STONE

BRICK

ELDORADO STONE®

WELCOME TO ELDORADO STONE

Where Believability Matters. There is a unique intersection that exists between nature and design, where the artists of our world engage in creating the spaces where we work, live and entertain. It is at this intersection where Eldorado Stone's undeniable passion lives. A commitment to authenticity…*where believability matters.* Every product hand-crafted by artisans to a level of precision, rarely seen. What memorable space will you create?

ELDORADO STONE®

Silver Lining Stacked Stone

TABLE OF CONTENTS

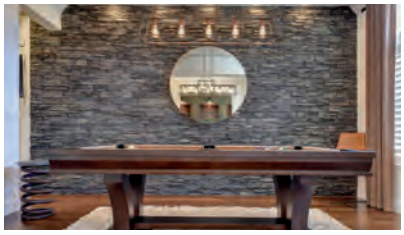
PRODUCTS

INSTALLATION

TECHNICAL

ELDORADO STONE®

SHARE YOUR PORTFOLIO



You Do Great Work and take pride in the quality of your projects! We invite you to share your designs. Upload any Eldorado Stone or Brick project for a chance to be included in our Designer's Portfolio Gallery. Open to all Trade Professionals, this is a great way to reach hundreds of thousands of Eldorado website visitors each year.

- Be seen by industry leaders across the nation
- Connect with new customers
- Reach thousands of visitors each month
- Share your creativity with Eldorado Stone
- Let our visitors share your work across the web

ELDORADO STONE®

Upload your project information at:
https://www.eldoradostone.com/share-portfolio/

Premium Architectural Solutions for Inspired Living

Explore a diverse range of industry-leading brands and high-performance manufactured products.

Westlake Royal Stone Solutions

Westlake Royal Stone Solutions offers an extensive portfolio of architectural stone veneer to meet the needs of any project level, style and lifestyle.

No other material offers the depth, complexity of color, pattern, and tactile distinction as architectural stone veneer. Our product portfolio provides limitless design opportunities that suit a wide range of styles and budgets, making it easy to enhance your project's aesthetic using natural textures and authentic color palettes that are virtually indistinguishable from stone and other natural materials.

CULTURED STONE®

culturedstone.com

ELDORADO STONE®

eldoradostone.com

DUTCH QUALITY STONE®

dutchqualitystone.com

VERSETTA STONE®

versettastone.com

STONECRAFT INDUSTRIES®

stonecraft.com

KINDRED® OUTDOORS + SURROUNDS

mykindredliving.com

For more information & design inspirations visit **elevatewithstone.com**.

Our Added Value

Backed by decades of industry leadership and manufacturing expertise, Westlake Royal is committed to providing products that inspire, attract, and add value. With six diverse brands to choose from, no other manufacturer can match the range and selection of design solutions we offer.

Scale & Availability—We manufacture the products your customers demand in the regions where you build and have the capability to scale up as your business grows.

Brand Equity—As the original manufacturers of architectural stone veneer, we take pride in having built North America's most recognized brands and delivering high-quality architectural solutions through a breadth of combined portfolios.

Expertise—We are committed to being a driving force in the decorative stone industry. From increasing installation knowledge, to Warranty and Code Compliance training, to a leadership role with the National Concrete Masonry Association, our teams put an unmatched depth of technical and practical expertise in your hands.

Design Solutions—Through ongoing research and development, we not only design products that are innovative and beautiful but are engineered to solve design and installation challenges.

Additionally, our collections have expanded beyond stone to include modern profiles that resemble other popular materials such as tile, brick and wood. With numerous options to choose from, we have the perfect solution for achieving a sleek and modern look, quaint country feel, formal atmosphere or casually elegant ambiance.

Nationwide Distribution—Unlike most local and regional manufacturers, we have partnerships that span across the country, allowing for popular products to be stocked on the ground in each market. That means you can expect the product to be available where you build.

Dedicated Team—We take pride in not only working at the corporate level with our dedicated national team, but also bringing value at the local level with more than 90 sales and technical resources focused on supporting your projects. Whether you need technical knowledge, support with national purchasing optimization, or help improving project efficiencies, with Westlake Royal, you have a partner you can rely on.

About Westlake Royal Building Products

Westlake Royal Building Products USA Inc., a Westlake company (NYSE:WLK), is a leader throughout North America in the innovation, design, and production of a broad and diverse range of exterior and interior building products, including Siding and Accessories, Trim and Mouldings, Roofing, Stone, Windows and Outdoor Living. For more than 50 years, Westlake Royal Building Products has manufactured high quality, low maintenance products to meet the specifications and needs of building professionals, homeowners, architects, engineers and distributors, while providing stunning curb appeal with an unmatched array of colors, styles, and accessories.

For more information about Westlake Royal Building Products visit **WestlakeRoyalBuildingProducts.com**.

For More Information Contact:

Westlake
Royal Stone Solutions™

THE MOST BELIEVABLE
ARCHITECTURAL STONE VENEER
IN THE WORLD.™

ELDORADO STONE®

THE MOST BELIEVABLE ARCHITECTURAL STONE VENEER IN THE WORLD

Believability is at the very core of our company philosophy. For over 50 years, Eldorado Stone has been refining the art of architectural stone veneer. When you set your eyes on Eldorado Stone, it looks authentic, natural and—most of all—believable. Take a closer look at Eldorado Stone and you'll see the difference: unmatched depth and variation of colors, crisp textural details and one of the most extensive selections of stone profiles and colors in the world.

THIS PAGE: **Montecito Cliffstone** (pg. 40) with a dry-stack grout technique.
FRONT COVER: **Grand Banks Limestone** (pg. 41) with a standard grout technique.

Rustic...

to Refined

Experience the limitless design opportunities Eldorado Stone makes possible with over 150 highly authentic architectural stone and brick veneers.

Dove Tail Marquee24 (pg. 32) and **Daybreak Stacked Stone** (pg. 36) using a dry-stack grout technique.

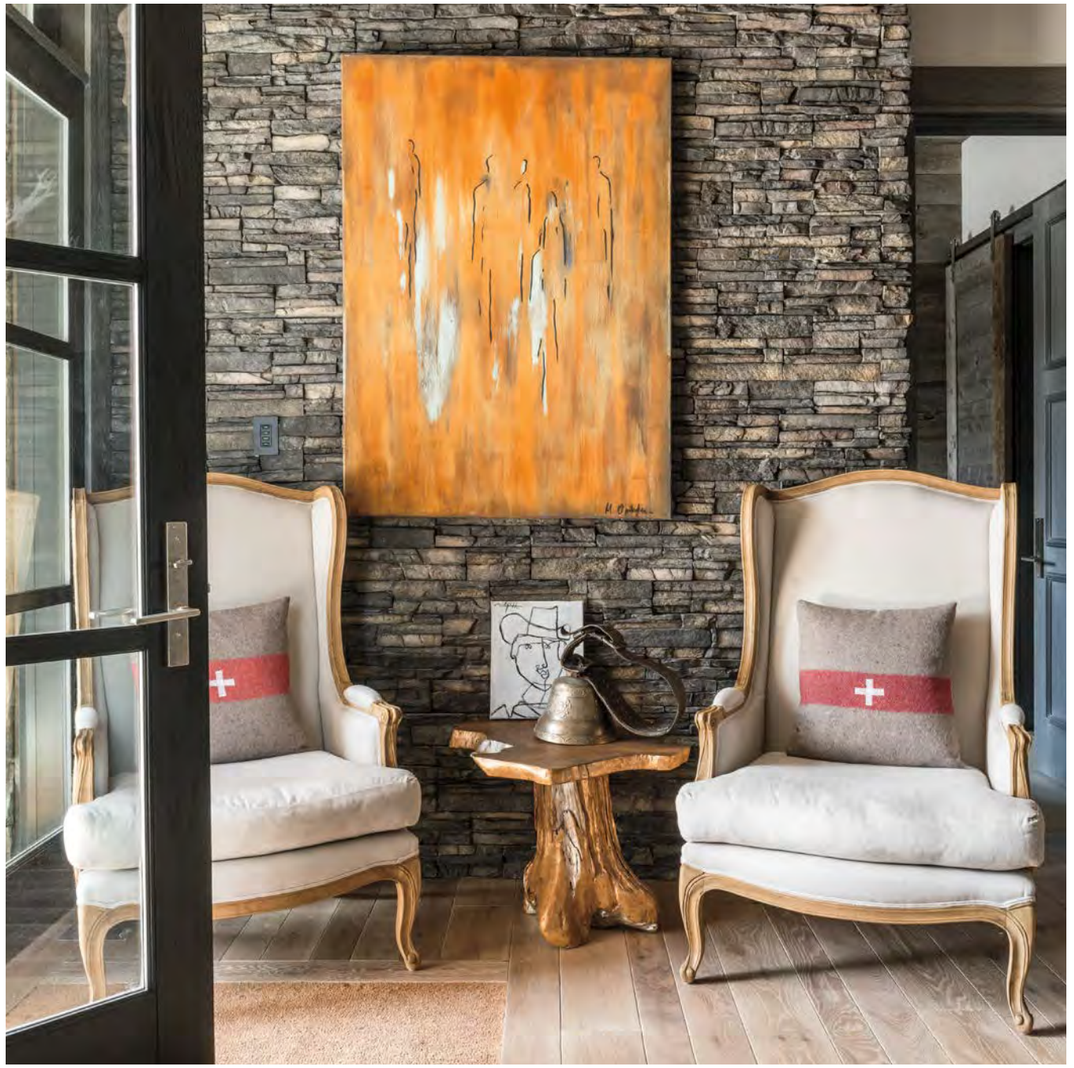
Lucera Hillstone (pg.45) whitewashed with a standard grout technique.

TOP: **Seashell Cut Coarse Stone** (pg. 33), **Ocean Floor LedgeCut33** (pg. 34) and **Linen European Ledge** (pg. 35) with a dry-stack grout technique.
BOTTOM: **Black River Stacked Stone** (pg. 36) with a dry-stack grout technique.

Grand Banks Limestone (pg. 41) with a standard grout technique.

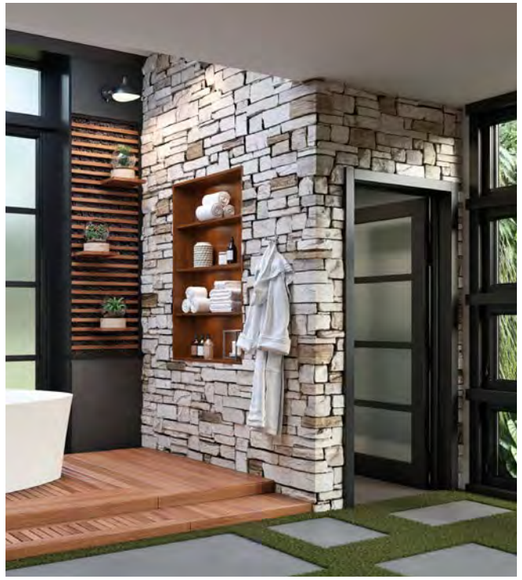
Manzanita Cliffstone (pg. 40) with a dry-stack grout technique.

Casa Blanca RoughCut (pg. 43) with a standard grout technique.



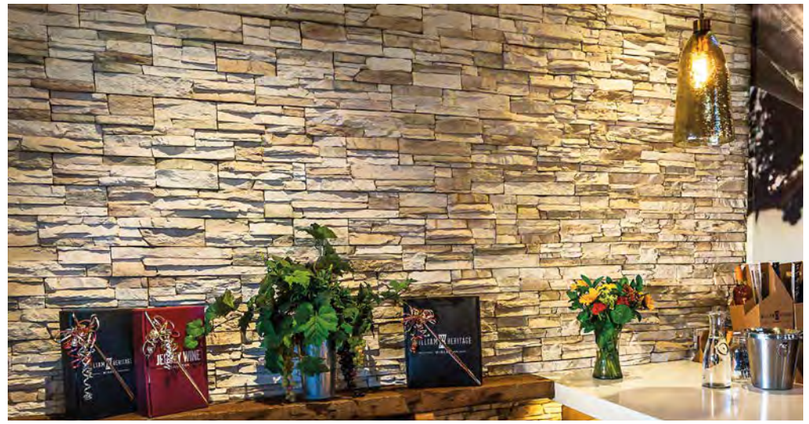
Chapel Hill Stacked Stone (pg. 36) with a dry-stack grout technique.

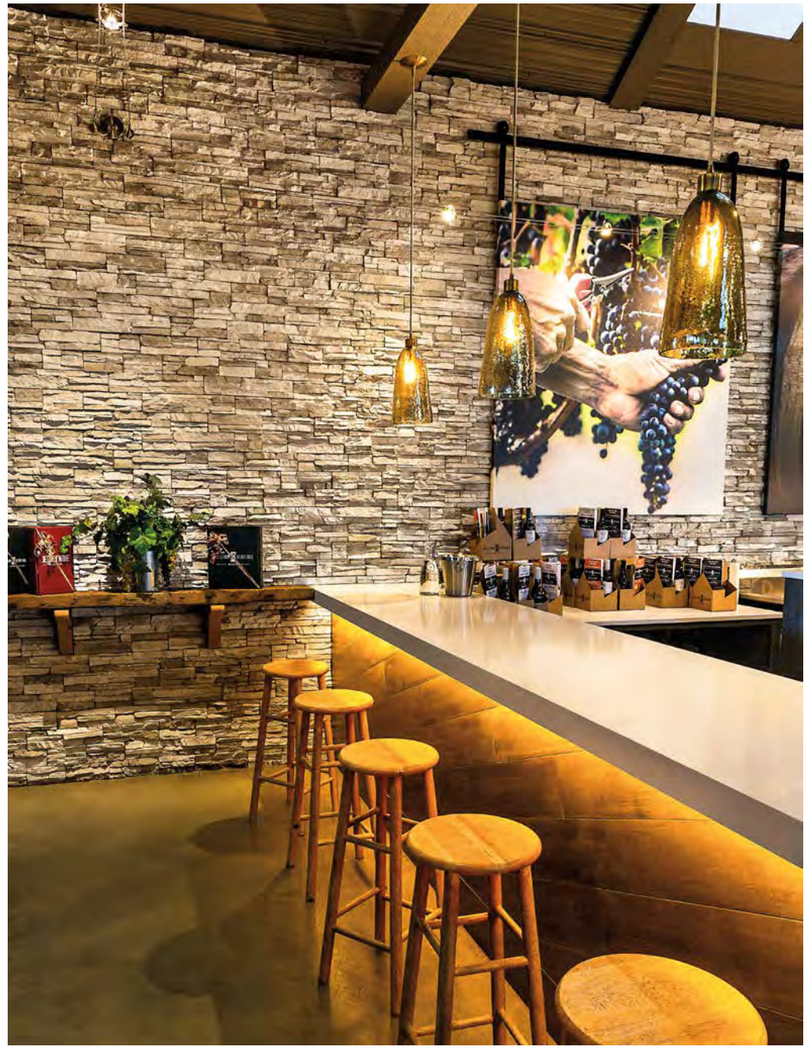
Ashland TundraBrick (pg. 59) with a standard grout technique.



Whitebark Cliffstone (pg. 41) with a dry-stack grout technique.

Ironside TundraBrick (pg. 59) with a standard grout technique.





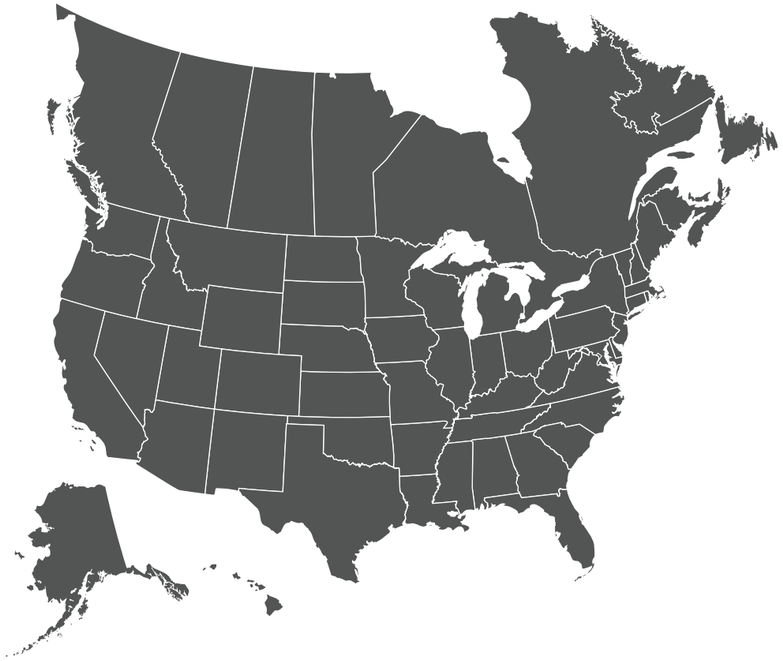
Daybreak Stacked Stone (pg. 36) with a dry-stack grout technique.

Monument SierraCut24 (pg. 32) with a dry-stack grout technique.

Oyster Cut Coarse Stone (pg. 33) with a dry-stack grout technique (6"H stones only/custom selection).

Silver Lining Stacked Stone (pg.37) with a dry-stack grout technique

NATIONWIDE STONE VENEER



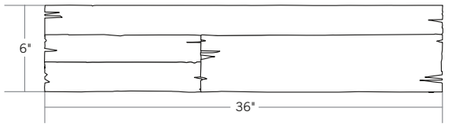
Nationwide profiles are among our most popular stones and are available coast to coast, transcending geography. Whether you're remodeling a farmhouse in Pennsylvania, building a lodge in Colorado, restoring a ranch in Arizona or renovating a coastal home in California, there's a Nationwide profile—or combination of Nationwide profiles—for the job.

For product availability outside the Continental United States & Canada, visit ***www.eldoradostone.com*** *to find your local distributor.*

ELDORADO STONE

VINTAGE RANCH™
WOOD PLANK

Enjoy the warmth and inviting texture of **Vintage Ranch**, our authentic interpretation of reclaimed barn wood. This American classic is composed of hand-selected boards culled for their celebrated patina and timeless beauty.



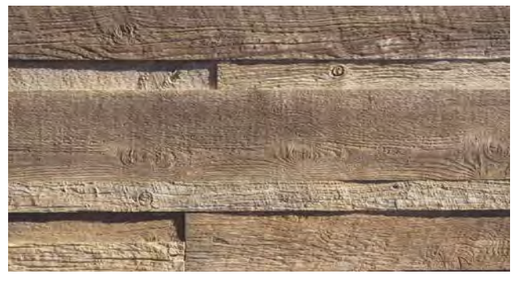
Milled to 2", 4" and 6" heights with subtle depth variations, **Vintage Ranch** has been designed as a panelized system for a quick installation process.

Stratuswood™ Vintage Ranch

Doverwood Vintage Ranch

Parchwood Vintage Ranch

Foxwood Vintage Ranch



Saddlewood Vintage Ranch

Dawnwood™ Vintage Ranch

Cumulus Vantage30 using a dry-stack grout technique.

VANTAGE30

Cumulus® Vantage30

Southern Peak Vantage30

Stormcloud Vantage30

White Elm Vantage30

RIDGETOP18

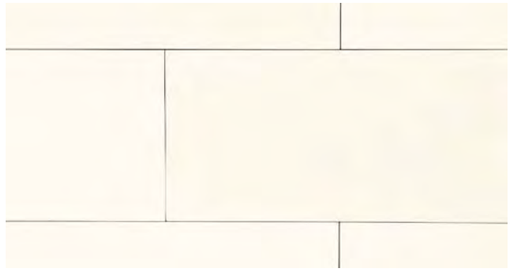
Granite Spire Ridgetop18

Whisper White Ridgetop18

LONGITUDE24

Foggy Meadow Longitude24

Silent Grey Longitude24



Snowdrift Longitude24

ZEN24

Nickel Zen24

Soft Light Zen24

Combine stone profiles to create unique textures and colors. The raked faces of **Soft Light Zen24** adds subtle texture and depth to the smooth surface of **Snowdrift Longitude24**.

MARQUEE24

Dove Tail Marquee24

Sanderling Marquee24

COASTALREEF®

Pearl White CoastalReef

Sanibel CoastalReef

SIERRACUT24

Hidden Creek SierraCut24

Monument SierraCut24

Zenith Grey SierraCut24

CUT COARSE STONE®

Cannonade® Cut Coarse Stone

Madrona Cut Coarse Stone

Oyster Cut Coarse Stone

Seashell Cut Coarse Stone

LEDGECUT33®

Beach Pebble LedgeCut33

Birch LedgeCut33

Ocean Floor LedgeCut33

Sage LedgeCut33

Whitecap™ LedgeCut33

EUROPEAN LEDGE®

Cottonwood® European Ledge

Glacier European Ledge

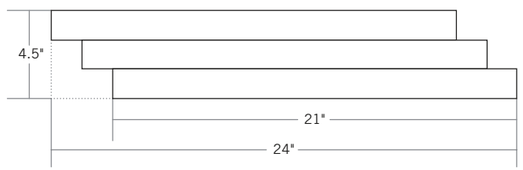
Iron Mill European Ledge

Linen European Ledge

Sea Cliff™ European Ledge

Sidewalk European Ledge

Zinc European Ledge



European Ledge creates a perfect fusion of old-world stonework and modern design. The 1.5" precision-cut ledge stones are molded into 4.5"H × 24"W panels. The stair stepped edge creates a tight-fit, eliminating unsightly vertical joints.

Stacked Stone

Alderwood® Stacked Stone

Black River® Stacked Stone

Castaway® Stacked Stone

Chapel Hill® Stacked Stone

Dark Rundle® Stacked Stone

Daybreak Stacked Stone

Dry Creek® Stacked Stone

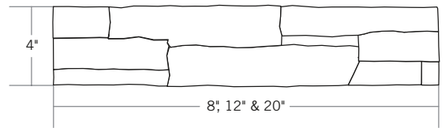
Koryak Ridge™ Stacked Stone

Stacked Stone CONTINUED

Nantucket Stacked Stone

Santa Fe Stacked Stone

Silver Lining Stacked Stone



Individual **Stacked Stone** panels vary greatly in the cut shapes within their layouts and are available in three different lengths to help avoid repetition while offering quick and convenient installation.

Rustic Ledge®

Cascade® Rustic Ledge

Clearwater Rustic Ledge

Sawtooth® Rustic Ledge

Sequoia® Rustic Ledge

Mountain Ledge

Durango® Mountain Ledge

Sierra® Mountain Ledge

Yukon Mountain Ledge

Durango Mountain Ledge using a dry-stack grout technique.

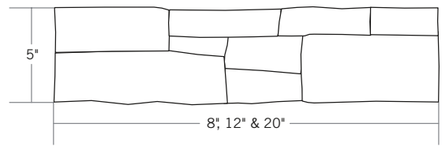
Mountain Ledge Panels

Pioneer Mountain Ledge Panels

Russet® Mountain Ledge Panels

Silverton® Mountain Ledge Panels

Whiskey Creek® Mountain Ledge Panels



Mountain Ledge Panels quickly install with 5" heights and varying stone lengths. The rustic surface textures and random stone heights create a highly authentic appearance.

CLIFFSTONE®

Banff Springs Cliffstone

Barley Cliffstone

Boardwalk Cliffstone

Cambria Cliffstone

Lantana® Cliffstone

Manzanita® Cliffstone

Mesquite® Cliffstone

Montecito® Cliffstone

CLIFFSTONE CONTINUED

Whitebark® Cliffstone

LIMESTONE

Grand Banks™ Limestone

San Marino Limestone

York Limestone

BLUFFSTONE

Bodega Bluffstone

Coos Bay Bluffstone

Mineret Bluffstone

Prescott Bluffstone

Prescott Bluffstone with a dry-stack grout technique.

ROUGHCUT®

Autumn Leaf® RoughCut

Casa Blanca RoughCut

Loire Valley™ RoughCut

Moonlight® RoughCut

Vineyard Trail® RoughCut

Wheatfield RoughCut

Cypress Ridge®

Catania Cypress Ridge

Orchard® Cypress Ridge

Country Rubble

Bella Country Rubble

Cognac Country Rubble

Polermo Country Rubble

Fieldledge®

Andante® Fieldledge

Meseta® Fieldledge

Padova Fieldledge

Veneto® Fieldledge

Hillstone®

Lucera® Hillstone

Verona Hillstone

Shadow Rock

Bronze Shadow Rock

Chesapeake Shadow Rock

Somerset Shadow Rock

Teton® Shadow Rock

River Rock

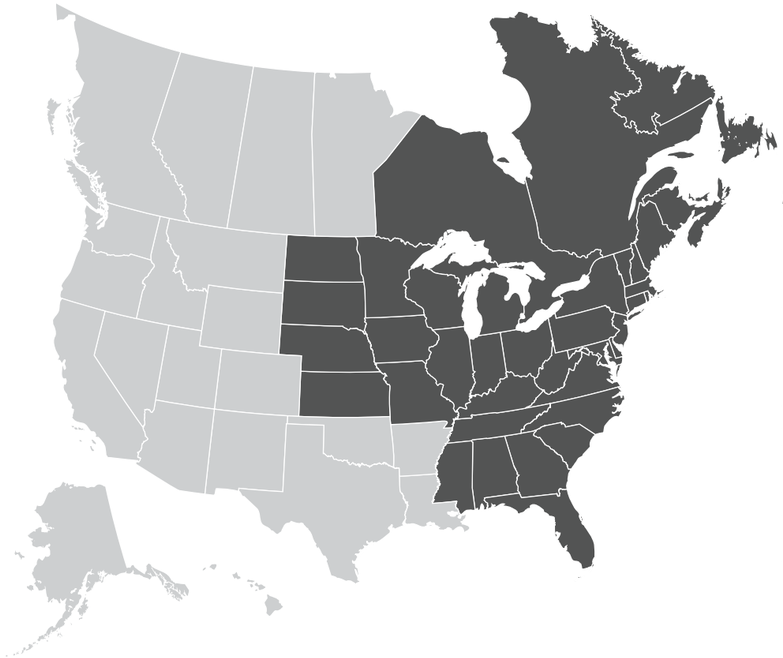
Colorado River Rock

Rio Grande River Rock

Yakima River Rock

Teton Shadow Rock using a dry-stack grout technique.

EASTERN REGIONAL STONE VENEER



Alabama
Connecticut
Delaware
District of Columbia
Florida
Georgia
Illinois
Indiana
Iowa
Kansas
Kentucky
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Nebraska
New Hampshire
New Jersey
New York
North Carolina
North Dakota
Ohio
Pennsylvania
Rhode Island
South Carolina
South Dakota
Tennessee
Vermont
Virginia
West Virginia
Wisconsin

The Eastern Region has a rich tradition of building with stone since colonial times. The abundance of raw materials was of great use to the skilled European stone masons who settled here.

*For product availability outside the Eastern United States & Eastern Canada, visit **www.eldoradostone.com** to find your local distributor. Regional profiles available in states & provinces indicated above; additional shipping charges apply if ordered outside this region.*

Country Rubble

Millstream Country Rubble

Limestone

New Haven Limestone

Mountain Ledge

Asheville Mountain Ledge

Charleston Mountain Ledge

Lexington Mountain Ledge

ROUGHCUT®

Falling Spring RoughCut

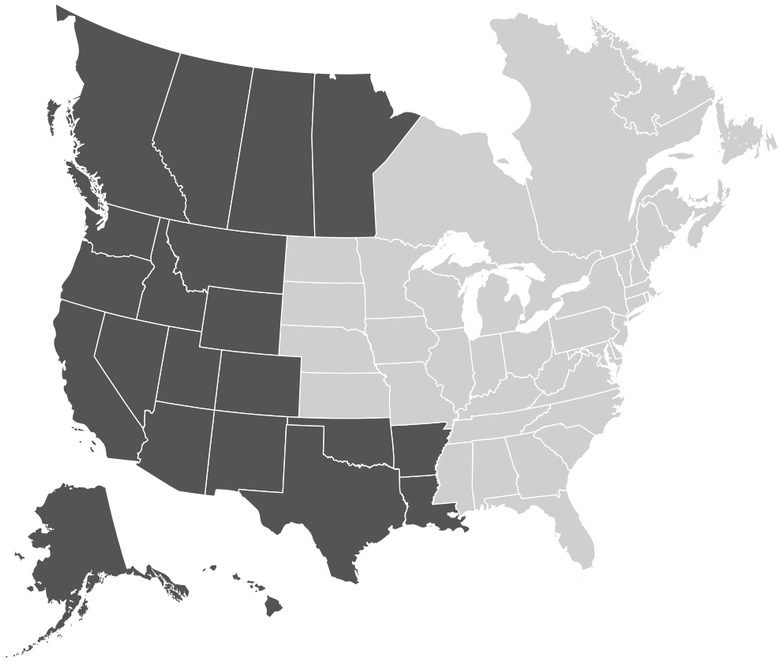
SHADOW ROCK

Crescent Peak Shadow Rock

Willow Shadow Rock

Crescent Peak Shadow Rock with a standard grout technique.

WESTERN REGIONAL STONE VENEER



Alaska
Arizona
Arkansas
California
Colorado
Hawaii
Idaho
Louisiana
Montana
Nevada
New Mexico
Oklahoma
Oregon
Texas
Utah
Washington
Wyoming

America's West embraces a diverse architectural palette that mirrors its grand landscapes. The colors, textures and shapes found in this region embody elements of the Pacific coast, Rocky Mountains, Southwest deserts and lush Northwest forests. Our profiles for this region respect the many stone types used across this varied terrain.

*For product availability outside the Western United States & Western Canada, visit **www.eldoradostone.com** to find your local distributor.*
Regional profiles available in states & provinces indicated above; additional shipping charges apply if ordered outside this region.

Mountain Ledge

Bitteroot Mountain Ledge

Shasta Mountain Ledge

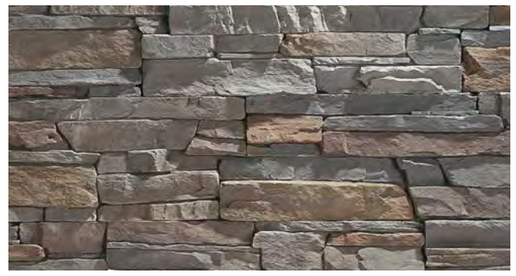
Mountain Ledge Panels

Bow Valley Mountain Ledge Panels

Limestone

Shilo Limestone

Stacked Stone



Slate Gray Stacked Stone

Rustic Ledge®

Saratoga Rustic Ledge

CapistranoAdobe

Bautista CapistranoAdobe

Carmelo CapistranoAdobe

Wall Caps

Wall Caps approx. 3.5" thick.
Available in 2 sizes:
16"L × 12"D
15.5"L × 7.5"D

Saratoga Rustic Ledge using a dry-stack grout technique.

A CHUNK OF HISTORY

Eldorado Brick isn't simply a great building material; it's a piece of history. Molded from centuries-old European dwellings, Eldorado Brick has distinct earthen textures, irregular size dimensions and comes in both traditional and design-forward colors. Eldorado Brick can help transform any space to your desired style whether it's warm with historical heritage or creative with contemporary sophistication.

Ironside TundraBrick (pg. 59) with a standard grout technique.

Chalk Dusk TundraBrick using a standard grout technique.

TUNDRABRICK®

Ashland TundraBrick

Chalk Dust TundraBrick

Hartford TundraBrick

Ironside® TundraBrick

Latigo® TundraBrick

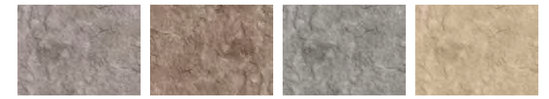
Riverbed TundraBrick

ARCHITECTURAL ACCENTS & ACCESSORIES

It's the final details that make an ordinary project an extraordinary one, and Eldorado Stone Architectural Accents are no exception to this philosophy. Each accent has been created by hand to meticulously emphasize unique color hues and detailed sculptural characteristics… the essence of true masonry craftsmanship.

ASHLAR ACCENTS

Ashlar Accents have been sculpted to create uniform edge details. The consistent shape simplifies the installation process, while providing the characteristics and texture of natural stone. Available in Taupe, Earth, Smoke & Buckskin.



Taupe | Earth | Smoke | Buckskin

Keystone
Approx. 1.5" to 2.5" thick.

Trim Stones
Approx. 2" thick.

Keystone & Archstone
Approx. 1.5" to 2" thick.

Cut Heads
Approx. 1.5" to 2.5" thick.

CRAFTSHIELD™

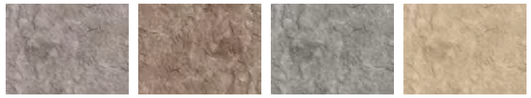
Preserving the Art of Masonry. CraftShield is a protective treatment that preserves the intended artistry and beauty of architectural stone veneer while safeguarding the surface from nature's elements.

Designed for use on concrete and most masonry surfaces including Eldorado Stone and Eldorado Brick veneer, CraftShield goes on wet and dries invisible to the eye. It's low odor and alkaline-stable formula is ideal for both exterior and interior applications and offers 10-Year Protection to help resist staining, spalling, cracking and other damage related to water intrusion.

Gallon covers 150-200 sq. ft. of surface area.

Chiseled Edge™ Accents

Historically, masons have worked with natural stone to create unique accent pieces to finalize their projects. Chiseled Edge Accents feature a hand-dressed appearance with a uniform yet rustic detail. Available in Taupe, Earth, Smoke & Buckskin.



Taupe | Earth | Smoke | Buckskin

Wainscot Sill 90°
8"L (both exterior sides) × 3"D × 2"H (face) to 2.5"H (back)

Wainscot Sill 135°
7.5"L (both exterior sides) × 3"D × 2"H (face) to 2.5"H (back)

Wainscot Sill Straight
19.75"L × 3"D × 2"H (face) to 2.5"H (back)

Hearthstone
20"L × 20"D × 2"H

Peaked Wall Caps
Available in 2 sizes:
20" × 16" (2"H sides with a 3.5"H peak)
20" × 12" (2.375"H sides with a 3.5"H peak)

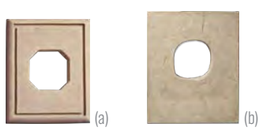
Textured Column Caps
Cap peak approx. 5.5"H.
Available in 3 sizes with or without hole:
26" × 26" (2.5"H sides)
22" × 22" (2.5"H sides)
18" × 18" (2.5"H sides)

Column & Wall Caps
Column Caps approx. 2.5" thick.
Available in 2 sizes:
30" × 24"
24" × 24"

Wall Caps approx. 2.25" thick.
Available in 3 sizes:
37" × 12"
37" × 9"
37" × 6"

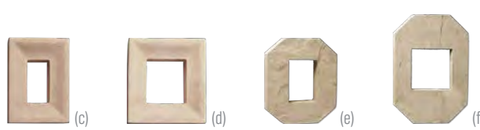
Utility Accents

Utility Accents create a simple yet decorative way of transitioning from the utility to the stone or brick veneer. Available in Taupe, Earth, Smoke & Buckskin (see colors above).



(a) (b)

Lightboxes
Approx. 1.75" thick.
(a) 8" × 10"
(b) 9.5" × 11"

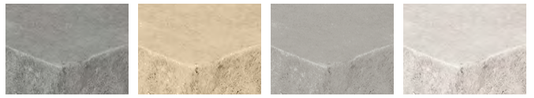


(c) (d) (e) (f)

Electrical Boxes
(c) 6" × 8" (approx. 2" thick)
(d) 8" × 8" (approx. 2" thick)
(e) 8" × 8" (approx. 1.75" thick)
(f) 8" × 12" (approx. 1.75" thick)

Split Edge™ Accents

Split Edge Accents feature a 2" guillotined edge to complement our line of modern stones and contemporary color palettes.



Blue Steel | Coastal Sand | Grey Sky | White Cloud

Column Caps
Available in 4 sizes:
26"L × 26"D × 2"H
24"L × 24"D × 2"H
22"L × 22"D × 2"H
18"L × 18"D × 2"H

Wall Caps
Available in 2 sizes:
12"L × 30"D × 2"H
9"L × 30"D × 2"H

Hearthstone
20"L × 20"D × 2"H

Wainscot Sill
20"L × 3"D × 2"H (face) to 2.5" H (back)

Snapped Edge™ Accents

Snapped-Edge Accents feature irregular edge details and random undulations that look as if they had been hand chiseled on location. Additionally, each accent features subtle yet contrasting color highlights on the surface and edge details for the ultimate natural appearance. Wainscot Sills have a recessed drip edge on the underside to prevent water from returning behind the stone or dripping onto the face of the stone wall. Available in Walnut, Pewter & Sand.

Walnut | Pewter | Sand

Column Caps
Available in 3 sizes:
24"L × 24"D × 1.5"H
22"L × 22"D × 1.5"H
18"L × 18"D × 1.5"H

Wall Caps
Available in 2 sizes:
24"L × 14"D × 1.5"H
18"L × 14"D × 1.5"H

Hearthstone
20"L × 20"D × 1.5"H

Wainscot Sill
19.75"L × 3"D × 1.5"H (face) to 2.5" H (back)

ELDORADO PROFILE SIZES

*Sizes are nominal ranges. Actual sizes may vary slightly.

STONE	HEIGHT	LENGTH	THICKNESS	PAGES
Bluffstone	1" – 5"	3⅝" – 21¼"	1½"	42
Cliffstone	1¼" – 5½"	4" – 21¼"	1⅓"	1, 10, 18, 40
CoastalReef	4" – 12"	4" – 16"	1⅓"	33
Country Rubble	2" – 16½"	3½" – 21"	1⅜"	44, 49
Cut Coarse Stone	3", 6", 9"	12", 18", 24"	1½"	8, 23, 33
Cypress Ridge	1" – 10½"	4" – 21¼"	1½"	44
European Ledge Single Stone	1½"	11"	1½"	8, 35
European Ledge Panel	4½"	24"	1½"	35
Fieldledge	1½" – 8"	4" – 19"	1⅓"	45
Hillstone	1" – 11½"	3" – 16"	1½"	6, 45
LedgeCut33	3"	12", 18", 24"	1½"	8, 34
Limestone	4" – 20⅜"	1½" – 12½"	1⅜"	Front Cover, 9, 41, 49, 53
Longitude24	11⅞"	23⅝"	1"	30
Marquee24	11⅞"	23⅝"	1"	4, 32
Mountain Ledge	1" – 4"	3½" – 19"	1½"	38, 49, 53
Mountain Ledge Panels	5"	8", 12", 20"	1½"	39, 53
Ridgetop18	9"	18"	1⅜"	29
River Rock	2" – 12½"	3" – 14½"	1½"	46
RoughCut	1½" – 11½"	3¼" – 18¼"	1½"	12, 43, 50
Rustic Ledge	1" – 4¼"	4½" – 21⅛"	1¼"	37, 54
Shadow Rock	1⅛" – 9¼"	3⅜" – 20⅜"	1¼"	46, 50
SierraCut24	11⅞"	23⅝"	1½"	22, 32
Stacked Stone	4"	8", 12", 20"	1⅜16"	4, 8, 14, 20, 24, 36, 53
Vantage30	6"	30"	1¼"	28
Vintage Ranch	6"	36"	1 15⁄16"	27
Zen24	11⅞"	23⅝"	1"	30
ADOBE				
CapistranoAdobe	3½"	15"	1¼"	54
BRICK				
TundraBrick	2½"	7¾" – 8"	⅞"	16, 19, 56, 58, 59, 64

Ashland TundraBrick (pg. 59) with an overgrout technique.

Because Eldorado Stone replicates natural stone, variations should, and can be expected. Even though colors in this brochure are as close to the actual stone as possible, photographic and printing techniques — and actual viewing conditions — can alter perception of color. It is recommended to obtain a sample of Eldorado Stone before placing an order.

If you would like more information on prices, availability of stone, the name of your local distributor, or answers to any questions not covered in this brochure, please contact us. We would be happy to assist you with your stone building plans. Detailed installation instructions, specifications, technical information and test data is available upon request.

800.925.1491 eldoradostone.com

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SIDING & ACCESSORIES
TRIM & MOULDINGS
ROOFING
STONE
WINDOWS
OUTDOOR LIVING

031822

INSTALLATION GUIDELINES

Eldorado Stone endorses and supports the National Concrete Masonry Association - Manufactured Stone Veneer (NCMA-MSV) Installation Guidelines. The mission of the NCMA organization is "To advance the growth of the manufactured masonry veneer products industry through proactive technical, advocacy, and awareness efforts."

One of the most important projects completed by the NCMA Technical Committee was the development of a highly detailed and carefully researched installation guide. The latest version of that guide can be downloaded at **www.eldoradostone.com/resources**. These guidelines are intended to share over 50 years of knowledge, experience and understanding regarding the proper installation of manufactured stone veneer products. For any specific or unique installation questions or challenges, including:

- Traditional masonry installation methods
- Installation over cement board using polymer modified mortar
- Installation over thick foam; fastener selection
- Installation of large format profiles

Please contact Eldorado Stone's Technical Support Service directly at 800.925.1491.

Note: It is important to recognize that Eldorado Stone and Brick veneer products are an adhered veneer or façade which are attached directly to a cementitious substrate for purposes of providing ornamentation and a first layer of weatherization protection. Adhered Concrete Masonry Veneers are not intended as a structural product or a waterproofing element. Most importantly, the real subject matter expert is your local building department and the local building code. Your local building code will supersede all other written or verbal installation guides provided by Eldorado Stone or the NCMA. Go to ncma.org/manufactured-stone-veneer for more information about the NCMA.

ELDORADO STONE®

Installation Guide and Detailing Options for

Compliance with ASTM C1780

For Adhered Manufactured Stone Veneer 5th Edition, 5th Printing

TABLE OF CONTENTS

Drawings/Cross Sections

TABLE OF CONTENTS (continued)

Drawings/Cross Sections (continued)

National Concrete Masonry Association
13750 Sunrise Valley Drive
Herndon, VA 20171
Phone: 703.713.1900
www.ncma.org

Disclaimer

This Guide addresses generally accepted methods and details for the installation of Adhered Manufactured Stone Veneer. To the best of our knowledge, it is correct and up to date. The document, however, is designed only as a guide and it is not intended for any specific construction project. NCMA makes no express or implied warranty or guarantee of the techniques, construction methods or materials identified herein.

It is understood that there are alternative means or methods that might be required and/or recommended based on project conditions, manufacturer's recommendations, or product characteristics.

This Guide is for builders, architects, designers, masons, installers and other construction professionals who can interpret the illustrations and typical applications of Adhered Manufactured Stone Veneer presented. Details in this guide that address the installation and detailing of Adhered Manufactured Stone Veneer and its interface with other building components are not intended as specific recommendations. It is the responsibility of all design and construction professionals to determine the applicability and appropriate application of any detail to any specific project.

About

The National Concrete Masonry Association (NCMA) unites, supports, and represents the producers and suppliers of concrete masonry systems - including concrete masonry, manufactured stone veneer, segmental retaining walls, and other hardscape systems. NCMA supports the growth of the manufactured masonry veneer products industry through proactive technical, advocacy, and awareness efforts.

