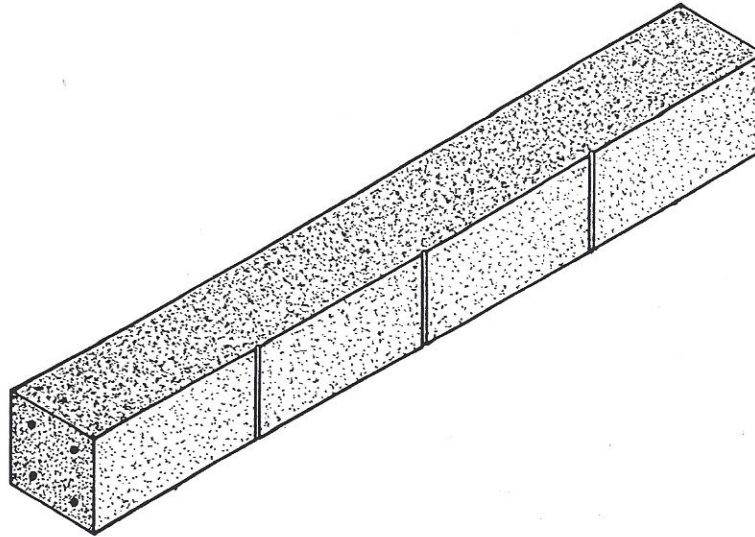


REINFORCED CONCRETE LINTELS



Martinsville Concrete Products, Inc.

530 HAIRSTON STREET

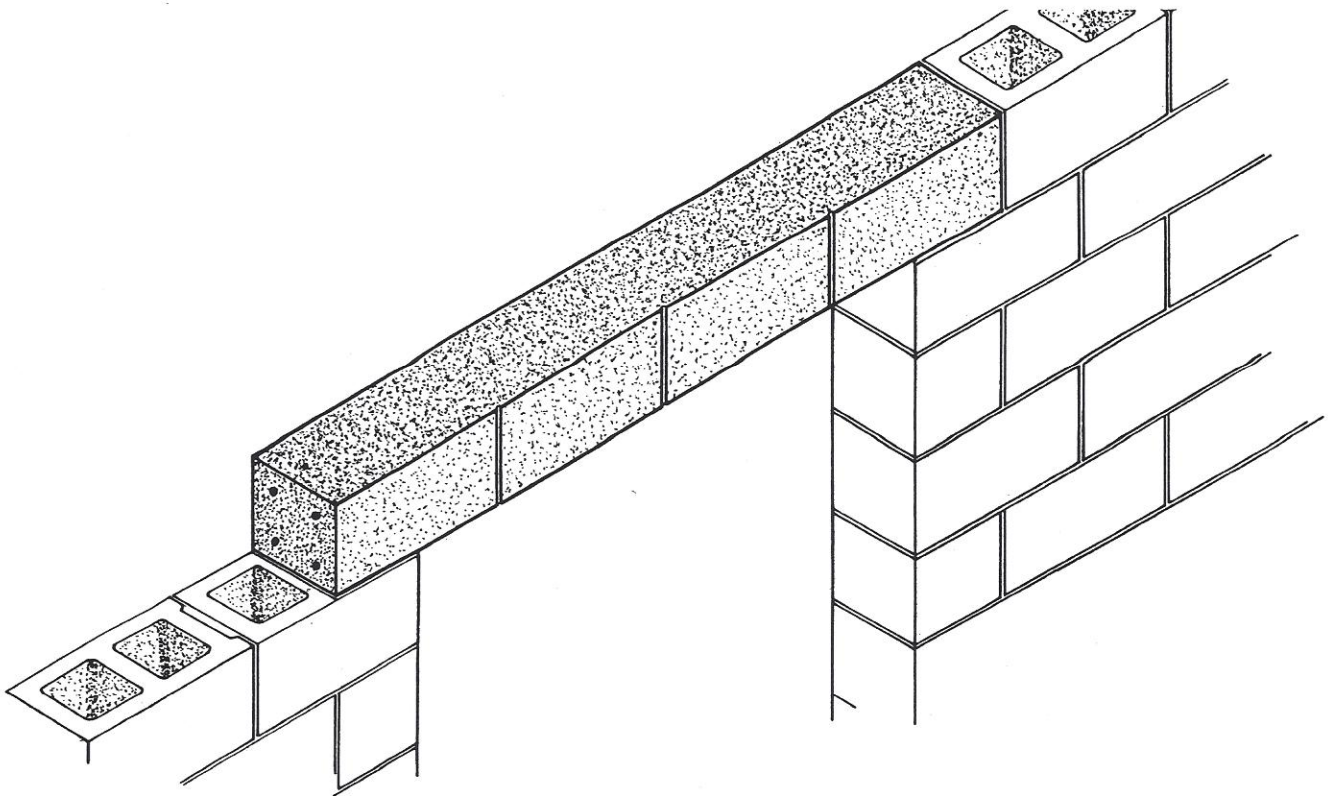
P. O. DRAWER 3351

MARTINSVILLE, VIRGINIA 24115

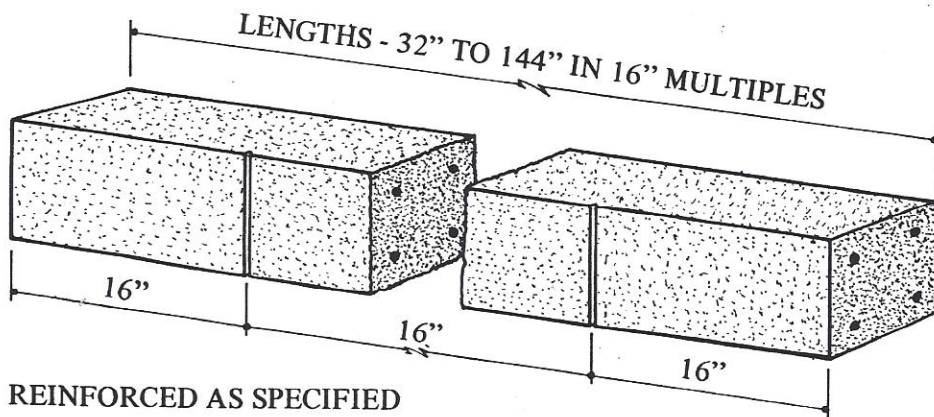
PHONE: (540) 632-6416

FAX: (540) 632-6688 or Our new area
FAX: (540) 632-0822 code is (276)

