

FIGURE 1

Installation Instructions For Safety Boot® Tall Guardrail Brace



For Use
Exclusively With

Safety Boot®

GUARDRAIL SYSTEM



STEP 1

Cut two 2X4's to desired height and fasten together to create a double 2x4 post. **Posts can be a maximum of 65 inches tall for use with the Safety Boot® Tall Guardrail Brace.**

*NOTE: The Tall Guardrail Brace is **NOT NEEDED** for standard 42 inch (± 3 inches) guardrail systems.*

STEP 3

Install Safety Boot units with posts attached along all open edges and floor openings following the installation instructions for the Safety Boot Guardrail System found in this booklet.

*NOTE: Different subfloor materials require different fasteners. Please Refer to the **FASTENER SPECIFICATIONS** page found in this booklet.*

STEP 5

For Tall Guardrail Systems Over 45 inches (42 ± 3 inches is standard height), we recommend using a third horizontal rail as shown in **FIGURE 1** on the front cover of this booklet.

Fasten horizontal top rails in line with top of posts, fasten upper mid rail 1/3 distance down and the lower mid rail another 1/3 distance down.

The three horizontal railings should be evenly spaced as shown in **FIGURE 1** on the front cover of this booklet. If needed, be sure and add toeboards following the installation instructions for the Safety Boot Guardrail System found in this booklet.



STEP 2

Insert tall guardrail posts into each Safety Boot Guardrail System unit as instructed in the Safety Boot Installation Instructions in this booklet.

Be sure and secure each post to the Safety Boot unit using **3/8" X 2" lag screw** (with supplied Fender Washer) through the hole in the sidewall of the Safety Boot unit.

STEP 4

Once the Safety Boot units with posts attached are in place and secured to the subfloor, insert the **Tall Guardrail Brace** into the open toeboard slot on the **INSIDE** of the Safety Boot unit. Secure Tall Guardrail Brace to the post using **3/8" X 2" lag screws** (with supplied Fender Washers) as shown in **FIGURE 2** below.

*Please refer to the **FASTENER SPECIFICATIONS** page found in this booklet for subfloor fastener specifications.*



**Properly Installed Safety Boot®
With Tall Guardrail Brace Attached**



Certificate of Test ***Stress Engineering Services, Inc.***

13800 Westfair East Drive
Houston, Texas 77041

TEST DATE: April 15, 2007 **SES PN 116466**

TEST CUSTOMER: Safety Maker, Houston TX

TEST PIECES: Sample 1-3 Safety Boot Tall Guardrail Brace

TEST REQUIREMENTS: Proof test samples by pulling in a horizontal direction.

TEST RESULTS:

Sample 1 was mounted using 3/8" x 2" lag bolts in plywood only and pulled to 354 lbs. No failure of the sample occurred. Test stopped per Safety Maker representative instructions.

Sample 2 was mounted using 3/8" x 3" lag bolts in solid wood and pulled to 440 lbs. No failure of the sample occurred. Test stopped per Safety Maker representative instructions.

Sample 3 was mounted using 3/8" x 3" lag bolts in solid wood and pulled to 404 lbs. No failure of the sample occurred. Test stopped per Safety Maker representative instructions.

Attachment A - Hand Log

Attachment B - Plot of Applied Test Loads

Attachment C - Photographs of General Test Setup


Attachment D - Equipment Calibration Documentation

Tested By:

Approved By:



Jimmy Beseda,
SES Senior Technician



W. T. Asbill, P.E.

Full test results including attachments are available upon request.

Safety Boot® Guardrail System

Safety Boot® Tall Guardrail Brace Provides Guardrail Protection Up To 65 Inches

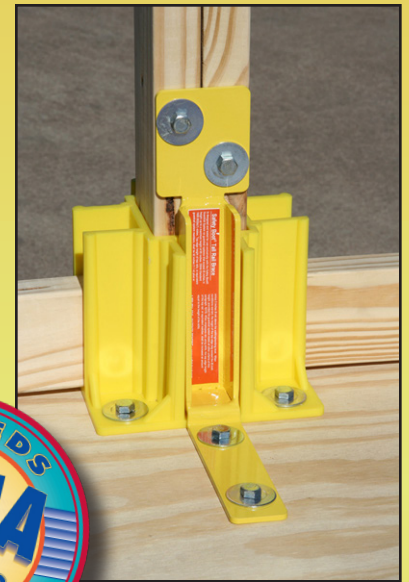
The Safety Boot® Tall Guardrail Brace is designed to allow contractors to stay in compliance with the **NOTE** in United States Federal OSHA Standard 1926.502(b)(1) which states:
Top edge height of top rails, or equivalent guardrail system members, shall be 42 inches (1.1 m) plus or minus 3 inches (8 cm) above the walking/working level.



