



Built around you.®

Fundamentals of Door Installation

Course Description

This program provides a general overview of best-practice installation procedures for wood and clad/wood doors, including a discussion on opening and unit preparations. ***“Surface Barrier” and “Membrane Drainage System”*** wall / fenestration interface design will be presented.

Learning Objectives

After participating in this program you will be able to:

- Identify varying types of wall conditions
- Explain installation methods for wood and aluminum clad Doors
- Understand basics of ASTM E-2112-07 Standards for Window and Door Installation
- Describe anchoring methods for residential wood and wood clad doors
- Specify for the most successful door installation

Copyright Notice

- This presentation is protected by U.S. and International copyright laws. Reproduction and distribution of the presentation without written permission of the sponsor is prohibited.
- © Marvin Windows and Doors

ASTM E2112-07



Designation: E 2112 – 07

Standard Practice for Installation of Exterior Windows, Doors and Skylights¹

This standard is issued under the fixed designation E 2112; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last approval. A superscript letter (Q) indicates an editorial change since the last revision or approval.

INTRODUCTION

This document is intended to provide technical guidance to organizations that are developing training programs for installers of fenestration units in low-rise residential and light commercial structures. The majority of fenestration units selected for installation in these types of structures are certified as meeting specified performance characteristics in standardized laboratory testing. Experience indicates, however, that the performance of fenestration installations is frequently significantly inferior to the performance of the manufactured units in laboratory testing. Installation of fenestration units can significantly influence in-service performance.

The requirements promulgated in this practice have, by consensus, (of individuals with specialized knowledge concerning installation of fenestration units) been identified as necessary to ensure that as-installed performance is roughly equivalent to performance in laboratory testing. The task group responsible for development of this practice recognizes that building owners sometimes, accept as adequate, in-service performance of fenestration installations that are significantly inferior to those of the units in laboratory testing. This practice is not intended for use in such circumstances, where owner expectations are modest. The intent of this practice is to provide guidance to those concerned with ensuring that as-installed performance is comparable to the capabilities of the units installed for a solid majority of installations.

A particularly noticeable behavior that indicates deficiencies in installation is rainwater leakage. Rainwater leakage has been the leading reason for dissatisfaction of building owners with performance of fenestration installations. For this reason, this practice places greater emphasis on preventing or limiting rainwater leakage than on any other single performance characteristic.

This practice emphasizes that the water-shedding surfaces of fenestration units must be adequately integrated with adjacent water-shedding surfaces of the building envelope. It does not, however, attempt to promulgate requirements for water-shedding surfaces of building envelopes other than those interfacing with fenestration units. The standard assumes that the basic design of the building's water-shedding system is adequate, that is, that either (1) there is a high probability that the outermost building surface will dependably prevent all water entry, or (2) the building envelope incorporates an effective concealed barrier that will dependably prevent further intrusion of incidental water that breaches the outermost surface. The practice further assumes that fenestration units can be dependably sealed to, and integrated with, at least one of these surfaces. If the basic design of the building's water-shedding system is inadequate, or does not allow for reliable integration of fenestration units into it, competent installation of the units is unlikely to nullify these deficiencies.

1. Scope

1.1 This practice covers the installation of fenestration products in new and existing construction. For the purpose of

this practice, fenestration products shall be limited to windows, sliding patio-type doors, swinging patio type doors, and skylights, as used primarily in residential and light commercial buildings.

1.2 This practice assumes that the installer possesses basic woodworking skills and an understanding of wall and roof construction, sheet metal work, and joint sealing practices.

1.3 This practice attempts to instruct and familiarize the installer with the concepts of both Barrier Systems and Membrane/Drainage Systems, in order to ensure the continuity

¹ This practice is under the jurisdiction of ASTM Committee D06 on Performance of Buildings and is the direct responsibility of Subcommittee B06.51 on Performance of Windows, Doors, Skylights and Curtain Walls. Current edition approved Feb. 1, 2007. Published March 2007. Originally approved in 2001. Last previous edition approved in 2001 as E 2112 – 01.

- Standard Practice for Installation of Exterior Doors, Windows, and Skylights

Manufacturer's Recommended Installation Instructions

General Installation Instructions



(Need to correct sill condition prior to door installation)

1. The key to proper operation is squaring the door frame in relation to the sill.
2. A GOOD INSTALLATION has a FLAT sill that is also LEVEL.
3. The BEST INSTALLATION requires a FLAT and LEVEL sill and a SQUARE and PLUMB opening.

Correcting an out of square opening requires shimming beneath the sill and/or at the corners. These instructions assume an opening is constructed for the BEST installation with a flat and level sill and a square opening.

These instructions are applicable for the following wood and clad products:

Ultimate Inswing French Door

Ultimate Sliding French Door

2 1/4" Inswing French Door

Ultimate Outswing French Door

Sliding Patio Door

2 1/4" Outswing French Door

Ultimate Inswing French Door Transom

Ultimate Inswing French Door Direct Glaze Transom

1 3/4 and 2 1/4" Commercial Door

ABSTRACT: Please read these instructions in their entirety before beginning to install your Marvin window product. These installation instructions demonstrate the installation of a Marvin door in new wood frame construction using an industry approved water management system. For installation using other construction methods, such as remodeling, replacement, and recessed openings refer to ASTM E2112-07, "Standard Practice for Installation of Exterior Windows, Doors and Skylights," for installation suggestions. The same information for ASTM E2112 can be found on the ASTM website, www.astm.org. Regional standard practices, environmental conditions, and codes may vary and supersede the procedures contained within. The responsibility for compliance is yours: the installer, inspector, and owner(s).

Recommended Sill leveling practice

Leveling the Sill Window and Door Supplemental Instruction



To meet published performance standards, ease of installation and optimum product operation, a flat and level surface across the entire span is required. (within 1/16" (1.5 mm))

Tools and Supplies Required

- Speed square
- Self-leveling horizontal and vertical laser
- Level (appropriate length for the opening)
- 5 1/2" (139 mm) wide strips of adhesive-backed sill shim*

* Marvin recommends the use of WinterGuard™ or similar as the adhesive-backed sill shim.

Inspect the Opening

For detailed weather barrier or building paper installation procedures see the online RO (Rough Opening) prep instructions. Inspect the opening to ensure that it has been properly sized for your unit. If not, make the necessary repairs and adjustments. Thoroughly clean the sill plate of dust and debris.

Determining High Point of Sill Plate

1. Place a self-leveling laser so that the horizontal beam is 1 – 3 inches (25-76 mm) above the RO sill plate. Place a speed square in the center of the opening and make a pencil mark on the laser beam. Run the square along the sill plate to find the high point. See figure 1a, b and c.