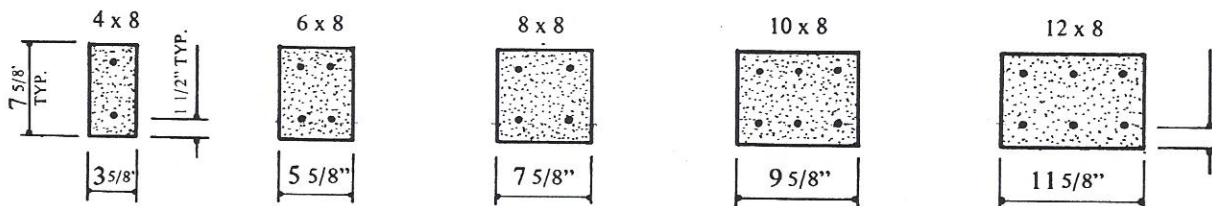
TOLL FREE: 1-800-868-0585

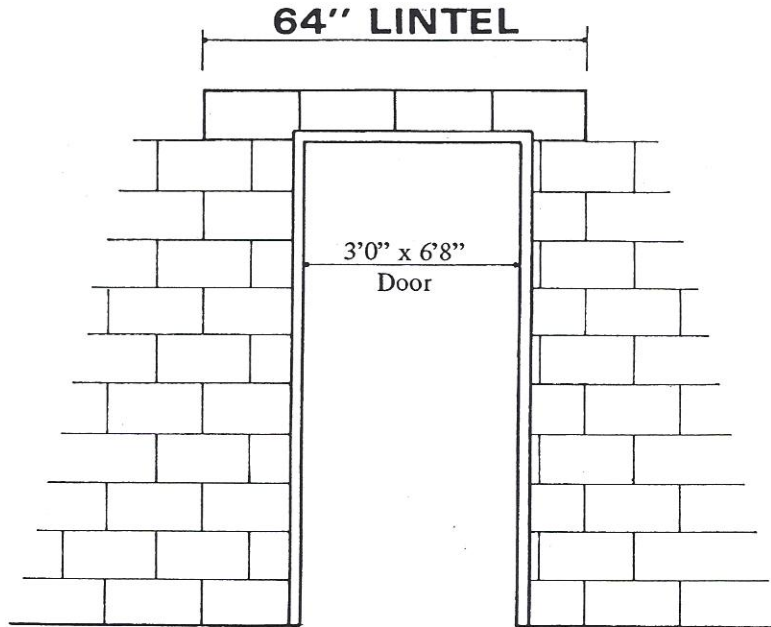


Lintels are professionally designed, laboratory tested and textured to match lightweight and heavyweight concrete block. Each unit can be marked for identification to insure proper handling and use. Special sizes or aggregates will be made on submission of a detailed specification. **IMPORTANT** – never store, handle, or use lintels flat and always install them within the limits of safe load tables for proper applicable loads and weights per foot.

