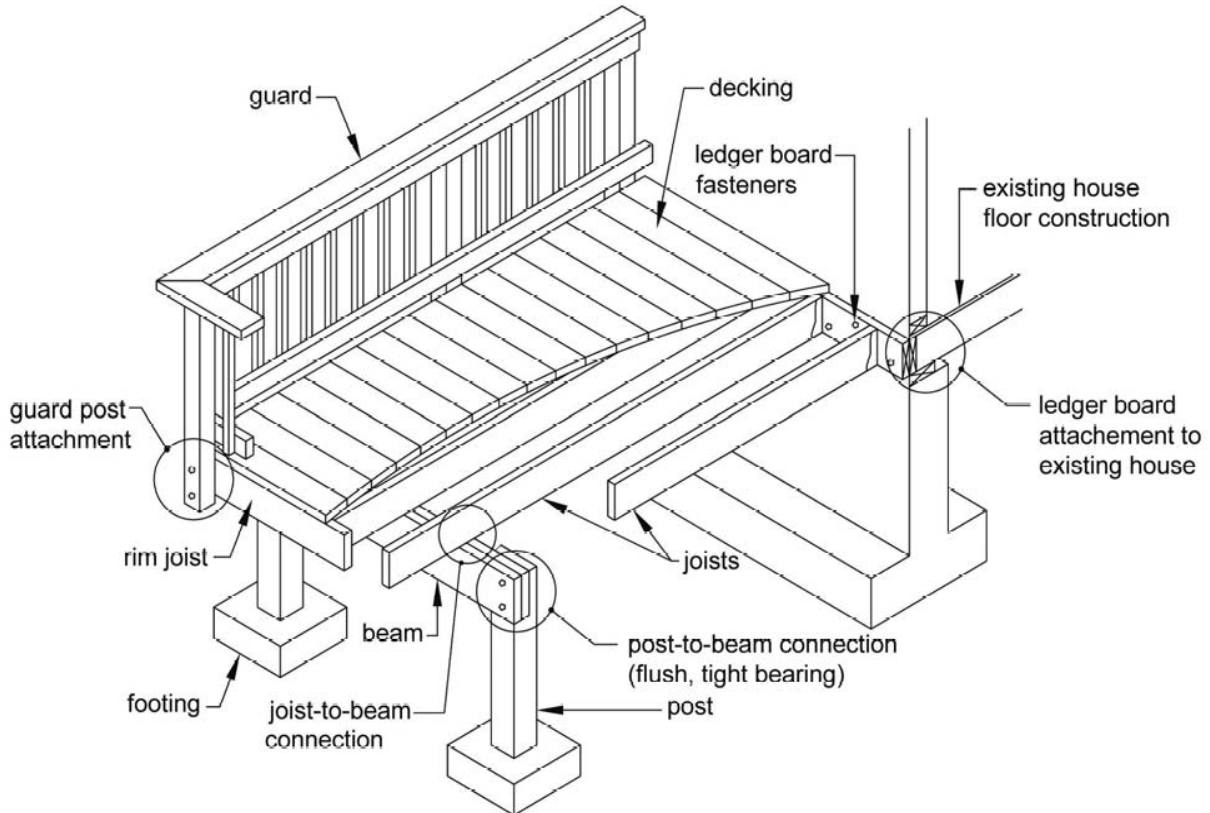


Town Of Littleton

REVISED 8-7-18

Typical Deck Details Package

Based on the 9th Edition One and Two Family Dwelling Code



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THE USE OF THIS DECK PACKAGE IN LIEU OF SUBMITTED DRAWINGS APPLIES TO SIMPLE SPAN, SINGLE LEVEL, RESIDENTIAL DECKS ONLY. THIS PRESCRIPTIVE PACKAGE MUST BE SIGNED AND SUBMITTED BY THE PERMIT APPLICANT INDICATING ACCEPTANCE OF THE DETAILS CONTAINED HEREIN. A COPY OF THIS PACKAGE MUST BE ONSITE AND AVAILABLE TO THE INSPECTOR DURING THE INSPECTION. AN UNSIGNED DECK PACKAGE WILL RESULT IN A PERMIT DENIAL.

SIGNATURE OF PERMIT APPLICANT

SIGNATURE OF BUILDING COMMISSIONER

INTRODUCTION

This package is provided as a supplement attachment to the permit application for a single story open deck in lieu of or in addition to the construction drawings.

Before proceeding, always check with the Building Department for land use, zoning, or other regulations that may affect your deck project.

When Do I Need A Permit For A Deck?

A building permit is required for all decks that are intended to be used in connection with a single or two family dwelling or accessory structures and swimming pools.

How Do I Use This Package To Get A Permit?

To obtain a building permit for your deck, you will need to submit plans of sufficient detail to the building department as a permanent record of what you want to build. ***If you are not sure how to draw plans, this package can be submitted to the building department for the permit. You will, however, be required to follow the details as provided without any deviation.*** In addition, a certified site plan is required showing an outline of your property (property lines), the house, septic system and outline of where you will be locating the deck and how it will appear. Be sure to indicate any additional existing accessory buildings or structures (shed, pool, retaining walls, etc.). Fill out a Residential building permit application, and submit this package (along with your site plan). After the application is reviewed and approved, a permit to construct your deck will be issued.

How Big Do The Footings, Beams, And Joists Need To Be?

The detail in this package will help you determine how big the footings, beams, joists, posts, and ledgers need to be. Much of it depends on the size of the deck, what size beams and joists you want to use, and how far apart you want to place the beams, posts, and footings. It will help to highlight Tables in this package for later reference during construction.

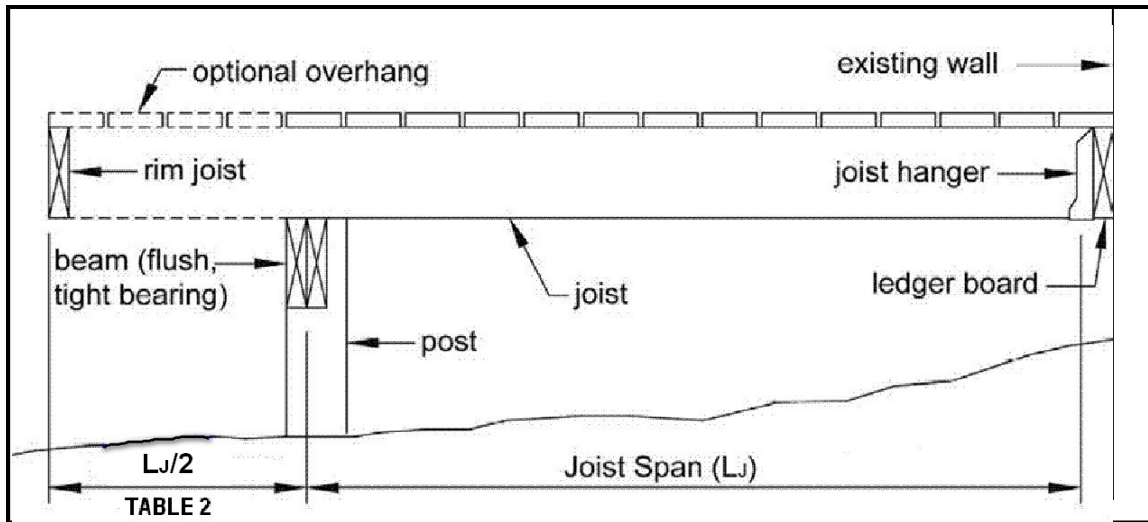
General Notes

1. All lumber shall be grade #2 Douglas-Fir, Hem-Fir, or better and shall be pressure treated (to resist insect and dry rot) in accordance with American Wood-Preservers' Association Standards. Decking material of redwood or cedar does not require pressure treatment as it has a natural resistance to decay. The pressure treatment category below must be identified on the lumber, usually in the form of a tag. The level of treatment depends on the use as follows:
 - Decking material, railings, joists, and beams must be treated to a **Category UC3B**.
 - Posts and other woods located on, in, or in contact with the ground must be a **Category UC4B**.
 - Any wood less than six inches above the ground or in contact with concrete must be a **Category UC4A**.
2. The level of preservative treatment is noted on the tags fixed to the ends of the wood members. **Remember, any time you make a cut, treat the cut end of the wood with a paint-on preservative. Cut ends expose the inner untreated wood to potential moisture and insect damage.**
3. All nails shall be "common" galvanized or better.
4. **New pressure treatment methods use chemicals that will prematurely corrode standard fasteners, hardware, and flashing when in contact with pressure treated lumber; and as a result, fastener and hardware requirements have changed. Note the following:**
 - All screws and nails shall be hot-dipped galvanized or stainless steel.
 - All hardware (joist hangers, cast-in-place post anchors, etc.) shall be galvanized with 1.85 oz/sf of zinc (G-185 coating) or shall be stainless steel.
 - Look for products such as "Zmax" from Simpson Strong-Tie or "Triple Zinc" from USP.
5. Decks constructed according to this handout are not designed to support spas or hot tubs. Installation of spas or hot tubs will require additional structural supports.

6. Decks shall not be attached to house overhangs, bay windows, brick veneers, or chimneys.
7. Deck designs that deviate from the conditions of this handout will require a specific plan submission and may require engineering.
8. Inspections:
 - A footing, framing, and a final inspection are required on all decks.
 - Footings shall be a minimum depth of 48" on virgin undisturbed soil unless closer than 5 feet from the exterior of the existing house foundation, then the deck footing shall be the same depth as the house footing.
 - Footing inspections are required PRIOR to the placement of concrete. At the time of the footing inspection, the ledger board must be attached to the existing house. Adequacy of connections will be verified by an inspector. If a ladder is required to access the ledger board, one must be provided.
 - Framing and final inspections may be combined if all portions of the deck framing and mechanical attachments are at least four feet above grade.
 - It is the responsibility of the permit holder or the permit holder's representative to notify the Building Department when stages of construction are reached that require an inspection.
9. All decking material shall be composed of 2x4, 2x6, or five quarter ("5/4") boards. Attach decking to each joist with two 10d nails or two #8 screws. Decking may be placed from an angle perpendicular to the joists to an angle of 45 degrees to the joists. Decking must have a span length such that each board bears on a minimum of two joists.
10. Plastic or composite decking products may be used as a substitute for conventional wood decking, but installation and span lengths of the substituted material must be in strict conformance with the product listing and the manufacturer's installation instructions. *Copies of the manufacturer's installation instructions must be submitted with this handout and permit application.*
11. Inspections are required by law. Failure to receive any and all inspections can result in the issuance of violation notices which may lead to legal action.
12. The minimum uniformly distributed live load is 40 pounds per square foot (Massachusetts State Building Code §5301.5)

JOIST SIZE

The span of a joist is measured from the centerline of bearing at one end of the joist to the centerline of bearing at the other end of the joist and does not include the length of the overhangs. Joist may overhang up to one-fourth of the actual joist span L_j . Use **TABLE 1** and **TABLE 2** to determine joist span and overhang based on lumber size and joist spacing. See **Figure 1, 2** and **3** for joist span types.