NOTE: Sill plates with a variance more than 1/16" (1.5 mm) should be leveled prior to proceeding with installation.

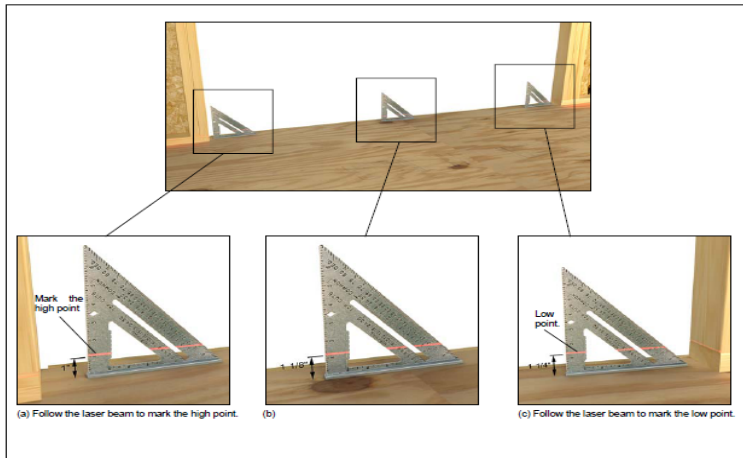


Figure 1 Use a speed square and laser to determine the sill's high/low point. Door RO shown but steps apply to window RO as well.

2013-03-27
19914735

1

Leveling the Sill
Window and Door Supplemental Instruction

Level the Sill

1. Place the sill shim* at the low point and move the speed square until level with high point of the sill. Cut and remove backing and secure sill shim to the sill plate. See figure 2a.
2. Place successive strips of sill shim on the sill until level. See figure 2b and figure 2c.
3. Install pan flashing per manufacturers instructions.
4. Dry fit the door/window to ensure proper fit. (1/4"-1/2" (6-13 mm) space between the RO and unit frame.) Use a 6 foot level to confirm the sill is within 1/16" (1.5 mm) of level across the entire span. See figure 2d and figure 2e.

* Marvin recommends the use of WinterGuard™ or similar as the adhesive-backed sill shim.

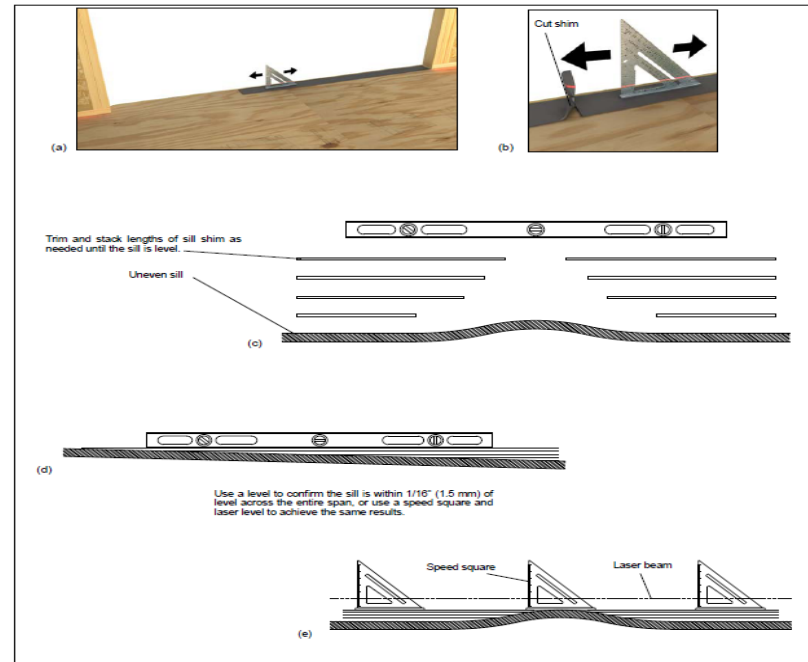


Figure 2 Door RO shown but steps apply to window RO as well.