DEFINITIONS

Adhered Manufactured Stone Veneer (AMSV) — lightweight, architectural, non-load-bearing product that is manufactured by wet cast blending of cementitious materials and aggregates, with or without pigments, admixtures, or other materials to simulate the appearance of natural stone and other masonry materials.

Note: NCMA recognizes there are many names used to describe Adhered Manufactured Stone Veneer products. Adhered Manufactured Stone Veneer is used commonly throughout the industry and by some manufacturers. In the International Building Code, Adhered Manufactured Stone Veneer products are referred to as Adhered Masonry Veneer. This guide will use AMSV (Adhered Manufactured Stone Veneer) when referencing the product.

Backup – The interior or exterior assembly to which AMSV systems are installed.

CMU – Concrete masonry unit.

Corrosion Resistant – A material that is intrinsically resistant to degradation or physically or chemically treated to be so under expected exposure conditions. Examples include: plastic-based materials stabilized for exposure to UV light, galvanized ferrous metals, and stainless steel.

Fasteners — Corrosion resistant hardware used to secure lath, screed, and flashing materials to backup systems.

Flashing — Corrosion resistant material used to restrict the movement of water around any intersection or projection of materials in an assembly.

Lath — Corrosion resistant mesh building material fastened to the substrate to act as base for adhering mortar.

Mortar — A mixture of cementitious material, water, and aggregate, with or without the addition of admixtures or additives to alter one or more plastic or hardened properties, used to bond masonry construction materials together and fill spaces between.

Pointing Mortar — Also known as grouting mortar, mortar mixture used to fill joints and cavities in AMSV construction.

Mortar Scratch Coat — Base coat of mortar used during the installation of AMSV; cross-raked to improve bond of subsequent mortar layers.

Mortar Screen — Sheet material installed to prevent the mortar scratch coat from filling the drainage space behind an AMSV assembly containing a rainscreen system.

Mortar Setting Bed — Mortar used to adhere the AMSV to the substrate or scratch coat.

Water Resistive Barrier (WRB) — Material used to restrict the transmission of water to the surface behind.

REFERENCES

AC191 — ICC-ES Acceptance Criteria for Metal Plaster Bases (Lath)

AC275 — ICC-ES Acceptance Criteria for Glass Fiber Lath used in Cementitious Exterior Wall Coating or Exterior Cement Plaster (Stucco)

AC376 — ICC-ES Acceptance Criteria for Reinforced Cementitious Sheets used as Wall and Ceiling Sheathing and Floor Underlayment (Cement Board)

ANSI Accredited Evaluation Service — (or equivalent) third-party organization that issues an evaluation report affirming a specific building product meets building code requirements.

International Code Council - Evaluation Service (ICC-ES) — An organization that performs technical evaluations on building products, components, and construction methods for building code compliance. In the case where the building code is silent or ambiguous as to a product's requirements or a specific construction method, ICC-ES may develop "Acceptance Criteria" (AC) for the product or construction method. www.icc-es.org

International Building Code — Building code that provides the minimum requirements for safety, health, and welfare of life and property from hazards of the built environment. The provisions of this code apply to the construction, alteration, addition, replacement, repair, use and occupancy of all buildings except one and two family dwellings, and single-family townhomes not more than three stories in height. www.iccsafe.org

International Residential Code — Building code that provides minimum requirements for safety, health, and welfare of life and property from hazards of the built environment. The provisions of this code apply to the construction, alteration, addition, replacement, repair, use and occupancy of detached one and two family dwellings and single-family townhomes not more than three stories in height. www.iccsafe.org

ANSI — American National Standards Institute, www.ansi.org

ANSI A118.1 — American National Standards Institute Specifications for Dry-Set Portland Cement Mortar

ANSI A118.4 — American National Standards Institute Specifications for Modifed Dry-Set Cement Mortars

ANSI A118.15 — American National Standards Institute Specifications for Improved Modified Dry-Set Cement Mortar

TMS 402 — Building Code Requirements for Masonry Structures. This standard is produced through the efforts of The Masonry Society (TMS). www.masonrysociety.org

REFERENCES (continued)

TMS 602 — Specification for Masonry Structures. This standard is produced through the efforts of The Masonry Society (TMS). www.masonrysociety.org

ICRI — International Concrete Repair Institute, Technical Guideline No. 310.2. www.icri.org

ASTM International — ASTM is a developer of technical standards for products, systems, and services. www.astm.org

ASTM C270 — Standard Specification for Mortar for Unit Masonry

ASTM C482 — Standard Test Method for Bond Strength of Ceramic Tile to Portland CementPasteStandard Specification for Metal Lath

ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation

ASTM C847 — Standard Specification for Surface Applied Bonding Compounds for Exterior Plastering

ASTM C933 — Standard Specification for Welded Wire Lath

ASTM C979/979M — Standard Specification for Pigments for Integrally Colored Concrete

ASTM C1032 — Standard Specification for Woven Wire Plaster Base

ASTM C1059/1059M — Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete

ASTM C1063 — Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement Based Plaster

ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board

ASTM C1325 — Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units

ASTM C1384 — Standard Specification for Admixtures for Masonry Mortars

ASTM C1670/C1670M — Standard Specification for Adhered Manufactured Stone Masonry Veneer Units

ASTM C1714/C1714M — Standard Specification for Preblended Dry Mortar Mix for Unit Masonry

ASTM C1780 — Standard Practice for Installation Methods for Adhered Manufactured Stone Masonry Veneer

ASTM C1788 - Standard Specification for Non Metallic Plaster Bases (Lath) Used with Portland Cement Based Plaster in Vertical Wall Applications

ASTM C1861 — Standard Specification for Lathing and Furring Accessories, and Fasteners, for Interior and Exterior Portland Cement-Based Plaster

ASTM E2556/E2556M — Standard Specification for Vapor Permeance Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment

ASTM D226/D226M — Standard Specification for Asphalt Saturated Organic Felt Used in Roofing and Water Proofing

ASTM F1667 — Standard Specification for Driven Fasteners, Nails, Spikes, and Staples

Table 1: AMSV Installation Requirements Summary[1]

Sheathing[5]	Substrate[5]	Water Resistive Barrier[2]	Lath Type	Fasteners[3]	Scratch Coat	Setting Bed Mortar
Backup: Interior Wood or Steel Stud Framing, Maximum Spacing 16 in. (406 mm)[4,10]						
▪ Gypsum Wall Board ▪ Plywood ▪ OSB ▪ Fiber Board	Lath & Scratch Coat	Optional[6]	Any approved lath	Corrosion Resistant; minimum penetration ¾ inch (19 mm) into wood framing member or 3/8 in. into Steel framing member	Type N or S mortar complying with ASTM C270 or ASTM C1714; minimum nominal thickness 1/2 in. (13 mm)	See Table 2
Optional when sheathing is non-structural	Cement Board	Not required	Not required	Corrosion-resistant cement board screws	Not required	ANSI A118.4 or ANSI A118.15
Backup: Exterior Wood or Steel Stud Framing; maximum spacing 16 in. (406 mm)[10]						
▪ Gypsum Wall Board ▪ Plywood ▪ OSB ▪ Fiber Board	Lath & Scratch Coat	Minimum 2 layers WRB	Any approved lath[7]	Corrosion Resistant; minimum penetration ¾ inch (19 mm) into wood framing member or 3/8 in. into Steel framing member	Type N or S mortar complying with ASTM C270 or ASTM C1714; minimum nominal thickness 1/2 in. (13 mm)	See Table 2
	Cement Board	Minimum 1 layer WRB	Not required	Corrosion-resistant cement board screws	Not required	ANSI A118.4 or ANSI A118.15
Backup: Concrete or Concrete Masonry[8,9,10]						
Not applicable	None (when surface is suitable for direct bonding)	Not applicable	Not applicable	Not applicable	Not applicable	See Table 2
	Lath and scratch coat (when required for bonding)	Optional[9]	Any approved Lath[7,9]	Corrosion resistant concrete screws, masonry nails, or powder actuated fasteners[9]	Type N or S mortar complying with ASTM C270 or ASTM C1714; minimum nominal thickness 1/2 in. (13 mm)[9]	See Table 2
	Cement board	Not applicable	Not applicable	Corrosion resistant concrete screws with washers	Not required	ANSI A118.4 or ANSI A118.15
Backup: Clay Masonry[8,9,10]						
Not applicable	Lath and Scratch Coat	Optional[9]	Any approved Lath	Corrosion resistant concrete screws, masonry nails, or powder actuated fasteners	Type N or S mortar complying with ASTM C270 or ASTM C1714; minimum nominal thickness 1/2 in. (13 mm)	See Table 2
	Cement Board	Not required	Not applicable	Corrosion resistant concrete screws with washers	Not required	ANSI A118.4 or ANSI A118.15

[1] Refer to AMSV manufacturer for installation recommendations addressing conditions not listed.
[2] WRB complying with ASTM D226 Type I, ASTM E2556 Type I or II, or equivalent.
[3] Fastener type must comply with ASTM C1861 and spacing must comply with ASTM C1063 for attachment of lath. For cement board attachment, refer to cement board manufacturer installation instructions. Refer to Tables 3 and 4 for minimum fastening requirements for direct attachment of AMSV systems over continuous insulation.
[4] For interior applications exposed to moisture, refer to corresponding exterior wall detailing requirements.
[5] Sheathing/substrate material shall be approved for intended application and installed in accordance with manufacturer's recommendations.
[6] A single layer of WRB is recommended where the sheathing/substrate is moisture sensitive.
[7] Approved lath options are listed in 'Material Requirements' section under 'Lath' in this guide.
[8] AMSV systems cannot be installed over existing anchored masonry veneers.
[9] When installing AMSV over concrete or concrete masonry walls where good bond cannot be achieved or the concrete or concrete masonry is unsound, install AMSV over lath.
[10] Backup systems should be designed to limit out-of-plane deflections to l/360 when subjected to 42% of the components and cladding wind pressure.

INTRODUCTION

This guide focuses on the installation of AMSV systems for backup assemblies addressed in the summary table. Other backup systems, such as structural insulated panels (SIPs), may require a specifically-designed system of installation for AMSVs. AMSV systems should not be installed over deteriorating or unsound backup assemblies or exterior insulation and finishing systems (EIFS).

DESIGN AND CONSTRUCTION CONSIDERATIONS

This Installation Guide assumes that construction personnel have knowledge of the materials described and their knowledge and experience of proper methods of installation.

Prior to commencing activity related to the scope of this Guide, review all adjacent products and other work that precedes the installation of AMSV to ensure that proper workmanship is reflected and that there are no recognizable errors or deficiencies that may compromise the installation or performance of the AMSV.

Quality

A successful project requires the use of quality materials, proper design and detailing for the application, and a high standard of care during installation. Unfortunately, the execution of these components in the field can be subject to value-engineering resulting in materials selected based solely on price and installation techniques that focus on speed rather than quality. While the performance of AMSV systems depends upon all three of these components, field workmanship issues tend to be the dominate source of problems when performance issues surface in the field. Installing AMSV in accordance with the recommended practices of this guide and ASTM C1780 helps to ensure AMSV systems perform as intended for decades.

Building Code Requirements

Building code requirements vary from area to area. Check with local authorities for building code requirements for your area and application. Carefully read all sections of this guide and follow the manufacturer's installation instructions before proceeding with your AMSV application. In the event the manufacturer's installation instructions conflict with the intent of statements made in this document, contact the manufacturer for additional guidance.

Project Site Requirements

Jobsite safety is outside of the scope of this guide, however, users should always follow proper job site safety requirements including local, state, and federal laws when installing AMSV products and systems.

MATERIAL REQUIREMENTS

Units

AMSV units installed in accordance with this guide must meet the minimum requirements of ASTM C1670/C1670M.

Flashing

All flashing and flashing accessories must be corrosion resistant and integrated with the WRB materials (if present). For exterior applications, flashing must be installed at all through-wall penetrations and at lower boundaries of AMSV installations. Flashing is not required for interior applications of AMSV systems not exposed to water. For interior applications that are exposed to water, treat as an exterior assembly.

In some applications, the use of self-adhering flashing, also known as flashing tape, can be used. It is recommended that applicable building codes as well as manufacturer's instructions are reviewed and followed to ensure they are permissible for the given project or application. Additionally, the manufacturer of the AMSV should be contacted prior to construction to ensure the compatibility of the two products.

Rainscreen Drainage Plane Systems

Rainscreens are optional building techniques used to improve the drainage of incidental water behind the cladding and reduce drying time. Rainscreen products (such as drainage mats or formed polymer sheeting) or construction techniques (such as strapping or furring) that create a capillary break/air space between the cladding and the water resistive barrier can be effectively incorporated into AMSV applications. Refer to the manufacturer's recommendation for rainscreen / drainage system applications with adhered manufactured stone veneer wall systems. Details of various applications utilizing rainscreen drainage plane systems can be found in Figures 35-38. Building codes may allow a single layer of a water resistive barrier when a drainage space is incorporated in the wall system (i.e. rainscreen). Requirements for rainscreens vary by region. Verify local jurisdictional requirements regarding the use and application of rainscreens and/or drainage products.

Weep Screeds and Casing Beads

Weep screeds and casing beads must be corrosion resistant, with weep screeds having a minimum vertical attachment flange of 3.5 inches (89 mm) that terminates behind the water resistive barrier (if present). The minimum thickness of metal weep screeds and casing beads should not be less than 0.0179 inches (0.45 mm) (26 gage). For plastic weep screeds or casing beads, the minimum thickness is 0.050 inches (1.3 mm).

Lath

Multiple lath materials have been used successfully for the installation of AMSV systems, including:

- 2.5 lb/yd^2 (1.4 kg/m^2) (or heavier) self-furring metal lath meeting ASTM C847;
- Welded wire lath complying with ASTM C933;
- 18 gauge (or heavier) woven wire lath meeting ASTM C1032; or
- The lath product is consistent with the AMSV manufacturer's installation instructions and has an evaluation acceptance report from an accredited evaluation service showing compliance with ICC-ES Acceptance Criteria 275 (AC275), or equivalent, and ASTM C1788.

All lath and lath accessories must be corrosion resistant, consisting of either galvanized or stainless steel materials or consisting of materials complying with AC 275, and ASTM C1788. All lath material must be self-furred or use self-furring fasteners. Refer to Table 1 of this guide for specific lath and fastener recommendations.

Fasteners

Corrosion resistant fasteners are used to secure flashing and lath or cement board to the backup system. A variety of fasteners are available such as staples, screws, and nails, provided the heads or washers of these fasteners are large enough to not pull through the lath or cement board and the fastener is of sufficient length to penetrate into the supporting material. For specific fastener selection criteria, refer to ASTM C1861.

- Wood framing - For lath, corrosion resistant staples, corrosion resistant roofing nails, or corrosion resistant screws and washers. For cement board, corrosion resistant cement board screws as recommended by the cement board manufacturer. Fasteners must be of sufficient length to penetrate a minimum of 3/4 inch (19 mm) into framing members.
- Metal framing or panels - For lath, corrosion resistant staples, corrosion resistant roofing nails, or corrosion resistant screws and washers. For cement board, corrosion resistant cement board screws as recommended by the cement board manufacturer. Fasteners must be of sufficient length to penetrate a minimum of 3/8 inch (9.5 mm) through metal studs or panels.
- Masonry or concrete walls or panels - Corrosion resistant concrete screws or powder actuated fasteners (or cap fastener). For cement board, use 1 ¾ inch to 2 ¼ inch long $^3/_{16}$ inch diameter concrete screws with 1-¼" diameter 25 gage galvanized washer.

Cement Board

Cement board may be used in place of lath and scratch coat, if desired. When used, cement board must comply with ASTM C1325. They must also be evaluated for interior or exterior use in accordance with ICC-ES AC376 based on the desired applications. When using cement board, only modified mortars complying with ANSI A118.4 or ANSI A118.15 should be used as the setting bed mortar. Do not use conventional mortars (Type S or N) with cement board installations. Refer to ASTM C1780 and manufacturer recommendations for additional details on cement board installations. Refer to Figures 4a and 4b for references to the primary difference between lath and cement board applications. Other construction details illustrated in this guide are applicable to cement boards installations as well.

It is permitted to use one layer of water-resistive barrier between cement board and substrate. For exterior applications, joints in cement board should be treated per manufacturer's recommendations with modified mortars meeting ANSI A118.4 or ANSI A118.15 and 4-in. (100 mm). wide alkali-resistant fiberglass mesh tape. For interior applications, joints in cement board should be treated per manufacturer's recommendations with modified mortars meeting ANSI A118.4 or ANSI A118.15 and 2-in (50 mm). wide alkali-resistant fiberglass mesh tape.

Mortar

Mortars used for the installation of AMSV systems can be grouped into three different categories; scratch coat mortar, setting bed mortar, and pointing mortar. Depending upon the type of mortar used and whether it is batched on site or delivered premixed to the project, each mortar must meet minimum requirements as described below:

Scratch Coat Mortars – Scratch coat mortars are applied directly to the lath or substrate to which AMSV systems are adhered. As the name implies, this first layer of mortar is intentionally scratched or roughened before hardening to provide enhanced mechanical bond between the scratch coat and setting bed mortars. Recommendations for the scratch coat mortar are as follows:

- Site Mixed: Meets the requirements of ASTM C270 Type N or Type S
- Preblended: Meets the requirements of ASTM C1714 /C1714M Type N or Type S

Setting Bed Mortars – After the scratch coat mortar has cured sufficiently, the setting bed mortar is used to adhere the AMSV units to the backing. The setting bed mortar is applied directly to the scratch coat or to the back of the AMSV units (back-buttering), or a combination of both application methods. Recommendations for setting bed mortars based on specific applications are described as follows in Table 2.

Pointing Mortars – Pointing mortars, also referred to as grouting mortars or mortar used to grout mortar joints, are used to fill the joints between individual AMSV units once the setting bed mortar has sufficiently cured. Not

Table 2: Application Based Setting Bed Mortar Recommendations[1]

Application	Type N Mortar (ASTM C270 or ASTM C1714)	Type S Mortar (ASTM C270 or ASTM C1714) or ANSI A118.1 Mortar	ANSI A118.4 or ANSI A118.15[5] Mortar
Interior Applications			
Less than 10 ft (3 m) in height above finished floor	Recommended	Recommended	Recommended
All other interior applications	Not Recommended	Recommended	Recommended
Exterior Single Family Residential Applications			
Grouted[2]	Not Recommended	Recommended	Recommended
All other exterior single family residential applications	Not Recommended	Recommended	Recommended
All Other Exterior Applications			
Less than 10 ft (3 m) in height above finished grade	Not Recommended	Recommended	Recommended
All other exterior applications	Not Recommended	Not Recommended	Recommended
Special Applications			
Installed directly on cement board	Not Recommended	Not Recommended	Recommended
Non-vertical applications[3,4]	Not Recommended	Not Recommended	Recommended

1 If the surface area of an AMSV unit exceeds 1 ft² (0.1 m²) or 24 in. (610 mm) in any dimension, then install using setting bed mortar complying with ANSI A118.4 or ANSI A118.15.
2 Requires a minimum nominal mortar joint thickness of 1/4 in. (6.4 mm) around AMSV units.
3 Requires a fastening system designed by a professional engineer.
4 AMSV units should not be subjected to pedestrian or vehicular traffic.
5 The scope of ANSI A118.15 references these mortars can be used in submerged locations. It is not recommended to use AMSV in submerged applications or other applications with continuous exposure to water.

all AMSV systems incorporate mortar between the units, while others allow the distance between units to be varied to create alternative architectural finishes. Recommendations for the pointing mortar are as follows:

- Site Mixed: Meets the requirements of ASTM C270 Type N or Type S
- Preblended: Meets the requirements of ASTM C1714/C1714M Type N or Type S

It is important to note that mortars mixed with higher amounts of cement will tend to be less workable and may be prone to increased shrinkage cracking, but will provide greater bond strength. Type N mortars are generally easier to work with than Type S mortars due to the higher cement content of Type S mortars.

General Mortar Considerations

When considering mortar selections, verify the mortar can provide a minimum shear bond strength of 50 lb/ in.² (345 kPa) when tested in accordance with ASTM C482, is consistent with the stone manufacturer's recommendations, and is suitable for installation of adhered manufactured stone veneer. Prepackaged/ preblended mortars should be mixed and installed per mortar manufacturer's instructions

In some cases additives or admixtures are added to mortars to modify one or more plastic or hardened properties of the mortar; such as workability enhancers, water repellents, or bond enhancers. When a modifier is introduced to a mortar comply with ASTM C270 or ASTM C1714, the additional requirements of ASTM C1384 must also be met. Modifiers used in the production of mortar complying with ANSI A118.4 or ANSI A118.15 are specifically designed to increase the mortar's bond strength.

As reflected in Table 2, modified mortars containing bond enhancers and mortars with higher cement contents are better suited for challenging installations or where increased bond strength is desired. Examples of these installations include exterior applications or when directly bonding to substrates such as cement board. As not all mortar admixtures are compatible or interchangeable, consult with mortar or additive manufacturers to ensure compatibility of mortar and admixture components.

SURFACE PREPARATION

Verify that the surface to which the AMSV is to be installed is structurally sound, free of any coatings or materials that would inhibit bonding, and capable of supporting the intended AMSV system. The majority of the discussion and details in this guide focuses on the

installation of AMSV systems on backup systems consisting of wood or steel framing with rigid sheathing and concrete or concrete masonry construction; however, virtually any backup system can be used when properly designed and prepared to receive AMSV systems.

Masonry walls, poured-in-place concrete walls, and concrete tilt up panels must be free of dirt, waterproofing, paint, form oil, or any other substance that could inhibit the mortar bond and must readily accept/absorb water in order to achieve good bond. The International Concrete Repair Institute, (ICRI), provides guidance for concrete surface preparation and assessment. The surfaces intended to receive AMSV units must have a rough texture to ensure good mortar bond. Refer to ICRI Technical Guideline 310.2 for additional information on concrete surface preparation, including information on Concrete Surface Profile (CSP), a standardized method to measure concrete surface roughness. A CSP equal to or greater than 2 is usually acceptable for the installation of AMSV over concrete and masonry assemblies. If necessary, cleaning may be done with power washing or mechanical methods (i.e. shot or bead blasting). If a bondable surface cannot be achieved, attach lath and scratch coat before installing AMSV. This guide does not address the installation of AMSV systems over open stud backup systems.

Wall Systems with Exterior Continuous Insulation

AMSV may be installed on walls insulated with continuous insulation such as foam insulation. See Tables 3 and 4 for requirements on fastening over continous insulation, which are adopted from similar provisions in Chapter 26 of the International Building Code. The requirements are contained within the IBC. The allowable insulation thicknesses are based upon the fastener type, fastener spacing, cladding weight, and supporting backup system.

Water Resistive Barrier

Where a water resistive barrier (WRB) is required, it should be installed in two separate layers in shingle fashion, starting from the bottom of the wall. The inner layer of WRB (herein referred to as the Primary WRB) should be installed, along with flashings, to create a drainage plane. The outer layer of WRB (herein referred to as the Secondary WRB) is intended to keep the scratch coat from contacting the Primary WRB. For WRB materials complying with ASTM D226, the upper layer of the WRB should lap on on top of the lower layer by a minimum of 2 inches (51 mm), and the vertical joints should be lapped a minimum of 6 inches (152 mm). Refer to the WRB manufacturer's information for lapping requirements for other WRBs. Inside and outside corners must be overlapped a minimum of 16 inches (406 mm) past the corner in both directions. The WRB should be installed in accordance with the manufacturer's recommendations and be integrated with all flashing accessories, adjacent WRBs, doors, windows, penetrations, and cladding transitions.

Acceptable WRBs:

- No. 15 felt complying with ASTM D226 Type 1.
- ASTM E2556 Type I or II
- Approved equal in accordance with the building code. Other approved materials must be used and installed in accordance with the manufacturer's instructions and as detailed in compliance reports. The following is a non-exhaustive list of additional materials that may be suitable as a WRB if they

Table 3: Cladding Minimum Fastening Requirements for Direct Attachment of AMSV Over Insulation for Steel Framing[a]

Cladding Fastener through Foam Sheathing into:	Cladding Fastener Type and Minimum Size[b]	Cladding Fastener Horizontal Spacing (in.)	Cladding Fastener Vertical Spacing (in.)	Maximum Thickness of Foam Sheathing[c] (in.)		
				Cladding System Weight[d]		
				11 psf	18 psf	25 psf
Steel framing (minimum penetration of steel thickness plus 3 threads)	#8 screw into 33 mil steel or thicker	16	6	2.95	2.20	1.45
	#10 screw into 33 mil steel or thicker	16	6	3.50	2.70	1.95
	#10 screw into 43 mil steel or thicker	16	6	4.00	4.00	3.60

For SI: 1 in. = 25.4 mm; 1 pound per square foot (psf) = 0.0479 kPa, 1 pound per square inch = 0.00689 MPa.
DR = design required;
[a] Steel framing shall be minimum 33 ksi steel for 33 mil and 43 mil steel and 50 ksi steel for 54 mil steel or thicker.
[b] Screws shall comply with the requirements of AISI S200.
[c] Foam sheathing shall have a minimum compressive strength of 15 pounds per square inch in accordance with ASTM C578 or ASTM C1289.
[d] Cladding System Weight includes the installed weight of the AMSV units, setting bed mortar, lath, and scratch coat.

Table 4: Cladding Minimum Fastening Requirements for Direct Attachment of AMSV over Insulation for Wood Framing[a]

Cladding Fastener through Foam Sheathing into:	Cladding Fastener Type and Minimum Size[b]	Cladding Fastener Horzintal Spacing (in.)	Cladding Fastener Vertical Spacing (in.)	Maximum Thickness of Foam Sheathing[c] (in.)		
				Cladding System Weight[d]		
				11 psf	18 psf	25 psf
Wood framing (minimum 1 1/4 in. pentration)	0.113 in. diameter nail	16	6	1.45	0.75	DR
	0.120 in. diameter nail	16	6	1.70	0.90	0.55
	0.131 in. diameter nail	16	6	2.15	1.20	0.75
	0.162 in. diameter nail	16	6	3.55	2.05	1.40

For SI: 1 inch = 25.4 mm; 1 pound per square foot (psf) = 0.0479 kPa
DR = design required
[a.] Wood framing shall be Spruce-Pine-Fir or any wood species with a specific gravity of 0.42 or greater in accordance with AFPA/NDS.
[b.] Nail fasteners shall comply with ASTM F1667, except nail length shall be permitted to exceed ASTM F1667 standard lengths.
[c.] Foam sheathing shall have a minimum compressive strength of 15 psi in accordance with ASTM C578 or ASTM C1289.
[d] Cladding System Weight includes the installed weight of the AMSV units, setting bed mortar, lath, and scratch coat.

include documentation of compliance with the referenced acceptance criteria:

- Materials evaluated for compliance with ICC-ES AC38.
- Liquid-applied materials evaluated for compliance with ICC-ES AC212 (for use as Primary WRB only)
- Pre-coated sheathing evaluated for compliance with ICC-ES AC310 (for use as Primary WRB only)

- It is permitted to use only a primary WRB between cement board and the substrate.
- As discussed in the "Rainscreen Drainage Plane Systems", building codes may allow a single layer of a WRB to be used when a drainage space is incorporated in the wall system. Requirements for the rainscreens vary by region. Verify with the local jurisdictional requirements regarding the use an application of rainscreens. Refer to Figures 35-38 for details on such construction method.
- When transitioning to another cladding (such as that shown in Figure 8), refer to the applicable building code requirements for WRB behind that specific cladding system. Despite the number of layers required for the non-AMSV cladding, there must be two (2) layers of WRB present behind the AMSV.
- Some types of continuous insulation may be substituted for the Primary WRB provided it is installed and sealed and/or taped in accordance with the insulation manufacturer's installation instructions and approved for such applications. Continuous insulation is commonly applied on the exterior side of the framing or on the exterior side of sheathing, runs continuously, and has minimal thermal bridging. Ensure WRB(s) selected are approved for wall applications. Some WRB's intended for roofs are not appropriate for walls. For example, 15 pound felt is not the same product as No. 15 felt. For details of this practice, please refer to the continuous insulation figures shown throughout the figures section of this guide.

Lath

The installation of lath should be in accordance with ASTM C1063. Lath should be applied horizontally (perpendicular to framing, if present) per manufacturer's instructions, and should overlap a minimum of 1 in. (25 mm) at the vertical seams and a minimum of 1/2 in. (13 mm) at the horizontal seams. Vertical seams should be staggered. Lath should be wrapped around inside and outside corners a minimum of 12 in. (305 mm). Lath should be fastened every 7 in. (178 mm) vertically on each stud. The spacing of studs should not exceed 16 in. (406 mm). A similar spacing should be used on concrete or masonry wall surfaces, when used. Do not place seams at inside/outside corner framing.

If not installed in accordance with ASTM C1063, alternate lath installation practices should be in accordance with manufacturer's instructions. Acceptable installation practices for metal lath should be evaluated in accordance with AC191 and ASTM C933.

While recommendations vary, existing codes and standards do not stipulate the orientation of the lath "cups" (keys) once installed. More important than the orientation of the lath cups is ensuring the lath is embedded

within, and bonded to, the mortar scratch coat for a successful AMSV installation. Lath is considered to be embedded within the mortar scratch coat when there is a 1/4 in. (6 mm) nominal thickness of mortar between the back plane of the lath and the back plane of the scratch coat for at least one-half (50%) of the surface area of the installation.

Please refer to Figures 1 and 2 for general details on lath installation based on backing.

Cement Board

The installation of cement board should be in accordance with the cement board manufacturer's instructions. Cement board should be fastened every 8 in. (203 mm) vertically on each stud. The spacing of studs should not exceed 16 in. (406 mm). A similar spacing should be used on concrete or masonry wall surfaces, when used.

The seams between cement boards must be treated per manufacturers instructions. For exterior applications, use 4 in. (100 mm) wide alkali-resistant fiberglass mesh tape. For interior applications use 2 in. (50 mm) wide alkali-resistant fiberglass mesh tape. A coat of modified mortar meeting either ANSI A118.4 or ANSI A118.15 must be used to bed the fiberglass mesh tape. The same modified mortar should be applied to corners, control joints, trims or other accessories. Feather modified mortar over fasteners to fully conceal.

Flashings/Weep Screeds/Casing Bead/ Movement Joints

All flashing and accessory detailing pieces should be corrosion resistant.

Verify that all flashing, including roofing kickout flashing, has been properly installed. Although roof flashings are not part of the wall cladding system, they are necessary for proper water management. Flashing material should extend above horizontal terminations, roofing material, and drainage planes or drainage products.

All flashing material should be integrated with water resistive barriers to mitigate water penetration into the structure. The WRB should overlap the weep screed flange.

Some applications may not require the use of flashing, weep screeds, and casing beads to prevent water penetration. In cases where there is no WRB present, a weep screed is usually not required but a weep screed or casing bead can still be used for aesthetic purposes. In cases where a drip edge is needed based on a cladding transition, then flashing is required. The use of both flashing and a weep screed simultaneously is not typically necessary.

Plan ahead with the various trades to integrate flashing and water resistive barriers to effectively shed water down and out of the wall system. This may require the preceding trade on the job to install flashing or WRBs for integration with the next trade on the job.

Movement Joints - Different elements and materials within any structure move differently in response to applied loads or as a result of fluctuations in temperature or moisture content. In determining if and where movement joints may be needed as part of an AMSV installation, consideration should be given to where differential movement is expected—for example, at the intersection of dissimilar materials; or where movement may be concentrated—for example, at the transition between a framed backup assembly and a concrete masonry assembly. Additional information is available on the NCMA website: www.ncma.org.

Clearances

On exterior frame walls, weep screeds and other base flashings should be held a minimum of 4 in. (102 mm) above grade or a minimum of 2 in. (51 mm) above paved surfaces. This minimum can be reduced to 1/2 in. (13 mm) if the paved surface is a walking surface supported by the same foundation that supports the wall. See Figure 5.

Where the backing is concrete or masonry, maintain 2 in. (51 mm) clearance from grade or ½ in. (13 mm) from a paved surface provided that frost heave of adjacent surfaces is taken into consideration.

Interior Applications

Interior applications in non-wet locations (areas not exposed to water) for AMSV are similar to exterior applications with the following alternatives:

- Two layers of WRB are not necessary behind the lath and scratch coat. A single layer of WRB is recommended protect moisture sensitive materials during AMSV installation.
- Interior applications are not subjected to the same fluctuations in temperature and moisture as exterior applications. As such, the criteria for clearances used for exterior applications are typically not necessary. Nevertheless, differential movement between different materials must still be accounted for.
- Flashings, weep screeds, and casing beads are not necessary.

INSTALLATION OF ADHERED MANUFACTURED STONE VENEER

Prior to commencing installation of AMSV, ensure the WRB and flashing are properly installed and integrated.

Refer to the flashing details, referenced in this guide, for detailing around windows, doors, through-wall penetrations, and AMSV terminations.

After the lath is installed, apply a nominal 1/2 in. (13 mm) thick layer of mortar ensuring the lath is completely encapsulated with mortar. The mortar should be applied with sufficient pressure and thickness to fully embed the lath in mortar. Once the mortar is thumbprint hard, scratch (score) the surface horizontally to create the mortar scratch coat.

Moist curing the mortar scratch coat will help reduce cracking and ensure proper hydration during curing. Before applying AMSV, the mortar scratch coat should be dampened so that the surface appears wet but free of standing water.

Before installing AMSV, lay out a minimum of 25 sq ft (2.3 m2) of AMSV units at the jobsite so there is a variety of sizes, shapes, and colors from which to choose. Mixing AMSV sizes, shapes, textures and color will allow for variety and contrast in the design to achieve the desirable finished project. Follow AMSV manufacturers recommendations regarding mixing of product to achieve desired results.

The following guidance for grouted and tight-fit application of adhered masonry veneer applies to conventional Type N and Type S mortars. If a modified mortar is used, some of the working properties and installation techniques may vary from those of conventional Type N or Type S mortars. Consult the mortar manufacturer for guidance and instructions. For typical details of AMSV systems, please refer to Figures 1-5.

Grouted Adhered Manufactured Stone Veneer Application

Tip: Installing AMSV from the top down will minimize cleanup requirements.

Prior to the application of mortar to the scratch coat or the back of the AMSV, the scratch coat and back of the AMSV should be moistened so that the surfaces appear damp but are free of standing water.

The back of each AMSV should be entirely buttered with mortar to a nominal thickness of 1/2 in. (13 mm). Cover the entire back of the AMSV, not just the perimeter. Buttered AMSV should be firmly worked onto the scratch coat and slid slightly back and forth or with a slight rotating motion to set the AMSV. Modified mortars, complying with ANSI A118.4 or ANSI A118.15, may have a different "feel" than non-modified mortars.

Achieve mortar squeeze out in a volume that results in a full setting bed covering the scratch coat completely. As an alternative to the back-butter only method, mortar may be troweled onto the scratch coat, completely covering the scratch coat. Or, both mortar application techniques may be combined. The resulting thickness of the scratch coat and setting bed should be nominally 1 in. (25 mm) measured from the outer surface of the WRB to the back surface of the unit.

With the proper mortar mix, moisture content, and scratch coat preparation, the installer will feel the mortar start to grab within a few seconds of the setting movement process. At this point, no further movement of the unit should be made as the bond will be broken. If the AMSV is inadvertently moved after initial set has begun, it should be removed, mortar scraped off the back of the AMSV and scratch coat, and then reinstalled following the application process.

Grouting the joints should be completed only after there is sufficient cure time of the installed AMSV units; when mild contact with AMSV units will not break the bond to the backup system. Grouting may be done with a grout bag, filling joints to the desired depth, ensuring that mortar is forced into all voids. Grout should be “thumbprint hard” before tooling the joints. The curing time required before the grout is ready will vary significantly with temperature and humidity. Use a wooden raking stick or pointing tool to tool the joints to the desired depth. Extra precaution should be taken while tooling so the surface of the AMSV is not damaged. Clean off remaining grout debris on the AMSV surface with a dry, soft-bristled brush.

To prevent mortar smearing, DO NOT use a wet brush to treat uncured mortar joints.

Tight Fitted Adhered Manufactured Stone Veneer Application

Refer to Mortar section for additional guidance regarding mortar selection. For this installation technique, refer to the General Mortar Considerations section.

The back of the AMSV and the scratch coat should be moistened with the surfaces appearing damp but free of standing water.

The back of each AMSV should be entirely buttered with mortar to a nominal thickness of 1/2 in. (13 mm). Cover the entire back of the AMSV, not just the perimeter. Buttered AMSV should be firmly worked onto the scratch coat and slid slightly back and forth to set the AMSV.

Achieve mortar squeeze out in a volume that results in a full setting bed which covers the scratch coat completely. As an alternative to the back-butter only method, mortar may be troweled onto the scratch coat, completely covering the scratch coat. Or, both mortar application techniques may be combined. The resulting thickness of the scratch coat and setting bed should be nominally 1 in. (25 mm) measured from the outer surface of the WRB to the back surface of the unit.

With the proper mortar mix, moisture content and scratch coat preparation, the installer will feel the mortar start to grab within a few seconds of the setting movement process. At this point, no further movement of that AMSV should be made as the bond will be broken. If the AMSV is inadvertently moved after initial set has begun, it should be removed, mortar scraped off the back of the AMSV and scratch coat, and then reinstalled following the application process.

Tight fitted AMSV should be applied from the corners toward the middle of a wall, and from the bottom toward the top of the wall.

Cold Weather Application

AMSV applications should be protected from temperatures below 40°F (4°C) during and immediately following installation. The use of anti-freeze admixtures to lower the freezing point of the mortar is not recommended. Accelerating admixtures shall comply with ASTM C1384; accelerating admixtures containing calcium chloride are not permitted. AMSV pieces containing visible frozen moisture shall not be installed.

The cold weather practices defined in TMS 602 should be followed for the installation of AMSV systems.

Hot Weather Application

If the environmental conditions during installation exceed 90°F (32°C) additional water may be needed on the scratch coat surface and the backs of the AMSV being installed. Providing shade and/or frequent misting of the wall may be required. Consult with mortar manufacturer to determine if hot weather mortar mix options are available. The hot weather practices defined in TMS 602 should be followed for the installation of AMSV systems.

Cleaning the Adhered Manufactured Stone Veneer

Refer to AMSV manufacturer recommendations on cleaning and maintenance. Do not use harsh chemicals for cleaning, such as acid, or use abrasive tools such as wire brushes or power washers.

Coating Adhered Manufactured Stone Veneer

Refer to the AMSV manufacturer for recommendations regarding the use of repellant, sealers, or other topically applied coatings used for water penetration resistance, graffiti resistance, or surface sealing.

Alternative Installation Methods/Materials

This guide covers common installation practices for AMSV systems. Alternative installation materials and methods not included in this guide may be introduced into the marketplace. Example: Exterior installation methods using cementitious adhesive mortars with a direct application to a substrate that may include coatings applied as loadbearing bonded water-proof membranes.

Alternative installation materials and methods along with their test methods and evaluation criteria are being developed. As a designer, contractor, or installer, you may wish to utilize these materials and/or methods in lieu of the recommended methods included in this guide. Users should verify that the alternative method(s) will meet or exceed the recommended installation practices presented in this guide.

Refer to manufacturer's recommendations for additional information regarding the use of alternative installation methods or materials.

CAUTIONS

The following precautions should be taken to ensure a successful and durable AMSV installation.

- Do not subject AMSV to direct or frequent water contact. Examples include avoiding sprinklers directly spraying on surfaces, pools, and Jacuzzis. Also, downspouts or drainage pipes should be placed so that water is not frequently moistening the AMSV units.
- Do not subject AMSV to contact with de-icing materials, salt, cleaning chemicals, pool chemicals, or other harsh chemicals. Prolonged exposure to these conditions may discolor the AMSV or result in surface damage.
- The installation of AMSV over open stud construction (no sheathing) is not covered in this Guide. Refer to recommendations from the AMSV manufacturer.
- Retaining Walls—the details in this Guide only cover installation of AMSV on retaining walls and required waterproofing for the soil side of the wall (Figure 39). Other details of construction of retaining walls, including water management behind the wall, are outside the scope of this Guide.
- Do not use AMSV on exterior stair risers (or similar situations) where exposure to de-icing chemicals, snow and ice removal tools, where standing water is likely to occur, or when appropriate clearances cannot be maintained.
- Do not use AMSV in applications with potential exposure in direct flame such as return into a firebox of a wood or gas-burning fireplace.

