

Manufacturing quality
lintels since 1956.



CONCRETE LINTEL **DESIGN & INSTALLATION GUIDE**



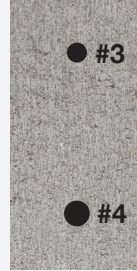
4" x 8" SOLID LINTELS



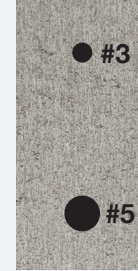
Lintel Length
30" to 68"



Lintel Length
72" to 88"



Lintel Length
90" to 96"



Lintel Length
102" to 144"

6" x 8" SOLID LINTELS



Lintel Length
30" to 64"



Lintel Length
72" to 88"

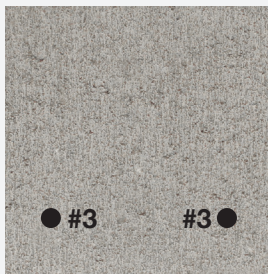


Lintel Length
90" to 96"

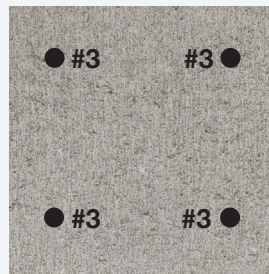


Lintel Length
104" to 144"

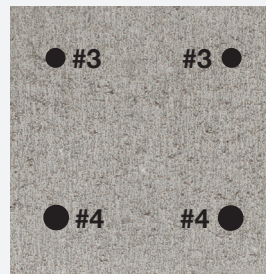
8" x 8" SOLID LINTELS



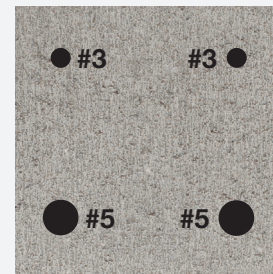
Lintel Length
40" to 64"



Lintel Length
72" to 88"



Lintel Length
96"



Lintel Length
108" to 144"

Special rebar schedules available upon request.

Rebar is grade 60 steel ASTM 615
Concrete compressive strength is 3,000 PSI

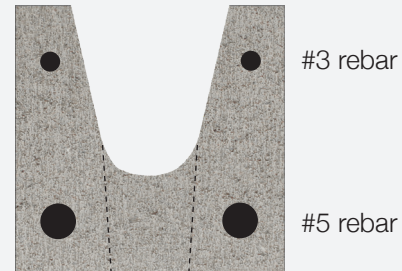
Rebar placement:
Clearance from bottom: 1 1/2"
Clearance from top: 1 1/2"

6" x 8" U-LINTELS



5 1/2" long horizontal notch
for seismic reinforcing.

8" x 8" U-LINTELS



5 1/2" long horizontal notch
for seismic reinforcing.

10" x 8" U-LINTELS



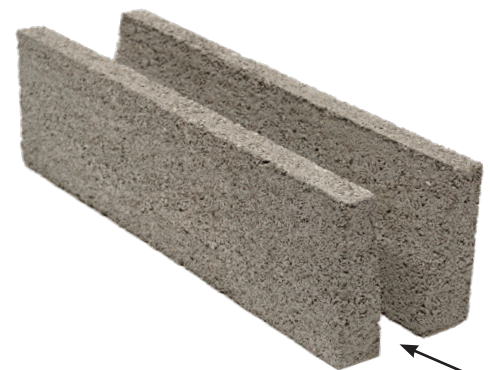
5 1/2" long horizontal notch
for seismic reinforcing.

12" x 8" U-LINTELS



5 1/2" long horizontal notch
for seismic reinforcing.

- U-lintels are available in lengths from 36" to 144".
- All four widths are stocked in these lengths:
48", 56", 72", 88", 96", 144"
- All other lengths available by special request.
- #3 and #5 rebar placed as shown.

