products in the same direction ensures knock-out alignment.		

IMPERIAL-SI METRIC CONVERSIONS		
Below are listed some conversion factors which apply to the information contained in this catalogue.		
From Imperial	To SI Metric Units	Multiply by
in.	mm	25.4
in. <sup>2</sup>	mm <sup>2</sup>	645.2
in. <sup>3</sup>	mm <sup>3</sup>	16 387
in. <sup>4</sup>	mm <sup>4</sup>	416 231
ft	m	0.3048
ft <sup>2</sup>	m <sup>2</sup>	0.0929
kips	kN	4.448
psf	kN/m <sup>2</sup>	0.0479
lbs./ft	kg/m	1.488
kips/in. <sup>2</sup>	N/mm <sup>2</sup>	6.895
kips-in.	N-m	113



# BAILEY

## STUD GEOMETRY



**WALL STUD SECTION PROPERTIES TABLE  
LIMIT STATES DESIGN**

STUD NAME	DIMENSIONS								PERFORATED PROPERTIES				
	THICK t (in)	DEP A (in)	FLG B1 (in)	FLG B2 (in)	LIP C (in)	RAD r (in)	PERF D (in)	PERF E (in)	I <sub>x</sub> (in <sup>4</sup> )	M <sub>rx</sub> (in.kips)	M <sub>ry</sub> web comp. (in.kips)	M <sub>ry</sub> lips comp (in.kips)	Shear V <sub>r</sub> (kips)
3 <sup>5</sup> / <sub>8</sub> x .048	.048	3.625	1.625	1.625	0.500	.096	1.5	4.0	0.732	11.2	3.32	3.37	0.84
3 <sup>5</sup> / <sub>8</sub> x .060	.060	3.625	1.625	1.625	0.500	.120	1.5	4.0	0.892	20.6	6.07	6.12	1.58
3 <sup>5</sup> / <sub>8</sub> x .075	.075	3.625	1.625	1.625	0.500	.150	1.5	4.0	1.08	24.9	7.24	7.24	2.38
4 x .048	.048	4.000	1.625	1.625	0.500	.096	1.5	4.0	0.924	12.7	3.36	3.45	0.98
4 x .060	.060	4.000	1.625	1.625	0.500	.120	1.5	4.0	1.13	23.5	6.13	6.27	1.85
4 x .075	.075	4.000	1.625	1.625	0.500	.150	1.5	4.0	1.37	28.5	7.43	7.43	2.81
6 x .048	.048	6.000	1.625	1.625	0.500	.096	2.5*	4.5*	2.38	22.1	3.40	3.60	1.03
6 x .060	.060	6.000	1.625	1.625	0.500	.120	2.5*	4.5*	2.91	40.9	6.22	6.55	1.99
6 x .075	.075	6.000	1.625	1.625	0.500	.150	2.5*	4.5*	3.55	49.9	7.61	7.78	3.79
8 x .048	.048	8.000	1.625	1.625	0.500	.096	2.5*	4.5*	4.82	32.5	3.44	3.77	0.99
8 x .060	.060	8.000	1.625	1.625	0.500	.120	2.5*	4.5*	5.93	61.7	6.30	6.88	1.93
8 x .075	.075	8.000	1.625	1.625	0.500	.150	2.5*	4.5*	7.25	75.5	7.74	8.18	3.74

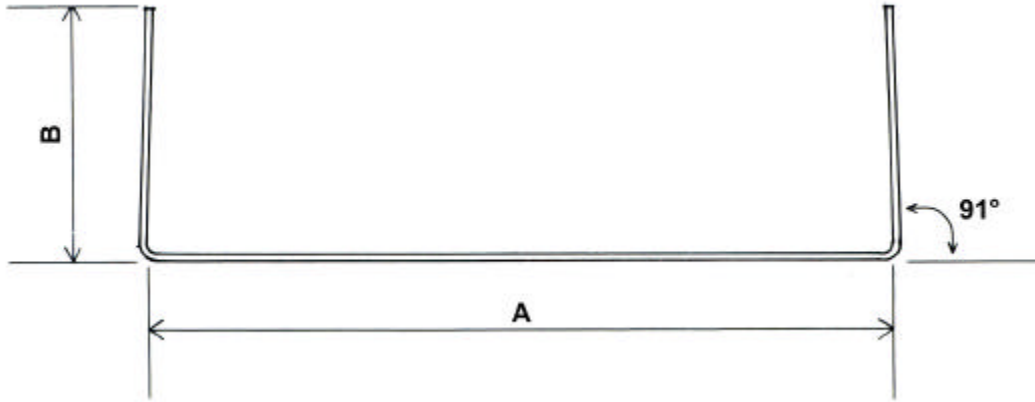
STUD NAME	UNPERFORATED PROPERTIES											
	WGHT (lbs/ft)	AREA (in <sup>2</sup> )	X <sub>cg</sub> (in)	X <sub>sc</sub> (in)	C <sub>w</sub> (in <sup>6</sup> )	J (in <sup>4</sup> )	j (in)	I <sub>y</sub> (in <sup>4</sup> )	r <sub>x</sub> (in)	r <sub>y</sub> (in)	S <sub>xc</sub> (in <sup>3</sup> )	Web Cripp P <sub>r</sub> (kips)
3 <sup>5</sup> / <sub>8</sub> x .048	1.22	0.359	0.536	0.790	0.390	.000276	2.15	0.133	1.44	0.608	0.411	0.544
3 <sup>5</sup> / <sub>8</sub> x .060	1.51	0.443	0.534	0.785	0.469	.000531	2.17	0.160	1.43	0.600	0.501	1.07
3 <sup>5</sup> / <sub>8</sub> x .075	1.85	0.544	0.532	0.780	0.558	.00102	2.20	0.190	1.42	0.591	0.607	1.66
								0.107				
4 x .048	1.28	0.377	0.511	0.767	0.477	.000289	2.30	0.137	1.58	0.603	0.469	0.535
4 x .060	1.58	0.465	0.510	0.762	0.574	.000558	2.32	0.165	1.57	0.596	0.572	1.05
4 x .075	1.95	0.572	0.508	0.756	0.685	.00107	2.35	0.196	1.56	0.586	0.693	1.64
6 x .048	1.61	0.473	0.412	0.669	1.14	.000363	3.41	0.155	2.27	0.573	0.813	0.488
6 x .060	1.99	0.585	0.411	0.662	1.38	.000702	3.47	0.187	2.26	0.565	0.996	0.983
6 x .075	2.46	0.722	0.410	0.654	1.65	.00135	3.55	0.223	2.25	0.555	1.21	1.56
8 x .048	1.94	0.569	0.347	0.594	2.17	.000437	5.14	0.167	2.93	0.542	1.22	0.441
8 x .060	2.40	0.705	0.346	0.586	2.63	.000846	5.25	0.202	2.92	0.535	1.50	0.912
8 x .075	2.97	0.872	0.346	0.577	3.16	.00164	5.40	0.240	2.90	0.525	1.84	1.47

### NOTES

- See general notes
- Where marked with an asterisk, D = 1.5 and E = 4.0 may be supplied as an alternative. Specifier select.



# BAILEY



## TRACK GEOMETRY

### TRACK SECTION PROPERTIES TABLE LIMIT STATES DESIGN

TRACK NAME	THICK- NESS t (in)	DIMENSIONS		WGHT (lbs/ft)	AREA (in <sup>2</sup> )	I <sub>x</sub> (in <sup>4</sup> )	I <sub>y</sub> (in <sup>4</sup> )	S <sub>xc</sub> (in <sup>3</sup> )	V <sub>r</sub> (kips)	M <sub>rx</sub> (in.kips)	r <sub>x</sub> (in)	r <sub>y</sub> (in)	X <sub>cg</sub> (in)	X <sub>sc</sub> (in)	C <sub>w</sub> (in <sup>6</sup> )	J (in <sup>4</sup> )
		DEPTH A (in)	FLANGE B (in)													
3 <sup>5</sup> / <sub>8</sub> x .048	.048	3.645	1.18	0.969	.285	0.544	.0351	0.304	2.93	7.80	1.41	.351	.250	.362	0.0863	.000219
3 <sup>5</sup> / <sub>8</sub> x .060	.060	3.645	1.18	1.21	.356	0.685	.0433	0.378	5.63	14.9	1.41	.349	.254	.353	0.107	.000427
3 <sup>5</sup> / <sub>8</sub> x .075	.075	3.645	1.18	1.51	.444	0.893	.0532	0.470	7.60	19.9	1.42	.346	.259	.343	0.133	.000833
4 x .048	.048	4.020	1.18	1.03	.303	0.685	.0360	0.347	2.94	8.97	1.54	.346	.236	.348	0.108	.000233
4 x .060	.060	4.020	1.18	1.29	.378	0.862	.0443	0.432	5.65	17.1	1.54	.342	.240	.340	0.134	.000454
4 x .075	.075	4.020	1.18	1.61	.472	1.12	.0545	0.538	8.41	22.8	1.54	.340	.245	.329	0.166	.000885
6 x .048	.048	6.020	1.18	1.36	.399	1.82	.0393	0.616	2.31	16.4	2.17	.314	.185	.290	0.274	.000306
6 x .060	.060	6.020	1.18	1.70	.498	2.29	.0484	0.767	4.50	31.1	2.17	.312	.190	.282	0.339	.000598
6 x .075	.075	6.020	1.18	2.12	.622	2.95	.0595	0.956	8.79	41.0	2.18	.309	.195	.272	0.419	.00117
8 x .048	.048	8.020	1.18	1.68	.495	3.74	.0413	0.949	1.74	20.1	2.79	.289	.154	.248	0.527	.000380
8 x .060	.060	8.020	1.18	2.10	.618	4.69	.0509	1.18	3.40	40.8	2.79	.287	.159	.240	0.652	.000742
8 x .075	.075	8.020	1.18	2.63	.772	6.02	.0626	1.47	6.64	63.6	2.79	.285	.165	.229	0.804	.00145

**Notes**

1. See general notes

# BAILEY

## WIND BEARING STUDS MAXIMUM ALLOWABLE HEIGHT TABLE MAXIMUM ALLOWABLE SINGLE SPAN HEIGHT IN FEET

SPECIFIED WIND LOAD LSD FACTORED WIND LOAD		5.0 PSF 7.5 PSF			10.0 PSF 15.0 PSF			15.0 PSF 22.5 PSF			20.0 PSF 30.0 PSF		
STUD NAME	DEFLECTION OR STRENGTH	STUD SPACING (in)											
		12	16	24	12	16	24	12	16	24	12	16	24
<b>3 5/8" WIND BEARING STEEL STUDS</b>													
3 5/8 x .048	SHEATHED	31.5	27.3	22.3	22.3	19.3	15.7	18.2	15.7	12.9	15.7	13.6	11.1
	UNSHEATHED	30.9	27.0	21.7	21.7	19.0	15.6	18.0	15.6	12.2	15.6	12.8	10.8
	L/360	18.6	16.9	14.7	14.7	13.4	11.7	12.9	11.7	10.2	11.7	10.6	9.3
3 5/8 x .060	SHEATHED	42.8	37.1	30.3	30.3	26.2	21.4	24.7	21.4	17.5	21.4	18.5	15.1
	UNSHEATHED	38.8	33.3	27.9	27.9	25.1	20.1	22.4	20.1	16.8	20.1	17.6	15.0
	L/360	19.8	18.0	15.7	15.7	14.3	12.5	13.7	12.5	10.9	12.5	11.3	9.9
3 5/8 x .075	SHEATHED	47.1	40.8	33.3	33.3	28.8	23.5	27.2	23.5	19.2	23.5	20.4	16.6
	UNSHEATHED	42.7	37.6	30.8	30.8	27.0	21.7	25.8	21.7	18.1	21.7	18.9	16.2
	L/360	21.1	19.2	16.8	16.8	15.2	13.3	14.6	13.3	11.6	13.3	12.1	10.6
<b>4" WIND BEARING STEEL STUDS</b>													
4 x .048	SHEATHED	33.6	29.1	23.8	23.8	20.6	16.8	19.4	16.8	13.7	16.8	14.6	11.9
	UNSHEATHED	32.6	28.5	22.9	22.9	20.3	16.7	19.1	16.7	12.9	16.7	13.5	11.4
	L/360	20.1	18.2	15.9	15.9	14.5	12.6	13.9	12.6	11.0	12.6	11.5	10.0
4 x .060	SHEATHED	45.7	39.6	32.3	32.3	28.0	22.9	26.4	22.9	18.7	22.9	19.8	16.2
	UNSHEATHED	41.7	36.7	30.1	30.1	26.4	21.2	25.2	21.2	17.7	21.2	18.5	15.8
	L/360	21.4	19.5	17.0	17.0	15.5	13.5	14.9	13.5	11.8	13.5	12.3	10.7
4 x .075	SHEATHED	50.3	43.6	35.6	35.6	30.8	25.2	29.1	25.2	20.5	25.2	21.8	17.8
	UNSHEATHED	46.5	40.3	32.4	32.4	28.4	22.7	27.2	22.7	19.0	22.7	20.4	17.1
	L/360	22.9	20.8	18.1	18.1	16.5	14.4	15.8	14.4	12.6	14.4	13.1	11.4
<b>6" WIND BEARING STEEL STUDS</b>													
6 x .048	SHEATHED	44.3	38.3	31.3	31.3	27.1	22.1	25.6	22.1	18.1	22.1	19.2	15.7
	UNSHEATHED	42.6	37.3	30.6	30.6	26.7	21.5	25.5	21.5	17.7	21.5	18.8	15.3
	L/360	27.5	25.0	21.8	21.8	19.8	17.3	19.1	17.3	15.1	17.3	15.7	13.7
6 x .060	SHEATHED	60.3	52.2	42.7	42.7	36.9	30.2	34.8	30.2	24.6	30.2	26.1	21.3
	UNSHEATHED	55.0	47.1	38.2	38.2	32.8	27.6	31.5	27.6	22.2	27.6	23.1	19.3
	L/360	29.4	26.7	23.3	23.3	21.2	18.5	20.4	18.5	16.2	18.5	16.8	14.7
6 x .075	SHEATHED	66.6	57.7	47.1	47.1	40.8	33.3	38.5	33.3	27.2	33.3	28.8	23.5
	UNSHEATHED	60.1	51.6	42.1	42.1	37.0	30.5	35.5	30.5	25.5	30.5	26.7	21.4
	L/360	31.4	28.5	24.9	24.9	22.7	19.8	21.8	19.8	17.3	19.8	18.0	15.7
<b>8" WIND BEARING STEEL STUDS</b>													
8 x .048	SHEATHED	53.7	46.5	38.0	38.0	32.9	26.9	31.0	26.9	21.9*	26.9	23.3*	19.0*
	UNSHEATHED	52.2	45.9	37.4	37.4	32.1	26.8	30.6	26.8	21.5*	26.8	22.6*	18.8*
	L/360	34.8	31.6	27.6	27.6	25.1	21.9	24.1	21.9	19.2	21.9	19.9	17.4*
8 x .060	SHEATHED	74.1	64.1	52.4	52.4	45.3	37.0	42.8	37.0	30.2	37.0	32.1	26.2
	UNSHEATHED	66.1	57.1	47.0	47.0	40.9	32.7	38.1	32.7	27.6	32.7	28.7	23.1
	L/360	37.3	33.9	29.6	29.6	26.9	23.5	25.8	23.5	20.5	23.5	21.3	18.6
8 x .075	SHEATHED	81.9	70.9	57.9	57.9	50.2	40.9	47.3	40.9	33.4	40.9	35.5	29.0
	UNSHEATHED	71.9	62.3	51.4	51.4	45.5	36.9	41.9	36.9	30.4	36.9	31.7	26.7
	L/360	39.9	36.2	31.6	31.6	28.7	25.1	27.6	25.1	21.9	25.1	22.8	19.9

**NOTES:**

1. See general Notes.
2. Sheathed and unsheathed allowable heights are limited by strength only. For sheathed allowable heights, sheathing providing full lateral support on both sides of the studs is assumed. See General Notes 3.2.2 for minimum bridging requirements. For unsheathed allowable heights, sheathing is not relied on to restrain the studs. Lateral support is to be provided by bridging conforming to General Notes 3.3.2 and the method outlined in Design Example 2, Page 4.
3. In no case shall the deflection allowable height exceed the sheathed or unsheathed allowable height, whichever is pertinent.

