



# Building Guide



## Single Family Residential Uncovered Decks and Porches

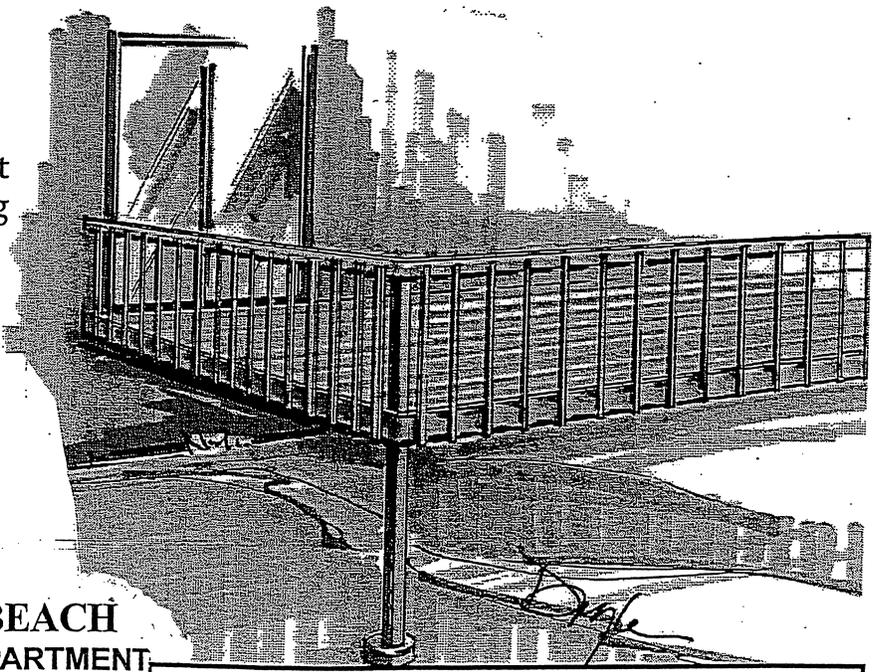
### How to Use this Guide

Provide two sets of plans and complete the following:

- 1. Complete this Building Guide** by filling in the blanks on page two, and indicating which construction details will be used.
- 2. Provide 2 Plot Plans** (site plan) showing dimensions of your project or addition and its relationship to existing buildings or structures on the property and the distance to existing property lines drawn to scale.

### 3. Fill out a building permit application.

The majority of permit applications are processed with little delay. The submitted documents will help determine if the project is in compliance with building safety codes, zoning ordinances and other applicable laws.



**TOWN OF ATLANTIC BEACH**  
**INSPECTION & PLANNING DEPARTMENT**  
125 WEST FORT MACON ROAD  
ATLANTIC BEACH, NORTH CAROLINA

Residential Code. It is not intended to cover all circumstances. Check with your Department of Building Safety for additional requirements.

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**STEP 1:**  
Determine your footing size.

Footing size is based on the tributary area of deck that loads onto each footing. Tributary area can be calculated by measuring halfway to the next support (girder, house band, post) in every direction, then multiplying the length times the width of that rectangle. Find the resulting square footage in the following chart, which gives the minimum footing size. Note that you cannot interpolate between sizes (you must use the next larger size on the chart).

TRIBUTARY AREA	PRECAST 4X8X16 SOLID BLOCKS	POURED CONCRETE
Up to 36 sq ft	8"x16"x4" deep	8"x16"x6" deep
Up to 40 sq ft	12"x12"x4" deep	12"x12"x6" deep
Up to 70 sq ft	16"x16"x8" deep	16"x16"x8" deep
Up to 100 sq ft		16"x24"x8" deep
Up to 150 sq ft		24"x24"x8" deep

All footings must be at least 12" below grade to the bottom of the footing.

If you ever plan to construct a roof over your deck, use one size larger than required in the above chart.

**STEP 2:**  
Determine your post size.

Post size is determined solely on height of your deck, measured from footing to girder. 4x4 treated posts can be used up to 8' high. 6x6 treated posts are okay up to 20' high. Decks over 20' high must be engineered.

1/16/2009

## Appendix M Wood Decks

(Entire section is a NC amended appendix)

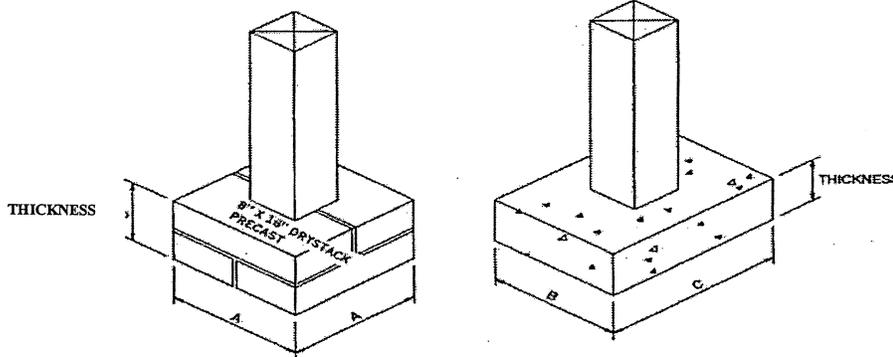
### Section AM101 General

**AM101.1 General.** A deck is an exposed exterior wood floor structure which may be attached to the structure or freestanding. Roofed porches (open or screened-in) may be constructed using these provisions.

**AM101.2 Deck design.** Computer deck design programs may be accepted by the Code Enforcement Official.

### Section AM102 Footers

**AM102.1 Footers.** Support post shall be supported by a minimum footing per Figure AM102 and Table AM102.1 Minimum footing depth shall be 12" below finished grade per R403.1.4. Tributary area is calculated per Figure AM102.1.



**Figure AM102**

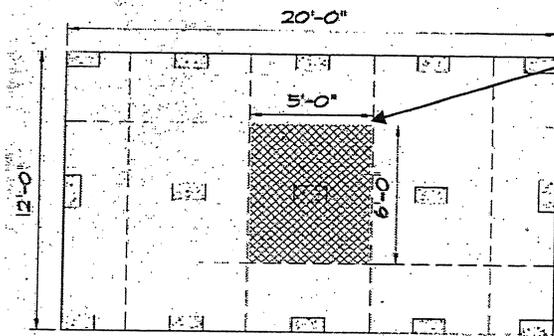
**Table AM102.1**

Size (inches)		Tributary Area (Sq. Ft.)	Thickness (inches)	
A x A	B x C		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

### Section AM103 Flashing

**AM103.1 Flashing.** When attached to a structure, the structure to which attached shall have a treated wood band for the length of the deck, or corrosion-resistant flashing shall be used to prevent moisture from coming in contact with the untreated framing of the structure. Aluminum flashing shall not be used in conjunction with deck construction. The deck band and the structure band shall be constructed in contact with each other except on brick veneer structures and where plywood sheathing is required and properly flashed (when plywood is required, use pressure preservative treated plywood). Siding shall not be installed between the structure and the deck band. If attached to a brick structure, neither flashing nor a treated band for the brick structure is required. In addition, the treated deck band shall be constructed in contact with the brick veneer. Flashing shall be installed per Figure AM103.



Tributary area of shaded section on free standing deck shown is 5'x6'=30 sq. ft. Code will require a minimum footer of 8"x 16" per Table AM102.1

Figure AM102.1

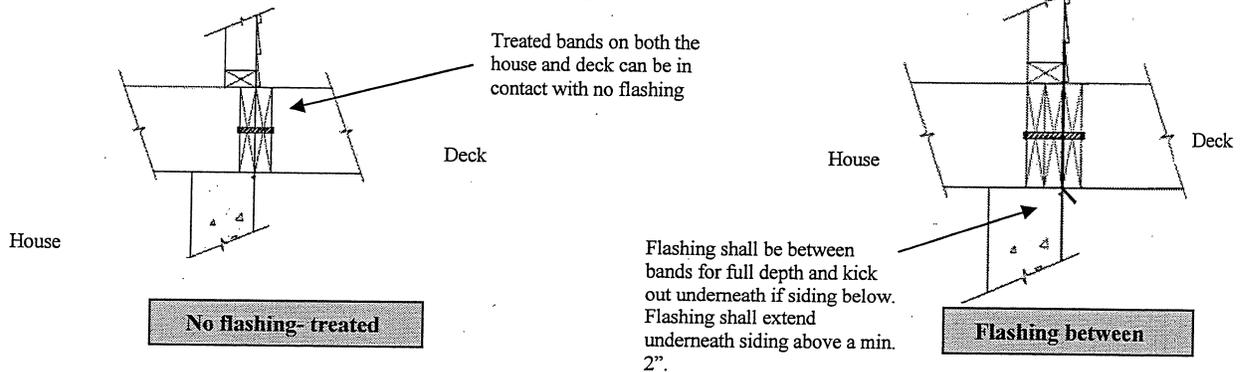


Figure AM103

### Section AM104 Deck attachment

**AM104.1 Deck Attachment.** When a deck is supported at the structure by attaching the deck to the structure, the following attachment schedules shall apply for attaching the deck band to the structure.