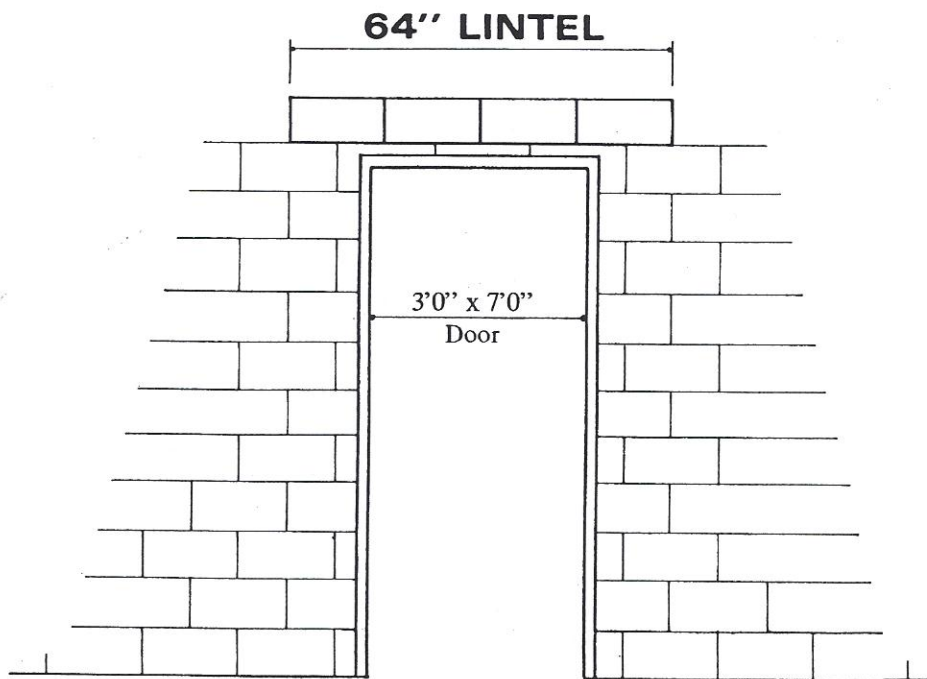


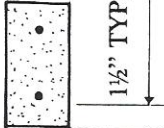



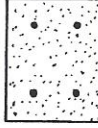

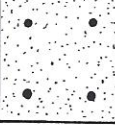
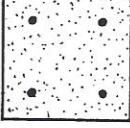
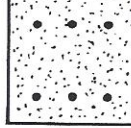
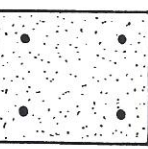
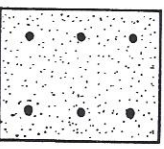
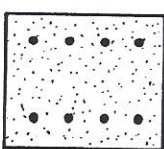
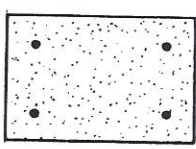
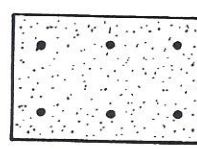
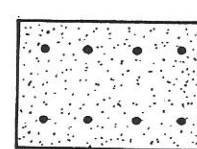
REINFORCED AS SPECIFIED
STANDARD SIZES – WIDTH, HEIGHT & LENGTH, SHOWN





Lintels 64'' long will course to most masonry openings up to 3'4'' wide, Contractor and supplier to work together to insure proper coursing. Shop drawing to be provided by request.



CLEAR SPAN TO 56" LINTEL LENGTHS - 48" - 56" - 64" - 80"	CLEAR SPAN TO 57" TO 80" LINTEL LENGTH - 96"	CLEAR SPAN TO 81" TO 128" LINTEL LENGTHS - 112" - 128" - 144"
<p>4 x 8 TO 80"</p>  <p>2 NO. 3 BARS</p>	<p>4 x 8 TO 96"</p>  <p>2 NO. 3 BARS</p>	<p>4 x 8" TO 144"</p>  <p>2 NO. 3 BARS</p>
<p>6 x 8" TO 80"</p>  <p>4 NO. 3 BARS</p>	<p>6 x 8 TO 96"</p>  <p>4 NO. 3 BARS</p>	<p>6 x 8" TO 144"</p>  <p>4 NO. 4 BARS</p>
<p>8 x 8" TO 80"</p>  <p>4 NO. 4 BARS</p>	<p>8 x 8" TO 96"</p>  <p>4 NO. 4 BARS</p>	<p>8 x 8" TO 144"</p>  <p>6 NO. 4 BARS</p>
<p>10 x 8 TO 80"</p>  <p>4 NO. 4 BARS</p>	<p>10 x 8" TO 96"</p>  <p>6 NO. 4 BARS</p>	<p>10 x 8 TO 144"</p>  <p>8 NO. 4 BARS</p>
<p>12 x 8" TO 80"</p>  <p>4 NO. 4 BARS</p>	<p>12 x 8" TO 96"</p>  <p>6 NO. 4 BARS</p>	<p>12 x 8" TO 144"</p>  <p>8 NO. 4 BARS</p>

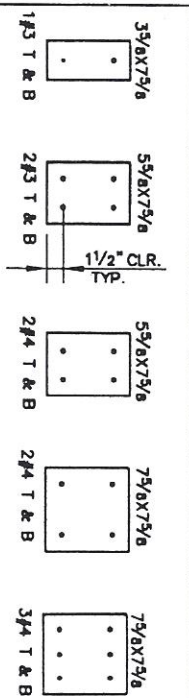
Lintel Weights

Length	4 x 8	6 x 8	8 x 8	10 x 8	12 x 8
40	67 lbs.	128 lbs.	140 lbs.	170 lbs.	200 lbs.
48	80 lbs.	128 lbs.	168 lbs.	208 lbs.	240 lbs.
56	93 lbs.	150 lbs.	196 lbs.	243 lbs.	280 lbs.
64	107 lbs.	170 lbs.	225 lbs.	278 lbs.	320 lbs.
72	120 lbs.	192 lbs.	252 lbs.	312 lbs.	360 lbs.
80	130 lbs.	213 lbs.	280 lbs.	347 lbs.	400 lbs.
88	147 lbs.	235 lbs.	308 lbs.	380 lbs.	440 lbs.
96	160 lbs.	256 lbs.	336 lbs.	416 lbs.	480 lbs.
104	174 lbs.	277 lbs.	365 lbs.	451 lbs.	521 lbs.
112	187 lbs.	298 lbs.	393 lbs.	487 lbs.	562 lbs.
120	200 lbs.	320 lbs.	420 lbs.	520 lbs.	600 lbs.
128	214 lbs.	341 lbs.	450 lbs.	555 lbs.	641 lbs.
136	227 lbs.	364 lbs.	477 lbs.	591 lbs.	682 lbs.
144	240 lbs.	384 lbs.	504 lbs.	624 lbs.	720 lbs.

TABLE OF SAFE UNIFORM LOAD (ALL LOADS GIVEN IN lbs./linear ft. as WLL /W_U) 7, 8, 9

