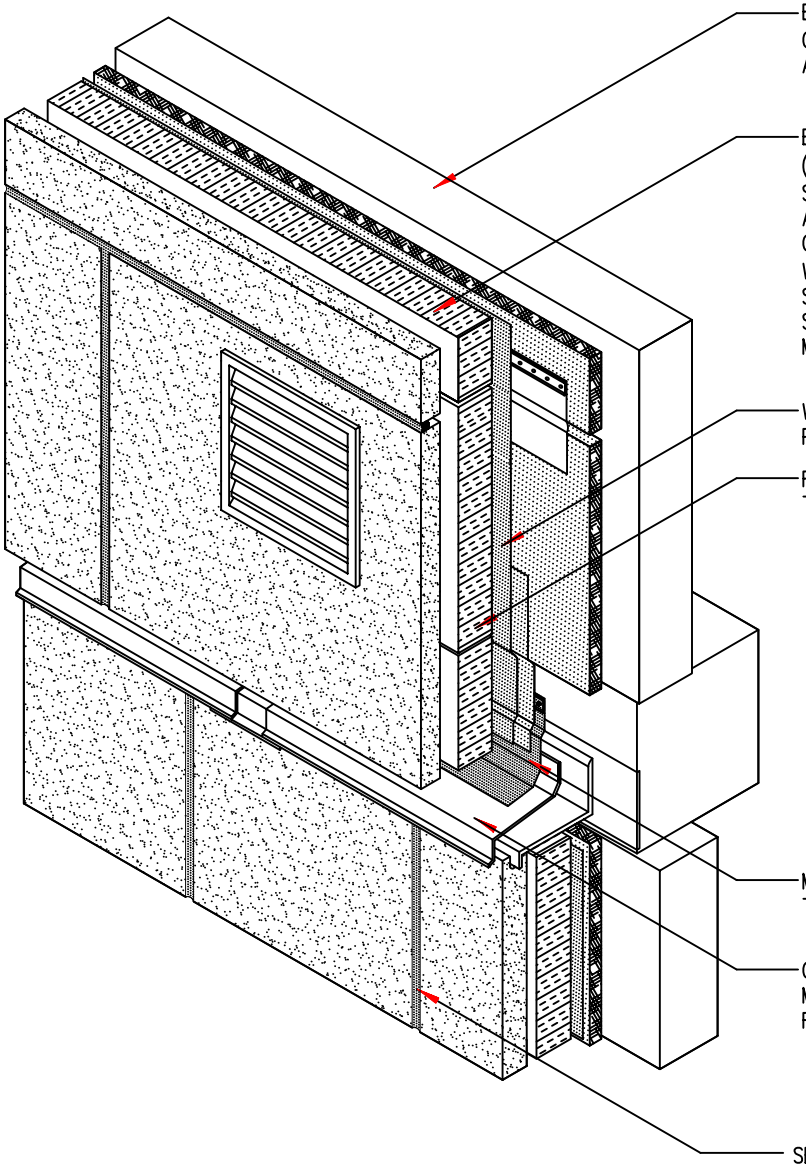

THIN STONE VENEER

NOTE: THE PRESENCE OF A CONTINUOUS RELIEVING ANGLE AND FLASHING AS SHOWN IS NOT REPRESENTATIVE OF TYPICAL STONE VENEER CONSTRUCTION, AND IS INTENDED TO CONVEY THE IMPORTANCE OF DESIGNING AN ANCHORING SYSTEM THAT MINIMIZES OR ELIMINATES THE NEED FOR PENETRATIONS THROUGH THE FLASHING IN CAVITY-TYPE EXTERIOR WALL CONSTRUCTION.

CONCEPTUAL - NOT FOR CONSTRUCTION

KEY CONCEPTS:

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Interface conditions between building envelope materials, components and systems should be fully detailed in a manner that is both technically sound and serviceable. Detailing should, at a minimum, allow for coordination of drainage planes when two or more different wall types are used in the same facade; allow for thermal and moisture-induced changes in material properties and differential thermal movement; and allow for in-service deflection, shrinkage, creep and similar behavior considered to be within the allowable structural limits of the project without compromise to the weather-tight integrity and thermal performance of the building envelope.

The air barrier can either be formed by employing the interior side airtight drywall approach or an exterior side air barrier.

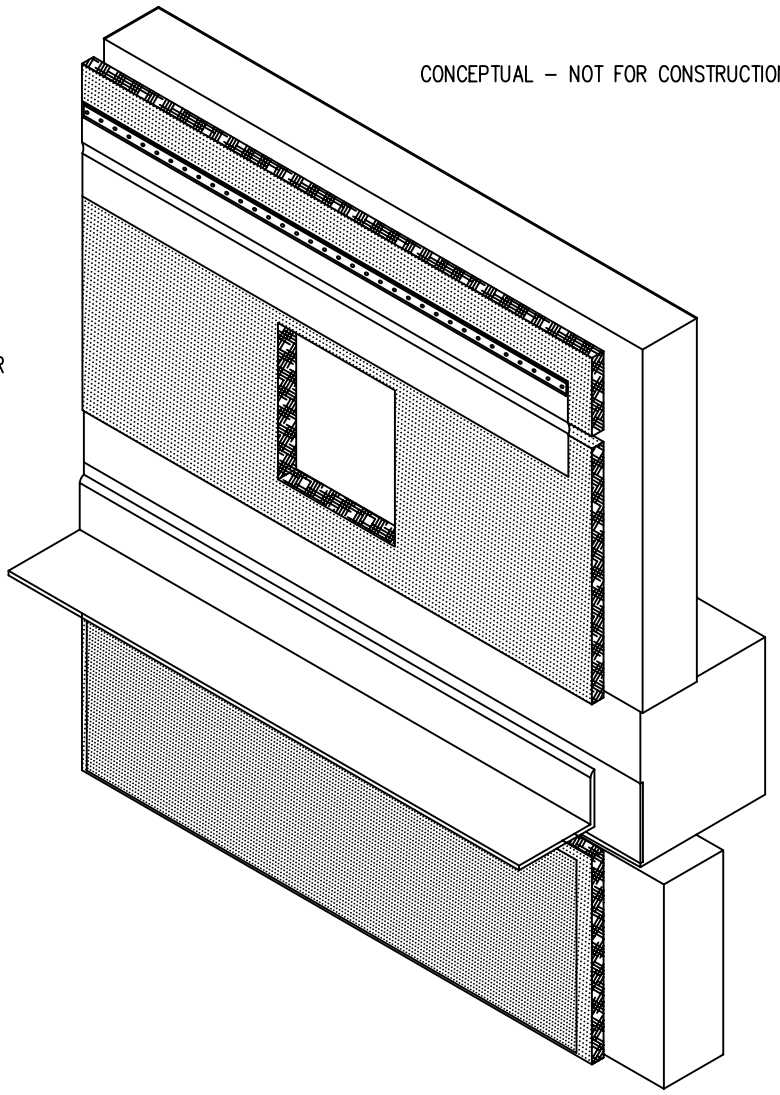
The location of or need for a vapor retarder within wall assemblies will vary based upon climate, and can be significantly influenced by the storage capacity and vapor permeance of the materials selected for each layer of the wall system. A climate-specific, hygrothermal analysis for any wall assembly should be considered to further evaluate this concern.

See the General section of the WBDG for additional information and guidance.

STONE VENEER SQUARE PENETRATION - OVERALL DETAIL

NOTE: ENSURE ALL SHEATHING/CONCRETE/CMU SURFACES ARE PROPERLY PREPARED AND PRIMED IN ACCORDANCE WITH THE MANUFACTURER REQUIREMENTS PRIOR TO INSTALLING THE WALL DRAINAGE PLANE PRODUCT. DETAIL THE DRAINAGE PLANE PRODUCT TO PREVENT WATER INFILTRATION AT THE STONE VENEER ANCHORS AND OTHER PENETRATIONS. THE VARIOUS PRODUCTS THAT CAN BE USED FOR THE DRAINAGE PLANE MATERIAL HAVE A WIDE RANGE OF AIR AND VAPOR PERMEANCE VALUES; SEE THE TABLES AND THE GENERAL SECTION CONTAINED WITHIN THE WALL PORTION OF THE WBDG FOR MORE SPECIFIC INFORMATION WITH REGARDS TO VAPOR RETARDERS AND AIR BARRIERS.

CONCEPTUAL – NOT FOR CONSTRUCTION



STEP 1:
INSTALL GLASS MAT FACED EXTERIOR SHEATHING OVER BACK–UP WALLS. INSTALL FOLLOWING ALL MANUFACTURER INSTRUCTIONS.

INSTALL HORIZONTAL JOINT SEAL (PEEL–AND–STICK MEMBRANE SHOWN) SECURE PER MANUFACTURER INSTRUCTIONS. ENSURE ALL SURFACES ARE PRIMED PRIOR TO INSTALLING HORIZONTAL JOINT SEAL. THE LOCATION OF THE JOINTS SHOWN ARE FOR INFORMATIONAL PURPOSES ONLY AND ARE INTENDED TO CONVEY EXTERIOR SHEATHING JOINT SEALING CONCEPTS. MAKE CUTOUT FOR PENETRATION. MINIMIZE SIZE OF OPENING WHILE ALLOWING FOR ADJUSTMENT OF EQUIPMENT/DUCT/ETC.

