City of Peterborough

# A GUIDE TO USING SUPPLEMENTARY STANDARD SB-7

## Guards for Residential Decks

Supplementary Standard SB-7 of the Ontario Building Code illustrates acceptable designs for guards.

There are two acceptable designs for residential decks:

- ✓ **Post and Rail System (Table 2.2.1)**
- ✓ **Cantilevered Picket System (Table 2.2.2)**

If a professionally engineered guard is proposed, documentation with an engineers stamp may be required.

To construct the **Post and Rail System** according to SB-7, follow these steps:

1. Select a Top Rail/Bottom Rail connection (Details EA-1 to EA-5)
2. Select a Post to Floor system (Details EB-1 to EB-6)
3. Select a Picket connection (Details EC-1 to EC-4)

To construct the **Cantilever System** according to SB-7, follow these steps:

1. Select a connection detail (Details ED-1, ED-2 or ED-5 for SPF). ( Details ED-3 or ED-4 for Cedar)

# SB-7 Guards for Housing and Small Buildings

## Section 1 General

### 1.1. Introduction

#### 1.1.1. Scope

(See Appendix A.)

(1) This Supplementary Standard includes details for the construction of wood guards.

(2) Guards located on the exterior of a building, where they may be subject to deterioration, shall be constructed in accordance with Section 2 of this Supplementary Standard. (See Appendix A.)

(3) Guards located inside a building shall be constructed in conformance with Section 2 or Section 3 of this Supplementary Standard.

### 1.2. Design of Guards

#### 1.2.1. Cantilever Action

(1) The construction details for guards in this Supplementary Standard are based on the assumption that the guard acts as a cantilever in resisting lateral loads. (See Appendix A.)

#### 1.2.2. Classification

(1) The structural systems of guards described in this Supplementary Standard are grouped into the following classifications:
(a) Post and Rail Systems, and
(b) Cantilevered Picket Systems.
(See Appendix A.)

## Section 2 Exterior Guards

### 2.1. Materials

#### 2.1.1. Lumber Grades

(1) The minimum grade of softwood dimension lumber for posts, rails and joists shall be Northern Species, No. 2.

(2) The minimum grade of softwood dimension lumber for pickets shall be Northern Species, No. 2 Picket grade.

(3) Wood for pickets shall be free of loose knots.
(See Appendix A.)

## 2.1.2. Lumber Dimensions

**(1)** Except as permitted in Sentence (2), the minimum sizes of loadbearing elements of wood guards shall conform to Table 2.1.2.

**Table 2.1.2.**
**Minimum Size of Loadbearing Elements**

| Guard Element | Minimum Size, mm (in) |
|---|---|
| Post | 89 x 89<br>(4" x 4" nominal) |
| Top Rail | 38 x 89<br>(2" x 4" nominal) |
| Bottom Rail | 38 x 89<br>(2" x 4" nominal) |
| Picket / Baluster | 32 x 32<br>($1^{9}/_{32}$" x $1^{9}/_{32}$") |
| Column 1 | 2 |

**(2)** Where a bottom rail is bevelled, the minimum sizes shown in Table 2.1.2. may be reduced to allow for a bevel, as detailed in Figure 2.1.2.

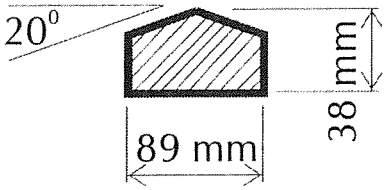



**Figure 2.1.2.**
**Bevel Detail**

## 2.1.3. Floor Construction

**(1)** The minimum dimensions of wood floor joists and wood decking shall conform to Table 2.1.3.

**(2)** Except as provided in Details EA-1 to ED-5, wood decking shall be fastened to each floor joist with nailing conforming to Table 2.1.3.

(See Appendix A.)

Table 2.1.3.
Minimum Size of Floor Elements

| Floor Element | Minimum size, mm (in) |
|---|---|
| Dimension Lumber Decking | 25 x 140 ($^5/_4$" x 6" nominal), when each is plank fastened with 2 - 63 mm (2½") nails |
| | 38 x 89 (2" x 4" nominal), when each plank is fastened with 2 - 76 mm (3") nails |
| Dimension Lumber Joists | 38 x 184 (2" x 8" nominal) |
| Column 1 | 2 |

### 2.1.4. Connectors

**(1)** Nails, screws, lag bolts and machine bolts shall not cause splitting of wood elements.

**(2)** Fasteners shall be resistant to corrosion.

**(3)** All nails shall be common spiral.

(See Appendix A.)
(See also A-2.1.4. in Appendix A. for glued joints.)

### 2.1.5. Decay-Resistant Lumber

**(1)** Lumber for guard systems and floor systems shall be
(a) a species resistant to decay,
(b) preservative treated to prevent decay, or
(c) pressure-treated.
(See Appendix A.)

**(2)** All cut ends of preservative treated lumber shall be treated to prevent decay.

## 2.2. Structural Details

### 2.2.1. Post and Rail System

**(1)** An exterior guard constructed as a Post and Rail System shall conform to the applicable connection details listed in Table 2.2.1.

### 2.2.2. Cantilevered Picket System

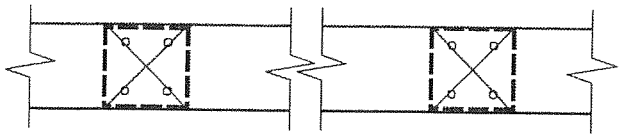
**(1)** An exterior guard constructed as a Cantilevered Picket System shall conform to the applicable connection details listed in Table 2.2.2.

**Table 2.2.1.**
**Exterior Post and Rail System Connection Details**

| Connection Detail | Detail Number | Description |
|---|---|---|
| Top Rail to Post and/or Bottom Rail to Post | EA-1 | Top rail nailed to post |
| | EA-2 | Top/bottom rail skew nailed to post with 76 mm (3") nails |
| | EA-3 | Top/bottom rail skew nailed to post with 63 mm (2½") nails |
| | EA-4 | Top/bottom rail face nailed or screwed to post |
| | EA-5 | Top/bottom rail fastened to post with framing anchors |
| Post to Floor | EB-1 | Post nailed to rim joist |
| | EB-2 | Post screwed to rim joist |
| | EB-3 | Post bolted to floor joist with 8 mm (5/16") machine bolts |
| | EB-4 | Post bolted to floor joist with 9.5 mm (3/8") machine bolts |
| | EB-5 | Post bolted to 2 floor joists |
| | EB-6 | Post fastened to floor, where guard is parallel to floor joists |
| Infill Picket | EC-1 | Picket nailed to endcap; endcap screwed to rail |
| | EC-2 | Picket nailed to rail |
| | EC-3 | Picket screwed to rail |
| | EC-4 | Picket screwed to top rail and rim joist |
| Column 1 | 2 | 3 |

**Table 2.2.2.**
**Exterior Cantilevered Picket System Connection Details**

| Connection Detail | Detail Number | Description |
|---|---|---|
| Cantilevered Picket (Douglas Fir-Larch, Spruce-Pine-Fir, Hem-Fir Species) | ED-1 | Picket screwed to rim joist |
| | ED-2 | Picket screwed to rim joist, where guard is parallel to floor joists |
| Cantilevered Picket (Northern Species) | ED-3 | Picket screwed to rim joist and deck |
| | ED-4 | Picket screwed to rim joist and deck, where guard is parallel to floor joists |
| Cantilevered Picket (Douglas Fir-Larch, Spruce-Pine-Fir, Hem-Fir Species, Northern Species) | ED-5 | Corner |
| Column 1 | 2 | 3 |



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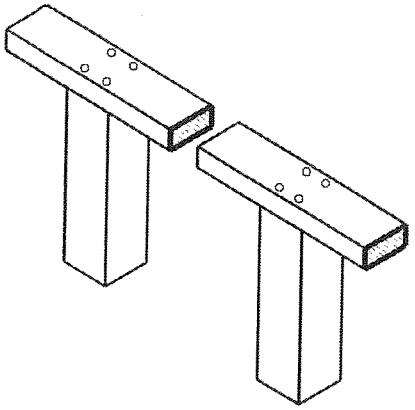

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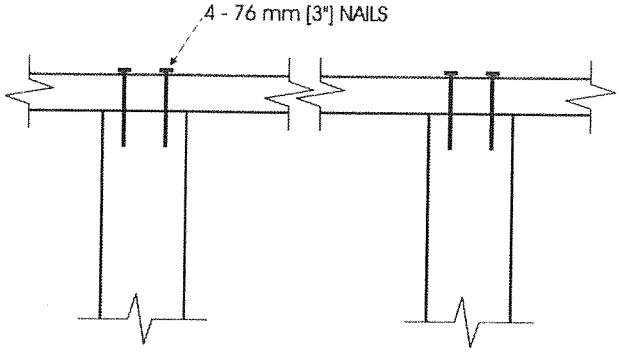


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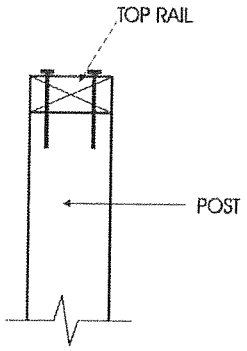



SIDE ELEVATION

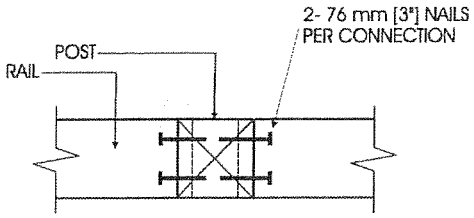
## Detail EA-1

### Exterior Connection: Top Rail Nailed to Post

**Notes:**

1. The top rail must be continuous. Use Detail EA-5 at the end spans, where continuity ends.

| MAXIMUM SPAN OF RAIL BETWEEN POSTS | |
|---|---|
| Species | Maximum Span, m (ft-in) |
| Douglas Fir-Larch, Hem-Fir, Spruce-Pine-Fir | 1.52 (5'-0") |
| Northern Species | 1.52 (5'-0") |
| Column 1 | 2 |

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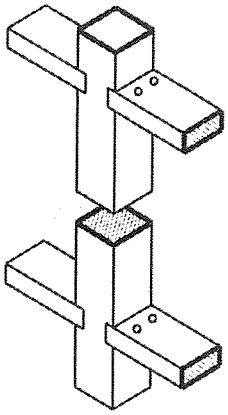

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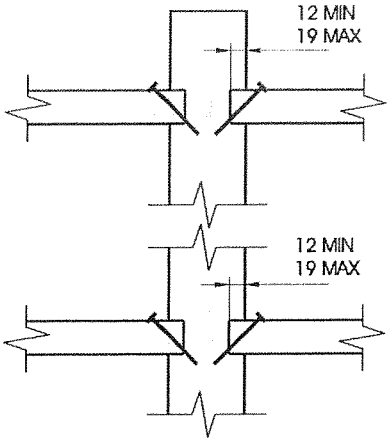