#### AM104.1.1 All Structures Except Brick veneer Structures:

Fasteners	8' Max Joist Span <sup>a</sup>	16' Max Joist Span <sup>a</sup>
5/8" Hot Dipped Galv. Bolts with nut and washer <sup>b</sup>	1 @ 3'-6" o.c.	1 @ 1'-8" o.c.
<b>and</b>	<b>and</b>	<b>and</b>
12d Common Hot Dipped Galv. Nails <sup>c</sup>	2 @ 8" o.c.	3 @ 6" 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 the supporting structure band a minimum of 1 1/2 inches

#### AM104.1.2 Brick Veneer Structures

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

- a. Attachment interpolation between 8' & 16' is allowed
- b. Minimum edge distance for bolts is 2 1/2 inches

#### AM104.1.3 Masonry Ledge Support

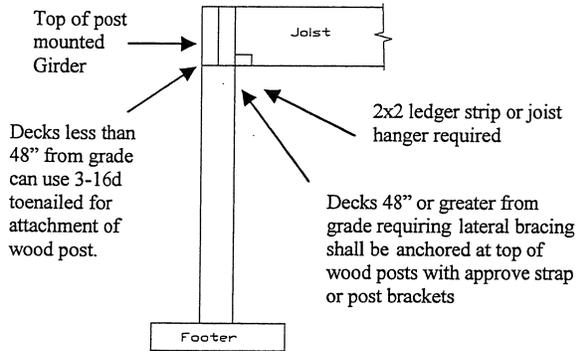
If the deck band is supported by a minimum of 1/2 inch masonry ledge along the foundation wall, 5/8 inch hot dipped galvanized bolts with washers spaced at 48 inches o.c. may be used for support.

#### AM104.1.4 Other means of support

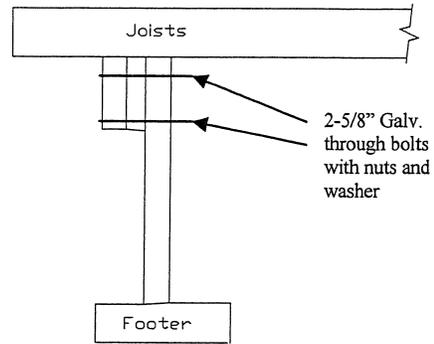
Joist hangers or other means of attachment may be connected to house band and shall be properly flashed

### Section AM105

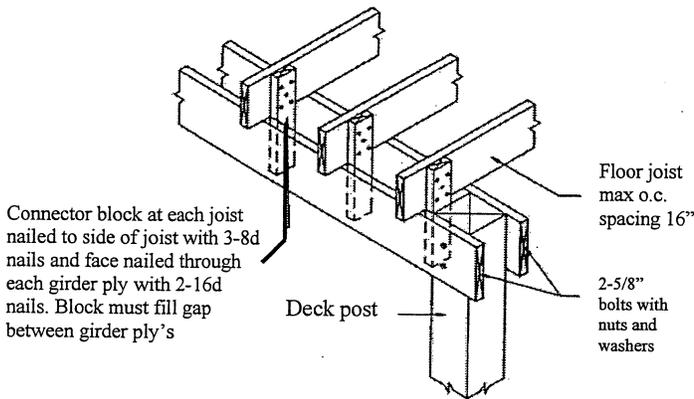
**AM105.1 Girder Support & Span.** Girders shall bear directly on support post with post attached at top to prevent lateral displacement or be connected to the side of posts with two 5/8 inch hot dipped galvanized bolts with nut and washer. Girder spans are per Table R502.5 (1&2). Girder support may be installed per Figure AM105 for top mount; Figure AM105.1 for side mount and Figure AM105.2 for split girder detail. Girders may also be cantilevered off ends of support post no more than 1 joist spacing or 16" whichever is greater per Figure AM105.3.



**Top mount/flush**  
**Figure AM105**

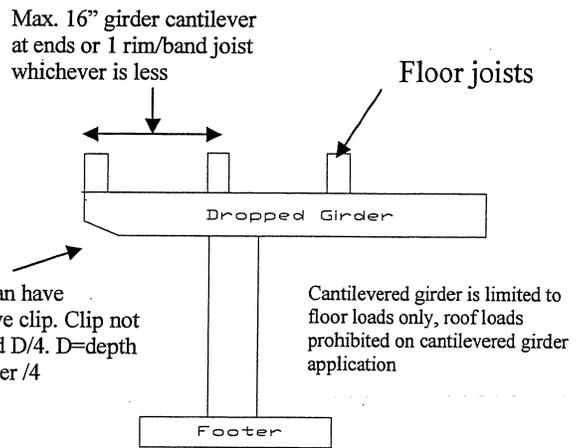


**Side mount dropped girder**  
**Figure AM105.1**



Split girder limited to floor loads only and cantilever girder ends allowed per AM105.3

**Split girder detail**  
**Figure AM105.2**



**Cantilevered dropped girder detail**  
**Figure AM105.3**

### Section AM106

**M106.1 Joist Spans & Cantilevers.** Joists spans shall be based upon Table R502.3.1(2) with 40 lbs per sq. ft. live load and 10 lbs per sq. ft. dead load. Floor joists for exterior decks may be cantilevered per Table R502.3.3 (1).

Spacing	2x6	2x8	2x10	2x12
12"	10-9	14-2	18-0	21-9
16"	9-9	12-10	16-1	18-10
19.2"	9-2	12-1	14-8	17-2
24"	8-6	11-0	13-1	15-5

Partial reprint of Table R502.3.1(2), #2 SYP only joist spans

### Section AM107

**AM107.1 Floor Decking.** Floor decking shall be No. 2 grade treated Southern Pine or equivalent. The minimum floor decking thickness shall be as follows:

Joist Spacing	Decking (nominal)
12" o.c.	1" S4S
16" o.c.	1" T&G
19.2 o.c.	1-1/4" S4S
24"-36" o.c.	2" S4S

### Section AM108

**AM108.1 Post height.** Maximum height of Deck support posts as follows:

Post size <sup>a</sup>	Max. Post Height <sup>b,c</sup>
4x4	8'-0"
6x6	20'-0"

a. This table is based on No. 2 Southern Pine posts.  
 b. From top of footing to bottom of girder  
 c. Decks with post heights exceeding these requirements shall be designed by a registered design professional

### Section AM109

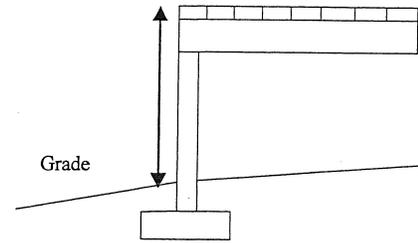
**AM109.1 Deck bracing.** Decks shall be braced to provide lateral stability. The following are acceptable means to provide lateral stability.

**AM109.1.1.** When the deck floor height is less than 4'-0" above finished grade per Figure AM109 and the deck is attached to the structure in accordance with Section AM104, lateral bracing is not required.

