

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

50 PSF ROOF SNOW 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 snow load of 50 psf. Table packages are also available for roof snow loads of 20 psf, 30 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 snow load is 50 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 32-inch-wide by 10-inch-thick continuous footing is required to support the header reactions (Maximum Column Load = 9467 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 snow load is 50 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 8496 pounds (refer to Figure 13, *Roof, Ceiling, and Two Center-Bearing Floors*) and that 4 (four) jack studs are required for a 6-inch-thick header. Table 1.1 indicates that a 32-inch-wide by 12-inch-thick continuous footing is required to support the header reactions (Maximum Column Load = 11,208 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 SNOW LOAD = 50 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	1490	5379	8691	12004						
	10	1490	5503	8964	12425	15886					
	12	1490	5604	9208	12813	16417	20021				
	14	1490	5684	9425	13167	16908	20650	24391			
	16	1490	5741	9614	13488	17361	21234	25108	28981		
	18	1490	5776	9775	13775	17775	21774	25774	29773	33773	
20	1490	5789	9909	14029	18149	22270	26390	30510	34631	38751	
ROOF, CEILING AND ONE CENTER-BEARING FLOOR (FIGURE 2)	8	1940	2866	6179	9492						
	10	1940	2840	6301	9763	13224					
	12	1940	2792	6396	10000	13604	17208				
	14	1940	2721	6463	10204	13946	17687	21429			
	16	1940	2628	6502	10375	14248	18122	21995	25868		
	18	1940	2513	6513	10513	14512	18512	22511	26511	30510	
20	1940	2376	6496	10617	14737	18857	22978	27098	31218	35338	
ROOF, CEILING AND ONE CLEAR-SPAN FLOOR (FIGURE 3)	8	2390	354	3666	6979						
	10	2390	178	3639	7100	10561					
	12	2390	-	3583	7188	10792	14396				
	14	2390	-	3500	7242	10983	14725	18466			
	16	2390	-	3389	7263	11136	15009	18883	22756		
	18	2390	-	3250	7250	11250	15249	19249	23248	27248	
20	2390	-	3084	7204	11324	15445	19565	23685	27806	31926	
ROOF, CEILING AND TWO CENTER-BEARING FLOORS (FIGURE 4)	8	2420	186	3499	6812						
	10	2420	0	3461	6923	10384					
	12	2420	-	3396	7000	10604	14208				
	14	2420	-	3303	7044	10786	14527	18269			
	16	2420	-	3182	7055	10928	14802	18675	22548		
	18	2420	-	3033	7033	11032	15032	19031	23031	27030	
20	2420	-	2856	6977	11097	15217	19338	23458	27578	31698	
ROOF, CEILING AND TWO CLEAR-SPAN FLOORS (FIGURE 5)	8	3230	-	-	2289						
	10	3230	-	-	2130	5591					
	12	3230	-	-	1938	5542	9146				
	14	3230	-	-	1712	5453	9195	12936			
	16	3230	-	-	1453	5326	9199	13073	16946		
	18	3230	-	-	1160	5160	9159	13159	17158	21158	
20	3230	-	-	834	4954	9075	13195	17315	21436	25556	
ROOF, CEILING AND THREE CENTER-BEARING FLOORS (FIGURE 6)	8	2900	-	819	4132						
	10	2900	-	621	4083	7544					
	12	2900	-	396	4000	7604	11208				
	14	2900	-	143	3884	7626	11367	15109			
	16	2900	-	-	3735	7608	11482	15355	19228		
	18	2900	-	-	3553	7552	11552	15551	19551	23550	
20	2900	-	-	3337	7457	11577	15698	19818	23938	28058	
ROOF, CEILING AND THREE CLEAR-SPAN FLOORS (FIGURE 7)	8	4070	-	-	-						
	10	4070	-	-	-	621					
	12	4070	-	-	-	292	3896				
	14	4070	-	-	-	-	3665	7406			
	16	4070	-	-	-	-	3389	7263	11136		
	18	4070	-	-	-	-	3069	7069	11068	15068	
20	4070	-	-	-	-	2705	6825	10945	15066	19186	