Figure 1. Installation Over Wood Framing

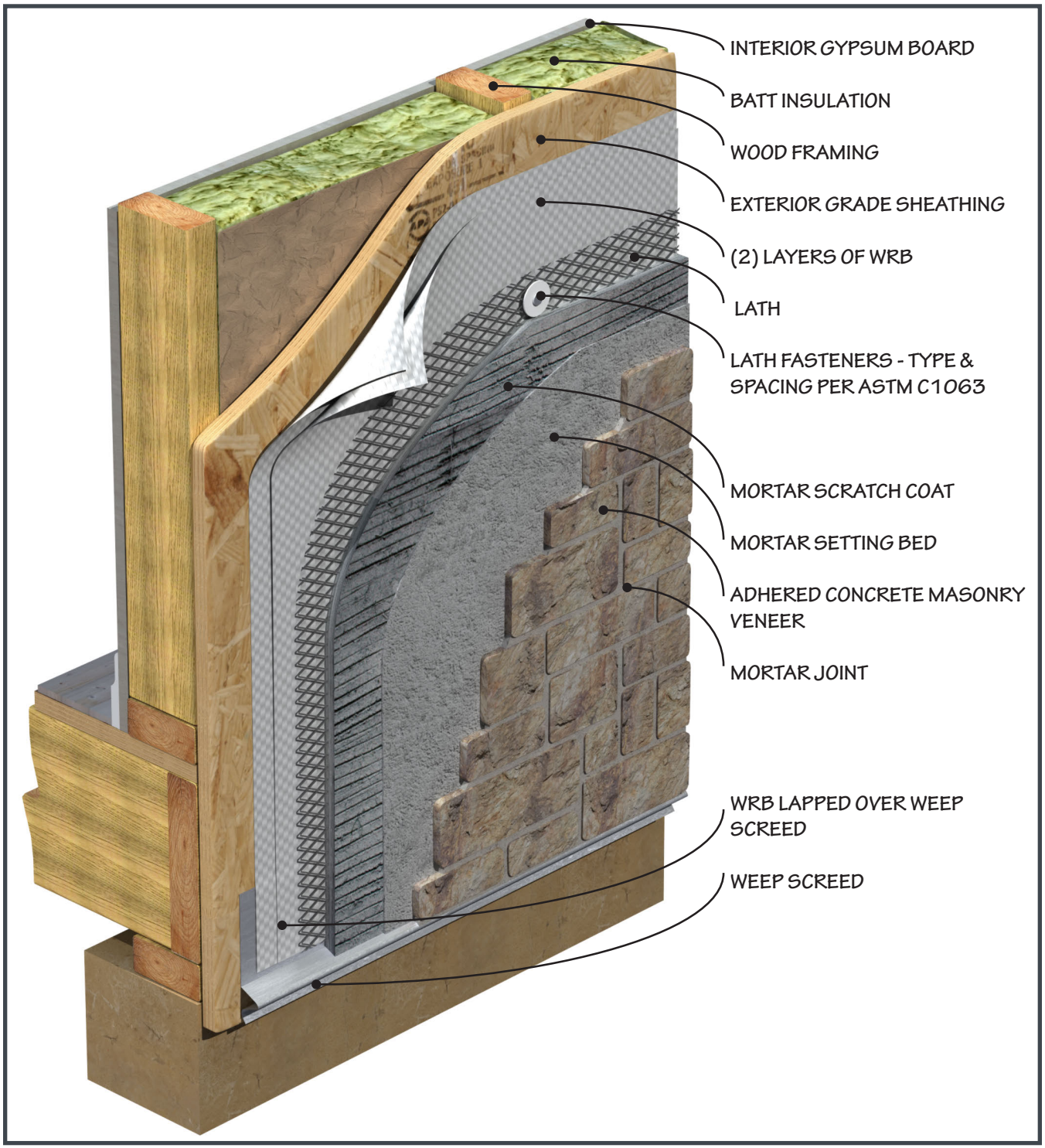


Figure 2. Installation Over Concrete Masonry Units

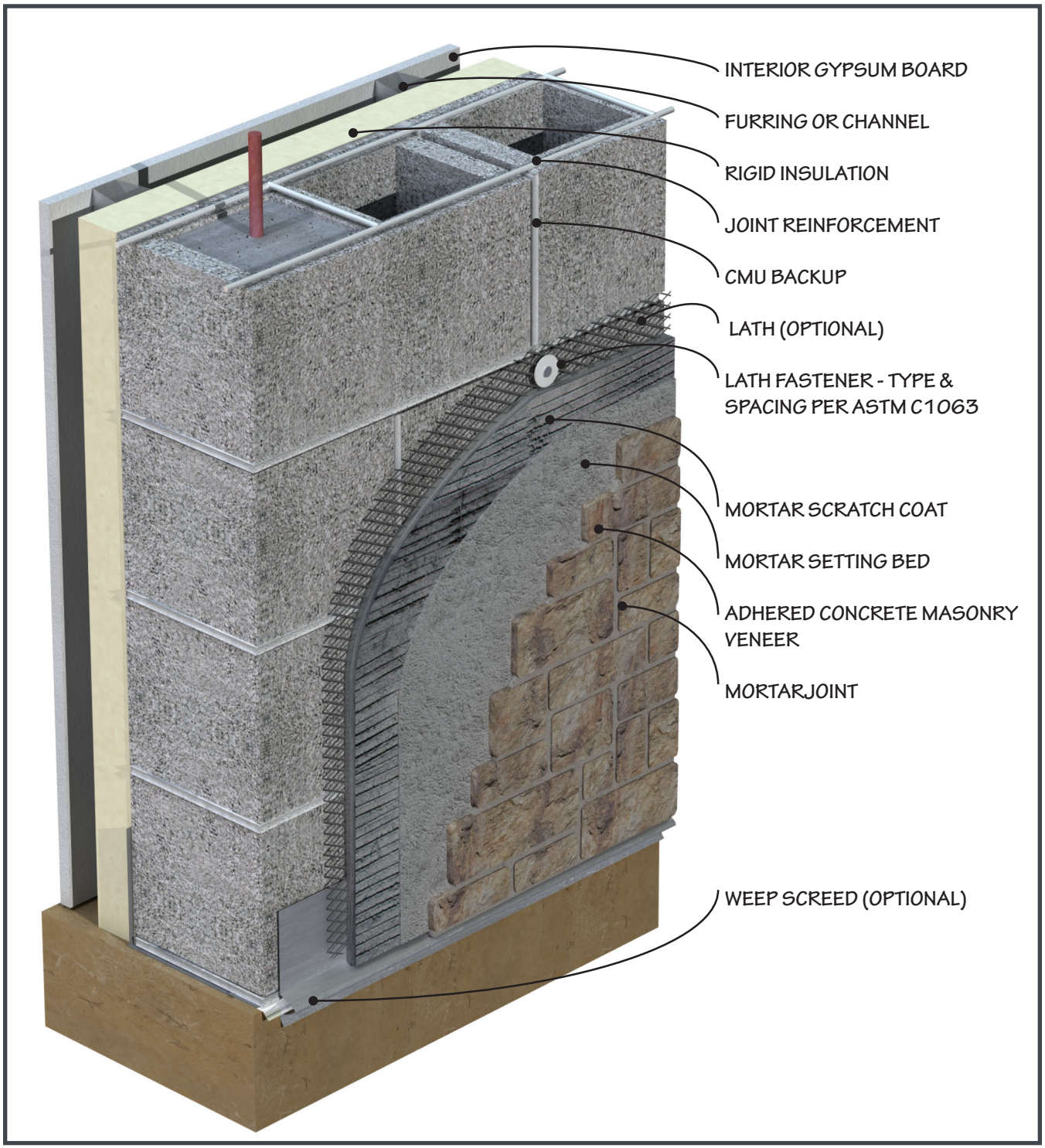


Figure 3. Wall Assembly Transition

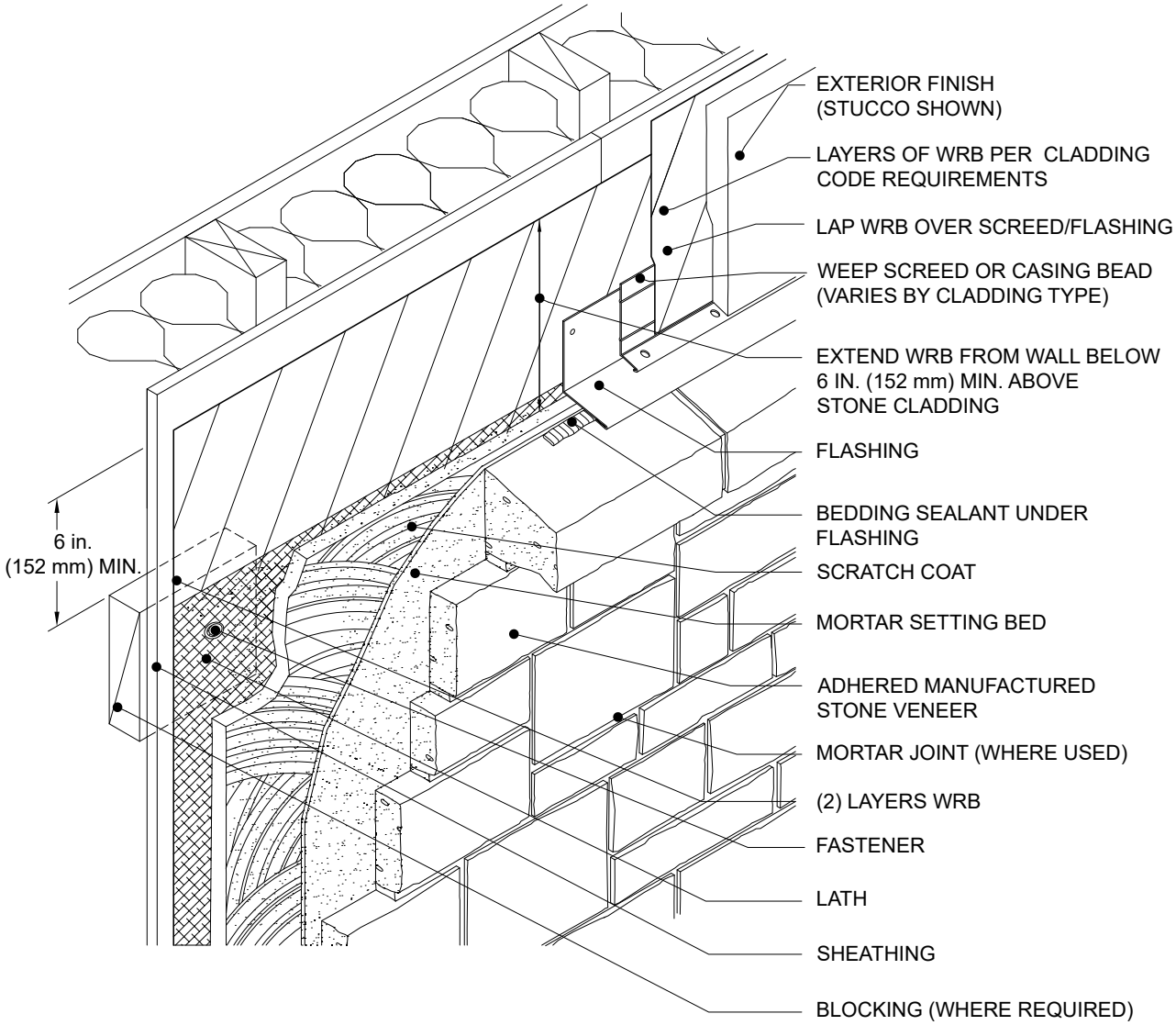


Figure 4a. Typical Frame Wall Section

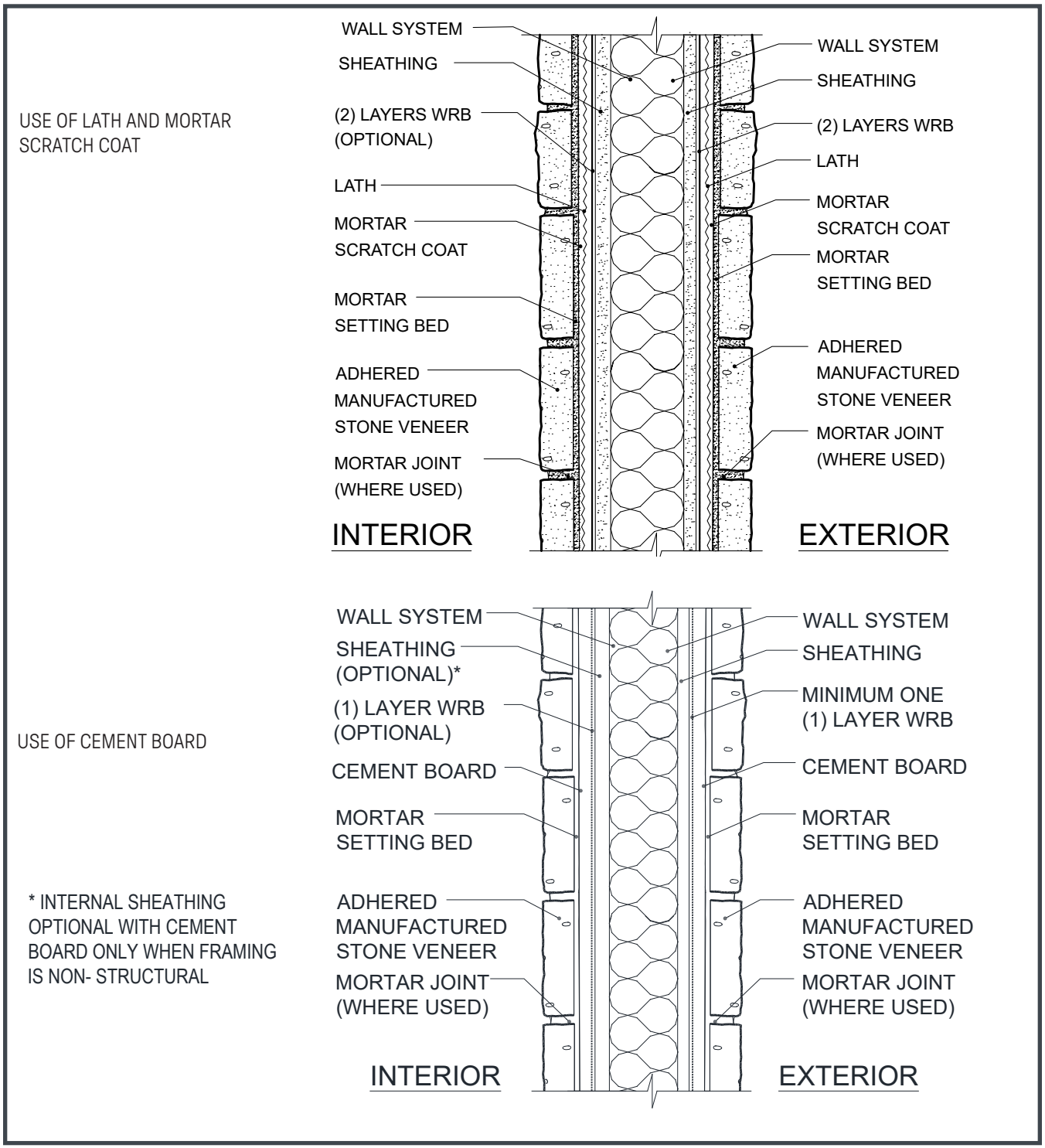
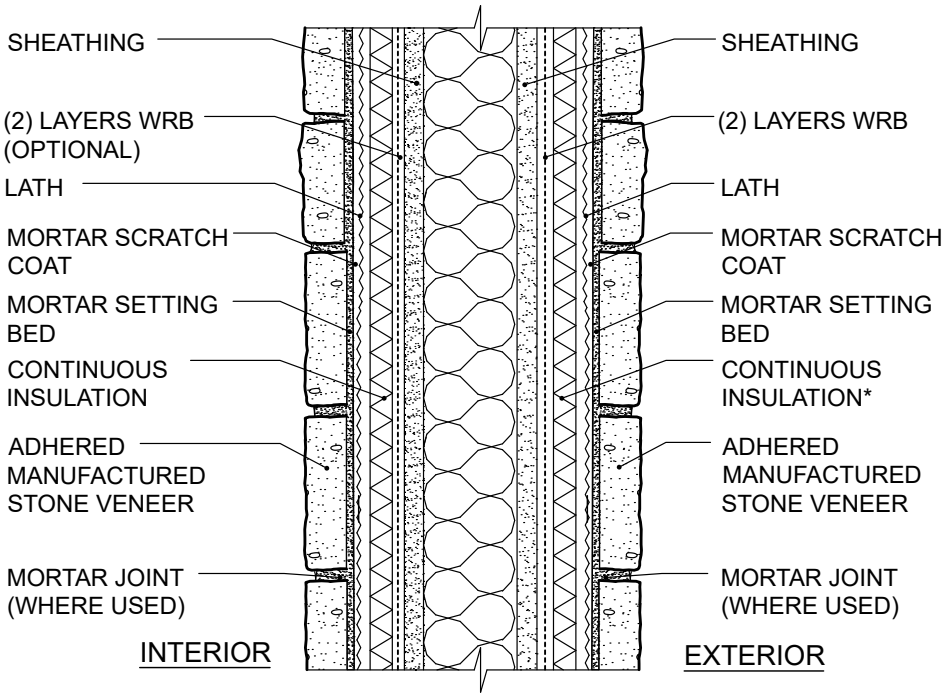
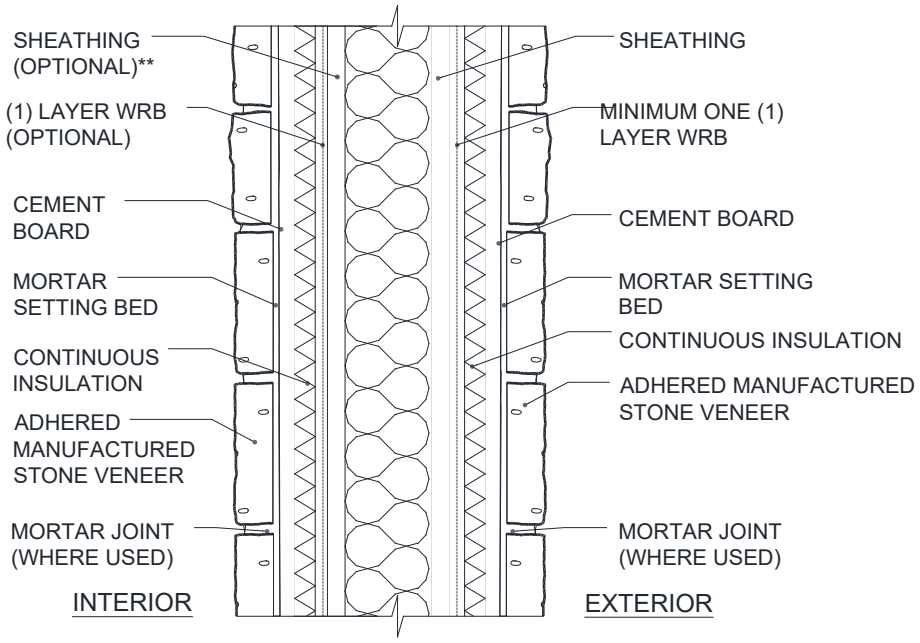


Figure 4b. Typical Wall Frame Section with Continuous Rigid Insulation

USE OF LATH AND MORTAR SCRATCH COAT



USE OF CEMENT BOARD



* SEE TABLES 3 AND 4 FOR FASTENER REQUIREMENTS OVER CONTINUOUS INSULATION
** INTERNAL SHEATHING OPTIONAL WITH CEMENT BOARD ONLY WHEN FRAMING IS NON- STRUCTURAL

Figure 5a. Foundation Wall Base

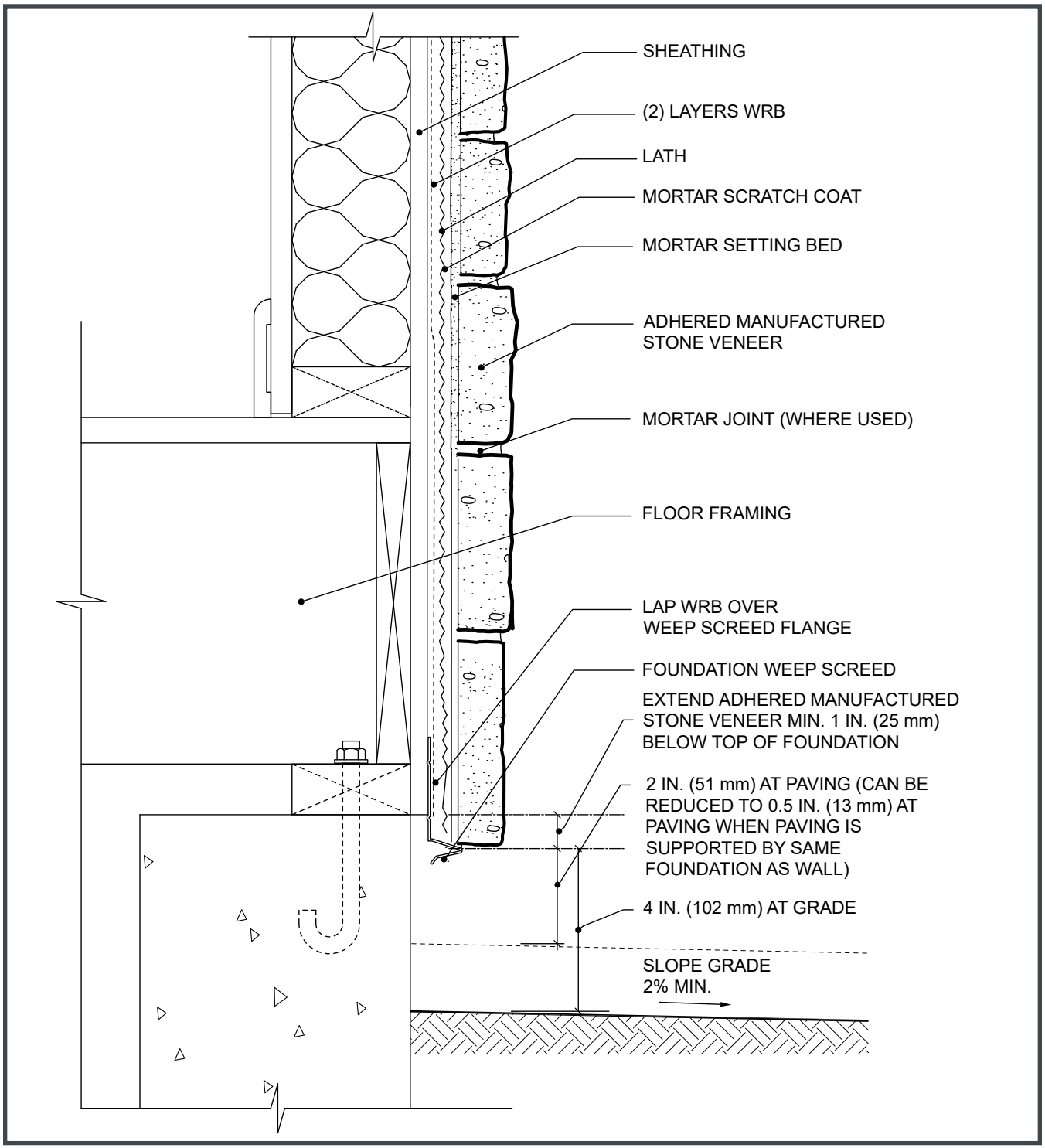


Figure 5b. Foundation Wall Base Over Continuous Rigid Insulation

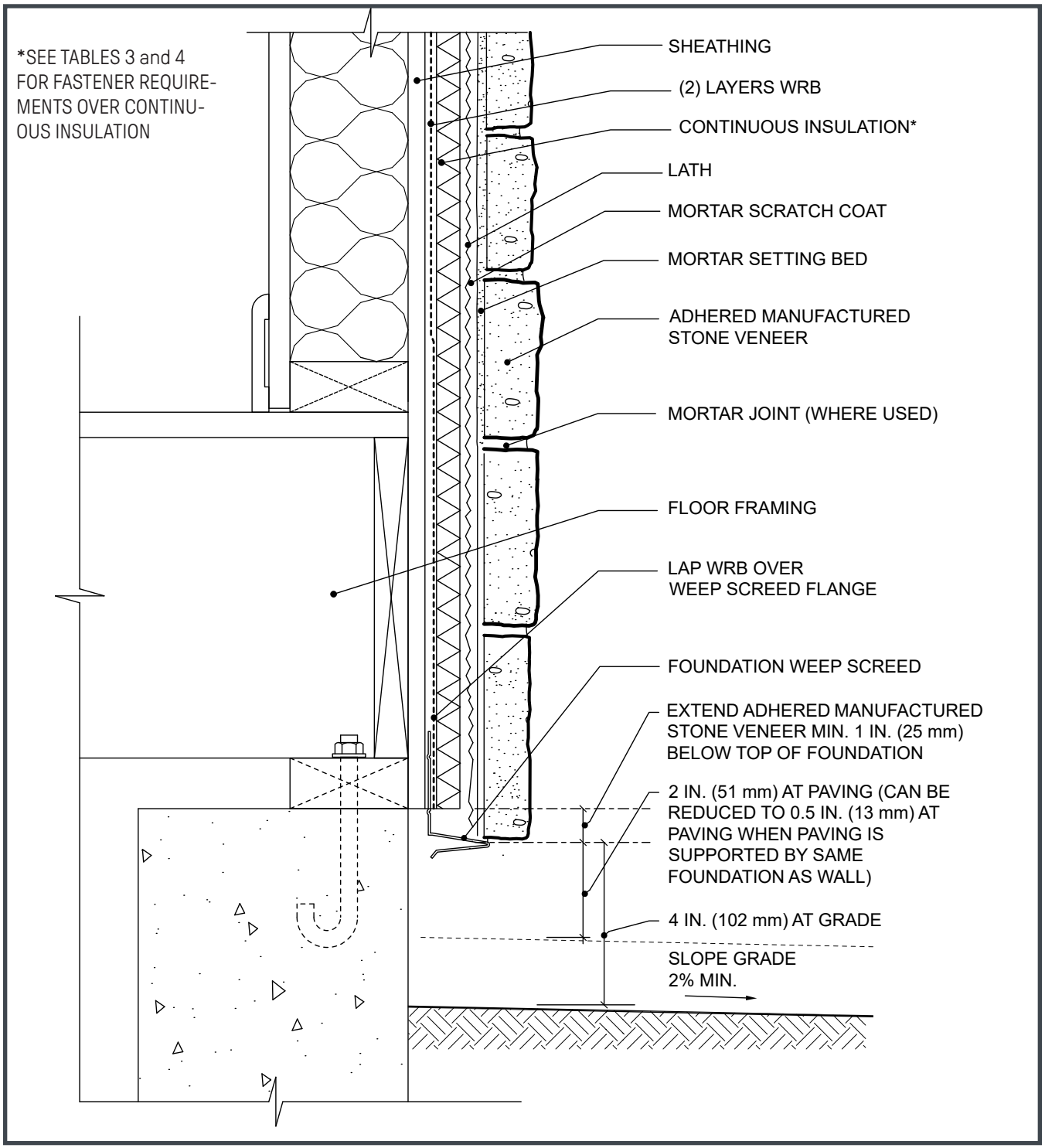


Figure 6. Foundation Wall Base – AMSV Overlapping Foundation

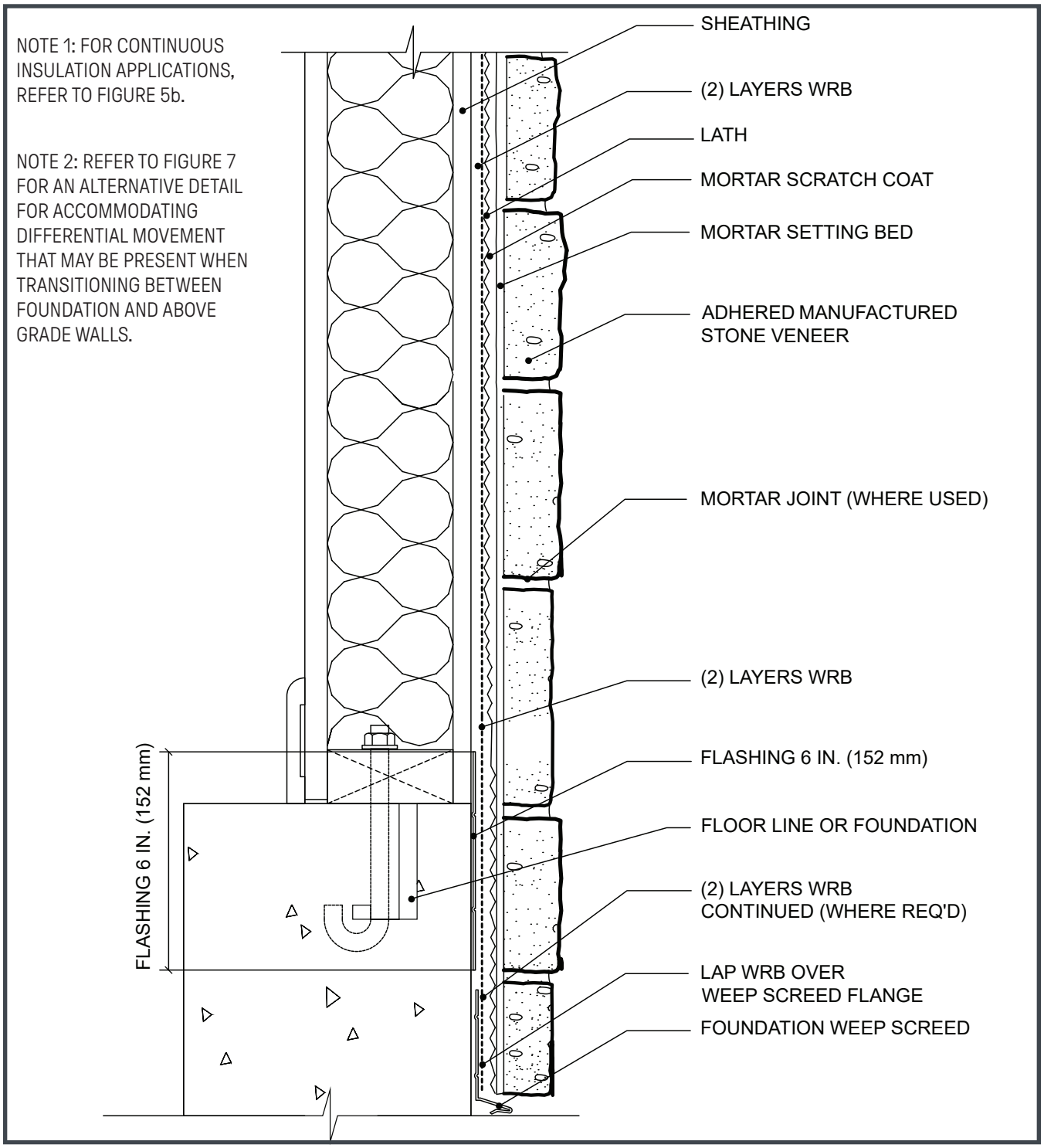


Figure 7. Foundation Wall – Transition to AMSV Continuing Down Foundation

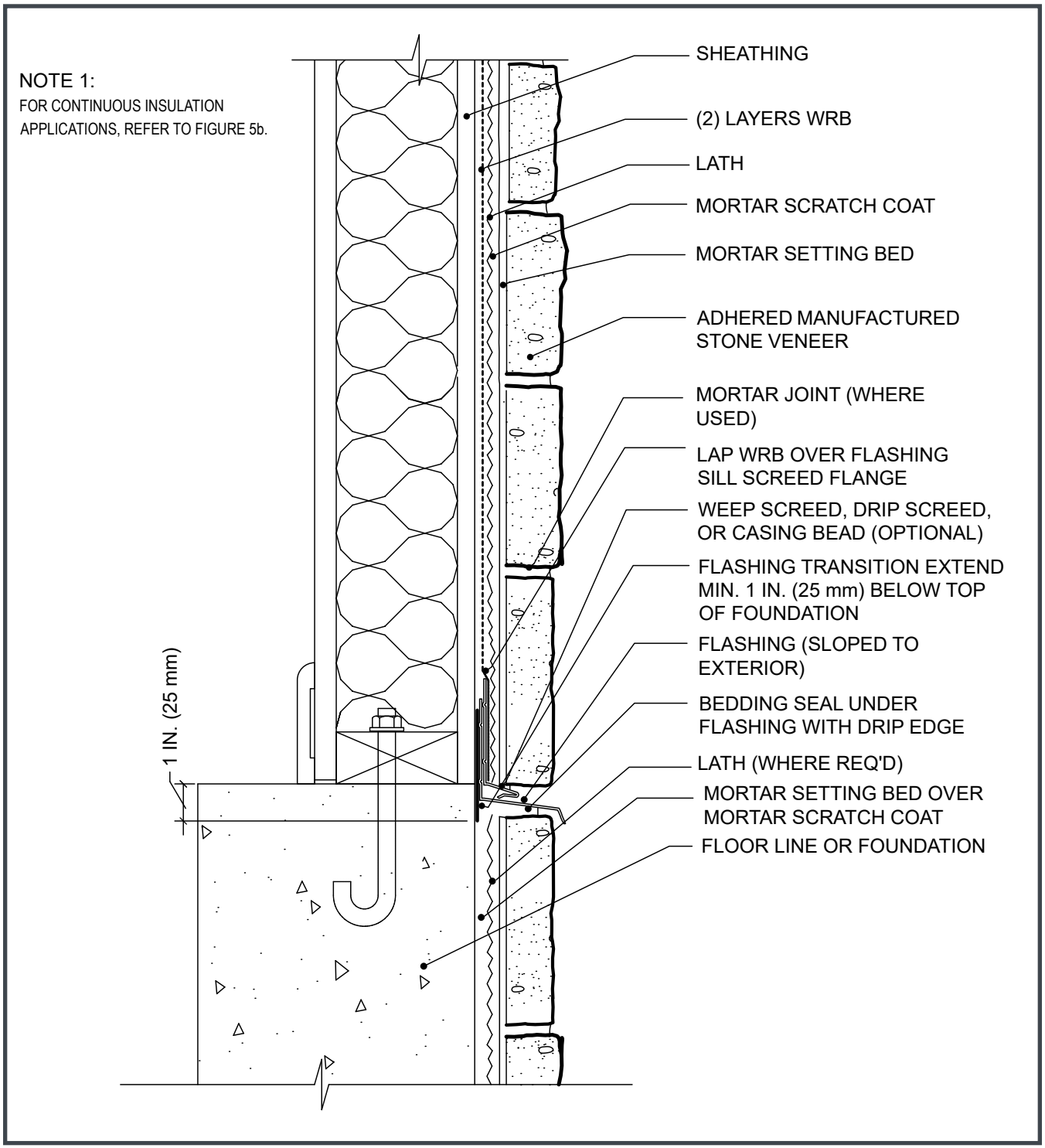
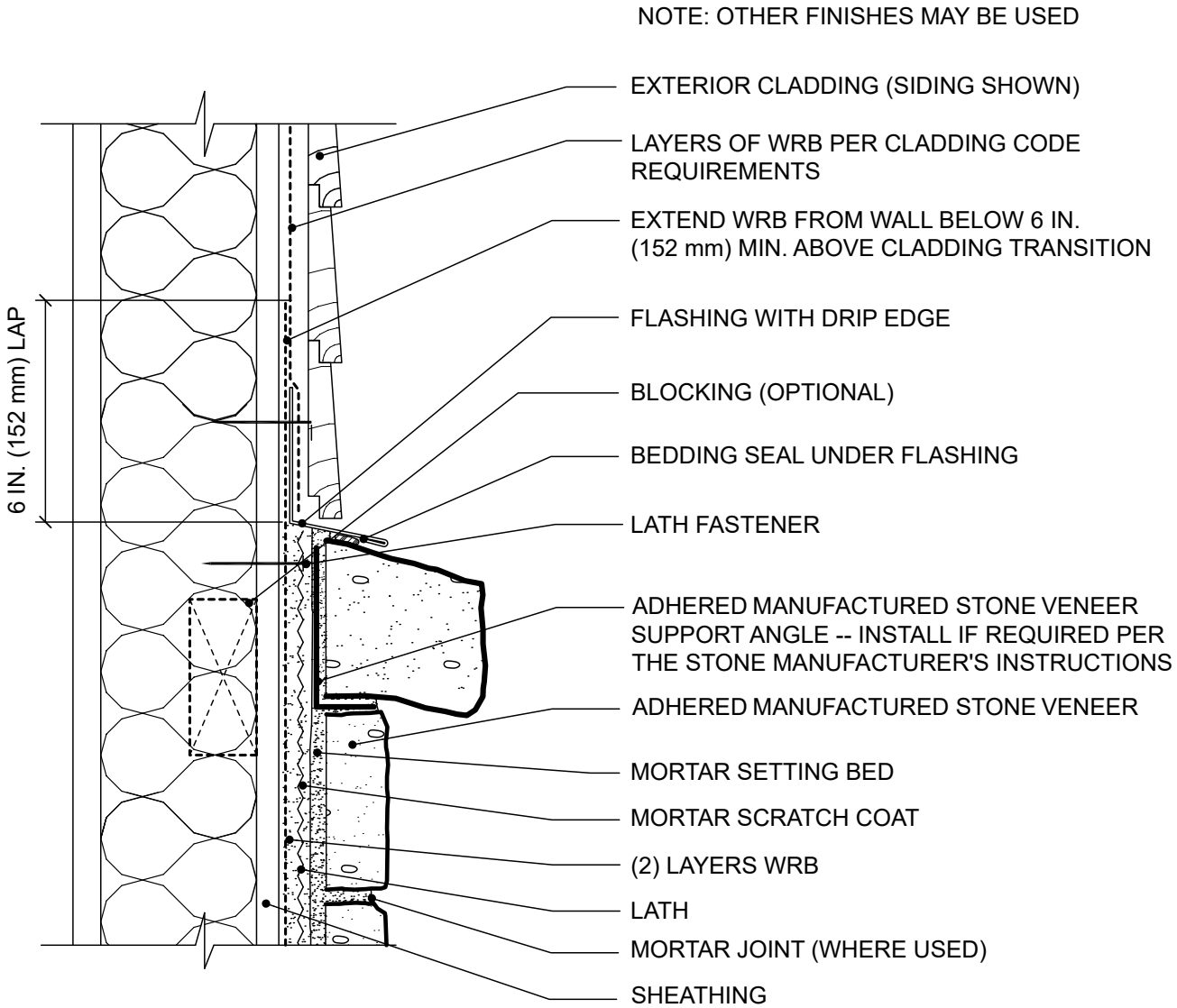
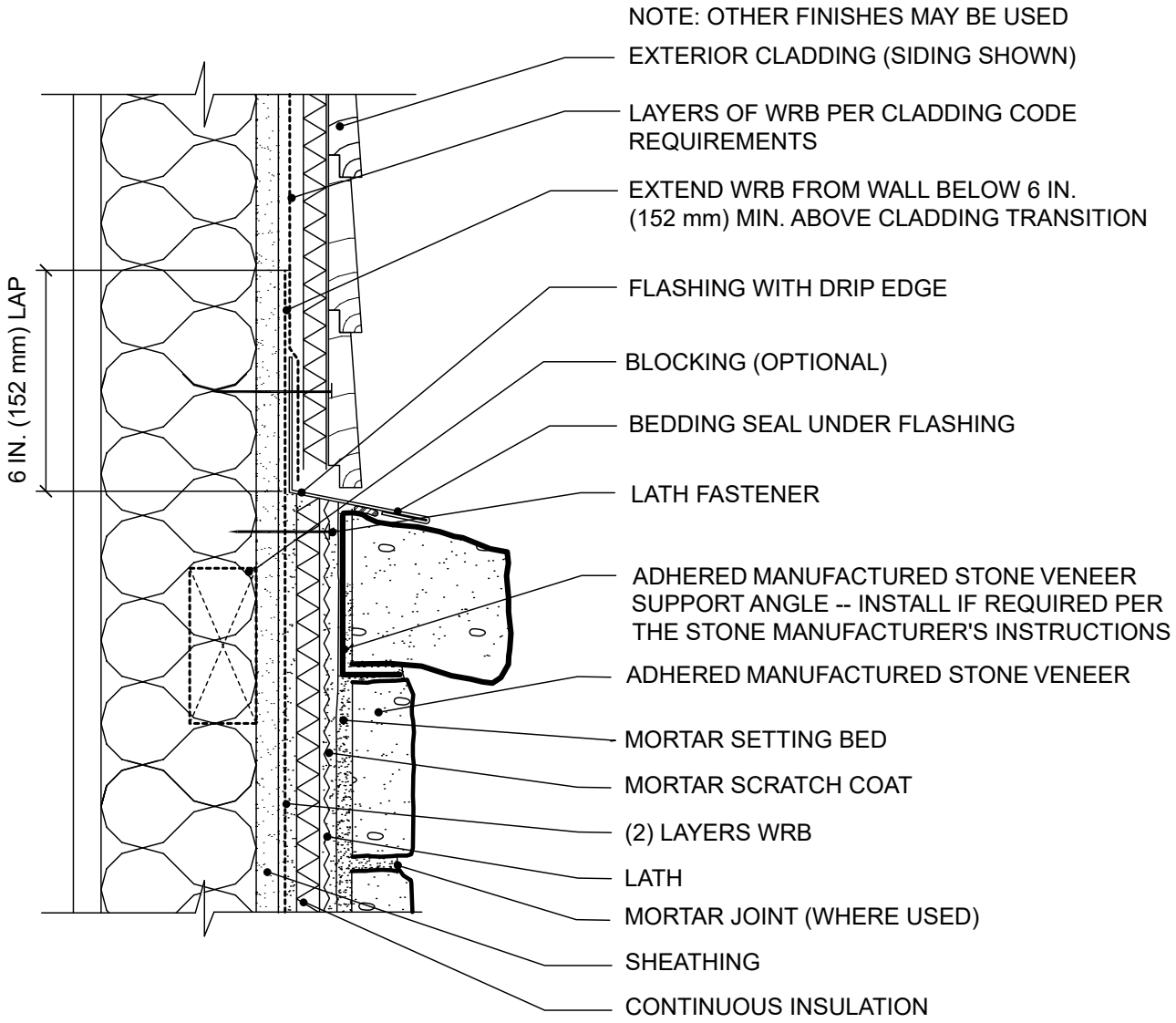


Figure 8a. Cladding Transition



Flashing should be installed prior to the adhered manufactured stone. Water resistive barrier laps over the vertical leg of flashing for positive drainage. Optional support angle shown. Verify installation requirements with adhered manufactured stone veneer manufacturer.

Figure 8b. Cladding Transition Over Continuous Rigid Insulation



Flashing should be installed prior to the adhered manufactured stone. Water resistive barrier laps over the vertical leg of flashing for positive drainage. Optional support angle shown. Verify installation requirements with adhered manufactured stone veneer manufacturer.

