StoneRox

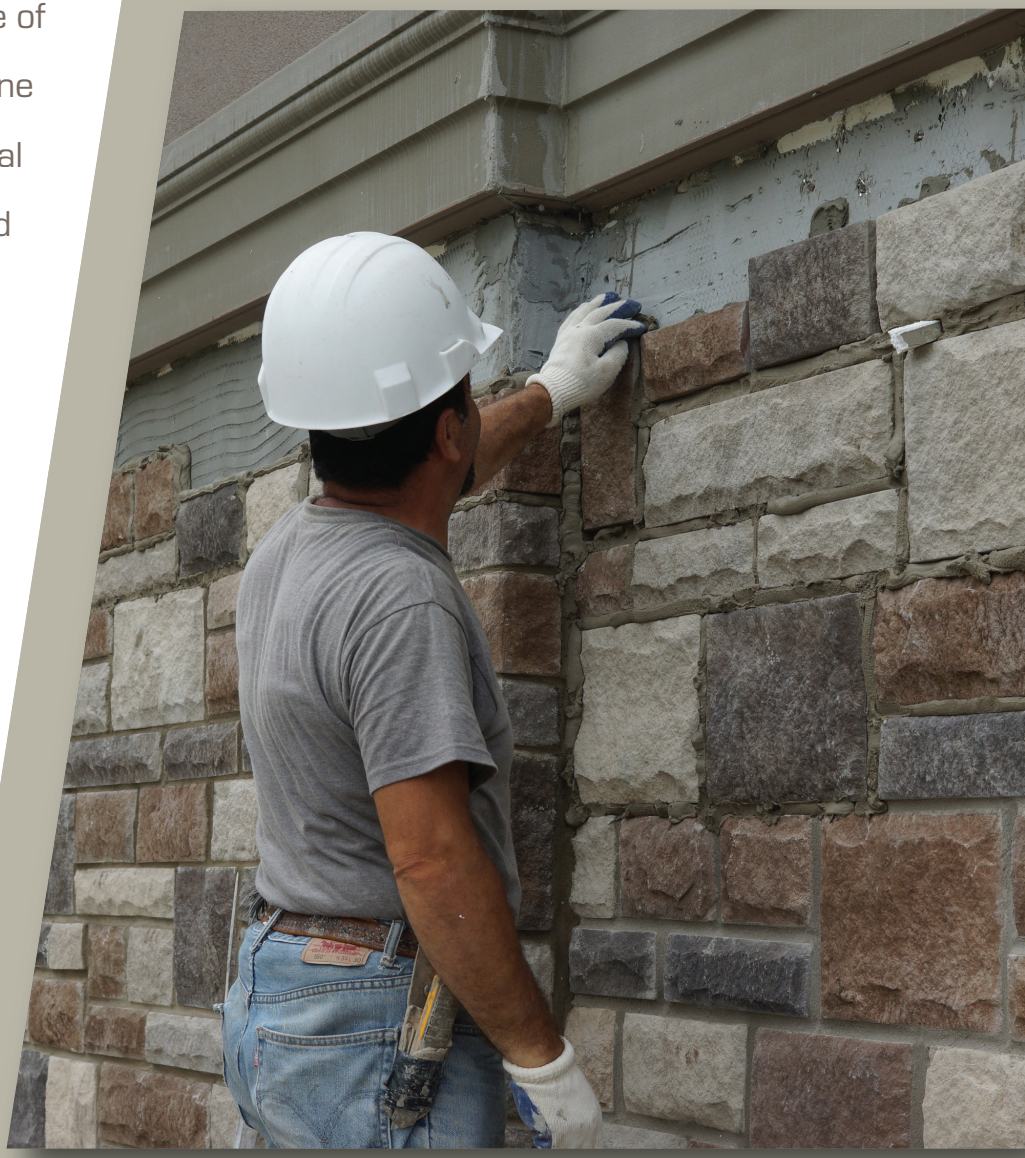
Facing the Future

Installation Guide and Detailing Options

For adhered Manufactured Stone Veneer
Natural Stone Panels & Thin Clay Brick

StoneRox offers a product range of Canadian Manufactured Stone Veneers and an International Range of Thin Clay Brick and Natural Stone Panels.

We are pleased to guide our clientele with the Installation Guide for Canadian Specifications to ensure a proper and compliant process.



Architectural Accents inc.

STONEROX PRODUCTS ARE MANUFACTURED BY ARCHITECTURAL ACCENTS INC

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Table of Contents

Profile Dimensions

StoneRox

Flats

Corners

STONE STYLE	HEIGHT	LENGTH	AVERAGE THICKNESS	SHORT REURN	LONG RETURN	CORNER HEIGHT
Precision Ledge	6”	24”	5/8” to 2“	N/A	N/A	6”
Dry Stack	1” to 5“	6” to 23”	5/8” to 2”	4“	4” to 23”	1” to 5“
Mountain Ledge	1” to 5”	5” to 23”	5/8” to 2(1/4)”	4“	4” to 23”	1” to 5“
Cobble Stone	2” to 10”	6” to 22”	5/8” to 2”	4“	4” to 22”	2” to 10“
Field Stone	5” to 21”	5” to 21”	5/8” to 2”	4“	4” to 21”	5” to 21“
Limestone	4”,6”,10”	8” to 21”	5/8” to 1”	4“	4” to 21”	4”,6”,10”
River Stone	3” to 10”	3” to 10”	5/8” to 2(1/4)”	4“	4” to 10”	2” to 10“

StoneRox International - Brick

BRICK STYLE	HEIGHT	LENGTH	AVERAGE THICKNESS	SHORT REURN	LONG RETURN	CORNER HEIGHT
Standard Sizes						
Cumberland	2(7/16)”	8(1/8)”	5/8”	3(7/8)”	8(1/8)”	2(7/16)”
Calaveras	2(7/16)”	8(1/8)”	5/8”	3(7/8)”	8(1/8)”	2(7/16)”
Sacramento Rustic	2(7/16)”	8(1/8)”	5/8”	3(7/8)”	8(1/8)”	2(7/16)”
Modular Sizes						
Kilburn	2(1/4)”	7(5/8)”	5/8”	3(5/8)”	7(5/8)”	2(1/4)”
Embarcadero	2(1/4)”	7(5/8)”	5/8”	3(5/8)”	7(5/8)”	2(1/4)”
Stratford	2(1/4)”	7(5/8)”	5/8”	3(5/8)”	7(5/8)”	2(1/4)”

StoneRox International - Natural Stone Panels

STONE STYLE	HEIGHT	LENGTH	AVERAGE THICKNESS	SHORT REURN	LONG RETURN	CORNER HEIGHT
Straight Edge Panels						
Bianco Wood	6”	24”	5/8”-1(1/2)”	6“	18“	6”
Rustic Multi-Colour	6”	24”	5/8”-1(1/2)”	6“	18“	6”
Springwood Black	6”	24”	5/8”-1(1/2)”	6“	18“	6”
Greyish Pearl	6”	24”	5/8”-1(1/2)”	6“	18“	6”
Rustic Wall Stone	6”	24”	5/8”-1(1/2)”	6“	18“	6”
Z Shaped Panels						
Snow White	6”	24”	5/8”-1(1/2)”	8“	16“	6”
Green Shine	6”	24”	5/8”-1(1/2)”	8“	16“	6”

Quantity Estimation

When working with any StoneRox products there are two components required for most installations, which are flat and corner pieces. The term ‘flats’ refers to the stone applied to the flat wall surface and these are measured and ordered in square feet. The term ‘corners’ refers to the stone applied only to the outside 90 degree corners and this is measured and ordered in linear feet

Determining Square Footage (Flats)

Length (in feet) multiplied by height (in feet)
of the proposed surfaces that are to be covered.