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 SNOW LOAD = 50 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	1490	12823	17997	23171						
	10	1490	13391	18825	24258	29692					
	12	1490	13938	19625	25313	31000	36688				
	14	1490	14461	20397	26333	32269	38205	44141			
	16	1490	14963	21142	27321	33500	39679	45858	52036		
	18	1490	15443	21859	28275	34691	41108	47524	53940	60356	
20	1490	15900	22548	29196	35844	42492	49140	55788	62436	69084	
ROOF, CEILING AND ONE CENTER-BEARING FLOOR (FIGURE 2)	8	1940	10311	15484	20658						
	10	1940	10729	16162	21596	27029					
	12	1940	11125	16813	22500	28188	33875				
	14	1940	11499	17435	23371	29307	35243	41179			
	16	1940	11851	18029	24208	30387	36566	42745	48924		
	18	1940	12180	18596	25013	31429	37845	44261	50678	57094	
20	1940	12487	19135	25783	32431	39079	45728	52376	59024	65672	
ROOF, CEILING AND ONE CLEAR-SPAN FLOOR (FIGURE 3)	8	2390	7798	12972	18146						
	10	2390	8066	13500	18933	24367					
	12	2390	8313	14000	19688	25375	31063				
	14	2390	8536	14472	20408	26344	32280	38216			
	16	2390	8738	14917	21096	27275	33454	39633	45811		
	18	2390	8918	15334	21750	28166	34583	40999	47415	53831	
20	2390	9075	15723	22371	29019	35667	42315	48963	55611	62259	
ROOF, CEILING AND TWO CENTER-BEARING FLOORS (FIGURE 4)	8	2420	7631	12804	17978						
	10	2420	7889	13322	18756	24189					
	12	2420	8125	13813	19500	25188	30875				
	14	2420	8339	14275	20211	26147	32083	38019			
	16	2420	8531	14709	20888	27067	33246	39425	45604		
	18	2420	8700	15116	21533	27949	34365	40781	47198	53614	
20	2420	8847	15495	22143	28791	35439	42088	48736	55384	62032	
ROOF, CEILING AND TWO CLEAR-SPAN FLOORS (FIGURE 5)	8	3230	3108	8282	13456						
	10	3230	3096	8530	13963	19397					
	12	3230	3063	8750	14438	20125	25813				
	14	3230	3006	8942	14878	20814	26750	32686			
	16	3230	2928	9107	15286	21465	27644	33823	40001		
	18	3230	2828	9244	15660	22076	28493	34909	41325	47741	
20	3230	2705	9353	16001	22649	29297	35945	42593	49241	55889	
ROOF, CEILING AND THREE CENTER-BEARING FLOORS (FIGURE 6)	8	2900	4951	10124	15298						
	10	2900	5049	10482	15916	21349					
	12	2900	5125	10813	16500	22188	27875				
	14	2900	5179	11115	17051	22987	28923	34859			
	16	2900	5211	11389	17568	23747	29926	36105	42284		
	18	2900	5220	11636	18053	24469	30885	37301	43718	50134	
20	2900	5207	11855	18503	25151	31799	38448	45096	51744	58392	
ROOF, CEILING AND THREE CLEAR-SPAN FLOORS (FIGURE 7)	8	4070	-	3592	8766						
	10	4070	-	3560	8993	14427					
	12	4070	-	3500	9188	14875	20563				
	14	4070	-	3412	9348	15284	21220	27156			
	16	4070	-	3297	9476	15655	21834	28013	34191		
	18	4070	-	3154	9570	15986	22403	28819	35235	41651	
20	4070	-	2983	9631	16279	22927	29575	36223	42871	49519	

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 SNOW LOAD = 50 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	1490	20268	27303	34338						
	10	1490	21280	28686	36092	43497					
	12	1490	22271	30042	37813	45583	53354				
	14	1490	23239	31370	39500	47630	55761	63891			
	16	1490	24185	32670	41154	49639	58123	66608	75092		
	18	1490	25109	33942	42775	51608	60441	69274	78107	86940	
	20	1490	26011	35187	44363	53538	62714	71890	81066	90242	99418
ROOF, CEILING AND ONE CENTER-BEARING FLOOR (FIGURE 2)	8	1940	17755	24790	31825						
	10	1940	18618	26023	33429	40835					
	12	1940	19458	27229	35000	42771	50542				
	14	1940	20277	28407	36538	44668	52798	60929			
	16	1940	21073	29557	38042	46526	55011	63495	71979		
	18	1940	21847	30680	39513	48345	57178	66011	74844	83677	
	20	1940	22598	31774	40950	50126	59302	68478	77653	86829	96005
ROOF, CEILING AND ONE CLEAR-SPAN FLOOR (FIGURE 3)	8	2390	15243	22278	29313						
	10	2390	15955	23361	30767	38172					
	12	2390	16646	24417	32188	39958	47729				
	14	2390	17314	25445	33575	41705	49836	57966			
	16	2390	17960	26445	34929	43414	51898	60383	68867		
	18	2390	18584	27417	36250	45083	53916	62749	71582	80415	
	20	2390	19186	28362	37538	46713	55889	65065	74241	83417	92593
ROOF, CEILING AND TWO CENTER-BEARING FLOORS (FIGURE 4)	8	2420	15075	22110	29145						
	10	2420	15778	23183	30589	37995					
	12	2420	16458	24229	32000	39771	47542				
	14	2420	17117	25247	33378	41508	49638	57769			
	16	2420	17753	26237	34722	43206	51691	60175	68659		
	18	2420	18367	27200	36033	44865	53698	62531	71364	80197	
	20	2420	18958	28134	37310	46486	55662	64838	74013	83189	92365
ROOF, CEILING AND TWO CLEAR-SPAN FLOORS (FIGURE 5)	8	3230	10553	17588	24623						
	10	3230	10985	18391	25797	33202					
	12	3230	11396	19167	26938	34708	42479				
	14	3230	11784	19915	28045	36175	44306	52436			
	16	3230	12150	20635	29119	37604	46088	54573	63057		
	18	3230	12494	21327	30160	38993	47826	56659	65492	74325	
	20	3230	12816	21992	31168	40343	49519	58695	67871	77047	86223
ROOF, CEILING AND THREE CENTER-BEARING FLOORS (FIGURE 6)	8	2900	12395	19430	26465						
	10	2900	12938	20343	27749	35155					
	12	2900	13458	21229	29000	36771	44542				
	14	2900	13957	22087	30218	38348	46478	54609			
	16	2900	14433	22917	31402	39886	48371	56855	65339		
	18	2900	14887	23720	32553	41385	50218	59051	67884	76717	
	20	2900	15318	24494	33670	42846	52022	61198	70373	79549	88725
ROOF, CEILING AND THREE CLEAR-SPAN FLOORS (FIGURE 7)	8	4070	5863	12898	19933						
	10	4070	6015	13421	20827	28232					
	12	4070	6146	13917	21688	29458	37229				
	14	4070	6254	14385	22515	30645	38776	46906			
	16	4070	6340	14825	23309	31794	40278	48763	57247		
	18	4070	6404	15237	24070	32903	41736	50569	59402	68235	
	20	4070	6446	15622	24798	33973	43149	52325	61501	70677	79853

