

BRICK VENEER LINTELS

Tables give allowable heights of 3" nominal brick (including King-size, Western King-size, and Queen-size), and 4" nominal brick (including modular, utility, and other 3 5/8" thick brick), which will not exceed allowable deflections for steel angle lintels without being attached to wood header beams in the wall. Allowable deflections in the MSJC 1.10.1 are $L/600$ or 0.3" max. Strength of steel lintels does not govern in these tables. We have limited spans to 12'-0" for economical angle sizes.

Longer spans such as those over garage doors should be designed by a structural engineer to carry brick, floor, and roof loads. We recommend a minimum L5x3x5/16 (LLV) to be bolted to the wood header with 1/2" x 3 1/2" galvanized lag bolts at 2'-0" c/c. Some wood header manufacturers will design wood headers to carry brick loads.

All steel lintels should be shop-primed with corrosion-resistant primer before placing in wall. Completely cover all steel lintels with flashing and do not trim until after joints are tooled. Place foam bead at end of lintels over 6'-0" long for expansion of steel.

Fig. 1 is a drawing provided to give guidance in constructing lintels over garage doors or with spans greater than 12'-0". The steel angle is bolted to the wood header, which should be designed to carry vertical loads. We have seen fewer problems with this type of lintel than with loose steel lintels for longer spans, but it is important that the header be properly constructed:

1. Header must be braced against twisting forces from the brick, which is not over the center of the beam. Design for $L/600$ or 0.3" max deflection with brick and floor loads.
2. Holes in angle must be drilled 1/16" larger than bolt. Wood header must be pre-drilled to fit shank of lag bolt.
3. Flashing must fully cover steel angle to prevent masonry cracks from angle movements.
4. Mortar must be properly mixed using 3 parts ASTM C144 sand with 1 part quality cement to assure good bond with brick. For best results use Type N Mortar Cement or Portland-lime.
5. Cover all exposed wood with building paper shingled to shed water before laying brick.

CLEAR SPAN IN FEET		3 5/8" BRICK 36 psf									
Angle Size	Wt	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'
L3x3x1/4	5.0	25.5	13.7	7.0	4.0	2.4	1.6	1.1			
L3x3x5/16	6.0		16.7	8.5	4.8	3.0	1.9	1.3			
L3x3x3/8	7.0		19.5	9.9	5.6	3.5	2.3	1.5	1.1		
L3.5x3.5x1/4	5.8			11.4	6.5	4.0	2.6	1.8	1.3		
L3.5x3.5x5/16	7.2			13.8	7.9	4.9	3.2	2.2	1.6	1.1	
L3.5x3.5x3/8	8.5			16.2	9.3	5.8	3.8	2.6	1.8	1.3	
L4x3x1/4	6.0			15.7	9.0	5.6	3.7	2.6	1.8	1.3	
L4x3x5/16	7.0				11.0	6.9	4.5	3.1	2.2	1.6	
L4x3x3/8	8.0				12.9	8.0	5.3	3.7	2.6	1.9	
L4x3.5x1/4	6.2				9.5	5.9	3.9	2.7	1.9	1.4	1.0
L4x3.5x5/16	7.7				11.6	7.2	4.8	3.3	2.3	1.7	1.3
L4x3.5x3/8	9.1				13.6	8.5	5.6	3.9	2.7	2.0	1.5
L5x3x1/4	7.0				16.7	10.5	7.0	4.8	3.5	2.6	1.9
L5x3x5/16	8.0					12.8	8.5	5.9	4.3	3.1	2.4
L5x3x3/8	10.0					15.1	10.0	7.0	5.0	3.7	2.8
L5x3.5x1/4	7.0					11.1	7.3	5.1	3.7	2.7	2.0
L5x3.5x5/16	8.7					13.5	9.0	6.2	4.5	3.3	2.5
L5x3.5x3/8	10.4					16.0	10.6	7.4	5.3	3.9	2.9
L6x4x5/16	10.0						15.7	10.9	7.9	5.9	4.4
L6x4x3/8	12.0						18.5	12.9	9.3	6.9	5.3

Allowable height of 3 5/8" brick in feet for various sizes of steel angle lintels.

CLEAR SPAN IN FEET		3" BRICK 30 psf									
Angle Size	Wt	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'
L3x3x1/4	5.0	30.6	16.5	8.4	4.8	2.9	1.9	1.3			
L3x3x5/16	6.0		20.1	10.2	5.8	3.6	2.3	1.6	1.1		
L3x3x3/8	7.0			11.9	6.8	4.2	2.7	1.8	1.3		
L3.5x3.5x1/4	5.8			13.6	7.8	4.8	3.2	2.2	1.5	1.1	
L3.5x3.5x5/16	7.2			16.6	9.5	5.9	3.9	2.6	1.9	1.3	
L3.5x3.5x3/8	8.5			19.4	11.1	6.9	4.5	3.1	2.2	1.6	
L4x3x1/4	6.0			18.8	10.8	6.7	4.4	3.1	2.2	1.6	1.2
L4x3x5/16	7.0				13.2	8.2	5.4	3.8	2.7	1.9	1.4
L4x3x3/8	8.0				15.5	9.7	6.4	4.4	3.1	2.3	1.7
L4x3.5x1/4	6.2				11.4	7.1	4.7	3.2	2.3	1.7	1.2
L4x3.5x5/16	7.7				13.9	8.7	5.7	3.9	2.8	2.0	1.5
L4x3.5x3/8	9.1				16.3	10.2	6.7	4.6	3.3	2.4	1.8
L5x3x1/4	7.0				20.1	12.6	8.3	5.8	4.2	3.1	2.3
L5x3x5/16	8.0					15.4	10.2	7.1	5.1	3.8	2.8
L5x3x3/8	10.0					18.1	12.0	8.4	6.0	4.4	3.3
L5x3.5x1/4	7.0					13.3	8.8	6.1	4.4	3.2	2.4
L5x3.5x5/16	8.7					16.2	10.8	7.5	5.4	4.0	3.0
L5x3.5x3/8	10.4					19.1	12.7	8.8	6.3	4.7	3.5
L6x4x5/16	10.0						18.8	13.1	9.5	7.0	5.3
L6x4x3/8	12.0							15.5	11.2	8.3	6.3

Allowable height of 3" brick in feet for various sizes of steel angle lintels.