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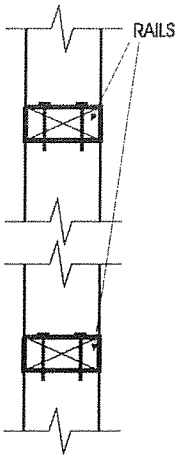



SIDE ELEVATION

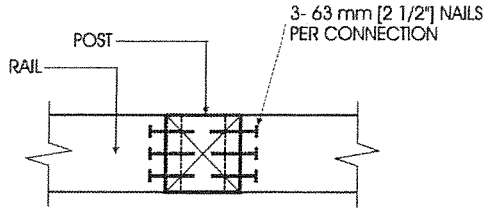
## Detail EA-2

### Exterior Connection: Top/Bottom Rail Skew Nailed to Post - 76 mm (3") Nails

**Notes:**

1. The maximum span is more often governed by post spacing.
2. Provide support to bottom rail at intervals not more than 2.0 m (6'-7").
3. The bottom rail may be bevelled as detailed in Figure 2.1.2.
4. 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 | 2.72 (8'-11") |
| Northern Species | 2.18 (7'-2") |
| Column 1 | 2 |

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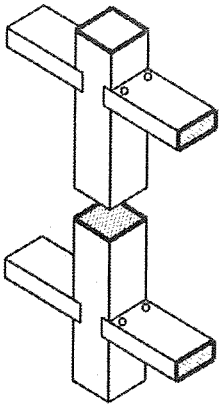

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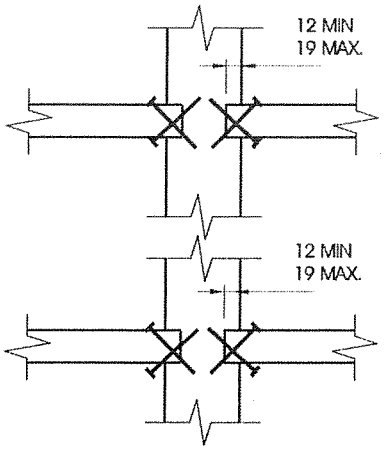
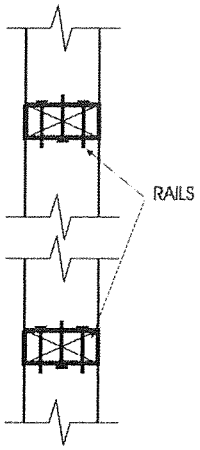



FRONT ELEVATION




SIDE ELEVATION

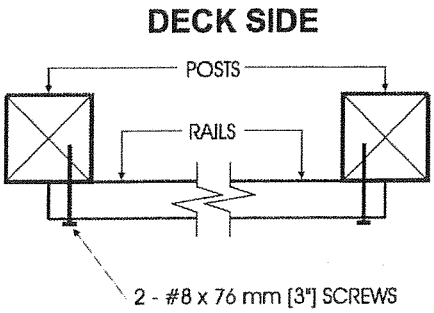
## Detail EA-3

### Exterior Connection: Top/Bottom Rail Skew Nailed to Post - 63 mm (2½") Nails

**Notes:**

1. Provide support to bottom rail at intervals not more than 2.0 m (6'-7").
2. The bottom rail may be bevelled as detailed in Figure 2.1.2.
3. 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 | 2.72 (8'-11") |
| Northern Species | 2.18 (7'-2") |
| Column 1 | 2 |

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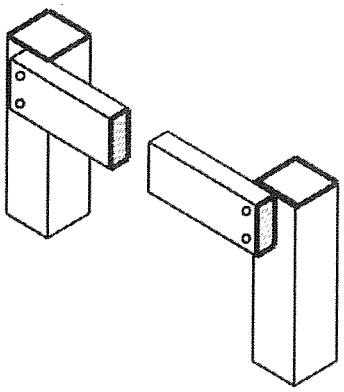

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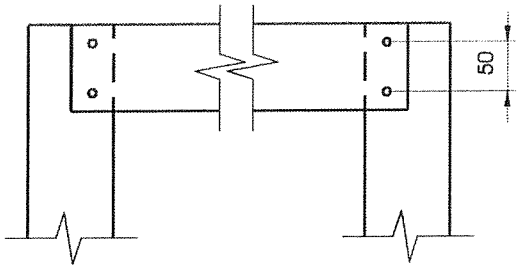


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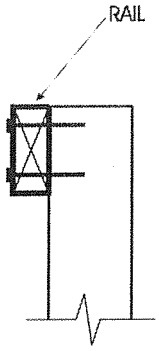



SIDE ELEVATION

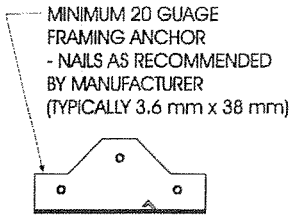
## Detail EA-4

### Exterior Connection: Top/Bottom Rail Face Nailed or Screwed to Post

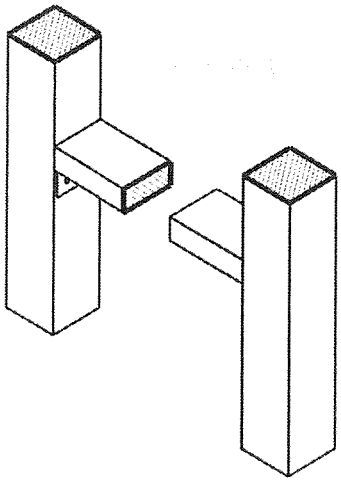
**Notes:**

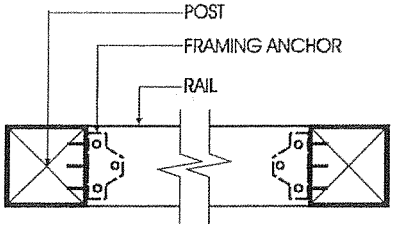
1. If the rails are located on the deck side of the posts, 76 mm (3") nails may be used in place of the screws.
2. Where the top rail is continuous, the top rail may be fastened to each post with 3 - #8 x 76 mm (3") screws.
3. Dimensions shown are in mm unless otherwise specified.

| MAXIMUM SPAN OF RAIL BETWEEN POSTS | |
|---|---|
| Species | Maximum Span, m (ft-in) |
| Douglas Fir-Larch, Hem-Fir, Spruce-Pine-Fir | 1.77 (5'-10") |
| Northern Species | 1.41 (4'-8") |
| Column 1 | 2 |




CORROSION RESISTANT
FRAMING ANCHOR



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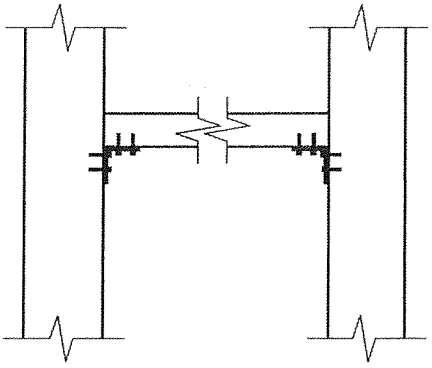
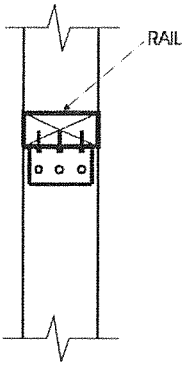


**FRONT ELEVATION**




**SIDE ELEVATION**

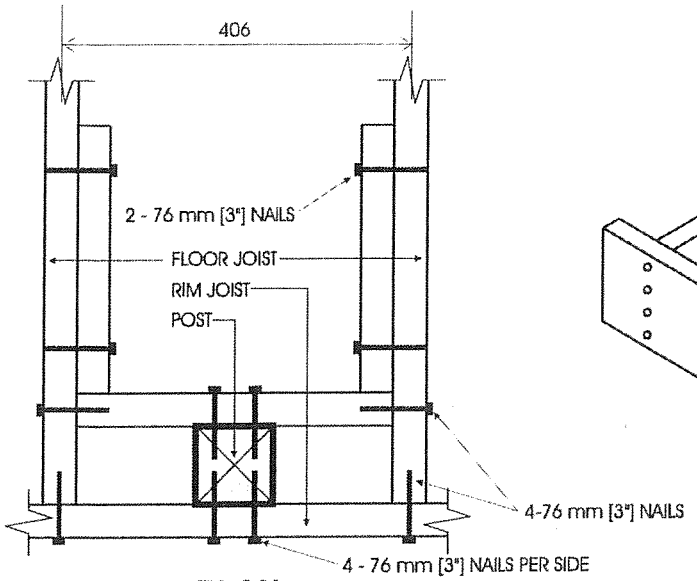
# Detail EA-5

## Exterior Connection: Top/Bottom Rail Fastened to Post with Framing Anchors

**Notes:**

1. Provide support to bottom rail at intervals not more than 2.0 m (6'-7").
2. The bottom rail may be bevelled as detailed in Figure 2.1.2.
3. 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 | 2.72 (8'-11") |
| Northern Species | 2.18 (7'-2") |
| Column 1 | 2 |

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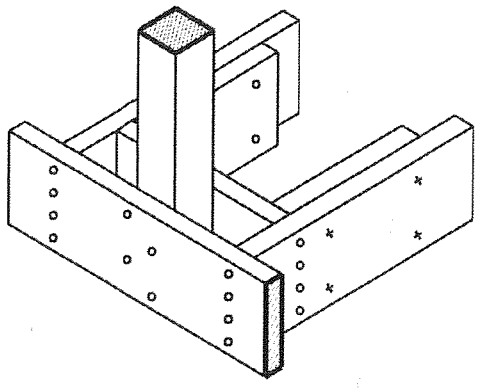

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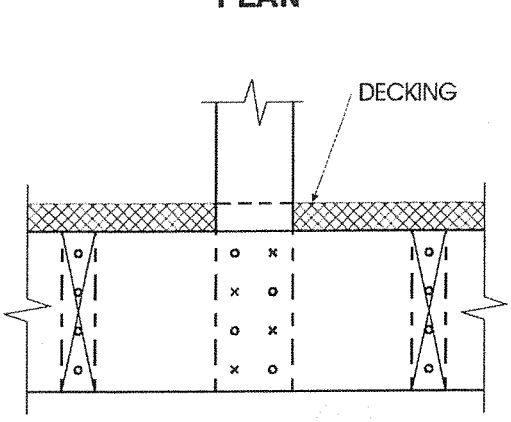