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 SNOW LOAD = 50 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	1910	3257	6570	9883	13195					
	10	1910	3254	6715	10177	13638	17099				
	12	1910	3229	6833	10438	14042	17646	21250			
	14	1910	3182	6923	10665	14407	18148	21890	25631		
	16	1910	3113	6986	10859	14733	18606	22479	26353	30226	
	18	1910	3021	7020	11020	15020	19019	23019	27018	31018	35018
20	1910	2907	7027	11148	15268	19388	23508	27629	31749	35869	
ROOF, CEILING AND ONE CENTER-BEARING FLOOR (FIGURE 2)	8	2360	744	4057	7370	10683					
	10	2360	592	4053	7514	10975	14437				
	12	2360	417	4021	7625	11229	14833	18438			
	14	2360	219	3961	7703	11444	15186	18927	22669		
	16	2360	-	3873	7747	11620	15493	19367	23240	27113	
	18	2360	-	3758	7758	11757	15757	19756	23756	27755	31755
20	2360	-	3615	7735	11855	15976	20096	24216	28336	32457	
ROOF, CEILING AND ONE CLEAR-SPAN FLOOR (FIGURE 3)	8	2810	-	1545	4858	8170					
	10	2810	-	1390	4852	8313	11774				
	12	2810	-	1208	4813	8417	12021	15625			
	14	2810	-	998	4740	8482	12223	15965	19706		
	16	2810	-	761	4634	8508	12381	16254	20128	24001	
	18	2810	-	495	4495	8495	12494	16494	20493	24493	28493
20	2810	-	202	4323	8443	12563	16683	20804	24924	29044	
ROOF, CEILING AND TWO CENTER-BEARING FLOORS (FIGURE 4)	8	3200	-	-	2680	5993					
	10	3200	-	-	2544	6005	9467				
	12	3200	-	-	2375	5979	9583	13188			
	14	3200	-	-	2173	5914	9656	13397	17139		
	16	3200	-	-	1937	5810	9683	13557	17430	21303	
	18	3200	-	-	1668	5667	9667	13666	17666	21665	25665
20	3200	-	-	1365	5485	9606	13726	17846	21966	26087	
ROOF, CEILING AND TWO CLEAR-SPAN FLOORS (FIGURE 5)	8	4010	-	-	-	1470					
	10	4010	-	-	-	1213	4674				
	12	4010	-	-	-	917	4521	8125			
	14	4010	-	-	-	582	4323	8065	11806		
	16	4010	-	-	-	207	4081	7954	11828	15701	
	18	4010	-	-	-	-	3794	7794	11793	15793	19793
20	4010	-	-	-	-	3463	7583	11704	15824	19944	
ROOF, CEILING AND THREE CENTER-BEARING FLOORS (FIGURE 6)	8	4040	-	-	-	1303					
	10	4040	-	-	-	1035	4497				
	12	4040	-	-	-	729	4333	7938			
	14	4040	-	-	-	384	4126	7867	11609		
	16	4040	-	-	-	-	3873	7747	11620	15493	
	18	4040	-	-	-	-	3577	7576	11576	15575	19575
20	4040	-	-	-	-	3236	7356	11476	15596	19717	
ROOF, CEILING AND THREE CLEAR-SPAN FLOORS (FIGURE 7)	8	5210	-	-	-	-					
	10	5210	-	-	-	-					
	12	5210	-	-	-	-		625			
	14	5210	-	-	-	-		165	3906		
	16	5210	-	-	-	-		-	3528	7401	
	18	5210	-	-	-	-		-	3093	7093	11093
20	5210	-	-	-	-		-	2604	6724	10844	