Figure 9a. Outside Corner

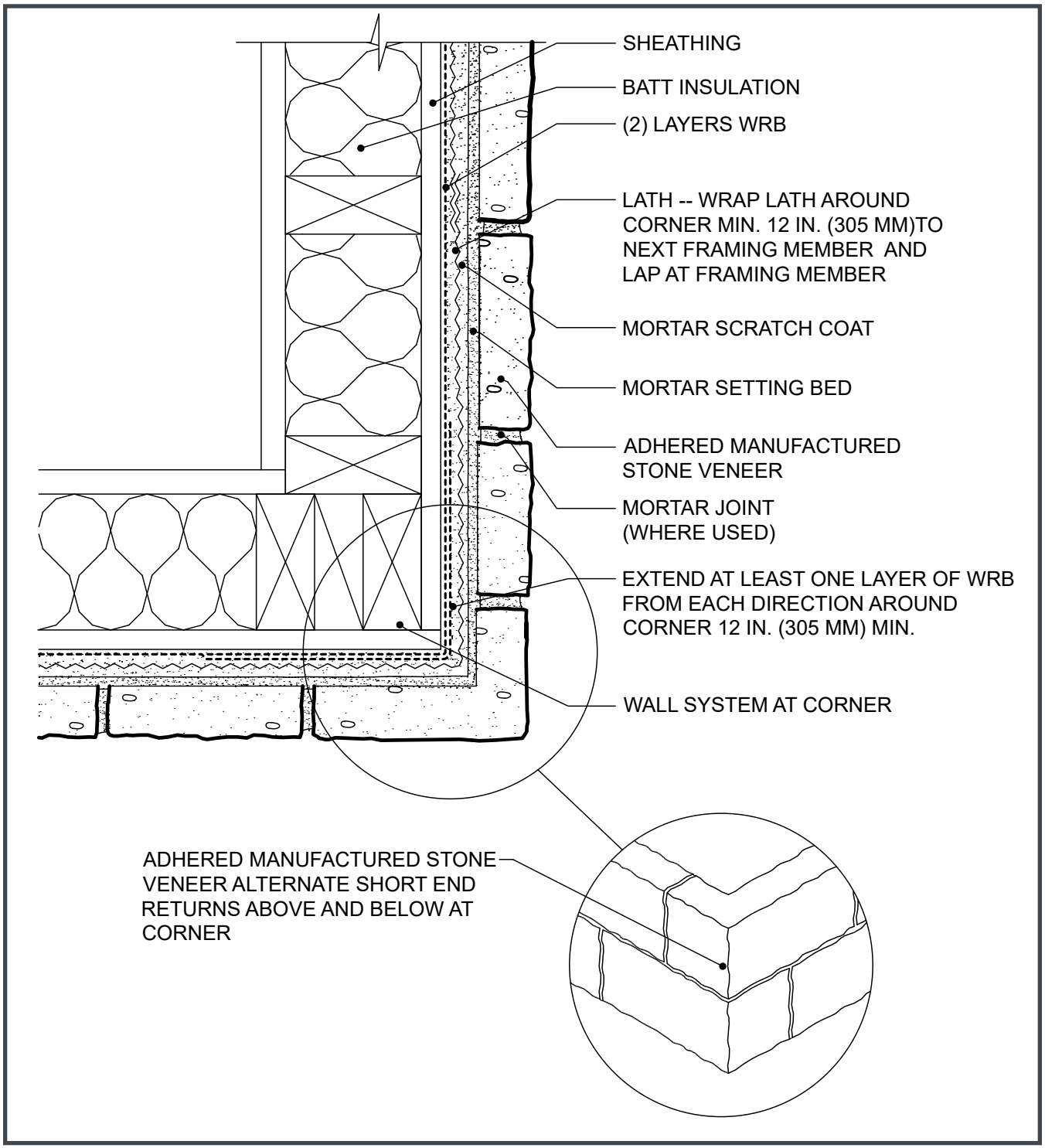


Figure 9b. Outside Corner Over Continuous Insulation

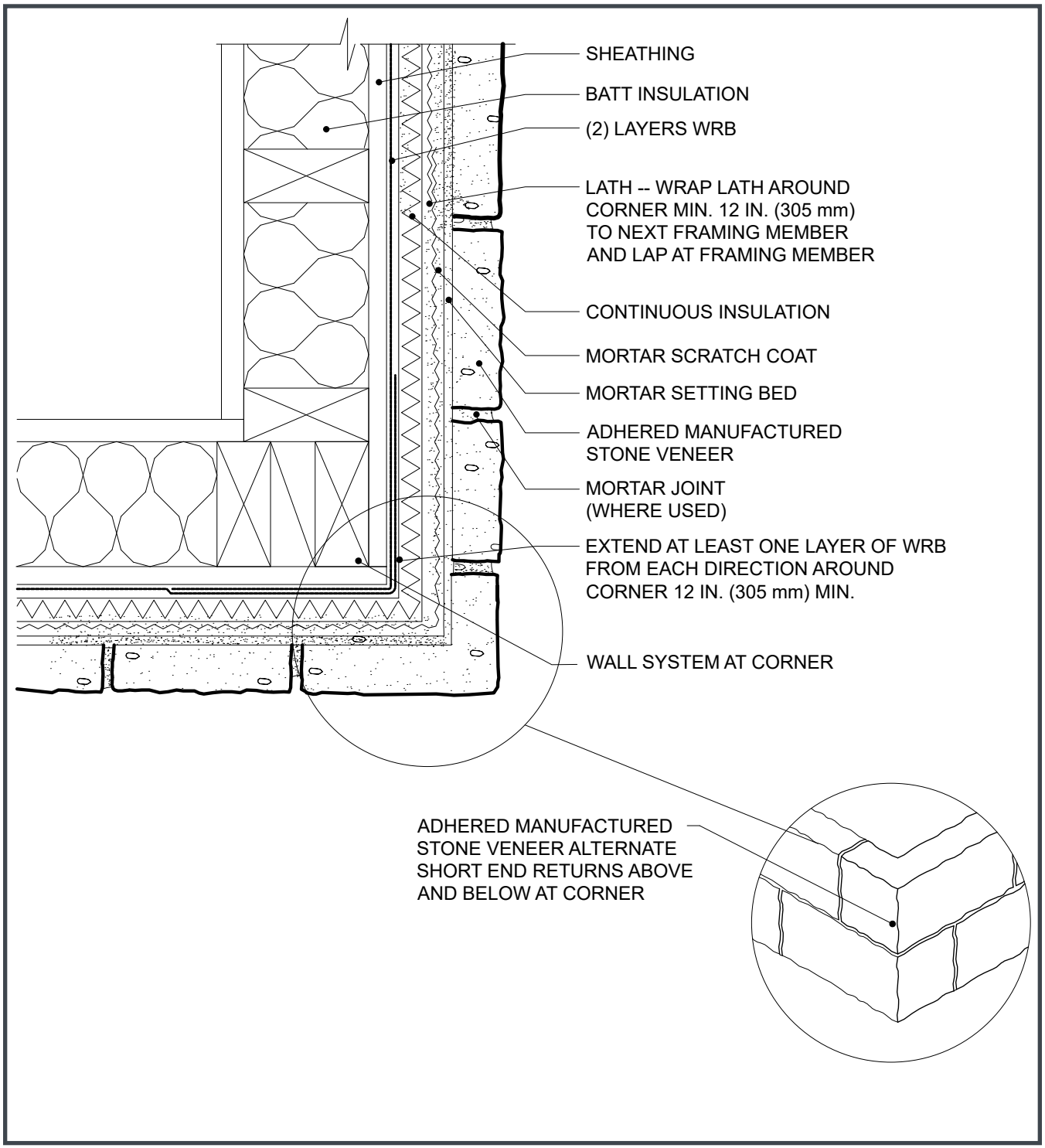


Figure 10a. Inside Corner

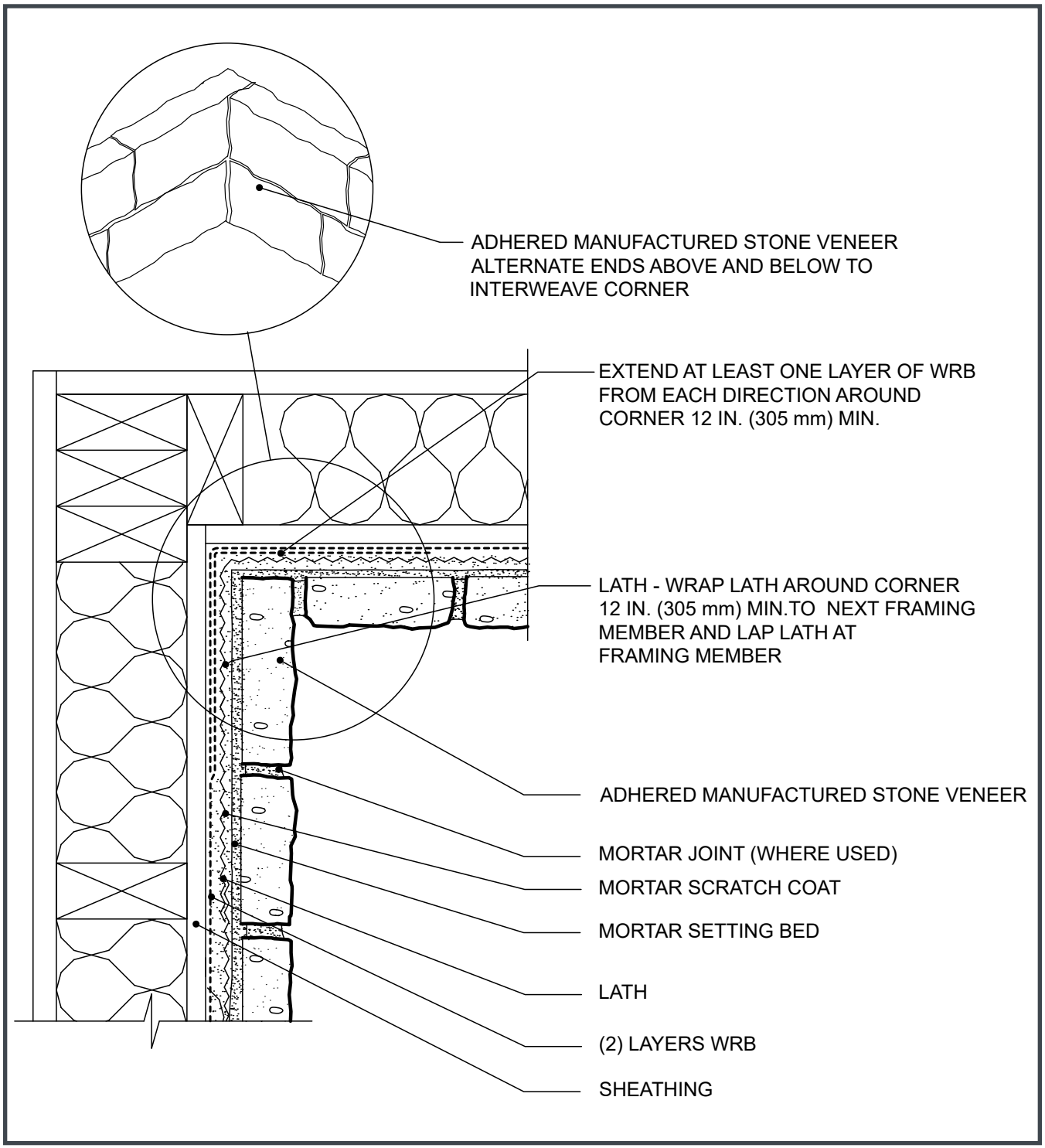


Figure 10b. Inside Corner Over Continuous Insulation

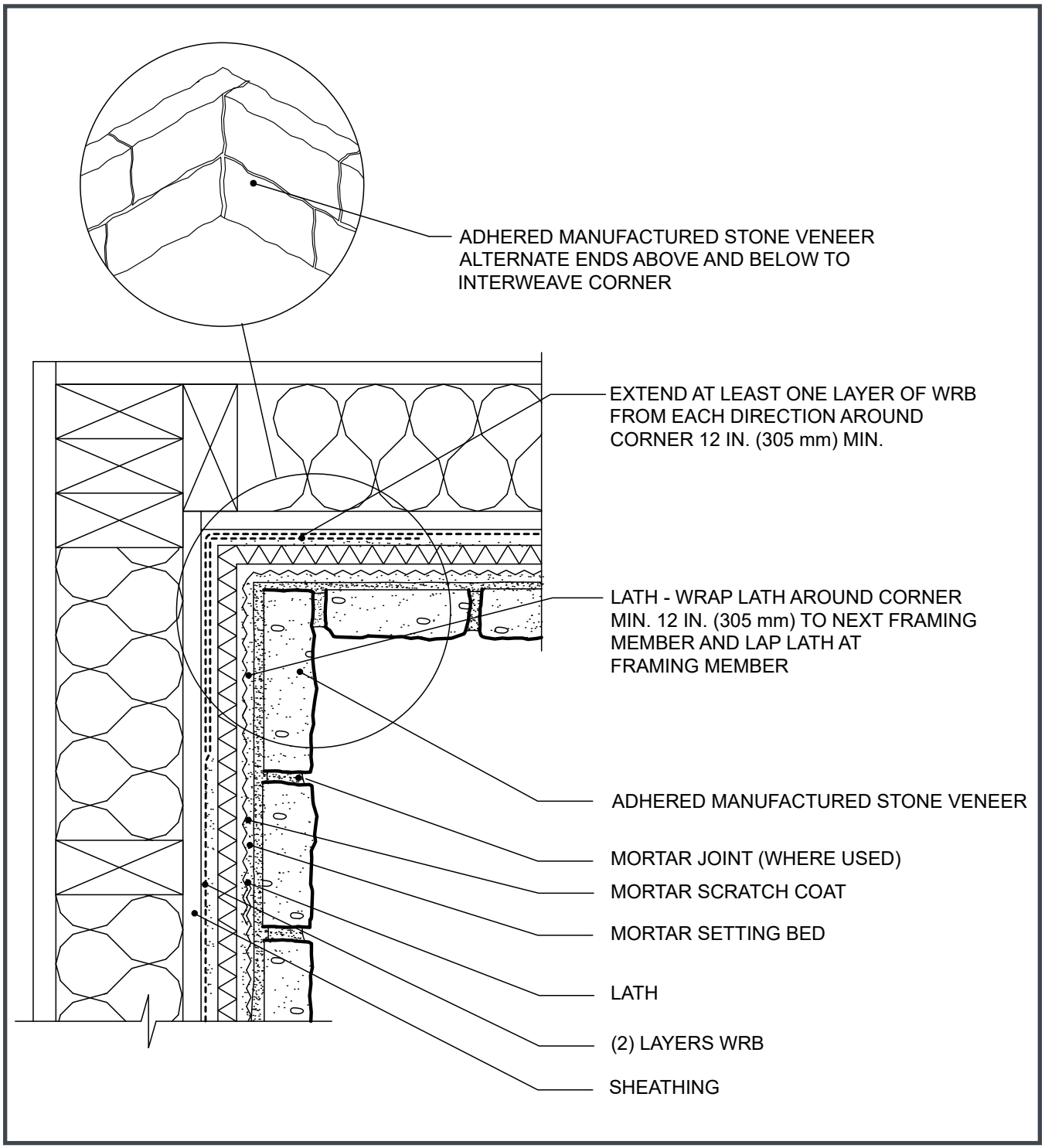


Figure 11a. Horizontal Transition

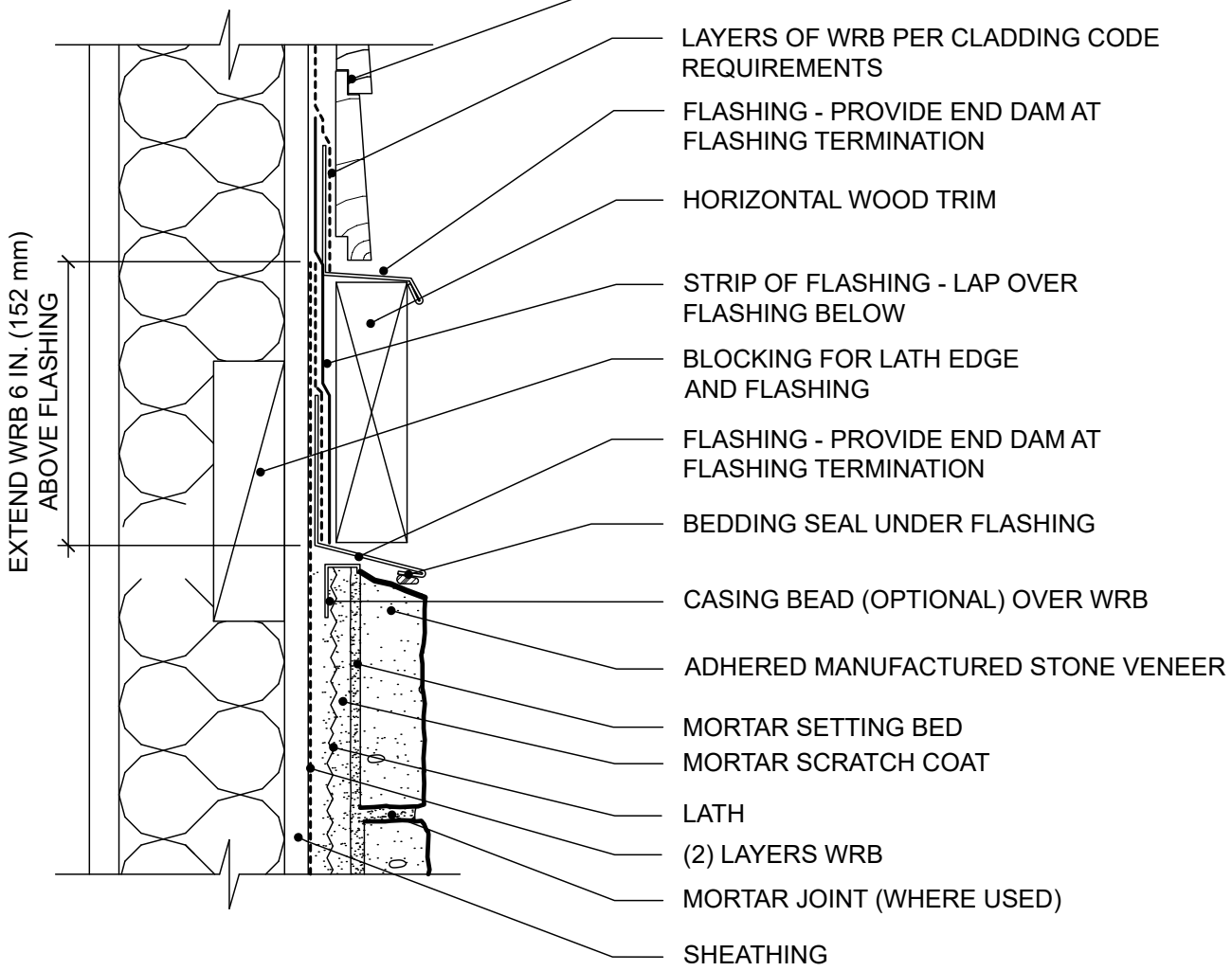


Figure 11b. Horizontal Transition Over Continuous Insulation

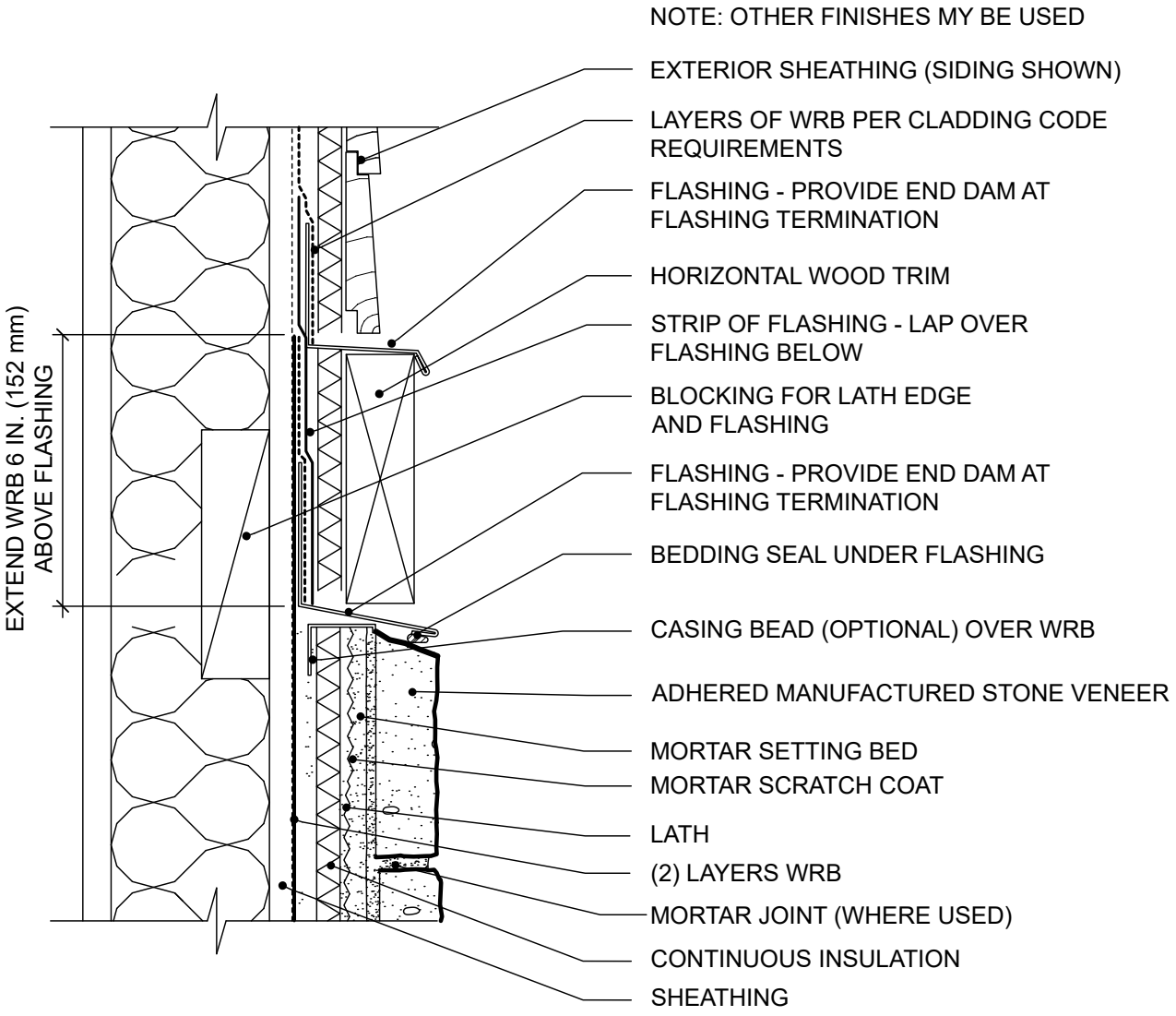


Figure 12a. Vertical Transition

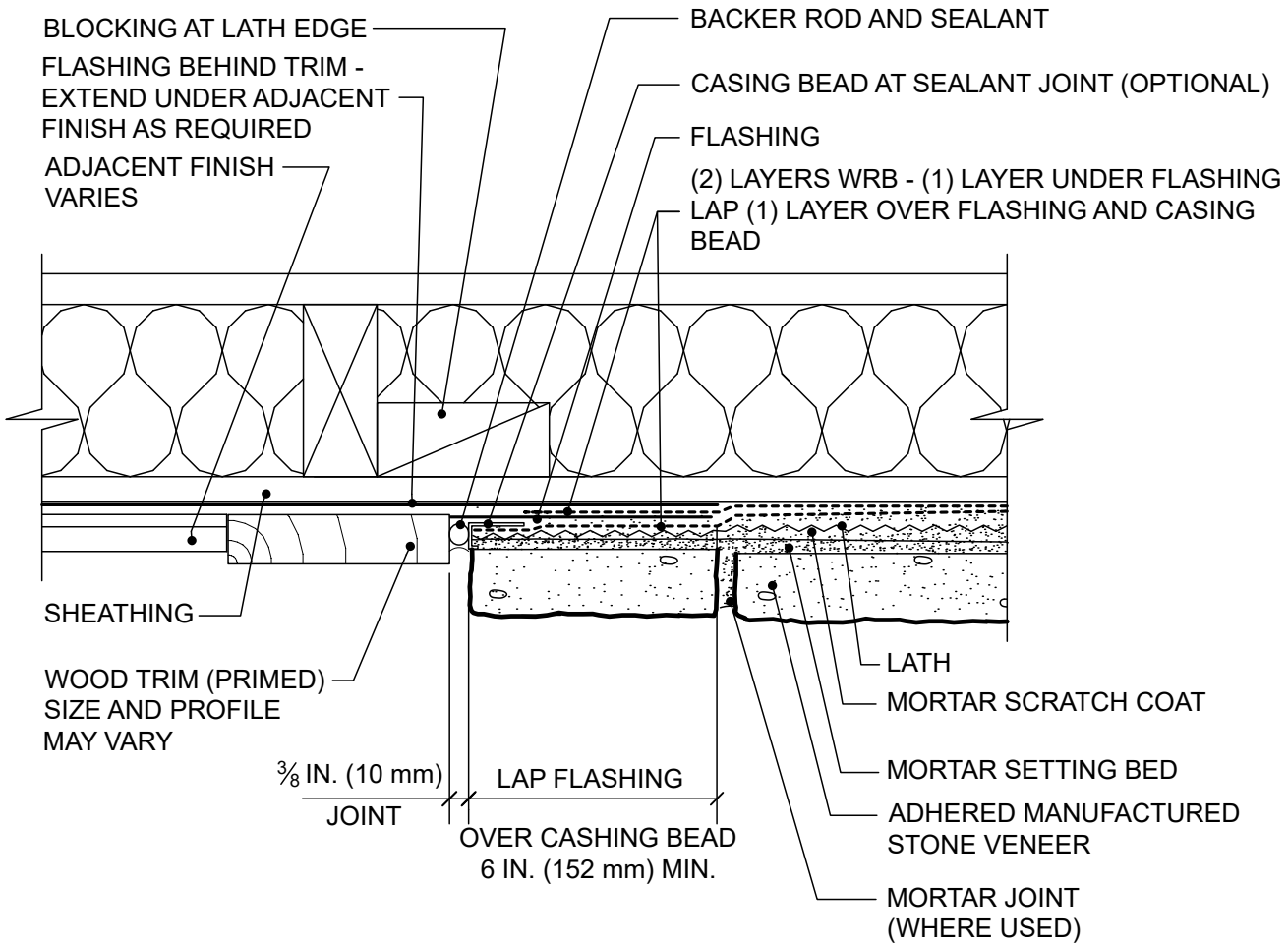


Figure 12b. Vertical Transition Over Continuous Insulation

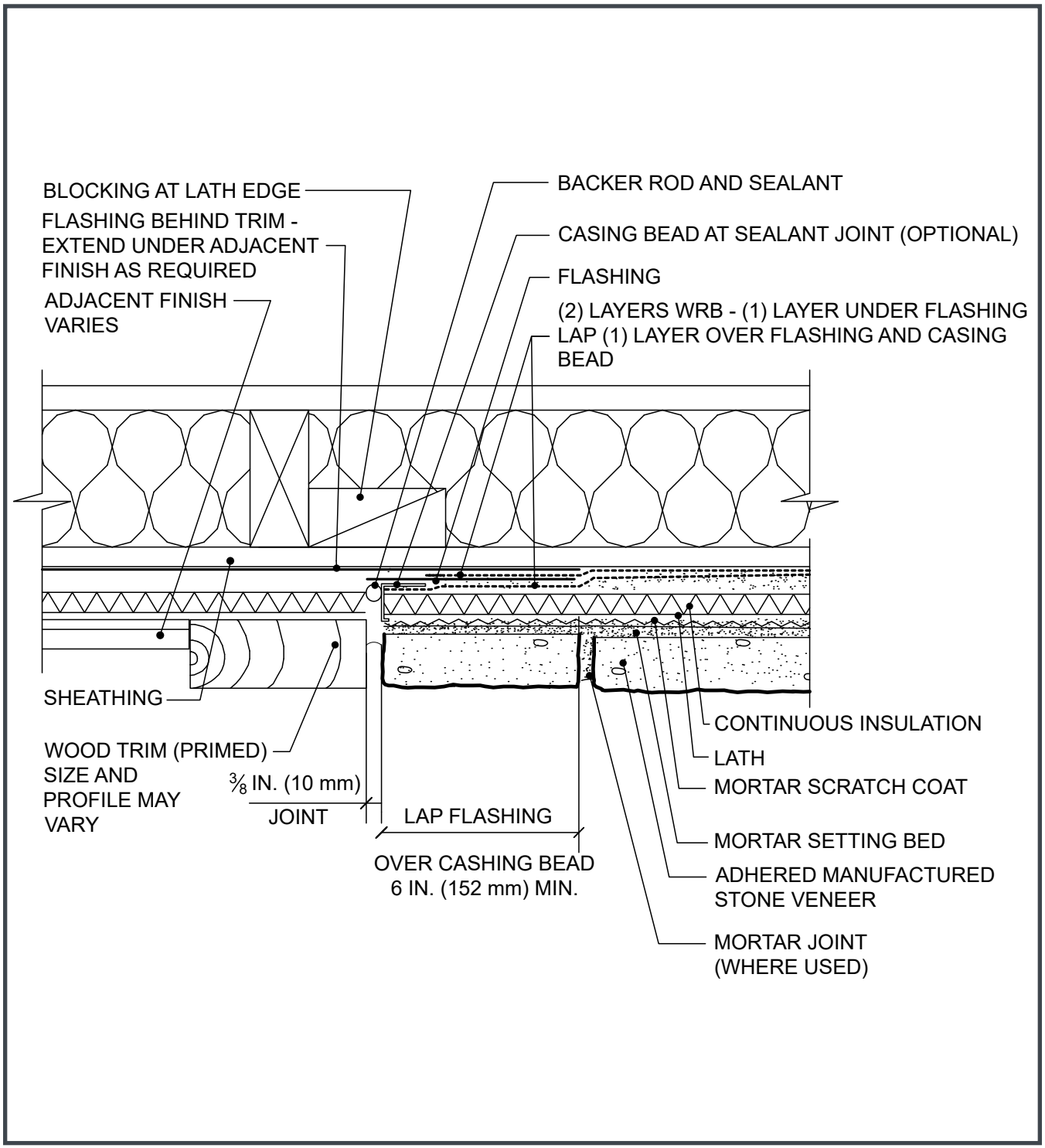
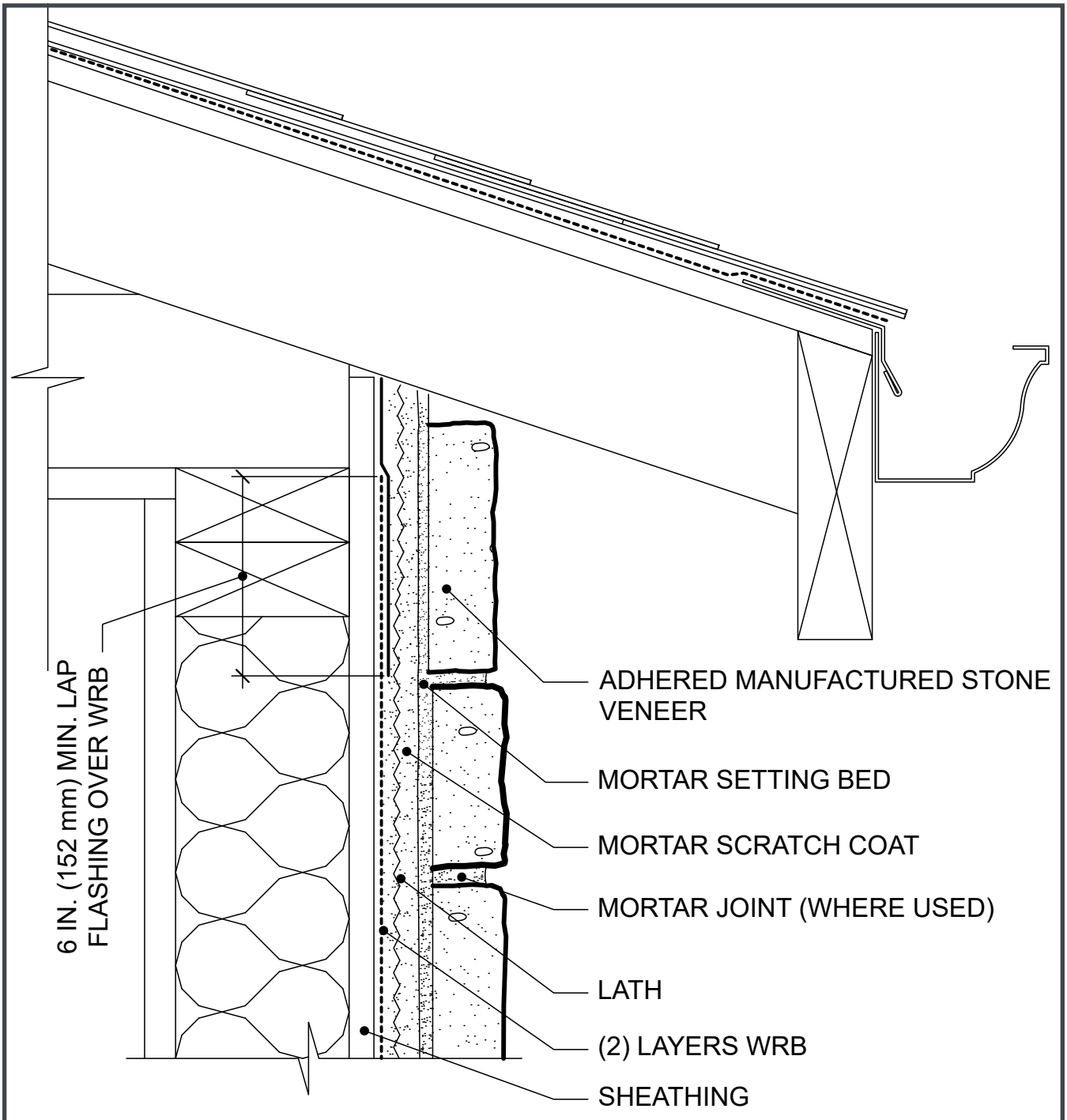
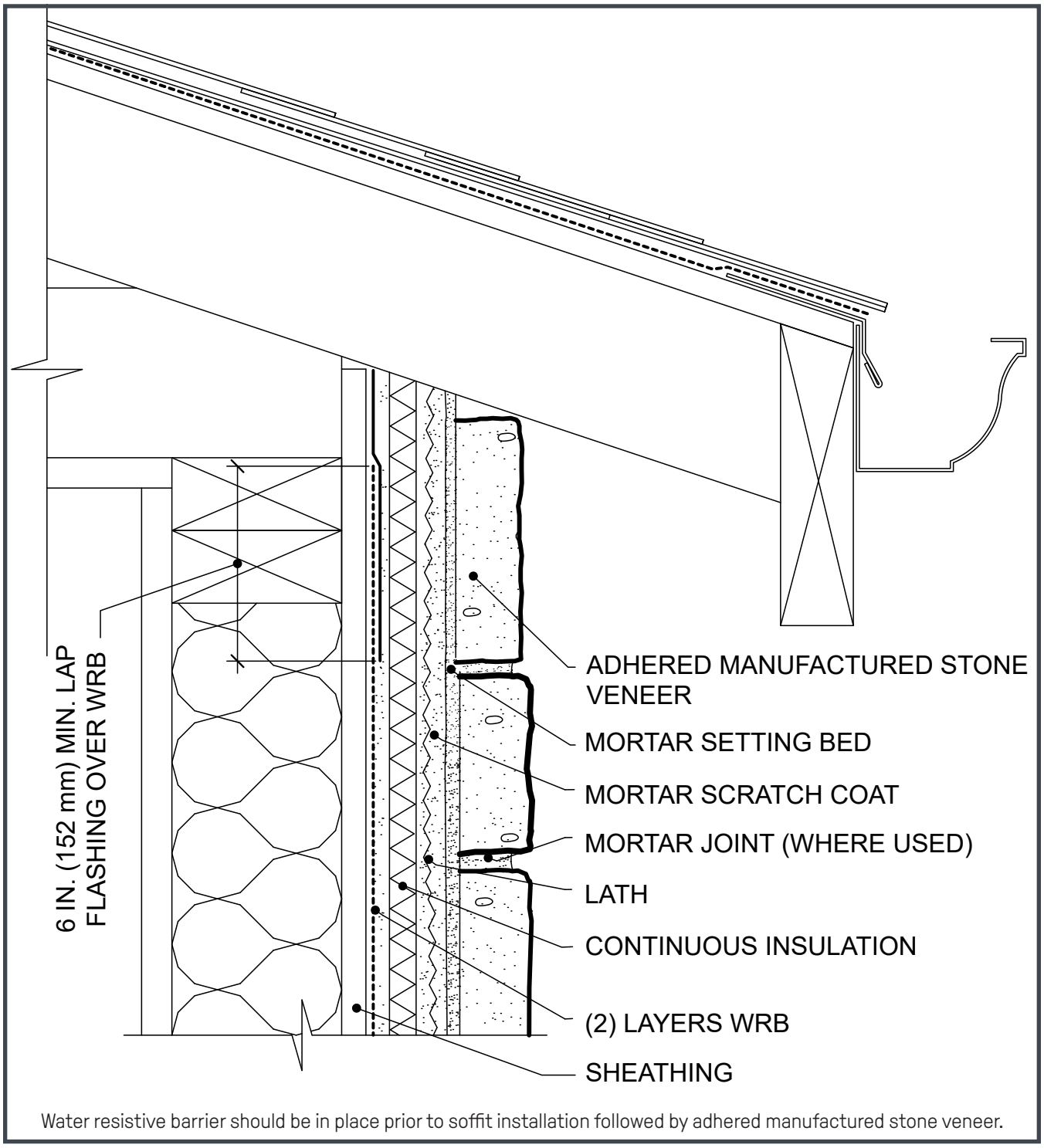


Figure 13a. Open Eave - Overhang



Water resistive barrier should be in place prior to soffit installation followed by adhered manufactured stone veneer.

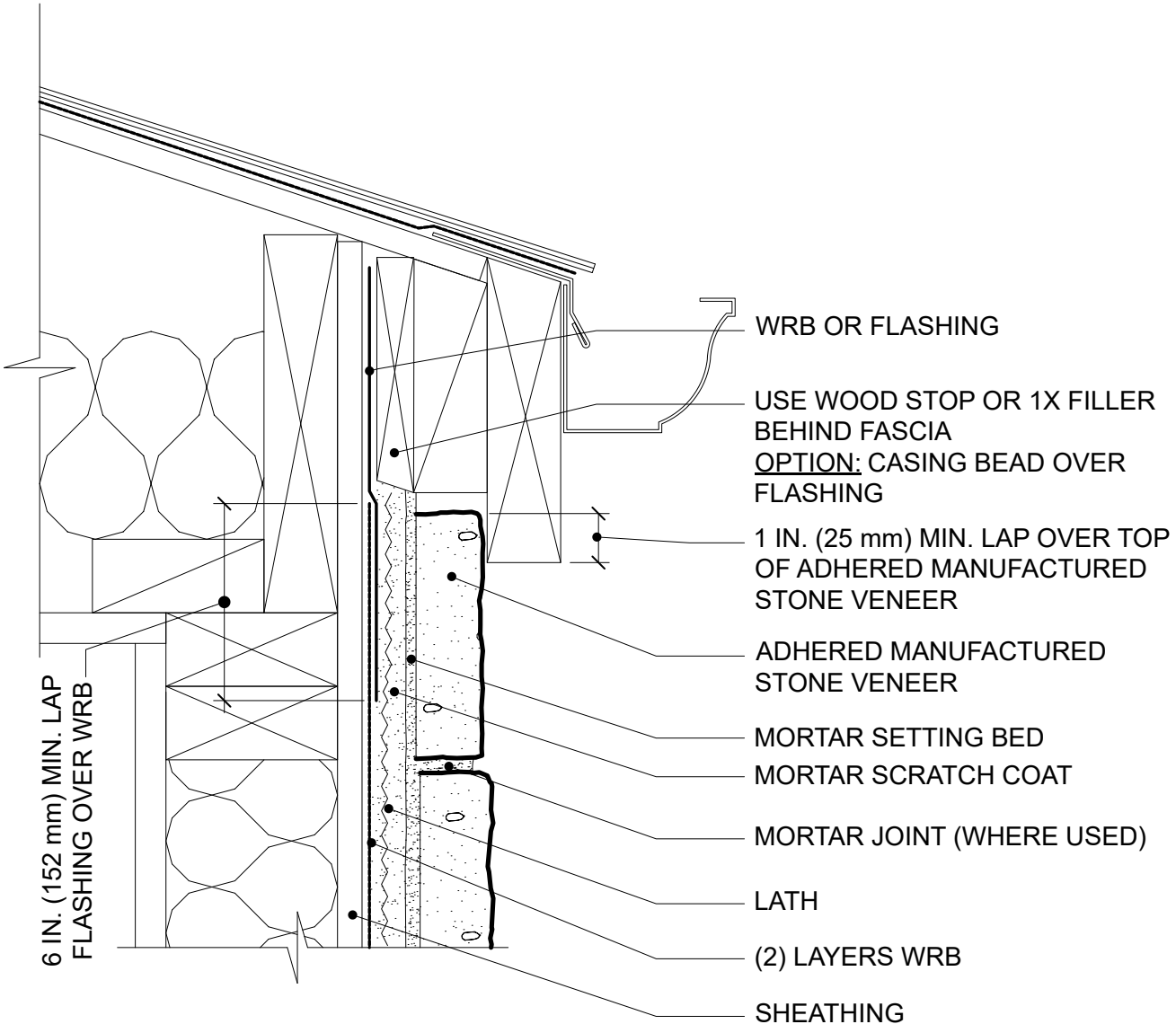
Figure 13b. Open Eave - Overhang Over Continuous Insulation



Water resistive barrier should be in place prior to soffit installation followed by adhered manufactured stone veneer.

Figure 14. Open Eave - Flush

NOTE:FOR CONTINUOUS INSULATION APPLICATIONS, REFER TO FIGURE 13b.



Water resistive barrier should be in place prior to soffit installation followed by adhered manufactured stone veneer.

Figure 15. Rake - Overhang

NOTE:FOR CONTINUOUS INSULATION APPLICATIONS, REFER TO FIGURE 13b.

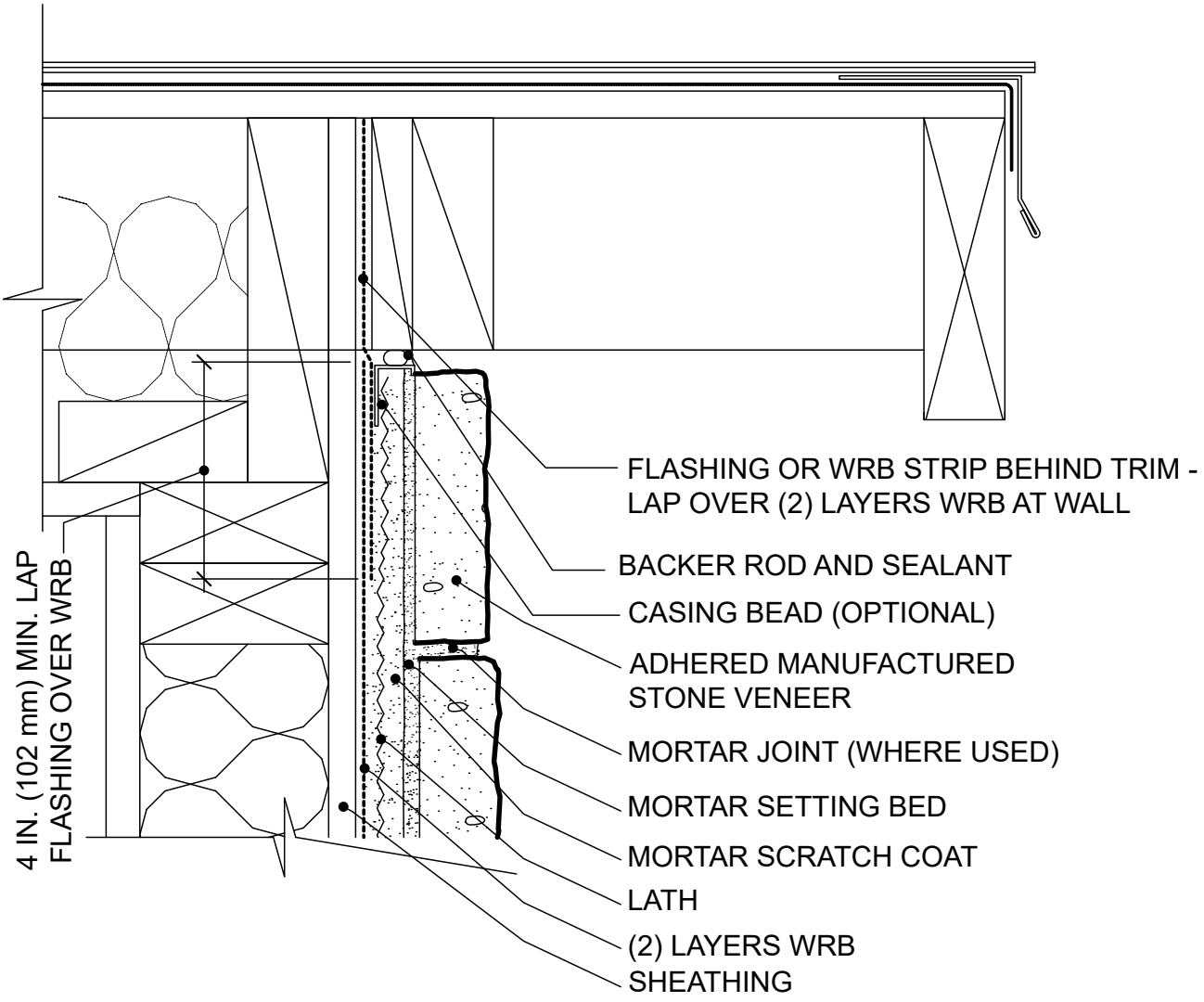


Figure 16. Rake - Flush

NOTE:FOR CONTINUOUS INSULATION APPLICATIONS, REFER TO FIGURE 13b.