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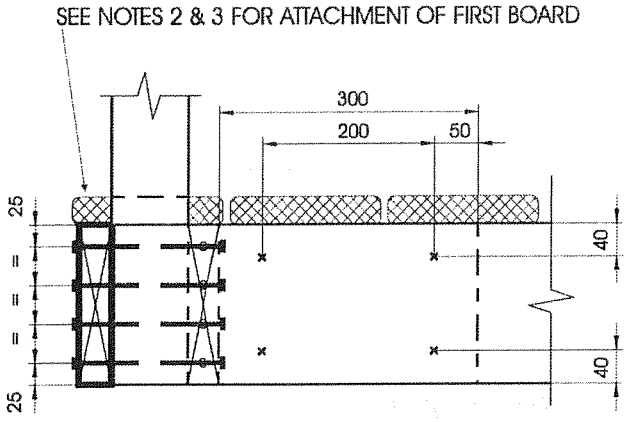



SIDE ELEVATION

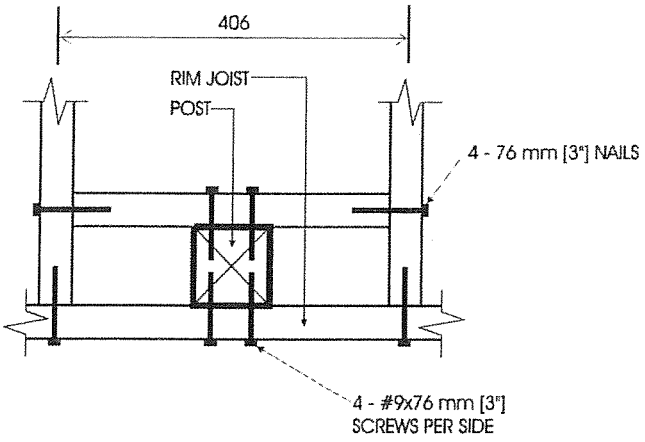
## Detail EB-1

### Exterior Connection: Post Nailed 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 (2½") 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 (2½") nail at each joist.
4. The post may be positioned anywhere between the joists.
5. Dimensions shown are in mm unless otherwise specified.

| MAXIMUM SPACING BETWEEN POSTS | |
|---|---|
| Species | Maximum Spacing, m (ft-in) |
| Douglas Fir-Larch, Hem-Fir, Spruce-Pine-Fir | 1.22 (4'-0") |
| Northern Species | 1.20 (3'-11") |
| Column 1 | 2 |

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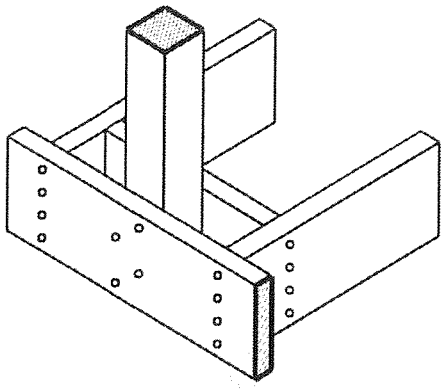

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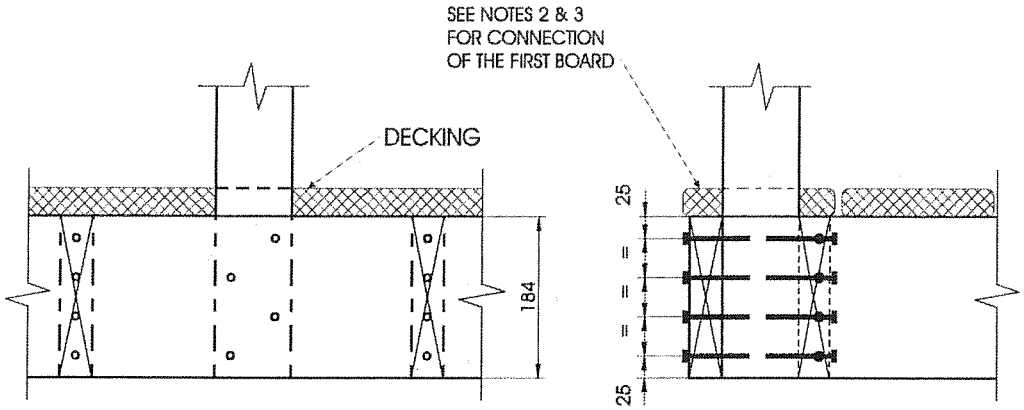



FRONT ELEVATION

SIDE ELEVATION

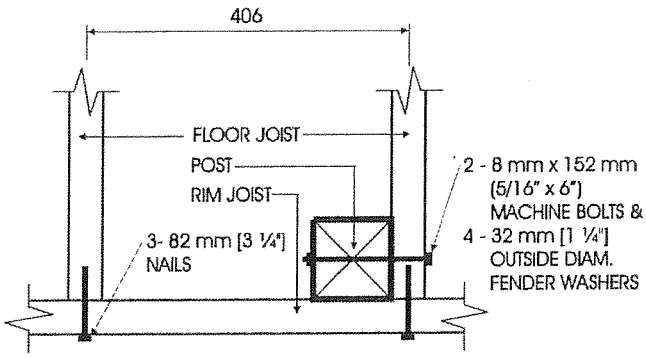
## Detail EB-2

### 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 (2½") 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 (2½") 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 SPACING BETWEEN POSTS | |
|---|---|
| Species | Maximum Spacing, m (ft-in) |
| Douglas Fir-Larch, Hem-Fir, Spruce-Pine-Fir | 1.56 (5'-1") |
| Northern Species | 1.20 (3'-11") |
| Column 1 | 2 |

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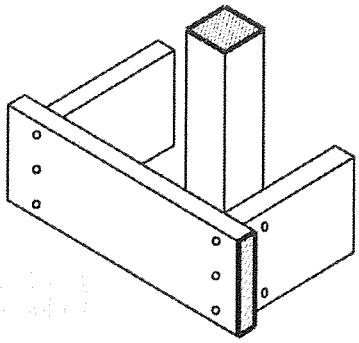

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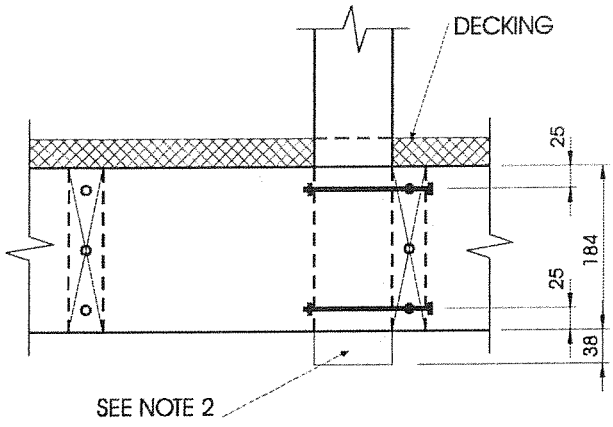
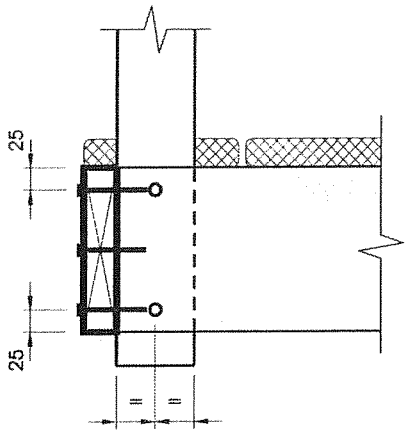



FRONT ELEVATION




SIDE ELEVATION

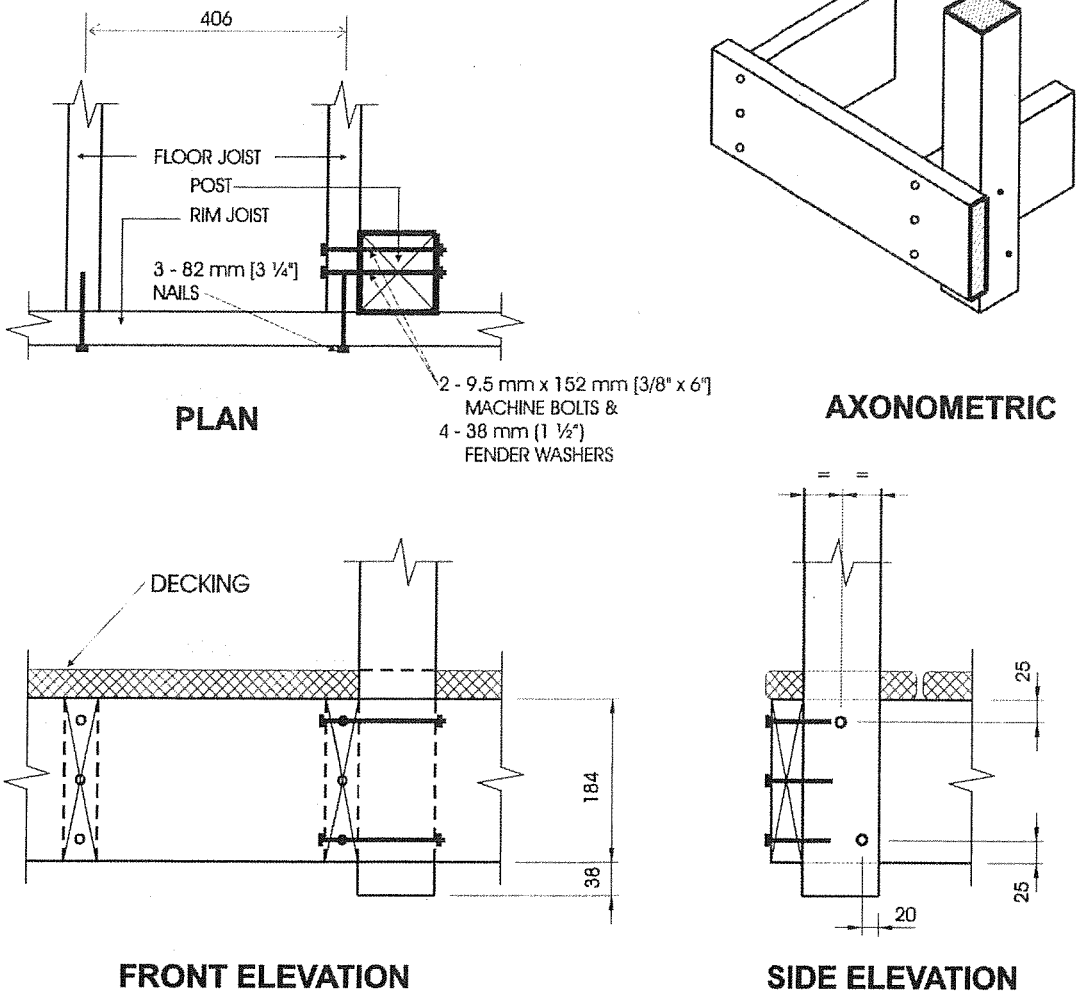
## Detail EB-3

### 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 (1½") 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 (1½") 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 Spacing, m (ft-in) |
| Douglas Fir-Larch, Hem-Fir, Spruce-Pine-Fir | 1.29 (4'-3") |
| Northern Species | 1.20 (3'-11") |
| Column 1 | 2 |