**AM109.1.2.** 4x4 wood knee braces may be provided on each column in both directions. The knee braces shall attach to each post at a point not less than 1/3 of the post length from the top of the post, and the braces shall be angled between 45 degrees and 60 degrees from the horizontal. Knee braces shall be bolted to the post and the girder with one 5/8 inch hot dipped galvanized bolt with nut and washer at both ends of the brace per Figure AM109.1

**AM109.1.3.** For freestanding decks without knee braces or diagonal bracing, lateral stability may be provided by embedding the post in accordance with Figure AM109.2 and the following:

Post size	Max. Tributary Area	Max. Post Height	Embedment Depth	Concrete Diameter
4x4	48 SF	4'-0"	2'-6"	1'-0"
6x6	120 SF	6'-0"	3'-6"	1'-8"



Less than 4' (decking to grade) and attached to structure no bracing required

Figure AM109

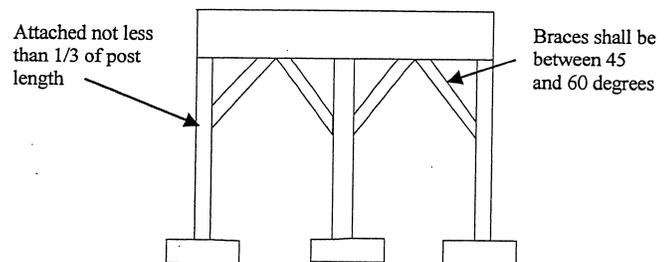
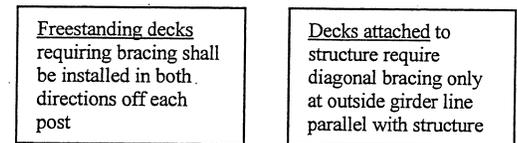


Figure AM109.1

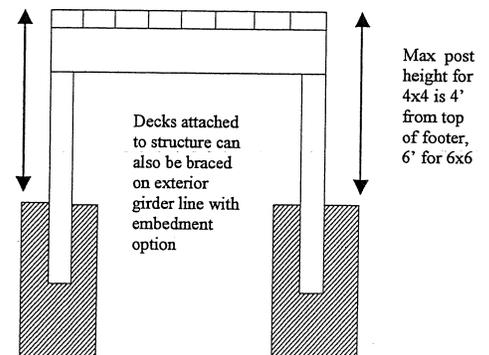
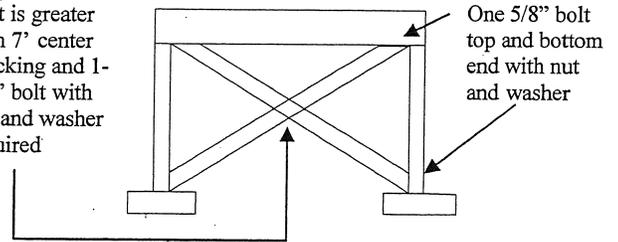


Figure AM109.2

**AM109.1.4** 2x6 diagonal vertical cross bracing may be provided in two perpendicular directions for freestanding decks or parallel to the structure at the exterior column line for attached decks. The 2x6's shall be attached to the posts with one 5/8 inch hot dipped galvanized bolt with nut and washer at each end of each bracing member per Figure AM109.3.

If span between post is greater than 7' center blocking and 1-5/8" bolt with nut and washer required

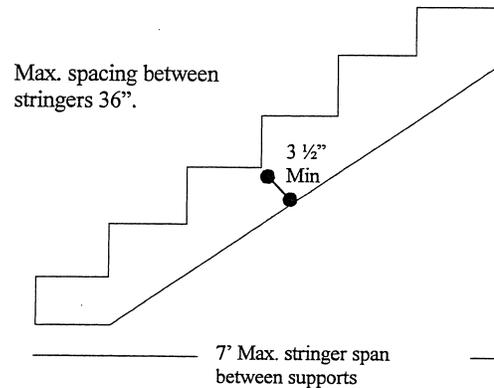


**Figure AM109.3**

**AM109.1.5** For embedment of piles in Coastal Regions, see Chapter 45.

**Section AM110**

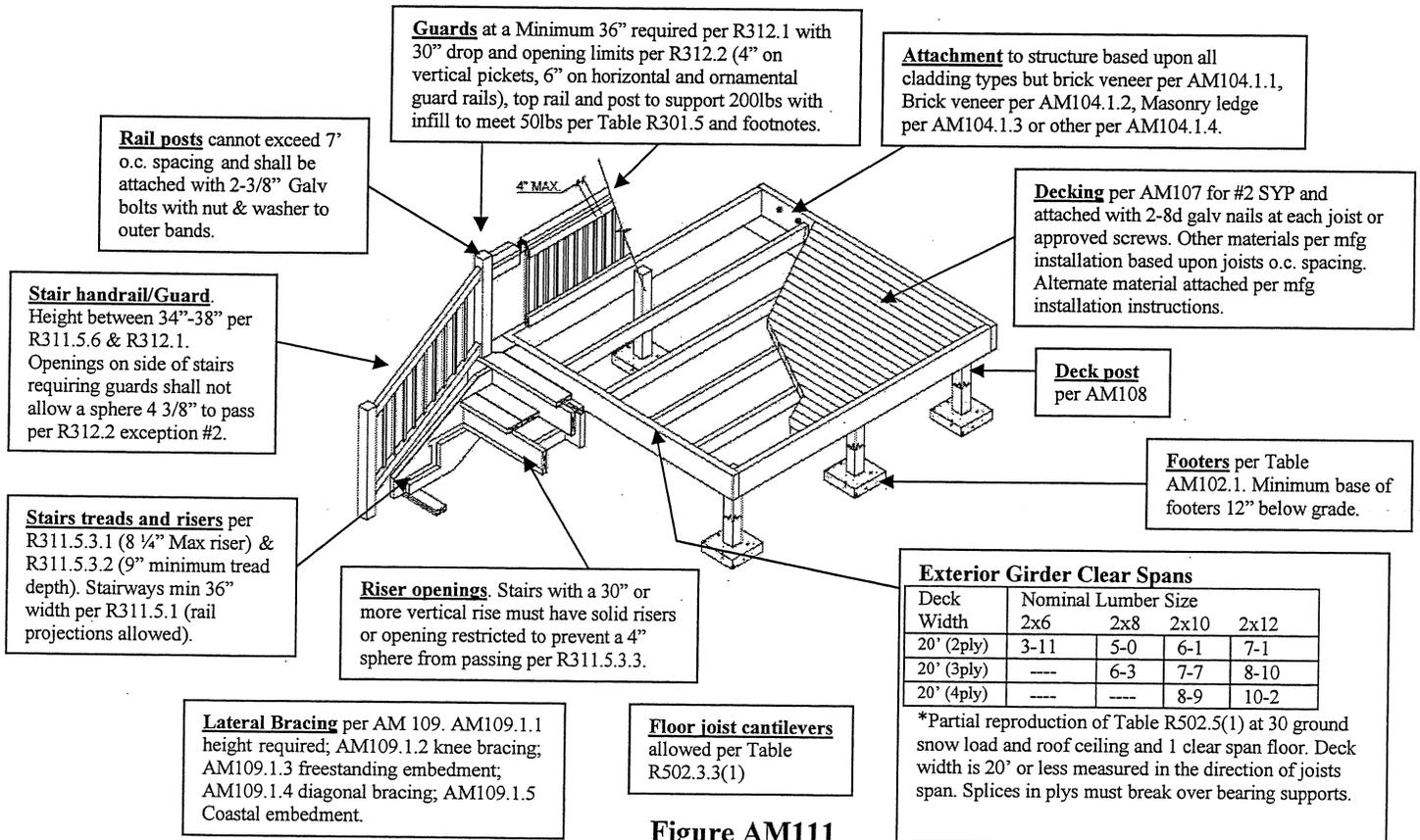
**AM110.1 Stairs** shall be constructed per Figure AM110. Stringer spans shall be no greater than 7' span between supports. Spacing between stringers shall be based upon decking material used per AM107.1. Each Stringer shall have minimum 3 1/2" between step cut and back of stringer. All stringers supported at top on suspended headers shall be attached with 3/8" Galv bolts with nuts and washers.



