

PRESCRIPTIVE TABLES
FOR
**SELECTION OF SUPPORT ELEMENTS FOR
BEAMS, GIRDERS, AND HEADERS**

20 PSF ROOF LIVE LOAD

FOR USE WITH
2018 NORTH CAROLINA RESIDENTIAL CODE

FEBRUARY 2018



FOREWORD

The following tables are updated versions of tables that were originally issued in September of 2003. The tables are based on, and intended for use with, the 2018 North Carolina Residential Code (2015 International Residential Code with North Carolina amendments). The following tables are intended for use with structures subject to a maximum roof live/snow load of 20 psf. Table packages are also available for roof snow loads of 30 psf, 50 psf, and 70 psf.

The tables are intended as a practical tool to assist contractors in:

1. Selecting footing widths.
2. Determining the number of wood studs required to support the end reactions of beams, girders, and/or headers.

The values presented in the tables were derived from the minimum design criteria, maximum span conditions, and allowable loads published in the 2018 North Carolina Residential Code. The section(s) of the 2018 North Carolina Residential Code used in the development of the tabulated values is noted on each table.

Structural elements that exceed the prescriptive limitations of the 2018 North Carolina Residential Code and/or these tables, must be designed in accordance with accepted engineering practice by a registered design professional.

Example Problem:

A 4.5-inch-thick header (3-2x plies) with an end reaction of 6400 pounds is located in the first story exterior wall of a 28-foot-wide, two-story house with center bearing floors and exterior brick veneer. The load bearing value of the soil is 2000 psf and the roof live load is 20 psf. Determine the quantity of jack studs and the minimum footing width required to support the reaction at each end of the header.

Solution:

Table 2.1 indicates that 4 (four) jack studs are required at each end of the header (Maximum End Reaction = 7040 pounds with a 4.5-inch-thick header). Table 1.4 indicates that a 28-inch-wide by 8-inch-thick continuous footing is required to support the header reactions (Maximum Column Load = 9008 pounds; refer to Figure 4, *Roof, Ceiling and Two Center-Bearing Floors*). Note that Table 1.4 is based on a 36-foot-wide house.

Example Problem:

A header with a span of 8 feet is located in the first story exterior wall of a 34-foot-wide, three-story house with center bearing floors and wood exterior cladding. The load bearing value of the soil is 2000 psf and the roof live load is 20 psf. Determine the quantity of jack studs and the minimum footing width required to support the reaction at each end of the header.

Solution:

Table 2.2 indicates that the header has an end reaction of 6096 pounds (refer to Figure 13, *Roof, Ceiling, and Two Center-Bearing Floors*) and that 4 (four) jack studs are required for a 4.5-inch-thick header and 3 (three) jack studs are required for a 6-inch-thick header. Table 1.1 indicates that a 24-inch-wide by 8-inch-thick continuous footing is required to support the header reactions (Maximum Column Load = 7147 pounds; refer to Figure 6, *Roof, Ceiling, and Three Center-Bearing Floors*). Note that both Table 2.2 and Table 1.1 are based on a 36-foot-wide house.

Example Problem:

An interior beam is required to support a uniform load of 600 plf over a span of 8 feet. Select an appropriate wood beam for the load and span specified and determine the quantity of jack studs required to support each end of the beam.

Solution:

Table 3.1 indicates that a 3-ply 2x10 spruce-pine-fir beam is required to support a load of 600 plf over a span of 8 feet (Allowable Load = 643 plf). Table 3.1 also indicates, for a 3-ply 2x10 with a uniform load of 643 plf and a span of 8 feet, an end reaction of 2572 pounds. Using this reaction, Table 2.1 indicates that 2 jack studs are required to support each end of the beam (Maximum End Reaction = 3520 pounds with a 4.5-inch-thick header).

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FOOTING TABLES

**TABLE 1.1: MAXIMUM COLUMN LOAD ON CONTINUOUS CAST-IN-PLACE CONCRETE FOOTING AT EXTERIOR WALL
LIGHT-FRAME CONSTRUCTION / ROOF LIVE LOAD = 20 PSF
(Reference: 2018 North Carolina Residential Code Section 403.1.1)**

LOAD BEARING VALUE OF SOIL (PSF)			2000								
FOOTING WIDTH, W (IN.)			16	20	24	28	32	36	40	44	48
FOUNDATION WALL SUPPORTING	FOOTING THICKNESS, T (IN.)	WALL LOAD ON FOOTING (PLF)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)
ROOF AND CEILING OVER SLAB-ON-GRADE (FIGURE 1)	8	950	8394	11706	15019						
	10	950	8698	12159	15620	19081					
	12	950	8979	12583	16188	19792	23396				
	14	950	9239	12980	16722	20463	24205	27946			
	16	950	9476	13349	17223	21096	24969	28843	32716		
	18	950	9691	13690	17690	21690	25689	29689	33688	37688	
20	950	9884	14004	18124	22244	26365	30485	34605	38726	42846	
ROOF, CEILING AND ONE CENTER-BEARING FLOOR (FIGURE 2)	8	1400	5881	9194	12507						
	10	1400	6035	9496	12958	16419					
	12	1400	6167	9771	13375	16979	20583				
	14	1400	6276	10018	13759	17501	21242	24984			
	16	1400	6363	10237	14110	17983	21857	25730	29603		
	18	1400	6428	10428	14428	18427	22427	26426	30426	34425	
20	1400	6471	10591	14712	18832	22952	27073	31193	35313	39433	
ROOF, CEILING AND ONE CLEAR-SPAN FLOOR (FIGURE 3)	8	1850	3369	6681	9994						
	10	1850	3373	6834	10295	13756					
	12	1850	3354	6958	10563	14167	17771				
	14	1850	3314	7055	10797	14538	18280	22021			
	16	1850	3251	7124	10998	14871	18744	22618	26491		
	18	1850	3166	7165	11165	15165	19164	23164	27163	31163	
20	1850	3059	7179	11299	15419	19540	23660	27780	31901	36021	
ROOF, CEILING AND TWO CENTER-BEARING FLOORS (FIGURE 4)	8	1880	3201	6514	9827						
	10	1880	3195	6656	10118	13579					
	12	1880	3167	6771	10375	13979	17583				
	14	1880	3116	6858	10599	14341	18082	21824			
	16	1880	3043	6917	10790	14663	18537	22410	26283		
	18	1880	2948	6948	10948	14947	18947	22946	26946	30945	
20	1880	2831	6951	11072	15192	19312	23433	27553	31673	35793	
ROOF, CEILING AND TWO CLEAR-SPAN FLOORS (FIGURE 5)	8	2690	-	1991	5304						
	10	2690	-	1864	5325	8786					
	12	2690	-	1708	5313	8917	12521				
	14	2690	-	1525	5267	9008	12750	16491			
	16	2690	-	1314	5188	9061	12934	16808	20681		
	18	2690	-	1075	5075	9075	13074	17074	21073	25073	
20	2690	-	809	4929	9049	13170	17290	21410	25531	29651	
ROOF, CEILING AND THREE CENTER-BEARING FLOORS (FIGURE 6)	8	2360	521	3834	7147						
	10	2360	355	3816	7278	10739					
	12	2360	167	3771	7375	10979	14583				
	14	2360	-	3698	7439	11181	14922	18664			
	16	2360	-	3597	7470	11343	15217	19090	22963		
	18	2360	-	3468	7468	11467	15467	19466	23466	27465	
20	2360	-	3311	7432	11552	15672	19793	23913	28033	32153	
ROOF, CEILING AND THREE CLEAR-SPAN FLOORS (FIGURE 7)	8	3530	-	-	614						
	10	3530	-	-	355	3816					
	12	3530	-	-	63	3667	7271				
	14	3530	-	-	-	3478	7220	10961			
	16	3530	-	-	-	3251	7124	10998	14871		
	18	3530	-	-	-	2985	6984	10984	14983	18983	
20	3530	-	-	-	2679	6800	10920	15040	19161	23281	

NOTES:

1. Refer to Table Notes on page 1.7 for additional information.
2. Refer to Figures 1 through 9 on pages 1.10 and 1.11 for additional information.

**TABLE 1.2: MAXIMUM COLUMN LOAD ON CONTINUOUS CAST-IN-PLACE CONCRETE FOOTING AT EXTERIOR WALL
LIGHT-FRAME CONSTRUCTION / ROOF LIVE LOAD = 20 PSF
(Reference: 2018 North Carolina Residential Code Section 403.1.1)**

LOAD BEARING VALUE OF SOIL (PSF)			3000								
FOOTING WIDTH, W (IN.)			16	20	24	28	32	36	40	44	48
FOUNDATION WALL SUPPORTING	FOOTING THICKNESS, T (IN.)	WALL LOAD ON FOOTING (PLF)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)
ROOF AND CEILING OVER SLAB-ON-GRADE (FIGURE 1)	8	950	15838	21012	26186						
	10	950	16586	22020	27453	32887					
	12	950	17313	23000	28688	34375	40063				
	14	950	18016	23952	29888	35824	41760	47696			
	16	950	18698	24877	31056	37235	43414	49593	55771		
	18	950	19358	25774	32190	38606	45023	51439	57855	64271	
ROOF, CEILING AND ONE CENTER-BEARING FLOOR (FIGURE 2)	8	1400	13326	18499	23673						
	10	1400	13924	19357	24791	30224					
	12	1400	14500	20188	25875	31563	37250				
	14	1400	15054	20990	26926	32862	38798	44734			
	16	1400	15586	21764	27943	34122	40301	46480	52659		
	18	1400	16095	22511	28928	35344	41760	48176	54593	61009	
ROOF, CEILING AND ONE CLEAR-SPAN FLOOR (FIGURE 3)	8	1850	10813	15987	21161						
	10	1850	11261	16695	22128	27562					
	12	1850	11688	17375	23063	28750	34438				
	14	1850	12091	18027	23963	29899	35835	41771			
	16	1850	12473	18652	24831	31010	37189	43368	49546		
	18	1850	12833	19249	25665	32081	38498	44914	51330	57746	
ROOF, CEILING AND TWO CENTER-BEARING FLOORS (FIGURE 4)	8	1880	10646	15819	20993						
	10	1880	11084	16517	21951	27384					
	12	1880	11500	17188	22875	28563	34250				
	14	1880	11894	17830	23766	29702	35638	41574			
	16	1880	12266	18444	24623	30802	36981	43160	49339		
	18	1880	12615	19031	25448	31864	38280	44696	51113	57529	
ROOF, CEILING AND TWO CLEAR-SPAN FLOORS (FIGURE 5)	8	2690	6123	11297	16471						
	10	2690	6291	11725	17158	22592					
	12	2690	6438	12125	17813	23500	29188				
	14	2690	6561	12497	18433	24369	30305	36241			
	16	2690	6663	12842	19021	25200	31379	37558	43736		
	18	2690	6743	13159	19575	25991	32408	38824	45240	51656	
ROOF, CEILING AND THREE CENTER-BEARING FLOORS (FIGURE 6)	8	2360	7966	13139	18313						
	10	2360	8244	13677	19111	24544					
	12	2360	8500	14188	19875	25563	31250				
	14	2360	8734	14670	20606	26542	32478	38414			
	16	2360	8946	15124	21303	27482	33661	39840	46019		
	18	2360	9135	15551	21968	28384	34800	41216	47633	54049	
ROOF, CEILING AND THREE CLEAR-SPAN FLOORS (FIGURE 7)	8	3530	1433	6607	11781						
	10	3530	1321	6755	12188	17622					
	12	3530	1188	6875	12563	18250	23938				
	14	3530	1031	6967	12903	18839	24775	30711			
	16	3530	853	7032	13211	19390	25569	31748	37926		
	18	3530	653	7069	13485	19901	26318	32734	39150	45566	
	20	3530	430	7078	13726	20374	27022	33670	40318	46966	53614

NOTES:

1. Refer to Table Notes on page 1.7 for additional information.
2. Refer to Figures 1 through 9 on pages 1.10 and 1.11 for additional information.