# BAILEY

## WIND BEARING STUDS MAXIMUM ALLOWABLE HEIGHT TABLE MAXIMUM ALLOWABLE SINGLE SPAN HEIGHT IN FEET

SPECIFIED WIND LOAD LSD FACTORED WIND LOAD		25.0 PSF 37.5 PSF			30.0 PSF 45.0 PSF			35.0 PSF 52.5 PSF			40.0 PSF 60.0 PSF		
STUD NAME	DEFLECTION OR STRENGTH	STUD SPACING (in)											
		12	16	24	12	16	24	12	16	24	12	16	24
<b>3<sup>5</sup>/<sub>8</sub>" WIND BEARING STEEL STUDS</b>													
3 <sup>5</sup> / <sub>8</sub> x .048	SHEATHED	14.1	12.2	10.0	12.9	11.1	9.1	11.9	10.3	8.4	11.1	9.6	7.9
	UNSHEATHED	13.2	11.7	7.8	12.2	10.8	7.1	11.4	10.1	6.6	10.8	7.6	6.2
	L/360	10.9	9.9	8.6	10.2	9.3	8.1	9.7	8.8	7.7	9.3	8.4	7.4
3 <sup>5</sup> / <sub>8</sub> x .060	SHEATHED	19.1	16.6	13.5	17.5	15.1	12.4	16.2	14.0	11.4	15.1	13.1	10.7
	UNSHEATHED	18.0	16.1	12.2	16.8	15.0	11.4	15.8	12.5	10.7	15.0	11.9	10.1
	L/360	11.6	10.5	9.2	10.9	9.9	8.7	10.4	9.4	8.2	9.9	9.0	7.9
3 <sup>5</sup> / <sub>8</sub> x .075	SHEATHED	21.4	18.2	14.9	19.2	16.6	13.6	17.8	15.4	12.6	16.6	14.4	11.8
	UNSHEATHED	19.4	17.4	13.1	18.1	16.2	12.2	17.1	15.2	11.5	16.2	12.8	10.9
	L/360	12.4	11.2	9.8	11.6	10.6	9.2	11.0	10.0	8.8	10.6	9.6	8.4
<b>4" WIND BEARING STEEL STUDS</b>													
4 x .048	SHEATHED	15.0	13.0	10.6	13.7	11.9	9.7	12.7	11.0	9.0	11.9	10.3	8.4
	UNSHEATHED	13.9	12.4	10.4	12.9	11.4	7.6	12.1	10.7	7.0	11.4	10.1	6.6
	L/360	11.7	10.7	9.3	11.0	10.0	8.8	10.5	9.5	8.3	10.0	9.1	8.0
4 x .060	SHEATHED	20.4	17.7	14.5	18.7	16.2	13.2	17.3	15.0	12.2	16.2	14.0	11.4
	UNSHEATHED	18.9	17.0	12.8	17.7	15.8	12.0	16.7	13.1	11.3	15.8	12.5	10.7
	L/360	12.5	11.4	10.0	11.8	10.7	9.4	11.2	10.2	8.9	10.7	9.7	8.5
4 x .075	SHEATHED	22.5	19.5	15.9	20.5	17.8	14.5	19.0	16.5	13.5	17.8	15.4	12.6
	UNSHEATHED	20.9	18.3	15.6	19.0	17.1	12.9	18.0	16.1	12.2	17.1	15.2	11.5
	L/360	13.4	12.1	10.6	12.6	11.4	10.0	11.9	10.9	9.5	11.4	10.4	9.1
<b>6" WIND BEARING STEEL STUDS</b>													
6 x .048	SHEATHED	19.8	17.1	14.0*	18.1	15.7	12.8*	16.7	14.5*	11.8*	15.7	13.6*	11.1*
	UNSHEATHED	19.3	16.8	13.1*	17.7	15.3	12.1*	16.4	13.4	11.4*	15.3	12.7*	10.7*
	L/360	16.1	14.6	12.8	15.1	13.7	12.0*	14.4	13.1	11.4*	13.7	12.5*	10.9*
6 x .060	SHEATHED	27.0	23.4	19.1	24.6	21.3	17.4	22.8	19.7	16.1	21.3	18.5	15.1
	UNSHEATHED	25.4	21.3	17.8	22.2	19.3	16.7	20.9	18.3	15.7	19.3	17.4	13.1
	L/360	17.2	15.6	13.7	16.2	14.7	12.8	15.4	14.0	12.2	14.7	13.4	11.7
6 x .075	SHEATHED	29.8	25.8	21.1	27.2	23.5	19.2	25.2	21.8	17.8	23.5	20.4	16.7
	UNSHEATHED	27.3	22.9	19.1	25.5	21.4	17.9	22.5	20.2	16.9	21.4	18.7	16.1
	L/360	18.4	16.7	14.6	17.3	15.7	13.7	16.4	14.9	13.0	15.7	14.3	12.5
<b>8" WIND BEARING STEEL STUDS</b>													
8 x .048	SHEATHED	24.0*	20.8*	17.0*	21.9*	19.0*	15.5*	20.3*	17.6*	14.4*	19.0*	16.5*	13.4*
	UNSHEATHED	23.1	20.6*	16.8*	21.5*	18.8*	15.4*	20.2*	17.4*	13.5*	18.8*	16.3*	12.8*
	L/360	20.4	18.5*	16.2*	19.2	17.4*	15.2*	18.2*	16.5*	14.4*	17.4*	15.8*	13.8*
8 x .060	SHEATHED	33.1	28.7	23.4	30.2	26.2	21.4*	28.0	24.2	19.8*	26.2	22.7	18.5*
	UNSHEATHED	30.3	26.6	21.3	27.6	23.1	19.9	26.1	21.9	18.3*	23.1	20.8	17.4*
	L/360	21.8	19.8	17.3	20.5	18.6	16.3	19.5	17.7	15.5	18.6	16.9	14.8
8 x .075	SHEATHED	36.6	31.7	25.9	33.4	29.0	23.6	31.0	26.8	21.9	29.0	25.1	20.5
	UNSHEATHED	32.4	28.4	22.8	30.4	26.7	21.4	27.9	25.2	20.3	26.7	22.3	18.7
	L/360	23.3	21.2	18.5	21.9	19.9	17.4	20.8	18.9	16.5	19.9	18.1	15.8

**NOTES:**

1. See General Notes.
2. Sheathed and unsheathed allowable heights are limited by strength only. For sheathed allowable heights, sheathing providing full lateral support on both sides of the studs is assumed. See General Notes 3.2.2 for minimum bridging requirements. For unsheathed allowable heights, sheathing is not relied on to restrain the studs. Lateral support is to be provided by bridging conforming to General Notes 3.3.2 and the method outlined in Design Example 2, Page 4.
3. In no case shall the deflection allowable height exceed the sheathed or unsheathed allowable height, whichever is pertinent.

**COMBINED WIND & AXIAL LOAD BEARING STUD TABLES 3<sup>5</sup>/<sub>8</sub>" STUDS**  
**MAXIMUM FACTORED COMPRESSIVE RESISTANCE EACH STUD (KIPS)**      **LIMIT STATES DESIGN**  
**SHEATHED**

FACTORED WIND LOAD (psf)	0			10			20			30			40			50			60								
	STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)								
STUD HEIGHT (ft)	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075			
<b>12" O.C. STUD SPACING</b>																											
8	6.9	11.9	14.9		6.1	11.0	13.9		5.4	10.2	13.0		4.7	9.4	12.2		4.0	8.7	11.4		3.4	8.0	10.7		2.9	7.4	10.0
9	6.6	11.0	13.6		5.6	9.9	12.4		4.7	8.9	11.4		3.9	8.0	10.4		3.1	7.2	9.6		2.5	6.5	8.8		1.8	5.8	8.0
10	6.3	10.0	12.3		5.0	8.7	10.8		4.0	7.6	9.7		3.1	6.6	8.7		2.3	5.8	7.8		1.6	5.0	6.9		0.9	4.3	6.2
11	5.9	8.9	10.8		4.4	7.4	9.2		3.3	6.3	8.0		2.4	5.3	7.0		1.5	4.5	6.1		0.8	3.7	5.3			3.0	4.5
12	5.5	7.6	9.2		3.8	6.1	7.6		2.7	5.0	6.5		1.7	4.1	5.5		0.9	3.3	4.6		0.1	2.6	3.9			2.0	3.2
14	4.6	5.6	6.7		2.7	4.2	5.3		1.6	3.2	4.2		0.6	2.4	3.4				1.7				1.9				
16	3.5	4.3	5.2		1.8	2.9	3.8		0.7	2.1	2.8				2.0												
<b>16" O.C. STUD SPACING</b>																											
8	6.9	11.9	14.9		5.9	10.7	13.6		4.9	9.7	12.5		4.0	8.7	11.7		3.2	7.8	10.5		2.5	7.0	9.6		1.8	6.2	8.7
9	6.6	11.0	13.6		5.3	9.5	12.1		4.1	8.3	10.7		3.1	7.2	9.6		2.2	6.2	8.5		1.4	5.4	7.5		0.6	4.5	6.6
10	6.3	10.0	12.3		4.7	8.3	10.4		3.4	6.9	9.0		2.3	5.8	7.8		1.3	4.8	6.7		0.5	3.9	5.7			3.0	4.8
11	5.9	8.9	10.8		4.0	7.0	8.8		2.7	5.6	7.3		1.5	4.5	6.1		0.5	3.5	5.0			2.6	4.1			1.8	3.2
12	5.5	7.6	9.2		3.4	5.7	7.2		2.0	4.4	5.8		0.9	3.3	4.6			2.4	3.6			1.6	2.7				1.9
14	4.6	5.6	6.7		2.3	3.8	4.9		0.9	2.6	3.6			1.7	2.6												
16	3.5	4.3	5.2		1.4	2.6	3.4			1.6	2.3				3.0												
<b>24" O.C. STUD SPACING</b>																											
8	6.9	11.9	14.9		5.4	10.2	13.0		4.0	8.7	11.4		2.9	7.4	10.0		1.8	6.2	8.7		0.8	5.1	7.6			4.1	6.4
9	6.6	11.0	13.6		4.7	8.9	11.4		3.1	7.2	9.6		1.8	5.8	8.0		0.6	4.5	6.6			3.4	5.4			2.3	4.2
10	6.3	10.0	12.3		4.0	7.6	9.7		2.3	5.8	7.8		0.9	4.3	6.2			3.0	4.8			1.9	3.5				2.4
11	5.9	8.9	10.8		3.3	6.3	8.0		1.5	4.5	6.1			3.0	4.5				1.8			3.2					
12	5.5	7.6	9.2		2.7	5.0	6.5		0.9	3.3	4.6			2.0	3.2				1.9								
14	4.6	5.6	6.7		1.6	3.2	4.2			1.7	2.6																
16	3.5	4.3	5.2		0.7	2.1	2.8				3.0																

**UNSHEATHED**

FACTORED WIND LOAD (psf)	0			10			20			30			40			50			60								
	STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)								
STUD HEIGHT (ft)	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075			
<b>12" O.C. STUD SPACING</b>																											
8	5.0	8.0	9.9		4.4	7.5	9.4		3.9	7.0	8.9		3.5	6.6	8.4		3.0	6.1	7.9		2.5	5.7	7.4		2.0	5.2	7.0
9	4.6	7.0	8.6		4.0	6.4	8.0		3.4	5.9	7.4		2.8	5.3	6.8		2.2	4.8	6.3		1.7	4.2	5.7		1.1	3.7	5.2
10	4.8	7.2	8.7		4.0	6.4	7.9		3.2	5.7	7.2		2.5	5.0	6.5		1.8	4.4	5.9		1.1	3.9	5.3		0.5	3.3	4.7
11	4.4	6.0	7.2		3.5	5.2	6.4		2.6	4.5	5.7		1.9	3.8	5.0		1.1	3.2	4.4		0.4	2.7	3.8			2.2	3.3
12	4.0	5.0	6.1		2.9	4.2	5.3		2.1	3.5	4.6		1.3	2.9	3.9		0.5	2.3	3.3			1.8	2.7			1.3	2.2
14	3.3	4.0	4.9		2.1	3.1	3.9		1.2	2.4	3.2		0.4	1.8	2.5				1.2			1.4					
16	2.5	3.1	3.8		1.3	2.2	2.8		0.5	1.5	2.1				1.4												
<b>16" O.C. STUD SPACING</b>																											
8	5.0	8.0	9.9		4.3	7.4	9.2		3.6	6.7	8.6		3.0	6.1	7.9		2.3	5.5	7.3		1.7	4.9	6.7		1.1	4.3	6.0
9	4.6	7.0	8.6		3.8	6.2	7.8		3.0	5.5	7.0		2.2	4.8	6.3		1.5	4.1	5.6		0.8	3.4	4.9		0.1	2.8	4.2
10	4.8	7.2	8.7		3.7	6.1	7.6		2.7	5.2	6.7		1.8	4.4	5.9		0.9	3.7	5.1		0.1	3.0	4.3			2.4	3.7
11	4.4	6.0	7.2		3.2	4.9	6.2		2.1	4.0	5.3		1.1	3.2	4.4		0.2	2.5	3.7			1.9	3.0			1.3	2.3
12	4.0	5.0	6.1		2.6	4.0	5.0		1.6	3.1	4.1		0.5	2.3	3.3				1.7			1.9					1.3
14	3.3	4.0	4.9		1.7	2.9	3.7		0.7	2.0	2.7			1.2	1.9												
16	2.5	3.1	3.8		1.0	1.9	2.5			1.1	1.6																
<b>24" O.C. STUD SPACING</b>																											
8	5.0	8.0	9.9		3.9	7.0	8.9		3.0	6.1	7.9		2.0	5.2	7.0		1.1	4.3	6.0		0.2	3.4	5.1			2.6	4.2
9	4.6	7.0	8.6		3.4	5.9	7.4		2.2	4.8	6.3		1.1	3.7	5.2		0.1	2.8	4.2			1.9	3.2			1.0	2.3
10	4.8	7.2	8.7		3.2	5.7	7.2		1.8	4.4	5.9		0.5	3.3	4.7			2.4	3.7			1.3	2.7				1.6
11	4.4	6.0	7.2		2.6	4.5	5.7		1.1	3.2	4.4			2.2	3.3				1.3			2.3		1.4			
12	4.0	5.0	6.1		2.1	3.5	4.6		0.5	2.3	3.3			1.3	2.2				1.3								
14	3.3	4.0	4.9		1.2	2.4	3.2			1.2	1.9																
16	2.5	3.1	3.8		0.5	1.5	2.1																				

**NOTES:**

1. See general notes. (For bridging see 4.2.5 and 4.3.3)



COMBINED WIND & AXIAL LOAD BEARING STUD TABLES 4" STUDS  
 MAXIMUM FACTORED COMPRESSIVE RESISTANCE EACH STUD (KIPS) LIMIT STATES DESIGN

