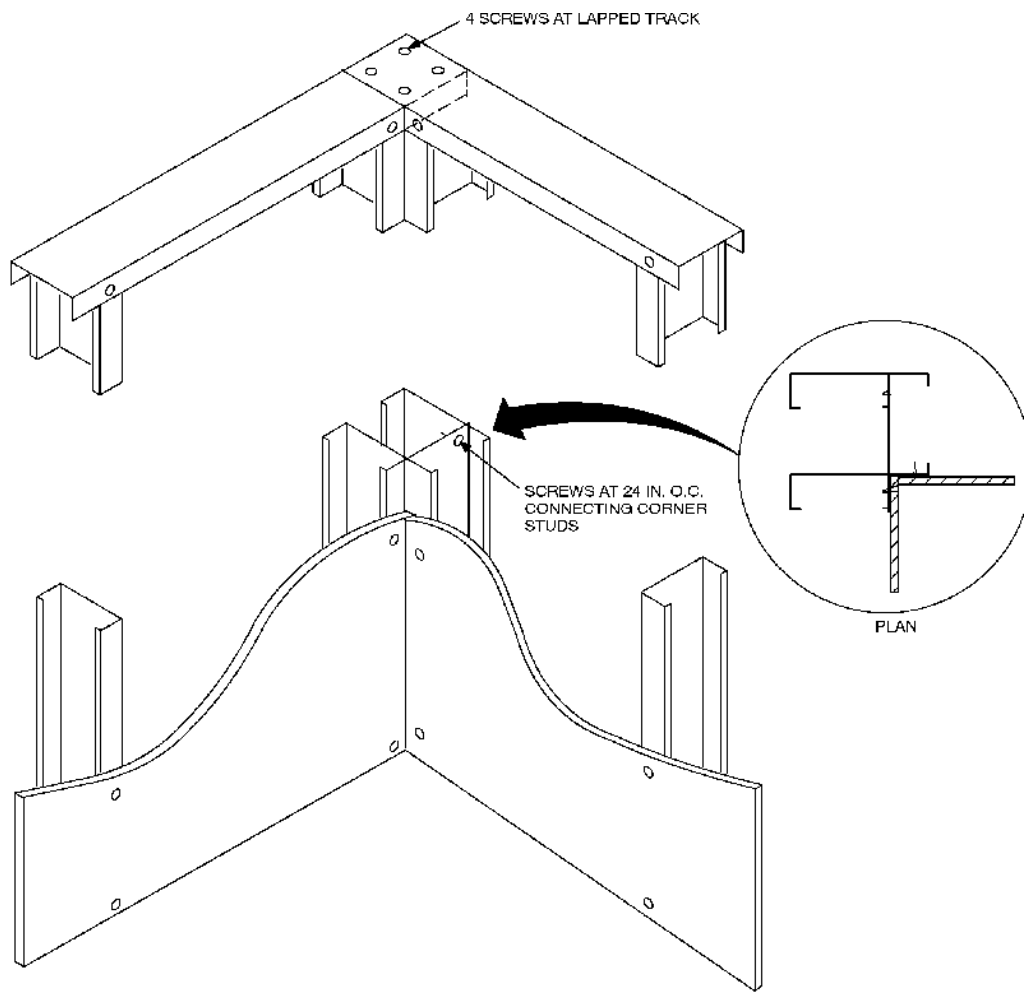


780 CMR FIGURE 5603.4
CORNER FRAMING



For SI: 1 inch = 25.4mm.