When conditions warrant, the height of the top edge may exceed the 45-inch height, provided the guardrail system meets all other criteria of this paragraph.

NOTE: When employees are using stilts, the top edge height of the top rail, or equivalent member, shall be increased an amount equal to the height of the stilts.

The Safety Boot® Tall Guardrail Brace is designed and tested for use exclusively with the Safety Boot® Guardrail System on guardrail systems that exceed 45 inches in height up to a maximum height of 65 inches.



The Safety Boot® Tall Guardrail Brace provides guardrail protection up to 65 inches for workers on stilts or ladders working near the guardrail system and has been certified by a national third party engineering firm as exceeding Federal OSHA guardrail standards. Certified engineering testing results are available anytime upon request.

Quickly installs following the same Fastener Specifications as the Safety Boot. Please refer to the Safety Boot Installation Instructions in this booklet for detailed installation information.

The Safety Boot® Tall Guardrail Brace is NOT needed for standard 42 inch (±3) guardrail systems.



P.O. Box 880 • Cypress, Texas 77410-0880

Phone 800.804.4741 or 832.593.0400 • Fax 800.914.8019 or 832.593.0910

www.safetyboot.com



Safety Boot® Guardrail System

◆ INSTALLATION INSTRUCTIONS ◆

See inside for detailed illustrations and stress engineering report summary

WARNING!  **NEVER USE NAILS OR UNSPECIFIED FASTENERS**

to Anchor the Safety Boot - Different Types of Subfloor Material Require Different Types of Fasteners In Order to Exceed the 200 lb. OSHA Guardrail Requirement

◆ IMPORTANT WARNING ◆

All specifications and dimensions for building compliant railing systems given within these installation instructions are written to meet United States Federal OSHA requirements of 1926.502(b)(3), (4), and (5) which are subject to change. Individual U.S. States with their own State run OSHA agencies might have slightly different and varying specifications for guardrail requirements. Be sure to check and confirm if your particular state follows Federal OSHA or State OSHA regulations. Always follow the specific safety regulations for your state or region. This system is designed and tested for flat surface applications only.



**FAILURE TO OBSERVE WARNINGS COULD
RESULT IN SERIOUS INJURY OR DEATH**



MAKE SURE EACH PERSON READS AND UNDERSTANDS THESE INSTRUCTIONS PRIOR TO USE. MANUFACTURER ASSUMES NO LIABILITY IN THE EVENT OF IMPROPER INSTALLATION, PRODUCT MISUSE, OR FAILURE OF WOOD CONSTRUCTION SUBSTRATE. NEVER ALTER OR MODIFY THE SAFETY BOOT. ALWAYS CAREFULLY INSPECT EACH SAFETY BOOT BEFORE EVERY NEW INSTALLATION. REPLACE IMMEDIATELY IF YOU NOTICE ANY SIGNS OF EXCESSIVE WEAR, DAMAGE, ABUSE OR PLASTIC DEGRADATION.

OSHA REGULATIONS (STANDARDS - 29 CFR)

**Guardrail Systems - Non-Mandatory Guidelines for Complying with 1926.502(b) -
1926 Subpart M App B states that for wood railings:**

... (1) For wood railings: Wood components shall be minimum 1500 lb-ft/in(2) fiber (stress grade) construction grade lumber; the posts shall be at least 2-inch by 4-inch (5 cm x 10 cm) lumber spaced not more than 8 feet (2.4 m) apart on centers; the top rail shall be at least 2-inch by 4-inch (5 cm x 10 cm) lumber, the intermediate rail shall be at least 1-inch by 6-inch (2.5 cm x 15 cm) lumber. All lumber dimensions are nominal sizes as provided by the American Softwood Lumber Standards, dated January 1970 . . .

For Technical Support or to Reorder,
Call Toll Free 1.800.804.4741
www.safetyboot.com ◆ info@safetyboot.com

**SAFETYTM
MAKER** 

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FREE!
Drill Adapter(s)
Included With
All Orders!



Use the Supplied Drill Adapter with a Power Drill and Socket for Fast and Easy Installation

Safety Boot® Guardrail System

◆ FASTENER SPECIFICATIONS ◆

WARNING! **NEVER USE NAILS OR UNSPECIFIED FASTENERS**

to Anchor the Safety Boot - Different Types of Subfloor Material Require Different Types of Fasteners In Order to Exceed the 200 lb. OSHA Guardrail Requirement

FASTENER SPECIFICATIONS FOR VARIOUS TYPES OF SUBFLOOR MATERIAL APPLICATIONS

SOLID 2X WOOD APPLICATIONS

for solid wood applications use:

- ◆ 4 - Hex-Head Lag Screws, $\frac{3}{8}$ X 2 inch and;
- ◆ 4 - $\frac{3}{8}$ X 1- $\frac{1}{2}$ Inch Fender Washers **(Fender Washers supplied with all orders)**
- ◆ Anchor directly into solid 2X lumber using the four primary corner holes.