**TABLE 1.3: MAXIMUM COLUMN LOAD ON CONTINUOUS CAST-IN-PLACE CONCRETE FOOTING AT EXTERIOR WALL
LIGHT-FRAME CONSTRUCTION / ROOF LIVE LOAD = 20 PSF
(Reference: 2018 North Carolina Residential Code Section 403.1.1)**

LOAD BEARING VALUE OF SOIL (PSF)			4000								
FOOTING WIDTH, W (IN.)			16	20	24	28	32	36	40	44	48
FOUNDATION WALL SUPPORTING	FOOTING THICKNESS, T (IN.)	WALL LOAD ON FOOTING (PLF)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)
ROOF AND CEILING OVER SLAB-ON-GRADE (FIGURE 1)	8	950	23283	30318	37353						
	10	950	24475	31881	39287	46692					
	12	950	25646	33417	41188	48958	56729				
	14	950	26794	34925	43055	51185	59316	67446			
	16	950	27920	36405	44889	53374	61858	70343	78827		
	18	950	29024	37857	46690	55523	64356	73189	82022	90855	
	20	950	30106	39282	48458	57633	66809	75985	85161	94337	103513
ROOF, CEILING AND ONE CENTER-BEARING FLOOR (FIGURE 2)	8	1400	20770	27805	34840						
	10	1400	21813	29218	36624	44030					
	12	1400	22833	30604	38375	46146	53917				
	14	1400	23832	31962	40093	48223	56353	64484			
	16	1400	24808	33292	41777	50261	58746	67230	75714		
	18	1400	25762	34595	43428	52260	61093	69926	78759	87592	
	20	1400	26693	35869	45045	54221	63397	72573	81748	90924	100100
ROOF, CEILING AND ONE CLEAR-SPAN FLOOR (FIGURE 3)	8	1850	18258	25293	32328						
	10	1850	19150	26556	33962	41367					
	12	1850	20021	27792	35563	43333	51104				
	14	1850	20869	29000	37130	45260	53391	61521			
	16	1850	21695	30180	38664	47149	55633	64118	72602		
	18	1850	22499	31332	40165	48998	57831	66664	75497	84330	
	20	1850	23281	32457	41633	50808	59984	69160	78336	87512	96688
ROOF, CEILING AND TWO CENTER-BEARING FLOORS (FIGURE 4)	8	1880	18090	25125	32160						
	10	1880	18973	26378	33784	41190					
	12	1880	19833	27604	35375	43146	50917				
	14	1880	20672	28802	36933	45063	53193	61324			
	16	1880	21488	29972	38457	46941	55426	63910	72394		
	18	1880	22282	31115	39948	48780	57613	66446	75279	84112	
	20	1880	23053	32229	41405	50581	59757	68933	78108	87284	96460
ROOF, CEILING AND TWO CLEAR-SPAN FLOORS (FIGURE 5)	8	2690	13568	20603	27638						
	10	2690	14180	21586	28992	36397					
	12	2690	14771	22542	30313	38083	45854				
	14	2690	15339	23470	31600	39730	47861	55991			
	16	2690	15885	24370	32854	41339	49823	58308	66792		
	18	2690	16409	25242	34075	42908	51741	60574	69407	78240	
	20	2690	16911	26087	35263	44438	53614	62790	71966	81142	90318
ROOF, CEILING AND THREE CENTER-BEARING FLOORS (FIGURE 6)	8	2360	15410	22445	29480						
	10	2360	16133	23538	30944	38350					
	12	2360	16833	24604	32375	40146	47917				
	14	2360	17512	25642	33773	41903	50033	58164			
	16	2360	18168	26652	35137	43621	52106	60590	69074		
	18	2360	18802	27635	36468	45300	54133	62966	71799	80632	
	20	2360	19413	28589	37765	46941	56117	65293	74468	83644	92820
ROOF, CEILING AND THREE CLEAR-SPAN FLOORS (FIGURE 7)	8	3530	8878	15913	22948						
	10	3530	9210	16616	24022	31427					
	12	3530	9521	17292	25063	32833	40604				
	14	3530	9809	17940	26070	34200	42331	50461			
	16	3530	10075	18560	27044	35529	44013	52498	60982		
	18	3530	10319	19152	27985	36818	45651	54484	63317	72150	
	20	3530	10541	19717	28893	38068	47244	56420	65596	74772	83948

NOTES:

1. Refer to Table Notes on page 1.7 for additional information.
2. Refer to Figures 1 through 9 on pages 1.10 and 1.11 for additional information.

**TABLE 1.4: MAXIMUM COLUMN LOAD ON CONTINUOUS CAST-IN-PLACE CONCRETE FOOTING AT EXTERIOR WALL
LIGHT-FRAME CONSTRUCTION WITH BRICK VENEER / ROOF LIVE LOAD = 20 PSF
(Reference: 2018 North Carolina Residential Code Section 403.1.1)**

LOAD BEARING VALUE OF SOIL (PSF)			2000								
FOOTING WIDTH, W (IN.)			16	20	24	28	32	36	40	44	48
FOUNDATION WALL SUPPORTING	FOOTING THICKNESS, T (IN.)	WALL LOAD ON FOOTING (PLF)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)
ROOF AND CEILING OVER SLAB-ON-GRADE (FIGURE 1)	8	1370	6272	9585	12898	16210					
	10	1370	6449	9910	13372	16833	20294				
	12	1370	6604	10208	13813	17417	21021	24625			
	14	1370	6737	10478	14220	17962	21703	25445	29186		
	16	1370	6848	10721	14594	18468	22341	26214	30088	33961	
	18	1370	6936	10935	14935	18935	22934	26934	30933	34933	38933
ROOF, CEILING AND ONE CENTER-BEARING FLOOR (FIGURE 2)	8	1820	3759	7072	10385	13698					
	10	1820	3787	7248	10709	14170	17632				
	12	1820	3792	7396	11000	14604	18208	21813			
	14	1820	3774	7516	11258	14999	18741	22482	26224		
	16	1820	3735	7608	11482	15355	19228	23102	26975	30848	
	18	1820	3673	7673	11673	15672	19672	23671	27671	31670	35670
ROOF, CEILING AND ONE CLEAR-SPAN FLOOR (FIGURE 3)	8	2270	1247	4560	7873	11185					
	10	2270	1124	4585	8047	11508	14969				
	12	2270	979	4583	8188	11792	15396	19000			
	14	2270	812	4553	8295	12037	15778	19520	23261		
	16	2270	622	4496	8369	12243	16116	19989	23863	27736	
	18	2270	411	4410	8410	12410	16409	20409	24408	28408	32408
ROOF, CEILING AND TWO CENTER-BEARING FLOORS (FIGURE 4)	8	2660	-	2382	5695	9008					
	10	2660	-	2278	5739	9200	12662				
	12	2660	-	2146	5750	9354	12958	16563			
	14	2660	-	1986	5728	9469	13211	16952	20694		
	16	2660	-	1798	5672	9545	13418	17292	21165	25038	
	18	2660	-	1583	5583	9582	13582	17581	21581	25580	29580
ROOF, CEILING AND TWO CLEAR-SPAN FLOORS (FIGURE 5)	8	3470	-	-	1173	4485					
	10	3470	-	-	947	4408	7869				
	12	3470	-	-	688	4292	7896	11500			
	14	3470	-	-	395	4137	7878	11620	15361		
	16	3470	-	-	69	3943	7816	11689	15563	19436	
	18	3470	-	-	-	3710	7709	11709	15708	19708	23708
ROOF, CEILING AND THREE CENTER-BEARING FLOORS (FIGURE 6)	8	3500	-	-	1005	4318					
	10	3500	-	-	769	4230	7692				
	12	3500	-	-	500	4104	7708	11313			
	14	3500	-	-	198	3939	7681	11422	15164		
	16	3500	-	-	-	3735	7608	11482	15355	19228	
	18	3500	-	-	-	3492	7492	11491	15491	19490	23490
ROOF, CEILING AND THREE CLEAR-SPAN FLOORS (FIGURE 7)	8	4670	-	-	-	-					
	10	4670	-	-	-	-	769				
	12	4670	-	-	-	-	396	4000			
	14	4670	-	-	-	-	-	3720	7461		
	16	4670	-	-	-	-	-	3389	7263	11136	
	18	4670	-	-	-	-	-	3009	7008	11008	15008
20	4670	-	-	-	-	-	2578	6699	10819	14939	

NOTES:

1. Refer to Table Notes on page 1.7 for additional information.
2. Refer to Figures 1 through 9 on pages 1.10 and 1.11 for additional information.