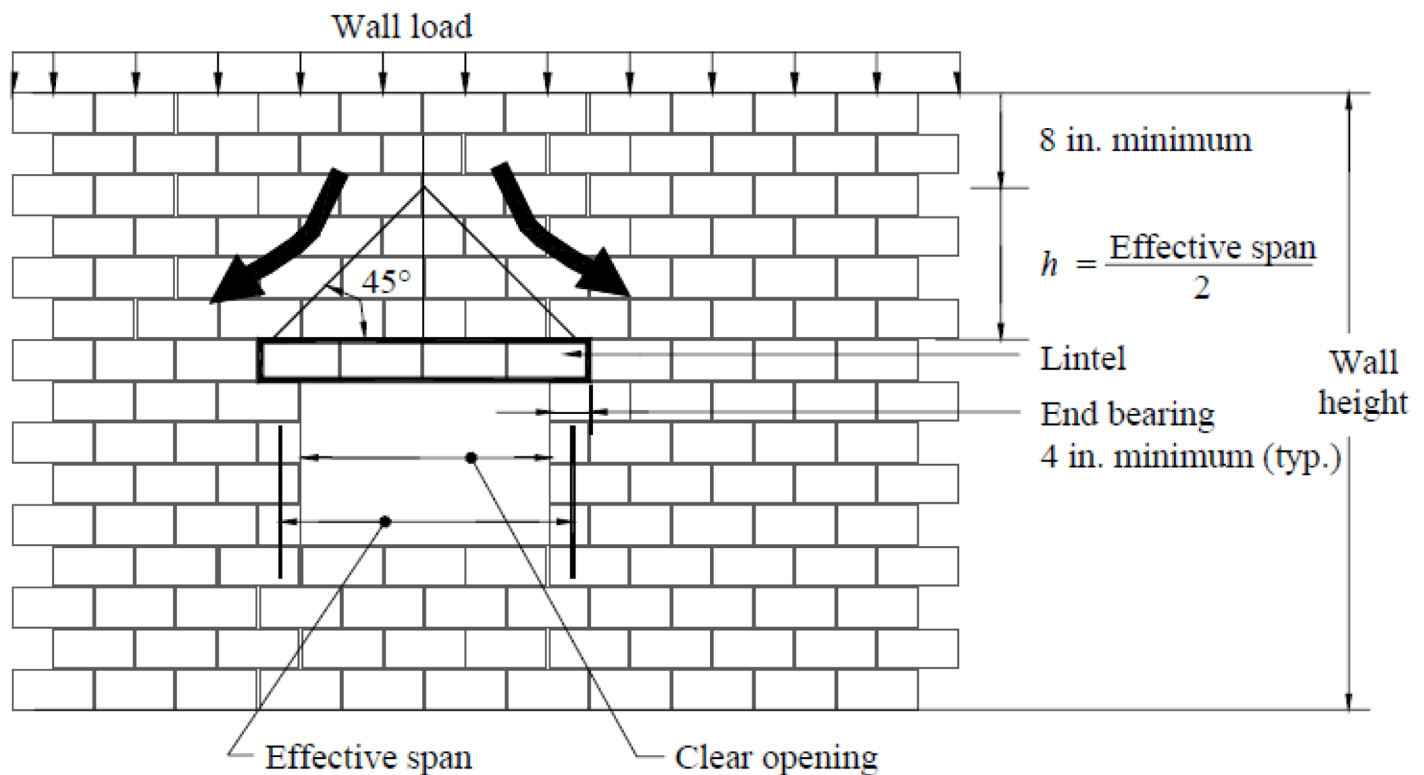


Notch to allow for seismic reinforcing.

Rebar is grade 60 steel ASTM 615
5,000 PSI concrete mix design

Rebar placement:
Clearance from bottom: 1 1/2"
Clearance from top: 1 1/2"

MASONRY WALL ARCHING ACTION



The typical door and window openings in masonry walls are bridged over by horizontal members spanning from opening jamb to jamb by lintels which are essentially beams. In many cases the loads to be applied to the York Building Products precast lintels may be calculated with consideration of masonry walls load “arching” behavior. Through the “arching” behavior some loads may be considered to distribute to either side of the opening and not need to be resisted by the precast lintel.

The wall surrounding the opening must meet several criterion in order to consider arching action to be occurring. These criterions are:

1. The masonry wall is laid in a running bond pattern.
2. At the time that all of loads that are to be supported by the lintel are applied, the masonry wall must be in a completed condition and cured to full wall material strength.
3. Minimum end bearing of at least 4 inches.
4. There is sufficient masonry wall on either side of the wall opening to resist the horizontal thrust induced by the arching action.
5. Control joints, expansion joints or other discontinuities are not located at or adjacent to the opening.
6. There is sufficient wall height above the top of the lintel to include a 45 degree triangular “arching” zone.
7. The wall height above the apex of the triangular zone is at least 8 inches.

If these criterions are met, arching action may be considered in lintel sizing and selection.

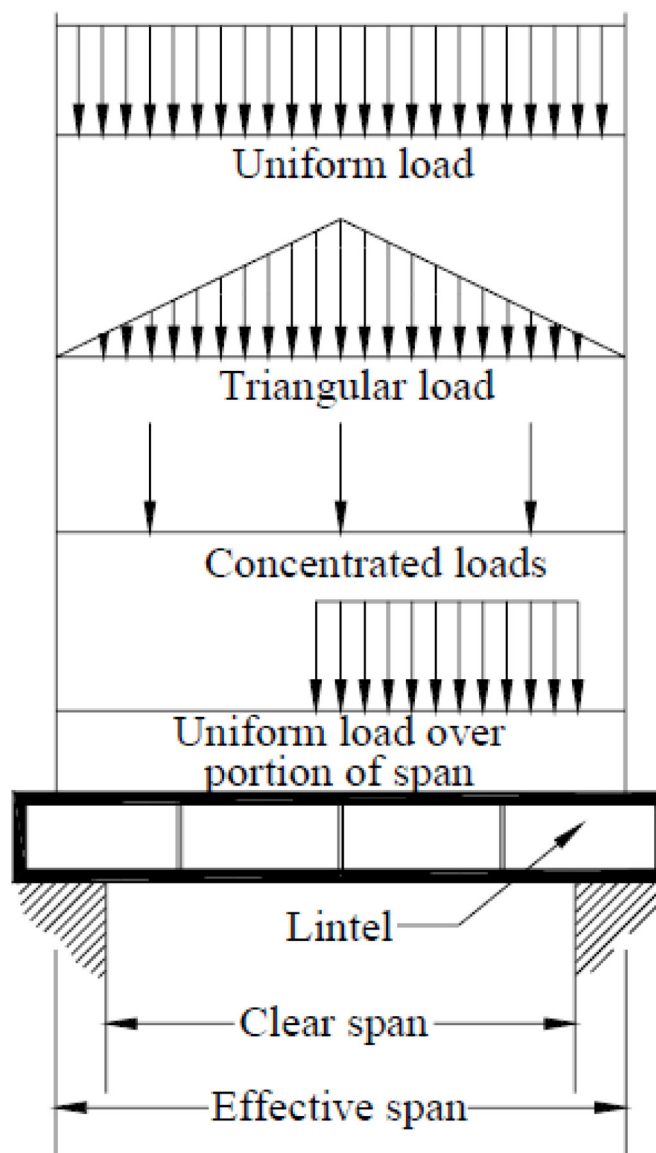
MASONRY WALL ARCHING ACTION

The types of load patterns that are typically supported by lintels are, uniform, concentrated, partial uniform and triangular as indicated in the below diagram.

