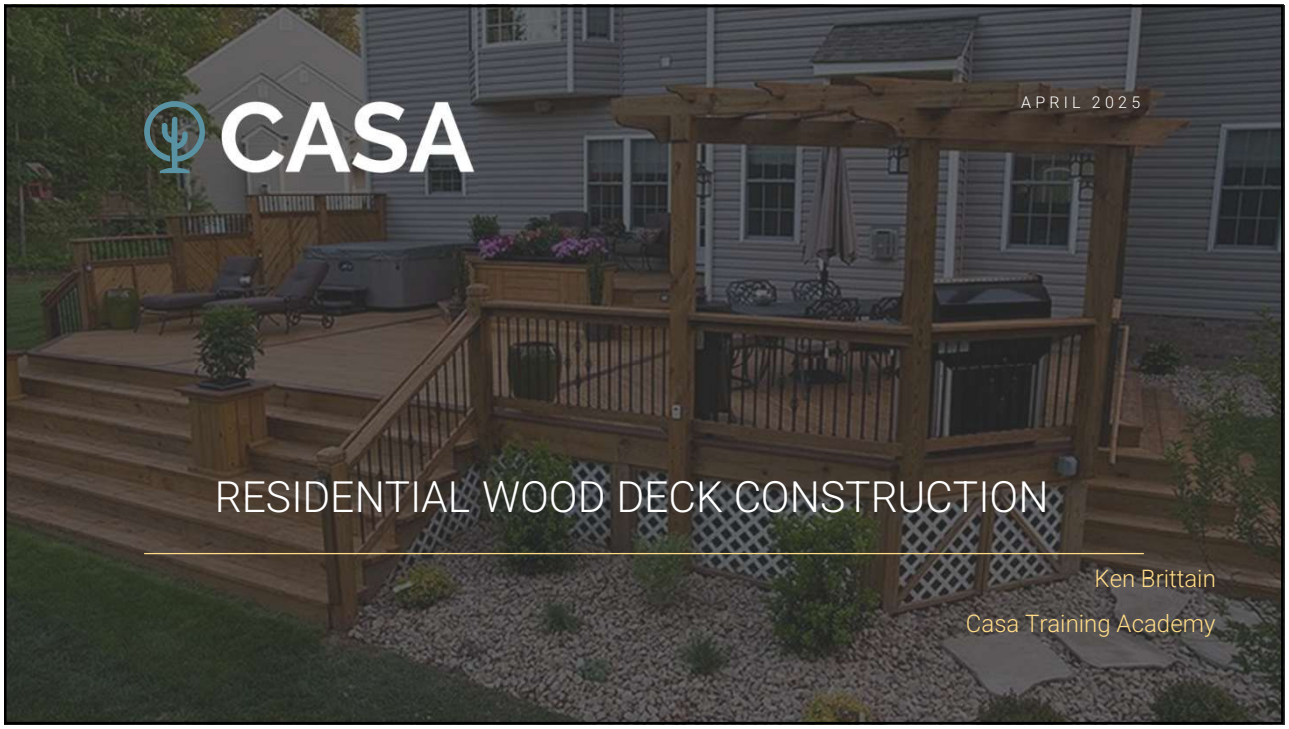
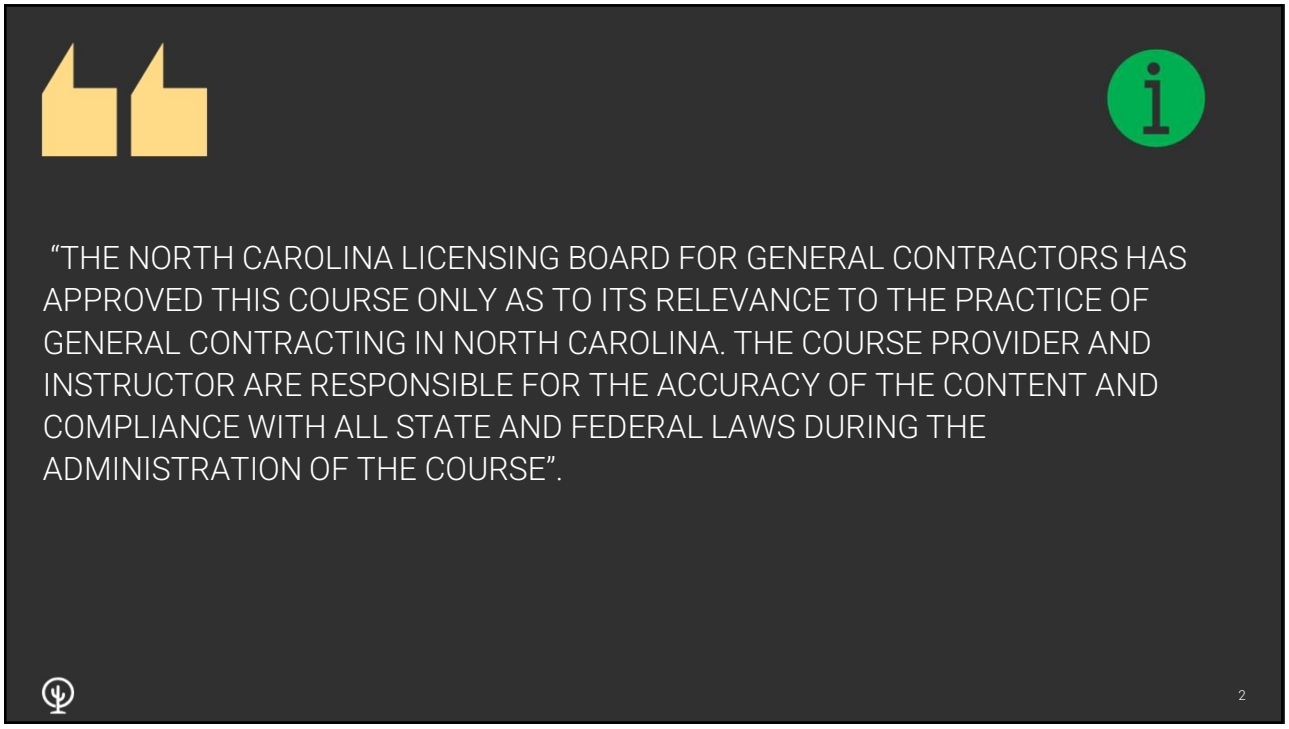

CASA
APRIL 2025
RESIDENTIAL WOOD DECK CONSTRUCTION
Ken Brittain
Casa Training Academy

1


"THE NORTH CAROLINA LICENSING BOARD FOR GENERAL CONTRACTORS HAS APPROVED THIS COURSE ONLY AS TO ITS RELEVANCE TO THE PRACTICE OF GENERAL CONTRACTING IN NORTH CAROLINA. THE COURSE PROVIDER AND INSTRUCTOR ARE RESPONSIBLE FOR THE ACCURACY OF THE CONTENT AND COMPLIANCE WITH ALL STATE AND FEDERAL LAWS DURING THE ADMINISTRATION OF THE COURSE".
2

2

The objective of this course is to provide North Carolina General Contractors with the knowledge and practical skills needed to design, plan, and construct safe, durable, and aesthetically appealing residential decks. Participants will learn about local building codes, materials selection, site preparation, and proper framing techniques, with a focus on ensuring compliance with North Carolina regulations. By the end of the course, contractors will be equipped to confidently manage residential deck projects from start to finish, ensuring quality craftsmanship, structural integrity, and client satisfaction.

Course Objective

The Goal is Education & Knowledge

3

3

The objective of this course is to provide North Carolina Home Inspectors with the knowledge about residential deck design and construction. Participants will learn about local building codes, materials selection, site preparation, proper framing techniques, and how they apply to inspection procedures.

