



DECKS

Construction Guide



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1. GENERAL NOTES

The information contained in this document is for references only. It is intended to assist homeowners with their deck project while ensuring compliance with the requirements of the Ontario Building Code. The drawings and details specified are typical construction details and other methods may be permitted upon authorization from Building Services at the discretion of the Building Official. Any deviation from this package will require the plans to be sealed by a Professional Engineer. All construction shall be inspected including footings prior to placing concrete, framing and a final inspection prior to use.

All construction shall conform to the latest edition of the Building Code, as amended.

Design Considerations: Limited Use of Standard Details

1. The proposed deck is for residential use only and is unenclosed with no roof;
2. No hot tubs, pergolas, gazebos, trellis or other roof structures are supported by the deck; and
3. The deck construction including guards and handrails are standard wood construction.
4. Decks shall not be constructed on septic systems, and ensure:
 - a. A 4'-11" (1.5m) setback is maintained from the deck pier to the septic tank.
 - b. A 16'-5" (5m) setback is maintained from the deck pier to the edge of the leaching bed

Material Specifications

1. Lumber shall be preservative-treated, southern pine fir, grade #2 or better.
2. Lumber in contact with the ground shall be rated as "ground-contact." Not all treated lumber is rated for ground contact.

2. FOOTINGS (“DECK PIERS”)

Footings shall be constructed in accordance with the requirements below:

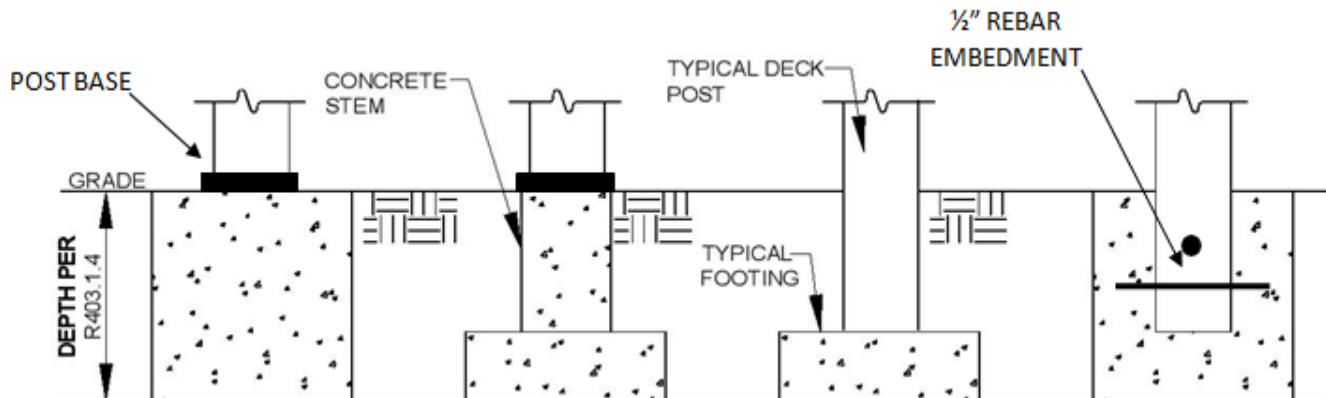
- Footings shall bear on solid ground at a minimum of 48” below grade for frost protection.
- Footings shall be deeper if solid ground is not found. Bearing conditions must be verified by the Building Inspector prior to placement of concrete.
- Concrete piers shall extend minimum 6” above grade.
- The size of footings supporting piers and columns shall be based on the tributary load and allowable soil pressure in accordance with Table 1 below.
- The maximum spacing of a pier is no greater than 10’-0” (3m)
- Minimum 28” x 28” footing is required for pier spacing that exceed 10’-0” (3m)
- Shaded Areas in Table 1 require a Minimum 28” x 28” footing or “Big Foot” Footing System
- Wood framing members that are not pressure-treated with a wood preservative and that are supported on concrete in contact with the ground or fill shall be separated from the concrete by not less than 0.05 mm polyethylene film or Type S roll roofing (not required if 6” above ground).

Table 1: Minimum Pier Sizes (Diameter in inches)

Joist Span	Pier Spacing				
	6’-0”	8’-0”	10’-0”	12’-0”	14’-0”
6’-0”	8”	8”	10”	10”	-
8’-0”	8”	10”	10”	12”	-
10’-0”	10”	10”	12”	12”	-
12’-0”	10”	12”	12”	-	-
14’-0”	12”	12”	-	-	-

Shaded Areas require a Minimum 28” x 28” footing or “Big Foot” Footing System

Below is an illustration of the four types of pier footings that are acceptable:

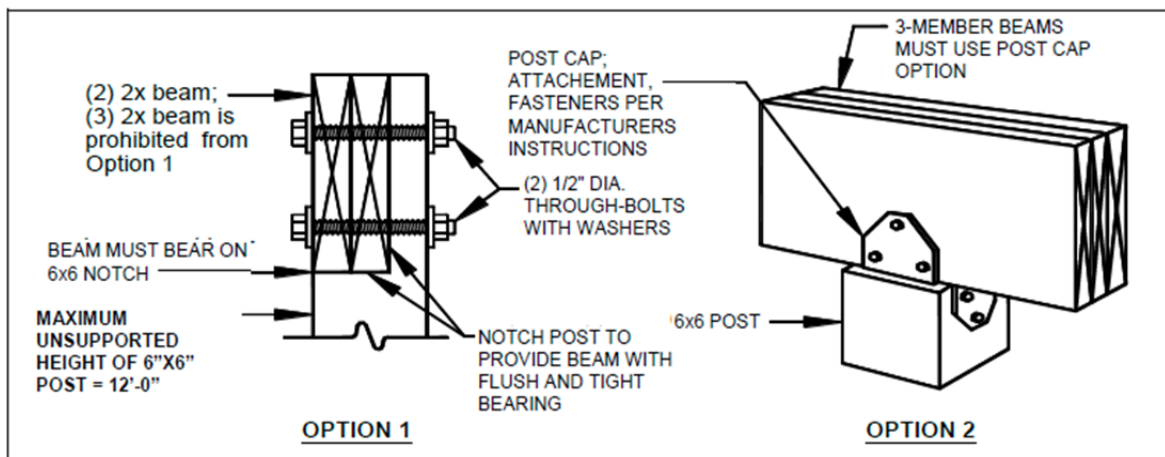


3. DECK SUPPORT POSTS

- All deck support posts shall be a minimum 6"x6" with a maximum unsupported height of 10'-0" measured from the top of the footings to the underside of the beam.
- All supports shall be restrained from lateral displacement at the footing. Lateral restraint shall be provided by manufactured connectors or by minimum post embedment of 12 inches in surrounding soils or concrete piers.
- Cut ends of posts shall be field treated with a wood preservative