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 SNOW LOAD = 50 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	1910	10701	15875	21049	26223					
	10	1910	11143	16577	22010	27443	32877				
	12	1910	11563	17250	22938	28625	34313	40000			
	14	1910	11960	17896	23832	29768	35704	41640	47576		
	16	1910	12335	18514	24693	30871	37050	43229	49408	55587	
	18	1910	12688	19104	25520	31936	38353	44769	51185	57601	64018
	20	1910	13018	19666	26314	32962	39610	46258	52906	59554	66203
ROOF, CEILING AND ONE CENTER-BEARING FLOOR (FIGURE 2)	8	2360	8189	13363	18537	23711					
	10	2360	8481	13914	19348	24781	30214				
	12	2360	8750	14438	20125	25813	31500	37188			
	14	2360	8997	14933	20869	26805	32741	38677	44613		
	16	2360	9222	15401	21580	27759	33938	40117	46296	52474	
	18	2360	9425	15841	22258	28674	35090	41506	47923	54339	60755
	20	2360	9606	16254	22902	29550	36198	42846	49494	56142	62790
ROOF, CEILING AND ONE CLEAR-SPAN FLOOR (FIGURE 3)	8	2810	5676	10850	16024	21198					
	10	2810	5818	11252	16685	22118	27552				
	12	2810	5938	11625	17313	23000	28688	34375			
	14	2810	6035	11971	17907	23843	29779	35715	41651		
	16	2810	6110	12289	18468	24646	30825	37004	43183	49362	
	18	2810	6163	12579	18995	25411	31828	38244	44660	51076	57493
	20	2810	6193	12841	19489	26137	32785	39433	46081	52729	59378
ROOF, CEILING AND TWO CENTER-BEARING FLOORS (FIGURE 4)	8	3200	3499	8673	13847	19021					
	10	3200	3511	8944	14378	19811	25244				
	12	3200	3500	9188	14875	20563	26250	31938			
	14	3200	3467	9403	15339	21275	27211	33147	39083		
	16	3200	3412	9591	15770	21949	28128	34307	40486	46664	
	18	3200	3335	9751	16168	22584	29000	35416	41833	48249	54665
	20	3200	3236	9884	16532	23180	29828	36476	43124	49772	56420
ROOF, CEILING AND TWO CLEAR-SPAN FLOORS (FIGURE 5)	8	4010	-	4150	9324	14498					
	10	4010	-	4152	9585	15018	20452				
	12	4010	-	4125	9813	15500	21188	26875			
	14	4010	-	4071	10007	15943	21879	27815	33751		
	16	4010	-	3989	10168	16346	22525	28704	34883	41062	
	18	4010	-	3879	10295	16711	23128	29544	35960	42376	48793
	20	4010	-	3741	10389	17037	23685	30333	36981	43629	50278
ROOF, CEILING AND THREE CENTER-BEARING FLOORS (FIGURE 6)	8	4040	-	3983	9157	14331					
	10	4040	-	3974	9408	14841	20274				
	12	4040	-	3938	9625	15313	21000	26688			
	14	4040	-	3873	9809	15745	21681	27617	33553		
	16	4040	-	3781	9960	16139	22318	28497	34676	40854	
	18	4040	-	3661	10078	16494	22910	29326	35743	42159	48575
	20	4040	-	3514	10162	16810	23458	30106	36754	43402	50050
ROOF, CEILING AND THREE CLEAR-SPAN FLOORS (FIGURE 7)	8	5210	-	-	2624	7798					
	10	5210	-	-	2485	7918	13352				
	12	5210	-	-	2313	8000	13688	19375			
	14	5210	-	-	2107	8043	13979	19915	25851		
	16	5210	-	-	1868	8046	14225	20404	26583	32762	
	18	5210	-	-	1595	8011	14428	20844	27260	33676	40093
	20	5210	-	-	1289	7937	14585	21233	27881	34529	41178

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 SNOW LOAD = 50 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	1910	18146	25628	32216	39251					
	10	1910	19032	26438	33843	41249	48655				
	12	1910	19896	27667	35438	43208	50979	58750			
	14	1910	20738	28868	36998	45129	53259	61390	69520		
	16	1910	21557	30041	38526	47010	55495	63979	72464	80948	
	18	1910	22354	31187	40020	48853	57686	66519	75352	84185	93018
ROOF, CEILING AND ONE CENTER-BEARING FLOOR (FIGURE 2)	8	2360	15633	22668	29703	36738					
	10	2360	16369	23775	31181	38587	45992				
	12	2360	17083	24854	32625	40396	48167	55938			
	14	2360	17775	25905	34036	42166	50297	58427	66558		
	16	2360	18444	26929	35413	43898	52382	60867	69351	77836	
	18	2360	19092	27925	36758	45590	54423	63256	72089	80922	89755
ROOF, CEILING AND ONE CLEAR-SPAN FLOOR (FIGURE 3)	8	2810	13121	20156	27191	34226					
	10	2810	13707	21113	28518	35924	43330				
	12	2810	14271	22042	29813	37583	45354	53125			
	14	2810	14813	22943	31073	39204	47334	55465	63595		
	16	2810	15332	23816	32301	40785	49270	57754	66239	74723	
	18	2810	15829	24662	33495	42328	51161	59994	68827	77660	86493
ROOF, CEILING AND TWO CENTER-BEARING FLOORS (FIGURE 4)	8	3200	10943	17978	25013	32048					
	10	3200	11399	18805	26211	33617	41022				
	12	3200	11833	19604	27375	35146	42917	50688			
	14	3200	12245	20375	28506	36636	44767	52897	61028		
	16	3200	12634	21119	29603	38088	46572	55057	63541	72026	
	18	3200	13002	21835	30668	39500	48333	57166	65999	74832	83665
ROOF, CEILING AND TWO CLEAR-SPAN FLOORS (FIGURE 5)	8	4010	6421	13456	20491	27526					
	10	4010	6607	14013	21418	28824	36230				
	12	4010	6771	14542	22313	30083	37854	45625			
	14	4010	6913	15043	23173	31304	39434	47565	55695		
	16	4010	7032	15516	24001	32485	40970	49454	57939	66423	
	18	4010	7129	15962	24795	33628	42461	51294	60127	68960	77793
ROOF, CEILING AND THREE CENTER-BEARING FLOORS (FIGURE 6)	8	4040	6253	13288	20323	27358					
	10	4040	6429	13835	21241	28647	36052				
	12	4040	6583	14354	22125	29896	37667	45438			
	14	4040	6715	14845	22976	31106	39237	47367	55498		
	16	4040	6824	15309	23793	32278	40762	49247	57731	66216	
	18	4040	6912	15745	24578	33410	42243	51076	59909	68742	77575
ROOF, CEILING AND THREE CLEAR-SPAN FLOORS (FIGURE 7)	8	5210	-	6756	13791	20826					
	10	5210	-	6913	14318	21724	29130				
	12	5210	-	7042	14813	22583	30354	38125			
	14	5210	-	7143	15273	23404	31534	39665	47795		
	16	5210	-	7216	15701	24185	32670	41154	49639	58123	
	18	5210	-	7262	16095	24928	33761	42594	51427	60260	69093
	20	5210	-	7280	16456	25632	34808	43983	53159	62335	71511

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	70 psf (50 psf snow 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)