**Figure AM110**

**Section AM111**

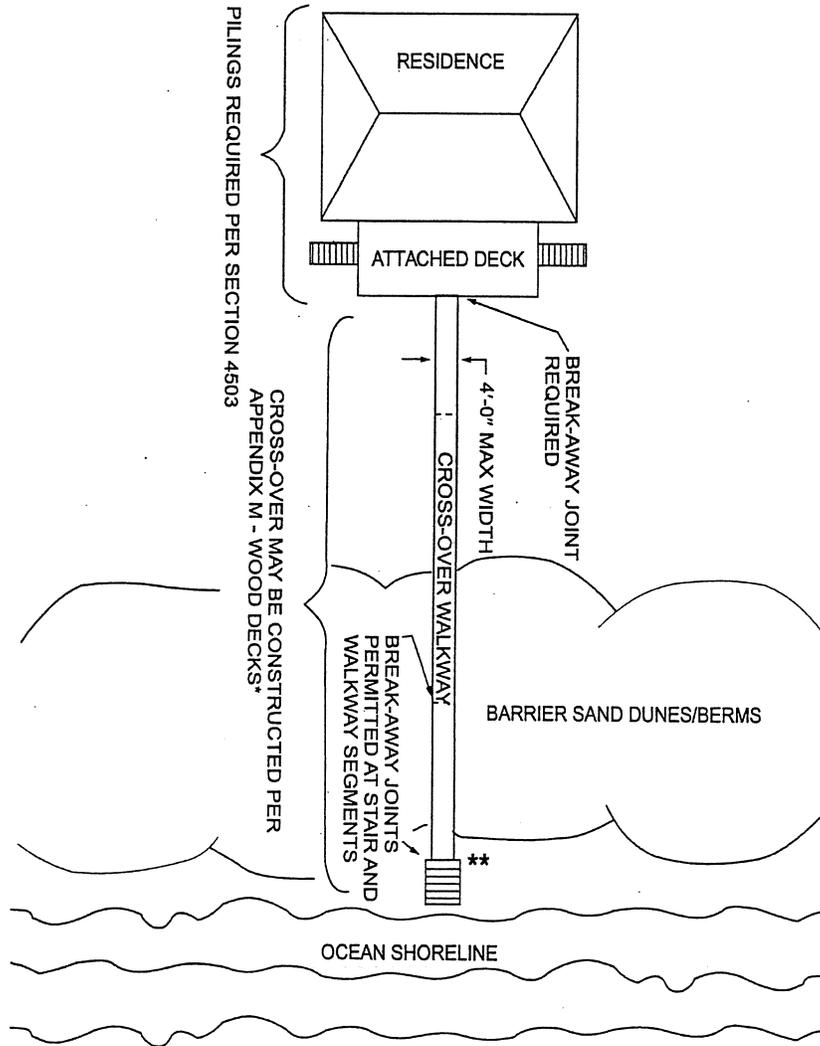
**AM111.1 Handrails, Guards and General.** Deck handrails, guards and general construction shall be per Figure AM111.



**Figure AM111**

Figure AM111.1

WALKWAYS OVER DUNES OR BERMS IN OCEAN HAZARD AREAS



For SI: 1 inch = 25.4, 1 foot = 304.8 mm.

\* Posts for walkways over dunes or berms shall be embedded a minimum depth of 4'-0" and post heights shall be limited to 5'-0" above grade for 4 x 4 and 10'-0" above grade for 6 x 6. Walkways or portions of walkways over 4'-0" in width, shall comply with the requirements of Chapters 44 and 45. Maximum walkway surface height is 30" above grade without guard rails.

\*\* Walkway stair runs can be greater than 12' without a landing.

### **R311.5 Stairways.**

**R311.5.1 Width.** Stairways shall not be less than **36 inches** (914 mm) in clear width at all points above the permitted Handrail height and below the required headroom height. Handrails shall not project more **than 4.5 inches** (114 mm) on either side of the stairway and the minimum clear width of the stairway at and below the handrail height, including treads and landings, shall not be less than 31.5 inches (787 mm) where a handrail is installed on one side and 27 inches (698 mm) where handrails are provided on both sides.

**Exception:** The width of spiral stairways shall be in accordance with Section R311.5.8.

**R311.5.2 Headroom.** The minimum headroom in all parts of the stairway shall not be less than **6 feet 8 inches** (2036 mm) measured vertically from the sloped plane adjoining the tread nosing or from the floor surface of the landing or platform.

### **R311.5.3 Stair treads and risers.**

**R311.5.3.1 Riser height.** The maximum riser height shall be **8 1/4 inches** (196 mm). The riser shall be measured vertically between leading edges of the adjacent treads. The greatest riser height within any flight of stairs shall not exceed the smallest by more than **3/8 inch** (9.5 mm).

**R311.5.3.2 Tread depth.** The minimum tread depth shall be **9 inches** (254 mm). The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than **3/8 inch** (9.5 mm). Winder treads shall have a minimum tread depth of **9 inches** (254 mm) measured as above at a point 12 inches (305 mm) from the side where the treads are narrower. Winder treads shall have a minimum tread depth of **4 inches** (152 mm) at any point. Within any flight of stairs, the greatest winder tread depth at the 12 inch (305 mm) walk line shall not exceed the smallest by more than 3/8 inch (9.5 mm).

**R311.5.3.3 Profile.** The radius of curvature at the leading edge of the tread shall be no greater than 9/16 inch (14.3 mm). **A nosing not less than 3/4 inch** (19 mm) but not more than 1 1/4 inch (32 mm) shall be provided on stairways with solid risers. The greatest nosing projection shall not exceed the smallest nosing projection by more than 3/8 inch (9.5 mm) between two stories, including the nosing at the level of floors and landings.

Beveling of nosing shall not exceed 1/2 inch (12.7 mm). Risers shall be vertical or sloped from the underside of the leading edge of the tread above at an angle not more than 30 (0.51 rad) degrees from the vertical. Open risers are permitted, provided that the opening between treads does not permit the passage of a 4-inch diameter (102 mm) sphere.

**Exceptions:**

1. A nosing is not required where the tread depth is a minimum of 11 inches (279 mm).
2. The opening between adjacent treads is not limited on stairs with a total rise of 30 inches (762 mm) or less.

**R311.5.4 Landings for stairways.** There shall be a floor or landing at the top and bottom of each stairway.

**Exception:** A floor or landing is not required at the top of an interior flight of stairs, provided a door does not swing over the stairs.

**A flight of stairs shall not have a vertical rise greater than 12 feet** (3658 mm) between floor levels or landings.

The width of each landing shall not be less than the stairway served. Every landing shall have a minimum dimension **of 36 inches** (914 mm) measured in the direction of travel.

**R311.5.5 Stairway walking surface.** The walking surface of treads and landings of stairways shall be sloped no steeper than one unit vertical in 48 inches horizontal (2-percent slope).

**R311.5.6 Handrails.** Handrails shall be provided on at least one side of each continuous run of treads or flight with four or more risers.

**R311.5.6.1 Height.** Handrail height, measured vertically from the sloped plane adjoining the tread nosing, or finish surface of ramp slope, **shall be not less than 30 inches (864 mm) and not more than 38 inches** (965 mm).

**R311.5.6.2 Continuity.** Handrails for stairways shall be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above lowest riser of the flight. Handrail ends shall be returned or shall terminate in newel posts or safety terminals. Handrails adjacent to a wall shall have a space of not less than 1 1/2 inch (38 mm) between the wall and the handrails.

**Exceptions:**

1. Handrails shall be permitted to be interrupted by a newel post at the turn.
2. The use of a volute, turnout, starting easing or starting newel shall be allowed over the lowest tread.

**R311.5.6.3 Handrail grip size.** All required handrails shall be of one of the following types or provide equivalent grasp ability.

1. Type I. Handrails with a circular cross section shall have an outside diameter of at least 1 1/4 inches (32 mm) and not greater than 2 inches (51 mm). If the handrail is not circular it shall have a perimeter dimension of at least 4 inches (102 mm) and not greater than 6 1/4 inches (160 mm) with a maximum cross section of dimension of 2 1/4 inches.

