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ANSI/AWI SMA 0643-2021 - Wood Stair, Handrail, and Guard Systems Standard



3.6 Installation

a) Installer shall obtain, review, and comply with manufacturer/supplier's documented instructions for installation. Product shall be securely attached. Contract documents regarding installation method(s) shall supersede manufacturer/supplier's directive unless design professional's approval to deviate is provided in writing.

b) Prior to commencement of installation, installer shall confirm the presence of wood blocking or metal strapping as indicated in contract documents. Installer shall confirm that field conditions and dimensions, including the elevation of landings and floors, are as indicated in the contract documents. If documented conditions are not met, written directives shall be obtained from the design professional prior to proceeding with installation.

c) It is not the responsibility of the installer to scribe or fit to walls, ceilings, floors, or openings whose plumb, level, flat, straight, or square values exceed tolerances specified in contract documents. In absence of specification, floor, wall, ceiling, and/or opening variations in excess of 6.4 mm [.250"] in 2438 mm [96"] of being plumb, level, flat, straight, square, or of the correct size are not acceptable for the installation of Product.

d) The types of joinery used shall be consistent throughout the stairway.

- e) Drywall and bugle head screws are not permitted for the installation of Product.
- f) Fasteners shall be concealed
- g) Fastener holes in pre-finished Product 4.8 mm [.188"] or smaller shall be filled by the installer with matching filler (putty) furnished by the manufacturer/supplier.
- h) Plugs are permitted provided they are sanded flush and compatible for color, grain, and grain direction.
- i) Fastener holes in Product larger than 4.8 mm [.188"] shall be filled by the installer with plugs furnished by the manufacturer/supplier.
- j) Installation shall comply with the Product's aesthetic grade as specified in the contract documents.
- k) Product shall be installed plumb and level within 3.2 mm [.125"] in 2438 mm [96"].
- l) When factory-finished Product is cut or modified to facilitate installation, the resulting unfinished core shall be sealed prior to installation.
- m) Tolerances listed for gaps and flushness apply to Product as installed.
- n) Unless otherwise indicated within this standard, Product shall be installed free of open joints, visible machine marks, cross sanding, tear-out, nicks, chips, scratches, layout lines, pencil lines, and/or natural defects exceeding the quantity and/or size limits defined in the AWI 300 - Materials Standard (latest edition).
- o) Plank (slab) platforms shall be installed with expansion joints to permit expansion and contraction.
- p) Tolerances for running trim not specified below shall be in accordance with the general tolerances indicated in AWI 0620 - Finish Carpentry/Installation (latest edition).
- q) All pre-manufactured cable components and/or hardware shall be installed in accordance with manufacturer/supplier's documented instructions for assembly and installation.
- r) All pre-manufactured glass components and/or hardware shall be installed in accordance with manufacturer/supplier's documented instructions for assembly and installation.
- s) Residual marks, including adhesive and filler residue on exposed or semi-exposed faces, shall be removed.

t) Areas of installation shall be left broom clean. Debris shall be removed and disposed of in containers provided by the contractor or construction manager.

3.6.1 Field Assembled Stair Components

a) Gap tolerances between exposed skirt boards, treads, and risers shall not exceed:

Premium	Custom	Economy
.8 mm [.031"]	1.2 mm [.047"]	1.6 mm [.063"]

b) Concealed stringer fasteners to wall shall be located no less than 50.8 mm [2"] from the bottom edge and no more than 610 mm [24"] on center measured horizontally.

3.6.1.1 Routed Stringers, Field Assembled

a) Shall be securely attached to the building structure.

b) Where fastened to wall, shall be securely attached to wall no more than 610 mm [24"] on center measured horizontally.

c) Treads and risers that are mortised into stringers shall be securely attached with wedges, glue, and/or mechanical fasteners.

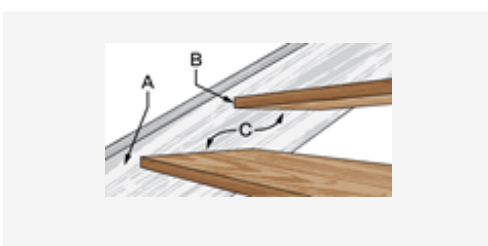
d) At open mortised (wedged) stringers, tread/riser/stringer joint gap shall be a maximum of .4 mm [.016"].

e) At nosing, joint gap shall be a maximum of .8 mm [.031"].

f) Mortise depth shall be a minimum of 6.4 mm [.250"] to facilitate securing of the wedge, tread, and riser.

g) At closed mortise (no wedge) stringers, tread/riser/stringer joint gap shall not exceed (See Figure 88):

Premium	Custom	Economy
.4 mm [.016"]	.8 mm [.031"]	1.2 mm [.047"]



3.6.1.2 Open Cut Stringers

- a) Shall be securely attached to underside of treads with glue blocks and/or pocket screws.
- b) Shall be mitered to risers with no visible end grain and no gap in the miter joints.
- c) At risers with transparent finish, miter joints shall be glued and fasteners shall be concealed whenever possible.