STEP 1: MULTIPLY LENGTH TIMES HEIGHT TO FIND PROJECT SQUARE FOOTAGE.

Subtract Openings

Once you found your total project square footage it is important to subtract the total square footage of all openings so that you are not left with excessive product. Openings can refer to windows, doors and any area that is not being covered with StoneRox. Once you have found the square footage of the openings, you must deduct that from your overall project square foot total.

STEP 2: SUBTRACT TOTAL SQUARE FOOTAGE OF DOORS, WINDOWS OR OTHER OPENING

Determining Linear Footage (Corners)

Now it is time to determine the quantity of outside corners required. This is done by measuring the linear feet of outside corners required to be covered and includes finishing all necessary openings such as windows and doors if needed.

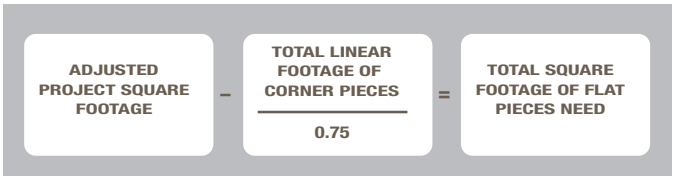
STEP 3: DETERMINE LINEAR FOOTAGE OF CORNER PIECES NEEDED.

Quantity Estimation

Determining Total Project Square Footage

- Due to the fact that the corner pieces also take up square footage, the area in which they cover must also be subtracted from the total square feet.
- A linear foot of corners will not equal a square foot so you can not simply just subtract the linear feet from square feet. A linear foot of corners is approximately 0.75 square feet.
- To subtract the proper amount you must take your linear feet of corners and multiply it by 0.75 to get the amount of square feet necessary to deduct from your adjusted project square footage.
- For Precision Ledge or Natural stone panels 1 linear foot equals 2 square feet of Product. This is because the panels are 6” high and 24” long which means each panel is a square foot. Since you need two 6” panels to get to 1 linear foot it will equal 2 square feet. In calcucating corners 1 linear foot of corners will equal 2 square feet of stone coverage.

This will give you your total square feet of flats required for the project. It is always recommended to add some extra product due to waste created by cutting and trimming.



STEP 4: DETERMINE THE SQUARE FOOTAGE OF FLAT PIECES NEEDED.

SAMPLE OF CALCULATION FOR 200 SQUARE FEET BASED ON ABOVE FORMULA

Stone Styles: Cobble Stone, Mountain Ledge, Field Stone, Lime Stone, Dry Stack and River Stone

Adjusted Project ft2 Required	Vertical Ft (VF) of corners	Ft2 corners Required	Ft2 Flats Required
200 ft2	20VF x 0.75	15 ft2	185 ft2

Standard allowances recommended for waste percentage:

- For standard mortar joint applications add 5% for waste
- For Dry Laid (no mortar joints) add 10% for waste

Stone Styles: Precision Ledge, All Natural Stone Panels

Adjusted Project ft2 Required	Vertical Ft (VF) of corners	Ft2 corners Required	Ft2 Flats Required
200 ft2	20VF x 2	40 ft2	160 ft2

Standard allowances recommended for waste percentage:

- For Dry Laid (no mortar joints) add 5% for waste

Material Checklist

StoneRox Lightweight Stone Veneer

Once the necessary square footage of StoneRox has been calculated, the items required for a clean and proper installation are provided below.

Exterior Application Materials

- ❑ Moisture Barrier
- ❑ Rain Screen
- ❑ Staple Gun
- ❑ 1.4 kg/m2 (2.5 lb) galvanized metal lath (18 gauge)
- ❑ 3mm shank diameter galvanized nails, screws or staples
- ❑ Power Drill/Hammer
- ❑ Heavyweight trimming shears or wire snips (for metal lath)
- ❑ Mortar Requirements for cast stone installation

    - Conforming to CSA A179,
    - Type S Masonry Cement
    - Brick sand (3 to 1 ratio-brick sand to cement),
    - Acrylic Bonding agent

    OR

    - Stone Mason Cement Bond (2 in 1 acrylic bonding agent) or equivalent, as accepted by the Consultant. Above mortar options to be used as per manufacturer's written instructions for dosage requirements.
- ❑ Water: Potable (clean, exempt of ice, oils, acid, alkalis, organic matter, sediments or any other harmful matter.

Exterior Application Tools

- ❑ Large Sponge
- ❑ Point Trowel
- ❑ Flat or Notched Trowel
- ❑ Electric Hand Grinder
- ❑ Masonry Cutting Blade
- ❑ Mortar/Grout Bag
- ❑ Joint Tools
- ❑ Stiff brush (not a wire brush)
- ❑ Gloves
- ❑ Safety Glasses
- ❑ Dust Mask

General Information

Cleaning

If the StoneRox product needs to be cleaned of dirt etc., it is best to use water and a bristle brush. Wire brushes will cause damage to the face of the stone. Cleaning products with acid, sandblasting or power washing is also not permitted.

Salt and De-Icing Chemicals

Due to the fact that any concrete product is damaged by salt, it is not permitted to install StoneRox below 6" above grade which reduces damage to the product. StoneRox products are not warranted against product inefficiencies due to salt or other chemicals used as de-icing solutions.

Efflorescence

Efflorescence is known as the white powdery deposit that sometimes can appear on exterior masonry applications using a manufactured stone. Efflorescence typically isn't harmful but is a good indicator of excessive moisture in the masonry wall. Remove these deposits with a bristle brush. Eliminate the moisture and the efflorescence will not reoccur. This can also be caused by de-icing chemicals in areas where it isn't high enough above grade or areas where salt can be splashed up due to high foot traffic. Avoid bringing the product closer than 6" to grade to avoid these concerns.

Rusting

Rusting occurs when a stone has high iron ore content. When this stone is exposed to moisture it will typically bleed rust. This primarily applies to our StoneRox International Natural Stone Panels. This can be avoided by utilizing a sealer which will help reduce any rust deposits.