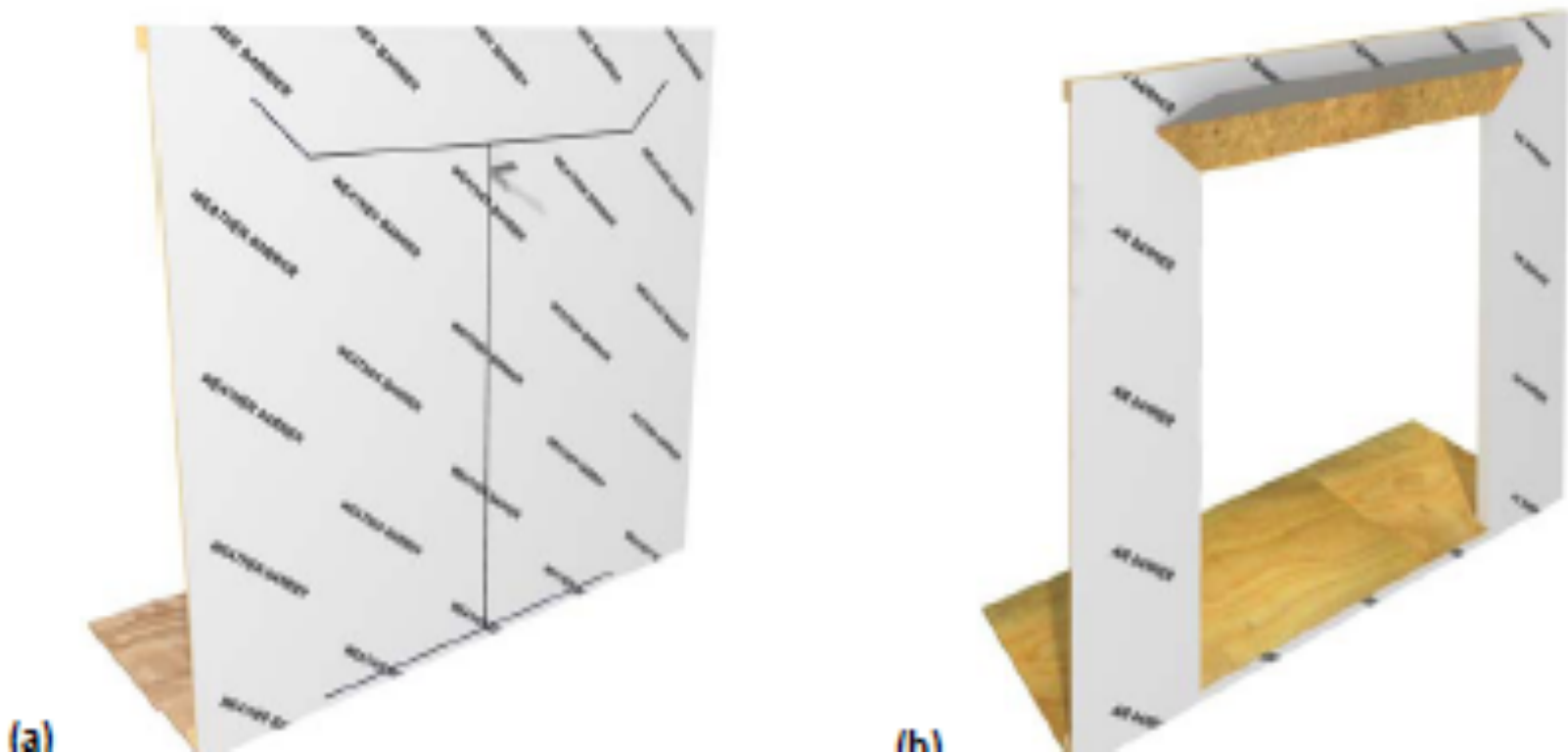
2013-03-27
19914735

2

Leveling the Sill
Window and Door Supplemental Instruction

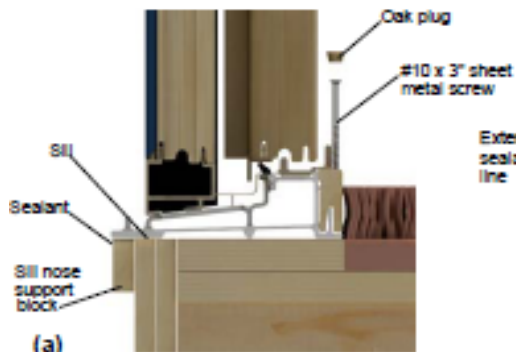
A1 method of installation Membrane Drainage System

Air Barrier Applications (A1 Method)



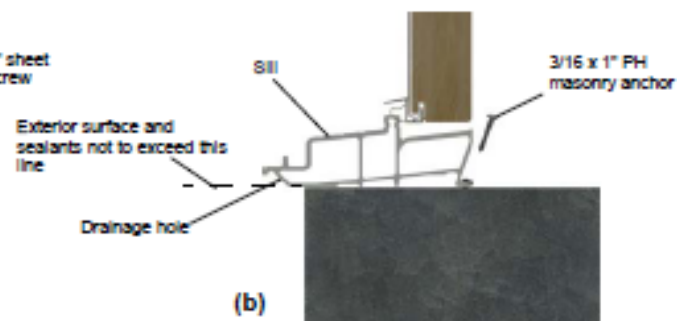
Sill Anchoring recommendations

Wood Frame Construction



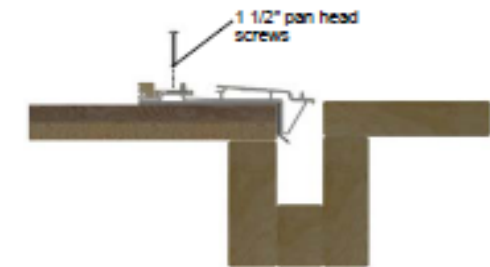
(a) Pre-2011 Platform Sill

Masonry Application



(b) 2012 Swinging Door Sill

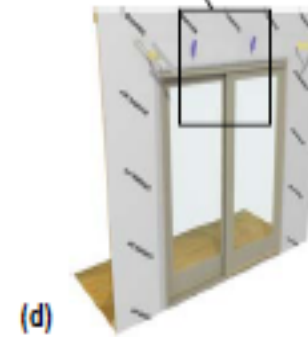
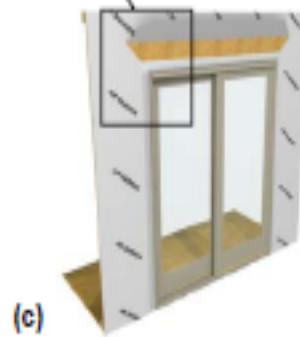
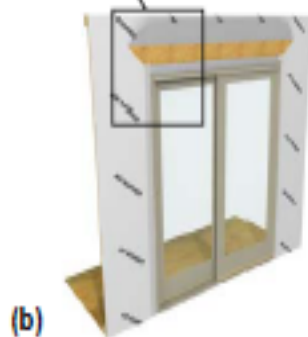
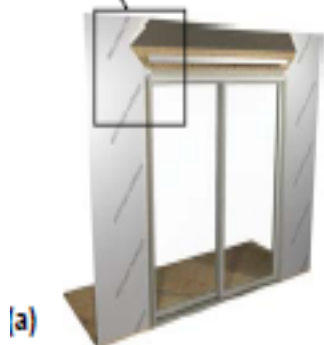
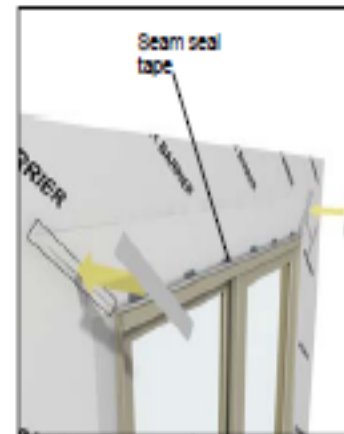
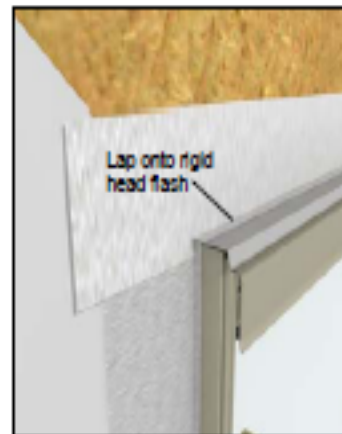
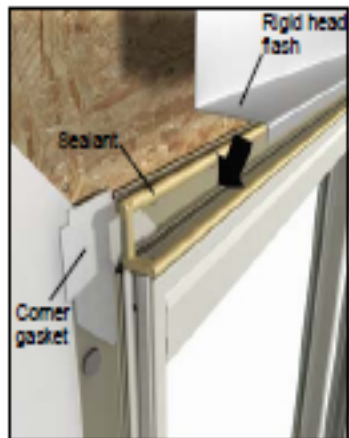
Wood Frame Construction
(also applies to Masonry Application)



(c)

