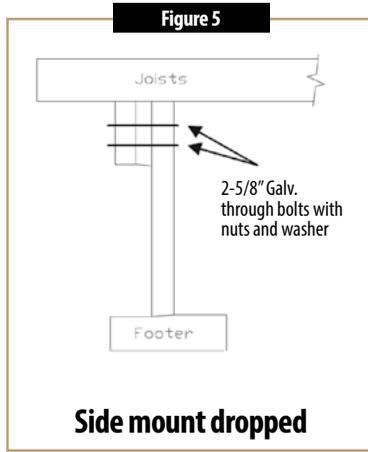
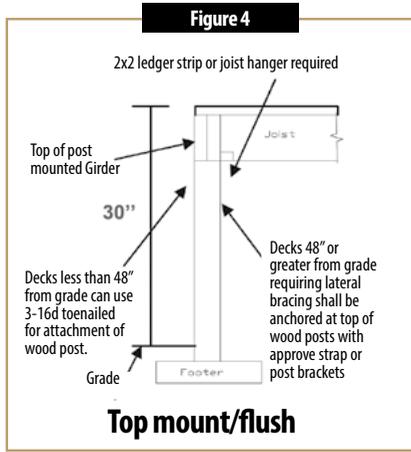




What you need to know before
building an attached or
self-supporting deck to your home

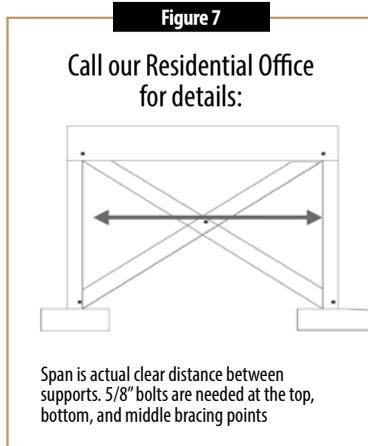
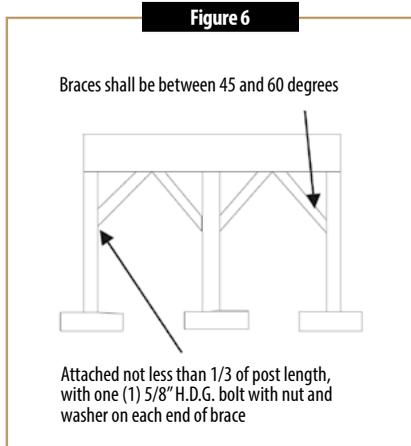
All Decked Out?



Girder span tables from the Building Code for #1SYP and a 40 lb. Live Load:

* Note: Girders are required to be minimum grade #1SYP
*Partial reproduction of Table R502.5(1) at 30 ground snow load and roof ceiling and 1 clear span floor. Deck width is 20' or less measured in the direction of joists span. Splices in plys must break over bearing supports.

Deck Width	Exterior Girder Clear Spans			
	Nominal Lumber Size			
	2 x 6	2 x 8	2 x 10	2 x 12
20' (2 ply)	3'11"	5'-0"	6'1"	7'1"
20' (3 ply)	----	6'3"	7'7"	8'10"
20' (4 ply)	----	----	8'9"	10'2"



Joist span tables from the Building Code for #2SYP and a 40 lb. Live Load:

* Cantilever Joist requires #1SYP. See the 2012 NC Residential Building Code Table R502.3.3(1) for span.

Joist Size	Spaced @	Will span	Joist Size	Spaced @	Will Span
2 x 6	12" O.C.	10'3"	2 x 10	12" O.C.	16'2"
	16" O.C.	9'4"		16" O.C.	14'-0"
	24" O.C.	7'7"		24" O.C.	11'5"
2 x 8	12" O.C.	13'6"	2 x 12	12" O.C.	19'1"
	16" O.C.	11'10"		16" O.C.	16'6"
	24" O.C.	9'8"		24" O.C.	13'6"

Figure 8
Handrails, Guards, and General Construction

Guards at a Minimum 36" required per R312.1 with 30" drop and opening limits per R312.2 & R312.3 (4" on vertical pickets, 6" on horizontal and ornamental guard rails), top rail and post to support 200 lbs with infill to meet 50 lbs per Table R301.5 and footnotes.

Rail posts cannot exceed 8' o.c. spacing and shall be attached with 2 3/8" galv bolts with nut & washer to outer bands.

Attachment to structure based upon all cladding types but brick veneer per AM104.1.1, Brick veneer per AM104.1.1, Brick veneer per AM104.1.2, Masonry ledge per AM104.1.3 or other per AM104.1.4

Stair handrail/ Guard
Height between 34"-38" per R311.7.1 & R312.1. Openings on side of stairs requiring guards shall not allow a sphere 4 3/8" to pass per R312.2 exception #2.