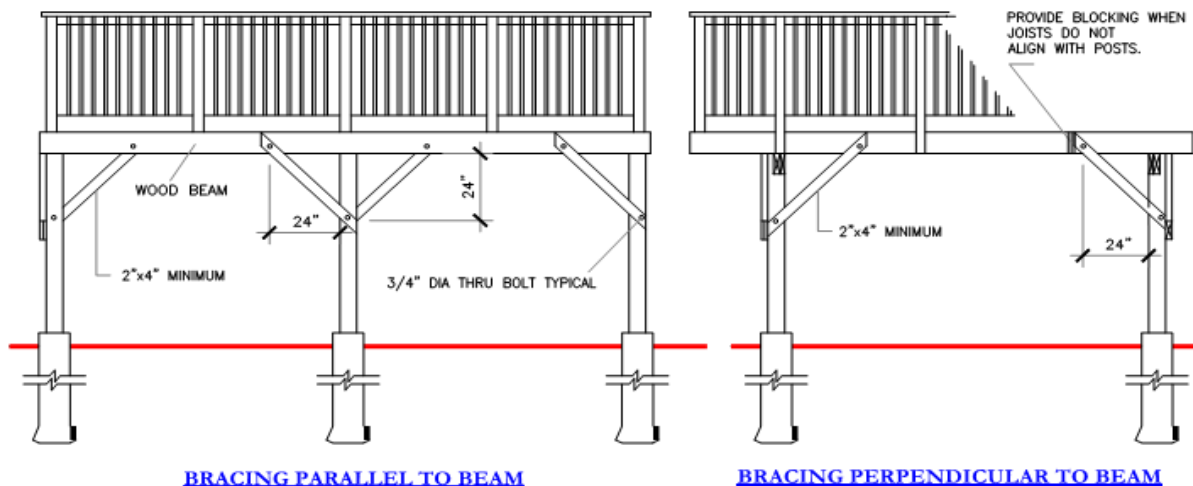
Deck Beam to Deck Post Connection

- Deck beam to deck post shall be connected together by either a post cap or by a notched post to accommodate all plied of the deck beam and bolted together.



Lateral Bracing

- Lateral bracing of all deck support posts shall be provided for decks that exceed 24" above grade



4. BEAMS

- Beams are assembled, multi-ply framing members which span between supporting posts. Multi-span decks have more than one beam; spacing between beams is dependent on the allowable span lengths of the supports joist.
- Inside beams have joists bearing from each side. Outside beams have joists, with or without an overhang, bearing from one side.
- Dropped beams have joists bearing above; flush beams have joists with hangers bearing on its sides; Multi-span decks are permitted to mix flush and dropped beams.

Beam Size

- Beam size is based on its influence width and longest span length per Table 2. Beam influence width is based on supported joists' span lengths and overhang dimensions.
- Beam span length is measured between the centerlines of two adjacent posts and does not include the beam overhangs.
- Flush beams shall have a depth greater than or equal to the deepest joist.

Table 2: Beam Size

Joist span	Pier spacing				
	6'-0"	8'-0"	10'-0"	12'-0"	14'-0"
6'-0"	2/2x8	2/2x8	3/ 2x8	3/ 2x10	4/2x12 or 3/2x10
8'-0"	2/2x8	2/2x8	3/ 2x8	3/ 2x10	3/2x12 or 3/2x10
10'-0"	2/2x8	3/ 2x8	3/ 2x8	3/ 2x10	3/2x12 or 4/2x10
12'-0"	3/ 2x8	3/ 2x8	3/2x10 or 4/ 2x8	3/ 2x10	3/2x12 or 4/ 2x10
14'-0"	3/ 2x8	3/ 2x10	3/2x10 or 4/ 2x8	3/ 2x12 or 4/2x10	3/2x12 or 4/ 2x10

Beam Assembly

- The plies of the built-up beam shall be fastened as follows:
 - a) nailed together with a double row of nails not less than 3-1/2" in length, spaced not more than 18" apart in each row with the end nails located 4" -6" from the end of each piece.
 - b) bolted together with not less than 1/2" diam. bolts equipped with washers and spaced not more than 48" o.c. with the end bolts located not more than 24" from the ends of the members.
- The distance from the centreline of the fastener to the top or bottom edge of the beam shall be 1/2-inch minimum.
- The distance from the centreline of the fastener to the ends of the beam shall be 1-inch minimum.
- Beam plies are permitted to have splices. However, splices shall be located at inside posts

5. DECK JOISTS

- Joists are repetitively placed framing members spaced at 12, 16, or 24 inches on centre which are supported at each end by a beam or ledger board.

Joist Spans

- Joist span length is measured from the ledger board to the centerline of the supporting beam or between the centerlines of the supporting beams at each end.
- Joists are permitted to overhand past a beam; joist span length does not include overhangs.
- The joists' design is based on spacing, size and span length. Use Table 3 to determine joist size.
- Where blocking between joists is required, attach blocking using joist hangers at each end or by toenailing blocking to joists at each end, top and bottom.
- Attach a continuous rim joist or blocking at the joist end as shown on page 8 of 21. Attach a rim joist to the end of each joist.
- When choosing 2x6 joists, the corresponding ledger board must be a 2x8 minimum.

Table 3: Joists Size and Span

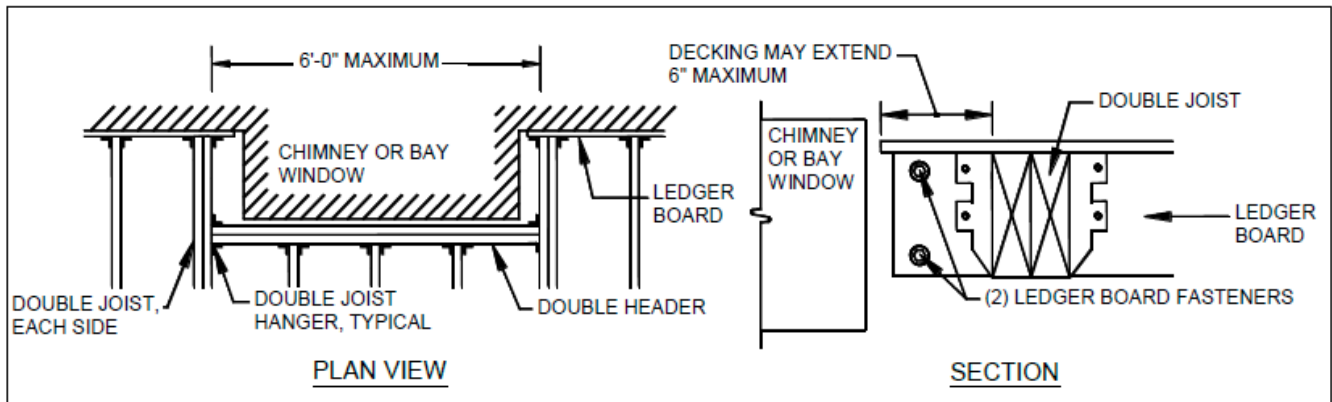
Joist Size	Joists Spacing on Centre (inches)	Maximum Span (feet)
2 x 8	12"	12'-0"
	16"	11'-0"
	24"	10'-0"
2 x 10	12"	14'-0"
	16"	13'-0"
	24"	12'-0"
2 x 12	12"	14'-0"
	16"	14'-0"