SHEATHED

FACTORED WIND LOAD (psf)	0			10			20			30			40			50			60																								
	STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)																								
	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075																						
STUD HEIGHT (ft)																						12" O.C. STUD SPACING																					
8	7.2	12.6	16.3	6.5	11.9	15.5	5.8	11.2	14.7	5.2	10.5	13.9	4.6	9.8	13.2	4.1	9.2	12.5	3.5	8.6	11.8																						
9	7.0	11.9	15.4	6.1	10.9	14.2	5.2	10.0	13.2	4.5	9.2	12.3	3.8	8.4	11.4	3.1	7.7	10.6	2.5	7.0	9.9																						
10	6.7	11.1	14.3	5.6	9.9	12.9	4.6	8.8	11.7	3.7	7.9	10.6	2.9	7.0	9.7	2.2	6.3	8.8	1.5	5.5	8.0																						
11	6.4	10.2	13.0	5.0	8.8	11.4	3.9	7.6	10.1	3.0	6.6	9.0	2.2	5.7	8.0	1.4	4.9	7.1	0.7	4.2	6.2																						
12	6.0	9.2	11.6	4.5	7.6	9.8	3.3	6.4	8.5	2.3	5.4	7.3	1.4	4.5	6.4	0.6	3.7	5.5		3.0	4.7																						
14	5.3	7.1	8.6	3.4	5.4	6.9	2.1	4.3	5.7	1.1	3.4	4.7	0.3	2.6	3.8		1.8	3.0			2.3																						
16	4.3	5.5	6.6	2.4	3.9	5.0	1.2	2.9	3.9		2.0	2.9			2.2																												
STUD HEIGHT (ft)																						16" O.C. STUD SPACING																					
8	7.2	12.6	16.3	6.3	11.6	15.2	5.4	10.7	14.1	4.6	9.8	13.2	3.9	9.0	12.2	3.1	8.2	11.4	2.5	7.4	10.5																						
9	7.0	11.9	15.4	5.8	10.6	13.9	4.7	9.5	12.6	3.8	8.4	11.4	2.9	7.5	10.4	2.1	6.6	9.4	1.3	5.8	8.4																						
10	6.7	11.1	14.3	5.2	9.5	12.5	4.0	8.2	11.0	2.9	7.0	9.7	2.0	6.0	8.5	1.1	5.1	7.5	0.3	4.2	6.5																						
11	6.4	10.2	13.0	4.6	8.3	10.9	3.3	6.9	9.3	2.2	5.7	8.0	1.1	4.7	6.8	0.2	3.7	5.7		2.8	4.7																						
12	6.0	9.2	11.6	4.1	7.2	9.3	2.6	5.7	7.7	1.4	4.5	6.4	0.4	3.5	5.2		2.5	4.1		1.7	3.2																						
14	5.3	7.1	8.6	2.9	5.0	6.5	1.4	3.7	5.0	0.3	2.6	3.8		1.6	2.7																												
16	4.3	5.5	6.6	2.0	3.5	4.6	0.6	2.3	3.2			2.2																															
STUD HEIGHT (ft)																						24" O.C. STUD SPACING																					
8	7.2	12.6	16.3	5.8	11.2	14.7	4.6	9.8	13.2	3.5	8.6	11.8	2.5	7.4	10.5	1.5	6.4	9.3	0.6	5.4	8.2																						
9	7.0	11.9	15.4	5.2	10.0	13.2	3.8	8.4	11.4	2.5	7.0	9.9	1.3	5.8	8.4	0.2	4.6	7.1		3.5	5.9																						
10	6.7	11.1	14.3	4.6	8.8	11.7	2.9	7.0	9.7	1.5	5.5	8.0	0.3	4.2	6.5		3.0	5.1		1.9	3.8																						
11	6.4	10.2	13.0	3.9	7.6	10.1	2.2	5.7	8.0	0.7	4.2	6.2		2.8	4.7		1.6	3.3			2.1																						
12	6.0	9.2	11.6	3.3	6.4	8.5	1.4	4.5	6.4		3.0	4.7		1.7	3.2			1.9																									
14	5.3	7.1	8.6	2.1	4.3	5.7	0.3	2.6	3.8			2.3																															
16	4.3	5.5	6.6	1.2	2.9	3.9			2.2																																		

UNSHEATHED

FACTORED WIND LOAD (psf)	0			10			20			30			40			50			60																								
	STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)																								
	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075																						
STUD HEIGHT (ft)																						12" O.C. STUD SPACING																					
8	5.2	8.7	11.4	4.8	8.3	10.8	4.3	7.8	10.3	3.9	7.4	9.9	3.4	7.0	9.4	3.0	6.5	8.9	2.5	6.1	8.5																						
9	4.9	7.9	10.2	4.4	7.3	9.6	3.8	6.8	9.0	3.3	6.3	8.4	2.7	5.8	7.8	2.2	5.3	7.3	1.7	4.7	6.8																						
10	5.2	8.2	10.5	4.4	7.5	9.7	3.7	6.8	8.9	3.0	6.1	8.2	2.3	5.5	7.5	1.7	4.9	6.9	1.0	4.4	6.3																						
11	4.9	7.3	9.2	4.0	6.5	8.3	3.2	5.7	7.4	2.4	5.0	6.7	1.6	4.3	6.0	0.9	3.7	5.3	0.3	3.2	4.7																						
12	4.5	6.3	7.8	3.5	5.4	6.8	2.6	4.6	6.0	1.8	3.9	5.3	1.0	3.3	4.6	0.3	2.7	3.9		2.1	3.3																						
14	4.0	5.1	6.2	2.7	4.1	5.1	1.7	3.2	4.3	0.8	2.5	3.5	0.1	1.9	2.8		1.3	2.2			1.6																						
16	3.2	3.9	4.8	1.8	2.9	3.7	0.9	2.1	2.8		1.4	2.1			1.5																												
STUD HEIGHT (ft)																						16" O.C. STUD SPACING																					
8	5.2	8.7	11.4	4.6	8.1	10.7	4.0	7.5	10.0	3.4	7.0	9.4	2.9	6.4	8.8	2.2	5.9	8.2	1.7	5.3	7.6																						
9	4.9	7.9	10.2	4.2	7.2	9.4	3.5	6.4	8.6	2.7	5.8	7.8	2.0	5.1	7.1	1.3	4.4	6.4	0.7	3.7	5.6																						
10	5.2	8.2	10.5	4.2	7.3	9.5	3.3	6.3	8.4	2.3	5.5	7.5	1.5	4.7	6.7	0.6	4.0	5.9		3.3	5.1																						
11	4.9	7.3	9.2	3.7	6.2	8.0	2.7	5.2	6.9	1.6	4.3	6.0	0.7	3.5	5.1		2.8	4.3		2.1	3.5																						
12	4.5	6.3	7.8	3.2	5.1	6.6	2.1	4.1	5.5	1.0	3.3	4.6		2.5	3.7		1.8	2.9		1.1	2.2																						
14	4.0	5.1	6.2	2.3	3.8	4.8	1.1	2.7	3.7	0.1	1.9	2.8		1.1	2.0																												
16	3.2	3.9	4.8	1.5	2.6	3.4	0.3	1.6	2.4			1.5																															
STUD HEIGHT (ft)																						24" O.C. STUD SPACING																					
8	5.2	8.7	11.4	4.3	7.8	10.3	3.4	7.0	9.4	2.5	6.1	8.5	1.7	5.3	7.6	0.8	4.4	6.6		3.6	5.7																						
9	4.9	7.9	10.2	3.8	6.8	9.0	2.7	5.8	7.8	1.7	4.7	6.8	0.7	3.7	5.6		2.8	4.6		1.9	3.6																						
10	5.2	8.2	10.5	3.7	6.8	8.9	2.3	5.5	7.5	1.0	4.4	6.3		3.3	5.1		2.2	4.0		1.2	2.9																						
11	4.9	7.3	9.2	3.2	5.7	7.4	1.6	4.3	6.0	0.3	3.2	4.7		2.1	3.5		1.0	2.5			1.3																						
12	4.5	6.3	7.8	2.6	4.6	6.0	1.0	3.3	4.6		2.1	3.3		1.1	2.2			1.2																									
14	4.0	5.1	6.2	1.7	3.2	4.3	0.1	1.9	2.8			1.6																															
16	3.2	3.9	4.8	0.9	2.1	2.8			1.5																																		

NOTES:  
 1. See general notes. (For bridging see 4.2.5 and 4.3.3)

COMBINED WIND & AXIAL LOAD BEARING STUD TABLES 6" STUDS  
 MAXIMUM FACTORED COMPRESSIVE RESISTANCE EACH STUD (KIPS) LIMIT STATES DESIGN

SHEATHED

FACTORED WIND LOAD (psf)	0			10			20			30			40			50			60						
	STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)						
	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075				
<b>12" O.C. STUD SPACING</b>																									
STUD HEIGHT (ft)																									
8	7.8	14.4	18.9	7.5	14.0	18.4	7.1	13.6	18.0	6.7	13.2	17.6	6.4	12.8	17.2	6.0	12.4	16.8	5.6	12.1	16.3				
9	7.7	14.0	18.4	7.2	13.5	17.9	6.8	13.0	17.3	6.3	12.5	16.8	5.8	12.1	16.2	5.4	11.6	15.7	4.9	11.1	15.2				
10	7.6	13.7	17.9	7.0	13.0	17.2	6.4	12.4	16.5	5.8	11.8	15.9	5.3	11.2	15.2	4.7	10.6	14.6	4.2	10.1	13.9				
11	7.4	13.2	17.4	6.7	12.4	16.5	6.0	11.7	15.7	5.3	11.0	14.8	4.7	10.3	14.1	4.0	9.6	13.3	3.4	8.9	12.6				
12	7.3	12.8	16.7	6.4	11.8	15.7	5.6	10.9	14.7	4.8	10.1	13.8	4.0	9.3	12.9	3.3	8.5	12.0	2.6	7.8	11.2				
14	6.9	11.7	15.3	5.7	10.4	13.9	4.7	9.3	12.6	3.7	8.3	11.4	2.8	7.3	10.3	1.9	6.4	9.3	1.1	5.5	8.4				
16	6.5	10.4	13.7	5.0	8.9	11.9	3.7	7.6	10.4	2.6	6.4	9.1	1.6	5.4	7.9	0.6	4.4	6.8				3.5	5.8		
<b>16" O.C. STUD SPACING</b>																									
STUD HEIGHT (ft)																									
8	7.8	14.4	18.9	7.3	13.9	18.3	6.8	13.3	17.7	6.4	12.8	17.2	5.9	12.3	16.6	5.4	11.8	16.1	4.9	11.3	15.5				
9	7.7	14.0	18.4	7.1	13.4	17.7	6.4	12.7	17.0	5.8	12.1	16.2	5.2	11.4	15.5	4.7	10.8	14.9	4.1	10.2	14.2				
10	7.6	13.7	17.9	6.8	12.8	17.0	6.0	12.0	16.1	5.3	11.2	15.2	4.6	10.4	14.3	3.9	9.7	13.5	3.2	9.0	12.7				
11	7.4	13.2	17.4	6.5	12.2	16.2	5.6	11.2	15.1	4.7	10.3	14.1	3.8	9.4	13.1	3.0	8.5	12.1	2.3	7.7	11.2				
12	7.3	12.8	16.7	6.1	11.5	15.4	5.1	10.4	14.1	4.0	9.3	12.9	3.1	8.3	11.7	2.2	7.3	10.6	1.3	6.4	9.6				
14	6.9	11.7	15.3	5.4	10.0	13.4	4.0	8.6	11.8	2.8	7.3	10.3	1.7	6.1	9.0	0.6	5.0	7.7				4.0	6.6		
16	6.5	10.4	13.7	4.5	8.4	11.3	2.9	6.8	9.5	1.6	5.4	7.9	0.4	4.1	6.4				3.0	5.1				1.9	3.9
<b>24" O.C. STUD SPACING</b>																									
STUD HEIGHT (ft)																									
8	7.8	14.4	18.9	7.1	13.6	18.0	6.4	12.8	17.2	5.6	12.1	16.3	4.9	11.3	15.5	4.2	10.6	14.7	3.5	9.9	13.9				
9	7.7	14.0	18.4	6.8	13.0	17.3	5.8	12.1	16.2	4.9	11.1	15.2	4.1	10.2	14.2	3.2	9.3	13.2	2.4	8.4	12.2				
10	7.6	13.7	17.9	6.4	12.4	16.5	5.3	11.2	15.2	4.2	10.1	13.9	3.2	9.0	12.7	2.2	7.9	11.5	1.2	6.9	10.4				
11	7.4	13.2	17.4	6.0	11.7	15.7	4.7	10.3	14.1	3.4	8.9	12.6	2.3	7.7	11.2	1.1	6.5	9.8				5.3	8.5		
12	7.3	12.8	16.7	5.6	10.9	14.7	4.0	9.3	12.9	2.6	7.8	11.2	1.3	6.4	9.6	0.1	5.1	8.1				3.9	6.7		
14	6.9	11.7	15.3	4.7	9.3	12.6	2.8	7.3	10.3	1.1	5.5	8.4				4.0	6.6				2.5	4.9			
16	6.5	10.4	13.7	3.7	7.6	10.4	1.6	5.4	7.9				3.5	5.8				1.9	3.9				2.3		

UNSHEATHED

FACTORED WIND LOAD (psf)	0			10			20			30			40			50			60						
	STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)						
	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075				
<b>12" O.C. STUD SPACING</b>																									
STUD HEIGHT (ft)																									
8	5.6	10.0	13.2	5.4	9.7	12.9	5.1	9.5	12.6	4.8	9.2	12.3	4.6	8.9	12.0	4.3	8.7	11.8	4.1	8.4	11.5				
9	5.5	9.5	12.6	5.1	9.2	12.2	4.8	8.8	11.8	4.5	8.5	11.5	4.1	8.2	11.1	3.8	7.9	10.8	3.5	7.5	10.4				
10	5.9	10.7	14.0	5.5	10.2	13.5	5.0	9.8	13.0	4.6	9.3	12.5	4.2	8.9	12.1	3.7	8.4	11.6	3.3	8.0	11.1				
11	5.8	10.2	13.4	5.3	9.6	12.8	4.7	9.1	12.2	4.2	8.6	11.6	3.7	8.1	11.0	3.2	7.5	10.8	2.6	7.0	9.9				
12	5.7	9.7	12.7	5.0	9.0	12.0	4.4	8.4	11.3	3.8	7.8	10.6	3.2	7.2	9.9	2.5	6.6	9.3	1.9	6.0	8.6				
14	5.4	9.0	11.8	4.5	8.0	10.8	3.7	7.2	9.8	2.9	6.4	8.9	2.1	5.6	8.0	1.4	4.8	7.1	0.8	4.1	6.3				
16	5.0	7.8	10.3	3.9	6.7	9.0	2.9	5.7	7.8	1.9	4.7	6.8	1.1	3.9	5.8	0.3	3.1	4.9				2.3	4.0		
<b>16" O.C. STUD SPACING</b>																									
STUD HEIGHT (ft)																									
8	5.6	10.0	13.2	5.3	9.6	12.8	4.9	9.3	12.4	4.6	8.9	12.0	4.2	8.6	11.7	3.9	8.2	11.3	3.6	7.9	10.9				
9	5.5	9.5	12.6	5.0	9.1	12.1	4.6	8.6	11.6	4.1	8.2	11.1	3.7	7.7	10.6	3.3	7.3	10.2	2.9	6.9	9.7				
10	5.9	10.7	14.0	5.3	10.1	13.3	4.7	9.5	12.7	4.2	8.9	12.1	3.6	8.3	11.4	3.0	7.7	10.8	2.3	7.1	10.2				
11	5.8	10.2	13.4	5.1	9.5	12.6	4.4	8.8	11.8	3.7	8.1	11.0	3.0	7.4	10.3	2.2	6.7	9.5	1.5	6.0	8.8				
12	5.7	9.7	12.7	4.8	8.8	11.8	4.0	8.0	10.8	3.2	7.2	9.9	2.3	6.4	9.1	1.5	5.6	8.2	0.7	4.8	7.4				
14	5.4	9.0	11.8	4.2	7.8	10.8	3.1	6.6	9.2	2.1	5.6	8.0	1.2	4.6	6.9	0.3	3.7	5.8				2.8	4.8		
16	5.0	7.8	10.3	3.5	6.3	8.6	2.2	5.0	7.1	1.1	3.9	5.8				2.8	4.6				1.8	3.5			
<b>24" O.C. STUD SPACING</b>																									
STUD HEIGHT (ft)																									
8	5.6	10.0	13.2	5.1	9.5	12.6	4.6	8.9	12.0	4.1	8.4	11.5	3.6	7.9	10.9	3.1	7.4	10.3	2.5	6.9	9.8				
9	5.5	9.5	12.6	4.8	8.8	11.8	4.1	8.2	11.1	3.5	7.5	10.4	2.9	6.9	9.7	2.2	6.3	9.0	1.5	5.6	8.3				
10	5.9	10.7	14.0	5.0	9.8	13.0	4.2	8.9	12.1	3.3	8.0	11.1	2.3	7.1	10.2	1.4	6.3	9.2	0.6	5.4	8.3				
11	5.8	10.2	13.4	4.7	9.1	12.2	3.7	8.1	11.0	2.6	7.0	9.9	1.5	6.0	8.8	0.5	5.1	7.7				4.0	6.7		
12	5.7	9.7	12.7	4.4	8.4	11.3	3.2	7.2	9.9	1.9	6.0	8.6	0.7	4.8	7.4				3.8	6.1				2.7	5.0
14	5.4	9.0	11.8	3.7	7.2	9.8	2.1	5.6	8.0	0.8	4.1	6.3				2.8	4.8				1.6	3.4			
16	5.0	7.8	10.3	2.9	5.7	7.8	1.1	3.9	5.8				2.3	4.0				0.9	2.4						

NOTES:  
 1. See general notes. (For bridging see 4.2.5 and 4.3.3)

**COMBINED WIND & AXIAL LOAD BEARING STUD TABLES 8" STUDS  
 MAXIMUM FACTORED COMPRESSIVE RESISTANCE EACH STUD (KIPS)      LIMIT STATES DESIGN**