Sliding Door Low Profile Sill

Installation and Flashing Details



Abstract Information

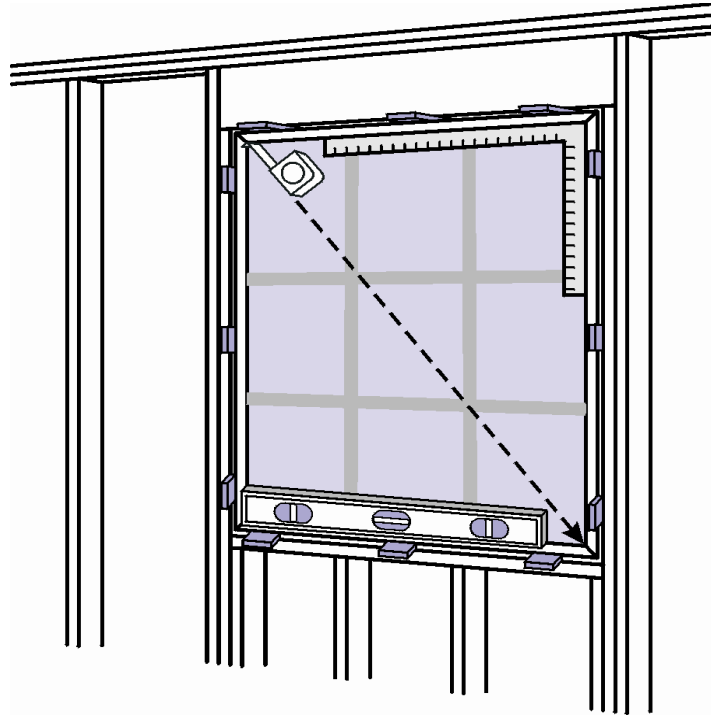
ABSTRACT: Please read these instructions in their entirety before beginning to install your Marvin window product. These installation instructions demonstrate the installation of a Marvin aluminum clad window in new wood frame construction using an industry approved water management system. For installation using other construction methods, such as remodeling, replacement, and recessed openings refer to "ASTM E2112-01, Standard Practice for Installation of Exterior Windows, Doors and Skylights," for installation suggestions. Information for ASTM E2112 can be found on the ASTM website, www.astm.org.

For product specific issues, service instructions and other field service guides, refer to the Marvin Service Manual, visit our website at www.marvin.com, or contact your Marvin representative.

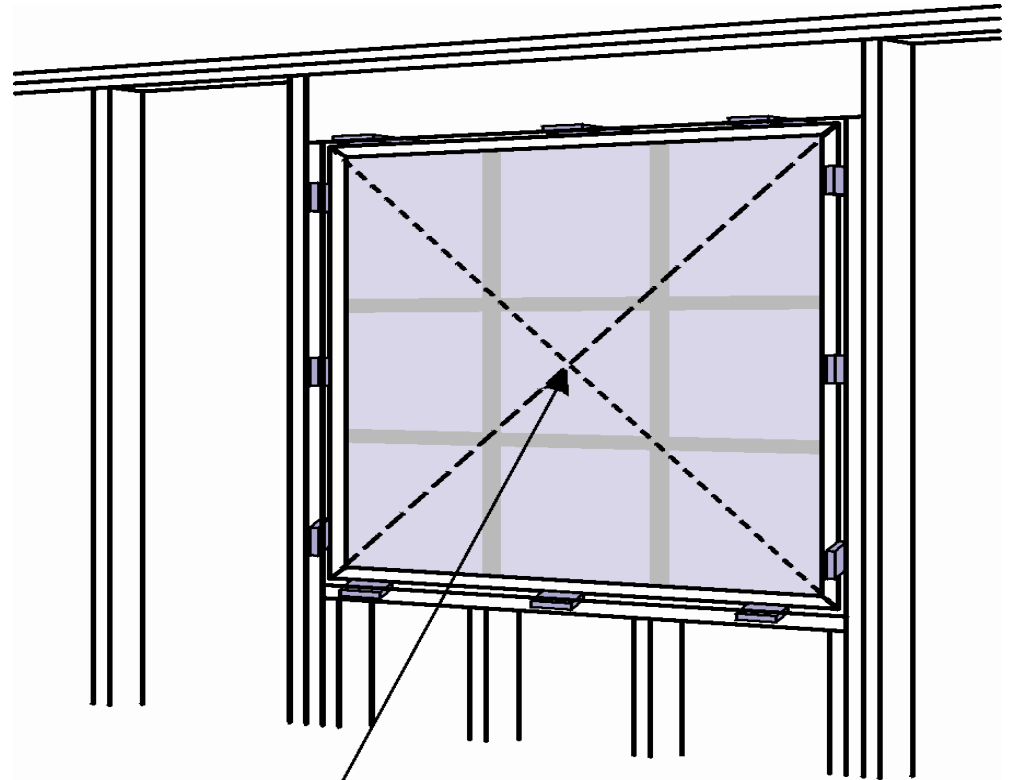
Regional standard practices, environmental conditions, and codes may vary and supersede the procedures contained within. The responsibility for compliance is yours: the installer, inspector, and owner(s).

The procedures within these instructions are consistent with those used in testing to achieve the advertised DP rating.

Level - Plumb - Square - True



LEVEL, SQUARE, AND PLUMB

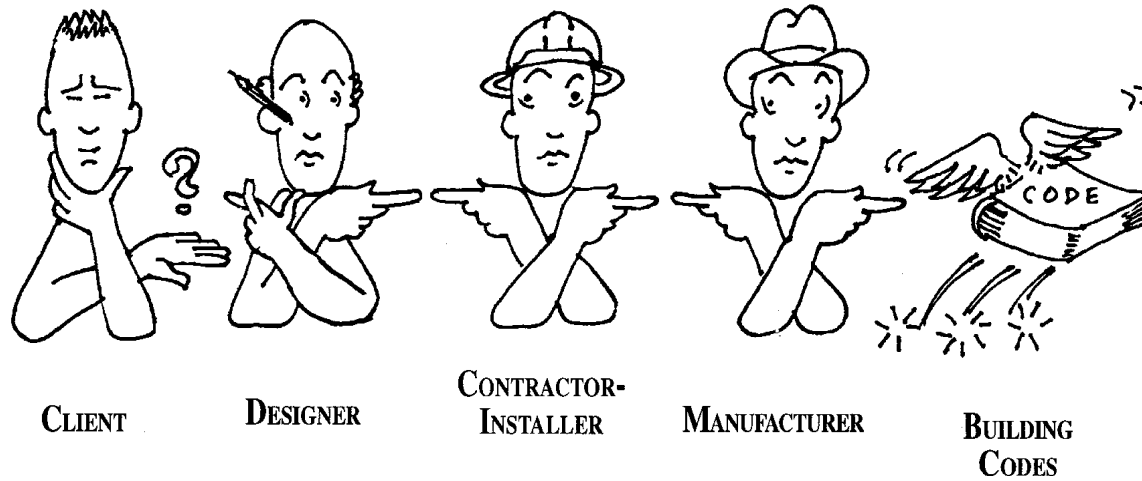


Strings Touch If "True"

TRUE

Window and Door Installation

- Who's Responsible?