CLEAR SPAN UNTEL LENGTH	UNTEL WIDTH x DEPTH AND REINFORCING											
	5/8" x 7 3/8" REIN. 1#3 T & B WLL=2762ft.-lbs WU=1682 lbs	5/8" x 7 3/8" REIN. 2#3 T & B WLL=5423ft.-lbs WU=2610 lbs	5/8" x 7 3/8" REIN. 2#4 T & B WLL=9069ft.-lbs WU=2610 lbs	7/8" x 7 3/8" REIN. 2#4 T & B WLL=9464ft.-lbs WU=3500 lbs	7/8" x 7 3/8" REIN. 3#4 T & B WLL=13,363ft.-lbs WU=3500 lbs	9/8" x 7 3/8" REIN. 2#4 T & B WLL=9695ft.-lbs WU=4420 lbs	9/8" x 7 3/8" REIN. 3#4 T & B WLL=13,982ft.-lbs WU=4420 lbs	9/8" x 7 3/8" REIN. 4#4 T & B WLL=17,630ft.-lbs WU=4420 lbs	11/8" x 7 3/8" REIN. 2#4 T & B WLL=9846ft.-lbs WU=5337 lbs	11/8" x 7 3/8" REIN. 3#4 T & B WLL=14,223ft.-lbs WU=5337 lbs	11/8" x 7 3/8" REIN. 4#4 T & B WLL=18,235ft.-lbs WU=5337 lbs	11/8" x 7 3/8" REIN. 4#4 T & B WLL=18,235ft.-lbs WU=5337 lbs
2'-0"	723/878	1123/1364	1123/1364	1506/1829	1506/1829	1902/2310	1902/2310	2296/2788	2296/2788	2296/2788	2296/2788	2296/2788
3'-4"	575/699	893/1084	893/1084	1197/1454	1197/1454	1512/1836	1512/1836	1825/2216	1825/2216	1825/2216	1825/2216	1825/2216
4'-0"	477/579	739/897	739/897	991/1203	991/1203	1251/1519	1251/1519	1511/1835	1511/1835	1511/1835	1511/1835	1511/1835
5'-4"	353/429	548/665	548/665	734/891	734/891	927/1126	927/1126	1119/1359	1119/1359	1119/1359	1119/1359	1119/1359
6'-8"	274/332	432/525	432/525	579/703	579/703	732/889	732/889	884/1073	884/1073	884/1073	884/1073	884/1073
8'-0"	185/224	356/432	356/432	476/578	476/578	602/731	602/731	665/808	665/808	665/808	665/808	665/808
9'-4"	131/159	265/322	265/322	403/489	403/489	475/577	475/577	509/618	509/618	509/618	509/618	509/618
10'-8"	96/117	196/238	196/238	348/423	348/423	353/429	353/429	439/533	439/533	439/533	439/533	439/533

STANDARD REINFORCED PRE-CAST LIGHTWEIGHT CONCRETE UNTEL TYPES



- CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS = 3000 PSI
- DENSITY OF LIGHTWEIGHT CONCRETE NOT TO EXCEED 115 LB/FT³
- REINFORCING STEEL SHALL BE ASTM A615 GRADE 60.
- UNTELS SHALL HAVE A MINIMUM BEARING OF 8" ON EACH END.
- UNTEL DESIGN BASED ON ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" AND THE FOLLOWING DESIGN FORMULAS:

$$\phi M_n > M_u$$

$$\phi V_n > V_u$$
 (ACI 318 11.5.5.1 SHALLOW BEAM DEPTH < 10 INCHES)
 WHERE $M_u = \frac{w_u L^2}{8}$ (CLEAR SPAN)² AND $V_u = \frac{w_u L}{2}$ (CLEAR SPAN) AND $w_u = 1.4 W_{DL} + 1.7 W_{LL}$
- ϕM_n = NOMINAL DESIGN MOMENT CAPACITY (ft.-lbs)
 ϕV_n = NOMINAL DESIGN SHEAR CAPACITY (lbs)
 M_u = CALCULATED FACTORED MOMENT (ft.-lbs)
 V_u = CALCULATED FACTORED SHEAR (lbs)
 w_u = FACTORED UNIFORM LOAD ON UNTEL (lbs/ft)
 W_{DL} = DEAD LOAD UNIFORM LOAD ON UNTEL INCLUDING UNTEL WEIGHT (lbs/ft)
 W_{LL} = LIVE LOAD UNIFORM LOAD ON UNTEL (lbs/ft)
 AS DEFINED BY THE NC STATE BUILDING CODE:
 DEAD LOAD—THE WEIGHT OF ALL PERMANENT CONSTRUCTION INCLUDING WALLS, FLOORS, CEILINGS, STAIRWAYS, AND FIXED SERVICE EQUIPMENT
 LIVE LOAD—THE WEIGHT SUPERIMPOSED BY THE USE AND OCCUPANCY OF THE BUILDING. (EXAMPLE: ROOF OR FLOOR LIVE LOADS AS PRESCRIBED WITHIN THE BUILDING CODE.)
- TWO NUMBERS FOR "SAFE UNIFORM LOAD" ARE GIVEN IN THE TABLE ABOVE.
 a) THE FIRST NUMBER (WLL) IS THE MAXIMUM UNIFORM LIVE LOAD THAT CAN BE SUPPORTED BY THE GIVEN UNTEL SECTION ASSUMING ALL LOAD SUPPORTED BY THE UNTEL IS LIVE LOAD. (UNIFORM DEAD LOAD OF THE UNTEL ITSELF HAS BEEN CONSIDERED IN THE SAFE UNIFORM LOADS GIVEN)
 b) THE SECOND NUMBER (WU) IS THE MAXIMUM UNIFORM DEAD LOAD THAT CAN BE SUPPORTED BY THE GIVEN UNTEL SECTION ASSUMING ALL LOAD SUPPORTED BY THE UNTEL IS DEAD LOAD.
 8. LOADS DESCRIBED IN 7b ABOVE CAN BE USED TO SELECT A UNTEL SECTION WHEN ALL LOAD ON THE UNTEL IS DEAD LOAD. (FOR EXAMPLE: NON-LOAD BEARING WALL APPLICATION) LOADS DESCRIBED IN 7a ABOVE ARE CONSERVATIVE TO USE TO SELECT A UNTEL IN ALL APPLICATIONS REGARDLESS OF THE DISTRIBUTION OF DEAD AND LIVE LOAD.
 9. FOR COMBINATIONS OF DEAD PLUS LIVE LOAD, BOTH WLL AND WU CAN BE ENTERED INTO THE FORMULAS GIVEN IN ITEM 5 TO COMPUTE M_u AND V_u FOR A GIVEN SPAN. A UNTEL SECTION CAN THEN BE SELECTED SUCH THAT M_u AND V_u DO NOT EXCEED GIVEN VALUES FOR ϕM_n AND ϕV_n , RESPECTIVELY.