Figure

Span – Deck Attached at House and Bearing Over Beam

1: Joist

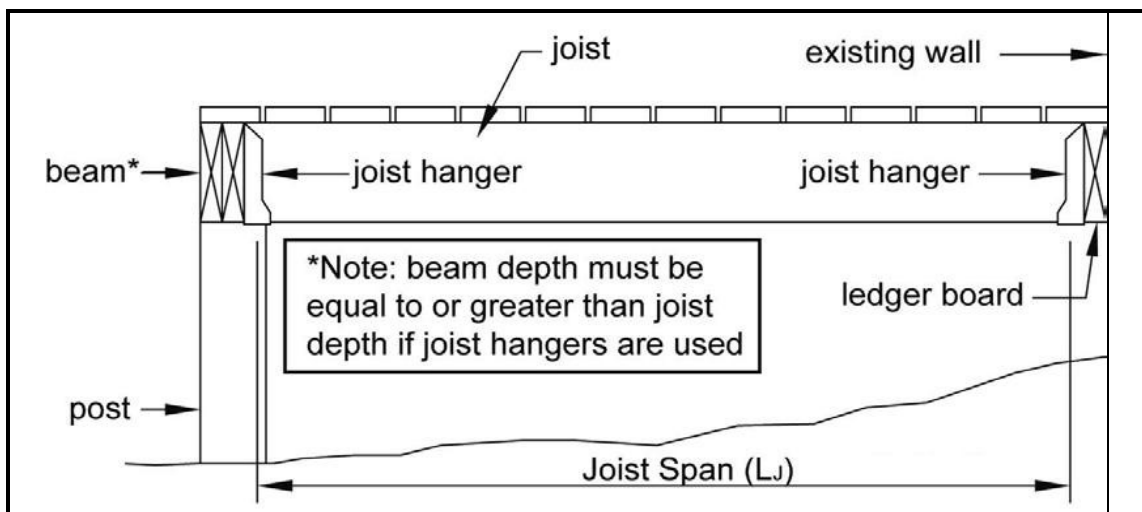


Figure 2:

Joists Attached at House and to Side of Beam

Joist Span –

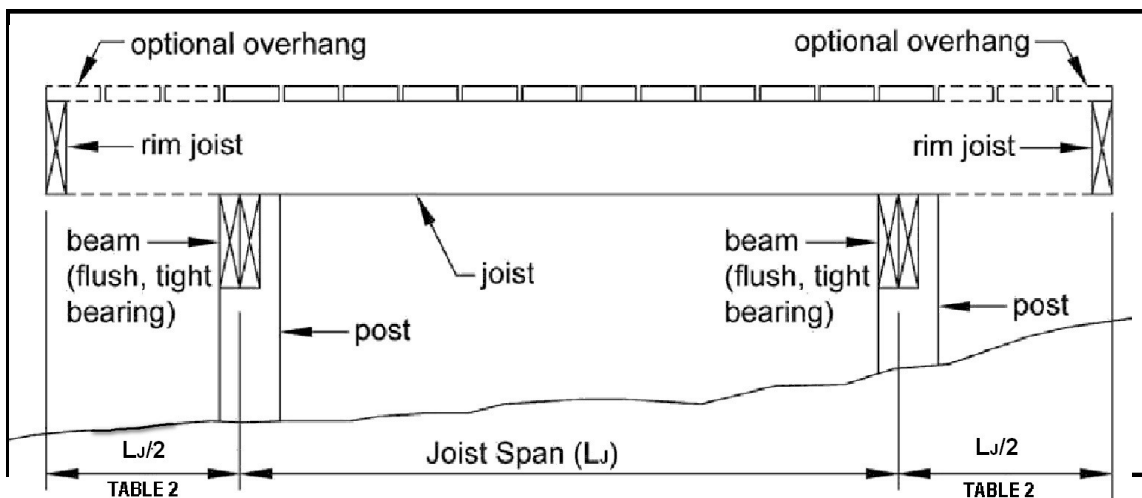


Figure 3:

Free Standing Deck

Joist Span –

TABLE 1: MAXIMUM JOIST SPAN LENGTH L_J

Joist Size	Joist Without Cantilever			Joist With Cantilever		
	Joist spacing, on center			Joist spacing, on center		
	12"	16"	24"	12"	16"	24"
2 x 8	13'-8"	12'-5"	10'-2"	10'-6"	10'-6"	10'-2"
2 x 10	17'-5"	15'-10"	13'-1"	15'-2"	15'-2"	13'-1"
2 x 12	18'-0"	18'-0"	15'-5"	18'-0"	18'-0"	15'-5"

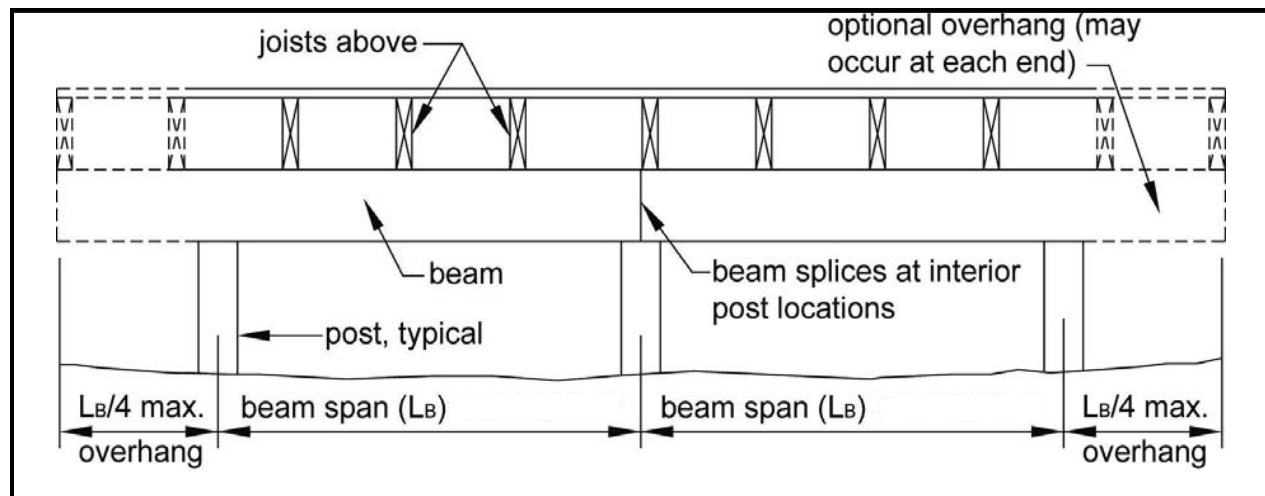
Spans are based on 40 PSF live load, 10 PSF dead load, southern yellow pine #2 or better, normal; loading duration, wet service conditions and deflection: $\Delta = t/360$ for simple span and $t/180$ for cantilever

TABLE 2: MAXIMUM JOIST CANTILEVER

Member Size	Spacing	Maximum Cantilever Span (Uplift Force at Backspan Support in Lbs.)
2x8	12"	39" (156)
2x8	16"	34" (171)
2x10	12"	57" (189)
2x10	16"	49" (208)
2x10	24"	40" (241)
2x12	16"	67" (260)
2x12	24"	54" (319)

BEAM SIZE AND ASSEMBLY REQUIREMENTS

Beam size is determined using **TABLE 3**. Beams may overhang up to one-fourth of the actual beam span between supports as shown in **Figure 4**



4:

Span Types

Figure Beam

TABLE 3: MINIMUM BEAM SIZE

Spans are based on 50 PSF live load, 10 PSF dead load, southern yellow pine #2 or better, normal; loading duration, wet service conditions and deflection: $\Delta = t/360$ for simple span and $t/180$ for cantilever with a 230 lb point load.

Joist Span	Beam Size							
	(2)2x6	(2)2x8	(2)2x10	(2)2x12	(3)2x6	(3)2x8	(3)2x10	(3)2x12
0 - 6'-0"	7'-1"	9'-2"	11'-10"	13'-11"	8'-7"	11'-4"	14'-5"	17'-5"
6'-1" - 8'-0"	6'-2"	7'-11"	10'-1'-3"	12'-0"	7'-8"	9'-11"	12'-1'-"	15'-1"
8'-1" - 10'-0"	5'-6"	7'-1"	9'-2"	10'-9"	6'-11"	8'-11"	11'-6"	13'-6"
10'-1" - 12'-0"	5'-0"	6'-6"	8'-5"	9'-10"	6'-3"	8'-1"	10'-6"	12'-4"
12'-1" - 14'-0"	4'-8"	6'-0"	7'-9"	9'-1"	5'-10"	7'-6"	9'-9"	11'-5"
14'-1" - 16'-0"	4'-4"	6'-0"	7'-9"	9'-1"	5'-10"	7'-6"	9'-9"	11'-5"
16'-1" - 18'-0"	4'-1"	5'-3"	6'-10"	8'-0"	5'-2"	6'-7"	8'-7"	10'-1"

The beam is assembled by attaching the members identified in **TABLE 3** in accordance with **Figure 5**.

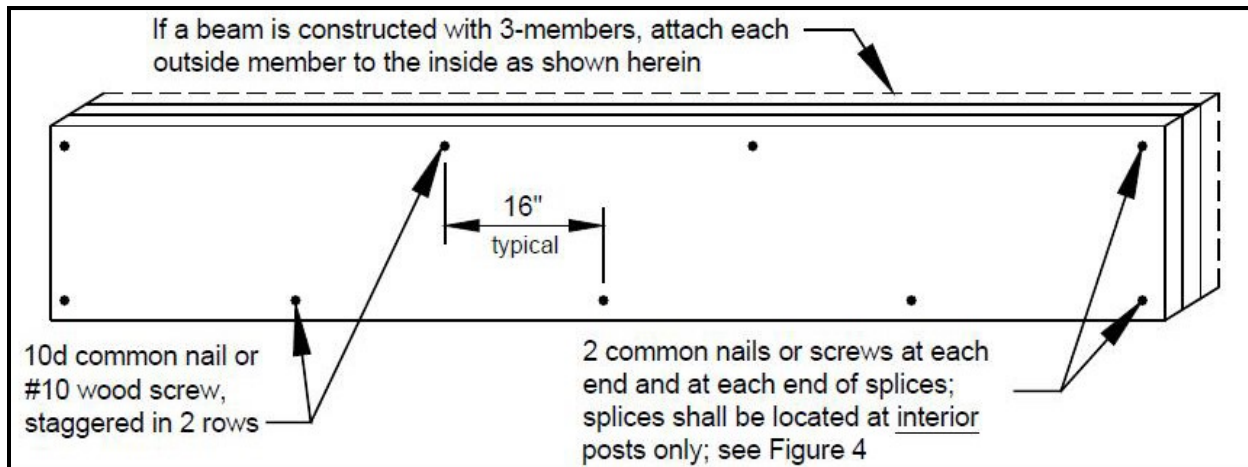


Figure 5:
Beam

Assembly Detail

5:

DECK FRAMING PLANS

A framing plan shows the joist and beam layout; the location of the ledger board, posts, and footings, and the type, size, and spacing of the ledger board fasteners. See **Figure 6** for an example of a typical deck framing plan.

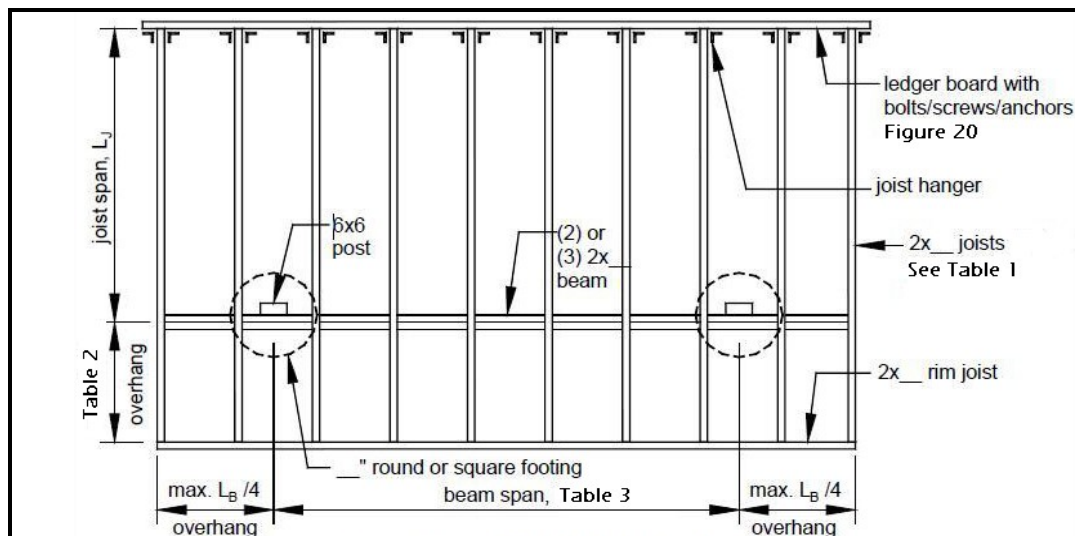


Figure 6:
Framing Plan

Typical Deck

JOIST TO BEAM CONNECTION

Each joist shall be attached to the beam as shown in **Figure 7**. Use **Option 1** or **Option 2** when joists bear on or overhang past the beam; see **Figure 1** and **Figure 3**. Use **Option 3** when joists attach to the side of the beam; see **Figure 2**. Mechanical fasteners or hurricane clips used in Option 2 shall have a minimum capacity of 100 lbs in both uplift and lateral load directions. See manufacturer's recommendations for additional requirements.