PLYWOOD (LESS THAN 1- $\frac{1}{8}$ INCH THICK) OR OSB APPLICATIONS

for plywood (less than 1- $\frac{1}{8}$ inch thick) or OSB applications use:

- ◆ 4 - Hex-Head Lag Screws, $\frac{3}{8}$ X 3 inch and;
- ◆ 4 - $\frac{3}{8}$ X 1- $\frac{1}{2}$ Inch Fender Washers **(Fender Washers supplied with all orders)**
- ◆ Anchor through the plywood or OSB into floor joists or solid 2X lumber blocking on the underside of subfloor using the four primary corner holes.

FOR OTHER SAFETY BOOT APPLICATIONS

The Safety Boot® Guardrail System must always be installed according to the manufacturers installation instructions. Any modifications, additions or alterations to the Safety Boot Guardrail System installation, as stated in these instructions is not recommended without the close supervision of a Certified Safety Professional or Safety Engineer. Always verify through a Certified Safety Professional or Safety Engineer that your completed system will support the required load as needed for your specific applications.

STURD-I-FLOOR® (1- $\frac{1}{8}$ INCH THICK) PLYWOOD

for Sturd-I-Floor® (1- $\frac{1}{8}$ inch thick) plywood applications use:

- ◆ 5 - Hex-Head Lag Screws, $\frac{3}{8}$ X 2 inch and;
- ◆ 5 - $\frac{3}{8}$ X 1- $\frac{1}{2}$ Inch Fender Washers **(Fender Washers supplied with all orders)**
- ◆ Anchor directly into Sturd-I-Floor® (1- $\frac{1}{8}$ inch thick) plywood using the four primary corner holes and by adding a 5th screw on the inside of the guardrail or stair rail system in the secondary hole provided.

CONCRETE APPLICATIONS

for concrete applications use:

- ◆ 4 - Common Masonry Fasteners or Similar Concrete Anchors and;
- ◆ 4 - $\frac{3}{8}$ X 1- $\frac{1}{2}$ Inch Fender Washers **(Fender Washers supplied with all orders)**
- ◆ Anchor using the four primary corner holes.

ADDITIONAL CONCRETE INFORMATION

Due to the variances in concrete mixtures and applications (such as, concrete mixture type, psi strength, slab thickness, cure time, etc.), concrete fasteners used to secure the Safety Boot **MUST** be evaluated on a case by case basis by a qualified competent person. They should verify that the selected fastener specifications for average ultimate pullout and shear values are in compliance with the OSHA required strength standards.* Most concrete fasteners are packaged to include a product specification chart that denotes the average ultimate pullout and shear values in concrete and/or hollow block applications.

*** OSHA STANDARD 1926.502(b)(3):**

Guardrail systems shall be capable of withstanding, without failure, a force of at least 200 pounds (890 N) applied within 2 inches (5.1 cm) of the top edge, in any outward or downward direction, at any point along the top edge.

Use the Supplied Drill Adapter with a Power Drill and Socket for  Fast and Easy Installation

Safety Boot® Guardrail System

◆ IMPORTANT INFORMATION ◆

◆ SAFETY BOOT GUARDRAIL SYSTEM ◆

enables the builder to easily construct freestanding guardrail and stair rail systems that meet OSHA Regulations on every job-site, even when using different employees or subcontractors.

OSHA STANDARDS REQUIRE THAT ENGINEERING TEST DATA CERTIFICATION MUST BE AVAILABLE

for the OSHA Compliance Officer on all temporary guardrail systems (including job-built railings).

[Subpart M — Appendix B]

SEE INSIDE FOR DETAILED ILLUSTRATIONS AND STRESS ENGINEERING REPORT SUMMARY

ADDITIONAL WARNINGS FOR STEEL DECKING



DO NOT use sheet metal screws to anchor the Safety Boot Guardrail System directly into steel decking (e.g., 18 - 22 gauge B-Deck, F-Deck or similar corrugated steel decking). Sheet metal screws, self starting screws or similar are **NOT** capable of withstanding a 200 pound load in corrugated steel decking and **DO NOT** meet United States Federal OSHA guardrail regulations.

ADDITIONAL WARNINGS FOR HOIST AREAS



Each employee in a hoist area shall be protected from falling 6 feet (1.8 m) or more to lower levels by guardrail systems or personal fall arrest systems. If guardrail systems, (or chain, gate, or guardrail) or portions thereof, are removed to facilitate the hoisting operation (e.g., during landing of materials), and an employee must lean through the access opening (to receive or guide equipment and materials, for example), that employee shall be protected from fall hazards by a personal fall arrest system. **[§1926.501(b)(3) Duty to have fall protection]**

FAILURE TO OBSERVE WARNINGS COULD RESULT IN SERIOUS INJURY OR DEATH

THE GENERAL / PRIME CONTRACTOR IS RESPONSIBLE

for assembling to OSHA standards, all of the various temporary railing systems mandated for different workplace situations.