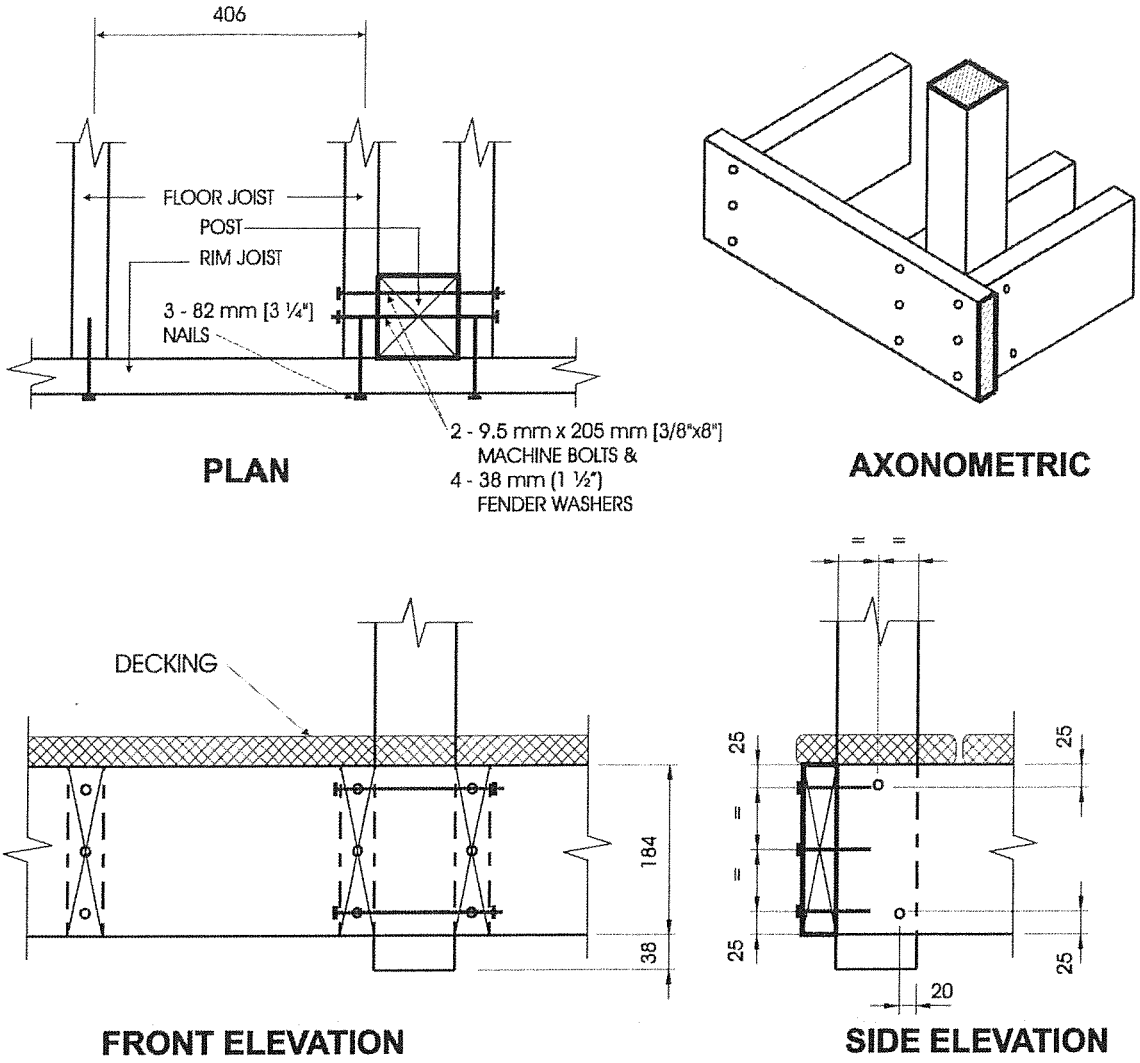

# Detail EB-4

## Exterior Connection: Post Bolted to Floor Joist - 9.5 mm (3/8") Bolts

**Notes:**

1. Decking is omitted from the plan view and the axonometric view for clarity.
2. 38 mm (1½") 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 (1½") 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 Spacing, m (ft-in) |
| Douglas Fir-Larch, Hem-Fir, Spruce-Pine-Fir | 1.49 (4'-11") |
| Northern Species | 1.20 (3'-11") |
| Column 1 | 2 |



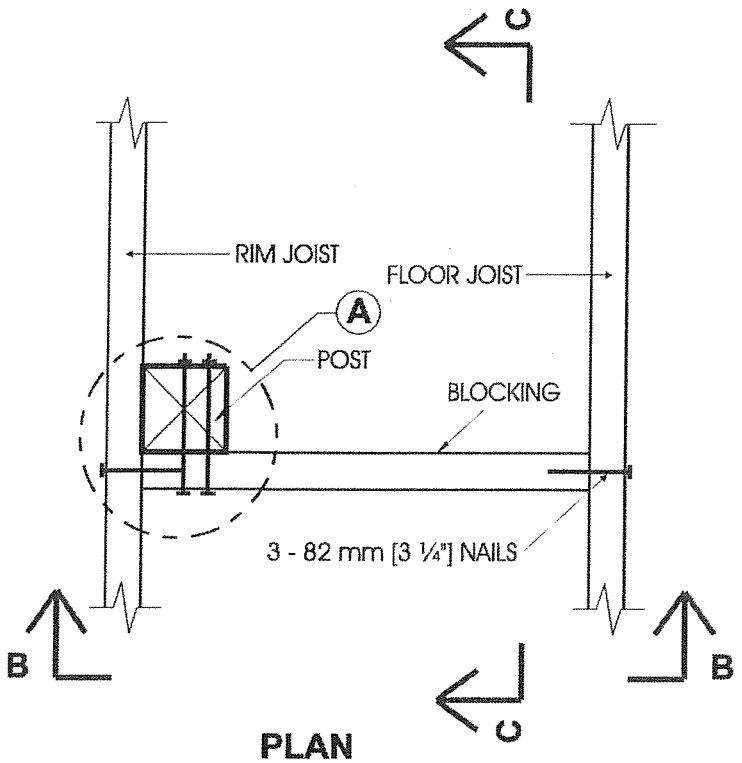

# Detail EB-5

## Exterior Connection: Post Bolted to 2 Floor Joists

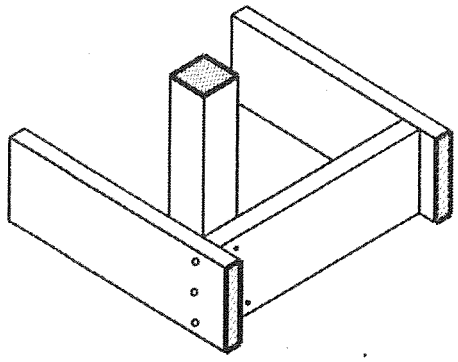
**Notes:**

1. Decking is omitted from the plan view and the axonometric view for clarity.
2. 38 mm (1½") 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 (1½") and shall be fastened to the floor with 2 - 76 mm (3") nails.
5. Dimensions shown are in mm unless otherwise specified.

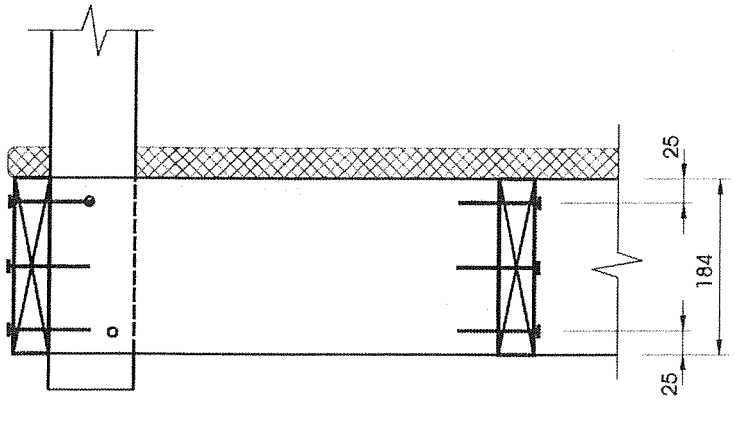
| MAXIMUM SPACING BETWEEN POSTS | |
|---|---|
| Species | Maximum Spacing, m (ft-in) |
| Douglas Fir-Larch, Hem-Fir, Spruce-Pine-Fir | 2.14 (7'-0") |
| Northern Species | 1.20 (3'-11") |
| Column 1 | 2 |



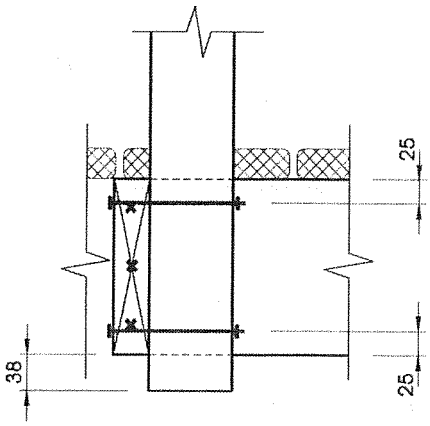

PLAN



AXONOMETRIC




ELEVATION B-B




ELEVATION C-C

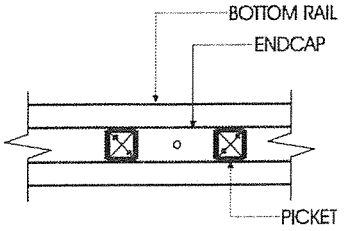
## Detail EB-6

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

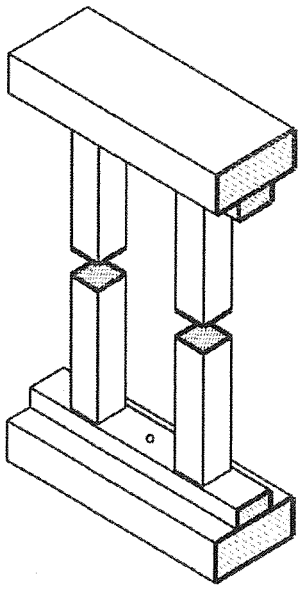
**Notes:**

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).