If arching action is in effect the final loads to be supported by the lintel include:

- The self weight of the lintel,
- The weight of the masonry wall within the triangular zone.
- Concentrated load within the triangular zone.

Other load types either dead or live load floor and roof loads above the triangular arching zone may be considered to “arch” and distribute the load to each side over the wall opening.



SOLID LINTELS

4" x 8"

6" x 8"

8" x 8"

U-LINTELS

6" x 8"

8" x 8"

10" x 8"

12" x 8"

The following load calculation tables were independently developed by a third party engineering firm to ensure accuracy.

Should you need additional assistance, or more detailed data, please contact a York Building Products representative.

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DESIGN CAPACITY TABLE

Materials:			Unit Dimensions:
Concrete Compressive Strength (f'c)	3,000 psi (min)		Width: bw = 3.63 inch
Reinforcing Fy =	60,000 psi		Height: h = 7.63 inch
Lintel Weight:	28 lbs/ft.		

Reinforcement	Top Bottom		None																								(1) - #3												(1) - #4				(1) - #5 (7)											
	Nominal Lintel Length (inch)	[LA-#]	24	30	32	36	40	42	44	48	54	56	60	64	66	72	78	80	84	88	90	96	102	104	108	112	114	120	128	132	136	144																						
	Masonry Opening M.O. (inch)		8	14	16	20	24	26	28	32	38	40	44	48	50	56	62	64	68	72	74	80	86	88	92	96	98	104	112	116	120	128																						
	Effective Span (LE = M.O.+ h/2) (inch)		16	22	24	28	32	34	36	40	46	48	52	56	58	64	70	72	76	80	82	88	94	96	100	104	106	112	120	124	128	136																						
	Maximum Shear Strength (FVn) lbs.		1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1221	1479	1479	1699	1699	1699	1699	1699	1699	1699	1699	1699	1699																						
	Maximum Moment Strength (+FMn) lb-ft.		2762	2762	2762	2762	2762	2762	2762	2762	2762	2762	2762	2762	2762	2762	2762	2762	2762	2762	4703	4703	6276	6276	6276	6276	6276	6276	6276	6276	6276	6276																						
	Maximum Uniform Factored Load (Nwn) lbs/ft.		3662	6575	5525	3605	2416	2074	1817	1456	1121	1042	912	811	768	664	584	562	522	487	570	520	548	534	507	483	472	441	406	391	376	350																						
	Maximum Unif. Service Load (ws) lbs/ft. @																																																					
(3/4)	LE / 240	9999+	9999+	9999+	9999+	9999+	8882	7410	6255	4568	3017	2659	2098	1685	1520	1138	875	805	688	592	830	674	734	690	611	544	514	436	355	323	294	245																						
	LE / 360	9999+	9999+	9999+	9999+	8903	5979	5004	4222	3093	2052	1812	1435	1157	1045	787	609	561	481	416	566	461	497	467	414	369	349	297	243	220	201	168																						
	LE / 600	9999+	9999+	8616	5464	3705	3108	2635	1946	1306	1157	924	751	682	520	408	378	327	285	363	297	312	293	261	233	221	189	155	142	130	109																							
(3/4)	LE / 240	9999+	9999+	9999+	6982	4752	3998	3397	2524	1710	1520	1221	999	909	743	589	542	469	410	514	423	440	414	369	330	313	268	221	201	184	156																							
	LE / 360	9999+	9807	7655	4959	3423	2889	2479	1867	1290	1154	938	776	710	576	454	428	374	329	384	319	319	301	269	242	230	198	165	151	139	119																							
	LE / 600	9999+	6567	5191	3448	2444	2091	1810	1391	987	890	734	616	567	457	363	337	292	255	289	243	230	218	196	178	169	148	122	112	102	87																							

Table Use:

Enter Table with Required Strength = Factored Uniform Load wu

Select Lintel Size Where $W_u < NW_n$

DL: Dead load
LL: live load
F/240, F/360, F/600 for either immediate or long term deflection

Factored load Effect W_{U1} : Greater of

1.4 DL	OR	1.2DL + 1.6LL	results in limiting deflection noted for LE/240, LE/360, LE/600.

Notes:

(1) See "arching" data sheet for applied load calculation where arching action determined by Architect/Engineer is applicable.

(2) See calculation example for explanation of table of calculation methods and Code references.

(3) Mid-Span deflection Δ_i at service load is calculated as $W_{SERVICE} = 0.67 \times F_{W_n}$ lbs/ft for the section in question.

For long term deflection D_s , sustained loads are assumed to be at maximum section capacity for time greater than 60 months

(4) Immediate elastic deflections values are for maximum uniform service load values noted. Long term deflections consider that

50 percent of maximum service is sustained load. Load values noted indicate limiting load for deflection limits of LE/240, LE/360, LE/600,

considering long term creep and shrinkage effect. Deflections values do not consider shear deformations and are for pin ended supports.

Di Immediate elastic deflection

Di + D s Immediate elastic deflection + Long Term Creep Deflection

(5) Load capacity of installed lintel assumed to have lateral bracing at distances not greater than: $[9.2.3.1] 50b_w$, $<5.2.1.2 > 32 b_w$ OR $120(b_w)^2/d_{eff} =$

(6) Minimum end bearing distance shall be 8 inches by width of the lintel.

(7) Moment capacity noted limited by maximum allowable reinforcement area for tension controlled section [9.3.3 & 21.2.2]. Excess steel area ignored in moment capacity value indicated.