FOR TECHNICAL SUPPORT OR TO REORDER

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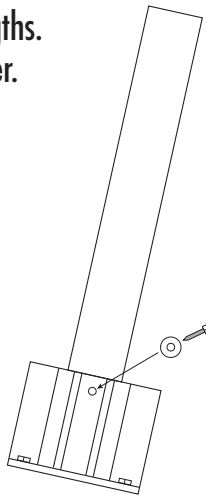
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Use the Supplied Drill Adapter with a Power Drill and Socket for *Fast* and Easy Installation

◆ STEP ONE ◆ Assemble Posts

Assemble Guardrails Using (Stress Grade) Construction Grade Lumber

- ◆ Cut 2X4 lumber into two 42 inch lengths. **DO NOT** use wet or oversized lumber.
- ◆ Fasten the lengths together with screws or nails to form a post.
- ◆ Place one end of the post into the top of the Safety Boot and tap until the bottom of the post is flush with the bottom of the Safety Boot.
- ◆ Be sure and anchor the Safety Boot to the post using one Hex-Head Lag Screw, $\frac{3}{8}$ X 2 inch with provided washer.



◆ STEP TWO ◆ Placement of Posts

Placement of Posts Should be Along Unprotected Sides or Edges

- ◆ Place Safety Boot Posts in line along all edges of unprotected walking/working surfaces of stairways, balconies, landings, roofs, on parapets, elevator shafts, bridges, etc.
- ◆ Space between the Posts **MUST NOT** exceed Eight (8) feet according to OSHA guidelines.
- ◆ Place Safety Boot Posts a maximum of Eighteen (18) inches on center away from all permanent wall structures. (Always leave ample room for drywall installation, if required).

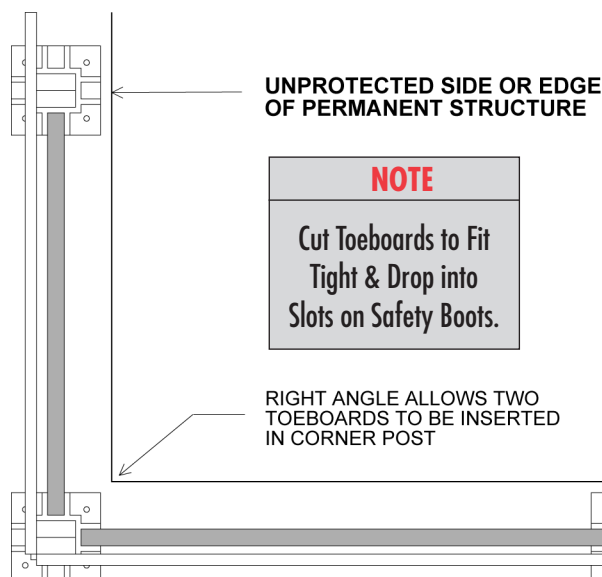
NOTE

Maximum Distance
of 8 Feet
Between the Posts

◆ STEP THREE ◆ Anchor Posts to Surface

Anchor Posts to Subfloor Surface

- ◆ Securely fasten Safety Boots to surface using specified fasteners (see previous page) and provided washers.
- ◆ You **MUST** always use the correct fasteners for different types of flooring — To meet OSHA strength requirements refer to the **Fastener Specifications Section** in this instruction booklet for your specific subfloor application.
- ◆ **DO NOT USE NAILS TO ANCHOR THE BOOTS! ALWAYS USE THE CORRECT FASTENERS!**