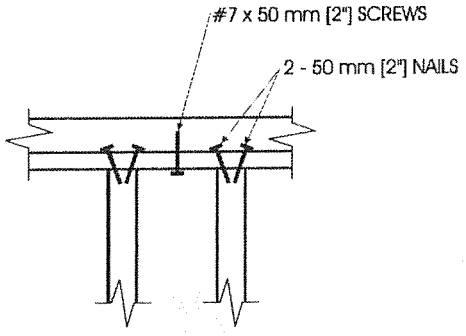
5. Dimensions shown are in mm unless otherwise specified.



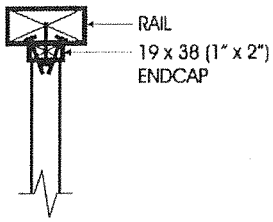

PLAN
BOTTOM RAIL



AXONOMETRIC




FRONT ELEVATION



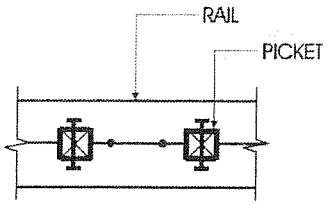

SIDE ELEVATION

## Detail EC-1

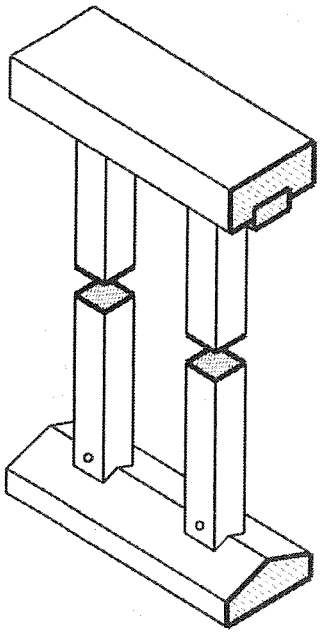
### Exterior Connection: Infill Picket Nailed to Endcap - Endcap Screwed to Rail

**Notes:**

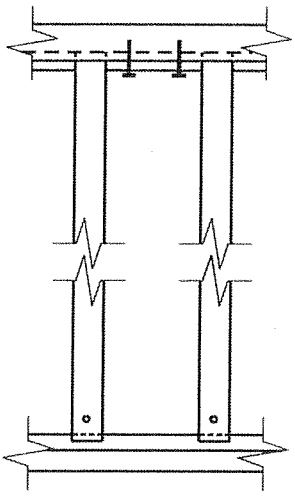
1. Fasten each end of each picket to endcaps with 2 - 50 mm (2") nails.
2. Fasten endcaps to rails with #7 x 50 mm (2") screws at 300 mm (12") o.c.
3. See Table 2.1.2. for minimum sizes of pickets.



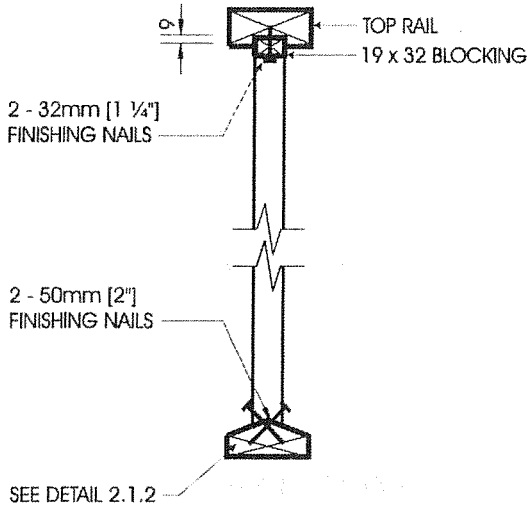

PLAN
BOTTOM RAIL



AXONOMETRIC



FRONT ELEVATION



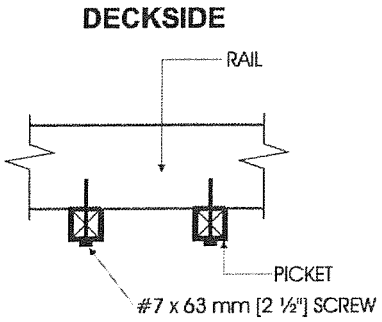

SIDE ELEVATION

## Detail EC-2

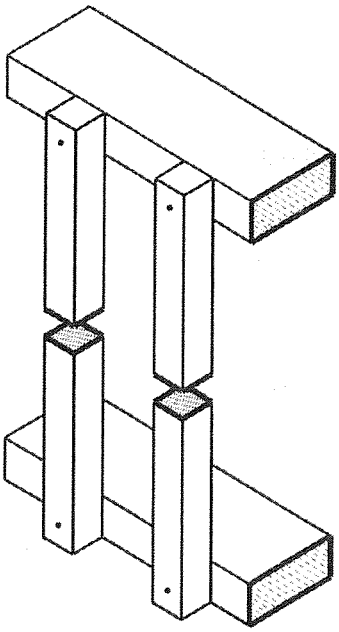
### Exterior Connection: Infill Picket Nailed to Rail

**Notes:**

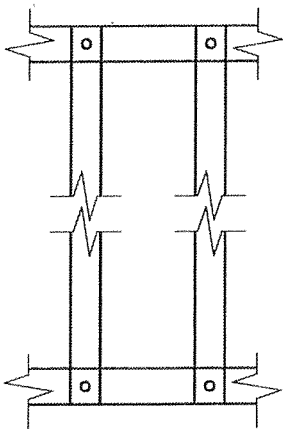
1. See Table 2.1.2. for minimum sizes of pickets.
2. Dimensions shown are in mm unless otherwise specified.




PLAN



AXONOMETRIC

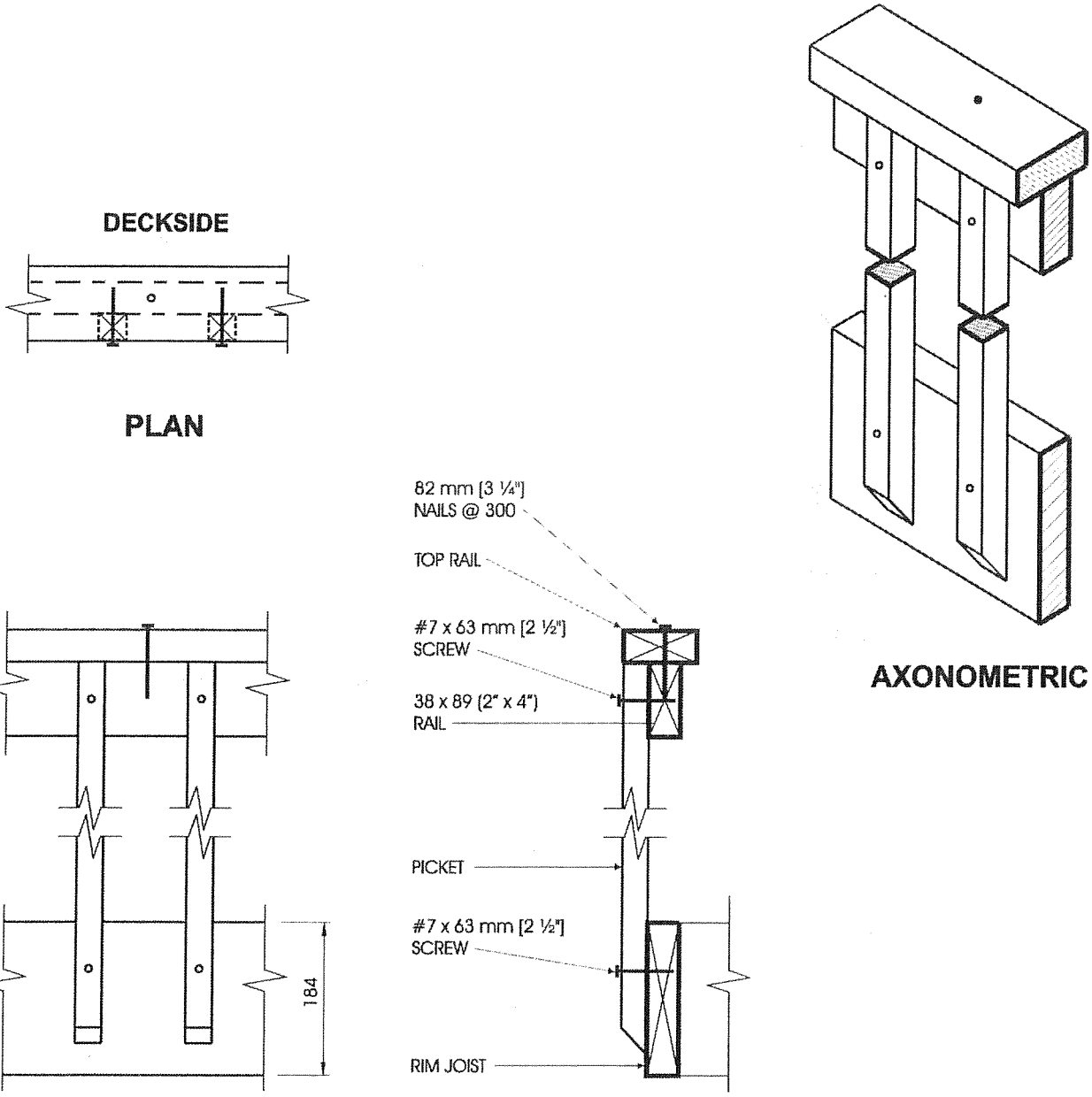


FRONT ELEVATION

SIDE ELEVATION

## Detail EC-3

**Exterior Connection: Infill Picket Screwed to Rail**

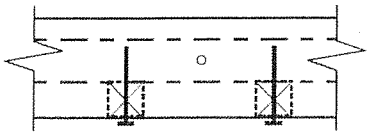



## Detail EC-4

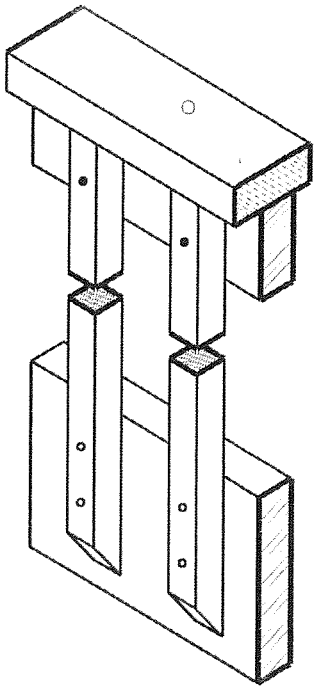
**Exterior Connection: Infill Picket Screwed to Top Rail and Rim Joist**

Note:

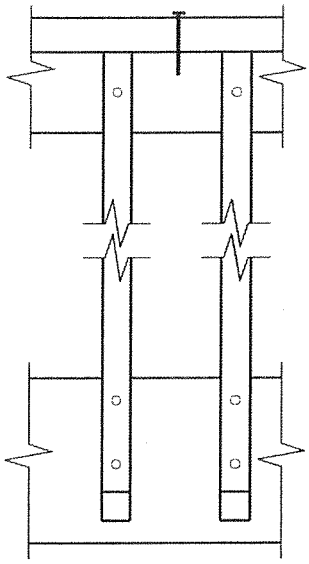
1. Dimensions shown are in mm unless otherwise specified.