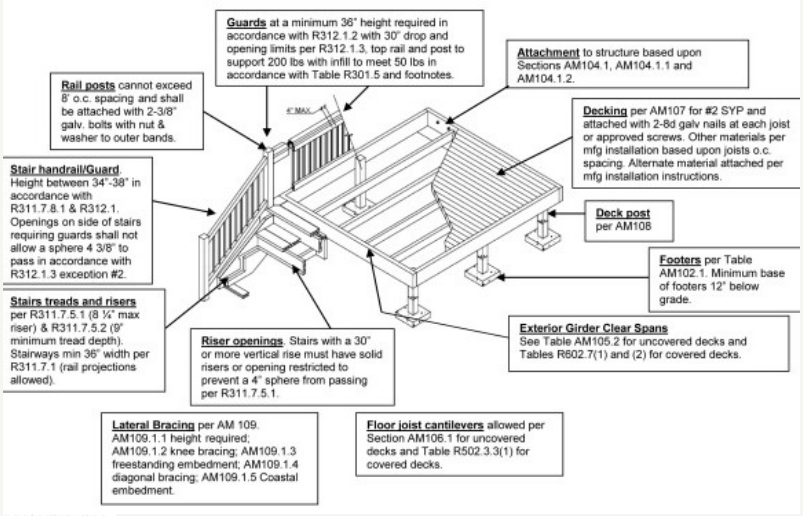
Course Objective

The Goal is Education & Knowledge

4

4

AGENDA



- Definitions
- Standards
- Foundations & Footings
- Posts, Beams & Girders
- Framing & Decking
- Attachment
- Fasteners
- Flashing
- Railings
- Steps
- Bracing
- Coastal Regions

5

5

AM101. 1

A deck is an exposed exterior wood floor structure that is permitted to be attached to the structure or freestanding. Roofed porches (open or screened-in) are permitted to be constructed using these provisions

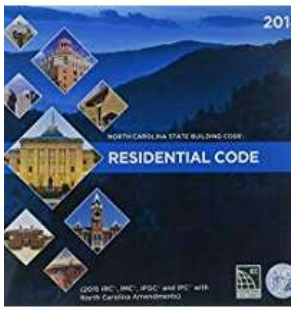
What is the definition of a deck?

It depends on your reference

6

6

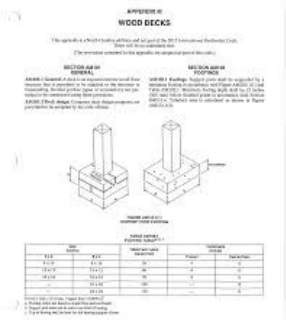
Standards and References



North Carolina State Building Code

2018 Residential Code

Chapters 3, 4, 5 & 45 (coastal)



North Carolina State Building Code

Appendix M (Replaces R507)

Supplement to NC Residential Code

International Residential Code

Basis for current NC Code is IRC 2015

Other Standards

American Wood Council

Design for Code Acceptance

Industry & MFG Guidelines

CASA TRAINING ACADEMY

The code is the minimum requirement

You may exceed the minimum and use other accepted documents or engineered designs R 301.1.1

- Composite decking & railing
- Engineered Lumber
- Structural Fasteners
- Brackets & Connectors

Manufactures instruction should be referenced and followed

Copies should be available for review

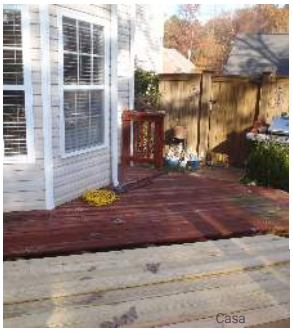
CASA TRAINING ACADEMY

Additional Definitions and References

R 106.1.2 Manufacturers' Instructions

Must be on site or

Referenced on plan documents



R 102.7 Existing Building

Additions, Alterations & Repairs

Conform to the current standards

Exemptions?

- Check with the local jurisdiction
- Size and location options may apply

R 104.9.1 Used Materials

- Must be regraded
- Require approval of Building Dept AHJ

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9

9

Critical areas

LOAD PATHS

- Types
- Ratings

FOOTINGS

- Size
- Materials
- Tributary Area

BEAMS & JOISTS

- Determining length
- Charts & Tables

LATERAL CONNECTIONS

- Connection to structure
- Other provisions

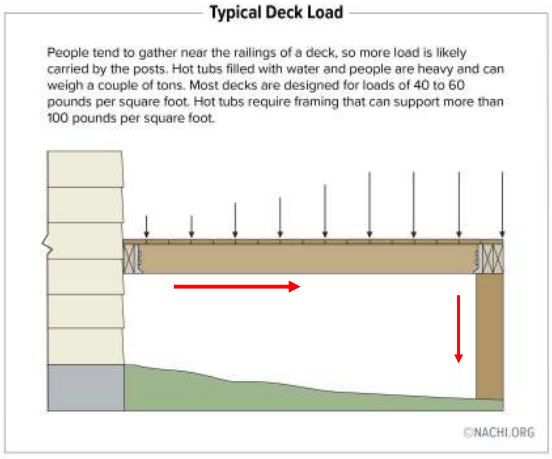
CASA

10

10

Deck Load Paths

What loads do decks experience?



- Vertical Loads
  - Live loads
  - Dead loads
- Lateral Loads
  - Wind
  - Seismic
- Transfer loads to the footing and soil

CASA

11

11

Load Calculations

FORCE

Force equals pressure times area

$F = P \times A$

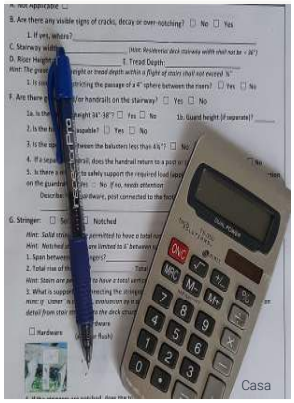
SEISMIC

Force equals mass times acceleration

$F = M \times A$

WIND UPLIFT

Prescriptive Tables



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12

12

Design Loads

Decks & Balconies

40 PSF

Fire Escapes

40 PSF

Railings & Stairs

200 PSF

Concentrated lateral load

Fill Ins

50 PSF

Concentrated lateral load

CASA

13

13

APPX M 102 Footings

SECTION AM102

FOOTINGS

AM102.1 Footings.

Support posts shall be supported by a minimum footing in accordance with Figure AM102.1(1) and Table AM102.1. Minimum footing depth shall be 12 inches (305 mm) below finished grade in accordance with Section R403.1.4. Tributary area is calculated as shown in Figure AM102.1(2).

Footing loads are based on single-floor and roof loads

Support posts must rest in the center one-third of the footing

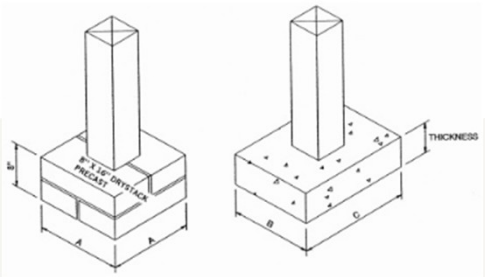
Top of footing shall be level for full bearing of support post

CASA

14

14

APPX M 102 Footers or Footings



Footing Types

- Cast in place
- Pre-cast dry stack
- Deck Blocks

Tributary area

CASA

15

APPX M 102 Footers or Footings

Tributary Area	Footing Size		Thickness	
(Square feet)	Stacked AxA	Poured BxC	Precast	Poured
36	8x16	8x16	4	6
40	12x12	12x12	4	6
70	16x16	16x16	8	8
100	-	16x24	-	8

Footing Types

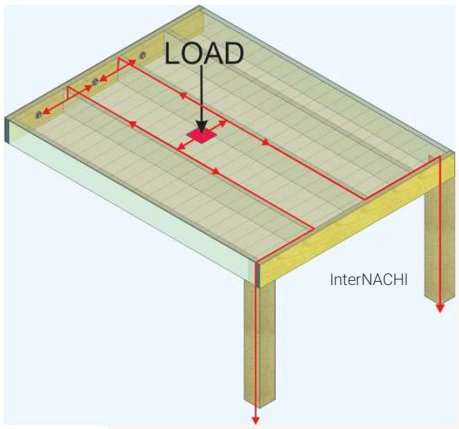
- Cast in place
- Pre-cast dry stack
- Deck Blocks

Tributary area

CASA

16

Tributary Area



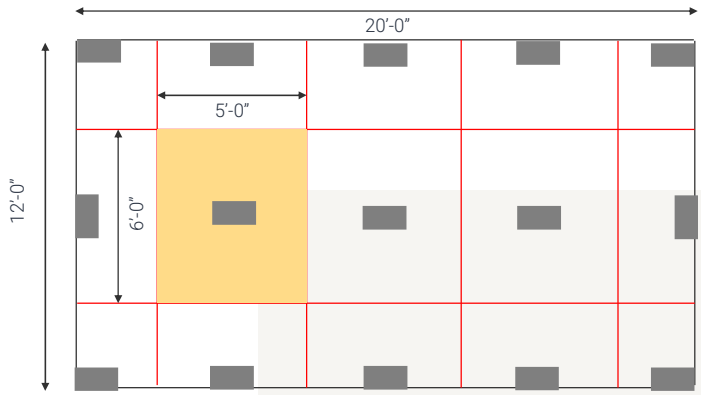
In structural engineering, a tributary area is the portion of a surface or floor area that a specific structural element (like a beam, column, or footing) is responsible for supporting and transferring loads to.

