

FALL PROTECTION SAFETY IN RESIDENTIAL FRAMING

Amendments to
Title 8, Chapter 4
CSO Article 29 (Erection and construction),
Section 1716.2
(effective Aug 6, 2004)

This Guide Book was created in
cooperation with the
California Framing Contractors Association,
Cal/OSHA and the
Residential Contractors Association

This document is intended to be used as a guide book only and not legal advice. Prior to use of this guide book, it is recommended that the user seek advice of individual legal counsel or expert consultation regarding its applicability to one's organization. This guide book is not an endorsement, directive, or advertisement of any product or company that may or may not be featured in any photograph, drawing, or sketch identifiable or identified in this guide book. This guide book is not a substitute for a training program and shall only be used as a supplemental part of one's complete training program. Other regulations, statutes, or laws may be applicable to the guide book user's operations that are not identified or made part of this guide book.

Copyright © 2004 by the California Framing Contractors Association. All rights reserved. Printed in the United States of America. Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in any data base or retrieval system, without the prior written permission of the publisher.

To order additional copies, contact AlphaGraphics at (909) 989-8550

The standards identified in this Guide Book were made possible through the joint efforts of the following:

ABC Framers Council
A-CON Systems, Inc.
Andrade & Associates
Associated General Contractors of California
B&B Framing
Beutler Heating and Air Conditioning
Bolin Companies
California Building Industry Association
California Division of Occupational Safety and Health
California Framing Contractors Association
California Labor Federation, AFL-CIO
California Professional Association of Specialty Contractors
Cal Coast Construction Specialists
Carpenters Joint Apprenticeship and Training for Southern California
Catch Systems
Centex Homes
Central Valley Framers
Coast Framing
County Line Framing
Courage Safety Systems
CW Construction, Inc., Production Framing
Energetic Lath & Plaster
FramePro Products
Fieldstone Communities
Greg Minor Construction Co.
Helix Construction Co., Inc.
JB Consulting
Jenson Construction
J.F. Shea Co., Inc.
KB Homes
KBI NorCal
Laborers Union, Southern District Council
Lennar Homes
Masino Plastering
Meritage Homes of Northern California
Pardee Homes
Production Framing Systems, Inc.
Pulte Homes
Rancho Framing
Renaissance Homes
Residential Contractors Association
Rockwell D. King Construction, Inc.
The Ryland Group
Safety Management Services
Safety Training Seminars
Southwestern Council of Carpenters
State Building Construction Trades Council
TC Scaffolding
Trimm Scaffolding
TWR Framing
Wick Risk Management
WORKSAFE

§1716.2. Wood and Light Gage Steel Frame Construction, Residential/Light Commercial.



Note: Photos are examples of structure types that are within the scope of Section 1716.2.

(a) Scope and Application.

This section applies to work directly associated with the framing of new buildings or structures using the operations, methods, and procedures associated with residential-type framing activities, i.e., joists or trusses resting on stud walls.

(b) Definitions.

- (1) **Bottom Plate.** The bottom horizontal member of a frame wall. Sometimes called the "sole plate."
- (2) **Eaves.** The lowest edge of a sloped roof.
- (3) **Fascia Board.** The exterior trim board at the perimeter of the roof.
- (4) **Joist.** One of a series of parallel beams used to create a structural support system for a floor deck or flat roof, onto which sheathing is fastened.
- (5) **Nominal Size.** For purposes of this section, the commercial size designation of a standard width and depth of standard sawn lumber and glue laminated lumber grades; larger than the standard actual net size of the finished, dressed lumber. An approximate rough-cut dimension assigned to a piece of material as a convenience in referencing to the piece, such as "2 x 4".
- (6) **Rafter.** One of a series of structural members of a roof designed to support roof loads. A framing member that runs up and down the slope of a pitched roof. The beams that slope from the ridge of a roof to the eaves and make-up the main body of the roof's framework. The rafters of a flat roof are sometimes called roof joists.
- (7) **Residential-type Framing Activities.** For the purposes of this section, residential-type framing activities include: installation of floor joists, floor sheathing, layout and installation of walls, hanging and nailing of shear panels, setting and bracing roof trusses and rafters, installation of starter board, roof sheathing, and fascia board; installation of windows, siding and exterior trim.
- (8) **Roof Slope.** For the purposes of this section, the incline angle of a roof surface, given as a ratio of the vertical rise to the horizontal run. A 7:12 roof has 7 feet of vertical rise for 12 feet of horizontal run.