780 CMR TABLE 5603.6(1)
ALLOWABLE HEADER SPANS^{a,b}
Headers supporting roof and ceiling only (33 ksi steel)

NOMINAL MEMBER	GROUND SNOW LOAD (20 psf)				GROUND SNOW LOAD (30 psf)				GROUND SNOW LOAD (50 psf)				GROUND SNOW LOAD (70 psf)			
	Building width ^c (feet)				Building width ^c (feet)				Building width ^c (feet)				Building width ^c (feet)			
	24	28	32	36	24	28	32	36	24	28	32	36	24	28	32	36
2-350S162-33	3'-11"	3'-8"	3'-5"	3'-3"	3'-8"	3'-5"	3'-2"	2'-10"	3'-0"	2'-7"	2'-4"	2'-1"	2'-4"	2'-1"	—	—
2-350S162-43	4'-9"	4'-5"	4'-2"	4'-0"	4'-5"	4'-2"	3'-11"	3'-9"	3'-10"	3'-7"	3'-4"	3'-2"	3'-5"	3'-2"	3'-0"	2'-9"
2-350S162-54	5'-4"	5'-0"	4'-9"	4'-6"	5'-0"	4'-8"	4'-5"	4'-2"	4'-3"	4'-0"	3'-9"	3'-7"	3'-10"	3'-7"	3'-4"	3'-2"
2-350S162-68	6'-0"	5'-7"	5'-3"	5'-0"	5'-7"	5'-3"	4'-11"	4'-8"	4'-10"	4'-6"	4'-3"	4'-0"	4'-3"	4'-0"	3'-9"	3'-7"
2-550S162-33	3'-11"	3'-5"	3'-0"	2'-9"	3'-5"	3'-0"	2'-8"	2'-5"	2'-6"	2'-2"	—	—	—	—	—	—
2-550S162-43	6'-5"	6'-0"	5'-8"	5'-5"	6'-0"	5'-8"	5'-4"	5'-0"	5'-2"	4'-10"	4'-4"	3'-11"	4'-5"	3'-10"	3'-5"	3'-1"
2-550S162-54	7'-3"	6'-10"	6'-5"	6'-1"	6'-9"	6'-4"	6'-0"	5'-8"	5'-10"	5'-5"	5'-1"	4'-10"	5'-2"	4'-10"	4'-7"	4'-4"
2-550S162-68	8'-2"	7'-8"	7'-2"	6'-11"	7'-7"	7'-2"	6'-9"	6'-4"	6'-6"	6'-1"	5'-9"	5'-6"	5'-10"	5'-5"	5'-1"	4'-10"
2-800S162-33	3'-0"	2'-8"	2'-4"	2'-1"	2'-7"	2'-3"	—	—	—	—	—	—	—	—	—	—
2-800S162-43	6'-8"	5'-10"	5'-2"	4'-8"	5'-10"	5'-1"	4'-6"	4'-1"	4'-3"	3'-9"	3'-4"	3'-0"	3'-4"	2'-11"	2'-7"	2'-4"
2-800S162-54	9'-6"	8'-10"	8'-4"	7'-11"	8'-10"	8'-3"	7'-9"	7'-5"	7'-7"	7'-1"	6'-7"	5'-11"	6'-9"	5'-10"	5'-3"	4'-8"
2-800S162-68	10'-8"	10'-0"	9'-5"	8'-11"	9'-11"	9'-4"	8'-9"	8'-4"	8'-6"	8'-0"	7'-6"	7'-2"	7'-7"	7'-1"	6'-8"	6'-4"
2-1000S162-43	5'-7"	4'-10"	4'-4"	3'-11"	4'-10"	4'-3"	3'-9"	3'-5"	3'-7"	3'-1"	2'-9"	2'-6"	2'-10"	2'-6"	2'-2"	—
2-1000S162-54	10'-6"	9'-8"	8'-7"	7'-9"	9'-8"	8'-5"	7'-6"	6'-9"	7'-1"	6'-2"	5'-6"	4'-11"	5'-7"	4'-11"	4'-4"	3'-11"
2-1000S162-68	12'-7"	11'-9"	11'-1"	10'-6"	11'-9"	10'- 12"	10'-4"	9'-10"	10'-1"	9'-5"	8'-10"	8'-5"	8'-11"	8'-4"	7'-11"	7'-6"
2-1200S162-43	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2-1200S162-54	9'-6"	8'-3"	7'-4"	6'-7"	8'-3"	7'-3"	6'-5"	5'-9"	6'-1"	5'-4"	4'-9"	4'-3"	4'-10"	4'-2"	3'-9"	3'-4"
2-1200S162-68	13'-5"	12'-7"	11'-10"	11'-3"	12'-6"	11'-9"	11'-1"	10'-6"	10'-9"	10'-1"	9'-6"	8'-6"	9'-7	8'-5"	7'-6"	6'-9"

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479kN/m², 1 kilogram per square inch = 6.895 MPa.

- a. Deflection criteria: 1/360 for live loads, 1/240 for total loads.
- b. Design load assumptions:
Roof dead load is 7 psf.
Ceiling dead load is 5 psf.
Attic live load is 10 psf.
- c. Building width is in the direction of horizontal framing members supported by the header.

780 CMR TABLE 5603.6(2) ALLOWABLE HEADER SPANS ^{a,b} Headers supporting one floor, roof and ceiling (33 ksi steel)																
NOMINAL MEMBER	GROUND SNOW LOAD (20 psf)				GROUND SNOW LOAD (30 psf)				GROUND SNOW LOAD (50 psf)				GROUND SNOW LOAD (70 psf)			
	Building width ^c (feet)				Building width ^c (feet)				Building width ^c (feet)				Building width ^c (feet)			
	24	28	32	36	24	28	32	36	24	28	32	36	24	28	32	36
2-350S162-42	3'-3"	3'-1"	2'-11"	2'-8"	3'-2"	3'-0"	2'-9"	2'-6"	2'-11"	2'-8"	2'-4"	2'-2"	2'-10"	2'-6"	2'-3"	2'-1"
2-350S162-54	3'-8"	3'-6"	3'-3"	3'-2"	3'-6"	3'-4"	3'-2"	3'-0"	3'-4"	3'-1"	2'-11"	2'-9"	3'-3"	3'-0"	2'-10"	2'-9"
2-350S162-68	4'-2"	3'-11"	3'-8"	3'-6"	4'-0"	3'-9"	3'-6"	3'-4"	3'-8"	3'-6"	3'-3"	3'-1"	3'-7"	3'-5"	3'-2"	3'-1"
2-550S162-43	4'-1"	3'-8"	3'-3"	3'-0"	3'-10"	3'-4"	3'-0"	2'-9"	3'-3"	2'-11"	2'-7"	2'-4"	3'-2"	2'-9"	2'-6"	2'-3"
2-550S162-54	5'-0"	4'-9"	4'-6"	4'-3"	4'-10"	4'-6"	4'-3"	4'-1"	4'-6"	4'-2"	4'-0"	3'-9"	4'-4"	4'-1"	3'-11"	3'-8"
2-550S162-68	5'-7"	5'-4"	5'-0"	4'-9"	5'-5"	5'-1"	4'-10"	4'-7"	5'-0"	4'-9"	4'-6"	4'-3"	4'-11"	4'-7"	4'-4"	4'-2"
2-800S162-43	3'-2"	2'-10"	2'-6"	2'-3"	2'-11"	2'-7"	2'-4"	—	2'-6"	2'-3"	—	—	2'-5"	2'-2"	—	—
2-800S162-54	6'-3"	5'-7"	5'-0"	4'-6"	5'-10"	5'-2"	4'-7"	4'-2"	5'-0"	4'-5"	4'-0"	3'-7"	4'-10"	4'-3"	3'-10"	3'-5"
2-800S162-68	7'-4"	6'-11"	6'-7"	6'-3"	7'-1"	6'-8"	6'-3"	6'-0"	6'-7"	6'-2"	5'-10"	5'-7"	6'-5"	6'-0"	5'-8"	5'-5"
2-1000S162-43	2'-8"	2'-4"	—	—	2'-5"	—	—	—	—	—	—	—	—	—	—	—
2-1000S162-54	5'-3"	4'-8"	4'-2"	3'-9"	4'-10"	4'-3"	3'-10"	3'-6"	4'-2"	3'-8"	3'-4"	3'-0"	4'-0"	3'-6"	3'-2"	2'-10"
2-1000S162-68	8'-8"	8'-2"	7'-9"	7'-4"	8'-4"	7'-10"	7'-5"	7'-0"	7'-9"	7'-3"	6'-8"	6'-0"	7'-7"	7'-1"	6'-5"	5'-9"
2-1000S162-54	4'-6"	4'-0"	3'-7"	3'-3"	4'-2"	3'-8"	3'-3"	3'-0"	3'-7"	3'-2"	2'-10"	2'-7"	3'-5"	3'-0"	2'-9"	2'-5"
2-1000S162-68	9'-1"	8'-0"	7'-2"	6'-6"	8'-4"	7'-5"	6'-8"	6'-0"	7'-3"	6'-5"	5'-9"	5'-2"	6'-11"	6'-1"	5'-6"	4'-11"