**SHEATHED**

FACTORED WIND LOAD (psf)	0			10			20			30			40			50			60		
	STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)		
	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075
<b>12" O.C. STUD SPACING</b>																					
STUD HEIGHT (ft)																					
8	8.2	15.2	20.1	7.9	14.9	19.9	7.7	14.7	19.6	7.4	14.4	19.3	7.2	14.2	19.0	6.9	13.9	18.7	6.7	13.7	18.5
9	8.1	15.0	19.9	7.8	14.6	19.5	7.4	14.3	19.2	7.1	14.0	18.8	6.8	13.7	18.4	6.5	13.4	18.1	6.2	13.0	17.7
10	8.0	14.7	19.6	7.6	14.3	19.1	7.2	13.9	18.7	6.8	13.5	18.2	6.4	13.1	17.8	6.0	12.7	17.4	5.7	12.4	16.9
11	7.9	14.5	19.2	7.4	14.0	18.7	7.0	13.5	18.1	6.5	13.0	17.6	6.0	12.5	17.1	5.6	12.1	16.6	5.1	11.6	16.0
12	7.8	14.2	18.9	7.2	13.6	18.2	6.7	13.0	17.6	6.1	12.5	16.9	5.6	11.9	16.3	5.0	11.3	15.7	4.5	10.8	15.1
14	7.6	13.6	18.0	6.8	12.8	17.1	6.0	12.0	16.2	5.3	11.2	15.4	4.6	10.5	14.5	3.9	9.7	13.7	3.2	9.0	12.9
16	7.4	12.8	17.1	6.3	11.8	15.9	5.3	10.8	14.7	4.4	9.8	13.6	3.5	8.9	12.6	2.7	8.0	11.6	1.9	7.2	10.7
<b>16" O.C. STUD SPACING</b>																					
STUD HEIGHT (ft)																					
8	8.2	15.2	20.1	7.8	14.8	19.8	7.5	14.5	19.4	7.2	14.2	19.0	6.8	13.8	18.6	6.5	13.5	18.3	6.2	13.1	17.9
9	8.1	15.0	19.9	7.7	14.5	19.4	7.2	14.1	18.9	6.8	13.7	18.4	6.4	13.2	18.0	6.0	12.8	17.5	5.6	12.4	17.0
10	8.0	14.7	19.6	7.5	14.2	19.0	7.0	13.7	18.4	6.4	13.1	17.8	5.9	12.6	17.2	5.4	12.1	16.6	4.9	11.6	16.1
11	7.9	14.5	19.2	7.3	13.8	18.5	6.6	13.2	17.8	6.0	12.5	17.1	5.4	11.9	16.4	4.8	11.3	15.7	4.2	10.7	15.0
12	7.8	14.2	18.9	7.1	13.4	18.0	6.3	12.7	17.1	5.6	11.9	16.3	4.8	11.2	15.5	4.1	10.4	14.7	3.4	9.7	13.9
14	7.6	13.6	18.0	6.6	12.5	16.8	5.5	11.5	15.7	4.6	10.5	14.5	3.7	9.5	13.5	2.8	8.6	12.4	1.9	7.7	11.4
16	7.4	12.8	17.1	6.0	11.4	15.5	4.7	10.1	14.0	3.5	8.9	12.6	2.4	7.7	11.3	1.4	6.6	10.1	0.3	5.6	8.9
<b>24" O.C. STUD SPACING</b>																					
STUD HEIGHT (ft)																					
8	8.2	15.2	20.1	7.7	14.7	19.6	7.2	14.2	19.0	6.7	13.7	18.5	6.2	13.1	17.9	5.7	12.6	17.4	5.2	12.2	16.8
9	8.1	15.0	19.9	7.4	14.3	19.2	6.8	13.7	18.4	6.2	13.0	17.7	5.6	12.4	17.0	4.9	11.8	16.4	4.3	11.2	15.7
10	8.0	14.7	19.6	7.2	13.9	18.7	6.4	13.1	17.8	5.7	12.4	16.9	4.9	11.6	16.1	4.2	10.8	15.2	3.4	10.1	14.4
11	7.9	14.5	19.2	7.0	13.5	18.1	6.0	12.5	17.1	5.1	11.6	16.0	4.2	10.7	15.0	3.3	9.8	14.0	2.4	8.9	13.0
12	7.8	14.2	18.9	6.7	13.0	17.6	5.6	11.9	16.3	4.5	10.8	15.1	3.4	9.7	13.9	2.4	8.7	12.7	1.5	7.6	11.6
14	7.6	13.6	18.0	6.0	12.0	16.2	4.6	10.5	14.5	3.2	9.0	12.9	1.9	7.7	11.4	0.6	6.4	9.9		5.1	8.5
16	7.4	12.8	17.1	5.3	10.8	14.7	3.5	8.9	12.6	1.9	7.2	10.7	0.3	5.6	8.9		4.1	7.2		2.7	5.5

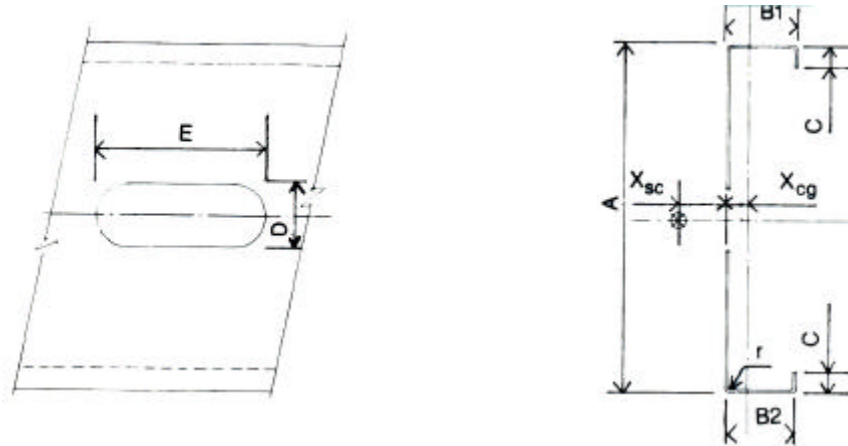
**UNSHEATHED**

FACTORED WIND LOAD (psf)	0			10			20			30			40			50			60		
	STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)			STUD THICKNESS (inches)		
	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075	.048	.060	.075
<b>12" O.C. STUD SPACING</b>																					
STUD HEIGHT (ft)																					
8	5.6	10.0	13.2	5.4	9.8	13.1	5.3	9.6	12.9	5.1	9.6	12.7	4.9	9.3	12.5	4.8	9.1	12.3	4.6	9.0	12.1
9	5.4	9.5	12.6	5.2	9.3	12.3	5.0	9.1	12.1	4.8	8.8	11.9	4.6	8.6	11.7	4.4	8.4	11.4	4.2	8.2	11.2
10	6.1	11.2	14.8	5.8	10.9	14.5	5.5	10.7	14.2	5.2	10.4	13.9	4.9	10.1	13.6	4.7	9.8	13.3	4.4	9.5	13.0
11	6.1	10.8	14.3	5.7	10.5	13.9	5.4	10.1	13.6	5.0	9.8	13.2	4.6	9.5	12.8	4.3	9.1	12.4	3.9	8.8	12.1
12	6.0	10.4	13.7	5.6	10.0	13.3	5.2	9.6	12.8	4.7	9.2	12.4	4.3	8.8	11.9	3.9	8.4	11.5	3.5	8.0	11.1
14	6.0	10.5	14.0	5.4	9.9	13.3	4.8	9.3	12.6	4.2	8.6	11.9	3.6	8.1	11.3	3.0	7.5	10.6	2.5	6.9	10.0
16	5.7	9.8	13.0	4.9	9.0	12.1	4.2	8.2	11.2	3.4	7.4	10.3	2.7	6.6	9.5	2.0	5.9	8.7	1.4	5.2	7.9
<b>16" O.C. STUD SPACING</b>																					
STUD HEIGHT (ft)																					
8	5.6	10.0	13.2	5.4	9.7	13.0	5.2	9.5	12.8	4.9	9.3	12.5	4.7	9.1	12.3	4.5	8.9	12.0	4.3	8.6	11.8
9	5.4	9.5	12.6	5.2	9.2	12.3	4.9	8.9	12.0	4.6	8.6	11.7	4.3	8.4	11.4	4.1	8.1	11.1	3.8	7.8	10.8
10	6.1	11.2	14.8	5.7	10.8	14.4	5.3	10.5	14.0	4.9	10.1	13.6	4.6	9.7	13.2	4.2	9.3	12.8	3.8	9.0	12.4
11	6.1	10.8	14.3	5.6	10.4	13.8	5.1	9.9	13.3	4.6	9.5	12.8	4.2	9.0	12.3	3.7	8.6	11.8	3.2	8.1	11.3
12	6.0	10.4	13.7	5.4	9.9	13.1	4.9	9.3	12.5	4.3	8.8	11.9	3.8	8.2	11.4	3.2	7.7	10.8	2.5	7.2	10.2
14	6.0	10.5	14.0	5.2	9.7	13.1	4.4	8.8	12.1	3.6	8.1	11.3	2.9	7.3	10.4	2.1	6.5	9.5	1.4	5.8	8.7
16	5.7	9.8	13.0	4.7	8.7	11.8	3.7	7.6	10.6	2.7	6.6	9.5	1.8	5.7	8.4	0.9	4.7	7.4		3.8	6.3
<b>24" O.C. STUD SPACING</b>																					
STUD HEIGHT (ft)																					
8	5.6	10.0	13.2	5.3	9.6	12.9	4.9	9.3	12.5	4.6	9.0	12.1	4.3	8.6	11.8	3.9	8.3	11.4	3.6	8.0	11.1
9	5.4	9.5	12.6	5.0	9.1	12.1	4.6	8.6	11.7	4.2	8.2	11.2	3.8	7.8	10.8	3.4	7.4	10.3	3.0	7.0	9.9
10	6.1	11.2	14.8	5.5	10.7	14.2	4.9	10.1	13.6	4.4	9.5	13.0	3.8	9.0	12.4	3.1	8.4	11.8	2.5	7.8	11.2
11	6.1	10.8	14.3	5.4	10.1	13.6	4.6	9.5	12.8	3.9	8.8	12.1	3.2	8.1	11.3	2.4	7.4	10.6	1.6	6.8	9.9
12	6.0	10.4	13.7	5.2	9.6	12.8	4.3	8.8	11.9	3.5	8.0	11.1	2.5	7.2	10.2	1.6	6.4	9.3	0.7	5.6	8.5
14	6.0	10.5	14.0	4.8	9.3	12.6	3.6	8.1	11.3	2.5	6.9	10.0	1.4	5.8	8.7	0.4	4.7	7.5		3.6	6.3
16	5.7	9.8	13.0	4.2	8.2	11.2	2.7	6.6	9.5	1.4	5.2	7.9		3.8	6.3		2.5	4.9		1.3	3.5

**NOTES:**  
 1. See general notes. (For bridging see 4.2.5 and 4.3.3)

# BAILEY

## JOIST GEOMETRY



**FLOOR JOIST SECTION PROPERTIES TABLE**  
**LIMIT STATES DESIGN**

JOIST NAME	DIMENSIONS								PERFORATED PROPERTIES		
	THICK t (in)	DEP A (in)	FLG B1 (in)	FLG B2 (in)	LIP C (in)	RAD r (in)	PERF D (in)	PERF E (in)	I <sub>x</sub> (in <sup>4</sup> )	M <sub>rx</sub> (in.kips)	V <sub>r</sub> (kips)
6 x .048	.048	6.00	1.625	1.625	.5000	.0960	1.5	4.0	2.43	22.1	1.14
6 x .060	.060	6.00	1.625	1.625	.5000	.1200	1.5	4.0	2.97	40.9	2.22
6 x .075	.075	6.00	1.625	1.625	.5000	.1500	1.5	4.0	3.62	49.9	4.23
8 x .048	.048	8.00	1.625	1.625	.5000	.0960	1.5	4.0	4.87	32.5	.99
8 x .060	.060	8.00	1.625	1.625	.5000	.1200	1.5	4.0	5.99	61.7	1.93
8 x .075	.075	8.00	1.625	1.625	.5000	.1500	1.5	4.0	7.32	75.5	3.74
10 x .060	.060	10.00	1.625	1.625	.5000	.1200	1.5	4.0	10.4	79.7	1.67
10 x .075	.075	10.00	1.625	1.625	.5000	.1500	1.5	4.0	12.8	105.0	3.25

JOIST NAME	UNPERFORATED PROPERTIES								
	WEIGHT (lbs/ft)	AREA (in <sup>2</sup> )	X <sub>cg</sub> (in)	X <sub>sc</sub> (in)	C <sub>w</sub> (in <sup>6</sup> )	J (in <sup>4</sup> )	I <sub>y</sub> (in <sup>4</sup> )	S <sub>xc</sub> (in <sup>3</sup> )	
6 x .048	1.61	0.473	0.412	0.669	1.14	.000363	0.155	0.813	
6 x .060	1.99	0.585	0.411	0.662	1.38	.000702	.0187	0.996	
6 x .075	2.46	0.722	0.410	0.654	1.65	.00135	.0223	1.21	
8 x .048	1.94	0.569	0.347	0.594	2.17	.000437	0.167	1.22	
8 x .060	2.40	0.705	0.346	0.586	2.63	.000846	0.202	1.50	
8 x .075	2.97	0.872	0.346	0.577	3.16	.00164	0.240	1.84	
10 x .060	2.81	0.825	0.300	0.526	4.36	.000990	0.212	2.09	
10 x .075	3.48	1.02	0.301	0.516	5.26	.00192	0.252	2.56	