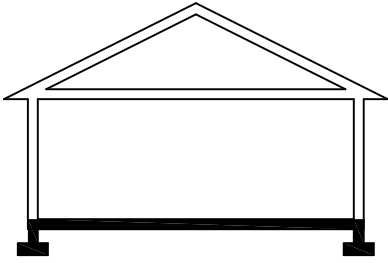


FIGURE 1: ROOF AND CEILING OVER SLAB-ON-GRADE

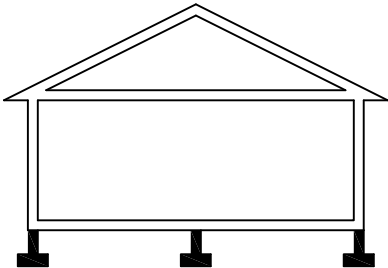


FIGURE 2: ROOF, CEILING AND ONE CENTER-BEARING FLOOR

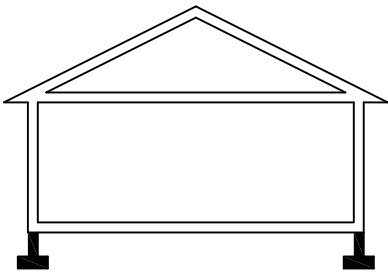


FIGURE 3: ROOF, CEILING AND ONE CLEAR-SPAN FLOOR

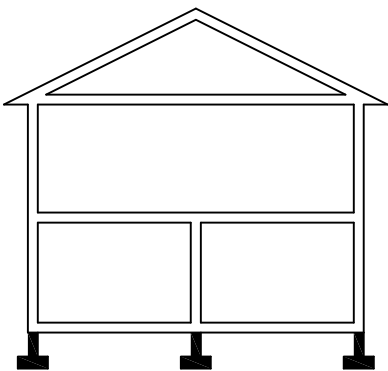


FIGURE 4: ROOF, CEILING AND TWO CENTER-BEARING FLOORS

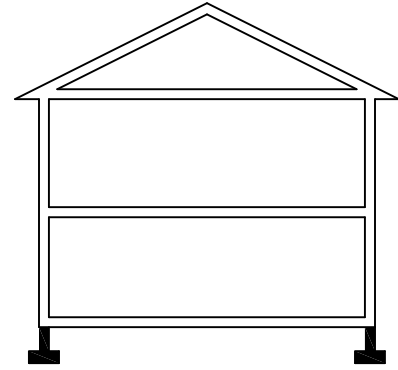


FIGURE 5: ROOF, CEILING AND TWO CLEAR-SPAN FLOORS

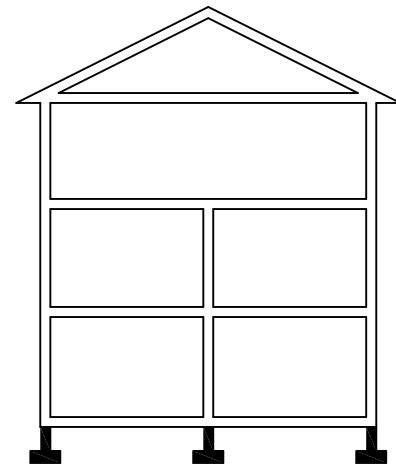


FIGURE 6: ROOF, CEILING AND THREE CENTER-BEARING FLOORS

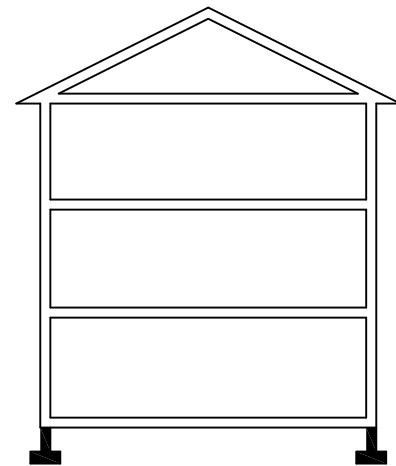
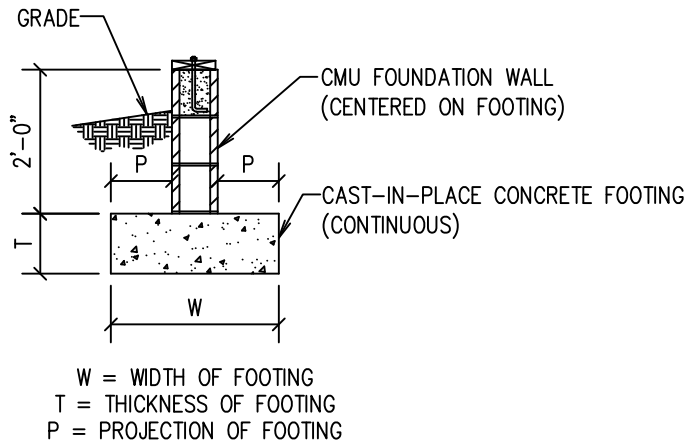
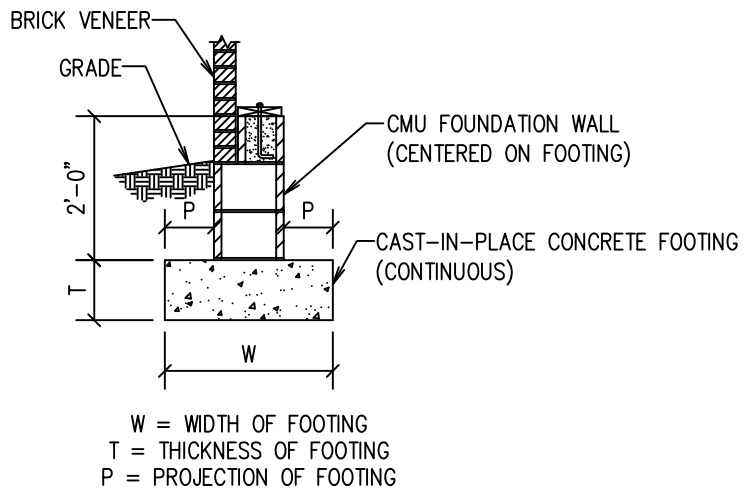