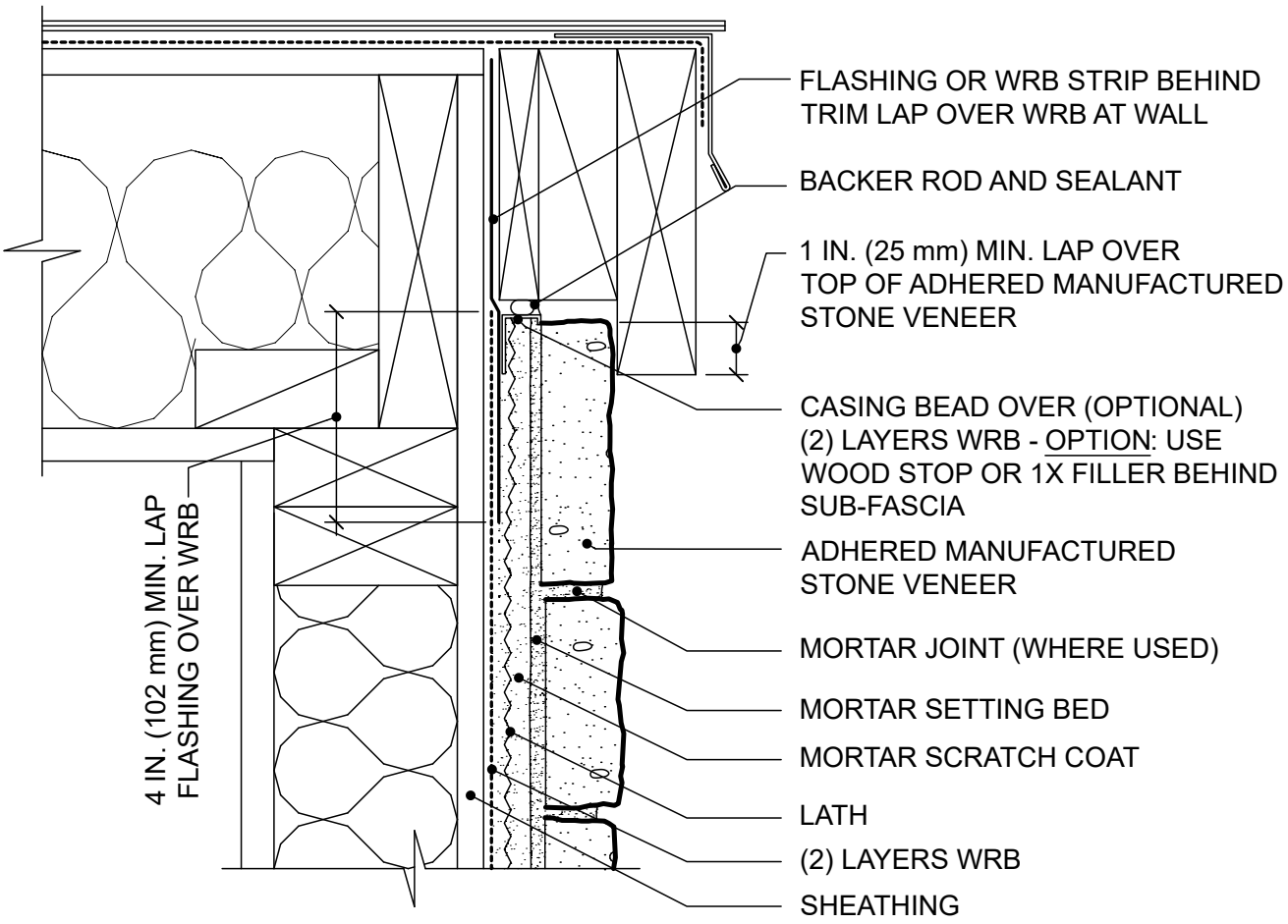


Figure 17a. Side Wall – Composition Shingles

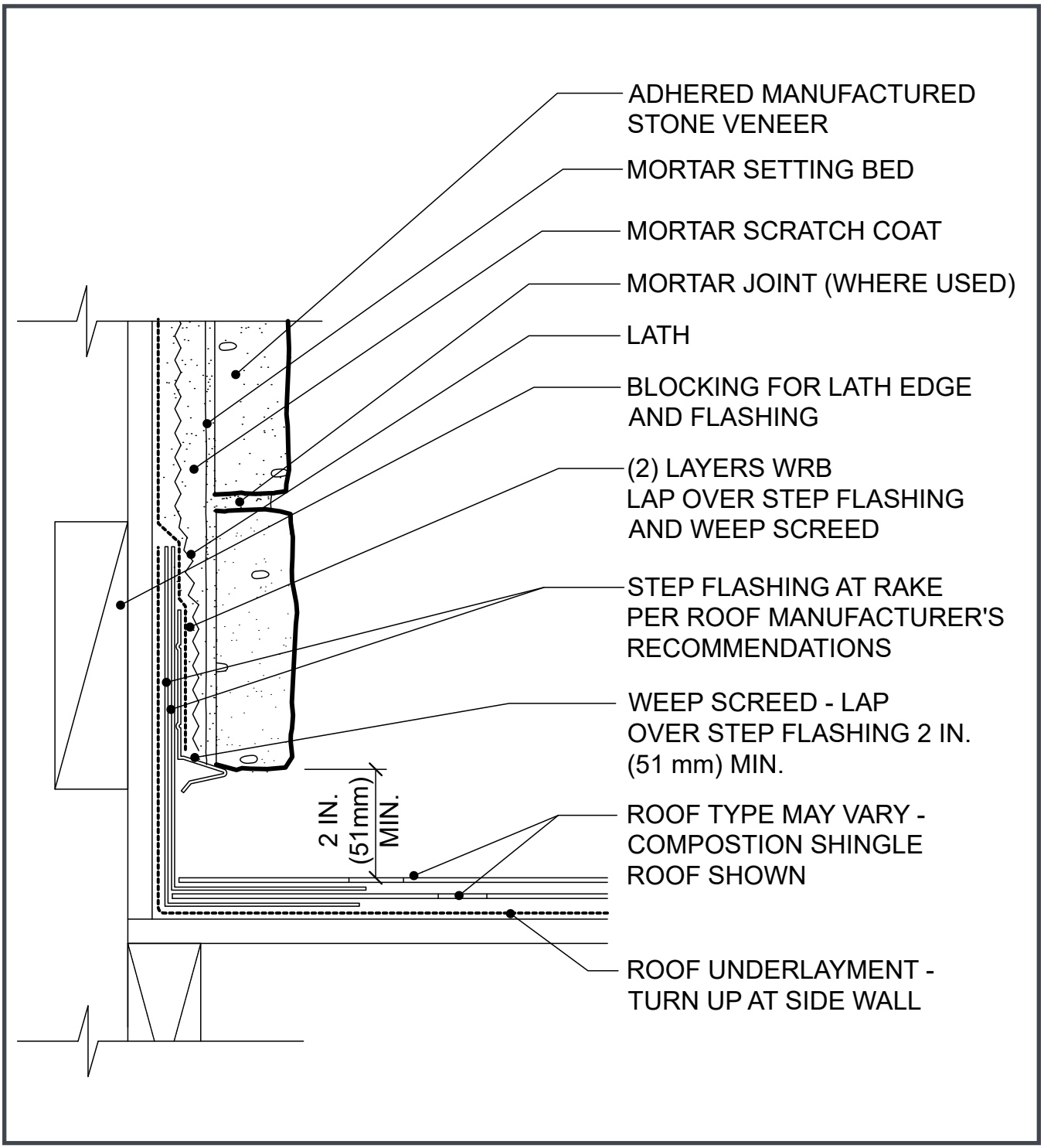


Figure 17b. Side Wall – Composition Shingles Over Continuous Insulation

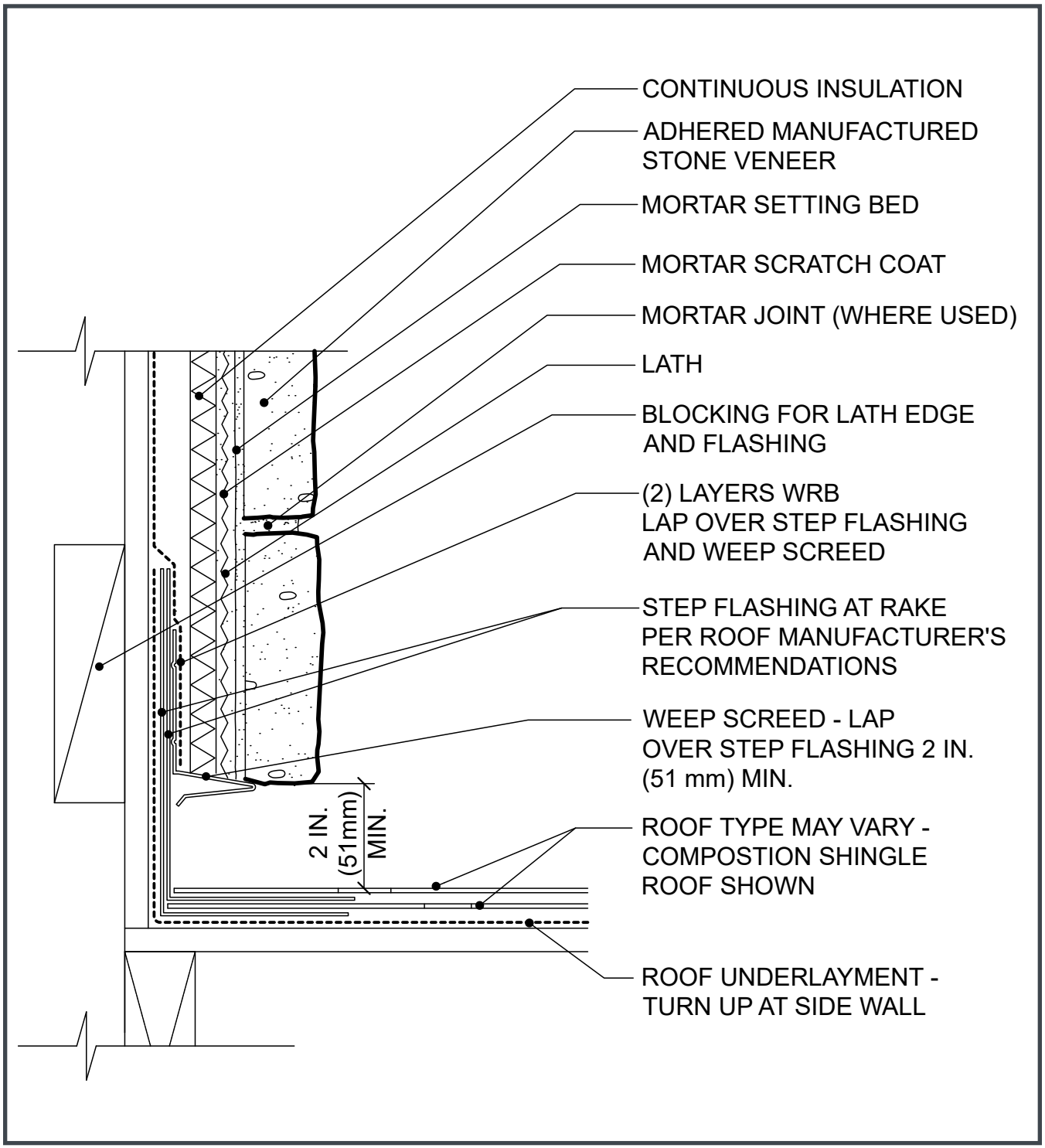


Figure 18. Side Wall – Composition Shingles Curbing

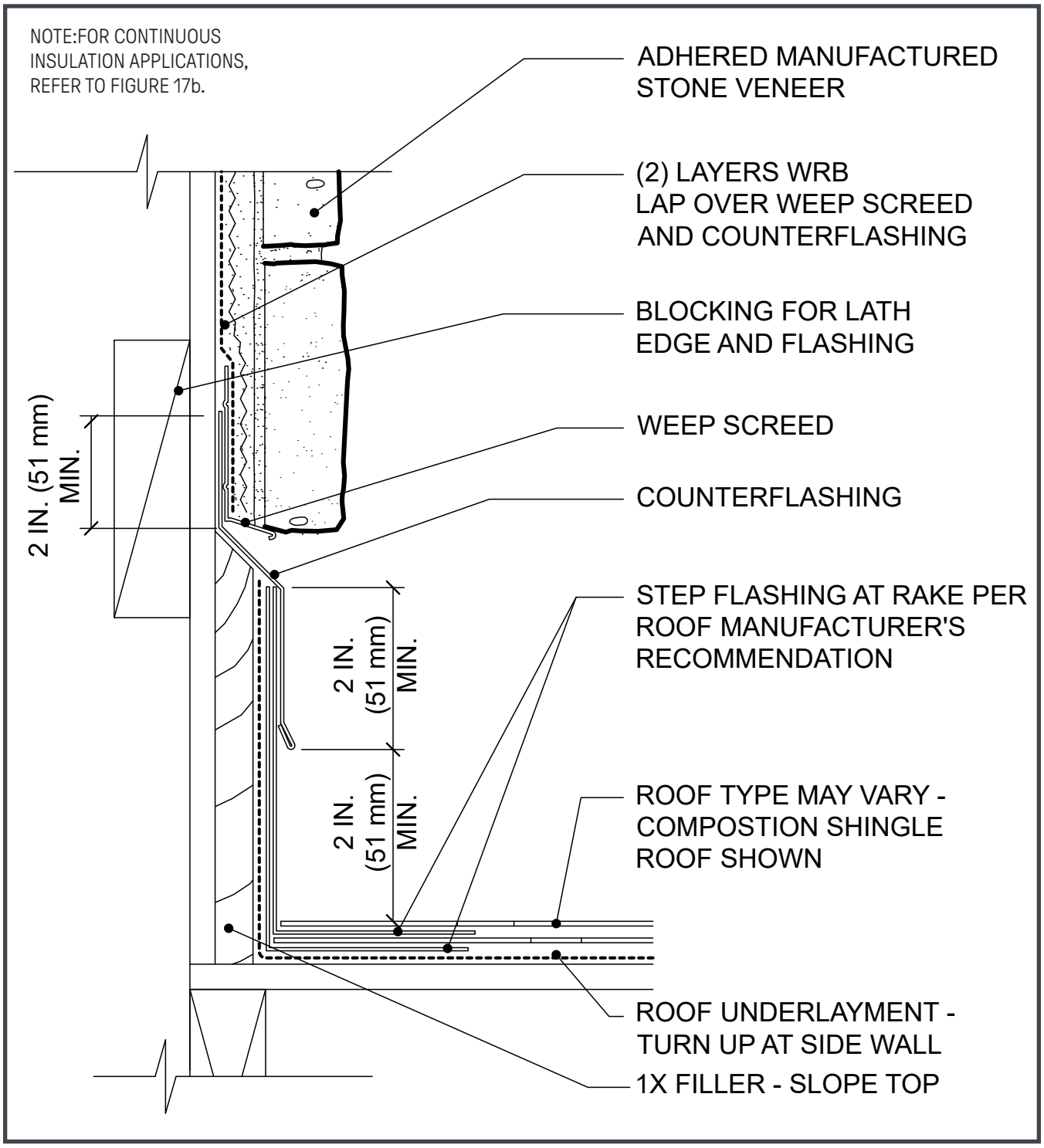


Figure 19. Side Wall – Tile Roofing

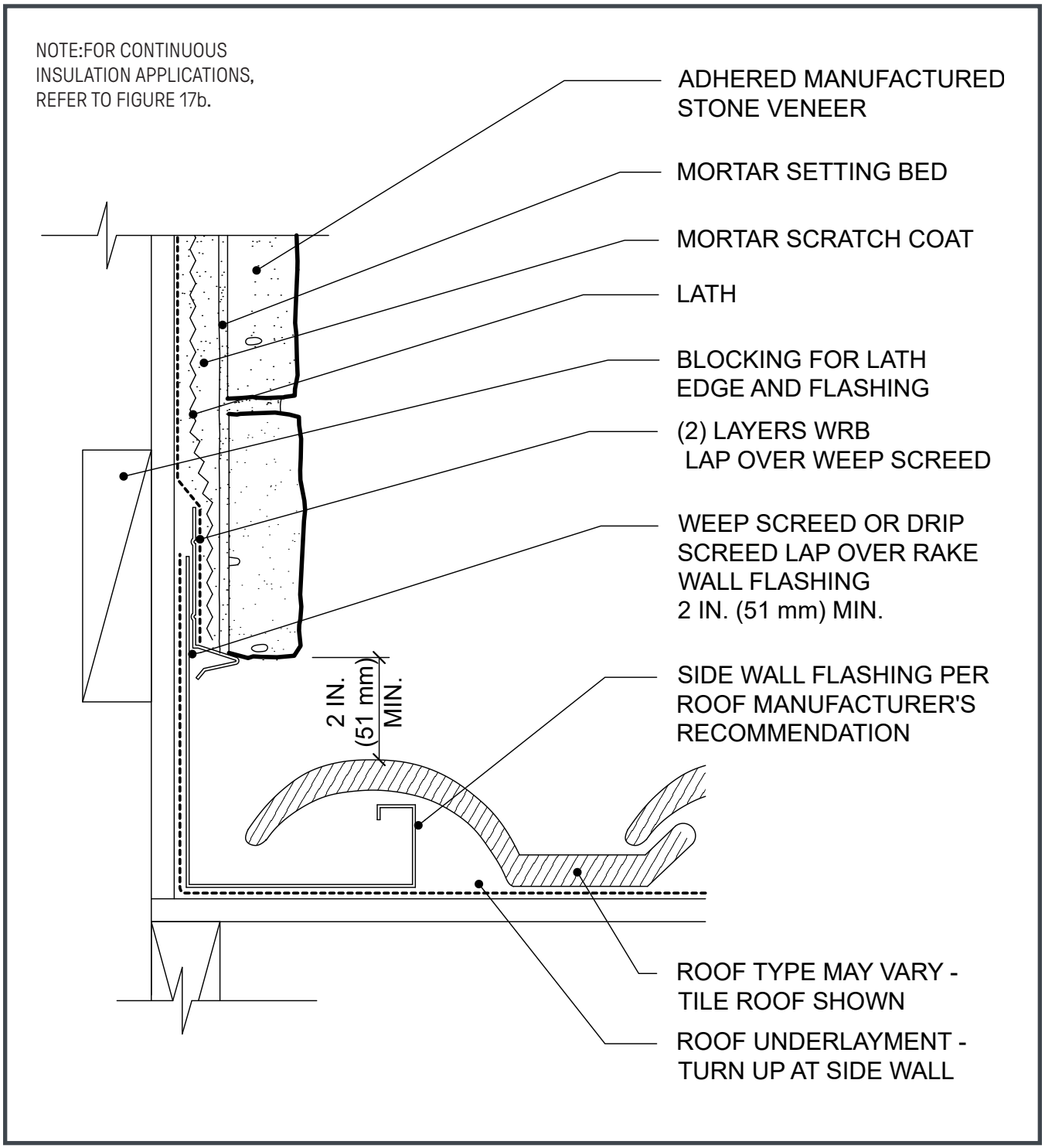


Figure 20. Side Wall – Tile Roofing Curbing

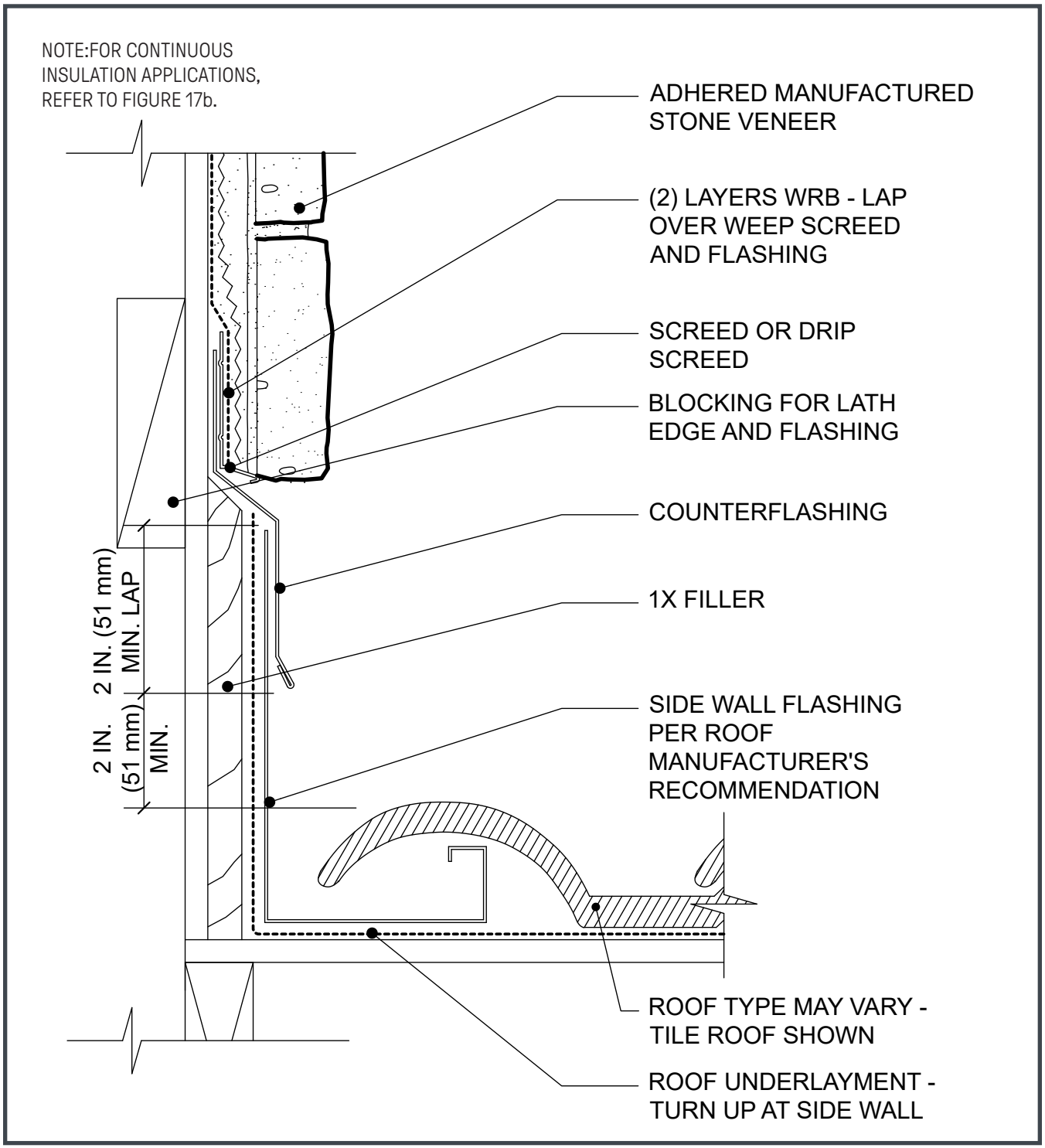
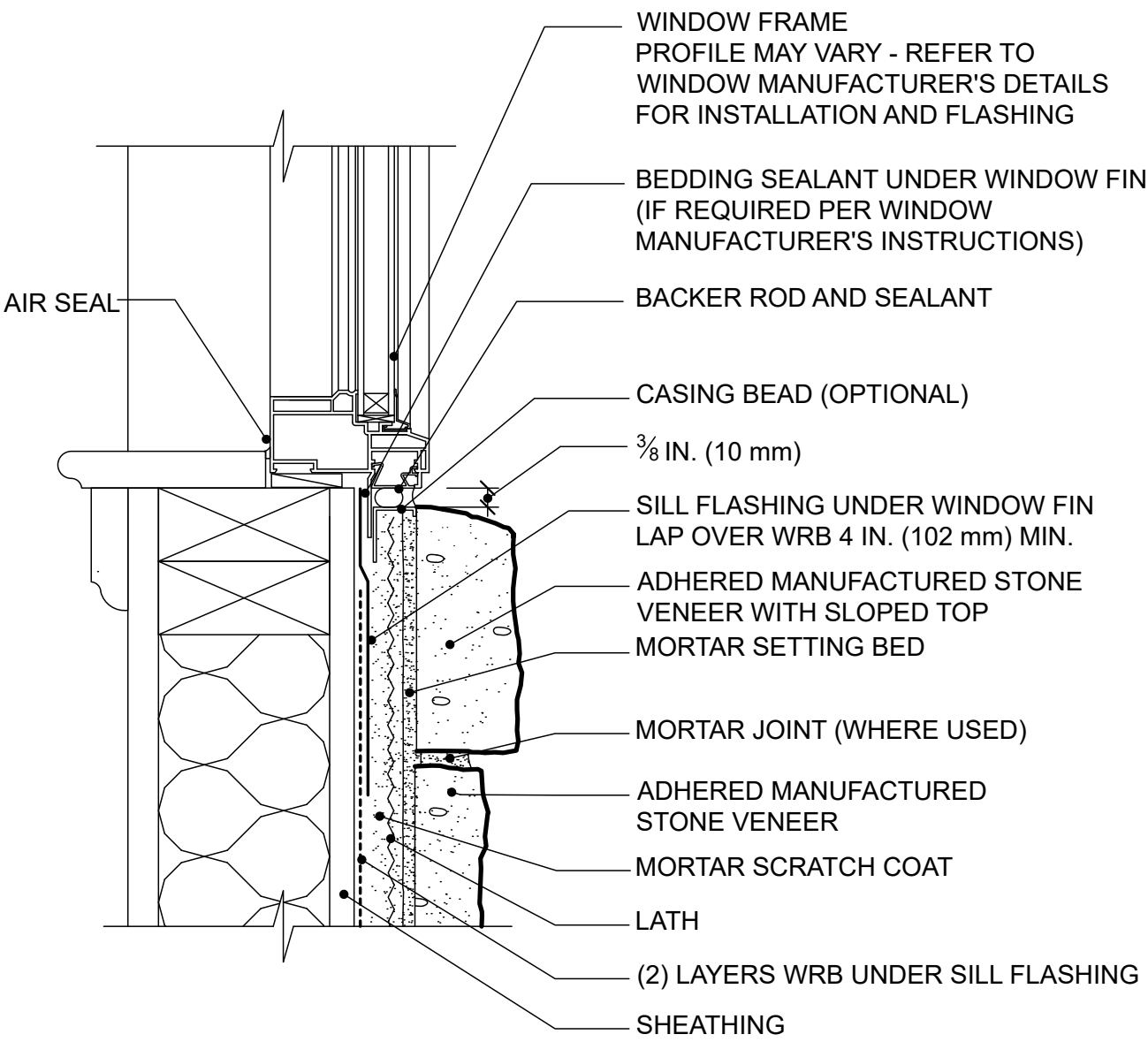
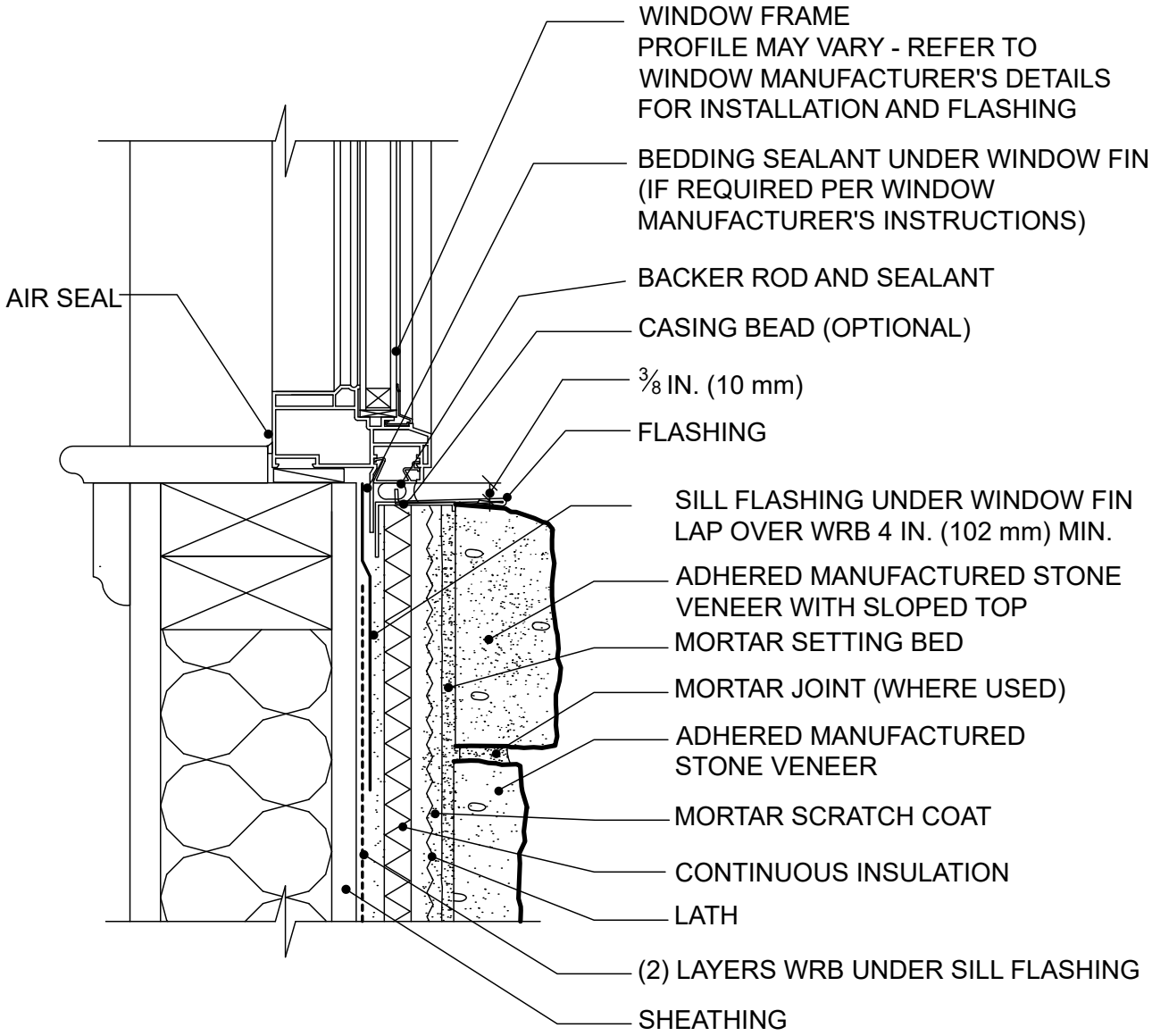


Figure 21a. Window Sill



Rough openings must be properly flashed prior to window installation. Tuck water resistive barrier under flashing at sill. Sill flashing should drain to the exterior of the primary WRB or to exterior of adhered manufactured stone veneer.

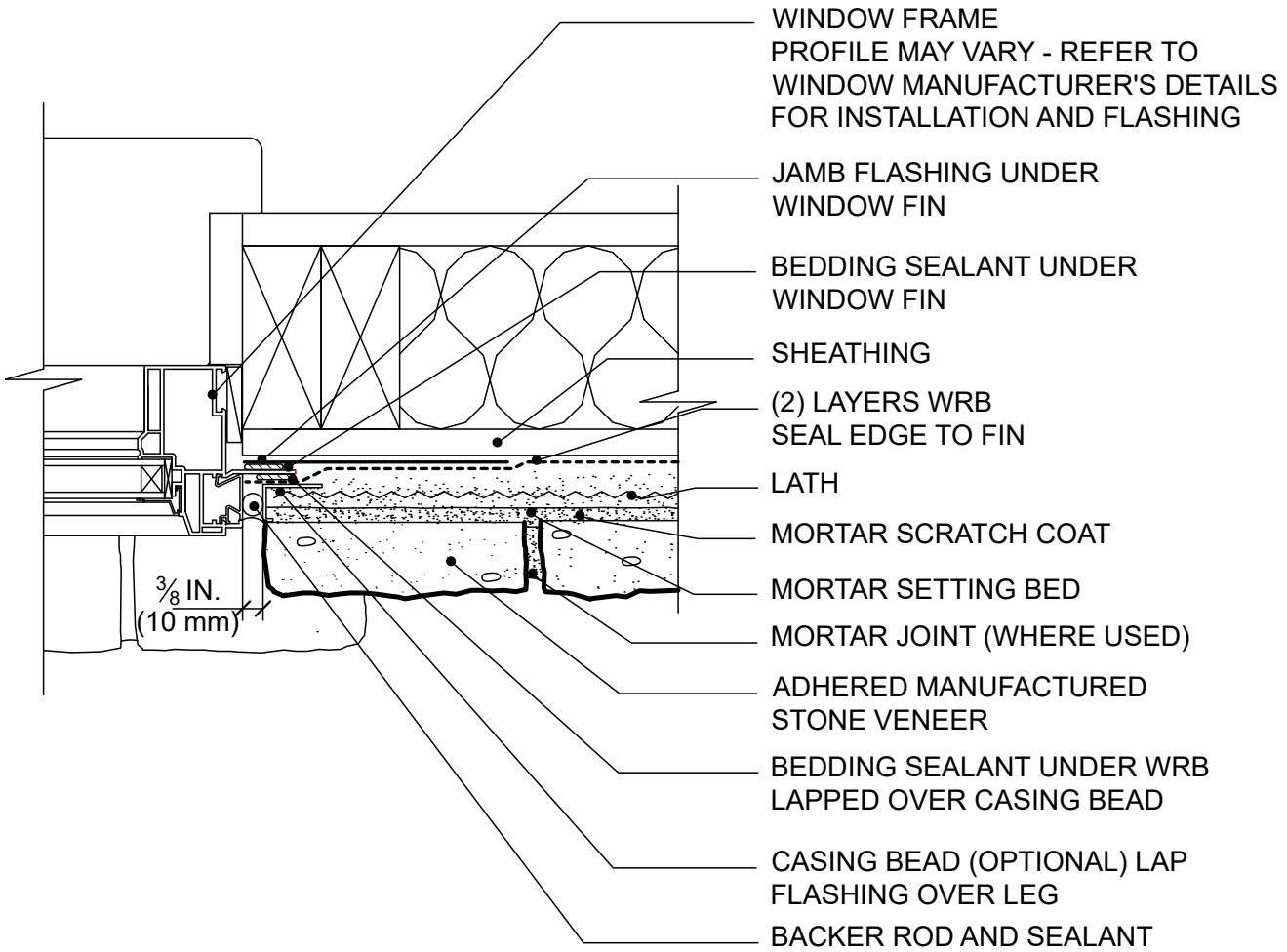
Figure 21b. Window Sill Over Continuous Insulation



Rough openings must be properly flashed prior to window installation. Tuck water resistive barrier under flashing at sill. Sill flashing should drain to the exterior of the primary WRB or to exterior of adhered manufactured stone veneer.

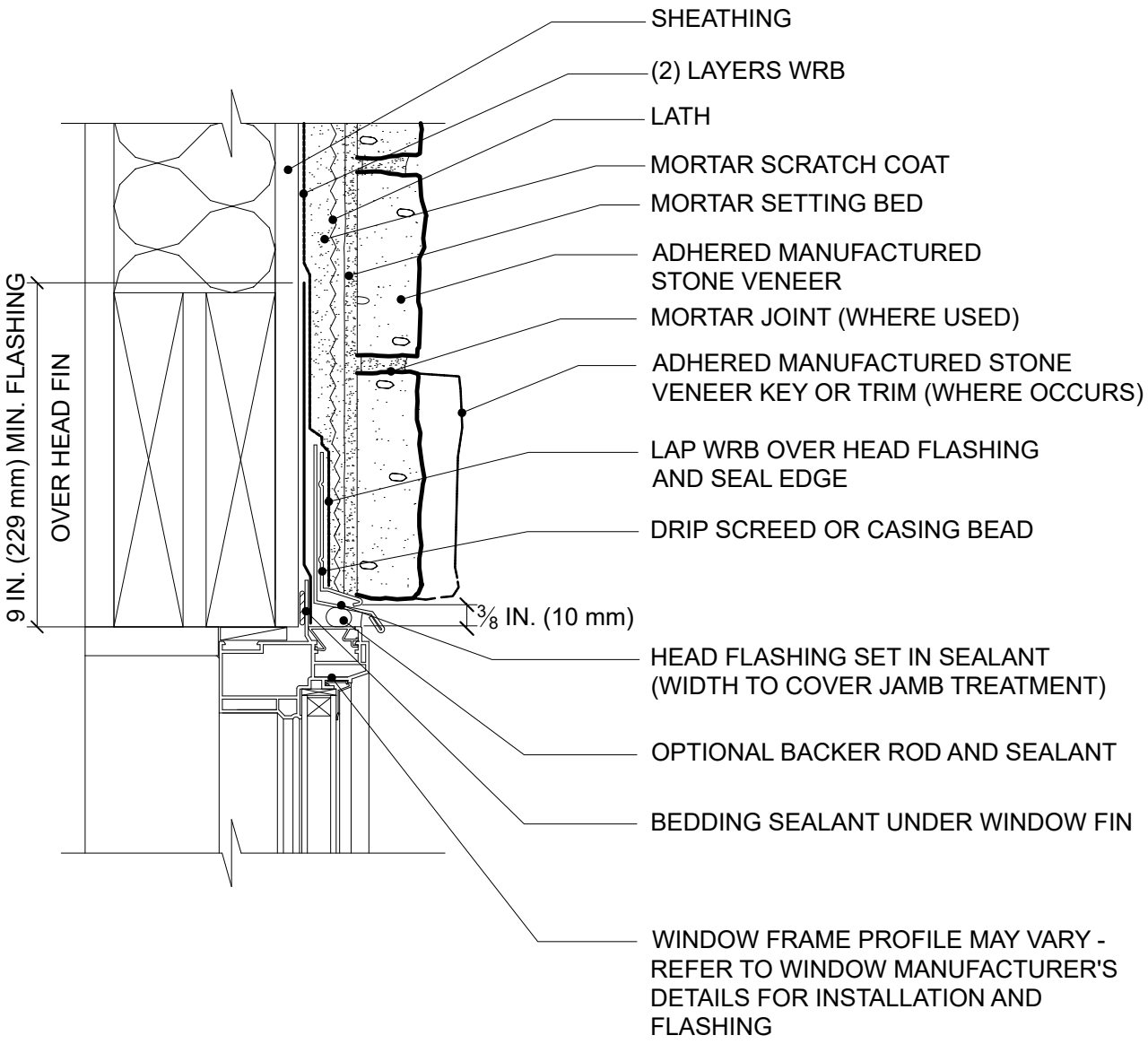
Figure 22. Window Jamb

NOTE:FOR CONTINUOUS INSULATION APPLICATIONS, REFER TO FIGURE 21b.



Rough openings must be properly flashed prior to window installation. Backer rod and sealant between the window frame and the adhered manufactured stone veneer allows for movement between the dissimilar materials.

Figure 23. Window Head



Flashing and WRB installed shingle fashion may be complimented with self-adhered flashing (SAF) to seal WRB to window frame.