(8) Shear span considered as M.O. for LA24.

(9) 24" lintels contain NO rebar.

Controlling Section Capacity Fw_a

Shear (Red) (Red)

Moment (Blue)

Code References:

ACI 318 - 19

TMS402-16

ASCE 7-16

116 in. =

9.67 ft.

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Materials:

Concrete Compressive Strength (f') 3,000 psi (min)
Reinforcing Fy = 60,000 psi
Lintel Weight: 28 lbs/ft.

Unit Dimensions:

Width: bw = 3.625 inch
Height h = 7.625 inch

INSTALLATION GUIDE TABLE

Code Reference: [ACI 318-19]

Reinforcement		Top		None																																						
		Bottom	(1) - #3																												(1) - #4		(1) - #5									
Nominal Lintel Length (inch) [LA-#]		24	30	32	36	40	42	44	48	54	56	60	64	66	72	78	80	84	88	90	96	102	104	108	112	114	120	128	132	136	144											
Masonry Opening M.O. (inch) ⁽⁴⁾		8	14	16	20	24	26	28	32	38	40	44	48	50	56	62	64	68	72	74	80	86	88	92	96	98	104	112	116	120	128											
Effective Span (LE = M.O. + h/2) (inch)		16	22	24	28	32	34	36	40	46	48	52	56	58	64	70	72	76	80	82	88	94	96	100	104	106	112	120	124	128	136											
Case 0																																										
Maximum Factored w _{cmu} Load (lbs/ft)		3622	6536	5485	3566	2377	2035	1777	1416	1082	1002	873	772	729	625	545	523	483	448	531	481	509	495	468	444	433	402	367	351	337	311											
Case 1 - 1 Strut																																										
Maximum Factored w _{cmu} Load (lbs/ft)		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	693	630	612	577	547	653	606	655	640	613	588	576	543	505	487	471	441									
Strut Load P _u (lbs)																	2441	2441	2441	2441	2958	3398	3398	3398	3398	3398	3398	3398	3398	3398	3398											
Case 2 - 2 Struts																																										
Maximum Factored w _{cmu} Load (lbs/ft)		NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	1107	1009	980	926	878	1045	971	1048	1025	982	943	924	873	812	785	759	712									
Strut Load P _u (lbs)																	2242	2242	2242	2242	2242	2717	2717	3121	3121	3121	3121	3121	3121	3121	3121	3121										

Table Use:

- Check Lintel Size & Support Requirements During Construction
- (1) Select weight of wall being supported by lintel from appropriate reference.
(Ref. NCMA TEK 14-13B), s_{wall} (lbs/sf)
- (2) Determine factored installed wall load as follows:
 $W_u = 1.4 \times s_{wall} \times H$ or $H_{max} = W_{cmu} / (1.4 \times s_{wall})$
"H" is maximum height of masonry wall to be installed above top of lintel before wall is cured. (ft.)
- (3) Enter table for appropriate support condition, lintel size, masonry opening.
Confirm calculated W_u is less than or equal to w_{cmu} noted in table.
- (4) Confirm loads do not exceed immediate deflection value limits desired as noted in Design Capacity Tables.
For Case 1 and Case 2 support conditions deflection span is $(L-E/2)$ and $(L-E/3)$, respectively.
- (5) NR - Not Recommended, no negative flexural reinforcement. Use continuous temporary support if required.
- (6) Load capacity of installed lintel assumed to have lateral bracing at distances not greater than:
 $[9.2.3.1] 50b_w$, $<5.2.1.2 > 32 bw$ OR $120(b_w)^2/d_{eff} = 116 \text{ in.} = 9.67 \text{ ft.}$
- (7) 24" lintels contain NO rebar.

Example:

- Lintel : 4" solid with M.O. = 144 inches
4" Normal Weight Solid CMU = 41 lbs/sf.
Support Condition Case 2
H Installed = 8 feet
 $W_u = 1.4 \times 41 \times 8 = 459 \text{ lbs/ft.}$
Enter table and confirm $W_u < W_{cmu} = 459 \text{ lbs/ft.} < 712 \text{ lbs/ft.}$ OK
- Strut Loads:**
At W_u : $P_u = [459 / ((1.4 \times 28 \text{ Lintel weight}) + 712)] \times 3121 = 1907 \text{ lbs}$
 $P_{SERVICE} = P_u / 1.4 = 1907 / 1.4 = 1362 \text{ lbs.}$
At W_{cmu} : $P_{SERVICE} = P_u / 1.4 = 3121 / 1.4 = 2229 \text{ lbs.}$
- Ref. 6"x8" For Case 0 Example
Ref. 8"x8" For Case 1 Example

DESIGN CAPACITY TABLE

Materials:

Concrete Compressive Strength (f'_c) 3,000 psi (min)
Reinforcing F_y = 60,000 psi
Lintel Weight: 42 lbs/ft.

Unit Dimensions:

Width: bw = 5.625 inch
Height: h = 7.625 inch

Reinforcement	Top		Bottom		None		(1) - #3		(1) - #4		(1) - #3		(1) - #5	
	[LB-#]		[LB-#]		(1) - #3		(1) - #3		(1) - #4		(1) - #3		(1) - #5	
Nominal Lintel Length (inch)														
Masonry Opening M.O. (inch)														
Effective Span (LE = M.O. + h/2) (inch)														
Maximum Shear Strength (F _{Vn}) lbs.														
Maximum Moment Strength (+F _{Mn}) lb.-ft.														
Maximum Uniform Factored Load (F _{wn}) lbs/ft.														
Maximum Unif. Service Load (w _s) lbs/ft. @														
Di =	(3/4)													
	LE / 240													
	LE / 360													
	LE / 600													
Di + Ds =	(3/4)													
	LE / 240													
	LE / 360													
	LE / 600													

Table Use:

Enter Table with Required Strength = Factored Uniform Load w_u

Select Lintel Size Where W_u < F_{wn}

DL: Dead Load LL: Live Load

Factored Load Effect W_u; Greater of

1.4 DL OR 1.2DL + 1.6LL

Notes:

(1) See "arching" information sheet for applied load calculation where arching action determined by Architect/Engineer is applicable.