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479kN/m², 1 kilogram per square inch = 6.895 MPa.

a. Deflection criteria: L/360 for live loads, L/240 for total loads.

b. Design load assumptions:
Roof dead load is 7 psf.
Ceiling dead load is 5 psf.
Attic live load is 10 psf.
Second floor live load is 30 psf.
Second floor dead load is 10 psf.
Second floor wall dead load is 10 psf.

c. Building width is in the direction of horizontal framing members supported by the header.

780 CMR TABLE 5603.6(3)

ALLOWABLE HEADER SPANS^{a,b,c}

Headers supporting one floor, roof and ceiling first story of a two-story building with center load bearing beam (33 ksi steel)

NOMINAL MEMBER	GROUND SNOW LOAD (20 psf)				GROUND SNOW LOAD (30 psf)				GROUND SNOW LOAD (50 psf)				GROUND SNOW LOAD (70 psf)			
	Building width ^c (feet)				Building width ^c (feet)				Building width ^c (feet)				Building width ^c (feet)			
	24	28	32	36	24	28	32	36	24	28	32	36	24	28	32	36
2-350S162-33	2'-10"	2'-6"	2'-3"	—	2'-7"	2'-3"	—	—	2'-2"	—	—	—	—	—	—	—
2-350S162-43	3'-9"	3'-6"	3'-4"	3'-2"	3'-7"	3'-4"	3'-2"	3'-0"	3'-3"	3'-1"	2'-11"	2'-8"	3'-0"	2'-9"	2'-6"	2'-3"
2-350S162-54	4'-2"	4'-0"	3'-9"	3'-7"	4'-0"	3'-9"	3'-7"	3'-5"	3'-8"	3'-5"	3'-3"	3'-1"	3'-5"	3'-2"	3'-0"	2'-10"
2-350S162-68	4'-8"	4'-5"	4'-2"	4'-0"	4'-6"	4'-2"	4'-0"	3'-10"	4'-1"	3'-10"	3'-8"	3'-6"	3'-9"	3'-7"	3'-4"	3'-2"
2-550S162-33	2'-5"	2'-2"	—	—	2'-2"	—	—	—	—	—	—	—	—	—	—	—
2-550S162-43	5'-1"	4'-9"	4'-3"	3'-10"	4'-10"	4'-3"	3'-10"	3'-6"	4'-0"	3'-7"	3'-2"	2'-11"	3'-5"	3'-1"	2'-9"	2'-6"
2-550S162-54	5'-8"	5'-4"	5'-1"	4'-10"	5'-5"	5'-1"	4'-10"	4'-7"	4'-11"	4'-8"	4'-5"	4'-2"	4'-7"	4'-4"	4'-1"	3'-11"
2-550S162-68	6'-5"	6'-0"	5'-9"	5'-6"	6'-1"	5'-9"	5'-5"	5'-2"	5'-7"	5'-3"	4'-11"	4'-9"	5'-2"	4'-10"	4'-7"	4'-4"
2-800S162-33	4'-2"	3'-8"	3'-3"	3'-0"	3'-8"	3'-3"	2'-11"	2'-8"	3'-1"	2'-9"	2'-5"	2'-3"	2'-8"	2'-4"	—	—
2-800S162-43	7'-5"	7'-0"	6'-6"	6'-0"	7'-1"	6'-6"	5'-10"	5'-4"	6'-2"	5'-5"	4'-11"	4'-5"	5'-3"	4'-8"	4'-2"	3'-9"
2-800S162-54	8'-4"	7'-11"	7'-6"	7'-1"	7'-11"	7'-6"	7'-1"	6'-9"	7'-3"	6'-10"	6'-6"	6'-2"	6'-9"	6'-4"	6'-0"	5'-8"
2-800S162-68	10'-0"	9'-9"	9'-0"	8'-6"	9'-6"	9'-0"	8'-6"	8'-1"	8'-8"	8'-2"	7'-9"	7'-5"	8'-1"	7'-7"	7'-2"	6'-10"
2-1000S162-43	3'-5"	3'-0"	2'-9"	2'-6"	3'-1"	2'-9"	2'-6"	2'-3"	2'-7"	2'-3"	2'-1"	—	2'-3"	—	—	—
2-1000S162-54	6'-10"	6'-0"	5'-6"	5'-0"	6'-2"	5'-5"	4'-11"	4'-5"	5'-1"	4'-6"	4'-1"	3'-8"	4'-5"	3'-11"	3'-6"	3'-2"
2-1000S162-68	9'-10"	9'-4"	8'-10"	8'-5"	9'-4"	8'-10"	8'-4"	8'-0"	8'-7"	8'-1"	7'-8"	7'-3"	7'-0"	7'-6"	7'-0"	6'-4"
2-1200S162-43	2'-11"	2'-7"	2'-4"	2'-1"	2'-8"	2'-4"	—	—	2'-3"	—	—	—	—	—	—	—
2-1200S162-54	5'-10"	5'-2"	4'-8"	4'-3"	5'-3"	4'-8"	4'-2"	3'-10"	4'-5"	3'-11"	3'-6"	3'-2"	3'-9"	3'-4"	3'-0"	2'-8"
2-1200S162-68	10'-6"	10'-0"	9'-5"	8'-6"	9'-12"	9'-5"	8'-5"	7'-8"	8'-10"	7'-10"	7'-0"	6'-4"	7'-7"	6'-9"	6'-0"	5'-5"