Figure 24. Kick-Out Flashing

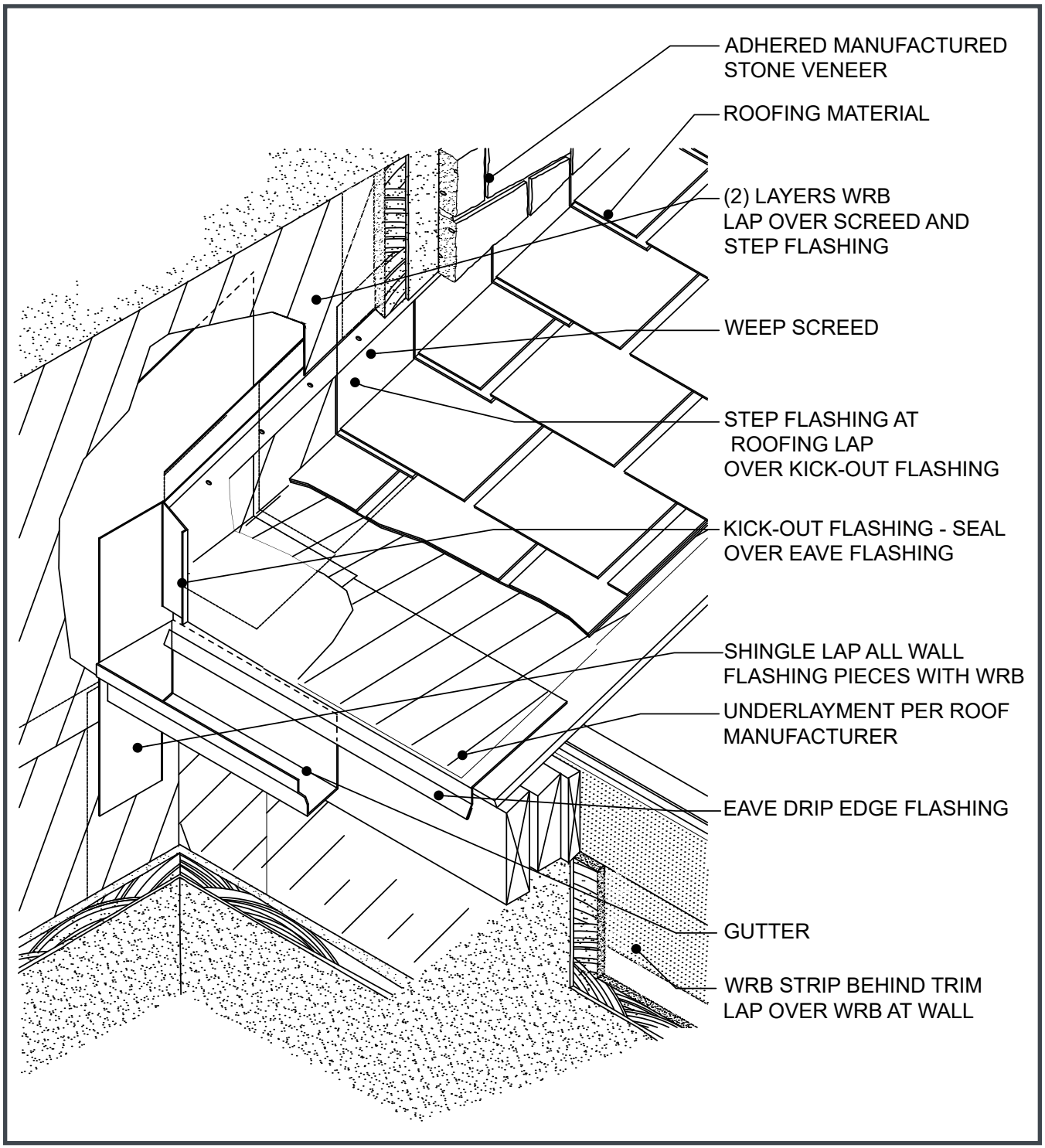


Figure 25. Cricket

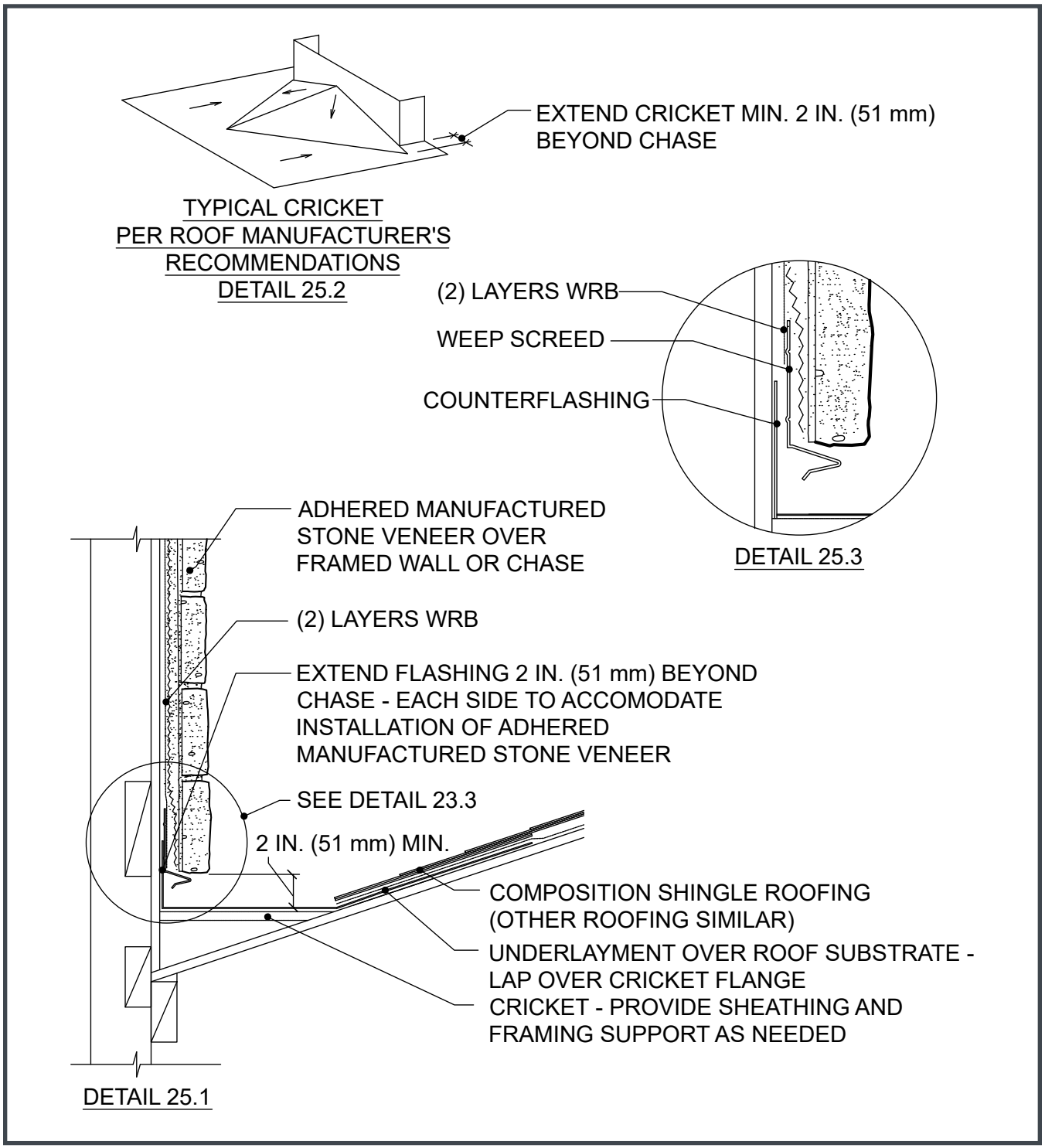


Figure 26. Chimney Chase

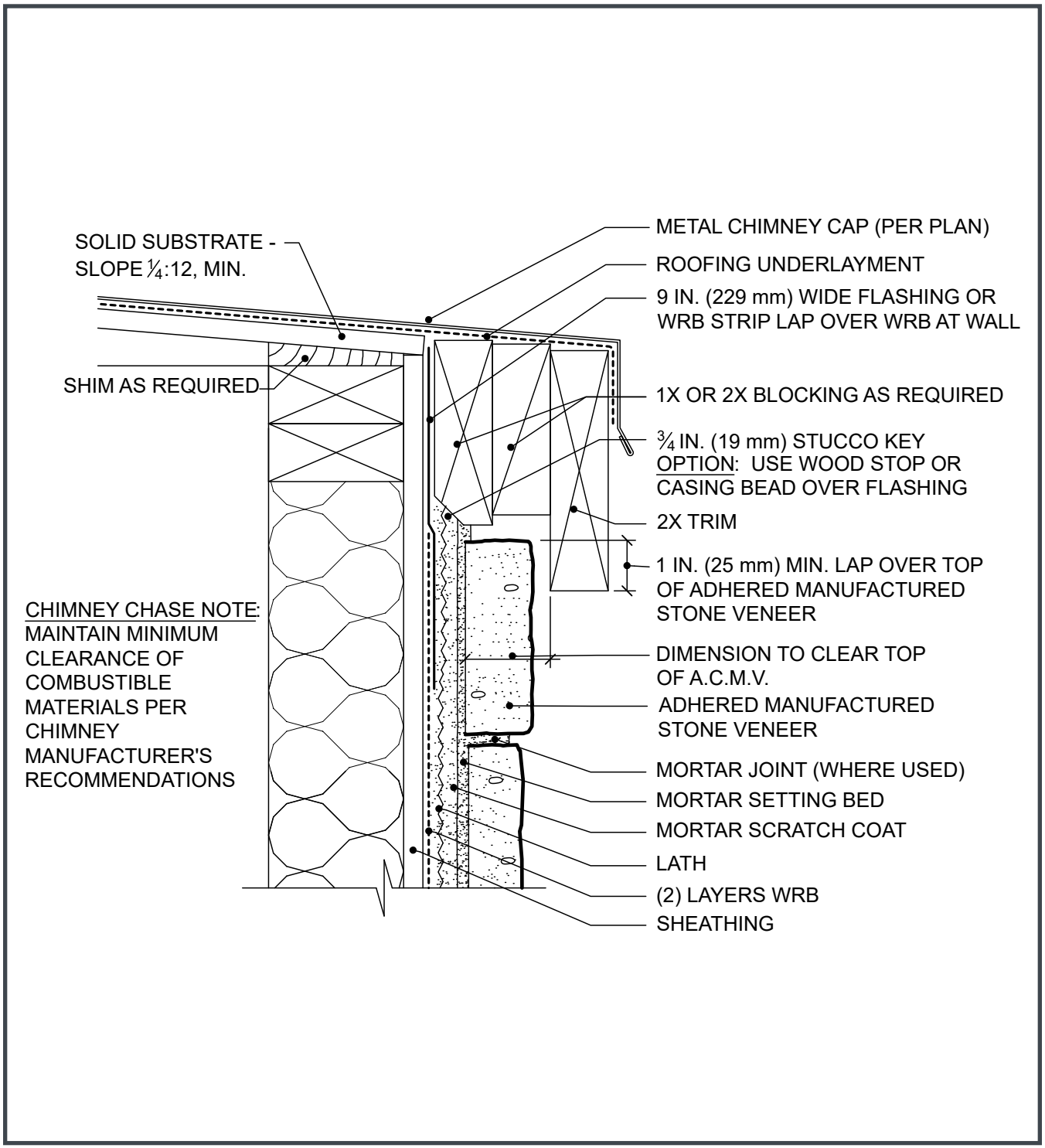
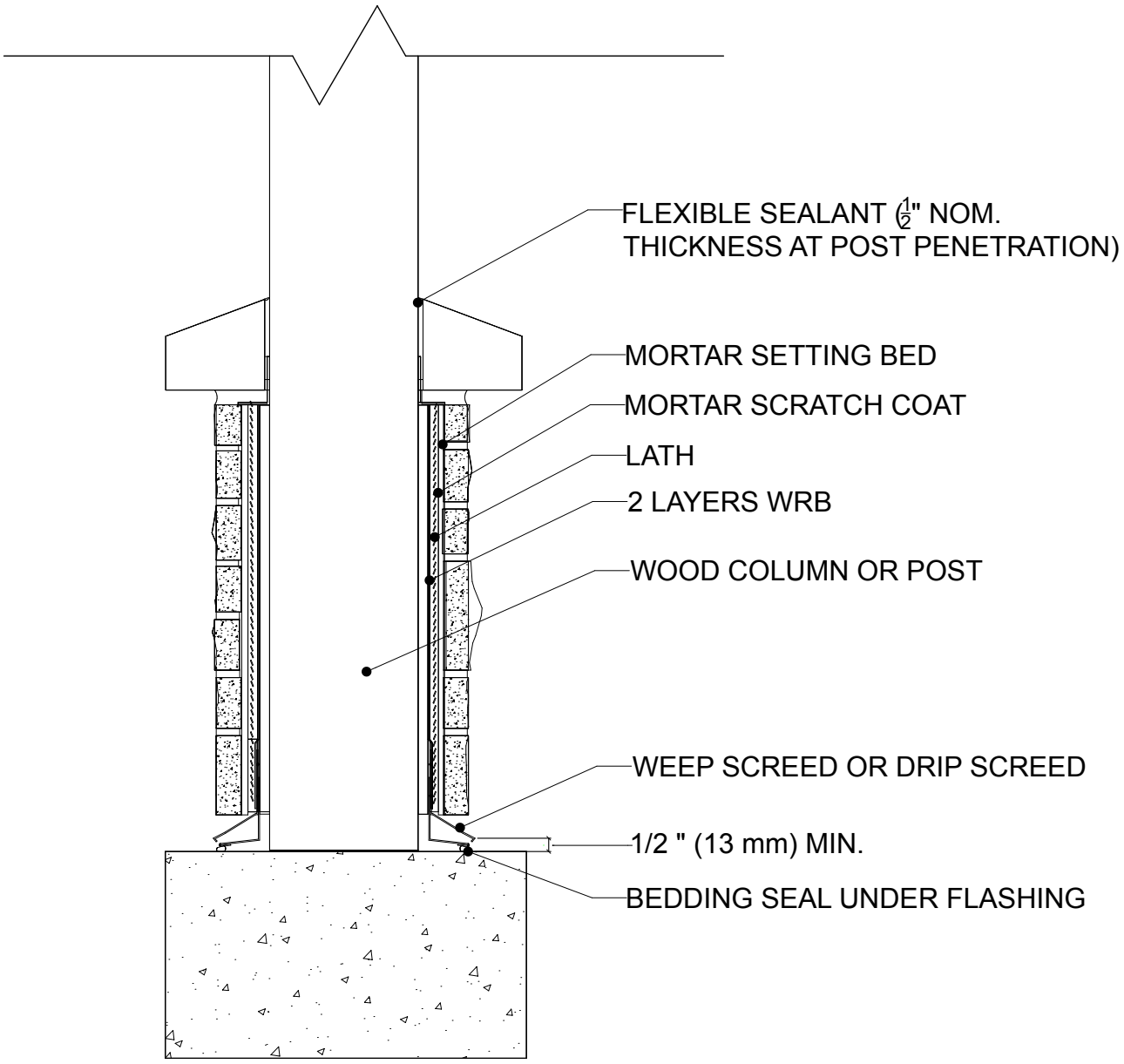
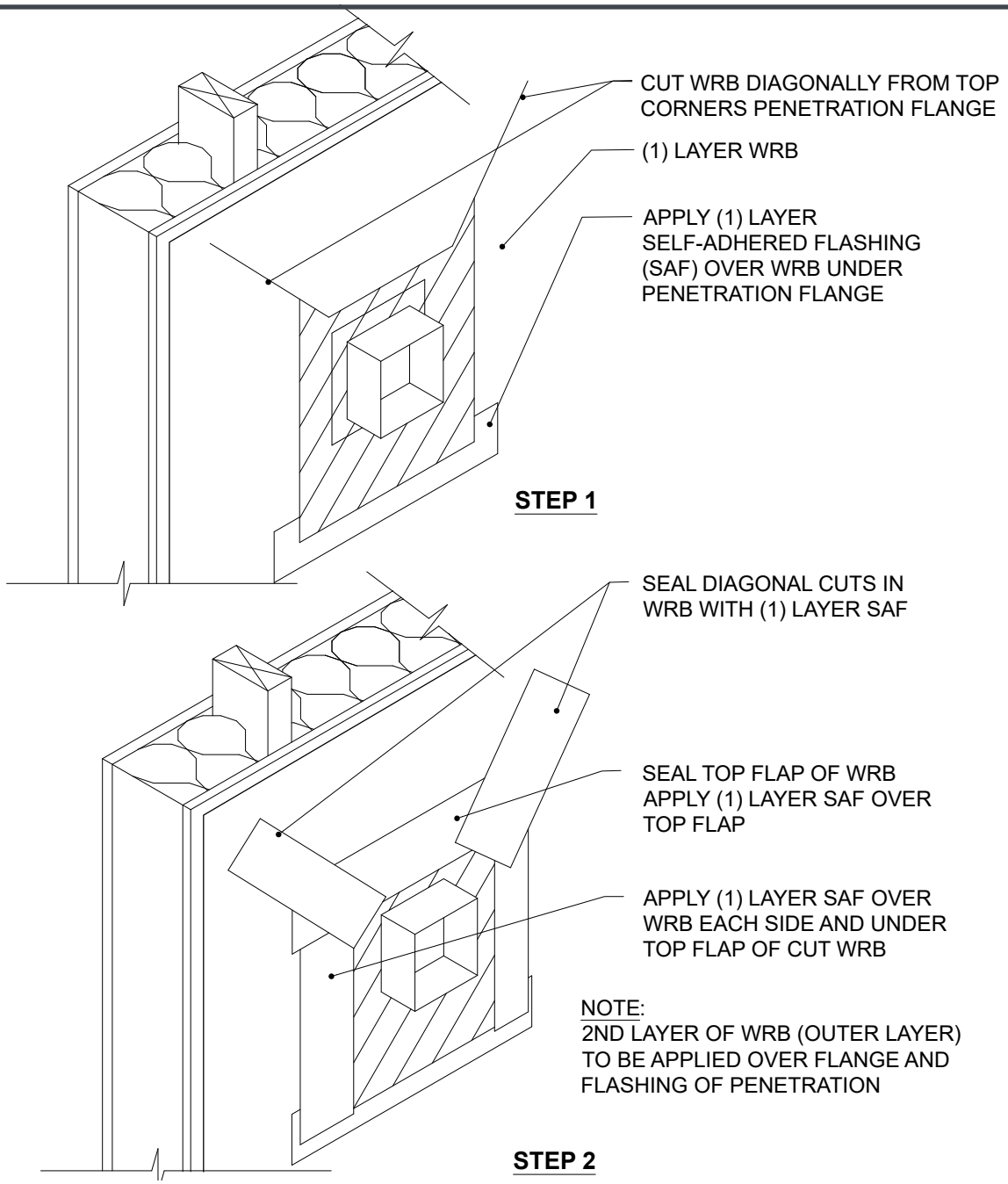


Figure 27. Wood Column with Penetration Through Cap



A minimum one half inch (13 mm) clearance should be maintained at all sides of the base. All column materials to be exterior grade. Do not extend flashing past edge of AMSV for safety reasons.

Figure 28. Penetration, Flanged



Penetration with flanges can be incorporated into the wall system by applying WRB in a watershed fashion and sealing cuts in the WRB with self-adhered flashing. Drawing illustrates installation with housewrap WRB. Installation with building paper WRB would be similar but instead of 45 degree cuts, fit last piece of WRB on top of flanges and tuck under WRB course above penetration.

Figure 29. Penetration Non-Flanged, with Building Paper WRB

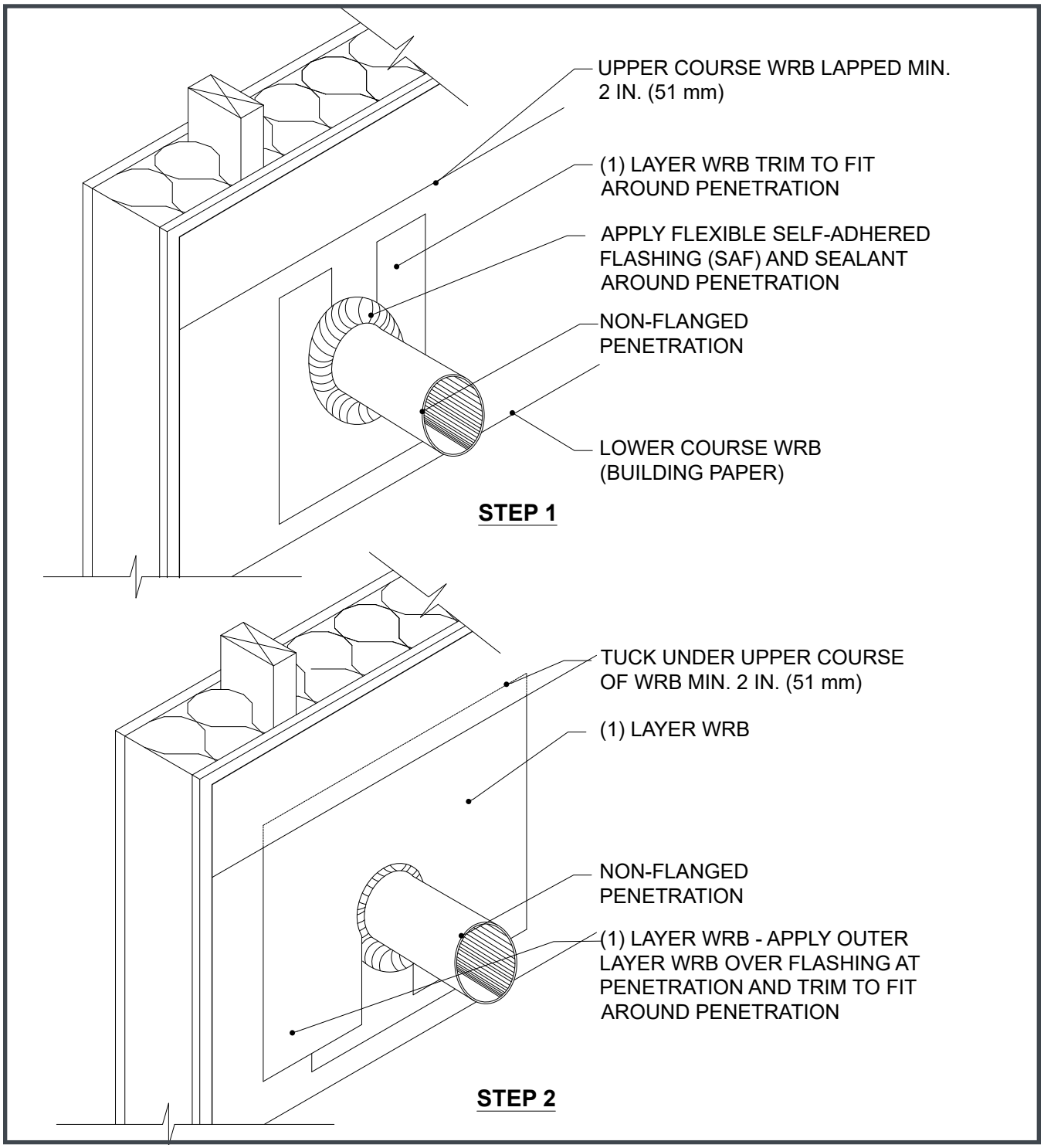


Figure 30. Penetration Non-Flanged, with Housewrap WRB

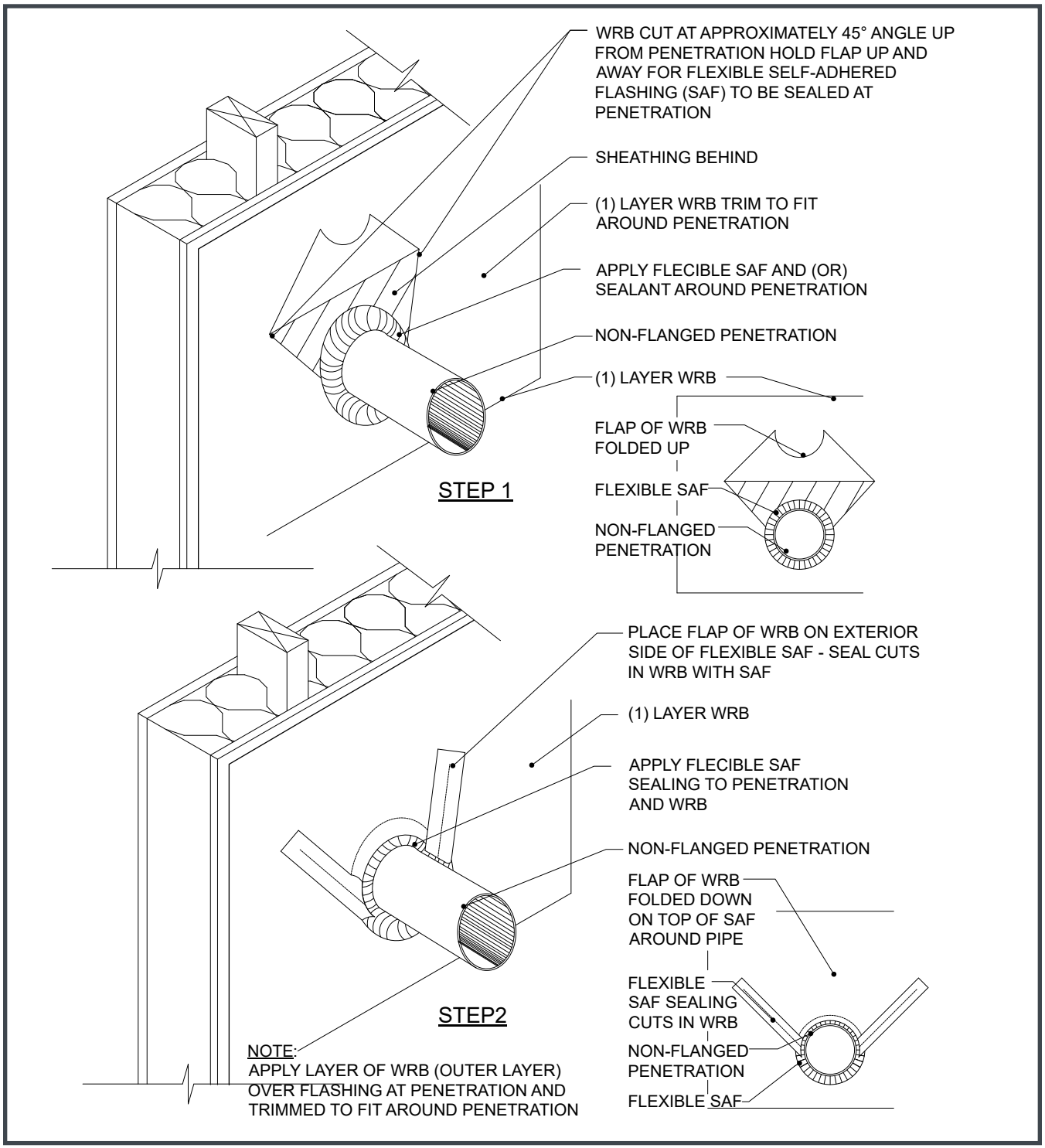
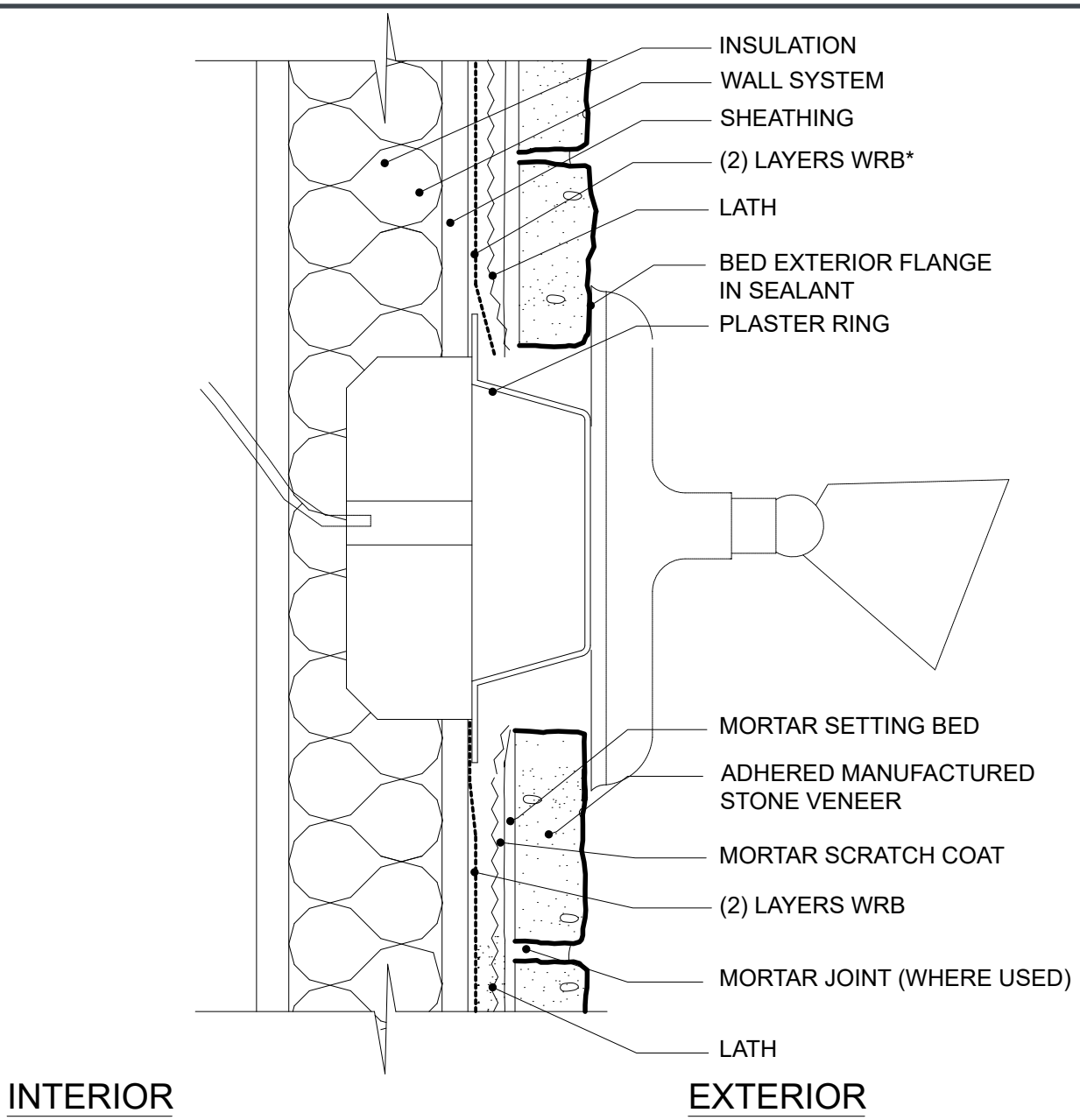


Figure 31. Penetration, Fixture



*SEE FIGURES 29, 30, AND 31 FOR FLASHING OPTIONS.

Plaster rings should be affixed over the service box to bring the face of the box flush with the adhered manufactured stone veneer. Bed the exterior flange in sealant. Water resistive barrier should be installed snugly around the plaster ring flange.