2. Type II. Handrails with a perimeter greater than 6 1/4 inches (160mm) shall provide a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of 3/4 inch (19mm) measured vertically from the tallest portion of the profile and achieve a depth of at least 5/16 inch (8 mm) within 7/8 inch (22 mm) below the widest portion of the profile. This required depth shall continue for at least 3/8 inch (10 mm) to a level that is not less than 1 3/4 inches (45 mm) below the tallest portion of the profile. The minimum width of the handrail above the recess shall be 1 1/4 inches (32mm) to a maximum of 2 3/4 inches (70 mm). Edges shall have a minimum radius of 0.01 inches (0.25 mm).

**R311.5.7 Illumination.** All stairs shall be provided with illumination in accordance with Section R303.6.

**R311.5.8 Special stairways.** Circular stairways, spiral stairways, winders and bulkhead enclosure stairways shall comply with all requirements of Section R311.5 except as specified below.

**R311.5.8.1 Spiral stairways.** Spiral stairways are permitted, provided the minimum width shall be 26 inches (660 mm) with each tread having 7 1/2-inches (190 mm) minimum tread depth at 12 inches from the narrower edge. All treads shall be identical, and the rise shall be no more than 9 1/2 inches (241 mm). A minimum headroom of 6 feet 6 inches (1982 mm) shall be provided.

**R311.5.8.2 Bulkhead enclosure stairways.** Stairways serving bulkhead enclosures, not part of the required building egress, providing access from the outside grade level to the basement shall be exempt from the requirements of Sections R311.4.3 and R311.5 where the maximum height from the basement finished floor level to grade adjacent to the stairway does not exceed 8 feet (2438 mm), and the grade level opening to the stairway is covered by a bulkhead enclosure with hinged doors or

other approved means.

### **R311.6 Ramps.**

**R311.6.1 Maximum slope.** Ramps shall have a maximum slope of one unit vertical in eight unit's horizontal (12.5-percent slope).

**R311.6.2 Landings required.** A minimum **3-foot-by-3-foot** (914 mm by 914 mm) landing shall be provided:

1. At the top and bottom of ramps,
2. Where doors open onto ramps,
3. Where ramps change direction.

**R311.6.3 Handrails required.** Handrails shall be provided on at least one side of all ramps exceeding a slope of one unit vertical in 12 units horizontal (8.33-percent slope).

**R311.6.3.1 Height.** Handrail height, measured above the finished surface of the ramp slope, shall be not less than **30 inches** (864 mm) and not more than **38 inches** (965 mm).

**R311.6.3.2 Handrail grip size.** Handrails on ramps shall comply with Section R311.5.6.3.

**R311.6.3.3 Continuity.** Handrails where required on ramps shall be continuous for the full length of the ramp. Handrail ends shall be returned or shall terminate in newel posts or safety terminals. Handrails adjacent to a wall shall have a space of not less than 1.5 inches (38 mm) between the wall and the handrails.

## **SECTION R312**

### **GUARDS**

**R312.1 Guards required.** Porches, balconies or raised floor surfaces located more than **30 inches** (762 mm) above the floor or grade below shall have guards not less than **36 inches** (914 mm) in height. **Open sides of stairs with a total rise of more than 30 inches (762 mm) above the floor or grade below shall have guards not less than 34 inches (864 mm) in height measured vertically from the nosing of the treads.**

Porches and decks which are enclosed with insect screening shall be provided with guards where the walking surface is located more than 30 inches (762 mm) above the floor or grade below.

**R312.2 Guard opening limitations.** Required guards on open sides of stairways, raised floor areas, balconies and porches shall have intermediate rails or ornamental closures which do not allow passage of a **sphere 4 inches** (102mm) or more in diameter.

#### **Exceptions:**

1. The triangular openings formed by the riser, tread and bottom rail of a guard at the open side of a stairway are permitted to be of such a size that a sphere **6 inches** cannot pass through.... Openings for required guards on the sides of stairtreads shall not allow a sphere  $4 \frac{3}{8}$  inches to pass through.

**TABLE R301.5**  
**MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS**  
**(in pounds per square foot)**  
**USE LIVE LOAD**

Attics with storage (b) 20

Attics without storage (b) 10

Decks (e) 40

Exterior balconies 60

Fire escapes 40

Guardrails and handrails (d) 200

Guardrails in-fill components (f) 50

Passenger vehicle garages (a) 50

Rooms other than sleeping rooms 40

Sleeping rooms 30

Stairs (c) 40

For SI: 1 pound per square foot = 0.0479 kN/m<sup>2</sup>, 1 square inch = 645 mm<sup>2</sup>,  
 1 pound = 4.45 N.

- a. Elevated garage floors shall be capable of supporting a 2,000-pound load applied over a 20-square-inch area.
- b. No storage with roof slope not over 3 units in 12 units.
- c. Individual stair treads shall be designed for the uniformly distributed live load or a 300-pound concentrated load acting over an area of 4 square inches, whichever produces the greater stresses?
- d. A single concentrated load applied in any direction at any point along the top.
- e. See Section R502.2.1 for decks attached to exterior walls.
- f. Guard in-fill components (all those except the handrail), balusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds on an area equal to 1 square foot. This load need not be assumed to act concurrently with any other live load requirement.

**R502.2.1 Decks.** Where supported by attachment to an exterior wall, decks shall be positively anchored to the primary structure and designed for both vertical and lateral loads as applicable. Such attachment shall not be accomplished by the use of toenails or nails subject to withdrawal. Where positive connection to the primary building structure cannot be verified during inspection, decks shall be self-supporting. For decks with cantilevered framing members, connections to exterior walls or other framing members, shall be designed and constructed to resist uplift resulting from the full live load specified in Table R301.5 acting on the cantilevered portion of the deck.

**R502.3 Allowable joist spans.** Spans for floor joists shall be in accordance with Tables R502.3.1 (1) and R502.3.1 (2). For other grades and species and for other loading conditions, refer to the AF&PA Span Tables for Joists and Rafters.

DECKS

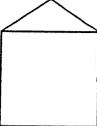
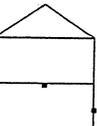
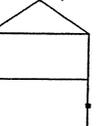
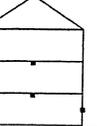
TABLE R502.3.1(2)  
FLOOR JOIST SPANS FOR COMMON LUMBER SPECIES  
(Residential living areas, live load = 40 psf, L/Δ = 360)