(b) Definitions. (cont.)

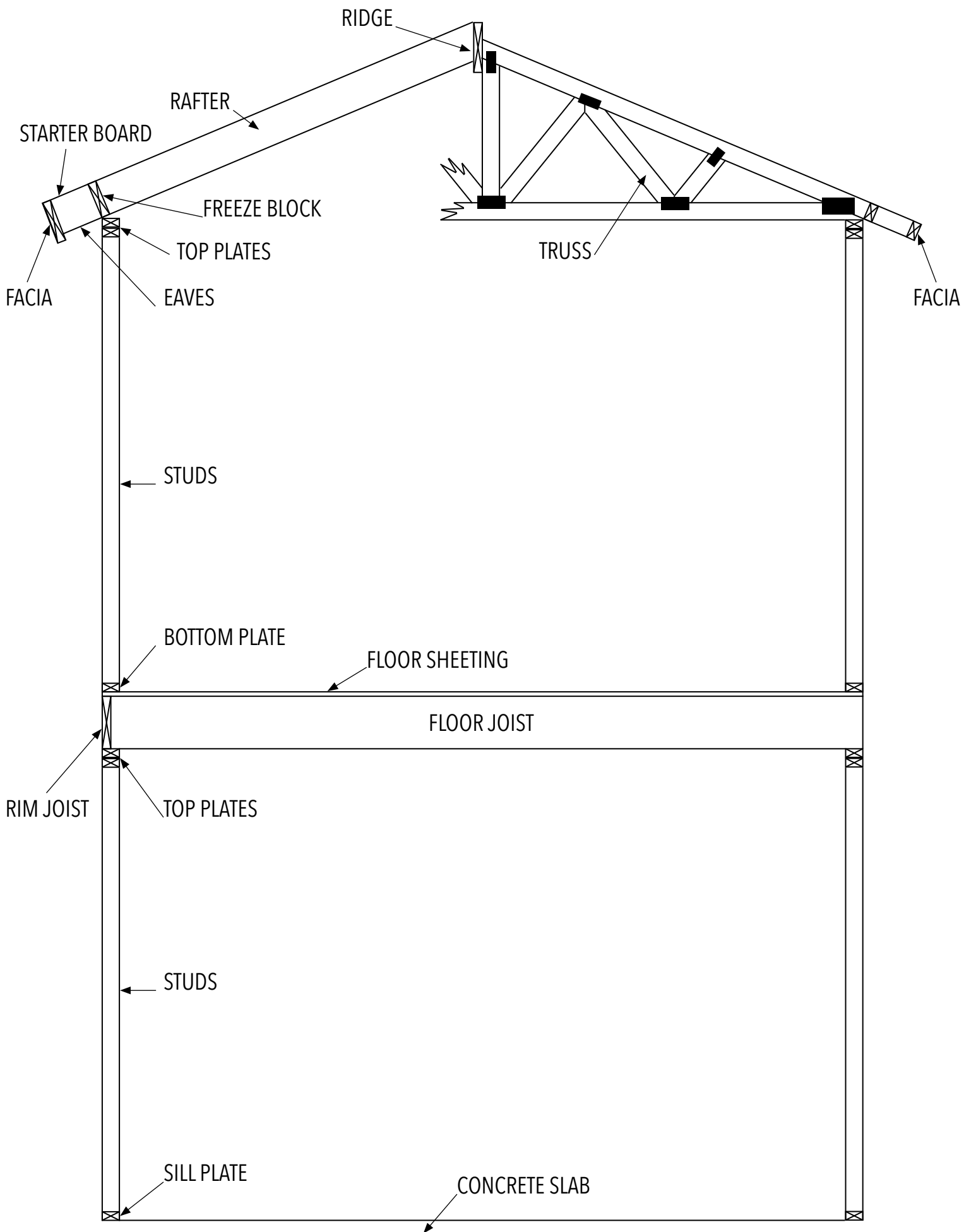
(9) **Sheathing.** The structural panel covering fastened onto studs, floor joists, and/or rafters/trusses.

(10) **Slide Guards.** A 2-inch nominal cleat, on centers not to exceed 4 feet, securely fastened to the roof sheathing to provide footing on a sloped roof.



(11) **Starter Board.** The board-type sheathing material installed at eaves and gable ends in the plane of the sheathing and visible from the underside.





(b) Definitions. (cont.)

(12) **Stud.** A vertical framing member in walls and partitions, also referred to as a wall stud, attached to the horizontal sole plate below and the top plate above.