(2) See calculation example for explanation of table calculation methods and Code references.

(3) Mid-Span deflection Di at service load is calculated as W_{SERVICE} = 0.67 x F_{wn} lbs/ft for the section in question.

For long term deflection Ds, sustained loads are assumed to be at maximum section capacity for time greater than 60 months

(4) Immediate elastic deflections values are for maximum uniform service load values noted. Long term deflections consider that

50 percent of maximum service is sustained load. Load values noted indicate limiting load for deflection limits of LE/240, LE/360, LE/600,

considering long term creep and shrinkage effect. Deflections values do not consider shear deformations and are for pin ended supports.

Di Immediate elastic deflection

Di + Ds Immediate elastic deflection + Long Term Creep Deflection

(5) Load capacity of installed lintel assumed to have lateral bracing at distances not greater than: [9.2.3.1] 50b_w, <5.2.1.2> 32 b_w OR 120(b_w)²/d_{eff} =

(6) Minimum end bearing distance shall be 8 inches by width of the lintel.

Controlling Section Capacity F_w

Shear (Red)

Moment (Blue)

Code References:

ACI 318 - 19 []

TMS402-16 < >

ASCE 7-16 { }

180 in. = 15.00 ft.

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INSTALLATION GUIDE TABLE

Materials:

Concrete Compressive Strength (f'c) 3,000 psi (min)
Reinforcing Fy = 60,000 psi
Lintel Weight: 42 lbs/ft.

Code Reference: [ACI 318-19]

bw = 5.625 inch

h = 7.625 inch

Reinforcement	Top		None										(1) - #3		(1) - #4		(1) - #5					
	Bottom		(1) - #3										(1) - #3		(1) - #4		(1) - #5					
Nominal Lintel Length (inch) [LB-#]			30	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144				
Masonry Opening M.O. (inch) ⁽⁴⁾			14	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128				
Effective Span (LE = M.O. + h/2) (inch)			22	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136				
Case 0																						
Maximum Factored w _{cmu} Load (lbs/ft)			6666	5592	3120	1892	1337	979	736	569	450	638	652	589	533	486	446	390				
Case 1 - 1 Strut																						
Maximum Factored w _{cmu} Load (lbs/ft)			NR	NR	NR	NR	NR	NR	NR	923	814	727	806	852	782	722	670	625	584			
Strut Load P _u (lbs)										3272	3272	3272	3965	4555	4555	4555	4555	4555	4555			
Case 2 - 2 Struts																						
Maximum Factored w _{cmu} Load (lbs/ft)			NR	NR	NR	NR	NR	NR	NR	1478	1307	1171	1296	1368	1258	1164	1082	1010	948			
Strut Load P _u (lbs)										3006	3006	3006	3642	4184	4184	4184	4184	4184	4184			

Table Use:

Check Lintel Size & Support Requirements During Construction

(1) Select weight of wall being supported by lintel from appropriate reference.

(Ref. NCMA TEK 14-13B), s_{WALL} (lbs/sf)

(2) Determine factored installed wall load as follows:

W_u = 1.4 x s_{WALL} x H or determine H_{max} = W_{cmu} / (1.4 x s_{WALL})

"H" (ft.) is the height of masonry wall to be installed above top of lintel before wall is cured.

(3) Enter table for appropriate support condition, lintel size, masonry opening.

Confirm calculated W_u is less than or equal to w_{cmu} noted in table.

(4) Confirm loads do not exceed immediate deflection value limits desired as noted in Design Capacity Tables.

For Case 1 and Case 2 support conditions deflection span is (L-E / 2) and (L-E / 3), respectively.

(5) NR - Not Recommended, no negative flexural reinforcement. Continuous temporary support if required.

(6) Load capacity of installed lintel assumed to have lateral bracing at distances not greater than:

[9.2.3.1] 50b_w, < 5.2.1.2 > 32 b_w OR 120(b_w)²/d_{eff} = 180 in. = 15.00 ft.

Example:

Lintel : 6" solid with M.O. = 72 inches Case 0

6" Normal Weight CMU wall grouted at 48" o.c. = 36 lbs/sf.

Support Condition Case 0

H Installed = 8 feet

W_u = 1.4 x 36 x 8 = 403 lbs/ft.

Enter table and confirm W_u < W_{cmu} =

403 lbs/ft. < 600 lbs/ft OK

Ref. 8"x8" For Case 1 Example

Ref. 4"x8" For Case 2 Example

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DESIGN CAPACITY TABLE

Materials:

Concrete Compressive Strength (f'c) 3,000 psi (min)
Reinforcing Fy = 60,000 psi
Lintel Weight: 56 lbs/ft.