This presentation pertains to the following types of window installations of Wood and Aluminum Clad/Wood Windows and Doors in:

- 1) Surface Barrier Wall condition
- 2) Membrane Drainage System

Surface Barrier Wall

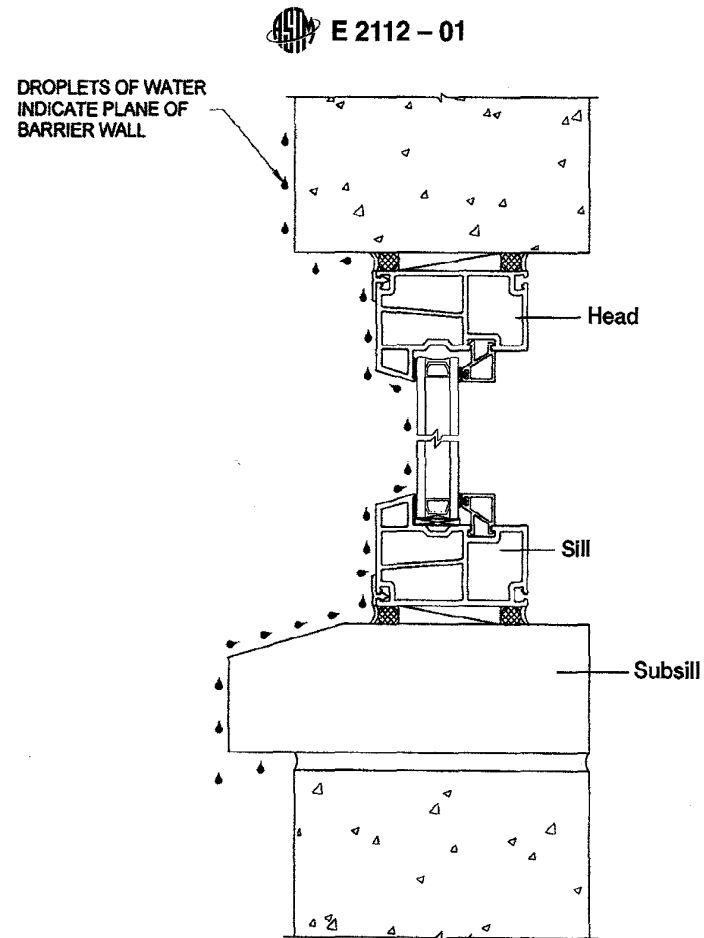


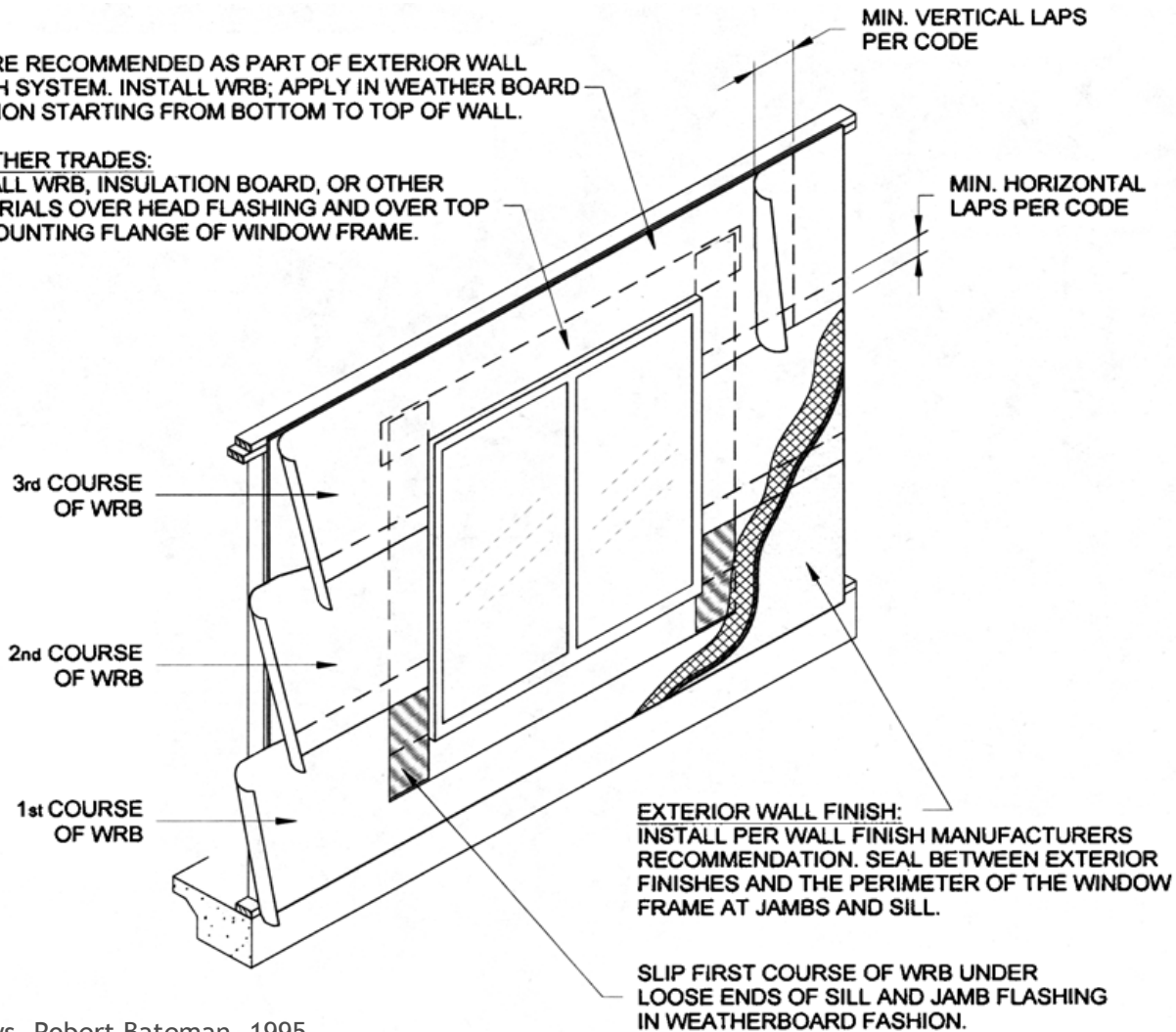
FIG. 11 Surface Barrier Wall (Head and Sill Detail)