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Rev: 1/1-5-01

Project: 00294

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National Concrete Masonry Association
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masonry technology

NCMA TEK

ALLOWABLE STRESS DESIGN OF CONCRETE MASONRY LINTELS

Keywords: design examples, lintels, openings in walls

INTRODUCTION

Loads above openings are carried by horizontal structural members known as lintels. Lintels may consist of concrete masonry units, precast or cast-in-place concrete, or structural steel. This TEK addresses reinforced concrete masonry lintels. Concrete masonry lintels make it easy to maintain the bond pattern, color, and surface texture of the surrounding masonry and do not require special lifting equipment.

Lintels are primarily designed as simply supported beams, and are sometimes constructed as a portion of a continuous bond beam. This provides several benefits: it is considered to be more advantageous in high seismic areas or areas where high winds may be expected to occur; control of wall movement due to shrinkage or temperature differentials is more easily accomplished; and deflection may be reduced by as much as 75%.

DESIGN LOADS

In any design, the dead and live loads, and the manner in which they act on the lintel, must be determined based on an analysis of the structure under consideration. Vertical loads carried by lintels typically include: (1) distributed loads from the dead weight of the lintel and the masonry above the lintel, and any floor and roof dead and live loads supported by the masonry; and (2) concentrated loads from floor beams, roof joists, and other beams framing into the wall.

Lintel loads can be separated into the four types illustrated in Figure 1: uniform load acting over the effective span; triangular load with apex at mid-span, acting over the effective span; concentrated load; and uniform load acting over a portion of the effective span. The designer calculates the effects of these load types individually and then combines them, using superposition, to determine the overall effect.

This TEK covers uniform and triangular loads acting over the effective span. In cases where concentrated loads and uniform loads act over a portion of the span, their contribution to the bending moment and shear must be taken into account.

Load Combinations

Building codes require design loads to be applied to structural members in various combinations. These load combinations are

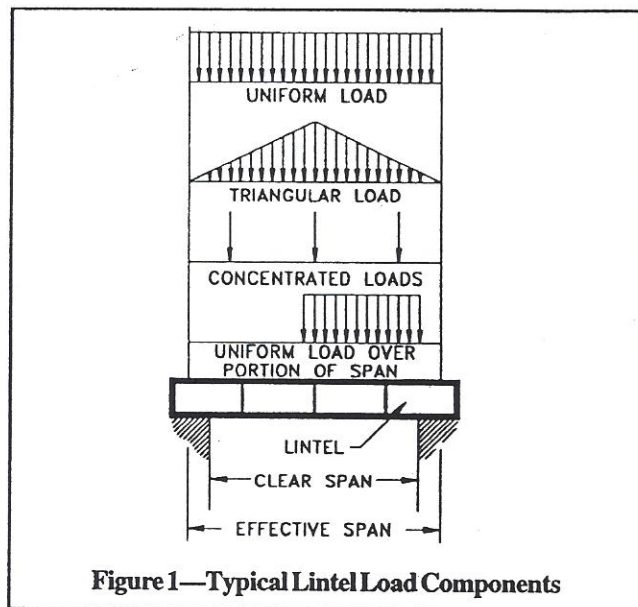


Figure 1—Typical Lintel Load Components

intended to account for the combined affects of several loadings occurring simultaneously. Accordingly, load combinations must be considered since these loadings will most likely occur at the same time. Typical load combinations for lintels are presented in Table 1.

Table 1 – Load Combinations

1. Dead load
2. Dead + live + (roof live load or snow load or rain load)

Arching Action

In some instances, the masonry will distribute loads so that they do not act on the lintel. This is called arching action of masonry and is based on the amount of masonry that is around the lintel. Arching action is assumed if the following criteria are met (see also Figure 2):

- masonry wall laid in running bond
- sufficient wall height above the lintel to form a 45° triangle
- wall height above the arch height at least 8 in. (203 mm)
- minimum end bearing, typically 4 in. (102 mm), is maintained
- control joints not located adjacent to the lintel
- sufficient masonry on each side of the opening to resist lateral thrust from the arching action. The designer should consider two cases. First there should be sufficient shear area of the masonry to resist the horizontal thrust, and,

second, there must be enough masonry to resist the moment due to overturning. In unreinforced masonry, this means using vertical loads to offset overturning. In reinforced masonry, vertical steel can be used to resist overturning. As an alternative, the steel in the lintel can be made continuous through the use of a bond beam at lintel height to provide adequate restraint. When there is a series of openings in a wall, the designer should consider the offsetting effect of thrust from adjacent openings on the piers between openings.

Lintel Loading

The loads supported by a lintel depend on whether arching action can occur or not. If arching occurs, the self weight of the lintel, the weight of the wall below the arched portion taken as a triangular load, and concentrated loads are considered. Otherwise, the self weight, the weight of the wall above the lintel as a uniform load, roof and floor loads, and concentrated loads are considered.

Self weight is a uniform load based on lintel weight. Table 2 provides lintel weights for various lintel sizes.

When arching action occurs, only the weight of the wall within the triangular area below the apex is considered (see Table 3). This triangular load has a base equal to the effective span length of the lintel and a height as shown in Figure 2.