(13) **Top Plate.** Top horizontal member of a frame wall supporting ceiling joists, rafters, or other structural members.

(14) **Truss.** Prefabricated structural roof unit consisting of triangular bracing (truss webs) between the ceiling joist (bottom chord) and the roof rafter (top chord) commonly installed parallel with other trusses to create a structural support system for a roof after which sheathing is fastened. The bottom chord often serves as a ceiling joist. Each member is usually subjected to longitudinal stress only, either tension or compression.

(15) **Truss Support Plate.** A temporary support structure erected near mid-span of an area with a large open span, such as a garage, to support trusses during installation.



(c) Raising Walls.

(1) Before manually raising wood framed walls that are 15 feet or more in height, temporary restraints such as cleats on the foundation/floor system or straps on the wall bottom plate shall be installed to prevent inadvertent horizontal sliding or uplift of the wood framed wall bottom plate.



Wall in the photo is not 15 feet. It is used only to show an example of a cleat/block.

(2) Anchor bolts alone shall not be used for blocking or bracing when raising framed walls 15 feet or more in height.



Anchor Bolts

(d) Stabilization of Structures

Employees shall not work from or walk on top plates, joists, rafters, trusses, beams or other similar structural members until they are securely braced and supported.



BRACING

This example shows the walls braced and supported on the first floor.

(e) Work on Top Plate, Joists and Roof Structure Framing

(1) When employees are walking/working on top plates, joists, rafters, trusses, beams or other similar structural members over 15 feet above the surrounding grade or floor level below, fall protection shall be provided by scaffolding, guardrails, a personal fall protection system, or by other means prescribed by Article 24, Fall Protection.



Note: Fall protection is not required at or below 15 feet (i.e. single story homes).

Fall Protection Systems include:

1. Protection systems - Scaffolds, Guardrails, nets, ect.
2. Fall arrest/restraint systems - Haneses, lanyards, cables, anchorage, etc.

Examples of fall protection commonly used for work above 15 feet



Metal Frame Scaffold (Stacked Scaffold)

(Toe boards are required over doorways and when scaffold is used as an edge protection platform.)

Examples of fall protection commonly used for work above 15 feet

Bracket Scaffold (1)



Bracket attaches to the top plate

Bracket Scaffold (2)



Bracket that is secured to the bottom plate

Examples of fall protection commonly used for work above 15 feet

Bracket Scaffold with Safety Nets



Bracket scaffold



Safety net

Safety nets used for interior fall exposure where the fall potential is greater than 15 feet

Personal Fall Arrest/Restraint System



Two versions of cable/tie-off systems
(All arrest/restraint systems must comply with §1670.)

Examples of fall protection commonly used for work above 15 feet

Personal Fall Arrest/Restraint Systems



An example of a harness, retractable lanyard and anchorage

(e) Work on Top Plate, Joists and Roof Structure Framing. (cont.)

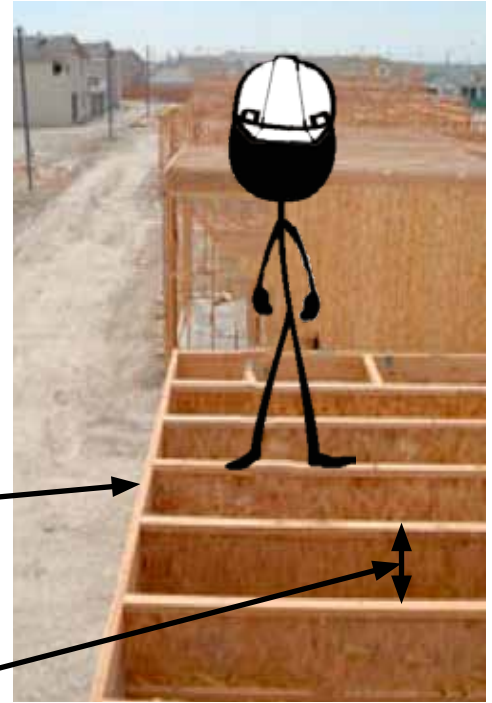
Exceptions: (A) When employees are walking/working on securely braced joists, rafters or roof trusses on center spacing not exceeding 24 inches, and more than 6 feet from an unprotected side or edge, they shall be considered protected from falls between the rafters or roof trusses.