**NOTES:**

1. See General Notes



# BAILEY

## FLOOR JOIST LOAD TABLE

### UNIFORMLY DISTRIBUTED SINGLE SPAN LOAD (PSF)

**LIMIT STATES DESIGN      STRENGTH LOADS ARE FACTORED – DEFLECTION LOADS ARE SPECIFIED**

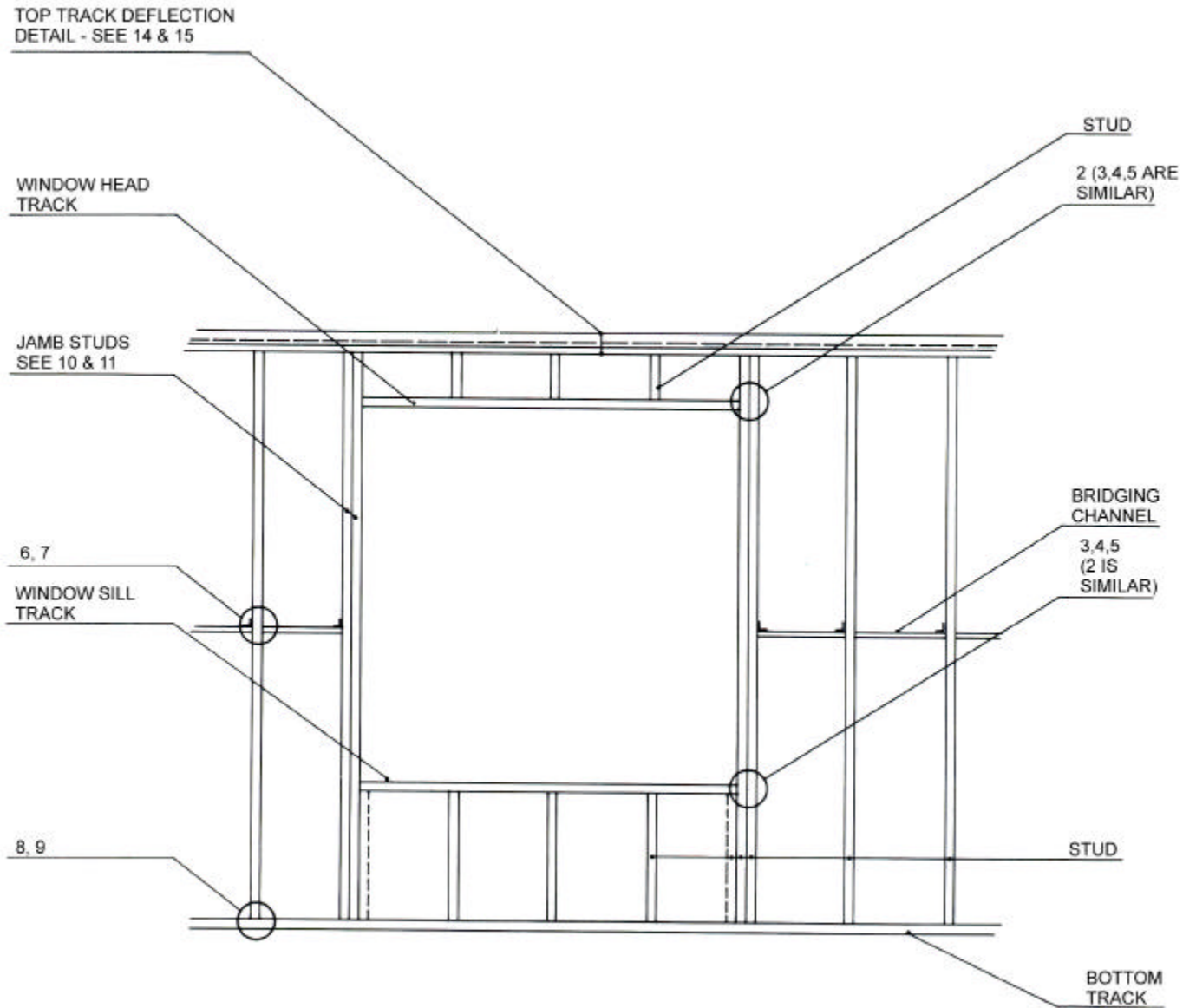
JOIST NAME		6 x .075			6 x .060			6 x .048			8 x .075			8 x .060			8 x .048		
SPAN (ft)	STRENGTH OR	JOIST SPACING (in)																	
	DEFLECTION	12	16	24	12	16	24	12	16	24	12	16	24	12	16	24	12	16	24
8	STRENGTH	520	390	260	427	320	213	230	172	115	786	590	393	482	361	241	248	186	124
	L/360	309	232	155	254	190	127	207	155	104	625	469	313	511	383	256	416	312	208
9	STRENGTH	411	308	205	337	253	169	182	136	91	621	466	311	428	321	214	220	165	110
	L/360	217	163	109	178	134	89	145	109	73	439	329	219	359	269	179	292	219	146
10	STRENGTH	333	250	166	273	205	136	147	110	74	503	377	252	385	289	193	198	149	99
	L/360	158	119	79	130	97	65	106	80	53	320	240	160	262	196	131	213	160	106
11	STRENGTH	275	206	137	226	169	113	122	91	61	416	312	208	340	255	170	179	134	90
	L/360	119	89	59	98	73	49	80	60	40	240	180	120	197	147	98	160	120	80
12	STRENGTH	231	173	116	190	142	95	102	77	51	349	262	175	286	214	143	150	113	75
	L/360	92	69	46	75	56	38	61	46	31	185	139	93	151	114	76	123	92	62
13	STRENGTH	197	148	98	162	121	81	87	65	43	298	223	149	243	183	122	128	96	64
	L/360	72	54	36	59	44	30	48	36	24	146	109	73	119	89	60	97	73	48
14	STRENGTH	170	127	85	139	104	70	75	56	38	257	192	128	210	157	105	111	83	55
	L/360	58	43	29	47	36	24	39	29	19	117	87	58	95	72	48	78	58	39
15	STRENGTH	148	111	74	121	91	61	65	49	33	224	168	112	183	137	91	96	72	48
	L/360	47	35	23	38	29	19	31	24	16	95	71	47	78	58	39	63	47	32
16	STRENGTH	130	97	65	107	80	53	57	43	29	197	147	98	161	120	80	85	63	42
	L/360	39	29	19	32	24	16	26	19	13	78	59	39	64	48	32	52	39	26
17	STRENGTH	115	86	58	94	71	47	51	38	25	174	131	87	142	107	71	75	56	37
	L/360	32	24	16	26	20	13	22	16	11	65	49	33	53	40	27	43	33	22
18	STRENGTH	103	77	51	84	63	42	45	34	23	155	116	78	127	95	63	67	50	33
	L/360	27	20	14	22	17	11	18	14	9	55	41	27	45	34	22	37	27	18
19	STRENGTH	92	69	46	76	57	38	41	31	20	139	105	70	114	85	57	60	45	30
	L/360	23	17	12	19	14	9	15	12	8	47	35	23	38	29	19	31	23	16
20	STRENGTH	83	62	42	68	51	34	37	28	18	126	94	63	103	77	51	54	41	27
	L/360	20	15	10	16	12	8	13	10	7	40	30	20	33	25	16	27	20	13
22	STRENGTH	69	52	34	56	42	28	30	23	15	104	78	52	85	64	42	45	34	22
	L/360	15	11	7	12	9	6	10	7	5	30	23	15	25	18	12	20	15	10
24	STRENGTH	58	43	29	47	36	24				87	66	44	71	54	36	38	28	19
	L/360	11	9	6	9	7	5				23	17	12	19	14	9	15	12	8

JOIST NAME		10 x .075			10 x .060		
SPAN (ft)	STRENGTH OR	JOIST SPACING (in)					
	DEFLECTION	12	16	24	12	16	24
16	STRENGTH	274	205	137	208	156	104
	L/360	136	102	68	111	83	56
17	STRENGTH	242	182	121	184	138	92
	L/360	114	85	57	93	69	46
18	STRENGTH	216	162	108	164	123	82
	L/360	96	72	48	78	59	39
19	STRENGTH	194	146	97	147	110	74
	L/360	81	61	41	66	50	33
20	STRENGTH	175	131	88	133	100	66
	L/360	70	52	35	57	43	28
21	STRENGTH	159	119	79	121	90	60
	L/360	60	45	30	49	37	25
22	STRENGTH	145	109	72	110	82	55
	L/360	52	39	26	43	32	21
23	STRENGTH	132	99	66	101	75	50
	L/360	46	34	23	37	28	19
24	STRENGTH	122	91	61	92	69	46
	L/360	40	30	20	33	25	16
25	STRENGTH	112	84	56	85	64	43
	L/360	36	27	18	29	22	15
26	STRENGTH	104	78	52	49	59	39
	L/360	32	24	16	26	19	13
28	STRENGTH	89	67	45	68	51	34
	L/360	25	19	13	21	16	10
30	STRENGTH	78	58	39	59	44	30
	L/360	21	15	10	17	13	8
32	STRENGTH	68	51	34	52	39	26
	L/360	17	13	9	14	10	7

**NOTES:**  
1. See general notes.

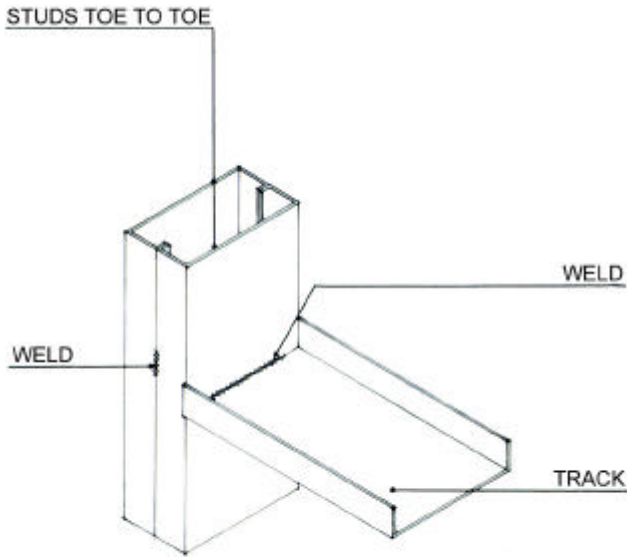
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## CONSTRUCTION DETAILS

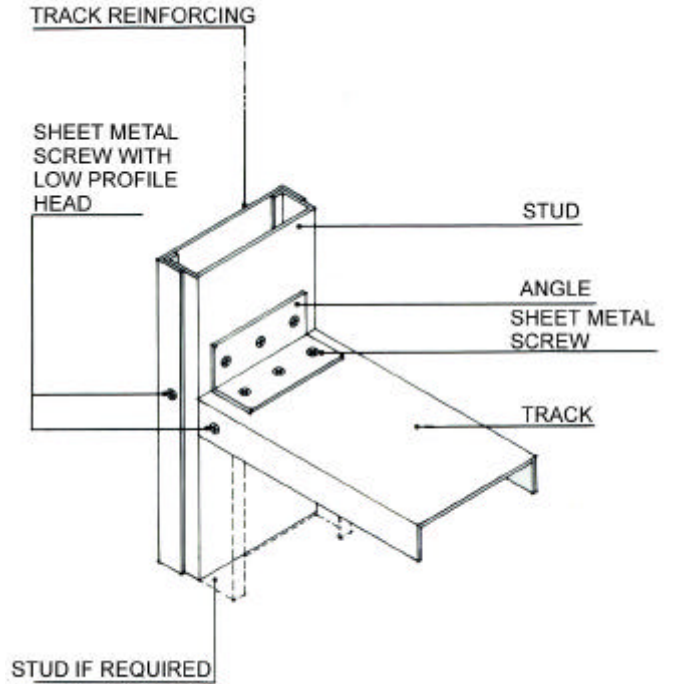


**DETAIL 1 – WIND BEARING STUD  
WALL WITH OPENING**

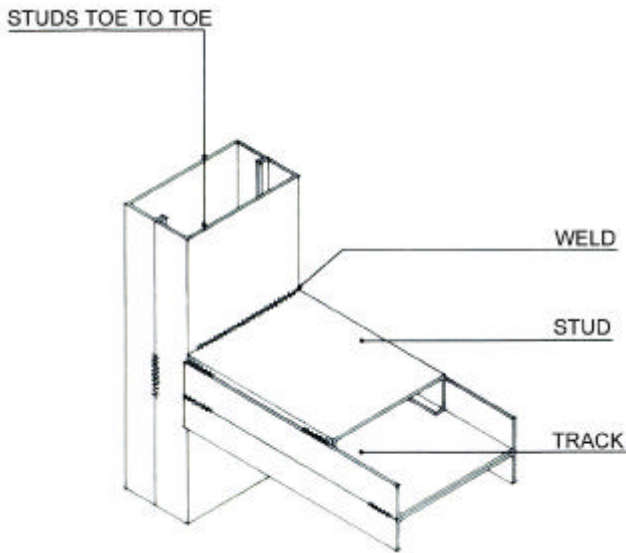
CONSTRUCTION DETAILS



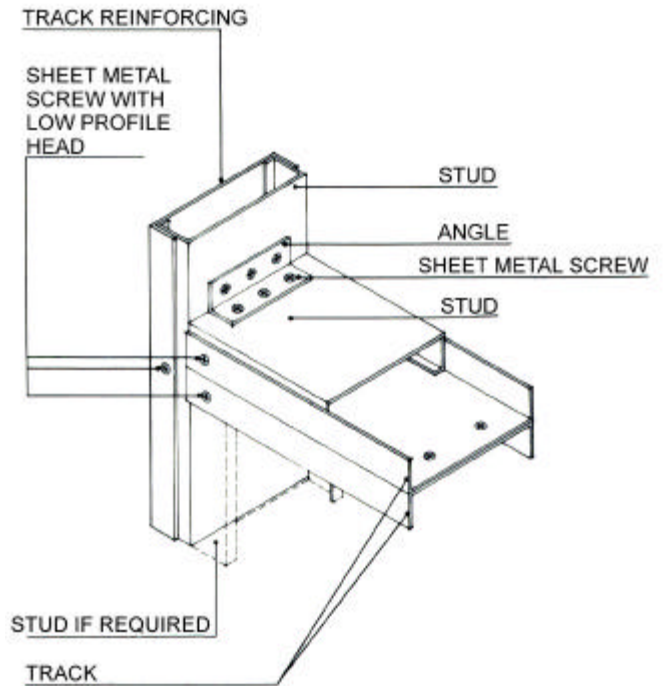
DETAIL 2 – WELDED CONNECTION DETAIL OR WINDOW HEAD TRACK TO JAMB STUDS – SEE 1



DETAIL 3 – SCREWED CONNECTION DETAIL FOR WINDOW SILL TRACK TO JAMB STUD – SEE 1

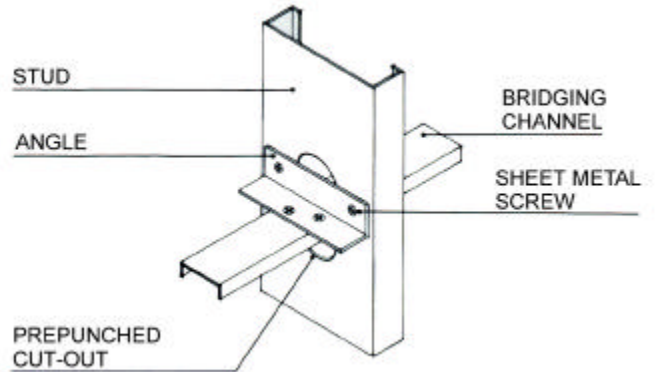
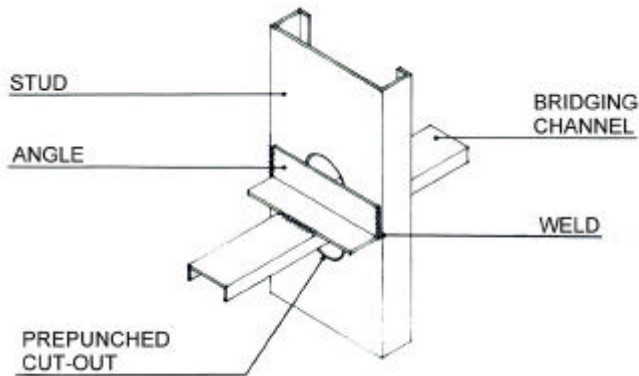


DETAIL 4 – WELDED CONNECTION DETAIL FOR REINFORCED WINDOW SILL TO JAMB STUDS – SEE 1



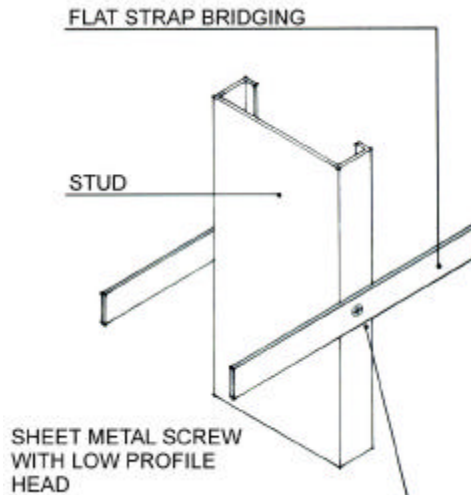
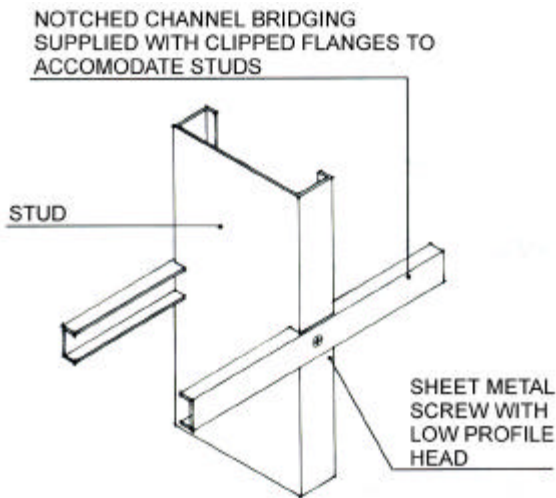
DETAIL 5 – SCREWED CONNECTION DETAIL FOR REINFORCED WINDOW SILL TO JAMB STUD – SEE 1