5. DECK JOISTS

Framing at Projections

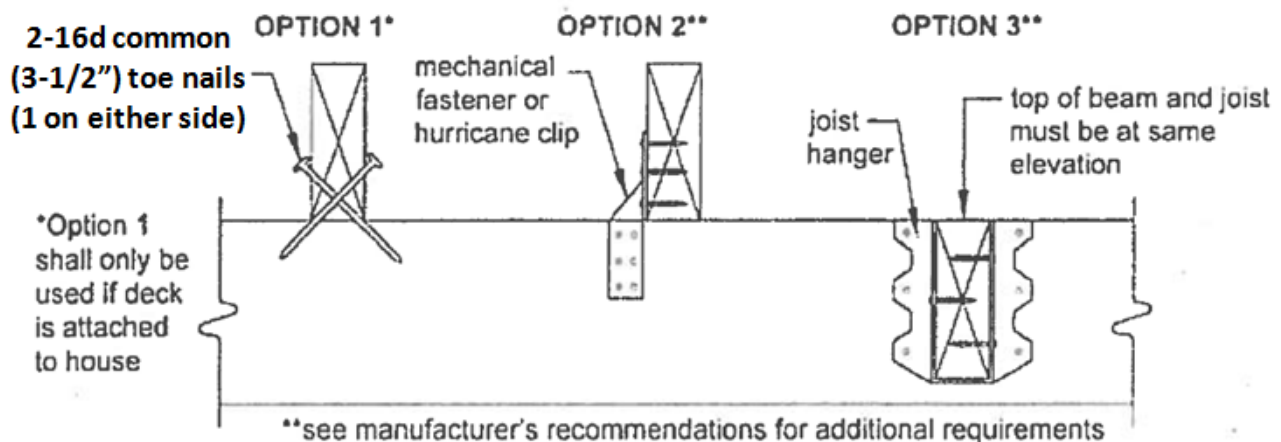
Additional framing and ledger board fasteners are required at the projections such as chimneys or bay windows refer to detail below. Each ply of the header shall be equal to the deck joist size. Joist hangers shall meet the requirements below.

Framing at Projections



Joist Hangers

- Joist hanger depth shall be greater than or equal to 60 percent of the joist depth.
- The manufactured width of the joist hanger shall accommodate the number of plies being carried.
- Do not bend hanger flanges to accommodate field conditions.
- Joist hangers shall be fastened to the ledger board or flush beam according to manufacturer specifications using proper hanger nails.
- Use joist hangers with inside flanges when clearances to the edge of the beam or ledger board dictate.
- Clip angles or brackets used to support framing members in lieu of joist hangers are prohibited.



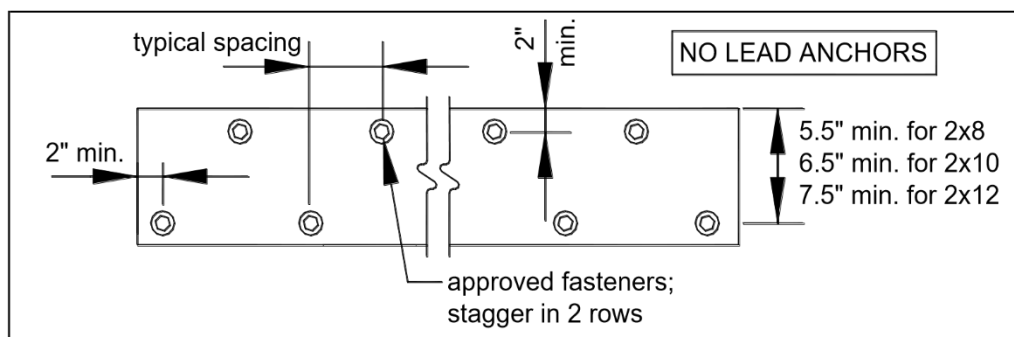
6. LEDGER BOARD ATTACHMENT

- Decks are usually supported on one side by a ledger attached to the house. This ledger attachment is critical to ensure the deck is safely and securely supported to the house. There are very specific requirements that must be met. Follow the diagrams closely for the proper attachment of the ledger.
- The deck ledger shall NOT be nailed to the house - it must be lagged screwed or bolted to the structure of the house.
- Do NOT secure a ledger to brick – it must be connected to the house structure.
- The size and spacing of the lag screws is based on their capacity. Lag screw values are assumed to be 325 pounds for 1/2-inch lag screws and 190 pounds for 3/8-inch lag screws. The span of the floor joists determines how much load is being transferred to the ledger and thus to the lag screws.

Table 4: Deck Ledger to House Connections: Lag Bolt Spacing (See Diagrams)

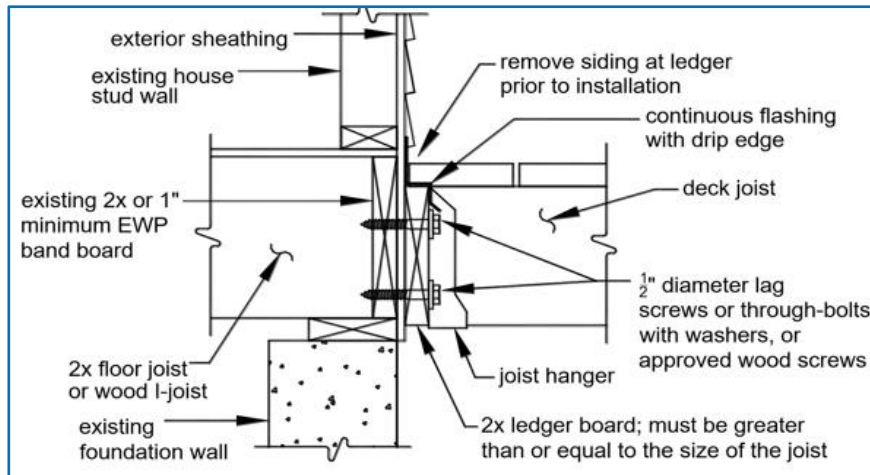
LAG BOLT SIZE	JOIST SPAN			
	Up to 6'-0"	8'-0"	10'-0"	12'-0"
1/2" (12.7mm)	32" o/c	16" o/c	16" o/c	12" o/c
Equivalent 16" o/c Joist Spacing	Every Other Joist Space	Every Joist Space	Every Joist Space	Each Joist Space with Two Every Other Space
3/8" (9.5mm)	24" o/c	12" o/c	12" o/c	8" o/c
Equivalent 16" o/c Joist Spacing	Two Every Third Joist Space	Each Joist Space with Two Every Other Space	Each Joist Space with Two Every Other Space	Two Each Joist Space Three Every Other Space

- Deck ledgers shall be minimum 2x8 pressure-preservative-treated No. 2 grade lumber or other approved materials as determined by good engineering practices.
- Pilot holes shall be pre-drilled with a size between 17/32" to 9/16".
- Lag screws are only permitted where existing site conditions can be confirmed. When solid-sawn pressure-preservative-treated deck ledgers are attached to engineered wood products (structural composite lumber rim board or laminated veneer lumber), the ledger board attachment shall be designed in accordance with the manufacturer's recommendations or good engineering practices