INSTALL WALL MEMBRANE PRODUCT BELOW THE RELIEVING ANGLE OR INDIVIDUAL RELIEVING CONNECTIONS. INDIVIDUAL CONNECTIONS ARE TYPICALLY USED INSTEAD OF A FULL RELIEVING ANGLE. THE WALL DRAINAGE PLANE PRODUCT SHOULD BE CARRIED BEHIND THESE CONNECTIONS AND CARRIED ABOVE THEM A MINIMUM OF 6–INCHES. SEE THE 2–DIMENSIONAL DETAILS CONTAINED WITHIN THE STONE SECTION IN THE WBDG FOR MORE INFORMATION. THE JOINT BETWEEN THE SHEATHING AND SLAB IS TO BE SEALED WITH A HORIZONTAL JOINT SEAL (SELF–ADHESIVE FLASHING) TO PROVIDE AIR BARRIER CONTINUITY AT THIS INTERFACE. DEPENDING ON THE DRAINAGE PLANE PRODUCT, THIS PRODUCT MAY BE USED TO PROVIDE FOR THE AIR BARRIER CONTINUITY AT THIS INTERFACE. A DETAIL SHOULD BE INCLUDED IN THE DRAWINGS FOR THE PROJECT SHOWING WHAT METHOD IS TO BE USED AT THIS INTERFACE TO PROVIDE AIR BARRIER CONTINUITY. THE DETAILS IN THIS SET SHOW THIS USING THE DRAINAGE PLANE PRODUCT.

KEY CONCEPTS:

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Interface conditions between building envelope materials, components and systems should be fully detailed in a manner that is both technically sound and serviceable. Detailing should, at a minimum, allow for coordination of drainage planes when two or more different wall types are used in the same facade; allow for thermal and moisture-induced changes in material properties and differential thermal movement; and allow for in-service deflection, shrinkage, creep and similar behavior considered to be within the allowable structural limits of the project without compromise to the weather-tight integrity and thermal performance of the building envelope.

The air barrier can either be formed by employing the interior side airtight drywall approach or an exterior side air barrier.

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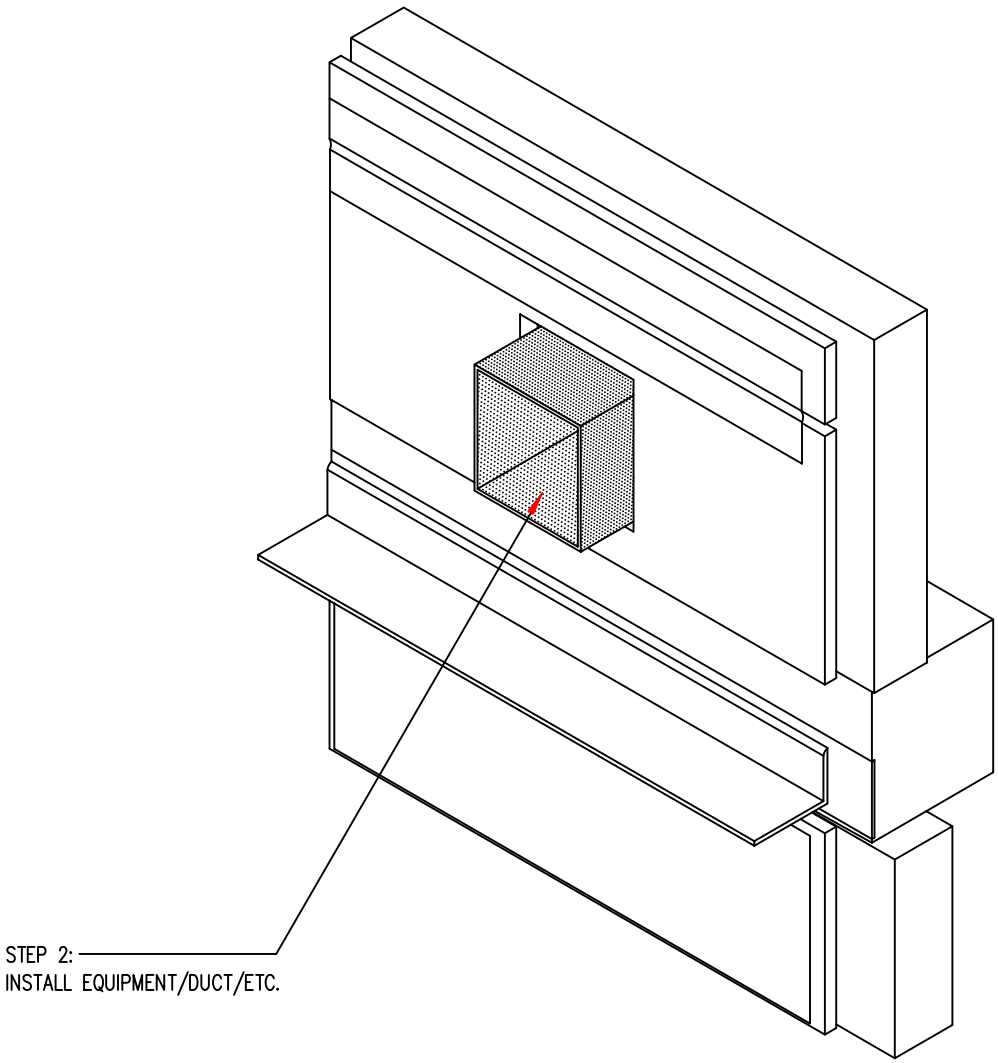
STONE VENEER SQUARE PENETRATION - STEP 1



CONCEPTUAL – NOT FOR CONSTRUCTION

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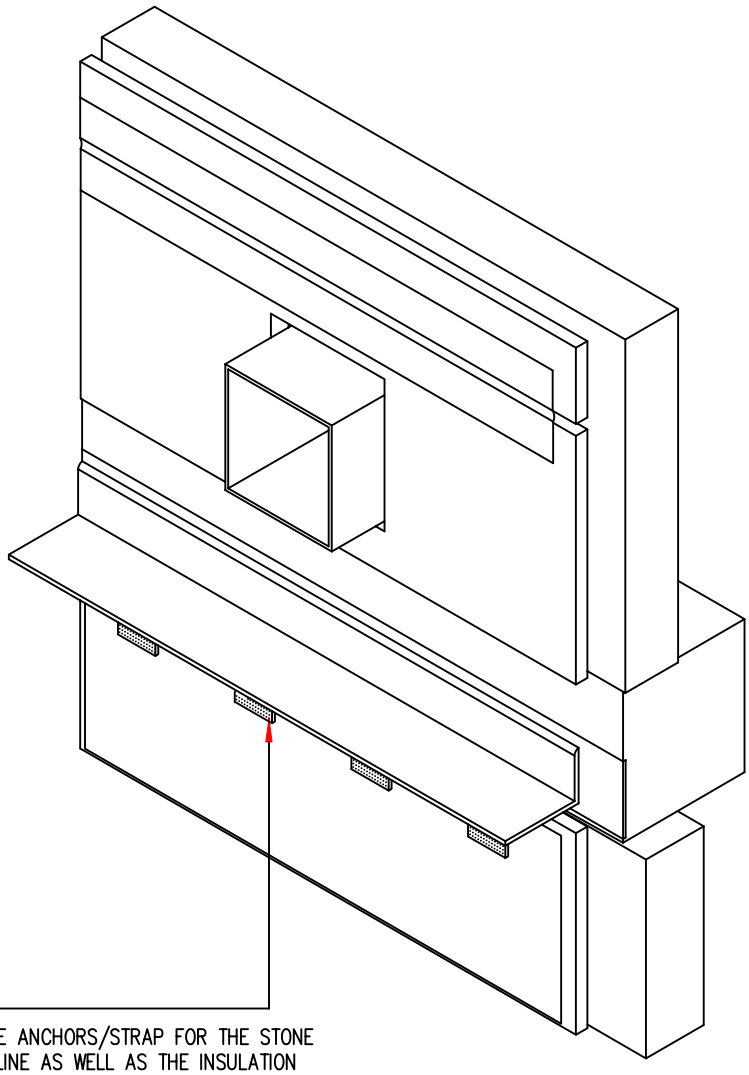
STONE VENEER SQUARE PENETRATION - STEP 2



STEP 3:
INSTALL THE STONE ANCHORS/STRAP FOR THE STONE BELOW THE SLAB LINE AS WELL AS THE INSULATION SECUREMENT DEVICES (IMPALING PINS OR OTHER APPROVED METHOD). IF A TROWEL–APPLIED PRODUCT IS USED INSTEAD OF A WALL MEMBRANE OR SHEET PRODUCT, THE TROWEL–APPLIED PRODUCT MAY BE USED AS AN INSULATION ADHESIVE IN ADDITION TO THE MECHANICAL ADHESION METHOD SHOWN. CHECK WITH THE MANUFACTURER FOR ALL REQUIREMENTS. ALL METAL ACCESSORIES IN DIRECT CONTACT WITH NATURAL STONE VENEERS SHALL BE NON–CORROSIVE, 300 SERIES STAINLESS STEEL OR AN EQUIVALENT MATERIAL.