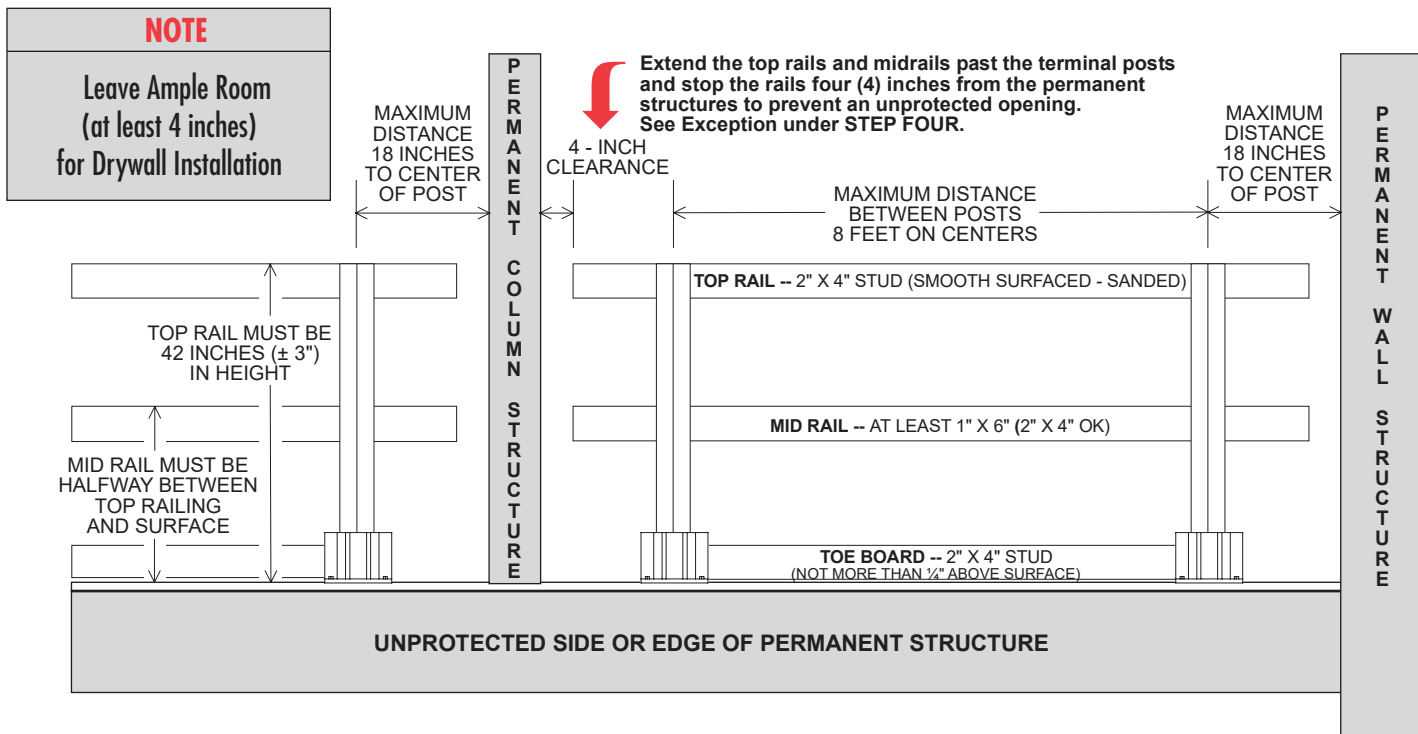
◆ STEP FOUR ◆ Fasten Rails to Posts & Insert Toeboard