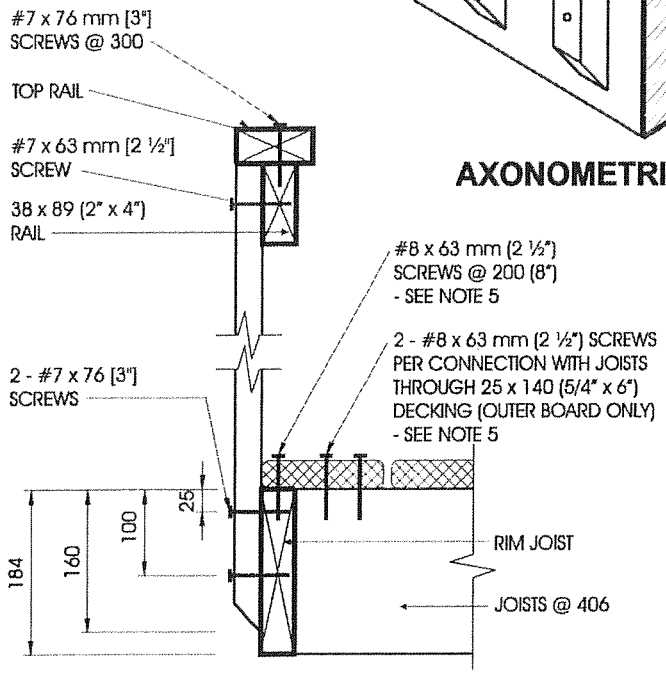
PLAN



AXONOMETRIC



FRONT ELEVATION



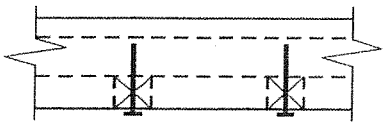

SIDE ELEVATION

## Detail ED-1

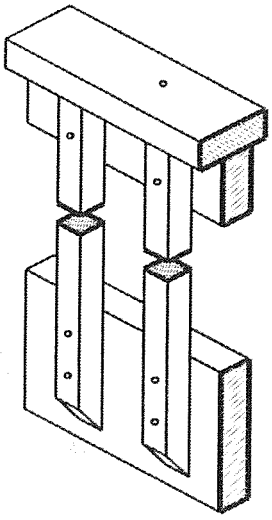
### Exterior Connection: Cantilevered Picket Screwed to Rim Joist

**Notes:**

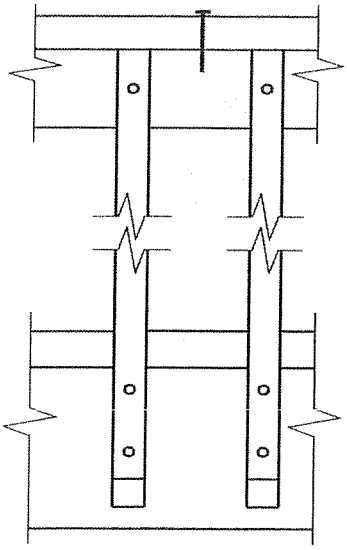
1. Provide a suitable post, return, or solid support at each end of the guard.
2. Wood for cantilevered pickets shall be Douglas Fir-Larch, Spruce-Pine-Fir, or Hem-Fir Species.
3. Fasten rim joist to each floor joist with 3 - 82 mm (3¼") nails.
4. Dimensions shown are in mm unless otherwise specified.
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").



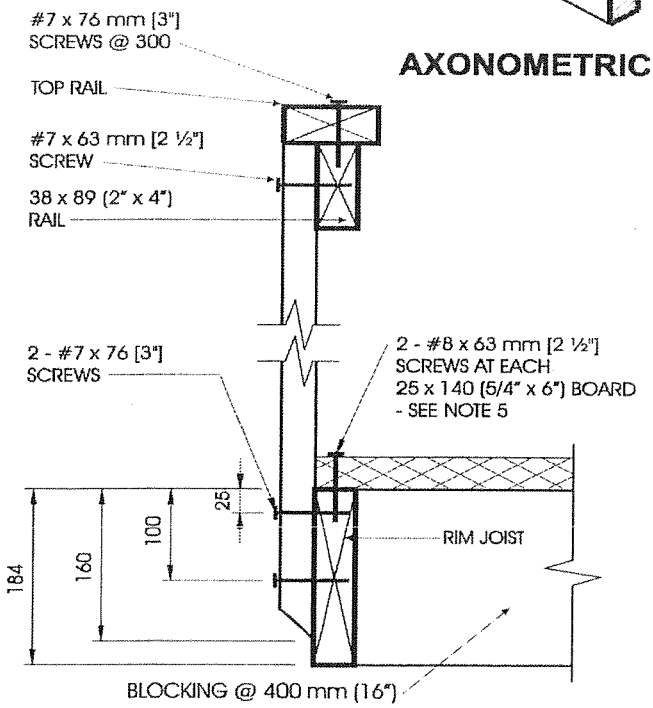
PLAN



AXONOMETRIC



FRONT ELEVATION



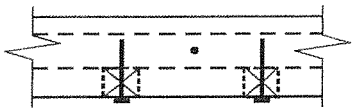

SIDE ELEVATION

## Detail ED-2

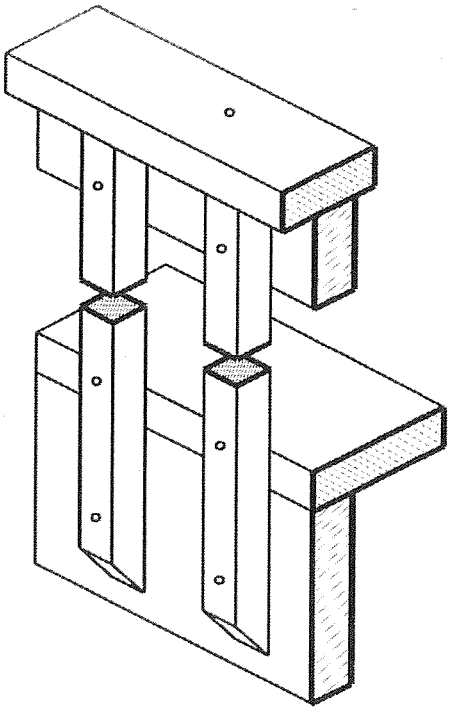
### Exterior Connection: Cantilevered Picket Screwed to Rim Joist, Guard Parallel to Floor Joists

**Notes:**

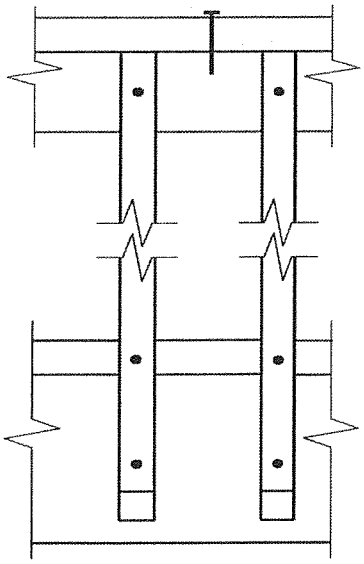
1. Provide a suitable post, return, or solid support at each end of the guard.
2. Wood for cantilevered pickets shall be Douglas Fir-Larch, Spruce-Pine-Fir, or Hem-Fir Species.
3. Fasten rim joist to blocking with 3 - 82 mm (3¼") nails.
4. Dimensions shown are in mm unless otherwise specified.
5. Where 38 mm (2" nominal) thick boards are used, the length of the wood screws shall be not less than 76 mm (3").



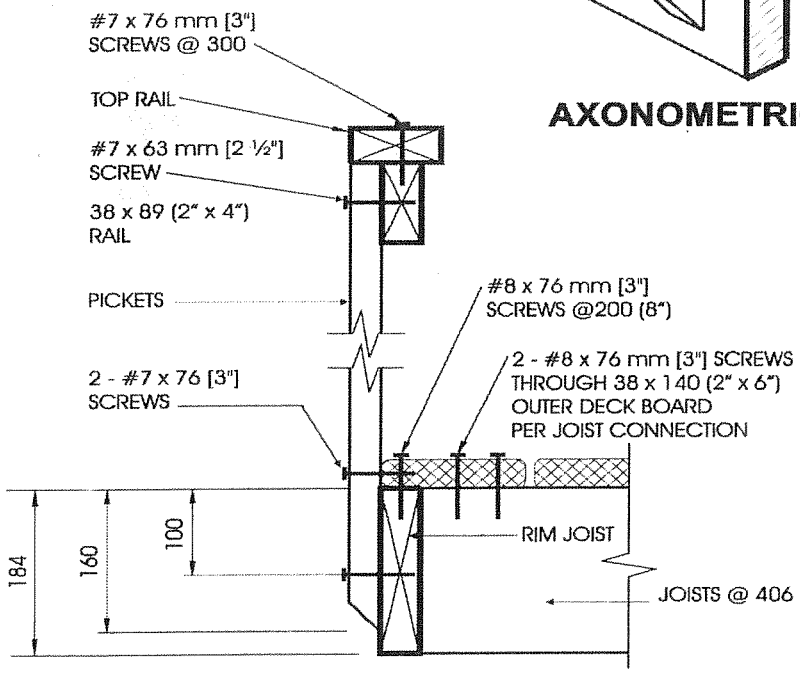
PLAN



AXONOMETRIC



FRONT ELEVATION



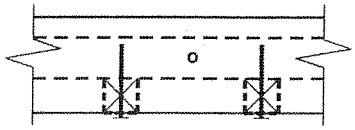

SIDE ELEVATION

## Detail ED-3

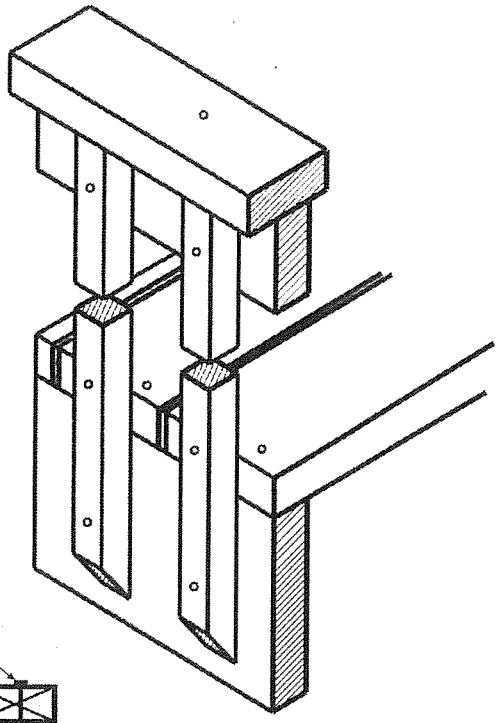
**Exterior Connection: Cantilevered Picket Screwed to Rim Joist and Deck**

Notes:

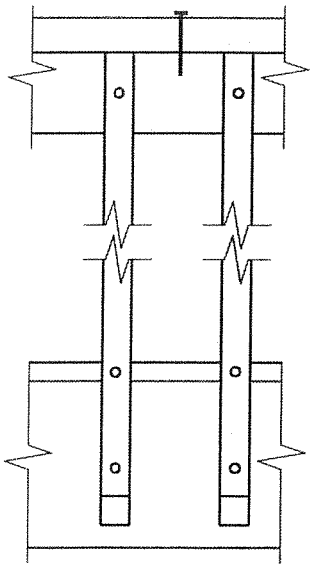
1. Provide a suitable post, return, or solid support at each end of the guard.
2. Wood for cantilevered pickets shall be Northern Species.
3. Fasten rim joist to each floor joist with 3 - 82 mm (3¼") nails.
4. Dimensions shown are in mm unless otherwise specified.