CONCEPTUAL – NOT FOR CONSTRUCTION

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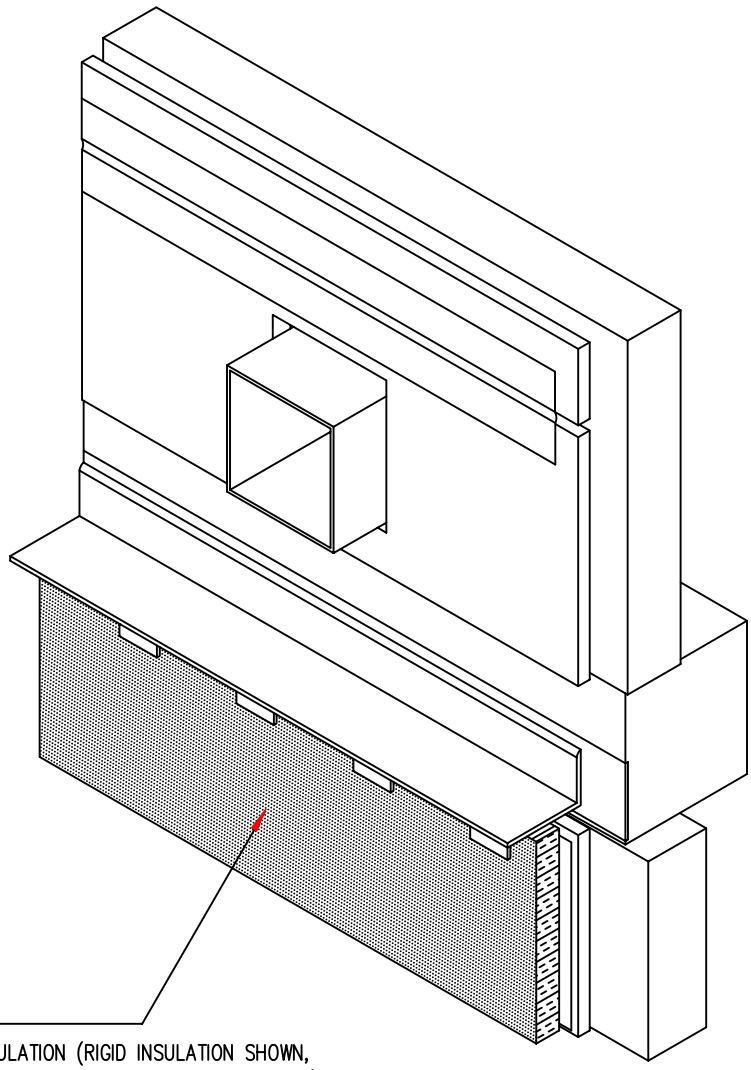
STONE VENEER SQUARE PENETRATION - STEP 3



STEP 4:
INSTALL THE INSULATION (RIGID INSULATION SHOWN, SEMI-RIGID INSULATION MAY ALSO BE APPROPRIATE) AND SECURE WITH THE IMPALING PIN CAPS, MAKING SURE ALL SHARP ENDS ARE CUT. SOME IMPALING PIN PRODUCTS ELIMINATE THE SHARP END CONCERN. SOME FOAM-APPLIED AND OTHER INSULATION PRODUCTS MAY BE APPROPRIATE FOR USE IN THE DRAINAGE CAVITY. CHECK WITH THE MANUFACTURER TO DETERMINE THE APPROPRIATENESS OF THE PRODUCT FOR USE WITHIN THE WET ZONE OF THE ASSEMBLY. INSULATING OUTBOUND OF THE BACK-UP WALL WITH THE FULL R-VALUE OF THE WALL IS MUCH MORE THERMALLY EFFICIENT.

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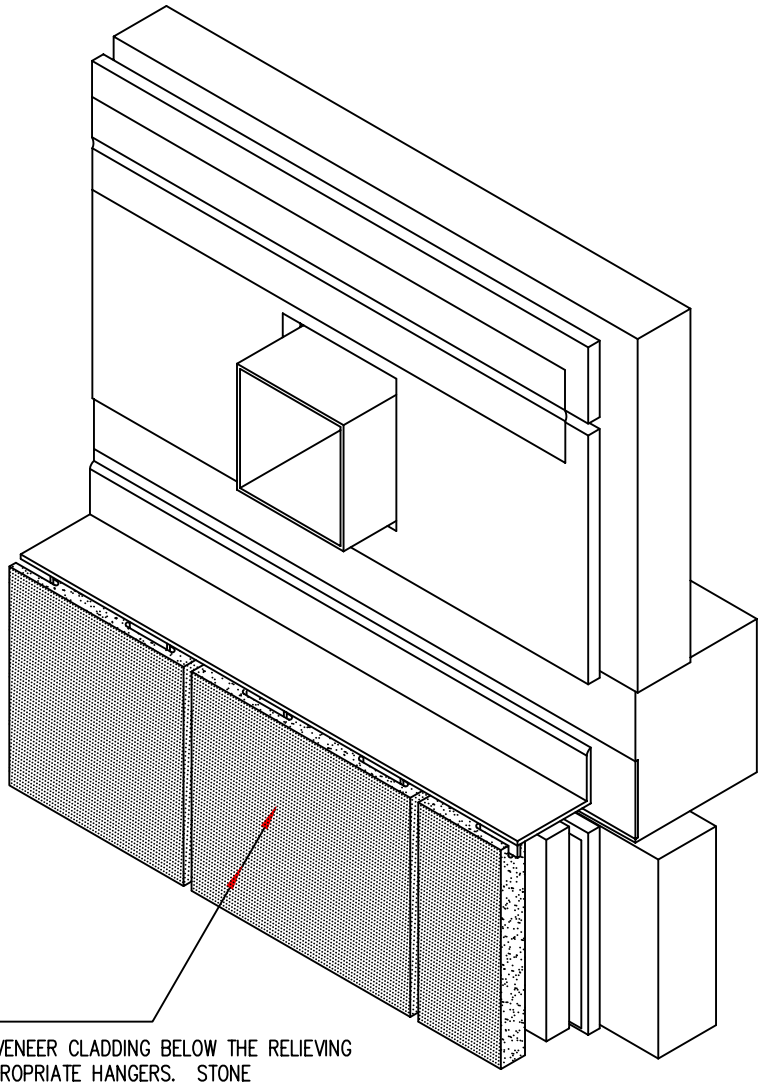
STONE VENEER SQUARE PENETRATION - STEP 4



STEP 5:
INSTALL STONE VENEER CLADDING BELOW THE RELIEVING ANGLE WITH APPROPRIATE HANGERS. STONE ANCHORING ASSEMBLY TO BE DESIGNED BY A STRUCTURAL ENGINEER REGISTERED IN THE STATE WHERE THE PROJECT IS LOCATED. PROVIDE ALLOWANCE FOR THERMAL MOVEMENT OF THE STONE BOTH VERTICALLY AND HORIZONTALLY, INCLUDING SUFFICIENT GAP BETWEEN THE STONE AND THE RELIEVING ANGLE.

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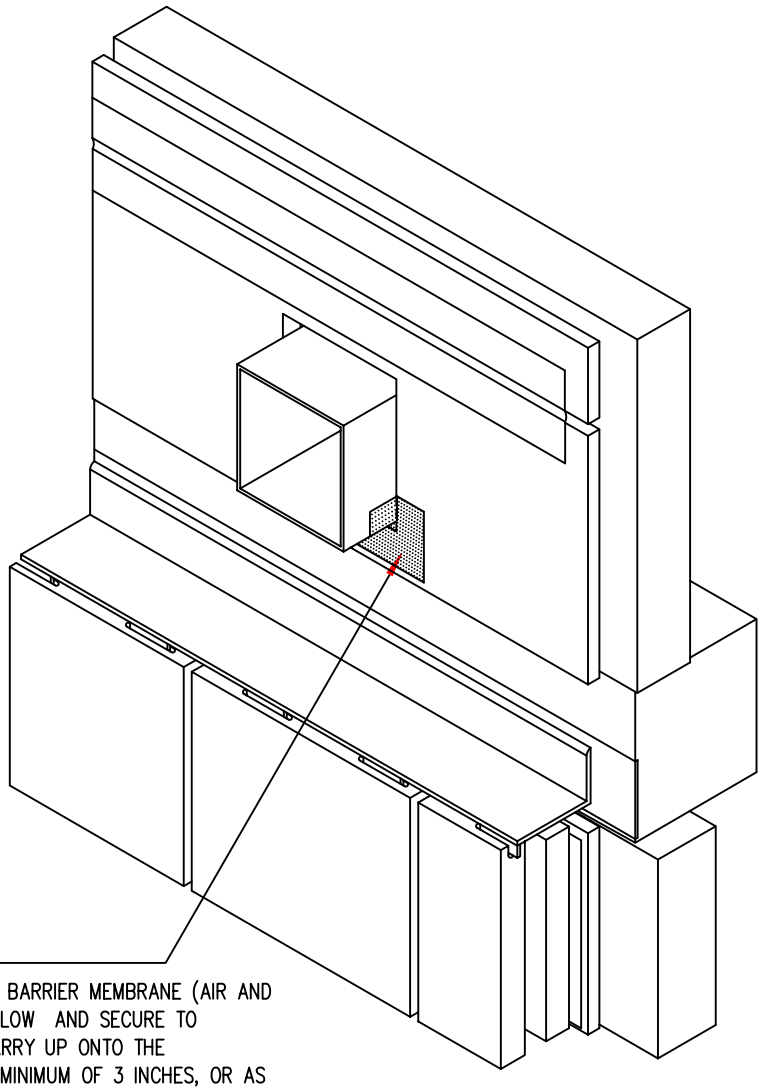
STONE VENEER SQUARE PENETRATION - STEP 5



STEP 6:
INSTALL PEEL–AND–STICK BARRIER MEMBRANE (AIR AND BULK WATER BARRIER) BELOW AND SECURE TO EQUIPMENT/DUCT/ETC. CARRY UP ONTO THE EQUIPMENT/DUCT/ETC. A MINIMUM OF 3 INCHES, OR AS RECOMMENDED BY MANUFACTURER, WHICHEVER IS GREATER.