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479kN/m², 1 kilogram per square inch = 6.895 MPa.

a. Deflection criteria: 1/360 for live loads, 1/240 for total loads.

b. Design load assumptions:

- Roof dead load is 7 psf.
- Ceiling dead load is 5 psf.
- Attic live load is 10 psf.
- Second floor live load is 30 psf.
- Second floor dead load is 10 psf.
- Second floor wall dead load is 10 psf.

c. Building width is in the direction of horizontal framing members supported by the header.

780 CMR TABLE 5603.6(4)

TOTAL NUMBER OF JACK AND KING STUDS REQUIRED AT EACH END OF AN OPENING

SIZE OF OPENING (feet-inches)	24 O.C. STUD SPACING		16 O.C. STUD SPACING	
	No. of jack studs	No. of king studs	No. of jack studs	No. of king studs
Up to 3'-6"	1	1	1	1
> 3'-6" to 5'-0"	1	2	1	2
> 5'-0"to 5'-6"	1	2	2	2
> 5'-6" to 8'-0"	1	2	2	2
> 8'-0" to 10'-6"	2	2	2	3
> 10'-6"to 12'-0"	2	2	3	3
> 12'-0"to 13'-0"	2	3	3	3
> 13'-0"to 14'-0"	2	3	3	4

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

780CMR TABLE 5603.6(5)

HEADER TO KING STUD CONNECTION REQUIREMENTS^{a,b,c,d}

HEADER SPAN (feet)	BASIC WIND SPEED (mph), EXPOSURE		
	85 A/B	85 C or less than 110 A/B	Less than 110 C
≤ 4'	4-No. 8 screws	4-No. 8 screws	6-No. 8 screws
> 4' to 8'	4-No. 8 screws	4-No. 8 screws	8-No. 8 screws
> 8' to 12'	4-No. 8 screws	6-No. 8 screws	10-No. 8 screws
> 12'to 16'	4-No. 8 screws	8-No. 8 screws	12-No. 8 screws

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 1.609 km/h, 1 pound = 0.454 kg.

- a. All screw sizes shown are minimum.
- b. For headers located on the first floor of a two-story building, the total number of screws may be reduced by two screws, but the total number of screws shall be no less than four.
- c. For roof slopes of 6:12 or greater, the required number of screws may be reduced by half, but the total number of screws shall be no less than four.
- d. Screws can be replaced by a up-lift connector which has a capacity of the number of screws multiplied by 164 pounds (e.g., 12-No. 8 screws can be replaced by an up-lift connector whose capacity exceeds 12 by 164 pounds = 1,968 pounds)

780 CMR TABLE 5603.7

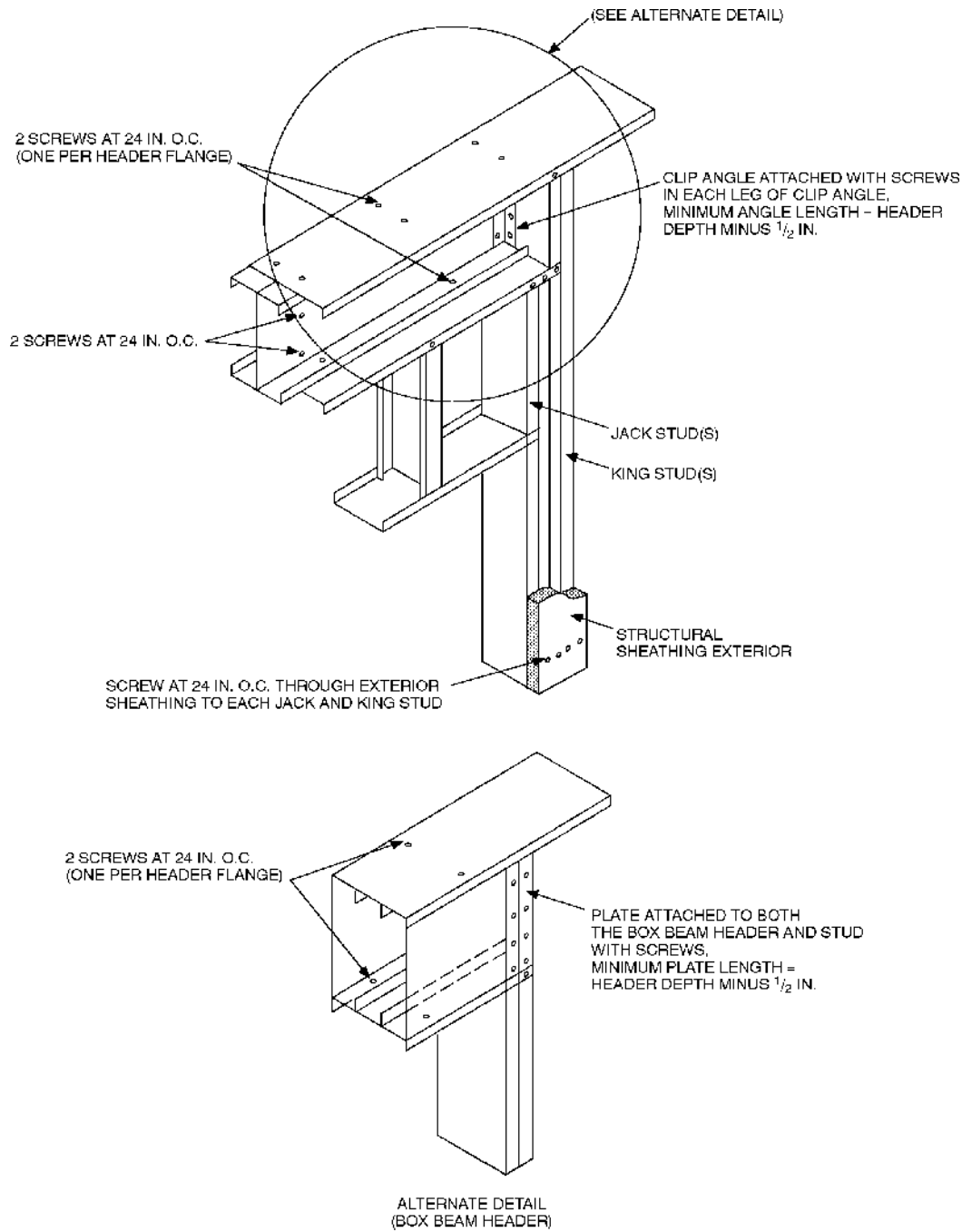
MINIMUM PERCENTAGE OF FULL HEIGHT STRUCTURAL SHEATHING ON EXTERIOR WALLS^{a,b,c,d,e}