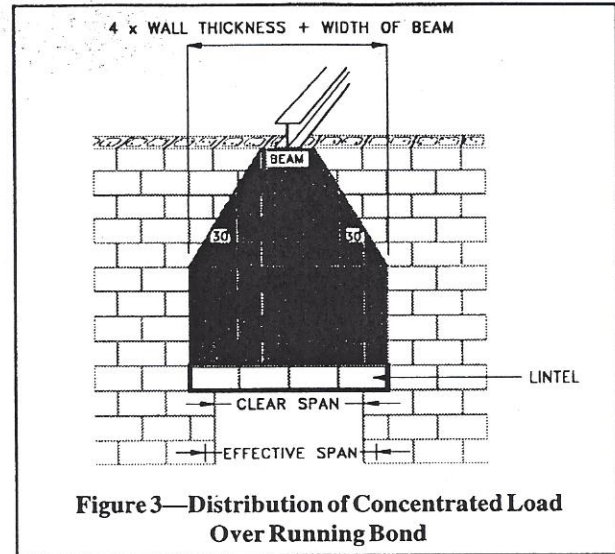


Figure 3—Distribution of Concentrated Load Over Running Bond

Concentrated loads are assumed to be distributed downwards at an angle of thirty degrees from the vertical on each side of bearing, with maximum length equal to four times the wall thickness plus the width of the bearing, as shown in Figure 3. This is then resolved onto the lintel as a uniform load. The magnitude of the load per unit length is determined by dividing the concentrated load by this length. In most cases, this results in a uniform load acting over a portion of the lintel span.

Table 2 – Lintel Weights in Pounds per Linear Foot (kg/m) ^a

Lintel height, in. nominal (mm)	Wall thickness, in. (mm) – nominal				
	4 (102)	6 (152)	8 (203)	10 (254)	12 (305)
LIGHTWEIGHT CONCRETE MASONRY UNITS					
8 (203)	24 (36)	39 (58)	54 (80)	69 (103)	87 (129)
16 (406)	49 (73)	78 (116)	110 (164)	141 (210)	180 (268)
24 (610)	72 (107)	117 (174)	162 (241)	207 (308)	261 (388)
NORMAL WEIGHT CONCRETE MASONRY UNITS					
8 (203)	29 (43)	45 (67)	61 (91)	77 (115)	94 (140)
16 (406)	58 (86)	90 (134)	122 (182)	155 (231)	197 (293)
24 (610)	87 (129)	135 (201)	183 (272)	231 (344)	282 (420)

^a Face shell mortar bedding. Unit weight of grout is 145 pcf (2323 kg/m³). Unit weight of masonry units is 100 pcf (1602 kg/m³) for lightweight units, 145 pcf (2323 kg/m³) for normal weight units.

DESIGN EXAMPLE

Design a lintel for a 12 in. (305 mm) hollow concrete masonry wall laid in running bond. The lintel spans an opening of 5'-4" (1.6m). The configuration of the wall is shown in Figure 4.

Check for Arching Action. The height of masonry required for arching action is computed. Assuming the lintel has 8 in. (203mm) bearing on each end, the effective span, L , is, $L = 5.33 + 0.67 = 6.0$ ft. (1.8m)

Therefore, the height of masonry above the lintel for arching action, from Figure 2, is $h = L/2 = 3.0$ ft. (0.9m).

Because there is $18.0 - 7.33 = 10.67$ ft. (3.3m) of masonry above the lintel, arching action of the wall is assumed. Consequently, any superimposed live loads and roof dead loads are neglected.

Design Loads. Because of arching action, only the lintel dead weight and wall weight above will be considered. The lintel weight, from Table 2, for 12 in. (305mm) normal weight concrete masonry units, assuming 16 in. (406mm) depth is,

$$D_{\text{lintel}} = 197 \text{ lb/ft (293 kg/m)}$$

For wall weight, only the triangular portion with a height of 3'-0" (0.9m) is considered. From Table 1, wall dead load is,

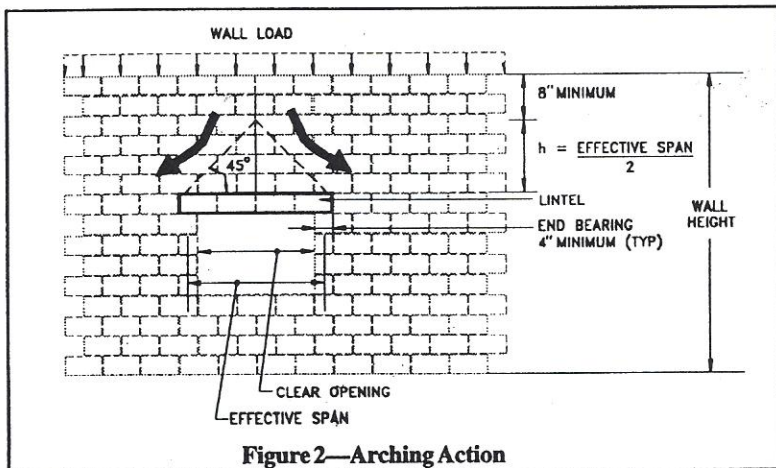


Figure 2—Arching Action

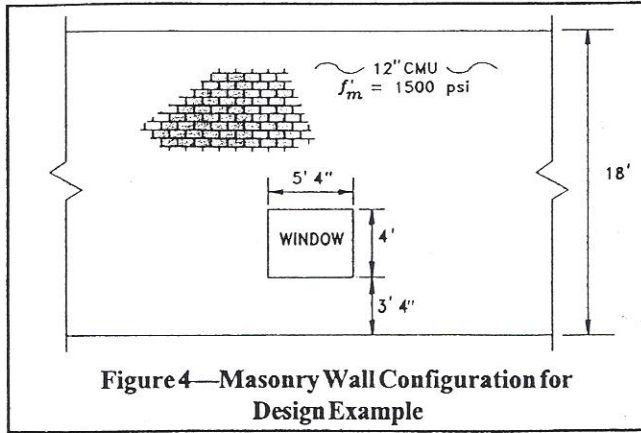


Figure 4—Masonry Wall Configuration for Design Example

$$D_{wall} = 58.2 \text{ lb/ft}^2 (3 \text{ ft}) = 175 \text{ lb/ft} (2.5 \text{ kN/m})$$