Reprinted, with permission, from ASTM E2112-07 Standard Practice for Installation of Exterior Windows, Doors and Skylights, copyright ASTM International (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM, www.astm.org

Membrane Drainage System

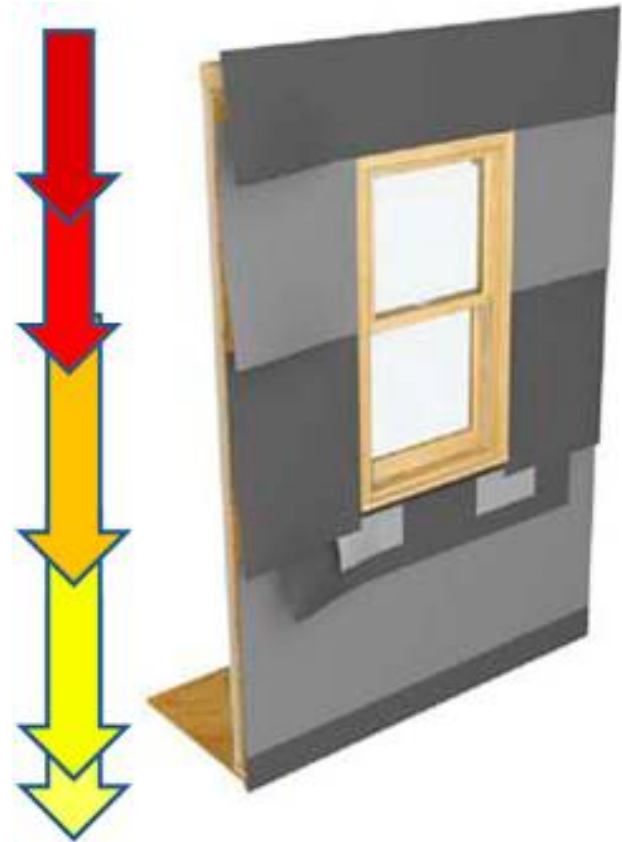
WHERE RECOMMENDED AS PART OF EXTERIOR WALL FINISH SYSTEM. INSTALL WRB; APPLY IN WEATHER BOARD FASHION STARTING FROM BOTTOM TO TOP OF WALL.

BY OTHER TRADES:
INSTALL WRB, INSULATION BOARD, OR OTHER MATERIALS OVER HEAD FLASHING AND OVER TOP OF MOUNTING FLANGE OF WINDOW FRAME.



Membrane Drainage System

- All wraps (Weather Resistant Barriers, **WRB**) and flashings are installed in a weather-board fashion.
- This allows the building to shed any water that may penetrate through the exterior cladding (siding, stucco, shingles, etc.) out the bottom of the wall.



Membrane Drainage System(s)

- Building Paper-
 - Typically 36” wide rolls of Asphalt Impregnated Paper
 - Known to ‘self-seal’ at fastener penetrations
 - Temperature resistant
- Air Barrier-
 - Building wrapped in ‘Cocoon’
 - Synthetic material
 - Breathable
 - Non-porous, except at penetrations

Flashing Methods (for Membrane Drainage Systems)

- Method “A” - Jamb Flashing applied **AFTER** door
- Method “B” - Jamb Flashing applied **BEFORE** door
- Method “A1” -WRB installed **BEFORE** Door, Jamb Flashing applied **AFTER** Door
- Method “B1” -WRB installed **BEFORE** Door Jamb Flashing applied **BEFORE** Door

Pan Flash

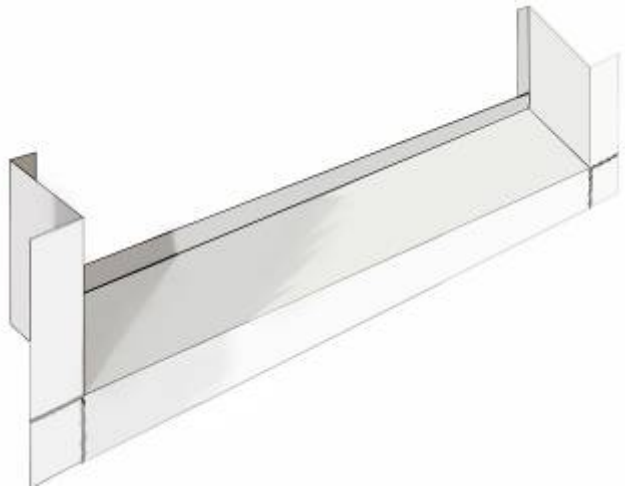
- **Install Pan Flashing -**

The ASTM E2112 -07 standard provides 5 methods of sill pan flashing that are well adopted for various types of openings, wall types and products.

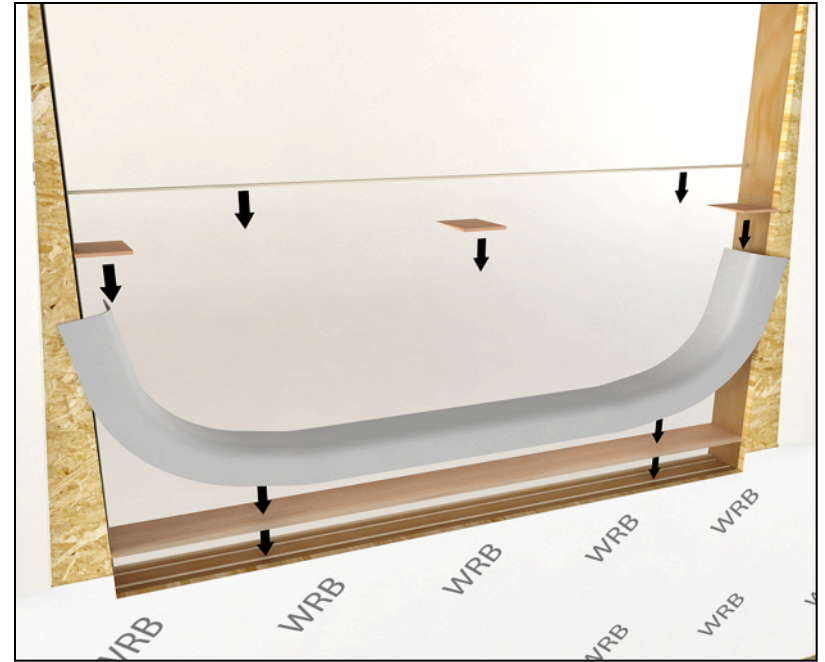
Pan Flashing – *continued*

- Type I - ***Rigid Sheet -1-Piece or Multiple-Piece Pan Flashing.***
Typically fabricated from sheet metals, plastics or composite.
Joints are continuously soldered or chemically or thermally welded.
- Type II - ***Rigid Sheet, Multiple Pieces Pan Flashing,*** assembled on site, lapped and joined with sealants.
- Type III - ***Flexible Membrane Pan Flashings*** are ‘Formed-in-place’ from one or multiple pieces of Self-Adhering Membrane (SAF) materials.
- Type IV - ***Combination Pan Flashings*** are assembled from a variety of rigid, flexible, and self-adhering membrane materials.