Fasten Top Rails and Mid Rails to Posts and Insert Toeboards Between Posts

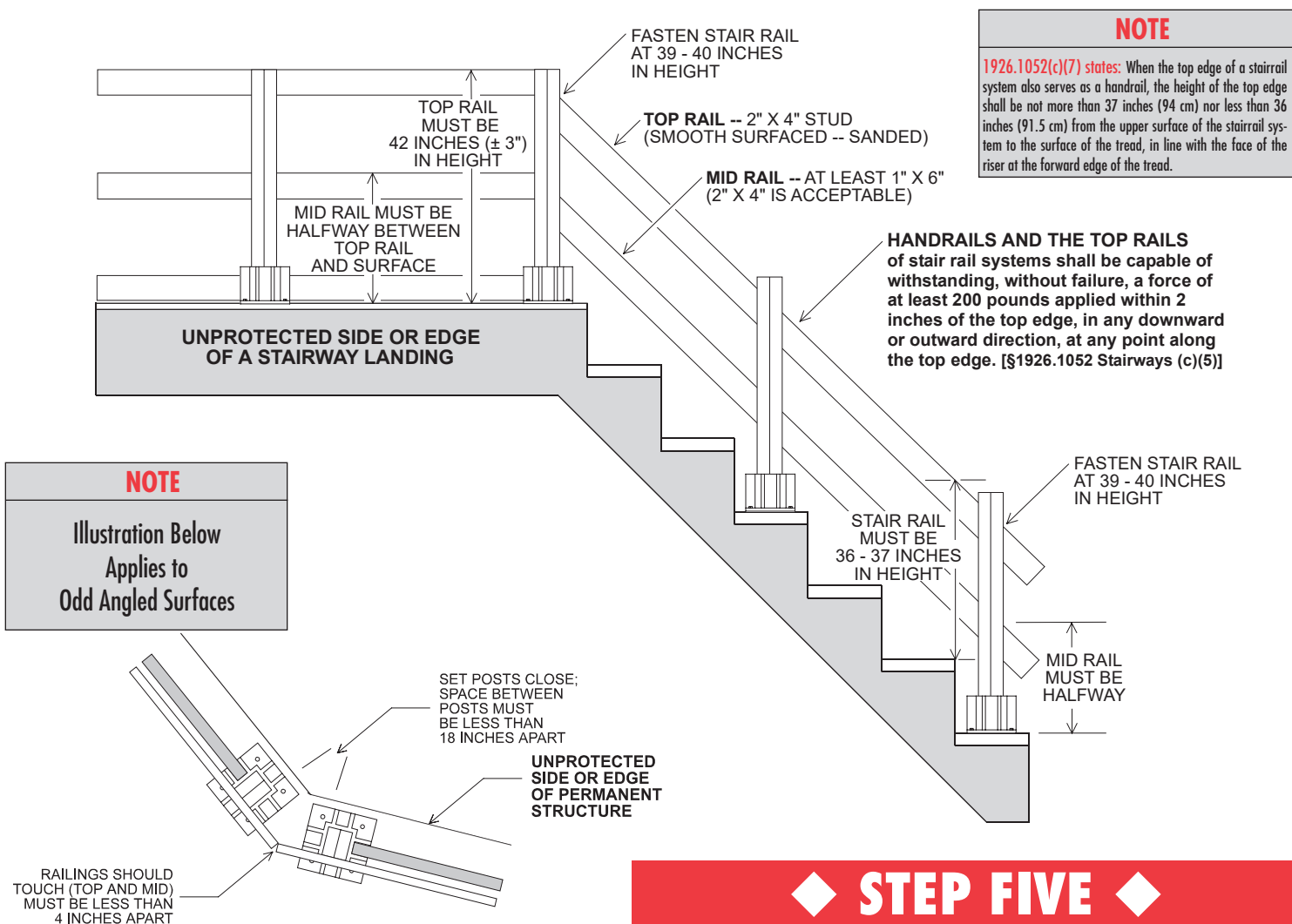
- ◆ For Stair rails, including Handrails, top railings must be attached to the posts at approximately 39-40 inches.
1926.1052(c)(7) states: When the top edge of a stairrail system also serves as a handrail, the height of the top edge shall be not more than 37 inches (94 cm) nor less than 36 inches (91.5 cm) from the upper surface of the stairrail system to the surface of the tread, in line with the face of the riser at the forward edge of the tread.
- ◆ For Guardrails, including Landings, top railings must be flush with top of posts (42 inches).
- ◆ For all Mid-rails, fasten halfway between top railing and flooring.
- ◆ Terminal (End) System, always extend the railings past the posts and stop the railings four (4) inches from any permanent structure. **EXCEPTION:** Where there is no permanent structure, the ends of the rails must stop at the terminal post to prevent a projection hazard.
- ◆ For Toeboards, (required by OSHA), cut 2X4's to fit tight between two posts and drop into toeboard slots on each Safety Boot. (Toeboards are not required on stair rail systems).

Applies to Walking / Working Surfaces and Stairway Landings

Applies to Unprotected Sides or Edges - Subpart M—§1926.502 Fall Protection Systems Criteria and Practices



Applies to Stairways, Handrails, Stair Rail Systems and Stairway Landings - Subpart X—Stairways and Ladders



◆ STEP FIVE ◆
Remove & Reuse Posts at Next Job Site

SUMMARY OF TESTS PERFORMED ON THE SAFETY BOOT®

PERFORMED FOR
SAFETY MAKER, INC.

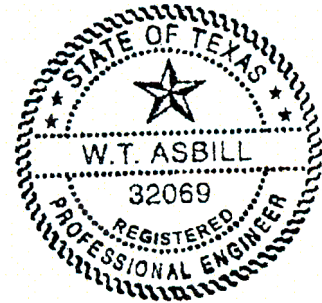
PERFORMED BY
STRESS ENGINEERING SERVICES
HOUSTON, TEXAS

W. T. Asbill

W. T. Asbill, P.E.

JULY 15, 2002

Revised April 11, 2003



STRESS ENGINEERING SERVICES (SES) IS A MULTI-DISCIPLINE ENGINEERING COMPANY THAT SERVES A VARIETY OF INDUSTRIES. ONE OF THE SERVICES PROVIDED BY SES IS A TEST FACILITY IN WHICH A VARIETY OF PRODUCTS ARE TESTED.