**TABLE 1.5: MAXIMUM COLUMN LOAD ON CONTINUOUS CAST-IN-PLACE CONCRETE FOOTING AT EXTERIOR WALL
LIGHT-FRAME CONSTRUCTION WITH BRICK VENEER / ROOF LIVE LOAD = 20 PSF
(Reference: 2018 North Carolina Residential Code Section 403.1.1)**

LOAD BEARING VALUE OF SOIL (PSF)			3000								
FOOTING WIDTH, W (IN.)			16	20	24	28	32	36	40	44	48
FOUNDATION WALL SUPPORTING	FOOTING THICKNESS, T (IN.)	WALL LOAD ON FOOTING (PLF)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)
ROOF AND CEILING OVER SLAB-ON-GRADE (FIGURE 1)	8	1370	13716	18890	24064	29238					
	10	1370	14338	19772	25205	30638	36072				
	12	1370	14938	20625	26313	32000	37688	43375			
	14	1370	15515	21451	27387	33323	39259	45195	51131		
	16	1370	16070	22249	28428	34606	40785	46964	53143	59322	
	18	1370	16603	23019	29435	35851	42268	48684	55100	61516	67933
	20	1370	17113	23761	30409	37057	43705	50353	57001	63649	70298
ROOF, CEILING AND ONE CENTER-BEARING FLOOR (FIGURE 2)	8	1820	11204	16378	21552	26726					
	10	1820	11676	17109	22543	27976	33409				
	12	1820	12125	17813	23500	29188	34875	40563			
	14	1820	12552	18488	24424	30360	36296	42232	48168		
	16	1820	12957	19136	25315	31494	37673	43852	50031	56209	
	18	1820	13340	19756	26173	32589	39005	45421	51838	58254	64670
	20	1820	13701	20349	26997	33645	40293	46941	53589	60237	66885
ROOF, CEILING AND ONE CLEAR-SPAN FLOOR (FIGURE 3)	8	2270	8691	13865	19039	24213					
	10	2270	9013	14447	19880	25313	30747				
	12	2270	9313	15000	20688	26375	32063	37750			
	14	2270	9590	15526	21462	27398	33334	39270	45206		
	16	2270	9845	16024	22203	28381	34560	40739	46918	53097	
	18	2270	10078	16494	22910	29326	35743	42159	48575	54991	61408
	20	2270	10288	16936	23584	30232	36880	43528	50176	56824	63473
ROOF, CEILING AND TWO CENTER-BEARING FLOORS (FIGURE 4)	8	2660	6514	11688	16862	22036					
	10	2660	6706	12139	17573	23006	28439				
	12	2660	6875	12563	18250	23938	29625	35313			
	14	2660	7022	12958	18894	24830	30766	36702	42638		
	16	2660	7147	13326	19505	25684	31863	38042	44221	50399	
	18	2660	7250	13666	20083	26499	32915	39331	45748	52164	58580
	20	2660	7331	13979	20627	27275	33923	40571	47219	53867	60515
ROOF, CEILING AND TWO CLEAR-SPAN FLOORS (FIGURE 5)	8	3470	1991	7165	12339	17513					
	10	3470	1913	7347	12780	18213	23647				
	12	3470	1813	7500	13188	18875	24563	30250			
	14	3470	1690	7626	13562	19498	25434	31370	37306		
	16	3470	1545	7724	13903	20081	26260	32439	38618	44797	
	18	3470	1378	7794	14210	20626	27043	33459	39875	46291	52708
	20	3470	1188	7836	14484	21132	27780	34428	41076	47724	54373
ROOF, CEILING AND THREE CENTER-BEARING FLOORS (FIGURE 6)	8	3500	1824	6998	12172	17346					
	10	3500	1736	7169	12603	18036	23469				
	12	3500	1625	7313	13000	18688	24375	30063			
	14	3500	1492	7428	13364	19300	25236	31172	37108		
	16	3500	1337	7516	13695	19874	26053	32232	38411	44589	
	18	3500	1160	7576	13993	20409	26825	33241	39658	46074	52490
	20	3500	961	7609	14257	20905	27553	34201	40849	47497	54145
ROOF, CEILING AND THREE CLEAR-SPAN FLOORS (FIGURE 7)	8	4670	-	465	5639	10813					
	10	4670	-	247	5680	11113	16547				
	12	4670	-	0	5688	11375	17063	22750			
	14	4670	-	-	5662	11598	17534	23470	29406		
	16	4670	-	-	5603	11781	17960	24139	30318	36497	
	18	4670	-	-	5510	11926	18343	24759	31175	37591	44008
	20	4670	-	-	5384	12032	18680	25328	31976	38624	45273

NOTES:

1. Refer to Table Notes on page 1.7 for additional information.
2. Refer to Figures 1 through 9 on pages 1.10 and 1.11 for additional information.

**TABLE 1.6: MAXIMUM COLUMN LOAD ON CONTINUOUS CAST-IN-PLACE CONCRETE FOOTING AT EXTERIOR WALL
LIGHT-FRAME CONSTRUCTION WITH BRICK VENEER / ROOF LIVE LOAD = 20 PSF
(Reference: 2018 North Carolina Residential Code Section 403.1.1)**

LOAD BEARING VALUE OF SOIL (PSF)			4000								
FOOTING WIDTH, W (IN.)			16	20	24	28	32	36	40	44	48
FOUNDATION WALL SUPPORTING	FOOTING THICKNESS, T (IN.)	WALL LOAD ON FOOTING (PLF)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)	MAXIMUM COLUMN LOAD (LB.)
ROOF AND CEILING OVER SLAB-ON-GRADE (FIGURE 1)	8	1370	21161	28643	35231	42266					
	10	1370	22227	29633	37038	44444	51850				
	12	1370	23271	31042	38813	46583	54354	62125			
	14	1370	24293	32423	40553	48684	56814	64945	73075		
	16	1370	25292	33776	42261	50745	59230	67714	76199	84683	
	18	1370	26269	35102	43935	52768	61601	70434	79267	88100	96933
	20	1370	27224	36400	45576	54752	63928	73103	82279	91455	100631
ROOF, CEILING AND ONE CENTER-BEARING FLOOR (FIGURE 2)	8	1820	18648	25683	32718	39753					
	10	1820	19564	26970	34376	41782	49187				
	12	1820	20458	28229	36000	43771	51542	59313			
	14	1820	21330	29460	37591	45721	53852	61982	70113		
	16	1820	22179	30664	39148	47633	56117	64602	73086	81571	
	18	1820	23007	31840	40673	49505	58338	67171	76004	84837	93670
	20	1820	23812	32988	42163	51339	60515	69691	78867	88043	97218
ROOF, CEILING AND ONE CLEAR-SPAN FLOOR (FIGURE 3)	8	2270	16136	23171	30206	37241					
	10	2270	16902	24308	31713	39119	46525				
	12	2270	17646	25417	33188	40958	48729	56500			
	14	2270	18368	26498	34628	42759	50889	59020	67150		
	16	2270	19067	27551	36036	44520	53005	61489	69974	78458	
	18	2270	19744	28577	37410	46243	55076	63909	72742	81575	90408
	20	2270	20399	29575	38751	47927	57103	66278	75454	84630	93806
ROOF, CEILING AND TWO CENTER-BEARING FLOORS (FIGURE 4)	8	2660	13958	20993	28028	35063					
	10	2660	14594	22000	29406	36812	44217				
	12	2660	15208	22979	30750	38521	46292	54063			
	14	2660	15800	23930	32061	40191	48322	56452	64583		
	16	2660	16369	24854	33338	41823	50307	58792	67276	75761	
	18	2660	16917	25750	34583	43415	52248	61081	69914	78747	87580
	20	2660	17442	26618	35793	44969	54145	63321	72497	81673	90848
ROOF, CEILING AND TWO CLEAR-SPAN FLOORS (FIGURE 5)	8	3470	9436	16471	23506	30541					
	10	3470	9802	17208	24613	32019	39425				
	12	3470	10146	17917	25688	33458	41229	49000			
	14	3470	10468	18598	26728	34859	42989	51120	59250		
	16	3470	10767	19251	27736	36220	44705	53189	61674	70158	
	18	3470	11044	19877	28710	37543	46376	55209	64042	72875	81708
	20	3470	11299	20475	29651	38827	48003	57178	66354	75530	84706
ROOF, CEILING AND THREE CENTER-BEARING FLOORS (FIGURE 6)	8	3500	9268	16303	23338	30373					
	10	3500	9624	17030	24436	31842	39247				
	12	3500	9958	17729	25500	33271	41042	48813			
	14	3500	10270	18400	26531	34661	42792	50922	59053		
	16	3500	10559	19044	27528	36013	44497	52982	61466	69951	
	18	3500	10827	19660	28493	37325	46158	54991	63824	72657	81490
	20	3500	11072	20248	29423	38599	47775	56951	66127	75303	84478
ROOF, CEILING AND THREE CLEAR-SPAN FLOORS (FIGURE 7)	8	4670	2736	9771	16806	23841					
	10	4670	2702	10108	17513	24919	32325				
	12	4670	2646	10417	18188	25958	33729	41500			
	14	4670	2568	10698	18828	26959	35089	43220	51350		
	16	4670	2467	10951	19436	27920	36405	44889	53374	61858	
	18	4670	2344	11177	20010	28843	37676	46509	55342	64175	73008
	20	4670	2199	11375	20551	29727	38903	48078	57254	66430	75606

NOTES:

1. Refer to Table Notes on page 1.7 for additional information.
2. Refer to Figures 1 through 9 on pages 1.10 and 1.11 for additional information.

TABLES 1.1 THROUGH 1.6: MAXIMUM COLUMN LOAD ON CONTINUOUS CAST-IN-PLACE CONCRETE FOOTING AT EXTERIOR WALL

TABLE NOTES:

1. To use Tables 1.1 through 1.6:
 - a. Select the table for the appropriate Load Bearing Value of Soil and exterior wall finish (without brick veneer or with brick veneer).
 - b. Select the row corresponding to the configuration of the structure (number of floors supported on foundation).
 - c. Select a footing width and thickness within that row that has a corresponding maximum column load equal to or greater than the required column load.
2. Tables 1.1 through 1.6 are for use with one- and two-family residential structures constructed in accordance with the 2018 North Carolina Residential Code (2015 International Residential Code with North Carolina amendments).
3. Tables 1.1 through 1.6 are for use with one- and two-family residential structures in Seismic Design Category A, B, or C.
4. Footing sizes indicated in Tables 1.1 through 1.6 have been evaluated for the effects of gravity loads only. The inclusion of lateral loads due to wind or seismic forces in the footing designs is beyond the scope of these tables.
5. Footing sizes in the shaded area of Tables 1.1 through 1.6 are not in compliance with the minimum size requirements of the 2018 North Carolina Residential Code, Section R403.1.1.
6. Maximum column loads and footing sizes indicated in Tables 1.1 through 1.6 are based on the following design criteria and assumptions:
 - a. House is 36-feet wide, both with and without a load-bearing center wall that carries half of the tributary floor framing, as indicated in the table headings.
 - b. House is built over 2-foot crawl space, unless noted otherwise on table.
 - c. House has 10-foot floor-to-floor heights. Tables 1.1 through 1.6 may be used for wall heights less than or equal to 10 feet.
 - d. Foundations are plain cast-in-place concrete footings constructed in accordance with Chapter 4 of the 2018 North Carolina Residential Code.
 - e. Foundation wall consists of minimum 8-inch hollow CMU laid in running bond and is constructed in accordance with the 2018 North Carolina Residential Code.
 - f. Foundation wall is 24-inches high and is centered on the footing, as shown in Figures 8 and 9 on Page 1.11.
 - g. Design loads:

i. First Floor	50 psf (40 psf live load, 10 psf dead load)
ii. Second Floor	40 psf (30 psf live load, 10 psf dead load)
iii. Third Floor	40 psf (30 psf live load, 10 psf dead load)
iv. Roof	40 psf (20 psf live load, 20 psf dead load)
v. Footing (self-weight)	150 pcf (normal weight concrete)
vi. Soil (self-weight)	120 pcf
vii. 8-inch CMU	55 psf
viii. 12-inch CMU	85 psf
ix. Exterior Wood-frame Wall	12 psf
x. Exterior Wood-frame Wall With Brick Veneer	48 psf
 - h. Habitable attics are considered a supported floor.
7. Refer to Figures 1 through 9 on pages 1.10 and 1.11 for additional information.
8. Footing sizes listed in Tables 1.1 through 1.6 with no column load are not adequate for the load bearing value of the soil indicated with the assumptions and design loads listed above taken into consideration.
9. Maximum column loads indicated in Tables 1.1 through 1.6 are based on the requirements for concrete footings in Section R403.1.1 of the 2018 North Carolina Residential Code and the calculated soil bearing pressure with the assumptions listed above taken into consideration. The evaluation of the masonry foundation wall is not included in the tables and the assumed masonry foundation wall described above may not be in compliance with the 2018 North Carolina Residential Code in all cases. The masonry foundation wall must be evaluated for the applied column load(s) as required by the provisions of the 2018 North Carolina Residential Code.