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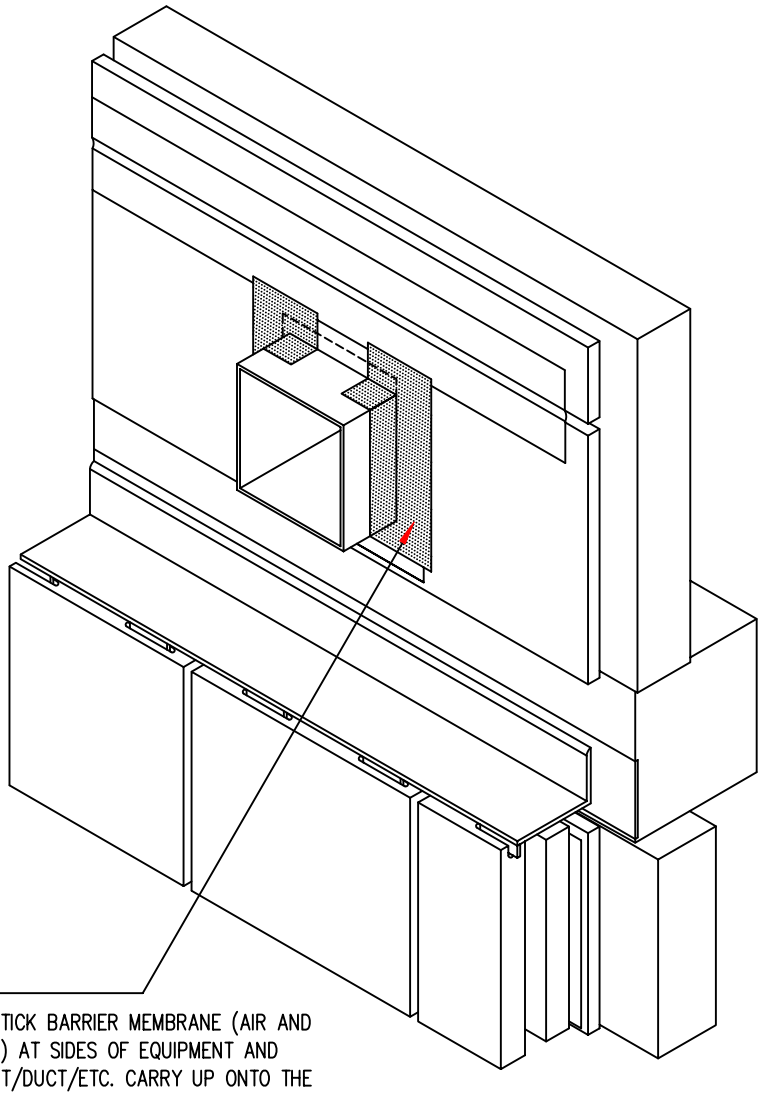
STONE VENEER SQUARE PENETRATION - STEP 6



STEP 7:
INSTALL PEEL–AND–STICK BARRIER MEMBRANE (AIR AND BULK WATER BARRIER) AT SIDES OF EQUIPMENT AND SECURE TO EQUIPMENT/DUCT/ETC. CARRY UP ONTO THE EQUIPMENT/DUCT/ETC. A MINIMUM OF 3–INCHES AND OVERLAP ONTO SECTION BELOW A MINIMUM OF 3–INCHES, OR AS RECOMMENDED BY MANUFACTURER, WHICHEVER IS GREATER.

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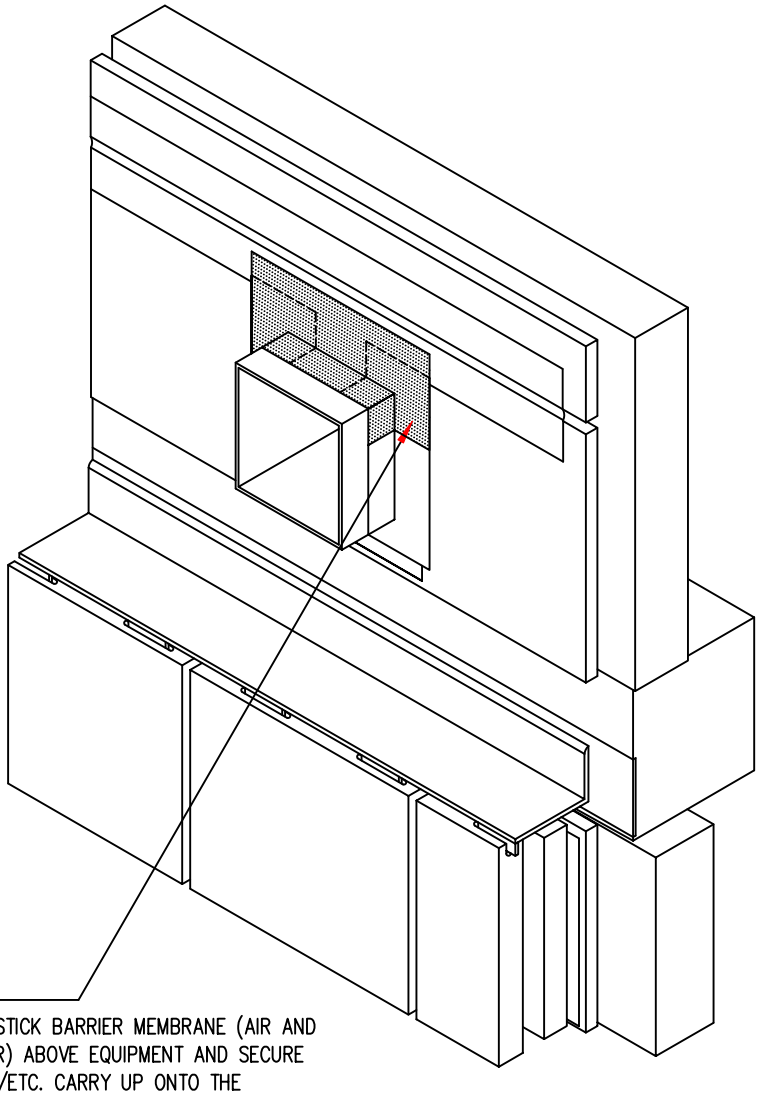
STONE VENEER SQUARE PENETRATION - STEP 7



STEP 8:
INSTALL PEEL–AND–STICK BARRIER MEMBRANE (AIR AND BULK WATER BARRIER) ABOVE EQUIPMENT AND SECURE TO EQUIPMENT/DUCT/ETC. CARRY UP ONTO THE EQUIPMENT/DUCT/ETC. A MINIMUM OF 3–INCHES AND OVERLAP ONTO SECTIONS AT SIDES A MINIMUM OF 3–INCHES, OR AS RECOMMENDED BY MANUFACTURER, WHICHEVER IS GREATER.