CONSTRUCTION DETAILS



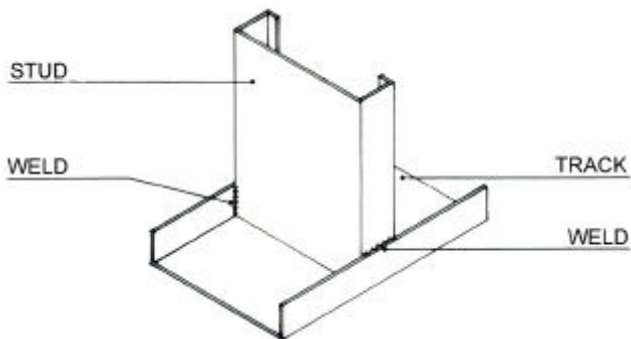
DETAIL 6 – WELDED CONNECTION DETAIL FOR BRIDGING TO STUD

DETAIL 7 – SCREWED CONNECTION DETAIL FOR BRIDGING TO STUD

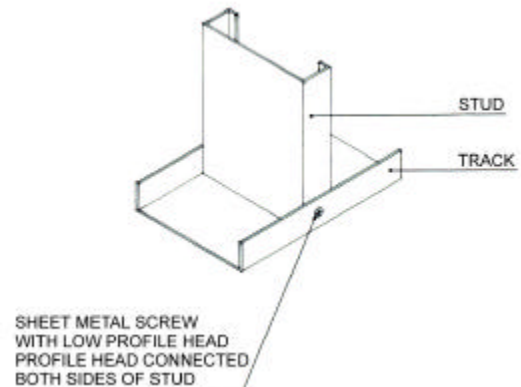


DETAIL 7A – NOTCHED CHANNEL BRIDGING – WELDED OR SCREWED

DETAIL 7B – FLAT STRAP BRIDGING – WELDED OR SCREWED



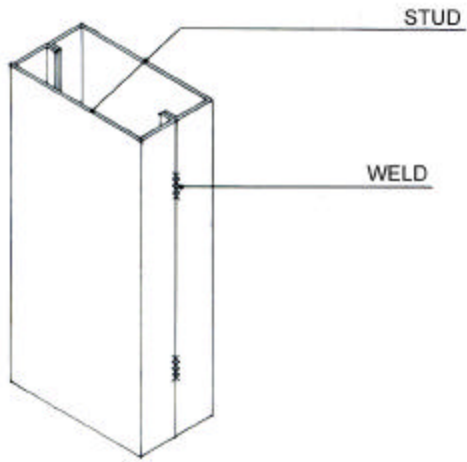
DETAIL 8 – WELDED CONNECTION DETAIL FOR STUD TO TRACK



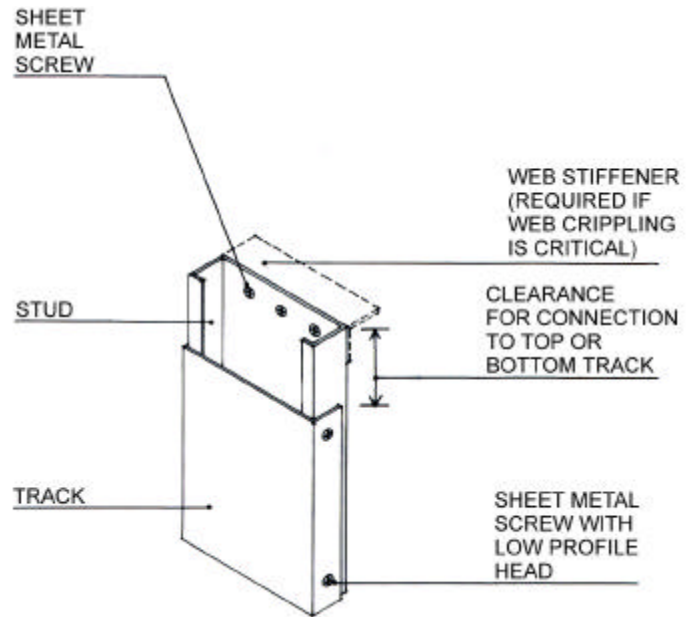
DETAIL 9 – SCREWED CONNECTION DETAIL FOR STUD TO TRACK



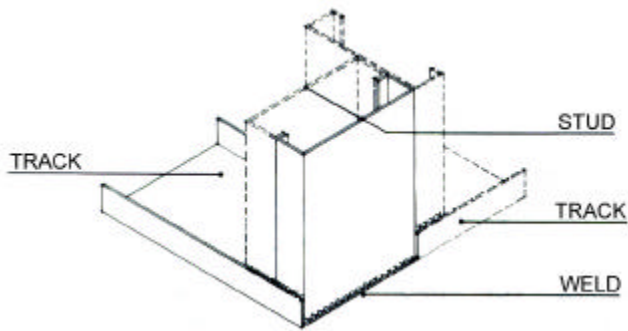
CONSTRUCTION DETAILS



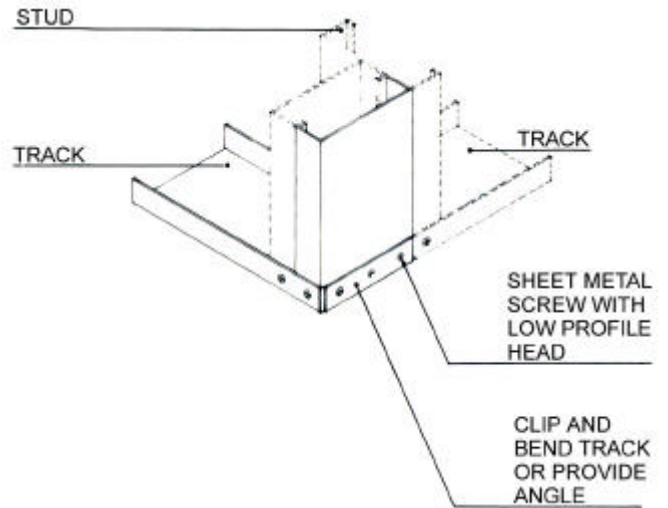
DETAIL 10 – WELDED CONNECTION FOR STUDS TOE TO TOE



DETAIL 11 – SCREWED CONNECTION FOR STUD WITH TRACK REINFORCING

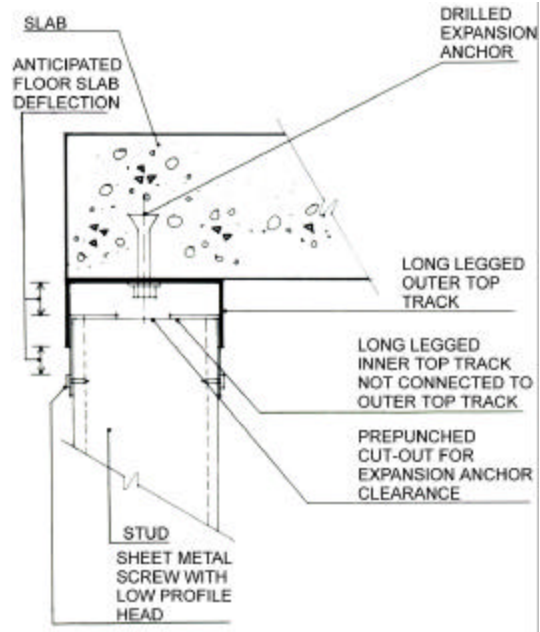
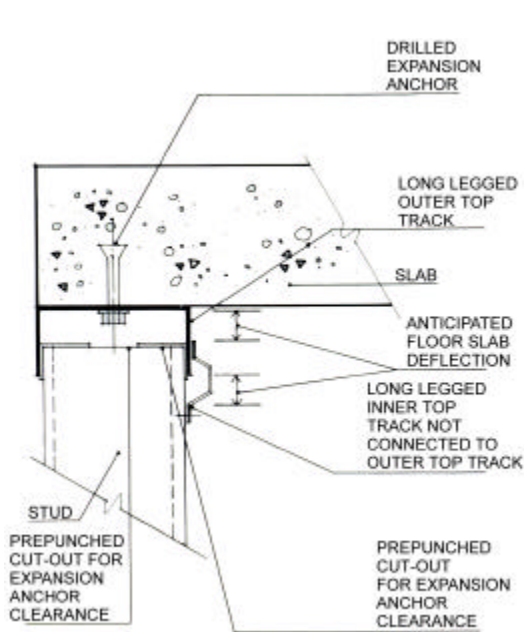


DETAIL 12 – WELDED CONNECTION DETAIL FOR STUD TO TRACK AT DOOR OPENINGS, CORNERS AND ENDS OF PANELS



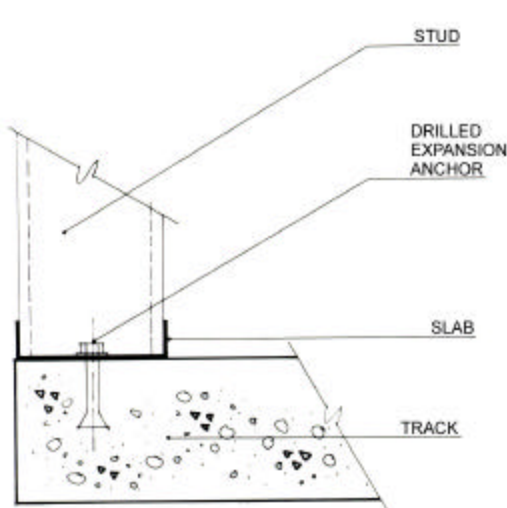
DETAIL 13 – SCREWED CONNECTION DETAIL FOR STUD TO TRACK AT DOOR OPENINGS, CORNERS AND ENDS OF PANELS

CONSTRUCTION DETAILS

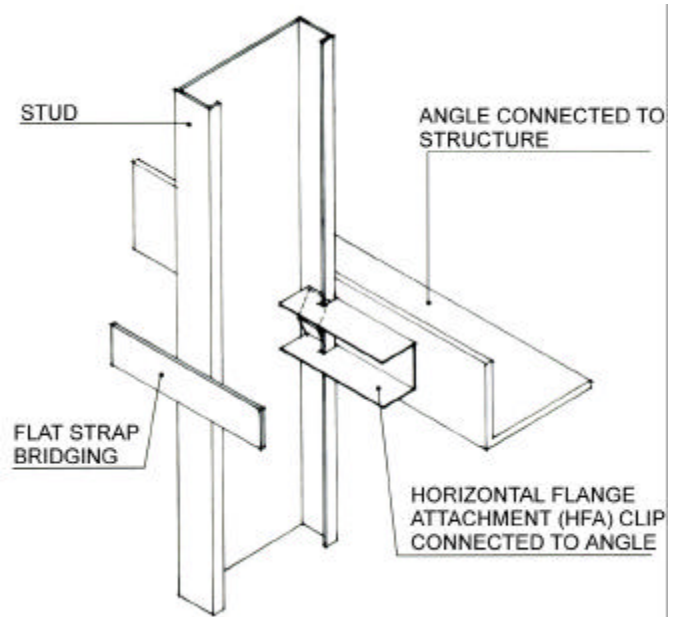


DETAIL 14 – WELDED TOP TRACK DEFLECTION  
DETAIL – SEE DETAIL 1

DETAIL 15 – SCREWED TOP TRACK  
DEFLECTION DETAIL  
– SEE DETAIL 1

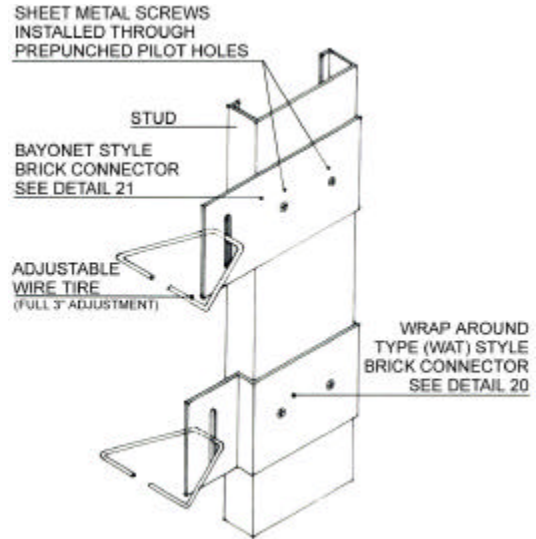
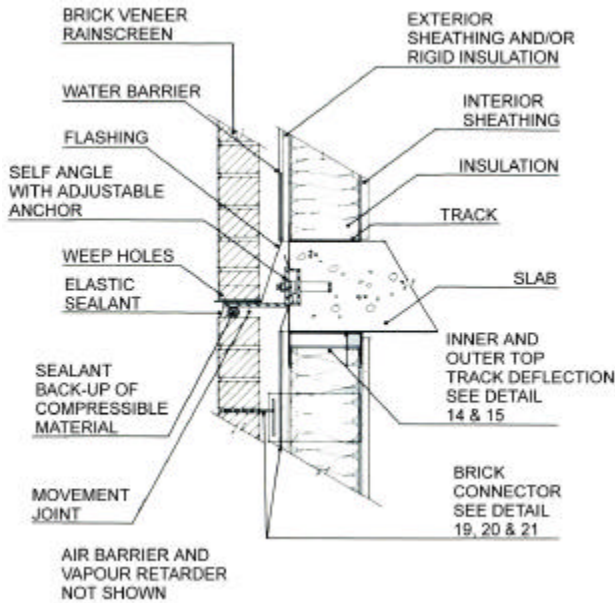


DETAIL 16 – BOTTOM TRACK  
TO SLAB CONNECTION



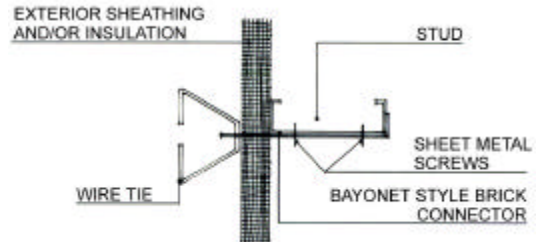
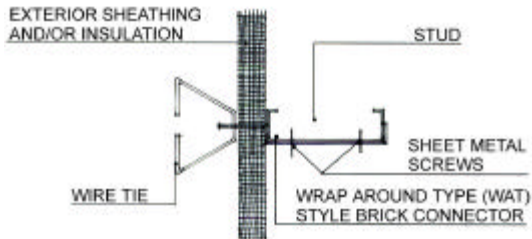
DETAIL 17 – DEFLECTION DETAIL FOR  
STUDS CONTINUOUS PAST  
THE FLOOR OR ROOF

CONSTRUCTION DETAILS



DETAIL 18 – STEEL STUD AND BRICK VENEER WITH SHELF ANGLE

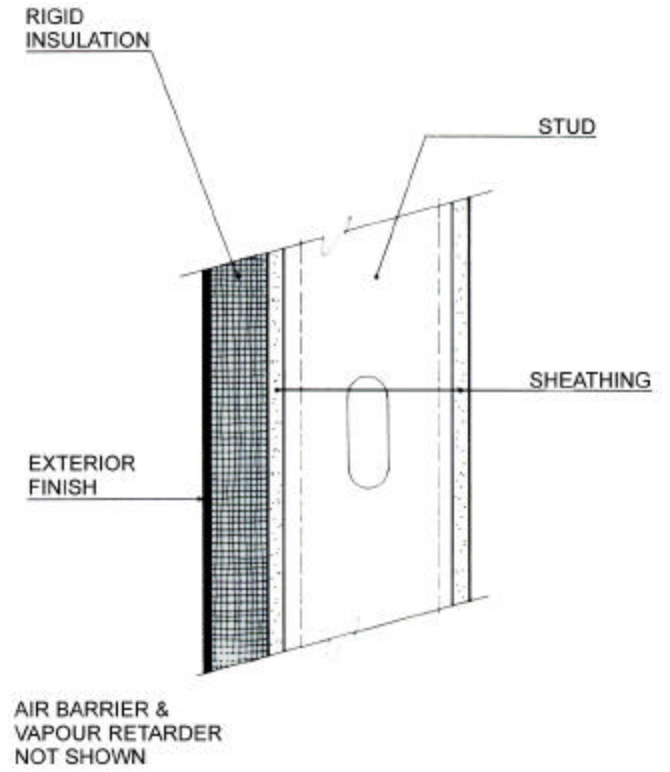
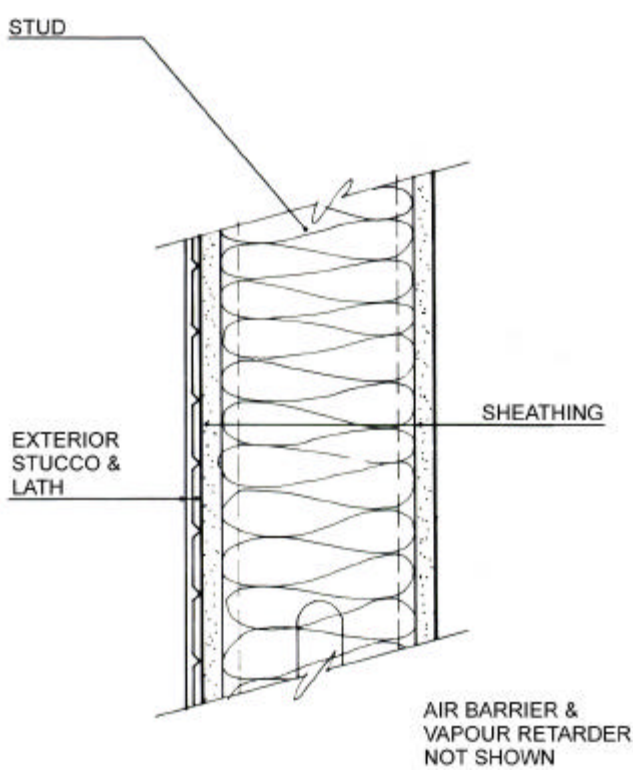
DETAIL 19 – BRICK CONNECTORS