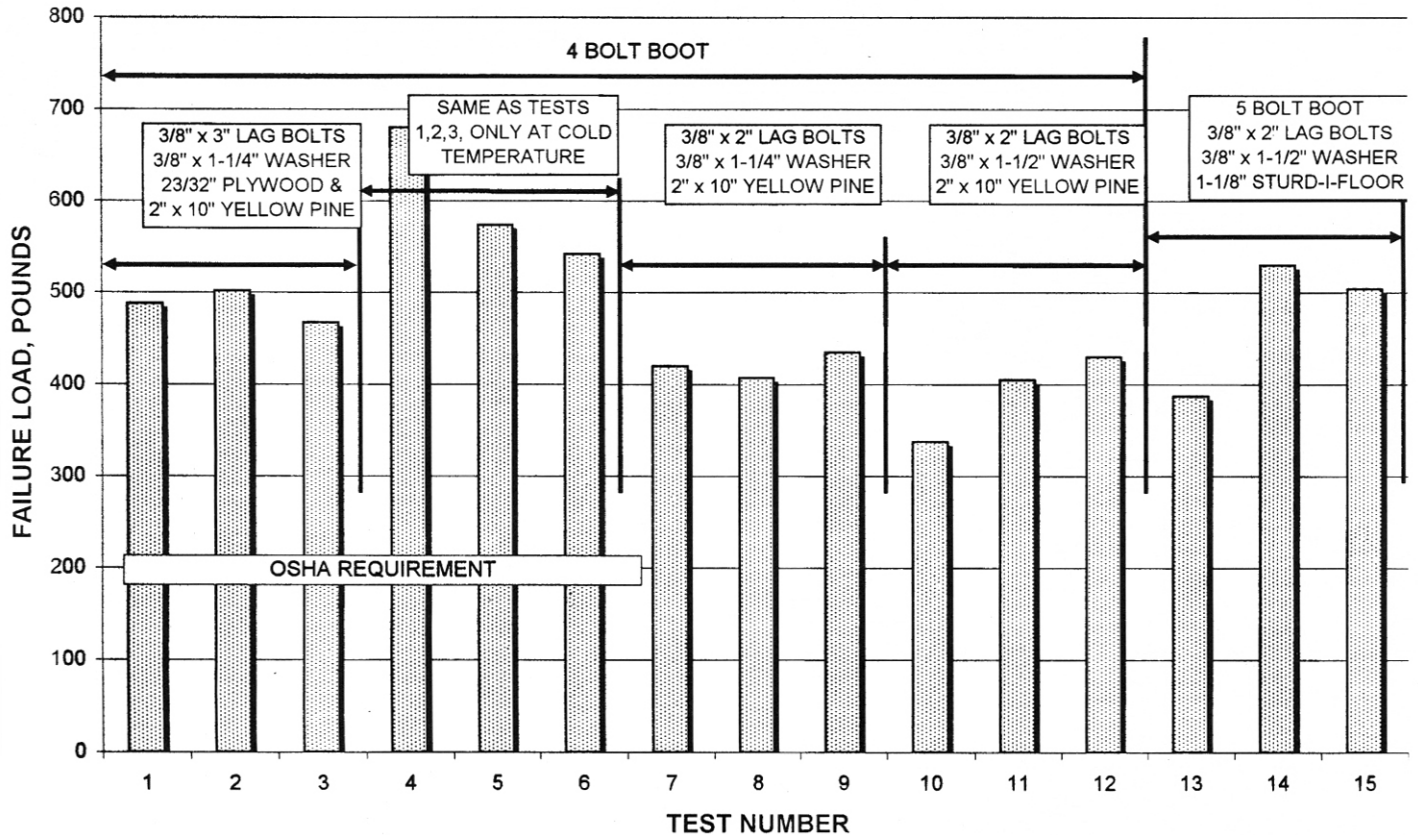
A SERIES OF TESTS WERE PERFORMED FOR SAFETY MAKER ON THEIR SAFETY BOOT®. THE PURPOSE OF THE TESTS WERE TO DETERMINE THE MAXIMUM LOAD THE BOOT AND FLOOR ASSEMBLY COULD WITHSTAND. THE TESTS WERE PERFORMED ACCORDING TO OSHA 1926.502 WHICH IS A CONSTRUCTION REGULATORY GUIDE FOR FALL PROTECTION GUARDRAIL SYSTEMS. THIS GUIDE REQUIRES THAT THE GUARDRAIL SYSTEM MUST BE ABLE TO WITHSTAND A FORCE OF 200 POUNDS AT A HEIGHT OF 42" ABOVE THE FLOOR.

A NUMBER OF TESTS WERE PERFORMED USING A VARIETY OF BOLTS AND SUBFLOORS. BELOW IS A TABLE AND PLOT THAT SUMMARIZES SOME OF THE TEST RESULTS. IN ALL TESTS SHOWN, THE SAFETY BOOT ASSEMBLY EXCEEDED THE OSHA REQUIREMENT OF 200 POUNDS FORCE. THE TESTS HAVE SHOWN THAT IT IS IMPORTANT TO HAVE THE CORRECT COMBINATION OF LAG BOLT SIZE, WASHER SIZE, NUMBER OF LAG BOLTS AND FLOOR MATERIAL THAT THE SAFETY BOOT IS ATTACHED TO. SOME FLOOR MATERIALS, SUCH AS PLYWOOD LESS THAN 1-1/8" THICK AND OSB, ARE INSUFFICIENT BY THEMSELVES AND MUST HAVE ADDITIONAL SUPPORT (2" PINE BOARD) FOR THE BOLTS TO PENETRATE. WITH THE ATTACHMENT COMBINATIONS SUMMARIZED, THE SAFETY BOOT EASILY EXCEEDED THE OSHA MINIMUM REQUIREMENT OF 200 POUNDS FORCE.