TABLE 1.7: PIER AND FOOTING SIZES FOR SUPPORT OF INTERIOR GIRDERS

(Reference: 2018 North Carolina Residential Code Table R403.1(2))

1 (ONE) STORY			
FLOOR AREA SUPPORTED (SQ. FT.)	PIER (W X L)	FOOTING (W X L X T)	TOTAL ALLOWABLE LOAD (LB.)
50	8" x 16"	1'-4" x 2'-0" x 8"	2500
100	8" x 16"	1'-4" x 2'-0" x 8"	5000
150	8" x 16"	2'-0" x 2'-0" x 8"	7500
200	8" x 16"	2'-4" x 2'-4" x 10"	10000
250	-	-	-
300	-	-	-
2 (TWO) STORY			
FLOOR AREA SUPPORTED (SQ. FT.)	PIER (W X L)	FOOTING (W X L X T)	TOTAL ALLOWABLE LOAD (LB.)
50	8" x 16"	1'-4" x 2'-6" x 8"	4500
100	8" x 16"	2'-0" x 2'-0" x 10"	9000
150	16" x 16"	2'-8" x 2'-8" x 10"	13500
200	16" x 16"	3'-0" x 3'-0" x 10"	18000
250	16" x 16"	3'-4" x 3'-4" x 1'-0"	22500
300	16" x 16"	3'-8" x 3'-8" x 1'-0"	27000
3 (THREE) STORY			
FLOOR AREA SUPPORTED (SQ. FT.)	PIER (W X L)	FOOTING (W X L X T)	TOTAL ALLOWABLE LOAD (LB.)
50	8" x 16"	1'-4" x 2'-6" x 8"	6500
100	16" x 16"	2'-6" x 2'-6" x 10"	13000
150	16" x 16"	3'-0" x 3'-0" x 10"	19500
200	16" x 16"	4'-0" x 4'-0" x 1'-0"	26000
250	16" x 24"	4'-0" x 4'-0" x 1'-0"	32500
300	16" x 24"	4'-6" x 4'-6" x 1'-0"	39000

NOTES:

1. Refer to Table Notes on page 1.9 for additional information.

TABLE 1.7: PIER AND FOOTING SIZES FOR SUPPORT OF INTERIOR GIRDERS

TABLE NOTES:

1. Table 1.7 expands on the data presented in Table 403.1(2) of the 2018 North Carolina Residential Code to include the *Total Allowable Load* that may be applied to the pier.
2. Table 1.7 is for use with one- and two-family residential structures constructed in accordance with the 2018 North Carolina Residential Code (2015 International Residential Code with North Carolina amendments).
3. Table 1.7 is for use with one- and two-family residential structures in Seismic Design Category A, B, or C.
4. Tabulated pier sizes are based on hollow CMU (concrete masonry unit) piers capped with 4 inches of solid masonry or concrete for 1 (one) story houses, 8 inches of solid masonry or concrete for 2 (two), 2½ (two-and-one-half) and 3 (three) story houses, or the cavities of the top course of masonry may be filled with concrete or grout.
5. Piers shall be constructed with Type S mortar.
6. Tabulated pier sizes are minimums. For height/thickness limitations see Section R606.7 of the North Carolina Residential Code.
7. Center of pier shall bear in the middle one-third of the footing.
8. Footing sizes are based on 2000 psf allowable soil bearing pressure and concrete with a minimum specified compression strength of 2500 psi.
9. Footings shall be full thickness over the entire area of the footing.
10. Girders must have full bearing on the piers.
11. The tabulated *Total Allowable Load* values represent the maximum load that may be applied to the corresponding tabulated masonry piers and are based on the preceding notes and the following design criteria and assumptions:
 - a. Structure is constructed with dimensional framing lumber in accordance with the 2018 North Carolina Residential Code.
 - b. Piers are concrete masonry piers constructed in accordance with Section R606 of the North Carolina Residential Code.
 - c. Footings are plain cast-in-place concrete footings constructed in accordance with Chapter 4 of the 2018 North Carolina Residential Code.
 - d. Piers and footings are located at the interior of the structure (not at the exterior walls).
 - e. Piers and footings support only floor loads (not roof loads).
 - f. Tabulated *Floor Area Supported* is the tributary area of each floor level supported by the corresponding pier and footing.
 - g. Design loads:
 - i. First Floor 50 psf (40 psf live load, 10 psf dead load)
 - ii. Second Floor 40 psf (30 psf live load, 10 psf dead load)
 - iii. Third Floor 40 psf (30 psf live load, 10 psf dead load)

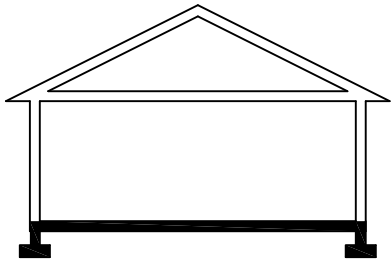


FIGURE 1: ROOF AND CEILING OVER SLAB-ON-GRADE

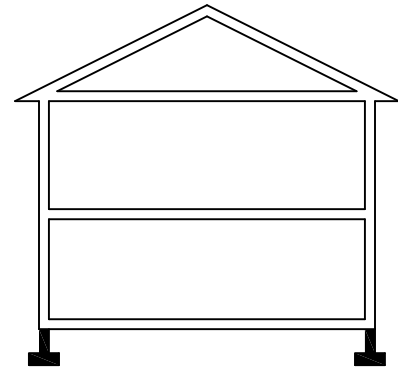


FIGURE 5: ROOF, CEILING AND TWO CLEAR-SPAN FLOORS

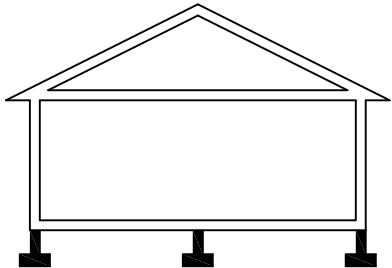


FIGURE 2: ROOF, CEILING AND ONE CENTER-BEARING FLOOR

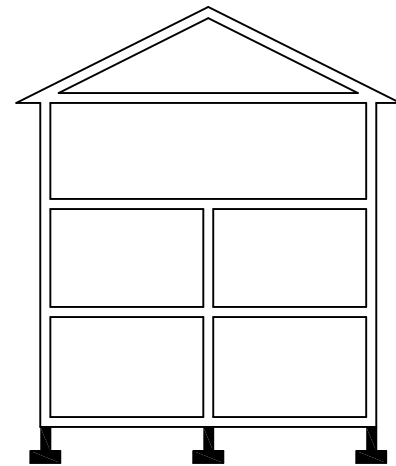


FIGURE 6: ROOF, CEILING AND THREE CENTER-BEARING FLOORS

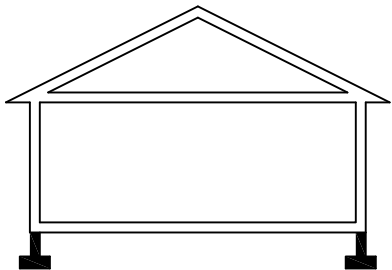


FIGURE 3: ROOF, CEILING AND ONE CLEAR-SPAN FLOOR

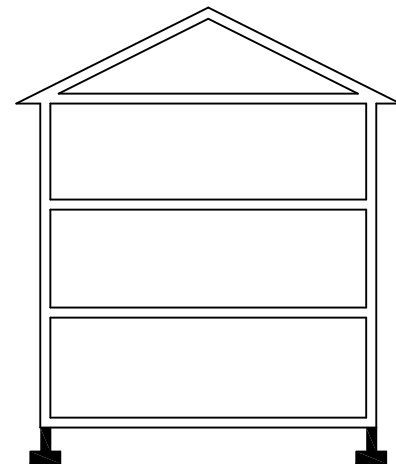


FIGURE 7: ROOF, CEILING AND THREE CLEAR-SPAN FLOORS

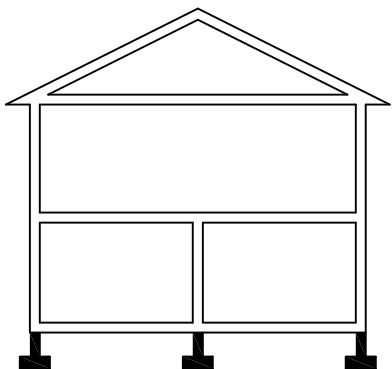
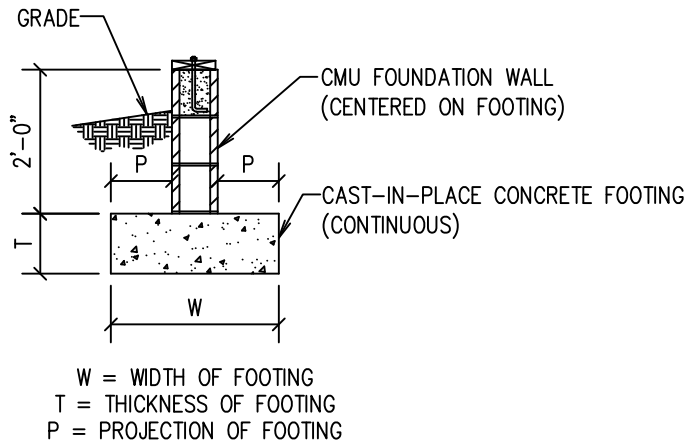
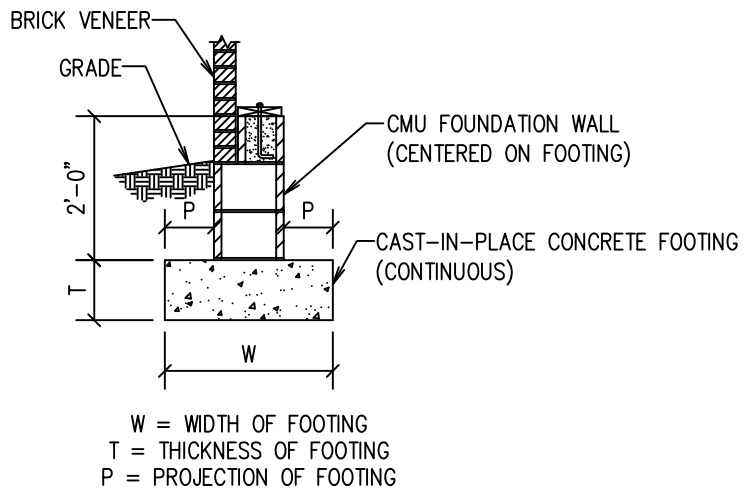