Sealers

The use of a sealer is not required on StoneRox products. Although, the use of a sealer can prevent stains from fire, soot, dirt, grease or water splashing. StoneRox recommends a silane based sealer which is breathable for the products. Sealers can alter the look of the stone depending on the type of sealer used. Sealers also reduce the draining of moisture in the stone which can lead to efflorescence issues as well as spalling and before using any sealer it is always best to ask the manufacturer for direct assistance.

Durability and Maintenance

In order to maintain longevity of the project a few simple guidelines must be followed:

A) Make sure all care is taken to relieve the wall of any unneeded moisture. Adjustment to sprinklers and downspouts can be vital in preventing water penetration.

B) A periodic removal of any vegetation such as moss or ivy.

C) Cracks may appear as a result of the structure shifting. If this occurs, it is important to repoint any cracks with new mortar to maintain the projects weather resistance capabilities.

General Information

Overhead Application Disclaimer

Any application that is overhead, angled or horizontal is not an installation that is warranted by StoneRox. It is vital to get approval by an engineer or architect for any of these applications before installation.

Below Water Level Disclaimer

It is not recommended to install StoneRox in applications where the product is required to withstand chlorinated or chemically treated water. Exposure to this will typically result in discolouration of the products. Although StoneRox is resistant to any fresh liquid, StoneRox should not be considered a material that is waterproof.

Scuffing

Any stone product is susceptible to scuffing. When StoneRox is scuffed it can often make the product look more natural. Excessive scuffing will result in loss of face colour and is not permitted.

Control Joints

Control Joints are used to accommodate movement and avoid cracking within the wall structure. Specifications can be for both vertical or horizontal depending on the design of the building. The structure may move because of settlement as well as weathering conditions such as freeze and thaw. Follow local Building codes for details on joint controls.

StoneRox Warranty

StoneRox has a 50 year warranty on its manufactured stone veneer from date of purchase. StoneRox will not show evidence of visible cracking or spalling resulting from inferior materials. StoneRox is not liable if any project does not install the products in accordance to the StoneRox recommended installation process as well as other instances previously stated throughout the installation guide. Please refer to “Cast Stone 3 part Specification Guide” located on the website.

Interior Applications

Moisture is typically not a concern, therefore no weather barrier, rain screen or metal lath is required.

Calculating Stone Requirements (see page 2/3 Quantity Estimation Section)

Materials & Tools Required (see page 4 Material Checklist)

Feature Walls or Areas not Exposed to High Heat or Water

- StoneRox is best applied to either plywood or cement board for most interior applications
- Prior to beginning your project check the type of surface to be covered to ensure the vertical wall is sound, clean and dry
- For "Dry Laid" options on styles such as Dry Stack Stone, Precision Ledge, Mountain Ledge or Natural Stone Panels, where no grout will be applied, it is suggested that the wall surface be painted a dark colour (usually black is the choice) with an acrylic latex paint. This will avoid the substrate being visible through any small gaps between the stones
- Apply stone with a construction grade adhesive, fast setting and appropriate for masonry veneers (for example; PL Premium or equivalent)
- Pre-modified mortars are also recommended if adhering to concrete board substrate or to a galvanized metal lath and scratch coat application.

Feature Walls or Areas Exposed to High Heat or Water

- Confirm specifications for clearance of the heat issues and appropriate substrates to be used from the fireplace manufacturer
- Metal Lath and scratch coat may be required depending on specifications (see page 10 & 11 in the Exterior Applications Wall Preparation Section)

Feature Walls or Areas over Masonry or Concrete

- Surface must be clean and untreated
- Scratch coat will be required (see page 11 in the exterior Applications Wall Preparation Section)

Stone Installation

- Follow details in the StoneRox Installation Section (pages 12 to 16)

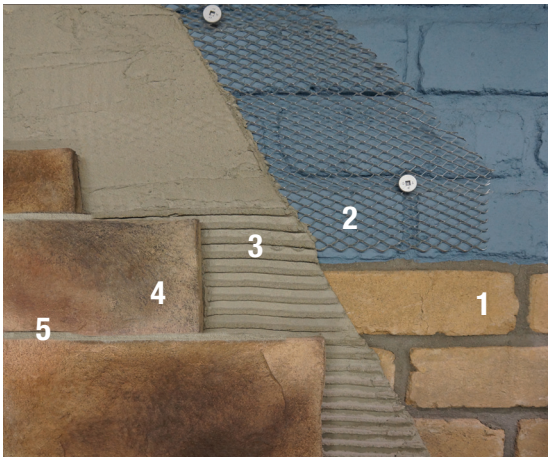
Installing Hearthstones

- Hearthstones are not warranted or permitted to be placed in areas subject to walking or standing.
- Sealing the hearthstone and fireplace will make removing smoke and soot stains easier if they occur.
- Refer to Sealers in the General Information section for additional information
- Hearth stones are to be placed on a ¾" deep mortar bed for leveling
- Hearth stones can be installed tight together or up to ½" spacing
- For ½" spacing, mortar should be placed between hearthstones with a flush joint.
- Hearthstones can be cut to fit with a diamond blade

Installation Sequence

Untreated/Unpainted Concrete Block, Brick or Cementitious Stucco

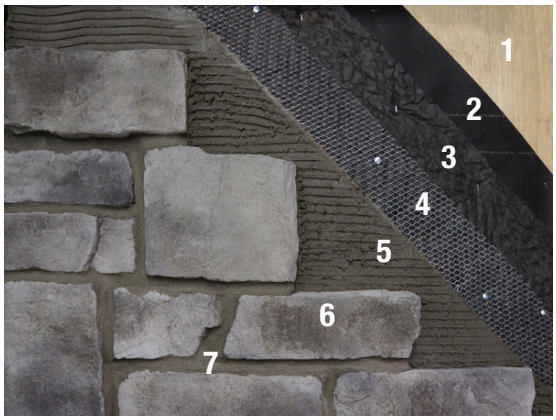
1. Existing clean surface
2. Galvanized metal lath (optional)
3. Mortar Bed
4. StoneRox manufactured stone veneer
5. Mortar joint



Note: If the existing block/brick has been painted, sealed or contains evidence of release agents proper cleaning methods must be taken to ensure the surface will create a proper bond.