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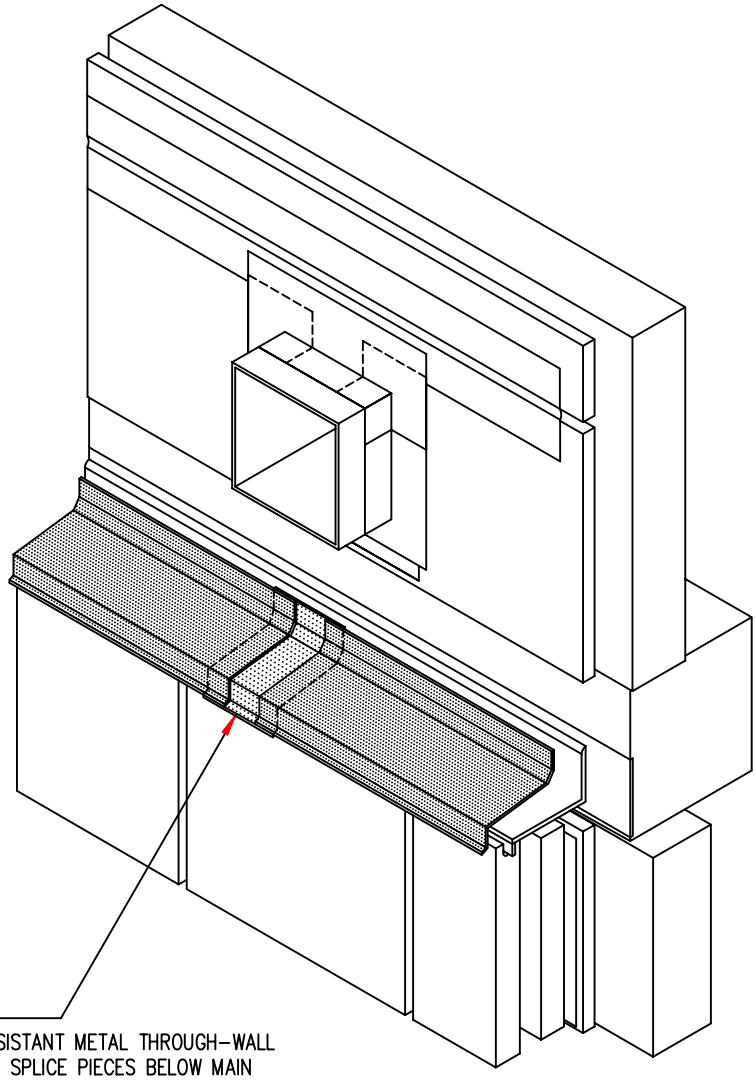
STONE VENEER SQUARE PENETRATION - STEP 8



STEP 9:
INSTALL CORROSION–RESISTANT METAL THROUGH–WALL FLASHING. INSTALL ALL SPLICE PIECES BELOW MAIN FLASHING (AS SHOWN) WITH SUFFICIENT GAP TO ALLOW FOR CONTRACTION AND EXPANSION OF THE FLASHING MATERIAL. THE THROUGH–WALL FLASHING MATERIAL SHOWN ON THIS AND SIMILAR EXTERIOR WALL DETAILS AND ASSEMBLIES MUST INCLUDE FULLY SEALED, WATER–TIGHT END–DAMS AT ALL EXTERIOR WALL PENETRATION AND FLASHING TERMINATIONS AS NECESSARY TO COLLECT AND DRAIN RAINWATER AND/OR CONDENSATION TO THE BUILDING EXTERIOR.

NOTE: THE PRESENCE OF A CONTINUOUS RELIEVING ANGLE AND FLASHING AS SHOWN IS NOT REPRESENTATIVE OF TYPICAL STONE VENEER CONSTRUCTION, AND IS INTENDED TO CONVEY THE IMPORTANCE OF DESIGNING AN ANCHORING SYSTEM THAT MINIMIZES OR ELIMINATES THE NEED FOR PENETRATIONS THROUGH THE FLASHING IN CAVITY–TYPE EXTERIOR WALL CONSTRUCTION.

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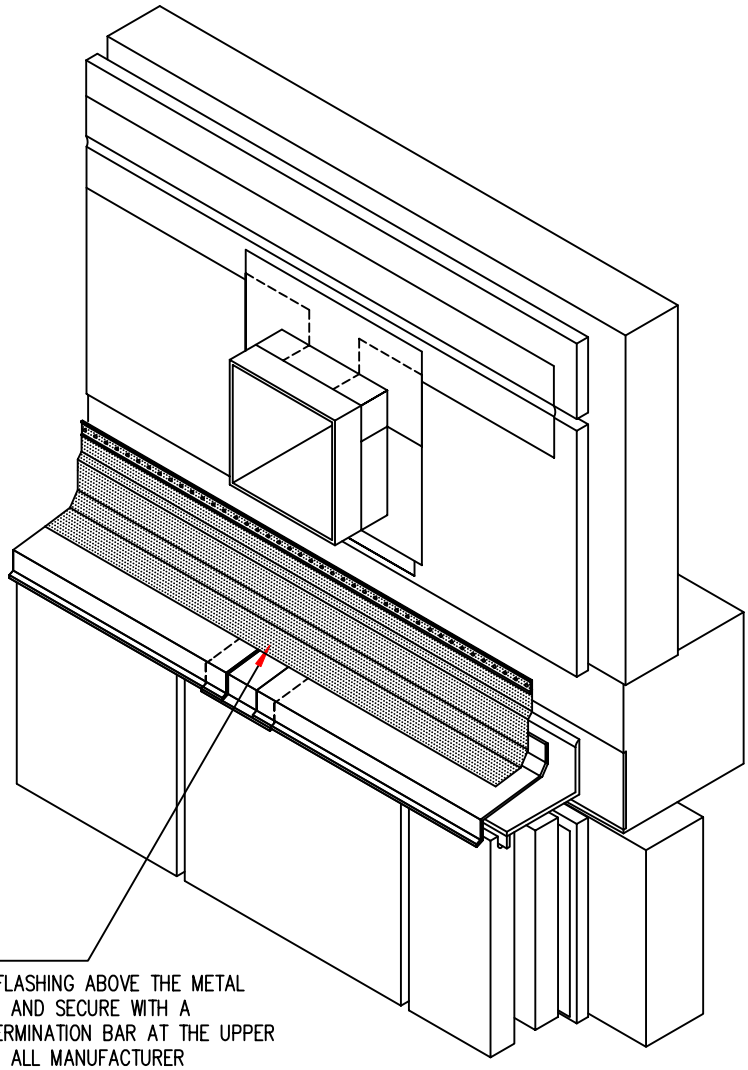
STONE VENEER SQUARE PENETRATION - STEP 9



STEP 10:
INSTALL THE MEMBRANE FLASHING ABOVE THE METAL THROUGH–WALL FLASHING AND SECURE WITH A CONTINUOUSLY SEALED TERMINATION BAR AT THE UPPER EDGE. INSTALL FOLLOWING ALL MANUFACTURER GUIDELINES. CARRY ONTO THROUGH–WALL FLASHING PER THE MANUFACTURERS MINIMUM DISTANCE PLUS 1–INCH AND SECURE PER MANUFACTURER REQUIREMENTS. TREAT ALL JOINTS AND EDGES PER MANUFACTURER REQUIREMENTS (MASTIC OR OTHER REQUIRED PRODUCT) AND OVERLAP ALL JOINTS A MINIMUM OF 2–INCHES MORE THAN THAT REQUIRED BY THE MANUFACTURER.

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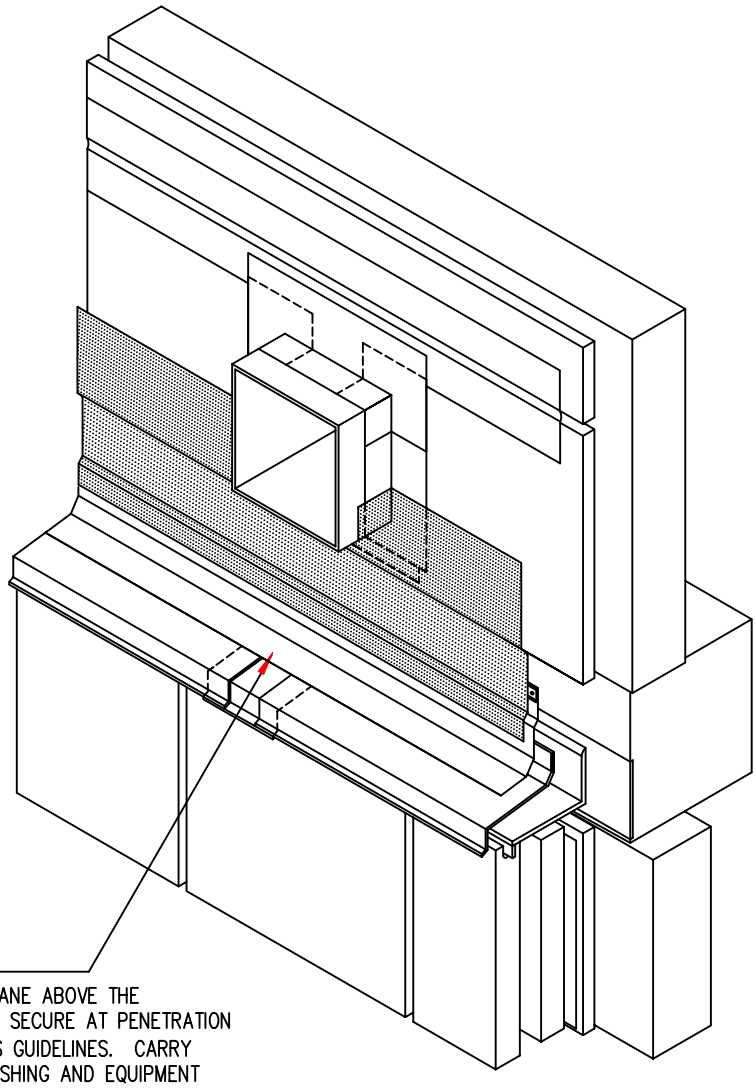
STONE VENEER SQUARE PENETRATION - STEP 10



STEP 11:
INSTALL THE WALL MEMBRANE ABOVE THE THROUGH–WALL FLASHING, SECURE AT PENETRATION PER THE MANUFACTURER'S GUIDELINES. CARRY ONTO THROUGH–WALL FLASHING AND EQUIPMENT OR EQUIPMENT SLEEVE PER THE MANUFACTURERS MINIMUM DISTANCE PLUS 1–INCH AND SECURE PER MANUFACTURER REQUIREMENTS.