CASA

17

17

Tributary Area



The area shaded is the tributary area

6'x5'= 30 Sq Ft

CASA

18

18

APPX M 102 Footers or Footings

Tributary Area	Footing Size		Thickness	
(Square feet)	Stacked AxA	Poured BxC	Precast	Poured
36	8x16	8x16	4	6
40	12x12	12x12	4	6
70	16x16	16x16	8	8
100	-	16x24	-	8

Footing Types

- Cast in place
- Pre-cast dry stack
- Deck Blocks

Tributary area

CASA

Footing Types

Pre-Cast

Cast in Place

Deck Blocks

Piers/Piles

4503.4 Depth of Piles

CASA

Pre-Cast

Minimum footing depth shall be 12 inches* below finished grade in accordance with section R403.1.4

- Undisturbed soil
- Same level as the building footing
- Measured to the bottom of the footing

*Requirements can vary by county (mountains vs coastal). Special Mountain Regions contact AHJ

CASA

21

21

Deck Bocks

Does this meet the footing requirements?

- Depth
- Size
- Tributary area

Check to see if the local jurisdiction approves their use

Special Mountain Regions contact AHJ for verification

CASA

22

22

Deck Bocks

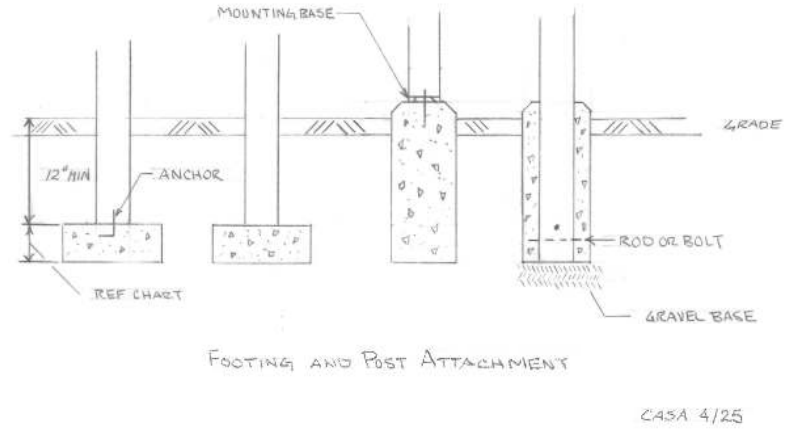
- Positive attachment and anchoring?
- Fastening of each component to the next
- New Products

CASA

23

23

Footing Connections



- R407.3
- Columns shall be restrained to prevent lateral displacement at the top and bottom end.
- Is a post considered a column?
- Does this apply to deck posts?
- What about lateral bracing?
- Embedment depth?

CASA

24

24

High Wind Areas

Mountain & Coastal Counties

TABLE R4503.2.1

FOOTINGS TO RESIST UPLIFT FROM PIERS IN 140 AND 150 MPH WIND ZONES SUPPORTING GIRDERS IN EXTERIOR WALLS

	FOOTING SIZE GIRDER SPAN		
VELOCITY (mph)	4'-0"	6'-0"	8'-0"
140	2'-0" x 2'-0" x 10"	2'-4" x 2'-4" x 10"	2'-8" x 2'-8" x 10"
150	3'-0" x 3'-0" x 10"	3'-4" x 3'-4" x 12"	3'-8" x 3'-8" x 12"

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 mile per hour = 0.447 m/s.
Note: See Table R403.1(2) for 130 mph wind zone.

- Tables R301.2 (4) & (5)
  - Determines the ultimate design load per county
- "Special Mountain Regions" should contact AHJ for requirements
- Reference Chapter 45 High Wind Zones
  - Footings
  - Anchorage
  - Bracing

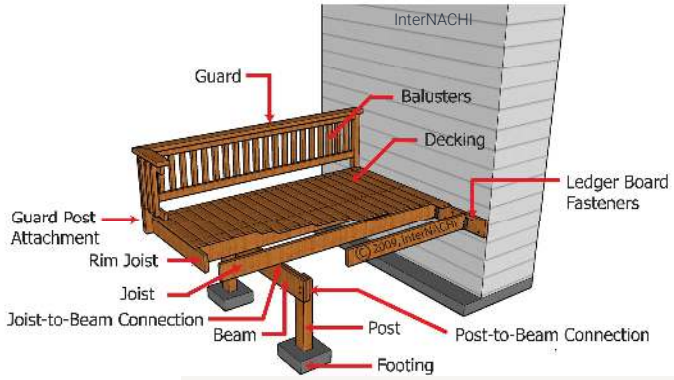
CASA

25

25

Framing

Typical deck construction



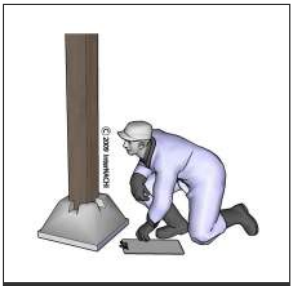
- Joist installation & attachment
- Beams & Girders
- Posts
- Bracing
- Connections

CASA

26

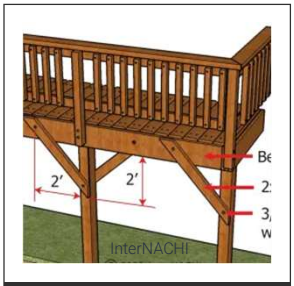
26

Framing



Posts & Bracing

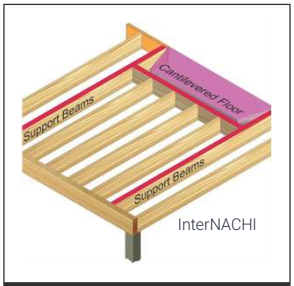
Height – Material -Size



Beams & Girders

Number of plys

Connection



Joists

Span Table

Attachment

Approved Fasteners

Flashing

CASA

27

27

Materials

PROPERITES

- Be pressure treated or naturally durable wood to resist rot & decay
- Wood must be termite resistant.
- Field treat cuts

GRADING

- Must be No. 2 Grade lumber or greater.

APPLICATION

- All pressure treated wood in contact with the ground must be labeled for such usage.

ALTERNATE MATERIALS

- Plastic composite material must be Decay & Termite Follow manufacturers specifications on allowable load and maximum allowable span.

CASA

28

28

Posts

AM 108 Post Height

Post Dimensions (inches)	Post Height (feet)
4 X 4	8
6 X 6	20

NOTES

- Measurements from top of footing to bottom of girder
- A registered design professional must design heights exceeding the maximum

CASA

29

29

Framing

Beams and Girders

SECTION AM105
GIRDER SUPPORT AND SPAN

AM105.1 General.

Girders shall bear directly on the support post with the post attached at top to prevent lateral displacement or be connected to the side of the posts with two 5/8-inch (16 mm) hot-dip galvanized bolts with nut and washer.

Reference figures AM 105.1-4

- Figure AM105.1(1) Top mount
- Figure AM105.1(2) Side mount
- Figure AM105.1(3) Split mount
- Figure AM105.1(4) Cantilevered girders

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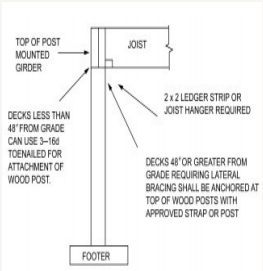
30

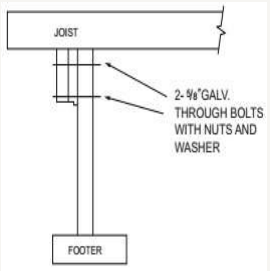
30

Beams and Girder Attachment

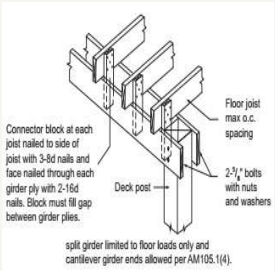
AM105.1(1)



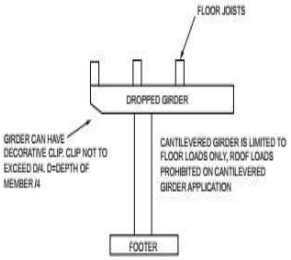
AM105.1(2)



AM105.1(3)



AM105.1(4)

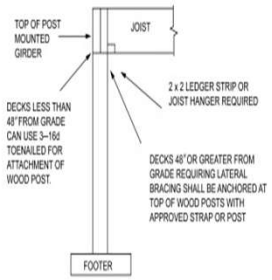


CASA

31

31

Beams and Girder Attachment



For SI: 1 inch = 25.4 mm.