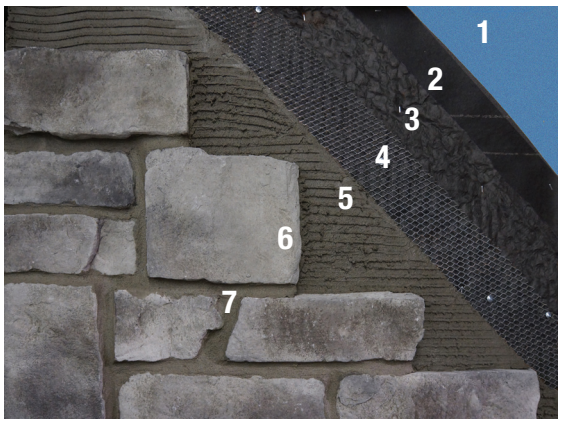
Wood or Metal Frame Surface

1. Sheathing
2. Moisture Barrier
3. 10 mm Rainscreen System
4. Galvanized metal lath
5. Scratch coat
6. StoneRox manufactured stone veneer
7. Mortar joint



Rigid Insulation & ICF Surface

1. Insulation
2. Moisture Barrier
3. 10 mm Rainscreen System
4. Galvanized metal lath
5. Scratch coat
6. StoneRox manufactured stone veneer
7. Mortar joint



Exterior Applications Wall Preparation

- Before beginning the installation steps required, make sure the process you use follows in accordance with the StoneRox recommended installation process for your substrate and incorporates proper building practices.
- All wall penetrations must have corrosion-resistant flashing installed.
- The locations and installation of flashing shall follow the guidelines of the applicable building code.
- With exterior applications, improper flashing installation or complete absence of flashing may result in poor diversion of water run-off onto the finished StoneRox product.
- Any masonry product that is continuously exposed to these conditions can result in staining and with harsh freeze thaw seasons can result in permanent damage.
- StoneRox does not recommend any product installation until all installation steps suggested are followed and issues due to missed steps will relieve StoneRox of any liabilities.

Flashing

For your exterior application to continuously withstand weathering where StoneRox is installed there must be corrosion resistant flashing/weep screed used at all wall penetrations as well as where stone is terminated. Areas in which flashing is needed and suggested types shall be in accordance with the local building code.

Clearance

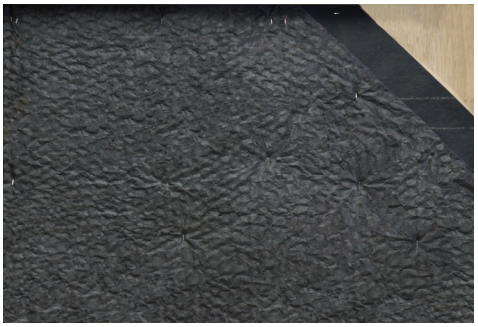
When installing StoneRox it is important to maintain a 6” clearance between StoneRox and grade. This is due to de-icing products that will damage the face of the product. Maintaining this clearance will assure longevity of the project while also following StoneRox recommended installation procedure.

Moisture Barrier

- When installing StoneRox on most exterior projects, you will require a moisture barrier and also a rainscreen system, if specified for water protection
- It is important that you confirm with your local building codes and requirements prior to installation.
- When installing StoneRox over block, brick or other masonry surfaces, no moisture barrier is required.
- Apply building paper (tar paper) or Tyvek to the entire surface of the project.
- We recommend a 2-ply grade D paper or #15 felt.
- Apply paper starting at the bottom and be sure to overlap each layer at least 3” on the horizontal and 6” on the vertical splits.
- Use a hand stapler to firmly secure the paper to the surface

Exterior Applications Wall Preparation

Secondary Moisture Barrier Installation



Where a secondary moisture barrier is required (refer to Installation Sequence for StoneRox Page 8) it shall be installed in accordance to the manufacturers installation instructions and must follow their recommendations for fasteners and fastening schedule.

- Apply moisture barrier as stated above.
- Next apply secondary or commonly known as a Rainscreen System using a hand stapler to firmly secure the material to the surface.
- This secondary moisture barrier will allow drainage of any moisture.

Lath Installation

Where lath is required, (refer to Installation Sequence for StoneRox Page 8) it shall be Installed in accordance to local building code and practices. Also refer to the manufacturers installation instructions for recommended installation.

- Upon completion of the moisture barrier, cover the entire surface with a wire lath.
- Be sure to overlap all sections by a minimum of 2", both horizontally and vertically.
- We recommend using a minimum of 2.5 galvanized diamond lath.
- The lath should feel rough when you run your hands upward and smooth when you rub downwards.
- For inside and outside corners, be sure to fold the lath tightly to fit and have seams at least 16" from any corner.
- Never have a seam on any corners, inside or outside.
- Attach the lath using 1 ½" – 1 ¾" galvanized nails or air stapler.
- Spacing of nails should be at least 6" vertically and 16" horizontally, trying to hit studs each time.
- Tack down any loose areas or bulges between studs.
- On outside corners be sure to nail the lath on both faces of the corner. The lath can be cut with tin snips

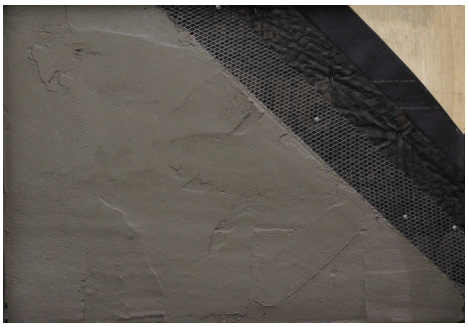
Exterior Applications Wall Preparation

Scratch Coat

To install the mortar scratch coat you must use a trowel or spray application. This mortar bed must be at least ½" thick and maximum of ¾" thick. After installing the scratch coat, you should not be able to see any part of the metal lath once the scratch coat is completed.

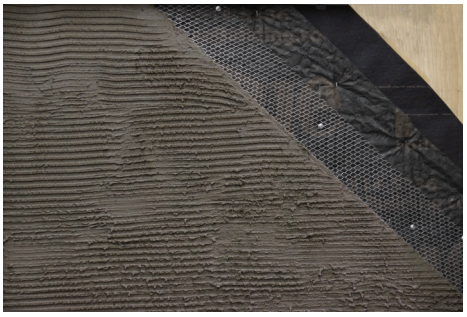
Option 1 Type S Masonry Cement (1 bag), Brick Sand (3 to 1 ratio – brick sand to cement),

- Small amount of Portland cement can be added to enhance mix design but not required.