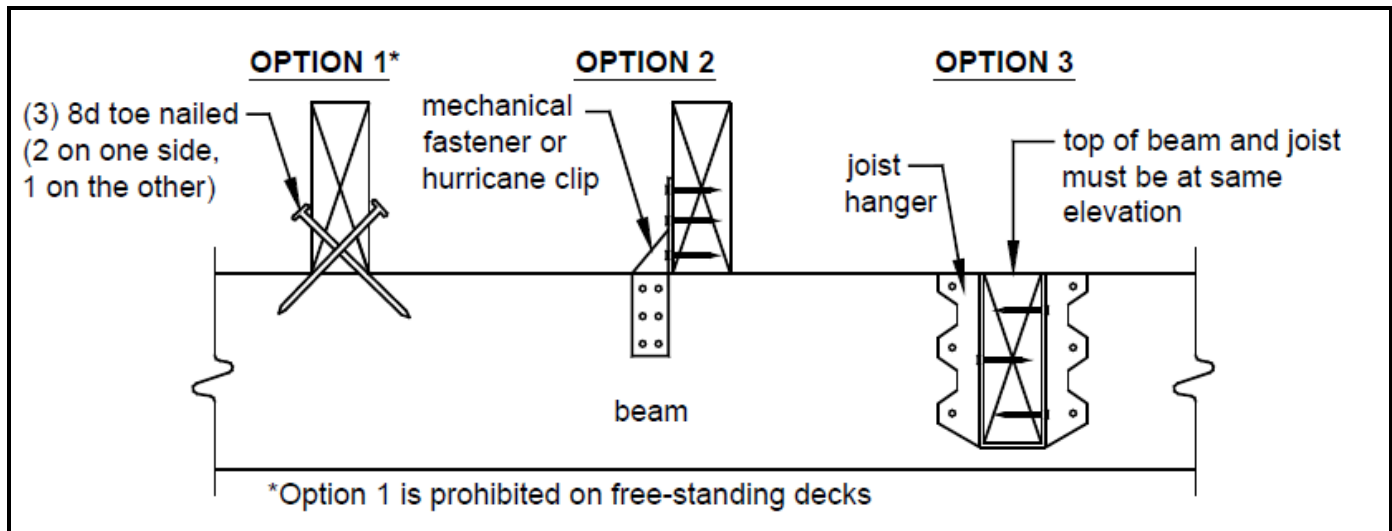


Figure 7: Joist-To-Beam Detail

JOIST HANGERS

Joist hangers, as shown in **Figure 8**, shall have a minimum capacity of 600 lbs for 2x8s, 700 lbs for 2x10s and 800 lbs for 2x12s. The depth and width of the joist hanger shall equal the dimensions of the member it is carrying. Joist hangers shall be galvanized per the requirements on Page 2.

Use joist hangers with inside flanges when clearances to the edge of the beam or ledger board dictate.

Do not use clip angles or brackets to support framing members. Do not bend hanger flanges to accommodate field conditions. Use only galvanized nails or equal as prescribed by the joist hanger manufacturer.

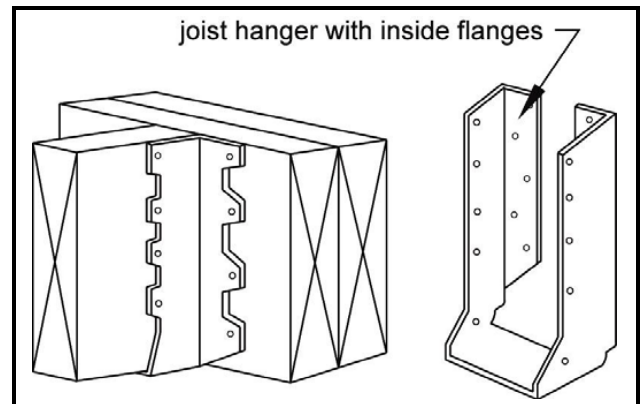


Figure 8: Typical Joist Hangers

POST REQUIREMENTS

All deck posts shall be **6x6** with a maximum height of 14'-0" measured from the top of the footing to the underside of the beam. The beam shall be attached to the post by one of the two methods shown in **Figure 10**. Attachment of the beam to the side of the post without notching is prohibited; see **Figure 9**

The post cap shown in **Figure 10**, Option 2, shall be specifically designed for (2) 2x or (3) 2x beams and 6x6 posts with a minimum downward allowable load capacity of 5,000 lbs. Attachment shall be per manufacturer's instructions. Post caps shall be galvanized per the requirements on page 2.

Cut ends of posts shall be field treated with a wood preservative containing **copper naphthenate**. Such products can be found in **Prohibited Post-To-** most hardware or home center stores in the paint department.

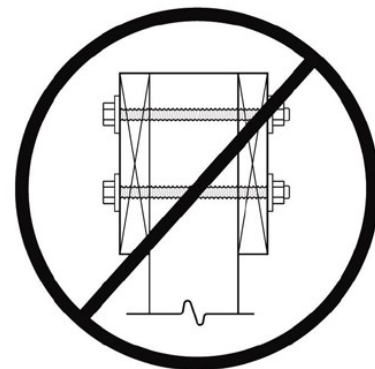


Figure 9:

Beam Attachment Condition

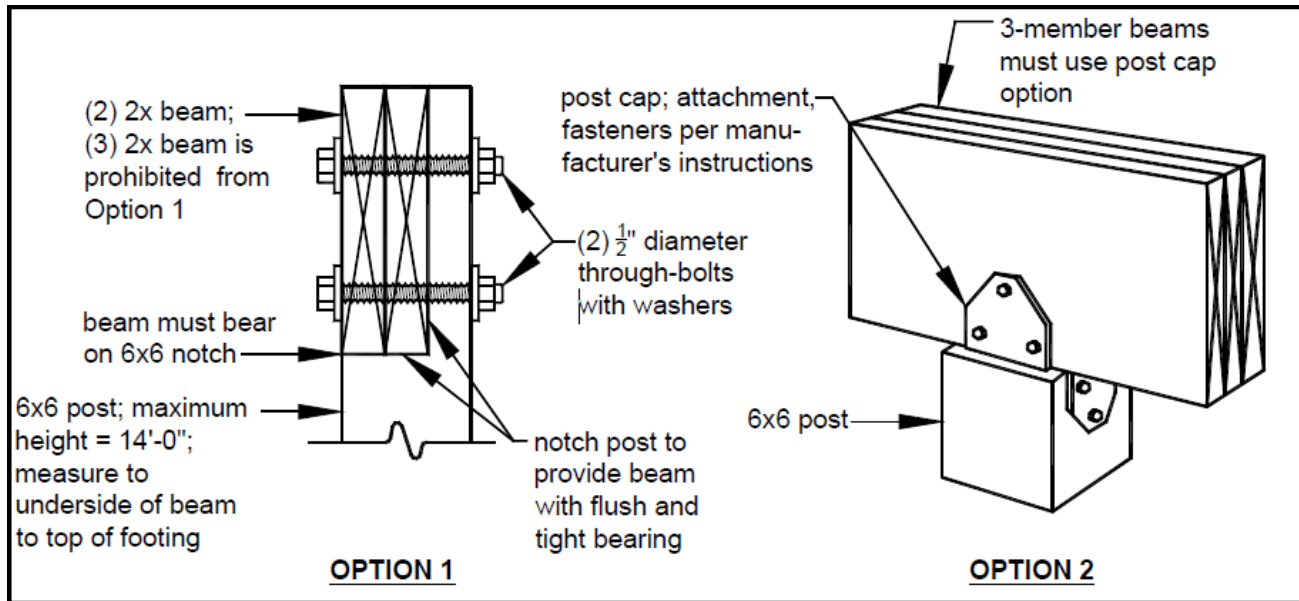


Figure 10: Post-To-Beam Connection Options

RIM JOIST REQUIREMENTS

Attach a continuous rim joist to the ends of joists as shown in **Figure 11**. Attach decking to the rim joist as shown in **Figure 11**. For more decking attachment requirements, see DECKING REQUIREMENTS on page 2.

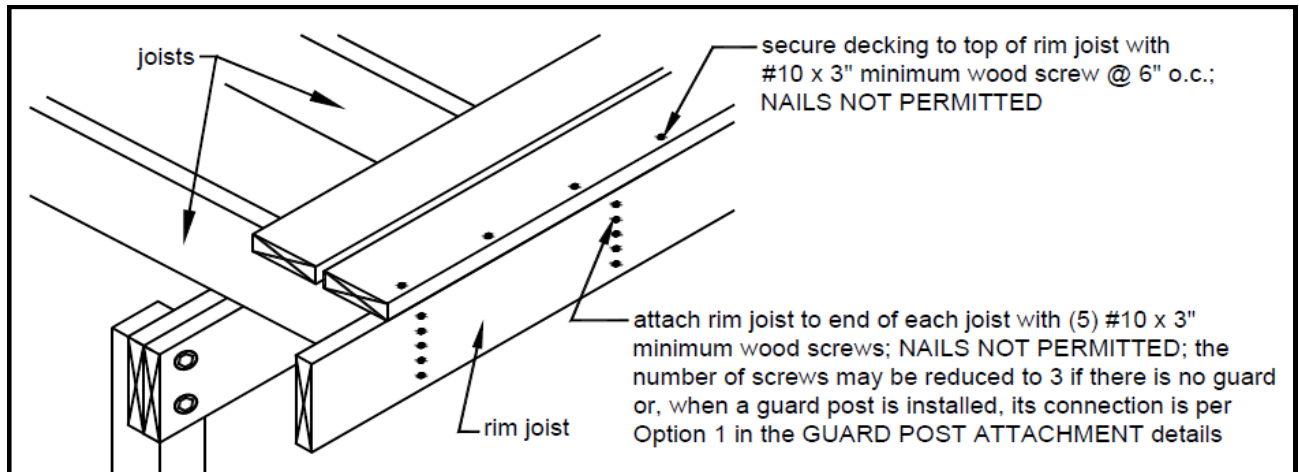


Figure 11: Rim Joist Connection Detail

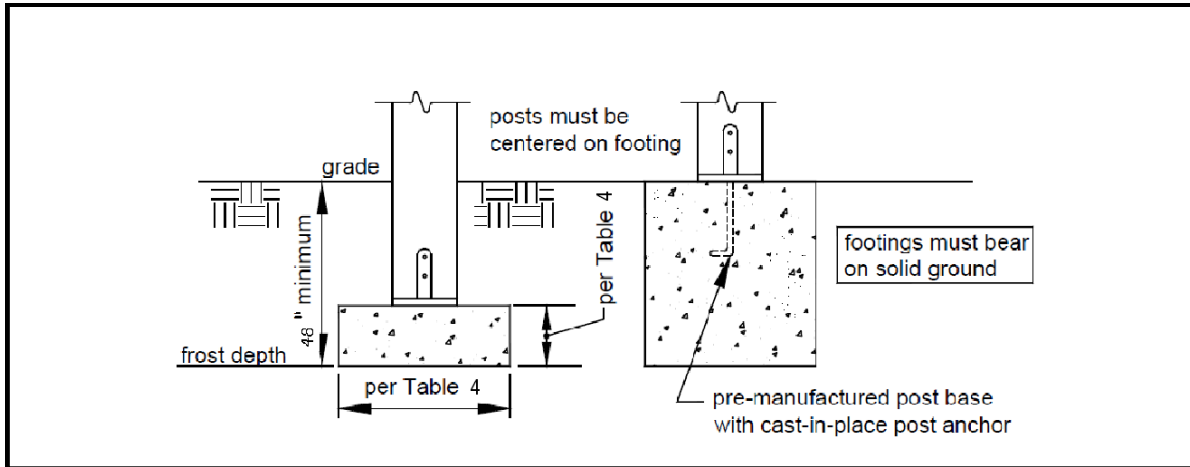
FOOTINGS

The concrete for all footings shall have a minimum compressive strength of 2,500 PSI concrete. See **TABLE 4** for footing size and footing thickness; see **Figure 12** for post attachment options and requirements. Post anchors shall be galvanized per the requirements on page 2. All footings shall bear on solid undisturbed ground; bearing conditions shall be verified in the field by the Building Commissioner prior to placement of concrete. DECK FOOTINGS CLOSER THAN 5'-0" TO AN EXISTING EXTERIOR HOUSE WALL MUST BEAR AT THE SAME ELEVATION AS THE EXISTING HOUSE FOOTINGS.

**Do not construct footings over utility lines of any kind.
Call DIG-SAFE 1-888-344-7233 before you dig**

TABLE 4: FOOTING SIZE

Beam Span, L_B	Joist Span, L_J	Footing Size		Minimum Thickness*
		Square	Round	
0 - 8'-0"	0 - 10'-0"	16"	18"	8"
	10'-1" - 14'-0"	16"	18"	8"
	14'-1" - 18'-0"	18"	20"	10"
8'-1" - 12'-0"	0 - 10'-0"	16"	18"	8"
	10'-1" - 14'-0"	22"	24"	10"
	14'-1" - 18'-0"	22"	24"	10"
12'-1" - 17'-5"	0 - 10'-0"	22"	24"	10"
	10'-1" - 14'-0"	24"	26"	12"

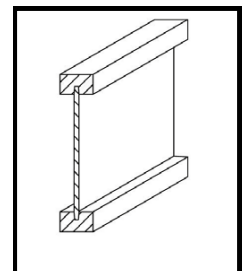
**Figure
To-Beam****12: Post-****Connection Options****LEDGER ATTACHMENT REQUIREMENTS**

GENERAL: Attach the ledger board, which shall be greater than or equal to the joist depth, to the existing exterior wall in accordance with **Figure 14** through **Figure 16**. When attachments are made to the existing house band board, the band board shall be capable of supporting the new deck. If this cannot be verified or conditions at the existing house differ from the details herein, then a free-standing deck is required. See [FREE-STANDING DECKS](#) on page 13.