FIGURE AM105.1(1) TOP MOUNT/FLUSH GIRDER

- Decks over 4 feet in height require top bearing and must be connected to the post with an appropriate bracket or strap
- Less than 48” can use 3-16d toenailed attachment
- Measure from the grade to the top of the platform

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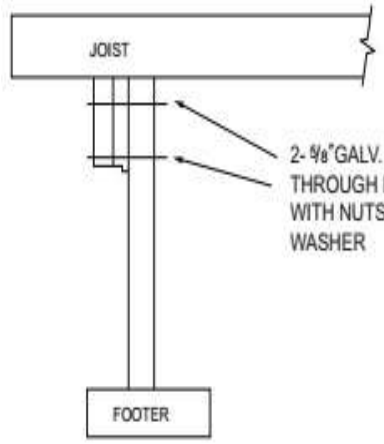
32

32

Beams and Girder Attachment



Side mount double built-up beam

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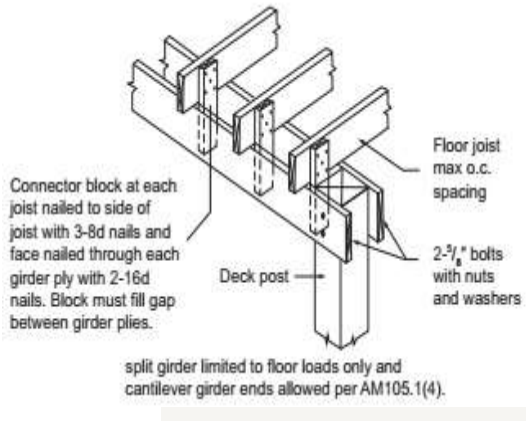
33

33

Beams and Girder Attachment



- Spilt Girder
- Blocking required between girder ply
- Must fill the gap
- Not intended for roof loads

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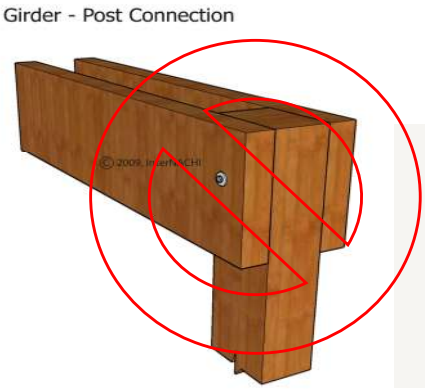
34

34

Beams and Girder Attachment

Other Standards



Note the differences between standards

Some require the beam support to be direct bearing on the post or column.

NC Appendix M allows

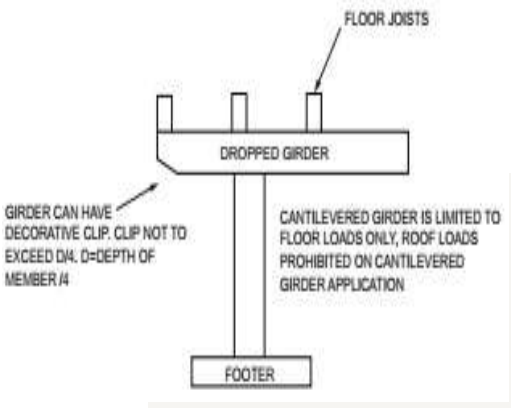
Is it okay to reference other standards?

CASA

35

35

Beams and Girder Attachment



- Drop Girder
- Can have a cantilever
  - Table R 502.3.3 (1)
- No roof loads on cantilever

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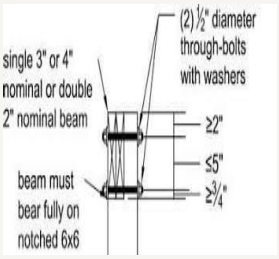
36

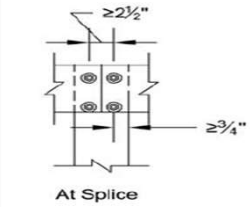
36

Beams and Girder Attachment

FASTNER SPACING

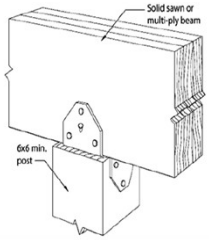


SPLICES



POST NOTCHING

POSITIVE ATTACHMENT



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37

37

Post Notching

- Shall not exceed 50% of post thickness
- Watch for overcutting
- Cuts shall be field treated

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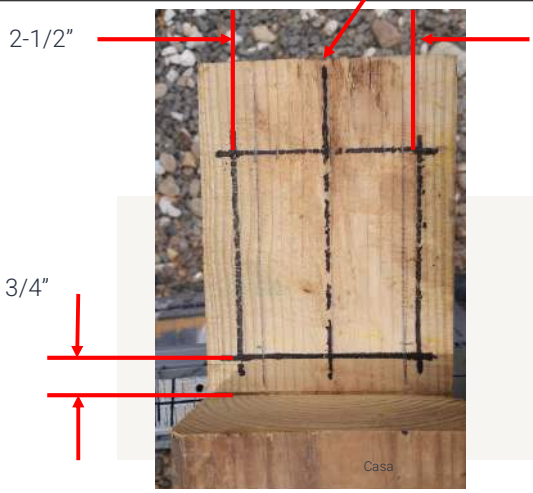
38

38

Fasteners and Spacing

Splices

End Splice – Butt Joint



- Minimum 2-1/2” between bolts
- Minimum ¾” at from edge

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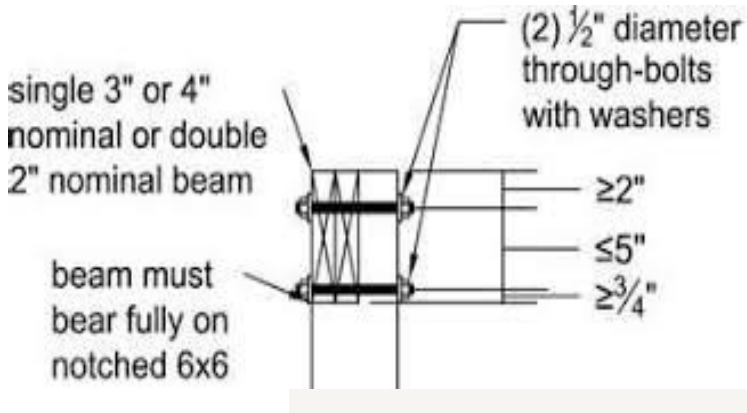
39

39

Fasteners and Spacing



- NC requires 5/8” hot-dipped galvanized through bolt with nut and washer

CASA

40

40

Beams and Girder Attachment

- Decks over 4 feet in height require top bearing and must be connected to the post with an appropriate bracket or strap
- Measure from the grade to the top of the platform

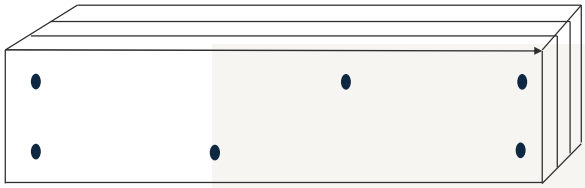
CASA

41

41

Built Up Beams

Other Standards



- Built-up beams have a specific nailing size and pattern requirement
- All joints and splices must be supported by a post
- #10d Thd Nail or #10 wood screws 3” in length
- Rows are staggered
- Each board must be attached to the adjacent board
- Typical spacing 16”

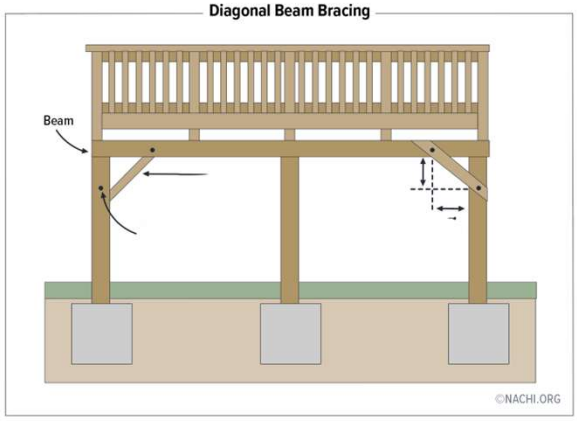
CASA

42

42

Deck Bracing

Section AM 109



- When is it required?
- Does the deck design change the requirements?
- Location & Spacing
- NC Requires 4x4 wood braces
- 5/8" through bolt & nut @ each end

CASA

43

43

Bracing

SECTION AM109
DECK BRACING

AM109.1 General.