Option 2 Stone Mason Cement Bond or equivalent

- Before applying scratch coat be sure all flashing and electrical connections are in place
- Using a plaster or mason's trowel, spread an even layer of scratch coat to the entire surface over the metal lath, thickness to be ½" to ¾"
- Work the scratch into the holes of the lath and scrape off the excess.
- Be sure the scratch coat seals around all windows, doors and electrical connections, etc.
- With the scratch coat still slightly wet, lightly scrape the surface with a soft bristle brush without removing any cement from the surface. This will provide a rougher surface for the stone to bond to.
- Let the scratch coat dry before applying the stone
- Drying time will vary depending on temperature and humidity
- The scratch coat will lighten in colour as it dries



StoneRox Application

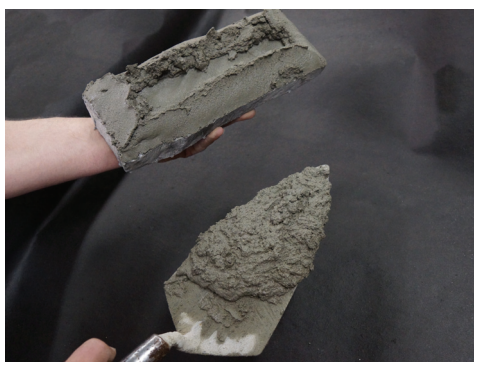
Step 1-Prepare your work area

- Before you begin installing the product on the wall it is best to lay the product out at the job site to ensure the usage of all necessary sizes, colours and profiles.
- Try not to group all big and small stones or rough and smooth stones together as it is best to incorporate a mix of the product to gain the wanted blend of profiles, colours and sizes.
- If the project is utilizing a StoneRox blend of colours, the percentage of each colour must be represented evenly throughout, for example if the project is 75% Loyalist Grey and 25% Meaford Mist each colour needs to be installed in proportion
- If the project is utilizing style blends, the percentage of each style must be represented evenly throughout, for example if the project is 75% Cobble Stone and 25% Field Stone each style needs to be placed in the wall in proportion.

Step 2-Starting Point

- Apply the StoneRox with mortar to the substrate working from the bottom up or the top down.
- Working from top to bottom may be beneficial for the overall look of the project because it tends to avoid mortar splashing from stone previously installed.
- With ledge styles of stone it is better to work from bottom to top.

Step 3- Setting StoneRox



- Once the Scratch coat has had time to cure and is ready for installation you can begin mortar preparation and the StoneRox application.
- We recommend using a type S mortar or a pre-modified mortar, which has added adhesive for a faster bond.
- Once the mortar is mixed per the manufacturer's recommendations, you can use your trowel to apply the mortar to the back of the StoneRox product about ½" thick and press it onto the wall with force enough to create a proper bond.
- If it is a dry laid application you must remove the squeezed out mortar to ensure a tight fit.
- ***(Note-StoneRox should not be installed in temperatures under 4 degrees Celsius, as mortar will not cure properly.)***

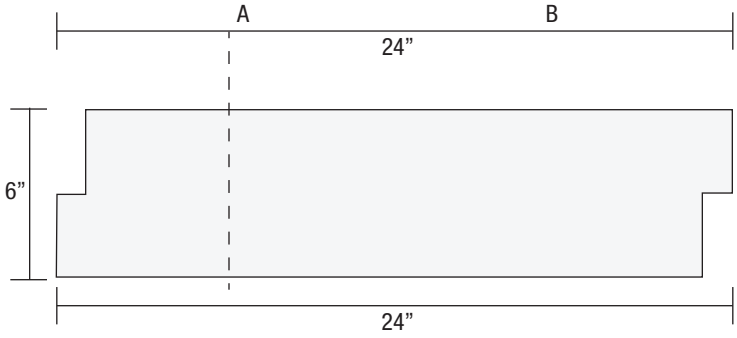
StoneRox Application

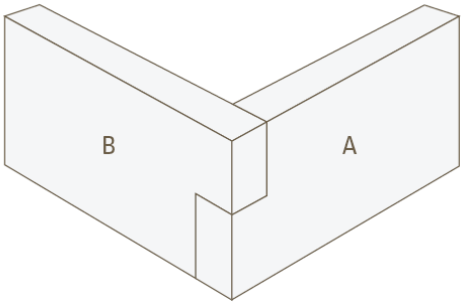
Step 4-Installing StoneRox Corners

- If the project requires the use of corner pieces these must be installed first.
- It is important that you alternate the long and short returns to avoid continuous joints throughout the project.

Installing StoneRox Panel Corners

- StoneRox Precision Ledge and natural stone panels have tab corners rather than return corners, Please refer to figure 2 below to show how to install panel stones.
- To Avoid continuous vertical joints, alternate cuts to corner stones as follows;
- First course A = 6” B = 18”
- Second course A = 18” B = 6”
- Third Course A = 6” B = 18”
- Continue alternating cuts as detailed above, this will provide a consistent running bond installation.





Step 5-Installing StoneRox Flats

After the corners are successfully installed you can begin to install the flats moving from the corner towards the walls center. It is important to avoid vertical mortar joints that cross more than 4 units.

StoneRox Application

Step 6-Installing StoneRox Sills

StoneRox sills provide a needed transition from stone to any other exterior cladding

- Sills are required for water run off and moisture control
- Sills when installed must use the required caulking and flashing which must be corrosive resistant.
- Flashing must extend to the surface of exterior wall finish
- Refer to detail to understand proper installation.

Step 7-Installing StoneRox Electrical Covers

- Attach UL-listed extension box to pre-wired and already mounted electrical box.
- Find your electrical box required and apply mortar to the back of the StoneRox electrical cover.
- Place the electrical cover over the extension box. You can use removable shims to ensure it is level.
- You can leave a cut out necessary to install the electrical cover or you can install it first and place StoneRox around it.

Step 8-Cutting and Trimming StoneRox

- StoneRox can be cut and shaped to fit properly in any application.
- It is recommended that you use a wet saw with a diamond blade or hand grinder for more difficult cuts.
- Broken stones are always found in a box and it is always a benefit for any project. They are to be used to fill gaps left by larger stones.
- For best appearance it is always best to position your cut ends inside and above eye level and only show finished edges.
- Also, refer to materials checklist. (Page 4)

StoneRox Application

Step 9-Jointing and Mortar Options

Joint Width

To get the most professional looking project it is important to make joints as narrow as the product will permit. The average should never exceed ½" thick. Mortar joints must be filled and tooled, as this will avoid water penetration and ensure longevity of the project. You can also choose to dry lay certain products in which mortar joints are not used. If using this method please refer to standard allowances to properly order additional material required. Also, if dry laying, it is vital to make sure the scratch coat has been completely covered with mortar without air pockets to prevent water being trapped.

Jointing Options

Dry Laid

StoneRox installed without a mortar joint

Recessed Joint

StoneRox installed with a mortar joint raked back

Flush Joint

StoneRox installed with a mortar joint flush with the stone

Overgrout Joint

StoneRox installed with a mortar joint that is left untooled and overlapping the stone

StoneRox Application

Colouring Mortar

The use of a coloured mortar can greatly enhance any StoneRox project. For example, if you are using our loyalist grey with a charcoal accent it would compliment the project to use a dark coloured mortar. Mortars can be tinted with iron oxide pigments.

Step 10-Grouting Joints

After the corners are successfully installed you can begin to install the flats moving from the corner towards the walls center. It is important to avoid vertical mortar joints that cross more than 4 units.