WALL SUPPORTING	ROOF SLOPE	WIND SPEED (mph) AND EXPOSURE				
		85 A/B	100 A/B	110 A/B or 85 C	100 C	110 C
Roof and ceiling only	3:12	8	9	12	16	20
	6:12	12	15	20	26	35
	9:12	21	25	30	50	58
	12:12	30	35	40	66	75
One story, roof and ceiling	3:12	24	30	35	50	66
	6:12	25	30	40	58	74
	9:12	35	40	55	74	91
	12:12	40	50	65	100	115

For SI: 1 mile per hour = 1.609 km/h.

- a. Linear interpolation shall be permitted.
- b. Bracing amount shall not be less than 20% of the wall length after all applicable adjustments are made.
- c. Minimum percentages are based on a building aspect ratio of 1:1. Minimum percentages for the shorter walls of a building shall be multiplied by a factor of 1.5 and 2.0 for building aspect ratios of 1.5:1 and 2:1 respectively.
- d. For hip roofed homes with continuous structural sheathing, the amount of bracing shall be permitted to be multiplied by a factor of 0.95 for roof slopes not exceeding 7:12 and a factor of 0.9 for roof slopes greater than 7:12.
- e. Sheathing percentage are permitted to be reduced in accordance with 780 CMR 5603.7.2.

780 CMR FIGURE 5603.6
HEADER DETAIL



For SI: 1 inch = 25.4 mm.

780 CMR 5606 GENERAL MASONRY
CONSTRUCTION

5606.1 General. Masonry construction shall be designed and constructed in accordance with the provisions of 780 CMR 5606 or in accordance with the provisions of ACI 530/ASCE 5/TMS 402.

5606.1.1 Professional Registration not Required. Unless the empirical design provisions of ACI 530/ASCE 5/TMS 402 Chapter 5 or the provisions of 780 CMR 5606 are used to design masonry, project drawings, typical details and specifications *shall* bear the seal of the architect or *registered professional* engineer responsible for design.

5606.2 Thickness of Masonry. The nominal thickness of masonry walls shall conform to the requirements of 780 CMR 5606.2.1 through 5606.2.4.

5606.2.1 Minimum Thickness. The minimum thickness of masonry bearing walls more than one story high shall be eight inches (203 mm). Solid masonry walls of one-story dwellings and garages shall not be less than six inches (152 mm) in thickness when not greater than nine feet (2743 mm) in height, provided that when gable construction is used, an additional six feet (1829 mm) is permitted to the peak of the gable. Masonry walls shall be laterally supported in either the horizontal or vertical direction at intervals as required by 780 CMR 5606.8.

5606.2.2 Rubble Stone Masonry Wall. The minimum thickness of rough, random or coursed rubble stone masonry walls shall be 16 inches (406 mm).

5606.2.3 Change in Thickness. Where walls of masonry of hollow units or masonry bonded

hollow walls are decreased in thickness, a course of solid masonry shall be constructed between the wall below and the thinner wall above, or special units or construction shall be used to transmit the loads from face shells or wythes above to those below.

5606.2.4 Parapet Walls. Unreinforced solid masonry parapet walls shall not be less than eight inches (203 mm) in thickness and their height shall not exceed four time their thickness. Unreinforced hollow unit masonry parapet walls shall be not less that eight inches (203 mm) in thickness, and their height shall not exceed three times their thickness.

5606.3 Corbeled Masonry. Solid masonry units shall be used for corbeling. The maximum corbeled projection beyond the face of the wall shall not be more than 1/2of the wall thickness or 1/2 the wythe thickness for hollow walls; the maximum projection of one unit shall not exceed 1/2 the height of the unit or 1/3 the thickness at right angles to the wall. The top course of corbels shall be a header course when the corbeled masonry is used to support floor or roof-framing members.