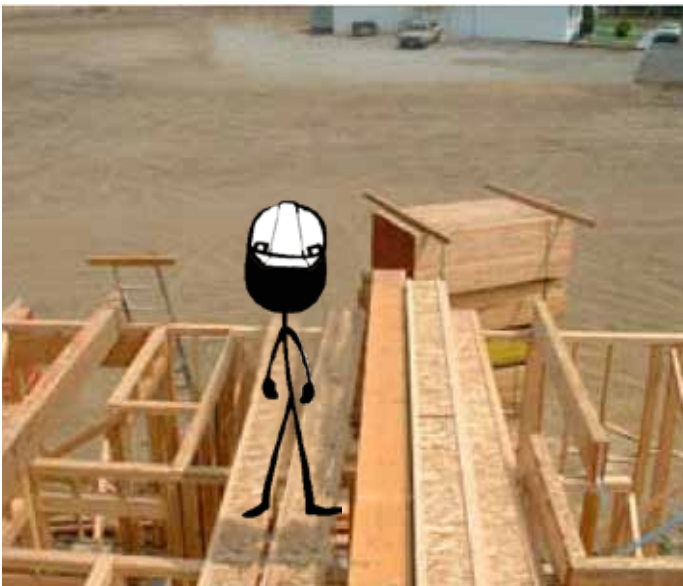
Work performed within 6 feet of the edge requires fall protection if the fall height is more than 15 feet.

Height from ground is not more than 15'

24" on center

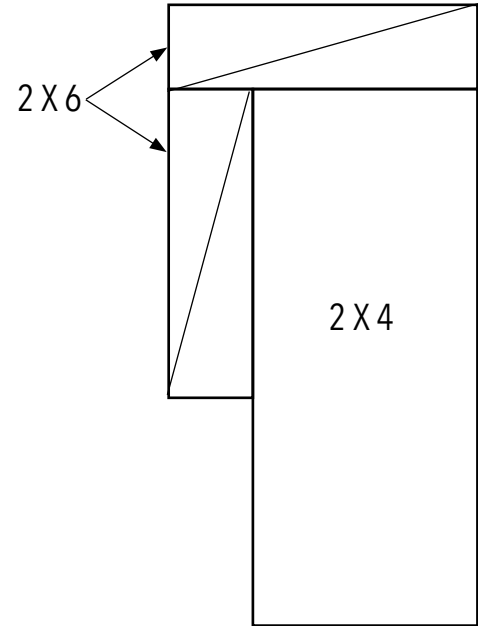


Exceptions: (B) When installing floor joists, employees shall be considered protected from falls up to and including 15 feet above the surrounding grade or floor level below when standing on or working from joists laid on their sides on the top plate on center spacing not exceeding 24 inches when walking/working within 24 inches of the top plate or other structural support.



(e) Work on Top Plate, Joists and Roof Structure Framing. (cont.)

(2) Truss Support Plate. Where a truss support plate is used during the installation of trusses, it shall be constructed of a 2x6 plank laid flat, secured lineally to a 2x6 plank laid on edge, supported with 2x4 wood members (legs) spaced no more than 6 feet on center and attached to diagonal bracing adequately secured to support its intended load. All material dimensions are minimum and nominal.



2 x 4 legs spaced no more than 6' on center and attached to diagonal bracing

(f) Work on Floors and Other Walking/Working Surfaces.

When working on floors and other walking/working surfaces that will later be enclosed by framed exterior walls, employees directly involved with the layout and construction of framed stud walls shall be protected from falling by standard guardrails as specified in Section 1620 around all unprotected sides or edges, or by other means prescribed by Article 24, Fall Protection, when the floor or walking/working surface is over 15 feet above the surrounding grade or floor level below.



Layout and framing on the 2nd floor (not over 15 feet) do not require guardrails.



3rd floor work (over 15 feet) requires guardrails. Work here would be in violation of the regulations.

(g) Work on Starter Board, Roof Sheathing and Fascia Board.