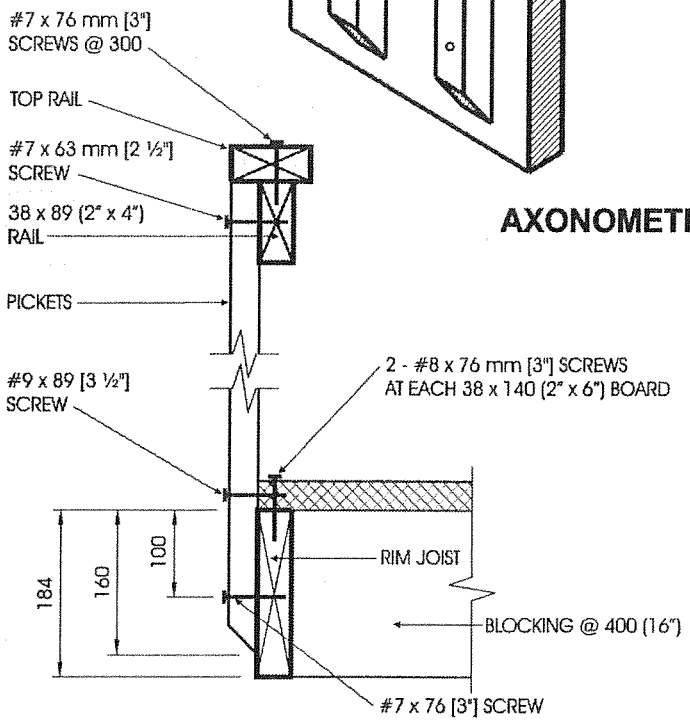
PLAN



AXONOMETRIC



FRONT ELEVATION



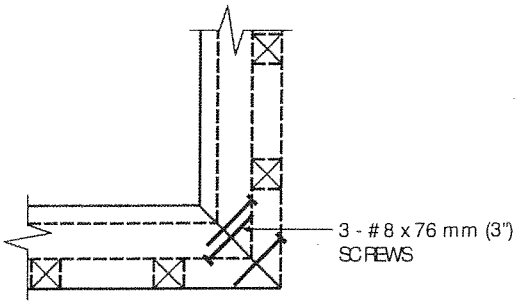

SIDE ELEVATION

## Detail ED-4

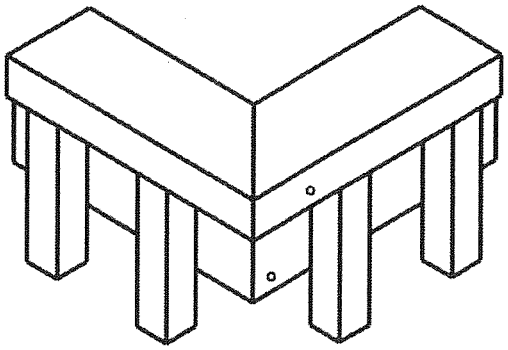
**Exterior Connection: Cantilevered Picket Screwed to Rim Joist and Deck, Guard Parallel to Floor Joists**

**Notes:**

1. Provide a suitable post, return, or solid support at each end of the guard.
2. Wood for cantilevered pickets shall be Northern Species.
3. Fasten rim joist to blocking with 3 - 82 mm (3¼") nails.
4. Dimensions shown are in mm unless otherwise specified.

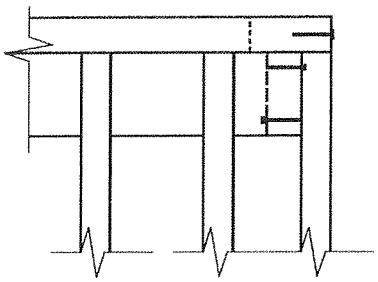



PLAN TOP RAIL

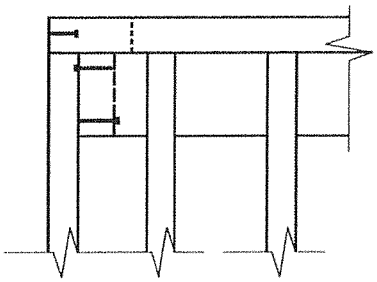


AXONOMETRIC

ONE FASTENER IN HORIZONTALLY ORIENTATED PORTION OF TOP RAIL
AND TWO IN VERTICALLY ORIENTATED PORTION.



FRONT TOP RAIL



SIDE TOP RAIL

## Detail ED-5

### Exterior Connection: Corner Joint

**Notes:**

1. Screws fastening pickets are omitted for clarity.
2. Provide a minimum of 10 pickets beyond the return if end restraint of the guard is provided by this return detail only.

# Appendix A

## Explanatory Material for SB-7

**Appendix A to this Supplementary Standard is included for explanatory purposes only and does not form part of the requirements. The bold-faced reference numbers that introduce each item apply to the requirements in this Supplementary Standard.**

**A-1.1.1. Scope.** A guard constructed in conformance with this Supplementary Standard is deemed to satisfy the requirements of Sentence 9.8.8.8.(2) of Division B.

Guard design in Supplementary Standard is based on a height of 1 070 mm and a maximum clear spacing of 100 mm between pickets or balusters.

**A-1.1.1.(2)** Guards located on the exterior of a building are subject to deterioration as a result of hygrothermal, electrochemical or biochemical action.

**A-1.2.1. Cantilever Action.** Where guards incorporate wood posts that are continuous from the top of the guard to the ground, or where the tops of the posts are attached to a superstructure that is connected to the building, the cantilever assumption in the Supplementary Standards is no longer valid. An example of a continuous post is shown in Figure A-1.2.1.

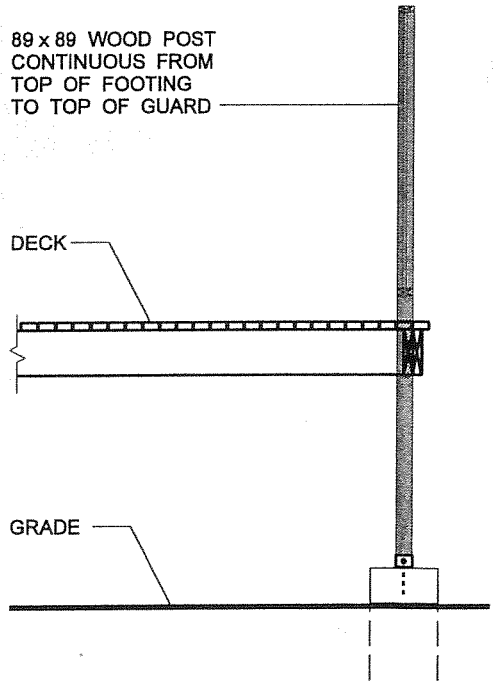



**Figure A-1.2.1.**
**Typical Continuous Post**

**A-1.2.2. Classification.** A Post and Rail System consists of a top rail that transfers horizontal loads to posts. The posts transfer the loads from the rail to the floor system. This system may incorporate a bottom rail that is anchored at each end to the posts. Infill panels or infill pickets are installed between the top rail and the floor or bottom rail. Examples of Post and Rail Systems are shown in Figure A-1.2.2.A.

The term "infill pickets" refers to an assembly of vertically oriented elements that span between the floor or bottom rail and the top rail. For the purpose of this Supplementary Standard, the words "picket" and "baluster" both relate to these individual elements.

The spacing of the posts in a Post and Rail System is detailed in this Supplementary Standard and is dictated by the ability of the posts to accept the design loads. The maximum spanning capacity of the rails is often not realised because it is dictated by the post spacing.

A Cantilevered Picket System consists of a top rail that transfers horizontal loads to pickets. The pickets transfer the loads from the top rail to the floor system. An example of a Cantilevered Picket System is shown in Figure A-1.2.2.B.

A guard classified as a Post and Rail System or a Cantilevered Picket System need not always terminate at a post if:
(a) the top rail is connected adequately to an element capable of accepting the forces applied to it, or
(b) the guard changes direction and the rails are adequately fastened at the return.

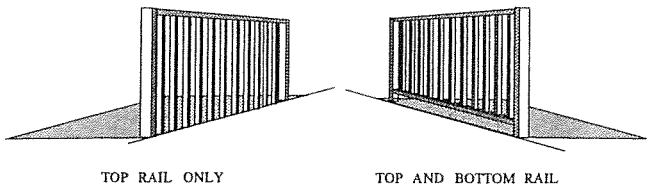



**Figure A-1.2.2.A**
**Typical Post and Rail Systems**

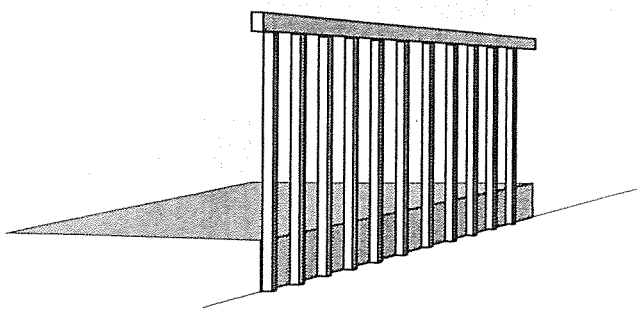


**Figure A-1.2.2.B**
**Cantilevered Picket System**

**A-2.1.1. Lumber Grades.** Whereas Northern Species is specified as the minimum lumber grade, Spruce-Pine-Fir, Douglas Fir-Larch and Hem-Fir may also be used since their structural properties exceed those of Northern Species. Cedar falls within the classification of Northern Species Group.