YOU MUST VERIFY THE EXISTING CONDITIONS IN THE FIELD PRIOR TO APPLYING FOR A BUILDING PERMIT. COMPLIANCE WITH ALL THE REQUIREMENTS HEREIN IS CRITICAL TO ENSURE THE STRUCTURAL STABILITY OF YOUR DECK AND THE SAFETY OF YOU AND YOUR FAMILY.

SIDING AND FLASHING: House siding, or the exterior finish system, must be removed prior to the installation of the ledger board. Flashing is required at any ledger board connection to a wall of wood framed construction and shall be composed of copper (attached using copper nails), stainless steel, UV resistant plastic or galvanized steel coated with 1.85 oz/sf of zinc (G-185 coating). See **Figure 14** for continuous flashing with drip edge. The threshold shall be carefully flashed and caulked to prevent water intrusion due to splashing from the deck or melting snow and ice.

WOOD I-JOISTS: Many new homes constructed with wood I-joists, see **Figure 13**, have a 1" or thicker manufactured engineered wood product (EWP) as the band board that can support the attachment of a deck; see **Figure 14**. However, older homes constructed with wood I-joists may not have a bandboard capable of supporting a deck. Some may have plywood band boards with a thickness of less than 1". Others may have an I-joist as the band board. In these cases a free-standing deck is required. See [FREE-STANDING DECKS](#) on page 13.

Figure 13: Wood**I-Joist Profile**

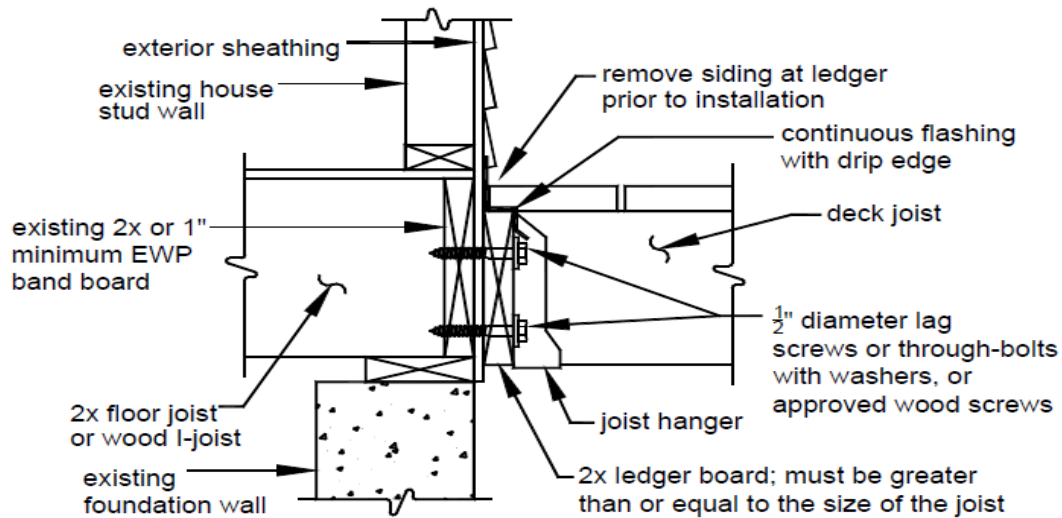
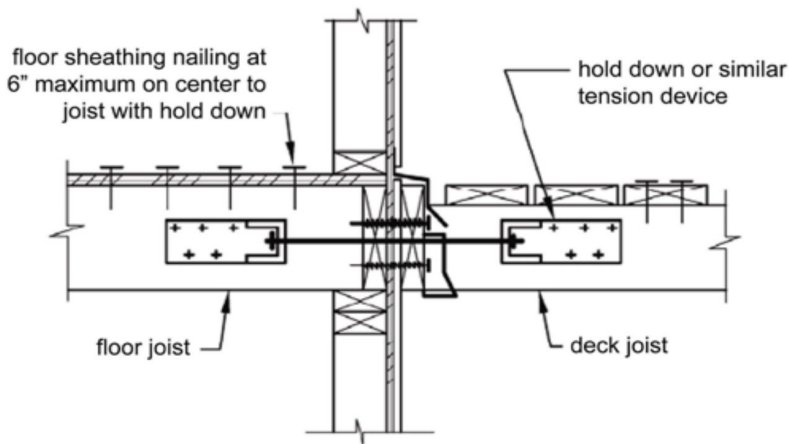


Figure 14:

Of Ledger Board-To-Band Board

Attachment



NOTE

Required attachment per IRC Figure 502.2.2.3 or equal
As an alternative see Simpson Tie DTT1Z and DTT2Z or equal...

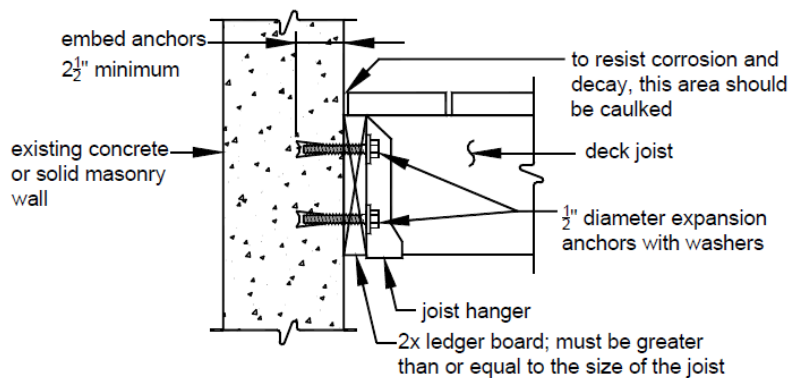
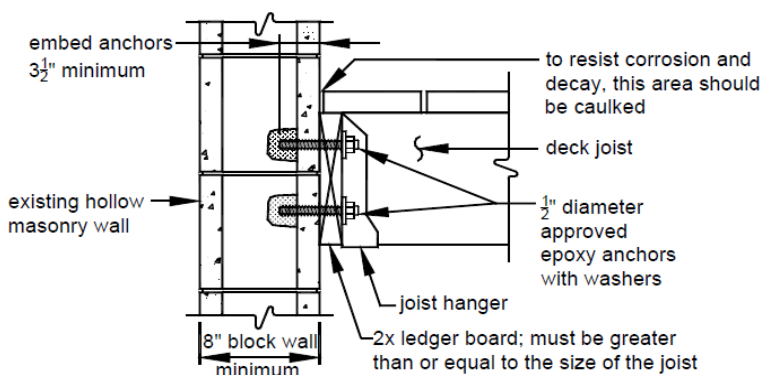


Figure 15: Attachment Of Ledger Board To Foundation Wall (Concrete or Solid Masonry)



PROHIBITED LEDGER ATTACHMENTS

Attachments to the ends of pre-manufactured open web joists, to brick veneers or chimneys, and to house overhangs or bay windows are strictly prohibited; see **Figure 17** through **Figure 19**. In such cases the deck shall be free-standing. See [FREE-STANDING DECKS](#) on page 13.

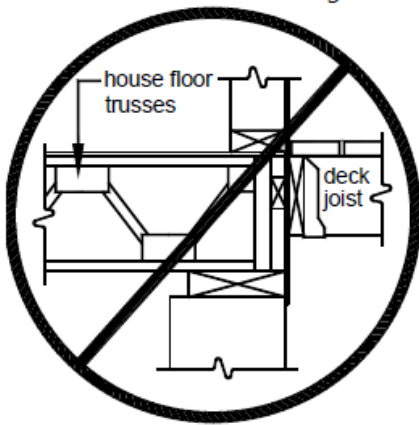


Figure 17: No Attachment To Open Web Trusses

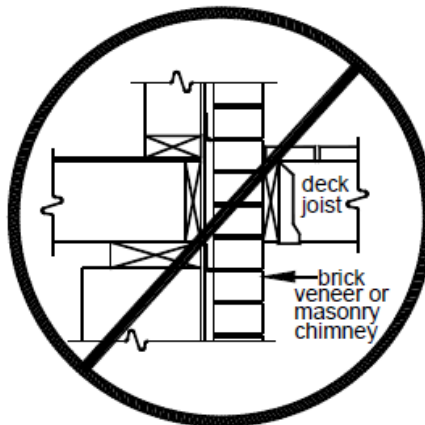


Figure 18: No Attachment To Or Through Brick Veneer

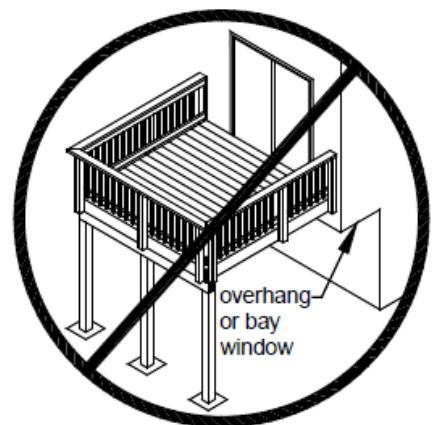
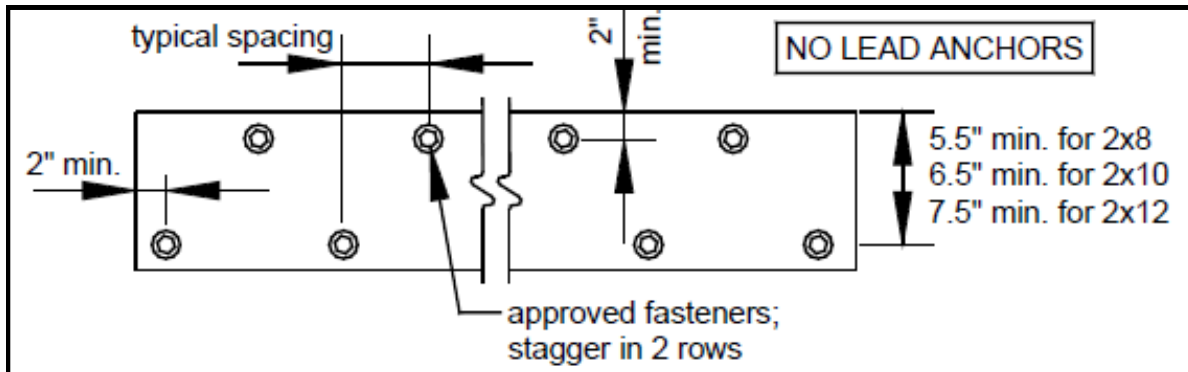


Figure 19: No Attachment To House Overhang

LEDGER BOARD FASTENERS

Ledger board fasteners shall be installed in accordance with **Figure 20** and the spacing in **TABLE 5**. Only those fastener types noted herein are approved for use; **LEAD ANCHORS ARE STRICTLY PROHIBITED**. Adequacy of connections will be verified by the inspector



Figure

Ledger Board Fastener Spacing And Clearances

20:

TABLE 5: LEDGER BOARD FASTENER SPACING

Fastener	Band Board Material ²	Joist Span						
		0 to 6'-0"	6'-1" to 8'-0"	8'-1" to 10'-0"	10'-1" to 12'-0"	12'-1" to 14'-0"	14'-1" to 16'-0"	16'-1" to 18'-0"
		Spacing of Fasteners, on center						
Lag Screws	1" EWP	24"	18"	14"	12"	10"	9"	8"
	1-1/8" EWP	28"	21"	16"	14"	12"	10"	9"
	2x lumber	30"	23"	18"	15"	13"	11"	10"
Through Bolts	1" EWP	24"	18"	14"	12"	10"	9"	8"
	1-1/8" EWP	28"	21"	16"	14"	12"	10"	9"
	2x lumber	36"	36"	34"	29"	24"	21"	19"
Approved Wood Screws	1" EWP	18"	13"	11"	9"	8"	7"	6"
	1-1/8" EWP	21"	15"	12"	10"	9"	7"	7"
	2x lumber	19"	14"	11"	9"	8"	7"	6"
Expansion Anchors		36"	36"	34"	29"	24"	21"	19"
Approved Epoxy Anchors		32"	32"	32"	24"	24"	16"	16"

¹See Sheet 11 for fastener specifications.

²EWP = manufactured engineered wood product; see Sheet 8 for more information.

Through-Bolts

Through-bolts shall have a minimum diameter of 1/2". Pilot holes for through-bolts shall be 17/32" to 9/16" in diameter. Through-bolts must be equipped with washers at the bolt head and nut.

Expansion Anchors

Use expansion anchors when attaching a ledger board to a concrete or solid masonry wall as shown in **Figure 15**. Bolt diameters of the anchors shall be a minimum of 1/2"; in some cases, this may require an anchor size of 5/8". Minimum embedment length shall be 2-1/2". Expansion anchors must have washers. Approved epoxy anchors may be substituted for expansion anchors; see below for minimum requirements.