(1) When installing starter board, roof sheathing, and fascia board, employees shall be protected from falling by scaffolding, guardrails, personal fall protection systems, or other means prescribed by Article 24, Fall Protection as follows:



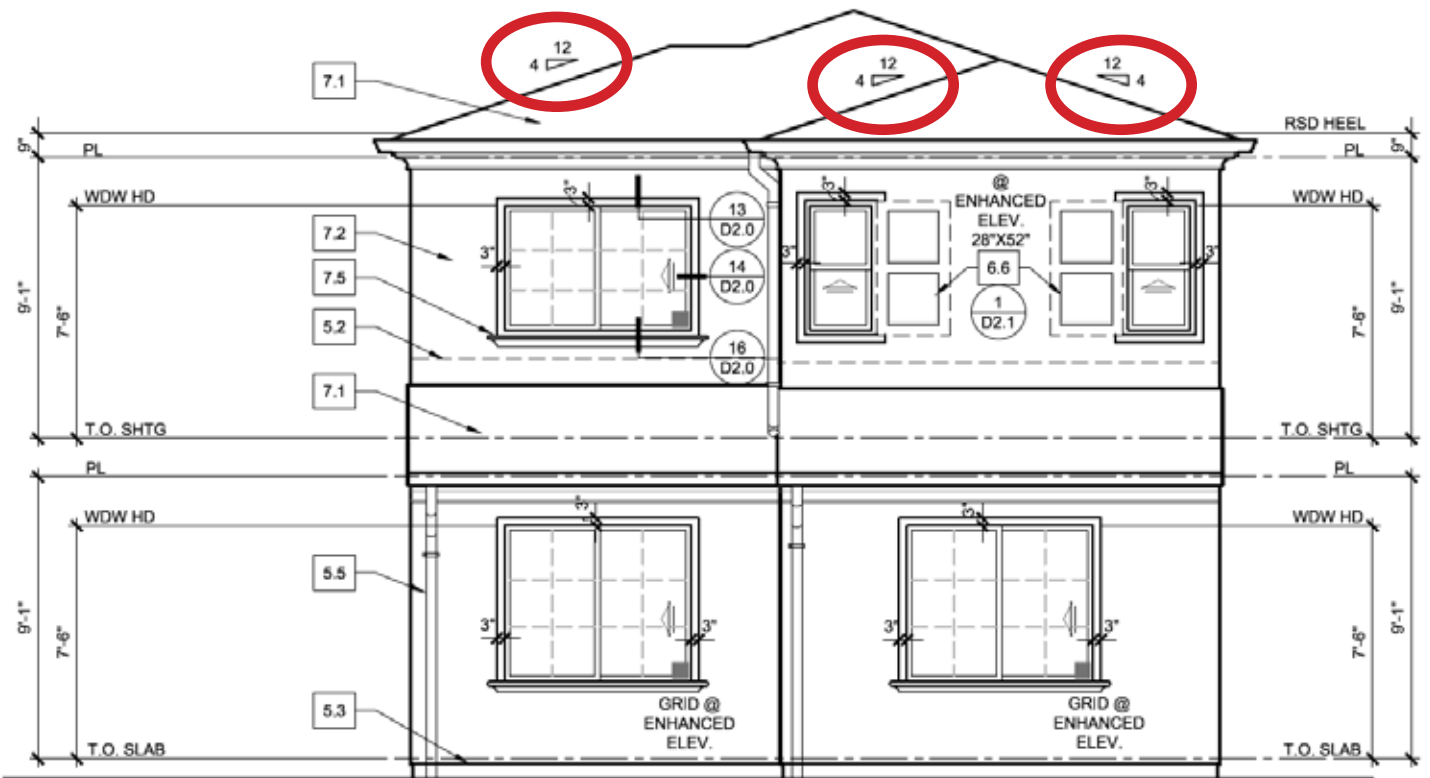
- (1) (A) For structures greater than one story in height where the fall height exceeds 15 feet above the surrounding grade or floor level below, or (B) When working on roofs sloped greater than 7: 12.
Exception to (g)(1)(B): For roofs sloped up to 12: 12, slide guards may be used as fall protection up to and including 15 feet as measured from the eaves to the surrounding grade or floor level below.



Under 15 feet, when the slope is between 7:12 and 12:12, slide guards may be used as the sole method of fall protection. Slide Guard shown is an example of one design type. See definitions section for design criteria.



Examples of where the roof slope can be located in the plans.



REAR ELEVATION

1A

SCALE : 1/4" = 1'-0"

(g) Work on Starter Board, Roof Sheeting and Fascia Board. (cont.)

(2) Employees working inside the gable end truss or rafter shall be considered (2) protected from falls where the gable end truss has been installed and braced to withstand a lateral force of 200 pounds and the employee installs fascia or starter board working from within the gable end truss or rafter.



Bracing of gable end truss



(3) (1) When work must be performed outside the gable end truss or rafter, the employee shall be protected from falling by scaffolding, or a personal fall protection system, or other means prescribed by Article 24.