Decks shall be braced to provide lateral stability. Lateral stability shall be provided in accordance with one of the methods in sections AM 109.1.1-AM 109.1.5

- Not required
- Knee bracing
  - Attached
  - Free Standing
- Cross bracing
- Coastal regions (Piles)

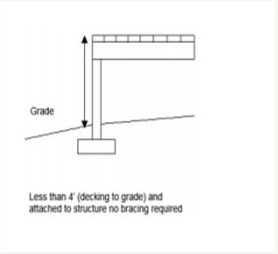
CASA

44

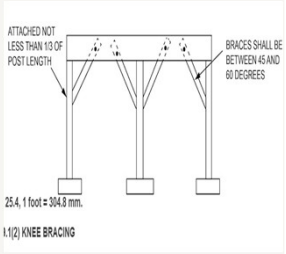
44

Bracing

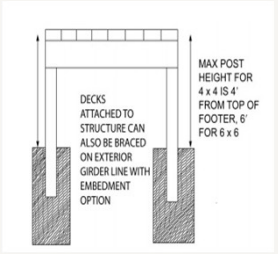
AM 109.1(1)NO BRACING



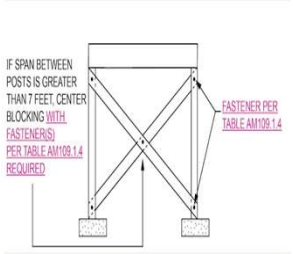
AM 109.1(2) KNEE BRACING



AM 109.1 (3) POST EMBEDMENT



AM 109.1 (4) CROSS BRACING

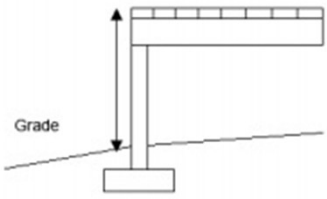


CASA TRAINING ACADEMY

45

Lateral Bracing

Not Required



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

- Deck floor is 48" or less from finished grade &
- Deck is attached to the structure & in accordance with AM 104
- Free-standing decks less than 30" above finished grade

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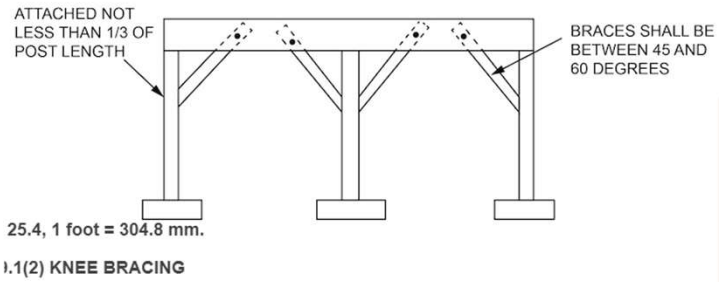
46

Lateral Bracing

Knee Bracing



- 4x4 wood knee braces permitted at each column in both directions
- Shall attach a point not less than 1/3 of post length (from top)
- Shall be angled between 45-60 degrees
- Fastened with one 5/8" hot dipped galvanized bolt w/ nut & washer on both ends of brace

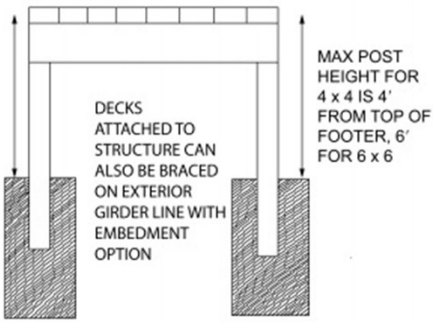
CASA

47

47

Lateral Bracing

AM 109.1.3 Post Embedment



- Free-standing decks without knee or cross bracing
- Lateral stability permitted by post embedment
- In accordance with table AM109.1

CASA

48

48

Lateral Bracing

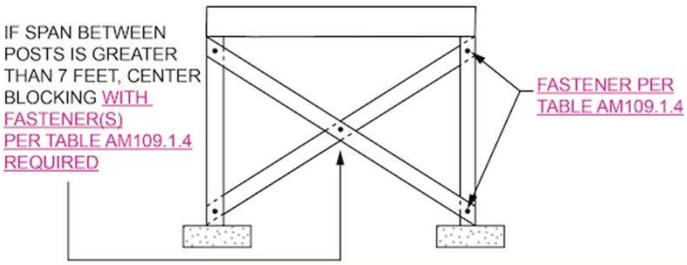
AM 109.1.3 Post Embedment for free standing decks

Size of Post (inches)	Tributary Area (SQFT) Maximum	Post Height (feet/inches) Maximum	Depth of Embedding	Diameter of Concrete
4X4	48	4-0	2'-6"	1'-0"
6X6	120	6-0	3'-6"	1'-8"

CASA

Lateral Bracing

AM 109.1.4 Cross Bracing



- 2x6 diagonal vertical cross bracing provided in 2 perpendicular directions for free-standing decks
- Parallel to the structure at the exterior column line for attached decks
- Attached with one 5/8" hot-dipped galvanized bolt w/nut & washer at end of each bracing member

CASA

Lateral Bracing

Table AM 109.1.4 Fastening of Braces

Type of Fastener	Size (Diameter in Inches)	Qty Req'd	Length
Bolt	5/8" *	1	As necessary
Screw	0.27" **	2	Must achieve 1-1/2 penetration into structural member from head of screw

- Bolts shall be hot-dipped galvanized through bolts with nut and washer
- Screws shall be hot-dipped galvanized. Self-drilling shall have a minimum diameter of 0.27"
- Self drilling screws shall be installed in the center of the post
- Self drilling screws shall have 1" spacing between screws

CASA

51

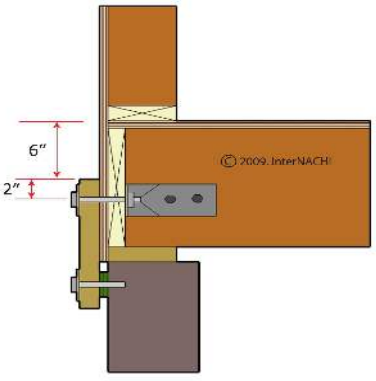
51

Lateral Bracing

Other Standards

AM 104.1.2 Other means of support

Deck Ledger to House Connection



Lateral Load Devices

- Manufacture specific
- Multiple options
- Specified by designer

CASA

52

52

Joists Spans & Cantilevers

Section AM 106

- Per table AM 106.1
- Cantilever shall not exceed ¼ actual joist span
- Lateral restraint required at joist ends
- Connections

CASA

53

53

Framing

How to determine the size & span of joists Table AM 106.1

TABLE AM106.1DECK JOIST SPANS FOR COMMON LUMBER SPECIES[f](feet – inches)

SPECIES[a]	SIZE	SPACING OF DECK JOISTS WITH NO CANTILEVER[b] (inches)			SPACING OF DECK JOISTS WITH CANTILEVERS[c] (inches)		
		12	16	24	12	16	24
Southern pine	2 x 6	9-11	9-0	7-7	6-8	6-8	6-8
	2 x 8	13-1	11-10	9-8	10-1	10-1	9-8
	2 x 10	16-2	14-0	11-5	14-6	14-0	11-5
	2 x 12	18-0	16-6	13-6	18-0	16-6	13-6
Douglas fir-larch[d], hem-fir[d], spruce-pine-fir[d]	2 x 6	9-6	8-8	7-2	6-3	6-3	6-3
	2 x 8	12-6	11-1	9-1	9-5	9-5	9-1
	2 x 10	15-8	13-7	11-1	13-7	13-7	11-1
	2 x 12	18-0	15-9	12-10	18-0	15-9	12-10
Redwood, western cedars, ponderosa pine[e], red pine[e]	2 x 6	8-10	8-0	7-0	5-7	5-7	5-7
	2 x 8	11-8	10-7	8-8	8-6	8-6	8-6
	2 x 10	14-11	13-0	10-7	12-3	12-3	10-7
	2 x 12	17-5	15-1	12-4	16-5	15-1	12-4

- Refer to the span chart for exterior applications
- Lumber species
- Lumber size
- Grade and Treatment marking should be present and visible
- No 2 grade wet service
- 40 PSF Live 10 PSF Dead loads

CASA

54

54

Bracing

SECTION AM106.1.1
Lateral Restraint at Supports

Joist ends shall and bearing locations shall be provided with lateral restraint to prevent rotation

When provided by blocking or hangers, their depth shall equal no less than 60% of the joist depth

Rim joists shall be secured to the end of each joist with not less than (3) 10d nails or (3) Number 10 x 3" wood screws (10d = 3" length)

Cantilevered floor joists refer to Table R503.3.3 (1)

CASA

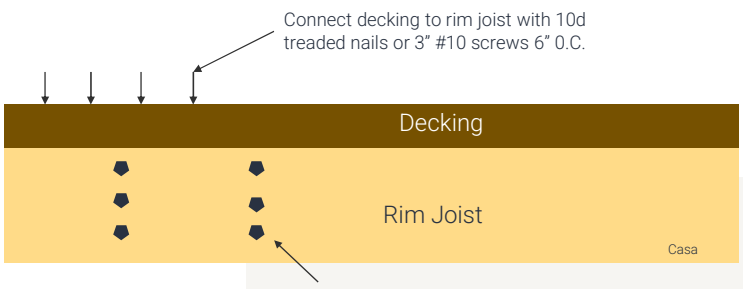
55

55

Framing

Other Standards

Rim Joist Connection



"Threaded" nails

Securing decking to rim joist @ 6" O.C.