Step 11-Finishing Joints

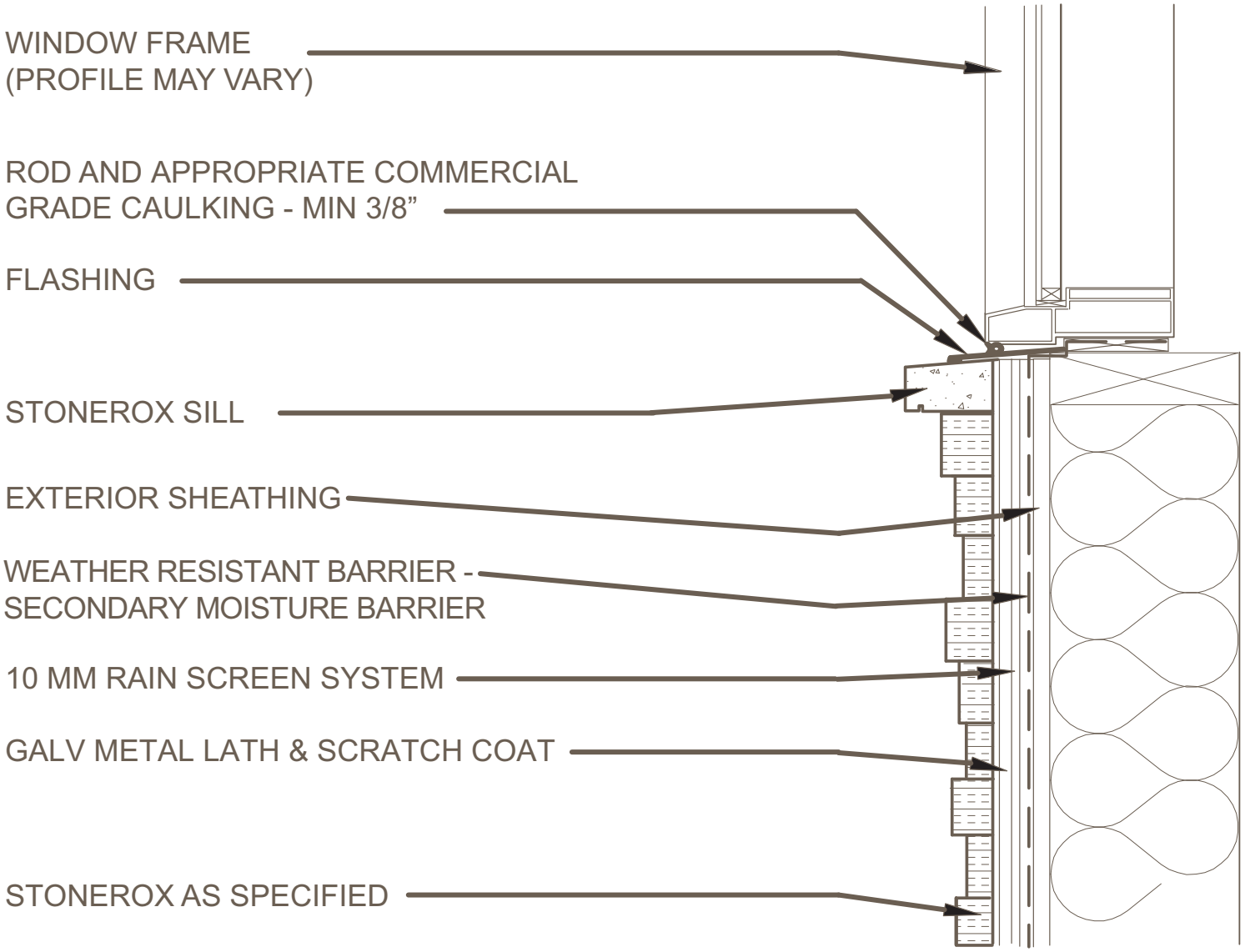
When the mortar joints have become firm (but not completely solid), they should be pointed using a jointing tool. You must remove excess mortar, and seal all edges. Attentiveness to finishing the project will result in a sharp application. Refer to materials checklist.

Step 12-Cleaning Finished Application

When mortar has finished setting, the finished application should be cleaned using a dry bristle brush. A water based cleaning product should never be used to treat mortar joints as this has tendency of staining and is very difficult to remove. Also, acid based products should never be used to clean any products.