3.6.1.3 Stringer Transitions

- a) Shall allow for continuation, return, or termination of base cap (See Figure 100).



3.6.1.4 Risers

- a) Tread/top and bottom of riser joint gap shall not exceed:

Premium	Custom	Economy
.4 mm [.016"]	.8 mm [.031"]	1.2 mm [.047"]

- b) Gap tolerance shall be measured between tread and scotia when scotia is used.
- c) Shall be securely attached to the leading edge of the tread with mechanical fasteners and/or glue blocks and may include groove and rabbet joints.
- d) Shall be securely attached to the trailing edge of the tread with mechanical fasteners and may include groove and rabbet joints.

3.6.1.5 Treads

- a) Shall be securely attached to stringers and risers with mechanical fasteners, wedges, and/or glue blocks.
- b) At open rise stairs, plank treads shall be attached to stringers with mechanical fasteners.

3.6.1.6 Stair Carriages (Concealed Stringers)

- a) Shall be securely attached to the staircase assembly.
- b) Shall be securely attached to the building structure.

3.6.2 Stairs, Shop Assembled

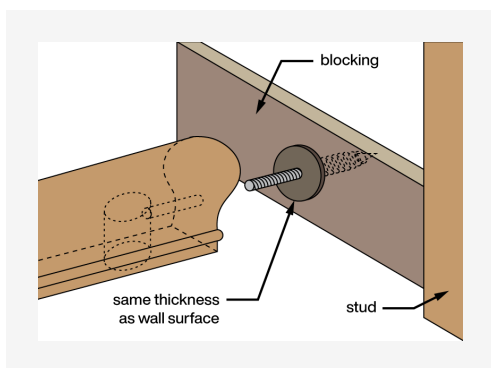
- a) Stair units shall be wrapped to protect stringer, riser, and tread exposed surfaces from handling and jobsite traffic when installation prior to application of wall finish is required.

3.6.2.1 Attachment to the Structure/Stringers, Concealed

- a) Stringers shall be securely attached to the building structure with fasteners that are not subject to withdrawal. When installed prior to wall finish, stringers shall be spaced off the framing as required.
- b) Fasteners shall be located no less than 50.8 mm [2"] from the bottom edge and no more than every 610 mm [24"] on-center measured horizontally.
- c) Ends of stringers shall be supported by the floor structure so as to prevent splitting using ledgers and/or mechanical connectors as necessary. The ends of stringers not supported by walls shall be connected to prevent rotation at the connection.
- d) The top and bottom riser heights shall be consistent with the other risers of the flight and the landing tread shall be flush with the finished floor at the top of the flight.
- e) Multiple flights in a stairway shall be positioned to align with stairway and/or building structure(s) and any guard and/or handrail requirements in accordance with the approved manufacturer/supplier submittals.

3.6.3 Guard and Handrail Installation

- a) Product shall be installed in accordance with structural and aesthetic requirements set forth within this standard.
- b) Guards and/or handrails shall be securely attached to remain secure and prevent compression of wall finish material (e.g. gypsum wallboard, drywall, etc.) (See Figure 99).



3.6.3.1 Newels

a) At connections to stair components other than rails, gaps shall not exceed:

Premium	Custom	Economy
.8 mm [.031"]	.8 mm [.031"]	1.6 mm [.063"]

b) At newel to rail, gaps shall not exceed 20 percent of the joint perimeter and gaps shall not exceed:

Premium	Custom	Economy
.4 mm [.016"]	.4 mm [.016"]	.8 mm [.031"]

3.6.3.2 Handrails

a) All rail to rail and rail to fitting joints shall be sanded and/or sculpted for seamless profile alignment to the following flushness tolerances:

Premium	Custom	Economy
.4 mm [.016"]	.4 mm [.016"]	.8 mm [.031"]

b) At rail to newel/rosette/wall termination, rail to rail, rail to fitting, gaps shall not exceed 20 percent of the joint perimeter and gaps shall not exceed:

Premium	Custom	Economy
.4 mm [.016"]	.4 mm [.016"]	.8 mm [.031"]

3.6.4 Fittings

a) Visible fasteners are not permitted unless specified.

b) Countersunk metal splines are permitted, provided the slots have been filled and sanded flush.

3.6.4.1 Fittings, Transparent Finish

a) Grain and color, unless otherwise specified, shall be:

Premium	Custom	Economy
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Well-matched for grain and color

Compatible for grain and color

Compatible for color

b) Finger joints are:

Premium	Custom	Economy
Not permitted	Not permitted	Permitted at lower plys of vertical drops of goosenecks

3.6.4.2 Fittings, Opaque Finish

a) At opaque finish, fittings shall be closed-grained wood.

b) Plugs at joints are permitted provided they are sanded flush.