FIGURE 7: ROOF, CEILING AND THREE CLEAR-SPAN FLOORS



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

GROUND SNOW LOAD = 50 PSF, ROOF SNOW LOAD = 50 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	50	10	0	1200	1200	1	1	1
	0	0	0	36	4	40	10	30	10	30	10	50	10	0	1200	2400	2	2	1
	0	0	0	36	6	40	10	30	10	30	10	50	10	0	1200	3600	3	3	2
	0	0	0	36	8	40	10	30	10	30	10	50	10	0	1200	4800	3	3	2
	0	0	0	36	10	40	10	30	10	30	10	50	10	0	1200	6000	4	4	3
	0	0	0	36	12	40	10	30	10	30	10	50	10	0	1200	7200			3
	0	0	0	36	14	40	10	30	10	30	10	50	10	0	1200	8400			4
ROOF, CEILING AND ONE CENTER-BEARING FLOOR (FIGURE 11)	0	18	0	36	2	40	10	30	10	30	10	50	10	108	1668	1668	2	1	1
	0	18	0	36	4	40	10	30	10	30	10	50	10	108	1668	3336	3	2	2
	0	18	0	36	6	40	10	30	10	30	10	50	10	108	1668	5004	4	3	2
	0	18	0	36	8	40	10	30	10	30	10	50	10	108	1668	6672		4	3
	0	18	0	36	10	40	10	30	10	30	10	50	10	108	1668	8340			4
	0	18	0	36	12	40	10	30	10	30	10	50	10	108	1668	10008			4
	0	18	0	36	14	40	10	30	10	30	10	50	10	108	1668	11676			
ROOF, CEILING AND ONE CLEAR-SPAN FLOOR (FIGURE 12)	0	36	0	36	2	40	10	30	10	30	10	50	10	108	2028	2028	2	2	1
	0	36	0	36	4	40	10	30	10	30	10	50	10	108	2028	4056	3	3	2
	0	36	0	36	6	40	10	30	10	30	10	50	10	108	2028	6084	4	4	3
	0	36	0	36	8	40	10	30	10	30	10	50	10	108	2028	8112			3
	0	36	0	36	10	40	10	30	10	30	10	50	10	108	2028	10140			4
	0	36	0	36	12	40	10	30	10	30	10	50	10	108	2028	12168			
	0	36	0	36	14	40	10	30	10	30	10	50	10	108	2028	14196			
ROOF, CEILING AND TWO CENTER-BEARING FLOORS (FIGURE 13)	0	18	18	36	2	40	10	30	10	30	10	50	10	204	2124	2124	2	2	1
	0	18	18	36	4	40	10	30	10	30	10	50	10	204	2124	4248	3	3	2
	0	18	18	36	6	40	10	30	10	30	10	50	10	204	2124	6372	4	4	3
	0	18	18	36	8	40	10	30	10	30	10	50	10	204	2124	8496			4
	0	18	18	36	10	40	10	30	10	30	10	50	10	204	2124	10620			4
	0	18	18	36	12	40	10	30	10	30	10	50	10	204	2124	12744			
	0	18	18	36	14	40	10	30	10	30	10	50	10	204	2124	14868			
ROOF, CEILING AND TWO CLEAR-SPAN FLOORS (FIGURE 14)	0	36	36	36	2	40	10	30	10	30	10	50	10	204	2844	2844	2	2	2
	0	36	36	36	4	40	10	30	10	30	10	50	10	204	2844	5688	4	4	3
	0	36	36	36	6	40	10	30	10	30	10	50	10	204	2844	8532			4
	0	36	36	36	8	40	10	30	10	30	10	50	10	204	2844	11376			
	0	36	36	36	10	40	10	30	10	30	10	50	10	204	2844	14220			
	0	36	36	36	12	40	10	30	10	30	10	50	10	204	2844	17064			
	0	36	36	36	14	40	10	30	10	30	10	50	10	204	2844	19908			
0	36	36	36	16	40	10	30	10	30	10	50	10	204	2844	22752				

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	60 psf (50 psf snow 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