FIGURE 4: ROOF, CEILING AND TWO CENTER-BEARING FLOORS



FOOTING PROJECTION P SHALL BE NOT LESS THAN 2 INCHES AND SHALL NOT EXCEED FOOTING THICKNESS T

FIGURE 8: CONCRETE FOOTING WITH CMU FOUNDATION WALL FOR LIGHT FRAME CONSTRUCTION



FOOTING PROJECTION P SHALL BE NOT LESS THAN 2 INCHES AND SHALL NOT EXCEED FOOTING THICKNESS T

FIGURE 9: CONCRETE FOOTING WITH CMU FOUNDATION WALL FOR LIGHT FRAME CONSTRUCTION WITH BRICK VENEER

JACK STUD TABLES

**TABLE 2.1: MAXIMUM HEADER / GIRDER END REACTION
FOR SPECIFIED NUMBER OF JACK STUDS AND HEADER
THICKNESS**

(Reference: 2018 North Carolina Residential Code Section R502.5 and
Table R602.7(1))

<i>HEADER THICKNESS</i>	<i>3" (2-2x)</i>	<i>4.5" (3-2X)</i>	<i>6" (4-2x)</i>
<i>NUMBER OF JACK STUDS</i>	<i>MAXIMUM END REACTION (LB.)</i>	<i>MAXIMUM END REACTION (LB.)</i>	<i>MAXIMUM END REACTION (LB.)</i>
1	1660	1760	2760
2	3320	3520	5520
3	4980	5280	8280
4	6640	7040	11040

NOTES:

1. Refer to Table Notes on page 2.2 for additional information.

TABLE 2.1: MAXIMUM HEADER / GIRDER END REACTION FOR SPECIFIED NUMBER OF JACK STUDS AND HEADER THICKNESS

TABLE NOTES:

1. Table 2.1 provides the maximum header or girder reaction for a given number of jack studs and a given header or girder thickness (number of nominal 2x plies).
2. Table 2.1 is for use with one- and two-family residential structures constructed in accordance with the 2018 North Carolina Residential Code (2015 International Residential Code with North Carolina amendments).
3. Table 2.1 is for use with one- and two-family residential structures in Seismic Design Category A, B, or C.
4. Jack studs must be a minimum of 2x nominal thickness and have a width at least equal to the width of the wall studs. Wall stud heights shall be in accordance with Table R602.3(5).
5. Tabulated values assume #2 grade lumber and Douglas fir-larch, hem-fir, southern pine and/or spruce-pine-fir lumber species.
6. Tabulated values are derived from the maximum spans and required number of jack studs listed in Tables R602.7(1) and R602.7(2), and the minimum design loads specified in Section R301 of the 2018 North Carolina Residential Code. Refer to Tables 2.4 and 2.5 on pages 2.6 and 2.7 for additional information.
7. Support for header and girder ends must provide a continuous load path from the bearing to the foundation.
8. For header and girder reactions greater than the tabulated values, the structural elements supporting the header or girder must be designed in accordance with accepted engineering practice by a registered design professional.

TABLE 2.2: LOAD CHART FOR END REACTIONS OF GIRDERS AND HEADERS IN EXTERIOR BEARING WALLS

ROOF LIVE LOAD = 20 psf

(Reference: 2018 North Carolina Residential Code Section R502.5 and Table R602.7(1))

BUILDING WIDTH = 36 FT.

GIRDERS AND HEADERS SUPPORTING	1st FLOOR SPAN (FT.)	2nd FLOOR SPAN (FT.)	3rd FLOOR SPAN (FT.)	ROOF SPAN (FT.)	HEADER / GIRDER SPAN (FT.)	1st FLOOR LIVE (PSF)	1st FLOOR DEAD (PSF)	2nd FLOOR LIVE (PSF)	2nd FLOOR DEAD (PSF)	3rd FLOOR LIVE (PSF)	3rd FLOOR DEAD (PSF)	ROOF LIVE / SNOW (PSF)	ROOF DEAD (PSF)	WALL LOAD (PLF)	HEADER / GIRDER LOAD (PLF)	HEADER END REACTION (LB.)	NJ		
																	HEADER THICKNESS		
																	3" (2-2x)	4.5" (3-2x)	6" (4-2x)
ROOF AND CEILING (FIGURE 10)	0	0	0	36	2	40	10	30	10	30	10	20	10	0	600	600	1	1	1
	0	0	0	36	4	40	10	30	10	30	10	20	10	0	600	1200	1	1	1
	0	0	0	36	6	40	10	30	10	30	10	20	10	0	600	1800	2	2	1
	0	0	0	36	8	40	10	30	10	30	10	20	10	0	600	2400	2	2	1
	0	0	0	36	10	40	10	30	10	30	10	20	10	0	600	3000	2	2	2
	0	0	0	36	12	40	10	30	10	30	10	20	10	0	600	3600	3	3	2
	0	0	0	36	14	40	10	30	10	30	10	20	10	0	600	4200	3	3	2
ROOF, CEILING AND ONE CENTER-BEARING FLOOR (FIGURE 11)	0	18	0	36	2	40	10	30	10	30	10	20	10	108	1068	1068	1	1	1
	0	18	0	36	4	40	10	30	10	30	10	20	10	108	1068	2136	2	2	1
	0	18	0	36	6	40	10	30	10	30	10	20	10	108	1068	3204	2	2	2
	0	18	0	36	8	40	10	30	10	30	10	20	10	108	1068	4272	3	3	2
	0	18	0	36	10	40	10	30	10	30	10	20	10	108	1068	5340	4	4	2
	0	18	0	36	12	40	10	30	10	30	10	20	10	108	1068	6408	4	4	3
	0	18	0	36	14	40	10	30	10	30	10	20	10	108	1068	7476			3
ROOF, CEILING AND ONE CLEAR-SPAN FLOOR (FIGURE 12)	0	36	0	36	2	40	10	30	10	30	10	20	10	108	1428	1428	1	1	1
	0	36	0	36	4	40	10	30	10	30	10	20	10	108	1428	2856	2	2	2
	0	36	0	36	6	40	10	30	10	30	10	20	10	108	1428	4284	3	3	2
	0	36	0	36	8	40	10	30	10	30	10	20	10	108	1428	5712	4	4	3
	0	36	0	36	10	40	10	30	10	30	10	20	10	108	1428	7140			3
	0	36	0	36	12	40	10	30	10	30	10	20	10	108	1428	8568			4
	0	36	0	36	14	40	10	30	10	30	10	20	10	108	1428	9996			4
ROOF, CEILING AND TWO CENTER-BEARING FLOORS (FIGURE 13)	0	18	18	36	2	40	10	30	10	30	10	20	10	204	1524	1524	1	1	1
	0	18	18	36	4	40	10	30	10	30	10	20	10	204	1524	3048	2	2	2
	0	18	18	36	6	40	10	30	10	30	10	20	10	204	1524	4572	3	3	2
	0	18	18	36	8	40	10	30	10	30	10	20	10	204	1524	6096	4	4	3
	0	18	18	36	10	40	10	30	10	30	10	20	10	204	1524	7620			3
	0	18	18	36	12	40	10	30	10	30	10	20	10	204	1524	9144			4
	0	18	18	36	14	40	10	30	10	30	10	20	10	204	1524	10668			4
ROOF, CEILING AND TWO CLEAR-SPAN FLOORS (FIGURE 14)	0	36	36	36	2	40	10	30	10	30	10	20	10	204	2244	2244	2	2	1
	0	36	36	36	4	40	10	30	10	30	10	20	10	204	2244	4488	3	3	2
	0	36	36	36	6	40	10	30	10	30	10	20	10	204	2244	6732		4	3
	0	36	36	36	8	40	10	30	10	30	10	20	10	204	2244	8976			4
	0	36	36	36	10	40	10	30	10	30	10	20	10	204	2244	11220			
	0	36	36	36	12	40	10	30	10	30	10	20	10	204	2244	13464			
	0	36	36	36	14	40	10	30	10	30	10	20	10	204	2244	15708			
0	36	36	36	16	40	10	30	10	30	10	20	10	204	2244	17952				

NOTES:

1. Refer to Table Notes on page 2.5 for additional information.
2. Refer to Figures 10 through 14 on page 2.9 for additional information.

TABLE 2.3: LOAD CHART FOR END REACTIONS OF GIRDERS AND HEADERS IN INTERIOR BEARING WALLS

(Reference: 2018 North Carolina Residential Code Section R502.5 and Table R602.7(2))

BUILDING WIDTH = 36 FT.																			
GIRDERS AND HEADERS SUPPORTING	1st FLOOR SPAN (FT.)	2nd FLOOR SPAN (FT.)	3rd FLOOR SPAN (FT.)	ROOF SPAN (FT.)	HEADER / GIRDER SPAN (FT.)	1st FLOOR LIVE (PSF)	1st FLOOR DEAD (PSF)	2nd FLOOR LIVE (PSF)	2nd FLOOR DEAD (PSF)	3rd FLOOR LIVE (PSF)	3rd FLOOR DEAD (PSF)	ROOF LIVE / SNOW (PSF)	ROOF DEAD (PSF)	WALL LOAD (PLF)	HEADER / GIRDER LOAD (PLF)	END REACTION (L.B.)	NJ		
																	HEADER THICKNESS		
																	3" (2-2x)	4.5" (3-2x)	6" (4-2x)
ONE FLOOR ONLY (FIGURE 15)	18	0	0	0	2	40	10	30	10	30	10	20	10	0	900	900	1	1	1
	18	0	0	0	4	40	10	30	10	30	10	20	10	0	900	1800	2	2	1
	18	0	0	0	6	40	10	30	10	30	10	20	10	0	900	2700	2	2	1
	18	0	0	0	8	40	10	30	10	30	10	20	10	0	900	3600	3	3	2
	18	0	0	0	10	40	10	30	10	30	10	20	10	0	900	4500	3	3	2
	18	0	0	0	12	40	10	30	10	30	10	20	10	0	900	5400	4	4	2
	18	0	0	0	14	40	10	30	10	30	10	20	10	0	900	6300	4	4	3
	18	0	0	0	16	40	10	30	10	30	10	20	10	0	900	7200			3
TWO FLOORS (FIGURE 16)	18	18	0	0	2	40	10	30	10	30	10	20	10	80	1700	1700	2	1	1
	18	18	0	0	4	40	10	30	10	30	10	20	10	80	1700	3400	3	2	2
	18	18	0	0	6	40	10	30	10	30	10	20	10	80	1700	5100	4	3	2
	18	18	0	0	8	40	10	30	10	30	10	20	10	80	1700	6800		4	3
	18	18	0	0	10	40	10	30	10	30	10	20	10	80	1700	8500			4
	18	18	0	0	12	40	10	30	10	30	10	20	10	80	1700	10200			4
	18	18	0	0	14	40	10	30	10	30	10	20	10	80	1700	11900			
	18	18	0	0	16	40	10	30	10	30	10	20	10	80	1700	13600			
THREE FLOORS (FIGURE 17)	18	18	18	0	2	40	10	30	10	30	10	20	10	152	2492	2492	2	2	1
	18	18	18	0	4	40	10	30	10	30	10	20	10	152	2492	4984	4	3	2
	18	18	18	0	6	40	10	30	10	30	10	20	10	152	2492	7476			3
	18	18	18	0	8	40	10	30	10	30	10	20	10	152	2492	9968			4
	18	18	18	0	10	40	10	30	10	30	10	20	10	152	2492	12460			
	18	18	18	0	12	40	10	30	10	30	10	20	10	152	2492	14952			
	18	18	18	0	14	40	10	30	10	30	10	20	10	152	2492	17444			
	18	18	18	0	16	40	10	30	10	30	10	20	10	152	2492	19936			

NOTES:

1. Refer to Table Notes on page 2.5 for additional information.
2. Refer to Figures 15 through 17 on page 2.10 for additional information.