Epoxy Anchors

When attaching to hollow masonry, use one of the approved epoxy anchors listed in **TABLE 6** and install as shown in **Figure 16**. Epoxy anchors shall have a minimum diameter of 1/2" and minimum embedment length of 3 -1/2". Installation shall be in strict conformance to the manufacturer's instructions. Epoxy anchors must have washers.

Lag Screws

Lag screws shall have a minimum diameter of 1/2" and shall be hot-dipped galvanized or stainless steel. Lag screws may be used only when the field conditions match those shown in **Figure 14**. See **Figure 21** for lag screw length and shank requirements. All lag screws shall be installed with washers.

Wood Screws

The approved wood screws listed in **TABLE 7** are similar to lag screws and have an integrated washer. However, no pilot holes are required for installation. The screws shall have a minimum diameter not less than 1/4" and shall be of sufficient length to fully penetrate the existing house band board. Installation shall be in strict conformance with the manufacturer's instructions.

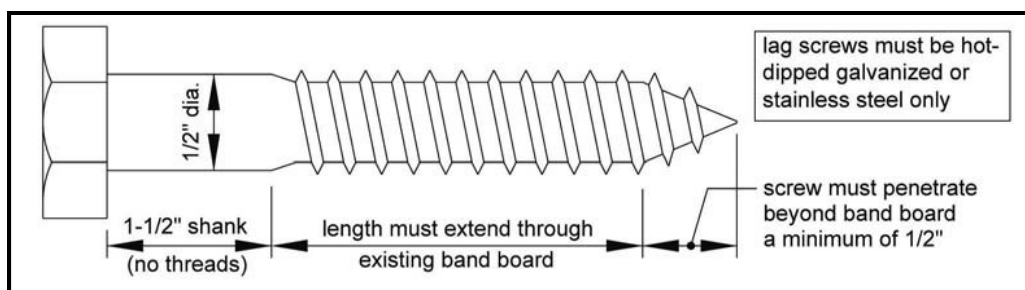
TABLE 6: APPROVED EPOXY ANCHORS

TABLE 7: APPROVED WOOD SCREWS

Manufacturer	Product
ITW Ramset/Red Head	Epcon Acrylic 7
Hilti	HY-20

Manufacturer	Product
FastenMaster	LedgerLok
Simpson Strong-Tie	Strong-Drive Screw (SDS)

Figure 21: Lag Screw Requirements



Screw

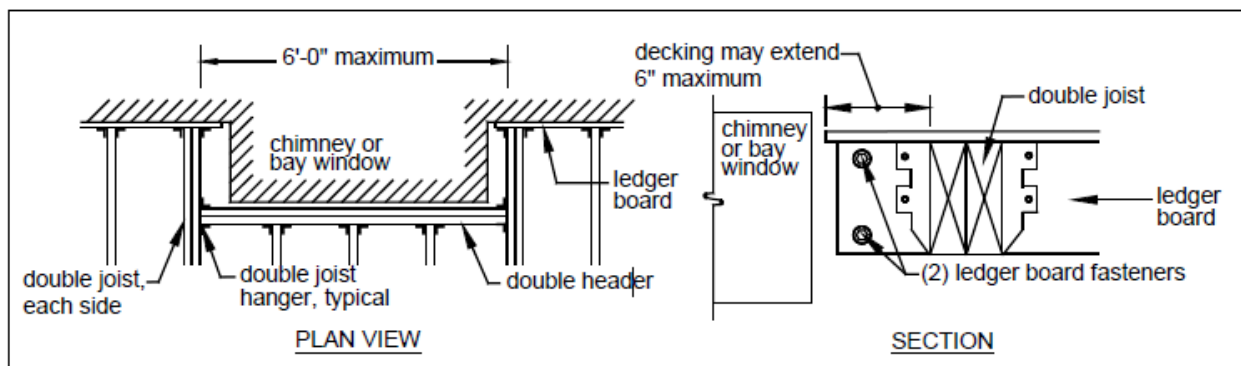
LAG SCREW INSTALLATION REQUIREMENTS

Each lag screw shall have pilot holes drilled as follows:

- 1) Drill a 1/2" diameter hole in the ledger board,
- 2) Drill a 5/16" diameter hole into the solid connection material of the existing house. **DO NOT DRILL A 1/2" DIAMETER HOLE INTO THE SOLID CONNECTION MATERIAL.**
- 3) The threaded portion of the lag screw shall be inserted into the pilot hole by turning. **DO NOT DRIVE WITH A HAMMER.** Use soap or a wood-compatible lubricant as required to facilitate tightening. Each lag screw shall be thoroughly tightened snug, but shall not be overly tightened so as to cause wood damage.

FRAMING AT CHIMNEY OR BAY WINDOW

All members at a chimney or bay window shall be framed in accordance with **Figure 22**. Headers may span a maximum of 6'-0". When a chimney or bay window is wider than 6'-0", one or more 6x6 posts may be added to reduce header spans to less than 6'-0". In such cases, the post footing must meet the requirements on page 8. Headers with a span length greater than 6'-0" require a plan submission.



Figure

Requirements For Framing At Chimney Or Bay Window

22:

FREE-STANDING DECKS

Decks which are free-standing do not utilize the exterior wall of the existing house to support vertical loads; instead, an additional beam with posts is provided at or offset from the existing house. THE ASSOCIATED DECK POST FOOTINGS SHALL BE PLACED AT THE SAME ELEVATION AS THE EXISTING HOUSE FOOTING. See **Figure 3** and **Figure 23**. Beam size is determined by **TABLE 3**.

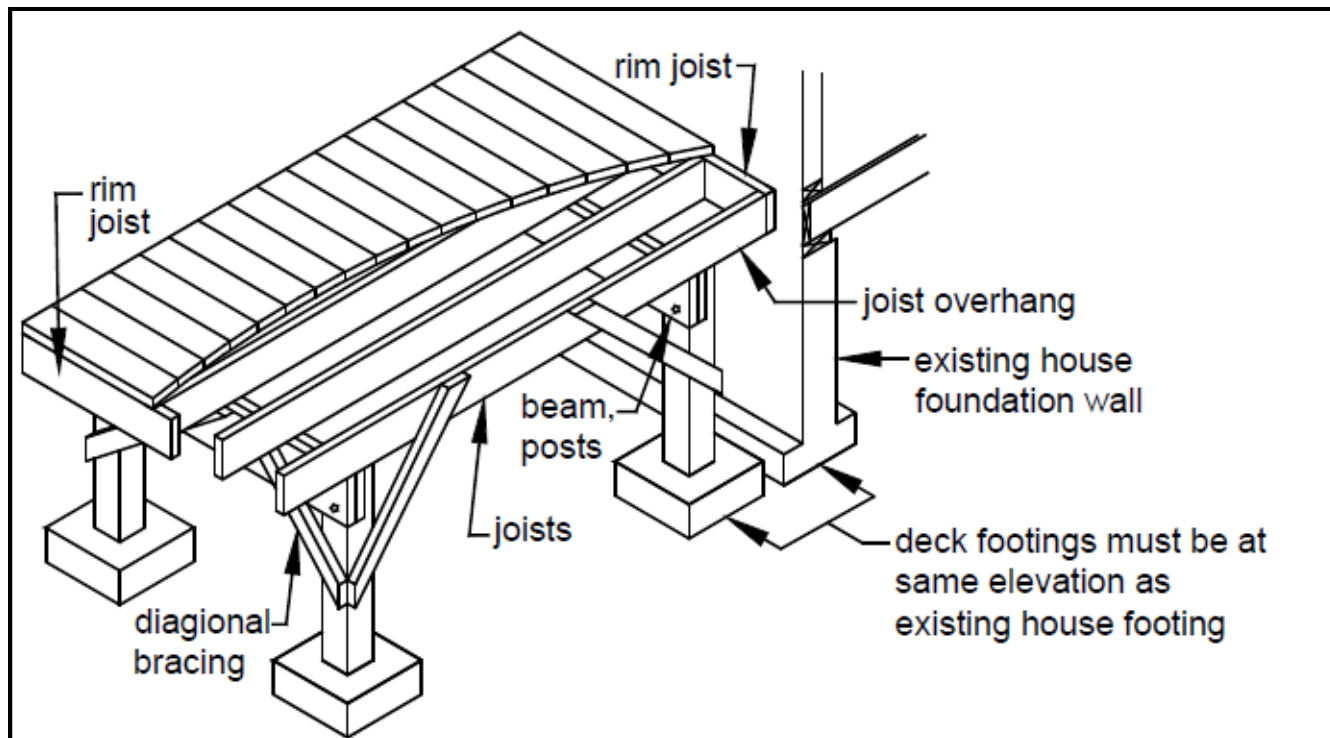


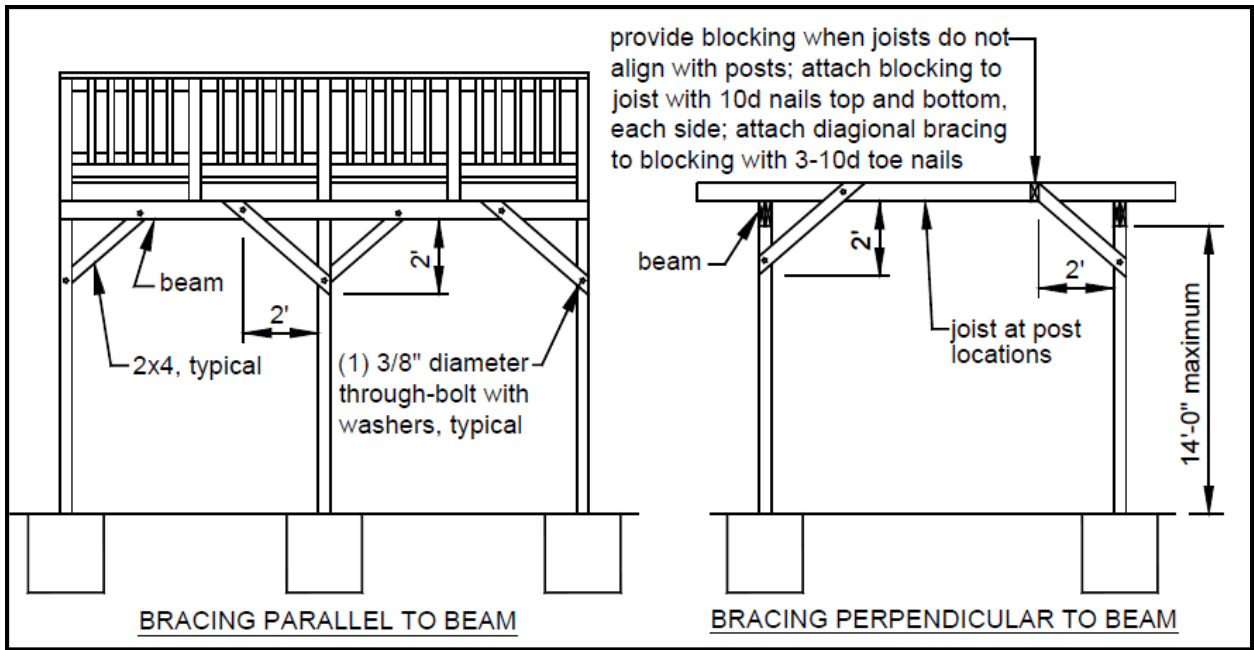
Figure 23: Free-Standing Deck

LATERAL SUPPORT OF FREE-STANDING DECKS

Free standing decks greater than 2 feet above grade shall resist lateral loading and horizontal movement by providing diagonal bracing or by attaching the deck to the exterior wall of the house.

DIAGONAL BRACING

Provide diagonal bracing both parallel and perpendicular to the beam at each post as shown in **Figure 24**. When parallel to the beam, the bracing shall be bolted to the post at one end and beam at the other. When perpendicular to the beam, the bracing shall be bolted to the post at one end and a joist at the other. When a joist does not align with the bracing location, provide blocking between the next adjacent joists; attach as noted in the figure.



Figure

24:

Diagonal Bracing Requirements

ATTACHMENT TO HOUSE

Attach the deck rim joist to the existing house exterior wall as shown in **Figure 25**. The wall must be sheathed with a minimum 3/8" structural panel sheathing. Use lag screws or through-bolts when fastening to an existing band board or wall stud; use expansion anchors or epoxy anchors when fastening to concrete or masonry. **LEAD ANCHORS ARE STRICTLY PROHIBITED. DO NOT USE THIS ATTACHMENT METHOD IF A BRICK VENEER IS PRESENT. YOU MUST VERIFY THIS CONDITION IN THE FIELD PRIOR TO UTILIZING THIS METHOD.** Fasteners shall be 16" on center and staggered in 2 rows. Flashing over the rim joist is required and must be installed in accordance with the flashing provisions on page 9.