CASA

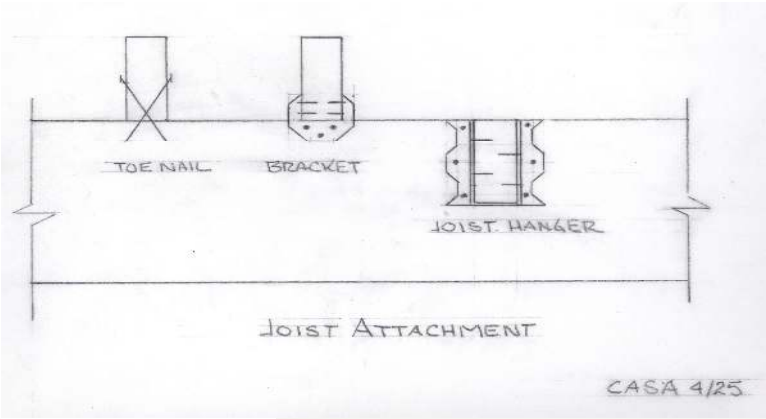
56

56

Framing

Other Standards

Joist connection to girder/beam



- Overhang restrictions
- Option one requires blocking bearing on girder
- Option 2 limited uplift load to 100 lbs
- Joist hangers refer to the manufacturer's guidelines

CASA

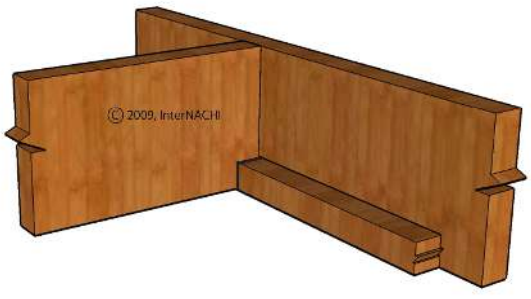
57

57

Framing

Joist connection to girder/beam

Ledger Strips



Ledger Strips

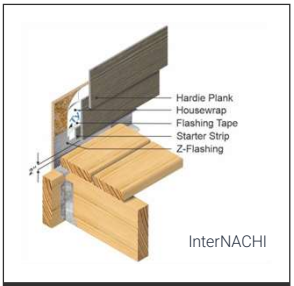
- Still allowable for NC
- Min size 2"x2" nominal (1-1/2 x1-1/2)
- Three nails under each joist location

CASA

58

58

Sections AM 103 – 105 – 110 - 111



Flashing

Type & Location

Attachment

Details & Connections

Decking

Materials

Steps & Railings

Requirements

CASA

59

59

Flashing

SECTION AM103.1

When attached to the structure, the structure to which it is 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 into contact with the untreated framing of the structure

CASA

60

60

Flashing

SECTION AM103.1

Aluminum flashing shall not be used in conjunction with deck construction.

Why?

What about coated aluminum?

CASA

61

61

Flashing

SECTION AM103.1

The deck band and the structure band shall be in contact with each other

Except

- On brick veneer structures
- Where plywood sheathing is required and properly flashed

Siding shall not be installed between the structure and the deck band

CASA

62

62

Flashing

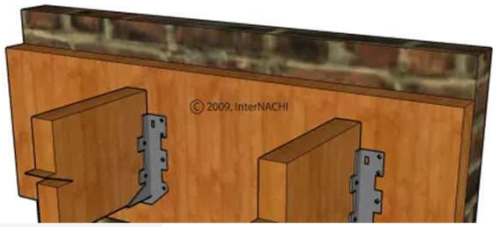
SECTION AM103.1

Brick Structures

- Flashing not required
- Treated band on the structure is not required

The treated deck band shall be in contact with the brick veneer

Joist Hanger/ Ledger Connections



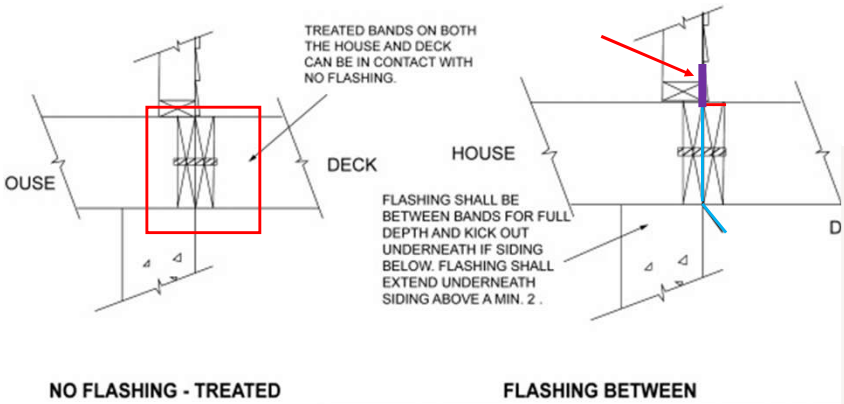
CASA

63

63

Flashing

Figure Am 103.1



- Treated bands on both deck and house, no flashing required
- Flashing between band for full length
- Kickout underneath if siding is below
- Flashing shall extend underneath siding 2" above (Min)

CASA

64

64

Deck Attachment

Section AM 104

- When attached to the structure
- Tables apply
  - AM 104.1 (1)
  - AM 104.1 (2)

CASA

65

65

Deck Attachment

Table AM 104.1 (1)

Deck attachment for all structures except brick veneer

TABLE AM104.1(1)DECK ATTACHMENT FOR ALL STRUCTURES EXCEPT BRICK VENEER

FASTENERS	8' MAX JOIST SPAN[a]	16' MAX JOIST SPAN[a]
$^5/_8$" Hot-dip galvanized bolts with nut and washer[b] and 12d Common hot-dip galvanized 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

- 5/8" Hot dipped Galvanized bolt w/nuts and washers
- AND 12d common hot dip galvanized nails
- OR self-drilling screw fasteners (aka Structural screws)

CASA

66

66

Deck Attachment

Other Standards

Lag Screws?

- Some allow for the use of lag screws
- North Carolina calls for self drilling screws
- Lag screws require pilot hole <u>and are not considered self drilling</u>

CASA

67

67

Deck Attachment

Fasteners

- Attachment spacing can be interpolated between 8 foot and 16 foot floor joist spans
- Minimum edge distance is 2-1/2”
- Nails must penetrate the supporting structure band a minimum of 1-1/2”
  - 12d nail = 3-1/4”

CASA

68

68

Deck Attachment

Fasteners

- Self Drilling Fasteners
  - Minimum shank diameter of 0.195”
    - # 9 Drill bit (0.196”)
    - 13/64 closest fraction (0.2031)
- Must penetrate through the structure band
- Min structure band depth 1-1/8”
- Approved shear for SYP to SYP
- Corrosion resistant finish or hot-dip galvanized
- Min distances
  - 1-7/16 edge
- Maximum 1/2” wood structural panel allowed between bands

CASA

69

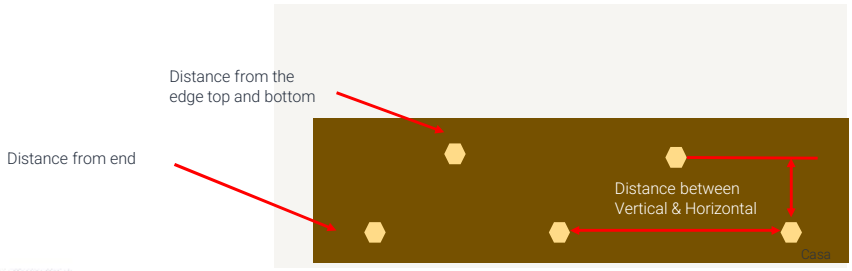
69

Deck Attachment

Table AM 104.1 (1) foot note

Self-Drilling Fasteners

Loading Conditions	Ledger Thickness	Fastener Length	Product Number	Rim Board Material and Size	Max Deck Span



- The number of fasteners and spacing are determined by multiple factors
- Manufacture dependent
- Check the manufacturer’s installation instructions for the specific product
- Variations allowable to avoid interference with joists

CASA

70

70

Deck Attachment

Table AM 104.1 (2)

Deck Attachment for Brick Veneer

Fastener Size and Spacing based on Span

Fastner Size	Max Joist Span 8’	Max Joist Span 16’
5/8” Hot Dipped Galvanized Bolt w/ Nut & Washer	1 Bolt every 2’-4” O.C.	1 Bolt every 1’-4” O.C.