5606.3.1 Support Conditions. Cavity wall or masonry veneer construction may be supported on an eight-inch (203 mm) foundation wall, provided the eight-inch (203 mm) wall is corbeled with solid masonry to the width of the wall system above. The total horizontal projection of the corbel shall not exceed two inches (51 mm) with individual corbels projecting not more than 1/3 the thickness of the unit or 1/2 the height of the unit. The top course of all corbels shall be a header course.

5606.4 Allowable Stresses. Allowable compressive stresses in masonry shall not exceed the values prescribed in 780 CMR Table 5606.4. In determining the stresses in masonry, the effects of all loads and conditions of loading and the influence of all forces affecting the design and strength of the several parts shall be taken into account.

**780 CMR TABLE 5606.4
ALLOWABLE COMPRESSIVE STRESSES FOR
EMPIRICAL DESIGN OF MASONRY**

CONSTRUCTION; COMPRESSIVE STRENGTH OF UNIT, GROSS AREA	ALLOWABLE COMPRESSIVE STRESSES ^a GROSS CROSS- SECTIONAL AREA ^b	
	Type M or S mortar	Type N mortar
Solid masonry of brick and other solid units of clay or shale; sand-lime or concrete brick:		
8,000 + psi	350	300
4,500 psi	225	200
2,500 psi	160	140
1,500 psi	115	100
Grouted ^c masonry, of clay or shale; sand-lime or concrete:		
4,500+ psi	225	200
2,500 psi	160	140
1,500 psi	115	100
Solid masonry of solid concrete masonry units:		
3,000+ psi	225	200
2,000 psi	160	140
1,200 psi	115	100
Masonry of hollow load-bearing units:		
2,000+ psi	140	120
1,500 psi	115	100
1,000 psi	75	70
700 psi	60	55
Hollow walls (cavity or masonry bonded ^d) solid units:		
2,500+ psi	160	140
1,500 psi	115	100
Hollow units	75	70
Stone ashlar masonry:		
Granite	720	640
Limestone or marble	450	400
Sandstone or cast stone	360	320
Rubble stone masonry:		
Coarse, rough or random	120	100

For SI: 1 pound per square inch = 6.895 kPa.

- a. Linear interpolation shall be used for determining allowable stresses for masonry units having compressive strengths that are intermediate between those given in the table.
- b. Gross cross-sectional area shall be calculated on the actual rather than nominal dimensions.
- c. See 780 CMR 5607.
- d. Where floor and roof loads are carried upon one wythe, the gross cross-sectional area is that of the wythe under load; if both wythes are loaded, the gross cross-sectional area is that of the wall minus the area of the cavity between the wythes. Walls bonded with metal ties shall be considered as cavity walls unless the collar joints are filled with mortar or grout.

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5606.4.1 Combined Units. In walls or other structural members composed of different kinds or grades of units, materials or mortars, the maximum stress shall not exceed the allowable stress for the weakest of the combination of units, materials and mortars of which the member is composed. The net thickness of any facing unit that is used to resist stress shall not be less than 1.5 inches (38 mm).

5606.5 Piers. The unsupported height of masonry piers shall not exceed ten times their least dimension. When structural clay tile or hollow concrete masonry units are used for isolated piers to support beams and girders, the cellular spaces shall be filled solidly with concrete or Type M or S mortar, except that unfilled hollow piers may be used if their unsupported height is not more than four times their least dimension. Where hollow masonry units are solidly filled with concrete or Type M, S or N mortar, the allowable compressive stress shall be permitted to be increased as provided in 780 CMR Table 5606.4.

5606.5.1 Pier Cap. Hollow piers shall be capped with four inches (102 mm) of solid masonry or concrete or shall have cavities of the top course filled with concrete or grout or other approved methods.

5606.6 Chases. Chases and recesses in masonry walls shall not be deeper than $\frac{1}{3}$ the wall thickness, and the maximum length of a horizontal chase or horizontal projection shall not exceed four feet (1219 mm), and shall have at least eight inches (203 mm) of masonry in back of the chases and recesses and between adjacent chases or recesses and the jambs of openings. Chases and recesses in masonry walls shall be designed and constructed so as not to reduce the required strength or required fire resistance of the wall and in no case shall a chase or recess be permitted within the required area of a pier. Masonry directly above chases or recesses wider than 12 inches (305 mm) shall be supported on noncombustible lintels.

5606.7 Stack Bond. In unreinforced masonry where masonry units are laid in stack bond, longitudinal reinforcement consisting of not less than two continuous wires each with a minimum aggregate cross-sectional area of 0.017 square inch (11 mm²) shall be provided in horizontal bed joints spaced not more than 16 inches (406 mm) on center vertically.

5606.8 Lateral Support. Masonry walls shall be laterally supported in either the horizontal or the vertical direction. The maximum spacing between lateral supports shall not exceed the distances in 780 CMR Table 5606.8. Lateral support shall be provided by cross walls, pilasters, buttresses or structural frame members when the limiting distance is taken horizontally, or by floors or roofs when the

limiting distance is taken vertically.

5606.8.1 Horizontal Lateral Support. Lateral support in the horizontal direction provided by intersecting masonry walls shall be provided by one of the methods in 780 CMR 5606.8.1.1 or 780 CMR 5606.8.1.2.

5606.8.1.1 Bonding Pattern. 50% of the units at the intersection shall be laid in an overlapping masonry bonding pattern, with alternate units having a bearing of not less than three inches (76 mm) on the unit below.

5606.8.1.2 Metal Reinforcement. Interior nonload-bearing walls shall be anchored at their intersections, at vertical intervals of not more than 16 inches (406mm) with joint reinforcement of at least nine gage, or $\frac{1}{4}$ inch (6.4 mm) galvanized mesh hardware cloth. Intersecting masonry walls, other than interior nonloadbearing walls, shall be anchored at vertical intervals of not more than eight inches (203 mm) with joint reinforcement of at least nine gage and shall extend at least 30 inches (762mm) in each direction at the intersection. Other metal ties, joint reinforcement or anchors, if used, shall be spaced to provide equivalent area of anchorage to that required by 780 CMR 5606.8.