DETAIL 20 – SECTION AT BRICK CONNECTOR

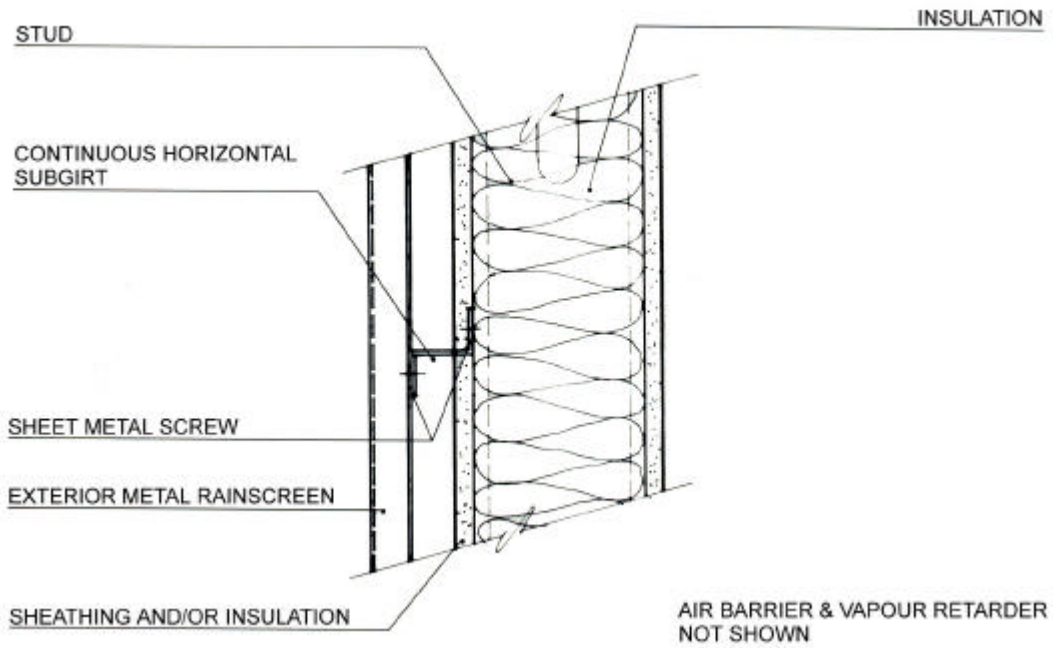
DETAIL 21 – SECTION AT BRICK CONNECTOR

CONSTRUCTION DETAILS



DETAIL 22 – STUCCO

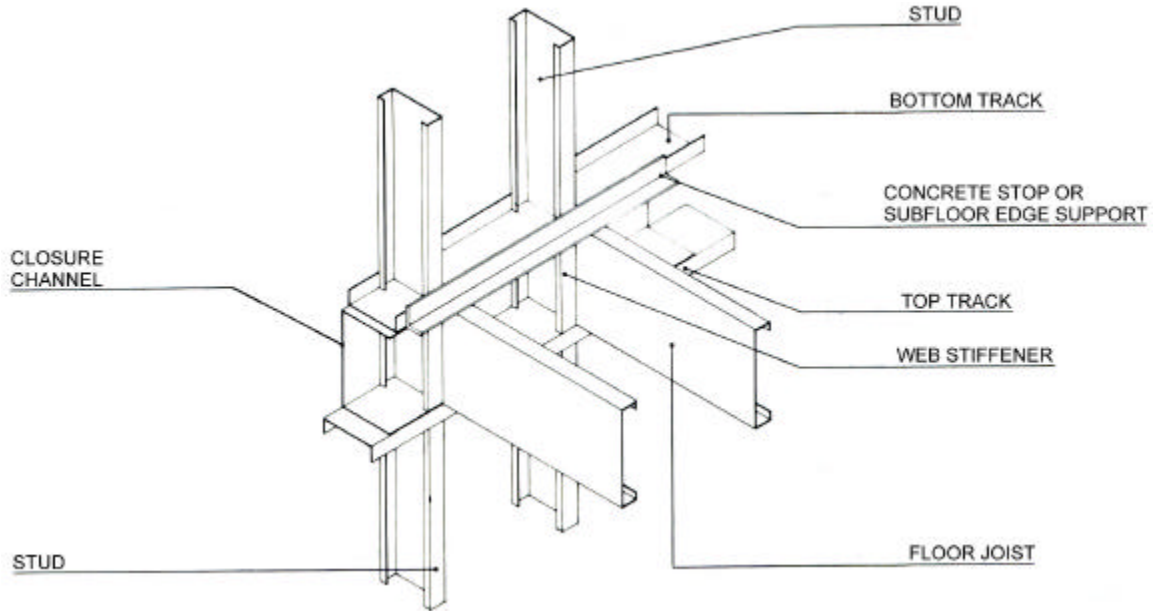
DETAIL 23 – EXTERIOR RIGID WALL INSULATION & FINISH SYSTEMS



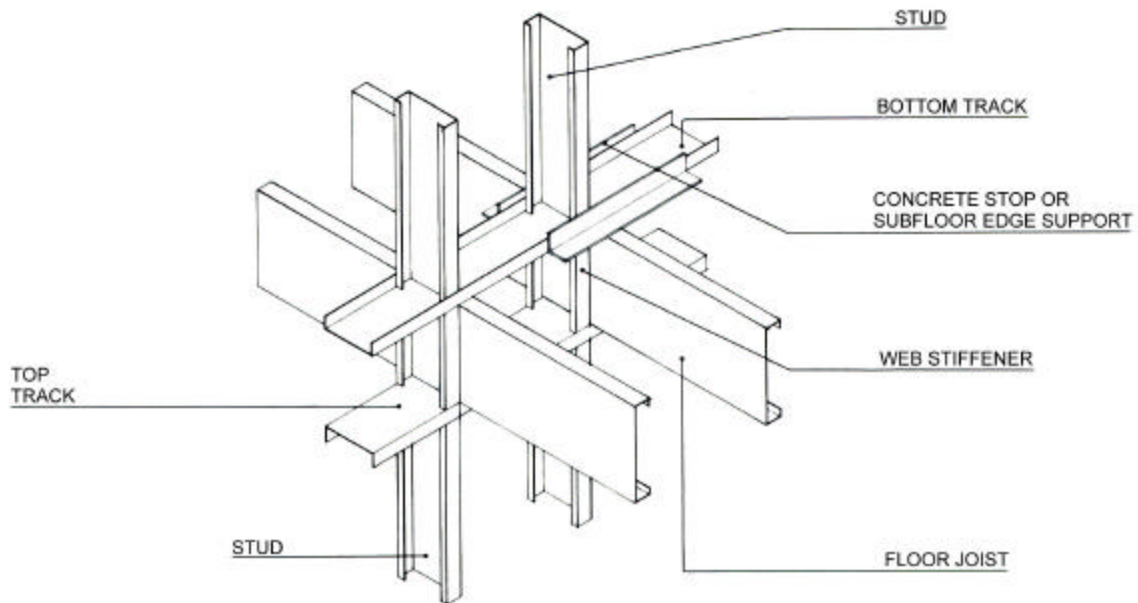
DETAIL 24 – METAL WALL SYSTEMS

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## CONSTRUCTION DETAILS



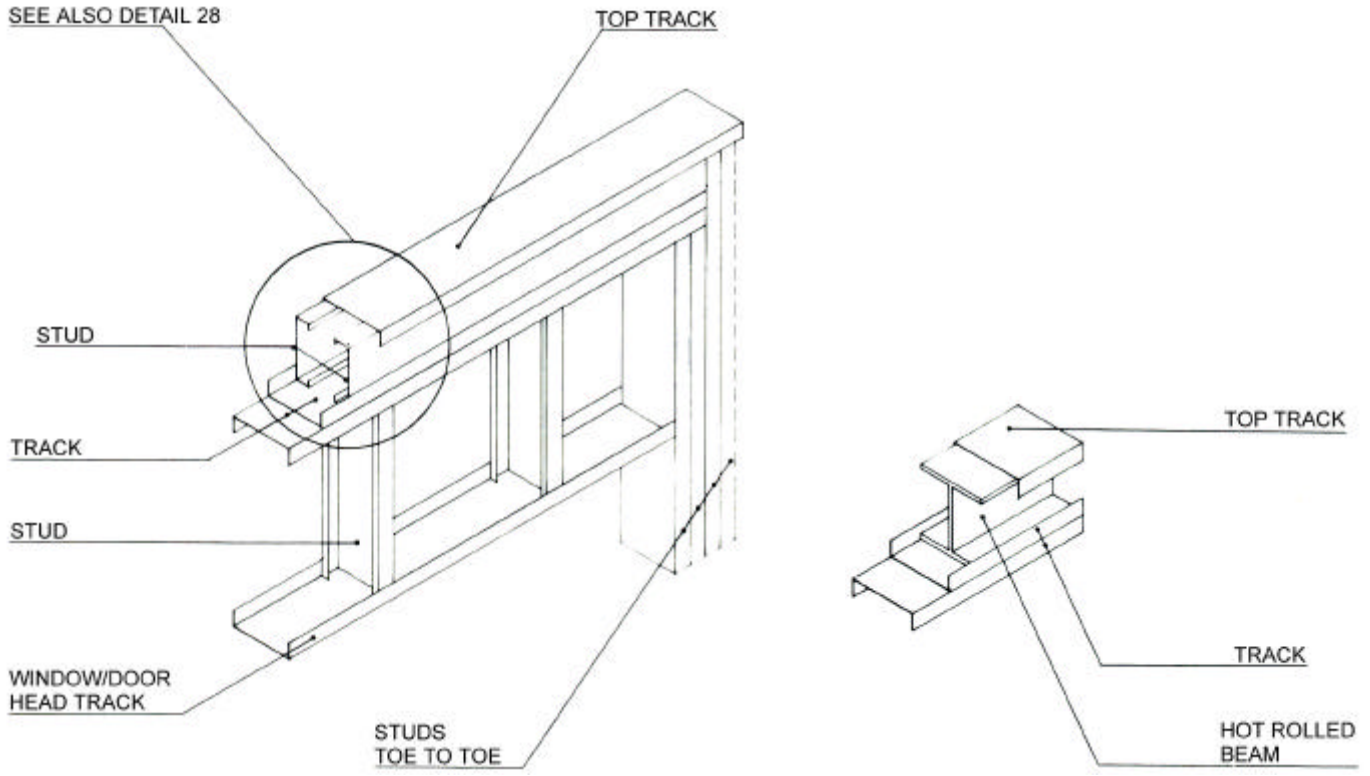
**DETAIL 25 – AXIAL LOAD BEARING EXTERIOR STUD WALL WITH FLOOR JOISTS PERPENDICULAR**