3.6.5 Guard, In-Fill

3.6.5.1 Wood Balusters and Wood In-Fill Joinery, Transparent and Opaque Finish

a) At round end (no shoulder) in drilled holes, gaps shall not exceed:

Premium	Custom	Economy
.8 mm [.031"]	.8 mm [.031"]	1.6 mm [.063"]

b) At round or square end (with shoulder), where not in plow, gaps shall not exceed:

Premium	Custom	Economy
.4 mm [.016"]	.8 mm [.031"]	.8 mm [.031"]

c) At square end in plow with fillet, gaps shall not exceed:

Premium	Custom	Economy
.8 mm [.031"]	.8 mm [.031"]	1.6 mm [.063"]

d) All joints in wood in-fill panels and panel systems shall be smooth and flush.

3.6.5.2 Balusters and Newels, Metal

a) Metal balusters and newels with shoes shall have:

Premium	Custom	Economy

Epoxy shoe centered on baluster or newel and fit to match <u>pitch</u> of stair	Epoxy shoe centered on baluster or newel and fit to match pitch of stair	Shoes at the option of the manufacturer/ supplier
Set screws not permitted	Set screws not permitted	Set screws are permitted at the option of the manufacturer/ supplier

b) Metal balusters and newels without shoes shall be:

Premium	Custom	Economy
Mortised to fit end of baluster or newel	Mortised to fit end of baluster or newel	At the option of the manufacturer/supplier

3.6.5.3 Cable In-Fill

- a) Exposed cable ends are not permitted.
- b) All sections of cable in-fill shall be tensioned equally.
- c) Where cables pass through wood posts at vertical or horizontal transitions, post protectors shall be used.
- d) Spreader bars shall be spaced equally and securely attached.
- e) Bushings shall be used to isolate reactive materials and prevent electrolysis.

3.6.5.4 Glass In-Fill/Guards

- a) Hardware and glass for glass infill/guards shall be installed per manufacturer/ supplier's specifications.

3.6.5.5 Metal In-Fill/Guards

- a) At round end in drilled holes, gaps shall not exceed:

Premium	Custom	Economy
.8 mm [.031"]	.8 mm [.031"]	1.6 mm [.063"]

- b) Where not in plow and without shoes, gaps shall not exceed:

Premium	Custom	Economy
1.6 mm [.063"]	1.6 mm [.063"]	2.4 mm [.094"]

c) Where in plow, gaps shall not exceed:

Premium	Custom	Economy
1.6 mm [.063"]	1.6 mm [.063"]	2.4 mm [.094"]

d) Metal in-fill balusters with shoes shall have:

Premium	Custom	Economy
Epoxy shoe centered on baluster or newel and fit to match pitch of stair	Epoxy shoe centered on baluster or newel and fit to match pitch of stair	Shoes at the option of the manufacturer/supplier
Set screws not permitted	Set screws not permitted	Set screws are permitted at the option of the manufacturer/supplier

e) Metal in-fill balusters without shoes shall be:

Premium	Custom	Economy
Mortised to fit end of baluster or newel	Mortised to fit end of baluster or newel	Fastened in placement at the option of the manufacturer/supplier

3.6.6 Well-Hole Trim

a) Outside corners shall be mitered.

b) Moulded components at inside corners shall be:

Premium	Custom	Economy
<u>Coped</u>	Coped	Mitered or coped

c) S4S at inside corners shall be butted.

d) Joinery of well-hole trim requires:

Premium	Custom	Economy
Exposed trimmed ends shall be miter returned	Exposed trimmed ends shall be profiled or miter returned	Exposed trimmed ends at the option of the installer

Multiple joints in running trim shall not be within 1219 mm [48"] of another joint in the run, including corners

Multiple joints in running trim shall not be within 914 mm [36"] of another joint in the run, including corners

Multiple joints in running trim shall not be within 610 mm [24"] of another joint in the run, including corners

e) Fasteners and fastening include the use of finish nails, trim screws, staples, pins, and/ or construction adhesive for inconspicuous fastening. Staples with a crown exceeding 4.8 mm [.188"] wide are not permitted.

f) Exposed fasteners shall be inconspicuous.

g) Exposed fasteners shall be countersunk through the exposed material surface, kept to a minimum, and shall be:

Premium	Custom	Economy
Set in <u>q</u> uirks and <u>r</u> eliefs where possible	Set in quirks and reliefs where possible	Fastened in placement at the option of the installer

3.6.6.1 Nosing, Well-Hole

a) Landing tread shall be installed flush with flooring at all flight exits.

b) Shall be installed in accordance with approved manufacturer/supplier submittals.