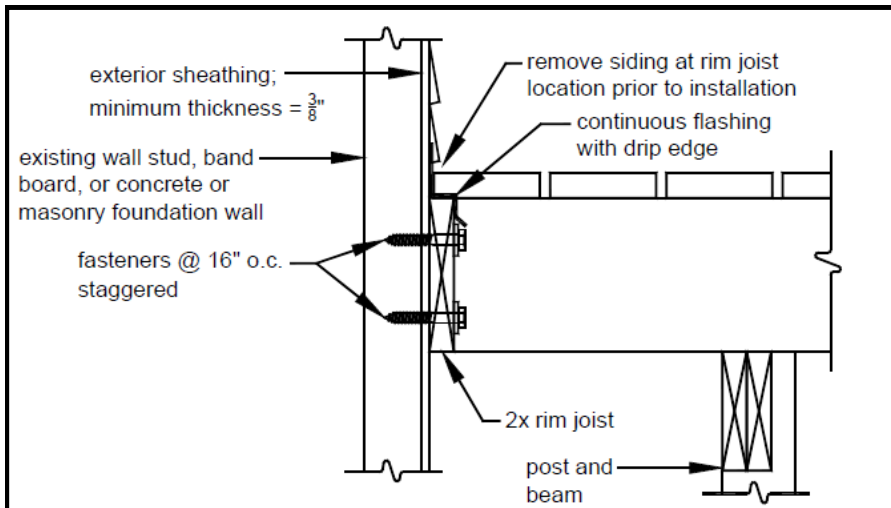


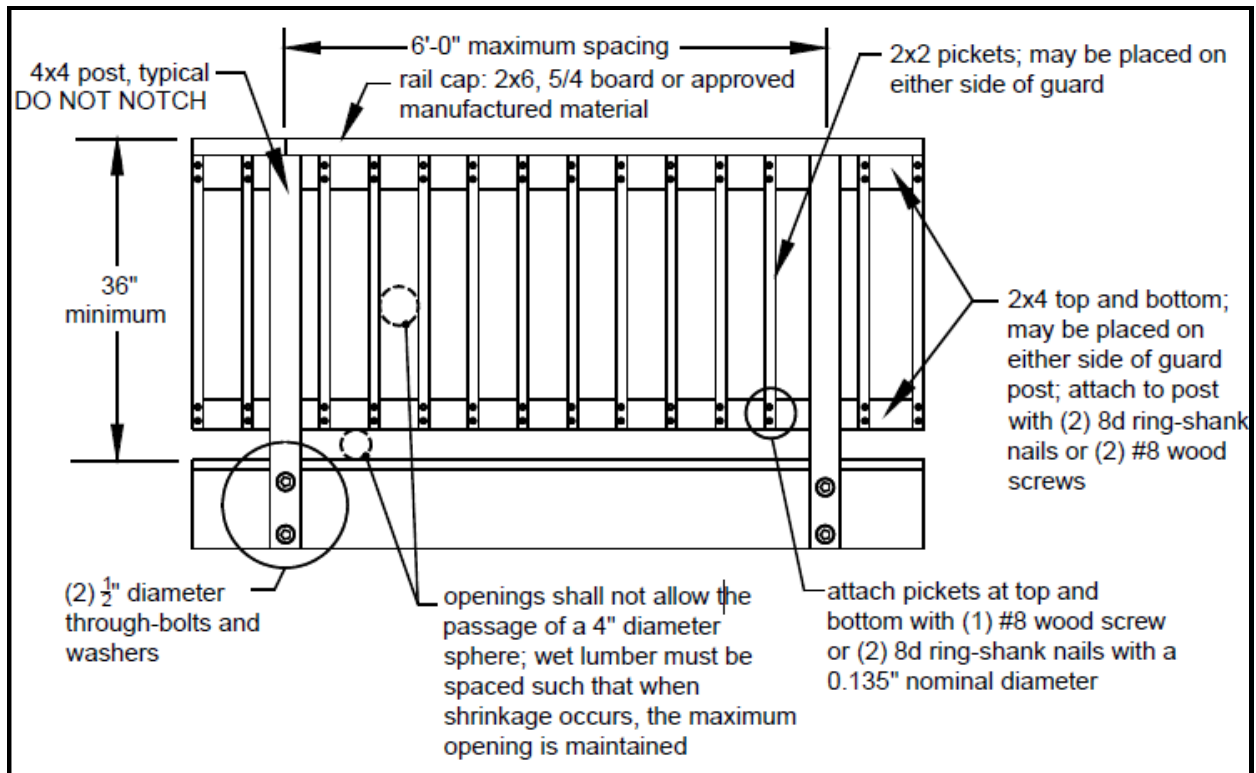
Figure 25:

House Lateral Support

Attachment To

GUARD REQUIREMENTS

All decks greater than 30" above grade are required to have a guard. If you are providing a guard when one is not required, it must meet these requirements. All guards shall be constructed in strict conformance with the details herein; any deviations require a plan submission. See **Figure 26**.



Figure

26:

Typical Guard Detail

The guardrail shall be designed to withstand a concentrated load of 200 pounds anywhere along its length, and the infill area is designed to withstand a load of 50 pounds on a square foot area. The guard cap may be composed of an approved foreign lumber, plastic or composite material provided the product has an approved evaluation report from an accredited testing laboratory which has listed the product. For a list of approved materials, go to the website below. The evaluation report must be the jobsite and available to the inspector during the inspection process. Guard post shall not be notched. See **Figure 27**.

Any guard wholly comprised of a pre-fabricated wood, plastic, composite or manufactured guard system purchased from a home center store, lumber company or similar will require a plan submission. ONLY THOSE SYSTEMS LISTED BY AN ACCREDITED TESTING AGENCY SUCH AS **ICC-ES EVALUATION REPORT** ARE APPROVED FOR USE IN LITTLETON MASSACHUSETTS. For a list of approved products, visit the website below.

<http://www.icc-es.org/>

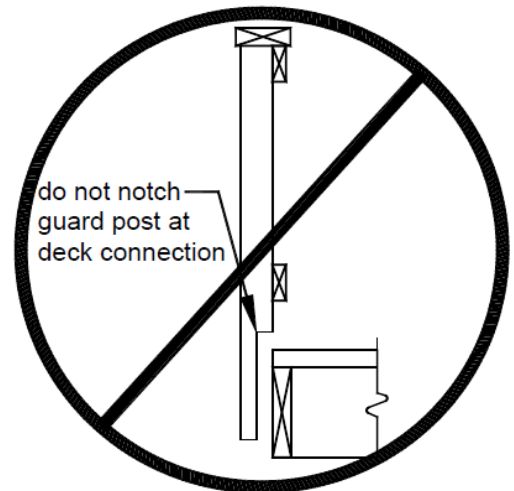


Figure 27: Prohibited Notching At Guard Post

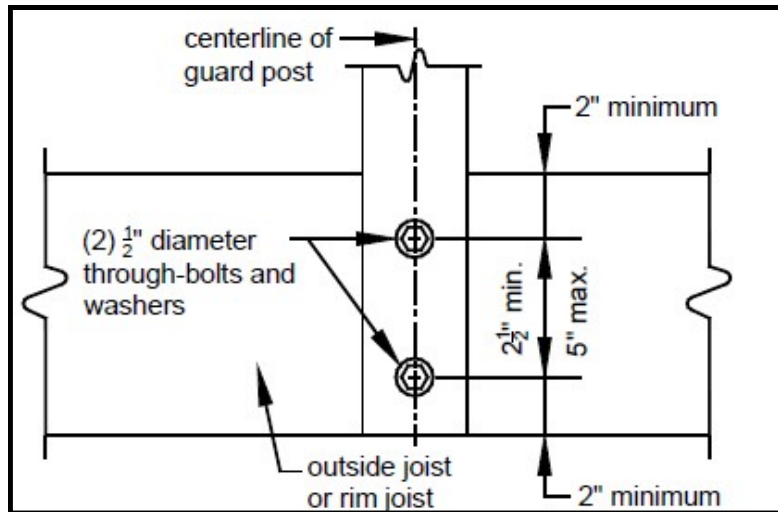


Figure 28: Guard Post

Attachment Detail

GUARD POST ATTACHMENTS

Guard posts may be attached to the inside or outside face of the rim joist. See **Figure 28** for attachment detail.

Guard posts for guards which run parallel to the deck joists (side of deck)

Shall be attached to the outside-joist shown in **Figure 29**. However, in this condition, and in addition to the attachment requirements shown in **Figure 11**, the rim joist must be fastened to the next adjacent joists with 20 gage *stud tie plates* attached per the manufacturer's instructions with hot-dipped galvanized or stainless steel fasteners. Stud tie plates must be galvanized with 1.85 oz/sf of zinc (G-185 coating) or shall be stainless steel. Look for model number SP1 in a Zmax coating from Simpson Strong-Tie or model number SPT22 in a Triple Zinc coating from USP.

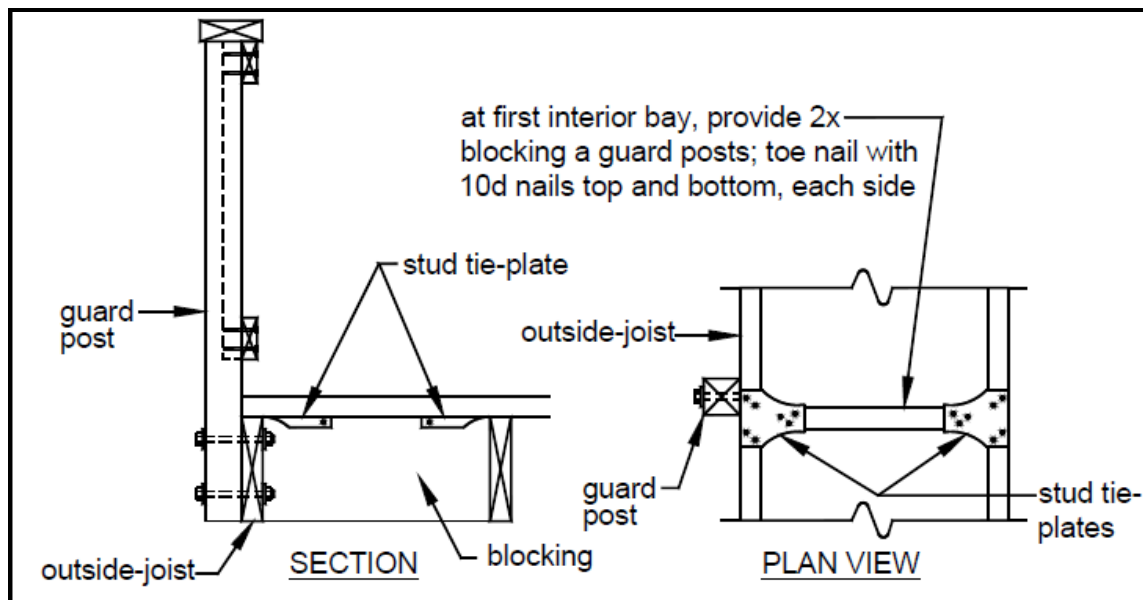


Figure 29:
Post To
Joist

Guard
Outside
Detail

Guard posts for guards which run perpendicular to the deck joists (rim joist)

Use one of the options shown in **Figure 30** and **Figure 31** to attach a guard post to a rim joist. See **Figure 11** for rim joist-to-deck joist and decking-to-rim joist attachment requirements.