**A-2.1.3. Floor Construction.** The lateral loads acting on a guard are transferred from either the posts or the pickets to the floor system. Therefore, the floor system must be sufficiently strong to transfer these loads.

**A-2.1.4. Connectors.** Pre-drilling of wood elements may be required in order to avoid splitting of structural wood elements. Where a glued joint is required, an adhesive conforming to CSA Standard O112.4-M1977 (Polyvinyl Adhesives for Wood) and CSA Standard O112.8-M1977 (Polyvinyl Adhesives - Cross Linking, for Wood) is acceptable.

**A-2.1.5. Decay-Resistant Lumber.** Cedar is a species considered resistant to decay.

### 9.8.8.3. Height of Guards

**(1)** Except as provided in Sentences (2) to (4), all *guards* shall be not less than 1 070 mm (3 ft 6 in) high.

**(2)** All *guards* within *dwelling units* shall be not less than 900 mm (2 ft 11 in) high.

**(3)** Exterior *guards* serving not more than one *dwelling unit* shall be not less than 900 mm high where the walking surface served by the *guard* is not more than 1 800 mm (5 ft 11 in) above the finished ground level.

**(4)** *Guards* for flights of steps, except in required *exit* stairs, shall be not less than 900 mm (2 ft 11 in) high.

**(5)** The height of *guards* for flights of steps shall be measured vertically from the top of the *guard* to a line drawn through the leading edge of the treads served by the *guard.*

### 9.8.8.6. Design to Prevent Climbing

**(1)** *Guards* required by Article 9.8.8.1., except those in *industrial occupancies* and where it can be shown that the location and size of openings do not represent a hazard, shall be designed so that no member, attachment or opening will facilitate climbing.

**(2)** *Guards* shall be deemed to comply with Sentence (1) where any elements protruding from the vertical and located within the area between 140 mm (5 ½ in) and 900 mm (2 ft 11 in) above the floor or walking surface protected by the *guard*,

(a) are located more than 450 mm (17 ¾ in) horizontally and vertically from each other,

(b) provide not more than 15 mm (⅝ in) horizontal offset,

(c) do not provide a toe-space more than 45 mm (1 ¾ in) horizontally and 20 mm (13/16 in) vertically, or

(d) present more than a 1-in-2 slope on the offset.

### 9.8.8.5. Openings in Guards

**(1)** Except as provided in Sentence (2), openings through any *guard* that is required by Article 9.8.8.1. shall be of a size that will prevent the passage of a spherical object having a diameter of 100 mm (4 in) unless it can be shown that the location and size of openings that exceed this limit do not represent a hazard.

**(2)** Openings through any *guard* that is required by Article 9.8.8.1. and that is installed in a *building* of *industrial occupancy* shall be of a size that will prevent the passage of a spherical object having a diameter of 200 mm (7 ⅞ in) unless it can be shown that the location and size of such openings that exceed this limit do not represent a hazard.

**(3)** Unless it can be shown that the location and size of openings that do not comply with the following limits do not represent a hazard, openings through any *guard* that is not required by Article 9.8.8.1. and that serves a *building* of other than *industrial occupancy*, shall be of a size that,

(a) will prevent the passage of a spherical object having a diameter of 100 mm (4 in), or

(b) will permit the passage of a spherical object having a diameter of 200 mm (7 ⅞ in).

### 9.8.8.2. Loads on Guards

**(1)** Except as provided in Sentence (5), *guards* shall be designed to resist the specified loads prescribed in Table 9.8.8.2.

**(2)** Where the width and spacing of balusters in *guards* within *dwelling units*, and exterior *guards* serving not more than 2 *dwelling units* is such that 3 balusters can be engaged by a load imposed over the 300 mm (11 ¾ in) width, the load shall be imposed so as to engage 3 balusters.

**(3)** None of the specified loads prescribed in Table 9.8.8.2. need be considered to act simultaneously.

**(4)** For *guards* within *dwelling units* and for exterior *guards* serving not more than 2 *dwelling units*, Table 9.8.8.2. need not apply where the *guard* construction has been demonstrated to provide effective performance.

**(5)** *Guards* constructed in accordance with the requirements in Supplementary Standard SB-7 shall be deemed to satisfy the requirements of Sentence (1).

**Table 9.8.8.2.**
**Specified Loads for Guards**

Forming Part of Sentence 9.8.8.2.(1)

| Column 1 | Column 2 | Column 3 | Column 4 |
|---|---|---|---|
| Location of *Guard* | Minimum Specified Loads | | |
| | Horizontal Load Applied Inward or Outward at any Point at the Top of the *Guard* | Horizontal Load Applied Inward or Outward on Elements Within the *Guard*, Including Solid Panels and Pickets | Evenly Distributed Vertical Load Applied at the Top of the *Guard* |
| *Guards* within *dwelling units* and exterior *guards* serving not more than 2 *dwelling units* | 0.5 kN/m (34 lb/ft) or concentrated load of 1.0 kN (224 lb) applied at any point(1) | 0.5 kN (112 lb) applied over a maximum width of 300 mm 11 ¾ in) and a height of 300 mm (11 ¾ in) (2) | 1.5 kN/m (103 lb/ft) |
| *Guards* serving access walkways to equipment platforms, contiguous stairs and similar areas | Concentrated load of 1.0 kN (224 lb)applied at any point | Concentrated load of 0.5 kN (112 lb) applied at any point on individual elements | 1.5 kN/m (103 lb/ft) |
| All other *guards* | 0.75 kN/m (52 lb/ft) or concentrated load of 1.0 kN (224 lb) applied at any point(1) | Concentrated load of 0.5 kN (112 lb) applied at any point on individual elements | 1.5 kN/m (103 lb/ft) |

**Notes to Table 9.8.8.2.:**

(1)The load that creates the most critical condition shall apply.

(2)See Sentence (2).

# 9.8.7. Handrails

## 9.8.7.1. Required Handrails

(1) Except as permitted in Sentences (2) and (3), a handrail shall be provided,
(a) on at least one side of stairs or ramps less than 1 100 mm (3 ft 7 in) in width,
(b) on 2 sides of curved stairs or curved ramps of any width, except curved stairs within *dwelling units*, and
(c) on 2 sides of stairs or ramps 1 100 mm (3 ft 7 in) in width or greater.

(2) Handrails are not required for,
(a) interior stairs having not more than 2 risers and serving a single *dwelling unit*,
(b) exterior stairs having not more than 3 risers and serving a single *dwelling unit*,
(c) ramps with a slope of not less than 1 in 12, or
(d) ramps rising not more than 400 mm (15¾ in).

(3) Only one handrail is required on exterior stairs having more than 3 risers provided such stairs serve a single *dwelling unit*.

## 9.8.7.2. Continuity of Handrails (See Appendix A.)

(1) Except as provided in Sentence (2), at least one required handrail shall be continuous throughout the length of the stair or ramp, including landings, except where interrupted by,
(a) doorways, or
(b) newel posts at changes in direction.

(2) For stairs or ramps serving a single *dwelling unit*, at least one handrail shall be continuous throughout the length of the stair or ramp, except where interrupted by,
(a) doorways,
(b) landings, or
(c) newel posts at changes in direction.

## 9.8.7.3. Termination of Handrails (See Appendix A.)

(1) Handrails shall be terminated in a manner that will not obstruct pedestrian travel or create a hazard.

(2) Except for stairs and ramps serving a single *dwelling unit*, at least one handrail at the sides of a stair or ramp shall extend horizontally not less than 300 mm (11¾ in) beyond the top and bottom of each stair or ramp.

## 9.8.7.4. Height of Handrails (See Appendix A.)

(1) The height of handrails on stairs and ramps shall be measured vertically from the top of the handrail to,
(a) a line drawn through the leading edge of the stair treads served by the handrail, or
(b) the surface of the ramp, floor or landing served by the handrail.

(2) Except as provided in Sentence (3), the height of handrails on stairs and ramps shall be,
(a) not less than 800 mm (2 ft 7 in), and
(b) not more than 965 mm (3 ft 2 in).

(3) Where *guards* are required, handrails required on landings shall be not more than 1 070 mm (3 ft 6 in) in height.

### 9.8.7.5. Ergonomic Design

(1) A clearance of not less than 50 mm (2 in) shall be provided between a handrail and any surface behind it.

(2) All handrails shall be constructed so as to be continually graspable along their entire length with no obstruction on or above them to break a handhold, except where the handrail is interrupted by newels at changes in direction. (See Appendix A.)

### 9.8.7.6. Projections into Stairs and Ramps

(1) Handrails and projections below handrails, including handrail supports and stair stringers shall not project more than 100 mm (4 in) into the required width of a stair or ramp.

### 9.8.7.7. Design and Attachment of Handrails (See Appendix A.)

(1) Handrails and any *building* element that could be used as a handrail shall be designed and attached in such a manner to resist,
(a) a concentrated load at any point of not less than 0.9 kN (202 lb), and
(b) for handrails other than those serving a single *dwelling unit*, a uniformly distributed load of 0.7 kN/m (48 lb/ft).

(2) Where a handrail serving a single *dwelling unit* is attached to wood studs or blocking, the attachment shall be deemed to comply with Sentence (1) where,
(a) the attachment points are spaced not more than 1.2 m (3 ft 11 in) apart,
(b) the first attachment point at either end is located not more than 300 mm (11¾ in) from the end of the handrail, and
(c) the fasteners consist of no fewer than 2 wood screws at each point, penetrating not less than 32 mm (1¼ in) into solid wood.

## 9.8.8. Guards

### 9.8.8.1. Required Guards (See Appendix A.)

(1) Except as provided in Sentences (2) and (3), every surface to which access is provided for other than maintenance purposes, including but not limited to flights of steps and ramps, exterior landings, porches, balconies, *mezzanines*, galleries and raised walkways, shall be protected by a *guard* on each side that is not protected by a wall for the length where,
(a) there is a difference in elevation of more than 600 mm (23⅝ in) between the walking surface and the adjacent surface, or
(b) the adjacent surface within 1.2 m (3 ft 11 in) from the walking surface has a slope of more than 1 in 2.

(2) *Guards* are not required,
(a) at loading docks,
(b) at floor pits in *repair garages*, or
(c) where access is provided for maintenance purposes only.

(3) When an interior stair has more than 2 risers or an interior ramp rises more than 400 mm (15¾ in), the sides of the stair or ramp and the landing or floor level around the stairwell or ramp shall be protected by a *guard* on each side that is not protected by a wall.

### 9.8.8.2. Loads on Guards (See Appendix A.)

$r_4$ (1) Except as provided in Sentence (5), *guards* shall be designed to resist the specified loads prescribed in Table 9.8.8.2.