TABLES 2.2 AND 2.3: LOAD CHART FOR END REACTIONS OF GIRDERS AND HEADERS IN EXTERIOR AND INTERIOR BEARING WALLS

TABLE NOTES:

1. Tables 2.2 and 2.3 provide a summary of header/girder loads and reactions for several header/girder spans and loading conditions. Tables 2.2 and 2.3 also provide the number of jack studs required to support each end of the header/girder for each of the spans and loading conditions.
2. Tables 2.2 and 2.3 are for use with one- and two-family residential structures constructed in accordance with the 2018 North Carolina Residential Code (2015 International Residential Code with North Carolina amendments).
3. Tables 2.2 and 2.3 are for use with one- and two-family residential structures in Seismic Design Category A, B, or C.
4. NJ = Number of jack studs required to support each end of the header/girder.
5. Jack studs must be a minimum of 2x nominal thickness and have a width at least equal to the width of the wall studs. Wall stud heights shall be in accordance with Table R602.3(5).
6. Tabulated values assume #2 grade lumber and Douglas fir-larch, hem-fir, southern pine and/or spruce-pine-fir lumber species.
7. Tabulated values are derived from the maximum spans and required number of jack studs listed in Tables R602.7(1) and R602.7(2), and the minimum design loads specified in Section R301 of the 2018 North Carolina Residential Code. Refer to Table 2.1 on page 2.1 and Tables 2.4 and 2.5 on pages 2.6 and 2.7 for additional information.
8. The header/girder reactions and the number of jack studs required to support the headers/girders indicated in Tables 2.2 and 2.3 are based on the following design criteria and assumptions:
 - a. 36-foot wide house with 2-foot roof overhang, both with and without a load-bearing center wall that carries half of the tributary floor framing, as indicated in the table headings.
 - b. Story heights:

i. First Story	10 feet
ii. Second Story	9 feet
iii. Third Story	8 feet
 - c. Design loads:

i. First Floor	50 psf (40 psf live load, 10 psf dead load)
ii. Second Floor	40 psf (30 psf live load, 10 psf dead load)
iii. Third Floor	40 psf (30 psf live load, 10 psf dead load)
iv. Roof	30 psf (20 psf live load, 10 psf dead load)
v. Exterior Wood-frame Wall	12 psf
vi. Interior Wood-frame Wall	8 psf
 - d. Habitable attics are considered a supported floor.
 - e. Headers and girders in interior bearing walls support only floor loads (not roof loads).
9. Refer to Figures 10 through 17 on pages 2.9 and 2.10 for additional information.
10. Support for header and girder ends must provide a continuous load path from the bearing to the foundation.
11. Where the number of jack studs required to support the header/girder is not listed on Tables 2.2 and 2.3 (shaded areas of table), the structural elements supporting the header/girder must be designed in accordance with accepted engineering practice by a registered design professional.

TABLE 2.4: REACTIONS OF GIRDERS AND HEADERS IN EXTERIOR BEARING WALLS

ROOF LIVE LOAD = 20 PSF

(Reference: 2018 North Carolina Residential Code Section R502.5 and Table R602.7(1))

GIRDERS AND HEADERS SUPPORTING	GIRDER / HEADER SIZE	BUILDING WIDTH = 20 FT.			BUILDING WIDTH = 28 FT.			BUILDING WIDTH = 36 FT.		
		SPAN (FT.)	END REACTION (LB.)	NJ	SPAN (FT.)	END REACTION (LB.)	NJ	SPAN (FT.)	END REACTION (LB.)	NJ
ROOF AND CEILING (FIGURE 10)	1 - 2x8	4.500	810	1	3.833	920	1	3.417	1025	1
	1 - 2x10	5.667	1020	1	4.917	1180	1	4.333	1300	1
	1 - 2x12	6.917	1245	1	5.917	1420	2	5.250	1575	2
	2 - 2x4	3.500	630	1	3.167	760	1	2.833	850	1
	2 - 2x6	5.417	975	1	4.667	1120	1	4.167	1250	1
	2 - 2x8	6.833	1230	1	5.917	1420	2	5.333	1600	2
	2 - 2x10	8.417	1515	2	7.250	1740	2	6.500	1950	2
	2 - 2x12	9.750	1755	2	8.417	2020	2	7.500	2250	2
	3 - 2x8	8.333	1500	1	7.417	1780	1	6.667	2000	1
	3 - 2x10	10.500	1890	1	9.083	2180	2	8.167	2450	2
	3 - 2x12	12.167	2190	2	10.583	2540	2	9.417	2825	2
ROOF, CEILING AND ONE CENTER-BEARING FLOOR (FIGURE 11)	1 - 2x8	3.917	1308	1	3.417	1483	1	3.000	1602	1
	1 - 2x10	5.000	1670	2	4.333	1881	2	3.833	2047	2
	1 - 2x12	5.833	1948	2	4.750	2062	2	4.167	2225	2
	2 - 2x4	3.083	1030	1	2.750	1194	1	2.417	1291	1
	2 - 2x6	4.500	1503	1	4.000	1736	1	3.583	1913	2
	2 - 2x8	5.750	1921	2	5.000	2170	2	4.500	2403	2
	2 - 2x10	7.000	2338	2	6.167	2676	2	5.500	2937	2
	2 - 2x12	8.083	2700	2	7.083	3074	2	6.417	3427	2
	3 - 2x8	7.167	2394	1	6.250	2713	2	5.667	3026	2
	3 - 2x10	8.750	2923	2	7.667	3327	2	6.917	3694	2
	3 - 2x12	10.167	3396	2	8.917	3870	2	8.000	4272	2
ROOF, CEILING AND ONE CLEAR-SPAN FLOOR (FIGURE 12)	1 - 2x8	3.500	1519	1	3.000	1722	1	2.667	1904	1
	1 - 2x10	4.500	1953	1	3.833	2200	1	3.250	2321	1
	1 - 2x12	5.500	2387	1	4.167	2392	2	3.250	2321	2
	2 - 2x4	2.667	1157	1	2.333	1339	1	2.083	1487	1
	2 - 2x6	3.917	1700	1	3.417	1961	2	3.000	2142	2
	2 - 2x8	5.000	2170	2	4.333	2487	2	3.833	2737	2
	2 - 2x10	6.083	2640	2	5.250	3014	2	4.667	3332	2
	2 - 2x12	7.083	3074	2	6.083	3492	3	5.417	3868	3
	3 - 2x8	6.250	2713	2	5.417	3109	2	4.833	3451	2
	3 - 2x10	7.583	3291	2	6.583	3779	2	5.917	4225	2
	3 - 2x12	8.833	3834	2	7.667	4401	2	6.833	4879	2
ROOF, CEILING AND TWO CENTER-BEARING FLOORS (FIGURE 13)	2 - 2x4	2.583	1245	1	2.250	1400	1	2.000	1524	1
	2 - 2x6	3.750	1808	2	3.250	2022	2	2.917	2223	2
	2 - 2x8	4.750	2290	2	4.167	2592	2	3.750	2858	2
	2 - 2x10	5.750	2772	2	5.083	3162	2	4.583	3492	3
	2 - 2x12	6.667	3213	2	5.833	3628	3	5.250	4001	3
	3 - 2x8	5.917	2852	2	5.167	3214	2	4.667	3556	2
	3 - 2x10	7.250	3495	2	6.333	3939	2	5.667	4318	2
	3 - 2x12	8.417	4057	2	7.333	4561	2	6.583	5016	2
	4 - 2x8	6.833	3294	1	6.000	3732	2	5.417	4128	2
	4 - 2x10	8.333	4017	2	7.333	4561	2	6.583	5016	2
	4 - 2x12	9.667	4659	2	8.500	5287	2	7.667	5842	2
ROOF, CEILING AND TWO CLEAR-SPAN FLOORS (FIGURE 14)	2 - 2x4	2.083	1421	1	1.667	1504	1	1.500	1683	2
	2 - 2x6	3.083	2103	2	2.667	2406	2	2.333	2618	2
	2 - 2x8	3.833	2614	2	3.333	3006	2	3.000	3366	3
	2 - 2x10	4.750	3240	2	4.083	3683	3	3.667	4114	3
	2 - 2x12	5.500	3751	3	4.750	4285	3	4.250	4769	3
	3 - 2x8	4.833	3296	2	4.167	3759	2	3.750	4208	2
	3 - 2x10	5.917	4035	2	5.083	4585	2	4.583	5142	3
	3 - 2x12	6.833	4660	2	5.917	5337	3	5.333	5984	3
	4 - 2x8	5.583	3808	2	4.833	4359	2	4.333	4862	2
	4 - 2x10	6.833	4660	2	5.917	5337	2	5.250	5891	2
4 - 2x12	7.917	5399	2	6.833	6163	2	6.167	6919	3	

NOTES:

1. Refer to Table Notes on page 2.8 for additional information.
2. Refer to Figures 10 through 14 on page 2.9 for additional information.