JOIST SPACING (inches)	SPECIES AND GRADE	DEAD LOAD = 10 psf				DEAD LOAD = 20 psf			
		2x6	2x8	2x10	2x12	2x6	2x8	2x10	2x12
		Maximum floor joist spans							
		(ft.- in.)	(ft.- in.)	(ft.- in.)	(ft.- in.)	(ft.- in.)	(ft.- in.)	(ft.- in.)	(ft.- in.)
12	Douglas fir-larch SS	11-4	15-0	19-1	23-3	11-4	15-0	19-1	23-3
	Douglas fir-larch #1	10-11	14-5	18-5	22-0	10-11	14-2	17-4	20-1
	Douglas fir-larch #2	10-9	14-2	17-9	20-7	10-6	13-3	16-3	18-10
	Douglas fir-larch #3	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
	Hem-fir SS	10-9	14-2	18-0	21-11	10-9	14-2	18-0	21-11
	Hem-fir #1	10-6	13-10	17-8	21-6	10-6	13-10	16-11	19-7
	Hem-fir #2	10-0	13-2	16-10	20-4	10-0	13-1	16-0	18-6
	Hem-fir #3	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
	Southern pine SS	11-2	14-8	18-9	22-10	11-2	14-8	18-9	22-10
	Southern pine #1	10-11	14-5	18-5	22-5	10-11	14-5	18-5	22-5
	Southern pine #2	10-9	14-2	18-0	21-9	10-9	14-2	16-11	19-10
	Southern pine #3	9-4	11-11	14-0	16-8	8-6	10-10	12-10	15-3
	Spruce-pine-fir SS	10-6	13-10	17-8	21-6	10-6	13-10	17-8	21-6
	Spruce-pine-fir #1	10-3	13-6	17-3	20-7	10-3	13-3	16-3	18-10
	Spruce-pine-fir #2	10-3	13-6	17-3	20-7	10-3	13-3	16-3	18-10
	Spruce-pine-fir #3	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
16	Douglas fir-larch SS	10-4	13-7	17-4	21-1	10-4	13-7	17-4	21-0
	Douglas fir-larch #1	9-11	13-1	16-5	19-1	9-8	12-4	15-0	17-5
	Douglas fir-larch #2	9-9	12-7	15-5	17-10	9-1	11-6	14-1	16-3
	Douglas fir-larch #3	7-6	9-6	11-8	13-6	6-10	8-8	10-7	12-4
	Hem-fir SS	9-9	12-10	16-5	19-11	9-9	12-10	16-5	19-11
	Hem-fir #1	9-6	12-7	16-0	18-7	9-6	12-0	14-8	17-0
	Hem-fir #2	9-1	12-0	15-2	17-7	8-11	11-4	13-10	16-1
	Hem-fir #3	7-6	9-6	11-8	13-6	6-10	8-8	10-7	12-4
	Southern pine SS	10-2	13-4	17-0	20-9	10-2	13-4	17-0	20-9
	Southern pine #1	9-11	13-1	16-9	20-4	9-11	13-1	16-4	19-6
	Southern pine #2	9-9	12-10	16-1	18-10	9-6	12-4	14-8	17-2
	Southern pine #3	8-1	10-3	12-2	14-6	7-4	9-5	11-1	13-2
	Spruce-pine-fir SS	9-6	12-7	16-0	19-6	9-6	12-7	16-0	19-6
	Spruce-pine-fir #1	9-4	12-3	15-5	17-10	9-1	11-6	14-1	16-3
	Spruce-pine-fir #2	9-4	12-3	15-5	17-10	9-1	11-6	14-1	16-3
	Spruce-pine-fir #3	7-6	9-6	11-8	13-6	6-10	8-8	10-7	12-4
19.2	Douglas fir-larch SS	9-8	12-10	16-4	19-10	9-8	12-10	16-4	19-2
	Douglas fir-larch #1	9-4	12-4	15-0	17-5	8-10	11-3	13-8	15-11
	Douglas fir-larch #2	9-1	11-6	14-1	16-3	8-3	10-6	12-10	14-10
	Douglas fir-larch #3	6-10	8-8	10-7	12-4	6-3	7-11	9-8	11-3
	Hem-fir SS	9-2	12-1	15-5	18-9	9-2	12-1	15-5	18-9
	Hem-fir #1	9-0	11-10	14-8	17-0	8-8	10-11	13-4	15-6
	Hem-fir #2	8-7	11-3	13-10	16-1	8-2	10-4	12-8	14-8
	Hem-fir #3	6-10	8-8	10-7	12-4	6-3	7-11	9-8	11-3
	Southern pine SS	9-6	12-7	16-0	19-6	9-6	12-7	16-0	19-6
	Southern pine #1	9-4	12-4	15-9	19-2	9-4	12-4	14-11	17-9
	Southern pine #2	9-2	12-1	14-8	17-2	8-8	11-3	13-5	15-8
	Southern pine #3	7-4	9-5	11-1	13-2	6-9	8-7	10-1	12-1
	Spruce-pine-fir SS	9-0	11-10	15-1	18-4	9-0	11-10	15-1	17-9
	Spruce-pine-fir #1	8-9	11-6	14-1	16-3	8-3	10-6	12-10	14-10
	Spruce-pine-fir #2	8-9	11-6	14-1	16-3	8-3	10-6	12-10	14-10
	Spruce-pine-fir #3	6-10	8-8	10-7	12-4	6-3	7-11	9-8	11-3
24	Douglas fir-larch SS	9-0	11-11	15-2	18-5	9-0	11-11	14-9	17-1
	Douglas fir-larch #1	8-8	11-0	13-5	15-7	7-11	10-0	12-3	14-3
	Douglas fir-larch #2	8-1	10-3	12-7	14-7	7-5	9-5	11-6	13-4
	Douglas fir-larch #3	6-2	7-9	9-6	11-0	5-7	7-1	8-8	10-1
	Hem-fir SS	8-6	11-3	14-4	17-5	8-6	11-3	14-4	16-10*
	Hem-fir #1	8-4	10-9	13-1	15-2	7-9	9-9	11-11	13-10
	Hem-fir #2	7-11	10-2	12-5	14-4	7-4	9-3	11-4	13-1
	Hem-fir #3	6-2	7-9	9-6	11-0	5-7	7-1	8-8	10-1
	Southern pine SS	8-10	11-8	14-11	18-1	8-10	11-8	14-11	18-1
	Southern pine #1	8-8	11-5	14-7	17-5	8-8	11-3	13-4	15-11
	Southern pine #2	8-6	11-0	13-1	15-5	7-9	10-0	12-0	14-0
	Southern pine #3	6-7	8-5	9-11	11-10	6-0	7-8	9-1	10-9
	Spruce-pine-fir SS	8-4	11-0	14-0	17-0	8-4	11-0	13-8	15-11
	Spruce-pine-fir #1	8-1	10-3	12-7	14-7	7-5	9-5	11-6	13-4
	Spruce-pine-fir #2	8-1	10-3	12-7	14-7	7-5	9-5	11-6	13-4
	Spruce-pine-fir #3	6-2	7-9	9-6	11-0	5-7	7-1	8-8	10-1

NOTE: Check sources for availability of lumber in lengths greater than 20 feet.  
For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kN/m<sup>2</sup>.  
a. End bearing length shall be increased to 2 inches.

## GIRDER SPANS FOR DECKS

**TABLE R502.5(1)**  
**GIRDER SPANS<sup>a</sup> AND HEADER SPANS<sup>a</sup> FOR EXTERIOR BEARING WALLS**  
 (Maximum spans for Douglas fir-larch, hem-fir, southern pine and spruce-pine-fir<sup>b</sup> and required number of jack studs)