Unit Dimensions:

Width: bw = 7.625 inch
Height: h = 7.625 inch

Reinforcement		Top		None								(2) - #3								(2) - #5 ⁽⁷⁾								(2)-#6 ⁽⁷⁾	
		Bottom		(2) - #3								(2)-#4								(2) - #5								(2)-#6	
Nominal Lintel Length (inch) [LC-#]		40	48	56	64	72	80	88	96	104	108	112	120	128	136	144	168												
Masonry Opening M.O. (inch)		24	32	40	48	56	64	72	80	88	92	96	104	112	120	128	152												
Effective Span (LE = M.O. + h/2) (inch)		32	40	48	56	64	72	80	88	96	100	104	112	120	128	136	160												
Maximum Shear Strength (F _{Vn}) lbs.		2525	2525	2525	2525	2525	2525	2525	3033	3496	3496	3496	3496	3496	3496	3496	3921												
Maximum Moment Strength (+F _{Mn}) lb.-ft.		5542	5542	5542	5542	5542	5542	5542	9255	13201	13201	13201	13201	13201	13201	13201	12919												
Maximum Uniform Factored Load (F _{wn}) lbs/ft.		4997	3011	2154	1677	1373	1162	998	1067	1098	1044	994	908	836	774	721	581												
Maximum Unif. Service Load (w _s) lbs/ft. @																													
(3/4)	LE / 240	9999+	9235	5381	3411	2305	1633	1202	1343	1387	1228	1093	878	715	591	494	382												
	LE / 360	9999+	6262	3675	2347	1599	1143	849	922	941	835	744	599	490	406	341	261												
	LE / 600	7510	3951	2356	1534	1064	774	585	600	594	529	473	384	316	264	223	168												
(3/4)	LE / 240	9660	5142	3106	2045	1518	1108	842	853	837	746	668	543	448	375	318	272												
	LE / 360	6990	3830	2374	1600	1187	883	681	649	613	549	494	406	338	286	244	197												
	LE / 600	5030	2876	1847	1281	949	693	525	503	449	409	368	305	252	211	179	139												

Table Use:

Enter Table with Required Strength = Factored Uniform Load wu

Select Lintel Size Where Wu < Fw_n

DL: Dead Load LL: Live Load

Factored Load Effect Wu; Greater of

1.4 DL OR 1.2DL + 1.6LL

Notes:

(1) See "arching" information sheet for applied load calculation where arching action determined by Architect/Engineer is applicable.

(2) See calculation example for explanation of table calculation methods and Code references.

(3) Mid-Span deflection Di at service load is calculated as W_{SERVICE} = 0.67 x Fw_n lbs/ft for the section in question.

For long term deflection Ds, sustained loads are assumed to be at maximum section capacity for time greater than 60 months

(4) Immediate elastic deflections values are for maximum uniform service load values noted. Long term deflections consider that

50 percent of maximum service is sustained load. Load values noted indicate limiting load for deflection limits of LE/240, LE/360, LE/600,

considering long term creep and shrinkage effect.

Di Immediate elastic deflection

Di + Ds Immediate elastic deflection + Long Term Creep Deflection

(5) Load capacity of installed lintel assumed to have lateral bracing at distances not greater than: [9.2.3.1] 50b_w, <5.2.1.2> 32 b_w OR 120(b_w)²/d_{eff} = 244 in. = 20.33 ft.

(6) Minimum end bearing distance shall be 8 inches by width of the lintel.

(7) Moment capacity noted limited by maximum allowable reinforcement area for tension controlled section [9.3.3 & 21.2.2]. Excess steel area ignored in moment capacity value indicated.

Controlling Section Capacity Fw_n

Shear (Red)

Moment (Blue)

Code References:

ACI 318 - 19 []

TMS402-16 < >

ASCE 7-16 { }

INSTALLATION GUIDE TABLE

Code Reference: [ACI 318-19]

Materials:
Concrete Compressive Strength (f_c) 3,000 psi (min)
Reinforcing F_y : 60,000 psi
Lintel Weight: 56 lbs/ft.

bw = 7.625 inch
h = 7.625 inch

Reinforcement	Top Bottom	None				(2) - #3												(2) - #6			
		(2) - #3				(2) - #4				(2) - #5				(2) - #5				(2) - #6			
Nominal Lintel Length (inch) [L-C#]		40	48	56	64	72	80	88	96	104	108	112	120	128	136	144	168				
Masonry Opening M.O. (inch) ⁽⁴⁾		24	32	40	48	56	64	72	80	88	92	96	104	112	120	128	152				
Effective Span (LE = M.O. + h/2) (inch)		32	40	48	56	64	72	80	88	96	100	104	112	120	128	136	160				
Case 0																					
Maximum Factored w _{cmu} Load (lbs/ft)		4919	2932	2076	1599	1295	1084	919	988	1020	965	916	830	757	696	642	503				
Case 1 - 1 Strut																					
Maximum Factored w _{cmu} Load (lbs/ft)		NR	NR	NR	NR	1436	1268	1133	1245	1320	1264	1212	1120	1040	970	909	863				
Strut Load P _U (lbs)						5049	5049	5049	6067	6991	6991	6991	6991	6991	6991	6991	7842				
Case 2 - 2 Struts																					
Maximum Factored w _{cmu} Load (lbs/ft)		NR	NR	NR	NR	2293	2030	1819	1994	2111	2023	1942	1798	1673	1563	1467	1395				
Strut Load P _U (lbs)						4638	4638	4638	5572	6421	6421	6421	6421	6421	6421	6421	7203				

Table Use:

Check Lintel Size & Support Requirements During Construction

(1) Select weight of wall being supported by lintel from appropriate reference.

(Ref. NCMA TEK 14-13B), S_{WALL} (lbs/sf)

(2) Determine factored installed wall load as follows:

$$W_u = 1.4 \times S_{WALL} \times H \text{ or } H_{max} = W_{cmu} / (1.4 \times S_{WALL})$$

"H" is maximum height of masonry wall to be installed above top of lintel before wall is cured. (ft.)