GROUND SNOW LOAD = 50 PSF, ROOF SNOW LOAD = 50 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	3.750	1350	1	3.167	1520	1	2.833	1700	2	
1 - 2x10	4.750	1710	1	4.083	1960	1	3.583	2150	2	
1 - 2x12	5.750	2070	2	4.667	2240	2	3.667	2200	2	
2 - 2x4	3.167	1140	1	2.750	1320	1	2.500	1500	1	
2 - 2x6	4.667	1680	1	4.083	1960	1	3.667	2200	2	
2 - 2x8	5.917	2130	2	5.167	2480	2	4.583	2750	2	
2 - 2x10	7.250	2610	2	6.250	3000	2	5.583	3350	2	
2 - 2x12	8.417	3030	2	7.250	3480	2	6.500	3900	2	
3 - 2x8	7.417	2670	1	6.417	3080	2	5.750	3450	2	
3 - 2x10	9.083	3270	2	7.833	3760	2	7.000	4200	2	
3 - 2x12	10.583	3810	2	9.167	4400	2	8.167	4900	2	
4 - 2x8	8.333	3000	1	7.417	3560	1	6.667	4000	1	
4 - 2x10	10.500	3780	1	9.083	4360	2	8.167	4900	2	
4 - 2x12	12.167	4380	2	10.583	5080	2	9.417	5650	2	
ROOF, CEILING AND ONE CENTER-BEARING FLOOR (FIGURE 11)										
1 - 2x8	3.583	1842	1	3.000	2022	2	2.667	2224	2	
1 - 2x10	4.500	2313	2	3.917	2640	2	3.333	2780	2	
1 - 2x12	5.417	2784	2	4.167	2809	2	3.333	2780	2	
2 - 2x4	2.750	1414	1	2.417	1629	1	2.167	1807	1	
2 - 2x6	4.083	2099	1	3.583	2415	2	3.250	2711	2	
2 - 2x8	5.167	2656	2	4.500	3033	2	4.083	3405	2	
2 - 2x10	6.333	3255	2	5.500	3707	2	5.000	4170	2	
2 - 2x12	7.333	3769	2	6.417	4325	2	5.750	4796	3	
3 - 2x8	6.417	3298	2	5.667	3820	2	5.083	4239	2	
3 - 2x10	7.917	4069	2	6.917	4662	2	6.250	5213	2	
3 - 2x12	9.167	4712	2	8.000	5392	2	7.250	6047	2	
4 - 2x8	7.417	3812	1	6.500	4381	1	5.917	4935	2	
4 - 2x10	9.083	4669	2	8.000	5392	2	7.167	5977	2	
4 - 2x12	10.583	5440	2	9.250	6235	2	8.333	6950	2	
ROOF, CEILING AND ONE CLEAR-SPAN FLOOR (FIGURE 12)										
1 - 2x8	3.417	2098	1	2.917	2374	1	2.583	2619	2	
1 - 2x10	4.333	2660	1	3.750	3053	1	3.083	3126	2	
1 - 2x12	5.333	3274	2	3.917	3188	2	3.083	3126	2	
2 - 2x4	2.583	1586	1	2.250	1832	1	2.000	2028	1	
2 - 2x6	3.833	2353	2	3.333	2713	2	3.000	3042	2	
2 - 2x8	4.833	2967	2	4.167	3392	2	3.750	3803	2	
2 - 2x10	5.917	3633	2	5.083	4138	2	4.583	4647	3	
2 - 2x12	6.833	4195	2	5.917	4816	3	5.333	5408	3	
3 - 2x8	6.167	3787	2	5.250	4274	2	4.667	4732	2	
3 - 2x10	7.417	4554	2	6.417	5223	2	5.750	5831	2	
3 - 2x12	8.583	5270	2	7.417	6037	2	6.667	6760	2	
4 - 2x8	7.000	4298	1	6.083	4952	2	5.417	5493	2	
4 - 2x10	8.583	5270	2	7.417	6037	2	6.583	6675	2	
4 - 2x12	9.917	6089	2	8.583	6987	2	7.667	7774	2	
ROOF, CEILING AND TWO CENTER-BEARING FLOORS (FIGURE 13)										
2 - 2x4	2.500	1655	1	2.167	1868	1	1.917	2036	1	
2 - 2x6	3.667	2428	2	3.167	2730	2	2.833	3009	2	
2 - 2x8	4.583	3034	2	4.000	3448	2	3.667	3894	2	
2 - 2x10	5.667	3752	2	4.917	4238	2	4.417	4691	3	
2 - 2x12	6.500	4303	2	5.750	4957	3	5.167	5487	3	
3 - 2x8	5.750	3807	2	5.083	4382	2	4.583	4867	2	
3 - 2x10	7.083	4689	2	6.167	5316	2	5.583	5929	2	
3 - 2x12	8.167	5407	2	7.167	6178	2	6.417	6815	3	
4 - 2x8	6.667	4414	1	5.833	5028	2	5.250	5576	2	
4 - 2x10	8.167	5407	2	7.167	6178	2	6.417	6815	2	
4 - 2x12	9.417	6234	2	8.250	7112	2	7.417	7877	2	
ROOF, CEILING AND TWO CLEAR-SPAN FLOORS (FIGURE 14)										
2 - 2x4	2.000	1724	1	1.667	1904	1	1.417	2015	2	
2 - 2x6	3.000	2586	2	2.583	2950	2	2.250	3200	2	
2 - 2x8	3.833	3304	2	3.333	3806	2	2.917	4148	3	
2 - 2x10	4.667	4023	2	4.000	4568	3	3.583	5095	3	
2 - 2x12	5.417	4669	3	4.667	5330	3	4.167	5925	3	
3 - 2x8	4.750	4095	2	4.083	4663	2	3.667	5214	2	
3 - 2x10	5.833	5028	2	5.000	5710	2	4.500	6399	3	
3 - 2x12	6.750	5819	2	5.833	6661	3	5.250	7466	3	
4 - 2x8	5.500	4741	2	4.750	5425	2	4.250	6044	2	
4 - 2x10	6.750	5819	2	5.833	6661	2	5.167	7347	2	
4 - 2x12	7.750	6681	2	6.750	7709	2	6.000	8532	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
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	60 psf (50 psf snow 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.