Exception to (g)(3): When the work is of short duration and limited exposure and the hazards involved in rigging and installing the safety devices required equal or exceed the hazards involved in the actual construction, these provisions may be temporarily suspended provided the work is performed by a qualified person.



Cutting barges/outlookers is an example of shortduration work performed by a qualified person.

(h) Installation of Windows.

Window openings shall be guarded as required by Section 1632. The guardrail may be removed immediately prior to the installation of the window components if removal of the guardrail is necessary to install the window(s).



Window sills are less than 36" high



Guardrail

(i) Scaffolding.

(1) Where scaffolding is used, it shall be constructed in accordance with all applicable requirements of Articles 21 and 22 (Scaffolds).



Note: Toe boards are required over doorways and when scaffold is used as an edge protection platform.

(i) Scaffolding. (cont.)

(2) Where scaffolds are installed parallel and adjacent to framed structure walls, the interior railing may be omitted for installing joists, rafters or trusses if the scaffold platform is 15 feet or less from the interior floor level below and the top plate is higher than the adjacent work platform.



Railings are omitted on the interior scaffold.

The guardrails would rise higher than the trusses or joists being installed, and the task could not be performed.

Interior scaffold

Exterior wall

(3) When a scaffold is used as an edge protection platform:

(A) The platform shall not be more than 2 feet vertically below the top plate, and shall be fully planked.

(B) The distance between the inboard edge of the platform and the building or structure wall shall not be more than 16 inches.



A



B

Point of measurement

(i) Scaffolding. (cont.)

(4) Additional provisions where metal frame scaffold is used as an edge protection platform:

(A) A 2" x 6" or larger toeboard shall be secured on edge parallel to the outer rail.

(B) Scaffolds shall be secured in tension and compression to the structure at or near the top of the scaffold at each end and at every other frame not to exceed 20-foot intervals.

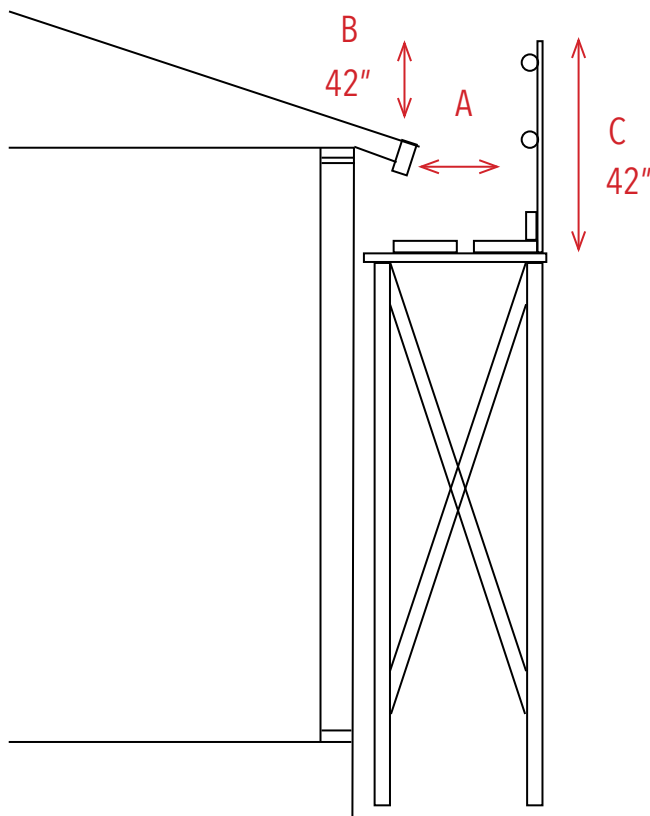
(C) Guard railings shall extend not less than 42 inches vertically above the eaves if the outboard edge of the platform extends less than 12 inches horizontally beyond the eaves.



A A 2" x 6" toeboard is required when the scaffold is used as an edge protection device.



B Tension/compression attachment



C

If "A" is less than 12", "B" (from the eaves to the top of the guard railing) must extend 42"

If "A" is 12" or more, the measurement is taken from the scaffold platform to the top of the guard railings ("C").

(i) Training.

Employees exposed to fall hazards shall be trained in accordance with the requirements of Sections 1509 and 3203 to recognize fall hazards associated with the erection and construction activities they will be performing and shall be trained in the procedures to be followed in order to minimize these hazards. Such training shall be documented in accordance with Section 3203.

Note: Authority cited: Section 142.3, Labor Code.

Reference: Section 142.3, Labor Code.