**DETAIL 26 – AXIAL LOAD BEARING INTERIOR STUD WALL WITH CONTINUOUS JOISTS**

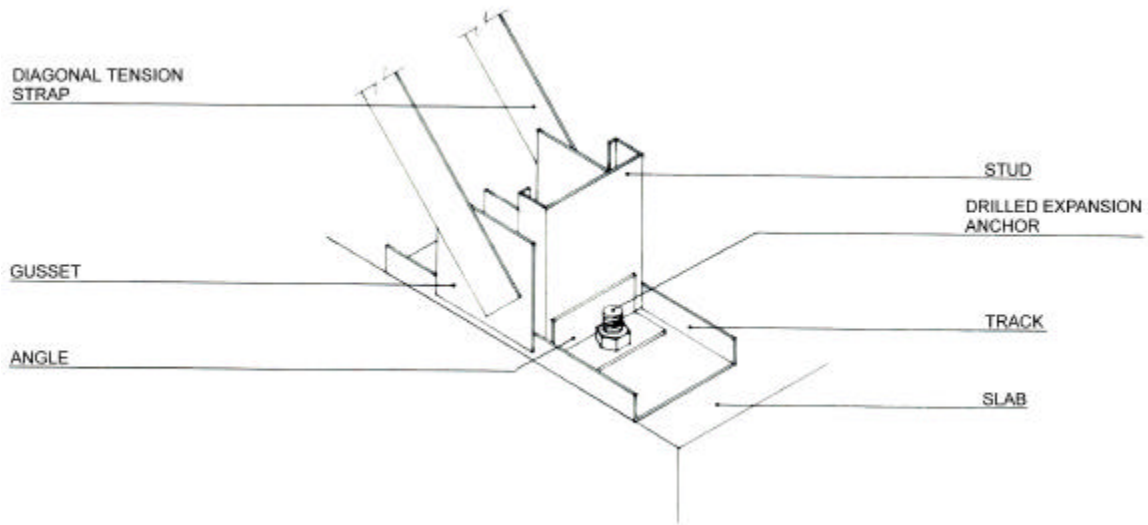


CONSTRUCTION DETAILS



DETAIL 27 – AXIAL LOAD BEARING STUD WALL OPENING

DETAIL 28 – HOT ROLLED BEAM – SEE DETAIL 27

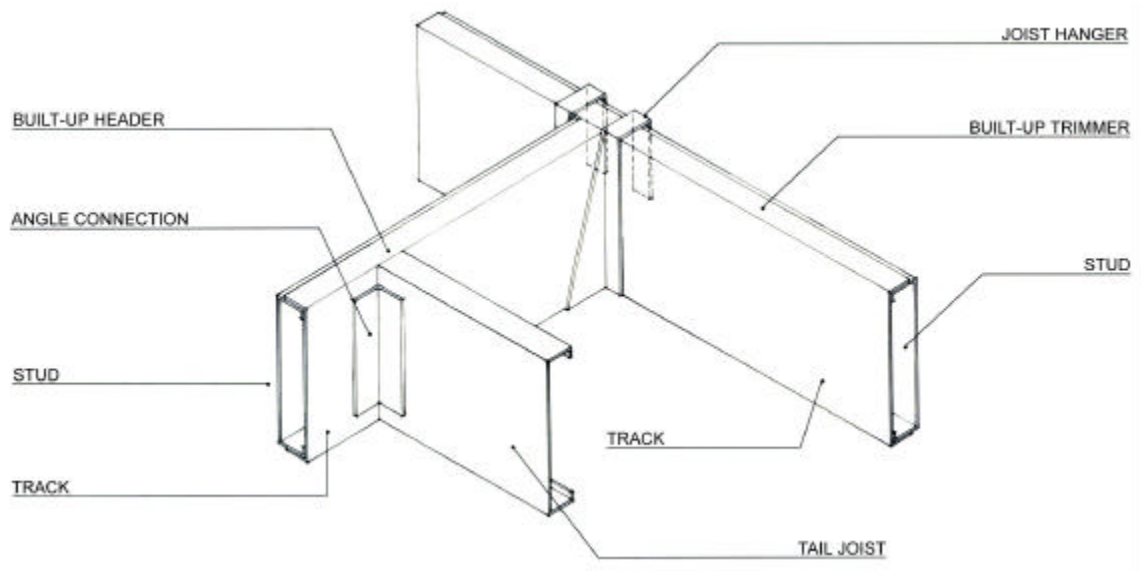


DETAIL 29 – CROSS BRACING TO RESIST LATERAL FORCES

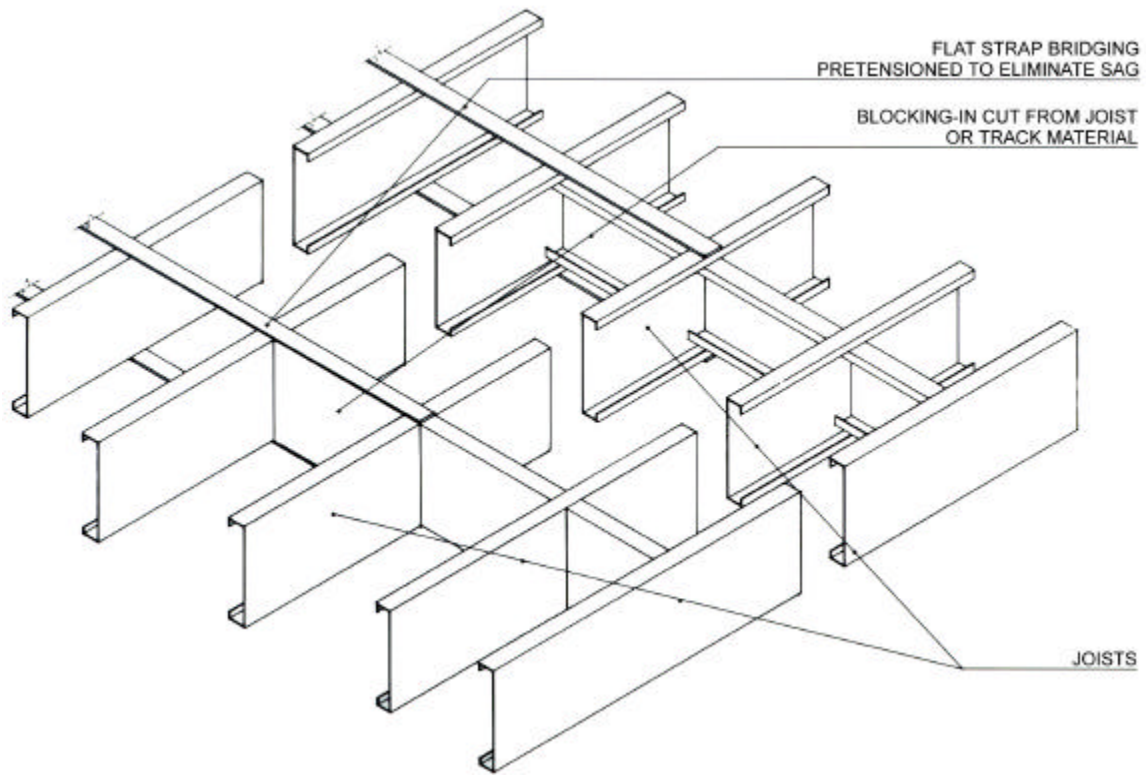


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## CONSTRUCTION DETAILS



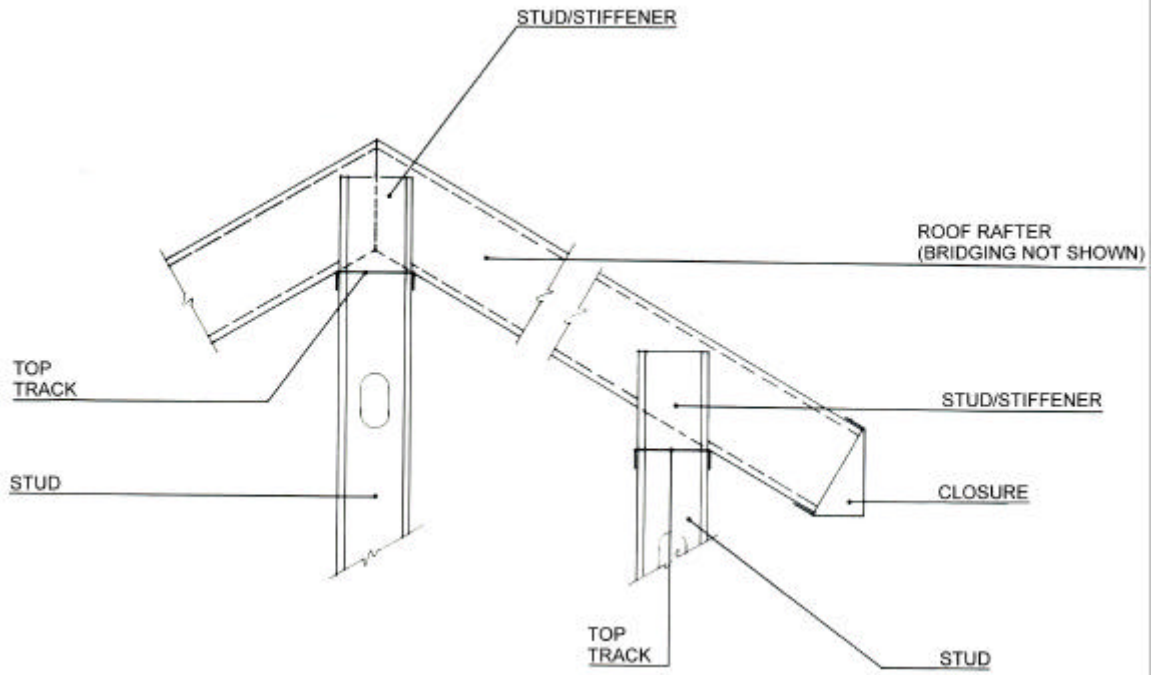
## DETAIL 30 – JOIST FRAMING AROUND OPENINGS



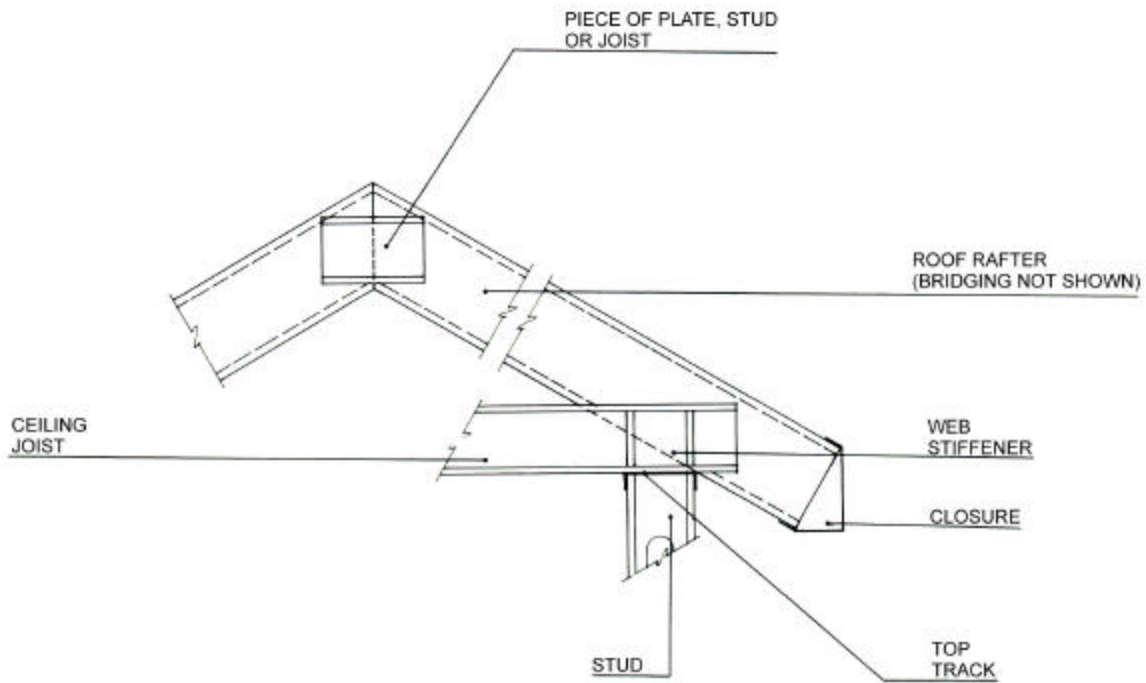
## DETAIL 31 – JOIST BRIDGING

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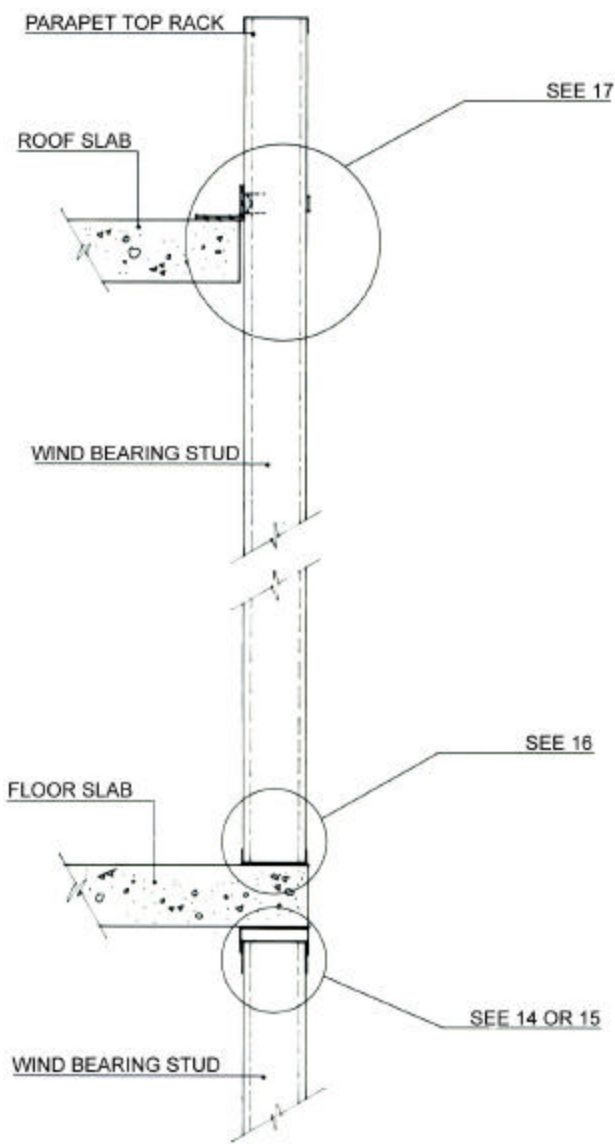
## CONSTRUCTION DETAILS



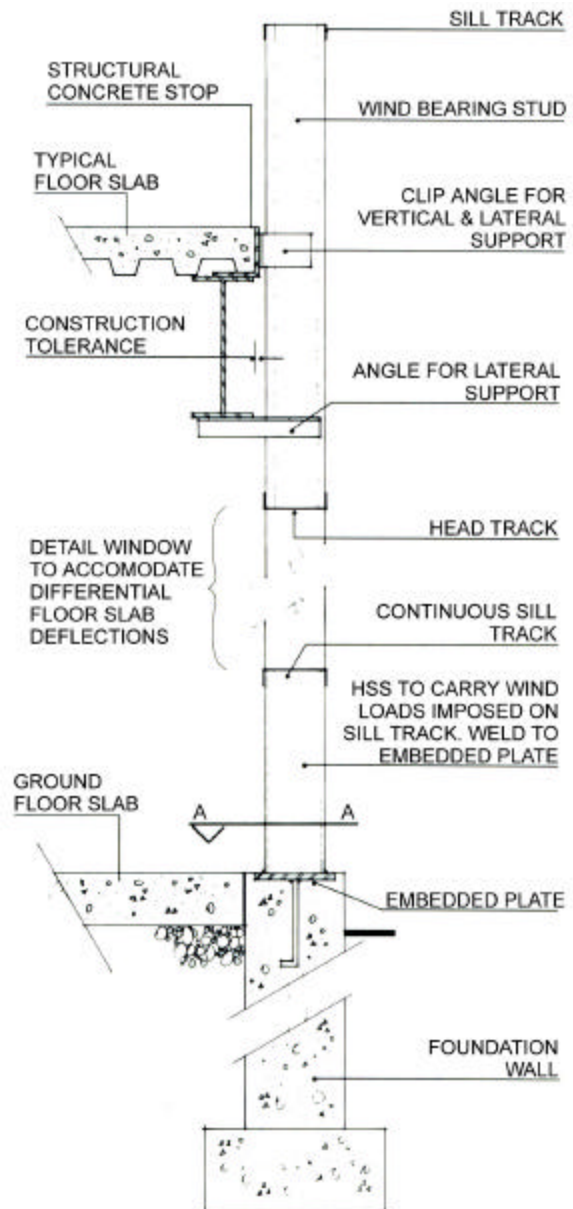
### DETAIL 30 – ROOF RAFTERS WITH STRUCTURAL SUPPORT AT RIDGE



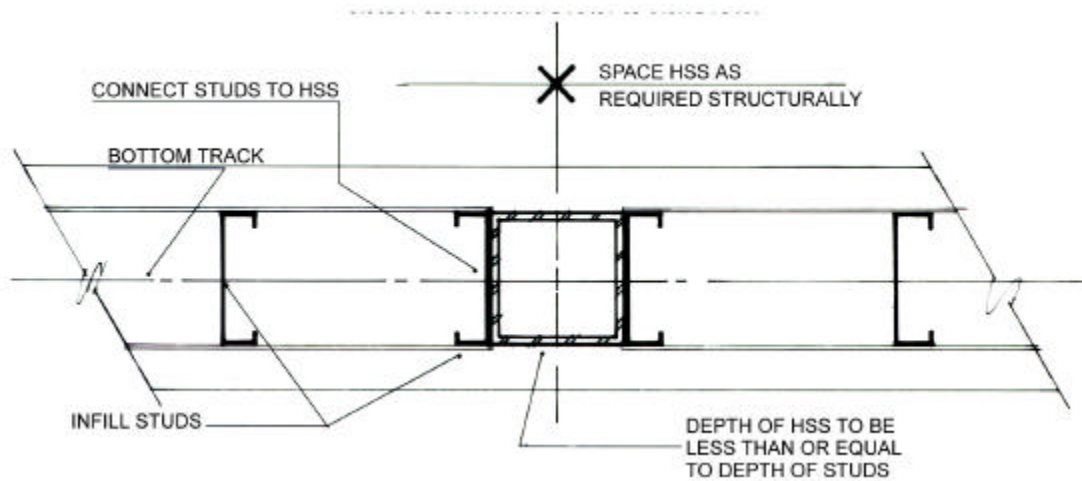
### DETAIL 31 – ROOF RAFTERS WITH CEILING JOIST TIES



DETAIL 34 – PARAPET FRAMING



DETAIL 35 – FRAMING FOR STUDS OUTSIDE THE FACE OF THE STRUCTURE TO ACCOMMODATE STRIP WINDOWS



SECTION A-A

# FIRE RESISTANCE RATINGS

## **WALLS – AXIAL LOAD BEARING STEEL STUDS**

The Bailey/Mantane Steel Framing System is fire rated under ULC Design Number W424.

REFERENCE	MATERIALS	RATING
Underwriters Laboratories of Canada (ULC) Design W424	1 layer 5/8" wallboard (each side) For details of design, materials, and construction, refer to ULC list of equipment and materials Design W424	1 Hour
Underwriters Laboratories of Canada (ULC) Design W424	2 layers 1/2" wallboard (each side) For details of design, materials, and construction, refer to ULC list of equipment and materials Design W424	1-1/2 Hours
Underwriters Laboratories of Canada (ULC) Design W424	2 layers 5/8" wallboard (each side) For details of design, materials, and construction, refer to ULC list of equipment and materials Design W424	2 Hours
Underwriters Laboratories of Canada (ULC) Design W424	3 layers of 1/2" wallboard (each side) For details of design, materials, and construction, refer to ULC list of equipment and materials Design W424	2 Hours
<p>NOTE: In all of the above assemblies, the following openings are permitted:</p> <p style="margin-left: 40px;">Doors of Windows            8' wide x 10' high maximum</p> <p style="margin-left: 40px;">Fire Dampers                 4'-1" x 5'-1" high maximum</p> <p style="margin-left: 40px;">Electrical Outlet Boxes     2" x 3-1/2" high maximum</p>		

## **FLOOR AND CEILING**

The following outlines details of Floor and Ceiling tests conducted in the USA. Please contact Bailey/Mantane for information regarding the application of this test data to Canadian standards.

REFERENCE	MATERIALS	RATING
Report BMS-92 U.S. Bureau of Standards	2-1/2" concrete floor on metal lath, steel joist, 1" vermiculite plaster on metal lath ceiling.	4 Hours
Report BMS-92 U.S. Bureau of Standards	2" concrete floor on metal lath, steel joist, 3/4" gypsum plaster on metal lath ceiling.	2 Hours
Underwriter's Laboratories Incorporated (ULI) Design L524	5/8" T&G Plywood underlayment over .0100 thick commercial resin-sized paper vapor barrier, over 1/2" plywood minimum grade with exterior glue. 8" joist, minimum .048" thickness, installed with web stiffeners. Joist bridging required. Ceiling two layers 1/2" gypsum wallboard.	1 Hour
Design FC245 Factory Mutual Research	2" (measured from top of deck) lightweight concrete floor fill of 105 lb.ft. <sup>3</sup> density, over metal form. 6" .048 joist, installed complete with web stiffeners and bridging.  Ceiling, one layer 1/2" firecode "C" gypsum wallboard designated as Type FC. Wallboard applied perpendicular to resilient furring channels with staggered end joints. Resilient channels applied perpendicular to joist.	1 Hour



THE BAILEY GROUP  
OF  
ASSOCIATED COMPANIES

**Ontario**  
**(Head Office)**

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403-451-4844