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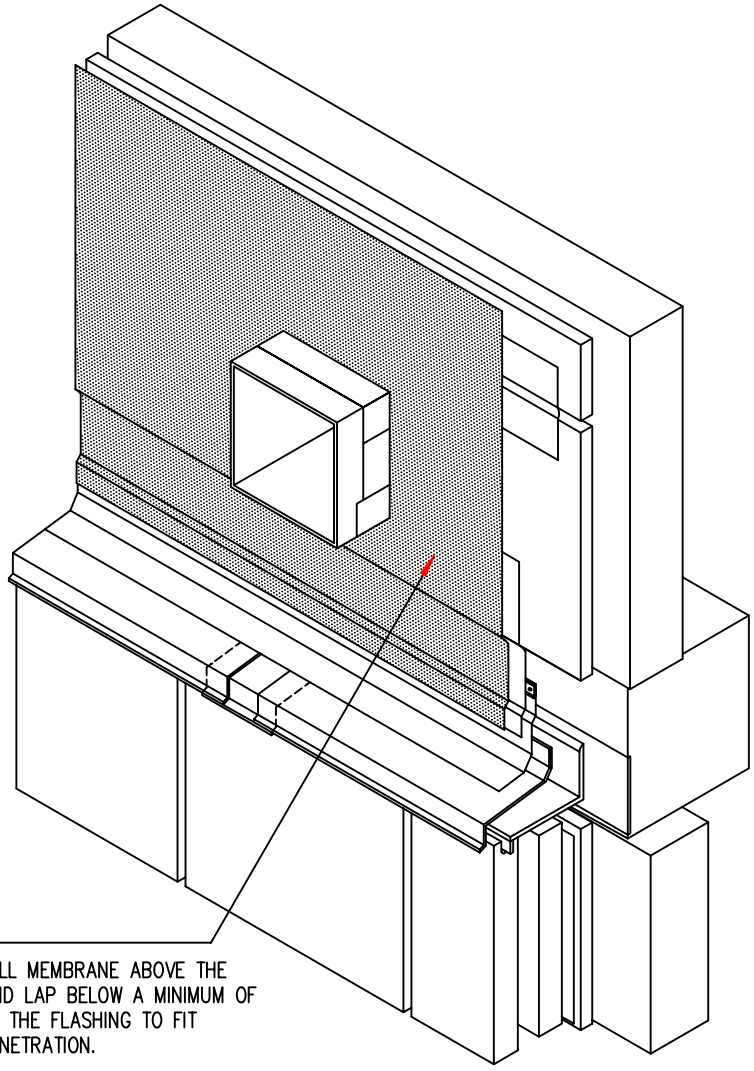
STONE VENEER SQUARE PENETRATION - STEP 11



STEP 12:
INSTALL THE WALL MEMBRANE ABOVE THE PENETRATION AND LAP BELOW A MINIMUM OF 3–INCHES. CUT THE FLASHING TO FIT AROUND THE PENETRATION.

NOTE: ENSURE ALL SHEATHING/CONCRETE/CMU SURFACES ARE PROPERLY PREPARED AND PRIMED IN ACCORDANCE WITH THE MANUFACTURER REQUIREMENTS PRIOR TO INSTALLING THE WALL DRAINAGE PLANE PRODUCT. DETAIL THE DRAINAGE PLANE PRODUCT TO PREVENT WATER INFILTRATION AT THE STONE VENEER ANCHORS AND OTHER PENETRATIONS. THE VARIOUS PRODUCTS THAT CAN BE USED FOR THE DRAINAGE PLANE MATERIAL HAVE A WIDE RANGE OF AIR AND VAPOR PERMEANCE VALUES; SEE THE TABLES AND THE GENERAL SECTION CONTAINED WITHIN THE WALL PORTION OF THE WBDG FOR MORE SPECIFIC INFORMATION WITH REGARDS TO VAPOR RETARDERS AND AIR BARRIERS.

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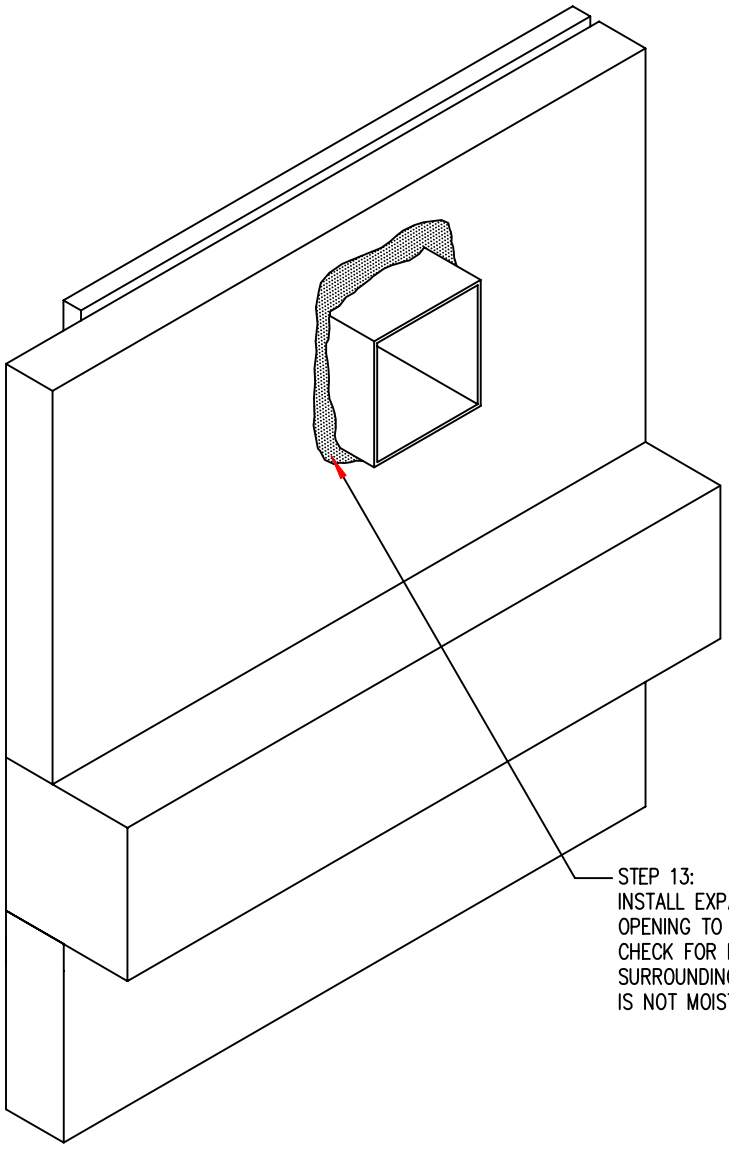
STONE VENEER SQUARE PENETRATION - STEP 12



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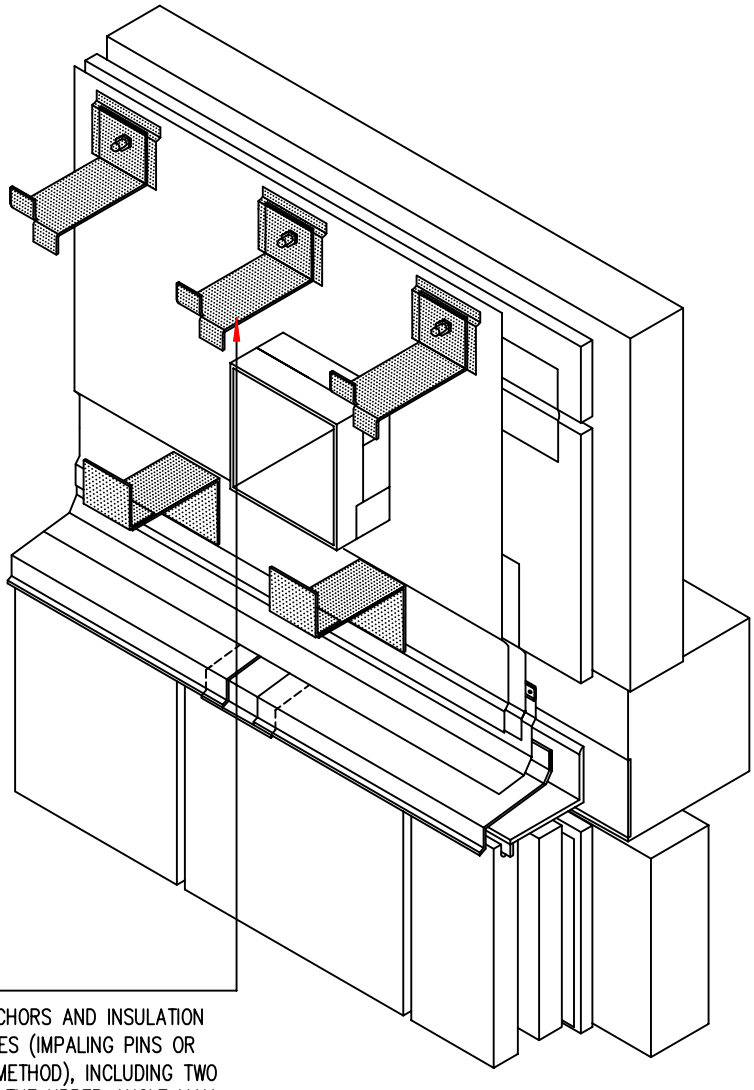

STEP 14:
INSTALL STONE ANCHORS AND INSULATION SECUREMENT DEVICES (IMPALING PINS OR OTHER APPROVED METHOD), INCLUDING TWO REVERSE ANGLES. THE UPPER ANGLE MAY BE SECURED TO THE STONE FIRST. BOLTED CONNECTIONS ARE TYPICALLY USED.