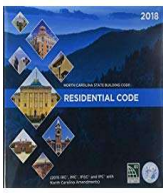
- Interpolation allowed for attachment between 8-16 foot joist spans
- Minimum edge distance 2-1/2”
- Flashing not required
- Lead expansion anchors are not allowed

CASA

71

71

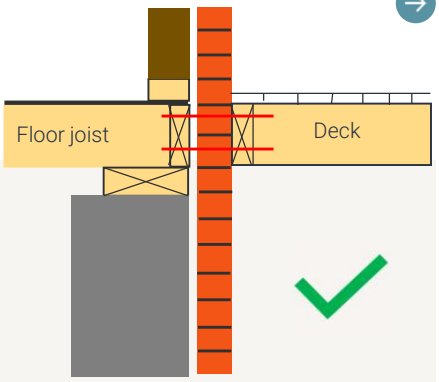
Deck Attachment



Other Standards

Brick Veneer

NC Allows Attachment to Brick Venner



Most codes, standards, and other states do not allow connecting a deck directly to brick Veneer

North Carolina

- Is unique
- Allows attaching directly to brick veneer

CASA

72

72

Deck Attachment

Alternate Materials

Allowable Loads for Rim Joist

Rim Board Material	½" Lag Bolt	½" Through Bolt	½" Through Bolt with space

- Engineered Rim Boards
- I Joists
  - Blocking?
- Refer to the manufacturer's installation guidelines
- Local Codes vary. Check for acceptance before installation.

CASA

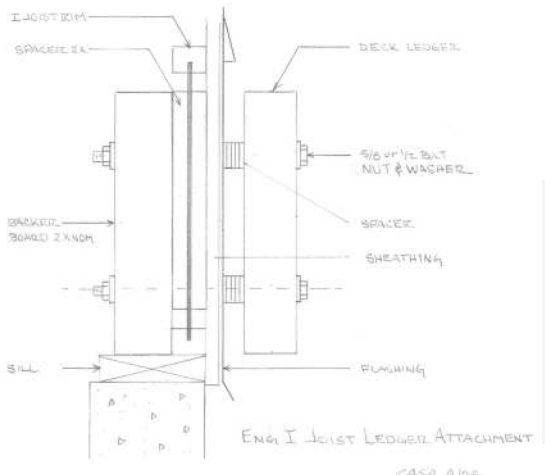
73

73

Deck Attachment

Alternate Materials

Rim Joist



- Engineered Rim Boards
- I Joists
  - Blocking?
- Refer to the manufacturer's installation guidelines

(See mock-up prop)

CASA

74

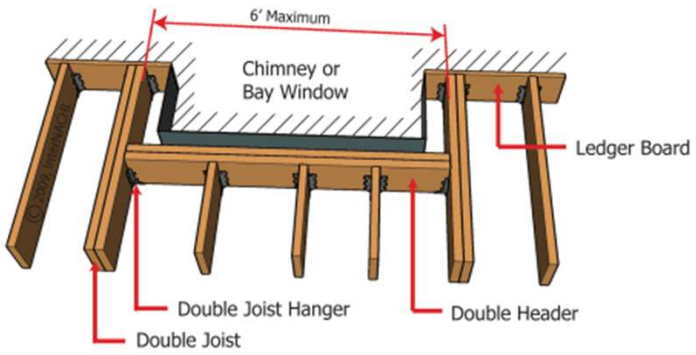
74

Deck Attachment

Other Standards

Framing around projections

Chimney – Bay Windows – Cantilevers



- Max 6' in width
- Over 6' require posts
- Double or triple trimmer, depending on joist span
- Attaching to cantilever is prohibited

CASA

75

75

Decking

Section AM 107

- Materials
  - SYP or equivalent
- Tables apply for thickness & spacing
  - AM 107.1
- Alternate Materials
  - Composites
  - MFG Instructions

CASA

76

76

Decking

Table AM 107.1

Thickness SYP

NOMINAL DECKING THICKNESS	JOIST SPACING (On Center)
1" S4S	12"
1" T&G	16"
1-1/4" S4S	19.2"
2" S4S	24-36"

CASA

77

77

Decking

Other Standards

Attachment – Size - Orientation

- 2" nominal thickness
- 1/8" spacing
- 2 – 8d Threaded nails or screws
- Minimum bearing of 3 joists
- 90 – 45 degree orientation
- AHJ for substitute materials

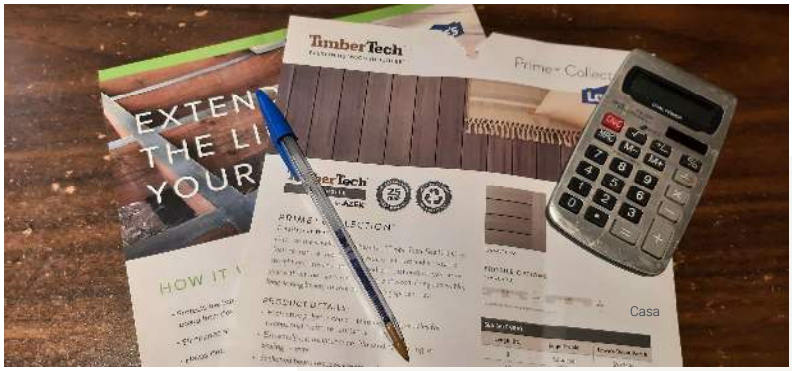
CASA

78

78

Decking

Alternate Materials



Adjust joist spans to accommodate different patterns

- 45 degree is 4" less than 90

NC options for 90 or 45 only

CASA

79

79

Steps, Handrails & Guards

Section AM 110

Section AM 111

- Spacing
- Posts
- Support
- Height
- Attachment

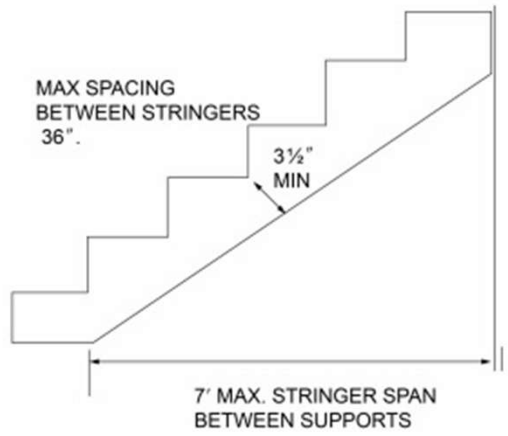
CASA

80

80

Stairs

AM 110



- Stringer span no longer than 7 feet between supports
- Spacing between stringers based on decking materials Table AM 107.1
- Maximum spacing between stringers 36”
- 3-1/2” between inside cut corner and back of stringer

CASA

81

81

Stairs

AM 110

Drop Headers

- Secure with 3/8” galvanized bolt, nut and washer
- Securely support stringer at top
- Brackets?

CASA

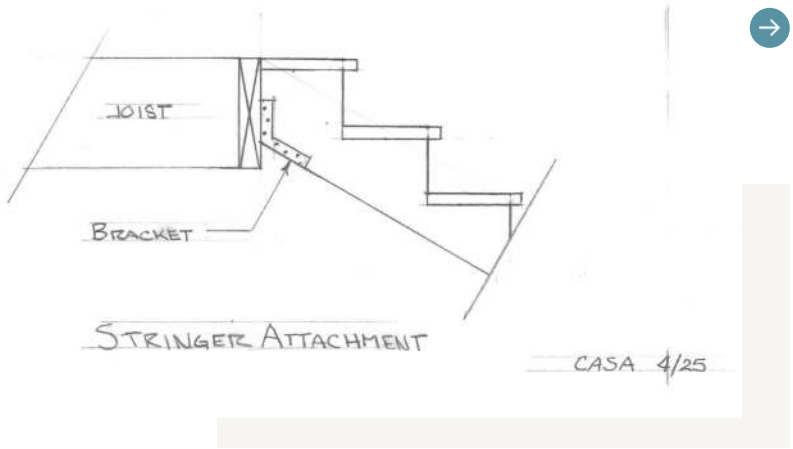
82

82

Stairs

Other Standards

Stringer Attachment



Some Standard
- Calls for joist hanger

NC Appendix M
- No details
- Ledger strip?