GIRDERS AND HEADERS SUPPORTING	SIZE	GROUND SNOW LOAD (psf) <sup>c</sup>											
		30						50					
		Building width <sup>c</sup> (feet)											
		20		28		36		20		28		36	
	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	Span	NJ <sup>d</sup>	
Roof and ceiling 	2-2x4	3-6	1	3-2	1	2-10	1	3-2	1	2-9	1	2-6	1
	2-2x6	5-5	1	4-8	1	4-2	1	4-8	1	4-1	1	3-8	2
	2-2x8	6-10	1	5-11	2	5-4	2	5-11	2	5-2	2	4-7	2
	2-2x10	8-5	2	7-3	2	6-6	2	7-3	2	6-3	2	5-7	2
	2-2x12	9-9	2	8-5	2	7-6	2	8-5	2	7-3	2	6-6	2
	3-2x8	8-4	1	7-5	1	6-8	1	7-5	1	6-5	2	5-9	2
	3-2x10	10-6	1	9-1	2	8-2	2	9-1	2	7-10	2	7-0	2
	3-2x12	12-2	2	10-7	2	9-5	2	10-7	2	9-2	2	8-2	2
	4-2x8	7-0	1	6-1	2	5-5	2	6-1	2	5-3	2	4-8	2
	4-2x10	11-8	1	10-6	1	9-5	2	10-6	1	9-1	2	8-2	2
4-2x12	14-1	1	12-2	2	10-11	2	12-2	2	10-7	2	9-5	2	
Roof, ceiling and one center-bearing floor 	2-2x4	3-1	1	2-9	1	2-5	1	2-9	1	2-5	1	2-2	1
	2-2x6	4-6	1	4-0	1	3-7	2	4-1	1	3-7	2	3-3	2
	2-2x8	5-9	2	5-0	2	4-6	2	5-2	2	4-6	2	4-1	2
	2-2x10	7-0	2	6-2	2	5-6	2	6-4	2	5-6	2	5-0	2
	2-2x12	8-1	2	7-1	2	6-5	2	7-4	2	6-5	2	5-9	3
	3-2x8	7-2	1	6-3	2	5-8	2	6-5	2	5-8	2	5-1	2
	3-2x10	8-9	2	7-8	2	6-11	2	7-11	2	6-11	2	6-3	2
	3-2x12	10-2	2	8-11	2	8-0	2	9-2	2	8-0	2	7-3	2
	4-2x8	5-10	2	5-2	2	4-8	2	5-3	2	4-7	2	4-2	2
	4-2x10	10-1	1	8-10	2	8-0	2	9-1	2	8-0	2	7-2	2
4-2x12	11-9	2	10-3	2	9-3	2	10-7	2	9-3	2	8-4	2	
<b>DECKS</b> Roof, ceiling and one clear span floor 	2-2x4	2-8	1	2-4	1	2-1	1	2-7	1	2-3	1	2-0	1
	2-2x6	3-11	1	3-5	2	3-0	2	3-10	2	3-4	2	3-0	2
	2-2x8	5-0	2	4-4	2	3-10	2	4-10	2	4-2	2	3-9	2
	2-2x10	6-1	2	5-3	2	4-8	2	5-11	2	5-1	2	4-7	3
	2-2x12	7-1	2	6-1	3	5-5	3	6-10	2	5-11	3	5-4	3
	3-2x8	6-3	2	5-5	2	4-10	2	6-1	2	5-3	2	4-8	2
	3-2x10	7-7	2	6-7	2	5-11	2	7-5	2	6-5	2	5-9	2
	3-2x12	8-10	2	7-8	2	6-10	2	8-7	2	7-5	2	6-8	2
	4-2x8	5-1	2	4-5	2	3-11	2	4-11	2	4-3	2	3-10	2
	4-2x10	8-9	2	7-7	2	6-10	2	8-7	2	7-5	2	6-7	2
4-2x12	10-2	2	8-10	2	7-11	2	9-11	2	8-7	2	7-8	2	
Roof, ceiling and two center-bearing floors 	2-2x4	2-7	1	2-3	1	2-0	1	2-6	1	2-2	1	1-11	1
	2-2x6	3-9	2	3-3	2	2-11	2	3-8	2	3-2	2	2-10	2
	2-2x8	4-9	2	4-2	2	3-9	2	4-7	2	4-0	2	3-8	2
	2-2x10	5-9	2	5-1	2	4-7	3	5-8	2	4-11	2	4-5	3
	2-2x12	6-8	2	5-10	3	5-3	3	6-6	2	5-9	3	5-2	3
	3-2x8	5-11	2	5-2	2	4-8	2	5-9	2	5-1	2	4-7	2
	3-2x10	7-3	2	6-4	2	5-8	2	7-1	2	6-2	2	5-7	2
	3-2x12	8-5	2	7-4	2	6-7	2	8-2	2	7-2	2	6-5	3
	4-2x8	4-10	2	4-3	2	3-10	2	4-9	2	4-2	2	3-9	2
	4-2x10	8-4	2	7-4	2	6-7	2	8-2	2	7-2	2	6-5	2
	4-2x12	9-8	2	8-6	2	7-8	2	9-5	2	8-3	2	7-5	2

(continued)

**TABLE R502.3.3(1)**  
**CANTILEVER SPANS FOR FLOOR JOISTS SUPPORTING LIGHT-FRAME EXTERIOR BEARING WALL AND ROOF ONLY<sup>a, b, c, f, g, h</sup>**  
 (Floor Live Load ≤ 40 psf, Roof Live Load ≤ 20 psf)

Member & Spacing	Maximum Cantilever Span (Uplift Force at Backspan Support in Lbs.) <sup>d, e</sup>											
	Ground Snow Load											
	≤ 20 psf			30 psf			50 psf			70 psf		
	Roof Width			Roof Width			Roof Width			Roof Width		
	24 ft.	32 ft.	40 ft.	24 ft.	32 ft.	40 ft.	24 ft.	32 ft.	40 ft.	24 ft.	32 ft.	40 ft.
2 × 8 @ 12"	20" (177)	15" (227)	—	18" (209)	—	—	—	—	—	—	—	—
2 × 10 @ 16"	29" (228)	21" (297)	16" (364)	26" (271)	18" (354)	—	20" (375)	—	—	—	—	—
2 × 10 @ 12"	36" (166)	26" (219)	20" (270)	34" (198)	22" (263)	16" (324)	26" (277)	—	—	19" (356)	—	—
2 × 12 @ 16"	—	32" (287)	25" (356)	36" (263)	29" (345)	21" (428)	29" (367)	20" (484)	—	23" (471)	—	—
2 × 12 @ 12"	—	42" (209)	31" (263)	—	37" (253)	27" (317)	36" (271)	27" (358)	17" (447)	31" (348)	19" (462)	—
2 × 12 @ 8"	—	48" (136)	45" (169)	—	48" (164)	38" (206)	—	40" (233)	26" (294)	36" (230)	29" (304)	18" (379)

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kN/m<sup>2</sup>.

- a. Tabulated values are for clear-span roof supported solely by exterior bearing walls.
- b. Spans are based on No. 2 Grade lumber of Douglas fir-larch, hem-fir, southern pine, and spruce-pine-fir for repetitive (3 or more) members.
- c. Ratio of backspan to cantilever span shall be at least 3:1.
- d. Connections capable of resisting the indicated uplift force shall be provided at the backspan support.
- e. Uplift force is for a backspan to cantilever span ratio of 3:1. Tabulated uplift values are permitted to be reduced by multiplying by a factor equal to 3 divided by the actual backspan ratio provided (3/backspan ratio).
- f. See Section R301.2.2.2.2, item 1, for additional limitations on cantilevered floor joists for detached one- and two-family dwellings in Seismic Design Categories D<sub>1</sub> and D<sub>2</sub> and townhouses in Seismic Design Categories C, D<sub>1</sub>, and D<sub>2</sub>.
- g. A full-depth rim joist shall be provided at the cantilevered end of the joists. Solid blocking shall be provided at the cantilever support.
- h. Linear interpolation shall be permitted for building widths and ground snow loads other than shown.

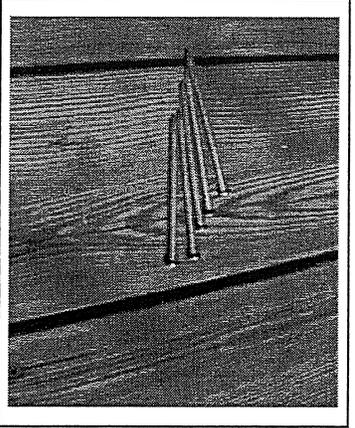
**TABLE R502.3.3(2)**  
**CANTILEVER SPANS FOR FLOOR JOISTS SUPPORTING EXTERIOR BALCONY<sup>a, b, e, f</sup>**

Member Size	Spacing	Maximum Cantilever Span (Uplift Force at Backspan Support in Lbs.) <sup>c, d</sup>		
		Ground Snow Load		
		≤ 30 psf	50 psf	70 psf
2 × 8	12"	42" (139)	39" (156)	34" (165)
2 × 8	16"	36" (151)	34" (171)	29" (180)
2 × 10	12"	61" (164)	57" (189)	49" (201)
2 × 10	16"	53" (180)	49" (208)	42" (220)
2 × 10	24"	43" (212)	40" (241)	34" (255)
2 × 12	16"	72" (228)	67" (260)	57" (268)
2 × 12	24"	58" (279)	54" (319)	47" (330)

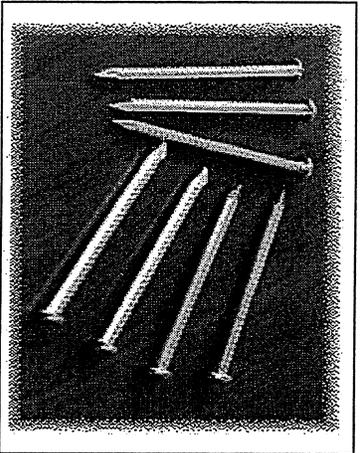
For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kN/m<sup>2</sup>.

- a. Spans are based on No. 2 Grade lumber of Douglas fir-larch, hem-fir, southern pine, and spruce-pine-fir for repetitive (3 or more) members.
- b. Ratio of backspan to cantilever span shall be at least 2:1.
- c. Connections capable of resisting the indicated uplift force shall be provided at the backspan support.
- d. Uplift force is for a backspan to cantilever span ratio of 2:1. Tabulated uplift values are permitted to be reduced by multiplying by a factor equal to 2 divided by the actual backspan ratio provided (2/backspan ratio).
- e. A full-depth rim joist shall be provided at the cantilevered end of the joists. Solid blocking shall be provided at the cantilevered support.
- f. Linear interpolation shall be permitted for ground snow loads other than shown.