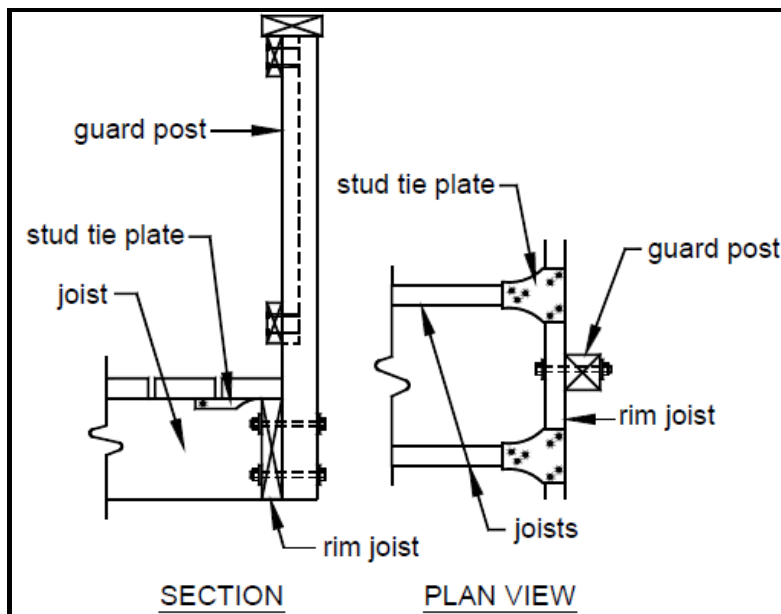
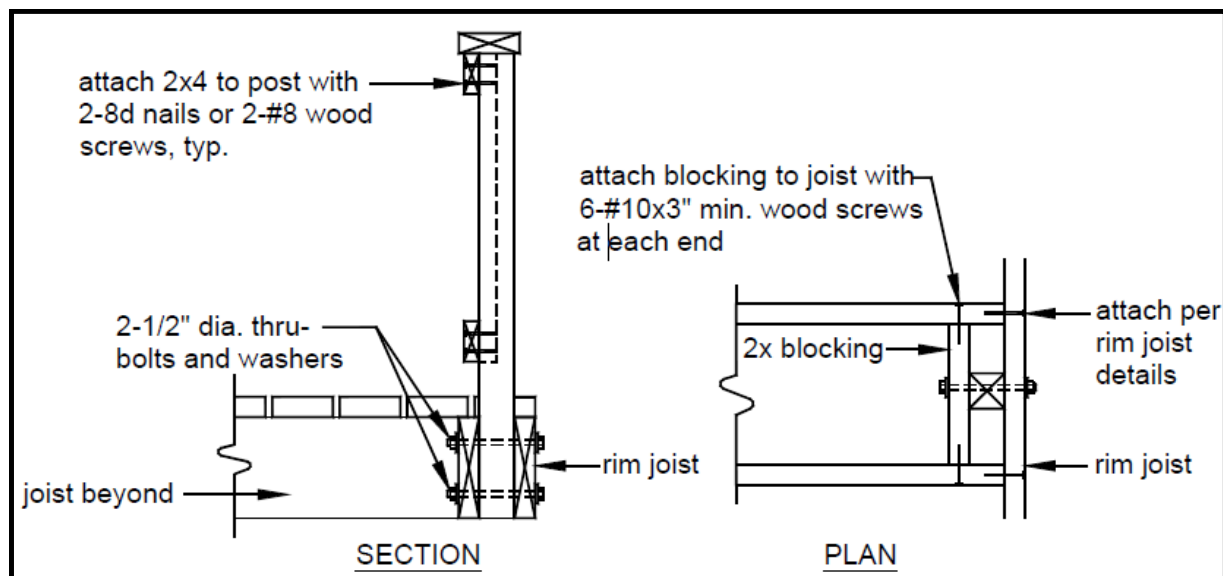


Figure 30: Guard Post

To Rim Joist Detail,

Option 1



Figure

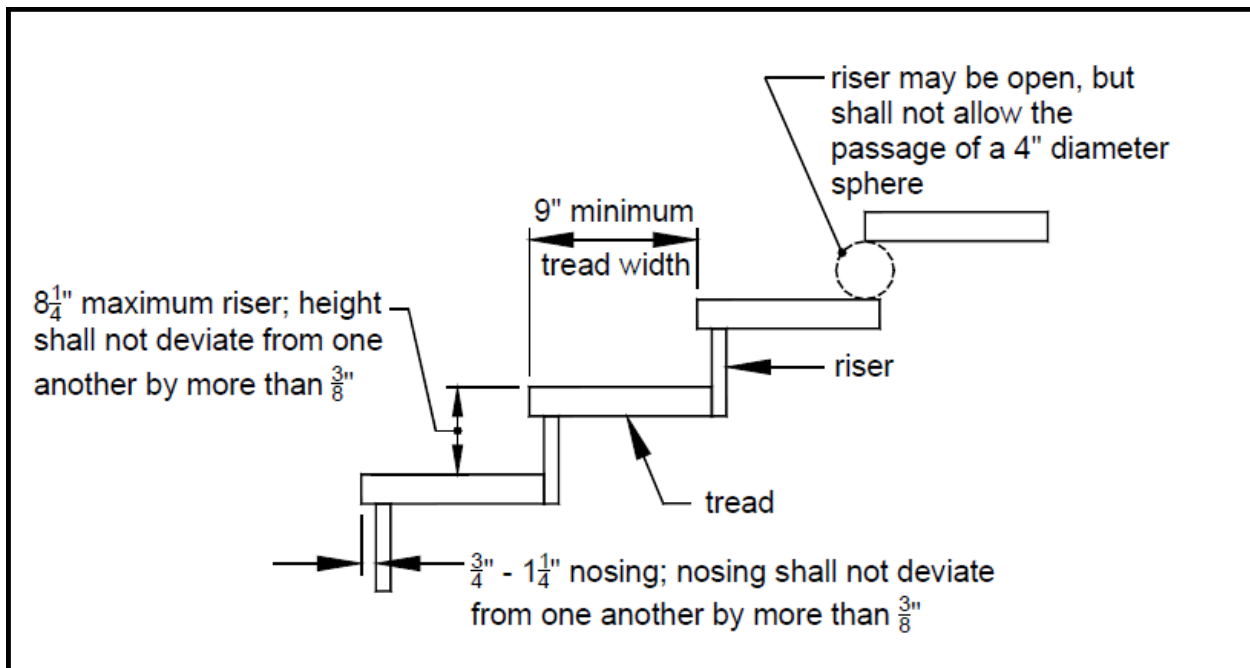
Guard Post To Rim Joist Detail, Option 2

31:

STAIR REQUIREMENTS

STAIR GEOMETRY: Stairs shall be a minimum of 36" in width as shown in **Figure 40**. Tread, riser and nosing dimensions, opening limitations and tolerance minimums shall meet the requirements shown in **Figure 32**. Treads may be framed with 2x lumber or 5/4 board. An approved manufactured material may be substituted provided the construction is within the product limitations listed in its evaluation report. See Decking Requirements on page 2 and Evaluation Report on page 15 for more information. Risers may be framed with 1x lumber minimum.

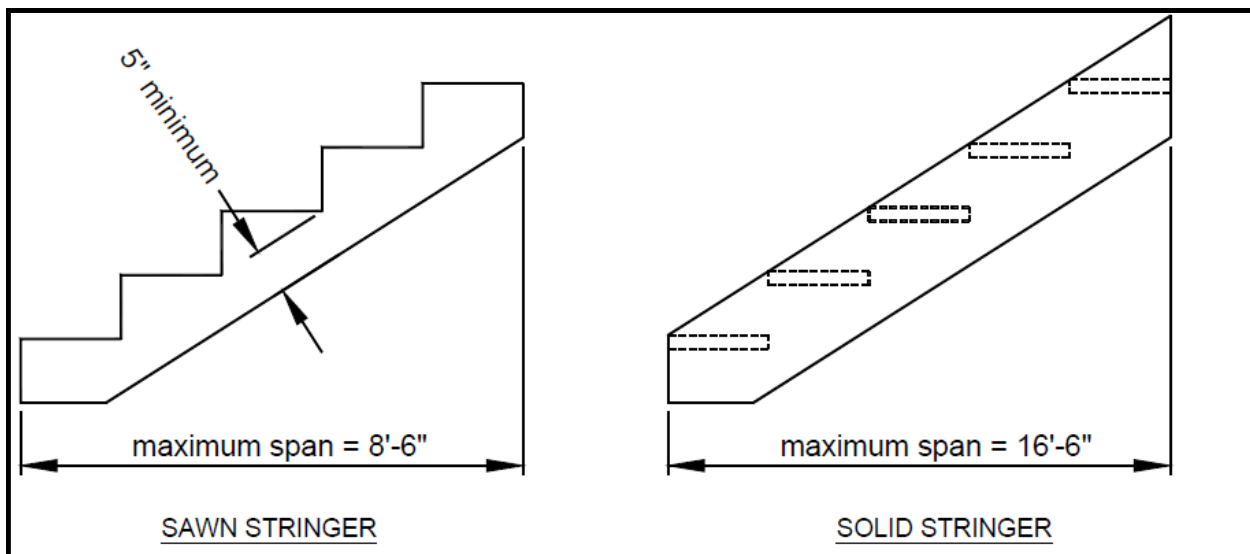
STAIR STRINGERS: Stringers shall be 2x12s cut to meet the stair geometry requirements shown in **Figure 32** and **Figure 33**. Solid 2x12s stringers may be substituted, but for 36" wide stairs only. All stair stringers shall be spaced a maximum of 18" on center, as shown in **Figure 34**. Stairs that are equal to 36" in width and have 2x tread material may be framed with two stringers, either sawn or solid.



**Figure
Tread
Riser**

**32:
And
Detail**

All stringers shall not exceed the horizontal span length shown in **Figure 33**. If the stringer span exceeds the maximum limit, a 4x4 post may be provided to support the stringer and shorten its span length. The 4x4 post shall be notched and bolted to the stringer with (2) 1/2" diameter through-bolts with washers per **Figure 10**, Option 1. The post shall be centered on a 12" diameter or 10" square, 4" thick footing. The footing shall bear 24" below grade, and the post shall be attached to the footing per **Figure 12**. An intermediate landing may also be provided to shorten the stringer span; see page 18 STAIR LANDINGS.

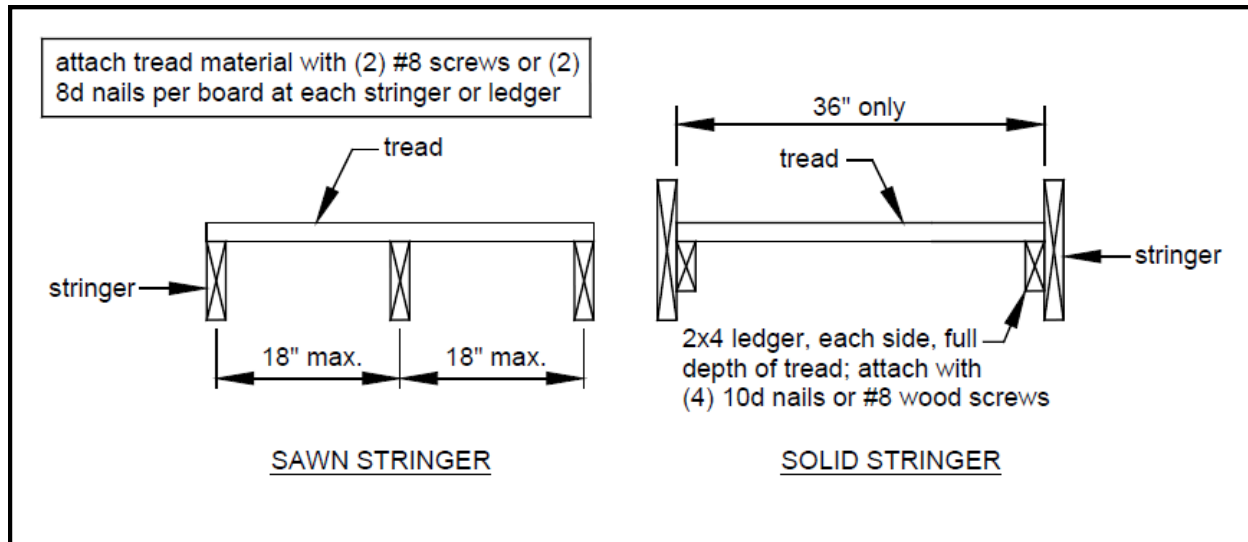


**Figure
Stair**

33:

Stringer Requirements

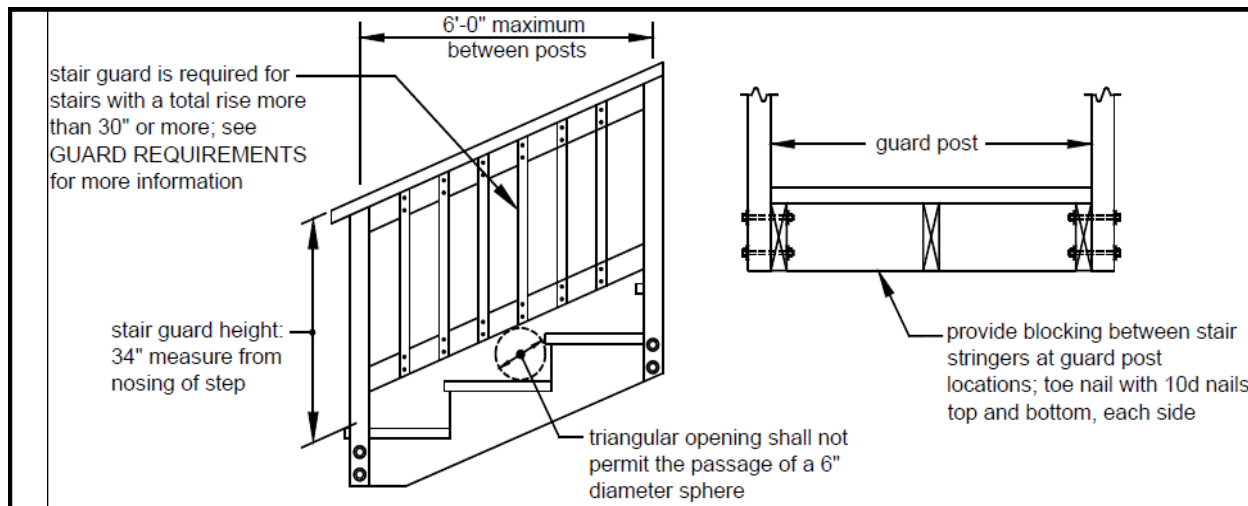
STAIR LANDINGS: If the total vertical height of a stairway exceeds 12'-0", then an intermediate landing will be required. All intermediate stair landings shall be designed and constructed as a free-standing deck using the details herein. The width of each landing shall not be less than the width of the stairway served. Every landing shall have a minimum dimension of 36" measured in the direction of travel and not less than the width of the stairway served.