(3) Enter table for appropriate support condition, lintel size, masonry opening.

Confirm calculated W_u is less than or equal to W_{cmu} noted in table.

(4) Confirm loads do not exceed immediate deflection value limits desired as noted in Design Capacity Tables.

For Case 1 and Case 2 support conditions deflection span is (L.E / 2) and (L.E / 3), respectively.

(5) NR - Not Recommended, no negative flexural reinforcement. Continuous temporary support if required.

(6) Load capacity of installed lintel assumed to have lateral bracing at distances not greater than:

$$[9.2.3.1] 50b_w, < 5.2.1.2 > 32 b_w \text{ OR } 120(b_w)^2 / d_{eff} = 244 \text{ in.} = 20.33 \text{ ft.}$$

Example:

Lintel : 8" solid with M.O. = 120 inches **CASE 1**

8" Normal Weight CMU wall grouted at 24" o.c. = 55 lbs/sf.

H Installed = 10.67 feet

$$W_u = 1.4 \times 55 \times 10.67 = 822 \text{ lbs/ft.}$$

Enter capacity table and confirm W_u < W_{cmu} =

822 lbs/ft. < 970 lbs/ft OK

Strut Loads:

$$\text{At } W_u: P_u = [822 / ((1.4 \times 56 \text{ Lintel weight}) + 970)] \times 6991 = 5481 \text{ lbs}$$

$$P_{SERVICE} = P_u / 1.4 = 5481 / 1.4 = 3915 \text{ lbs.}$$

$$\text{At } W_{cmu}: P_{SERVICE} = P_u / 1.4 = 6991 / 1.4 = 4993 \text{ lbs.}$$

Ref. 6"x8" For Case 0 Example

Ref. 4"x8" For Case 2 Example

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DESIGN CAPACITY TABLE

Unit Dimensions:

	Actual	Nominal
Width: bw =	7.625 inch	8 inch
Height: h =	7.625 inch	8 inch

Table 3.0.3.0.	Enter Table with Required Strength = Factored Uniform Load W_u	Deflections	Controlling Section Capacity F_w	Code References:
Select Limit Size Where $W_u < F_w$		1. Enter the table for given span with desired deflection limit at M.O./240, M.O./360, M.O./600 for either immediate or long term deflection	Shear (Red)	TMS402-16
DL: Dead Load	LL: Live Load	2. Read value of SERVICE (Unfactored) uniform load on Intel that results in limiting deflection noted for M.O./240, M.O./360, M.O./600.	Moment (Blue)	ASCE 7-16
Factored Load Effect W_u ; Greater of				
1.4 DL OR	1.2 DL + 1.6 LL			

Controlling Section Capacity FW_n

Code References: TMS402-16 < ASCE 7-16 {

Notes:
(1) See "arching" information sheet for applied load calculation where arching action determined by Architect/Engineer is applicable.

(2) See calculation example for explanation of table calculation methods and Code references.

(3) Mid-span immediate deflection Δ_i at service load noted is calculated for the section in question:

For long term deflection D_s , sustained loads are assumed to be applied for a time greater than 60 months.

(4) Immediate elastic deflections values are for maximum uniform service load values noted. Long term deflections consider that

50 percent of maximum service is sustained load. Load values noted indicate limiting limits of M.O./240, M.O./360, M.O./600,

considering long term creep and shrinkage effect. Deflections values do not consider shear deformations and are for pin ended supports.

$D_i =$ Immediate elastic deflection

$$D_i + D_s = \text{Immediate elastic deflection} + \text{Long Term Creep Deflection}$$

(5) Load capacity of installed Intel assumed to have lateral bracing at distances not greater than: $< 5.2.1.2 > 32 b_w =$

(6) Minimum end bearing distance shall be 8 inches by width of the lintel

(7) Masonry Mortar ASTM C270 PCL or Masonry Cement Type M or S

(8) Shear span considered as M.O., at face of support for shear controlled capacity values.

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U-LINTEL SIZE: 10"x8"

DESIGN CAPACITY TABLE

Materials:

Concrete Compressive Strength (f'_c) = 5,000 (min)
Reinforcing F_y = 5,000 psi
Lintel Weight: 55 lbs/ft, ungrouted

Unit Dimensions:

Masonry Comp. Strength f_m : 3,000 psi
Grout Comp. Strength f_g : 3,000 psi
Width: bw = 10 inch
Height: h = 8 inch