TABLE 2.5: REACTIONS OF GIRDERS AND HEADERS IN INTERIOR BEARING WALLS

(Reference: 2018 North Carolina Residential Code Section R502.5 and Table R602.7(2))

GIRDERS AND HEADERS SUPPORTING	GIRDER / HEADER SIZE	BUILDING WIDTH = 20 FT.			BUILDING WIDTH = 28 FT.			BUILDING WIDTH = 36 FT.		
		SPAN (FT.)	END REACTION (LB.)	NJ	SPAN (FT.)	END REACTION (LB.)	NJ	SPAN (FT.)	END REACTION (LB.)	NJ
ONE FLOOR ONLY (FIGURE 15)	2 - 2x4	3.083	771	1	2.667	933	1	2.417	1088	1
	2 - 2x6	4.500	1125	1	3.917	1371	1	3.500	1575	1
	2 - 2x8	5.750	1438	1	5.000	1750	2	4.417	1988	2
	2 - 2x10	7.000	1750	2	6.083	2129	2	5.417	2438	2
	2 - 2x12	8.083	2021	2	7.000	2450	2	6.250	2813	2
	3 - 2x8	7.167	1792	1	6.250	2188	1	5.583	2512	2
	3 - 2x10	8.750	2188	1	7.583	2654	2	6.750	3038	2
	3 - 2x12	10.167	2542	2	8.833	3092	2	7.833	3525	2
	4 - 2x8	9.000	2250	1	7.667	2683	1	6.750	3038	1
4 - 2x10	10.083	2521	1	8.750	3063	1	7.833	3525	2	
4 - 2x12	11.750	2938	1	10.167	3558	2	9.083	4087	2	
TWO FLOORS (FIGURE 16)	2 - 2x4	2.167	1062	1	1.833	1228	1	1.583	1346	1
	2 - 2x6	3.167	1552	2	2.750	1843	2	2.417	2054	2
	2 - 2x8	4.083	2001	2	3.500	2345	2	3.167	2692	2
	2 - 2x10	4.917	2409	2	4.250	2848	2	3.833	3258	3
	2 - 2x12	5.750	2818	2	5.000	3350	3	4.417	3754	3
	3 - 2x8	5.083	2491	2	4.417	2959	2	3.917	3329	2
	3 - 2x10	6.167	3022	2	5.333	3573	2	4.833	4108	2
	3 - 2x12	7.167	3512	2	6.250	4188	2	5.417	4604	3
	4 - 2x8	6.083	2981	1	5.250	3518	2	4.667	3967	2
4 - 2x10	7.167	3512	2	6.167	4132	2	5.500	4675	2	
4 - 2x12	8.333	4083	2	7.167	4802	2	6.417	5454	2	

NOTES:

1. Refer to Table Notes on page 2.8 for additional information.
2. Refer to Figures 15 through 17 on page 2.10 for additional information.

TABLES 2.4 AND 2.5: REACTIONS OF GIRDERS AND HEADERS IN EXTERIOR AND INTERIOR BEARING WALLS

TABLE NOTES:

1. Tables 2.4 and 2.5 expand on the data presented in Table R602.7(1) and Table R602.7(2) of the 2018 North Carolina Residential Code to include the reactions of the headers/girders listed in the tables. The tabulated reactions are based on the design criteria and assumptions described in the following notes.
2. Tables 2.4 and 2.5 are for use with one- and two-family residential structures constructed in accordance with the 2018 North Carolina Residential Code (2015 International Residential Code with North Carolina amendments).
3. Tables 2.4 and 2.5 are for use with one- and two-family residential structures in Seismic Design Category A, B, or C.
4. NJ = Number of jack studs required to support each end of the header/girder.
5. Jack studs must be a minimum of 2x nominal thickness and have a width at least equal to the width of the wall studs. Wall stud heights shall be in accordance with Table R602.3(5).
6. Tabulated values assume #2 grade lumber and Douglas fir-larch, hem-fir, southern pine and/or spruce-pine-fir lumber species.
7. Tabulated reactions are derived from the minimum design loads specified in Section R301 of the 2018 North Carolina Residential Code.
8. The header/girder reactions tabulated in Tables 2.4 and 2.5 are based on the following design criteria and assumptions:
 - a. House with 2-foot roof overhang, both with and without a load-bearing center wall that carries half of the tributary floor framing, as indicated in the table headings. Width of house as indicated in the table headings.
 - b. Story heights:

i. First Story	10 feet
ii. Second Story	9 feet
iii. Third Story	8 feet
 - c. Design loads:

i. First Floor	50 psf (40 psf live load, 10 psf dead load)
ii. Second Floor	40 psf (30 psf live load, 10 psf dead load)
iii. Third Floor	40 psf (30 psf live load, 10 psf dead load)
iv. Roof	30 psf (20 psf live load, 10 psf dead load)
v. Exterior Wood-frame Wall	12 psf
vi. Interior Wood-frame Wall	8 psf
 - d. Habitable attics are considered a supported floor.
 - e. Headers and girders in interior bearing walls support only floor loads (not roof loads).
9. Refer to Figures 10 through 17 on pages 2.9 and 2.10 for additional information.

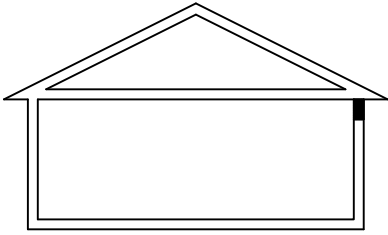


FIGURE 10: ROOF AND CEILING

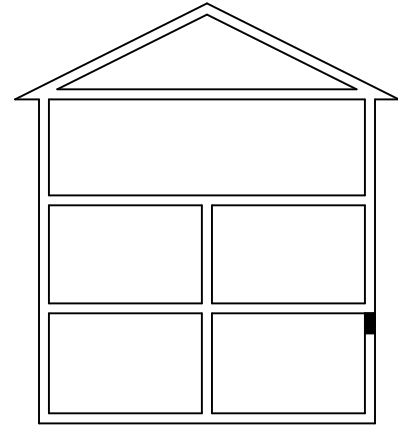


FIGURE 13: ROOF, CEILING AND TWO CENTER-BEARING FLOORS

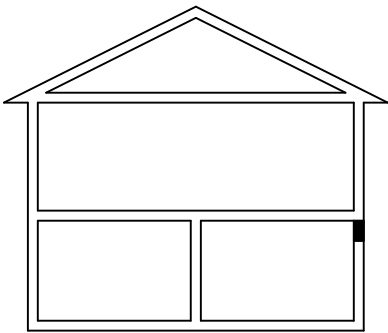


FIGURE 11: ROOF, CEILING AND ONE CENTER-BEARING FLOOR

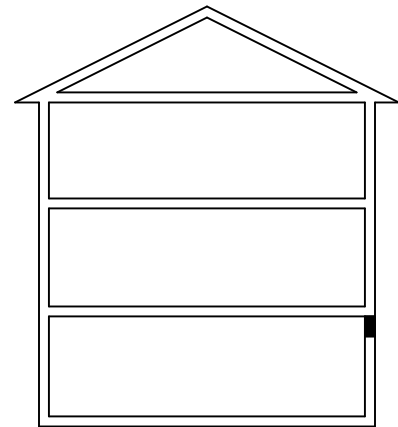


FIGURE 14: ROOF, CEILING AND TWO CLEAR-SPAN FLOORS

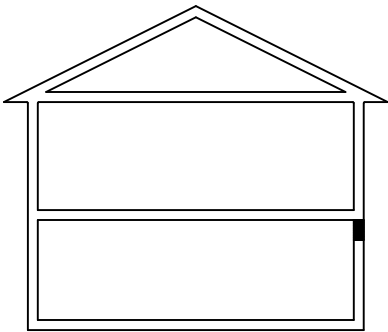


FIGURE 12: ROOF, CEILING AND ONE CLEAR-SPAN FLOOR

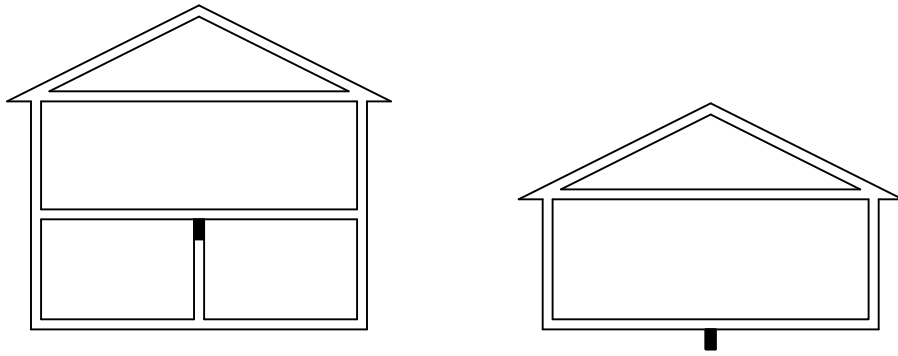


FIGURE 15: ONE FLOOR ONLY

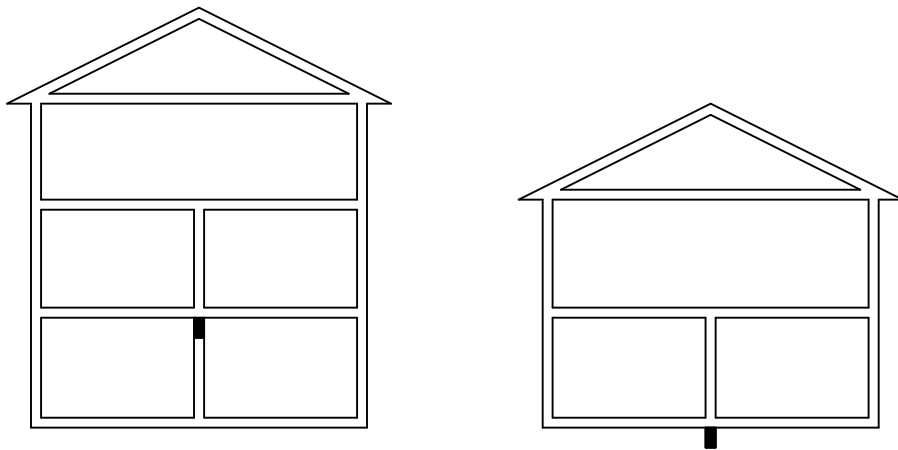


FIGURE 16: TWO FLOORS

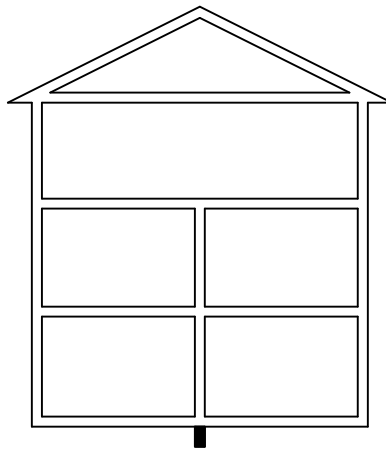


FIGURE 17: THREE FLOORS

BEAM TABLES

TABLE 3.1: WOOD BEAMS AND GIRDERS ALLOWABLE LOADS AND CORRESPONDING REACTIONS

(Reference: 2018 North Carolina Residential Code Table W-1)