SUMMARY OF SELECTED SAFETY BOOT® STRESS TESTS PERFORMED BY SES

TEST NO. & TEMPERATURE	LAG BOLT	FENDER WASHER	SUBFLOOR MATERIAL	MAX. FORCE POUNDS
1 : Room	3/8" x 3"	3/8" x 1-1/4"	23/32" STURD-I-FLOOR Plywood & 2" x 10" Yellow Pine	488
2 : Room	3/8" x 3"	3/8" x 1-1/4"	23/32" STURD-I-FLOOR Plywood & 2" x 10" Yellow Pine	502
3 : Room	3/8" x 3"	3/8" x 1-1/4"	23/32" STURD-I-FLOOR Plywood & 2" x 10" Yellow Pine	467
4 : 0°F	3/8" x 3"	3/8" x 1-1/4"	23/32" STURD-I-FLOOR Plywood & 2" x 10" Yellow Pine	680
5 : -13°F	3/8" x 3"	3/8" x 1-1/4"	23/32" STURD-I-FLOOR Plywood & 2" x 10" Yellow Pine	574
6 : -15°F	3/8" x 3"	3/8" x 1-1/4"	23/32" STURD-I-FLOOR Plywood & 2" x 10" Yellow Pine	542
7 : Room	3/8" x 2"	3/8" x 1-1/4"	2" x 10" Yellow Pine	420
8 : Room	3/8" x 2"	3/8" x 1-1/4"	2" x 10" Yellow Pine	407
9 : Room	3/8" x 2"	3/8" x 1-1/4"	2" x 10" Yellow Pine	435
10 : Room	3/8" x 2"	3/8" x 1-1/2"	2" x 10" Yellow Pine	337
11 : Room	3/8" x 2"	3/8" x 1-1/2"	2" x 10" Yellow Pine	405
12 : Room	3/8" x 2"	3/8" x 1-1/2"	2" x 10" Yellow Pine	430
13 : Room	3/8" x 2"	3/8" x 1-1/2"	1-1/8" STURD-I-FLOOR Plywood	387
14 : Room	3/8" x 2"	3/8" x 1-1/2"	1-1/8" STURD-I-FLOOR Plywood	530
15 : Room	3/8" x 2"	3/8" x 1-1/2"	1-1/8" STURD-I-FLOOR Plywood	504

SAFETY BOOT® ENGINEERING STRESS TEST RESULTS





IMPORTANT INSTALLATION INFORMATION

All specifications and dimensions for building compliant railing systems given within these installation instructions are written to meet United States Federal OSHA requirements of 1926.502(b)(3), (4), and (5) which are subject to change. Individual U.S. States with their own State run OSHA agencies might have slightly different and varying specifications for guardrail requirements. Be sure to check and confirm if your particular state follows Federal OSHA or State OSHA regulations. Always follow the specific safety regulations for your state or region.

Make sure each person reads and understands these instructions prior to use. Failure to observe this warning could result in serious injury or death. Manufacturer assumes no liability in the event of improper installation, product misuse, or failure of wood construction substrate. Never alter or modify the Safety Boot or Tall Guardrail Brace. Make sure that the top rail and mid rail do not create a projection hazard.

ALWAYS CAREFULLY INSPECT EACH SAFETY BOOT AND TALL GUARDRAIL BRACE AND HARDWARE DAILY AND BEFORE EVERY NEW INSTALLATION. REPLACE IMMEDIATELY IF YOU NOTICE ANY SIGNS OF EXCESSIVE WEAR, DAMAGE, ABUSE OR PRODUCT DEGRADATION.

***OSHA Regulations (Standards - 29 CFR)**

Guardrail Systems - Non-Mandatory Guidelines for Complying with 1926.502(b) - 1926 Subpart M App B states that for wood railings:

... (1) For wood railings: Wood components shall be minimum 1500 lb-ft/in(2) fiber (stress grade) construction grade lumber; the posts shall be at least 2-inch by 4-inch (5 cm x 10 cm) lumber spaced not more than 8 feet (2.4 m) apart on centers; the top rail shall be at least 2-inch by 4-inch (5 cm x 10 cm) lumber, the intermediate rail shall be at least 1-inch by 6-inch (2.5 cm x 15 cm) lumber. All lumber dimensions are nominal sizes as provided by the American Softwood Lumber Standards, dated January 1970 . . .

FOR TECHNICAL INFORMATION PLEASE CONTACT:



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