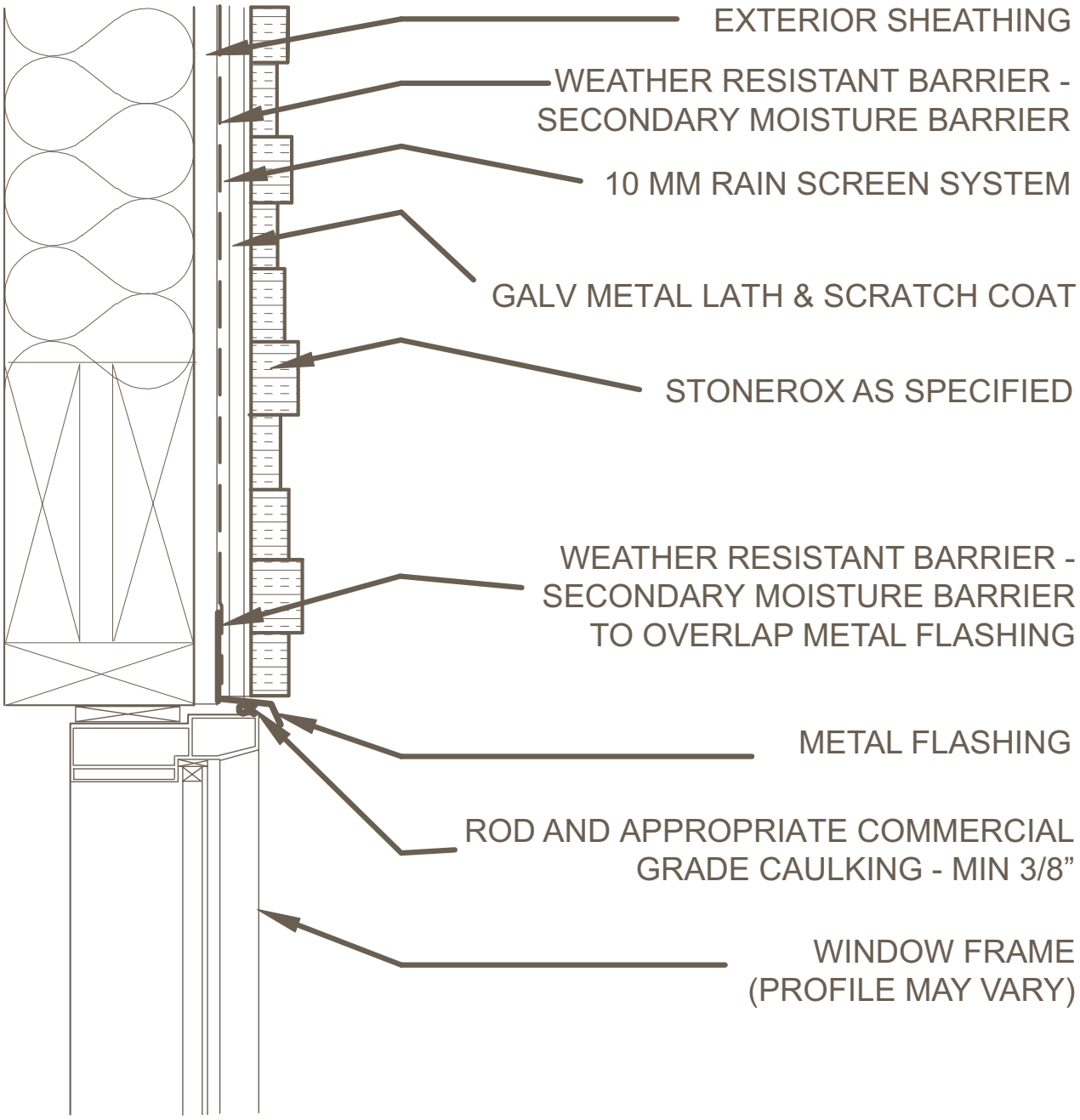
PRE-CAST SILL DETAIL - WINDOW

INSTALLATION OVER SHEATHING AND WOOD STUDS



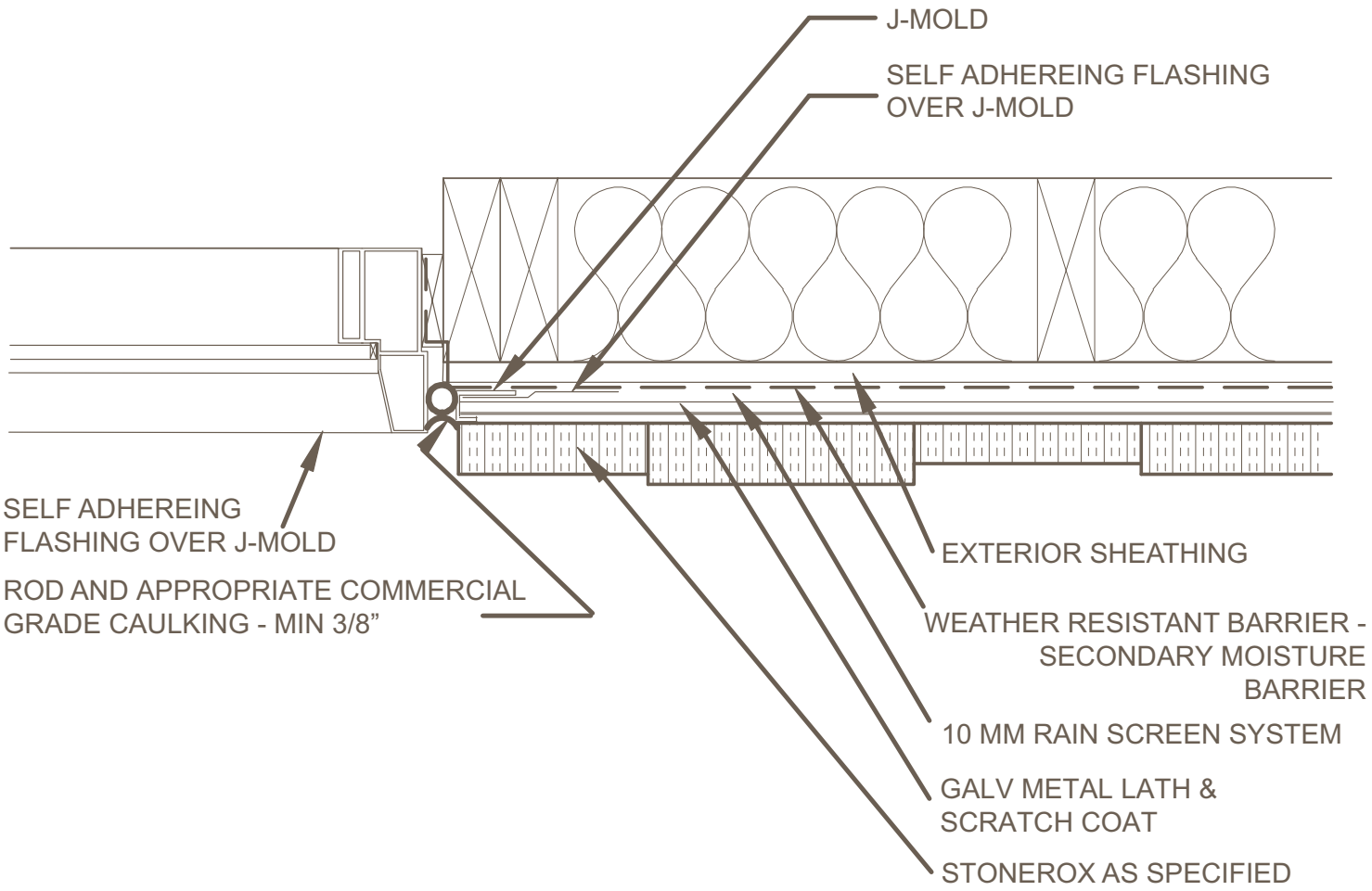
WINDOW HEAD DETAIL

INSTALLATION OVER SHEATHING AND WOOD STUDS



WINDOW JAMB DETAIL

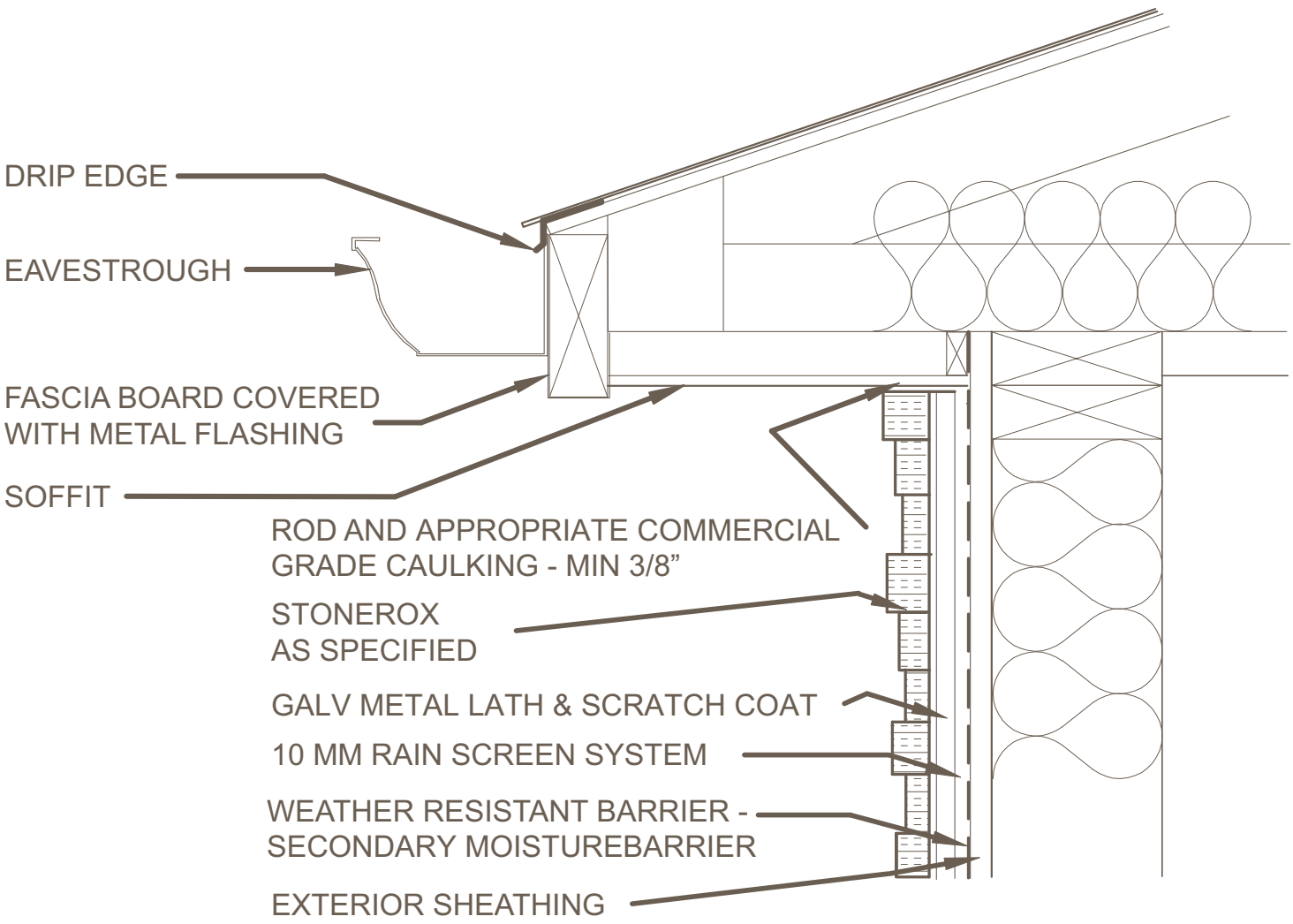