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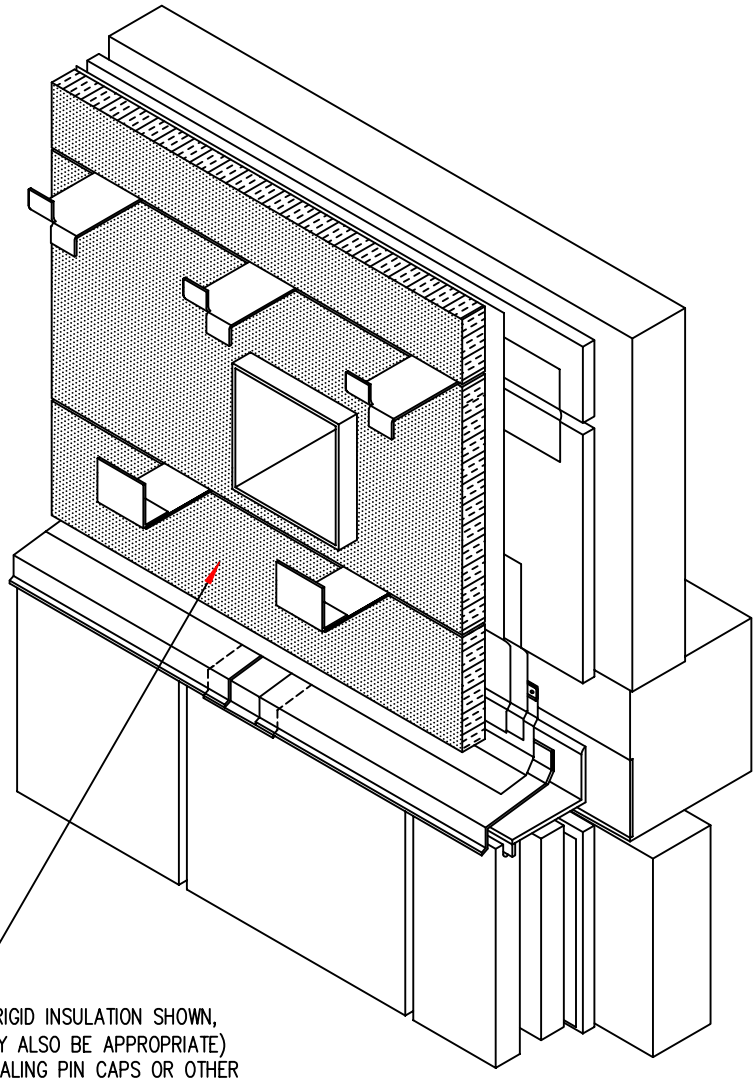

STEP 15:
INSTALL THE INSULATION (RIGID INSULATION SHOWN, SEMI-RIGID INSULATION MAY ALSO BE APPROPRIATE) AND SECURE WITH THE IMPALING PIN CAPS OR OTHER APPROVED METHOD, MAKING SURE ALL SHARP ENDS ARE CUT. SOME IMPALING PIN PRODUCTS ELIMINATE THE SHARP END CONCERN. SOME FOAM-APPLIED AND OTHER INSULATION PRODUCTS MAY BE APPROPRIATE FOR USE IN THE DRAINAGE CAVITY. CHECK WITH THE MANUFACTURER TO DETERMINE THE APPROPRIATENESS OF THE PRODUCT FOR USE WITHIN THE WET ZONE OF THE ASSEMBLY. INSULATING OUTBOUND OF THE BACK-UP WALL WITH THE FULL R-VALUE OF THE WALL IS MUCH MORE THERMALLY EFFICIENT.

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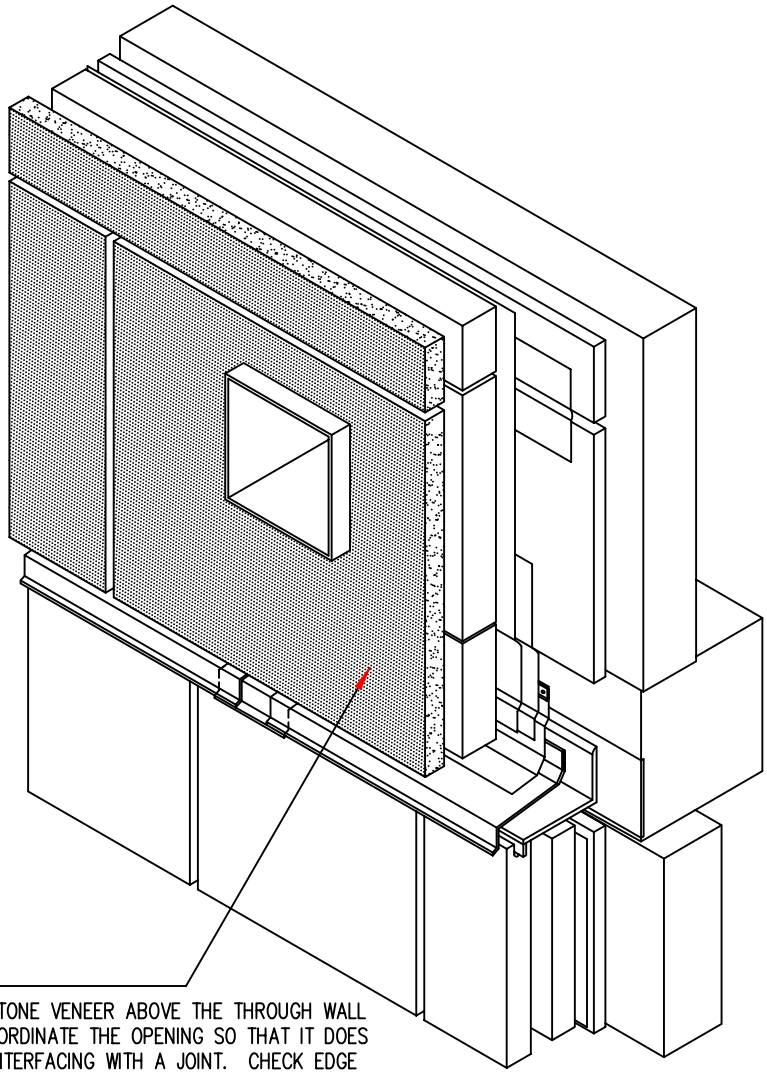

STEP 16:
INSTALL THE STONE VENEER ABOVE THE THROUGH WALL FLASHING. COORDINATE THE OPENING SO THAT IT DOES NOT END UP INTERFACING WITH A JOINT. CHECK EDGE DISTANCE ON THE STONE TO ENSURE SUFFICIENT MATERIAL REMAINS. PROVIDE ALLOWANCE FOR THERMAL MOVEMENT OF THE STONE BOTH VERTICALLY AND HORIZONTALLY.

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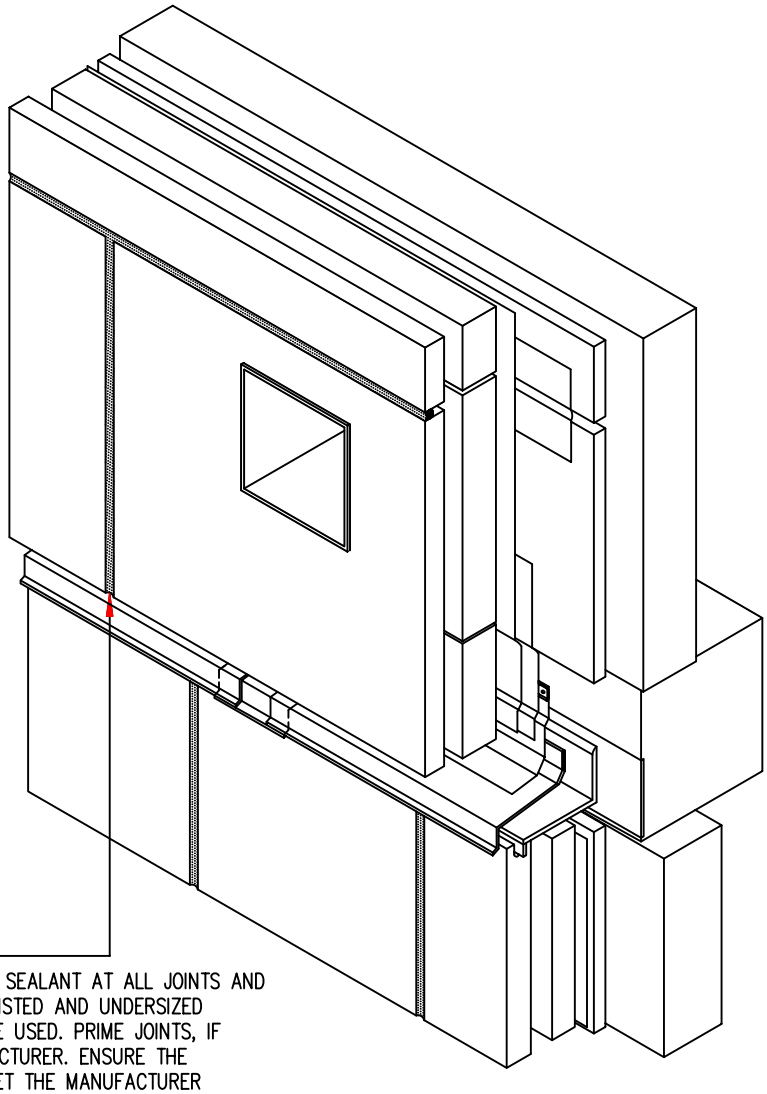