Figure 32. Penetration, Dryer Vent

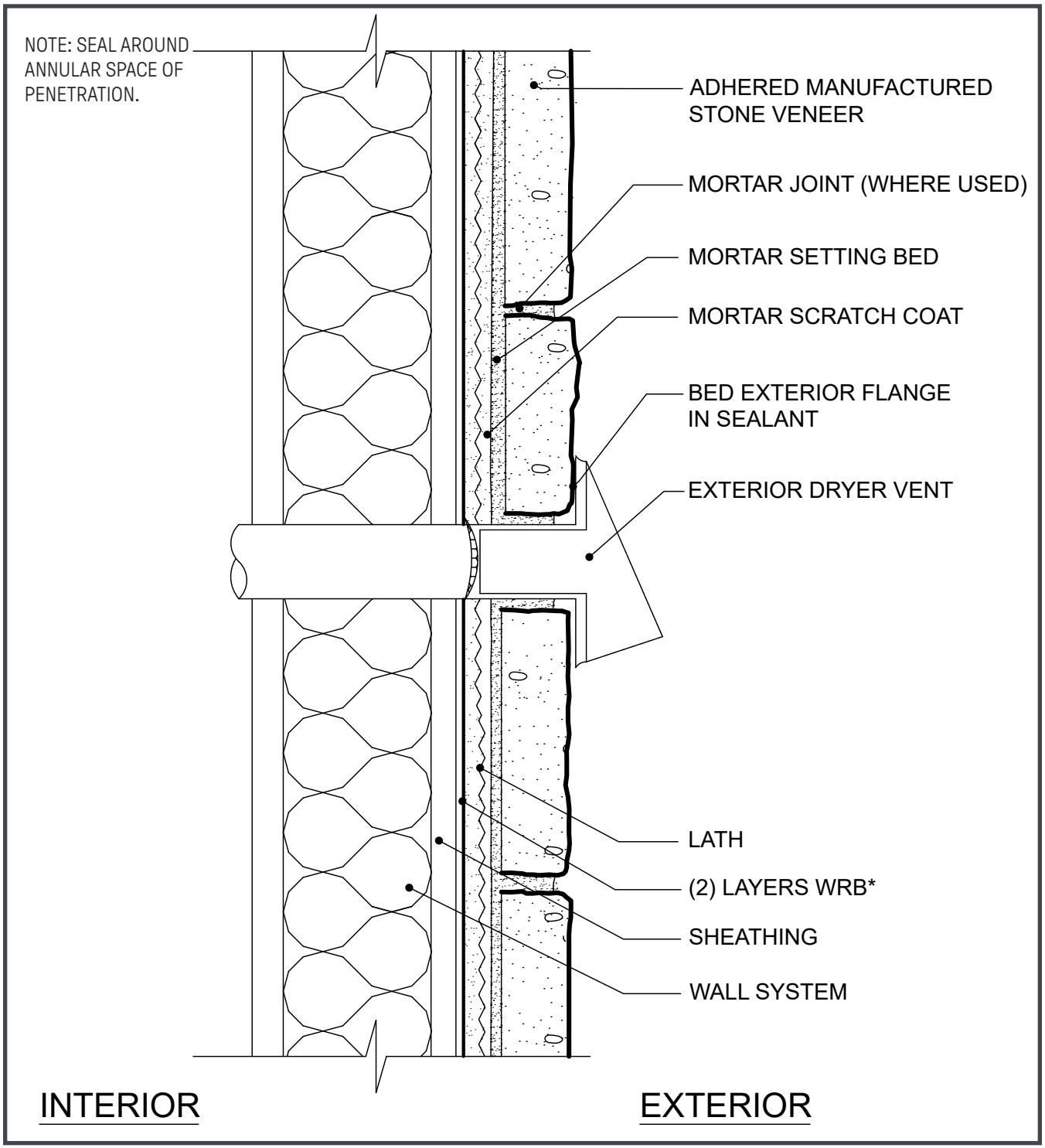


Figure 33. Deck Termination

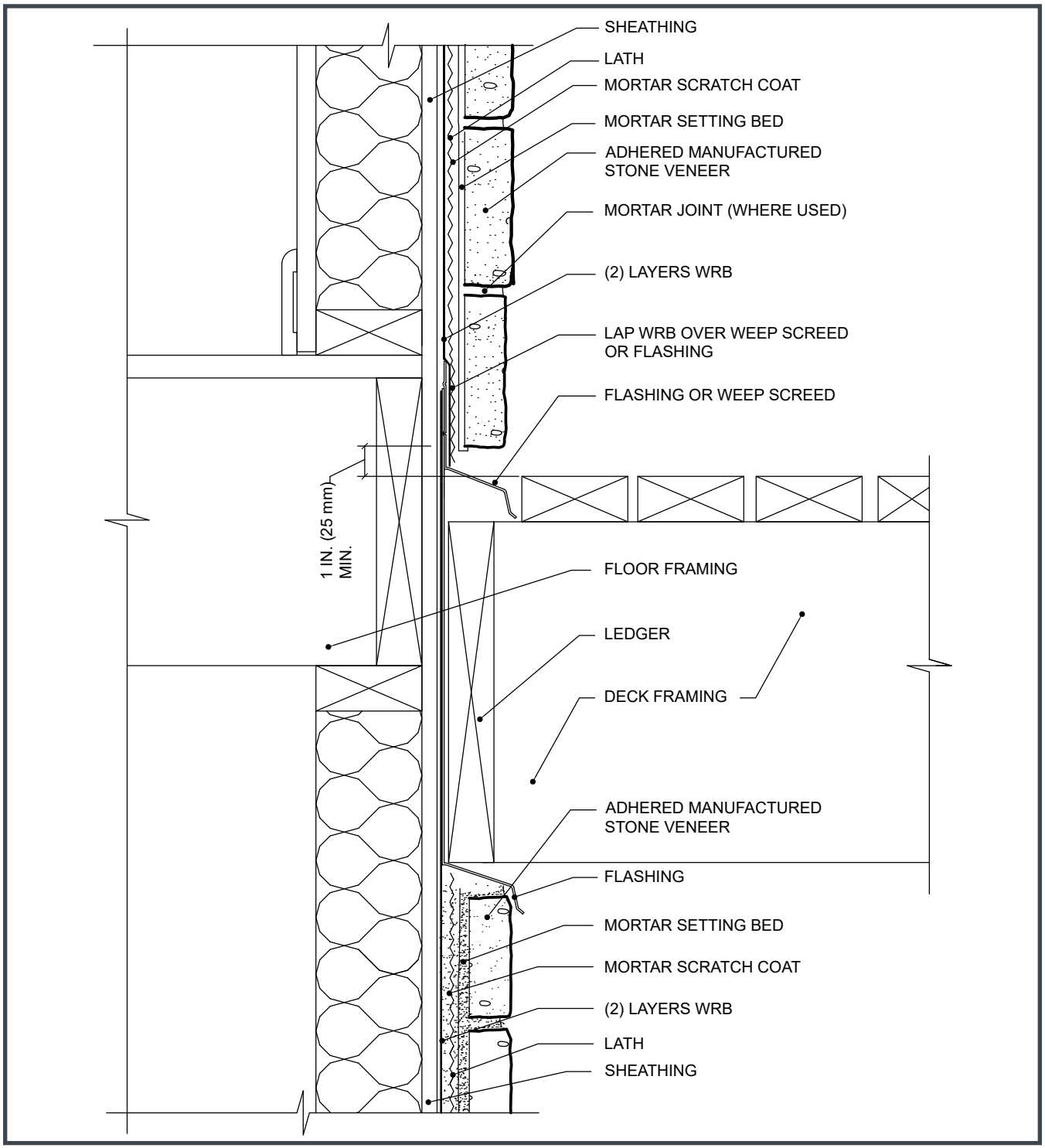


Figure 34. Wall Cap

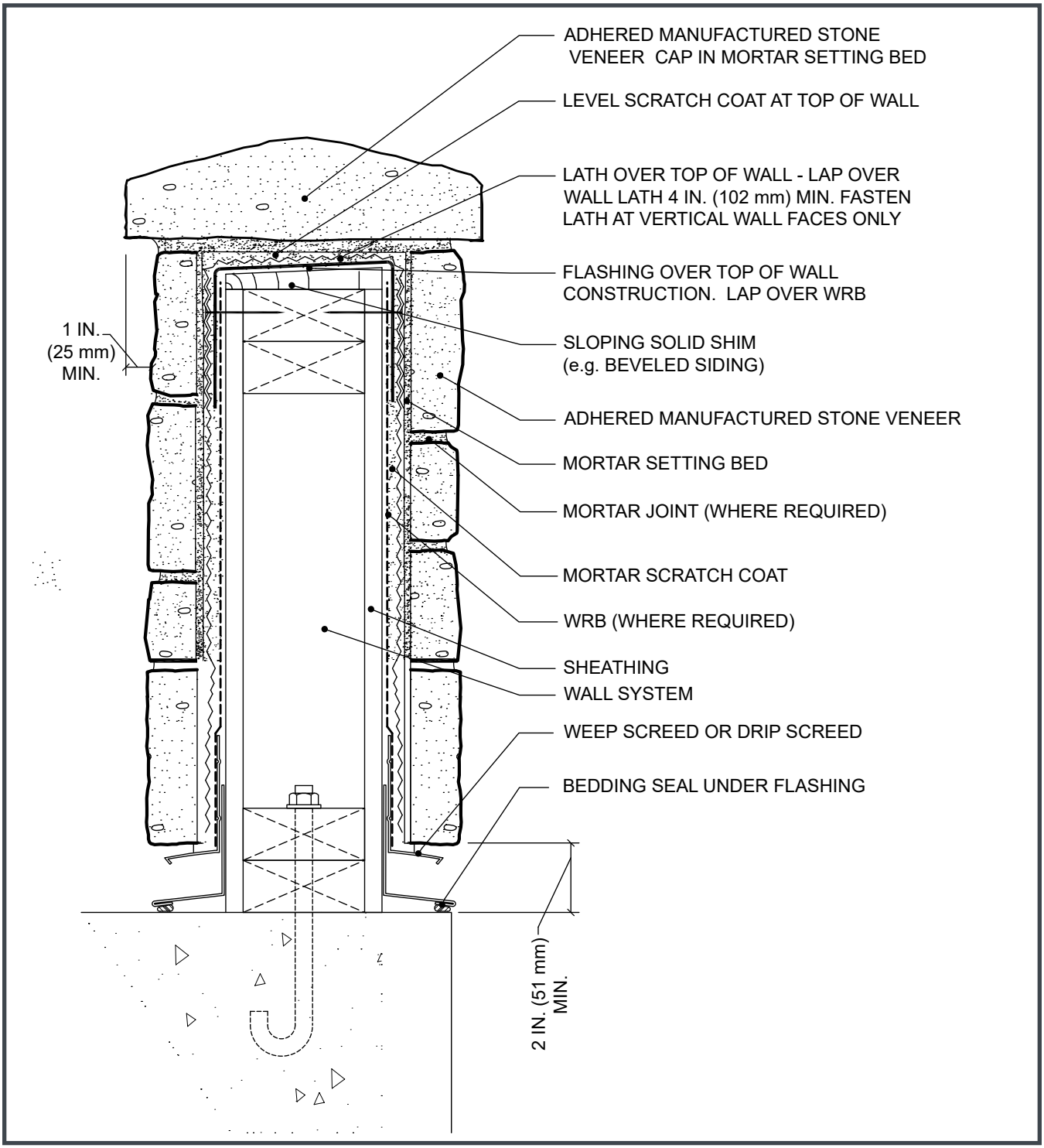


Figure 35. Wall Assembly – Rainscreen System – Membrane System

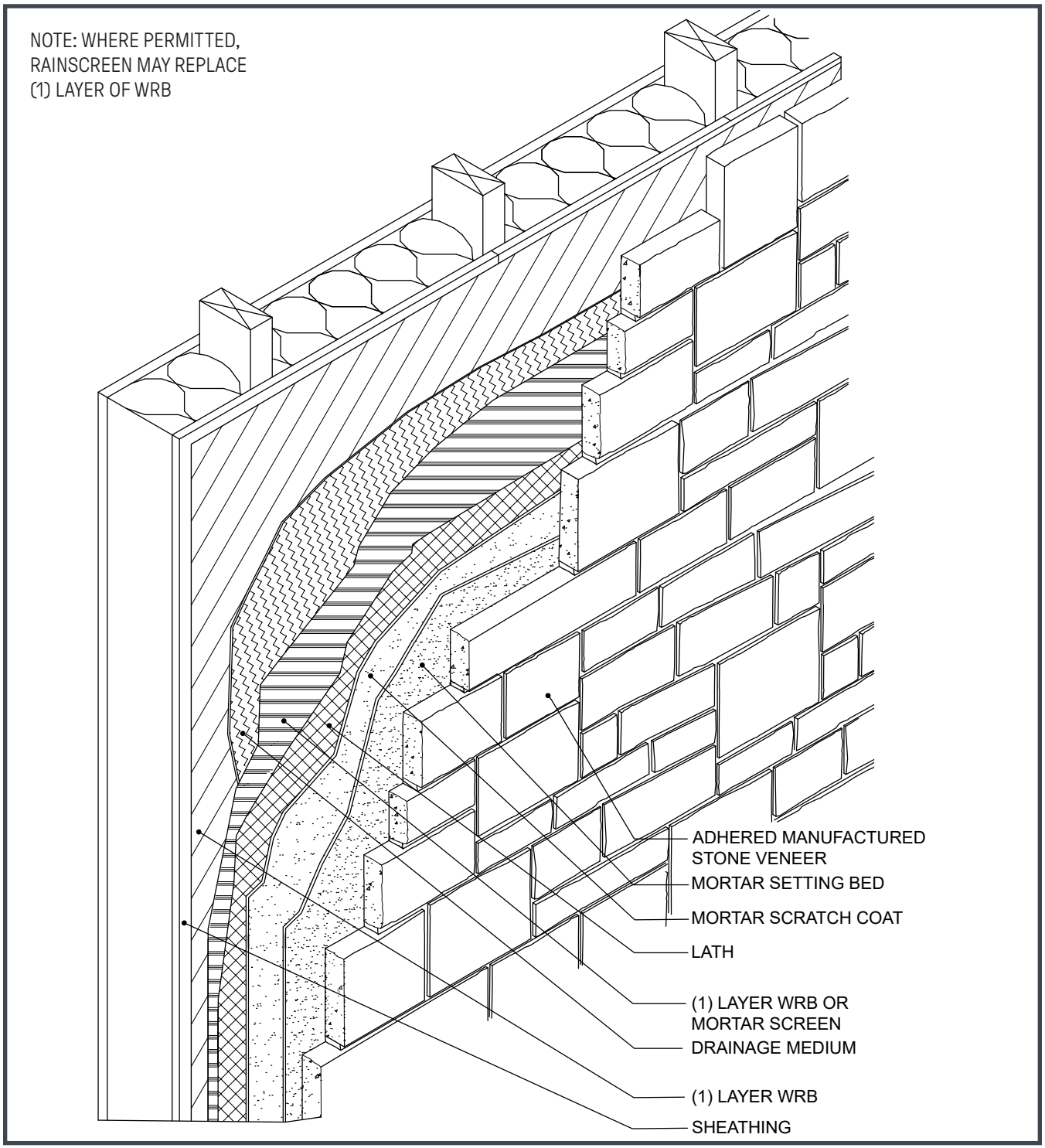


Figure 36. Wall Assembly – Rainscreen System – Strapped

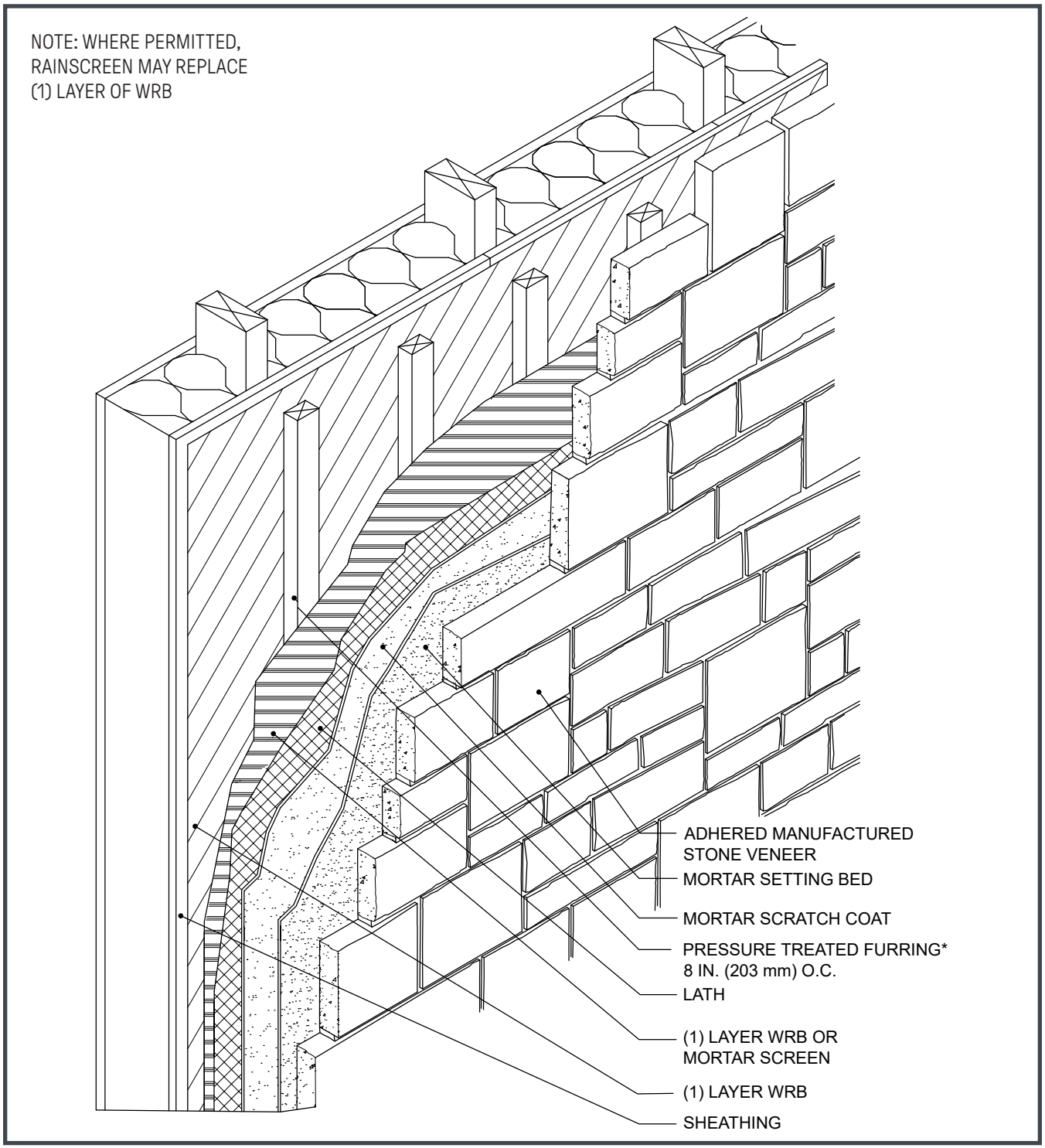


Figure 37. Foundation Wall Base – Rainscreen System

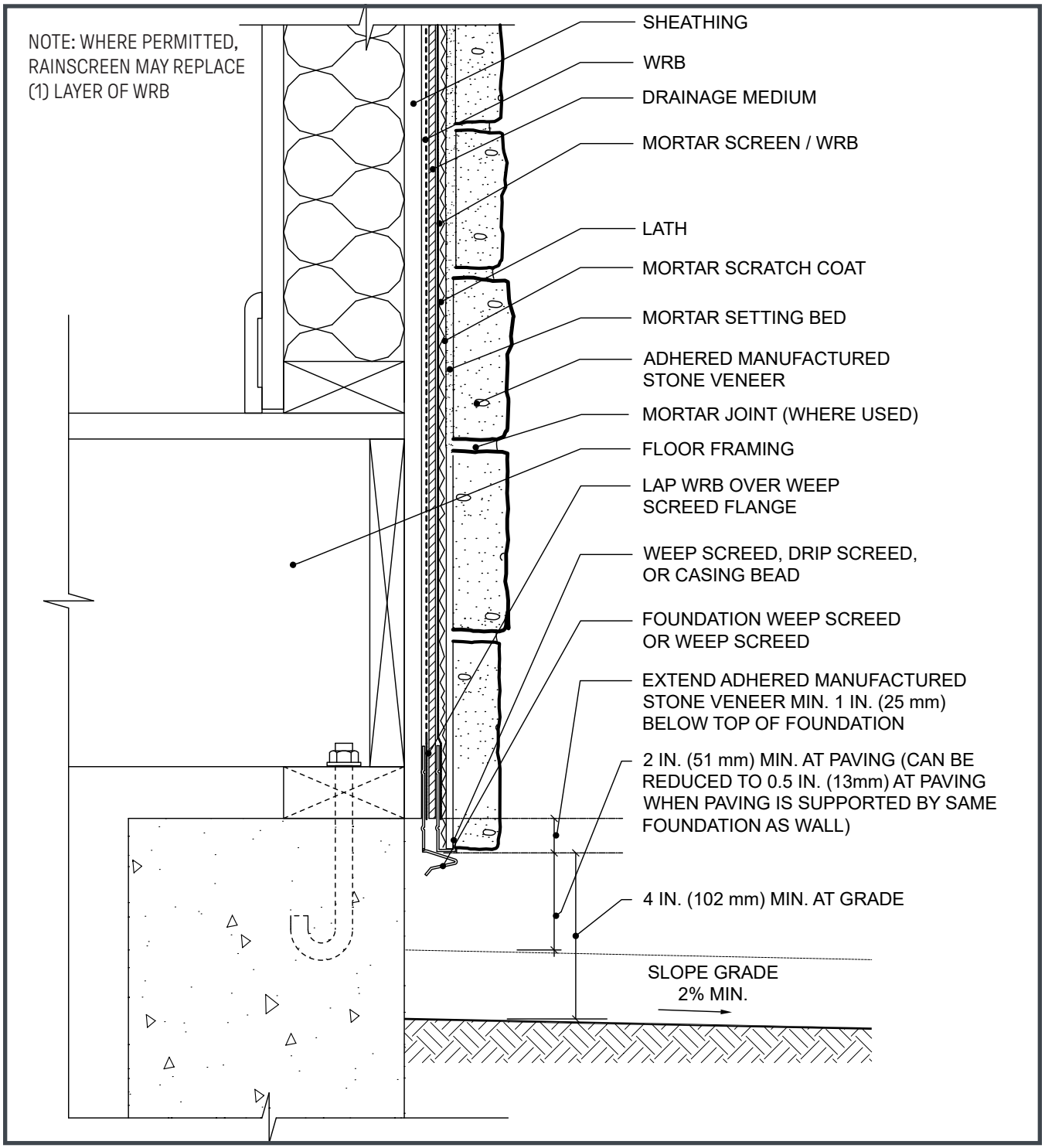


Figure 38. Typical Wall Section – Rainscreen System

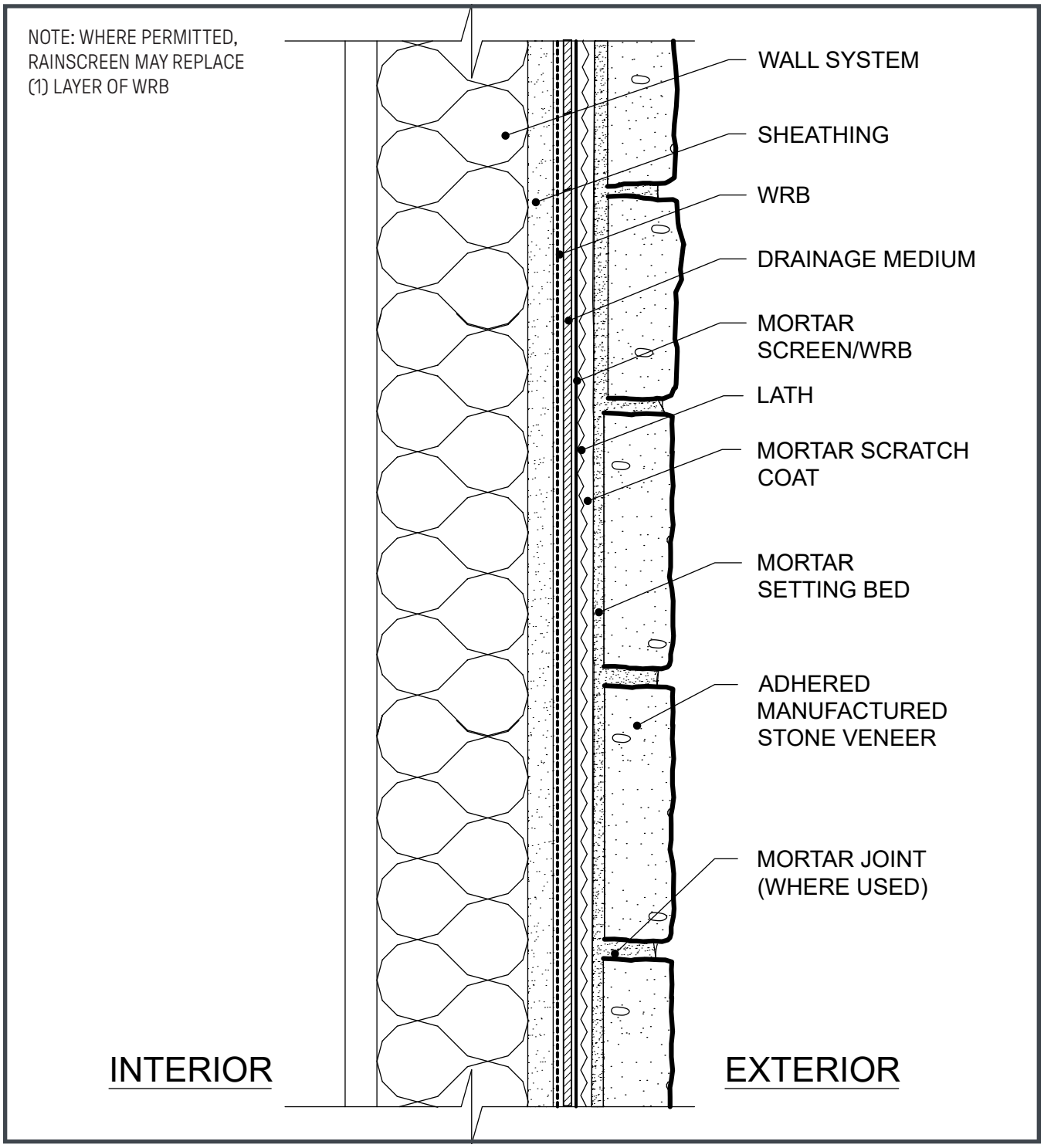


Figure 39. Retaining Wall (CMU)

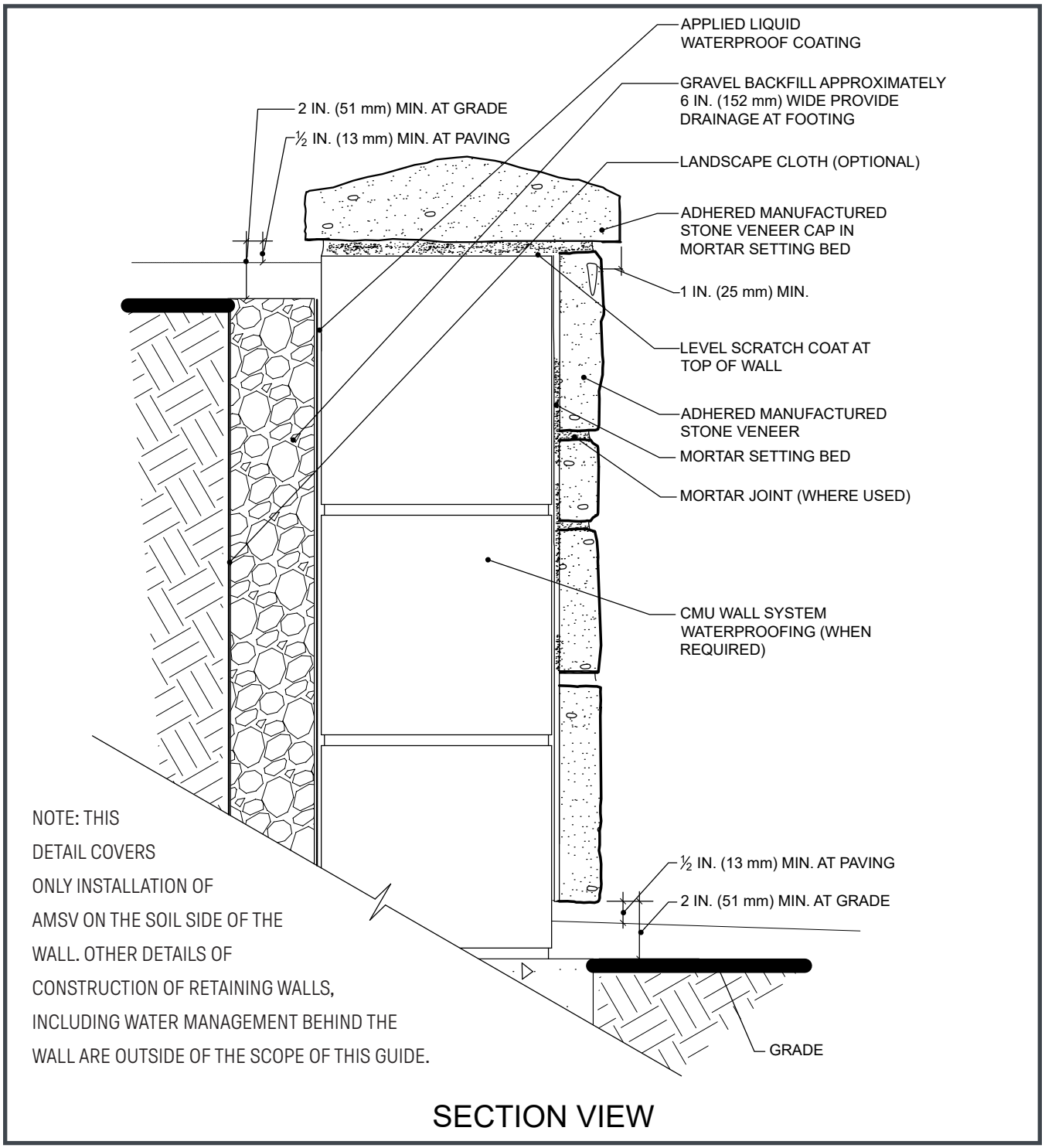


Figure 40. Stone Wrap Under Straight Overhang

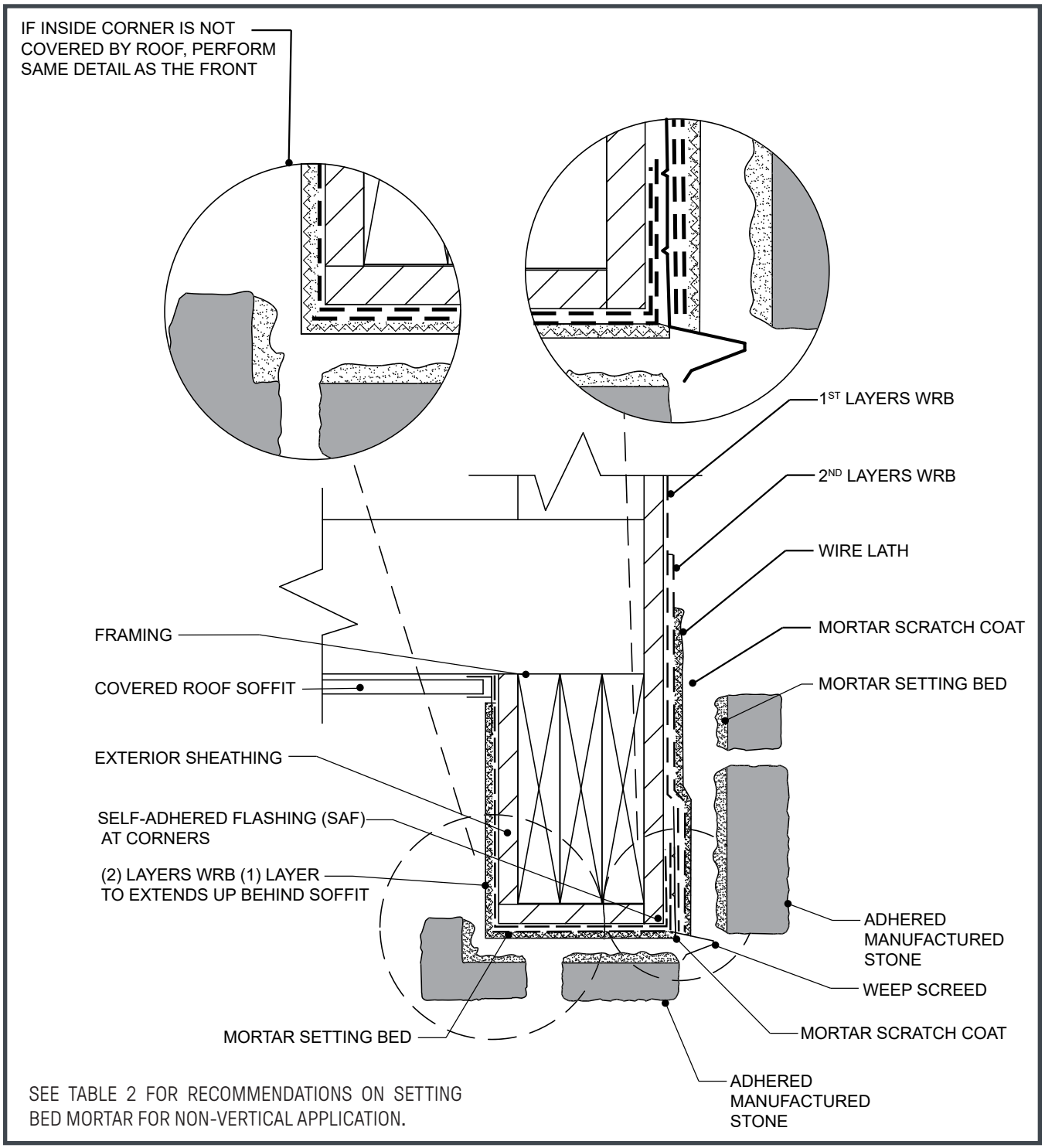
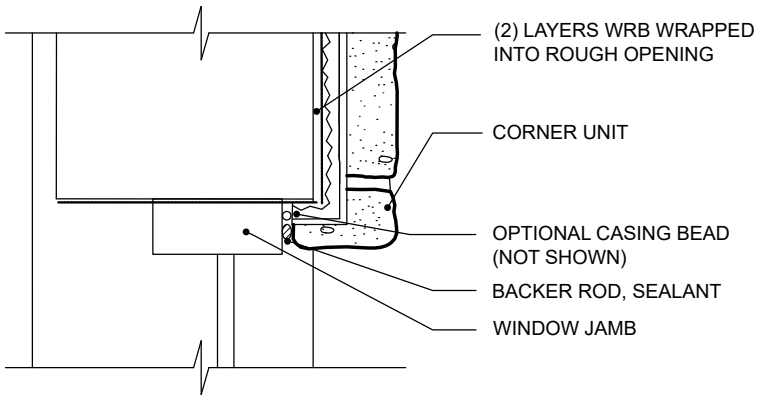


Figure 41a. Forward Mounted Commercial Window



JAMB DETAIL

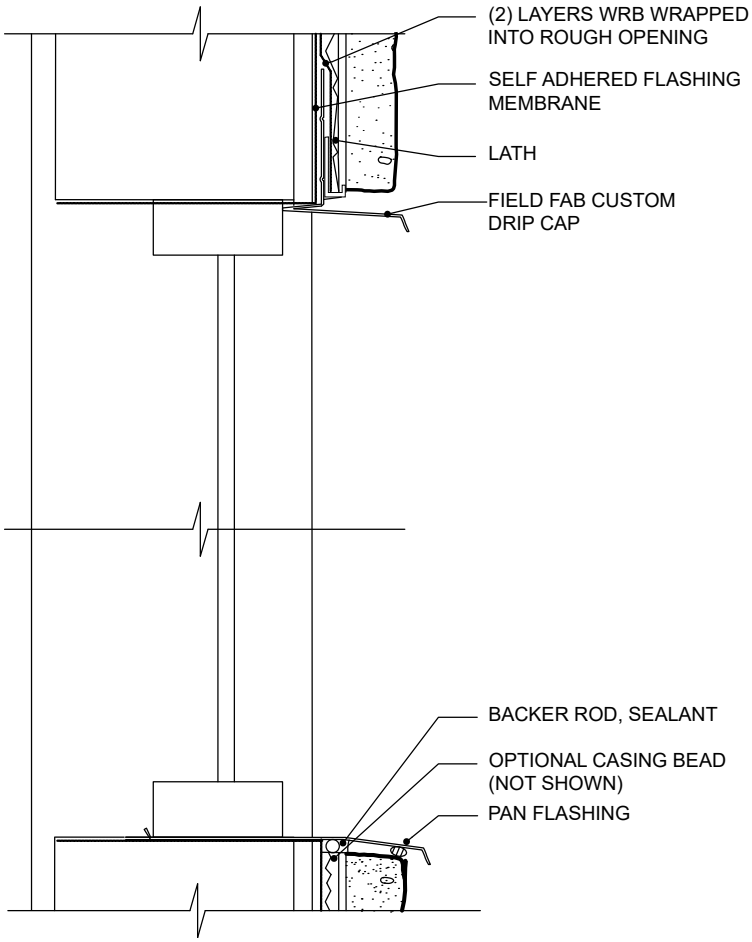
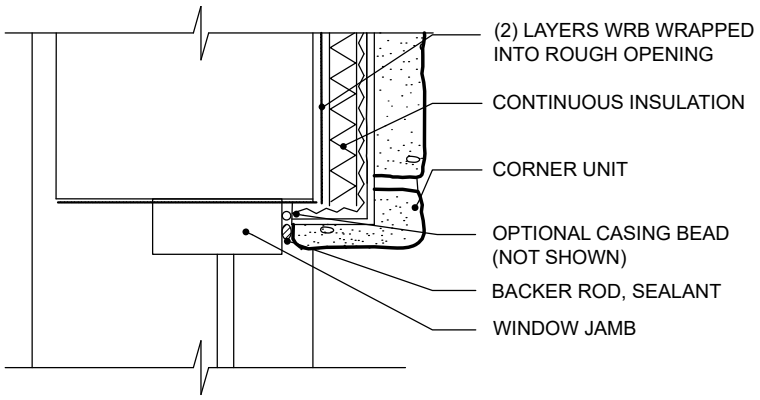


Figure 41b. Forward Mounted Commercial Window Over Continuous Insulation



JAMB DETAIL

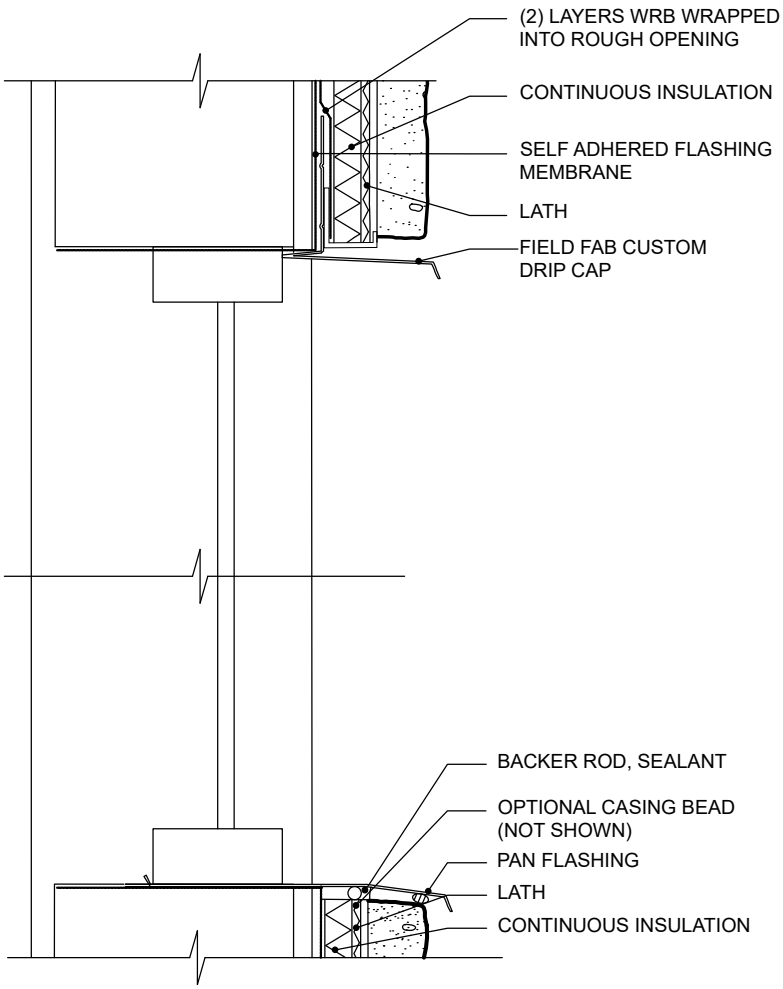


Figure 42. Forward Mounted Commercial Window – Top View

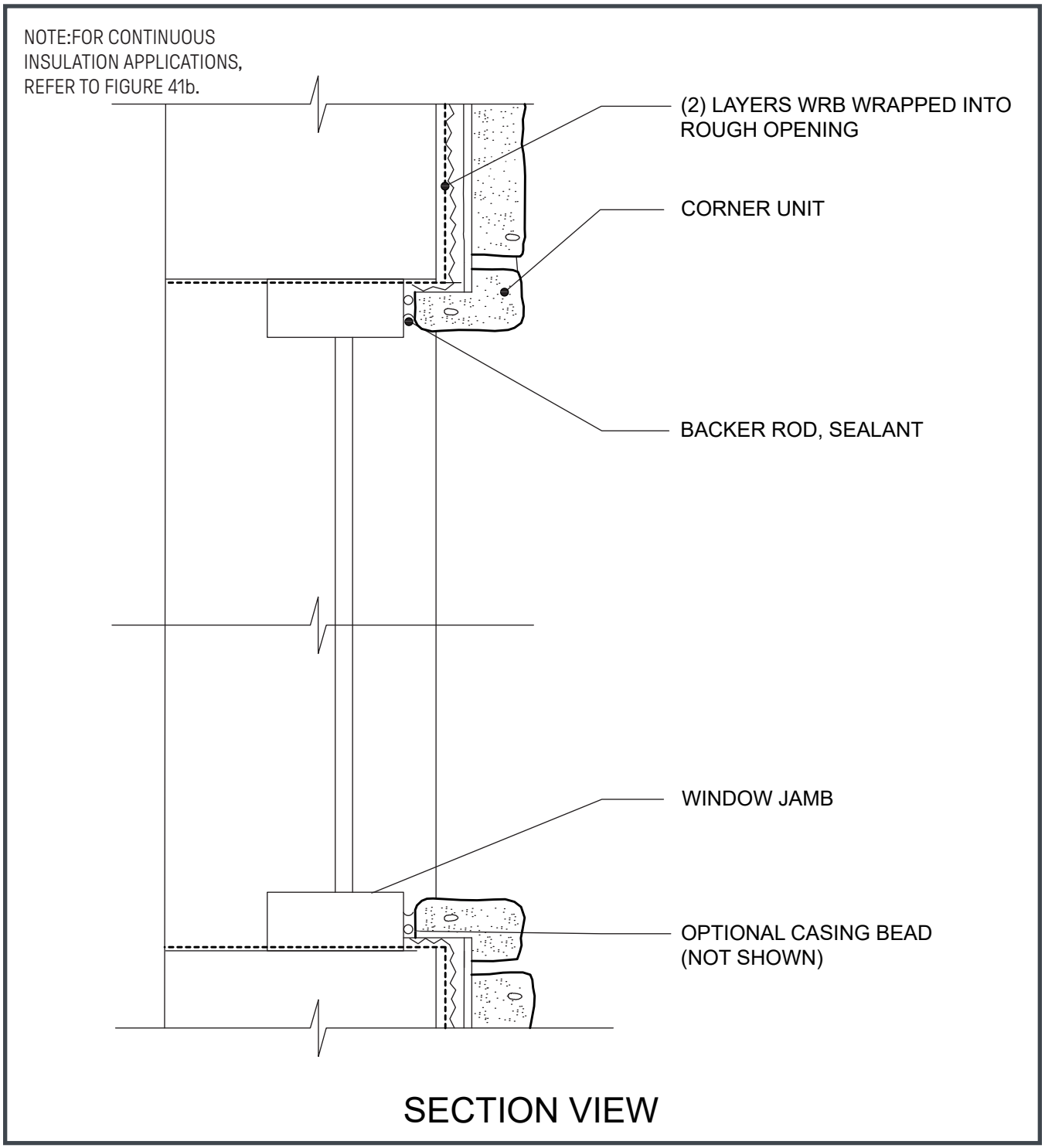


Figure 43. Commercial Storefront Window – Top View

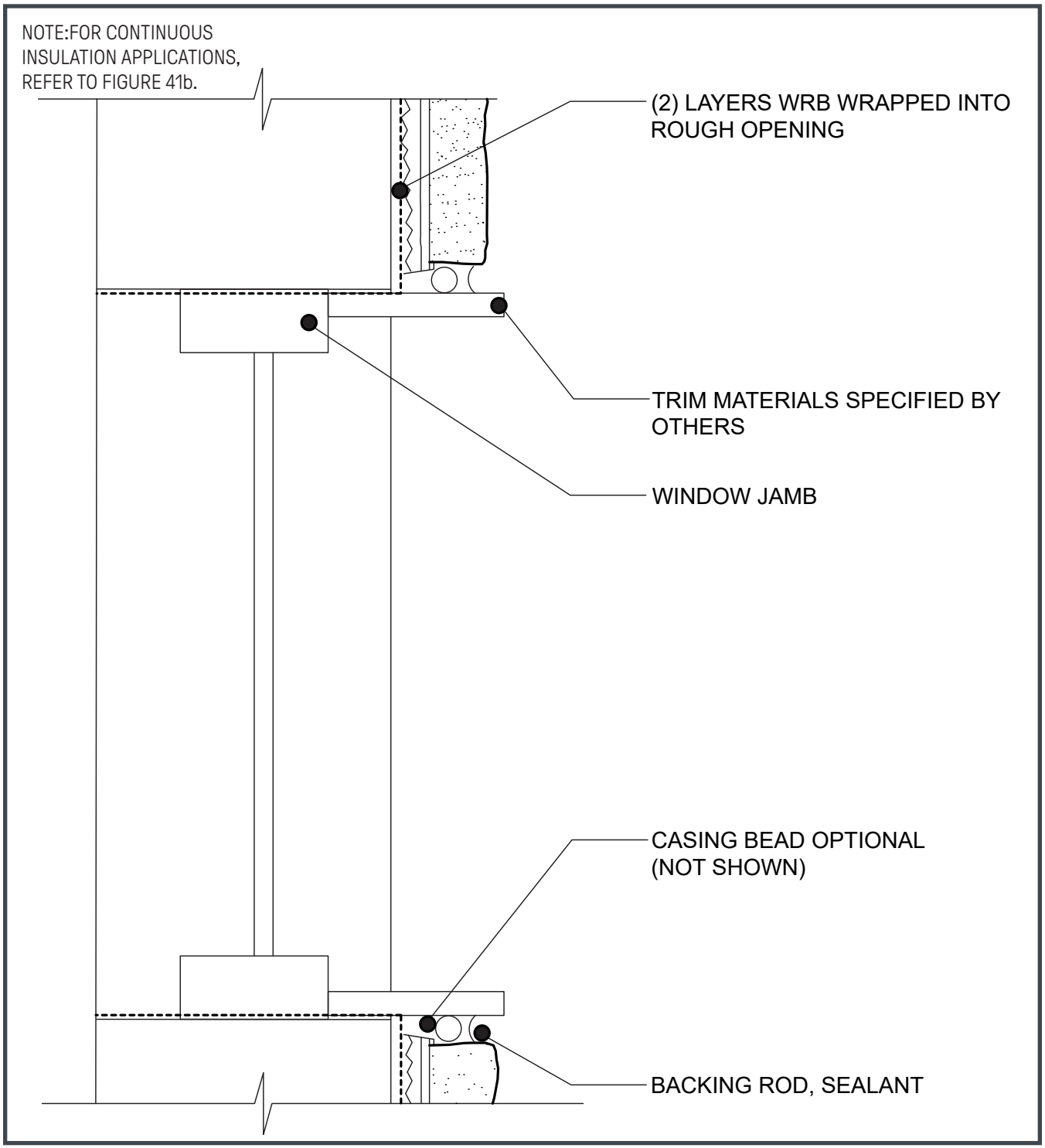
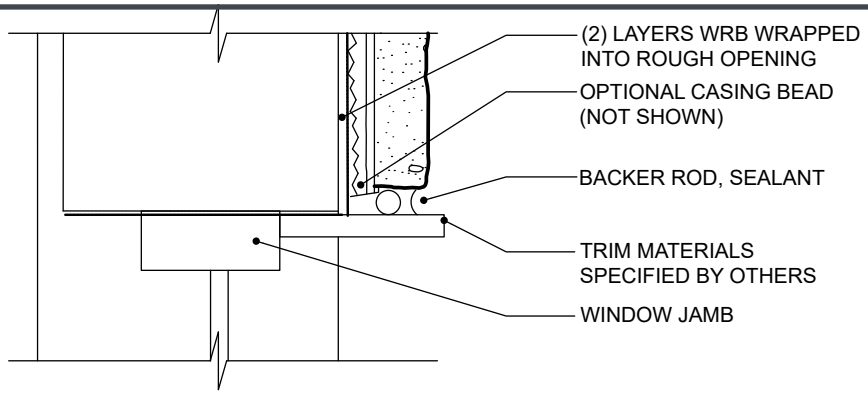


Figure 44. Commercial Storefront Window

NOTE:FOR CONTINUOUS INSULATION APPLICATIONS, REFER TO FIGURE 41b.



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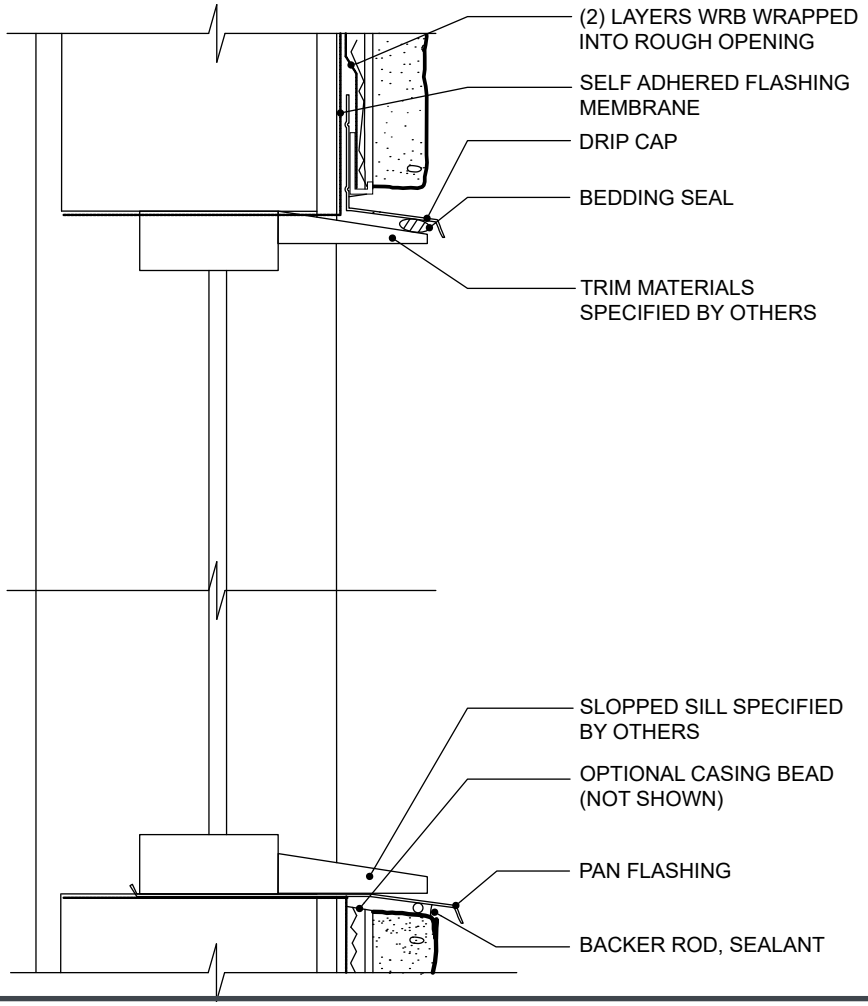