**780 CMR TABLE 5606.8
SPACING OF LATERAL SUPPORT FOR
MASONRY WALLS**

CONSTRUCTION	MAXIMUM WALL LENGTH TO THICKNESS OR WALL HEIGHT TO THICKNESS ^{a,b}
Bearing walls:	
Solid or solid grouted	20
All other	18
Nonbearing walls:	
Exterior	18
Interior	36

For SI: 1 foot = 304.8 mm.

- Except for cavity walls and cantilevered walls, the thickness of a wall shall be its nominal thickness measured perpendicular to the face of the wall. For cavity walls, the thickness shall be determined as the sum of the nominal thicknesses of the individual wythes. For cantilever walls, except for parapets, the ratio of height to nominal thickness shall not exceed six for solid masonry, or four for hollow masonry. For parapets, see 780 CMR 5606.2.4.
- An additional unsupported height of six feet is permitted for gable end walls.

5606.8.2 Vertical Lateral Support. Vertical lateral support of masonry walls *shall be provided in accordance with one of the methods in 780 CMR 5606.8.2.1 or 780 CMR 5606.8.2.2.*

5606.8.2.1 Roof Structures. Masonry walls shall be anchored to roof structures with metal strap anchors spaced in accordance with the manufacturer's instructions, $\frac{1}{2}$ -inch (12.7 mm) bolts spaced not more than six feet (1829 mm)

on center, or other approved anchors. Anchors shall be embedded at least 16 inches (406 mm) into the masonry, or be hooked or welded to bond beam reinforcement placed not less than six inches (152 mm) from the top of the wall.

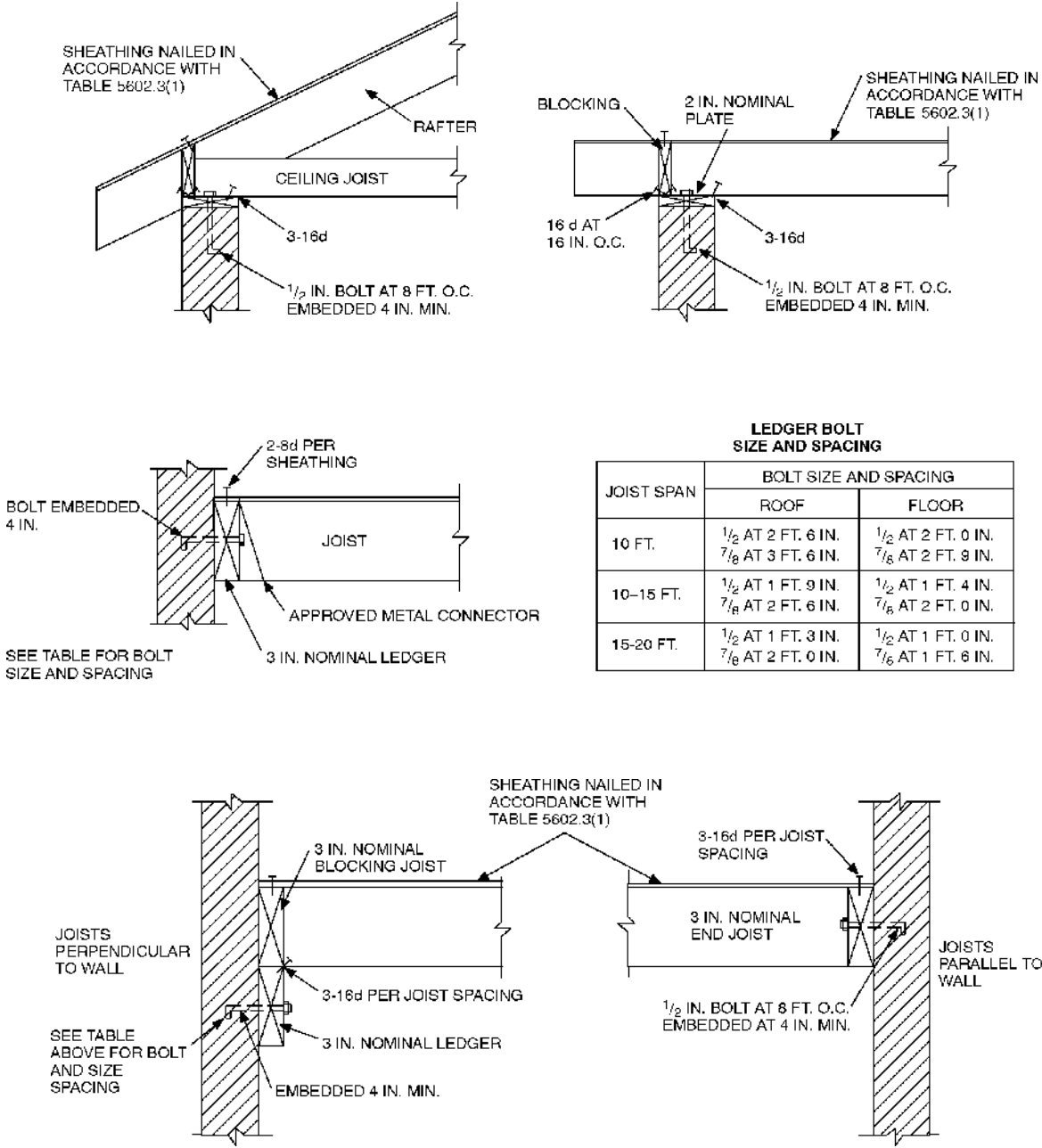
5606.8.2.2 Floor Diaphragms. Masonry walls shall be anchored to floor diaphragm framing by metal strap anchors spaced in accordance with the manufacturer’s instructions, 1/2-inch-diameter (12.7 mm) bolts spaced at intervals not to exceed six feet (1829mm) and installed as shown in Figure 5606.10(1), or by other

approved methods.