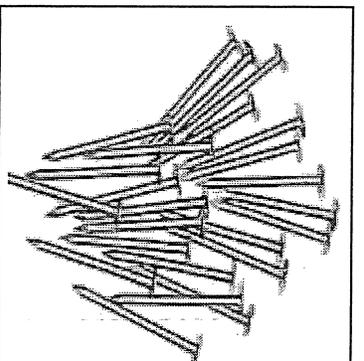
**FASTENERS IN CONTACT WITH ACO PRESERVATIVE-TREATED LUMBER**



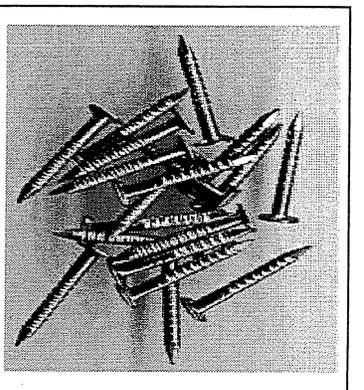
Hot dipped galvanized steel nails



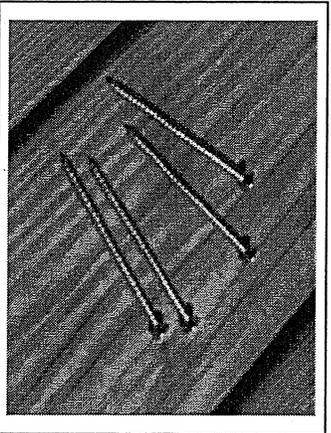
Stainless steel nails, screws or bolts



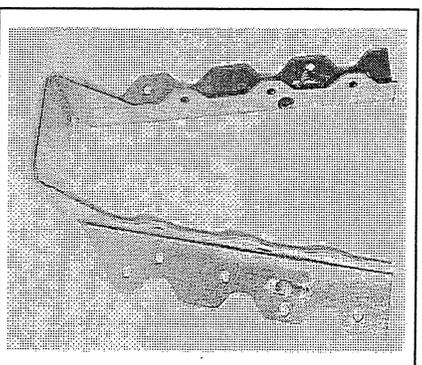
Copper nails



Silicon bronze nails

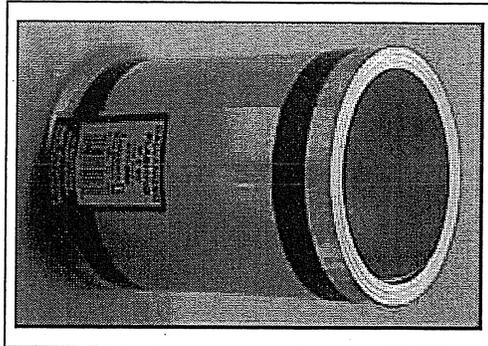


Screws with proprietary coatings approved by the Building Official

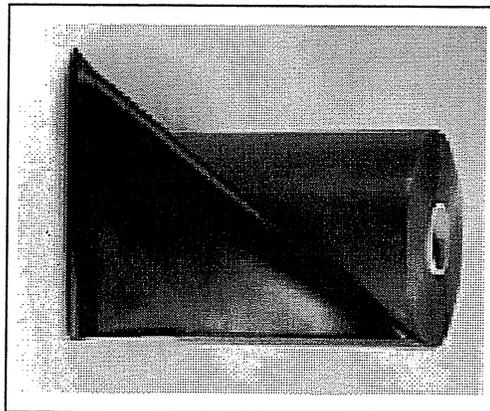


Hot dipped galvanized hangers

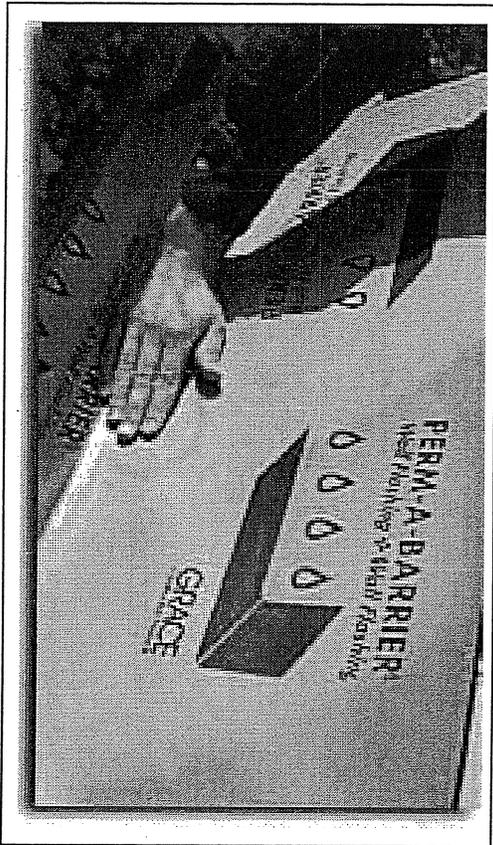
**FLASHING OPTIONS**



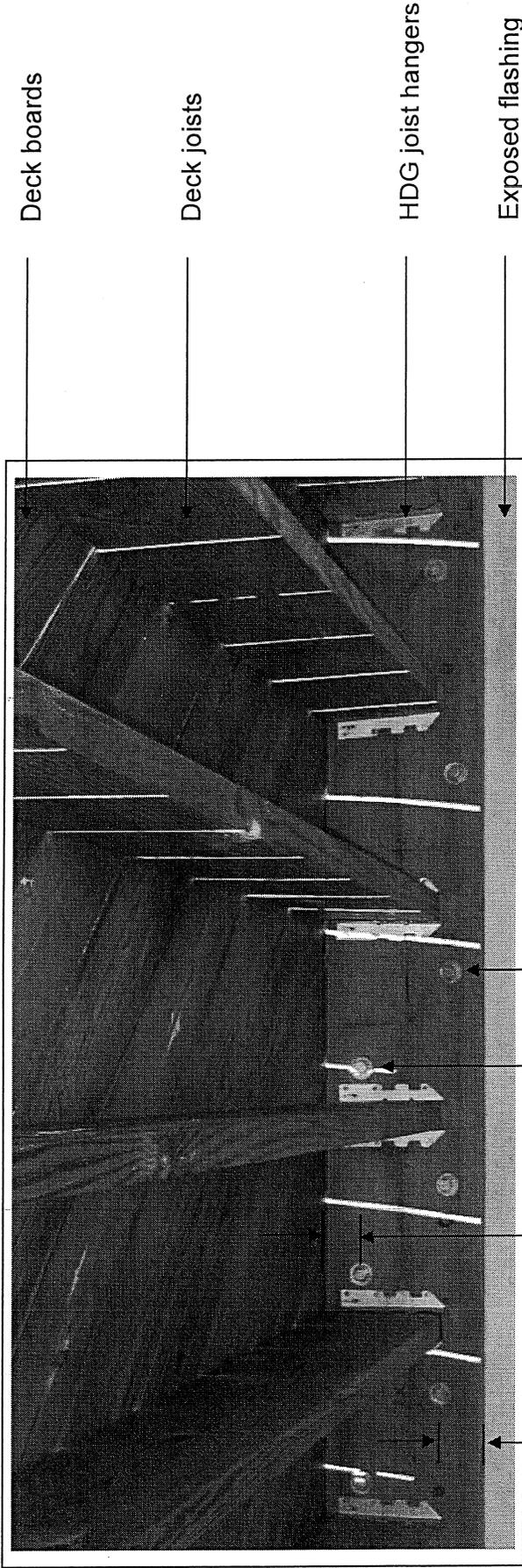
Minimum 19 mil  
galvanized steel flashing  
(Aluminum is NOT allowed)



Minimum 45 mil EPDM  
(ethylene propylene diene)



Minimum 40 mil rubberized asphalt  
self-adhering vapor barrier



1/2" diameter thru-bolts  
Staggered, spacing per table on sheet 3

Min 2"

**DECK LEDGER CONNECTION TO HOUSE BAND JOIST  
(IRC R502.2.2)**