Maximum moment and shear are determined using standard beam relationships. For example, the lintel is considered simply supported. The lintel dead weight is considered a uniform load, so the moment and shear are,

$$M_{lintel} = wL^2/8 = 197(6)^2/8 = 887 \text{ ft-lb} (1.2 \text{ kN-m})$$

$$V_{lintel} = wL/2 = 197(6)/2 = 591 \text{ lb} (2.6 \text{ kN})$$

For wall load, moment and shear for triangular loading are,

$$M_{wall} = wL^2/12 = 175(6)^2/12 = 524 \text{ ft-lb} (0.71 \text{ kN-m})$$

$$V_{wall} = wL/4 = 175(6)/4 = 262 \text{ lb} (1.2 \text{ kN})$$

Since the maximum moments and shears for the two loading conditions occur in the same locations on the lintel, the maximum moment and shear are the addition of the two components and are,

$$M_{max} = 887 + 524 = 1411 \text{ ft-lb} = 16,932 \text{ in-lb} (1.9 \text{ kN-m})$$

$$V_{max} = 591 + 262 = 853 \text{ lb} (3.8 \text{ kN})$$

Lintel Design. From Table 4, a 12x8 lintel with one No. 4 reinforcing bar and 2.5 in. (64mm) or less bottom cover has adequate strength. For cases where a lintel is adequate for moment but not for shear. *Building Code Requirements for Masonry Structures* (ref. 1) allows maximum shear to be calculated using a distance $d/2$ from the face of the support.

REFERENCES

1. *Building Code Requirements for Masonry Structures*, ACI 530-95/ASCE 5-95/TMS 402-95. Reported by the Masonry Standards Joint Committee, 1995.
2. *Design Tables for Concrete Masonry and Precast Concrete Lintels*, TR 91A. National Concrete Masonry Association, 1996.
3. *Minimum Design Loads for Buildings and Other Structures*, ASCE 7-95. American Society of Civil Engineers, 1995

Table 3—Wall Weights, lb/ft² *

Wall weights for wall thicknesses, in. (mm), of:

Grouted cells	Lightweight units					Normal weight units				
	4(102)	6(152)	8(203)	10(254)	12(305)	4(102)	6(152)	8(203)	10(254)	12(305)
None	15.4	22.9	29.5	35.6	40.8	21.9	32.5	41.9	50.8	58.2
48 in. o.c.	19.0	28.7	37.7	46.3	54.2	25.5	38.3	50.	61.5	71.6
40 in. o.c.	19.7	29.8	39.3	48.5	56.9	26.2	39.5	51.8	63.6	74.3
32 in. o.c.	20.8	31.6	41.8	51.7	60.9	27.3	41.2	54.2	66.8	78.3
24 in. o.c.	22.6	34.5	45.9	57.0	67.6	29.1	44.1	58.4	72.2	85.0
16 in. o.c.	26.2	40.3	54.	67.7	81.1	32.7	49.9	66.6	82.9	98.5
Full grout	37.0	57.7	78.8	99.9	121.4	43.5	67.3	91.2	115.0	138.8

* Assumes face shell mortar bedding, unit weight of grout of 145 pcf (2323 kg/m³), unit weight of masonry units of 100 pcf (1602 kg/m³) for lightweight units, or 145 pcf (2323 kg/m³) for normal weight units. kg/m³ = lb/ft³ x 4.882

Table 4—Allowable Shear and Moment Capacities for Concrete Masonry Lintels*

Steel size	No. of bars	Bottom covers, in. (mm):							
		1.5(38)		2(51)		2.5(64)		3(76)	
		V _{all} lb	M _{all} in.-lb	V _{all} lb	M _{all} in.-lb	V _{all} lb	M _{all} in.-lb	V _{all} lb	M _{all} in.-lb
8 x 8 lintels									
#4	1	1,735	17,810	1,587	15,397	1,440	13,115	1,292	10,971
#5	1	1,717	20,414	1,569	17,573	1,421	14,895	1,274	12,387
#6	1	1,698	22,457	1,550	19,252	1,403	16,239	1,255	13,429
#4	2 ^b	1,735	22,597	1,587	19,454	1,440	16,493	1,292	13,723
#5	2 ^b	1,717	25,333	1,569	21,703	1,421	18,296	1,274	15,123
10 x 8 lintels									
#4	1	2,190	20,614	2,004	17,842	1,817	15,219	1,631	12,751
#5	1	2,167	23,781	1,980	20,500	1,794	17,403	1,608	14,500
#6	1	2,143	26,315	1,957	22,595	1,771	19,093	1,584	15,821
#4	2	2,190	26,426	2,004	22,785	1,817	19,350	1,631	16,131
#5	2	2,167	29,862	1,980	25,627	1,794	21,646	1,608	17,930
12 x 8 lintels									
#4	1	2,645	23,158	2,420	20,061	2,195	17,129	1,970	14,368
#5	1	2,617	26,844	2,392	23,165	2,167	19,689	1,942	16,427
#6	1	2,589	29,837	2,364	25,651	2,139	21,705	1,913	18,013
#4	2	2,645	29,919	2,420	25,825	2,195	21,960	1,970	18,335
#5	2	2,617	34,015	2,392	29,229	2,167	24,725	1,942	20,515

Table 4—Allowable Shear and Moment Capacities for Concrete Masonry Lintels (continued)^a