2x8 (1-1/2" x 7-1/4")												
BEAM / GIRDER SPAN, L (FT.)	SPRUCE-PINE-FIR						SOUTHERN PINE					
	2-PLY		3-PLY		4-PLY		2-PLY		3-PLY		4-PLY	
	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)
3	1305	1958	1956	2934	2610	3915	1692	2538	2538	3807	3383	5075
4	979	1958	1468	2936	1958	3916	1013	2026	1519	3038	2026	4052
5	736	1840	1104	2760	1472	3680	648	1620	972	2430	1296	3240
6	511	1533	767	2301	1022	3066	450	1350	675	2025	900	2700
7	375	1313	563	1971	751	2629	331	1159	496	1736	661	2314
8	287	1148	431	1724	575	2300	253	1012	380	1520	506	2024
9	227	1022	341	1535	454	2043	200	900	300	1350	400	1800
10	184	920	276	1380	368	1840	162	810	243	1215	324	1620
12	114	684	172	1032	228	1368	113	678	169	1014	225	1350
14	72	504	108	756	144	1008	72	504	108	756	144	1008
2x10 (1-1/2" x 9-1/4")												
BEAM / GIRDER SPAN, L (FT.)	SPRUCE-PINE-FIR						SOUTHERN PINE					
	2-PLY		3-PLY		4-PLY		2-PLY		3-PLY		4-PLY	
	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)
3	1665	2498	2498	3747	3330	4995	2158	3237	3238	4857	4317	6476
4	1249	2498	1873	3746	2498	4996	1426	2852	2139	4278	2852	5704
5	999	2498	1499	3748	1998	4995	913	2283	1369	3423	1825	4563
6	763	2289	1144	3432	1525	4575	634	1902	951	2853	1268	3804
7	560	1960	840	2940	1120	3920	466	1631	698	2443	931	3259
8	429	1716	643	2572	858	3432	357	1428	535	2140	713	2852
9	339	1526	508	2286	678	3051	282	1269	423	1904	563	2534
10	275	1375	412	2060	549	2745	228	1140	342	1710	456	2280
12	191	1146	286	1716	381	2286	158	948	238	1428	317	1902
14	140	980	210	1470	280	1960	116	812	175	1225	233	1631
2x12 (1-1/2" x 11-1/4")												
BEAM / GIRDER SPAN, L (FT.)	SPRUCE-PINE-FIR						SOUTHERN PINE					
	2-PLY		3-PLY		4-PLY		2-PLY		3-PLY		4-PLY	
	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)
3	2025	3038	3038	4557	4050	6075	2625	3938	3938	5907	5250	7875
4	1519	3038	2278	4556	3038	6076	1969	3938	2953	5906	3938	7876
5	1215	3038	1823	4558	2430	6075	1266	3165	1898	4745	2531	6328
6	1013	3039	1519	4557	2025	6075	879	2637	1318	3954	1756	5268
7	753	2636	1130	3955	1507	5275	646	2261	969	3392	1291	4519
8	577	2308	856	3424	1154	4616	494	1976	742	2968	989	3956
9	456	2052	684	3078	911	4100	391	1760	586	2637	781	3515
10	369	1845	554	2770	738	3690	316	1580	475	2375	633	3165
12	256	1536	385	2310	513	3078	220	1320	330	1980	439	2634
14	188	1316	283	1981	377	2639	161	1127	242	1694	323	2261

NOTES:

1. Refer to Table Notes on page 3.2 for additional information.

TABLE 3.1: WOOD BEAMS AND GIRDERS ALLOWABLE LOADS AND CORRESPONDING REACTIONS

TABLE NOTES:

1. Table 3.1 expands on the data presented in Table W-1 of the 2018 North Carolina Residential Code to include the reactions of the beams and girders for the spans and loads listed in the table. The tabulated reactions were determined by multiplying the span by the corresponding allowable load and dividing by 2.
2. Table 3.1 is for use with one- and two-family residential structures constructed in accordance with the 2018 North Carolina Residential Code (2015 International Residential Code with North Carolina amendments).
3. Table 3.1 is for use with one- and two-family residential structures in Seismic Design Category A, B, or C.
4. Lumber grade is #2 intended for an in-service moisture content of 19% or less.
5. Deflection is limited to $L/360$.
6. Load duration factor used in calculations is 1.0.
7. Adequate bearing and lateral support for the member must be provided. Support for the member ends must provide a continuous load path from the bearing to the foundation.
8. Values tabulated are for spruce-pine-fir, not spruce-pine-fir (south). Values tabulated for southern pine are based on design values published by the American Wood Council in an addendum to NDS dated March 2013.
9. Span, L , is clear span. Effective span for bending and deflection is clear span plus 3 inches.
10. For beam and girder loads and/or spans greater than the tabulated values, the beam or girder must be designed in accordance with accepted engineering practice by a registered design professional.

TABLE 3.2: FLITCH PLATE BEAMS ALLOWABLE LOADS AND CORRESPONDING REACTIONS
(Reference: 2018 North Carolina Residential Code Table W-2)

(2) 2x6 WITH PLATE INDICATED										
PLATE SIZE / (BEAM WEIGHT PER FOOT)										
BEAM SPAN, L (FT.)	1/4" x 5" PLATE (8 PLF)		3/8" x 5" PLATE (10 PLF)		1/2" x 5" PLATE (13 PLF)		5/8" x 5" PLATE (15 PLF)		3/4" x 5" PLATE (17 PLF)	
	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)
6	643	1929	825	2475	1006	3018	1188	3564	1370	4110
7	473	1656	606	2121	739	2587	873	3056	1006	3521
8	362	1448	464	1856	566	2264	668	2672	771	3084
9	272	1224	348	1566	425	1913	502	2259	579	2606
10	198	990	254	1270	310	1550	366	1830	422	2110
11	149	820	191	1051	233	1282	275	1513	317	1744
12	115	690	147	882	179	1074	212	1272	244	1464
(2) 2x8 WITH PLATE INDICATED										
PLATE SIZE / (BEAM WEIGHT PER FOOT)										
BEAM SPAN, L (FT.)	1/4" x 7" PLATE (11 PLF)		3/8" x 7" PLATE (14 PLF)		1/2" x 7" PLATE (17 PLF)		5/8" x 7" PLATE (20 PLF)		3/4" x 7" PLATE (23 PLF)	
	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)
6	1150	3450	1499	4497	1849	5547	2199	6597	2549	7647
7	845	2958	1102	3857	1359	4757	1615	5653	1872	6552
8	647	2588	843	3372	1040	4160	1237	4948	1434	5736
9	511	2300	666	2997	822	3699	977	4397	1133	5099
10	414	2070	540	2700	666	3330	792	3960	917	4585
11	342	4372	446	6556	550	8743	654	4991	758	7487
12	287	3996	375	5996	462	7992	550	3652	637	5476
13	230	3434	300	5148	369	6863	439	2853	509	4280
14	184	2800	240	4200	296	5600	352	2330	408	3490
15	150	1125	195	1463	240	1800	286	2145	331	2483
16	123	984	161	1288	198	1584	236	1888	273	2184
(2) 2x10 WITH PLATE INDICATED										
PLATE SIZE / (BEAM WEIGHT PER FOOT)										
BEAM SPAN, L (FT.)	1/4" x 9" PLATE (14 PLF)		3/8" x 9" PLATE (18 PLF)		1/2" x 9" PLATE (22 PLF)		5/8" x 9" PLATE (26 PLF)		3/4" x 9" PLATE (30 PLF)	
	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)
6	1642	4926	2145	6435	2649	7947	3153	9459	3657	10971
7	1206	4221	1576	5516	1946	6811	2317	8110	2687	9405
8	923	3692	1207	4828	1490	5960	1774	7096	2057	8228
9	730	3285	954	4293	1177	5297	1401	6305	1625	7313
10	591	2955	772	3860	954	4770	1135	5675	1317	6585
11	488	6075	638	9114	788	12150	938	7875	1088	11814
12	410	5317	536	7973	662	10633	788	6892	914	10336
13	350	4860	457	7292	564	9720	672	5064	779	7592
14	302	4559	394	6836	487	9113	579	3956	672	5931
15	263	3765	343	5650	424	7535	504	3230	585	4845
16	231	6075	302	9114	373	12150	443	7875	514	11814
17	204	5317	267	7973	330	10633	393	6892	456	10336
18	182	4860	238	7292	294	9720	350	5064	406	7592
19	155	1473	203	1929	250	2375	298	2831	345	3278
20	133	1330	174	1740	214	2140	255	2550	296	2960
(2) 2x12 WITH PLATE INDICATED										
PLATE SIZE / (BEAM WEIGHT PER FOOT)										
BEAM SPAN, L (FT.)	1/4" x 11" PLATE (18 PLF)		3/8" x 11" PLATE (22 PLF)		1/2" x 11" PLATE (27 PLF)		5/8" x 11" PLATE (32 PLF)		3/4" x 11" PLATE (36 PLF)	
	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)	LOAD (PLF)	END REACTION (LB.)
6	2297	6891	3006	9018	3715	11145	4425	13275	5134	15402
7	1688	5908	2209	7732	2730	9555	3251	11379	3772	13202
8	1292	5168	1691	6764	2090	8360	2489	9956	2888	11552
9	1021	4595	1336	6012	1651	7430	1966	8847	2282	10269
10	827	4135	1082	5410	1338	6690	1593	7965	1848	9240
11	683	6075	894	9114	1105	12150	1316	7875	1527	11814
12	574	5317	752	7973	929	10633	1106	6892	1283	10336
13	489	4860	640	7292	791	9720	943	5064	1094	7592
14	422	4559	552	6836	682	9113	813	3956	943	5931
15	367	3765	481	5650	594	7535	708	3230	821	4845
16	323	2584	423	3384	522	4176	622	4976	722	5776
17	286	2431	374	3179	463	3936	551	4684	639	5432
18	255	2295	334	3006	413	3717	492	4428	570	5130
19	229	6075	300	9114	371	12150	441	7875	512	11814
20	207	5317	271	7973	334	10633	398	6892	462	10336
21	188	4860	245	7292	303	9720	361	5064	419	7592
22	171	4559	224	6836	276	9113	329	3956	382	5931
23	156	3765	205	5650	253	7535	301	3230	349	4845
24	140	1680	183	2196	226	2712	269	3228	312	3744

NOTES:

1. Refer to Table Notes on page 3.4 for additional information.

TABLE 3.2: FLITCH PLATE BEAMS ALLOWABLE LOADS AND CORRESPONDING REACTIONS

TABLE NOTES:

1. Table 3.2 expands on the data presented in Table W-2 of the 2018 North Carolina Residential Code to include the reactions of the beams for the spans and loads listed in the table. The tabulated reactions were determined by multiplying the span by the corresponding allowable load and dividing by 2.
2. Table 3.2 is for use with one- and two-family residential structures constructed in accordance with the 2018 North Carolina Residential Code (2015 International Residential Code with North Carolina amendments).
3. Table 3.2 is for use with one- and two-family residential structures in Seismic Design Category A, B, or C.
4. Lumber species and grade is #2 southern pine or #2 spruce-pine-fir intended for an in-service moisture content of 19% or less.
5. Southern pine lumber design values were published by the American Wood Council in an addendum to NDS dated March 2013.
6. Tabulated values are based on ASTM A36 structural steel plate.
7. Deflection is limited to $L/360$.
8. Load duration factor used in calculations is 1.0.
9. Adequate bearing and lateral support for the member must be provided. Support for the member ends must provide a continuous load path from the bearing to the foundation.
10. Wood side plates and steel flitch plates shall be continuous throughout the span.
11. Span, L , is center-to-center of supports.
12. For beam and girder loads and/or spans greater than the tabulated values, the beam or girder must be designed in accordance with accepted engineering practice by a registered design professional.