Reinforcement		Top	(2) - #3																(2) - #5															
		Bottom																																
Nominal Lintel Length (inch) [LUD-#]			24	30	32	36	40	48	54	56	60	64	66	72	78	80	84	88	90	96	102	104	108	112	114	120	128	132	136	144				
Masonry Opening M.O. (inch)			8	14	16	20	24	32	38	40	44	48	50	56	62	64	68	72	74	80	86	88	92	96	98	104	112	116	120	128				
Effective Span (LE = M.O. + h _{nom}) (inch)			16	22	24	28	32	40	46	48	52	56	58	64	70	72	76	80	82	88	94	96	100	104	106	112	120	124	128	136				
Maximum Shear Strength (F _{V,m}) lbs.			5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872	5872					
Maximum Moment Strength (+F _M) lb-ft.			15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017	15017					
Maximum Uniform Factored Load (F _w) lbs/ft.			17616	10066	8808	7046	5872	4404	3708	3523	3203	2936	2818	2516	2273	2202	2072	1957	1904	1761	1639	1601	1532	1468	1438	1355	1201	1125	1056	935				
Maximum Unif. Service Load (w _s) lbs/ft. @																																		
3/4"	M.O. / 240		9999+	9999+	9999+	9999+	9999+	9999+	9999+	9999+	9999+	9999+	9999+	8270	6100	5545	4626	3900	3593	2848	2295	2143	1877	1654	1556	1305	1047	944	854	706				
	M.O. / 360		9999+	9999+	9999+	9999+	9999+	9999+	9999+	9999+	9999+	9999+	9999+	7770	5541	4091	3724	3110	2625	2421	1923	1555	1453	1276	1127	1061	893	720	651	491				
	M.O. / 600		9999+	9999+	9999+	9999+	9999+	9999+	9999+	9999+	9155	6905	5346	4739	3399	2526	2304	1935	1643	1519	1217	993	931	822	731	690	568	479	436	398				
3/4"	M.O. / 240		9999+	9999+	9999+	9999+	9999+	9999+	9999+	9999+	9452	7321	6500	4679	3492	3190	2685	2284	2114	1700	1380	1305	1155	1028	971	827	677	616	563	474				
	M.O. / 360		9999+	9999+	9999+	9999+	9999+	9999+	9999+	9999+	8630	6569	5139	4580	3340	2523	2313	1961	1680	1561	1267	1045	984	875	782	741	635	524	478	438				
	M.O. / 600		9999+	9999+	9999+	9999+	9999+	9999+	9999+	9999+	6610	5750	4441	3520	3156	2341	1794	1652	1412	1218	1136	930	774	652	585	556	476	390	355	325	274			

Table Use:

Enter Table with Required Strength = Factored Uniform Load W_u

Select Lintel Size Where $W_u < F W_n$

DL: Dead Load LL: Live Load

Factored Load Effect W_u ; Greater of

1.4 DL OR 1.2DL + 1.6LL

Deflections

1. Enter the table for given span with desired deflection limit at M.O./240, M.O./360, M.O./600 for either immediate or long term deflection
2. Read value of SERVICE (Unfactored) uniform load on lintel that results in limiting deflection noted for M.O./240, M.O./360, M.O./600.

Controlling Section Capacity F_w

Shear (Red)
Moment (Blue)

Code References:

TMS402-16
ASCE 7-16

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Notes:

- (1) See "arching" data sheet for applied load calculation where arching action determined by Architect/Engineer is applicable.
- (2) See calculation example for explanation of table of calculation methods and Code references.
- (3) Mid-span immediate deflection Δ_i at service load noted is calculated for the section in question.
For long term deflection Δ_s , sustained loads are assumed to be applied for a time greater than 60 months.
- (4) Immediate elastic deflections values are for maximum uniform service load values noted. Long term deflections consider that 50 percent of maximum service is sustained load. Load values noted indicate limiting load for deflection limits of M.O./240, M.O./360, M.O./600, considering long term creep and shrinkage effect. Deflections values do not consider shear deformations and are for pin ended supports.

Δ_i = Immediate elastic deflection

$\Delta_i + \Delta_s$ = Immediate elastic deflection + Long Term Creep Deflection

(5) Load capacity of installed lintel assumed to have lateral bracing at distances not greater than: $< 5.2, 1.2 > 32 b_w$ =

(6) Minimum end bearing distance shall be 8 inches by width of the lintel

(7) Masonry Mortar ASTM C270 PCL or Masonry Cement Type M or S

(8) Shear span considered as M.O., at face of support for shear controlled capacity values.

L_p = 308 in. = 25.67 ft.

OR 120 b_w^2 /deff = 308.0 in.

1796.7 in.

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DESIGN CAPACITY TABLE

Unit Dimensions:

Width:	bw =	Actual 11
Height:	h =	7.6

<u>Table Use:</u>	Enter Table with Required Strength = Factored Uniform Load W_u	<u>Deflections</u>	<u>Controlling Section Capacity FW_u</u>	Code References:
Select Lintel Size Where $W_u < F W_n$ DL: Dead Load LL: Live Load Factored Load Effect W_u ; Greater of 1.4 DL OR 1.2DL + 1.6LL OR	1. Enter the table for given span with desired deflection limit at M.O./240, M.O./360, M.O./600 for either immediate or long term deflection 2. Read value of SERVICE (Unfactored) uniform load on lintel that results in limiting deflection noted for M.O./240, M.O./360, M.O./600.		Shear (Red) Moment (Blue)	TMS402-16 ASCE 7-16

Notes:

- (1) See "arching" data sheet for applied load calculation where arching action determined by Architect/Engineer is applicable.
- (2) See calculation example for explanation of table of calculation methods and Code references.
- (3) Mid-span immediate deflection Δ_i at service load noted is calculated for the section in question.
For long term deflection Δ_s , sustained loads are assumed to be applied for a time greater than 60 months.
- (4) Immediate elastic deflections values are for maximum uniform service load values noted. Long term deflections consider the 50 percent of maximum service is sustained load. Load values noted indicate limiting load for deflection limits of M.O./240 M.O. considering long term creep and shrinkage effect. Deflections values do not consider shear deformations and are for pin end

$$\Delta_i = \text{Immediate elastic deflection}$$

$$\Delta_i + \Delta_s = \text{Immediate elastic deflection} + \text{Long Term Creep Deflection}$$

- (5) Load capacity of installed lintel assumed to have lateral bracing at distances not greater than: $<5.2, 1.2^{\circ} - 32 \text{ } b_W =$
- (6) Minimum end bearing distance shall be 8 inches by width of the lintel.
- (7) Masonry Mortar ASTM C270 PCL or Masonry Cement Type M or S
- (8) Shear span considered as M.O., at face of support for shear controlled capacity values.

LINTELS



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