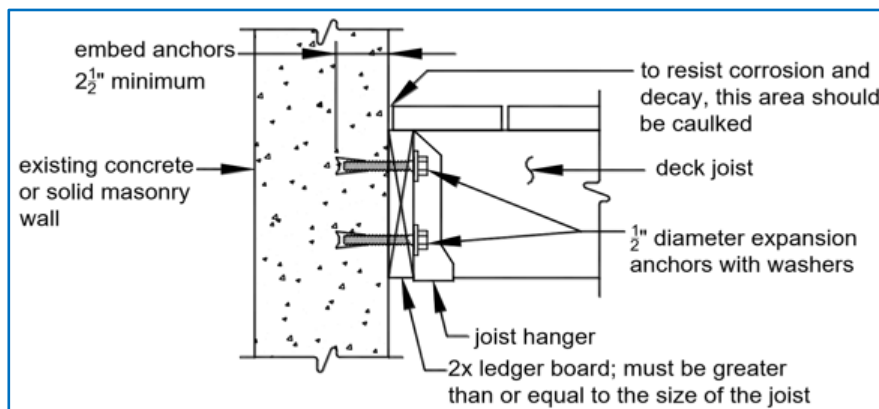


7. LEDGER BOARD CONNECTION EXAMPLES

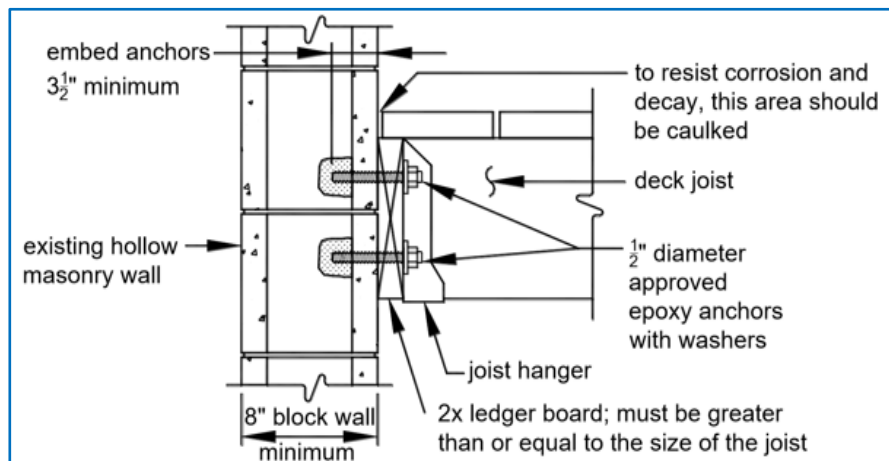
Connection to Rim Board



Connection to a Poured Foundation Wall



Connection to a Block Wall



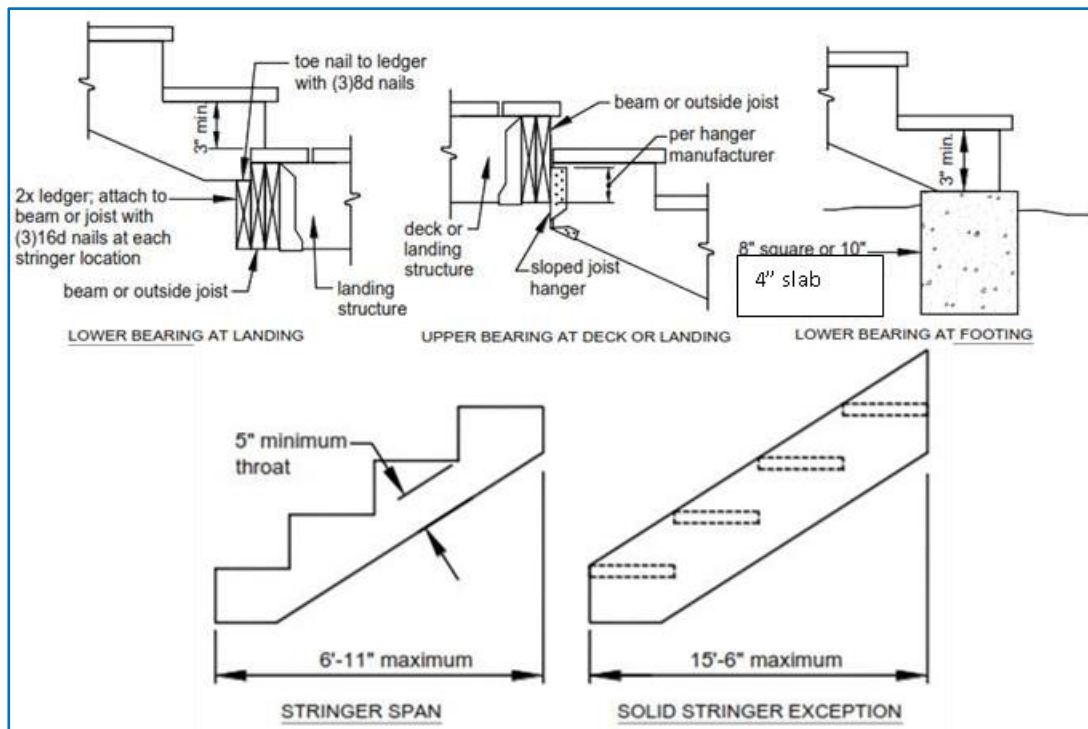
8. STAIR DETAILS

Stair Landing

- Where the total vertical height of a stairway exceeds 12 feet, then an intermediate landing is required and must be constructed as a free-standing deck.
- Stair landings to be constructed with 6x6 posts.
- Landing widths shall be equal to the total width(s) of the stairway(s) served.

Stair Stringers

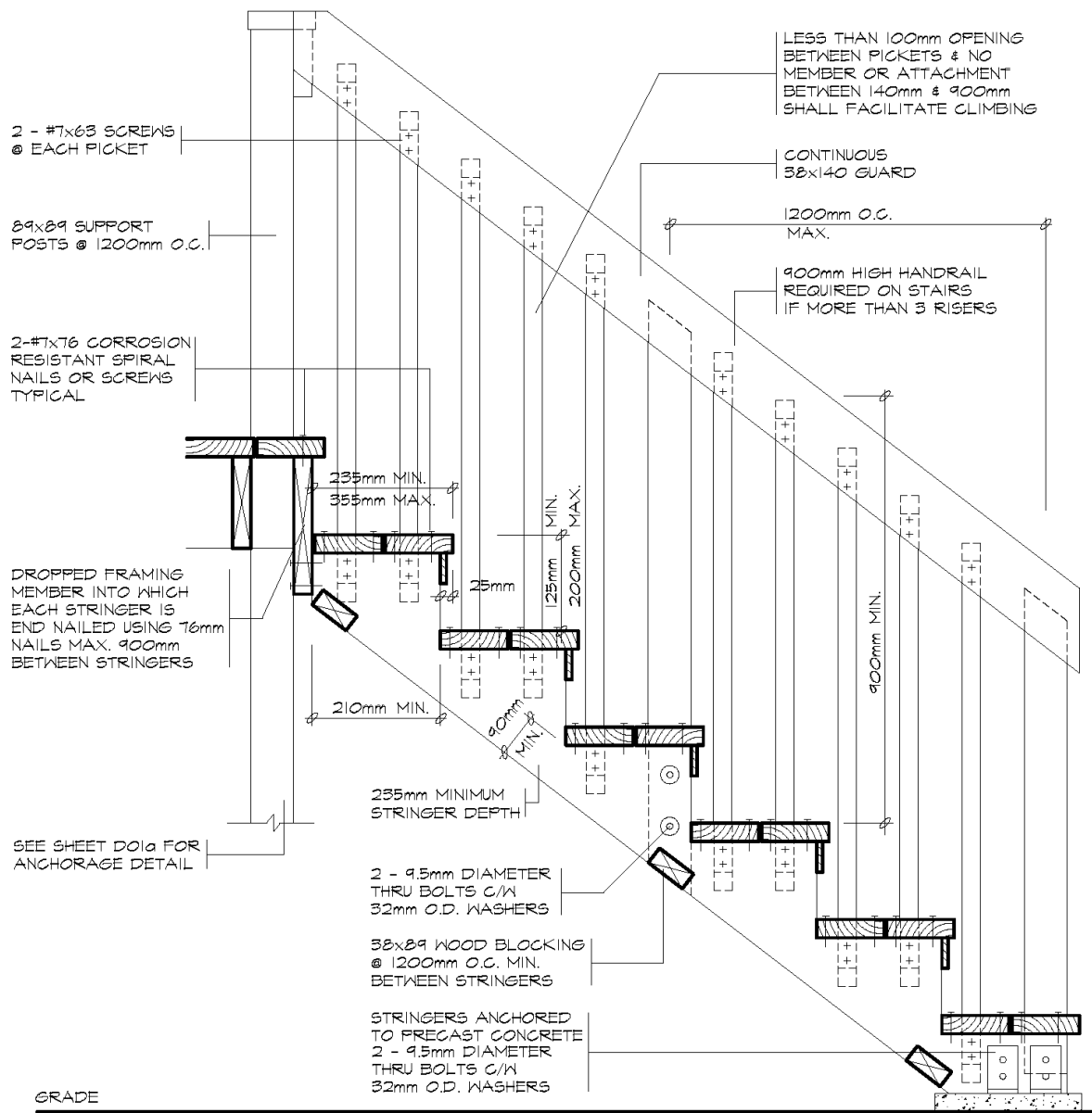
- Stringers shall be of sawn or solid 2x12's complying with the tread and riser geometry requirements.
- Stringer span length is measured using the horizontally projected distance between the centerlines of bearing at each end
- The span length of stringer shall not exceed 6 feet-11 inches, and the throat size of cut stringers shall not exceed 5 inches as shown below.