The above tables show allowable heights in feet of brick that can be carried on steel angle lintels at different clear spans. They include weight of brick plus self-weight of angle. These tables are based on Brick Industry Association's recommended maximum deflection of L/600 (with 0.3" maximum) to prevent cracking of brick. Acme Brick Company is not responsible for use of these data by designers.

Other designs are possible using lighter angles attached to wood beams or with wire reinforcing in the bed joints. Consult your structural engineer for alternate designs. All designs should be verified by your design professional. BIA E&R Digest on "Brick Masonry Over Garage Openings," Oct '93 discusses design procedures using joint reinforcing.

Fig 1. - STEEL ANGLE LINTEL LOAD TABLES

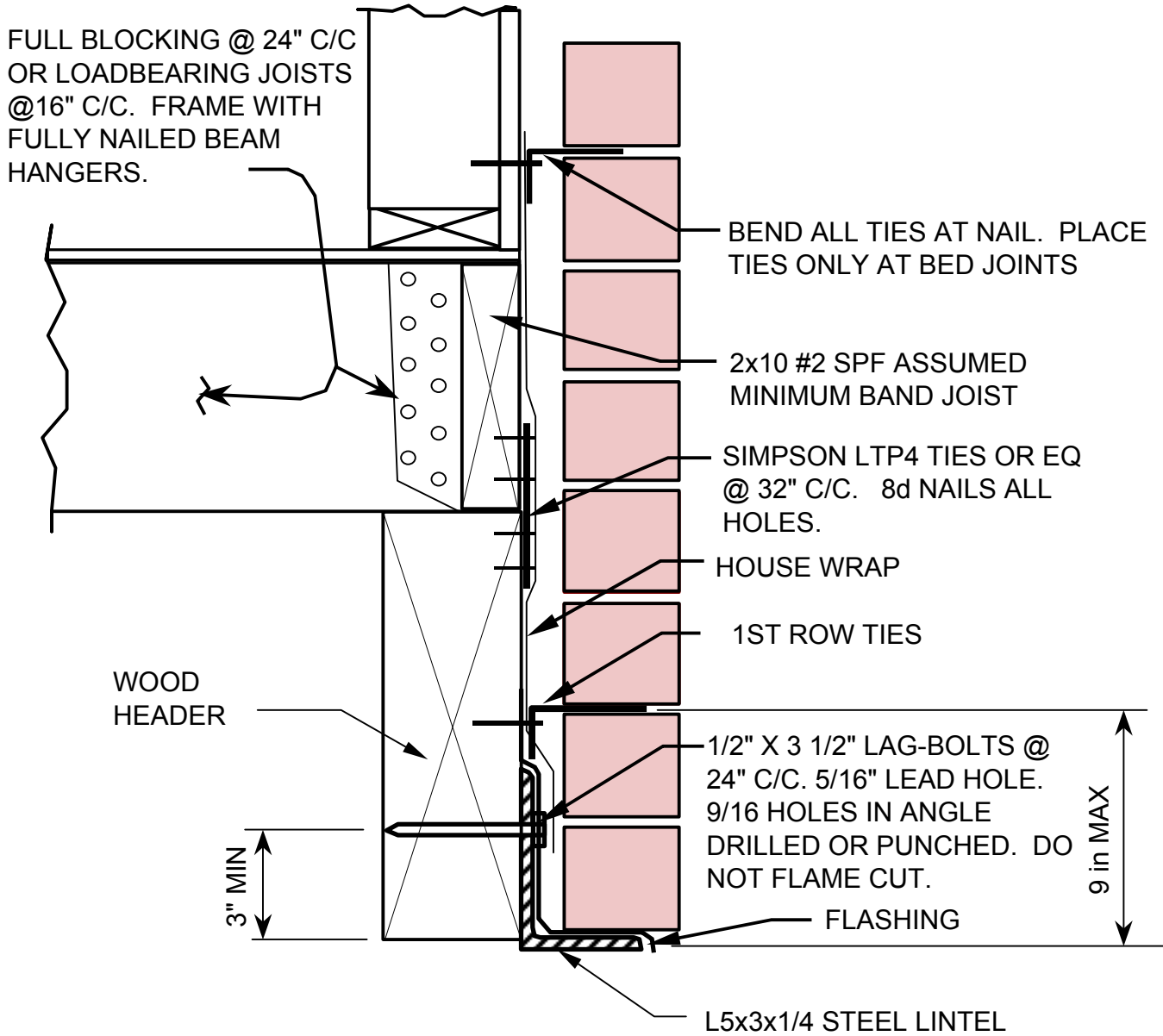


Fig 2. - WOOD HEADER AND STEEL ANGLE LINTEL
SECTION THROUGH HEADER