STEP 17:
INSTALL BACKER ROD AND SEALANT AT ALL JOINTS AND AT THE PENETRATION. TWISTED AND UNDERSIZED BACKER ROD MUST NOT BE USED. PRIME JOINTS, IF REQUIRED BY THE MANUFACTURER. ENSURE THE SEALANT PROFILE WILL MEET THE MANUFACTURER REQUIREMENTS. THE JOINT AT THE FLASHING WILL REQUIRE WEEP HOLES, APPROXIMATELY EVERY 2–FEET. VENTED WEEPS MAY BE USED AT VERTICAL STONE JOINTS. ALTERNATIVELY, THE JOINT CAN BE LEFT OPEN. ENSURE ANY UV SENSITIVE MEMBRANE MATERIAL IS BACK FAR ENOUGH TO NOT UV DEGRADE IF THE JOINT IS LEFT OPEN. ALL JOINT SEALANT IN CONTACT WITH NATURAL STONE CLADDING SHALL BE TESTED PRIOR TO CONSTRUCTION FOR ADHESION, MOVEMENT CAPACITY, AND STAIN RESPONSE IN ACCORDANCE WITH APPLICABLE ASTM STANDARDS. CONDUCT FIELD PEEL–ADHESION TESTING OF INSTALLED JOINT SEALANT BY A QUALIFIED TECHNICAL REPRESENTATIVE OF THE SEALANT MANUFACTURER.

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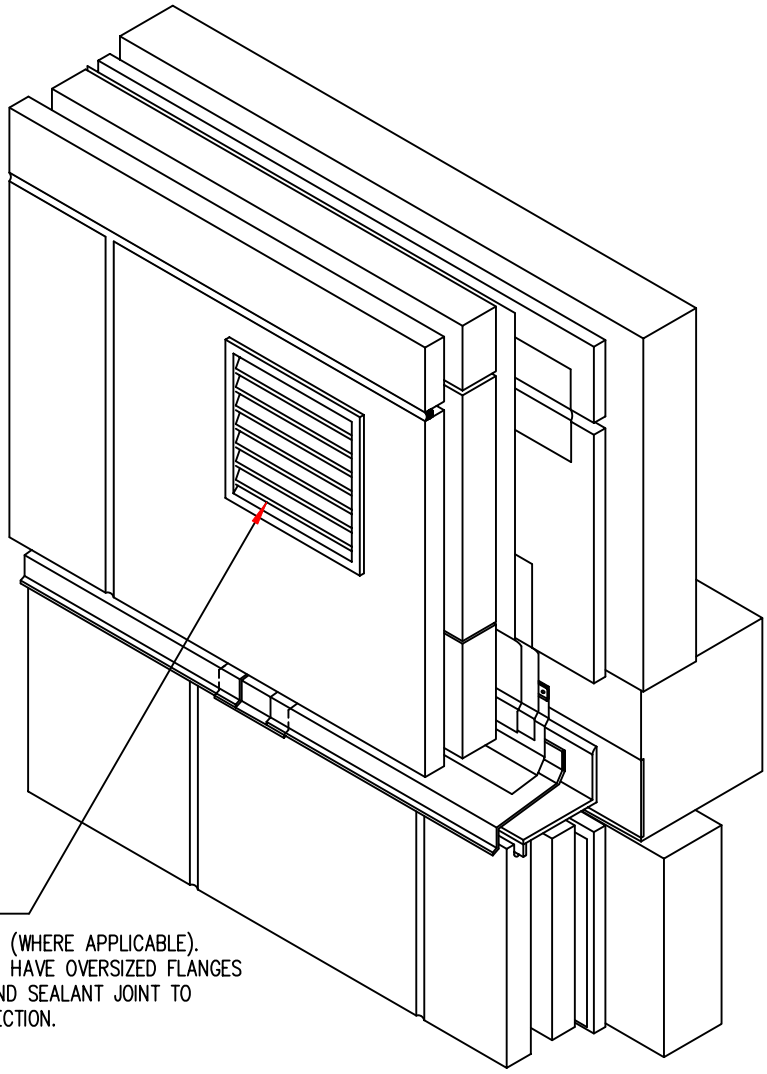

STEP 18:
INSTALL LOUVER OR COVER (WHERE APPLICABLE). COVER OR LOUVER SHOULD HAVE OVERSIZED FLANGES AT EDGE TO EXTEND BEYOND SEALANT JOINT TO PROVIDE ADDITIONAL PROTECTION.

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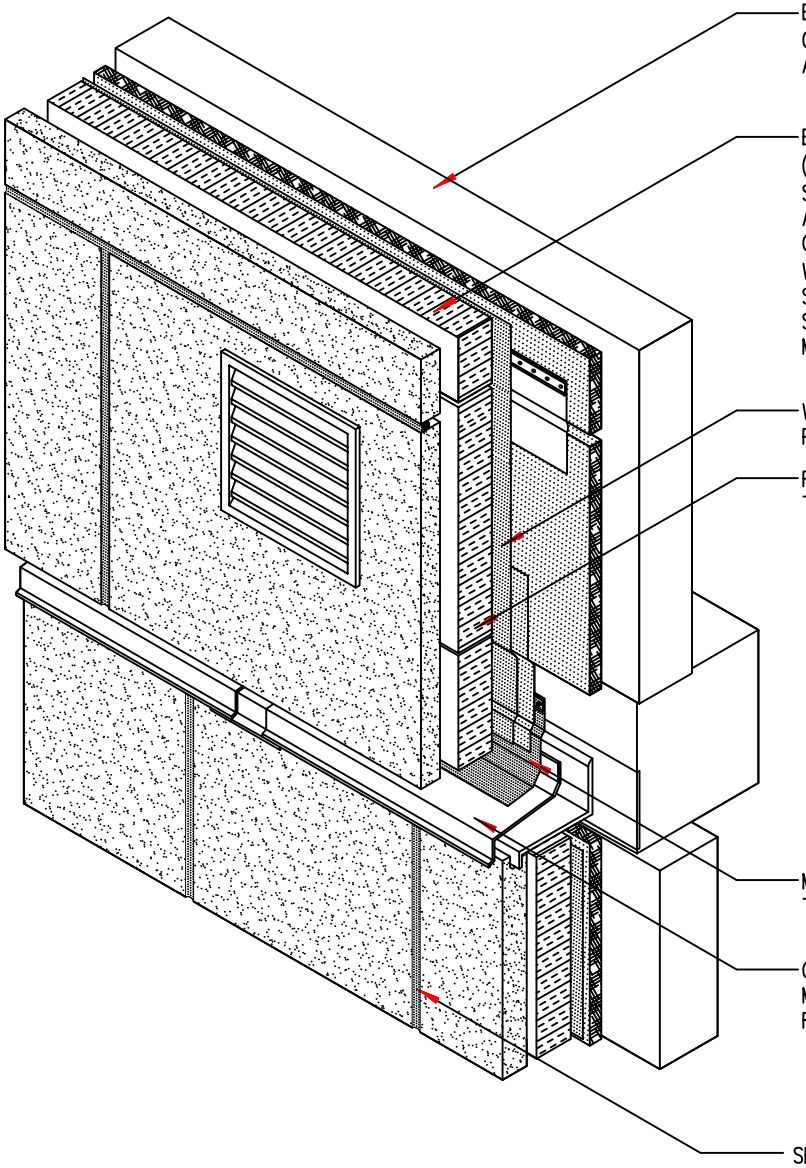

THIN STONE VENEER

NOTE: THE PRESENCE OF A CONTINUOUS RELIEVING ANGLE AND FLASHING AS SHOWN IS NOT REPRESENTATIVE OF TYPICAL STONE VENEER CONSTRUCTION, AND IS INTENDED TO CONVEY THE IMPORTANCE OF DESIGNING AN ANCHORING SYSTEM THAT MINIMIZES OR ELIMINATES THE NEED FOR PENETRATIONS THROUGH THE FLASHING IN CAVITY-TYPE EXTERIOR WALL CONSTRUCTION.

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STONE VENEER SQUARE PENETRATION - OVERALL DETAIL