9. HANDRAILS AND GUARDS

Handrails and Guards

- Handrails are required to be installed on every stair with more than 3 risers
- Height of handrails on stairs shall be between 34", and 38"
- Height of guard for a deck between 24" and 5'-11" above grade is 35"
- Height of guard for a deck more than 5'-11" above grade is 42"
- Maximum 4" openings between pickets
- All steps to be equal rise and run between landings



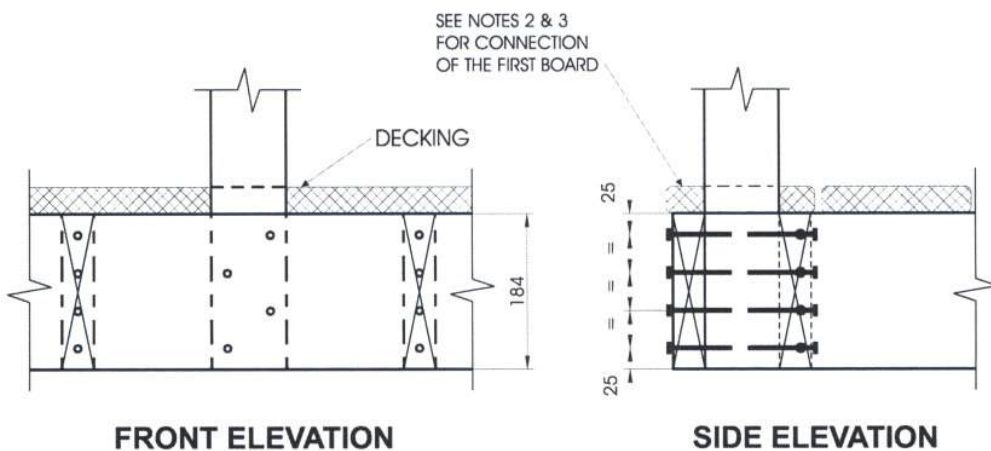
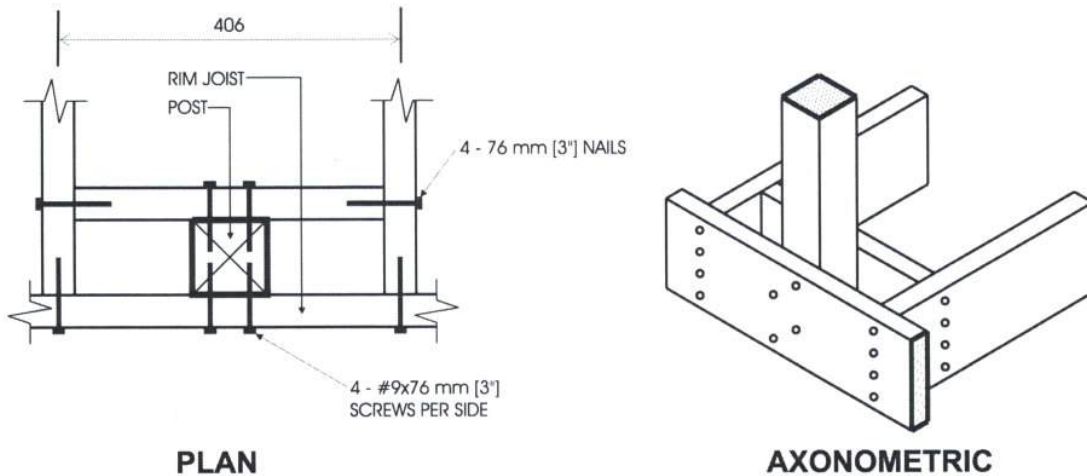
10. GUARDS

- Min. height of guards where deck height is between 24" & 5'-11" above grade: 35"
- Min. height of guards where deck height exceeds 5'-11" above grade: 42"
- Maximum 4" opening between pickets and no member or attachment between 5-1/2" and 35" shall not facilitate climbing
- **Guard posts shall not be notched.** They shall be attached by installing (2) ½" bolts or hold down anchors per manufacturer's specifications.
- All fasteners shall be resistant to corrosion. All lumber shall be decay resistant. All cut ends of preservative treated lumber shall be treated to prevent decay.
- Composite decking is required to have BMEC or CCMC approvals
- Pre-engineered guard systems are required to have Ontario Engineering
- Any guard assembly that is site manufactured, such as wood/glass guards is required to be engineered. If a professionally engineered guard is proposed, documentation with an engineer's stamp may be required.
- A privacy wall/ fence boards is permitted if constructed as a guard and should be discussed with the Building Inspector prior to constructing

Wood Guards

Supplementary Standard SB-7 of the Ontario Building Code illustrates acceptable designs for guards: See attached for common installations. For additional details or for the complete package contact the Building Department.

11. SB-7 GUARDS FOR HOUSING AND SMALL BUILDINGS



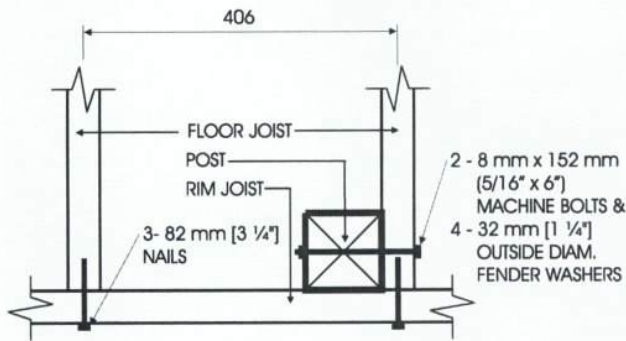
Detail EB-2
Exterior Connection: Post Screwed to Rim Joist

Notes:

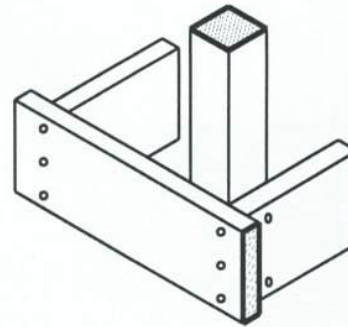
1. Decking is omitted from the plan view and the axonometric view for clarity.
2. Fasten 25 mm x 140 mm (5/4" x 6" nominal) outer deck board to rim joist with 63 mm (2 1/2") nails at 300 mm (12").
3. Fasten 25 mm x 140 mm (5/4" x 6" nominal) outer deck board to floor joist with 1 - 63 mm (2 1/2") nail at each joist.
4. The post may be positioned anywhere between the joists.
5. #9 screws may be replaced by #8 screws if the maximum spacing between posts is not more than 1.20 m (3'-11").
6. Dimensions shown are in mm unless otherwise specified.