CASA

83

83

Stairs

AM 110

Stringer Support

- 7' Max between Supports for stringer

CASA

84

84

Stairs

AM 110

Treads and Risers

- Max riser height 8-1/4”
  - R3117.5.1
- 9” Min tread depth
  - R311.7.5.2
- Minimum 36” wide
  - R311.7.1

CASA

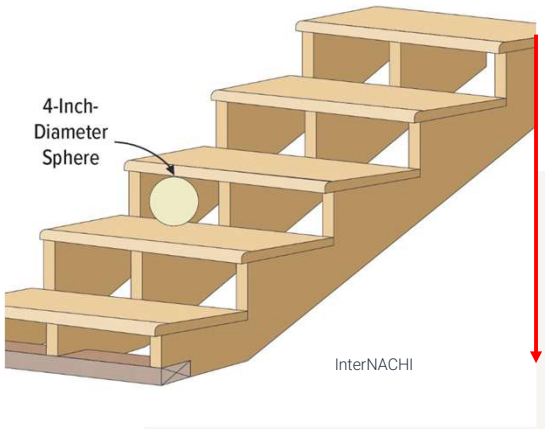
85

85

Stairs

AM 110

Riser Openings



- 30” or more vertical rise require solid risers
- Or opening restriction to prevent a 4” sphere from passing

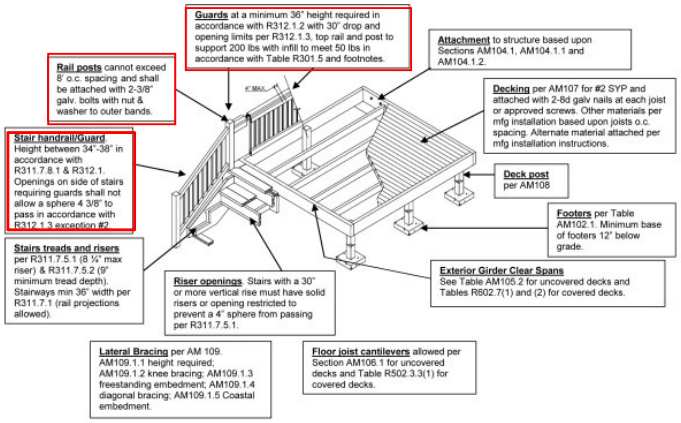
CASA

86

86

Handrails & Guards

AM 111



- Posts
- Guards
  - R312.1.2 & .3
- Stair Handrail/Guard
  - R311.7.8.1
  - R312.1

CASA

87

87

Handrails & Guards

Posts

Cannot exceed 8’ O.C. Spacing

Shall be attached with 3/8” galvanized bolt with nut and washer to the outer band

CASA

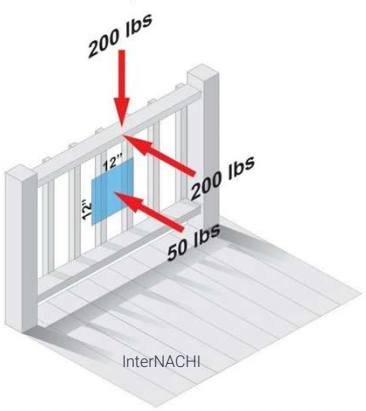
88

88

Handrails & Guards

Guards

- Minimum of 36” in height R312.1.2
  - 30” measured vertically to floor to grade from any point within 36” horizontally to the edge of the opening side
- Top rail 200 lbs of force
- Infill 50 lbs of force
  - Table R301.5 & Footnotes
- Screening not acceptable, fill in material



CASA

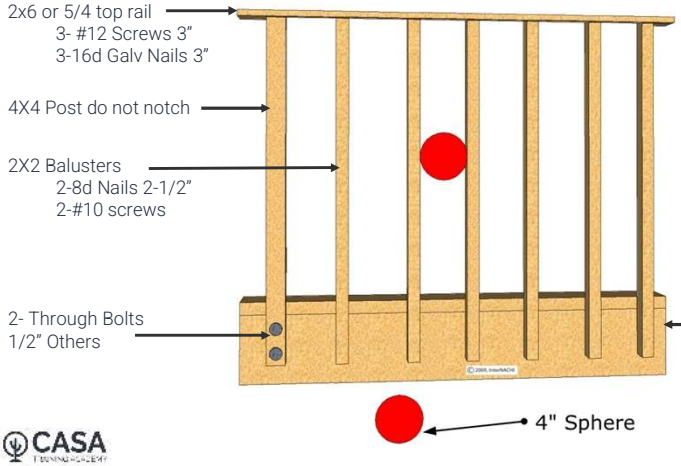
89

89

Handrails & Guards

Other Standards

Guard Detail



- Spacing Varies from NC
  - 6’ Post Spacing
  - ½” Fasteners

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90

90

Handrails & Guards

Other Standards

Guard Detail

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91

91

Means of Egress

R311

R311.7 Stairways

- Width not less than 36”
  - All points above the handrail and below permitted headroom
- Handrails project no more than 4-1/2” on either side
  - Width not less than 31-1/4” for single handrail
  - Width not less than 27” for handrail on both sides
- Vertical rise not larger than 147”

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92

Means of Egress

R311

R311.7.5 Stair Treads & Risers

- Riser height not more than 8-1/4”
  - Max variation 3/8”
- Minimum tread width not less than 9”
  - Variation 3/8”
- Nosing
  - Radius not greater than 9/16”
  - Projection
    - Not less than 3/4” or greater than 1-1/4”

* Exception: nosing projection not required if stair width is not less than 11”

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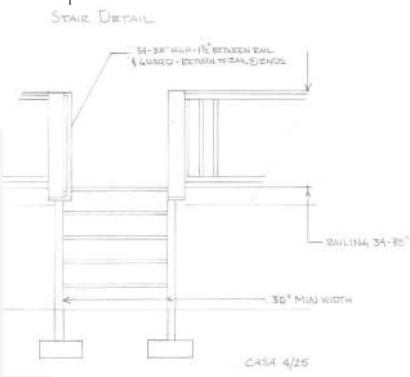
93

Means of Egress

R311

R311.7.8. Handrails

- Handrails shall be provided on not less than one side of each continuous run of treads or flight with 4 or more risers
- Not less than 34” or more than 36”
  - Can be higher at between flights/landings & winders 38” max
- Must be continuous for the full length of the flight
  - Can be interrupted by a newel post at the turn
  - Considered continuous if terminations are less than 6” apart
  - Shall terminate at the newel post or safety terminals



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Means of Egress

R311

R311.7.8.3 Grip Size

- Type I
  - OD not less than 1-1/2" or greater than 2"
  - Non-circular perimeter not less than 4" or greater than 6-1/4" with a cross section of 2-1/4"
  - Edges shall have a radius
- Type II
  - Perimeter greater than 6-1/4" must have a finger recess
- Exception
  - Exterior handrails (garages and areas exposed to weather) shall not be more than 3-1/4" in cross section

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Costal Regions

Chapter 46

- Type & Materials
- Sizing of wood piles
- Required Depth
- Spacing
- Tying and Bracing of wood piles

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96

Piling

R4603

R4603.3 Size of wood piles
- Minimum 8" with 6 " diameter at tip
- 8"x8" Square
- 6"x6" Square uncovered stairs, walkways, and decks
- 4"x4" if less than 5' above grade (stairs, walkways & decks)

R4603.4 Required depth of piles
- Not less than 8 feet
- Below natural or finished grade
- Ocean hazard zone
  - Min 5' below mean sea level
  - Or 16' below the average original grade
  - Which ever is less

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Piling

R4603

R4603.5 Spacing of wood piles
- Max center to center 8'
- Under load-bearing sills, beams & girders
- 2 Stories where piling spacing exceeds 8'
  - Designed by a registered design professional
- Non-load bearing 12' max

R4603.6 Tying & Bracing of wood piles
- 2-5/8" galvanized bolts and nuts at each connection
- If the notch is over 50%, then strapping is required
- Cross bracing is required when
  - More than 10' from grade to beam
  - More than 2 stories

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