Deck Post per AM108

Footers per Table AM102.1. Minimum base of footers 12" below grade.

Decking per AM107 for #2 SYP and attached with 2-8d galvanized nails at each joist or approved screws. Other materials per mfg installation based upon joists o.c. spacing. Alternate material attached per mfg installation instructions.

Stair treads and risers per R311.7.4.1 (8 1/4" Max riser) & R311.7.4.2 (9" minimum tread depth). Stairways min 36" width per R311.5.1 (rail projections allowed).

Riser openings Stairs with a 30" or more vertical rise must have solid risers or opening restricted to prevent a 4" sphere from passing per R311.7.4.3

Lateral Bracing per AM109. AM 109.1.1 height required; AM109.1.3 freestanding embedment; AM109.1.4 diagonal bracing; AM109.1.5 Coastal embedment.

Stair joist cantilevers allowed per table R502.3.3(1)

Exterior Girder Clear Spans

Deck Width	Nominal Lumber Size			
	2x6	2x8	2x10	2x12
20' (2 ply)	3-11	5-0	6-1	7-1
20' (3 ply)	---	6-3	7-7	8-10
20' (4 ply)	---	---	8-9	10-2

*Partial reproduction of Table R502.5(1) at 30 ground snow load and roof ceiling and 1 clear span floor. Deck width is 20' or less measured in the direction of joists span. Splices in plys must break over bearing supports.

If you have any questions about these specifications, the use of other materials, standards, or the code requirements for your deck, please do not hesitate to call Development Services Department - Litchford Satellite Office at (919) 996-4200 or Development Services Department - Customer Service Center at (919) 996-2495.

For more information, visit our web site at

raleighnc.gov

This brochure is a publication of:



City of Raleigh
Development Services Department

First Things First...

A Everyone dreams of the “perfect deck”...

But getting from point A (the dream deck) to point B (planning and constructing it) is not always as easy. This brochure will help you construct a safe, code-compliant “dream deck.”

But, first things first...

B Be sure to obtain a building permit for the deck before you build it. For more information on how and where to obtain your building permit, call or visit the Residential Office 8320-130 Litchford Road, Raleigh N.C. or simply call us at (919) 996-4200. Office hours are Monday-Friday from 8:00 a.m. to 4:45 p.m.

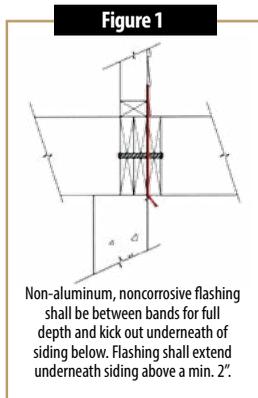
Why the permit and inspections?

C To ensure that the deck will comply with local zoning regulations and with the North Carolina State Residential Building Code. The zoning regulations establish minimum setbacks that must be maintained from property lines. The building code governs the method of construction, materials, means of support, attachment, and requires safety features such as guard rails and hand rails.

Some Things to Think About...

1. Will your deck be attached to the residence for support or will it be a “self supported” deck?

If attached, this means the deck band will be connected to the house band and that your deck will be supported partially by the existing foundation of the house. Attached decks must be connected to the band or rim joist of the house by 5/8 inch galvanized through bolts. Also, the existing siding (except brick) which covers the house band must be removed so that the deck band makes full contact with the house band. Non-aluminum, non-corrosive flashing must be installed between the house and deck bands (see flashing detail in Figure 1) to prevent water from rotting the house band. See diagram below for detail.



All Structures Except Brick Veneer

Fasteners	8' Max Joist Span ^a	16' Max Joist Span ^a
5/8" Hot Dipped Galv. Bolts with nut and washer b and 12d Common Hot Dipped Galv. Nails ^c	1 @ 3'-6" o.c. and 2 @ 8" o.c.	1 @ 1'-8" o.c. and 3 @ 6" o.c.
OR		
Self-Drilling Screw Fastener ^d	12" o.c. staggered	6" o.c. staggered

Brick Veneer Structures

Fasteners	8' Max Joist Span ^a	16' Max Joist Span ^a
5/8" Hot Dipped Galv. Bolts with Nut and Washer b	1 @ 2'-4" o.c.	1 @ 1'-4" o.c.