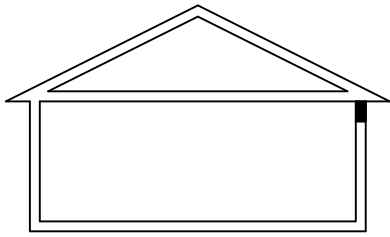


FIGURE 10: ROOF AND CEILING

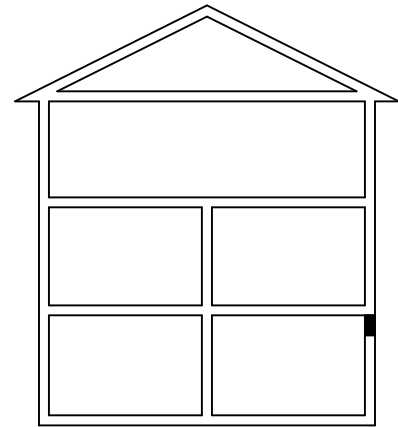


FIGURE 13: ROOF, CEILING AND TWO CENTER-BEARING FLOORS

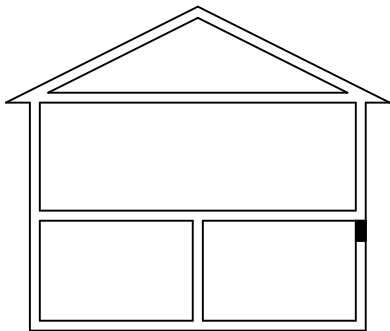


FIGURE 11: ROOF, CEILING AND ONE CENTER-BEARING FLOOR

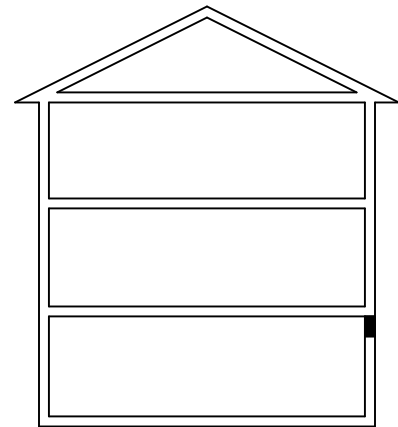


FIGURE 14: ROOF, CEILING AND TWO CLEAR-SPAN FLOORS

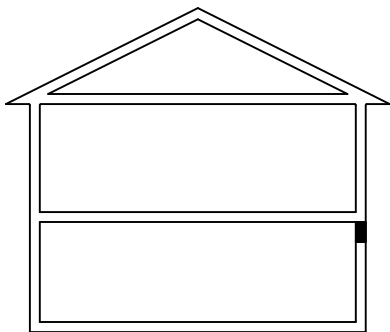


FIGURE 12: ROOF, CEILING AND ONE CLEAR-SPAN FLOOR

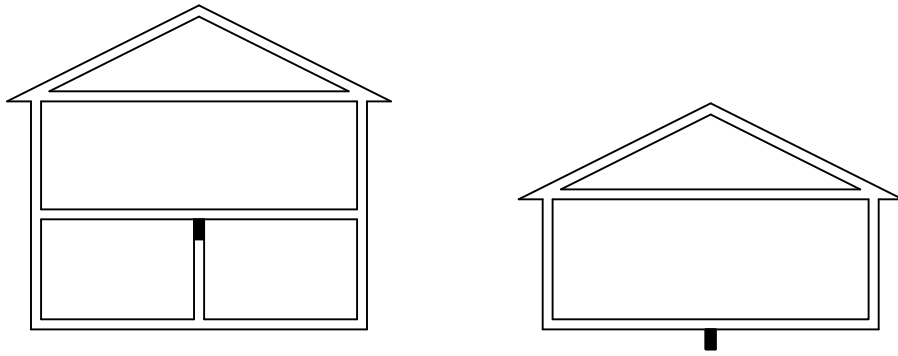


FIGURE 15: ONE FLOOR ONLY

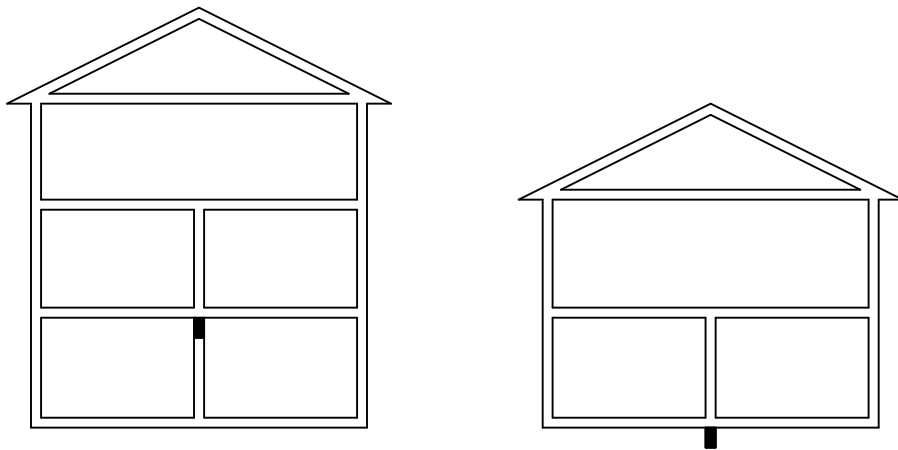


FIGURE 16: TWO FLOORS

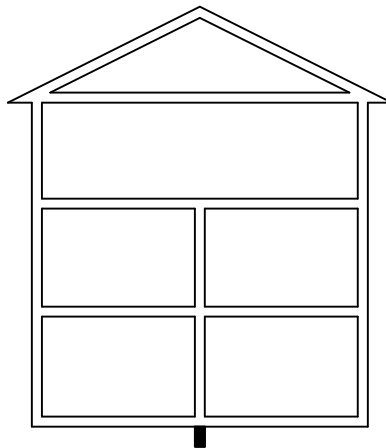


FIGURE 17: THREE FLOORS

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.