Pan Flashing

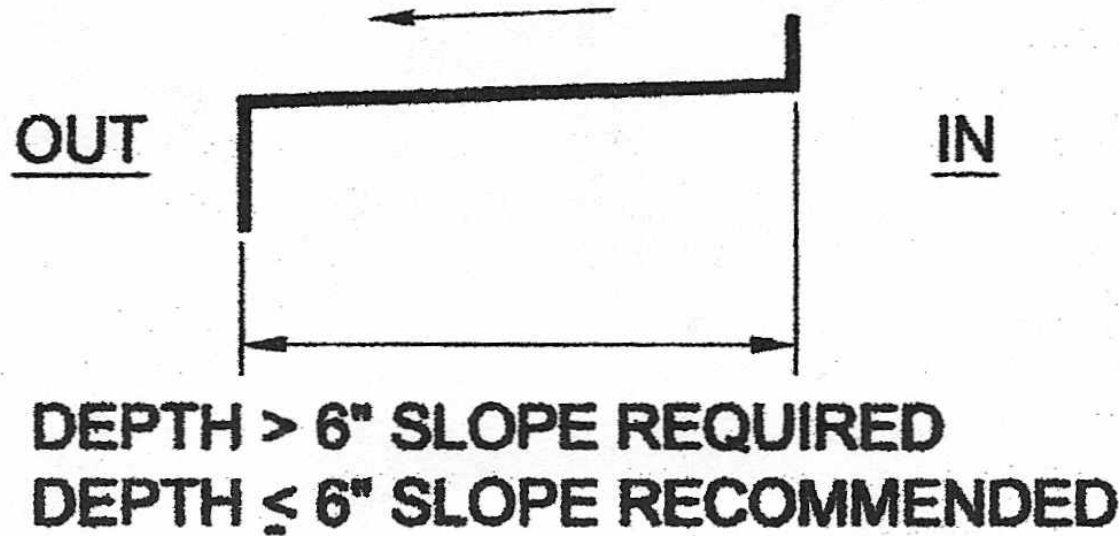


Type I or Type II
Rigid Sheet



Type III Flexible
Membrane

Pan Slope



Reprinted, with permission, from ASTM E2112-07 Standard Practice for Installation of Exterior Windows, Doors and Skylights, copyright ASTM International (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM, www.astm.org