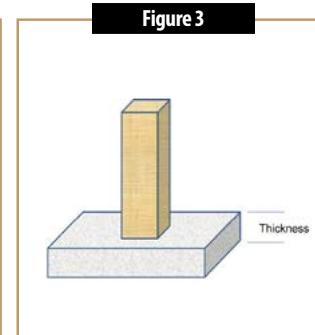
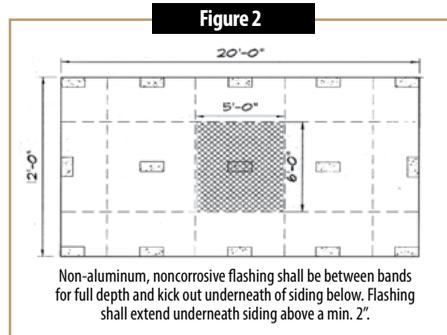
a: attachment interpolation between 8' & 16' joists span are allowed,
b: Minimum edge distance for bolts is 2.1/2 inches,
c: Nails must penetrate supporting structure band a minimum of 1.5 inches
d: Self-drilling screw fastener shall be an approved screw having a minimum shank diameter of 0.195" and a length long enough to penetrate through the supporting structure band. The structure band shall have a minimum depth of 1-1/8". Screw shall have an evaluated allowable shear load for Southern Pine to Southern Pine Lumber of 250 pounds and shall have a corrosion resistant finish equivalent to hot dipped galvanized. Minimum edge distance for screws is 1-7/16". A maximum of 1/2" thick wood structural panel is permitted to be located between the deck ledger and the structure band.

2. What distance will you span between supports?

Your joists must be sized to carry a 40 lb. per sq. ft. live load. In some instances, a girder is used to help meet this design criteria and to allow use of smaller individual floor joists (See span table under Figure 6).

3. How deep and how large must the footings under support posts be?

Each deck support post must be supported by concrete footings. The size of each footing is determined by the tributary load imposed on it. See the diagram below for an explanation of tributary load. Each footing must be dug down into undisturbed soil and to a minimum depth of 12 inches.



Footing Chart a, b, c*

SIZE (inches)		TRIBUTARY AREA (square)	THICKNESS (inches)	
Precast Footings	Poured-in-Place Footings		Precast	Cast-in-Place
8 x 16	8 x 16	36	4	6
12 x 12	12 x 12	40	4	6
**16 x 16	16 x 16	70	8	8
—	16 x 24	100	—	8
—	24 x 24	150	—	8

*a. Footing values are based on single floor and roof loads; b. Support post must rest in center 1/3 of footer; c. Top of footer shall be level for full bearing support of post

** Ex: 4"x8"x16" double stacked solid block

4. How high off the ground will the floor of your deck be?

If the walking surface of the deck is 30 inches off of the ground, your deck must be surrounded by guard rails which are a minimum of 36 inches in height. The steps for the deck must also have guard rails on both sides if there are 4 or more individual risers (spaces between steps). If the steps have a total rise of 30" or more above ground level, guard rails/hand rails must also be provided on open sides of the steps. See figure 4 & 8.

5. Bracing your deck for lateral support.

If your planned deck is attached and over 4' above the ground (measured from top of footing to deck floor), bracing for lateral support is required. Self supported decks greater than 30" in height (measured from the top of footing to deck floor) also require bracing. Several methods of bracing are acceptable depending on whether the deck is free standing or attached (see figure 6 & 7). Consult with the Residential Office at 919-996-4200 to select a method that meets code and will work best for your project.

Our Recommendations for a “Minimum Code” and a “Code Plus” Deck... Lumber

First, all lumber should be treated or decay resistant. We will assume that you will use pressure treated Southern Yellow Pine #1SYP (girders and cantilever joist) and #2SYP floor joist with joist spacing set at 16 inches on center (OC). Other species of lumber are acceptable for use. For specific allowable spans on other species, consult the building code or call the Residential Office.

You only need to build to Minimum Code. However, if you want a sturdier deck, we have also given you our recommendations for a Code Plus deck.

	Minimum Code Deck	Code Plus Deck
Footing Depth:	12" to bottom of footing	2'
Footing Size:	8" x 16" x 6"	16" x 16" x 8"
Post Size:	4" x 4" x varies up to 8'	6" x 6"
Girder Size:	2-2" x 8" (see girder table in Figure 4 & 5)	2-2" x 12" through bolted to posts
Post Spacing:	(see span drawing in Figure 7)	6' maximum between posts around perimeter and in lines across the deck floor
Deck Band & Ledger:	2" x 8" for Band 2" x 2" for Ledger or use Joist hanger (see Figure 1)	Deck band: use 2" x 10" Ledger: use 2" x 2" with 3 nails under each joist *(may substitute 2" x 8" for band if joist hangers are used in lieu of ledgers)
Joist Size:	(see span table under Figure 6)	Use 2" x 10" spaced 16" OC
Deck Flooring:	5/4" x 6"	Use 2" x 6" flooring with 1/8" space between
Guard Rail & Height:	Max. clear space between pickets is 4" max. Guardrail height: 36" minimum	Space railing posts 6' OC

* This option requires the Code-Plus features

Important Note:

The Building Code also regulates items such as the stringers and treads for steps, fastening (nailing and/or bolting) and bracing for lateral stability. Be sure to discuss these with one of our specialists if you have questions about what the code requires.