MAXIMUM SPAN OF RAIL BETWEEN POSTS	
Species	Maximum Span, m (ft-in)
Douglas Fir-Larch, Hem-Fir, Spruce-Pine-Fir	1.56 (5'-1")
Northern Species	1.20 (3'-11")
Column 1	2

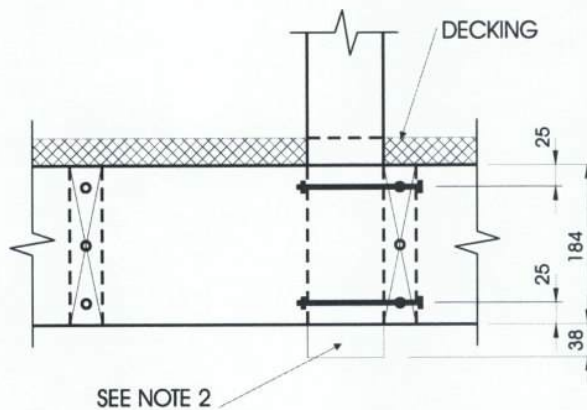
11. SB-7 GUARDS FOR HOUSING AND SMALL BUILDINGS



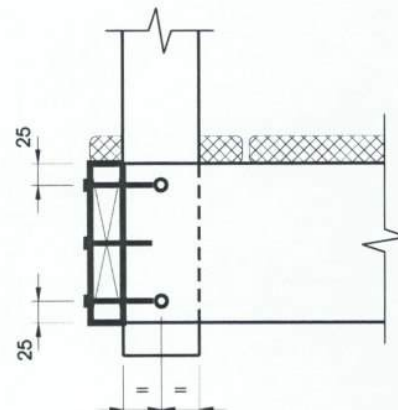
PLAN



AXONOMETRIC



FRONT ELEVATION



SIDE ELEVATION

Detail EB-3

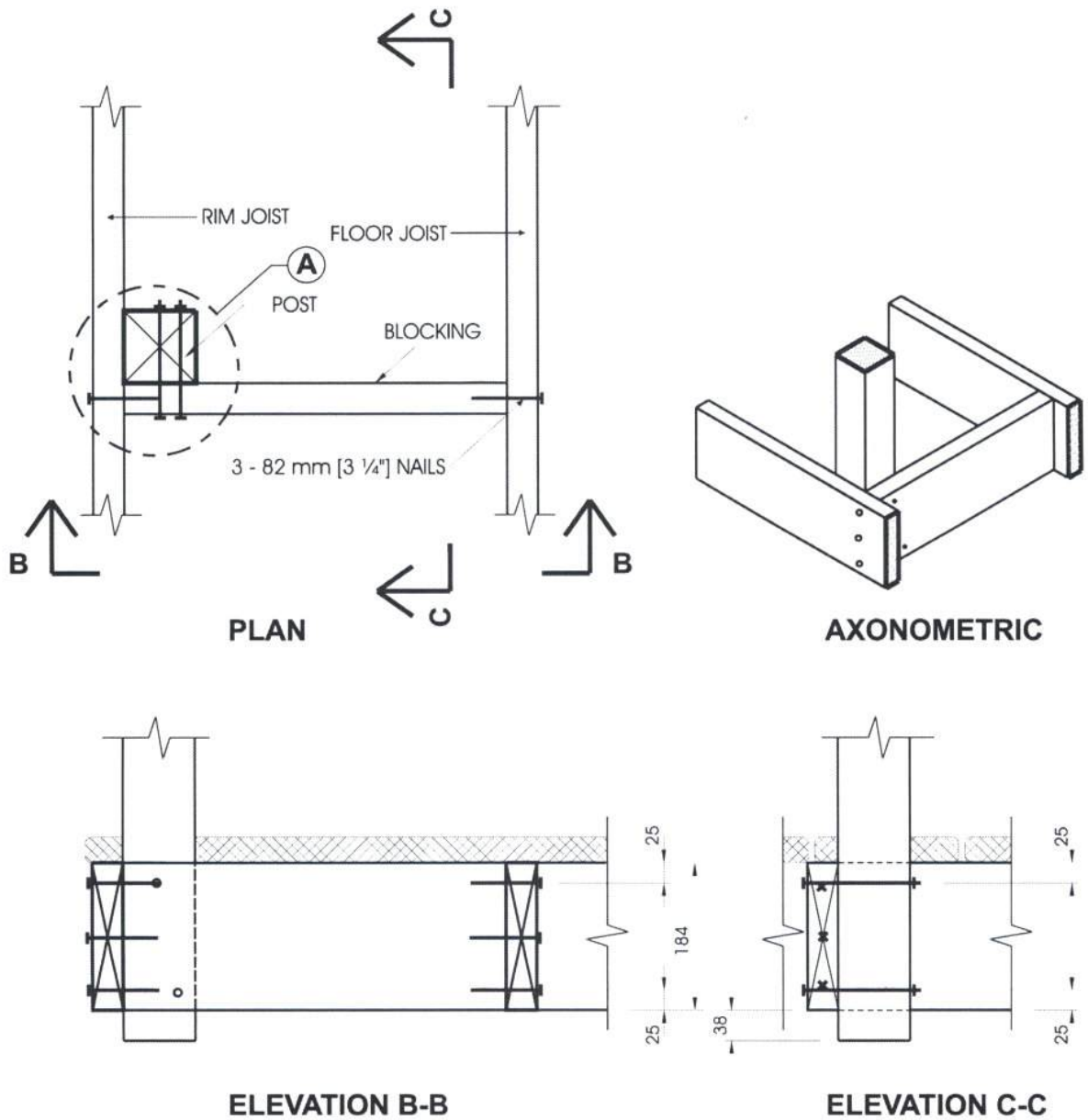
Exterior Connection: Post Bolted to Floor Joist - 8 mm (5/16") Bolts

Notes:

1. Decking is omitted from the plan view and the axonometric view for clarity.
2. 38 mm (1 1/2") post projection is not required where the maximum spacing between posts does not exceed 1.20 m (3'-11").
3. Joists may be spaced at 610 mm (24") o.c. or 406 mm (16") o.c.
4. Where floor joists are spaced at 610 mm (24") o.c., decking shall have a minimum thickness of 38 mm (1 1/2") and shall be fastened to the floor with 2 - 76 mm (3") nails.
5. Dimensions shown are in mm unless otherwise specified.

MAXIMUM SPACING BETWEEN POSTS	
Species	Maximum Span, m (ft-in)
Douglas Fir-Larch, Hem-Fir, Spruce-Pine-Fir	1.29 (4'-3")
Northern Species	1.20 (3'-11")
Column 1	2

11. SB-7 GUARDS FOR HOUSING AND SMALL BUILDINGS



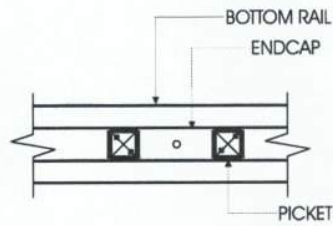
Detail EB-6

Exterior Connection: Post Fastened to Floor, Guard Parallel to Floor Joists

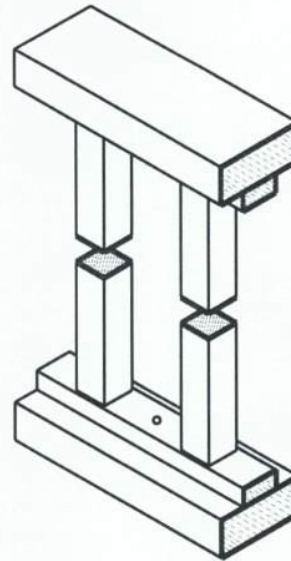
Notes:

1. Use any of the connection details shown on Details EB-1 to EB-5 at location "A". Connection Detail EB-4 is shown in this detail, as an example.
2. Maximum spacing between posts is determined from connection detail used at location "A".
3. Decking is omitted from the plan view and the axonometric view for clarity.
4. Blocking shall be not less than 38 mm x 184 mm (2" x 8" nominal).
5. Dimensions shown are in mm unless otherwise specified.