Anchoring Windows and Doors



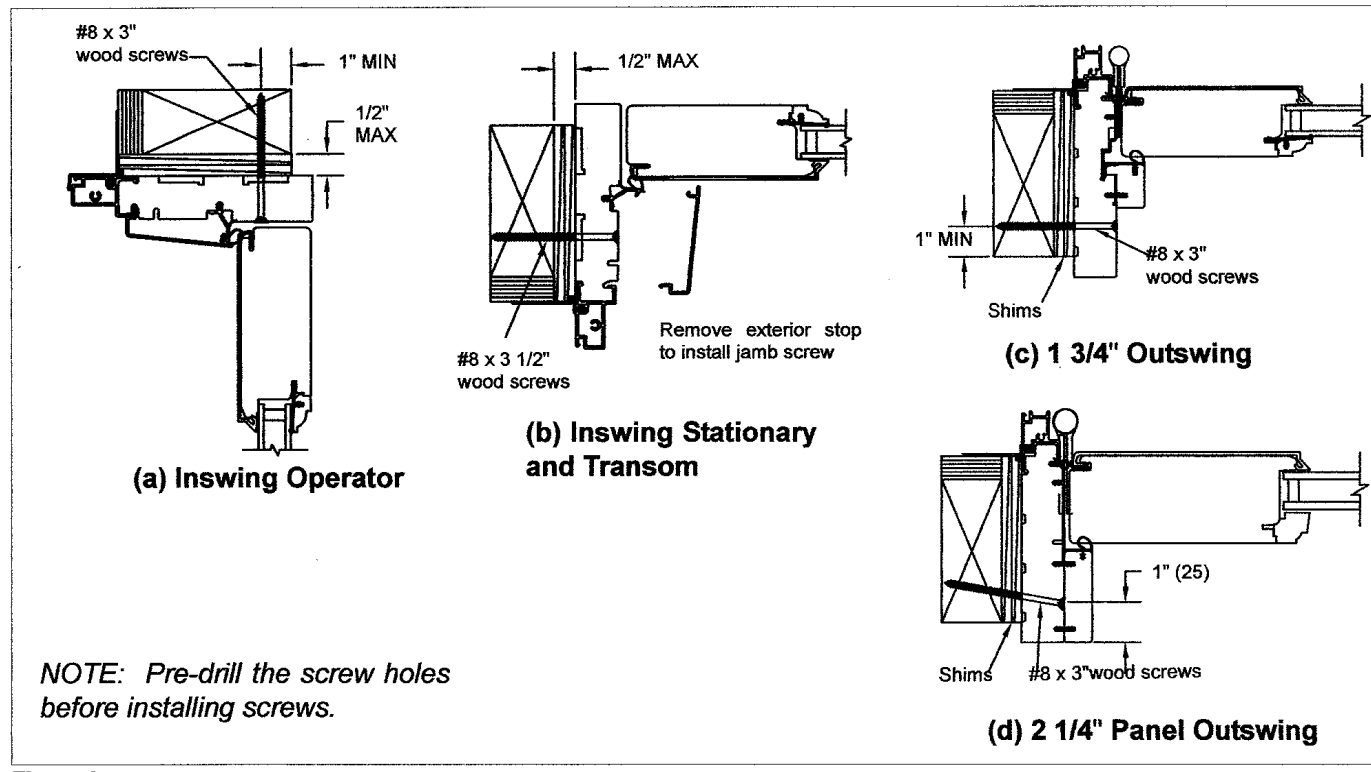
Anchoring: Through Frame

Removable Clad or Wood Jamb/Head Covers-
French Door



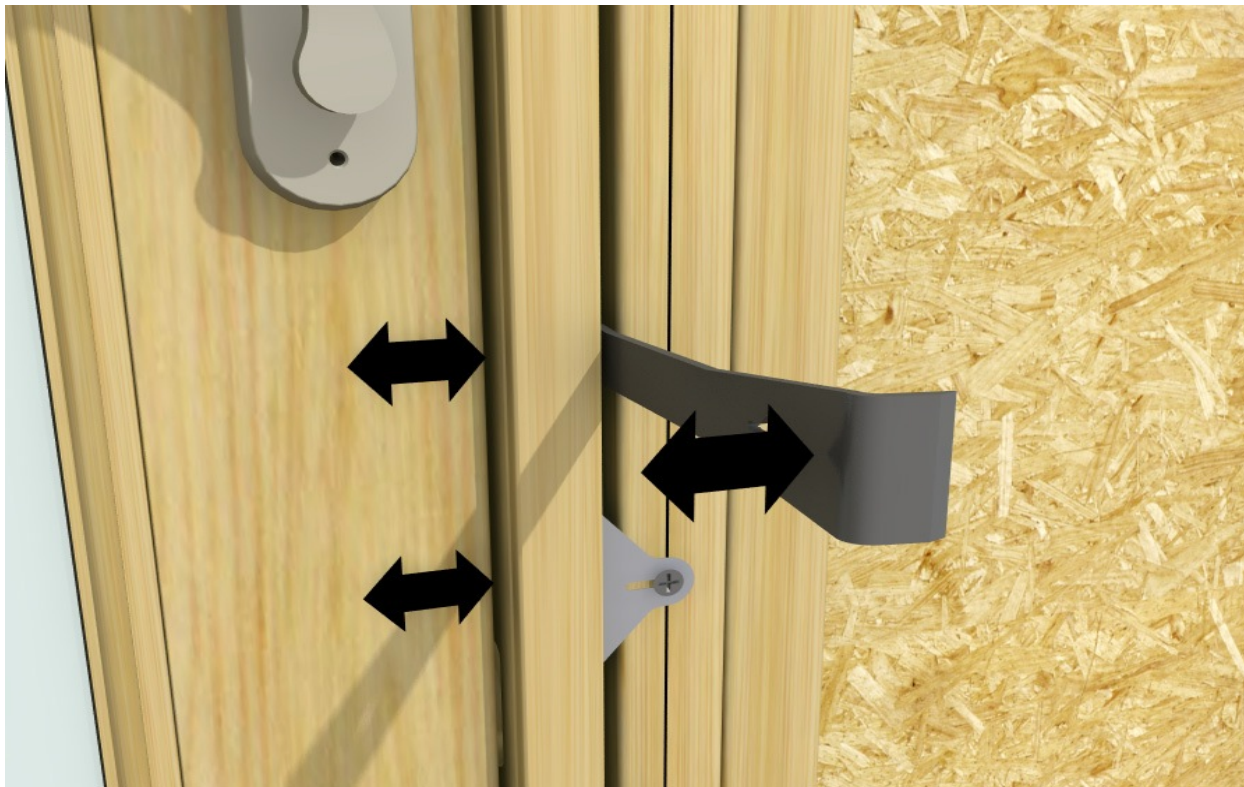
Anchoring: Through Frame

- Through-Frame anchoring Door Head, Side Jambs



Door Anchoring Guide

- Supplied by Manufacturer - to assist installation



Anchoring: Through Frame

- It is **IMPERATIVE** to install **LONG SCREWS** through minimum of (1) hole at Each of Top (2) Hinges



Anchoring” Through Frame

Anchor-Screw installed at “Contact Point” -on Door Strike



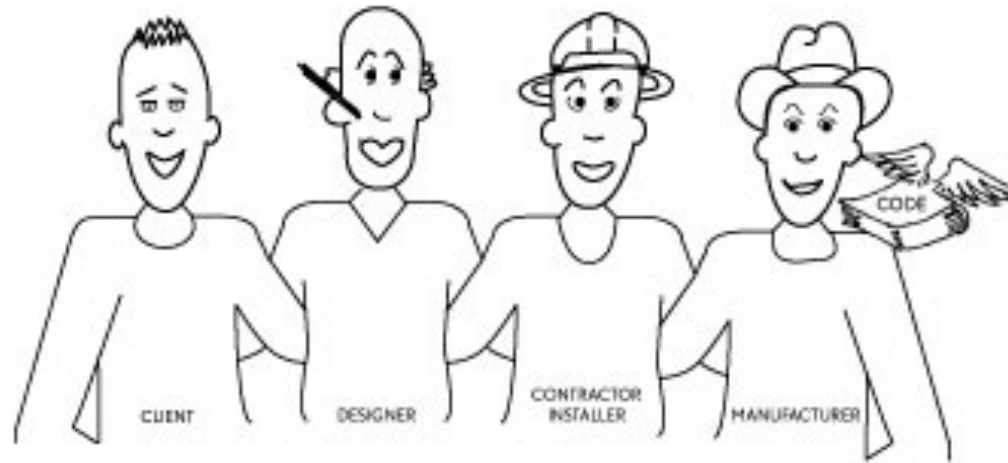
How to Specify for the most Successful Door Installations *continued*

- Specify Installation:
 - Wall Condition Type (i.e. Membrane Drainage System or Surface Barrier)
 - Installation Method (i.e. A,B,A1, B1)
 - Refer to Manufacturers' recommendations as minimum. If not available refer to ASTM E-2112-07
 - Specify Products that offer Removable Interior Stops, Covers - for Anchoring from Inside-Out
 - Specify Installation to be done by AAMA Installation Masters Certified Installers
- Specify trusted brands only
- Request Shop Drawings

How to Specify for the most Successful Door Installations *continued*

- Request Samples
- Request Mock-up
- Allow for proper rough opening provisions
- Compatible materials
- Meet with Reps!

DID THAT HELP?



Group Hug

Questions?

Thank You for Attending!

Credits

- AAMA Installation Masters certification program. See <http://www.installationmastersusa.com> for further information
- ASTM E2112-07 Standard Practice for Installation of Exterior Windows, Doors and Skylights, © ASTM International (ASTM). A copy of the complete standard may be obtained from ASTM at www.astm.org
- Robert Bateman, AIA, Simpson Gumpertz & Heger, Inc., San Francisco, CA
- Keith Sternal, Marvin Windows and Doors
- Eric Klein, Marvin Windows and Doors