5606.9 Lintels. Masonry over openings shall be supported by steel lintels, reinforced concrete or masonry lintels or masonry arches, designed to support load imposed.

5606.10 Anchorage. Masonry walls shall be anchored to floor and roof systems in accordance with the details shown in 780 CMR Figure 5606.10(1). Footings may be considered as points of lateral support.

780 CMR FIGURE 5606.10(1)
ANCHORAGE REQUIREMENTS FOR MASONRY WALLS LOCATED WHERE
WIND LOADS ARE LESS THAN 30 PSF



NOTE: Where bolts are located in hollow masonry, the cells in the courses receiving the bolt shall be grouted solid.
For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479kN/m².

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5606.11 Protection for Reinforcement. All bars shall be completely embedded in mortar or grout. Joint reinforcement embedded in horizontal mortar joints shall not have less than 5/8-inch (15.9 mm) mortar coverage from the exposed face. All other reinforcement shall have a minimum coverage of one bar diameter over all bars, but not less than 3/4 inch (19.1 mm), except where exposed to weather or soil, in which case the minimum coverage shall be two inches (51 mm).

5606.12 Beam Supports. Beams, girders or other concentrated loads supported by a wall or column shall have a bearing of at least three inches (76 mm) in length measured parallel to the beam upon solid masonry not less than four inches (102 mm) in thickness, or upon a metal bearing plate of adequate design and dimensions to distribute the load safely, or upon a continuous reinforced masonry member projecting not less than four inches (102 mm) from the face of the wall.

5606.12.1 Joist Bearing. Joists shall have a bearing of not less than 1½ inches (38 mm), except as provided in 780CMR 5606.12, and shall be supported in accordance with 780 CMR Figure 5606.10(1).

5606.13 Metal Accessories. Joint reinforcement, anchors, ties and wire fabric shall conform to the following: ASTM A 82 for wire anchors and ties; ASTM A 36 for plate, headed and bent-bar anchors; ASTM A 510 for corrugated sheet metal anchors and ties; ASTM A 951 for joint reinforcement; ASTM B 227 for copper-clad steel wire ties; or ASTM A 167 for stainless steel hardware.

5606.13.1 Corrosion Protection. Minimum corrosion protection of joint reinforcement, anchor ties and wire fabric for use in masonry wall construction shall conform to 780 Table 5606.13.1.

**780CMR TABLE 5606.13.1
MINIMUM CORROSION PROTECTION**

MASONRY METAL ACCESSORY	STANDARD
Joint reinforcement, interior walls	ASTM A 641, Class 1
Wire ties or anchors in exterior walls completely embedded in mortar or grout	ASTM A 641, Class 3
Wire ties or anchors in exterior walls not completely embedded in mortar or grout	ASTM A 153, Class B-2
Joint reinforcement in exterior walls or interior walls exposed to moist environment	ASTM A 153, Class B-2
Sheet metal ties or anchors exposed to weather	ASTM A 153, Class B-2
Sheet metal ties or anchors completely embedded in mortar or grout	ASTM A 525, Class G-60
Stainless steel hardware for any exposure	ASTM A 167, Type 304

780CMR 5607 UNIT MASONRY

5607.1 Mortar. Mortar for use in masonry construction shall comply with ASTM C 270. The type of mortar shall be in accordance with 780 CMR 5607.1.1, 5607.1.2 and 5607.1.3 and shall meet the proportion specifications of 780CMR Table 5607.1 or the property specifications of ASTM C 270.

5607.1.1 Foundation Walls. Masonry foundation walls constructed as set forth in 780 CMR Tables 5404.1.1(1) through 5404.1.1(4) and mortar shall be Type M or S.

5607.1.2 Masonry Serving as the Lateral-force-resisting System. Mortar for masonry serving as the lateral-force-resisting system shall be Type M, S or N mortar.

5607.2 Placing Mortar and Masonry Units.

5607.2.1 Bed and Head Joints. Unless otherwise required or indicated on the project drawings, head and bed joints shall be 3/8 inch (9.5 mm) thick, except that the thickness of the bed joint of the starting course placed over foundations shall not be less than 1/4 inch (6.4mm) and not more than 3/4 inch (19.1 mm).

5607.2.1.1 Mortar Joint Thickness Tolerance. Mortar joint thickness shall be within the following tolerances from the specified dimensions:

1. Bed joint: + 1/8 inch (3.2 mm).
2. Head joint: 1/4 inch (6.4mm), + 3/8 inch (9.5mm).
3. Collar joints: 1/4 inch (6.4mm), + 3/8 inch (9.5mm).

Exception: Nonload-bearing masonry elements and masonry veneers designed and constructed in accordance with 780 CMR 5703.7 are not required to meet these tolerances.

5607.2.2 Masonry Unit Placement. The mortar shall be sufficiently plastic and units shall be placed with sufficient pressure to extrude mortar from the joint and produce a tight joint. Deep furrowing of bed joints that produces voids shall not be permitted. Any units disturbed to the extent that initial bond is broken after initial placement shall be removed and relaid in fresh mortar. Surfaces to be in contact with mortar shall be clean and free of deleterious materials.

5607.2.2.1 Solid Masonry. All solid masonry units shall be laid with full head and bed joints and all interior vertical joints that are designed to receive mortar shall be filled.

5607.2.2.2 Hollow Masonry. For hollow masonry units, all head and bed joints shall be filled solidly with mortar for a distance in from the face of the unit not less than the thickness of the face shell.