Steel size	No. of bars	Bottom covers, in. (mm), of:							
		1.5 (38)		2 (51)		2.5 (64)		3 (76)	
		V_{all} lb	M_{all} in.-lb	V_{all} lb	M_{all} in.-lb	V_{all} lb	M_{all} in.-lb	V_{all} lb	M_{all} in.-lb
8 x 16 lintels									
4	1	4,097	61,975	3,950	59,669	3,802	57,365	3,655	55,062
5	1	4,079	84,126	3,931	79,271	3,784	74,520	3,636	69,876
6	1	4,061	95,364	3,913	89,771	3,765	84,302	3,618	78,960
4	2 ^b	4,097	93,407	3,950	87,996	3,802	82,704	3,655	77,532
5	2 ^b	4,079	108,666	3,931	102,242	3,784	95,964	3,636	89,836
10 x 16 lintels									
4	1	5,172	62,431	4,986	60,114	4,799	57,799	4,613	55,486
5	1	5,149	94,940	4,963	91,324	4,776	85,889	4,590	80,573
6	1	5,126	110,290	4,939	103,871	4,753	97,592	4,566	91,457
4	2	5,172	107,883	4,986	101,681	4,799	95,611	4,613	89,678
5	2	5,149	126,258	4,963	118,858	4,776	111,623	4,590	104,557
12 x 16 lintels									
4	1	6,247	62,771	6,022	60,447	5,797	58,124	5,572	55,803
5	1	6,219	95,562	5,994	91,989	5,769	88,419	5,544	84,852
6	1	6,191	123,822	5,966	116,657	5,740	109,647	5,515	102,795
4	2	6,247	121,001	6,022	114,083	5,797	107,312	5,572	100,691
5	2	6,219	142,244	5,994	133,961	5,769	125,861	5,544	117,947
8 x 24 lintels									
4	1	6,460	99,054	6,312	96,728	6,165	94,404	6,017	92,080
5	1	6,442	151,086	6,294	147,510	6,146	143,935	5,999	140,363
6	1	6,423	200,297	6,275	192,949	6,128	185,701	5,980	178,552
4	2 ^b	6,460	193,814	6,312	187,581	6,165	180,595	6,017	173,706
5	2 ^b	6,442	229,624	6,294	221,133	6,146	212,760	5,999	204,505
10 x 24 lintels									
4	1	8,154	99,653	7,968	97,320	7,782	94,987	7,595	92,655
5	1	8,131	152,189	7,945	148,598	7,758	145,008	7,572	141,419
6	1	8,108	212,968	7,921	207,905	7,735	202,844	7,549	197,786
4	2	8,154	195,385	7,968	190,773	7,782	186,162	7,595	181,554
5	2	8,131	265,166	7,945	255,434	7,758	245,835	7,572	236,369
12 x 24 lintels									
4	1	9,849	100,098	9,624	97,759	9,399	95,420	9,174	93,082
5	1	9,821	153,013	9,596	149,410	9,371	145,808	9,145	142,208
6	1	9,793	214,305	9,567	209,222	9,342	204,142	9,117	199,065
4	2	9,849	196,561	9,624	191,932	9,399	187,305	9,174	182,680
5	2	9,821	297,369	9,596	286,517	9,371	275,811	9,145	265,251

^a $f'_m = 1500$ psi (10.3 MPa). $N = \text{lb} \times 4.44822$. $N\text{m} = \text{in.-lb} \times 0.112985$

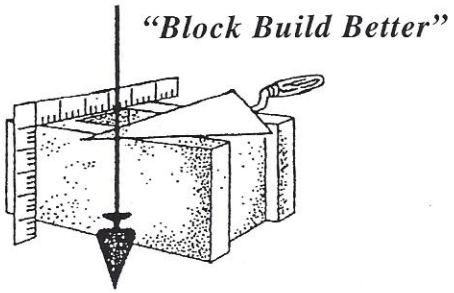
^b Where two bars are used in 8 in. (204 mm) lintels, low lift grouting is recommended for adjacent jambs to ensure proper grout flow and consolidation of the grout.

ORDER FORM

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Martinsville, VA 24115

276
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	4 x 8	6 x 8	8 x 8	10 x 8	12 x 8
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144					

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SUGGESTED SPECIFICATIONS
FOR REINFORCED PRE-CAST CONCRETE LINTELS

A. MATERIALS

1. Pre-Cast lightweight Concrete Lintels as manufactured by Martinsville Concrete Products or equal. Lintels shall be scored on each side with 3/8" mortar groove at 16" on centers.
2. Concrete used in lintels shall have a minimum compressive strength at 28 days equal to at least 3000 P.S.I. Lightweight concrete and have a uniformly smooth texture to match block on exposed surfaces.
3. Reinforcement shall consist of intermediate or hard grade billet steel bars, rail steel bars, or cold drawn steel wire conforming to the current ASTM specifications A 15, A 16, and A 82 respectively, Number 3 bars or larger shall be deformed according to the requirements of current ASTM Specifications A 305. All Lintels to be properly cured before setting in place.
4. Lintel reinforcement shall be such so as to satisfy the indicated loads for the required clear span.

B. INSTALLATION

1. The contractor shall furnish and install Reinforced Pre-Cast Concrete Lintels over doorways and openings as shown on the plans.
2. Except where otherwise indicated on the plans, a minimum bearing of 8 inches on each end shall be provided for all lintels. Larger bearing areas shall be provided for all lintels. Larger bearing areas shall be provided where shown on the plans.
3. All Lintels to be standard 16" multiples' with a 3/8" mortar groove to give the appearance of Block. All Lintels are 7 5/8" High, and in modular widths of 3 5/8" - 5 5/8" - 7 5/8" - 9 5/8" - 11 5/8".
4. Lintels to be professionally designed, laboratory tested and textured to match lightweight and heavyweight concrete block.
5. Contractor shall submit lintel schedules for approval.

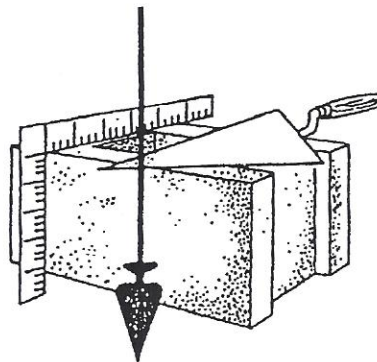
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