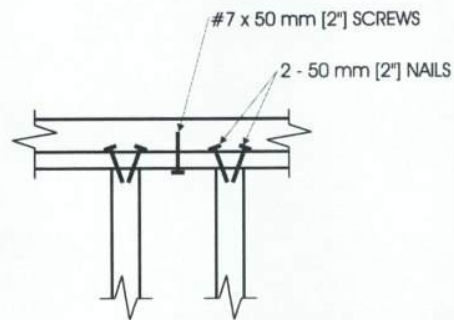
11. SB-7 GUARDS FOR HOUSING AND SMALL BUILDINGS



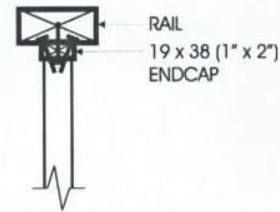
**PLAN
BOTTOM RAIL**



AXONOMETRIC



FRONT ELEVATION



SIDE ELEVATION

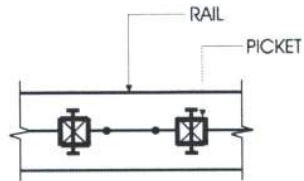
Detail EC-1

Exterior Connection: Infill Picket Nailed to Endcap - Endcap Screwed to Rail

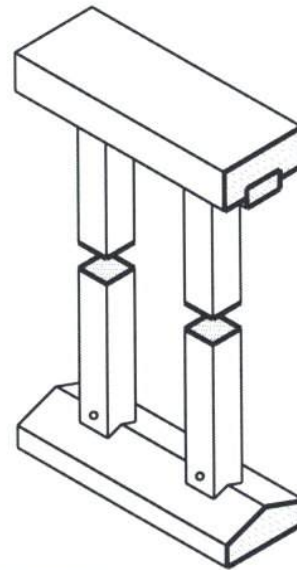
Notes:

1. Fasten each end of each picket to endcaps with 2 - 50 mm (2") nails.
2. Fasten endcaps to rails with #7 x 50 mm (2") screws at 300 mm (12") o.c.
3. See Table 2.1.2. for minimum sizes of pickets.

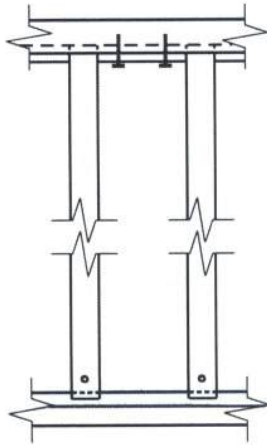
11. SB-7 GUARDS FOR HOUSING AND SMALL BUILDINGS



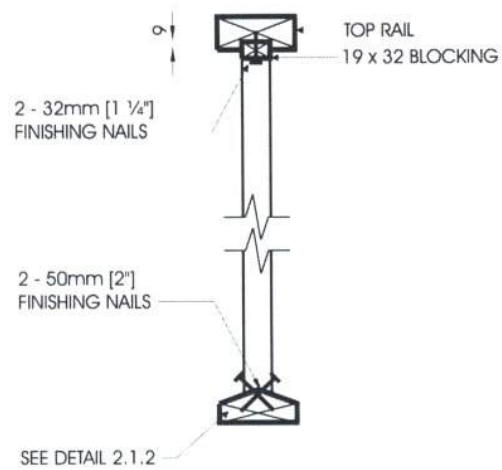
**PLAN
BOTTOM RAIL**



AXONOMETRIC



FRONT ELEVATION



SIDE ELEVATION

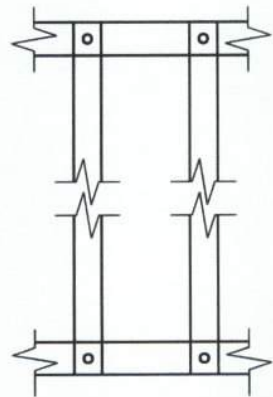
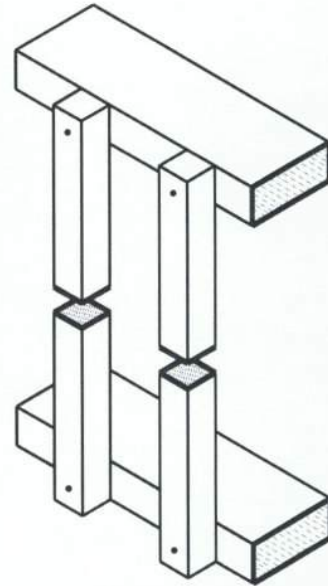
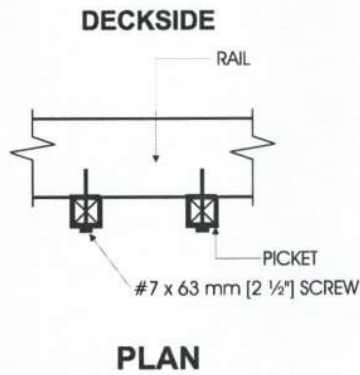
Detail EC-2

Exterior Connection: Infill Picket Nailed to Rail

Notes:

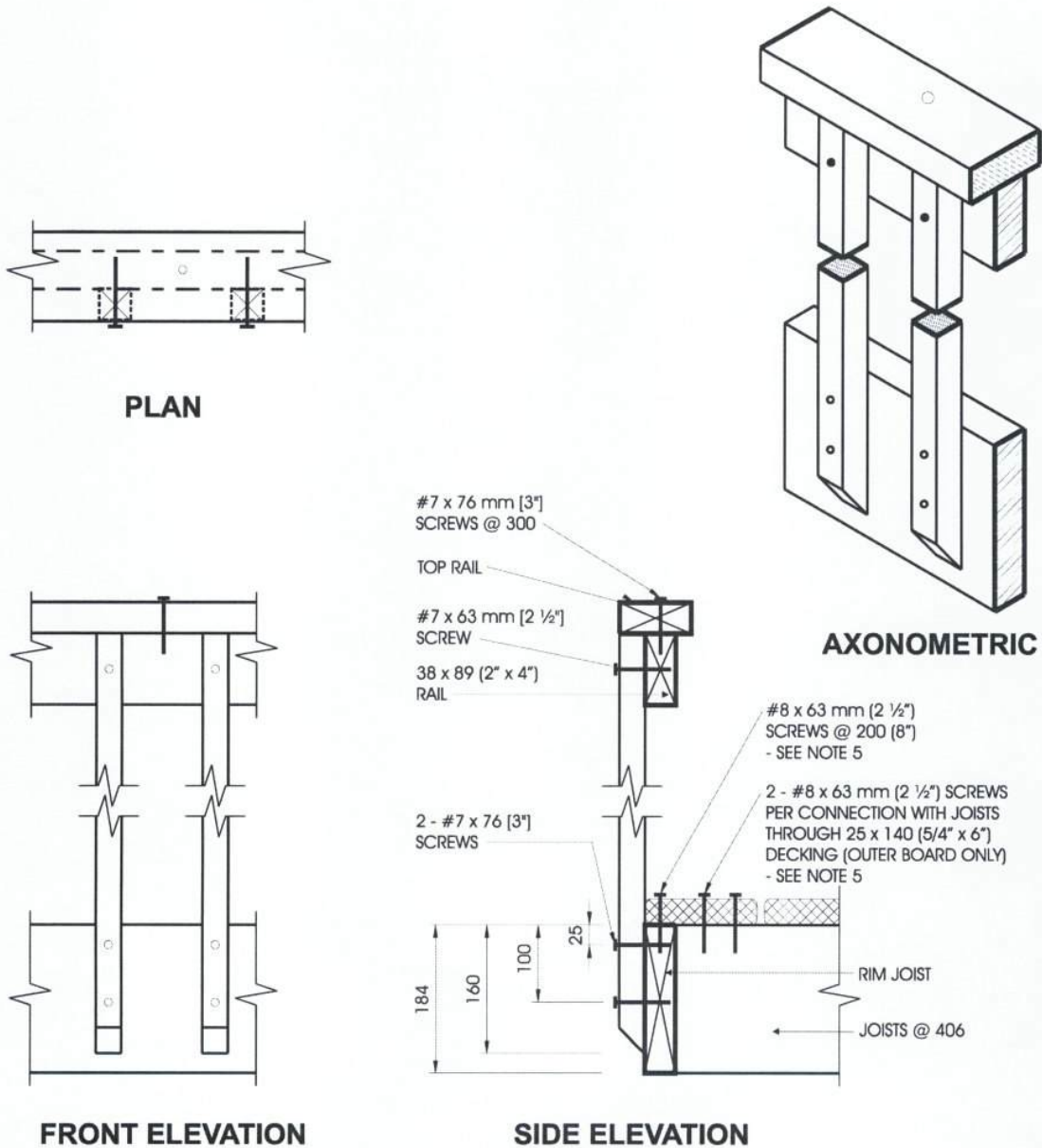
1. See Table 2.1.2. for minimum sizes of pickets.
2. Dimensions shown are in mm unless otherwise specified.

11. SB-7 GUARDS FOR HOUSING AND SMALL BUILDINGS



Detail EC-3
Exterior Connection: Infill Picket Screwed to Rail

11. SB-7 GUARDS FOR HOUSING AND SMALL BUILDINGS



Detail ED-1

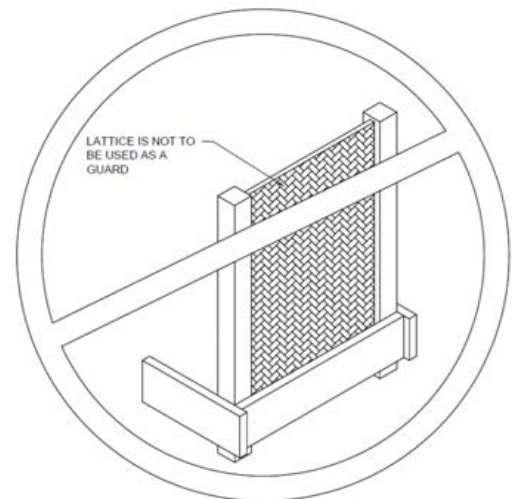
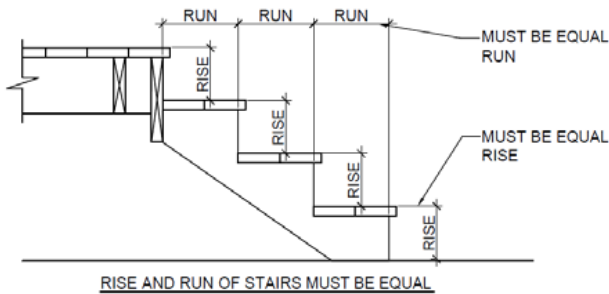
Exterior Connection: Cantilevered Picket Screwed to Rim Joist

Notes:

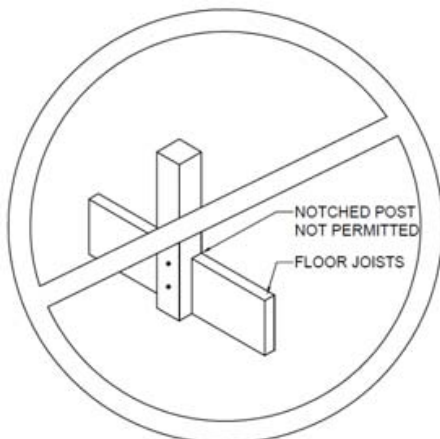
1. Provide a suitable post, return, or solid support at each end of the guard.
2. Wood for cantilevered pickets shall be Douglas Fir-Larch, Spruce-Pine-Fir, or Hem-Fir Species.
3. Fasten rim joist to each floor joist with 3 - 82 mm (3 1/4") nails.
4. Dimensions shown are in mm unless otherwise specified.
5. The outer deck board shall not be less than 140 mm (6" nominal) wide. Where 38 mm (2" nominal) thick boards are used, the length of the wood screws shall be not less than 76 mm (3").

12. KEEP IN MIND

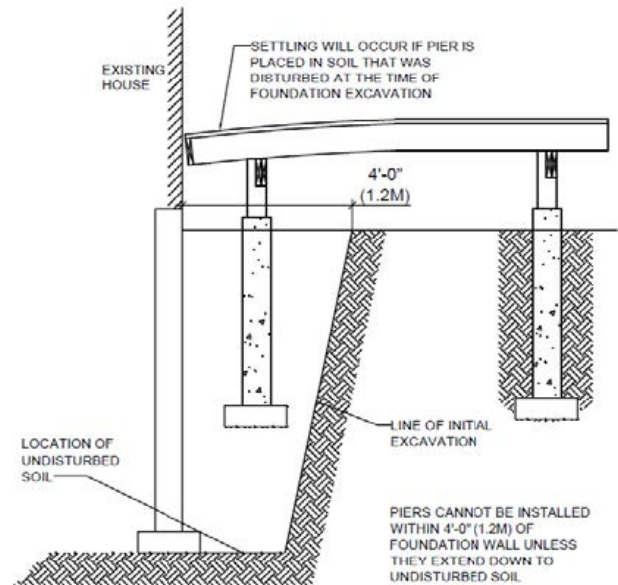
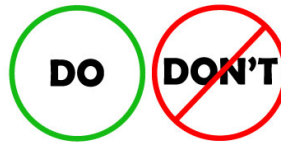
- Install guard posts minimum 1.5" below rim board/floor framing with appropriate support blocking
 - Review location and required depth of pier footings
 - Ensure rise and run of stairs to be uniform
 - Leave deck skirting off until final inspection
 - Install engineered guard rails as per submitted details
 - Include notation for the type of railing being used. If SB-7 is not being applied, an engineer's stamp is required.
-
- Do not notch posts
 - Do not install privacy guard rails without approved engineered drawings
 - Do not install joist hangers with deck screws or roofing nails
 - Do not notch any structural member, including beams, floor joists, post railings and guards
 - Refer to the following illustrations for additional deck details:



LATTICE RESTRICTIONS



NOTCHING OF POST IS NOT PERMITTED



LOCATION OF PIERS