Figure 45. Wall–Section Multi-Floor Joint Detail

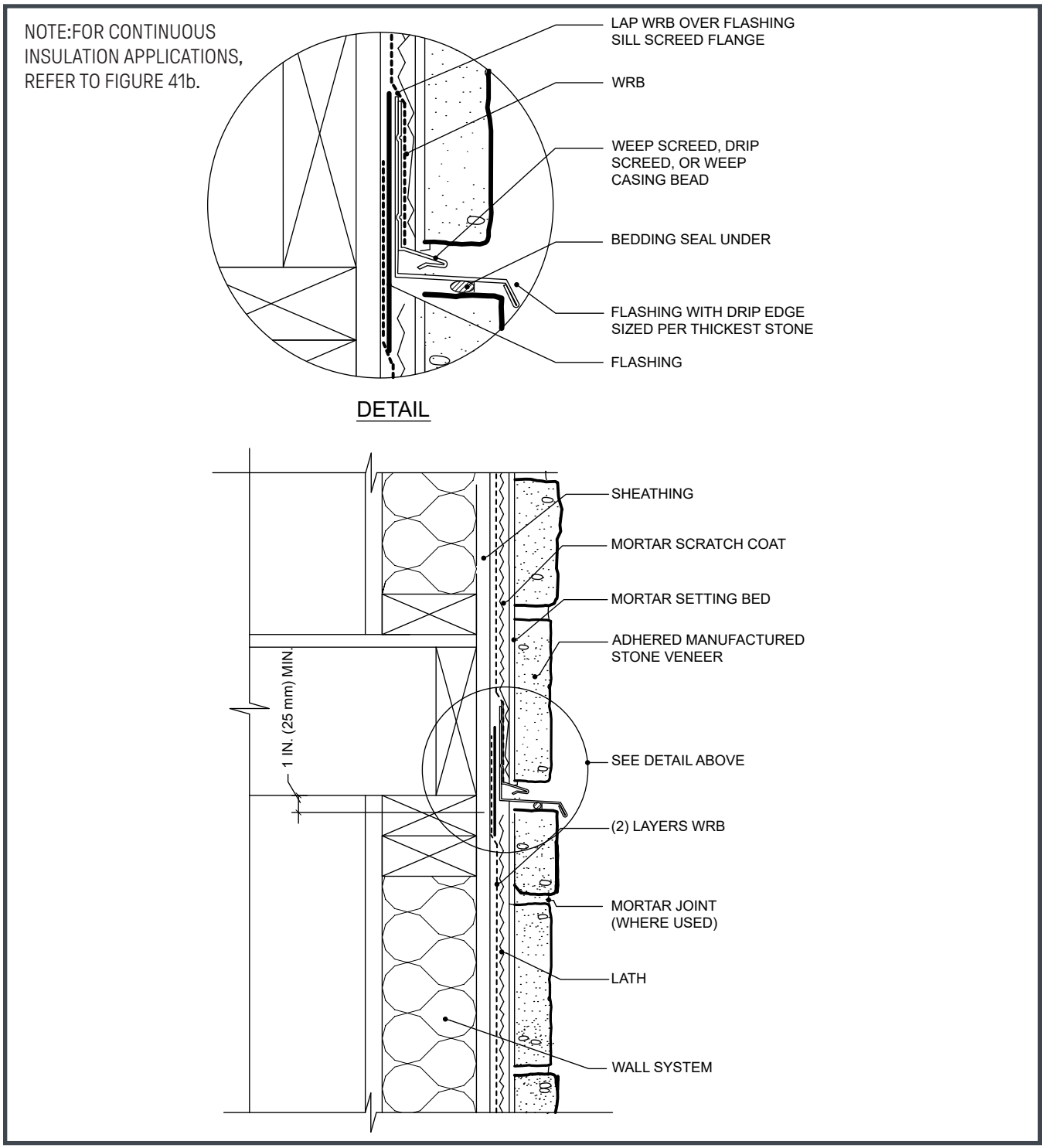


Figure 46a. Wall–Section CMU

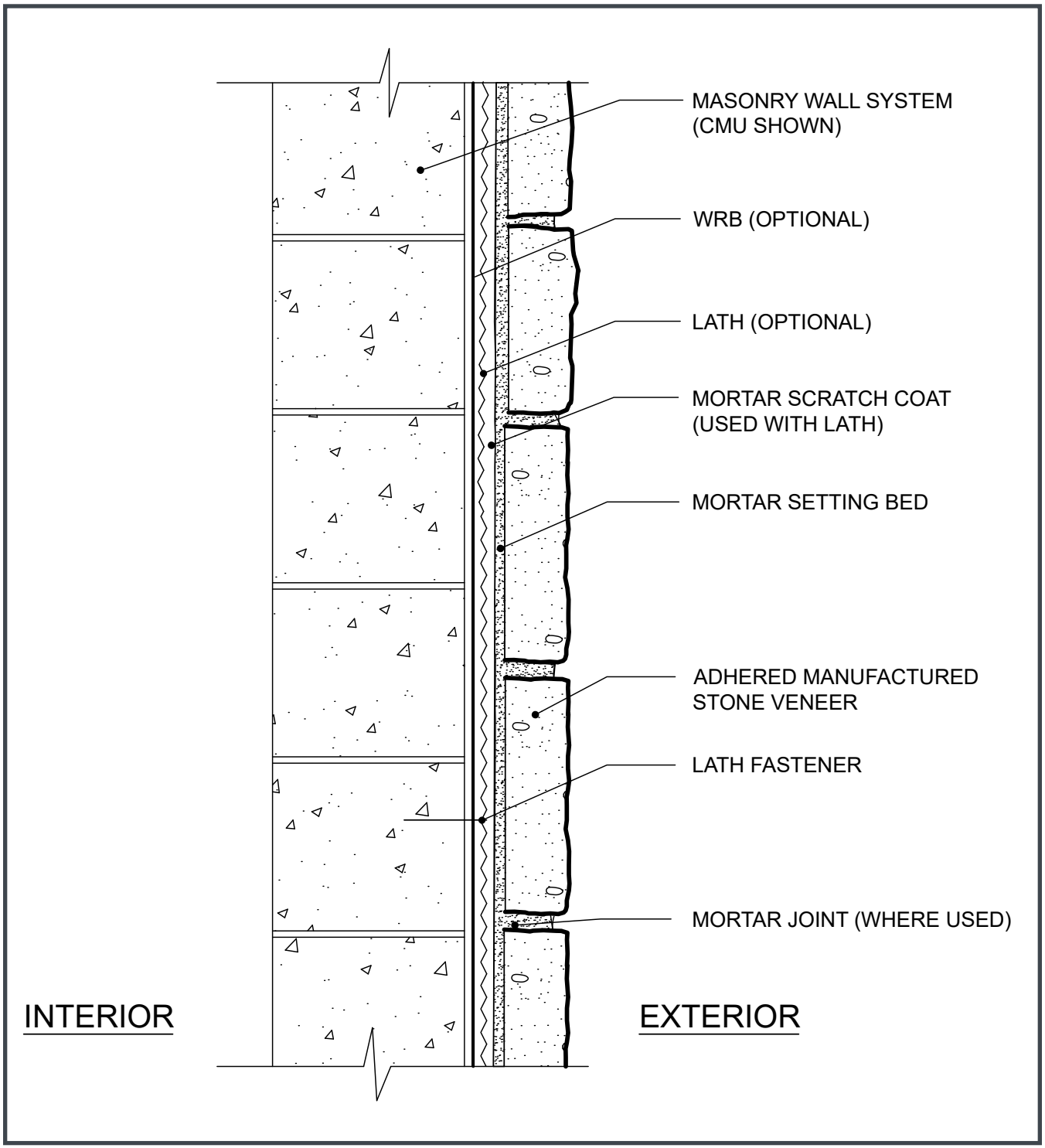


Figure 46b. Wall–Section Over Continuous Rigid Insulation

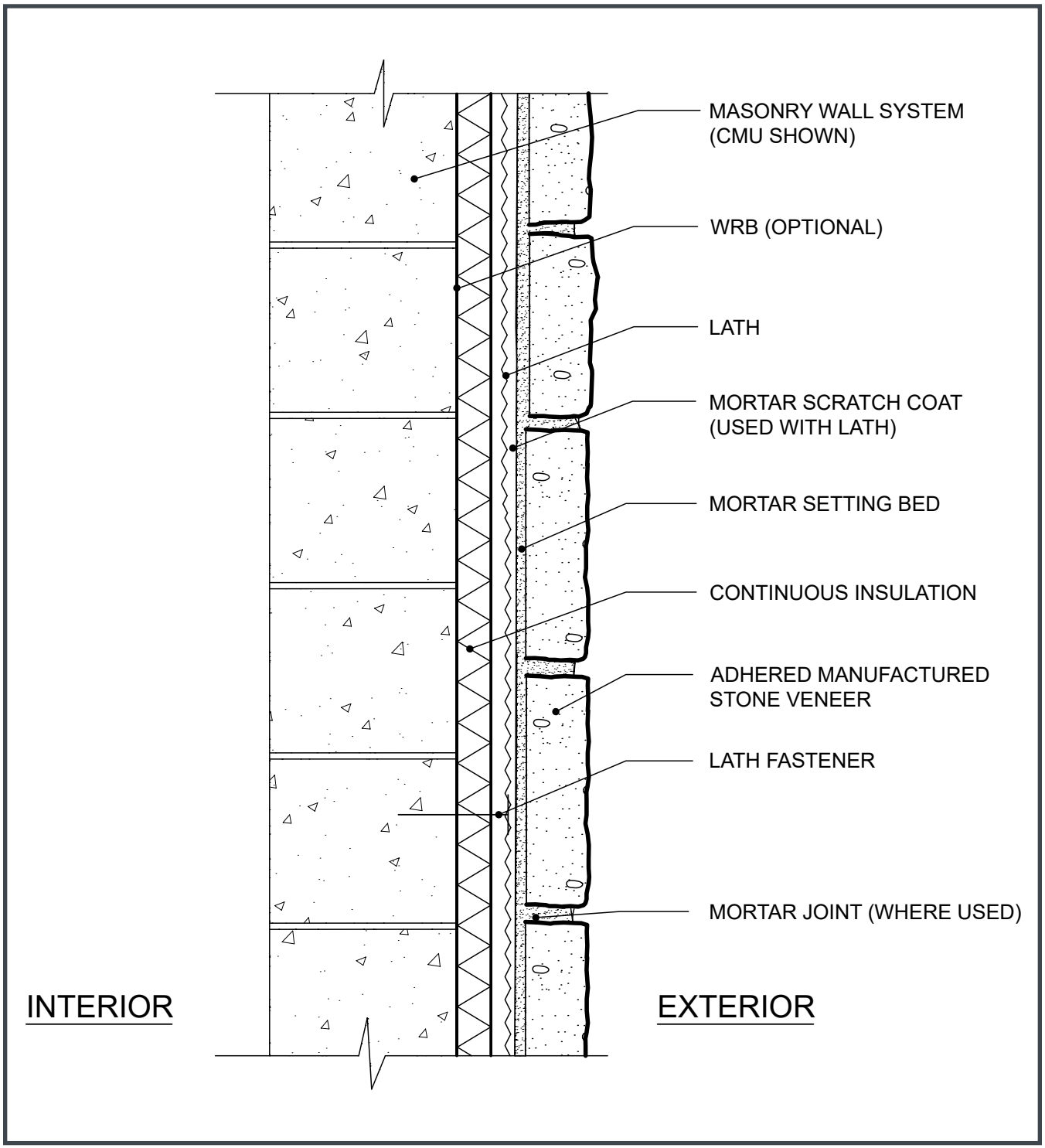
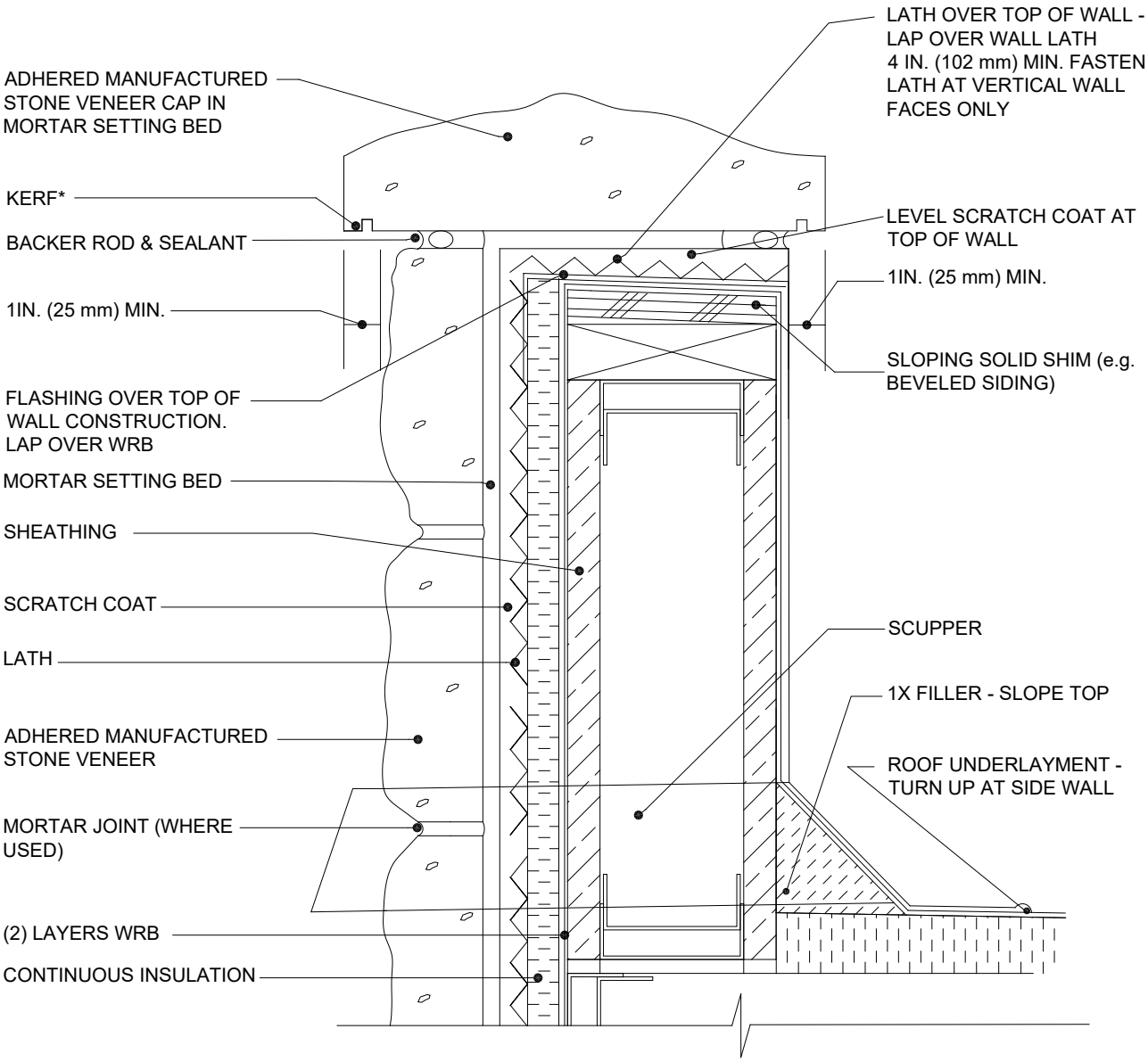


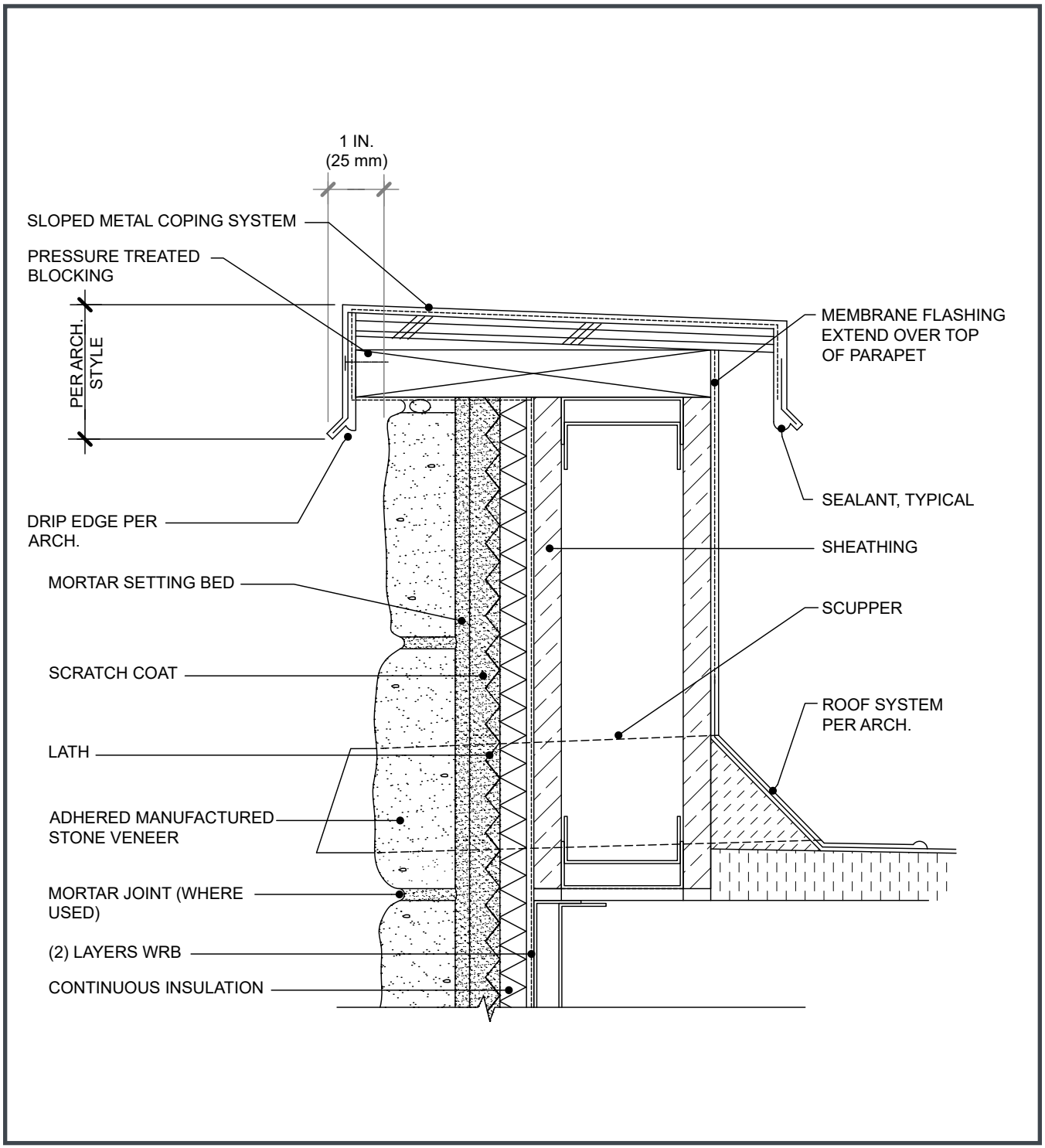
Figure 47. Wall-Section Parapet with Stone Cap



SECTION VIEW

*Kerfs are typically not a molded feature of manufactured stone units, but instead are field-cut features where desired.

Figure 48. Wall-Section Parapet with Steel Cap



Notes:

Notes:

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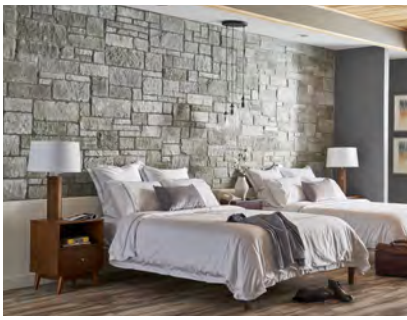

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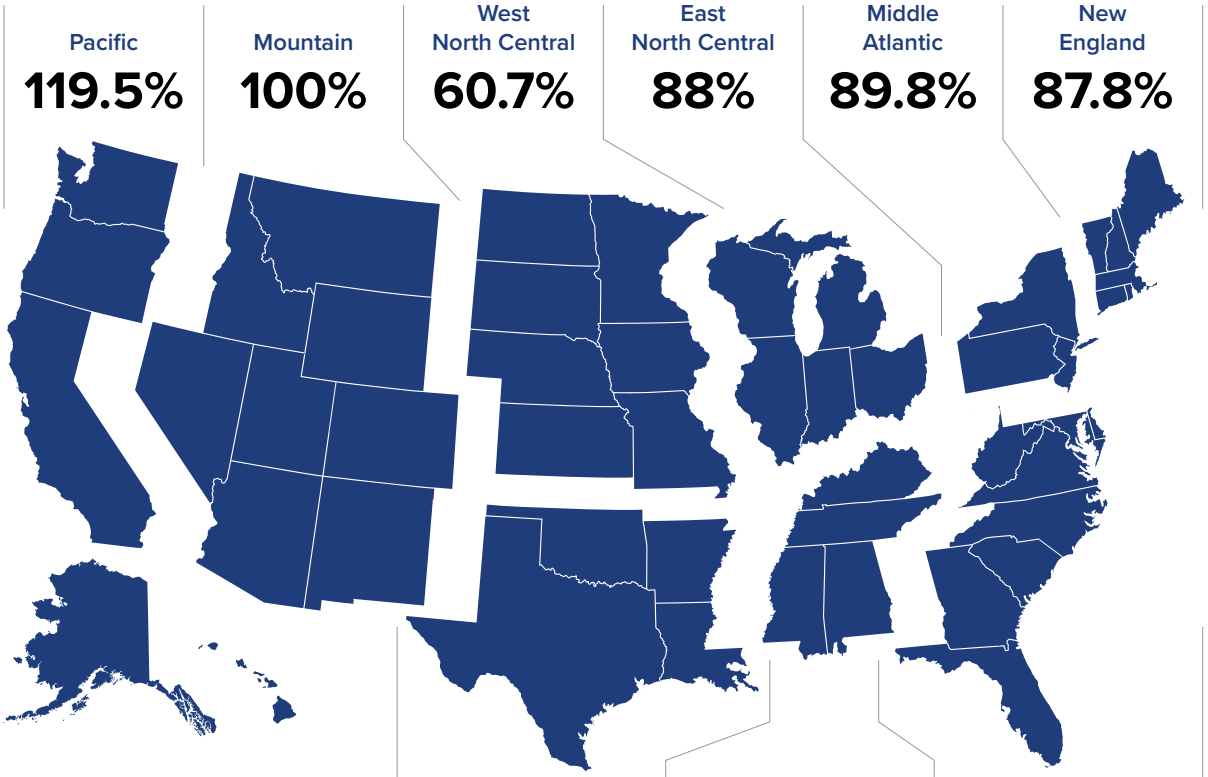
95.6%

The average amount U.S. homeowners recoup from their manufactured stone veneer investment



All figures represent average value recouped per region according to Remodeling Magazine's 2020 Cost vs. Value Report.

Manufactured stone veneer doesn't just enliven your outdoor and indoor living spaces. According to multiple sources, it's also one of the most sound investments you can make to increase home resale value. It's cost effective, easy to install, and adds tremendous curb appeal to any number of exterior features.

CULTURED STONE. ELDORADO STONE. DUTCH QUALITY STONE. STONECRAFT INDUSTRIES. VERSETTA STONE. KINDRED OUTDOORS + SURROUNDS

For interior inspiration and stone veneer options,
visit elevatewithstone.com.

Westlake Royal Stone Solutions™

TECHNICAL RESOURCES
ONLINE DIRECTORY

Eldorado Stone is designed to meet or exceed building code requirements. Independent testing confirms compliance with ICC-ES Acceptance Criteria 51 and ASTM C1670, standard specification for Adhered Stone Veneer. Local building codes may vary by area. Always check with your local building authorities before installing stone.

Please visit **www.eldoradostone.com/resources** to view all digital materials available for download.

CATEGORIES

PRODUCT LITERATURE
- Stone & Brick Brochure
- Craftshield Brochure
- Architectural Solutions
- Interior Design Resources

EDUCATION
- CEU-AIA Courses
- Stone 101 Guide
- Technically Speaking Webinar Series
- FAQs

SPECIFICATIONS & DETAILS
- Technical Evaluation Report
- Safety Data Sheet
- Technical Data Sheet
- Material Safety Data Sheet
- ICC-ES Evaluation Report
- CSI 3-Part Spec
- Wind Load Test
- 910f
- Warranty
- Craftshield Technical Data Sheet
- Craftshield Material Safety Data Sheet
- Craftshield 3-Part Spec

BIM + CAD
- BIM-CAD Files: Stone & Brick
- NCMA CAD Drawings

INSTALLATION & MAINTENANCE
- NCMA Installation Guide
- Supplemental Installation Guide
- Large Format Installation Guide
- Grout Techniques
- Stone Care & Maintenance

ELDORADO STONE®

EARN CEU CREDITS & LEARN ABOUT STONE VENEER

Presentation Options

All of our AIA courses are available as virtual or in-person presentations led by one of our stone experts.

On-Demand Courses

Select courses can be taken online independently, without a presenter.

Note: AIA only issues credit once per course, therefore courses can't be taken multiple times.

Schedule a Presenation

To schedule a presentation contact:
StoneCEU@westlake.net

Westlake
Royal Stone Solutions™

CEU Course Offerings
WESTLAKE ROYAL STONE SOLUTIONS

The following are CEU courses offered under Westlake Royal Stone Solutions.

Designing Commercial Projects with Manufactured Masonry – AIA

Design guidelines for sustainable manufactured stone veneer buildings, including product innovations and industry related education.

1 LU | HSW | GBCI

Precision & Performance with Manufactured Stone Veneer – AIA / IDCEC

Explore manufactured stone veneer as an inspirational design element, born from innovative technology and creative solutions.

1 LU | IDCEC | GBCI

Architectural Stone Veneer: Designing With Nature in Mind – AIA / IDCEC

Discover how incorporating architectural stone veneer into your project can help promote well-being, sustainability, and design versatility.

1 LU | HSW | GBCI

Architectural Stone Veneer: Transforming Spaces Through Color & Texture – AIA

Understand the benefits of specifying architectural stone veneer in your design projects and learn about proper installation techniques.

1 LU | HSW | GBCI

Elevating Design with Architectural Stone Veneer – AIA

Explore how stone veneer contributes to biophilic design principles and helps architects specify for changing residential building trends.

1 LU | HSW | IDCEC | GBCI

NEW! COURSE AVAILABLE ON-DEMAND
Register Here: hanleywooduniversity.com/course/7852

Manufactured Stone Plant Tour – AIA

A one-hour tour of the manufacturing process of MSV, including detailed overview of accreditation, production, packing, storage, and transportation.

1 LU | HSW | GBCI

Understanding Mortarless Stone Veneer & Other Stone Veneer Products – AIA

An examination of the new Mortarless Stone Veneer category of cladding products as it relates to other types of stone veneer, specifically around the areas of installation and applications.

1 LU | HSW | GBCI

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FREQUENTLY ASKED **QUESTIONS**

Why is Eldorado Stone® considered *The Most Believable Architectural Stone Veneer in the World™?*

Believability. It's the most important ingredient of Eldorado Stone and the most compelling reason why so many architects, builders and homeowners choose Eldorado Stone. Eldorado's distinct process handcrafts molds and creates the natural color palettes that capture all the nuances of real stone. The warmth and richness of Eldorado Stone creates unique spaces of permanence, romance and beauty; inside and out. *The Most Believable Architectural Stone Veneer in the World*. Only from Eldorado Stone.

What is the difference between manufactured stone veneer and natural stone?

Manufactured stone veneer is cast from molds of real stone which makes it lighter than natural stone. Natural stone may require wall ties and footings, which, in turn, can increase installation cost and difficulty. Eldorado's architectural stone veneer is lighter weight, designed to adhere easily to a variety of structurally sound surfaces, and is capable of installations that would normally be very difficult and costly to achieve with natural stone.

What are the benefits of using manufactured stone?

Installed, manufactured stone is approximately ⅓ to ½ the cost of natural stone. Its light weight properties eliminate the need for wall ties or footings. Manufactured stone has a 2% (approximately) waste factor versus 10% or more for natural stone.

Where can I install Eldorado Stone?

Eldorado Stone can be applied to any structurally sound surface with the proper preparation. It fits nearly any building plan — large or small, interior or exterior, new residential or commercial projects — or on any remodel. For inspirational installations visit **www.eldoradostone.com/imagine**.

ELDORADO STONE®

FREQUENTLY ASKED **QUESTIONS**

Can I install Eldorado Stone myself?

In general, installation of Eldorado Stone can be installed by almost anyone. However, installation does require a fundamental understanding of stone masonry. Please review the *Installation Procedures* and *How to Install* at **www.eldoradostone.com** or contact Customer Service at 800.925.1491.

How does Eldorado Stone withstand freeze/thaw cycles?

Eldorado Stone products are tested for freeze/thaw durability. As with any installation, making sure to incorporate good building practices that include proper flashing and water diversion techniques will help ensure a successful installation.

How much does Eldorado Stone weigh?

Approximately 10-12 lbs. per square foot. Eldorado Stone qualifies as an adhered veneer because it weighs less than 15 lbs. per square foot.

Will Eldorado Stone fade?

The base color is blended throughout and permanent mineral oxide pigments are applied and absorbed when the veneer is cast. Color becomes an integral part of the veneer and, similar to natural stone, there are minimal noticeable color changes after years of weathering.

How important is a good stone installation?

As with any building material, the beauty of that product is greatly enhanced by how well it is installed. With Eldorado Stone, careful consideration regarding the type of profile and color selected, the actual installed stone "pattern", and the type of grout technique used, are all very important factors to regard. It is always best to create a mock up board with the desired aesthetic appeal prior to installation on your project. For more information download the *Installation Procedures* and *Finishing Details* PDFs from **www.eldoradostone.com**.

What type of coverage can be expected?

Approximately 100 square feet per day. This varies depending upon the stone type used and the installers ability. Stacked Stone, for instance, sold in 4" modular component panels, is easy to install and will provide coverage of up to 200 square feet in a day. Conversely, Shadow Rock, with its irregular shapes and varying stone sizes, can provide coverage of 70- 80 square feet a day.

Where can I buy Eldorado Stone?

Eldorado Stone is sold by more than 1,000 authorized distributors throughout the U.S. and Canada. Please visit www.eldoradostone.com and select "Contact" to find a distributor near you.

Where can I find knowledgeable masons?

Your local Eldorado Stone distributor can recommend local masons that are familiar with Eldorado Stone products and installation.

Does Eldorado Stone meet building code requirements?

Eldorado Stone complies with all applicable Building Code requirements. A copy of the Eldorado Stone *Technical Data Sheet* is available online at **www.eldoradostone.com**.

Is Eldorado Stone combustible?

No. Eldorado Stone's listing by Underwriter's Laboratories shows zero fuel contributed and zero smoke developed. It can be installed as a façade to fireplaces and behind stoves. It is recommended the product is at least 18" away from any direct flame.

Can I install Eldorado Stone on overhead horizontal surfaces?

Please verify your installation with your building official and consult with an engineer for specific design issues on your project. There are grout and mortar manufacturers that will support their product's use in these installations. Eldorado Stone's *50 Year Limited Warranty* will still cover our veneer products for manufacturing defects.

FREQUENTLY ASKED **QUESTIONS**

Can I install Eldorado Stone near water?

It is not recommended for use below the water line in a pool, a fountain or below grade. A high quality penetrating and breathable sealer that is either silane or siloxane-based is recommended in areas where the stone may be subject to frequent water run off.

NOTE: A sealer may affect the stone color and may create a gloss or matte finish. Always test a small area beforehand.

How thick are the stones?

0.625" to 3.625" depending on the texture.

What's the thickness from the substrate to surface of the stone?

There will be (approximately) an additional 0.5"-1" of mortar thickness behind the stone. For example, if your stone profile is 2" thick, you can expect the total thickness from the substrate to the face of the stone to be (approximately) 2.5" - 3" thick.

What is the R-value of Eldorado Stone?

An average of 0.41 per inch of thickness.

What is the installed weight?

The installed weight will vary depending upon the profile chosen and the mortar, grout technique, lath and lath accessories used. Eldorado Stone can weigh up to 15 lb./sq.ft. If a specific weight is needed for a project we recommend having an engineer evaluate the system.

How many square feet will a bag of mortar cover?

A 94 lb. bag covers 8'-12' for the standard, full and overgrout applications and 10'-14' for the drystack applications.

What happens if Eldorado Stone is damaged?

Small chips and cracks can be repaired using our *Color Touch-Up Kit* which includes easy-to-follow instructions. These kits are available from Customer Service at 800.925.1491. *Touch-Up Kits* are not made for coloring aggregate exposed by cutting stones. The best installers will bury cuts into transitions and/or hide them with mortar when grouting.

How do I clean the Eldorado Stone ?

To clean dirt or other particles first try a simple soft bristle brush. If necessary use a solution of mild detergent with water and scrub the surface with a soft bristle brush. Rinse with clean water to remove any cleaning solution that might remain on the surface. If the stone has a white stain deposit (efflorescence) please contact Customer Service at 800.925.1491 for recommendations. Never use wire brushes, acid cleaners, power washers, bleach, paint remover or any other type of concrete cleaner.

How do I clean efflorescence?

When efflorescence occurs, as it does with many masonry products, it is the usually the result of moisture migration through the masonry substrate. Once the moisture is on the masonry surface, it evaporates, depositing dissolved salts in the form of efflorescence. Efflorescence naturally disappears over time as long as the moisture source is controlled or eliminated. If the stain will not wash off, do not apply chemicals or cleaners to the stone. Call Eldorado customer service to discuss optional solutions.

Can I seal Eldorado Stone?

It is not required to seal Eldorado Stone. A sealer will provide added protection and will usually be easier to clean if the surface becomes dirty. If you choose to use a sealer for added protection use only a silane or siloxane-based penetrating, breathable masonry sealer.

NOTE: A sealer may affect the stone color and may create a gloss or matte finish. Always test a small area beforehand.

What about protection against graffiti?

In many areas, Eldorado Stone is considered a protection against graffiti. The color blends and uneven textures are not the best canvas for graffiti "artists." However, if you should choose to use an anti-graffiti coating please speak directly to the manufacturer of the anti-graffiti coating product and ask your contractor to submit a test prior to installation. There are urethane and wax-based sealers that can damage the surface or cause it to "yellow." Other sealers may encourage additional efflorescence on the stone's surface. No type of coating should be applied until the stone has been on the wall for at least 14 to 28 days.

FREQUENTLY ASKED **QUESTIONS**

Does Eldorado Stone require movement joints?

Expansion joints normally pass completely through a wall. Control joints normally are on the surface of the wall and relieve strain on the skin of the wall. Terminate the veneer installation where control and expansion joints occur in the substrate. Do not span these joints with veneer because this will lead to cracking. Expansion joints in a building must be specified by the architect or engineer. The architect or engineer should consider the ASTM C 1063 control joint requirements when determining the location of control joints on any structure. Normally the weakest point on a wall is immediately above and below penetrations.

How do I install Eldorado Stone when there is an expansion joint?

Treat each section as a "separate" installation. Do not span movement joints with the veneer.

What is Eldorado Stone's recommendation regarding flashing around windows and doors?

To maintain the weather-resistance of the exterior wall on which the stone products are installed, a rigid, corrosion-resistant flashing — and a means of drainage — should be installed at all penetrations and terminations of the veneer cladding. Flashing type and locations shall be in accordance with the requirements of the applicable code.

Please reference the *Finishing Details* PDF on our website. Also refer to ASTM E2112 and any information from your Window and Door manufacturer.

What kind of Weather Resistive Barrier (WRB) can I use?

It is recommended to use two separate layers of WRB in all applications where WRB is specified.* The WRB must meet the requirements of ICC-ES AC 38 *Acceptance Criteria for Water-Resistive Barriers*. When using Grade D paper, a 60 minute rating is recommended. Felt paper must be clearly marked that it meets the requirements of ASTM D 226 for #15 or #30 asphalt saturated felt.** It is acceptable to use one layer of housewrap covered by a second layer of WRB meeting the requirements above. The WRB should be free of tears or holes.

** It is acceptable to use one layer of WRB on interior applications.*

*** Felt meeting ASTM D 4869 or non-ASTM #15 felt is not recommended for use behind veneer.*

Should I use a rainscreen drainage plane system?

Eldorado Stone veneer does not require the use of a rainscreen drainage plane system for all applications. However, some building codes now require the use of rainscreen drainage plane systems behind cladding materials such as manufactured veneer. If you are installing veneer in these areas, or wish to provide additional protection against entrapped moisture, download the *Installation Procedures* PDF from **www.eldoradostone.com** for more detailed information.

What is the fire rating of Eldorado Stone?

Eldorado Stone has been tested for fire hazard and shows zero flame spread and zero smoke developed. Since Eldorado Stone is non-combustible there is no fire rating.

Can we install Eldorado Stone around a fireplace?

Eldorado Stone can be installed around a fireplace. The veneer has to be a minimum of 18" from any open flame. Download the *Installation Procedures* PDF from **www.eldoradostone.com** for more detailed information.

What measures should be taken for hot/cold weather installations?

For cold weather installations ambient temperature should be 40°F or higher at the time Eldorado Stone veneer is applied. If the temperature is below 40°F, mortar should be heated between 40°F – 120°F (not to exceed 140°F). Any mortar that freezes should be discarded. Wall surfaces may need to be covered and heated after installation of veneer to avoid freezing the mortar. See section 2104.3 of the International Building Code (IBC) for additional cold weather requirements.

Applications in hot weather conditions should follow the requirements in section 2104.4 of the IBC. Mortar should be kept under 120°F and be used within 2 hours of initial mixing.

Does Eldorado Stone need a ledge detail at the bottom for structural support or can it hang freely?

No footings or support ledges are needed. The product is an adhered veneer and is supported on the wall by the bond of the mortar to the stone and scratch coat.

FREQUENTLY ASKED **QUESTIONS**

What measures should be taken for applications over 30 feet?

Eldorado Stone can be installed on any structurally sound surface. For all applications up to 30' in height we recommend following our *Installation Procedures*. Unless special construction techniques accommodates differential movement — which is approved by a code official — there is a 30' height limit for installations over wood-frame construction. For installations over non wood-framed sheathing (e.g., steel studs, concrete walls, etc.) there's no specific height limitation. However, Eldorado Stone recommends that you consult with a building code official regarding any project exceeding 30' in height.

What kind of wind-load testing has been applied to Eldorado Stone veneer?

Eldorado Stone has tested grouted and dry-stacked applications in accordance with: ASTM E330, *Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference (Modified)*. Wall samples were subjected to positive and negative structural load tests at 57.6 psf (150 mph wind speed) and 60 psf (153 mph wind speed) pressure differentials. After completion of each load a visual inspection revealed no visible damage or cracking.

Where can I learn more about Eldorado Stone?

Contact your Architectural Representative, visit **www.eldoradostone.com** or talk to your local distributor to find out more about the many inspirational and technical attributes that make Eldorado Stone *The Most Believable Architectural Stone Veneer in the World™*.

ELDORADO STONE®

WESTLAKE ROYAL STONE LLC
ELDORADO STONE® PRODUCTS
50-YEAR TRANSFERABLE EXPRESS LIMITED WARRANTY

1. Subject to the following terms, Westlake Royal Stone LLC ("WRS") warrants under this express limited warranty ("Warranty") to the original purchaser and subsequent owners of its Eldorado Stone® brand manufactured stone or brick veneer (collectively, the "Product" or the "Products") that for fifty (50) years from the date of sale of the Product, the Product will not blister, peel, flake, delaminate or crack excessively (each, a "Defect") as a result of manufacturing defects when used on structures (each, a "Structure") conforming to local building codes and installed in accordance with the National Concrete Masonry Association's written instructions issued before and closest in time to original date of the installation of the Product in the Structure. The definition of "veneer" contained in the International Building Code is determinative for purposes of establishing what Products constitute WRS's manufactured stone or brick veneer and are covered by this Warranty.

2. In the event of a Defect, WRS will, at its option, either: (1) pay the reasonable replacement cost of the defectively manufactured Product; (2) provide a replacement of the defective Product or a Product of a similar design; or (3) pay the reasonable cost for repair of the defective Product. This Warranty applies only to Products manufactured by WRS and does not apply to any other products or materials, including exterior walls, exterior wall envelopes, backing to which Products are secured, or water-resistive barriers.

3. This Warranty runs with the sale or transfer of the Structure into which the Products have been incorporated to subsequent owners of the Structure, but the warranty period as to such subsequent owners is limited to fifteen (15) years from the original date of sale of the Product.

4. No warranty whatsoever is made with respect to the manufacture or performance of materials or components of construction not sold or manufactured by WRS, including, but not limited to, mortar, lath, weather resistant barriers, doors, windows, sealants, flashings, roofing, copings, sheathing and framing. Further, WRS makes no warranties whatsoever with respect to aesthetics, design and engineering of the Structure into which Products are incorporated, or workmanship involved in the application of any Products warranted hereunder. The Product is not waterproof and should not be used on exterior or interior steps or risers. The Product must be incorporated into a wall assembly designed by a building professional that contains adequate mechanisms for water management. WRS has no responsibility for damage caused by moisture intrusion through the building envelope or around any of the building envelope components or by vapor transmission from the inside of the Structure to a moisture sensitive part of the wall assembly.

This Warranty is effective for sales after January 26, 2022 ("Effective Date") and supersedes all previously published versions of this Warranty for Products sold on or after the Effective Date.

Last Modified: January 26, 2022

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5. This Warranty covers only manufacturing defects in the Products. WRS's manufacturing process has been designed to imitate the random beauty and nature of real stone. As such, stone surfaces on the Products may contain small air holes or surface anomalies. These differences add to the overall character of the Products and are not considered manufacturing defects. Changes in the appearance of Products caused by normal weathering or efflorescence, which is a natural phenomenon of all concrete products, are also not considered manufacturing defects. Normal weathering is defined as exposure to sunlight and extremes of weather and atmosphere, which will cause any colored surface to fade, chalk, or accumulate dirt or stains.

6. Without limiting anything else in this Warranty, WRS disclaims and assumes no liability for the following:

   a. improper use, application or installation of Products;

   b. use of Products as part of improperly designed or constructed assemblies or Structures or with defective adjacent materials or assemblies;

   c. failure to follow applicable specifications, instructions and construction details;

   d. use of any sealing or coating on the Product other than one that is silane or siloxane and based in strict compliance with sealant manufacturer's instructions;

   e. other design or construction defects, deficiencies and failures on a Structure where Product is used;

   f. undertaking on-site inspections or any on-site activities or making oral statements at the site;

   g. any damage or injury whatsoever caused in whole or in part by acts of God, natural phenomenon or physical abuse, such as, but not limited to, falling objects, projectiles, fire, earthquake, floods, windstorm, hail, tornadoes, lightning, hurricanes, other abnormal weather conditions, pests, chemical fumes, foreign substances in the air, misuse, vandalism, civil disobedience, war, damage caused by remodeling or renovation;

   h. damage resulting from moisture intrusion, mold, settlement of Structure or other Structure or wall movement;

   i. discoloration or deterioration due to airborne contaminates, contact with any chemicals or paint, staining or oxidations;

   j. any accumulation of water or moisture in wall assemblies;

   k. negligence or accidents by any party or parties in maintaining the Products, including, but not limited to, use of a pressure washer or harsh or acid chemicals of any nature, including vinegar, to clean;

   l. replacement of Product if Product is mixed with other chemicals or materials not approved by WRS in writing;

   m. any cause beyond WRS's control; and

   n. any workmanship, aesthetics or other damage or injury not solely and directly caused by a manufacturing defect in Products as covered under this Warranty.

7. This Warranty is exclusive, the only warranty made by WRS with respect to the Products, and is in lieu of all other warranties or remedies of any nature whatsoever to the original purchaser or subsequent owners under any theory of liability, whether in contract, tort, statutory law or otherwise, except for actual economic damages for personal physical bodily injury. All other warranties, representations or remedies with respect to the Products, whether oral, written, express or implied or imposed by law, are disclaimed by WRS and are waived by the original and subsequent purchasers, particularly the implied warranties of merchantability or fitness for a particular purpose or arising from a course of dealing, usage or trade practice, or any warranty against patent infringement or warranty for work performed in a workmanlike manner. WRS shall not be liable under any circumstances for any incidental, special, indirect or punitive damages to any party whatsoever, including but not limited to, loss of profits, damage to the Structure or its contents, and attorney's fees. This exclusion of damages includes, but is not limited to, payments of any nature made because of actual or potential liability to others, damages to any other part of the Structure to which the Products are incorporated or damage to any other property.

8. WRS shall have no further obligation or liability of any kind, other than as stated in this Warranty, and it is further agreed and understood that the price paid for Products is consideration for the limitation of WRS's liability hereunder.

9. Warranty coverage is limited as set forth herein and does not cover labor to remove or install Products and does not cover the cost of shipping replacement Product. The remedies contained herein shall be sole and exclusive.

10. WRS's obligations under this Warranty shall only begin if the original purchaser or subsequent owner notifies WRS, in writing, within sixty (60) days of actual or constructive notice of the alleged Defect. WRS shall be allowed a reasonable period of time and authorization to remove samples of the Product, so as to perform any testing WRS deems necessary to investigate and determine the cause of the alleged Defect. The original purchaser or subsequent owner shall make temporary repairs in a timely manner to prevent further damage to the Structure, contents of the Structure, and the Products until the cause of the alleged Defect is determined and permanent repair recommendations may be made, as applicable.

11. WRS's obligation to supply replacement Product pursuant to this Warranty shall become null and void if, in the sole judgment of WRS, any of the following events shall occur: (i) if after installation of the Products there are any alterations or repairs made to the Structure that affect any component of the wall assembly of which Products are a part in any way; (ii) if the original purchaser or subsequent owner or any of their respective tenants fail to use reasonable care in maintaining the Products before and after installation; (iii) if the Products are installed in a manner that causes them to be repeatedly or continuously wet, such as if installed in the direct path of a water sprinkler, pool, jacuzzi, or similar water device; or (iv) if the Products are installed in an area that exposes them to de-icing salts or other harsh chemicals.

12. Applicability of the Magnusson-Moss Act is hereby disclaimed.

13. Any provision of this Warranty that is prohibited or unenforceable in any jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such prohibition or unenforceability without invalidating the remaining provisions hereof or affecting the validity of enforceability of such provision in any other jurisdiction.

14. WRS's failure at any time to enforce any of the terms or conditions stated herein shall not be construed to be a waiver of such provisions.

15. This Warranty shall be interpreted under the laws of the State of New York.

16. Neither the sales personnel nor other agents of WRS are authorized to make warranties about the Products. Oral statements by WRS employees or agents do not constitute warranties, shall not be relied upon by the original purchaser or subsequent owner or any third party, and are not part of the contract for sale or warranty as stated herein. No distributor, dealer or representative of WRS has the authority to change or modify this Warranty either orally or in writing in any respect. The entire and final contract is embodied in this Warranty and no other warranties are given beyond those set forth in this Warranty.