Figure

Tread Connection Requirements

34:



Figure

Stair Guard Requirements

35:

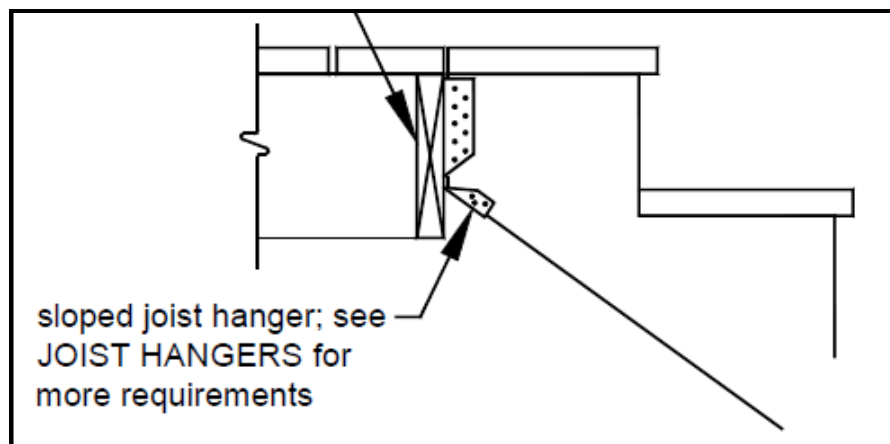


Figure 36: Stair

Detail

Stringer Attachment

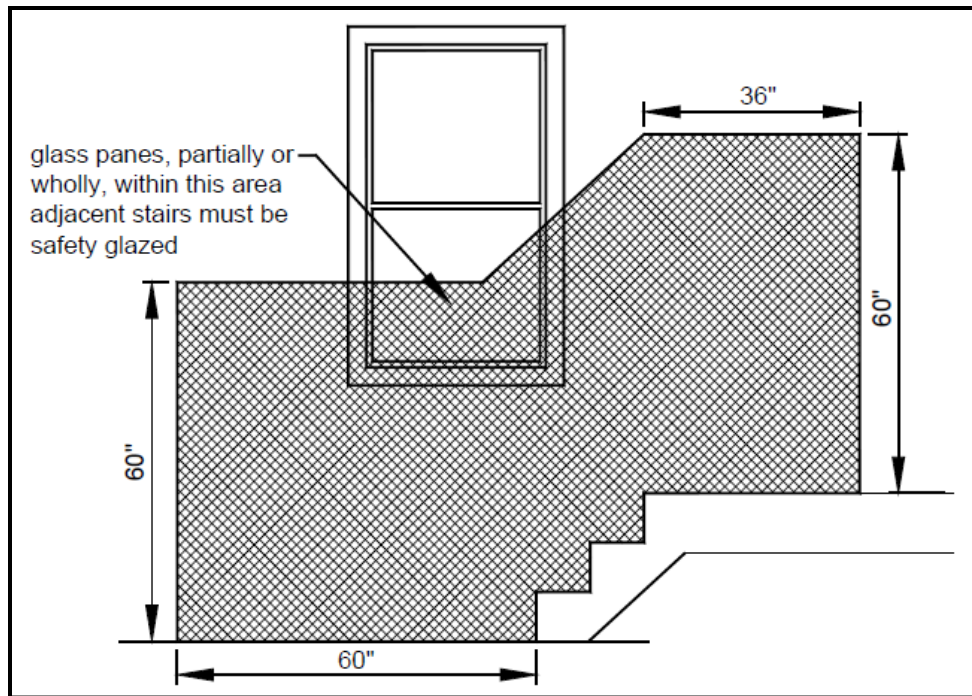


Figure 37: Safety

Glazing Area

STAIR HANDRAIL REQUIREMENTS: All stairs with 4 or more risers shall have a handrail on one side. Handrails shall be graspable per **Figure 38** and shall be composed of decay-resistant and/or corrosion resistant material. Handrail shall be attached to the stair guard or an existing exterior wall which acts as a barrier to the stairs. See **Figure 39**. All shapes shall have a smooth surface with no sharp corners. Recessed sections may be shaped from 2x6s or 5/4 board.

Handrails shall run continuously from a point directly over the lowest riser to a point directly over the highest riser and shall return to the guard at each end; see **Figure 40**. Handrails may be interrupted by guard posts only at a turn in the stair.

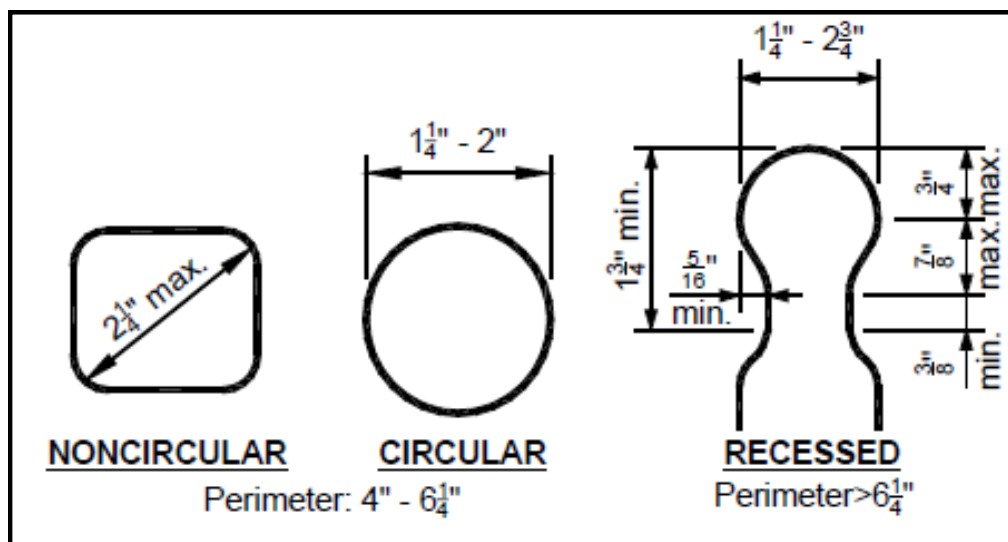


Figure 38:
Graspability
Geometry

Handrail
Types /

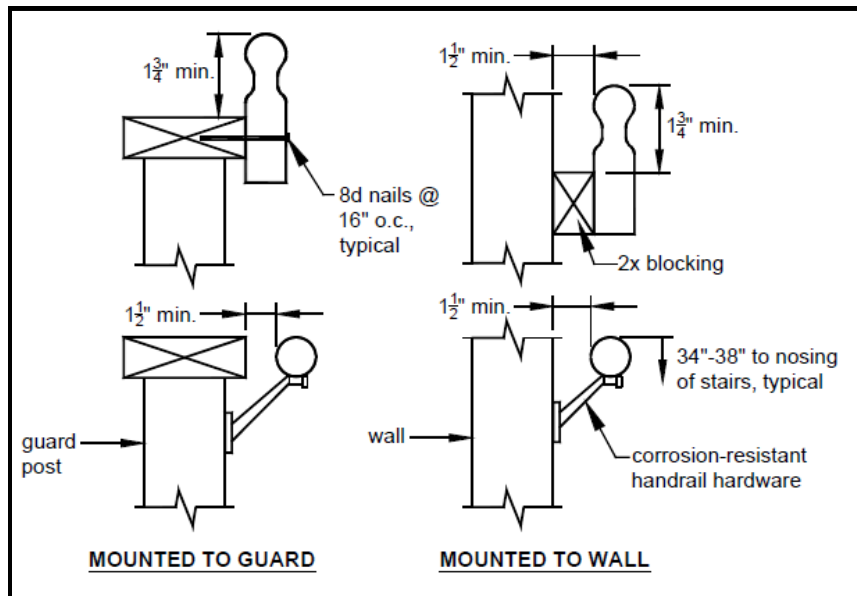


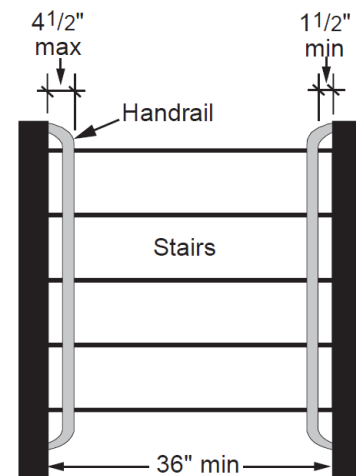
Figure 39: Handrail

Requirements

STAIR LIGHTING REQUIREMENTS: Stairways shall have a light source located at the top landing such that all stairs and landings are illuminated. The light switch shall be operated from inside the house. However, motion detected or timed switches are acceptable.

Handrails

- Stairways must have a handrail if the stairway has more than three risers.
- Handrails may project over stairs by 4 1/2 inches maximum on each side of the stairway.
- Handrails must be continuous for the full length of the stairs. They must turn back into the wall or butt into a post so that purse straps and clothing won't get caught behind them and cause a fall.
- Handrails attached to the wall must have a space between the wall and the rail of at least 1 1/2 inches to provide a grippable surface.
- Handrails on the open side of a stairway must meet guardrail requirements.
- The height of handrails is measured straight up from the nosing of the treads to the top of the handrail. A handrail along a wall must be between 30 inches and 38 inches high.
- A round handrail must have a diameter no smaller than 1 1/4 inches and no larger than 2 inches, so that it can be easily and securely gripped. Other handrail shapes are allowed, if the perimeter dimension is at least 4 inches and not more than 6 1/4 inches, with a cross section dimension not more than 2 1/4 inches.



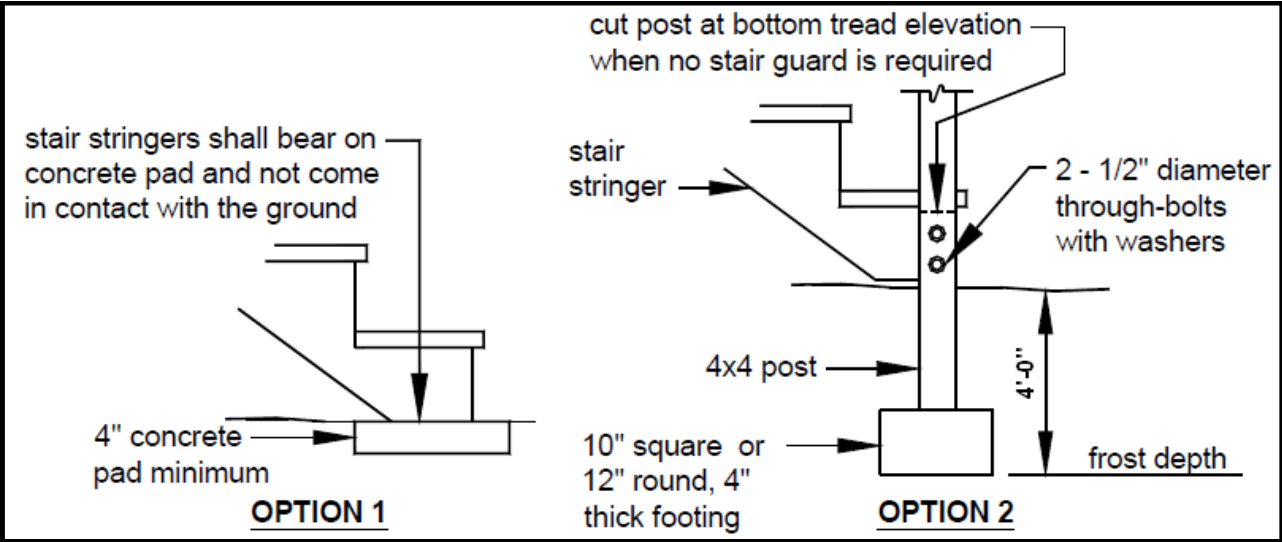
Figure

All stairs and landings must be illuminated

40:

Miscellaneous Stair Requirements

STAIR FOOTING REQUIREMENTS: Where the stairway meets grade the stair stringers shall bear on a 4" concrete pad minimum or attach to 4x4 posts as shown in FIGURE 42. The pad shall be sized such that all stringers have complete bearing on concrete and do not come in contact with the ground.



Figure

41: Stair Stringer Bearing At Grade

It is the responsibility of the permit holder or the permit holder's representative to notify the inspector when the stages of construction are reached that require an inspection. Inspection requests may be made using one of the methods listed below; please have your permit number available when scheduling an inspection.