INSTALLATION OVER SHEATHING AND WOOD STUDS



Installation Detail Drawings

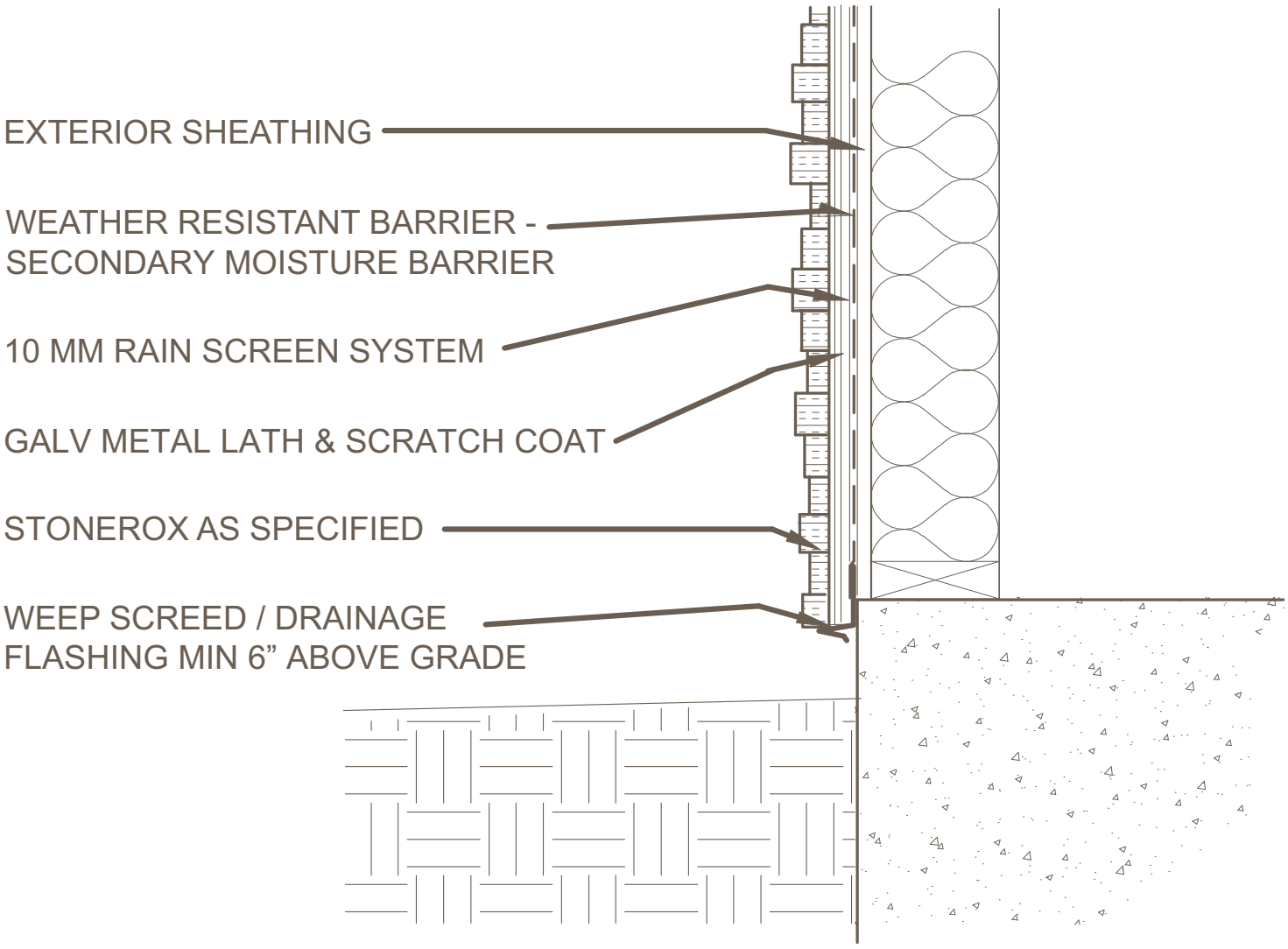
SOFFIT DETAIL

INSTALLATION OVER SHEATHING AND WOOD STUDS



WALL BASE DETAIL

INSTALLATION OVER SHEATHING AND WOOD STUDS



WALL PENETRATION DETAIL

INSTALLATION OVER SHEATHING AND WOOD STUDS